



QUICK SELECTION GUIDE

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SOLENOID OPERATED DIRECTIONAL CONTROLS

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Solenoid Operated Directional Controls

2W2P, Normally Closed

	GPM	PSI	LPM	BAR	MODEL	PAGE
	5	3000	19	207	MA-S2A	10
	5	4000	19	276	HA-S2A	12
	8	3500	30	241	PB-S2A	14
	12	5000	45	350	HB-S2A	16
	15	3500	57	241	DE-S2A	18
	15	4000	57	276	HE-S2A	20
	25	3000	95	207	TT-S2A	22
	30	3500	114	241	SJ-S2A	24
	40	4350	151	300	HJ-S2A	26
	8	3500	30	241	PB-S2B	28
	12	5000	45	350	HB-S2B	30
	15	3500	57	241	DE-S2B	32
	15	4000	57	276	HE-S2B	34
	25	3000	95	207	TT-S2B	36
	25	5000	95	345	HT-S2B	38
	30	3500	114	241	SJ-S2B	40
	0.20	3000	76	207	MA-S2E	44
	3	3000	11	207	PB-S2I	46
	3	3000	11	207	DE-S2I	48
	12	5000	45	350	HB-S2L	50
	2.5	1500	9.5	103	MA-S2F	54
	6	2500	23	172	PB-S2F	56
	10	1000	38	69	DE-S2F	58
SOFT SEAT						
	1.5	3000	6	207	MA-S2G	64
	4	4000	15	276	HA-S2G	66
	8	3000	30	207	PB-S2G	68
	8	3000	30	207	DE-S2G	70
	15	4000	57	276	HE-S2G	72
	0.1	5000	38	350	HA-S2P	60

2W2P, Normally Open

	GPM	PSI	LPM	BAR	MODEL	PAGE
	5	3000	19	207	MA-S2C	76
	10	3500	38	241	PB-S2C	78
	12	5000	45	350	HB-S2C	80
	15	3500	57	241	DE-S2C	82
	30	3000	114	207	TT-S2C	84
	40	3000	151	207	SJ-S2C	86
	40	4350	151	300	HJ-S2C	88
	10	3500	38	241	PB-S2D	90
	12	5000	45	350	HB-S2D	92
	15	3500	57	241	DE-S2D	94
	30	3000	114	207	TT-S2D	96
	40	3000	151	207	SJ-S2D	98
	8	2000	30	138	PB-S2J	100
SOFT SEAT						
	3	3000	11	207	MA-S2H	104
	3	4000	11	276	HA-S2H	106
	5	3000	19	207	PB-S2H	108
	8	3000	30	207	DE-S2H	110
	8	4000	30	276	HE-S2H	112
	6	1000	23	70	IE-S2H	660

3W2P, Spool

	GPM	PSI	LPM	BAR	MODEL	PAGE
	1	3000	3.8	207	MC-S3A	116
	2	4000	8	276	HC-S3A	118
	3	3000	11	207	PP-S3A	120
	10	3000	38	207	DF-S3A	122
	10	4000	38	276	HF-S3A	124
	6	1000	23	70	IF-S3A	652
	6	1000	23	70	QF-S3A	642
	2.5	3000	9.5	207	PP-S3B	126
	8	3000	30	207	DF-S3B	128
	8	4000	30	276	HF-S3B	130
	3	3000	11	207	PP-S3D	132
	6	1000	23	70	IF-S3D	664
	6	1000	23	69	QF-S3D	654
	15	5000	57	345	HU-S3E	134
	15	5000	57	345	HU-S3F	136
	0.3	4000	1.13	276	HC-S3P	138
	4	1500	15	103	MC-S3T	140
	8	1500	30	103	DF-S3T	142
	3	3000	11	207	PP-S3X	144

4W2P, Spool

	GPM	PSI	LPM	BAR	MODEL	PAGE
	1	3000	4	207	MD-S4A	148
	1.5	4000	6	276	HD-S4A	150
	4	3000	15	207	PQ-S4A	152
	10	3000	38	207	DG-S4A	154
	10	4000	38	276	HG-S4A	156
	5	1000	19	70	QG-S4A	656
	5.28	1000	20	70	IG-S4A	666
	15	5000	57	345	HV-S4A	158
	1.5	3000	6	207	MD-S4B	160
	3	4000	11	276	HD-S4B	162
	4	3000	15	207	PQ-S4B	164
	10	3000	38	207	DG-S4B	166
	10	4000	38	276	HG-S4B	168
	4	3000	15	207	PQ-S4C	170
	8	3000	30	207	DG-S4C	172
	8	4000	30	276	HG-S4C	174
	2.5	3000	9	207	PQ-S4D	176
	6	3000	23	207	DG-S4D	178
	8	4000	30	276	HG-S4D	180
	6	3000	23	207	DG-S4E	182
	8	4000	30	276	HG-S4E	184
	15	5000	57	345	HV-S4E	186
	6	3000	23	207	DG-S4F	188
	6	4000	23	276	HG-S4F	190

4W3P, Motor Center

	GPM	PSI	LPM	BAR	MODEL	PAGE
	6	3000	23	207	PQ-S4M	194
	3	3000	11	207	VQ-S4M	196
	6	3000	23	207	DG-S4M	198

4W3P, Tandem Center

	GPM	PSI	LPM	BAR	MODEL	PAGE
	5	3000	19	207	PQ-S4N	200
	6	3000	23	207	DG-S4N	202
	3	3000	11	207	PQ-S4R	204
	2.5	3000	9.5	207	VQS4R	206

4W3P, Open Center

	GPM	PSI	LPM	BAR	MODEL	PAGE
	3	3000	11	207	PQ-S4O	208
	8	3000	30	207	DG-S4O	210
	5	3000	19	207	PQ-S4T	212

4W3P, Closed Center

	GPM	PSI	LPM	BAR	MODEL	PAGE
	8	3000	30	207	PQ-S4P	214
	8	3000	30	207	DG-S4P	216
	6	3000	23	207	PQ-S4Q	218
	3.5	3000	13.2	207	VQ-S4Q	220

4W3P, Scotch Center

	GPM	PSI	LPM	BAR	MODEL	PAGE
	6	3000	23	207	DG-S4S	222

Note: Model M* = (7) Series 5/8-18

Model P* = (8) Series 3/4-16

Model D* = (10) Series 7/8-14

Model T* = (12) Series 1 1/16-12

Model S* = (16) Series 1 5/16-12

Model H* = High Pressure Series

Model Q* = Special Series

All "Actual Test Data" curves are the result of a 3 pieces random sample from our production built product. These test were run at 100° F (38° C) and 150 SSU (32 cSt).

Highlighted Valves are New Additions to Catalog

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Mechanical Directional Controls

Direct Acting Check Valves

	GPM	PSI	LPM	BAR	MODEL	PAGE
	5	3500	19	241	MA-CVA	228
	10	4350	38	300	HB-CVA	230
	15	3500	57	241	DE-CVA	232
	15	5000	57	345	HE-CVA	234
	35	5000	132	345	HT-CVA	236
	40	3500	151	241	SJ-CVA	238
	10	3500	38	241	DE-CVB	240
	10	3500	38	241	PB-CVC	242
	8	3500	30	241	DE-CVC	244
	15	3500	57	241	DE-CVR	246
	35	5000	132	345	HT-CVR	248
	2.5	1500	9.5	103	MA-CVS	250
	5	3500	19	241	PB-CVS	252
	10	1000	38	69	DE-CVS	254

Pilot to Open Check Valves

	GPM	PSI	LPM	BAR	MODEL	PAGE
	6	3500	23	241	PP-CPB	258
	8	3500	30	241	DF-CPB	260
	10	3500	38	241	DF-CPC	262

Double Pilot Operated Check Valves

	GPM	PSI	LPM	BAR	MODEL	PAGE
	3	3000	11	207	MD-CDP	264
	5	3000	19	207	PQ-CDP	266
	8	3000	30	207	DG-CDP	268

Pilot to Close Check Valves

	GPM	PSI	LPM	BAR	MODEL	PAGE
	10	3500	38	241	DF-CPD	272
	20	3500	76	241	SL-CPD	274

Check Valves with Thermal Relief

	GPM	PSI	LPM	BAR	MODEL	PAGE
	15	4000	57	276	DE-CVT	278

Single, P.O. Check Valves (Pre-Engineered Blocks)

	GPM	PSI	LPM	BAR	MODEL	PAGE
	5	3000	19	207	MS-POC	554
	10	3000	38	207	PS-POC	556
	15	3000	57	207	DS-POC	558
	40	3500	151	241	SS-POC	560

Double, P.O. Check Valves (Pre-Engineered Blocks)

	GPM	PSI	LPM	BAR	MODEL	PAGE
	5	3500	19	241	MD-POC	562
	10	3500	38	241	PD-POC	564
	15	3500	57	241	DD-POC	566
	40	3500	151	241	SD-POC	568
	15	4000	57	276	DD-POT	570

2W2P Manual Valves

	GPM	PSI	LPM	BAR	MODEL	PAGE
	12	3500	45	241	PB-MCA	282
	15	3500	57	241	DE-MCA	284
	20	1500	76	103	DE-MCF	286
	20	3500	76	241	DE-MCS	288
	20	3500	76	241	DE-MCB	290
	8	3500	30	241	PB-MCI	292
	8	3500	30	241	PB-MCL	294
	15	3500	57	241	DE-MCL	296
	20	3000	76	207	DE-M2G	298
	1	4000	4	276	HB-MCP	300

3W2P Manual Valves

	GPM	PSI	LPM	BAR	MODEL	PAGE
	12	3000	45	207	DF-M3A	304

4W2P Manual Valves

	GPM	PSI	LPM	BAR	MODEL	PAGE
	10	3000	38	207	DG-M4A	308
	15	3000	57	207	DG-M4B	310
	12	3000	45	207	DG-M4C	312

Pilot to Shift Valves

	GPM	PSI	LPM	BAR	MODEL	PAGE
	40	3500	151	241	SO-PTS	316
	40	3500	151	241	SO-PTT	318

Shuttle Valves

	GPM	PSI	LPM	BAR	MODEL	PAGE
	6	3500	23	241	PP-CSB	322
	8	3500	30	241	DF-CSB	324

Rotary Valves

	GPM	PSI	LPM	BAR	MODEL	PAGE
	40	3000	151	207	SJ-MRA	328

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Pressure Controls

Direct Acting Relief Valves

	GPM	PSI	LPM	BAR	MODEL	PAGE
	12	3500	45	241	DE-RCA	334
	5	3000	19	207	MA-RVA	336
	6	3500	23	241	PB-RVA	338
	8	4000	30	276	DE-RVA	340
	6	3500	23	241	PB-RWA	342
	8	4000	30	276	DE-RWA	344

Differential Area Relief Valves

	GPM	PSI	LPM	BAR	MODEL	PAGE
	15	3500	57	241	DE-RCD	346
	8	3500	30	241	PB-RVD	348
	15	4000	57	276	DE-RVD	350
	40	5000	151	350	HE-RVD	352
	8	3500	30	241	PB-RWD	354
	15	4000	57	276	DE-RWD	356

Pilot Operated Relief Valves

	GPM	PSI	LPM	BAR	MODEL	PAGE
	20	4000	76	276	DE-RVP	360
	20	5000	76	350	HT-RVP	362
	15	4000	57	276	DE-RVR	364
	40	3500	151	241	SJ-RVR	366
	15	4000	57	276	DE-RWP	368
	40	5000	151	350	HE-RWP	370
	15	4000	57	276	DE-RWR	372

Crossover Relief Valves

	GPM	PSI	LPM	BAR	MODEL	PAGE
	15	4000	57	276	DE-RVB	376
	15	4000	57	276	DE-RVC	378

Pressure Compensated Regulator Valves

	GPM	PSI	LPM	BAR	MODEL	PAGE
	40	3500	151	241	TR-PCA	382
	40	3500	151	241	SL-PCA	384
	10	3500	38	241	DG-PCB	386
	40	3500	151	241	SL-PCB	388
	8	3000	30	207	PP-PCC	390
	20	3500	76	241	TR-PCC	392
	10	3500	38	241	DF-PCE	394
	40	3500	151	241	SL-PCE	396
	10	3500	38	241	DF-PCR	398
	10	3500	38	241	DF-PCS	400
	10	3500	38	241	DF-PCT	402

Pressure Reducing/Relieving Valves

	GPM	PSI	LPM	BAR	MODEL	PAGE
	10	3000	38	207	DF-PRP	406
	20	3000	76	207	SK-PRP	408
	10	4000	38	276	DF-PWP	410

Sequence Valves

	GPM	PSI	LPM	BAR	MODEL	PAGE
	10	3000	38	207	DG-PSA	414
	10	3000	38	207	DG-PSC	416
	10	3000	38	207	DG-PSI	418
	10	3000	38	207	DG-PSO	420
	12	3000	45	207	DG-PSS	422
	10	3000	38	207	DG-PTC	424
	10	3000	38	207	DG-PTO	426
	10	3000	38	207	DF-PWE	428
	8	3000	30	207	DF-PWI	430
	40	3500	151	241	SL-PWA	432
	40	3500	151	241	SL-PWB	434

Shut Down Valves

	GPM	PSI	LPM	BAR	MODEL	PAGE
	15	4500	57	310	DE-PSD	438

Unloading Valves

	GPM	PSI	LPM	BAR	MODEL	PAGE
	1	4000	3.8	276	DF-PUV	442

Note: Aluminum bodies NOT durability rated for 4000 PSI (276 bar).
Consult factory for body options.

Flow Controls

Flow Restrictors, Adjustable (Needle Valves)

	GPM	PSI	LPM	BAR	MODEL	PAGE
	12	3500	45	241	DE-FCH	448
	6	3500	23	241	MA-NVA	450
	6	3500	23	241	PB-NVA	452
	10	3500	38	241	DE-NVA	454
	35	5000	132	350	HT-NVA	456
	40	3500	151	241	SJ-NVA	458
	3	3500	11	241	PB-NVB	460
	15	3500	57	241	DE-NVB	462

Pressure Compensated Flow Regulator Valves

	GPM	PSI	LPM	BAR	MODEL	PAGE
	3	3000	11	207	MA-FCA	466
	4	3500	15	241	PB-FCA	468
	8	3500	30	241	DE-FCA	470
	20	5000	76	345	HT-FCA	472
	25	3500	95	241	SJ-FCA	474
	8	3500	30	241	DE-FCB	476
	8	3500	30	241	DE-FCC	478
	8	3500	30	241	DE-FCF	480

Priority Flow Regulator Valves

	GPM	PSI	LPM	BAR	MODEL	PAGE
	10	3000	38	207	DF-FCP	484
	10	3000	38	207	DF-FCQ	486
	25	3000	95	207	SK-FCQ	488

Velocity Fuses

	GPM	PSI	LPM	BAR	MODEL	PAGE
	10	3500	38	241	DE-CVF	492

Flow Divider/Combiner Valves

	GPM	PSI	LPM	BAR	MODEL	PAGE
	12	3500	45	241	DG-FDA	496
	40	3500	151	241	SN-FDA	498
	12	3500	45	241	DG-FDB	500
	12	3500	45	241	DG-FDH	502
	12	3500	45	241	DG-FDT	504

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Proportional Controls

2W Normally Closed Proportional Flow Regulator Valves

Spool Type	GPM	PSI	LPM	BAR	MODEL	PAGE
	5.8	3500	22	245	EE-P2G-A	512
	13.2	3500	50	245	EE-P2G-B	512
	13.2	3500	50	245	EE-P2G-C	512
	6.5	3500	25	245	EB-P2A	514
	4	3500	15	245	EE-P2A-A	516
	8	3500	30	245	EE-P2A-B	516
	12	3500	45	245	EE-P2A-C	516
	17.2	3500	65	245	ET-P2A-A	518
	22.5	3500	85	245	ET-P2A-B	518
	29	3500	110	245	ET-P2A-C	518

2W Normally Open Proportional Flow Regulator Valves

Spool Type	GPM	PSI	LPM	BAR	MODEL	PAGE
	8	3500	30	245	EE-P2H	522

Direct Acting Proportional Pressure Reducing / Relieving Valves

Direct Acting	GPM	PSI	LPM	BAR	MODEL	PAGE
	1	5000	3.8	350	IP-DAR-43C-HJ	528
	1	700	3.8	50	IP-DAR-43C-L	528
	2	500	8	35	EC-PRV	530

Pilot Operated Proportional Pressure Reducing / Relieving Valves

Pilot Operated	GPM	PSI	LPM	BAR	MODEL	PAGE
	7.9	700	30	50	IP-PRZ-59	532
	8	450	30	31	EG-PRZ	534
	30	450	114	28	ES-PRZ	536

Proportional Pressure Relief Valves

Direct Acting	GPM	PSI	LPM	BAR	MODEL	PAGE
	12	3000	45	207	EE-PRD	540

Logic Elements

Logic Elements

	GPM	PSI	LPM	BAR	MODEL	PAGE
	40	3500	151	241	SL-PLA	546
	40	3500	151	241	SL-PLB	548
	40	3500	151	241	SL-PLC	550

Special Valves

Counterbalance Valves

	GPM	PSI	LPM	BAR	MODEL	PAGE
	15	4000	57	276	QS-CBS	616

In-Line Valves (Checks, Velocity Fuse, Shuttle)

	GPM	PSI	LPM	BAR	MODEL	PAGE
	8	3000	30	207	IM-CVA	620
	6	3500	23	241	IM-CVF-11	622
	6	3000	23	207	IM-CVF-13	624
	10	3500	38	241	IM-CSB	626

Motorized Valves

	GPM	PSI	LPM	BAR	MODEL	PAGE
	10	3500	38	241	AE-NVA	630
	25	3500	95	241	AJ-FCA	632
	25	3500	95	241	AK-FCQ	634

Hand Pumps

	GPM	PSI	LPM	BAR	MODEL	PAGE
	--	500	--	34	DE-HPA	638
	--	3000	--	207	DE-HPB	640
	--	500	--	34	DE-HPC	642
	--	3000	--	138	DE-HPD	644

Selector Valves

	GPM	PSI	LPM	BAR	MODEL	PAGE
	25	3000	95	207	QS-MRS	648

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Pre-Engineered Circuits, Mizer Blocks

Block A

20200001

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8-15 gpm - 3500 psi

AA - Load holding,
solenoid operated

AB - Relief valve w/adj
pressure comp flow control

AC - Relief valve w/ fixed pressure
comp flow control

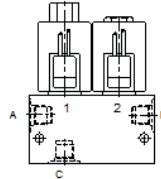
AD - Unloading w/ flow control

AE - Lift circuit w/ relief valve

AF - Relief valve w/ flow control

AG - Unloading w/ fixed pressure
comp flow control

AH - Speed control



Block B

20200002

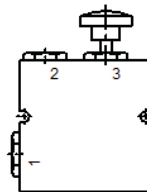
Page 574

12 gpm - 3500 psi

BA - Lift, check, and dump

BB - Start up circuit

BC - Lift, check, and dump



Block C

20200003

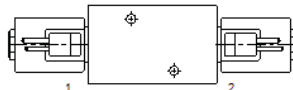
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7-15 gpm - 3000-4000 psi

CA - Dual relief

CB - Dump CC - Flow Divider

CD - Motor speed control CE - Selector



Block D

20200004

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7-20 gpm - 3000-4000 psi

DA - Normally closed poppet valve

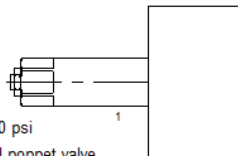
DB - Single relief valve

DC - Needle flow control

DD - Flow control w/ free flow check

DE - Normally open spool valve

DF - Crossover relief valve



Block E

20200005

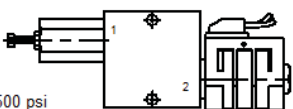
Page 580

8-12 gpm - 3500 psi

EA - Dual speed EB - Dual speed

EC - Pressure comp flow control
w/ check

ED - Dual speed EE - Dual speed



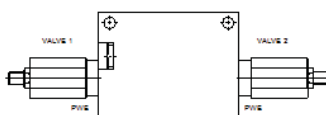
Block F

20200006

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9 gpm - 3000 psi

FA - Dual sequence w/ dual checks



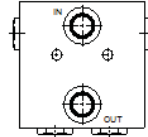
Block G

20200007

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15 gpm - 3500 psi

GA - Rectifier circuit



Block H

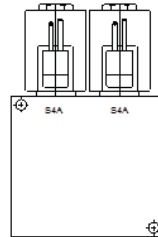
20200008

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8 gpm - 3000 psi

HA - 4 way 3 position open center

HB - 4 way 3 position closed center



Block I

20200009

Page 588

12 gpm - 3500 psi

IA - Dual 3 way

IB - Manual lift, check & dump

IC - Normally closed w/ relief

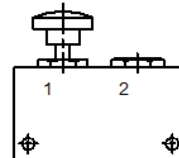
ID - Lift, check & dump

IE - Pump, check & relief

IF - Needle flow control w/ check

IG - Normally open w/ check

IH - Normally open w/ relief



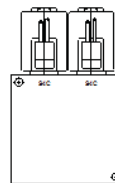
Block J

20200010

Page 590

8 gpm - 3000 psi

JA - 4 way 3 position tandem center



Block K

20200011

Page 592

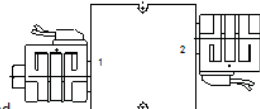
8-12 gpm - 3500 psi

KA - Dual normally closed

KB - Normally open w/ needle flow control

KC - Normally open w/ normally closed

KD - Normally closed w/ pressure comp
flow control



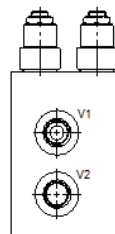
Block L

20200012

Page 594

15 gpm - 4000 psi

LA - Dual counterbalance



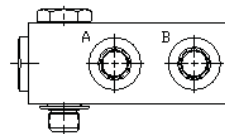
Block M

20200013

Page 596

12 gpm - 3500 psi

MA - Check, 4:1 ratio, banjo bolt



Block N

20200014

Page 598

7-15 gpm -
3000-3500 psi

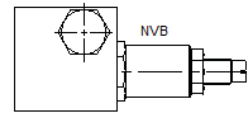
NA - Banjo bolt
velocity fuse

NB - Banjo bolt, normally closed 2 way

NC - Banjo bolt, flow control

ND - Banjo bolt, needle

NE - Banjo bolt, normally open 2 way



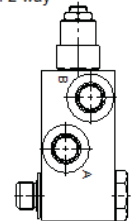
Block O

20200015

Page 600

12 gpm - 4000 psi

OA - Banjo bolt,
counterbalance



Block P

20200017

Page 602

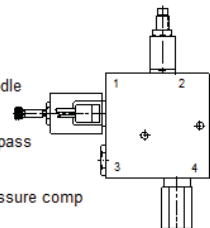
12 gpm - 3500 psi

PA - Lift circuit w/ needle
& relief valve

PB - Lift circuit w/ by-pass
& needle

PC - Lift circuit w/ pressure comp
& relief valve

PD - Lift circuit w/ pressure comp
& by-pass



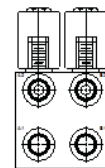
Block Q

20200018

Page 604

8 gpm - 3000 psi

QA - Dual 3 way 2 position selector



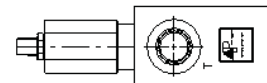
Block R

20200019

Page 606

20 gpm - 4000 psi

RA - In-line relief valve



Block S

20200020

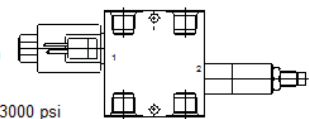
Page 608

20 gpm - 3000 psi

SA - Crossover relief

SB - Unloading relief

SC - Mower breakaway



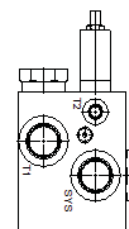
Block TA

20200021

Page 610

20 gpm - 3000 psi

TA - Pump unloading
circuit



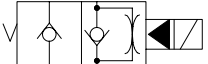
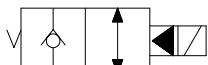
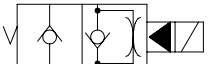

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.



SECTION/Description	Pages
2W2P Normally Closed Poppet Valves	9
2W2P Normally Closed Bi-Directional Valves	43
2W2P Normally Closed Spool Valves	63
2W2P Normally Open Poppet Valves	75
2W2P Normally Open Spool Valves	103
3W2P Spool Valves	115
4W2P Spool Valves	147
4W3P Spool Valves	193

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.


2 Way 2 Position Normally Closed Poppet Valves

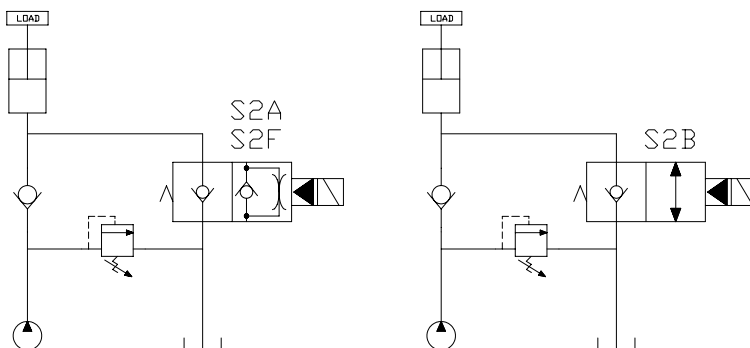
	GPM	PSI	LPM	BAR	MODEL	PAGE
	5	3000	19	207	MA-S2A	10
	5	4000	19	276	HA-S2A	12
	8	3500	30	241	PB-S2A	14
	12	5000	45	350	HB-S2A	16
	15	3500	57	241	DE-S2A	18
	15	4000	57	276	HE-S2A	20
	25	3000	95	207	TT-S2A	22
	30	3500	114	241	SJ-S2A	24
	40	4350	151	300	HJ-S2A	26
	8	3500	30	241	PB-S2B	28
	12	5000	45	350	HB-S2B	30
	15	3500	57	241	DE-S2B	32
	15	4000	57	276	HE-S2B	34
	25	3000	95	207	TT-S2B	36
	25	5000	95	345	HT-S2B	38
	30	3500	114	241	SJ-S2B	40
SOFT SEAT 	2.5	1500	9	103	MA-S2F	54
	6	2500	23	172	PB-S2F	56
	10	1000	38	69	DE-S2F	58
	.10	5000	.38	350	HA-S2P	60

Typical Schematic

Typical application for the S2A is load holding and lowering in a Lift, Check and Dump circuit.

Typical application for the S2B is load holding and lowering when free flow in both directions is required to float the cylinder.

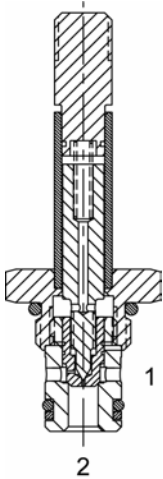
Typical application for the S2F is load holding and lowering of a cylinder in low pressure application where the soft seat gives better leakage control.



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MA-S2A Pilot Operated Poppet, 2 Way, Normally Closed



DESCRIPTION

7 size, 5/8-18 thread, "Mini" series, solenoid operated, 2 way normally closed, pilot operated poppet valve with reverse flow de-energized.

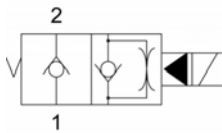
OPERATION

When de-energized the MA-S2A blocks flow from (1) to (2) and allows reverse flow from (2) to (1). When energized the valve allows flow from (1) to (2) and restricts flow from (2) to (1).

FEATURES

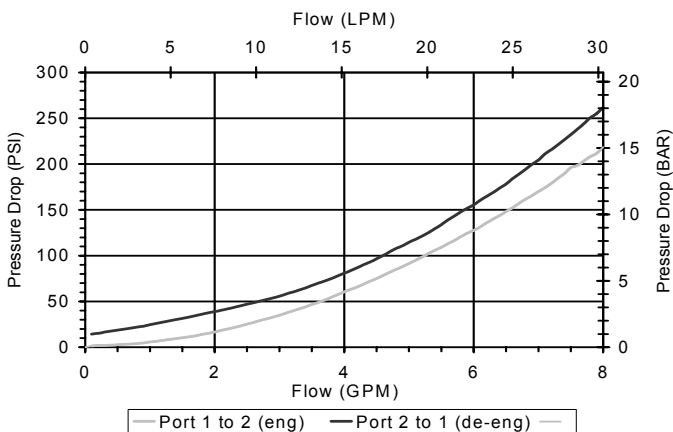
- Hardened parts for long life.
- Efficient wet-armature construction.
- Cartridges are voltage interchangeable.
- Industry common cavity.
- Unitized, molded coil design.
- Continuous duty rated solenoid.
- Optional coil voltages and terminations.

HYDRAULIC SYMBOL



PERFORMANCE

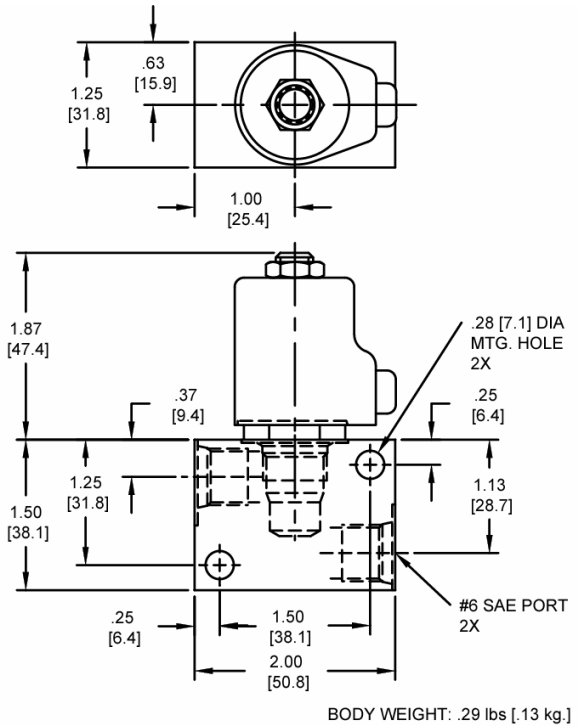
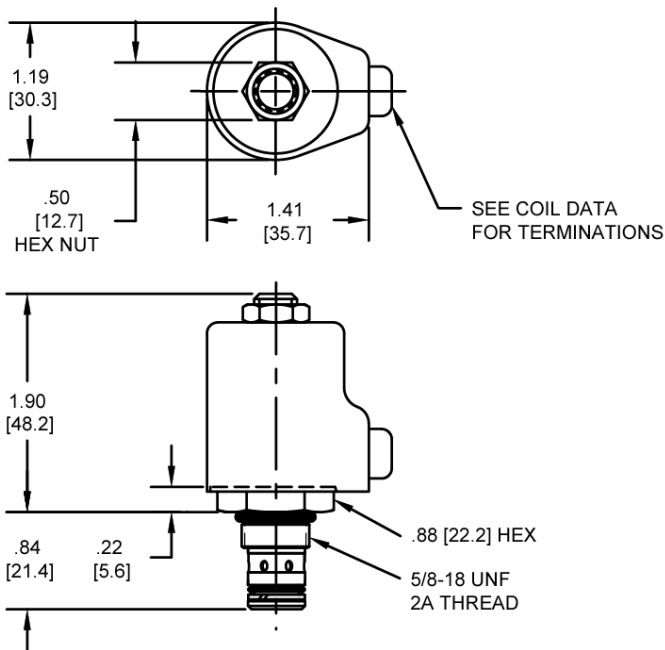
Actual Test Data (Cartridge Only)



VALVE SPECIFICATIONS

Nominal Flow	5 GPM (19 LPM)
Rated Operating Pressure	3000 PSI (207 bar)
Typical Internal Leakage (150 SSU)	0-5 drops/min
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temperature Range	-40° to 250° F (-40° to 120° C)
Weight	.13 lbs. (.06 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	15 ft-lbs (20.3 Nm)
Coil Nut Torque Requirements	3-5 ft-lbs (4.1-6.8 Nm)
Cavity	MINI 2V
Cavity Form Tool (Finishing)	40500003
Seal Kit (Buna)	21191000

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.


DIMENSIONS

ORDERING INFORMATION
MA-S2A -
OPTIONS

Buna Standard **00**
 Viton Standard **V0**
 Buna, Screen **A0**
 Viton, Screen **W0**

Note: Use screen only if flow direction is from (1) to (2).

"M" COIL TERMINATION

(All DC Except as Noted)

Double Lead **DL**
 Deutsch on Leads DT04-2P **DT**
 Metri-Pack on Leads **ML**
 Packard on Leads **PL**
 Weatherpack on Leads **WL**
 Single Spade **SS**
 Double Spade **DS**
 DIN 43650 (Hirschman) - (AC&DC) **HC**
 Conduit Lead - (AC Only) **CL**

Blank

N
S
BODIES

Without Body
 1/4 NPTF Ports
 #6 SAE Ports

VOLTAGE

06 6 VDC
12 12 VDC
24 24 VDC
36 36 VDC
48 48 VDC
25 24 VAC
11 120 VAC
22 220 VAC
44 440 VAC

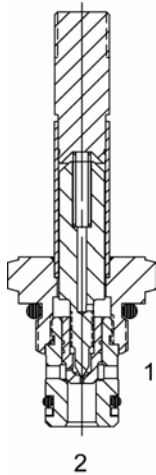
Approximate Coil Weight: .30 lbs. (.14 kg.)

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

Phone: (815) 397-6628

Fax: (815) 397-2526

 E-mail: delta@delta-power.com

**HA-S2A Pilot Operated Poppet, 2 Way, Normally Closed****DESCRIPTION**

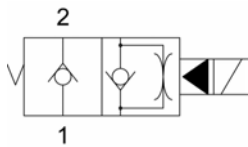
"High Pressure" 7 size, 5/8-18 thread, "Mini" series, solenoid operated, 2 way normally closed, pilot operated poppet valve with free reverse flow de-energized.

OPERATION

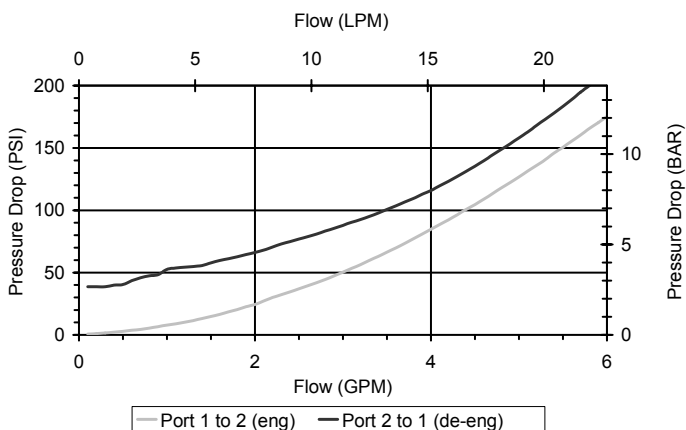
When de-energized the HA-S2A blocks flow from (1) to (2) and allows flow from (2) to (1). When energized the valve allows flow from (1) to (2) and restricts flow from (2) to (1).

FEATURES

- Hardened parts for long life.
- Efficient wet-armature construction.
- Cartridges are voltage interchangeable.
- Industry common cavity.
- Unitized, molded coil design (for most common termination, see coil page).
- Continuous duty rated solenoid.
- Optional coil voltages and terminations.

HYDRAULIC SYMBOL**PERFORMANCE**

Actual Test Data (Cartridge Only)

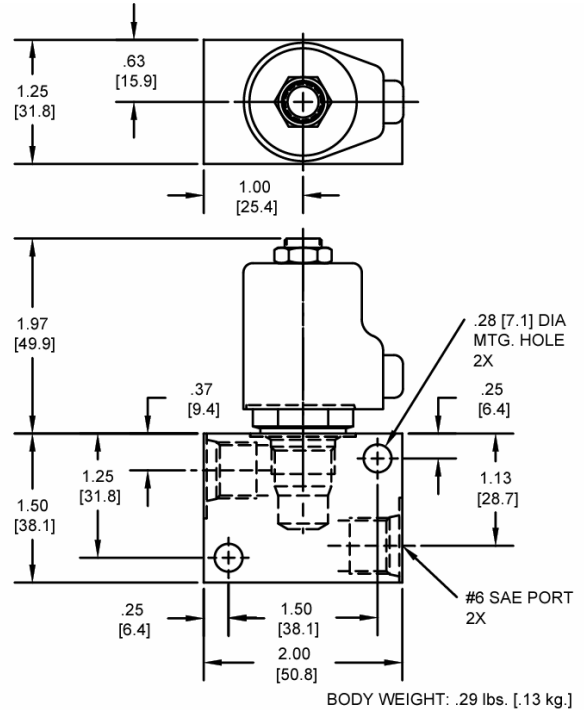
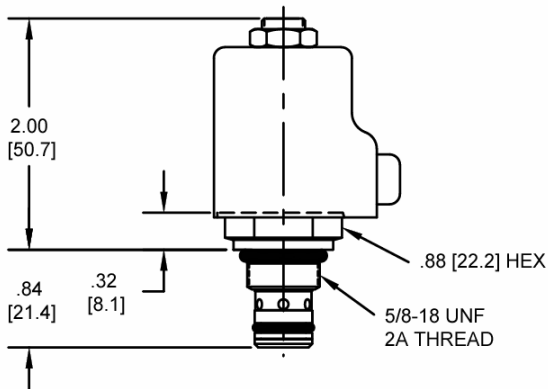
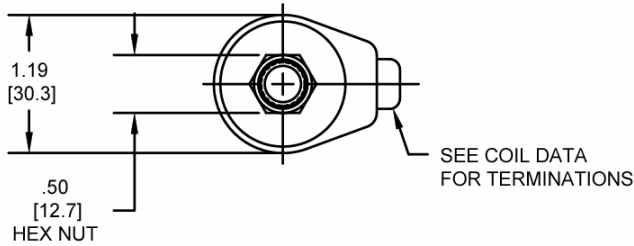
**VALVE SPECIFICATIONS**

Nominal Flow	5 GPM (19 LPM)
Rated Operating Pressure	4000 PSI (276 bar)
Typical Internal Leakage (150 SSU)	0-5 drops/min
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temperature Range	-40° to 250° F (-40° to 120° C)
Weight	.14 lbs. (.06 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	15 ft-lbs (20.3 Nm)
Coil Nut Torque Requirements	3-5 ft-lbs (4.1-6.8 Nm)
Cavity	MINI 2W
Cavity Form Tool (Finishing)	40500003
Seal Kit	21191000

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.



DIMENSIONS



ORDERING INFORMATION

HA-S2A -

OPTIONS

Buna Standard 00
Viton Standard V0

Blank N
S

BODIES

Without Body
1/4 NPTF Ports
#6 SAE Ports

Note: Aluminum, NOT durability rated for 4000 PSI. Consult factory for body options.

VOLTAGE

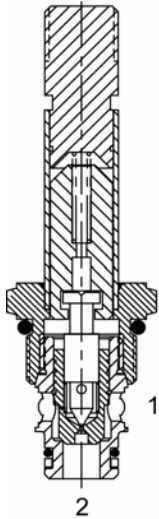
06 6 VDC
12 12 VDC
24 24 VDC
36 36 VDC
48 48 VDC
25 24 VAC
11 120 VAC
22 220 VAC
44 440 VAC

"M" COIL TERMINATION

Double Lead DL
Deutsch on Leads DT04-2P DT
Metri-Pack on Leads ML
Packard on Leads PL
Weatherpack on Leads WL
Single Spade SS
Double Spade DS
DIN 43650 (Hirschman) - (AC&DC) HC
Conduit Lead - (AC Only) CL

Approximate Coil Weight: .30 lbs/.14 kg.

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

**PB-S2A Pilot Operated Poppet, 2 Way, Normally Closed****DESCRIPTION**

8 size, 3/4-16 thread, "Power" series, solenoid operated, 2 way normally closed, pilot operated poppet valve with reverse flow de-energized.

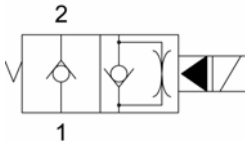
OPERATION

When de-energized the PB-S2A blocks flow from (1) to (2) and allows reverse flow from (2) to (1). When energized the valve allows flow from (1) to (2) and restricts flow from (2) to (1).

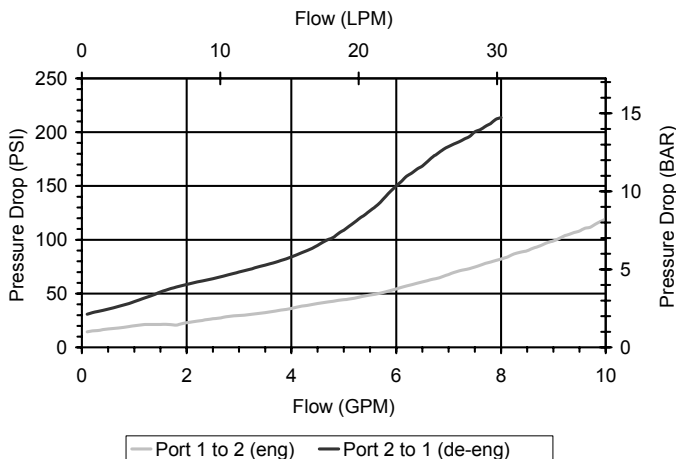
OPERATION OF MANUAL OVERRIDE OPTION: To override, pull knob out. On the detented version, after pulling knob out twist 180 degrees and release. The valve will remain in that position.

FEATURES

- Hardened parts for long life.
- Efficient wet-armature construction.
- Cartridges are voltage interchangeable.
- Manual override option.
- Industry common cavity.
- Unitized, molded coil design.
- Continuous duty rated solenoid.
- Optional coil voltages and terminations.
- Optional "I" Coil: Weatherproof, Thermal Shock, Immersion Safe.

HYDRAULIC SYMBOL**PERFORMANCE**

Actual Test Data (Cartridge Only)

**VALVE SPECIFICATIONS**

Nominal Flow	8 GPM (30 LPM)
Rated Operating Pressure	3500 PSI (241 bar)
Typical Internal Leakage (150 SSU)	0-5 drops/min
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temperature Range	-40° to 250° F (-40° to 120° C)
Weight	.20 lbs. (.09 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	25 ft-lbs (34 Nm)
Coil Nut Torque Requirements	4-6 ft-lbs (5.4-8.1 Nm)
Cavity	POWER 2W
Cavity Form Tool (Finishing)	40500005
Seal Kit	21191100

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

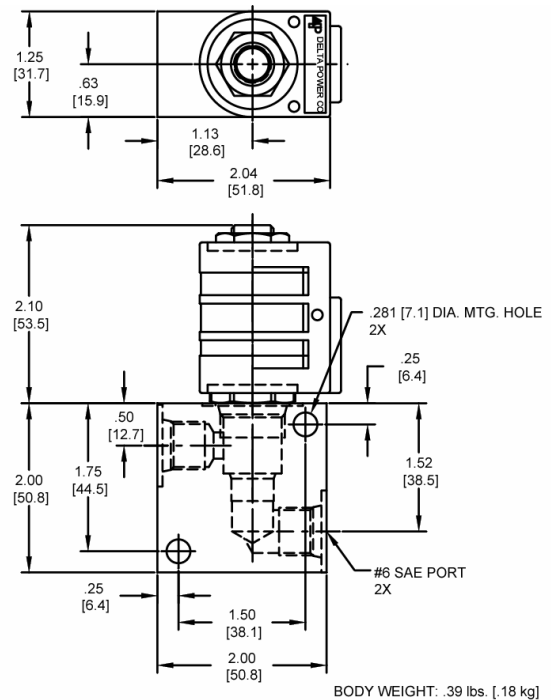
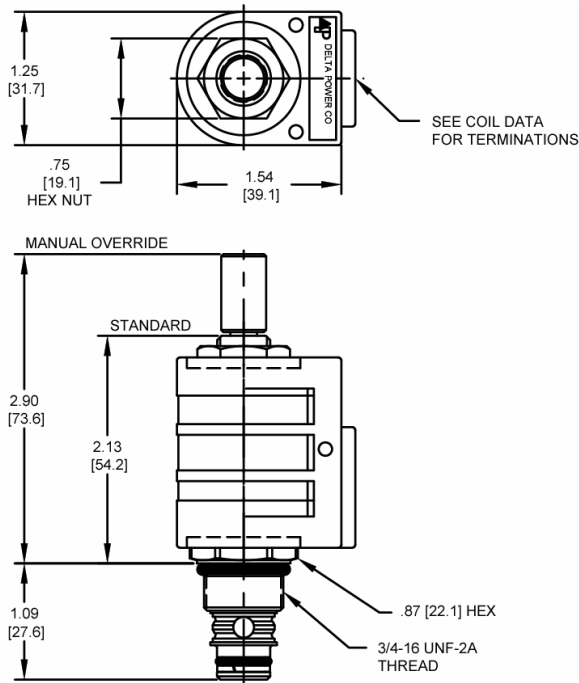
Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com



DIMENSIONS



ORDERING INFORMATION

PB-S2A

OPTIONS

Buna Standard	00
Viton Standard	V0
Buna, Override, Detent	0M
Viton, Override, Detent	VM
Buna, Screen	A0
Viton, Screen	W0
Buna, Override, Nondetent	B1
Viton, Override, Nondetent	V1
Buna, Screen, Override, Nondetent	B3
Viton, Screen, Override, Nondetent	V3
Buna, Screen, Override, Detent	B4
Viton, Screen, Override, Detent	V4

Note: Use screen only if flow direction is from (1) to (2).

"P" COIL TERMINATION

(All DC Except as Noted)

DL	Double Lead
DT	Deutsch on Leads DT04-2P
ML	Metri-Pack on Leads
PL	Packard on Leads
WL	Weatherpack on Leads

SS	Single Spade
DS	Double Spade
HC	DIN 43650 (Hirschman) – (AC & DC)
CL	Conduit Lead – (AC Only)
DI	Deutsch – Integral DT04-2P

Blank
N
S

BODIES

Without Body
1/4 NPTF Ports
#6 SAE Ports

VOLTAGE

06	6 VDC
12	12 VDC
24	24 VDC
36	36 VDC
48	48 VDC
25	24 VAC
11	120 VAC
22	220 VAC
44	440 VAC

IMMERSION PROOF "P" TYPE

IA	"I" Coil AMP Superseal - Integral
ID	"I" Coil Deutsch – Integral DT04-2P
IJ	"I" Coil AMP Jr. Timer - Integral
IM	"I" Coil Metri-Pack – Integral

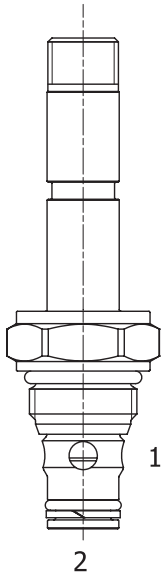
Approximate Coil Weight: .42 lbs (.19 kg.)

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com


HB-S2A Pilot Operated Poppet, 2 Way Normally Closed

DESCRIPTION

8 size, 3/4-16 thread, "Power" series, solenoid operated, 2 way normally closed, pilot operated poppet valve with reverse flow de-energized.

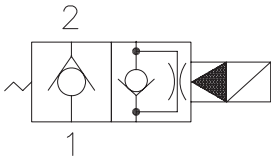
OPERATION

When de-energized the HB-S2A blocks flow from (1) to (2) and allows reverse flow from (2) to (1). When energized the valve allows flow from (1) to (2) and restricts flow from (2) to (1).

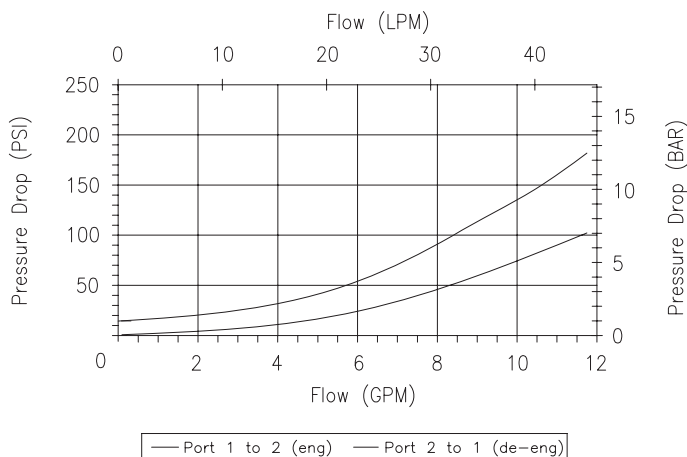
MANUAL OVERRIDE OPTION: to override, turn the manual override screw counter-clockwise. To release, turn the manual override screw clockwise.

FEATURES

- Hardened parts for long life.
- Efficient wet-armature construction.
- Cartridges are voltage interchangeable.
- Manual override option.
- Industry common cavity.
- Unitized, molded coil design.
- Continuous duty rated solenoid.
- Optional coil voltages and terminations.

HYDRAULIC SYMBOL

PERFORMANCE

Actual Test Data (Cartridge Only)


VALVE SPECIFICATIONS

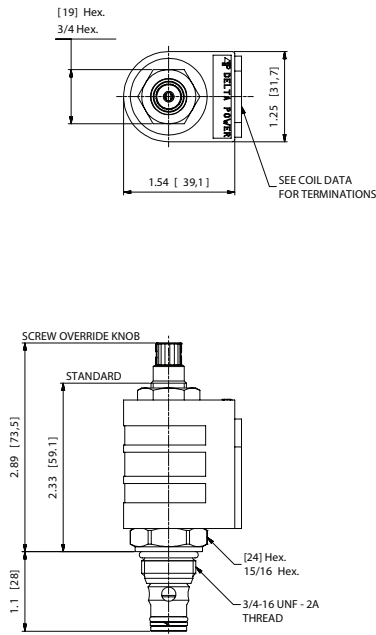
Nominal Flow	12 GPM (45 LPM)
Rated Operating Pressure	5000 PSI (350 bar)
Typical Internal Leakage (150 SSU)	0-5 drops/min at 5000 PSI (350 bar)
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temperature Range	-40° to 210° F (-40° to 100° C) BUNA seals -4° to 250° F (-20° to 120° C) VITON seals
Weight	.29 lbs. (.13 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	35 ft-lbs (47 Nm)
Coil Nut Torque Requirements	4-6 ft-lbs (5.4-8.1 Nm)
Cavity	POWER 2W
Cavity Tools kit	40500005
Seal Kit	21191100

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

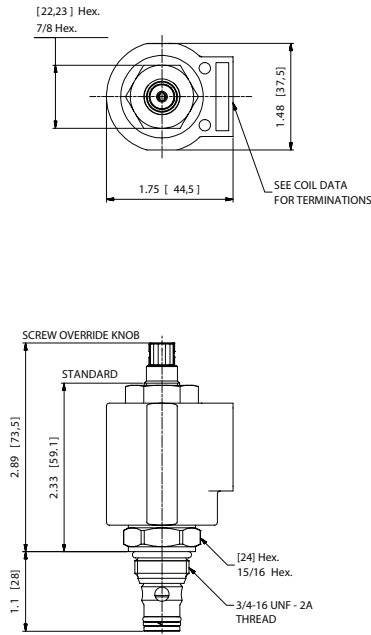


DIMENSIONS

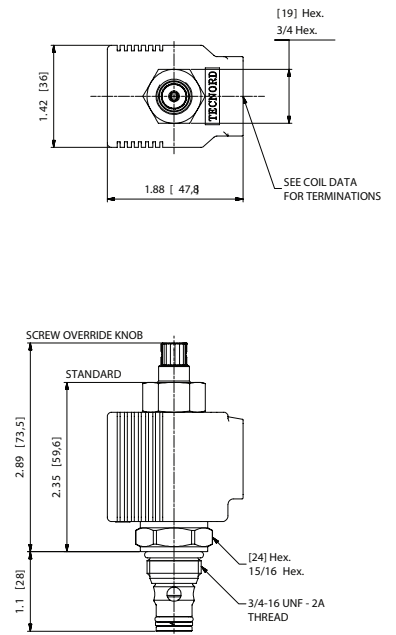
"P" COIL TERMINATION



IMMERSION PROOF "I" TYPE



"J" COIL TERMINATION



BODY WEIGHT: .39 lbs. (.18 kg)

ORDERING INFORMATION

HB - S2A -

OPTIONS

Buna Standard	00
Viton Standard	V0
Buna, Override	0M
Viton, Override	VM

CONSULT FACTORY FOR BODY

VOLTAGE

06	06 VDC
12	12 VDC
24	24 VDC
36	36 VDC
48	48 VDC
25	24 VAC
11	120 VAC
22	220 VAC
44	440 VAC

"P" COIL TERMINATION

(All DC Except as Noted)

DL	Double Lead
DS	Double Spade
HC	DIN 43650 (Hirschman) - (AC & DC)
CL	Conduit Lead - (AC Only)
DI	Deutsch - Integral DT04-2P

IMMERSION PROOF "I" TYPE

IA	"I" Coil AMP Superseal - Integral
ID	"I" Coil Deutsch - Integral DT04-2P
IJ	"I" Coil AMP Jr. Time - Integral
IM	"I" Coil Metri-Pack - Integral

"J" COIL TERMINATION

JA	"J" Coil AMP Superseal - Integral
JD	"J" Coil Deutsch - Integral DT04-2P
JJ	"J" Coil AMP Jr. Time - Integral
JM	"J" Coil Metri-Pack - Integral
JL	"J" Coil Double Lead
JH	"J" Coil DIN 43650 (Hirschman)

Approximate Coil Weight: .42 lbs/.19 kg.

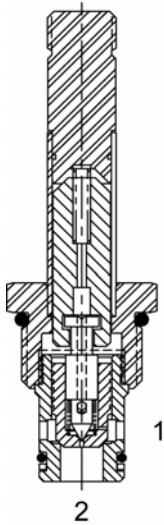
For Optional Coil Terminations See Coil Section

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com

**DE-S2A Pilot Operated Poppet, 2 Way Normally Closed****DESCRIPTION**

10 size, 7/8-14 thread, "Delta" series, solenoid operated, 2 way normally closed, pilot operated poppet valve with reverse flow de-energized.

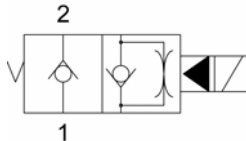
OPERATION

When de-energized the DE-S2A blocks flow from (1) to (2) and allows reverse flow from (2) to (1). When energized the valve allows flow from (1) to (2) and restricts flow from (2) to (1).

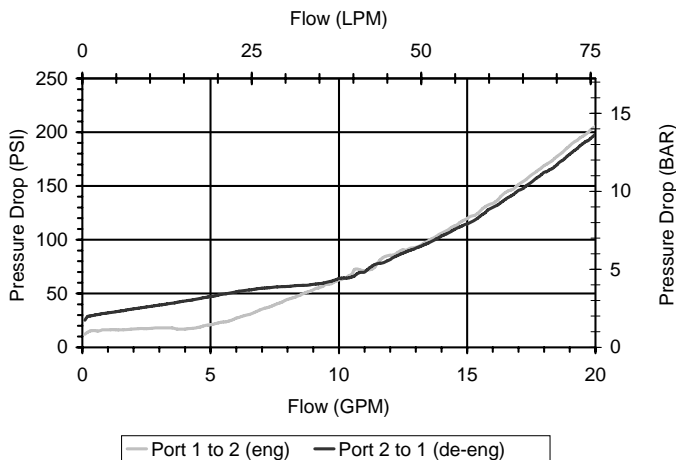
OPERATION OF MANUAL OVERRIDE OPTION: To override, pull knob out. On the detented version, after pulling knob out twist 180 degrees and release. The valve will remain in that position.

FEATURES

- Hardened parts for long life.
- Efficient wet-armature construction.
- Cartridges are voltage interchangeable.
- Manual override option.
- Industry common cavity.
- Unitized, molded coil design.
- Continuous duty rated solenoid.
- Optional coil voltages and terminations.
- Optional "I" Coil: Weatherproof, Thermal Shock, Immersion Safe.

HYDRAULIC SYMBOL**PERFORMANCE**

Actual Test Data (Cartridge Only)

**VALVE SPECIFICATIONS**

Nominal Flow	15 GPM (57 LPM)
Rated Operating Pressure	3500 PSI (241 bar)
Typical Internal Leakage (150 SSU)	0-5 drops/min
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temperature Range	-40° to 250° F (-40° to 120° C)
Weight	.27 lbs. (.12 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	30 ft-lbs (40.6 Nm)
Coil Nut Torque Requirements	4-6 ft-lbs (5.4-8.1 Nm)
Cavity	DELTA 2W
Cavity Form Tool (Finishing)	40500000
Seal Kit	21191200

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

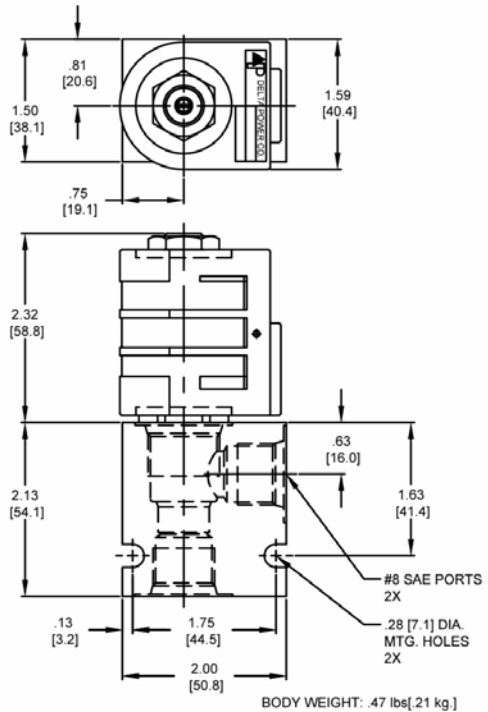
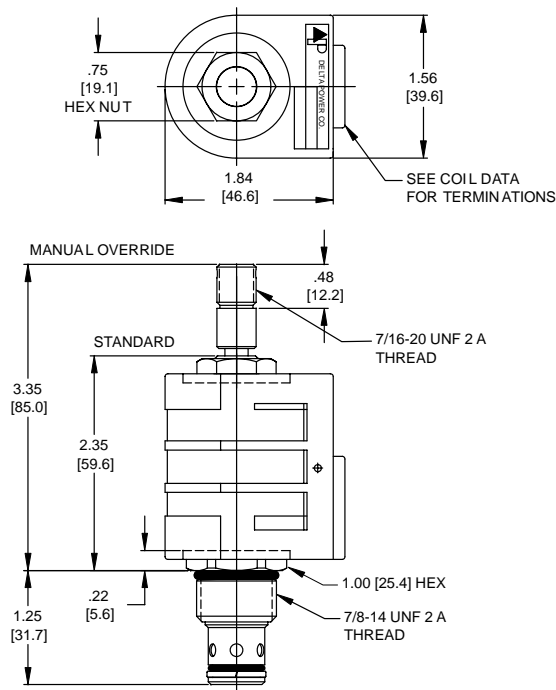
Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com



DIMENSIONS



ORDERING INFORMATION

DE-S2A -

OPTIONS

Buna Standard	00
Viton Standard	V0
Buna, Override	0M
Viton, Override	VM
Buna & Screen	A0
Viton & Screen	W0
Buna, Override, Non-detent	B1
Viton, Override, Non-detent	V1
Buna, Screen, Override, Non-detent	B3
Buna, Screen, Override, Detent	B4
Viton, Screen, Override, Non-detent	V3
Viton, Screen, Override, Detent	V4

Note: Use screen only if flow direction is from (1) to (2).

"D" COIL TERMINATION

(All DC Except as Noted)

DL	Double Lead
DT	Deutsch on Leads DT04-2P
ML	Metri-Pack on Leads
PL	Packard on Leads
WL	Weatherpack on Leads

SS	Single Spade
DS	Double Spade
HC	DIN 43650 (Hirschman) - (AC & DC)
CL	Conduit Lead - (AC Only)
DI	Deutsch - Integral DT04-2P

Blank
N
S

BODIES

Without Body
3/8 NPTF Ports
#8 SAE Ports

VOLTAGE

06	6 VDC
12	12 VDC
24	24 VDC
36	36 VDC
48	48 VDC
25	24 VAC
11	120 VAC
22	220 VAC
44	440 VAC

IMMERSION PROOF "D" TYPE

IA	"I" Coil AMP Superseal - Integral
ID	"I" Coil Deutsch - Integral DT04-2P
IJ	"I" Coil AMP Jr. Timer - Integral
IM	"I" Coil Metri-Pack - Integral

Approximate Coil Weight: .74 lbs (.33 kg.)

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

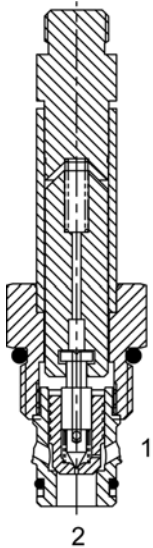
Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com



HE-S2A Pilot Operated Poppet, 2 Way Normally Closed



DESCRIPTION

"High Pressure" 10 size, 7/8-14 thread, "Delta" series, solenoid operated, 2 way normally closed, pilot operated poppet valve with reverse flow de-energized.

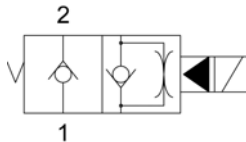
OPERATION

When de-energized the HE-S2A blocks flow from (1) to (2) and allows reverse flow from (2) to (1). When energized the valve allows flow from (1) to (2) and restricts flow from (2) to (1).

FEATURES

- Hardened parts for long life.
- Efficient wet-armature construction.
- Cartridges are voltage interchangeable.
- Industry common cavity.
- Unitized, molded coil design.
- Continuous duty rated solenoid.
- Optional coil voltages and terminations.
- Optional "I" Coil: Weatherproof, Thermal Shock, Immersion Safe.

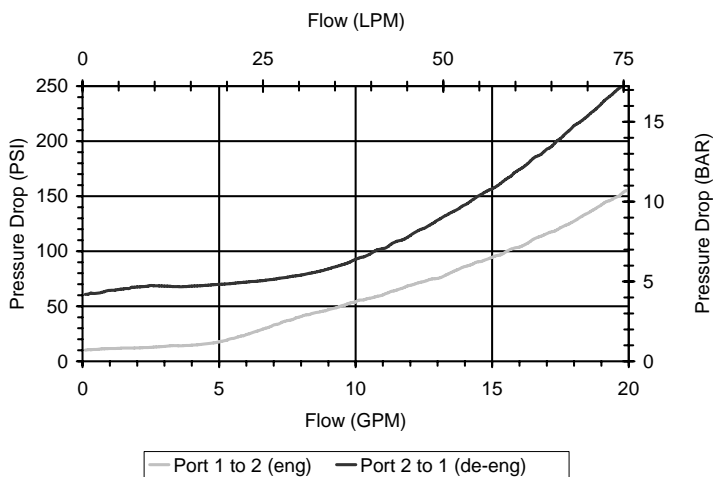
HYDRAULIC SYMBOL



Uses "L" Coil.

PERFORMANCE

Actual Test Data (Cartridge Only)



VALVE SPECIFICATIONS

Nominal Flow	15 GPM (57 LPM)
Rated Operating Pressure	4000 PSI (276 bar)
Typical Internal Leakage (150 SSU)	0-5 drops/min
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temperature Range	-40° to 250° F (-40° to 120° C)
Weight	.39 lbs. (.17 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	50 ft-lbs (67.8 Nm)
Coil Nut Torque Requirements	4-6 ft-lbs (5.4-8.1 Nm)
Cavity	DELTA 2W
Cavity Form Tool (Finishing)	40500000
Seal Kit	21191200

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

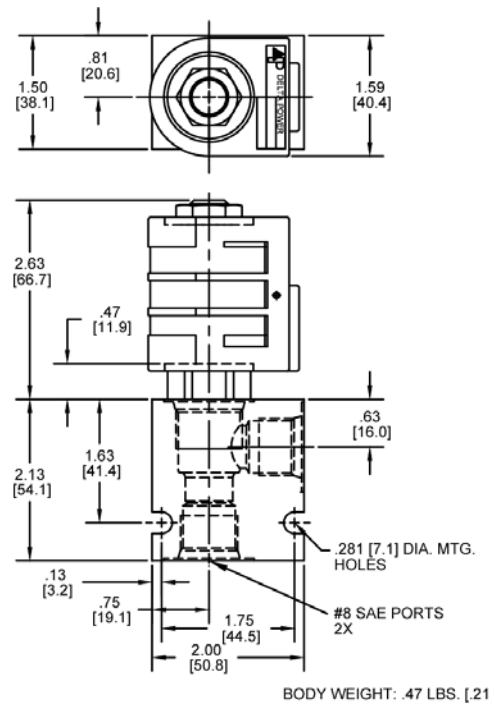
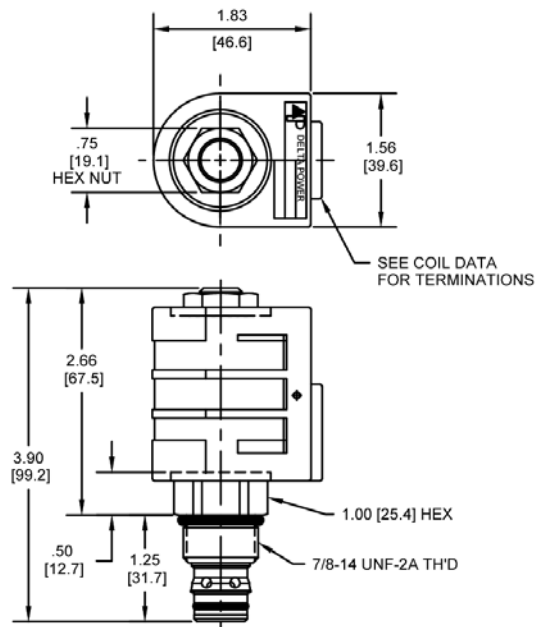
Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com



DIMENSIONS



ORDERING INFORMATION

HE-S2A -

OPTIONS

Buna Standard 00
Viton Standard V0

Blank N
S

BODIES

Without Body
3/8 NPTF Ports
#8 SAE Ports

Note: Aluminum, NOT durability rated for 4000 PSI. Consult factory options.

VOLTAGE

06 6 VDC
12 12 VDC
24 24 VDC
36 36 VDC
48 48 VAC
25 25 VAC
11 120 VAC
22 220 VAC
44 440 VAC

"L" COIL TERMINATION

(All DC Except as Noted)

DL Double Lead
DT Deutsch on Leads DT04-2P
ML Metri-Pack on Leads
PL Packard on Leads
WL Weatherpack on Leads

SS Single Spade
DS Double Spade
HC DIN 43650 (Hirschman) - (AC & DC)
CL Conduit Lead - (AC Only)
DI Deutsch - Integral DT04-2P

IMMERSION PROOF "D" TYPE

IA "I" Coil AMP Superseal - Integral
ID "I" Coil Deutsch - Integral DT04-2P
IJ "I" Coil AMP Jr. Timer - Integral
IM "I" Coil Metri-Pack - Integral

Approximate Coil Weight: .68 lbs. (.31 kg.)

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com

**TT-S2A Pilot Operated Poppet, 2 Way Normally Closed****DESCRIPTION**

12 size, 1 1/16-12 thread, "Tecnom" series, solenoid operated, 2 way normally closed, pilot operated poppet valve with reverse flow de-energized.

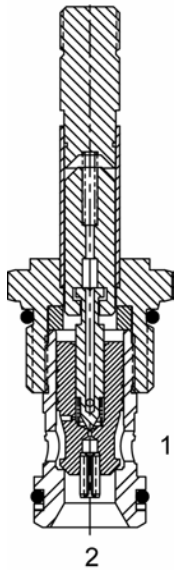
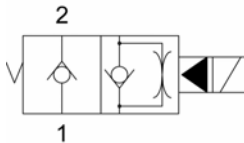
OPERATION

When de-energized the TT-S2A blocks flow from (1) to (2) and allows reverse flow from (2) to (1). When energized the valve allows flow from (1) to (2) and restricts flow from (2) to (1).

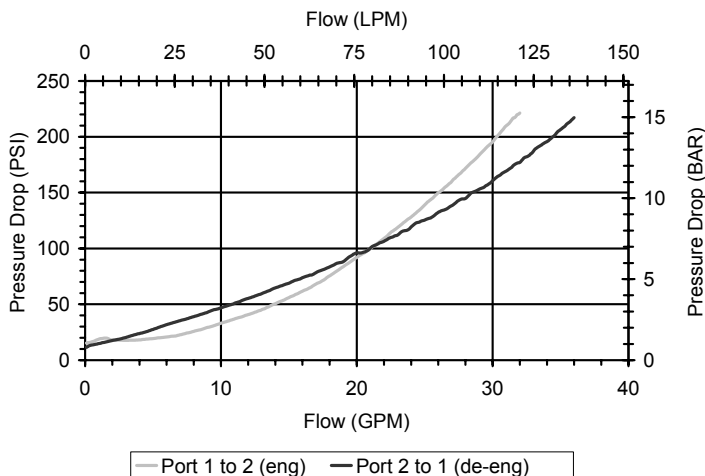
OPERATION OF MANUAL OVERRIDE OPTION: To override, pull knob out. On the detented version, after pulling knob out twist 180 degrees and release. The valve will remain in that position.

FEATURES

- Hardened parts for long life.
- Efficient wet-armature construction.
- Cartridges are voltage interchangeable.
- Manual override option.
- Industry common cavity.
- Unitized, molded coil design.
- Continuous duty rated solenoid.
- Optional coil voltages and terminations.
- Optional "I" Coil: Weatherproof, Thermal Shock, Immersion Safe.

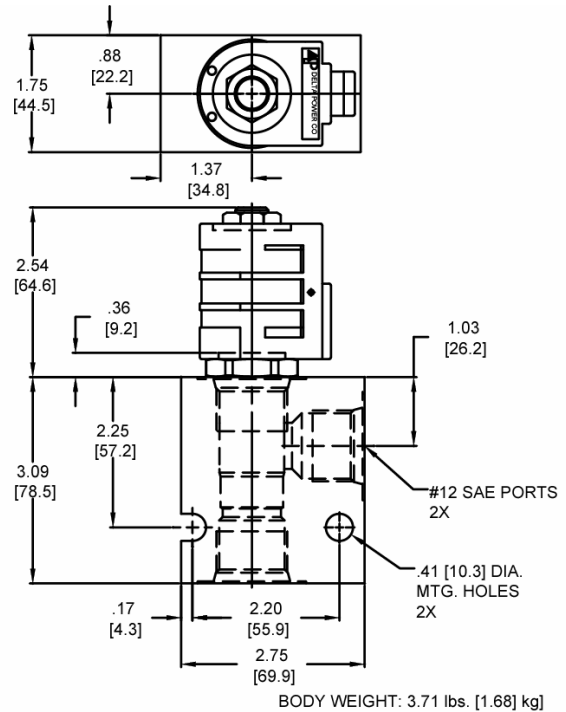
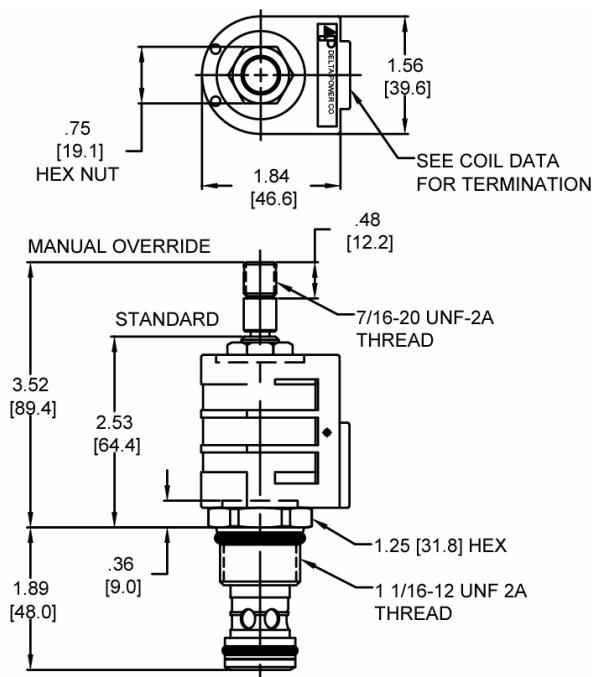
**HYDRAULIC SYMBOL****PERFORMANCE**

Actual Test Data (Cartridge Only)

**VALVE SPECIFICATIONS**

Nominal Flow	25 GPM (95 LPM)
Rated Operating Pressure	3000 PSI (207 bar)
Typical Internal Leakage (150 SSU)	0-5 drops/min
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temperature Range	-40° to 250° F (-40° to 120° C)
Weight	49 lbs. (.22 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	70 ft-lbs (94.9 Nm)
Coil Nut Torque Requirements	4-6 ft-lbs (5.4-8.1 Nm)
Cavity	TECNORD 2W
Cavity Form Tool (Finishing)	40500032
Seal Kit	21191300

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.


DIMENSIONS

ORDERING INFORMATION
TT-S2A -
OPTIONS

Buna, Standard	00
Viton, Standard	V0
Buna, Override	OM
Viton, Override	VM
Buna, Screen	A0
Viton, Screen	W0
Buna, Override, Non-detent	BI
Viton, Override, Non-detent	VI
Buna, Screen, Override, Non-detent	B3
Buna, Screen, Override, Detent	B4
Viton, Screen, Override, Non-detent	V3
Viton, Screen, Override, Detent	V4

Note: Use screen only if flow direction is from (1) to (2).

"D" COIL TERMINATION

(All DC Except as Noted)

DL	Double Lead
DT	Deutsch on Leads DT04-2P
ML	Metri-Pack on Leads
PL	Packard on Leads
WL	Weatherpack on Leads

SS	Single Spade
DS	Double Spade
HC	DIN 43650 (Hirschman) – (AC & DC)
CL	Conduit Lead – (AC Only)
DI	Deutsch – Integral DT04-2P

Blank
S

BODIES

Without Body
#12 SAE Ports

VOLTAGE

06	6 VDC
12	12 VDC
24	24 VDC
36	36 VDC
48	48 VDC
25	24 VAC
11	120 VAC
22	220 VAC
44	440 VAC

IMMERSION PROOF "D" TYPE

IA	"I" Coil AMP Superseal - Integral
ID	"I" Coil Deutsch – Integral DT04-2P
IJ	"I" Coil AMP Jr. Timer - Integral
IM	"I" Coil Metri-Pack – Integral

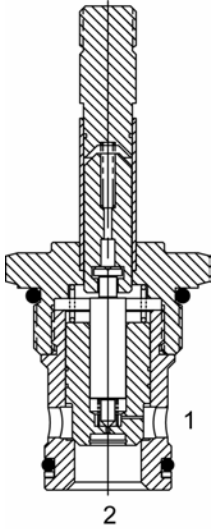
Approximate Coil Weight: .74 lbs. (.33 kg.)

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com

**SJ-S2A Pilot Operated Poppet, 2 Way Normally Closed****DESCRIPTION**

16 size, 1 5/16-12 thread, "Super" series, solenoid operated, 2 way normally closed, pilot operated poppet valve with reverse flow de-energized.

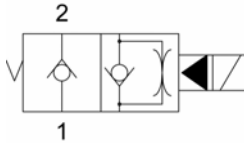
OPERATION

When de-energized the SJ-S2A blocks flow from (1) to (2) and allows reverse flow from (2) to (1). When energized the valve allows flow from (1) to (2) and restricted flow from (2) to (1).

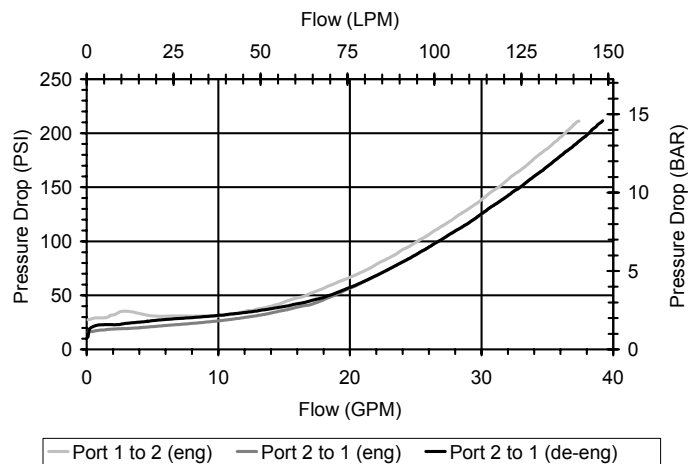
OPERATION OF MANUAL OVERRIDE OPTION: To override, pull knob out. On the detented version, after pulling knob out twist 180 degrees and release. The valve will remain in that position.

FEATURES

- Hardened parts for long life.
- Efficient wet-armature construction.
- Cartridges are voltage interchangeable.
- Manual override option.
- Industry common cavity.
- Unitized, molded coil design.
- Continuous duty rated solenoid.
- Optional coil voltages and terminations.
- Optional "I" Coil: Weatherproof, Thermal Shock, Immersion Safe.

HYDRAULIC SYMBOL**PERFORMANCE**

Actual Test Data (Cartridge Only)

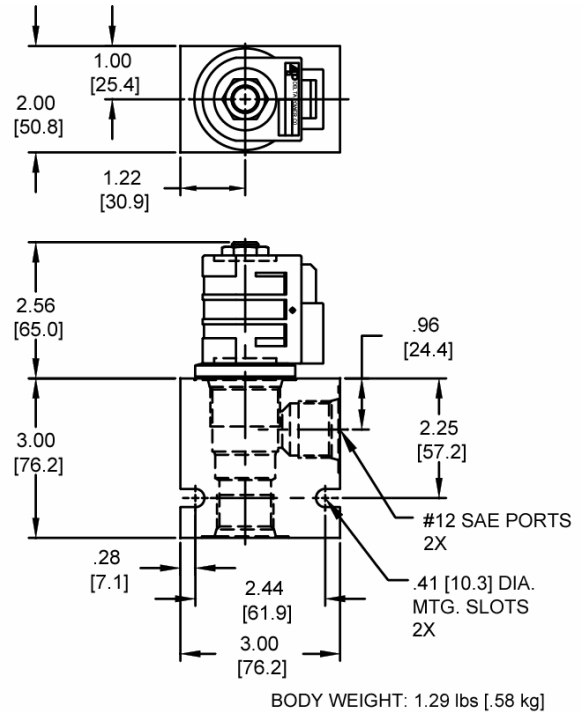
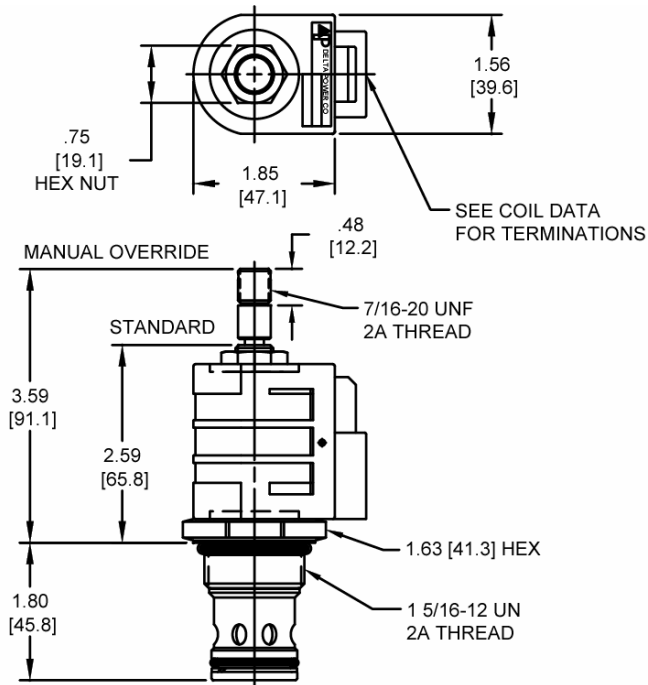
**VALVE SPECIFICATIONS**

Nominal Flow	30 GPM (114 LPM)
Rated Operating Pressure	3500 PSI (241 bar)
Typical Internal Leakage (150 SSU)	0-10 drops/min
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temperature Range	-40° to 250° F (-40° to 120° C)
Weight	.72 lbs. (.32 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	90 ft-lbs (122 Nm)
Coil Nut Torque Requirements	4-6 ft-lbs (5.4-8.1 Nm)
Cavity	SUPER 2W
Cavity Form Tool (Finishing)	40500017
Seal Kit	21191400

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.



DIMENSIONS



ORDERING INFORMATION

SJ-S2A -

OPTIONS

Buna Standard **00**
 Viton Standard **V0**
 Buna, Override, Detent **0M**
 Viton, Override, Detent **VM**
 Buna, Override, Nondetent **B1**
 Viton, Override, Nondetent **V1**

Blank
N
S

BODIES

Without Body
 3/4 NPT Ports
 #12 SAE Ports

VOLTAGE

06 6 VDC
12 12 VDC
24 24 VDC
36 36 VDC
48 48 VDC
25 24 VAC
11 120 VAC
22 220 VAC
44 440 VAC

"D" COIL TERMINATION

(All DC Except as Noted)

DL Double Lead
DT Deutsch on Leads DT04-2P
ML Metri-Pack on Leads
PL Packard on Leads
WL Weatherpack on Leads

SS Single Spade
DS Double Spade
HC DIN 43650 (Hirschman) – (AC & DC)
CL Conduit Lead – (AC Only)
DI Deutsch – Integral DT04-2P

IMMERSION PROOF "D" TYPE

IA "I" Coil AMP Superseal - Integral
ID "I" Coil Deutsch – Integral DT04-2P
IJ "I" Coil AMP Jr. Timer - Integral
IM "I" Coil Metri-Pack – Integral

Approximate Coil Weight: .74 lbs (.33 kg.)

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com

**HJ-S2A Pilot Operated Poppet, 2 Way Normally Closed****DESCRIPTION**

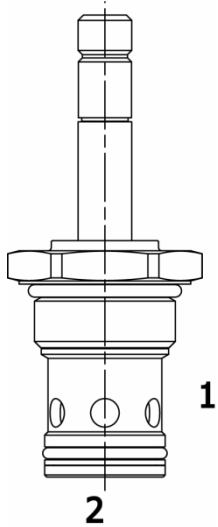
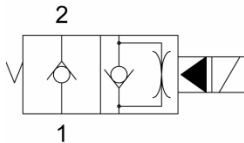
"High Pressure" 16 size, 1 5/16-12 thread, "Super" series, solenoid operated, 2 way normally closed, pilot operated poppet valve with reverse flow de-energized.

OPERATION

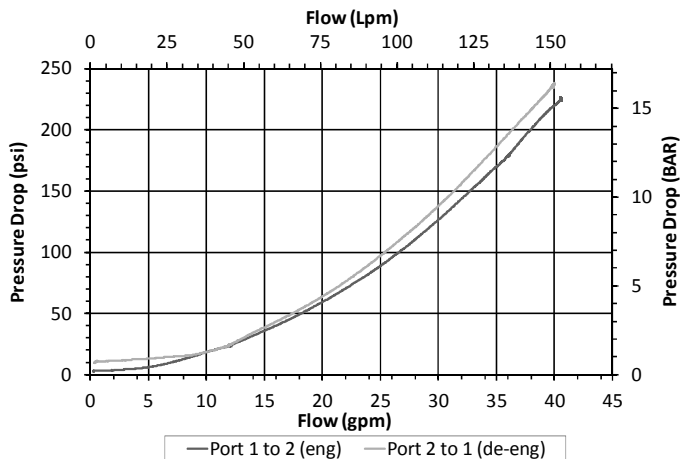
When de-energized the HJ-S2A blocks flow from (1) to (2) and allows reverse flow from (2) to (1). When energized the valve allows flow from (1) to (2) and restricted flow from (2) to (1).

FEATURES

- Hardened parts for long life.
- Efficient wet-armature construction.
- Cartridges are voltage interchangeable.
- Industry common cavity.
- Unitized, molded coil design.
- Continuous duty rated solenoid.
- Optional coil voltages and terminations.

**HYDRAULIC SYMBOL****PERFORMANCE**

Actual Test Data (Cartridge Only)

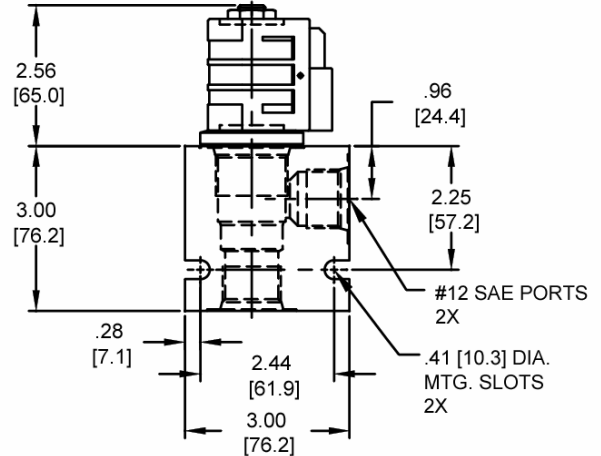
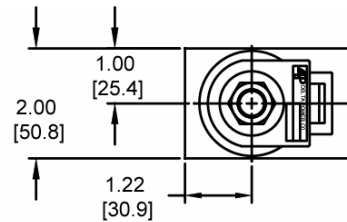
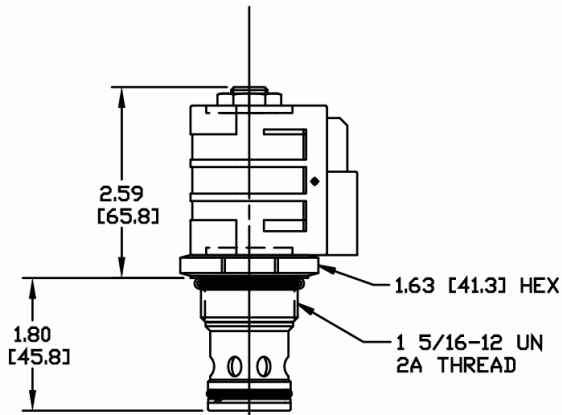
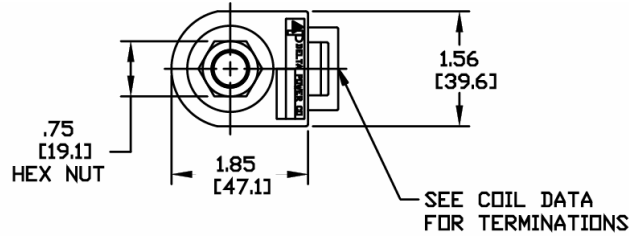
**VALVE SPECIFICATIONS**

Nominal Flow	40 GPM (151 LPM)
Rated Operating Pressure	4350 PSI (300 bar)
Typical Internal Leakage (150 SSU)	0-10 drops/min
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temperature Range	-40° to 250° F (-40° to 120° C)
Weight	.72 lbs. (.32 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	115 ft-lbs (156 Nm)
Coil Nut Torque Requirements	4-6 ft-lbs (5.4-8.1 Nm)
Cavity	SUPER 2W
Cavity Form Tool (Finishing)	40500017
Seal Kit	21191400

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.



DIMENSIONS



BODY WEIGHT: 1.29 lbs [.58 kg]

ORDERING INFORMATION

HJ-S2A - - - -

OPTIONS
Buna Standard
Viton Standard

00
V0

Blank
N
S

BODIES
Without Body
3/4 NPT Ports
#12 SAE Ports

VOLTAGE
06 6 VDC
12 12 VDC
24 24 VDC
36 36 VDC
48 48 VDC
25 24 VAC
11 120 VAC
22 220 VAC
44 440 VAC

Note: Aluminum, NOT durability rated for 4350 PSI. Consult factory for options.

"D" COIL TERMINATION
(All DC Except as Noted)

DL Double Lead
DT Deutsch on Leads DT04-2P
ML Metri-Pack on Leads
PL Packard on Leads
WL Weatherpack on Leads

SS Single Spade
DS Double Spade
HC DIN 43650 (Hirschman) - (AC & DC)
CL Conduit Lead - (AC Only)
DI Deutsch - Integral DT04-2P

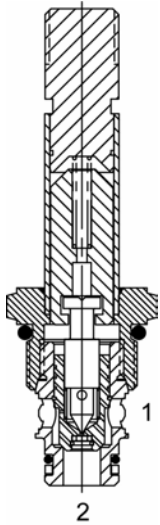
Approximate Coil Weight: .74 lbs (.33 kg.)

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com

**PB-S2B Pilot Operated Poppet, 2 Way Normally Closed****DESCRIPTION**

8 size, 3/4-16 thread, "Power" series, solenoid operated, 2 way normally closed, pilot operated poppet valve with reverse flow energized and de-energized.

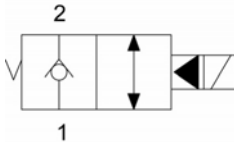
OPERATION

When de-energized the PB-S2B blocks flow from (1) to (2) and allows reverse flow from (2) to (1). When energized the valve allows flow from (1) to (2) and (2) to (1).

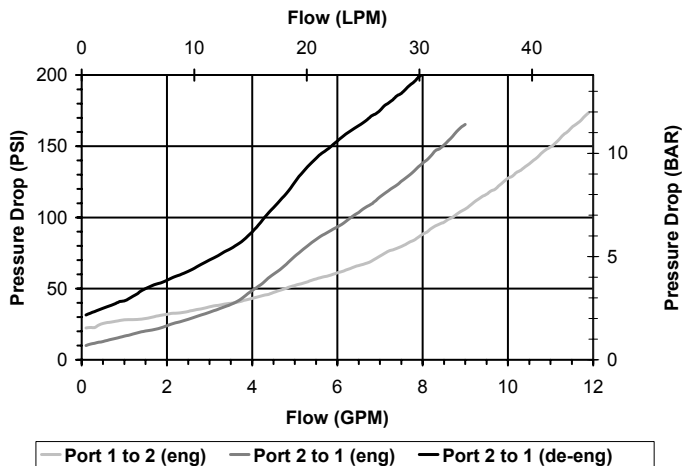
OPERATION OF MANUAL OVERRIDE OPTION: To override, pull knob out. On the detented version, after pulling knob out twist 180 degrees and release. The valve will remain in that position.

FEATURES

- Hardened parts for long life.
- Efficient wet-armature construction.
- Cartridges are voltage interchangeable.
- Manual override option.
- Industry common cavity.
- Unitized, molded coil design.
- Continuous duty rated solenoid.
- Optional coil voltages and terminations.
- Optional "I" Coil: Weatherproof, Thermal Shock, Immersion Safe.

HYDRAULIC SYMBOL**PERFORMANCE**

Actual Test Data (Cartridge Only)

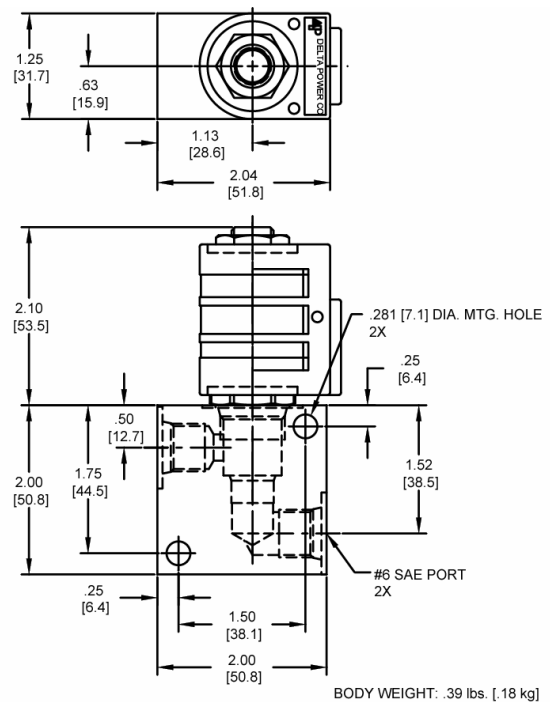
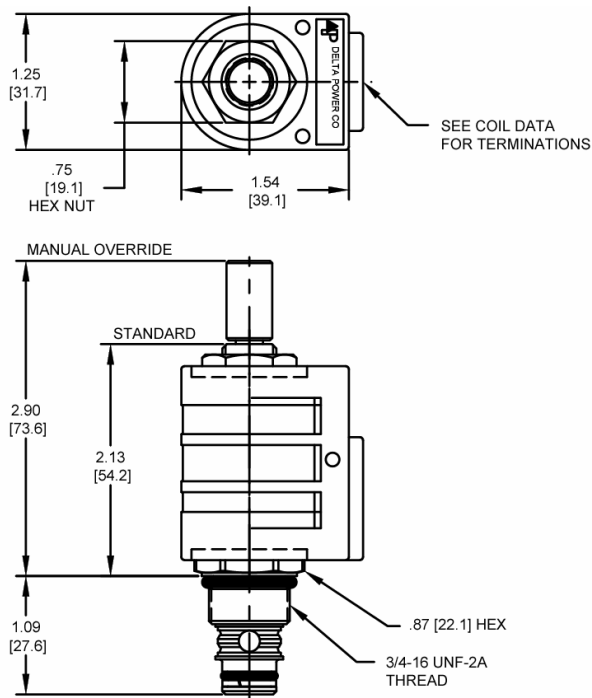
**VALVE SPECIFICATIONS**

Nominal Flow	8 GPM (30 LPM)
Rated Operating Pressure	3500 PSI (241 bar)
Typical Internal Leakage (150 SSU)	0-5 drops/min
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temperature Range	-40° to 250° F (-40° to 120° C)
Weight	.20 lbs. (.09 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	25 ft-lbs (34 Nm)
Coil Nut Torque Requirements	4-6 ft-lbs (5.4-8.1 Nm)
Cavity	POWER 2W
Cavity Form Tool (Finishing)	40500005
Seal Kit	21191100

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.



DIMENSIONS



ORDERING INFORMATION

PB-S2B -

OPTIONS

Buna Standard	00
Viton Standard	V0
Buna, Override, Detent	0M
Viton, Override, Detent	VM
Buna, Screen	A0
Viton, Screen	W0
Buna, Override, Nondetent	B1
Viton, Override, Nondetent	V1
Buna, Screen, Override, Nondetent	B3
Viton, Screen, Override, Nondetent	V3
Buna, Screen, Override, Detent	B4
Viton, Screen, Override, Detent	V4

Note: Use screen only if flow direction is from (1) to (2).

"P" COIL TERMINATION

(All DC Except as Noted)

DL	Double Lead
DT	Deutsch on Leads DT04-2P
ML	Metri-Pack on Leads
PL	Parkard on Leads
WL	Weatherpack on Leads

SS	Single Spade
DS	Double Spade
HC	DIN 43650 (Hirschman) - (AC & DC)
CL	Conduit Lead - (AC Only)
DI	Deutsch - Integral DT04-2P

Blank

N

S

BODIES

Without Body
1/4 NPTF Ports
#6 SAE Ports

VOLTAGE

06	6 VDC
12	12 VDC
24	24 VDC
36	36 VDC
48	48 VDC
25	24 VAC
11	120 VAC
22	220 VAC
44	440 VAC

IMMERSION PROOF "P" TYPE

IA	"I" Coil AMP Superseal - Integral
ID	"I" Coil Deutsch - Integral DT04-2P
IJ	"I" Coil AMP Jr. Timer - Integral
IM	"I" Coil Metri-Pack - Integral

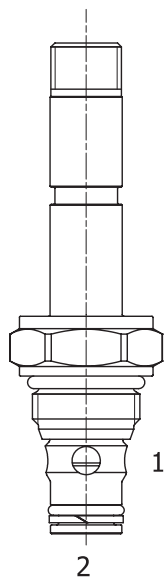
Approximate Coil Weight: .42 lbs/.19 kg.

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com


HB-S2B Pilot Operated, 2 Way Normally Closed with Free Reversed Flow

DESCRIPTION

8 size, 3/4-16 thread, "Power" series, solenoid operated, 2 way normally closed, pilot operated poppet valve with reverse flow energized and de-energized.

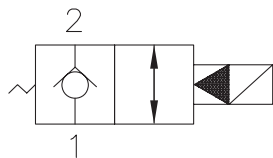
OPERATION

When de-energized the HB-S2B blocks flow from (1) to (2) and allows reverse flow from (2) to (1). When energized the valve allows flow from (1) to (2) and from (2) to (1).

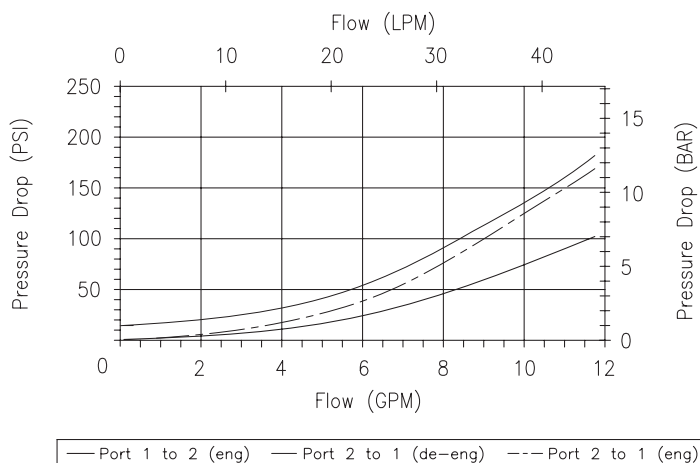
MANUAL OVERRIDE OPTION: to override, turn the manual override screw clockwise. To release, turn the manual override screw counter-clockwise.

FEATURES

- Hardened parts for long life.
- Efficient wet-armature construction.
- Cartridges are voltage interchangeable.
- Industry common cavity.
- Unitized, molded coil design.
- Continuous duty rated solenoid.
- Optional coil voltages and terminations.
- Optional "I" Coil: Weatherproof, Thermal Shock, Immersion Safe.
- Manual override option.

HYDRAULIC SYMBOL

PERFORMANCE

Actual Test Data (Cartridge Only)


VALVE SPECIFICATIONS

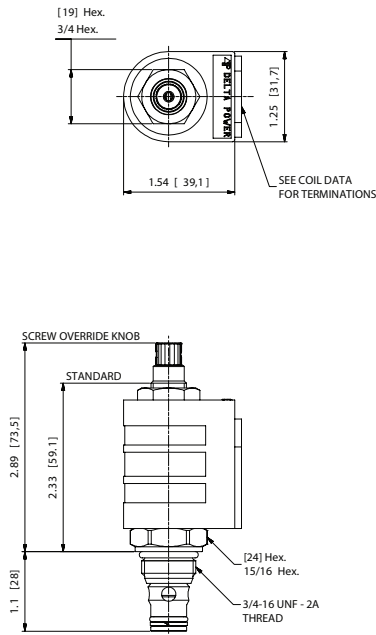
Nominal Flow	12 GPM (45 LPM)
Rated Operating Pressure	5000 PSI (350 bar)
Typical Internal Leakage (150 SSU)	0-5 drops/min at 5000 PSI (350 bar)
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temperature Range	-40° to 210° F (-40° to 100° C) BUNA seals -4° to 250° F (-20° to 120° C) VITON seals
Weight	.29 lbs. (.13 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	35 ft-lbs (47 Nm)
Coil Nut Torque Requirements	4-6 ft-lbs (5.4-8.1 Nm)
Cavity	POWER 2W
Cavity Tools kit	40500005
Seal Kit	21191100

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

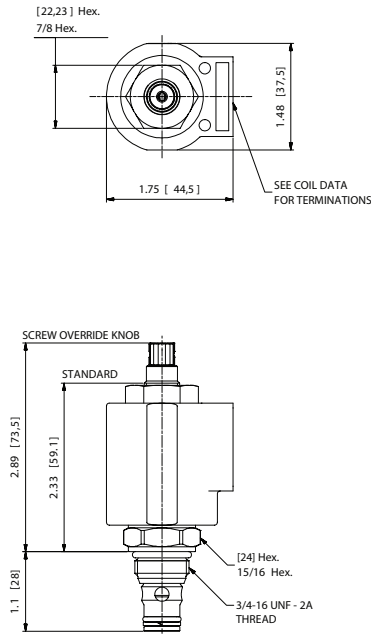


DIMENSIONS

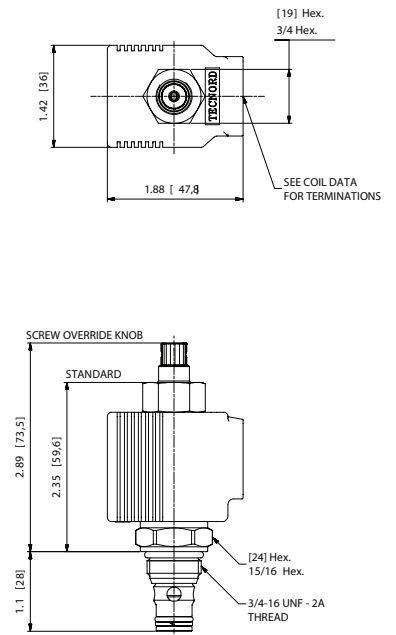
"P" COIL TERMINATION



IMMERSION PROOF "I" TYPE



"J" COIL TERMINATION



ORDERING INFORMATION

HB - S2B -

CONSULT FACTORY FOR BODY

OPTIONS

Buna Standard	00
Viton Standard	V0
Buna, Override	0M
Viton, Override	VM

VOLTAGE

06	06 VDC
12	12 VDC
24	24 VDC
36	36 VDC
48	48 VDC
25	24 VAC
11	120 VAC
22	220 VAC
44	440 VAC

"P" COIL TERMINATION

(All DC Except as Noted)

DL	Double Lead
DS	Double Spade
HC	DIN 43650 (Hirschman) - (AC & DC)
CL	Conduit Lead - (AC Only)
DI	Deutsch - Integral DT04-2P

IMMERSION PROOF "I" TYPE

IA	"I" Coil AMP Superseal - Integral
ID	"I" Coil Deutsch - Integral DT04-2P
IJ	"I" Coil AMP Jr. Time - Integral
IM	"I" Coil Metri-Pack - Integral

"J" COIL TERMINATION

JA	"J" Coil AMP Superseal - Integral
JD	"J" Coil Deutsch - Integral DT04-2P
JJ	"J" Coil AMP Jr. Time - Integral
JM	"J" Coil Metri-Pack - Integral
JL	"J" Coil Double Lead
JH	"J" Coil DIN 43650 (Hirschman)

Approximate Coil Weight: .42 lbs/.19 kg.

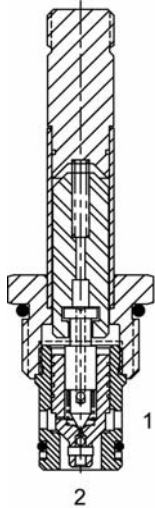
For Optional Coil Terminations See Coil Section

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com

**DE-S2B Pilot Operated Poppet, 2 Way Normally Closed****DESCRIPTION**

10 size, 7/8-14 thread, "Delta" series, solenoid operated, 2 way normally closed, pilot operated poppet valve with reverse flow energized and de-energized.

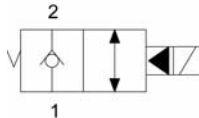
OPERATION

When de-energized the DE-S2B acts as a check valve, allowing flow to pass from (2) to (1), while blocking flow from (1) to (2). When energized the valve opens allowing flow to pass from (1) to (2).

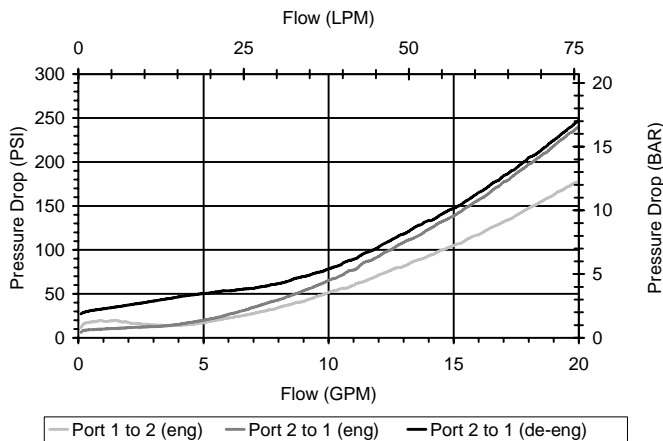
OPERATION OF MANUAL OVERRIDE OPTION: To override, pull knob out. On the detented version, after pulling knob out twist 180 degrees and release. The valve will remain in that position.

FEATURES

- Hardened parts for long life.
- Efficient wet-armature construction.
- Cartridges are voltage interchangeable.
- Manual override option.
- Industry common cavity.
- Unitized, molded coil design.
- Continuous duty rated solenoid.
- Optional coil voltages and terminations.
- Optional "I" Coil: Weatherproof, Thermal Shock, Immersion Safe.

HYDRAULIC SYMBOL**PERFORMANCE**

Actual Test Data (Cartridge Only)

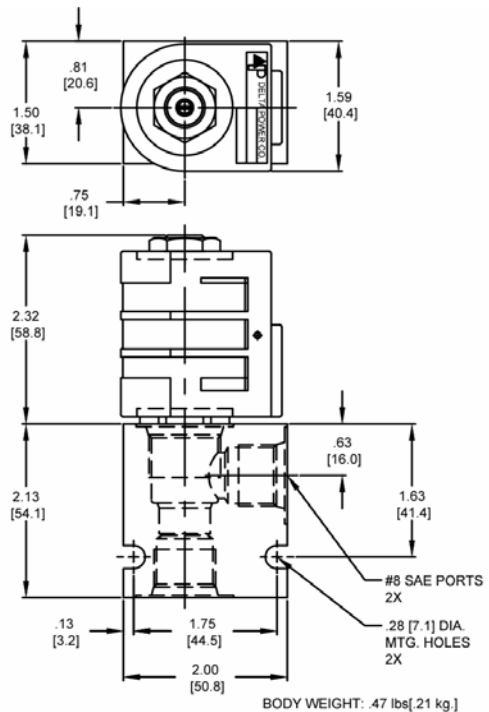
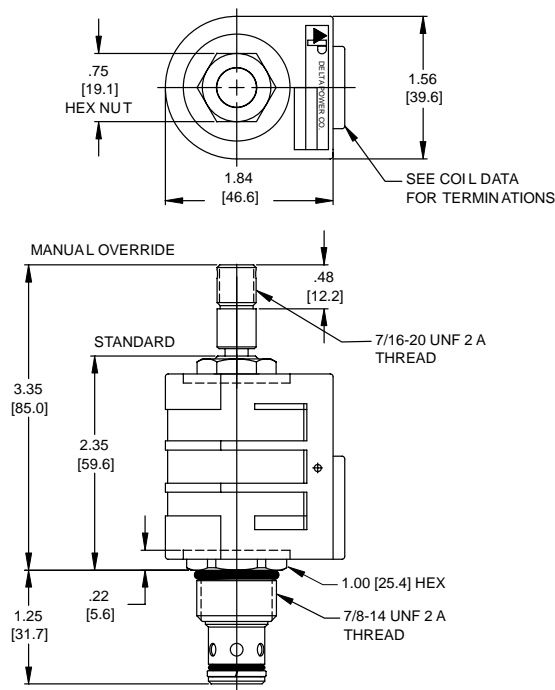
**VALVE SPECIFICATIONS**

Nominal Flow	15 GPM (57 LPM)
Rated Operating Pressure	3500 PSI (241 bar)
Typical Internal Leakage (150 SSU)	0-5 drops/min
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temperature Range	-40° to 250° F (-40° to 120° C)
Weight	.27 lbs. (.12 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	30 ft-lbs (40.6 Nm)
Coil Nut Torque Requirements	4-6 ft-lbs (5.4-8.1 Nm)
Cavity	DELTA 2W
Cavity Form Tool (Finishing)	40500000
Seal Kit	21191200

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.



DIMENSIONS



ORDERING INFORMATION

DE-S2B -

OPTIONS

Buna Standard	00
Viton Standard	V0
Buna, Override	0M
Viton, Override	VM
Buna & Screen	A0
Viton & Screen	W0
Buna, Override, Non-detent	B1
Viton, Override, Non-detent	V1
Buna, Screen, Override, Non-detent	B3
Buna, Screen, Override, Detent	B4
Viton, Screen, Override, Non-detent	V3
Viton, Screen, Override, Detent	V4

Note: Use screen only if flow direction is from (1) to (2).

"D" COIL TERMINATION

(All DC Except as Noted)

DL	Double Lead
DT	Deutsch on Leads DT04-2P
ML	Metri-Pack on Leads
PL	Packard on Leads
WL	Weatherpack on Leads

SS	Single Spade
DS	Double Spade
HC	DIN 43650 (Hirschman) - (AC & DC)
CL	Conduit Lead - (AC Only)
DI	Deutsch - Integral DT04-2P

Blank
N
S

BODIES

Without Body
3/8 NPTF Ports
#8 SAE Ports

VOLTAGE

06	6 VDC
12	12 VDC
24	24 VDC
36	36 VDC
48	48 VDC
25	24 VAC
11	120 VAC
22	220 VAC
44	440 VAC

IMMERSION PROOF "D" TYPE

IA	"I" Coil AMP Superseal - Integral
ID	"I" Coil Deutsch - Integral DT04-2P
IJ	"I" Coil AMP Jr. Timer - Integral
IM	"I" Coil Metri-Pack - Integral

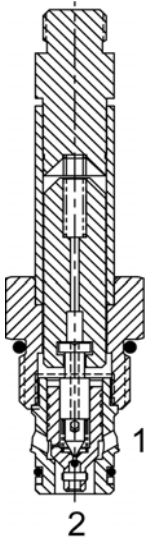
Approximate Coil Weight: .74 lbs (.33 kg.)

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com

**HE-S2B Pilot Operated Poppet, 2 Way Normally Closed****DESCRIPTION**

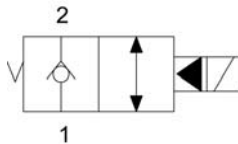
"High Pressure" 10 size, 7/8-14 thread, "Delta" series, solenoid operated, 2 way normally closed, pilot operated poppet valve with reverse flow energized and de-energized.

OPERATION

When de-energized the HE-S2B acts as a check valve, allowing flow to pass from (2) to (1), while blocking flow from (1) to (2). When energized the valve opens allowing flow to pass from (1) to (2).

FEATURES

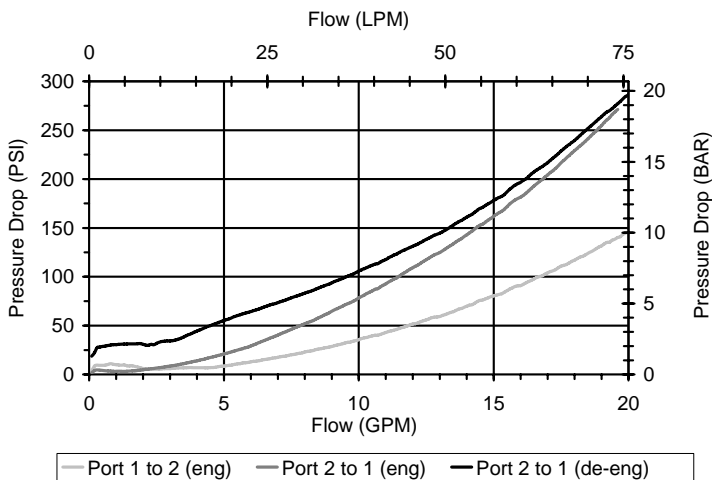
- Hardened parts for long life.
- Efficient wet-armature construction.
- Cartridges are voltage interchangeable.
- Industry common cavity.
- Unitized, molded coil design.
- Continuous duty rated solenoid.
- Optional coil voltages and terminations.
- Optional "I" Coil: Weatherproof, Thermal Shock, Immersion Safe.

HYDRAULIC SYMBOL

Uses "L" Coil.

PERFORMANCE

Actual Test Data (Cartridge Only)

**VALVE SPECIFICATIONS**

Nominal Flow	15 GPM (57 LPM)
Rated Operating Pressure	4000 PSI (276 bar)
Typical Internal Leakage (150 SSU)	0-5 drops/min
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temperature Range	-40° to 250° F (-40° to 120° C)
Weight	.39 lbs. (.17 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	50 ft-lbs (67.8 Nm)
Coil Nut Torque Requirements	4-6 ft-lbs (5.4-8.1 Nm)
Cavity	DELTA 2W
Cavity Form Tool (Finishing)	40500000
Seal Kit	21191200

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

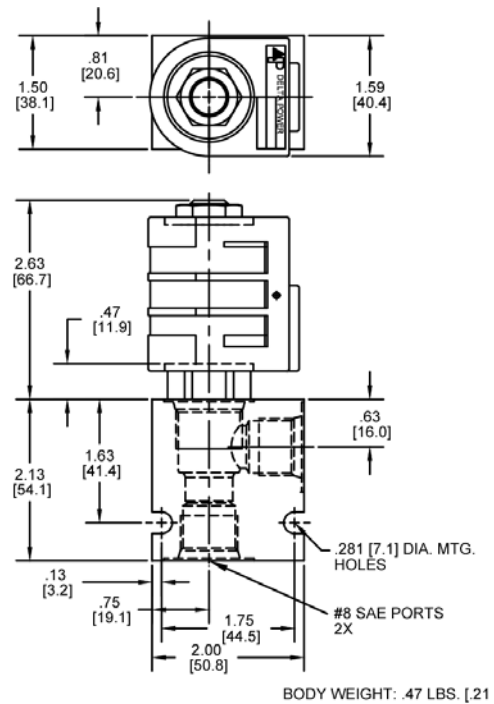
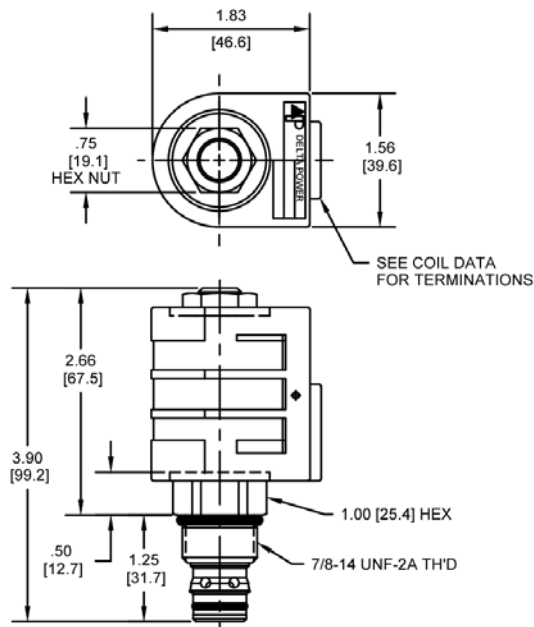
Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com



DIMENSIONS



ORDERING INFORMATION

HE-S2B -

OPTIONS

Buna Standard 00
Viton Standard V0

Blank N
S

BODIES

Without Body
3/8 NPTF Ports
#8 SAE Ports

Note: Aluminum, NOT durability rated for 4000 PSI. Consult factory options.

VOLTAGE

06 6 VDC
12 12 VDC
24 24 VDC
36 36 VDC
48 48 VAC
25 25 VAC
11 120 VAC
22 220 VAC
44 440 VAC

"L" COIL TERMINATION

(All DC Except as Noted)

DL Double Lead
DT Deutsch on Leads DT04-2P
ML Metri-Pack on Leads
PL Packard on Leads
WL Weatherpack on Leads

SS Single Spade
DS Double Spade
HC DIN 43650 (Hirschman) - (AC & DC)
CL Conduit Lead - (AC Only)
DI Deutsch - Integral DT04-2P

IA "I" Coil AMP Superseal - Integral
ID "I" Coil Deutsch - Integral DT04-2P
IJ "I" Coil AMP Jr. Timer - Integral
IM "I" Coil Metri-Pack - Integral

Approximate Coil Weight: .68 lbs. (.31 kg.)

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com

**TT-S2B Pilot Operated Poppet, 2 Way Normally Closed****DESCRIPTION**

12 size, 1 1/16-12 thread, "Tecnom" series, solenoid operated, 2 way normally closed, pilot operated poppet valve with reverse flow energized and de-energized.

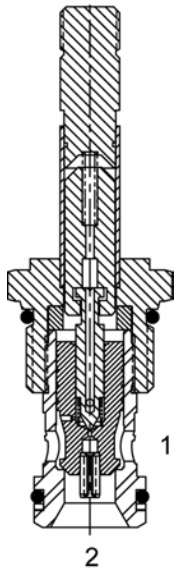
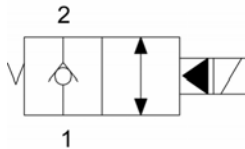
OPERATION

When de-energized the TT-S2B blocks flow from (1) to (2) and allows reverse flow from (2) to (1). When energized the valve allows flow from (1) to (2) and from (2) to (1).

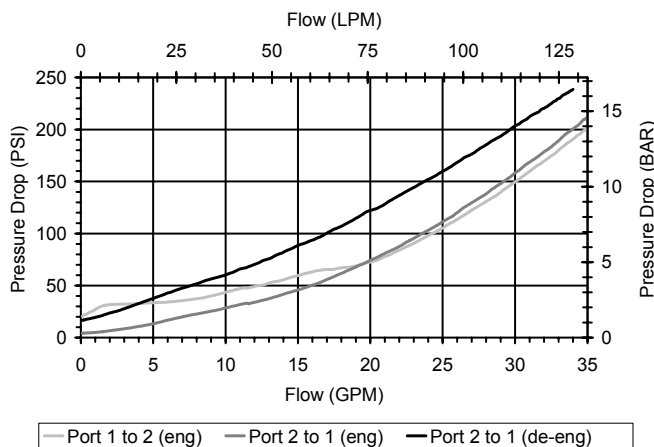
OPERATION OF MANUAL OVERRIDE OPTION: To override, pull knob out. On the detented version, after pulling knob out twist 180 degrees and release. The valve will remain in that position.

FEATURES

- Hardened parts for long life.
- Efficient wet-armature construction.
- Cartridges are voltage interchangeable.
- Manual override option.
- Industry common cavity.
- Unitized, molded coil design.
- Continuous duty rated solenoid.
- Optional coil voltages and terminations.
- Optional "I" Coil: Weatherproof, Thermal Shock, Immersion Safe.

**HYDRAULIC SYMBOL****PERFORMANCE**

Actual Test Data (Cartridge Only)

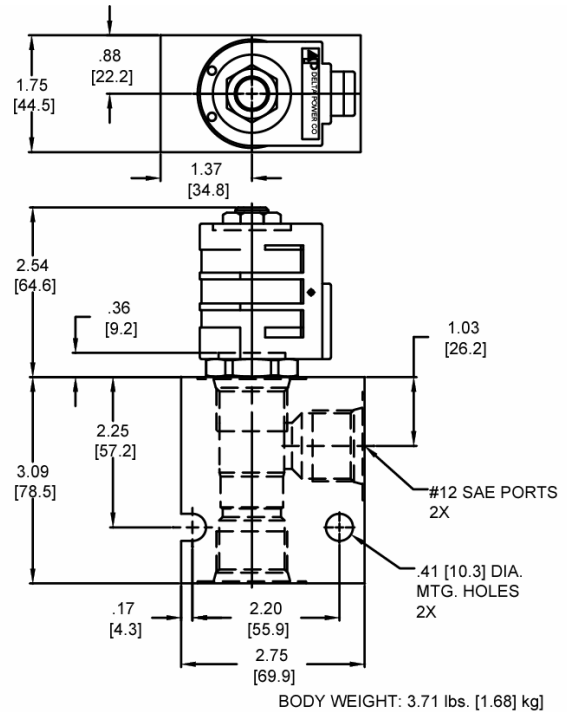
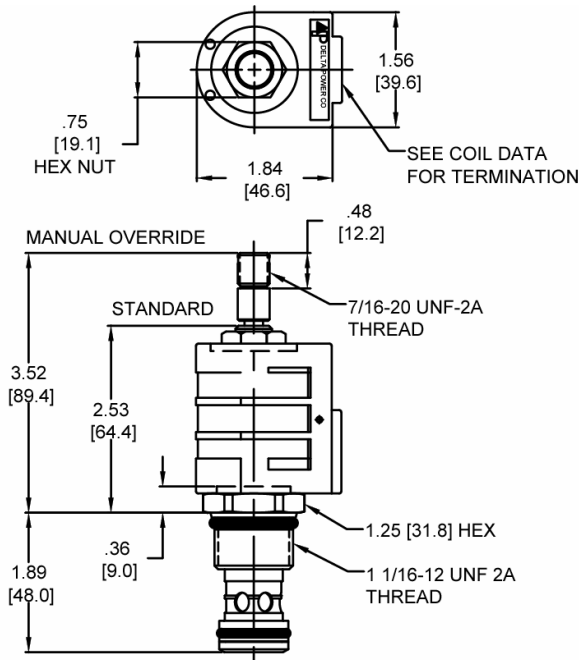
**VALVE SPECIFICATIONS**

Nominal Flow	25 GPM (95 LPM)
Rated Operating Pressure	3000 PSI (207 bar)
Typical Internal Leakage (150 SSU)	0-5 drops/min
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temperature Range	-40° to 250° F (-40° to 120° C)
Weight	49 lbs. (22 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	70 ft-lbs (94.9 Nm)
Coil Nut Torque Requirements	4-6 ft-lbs (5.4-8.1 Nm)
Cavity	TECNORD 2W
Cavity Form Tool (Finishing)	40500032
Seal Kit	21191300

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.



DIMENSIONS



ORDERING INFORMATION

TT-S2B -

OPTIONS

Buna Standard	00
Viton Standard	V0
Buna, Override	0M
Viton, Override	VM
Buna & Screen	A0
Viton & Screen	W0
Buna, Override, Non-detent	B1
Viton, Override, Non-detent	V1
Buna, Screen, Override, Non-detent	B3
Buna, Screen, Override, Detent	B4
Viton, Screen, Override, Non-detent	V3
Viton, Screen, Override, Detent	V4

Note: Use screen only if flow direction is from (1) to (2).

"D" COIL TERMINATION

(All DC Except as Noted)

DL	Double Lead
DT	Deutsch on Leads DT04-2P
ML	Metri-Pack on Leads
PL	Packard on Leads
WL	Weatherpack on Leads

SS	Single Spade
DS	Double Spade
HC	DIN 43650 (Hirschman) - (AC & DC)
CL	Conduit Lead - (AC Only)
DI	Deutsch - Integral DT04-2P

Blank
S

BODIES

Without Body
#12 SAE Ports

VOLTAGE

06	6 VDC
12	12 VDC
24	24 VDC
36	36 VDC
48	48 VDC
25	24 VAC
11	120 VAC
22	220 VAC
44	440 VAC

IMMERSION PROOF "D" TYPE

IA	"I" Coil AMP Superseal - Integral
ID	"I" Coil Deutsch - Integral DT04-2P
IJ	"I" Coil AMP Jr. Timer - Integral
IM	"I" Coil Metri-Pack - Integral

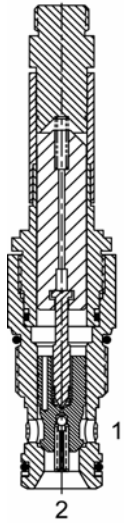
Approximate Coil Weight: .74 lbs. (.33 kg.)

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com

**HT-S2B Pilot Operated Poppet, 2 Way Normally Closed****DESCRIPTION**

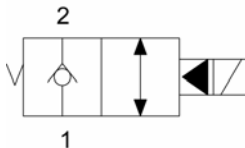
"High pressure" 12 size, 1 1/16-12 thread, "Tecnord" series, solenoid operated, 2 way normally closed, pilot operated poppet valve with reverse flow energized and de-energized.

OPERATION

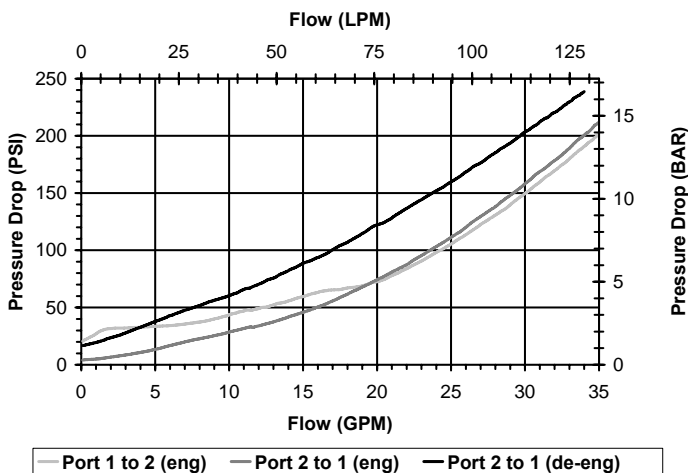
When de-energized the HT-S2B blocks flow from (1) to (2) and allows reverse flow from (2) to (1). When energized the valve allows flow from (1) to (2) and from (2) to (1).

FEATURES

- Hardened parts for long life.
- Efficient wet-armature construction.
- Cartridges are voltage interchangeable.
- Industry common cavity.
- Unitized, molded coil design.
- Continuous duty rated solenoid.
- Optional coil voltages and terminations.

HYDRAULIC SYMBOL**PERFORMANCE**

Actual Test Data (Cartridge Only)

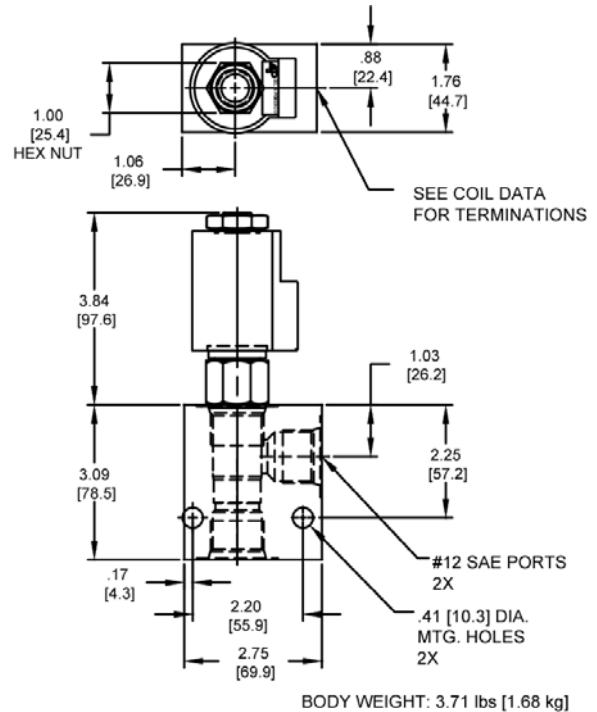
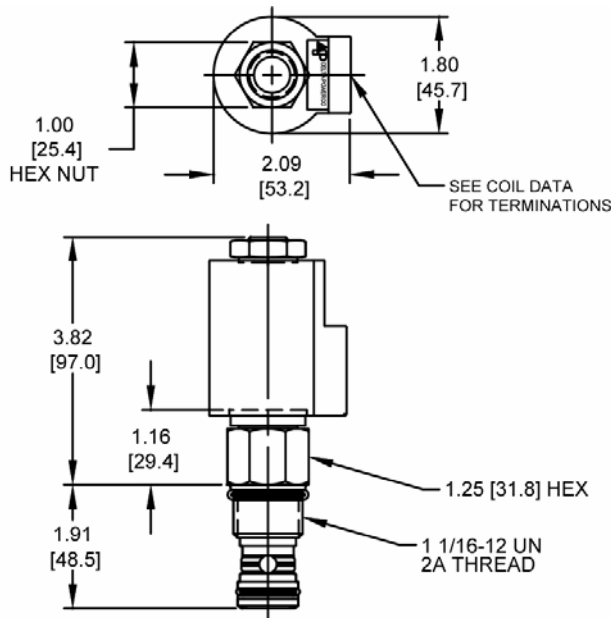
**VALVE SPECIFICATIONS**

Nominal Flow	25 GPM (95 LPM)
Rated Operating Pressure	5000 PSI (345 bar)
Typical Internal Leakage (150 SSU)	0-8 drops/min
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temperature Range	-40° to 250° F (-40° to 120° C)
Weight	.94 lbs. (.43 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	70 ft-lbs (94.9 Nm)
Coil Nut Torque Requirements	5-7 ft-lbs (6.8-9.5 Nm)
Cavity	TECNORD 2W
Cavity Form Tool (Finishing)	40500032
Seal Kit	21191301

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.



DIMENSIONS



ORDERING INFORMATION

HT-S2B -

OPTIONS

Buna Standard 00
Viton Standard V0
Buna, Screen A0
Viton, Screen W0

Blank S

BODIES

Without Body
#12 SAE Ports

VOLTAGE

06 6 VDC
12 12 VDC
24 24 VDC
36 36 VDC
48 48 VDC
25 24 VAC
11 120 VAC
22 220 VAC

Note: Use screen only if flow direction is from (1) to (2).

"T" COIL TERMINATION

(All DC Except as Noted)

Double Lead DL
Deutsch on Leads DT
Metri-Pack on Leads ML
Packard on Leads PL
Weatherpak on Leads WL
Double Spade DS
DIN 43650 (Hirschman) - (AC/DC) HC

Approximate Coil Weight: .89 lbs/.41 kg.

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

**SJ-S2B Pilot Operated Poppet, 2 Way Normally Closed****DESCRIPTION**

16 size, 1 5/16-12 thread, "Super" series, solenoid operated, 2 way normally closed, pilot operated poppet valve with reverse flow energized and de-energized.

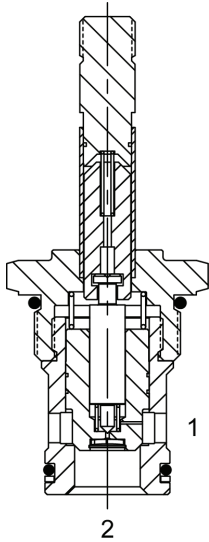
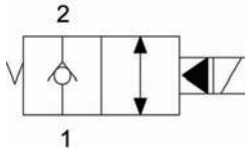
OPERATION

When de-energized the SJ-S2B blocks flow from (1) to (2) and allows reverse flow from (2) to (1). When energized the valve allows flow from (1) to (2) and from (2) to (1).

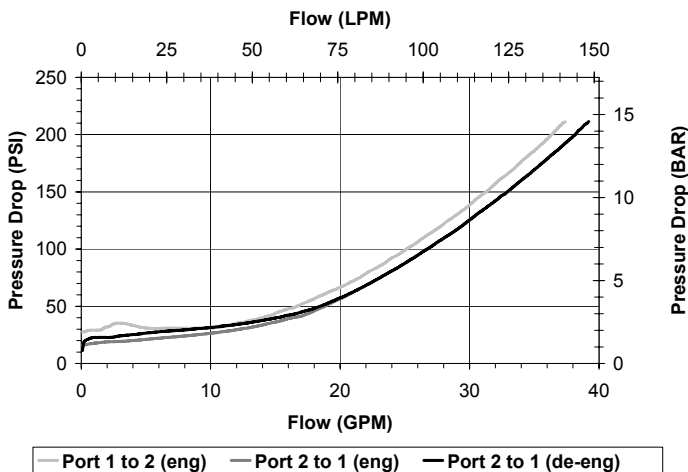
OPERATION OF MANUAL OVERRIDE OPTION: To override, pull knob out. On the detented version, after pulling knob out twist 180 degrees and release. The valve will remain in that position.

FEATURES

- Hardened parts for long life.
- Efficient wet-armature construction.
- Cartridges are voltage interchangeable.
- Manual override option.
- Industry common cavity.
- Unitized, molded coil design.
- Continuous duty rated solenoid.
- Optional coil voltages and terminations.
- Optional "I" Coil: Weatherproof, Thermal Shock, Immersion Safe.

**HYDRAULIC SYMBOL****PERFORMANCE**

Actual Test Data (Cartridge Only)

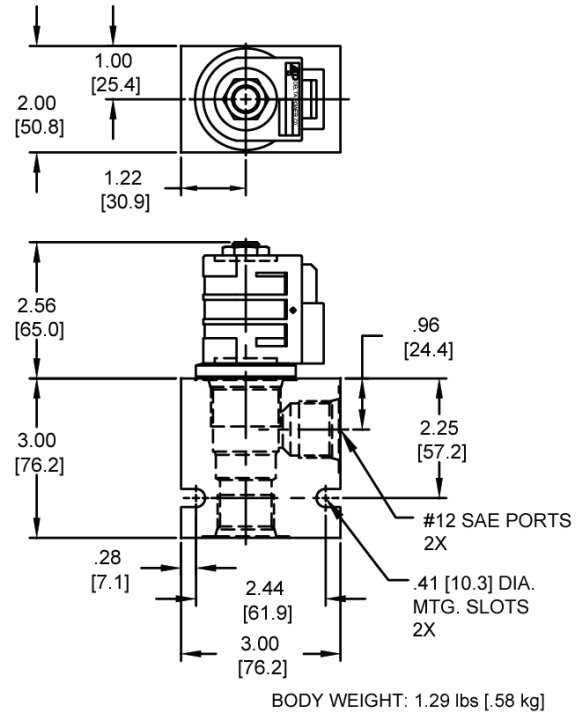
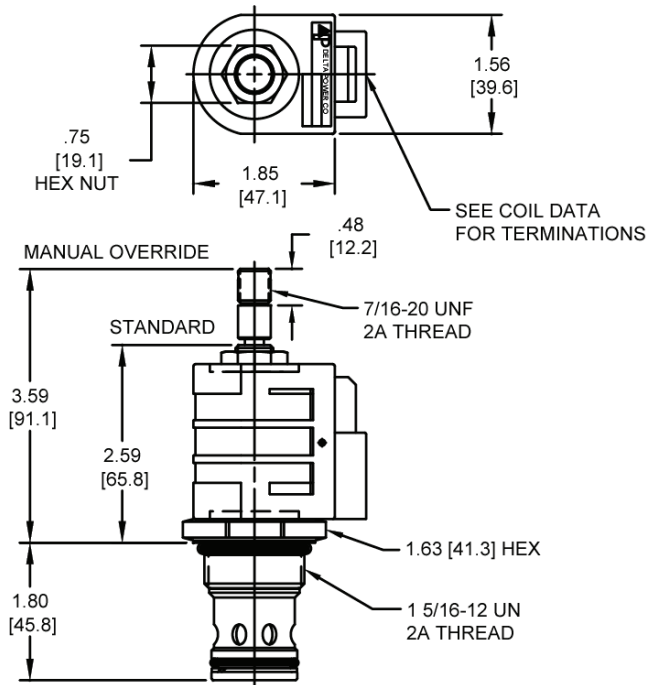
**VALVE SPECIFICATIONS**

Nominal Flow	30 GPM (114 LPM)
Rated Operating Pressure	3500 PSI (241 bar)
Typical Internal Leakage (150 SSU)	0-10 drops/min
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temperature Range	-40° to 250° F (-40° to 120° C)
Weight	.72 lbs. (.32 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	90 ft-lbs (122 Nm)
Coil Nut Torque Requirements	4-6 ft-lbs (5.4-8.1 Nm)
Cavity	SUPER 2W
Cavity Form Tool (Finishing)	40500017
Seal Kit	21191401

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.



DIMENSIONS



ORDERING INFORMATION

SJ-S2B -

OPTIONS

Buna Standard	00
Viton Standard	VO
Buna, Screen	A0
Viton, Screen	W0
Buna, Override, Detent	0M
Viton, Override, Detent	VM
Buna, Override, Non-detent	B1
Viton, Override, Non-detent	V1
Buna, Screen, Override, Non-detent	B3
Viton, Screen, Override, Non-detent	V3
Buna, Screen, Override, Detent	B4
Viton, Screen, Override, Detent	V4

Note: Use screen only if flow direction is from (1) to (2)

"D" COIL TERMINATION

(All DC Except as Noted)

DL	Double Lead
DT	Deutsch on Leads DT04-2P
ML	Metri-Pack on Leads
PL	Packard on Leads
WL	Weatherpack on Leads

SS	Single Spade
DS	Double Spade
HC	DIN 43650 (Hirschman) – (AC & DC)
CL	Conduit Lead – (AC Only)
DI	Deutsch – Integral DT04-2P

Blank
N
S

BODIES

Without Body
3/4 NPT Ports
#12 SAE Ports

VOLTAGE

06	6 VDC
12	12 VDC
24	24 VDC
36	36 VDC
48	48 VDC
25	24 VAC
11	120 VAC
22	220 VAC
44	440 VAC

IMMERSION PROOF "D" TYPE

IA	"I" Coil AMP Superseal - Integral
ID	"I" Coil Deutsch – Integral DT04-2P
IJ	"I" Coil AMP Jr. Timer - Integral
IM	"I" Coil Metri-Pack – Integral

Approximate Coil Weight: .74 lbs (.33 kg.)

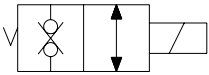
WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

Phone: (815) 397-6628

Fax: (815) 397-2526

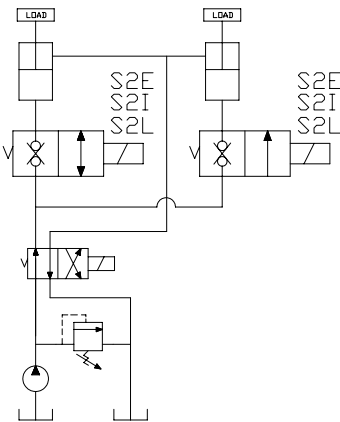
E-mail: delta@delta-power.com

2 Way 2 Position Normally Closed Bi-Directional Valves

	GPM	PSI	LPM	BAR	MODEL	PAGE
	0.20	3000	0.76	207	MA-S2E	44
	3	3000	11	207	PB-S2I	46
	3	3000	15	207	DE-S2I	48
	12	5000	45	350	HB-S2L	50
	12	3000	45	207	DE-S2L	52

Typical Schematic

Typical application for the S2E, S2I, and S2L is where load holding in both directions is required.

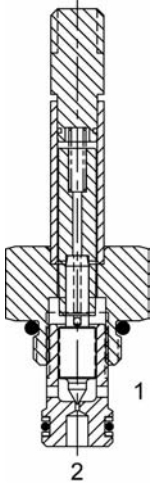


WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com

**MA-S2E Poppet, 2 Way, Normally Closed, Bi-directional****DESCRIPTION**

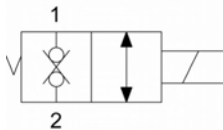
7 size, 5/8-18 thread, "Mini" series, solenoid operated, 2 way normally closed, bi-directional poppet valve.

OPERATION

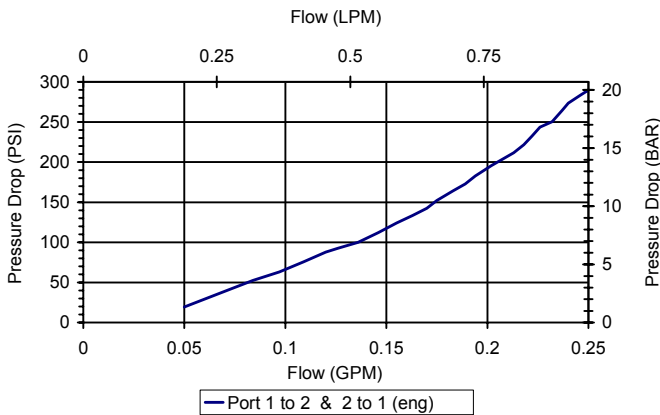
When de-energized the MA-S2E blocks flow from (1) to (2) and (2) to (1). When energized the valve allows flow from (1) to (2) and (2) to (1).

FEATURES

- Hardened parts for long life.
- Efficient wet-armature construction.
- Cartridges are voltage interchangeable.
- Industry common cavity.
- Unitized, molded coil design.
- Continuous duty rated solenoid.
- Optional coil voltages and terminations.

HYDRAULIC SYMBOL**PERFORMANCE**

Actual Test Data (Cartridge Only)

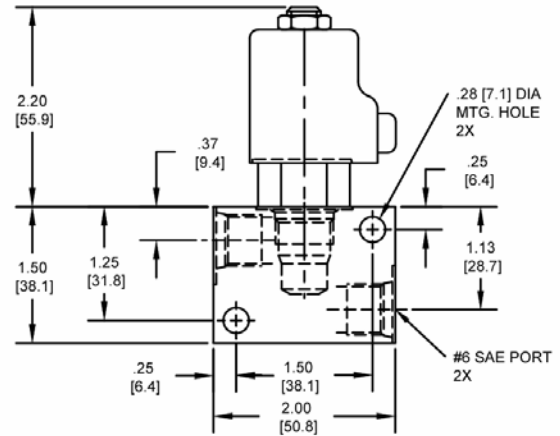
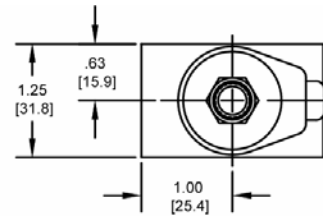
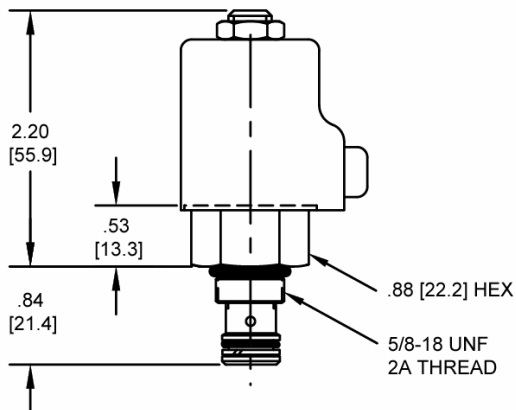
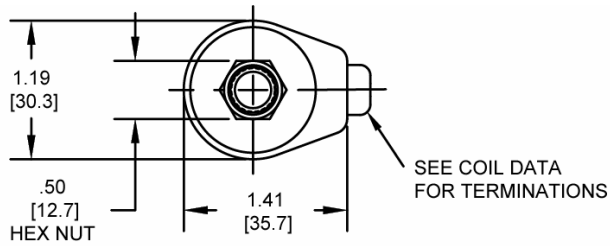
**VALVE SPECIFICATIONS**

Nominal Flow	20 GPM (.76 LPM)
Rated Operating Pressure	3000 PSI (207 bar)
Typical Internal Leakage (150 SSU)	0-10 drops/min
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temperature Range	-40° to 250° F (-40° to 120° C)
Weight	.18 lbs. (.08 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	15 ft-lbs (20.3 Nm)
Coil Nut Torque Requirements	3-5 ft-lbs (4.1-6.8 Nm)
Cavity	MINI 2W
Cavity Form Tool (Finishing)	40500003
Seal Kit	21191003

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.



DIMENSIONS



BODY WEIGHT: .47 lbs. [21 kg.]

MA-S2E -

OPTIONS

Buna Standard **00**
 Viton Standard **V0**
 Buna, Screen **A0**
 Viton, Screen **W0**

**Note: Use screen only if flow direction
 is from (1) to (2).**

"M" COIL TERMINATION

(All DC Except as Noted)

Double Lead **DL**
 Deutsch on Leads DT04-2P **DT**
 Metri-Pack on Leads **ML**
 Parkard on Leads **PL**
 Weather on Leads **WL**
 Single Spade **SS**
 Double Spade **DS**
 DIN 43650 (Hirschmann) – (AC&DC) **HC**
 Conduit Lead – (AC only) **CL**

Blank

N**S****BODIES**

Without Body
 1/4 NPTF Ports
 #6 SAE Ports

VOLTAGE

06 6 VDC
12 12 VDC
24 24 VDC
36 36 VDC
48 48 VDC
25 24 VAC
11 120 VAC
22 220 VAC
44 440 VAC

Approximate Coil Weight: .30 lbs/.14 kg.

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

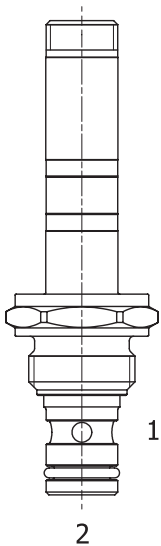

PB-S2I Direct Acting Poppet, 2 Way Double Lock Normally Closed
DESCRIPTION

8 size, 3/4-16 thread, "Power" series, solenoid operated, 2 way normally closed, bi-directional poppet valve.

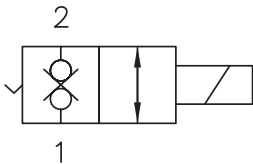
OPERATION

When de-energized the PB S2I blocks flow from (1) to (2) and from (2) to (1). When energized the valve allows flow from (1) to (2) and from (2) to (1).

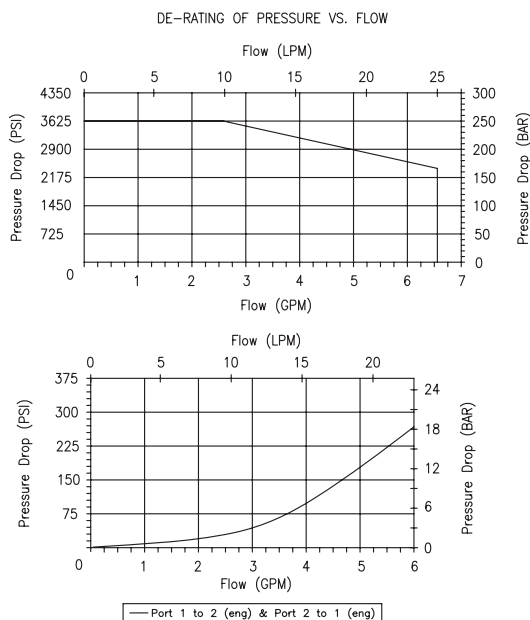
MANUAL OVERRIDE OPTION: to override, turn clockwise the manual override screw. To release, turn the manual override screw counter-clockwise.


FEATURES

- Hardened parts for long life.
- Efficient wet-armature construction.
- Cartridges are voltage interchangeable.
- Industry common cavity.
- Unitized, molded coil design.
- Continuous duty rated solenoid.
- Optional coil voltages and terminations.

HYDRAULIC SYMBOL

PERFORMANCE

Actual Test Data (Cartridge Only)

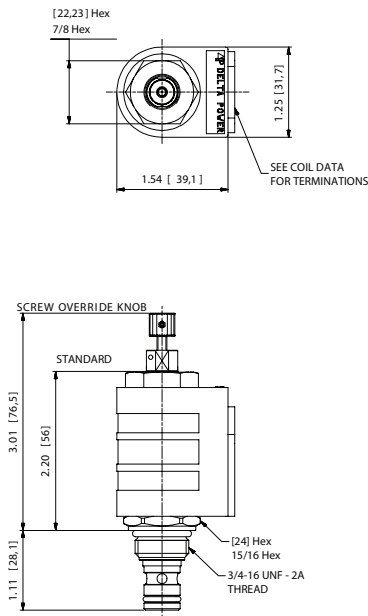

VALVE SPECIFICATIONS

Nominal Flow	3 GPM (11 LPM)
Rated Operating Pressure	3600 PSI (250 bar)
Typical Internal Leakage (150 SSU)	0-10 drops/min at 3600 PSI (250 bar)
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temperature Range	-40° to 210° F (-40° to 100° C) BUNA seals -4° to 250° F (-20° to 120° C) VITON seals
Weight	.29 lbs. (.13 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	25 ft-lbs (34 Nm)
Coil Nut Torque Requirements	4-6 ft-lb (5.4-8.1 Nm))
Cavity	POWER 2W
Cavity Tool	40500005
Seal Kit	TBA

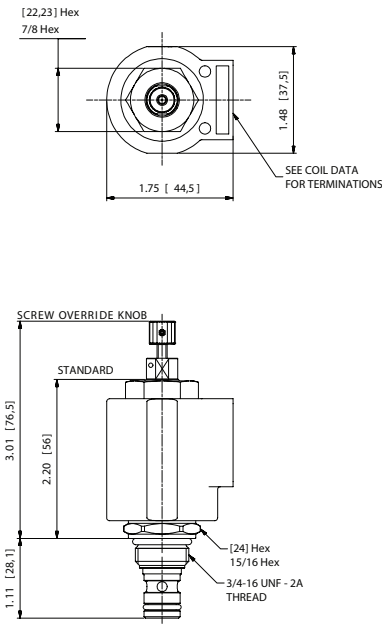
WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

DIMENSIONS

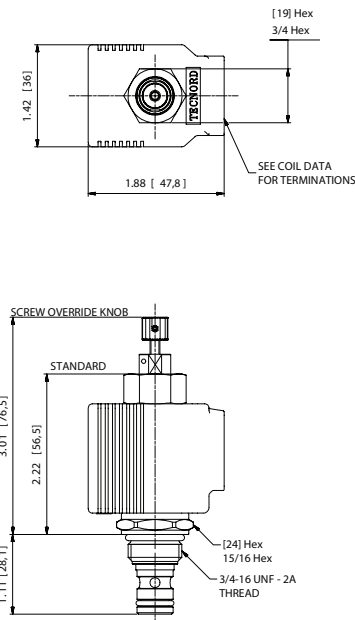
“P” COIL TERMINATION



IMMERSION PROOF “I” TYPE



“J” COIL TERMINATION



ORDERING INFORMATION

PB - S2I -

OPTIONS

Buna Standard	00
Viton Standard	V0
Buna Knob	OK

CONSULT FACTORY FOR BODY

VOLTAGE

06	06 VDC
12	12 VDC
24	24 VDC
36	36 VDC
48	48 VDC
25	24 VAC
11	120 VAC
22	220 VAC
44	440 VAC

“P” COIL TERMINATION

(All DC Except as Noted)

DL	Double Lead
DS	Double Spade
HC	DIN 43650 (Hirschman) - (AC & DC)
CL	Conduit Lead - (AC Only)
DI	Deutsch - Integral DT04-2P

IMMERSION PROOF “I” TYPE

IA	“I” Coil AMP Superseal - Integral
ID	“I” Coil Deutsch - Integral DT04-2P
IJ	“I” Coil AMP Jr. Time - Integral
IM	“I” Coil Metri-Pack - Integral

“J” COIL TERMINATION

JA	“J” Coil AMP Superseal - Integral
JD	“J” Coil Deutsch - Integral DT04-2P
JJ	“J” Coil AMP Jr. Time - Integral
JM	“J” Coil Metri-Pack - Integral
JL	“J” Coil Double Lead
JH	“J” Coil DIN 43650 (Hirschman) - (AC & DC)

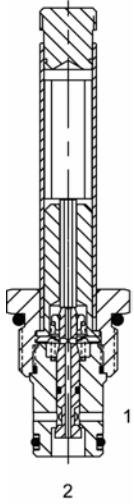
Approximate Coil Weight: .42 lbs/.19 kg.
For Optional Coil Terminations See Coil Section

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com

**DE-S2I Poppet, 2 Way, Normally Closed, Bi-Directional****DESCRIPTION**

10 size, 7/8-14 thread, "Delta" series, solenoid operated, 2 way normally closed, bi-directional poppet valve.

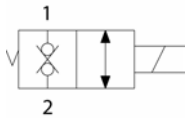
OPERATION

When de-energized the DE-S2I blocks flow from (1) to (2) and (2) to (1). When energized the valve allows flow from (1) to (2) and (2) to (1).

OPERATION OF MANUAL OVERRIDE OPTION: To override, turn the manual override screw clockwise. To release turn the manual override screw counter-clockwise.

FEATURES

- Hardened parts for long life.
- Efficient wet-armature construction.
- Cartridges are voltage interchangeable.
- Manual override option.
- Industry common cavity.
- Unitized, molded coil design.
- Continuous duty rated solenoid.
- Optional coil voltages and terminations.
- Optional "I" Coil: Weatherproof, Thermal Shock, Immersion Safe.

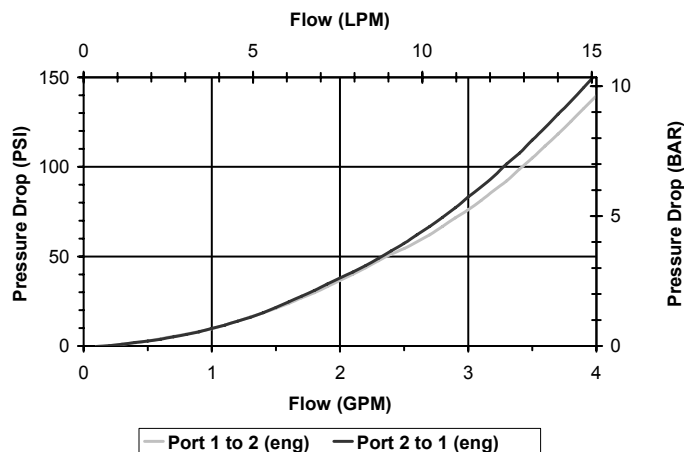
HYDRAULIC SYMBOL

Higher pressure or higher flow capable, consult factory for options.

For Higher flow see DE-S2L.

PERFORMANCE

Actual Test Data (Cartridge Only)

**VALVE SPECIFICATIONS**

Nominal Flow	3 GPM (11 LPM)
Rated Operating Pressure	3000 PSI (207 bar)
Typical Internal Leakage (150 SSU)	0-10 drops/min
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temperature Range	-40° to 250° F (-40° to 120° C)
Weight	.21 lbs. (.09 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	30 ft-lbs (40.6 Nm)
Coil Nut Torque Requirements	4-6 ft-lbs (5.4-8.1 Nm)
Cavity	DELTA 2W
Cavity Form Tool (Finishing)	40500000
Seal Kit	21191202

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

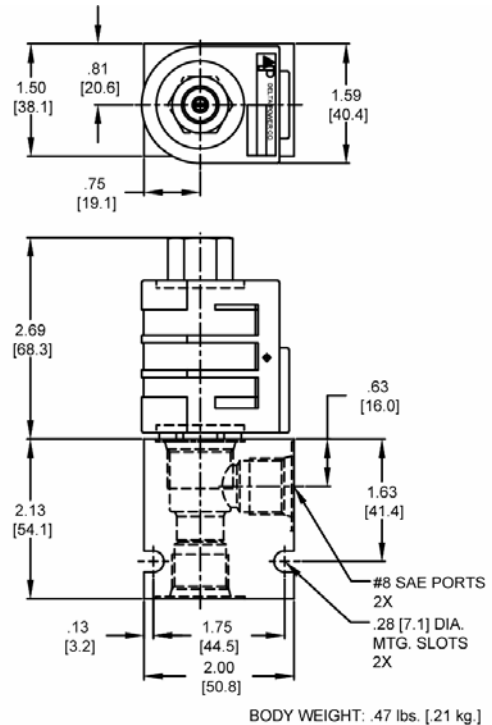
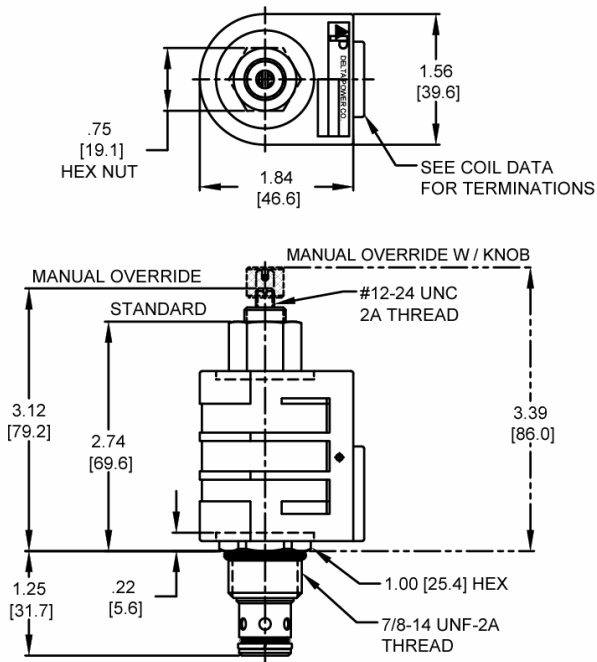
Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com



DIMENSIONS



ORDERING INFORMATION

DE-S2I -

OPTIONS

Buna Standard	00
Viton Standard	V0
Buna, Override	OM
Viton, Override	VM
Buna, Override, Knob	OK
Viton, Override, Knob	VK
Buna, Screen	A0
Viton, Screen	W0
Buna, Screen, Override	B2
Viton, Screen, Override	V2
Buna, Screen, Override, Knob	B5
Viton, Screen, Override, Knob	V5

Note: Use screen only if flow direction is from (1) to (2).

"D" COIL TERMINATION

(All DC Except as Noted)

DL	Double Lead
DT	Deutsch on Leads DT04-2P
ML	Metri-Pack on Leads
PL	Packard on Leads
WL	Weatherpack on Leads

SS	Single Spade
DS	Double Spade
HC	DIN 43650 (Hirschman) - (AC & DC)
CL	Conduit Lead - (AC Only)
DI	Deutsch - Integral DT04-2P

Blank

N

S

BODIES

Without Body
3/8 NPTF Ports
#8 SAE Ports

VOLTAGE

06	6 VDC
12	12 VDC
24	24 VDC
36	36 VDC
48	48 VDC
25	24 VAC
11	120 VAC
22	220 VAC
44	440 VAC

IMMERSION PROOF "D" TYPE

IA	"I" Coil AMP Superseal - Integral
ID	"I" Coil Deutsch - Integral DT04-2P
IJ	"I" Coil AMP Jr. Timer - Integral
IM	"I" Coil Metri-Pack - Integral

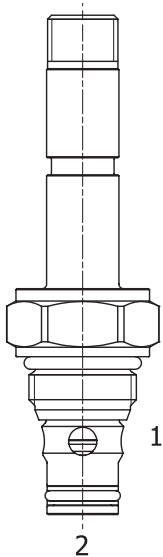
Approximate Coil Weight: .72 lbs. (.32 kg.)

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com


HB-S2L Piloted Operated Poppet, 2 Way, Normally Closed, Bi-directional

DESCRIPTION

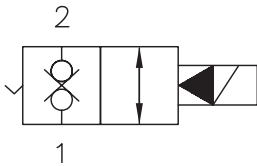
8 size, 3/4-16 thread, "Power" series, solenoid operated, 2 way normally closed, bi-directional poppet valve.

OPERATION

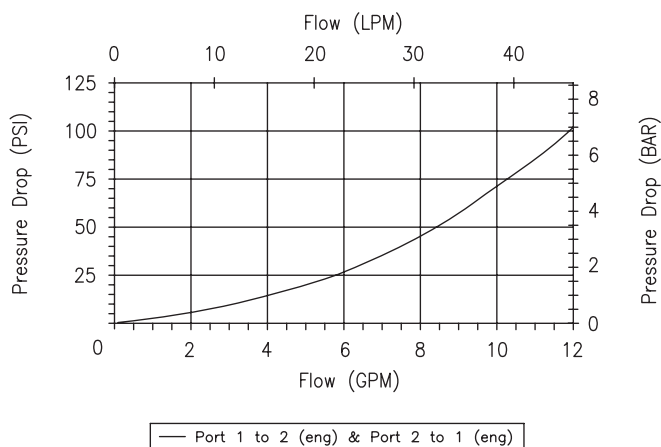
When de-energized the HB-S2L blocks flow from (1) to (2) and (2) to (1). When energized the valve allows flow from (1) to (2) and (2) to (1).

FEATURES

- Hardened parts for long life.
- Efficient wet-armature construction.
- Cartridges are voltage interchangeable.
- Industry common cavity.
- Unitized, molded coil design.
- Continuous duty rated solenoid.
- Optional coil voltages and terminations.
- Optional "I" Coil: Weatherproof, Thermal Shock, Immersion Safe.

HYDRAULIC SYMBOL

PERFORMANCE

Actual Test Data (Cartridge Only)


VALVE SPECIFICATIONS

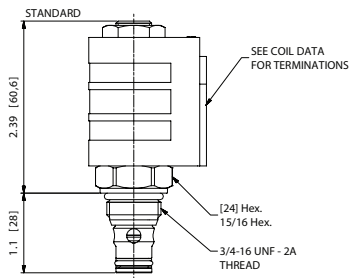
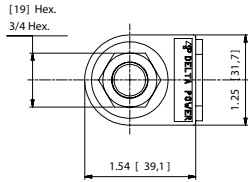
Nominal Flow	12 GPM (45 LPM)
Rated Operating Pressure	5000 PSI (350 bar)
Typical Internal Leakage (150 SSU)	0-10 drops/min
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temperature Range	-40° to 250° F (-40° to 120° C)
Weight	.26 lbs. (.12 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	35 ft-lbs (47 Nm)
Coil Nut Torque Requirements	4-6 ft-lbs (5.4-8.1 Nm)
Cavity	POWER 2W
Cavity Tools kit	40500005
Seal Kit	21191102

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

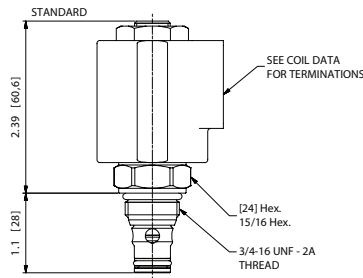
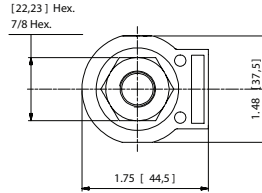


DIMENSIONS

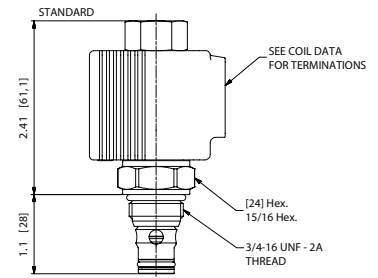
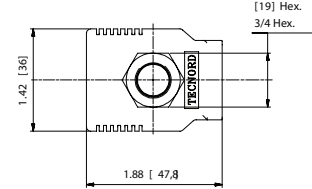
"P" COIL TERMINATION



IMMERSION PROOF "I" TYPE



"J" COIL TERMINATION



ORDERING INFORMATION

HB - S2L -

OPTIONS

Buna Standard
Viton Standard

00
V0

CONSULT FACTORY FOR BODY

VOLTAGE

06 06 VDC
12 12 VDC
24 24 VDC
36 36 VDC
48 48 VDC
25 24 VAC
11 120 VAC
22 220 VAC
44 440 VAC

"P" COIL TERMINATION

(All DC Except as Noted)

DL Double Lead
DS Double Spade
HC DIN 43650 (Hirschman) - (AC & DC)
CL Conduit Lead - (AC Only)
DI Deutsch - Integral DT04-2P

IMMERSION PROOF "I" TYPE

IA "I" Coil AMP Superseal - Integral
ID "I" Coil Deutsch - Integral DT04-2P
IJ "I" Coil AMP Jr. Time - Integral
IM "I" Coil Metri-Pack - Integral

"J" COIL TERMINATION

JA "J" Coil AMP Superseal - Integral
JD "J" Coil Deutsch - Integral DT04-2P
JJ "J" Coil AMP Jr. Time - Integral
JM "J" Coil Metri-Pack - Integral
JL "J" Coil Double Lead
JH "J" Coil DIN 43650 (Hirschman)

Approximate Coil Weight: .42 lbs/.19 kg.

For Optional Coil Terminations See Coil Section

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

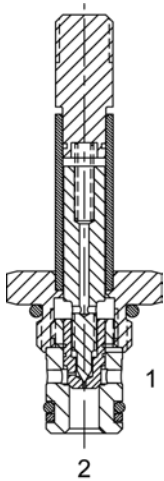
Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com



MA-S2F Pilot Operated Poppet, 2 Way, Normally Closed – Soft Seat



DESCRIPTION

7 size, 5/8-18 thread, "Mini" series, solenoid operated, 2 way normally closed, pilot operated soft seat poppet valve with reverse flow de-energized.

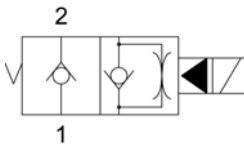
OPERATION

When de-energized the MA-S2F blocks flow from (1) to (2) and allows free reverse flow from (2) to (1). When energized the valve allows flow from (1) to (2) and restricts flow from (2) to (1).

FEATURES

- Soft seat for ultra low leakage.
- Efficient wet-armature construction.
- Cartridges are voltage interchangeable.
- Industry common cavity.
- Unitized, molded coil design.
- Continuous duty rated solenoid.
- Optional coil voltages and terminations.

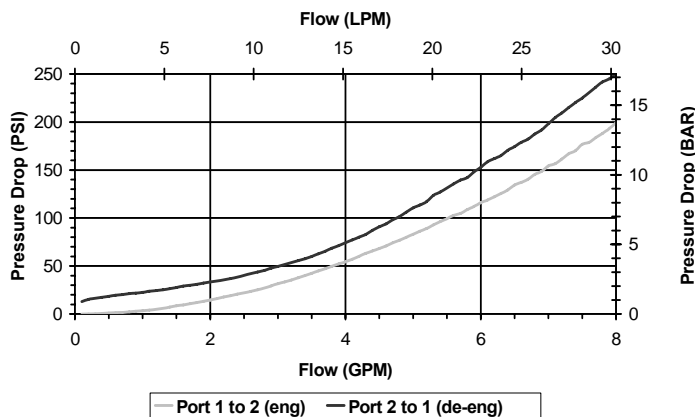
HYDRAULIC SYMBOL



Operational shift limit 2.5 GPM (9.5 LPM). For shifted flow performance consult chart.

PERFORMANCE

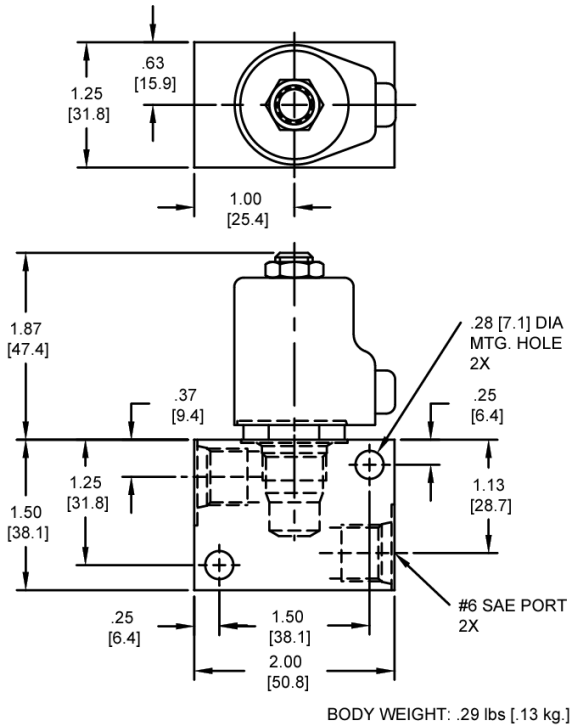
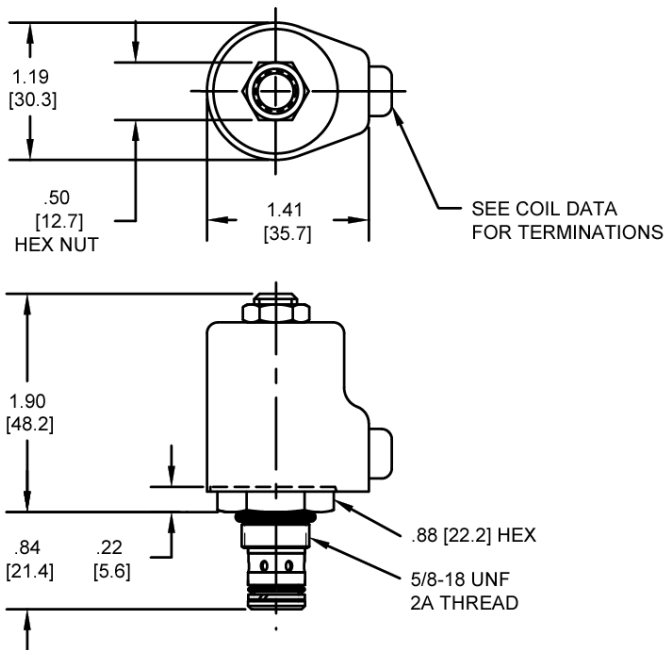
Actual Test Data (Cartridge Only)



VALVE SPECIFICATIONS

Maximum Flow	2.5 GPM (9.5 LPM)
Rated Operating Pressure	1500 PSI (103 bar)
Typical Internal Leakage (150 SSU)	Negligible
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temperature Range	32° to 160° F (0° to 70° C)
Weight	.12 lbs. (.05 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	15 ft-lbs (20.3 Nm)
Coil Nut Torque Requirements	3-5 ft-lbs (4.1-6.8 Nm)
Cavity	MINI 2W
Cavity Form Tool (Finishing)	40500003
Seal Kit	21191000

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.


DIMENSIONS

ORDERING INFORMATION
MA-S2F -
OPTIONS

Buna Standard **00**
 Viton Standard **V0**
 Buna & Screen **A0**
 Viton & Screen **W0**

Note: Use screen only if flow direction is from (1) to (2).

"M" COIL TERMINATION

(All DC Except as Noted)

Double Lead **DL**
 Deutsch on Leads DT04-2P **DT**
 Metri-Pack on Leads **ML**
 Packard on Leads **PL**
 Weatherpack on Leads **WL**
 Single Spade **SS**
 Double Spade **DS**
 DIN 43650 (Hirschman) - (AC&DC) **HC**
 Conduit Lead - (AC Only) **CL**

Blank

N
S

BODIES

Without Body
 1/4 NPTF Ports
 #6 SAE Ports

VOLTAGE

06 6 VDC
12 12 VDC
24 24 VDC
36 36 VDC
48 48 VDC
25 24 VAC
11 120 VAC
22 220 VAC
44 440 VAC

Approximate Coil Weight: .30 lbs. (.14 kg.)

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

**PB-S2F Pilot Operated Poppet, 2 Way Normally Closed – Soft Seat****DESCRIPTION**

8 size, 3/4-16 thread, "Power" series, solenoid operated, 2 way normally closed, pilot operated soft seat poppet valve with reverse flow de-energized.

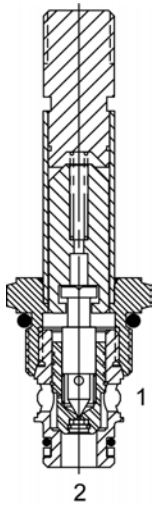
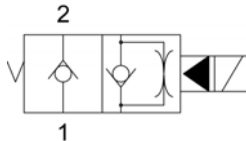
OPERATION

When de-energized the PB-S2F blocks flow from (1) to (2) and allows reverse flow from (2) to (1). When energized the valve allows flow from (1) to (2) and restrict flow from (2) to (1).

OPERATION OF MANUAL OVERRIDE OPTION: To override, pull knob out. On the detented version, after pulling knob out twist 180 degrees and release. The valve will remain in that position.

FEATURES

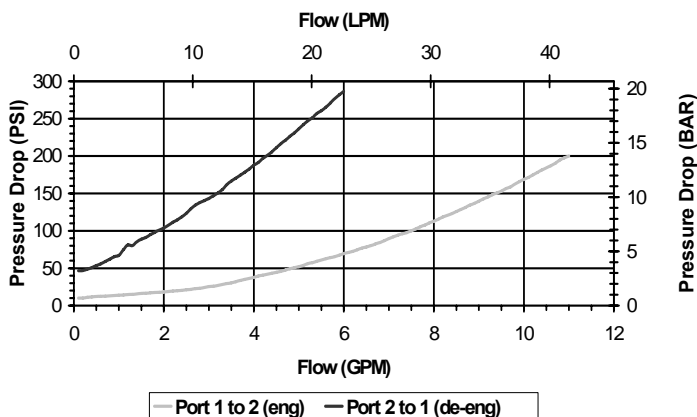
- Soft seat for ultra low leakage.
- Efficient wet-armature construction.
- Cartridges are voltage interchangeable.
- Manual override option.
- Industry common cavity.
- Unitized, molded coil design.
- Continuous duty rated solenoid.
- Optional coil voltages and terminations.
- Optional "I" Coil: Weatherproof, Thermal Shock, Immersion Safe.

**HYDRAULIC SYMBOL**

Operational shift limit is 6 GPM.
For shifted performance consult chart.

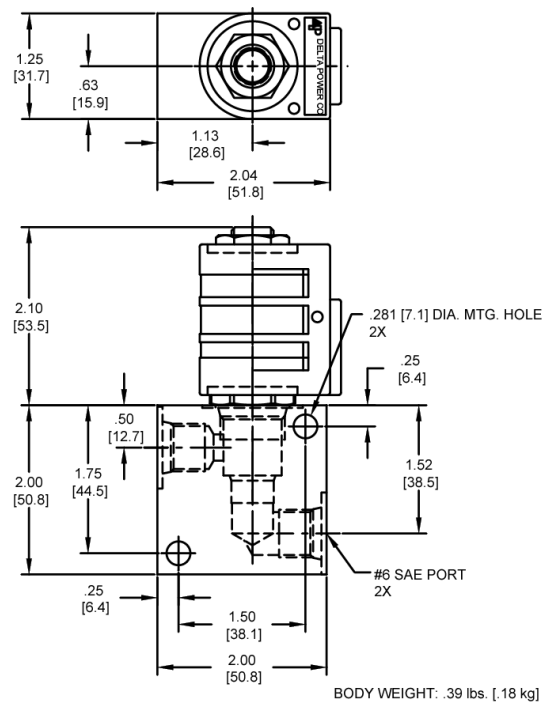
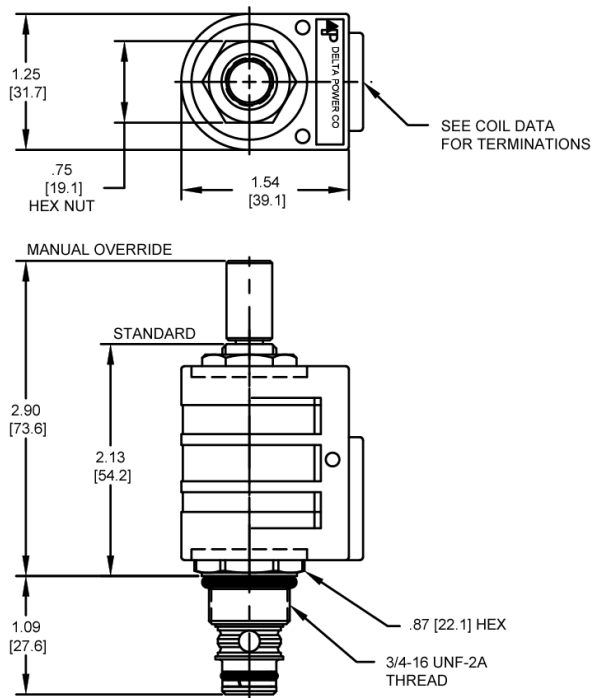
PERFORMANCE

Actual Test Data (Cartridge Only)

**VALVE SPECIFICATIONS**

Maximum Flow	6 GPM (23 LPM)
Rated Operating Pressure	2500 PSI (172 bar)
Typical Internal Leakage (150 SSU)	Negligible
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temperature Range	-35° to 200° F (-37° to 93° C)
Weight	.19 lbs. (.08 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	25 ft-lbs (34 Nm)
Coil Nut Torque Requirements	4-6 ft-lbs (5.4-8.1 Nm)
Cavity	POWER 2W
Cavity Form Tool (Finishing)	40500005
Seal Kit	21191100

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.


DIMENSIONS

ORDERING INFORMATION
PB-S2F -
OPTIONS

Buna Standard	00
Viton Standard	V0
Buna, Override, Detent	0M
Viton, Override, Detent	VM
Buna, Screen	A0
Viton, Screen	W0
Buna, Override, Nondetent	B1
Viton, Override, Nondetent	V1
Buna, Screen, Override, Nondetent	B3
Viton, Screen, Override, Nondetent	V3
Buna, Screen, Override, Detent	B4
Viton, Screen, Override, Detent	V4

Note: Use screen only if flow direction is from (1) to (2).

"P" COIL TERMINATION

(All DC Except as Noted)

DL	Double Lead
DT	Deutsch on Leads DT04-2P
ML	Metri-Pack on Leads
PL	Packard on Leads
WL	Weatherpack on Leads

SS	Single Spade
DS	Double Spade
HC	DIN 43650 (Hirschmann) - (AC & DC)
CL	Conduit Lead - (AC Only)
DI	Deutsch - Integral DT04-2P

Blank

N

S

BODIES

Without Body
1/4 NPTF Ports
#6 SAE Ports

VOLTAGE

06	6 VDC
12	12 VDC
24	24 VDC
36	36 VDC
48	48 VDC
25	24 VAC
11	120 VAC
22	220 VAC
44	440 VAC

IMMERSION PROOF "P" TYPE

IA	"I" Coil AMP Superseal - Integral
ID	"I" Coil Deutsch - Integral DT04-2P
IJ	"I" Coil AMP Jr. Timer - Integral
IM	"I" Coil Metri-Pack - Integral

Approximate Coil Weight: .42 lbs/.19 kg.

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

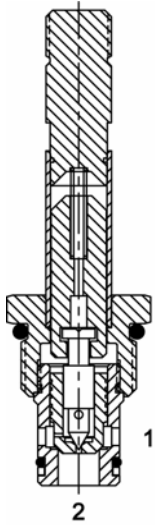
Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com



DE-S2F Pilot Operated Poppet, 2 Way Normally Closed – Soft Seat



DESCRIPTION

10 size, 7/8-14 thread, "Delta" series, solenoid operated, 2 way normally closed, pilot operated soft seat poppet valve with reverse flow de-energized.

OPERATION

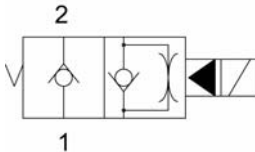
When de-energized the DE-S2F blocks flow from (1) to (2) and allows reverse flow from (2) to (1). When energized the valve allows flow from (1) to (2) but restricts reverse flow from (2) to (1).

OPERATION OF MANUAL OVERRIDE OPTION: To override, pull knob out. On the detented version, after pulling knob out twist 180 degrees and release. The valve will remain in that position.

FEATURES

- Soft seat for ultra low leakage.
- Efficient wet-armature construction.
- Cartridges are voltage interchangeable.
- Manual override option.
- Industry common cavity.
- Unitized, molded coil design.
- Continuous duty rated solenoid.
- Optional coil voltages and terminations.
- Optional "I" Coil: Weatherproof, Thermal Shock, Immersion Safe.

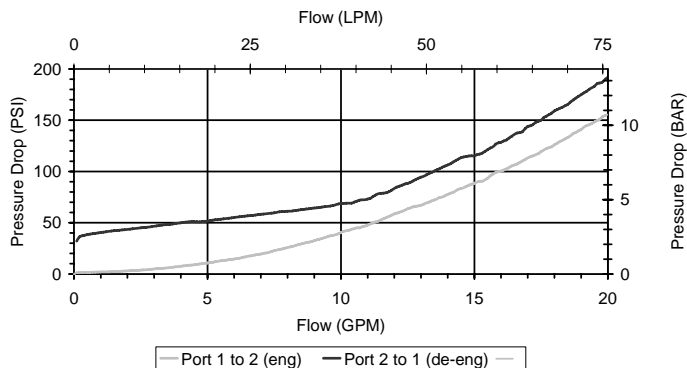
HYDRAULIC SYMBOL



Operational shift limit 10 GPM (38 LPM). For shifted flow performance consult chart.

PERFORMANCE

Actual Test Data (Cartridge Only)



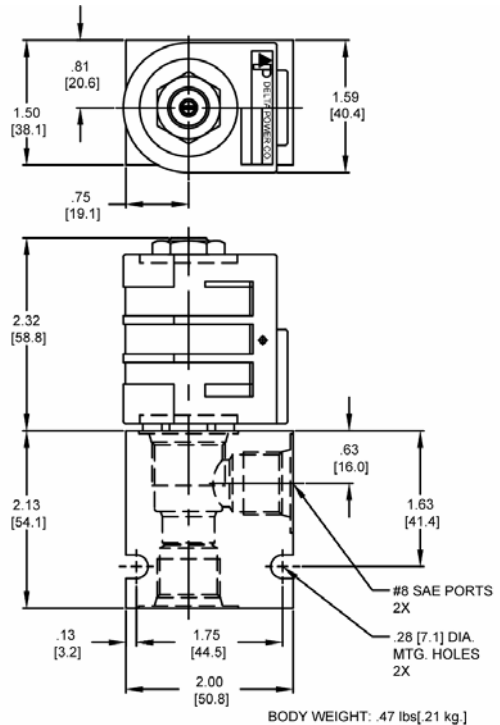
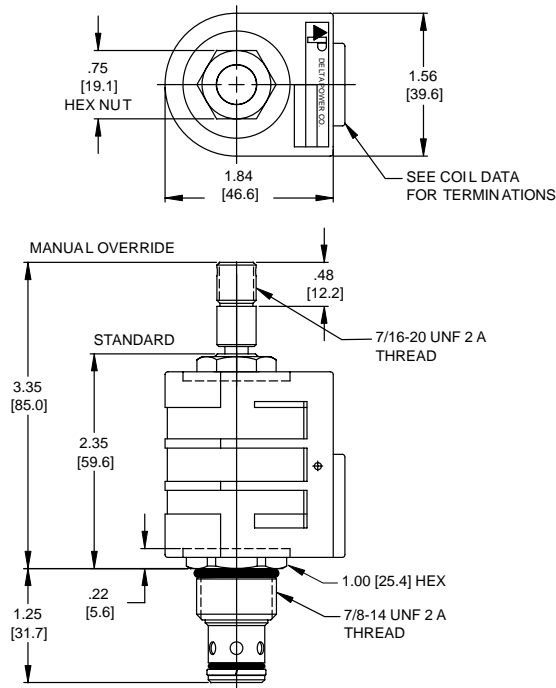
VALVE SPECIFICATIONS

Nominal Flow	10 GPM (38 LPM)
Rated Operating Pressure	1000 PSI (69 bar)
Typical Internal Leakage (150 SSU)	Negligible
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temperature Range	32° to 160° F (0° to 70° C)
Weight	.25 lbs. (.11 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	30 ft-lbs (40.6 Nm)
Coil Nut Torque Requirements	4-6 ft-lbs (5.4-8.1 Nm)
Cavity	DELTA 2W
Cavity Form Tool (Finishing)	40500000
Seal Kit	21191200

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.



DIMENSIONS



ORDERING INFORMATION

DE-S2F -

OPTIONS

Buna Standard	00
Viton Standard	V0
Buna, Override	0M
Viton, Override	VM
Buna & Screen	A0
Viton & Screen	W0
Buna, Override, Non-detent	B1
Viton, Override, Non-detent	V1
Buna, Screen, Override, Non-detent	B3
Buna, Screen, Override, Detent	B4
Viton, Screen, Override, Non-detent	V3
Viton, Screen, Override, Detent	V4

Note: Use screen only if flow direction is from (1) to (2).

"D" COIL TERMINATION

(All DC Except as Noted)

DL	Double Lead
DT	Deutsch on Leads DT04-2P
ML	Metri-Pack on Leads
PL	Packard on Leads
WL	Weatherpack on Leads

SS	Single Spade
DS	Double Spade
HC	DIN 43650 (Hirschman) - (AC & DC)
CL	Conduit Lead - (AC Only)
DI	Deutsch - Integral DT04-2P

BODIES

Blank	Without Body
N	3/8 NPTF Ports
S	#8 SAE Ports

VOLTAGE

06	6 VDC
12	12 VDC
24	24 VDC
36	36 VDC
48	48 VDC
25	24 VAC
11	120 VAC
22	220 VAC
44	440 VAC

IMMERSION PROOF "D" TYPE

IA	"I" Coil AMP Superseal - Integral
ID	"I" Coil Deutsch - Integral DT04-2P
IJ	"I" Coil AMP Jr. Timer - Integral
IM	"I" Coil Metri-Pack - Integral

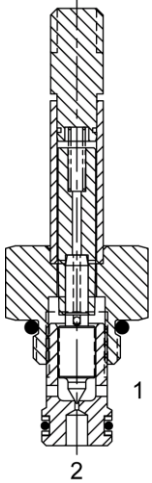
Approximate Coil Weight: .74 lbs (.33 kg.)

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com

**HA-S2P Poppet, 2 Way, Normally Closed****DESCRIPTION**

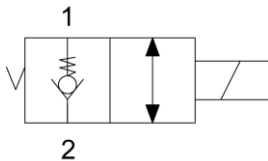
"High Pressure" 7 size, 5/8-18 thread, "Mini" series, solenoid operated, 2 way normally closed, poppet valve.

OPERATION

When de-energized the HA-S2P blocks flow from (1) to (2). When energized the valve allows flow from (1) to (2).

FEATURES

- Hardened parts for long life.
- Efficient wet-armature construction.
- Cartridges are voltage interchangeable.
- Industry common cavity.
- Unitized, molded coil design.
- Continuous duty rated solenoid.
- Optional coil voltages and terminations.

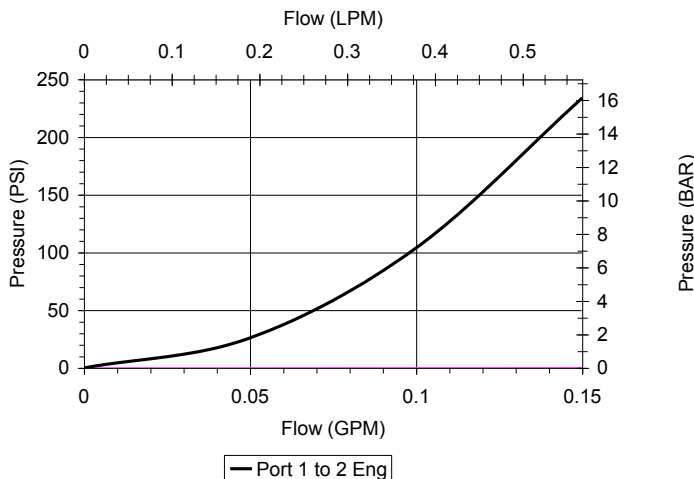
HYDRAULIC SYMBOL

Great for pilot control, low leakage.

Flow from port (2) to port (1) will happen once pressure is between 1000 and 2000 PSI

PERFORMANCE

Actual Test Data (Cartridge Only)

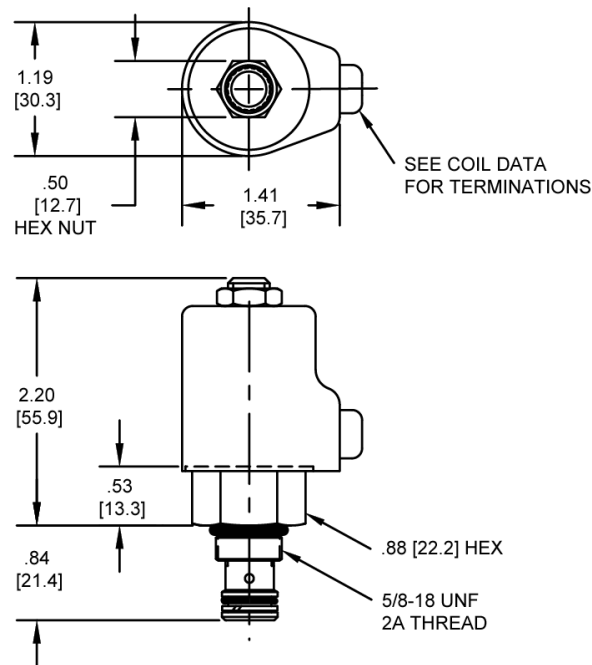
**VALVE SPECIFICATIONS**

Nominal Flow	.10 GPM (.38 LPM)
Rated Operating Pressure	5000 PSI (350 bar)
Typical Internal Leakage (150 SSU)	0-10 drops/min
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temperature Range	-40° to 250° F (-40° to 120° C)
Weight	.18 lbs. (.08 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	15 ft-lbs (20.3 Nm)
Coil Nut Torque Requirements	3-5 ft-lbs (4.1-6.8 Nm)
Cavity	MINI 2W
Cavity Form Tool (Finishing)	40500058
Seal Kit	21191000

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.



DIMENSIONS



HA-S2P -

OPTIONS

Buna Standard **00**
Viton Standard **V0**

BODIES

Blank **S**
Without Body #4 SAE Ports

WARNING
DO NOT USE ALUMINUM
HIGH PRESSURE (5000 PSI) PRODUCT

"M" COIL TERMINATION

(All DC Except as Noted)

Double Lead **DL**
Deutsch on Leads DT04-2P **DT**
Metri-Pack on Leads **ML**
Packard on Leads **PL**
Weatherpack on Leads **WL**
Single Spade **SS**
Double Spade **DS**
DIN 43650 (Hirschmann) – (AC&DC) **HC**
Conduit Lead – (AC only) **CL**

VOLTAGE

06 6 VDC
12 12 VDC
24 24 VDC
36 36 VDC
48 48 VDC
25 24 VAC
11 120 VAC
22 220 VAC
44 440 VAC

Approximate Coil Weight: .30 lbs/.14 kg.

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com

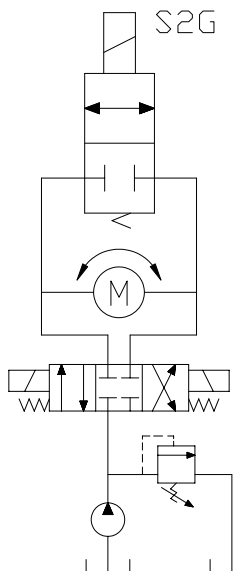


2 Way 2 Position Normally Closed Spool Valves

	GPM	PSI	LPM	BAR	MODEL	PAGE
	1.5	3000	6	207	MA-S2G	64
	4	4000	15	276	HA-S2G	66
	8	3000	30	207	PB-S2G	68
	8	3000	30	207	DE-S2G	70
	15	4000	57	276	HE-S2G	72

Typical Schematic

Typical application for the S2G is locking or braking of a fluid motor.



WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com

**MA-S2G Direct Acting Spool, 2 Way, Normally Closed****DESCRIPTION**

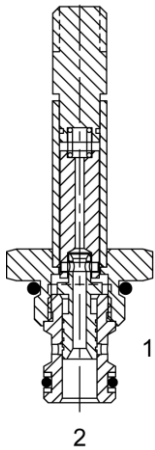
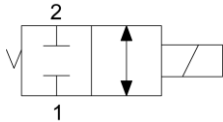
7 size, 5/8-18 thread, "Mini" series, solenoid operated, 2 way normally closed, spool valve.

OPERATION

When de-energized the MA-S2G blocks flow from (1) to (2) and (2) to (1). When energized the valve allows flow from (1) to (2) and (2) to (1).

FEATURES

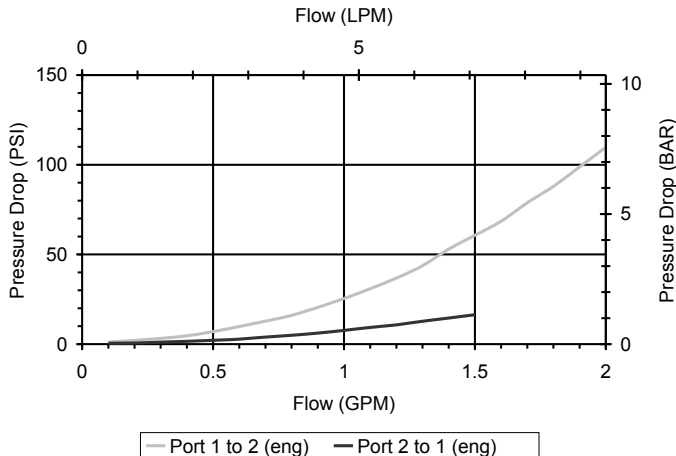
- Efficient wet-armature construction.
- Cartridges are voltage interchangeable.
- Industry common cavity.
- Unitized, molded coil design.
- Continuous duty rated solenoid.
- Optional coil voltages and terminations.

**HYDRAULIC SYMBOL**

For higher flow or pressure see HA-S2G.

PERFORMANCE

Actual Test Data (Cartridge Only)

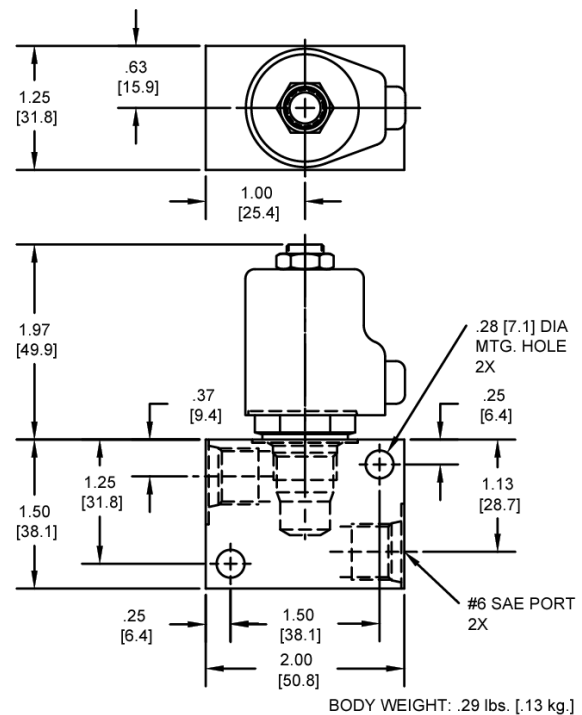
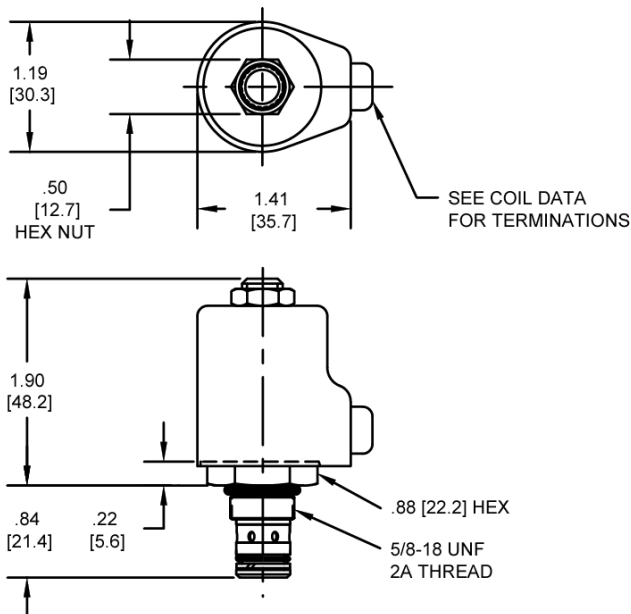
**VALVE SPECIFICATIONS**

Nominal Flow	1.5 GPM (6 LPM)
Rated Operating Pressure	3000 PSI (207 bar)
Typical Internal Leakage (150 SSU)	5 cu in/min (82 ml/min)
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temperature Range	-40° to 250° F (-40° to 120° C)
Weight	.12 lbs. (.05 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	15 ft-lbs (20.3 Nm)
Coil Nut Torque Requirements	3-5 ft-lbs (6.8 Nm)
Cavity	MINI 2W
Cavity Form Tool (Finishing)	40500003
Seal Kit	21191002

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.



DIMENSIONS



ORDERING INFORMATION

MA-S2G -

OPTIONS

Buna Standard **00**
 Viton Standard **V0**
 Buna, Screen **A0**
 Viton, Screen **W0**

**Note: Use screen only if flow direction
 is from (1) to (2).**

"M" COIL TERMINATION

(All DC Except as Noted)

DL Double Lead
DT Deutsch on Leads DT04-2P
ML Metri-Pack on Leads
PL Parkard on Leads
WL Weatherpack on Leads

SS Single Spade
DS Double Spade
HC DIN 43650 (Hirschmann) - (AC&DC)
CL Conduit Lead - (AC Only)

Blank

N

S

BODIES

Without Body
 1/4 NPTF Ports
 #6 SAE Ports

VOLTAGE

06 6 VDC
12 12 VDC
24 24 VDC
36 36 VDC
48 48 VDC
24 24 VAC
11 120 VAC
22 220 VAC
44 440 VAC

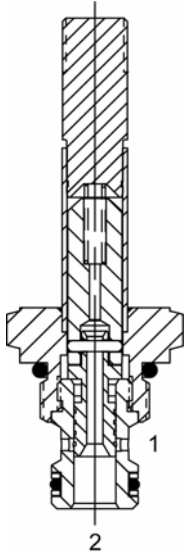
Approximate Coil Weight: .30 lbs/.14 kg.

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com

**HA-S2G Direct Acting Spool, 2 Way, Normally Closed****DESCRIPTION**

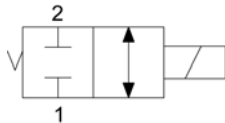
"High Pressure" 7 size, 5/8-18 thread, "Mini" series, solenoid operated, 2 way normally closed, spool valve with free reverse.

OPERATION

When de-energized the HA-S2G blocks flow from (1) to (2) and (2) to (1). When energized the valve allows flow from (1) to (2) and (2) to (1).

FEATURES

- Hardened parts for long life.
- Efficient wet-armature construction.
- Cartridges are voltage interchangeable.
- Industry common cavity.
- Unitized, molded coil design (for most common terminations, see coil page).
- Continuous duty rated solenoid.
- Optional coil voltages and terminations.

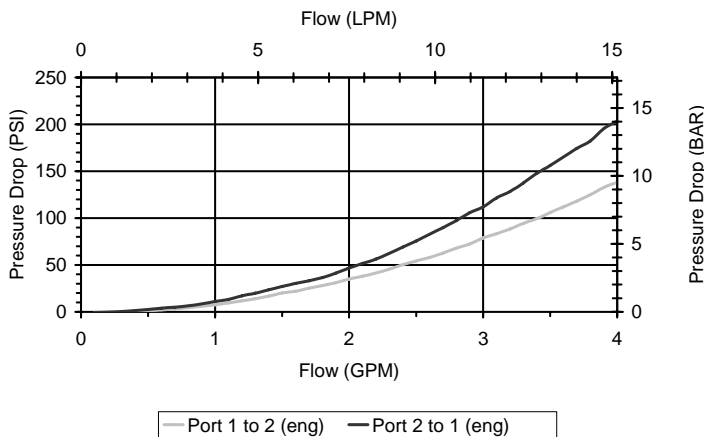
HYDRAULIC SYMBOL

Operation shift limit 2 GPM (8 LPM).

For shifted performance consult chart.

PERFORMANCE

Actual Test Data (Cartridge Only)

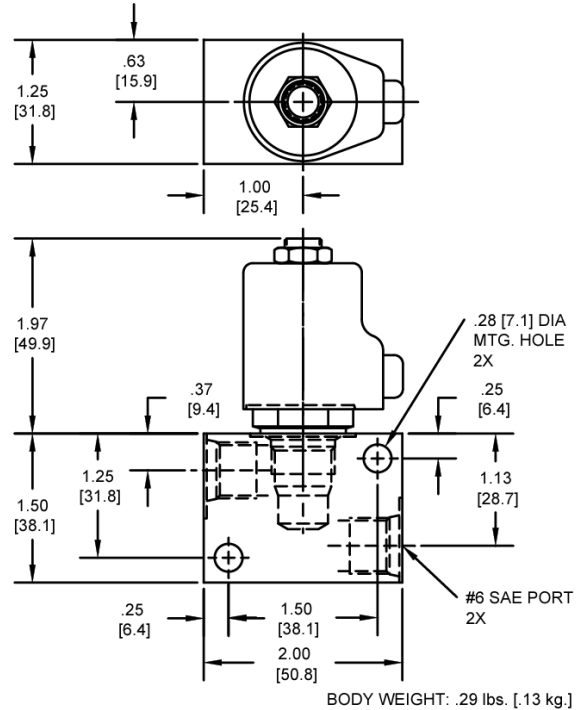
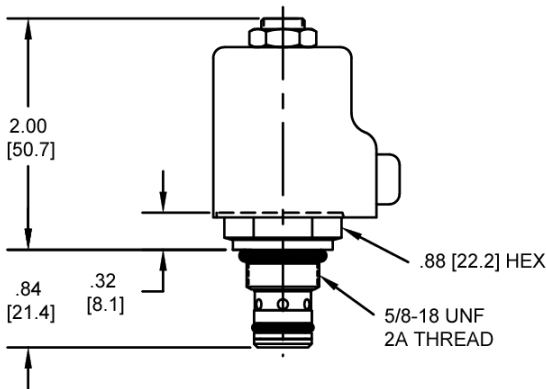
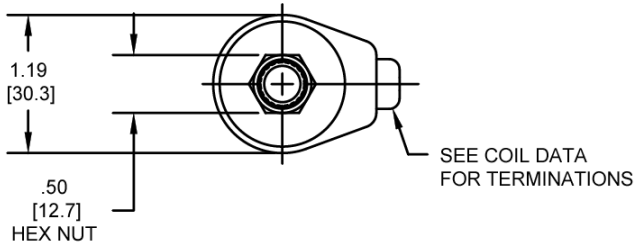
**VALVE SPECIFICATIONS**

Maximum Flow	4 GPM (15 LPM)
Rated Operating Pressure	4000 PSI (276 bar)
Typical Internal Leakage (150 SSU)	8 cu in/min (131 ml/min)
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temperature Range	-40° to 250° F (-40° to 120° C)
Weight	.14 lbs. (.06 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	15 ft-lbs (20.3 Nm)
Coil Nut Torque Requirements	3-5 ft-lbs (4.1-6.8 Nm)
Cavity	MINI 2W
Cavity Form Tool (Finishing)	40500003
Seal Kit	21191002

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.



DIMENSIONS



ORDERING INFORMATION

HA-S2G -

OPTIONS

Buna Standard
Viton Standard

00
V0

Blank
N
S

BODIES

Without Body
1/4 NPTF Ports
#6 SAE Ports

Note: Aluminum, NOT durability rated for 4000 PSI. Consult factory for body options.

VOLTAGE

06 6 VDC
12 12 VDC
24 24 VDC
36 36 VDC
48 48 VDC
25 24 VAC
11 120 VAC
22 220 VAC
44 440 VAC

"M" COIL TERMINATION

(All DC Except as Noted)

Double Lead DL
Deutsch on Leads DT04-2P DT
Metri-Pack on Leads ML
Packard on Leads PL
Weatherpack on Leads WL
Single Spade SS
Double Spade DS
DIN 43650 (Hirschman) - (AC&DC) HC
Conduit Lead - (AC Only) CL

Approximate Coil Weight: .30 lbs/.14 kg.

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com

**PB-S2G Direct Acting Spool, 2 Way, Normally Closed****DESCRIPTION**

8 size, 3/4-16 thread, "Power" series, solenoid operated, 2 way normally closed, spool valve.

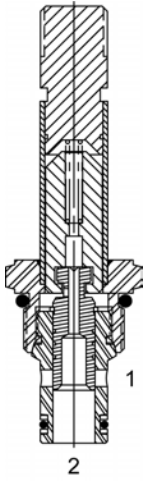
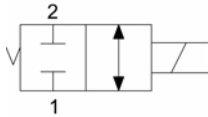
OPERATION

When de-energized the PB-S2G blocks flow from (1) to (2) and (2) to (1). When energized the valve allows flow from (1) to (2) and (2) to (1).

OPERATION OF MANUAL OVERRIDE OPTION: To override, pull knob out. On the detented version, after pulling knob out twist 180 degrees and release. The valve will remain in that position.

FEATURES

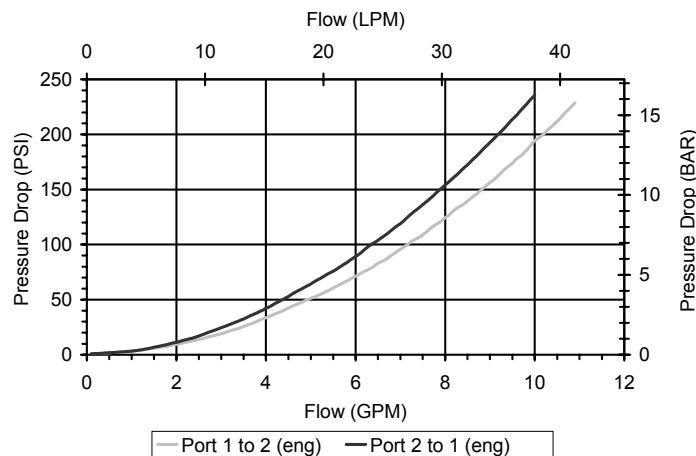
- Hardened parts for long life.
- Efficient wet-armature construction.
- Cartridges are voltage interchangeable.
- Manual override option.
- Industry common cavity.
- Unitized, molded coil design.
- Continuous duty rated solenoid.
- Optional coil voltages and terminations.
- Optional "I" Coil: Weatherproof, Thermal Shock, Immersion Safe.

**HYDRAULIC SYMBOL**

Operational shift limit in 2 to 1 direction is 4 GPM. For shifted flow performance consult chart.

PERFORMANCE

Actual Test Data (Cartridge Only)

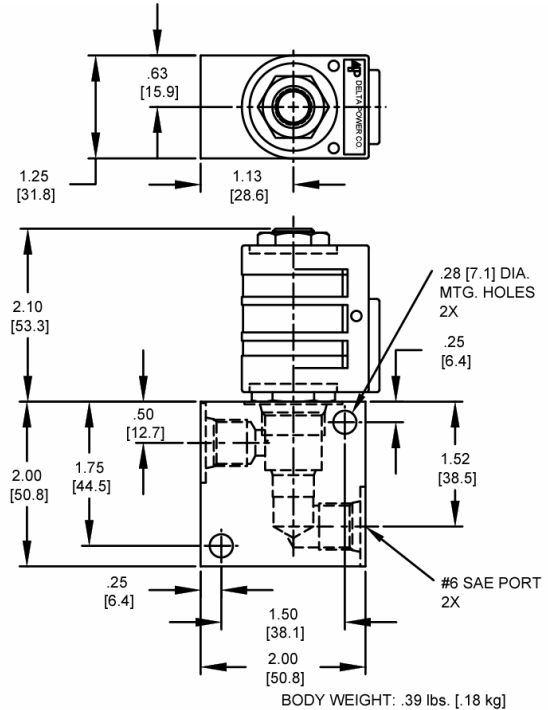
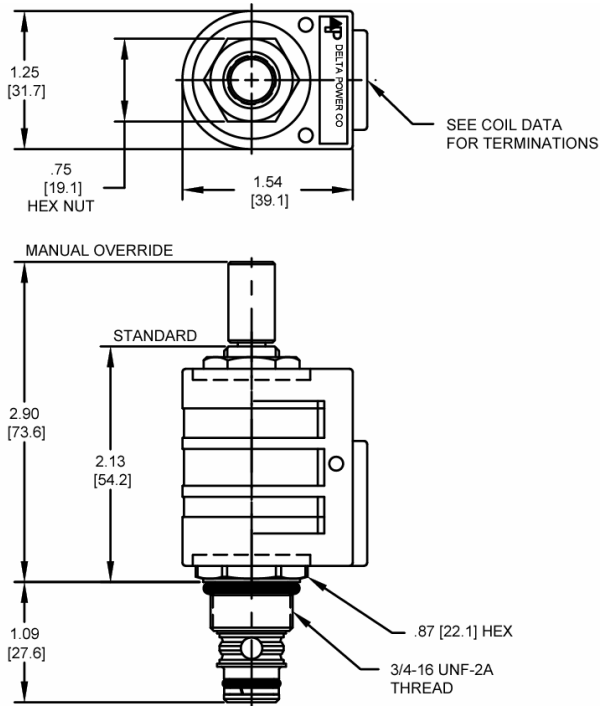
**VALVE SPECIFICATIONS**

Nominal Flow	8 GPM (30 LPM) from (1) to (2) 4 GPM (15 LPM) from (2) to (1)
Rated Operating Pressure	3000 PSI (207 bar)
Typical Internal Leakage (150 SSU)	5 cu in/min (82 ml/min)
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temperature Range	-40° to 250° F (-40° to 120° C)
Weight	.19 lbs. (.09 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	25 ft-lbs (34 Nm)
Coil Nut Torque Requirements	4-6 ft-lbs (5.4-8.1 Nm)
Cavity	POWER 2W
Cavity Form Tool (Finishing)	40500005
Seal Kit	21191102

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.



DIMENSIONS



ORDERING INFORMATION

PB-S2G -

OPTIONS

Buna Standard	00
Viton Standard	V0
Buna, Override, Detent	0M
Viton, Override, Detent	VM
Buna, Screen	A0
Viton, Screen	W0
Buna, Override, Nondetent	B1
Viton, Override, Nondetent	V1
Buna, Screen, Override, Nondetent	B3
Viton, Screen, Override, Nondetent	V3
Buna, Screen, Override, Detent	B4
Viton, Screen, Override, Detent	V4

Note: Use screen only if flow direction is from (1) to (2).

"P" COIL TERMINATION

(All DC Except as Noted)

DL	Double Lead
DT	Deutsch on Leads DT04-2P
ML	Metri-Pack on Leads
PL	Packard on Leads
WL	Weatherpack on Leads

SS	Single Spade
DS	Double Spade
HC	DIN 43650 (Hirschman) - (AC & DC)
CL	Conduit Lead - (AC Only)
DI	Deutsch - Integral DT04-2P

Blank

N

S

BODIES

Without Body
1/4 NPTF Ports
#6 SAE Ports

VOLTAGE

06	6 VDC
12	12 VDC
24	24 VDC
36	36 VDC
48	48 VDC
25	24 VAC
11	120 VAC
22	220 VAC
44	440 VAC

IMMERSION PROOF "P" TYPE

IA	"I" Coil AMP Superseal - Integral
ID	"I" Coil Deutsch - Integral DT04-2P
IJ	"I" Coil AMP Jr. Timer - Integral
IM	"I" Coil Metri-Pack - Integral

Approximate Coil Weight: .42 lbs (.19 kg.)

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com

**DE-S2G Direct Acting Spool, 2 Way Normally Closed****DESCRIPTION**

10 size, 7/8-14 thread, "Delta" series, solenoid operated, 2 way normally closed, spool valve.

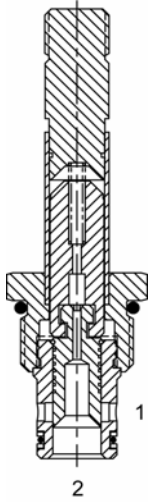
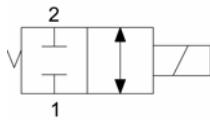
OPERATION

When de-energized the DE-S2G blocks flow from (1) to (2) and (2) to (1). When energized the valve allows flow from (1) to (2) and (2) to (1).

OPERATION OF MANUAL OVERRIDE OPTION: To override, pull knob out. On the detented version, after pulling knob out twist 180 degrees and release. The valve will remain in that position.

FEATURES

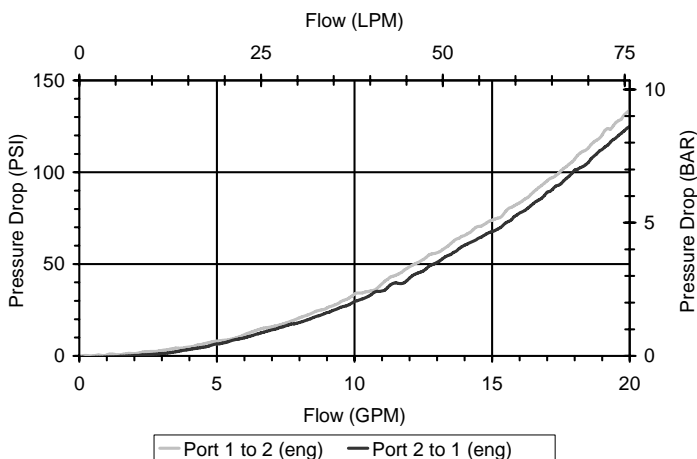
- Hardened parts for long life.
- Efficient wet-armature construction.
- Cartridges are voltage interchangeable.
- Manual override option.
- Industry common cavity.
- Unitized, molded coil design.
- Continuous duty rated solenoid.
- Optional coil voltages and terminations.
- Optional "I" Coil: Weatherproof, Thermal Shock, Immersion Safe.

**HYDRAULIC SYMBOL**

Operational shift limit 8 GPM (30 LPM) and 5 GPM (19 LPM).
For shifted flow performance consult chart.
For higher flow or pressure see HE-S2G.

PERFORMANCE

Actual Test Data (Cartridge Only)

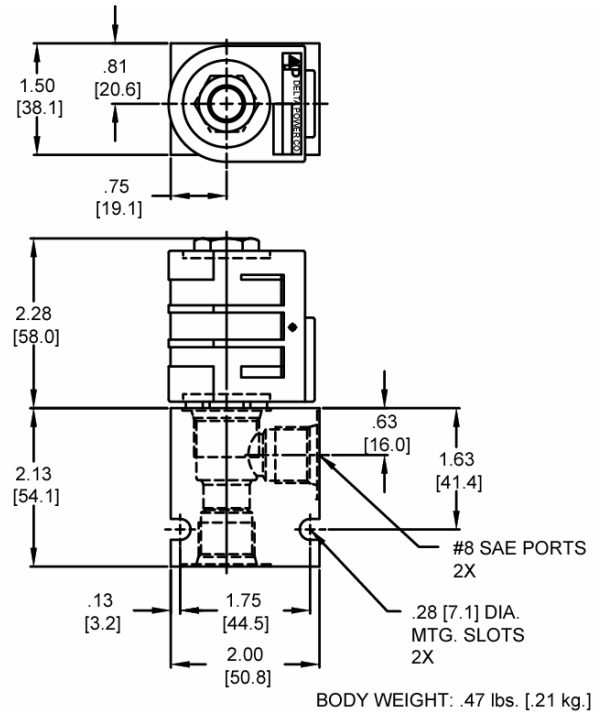
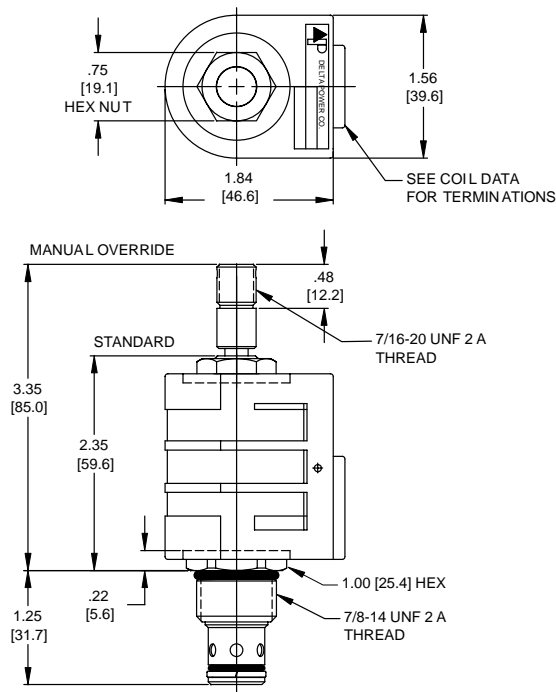
**VALVE SPECIFICATIONS**

Nominal Flow	8 GPM (30 LPM) from (1) to (2) 5 GPM (19 LPM) from (2) to (1)
Rated Operating Pressure	3000 PSI (207 bar)
Typical Internal Leakage (150 SSU)	5 cu in/min (82 ml/min)
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temperature Range	-40° to 250° F (-40° to 120° C)
Weight	.26 lbs. (.12 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	30 ft-lbs (40.6 Nm)
Coil Nut Torque Requirements	4-6 ft-lbs (5.4-8.1 Nm)
Cavity	DELTA 2W
Cavity Form Tool (Finishing)	40500000
Seal Kit	21191202

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.



DIMENSIONS



ORDERING INFORMATION

DE-S2G -

OPTIONS

Buna Standard	00
Viton Standard	V0
Buna, Override	0M
Viton, Override	VM
Buna, Screen	A0
Viton, Screen	W0
Buna, Override, Non-detent	B1
Viton, Override, Non-detent	V1
Buna, Screen, Override, Non-detent	B3
Buna, Screen, Override, Detent	B4
Viton, Screen, Override, Non-detent	V3
Viton, Screen, Override, Detent	V4

Note: Use screen only if flow direction is from (1) to (2).

"D" COIL TERMINATION

(All DC Except as Noted)

DL	Double Lead
DT	Deutsch on Leads DT04-2P
ML	Metri-Pack on Leads
PL	Packard on Leads
WL	Weatherpack on Leads

SS	Single Spade
DS	Double Spade
HC	DIN 43650 (Hirschman) - (AC & DC)
CL	Conduit Lead - (AC Only)
DI	Deutsch - Integral DT04-2P

Blank

N

S

BODIES

Without Body
3/8 NPTF Ports
#8 SAE Ports

VOLTAGE

06	6 VDC
12	12 VDC
24	24 VDC
36	36 VDC
48	48 VDC
25	24 VAC
11	120 VAC
22	220 VAC
44	440 VAC

IMMERSION PROOF "D" TYPE

IA	"I" Coil AMP Superseal - Integral
ID	"I" Coil Deutsch - Integral DT04-2P
IJ	"I" Coil AMP Jr. Timer - Integral
IM	"I" Coil Metri-Pack - Integral

Approximate Coil Weight: .74 lbs (.33 kg.)

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com

**HE-S2G Direct Acting Spool, 2-Way, Normally Closed****DESCRIPTION**

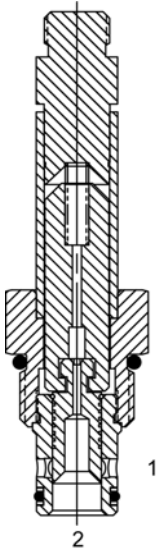
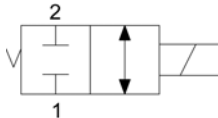
"High Pressure" 10 size, 7/8-14 thread, "Delta" series, solenoid operated, 2-way normally closed, spool valve.

OPERATION

When de-energized the HE-S2G blocks flow from (1) to (2) and (2) to (1). When energized the valve allows flow from (1) to (2) and (2) to (1).

FEATURES

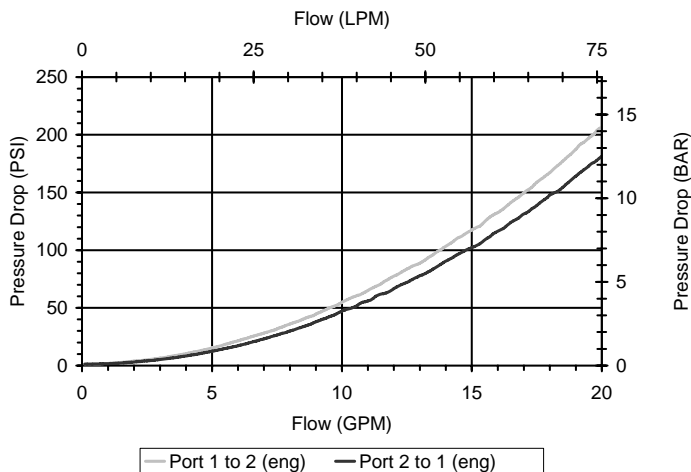
- Hardened parts for long life.
- Efficient wet-armature construction.
- Cartridges are voltage interchangeable.
- Industry common cavity.
- Unitized, molded coil design.
- Continuous duty rated solenoid.
- Optional coil voltages and terminations.
- Optional "I" Coil: Weatherproof, Thermal Shock, Immersion Safe.

**HYDRAULIC SYMBOL**

Uses "L" Coil.

PERFORMANCE

Actual Test Data (Cartridge Only)

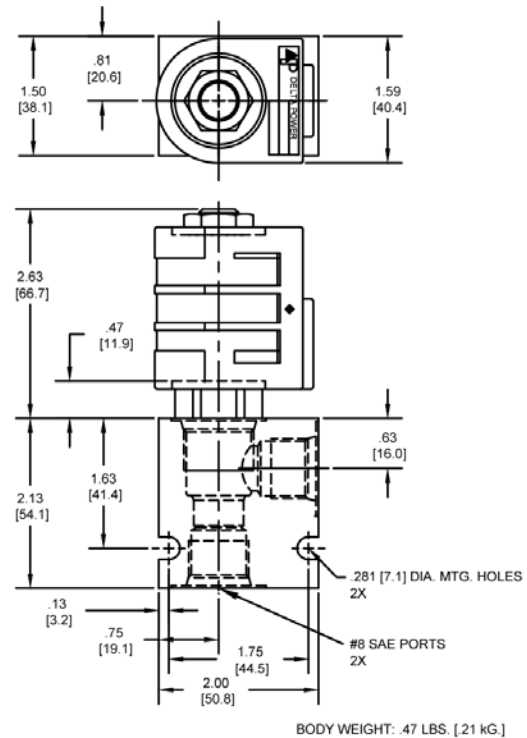
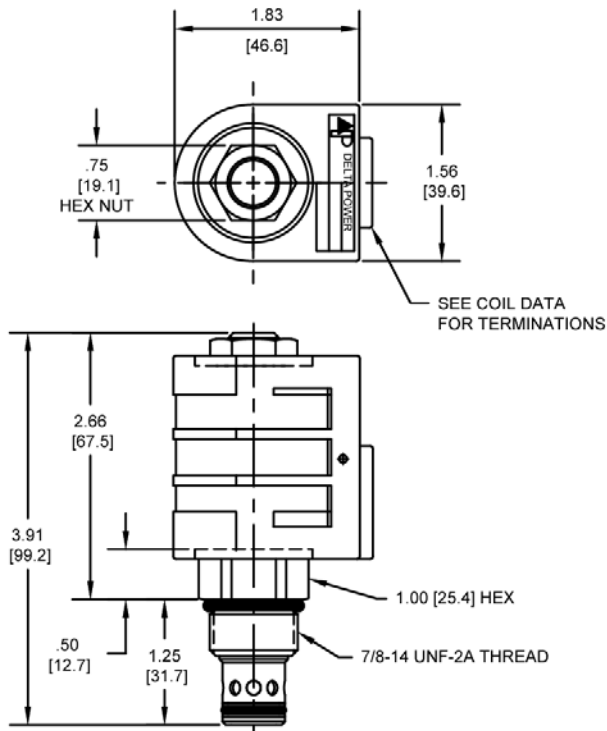
**VALVE SPECIFICATIONS**

Nominal Flow	15 GPM (57 LPM) from (1) to (2) 6 GPM (23 LPM) from (2) to (1)
Max Operating Pressure	4000 PSI (276 bar)
Typical Internal Leakage (150 SSU)	8 cu in/min (131 ml/min)
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temperature Range	-40° to 250° F (-40° to 120° C)
Weight	.39 lbs. (.17 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	35 ft-lbs (47.5 Nm)
Coil Nut Torque Requirements	4-6 ft-lbs (5.4-8.1 Nm)
Cavity	DELTA 2W
Cavity Form Tool (Finishing)	40500000
Seal Kit	21191202

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.



DIMENSIONS



ORDERING INFORMATION

HE-S2G -

OPTIONS

Buna Standard
Viton Standard

00
V0

Blank
N
S

BODIES

Without Body
3/8 NPTF Ports
#8 SAE Ports

Note: Aluminum, NOT durability rated for 4000 PSI. Consult factory options.

VOLTAGE

06 6 VDC
12 12 VDC
24 24 VDC
36 36 VDC
48 48 VAC
25 25 VAC
11 120 VAC
22 220 VAC
44 440 VAC

"L" COIL TERMINATION

(All DC Except as Noted)

DL Double Lead
DT Deutsch on Leads DT04-2P
ML Metri-Pack on Leads
PL Packard on Leads
WL Weatherpack on Leads

SS Single Spade
DS Double Spade
HC DIN 43650 (Hirschman) - (AC & DC)
CL Conduit Lead - (AC Only)
DI Deutsch - Integral DT04-2P

IA "I" Coil AMP Superseal - Integral
ID "I" Coil Deutsch - Integral DT04-2P
IJ "I" Coil AMP Jr. Timer - Integral
IM "I" Coil Metri-Pack - Integral

Approximate Coil Weight: .68 lbs. (.31 kg.)

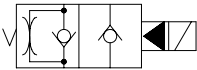
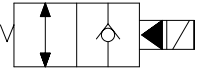
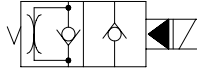
WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

Phone: (815) 397-6628

Fax: (815) 397-2526

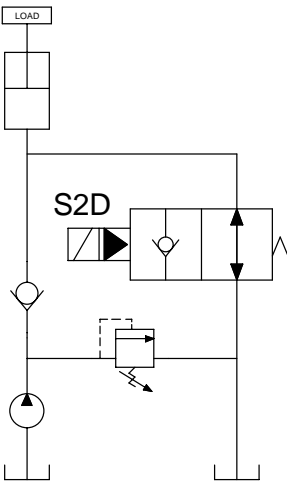
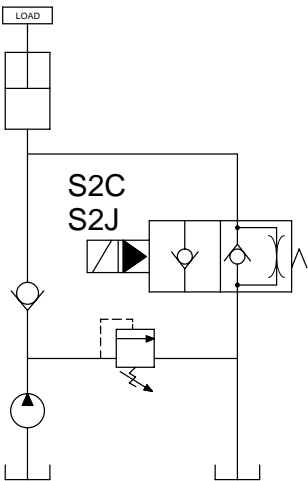
E-mail: delta@delta-power.com

2 Way 2 Position Normally Open Poppet Valves

	GPM	PSI	LPM	BAR	MODEL	PAGE
	5	3000	19	207	MA-S2C	76
	10	3500	38	241	PB-S2C	78
	12	5000	45	350	HB-S2C	80
	15	3500	57	241	DE-S2C	82
	30	3000	114	207	TT-S2C	84
	40	3000	151	207	SJ-S2C	86
	40	4350	151	207	HJ-S2C	88
	10	3500	38	241	PB-S2D	90
	12	5000	45	350	HB-S2D	92
	15	3500	57	241	DE-S2D	94
	30	3000	114	207	TT-S2D	96
	40	3000	151	207	SJ-S2D	98
SOFT SEAT 	8	2000	30	138	PB-S2J	100

Typical Schematic

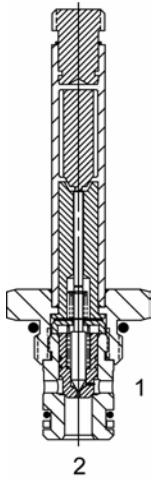
Typical application for the S2C is a pump unloading circuit when high flow and low pressure drop is required.
Typical application for the S2D is for when free flow is required in both directions to float the cylinder.
Typical application for the S2J is for low pressure applications where the soft seat gives better leakage control.



WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.



MA-S2C Pilot Operated Poppet, 2 Way, Normally Open



DESCRIPTION

7 size, 5/8-18 thread, "Mini" series, solenoid operated, 2 way normally open, pilot operated poppet valve with free reverse flow energized.

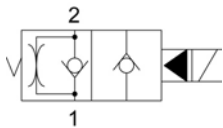
OPERATION

When de-energized the MA-S2C allows flow from (1) to (2) and restricts flow from (2) to (1). When energized the valve blocks flow from (1) to (2) and allows flow from (2) to (1).

FEATURES

- Hardened parts for long life.
- Efficient wet-armature construction.
- Cartridges are voltage interchangeable.
- Industry common cavity.
- Unitized, molded coil design.
- Continuous duty rated solenoid.
- Optional coil voltages and terminations.

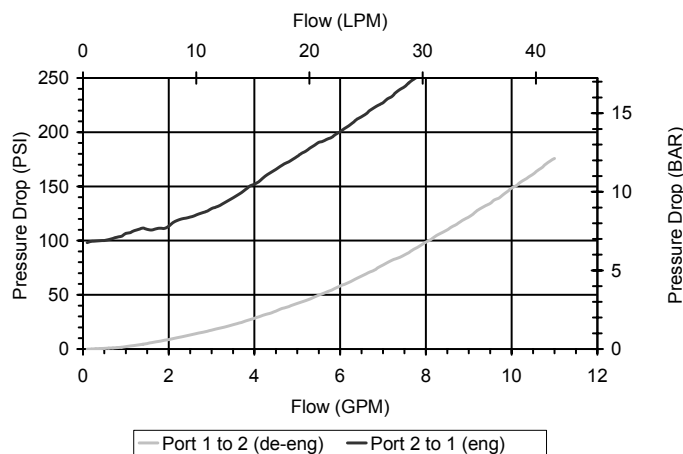
HYDRAULIC SYMBOL



Operational shift limit 5 GPM (19 LPM) from (1) to (2) energized. For shifted flow performance consult chart.

PERFORMANCE

Actual Test Data (Cartridge Only)



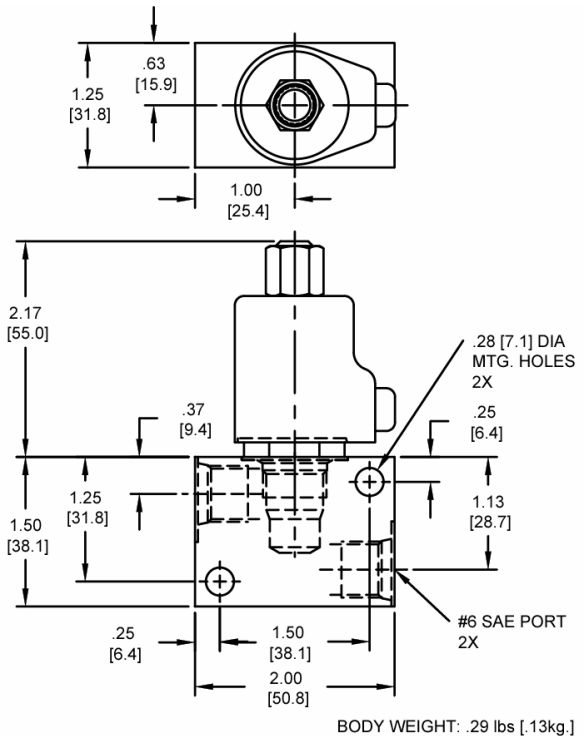
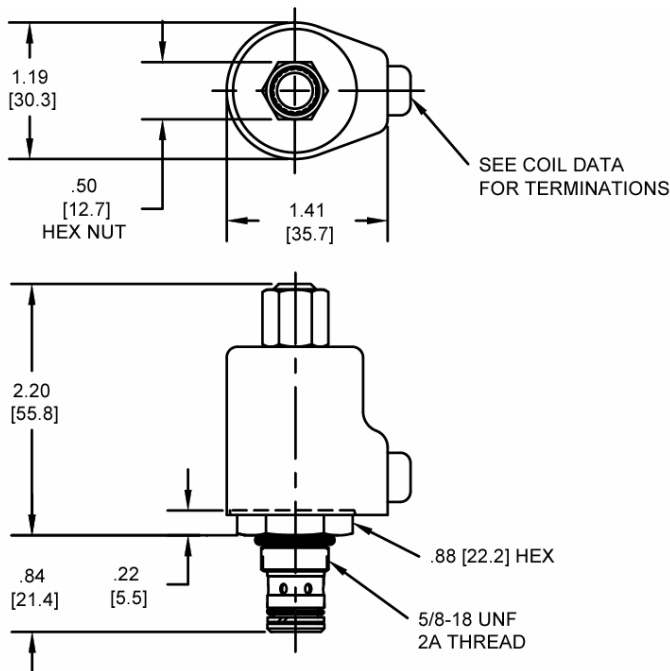
VALVE SPECIFICATIONS

Nominal Flow	5 GPM (19 LPM)
Rated Operating Pressure	3000 PSI (207 bar)
Typical Internal Leakage (150 SSU)	0-5 drops/min
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temperature Range	-40° to 250° F (-40° to 120° C)
Weight	.14 lbs. (.06 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	15 ft-lbs (20.3 Nm)
Coil Nut Torque Requirements	3-5 ft-lbs (4.1-6.8 Nm)
Cavity	MINI 2W
Cavity Form Tool (Finishing)	40500003
Seal Kit (Buna)	21191001

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.



DIMENSIONS



ORDERING INFORMATION

MA-S2C -

OPTIONS

Buna Standard **00**
 Viton Standard **V0**
 Buna, Screen **A0**
 Viton, Screen **W0**

Note: Use screen only if flow direction
 is from (1) to (2).

"M" COIL TERMINATION
 (All DC Except as Noted)

DL Double Lead
DT Deutsch on Leads DT04-2P
ML Metri-Pack on Leads
PL Packard on Leads
WL Weatherpack on Leads

SS Single Spade
DS Double Spade
HC DIN 43650 (Hirschman) – (AC & DC)
CL Conduit Lead – (AC Only)

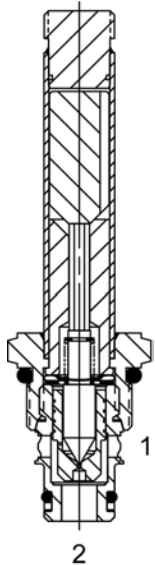
Blank
N Without Body
S 1/4 NPTF Ports
S #6 SAE Ports

VOLTAGE

06 6 VDC
12 12 VDC
24 24 VDC
36 36 VDC
48 48 VDC
25 24 VAC
11 120 VAC
22 220 VAC
44 440 VAC

Approximate Coil Weight: .30 lbs/.14 kg.

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

**PB-S2C Pilot Operated Poppet, 2 Way, Normally Open****DESCRIPTION**

8 size, 3/4-16 thread, "Power" series, solenoid operated, 2 way normally open, pilot operated poppet valve with free reverse flow energized.

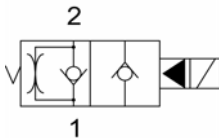
OPERATION

When de-energized the PB-S2C allows flow from (1) to (2) and restricted flow from (2) to (1). When energized the valve blocks flow from (1) to (2) and allows flow from (2) to (1).

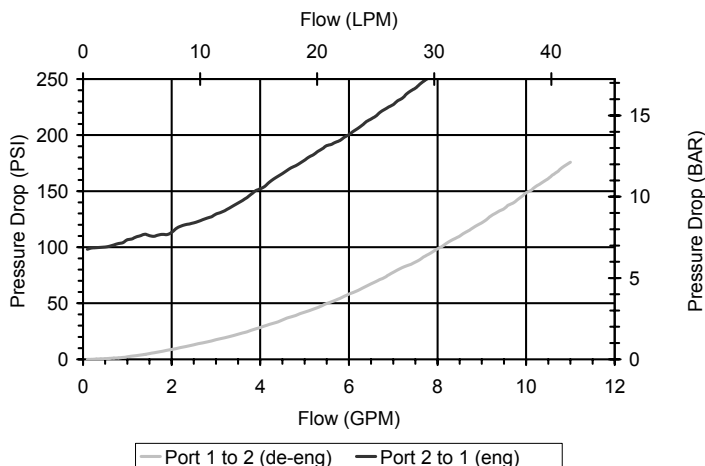
OPERATION OF MANUAL OVERRIDE OPTION: To override, turn the manual override screw clockwise. To release turn the manual override screw counter-clockwise.

FEATURES

- Hardened parts for long life.
- Efficient wet-armature construction.
- Cartridges are voltage interchangeable.
- Manual override option.
- Industry common cavity.
- Unitized, molded coil design.
- Continuous duty rated solenoid.
- Optional coil voltages and terminations.
- Optional "I" Coil: Weatherproof, Thermal Shock, Immersion Safe.

HYDRAULIC SYMBOL

Unshifted limit 10 GPM (38 LPM) from (1) to (2) when deenergized. For shifted flow performance consult chart.

PERFORMANCE**Actual Test Data (Cartridge Only)****VALVE SPECIFICATIONS**

Nominal Flow	10 GPM (38 LPM)
Rated Operating Pressure	3500 PSI (241 bar)
Typical Internal Leakage (150 SSU)	0-5 drops/min
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temperature Range	-40° to 250° F (-40° to 120° C)
Weight	22 lbs. (.10 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	25 ft-lbs (34 Nm)
Coil Nut Torque Requirements	4-6 ft-lbs (5.4-8.1 Nm)
Cavity	POWER 2W
Cavity Form Tool (Finishing)	40500005
Seal Kit	21191100

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

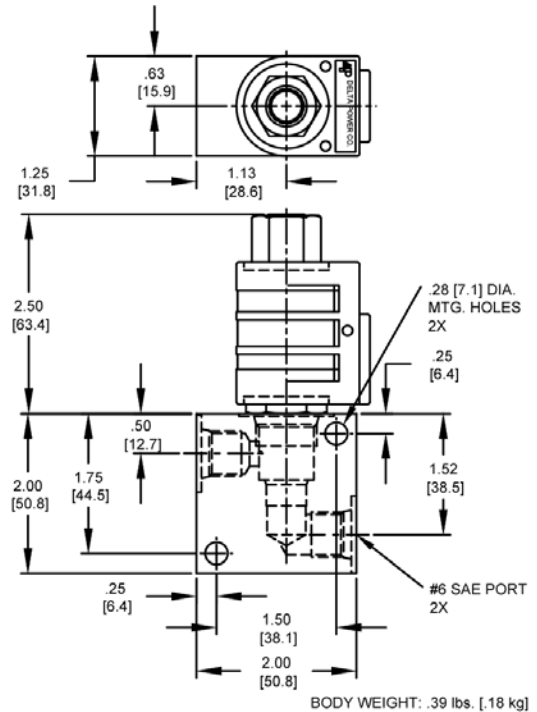
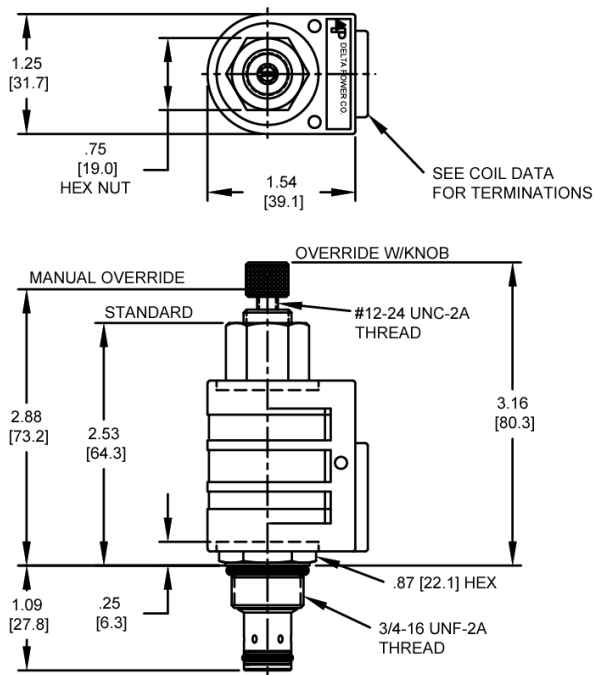
Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com



DIMENSIONS



ORDERING INFORMATION

PB-S2C

OPTIONS

Buna Standard	00
Viton Standard	V0
Buna, Override, Detent	0M
Viton, Override, Detent	VM
Buna, Override, Knob	OK
Viton, Override, Knob	VK
Buna, Screen	A0
Viton, Screen	W0
Buna, Screen, Override	B2
Viton, Screen, Override	V2
Buna, Screen, Override, Knob	B5
Viton, Screen, Override, Knob	V5

Note: Use screen only if flow direction is from (1) to (2).

"P" COIL TERMINATION

(All DC Except as Noted)

DL	Double Lead
DT	Deutsch on Leads DT04-2P
ML	Metri-Pack on Leads
PL	Packard on Leads
WL	Weatherpack on Leads

SS	Single Spade
DS	Double Spade
HC	DIN 43650 (Hirschman) – (AC & DC)
CL	Conduit Lead – (AC Only)
DI	Deutsch – Integral DT04-2P

Blank

N

S

BODIES

Without Body
1/4 NPTF Ports
#6 SAE Ports

VOLTAGE

06	6 VDC
12	12 VDC
24	24 VDC
36	36 VDC
48	48 VDC
25	24 VAC
11	120 VAC
22	220 VAC
44	440 VAC

IMMERSION PROOF "P" TYPE

IA	"I" Coil AMP Superseal - Integral
ID	"I" Coil Deutsch – Integral DT04-2P
IJ	"I" Coil AMP Jr. Timer - Integral
IM	"I" Coil Metri-Pack – Integral

Approximate Coil Weight: .42 lbs. (.19 kg.)

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com


HB-S2C Pilot Operated Poppet, 2Way Normally Open
DESCRIPTION

8 size, 3/4-16 thread, "Power" series, solenoid operated, 2 way normally open, pilot operated poppet valve with reverse flow energized.

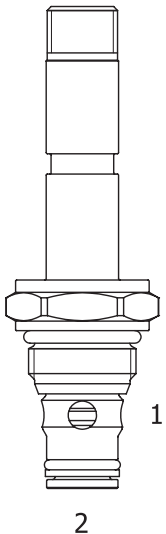
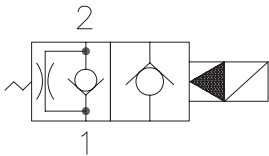
OPERATION

When de-energized the HB-S2C allows flow from (1) to (2) and restricted flow from (2) to (1). When energized the valve blocks flow from (1) to (2) and allows flow from (2) to (1).

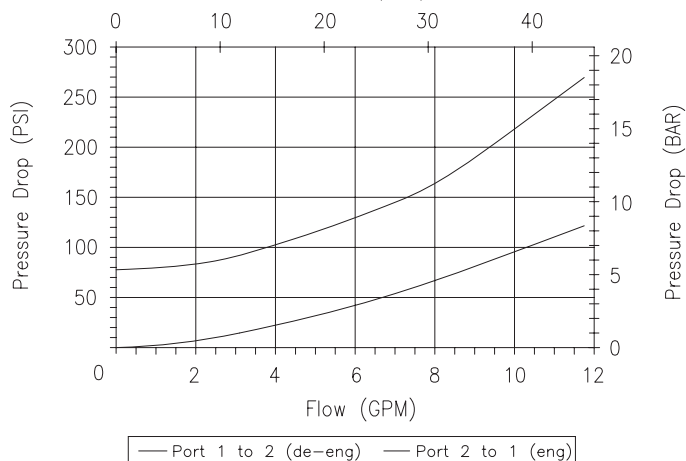
MANUAL OVERRIDE OPTION: to override, turn the manual override screw clockwise. To release, turn the manual override screw counter-clockwise.

FEATURES

- Hardened parts for long life.
- Efficient wet-armature construction.
- Cartridges are voltage interchangeable.
- Industry common cavity.
- Unitized, molded coil design.
- Continuous duty rated solenoid.
- Optional coil voltages and terminations.
- Optional "I" Coil: Weatherproof, Thermal Shock, Immersion Safe.
- Manual override option.


HYDRAULIC SYMBOL

PERFORMANCE

Actual Test Data (Cartridge Only)


VALVE SPECIFICATIONS

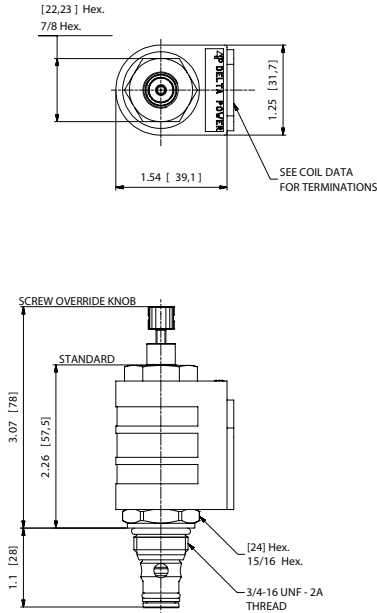
Nominal Flow	12 GPM (45 LPM)
Rated Operating Pressure	5000 PSI (350 bar)
Typical Internal Leakage (150 SSU)	0-5 drops/min at 5000 PSI (350 bar)
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temperature Range	-40° to 210° F (-40° to 100° C) BUNA seals -4° to 250° F (-20° to 120° C) VITON seals
Weight	.29 lbs. (.13 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	35 ft-lbs (47 Nm)
Coil Nut Torque Requirements	4-6 ft-lbs (5.4-8.1 Nm)
Cavity	POWER 2W
Cavity Tools kit	40500005
Seal Kit	21191100

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

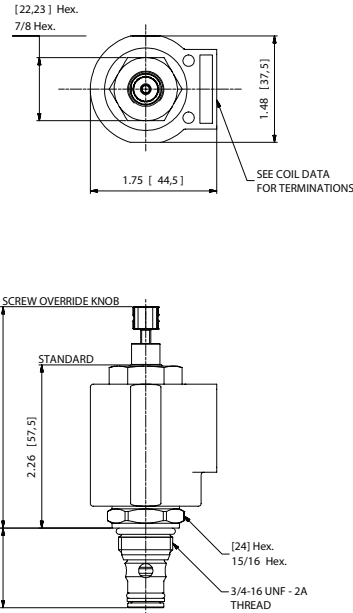


DIMENSIONS

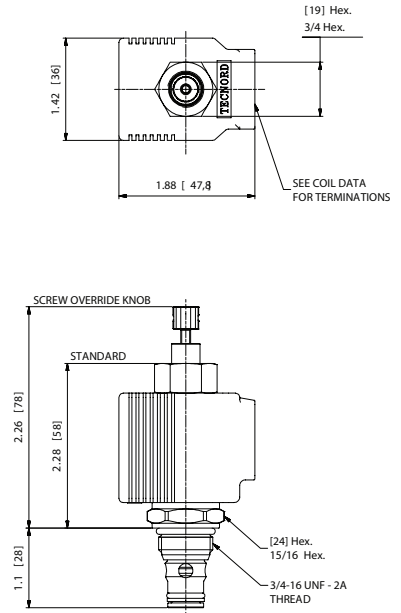
"P" COIL TERMINATION



IMMERSION PROOF "I" TYPE



"J" COIL TERMINATION



ORDERING INFORMATION

HB - S2C -

CONSULT FACTORY FOR BODY

OPTIONS

Buna Standard **00**
Viton Standard **V0**
Buna, Override, Knob **0K**
Viton, Override, Knob **VK**

VOLTAGE

06 06 VDC
12 12 VDC
24 24 VDC
36 36 VDC
48 48 VDC
25 24 VAC
11 120 VAC
22 220 VAC
44 440 VAC

"P" COIL TERMINATION

(All DC Except as Noted)

DL Double Lead
DS Double Spade
HC DIN 43650 (Hirschman) - (AC & DC)
CL Conduit Lead - (AC Only)
DI Deutsch - Integral DT04-2P

IMMERSION PROOF "I" TYPE

IA "I" Coil AMP Superseal - Integral
ID "I" Coil Deutsch - Integral DT04-2P
IJ "I" Coil AMP Jr. Time - Integral
IM "I" Coil Metri-Pack - Integral

"J" COIL TERMINATION

JA "J" Coil AMP Superseal - Integral
JD "J" Coil Deutsch - Integral DT04-2P
JJ "J" Coil AMP Jr. Time - Integral
JM "J" Coil Metri-Pack - Integral
JL "J" Coil Double Lead
JH "J" Coil DIN 43650 (Hirschman)

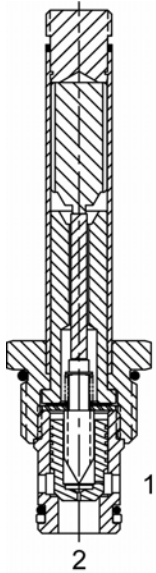
Approximate Coil Weight: .42 lbs/.19 kg.
For Optional Coil Terminations See Coil Section

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com

**DE-S2C Pilot Operated Poppet, 2 Way, Normally Open****DESCRIPTION**

10 size, 7/8-14 thread, "Delta" series, solenoid operated, 2 way normally open, pilot operated poppet valve with free reverse flow energized.

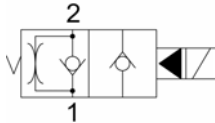
OPERATION

When de-energized the DE-S2C allows flow to pass from (1) to (2), but restricts flow from (2) to (1). When energized the valve blocks flow from (1) to (2) but allows free reverse flow from (2) to (1).

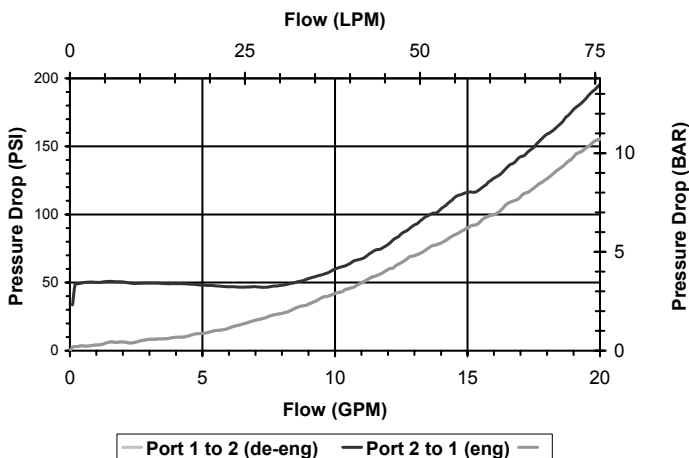
OPERATION OF MANUAL OVERRIDE OPTION: To override, turn the manual override screw clockwise. To release turn the manual override screw counter-clockwise.

FEATURES

- Hardened parts for long life.
- Efficient wet-armature construction.
- Cartridges are voltage interchangeable.
- Manual override option.
- Industry common cavity.
- Unitized, molded coil design.
- Continuous duty rated solenoid.
- Optional coil voltages and terminations.
- Optional "I" Coil: Weatherproof, Thermal Shock, Immersion Safe.

HYDRAULIC SYMBOL**PERFORMANCE**

Actual Test Data (Cartridges Only)

**VALVE SPECIFICATIONS**

Nominal Flow	15 GPM (57 LPM)
Rated Operating Pressure	3500 PSI (241 bar)
Typical Internal Leakage (150 SSU)	0-5 drops/min
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temperature Range	-40° to 250° F (-40° to 120° C)
Weight	.29 lbs. (.13 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	30 ft-lbs (40.6 Nm)
Coil Nut Torque Requirements	4-6 ft-lbs (5.4-8.1 Nm)
Cavity	DELTA 2W
Cavity Form Tool (Finishing)	40500000
Seal Kit	21191200

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

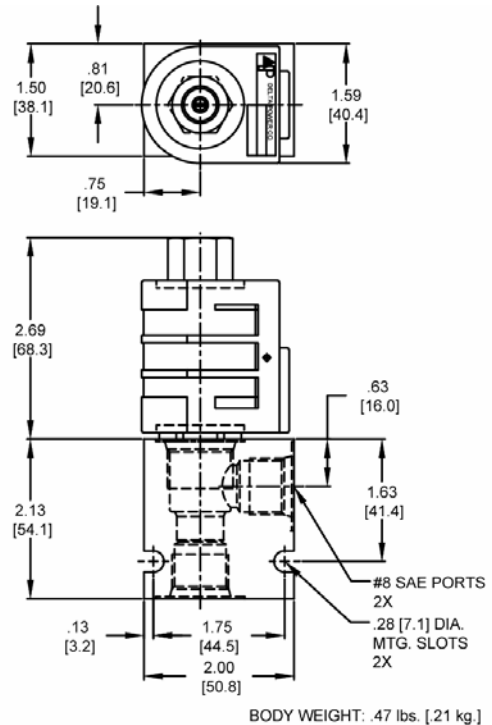
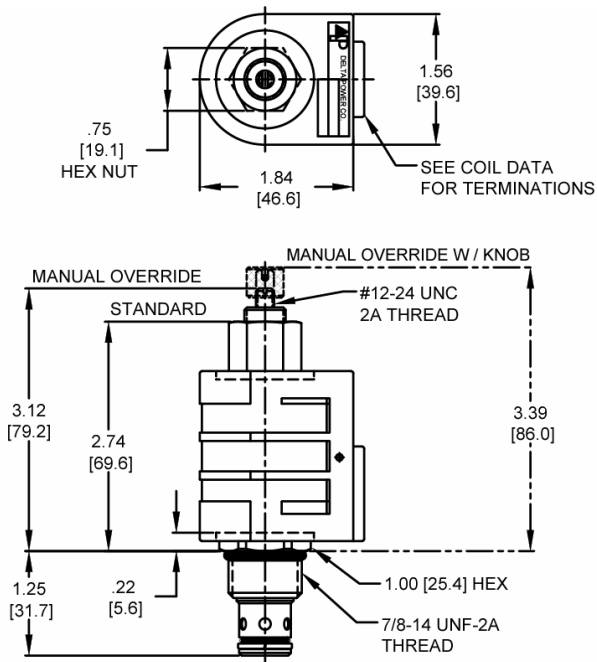
Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com



DIMENSIONS



ORDERING INFORMATION

DE-S2C -

OPTIONS

Buna Standard	00
Viton Standard	V0
Buna, Override	0M
Viton, Override	VM
Buna, Override, Knob	OK
Viton, Override, Knob	VK
Buna, Screen	A0
Viton, Screen	W0
Buna, Screen, Override	B2
Viton, Screen, Override	V2
Buna, Screen, Override, Knob	B5
Viton, Screen, Override, Knob	V5

Note: Use screen only if flow direction is from (1) to (2).

"D" COIL TERMINATION

(All DC Except as Noted)

DL	Double Lead
DT	Deutsch on Leads DT04-2P
MI	Metri-Pack on Leads
PI	Packard on Leads
WL	Weatherpack on Leads

SS	Single Spade
DS	Double Spade
HC	DIN 43650 (Hirschmann) - (AC & DC)
CL	Conduit Lead - (AC Only)
DI	Deutsch - Integral DT04-2P

Blank

N

S

BODIES

Without Body
3/8 NPTF Ports
#8 SAE Ports

VOLTAGE

06	6 VDC
12	12 VDC
24	24 VDC
36	36 VDC
48	48 VDC
25	24 VAC
11	120 VAC
22	220 VAC
44	440 VAC

IMMERSION PROOF "D" TYPE

IA	"I" Coil AMP Superseal - Integral
ID	"I" Coil Deutsch - Integral DT04-2P
IJ	"I" Coil AMP Jr. Timer - Integral
IM	"I" Coil Metri-Pack - Integral

Approximate Coil Weight: .74 lbs/.33 kg.

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

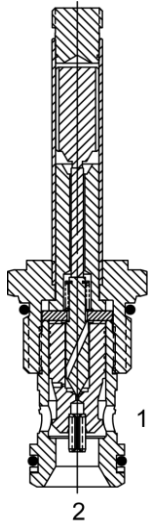
Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com



TT-S2C Pilot Operated Poppet, 2 Way, Normally Open



DESCRIPTION

12 size, 1 1/16-12 thread, "Tecnord" series, solenoid operated, 2 way normally open, pilot operated poppet valve with free reverse flow energized.

OPERATION

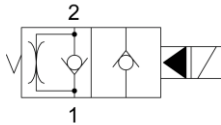
When de-energized the TT-S2C allows flow to pass from (1) to (2), but restricts flow from (2) to (1). When energized the valve blocks flow from (1) to (2) but allows free reverse flow from (2) to (1).

OPERATION OF MANUAL OVERRIDE OPTION: To override, turn the manual override screw clockwise. To release turn the manual override screw counter-clockwise.

FEATURES

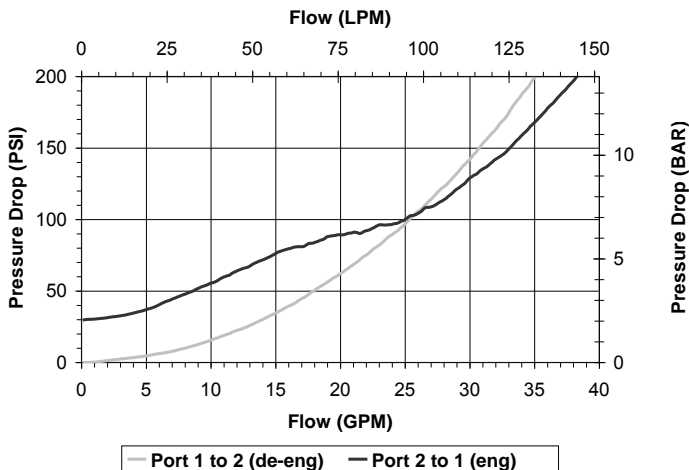
- Hardened parts for long life.
- Efficient wet-armature construction.
- Cartridges are voltage interchangeable.
- Manual override option.
- Industry common cavity.
- Unitized, molded coil design.
- Continuous duty rated solenoid.
- Optional coil voltages and terminations.
- Optional "I" Coil: Weatherproof, Thermal Shock, Immersion Safe.

HYDRAULIC SYMBOL



PERFORMANCE

Actual Test Data (Cartridges Only)



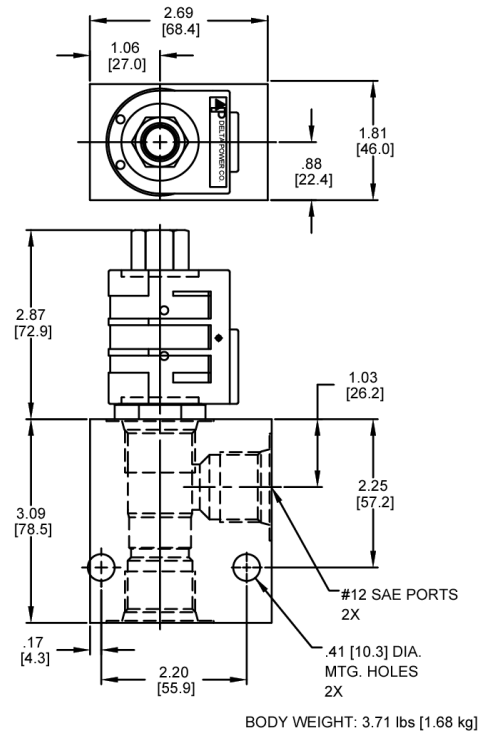
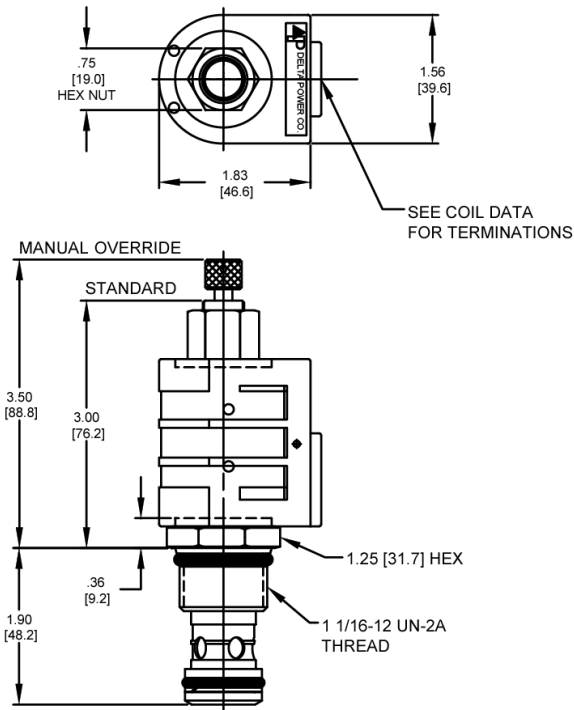
VALVE SPECIFICATIONS

Nominal Flow	30 GPM (114 LPM)
Rated Operating Pressure	3000 PSI (207 bar)
Typical Internal Leakage (150 SSU)	0-10 drops/min
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temperature Range	-40° to 250° F (-40° to 120° C)
Weight	.51 lbs. (.23 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	70 ft-lbs (94.9 Nm)
Coil Nut Torque Requirements	4-6 ft-lbs (5.4-8.1 Nm)
Cavity	TECNORD 2W
Cavity Form Tool (Finishing)	40500032
Seal Kit	21191300

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.



DIMENSIONS



ORDERING INFORMATION

TT-S2C

OPTIONS

Buna Standard	00
Viton Standard	V0
Buna, Override, Knob	0K
Viton, Override, Knob	VK
Buna, Screen	A0
Viton, Screen	W0
Buna, Screen, Override, Knob	B5
Viton, Screen, Override, Knob	V5

Note: Use screen only if flow direction is from (1) to (2).

Blank
S

BODIES

Without Body
#12 SAE Ports

VOLTAGE

06	6 VDC
12	12 VDC
24	24 VDC
36	36 VDC
48	48 VDC
25	24 VAC
11	120 VAC
22	220 VAC
44	440 VAC

"D" COIL TERMINATION

(All DC Except as Noted)

DL	Double Lead
DT	Deutsch on Leads DT04-2P
MI	Metri-Pack on Leads
PI	Packard on Leads
WL	Weatherpack on Leads

SS	Single Spade
DS	Double Spade
HC	DIN 43650 (Hirschmann) - (AC & DC)
CL	Conduit Lead - (AC Only)
DI	Deutsch - Integral DT04-2P

IMMERSION PROOF "D" TYPE

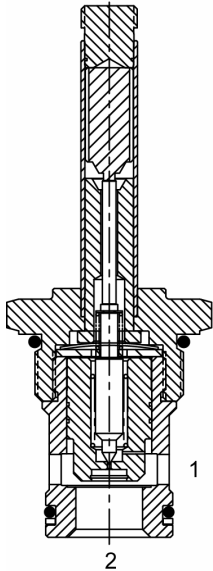
IA	"I" Coil AMP Superseal - Integral
ID	"I" Coil Deutsch - Integral DT04-2P
IJ	"I" Coil AMP Jr. Timer - Integral
IM	"I" Coil Metri-Pack - Integral

Approximate Coil Weight: .74 lbs/.33 kg.

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.



SJ-S2C Pilot Operated Poppet, 2 Way, Normally Open



DESCRIPTION

16 size, 1 5/16-12 thread, "Super" series, solenoid operated, 2 way normally open, pilot operated poppet valve with free reverse flow energized.

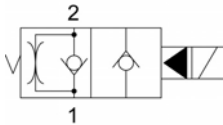
OPERATION

When de-energized the SJ-S2C allows flow to pass from (1) to (2), but restricts flow from (2) to (1). When energized the valve blocks flow from (1) to (2) but allows free reverse flow from (2) to (1).

FEATURES

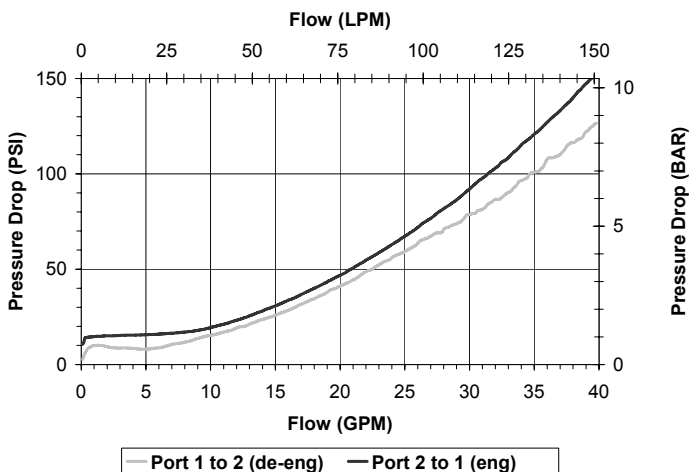
- Hardened parts for long life.
- Efficient wet-armature construction.
- Cartridges are voltage interchangeable.
- Industry common cavity.
- Unitized, molded coil design.
- Continuous duty rated solenoid.
- Optional coil voltages and terminations.
- Optional "I" Coil: Weatherproof, Thermal Shock, Immersion Safe.

HYDRAULIC SYMBOL



PERFORMANCE

Actual Test Data (Cartridges Only)



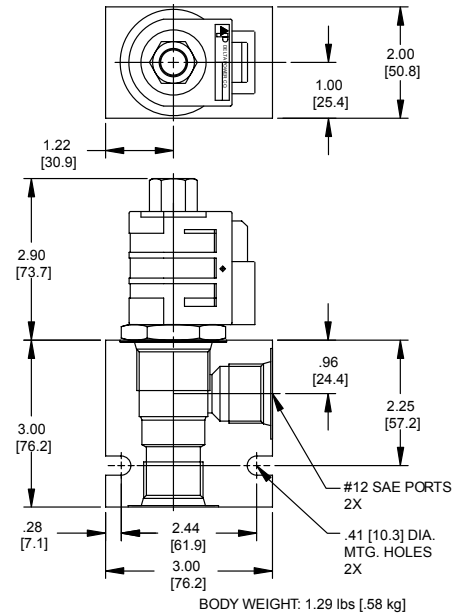
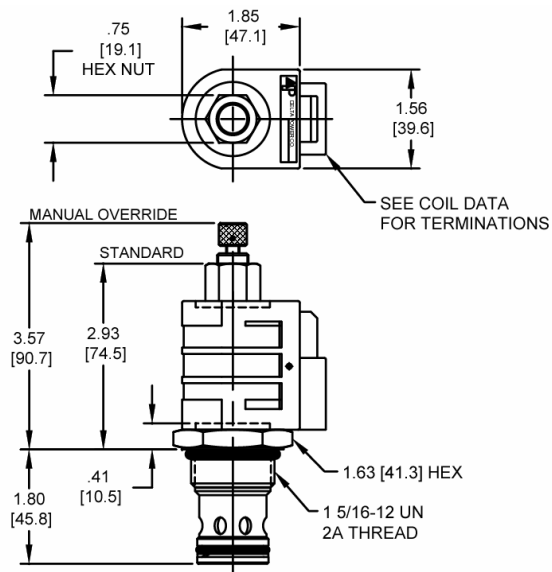
VALVE SPECIFICATIONS

Nominal Flow	40 GPM (151 LPM)
Rated Operating Pressure	3000 PSI (207 bar)
Typical Internal Leakage (150 SSU)	0-10 drops/min
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temperature Range	-40° to 250° F (-40° to 120° C)
Weight	.74 lbs. (.33 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	90 ft-lbs (121 Nm)
Coil Nut Torque Requirements	4-6 ft-lbs (5.4-8.1 Nm)
Cavity	SUPER 2W
Cavity Form Tool (Finishing)	40500017
Seal Kit	21191400

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.



DIMENSIONS



ORDERING INFORMATION

SJ-S2C - - - -

OPTIONS

Buna Standard **00**
 Viton Standard **V0**
 Buna, Screen **A0**
 Viton, Screen **W0**
 Buna, Override **0K**
 Viton, Override **VK**
 Buna, Screen, Override **B2**
 Viton, Screen, Override **V2**

**Note: Use screen only if flow direction
 is from (1) to (2).**

"D" COIL TERMINATION*(All DC Except as Noted)*

DL Double Lead
DT Deutsch on Leads DT04—2P
MI Metri-Pack on Leads
PI Packard on Leads
WL Weatherpack on Leads

SS Single Spade
DS Double Spade
HC Din 43650 (Hirschmann) — (AC & DC)
CL Conduit Lead — (AC Only)
DI Deutsch — Integral DT04—2P

BODIES

Blank
N 3/4 NPTF Ports
S #12 SAE Ports

VOLTAGE

06 6 VDC
12 12 VDC
24 24 VDC
36 36 VDC
48 48 VDC
25 24 VAC
11 120 VAC
22 220 VAC
44 440 VAC

IMMERSION PROOF "D" TYPE

IA "I" Coil AMP Superseal — Integral
ID "I" Coil Deutsch — Integral DT04-2P
IJ "I" Coil AMP Jr. Timer — Integral
IM "I" Coil Metri-Pack — Integral

Approximate Coil Weight: .74 lbs/.33 kg.

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

**HJ-S2C Pilot Operated Poppet, 2 Way, Normally Open****DESCRIPTION**

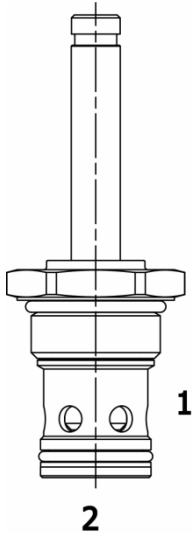
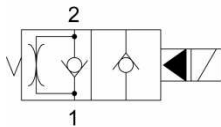
"High Pressure" 16 size, 1 5/16-12 thread, "Super" series, solenoid operated, 2 way normally open, pilot operated poppet valve with free reverse flow energized.

OPERATION

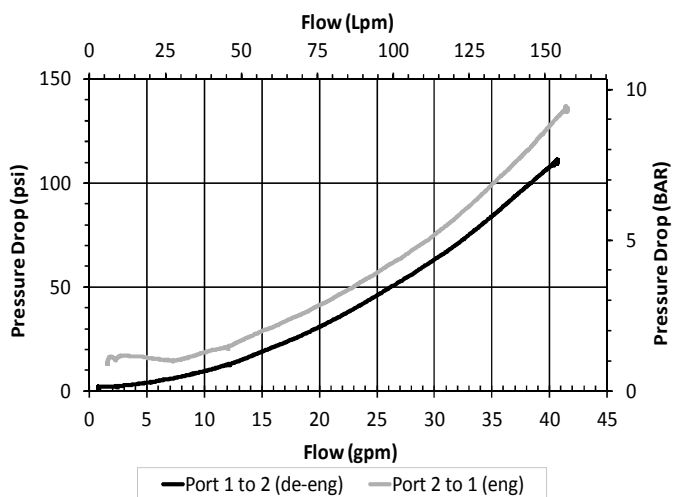
When de-energized the HJ-S2C allows flow to pass from (1) to (2), but restricts flow from (2) to (1). When energized the valve blocks flow from (1) to (2) but allows free reverse flow from (2) to (1).

FEATURES

- Hardened parts for long life.
- Efficient wet-armature construction.
- Cartridges are voltage interchangeable.
- Industry common cavity.
- Unitized, molded coil design.
- Continuous duty rated solenoid.
- Optional coil voltages and terminations.

**HYDRAULIC SYMBOL****PERFORMANCE**

Actual Test Data (Cartridges Only)

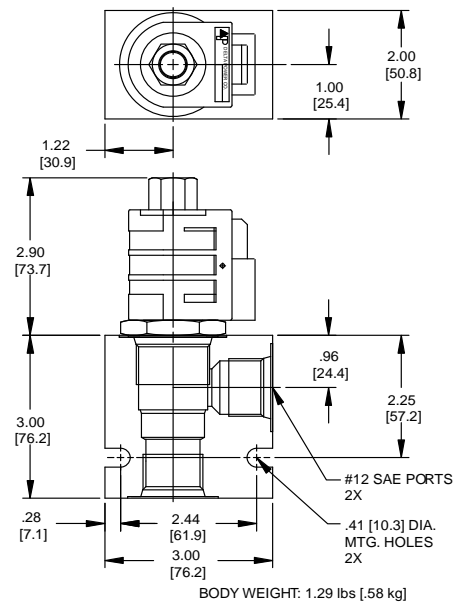
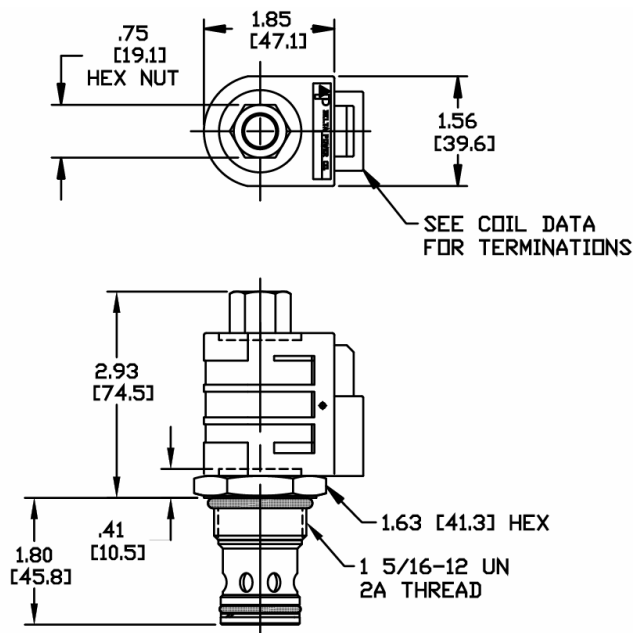
**VALVE SPECIFICATIONS**

Nominal Flow	40 GPM (151 LPM)
Rated Operating Pressure	4350 PSI (300 bar)
Typical Internal Leakage (150 SSU)	0-10 drops/min
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temperature Range	-40° to 250° F (-40° to 120° C)
Weight	.74 lbs. (.33 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	115 ft-lbs (156 Nm)
Coil Nut Torque Requirements	4-6 ft-lbs (5.4-8.1 Nm)
Cavity	SUPER 2W
Cavity Form Tool (Finishing)	40500017
Seal Kit	21191400

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.



DIMENSIONS



ORDERING INFORMATION

HJ-S2C - - - -

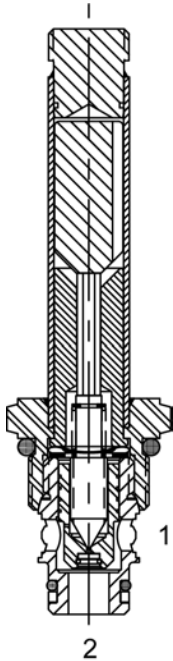
OPTIONSBuna Standard 00
Viton Standard V0Blank
N
S**BODIES**Without Body
3/4 NPTF Ports
#12 SAE Ports**VOLTAGE**06 6 VDC
12 12 VDC
24 24 VDC
36 36 VDC
48 48 VDC
25 24 VAC
11 120 VAC
22 220 VAC
44 440 VAC**"D" COIL TERMINATION**

(All DC Except as Noted)

DL Double Lead
DT Deutsch on Leads DT04—2P
MI Metri-Pack on Leads
PI Packard on Leads
WL Weatherpack on LeadsSS Single Spade
DS Double Spade
HC Din 43650 (Hirschmann) — (AC & DC)
CL Conduit Lead — (AC Only)
DI Deutsch — Integral DT04—2P**Note: Aluminum, NOT durability rated for 4350 PSI. Consult factory for options.**

Approximate Coil Weight: .74 lbs/.33 kg.

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

**PB-S2D Pilot Operated Poppet, 2 Way, Normally Open****DESCRIPTION**

8 size, 3/4-16 thread, "Power" series, solenoid operated, 2 way normally open, pilot operated poppet valve with free reverse flow energized and de-energized.

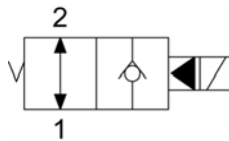
OPERATION

When de-energized the PB-S2D allows flow from (1) to (2) or (2) to (1). When energized the valve blocks flow from (1) to (2) and allows flow from (2) to (1).

OPERATION OF MANUAL OVERRIDE OPTION: To override, turn the manual override screw clockwise. To release turn the manual override screw counter-clockwise.

FEATURES

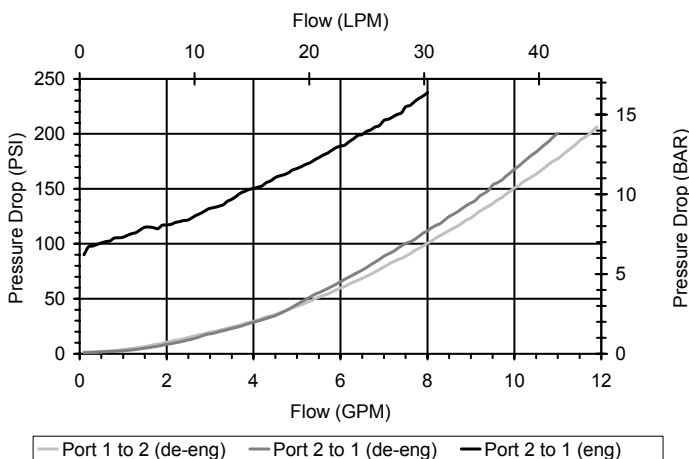
- Hardened parts for long life.
- Efficient wet-armature construction.
- Cartridges are voltage interchangeable.
- Manual override option.
- Industry common cavity.
- Unitized, molded coil design.
- Continuous duty rated solenoid.
- Optional coil voltages and terminations.
- Optional "I" Coil: Weatherproof, Thermal Shock, Immersion Safe.

HYDRAULIC SYMBOL

Unshifted limit of 10 GPM (38 LPM) from (1) to (2) energized and from (2) to (1) de-energized. For shifted flow performance consult chart.

PERFORMANCE

Actual Test Data (Cartridge Only)

**VALVE SPECIFICATIONS**

Nominal Flow	10 GPM (38 LPM)
Rated Operating Pressure	3500 PSI (241 bar)
Typical Internal Leakage (150 SSU)	0-5 drops/min
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temperature Range	-40° to 250° F (-40° to 120° C)
Weight	.22 lbs. (.10 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	25 ft-lbs (34 Nm)
Coil Nut Torque Requirements	4-6 ft-lbs (5.4-8.1 Nm)
Cavity	POWER 2W
Cavity Form Tool (Finishing)	40500005
Seal Kit	21191100

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

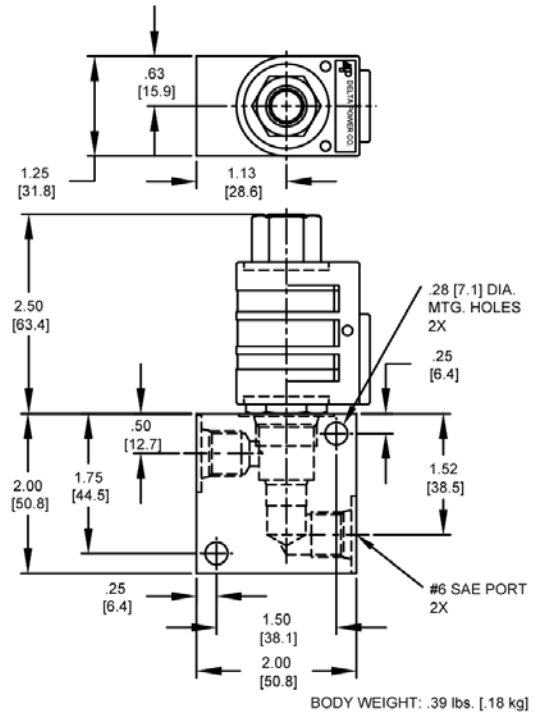
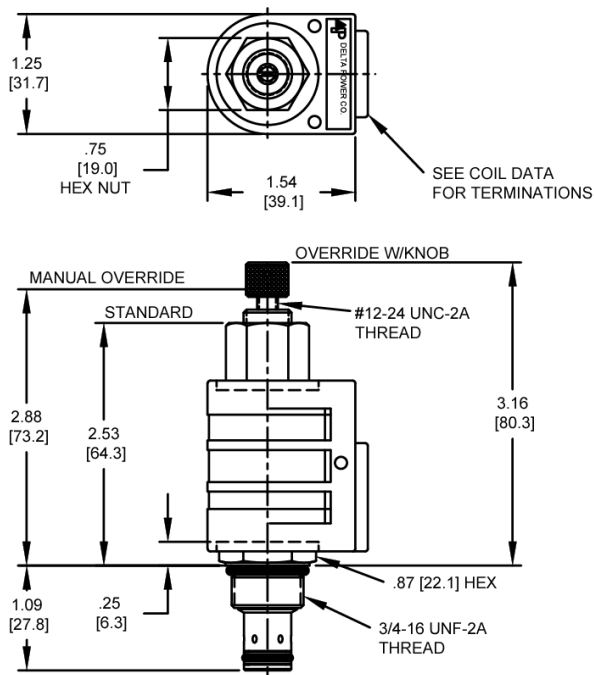
Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com



DIMENSIONS



ORDERING INFORMATION

PB-S2D -

OPTIONS

Buna Standard	00
Viton Standard	V0
Buna, Override, Detent	0M
Viton, Override, Detent	VM
Buna, Override, Knob	OK
Viton, Override, Knob	VK
Buna, Screen	A0
Viton, Screen	W0
Buna, Screen, Override	B2
Viton, Screen, Override	V2
Buna, Screen, Override, Knob	B5
Viton, Screen, Override, Knob	V5

Note: Use screen only if flow direction is from (1) to (2).

"P" COIL TERMINATION

(All DC Except as Noted)

DL	Double Lead
DT	Deutsch on Leads DT04-2P
ML	Metri-Pack on Leads
PL	Packard on Leads
WL	Weatherpack on Leads

SS	Single Spade
DS	Double Spade
HC	DIN 43650 (Hirschman) - (AC & DC)
CL	Conduit Lead - (AC Only)
DI	Deutsch - Integral DT04-2P

Blank

N

S

BODIES

Without Body
1/4 NPTF Ports
#6 SAE Ports

VOLTAGE

06	6 VDC
12	12 VDC
24	24 VDC
36	36 VDC
48	48 VDC
25	24 VAC
11	120 VAC
22	220 VAC
44	440 VAC

IMMERSION PROOF "P" TYPE

IA	"I" Coil AMP Superseal - Integral
ID	"I" Coil Deutsch - Integral DT04-2P
IJ	"I" Coil AMP Jr. Timer - Integral
IM	"I" Coil Metri-Pack - Integral

Approximate Coil Weight: .42 lbs. (.19 kg.)

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com


HB-S2D Pilot Operated Poppet, 2 Way Normally Open
DESCRIPTION

8 size, 3/4-16 thread, "Power" series, solenoid operated, 2 way normally open, pilot operated poppet valve with reverse flow energized and de-energized.

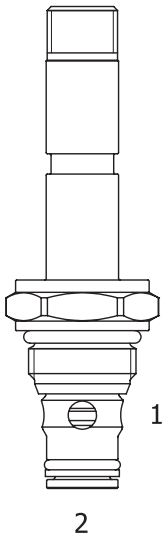
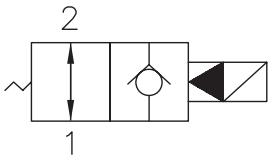
OPERATION

When de-energized the HB-S2D allows flow from (1) to (2) or from (2) to (1). When energized the valve blocks flow from (1) to (2) and allows flow from (2) to (1).

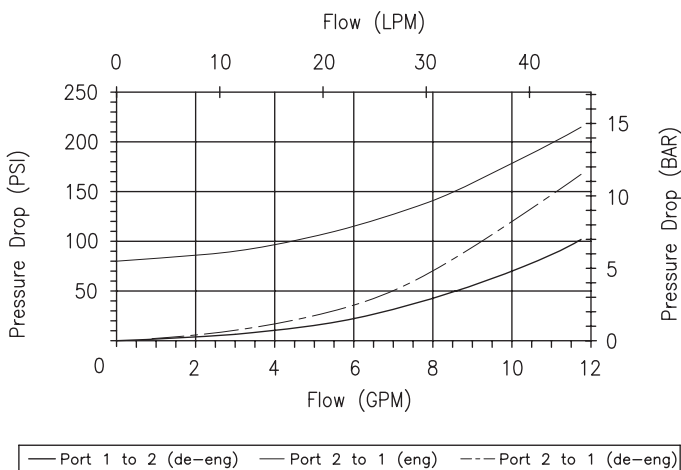
MANUAL OVERRIDE OPTION: to override, turn the manual override screw clockwise. To release, turn the manual override screw counter-clockwise.

FEATURES

- Hardened parts for long life.
- Efficient wet-armature construction.
- Cartridges are voltage interchangeable.
- Industry common cavity.
- Unitized, molded coil design.
- Continuous duty rated solenoid.
- Optional coil voltages and terminations.
- Optional "I" Coil: Weatherproof, Thermal Shock, Immersion Safe.
- Manual override option.

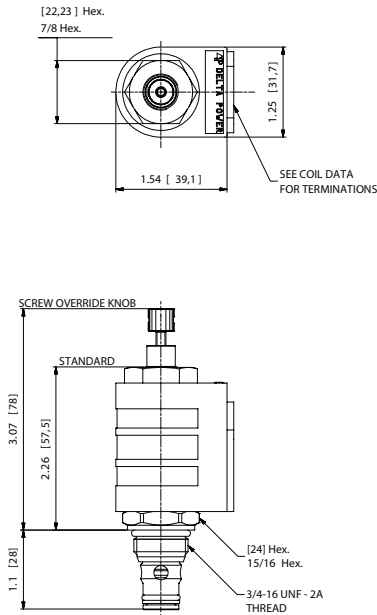
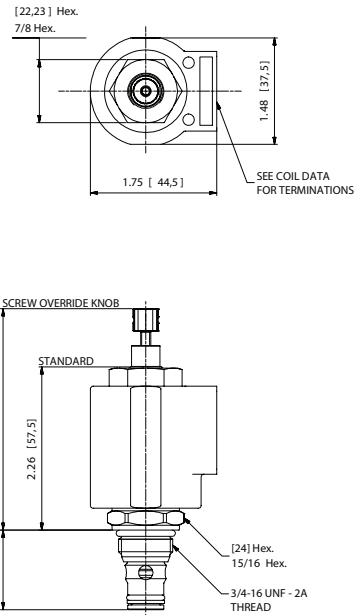
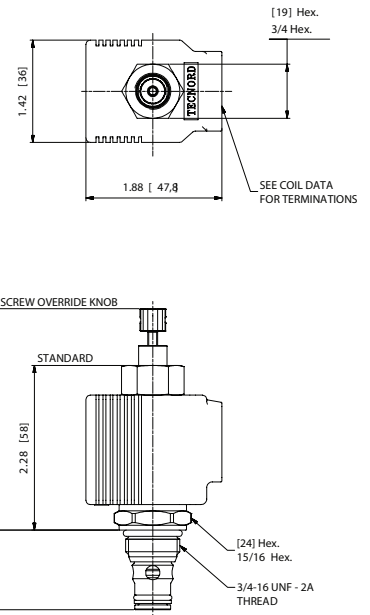

HYDRAULIC SYMBOL

PERFORMANCE

Actual Test Data (Cartridge Only)


VALVE SPECIFICATIONS

Nominal Flow	12 GPM (45 LPM)
Rated Operating Pressure	5000 PSI (350 bar)
Typical Internal Leakage (150 SSU)	0-5 drops/min at 5000 PSI (350 bar)
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temperature Range	-40° to 210° F (-40° to 100° C) BUNA seals -4° to 250° F (-20° to 120° C) VITON seals
Weight	.29 lbs. (.13 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	35 ft-lbs (47 Nm)
Coil Nut Torque Requirements	4-6 ft-lbs (5.4-8.1 Nm)
Cavity	POWER 2W
Cavity Tools kit	40500005
Seal Kit	21191100

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.


DIMENSIONS
"P" COIL TERMINATION

IMMERSION PROOF "I" TYPE

"J" COIL TERMINATION

ORDERING INFORMATION
HB - S2D -
OPTIONS

Buna Standard	00
Viton Standard	V0
Buna, Override, Knob	0K
Viton, Override, Knob	VK

CONSULT FACTORY FOR BODY
VOLTAGE

06	06 VDC
12	12 VDC
24	24 VDC
36	36 VDC
48	48 VDC
25	24 VAC
11	120 VAC
22	220 VAC
44	440 VAC

"P" COIL TERMINATION
(All DC Except as Noted)

DL	Double Lead
DS	Double Spade
HC	DIN 43650 (Hirschman) - (AC & DC)
CL	Conduit Lead - (AC Only)
DI	Deutsch - Integral DT04-2P

IMMERSION PROOF "I" TYPE

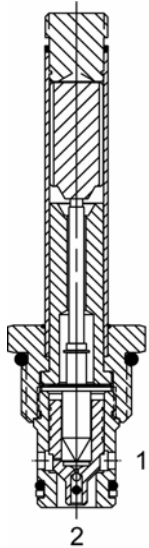
IA	"I" Coil AMP Superseal - Integral
ID	"I" Coil Deutsch - Integral DT04-2P
IJ	"I" Coil AMP Jr. Time - Integral
IM	"I" Coil Metri-Pack - Integral

"J" COIL TERMINATION

JA	"J" Coil AMP Superseal - Integral
JD	"J" Coil Deutsch - Integral DT04-2P
JJ	"J" Coil AMP Jr. Time - Integral
JM	"J" Coil Metri-Pack - Integral
JL	"J" Coil Double Lead
JH	"J" Coil DIN 43650 (Hirschman)

Approximate Coil Weight: .42 lbs/.19 kg.
For Optional Coil Terminations See Coil Section

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

**DE-S2D Pilot Operated Poppet, 2 Way, Normally Open****DESCRIPTION**

10 size, 7/8-14 thread, "Delta" series, solenoid operated, 2 way normally open, pilot operated poppet valve with free reverse flow energized and de-energized.

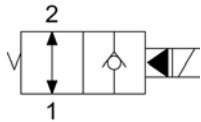
OPERATION

When de-energized the DE-S2D allows flow to pass from (1) to (2) and (2) to (1), When energized the valve blocks flow from (1) to (2) but allows free reverse flow from (2) to (1).

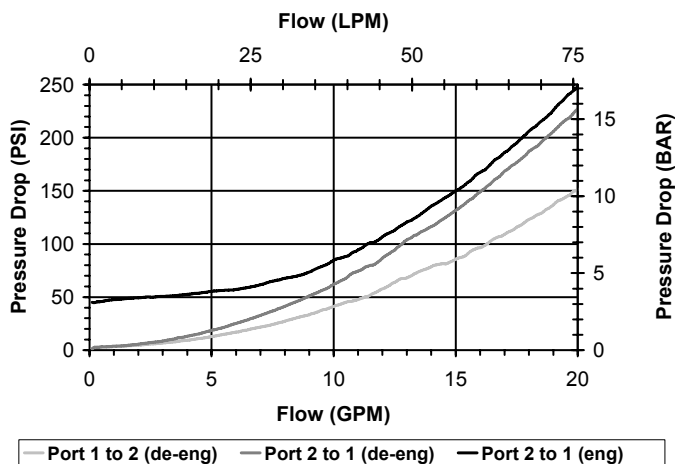
OPERATION OF MANUAL OVERRIDE OPTION: To override, turn the manual override screw clockwise. To release turn the turn the manual override screw counter-clockwise.

FEATURES

- Hardened parts for long life.
- Efficient wet-armature construction.
- Cartridges are voltage interchangeable.
- Manual override option.
- Industry common cavity.
- Unitized, molded coil design.
- Continuous duty rated solenoid.
- Optional coil voltages and terminations.
- Optional "I" Coil: Weatherproof, Thermal Shock, Immersion Safe.

HYDRAULIC SYMBOL**PERFORMANCE**

Actual Test Data (Cartridge Only)

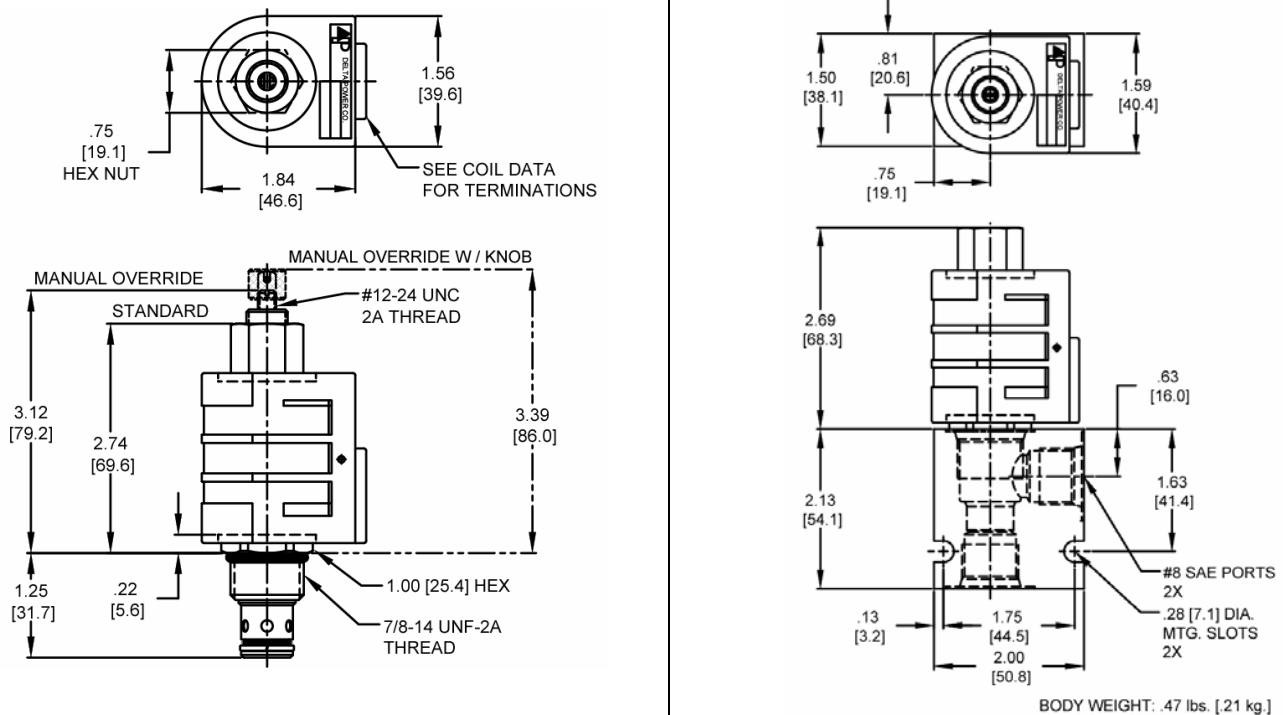
**VALVE SPECIFICATIONS**

Nominal Flow	15 GPM (57 LPM)
Rated Operating Pressure	3500 PSI (241 bar)
Typical Internal Leakage (150 SSU)	0-5 drops/min
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temperature Range	-40° to 250° F (-40° to 120° C)
Weight	.29 lbs. (.13 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	30 ft-lbs (40.6 Nm)
Coil Nut Torque Requirements	4-6 ft-lbs (5.4-8.1 Nm)
Cavity	DELTA 2W
Cavity Form Tool (Finishing)	40500000
Seal Kit	21191200

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.



DIMENSIONS



ORDERING INFORMATION

DE-S2D -

OPTIONS

Buna Standard	00
Viton Standard	V0
Buna, Override	0M
Viton, Override	VM
Buna, Override, Knob	OK
Viton, Override, Knob	VK
Buna, Screen	A0
Viton, Screen	W0
Buna, Screen, Override	B2
Viton, Screen, Override	V2
Buna, Screen, Override, Knob	B5
Viton, Screen, Override, Knob	V5

Note: Use screen only if flow direction is from (1) to (2).

"D" COIL TERMINATION

(All DC Except as Noted)

DL	Double Lead
DT	Deutsch on Leads DT04-2P
MI	Metri-Pack on Leads
PI	Packard on Leads
WL	Weatherpack on Leads

SS	Single Spade
DS	Double Spade
HC	DIN 43650 (Hirschmann) - (AC & DC)
CL	Conduit Lead - (AC Only)
DI	Deutsch - Integral DT04-2P

Blank

N

S

BODIES

Without Body
3/8 NPTF Ports
#8 SAE Ports

VOLTAGE

06	6 VDC
12	12 VDC
24	24 VDC
36	36 VDC
48	48 VDC
25	24 VAC
11	120 VAC
22	220 VAC
44	440 VAC

IMMERSION PROOF "D" TYPE

IA	"I" Coil AMP Superseal - Integral
ID	"I" Coil Deutsch - Integral DT04-2P
IJ	"I" Coil AMP Jr. Timer - Integral
IM	"I" Coil Metri-Pack - Integral

Approximate Coil Weight: .74 lbs/.33 kg.

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

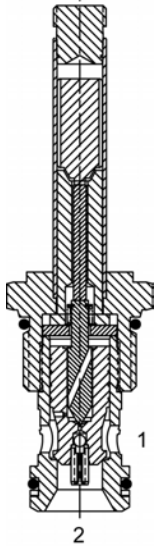
Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com



TT-S2D Pilot Operated Poppet, 2 Way, Normally Open



DESCRIPTION

12 size, 1 1/16-12 thread, "Tecnord" series, solenoid operated, 2 way normally open, pilot operated poppet valve with free reverse flow energized and de-energized.

OPERATION

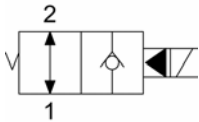
When de-energized the TT-S2D allows flow to pass from (1) to (2) and (2) to (1), When energized the valve blocks flow from (1) to (2) but allows free reverse flow from (2) to (1).

OPERATION OF MANUAL OVERRIDE OPTION: To override, turn the manual override screw clockwise. To release turn the manual override screw counter-clockwise.

FEATURES

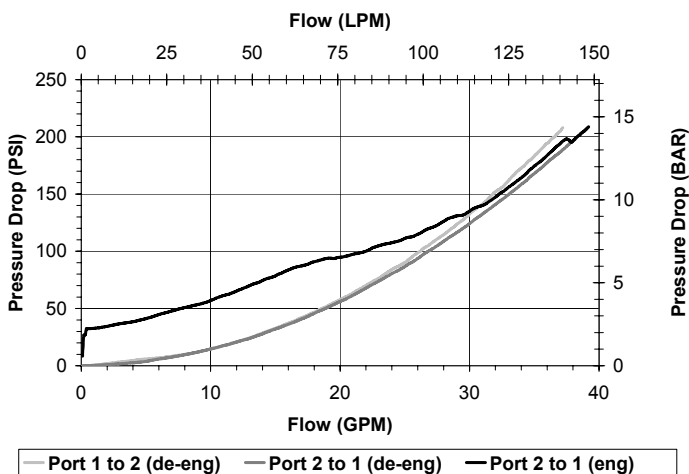
- Hardened parts for long life.
- Efficient wet-armature construction.
- Cartridges are voltage interchangeable.
- Manual override option.
- Industry common cavity.
- Unitized, molded coil design.
- Continuous duty rated solenoid.
- Optional coil voltages and terminations.
- Optional "I" Coil: Weatherproof, Thermal Shock, Immersion Safe.

HYDRAULIC SYMBOL



PERFORMANCE

Actual Test Data (Cartridge Only)



VALVE SPECIFICATIONS

Nominal Flow	30 GPM (114 LPM)
Rated Operating Pressure	3000 PSI (207 bar)
Typical Internal Leakage (150 SSU)	0-10 drops/min
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temperature Range	-40° to 250° F (-40° to 120° C)
Weight	.51 lbs. (.23 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	70 ft-lbs (94.9 Nm)
Coil Nut Torque Requirements	4-6 ft-lbs (4.5-8.1 Nm)
Cavity	TECNORD 2W
Cavity Form Tool (Finishing)	40500032
Seal Kit	21191300

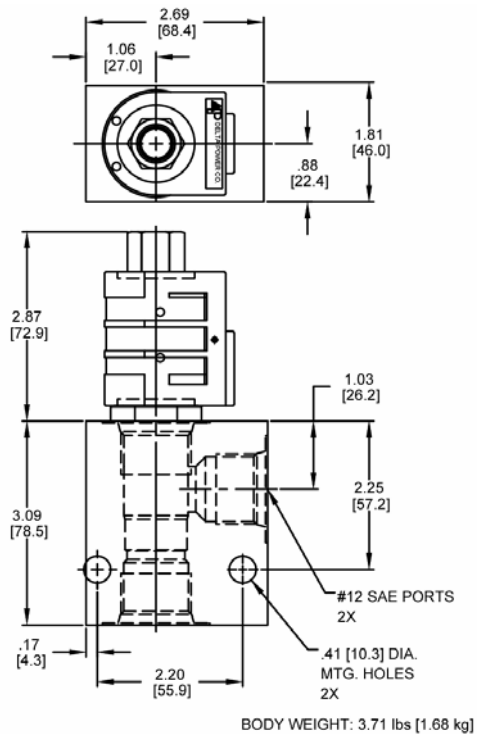
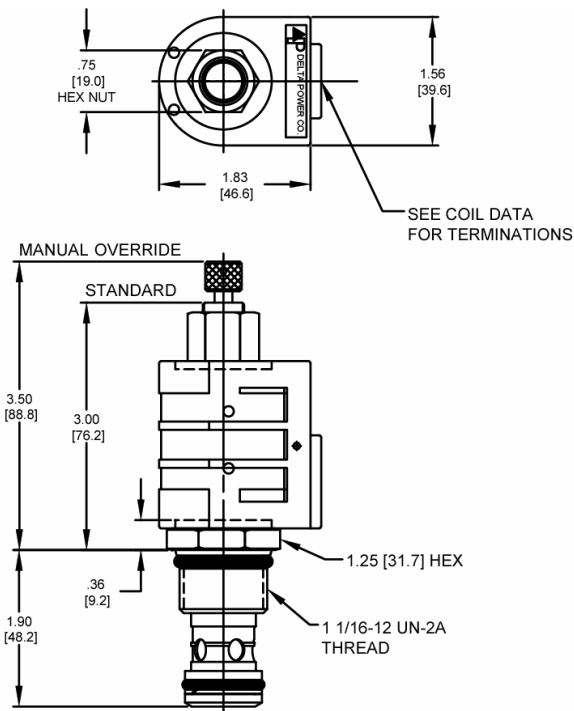
WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.



Delta Power Company

4484 Boeing Drive - Rockford, IL 61109

DIMENSIONS



ORDERING INFORMATION

TT-S2D

OPTIONS

Buna Standard
Viton Standard
Buna, Override, Knob
Viton, Override, Knob
Buna, Screen
Viton, Screen
Buna, Screen, Override, Knob
Viton, Screen, Override, Knob

Blank
S

BODIES

Without Body #12 SAE Ports

VOLTAGE

06	6 VDC
12	12 VDC
24	24 VDC
36	36 VDC
48	48 VDC
25	24 VAC
11	120 VAC
22	220 VAC
44	440 VAC

Note: Use screen only if flow direction is from (1) to (2).

“D” COIL TERMINATION

(All DC Except as Noted)

DL	Double Lead
DT	Deutsch on Leads DT04-2P
MI	Metri-Pack on Leads
PI	Packard on Leads
WL	Weatherpack on Leads

SS Single Spade
DS Double Spade
HC DIN 43650 (Hirschmann) – (AC & DC)
CL Conduit Lead – (AC Only)
DI Deutsch – Integral DT04-2P

IMMERSION PROOF "D" TYPE

IA "I" Coil AMP Superseal - Integral
ID "I" Coil Deutsch – Integral DT04-2P
IJ "I" Coil AMP Jr. Timer - Integral
IM "I" Coil Metri-Pack- Integral

Approximate Coil Weight: .74 lbs/.33 kg.

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

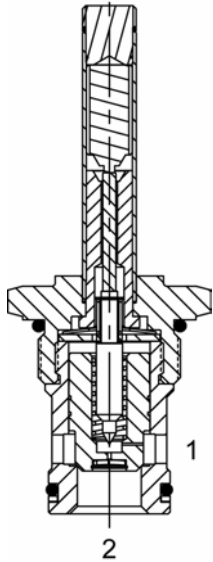
Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com



SJ-S2D Pilot Operated Poppet, 2 Way, Normally Open



DESCRIPTION

16 size, 1 5/16-12 thread, "Super" series, solenoid operated, 2 way normally open, pilot operated poppet valve with free reverse flow energized and de-energized.

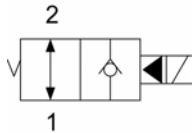
OPERATION

When de-energized the SJ-S2D allows flow to pass from (1) to (2) and (2) to (1), When energized the valve blocks flow from (1) to (2) but allows free reverse flow from (2) to (1).

FEATURES

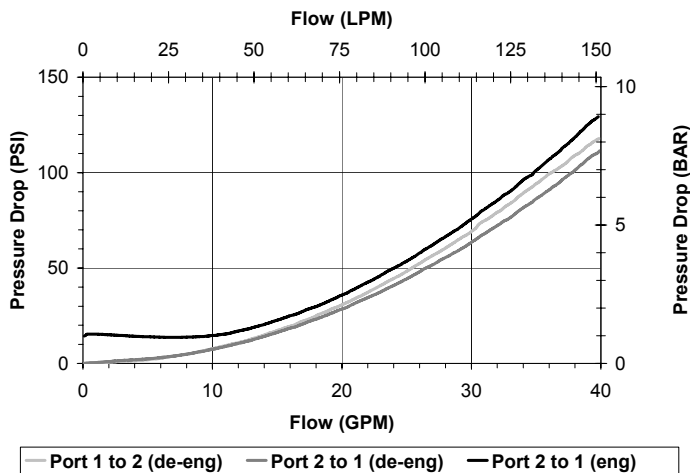
- Hardened parts for long life.
- Efficient wet-armature construction.
- Cartridges are voltage interchangeable.
- Industry common cavity.
- Unitized, molded coil design.
- Continuous duty rated solenoid.
- Optional coil voltages and terminations.
- Optional "I" Coil: Weatherproof, Thermal Shock, Immersion Safe.

HYDRAULIC SYMBOL



PERFORMANCE

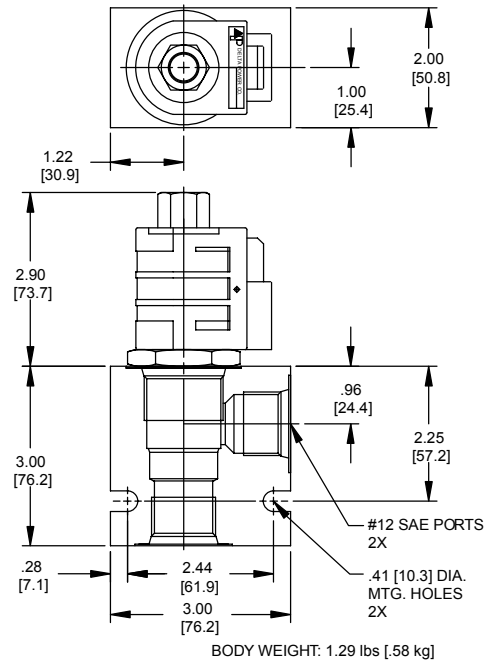
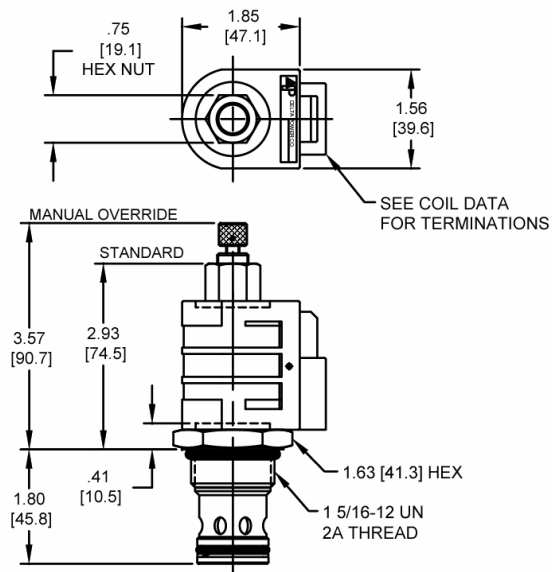
Actual Test Data (Cartridge Only)



VALVE SPECIFICATIONS

Nominal Flow	40 GPM (151 LPM)
Rated Operating Pressure	3000 PSI (207 bar)
Typical Internal Leakage (150 SSU)	0-10 drops/min
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temperature Range	-40° to 250° F (-40° to 120° C)
Weight	.74 lbs. (.33 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	90 ft-lbs (122 Nm)
Coil Nut Torque Requirements	4-6 ft-lbs (5.4-8.1 Nm)
Cavity	SUPER 2W
Cavity Form Tool (Finishing)	40500017
Seal Kit	21191400

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.


DIMENSIONS

ORDERING INFORMATION
SJ-S2D - - - -
OPTIONS

Buna Standard **00**
 Viton Standard **V0**
 Buna, Screen **A0**
 Viton, Screen **W0**
 Buna, Override **0K**
 Viton, Override **VK**
 Buna, Screen, Override **B2**
 Viton, Screen, Override **V2**

Note: Use screen only if flow direction is from (1) to (2).

"D" COIL TERMINATION
(All DC Except as Noted)

DL Double Lead
DT Deutsch on Leads DT04—2P
MI Metri-Pack on Leads
PI Packard on Leads
WL Weatherpack on Leads

SS Single Spade
DS Double Spade
HC Din 43650 (Hirschmann) — (AC & DC)
CL Conduit Lead — (AC Only)
DI Deutsch — Integral DT04—2P

Blank
N
S

BODIES

Without Body
 3/4 NPTF Ports
 #12 SAE Ports

VOLTAGE

06 6 VDC
12 12 VDC
24 24 VDC
36 36 VDC
48 48 VDC
25 24 VAC
11 120 VAC
22 220 VAC
44 440 VAC

IMMERSION PROOF "D" TYPE

IA "I" Coil AMP Superseal — Integral
ID "I" Coil Deutsch — Integral DT04—2P
IJ "I" Coil AMP Jr. Timer — Integral
IM "I" Coil Metri-Pack — Integral

Approximate Coil Weight: .74 lbs/.33 kg.

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

**PB-S2J Pilot Operated Poppet, 2 Way, Normally Open, Soft Seat****DESCRIPTION**

8 size, 3/4-16 thread, "Power" series, solenoid operated, 2 way normally open, pilot operated soft seat poppet valve with free reverse flow energized.

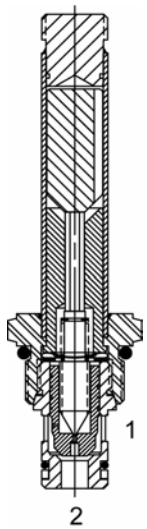
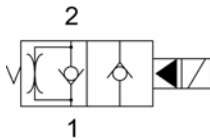
OPERATION

When de-energized the PB-S2J allows flow from (1) to (2) and restricts flow from (2) to (1). When energized the valve blocks flow from (1) to (2) and allows free flow from (2) to (1).

OPERATION OF MANUAL OVERRIDE OPTION: To override, turn the manual override screw clockwise. To release turn the manual override screw counter-clockwise.

FEATURES

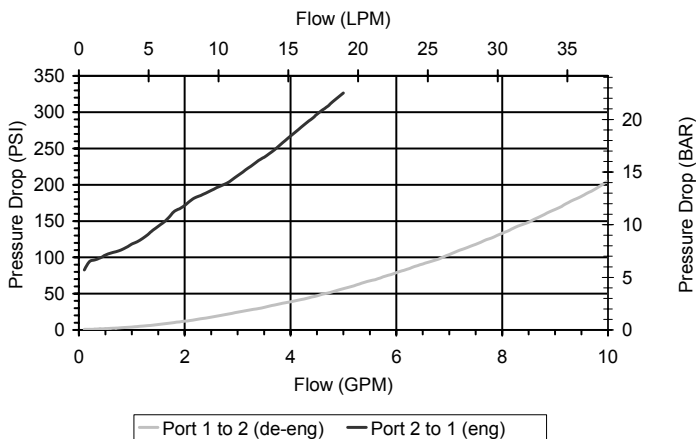
- Soft seat for ultra low leakage.
- Efficient wet-armature construction.
- Cartridges are voltage interchangeable.
- Manual override option.
- Industry common cavity.
- Unitized, molded coil design.
- Continuous duty rated solenoid.
- Optional coil voltages and terminations.
- Optional "I" Coil: Weatherproof, Thermal Shock, Immersion Safe.

**HYDRAULIC SYMBOL**

Unshifted limit 6 GPM (23 LPM) from (1) to (2) energized. For shifted flow performance consult chart.

PERFORMANCE

Actual Test Data (Cartridge Only)

**VALVE SPECIFICATIONS**

Nominal Flow	8 GPM (30 LPM)
Rated Operating Pressure	2000 PSI (138 bar)
Typical Internal Leakage (150 SSU)	Negligible
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temperature Range	-35° to 200° F (-37° to 93° C)
Weight	21 lbs. (.10 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	25 ft-lbs (34 Nm)
Coil Nut Torque Requirements	4-6 ft-lbs (5.4-8.1 Nm)
Cavity	POWER 2W
Cavity Form Tool (Finishing)	40500005
Seal Kit	21191100

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

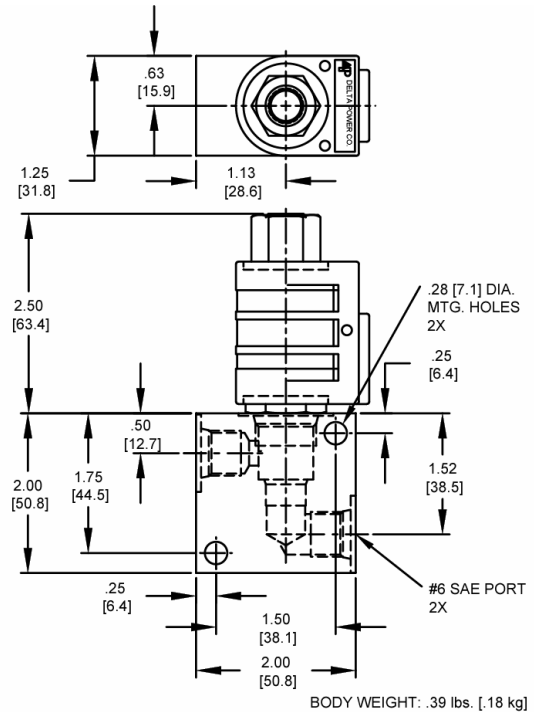
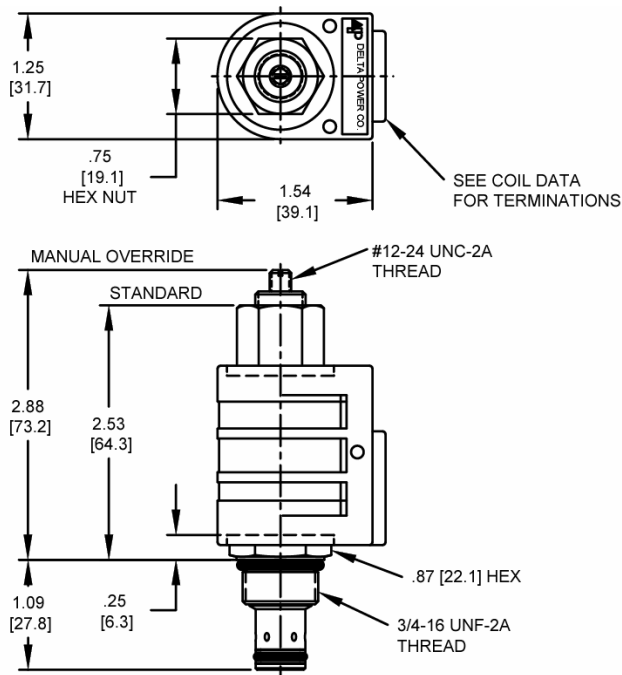
Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com



DIMENSIONS



ORDERING INFORMATION

PB-S2J

OPTIONS

Buna Standard	00
Viton Standard	V0
Buna, Override, Detent	0M
Viton, Override, Detent	VM
Buna, Screen	A0
Viton, Screen	W0
Buna, Screen Override	B2
Viton, Screen, Override	V2

Note: Use screen only if flow direction is from (1) to (2).

"P" COIL TERMINATION

(All DC Except as Noted)

DL	Double Lead
DT	Deutsch on Leads DT04-2P
ML	Metri-Pack on Leads
PL	Packard on Leads
WL	Weatherpack on Leads

SS	Single Spade
DS	Double Spade
HC	DIN 43650 (Hirschman) – (AC & DC)
CL	Conduit Lead – (AC Only)
DI	Deutsch – Integral DT04-2P

Blank
N
S

BODIES

Without Body
1/4 NPTF Ports
#6 SAE Ports

VOLTAGE

06	6 VDC
12	12 VDC
24	24 VDC
36	36 VDC
48	48 VDC
25	24 VAC
11	120 VAC
22	220 VAC
44	440 VAC

IMMERSION PROOF "P" TYPE

IA	"I" Coil AMP Superseal - Integral
ID	"I" Coil Deutsch – Integral DT04-2P
IJ	"I" Coil AMP Jr. Timer - Integral
IM	"I" Coil Metri-Pack – Integral

Approximate Coil Weight: .42 lbs. (.19 kg.)

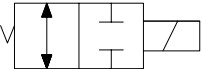
WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

Phone: (815) 397-6628

Fax: (815) 397-2526

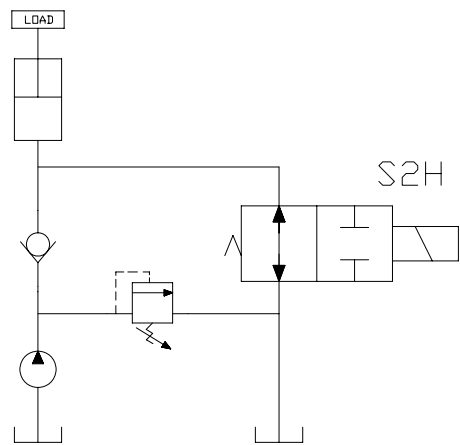
E-mail: delta@delta-power.com

2 Way 2 Position Normally Open Spool Valves

	GPM	PSI	LPM	BAR	MODEL	PAGE
	3	3000	11	207	MA-S2H	104
	3	4000	11	276	HA-S2H	106
	5	3000	19	207	PB-S2H	108
	8	3000	30	207	DE-S2H	110
	8	4000	30	276	HE-S2H	112
	6	1000	23	69	IE-S2H	660

Typical Schematic

Typical application for the S2H is a pump unloading valve.

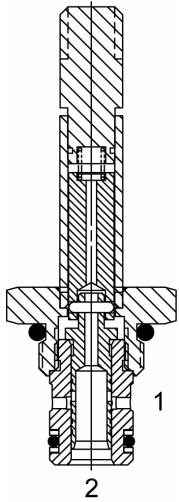


WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com

**MA-S2H Direct Acting Spool, 2 Way, Normally Open****DESCRIPTION**

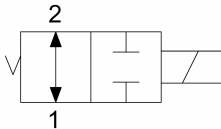
7 size, 5/8-18 thread, "Mini" series, solenoid operated, 2 way normally open, spool valve.

OPERATION

When de-energized the MA-S2H allows flow from (1) to (2) and (2) to (1). When energized the valve blocks flow from (1) to (2) and (2) to (1).

FEATURES

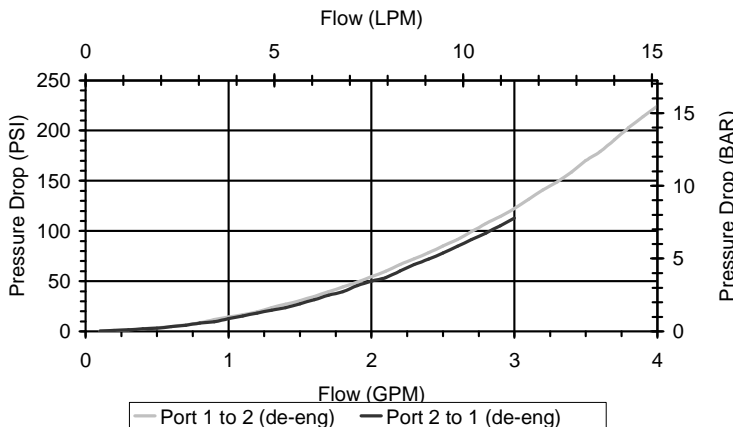
- Hardened parts for long life.
- Efficient wet-armature construction.
- Cartridges are voltage interchangeable.
- Industry common cavity.
- Unitized, molded coil design.
- Continuous duty rated solenoid.
- Optional coil voltages and terminations.

HYDRAULIC SYMBOL

Valve is rated for shift and return from 1 to 2 only: 3 GPM, 3000 PSI. Max steady state flow 2 to 1: 3 GPM. HA-S2H should be specified where higher pressures or 2 to 1 shift operation is required.

PERFORMANCE

Actual Test Data (Cartridge Only)

**VALVE SPECIFICATIONS**

Maximum Flow	3 GPM (11 LPM)
Rated Operating Pressure	3000 PSI (207 bar)
Typical Internal Leakage (150 SSU)	5 cu in/min (82 ml/min)
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temperature Range	-40° to 250° F (-40° to 120° C)
Weight	.12 lbs. (.05 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	15 ft-lbs (40 Nm)
Coil Nut Torque Requirements	3-5 ft-lbs (4.1-6.8 Nm)
Cavity	MINI 2W
Cavity Form Tool (Finishing)	40500003
Seal Kit	21191002

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

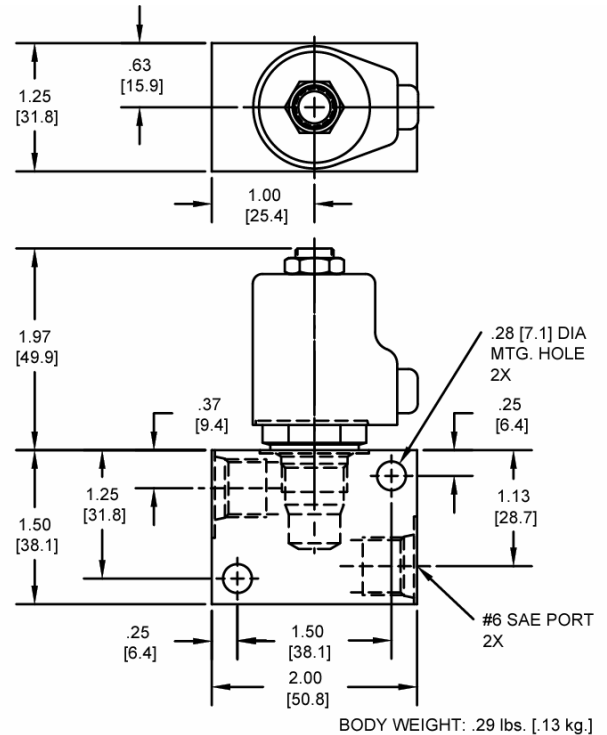
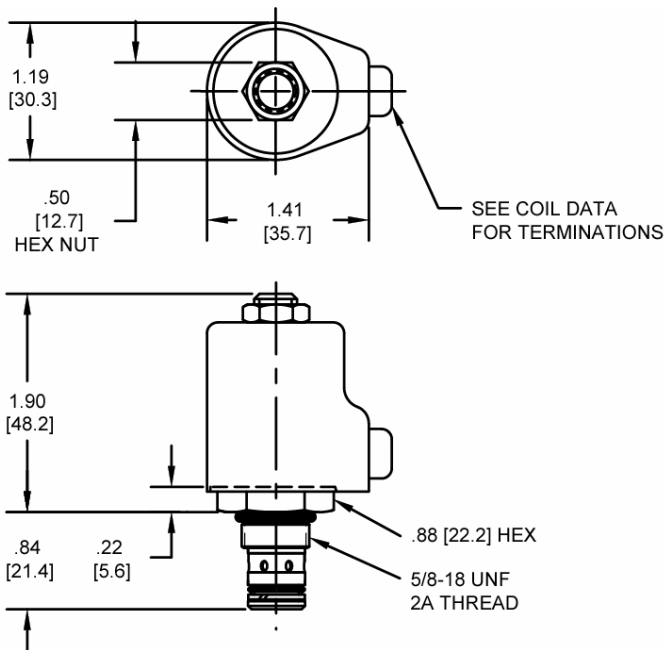
Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com



DIMENSIONS



ORDERING INFORMATION

MA-S2H

OPTIONS

Buna Standard
Viton Standard
Buna, Screen
Viton, Screen

00
V0
A0
W0

Blank
N
S

BODIES

Without Body
1/4 NPTF Ports
#6 SAE Ports

VOLTAGE

06 6 VDC
12 12 VDC
24 24 VDC
36 36 VDC
48 48 VDC
25 24 VAC
11 120 VAC
22 220 VAC
44 440 VAC

Note: Use screen only if flow direction is from (1) to (2).

"M" COIL TERMINATION

(All DC Except as Noted)

Double Lead
Deutsch on Leads DT04-2P
Metri-Pack on Leads
Packard on Leads
Weatherpack on Leads
Single Spade
Double Spade
DIN 43650 (Hirschman) - (AC&DC)
Conduit Lead - (AC Only)

DL
DT
ML
PL
WL
SS
DS
HC
CL

Approximate Coil Weight: .30 lbs (.14 kg.)

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com

**HA-S2H Direct Acting Spool, 2 Way, Normally Open****DESCRIPTION**

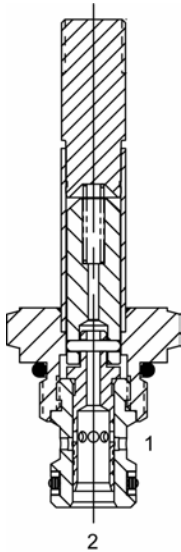
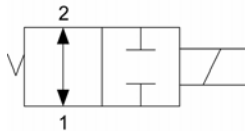
"High Pressure" 7 size, 5/8-18 thread, "Mini" series, solenoid operated, 2-way normally open, spool valve.

OPERATION

When de-energized the HA-S2H allows flow from (1) to (2) and (2) to (1). When energized the valve blocks flow from (1) to (2) and (2) to (1).

FEATURES

- Hardened parts for long life.
- Efficient wet-armature construction.
- Cartridges are voltage interchangeable.
- Industry common cavity.
- Unitized, molded coil design (for most common terminations, see coil page).
- Continuous duty rated solenoid.
- Optional coil voltages and terminations.

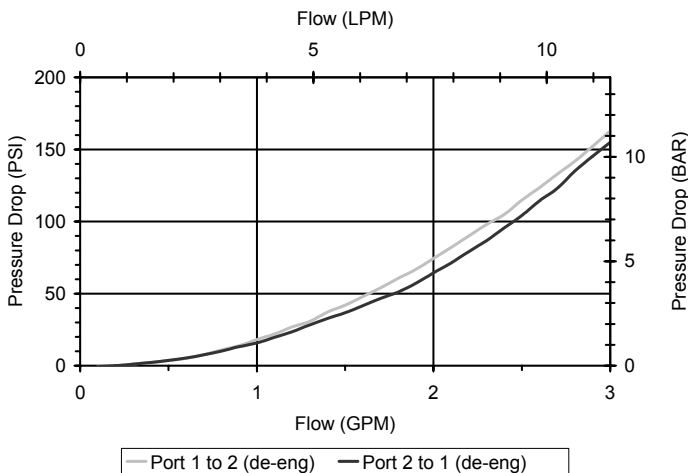
**HYDRAULIC SYMBOL**

Operational shift limit 2 GPM (8 LPM).

For shifted performance consult chart.

PERFORMANCE

Actual Test Data (Cartridge Only)

**VALVE SPECIFICATIONS**

Maximum Flow	3 GPM (11 LPM)
Rated Operating Pressure	4000 PSI (276 bar)
Typical Internal Leakage (150 SSU)	8 cu in/min (131 ml/min)
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temperature Range	-40° to 250° F (-40° to 120° C)
Weight	.14 lbs. (.06 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	15 ft-lbs (20 Nm)
Coil Nut Torque Requirements	3-5 ft-lbs (4.1-6.8 Nm)
Cavity	MINI 2W
Cavity Form Tool (Finishing)	40500003
Seal Kit	21191002

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

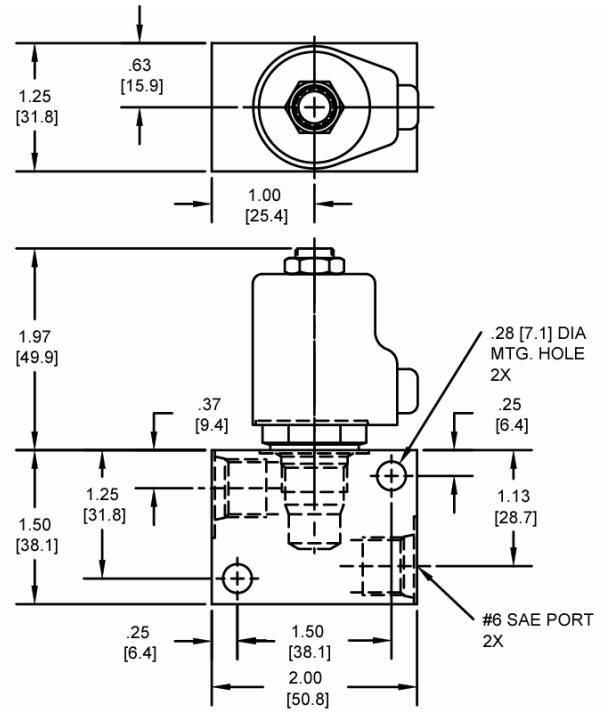
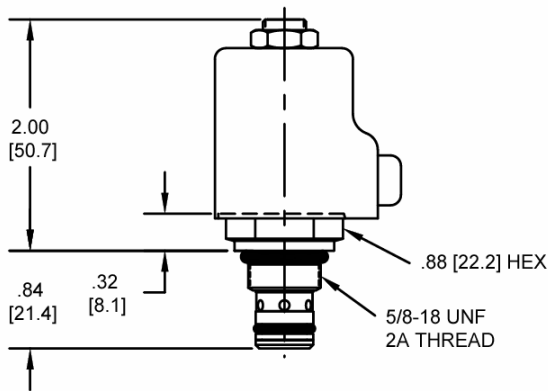
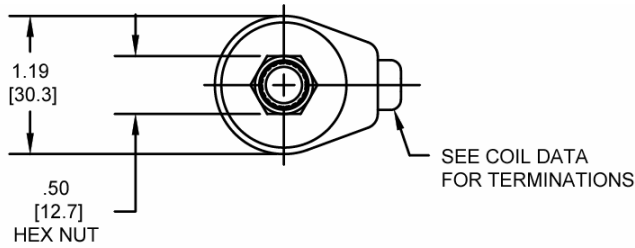
Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com



DIMENSIONS



BODY WEIGHT: .29 lbs. [13 kg.]

ORDERING INFORMATION

HA-S2H -

OPTIONSBuna Standard
Viton Standard00
V0Blank
N
S**BODIES**Without Body
1/4 NPTF Ports
#6 SAE Ports

Note: Aluminum, NOT durability rated for 4000 PSI. Consult factory for body options.

"M" COIL TERMINATION

(All DC Except as Noted)

Double Lead
Deutsch on Leads DT04-2P
Metri-Pack on Leads
Packard on Leads
Weatherpack on Leads
Single Spade
Double Spade
DIN 43650 (Hirschman) - (AC&DC)
Conduit Lead - (AC Only)DL
DT
ML
PL
WL
SS
DS
HC
CL**VOLTAGE**06 6 VDC
12 12 VDC
24 24 VDC
36 36 VDC
48 48 VDC
25 24 VAC
11 120 VAC
22 220 VAC
44 440 VAC

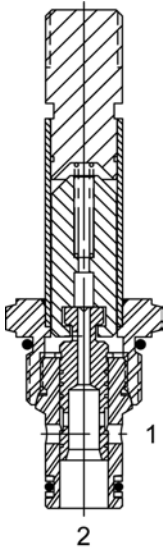
Approximate Coil Weight: .30 lbs (.14 kg.)

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com

**PB-S2H Direct Acting Spool, 2 Way, Normally Open****DESCRIPTION**

8 size, 3/4-16 thread, "Power" series, solenoid operated, 2 way normally open, spool valve.

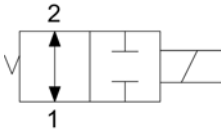
OPERATION

When de-energized the PB-S2H allows flow from (1) to (2) and (2) to (1). When energized the valve blocks flow from (1) to (2) and (2) to (1).

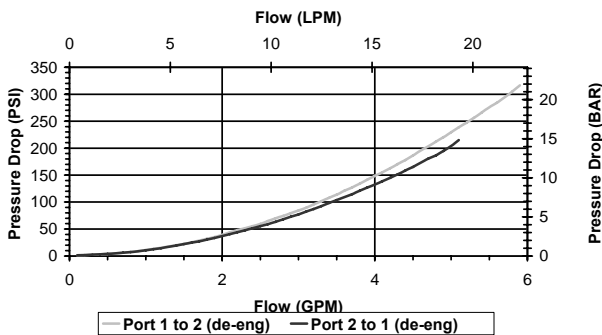
OPERATION OF MANUAL OVERRIDE OPTION: To override, pull knob out. On the detented version, after pulling knob out twist 180 degrees and release. The valve will remain in that position.

FEATURES

- Hardened parts for long life.
- Efficient wet-armature construction.
- Cartridges are voltage interchangeable.
- Manual override option.
- Industry common cavity.
- Unitized, molded coil design.
- Continuous duty rated solenoid.
- Optional coil voltages and terminations.
- Optional "I" Coil: Weatherproof, Thermal Shock, Immersion Safe.

HYDRAULIC SYMBOL**PERFORMANCE**

Actual Test Data (Cartridge Only)

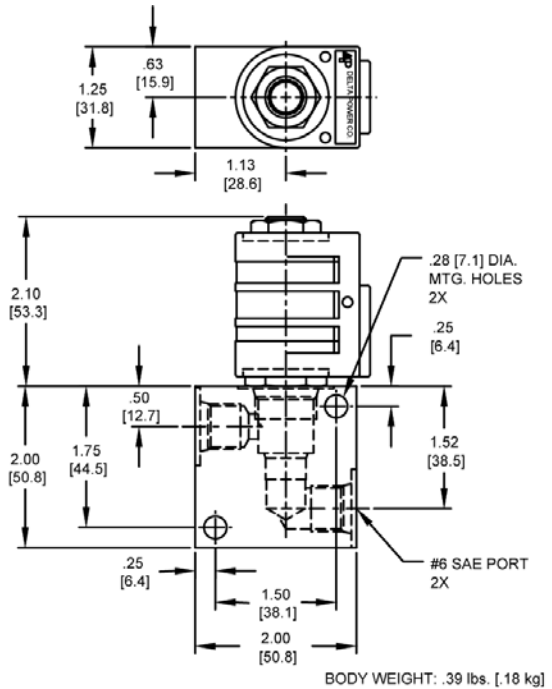
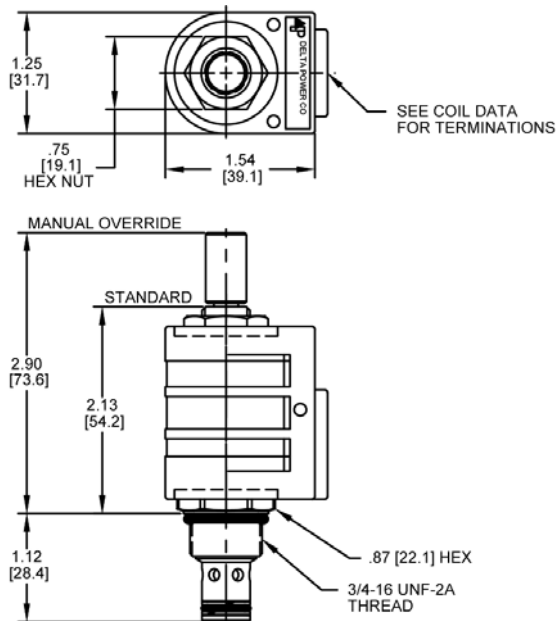
**VALVE SPECIFICATIONS**

Nominal Flow	5 GPM (19 LPM) from (1) to (2) 3 GPM (11 LPM) from (2) to (1)
Rated Operating Pressure	3000 PSI (207 bar)
Typical Internal Leakage (150 SSU)	5 cu in/min (82 ml/min)
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temperature Range	-40° to 250° F (-40° to 120° C)
Weight	.19 lbs. (.09 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	25 ft-lbs (34 Nm)
Coil Nut Torque Requirements	4-6 ft-lbs (5.4-8.1 Nm)
Cavity	POWER 2W
Cavity Form Tool (Finishing)	40500005
Seal Kit	21191102

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.



DIMENSIONS



ORDERING INFORMATION

PB-S2H -

OPTIONS

Buna Standard	00
Viton Standard	V0
Buna, Override, Detent	0M
Viton, Override, Detent	VM
Buna, Screen	A0
Viton, Screen	W0
Buna, Override, Nondetent	B1
Viton, Override, Nondetent	V1
Buna, Screen, Override, Nondetent	B3
Viton, Screen, Override, Nondetent	V3
Buna, Screen, Override, Detent	B4
Viton, Screen, Override, Detent	V4

Note: Use screen only if flow direction is from (1) to (2).

"P" COIL TERMINATION

(All DC Except as Noted)

DL	Double Lead
DT	Deutsch on Leads DT04-2P
ML	Metri-Pack on Leads
PL	Packard on Leads
WL	Weatherpack on Leads

SS	Single Spade
DS	Double Spade
HC	Din 43650 (Hirschmann) - (AC & DC)
CL	Conduit Lead - (AC Only)
DI	Deutsch - Integral DT04-2P

Blank

N

S

BODIES

Without Body
1/4 NPTF Ports
#6 SAE Ports

VOLTAGE

06	6 VDC
12	12 VDC
24	24 VDC
36	36 VDC
48	48 VDC
25	24 VAC
11	120 VAC
22	220 VAC
44	440 VAC

IMMERSION PROOF "P" TYPE

IA	"I" COIL AMP Superseal - Integral
ID	"I" COIL Deutsch - Integral DT04-2P
IJ	"I" COIL AMP Jr. Timer - Integral
IM	"I" COIL Metri-Pack - Integral

Approximate Coil Weight: .42 lbs/.19 kg.

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

**DE-S2H Direct Acting Spool, 2 Way, Normally Open****DESCRIPTION**

10 size, 7/8-14 thread, "Delta" series, solenoid operated, 2 way normally open, spool valve

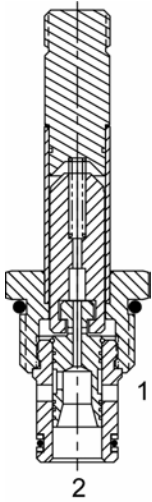
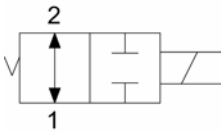
OPERATION

When de-energized the DE-S2H allows flow from (1) to (2) and (2) to (1). When energized the valve blocks flow from (1) to (2) and (2) to (1).

OPERATION OF MANUAL OVERRIDE OPTION: To override, pull knob out. On the detented version, after pulling knob out twist 180 degrees and release. The valve will remain in that position.

FEATURES

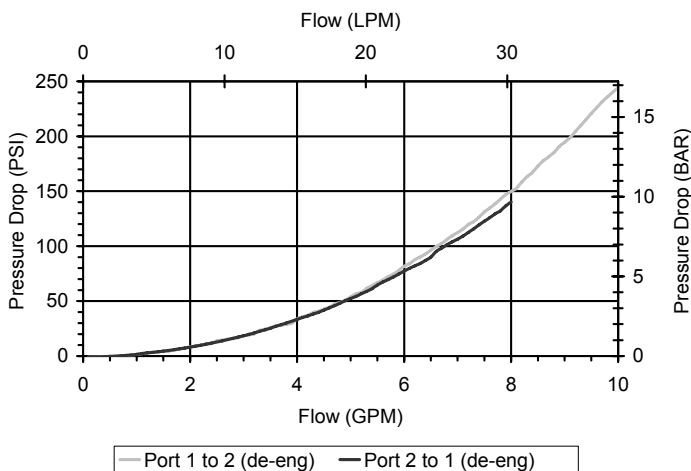
- Hardened parts for long life.
- Efficient wet-armature construction.
- Manual override option.
- Industry common cavity.
- Unitized, molded coil design.
- Continuous duty rated solenoid.
- Optional coil voltages and terminations.
- Optional "I" Coil: Weatherproof, Thermal Shock, Immersion Safe.

**HYDRAULIC SYMBOL**

For higher pressure systems see HE-S2H

PERFORMANCE

Actual Test Data (Cartridge Only)

**VALVE SPECIFICATIONS**

Nominal Flow	8 GPM (30 LPM) from (1) to (2) 4 GPM (15 LPM) from (2) to (1)
Rated Operating Pressure	3000 PSI (207 bar)
Typical Internal Leakage (150 SSU)	5 cu in/min (82 ml/min)
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temperature Range	-40° to 250° F (-40° to 120° C)
Weight	.26 lbs. (.12 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	30 ft-lbs (40.6 Nm)
Coil Nut Torque Requirements	4-6 ft-lbs (5.4-8.1 Nm)
Cavity	DELTA 2W
Cavity Form Tool (Finishing)	40500000
Seal Kit	21191202

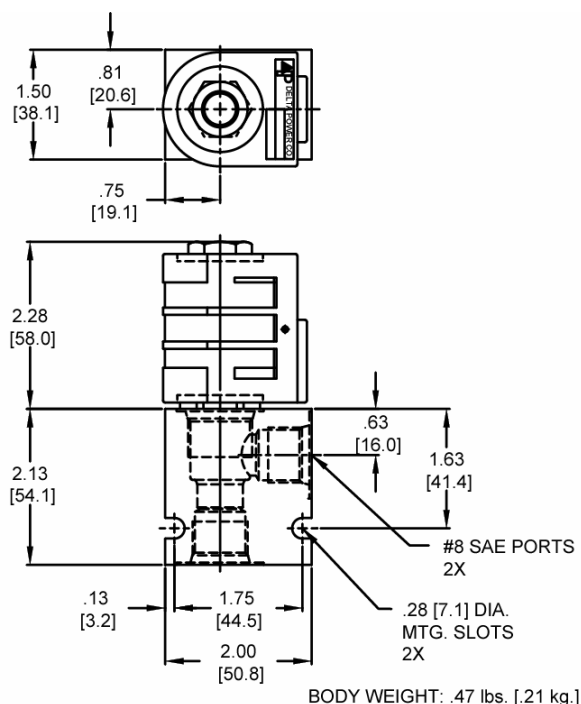
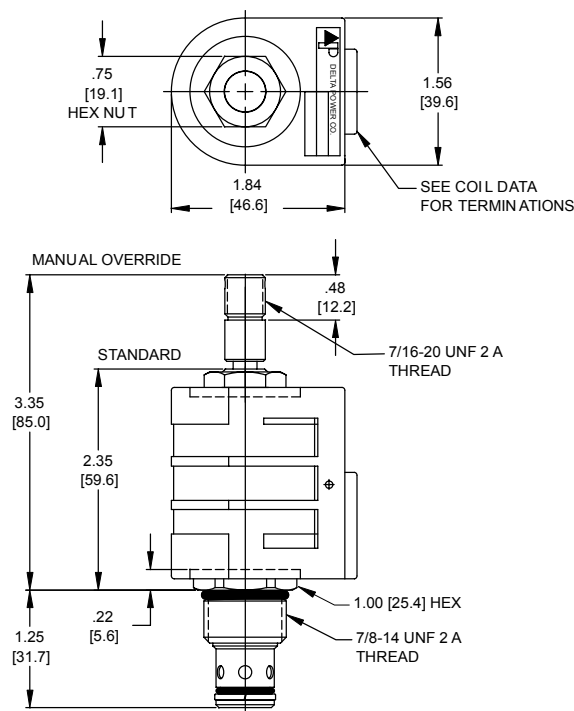
WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.



Delta Power Company

4484 Boeing Drive - Rockford, IL 61109

DIMENSIONS



ORDERING INFORMATION

DE-S2H -

<u>OPTIONS</u>	
Buna Standard	00
Viton Standard	V0
Buna, Override	0M
Viton, Override	VM
Buna, Screen	A0
Viton, Screen	W0
Buna, Override, Non-detent	B1
Viton, Override, Non-detent	V1
Buna, Screen, Override, Non-detent	B3
Buna, Screen, Override, Detent	B4
Viton, Screen, Override, Non-detent	V3
Viton, Screen, Override, Detent	V4

Note: Use screen only if flow direction is from (1) to (2).

"D" COIL TERMINATION

(All DC Except as Noted)

DL	Double Lead
DT	Deutsch on Leads DT04-2P
ML	Metri-Pack on Leads
PL	Packard on Leads
WL	Weatherpack on Leads

SS Single Spade
DS Double Spade
HC DIN 43650 (Hirschman) – (AC & DC)
CL Conduit Lead – (AC Only)
DI Deutsch – Integral DT04-2P

BODIES

Blank	Without Body
N	3/8 NPTF Ports
S	#8 SAE Ports

VOLTAGE

06	6 VDC
12	12 VDC
24	24 VDC
36	36 VDC
48	48 VDC
25	24 VAC
11	120 VAC
22	220 VAC
44	440 VAC

IMMERSION PROOF “D” TYPE

IA	"I" Coil AMP Superseal - Integral
ID	"I" Coil Deutsch – Integral DT04-2P
IJ	"I" Coil AMP Jr. Timer - Integral
IM	"I" Coil Metri-Pack – Integral

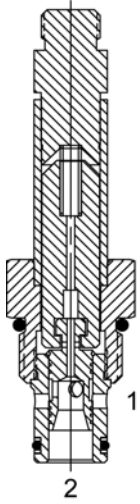
Approximate Coil Weight: .74 lbs/.33 kg.

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com

**HE-S2H Direct Acting Spool, 2-Way, Normally Open****DESCRIPTION**

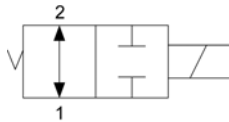
"High Pressure" 10 size, 7/8-14 thread, "Delta" series, solenoid operated, 2 way normally open, spool valve

OPERATION

When de-energized the HE-S2H allows flow from (1) to (2) and (2) to (1). When energized the valve blocks flow from (1) to (2) and (2) to (1).

FEATURES

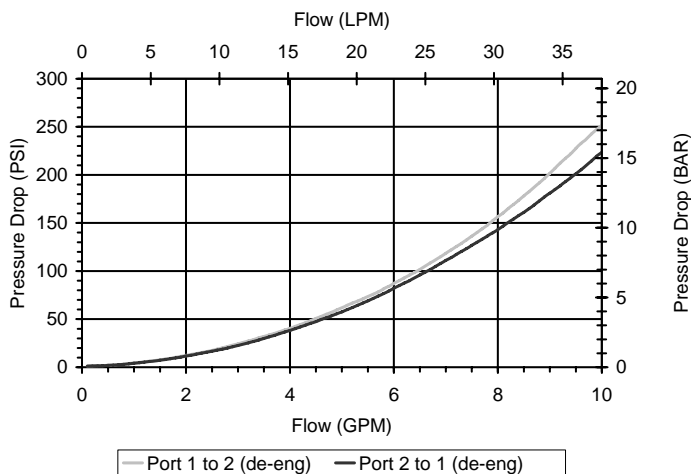
- Hardened parts for long life.
- Efficient wet-armature construction.
- Cartridges are voltage interchangeable.
- Industry common cavity.
- Unitized, molded coil design.
- Continuous duty rated solenoid.
- Optional coil voltages and terminations.
- Optional "I" Coil: Weatherproof, Thermal Shock, Immersion Safe.

HYDRAULIC SYMBOL

Uses "L" Coil.

PERFORMANCE

Actual Test Data (Cartridge Only)

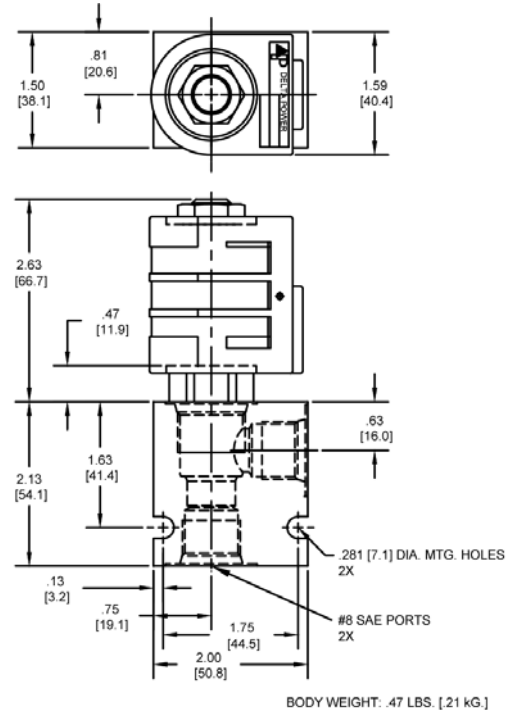
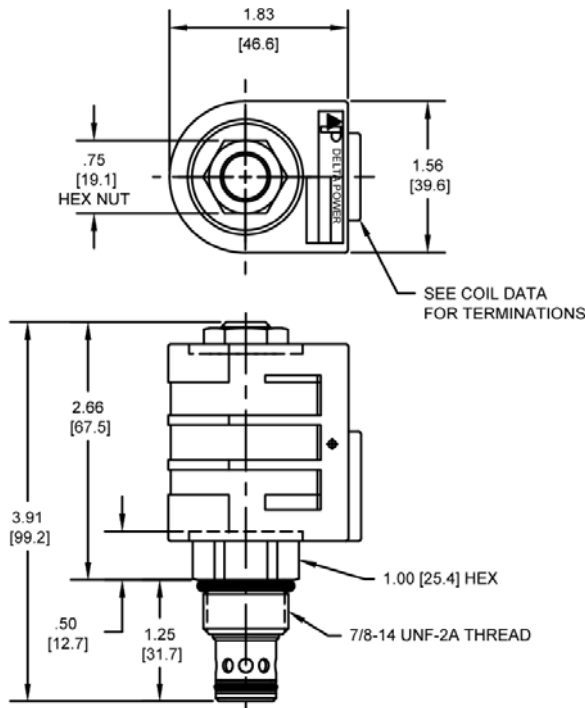
**VALVE SPECIFICATIONS**

Maximum Flow	8 GPM (30 LPM) from 1 to 2 4 GPM (15 LPM) from 2 to 1
Max Operating Pressure	4000 PSI (276 bar)
Typical Internal Leakage (150 SSU)	8 cu in/min (131 ml/min)
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temperature Range	-40° to 250° F (-40° to 120° C)
Weight	.38 lbs. (.17 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	35 ft-lbs (47.5 Nm)
Coil Nut Torque Requirements	4-6 ft-lbs (5.4-8.1 Nm)
Cavity	DELTA 2W
Cavity Form Tool (Finishing)	40500000
Seal Kit	21191202

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.



DIMENSIONS



ORDERING INFORMATION

HE-S2H -

OPTIONS

Buna Standard
Viton Standard

00
V0

Blank
N
S

BODIES

Without Body
3/8 NPTF Ports
#8 SAE Ports

Note: Aluminum, NOT durability rated for 4000 PSI. Consult factory options.

VOLTAGE

06 6 VDC
12 12 VDC
24 24 VDC
36 36 VDC
48 48 VAC
25 25 VAC
11 120 VAC
22 220 VAC
44 440 VAC

"L" - COIL TERMINATION

(All DC Except as Noted)

DL Double Lead
DT Deutsch on Leads DT04-2P
ML Metri-Pack on Leads
PL Packard on Leads
WL Weatherpack on Leads

SS Single Spade
DS Double Spade
HC DIN 43650 (Hirschman) - (AC & DC)
CL Conduit Lead - (AC Only)
DI Deutsch - Integral DT04-2P

IA "I" Coil AMP Superseal - Integral
ID "I" Coil Deutsch - Integral DT04-2P
IJ "I" Coil AMP Jr. Timer - Integral
IM "I" Coil Metri-Pack - Integral

Approximate Coil Weight: .68 lbs. (.31 kg.)

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com



3 Way 2 Position Spool Valves

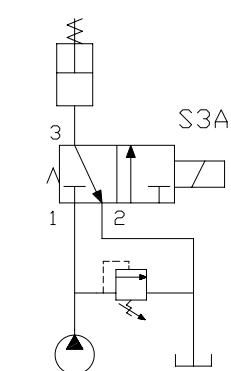
	GPM	PSI	LPM	BAR	MODEL	PAGE
	1	3000	4	207	MC-S3A	116
	2	4000	8	276	HC-S3A	118
	3	3000	11	207	PP-S3A	120
	10	3000	38	207	DF-S3A	122
	10	4000	38	276	HF-S3A	124
	6	1000	23	69	IF-S3A	652
	6	1000	23	69	QF-S3A	642
	2.5	3000	9.5	207	PP-S3B	126
	8	3000	30	207	DF-S3B	128
	8	4000	30	276	HF-S3B	130
	3	3000	11	207	PP-S3D	132
	6	1000	23	69	IF-S3D	654
	6	1000	23	69	QF-S3D	644
	15	5000	57	345	HU-S3E	134
	15	5000	57	345	HU-S3F	136
	3	4000	11	276	HC-S3P	138
	4	1500	15	103	MC-S3T	140
	8	1500	30	103	DF-S3T	142
	3	3000	11	207	PP-S3X	144

Typical Schematic

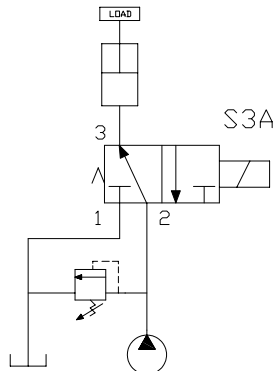
Typical application for porting option 1 is to operate a spring loaded hydraulic clutch.

Typical application for porting option 2 is single acting cylinder control in a gravity lower circuit.

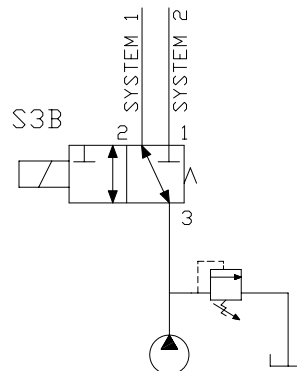
Typical application for porting option 3 is a selector valve for two different systems or functions.



PORTING OPTION 1



PORTING OPTION 2



PORTING OPTION 3

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

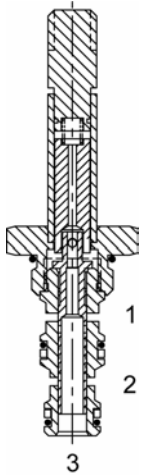
Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com



MC-S3A Direct Acting Spool, 3 Way 2 Position



DESCRIPTION

7 size, 5/8-18 thread, "Mini" series, solenoid operated, 3 way 2 position, spool valve.

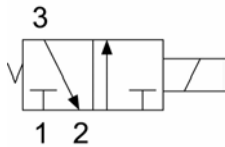
OPERATION

When de-energized the MC-S3A blocks flow at (1) and allows flow from (3) to (2). When energized the valve allows flow from (1) to (3) and blocks flow at (2).

FEATURES

- Hardened parts for long life.
- Efficient wet-armature construction.
- Cartridges are voltage interchangeable.
- Industry common cavity.
- Unitized, molded coil design.
- Continuous duty rated solenoid.
- Optional coil voltages and terminations.

HYDRAULIC SYMBOL



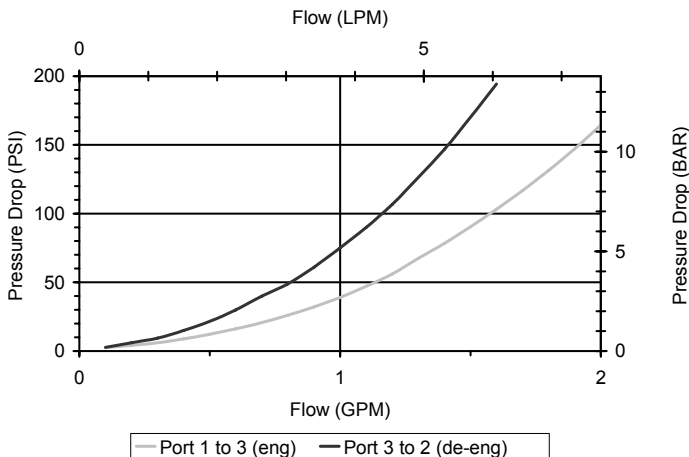
Operational shift limit 1 GPM (3.8 LPM) from (1) to (3) at 3000 PSI and 2 GPM (7.6 LPM) from (3) to (2) with no load.

For shifted flow performance consult chart.

For higher pressures or flows SEE HC-S3A

PERFORMANCE

Actual Test Data (Cartridge Only)



VALVE SPECIFICATIONS

Nominal Flow	1 GPM (3.8 LPM) from (1) to (3) 2 GPM (7.6 LPM) from (3) to (2)
Rated Operating Pressure	3000 PSI (207 bar)
Typical Internal Leakage (150 SSU)	5 cu in/min (82 ml/min)
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temperature Range	-40° to 250° F (-40° to 120° C)
Weight	.14 lbs. (.06 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	15 ft-lbs (20.3 Nm)
Coil Nut Torque Requirements	3-5 ft-lbs (4.1-6.8 Nm)
Cavity	MINI 3W
Cavity Form Tool (Finishing)	40500004
Seal Kit	21191004

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

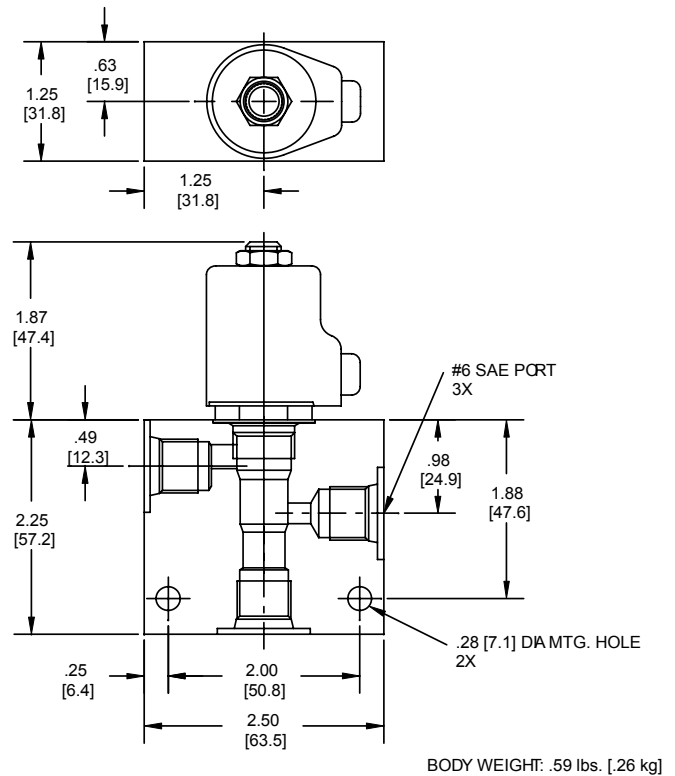
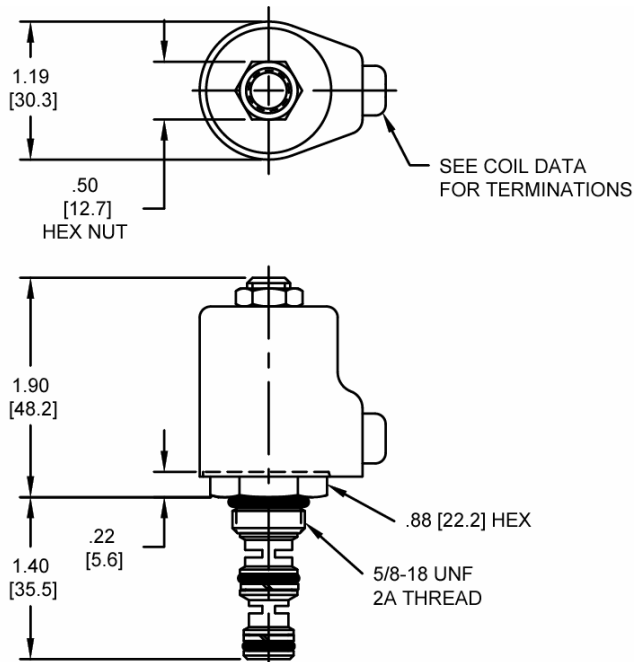
Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com



DIMENSIONS



ORDERING INFORMATION

MC-S3A - - - -

OPTIONS

Buna Standard 00
Viton Standard V0

Blank

N

S

BODIES

Without Body
1/4 NPTF Ports
#6 SAE Ports

VOLTAGE

06 6 VDC
12 12 VDC
24 24 VDC
36 36 VDC
48 48 VDC
25 24 VAC
11 120 VAC
22 220 VAC
44 440 VAC

"M" COIL TERMINATION

(All DC Except as Noted)

Double Lead DL
Deutsch on Leads DT04-2P DT
Metri-Pack on Leads ML
Packard on Leads PL
Weatherpack on Leads WL
Single Spade SS
Double Spade DS
DIN 43650 (Hirschman) - (AC&DC) HC
Conduit Lead - (AC Only) CL

Approximate Coil Weight: .30 lbs/.14 kg.

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com



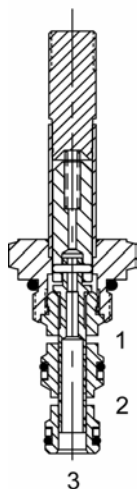
HC-S3A Direct Acting Spool, 3 Way 2 Position

DESCRIPTION

"High Pressure" 7 size, 5/8-18 thread, "Mini" series, solenoid operated, 3 way 2 Position, spool valve.

OPERATION

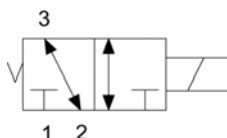
When de-energized the HC-S3A blocks flow at (1) and allows flow from (3) to (2). When energized the valve allows flow from (1) to (3) and blocks flow at (2).



FEATURES

- Hardened parts for long life.
- Efficient wet-armature construction.
- Cartridges are voltage interchangeable.
- Industry common cavity.
- Unitized, molded coil design (for most common terminations, see coil page).
- Continuous duty rated solenoid.
- Optional coil voltages and terminations.

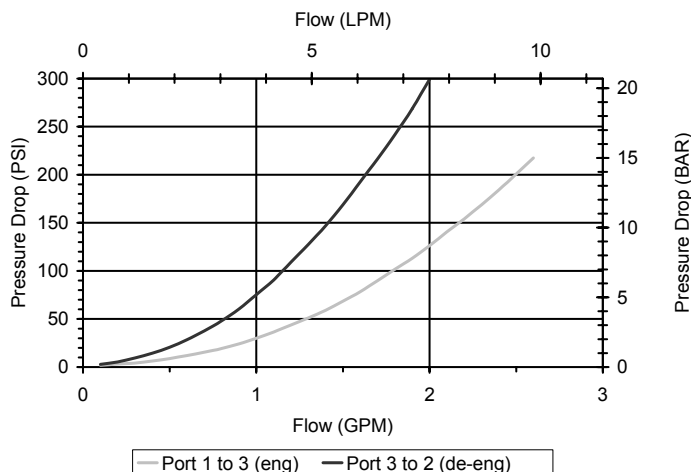
HYDRAULIC SYMBOL



Flow limited at 1.5 GPM for flow at port (3)

PERFORMANCE

Actual Test Data (Cartridge Only)



VALVE SPECIFICATIONS

Nominal Flow	2 GPM (8 LPM)
Rated Operating Pressure	4000 PSI (276 bar)
Typical Internal Leakage (150 SSU)	8 cu in/min (131 ml/min)
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temperature Range	-40° to 250° F (-40° to 120° C)
Weight	.15 lbs. (.07 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	15 ft-lbs (20.3 Nm)
Coil Nut Torque Requirements	3-5 ft-lbs (4.1-6.8 Nm)
Cavity	MINI 3W
Cavity Form Tool (Finishing)	40500004
Seal Kit	21191004

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

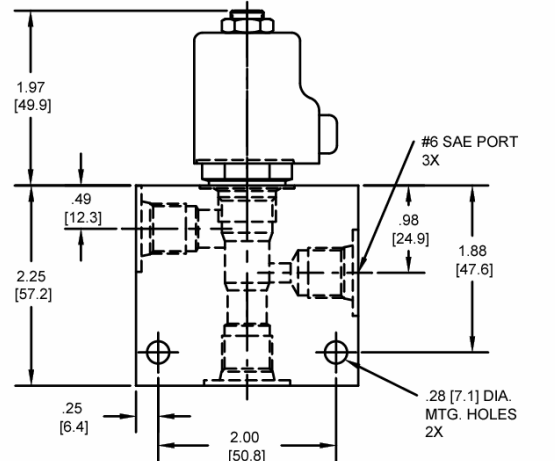
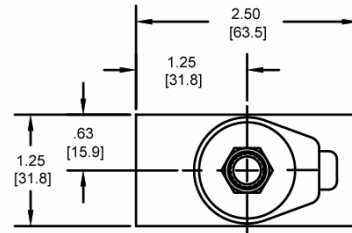
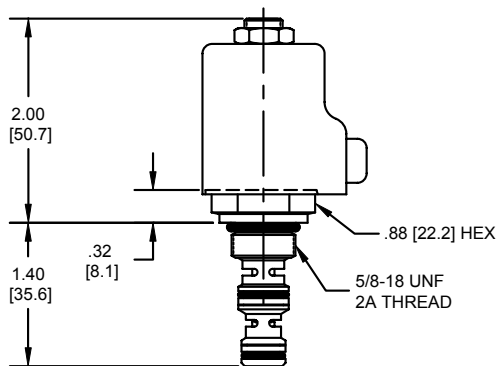
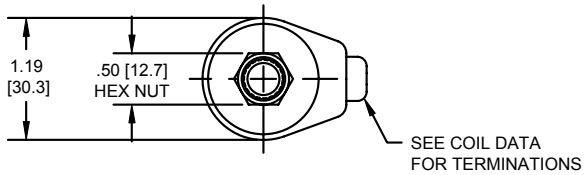
Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com



DIMENSIONS



BODY WEIGHT: .59 lbs. [26 kg]

ORDERING INFORMATION

HC-S3A

OPTIONS
Buna Standard
Viton Standard

00
V0

Blank
N
S

BODIES
Without Body
1/4 NPTF Ports
#6 SAE Ports

Note: Aluminum, NOT durability rated for 4000 PSI. Consult factory for body options.

VOLTAGE

06 6 VDC
12 12 VDC
24 24 VDC
36 36 VDC
48 48 VDC
25 24 VAC
11 120 VAC
22 220 VAC
44 440 VAC

"M" COIL TERMINATION

(All DC Except as Noted)

Double Lead DL
Deutsch on Leads DT04-2P DT
Metri-Pack on Leads ML
Packard on Leads PL
Weatherpack on Leads WL
Single Spade SS
Double Spade DS
DIN 43650 (Hirschman) - (AC&DC) HC
Conduit Lead - (AC Only) CL

Approximate Coil Weight: .30 lbs/.14 kg.

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com

**PP-S3A Direct Acting Spool, 3 Way 2 Position****DESCRIPTION**

8 size, 3/4-16 thread, "Power" series, solenoid operated, 3 way 2 position, spool valve.

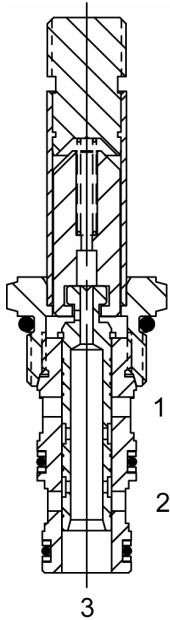
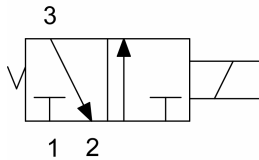
OPERATION

When de-energized the PP-S3A allows flow from (3) to (2) and blocks flow at port (1). When energized the valve allows flow from (1) to (3) and blocks flow at port (2).

OPERATION OF MANUAL OVERRIDE OPTION: To override, pull knob out. On the detented version, after pulling knob out twist 180 degrees and release. The valve will remain in that position.

FEATURES

- Hardened parts for long life.
- Efficient wet-armature construction.
- Cartridges are voltage interchangeable.
- Manual override option.
- Industry common cavity.
- Unitized, molded coil design.
- Continuous duty rated solenoid.
- Optional coil voltages and terminations.
- Optional "I" Coil: Weatherproof, Thermal Shock, Immersion Safe.

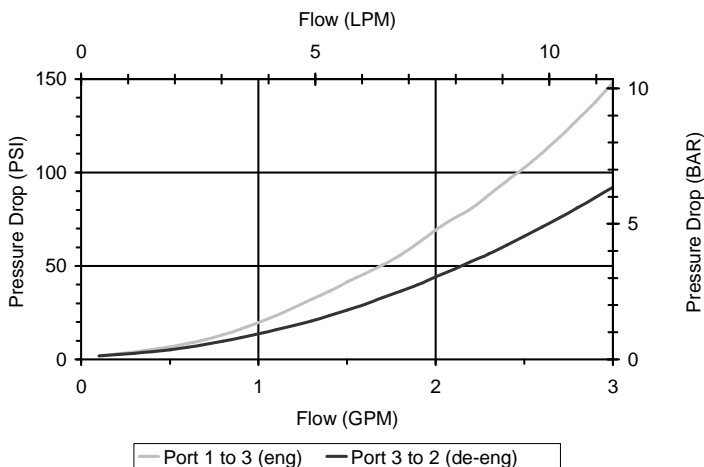
**HYDRAULIC SYMBOL**

Operational shift limit 3 GPM (11 LPM) from (1) to (3) at 3000 PSI (207 bar) and (3) to (2) with no load.

For shifted flow performance consult chart.

PERFORMANCE

Actual Test Data (Cartridge Only)

**VALVE SPECIFICATIONS**

Nominal Flow	3 GPM (11 LPM)
Rated Operating Pressure	3000 PSI (207 bar)
Typical Internal Leakage (150 SSU)	5 cu in/min (82 ml/min)
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temperature Range	-40° to 250° F (-40° to 120° C)
Weight	.23 lbs. (.10 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	25 ft-lbs (34 Nm)
Coil Nut Torque Requirements	4-6 ft-lbs (5.4-8.1 Nm)
Cavity	POWER 3W
Cavity Form Tool (Finishing)	40500024
Seal Kit	21191104

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

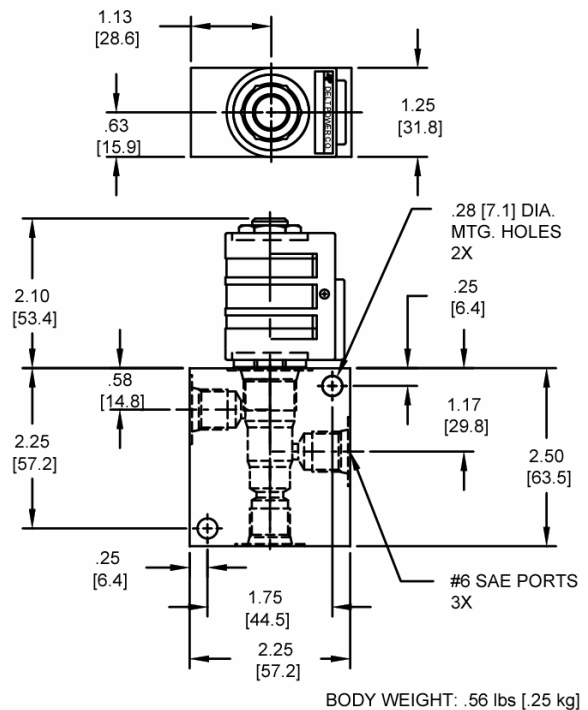
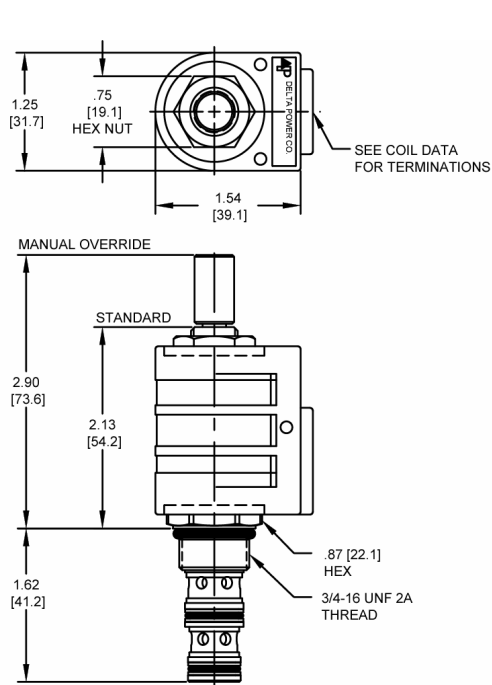
Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com



DIMENSIONS



ORDERING INFORMATION

PP-S3A -

OPTIONS

Buna Standard	00
Viton Standard	V0
Buna, Override	0M
Viton, Override	VM
Buna, Screen	A0
Viton, Screen	W0
Buna, Override, Non-detent	B1
Viton, Override, Non-detent	V1
Buna, Screen, Override, Non-detent	B3
Buna, Screen, Override, Detent	B4
Viton, Screen, Override, Non-detent	V3
Viton, Screen, Override, Detent	V4

Note: Use screen only if flow direction is from (1) to (2).

"P" COIL TERMINATION

(All DC Except as Noted)

DL	Double Lead
DT	Deutsch on Leads DT04-2P
ML	Metri-Pack on Leads
PL	Packard on Leads
WL	Weatherpack on Leads

SS	Single Spade
DS	Double Spade
HC	DIN 43650 (Hirschman) - (AC & DC)
CL	Conduit Lead - (AC Only)
DI	Deutsch - Integral DT04-2P

Blank
N
S

BODIES

Without Body
1/4 NPTF Ports
#6 SAE Ports

VOLTAGE

06	6 VDC
12	12 VDC
24	24 VDC
36	36 VDC
48	48 VDC
25	24 VAC
11	120 VAC
22	220 VAC
44	440 VAC

IMMERSION PROOF "P" TYPE

IA	"I" Coil AMP Superseal - Integral
ID	"I" Coil Deutsch - Integral DT04-2P
IJ	"I" Coil AMP Jr. Timer - Integral
IM	"I" Coil Metri-Pack - Integral

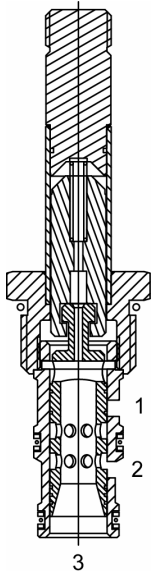
Approximate Coil Weight: .42 lbs. (.19 kg.)

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com

**DF-S3A Direct Acting Spool, 3 Way 2 Position****DESCRIPTION**

10 size, 7/8-14 thread, "Delta" series, solenoid operated, 3 way 2 position, spool valve.

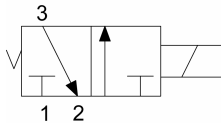
OPERATION

When de-energized the DF-S3A allows flow from (3) to (2) and blocks flow at port (1). When energized the valve allows flow from (1) to (3) and blocks flow at port (2).

OPERATION OF MANUAL OVERRIDE OPTION: To override, pull knob out. On the detented version, after pulling knob out twist 180 degrees and release. The valve will remain in that position.

FEATURES

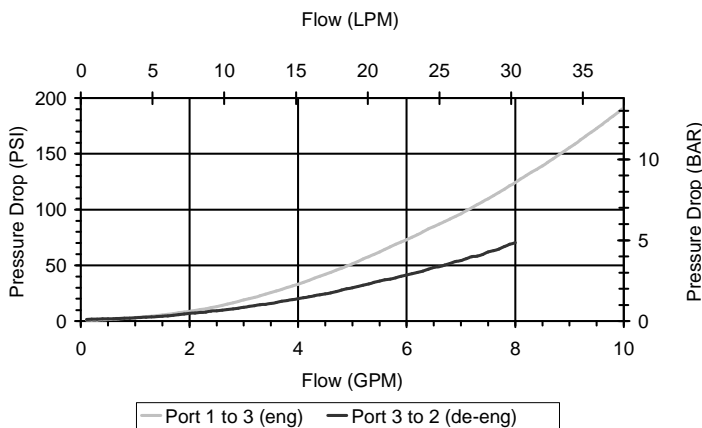
- Hardened parts for long life.
- Efficient wet-armature construction.
- Cartridges are voltage interchangeable.
- Manual override option.
- Industry common cavity.
- Unitized, molded coil design.
- Continuous duty rated solenoid.
- Optional coil voltages and terminations.
- Optional "I" Coil: Weatherproof, Thermal Shock, Immersion Safe.

HYDRAULIC SYMBOL

Common lift/lower valve where load holding is not required. For higher pressures see HF-S3A.

PERFORMANCE

Actual Test Data (Cartridge Only)

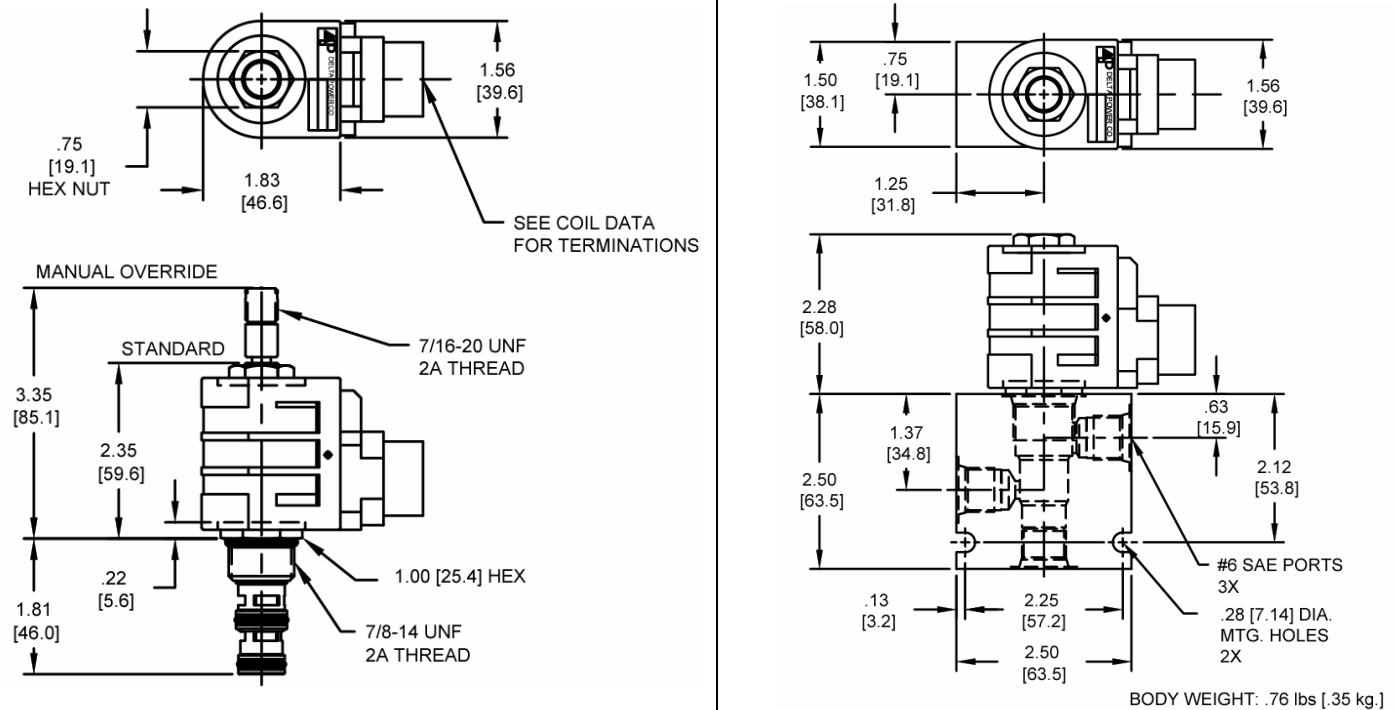
**VALVE SPECIFICATIONS**

Nominal Flow	10 GPM (38 LPM)
Rated Operating Pressure	3000 PSI (207 bar)
Typical Internal Leakage (150 SSU)	5 cu/in per min (82 ml/min)
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temperature Range	-40° to 250° F (-40° to 120° C)
Weight	.28 lbs. (.12 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	30 ft-lbs (40.6 Nm)
Coil Nut Torque Requirements	4-6 ft-lbs (5.4-8.1 Nm)
Cavity	DELTA 3W
Cavity Form Tool (Finishing)	40500001
Seal Kit	21191210

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.



DIMENSIONS



ORDERING INFORMATION

DF-S3A - - - -

OPTIONS

Buna Standard	00
Viton Standard	V0
Buna, Override	0M
Viton, Override	VM
Buna, Override, Non-detent	B1
Viton, Override, Non-detent	V1
Buna, Screen	V0
Viton, Screen	W0
Buna, Screen, Override, Non-detent	B3
Buna, Screen, Override, Detent	B4
Viton, Screen, Override, Non-detent	V3
Viton, Screen, Override, Detent	V4

Note: Use screen only if flow direction is from (1) to (3).

"D" COIL TERMINATION

(All DC Except as Noted)

DL	Double Lead
DT	Deutsch on Leads DT04-2P
ML	Metri-Pack on Leads
PL	Packard on Leads
WL	Weatherpack on Leads

SS	Single Spade
DS	Double Spade
HC	Din 43650 (Hirshman) - (AC & DC)
CL	Conduit Lead - (AC Only)
DI	Deutsch - Integral DT04-2P

Blank

N

S

BODIES

Without Body
1/4 NPTF Ports
#6 SAE Ports

VOLTAGE

06	6 VDC
12	12 VDC
24	24 VDC
36	36 VDC
48	48 VDC
25	24 VAC
11	120 VAC
22	220 VAC
44	440 VAC

IMMERSION PROOF "D" TYPE

IA	"I" Coil AMP Superseal - Integral
ID	"I" Coil - Deutsch - Integral DT04-2P
IJ	"I" Coil AMP Jr. Timer - Integral
IM	"I" Coil - Metri-Pack - Integral

Approximate Coil Weight: .74 lbs/.33 kg.

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com

**HF-S3A Direct Acting Spool, 3 Way 2 Position****DESCRIPTION**

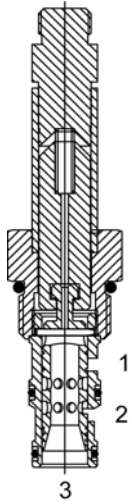
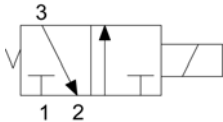
"High Pressure" 10 size, 7/8-14 thread, "Delta" series, solenoid operated, 3 way 2 position, spool valve.

OPERATION

When de-energized the HF-S3A blocks flow at port (1) and allows flow from (3) to (2). When energized the valve allows flow from (1) to (3) and blocks flow at port (2).

FEATURES

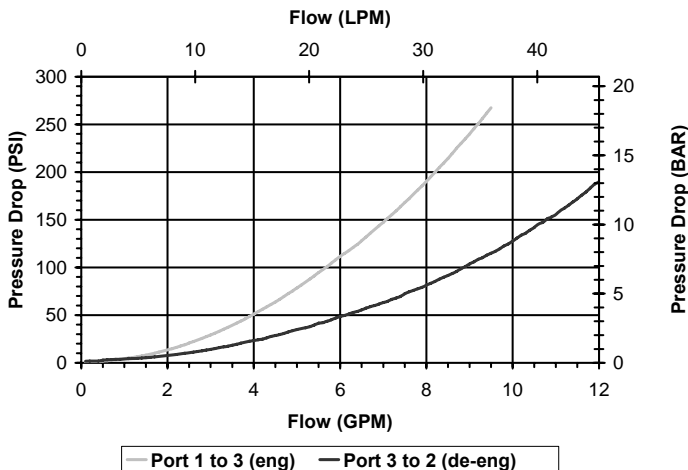
- Hardened parts for long life.
- Efficient wet-armature construction.
- Cartridges are voltage interchangeable.
- Industry common cavity.
- Unitized, molded coil design.
- Continuous duty rated solenoid.
- Optional coil voltages and terminations.
- Optional "I" Coil: Weatherproof, Thermal Shock, Immersion Safe.

**HYDRAULIC SYMBOL**

Uses "L" Coil.

PERFORMANCE

Actual Test Data (Cartridge Only)

**VALVE SPECIFICATIONS**

Nominal Flow	10 GPM (38 LPM)
Rated Operating Pressure	4000 PSI (276 bar)
Typical Internal Leakage (150 SSU)	8 cu/in per min (131 ml/min)
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temperature Range	-40° to 250° F (-40° to 120° C)
Weight	.40 lbs. (.18 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	35 ft-lbs (47.5 Nm)
Coil Nut Torque Requirements	4-6 ft-lbs (5.4-8.1 Nm)
Cavity	DELTA 3W
Cavity Form Tool (Finishing)	40500001
Seal Kit	21191210

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

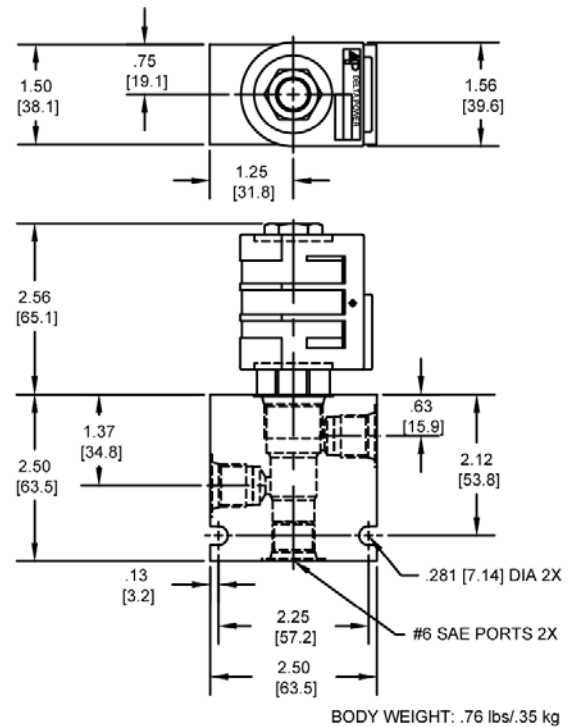
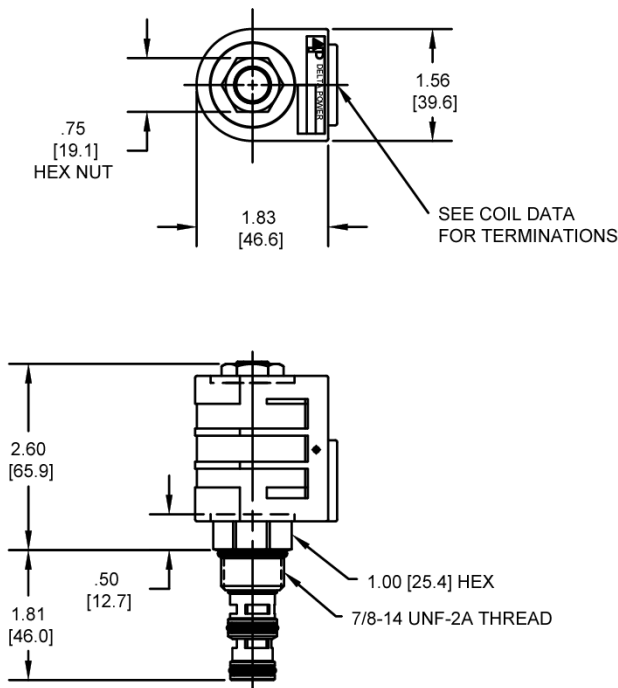
Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com



DIMENSIONS



ORDERING INFORMATION

HF-S3A -

OPTIONS

Buna Standard 00
 Viton Standard V0

Blank N
 S

BODIES

Without Body
 1/4 NPTF Ports
 #6 SAE Ports

Note: Aluminum, NOT durability rated for 4000 PSI. Consult factory for body options.

VOLTAGE

06 6 VDC
 12 12 VDC
 24 24 VDC
 36 36 VDC
 48 48 VDC
 25 24 VAC
 11 120 VAC
 22 220 VAC
 44 440 VAC

"L" COIL TERMINATION

(All DC Except as Noted)

DL Double Lead
 DT Deutsch on Leads DT04-2P
 ML Metri-Pack on Leads
 PL Packard on Leads
 WL Weatherpack on Leads

SS Single Spade
 DS Double Spade
 HC DIN 43650 (Hirschman) - (AC & DC)
 CL Conduit Lead - (AC Only)
 DI Deutsch - Integral DT04-2P

IMMERSION PROOF "L" TYPE

IA "I" Coil AMP Superseal - Integral
 ID "I" Coil Deutsch - Integral DT04-2P
 IJ "I" Coil AMP Jr. Timer - Integral
 IM "I" Coil Metri-Pack - Integral

Approximate Coil Weight: .68 lbs/.31 kg.

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com

**PP-S3B Direct Acting Spool, 3 Way 2 Position****DESCRIPTION**

8 size, 3/4-16 thread, "Power" series, solenoid operated, 3 way 2 position, selector spool valve.

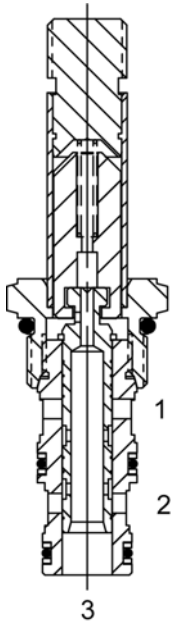
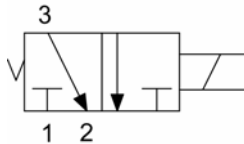
OPERATION

When de-energized the PP-S3B allows flow from (3) to (2) and blocks flow at port (1). When energized the valve allows flow from (3) to (1) and blocks flow at port (2).

OPERATION OF MANUAL OVERRIDE OPTION: To override, pull knob out. On the detented version, after pulling knob out twist 180 degrees and release. The valve will remain in that position.

FEATURES

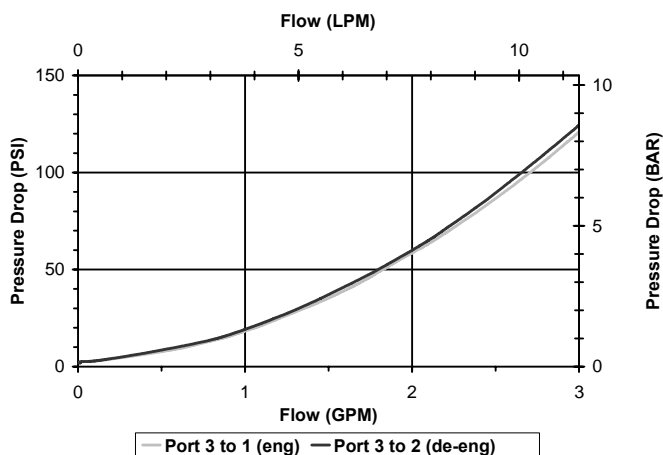
- Hardened parts for long life.
- Efficient wet-armature construction.
- Cartridges are voltage interchangeable.
- Manual override option.
- Industry common cavity.
- Unitized, molded coil design.
- Continuous duty rated solenoid.
- Optional coil voltages and terminations.
- Optional "I" Coil: Weatherproof, Thermal Shock, Immersion Safe.

**HYDRAULIC SYMBOL**

This valve is great for transmission and brake applications, even with port (1) inlet, port (2) tank circuit orientations.

PERFORMANCE

Actual Test Data (Cartridge Only)

**VALVE SPECIFICATIONS**

Nominal Flow	2.5 GPM (9.5 LPM)
Rated Operating Pressure	3000 PSI (207 bar)
Typical Internal Leakage (150 SSU)	5 cu in/min (82 ml/min)
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temperature Range	-40° to 250° F (-40° to 120° C)
Weight	.23 lbs. (.10 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	25 ft-lbs (34 Nm)
Coil Nut Torque Requirements	4-6 ft-lbs (5.4-8.1 Nm)
Cavity	POWER 3W
Cavity Form Tool (Finishing)	40500024
Seal Kit	21191105

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

Phone: (815) 397-6628

Fax: (815) 397-2526

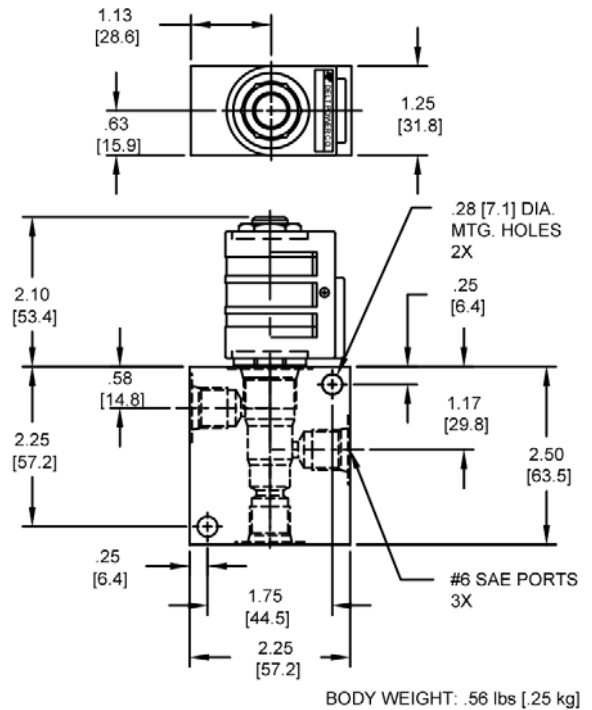
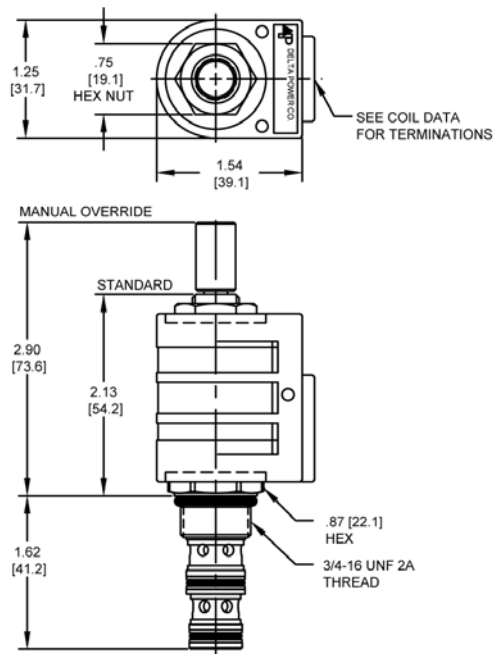
E-mail: delta@delta-power.com



Delta Power Company

4484 Boeing Drive - Rockford, IL 61109

DIMENSIONS



ORDERING INFORMATION

PP-S3B

OPTIONS

Buna Standard	00
Viton Standard	V0
Buna, Override	0M
Viton, Override	VM
Buna, Override, Non-detent	B1
Viton, Override, Non-detent	V1

Blank
N
S

BODIES

Without Body
1/4 NPTF Ports
#6 SAE Ports

VOLTAGE

06	6 VDC
12	12 VDC
24	24 VDC
36	36 VDC
48	48 VDC
25	24 VAC
11	120 VAC
22	220 VAC
44	440 VAC

"P" COIL TERMINATION

(All DC Except as Noted)

DL	Double Lead
DT	Deutsch on Leads DT04-2P
ML	Metri-Pack on Leads
PL	Packard on Leads
WL	Weatherpack on Leads

SS	Single Spade
DS	Double Spade
HC	DIN 43650 (Hirschman) – (AC & DC)
CL	Conduit Lead – (AC Only)
DI	Deutsch – Integral DT04-2P

IMMERSION PROOF “P” TYPE

- "I" Coil AMP Superseal - Integral
- "I" Coil Deutsch – Integral DT04-2P
- "I" Coil AMP Jr. Timer - Integral
- "I" Coil Metri-Pack – Integral

Approximate Coil Weight: .42 lbs. (.19 kg.)

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com

**DF-S3B Direct Acting Spool, 3 Way 2 Position, Selector****DESCRIPTION**

10 size, 7/8-14 thread, "Delta" series, solenoid operated, 3 way 2 position, selector spool valve.

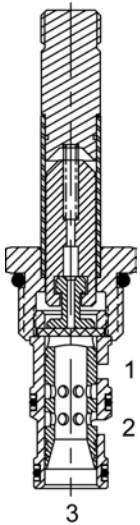
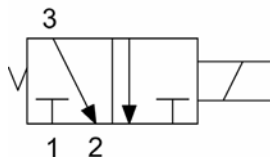
OPERATION

When de-energized the DF-S3B allows flow from (3) to (2) and blocks flow at port (1). When energized the valve allows flow from (3) to (1) and blocks flow at port (2).

OPERATION OF MANUAL OVERRIDE OPTION: To override, pull knob out. On the detented version, after pulling knob out twist 180 degrees and release. The valve will remain in that position.

FEATURES

- Hardened parts for long life.
- Efficient wet-armature construction.
- Cartridges are voltage interchangeable.
- Manual override option.
- Industry common cavity.
- Unitized, molded coil design.
- Continuous duty rated solenoid.
- Optional coil voltages and terminations.
- Optional "I" Coil: Weatherproof, Thermal Shock, Immersion Safe.

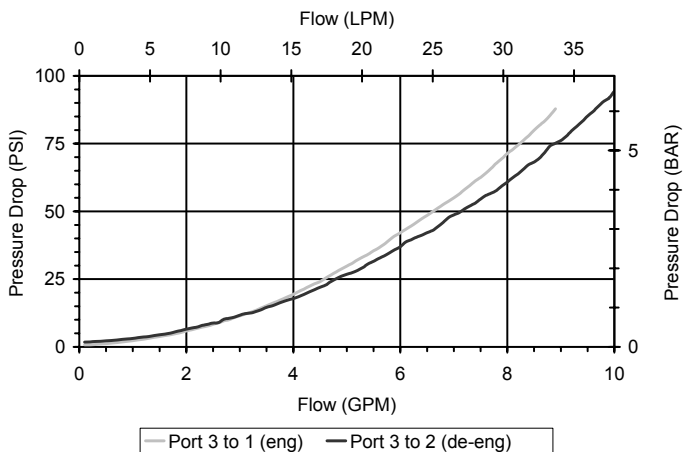
**HYDRAULIC SYMBOL**

Trapped differentials above 1500 PSI from ports 2 to 1 can create shift issues near flow rating. (Differentials to 3000 psi from 1 to 2 are not an issue.)

For higher pressures consult HF-S3B.

PERFORMANCE

Actual Test Data (Cartridge Only)

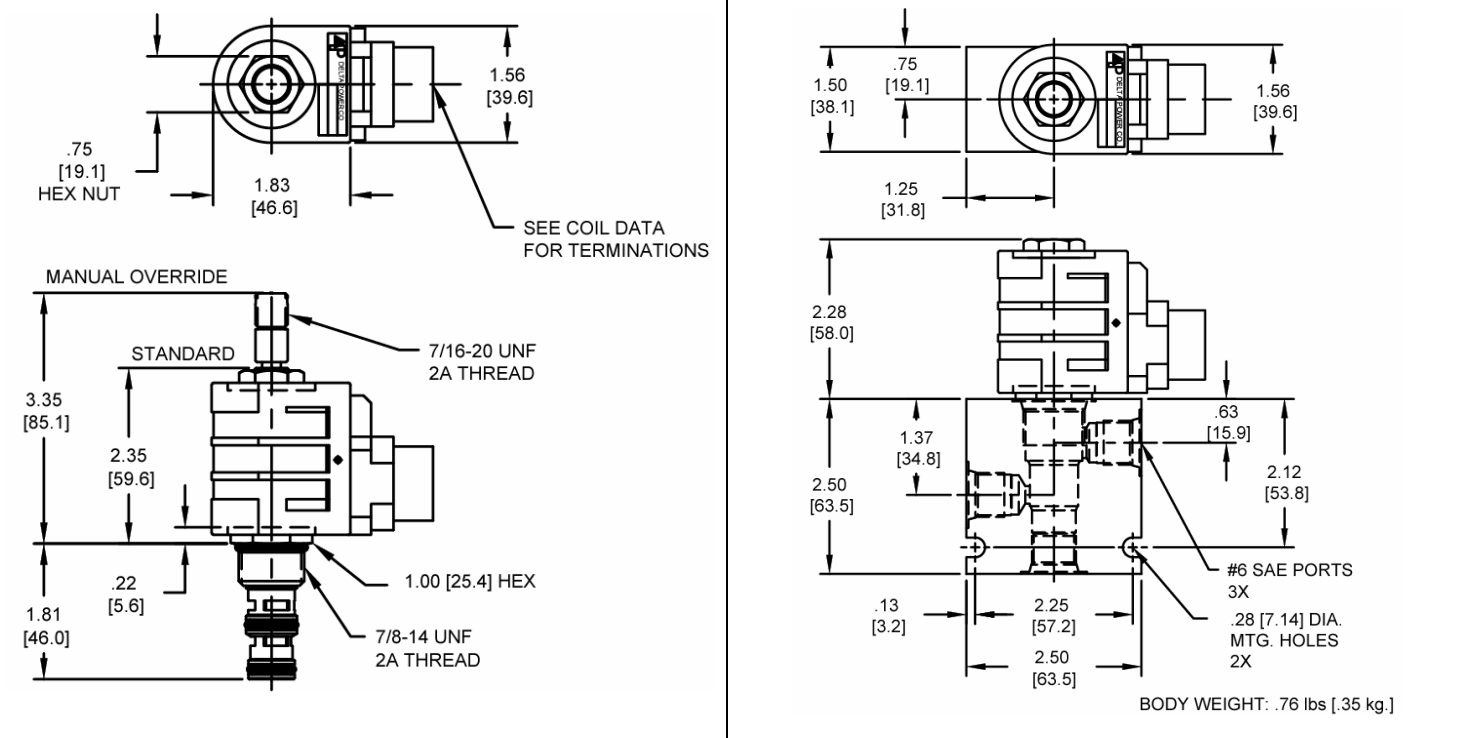
**VALVE SPECIFICATIONS**

Nominal Flow	8 GPM (30 LPM)
Rated Operating Pressure	3000 PSI (207 bar)
Typical Internal Leakage (150 SSU)	5 cu/in per min (82 ml/min)
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temperature Range	-40° to 250° F (-40° to 120° C)
Weight	.28 lbs. (.12 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	30 ft-lbs (40.6 Nm)
Coil Nut Torque Requirements	4-6 ft-lbs (5.4-8.1 Nm)
Cavity	DELTA 3W
Cavity Form Tool (Finishing)	40500001
Seal Kit	21191210

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.



DIMENSIONS



ORDERING INFORMATION

DF-S3B -

OPTIONS

Buna Standard	00
Viton Standard	V0
Buna, Override	0M
Viton, Override	VM
Buna, screen	A0
Viton, screen	W0
Buna, Override, Non-detent	B1
Viton, Override, Non-detent	V1
Buna, Screen, Override, Non-detent	B3
Buna, Screen, Override, Detent	B4
Viton, Screen, Override, Non-detent	V3
Viton, Screen, Override, Detent	V4

Note: Use screen only if flow direction is from (1) to (2).

"D" COIL TERMINATION

(All DC Except as Noted)

DL	Double Leads
DT	Deutsch on Leads DT04-2P
ML	Metri-Pack on Leads
PL	Packard on Leads
WL	Weatherpack on Leads

SS	Single Spade
DS	Double Spade
HS	Din 43650 (Hirshman) - (AC & DC)
CL	Conduit Lead - (AC Only)
DI	Deutsch - Integral DT04-2P

BODIES

Blank	Without Body
N	1/4 NPTF Ports
S	#6 SAE Ports

VOLTAGE

06	6 VDC
12	12 VDC
24	24 VDC
36	36 VDC
48	48 VDC
25	24 VAC
11	120 VAC
22	220 VAC
44	440 VAC

IMMERSION PROOF "D" TYPE

IA	"I" Coil AMP Superseal - Integral
ID	"I" Coil - Deutsch - Integral DT04-2P
IJ	"I" Coil AMP Jr. Timer - Integral
IM	"I" Coil - Metri-Pack - Integral

Approximate Coil Weight: .74 lbs/.33 kg.

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

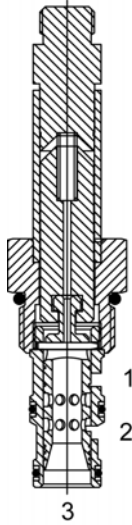
Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com



HF-S3B Direct Acting Spool, 3 Way 2 Position, Selector



DESCRIPTION

"High Pressure" 10 size, 7/8-14 thread, "Delta" series, solenoid operated, 3 way 2 position, selector spool valve.

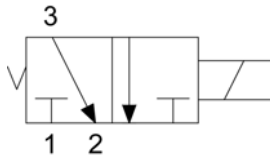
OPERATION

When de-energized the HF-S3B allows flow from (3) to (2) and blocks flow at port (1). When energized the valve allows flow from (3) to (1) and blocks flow at port (2).

FEATURES

- Hardened parts for long life.
- Efficient wet-armature construction.
- Cartridges are voltage interchangeable.
- Industry common cavity.
- Unitized, molded coil design.
- Continuous duty rated solenoid.
- Optional coil voltages and terminations.
- Optional "I" Coil: Weatherproof, Thermal Shock, Immersion Safe

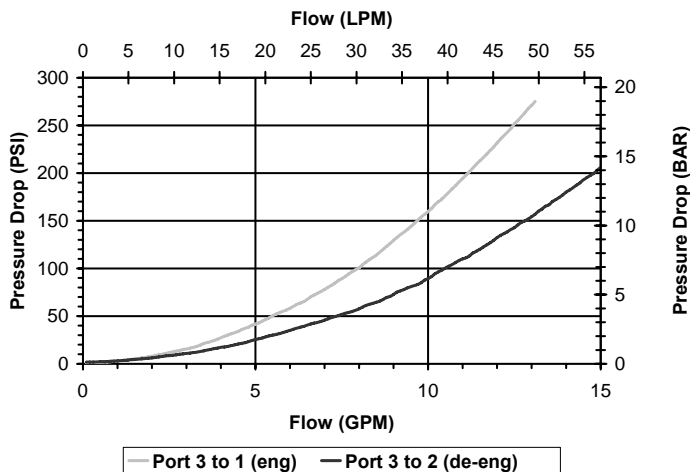
HYDRAULIC SYMBOL



Uses "L" Coil.

PERFORMANCE

Actual Test Data (Cartridge Only)



VALVE SPECIFICATIONS

Nominal Flow	8 GPM (30 LPM)
Rated Operating Pressure	4000 PSI (276 bar)
Typical Internal Leakage (150 SSU)	8 cu/in per min (131 ml/min)
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temperature Range	-40° to 250° F (-40° to 120° C)
Weight	.40 lbs. (.18 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	35 ft-lbs (47.5 Nm)
Coil Nut Torque Requirements	4-6 ft-lbs (5.4-8.1 Nm)
Cavity	DELTA 3W
Cavity Form Tool (Finishing)	40500001
Seal Kit	21191210

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

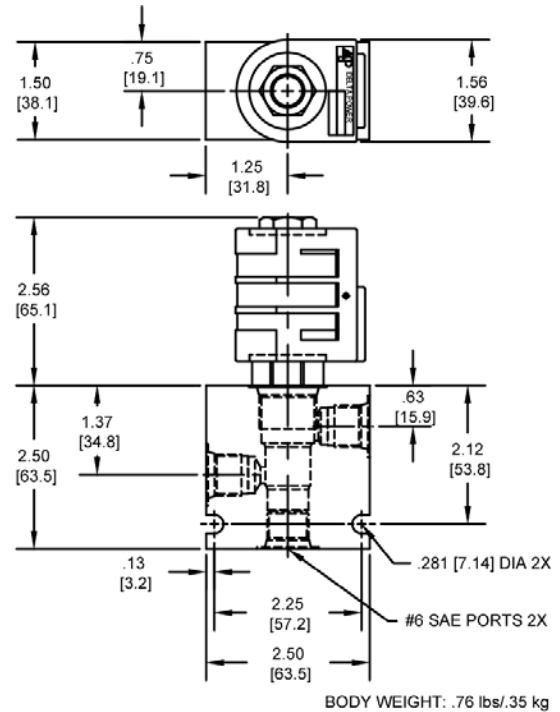
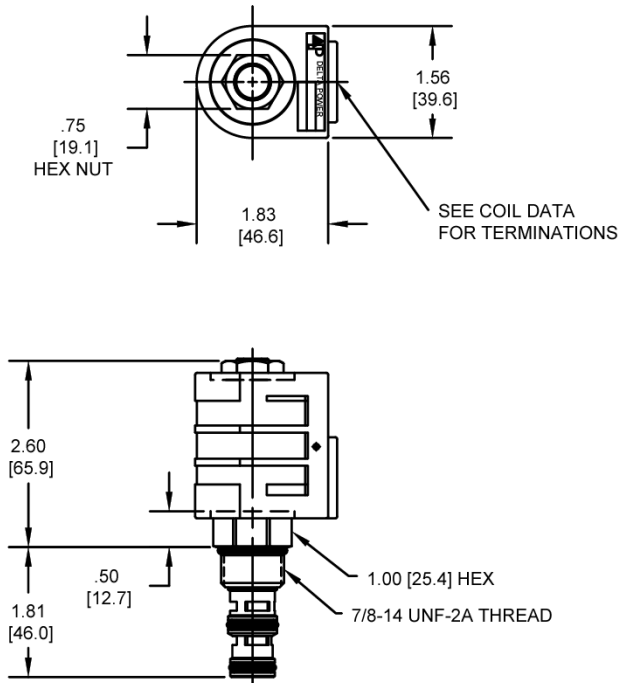
Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com



DIMENSIONS



ORDERING INFORMATION

HF-S3B -

OPTIONS

Buna Standard 00
Viton Standard V0

Blank N
S

BODIES

Without Body
1/4 NPTF Ports
#6 SAE Ports

Note: aluminum, NOT durability rated for 4000 PSI. Consult factory for body options.

VOLTAGE

06 6 VDC
12 12 VDC
24 24 VDC
36 36 VDC
48 48 VDC
25 24 VAC
11 120 VAC
22 220 VAC
44 440 VAC

"L" COIL TERMINATION
(All DC Except as Noted)

DL Double Lead
DT Deutsch on Leads DT04-2P
ML Metri-Pack on Leads
PL Packard on Leads
WL Weatherpack on Leads

SS Single Spade
DS Double Spade
HC DIN 43650 (Hirschman) - (AC & DC)
CL Conduit Lead - (AC Only)
DI Deutsch - Integral DT04-2P

IMMERSION PROOF "L" TYPE

IA "I" Coil AMP Superseal - Integral
ID "I" Coil Deutsch - Integral DT04-2P
IJ "I" Coil AMP Jr. Timer - Integral
IM "I" Coil Metri-Pack

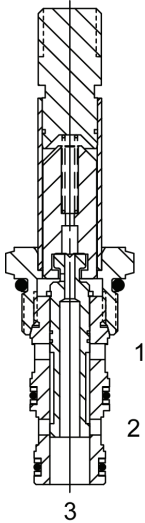
Approximate Coil Weight: .68 lbs/.31 kg.

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com

**PP-S3D Direct Acting Spool, 3 Way 2 Position****DESCRIPTION**

8 size, 3/4-16 thread, "Power" series, solenoid operated, 3 way 2 position spool valve.

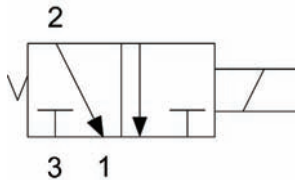
OPERATION

When de-energized the PP-S3D allows flow from (2) to (1) and blocks flow at port (3). When energized the valve allows flow from (2) to (3) and blocks flow at port (1).

OPERATION OF MANUAL OVERRIDE OPTION: To override, pull knob out. On the detented version, after pulling knob out twist 180 degrees and release. The valve will remain in that position.

FEATURES

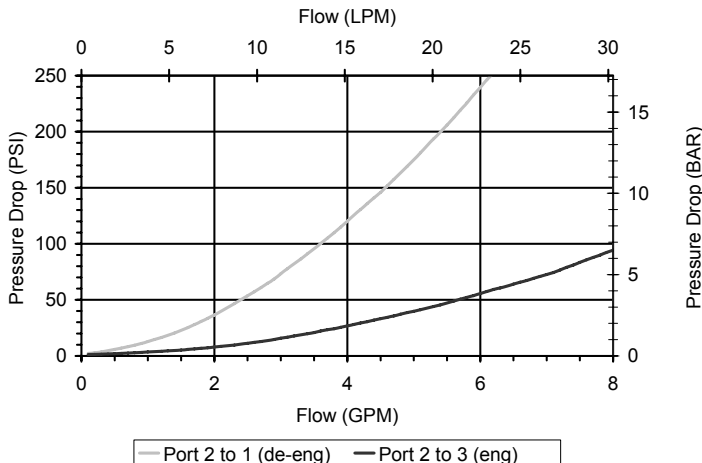
- Hardened parts for long life.
- Efficient wet-armature construction.
- Cartridges are voltage interchangeable.
- Manual override option.
- Industry common cavity.
- Unitized, molded coil design.
- Continuous duty rated solenoid.
- Optional coil voltages and terminations.
- Optional "I" Coil: Weatherproof, Thermal Shock, Immersion Safe.

HYDRAULIC SYMBOL

Operational shift limit 3 GPM (11 LPM) from (2) or (3). Consult factory for flow in (1) that exceed 3 GPM. For shifted flow performance consult chart.

PERFORMANCE

Actual Test Data (Cartridge Only)

**VALVE SPECIFICATIONS**

Nominal Flow	3 GPM (11 LPM)
Rated Operating Pressure	3000 PSI (207 bar)
Typical Internal Leakage (150 SSU)	5 cu in/min (82 ml/min)
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temperature Range	-40° to 250° F (-40° to 120° C)
Weight	.22 lbs. (.10 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	25 ft-lbs (34 Nm)
Coil Nut Torque Requirements	4-6 ft-lbs (5.4-8.1 Nm)
Cavity	POWER 3W
Cavity Form Tool (Finishing)	40500024
Seal Kit	21191105

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

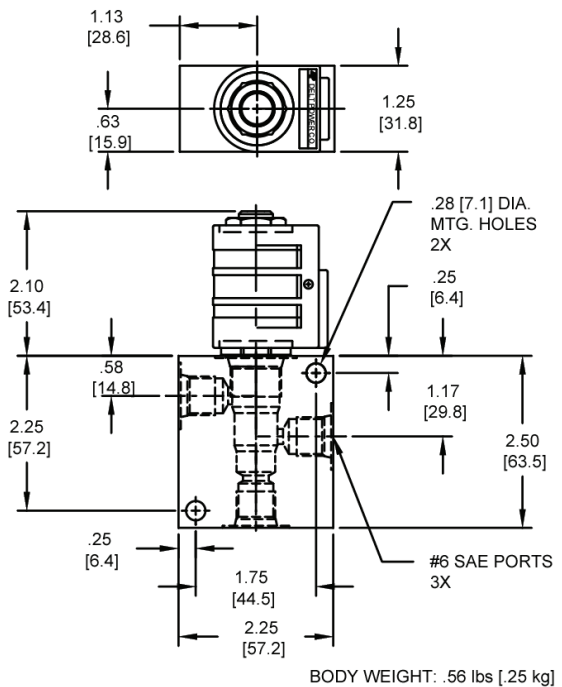
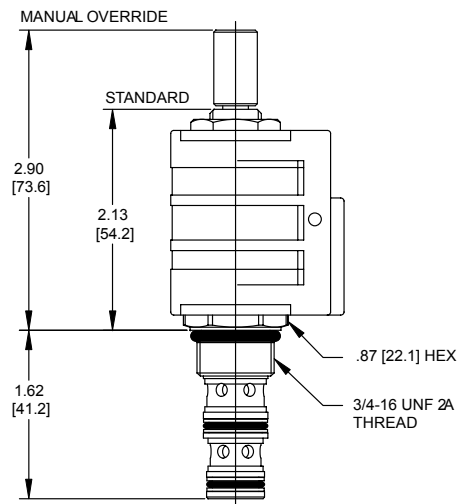
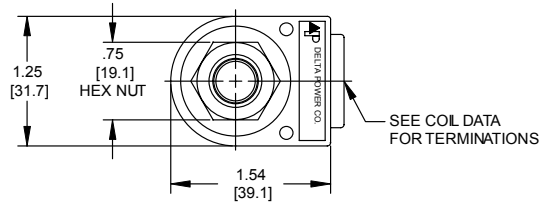
Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com



DIMENSIONS



ORDERING INFORMATION

PP-S3D -

OPTIONS

Buna Standard	00
Viton Standard	V0
Buna, Override	0M
Viton, Override	VM
Buna, Screen	A0
Viton, Screen	W0
Buna, Override, Non-detent	B1
Viton, Override, Non-detent	V1
Buna, Screen, Override, Non-detent	B3
Buna, Screen, Override, Detent	B4
Viton, Screen, Override, Non-detent	V3
Viton, Screen, Override, Detent	V4

Note: Use screen only if flow direction is from (1) to (2).

"P" COIL TERMINATION

(All DC Except as Noted)

DL	Double Lead
DT	Deutsch on Leads DT04-2P
ML	Metri-Pack on Leads
PL	Packard on Leads
WL	Weatherpack on Leads

SS	Single Spade
DS	Double Spade
HC	DIN 43650 (Hirschman) - (AC & DC)
CL	Conduit Lead - (AC Only)
DI	Deutsch - Integral DT04-2P

Blank

N

S

BODIES

Without Body
1/4 NPTF Ports
#6 SAE Ports

VOLTAGE

06	6 VDC
12	12 VDC
24	24 VDC
36	36 VDC
48	48 VDC
25	24 VAC
11	120 VAC
22	220 VAC
44	440 VAC

IMMERSION PROOF "P" TYPE

IA	"I" Coil AMP Superseal - Integral
ID	"I" Coil Deutsch - Integral DT04-2P
IJ	"I" Coil AMP Jr. Timer - Integral
IM	"I" Coil Metri-Pack - Integral

Approximate Coil Weight: .42 lbs. (.19 kg.)

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com

**HU-S3E Direct Acting Spool, 3 Way 2 Position, High Pressure****DESCRIPTION**

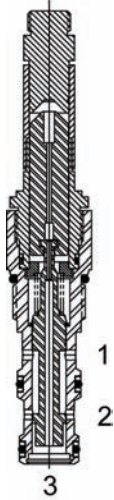
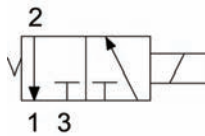
12 size, 1 1/16-12 thread, "Tecnord" series, solenoid operated, 3 way 2 position, spool valve.

OPERATION

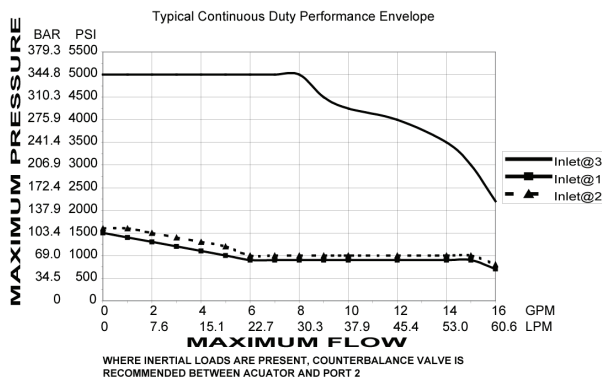
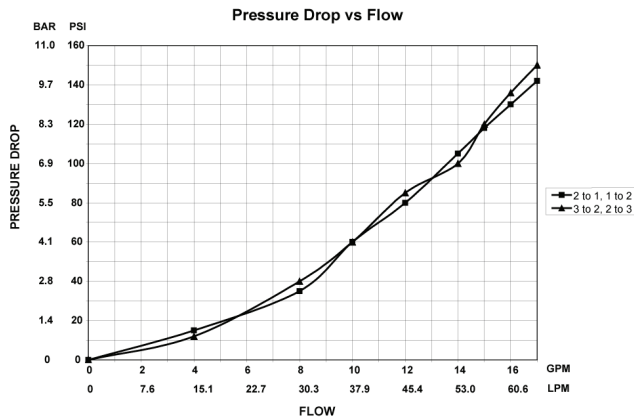
When de-energized the HU-S3E allows flow from (2) to (1) and blocks flow at port (3). When energized the valve allows flow from (3) to (2) and blocks flow at port (1).

FEATURES

- Hardened parts for long life.
- Efficient wet-armature construction.
- Cartridges are voltage interchangeable.
- Industry common cavity.
- Unitized, molded coil design.
- Continuous duty rated solenoid.
- Optional coil voltages and terminations.

**HYDRAULIC SYMBOL**

Common usage is inlet at port 3.
See HU-S3F for port 2 or port 1 inlet.

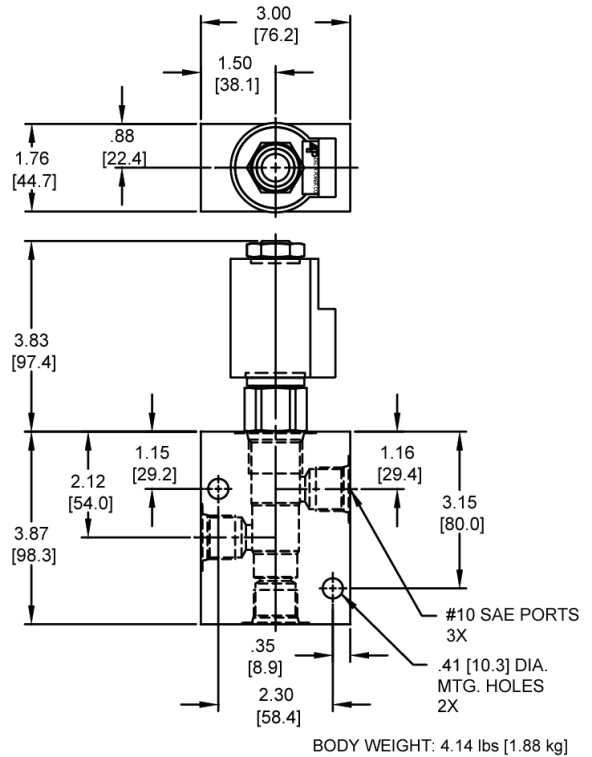
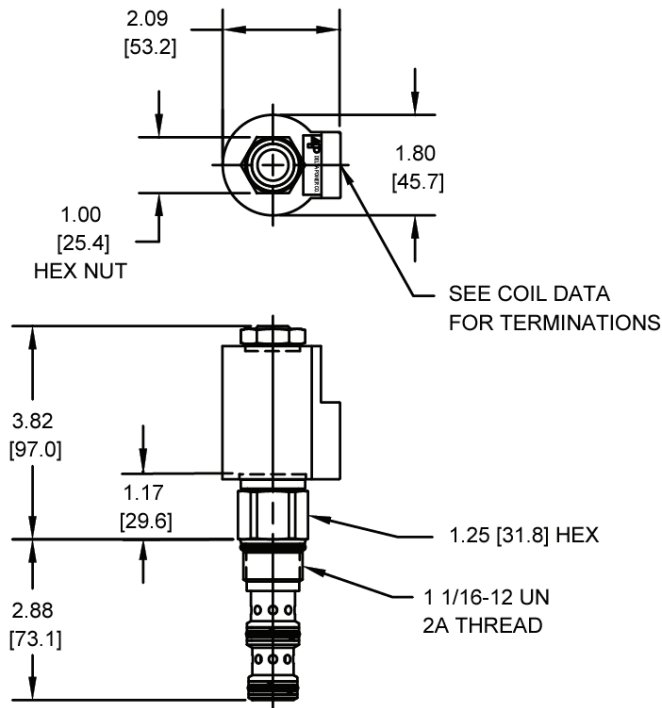
PERFORMANCE**VALVE SPECIFICATIONS**

Nominal Flow	15 GPM (57 LPM)
Rated Operating Pressure	5000 PSI (345 bar)
Typical Internal Leakage (150 SSU)	8 cu in/min @ 3000 PSI
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temperature Range	-40° to 250° F (-40° to 120° C)
Weight	1.01 lbs. (.46 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	70 ft-lbs (94.9 Nm)
Coil Nut Torque Requirements	5-7 ft-lbs (6.8-9.5 Nm)
Cavity	TECNORD 3W
Cavity Form Tool (Finishing)	40500034
Seal Kit	21191305

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.



DIMENSIONS



ORDERING INFORMATION

HU-S3E

OPTIONS
Buna Standard
Viton Standard

00
V0

Blank
S

BODIES
Without Body
#10 SAE Ports

VOLTAGE

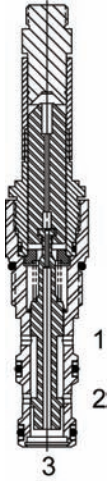
06 6 VDC
12 12 VDC
24 24 VDC
36 36 VDC
48 48 VDC
25 24 VAC
11 120 VAC
22 220 VAC

"T" COIL TERMINATION
(All DC Except as Noted)

Double Lead **DL**
Deutsch on leads **DT**
Metri-Pack on leads **ML**
Packard on leads **PL**
Weatherpack on leads **WL**
Double Spade **DS**
DIN 43650 (Hirschman) – (AC & DC) **HC**

Approximate Coil Weight: .89 lbs/.41 kg.

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

**HU-S3F Direct Acting Spool, 3 Way 2 position, High Pressure****DESCRIPTION**

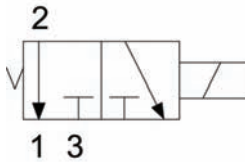
12 size, 1 1/16-12 thread, "Tecnord" series, solenoid operated, 3 way 2 position, spool valve.

OPERATION

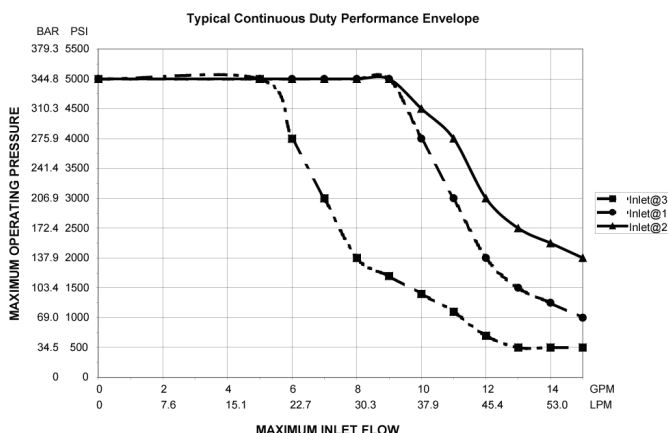
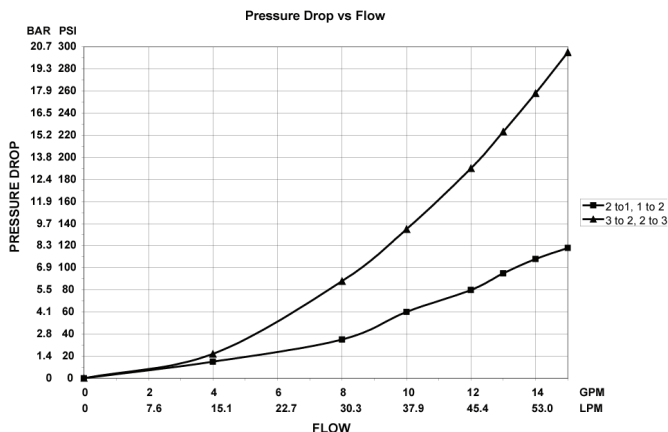
When de-energized the HU-S3F allows flow from (2) to (1) and blocks flow at port 3. When energized the valve allows flow from (2) to (3) and blocks flow at port (1).

FEATURES

- Hardened parts for long life.
- Efficient wet-armature construction.
- Cartridges are voltage interchangeable.
- Industry common cavity.
- Unitized, molded coil design.
- Continuous duty rated solenoid.
- Optional coil voltages and terminations.

HYDRAULIC SYMBOL

Recommended usage is inlet at port 1 or 2.
See HU-S3E for port 3 inlet.

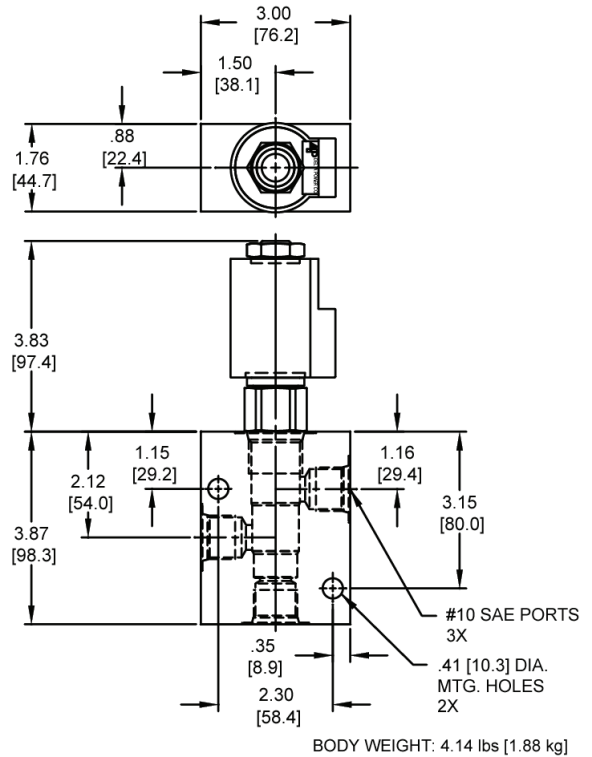
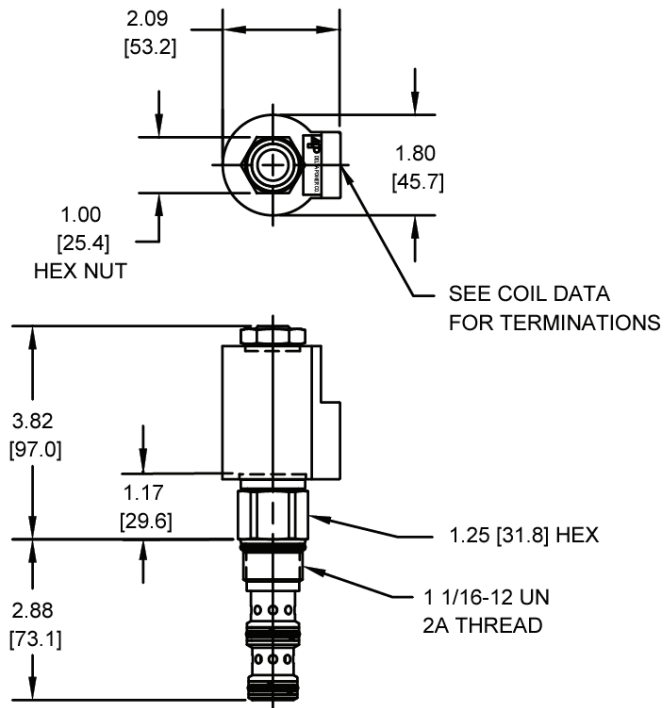
PERFORMANCE**VALVE SPECIFICATIONS**

Nominal Flow	15 GPM (57 LPM)
Rated Operating Pressure	5000 PSI (345 bar)
Typical Internal Leakage (150 SSU)	8 cu in/min @ 3000 PSI
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temperature Range	-40° to 250° F (-40° to 120° C)
Weight	1.01 lbs. (.46 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	70 ft-lbs (94.9 Nm)
Coil Nut Torque Requirements	5-7 ft-lbs (6.8-9.5 Nm) Maximum
Cavity	TECNORD 3W
Cavity Form Tool (Finishing)	40500034
Seal Kit	21191305

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.



DIMENSIONS



ORDERING INFORMATION

HU-S3F - - - -

OPTIONS

Buna Standard
Viton Standard

00
V0

Blank
S

BODIES

Without Body
#10 SAE Ports

VOLTAGE

06 6 VDC
12 12 VDC
24 24 VDC
36 36 VDC
48 48 VDC
25 24 VAC
11 120 VAC
22 220 VAC

"T" TYPE COIL TERMINATION

(All DC Except as Noted)

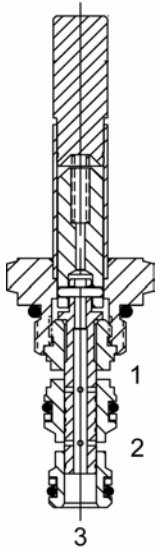
Double Lead DL
Deutsch on leads DT
Metri-Pack on leads ML
Packard on leads PL
Weatherpack on leads WL
Double Spade DS
DIN 43650 (Hirschman) - (AC & DC) HC

Approximate Coil Weight: .89 lbs/.41 kg.

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.



HC-S3P Direct Acting Spool, 3 Way 2 Position, Pilot Control, Low Leakage



DESCRIPTION

"High Pressure" 7 size, 5/8-18 thread, "Mini" series, solenoid operated, 3 way 2 Position, pilot control spool valve.

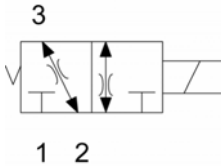
OPERATION

When de-energized the HC-S3P blocks flow at (1) and allows flow from (3) to (2). When energized the valve allows flow from (1) to (3) and blocks flow at (2).

FEATURES

- Hardened parts for long life.
- Efficient wet-armature construction.
- Cartridges are voltage interchangeable.
- Industry common cavity.
- Unitized, molded coil design (for most common terminations, see coil page).
- Continuous duty rated solenoid.
- Optional coil voltages and terminations.

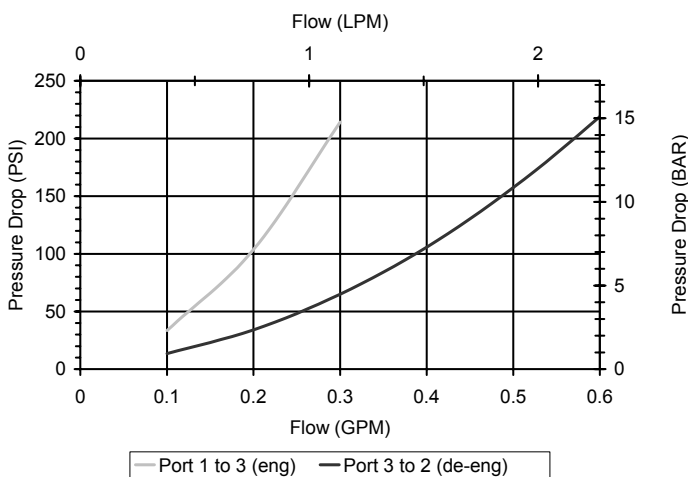
HYDRAULIC SYMBOL



Great for pilot control, low leakage.

PERFORMANCE

Actual Test Data (Cartridge Only)



VALVE SPECIFICATIONS

Nominal Flow	.3 GPM (1.13 LPM)
Rated Operating Pressure	4000 PSI (276 bar)
Typical Internal Leakage (150 SSU)	3 cu in/min (49 ml/min)
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temperature Range	-40° to 250° F (-40° to 120° C)
Weight	.15 lbs. (.07 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	15 ft-lbs (20.3 Nm)
Coil Nut Torque Requirements	3-5 ft-lbs (4.1-6.8 Nm)
Cavity	MINI 3W
Cavity Form Tool (Finishing)	40500004
Seal Kit	21191004

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

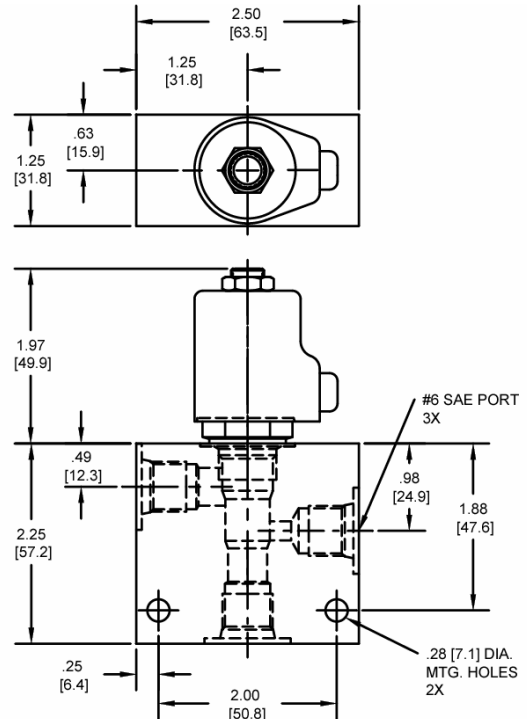
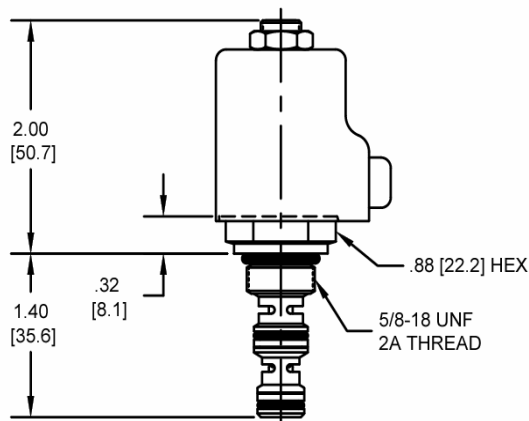
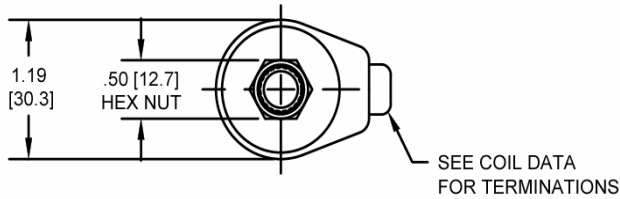
Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com



DIMENSIONS



BODY WEIGHT: .59 lbs. [.26 kg]

ORDERING INFORMATION

HC-S3P

OPTIONS
Buna Standard
Viton Standard

00
V0

Blank
N
S

BODIES
Without Body
1/4 NPTF Ports
#6 SAE Ports

Note: Aluminum, NOT durability rated for 4000 PSI. Consult factory for body options.

VOLTAGE

06 6 VDC
12 12 VDC
24 24 VDC
36 36 VDC
48 48 VDC
25 24 VAC
11 120 VAC
22 220 VAC
44 440 VAC

"M" COIL TERMINATION

(All DC Except as Noted)

Double Lead DL
Deutsch on Leads DT04-2P DT
Metri-Pack on Leads ML
Packard on Leads PL
Weatherpack on Leads WL
Single Spade SS
Double Spade DS
DIN 43650 (Hirschman) – (AC&DC) HC
Conduit Lead – (AC Only) CL

Approximate Coil Weight: .30 lbs/.14 kg.

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com

**MC-S3T Direct Acting Spool, 3 Way 2 Position, Transmission & Brake****DESCRIPTION**

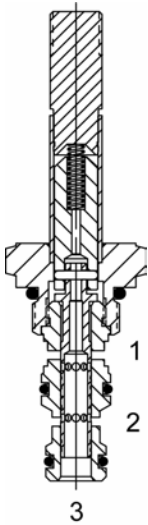
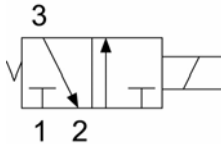
7 size, 5/8-18 thread, "Mini" series, solenoid operated, 3 way 2 position, transmission & brake spool valve.

OPERATION

When de-energized the MC-S3T blocks flow at (1) and allows flow from (3) to (2). When energized the valve allows flow from (1) to (3) and blocks flow at (2).

FEATURES

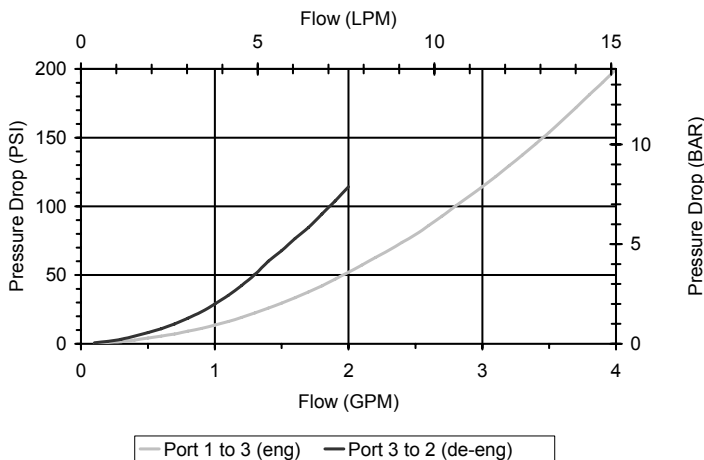
- Hardened parts for long life.
- Efficient wet-armature construction.
- Cartridges are voltage interchangeable.
- Industry common cavity.
- Unitized, molded coil design.
- Continuous duty rated solenoid.
- Optional coil voltages and terminations.

**HYDRAULIC SYMBOL****Contamination Tolerant Product**

This valve is designed for transmission and brake applications. Consult factory for alternate low wattage coil options.

PERFORMANCE

Actual Test Data (Cartridge Only)

**VALVE SPECIFICATIONS**

Nominal Flow	4 GPM (15 LPM) from (1) to (3) 2 GPM (7.6 LPM) from (3) to (2)
Rated Operating Pressure	1500 PSI (103 bar)
Typical Internal Leakage (150 SSU)	5 cu in/min (82 ml/min)
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 20/18/15
Media Operating Temperature Range	-40° to 250° F (-40° to 120° C)
Weight	.14 lbs. (.06 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	15 ft-lbs (20.3 Nm)
Coil Nut Torque Requirements	3-5 ft-lbs (4.1-6.8 Nm)
Cavity	MINI 3W
Cavity Form Tool (Finishing)	40500004
Seal Kit	21191006

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

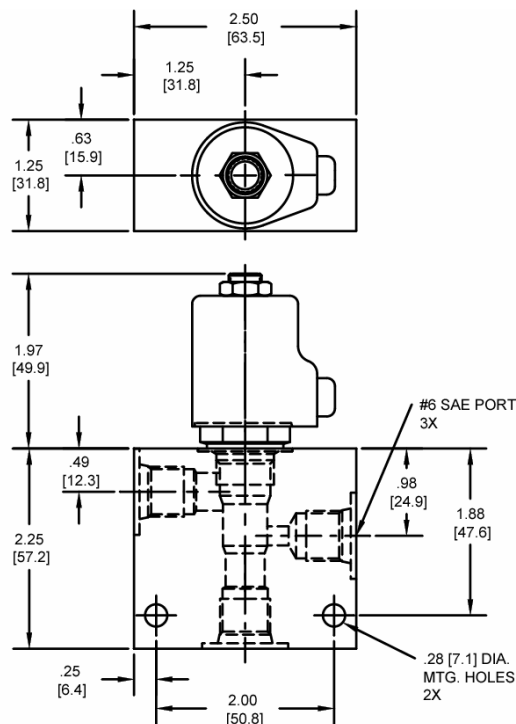
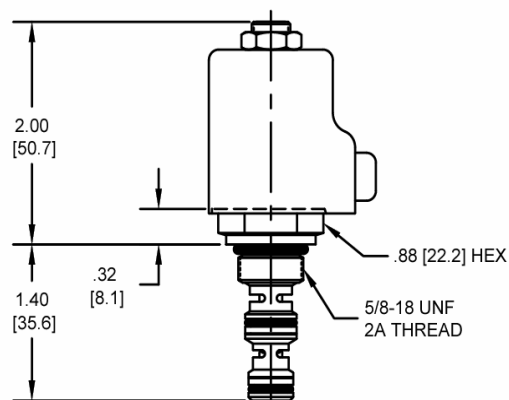
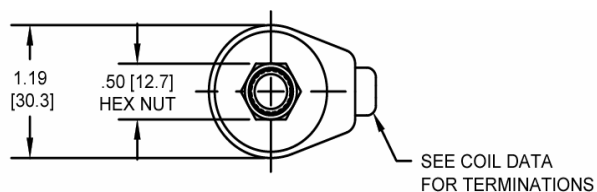
Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com



DIMENSIONS



BODY WEIGHT: .59 lbs. [.26 kg]

ORDERING INFORMATION

MC-S3T -

OPTIONS

Buna Standard
Viton Standard00
V0Blank
N
S

BODIES

Without Body
1/4 NPTF Ports
#6 SAE Ports

VOLTAGE

06 6 VDC
12 12 VDC
24 24 VDC
36 36 VDC
48 48 VDC
25 24 VAC
11 120 VAC
22 220 VAC
44 440 VAC"M" TYPE COIL TERMINATION

(All DC Except as Noted)

Double Lead DL
Deutsch on Leads DT04-2P DT
Metri-Pack on Leads ML
Packard on Leads PL
Weatherpack on Leads WL
Single Spade SS
Double Spade DS
DIN 43650 (Hirschman) - (AC & DC) HC
Conduit Lead - (AC Only) CL

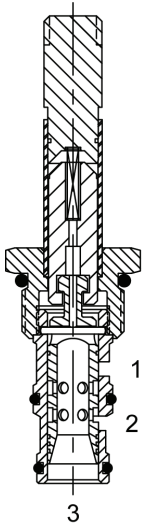
Approximate Coil Weight: .30 lbs/.14 kg.

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com

**DF-S3T Direct Acting Spool, 3 Way 2 Position, Transmission & Brake****DESCRIPTION**

10 size, 7/8-14 thread, "Delta" series, solenoid operated, 3 way 2 position, transmission & brake spool valve.

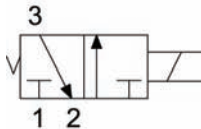
OPERATION

When de-energized the DF-S3T allows flow from (3) to (2) and blocks flow at port (1). When energized the valve allows flow from (1) to (3) and blocks flow at port (2).

OPERATION OF MANUAL OVERRIDE OPTION: To override, pull knob out. On the detented version, after pulling knob out twist 180 degrees and release. The valve will remain in that position.

FEATURES

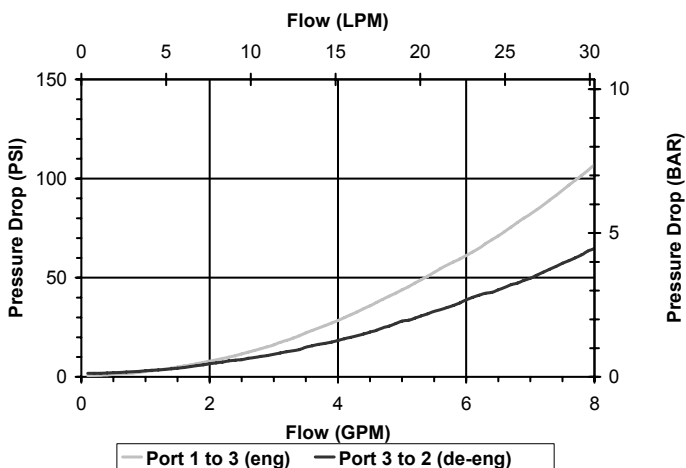
- Hardened parts for long life.
- Efficient wet-armature construction.
- Cartridges are voltage interchangeable.
- Manual override option.
- Industry common cavity.
- Unitized, molded coil design.
- Continuous duty rated solenoid.
- Optional coil voltages and terminations.
- Optional "I" Coil: Weatherproof, Thermal Shock, Immersion Safe.

HYDRAULIC SYMBOL**Contamination Tolerant Product**

This valve is designed for transmission and brake applications. Consult factory for alternate low wattage coil options.

PERFORMANCE

Actual Test Data (Cartridge Only)

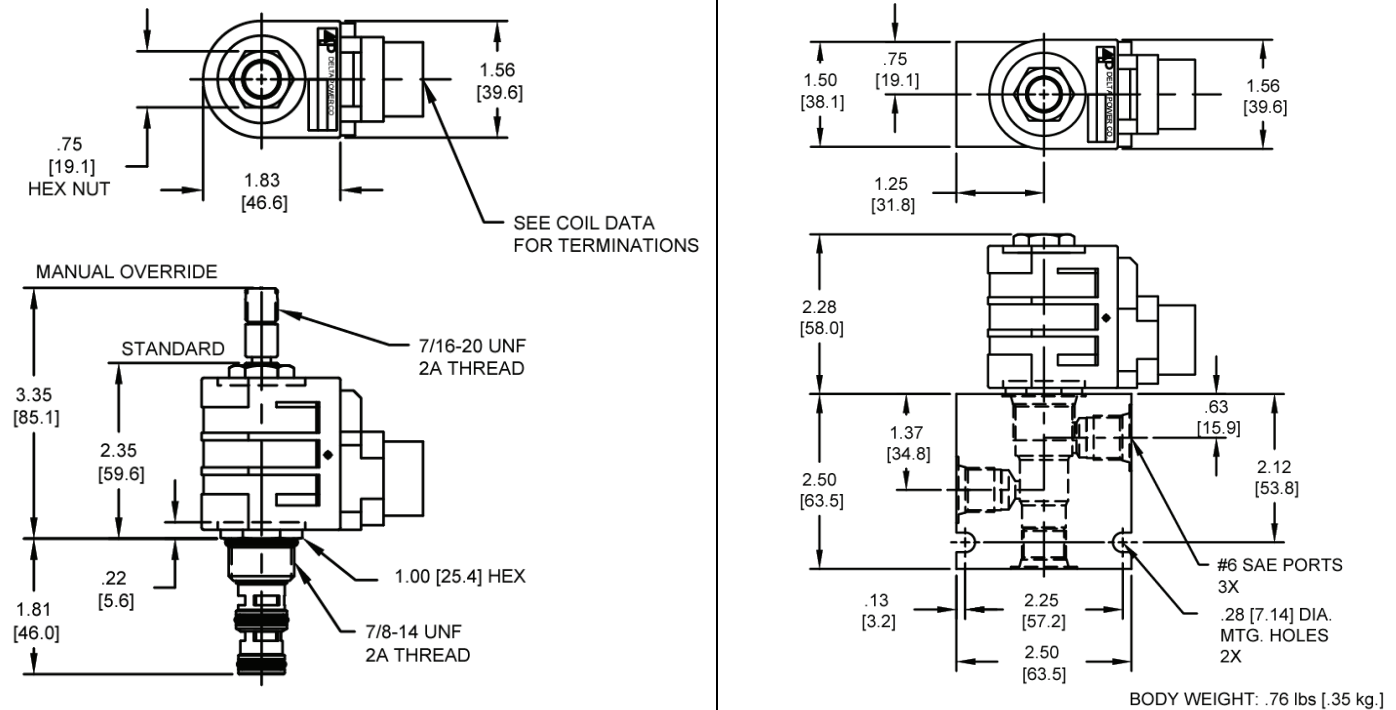
**VALVE SPECIFICATIONS**

Nominal Flow	8 GPM (30 LPM)
Rated Operating Pressure	1500 PSI (103 bar)
Typical Internal Leakage (150 SSU)	5 cu/in per min (82 ml/min)
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temperature Range	-40° to 250° F (-40° to 120° C)
Weight	.28 lbs. (.12 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	30 ft-lbs (40.6 Nm)
Coil Nut Torque Requirements	4-6 ft-lbs (5.4-8.1 Nm)
Cavity	DELTA 3W
Cavity Form Tool (Finishing)	40500001
Seal Kit	21191204

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.



DIMENSIONS



ORDERING INFORMATION

DF-S3T -

OPTIONS

Buna Standard	00
Viton Standard	V0
Buna, Override	0M
Viton, Override	VM
Buna, Override, Non-detent	B1
Viton, Override, Non-detent	V1
Buna, Screen	AO
Viton, Screen	WO
Buna, Screen, Override, Non-detent	B3
Buna, Screen, Override, Detent	B4
Viton, Screen, Override, Non-detent	V3
Viton, Screen, Override, Detent	V4

Note: Use screen only if flow direction is from (1) to (2).

"D" COIL TERMINATION

(All DC Except as Noted)

DL	Double Lead
DT	Deutsch on Leads DT04-2P
ML	Metri-Pack on Leads
PL	Packard on Leads
WL	Weatherpack on Leads

SS	Single Spade
DS	Double Spade
HS	Din 43650 (Hirshman) - (AC & DC)
CL	Conduit Leads - (AC Only)
DI	Deutsch - Integral DT04-2P

Blank

N

S

BODIES

Without Body
1/4 NPTF Ports
#6 SAE Ports

VOLTAGE

06	6 VDC
12	12 VDC
24	24 VDC
36	36 VDC
48	48 VDC
25	24 VAC
11	120 VAC
22	220 VAC
44	440 VAC

IMMERSION PROOF "D" TYPE

IA	"I" Coil AMP Superseal - Integral
IM	"I" Coil - Deutsch - Integral DT04-2P
IJ	"I" Coil AMP Jr. Timer - Integral
IM	"I" Coil - Metri-Pack - Integral

Approximate Coil Weight: .74 lbs/.33 kg.

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com

**PP-S3X Direct Acting Spool, 3 Way 2 Position, Selector****DESCRIPTION**

8 size, 3/4-16 thread, "Power" series, solenoid operated, 3 way 2 position, selector spool valve.

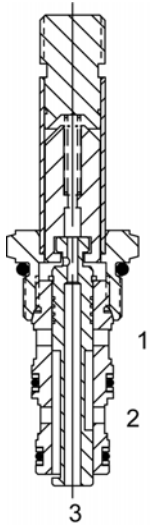
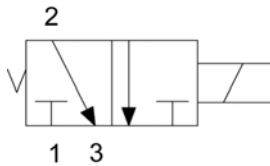
OPERATION

When de-energized the PP-S3X allows flow from (2) to (3) and blocks flow at port (1). When energized the valve allows flow from (2) to (1) and blocks flow at port (3).

OPERATION OF MANUAL OVERRIDE OPTION: To override, pull knob out. On the detented version, after pulling knob out twist 180 degrees and release. The valve will remain in that position.

FEATURES

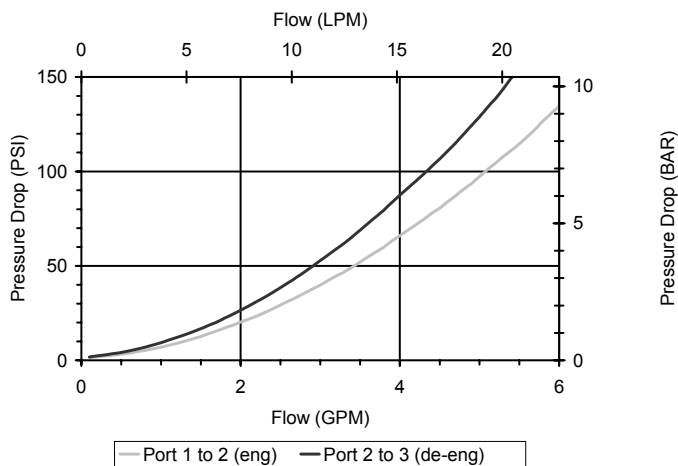
- Hardened parts for long life.
- Efficient wet-armature construction.
- Cartridges are voltage interchangeable.
- Manual override option.
- Industry common cavity.
- Unitized, molded coil design.
- Continuous duty rated solenoid.
- Optional coil voltages and terminations.
- Optional "I" Coil: Weatherproof, Thermal Shock, Immersion Safe.

**HYDRAULIC SYMBOL**

Operational shift limit 3 GPM (11 LPM) from port 2.
Not recommended for port 3 inlet cavity.
For shifted flow performance consult chart.

PERFORMANCE

Actual Test Data (Cartridge Only)

**VALVE SPECIFICATIONS**

Nominal Flow	3 GPM (11 LPM)
Rated Operating Pressure	3000 PSI (207 bar)
Typical Internal Leakage (150 SSU)	5 cu in/min (82 ml/min)
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temperature Range	-40° to 250° F (-40° to 120° C)
Weight	.23 lbs. (.10 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	25 ft-lbs (34 Nm)
Coil Nut Torque Requirements	4-6 ft-lbs (5.4-8.1 Nm)
Cavity	POWER 3W
Cavity Form Tool (Finishing)	40500024
Seal Kit	21191105

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

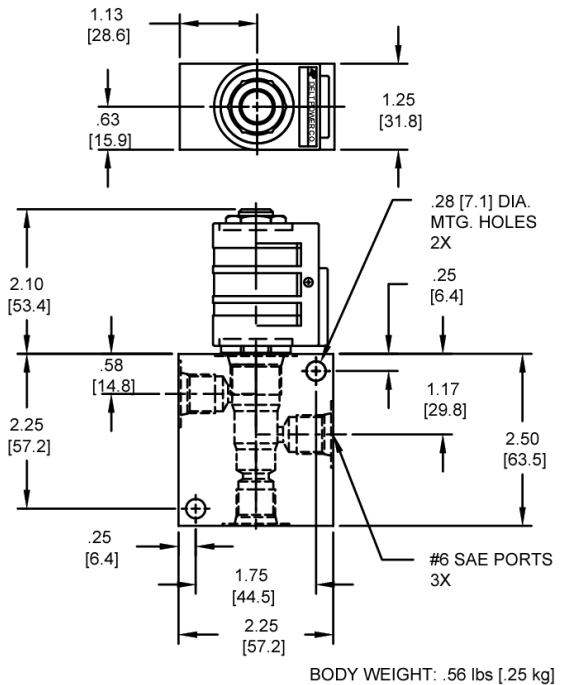
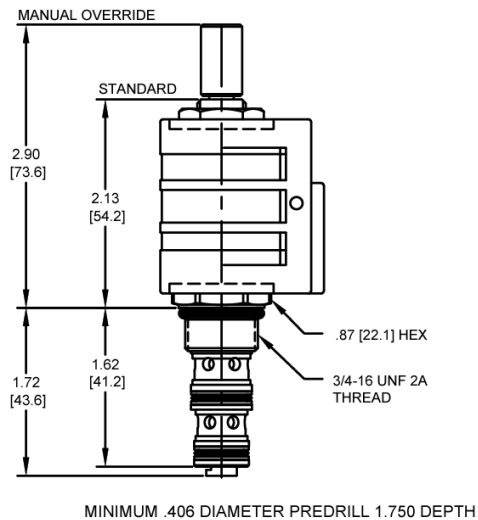
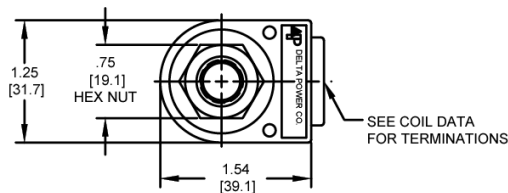
Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com



DIMENSIONS



ORDERING INFORMATION

PP-S3X

OPTIONS

Buna Standard	00
Viton Standard	V0
Buna, Override	0M
Viton, Override	VM
Buna, Screen	A0
Viton, Screen	W0
Buna, Override, Non-detent	B1
Viton, Override, Non-detent	V1
Buna, Screen, Override, Non-detent	B3
Buna, Screen, Override, Detent	B4
Viton, Screen, Override, Non-detent	V3
Viton, Screen, Override, Detent	V4

Note: Use screen only if flow direction is from (1) to (2).

"P" COIL TERMINATION

(All DC Except as Noted)

DL	Double Lead
DT	Deutsch on Leads DT04-2P
ML	Metri-Pack on Leads
PL	Packard on Leads
WL	Weatherpack on Leads

SS	Single Spade
DS	Double Spade
HC	DIN 43650 (Hirschman) – (AC & DC)
CL	Conduit Lead – (AC Only)
DI	Deutsch – Integral DT04-2P

Blank

N

S

BODIES

Without Body
1/4 NPTF Ports
#6 SAE Ports

VOLTAGE

06	6 VDC
12	12 VDC
24	24 VDC
36	36 VDC
48	48 VDC
25	24 VAC
11	120 VAC
22	220 VAC
44	440 VAC

IMMERSION PROOF "P" TYPE

IA	"I" Coil AMP Superseal - Integral
ID	"I" Coil Deutsch – Integral DT04-2P
IJ	"I" Coil AMP Jr. Timer - Integral
IM	"I" Coil Metri-Pack – Integral

Approximate Coil Weight: .42 lbs. (.19 kg.)

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

Phone: (815) 397-6628

Fax: (815) 397-2526

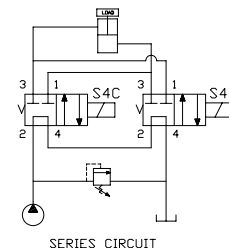
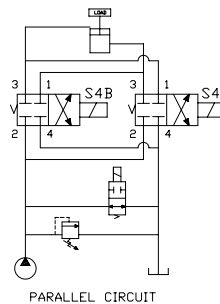
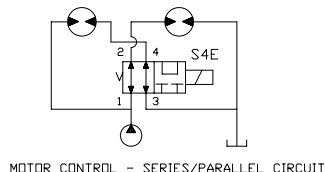
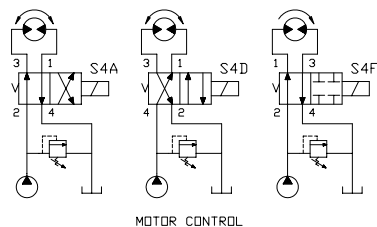
E-mail: delta@delta-power.com


4 Way 2 Position Spool Valves

	GPM	PSI	LPM	BAR	MODEL	PAGE
	1	3000	4	207	MD-S4A	148
	1.5	4000	6	276	HD-S4A	150
	4	3000	15	207	PQ-S4A	152
	10	3000	38	207	DG-S4A	154
	10	4000	38	276	HG-S4A	156
	5	1000	19	69	QG-S4A	646
	5.28	1000	20	69	IG-S4A	656
	15	5000	57	345	HV-S4A	158
	1.5	3000	6	207	MD-S4B	160
	3	4000	11	276	HD-S4B	162
	4	3000	15	207	PQ-S4B	164
	10	3000	38	207	DG-S4B	166
	10	4000	38	276	HG-S4B	168
	4	3000	15	207	PQ-S4C	170
	8	3000	30	207	DG-S4C	172
	8	4000	30	276	HG-S4C	174
	2.5	3000	9	207	PQ-S4D	176
	6	3000	23	207	DG-S4D	178
	8	4000	30	276	HG-S4D	180
	6	3000	23	207	DG-S4E	182
	8	4000	30	276	HG-S4E	184
	15	5000	57	345	HV-S4E	186
	6	3000	23	207	DG-S4F	188
	6	4000	23	276	HG-S4F	190

Typical Schematic

Typical application for the S4A, S4D, and S4F is directional motor or cylinder control.
 Typical application for the S4B is directional motor or cylinder control in a parallel circuit.
 Typical application for the S4C is directional motor or cylinder control in a series circuit.
 Typical application for the S4E is motor control in a series/parallel circuit.



WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

Phone: (815) 397-6628

Fax: (815) 397-2526

 E-mail: delta@delta-power.com



MD-S4A Direct Acting Spool, 4 Way 2 Position

DESCRIPTION

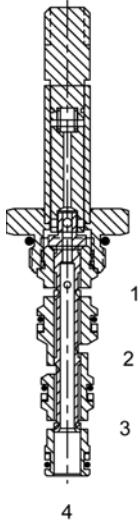
7 size, 5/8-18 thread, "Mini" series, solenoid operated, 4 way 2 position, spool valve.

OPERATION

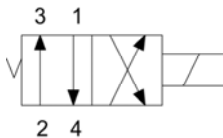
When de-energized the MD-S4A allows flow from (1) to (4) and (2) to (3). When energized the valve allows flow from (2) to (1) and (3) to (4).

FEATURES

- Hardened parts for long life.
- Efficient wet-armature construction.
- Cartridges are voltage interchangeable.
- Industry common cavity.
- Unitized, molded coil design.
- Continuous duty rated solenoid.
- Optional coil voltages and terminations.



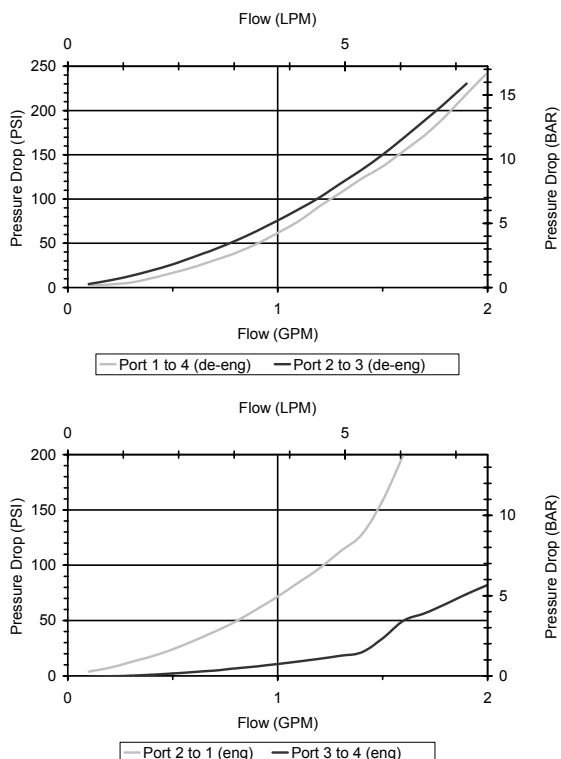
HYDRAULIC SYMBOL



Operational shift limit 1 GPM (3.8 LPM).
For shifted flow performance consult chart.
For higher pressures or flows see HD-S4A.

PERFORMANCE

Actual Test Data (Cartridge Only)



VALVE SPECIFICATIONS

Maximum Flow	1 GPM (4 LPM)
Rated Operating Pressure	3000 PSI (207 bar)
Typical Internal Leakage (150 SSU)	5 cu in/min (82 ml/min) per path
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temperature Range	-40° to 250° F (-40° to 120° C)
Weight	.15 lbs. (.07 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	15 ft-lbs (20.3 Nm)
Coil Nut Torque Requirements	3-5 ft-lbs (4.1-6.8 Nm)
Cavity	MINI 4W
Cavity Form Tool (Finishing)	40500006
Seal Kit	21191008

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

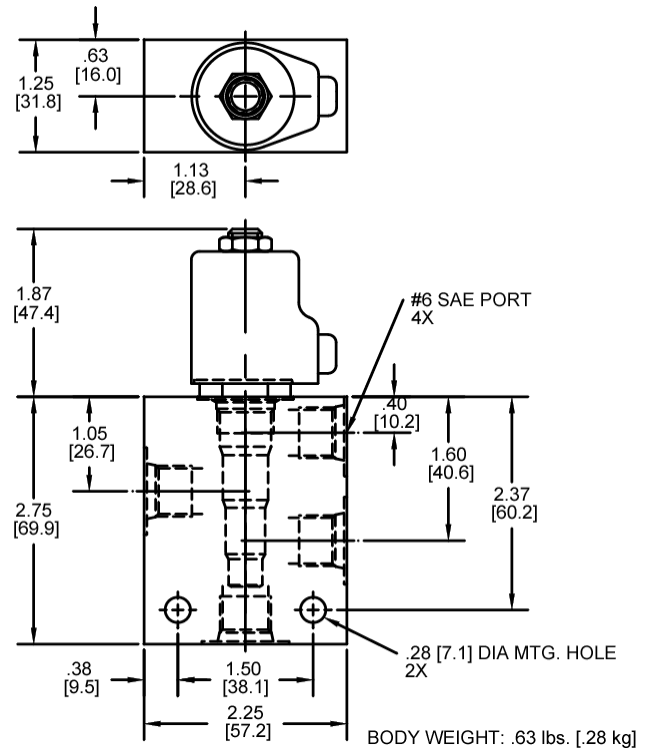
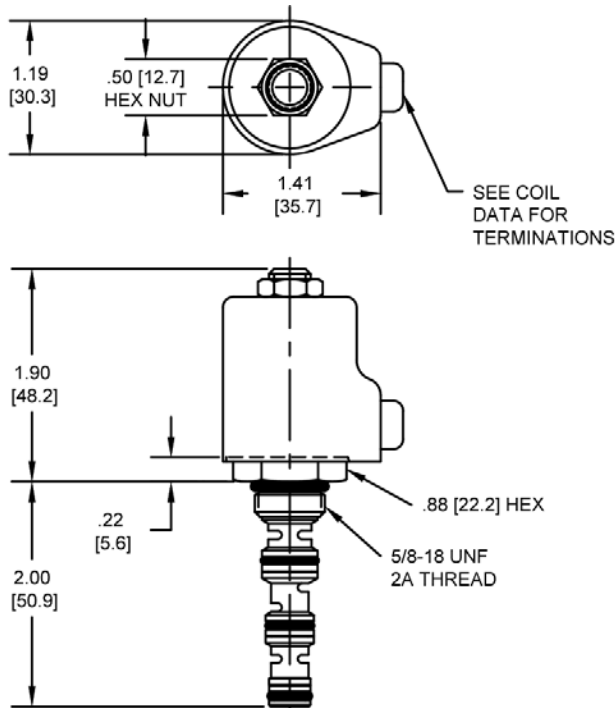
Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com



DIMENSIONS



ORDERING INFORMATION

MD-S4A

OPTIONS

Buna Standard
Viton Standard

00
V0

Blank
N
S

BODIES

Without Body
1/4 NPTF Ports
#6 SAE Ports

VOLTAGE

06 6 VDC
12 12 VDC
24 24 VDC
36 36 VDC
48 48 VDC
25 24 VAC
11 120 VAC
22 220 VAC
44 440 VAC

"M" COIL TERMINATION

(All DC Except as Noted)

Double Lead DL
Deutsch on Leads DT04-2P DT
Metri-Pack on Leads ML
Packard on Leads PL
Weatherpack on Leads WL
Single Spade SS
Double Spade DS
DIN 43650 (Hirschman) – (AC & DC) HC
Conduit Lead – (AC Only) CL

Approximate Coil Weight: .30 lbs/.14 kg.

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com

**HD-S4A Direct Acting Spool, 4 Way 2 Position****DESCRIPTION**

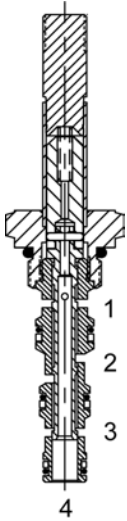
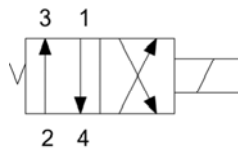
"High Pressure" 7 size, 5/8-18 thread, "Mini" series, solenoid operated, 4 way 2 position spool valve.

OPERATION

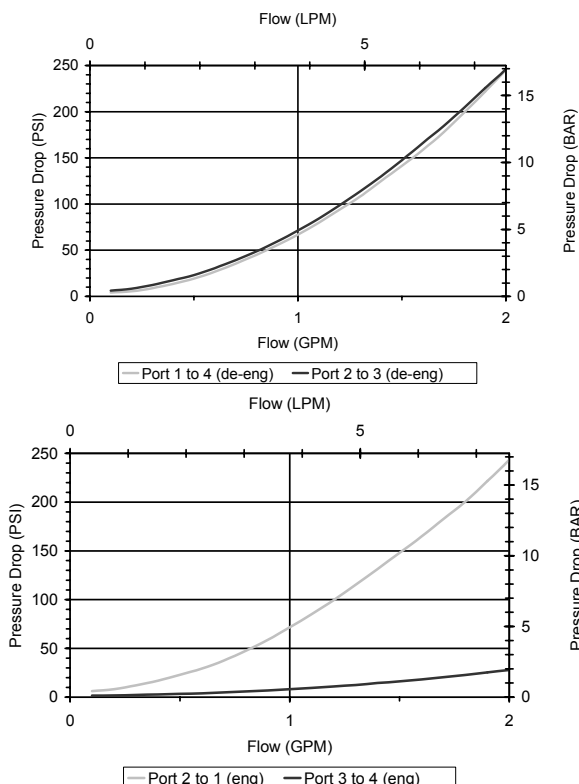
When de-energized the HD-S4A allows flow from (1) to (4) and (2) to (3). When energized the valve allows flow from (2) to (1) and (3) to (4).

FEATURES

- Hardened parts for long life.
- Efficient wet-armature construction.
- Cartridges are voltage interchangeable.
- Industry common cavity.
- Unitized, molded coil design (for most common terminations, see coil page).
- Continuous duty rated solenoid.
- Optional coil voltages and terminations.

**HYDRAULIC SYMBOL****PERFORMANCE**

Actual Test Data (Cartridge Only)

**VALVE SPECIFICATIONS**

Nominal Flow	1.5 GPM (6 LPM)
Rated Operating Pressure	4000 PSI (276 bar)
Typical Internal Leakage (150 SSU)	8 cu in/min (131 ml/min) per path
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temperature Range	-40° to 250° F (-40° to 120° C)
Weight	.16 lbs. (.07 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	15 ft-lbs (20 Nm)
Coil Nut Torque Requirements	3-5 ft-lbs (4.1-6.8 Nm)
Cavity	MINI 4W
Cavity Form Tool (Finishing)	40500006
Seal Kit	21191008

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

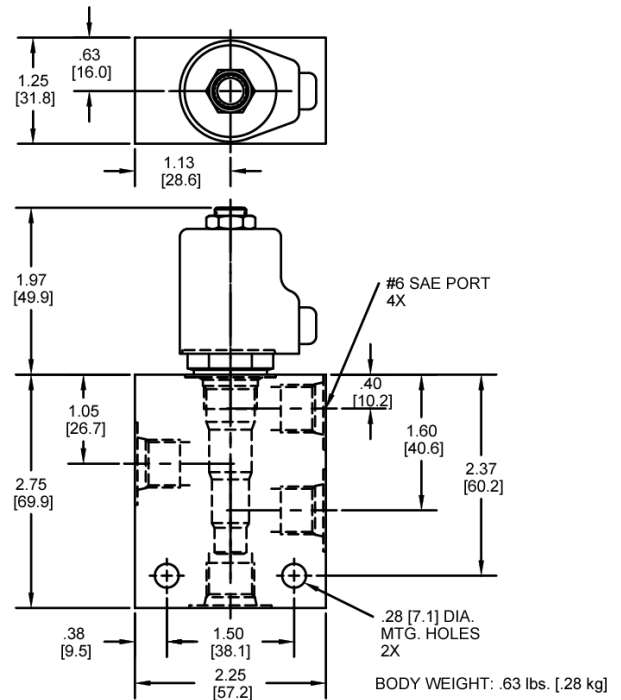
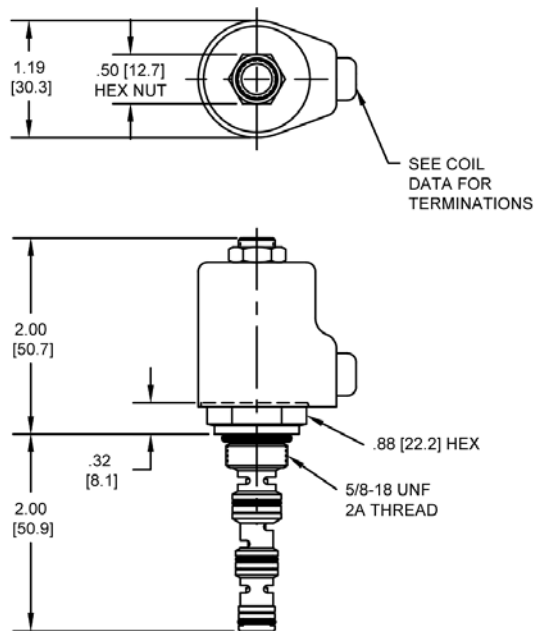
Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com



DIMENSIONS



ORDERING INFORMATION

HD-S4A

OPTIONS

Buna Standard
Viton Standard

00
V0

Blank
N
S

BODIES

Without Body
1/4 NPTF Ports
#6 SAE Ports

Note: Aluminum, NOT durability rated for 4000 PSI. Consult factory for body options.

VOLTAGE

06 6 VDC
12 12 VDC
24 24 VDC
36 36 VDC
48 48 VDC
25 24 VAC
11 120 VAC
22 220 VAC
44 440 VAC

"M" COIL TERMINATION

(All DC Except as Noted)

Double Lead DL
Deutsch on Leads DT04-2P DT
Metri-Pack on Leads ML
Packard on Leads PL
Weatherpack on Leads WL
Single Spade SS
Double Spade DS
DIN 43650 (Hirschman) – (AC & DC) HC
Conduit Lead – (AC Only) CL

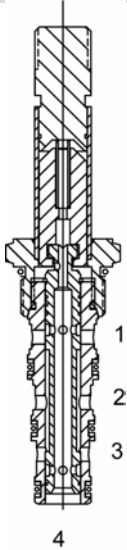
Approximate Coil Weight: .30 lbs./14 kg

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com

**PQ-S4A Direct Acting Spool, 4 Way 2 Position****DESCRIPTION**

8 size, 3/4-16 thread, "Power" series, solenoid operated, 4 way 2 position, spool valve.

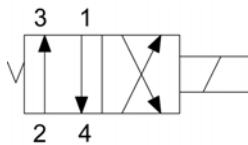
OPERATION

When de-energized the PQ-S4A allows flow from (1) to (4) and from (2) to (3). When energized the valve allows flow from (2) to (1) and from (3) to (4).

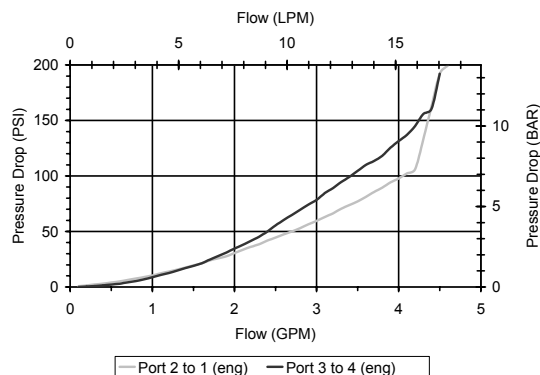
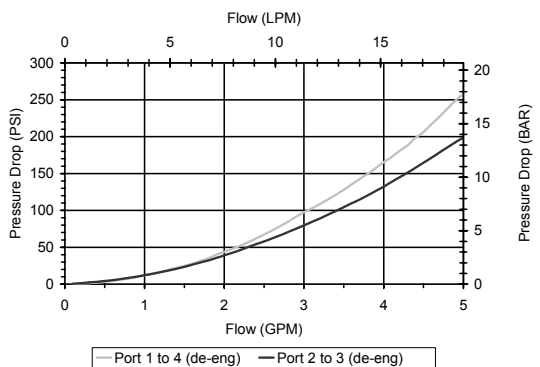
OPERATION OF MANUAL OVERRIDE OPTION: To override, pull knob out. On the detented version, after pulling knob out twist 180 degrees and release. The valve will remain in that position.

FEATURES

- Hardened parts for long life.
- Efficient wet-armature construction.
- Cartridges are voltage interchangeable.
- Manual override option.
- Industry common cavity.
- Unitized, molded coil design.
- Continuous duty rated solenoid.
- Optional coil voltages and terminations.
- Optional "I" Coil: Weatherproof, Thermal Shock, Immersion Safe.

HYDRAULIC SYMBOL

Modes of shift operation to 6 GPM, Consult Factory.

PERFORMANCE**Actual Test Data (Cartridge Only)****VALVE SPECIFICATIONS**

Nominal Flow	4 GPM (15 LPM)
Rated Operating Pressure	3000 PSI (207 bar)
Typical Internal Leakage (150 SSU)	5 cu in/min (82 ml/min) per path
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temperature Range	-40° to 250° F (-40° to 120° C)
Weight	.24 lbs. (.11 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	25 ft-lbs (34 Nm)
Coil Nut Torque Requirements	4-6 ft-lbs (5.4-8.1 Nm)
Cavity	POWER 4W
Cavity Form Tool (Finishing)	40500029
Seal Kit	21191108

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

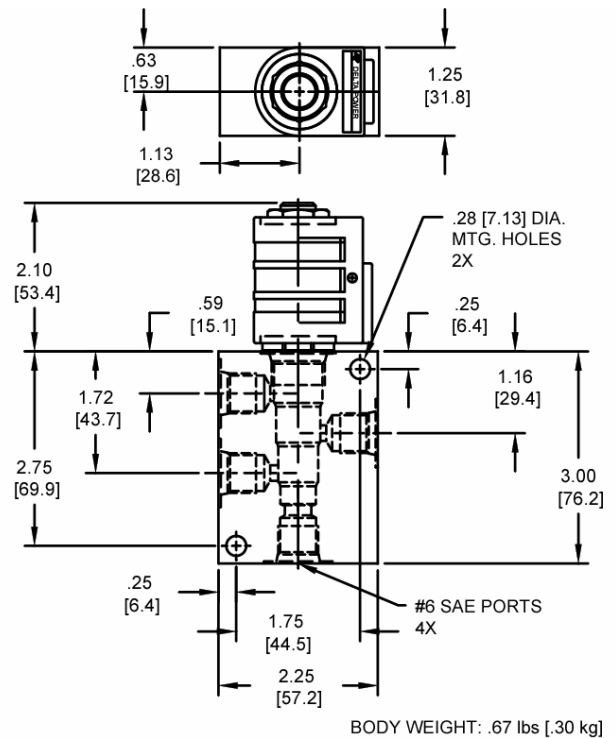
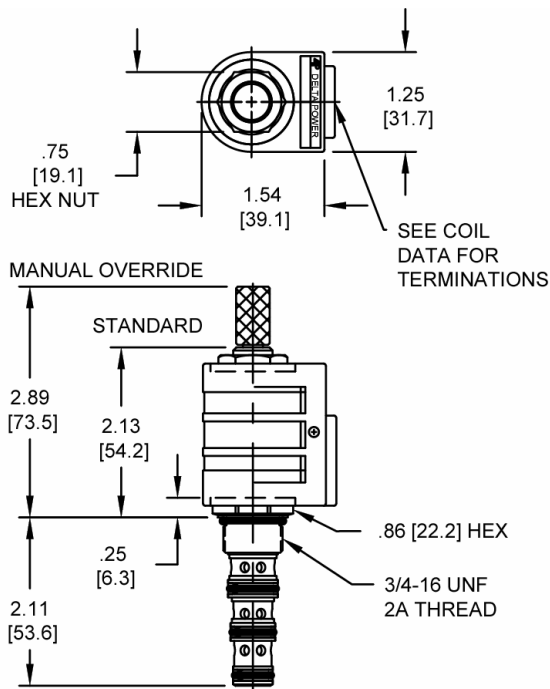
Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com



DIMENSIONS



ORDERING INFORMATION

PQ-S4A - - - -

OPTIONS

Buna Standard **00**
Viton Standard **V0**
Buna, Override, Detent **0M**
Viton, Override, Detent **VM**
Buna, Override, Non-detent **B1**
Viton, Override, Non-detent **V1**

Blank
N
S

BODIES

Without Body
1/4 NPTF Ports
#6 SAE Ports

VOLTAGE

06 6 VDC
12 12 VDC
24 24 VDC
36 36 VDC
48 48 VDC
25 24 VAC
11 120 VAC
22 220 VAC
44 440 VAC

"P" COIL TERMINATION

(All DC Except as Noted)

DL Double Lead
DT Deutsch on Leads DT04-2P
ML Metri-Pack on Leads
PL Packard on Leads
WL Weatherpack on Leads

SS Single Spade
DS Double Spade
HC DIN 43650 (Hirschman) - (AC & DC)
CL Conduit Lead - (AC Only)
DI Deutsch - Integral DT04-2P

IMMERSION PROOF "P" TYPE

IA "I" Coil AMP Superseal - Integral
ID "I" Coil Deutsch - Integral DT04-2P
IJ "I" Coil AMP Jr. Timer - Integral
IM "I" Coil Metri-Pack - Integral

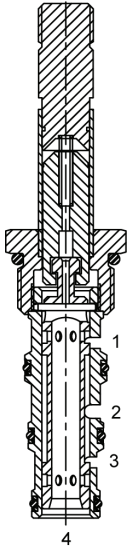
Approximate Coil Weight: .42 lbs (.19 kg.)

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com

**DG-S4A Direct Acting Spool, 4 Way 2 Position****DESCRIPTION**

10 size, 7/8-14 thread, "Delta" series, solenoid operated, 4 way 2 position, side flow spool valve.

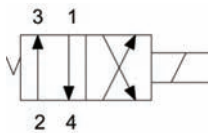
OPERATION

When de-energized the DG-S4A allows flow between (1) to (4) and (2) to (3). When energized the valve allows flow between (2) to (1) and (3) to (4).

OPERATION OF MANUAL OVERRIDE OPTION: To override, pull knob out. On the detented version, after pulling knob out twist 180 degrees and release. The valve will remain in that position.

FEATURES

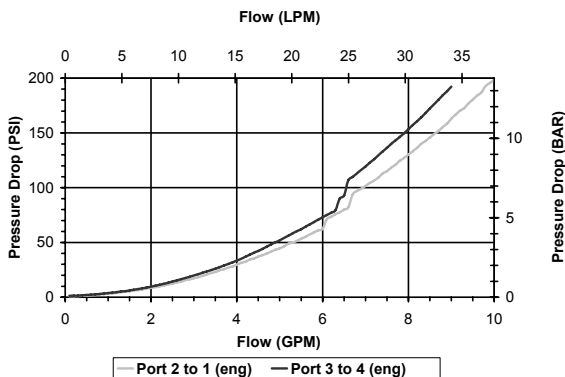
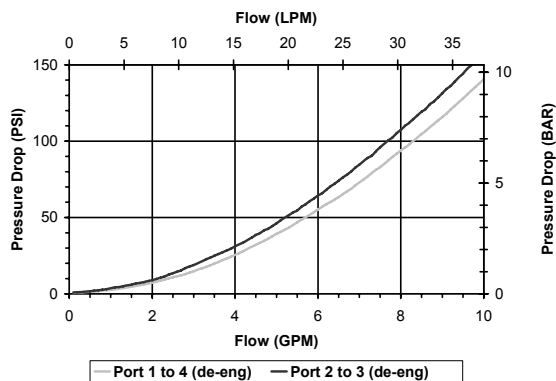
- Hardened parts for long life.
- Efficient wet-armature construction.
- Cartridges are voltage interchangeable.
- Manual override option.
- Industry common cavity.
- Unitized, molded coil design.
- Continuous duty rated solenoid.
- Optional coil voltages and terminations.
- Optional "I" Coil: Weatherproof, Thermal Shock, Immersion Safe.

HYDRAULIC SYMBOL

For higher pressures see HG-S4A.

PERFORMANCE

Actual Test Data (Cartridge Only)

**VALVE SPECIFICATIONS**

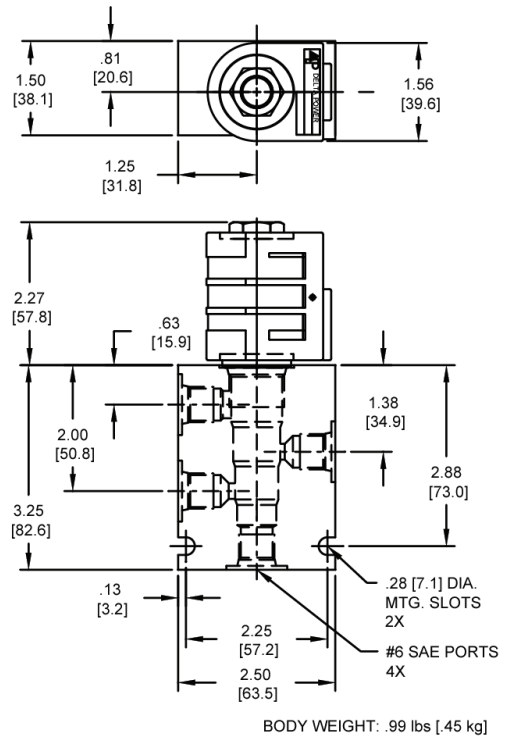
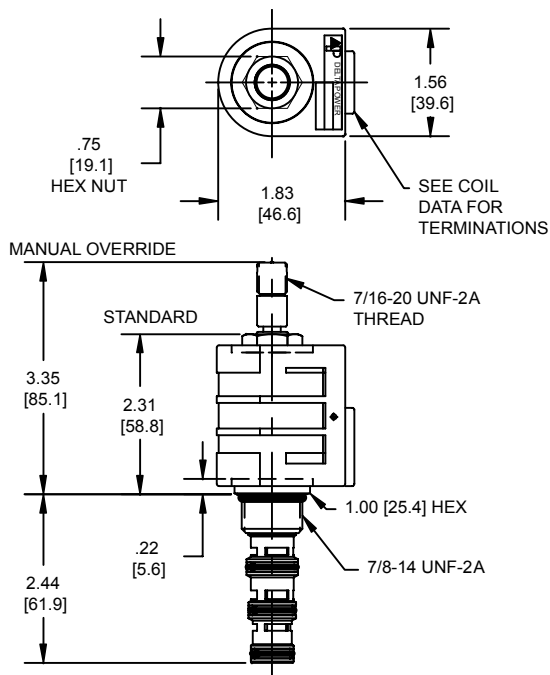
Nominal Flow	10 GPM (38 LPM)
Rated Operating Pressure	3000 PSI (207 bar)
Typical Internal Leakage (150 SSU)	5 cu in/min (82 ml/min) per path
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temperature Range	-40° to 250° F (-40° to 120° C)
Weight	.32 lbs. (.15 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	30 ft-lbs (40.6 Nm)
Coil Nut Torque Requirements	4-6 ft-lbs (5.4-8.1 Nm) Maximum
Cavity	DELTA 4W
Cavity Form Tool (Finishing)	40500002
Seal Kit	21191214

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com


DIMENSIONS

ORDERING INFORMATION
DG-S4A -
OPTIONS

Buna Standard **00**
 Viton Standard **V0**
 Buna, Override **0M**
 Viton, Override **VM**
 Buna, Override, Non-detent **B1**
 Viton, Override, Non-detent **V1**

Blank
N
S

BODIES

Without Body
 1/4 NPTF Ports
 #6 SAE Ports

VOLTAGE

06 6 VDC
12 12 VDC
24 24 VDC
36 36 VDC
48 48 VDC
25 24 VAC
11 120 VAC
22 220 VAC
44 440 VAC

"D" COIL TERMINATION

(All DC Except as Noted)

DL Double Lead
DT Deutsch on Leads DT04-2P
ML Metri-Pack on Leads
PL Packard on Leads
WL Weatherpack on Leads

SS Single Spade
DS Double Spade
HC DIN 43650 (Hirschman) – (AC & DC)
CL Conduit Lead – (AC Only)
DI Deutsch – Integral DT04-2P

IA "I" Coil AMP Superseal - Integral
ID "I" Coil Deutsch – Integral DT04-2P
IJ "I" Coil AMP Jr. Timer - Integral
IM "I" Coil Metri-Pack – Integral

IMMERSION PROOF "D" TYPE

Approximate Coil Weight: .74 lbs (.33 kg.)

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com

**HG-S4A, Direct Acting Spool, 4 Way 2 Position, Criss Cross****DESCRIPTION**

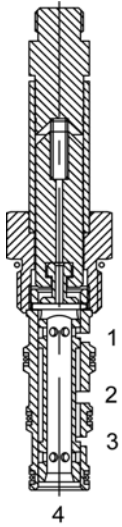
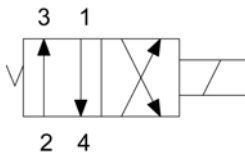
"High Pressure" 10 size, 7/8-14 thread, "Delta" series, 4 way 2 position, side flow spool valve.

OPERATION

When de-energized the HG-S4A allows flow from (1) to (4) and from (2) to (3). When energized the valve allows flow from (2) to (1) and from (3) to (4).

FEATURES

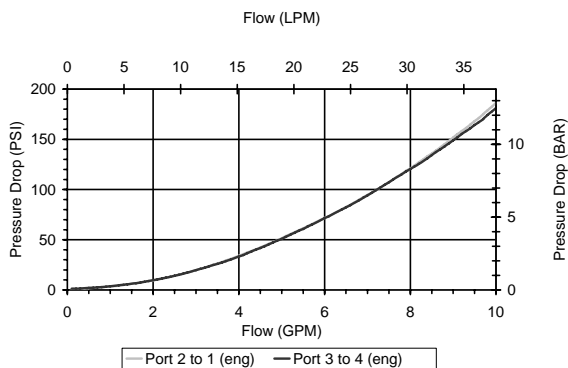
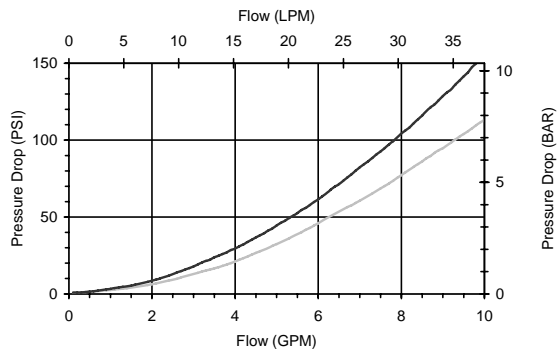
- Hardened parts for long life.
- Efficient wet-armature construction.
- Cartridges are voltage interchangeable.
- Industry common cavity.
- Unitized, molded coil design.
- Continuous duty rated solenoid.
- Optional coil voltages and terminations.
- Optional "I" Coil: Weatherproof, Thermal Shock, Immersion Safe.

**HYDRAULIC SYMBOL**

Uses "L" Coil.

PERFORMANCE

Actual Test Data (Cartridge Only)

**VALVE SPECIFICATIONS**

Nominal Flow	10 GPM (38 LPM)
Rated Operating Pressure	4000 PSI (276 bar)
Typical Internal Leakage (150 SSU)	10 cu in/min (164 ml/min) per path
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temperature Range	-40° to 250° F (-40° to 120° C)
Weight	.44 lbs. (.20 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	35 ft-lbs (47.5 Nm)
Coil Nut Torque Requirements	4-6 ft-lbs (5.4-8.1 Nm)
Cavity	DELTA 4W
Cavity Form Tool (Finishing)	40500002
Seal Kit	21191214

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

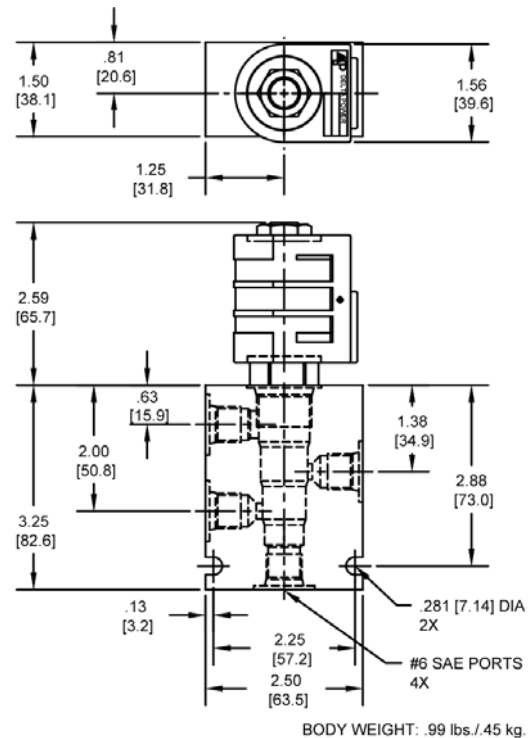
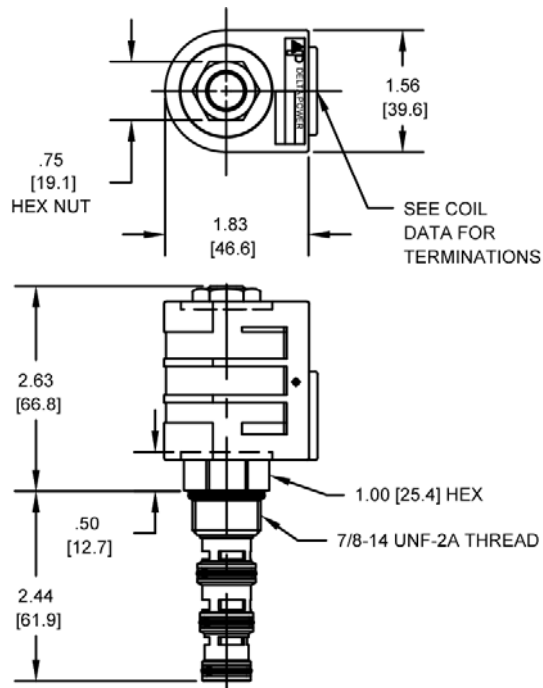
Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com



DIMENSIONS



ORDERING INFORMATION

HG-S4A -

OPTIONS

Buna Standard 00
Viton Standard V0

Blank N
S

BODIES

Without Body
1/4 NPTF Ports
#6 SAE Ports

Note: Aluminum, NOT durability rated for 4000 PSI. Consult factory for body options.

VOLTAGE

06 6 VDC
12 12 VDC
24 24 VDC
36 36 VDC
48 48 VDC
25 24 VAC
11 120 VAC
22 220 VAC
44 440 VAC

"L" COIL TERMINATION

(All DC Except as Noted)

DL Double Lead
DT Deutsch on Leads DT04-2P
ML Metri-Pack on Leads
PL Packard on Leads
WL Weatherpack on Leads

SS Single Spade
DS Double Spade
HC DIN 43650 (Hirschman) - (AC & DC)
CL Conduit Lead - (AC Only)
DI Deutsch - Integral DT04-2P

IMMERSION PROOF "L" TYPE

IA "I" Coil AMP Superseal - Integral
ID "I" Coil Deutsch - Integral DT04-2P
IJ "I" Coil AMP Jr. Timer - Integral
IM "I" Coil Metri-Pack - Integral

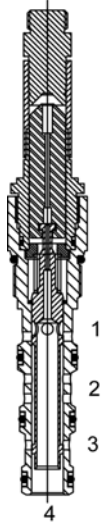
Approximate Coil Weight: .68 lbs. (.31 kg.)

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com

**HV-S4A Direct Acting Spool, 4 Way 2 Position****DESCRIPTION**

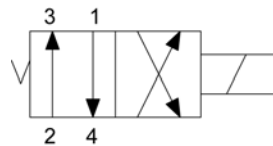
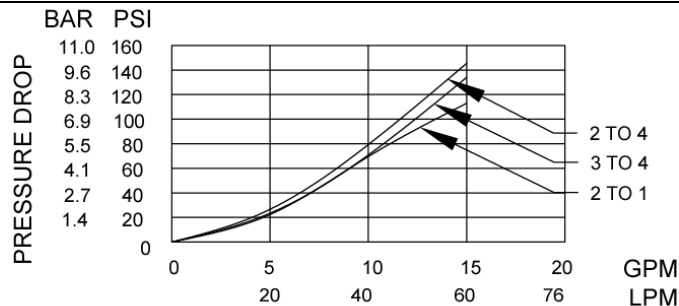
"High pressure" 12 size, 1 1/16-12 thread, "Tecnom" series, solenoid operated, 4 way 2 position, criss cross side flow spool valve.

OPERATION

When de-energized the HV-S4A allows flow from (1) to (4) and from (2) to (3). When energized the valve allows flow from (2) to (1) and from (3) to (4).

FEATURES

- Hardened parts for long life.
- Efficient wet-armature construction.
- Cartridges are voltage interchangeable.
- Industry common cavity.
- Unitized, molded coil design.
- Continuous duty rated solenoid.
- Optional coil voltages and terminations.

HYDRAULIC SYMBOL**PERFORMANCE**

ABOVE CURVE IS WITH
HYDRAULIC OIL 150 SSU AT 100°F.

PORTING OPTIONS	FLOW (GPM)	FLOW (LPM)
2	15	56.7
4	8	30

VALVE SPECIFICATIONS

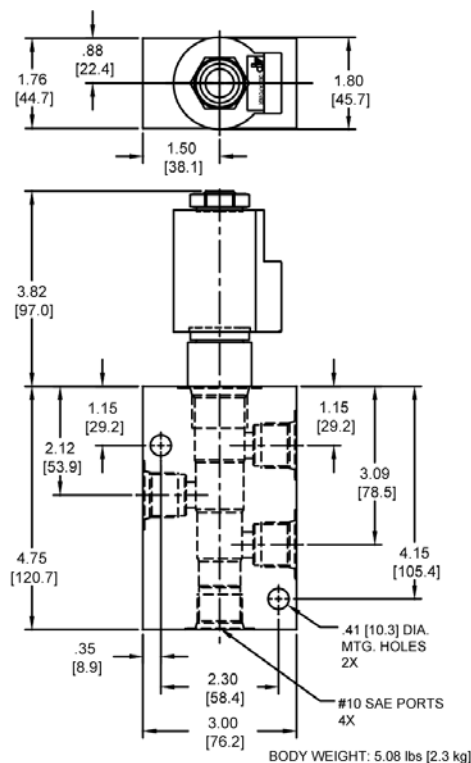
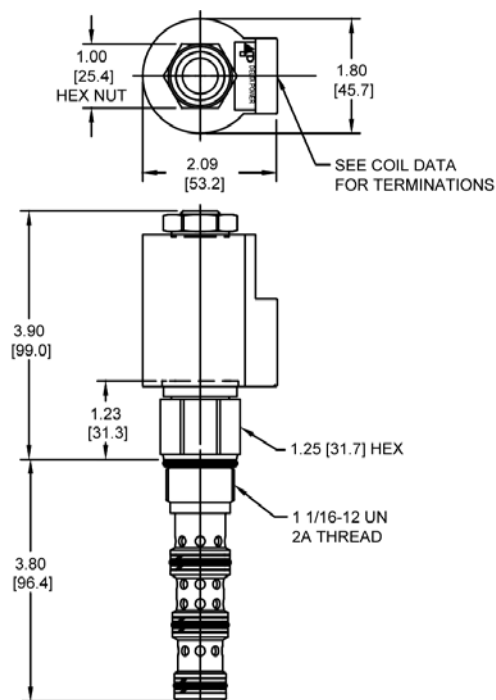
Nominal Flow	15 GPM (57 LPM)
Rated Operating Pressure	5000 PSI (345 bar)
Typical Internal Leakage (150 SSU)	8 cu in/min (131 ml/min) per path
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temperature Range	-40° to 250° F (-40° to 120° C)
Weight	1.07 lbs. (.48 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	70 ft-lbs (94.9 Nm)
Coil Nut Torque Requirements	5-7 ft-lbs (6.8-9.5Nm)
Cavity	TECNORD 4W
Cavity Form Tool (Finishing)	40500035
Seal Kit	21191309

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com


DIMENSIONS

ORDERING INFORMATION
HV-S4A - - - -
OPTIONS

 Buna Standard
 Viton Standard

00
V0

 Blank
S
BODIES

 Without Body
 #10 SAE Ports

"T" COIL TERMINATION
(All DC Except as Noted)

 Double Lead **DL**
 Deutsch on Leads **DT**
 Metri-Pack on Leads **ML**
 Packard on Leads **PL**
 Weatherpack on Leads **WL**
 Double Spade **DS**
 DIN 43650 (Hirschman) – (AC & DC) **HC**
VOLTAGE
06 6 VDC
12 12 VDC
24 24 VDC
36 36 VDC
48 48 VDC
25 24 VAC
11 120 VAC
22 220 VAC

Approximate Coil Weight: .89 lbs/.41 kg.

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

Phone: (815) 397-6628

Fax: (815) 397-2526

 E-mail: delta@delta-power.com

**MD-S4B Direct Acting Spool, 4 Way 2 Position, Closed Center****DESCRIPTION**

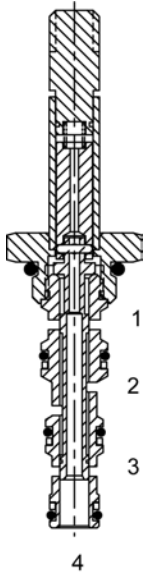
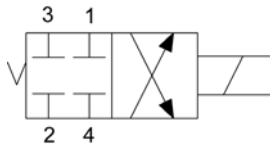
7 size, 5/8-18 thread, "Mini" series, solenoid operated, 4 way 2 position, closed center spool valve.

OPERATION

When de-energized the MD-S4B blocks flow at all ports. When energized the valve allows flow from (2) to (1) and (3) to (4).

FEATURES

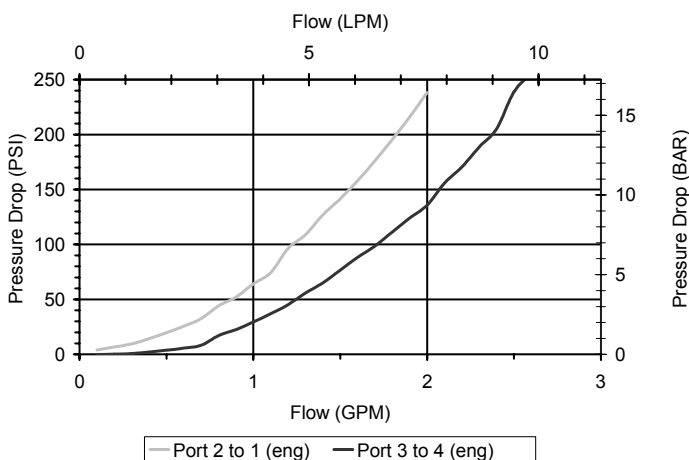
- Hardened parts for long life.
- Efficient wet-armature construction.
- Cartridges are voltage interchangeable.
- Industry common cavity.
- Unitized, molded coil design.
- Continuous duty rated solenoid.
- Optional coil voltages and terminations.

**HYDRAULIC SYMBOL**

Modes of shift operation to 3 GPM, Consult Factory.
For higher pressures or flows see HD-S4B.

PERFORMANCE

Actual Test Data (Cartridge Only)

**VALVE SPECIFICATIONS**

Nominal Flow	1.5 GPM (6 LPM)
Rated Operating Pressure	3000 PSI (207 bar)
Typical Internal Leakage (150 SSU)	5 cu in/min (82 ml/min) per path
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temperature Range	-40° to 250° F (-40° to 120° C)
Weight	.15 lbs. (.07 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	15 ft-lbs (20.3 Nm)
Coil Nut Torque Requirements	3-5 ft-lbs (4.1-6.8 Nm)
Cavity	MINI 4W
Cavity Form Tool (Finishing)	40500006
Seal Kit	21191008

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

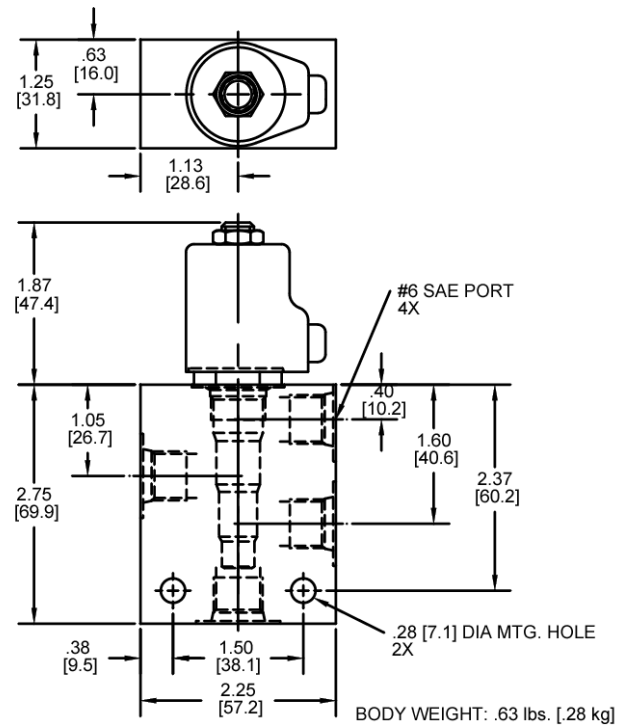
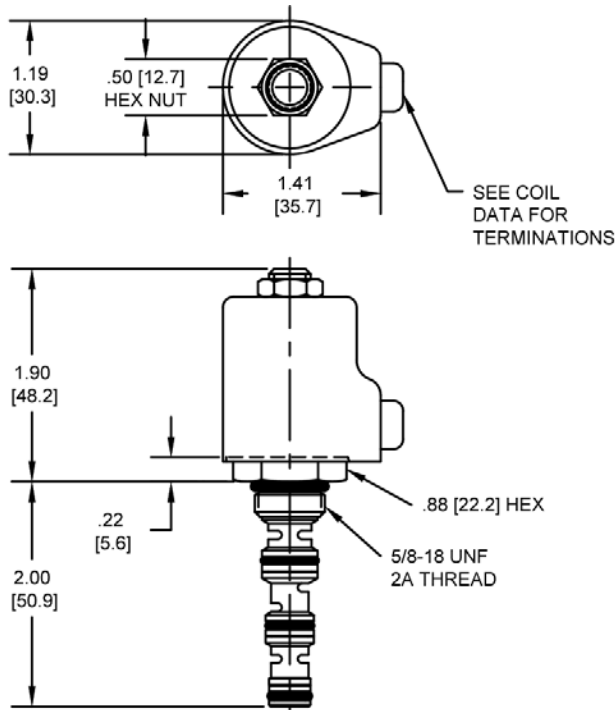
Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com



DIMENSIONS



ORDERING INFORMATION

MD-S4B -

OPTIONS

Buna Standard 00
 Viton Standard V0

"M" COIL TERMINATION

(All DC Except as Noted)

Double Lead DL
 Deutsch on Leads DT04-2P DT
 Metri-Pack on Leads ML
 Packard on Leads PL
 Weatherpack on Leads WL
 Single Spade SS
 Double Spade DS
 DIN 43650 (Hirschman) - (AC&DC) HC
 Conduit Lead - (AC Only) CL

Blank

N
 S

BODIES

Without Body
 1/4 NPTF Ports
 #6 SAE Ports

VOLTAGE

06 6 VDC
 12 12 VDC
 24 24 VDC
 36 36 VDC
 48 48 VDC
 25 24 VAC
 11 120 VAC
 22 220 VAC
 44 440 VAC

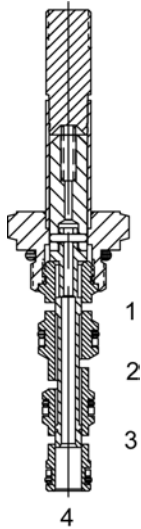
Approximate Coil Weight: .30 lbs/.14 kg.

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com


HD-S4B Direct Acting Spool, 4 Way 2 Position, Closed Center

DESCRIPTION

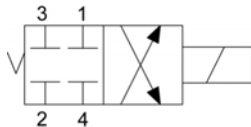
"High Pressure" 7 size, 5/8-18 thread, "Mini" series, solenoid operated, 4 way 2 Position, closed center spool valve.

OPERATION

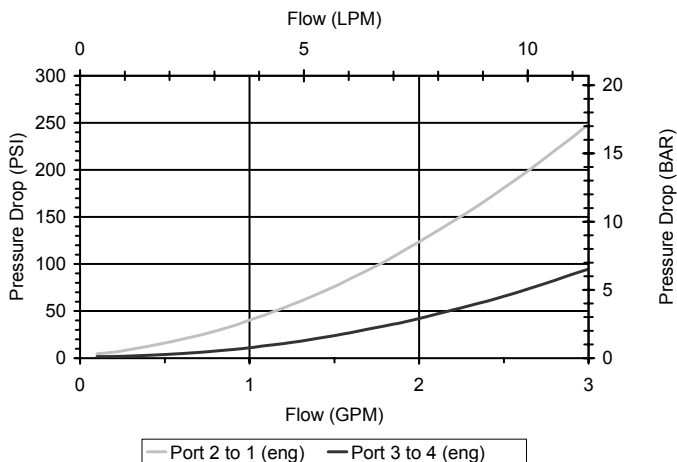
When de-energized the HD-S4B blocks flow at all ports. When energized the valve allows flow from (2) to (1) and (3) to (4).

FEATURES

- Hardened parts for long life.
- Efficient wet-armature construction.
- Cartridges are voltage interchangeable.
- Industry common cavity.
- Unitized, molded coil design (for most common terminations, see coil page).
- Continuous duty rated solenoid.
- Optional coil voltages and terminations.

HYDRAULIC SYMBOL

PERFORMANCE

Actual Test Data (Cartridge Only)


VALVE SPECIFICATIONS

Maximum Flow	3 GPM (11 LPM)
Rated Operating Pressure	4000 PSI (276 bar)
Typical Internal Leakage (150 SSU)	8 cu in/min (131 ml/min) per path
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temperature Range	-40° to 250° F (-40° to 120° C)
Weight	.16 lbs. (.07 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	15 ft-lbs (20 Nm)
Coil Nut Torque Requirements	3-5 ft-lbs (4.1-6.8 Nm)
Cavity	MINI 4W
Cavity Form Tool (Finishing)	40500006
Seal Kit	21191008

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

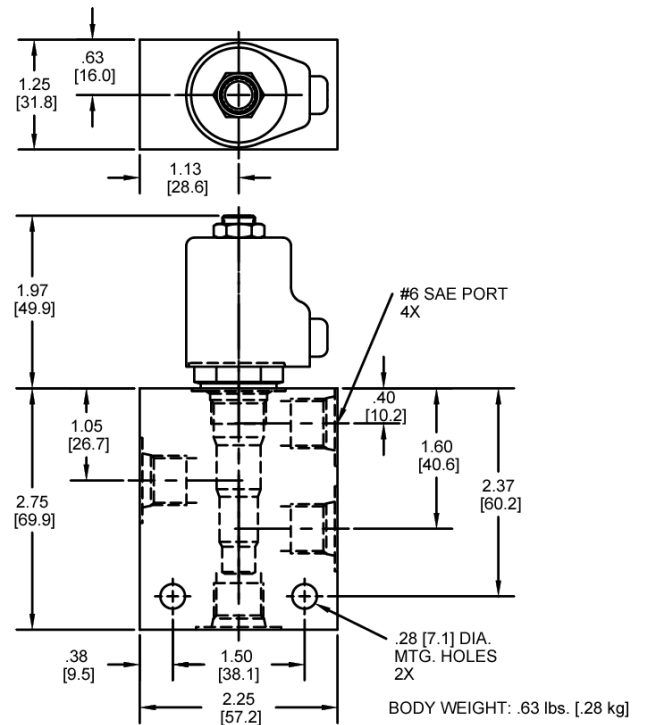
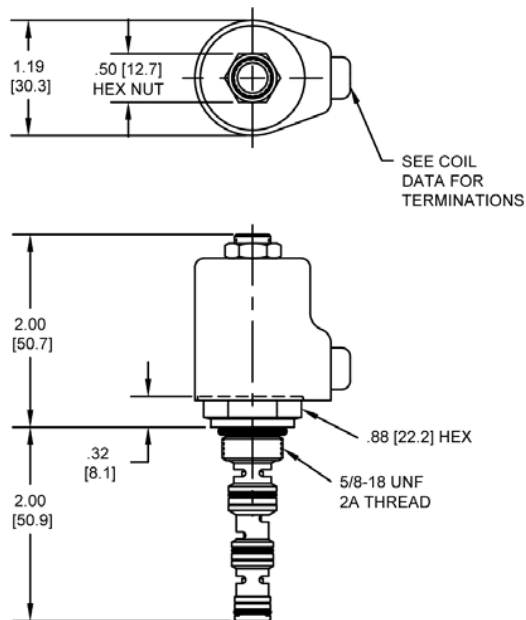
Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com



DIMENSIONS



ORDERING INFORMATION

HD-S4B -

OPTIONS

Buna Standard 00
 Viton Standard V0

"M" COIL TERMINATION

(All DC Except as Noted)

Double Lead DL
 Deutsch on Leads DT04-2P DT
 Metri-Pack on Leads ML
 Packard on Leads PL
 Weatherpack on Leads WL
 Single Spade SS
 Double Spade DS
 DIN 43650 (Hirschman) - (AC & DC) HC
 Conduit Lead - (AC Only) CL

Blank N
 S

BODIES

Without Body
 1/4 NPTF Ports
 #6 SAE Ports

Note: Aluminum, NOT durability rated for 4000 PSI. Consult factory for body options.

VOLTAGE

06 6 VDC
 12 12 VDC
 24 24 VDC
 36 36 VDC
 48 48 VDC
 25 24 VAC
 11 120 VAC
 22 220 VAC
 44 440 VAC

Approximate Coil Weight: .30 lbs/.14 kg.

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

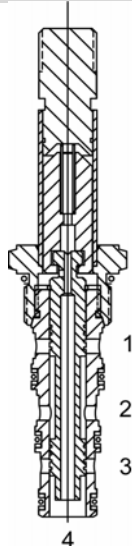
Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com



PQ-S4B Direct Acting Spool, 4 Way 2 Position, Closed Center



DESCRIPTION

8 size, 3/4 -16 thread, "Power" series, solenoid operated, 4 way 2 position, closed center spool valve.

OPERATION

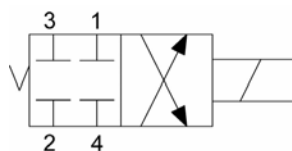
When de-energized the PQ-S4B blocks flow at all ports. When energized the valve allows flow from (2) to (1) and from (3) to (4).

OPERATION OF MANUAL OVERRIDE OPTION: To override, pull knob out. On the detented version, after pulling knob out twist 180 degrees and release. The valve will remain in that position.

FEATURES

- Hardened parts for long life.
- Efficient wet-armature construction.
- Cartridges are voltage interchangeable.
- Manual override option.
- Industry common cavity.
- Unitized, molded coil design.
- Continuous duty rated solenoid.
- Optional coil voltages and terminations.
- Optional "I" Coil: Weatherproof, Thermal Shock, Immersion Safe.

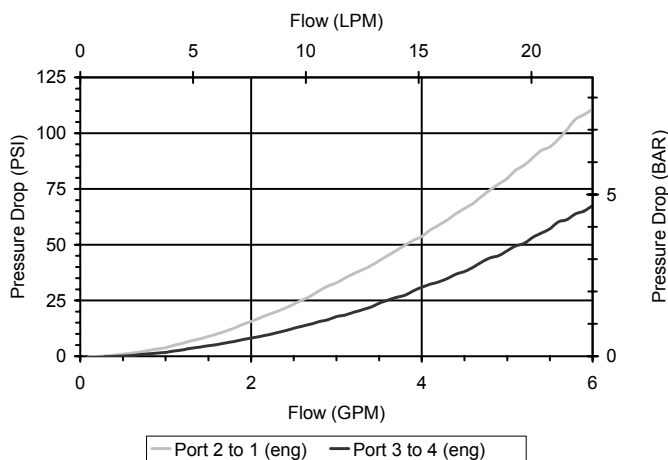
HYDRAULIC SYMBOL



Modes of shift operation to 6 GPM, Consult Factory.

PERFORMANCE

Actual Test Data (Cartridge Only)



VALVE SPECIFICATIONS

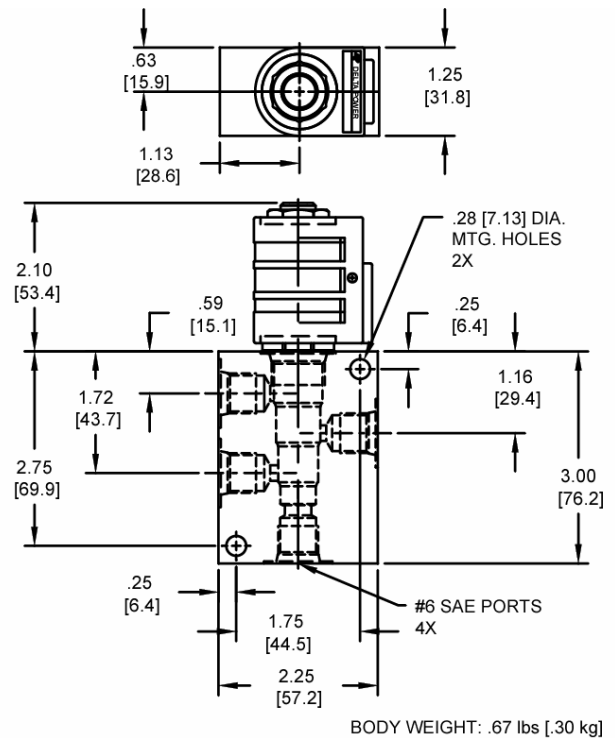
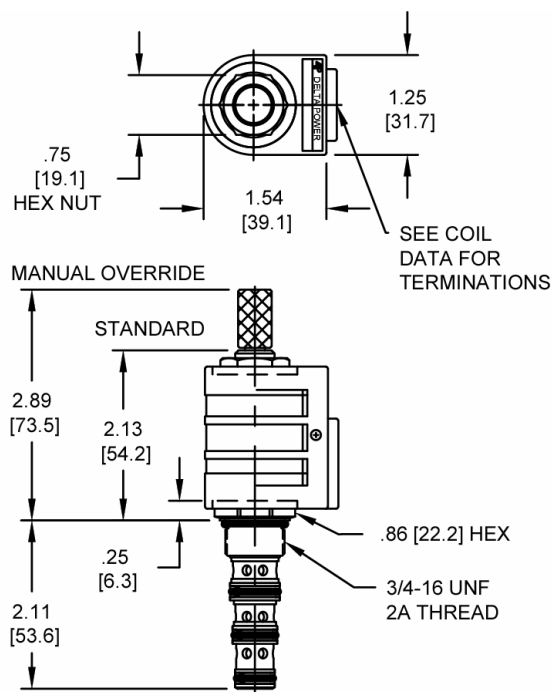
Nominal Flow	4 GPM (15 LPM)
Rated Operating Pressure	3000 PSI (207 bar)
Typical Internal Leakage (150 SSU)	5 cu in/min (82 ml/min) per path
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temperature Range	-40° to 250° F (-40° to 120° C)
Weight	.24 lbs. (.11 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	25 ft-lbs (34 Nm)
Coil Nut Torque Requirements	4-6 ft-lbs (5.4-8.1 Nm)
Cavity	POWER 4W
Cavity Form Tool (Finishing)	40500029
Seal Kit	21191108

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com


DIMENSIONS


BODY WEIGHT: .67 lbs [.30 kg]

ORDERING INFORMATION
PQ-S4B -
OPTIONS

Buna Standard	00
Viton Standard	V0
Buna, Override, Detent	0M
Viton, Override, Detent	VM
Buna, Override, Non-detent	B1
Viton, Override, Non-detent	V1

Blank
N
S

BODIES

Without Body
1/4 NPTF Ports
#6 SAE Ports

VOLTAGE

06	6 VDC
12	12 VDC
24	24 VDC
36	36 VDC
48	48 VDC
25	24 VAC
11	120 VAC
22	220 VAC
44	440 VAC

"P" COIL TERMINATION

(All DC Except as Noted)

DL	Double Lead
DT	Deutsch on Leads DT04-2P
ML	Metri-Pack on Leads
PL	Packard on Leads
WL	Weatherpack on Leads

SS	Single Spade
DS	Double Spade
HC	DIN 43650 (Hirschman) – (AC & DC)
CL	Conduit Lead – (AC Only)
DI	Deutsch – Integral DT04-2P

IMMERSION PROOF "P" TYPE

IA	"I" Coil AMP Superseal - Integral
ID	"I" Coil Deutsch – Integral DT04-2P
IJ	"I" Coil AMP Jr. Timer - Integral
IM	"I" Coil Metri-Pack – Integral

Approximate Coil Weight: .42 lbs (.19 kg.)

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

Phone: (815) 397-6628

Fax: (815) 397-2526

 E-mail: delta@delta-power.com

**DG-S4B Direct Acting Spool, 4 Way 2 Position, Closed Center****DESCRIPTION**

10 size, 7/8 -14 thread, "Delta" series, solenoid operated, 4 way 2 position, closed center spool valve.

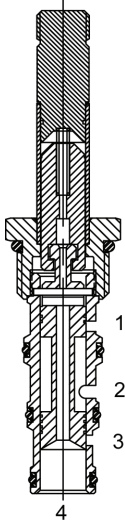
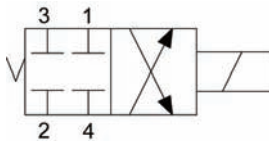
OPERATION

When de-energized the DG-S4B blocks flow at all ports. When energized the valve allows flow from (2) to (1) and (3) to (4).

OPERATION OF MANUAL OVERRIDE OPTION: To override, pull knob out. On the detented version, after pulling knob out twist 180 degrees and release. The valve will remain in that position.

FEATURES

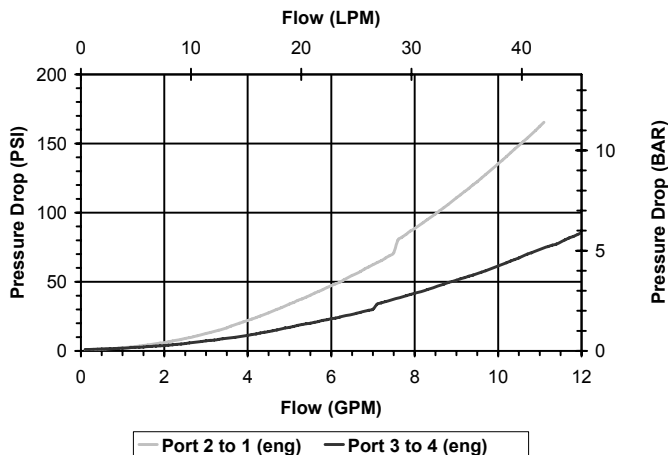
- Hardened parts for long life.
- Efficient wet-armature construction.
- Cartridges are voltage interchangeable.
- Manual override option.
- Industry common cavity.
- Unitized, molded coil design.
- Continuous duty rated solenoid.
- Optional coil voltages and terminations.
- Optional "I" Coil: Weatherproof, Thermal Shock, Immersion Safe.

**HYDRAULIC SYMBOL**

For higher pressures see HG-S4B.
Operational shift limit, 10 GPM.
For shift performance consult chart.

PERFORMANCE

Actual Test Data (Cartridge Only)

**VALVE SPECIFICATIONS**

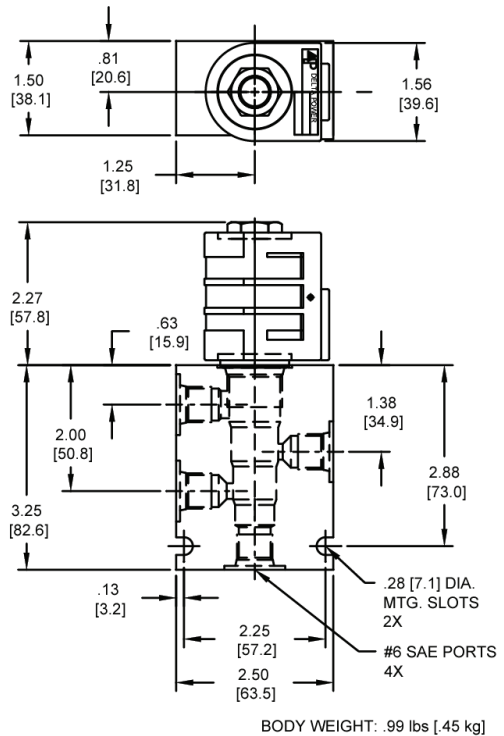
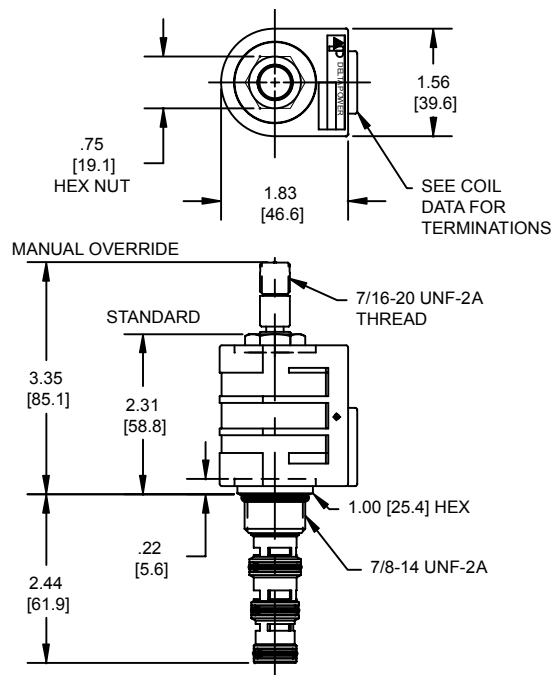
Nominal Flow	10 GPM (38 LPM)
Rated Operating Pressure	3000 PSI (207 bar)
Typical Internal Leakage (150 SSU)	5 cu in/min (82 ml/min) per path
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temperature Range	-40° to 250° F (-40° to 120° C)
Weight	.32 lbs (.15 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	30 ft-lbs (40.6 Nm)
Coil Nut Torque Requirements	4-6 ft-lbs (5.4-8.1 Nm)
Cavity	DELTA 4W
Cavity Form Tool (Finishing)	40500002
Seal Kit	21191214

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com


DIMENSIONS

ORDERING INFORMATION
DG-S4B -
OPTIONS

Buna Standard **00**
 Viton Standard **V0**
 Buna, Override **0M**
 Viton, Override **VM**
 Buna, Override, Non-detent **B1**
 Viton, Override, Non-detent **V1**

Blank

N

S

BODIES

Without Body
 1/4 NPTF Ports
 #6 SAE Ports

VOLTAGE

06 6 VDC
12 12 VDC
24 24 VDC
36 36 VDC
48 48 VDC
25 24 VAC
11 120 VAC
22 220 VAC
44 440 VAC

"D" COIL TERMINATION

(All DC Except as Noted)

DL Double Lead
DT Deutsch on Leads DT04-2P
ML Metri-Pack on Leads
PL Packard on Leads
WL Weatherpack on Leads

SS Single Spade
DS Double Spade
HC DIN 43650 (Hirschman) – (AC & DC)
CL Conduit Lead – (AC Only)
DI Deutsch – Integral DT04-2P

IA "I" Coil AMP Superseal - Integral
ID "I" Coil Deutsch – Integral DT04-2P
IJ "I" Coil AMP Jr. Timer - Integral
IM "I" Coil Metri-Pack – Integral

IMMERSION PROOF "D" TYPE

Approximate Coil Weight: .74 lbs/.33 kg.

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com

**HG-S4B, Direct Acting Spool, 4 Way 2 Position****DESCRIPTION**

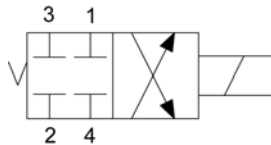
"High Pressure" 10 size, 7/8-14 thread, "Delta" series, solenoid operated, 4 way 2 position closed center spool valve.

OPERATION

When de-energized the HG-S4B blocks flow at all ports. When energized the valve allows flow from (2) to (1) and from (3) to (4).

FEATURES

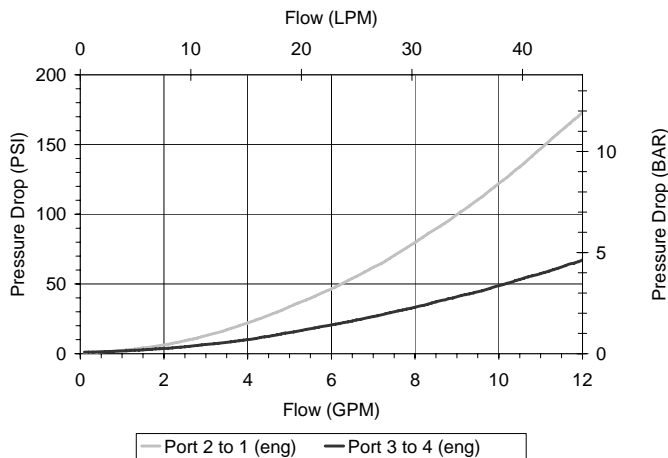
- Hardened parts for long life.
- Efficient wet-armature construction.
- Cartridges are voltage interchangeable.
- Industry common cavity.
- Unitized, molded coil design.
- Continuous duty rated solenoid.
- Optional coil voltages and terminations.
- Optional "I" Coil: Weatherproof, Thermal Shock, Immersion Safe.

HYDRAULIC SYMBOL

Uses "L" Coil

PERFORMANCE

Actual Test Data (Cartridge Only)

**VALVE SPECIFICATIONS**

Nominal Flow	10 GPM (38 LPM)
Rated Operating Pressure	4000 PSI (276 bar)
Typical Internal Leakage (150 SSU)	10 cu in/min (164 ml/min) per path
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temperature Range	-40° to 250° F (-40° to 120° C)
Weight	.44 lbs. (.20 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	35 ft-lbs (47.5 Nm)
Coil Nut Torque Requirements	4-6 ft-lbs (5.4-8.1 Nm)
Cavity	DELTA 4W
Cavity Form Tool (Finishing)	40500002
Seal Kit	21191214

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

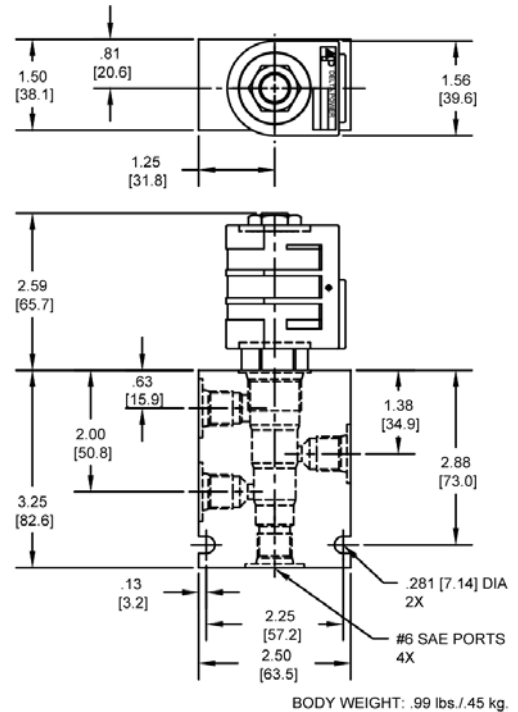
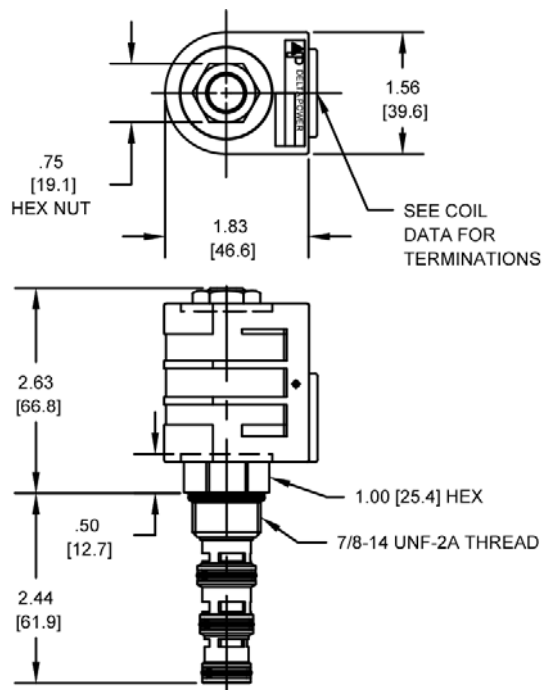
Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com



DIMENSIONS



ORDERING INFORMATION

HG-S4B -

OPTIONS

Buna Standard 00
Viton Standard V0

Blank N
S

BODIES

Without Body
1/4 NPTF Ports
#6 SAE Ports

Note: Aluminum, Not durability rated for 4000 PSI. Consult factory for body options.

VOLTAGE

06 6 VDC
12 12 VDC
24 24 VDC
36 36 VDC
48 48 VDC
25 24 VAC
11 120 VAC
22 220 VAC
44 440 VAC

"L" COIL TERMINATION

(All DC Except as Noted)

DL Double Lead
DT Deutsch on Leads DT04-2P
ML Metri-Pack on Leads
PL Packard on Leads
WL Weatherpack on Leads

SS Single Spade
DS Double Spade
HC DIN 43650 (Hirschman) – (AC & DC)
CL Conduit Lead – (AC Only)
DI Deutsch – Integral DT04-2P

IMMERSION PROOF "L" TYPE

IA "I" Coil AMP Superseal - Integral
ID "I" Coil Deutsch – Integral DT04-2P
IJ "I" Coil AMP Jr. Timer - Integral
IM "I" Coil Metri-Pack – Integral

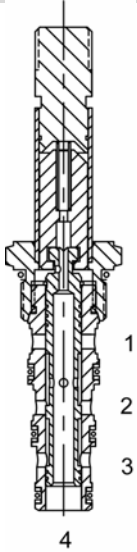
Approximate Coil Weight: .68 lbs. (.31 kg.)

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com

**PQ-S4C Direct Acting Spool, 4 Way 2 Position, Tandem Center****DESCRIPTION**

8 size, 3/4-16 thread, "Power" series, solenoid operated, 4 way 2 position, tandem center spool valve.

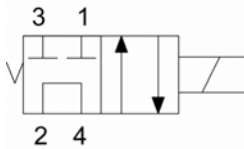
OPERATION

When de-energized the PQ-S4C allows flow between (2) and (4), blocks flow at (1) and (3). When energized the valve allows flow from (2) to (3) and from (1) to (4).

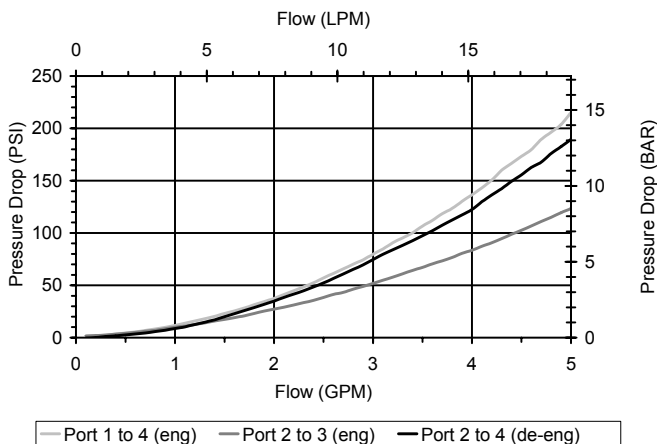
OPERATION OF MANUAL OVERRIDE OPTION: To override, pull knob out. On the detented version, after pulling knob out twist 180 degrees and release. The valve will remain in that position.

FEATURES

- Hardened parts for long life.
- Efficient wet-armature construction.
- Cartridges are voltage interchangeable.
- Manual override option.
- Industry common cavity.
- Unitized, molded coil design.
- Continuous duty rated solenoid.
- Optional coil voltages and terminations.
- Optional "I" Coil: Weatherproof, Thermal Shock, Immersion Safe.

HYDRAULIC SYMBOL**PERFORMANCE**

Actual Test Data (Cartridge Only)

**VALVE SPECIFICATIONS**

Nominal Flow	4 GPM (15 LPM)
Rated Operating Pressure	3000 PSI (207 bar)
Typical Internal Leakage (150 SSU)	5 cu in/min (82 ml/min) per path
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temperature Range	-40° to 250° F (-40° to 120° C)
Weight	.24 lbs. (.11 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	25 ft-lbs (34 Nm)
Coil Nut Torque Requirements	4-6 ft-lbs (5.4-8.1 Nm)
Cavity	<u>POWER 4W</u>
Cavity Form Tool (Finishing)	40500029
Seal Kit	21191108

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

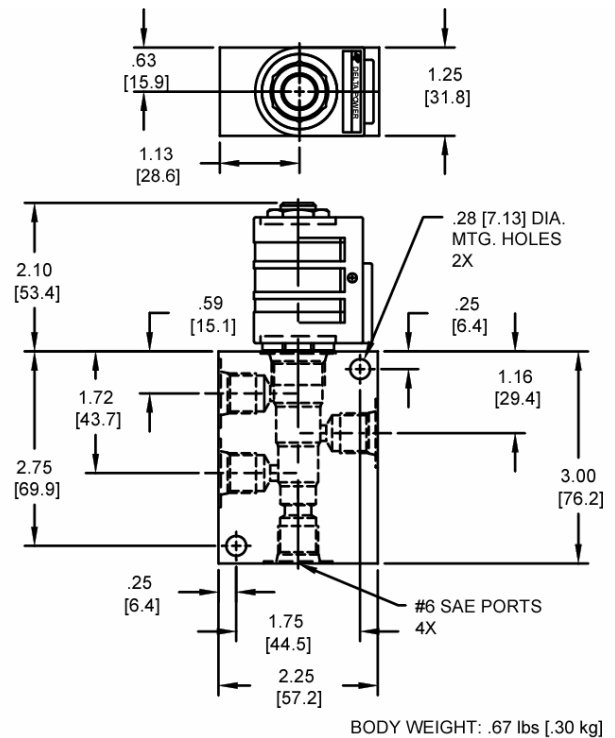
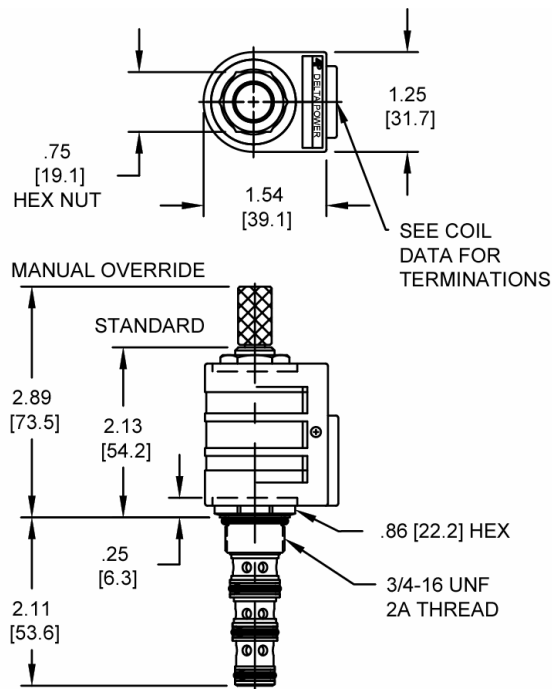
Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com



DIMENSIONS



BODY WEIGHT: .67 lbs [.30 kg]

ORDERING INFORMATION

PQ-S4C -

OPTIONS

Buna Standard **00**
 Viton Standard **V0**
 Buna, Override, Detent **0M**
 Viton, Override, Detent **VM**
 Buna, Override, Non-detent **B1**
 Viton, Override, Non-detent **V1**

Blank
N
S

BODIES

Without Body
 1/4 NPTF Ports
 #6 SAE Ports

VOLTAGE

06 6 VDC
12 12 VDC
24 24 VDC
36 36 VDC
48 48 VDC
25 24 VAC
11 120 VAC
22 220 VAC
44 440 VAC

"P" COIL TERMINATION

(All DC Except as Noted)

DL Double Lead
DT Deutsch on Leads DT04-2P
ML Metri-Pack on Leads
PL Packard on Leads
WL Weatherpack on Leads

SS Single Spade
DS Double Spade
HC DIN 43650 (Hirschman) – (AC & DC)
CL Conduit Lead – (AC Only)
DI Deutsch – Integral DT04-2P

IMMERSION PROOF "P" TYPE

IA "I" Coil AMP Superseal - Integral
ID "I" Coil Deutsch – Integral DT04-2P
IJ "I" Coil AMP Jr. Timer - Integral
IM "I" Coil Metri-Pack – Integral

Approximate Coil Weight: .42 lbs (.19 kg.)

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com

**DG-S4C Direct Acting Spool, 4 Way 2 Position, Tandem Center****DESCRIPTION**

10 size, 7/8 -14 thread, "Delta" series, solenoid operated, 4 way 2 position, tandem center spool valve.

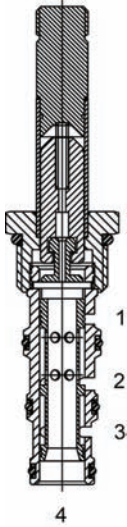
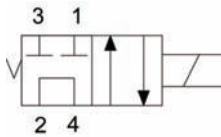
OPERATION

When de-energized the DG-S4C allows flow between (2) and (4), and blocks flow at ports (1) and (3). When energized the valve allows flow from (2) to (3) and (1) to (4).

OPERATION OF MANUAL OVERRIDE OPTION: To override, pull knob out. On the detented version, after pulling knob out twist 180 degrees and release. The valve will remain in that position.

FEATURES

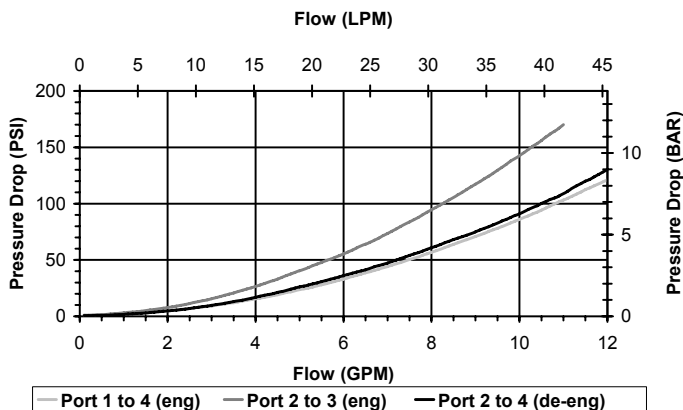
- Hardened parts for long life.
- Efficient wet-armature construction.
- Cartridges are voltage interchangeable.
- Manual override option.
- Industry common cavity.
- Unitized, molded coil design.
- Continuous duty rated solenoid.
- Optional coil voltages and terminations.
- Optional "I" Coil: Weatherproof, Thermal Shock, Immersion Safe.

**HYDRAULIC SYMBOL**

For higher pressures see HG-S4C.
Operational shift limit, 8 GPM.
For shift performance consult chart.

PERFORMANCE

Actual Test Data (Cartridge Only)

**VALVE SPECIFICATIONS**

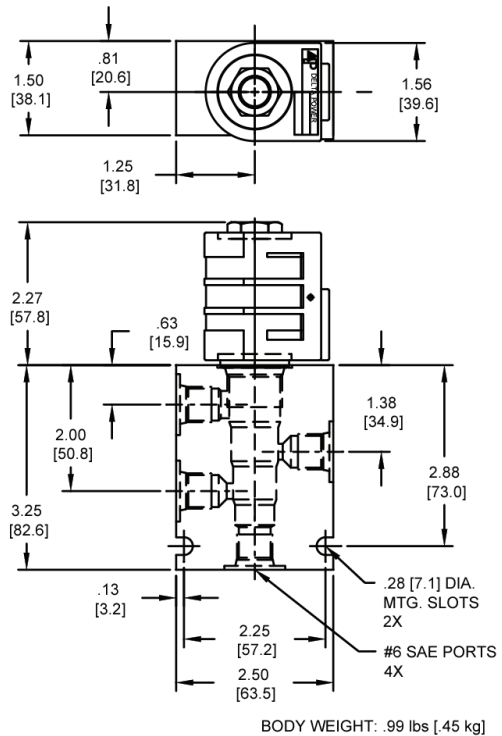
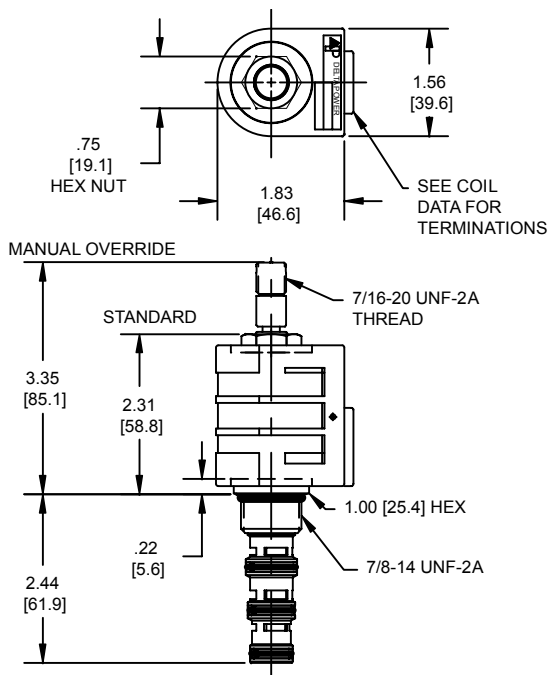
Nominal Flow	8 GPM (30 LPM)
Rated Operating Pressure	3000 PSI (207 bar)
Typical Internal Leakage (150 SSU)	5 cu in/min (82 ml/min) per path
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temperature Range	-40° to 250° F (-40° to 120° C)
Weight	.31 lbs (.14 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	30 ft-lbs (40.6 Nm)
Coil Nut Torque Requirements	4-6 ft-lbs (5.4-8.1Nm)
Cavity	DELTA 4W
Cavity Form Tool (Finishing)	40500002
Seal Kit	21191214

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com


DIMENSIONS

ORDERING INFORMATION
DG-S4C -
OPTIONS

Buna Standard **00**
 Viton Standard **V0**
 Buna, Override **0M**
 Viton, Override **VM**
 Buna, Override, Non-detent **B1**
 Viton, Override, Non-detent **V1**

Blank
N
S

BODIES

Without Body
 1/4 NPTF Ports
 #6 SAE Ports

VOLTAGE

06 6 VDC
12 12 VDC
24 24 VDC
36 36 VDC
48 48 VDC
25 24 VAC
11 120 VAC
22 220 VAC
44 440 VAC

"D" COIL TERMINATION
(All DC Except as Noted)

DL Double Lead
DT Deutsch on Leads DT04-2P
ML Metri-Pack on Leads
PL Packard on Leads
WL Weatherpack on Leads

SS Single Spade
DS Double Spade
HC DIN 43650 (Hirschman) – (AC & DC)
CL Conduit Lead – (AC Only)
DI Deutsch – Integral DT04-2P

IMMERSION PROOF "D" TYPE

IA "I" Coil AMP Superseal - Integral
ID "I" Coil Deutsch – Integral DT04-2P
IJ "I" Coil AMP Jr. Timer - Integral
IM "I" Coil Metri-Pack – Integral

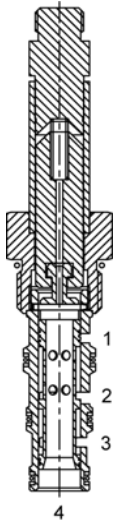
Approximate Coil Weight: .74 lbs/.33 kg.

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com

**HG-S4C, Direct Acting Spool, 4 Way 2 Position, Tandem****DESCRIPTION**

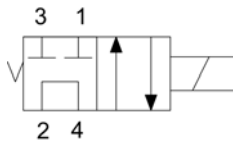
"High Pressure" 10 size, 7/8-14 thread, "Delta" series, solenoid operated, 4 way 2 position tandem center spool valve.

OPERATION

When de-energized the HG-S4C allows flow between (2) and (4) and blocks the flow at (1) and (3). When energized the valve allows flow from (2) to (3) and from (1) to (4).

FEATURES

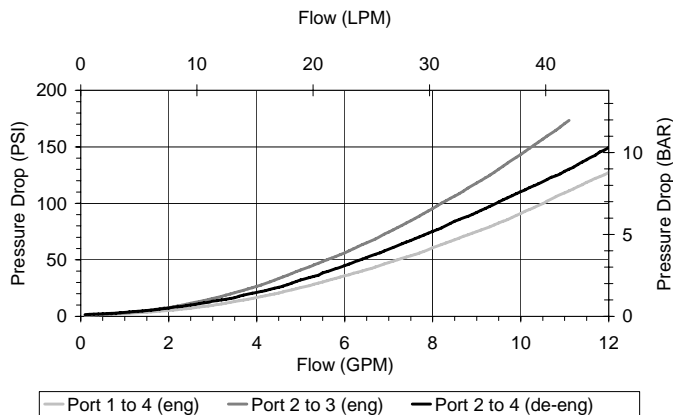
- Hardened Parts for long life.
- Efficient wet-armature construction.
- Cartridges are voltage interchangeable.
- Industry common cavity.
- Unitized, molded coil design.
- Continuous duty rated solenoid.
- Optional coil voltages and terminations.
- Optional "I" Coil: Weatherproof, Thermal Shock, Immersion Safe.

HYDRAULIC SYMBOL

Uses "L" Coil

PERFORMANCE

Actual Test Data (Cartridge Only)

**VALVE SPECIFICATIONS**

Nominal Flow	8 GPM (30 LPM)
Rated Operating Pressure	4000 PSI (276 bar)
Typical Internal Leakage (150 SSU)	10 cu in/min (164 ml/min) per path
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temperature Range	-40° to 250° F (-40° to 120° C)
Weight	.43 lbs. (.20 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	35 ft-lbs (47.5 Nm)
Coil Nut Torque Requirements	4-6 ft-lbs (5.4-8.1 Nm)
Cavity	DELTA 4W
Cavity Form Tool (Finishing)	40500002
Seal Kit	21191214

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

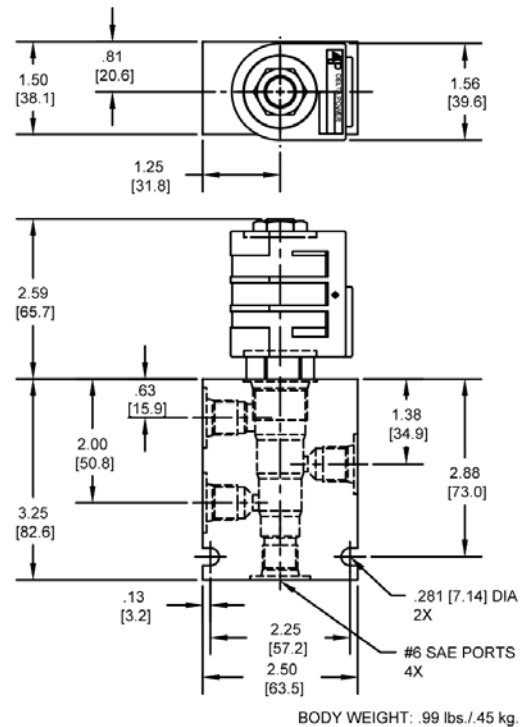
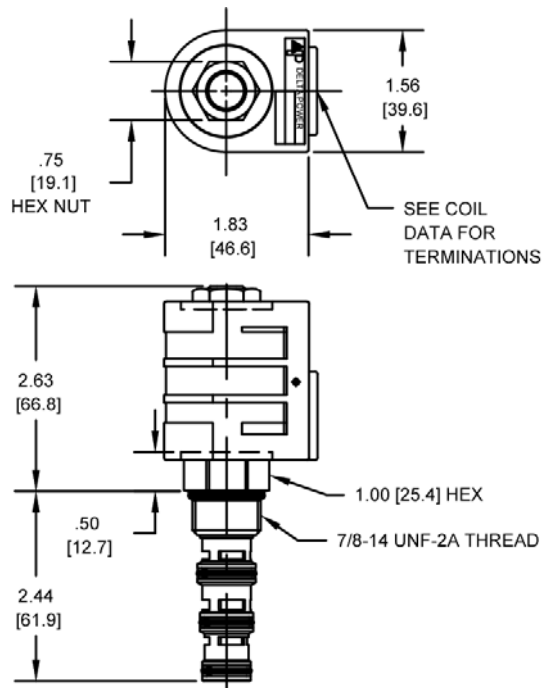
Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com



DIMENSIONS



ORDERING INFORMATION

HG-S4C -

OPTIONS

Buna Standard 00
Viton Standard V0

Blank N
S

BODIES

Without Body
1/4 NPTF Ports
#6 SAE Ports

Note: Aluminum, NOT durability rated for 4000 PSI. Consult factory for body options.

VOLTAGE

06 6 VDC
12 12 VDC
24 24 VDC
36 36 VDC
48 48 VDC
25 24 VAC
11 120 VAC
22 220 VAC
44 440 VAC

"L" COIL TERMINATION

(All DC Except as Noted)

DL Double Lead
DT Deutsch on Leads DT04-2P
ML Metri-Pack on Leads
PL Packard on Leads
WL Weatherpack on Leads

SS Single Spade
DS Double Spade
HC DIN 43650 (Hirschman) - (AC & DC)
CL Conduit Lead - (AC Only)
DI Deutsch - Integral DT04-2P

IA "I" Coil AMP Superseal - Integral
ID "I" Coil Deutsch - Integral DT04-2P
IJ "I" Coil AMP Jr. Timer - Integral
IM "I" Coil Metri-Pack - Integral

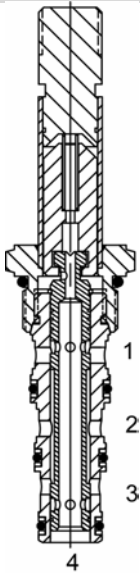
Approximate Coil Weight: .68 lbs. (.31 kg.)

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com

**PQ-S4D Direct Acting Spool, 4 Way 2 Position, Criss Cross****DESCRIPTION**

8 size, 3/4-16 thread, "Power" series, solenoid operated, 4 way 2 position, criss cross, bottom flow spool valve.

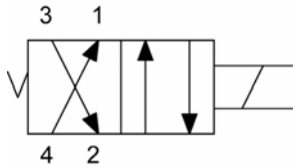
OPERATION

When de-energized the PQ-S4D allows flow from (3) to (2), and from (4) to (1). When energized the valve allows flow from (1) to (2) and from (4) to (3).

OPERATION OF MANUAL OVERRIDE OPTION: To override, pull knob out. On the detented version, after pulling knob out twist 180 degrees and release. The valve will remain in that position.

FEATURES

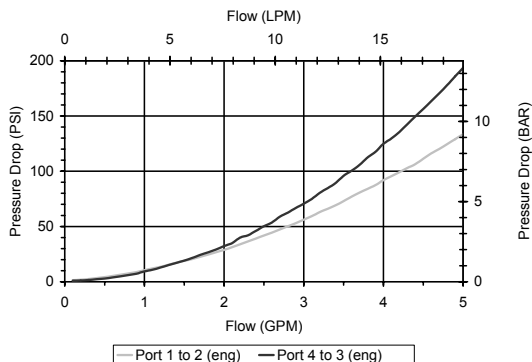
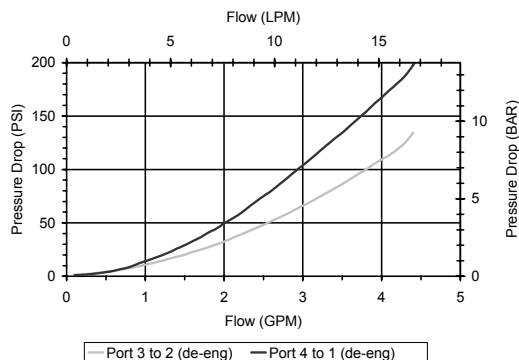
- Hardened parts for long life.
- Efficient wet-armature construction.
- Cartridges are voltage interchangeable.
- Manual override option.
- Industry common cavity.
- Unitized, molded coil design.
- Continuous duty rated solenoid.
- Optional coil voltages and terminations.
- Optional "I" Coil: Weatherproof, Thermal Shock, Immersion Safe.

HYDRAULIC SYMBOL

Modes of shift operation to 3 GPM, Consult Factory.

PERFORMANCE

Actual Test Data (Cartridge Only)

**VALVE SPECIFICATIONS**

Maximum Flow	2.5 GPM (9 LPM)
Rated Operating Pressure	3000 PSI (207 bar)
Typical Internal Leakage (150 SSU)	5 cu in/min (82 ml/min) per path
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temperature Range	-40° to 250° F (-40° to 120° C)
Weight	.24 lbs. (.11 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	25 ft-lbs (33.8 Nm)
Coil Nut Torque Requirements	4-6 ft-lbs (5.4-8.1 Nm)
Cavity	POWER 4W
Cavity Form Tool (Finishing)	40500029
Seal Kit	21191108

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

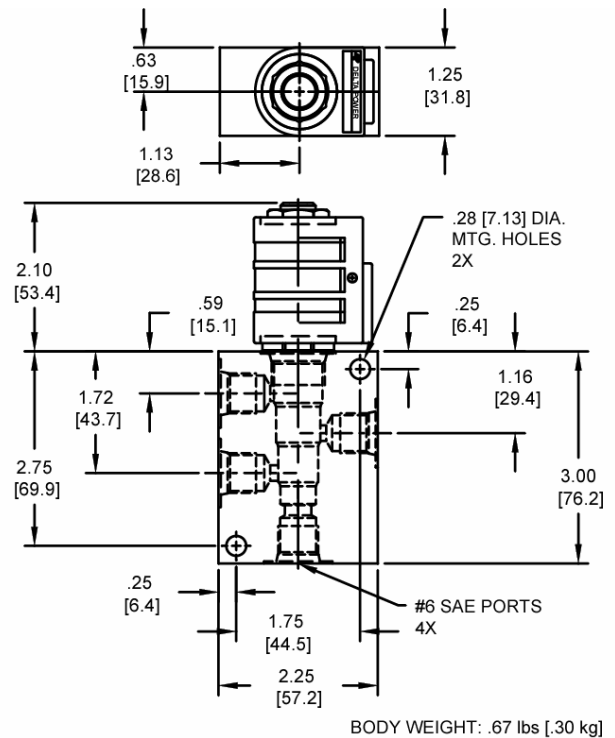
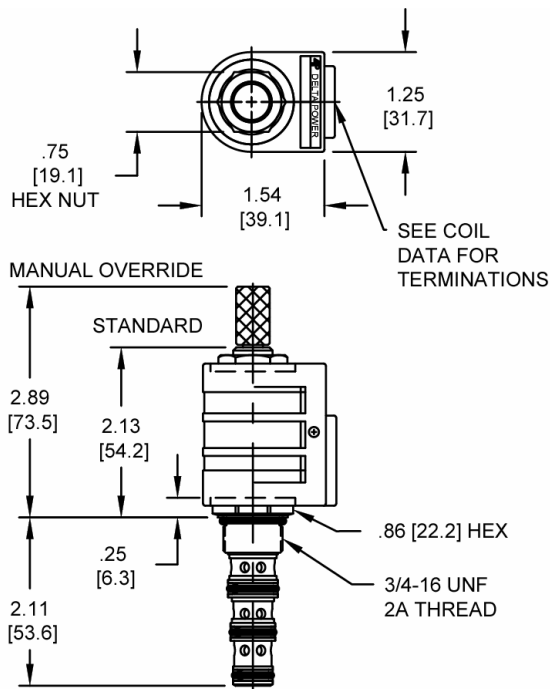
Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com



DIMENSIONS



ORDERING INFORMATION

PQ-S4D

OPTIONS

Buna Standard **00**
 Viton Standard **V0**
 Buna, Override, Detent **0M**
 Viton, Override, Detent **VM**
 Buna, Override, Non-detent **B1**
 Viton, Override, Non-detent **V1**

Blank
N
S

BODIES

Without Body
 1/4 NPTF Ports
 #6 SAE Ports

VOLTAGE

06 6 VDC
12 12 VDC
24 24 VDC
36 36 VDC
48 48 VDC
25 24 VAC
11 120 VAC
22 220 VAC
44 440 VAC

"P" COIL TERMINATION

(All DC Except as Noted)

DL Double Lead
DT Deutsch on Leads DT04-2P
ML Metri-Pack on Leads
PL Packard on Leads
WL Weatherpack on Leads

SS Single Spade
DS Double Spade
HC DIN 43650 (Hirschman) – (AC & DC)
CL Conduit Lead – (AC Only)
DI Deutsch – Integral DT04-2P

IMMERSION PROOF "D" TYPE

IA "I" Coil AMP Superseal - Integral
ID "I" Coil Deutsch – Integral DT04-2P
IJ "I" Coil AMP Jr. Timer - Integral
IM "I" Coil Metri-Pack – Integral

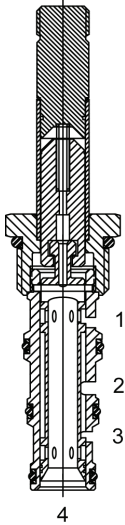
Approximate Coil Weight: .42 lbs (.19 kg.)

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com

**DG-S4D Direct Acting Spool, 4 Way 2 Position, Criss Cross****DESCRIPTION**

10 size, 7/8 -14 thread, "Delta" series, solenoid operated, 4 way 2 position, criss cross, bottom flow spool valve.

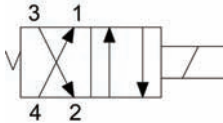
OPERATION

When de-energized the DG-S4D allows flow from (4) to (1), and (3) to (2). When energized the valve allows flow from (4) to (3) and (1) to (2).

OPERATION OF MANUAL OVERRIDE OPTION: To override, pull knob out. On the detented version, after pulling knob out twist 180 degrees and release. The valve will remain in that position.

FEATURES

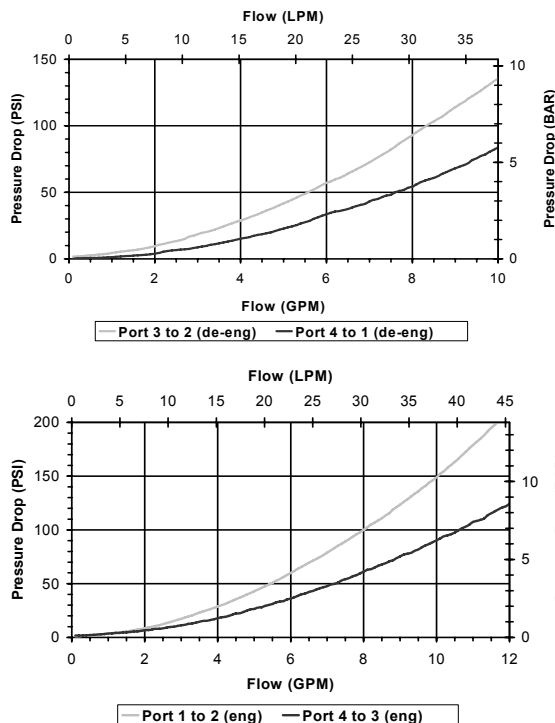
- Hardened parts for long life.
- Efficient wet-armature construction.
- Cartridges are voltage interchangeable.
- Manual override option.
- Industry common cavity.
- Unitized, molded coil design.
- Continuous duty rated solenoid.
- Optional coil voltages and terminations.
- Optional "I" Coil: Weatherproof, Thermal Shock, Immersion Safe.

HYDRAULIC SYMBOL

For higher pressures see HG-S4D.
Operational shift limit, 6 GPM.
For shift performance consult chart.

PERFORMANCE

Actual Test Data (Cartridge Only)

**VALVE SPECIFICATIONS**

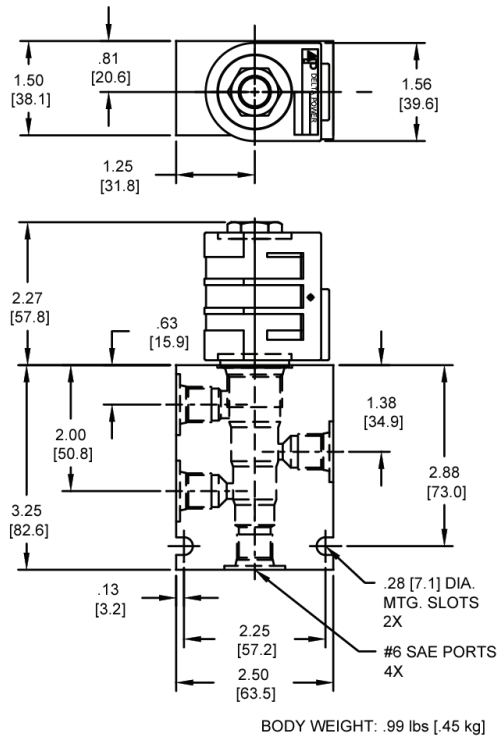
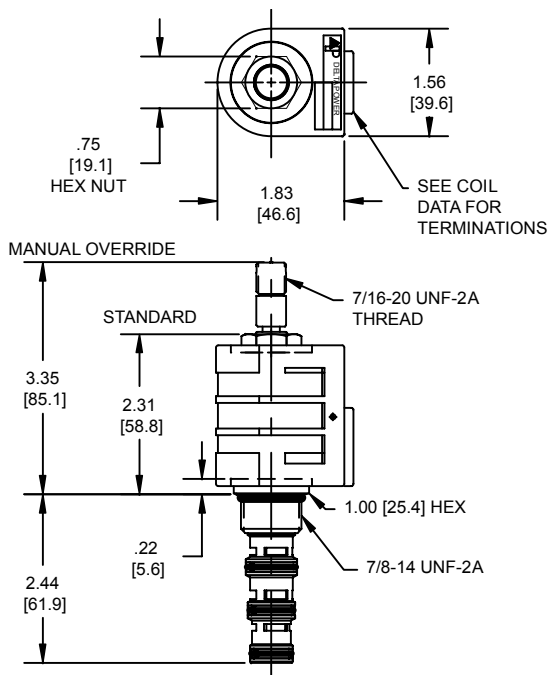
Nominal Flow	6 GPM (23 LPM)
Rated Operating Pressure	3000 PSI (207 bar)
Typical Internal Leakage (150 SSU)	5 cu in/min (82 ml/min) per path
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temperature Range	-40° to 250° F (-40° to 120° C)
Weight	.31 lbs (.14 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	30 ft-lbs (40.6 Nm)
Coil Nut Torque Requirements	4-6 ft-lbs (5.4-8.1 Nm)
Cavity	DELTA 4W
Cavity Form Tool (Finishing)	40500002
Seal Kit	21191214

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com


DIMENSIONS

ORDERING INFORMATION
DG-S4D -
OPTIONS

Buna Standard **00**
 Viton Standard **V0**
 Buna, Override **0M**
 Viton, Override **VM**
 Buna, Override, Non-detent **B1**
 Viton, Override, Non-detent **V1**

Blank
N
S

BODIES

Without Body
 1/4 NPTF Ports
 #6 SAE Ports

VOLTAGE

06 6 VDC
12 12 VDC
24 24 VDC
36 36 VDC
48 48 VDC
25 24 VAC
11 120 VAC
22 220 VAC
44 440 VAC

"D" COIL TERMINATION

(All DC Except as Noted)

DL Double Lead
DT Deutsch on Leads DT04-2P
ML Metri-Pack on Leads
PL Packard on Leads
WL Weatherpack on Leads

SS Single Spade
DS Double Spade
HC DIN 43650 (Hirschman) – (AC & DC)
CL Conduit Lead – (AC Only)
DI Deutsch – Integral DT04-2P

IA "I" Coil AMP Superseal - Integral
ID "I" Coil Deutsch – Integral DT04-2P
IJ "I" Coil AMP Jr. Timer - Integral
IM "I" Coil Metri-Pack – Integral

IMMERSION PROOF "D" TYPE

"I" Coil AMP Superseal - Integral
 "I" Coil Deutsch – Integral DT04-2P
 "I" Coil AMP Jr. Timer - Integral
 "I" Coil Metri-Pack – Integral

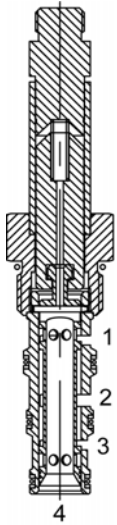
Approximate Coil Weight: .74 lbs/.33 kg.

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com

**HG-S4D, Direct Acting Spool, 4 Way 2 Position, Bottom Flow****DESCRIPTION**

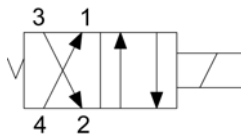
"High Pressure" 10 size, 7/8-14 thread, "Delta" series, solenoid operated, 4 way 2 position bottom flow spool valve.

OPERATION

When de-energized the HG-S4D allows flow from (4) to (1) and from (3) to (2). When energized the valve allows flow from (4) to (3) and from (1) to (2).

FEATURES

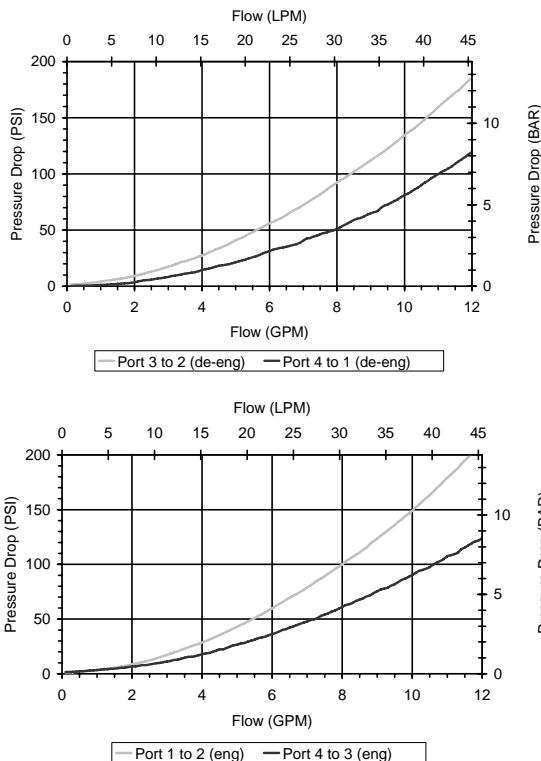
- Hardened parts for long life.
- Efficient wet-armature construction.
- Cartridges are voltage interchangeable.
- Industry common cavity.
- Unitized, molded coil design.
- Continuous duty rated solenoid.
- Optional coil voltages and terminations.
- Optional "I" Coil: Weatherproof, Thermal Shock, Immersion Safe.

HYDRAULIC SYMBOL

Uses "L" Coil

PERFORMANCE

Actual Test Data (Cartridge Only)

**VALVE SPECIFICATIONS**

Nominal Flow	8 GPM (30 LPM)
Rated Operating Pressure	4000 PSI (276 bar)
Typical Internal Leakage (150 SSU)	10 cu in/min (164 ml/min) per path
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temperature Range	-40° to 250° F (-40° to 120° C)
Weight	.43 lbs. (.20 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	35 ft-lbs (47.5 Nm)
Coil Nut Torque Requirements	4-6 ft-lbs (5.4-8.1 Nm)
Cavity	DELTA 4W
Cavity Form Tool (Finishing)	40500002
Seal Kit	21191214

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

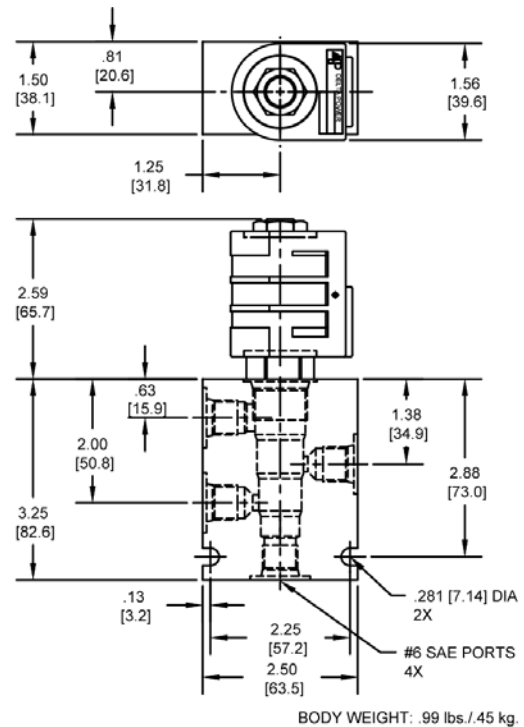
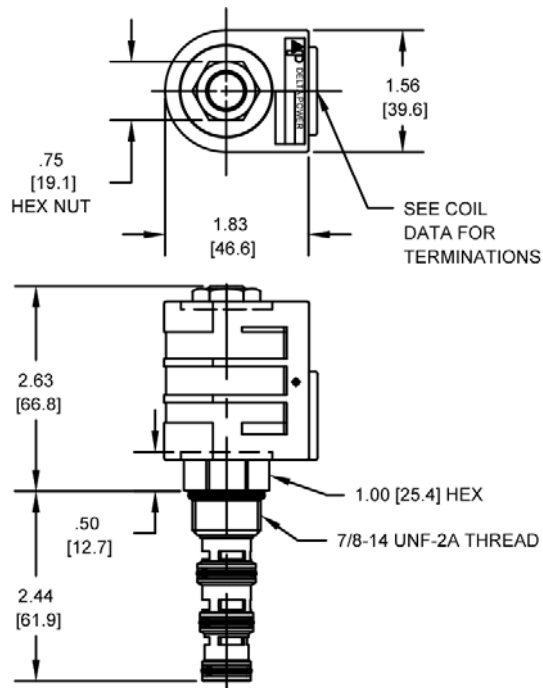
Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com



DIMENSIONS



ORDERING INFORMATION

HG-S4D -

OPTIONS

Buna Standard 00
Viton Standard V0

Blank N
S

BODIES

Without Body
1/4 NPTF Ports
#6 SAE Ports

Note: Aluminum, NOT durability rated for 4000 PSI. Consult factory for options.

VOLTAGE

06 6 VDC
12 12 VDC
24 24 VDC
36 36 VDC
48 48 VDC
25 24 VAC
11 120 VAC
22 220 VAC
44 440 VAC

"L" COIL TERMINATION

(All DC Except as Noted)

DL Double Lead
DT Deutsch on Leads DT04-2P
ML Metri-Pack on Leads
PL Packard on Leads
WL Weatherpack on Leads

SS Single Spade
DS Double Spade
HC DIN 43650 (Hirschman) - (AC & DC)
CL Conduit Lead - (AC Only)
DI Deutsch - Integral DT04-2P

IA "I" Coil AMP Superseal - Integral
ID "I" Coil Deutsch - Integral DT04-2P
IJ "I" Coil AMP Jr. Timer - Integral
IM "I" Coil Metri-Pack - Integral

Approximate Coil Weight: .68 lbs. (.31 kg.)

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com

**DG-S4E Direct Acting Spool, 4 Way 2 Position, Series/Parallel****DESCRIPTION**

10 size, 7/8-14 thread, "Delta" series, solenoid operated, 4 way 2 position, series/parallel spool valve.

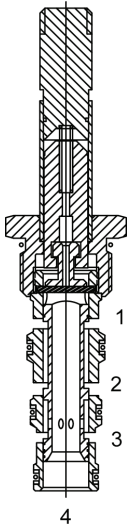
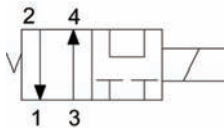
OPERATION

When de-energized the DG-S4E allows flow from (2) and (1), and (3) to (4). When energized the valve allows flow (2) to (4) and blocks the flow at (1) and (3).

OPERATION OF MANUAL OVERRIDE OPTION: To override, pull knob out. On the detented version, after pulling knob out twist 180 degrees and release. The valve will remain in that position.

FEATURES

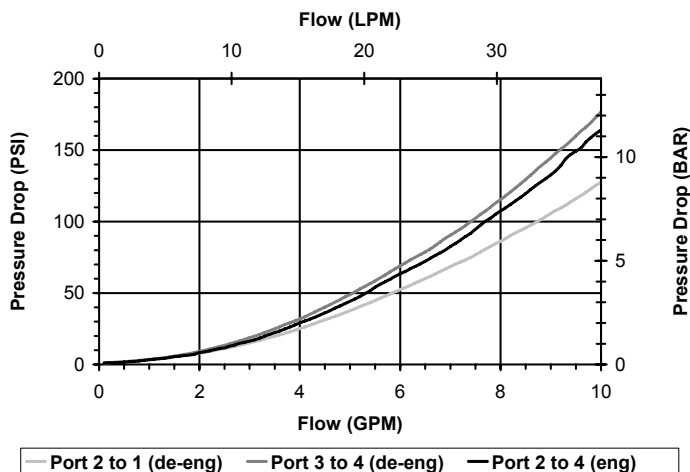
- Hardened parts for long life.
- Efficient wet-armature construction.
- Cartridges are voltage interchangeable.
- Manual override option.
- Industry common cavity.
- Unitized, molded coil design.
- Continuous duty rated solenoid.
- Optional coil voltages and terminations.
- Optional "I" Coil: Weatherproof, Thermal Shock, Immersion Safe.

**HYDRAULIC SYMBOL**

For higher pressures see HG-S4E.
Operational shift limit, 6 GPM.
For shift performance consult chart.

PERFORMANCE

Actual Test Data (Cartridge Only)

**VALVE SPECIFICATIONS**

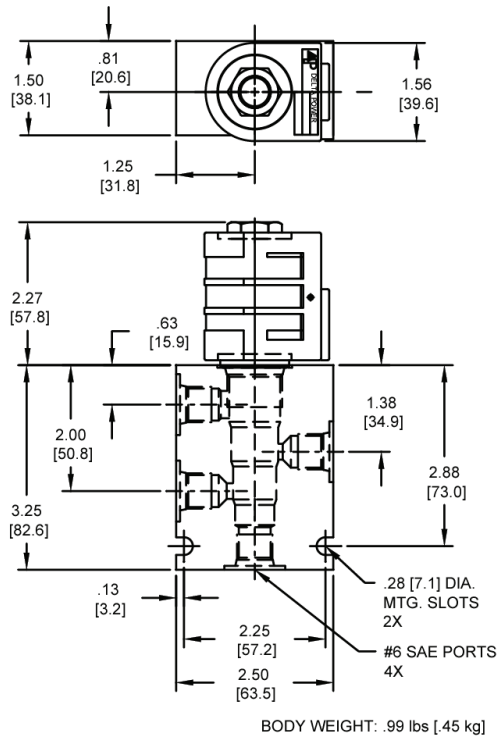
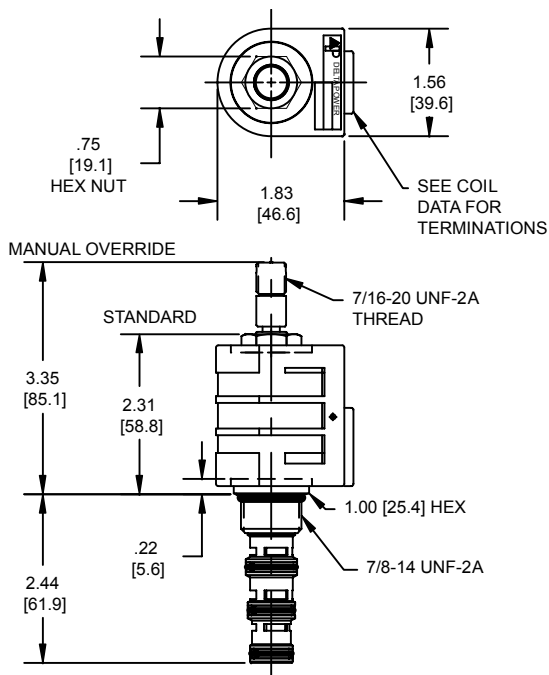
Nominal Flow	6 GPM (23 LPM)
Rated Operating Pressure	3000 PSI (207 bar)
Typical Internal Leakage (150 SSU)	5 cu in/min (82 ml/min) per path
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temperature Range	-40° to 250° F (-40° to 120° C)
Weight	.31 lbs (.14 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	30 ft-lbs (40.6 Nm)
Coil Nut Torque Requirements	4-6 ft-lbs (5.4-8.1 Nm)
Cavity	DELTA 4W
Cavity Form Tool (Finishing)	40500002
Seal Kit	21191214

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com


DIMENSIONS

ORDERING INFORMATION
DG-S4E -
OPTIONS

Buna Standard **00**
 Viton Standard **V0**
 Buna, Override **0M**
 Viton, Override **VM**
 Buna, Override, Non-detent **B1**
 Viton, Override, Non-detent **V1**

Blank **N**
 1/4 NPTF Ports **S**
 #6 SAE Ports

BODIES

Without Body
 1/4 NPTF Ports
 #6 SAE Ports

VOLTAGE

06 6 VDC
12 12 VDC
24 24 VDC
36 36 VDC
48 48 VDC
25 24 VAC
11 120 VAC
22 220 VAC
44 440 VAC

"D" COIL TERMINATION

(All DC Except as Noted)

DL Double Lead
DT Deutsch on Leads DT04-2P
ML Metri-Pack on Leads
PL Packard on Leads
WL Weatherpack on Leads

SS Single Spade
DS Double Spade
HC DIN 43650 (Hirschman) – (AC & DC)
CL Conduit Lead – (AC Only)
DI Deutsch – Integral DT04-2P

IA "I" Coil AMP Superseal - Integral
ID "I" Coil Deutsch – Integral DT04-2P
IJ "I" Coil AMP Jr. Timer - Integral
IM "I" Coil Metri-Pack – Integral

IMMERSION PROOF "D" TYPE

"I" Coil AMP Superseal - Integral
 "I" Coil Deutsch – Integral DT04-2P
 "I" Coil AMP Jr. Timer - Integral
 "I" Coil Metri-Pack – Integral

Approximate Coil Weight: .74 lbs/.33 kg.

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com

**HG-S4E, Direct Acting Spool, 4 Way 2 Position, Series/Parallel****DESCRIPTION**

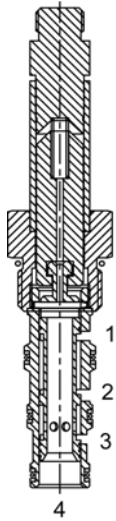
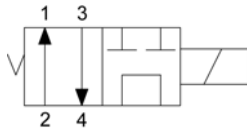
"High Pressure" 10 size, 7/8-14 thread, "Delta" series, solenoid operated, 4 way 2 position series / parallel spool valve.

OPERATION

When de-energized the HG-S4E allows flow from (1) to (2) and from (3) to (4). When energized the valve allows flow from (2) to (4) and blocks flow at (1) and (3).

FEATURES

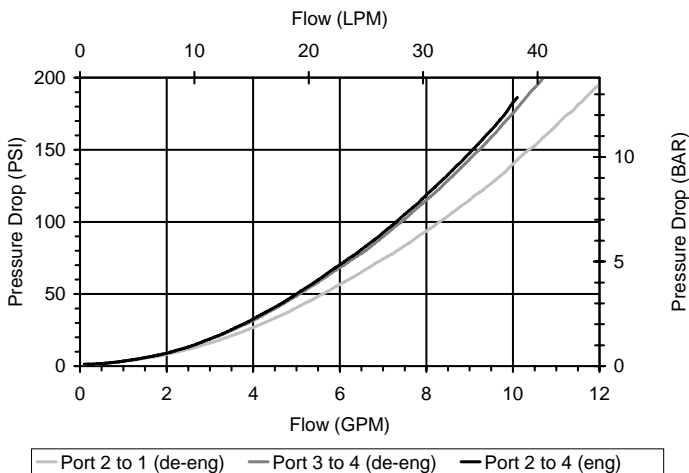
- Hardened parts for long life.
- Efficient wet-armature construction.
- Cartridges are voltage interchangeable.
- Industry common cavity.
- Unitized, molded coil design.
- Continuous duty rated solenoid.
- Optional coil voltages and terminations.
- Optional "I" Coil: Weatherproof, Thermal Shock, Immersion Safe.

**HYDRAULIC SYMBOL**

Uses "L" Coil

PERFORMANCE

Actual Test Data (Cartridge Only)

**VALVE SPECIFICATIONS**

Nominal Flow	8 GPM (30 LPM)
Rated Operating Pressure	4000 PSI (276 bar)
Typical Internal Leakage (150 SSU)	10 cu in/min (164 ml/min) per path
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temperature Range	-40° to 250° F (-40° to 120° C)
Weight	.43 lbs. (.20 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	35 ft-lbs (47.5 Nm)
Coil Nut Torque Requirements	4-6 ft-lbs (5.4-8.1 Nm)
Cavity	DELTA 4W
Cavity Form Tool (Finishing)	40500002
Seal Kit	21191214

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

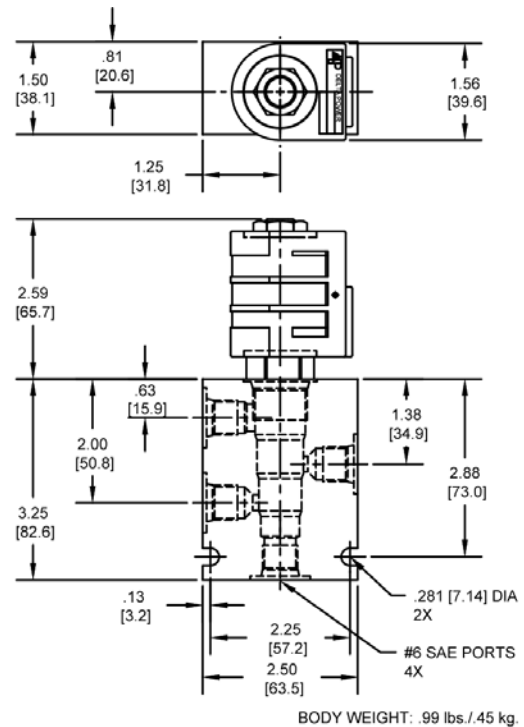
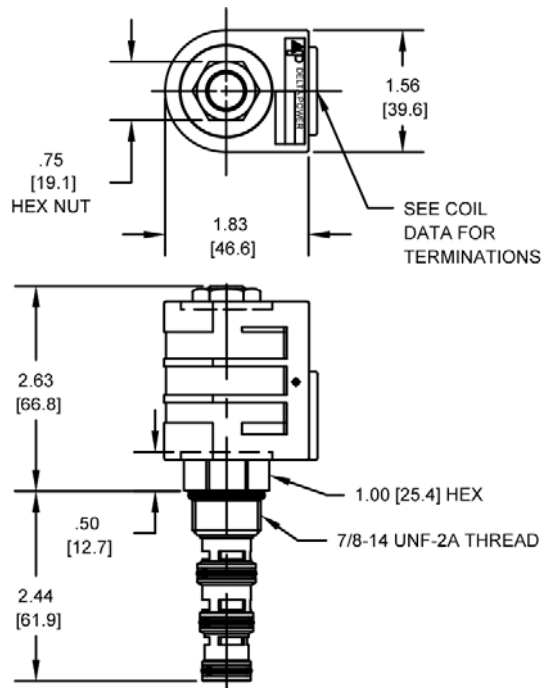
Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com



DIMENSIONS



ORDERING INFORMATION

HG-S4E -

OPTIONS

Buna Standard 00
Viton Standard V0

Blank

N
S

BODIES

Without Body
1/4 NPTF Ports
#6 SAE Ports

Note: Aluminum, NOT durability rated for 4000 PSI. Consult factory for body options.

VOLTAGE

06 6 VDC
12 12 VDC
24 24 VDC
36 36 VDC
48 48 VDC
25 24 VAC
11 120 VAC
22 220 VAC
44 440 VAC

"L" COIL TERMINATION

(All DC Except as Noted)

DL Double Lead
DT Deutsch on Leads DT04-2P
ML Metri-Pack on Leads
PL Packard on Leads
WL Weatherpack on Leads

SS Single Spade
DS Double Spade
HC DIN 43650 (Hirschman) - (AC & DC)
CL Conduit Lead - (AC Only)
DI Deutsch - Integral DT04-2P

IA "I" Coil AMP Superseal - Integral
ID "I" Coil Deutsch - Integral DT04-2P
IJ "I" Coil AMP Jr. Timer - Integral
IM "I" Coil Metri-Pack - Integral

IMMERSION PROOF "L" TYPE

Approximate Coil Weight: .68 lbs. (.31 kg.)

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

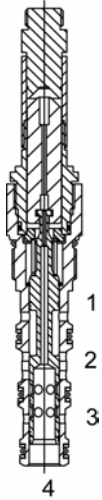
Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com



HV-S4E Direct Acting Spool, 4 Way 2 Position, Series / Parallel



DESCRIPTION

"High pressure" 12 size, 1 1/16-12 thread, "Tecnord" series, solenoid operated, 4 way 2 position, series / parallel flow spool valve.

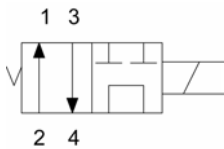
OPERATION

When de-energized the HV-S4E allows flow from (2) to (1) and from (3) to (4). When energized the valve allows flow from (2) to (4) and blocks flow at (1) to (3).

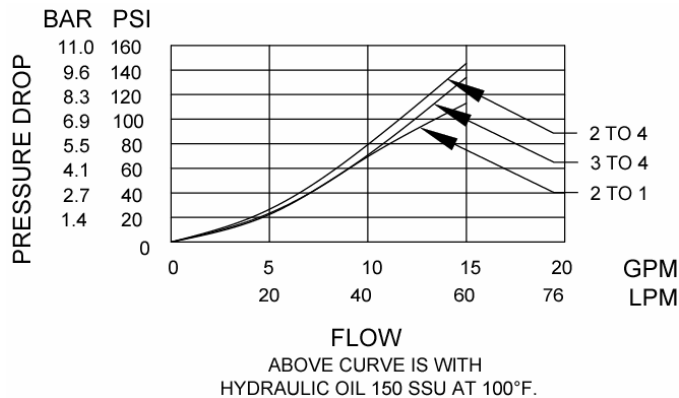
FEATURES

- Hardened parts for long life.
- Efficient wet-armature construction.
- Cartridges are voltage interchangeable.
- Industry common cavity.
- Unitized, molded coil design.
- Continuous duty rated solenoid.
- Optional coil voltages and terminations.

HYDRAULIC SYMBOL



PERFORMANCE



VALVE SPECIFICATIONS

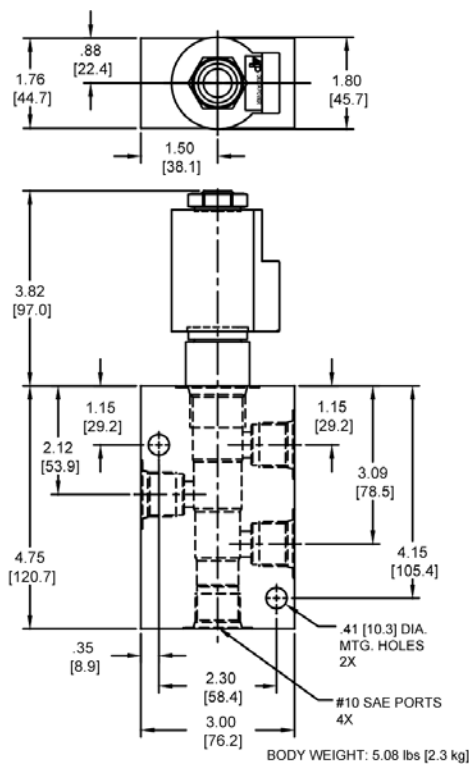
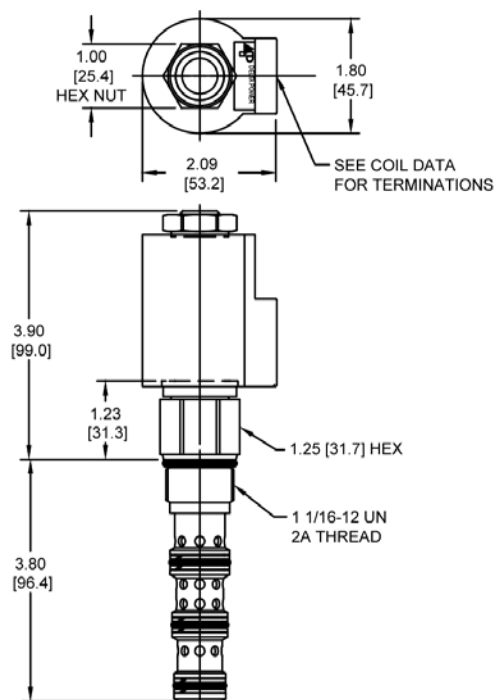
Nominal Flow	15 GPM (57 LPM) From (2) to (4) 8 GPM (30 LPM) from (4) to (2)
Rated Operating Pressure	5000 PSI (345 bar)
Typical Internal Leakage (150 SSU)	8 cu in/min (131 ml/min) per path
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temperature Range	-40° to 250° F (-40° to 120° C)
Weight	1.09 lbs. (.49 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	70 ft-lbs (94.9 Nm)
Coil Nut Torque Requirements	5-7 ft-lbs (6.8-9.5 Nm) Maximum
Cavity	TECNORD 4W
Cavity Form Tool (Finishing)	40500035
Seal Kit	21191309

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com


DIMENSIONS

ORDERING INFORMATION
HV-S4E
OPTIONS

 Buna Standard
 Viton Standard

00
V0

 Blank
S
BODIES

 Without Body
 #10 SAE Ports

"T" COIL TERMINATION
(All DC Except as Noted)

 Double Lead **DL**
 Deutsch on Leads **DT**
 Metri-Pack on Leads **ML**
 Packard on Leads **PL**
 Weatherpack on Leads **WL**
 Double Spade **DS**
 DIN 43650 (Hirschman) – (AC & DC) **HC**
VOLTAGE
06 6 VDC
12 12 VDC
24 24 VDC
36 36 VDC
48 48 VDC
25 24 VAC
11 120 VAC
22 220 VAC

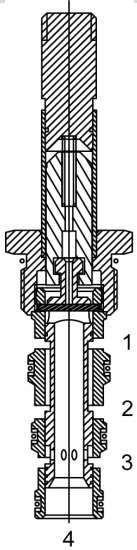
Approximate Coil Weight: .89 lbs/.41 kg.

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

Phone: (815) 397-6628

Fax: (815) 397-2526

 E-mail: delta@delta-power.com

**DG-S4F Direct Acting Spool, 4 Way 2 Position, Energized to Block****DESCRIPTION**

10 size, 7/8-14 thread, "Delta" series, solenoid operated, 4 way 2 position, energized to block spool valve.

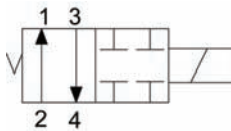
OPERATION

When de-energized the DG-S4F allows flow from (2) and (1), and from (3) to (4). When energized the valve blocks flow at all ports.

OPERATION OF MANUAL OVERRIDE OPTION: To override, pull knob out. On the detented version, after pulling knob out twist 180 degrees and release. The valve will remain in that position.

FEATURES

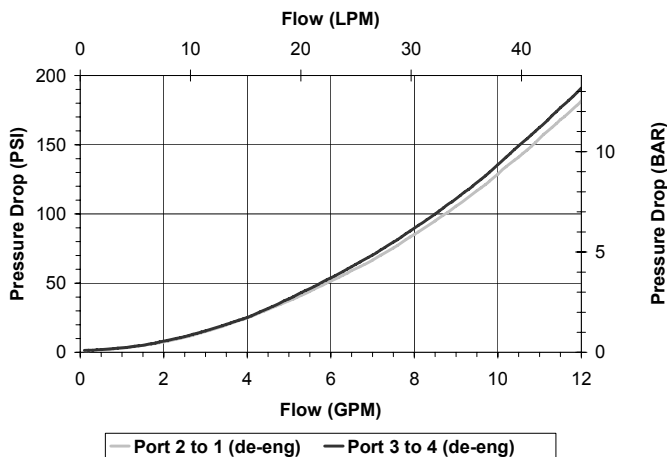
- Hardened parts for long life.
- Efficient wet-armature construction.
- Cartridges are voltage interchangeable.
- Manual override option.
- Industry common cavity.
- Unitized, molded coil design.
- Continuous duty rated solenoid.
- Optional coil voltages and terminations.
- Optional "I" Coil: Weatherproof, Thermal Shock, Immersion Safe.

HYDRAULIC SYMBOL

For higher pressures see HG-S4F.
Operational shift limit, 6 GPM.
For shift performance consult chart.

PERFORMANCE

Actual Test Data (Cartridge Only)

**VALVE SPECIFICATIONS**

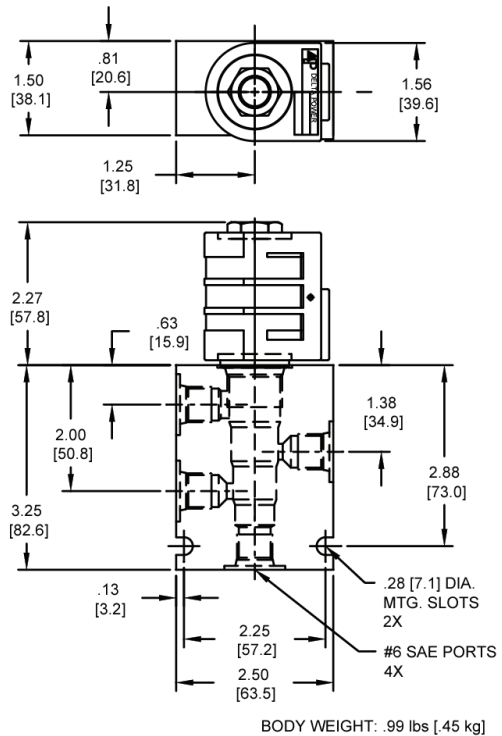
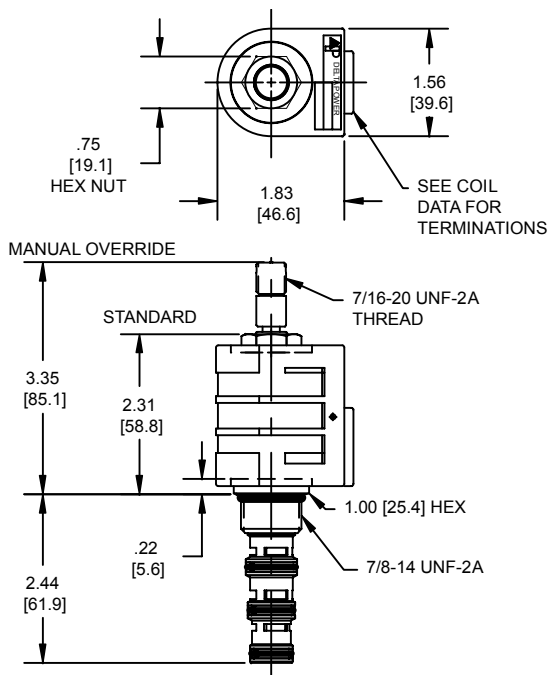
Nominal Flow	6 GPM (23 LPM)
Rated Operating Pressure	3000 PSI (207 bar)
Typical Internal Leakage (150 SSU)	5 cu in/min (82 ml/min) per path
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temperature Range	-40° to 250° F (-40° to 120° C)
Weight	.31 lbs (.14 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	30 ft-lbs (40.6 Nm)
Coil Nut Torque Requirements	4-6 ft-lbs (5.4-8.1 Nm)
Cavity	DELTA 4W
Cavity Form Tool (Finishing)	40500002
Seal Kit	21191214

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com


DIMENSIONS

ORDERING INFORMATION
DG-S4F -
OPTIONS

Buna Standard **00**
 Viton Standard **V0**
 Buna, Override **0M**
 Viton, Override **VM**
 Buna, Override, Non-detent **B1**
 Viton, Override, Non-detent **V1**

Blank
N
S

BODIES

Without Body
 1/4 NPTF Ports
 #6 SAE Ports

VOLTAGE

06 6 VDC
12 12 VDC
24 24 VDC
36 36 VDC
48 48 VDC
25 24 VAC
11 120 VAC
22 220 VAC
44 440 VAC

"D" COIL TERMINATION

(All DC Except as Noted)

DL Double Lead
DT Deutsch on Leads DT04-2P
ML Metri-Pack on Leads
PL Packard on Leads
WL Weatherpack on Leads

SS Single Spade
DS Double Spade
HC DIN 43650 (Hirschman) – (AC & DC)
CL Conduit Lead – (AC Only)
DI Deutsch – Integral DT04-2P

IMMERSION PROOF "D" TYPE

IA "I" Coil AMP Superseal - Integral
ID "I" Coil Deutsch – Integral DT04-2P
IJ "I" Coil AMP Jr. Timer - Integral
IM "I" Coil Metri-Pack – Integral

Approximate Coil Weight: .74 lbs/.33 kg.

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

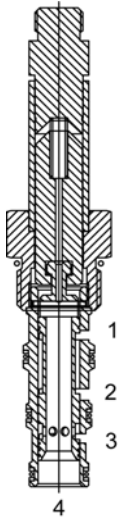
Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com



HG-S4F, Direct Acting Spool, 4 Way 2 Position, Energized to Block



DESCRIPTION

"High Pressure" 10 size, 7/8-14 thread, "Delta" series, solenoid operated, 4 way 2 position energized to block spool valve.

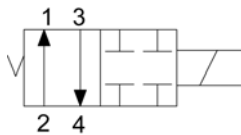
OPERATION

When de-energized the HG-S4F allows flow from (2) to (1) and from (3) to (4). When energized the valve blocks flow at all ports.

FEATURES

- Hardened parts for long life.
- Efficient wet-armature construction.
- Cartridges are voltage interchangeable.
- Industry common cavity.
- Unitized, molded coil design.
- Continuous duty rated solenoid.
- Optional coil voltages and terminations.
- Optional "I" Coil: Weatherproof, Thermal Shock, Immersion Safe.

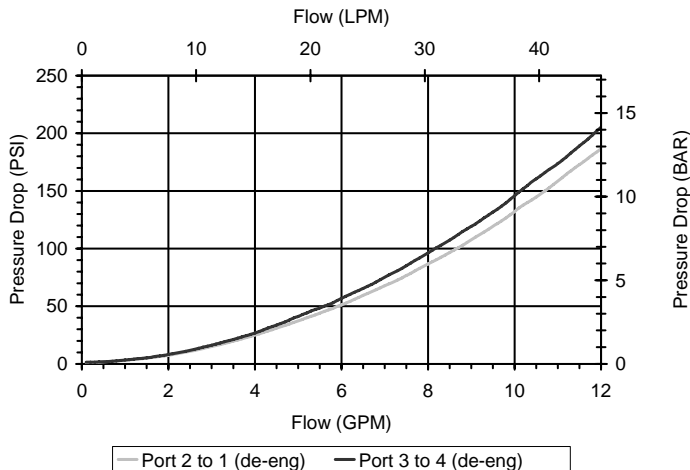
HYDRAULIC SYMBOL



Uses "L" Coil

PERFORMANCE

Actual Test Data (Cartridge Only)



VALVE SPECIFICATIONS

Nominal Flow	6 GPM (23 LPM)
Rated Operating Pressure	4000 PSI (276 bar)
Typical Internal Leakage (150 SSU)	10 cu in/min (164 ml/min) per path
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temperature Range	-40° to 250° F (-40° to 120° C)
Weight	.44 lbs. (.20 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	35 ft-lbs (47.5 Nm)
Coil Nut Torque Requirements	4-6 ft-lbs (5.4-8.1 Nm)
Cavity	DELTA 4W
Cavity Form Tool (Finishing)	40500002
Seal Kit	21191214

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

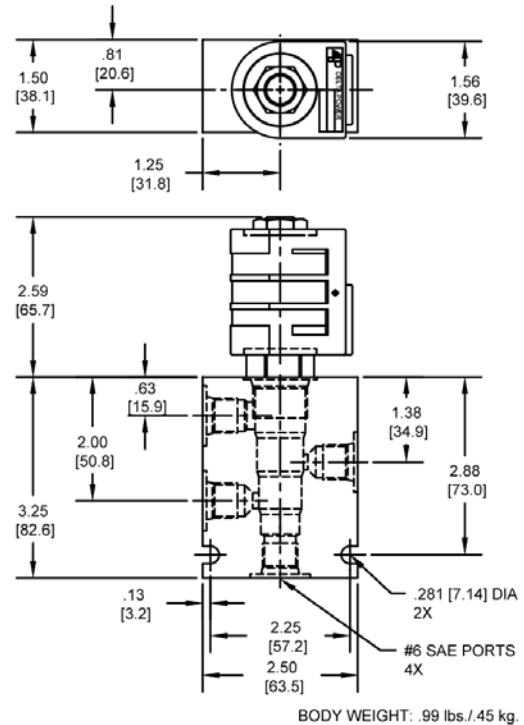
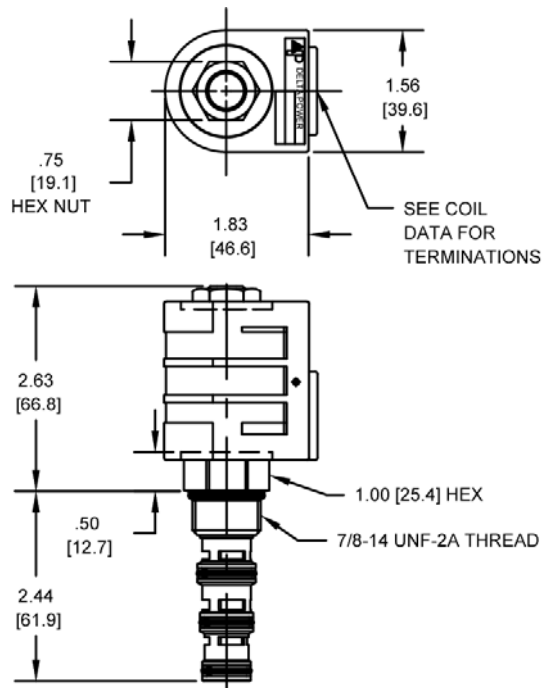
Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com



DIMENSIONS



ORDERING INFORMATION

HG-S4F -

OPTIONS

Buna Standard 00
Viton Standard V0

Blank

N
S

BODIES

Without Body
1/4 NPTF Ports
#6 SAE Ports

Note: Aluminum, NOT durability rated for 4000 PSI. Consult factory for body options.

VOLTAGE

06 6 VDC
12 12 VDC
24 24 VDC
36 36 VDC
48 48 VDC
25 24 VAC
11 120 VAC
22 220 VAC
44 440 VAC

"L" COIL TERMINATION

(All DC Except as Noted)

DL Double Lead
DT Deutsch on Leads DT04-2P
ML Metri-Pack on Leads
PL Packard on Leads
WL Weatherpack on Leads

SS Single Spade
DS Double Spade
HC DIN 43650 (Hirschman) - (AC & DC)
CL Conduit Lead - (AC Only)
DI Deutsch - Integral DT04-2P

IA "I" Coil AMP Superseal - Integral
ID "I" Coil Deutsch - Integral DT04-2P
IJ "I" Coil AMP Jr. Timer - Integral
IM "I" Coil Metri-Pack - Integral

Approximate Coil Weight: .68 lbs. (.31 kg.)

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

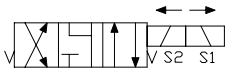
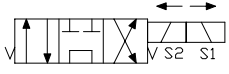
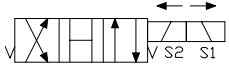
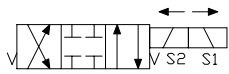
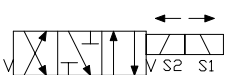
Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com



4 Way 3 Position Spool Valves

	GPM	PSI	LPM	BAR	MODEL	PAGE
	6	3000	23	207	PQ-S4M	194
	3	3000	11.3	207	VQ-S4M	196
	6	3000	23	207	DG-S4M	198
	5	3000	19	207	PQ-S4N	200
	6	3000	23	207	DG-S4N	202
	3	3000	11	207	PQ-S4R	204
	2.5	3000	9.5	207	VQ-S4R	206
	3	3000	11	207	PQ-S4O	208
	8	3000	30	207	DG-S4O	210
	5	3000	19	207	PQ-S4T	212
	8	3000	30	207	PQ-S4P	214
	8	3000	30	207	DG-S4P	216
	6	3000	23	207	PQ-S4Q	218
	3.5	3000	13.2	207	VQ-S4Q	220
	6	3000	23	207	DG-S4S	222

Typical Schematic

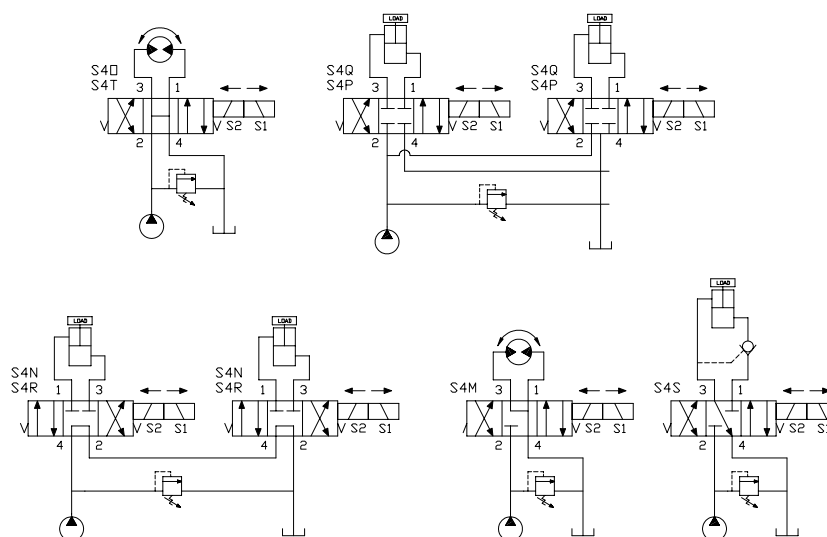
Typical application for the S4O and S4T "Open Center" valve is a bi-directional fluid motor control with coasting.

Typical application for the S4Q and S4P "Closed Center" valve is a parallel circuit for cylinder control.

Typical application for the S4N and S4R "Tandem Center" valve is a series circuit with power beyond.

Typical application for the S4M "Figure Four" valve is coasting in a fluid motor control circuit.

Typical application for the S4S "Scotch Center" valve is to vent the pilot side of load holding application.



WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com

**PQ-S4M Direct Acting Spool, 4 Way 3 Position, Motor Center****DESCRIPTION**

8 size, 3/4-16 thread, "Power" series, solenoid operated, 4 way 3 position, motor center spool valve.

OPERATION

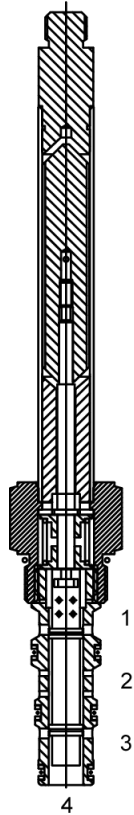
When de-energized the PQ-S4M allows flow between (1), (3) and (4), blocks flow at (2). When outer coil (S1) is energized the valve allows flow from (2) to (1) and from (3) to (4). When inner coil (S2) is energized the valve allows flow from (2) to (3) and from (1) to (4).

OPERATION OF MANUAL OVERRIDE OPTION:

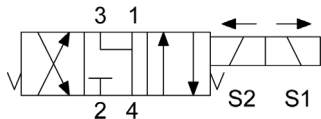
Push Only Override - Spring biased in neutral center position, when pushed the valve shifts in the S2 direction.

FEATURES

- Hardened parts for long life.
- Efficient wet-armature construction.
- Cartridges are voltage interchangeable.
- Industry common cavity.
- Optional manual "push only" override.
- Unitized, molded coil design.
- Continuous duty rated solenoid.
- Optional coil voltages and terminations.



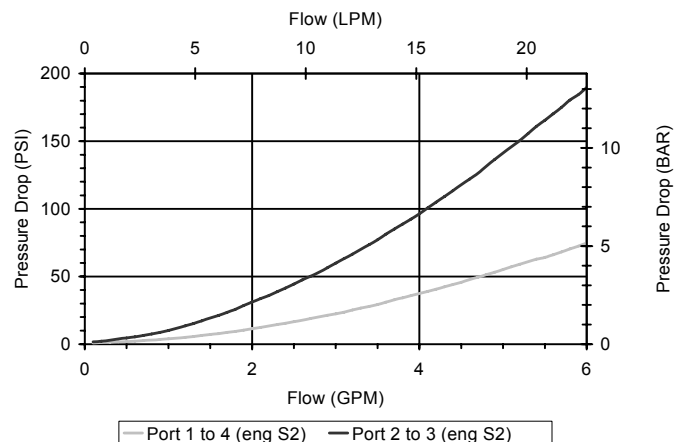
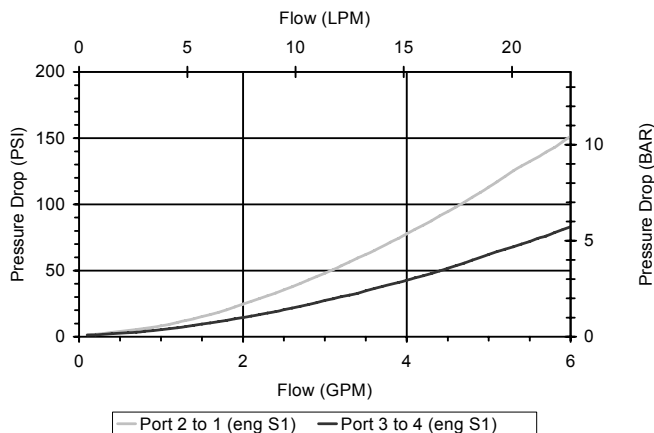
Uses "D" Delta coil.
Flow rating based on maximum differential load of 1000 PSI.
"OP" override is a push only non-detented button that actuates S2 direction.

HYDRAULIC SYMBOL**PERFORMANCE**

Actual Test Data (Cartridge Only)

VALVE SPECIFICATIONS

Nominal Flow	6 GPM (23 LPM)
Rated Operating Pressure	3000 PSI (207 bar)
Typical Internal Leakage (150 SSU)	5 cu in/min (82 ml/min) per path
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temperature Range	-40° to 250° F (-40° to 120° C)
Weight	.42 lbs. (.19 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	25 ft-lbs (34 Nm)
Coil Nut Torque Requirements	4-6 ft-lbs (5.4-8.1 Nm)
Cavity	POWER 4W
Cavity Form Tool (Finishing)	40500029
Seal Kit	21191108

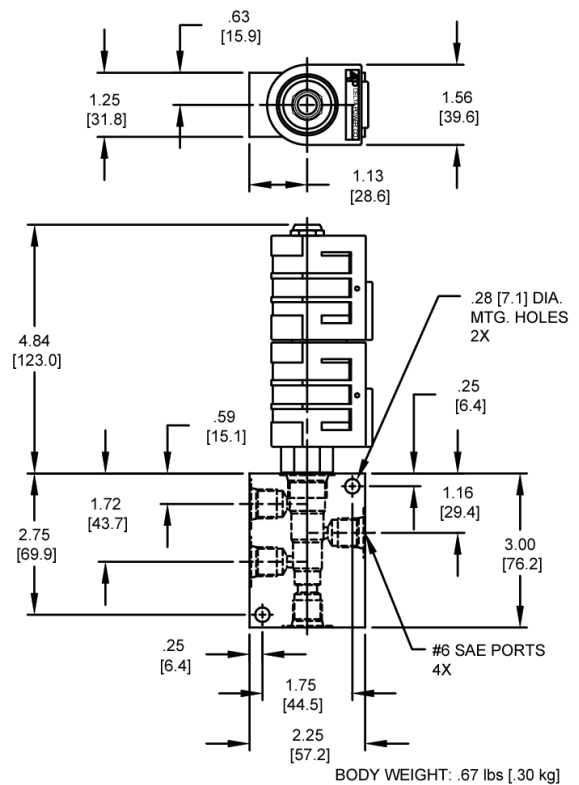
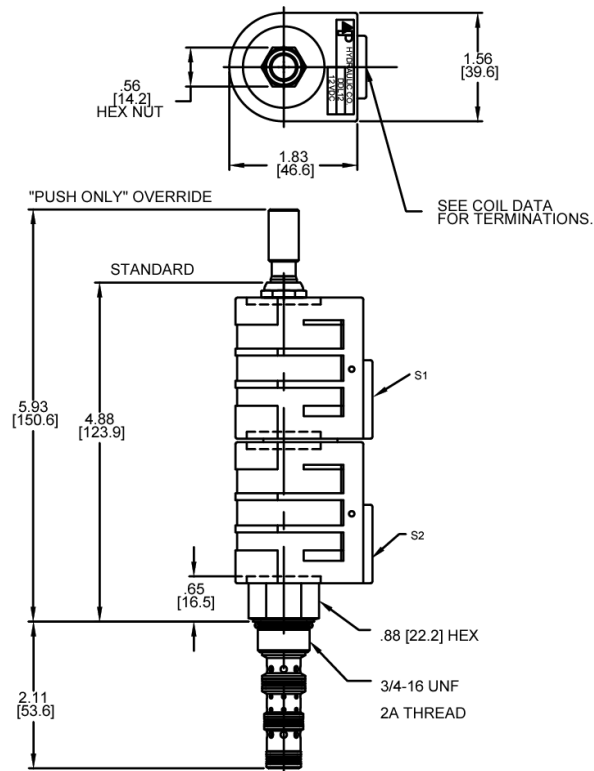


WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com


DIMENSIONS

ORDERING INFORMATION
PQ-S4M
OPTIONS

Buna Standard **00**
 Viton Standard **V0**
 Buna, Push only override **0P**
 Viton, Push only override **VP**

Blank
N
S

BODIES

Without Body
 1/4 NPTF Ports
 #6 SAE Ports

VOLTAGE

06 6 VDC
12 12 VDC
24 24 VDC
36 36 VDC
48 48 VDC
25 24 VAC
11 120 VAC
22 220 VAC
44 440 VAC

"D" COIL TERMINATION

(All DC Except as Noted)

DL Double Lead
DT Deutsch on Leads DT04-2P
ML Metri-Pack on Leads
PL Packard on Leads
WL Weatherpack on Leads

SS Single Spade
DS Double Spade
HC DIN 43650 (Hirschman) – (AC & DC)
CL Conduit Lead – (AC Only)
DI Deutsch – Integral DT04-2P

Approximate Coil Weight: .74 lbs. (.33 kg.)

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com

**VQ-S4M Direct Acting Spool, 4 Way 3 Position, Motor Center****DESCRIPTION**

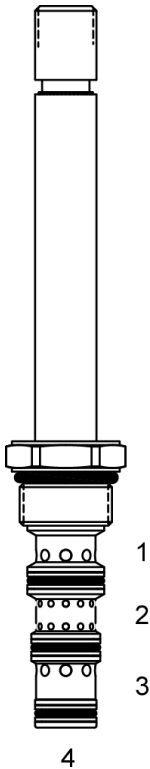
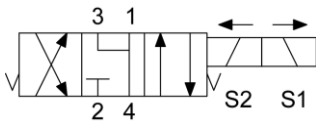
Low Profile 8 size, 3/4-16 thread, "Power" series, solenoid operated, 4W3P, motor center spool valve.

OPERATION

When de-energized the VQ-S4M allows flow between (1), (3) and (4), blocks flow at (2). When outer coil (S1) is energized the valve allows flow from (2) to (1) and from (3) to (4). When inner coil (S2) is energized the valve allows flow from (2) to (3) and from (1) to (4).

FEATURES

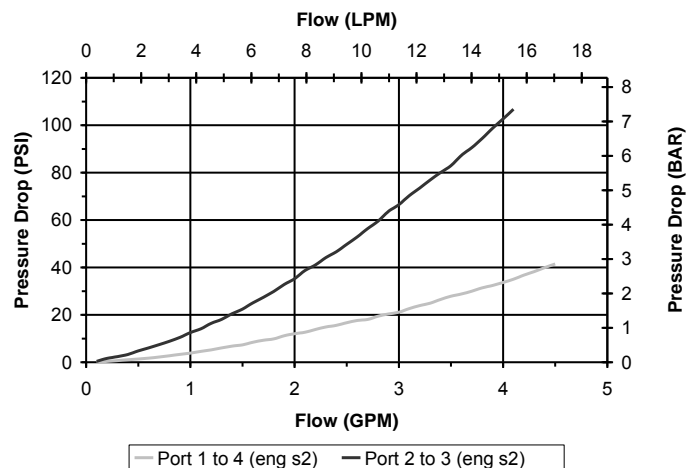
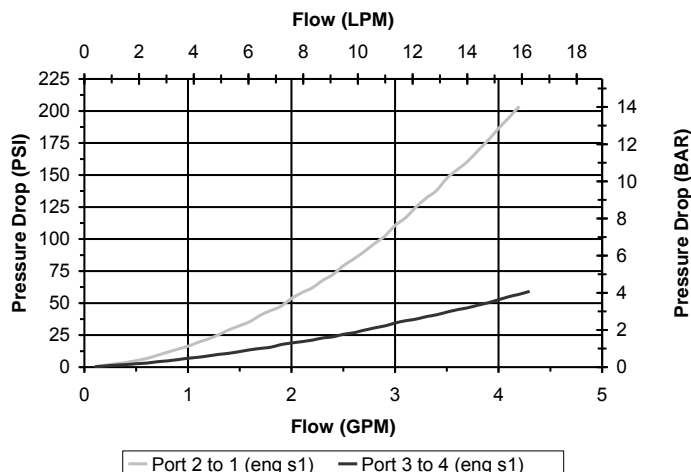
- Hardened parts for long life.
- Efficient wet-armature construction.
- Cartridges are voltage interchangeable.
- Industry common cavity.
- Unitized, molded coil design.
- Continuous duty rated solenoid.
- Optional coil voltages and terminations.
- Optional "I" Coil: Weatherproof, Thermal Shock, Immersion Safe.

**HYDRAULIC SYMBOL****PERFORMANCE**

Actual Test Data (Cartridge Only)

VALVE SPECIFICATIONS

Nominal Flow	3 GPM (11 LPM)
Rated Operating Pressure	3000 PSI (207 bar)
Typical Internal Leakage (150 SSU)	10 cu in/min (163 ml/min) per path
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temperature Range	-40° to 250° F (-40° to 120° C)
Weight	.42 lbs. (.19 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	25 ft-lbs (34 Nm)
Coil Nut Torque Requirements	4-6 ft-lbs (5.4-8.1 Nm)
Cavity	POWER 4W
Cavity Form Tool (Finishing)	40500029
Seal Kit	21191108



WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

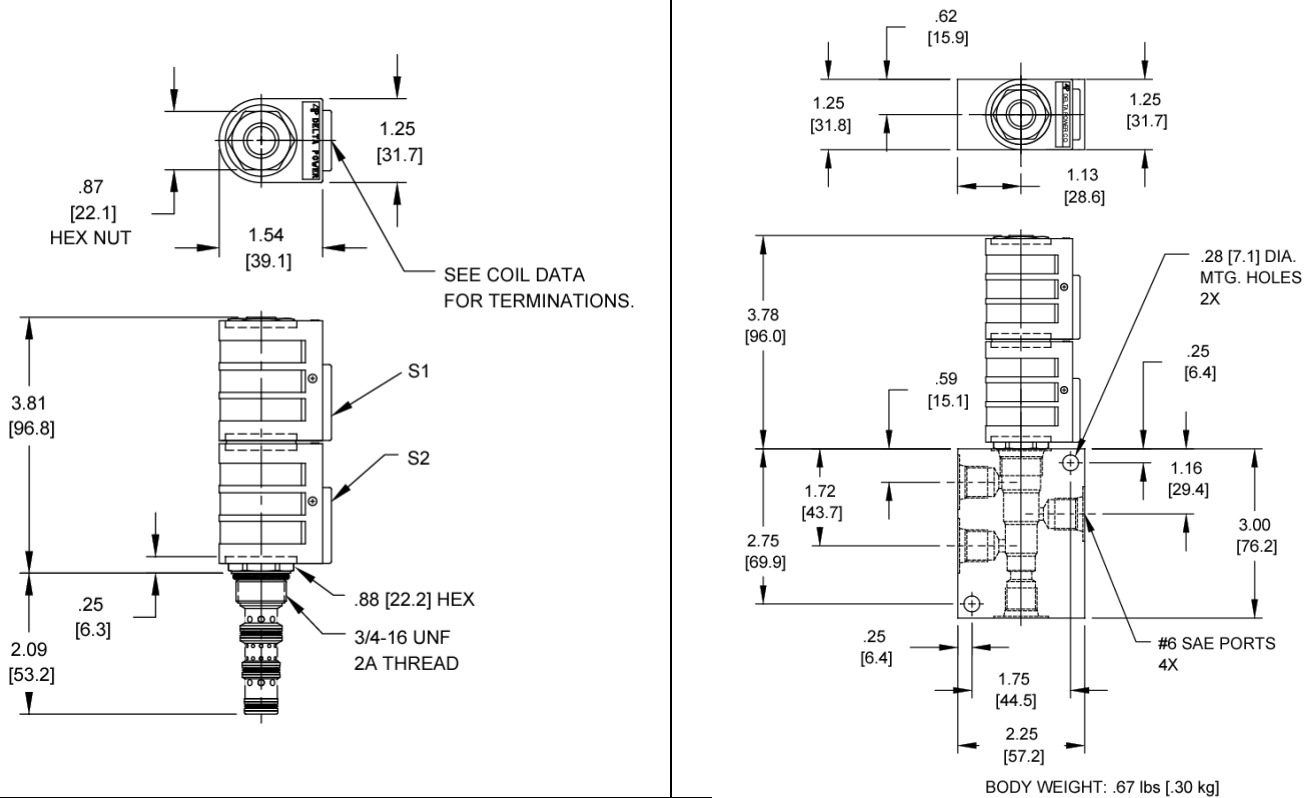
Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com



DIMENSIONS



ORDERING INFORMATION

VQ-S4M

OPTIONS

Buna Standard
Viton Standard

00
V0

BODIES

Without Body
1/4 NPTF Ports
#6 SAE Ports

Blank
N
S

VOLTAGE

06 6 VDC
12 12 VDC
24 24 VDC
36 36 VDC
48 48 VDC
25 24 VAC
11 120 VAC
22 220 VAC
44 440 VAC

"P" COIL TERMINATION

(All DC Except as Noted)

DL Double Lead
DT Deutsch on Leads DT04-2P
ML Metri-Pack on Leads
PL Packard on Leads
WL Weatherpack on Leads

SS Single Spade
DS Double Spade
HC DIN 43650 (Hirschman) - (AC & DC)
CL Conduit Lead - (AC Only)
DI Deutsch - Integral DT04-2P

IMMERSION PROOF "P" TYPE

"I" Coil AMP Superseal - Integral
"I" Coil Deutsch - Integral DT04-2P
"I" Coil AMP Jr. Timer - Integral
"I" Coil Metri-Pack - Integral

Approximate Coil Weight: .74 lbs. (.33 kg.)

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com

**DG-S4M Direct Acting Spool, 4 Way 3 Position, Motor Center****DESCRIPTION**

10 size, 7/8-14 thread, "Delta" series, solenoid operated, 4 way 3 position motor center spool valve.

OPERATION

When de-energized the DG-S4M block the flow at (2) and allows flow between (1), (3) and (4). When outer coil (S1) is energized the valve allows flow from (2) to (1) and from (3) to (4). When inner coil (S2) is energized the valve allows flow from (2) to (3) and from (1) to (4).

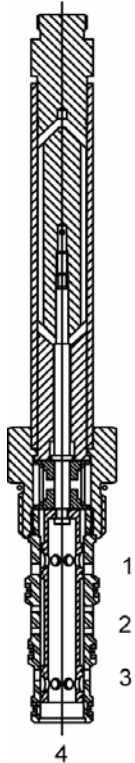
OPERATION OF MANUAL OVERRIDE OPTION:

Bi-Directional Override - Spring biased in neutral center position, when pushed the valve shifts in the S2 direction, when pulled the valve shifts in the S1 direction.

Push Only Override - Spring biased in neutral center position, when pushed the valve shifts in the S2 direction.

FEATURES

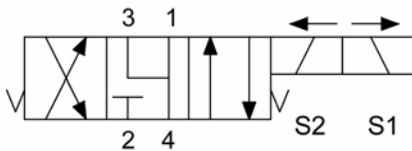
- Hardened parts for long life.
- Efficient wet-armature construction.
- Cartridges are voltage interchangeable.
- Manual override option.
- Industry common cavity.
- Unitized, molded coil design.
- Continuous duty rated solenoid.
- Optional coil voltages and terminations.
- Optional "I" Coil: Weatherproof, Thermal Shock, Immersion Safe.



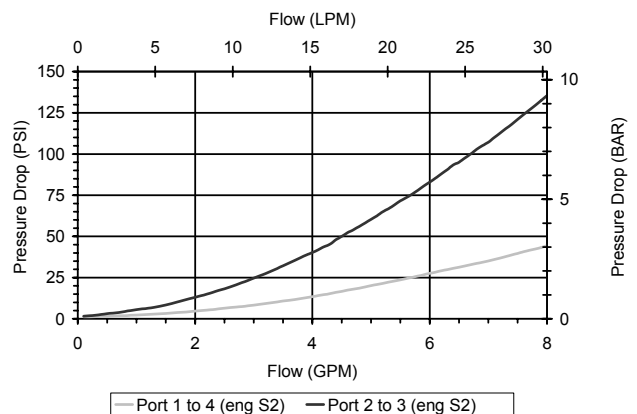
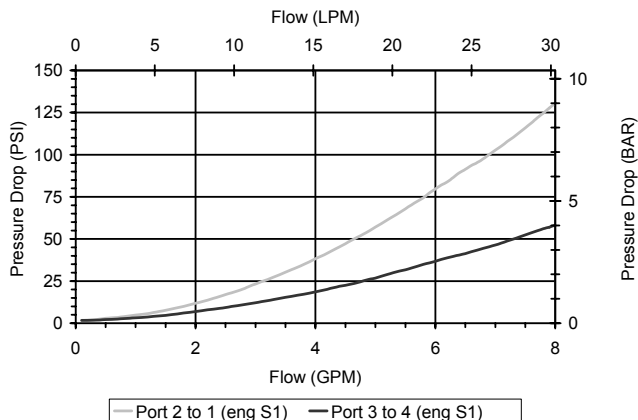
Uses "L" Coil.
Flow rating is at 1000 PSID maximum differential loading.

**VALVE SPECIFICATIONS**

Nominal Flow	6 GPM (23 LPM)
Rated Operating Pressure	3000 PSI (207 bar)
Typical Internal Leakage (150 SSU)	5 cu in/min (82 ml/min) per path
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temperature Range	-40° to 250° F (-40° to 120° C)
Weight	.51 lbs. (.23 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	30 ft-lbs (40.6 Nm)
Coil Nut Torque Requirements	4-6 ft-lbs (5.4-8.1 Nm)
Cavity	DELTA 4W
Cavity Form Tool (Finishing)	40500002
Seal Kit	21191214

HYDRAULIC SYMBOL**PERFORMANCE**

Actual Test Data (Cartridge Only)



WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

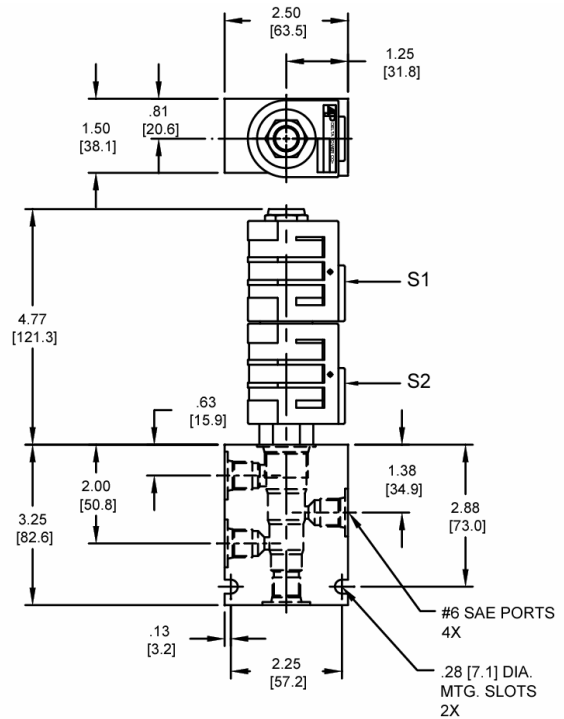
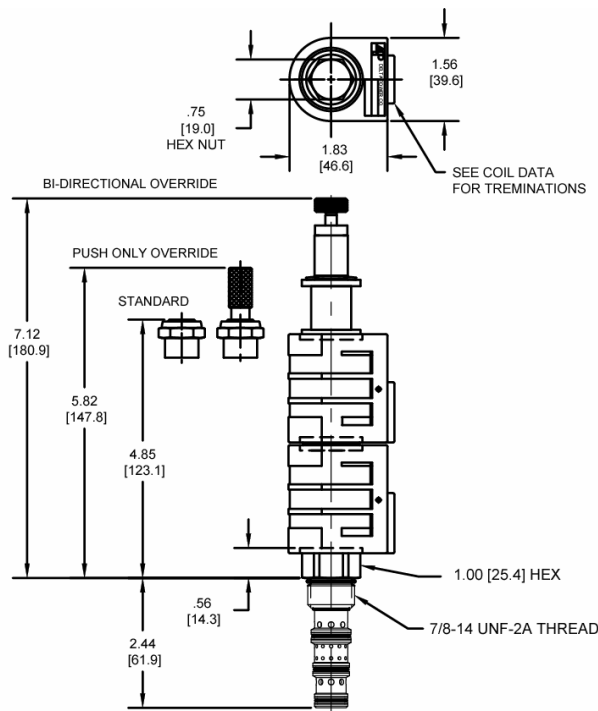
Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com



DIMENSIONS



BODY WEIGHT: .98 lbs [.45 kg]

ORDERING INFORMATION

DG-S4M

OPTIONS

Buna Standard **00**
 Viton Standard **V0**
 Buna, Override **0M**
 Viton, Override **VM**
 Buna, Push only override **0P**
 Viton, Push only override **VP**

Blank **N**
S

BODIES

Without Body
 1/4 NPTF Ports
 #6 SAE Ports

VOLTAGE

06 6 VDC
12 12 VDC
24 24 VDC
36 36 VDC
48 48 VDC
25 24 VAC
11 120 VAC
22 220 VAC
44 440 VAC

"L" COIL TERMINATION

(All DC Except as Noted)

DL Double Lead
DT Deutsch on Leads DT04-2P
ML Metri-Pack on Leads
PL Packard on Leads
WL Weatherpack on Leads

SS Single Spade
DS Double Spade
HC DIN 43650 (Hirschman) – (AC & DC)
CL Conduit Lead – (AC Only)
DI Deutsch – Integral DT04-2P

IA "I" Coil AMP Superseal - Integral
ID "I" Coil Deutsch – Integral DT04-2P
IJ "I" Coil AMP Jr. Timer - Integral
IM "I" Coil Metri-Pack – Integral

Approximate Coil Weight: .68 lbs. (.31 kg.)

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com

**PQ-S4N Direct Acting Spool, 4 Way 3 Position, Tandem Center****DESCRIPTION**

8 size, 3/4-16 thread, "Power" series, solenoid operated, 4 way 3 position, tandem center spool valve.

OPERATION

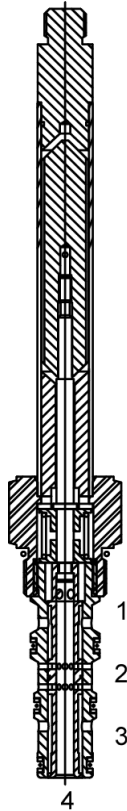
When de-energized the PQ-S4N allows flow between (2) and (4), blocks flow at (1) and (3). When outer coil (S1) is energized the valve allows flow from (2) to (3) and from (1) to (4). When inner coil (S2) is energized the valve allows flow from (2) to (1) and from (3) to (4).

OPERATION OF MANUAL OVERRIDE OPTION:

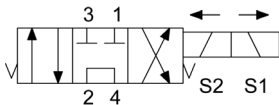
Push Only Override - Spring biased in neutral center position, when pushed the valve shifts in the S2 direction.

FEATURES

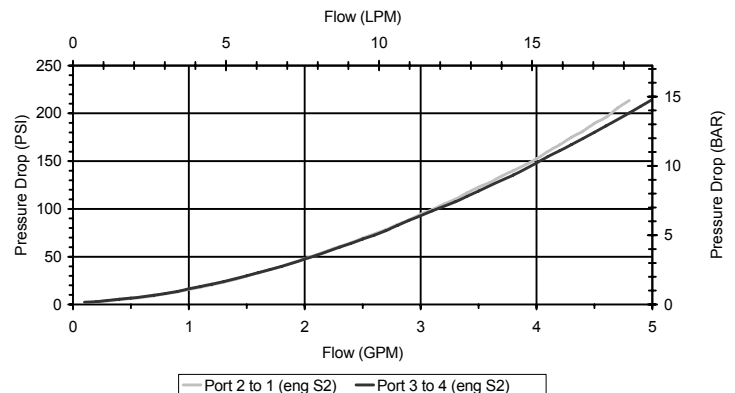
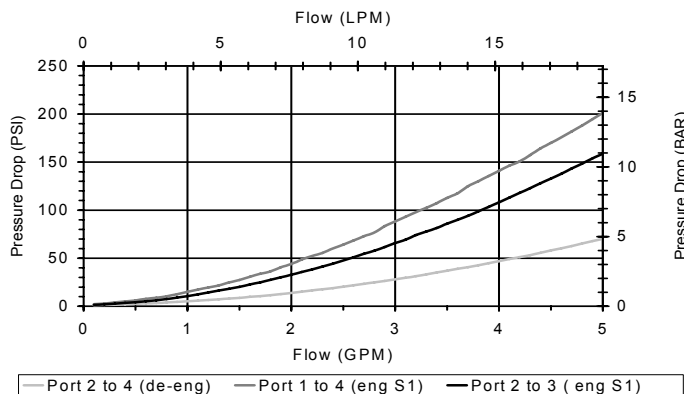
- Hardened parts for long life.
- Efficient wet-armature construction.
- Cartridges are voltage interchangeable.
- Industry common cavity.
- Optional manual "push only" override.
- Unitized, molded coil design.
- Continuous duty rated solenoid.
- Optional coil voltages and terminations.



Uses "D" Delta coil.
"OP" override is a push only non-detented button that actuates S2 direction.

HYDRAULIC SYMBOL**PERFORMANCE**

Actual Test Data (Cartridge Only)

**VALVE SPECIFICATIONS**

Nominal Flow	5 GPM (19 LPM)
Rated Operating Pressure	3000 PSI (207 bar)
Typical Internal Leakage (150 SSU)	5 cu in/min (82 ml/min) per path
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temperature Range	-40° to 250° F (-40° to 120° C)
Weight	.42 lbs. (.19 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	25 ft-lbs (34 Nm)
Coil Nut Torque Requirements	4-6 ft-lbs (5.4-8.1 Nm)
Cavity	POWER 4W
Cavity Form Tool (Finishing)	40500029
Seal Kit	21191108

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

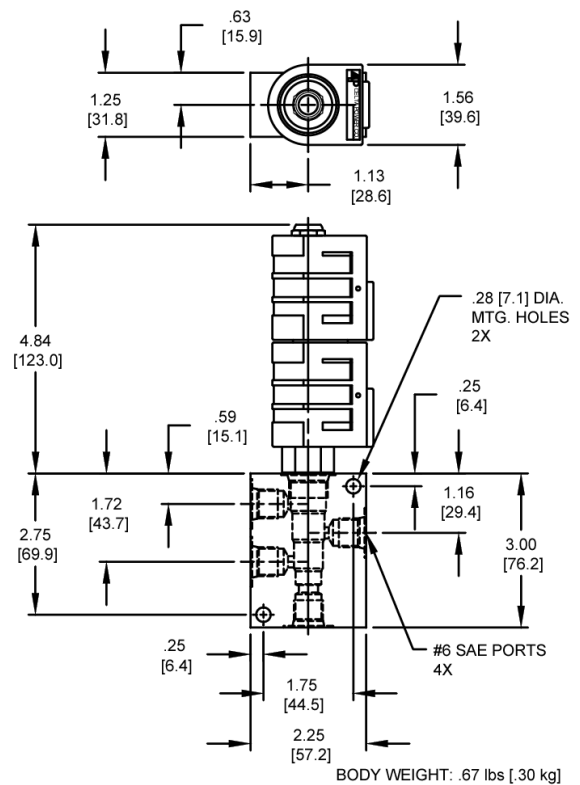
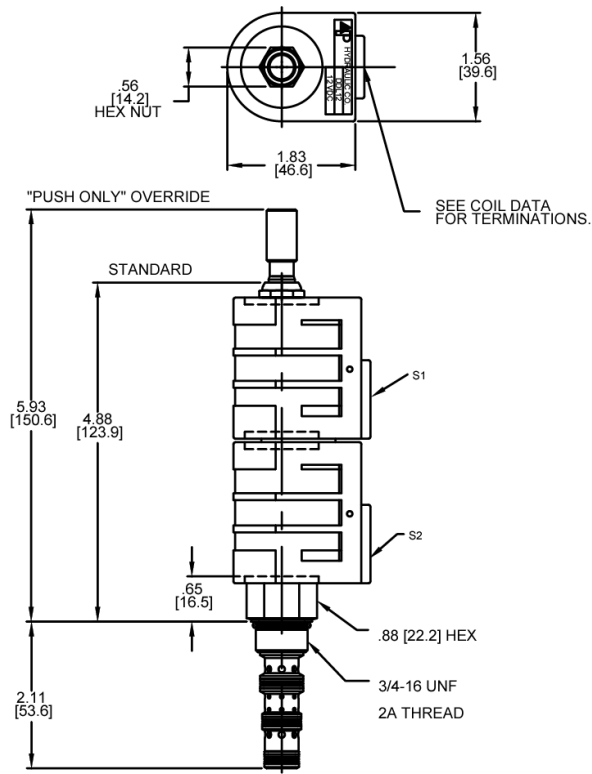
Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com



DIMENSIONS



ORDERING INFORMATION

PQ-S4N

OPTIONS
Buna Standard
Viton Standard
Buna, Push only override
Viton, Push only override

00
V0
0P
VP

Blank
N
S

BODIES
Without Body
1/4 NPTF Ports
#6 SAE Ports

VOLTAGE
06 6 VDC
12 12 VDC
24 24 VDC
36 36 VDC
48 48 VDC
25 24 VAC
11 120 VAC
22 220 VAC
44 440 VAC

"D" COIL TERMINATION
(All DC Except as Noted)

DL Double Lead
DT Deutsch on Leads DT04-2P
ML Metri-Pack on Leads
PL Packard on Leads
WL Weatherpack on Leads

SS Single Spade
DS Double Spade
HC DIN 43650 (Hirschman) – (AC & DC)
CL Conduit Lead – (AC Only)
DI Deutsch – Integral DT04-2P

Approximate Coil Weight: .74 lbs. (.33 kg.)

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com

**DG-S4N Direct Acting Spool, 4 Way 3 Position, Tandem Center****DESCRIPTION**

10 size, 7/8-14 thread, "Delta" series, solenoid operated, 4 way 3 position, tandem center spool valve.

OPERATION

When de-energized the DG-S4N allows flow between (2) and (4), and blocks flow at (1) and (3). When outer coil (S1) is energized the valve allows flow from (2) to (3) and from (1) to (4). When inner coil (S2) is energized the valve allows flow from (2) to (1) and from (3) to (4).

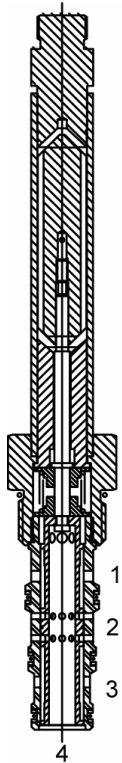
OPERATION OF MANUAL OVERRIDE OPTION:

Bi-Directional Override - Spring biased in neutral center position, when pushed the valve shifts in the S2 direction, when pulled the valve shifts in the S1 direction.

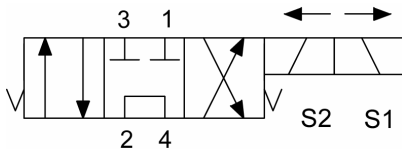
Push Only Override - Spring biased in neutral center position, when pushed the valve shifts in the S2 direction.

FEATURES

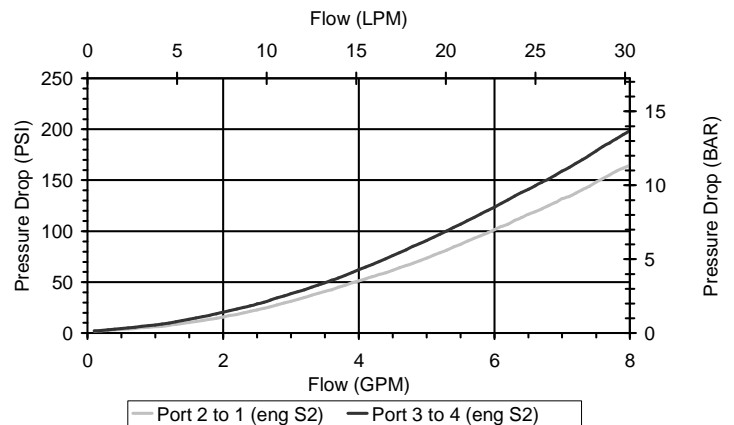
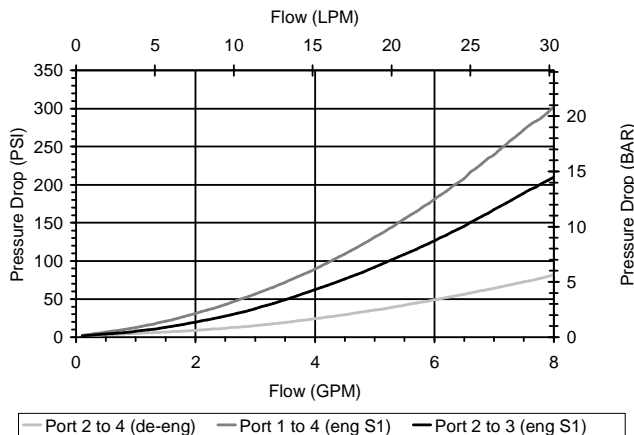
- Hardened parts for long life.
- Efficient wet-armature construction.
- Cartridges are voltage interchangeable.
- Manual override option.
- Industry common cavity.
- Unitized, molded coil design.
- Continuous duty rated solenoid.
- Optional coil voltages and terminations.
- Optional "I" Coil: Weatherproof, Thermal Shock, Immersion Safe.



Uses "L" coil.

HYDRAULIC SYMBOL**PERFORMANCE**

Actual Test Data (Cartridge Only)



WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

Phone: (815) 397-6628

Fax: (815) 397-2526

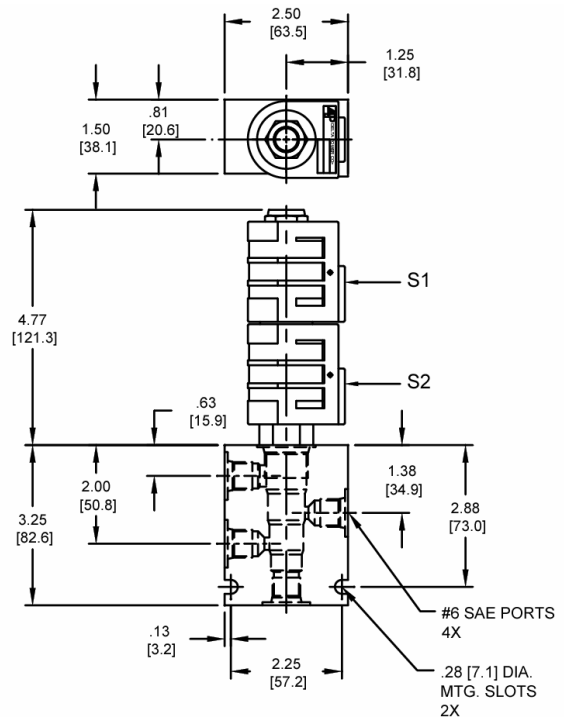
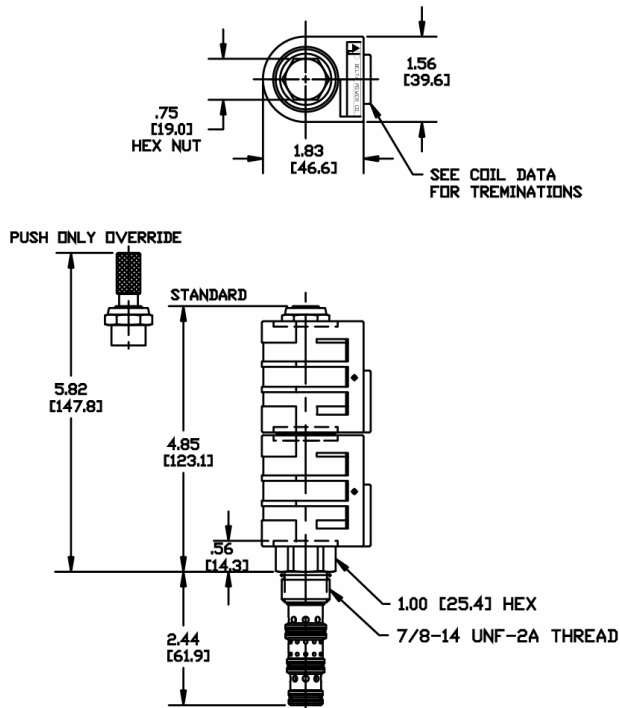
E-mail: delta@delta-power.com



Delta Power Company

4484 Boeing Drive - Rockford, IL 61109

DIMENSIONS



BODY WEIGHT: .98 lbs [.45 kg]

ORDERING INFORMATION

DG-S4N

OPTIONS

Buna Standard
Viton Standard
Buna, Push only override
Viton, Push only override

00
V0
0P
VP

Blank

N

S

BODIES

Without Body
1/4 NPTF Ports
#6 SAE Ports

VOLTAGE

06	6 VDC
12	12 VDC
24	24 VDC
36	36 VDC
48	48 VDC
25	24 VAC
11	120 VAC
22	220 VAC
44	440 VAC

“L” COIL TERMINATION

(All DC Except as Noted)

DL	Double Lead
DT	Deutsch on Leads DT04-2P
ML	Metri-Pack on Leads
PL	Packard on Leads
WL	Weatherpack on Leads

SS	Single Spade
DS	Double Spade
HC	DIN 43650 (Hirschman) – (AC & DC)
CL	Conduit Lead – (AC Only)
DI	Deutsch – Integral DT04-2P

IMMERSION PROOF “L” TYPE

“I” Coil AMP Superseal - Integral
 “I” Coil Deutsch – Integral DT04-2P
 “I” Coil AMP Jr. Timer - Integral
 “I” Coil Metri-Pack – Integral

Approximate Coil Weight: .68 lbs. (.31 kg.)

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com


PQ-S4R Direct Acting Spool, 4 Way 3 Position, Tandem Center
DESCRIPTION

8 size, 3/4-16 thread, "Power" series, solenoid operated, 4 way 3 position, tandem center spool valve.

OPERATION

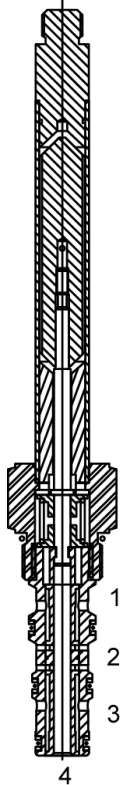
When de-energized the PQ-S4R allows flow between (2) and (4), ports (1) and (3) are blocked. When outer coil (S1) is energized the valve allows flow from (2) to (3) and from (1) to (4). When inner coil (S2) is energized the valve allows flow from (2) to (1) and from (3) to (4).

OPERATION OF MANUAL OVERRIDE OPTION:

Push Only Override - Spring biased in neutral center position, when pushed the valve shifts in the S2 direction.

FEATURES

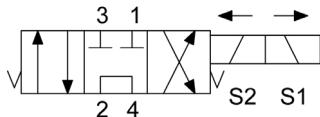
- Hardened parts for long life.
- Efficient wet-armature construction.
- Cartridges are voltage interchangeable.
- Industry common cavity.
- Optional manual "push only" override.
- Unitized, molded coil design.
- Continuous duty rated solenoid.
- Optional coil voltages and terminations.



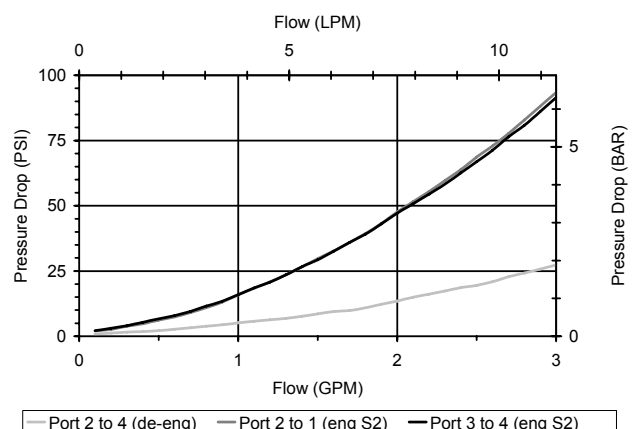
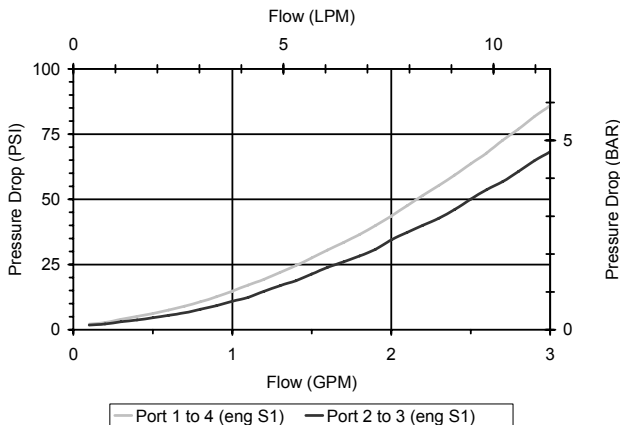
Uses "P" Power coil.
For higher flow see PQ-S4N.
"OP" override is a push only non-detented button that actuates S2 direction.

VALVE SPECIFICATIONS

Nominal Flow	3 GPM (11 LPM)
Rated Operating Pressure	3000 PSI (207 bar)
Typical Internal Leakage (150 SSU)	5 cu in/min (82 ml/min) per path
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temperature Range	-40° to 250° F (-40° to 120° C)
Weight	.42 lbs. (.19 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	25 ft-lbs (34 Nm)
Coil Nut Torque Requirements	4-6 ft-lbs (5.4-8.1 Nm)
Cavity	POWER 4W
Cavity Form Tool (Finishing)	40500029
Seal Kit	21191108

HYDRAULIC SYMBOL

PERFORMANCE

Actual Test Data (Cartridge Only)



WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

Phone: (815) 397-6628

Fax: (815) 397-2526

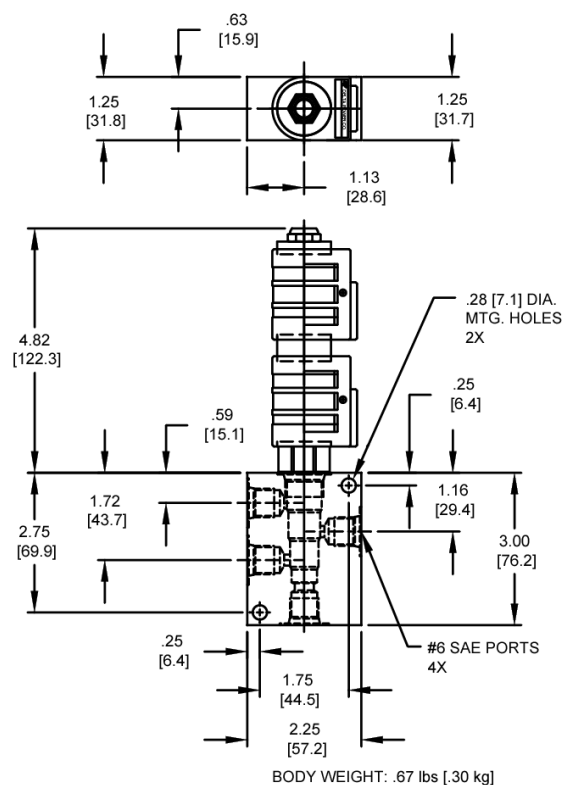
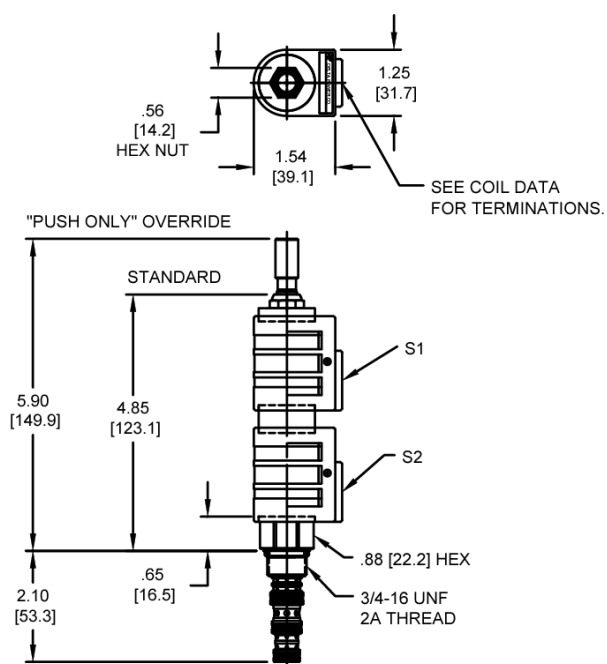
E-mail: delta@delta-power.com



Delta Power Company

4484 Boeing Drive - Rockford, IL 61109

DIMENSIONS



ORDERING INFORMATION

PQ-S4R

OPTIONS

Buna Standard
Viton Standard
Buna, Push only override
Viton, Push only override

00
V0
0P
VP

Blank
N
S

BODIES

Without Body
1/4 NPTF Ports
#6 SAE Ports

VOLTAGE

06	6 VDC
12	12 VDC
24	24 VDC
36	36 VDC
48	48 VDC
25	24 VAC
11	120 VAC
22	220 VAC
44	440 VAC

"P" COIL TERMINATION

(All DC Except as Noted)

DL	Double Lead
DT	Deutsch on Leads DT04-2P
ML	Metri-Pack on Leads
PL	Packard on Leads
WL	Weatherpack on Leads

SS	Single Spade
DS	Double Spade
HC	DIN 43650 (Hirschman) – (AC & DC)
CL	Conduit Lead – (AC Only)
DI	Deutsch – Integral DT04-2P

Approximate Coil Weight: .42 lbs. (.19 kg.)

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com

**VQ-S4R Direct Acting Spool, 4 Way 3 Position, Tandem Center****DESCRIPTION**

Low Profile 8 size, 3/4-16 thread, "Power" series, solenoid operated, 4W3P, tandem center spool valve

OPERATION

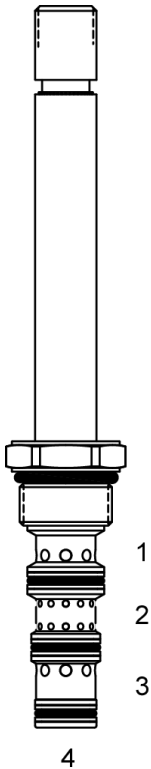
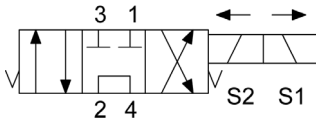
When de-energized the VQ-S4R allows flow between (2) and (4), ports (1) and (3) are blocked. When outer coil (S1) is energized the valve allows flow from (2) to (3) and from (1) to (4). When inner coil (S2) is energized the valve allows flow from (2) to (1) and from (3) to (4).

FEATURES

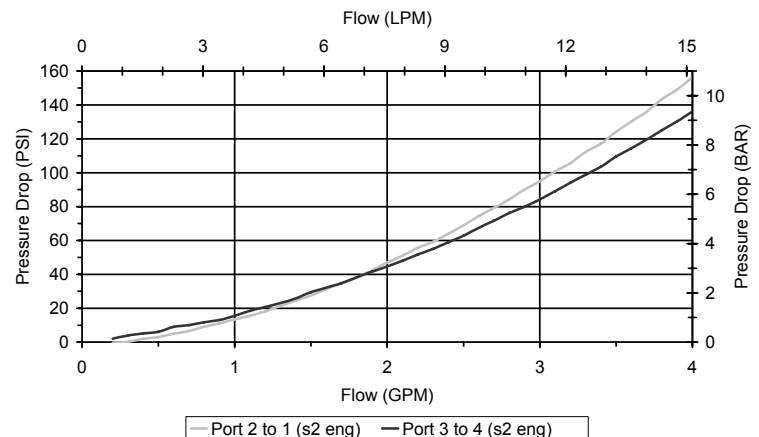
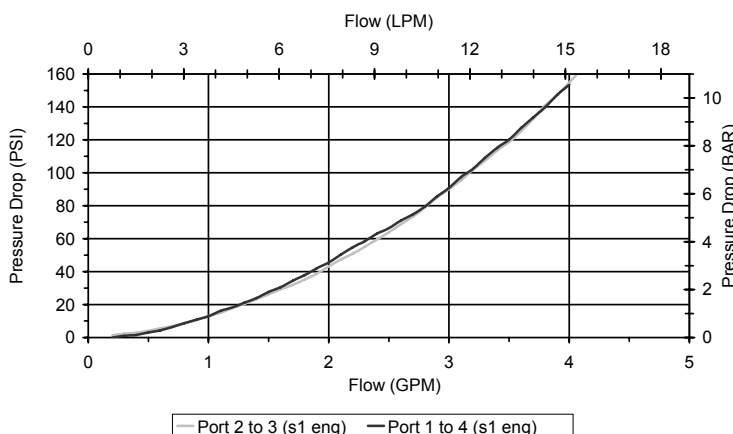
- Hardened parts for long life.
- Efficient wet-armature construction.
- Cartridges are voltage interchangeable.
- Manual override options.
- Industry common cavity.
- Unitized, molded coil design.
- Continuous duty rated solenoid.
- Optional coil voltages and terminations.
- Optional "I" Coil: Weatherproof, Thermal Shock, Immersion Safe.

VALVE SPECIFICATIONS

Nominal Flow	2.5 GPM (9.5 LPM)
Rated Operating Pressure	3000 PSI (207 bar)
Typical Internal Leakage (150 SSU)	15 cu in/min (245 ml/min) per path
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temperature Range	-40° to 250° F (-40° to 120° C)
Weight	.42 lbs. (.19 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	25 ft-lbs (34 Nm)
Coil Nut Torque Requirements	4-6 ft-lbs (5.4-8.1 Nm)
Cavity	POWER 4W
Cavity Form Tool (Finishing)	40500029
Seal Kit	21191108

**HYDRAULIC SYMBOL****PERFORMANCE**

Actual Test Data (Cartridge Only)

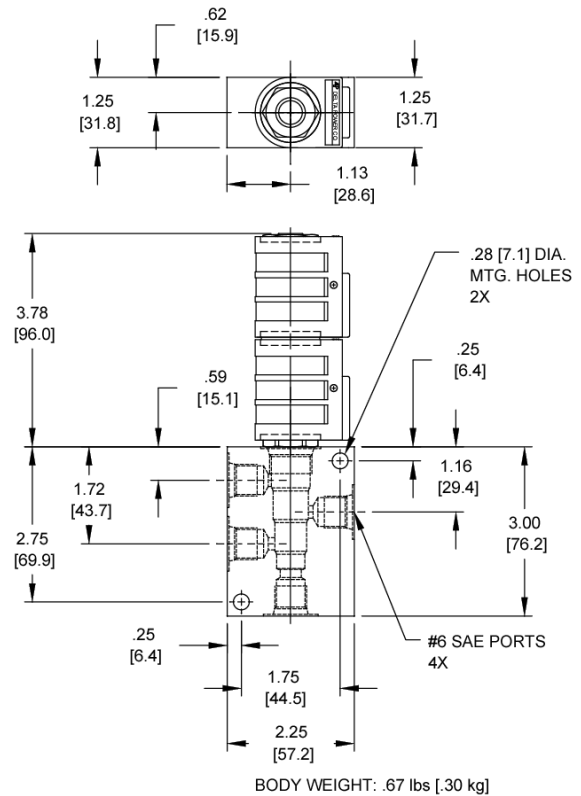
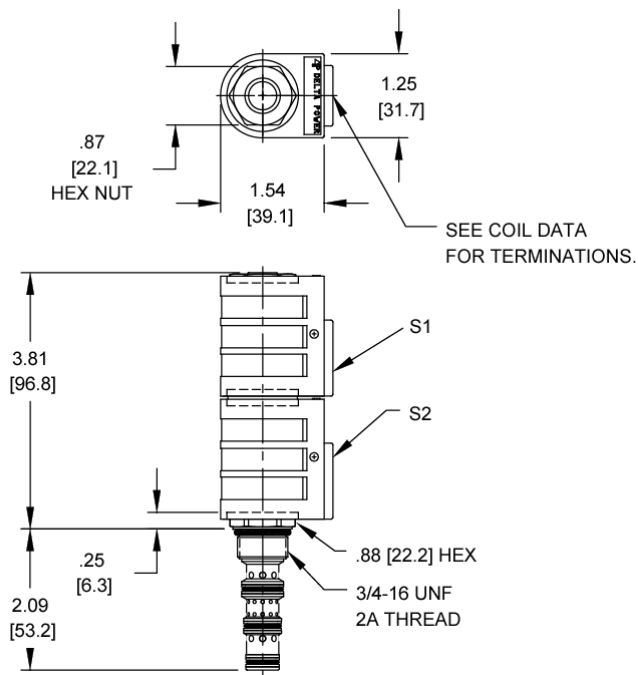


WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com


DIMENSIONS

ORDERING INFORMATION
VQ-S4R
OPTIONS

 Buna Standard
 Viton Standard

00
V0

 Blank
N
S
BODIES

 Without Body
 1/4 NPTF Ports
 #6 SAE Ports

VOLTAGE
06 6 VDC
12 12 VDC
24 24 VDC
36 36 VDC
48 48 VDC
25 24 VAC
11 120 VAC
22 220 VAC
44 440 VAC

"P" COIL TERMINATION

(All DC Except as Noted)

DL Double Lead
DT Deutsch on Leads DT04-2P
ML Metri-Pack on Leads
PL Packard on Leads
WL Weatherpack on Leads

SS Single Spade
DS Double Spade
HC DIN 43650 (Hirschman) – (AC & DC)
CL Conduit Lead – (AC Only)
DI Deutsch – Integral DT04-2P

IA "I" Coil AMP Superseal - Integral
ID "I" Coil Deutsch – Integral DT04-2P
IJ "I" Coil AMP Jr. Timer - Integral
IM "I" Coil Metri-Pack – Integral

Approximate Coil Weight: .74 lbs. (.33 kg.)

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

Phone: (815) 397-6628

Fax: (815) 397-2526

 E-mail: delta@delta-power.com

**PQ-S4O Direct Acting Spool, 4 Way 3 Position, Open Center****DESCRIPTION**

8 size, 3/4-16 thread, "Power" series, solenoid operated, 4 way 3 position, open center spool valve.

OPERATION

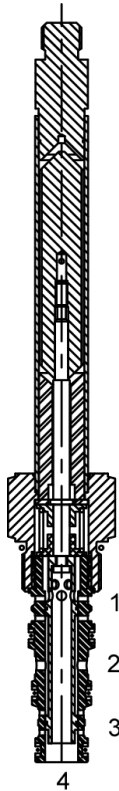
When de-energized the PQ-S4O allows flow to all ports, and pressures are relieved. When outer coil (S1) is energized the valve allows flow from (2) to (1) and from (3) to (4). When inner coil (S2) is energized the valve allows flow from (2) to (3) and from (1) to (4).

OPERATION OF MANUAL OVERRIDE OPTION:

Push Only Override - Spring biased in neutral center position, when pushed the valve shifts in the S2 direction.

FEATURES

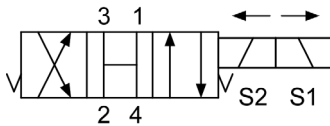
- Hardened parts for long life.
- Efficient wet-armature construction.
- Cartridges are voltage interchangeable.
- Industry common cavity.
- Optional manual "push only" override.
- Unitized, molded coil design.
- Continuous duty rated solenoid.
- Optional coil voltages and terminations.



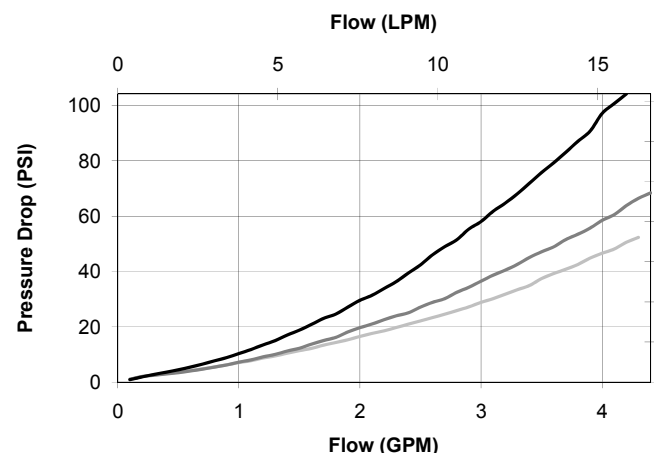
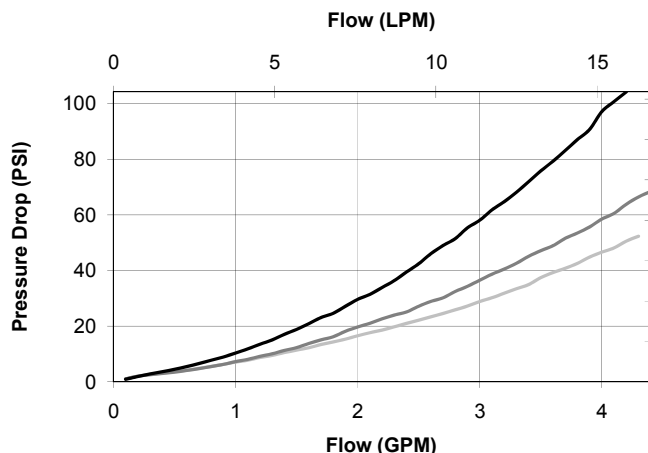
Uses "P" Power coil.
For higher flow see PQ-S4T.
"OP" override is a push only
non-detented button that
actuates S2 direction.

VALVE SPECIFICATIONS

Nominal Flow	3 GPM (11 LPM)
Rated Operating Pressure	3000 PSI (207 bar)
Typical Internal Leakage (150 SSU)	5 cu in/min (82 ml/min) per path
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temperature Range	-40° to 250° F (-40° to 120° C)
Weight	.42 lbs. (.19 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	25 ft-lbs (33.9 Nm)
Coil Nut Torque Requirements	4-6 ft-lbs (5.4-8.1 Nm)
Cavity	POWER 4W
Cavity Form Tool (Finishing)	40500029
Seal Kit	21191108

HYDRAULIC SYMBOL**PERFORMANCE**

Actual Test Data (Cartridge Only)

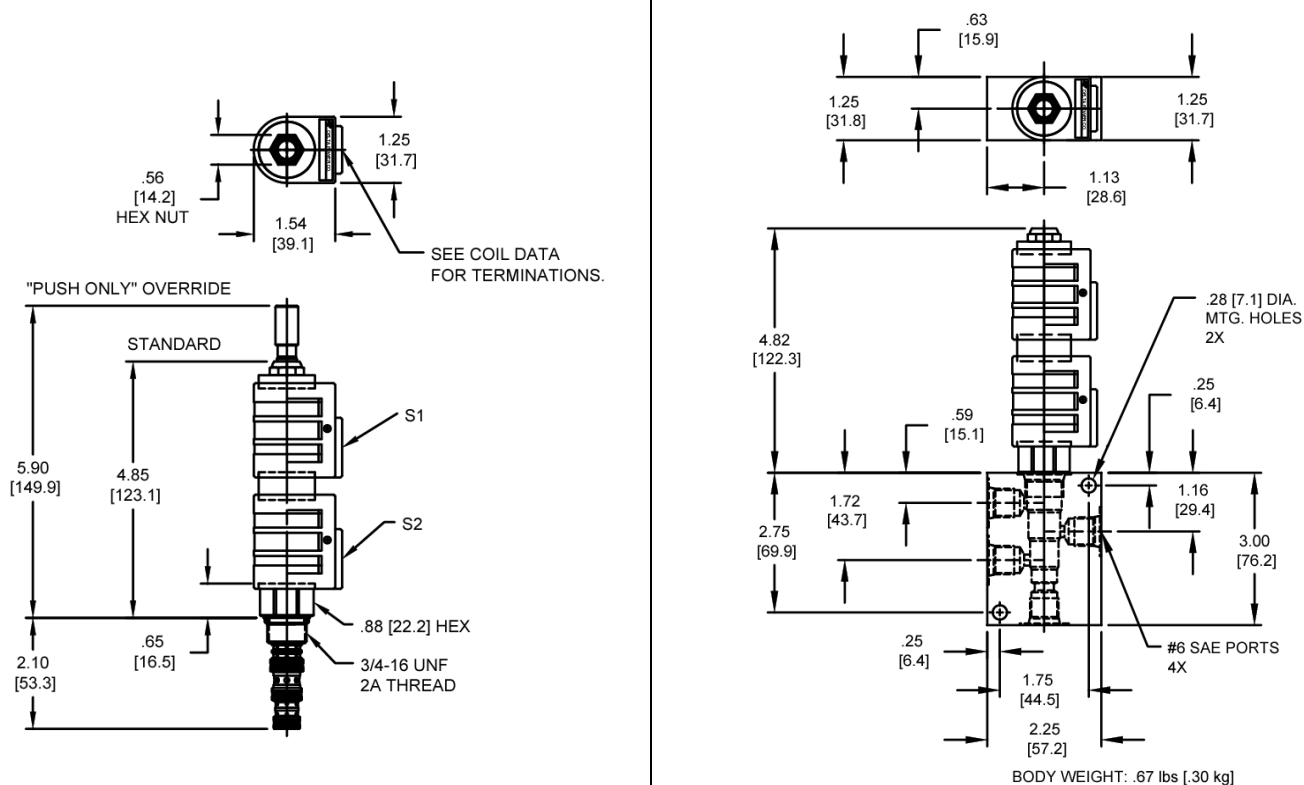


WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com


DIMENSIONS

ORDERING INFORMATION
PQ-S40
OPTIONS

Buna Standard
 Viton Standard
 Buna, Push only override
 Viton, Push only override

00
 V0
 0P
 VP

Blank
 N
 S

BODIES

Without Body
 1/4 NPTF Ports
 #6 SAE Ports

VOLTAGE

06 6 VDC
 12 12 VDC
 24 24 VDC
 36 36 VDC
 48 48 VDC
 25 24 VAC
 11 120 VAC
 22 220 VAC
 44 440 VAC

"P" COIL TERMINATION

(All DC Except as Noted)

DL Double Lead
 DT Deutsch on Leads DT04-2P
 ML Metri-Pack on Leads
 PL Packard on Leads
 WL Weatherpack on Leads

SS Single Spade
 DS Double Spade
 HC DIN 43650 (Hirschman) – (AC & DC)
 CL Conduit Lead – (AC Only)
 DI Deutsch – Integral DT04-2P

Approximate Coil Weight: .42 lbs. (.19 kg.)

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com

**DG-S4O Direct Acting Spool, 4 Way 3 Position, Open Center****DESCRIPTION**

10 size, 7/8-14 thread, "Delta" series, solenoid operated, 4 way 3 position, open center spool valve.

OPERATION

When de-energized the DG-S4O is open to all ports, all pressures are relieved. When outer coil (S1) is energized the valve allows flow from (2) to (1) and from (3) to (4). When inner coil (S2) is energized the valve allows flow from (2) to (3) and from (1) to (4).

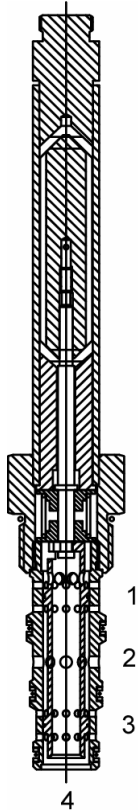
OPERATION OF MANUAL OVERRIDE OPTION:

Bi-Directional Override - Spring biased in neutral center position, when pushed the valve shifts in the S2 direction, when pulled the valve shifts in the S1 direction.

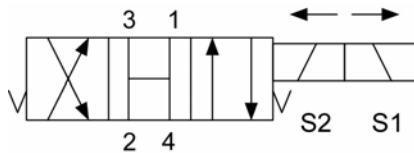
Push Only Override - Spring biased in neutral center position, when pushed the valve shifts in the S2 direction.

FEATURES

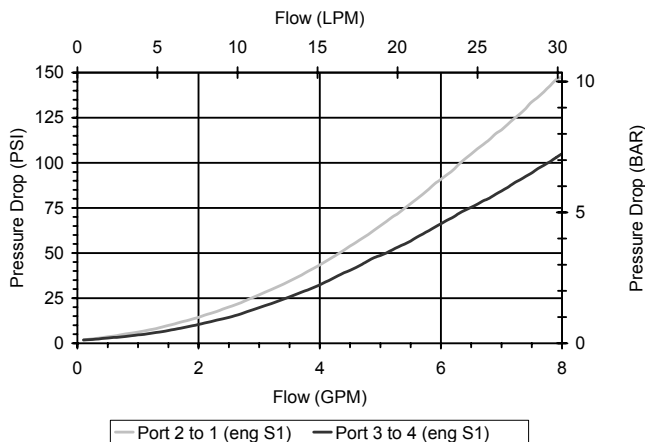
- Hardened parts for long life.
- Efficient wet-armature construction.
- Cartridges are voltage interchangeable.
- Manual override options.
- Industry common cavity.
- Unitized, molded coil design.
- Continuous duty rated solenoid.
- Optional coil voltages and terminations.
- Optional "I" Coil: Weatherproof, Thermal Shock, Immersion Safe.



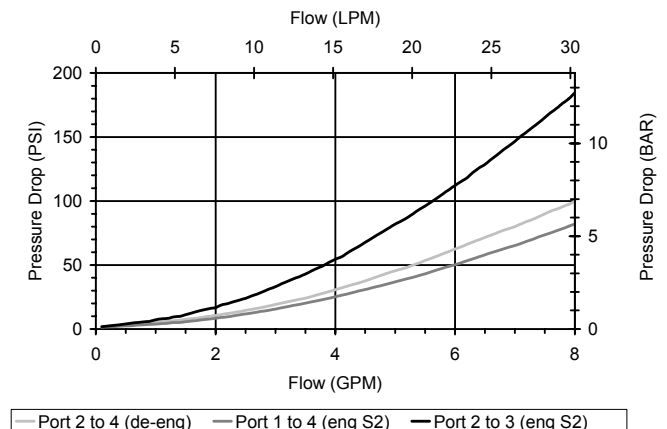
Uses "L" coil.

HYDRAULIC SYMBOL**PERFORMANCE**

Actual Test Data (Cartridge Only)

**VALVE SPECIFICATIONS**

Nominal Flow	8 GPM (30 LPM)
Rated Operating Pressure	3000 PSI (207 bar)
Typical Internal Leakage (150 SSU)	5 cu in/min (82 ml/min) per path
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temperature Range	-40° to 250° F (-40° to 120° C)
Weight	.50 lbs. (.23 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	30 ft-lbs (40.6 Nm)
Coil Nut Torque Requirements	4-6 ft-lbs (5.4 to 8.1 Nm)
Cavity	DELTA 4W
Cavity Form Tool (Finishing)	40500002
Seal Kit	21191214



WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

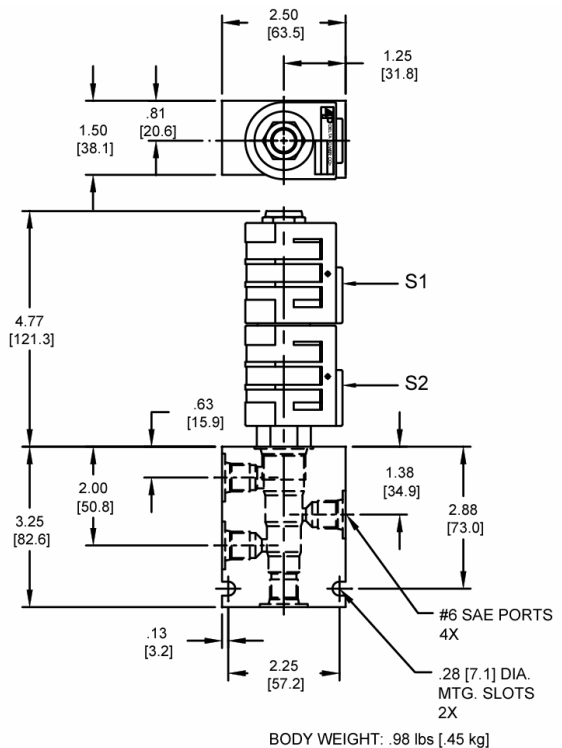
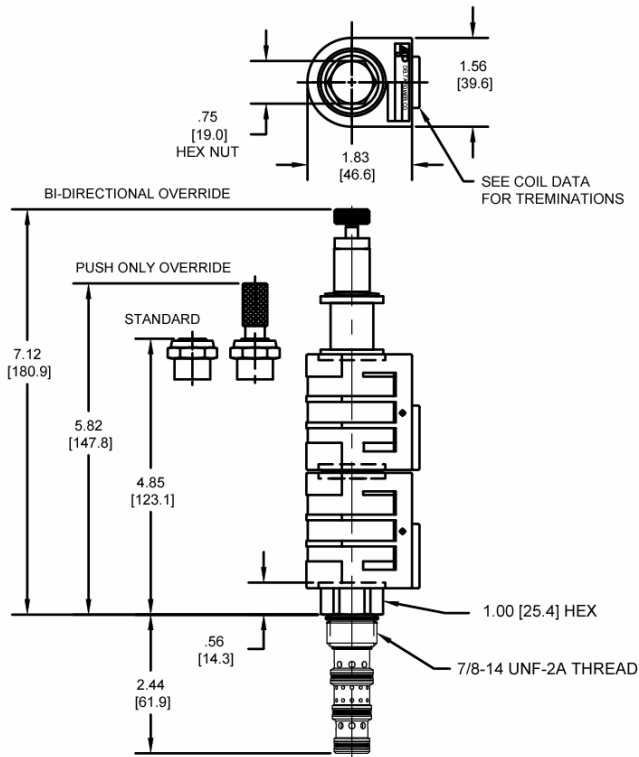
Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com



DIMENSIONS



ORDERING INFORMATION

DG-S40

OPTIONS

Buna Standard **00**
Viton Standard **V0**
Buna, Override **0M**
Viton, Override **VM**
Buna, Push only override **0P**
Viton, Push only override **VP**

Blank **N**
S

BODIES

Without Body
1/4 NPTF Ports
#6 SAE Ports

VOLTAGE

06 6 VDC
12 12 VDC
24 24 VDC
36 36 VDC
48 48 VDC
25 24 VAC
11 120 VAC
22 220 VAC
44 440 VAC

"L" COIL TERMINATION

(All DC Except as Noted)

DL Double Lead
DT Deutsch on Leads DT04-2P
ML Metri-Pack on Leads
PL Packard on Leads
WL Weatherpack on Leads

SS Single Spade
DS Double Spade
HC DIN 43650 (Hirschman) – (AC & DC)
CL Conduit Lead – (AC Only)
DI Deutsch – Integral DT04-2P

IMMERSION PROOF "L" TYPE

IA "I" Coil AMP Superseal - Integral
ID "I" Coil Deutsch – Integral DT04-2P
IJ "I" Coil AMP Jr. Timer - Integral
IM "I" Coil Metri-Pack – Integral

Approximate Coil Weight: .68 lbs. (.31 kg.)

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com

**PQ-S4T Direct Acting Spool, 4 Way 3 Position, Open Center****DESCRIPTION**

8 size, 3/4-16 thread, "Power" series, solenoid operated, 4 way 3 position, open center spool valve.

OPERATION

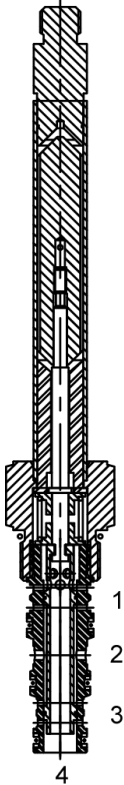
When de-energized the PQ-S4T is open to all ports, all pressures are relieved. When outer coil (S1) is energized the valve allows flow from (2) to (1) and from (3) to (4). When inner coil (S2) is energized the valve allows flow from (2) to (3) and from (1) to (4).

OPERATION OF MANUAL OVERRIDE OPTION:

Push Only Override - Spring biased in neutral center position, when pushed the valve shifts in the S2 direction.

FEATURES

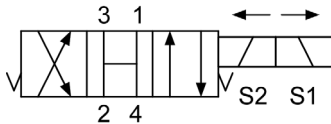
- Hardened parts for long life.
- Efficient wet-armature construction.
- Cartridges are voltage interchangeable.
- Industry common cavity.
- Optional manual "push only" override.
- Unitized, molded coil design.
- Continuous duty rated solenoid.
- Optional coil voltages and terminations.



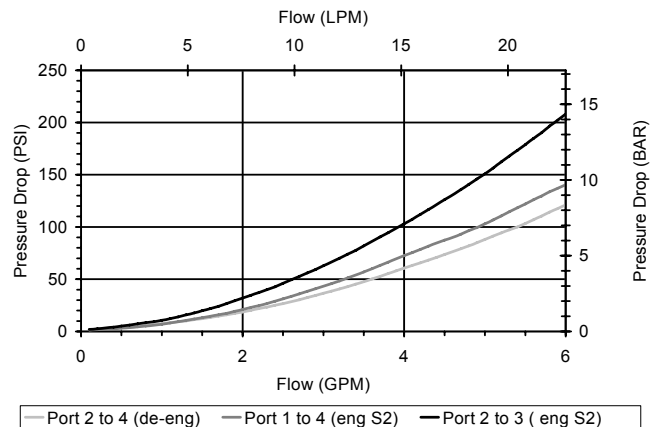
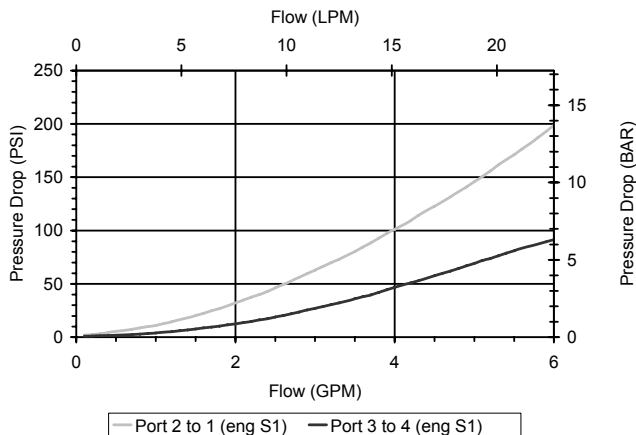
Uses "D" Delta coil.
"OP" override is a push only non-detented button that actuates S2 direction.

VALVE SPECIFICATIONS

Nominal Flow	5 GPM (19 LPM)
Rated Operating Pressure	3000 PSI (207 bar)
Typical Internal Leakage (150 SSU)	5 cu in/min (82 ml/min) per path
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temperature Range	-40° to 250° F (-40° to 120° C)
Weight	.42 lbs. (.19 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	25 ft-lbs (34 Nm)
Coil Nut Torque Requirements	4-6 ft-lbs (5.4-8.1Nm)
Cavity	POWER 4W
Cavity Form Tool (Finishing)	40500029
Seal Kit	21191108

HYDRAULIC SYMBOL**PERFORMANCE**

Actual Test Data (Cartridge Only)



WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

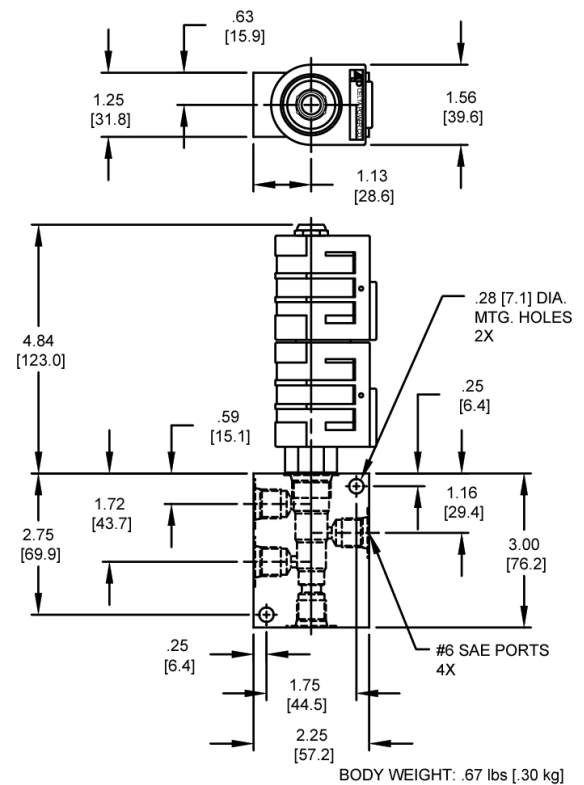
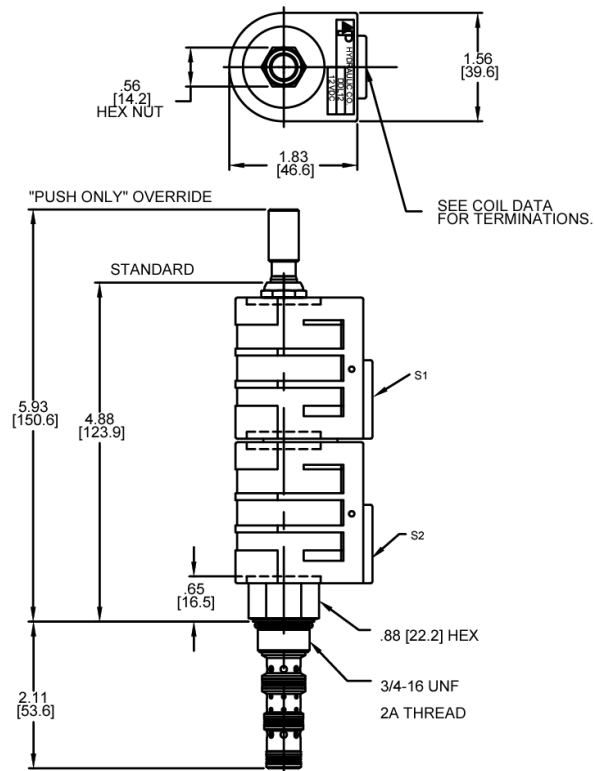
Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com



DIMENSIONS



BODY WEIGHT: .67 lbs [.30 kg]

ORDERING INFORMATION

PQ-S4T -

OPTIONS

Buna Standard **00**
 Viton Standard **V0**
 Buna, Push only override **0P**
 Viton, Push only override **VP**

Blank
N
S

BODIES

Without Body
 1/4 NPTF Ports
 #6 SAE Ports

VOLTAGE

06 6 VDC
12 12 VDC
24 24 VDC
36 36 VDC
48 48 VDC
25 24 VAC
11 120 VAC
22 220 VAC
44 440 VAC

"D" COIL TERMINATION

(All DC Except as Noted)

DL Double Lead
DT Deutsch on Leads DT04-2P
ML Metri-Pack on Leads
PL Packard on Leads
WL Weatherpack on Leads

SS Single Spade
DS Double Spade
HC DIN 43650 (Hirschman) – (AC & DC)
CL Conduit Lead – (AC Only)
DI Deutsch – Integral DT04-2P

Approximate Coil Weight: .74 lbs. (.33 kg.)

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com


PQ-S4P Direct Acting Spool, 4 Way 3 Position, Closed Center
DESCRIPTION

8 size, 3/4-16 thread, "Power" series, solenoid operated, 4 way 3 position, closed center spool valve.

OPERATION

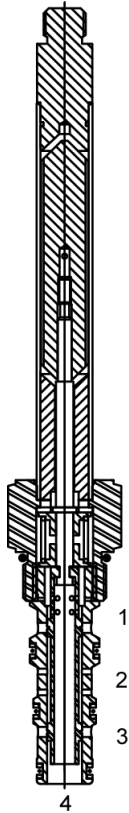
When de-energized the PQ-S4P blocks flow at all ports. When outer coil (S1) is energized the valve allows flow from (2) to (1) and from (3) to (4). When inner coil (S2) is energized the valve allows flow from (2) to (3) and from (1) to (4).

OPERATION OF MANUAL OVERRIDE OPTION:

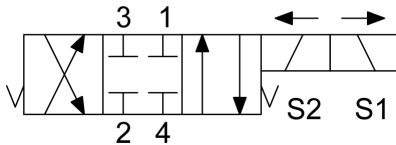
Push Only Override - Spring biased in neutral center position, when pushed the valve shifts in the S2 direction.

FEATURES

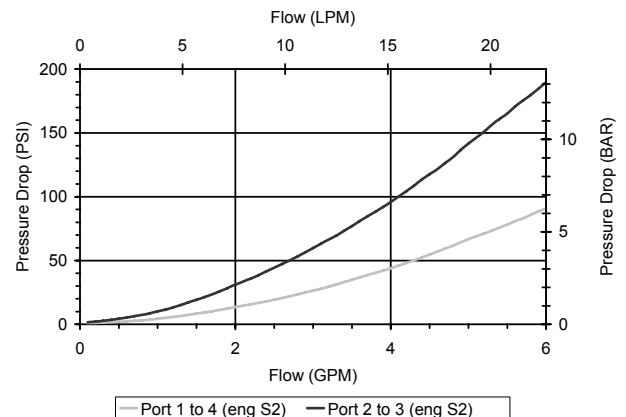
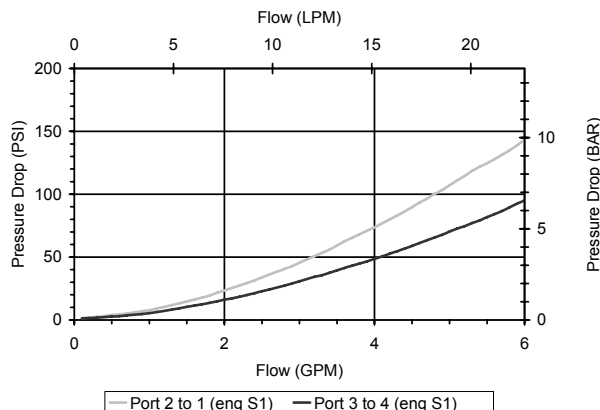
- Hardened parts for long life.
- Efficient wet-armature construction.
- Cartridges are voltage interchangeable.
- Industry common cavity.
- Unitized, molded coil design.
- Optional manual "push only" override.
- Continuous duty rated solenoid.
- Optional coil voltages and terminations.



Uses "D" Delta coil.
 Flow rating based upon on maximum differential load of 1000 PSI.
 "OP" override is a push only non-detented button that actuates S2 direction.

HYDRAULIC SYMBOL

PERFORMANCE

Actual Test Data (Cartridge Only)



WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

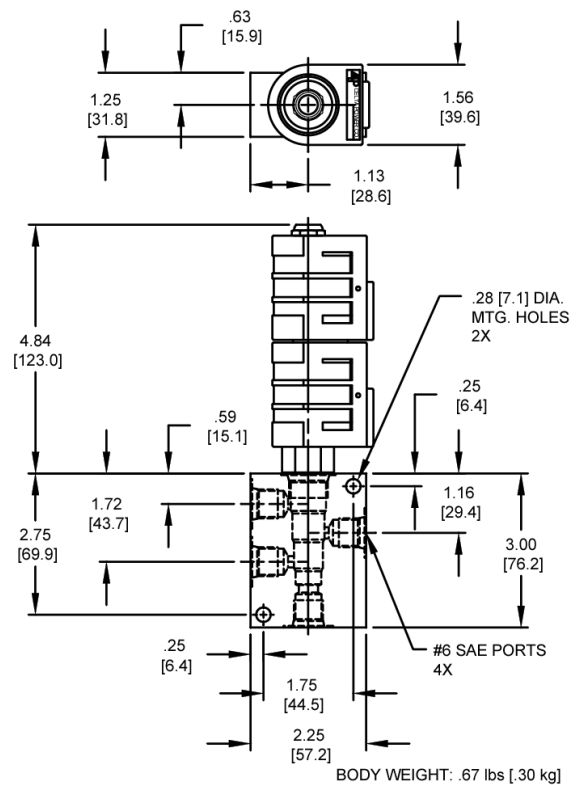
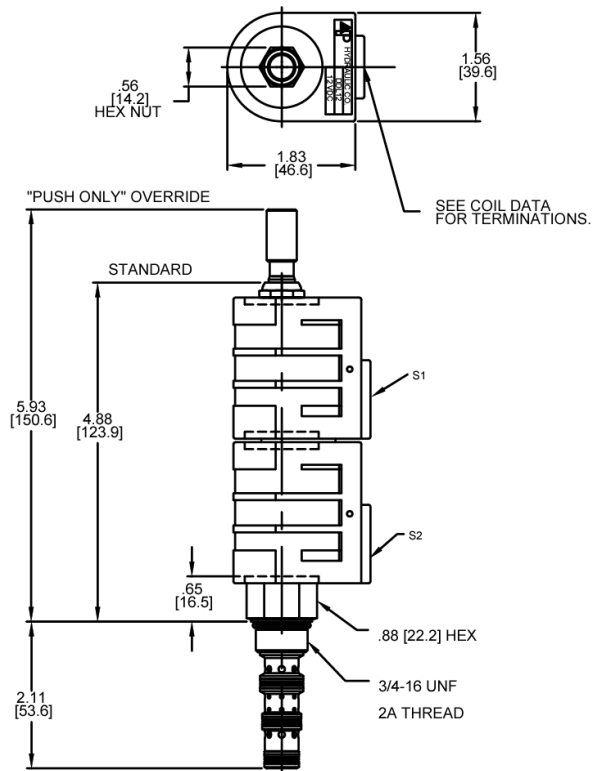
Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com



DIMENSIONS



ORDERING INFORMATION

PQ-S4P

OPTIONS
Buna Standard
Viton Standard
Buna, Push only override
Viton, Push only override

00
V0
0P
VP

Blank
N
S

BODIES
Without Body
1/4 NPTF Ports
#6 SAE Ports

VOLTAGE
06 6 VDC
12 12 VDC
24 24 VDC
36 36 VDC
48 48 VDC
25 24 VAC
11 120 VAC
22 220 VAC
44 440 VAC

"D" COIL TERMINATION
(All DC Except as Noted)

DL Double Lead
DT Deutsch on Leads DT04-2P
ML Metri-Pack on Leads
PL Packard on Leads
WL Weatherpack on Leads

SS Single Spade
DS Double Spade
HC DIN 43650 (Hirschman) – (AC & DC)
CL Conduit Lead – (AC Only)
DI Deutsch – Integral DT04-2P

Approximate Coil Weight: .74 lbs. (.33 kg.)

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com

**DG-S4P Direct Acting Spool, Closed Center, 4 Way 3 Position, Closed Center****DESCRIPTION**

10 size, 7/8-14 thread, "Delta" series, solenoid operated, 4 way 3 position, closed center spool valve.

OPERATION

When de-energized the DG-S4P blocks flow at all ports. When outer coil (S1) is energized the valve allows flow from (2) to (1) and from (3) to (4). When inner coil (S2) is energized the valve allows flow from (2) to (3) and from (1) to (4).

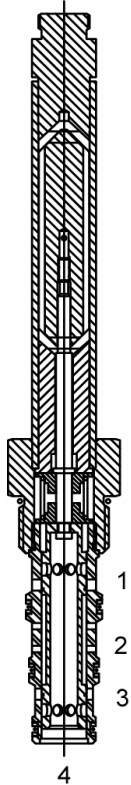
OPERATION OF MANUAL OVERRIDE OPTION:

Bi-Directional Override - Spring biased in neutral center position, when pushed the valve shifts in the S2 direction, when pulled the valve shifts in the S1 direction.

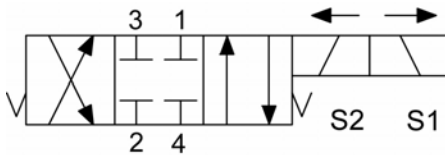
Push Only Override - Spring biased in neutral center position, when pushed the valve shifts in the S2 direction.

FEATURES

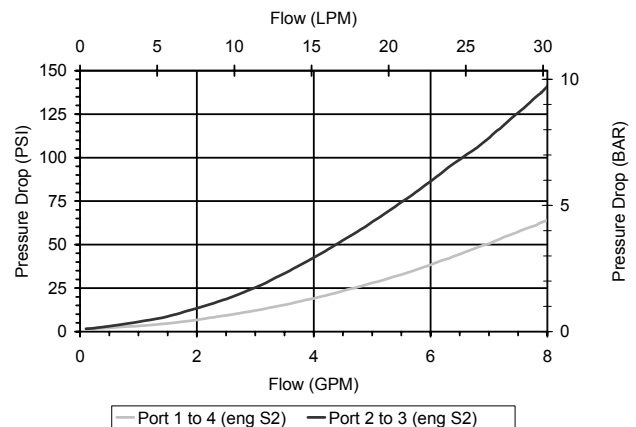
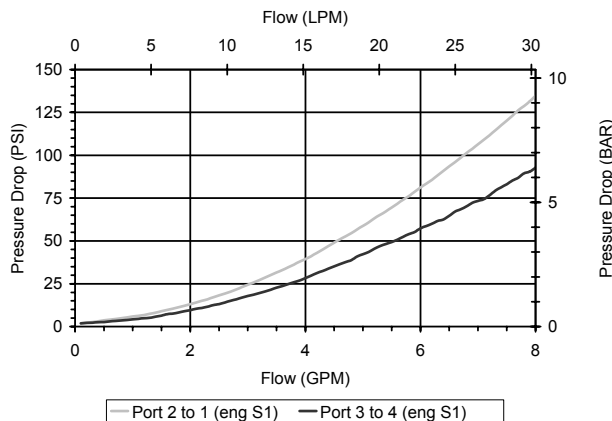
- Hardened parts for long life.
- Efficient wet-armature construction.
- Cartridges are voltage interchangeable.
- Manual override options.
- Industry common cavity.
- Unitized, molded coil design.
- Continuous duty rated solenoid.
- Optional coil voltages and terminations.
- Optional "I" Coil: Weatherproof, Thermal Shock, Immersion Safe.



Uses "L" Coil.
Flow rating is at 1000 PSID
maximum differential loading.

HYDRAULIC SYMBOL**PERFORMANCE**

Actual Test Data (Cartridge Only)



WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

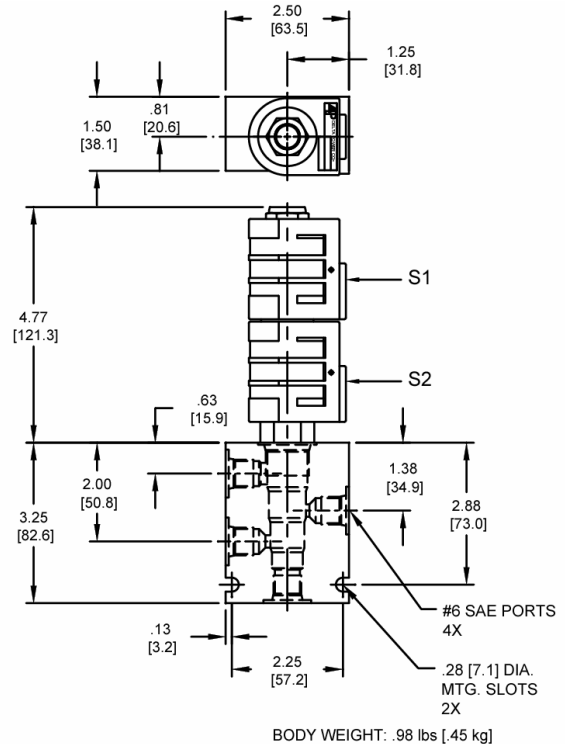
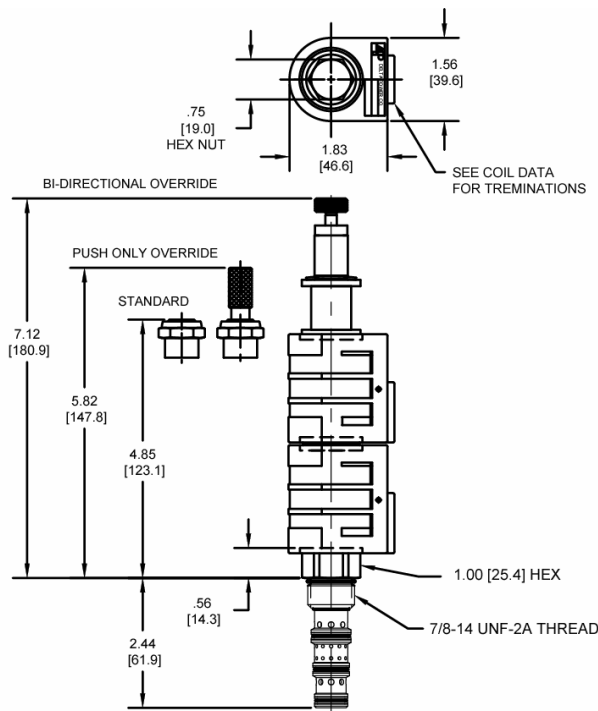
Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com



DIMENSIONS



ORDERING INFORMATION

DG-S4P

OPTIONS

Buna Standard **00**
Viton Standard **V0**
Buna, Override **0M**
Viton, Override **VM**
Buna, Push only override **0P**
Viton, Push only override **VP**

Blank **N**
S

BODIES

Without Body
1/4 NPTF Ports
#6 SAE Ports

VOLTAGE

06 6 VDC
12 12 VDC
24 24 VDC
36 36 VDC
48 48 VDC
25 24 VAC
11 120 VAC
22 220 VAC
44 440 VAC

"L" COIL TERMINATION

(All DC Except as Noted)

DL Double Lead
DT Deutsch on Leads DT04-2P
ML Metri-Pack on Leads
PL Packard on Leads
WL Weatherpack on Leads

SS Single Spade
DS Double Spade
HC DIN 43650 (Hirschman) – (AC & DC)
CL Conduit Lead – (AC Only)
DI Deutsch – Integral DT04-2P

IMMERSION PROOF "L" TYPE

IA "I" Coil AMP Superseal - Integral
ID "I" Coil Deutsch – Integral DT04-2P
IJ "I" Coil AMP Jr. Timer - Integral
IM "I" Coil Metri-Pack – Integral

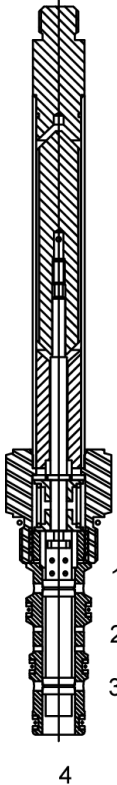
Approximate Coil Weight: .68 lbs. (.31 kg.)

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com


PQ-S4Q Direct Acting Spool, 4 Way 3 Position, Closed Center

DESCRIPTION

8 size, 3/4-16 thread, "Power" series, solenoid operated, 4 way 3 position, closed center spool valve.

OPERATION

When de-energized the PQ-S4Q blocks flow to all ports. When outer coil (S1) is energized the valve allows flow from (2) to (1) and from (3) to (4). When inner coil (S2) is energized the valve allows flow from (2) to (3) and from (1) to (4).

OPERATION OF MANUAL OVERRIDE OPTION:

Push Only Override - Spring biased in neutral center position, when pushed the valve shifts in the S2 direction.

FEATURES

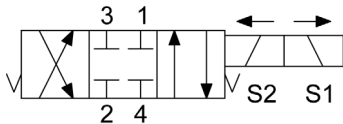
- Hardened parts for long life.
- Efficient wet-armature construction.
- Cartridges are voltage interchangeable.
- Industry common cavity.
- Optional manual "push only" override.
- Unitized, molded coil design.
- Continuous duty rated solenoid.
- Optional coil voltages and terminations.



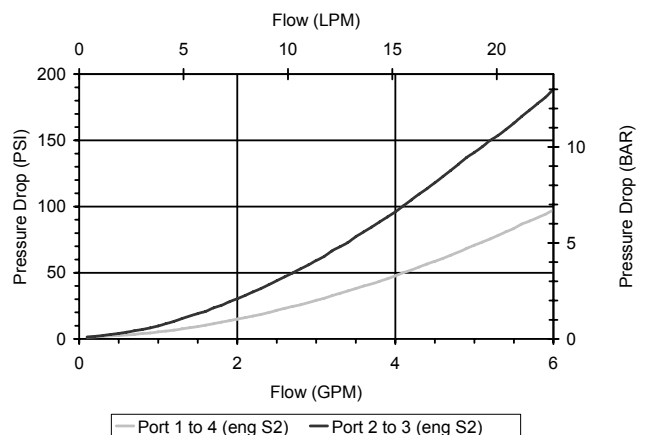
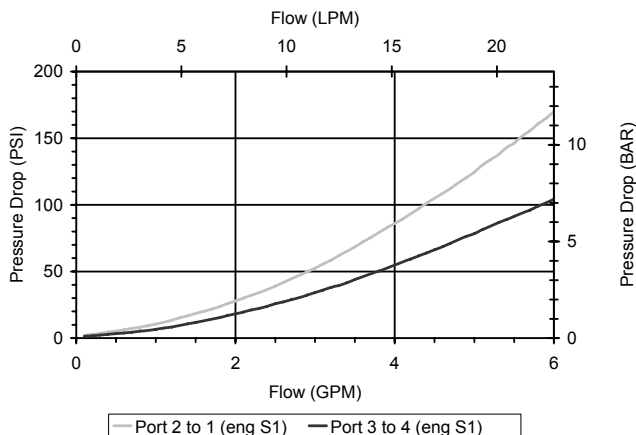
Uses "P" Power coil.
 For higher flow see PQ-S4P. Flow rating based on maximum differential load of 1000 PSI.
 "OP" override is a push only non-detented button that actuates S2 direction.

VALVE SPECIFICATIONS

Nominal Flow	6 GPM (23 LPM)
Rated Operating Pressure	3000 PSI (207 bar)
Typical Internal Leakage (150 SSU)	5 cu in/min (82 ml/min) per path
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temperature Range	-40° to 250° F (-40° to 120° C)
Weight	.42 lbs. (.19 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	30 ft-lbs (40.6 Nm)
Coil Nut Torque Requirements	4-6 ft-lbs (5.4-8.1 Nm)
Cavity	POWER 4W
Cavity Form Tool (Finishing)	40500029
Seal Kit	21191108

HYDRAULIC SYMBOL

PERFORMANCE

Actual Test Data (Cartridge Only)



WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

Phone: (815) 397-6628

Fax: (815) 397-2526

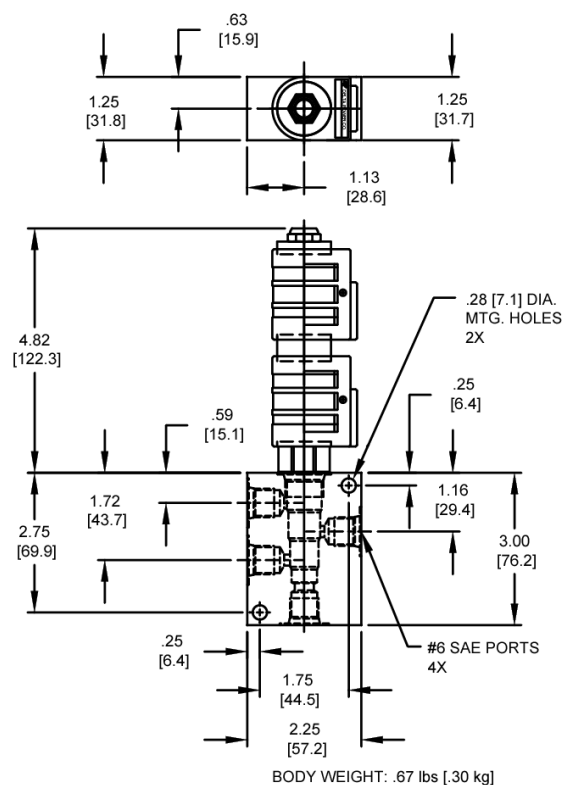
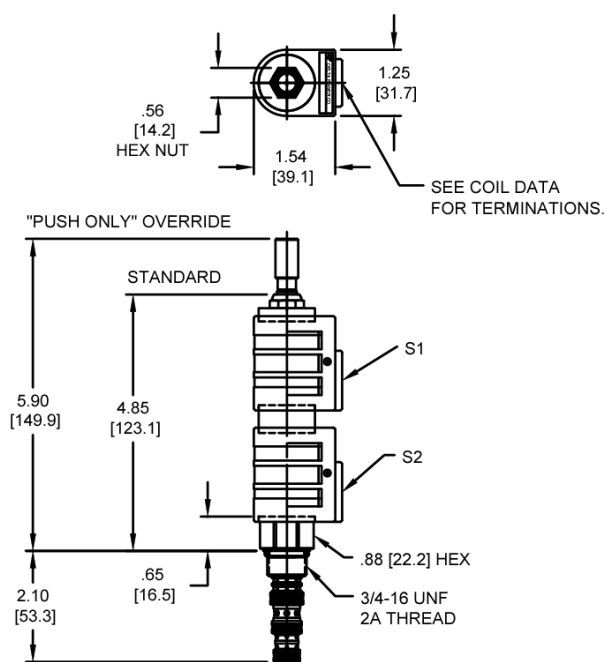
E-mail: delta@delta-power.com



Delta Power Company

4484 Boeing Drive - Rockford, IL 61109

DIMENSIONS



ORDERING INFORMATION

PQ-S4Q

OPTIONS

Buna Standard
Viton Standard
Buna, Push only override
Viton, Push only override

00
V0
0P
VP

Blank
N
C

BODIES

Without Body
1/4 NPTF Ports
#6 SAE Ports

VOLTAGE

06	6 VDC
12	12 VDC
24	24 VDC
36	36 VDC
48	48 VDC
25	24 VAC
11	120 VAC
22	220 VAC
44	440 VAC

"P" COIL TERMINATION

(All DC Except as Noted)

DL	Double Lead
DT	Deutsch on Leads DT04-2P
ML	Metri-Pack on Leads
PL	Packard on Leads
WL	Weatherpack on Leads

SS Single Spade
DS Double Spade
HC DIN 43650 (Hirschman) – (AC & DC)
CL Conduit Lead – (AC Only)
DI Deutsch – Integral DT04-2P

Approximate Coil Weight: .42 lbs. (.19 kg.)

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com



VQ-S4Q Direct Acting Spool, 4 Way 3 Position, Closed Center

DESCRIPTION

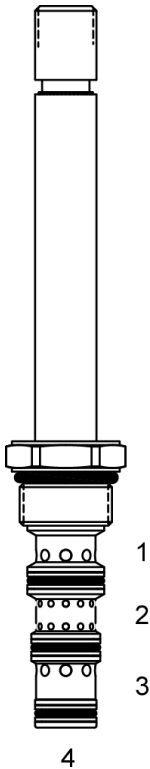
Low Profile 8 size, 3/4-16 thread, "Power" series, solenoid operated, 4W3P, closed center spool valve.

OPERATION

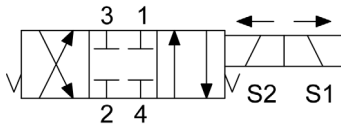
When de-energized the VQ-S4Q blocks flow to all ports. When outer coil (S1) is energized the valve allows flow from (2) to (1) and from (3) to (4). When inner coil (S2) is energized the valve allows flow from (2) to (3) and from (1) to (4).

FEATURES

- Hardened parts for long life.
- Efficient wet-armature construction.
- Cartridges are voltage interchangeable.
- Industry common cavity.
- Unitized, molded coil design.
- Continuous duty rated solenoid.
- Optional coil voltages and terminations.
- Optional "I" Coil: Weatherproof, Thermal Shock, Immersion Safe.

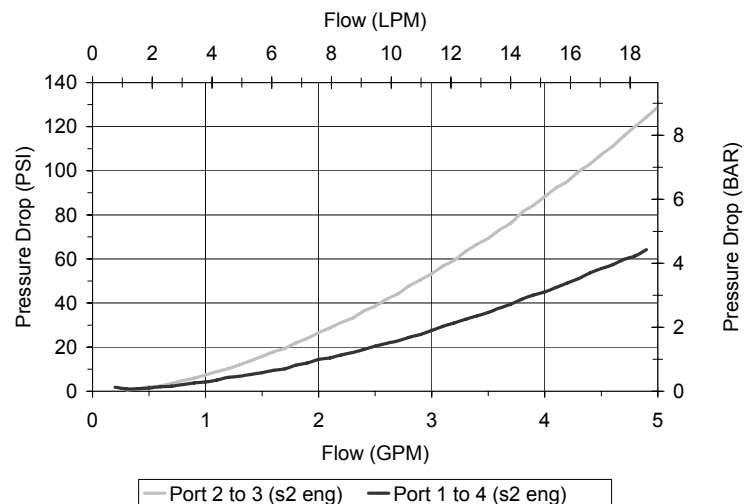
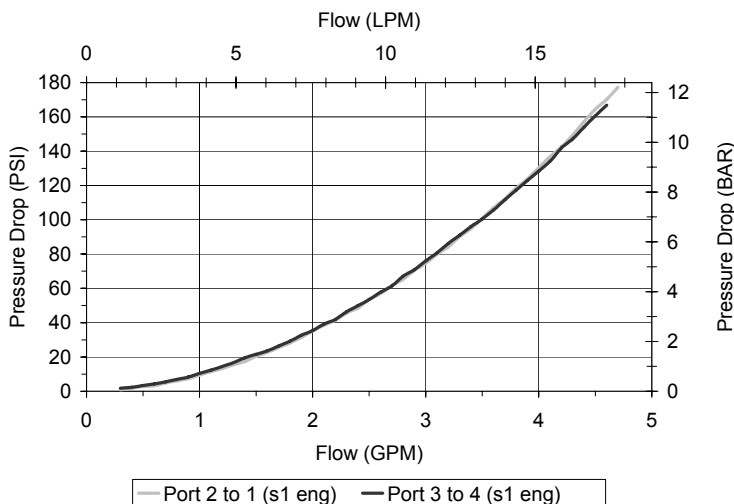


HYDRAULIC SYMBOL



PERFORMANCE

Actual Test Data (Cartridge Only)

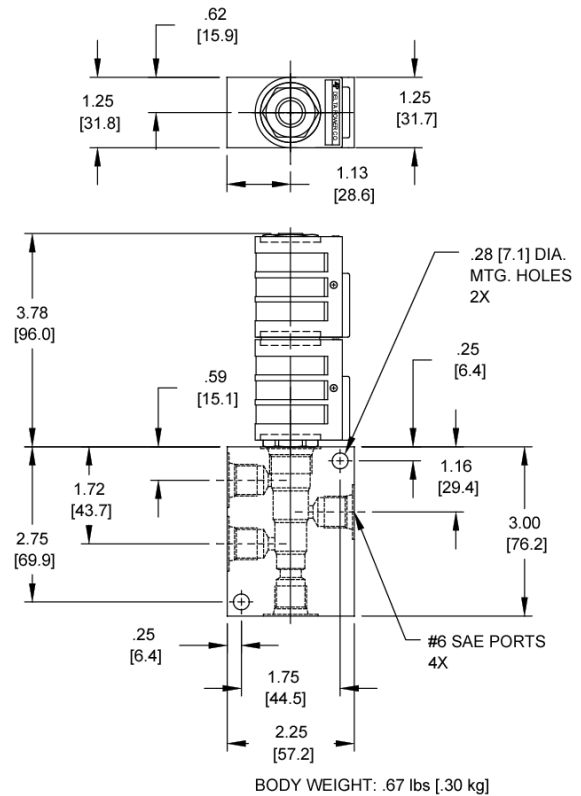
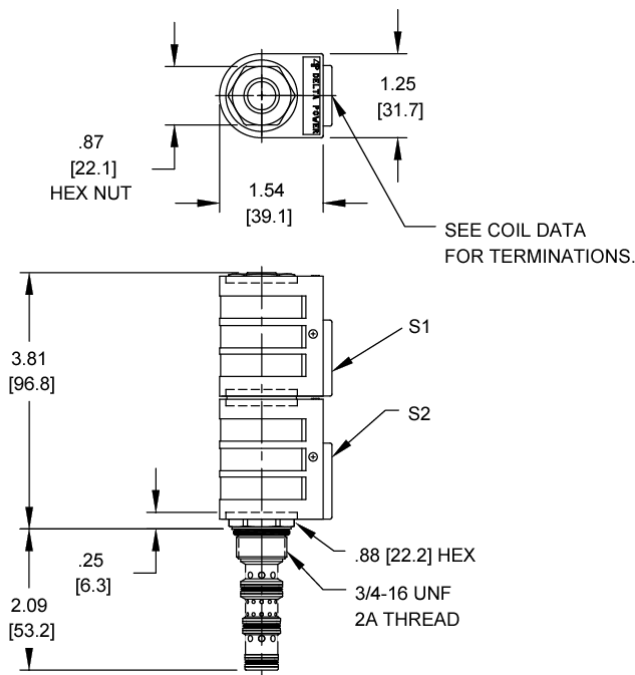


WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com


DIMENSIONS

ORDERING INFORMATION
VQ-S4Q

OPTIONS
 Buna Standard 00
 Viton Standard V0

BODIES
 Without Body
 1/4 NPTF Ports
 #6 SAE Ports

VOLTAGE
 06 6 VDC
 12 12 VDC
 24 24 VDC
 36 36 VDC
 48 48 VDC
 25 24 VAC
 11 120 VAC
 22 220 VAC
 44 440 VAC

"P" COIL TERMINATION
 (All DC Except as Noted)

DL Double Lead
DT Deutsch on Leads DT04-2P
ML Metri-Pack on Leads
PL Packard on Leads
WL Weatherpack on Leads

SS Single Spade
DS Double Spade
HC DIN 43650 (Hirschman) – (AC & DC)
CL Conduit Lead – (AC Only)
DI Deutsch – Integral DT04-2P

IMMERSION PROOF "P" TYPE
IA "I" Coil AMP Superseal - Integral
ID "I" Coil Deutsch – Integral DT04-2P
IJ "I" Coil AMP Jr. Timer - Integral
IM "I" Coil Metri-Pack – Integral

Approximate Coil Weight: .42 lbs. (.19 kg.)

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com

**DG-S4S Spool Operated, 4 Way 3 Position, Scotch Center****DESCRIPTION**

10 size, 7/8-14 thread, "Delta" series, solenoid operated, 4 way 3 position, scotch center spool valve.

OPERATION

When de-energized the DG-S4S blocks flow at (1) and (2) and allows flow from (3) to (4). When outer coil (S1) is energized the valve allows flow from (2) to (1) and from (3) to (4). When inner coil (S2) is energized the valve allows flow from (2) to (3) and from (1) to (4).

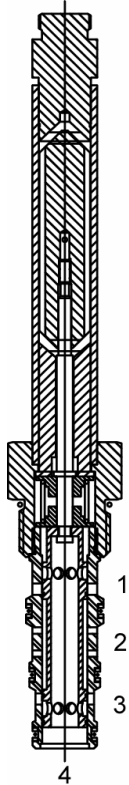
OPERATION OF MANUAL OVERRIDE OPTION:

Bi-Directional Override - Spring biased in neutral center position, when pushed the valve shifts in the S2 direction, when pulled the valve shifts in the S1 direction.

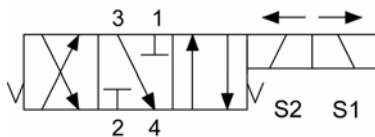
Push Only Override - Spring biased in neutral center position, when pushed the valve shifts in the S2 direction.

FEATURES

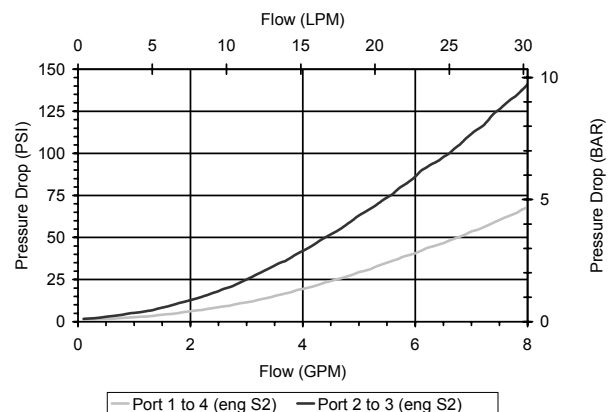
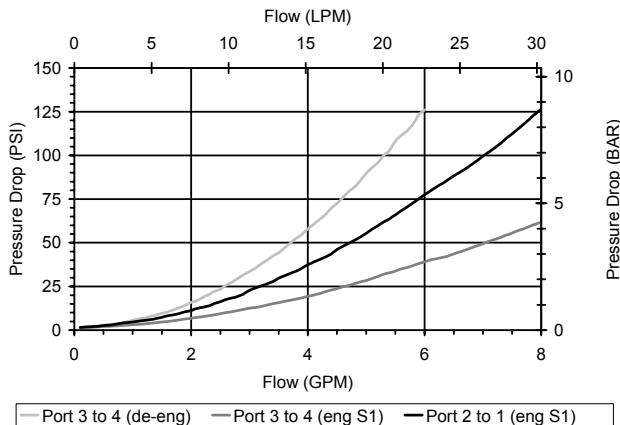
- Hardened parts for long life.
- Efficient wet-armature construction.
- Cartridges are voltage interchangeable.
- Manual override options.
- Industry common cavity.
- Unitized, molded coil design.
- Continuous duty rated solenoid.
- Optional coil voltages and terminations.
- Optional "I" Coil: Weatherproof, Thermal Shock, Immersion Safe.



Uses "L" Coil.
Flow rating is at 1000 PSID maximum differential loading

HYDRAULIC SYMBOL**PERFORMANCE**

Actual Test Data (Cartridge Only)



WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

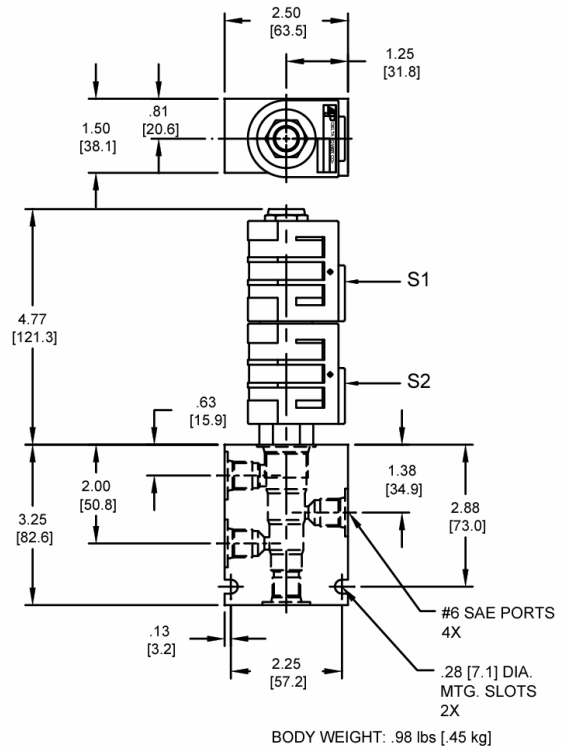
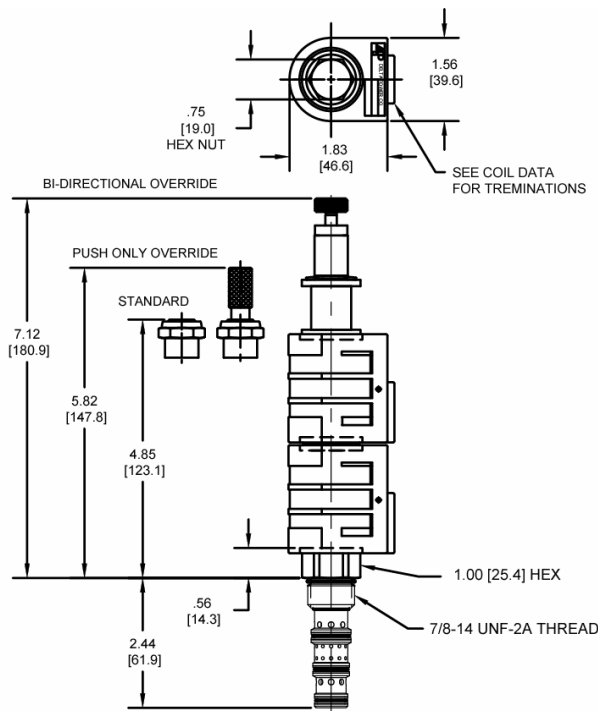
Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com



DIMENSIONS



ORDERING INFORMATION

DG-S4S

OPTIONS

Buna Standard **00**
Viton Standard **V0**
Buna, Override **0M**
Viton, Override **VM**
Buna, Push only override **0P**
Viton, Push only override **VP**

Blank **N**
S

BODIES

Without Body
1/4 NPTF Ports
#6 SAE Ports

VOLTAGE

06 6 VDC
12 12 VDC
24 24 VDC
36 36 VDC
48 48 VDC
25 24 VAC
11 120 VAC
22 220 VAC
44 440 VAC

"L" COIL TERMINATION

(All DC Except as Noted)

DL Double Lead
DT Deutsch on Leads DT04-2P
ML Metri-Pack on Leads
PL Packard on Leads
WL Weatherpack on Leads

SS Single Spade
DS Double Spade
HC DIN 43650 (Hirschman) – (AC & DC)
CL Conduit Lead – (AC Only)
DI Deutsch – Integral DT04-2P

IA "I" Coil AMP Superseal - Integral
ID "I" Coil Deutsch – Integral DT04-2P
IJ "I" Coil AMP Jr. Timer - Integral
IM "I" Coil Metri-Pack – Integral

Approximate Coil Weight: .68 lbs. (.31 kg.)

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

Phone: (815) 397-6628

Fax: (815) 397-2526

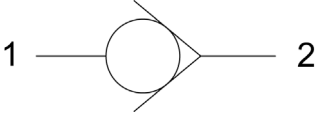
E-mail: delta@delta-power.com



SECTION/Description	Pages
Direct Acting Check Valves	227
Pilot to Open and Double PO Check Valves	257
Pilot to Close Check Valves	271
Check Valves with Thermal Relief	277
2W2P Manual Valves	281
3W2P Manual Valves	303
4W2P Manual Valves	307
Pilot to Shift Valves	315
Shuttle Valves	321
Rotary Valves	327

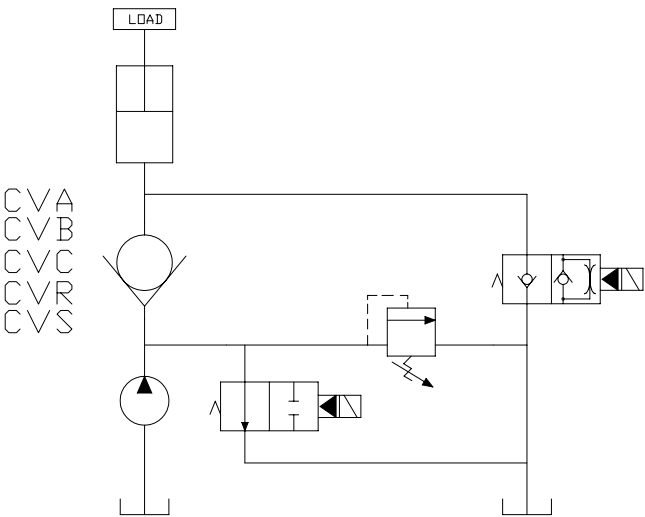
WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

Direct Acting Check Valves

	GPM	PSI	LPM	BAR	MODEL	PAGE
	5	3500	19	241	MA-CVA	228
	10	4350	38	300	HB-CVA	230
	15	3500	57	241	DE-CVA	232
	15	5000	57	345	HE-CVA	234
	35	5000	132	345	HT-CVA	236
	40	3500	151	241	SJ-CVA	238
	10	3500	38	241	DE-CVB	240
	10	3500	38	241	PB-CVC	242
	15	3500	57	241	DE-CVC	244
	15	3500	57	241	DE-CVR	246
	35	5000	132	345	HT-CVR	248
	2.5	1500	9.5	103	MA-CVS	250
	5	3500	19	241	PB-CVS	252
	10	1000	38	69	DE-CVS	254

Typical Schematic

Typical application for the CVA, CVB, CVC, CVR, and CVS is load holding in a lift, check, or dump circuit.



WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com



MA-CVA Direct Acting Check Valve, Poppet

DESCRIPTION

7 size, 5/8-18 thread, "Mini" series, direct acting check valve.

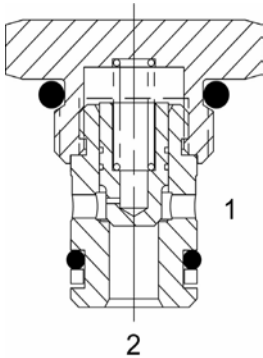
OPERATION

The MA-CVA allows flow passage from (2) to (1), while normally blocking oil flow from (1) to (2).

The cartridge has a fully guided poppet, which is spring-biased closed, until sufficient pressure is applied at (2) to open to (1).

FEATURES

- Hardened parts for long life and low leakage.
- Optional bias springs for backpressure application flexibility.
- Fully guided poppet.
- Industry common cavity.

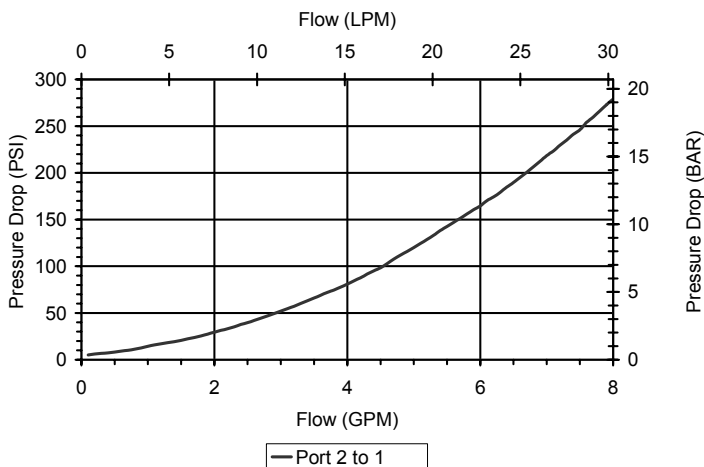


HYDRAULIC SYMBOL



PERFORMANCE

Actual Test Data (Cartridge Only)



VALVE SPECIFICATIONS

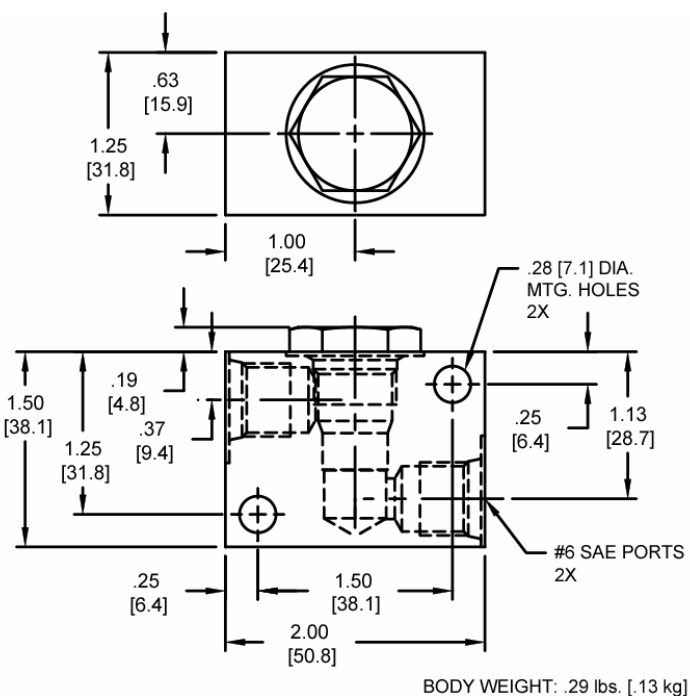
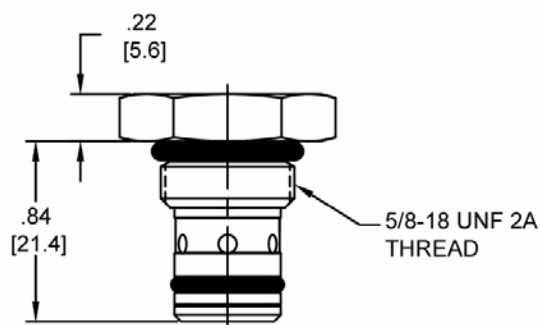
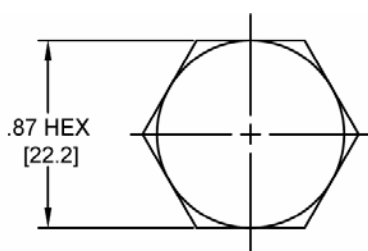
Nominal Flow	5 GPM (19 LPM)
Rated Operating Pressure	3500 PSI (241 bar)
Typical Internal Leakage (150 SSU)	0-5 drops/min
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temperature Range	-40° to 250° F (-40° to 120° C)
Weight	.08 lbs. (.03 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	15 ft-lbs (20.3 Nm)
Cavity	MINI 2W
Cavity Form Tool (Finishing)	40500003
Seal Kit	21191000

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com


DIMENSIONS

ORDERING INFORMATION
MA-CVA
OPTIONS
 Buna Standard
 Viton Standard

00
V0

 Blank
N
S
BODIES

 Without Body
 1/4 NPTF Ports
 #6 SAE Ports

CRACK PRESSURE
0005
0020
 5 PSI
 20 PSI
 ± 10%

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

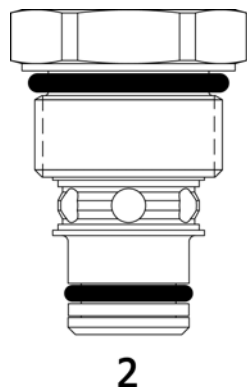
Phone: (815) 397-6628

Fax: (815) 397-2526

 E-mail: delta@delta-power.com



HB-CVA Direct Acting Check Valve, Poppet



DESCRIPTION

"High Pressure" 8 size, 3/4-16 thread, "Power" series, direct acting check valve.

OPERATION

The HB-CVA allows free flow passage from (2) to (1), and blocks flow from (1) to (2).

The cartridge has a fully guided check poppet, which is spring-biased closed until sufficient pressure is applied at (2) to open to (1).

FEATURES

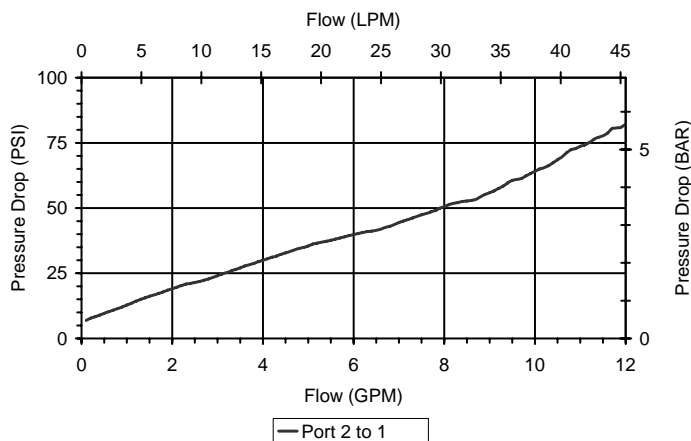
- Hardened parts for long life and low leakage.
- Optional bias springs for back-pressure application flexibility.
- Fully guided poppet assembly.
- Industry common cavity.

HYDRAULIC SYMBOL



PERFORMANCE

Actual Test Data (Cartridge Only)



VALVE SPECIFICATIONS

Nominal Flow	10 GPM (38 LPM)
Rated Operating Pressure	4350 PSI (300 bar)
Typical Internal Leakage (150 SSU)	0-5 drops/min
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temperature Range	-40° to 250° F (-40° to 120° C)
Weight	.10 lbs. (.05 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	35 ft-lbs (47 Nm)
Cavity	POWER 2W
Cavity Form Tool (Finishing)	40500005
Seal Kit	21191100

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

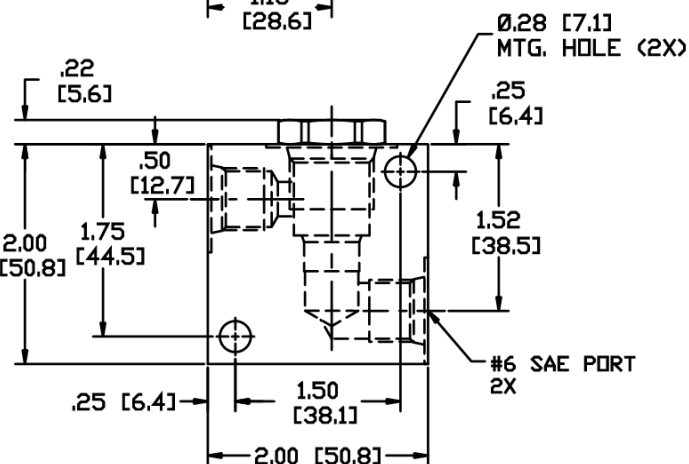
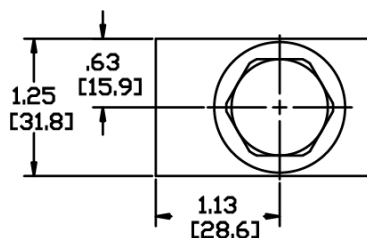
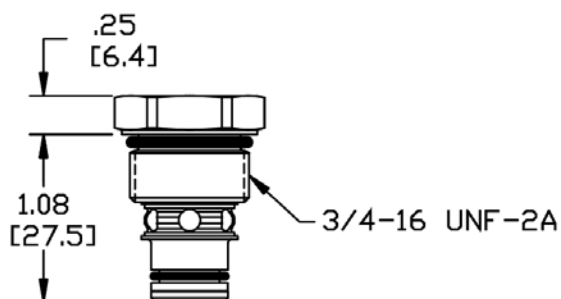
Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com



DIMENSIONS



BODY WEIGHT: .40 LBS. [.18 kg]

ORDERING INFORMATION

HB-CVA - - -

OPTIONS

Buna Standard
Viton Standard00
V0Blank
N
S

BODIES

Without Body
1/4 NPTF Ports
#6 SAE Ports

CRACK PRESSURE

0005 5 PSI
0010 10 PSI
0030 30 PSI
0070 70 PSI
± 10%

Note: Aluminum, NOT durability rated for 4350 PSI. Consult factory for options.

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com


DE-CVA Direct Acting Check Valve, Poppet
DESCRIPTION

10 size, 7/8-14 thread, "Delta" series, direct acting check valve.

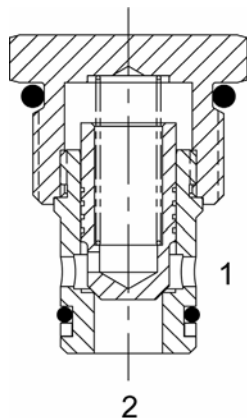
OPERATION

The DE-CVA allows free flow passage from (2) to (1), and blocks flow from (1) to (2).

The cartridge has a fully guided check poppet, which is spring-biased closed, until sufficient pressure is applied at (2) to open to (1).

FEATURES

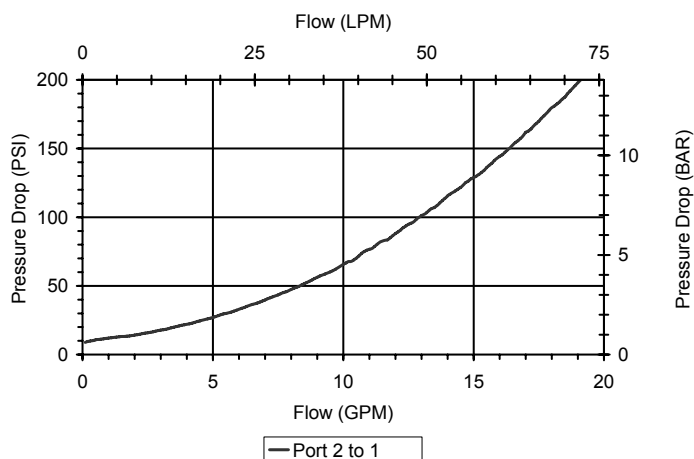
- Hardened parts for long life and low leakage.
- Optional bias springs for backpressure application flexibility.
- Fully guided poppet assembly.
- Industry common cavity.


HYDRAULIC SYMBOL


Drop-In pilot pistons can be used (except the 135 and 150 psi version) to create P.O. Check Valve Function, see the Hydraulic Integrated Circuits section (page 480) for details.

PERFORMANCE

Actual Test Data (Cartridge Only)


VALVE SPECIFICATIONS

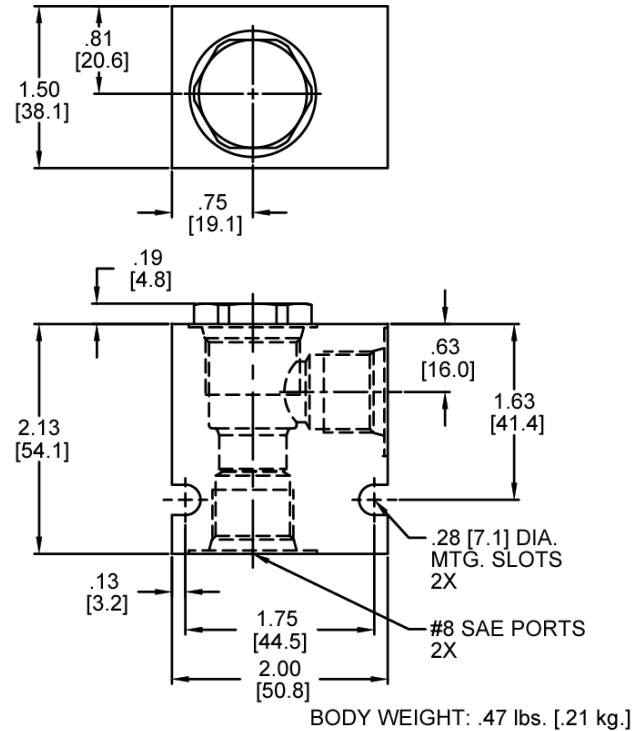
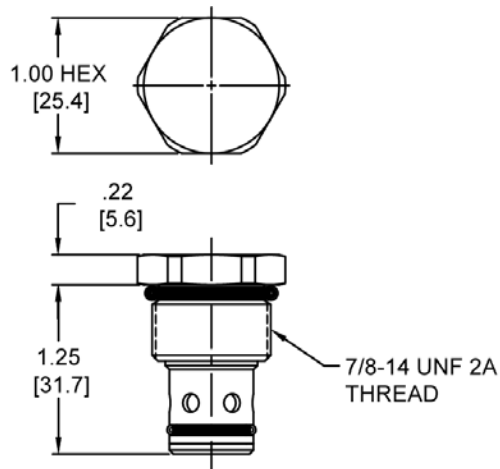
Nominal Flow	15 GPM (57 LPM)
Rated Operating Pressure	3500 PSI (241 bar)
Typical Internal Leakage (150 SSU)	0-5 drops/min
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temperature Range	-40° to 250° F (-40° to 120° C)
Weight	.15 lbs. (.07 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	30 ft-lbs (40.6 Nm)
Cavity	DELTA 2W
Cavity Form Tool (Finishing)	40500000
Seal Kit	21191200

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com


DIMENSIONS

ORDERING INFORMATION
DE-CVA

OPTIONS
 Buna Standard
 Viton Standard

00
V0

Blank
N
S

BODIES

Without Body
 3/8 NPTF Ports
 #8 SAE Ports

CRACK PRESSURE

0010 10 PSI
0035 35 PSI
0070 70 PSI
0100 100 PSI
0135 135 PSI
0150 150 PSI
 ± 10%

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com



HE-CVA Direct Acting Check Valve, Poppet

DESCRIPTION

"High Pressure" 10 size, 7/8-14 thread, "Delta" series, direct acting check valve.

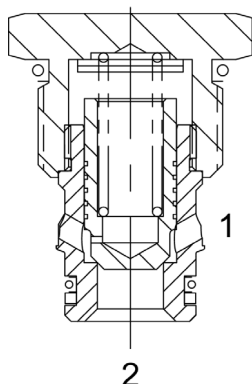
OPERATION

The HE-CVA allows free flow passage from (2) to (1), and blocks flow from (1) to (2).

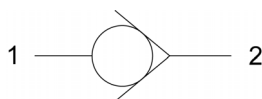
The cartridge has a fully guided check poppet, which is spring-biased closed, until sufficient pressure is applied at (2) to open to (1).

FEATURES

- Hardened parts for long life and low leakage.
- Optional bias springs for backpressure application flexibility.
- Fully guided poppet assembly.
- Industry common cavity.



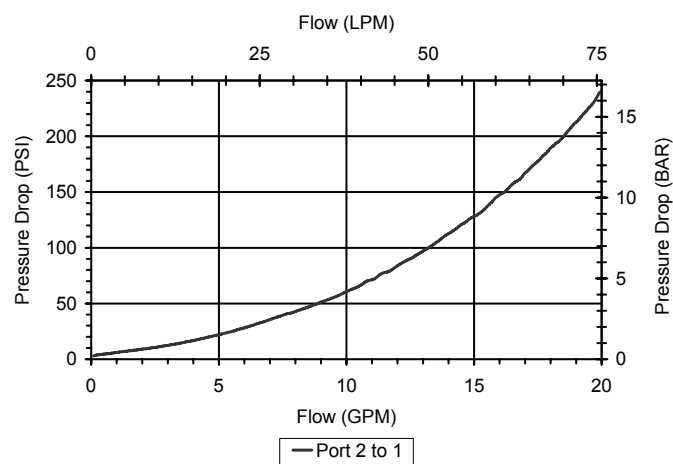
HYDRAULIC SYMBOL



Drop-In pilot pistons can be used (except the 135 and 150 psi version) to create P.O. Check Valve Function, see the Hydraulic Integrated Circuits section (page 480) for details.

PERFORMANCE

Actual Test Data (Cartridge Only)



VALVE SPECIFICATIONS

Nominal Flow	15 GPM (57 LPM)
Rated Operating Pressure	5000 PSI (345 bar)
Typical Internal Leakage (150 SSU)	0-5 drops/min
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temperature Range	-40° to 250° F (-40° to 120° C)
Weight	1.23 lbs. (.56 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	50 ft-lbs (67.8 Nm)
Cavity	DELTA 2W
Cavity Form Tool (Finishing)	40500000
Seal Kit	21191200

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

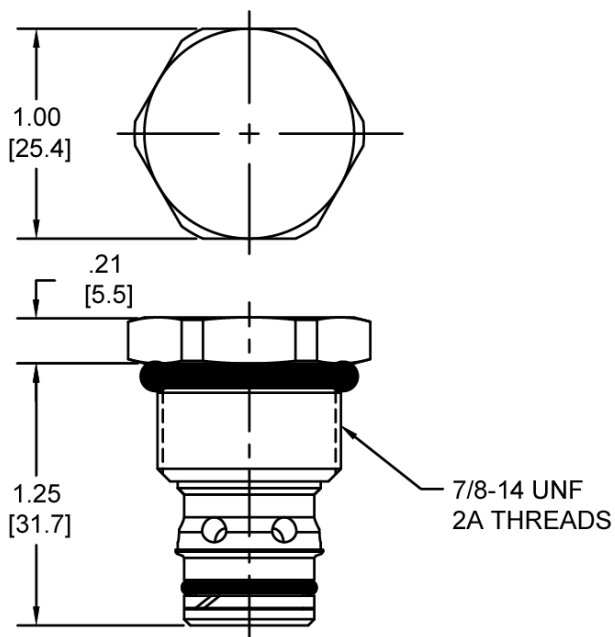
Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com



DIMENSIONS



ORDERING INFORMATION

HE-CVA

OPTIONS
Buna Standard
Viton Standard

00
V0

BODIES
Consult Factory

WARNING
DO NOT USE ALUMINUM BODY
HIGH PRESSURE (5000 PSI) PRODUCT.

CRACK PRESSURE

0005 5 PSI
0010 10 PSI
0020 20 PSI
0035 35 PSI
0070 70 PSI
0090 90 PSI
0135 135 PSI
0150 150 PSI
± 10%

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

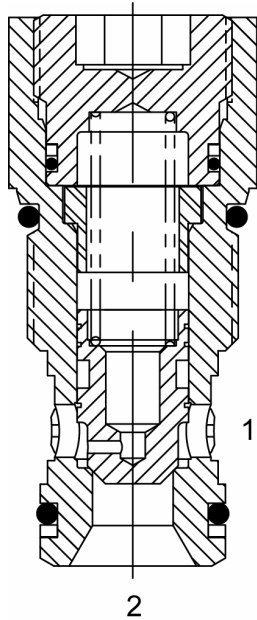
Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com



HT-CVA Direct Acting Check Valve, Poppet



DESCRIPTION

"High Pressure" 12 size, 1 1/16-12 thread, "Tecnord" series, direct acting check valve.

OPERATION

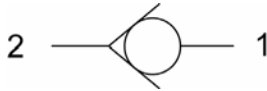
The HT-CVA allows flow passage from (2) to (1), while normally blocking oil flow from (1) to (2).

The cartridge has a fully guided poppet, which is spring biased closed, until sufficient pressure is applied at (2) to open to (1).

FEATURES

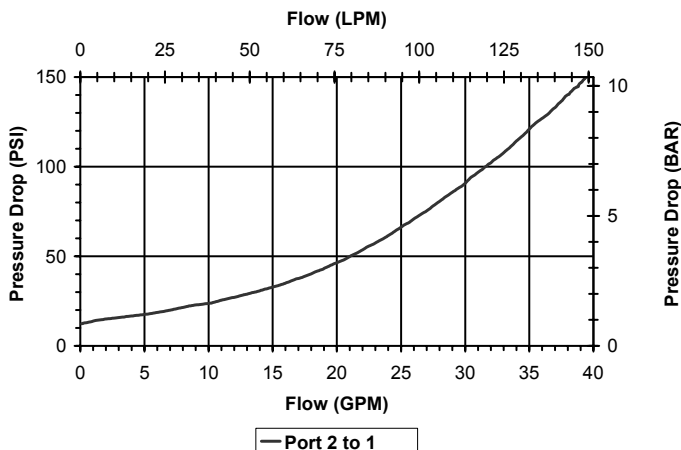
- Hardened parts for long life and low leakage.
- Industry common cavity.
- Optional bias springs for backpressure application flexibility.

HYDRAULIC SYMBOL



PERFORMANCE

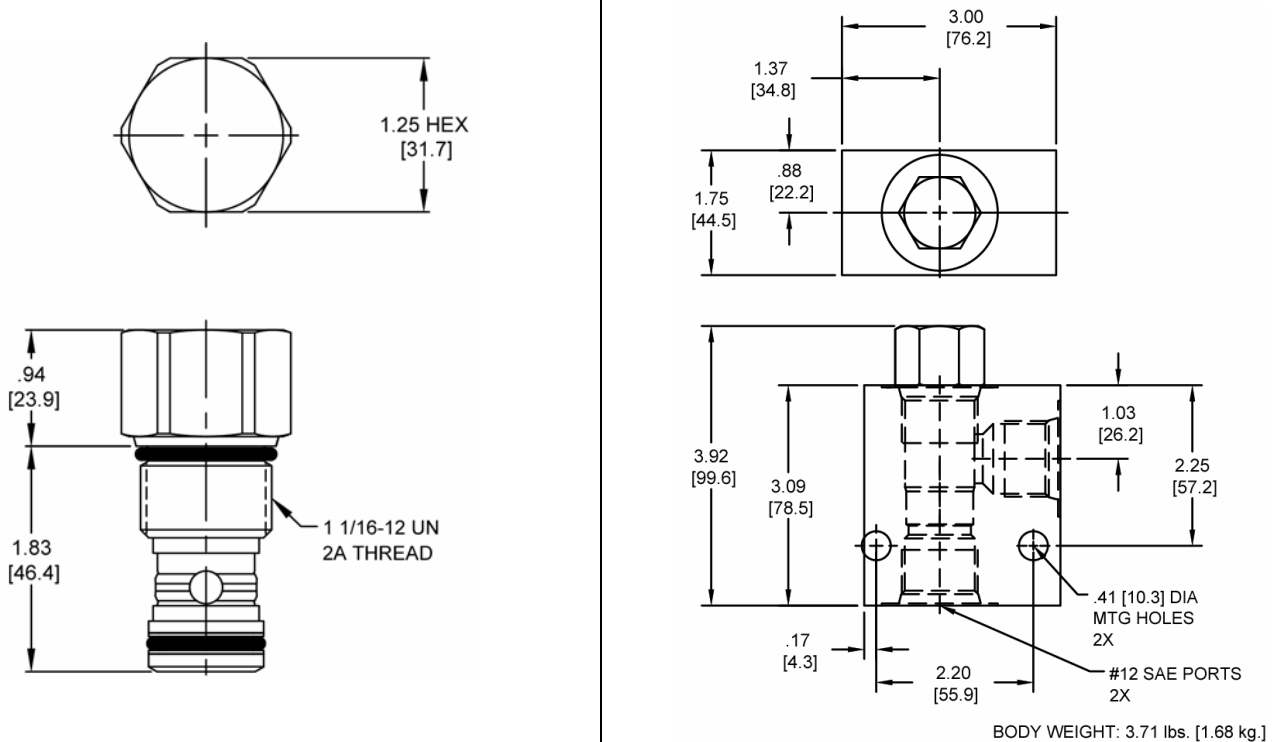
Actual Test Data (Cartridge Only)



VALVE SPECIFICATIONS

Nominal Flow	35 GPM (132 LTR/M)
Rated Operating Pressure	5000 PSI (345 bar)
Typical Internal Leakage (150 SSU)	0-5 drops/min
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temperature Range	-40° to 250° F (-40° to 120° C)
Weight	.55 lbs. (.25 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	70 ft-lbs (95 Nm)
Cavity	TECNORD 2W
Cavity Form Tool (Finishing)	40500032
Seal Kit	21191300

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.


DIMENSIONS

ORDERING INFORMATION

HT-CVA		-	-	-	-
OPTIONS					BODIES
Buna Standard	00			Blank	Without Body
Viton Standard	V0			S	#12 SAE Ports
					CRACK PRESSURE
		0010			10 PSI
		0030			30 PSI
		0050			50 PSI
					±10%

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.



SJ-CVA Direct Acting Check Valve, Poppet

DESCRIPTION

16 size, 1 5/16-12 thread, "Super" series, direct acting check valve.

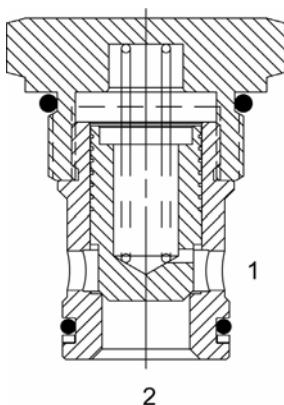
OPERATION

The SJ-CVA allows free flow from (2) to (1) and blocks flow from (1) to (2).

The cartridge has a fully guided poppet, which is spring-biased closed, until sufficient pressure is applied at (2) to open to (1).

FEATURES

- Hardened parts for long life and low leakage.
- Industry common cavity.
- Optional bias springs for backpressure application flexibility.

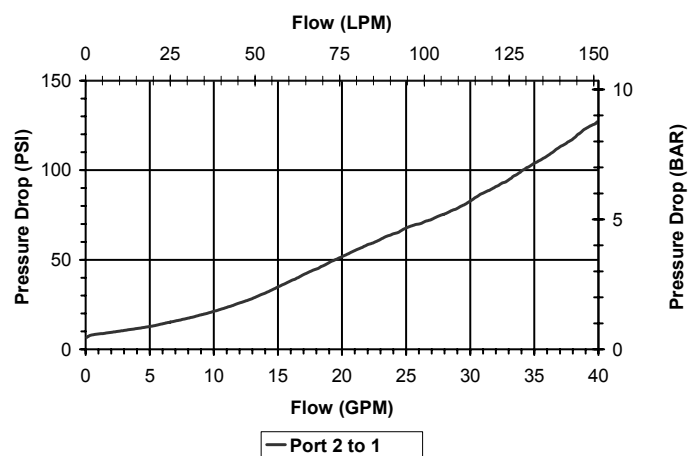


HYDRAULIC SYMBOL



PERFORMANCE

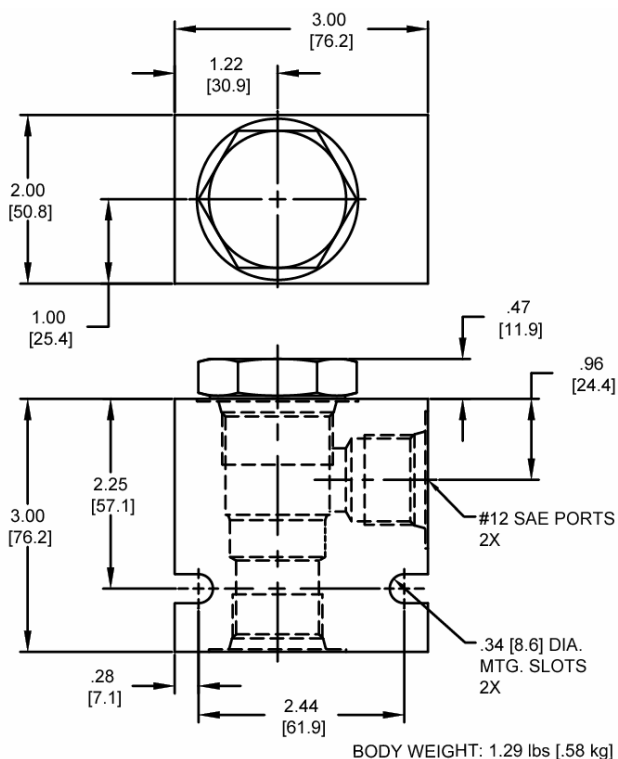
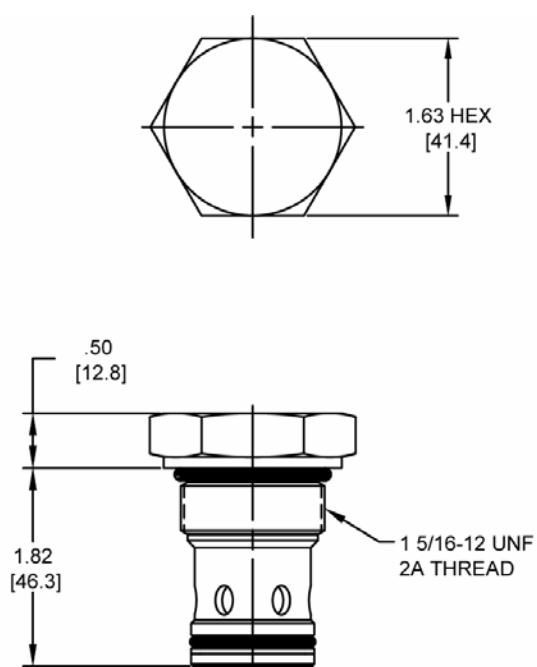
Actual Test Data (Cartridge Only)



VALVE SPECIFICATIONS

Nominal Flow	40 GPM (151 LPM)
Rated Operating Pressure	3500 PSI (241 bar)
Typical Internal Leakage (150 SSU)	0-5 drops/min
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temperature Range	-40° to 250° F (-40° to 120° C)
Weight	.67 lbs. (.30 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	90 ft-lbs (122 Nm)
Cavity	SUPER 2W
Cavity Form Tool (Finishing)	40500017
Seal Kit	21191400

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.


DIMENSIONS

ORDERING INFORMATION
SJ-CVA - - -

OPTIONS
 Buna Standard **00**
 Viton Standard **V0**

Blank **N**
S

BODIES
 Without Body
 3/4 NPTF Ports
 #12 SAE Ports

CRACK PRESSURE

0005 5 PSI
0010 10 PSI
0030 30 PSI
0050 50 PSI
 ±10%

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

**DE-CVB Direct Acting Check Valve, Ball****DESCRIPTION**

10 size, 7/8-14 thread, "Delta" series, direct acting, check valve.

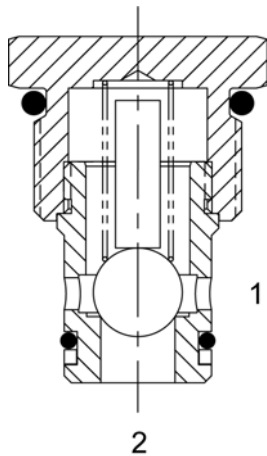
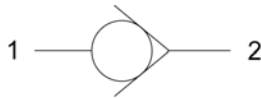
OPERATION

The DE-CVB allows free flow passage from (2) to (1), and blocks flow from (1) to (2).

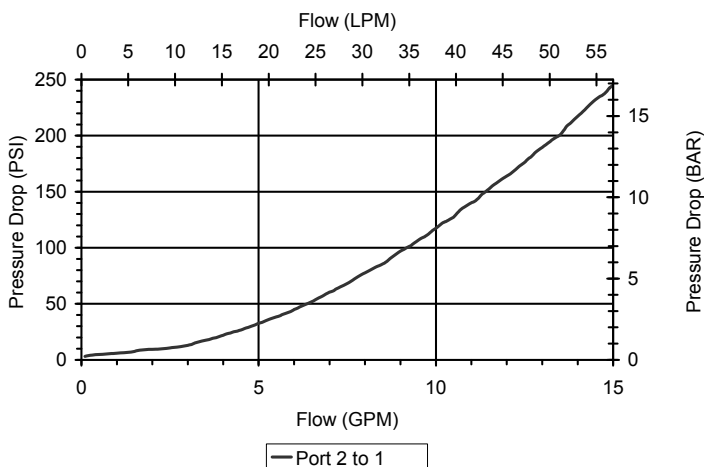
The cartridge has a hardened ball, which is spring-biased closed, until sufficient pressure is applied at (2) to open to (1).

1 FEATURES

- Hardened seat for long life and low leakage.
- Optional bias springs for backpressure application flexibility.
- Industry common cavity.

**HYDRAULIC SYMBOL****PERFORMANCE**

Actual Test Data (Cartridge Only)

**VALVE SPECIFICATIONS**

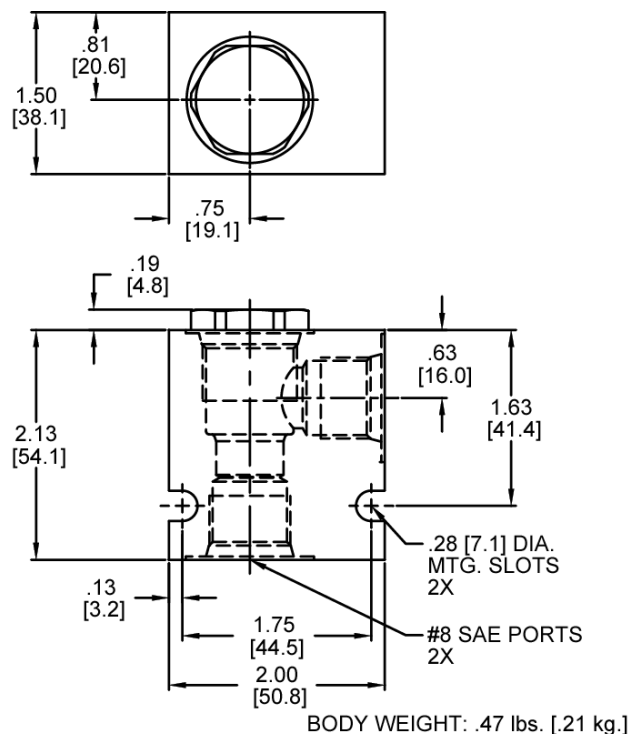
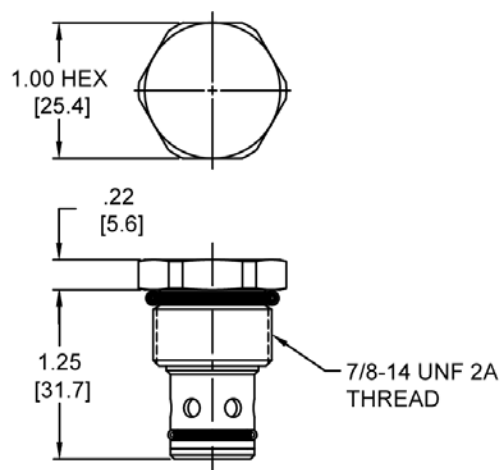
Nominal Flow	10 GPM (38 LPM)
Rated Operating Pressure	3500 PSI (241 bar)
Typical Internal Leakage (150 SSU)	0-5 drops/min
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temperature Range	-40° to 250° F (-40° to 120° C)
Weight	.14 lbs. (.06 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	30 ft-lbs (40.6 Nm)
Cavity	DELTA 2W
Cavity Form Tool (Finishing)	40500000
Seal Kit	21191000

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com


DIMENSIONS

ORDERING INFORMATION
DE-CVB
OPTIONS
 Buna Standard
 Viton Standard

00
V0

 Blank
N
S
BODIES
 Without Body
 3/8 NPTF Ports
 #8 SAE Ports

CRACK PRESSURE
0005
0015

 05 PSI
 15 PSI
 ± 10%

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

Phone: (815) 397-6628

Fax: (815) 397-2526

 E-mail: delta@delta-power.com

**PB-CVC Direct Acting Check Valve, Guided Ball****DESCRIPTION**

8 size, 3/4-16 thread, "Power" series, direct acting check valve.

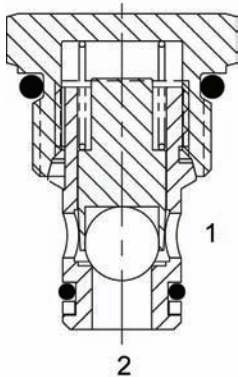
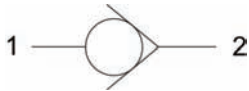
OPERATION

The PB-CVC allows free flow passage from (2) to (1), and blocks flow from (1) to (2).

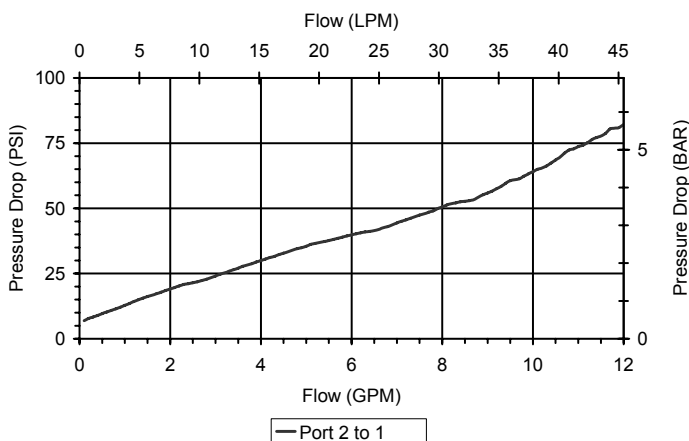
The cartridge has a fully guided hardened ball, which is spring-biased closed, until sufficient pressure is applied at (2) to open to (1).

FEATURES

- Hardened parts for long life and low leakage.
- Optional bias springs for back-pressure application flexibility.
- Fully guided ball assembly.
- Industry common cavity.

**HYDRAULIC SYMBOL****PERFORMANCE**

Actual Test Data (Cartridge Only)

**VALVE SPECIFICATIONS**

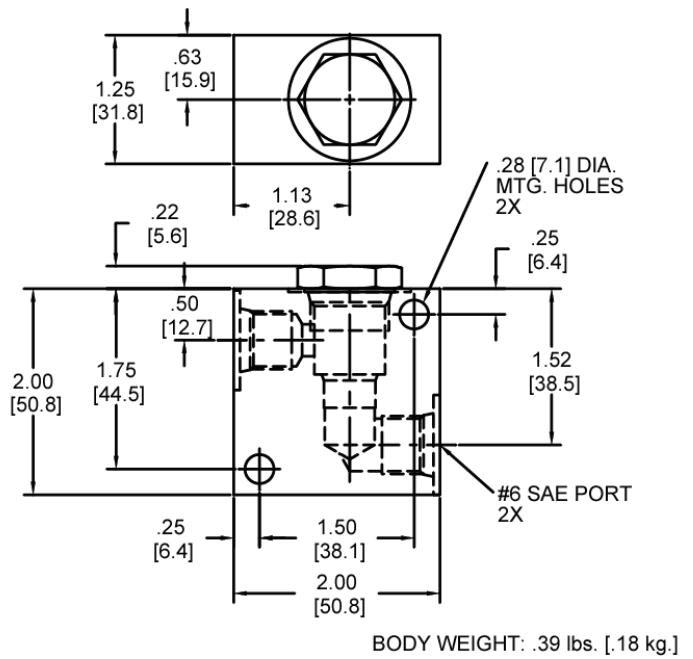
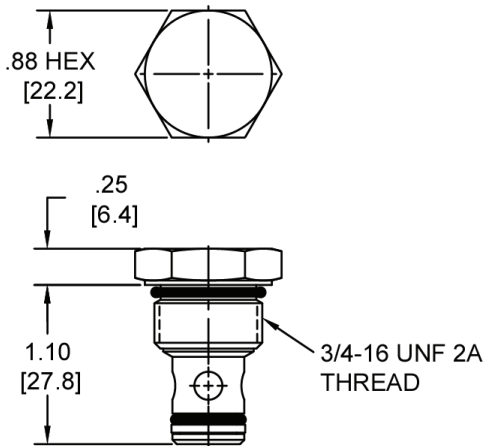
Nominal Flow	10 GPM (38 LPM)
Rated Operating Pressure	3500 PSI (241 bar)
Typical Internal Leakage (150 SSU)	0-5 drops/min
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temperature Range	-40° to 250° F (-40° to 120° C)
Weight	.10 lbs. (.05 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	25 ft-lbs (34 Nm)
Cavity	POWER 2W
Cavity Form Tool (Finishing)	40500005
Seal Kit	21191100

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com


DIMENSIONS

ORDERING INFORMATION
PB-CVC

OPTIONS
 Buna Standard
 Viton Standard

00
V0

Blank
N
S

BODIES

Without Body
 1/4 NPTF Ports
 #6 SAE Ports

CRACK PRESSURE

0005 5 PSI
0020 20 PSI
0030 30 PSI
0050 50 PSI
 ± 10%

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Phone: (815) 397-6628

Fax: (815) 397-2526

 E-mail: delta@delta-power.com



DE-CVC Direct Acting Check Valve, Guided Ball

DESCRIPTION

10 size, 7/8-14 thread, "Delta" series, direct acting check valve.

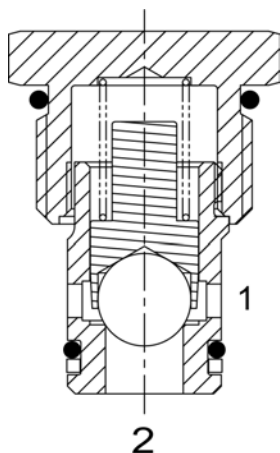
OPERATION

The DE-CVC allows free flow passage from (2) to (1), and blocks flow from (1) to (2).

The cartridge has a fully guided hardened ball, which is spring-biased closed, until sufficient pressure is applied at (2) to open to (1).

FEATURES

- Hardened parts for long life and low leakage.
- Optional bias springs for back-pressure application flexibility.
- Fully guided ball assembly.
- Industry common cavity.

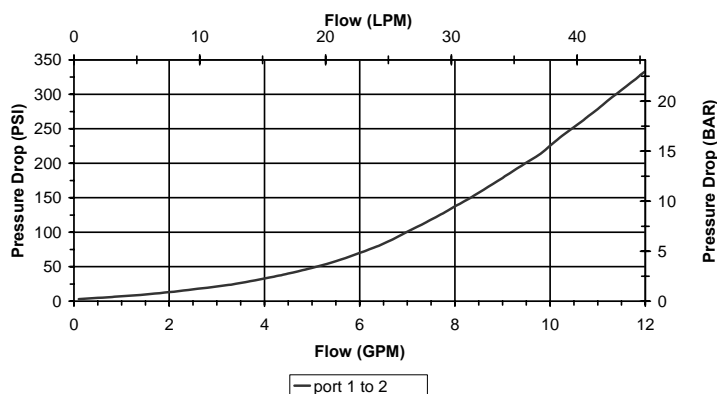


HYDRAULIC SYMBOL



PERFORMANCE

Actual Test Data (Cartridge Only)



VALVE SPECIFICATIONS

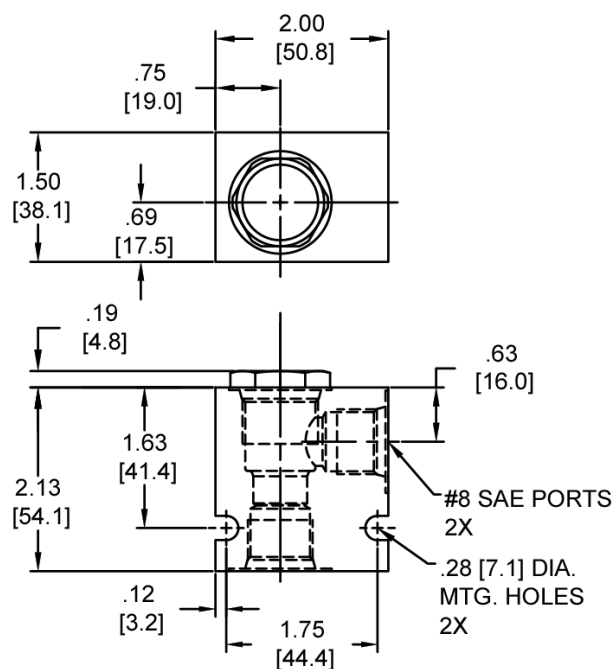
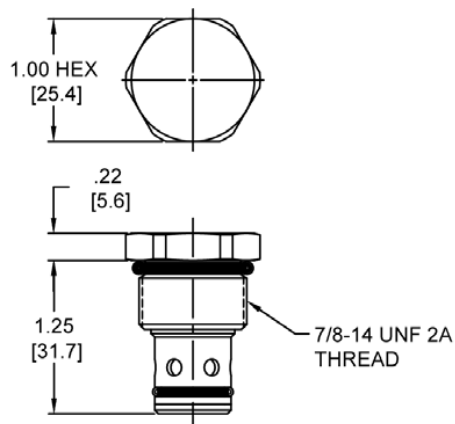
Nominal Flow	8 GPM (30 LPM)
Rated Operating Pressure	3500 PSI (241 bar)
Typical Internal Leakage (150 SSU)	0-5 drops/min
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temperature Range	-40° to 250° F (-40° to 120° C)
Weight	.15 lbs. (.07 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	30 ft-lbs (40.6 Nm)
Cavity	DELTA 2W
Cavity Form Tool (Finishing)	40500000
Seal Kit	21191200

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com


DIMENSIONS


BODY WEIGHT: .47 lbs. [.21kg]

ORDERING INFORMATION
DE-CVC
OPTIONS
 Buna Standard
 Viton Standard

00
V0

 Blank
N
S
BODIES

 Without Body
 3/8 NPTF Ports
 #8 SAE Ports

CRACK PRESSURE
0003 3 PSI
0005 5 PSI
0010 10 PSI
0020 20 PSI
0035 35 PSI
0050 50 PSI
0075 75 PSI
0095 95 PSI
 ± 10%

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

Phone: (815) 397-6628

Fax: (815) 397-2526

 E-mail: delta@delta-power.com



DE-CVR Reverse Flow Check Valve, Poppet

DESCRIPTION

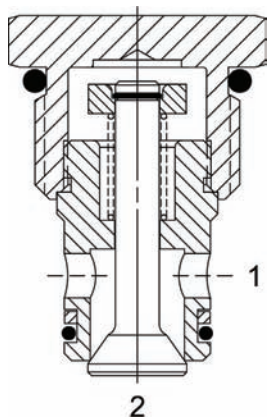
10 size, 7/8-14 thread, "Delta" series, reverse flow check valve.

OPERATION

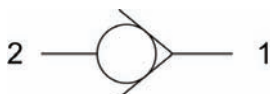
The DE-CVR allows free flow (1) to (2) and blocks flow from (2) to (1).

FEATURES

- Hardened parts for long life and low leakage.
- Industry common cavity.
- Optional bias springs for backpressure application flexibility.

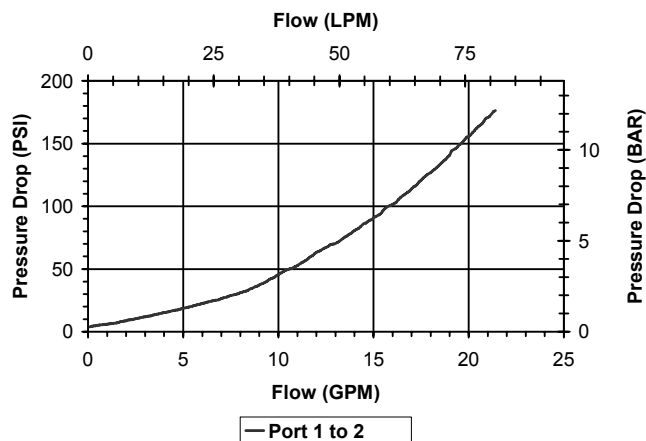


HYDRAULIC SYMBOL



PERFORMANCE

Actual Test Data (Cartridge Only)



VALVE SPECIFICATIONS

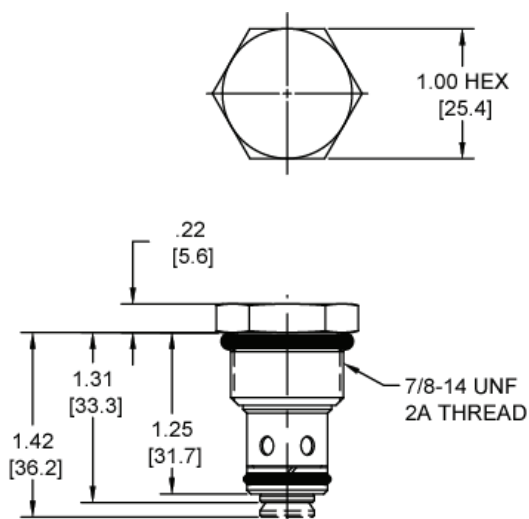
Nominal Flow	15 GPM (57 LPM)
Rated Operating Pressure	3500 PSI (241 bar)
Typical Internal Leakage (150 SSU)	0-5 drops/min
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temperature Range	-40° to 250° F (-40° to 120° C)
Weight	.15 lbs. (.07 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	30 ft-lbs (40.6 Nm)
Cavity	DELTA 2W
Cavity Form Tool (Finishing)	40500000
Seal Kit	21191204

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

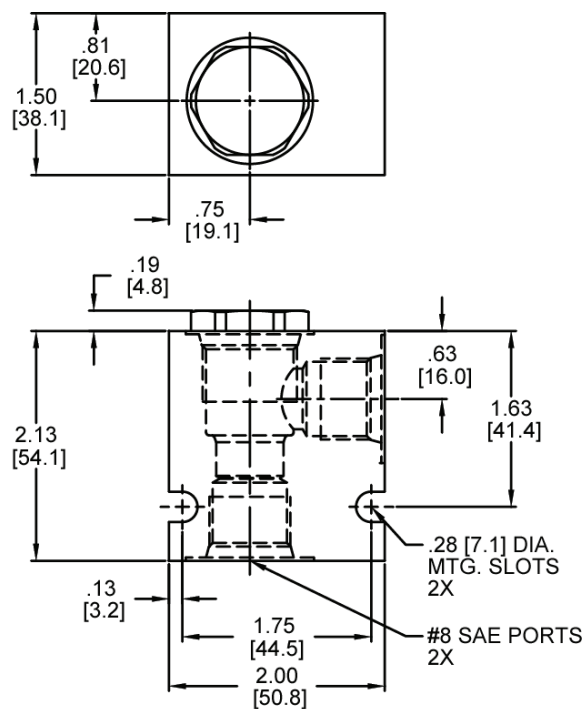
Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com


DIMENSIONS


MINIMUM .563 DIAMETER PREDRILL 1.53 DEEP REQUIRED.



BODY WEIGHT: .47 lbs. [.21 kg.]

ORDERING INFORMATION
DE-CVR
OPTIONS

 Buna Standard
 Viton Standard

 00
 V0

 Blank
 N
 S

BODIES

 Without Body
 3/8 NPTF Ports
 #8 SAE Ports

CRACK PRESSURE

 5 PSI
 25 PSI
 ±10%

 0005
 0025

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

Phone: (815) 397-6628

Fax: (815) 397-2526

 E-mail: delta@delta-power.com



HT-CVR Reverse Flow Check Valve, Poppet

DESCRIPTION

"High Pressure" 12 size, 1 1/16-12 thread, "Tecnord" series, reverse flow check valve.

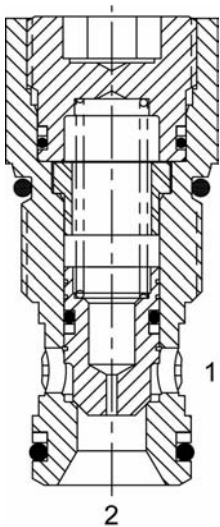
OPERATION

The HT-CVR allows free flow from (1) to (2) and blocks flow from (2) to (1).

The cartridge has a fully guided poppet, which is spring biased closed, until sufficient pressure is applied at (1) to open to (2).

FEATURES

- Hardened parts for long life and low leakage.
- Industry common cavity.
- Optional bias springs for backpressure application flexibility.

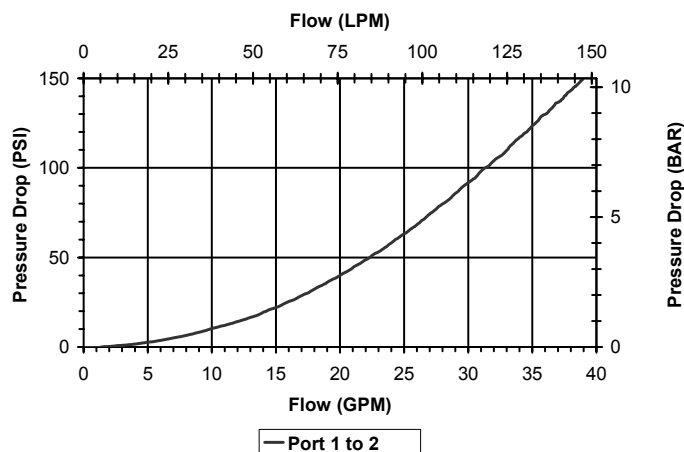


HYDRAULIC SYMBOL



PERFORMANCE

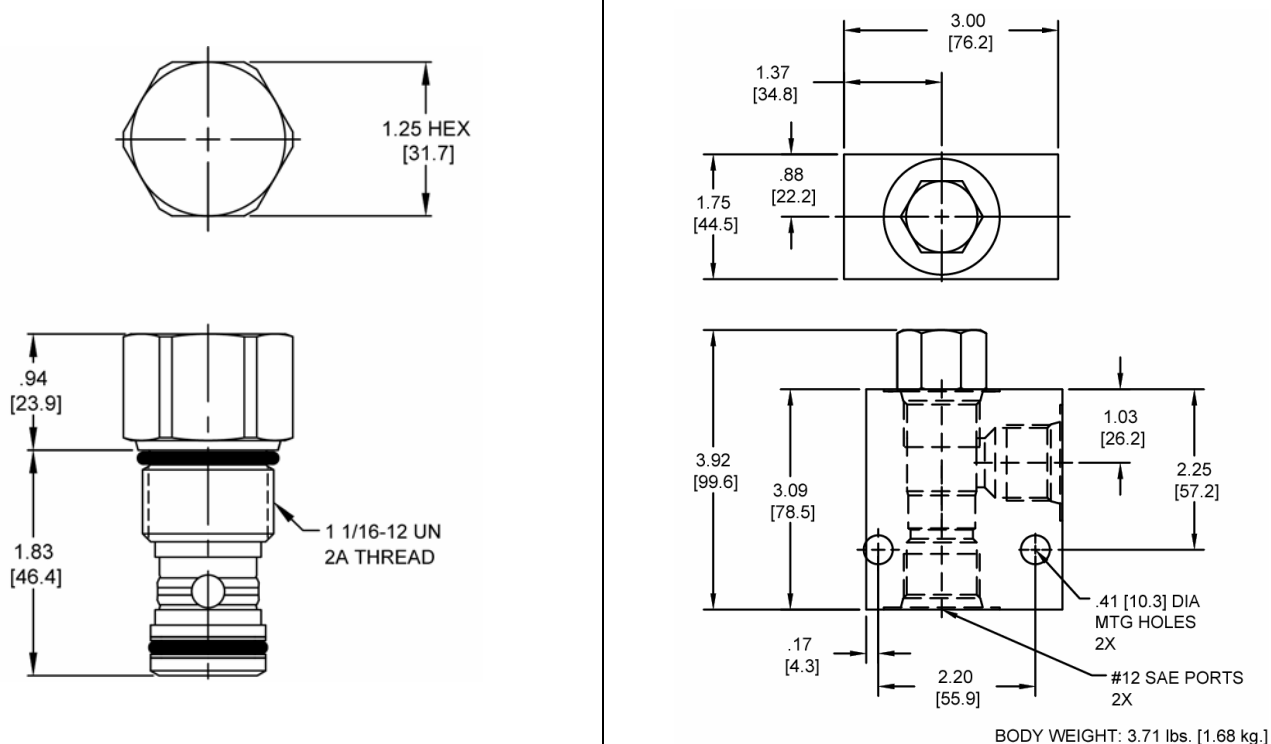
Actual Test Data (Cartridge Only)



VALVE SPECIFICATIONS

Nominal Flow	35 GPM (132 LPM)
Rated Operating Pressure	5000 PSI (345 bar)
Typical Internal Leakage (150 SSU)	0-8 drops/min
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temperature Range	-40° to 250° F (-40° to 120° C)
Weight	.55 lbs. (.25 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	70 ft-lbs (95 Nm)
Cavity	TECNORD 2W
Cavity Form Tool (Finishing)	40500032
Seal Kit	21191300

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.


DIMENSIONS

ORDERING INFORMATION

HT-CVR - - -			
OPTIONS			BODIES
Buna Standard	00		Without Body
Viton Standard	V0		#12 SAE Ports
		Blank	
		S	
		CRACK PRESSURE	
		0010	10 PSI
		0030	30 PSI
		0050	50 PSI
			± 10%

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.



MA-CVS Direct Acting Check Valve, Soft Seat, Poppet

DESCRIPTION

7 size, 5/8-18 Thread, "Mini" series, direct acting check valve, soft seat, poppet.

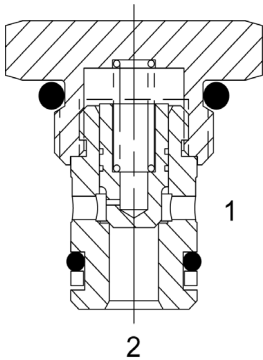
OPERATION

The MA-CVS allows free flow (2) to (1) and blocks flow from (1) to (2).

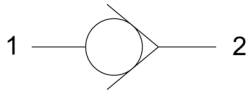
The cartridge has a fully guided poppet, which is spring-biased closed, until sufficient pressure is applied at (2) to open (1).

FEATURES

- Soft seat for ultra low leakage.
- Industry common cavity.
- Optional bias springs for backpressure application flexibility.
- Fully guided poppet.



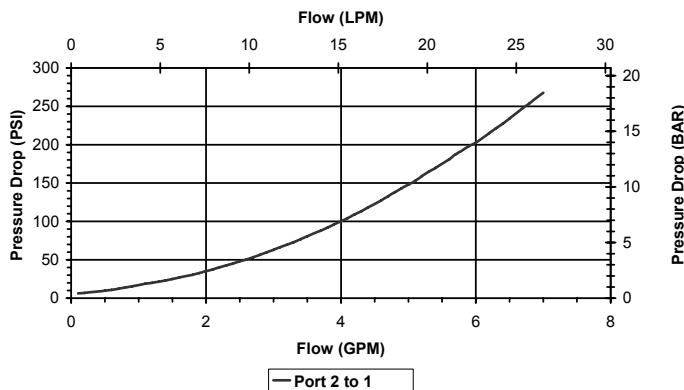
HYDRAULIC SYMBOL



Drop-in Pilot Pistons are NOT recommended for this valve.

PERFORMANCE

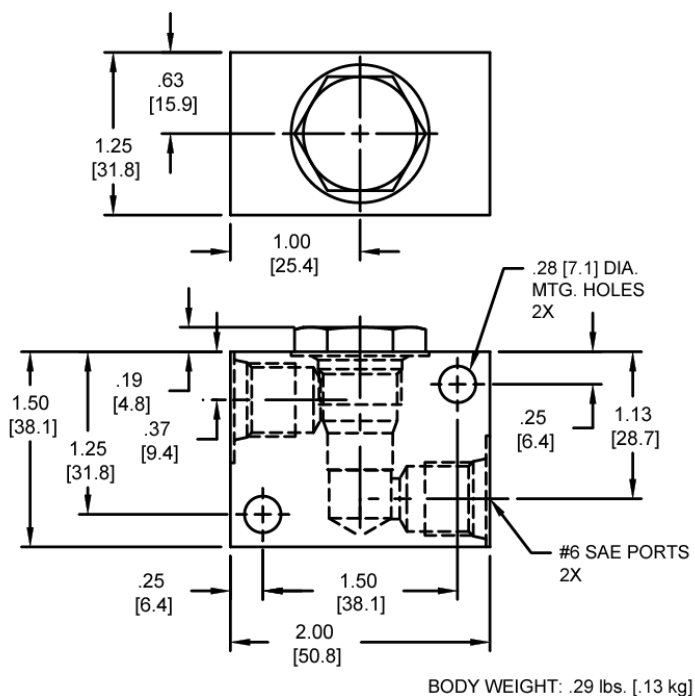
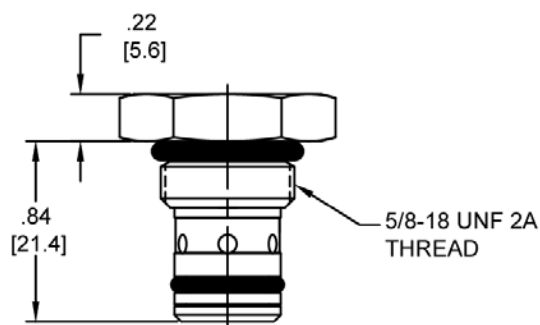
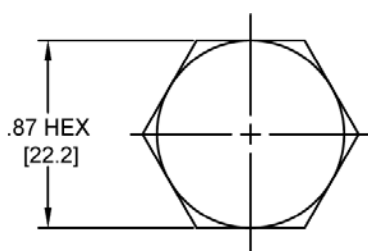
Actual Test Data (Cartridge Only)



VALVE SPECIFICATIONS

Nominal Flow	2.5 GPM (9.5 LPM)
Rated Operating Pressure	1500 PSI (103 bar)
Typical Internal Leakage (150 SSU)	Negligible
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temperature Range	32° to 120° F (0° to 49° C)
Weight	.08 lbs. (.03 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	15 ft-lbs (20.3 Nm)
Cavity	MINI 2W
Cavity Form Tool (Finishing)	40500003
Seal Kit	21191000

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.


DIMENSIONS

ORDERING INFORMATION

MA-CVS - - -			
OPTIONS			BODIES
Buna Standard	00	Blank	Without Body
Viton Standard	V0	N	1/4 NPTF Ports
		S	#6 SAE Ports
			CRACK PRESSURE
		0005	5 PSI
		0020	20 PSI
			±10%

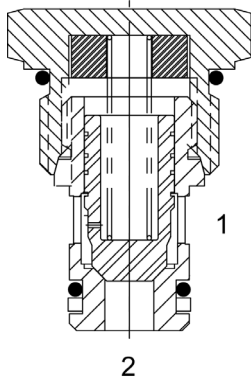
WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.



PB-CVS Direct Acting Check Valve, Soft Seat, Poppet

DESCRIPTION

8 size, 3/4-16 thread, "Power" series, direct acting check valve, soft seat, poppet.



OPERATION

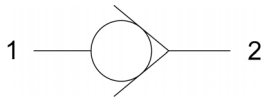
The PB-CVS allows free flow passage from (2) to (1), and blocks flow from (1) to (2).

The cartridge has a fully guided poppet, which is spring-biased closed, until sufficient pressure is applied at (2) to open to (1).

FEATURES

- Soft seat for ultra low leakage.
- Optional bias springs for backpressure application flexibility.
- Fully guided poppet assembly.
- Industry common cavity.

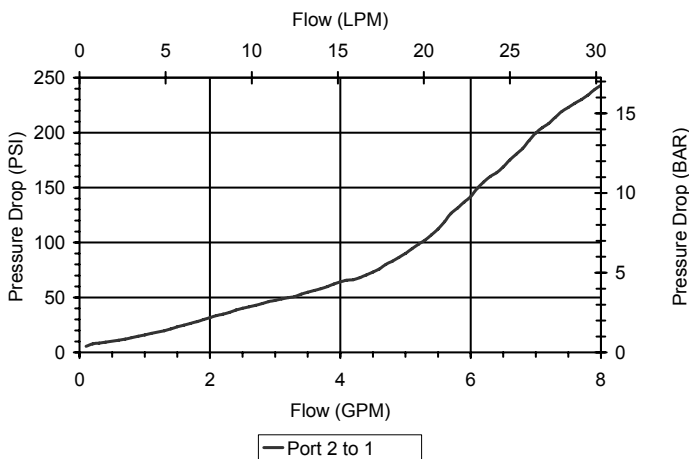
HYDRAULIC SYMBOL



Drop-in Pilot Pistons are NOT recommended for this valve.

PERFORMANCE

Actual Test Data (Cartridge Only)



VALVE SPECIFICATIONS

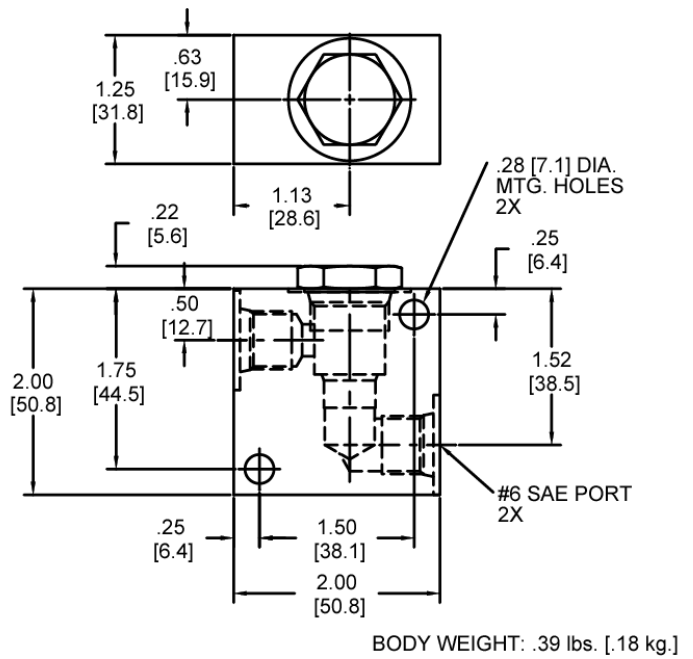
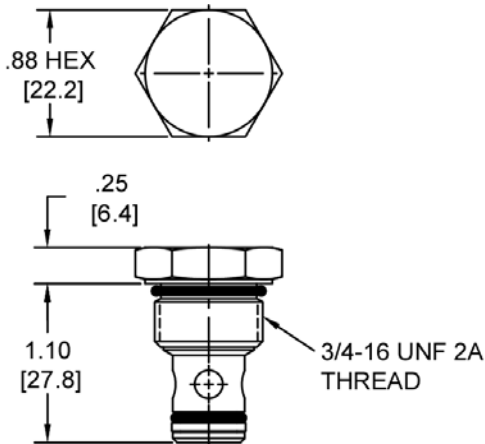
Nominal Flow	5 GPM (19 LPM)
Rated Operating Pressure	3500 PSI (241 bar)
Typical Internal Leakage (150 SSU)	Negligible
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temperature Range	32° to 120° F (0° to 49° C)
Weight	.09 lbs. (.04 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	25 ft-lbs (33.9 Nm)
Cavity	POWER 2W
Cavity Form Tool (Finishing)	40500005
Seal Kit	21191100

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com


DIMENSIONS

ORDERING INFORMATION
PB-CVS
OPTIONS
 Buna Standard
 Viton Standard

00
V0

 Blank
N
S
BODIES
 Without Body
 1/4 NPTF Ports
 #6 SAE Ports

CRACK PRESSURE
0005 5 PSI
0020 20 PSI
0030 30 PSI
0050 50 PSI
 ± 10%

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

Phone: (815) 397-6628

Fax: (815) 397-2526

 E-mail: delta@delta-power.com



DE-CVS Direct Acting Check Valve, Soft Seat, Poppet

DESCRIPTION

10 size, 7/8-14 thread, "Delta" series, soft seat check valve.

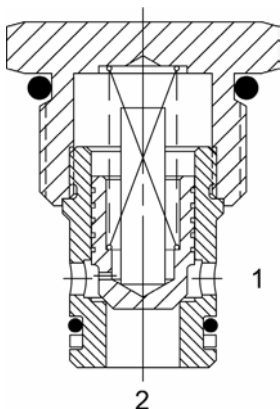
OPERATION

The DE-CVS allows flow to pass from (2) to (1) and blocks flow from (1) to (2).

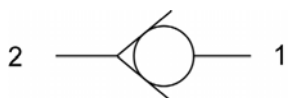
The cartridge has a fully guided check poppet, which is spring-biased closed until sufficient pressure is applied at (2) to open to (1).

FEATURES

- Soft seat for ultra low leakage.
- Industry common cavity.
- Optional bias springs for backpressure application flexibility.



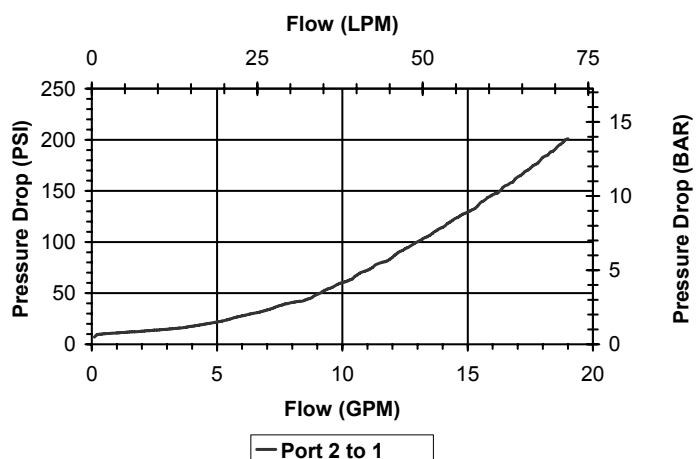
HYDRAULIC SYMBOL



Drop-In pilot pistons are **NOT** recommended for this valve. If you would like to create P.O. Check Valve Function, please use the CVA valve and / or see the Hydraulic Integrated Circuits section (page 480) for details.

PERFORMANCE

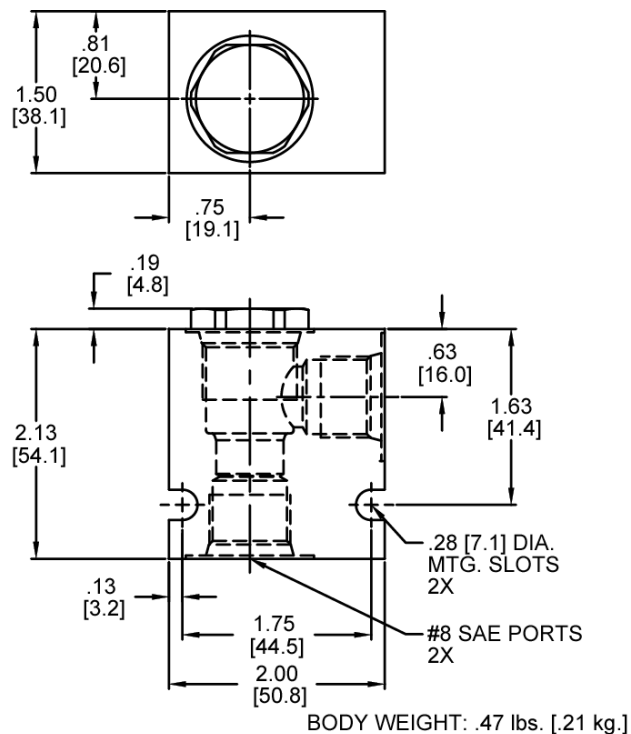
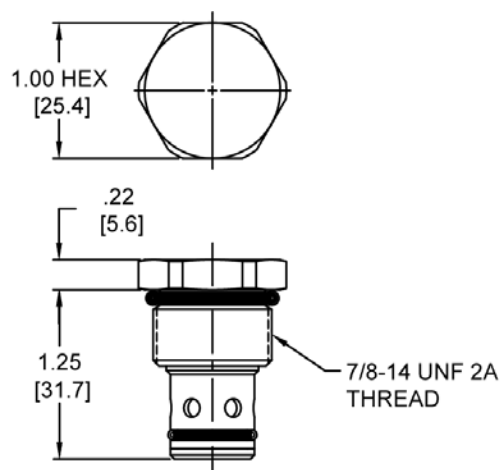
Actual Test Data (Cartridge Only)



VALVE SPECIFICATIONS

Nominal Flow	10 GPM (38 LTR/M)
Rated Operating Pressure	1000 PSI (69 bar)
Typical Internal Leakage (150 SSU)	Negligible
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temperature Range	32° to 160° F (0° to 70° C)
Weight	.14 lbs. (.06 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	30 ft-lbs (40.6 Nm)
Cavity	DELTA 2W
Cavity Form Tool (Finishing)	40500000
Seal Kit	21191200

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

**DIMENSIONS****ORDERING INFORMATION****DE-CVS**

OPTIONS
Buna Standard
Viton Standard

00
V0

Blank
N
S

BODIES

Without Body
3/8 NPTF Ports
#8 SAE Ports

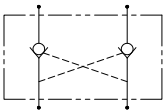
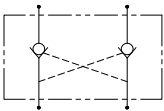
CRACK PRESSURE

0010

10 PSI
+/-15%

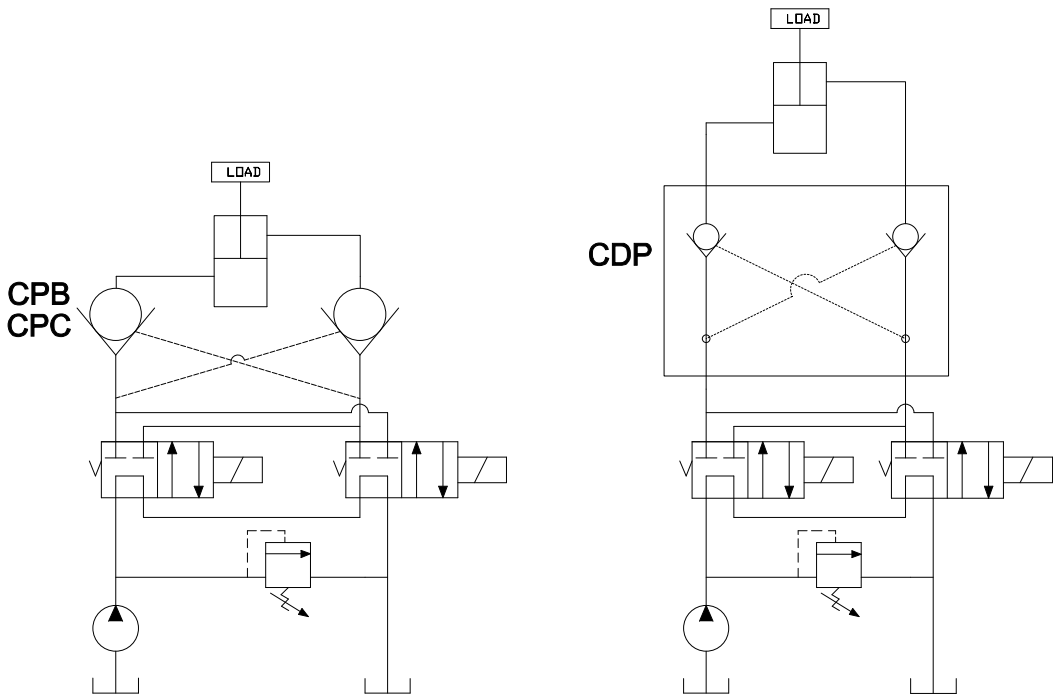
WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

Pilot To Open and Double PO Check Valves

Pilot to Open Check Valves	GPM	PSI	LPM	BAR	MODEL	PAGE
	6	3500	23	241	PP-CPB	258
	8	3500	30	241	DF-CPB	260
	10	3500	38	341	DF-CPC	262
Double PO Check Valves	GPM	PSI	LPM	BAR	MODEL	PAGE
	3	3000	11	207	MD-CDP	264
	5	3000	19	207	PQ-CDP	266
	8	3000	30	207	DG-CDP	268

Typical Schematic

Typical application for the CPB, CPC and CDP is load holding as shown.



WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

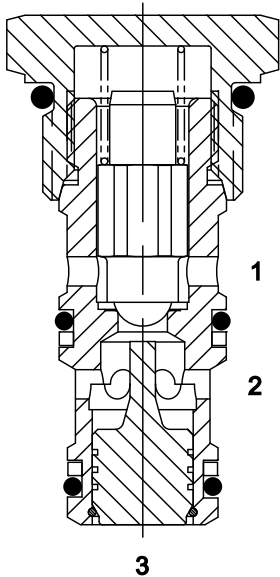
Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com



PP-CPB Pilot Operated Check Valve, Guided Ball



DESCRIPTION

8 size, 3/4-16 thread, "Power" series, pilot operated, ball check valve.

OPERATION

The PP-CPB allows free flow to pass from (2) to (1) and blocks flow from (1) to (2). When pilot pressure is applied to port (3) the valve allows free flow from (1) to (2).

FEATURES

- Hardened parts for long life.
- Industry common cavity.

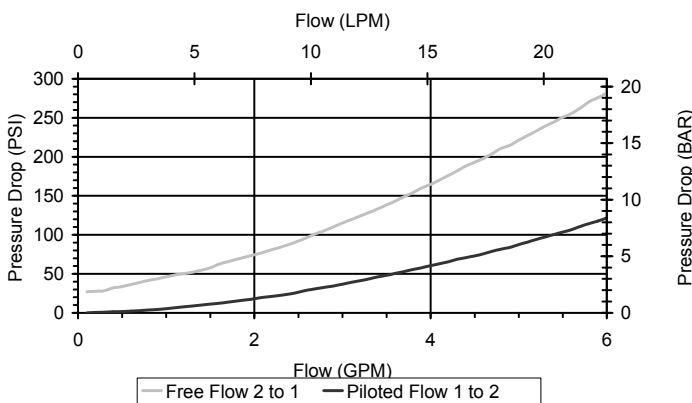
HYDRAULIC SYMBOL



For sealed pilot piston consult factory.

PERFORMANCE

Actual Test Data (Cartridge Only)



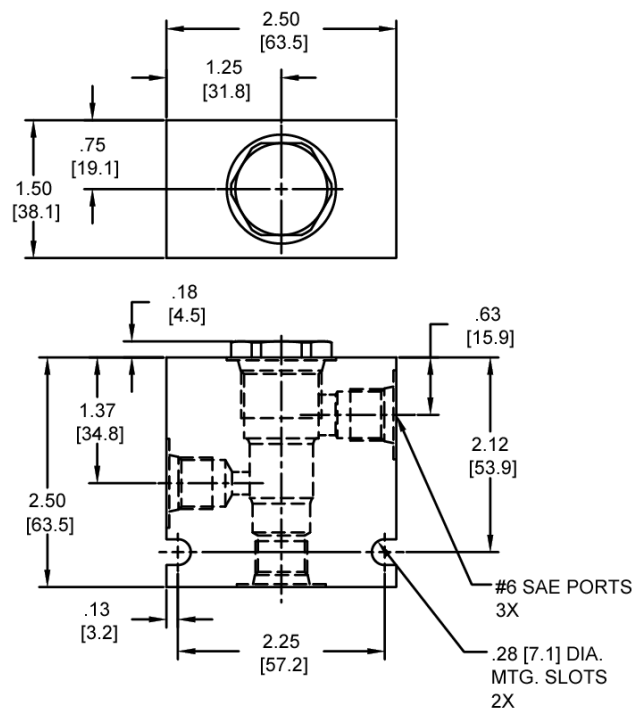
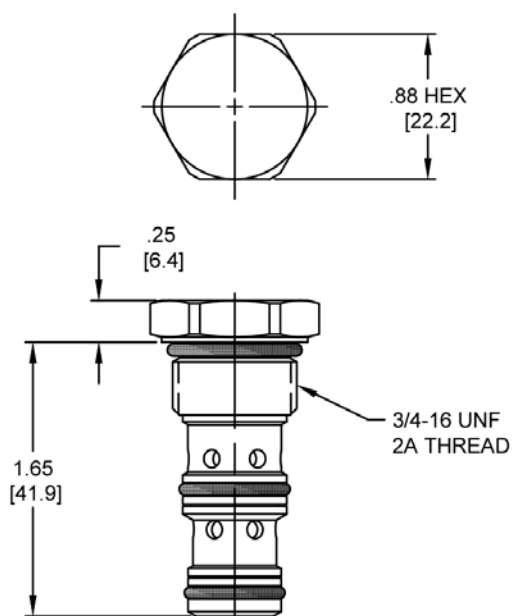
VALVE SPECIFICATIONS

Nominal Flow	6 GPM (23 LTR/M) 1 to 2 4 GPM (15 LTR/M) 2 to 1
Rated Operating Pressure	3500 PSI (241 bar)
Typical Internal Leakage (150 SSU)	0-5 drops/min
Pilot Ratio	4:1
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temperature Range	-40° to 250° F (-40° to 120° C)
Weight	.14 lbs. (.06 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	25 ft-lbs (34 Nm)
Cavity	POWER 3W
Cavity Form Tool (Finishing)	40500024
Seal Kit	21191108

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.



DIMENSIONS



ORDERING INFORMATION

PP-CPB

OPTIONS

Buna Standard

Viton Standard

00

VO

Blank

N

S

BODIES

Without Body

1/4 NPTF Ports

#6 SAE Ports

CRACK PRESSURE

0025

25 PSI

$\pm 10\%$

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com

**DF-CPB Pilot Operated Check Valve, Guided Ball****DESCRIPTION**

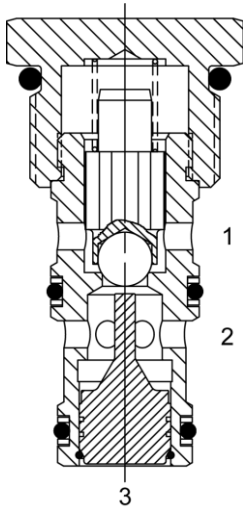
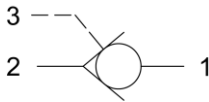
10 size, 7/8-14 thread, "Delta" series, pilot operated, ball check valve.

OPERATION

The DF-CPB allows free flow to pass from (2) to (1) and blocks flow from (1) to (2). When pilot pressure is applied to port (3) the valve allows free flow from (1) to (2).

FEATURES

- Hardened parts for long life.
- Industry common cavity.

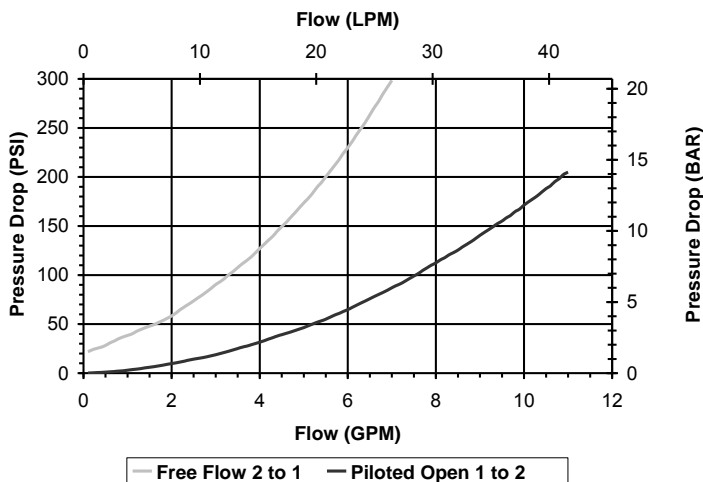
**HYDRAULIC SYMBOL**

For sealed pilot piston consult factory.

0.030" to 0.060" diameter orifice recommended in the feed line to port #3

PERFORMANCE

Actual Test Data (Cartridge Only)

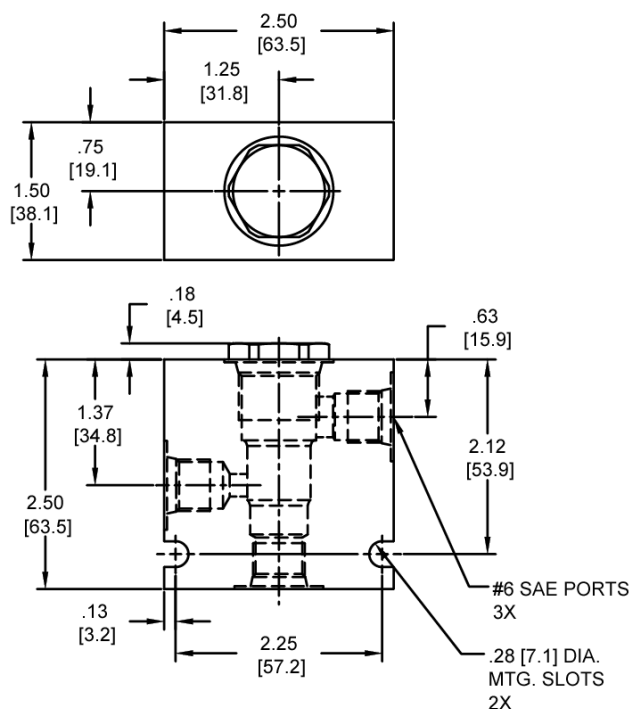
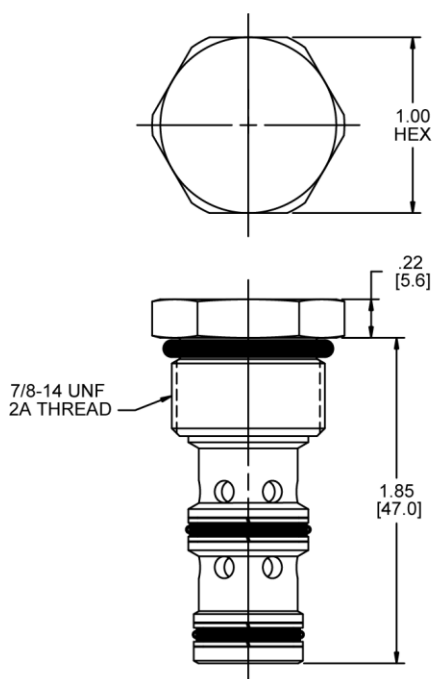
**VALVE SPECIFICATIONS**

Nominal Flow	8 GPM (30 LTR/M) 1 to 2 5 GPM (19 LTR/M) 2 to 1
Rated Operating Pressure	3500 PSI (241 bar)
Typical Internal Leakage (150 SSU)	0-5 drops/min
Pilot Ratio	4:1
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temperature Range	-40° to 250° F (-40° to 120° C)
Weight	.19 lbs. (.09 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	30 ft-lbs (40.6Nm)
Cavity	DELTA 3W
Cavity Form Tool (Finishing)	40500001
Seal Kit	21191202

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DIMENSIONS



ORDERING INFORMATION

DF-CPB - - -

OPTIONSBuna Standard
Viton Standard**00**
V0Blank
N
S**BODIES**Without Body
3/8 NPTF Ports
SAE #6 Ports**CRACK PRESSURE****0025**
25 PSI
±10%

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

**DF-CPC Pilot To Open, Check Valve, Guided Ball****DESCRIPTION**

10 size, 7/8-14 thread, "Delta" series, pilot to open, ball check valve.

OPERATION

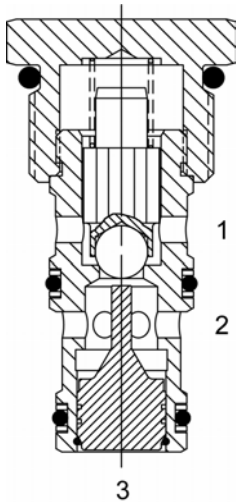
The DF-CPC allows free flow to pass from (2) to (1) and blocks flow from (1) to (2). When pilot pressure is applied to port (3) the valve allows free flow from (1) to (2).

The cartridge has a 2:1 pilot ratio, meaning that at least one half of the load pressure held at (1) is required at (3) to open the valve.

The check is spring biased to assure holding in static or no-load conditions.

FEATURES

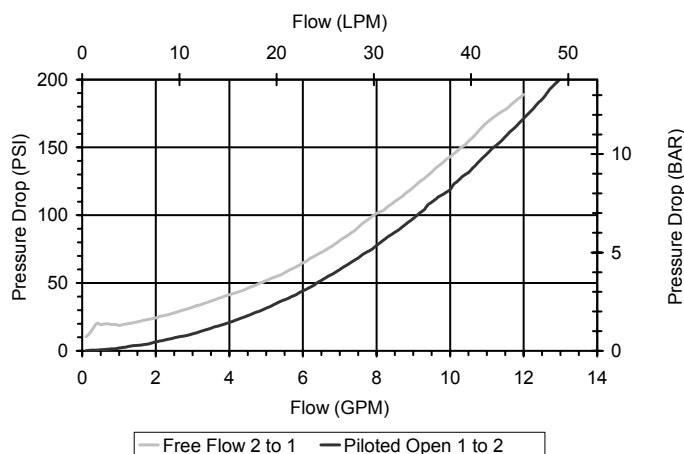
- Hardened parts for long life.
- Industry common cavity.

**HYDRAULIC SYMBOL**

Special higher bias spring values available. Consult factory.
For sealed pilot piston consult factory.

PERFORMANCE

Actual Test Data (Cartridge Only)

**VALVE SPECIFICATIONS**

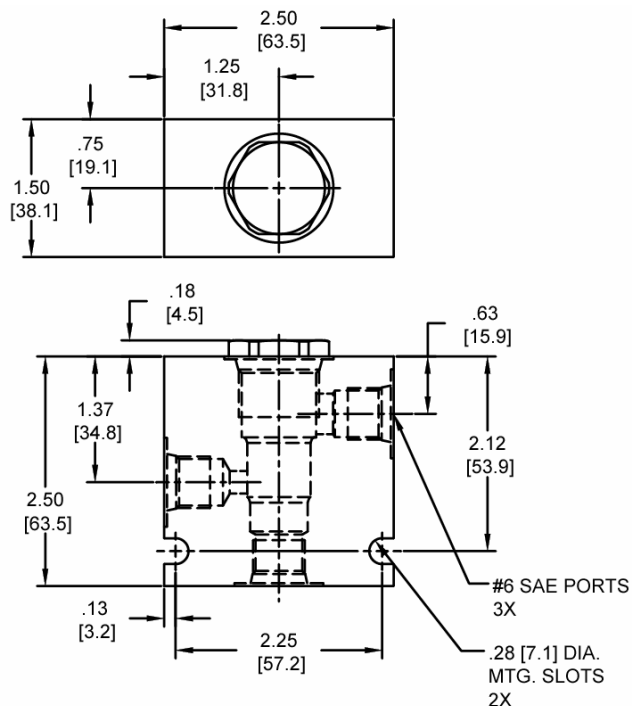
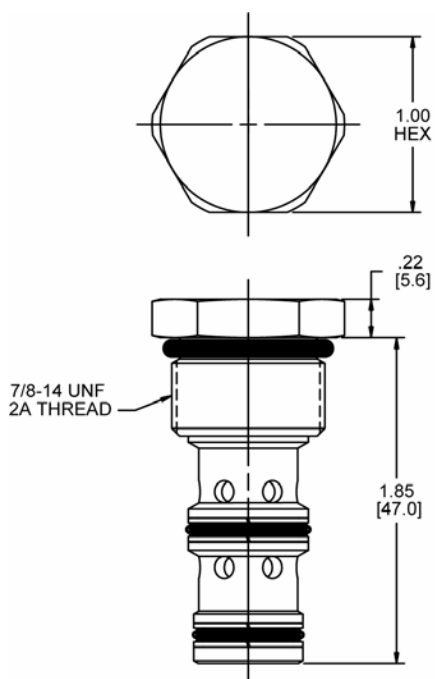
Nominal Flow	10 GPM (38 LPM)
Rated Operating Pressure	3500 PSI (241 bar)
Typical Internal Leakage (150 SSU)	0-5 drops/min
Pilot Ratio	2:1
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temperature Range	-40° to 250° F (-40° to 120° C)
Weight	.19 lbs. (.08 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	30 ft-lbs (40.6 Nm)
Cavity	DELTA 3W
Cavity Form Tool (Finishing)	40500001
Seal Kit	21191202

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Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com


DIMENSIONS

ORDERING INFORMATION
DF-CPC
OPTIONS

 Buna Standard
 Viton Standard

00
V0

 blank
N
S
BODIES

 Without Body
 1/4 NPTF Ports
 #6 SAE Ports

CRACK PRESSURE

 25 PSI
 ± 10%

0025

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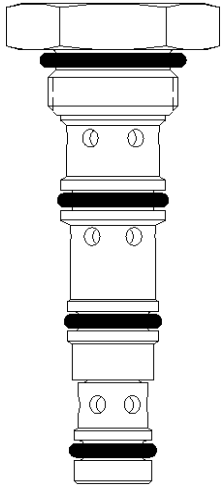
Phone: (815) 397-6628

Fax: (815) 397-2526

 E-mail: delta@delta-power.com



MD-CDP Double Pilot Operated Check Valve



DESCRIPTION

7 size, 5/8 -18 thread, "Mini" series, double pilot operated check valve.

OPERATION

The MD-CDP allows flow to pass from (3) to (4) and (2) to (1). The valve blocks flow from (4) to (3) and from (1) to (2). Blocked flow is released when pilot pressure is applied to the port opposite of (3) and /or (2) respectively.

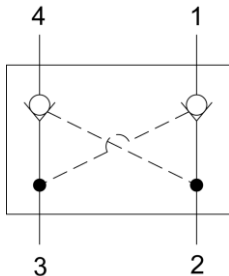
The valve has a 3:1 pilot ratio, so at least 1/3 of the load pressure at port (4) or (1) is required at the pilot line ports (ports (4) or (1) respectively) to open the flow passage to allow flow from port (4) or (1) respectively.

The check spring biased at 20 PSI (1.4 bar) to assure holding in the static or no-load conditions.

FEATURES

- Hardened parts for long life.
- Industry common cavity.

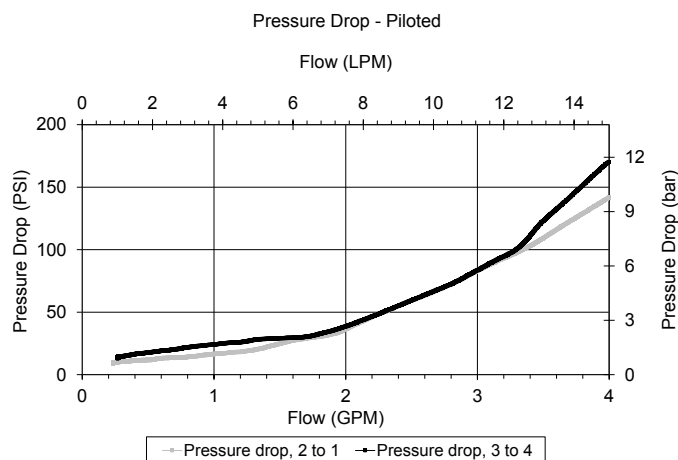
HYDRAULIC SYMBOL



Great for "in Cylinder " use Application

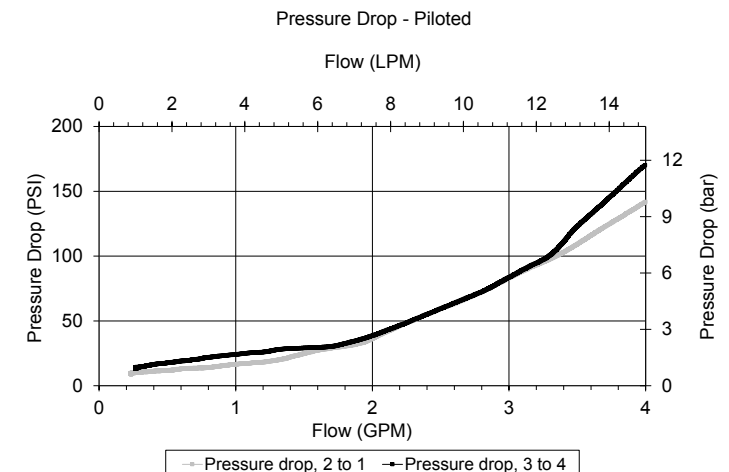
PERFORMANCE

Actual Test Data (Cartridge Only)



VALVE SPECIFICATIONS

Nominal Flow	3 GPM (11 LPM)
Rated Operating Pressure	3000 PSI (207 bar)
Typical Internal Leakage (150 SSU)	0 - 5 drop / min
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temperature Range	-40° to 250° F (-40° to 120° C)
Weight	.10 lbs. (.04 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	15 ft-lbs (20.3 Nm)
Cavity	MINI 4W
Cavity Form Tool (Finishing)	40500006
Seal Kit	21191010



WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

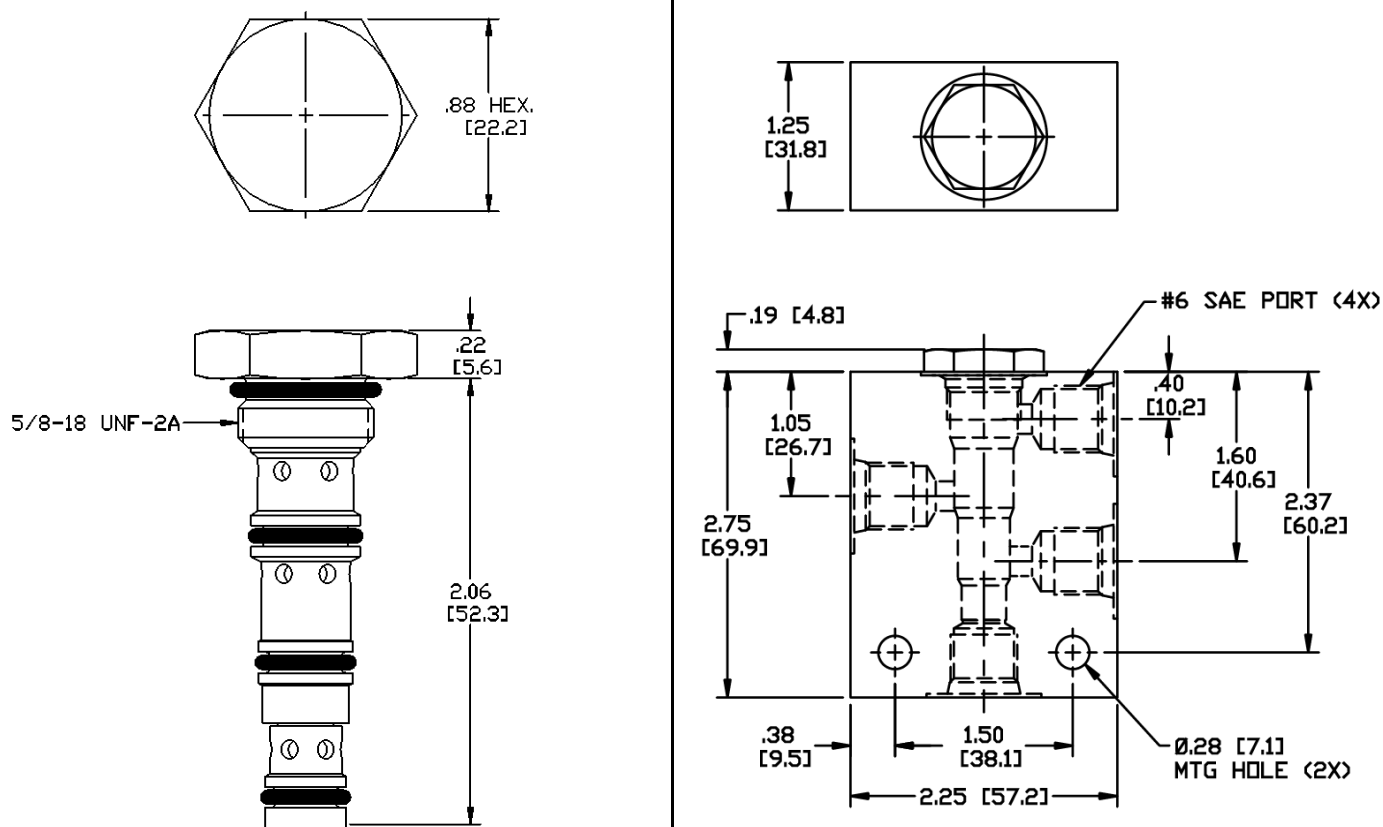
Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com



DIMENSIONS



ORDERING INFORMATION

MD-CDP		- - -		- - -	
OPTIONS				BODIES	
Urethane Standard	U0			Blank	Without Body
				N	1/4" NPTF PORT
				S	#6 SAE Ports
				SPRING BIAS	
		0020		20 PSI	

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

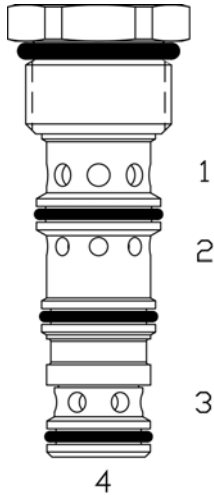
Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com



PQ-CDP Double Pilot Operated Check Valve



DESCRIPTION

8 size, 3/4 -16 thread, "Power" series, double pilot operated check valve.

OPERATION

The PQ-CDP allows flow to pass from (3) to (4) and (2) to (1). The valve blocks flow from (4) to (3) and from (1) to (2). Blocked flow is released when pilot pressure is applied to the port opposite of (3) and /or (2) respectively.

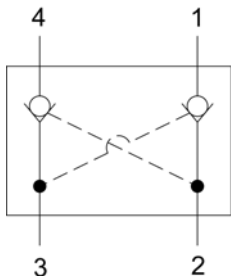
The valve has a 3:1 pilot ratio, so at least 1/3 of the load pressure at port (4) or (1) is required at the pilot line ports (ports (4) or (1) respectively) to open the flow passage to allow flow from port (4) or (1) respectively.

The check spring biased at 20 PSI (1.4 bar) to assure holding in the static or no-load conditions.

FEATURES

- Hardened parts for long life.
- Industry common cavity.

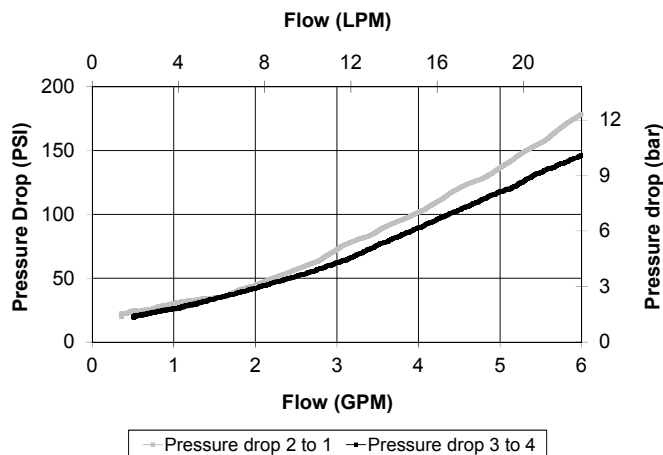
HYDRAULIC SYMBOL



Great for "in Cylinder " use Application

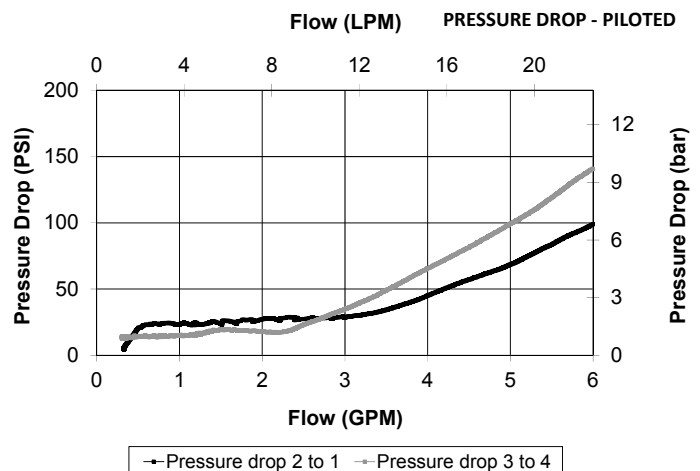
PERFORMANCE

Actual Test Data (Cartridge Only)



VALVE SPECIFICATIONS

Nominal Flow	5 GPM (19 LPM)
Rated Operating Pressure	3000 PSI (207 bar)
Typical Internal Leakage (150 SSU)	0 - 5 drop / min
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temperature Range	-40° to 250° F (-40° to 120° C)
Weight	.12 lbs. (.05 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	25 ft-lbs (34 Nm)
Cavity	POWER 4W
Cavity Form Tool (Finishing)	40500029
Seal Kit	21191112



WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

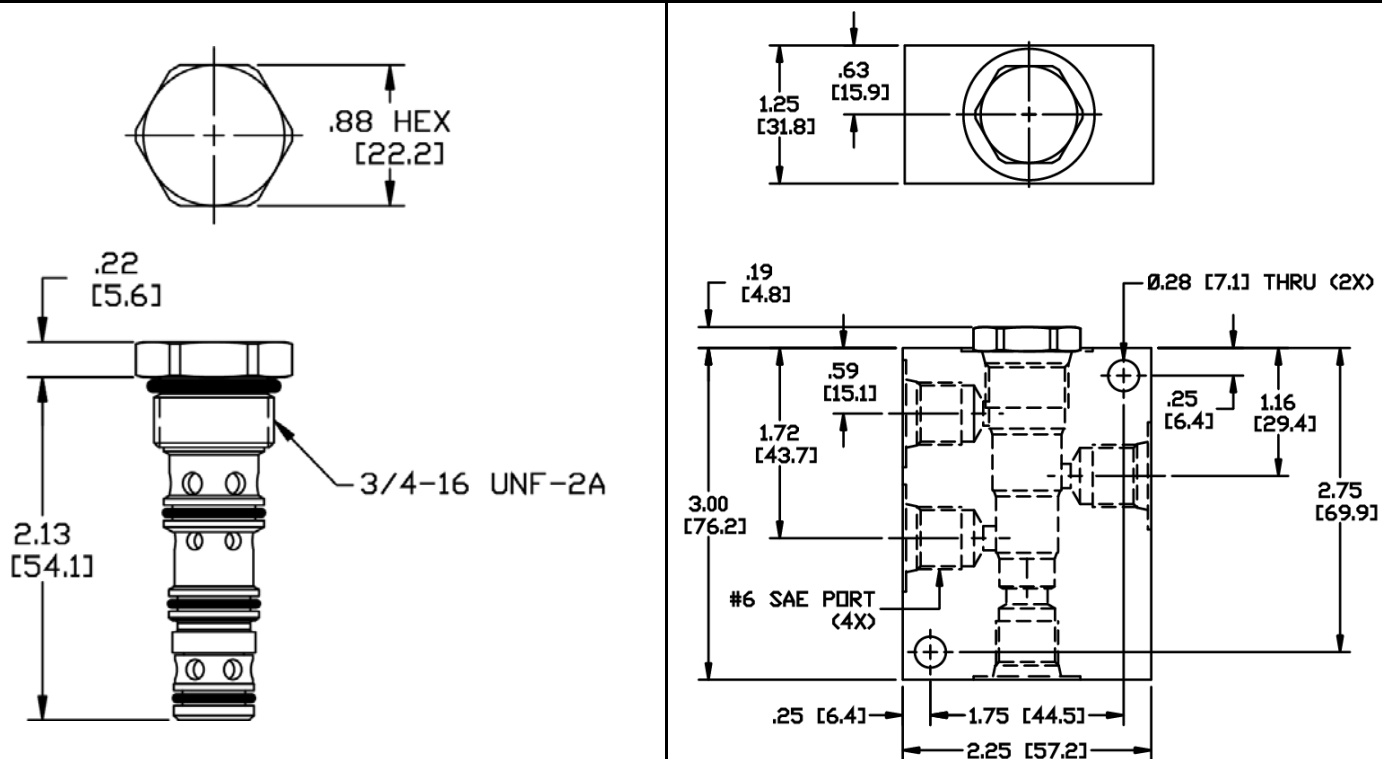
Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com



DIMENSIONS



ORDERING INFORMATION

PQ-CDP - - -

OPTIONS
Urethane Standard U0

BODIES
Blank N
1/4" NPTF PORT S
#6 SAE Ports

SPRING BIAS
20 PSI 0020

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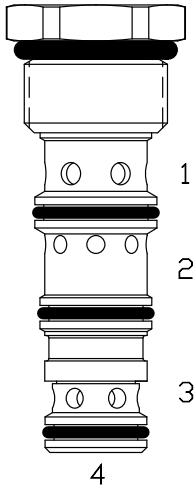
Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com



DG-CDP Double Pilot Operated Check Valve



DESCRIPTION

10 size, 7/8 -14 thread, "Delta" series, double pilot operated check valve.

OPERATION

The DG-CDP allows flow to pass from (3) to (4) and (2) to (1). The valve blocks flow from (4) to (3) and from (1) to (2). Blocked flow is released when pilot pressure is applied to the port opposite of (3) and /or (2) respectively.

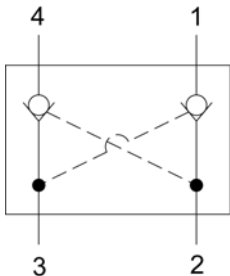
The valve has a 3:1 pilot ratio, so at least 1/3 of the load pressure at port (4) or (1) is required at the pilot line ports (ports (4) or (1) respectively) to open the flow passage to allow flow from port (4) or (1) respectively.

The check spring biased at 20 PSI (1.4 bar) to assure holding in the static or no-load conditions.

FEATURES

- Hardened parts for long life.
- Industry common cavity.

HYDRAULIC SYMBOL



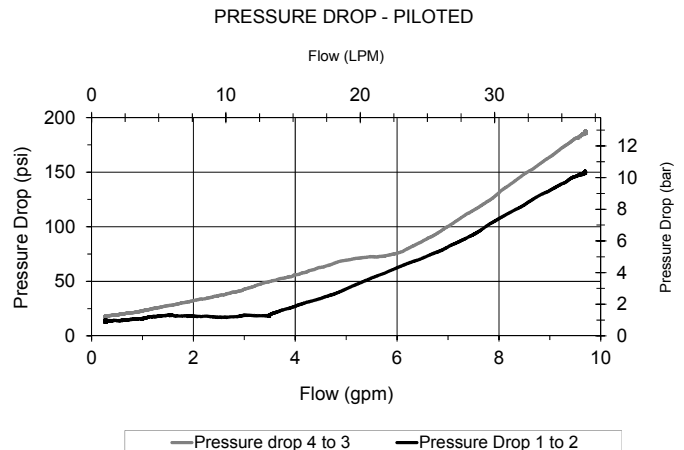
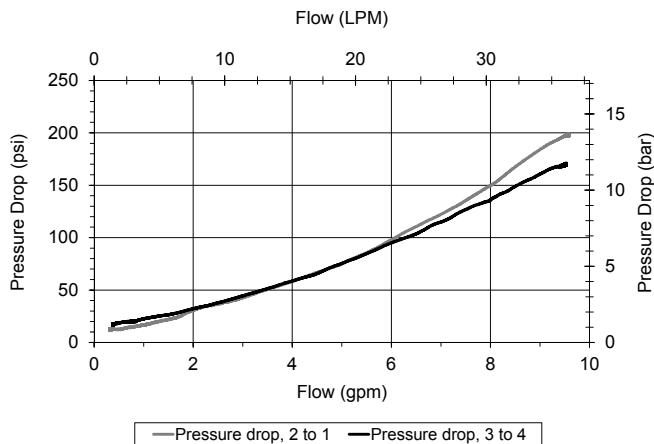
Great for "in Cylinder " use Application

PERFORMANCE

Actual Test Data (Cartridge Only)

VALVE SPECIFICATIONS

Nominal Flow	8 GPM (30 LPM)
Rated Operating Pressure	3000 PSI (207 bar)
Typical Internal Leakage (150 SSU)	0 - 5 drop / min
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temperature Range	-40° to 250° F (-40° to 120° C)
Weight	.20 lbs. (.09 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	30 ft-lbs (40.6 Nm)
Cavity	DELTA 4W
Cavity Form Tool (Finishing)	40500002
Seal Kit	21191216

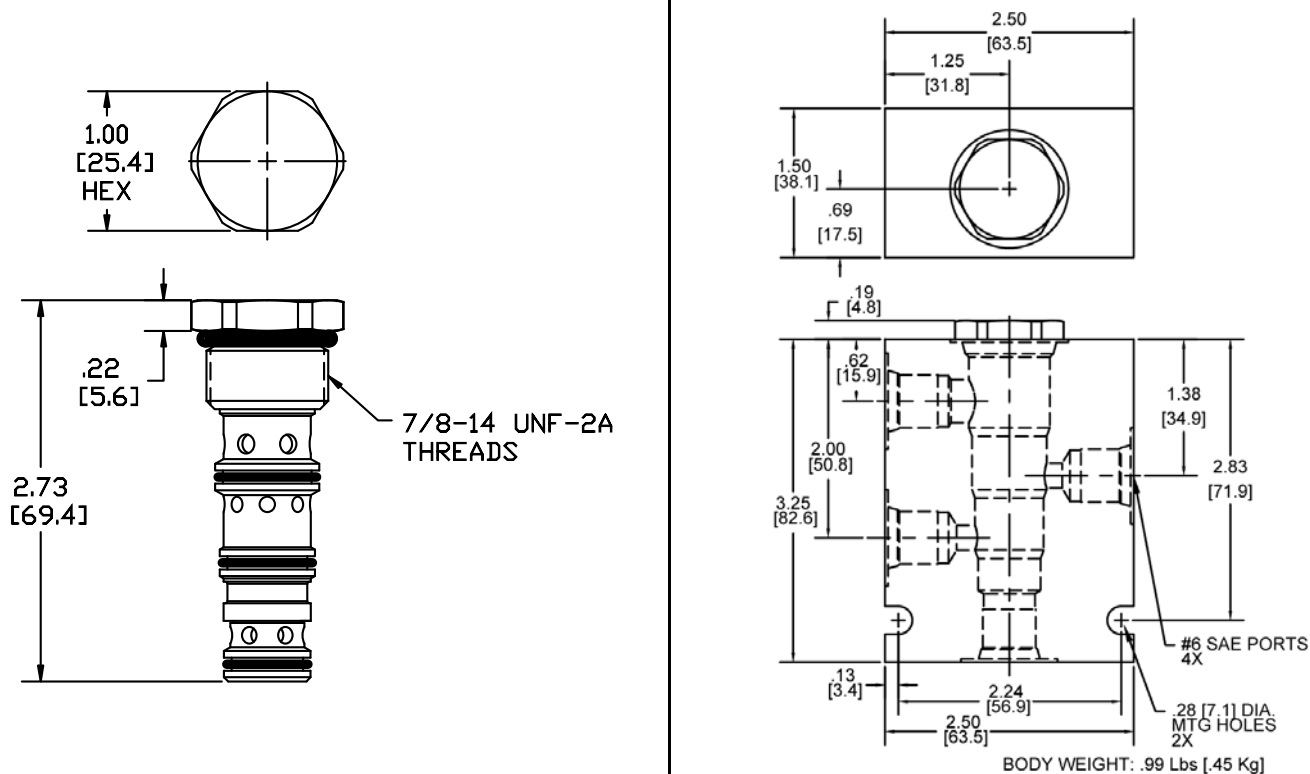


WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com


DIMENSIONS

ORDERING INFORMATION

DG-CDP - - -

OPTIONS

Urethane Standard **U0**

BODIES

Blank **N**

1/4" NPTF PORT **S**

#6 SAE Ports

SPRING BIAS

20 PSI **0020**

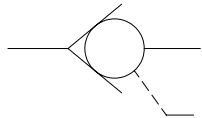
WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

Phone: (815) 397-6628

Fax: (815) 397-2526

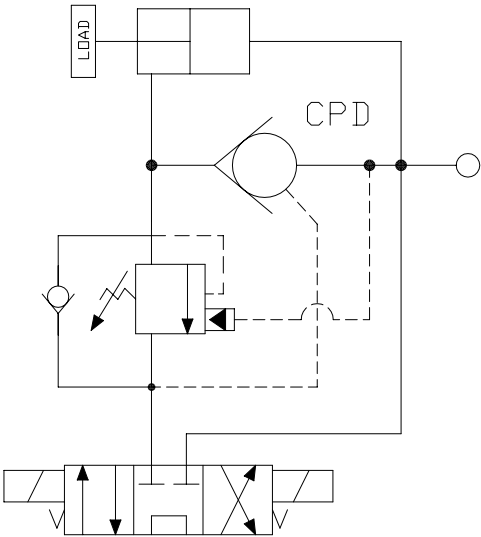
 E-mail: delta@delta-power.com

Pilot To Close Check Valves

	GPM	PSI	LPM	BAR	MODEL	PAGE
	10	3500	38	241	DF-CPD	272
	20	3500	76	241	SL-CPD	274

Typical Schematic

Typical application for the CPD is in a regenerative circuit such as a baler or refuse compactor. The valve allows flow from the rod end of the cylinder to regenerate with pump flow to increase cylinder speed.



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DF-CPD Pilot to Close Check Valve, Guided Ball

DESCRIPTION

10 size, 7/8-14 thread, "Delta" series, pilot to close, ball check valve.

OPERATION

The DF-CPD allows free flow from (3) to (2), and blocks flow from (2) to (3). Flow will be blocked from (3) to (2) when sufficient pressure is applied at (1).

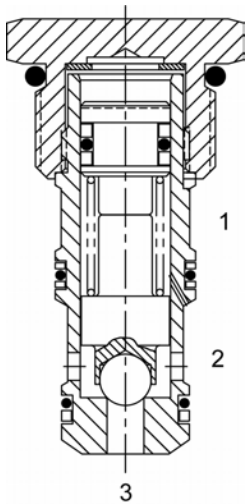
The cartridge has various "pilot ratios" (see options).

Example: 1/4 for 4:1 of the load pressure held at (3) is required at (1) to close the valve.

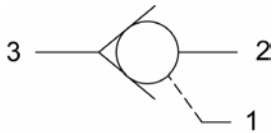
The check is spring biased to assure holding in static or no-load conditions.

FEATURES

- Hardened parts for long life.
- Industry common cavity.



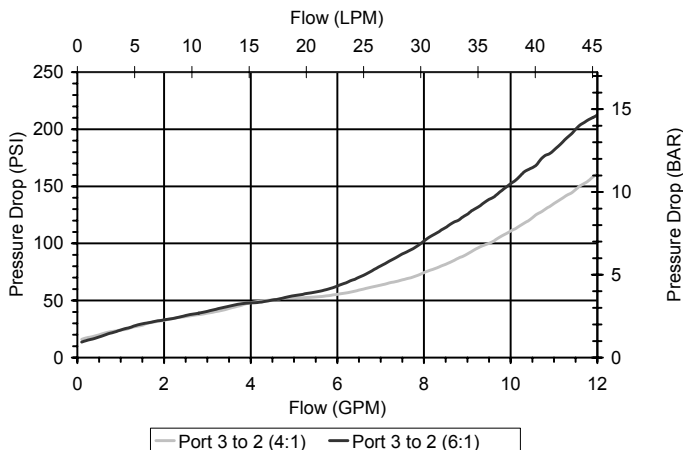
HYDRAULIC SYMBOL



Consult chart for flow operation of each model.
Special higher bias spring values available. Consult factory.

PERFORMANCE

Actual Test Data (Cartridge Only)



VALVE SPECIFICATIONS

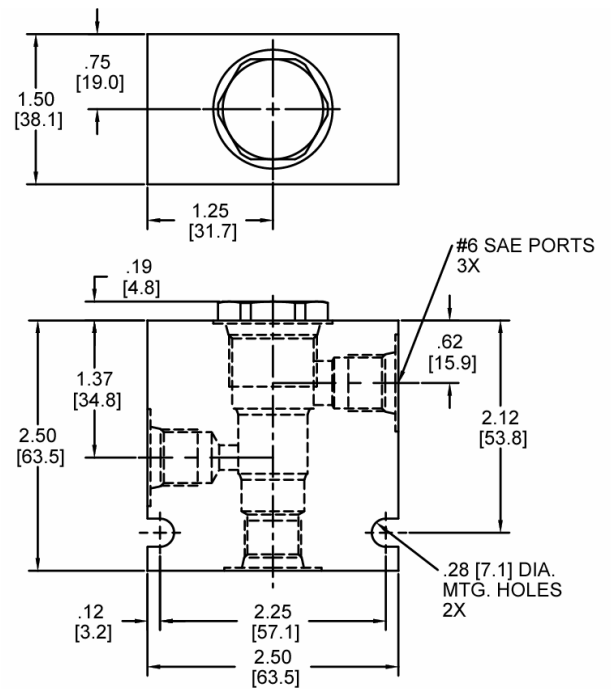
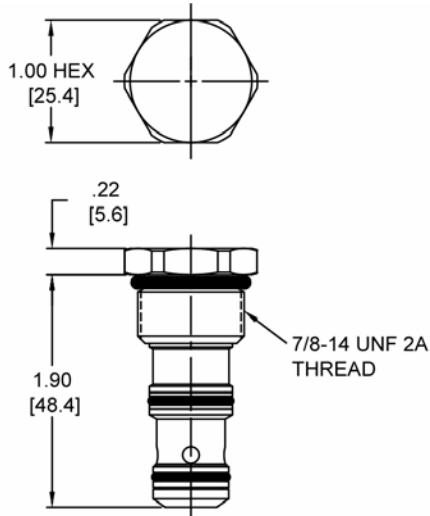
Maximum Flow	10 GPM (38 LPM)
Rated Operating Pressure	3500 PSI (241 bar)
Typical Internal Leakage (150 SSU)	50 drops/min from (2) to (3) 5 drops/min from (3) to (2) when port (1) is piloted
Pilot Ratio	(see options)
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temperature Range	-40° to 250° F (-40° to 120° C)
Weight	.20 lbs. (.09 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	30 ft-lbs (40.6 Nm)
Cavity	DELTA 3W
Cavity Form Tool (Finishing)	40500001
Seal Kit	21191202

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Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com


DIMENSIONS


BODY WEIGHT: .76 lbs. [.35 kg.]

ORDERING INFORMATION
DF-CPD
OPTIONS

 Buna, 4:1 Ratio **04**
 Buna, 6:1 Ratio **06**
 Viton, 4:1 Ratio **V4**
 Viton, 6:1 Ratio **V6**

 Blank **N**
S
BODIES

 Without Body
 1/4 NPTF Ports
 #6 SAE Ports

CRACK PRESSURE
0015 15 PSI
0025 25 PSI
0050 50 PSI
0075 75 PSI
0100 100 PSI
 ± 10%

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

Phone: (815) 397-6628

Fax: (815) 397-2526

 E-mail: delta@delta-power.com



SL-CPD Pilot to Close Check Valve, Poppet

DESCRIPTION

16 size, 1 5/16-12 thread, "Super" series, pilot to close, poppet check valve.

OPERATION

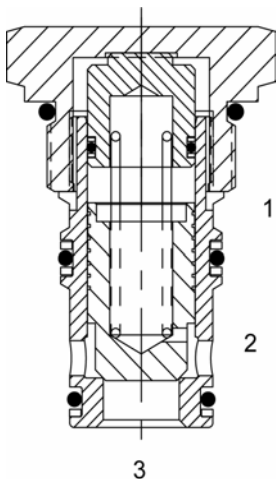
The SL-CPD allows free flow from (3) to (2), and blocks flow from (2) to (3). Flow will be blocked from (3) to (2) when sufficient pressure is applied at (1).

The cartridge has a 2:1 pilot ratio, meaning that at least one half of the load pressure held at (3) is required at (1) to close the valve.

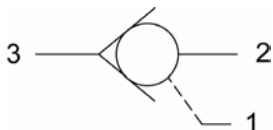
The check is spring biased to assure holding in static or no-load conditions.

FEATURES

- Hardened seat for long life.
- Industry common cavity.



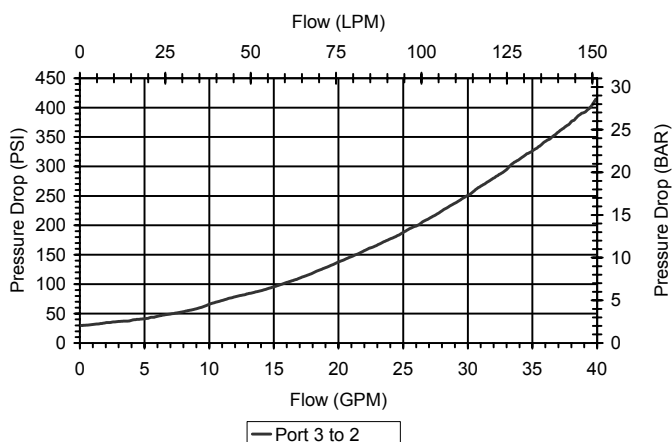
HYDRAULIC SYMBOL



Special higher bias spring values available. Consult factory.

PERFORMANCE

Actual Test Data (Cartridge Only)



VALVE SPECIFICATIONS

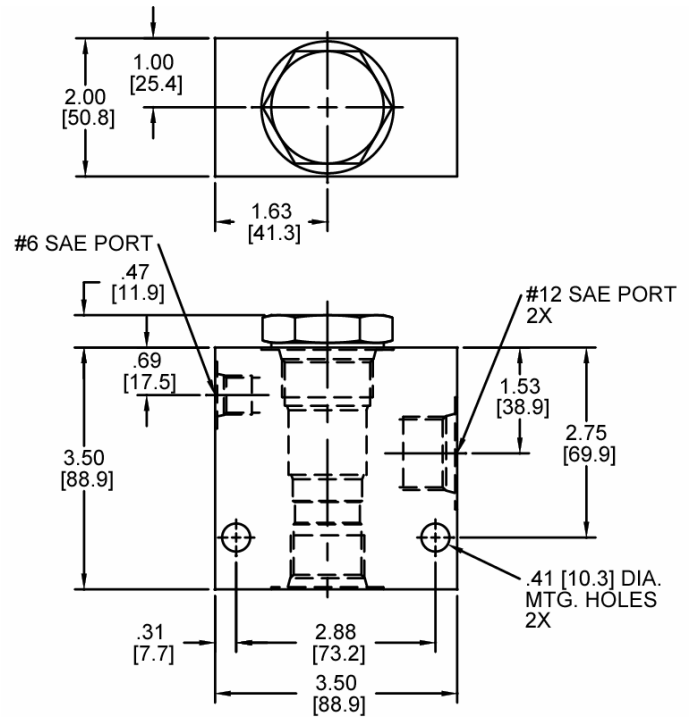
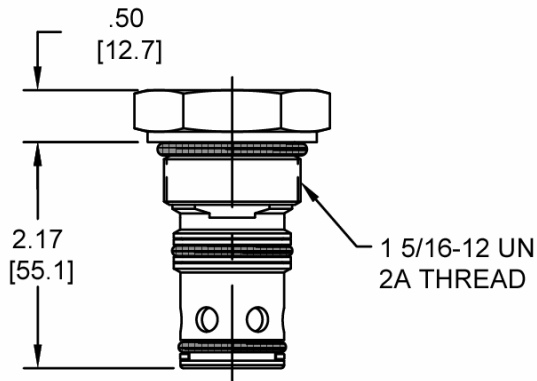
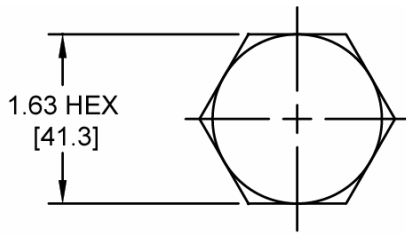
Nominal Flow	20 GPM (76 LPM)
Rated Operating Pressure	3500 PSI (241 bar)
Typical Internal Leakage (150 SSU)	5 drops/min
Pilot Ratio	2:1
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temperature Range	-40° to 250° F (-40° to 120° C)
Weight	.68 lbs. (.31 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	90 ft-lbs (122 Nm)
Cavity	SUPER 3WS
Cavity Form Tool (Finishing)	40500021
Seal Kit	21191404

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com

**DIMENSIONS**

BODY WEIGHT: 1.89 lbs. [.86 kg.]

ORDERING INFORMATION

SL-CPD -

OPTIONSBuna, 2:1 Ratio
Viton, 2:1 Ratio**02****V2**

Blank

S**BODIES**Without Body
#12 SAE Ports**CRACK PRESSURE**

0015 15 PSI
0025 25 PSI
0050 50 PSI
0075 75 PSI
0100 100 PSI
 ± 10%

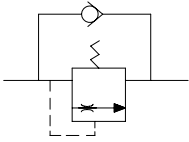
WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

Phone: (815) 397-6628

Fax: (815) 397-2526

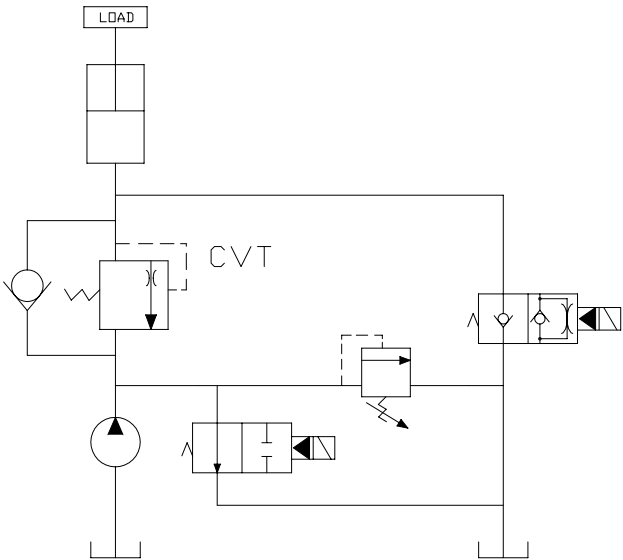
E-mail: delta@delta-power.com

Check Valves With Thermal Relief

	GPM	PSI	LPM	BAR	MODEL	PAGE
	15	4000	57	276	DE-CVT	278

Typical Schematic

Typical application for the CVT is a relief to protect system from damage due to thermal expansion on load holding circuits.



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E-mail: delta@delta-power.com



DE-CVT Direct Acting Check Valve Thermal Relief, Poppet

DESCRIPTION

10 size, 7/8-14 thread, "Delta" series, direct acting check valve with thermal relief.

OPERATION

The DE-CVT allows free flow passage from (2) to (1), and blocks flow from (1) to (2).

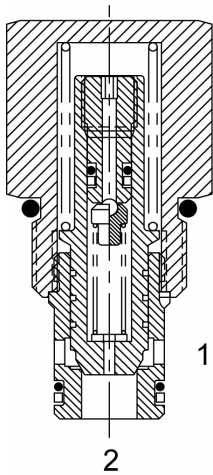
If the pressure at (1) exceeds the thermal relief valve setting, a small amount of oil will be allowed to pass from (1) to (2), preventing cylinder damage from excessive pressure.

The cartridge has a fully guided poppet, which is spring biased closed until sufficient pressure is applied at (2) to open to (1).

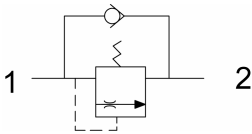
NOTE: The relief valve feature is not intended for use in dynamic pressure limiting applications. Consult factory

FEATURES

- Hardened parts for long life.
- Optional bias springs for backpressure application flexibility.
- Fully guided poppet assembly.
- Industry common cavity.



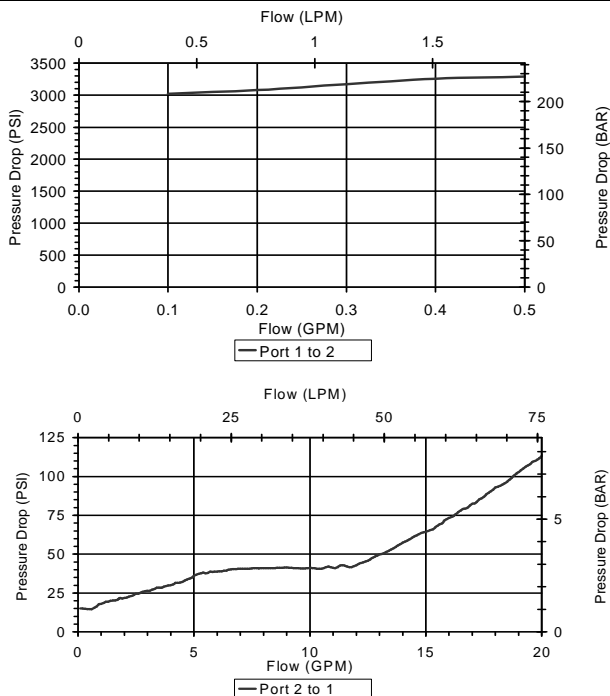
HYDRAULIC SYMBOL



Nominal flow rating is 15 GPM for free flow port (2) to (1). Consult chart for free flow differential pressure. Thermal relief is cyclic rated to 0.1 GPM. Port (1) to (2) chart demonstrates override characteristics for a typical thermal relief application.

PERFORMANCE

Actual Test Data (Cartridge Only)



VALVE SPECIFICATIONS

Nominal Flow	15 GPM (57 LPM)
Rated Operating Pressure	4000 PSI (276 bar)
Typical Internal Leakage (150 SSU)	0-10 drops/min
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temperature Range	-40° to 250° F (-40° to 120° C)
Weight	.31 lbs. (.14 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	30 ft-lbs (40.6 Nm)
Cavity	DELTA 2W
Cavity Form Tool (Finishing)	40500000
Seal Kit	21191200

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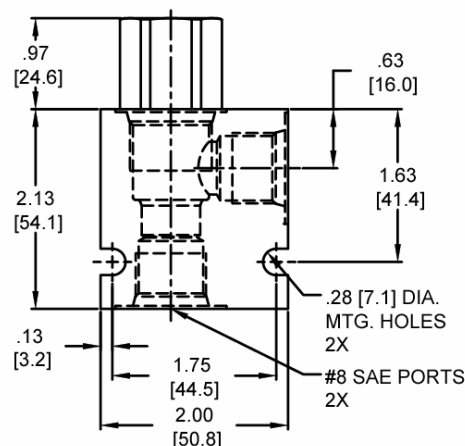
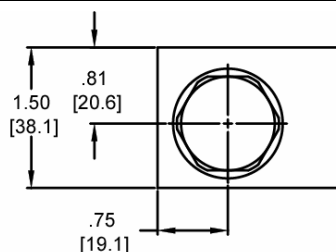
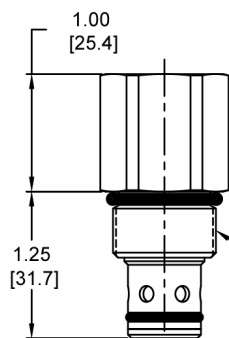
Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com



DIMENSIONS



BODY WEIGHT: .47 lbs. [.21 kg.]

ORDERING INFORMATION

DE-CVT -

OPTIONS
Buna Standard
Viton Standard

B
V

Blank
N
S

BODIES

Without Body
3/8 NPTF Ports
#8 SAE Ports

PRESSURE SETTING

1000 PSI 1
2000 PSI 2
3000 PSI 3
4000 PSI 4

0020
0100

Crack Pressure

20 PSI
100 PSI
± 10%

**WARNING: DO NOT USE ALUMINUM BODY.
HIGH PRESSURE (4000 PSI) PRODUCT**

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2 Way 2 Position Manual Valves

	GPM	PSI	LPM	BAR	MODEL	PAGE
	12	3500	45	241	PB-MCA	282
	15	3500	57	241	DE-MCA	284
	10	1500	38	103	DE-MCF	286
	20	3500	76	241	DE-MCS	288
	20	3500	76	241	DE-MCB	290
	8	3500	30	241	PB-MCI	292
	8	3500	30	241	PB-MCL	294
	15	3500	57	241	DE-MCL	296
	20	3000	76	207	DE-M2G	298
	1	4000	4	276	HB-MCP	300

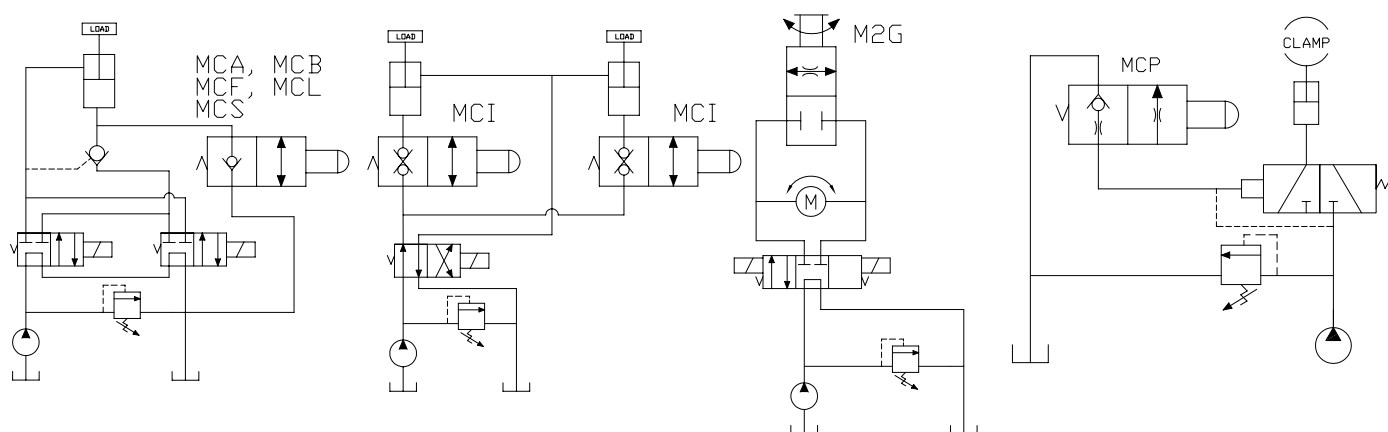
Typical Schematic

Typical application for MCA, MCB, MCF, MCL, and MCS is an emergency lowering device.

Typical application for the MCI is a selector circuit when load holding is required in both directions.

Typical application for the M2G is adjustable speed control or full bypass of fluid motor.

Typical application for the MCP is a pilot dump valve.



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Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com



PB-MCA Manual Poppet Valve, 2 Way Normally Closed, Pull Type

DESCRIPTION

8 size, 3/4-16 thread, "Power" series, manual poppet, 2 way normally closed, pull type valve.

OPERATION

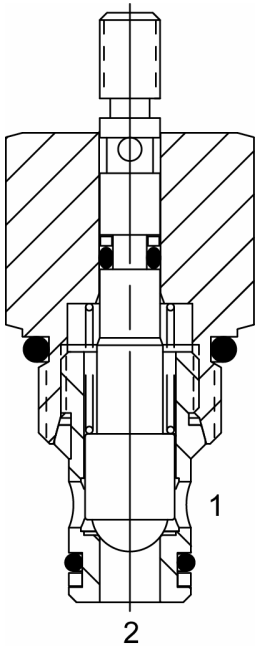
The PB-MCA blocks flow from (1) to (2) until an operator pulls the shaft outward.

The bias spring (see option page for pressure) allows for backpressure at (2) before the valve will open.

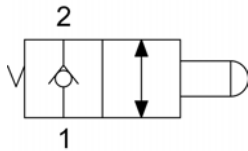
Note: Pressure at port (2) will act directly on the poppet and spring. Port (2) is intended to be a tank port only.

FEATURES

- Hardened parts for long life.
- Industry common cavity.
- Optional bias springs for backpressure application flexibility.



HYDRAULIC SYMBOL

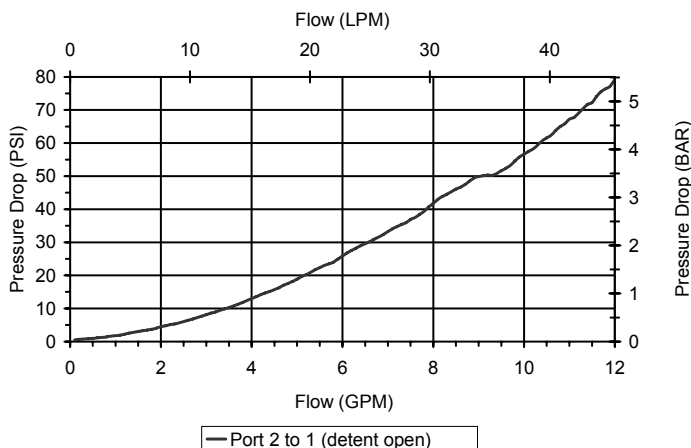


75 PSI bias provides comfortable effort where return line is near zero. 150 PSI option may be difficult to pull, if tank pressure is near zero.

Pressure above SPRING BIAS PRESSURE at port (2) may cause valve to self open.

PERFORMANCE

Actual Test Data (Cartridge Only)



VALVE SPECIFICATIONS

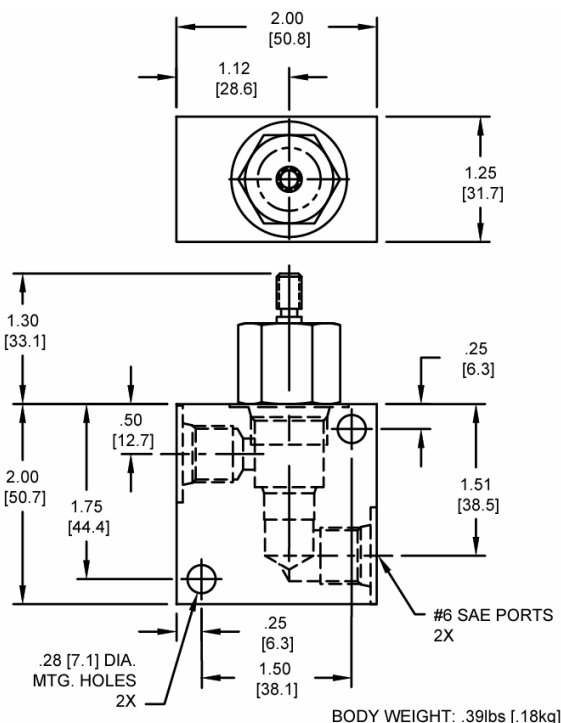
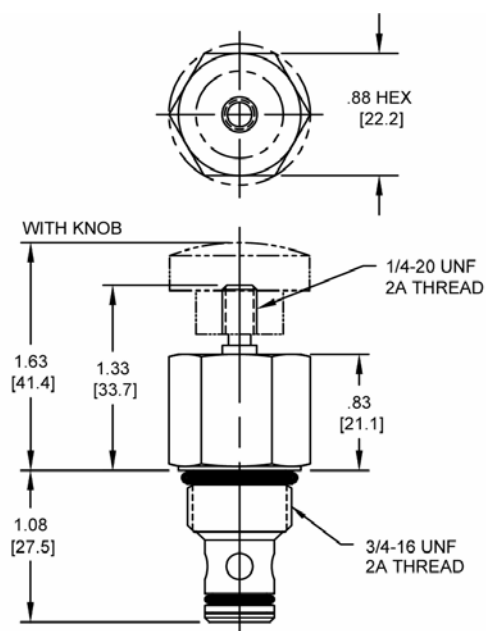
Nominal Flow	12 GPM (45 LTR/M)
Rated Operating Pressure	3500 PSI (241 bar)
Typical Internal Leakage (150 SSU)	0-5 drops/min
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temperature Range	-40° to 250° F (-40° to 120° C)
Weight	.21 lbs. (.10 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	25 ft-lbs (34 Nm)
Cavity	POWER 2W
Cavity Form Tool (Finishing)	40500005
Seal Kit	21191100

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Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com


DIMENSIONS

ORDERING INFORMATION
PB-MCA
OPTIONS

Buna Standard	00
Viton Standard	V0
Buna, Screen	A0
Viton, Screen	W0
Buna, Knob	0K
Viton, Knob	VK
Buna, Knob, Screen	AK
Viton, Knob, Screen	WK
Buna, Detent	0D
Viton, Detent	VD
Buna, Screen, Detent	AD
Viton, Screen, Detent	WD
Buna, Knob, Detent	1D
Viton, Knob, Detent	2D
Buna, Knob, Screen, Detent	3D
Viton, Knob, Screen, Detent	4D

 0075
 0150

BODIES

Blank	Without Body
N	1/4 NPT PORTS
S	#6 SAE PORTS

SPRING BIAS PRESSURE

 75 PSI
 150 PSI

NOTE: Pressure above SPRING BIAS PRESSURE at port (2) may cause valve to self open.

NOTE: Use screen only if flow direction is from (1) to (2).

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Phone: (815) 397-6628

Fax: (815) 397-2526

 E-mail: delta@delta-power.com



DE-MCA Manual Poppet Valve, 2 Way Normally Closed, Pull Type

DESCRIPTION

10 size, 7/8-14 thread, "Delta" series, manual poppet valve, 2 way normally closed, pull type.

OPERATION

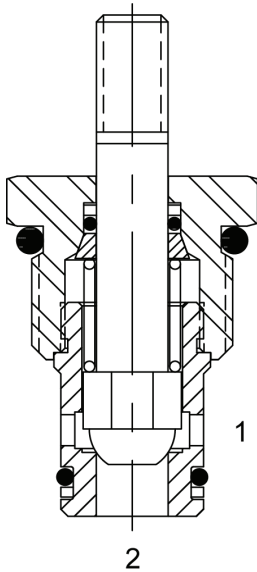
The DE-MCA blocks flow from (1) to (2) until an operator pulls the shaft outward.

The bias spring allows for backpressure at (2) before the valve will open (See option page for pressure).

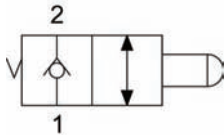
Note: Pressure at port (2) will directly act on the poppet and spring. Port (2) is intended to be a tank port only.

FEATURES

- Hardened parts for long life.
- Industry common cavity.
- Optional bias springs for backpressure application flexibility.



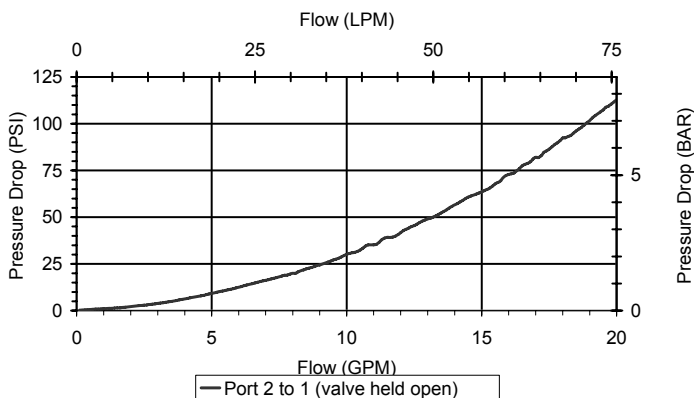
HYDRAULIC SYMBOL



65 PSI bias provides comfortable effort where return line is near zero. 160 PSI option may be difficult to pull, if tank pressure is near zero.

PERFORMANCE

Actual Test Data (Cartridge Only)



VALVE SPECIFICATIONS

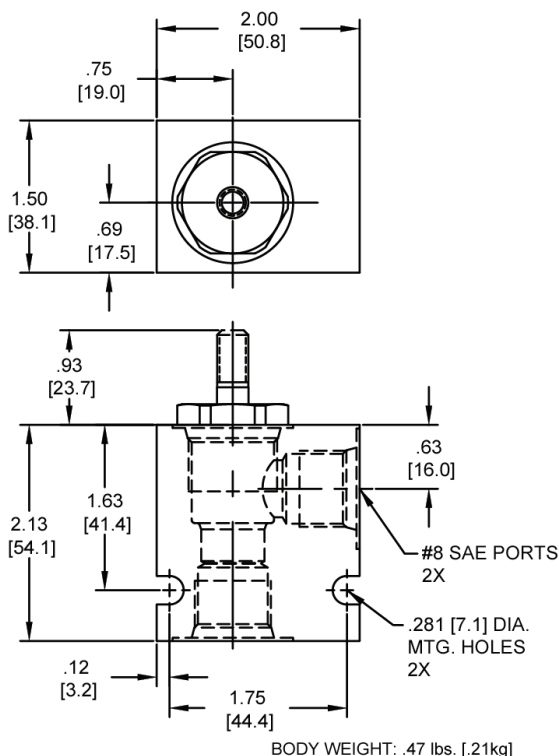
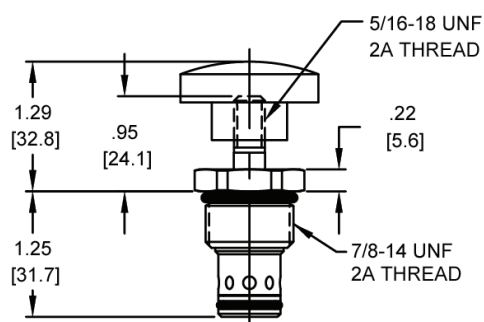
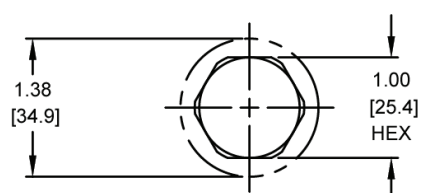
Nominal Flow	15 GPM (57 LPM)
Rated Operating Pressure	3500 PSI (241 bar)
Typical Internal Leakage (150 SSU)	5 drops/min
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temperature Range	-40° to 250° F (-40° to 120° C)
Weight	.18 lbs. (.08 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	30 ft-lbs (40.6 Nm)
Cavity	DELTA 2W
Cavity Form Tool (Finishing)	40500000
Seal Kit	21191200

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Fax: (815) 397-2526

E-mail: delta@delta-power.com


DIMENSIONS

ORDERING INFORMATION
DE-MCA
OPTIONS

Buna Standard	00
Viton Standard	V0
Buna, Screen	A0
Viton, Screen	W0
Buna, Knob	0K
Viton, Knob	VK
Buna, Knob, Screen	AK
Viton, Knob, Screen	WK

 0065
 0160

BODIES

Blank	Without Body
N	3/8 NPTF Ports
S	#8 SAE Ports

SPRING BIAS PRESSURE

 65 PSI
 160 PSI

NOTE: Use screen only if flow direction is from (1) to (2).

NOTE: Pressure above SPRING BIAS PRESSURE at port (2) may cause valve to self open.

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Phone: (815) 397-6628

Fax: (815) 397-2526

 E-mail: delta@delta-power.com



DE-MCF Manual Poppet Valve, 2 Way Normally Closed, Pull Type, Soft Seat

DESCRIPTION

10 size, 7/8-14 thread, "Delta" series, manual poppet valve, 2 way normally closed, pull type, soft seat.

OPERATION

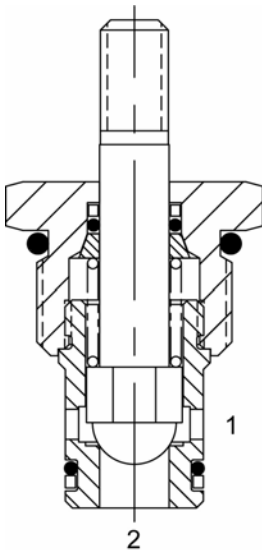
The DE-MCF blocks flow from (1) to (2) until an operator pulls the shaft outward.

The bias spring allows for backpressure at (2) before the valve will open (See option page for pressure).

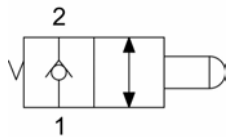
Note: Pressure at port (2) will directly act on the spool and spring. Port (2) is intended to be a tank port only.

FEATURES

- Soft seat for ultra low leakage.
- Industry common cavity..



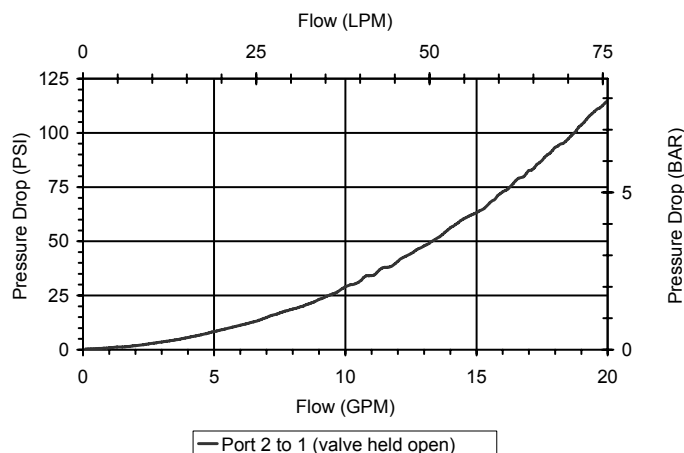
HYDRAULIC SYMBOL



Pressure above SPRING BIAS PRESSURE at port (2) may cause valve to self open.

PERFORMANCE

Actual Test Data (Cartridge Only)



VALVE SPECIFICATIONS

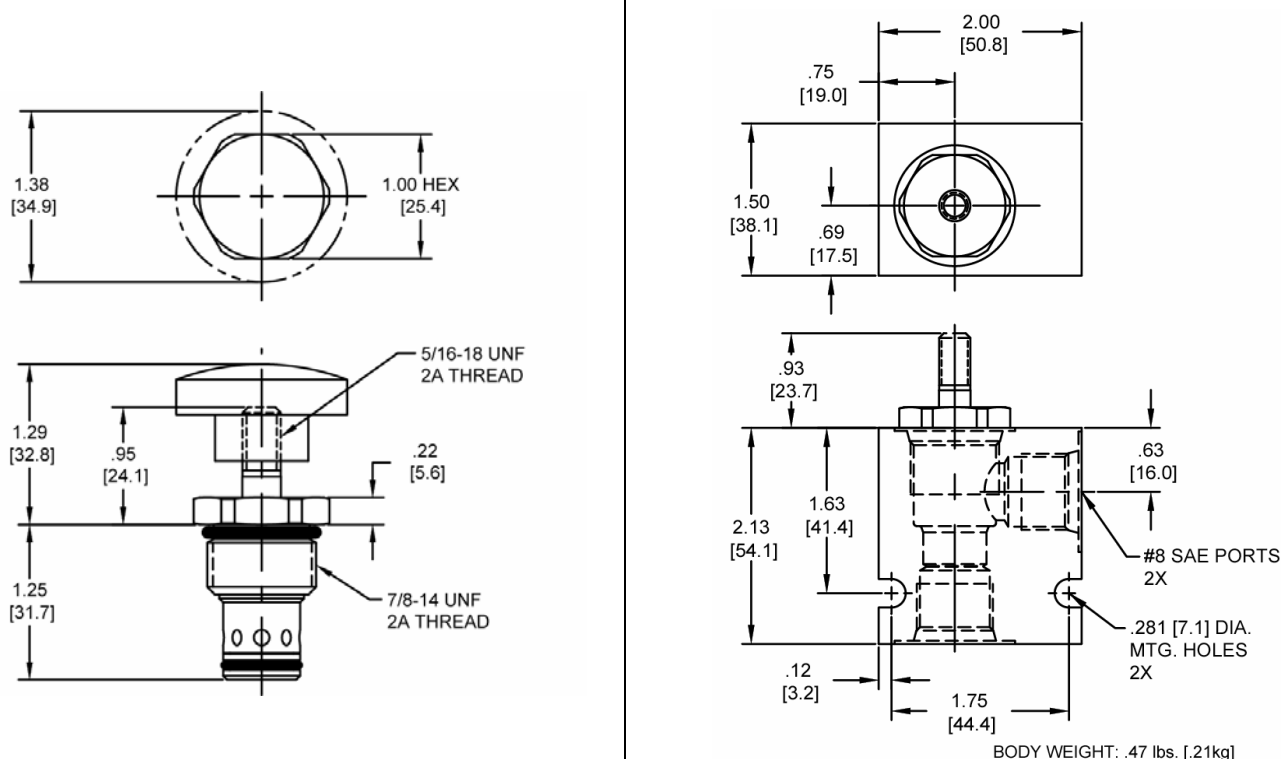
Nominal Flow	20 GPM (76 LPM)
Rated Operating Pressure	1500 PSI (103 bar)
Typical Internal Leakage (150 SSU)	Negligible
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temperature Range	32° to 160° F (0° to 70° C)
Weight	.14 lbs. (.06 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	30 ft-lbs (40.6 Nm)
Cavity	DELTA 2W
Cavity Form Tool (Finishing)	40500000
Seal Kit	21191200

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Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com


DIMENSIONS

ORDERING INFORMATION
DE-MCF
OPTIONS

Buna Standard	00
Viton Standard	V0
Buna, Knob	0K
Viton, Knob	VK
Buna, Screen	A0
Viton, Screen	W0
Buna, Knob, Screen	AK
Viton, Knob, Screen	WK

0065

Blank

N
S
BODIES

Without Body
3/8 NPTF Ports
#8 SAE Ports

SPRING BIAS PRESSURE

65 PSI

NOTE: Use screen only if flow direction is from (1) to (2).

NOTE: Pressure above **SPRING BIAS PRESSURE** at port (2) may cause valve to self open.

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

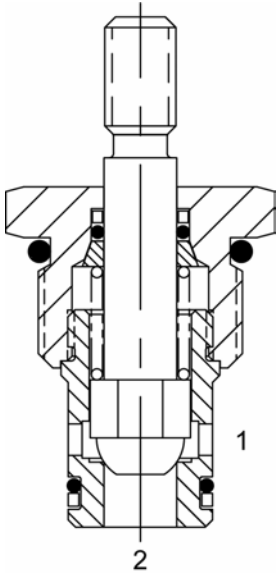
Phone: (815) 397-6628

Fax: (815) 397-2526

 E-mail: delta@delta-power.com



DE-MCS Manual Poppet Valve, 2 way Normally Closed, Pull Type, Corrosion Resistant



DESCRIPTION

10 size, 7/8-14 thread, "Delta" series, manual poppet valve, 2 way normally closed, pull type, corrosion resistant.

OPERATION

The DE-MCS blocks flow from (1) to (2) until an operator pulls the shaft outward.

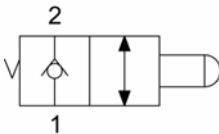
The bias spring allows for backpressure at (2) before the valve will open (See option page for pressure).

Note: Pressure at port (2) will directly act on the spool and spring. Port (2) is intended to be a tank port only.

FEATURES

- Hardened parts for long life.
- Industry common cavity.
- Corrosion resistant.
- Optional bias springs for backpressure application flexibility.

HYDRAULIC SYMBOL



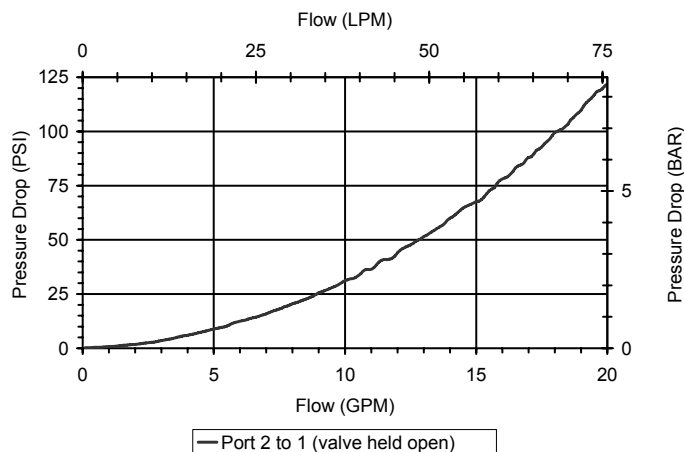
65 PSI bias provides comfortable effort where return line is near zero. 160 PSI option may be difficult to pull, if tank pressure is near zero.

Stainless Steel Shaft.

Pressure above SPRING BIAS PRESSURE at port (2) may cause valve to self open.

PERFORMANCE

Actual Test Data (Cartridge Only)



VALVE SPECIFICATIONS

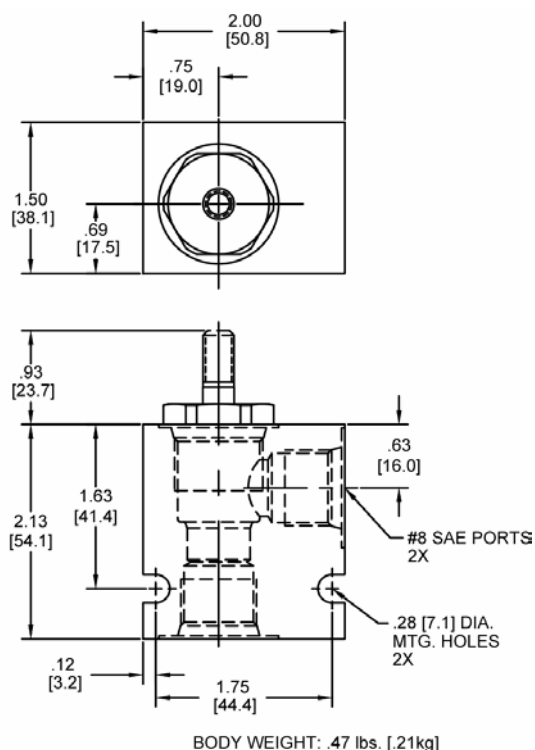
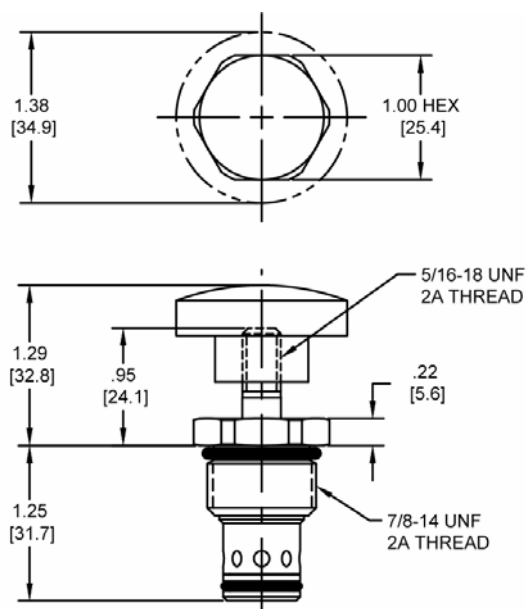
Nominal Flow	20 GPM (76 LPM)
Rated Operating Pressure	3500 PSI (241 bar)
Typical Internal Leakage (150 SSU)	0-5 drops/min
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temperature Range	-40° to 250° F (-40° to 120° C)
Weight	.75 lbs. (.34 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	30 ft-lbs (40.6 Nm)
Cavity	DELTA 2W
Cavity Form Tool (Finishing)	40500000
Seal Kit	21191200

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Fax: (815) 397-2526

E-mail: delta@delta-power.com


DIMENSIONS

ORDERING INFORMATION
DE-MCS
OPTIONS

Buna Standard	00
Viton Standard	V0
Buna, Screen	A0
Viton, Screen	W0
Buna, Knob	0K
Viton, Knob	VK
Buna, Knob, Screen	AK
Viton, Knob, Screen	WK

 0065
 0160

BODIES

Blank
N 3/8 NPTF Ports
S #8 SAE Ports

SPRING BIAS

 65 PSI
 160 PSI

NOTE: Use screen only if flow direction is from (1) to (2).

NOTE: Pressure above SPRING BIAS PRESSURE at port (2) may cause valve to self open.

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

Phone: (815) 397-6628

Fax: (815) 397-2526

 E-mail: delta@delta-power.com



DE-MCB Manual Poppet Valve, 2 Way Normally Closed, Pull, Detent

DESCRIPTION

10 size, 7/8-14 thread, "Delta" series, manual poppet valve, 2 way normally closed, pull with detent.

OPERATION

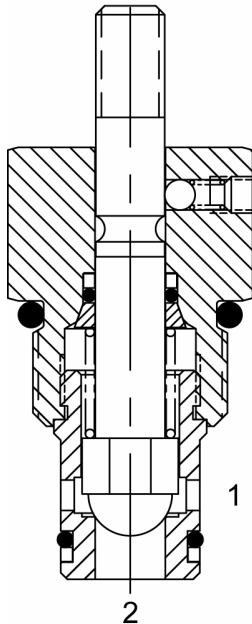
The DE-MCB blocks flow from (1) to (2) until an operator pulls the shaft outward.

The bias spring allows for backpressure at (2) before the valve will open (See option page for pressure).

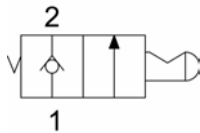
Note: Pressure at port (2) will directly act on the spool and spring. Port (2) is intended to be a tank port only.

FEATURES

- Hardened parts for long life.
- Industry common cavity.
- Optional bias springs for backpressure application flexibility.



HYDRAULIC SYMBOL

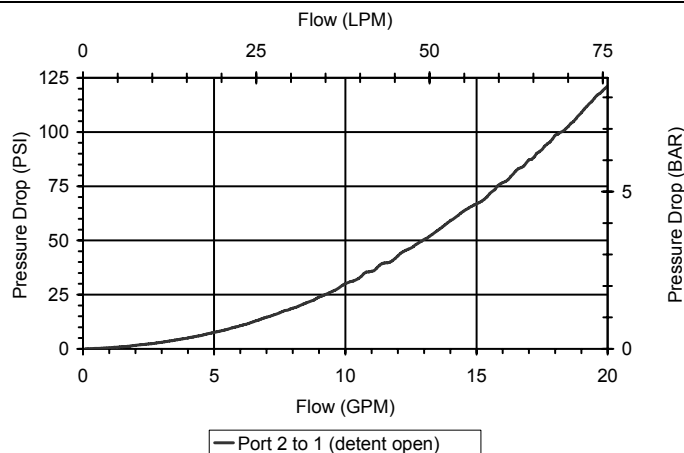


65 PSI bias provides comfortable effort where return line is near zero. 160 PSI option may be difficult to pull, if tank pressure is near zero.

Pressure above SPRING BIAS PRESSURE at port (2) may cause valve to self open.

PERFORMANCE

Actual Test Data (Cartridge Only)



VALVE SPECIFICATIONS

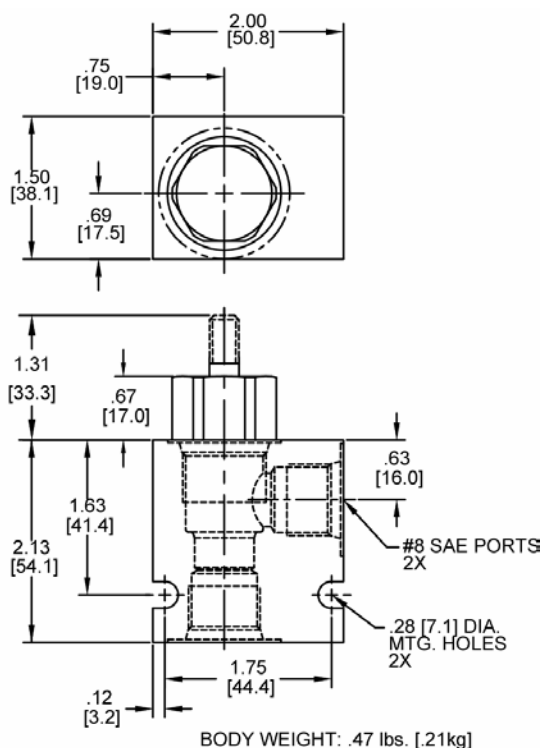
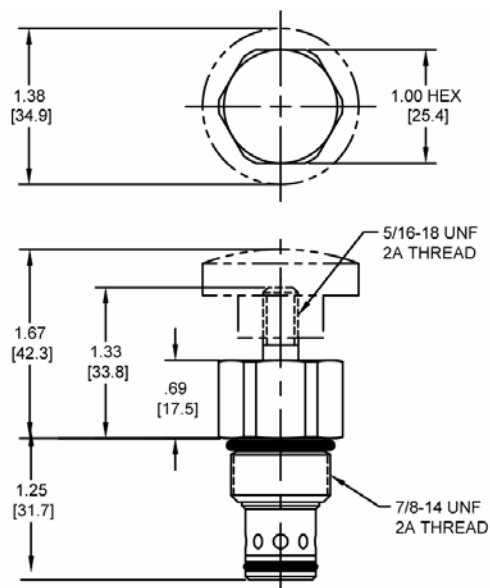
Nominal Flow	20 GPM (76 LPM)
Rated Operating Pressure	3500 PSI (241 bar)
Typical Internal Leakage (150 SSU)	5 drops/min
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temperature Range	-40° to 250° F (-40° to 120° C)
Weight	.28 lbs. (.13 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	30 ft-lbs (40.6 Nm)
Cavity	DELTA 2W
Cavity Form Tool (Finishing)	40500000
Seal Kit	21191200

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com


DIMENSIONS

ORDERING INFORMATION
DE-MCB
OPTIONS

Buna Standard	00
Viton Standard	V0
Buna, Screen	A0
Viton, Screen	W0
Buna, Knob	0K
Viton, Knob	VK
Buna, Knob, Screen	AK
Viton, Knob, Screen	WK

 0065
 0160

BODIES

Blank	Without Body
N	3/8 NPTF Ports
S	#8 SAE Ports

SPRING BIAS PRESSURE

 65 PSI
 160 PSI

NOTE: Use screen only if flow direction is from (1) to (2).

NOTE: Pressure above SPRING BIAS PRESSURE at port (2) may cause valve to self open.

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

Phone: (815) 397-6628

Fax: (815) 397-2526

 E-mail: delta@delta-power.com



PB-MCI Manual Poppet Valve, 2 Way Normally Closed, Push Type

DESCRIPTION

8 size, 3/4-16 thread, "Power" series, manual poppet, 2 way normally closed, push type valve.

OPERATION

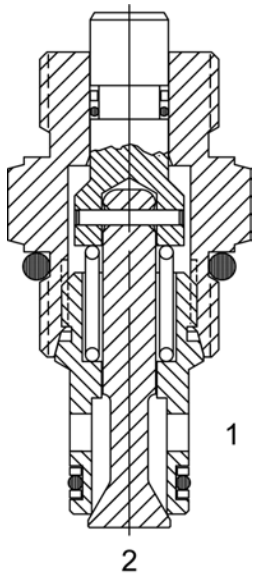
The PB-MCI blocks flow from (2) to (1) until sufficient force is applied to button to overcome spring bias and load force.

Actuation Force Required	
No Pressure:	7 lbs.
Side Pressure:	$7 + (P_1 \times .009)$
Nose Pressure:	$7 + (P_1 \times .076)$

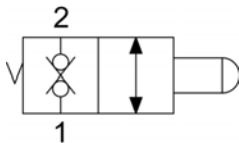
Note: ($\varnothing.437$) cavity predrill depth must be 1.312 minimum from spotface.

FEATURES

- Hardened parts for long life.
- Industry common cavity.

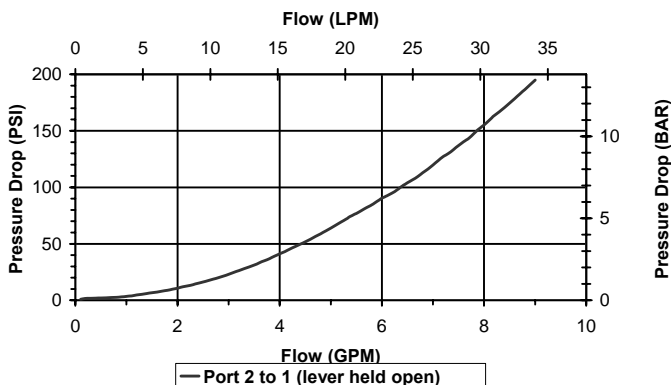


HYDRAULIC SYMBOL



PERFORMANCE

Actual Test Data (Cartridge Only)



VALVE SPECIFICATIONS

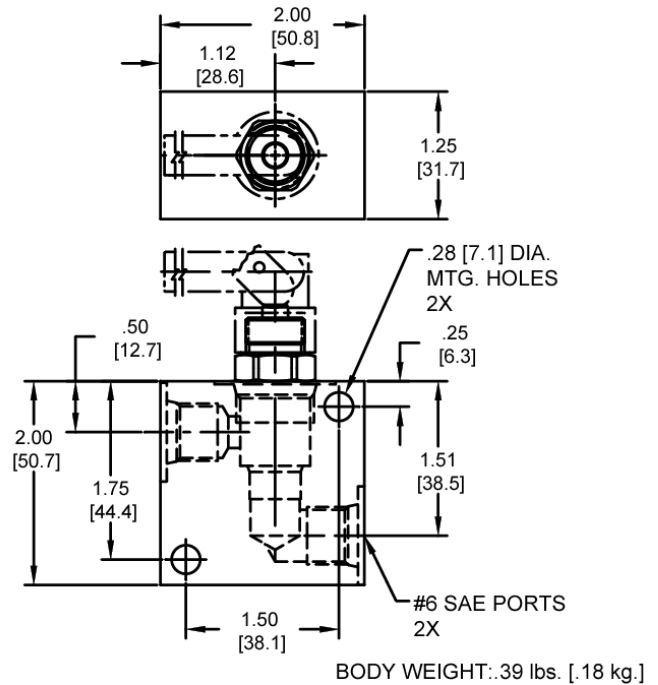
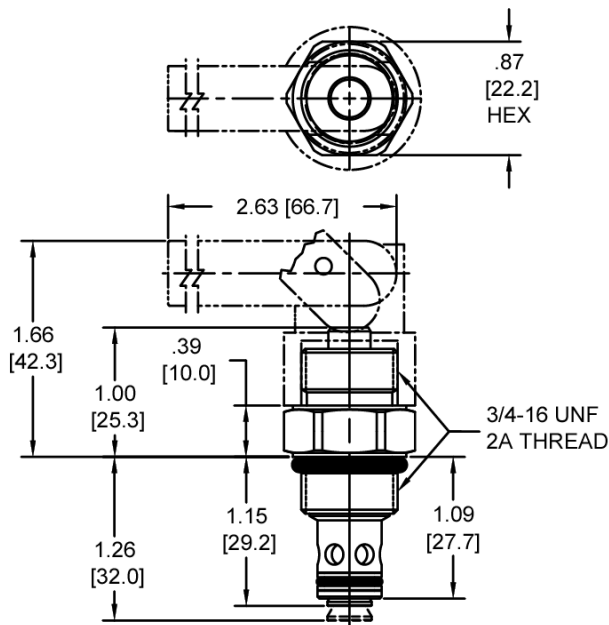
Nominal Flow	8 GPM (30 LTR/M)
Rated Operating Pressure	3500 PSI (241 bar)
Typical Internal Leakage (150 SSU)	Consult Factory
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temperature Range	-40° to 250° F (-40° to 120° C)
Weight	.26 lbs. (.12 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	25 ft-lbs (34 Nm)
Cavity	POWER 2W
Cavity Form Tool (Finishing)	40500005
Seal Kit	21191102

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com


DIMENSIONS

ORDERING INFORMATION
PB-MCI - -

OPTIONS

Buna Standard	00
Viton Standard	V0
Buna, Lever	0L
Viton, Lever	VL
Buna, Screen	A0
Viton, Screen	W0
Buna, Screen, Lever	AL
Viton, Screen, Lever	WL

Blank
N
S

BODIES

Without Body
1/4 NPTF Ports
#6 SAE Ports

NOTE: Use screen only if flow direction is from (1) to (2).

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

Phone: (815) 397-6628

Fax: (815) 397-2526

 E-mail: delta@delta-power.com


PB-MCL Manual Poppet Valve, 2 Way Normally Closed, Pull Type, Lever
DESCRIPTION

8 size, 3/4-16 thread, "Power" series, manual poppet, 2 way normally closed, pull type valve with lever.

OPERATION

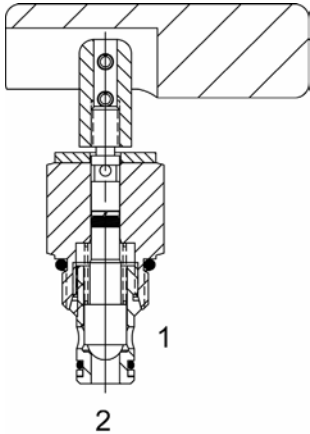
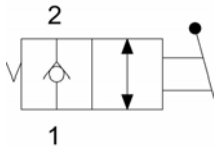
The PB-MCL blocks flow from (1) to (2) until an operator pulls the handle upward.

The bias spring (see option page for pressure) allows for back-pressure at (2) before the valve will open.

Note: Pressure at port (2) will directly act on the spool and spring. Port (2) is intended to be a tank port only.

FEATURES

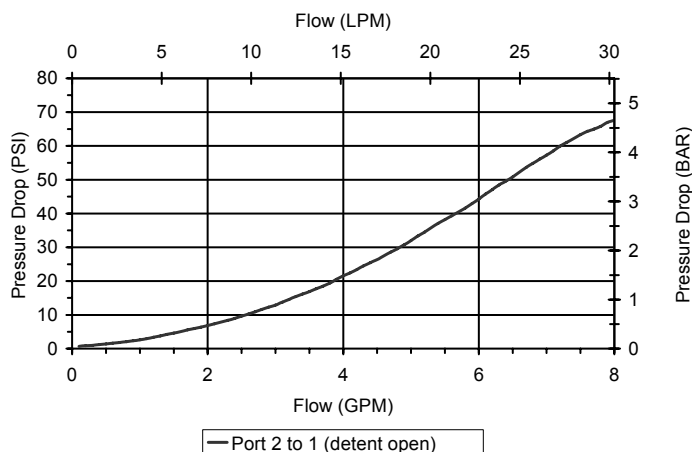
- Hardened parts for long life.
- Industry common cavity.


HYDRAULIC SYMBOL


Pressure above SPRING BIAS PRESSURE at port (2) may cause valve to self open.

PERFORMANCE

Actual Test Data (Cartridge Only)


VALVE SPECIFICATIONS

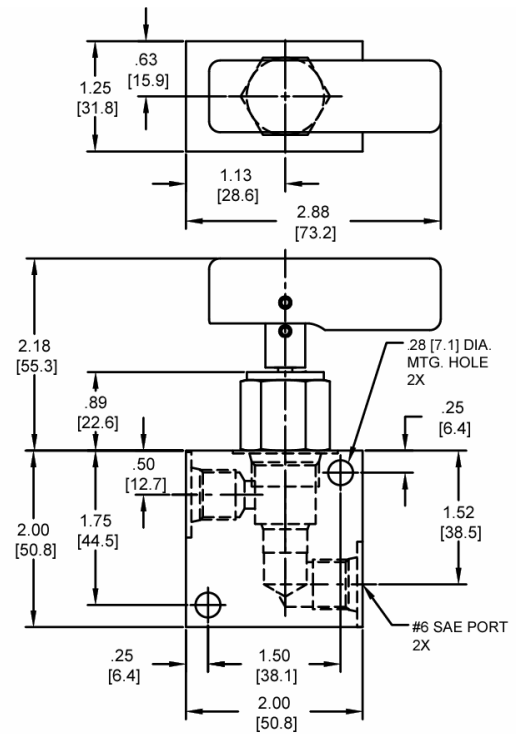
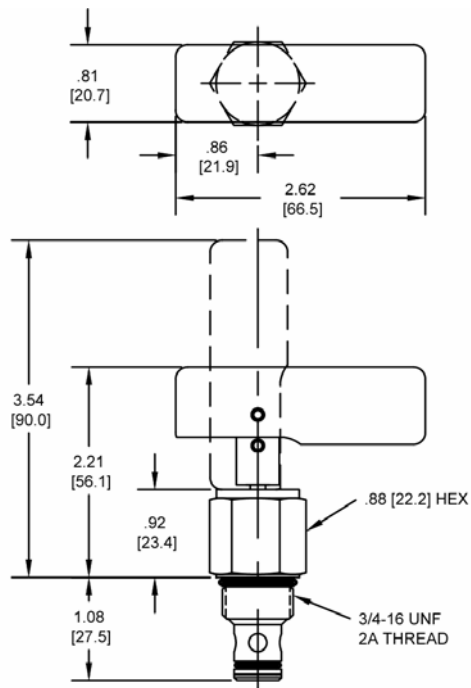
Nominal Flow	8 GPM (30 LTR/M)
Rated Operating Pressure	3500 PSI (241 bar)
Typical Internal Leakage (150 SSU)	0-5 drops/min
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temperature Range	-40° to 250° F (-40° to 120° C)
Weight	.33 lbs. (.15 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	25 ft-lbs (34 Nm)
Cavity	POWER 2W
Cavity Form Tool (Finishing)	40500005
Seal Kit	21191101

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com


DIMENSIONS


BODY WEIGHT: .39 lbs. [18 kgs.]

ORDERING INFORMATION

PB-MCL - - -	
OPTIONS	
Buna Standard	00
Viton Standard	V0
Buna, Screen	A0
Viton, Screen	W0
	0075
	0150

BODIES

Blank	Without Body
N	1/4 NPT PORTS
S	#6 SAE PORTS

SPRING BIAS PRESSURE

0075	75 PSI
0150	150 PSI

NOTE: Use screen only if flow direction is from (1) to (2).

NOTE: Pressure above SPRING BIAS PRESSURE at port (2) may cause valve to self open.

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

Phone: (815) 397-6628

Fax: (815) 397-2526

 E-mail: delta@delta-power.com

**DE-MCL NORMALLY CLOSED MANUAL, PULL VALVE****DESCRIPTION**

10 size, 7/8-14 thread, "Delta" series, normally closed, manual pull valve

OPERATION

The DE-MCL blocks flow from (1) to (2) until an operator pulls the shaft outward.

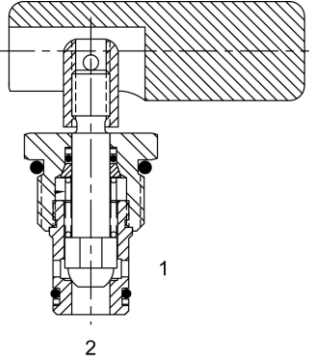
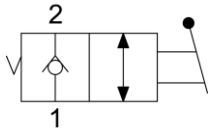
The bias spring allows for backpressure at (2) before the valve will open (See option page for pressure).

Note: Pressure at port (2) will directly act on the spool and spring. Port (2) is intended to be a tank port only.

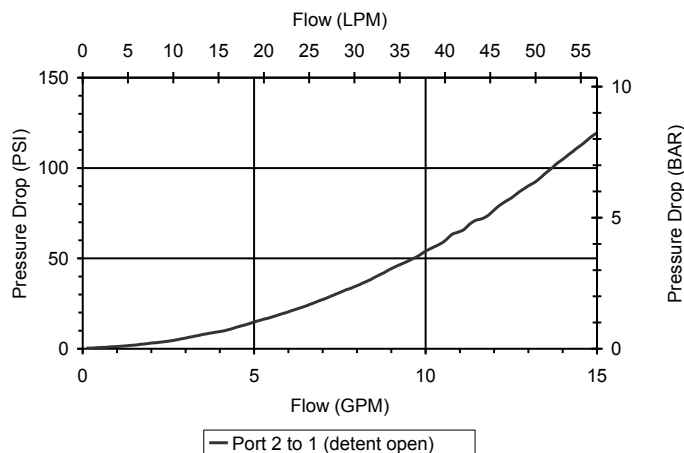
The cartridge offers smooth transition in response to load changes in common hydraulic circuits.

FEATURES

- Hardened cage for long life.
- Industry common cavity

**HYDRAULIC SYMBOL**

Pressure above SPRING BIAS PRESSURE at port (2) may cause valve to self open.

PERFORMANCE**Actual Test Data (Cartridge Only)****VALVE SPECIFICATIONS**

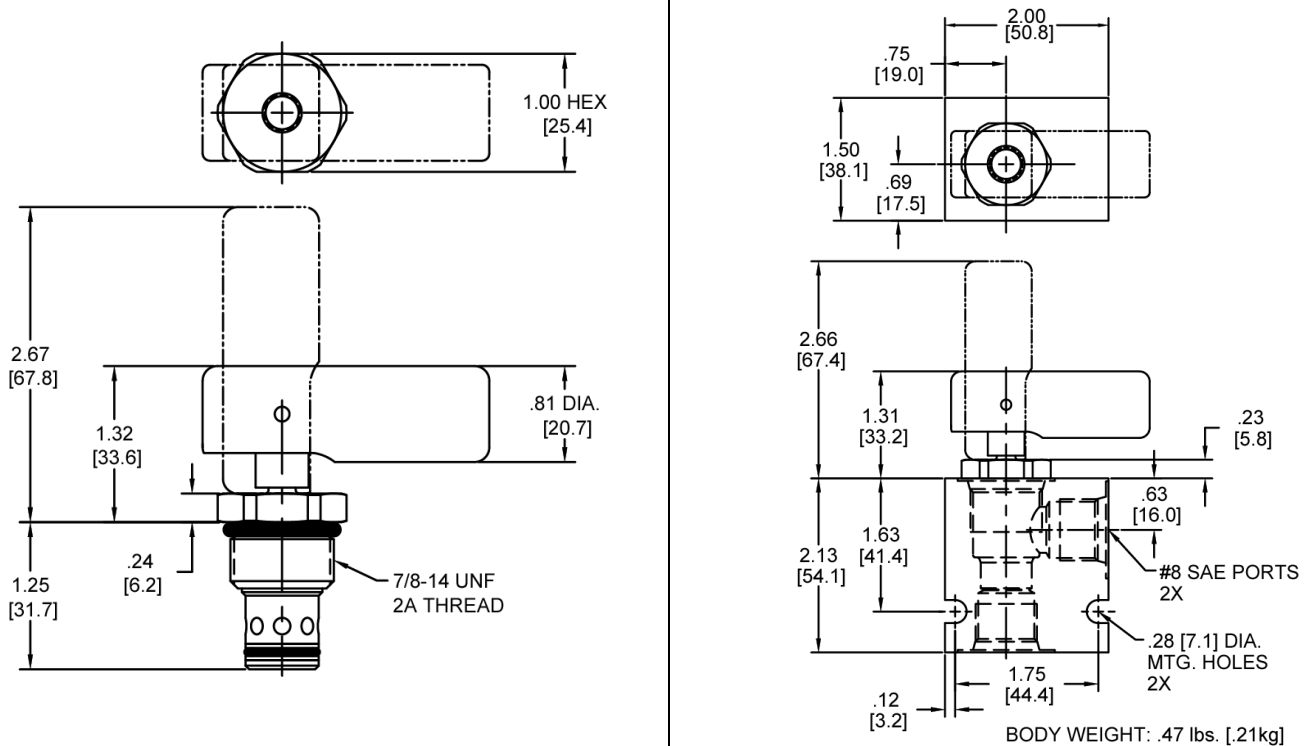
Nominal Flow	15 GPM (57 LPM)
Rated Operating Pressure	3500 PSI (241 bar)
Typical Internal Leakage (150 SSU)	5 drops/min (82 ml/min)
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temperature Range	-40° to 250° F (-40° to 120° C)
Weight	.15 lbs. (.15 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	30 ft-lbs (40.6 Nm)
Cavity	DELTA 2W
Cavity Form Tool (Finishing)	40500000
Seal Kit	21191201

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com

**DIMENSIONS****ORDERING INFORMATION****DE-MCL****OPTIONS**

Buna Standard **00**
 Viton Standard **V0**
 Buna, Screen **A0**
 Viton, Screen **W0**

0065
0160

BODY

Blank
N Without Body
S 3/8 NPTF Ports
 #8 SAE Ports

SPRING BIAS PRESSURE

65 PSI
 165 PSI

NOTE: Use screen only if flow direction is from (1) to (2).

NOTE: Pressure above **SPRING BIAS PRESSURE** at port (2) may cause valve to self open.

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com



DE-M2G Manual Rotary Spool Valve, 2 Way Normally Closed

DESCRIPTION

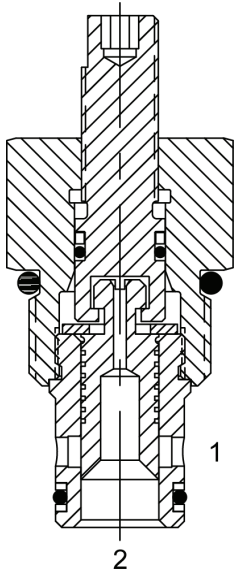
10 size, 7/8-14 thread, "Delta" series, manual rotary spool valve, 2 way normally closed.

OPERATION

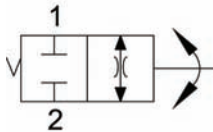
The DE-M2G when rotated clockwise (fully closed position) blocks flow from (1) to (2) and (2) to (1). When rotated counterclockwise (fully open position), the cartridge allows flow from (1) to (2) and (2) to (1).

FEATURES

- Hardened parts for long life.
- Industry common cavity.



HYDRAULIC SYMBOL

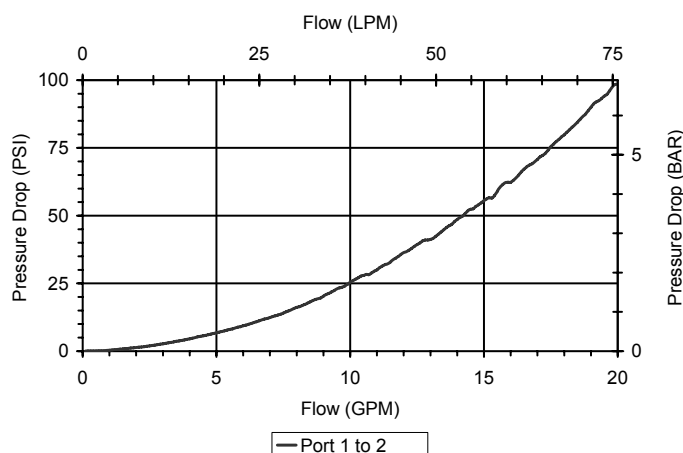


May be used as a metering product. Valve has approximately 3.5 turns of adjustment from fully open to fully closed.

See Chart for fully open pressure drop.

PERFORMANCE

Actual Test Data (Cartridge Only)



VALVE SPECIFICATIONS

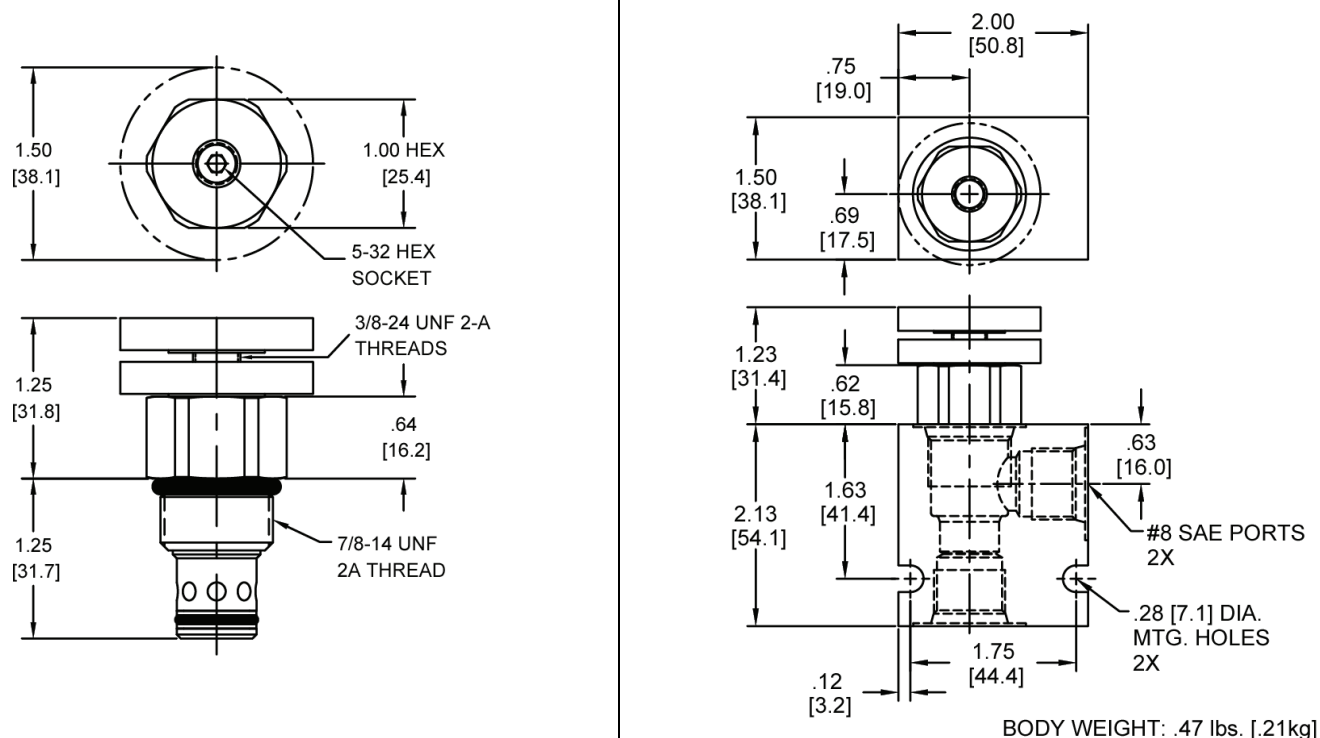
Nominal Flow	20 GPM (76 LPM)
Rated Operating Pressure	3000 PSI (207 bar)
Typical Internal Leakage (150 SSU)	5 cu/in per min (82 ml/min)
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temperature Range	-40° to 250° F (-40° to 120° C)
Weight	.27 lbs. (.12 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	30 ft-lbs (40.6 Nm)
Cavity	DELTA 2W
Cavity Form Tool (Finishing)	40500000
Seal Kit	21191202

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Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com


DIMENSIONS

ORDERING INFORMATION
DE-M2G
OPTIONS

Buna Standard	00
Viton Standard	V0
Buna, Screen	A0
Viton, Screen	W0
Buna, Knob	0K
Viton, Knob	VK
Buna, Knob, Screen	AK
Viton, Knob, Screen	WK

Blank

N
S
BODIES

Without Body
3/8 NPTF Ports
#8 SAE Ports

NOTE: Use screen only if flow direction is from (1) to (2).

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

Phone: (815) 397-6628

Fax: (815) 397-2526

 E-mail: delta@delta-power.com



HB-MCP 2 Way Manual Valve, Normally Closed, Push Type

DESCRIPTION

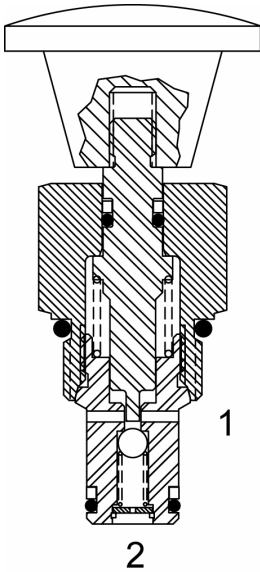
8 size, 3/4-16 thread, "Power" series, manual valve, 2 way normally closed, push type.

OPERATION

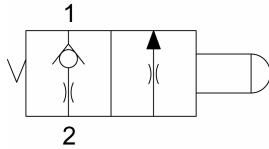
The HB-MCP blocks flow from (2) to (1) until an operator pushes the knob in allowing pressure at port #2 to drop to port #1 pressure.

FEATURES

- Hardened parts for long life.
- Industry common cavity.



HYDRAULIC SYMBOL

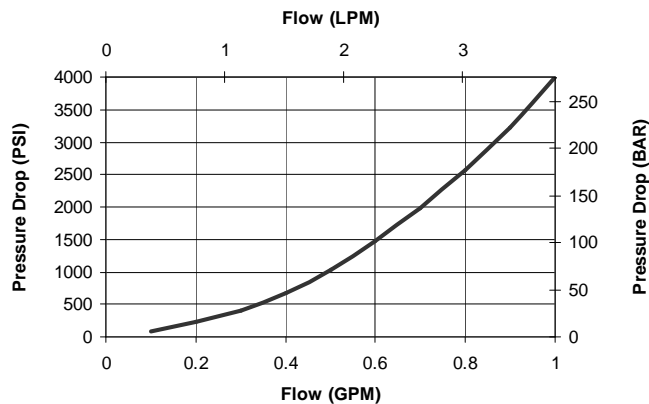


Good as a pilot dump valve.

Port #1 should be limited to < 500 PSI to allow actuation (50 lbs), Port #2 actuation load at 4000 PSI (50 lbs).

PERFORMANCE

Actual Test Data (Cartridge Only)



- Port 2 to 1

VALVE SPECIFICATIONS

Nominal Flow	1 GPM (4 LPM)
Max. Operating Pressure	4000 PSI (276 bar)
Typical Internal Leakage (150 SSU)	5 drops/min
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temperature Range	32° to 160° F (0° to 70° C)
Weight	.14 lbs. (.06 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	25 ft-lbs (34 Nm)
Cavity	POWER 2W
Cavity Form Tool (Finishing)	40500005
Seal Kit	21191100

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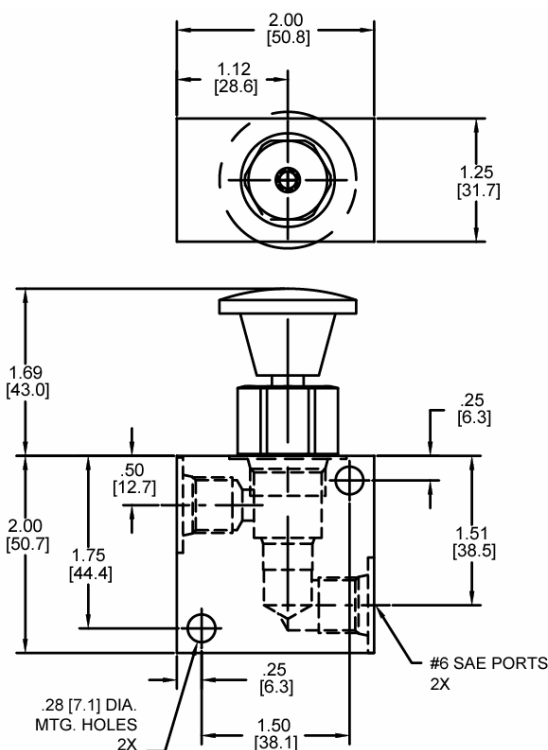
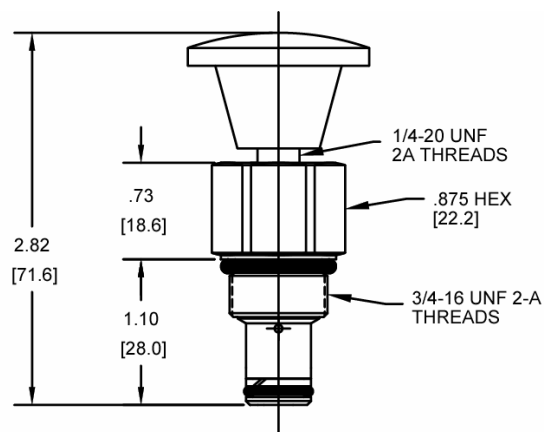
Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com



DIMENSIONS



BODY WEIGHT: .39lbs [.18kg]

ORDERING INFORMATION

HB-MCP

OPTIONS

Buna, Knob
Viton, Knob

OK
VK

Blank
N
S

BODIES

Without Body
1/4 NPTF Ports
#6 SAE Ports

Note: Aluminum NOT durability rated for 4000 PSI. Consult factory for options.

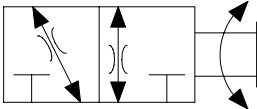
WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

Phone: (815) 397-6628

Fax: (815) 397-2526

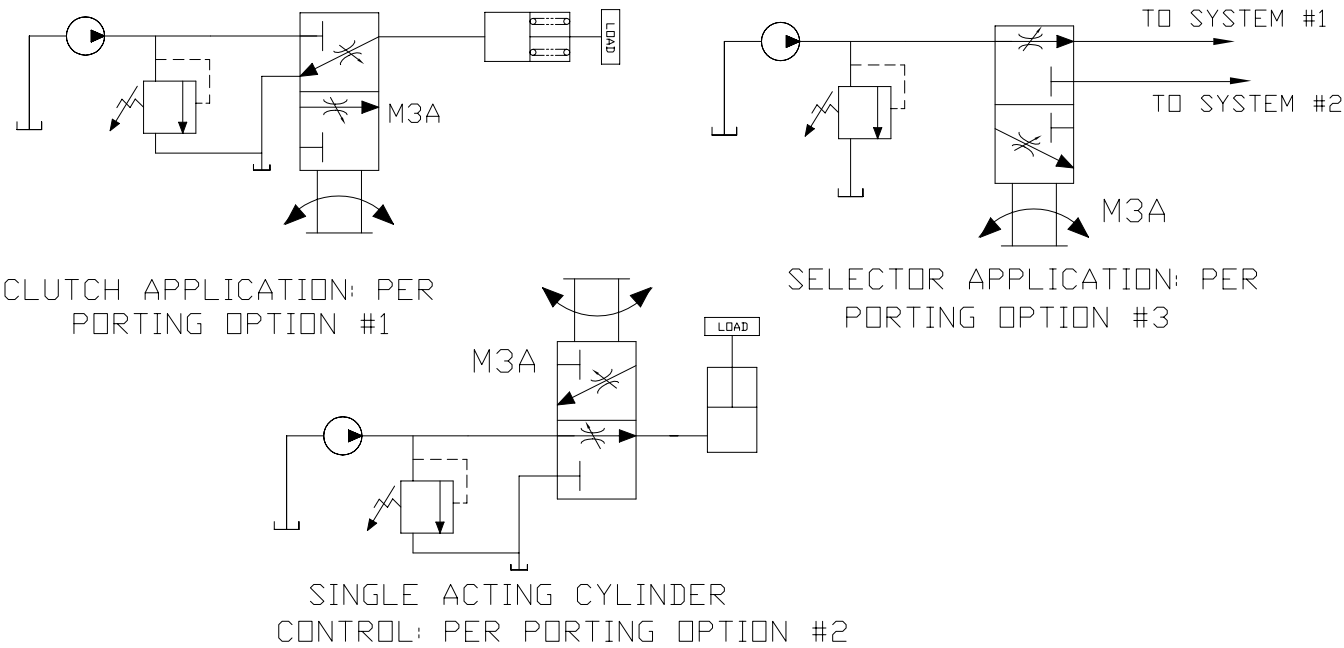
E-mail: delta@delta-power.com

3 Way 2 Position Manual Valves

	GPM	PSI	LPM	BAR	MODEL	PAGE
	12	3000	45	207	DF-M3A	304

Typical Schematic

Typical application for a M3A depends on the porting used. The M3A can be used in a clutch application with porting option #1, for a single acting cylinder control with porting option #2, and for a selector application with porting option #3.



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Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com



DF-M3A Manual Rotary Spool Valve, 3 Way 2 Position

DESCRIPTION

10 size, 7/8-14 thread, "Delta" series, 3 way 2 position, manual rotary spool valve.

OPERATION

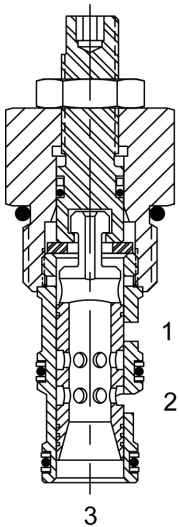
The DF-M3A when rotated fully to the clockwise position, the cartridge directs flow from (3) to (2) or (2) to (3) and blocks flow at (1).

When rotated fully to the counterclockwise position, the cartridge directs flow from (1) to (3) or (3) to (1) and blocks flow at (2).

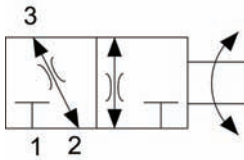
All ports are closed in transition.

FEATURES

- Hardened parts for long life.
- Industry common cavity.



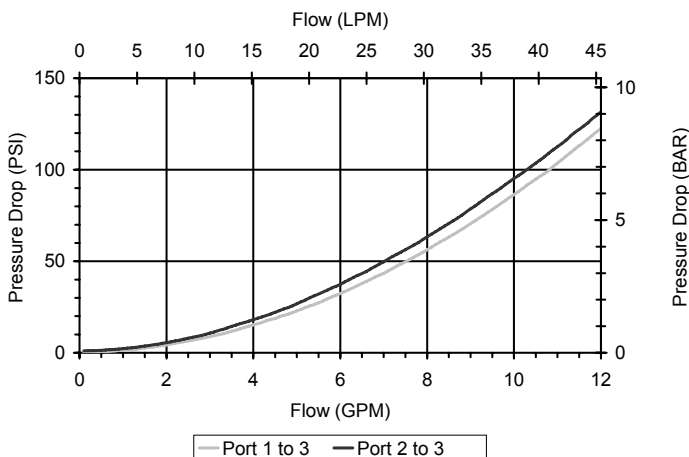
HYDRAULIC SYMBOL



May be used as metering product. Valve has approximately 3.5 turns adjustment from extreme clockwise fully to counterclockwise positions. See chart for pressure drop in both positions.

PERFORMANCE

Actual Test Data (Cartridge Only)



VALVE SPECIFICATIONS

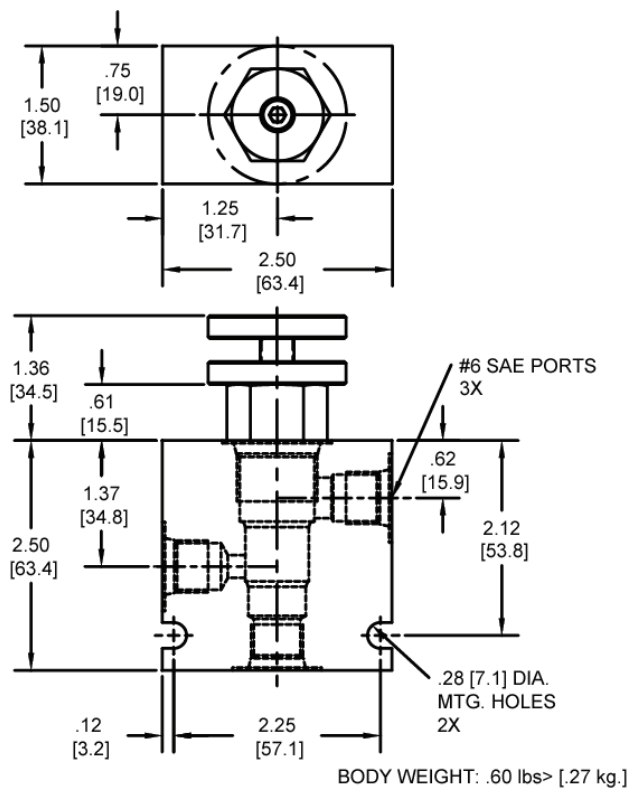
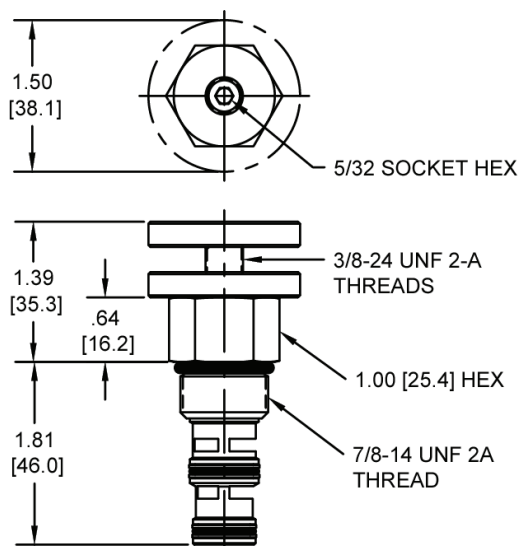
Nominal Flow	12 GPM (45 LPM)
Rated Operating Pressure	3000 PSI (207 bar)
Typical Internal Leakage (150 SSU)	5 cu in/min (82 ml/min)
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temperature Range	-40° to 250° F (-40° to 120° C)
Weight	.49 lbs. (.22 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	30 ft-lbs (40.6 Nm)
Cavity	DELTA 3W
Cavity Form Tool (Finishing)	40500001
Seal Kit	21191210

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com


DIMENSIONS

ORDERING INFORMATION
DF-M3A
OPTIONS

 Buna Standard
 Viton Standard
 Buna, Knob
 Viton Knob

00
V0
0K
VK

 Blank
N
S
BODIES

 Without Body
 1/4 NPTF Ports
 #6 SAE Ports

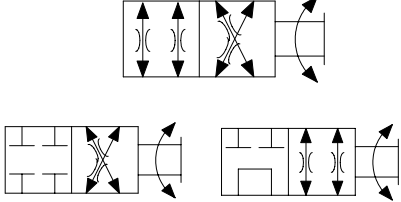
WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

Phone: (815) 397-6628

Fax: (815) 397-2526

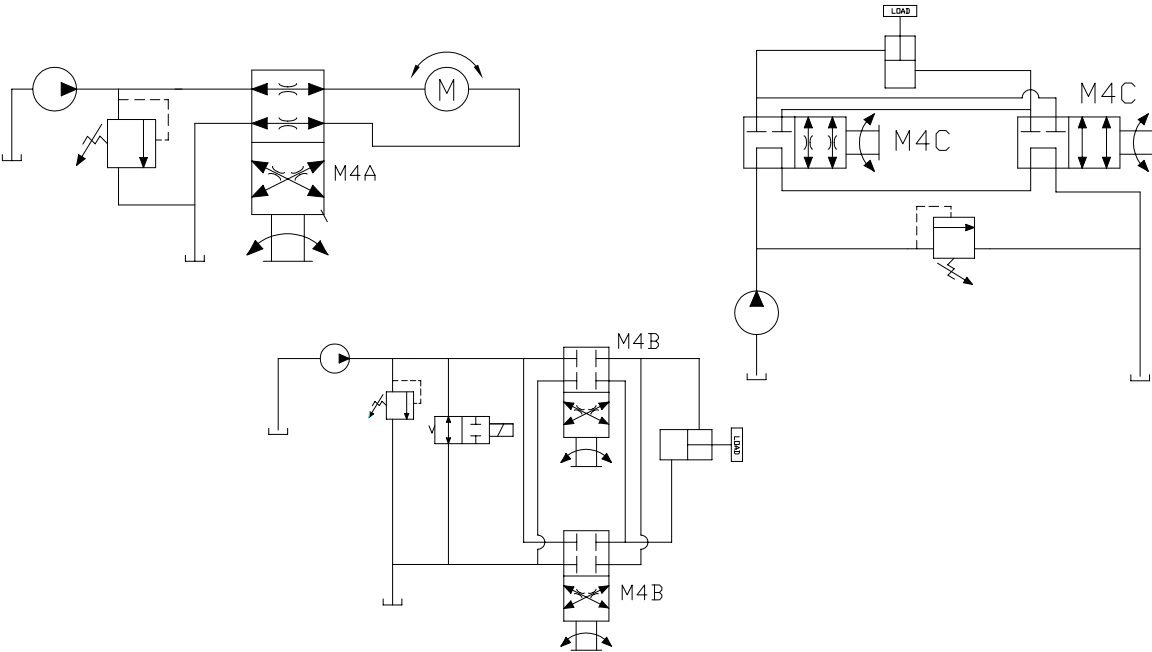
 E-mail: delta@delta-power.com

4 Way 2 Position Manual Valves

	GPM	PSI	LPM	BAR	MODEL	PAGE
	10	3000	38	207	DG-M4A	308
	15	3000	57	207	DG-M4B	310
	12	3000	45	207	DG-M4C	312

Typical Schematic

Typical application for the M4A is directional motor control.
Typical application for the M4B is directional cylinder control in a parallel circuit.
Typical application for the M4C is directional cylinder control in a series circuit.



WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

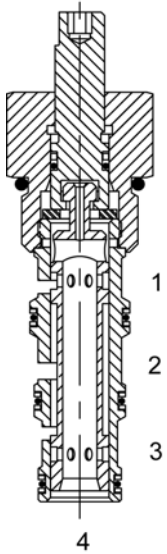
Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com



DG-M4A Manual Spool Rotary Valve, 4 Way 2 Position, Criss Cross



DESCRIPTION

10 size, 7/8-14 thread, "Delta" series, manual rotary spool valve, 4 way 2 position, criss cross

OPERATION

The DG-M4A, when rotated fully to clockwise position, the cartridge directs flow between (2) to (3) and (1) to (4).

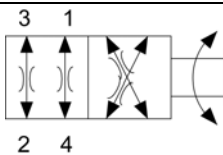
When rotated fully to counterclockwise position, the cartridge directs flow between (3) to (4) and (1) to (2).

All ports are closed in transition.

FEATURES

- Hardened parts for long life.
- Industry common cavity.

HYDRAULIC SYMBOL

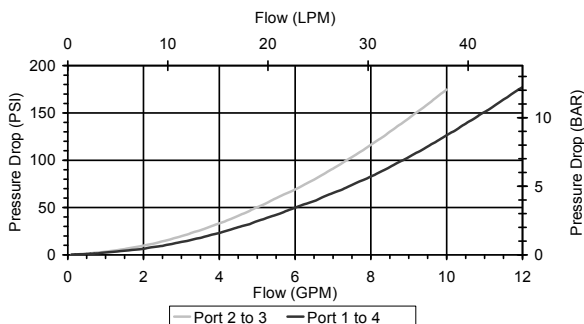
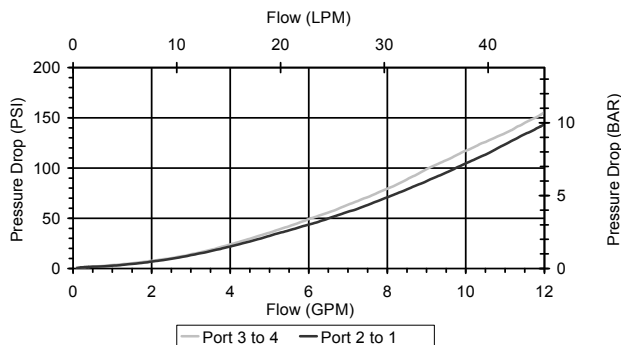


May be used as metering product. Valve has approximately 3.5 turns adjustment from extreme clockwise fully to counterclockwise positions.

See chart for pressure drop in both positions.

PERFORMANCE

Actual Test Data (Cartridge Only)



VALVE SPECIFICATIONS

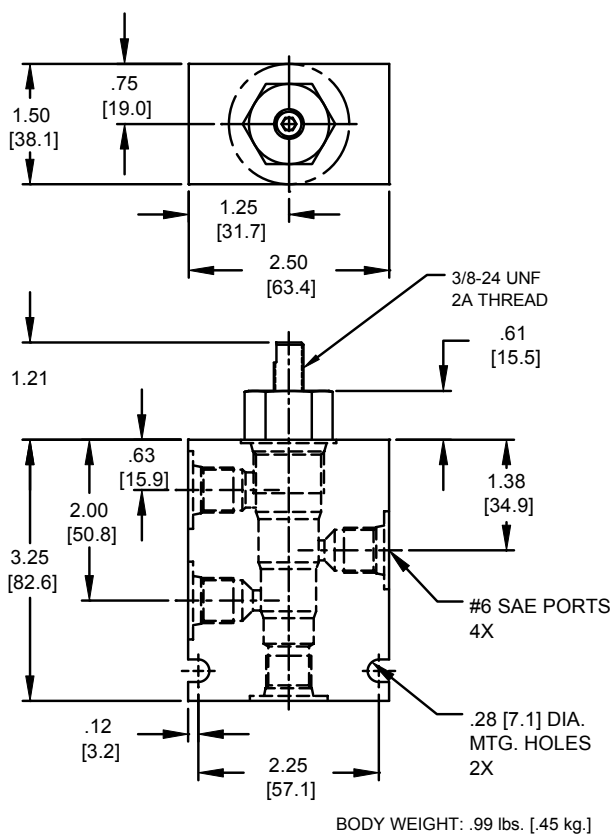
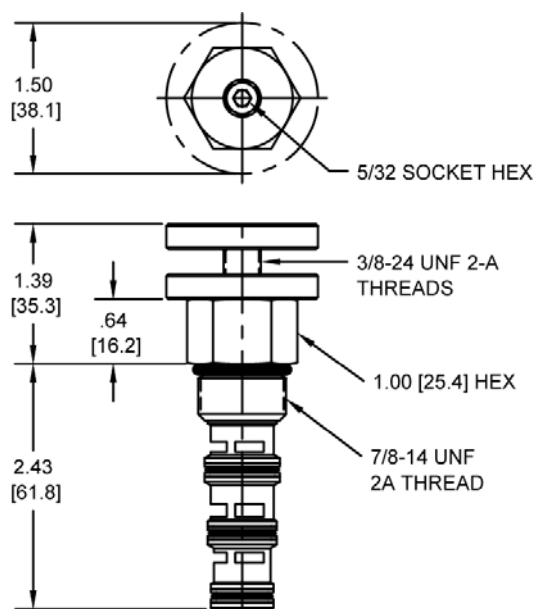
Nominal Flow	10 GPM (38 LPM)
	8 GPM (30 LPM) from (2) to (3)
Rated Operating Pressure	3000 PSI (207 bar)
Typical Internal Leakage (150 SSU)	5 cu in/min (82 ml/min) per path
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temperature Range	-40° to 250° F (-40° to 120° C)
Weight	.32 lbs. (.15 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	30 ft-lbs (40.6 Nm)
Cavity	DELTA 4W
Cavity Form Tool (Finishing)	40500002
Seal Kit	21191214

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com


DIMENSIONS

ORDERING INFORMATION
DG-M4A

OPTIONS
 Buna Standard
 Viton Standard
 Buna, Knob
 Viton Knob

00
V0
OK
VK

Blank
N
S

BODIES

Without Body
 1/4 NPTF Ports
 #6 SAE Ports

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

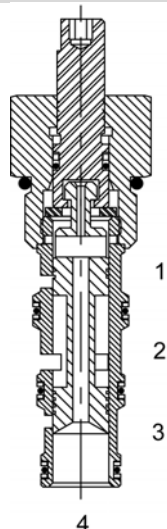
Phone: (815) 397-6628

Fax: (815) 397-2526

 E-mail: delta@delta-power.com



DG-M4B Manual Rotary Spool Valve, 4 Way 2 Position, Closed Center



DESCRIPTION

10 size, 7/8-14 thread, "Delta" series, 4 way 2 position, manual rotary spool valve, closed center.

OPERATION

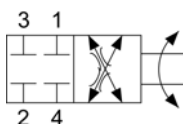
The DG-M4B when rotated fully to clockwise position, this valve blocks flow at all ports.

When rotated fully to counterclockwise position, the cartridge directs flow between (2) and (1), as well as (3) and (4).

FEATURES

- Hardened parts for long life.
- Industry common cavity.

HYDRAULIC SYMBOL

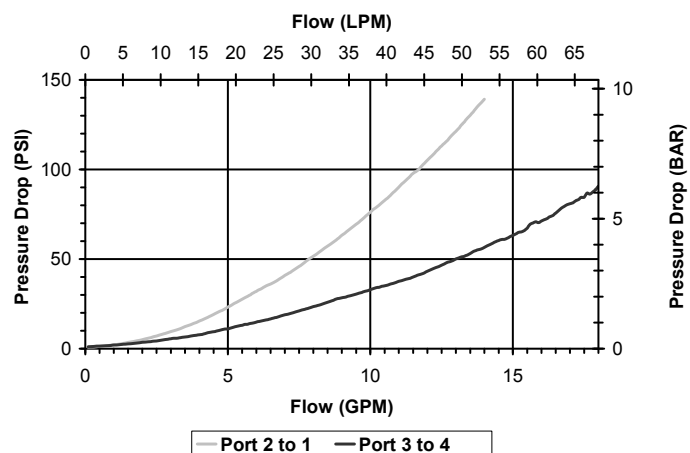


May be used as metering product. Valve has approximately 3.5 turns adjustment from extreme clockwise fully to counterclockwise positions.

See chart for pressure drop.

PERFORMANCE

Actual Test Data (Cartridge Only)



VALVE SPECIFICATIONS

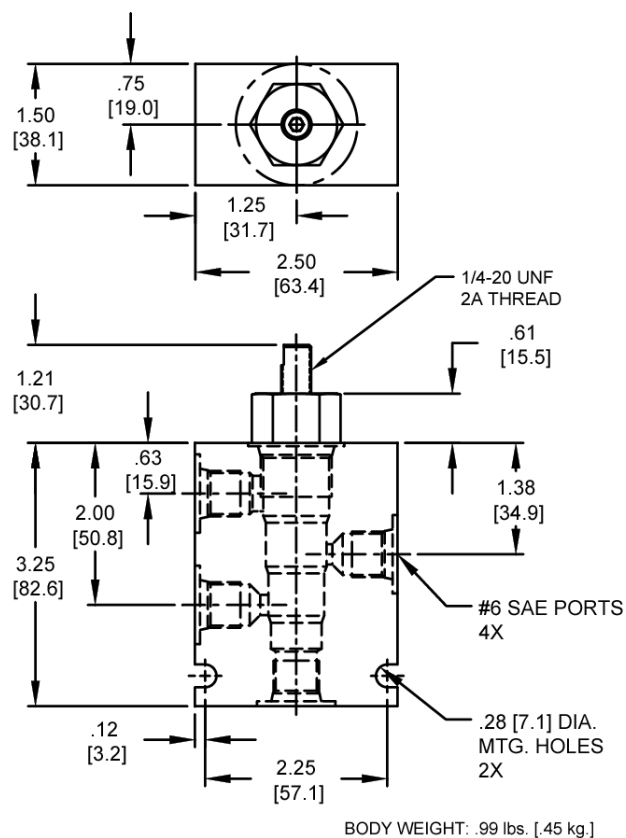
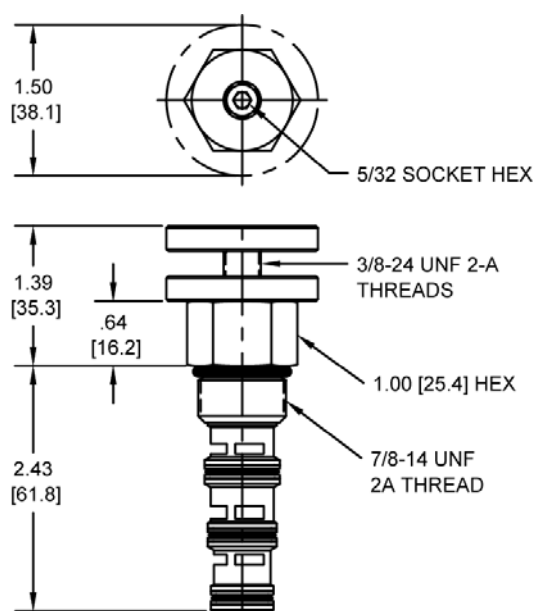
Nominal Flow	15 GPM (57 LTR/M)
Rated Operating Pressure	3000 PSI (207 bar)
Typical Internal Leakage (150 SSU)	5 cu in/min (82 ml/min) per path
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temperature Range	-40° to 250° F (-40° to 120° C)
Weight	.33 lbs (.15 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	30 ft-lbs (40.6 Nm)
Cavity	DELTA 4W
Cavity Form Tool (Finishing)	40500002
Seal Kit	21191214

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Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com


DIMENSIONS

ORDERING INFORMATION
DG-M4B

OPTIONS
 Buna Standard
 Viton Standard
 Buna, Knob
 Viton Knob

00
V0
0K
VK

Blank
N
S

BODIES

Without Body
 1/4 NPTF Ports
 #6 SAE Ports

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

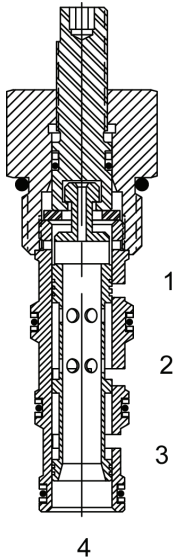
Phone: (815) 397-6628

Fax: (815) 397-2526

 E-mail: delta@delta-power.com



DG-M4C Manual Rotary Spool Valve, 4 Way 2 Position, Tandem Center



DESCRIPTION

10 size, 7/8-14 thread, "Delta" series, 4 way 2 position, manual rotary spool valve tandem center.

OPERATION

The DG-M4C when rotated fully to clockwise position, the cartridge allows flow from (2) to (4) and blocks flow at (1) and (3).

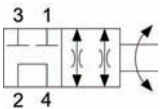
When rotated fully total counterclockwise position, the cartridge allows flow between (2) and (3) and between (1) and (4).

All ports are closed in transition.

FEATURES

- Hardened parts for long life.
- Industry common cavity.

HYDRAULIC SYMBOL

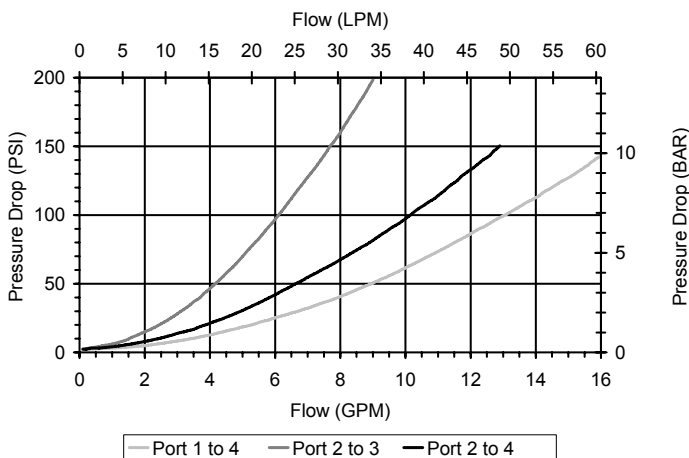


May be used as metering product. Valve has approximately 3.5 turns adjustment from extreme clockwise fully to counterclockwise positions.

See chart for fully open and fully closed pressure drop.

PERFORMANCE

Actual Test Data (Cartridge Only)



VALVE SPECIFICATIONS

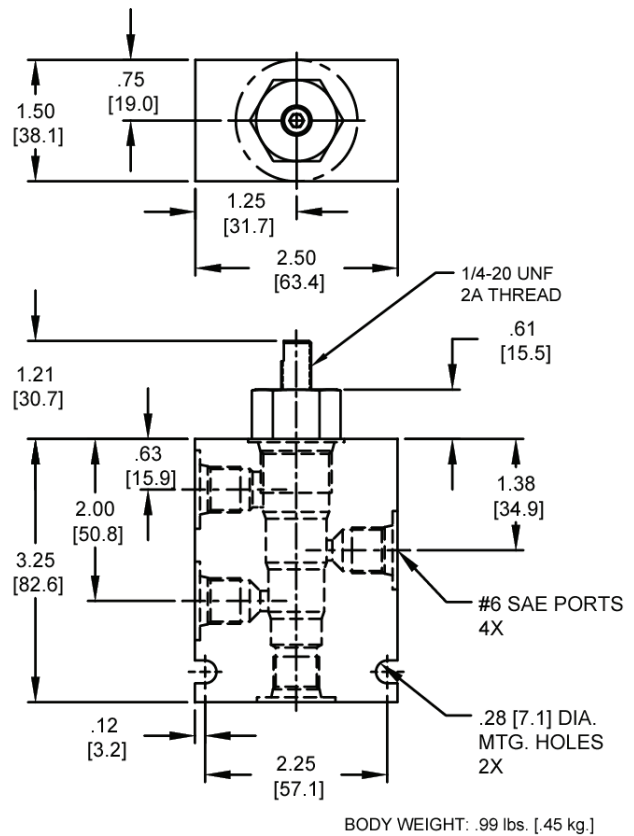
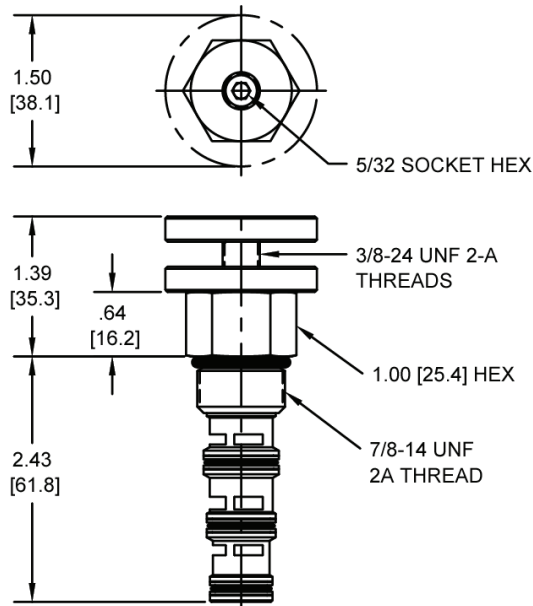
Nominal Flow	12 GPM (45 LPM)
	8 GPM (30 LPM) from (2) to (3)
Rated Operating Pressure	3000 PSI (207 bar)
Typical Internal Leakage (150 SSU)	5 cu in/min (82 ml/min) per path
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temperature Range	-40° to 250° F (-40° to 120° C)
Weight	.52 lbs. (.23 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	30 ft-lbs (40.6 Nm)
Cavity	DELTA 4W
Cavity Form Tool (Finishing)	40500002
Seal Kit	21191214

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Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com


DIMENSIONS

ORDERING INFORMATION
DG-M4C

OPTIONS
 Buna Standard
 Viton Standard
 Buna, Knob
 Viton Knob

00
V0
0K
VK

Blank
N
S

BODIES

Without Body
 1/4 NPTF Ports
 #6 SAE Ports

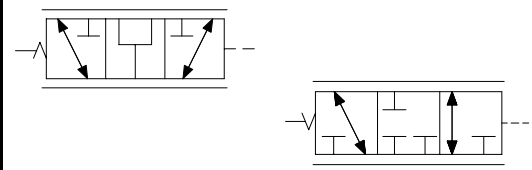
WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

Phone: (815) 397-6628

Fax: (815) 397-2526

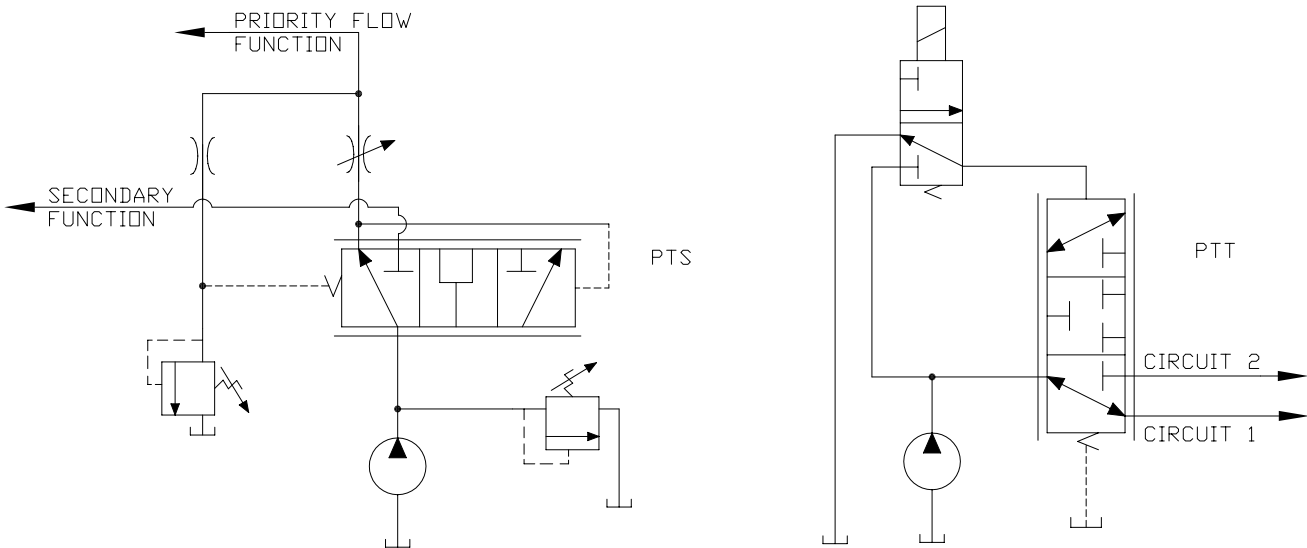
 E-mail: delta@delta-power.com

Pilot To Shift Valves

	GPM	PSI	LPM	BAR	MODEL	PAGE
	40	3500	154	241	SO-PTS	316
	40	3500	154	241	SO-PTT	318

Typical Schematic

Typical application for the PTS is a high flow priority flow control.
Typical application for the PTT is a high flow selector valve.



WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com



SO-PTS Pilot to Shift, 3 Way Valve, Open Transition

DESCRIPTION

16 size, 1 5/16 -12 thread, "Super" series, pilot to shift, 3 way valve, open transition.

OPERATION

In neutral the SO-PTS allows flow between ports (3) and (4), port (2) is blocked.

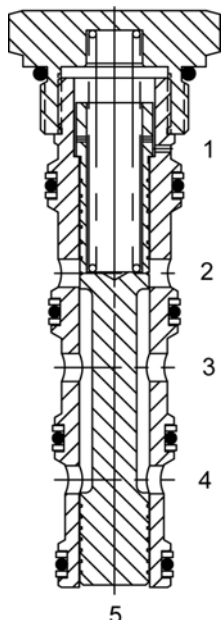
With application of a remote pilot signal at (5), the valve's spool shifts to allow flow between ports (2) and (3), while port (4) is blocked. During transition ports (2), (3), and (4) are open

The spring chamber is vented to the tank through port (1). The vented spring chamber allows the valve to be fully pressurized at ports (2), (3), and (4) without affecting required pilot pressure.

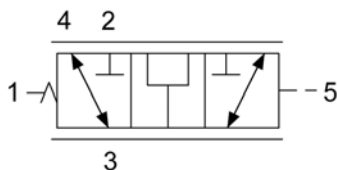
Pressure at (1) will affect required pilot pressure.

FEATURES

- Hardened parts for long life.
- Industry common cavity.



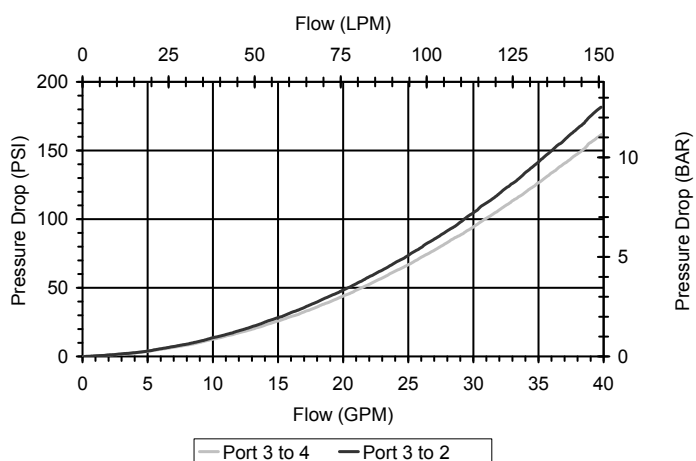
HYDRAULIC SYMBOL



A rate limiting orifice less than .060" diameter is recommended at port 5.

PERFORMANCE

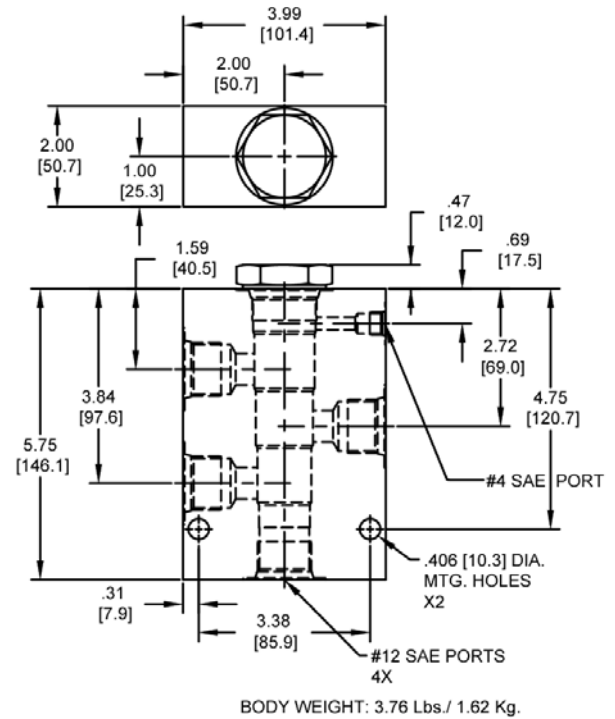
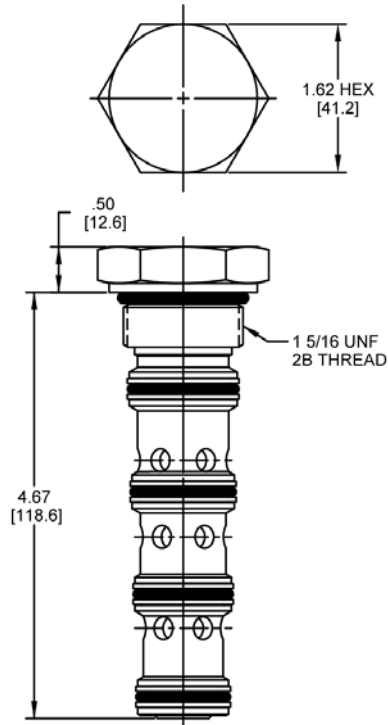
Actual Test Data (Cartridge Only)



VALVE SPECIFICATIONS

Nominal Flow	40 GPM (151 LTR/M)
Rated Operating Pressure	3500 PSI (241 bar)
Typical Internal Leakage (150 SSU)	10 cu in/min (164 ml/min)
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temperature Range	-40° to 250° F (-40° to 120° C)
Weight	1.11 lbs. (.50 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	90 ft-lbs (122 Nm)
Cavity	SUPER 5W SHORT
Cavity Form Tool (Finishing)	40500020
Seal Kit	21191410

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.


DIMENSIONS

ORDERING INFORMATION
SO-PTS

OPTIONS
 Buna Standard
 Viton Standard

00
V0

Blank
S

BODIES
 Without Body
 #12 SAE Ports

SPRING BIAS

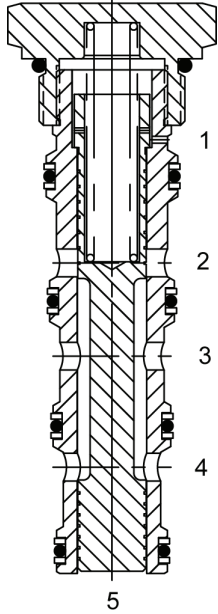
70 PSI
 150 PSI
 ± 10%

0070
0150

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.



SO-PTT Pilot to Shift, 3 Way Valve, Closed Transition



DESCRIPTION

16 size, 1 5/16 -12 thread, "Super" series, pilot to shift, 3 way valve, closed transition.

OPERATION

In neutral the SO-PTT allows flow between ports (3) and (4), port (2) is blocked.

With application of a remote pilot signal at (5), the valve's spool shifts to allow flow between ports (2) and (3), while port (4) is blocked. During transition all ports are closed.

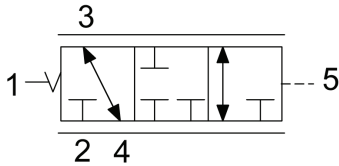
The spring chamber is vented to the tank through port (1). The vented spring chamber allows the valve to be fully pressurized at ports (2), (3), and (4) without affecting required pilot pressure.

Pressure at (1) will affect required pilot pressure.

FEATURES

- Hardened parts for long life.
- Industry common cavity.

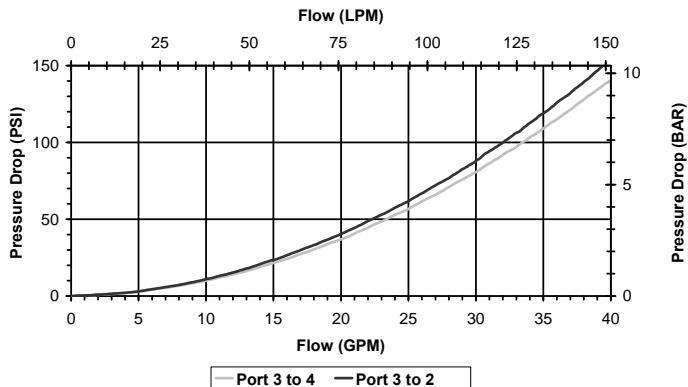
HYDRAULIC SYMBOL



A rate limiting orifice less than .060" diameter is recommended at port 5.

PERFORMANCE

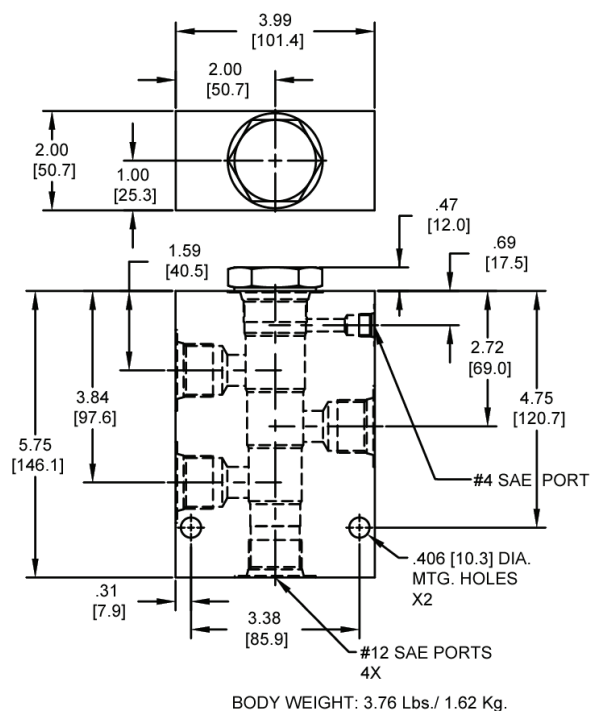
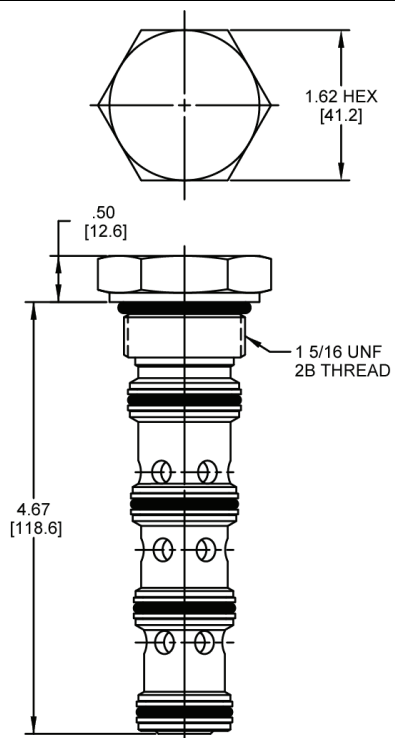
Actual Test Data (Cartridge Only)



VALVE SPECIFICATIONS

Nominal Flow	40 GPM (151 LTR/M)
Rated Operating Pressure	3500 PSI (241 bar)
Typical Internal Leakage (150 SSU)	10 cu in/min (164 ml/min)
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temperature Range	-40° to 250° F (-40° to 120° C)
Weight	1.08 lbs. (.49 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	90 ft-lbs (122 Nm)
Cavity	SUPER 5W SHORT
Cavity Form Tool (Finishing)	40500020
Seal Kit	21191410

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.


DIMENSIONS

ORDERING INFORMATION
SO-PTT
OPTIONS
 Buna Standard
 Viton Standard

00
V0

 Blank
S
BODIES


 Without Body
 #12 SAE Ports

SPRING BIAS
0070
0150

 70 PSI
 150 PSI
 ± 10%

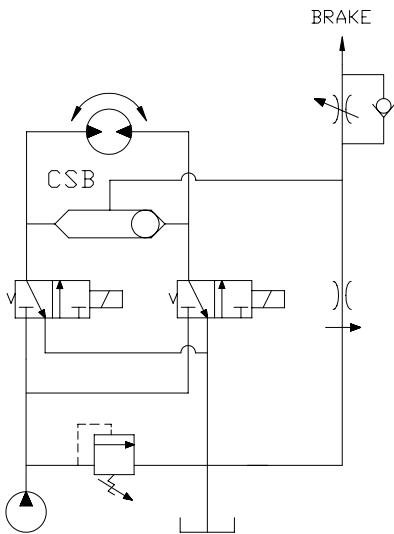
WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

Shuttle Valves

	GPM	PSI	LPM	BAR	MODEL	PAGE
	6	3500	23	241	PP-CSB	322
	8	3500	30	241	DF-CSB	324

Typical Schematic

Typical application for the CSB is load sense in a motor circuit with a spring loaded brake.



WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com

**PP-CSB Shuttle Valve****DESCRIPTION**

8 size, 3/4-16 thread, "Power" series, shuttle valve.

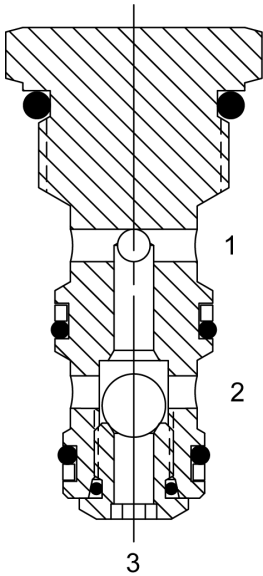
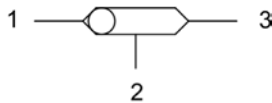
OPERATION

The PP-CSB allows flow from the higher pressure of (1) or (3) to (2).

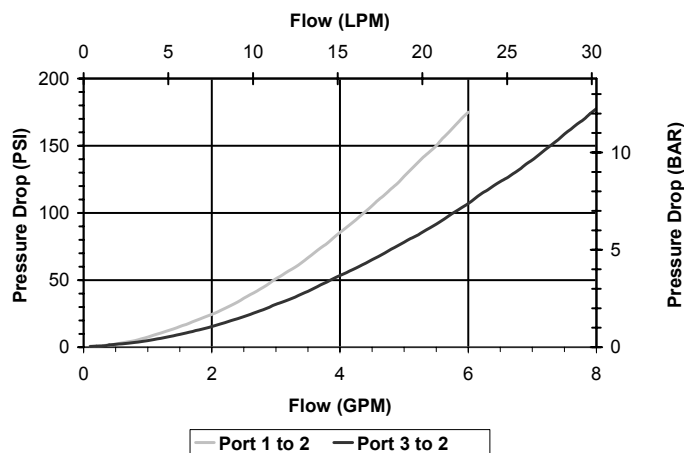
The valve is commonly used as a load sense to direct oil from the pressure side of a bidirectional hydraulic motor to a pressure released hydraulic brake.

FEATURES

- Hardened parts for long life.
- Industry common cavity.

**HYDRAULIC SYMBOL****PERFORMANCE**

Actual Test Data (Cartridge Only)

**VALVE SPECIFICATIONS**

Nominal Flow	6 GPM (23 LTR/M)
Rated Operating Pressure	3500 PSI (241 bar)
Typical Internal Leakage (150 SSU)	1 cu in/min (16 ml/min)
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temperature Range	-40° to 250° F (-40° to 120° C)
Weight	.16 lbs. (.07 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	25 ft-lbs (34 Nm)
Cavity	POWER 3W
Cavity Form Tool (Finishing)	40500024
Seal Kit	21191104

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

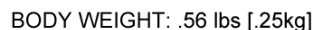
Technical drawing of the 1/2" NPT x 1/2" NPT 304 Stainless Steel Tee Fitting. The drawing shows a top view and a side view. The top view is a hexagon with a central crosshair. The side view shows the fitting's profile with a hexagonal nut on top. Dimensions are provided in inches and millimeters.

Top View Dimensions:

- Hexagon size: .88 HEX [22.4]

Side View Dimensions:

- Top flange thickness: .25 [6.4]
- Overall height: 1.69 [43.1]
- Thread specification: 3/4-16 UNF 2A THREAD



PP-CSB		Blank	
Options		Options	
Buna Standard	00	Buna Standard	N
Viton Standard	V0	Viton Standard	S

Buna Standard
Viton Standard

00
VO

Blank
N
S

Without Body
1/4 NPTF Ports
#6 SAE Ports

E-mail: delta@delta-power.com

**DF-CSB Shuttle Valve****DESCRIPTION**

10 size, 7/8-14 thread, "Delta" series, shuttle valve.

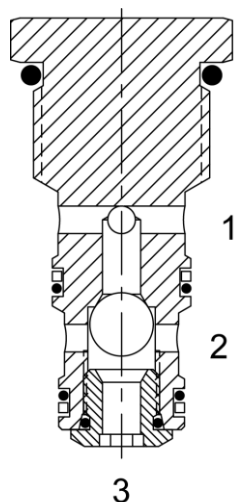
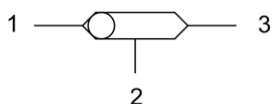
OPERATION

The DF-CSB allows flow from the higher pressure of (1) or (3) to (2).

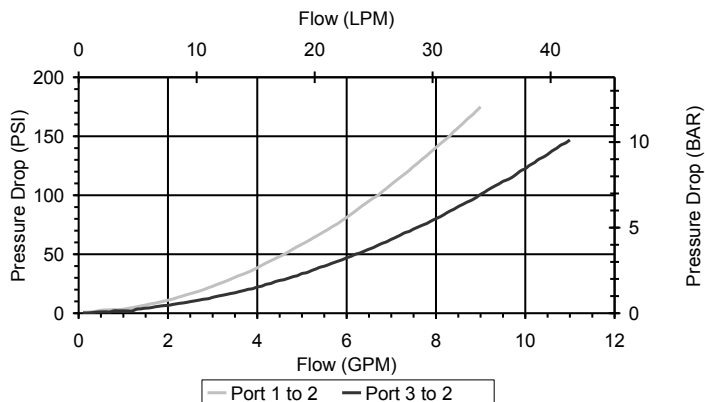
The valve is commonly used as a load sense to direct oil from the pressure side of a bidirectional hydraulic motor to a pressure-released hydraulic brake.

FEATURES

- Hardened parts for long life.
- Industry common cavity.

**HYDRAULIC SYMBOL****PERFORMANCE**

Actual Test Data (Cartridge Only)

**VALVE SPECIFICATIONS**

Nominal Flow	8 GPM (30 LPM)
Rated Operating Pressure	3500 PSI (241 bar)
Typical Internal Leakage (150 SSU)	1 cu in/min (16 ml/min)
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temperature Range	-40° to 250° F (-40° to 120° C)
Weight	.22 lbs. (.10 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	30 ft-lbs (40.6 Nm)
Cavity	DELTA 3W
Cavity Form Tool (Finishing)	40500001
Seal Kit	21191206

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

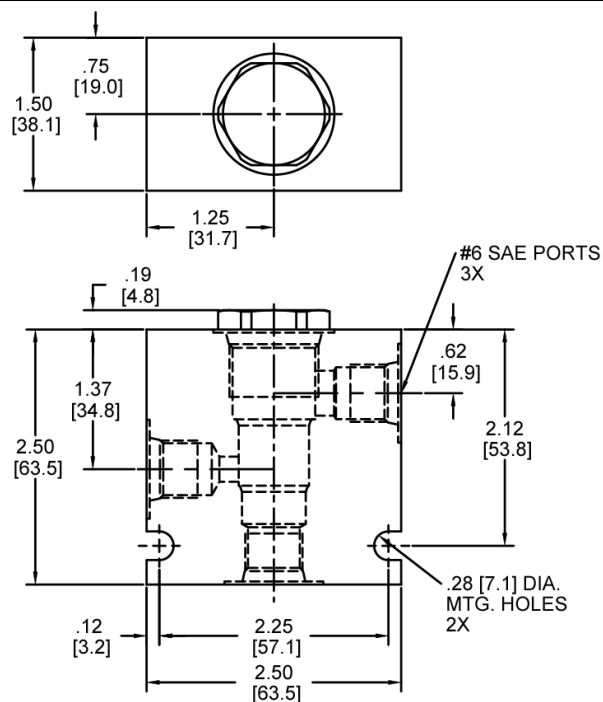
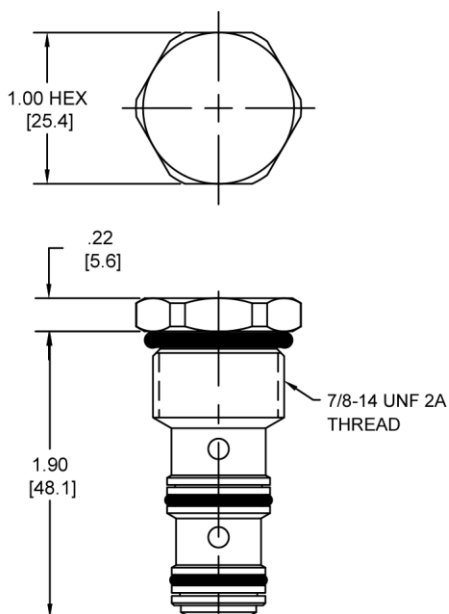
Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com



DIMENSIONS



BODY WEIGHT: .76 lbs. [.35 kg.]

ORDERING INFORMATION

DF-CSB -

OPTIONSBuna Standard
Viton Standard00
V0Blank
N
S**BODIES**Without Body
1/4 NPTF Ports
#6 SAE Ports

Blank

Leave this box blank

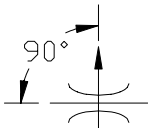
WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

Phone: (815) 397-6628

Fax: (815) 397-2526

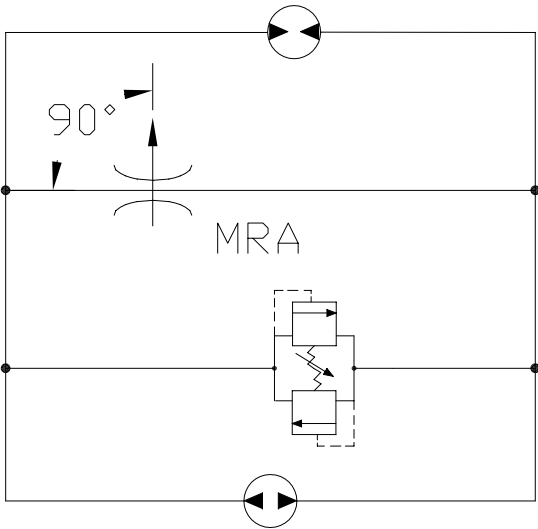
E-mail: delta@delta-power.com

Rotary Valves

	GPM	PSI	LPM	BAR	MODEL	PAGE
	40	3000	151	207	SJ-MRA	328

Typical Schematic

Typical application for the MRA is a emergency by-pass flow in a closed loop system.



WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

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E-mail: delta@delta-power.com



SJ-MRA Manual Rotary Spool Valve, 2 Way

DESCRIPTION

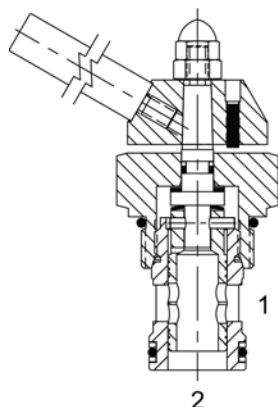
16 size, 1 5/16-12, "Super" series, manual rotary spool valve.

OPERATION

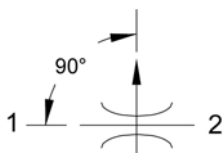
The SJ-MRA regulates flow from (1) to (2) or (2) to (1). Counter-clockwise Rotation of 90° adjusts valve from fully closed to fully open.

FEATURES

- Hardened parts for long life.
- Industry common cavity.

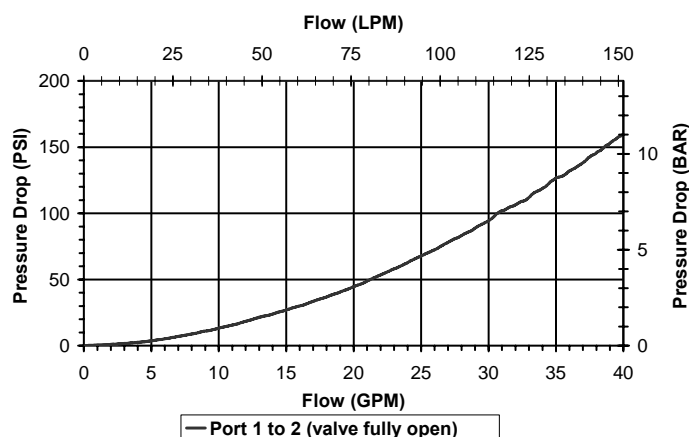


HYDRAULIC SYMBOL



PERFORMANCE

Actual Test Data (Cartridge Only)



VALVE SPECIFICATIONS

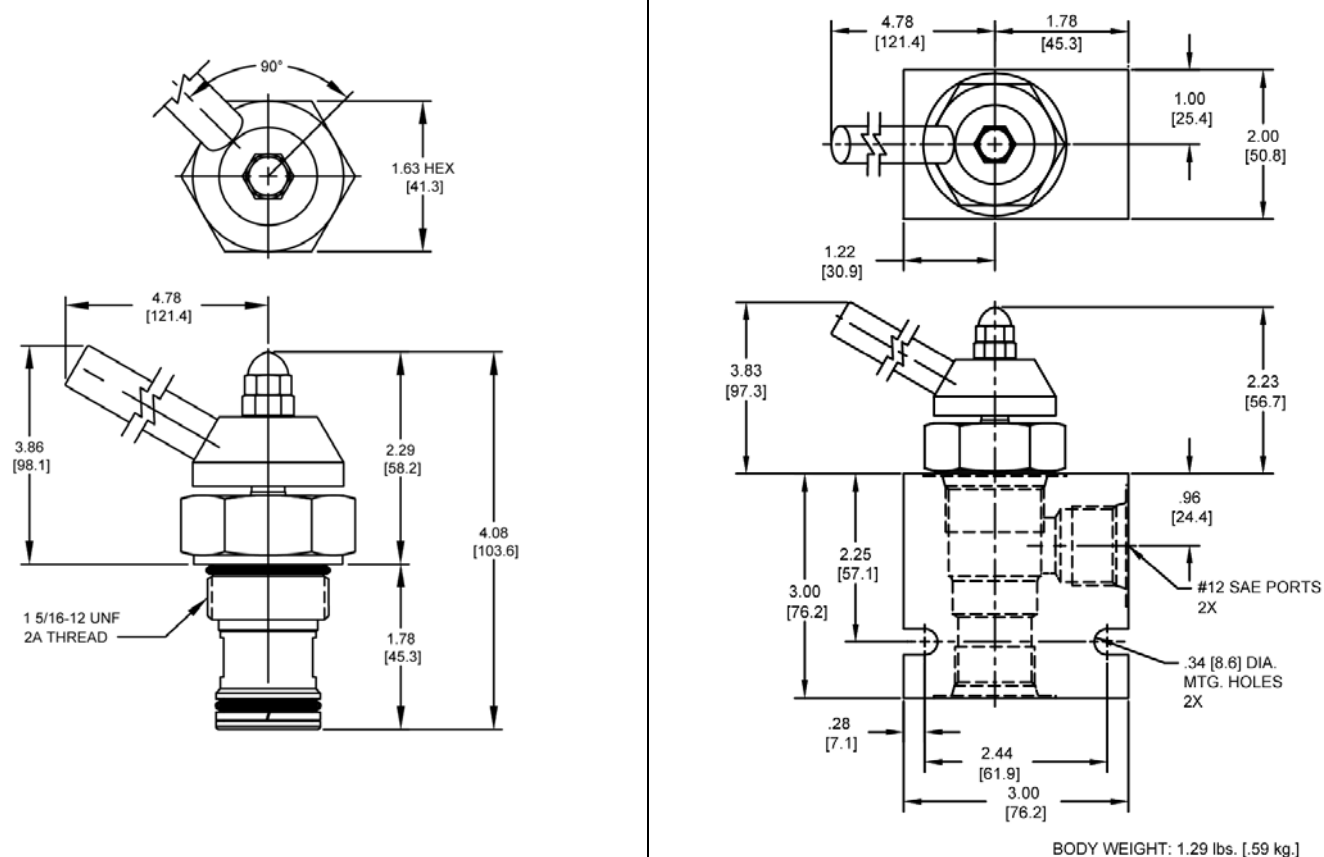
Nominal Flow	40 GPM (151 LPM)
Rated Operating Pressure	3000 PSI (207 bar)
Typical Internal Leakage (150 SSU)	15 cu in/min (246 ml/min)
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temperature Range	-40° to 250° F (-40° to 120° C)
Weight	1.13 lbs. (.51 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	90 ft-lbs (122 Nm)
Cavity	SUPER 2W
Cavity Form Tool (Finishing)	40500017
Seal Kit	21191402

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com


DIMENSIONS

ORDERING INFORMATION

SJ-MRA - - -			
OPTIONS			BODIES
Buna Standard	00	Blank	Without Body
Viton Standard	V0	N	3/4 NPTF Ports
		S	#12 SAE Ports

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Fax: (815) 397-2526

 E-mail: delta@delta-power.com



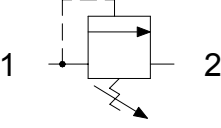
SECTION/Description	Pages
Direct Acting and Differential Area Relief Valves	333
Pilot Operated Relief Valves	359
Crossover Relief Valves	375
Pressure Compensated Regulator Valves	381
Pressure Reducing/Relieving Valves	405
Sequence Valves	413
Shut Down Valves	437
Unloading Valves	441

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

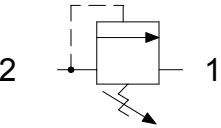


Direct Acting and Differential Area Relief Valves

Direct Acting Relief Valves

	GPM	PSI	LPM	BAR	MODEL	PAGE
	12	3500	45	241	DE-RCA	334
	5	3000	19	207	MA-RVA	336
	6	3500	23	241	PB-RVA	338
	8	4000	30	276	DE-RVA	340
	6	3500	23	241	PB-RWA	342
	8	4000	30	276	DE-RWA	344

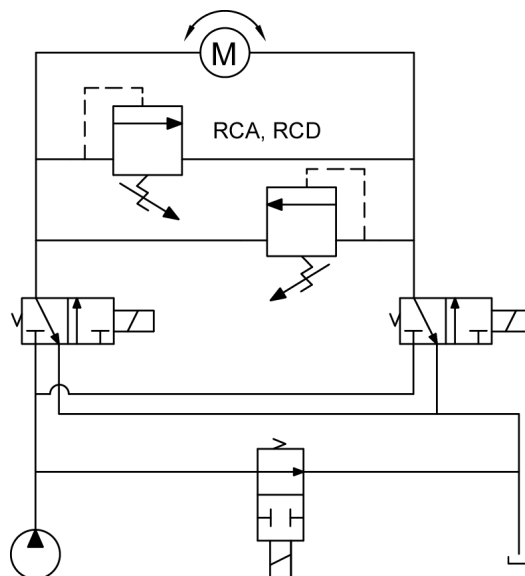
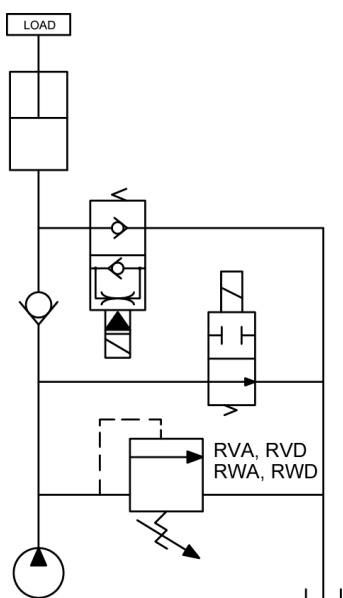
Differential Area Relief Valves

	GPM	PSI	LPM	BAR	MODEL	PAGE
	15	3500	57	241	DE-RCD	346
	8	3500	30	241	PB-RVD	348
	15	4000	57	276	DE-RVD	350
	40	5000	151	345	HE-RVD	352
	8	3500	30	241	PB-RWD	354
	15	4000	57	276	DE-RWD	356

Typical Schematic

Typical application for the RVA, RVD, RWA, RWD is to protect pump and system.

Typical application for the RCA and RCD is cross over relief to protect motor in both directions, where lowest possible price is desired.



WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

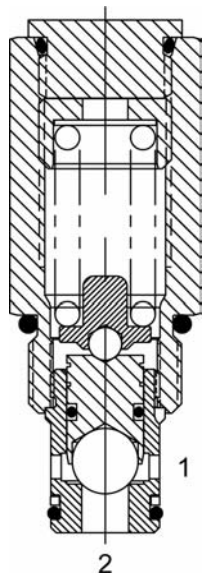
Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com



DE-RCA Guided Ball, Direct Acting Relief Valve



DESCRIPTION

10 size, 7/8-14 thread, "Delta" series, direct acting relief valve.

OPERATION

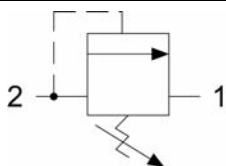
The DE-RCA blocks flow from (2) to (1) until sufficient pressure is present at (2) to force the poppet to open and allow metered flow from (2) to (1).

The cartridge offers smooth transition in response to load changes in common hydraulic circuits.

FEATURES

- Hardened parts for long life.
- Industry common cavity.

HYDRAULIC SYMBOL



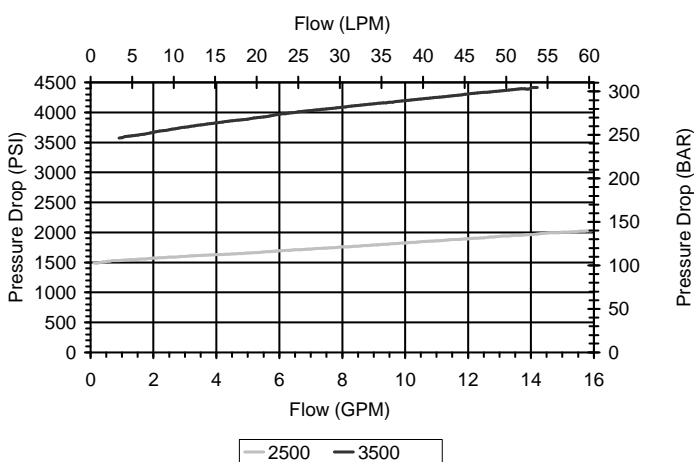
Installation Space Saving Product.

Cannot be field adjusted.

Not recommended for crossover relief valve applications, use DE-RWA

PERFORMANCE

Actual Test Data (Cartridge Only)



VALVE SPECIFICATIONS

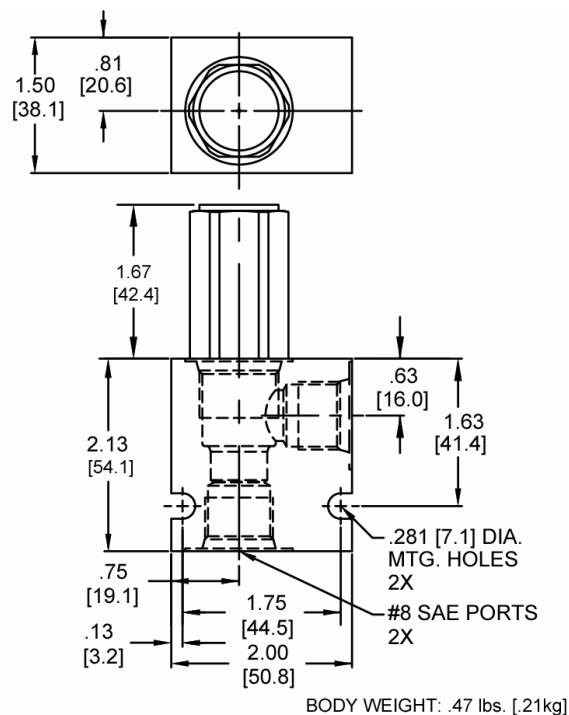
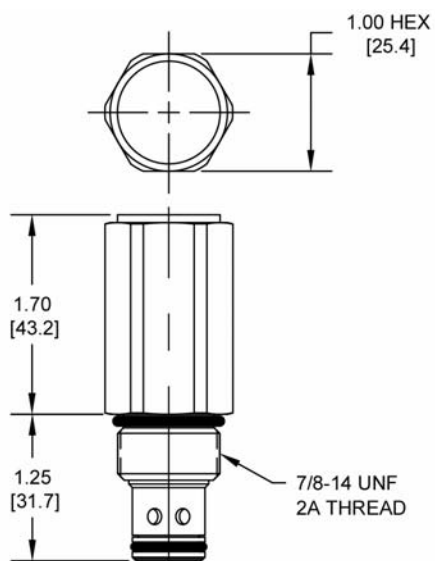
Nominal Flow	12 GPM (45 LPM)
Rated Operating Pressure	3500 PSI (241 bar)
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temperature Range	-40° to 250° F (-40° to 120° C)
Weight	.38 lbs. (.17 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	30 ft-lbs (40.6 Nm)
Cavity	DELTA 2W
Cavity Form Tool (Finishing)	40500000
Seal Kit	21191200

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Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com

**DIMENSIONS****ORDERING INFORMATION****DE-RCA**

OPTIONS
Buna Standard
Viton Standard

00
V0

Blank
N
S

BODIES

Without Body
3/8 NPTF Ports
#8 SAE Ports

PRESSURE RANGE/SETTING

2500
3500

100 – 2500 PSI
250 – 3500 PSI

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

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Fax: (815) 397-2526

E-mail: delta@delta-power.com



MA-RVA Direct Acting Relief Valve

DESCRIPTION

7 size, 5/8-18 thread, "Mini" series, direct acting relief valve.

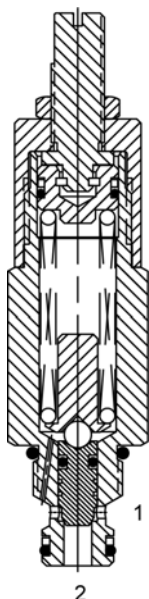
OPERATION

The MA-RVA blocks flow from (2) to (1) until sufficient pressure is present at (2) to force the poppet to open and allow metered flow from (2) to (1)

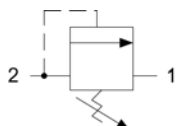
The cartridge offers smooth transition in response to load changes in common hydraulic circuits.

FEATURES

- Hardened parts for long life.
- Industry common cavity.

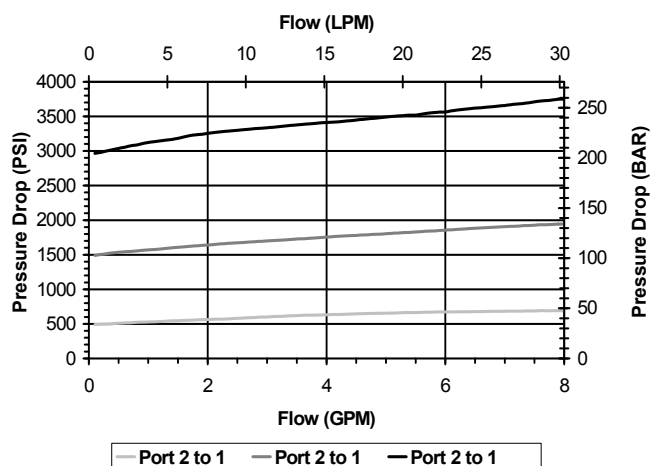


HYDRAULIC SYMBOL



PERFORMANCE

Actual Test Data (Cartridge Only)



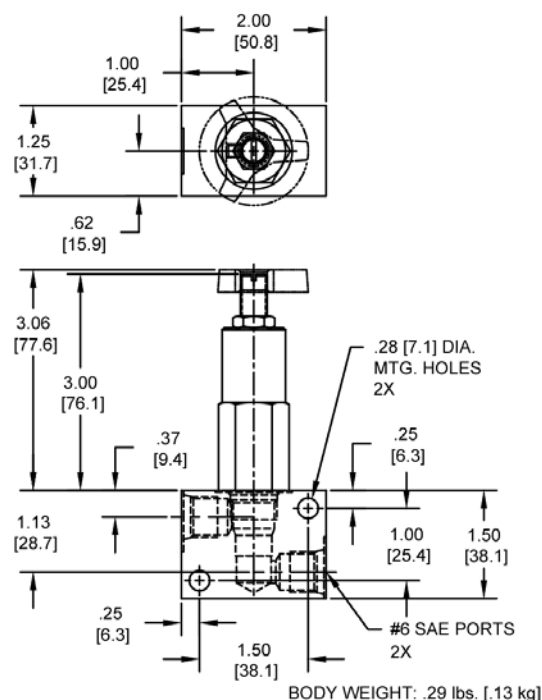
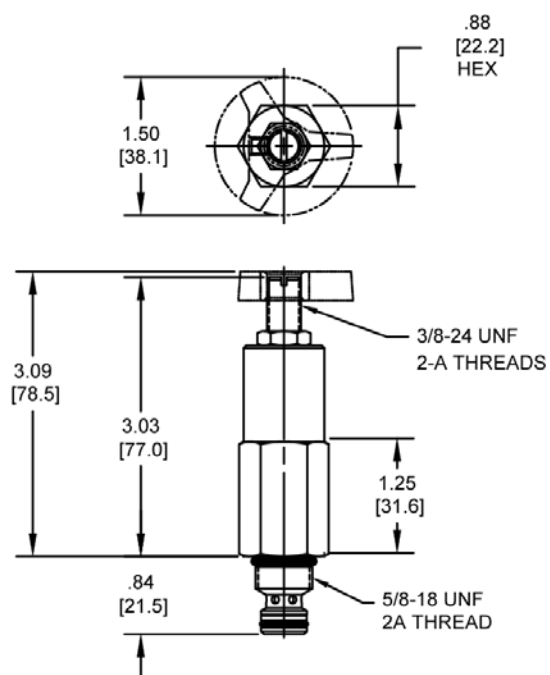
VALVE SPECIFICATIONS

Nominal Flow	5 GPM (19 LPM)
Rated Operating Pressure	3000 PSI (207 bar)
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temperature Range	-40° to 250° F (-40° to 120° C)
Weight	.39 lbs. (.17kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	15 ft-lbs (20.3 Nm)
Cavity	MINI 2W
Cavity Form Tool (Finishing)	40500003
Seal Kit	21191000

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.



DIMENSIONS



ORDERING INFORMATION

MA-RVA		- - -		- - -	
OPTIONS				BODIES	
Buna Standard	00			Blank	Without Body
Viton Standard	V0			N	1/4 NPTF Ports
Buna, Knob	0K			S	#6 SAE Ports
Viton, Knob	VK				
				PRESSURE RANGE	
		0500		100-500 PSI	
		1500		500-1500 PSI	
		3000		1500-3000 PSI	

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

**PB-RVA Direct Acting Relief Valve****DESCRIPTION**

8 size, 3/4-16 thread, "Power" series, direct acting relief valve.

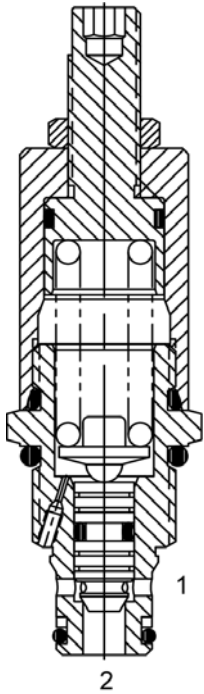
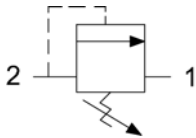
OPERATION

The PB-RVA blocks flow from (2) to (1) until sufficient pressure is present at (2) to force the poppet to open and allow metered flow from (2) to (1)

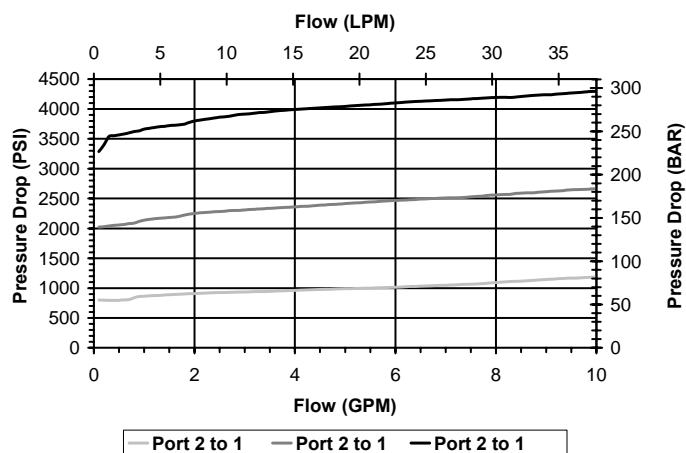
The cartridge offers smooth transition in response to load changes in common hydraulic circuits.

FEATURES

- Hardened parts for long life.
- Industry common cavity.

**HYDRAULIC SYMBOL****PERFORMANCE**

Actual Test Data (Cartridge Only)

**VALVE SPECIFICATIONS**

Nominal Flow	6 GPM (23 LPM)
Rated Operating Pressure	3500 PSI (241 bar)
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temperature Range	-40° to 250° F (-40° to 120° C)
Weight	.30 lbs. (.14 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	25 ft-lbs (34 Nm)
Cavity	POWER 2W
Cavity Form Tool (Finishing)	40500005
Seal Kit	21191100

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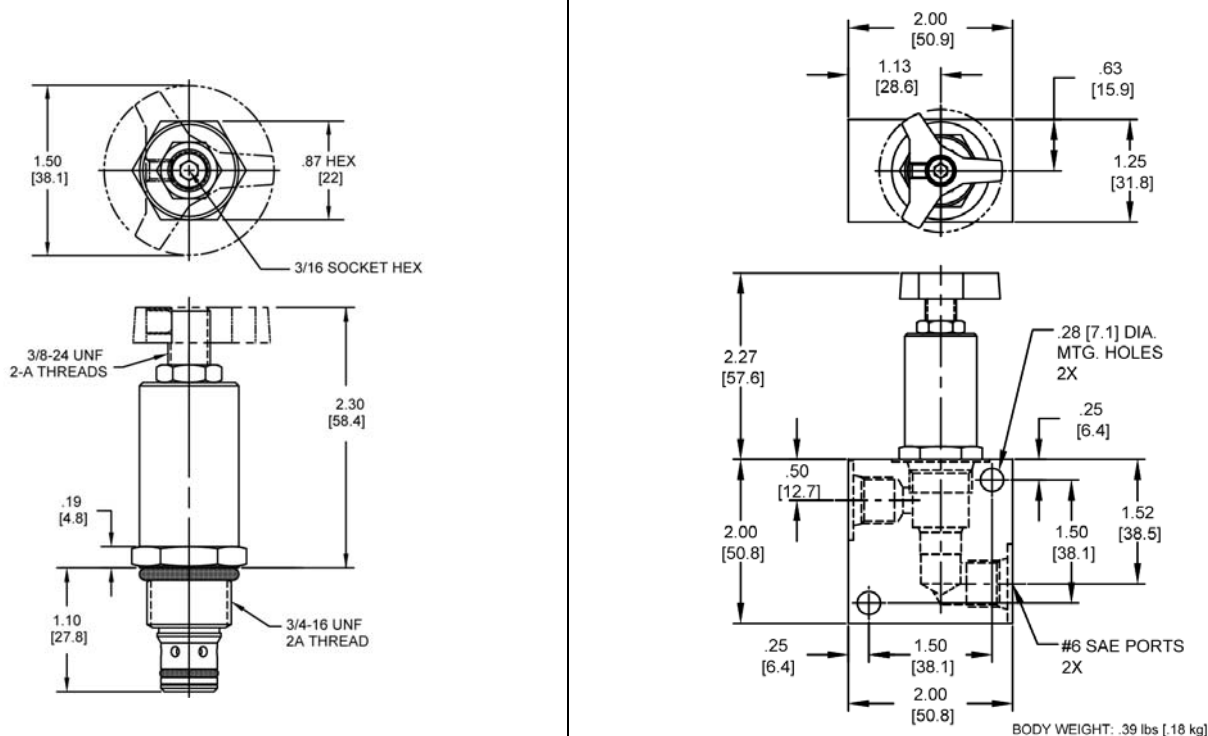
Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com



DIMENSIONS



ORDERING INFORMATION

PB-RVA - - -		
<u>OPTIONS</u>		<u>BODIES</u>
Buna Standard	00	Blank Without Body
Viton Standard	V0	N 1/4 NPTF Ports
Buna, Knob	0K	S #6 SAE Ports
Viton, Knob	VK	
		<u>PRESSURE RANGE/SETTING</u>
	0800	100 - 800 PSI
	2000	800 - 2000 PSI
	3500	2000 - 3500 PSI

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com



DE-RVA Direct Acting Relief Valve

DESCRIPTION

10 size, 7/8-14 thread, "Delta" series, direct acting relief valve.

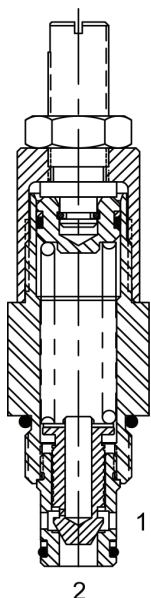
OPERATION

The DE-RVA blocks flow from (2) to (1) until sufficient pressure is present at (2) to force the poppet to open and allow metered flow from (2) to (1)

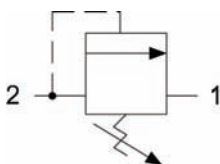
The cartridge offers smooth transition in response to load changes in common hydraulic circuits.

FEATURES

- Hardened parts for long life.
- Industry common cavity.

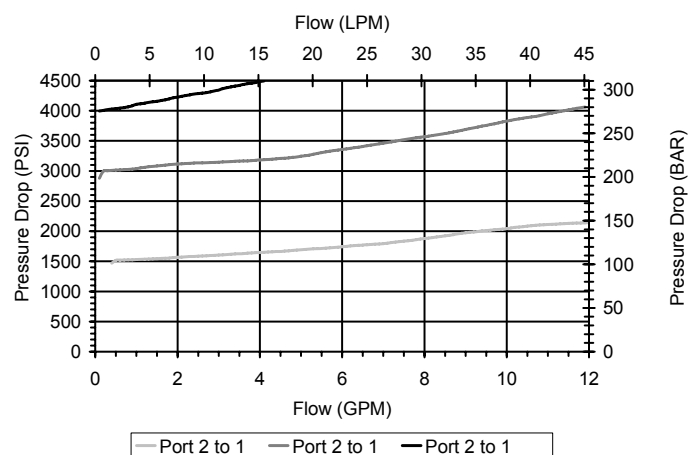


HYDRAULIC SYMBOL



PERFORMANCE

Actual Test Data (Cartridge Only)



VALVE SPECIFICATIONS

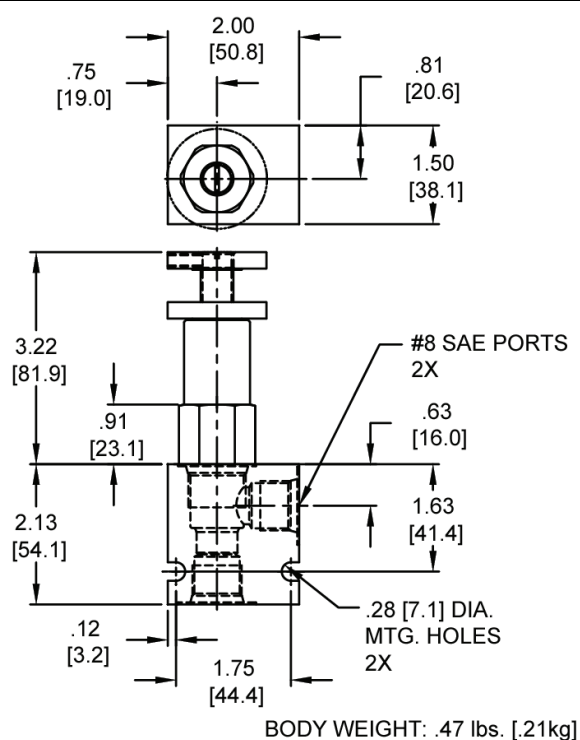
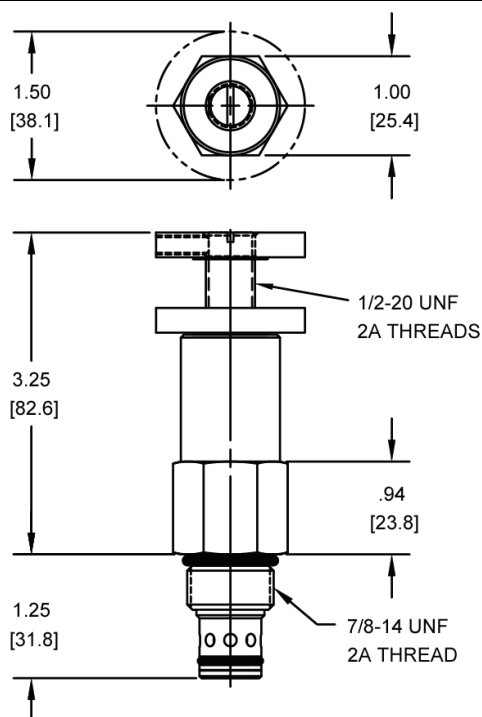
Nominal Flow	4 GPM (15.6 LPM) 4000 PSI 8 GPM (30 LPM) 3000 PSI
Rated Operating Pressure	4000 PSI (276 bar)
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temperature Range	-40° to 250° F (-40° to 120° C)
Weight	.56 lbs. (.25 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	30 ft-lbs (40.6 Nm)
Cavity	DELTA 2W
Cavity Form Tool (Finishing)	40500000
Seal Kit	21191200

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Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com


DIMENSIONS

ORDERING INFORMATION
DE-RVA
OPTIONS

Buna Standard **00**
 Viton Standard **V0**
 Buna, Knob **0K**
 Viton, Knob **VK**

Blank **N**
S

BODIES

Without Body
 3/8 NPTF Ports
 #8 SAE Ports

PRESSURE RANGE/SETTING

1500 200 – 1500 PSI
3000 1500 – 3000 PSI
4000 2500 – 4000 PSI

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

Phone: (815) 397-6628

Fax: (815) 397-2526

 E-mail: delta@delta-power.com



PB-RWA Direct Acting Relief Valve

DESCRIPTION

8 size, 3/4-16 thread, "Power" series, direct acting relief valve.

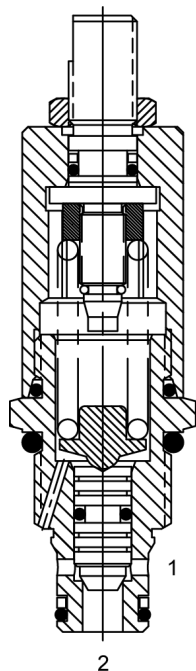
OPERATION

The PB-RWA blocks flow from (2) to (1) until sufficient pressure is present at (2) to force the poppet to open and allow metered flow from (2) to (1)

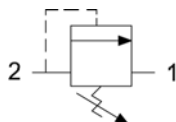
The cartridge offers smooth transition in response to load changes in common hydraulic circuits.

FEATURES

- Hardened parts for long life.
- Industry common cavity.

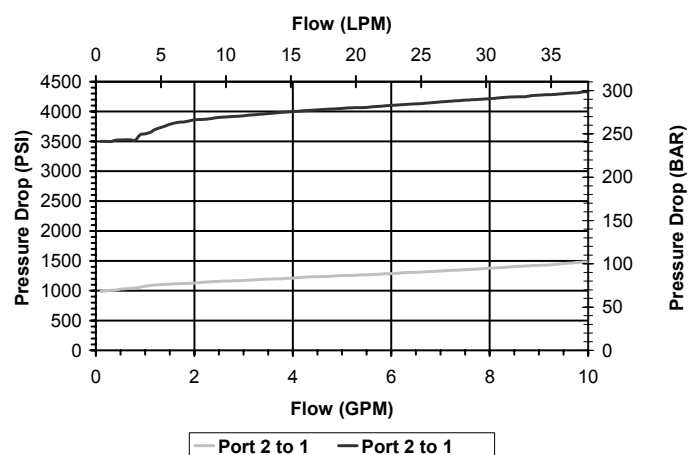


HYDRAULIC SYMBOL



PERFORMANCE

Actual Test Data (Cartridge Only)



VALVE SPECIFICATIONS

Nominal Flow	6 GPM (23 LPM)
Rated Operating Pressure	3500 PSI (241 bar)
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temperature Range	-40° to 250° F (-40° to 120° C)
Weight	.31 lbs. (.14 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	25 ft-lbs (34 Nm)
Cavity	POWER 2W
Cavity Form Tool (Finishing)	40500005
Seal Kit	21191100

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

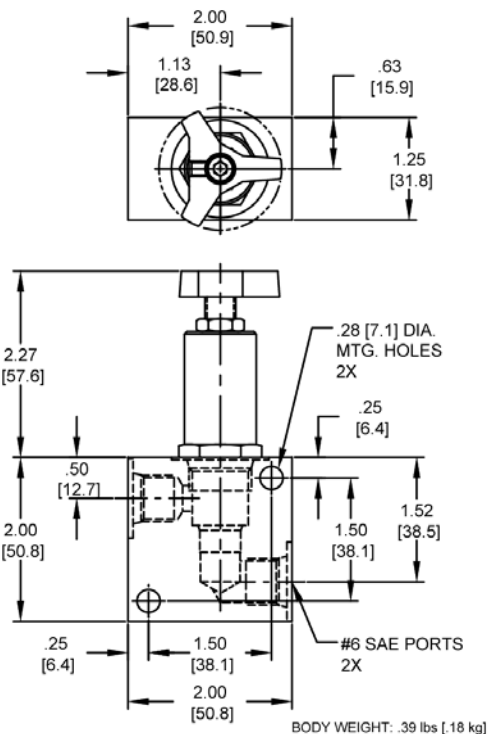
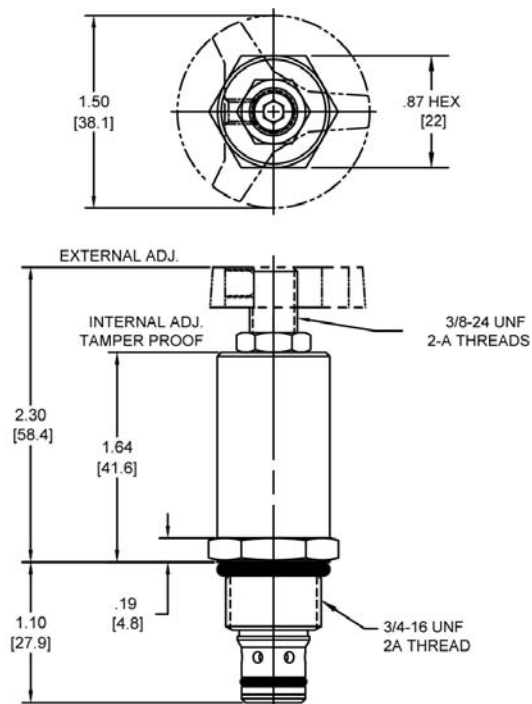
Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com



DIMENSIONS



ORDERING INFORMATION

PB-RWA

OPTIONS		BODIES	
External Adj. W/Locknut Buna	00	Blank	Without Body
External Adj. W/Locknut Viton	V0	N	1/4 NPTF Ports
Buna, Knob	0K	S	#6 SAE Ports
Viton, Knob	VK		
Internal Adj. Buna	0I		
Internal Adj. Viton	VI		
Tamper Proof Buna	0T		
Tamper Proof Viton	VT		

PRESSURE RANGE/SETTING

Ext./Int. Adjustable

100 - 1000 PSI
500 - 3500 PSI

Tamper Proof

Fill in 4 Digit Pressure Setting
Example: 0500 - 500 PSI

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

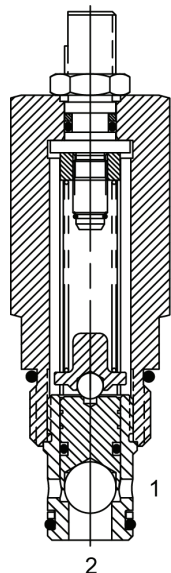
Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com



DE-RWA Direct Acting Relief Valve



DESCRIPTION

10 size, 7/8-14 thread, "Delta" series, direct acting relief valve

OPERATION

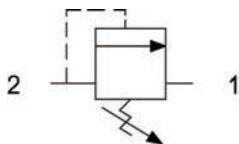
The DE-RWA blocks flow from (2) to (1) until sufficient pressure is present at (2) to force the poppet to open and allow metered flow from (2) to (1).

The cartridge offers smooth transition in response to load changes in common hydraulic circuits.

FEATURES

- Hardened parts for long life.
- Industry common cavity.

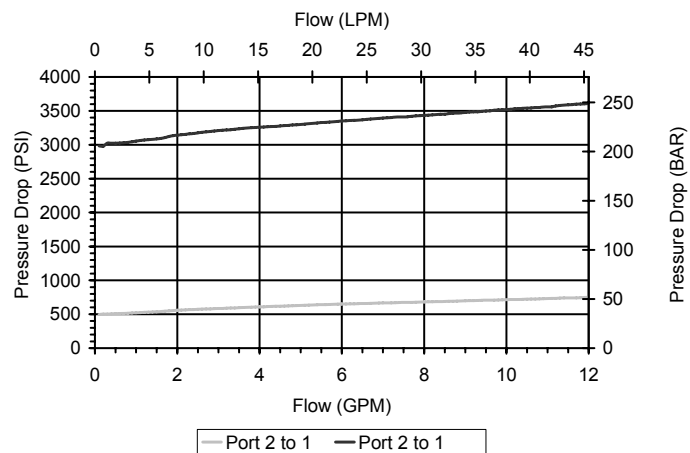
HYDRAULIC SYMBOL



For critical leakage applications consult factory.

PERFORMANCE

Actual Test Data (Cartridge Only)



VALVE SPECIFICATIONS

Nominal Flow	8 GPM (30 LPM)
Rated Operating Pressure	4000 PSI (276 bar)
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temperature Range	-40° to 250° F (-40° to 120° C)
Weight	.51 lbs. (.23 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	30 ft-lbs (40.6 Nm)
Cavity	DELTA 2W
Cavity Form Tool (Finishing)	40500000
Seal Kit	21191200

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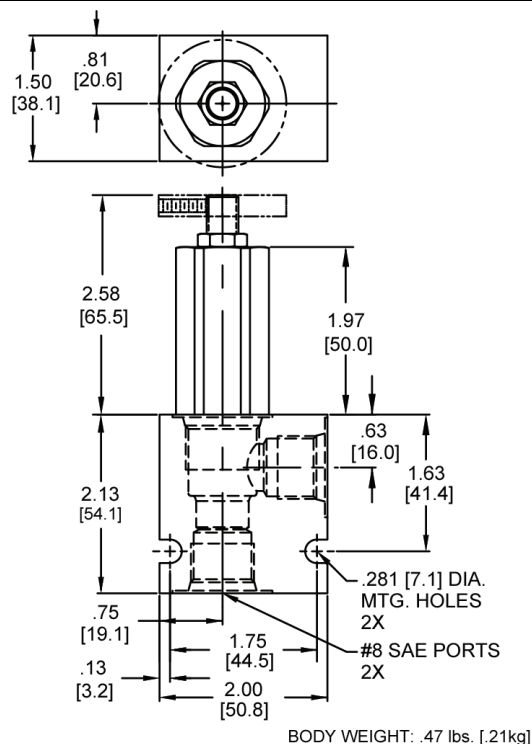
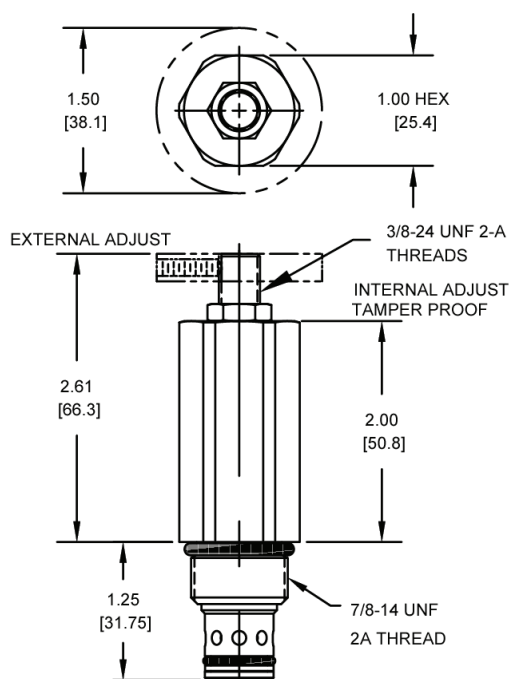
Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com



DIMENSIONS



ORDERING INFORMATION

DE-RWA

OPTIONS
External Adj. W/Locknut, Buna
External Adj. W/Locknut, Viton
Buna, Knob
Viton, Knob
Internally Adj. Buna
Internally Adj. Viton
Tamper Proof, Buna
Tamper Proof, Viton

00
V0
0K
VK
0I
VI
0T
VT

0500
3000
4000

BODIES
Blank
N
S
Without Body
3/8 NPTF Ports
#8 SAE Ports

PRESSURE RANGE/SETTING

Ext./Int. Adjustment

100 – 500 PSI
100 – 3000 PSI
3000 – 4000 PSI

Tamper Proof

Fill In 4 Digit Pressure Setting
Example: 0500 – 500 PSI

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com

**DE-RCD Differential Area Relief Valve****DESCRIPTION**

10 size, 7/8-14 thread, "Delta" series, differential area relief valve

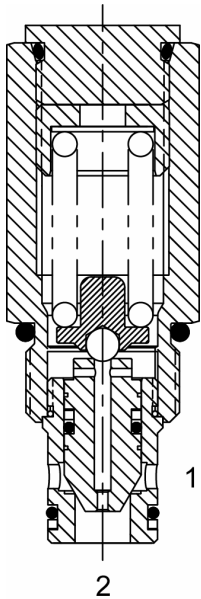
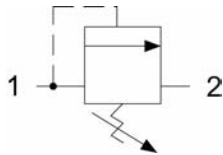
OPERATION

The DE-RCD blocks flow from (1) to (2) until sufficient pressure is present at (1) to force the poppet to open and allow metered flow from (1) to (2).

The cartridge offers smooth transition in response to load changes in common hydraulic circuits.

FEATURES

- Hardened parts for long life.
- Industry common cavity.

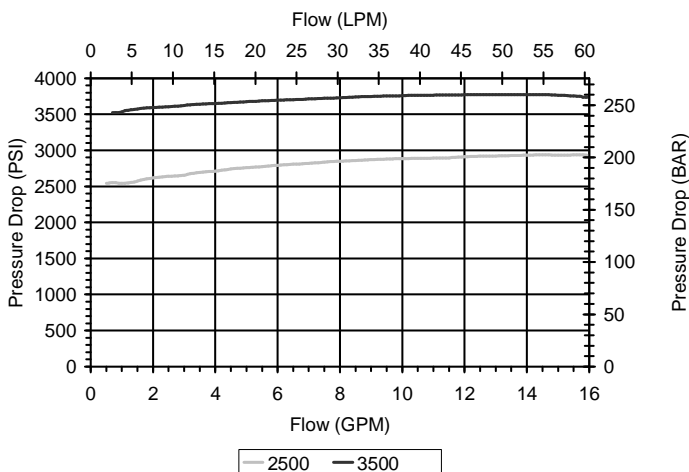
**HYDRAULIC SYMBOL**

Installation Space Saving Product.
Cannot be field adjusted.

Not recommended for crossover relief valve applications, use DE-RWD.

PERFORMANCE

Actual Test Data (Cartridge Only)

**VALVE SPECIFICATIONS**

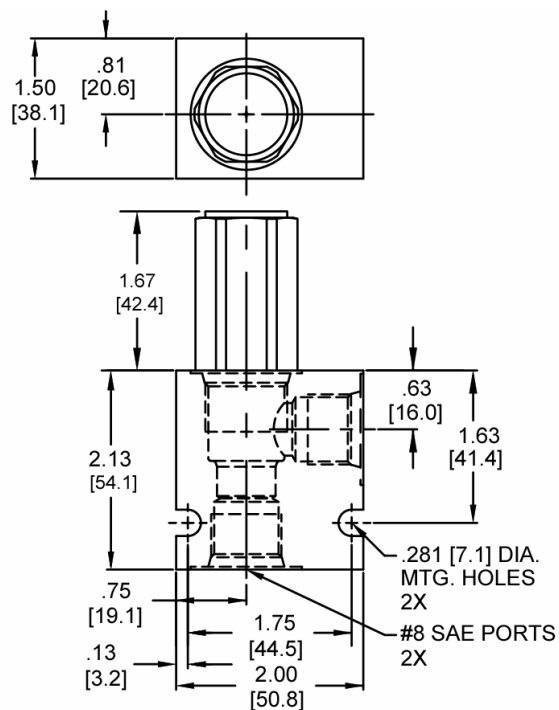
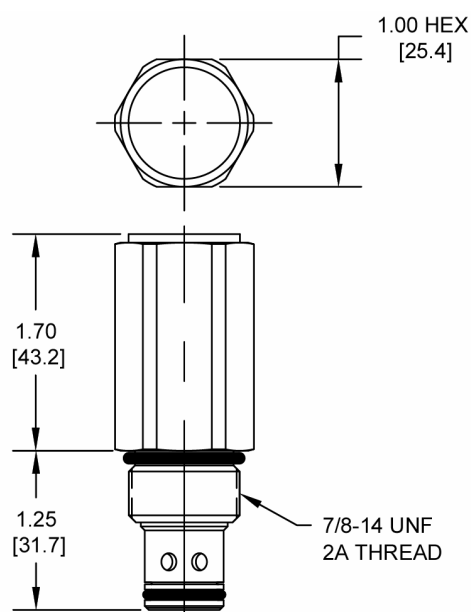
Nominal Flow	15 GPM (57 LPM)
Rated Operating Pressure	3500 PSI (241 bar)
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temperature Range	-40° to 250° F (-40° to 120° C)
Weight	.37 lbs. (.17 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	30 ft-lbs (40.6 Nm)
Cavity	DELTA 2W
Cavity Form Tool (Finishing)	40500000
Seal Kit	21191200

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com

**DIMENSIONS**

BODY WEIGHT: .47 lbs. [.21kg]

ORDERING INFORMATION**DE-RCD**

OPTIONS
Buna Standard
Viton Standard

00
V0

Blank
N
S

BODIES
Without Body
3/8 NPTF Ports
#8 SAE Ports

PRESSURE RANGE/SETTING

2500
3500

100 – 2500 PSI
250 – 3500 PSI

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PB-RVD Differential Area Relief Valve

DESCRIPTION

8 size, 3/4-16 thread, "Power" series, differential area relief valve.

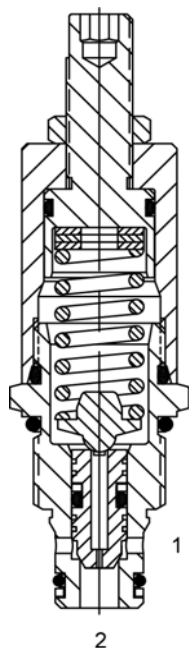
OPERATION

The PB-RVD blocks flow from (1) to (2) until sufficient pressure is present at (1) to force the poppet to open and allow metered flow from (1) to (2).

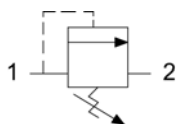
The cartridge offers smooth transition in response to load changes in common hydraulic circuits.

FEATURES

- Hardened parts for long life.
- Industry common cavity.

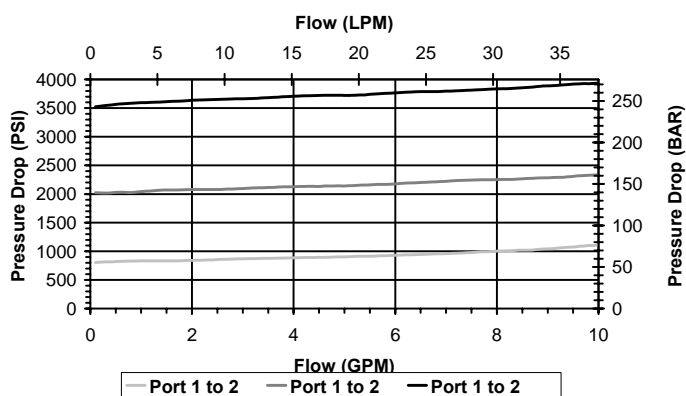


HYDRAULIC SYMBOL



PERFORMANCE

Actual Test Data (Cartridge Only)



VALVE SPECIFICATIONS

Nominal Flow	8 GPM (30 LPM)
Rated Operating Pressure	3500 PSI (241 bar)
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temperature Range	-40° to 250° F (-40° to 120° C)
Weight	.31 lbs. (.14 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	25 ft-lbs (34 Nm)
Cavity	POWER 2W
Cavity Form Tool (Finishing)	40500005
Seal Kit	21191100

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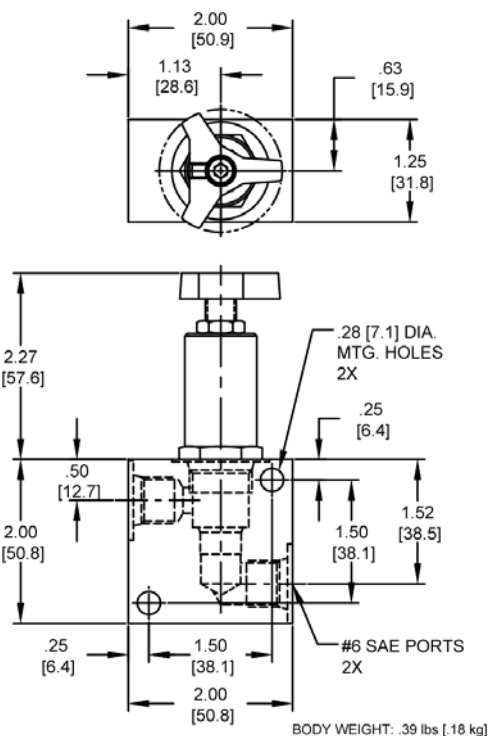
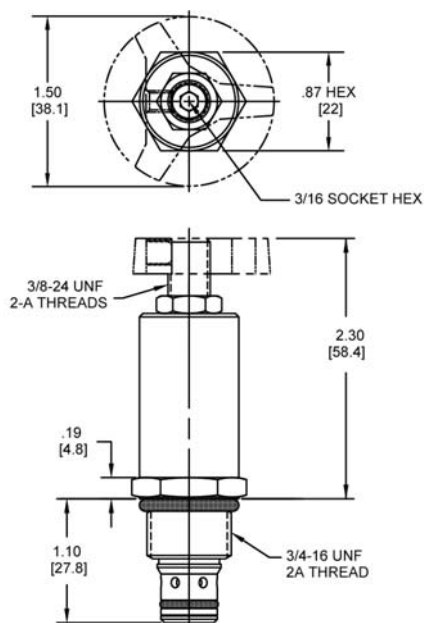
Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com



DIMENSIONS



ORDERING INFORMATION

PB-RVD

OPTIONS

Buna Standard	00
Viton Standard	V0
Buna, Knob	0K
Viton, Knob	VK

00
V0
OK
VK

Blank
N
S

BODIES

Without Body
1/4 NPTF Ports
#6 SAE Ports

PRESSURE RANGE/SETTING

0800	100 - 800 PSI
2000	800 - 2000 PSI
3500	2000 - 3500 PSI

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DE-RVD Differential Area Relief Valve

DESCRIPTION

10 size, 7/8-14 thread, "Delta" series, differential area relief valve

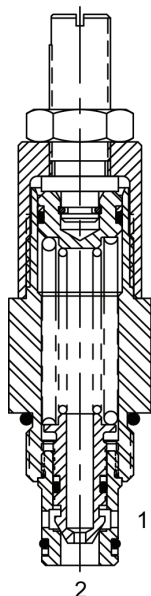
OPERATION

The DE-RVD blocks flow from (1) to (2) until sufficient pressure is present at (1) to force the poppet to open and allow metered flow from (1) to (2).

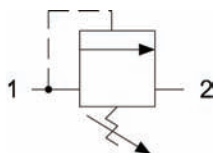
The cartridge offers smooth transition in response to load changes in common hydraulic circuits.

FEATURES

- Hardened parts for long life.
- Industry common cavity.



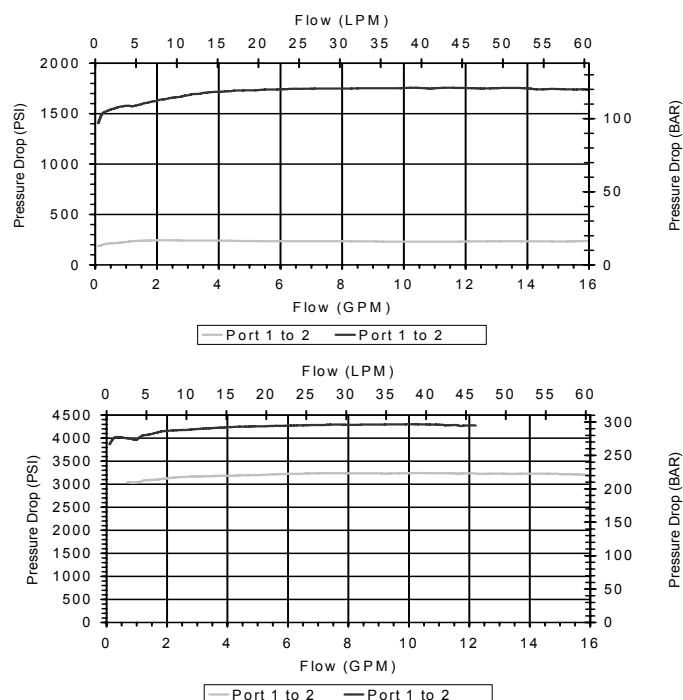
HYDRAULIC SYMBOL



Low PSI/turn adjustment.
Good pressure vs. flow characteristic.

PERFORMANCE

Actual Test Data (Cartridge Only)



VALVE SPECIFICATIONS

Nominal Flow	15 GPM (57 LPM)
Rated Operating Pressure	4000 PSI (276 bar)
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temperature Range	-40° to 250° F (-40° to 120° C)
Weight	.57 lbs. (.26 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	30 ft-lbs (40.6 Nm)
Cavity	DELTA 2W
Cavity Form Tool (Finishing)	40500000
Seal Kit	21191200

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

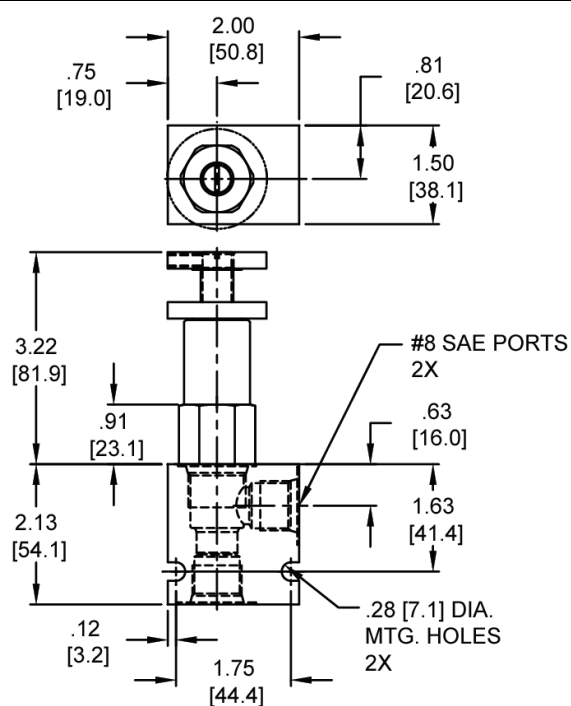
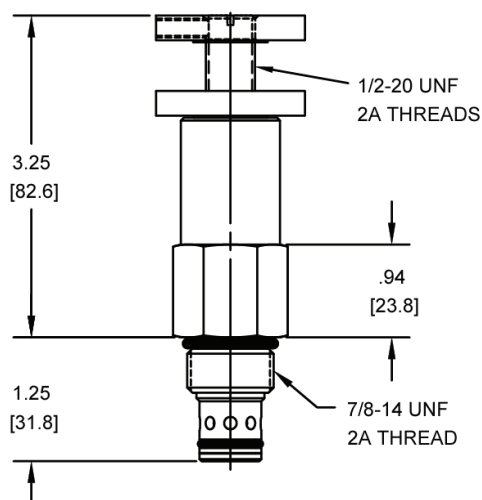
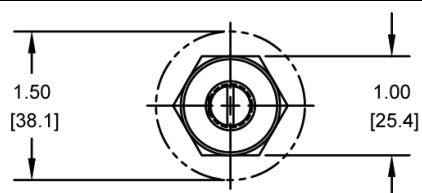
Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com



DIMENSIONS



BODY WEIGHT: .47 lbs. [.21kg]

ORDERING INFORMATION

DE-RVD

OPTIONS

Buna Standard 00
 Viton Standard V0
 Buna, Screen A0
 Viton, Screen W0
 Buna, Knob 0K
 Viton, Knob VK
 Buna, Knob, Screen AK
 Viton, Knob, Screen WK

Blank
 N
 S

BODIES

Without Body
 3/8 NPTF Ports
 #8 SAE Ports

PRESSURE RANGE/SETTING

0200 50 – 200 PSI
 1500 200 – 1500 PSI
 3000 1500 – 3000 PSI
 4000 2500 – 4000 PSI

**Note: Use screen only if flow direction
 is from (1) to (2).**

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

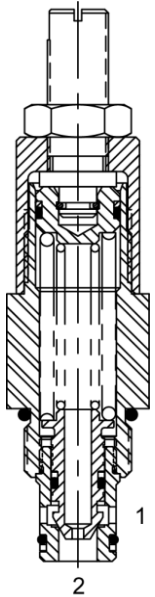
Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com



HE-RVD Differential Area Relief Valve



DESCRIPTION

10 size, 7/8-14 thread, "Delta" series, differential area relief valve

OPERATION

The HE-RVD blocks flow from (1) to (2) until sufficient pressure is present at (1) to force the poppet to open and allow metered flow from (1) to (2).

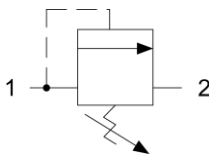
The cartridge offers smooth transition in response to load changes in common hydraulic circuits.

FEATURES

- Hardened parts for long life.
- Industry common cavity.

Good pressure vs. flow characteristic.

HYDRAULIC SYMBOL

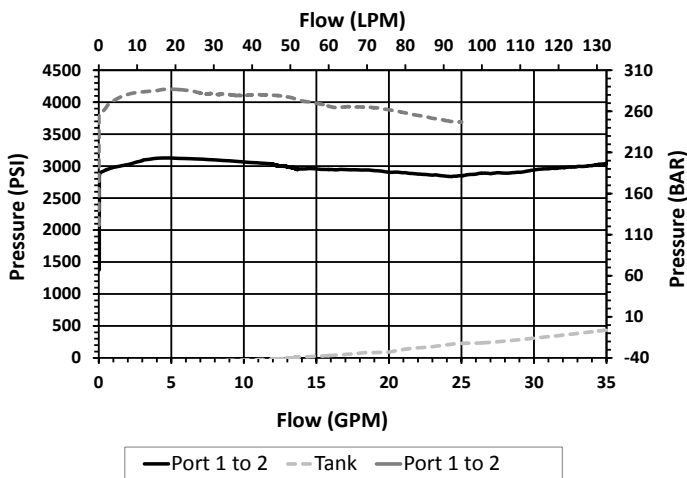


Recommended Return Line Pressure as shown on Performance Data Graph.

Undercut Cavity Recommended for Max. flows.
(Consult Factory for Details)

PERFORMANCE

Actual Test Data (Cartridge Only)



VALVE SPECIFICATIONS

Nominal Flow	40 GPM (151 LPM)
Rated Operating Pressure	5000 PSI (350 bar)
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temperature Range	-40° to 250° F (-40° to 120° C)
Weight	.57 lbs. (.26 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	30 ft-lbs (40.6 Nm)
Cavity	DELTA 2W
Cavity Form Tool (Finishing)	40500000
Seal Kit	21191200

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

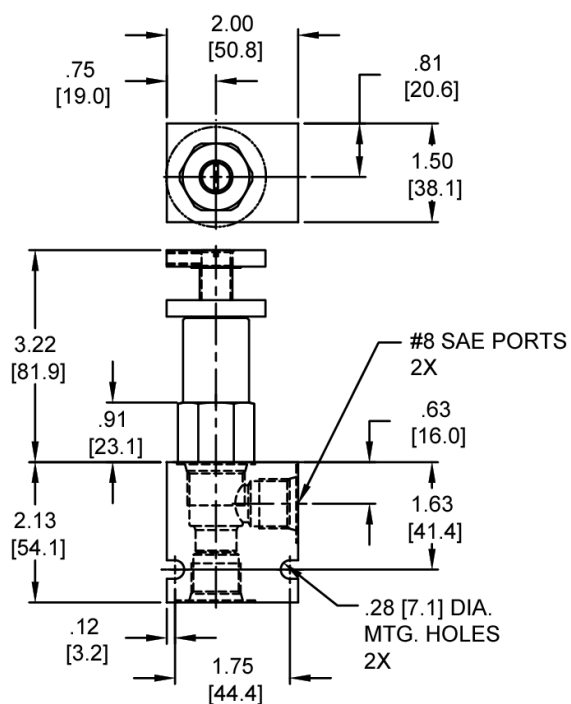
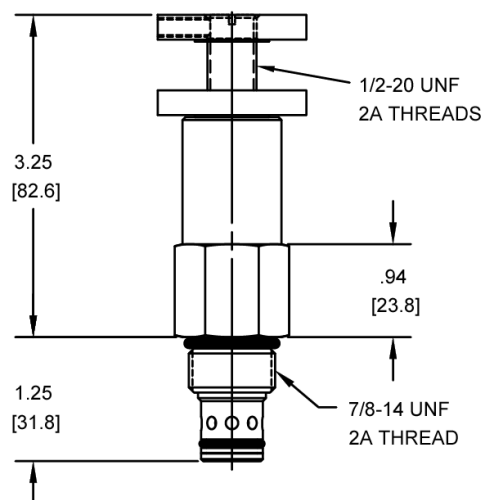
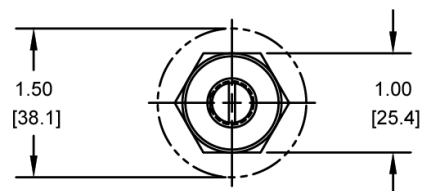
Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com



DIMENSIONS



BODY WEIGHT: .47 lbs. [.21kg]

ORDERING INFORMATION

HE-RVD - - -

OPTIONS

Buna Standard **00**
 Viton Standard **V0**
 Buna, Screen **A0**
 Viton, Screen **W0**
 Buna, Knob **0K**
 Viton, Knob **VK**
 Buna, Knob, Screen **AK**
 Viton, Knob, Screen **WK**

Blank
N
S

BODIES

Without Body
 3/8 NPTF Ports
 #8 SAE Ports

PRESSURE RANGE/SETTING

5000 1000-5000 PSI

Note: Aluminum, NOT durability rated for 4000 PSI. Consult factory options.

Note: Use screen only if flow direction is from (1) to (2).

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

Phone: (815) 397-6628

Fax: (815) 397-2526

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PB-RWD Differential Area Relief Valve
DESCRIPTION

8 size, 3/4-16 thread, "Power" series, differential area relief valve.

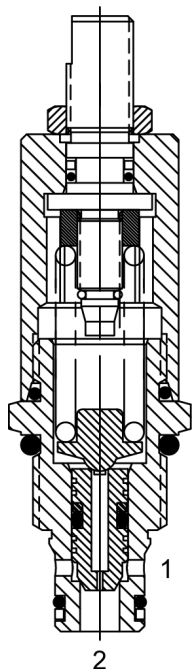
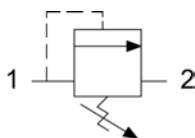
OPERATION

The PB-RWD blocks flow from (1) to (2) until sufficient pressure is present at (1) to force the poppet to open and allow metered flow from (1) to (2).

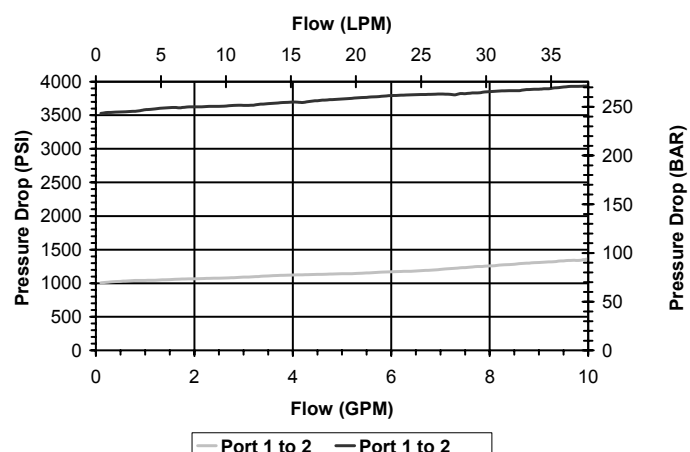
The cartridge offers smooth transition in response to load changes in common hydraulic circuits.

FEATURES

- Hardened parts for long life.
- Industry common cavity.


HYDRAULIC SYMBOL

PERFORMANCE

Actual Test Data (Cartridge Only)


VALVE SPECIFICATIONS

Nominal Flow	8 GPM (30 LPM)
Rated Operating Pressure	3500 PSI (241 bar)
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temperature Range	-40° to 250° F (-40° to 120° C)
Weight	.32 lbs. (.15 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	25 ft-lbs (34 Nm)
Cavity	POWER 2W
Cavity Form Tool (Finishing)	40500005
Seal Kit	21191100

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

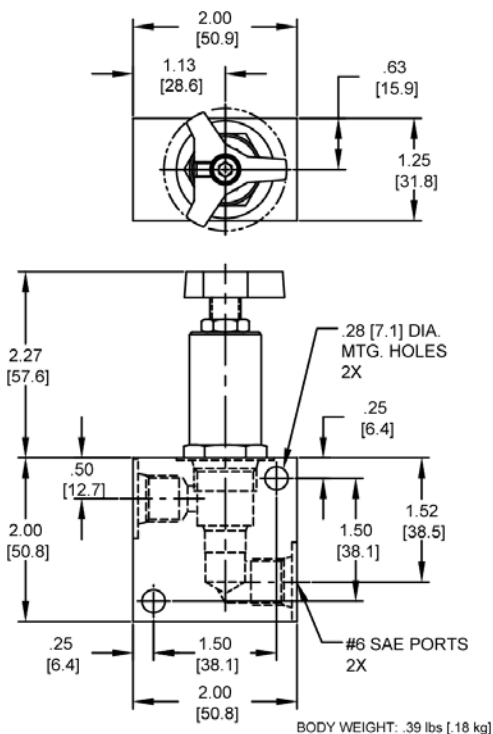
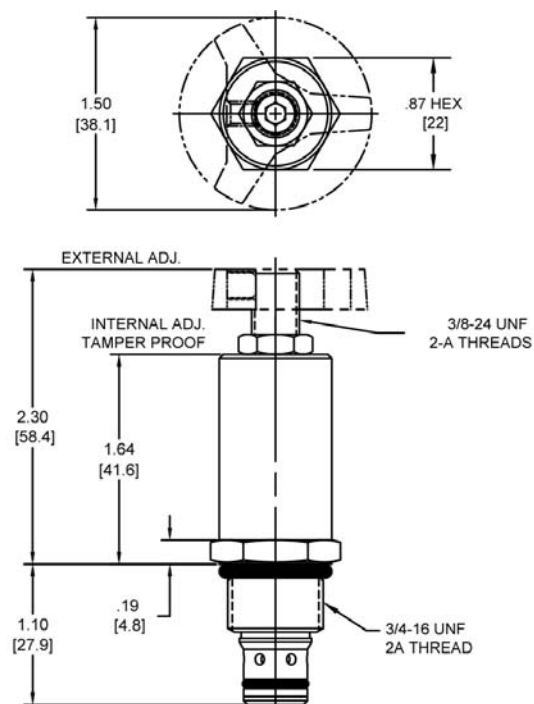
Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com



DIMENSIONS



ORDERING INFORMATION

PB-RWD	-	-	-
--------	---	---	---

OPTIONS

External Adj. W/Locknut Buna	00
External Adj. W/Locknut Viton	0V
Buna, Knob	0K
Viton, Knob	VK
Internal Adj. Buna	0I
Internal Adj. Viton	VI
Tamper Proof Buna	0T
Tamper Proof Viton	VT

BODIES

Blank	BODIES
N	Without Body
S	1/4 NPTF Ports
	#6 SAE Ports

PRESSURE RANGE/SETTING

Ext./Int. Adjustable

1000	100 - 1000 PSI
3500	500 – 3500 PSI

Tamper Proof

Fill in 4 Digit Pressure Setting
Example: 0500 – 500 PSI

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Phone: (815) 397-6628

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DE-RWD Differential Area Relief Valve

DESCRIPTION

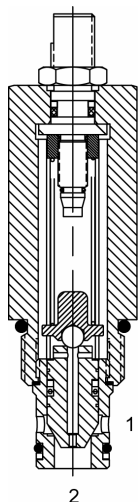
10 size, 7/8-14 thread, "Delta" series, differential area relief valve.

OPERATION

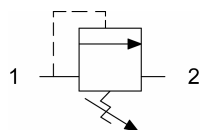
The DE-RWD blocks flow from (1) to (2) until sufficient pressure is present at (1) to force the poppet to open and allow metered flow from (1) to (2).

FEATURES

- Hardened parts for long life.
- Industry common cavity.

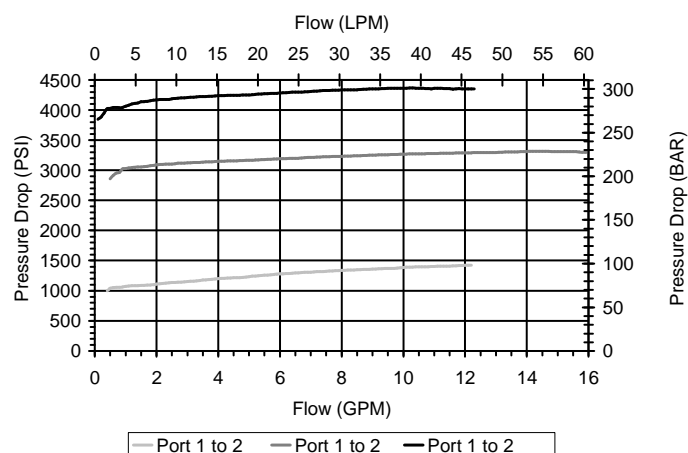


HYDRAULIC SYMBOL



PERFORMANCE

Actual Test Data (Cartridge Only)



VALVE SPECIFICATIONS

Nominal Flow	15 GPM (57 LPM)
Rated Operating Pressure	4000 PSI (276 bar)
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temperature Range	-40° to 250° F (-40° to 120° C)
Weight	.55 lbs. (.25 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	30 ft-lbs (40.6 Nm)
Cavity	DELTA 2W
Cavity Form Tool (Finishing)	40500000
Seal Kit	21191200

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

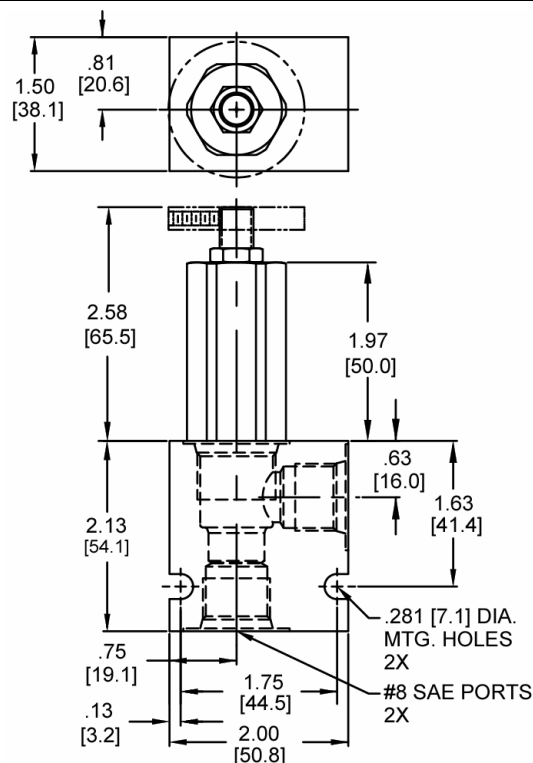
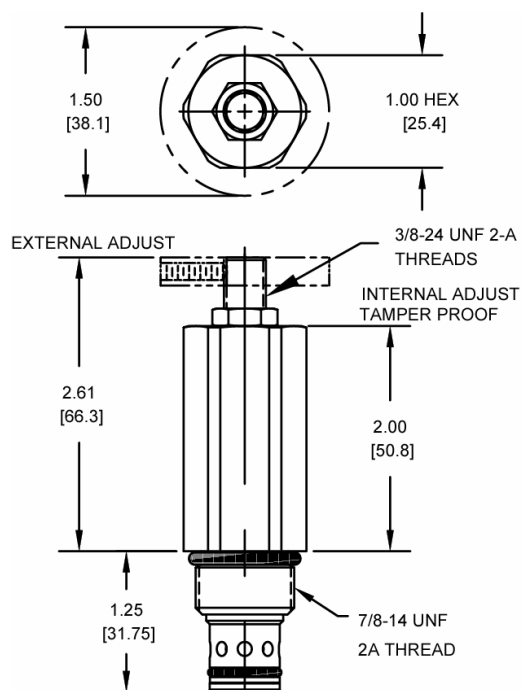
Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com



DIMENSIONS



BODY WEIGHT: .47 lbs. [.21kg]

ORDERING INFORMATION

DE-RWD

OPTIONS
 External Adj. W/Locknut, Buna **00**
 External Adj. W/Locknut, Viton **V0**
 Buna, Knob **0K**
 Viton, Knob **VK**
 Internally Adj. Buna **0I**
 Internally Adj. Viton **VI**
 Tamper Proof, Buna **0T**
 Tamper Proof, Viton **VT**

0500
3000
4000

Blank **N**
 S **S**

BODIES

Without Body
 3/8 NPTF Ports
 #8 SAE Ports

PRESSURE RANGE/SETTING

Ext./Int. Adjustment

100 – 1000 PSI
 100 – 3000 PSI
 3000 – 4000 PSI

Tamper Proof

Fill In 4 Digit Pressure Setting
 Example: 0500 – 500 PSI

Note: Aluminum NOT durability rated for 4000 PSI. Consult factory for options.

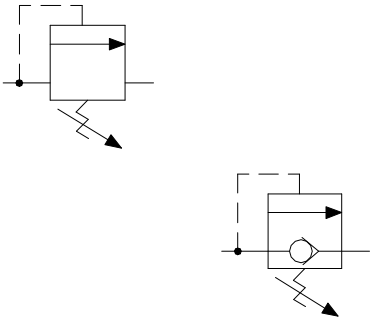
WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

Phone: (815) 397-6628

Fax: (815) 397-2526

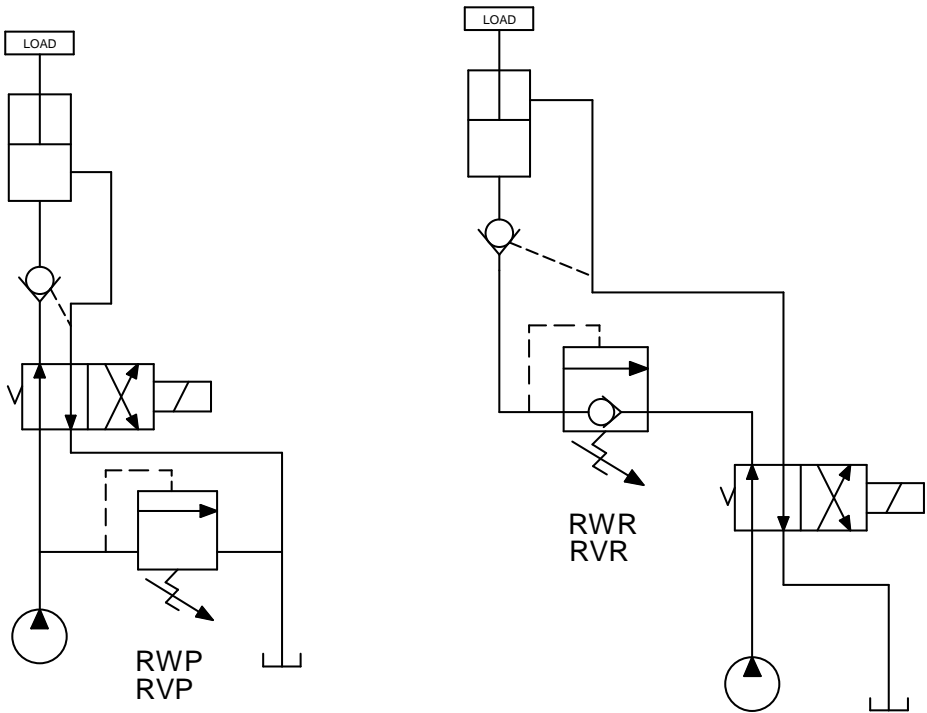
E-mail: delta@delta-power.com

Pilot Operated Relief Valves

	GPM	PSI	LPM	BAR	MODEL	PAGE
	20	4000	76	276	DE-RVP	360
	20	4000	76	276	HT-RVP	362
	15	4000	57	276	DE-RVR	364
	40	3500	151	241	SJ-RVR	366
	15	4000	57	276	DE-RWP	368
	40	5000	151	345	HE-RWP	370
	15	4000	57	276	DE-RWR	372

Typical Schematic

Typical application for the RVP and RWP is to protect pump or system.
Typical application for the RWR and RVR, is to be used as counterbalance in a system where positive hydraulic locking is not required. In this schematic positive locking is done by using a P. O. check valve.



WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.



DE-RVP Pilot Operated Relief Valve

DESCRIPTION

10 size, 7/8-14 thread, "Delta" series, pilot operated relief valve.

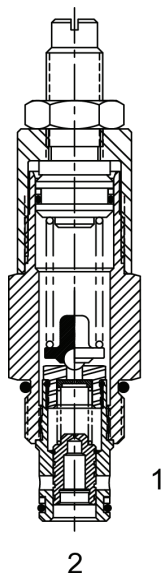
OPERATION

The DE-RVP blocks flow from (2) to (1) until sufficient pressure is present at (2) to force the pilot stage open, allowing the main stage to shift, opening (2) to (1).

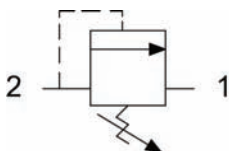
The cartridge offers smooth transition in response to load changes in common hydraulic circuits.

FEATURES

- Hardened parts for long life.
- Industry common cavity.

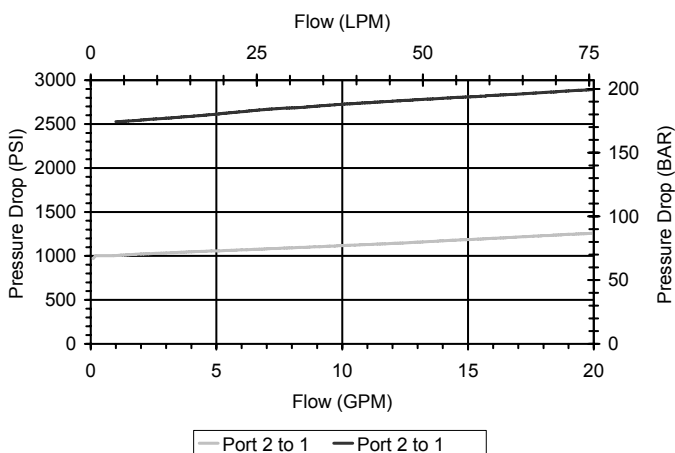


HYDRAULIC SYMBOL



PERFORMANCE

Actual Test Data (Cartridge Only)



VALVE SPECIFICATIONS

Nominal Flow	20 GPM (76 LPM)
Rated Operating Pressure	4000 PSI (276 bar)
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temperature Range	-40° to 250° F (-40° to 120° C)
Weight	.56 lbs. (.25 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	30 ft-lbs (40.6 Nm)
Cavity	DELTA 2W
Cavity Form Tool (Finishing)	40500000
Seal Kit	21191200

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

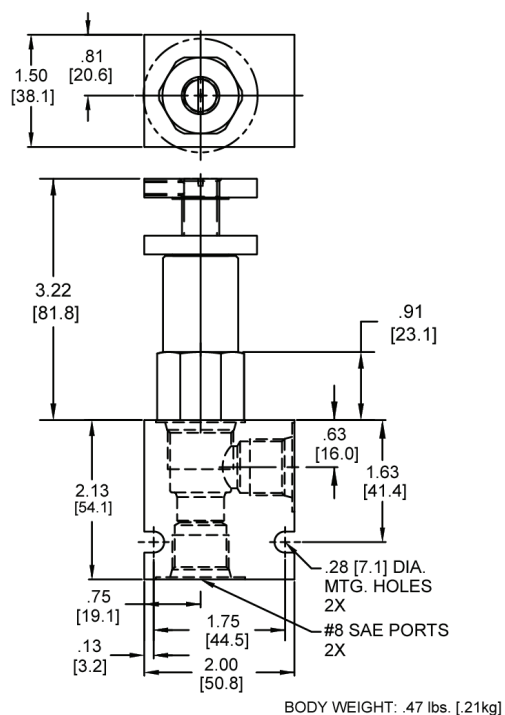
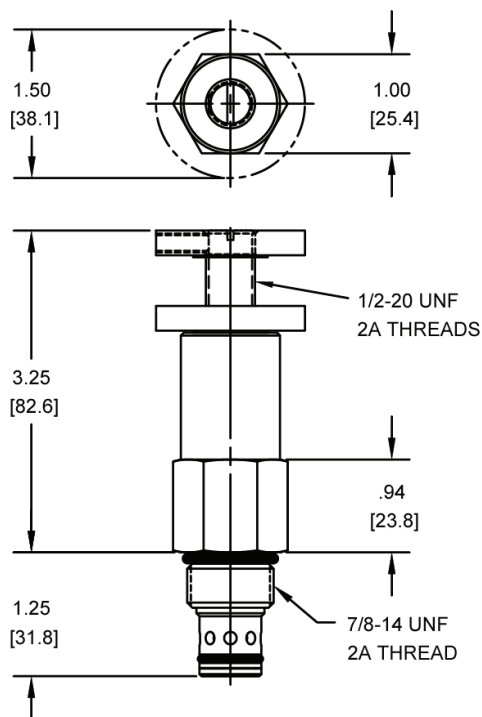
Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com



DIMENSIONS



ORDERING INFORMATION

DE-RVP

OPTIONS

Buna Standard **00**
Viton Standard **V0**
Buna, Knob **0K**
Viton, Knob **VK**

Blank **N**

S

BODIES

Without Body
3/8 NPTF Ports
#8 SAE Ports

PRESSURE RANGE/SETTING

100 – 4000 PSI

4000

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com



HT-RVP Pilot Operated Relief Valve

DESCRIPTION

12 size, 1 1/16-12 thread, "Tecnord" series, pilot operated relief valve.

OPERATION

The HT-RVP blocks flow from (2) to (1) until sufficient pressure is present at (2) to force the pilot stage off its seat, allowing the main stage spool to shift, opening (2) to (1).

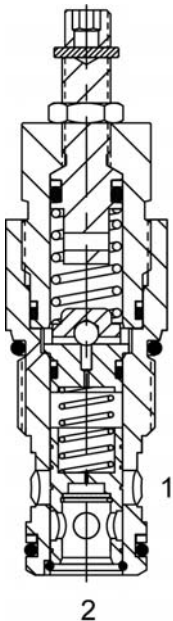
The cartridge offers smooth transition in response to load changes in common hydraulic circuits.

FEATURES

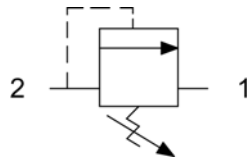
- Hardened parts for long life.
- Industry common cavity.



Undercut cavity recommended for circuits above 2500 PSI where flows go to 30 GPM.



HYDRAULIC SYMBOL

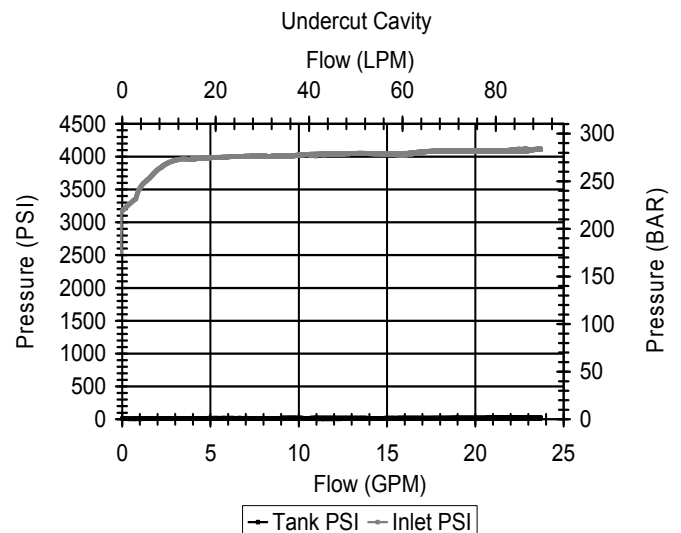
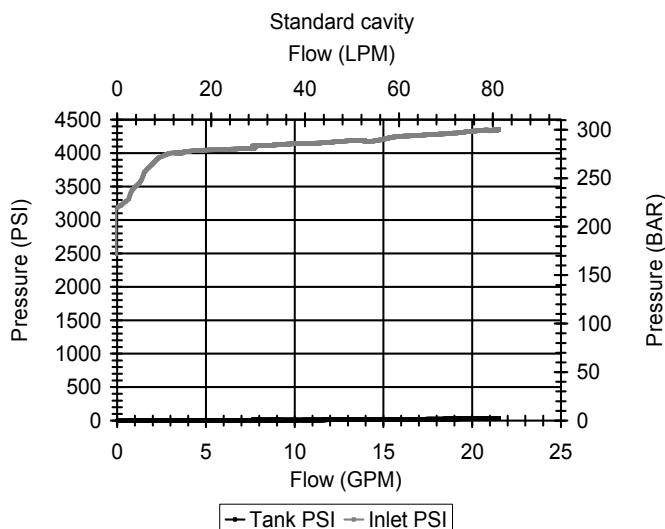


VALVE SPECIFICATIONS

Nominal Flow	20 GPM (76 LPM)
Rated Operating Pressure	5000 PSI (345 bar)
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temperature Range	-40° to 250° F (-40° to 120° C)
Weight	1.13 lbs. (.51 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	70 ft-lbs (95 Nm)
Cavity	TECNORD 2W
Cavity Form Tool (Finishing)	40500032
Seal Kit	21191300

PERFORMANCE

Actual Test Data (Cartridge Only)



WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

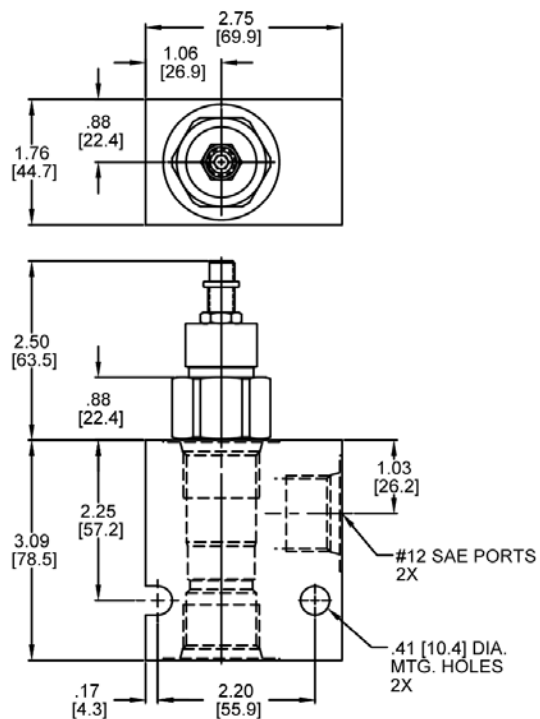
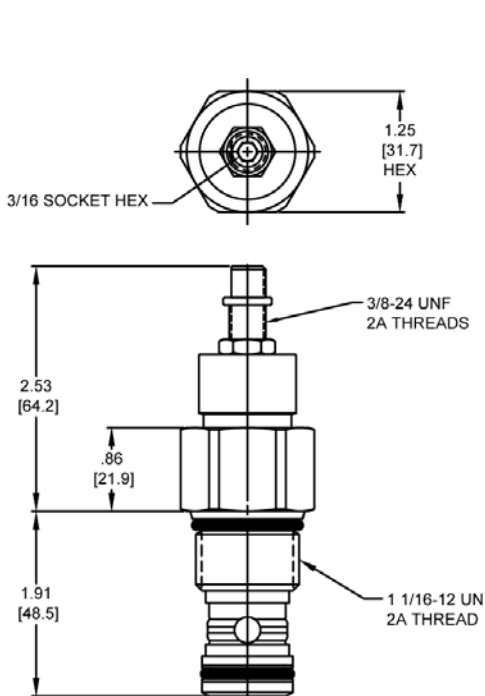
Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com



MENSIONS



BODY WEIGHT: 3.71 lbs. [1.68 kg.]

ORDERING INFORMATION

HT-RVP

OPTIONS

Buna Standard **00**
 Viton Standard **V0**
 Buna, Knob **0K**
 Viton, Knob **VK**

Blank
S

BODIES

Without Body
 #12 SAE Ports

PRESSURE SETTING

100 - 5000 PSI

5000

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

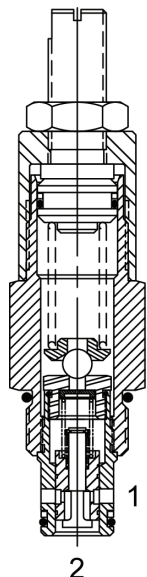
Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com



DE-RVR Pilot Operated Relief Valve, with Reverse Flow



DESCRIPTION

10 size, 7/8-14 thread, "Delta" series, pilot operated relief valve with reverse flow

OPERATION

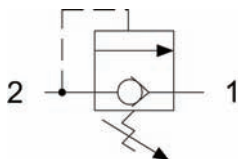
The DE-RVR blocks flow from (2) to (1) until sufficient pressure is present at (2) to force the pilot stage open, allowing the main stage to shift, opening (2) to (1).

The relief flow path is from (2) to (1). Free reverse flow, from (1) to (2), occurs when the pressure at (1) is at least 10 PSI (.7 bar) higher than at port (2).

FEATURES

- Hardened parts for long life.
- Industry common cavity.

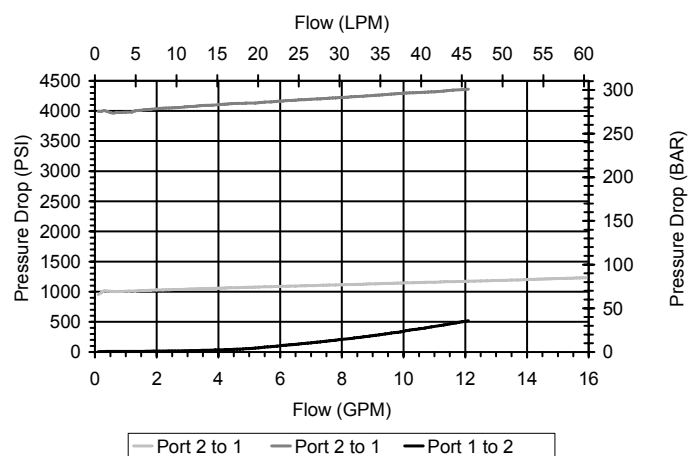
HYDRAULIC SYMBOL



Consult Chart for flow capacity port 1 to 2

PERFORMANCE

Actual Test Data (Cartridge Only)



VALVE SPECIFICATIONS

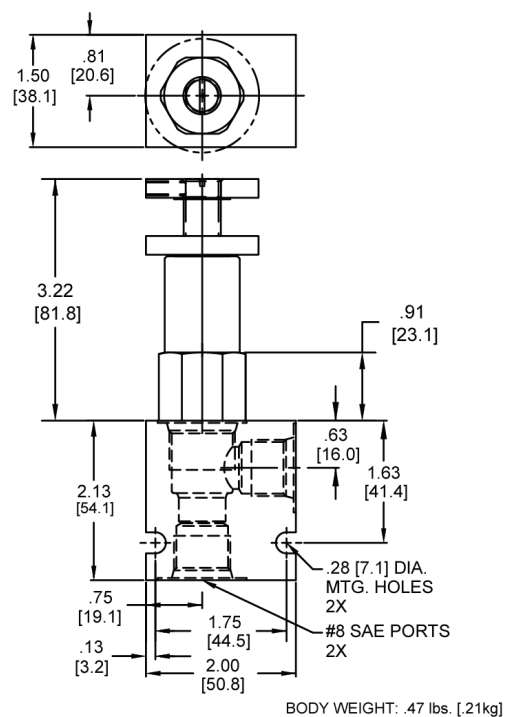
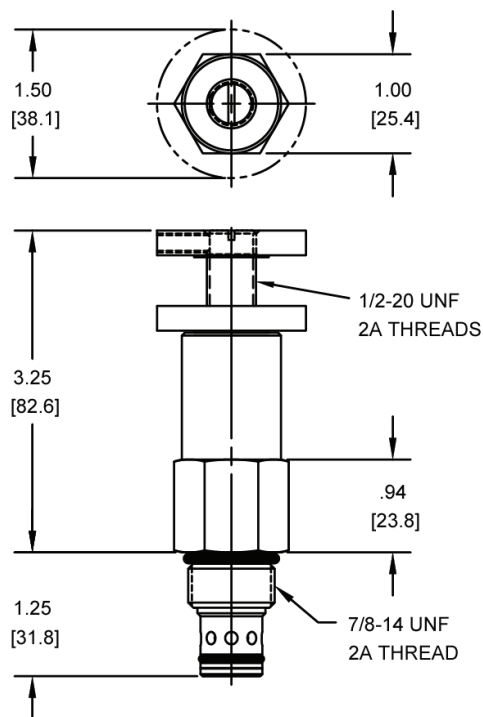
Nominal Flow	15 GPM (57 LPM)
Rated Operating Pressure	4000 PSI (276 bar)
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temperature Range	-40° to 250° F (-40° to 120° C)
Weight	.56 lbs. (.25 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	30 ft-lbs (40.6 Nm)
Cavity	DELTA 2W
Cavity Form Tool (Finishing)	40500000
Seal Kit	21191200

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com


DIMENSIONS

ORDERING INFORMATION
DE-RVR
OPTIONS

Buna Standard **00**
 Viton Standard **V0**
 Buna, Knob **0K**
 Viton, Knob **VK**

Blank

N
S
BODIES

Without Body
 3/8 NPTF Ports
 #8 SAE Ports

PRESSURE RANGE/SETTING

100 – 4000 PSI

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

Phone: (815) 397-6628

Fax: (815) 397-2526

 E-mail: delta@delta-power.com



SJ-RVR Pilot Operated Relief Valve, with Reverse Flow

DESCRIPTION

16 size, 1 5/16-12 thread, "Super" series, pilot operated relief valve with reverse flow.

OPERATION

The SJ-RVR blocks flow from (2) to (1) until sufficient pressure is present at (2) to force the pilot stage off its seat, allowing the main stage spool to shift, opening (2) to (1).

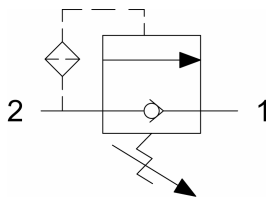
The relief flow path is from (2) to (1). Reverse flow, from (1) to (2), occurs when the pressure at (1) is at least 30 PSI (2.1bar) higher than at port (2).

The Cartridge offers smooth transition in response to load changes in common hydraulic circuits.

FEATURES

- Hardened parts for long life.
- Industry common cavity.

HYDRAULIC SYMBOL

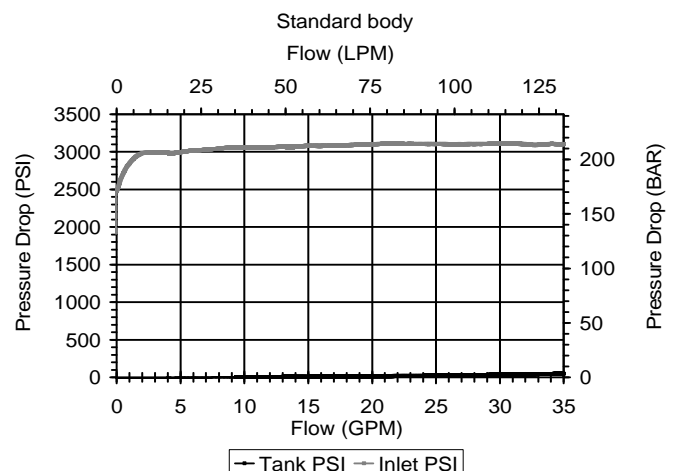
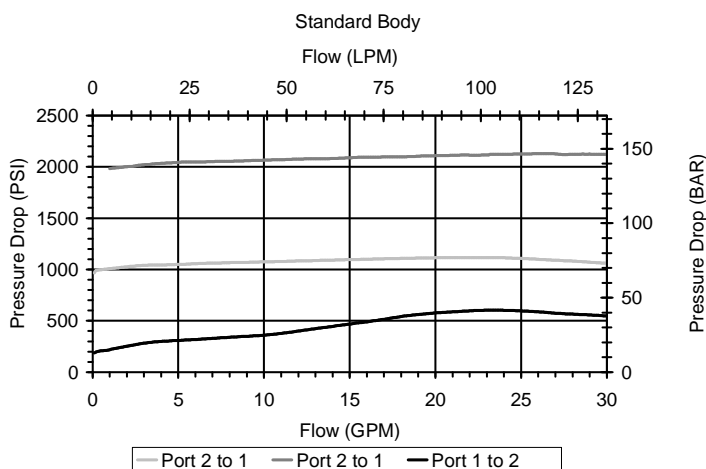


VALVE SPECIFICATIONS

Nominal Flow	40 GPM (151 LPM)
Rated Operating Pressure	3500 PSI (241 bar)
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temperature Range	-40° to 250° F (-40° to 120° C)
Weight	1.13 lbs. (.51 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	90 ft-lbs (122 Nm)
Cavity	SUPER 2W
Cavity Form Tool (Finishing)	40500017
Seal Kit	21191400

PERFORMANCE

Actual Test Data (Cartridge Only)



WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

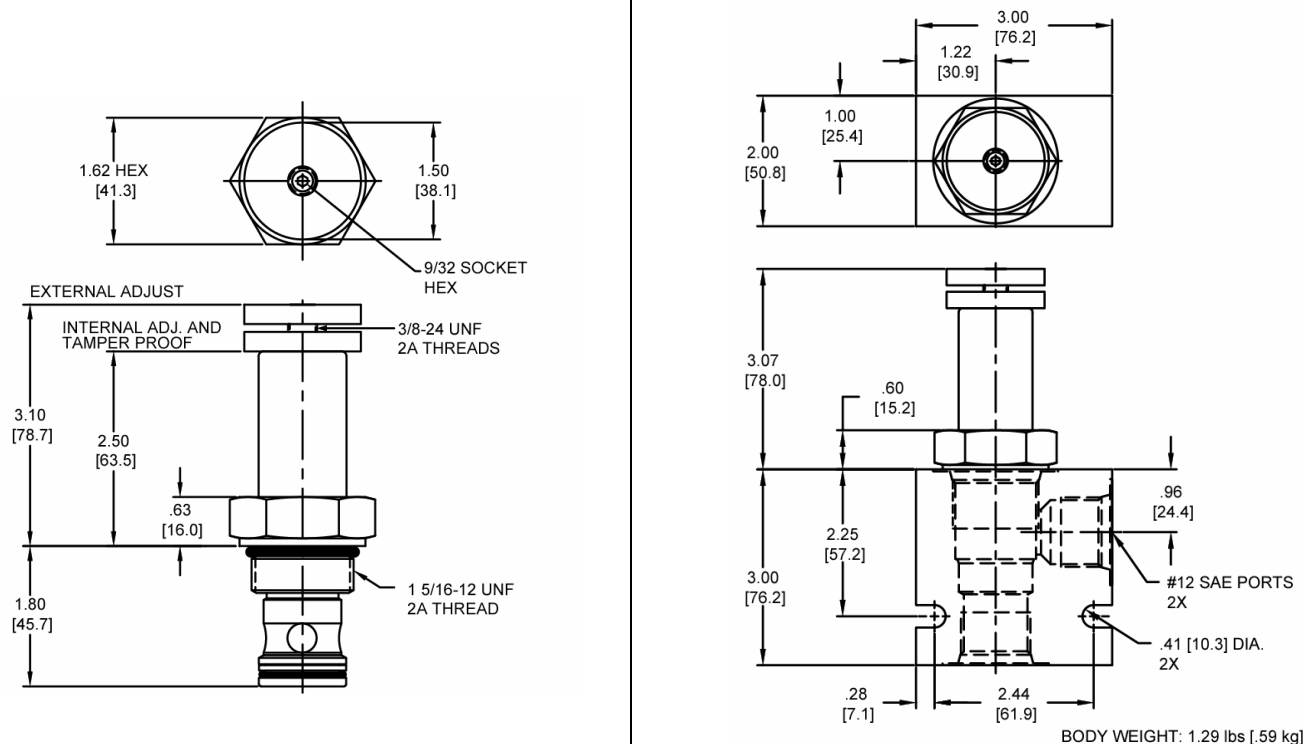
Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com



DIMENSIONS



ORDERING INFORMATION

SJ-RVR -

OPTIONS

Buna Standard **00**
 Viton Standard **V0**
 Buna, Knob **0K**
 Viton, Knob **VK**
 Buna, Internal Adjust **0I**
 Viton, Internal Adjust **VI**
 Buna, Tamper Proof **0T**
 Viton, Tamper Proof **VT**

3500**Example**

Blank

N**S**BODIES

Without Body
 3/4 NPTF Ports
 #12 SAE Ports

PRESSURE SETTING

500 - 3500 PSI

TAMPER PROOF (fill in 4 digit pressure setting)

0500 = 500 PSI

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com



DE-RWP Pilot Operated Relief Valve

DESCRIPTION

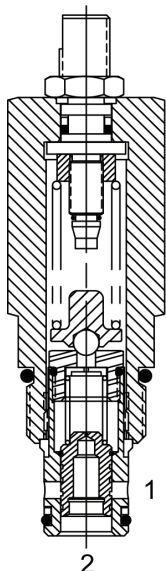
10 size, 7/8-14 thread, "Delta" series, pilot operated relief valve.

OPERATION

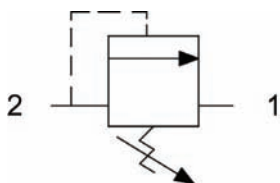
The DE-RWP blocks flow from (2) to (1) until sufficient pressure is present at (2) to force the pilot stage open, allowing the main stage to shift, opening (2) to (1).

FEATURES

- Hardened parts for long life.
- Industry common cavity.

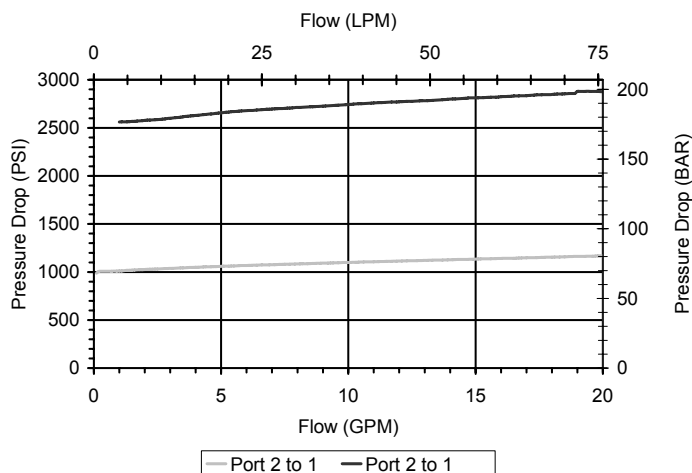


HYDRAULIC SYMBOL



PERFORMANCE

Actual Test Data (Cartridge Only)



VALVE SPECIFICATIONS

Nominal Flow	15 GPM (57 LPM)
Rated Operating Pressure	4000 PSI (276 bar)
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temperature Range	-40° to 250° F (-40° to 120° C)
Weight	.53 lbs. (.24 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	30 ft-lbs (40.6 Nm)
Cavity	DELTA 2W
Cavity Form Tool (Finishing)	40500000
Seal Kit	21191200

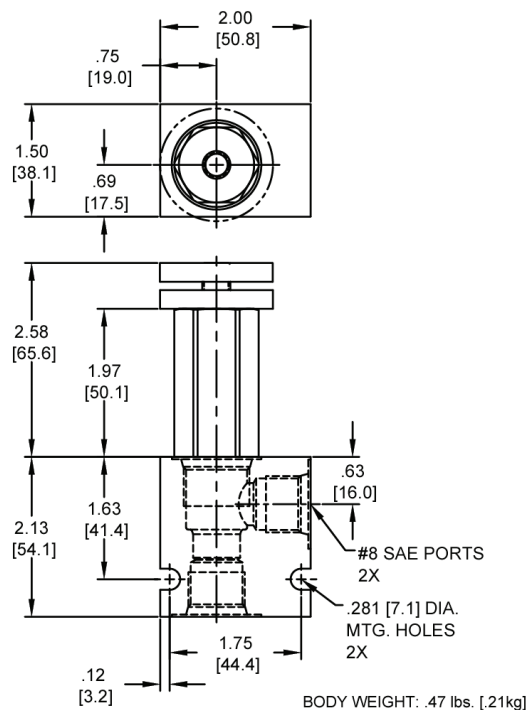
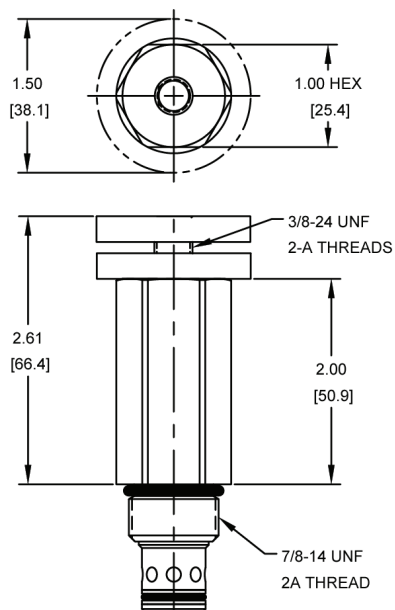
WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com

DIMENSIONS



ORDERING INFORMATION

DE-RWP

OPTIONS

Buna Standard **00**
Viton Standard **V0**
Buna, Knob **0K**
Viton, Knob **VK**
Internally Adj. Buna **0I**
Internally Adj. Viton **VI**
Tamper Proof Buna **0T**
Tamper Proof Viton **VT**

4000

Blank **N**
S

BODIES

Without Body
3/8 NPTF Ports
#8 SAE Ports

PRESSURE RANGE/SETTING

1000 – 4000 PSI

Tamper Proof

Fill in 4 Digit Pressure Setting
Example: 0500 – 500 PSI

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

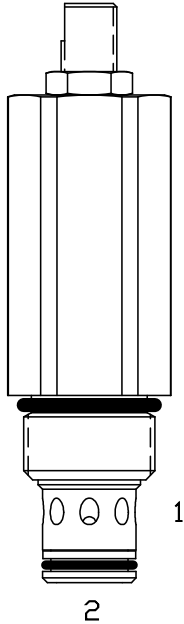
Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com



HE-RWP Rapid Response, Pilot Operated Relief Valve



DESCRIPTION

"High Pressure, High Flow, Rapid Response, 10 size, 7/8-14 thread, "Delta" series, pilot operated relief valve.

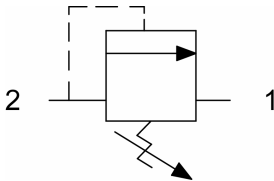
OPERATION

The HE-RWP blocks flow from (2) to (1) until sufficient pressure is present at (2) to force the pilot stage open, allowing the main stage to shift, opening (2) to (1).

FEATURES

- High pressure valve
- Hardened parts for long life.
- Industry common cavity.
- Rapid response to sudden pressure application
- Excellent regulation of pressure with flow (low override)

HYDRAULIC SYMBOL



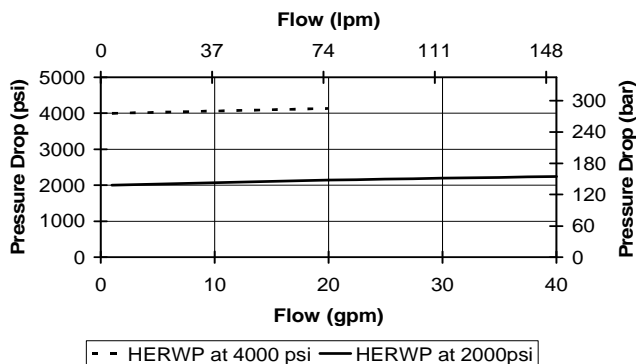
This is a rapid response, high pressure relief valve with excellent high flow regulation.

(Consult factory for higher flow capacity cavity option)

PERFORMANCE

Actual Test Data (Cartridge Only)

HERWP/Pressure drop vs flow



VALVE SPECIFICATIONS

Nominal Flow	40 GPM (151 LPM)
Rated Operating Pressure	5000 PSI (345 bar)
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temperature Range	-40° to 250° F (-40° to 120° C)
Weight	.53 lbs. (.24 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	30 ft-lbs (40.6 Nm)
Cavity	DELTA 2W
Cavity Form Tool (Finishing)	40500000
Seal Kit	21191200

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

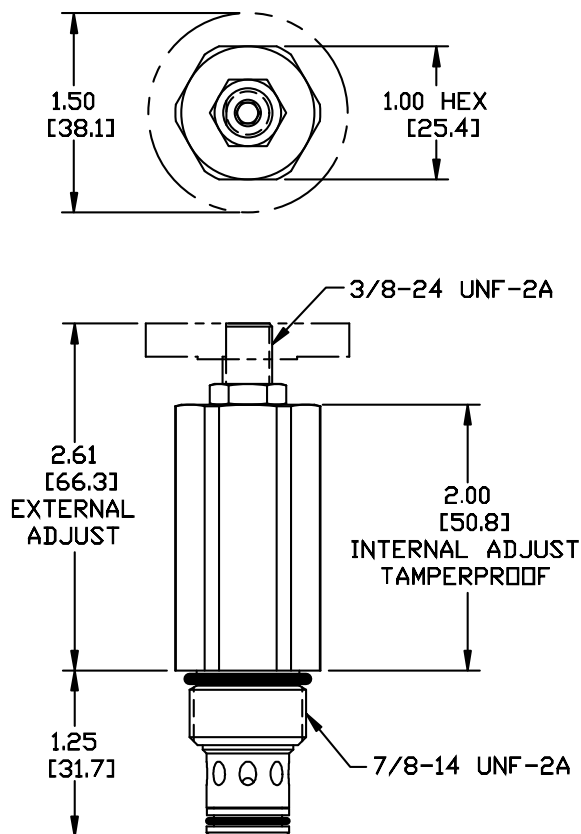
Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com



DIMENSIONS



ORDERING INFORMATION

HE-RWP - - -

OPTIONS

Buna Standard **00**
 Viton Standard **V0**
 Buna, Knob **0K**
 Viton, Knob **VK**
 Internally Adj. Buna **0I**
 Internally Adj. Viton **VI**
 Tamper Proof Buna **0T**
 Tamper Proof Viton **VT**

00**V0****0K****VK****0I****VI****0T****VT****5000****BODIES**

Consult Factory

PRESSURE RANGE/SETTING

1000 – 5000 PSI

Tamper Proof

Fill in 4 Digit Pressure Setting
 Example: 1500 – 1500 PSI

WARNING
DO NOT USE ALUMINUM BODY
HIGH PRESSURE (5000 PSI) PRODUCT

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com



DE-RWR Pilot Operated Relief Valve, with Reverse Flow

DESCRIPTION

10 size, 7/8-14 thread, "Delta" series, pilot operated relief valve with reverse flow.

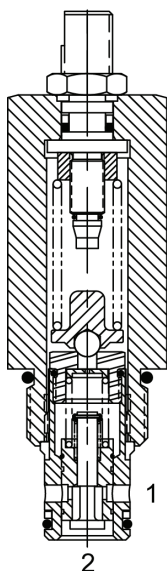
OPERATION

The DE-RWR blocks flow from (2) to (1) until sufficient pressure is present at (2) to force the pilot stage open, and allow metered flow from (2) to (1).

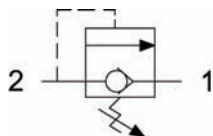
The relief flow path is from (2) to (1). Free reverse flow, from (1) to (2), occurs when the pressure at (1) is at least 10 PSI (.7 bar) higher than at port (2).

FEATURES

- Hardened parts for long life.
- Industry common cavity.



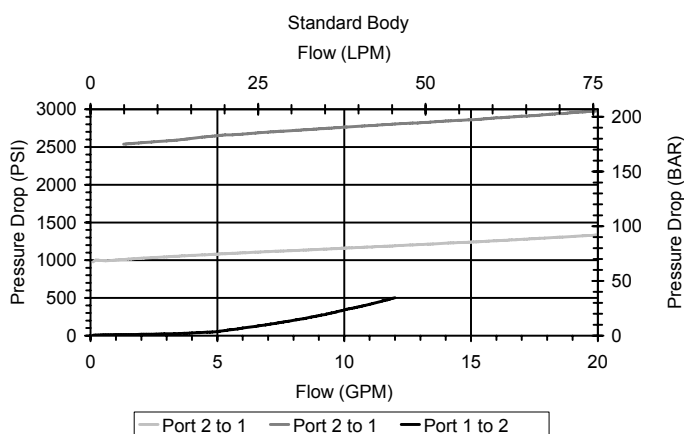
HYDRAULIC SYMBOL



Consult chart for flow capacity (1) to (2).

PERFORMANCE

Actual Test Data (Cartridge Only)



VALVE SPECIFICATIONS

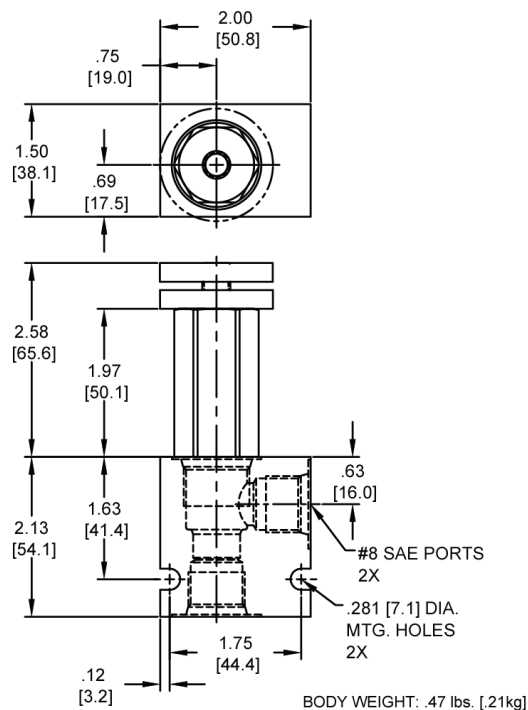
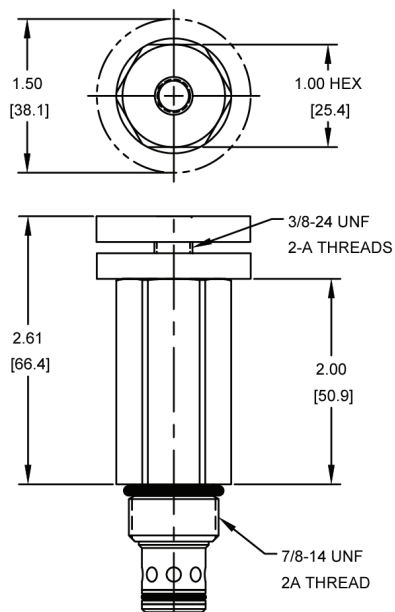
Nominal Flow	15 GPM (57 LPM)
Rated Operating Pressure	4000 PSI (276 bar)
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temperature Range	-40° to 250° F (-40° to 120° C)
Weight	.53 lbs. (.24 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	30 ft-lbs (40.6 Nm)
Cavity	DELTA 2W
Cavity Form Tool (Finishing)	40500000
Seal Kit	21191200

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com


DIMENSIONS

ORDERING INFORMATION
DE-RWR
OPTIONS

Buna Standard **00**
 Viton Standard **V0**
 Buna, Knob **0K**
 Viton, Knob **VK**
 Internally Adj. Buna **0I**
 Internally Adj. Viton **VI**
 Tamper Proof Buna **0T**
 Tamper Proof Viton **VT**

4000

Blank **N**
S

BODIES

Without Body
 3/8 NPTF Ports
 #8 SAE Ports

PRESSURE RANGE/SETTING

1000 – 4000 PSI

Tamper Proof

Fill in 4 Digit Pressure Setting
 Example: 0500 – 500 PSI

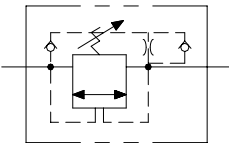
WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

Phone: (815) 397-6628

Fax: (815) 397-2526

 E-mail: delta@delta-power.com

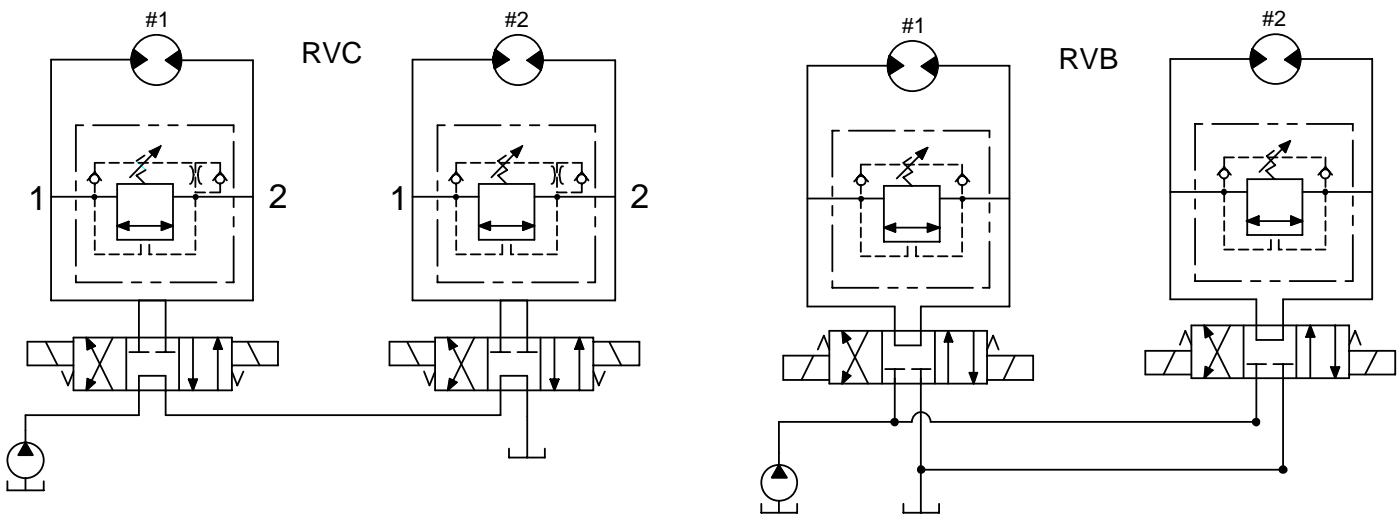
Crossover Relief Valves

	GPM	PSI	LPM	BAR	MODEL	PAGE
	15	4000	57	276	DE-RVB	376
	15	4000	57	276	DE-RVC	378

Typical Schematic

Typical application for the RVC is in a series circuit where a load on motor #2 causes back pressure on motor #1 and relief valve #1. Vent in port 2 of RV 1 allows spring to maintain proper load on motor #1 even though back pressure is present. Port 2 pressure into spring chamber to offset back pressure. Vent at port 2 causes .2 GPM flow from port 2 to port 1.

Typical application for the RVB is in a parallel circuit where the load on motor #2 does not cause back pressure on motor #1. Relief valve maintains differential pressure across motor because one side of motor always goes to tank.



WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com



DE-RVB Crossover Relief Valve, For Parallel Circuits

DESCRIPTION

10 size, 7/8-14 thread, "Delta" series, crossover relief valve for parallel circuit applications

OPERATION

The DE-RVB is a direct-acting, cross over relief valve. When pressure at either port exceeds the nominal setting value, flow will be diverted to the opposite port.

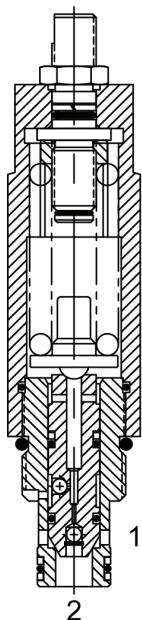
Back pressure at either port will affect the nominal setting of the opposite port on a 1:1 basis.

For correlation purposes, pre-set value will be measured at port (2). Pressure at port (1) will not vary more than ± 300 PSI from the port (2) value.

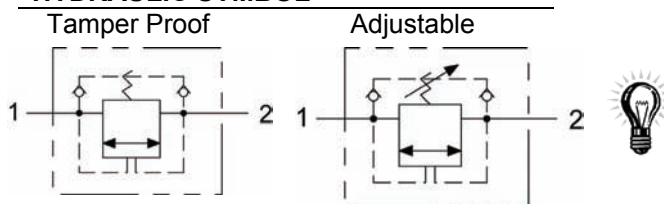
The cartridge offers smooth transition in response to load changes in common hydraulic circuits.

FEATURES

- Hardened parts for long life.
- Industry common cavity.



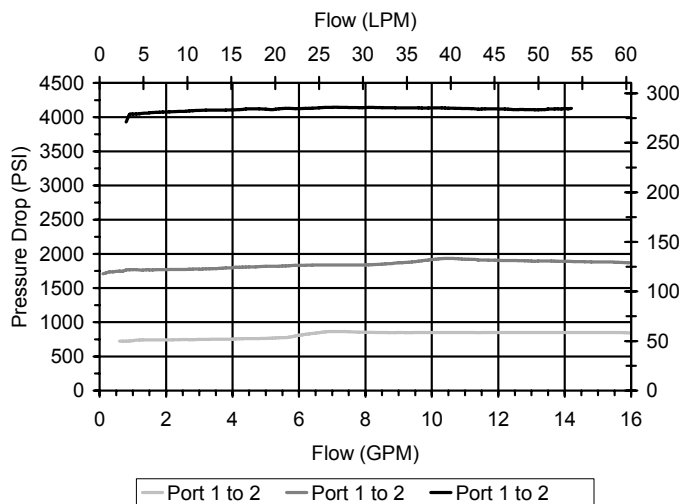
HYDRAULIC SYMBOL



The DE-RVB is designed for parallel circuit applications.
For series circuits, use DE-RVC

PERFORMANCE

Actual Test Data (Cartridge Only)



VALVE SPECIFICATIONS

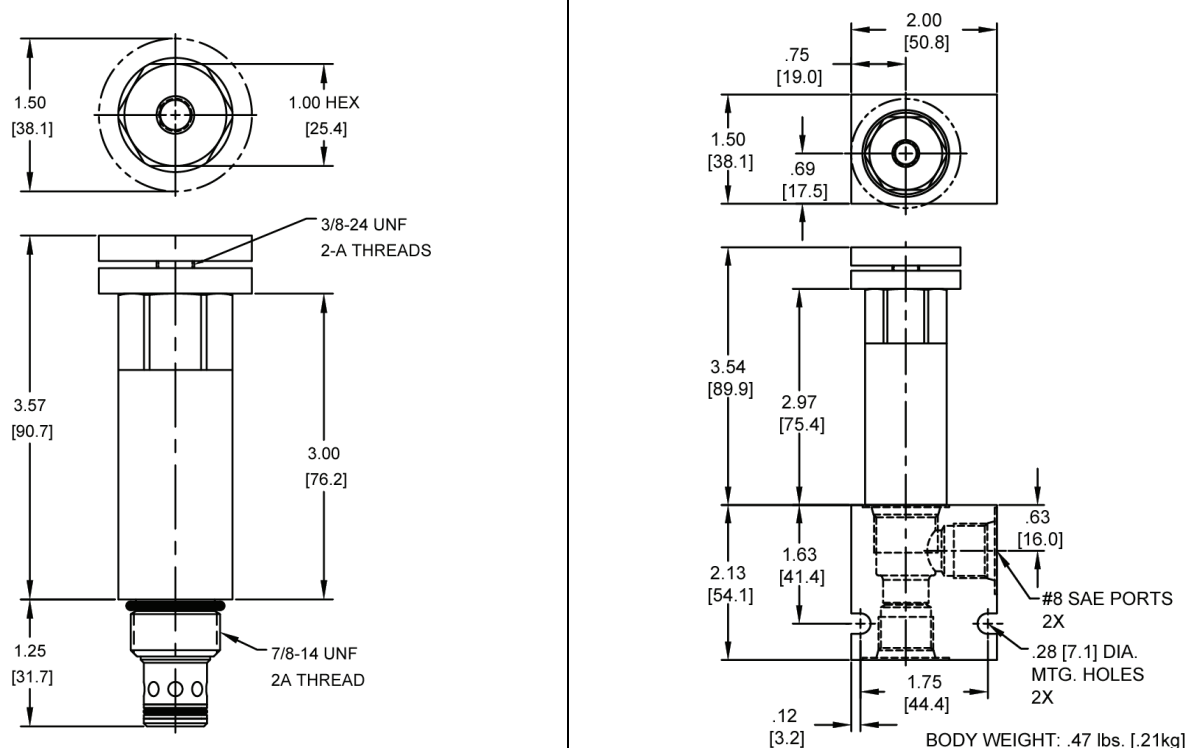
Nominal Flow	15 GPM (57 LPM) FROM (2) TO (1) 20 GPM (76 LPM) FROM (1) TO (2)
Rated Operating Pressure	4000 PSI (276 bar)
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temperature Range	-40° to 250° F (-40° to 120° C)
Weight	.80 lbs. (.36 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	30 ft-lbs (40.6 Nm)
Cavity	DELTA 2W
Cavity Form Tool (Finishing)	40500000
Seal Kit	21191202

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com


DIMENSIONS

ORDERING INFORMATION
DE-RVB
OPTIONS

Buna Standard **00**
 Viton Standard **V0**
 Buna, Knob **0K**
 Viton, Knob **VK**
 Buna, Internal Adjust **0I**
 Viton, Internal Adjust **VI**
 Buna, Tamper Proof **0T**
 Viton, Tamper Proof **VT**

0700
1800
4000

Blank **N**
S

BODIES

Without Body
 3/8 NPTF Ports
 #8 SAE Ports

PRESSURE RANGE/SETTING
Ext./Int. Adjustable

100 – 700 PSI
 500 – 1800 PSI
 1000 – 4000 PSI

Tamper Proof

Fill in 4 Digit Pressure Setting
 Example: 0500 – 500 PSI

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Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com



DE-RVC Crossover Relief Valve, For Series Circuits

DESCRIPTION

10 size, 7/8-14 thread, "Delta" series, crossover relief valve for series circuit application

OPERATION

The DE-RVC is a direct-acting, cross over relief valve. When pressure at either port exceeds the nominal setting value, flow will be diverted to the opposite port.

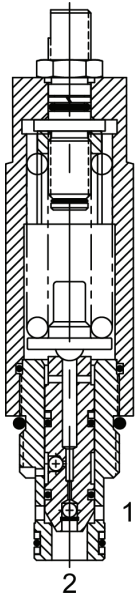
Back pressure at either port will affect the nominal setting of the opposite port on a 1:1 basis.

For correlation purposes, pre-set value will be measured at port (2). Pressure at port (1) will not vary more than ± 300 PSI from the port (2) value.

The cartridge offers smooth transition in response to load changes in common hydraulic circuits.

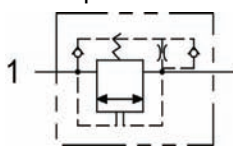
FEATURES

- Hardened parts for long life.
- Industry common cavity.

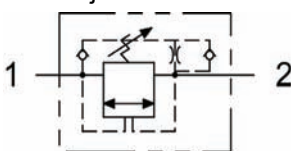


HYDRAULIC SYMBOL

Tamper Proof



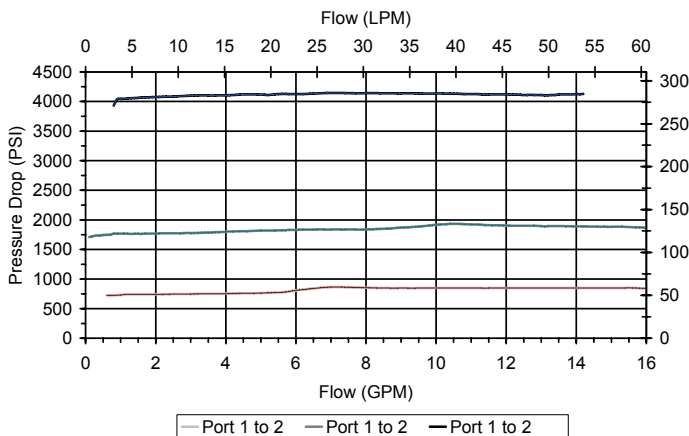
Adjustable



The DE-RVC is designed for series circuit applications with controlled leakage between ports (2) and (1). For parallel circuits, use DE-RVB.

PERFORMANCE

Actual Test Data (Cartridge Only)



VALVE SPECIFICATIONS

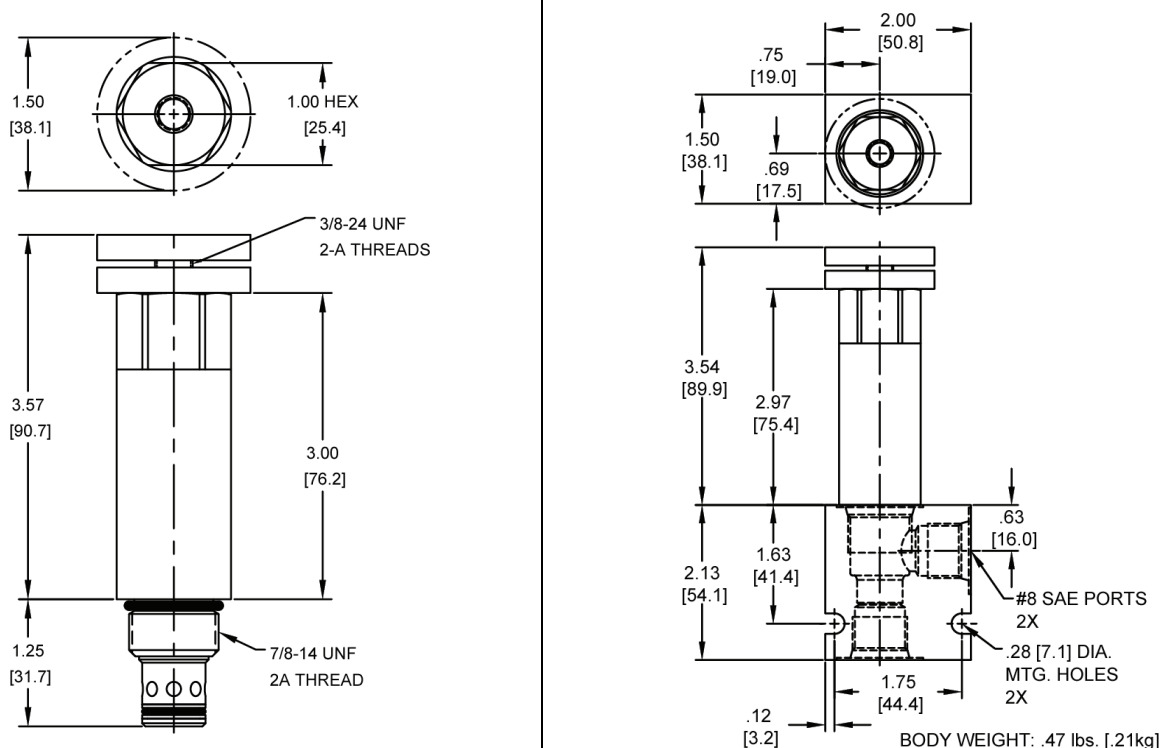
Nominal Flow	15 GPM (57 LPM) FROM (2) TO (1) 20 GPM (76 LPM) FROM (1) TO (2)
Rated Operating Pressure	4000 PSI (276 bar)
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temperature Range	-40° to 250° F (-40° to 120° C)
Weight	.80 lbs. (.36 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	30 ft-lbs (40.6 Nm)
Cavity	DELTA 2W
Cavity Form Tool (Finishing)	40500000
Seal Kit	21191202

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Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com


DIMENSIONS

ORDERING INFORMATION
DE-RVC
OPTIONS

Buna Standard
 Viton Standard
 Buna, Knob
 Viton, Knob
 Buna, Internal Adjust
 Viton, Internal Adjust
 Buna, Tamper Proof
 Viton, Tamper Proof

00
V0
0K
VK
0I
VI
0T
VT

0700
1800
4000

Blank
N
S

BODIES

Without Body
 3/8 NPTF Ports
 #8 SAE Ports

PRESSURE RANGE/SETTING
Ext./Int. Adjustable

100 – 700 PSI
 500 – 1800 PSI
 1000 – 4000 PSI

Tamper Proof

Fill in 4 Digit Pressure Setting
 Example: 0500 – 500 PSI

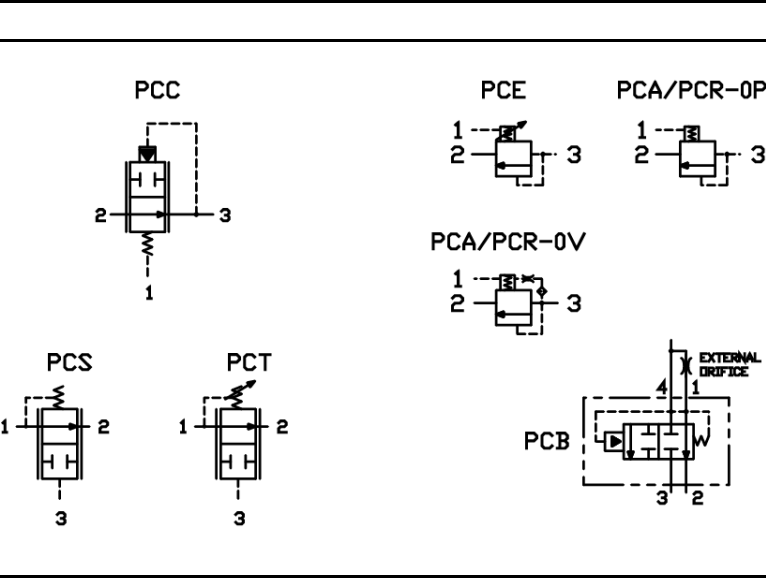
WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

Phone: (815) 397-6628

Fax: (815) 397-2526

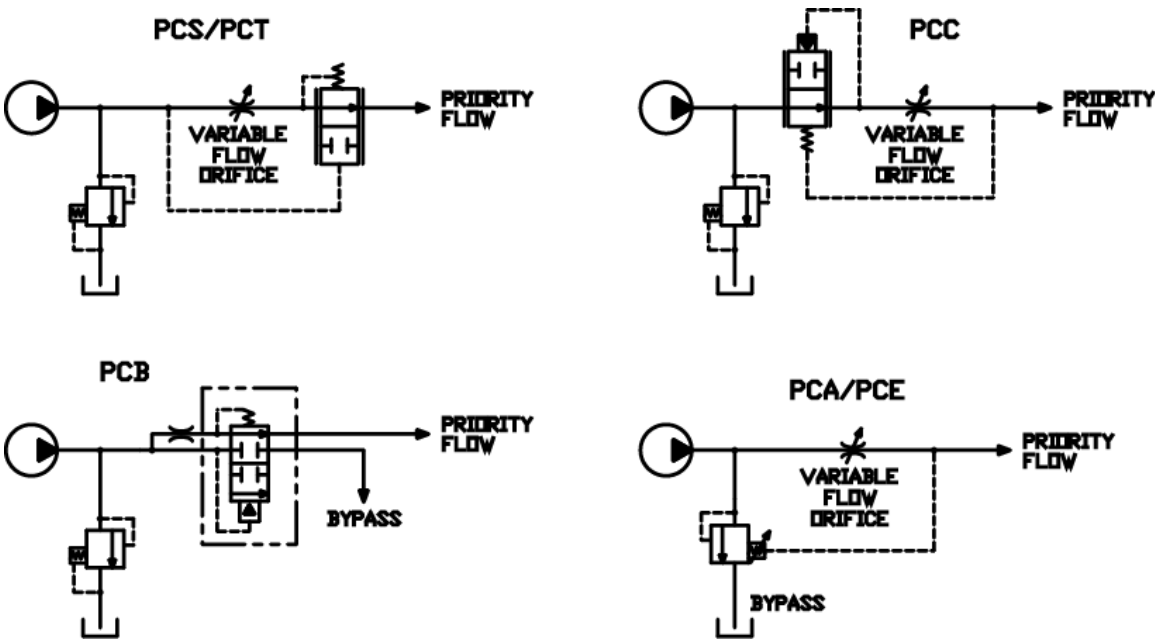
 E-mail: delta@delta-power.com

Pressure Compensated Regulator Valves

	GPM	PSI	LPM	BAR	MODEL	PAGE
	40	3500	151	241	TR-PCA	382
	40	3500	151	241	SL-PCA	384
	10	3500	38	241	DG-PCB	386
	40	3500	151	241	SL-PCB	388
	8	3000	30	207	PP-PCC	390
	20	3500	76	241	TR-PCC	392
	10	3500	38	241	DF-PCE	394
	40	3500	151	241	SL-PCE	396
	10	3500	38	241	DF-PCR	398
	10	3500	38	241	DF-PCS	400
	10	3500	38	241	DF-PCT	402

Typical Schematics

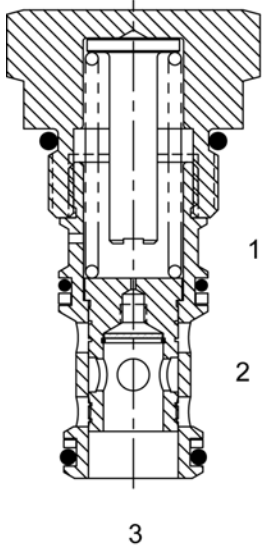
These very flexible pressure compensator valves can regulate flow through many types of orifices: Electro-Proportional Orifices, Plate or Set Screw Orifices, Needle Valves &/or even across the pressure drop of other control valve(s). When using multiple compensating devices in the same circuit it is good practice to keep at least 50 PSID between their settings to reduce the likelihood of cross talking during dynamic events.



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TR-PCA Pressure Compensating Regulator Valve



DESCRIPTION

12 size, 1 1/16-12 thread, "Tecnord" series, pressure compensating regulator valve.

OPERATION

The TR-PCA-0P with an orifice between ports (3) and (1) maintains a constant flow rate from (3) regardless of load pressure changes in the system upstream of (3), or in the bypass leg at (2) as long as pressure at (2) is less than (1).

The valve's spool maintains a constant differential pressure across an external orifice, thereby regulating the hydraulic flow rate across this external orifice. (see options table for pressure ranges)

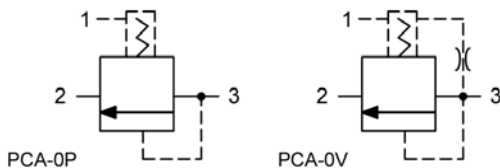
When used with an orifice as described above, it functions as a priority type regulator, delivering pump flow first to the external orifice, then bypassing excess to (2). All ports may be fully pressurized.

The TR-PCA-0V with a dump valve and a pilot relief valve at (1) acts as main stage of a ventable relief valve.

FEATURES

- Hardened parts for long life.
- Industry common cavity.

HYDRAULIC SYMBOL



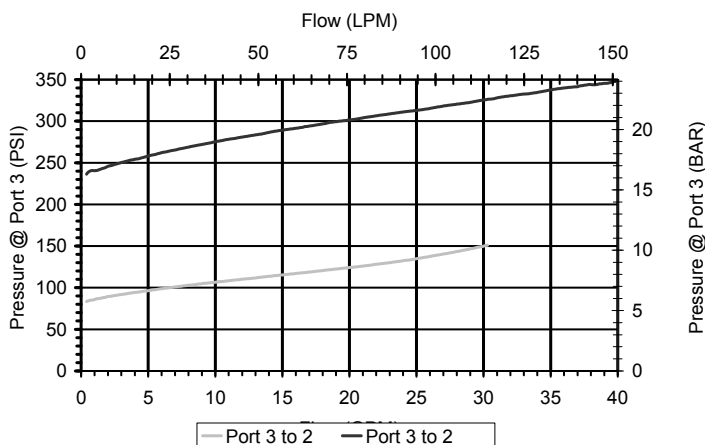
Can be used as a logic element.

TR-PCA-0P is commonly used as a bypass flow regulator (90 and 150 PSI recommended).

TR-PCA-0V is commonly used as the main stage of a ventable relief valve (50 and 90 PSI recommended).

PERFORMANCE

Actual Test Data (Cartridge Only)



VALVE SPECIFICATIONS

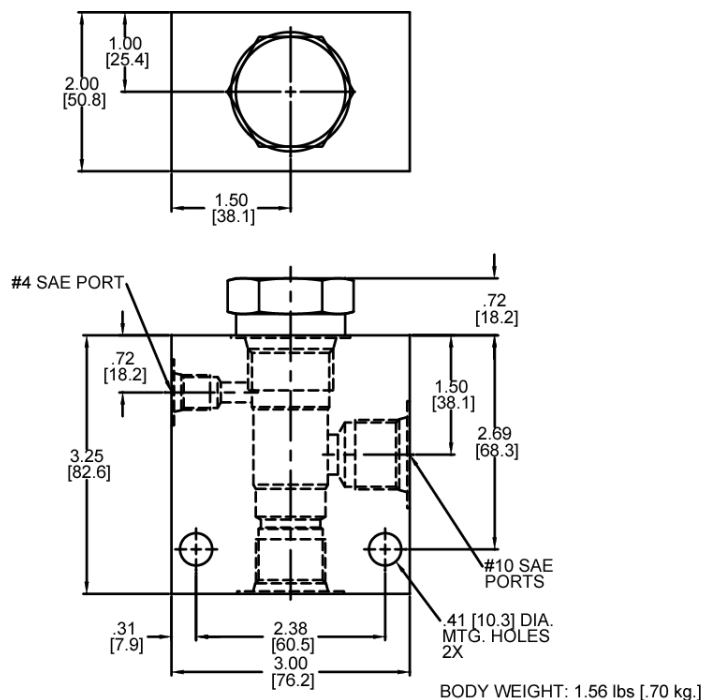
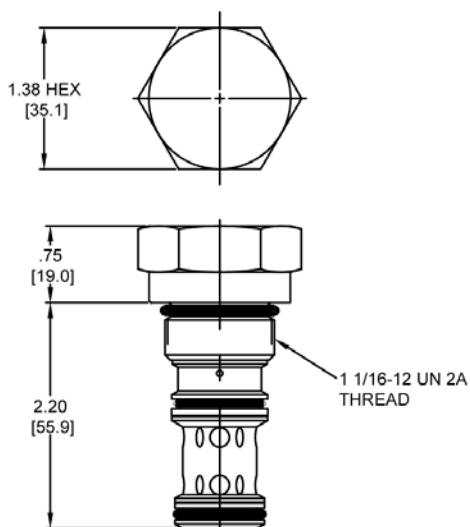
Nominal Flow	40 GPM (151 LPM)
Rated Operating Pressure	3500 PSI (241 bar)
Seat Ratio	Area of Pilot is equal to the area at Port (3)
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temperature Range	-40° to 250° F (-40° to 120° C)
Weight	.54 lbs. (.24 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	70 ft-lbs (95 Nm)
Cavity	TECNORD 3WS
Cavity Form Tool (Finishing)	40500033
Seal Kit	21191306

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com


DIMENSIONS

ORDERING INFORMATION
TR-PCA
OPTIONS
 Buna, Pilot to Close
 Buna, Vent to Open
 Viton, Pilot to Close
 Viton, Vent to Open

OP
OV
VP
VV

 Blank
S
BODIES
 Without Body
 #10 SAE Ports

Δ P SETTING
@ 1 GPM with Pilot Vented
 0020 20 PSI
 0050 50 PSI
 0090 90 PSI
 0150 150 PSI
 0230 230 PSI
 ± 10%

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Phone: (815) 397-6628

Fax: (815) 397-2526

 E-mail: delta@delta-power.com



SL-PCA Pressure Compensating Regulator Valve

DESCRIPTION

16 size, 1 5/16-12 thread, "Super" series, pressure compensating regulator valve.

OPERATION

The SL-PCA-0P with an external orifice between ports (3) and (1) maintains a constant flow rate across the external orifice, regardless of load pressure changes in the system upstream of (3), or in the bypass leg at (2) as long as pressure at (2) is less than (1).

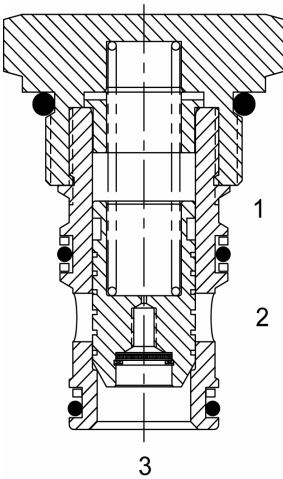
The valve's spool maintains a constant differential pressure across the external orifice, thereby regulating the hydraulic flow rate across the external orifice. (see options table for pressure ranges)

When used with an orifice as described above, it functions as a priority type regulator, delivering pump flow first to the external orifice, then bypassing excess to (2). All ports may be fully pressurized.

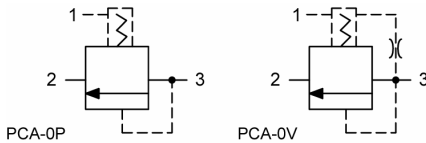
The SL-PCA-0V with a dump valve and a pilot relief valve at (1) acts as main stage of a ventable relief valve.

FEATURES

- Hardened parts for long life.
- Industry common cavity.



HYDRAULIC SYMBOL



Can be used as a logic element.

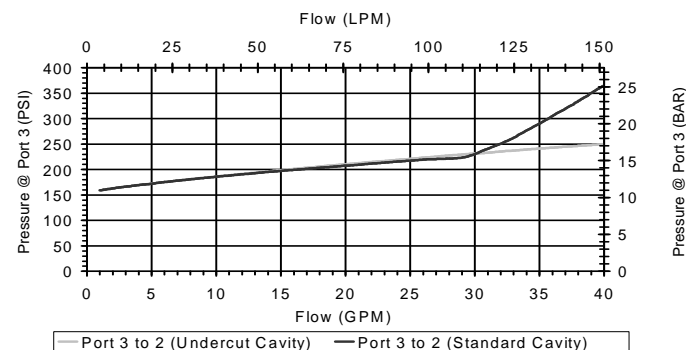
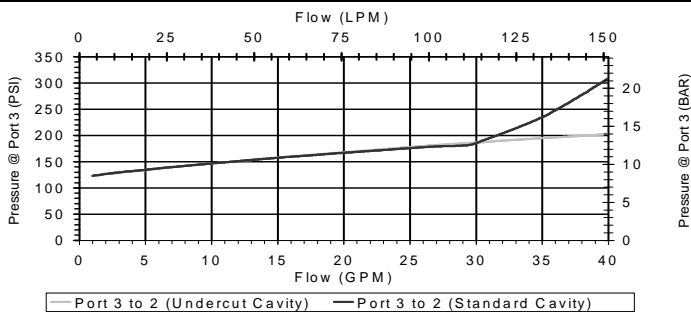
SL-PCA-0P is commonly used as a bypass flow regulator (100 PSI recommended).

SL-PCA-0V is commonly used as the main stage of a ventable relief valve (50 and 100 PSI recommended).



PERFORMANCE

Actual Test Data (Cartridge Only)



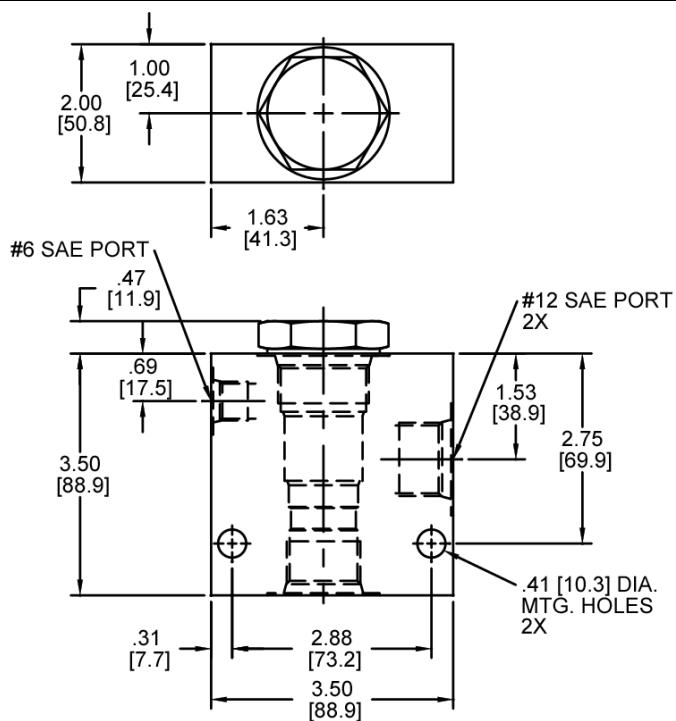
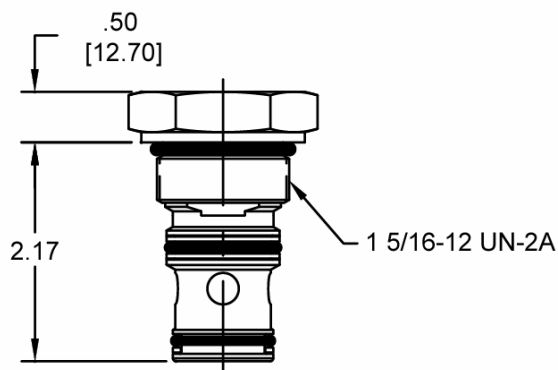
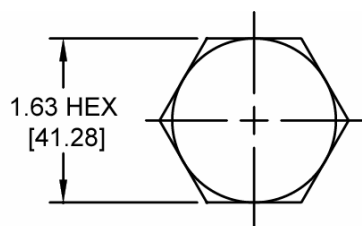
VALVE SPECIFICATIONS

Nominal Flow	40 GPM (151 LPM)
Rated Operating Pressure	3500 PSI (241 bar)
Seat Ratio	Initially area of Pilot is 1.2 times the area at Port (3), then 1:1
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temperature Range	-40° to 250° F (-40° to 120° C)
Weight	.70 lbs. (.32 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	90 ft-lbs (122 Nm)
Cavity	SUPER 3WS
Cavity Form Tool (Finishing)	40500021
Seal Kit	21191406

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DIMENSIONS



BODY WEIGHT: 1.89 lbs. [.86 kg.]

ORDERING INFORMATION

SL-PCA

OPTIONS
 Buna, Pilot to Close
 Buna, Vent to Open
 Viton, Pilot to Close
 Viton, Vent to Open
 Buna, Pilot to Close with Seals
 Buna, Vent to Open with Seals
 Viton, Pilot to Close with Seals
 Viton, Vent to Open with Seals

OP
OV
VP
VV
OB
OC
VB
VC

0020
0050
0100
0150

Blank
S

BODIES

Without Body
 #12 SAE Ports

Δ P SETTING

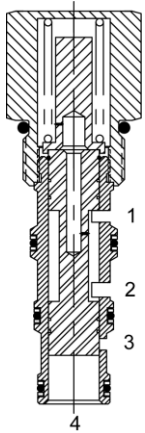
@ 1 GPM with Pilot Vented

20 PSI
 50 PSI
 100 PSI
 150 PSI

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.



DG-PCB Pressure Compensating Valve, Restrictive Type With By-pass



DESCRIPTION

10 size, 7/8-14 thread, "Delta" series, pressure compensating valve, restrictive type with by-pass.

OPERATION

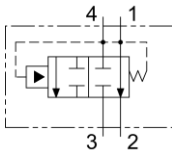
The DG-PCB allows pressure compensated or proportional flow from (1) to (2) regulated by the pressure differential across (1) and (4) with a bypass of (4) to (3).

The spring chamber is constantly connected at (1).

FEATURES

- Hardened parts for longer life.
- Industry common cavity.

HYDRAULIC SYMBOL



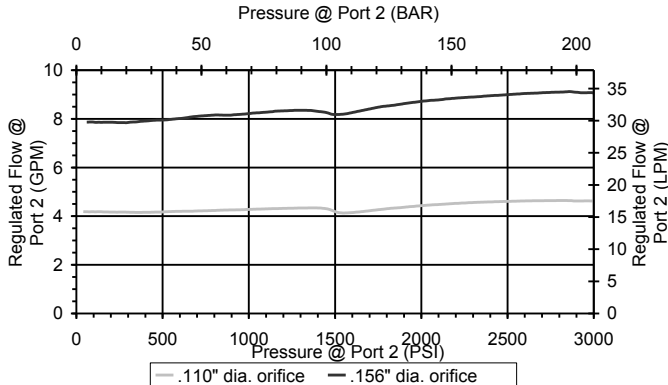
DG-PCB is not intended for differential pressure more than 1500 PSI from (4) to (3).

Consult Factory for abrupt pressure change applications that exceed 1500 PSI, for alternative products.

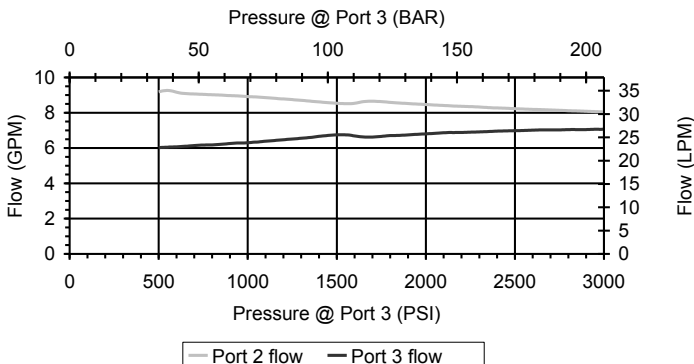
PERFORMANCE

Actual Test Data (Cartridge Only with 150 PSI Spring)

10 gpm supply flow, .110" orifice, 150 psi spring
15 gpm supply flow, .156" orifice, 150 psi spring
1500 psi load on port 3



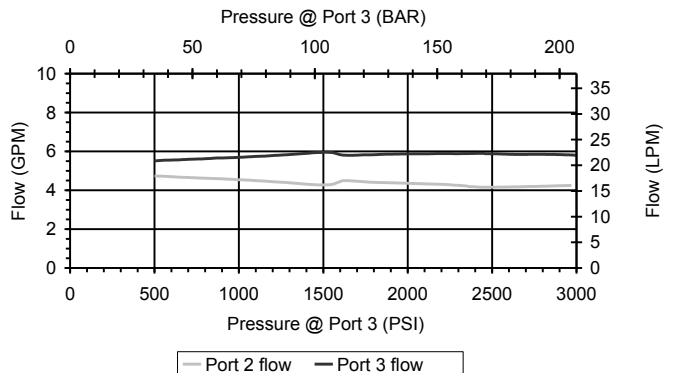
priority port 2 load: 1500-1700 psi, .156" dia orifice, 15 gpm supply
not intended for differential pressure > 1500 psi port 4 to port 3



VALVE SPECIFICATIONS

Nominal Flow	10 GPM (38 LPM)
Rated Operating Pressure	3500 PSI (241 bar)
Typical Internal Leakage (150 SSU)	5 cu in/min (82 ml/min) per path
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temperature Range	-40° to 250° F (-40° to 120° C)
Weight	.38 lbs. (.17 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	30 ft-lbs (40.6 Nm)
Cavity	DELTA 4W
Cavity Form Tool (Finishing)	40500002
Seal Kit	21191214

priority port 2 load: 1500-1700 psi, .110" dia orifice, 10 gpm supply
not intended for differential pressure > 1500 psi port 4 to port 3

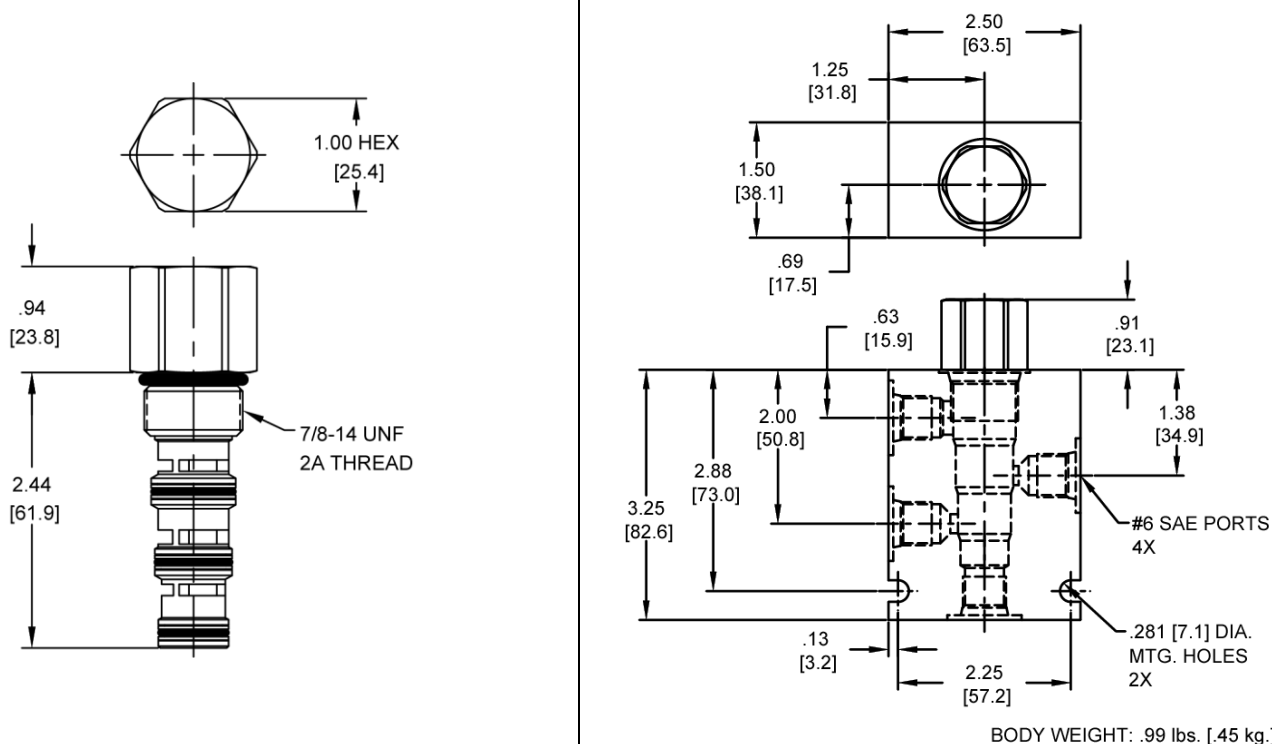


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Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com

**DIMENSIONS****ORDERING INFORMATION****DG-PCB****OPTIONS**Buna Standard
Viton Standard**00**
V0Blank
N
S**BODIES**Without Body
1/4 NPTF Ports
#6 SAE Ports**PRESSURE DIFFERENTIAL**150 PSI
250 PSIDifferential Pressure Across
External Controlling Orifice

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com



SL-PCB Pressure Compensating Regulator Valve

DESCRIPTION

16 size, 1 5/16-12 thread, "Super" series, pressure compensating regulator valve.

OPERATION

The SL-PCB-0P with an orifice between ports (3) and (1) maintains a constant flow rate from (3) regardless of load pressure changes in the system upstream of (3), or in the bypass leg at (2) as long as pressure at (2) is less than (1).

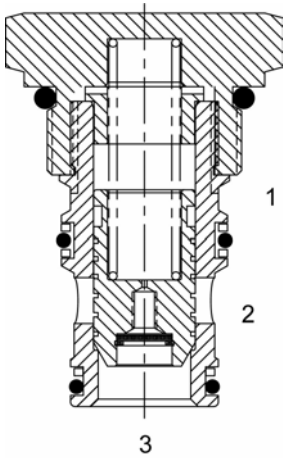
The valve's spool maintains a constant differential pressure across an internal orifice, thereby regulating the hydraulic flow rate from across this external orifice. (see options table for pressure ranges)

When used with an orifice as described above, it functions as a priority type regulator, delivering pump flow first to the external orifice, then bypassing excess to (2). All ports may be fully pressurized.

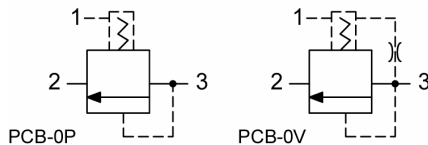
The SL-PCB-0V with a dump valve and a pilot relief valve at (1) acts as main stage of a ventable relief valve.

FEATURES

- Hardened parts for long life.
- Industry common cavity.



HYDRAULIC SYMBOL



Can be used as a logic element.

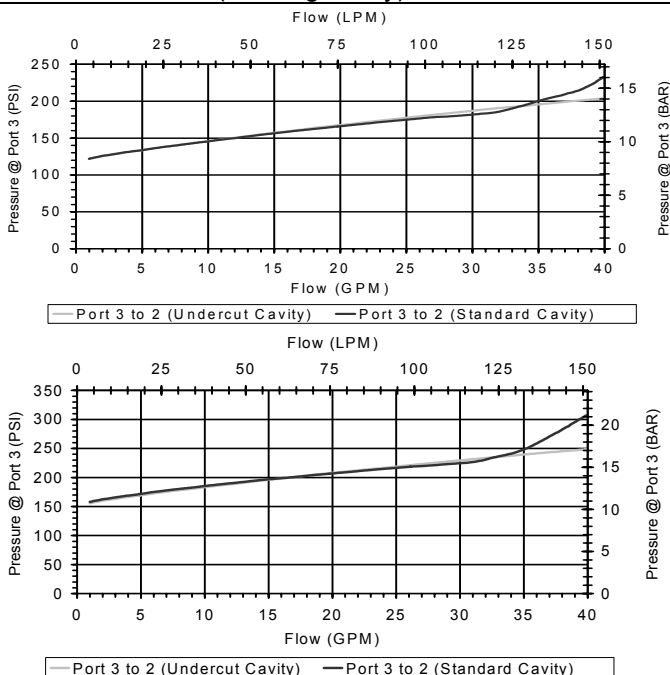
SL-PCB-0P is commonly used as a bypass flow regulator (100 PSI recommended).

SL-PCB-0V is commonly used as the main stage of a ventable relief valve (50 and 100 PSI recommended).



PERFORMANCE

Actual Test Data (Cartridge Only)



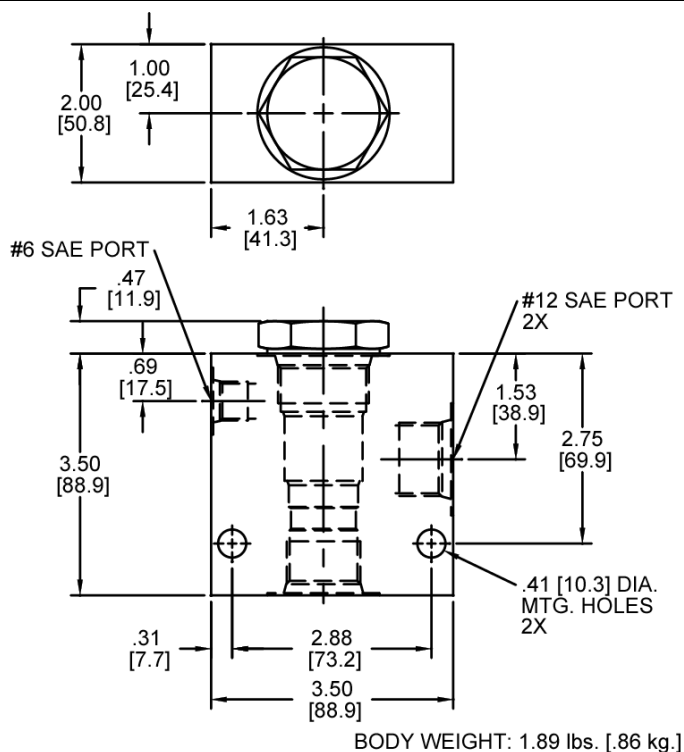
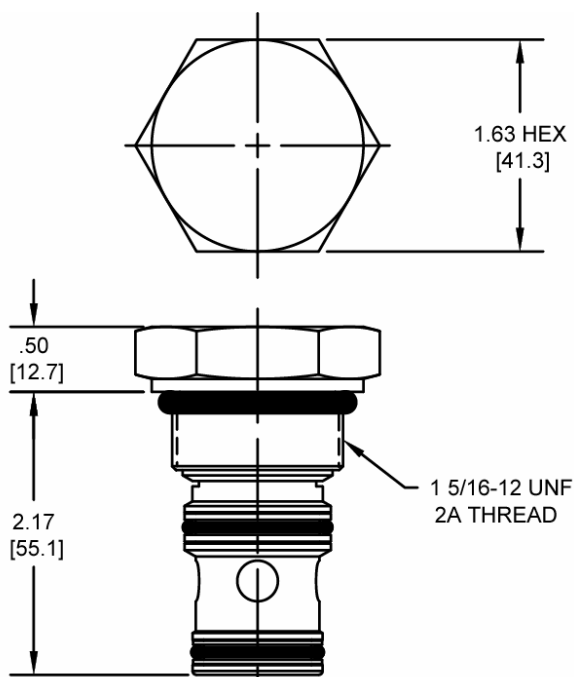
VALVE SPECIFICATIONS

Nominal Flow	40 GPM (151 LPM)
Rated Operating Pressure	3500 PSI (241 bar)
Seat Ratio	Initially area of Pilot is 1.5 times the area at Port (3), then 1:1
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temperature Range	-40° to 250° F (-40° to 120° C)
Weight	.71 lbs. (.32 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	90 ft-lbs (122 Nm)
Cavity	SUPER 3WS
Cavity Form Tool (Finishing)	40500017
Seal Kit	21191406

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.



DIMENSIONS



BODY WEIGHT: 1.89 lbs. [.86 kg.]

ORDERING INFORMATION

SL-PCB

OPTIONS

Buna, Pilot to Close
 Buna, Vent to Open
 Viton, Pilot to Close
 Viton, Vent to Open
 Buna, Pilot to Close with Seals
 Buna, Vent to Open with Seals
 Viton, Pilot to Close with Seals
 Viton, Vent to Open with Seals

0P
 0V
 VP
 VV
 0B
 0C
 VB
 VC

0020
 0050
 0100
 0150

Blank
 S

BODIES

Without Body
 #12 SAE Ports

Δ P SETTING

@ 1 GPM with Pilot Vented

20 PSI
 50 PSI
 100 PSI
 150 PSI
 ± 20%

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.



PP-PCC Fixed Pressure Compensating Regulator Valve - Restrictive Type

DESCRIPTION

8 size, 3/4-16 thread, "Power" series, pressure compensating regulator valve (restrictive type).

OPERATION

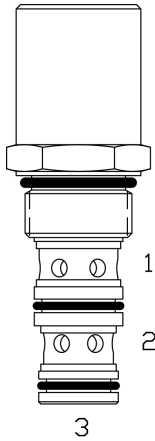
The PP-PCC-00 with an external orifice beyond port (3) and sensed by port (1) maintains a constant flow rate from (3) regardless of load pressure changes in the system downstream of (3), or in the inlet at (2) as long as pressure at (3) is above (1) by more than spring setting chosen and pump supply is in excess of demand.

The valve's spool maintains a constant differential pressure across an external orifice, thereby regulating the hydraulic flow rate across this external orifice. (see options table for pressure ranges)

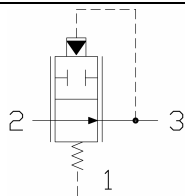
When used with an orifice as described above, it functions as a restrictive type regulator, delivering pump flow through the external orifice. All ports may be fully pressurized.

FEATURES

- Hardened parts for long life.
- Industry common cavity.



HYDRAULIC SYMBOL



Can be used as a logic element

Fixed setting pressure reducing valve. For adjustable setting see PP-PCD.

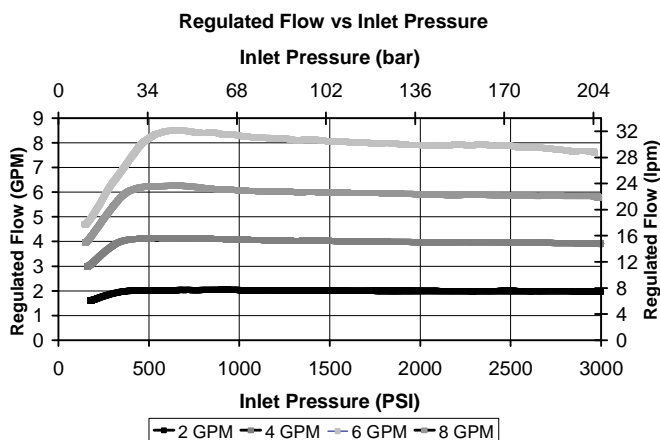
PP-PCC-00-0100 is recommended for regulated flows up to 4.0 GPM only.

PP-PCC-00-0220 is recommended for regulated flows up to 8.0 GPM.

For fixed pressure reducing/relieving valve see PP-PCP

PERFORMANCE

Actual Test Data (Cartridge Only)



VALVE SPECIFICATIONS

Nominal Flow	8 GPM (30 LPM)
Rated Operating Pressure	3000 PSI (207 bar)
Ratio	Area of Pilot is equal to the area at Port (3)
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temperature Range	-40° to 250° F (-40° to 120° C)
Weight	.25 lbs. (.11 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	25 ft-lbs (34 Nm)
Cavity	POWER 3W
Cavity Form Tool (Finishing)	40500024
Seal Kit	21191111

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

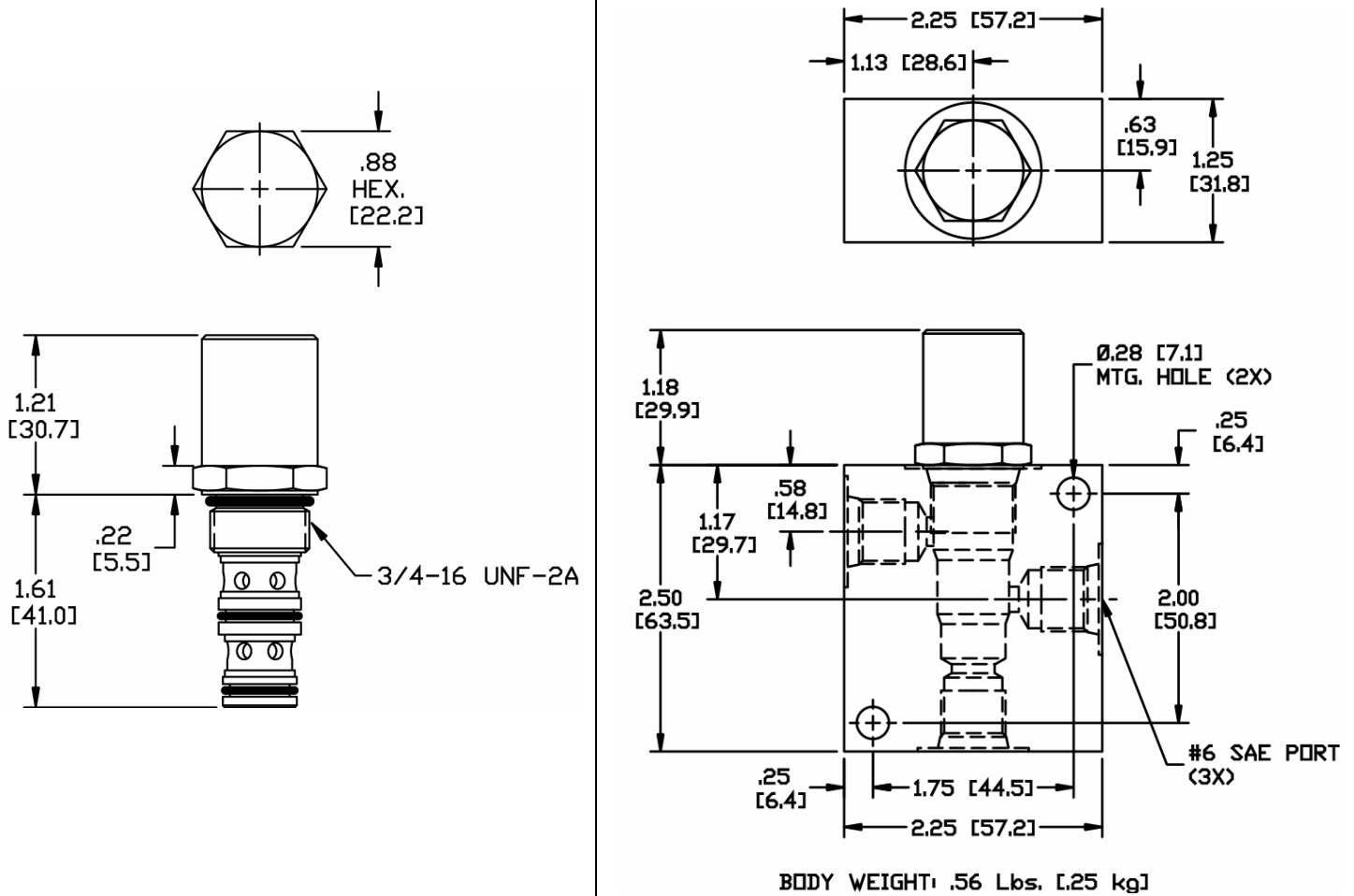
Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com



DIMENSIONS



ORDERING INFORMATION

PP-PCC

OPTIONS
 Buna, Standard **00**
 Viton, Standard **V0**
 *Urethane, Standard **U0**
 Buna, Screen **A0**
 Viton Screen **W0**
 Urethane, Screen **Y0**

Blank
S

BODIES
 Without Body
 #6 SAE Ports

Δ P SETTING

0100 100 PSI
0220 220 PSI

*Urethane seals are recommended
 when inlet pressures exceed 1500 PSI

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com



TR-PCC Pressure Compensating Regulator Valve – Restrictive Type

DESCRIPTION

12 size, 1 1/16-12 thread, "Tecnord" series, pressure compensating regulator valve (restrictive type)

OPERATION

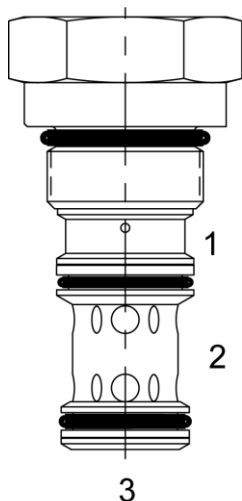
The TR-PCC with an external orifice beyond port (3) and sensed by port (1) maintains a constant flow rate from (3) regardless of load pressure changes in the system downstream of (3), or in the inlet at (2) as long as pressure at (3) is greater than (1) by more than spring setting chosen and pump supply is in excess of demand.

The valve's spool maintains a constant differential pressure across an external orifice, thereby regulating the hydraulic flow rate across this external orifice. (see table for pressure ranges)

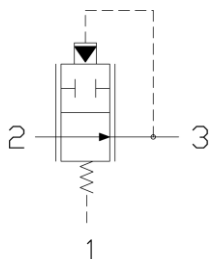
When used with an orifice as described above, it functions as a restrictive type regulator, delivering pump flow through the external orifice. All ports may be fully pressurized.

FEATURES

- Hardened parts for long life.
- Industry common cavity.



HYDRAULIC SYMBOL

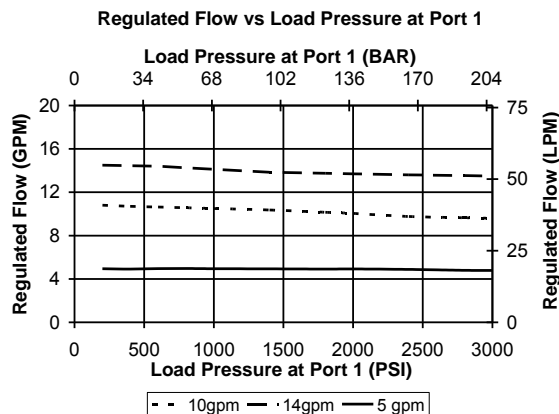


Can be used as a logic element.

Fixed setting pressure reducing valve. For adjustable setting see TR-PCD.

PERFORMANCE

Actual Test Data (Cartridge Only)



VALVE SPECIFICATIONS

Nominal Flow	20 GPM (76 LPM)
Rated Operating Pressure	3500 PSI (241 bar)
Seat Ratio	Area of Pilot is equal to the area at Port (3)
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temperature Range	-40° to 250° F (-40° to 120° C)
Weight	.54 lbs. (.24 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	70 ft-lbs (95 Nm)
Cavity	TECNORD 3WS
Cavity Form Tool (Finishing)	40500033
Seal Kit	21191306

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

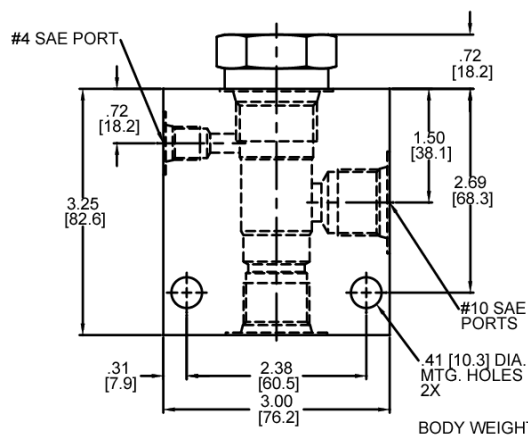
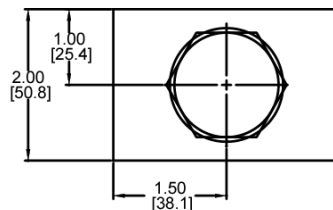
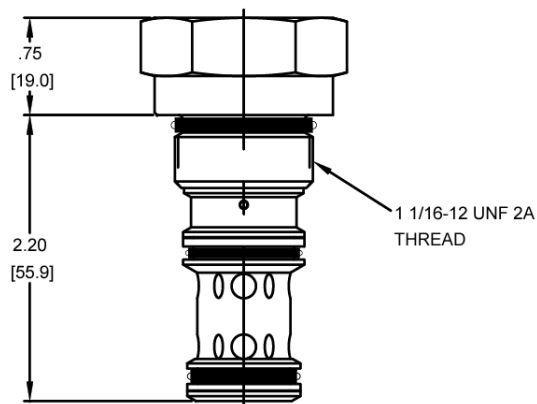
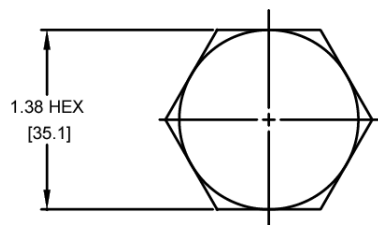
Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com



DIMENSIONS



BODY WEIGHT: 1.56 lbs [.70 kg.]

ORDERING INFORMATION

TR-PCC - - -			BODIES
OPTIONS			
Buna	00	Blank	Without Body
Viton	V0	S	#10 SAE Ports
			<u>Δ P SETTING</u>
			<u>@ 1 GPM with Pilot Vented</u>
0150			150 PSI
0300			300 PSI

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com



DF-PCE Adjustable Pressure Compensating Valve, Bypass Type

DESCRIPTION

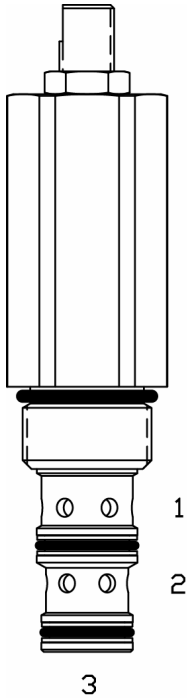
10 size, 7/8-14 thread, "Delta" series, spring adjustable pressure compensating valve, bypass type.

OPERATION

The DF-PCE with an external orifice in parallel with ports (3) and (1) maintains a constant flow rate across the external orifice, regardless of load pressure changes in the system upstream of (3), or in the bypass leg at (2) as long as pressure at (2) is greater than (1).

The valve's spool maintains a constant differential pressure across an external orifice, thereby regulating the hydraulic flow rate across this external orifice. (see table for pressure ranges)

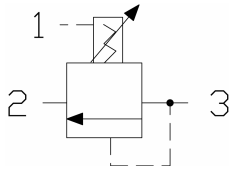
When used with an orifice as described above, it functions as a bypass type regulator, delivering pump flow through the external orifice.



FEATURES

- Hardened parts for long life.
- Industry common cavity.

HYDRAULIC SYMBOL



Can be used as an adjustable logic element.

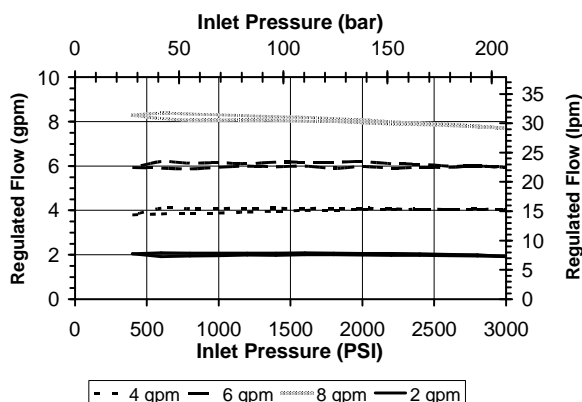
Great as an adjustable pressure setting regulation device in brake, transmission & cooling systems, because the spring chamber is separately drained, the outlet can be used for lower pressure functions. For fixed version see DF-PCR-0P.

For higher spring differential pressure ranges consult factory

PERFORMANCE

Actual Test Data (Cartridge Only)

300 psi setting /Regulated Flow vs Inlet Pressure



VALVE SPECIFICATIONS

Nominal Flow	10 GPM (38 LPM)
Rated Operating Pressure	3500 PSI (241 bar)
Seat Ratio	Area of Pilot is equal to the area at Port (3)
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temperature Range	-40° to 250° F (-40° to 120° C)
Weight	.52 lbs. (.23 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	30 ft-lbs (40.6 Nm)
Cavity	DELTA 3W
Cavity Form Tool (Finishing)	40500001
Seal Kit	21191210

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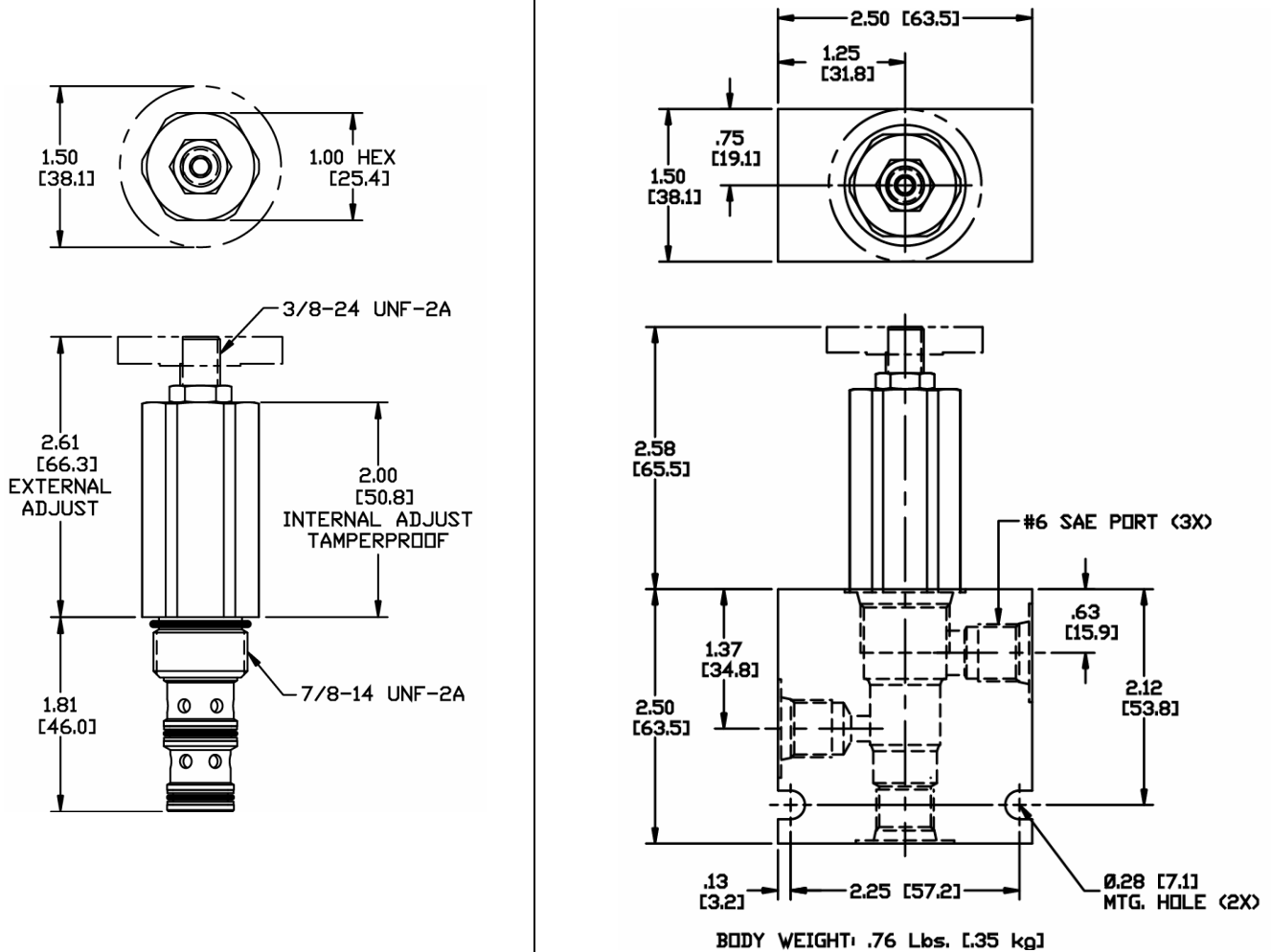
Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com



DIMENSIONS



ORDERING INFORMATION

DF-PCE

OPTIONS

Buna Standard **00**
 Viton Standard **V0**
 Buna, Knob **OK**
 Viton, Knob **VK**
 Buna, Internal Adjust **0I**
 Viton, Internal Adjust **VI**
 Buna, Tamper Proof **0T**
 Viton, Tamper Proof **VT**

0300

BODIES

Blank
N
S

PRESSURE RANGE

100-300 PSI

Differential Pressure Across
 External Controlling Orifice

TAMPER PROOF

Fill in 4 Digit Pressure Setting
 Example: 0200 = 200 PSI

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

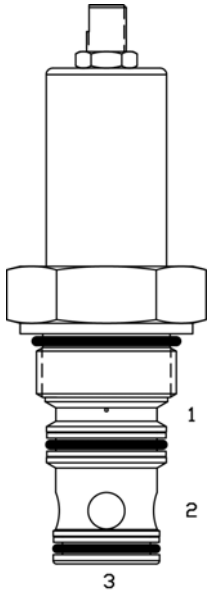
Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com



SL-PCE Adjustable Pressure Compensating Regulator Valve



DESCRIPTION

16 size, 1 5/16-12 thread, "Super" series, pressure compensating regulator valve.

OPERATION

The SL-PCE with an external orifice in parallel with ports (3) and (1) maintains a constant flow rate across the external orifice, regardless of load pressure changes in the system upstream of (3), or in the bypass leg at (2) as long as pressure at (2) is less than (1).

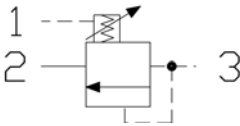
The valve's spool maintains a constant differential pressure across the external orifice, thereby regulating the hydraulic flow rate across the external orifice. (see options table for pressure ranges)

When used with an orifice as described above, it functions as a priority type regulator, delivering pump flow first to the external orifice, then bypassing excess to (2). All ports may be fully pressurized.

FEATURES

- Hardened parts for long life.
- Industry common cavity.

HYDRAULIC SYMBOL



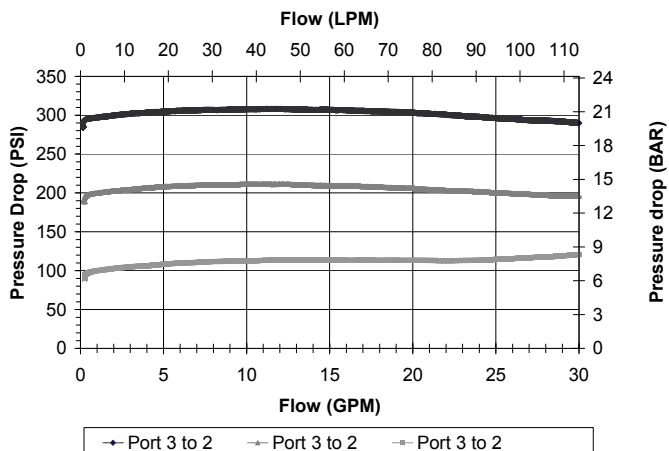
Can be used as an adjustable logic element.

Great as an adjustable pressure setting regulation device in brake, transmission & cooling systems. Because the spring chamber is separately drained, the outlet flow can be used for lower pressure functions. For fixed version see SL-PCA-0P.

For higher spring differential pressure ranges consult factory.

PERFORMANCE

Actual Test Data (Cartridge Only)



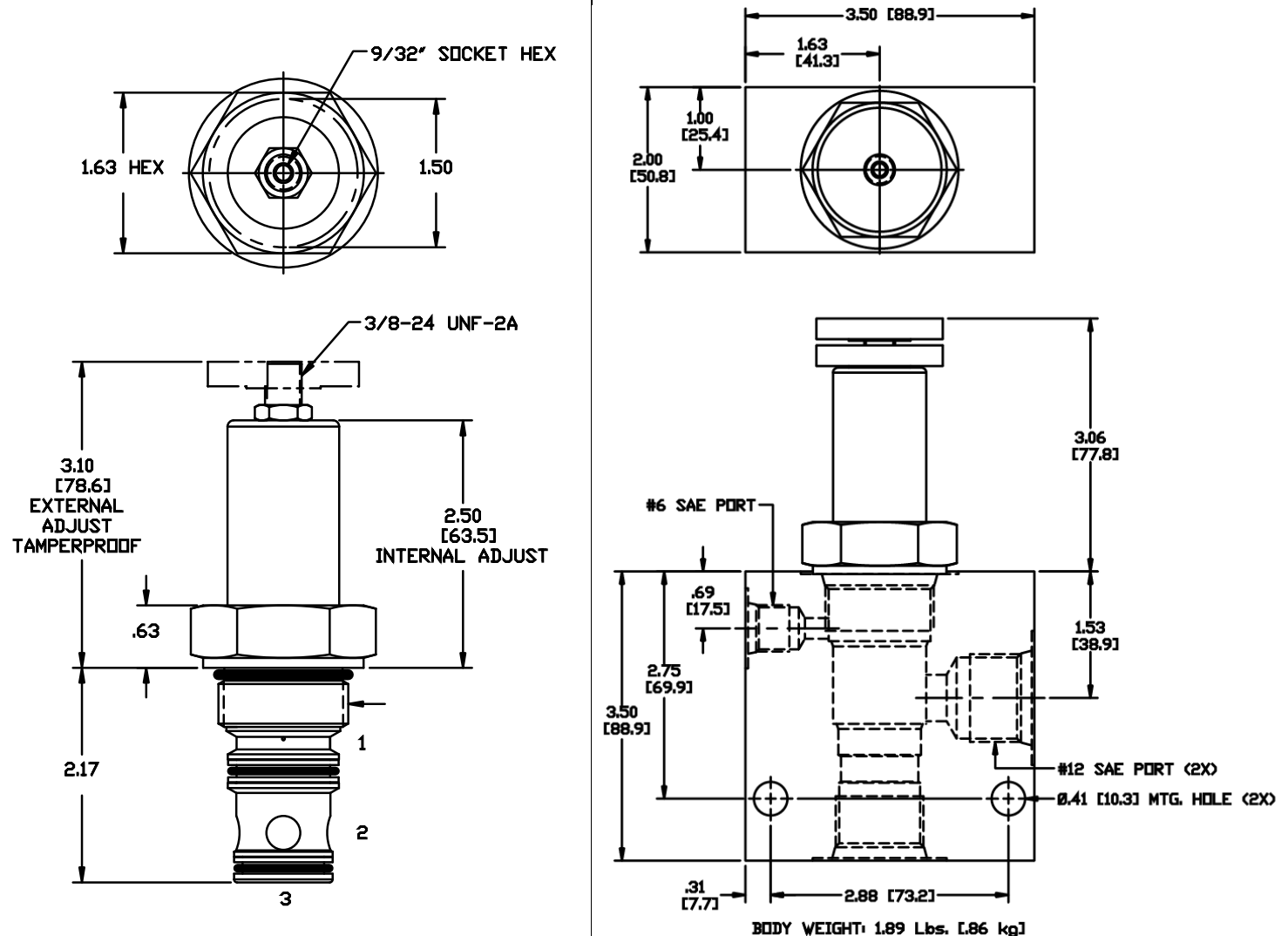
VALVE SPECIFICATIONS

Nominal Flow	40 GPM (151 LPM)
Rated Operating Pressure	3500 PSI (241 bar)
Seat Ratio	Area of pilot is equal to the area at Port (3)
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temperature Range	-40° to 250° F (-40° to 120° C)
Weight	1.15 Lbs. (.52 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	90 ft-lbs (122 Nm)
Cavity	SUPER 3WS
Cavity Form Tool (Finishing)	40500021
Seal Kit	21191406

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.



DIMENSIONS



ORDERING INFORMATION

SL-PCE

OPTIONS

Buna, Standard
Viton, Standard
Buna, Knob
Viton, Knob
Buna, Internal Adjust
Viton, Internal Adjust
Buna, Tamper Proof
Viton, Tamper Proof

00
V0
0K
VK
0I
VI
0T
VT

0300

BODIES

Blank
S

Without Body
#12 SAE Ports

PRESSURE RANGE/SETTING

50 – 300 PSI

TAMPERPROOF (fill in 4 digit pressure setting)

Example: 0200 = 200 PSI

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.



DF-PCR Pressure Compensating Regulator Valve

DESCRIPTION

10 size, 7/8-14 thread, "Delta" series, pressure compensating regulator valve.

OPERATION

The DF-PCR-0P with an orifice between ports (3) and (1) maintains a constant flow rate from (3) regardless of load pressure changes in the system upstream of (3), or in the bypass leg at (2) as long as pressure at (2) is less than (1).

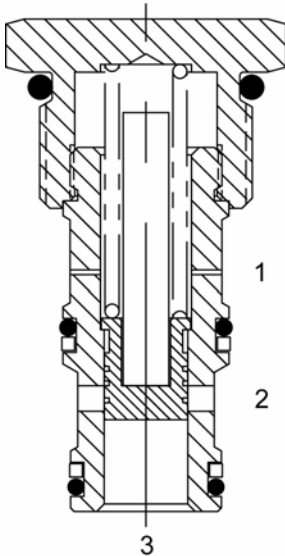
The valve's spool maintains a constant differential pressure across an external orifice, thereby regulating the hydraulic flow rate from (3) to (2). (see options table for pressure ranges)

When used with an orifice as described above, as a priority type regulator, delivering pump flow first to (3), then bypassing excess to (2). All ports may be fully pressurized.

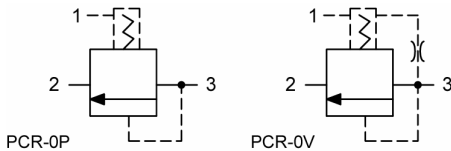
The DF-PCR-0V with a dump valve and a pilot relief valve at (1) acts as main stage of a ventable relief valve.

FEATURES

- Hardened parts for long life.
- Industry common cavity.



HYDRAULIC SYMBOL



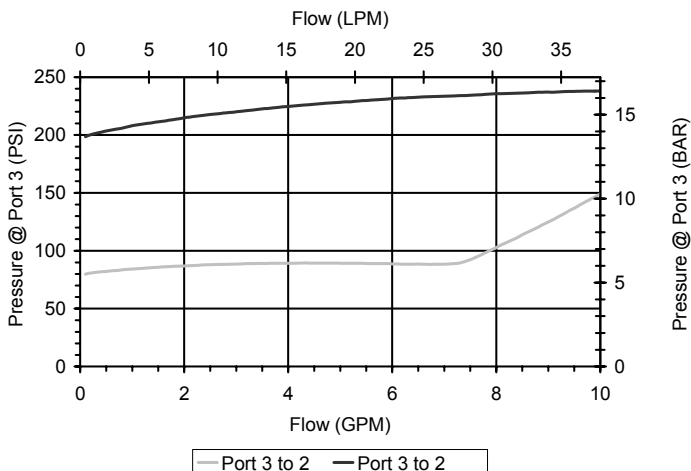
Can be used as a logic element.

DF-PCR-0P is commonly used as a bypass flow regulator (80 PSI recommended).

DF-PCR-0V is commonly used as the main stage of a ventable relief valve (40 and 80 PSI recommended).

PERFORMANCE

Actual Test Data (Cartridge Only)



VALVE SPECIFICATIONS

Nominal Flow	10 GPM (38 LPM)
Rated Operating Pressure	3500 PSI (241 bar)
Seat Ratio	Area of Pilot is equal to the area at Port (3)
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temperature Range	-40° to 250° F (-40° to 120° C)
Weight	.19 lbs. (.08 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	30 ft-lbs (40.6 Nm)
Cavity	DELTA 3W
Cavity Form Tool (Finishing)	40500001
Seal Kit	21191206

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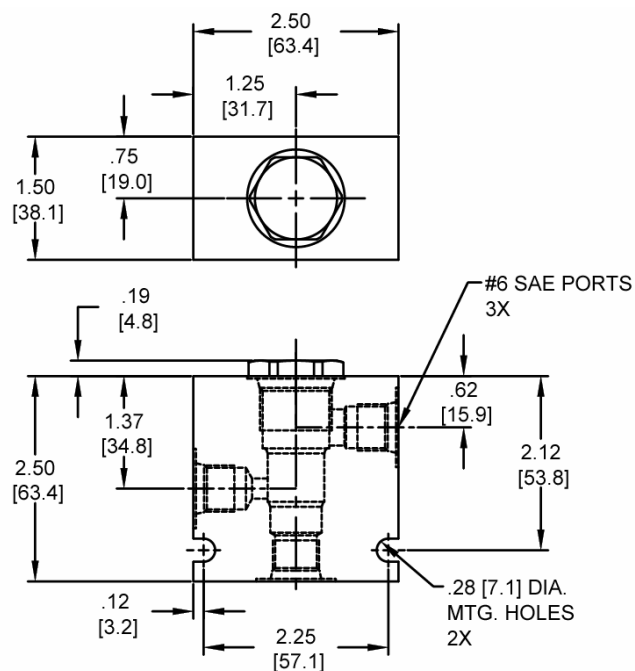
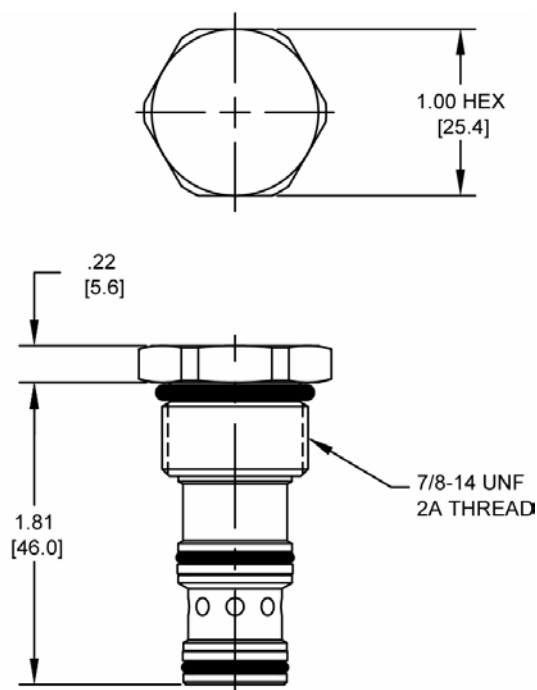
Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com



DIMENSIONS



BODY WEIGHT: .76 lbs [.35 kg.]

ORDERING INFORMATION

DF-PCR

OPTIONS
Buna, Vent to Open
Buna, Pilot to Close
Viton, Vent to Open
Viton, Pilot to Close

0V
0P
VV
VP

Blank
N
S

BODIES
Without Body
1/4 NPTF Ports
#6 SAE Ports

PRESSURE SETTING

0040 40 PSI
0080 80 PSI
0150 150 PSI
0200 200 PSI

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Fax: (815) 397-2526

E-mail: delta@delta-power.com



DF-PCS Pressure Compensating Valve, Restrictive Type

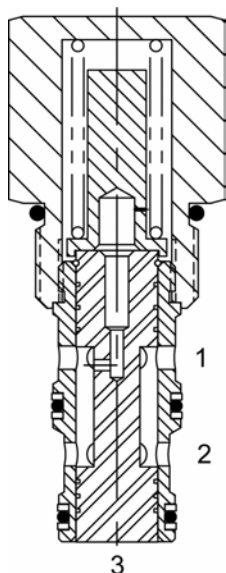
DESCRIPTION

10 size, 7/8-14 thread, "Delta" series, pressure compensating valve, restrictive type.

OPERATION

The DF-PCS allows pressure compensated flow from (1) to (2) regulated by the pressure present at (3).

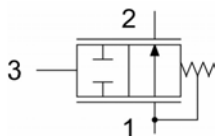
The spring chamber is constantly vented at (1).



FEATURES

- Hardened parts for long life.
- Industry common cavity.

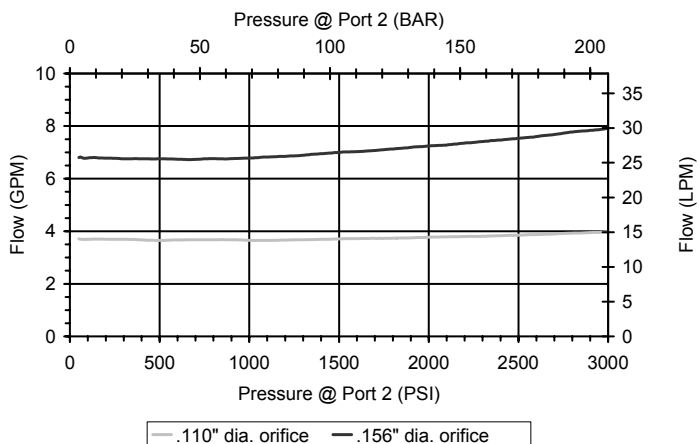
HYDRAULIC SYMBOL



Pressure compensator for flow control, typically used with an external orifice inline with port (1). Port (3) should sense upstream pressure of orifice.

PERFORMANCE

Actual Test Data (Cartridge Only)



VALVE SPECIFICATIONS

Nominal Flow	10 GPM (38 LPM)
Rated Operating Pressure	3500 PSI (241 bar)
Typical Internal Leakage (150 SSU)	5 cu in/min (82 ml/min) per path
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temperature Range	-40° to 250° F (-40° to 120° C)
Weight	.35 lbs. (.16 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	30 ft-lbs (40.6 Nm)
Cavity	DELTA 3W
Cavity Form Tool (Finishing)	40500001
Seal Kit	21191210

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

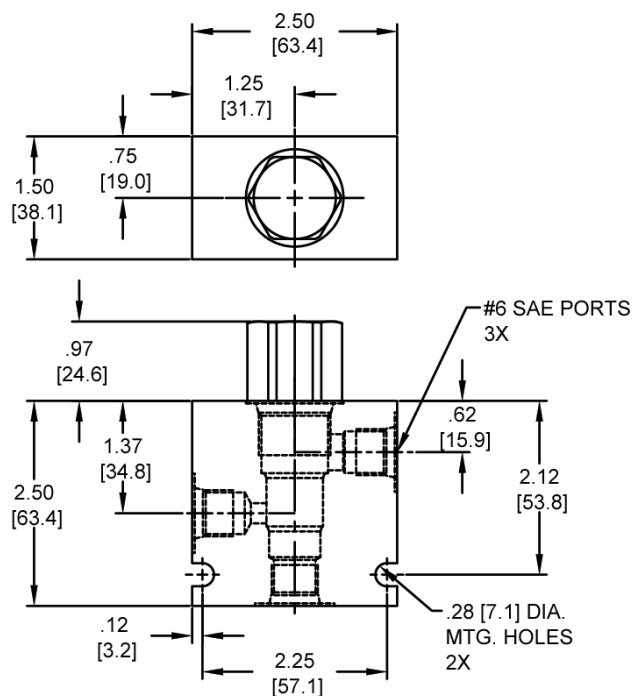
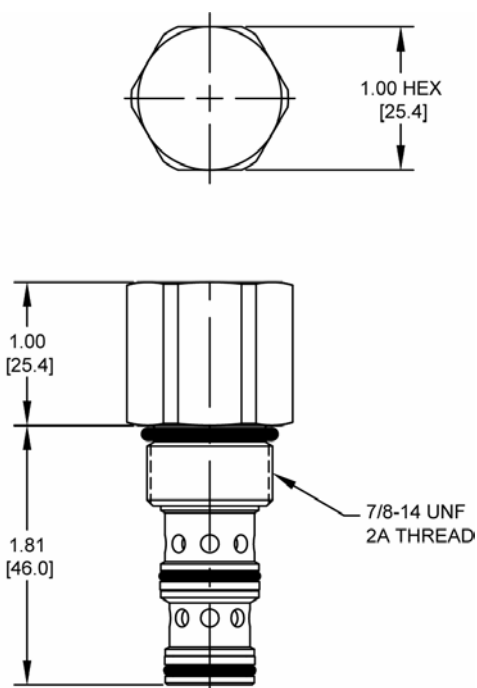
Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com



DIMENSIONS



BODY WEIGHT: .76 lbs [.35 kg.]

ORDERING INFORMATION

DF-PCS

OPTIONS
Buna Standard
Viton Standard

00
V0

Blank
N
S

BODIES
Without Body
1/4 NPTF Ports
#6 SAE Ports

PRESSURE DIFFERENTIAL

0150
0450

Differential Pressure Across
External Controlling Orifice

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

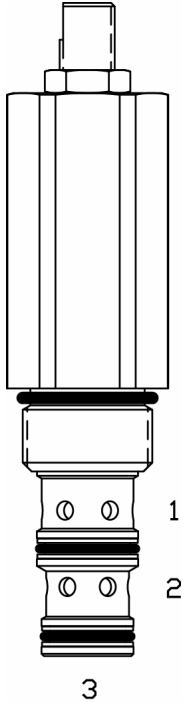
Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com



DF-PCT Adjustable Pressure Compensating Valve, Restrictive Type



DESCRIPTION

10 size, 7/8-14 thread, "Delta" series, pressure compensating valve, restrictive type.

OPERATION

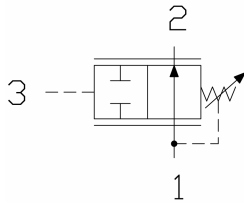
The DF-PCT with an external orifice in front of port (1) allows pressure compensated flow from (1) to (2), regulated by the pressure present at (3).

The spring chamber is constantly vented at (1).

FEATURES

- Hardened parts for long life.
- Industry common cavity.

HYDRAULIC SYMBOL



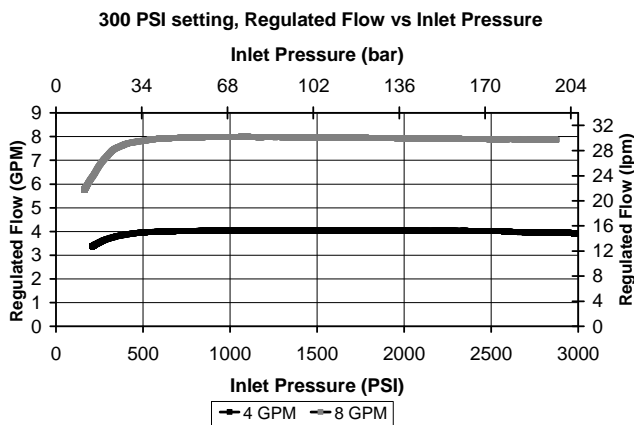
Can be used as an adjustable logic element.

For fixed version see DF-PCS.

For higher spring differential pressure ranges consult factory.

PERFORMANCE

Actual Test Data (Cartridge Only)



VALVE SPECIFICATIONS

Nominal Flow	10 GPM (38 LPM)
Rated Operating Pressure	3500 PSI (241 bar)
Typical Internal Leakage (150 SSU)	5 cu in/min (82 ml/min) per path
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temperature Range	-40° to 250° F (-40° to 120° C)
Weight	.60 lbs. (.27 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	30 ft-lbs (40.6 Nm)
Cavity	DELTA 3W
Cavity Form Tool (Finishing)	40500001
Seal Kit	21191210

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

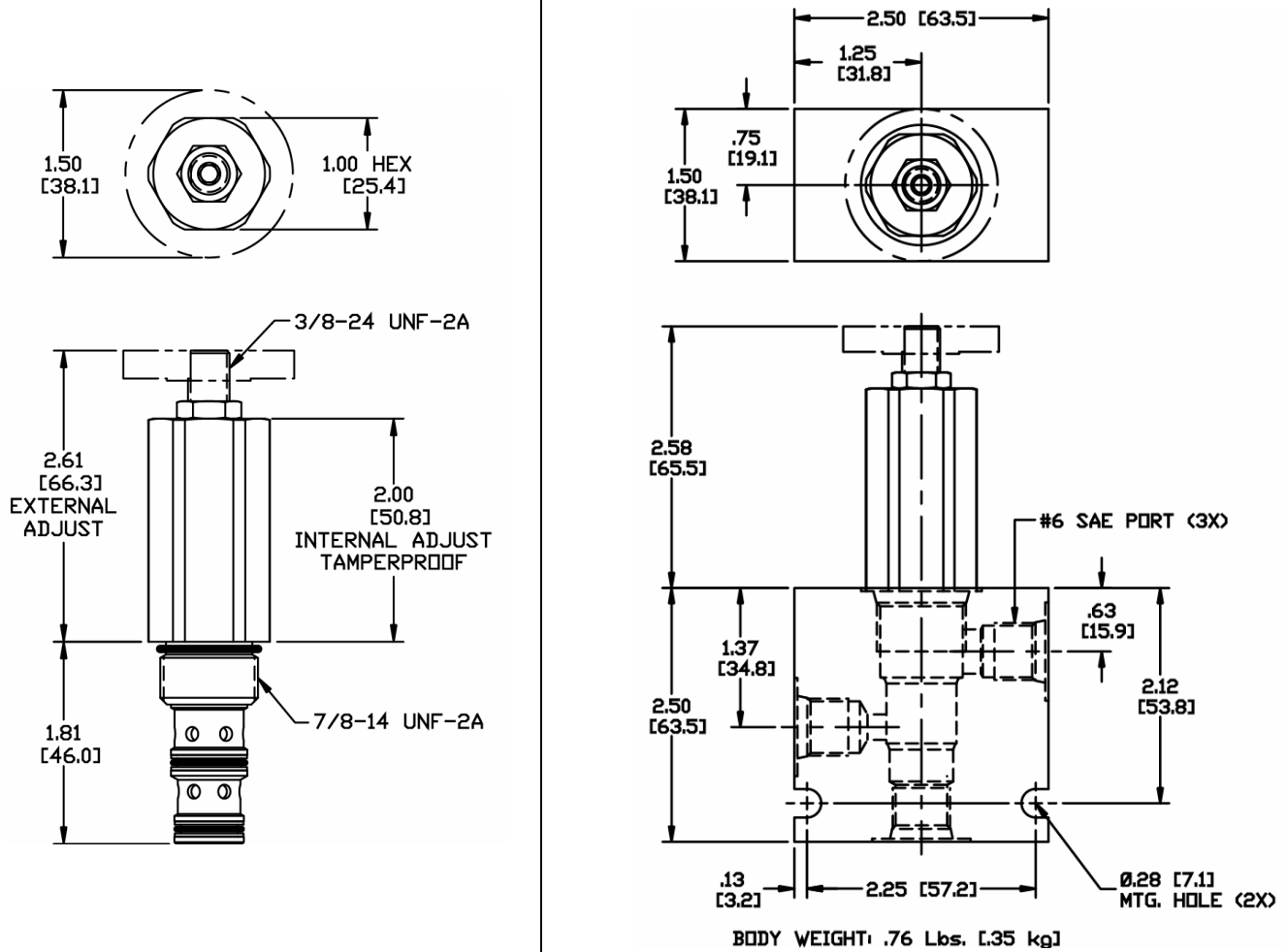
Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com



DIMENSIONS



ORDERING INFORMATION

DF-PCT

OPTIONS

Buna Standard 00
 Viton Standard V0
 Buna, Knob OK
 Viton, Knob VK
 Buna, Internal Adjust OI
 Viton, Internal Adjust VI
 Buna, Tamper Proof OT
 Viton, Tamper Proof VT

0300

BODIES

Blank
 N Without Body
 S 1/4 NPTF Ports
 #6 SAE Ports

PRESSURE RANGE

50-300 PSI

Differential Pressure Across
 External Controlling Orifice

TAMPER PROOF

Fill in 4 Digit Pressure Setting
 Example: 0200 = 200 PSI

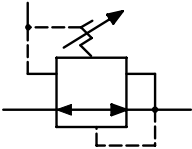
WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

Phone: (815) 397-6628

Fax: (815) 397-2526

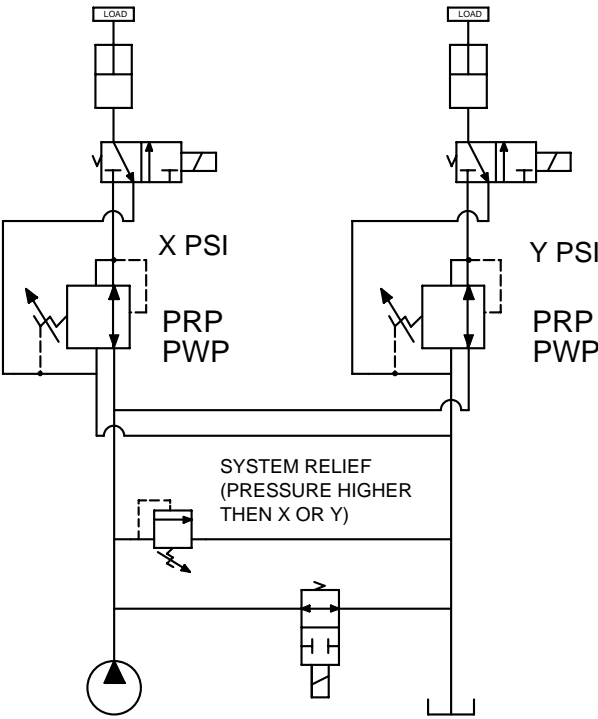
E-mail: delta@delta-power.com

Pressure Reducing/Relieving Valves

	GPM	PSI	LPM	BAR	MODEL	PAGE
	10	4000	38	276	DF-PRP	406
	20	3000	76	207	SK-PRP	408
	10	4000	38	276	DF-PWP	410

Typical Schematic

Typical application for the PRP and PWP is multi-system pressure setting. System relief pressure must be greater then reduce pressure setting.



WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

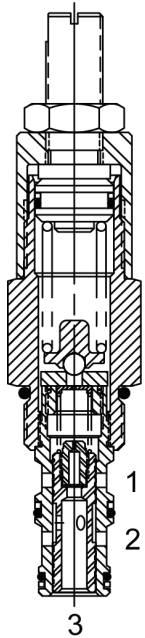
Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com



DF-PRP Pilot Operated, Pressure Reducing, Relieving Valve



DESCRIPTION

10 size, 7/8-14 thread, "Delta" series, pilot operated, pressure reducing, relieving valve

OPERATION

The DF-PRP in its steady state, allows flow to pass from (2) to (3), with the spring chamber constantly drained at (1).

When a pre-determined pressure is reached at (3), the spool shifts to restrict input flow at (2), thereby reducing (restricting) flow.

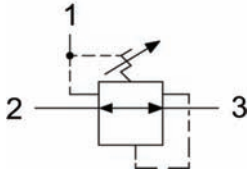
If valve and pressure at port (3) exceeds setting, spool shift to open passage at port (1), thereby regulating pressure at port (3) by relieving excess flow.

The cartridge offers smooth transition in response to load changes in common hydraulic circuits.

FEATURES

- Hardened parts for long life.
- Industry common cavity.

HYDRAULIC SYMBOL

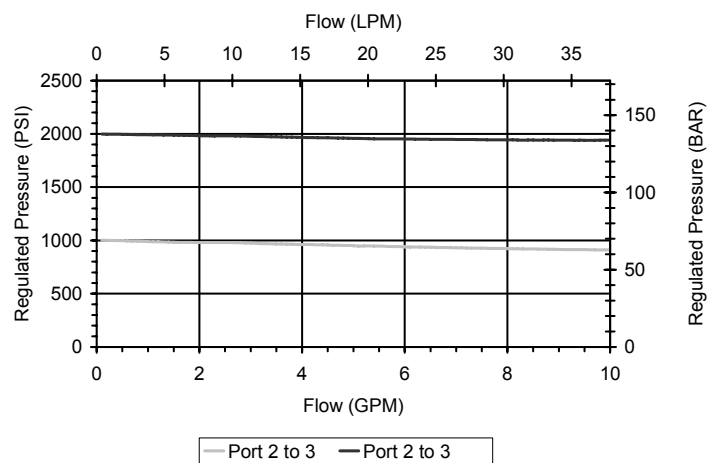
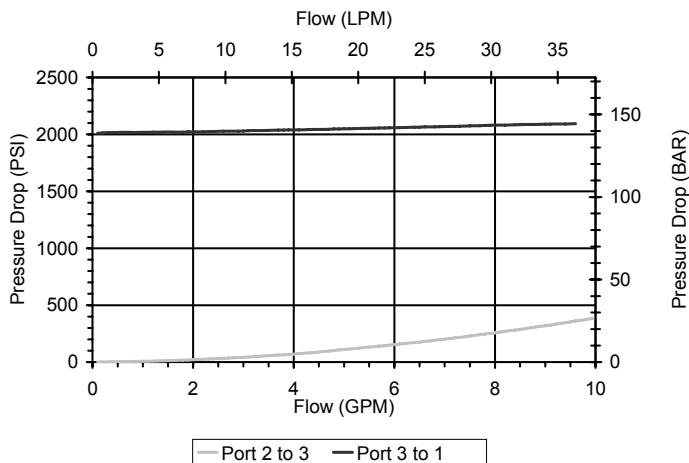


VALVE SPECIFICATIONS

Nominal Flow	10 GPM (38 LPM)
Rated Operating Pressure	3000 PSI (207 bar)
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temperature Range	-40° to 250° F (-40° to 120° C)
Weight	.59 lbs. (.27 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	30 ft-lbs (40.6 Nm)
Cavity	DELTA 3W
Cavity Form Tool (Finishing)	40500001
Seal Kit	21191206

PERFORMANCE

Actual Test Data (Cartridge Only)



WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

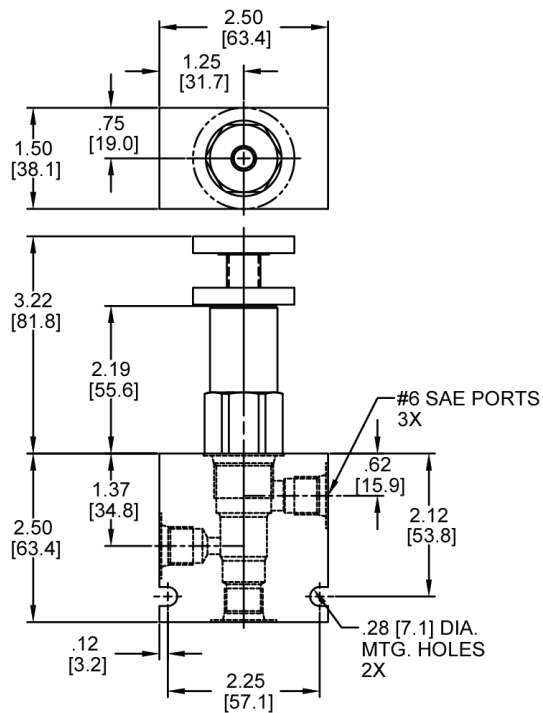
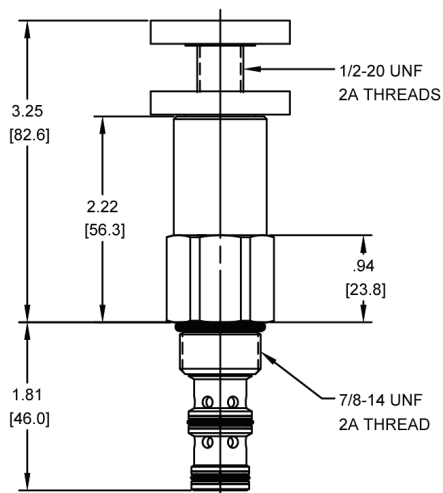
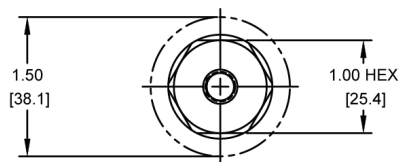
Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com



DIMENSIONS



BODY WEIGHT: .76 lbs [.35 kg.]

ORDERING INFORMATION

DF-PRP

OPTIONS

Buna Standard **00**
Viton Standard **V0**
Buna, Knob **0K**
Viton, Knob **VK**

Blank

N

S

BODIES

Without Body
1/4 NPTF Ports
#6 SAE Ports

PRESSURE RANGE

100 – 3000 PSI

3000

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

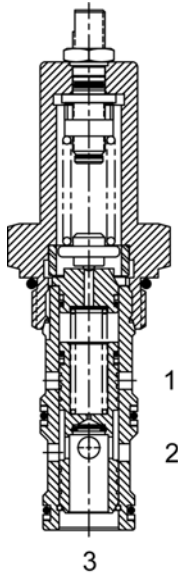
Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com



SK-PRP Pilot Operated Pressure Reducing, Relieving Valve



DESCRIPTION

16 size, 1 5/16-12 thread, "Super" series, pilot operated pressure reducing, relieving valve

OPERATION

The SK-PRP in its steady state, allows flow to pass from (2) to (3), with the spring chamber constantly drained at (1).

When a pre-determined pressure is reached at (3), the spool shifts to restrict input flow at (2), thereby reducing (restricting) flow.

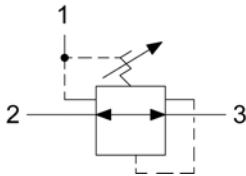
If the valve and pressure at port (3) exceeds setting, spool shifts to open passage at port (1), thereby regulating pressure at (3) by relieving excess flow.

The cartridge offers smooth transition in response to load changes in common hydraulic circuits.

FEATURES

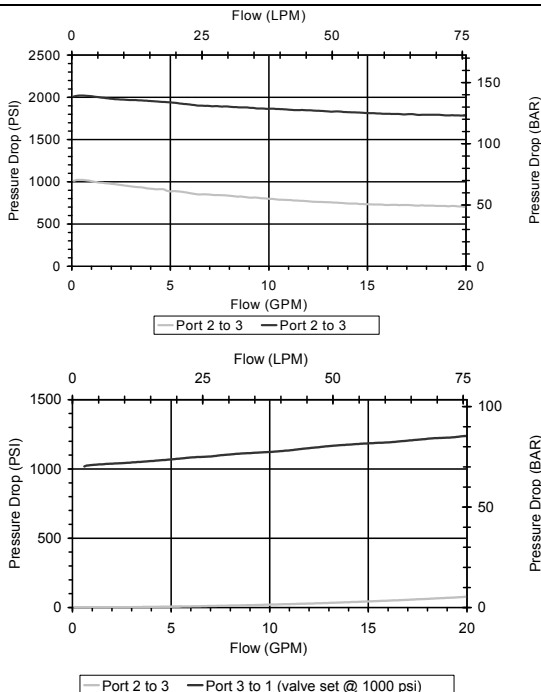
- Hardened parts for long life.
- Industry common cavity.

HYDRAULIC SYMBOL



PERFORMANCE

Actual Test Data (Cartridge Only)



VALVE SPECIFICATIONS

Nominal Flow	20 GPM (76 LPM)
Rated Operating Pressure	500-3000 PSI (34-207 bar)
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temperature Range	-40° to 250° F (-40° to 120° C)
Weight	1.28 lbs. (.58 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	90 ft-lbs (122 Nm)
Cavity	SUPER 3W
Cavity Form Tool (Finishing)	40500018
Seal Kit	21191406

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

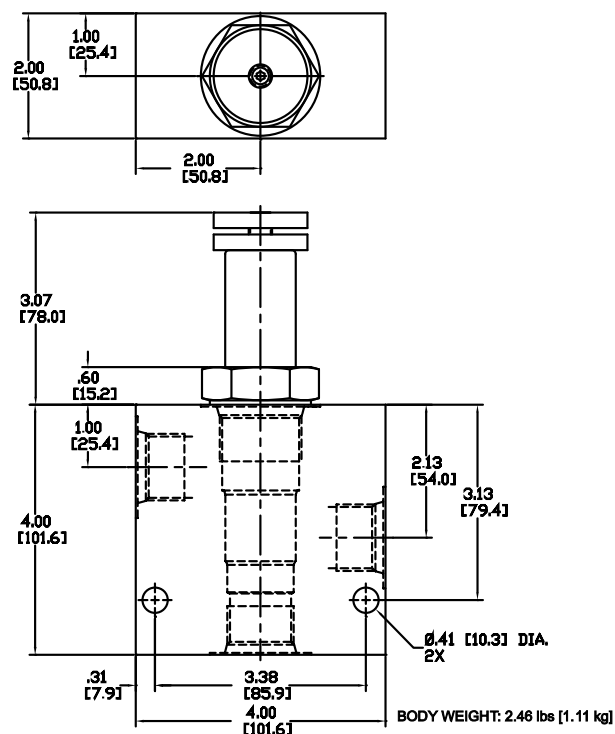
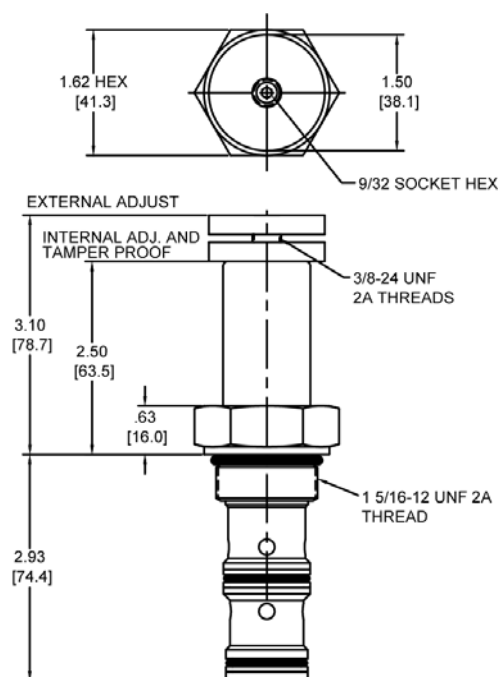
Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com



DIMENSIONS



ORDERING INFORMATION

SK-PRP - - -

OPTIONS

Buna Standard **00**
 Viton Standard **V0**
 Buna, Knob **0K**
 Viton, Knob **VK**
 Buna, Internal Adjust **0I**
 Viton, Internal Adjust **VI**
 Buna, Tamper Proof **0T**
 Viton, Tamper Proof **VT**

Blank
S

BODIES

Without Body
 #12 SAE Ports

PRESSURE RANGE/SETTINGExt./Int. Adjustable

500 – 3000 PSI

Tamper Proof

Fill in 4 digit pressure setting

Example: 0500 – 500 PSI

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com



DF-PWP Pilot Operated Pressure Reducing, Relieving Valve

DESCRIPTION

10 size, 7/8-14 thread, "Delta" series, pilot operated pressure reducing, relieving valve

OPERATION

The DF-PWP in its steady state, allows flow to pass from (2) to (3), with the spring chamber constantly drained at (1).

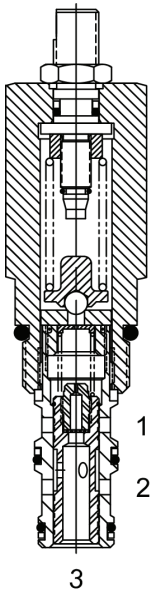
When a pre-determined pressure is reached at (3), the spool shifts to restrict input flow at (2), thereby reducing (restricting) flow.

If valve and pressure at port (3) exceeds setting, spool shifts to open passage at port (1), thereby regulating pressure at port (3) by relieving excess flow.

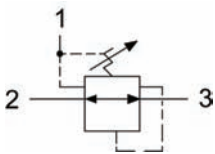
The cartridge offers smooth transition in response to load changes in common hydraulic circuits.

FEATURES

- Hardened parts for long life.
- Industry common cavity.



HYDRAULIC SYMBOL

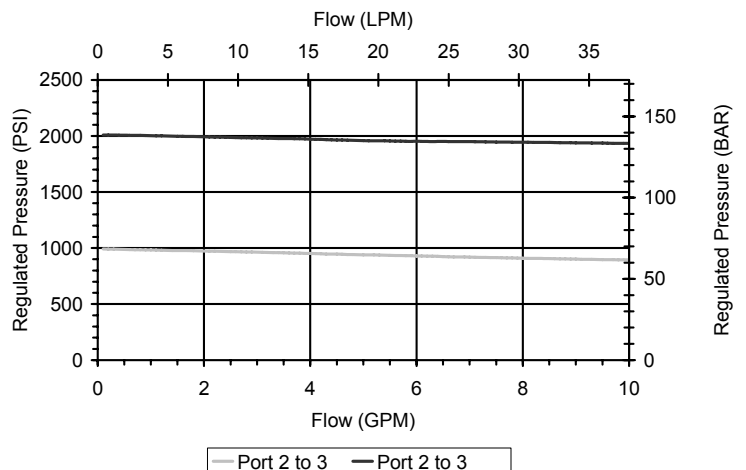
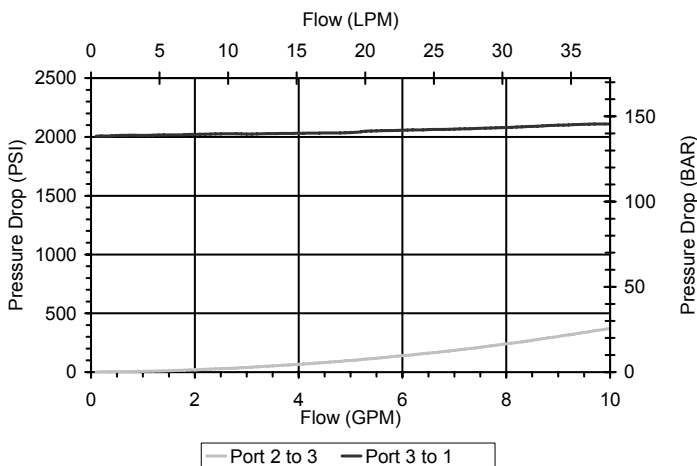


PERFORMANCE

Actual Test Data (Cartridge Only)

VALVE SPECIFICATIONS

Nominal Flow	10 GPM (38 LPM)
Rated Operating Pressure	4000 PSI (276 bar)
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temperature Range	-40° to 250° F (-40° to 120° C)
Weight	57 lbs. (.26 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	30 ft-lbs (40.6 Nm)
Cavity	DELTA 3W
Cavity Form Tool (Finishing)	40500001
Seal Kit	21191206

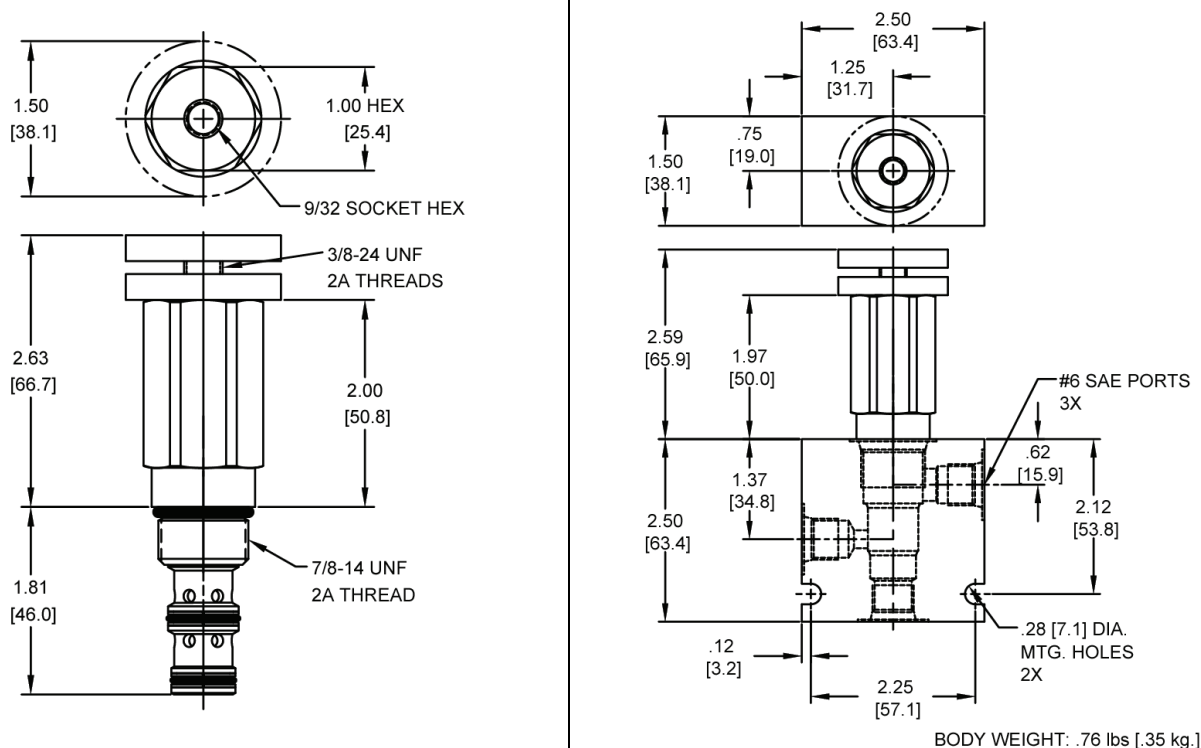


WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com


DIMENSIONS

ORDERING INFORMATION
DF-PWP

OPTIONS

Buna Standard **00**
 Viton Standard **V0**
 Buna, Knob **0K**
 Viton, Knob **VK**
 Internally Adj. Buna **0I**
 Internally Adj. Viton **VI**
 Tamper Proof Buna **0T**
 Tamper Proof Viton **VT**

4000

Blank **N**
S

BODIES

Without Body
 1/4 NPTF Ports
 #6 SAE Ports

PRESSURE RANGE/SETTING
Ext./Int. Adjustable

100 – 4000 PSI

Tamper Proof

Fill in 4 Digit Pressure Setting

Example: 0500 – 500 PSI

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

Phone: (815) 397-6628

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 E-mail: delta@delta-power.com



Sequence Valves

	GPM	PSI	LPM	BAR	MODEL	PAGE
	10	3000	38	207	DG-PSA	414
	10	3000	38	207	DG-PSC	416
	10	3000	38	207	DG-PSI	418
	10	3000	38	207	DG-PSO	420
	12	3000	45	207	DG-PSS	422
	10	3000	38	207	DG-PTC	424
	10	3000	38	207	DG-PTO	426
	10	3000	38	207	DF-PWE	428
	8	3000	30	207	DF-PWI	430
	40	3500	151	241	SL-PWA	432
	40	3500	151	241	SL-PWB	434

Typical Schematic

Typical application for the PSO or PSC sequence valve is for a high/low application like a log splitter where the spring chamber can be vented externally (spring chamber pressure directly adds to the pilot pressure required to shift the valve).

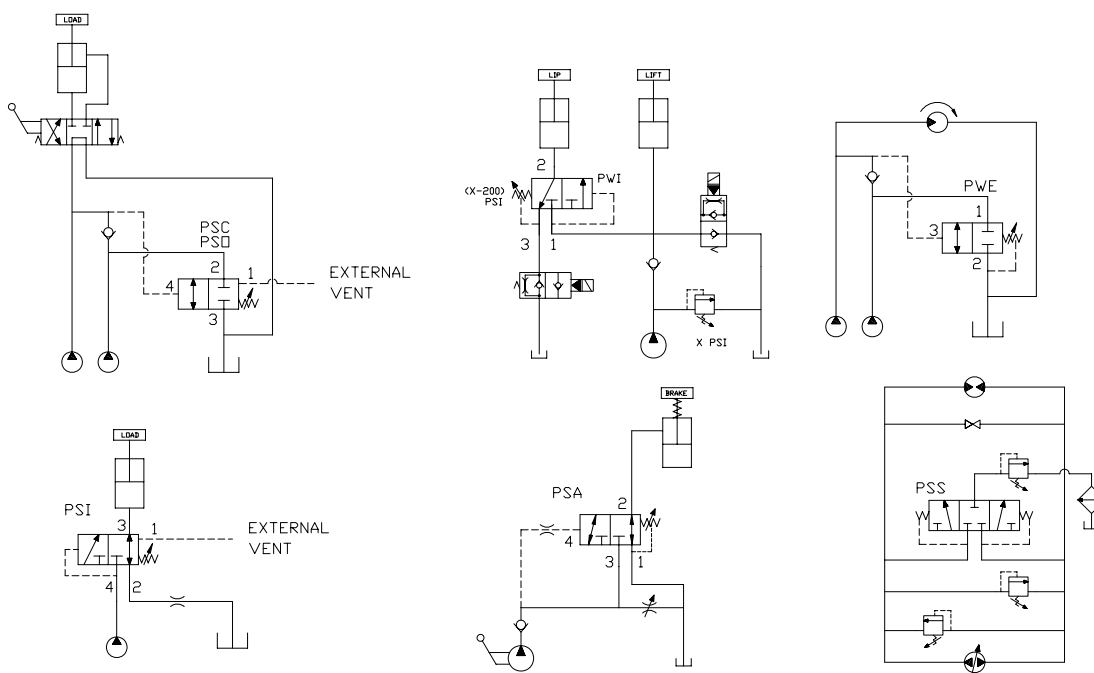
Typical application for the PWI sequence valve is for controlling the lip on a dock leveler.

Typical application for the PWE sequence valve is for a high/low pump in a positive traction circuit where the valve automatically shifts to low speed high torque mode.

Typical application for the PSI sequence valve is when starting against load where the spring chamber can be vented externally (spring chamber pressure directly adds to the pilot pressure required to shift the valve).

Typical application for the PSA sequence valve is a hydraulic brake release of a spring loaded single acting cylinder.

Typical application for the PSS hot oil shuttle is to divert fluid from the low pressure side of a closed loop hydrostatic transmission for cooling or filtering.



WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

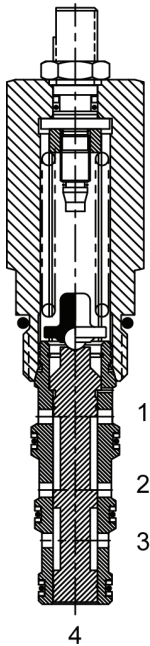
Phone: (815) 397-6628

Fax: (815) 397-2526

 E-mail: delta@delta-power.com



DG-PSA Sequence Valve, 4 Way Normally Closed, External Pilot



DESCRIPTION

10 size, 7/8-14 thread, "Delta" series, 4 way external pilot sequence valve.

OPERATION

The DG-PSA in neutral (un-piloted), allows flow between (1) and (2) bi-directionally, while blocking at (3).

The spring chamber is constantly vented at (1).

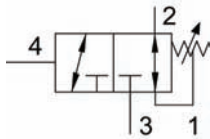
On attainment of a predetermined pressure at (4), the cartridge shifts to close (1) to (2), while opening (2) to (3).

Note that the backpressure value at (1) must be added to the selected pressure setting to determine pilot pressure necessary to open valve.

FEATURES

- Optional spring ranges to 1500 PSI (103 bar).
- Hardened parts for long life.
- Industry common cavity.

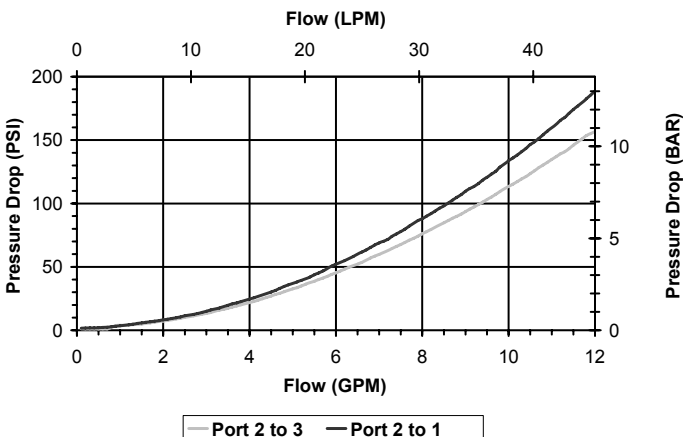
HYDRAULIC SYMBOL



.030 to .060 diameter orifice recommended beneath port (4).

PERFORMANCE

Actual Test Data (Cartridge Only)



VALVE SPECIFICATIONS

Nominal Flow	10 GPM (38 LTR/M)
Rated Operating Pressure	3000 PSI (207 bar)
Typical Internal Leakage (150 SSU)	5 cu in/min (82 ml/min)
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temperature Range	-40° to 250° F (-40° to 120° C)
Weight	.63 lbs. (.28 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	30 ft-lbs (40.6 Nm)
Cavity	DELTA 4W
Cavity Form Tool (Finishing)	40500002
Seal Kit	21191214

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

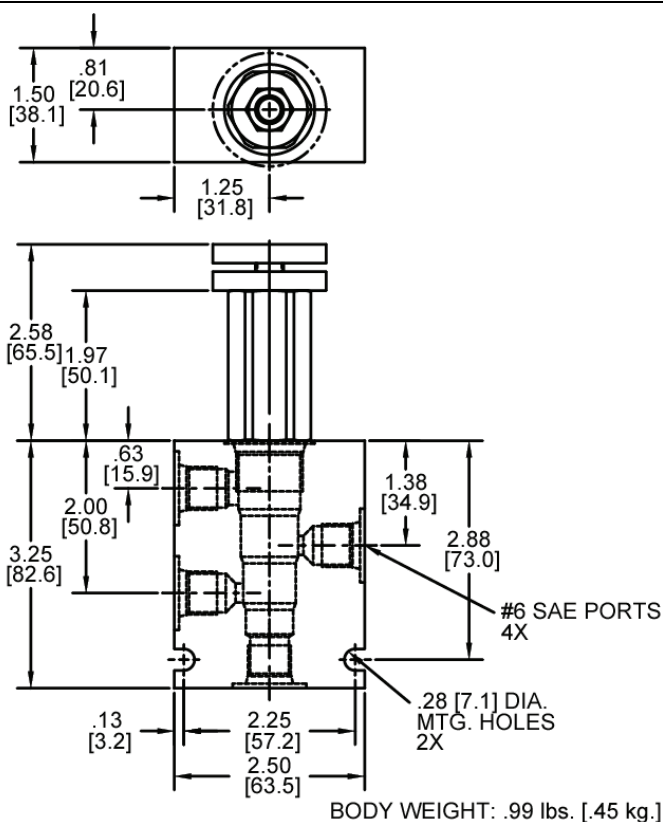
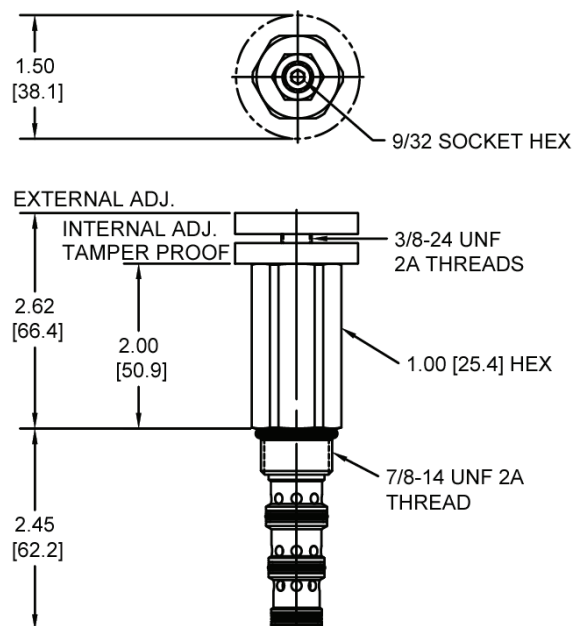
Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com



DIMENSIONS



ORDERING INFORMATION

DG-PSA

OPTIONS

Buna Standard **00**

Viton Standard **V0**

Buna, Knob **0K**

Viton Knob **VK**

Buna, Internal Adjust **0I**

Viton, Internal Adjust **VI**

Buna, Tamper Proof **0T**

Viton, Tamper Proof **VT**

0425

1500

Blank

N

S

BODIES

Without Body

1/4 NPTF Ports

#6 SAE Ports

PRESSURE RANGE

50-425 PSI

425-1500 PSI

TAMPER PROOF

Fill in 4 Digit Pressure Setting

Example: 0500-500PSI

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

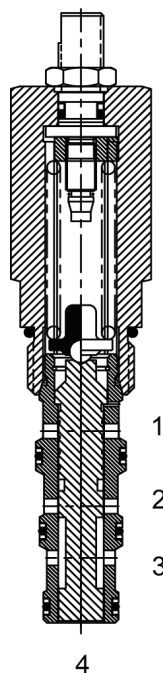
Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com



DG-PSC Sequence Valve, 2 Way Normally Closed, External Pilot



DESCRIPTION

10 size, 7/8-14 thread, "Delta" series, 2 way normally closed sequence valve, external pilot

OPERATION

The DG-PSC in neutral (unpiloted), blocks flow between (3) and (2).

The spring chamber is constantly vented at (1).

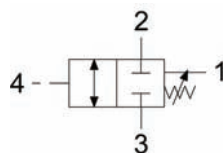
On attainment of a predetermined pressure at (4), the cartridge shifts to allow flow from (3) to (2).

Note that the backpressure value at (1) must be added to the selected pressure setting to determine pilot pressure.

FEATURES

- Optional spring ranges to 1500 PSI (103 bar).
- Hardened parts for long life.
- Industry common cavity.

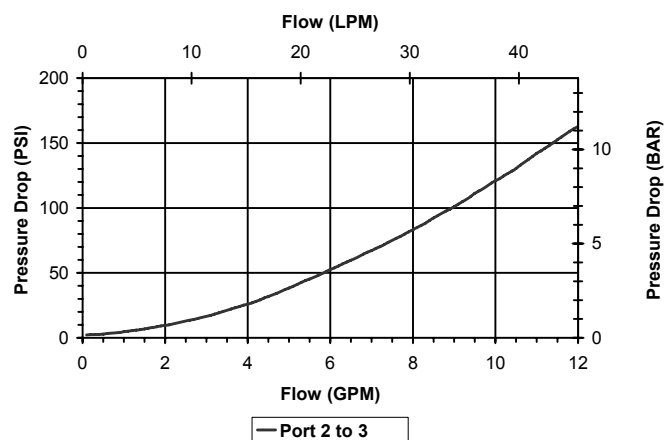
HYDRAULIC SYMBOL



.030 to .060 diameter orifice recommended beneath port (4).

PERFORMANCE

Actual Test Data (Cartridge Only)



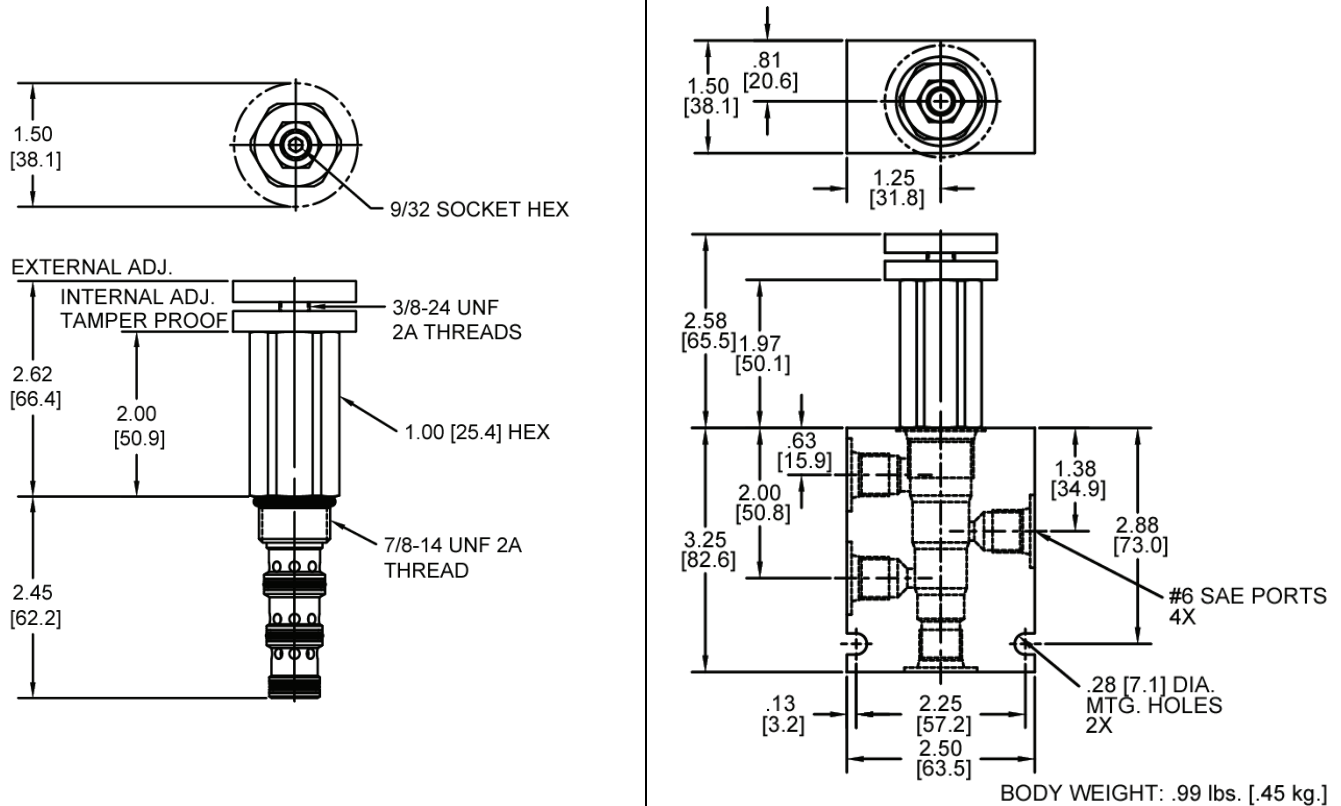
VALVE SPECIFICATIONS

Nominal Flow	10 GPM (38 LPM)
Rated Operating Pressure	3000 PSI (207 bar)
Typical Internal Leakage (150 SSU)	5 cu in/min (82 ml/min)
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temperature Range	-40° to 250° F (-40° to 120° C)
Weight	.63 lbs. (.28 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	30 ft-lbs (40.6 Nm)
Cavity	DELTA 4W
Cavity Form Tool (Finishing)	40500002
Seal Kit	21191214

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.



DIMENSIONS



ORDERING INFORMATION

DG-PSC

OPTIONS

Buna Standard **00**
 Viton Standard **V0**
 Buna, Knob **0K**
 Viton Knob **VK**
 Buna, Internal Adjust **0I**
 Viton, Internal Adjust **VI**
 Buna, Tamper Proof **0T**
 Viton, Tamper Proof **VT**

0425
1500

Blank
N
S

BODIES

Without Body
 1/4 NPTF Ports
 #6 SAE Ports

PRESSURE RANGE

50-425 PSI
 425-1500 PSI

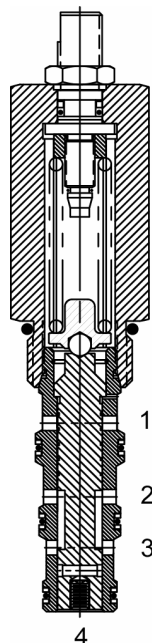
TAMPER PROOF

Fill in 4 Digit Pressure Setting
 Example: 0500-500PSI

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.



DG-PSI Sequence Valve, 3 Way Normally Open, Internal Pilot



DESCRIPTION

10 size, 7/8-14 thread, "Delta" series, 3 way normally open internal pilot sequence valve

OPERATION

The DG-PSI in neutral (un-piloted), allows flow between (3) and (2) bi-directional, while blocking at (4).

The spring chamber is constantly vented at (1).

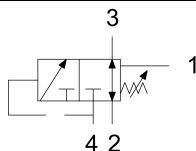
On attainment of a predetermined pressure at (4), the cartridge shifts to close (3) to (2), while opening (4) to (3).

Note that the backpressure value at (1) must be added to the selected pressure setting to determine pilot pressure necessary to open valve.

FEATURES

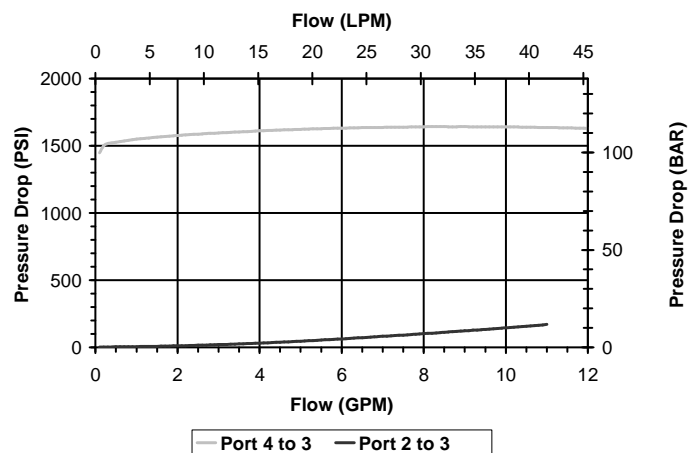
- Optional spring ranges to 1500 PSI (103 bar).
- Hardened parts for long life.
- Industry common cavity.

HYDRAULIC SYMBOL



PERFORMANCE

Actual Test Data (Cartridge Only)



VALVE SPECIFICATIONS

Nominal Flow	10 GPM (38 LTR/M)
Rated Operating Pressure	3000 PSI (207 bar)
Typical Internal Leakage (150 SSU)	5 cu in/min (82 ml/min)
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temperature Range	-40° to 250° F (-40° to 120° C)
Weight	.63 lbs. (.28 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	30 ft-lbs (40.6 Nm)
Cavity	DELTA 4W
Cavity Form Tool (Finishing)	40500002
Seal Kit	21191214

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

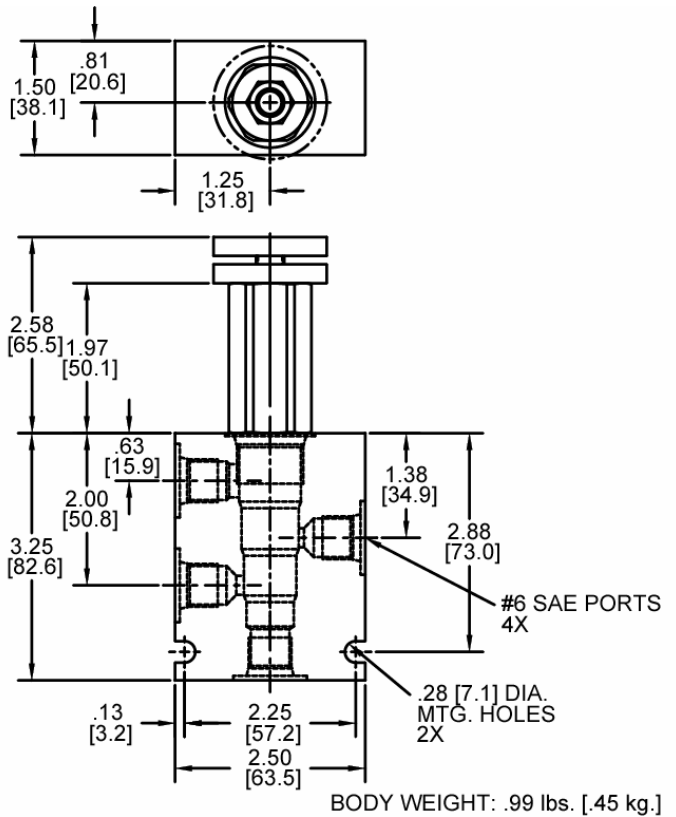
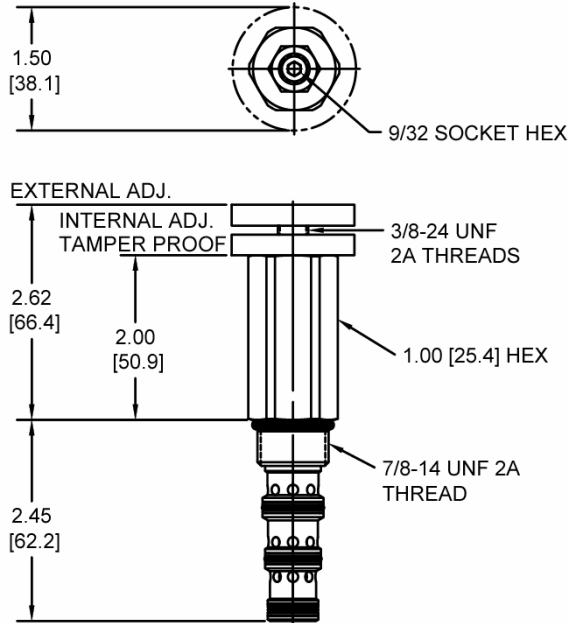
Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com



DIMENSIONS



BODY WEIGHT: .99 lbs. [.45 kg.]

ORDERING INFORMATION

DG-PSI

OPTIONS

Buna Standard
Viton Standard
Buna, Knob
Viton, Knob
Buna, Internal Adjust
Viton, Internal Adjust
Buna, Tamper Proof
Viton, Tamper Proof

00
V0
OK
VK
OI
VI
OT
VT

0425
1500

Blank
N
S

BODIES

Without Body
1/4 NPTF Ports
#6 SAE Ports

PRESSURE RANGE

50-425 PSI
425-1500 PSI

TAMPER PROOF

Fill in 4 Digit Pressure Setting
Example: 0500-500PSI

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

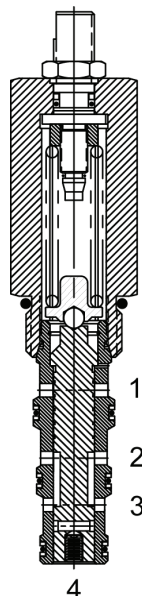
Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com



DG-PSO Sequence Valve, 2 Way Normally Open, External Pilot



DESCRIPTION

10 size, 7/8-14 thread, "Delta" series, 2 way normally open sequence valve, external pilot

OPERATION

The DG-PSO in neutral (un-piloted), allows flow between (3) and (2) bi-directionally.

The spring chamber is constantly vented at (1).

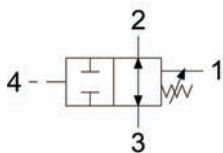
On attainment of a predetermined pressure at (4), the cartridge shifts to block flow from (3) to (2).

Note that the backpressure value at (1) must be added to the selected pressure setting to determine pilot pressure necessary to close valve.

FEATURES

- Optional spring ranges to 1500 PSI (103 bar).
- Hardened parts for long life.
- Industry common cavity.

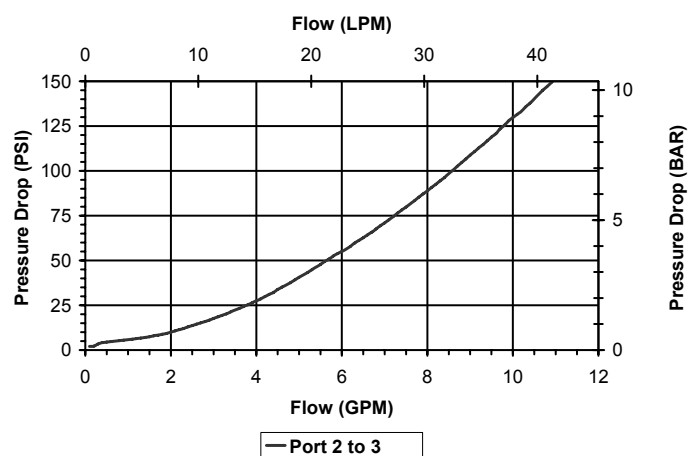
HYDRAULIC SYMBOL



Orifice .030 - .060 Dia. recommended beneath port (4).

PERFORMANCE

Actual Test Data (Cartridge Only)



VALVE SPECIFICATIONS

Nominal Flow	10 GPM (38 LTR/M)
Rated Operating Pressure	3000 PSI (207 bar)
Typical Internal Leakage (150 SSU)	5 cu in/min (82 ml/min)
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temperature Range	-40° to 250° F (-40° to 120° C)
Weight	.62 lbs. (.28 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	30 ft-lbs (40.6 Nm)
Cavity	DELTA 4W
Cavity Form Tool (Finishing)	40500002
Seal Kit	21191214

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

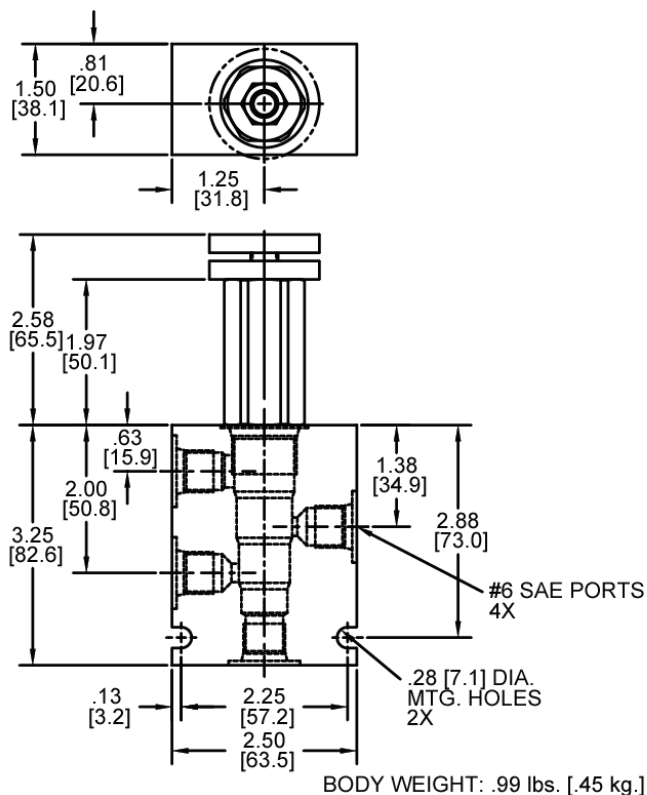
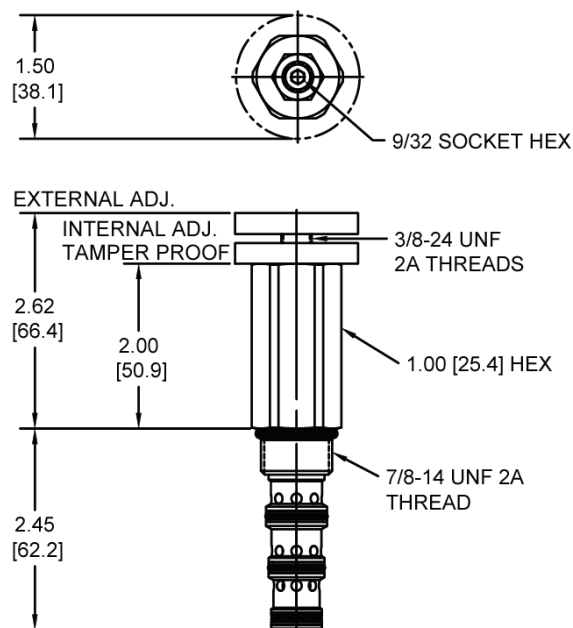
Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com



DIMENSIONS



BODY WEIGHT: .99 lbs. [.45 kg.]

ORDERING INFORMATION

DG-PSO

OPTIONS
 Buna Standard **00**
 Viton Standard **V0**
 Buna, Knob **0K**
 Viton Knob **VK**
 Buna, Internal Adjust **0I**
 Viton, Internal Adjust **VI**
 Buna, Tamper Proof **0T**
 Viton, Tamper Proof **VT**

0425
1500

Blank
N
S

BODIES

Without Body
 1/4 NPTF Ports
 #6 SAE Ports

PRESSURE RANGE

50-425 PSI
 425-1500 PSI

TAMPER PROOF

Fill in 4 Digit Pressure Setting
 Example: 0500-500PSI

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

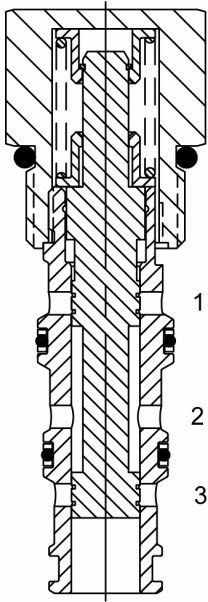
Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com



DG-PSS Hot Oil Shuttle Valve



DESCRIPTION

10 size, 7/8-14 thread, "Delta" series, hot oil shuttle valve

OPERATION

The DG-PSS, with internal piloting at port (1) or (3), oil will flow from the port opposite of the port piloted to port (2), thus removing oil from the low-pressure side for cooling or filtration purposes.

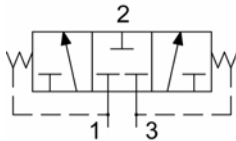
The Valve is spring bias neutral, relying solely on the internal pilot pressure signal to shift to either side.

The DG-PSS is closed in transition.

FEATURES

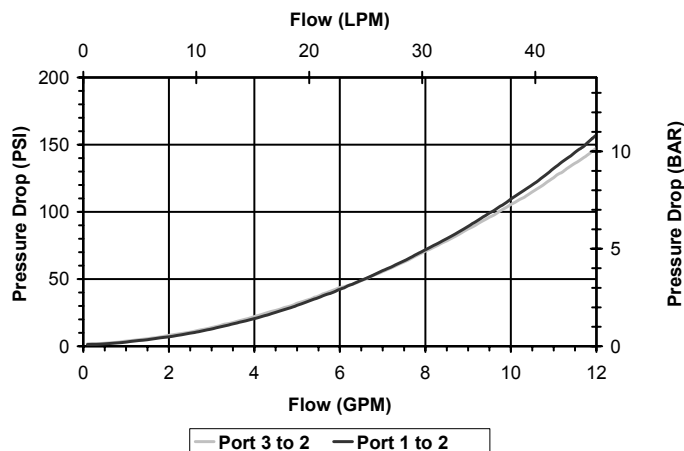
- Hardened parts for long life.
- Industry common cavity.

HYDRAULIC SYMBOL



PERFORMANCE

Actual Test Data (Cartridge Only)



VALVE SPECIFICATIONS

Nominal Flow	12 GPM (45 LTR/M)
Rated Operating Pressure	3000 PSI (207 bar)
Typical Internal Leakage (150 SSU)	5 cu/in per/min (82 ml/min)
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temperature Range	-40° to 250° F (-40° to 120° C)
Weight	.34 lbs. (.15 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	30 ft-lbs (40.6 Nm)
Cavity	DELTA 4W
Cavity Form Tool (Finishing)	40500002
Seal Kit	21191212

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

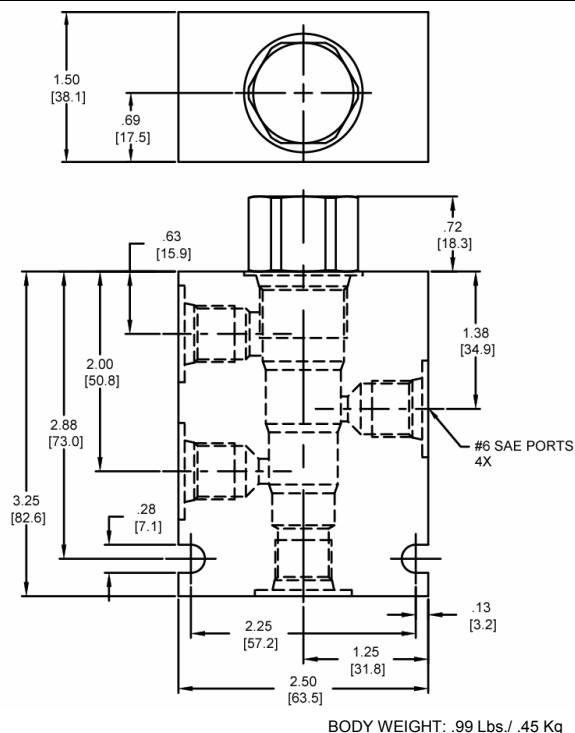
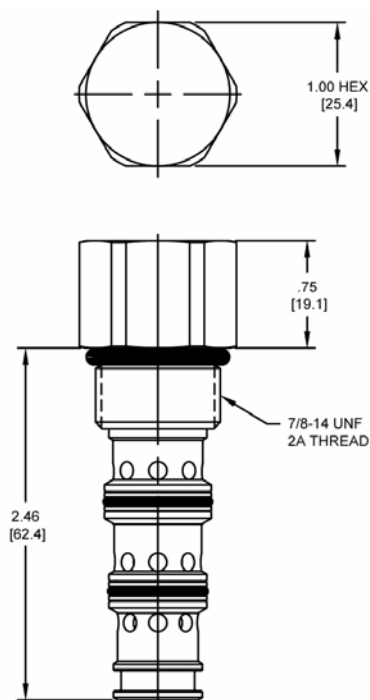
Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com



DIMENSIONS



ORDERING INFORMATION

DG-PSS -

OPTIONS
Buna Standard
Viton Standard

00
V0

Blank
N
S

BODIES
Without Body
1/4 NPTF Ports
#6 SAE Ports

CRACK PRESSURE

0040 40 PSI
0080 80 PSI
0120 120 PSI
0160 160 PSI
0000 0 PSI (NO SPRING)

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

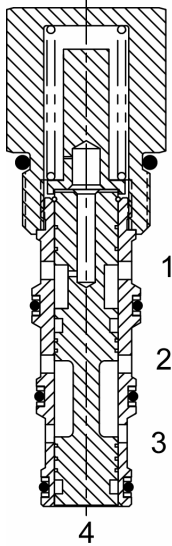
Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com



DG-PTC Sequence Valve, Normally Open, External Pilot



DESCRIPTION

10 size, 7/8-14 thread, "Delta" series, external pilot, normally open.

OPERATION

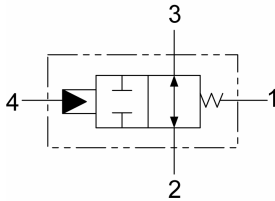
The DG-PTC allows flow at ports (3) and (2). On attainment of a predetermined pressure at port (4), the valve shifts to block flow from port (3) to (2).

Spring Chamber is constantly vented to port (1).

FEATURES

- Hardened parts for long life.
- Industry common cavity.

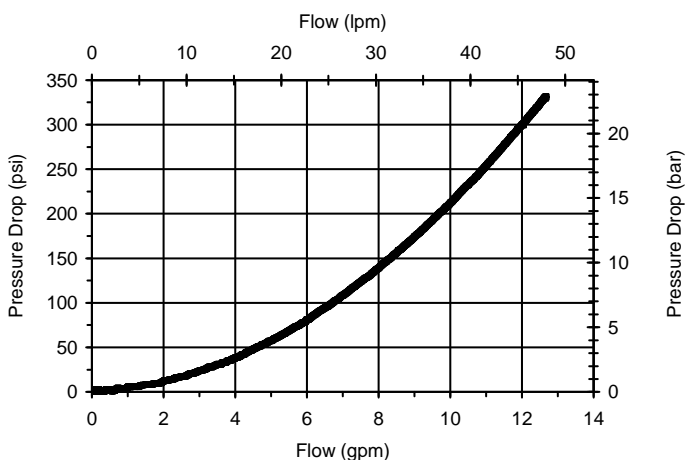
HYDRAULIC SYMBOL



.030 to .060 diameter orifice recommended beneath port (4).

PERFORMANCE

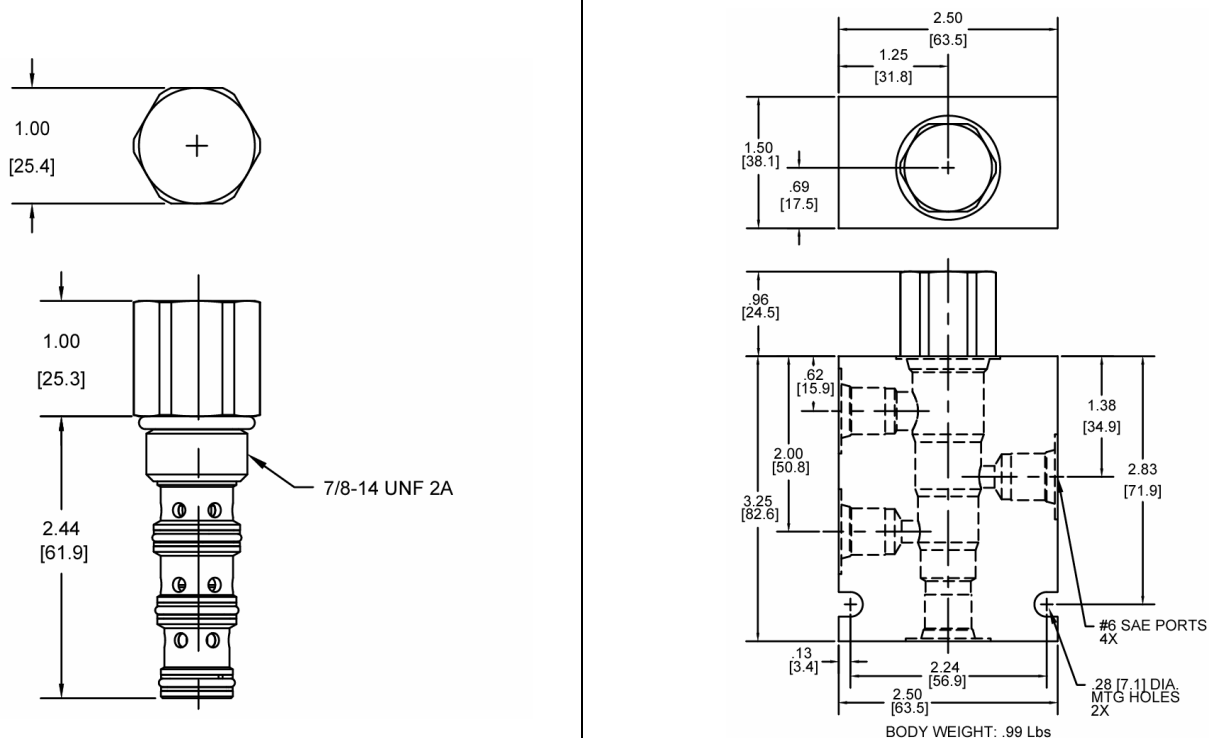
Actual Test Data (Cartridge Only)



VALVE SPECIFICATIONS

Nominal Flow	10 GPM (38 LTR/M)
Rated Operating Pressure	3000 PSI (207 bar)
Typical Internal Leakage (150 SSU)	5 cu in/min (82 ml/min)
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temperature Range	-40° to 250° F (-40° to 120° C)
Weight	.39 lbs. (.18 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	30 ft-lbs (40.6 Nm)
Cavity	DELTA 4W
Cavity Form Tool (Finishing)	40500002
Seal Kit	21191108

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

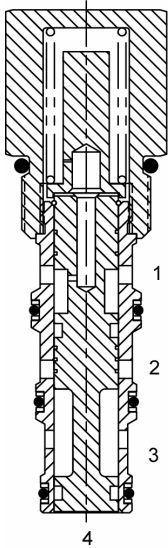

DIMENSIONS

ORDERING INFORMATION

DG-PTC - - -			
OPTIONS		BODIES	
Buna Standard	00	Blank	Without Body
Viton Standard	V0	N	1/4" NPTF PORT
		S	#6 SAE Ports
		SPRING BIAS	
		0050	50 PSI
		0180	180 PSI
			± 10%

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.



DG-PTO Sequence Valve, Normally Closed, External Pilot



DESCRIPTION

10 size, 7/8-14 thread, "Delta" series, external pilot, normally closed.

OPERATION

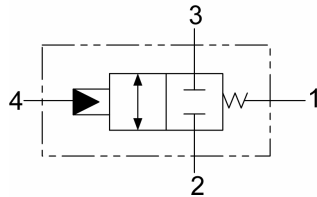
The DG-PTO blocks flow at ports (3) and (2). On attainment of a predetermined pressure at port (4), the valve shifts to allow flow from port (3) to (2).

Spring Chamber is constantly vented to port (1).

FEATURES

- Hardened parts for long life.
- Industry common cavity.

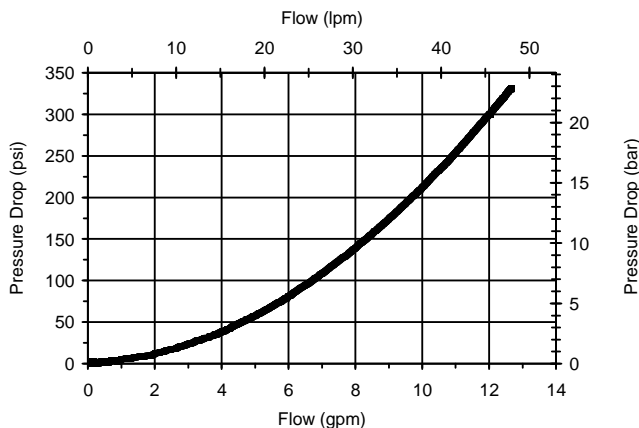
HYDRAULIC SYMBOL



.030 to .060 diameter orifice recommended beneath port (4).

PERFORMANCE

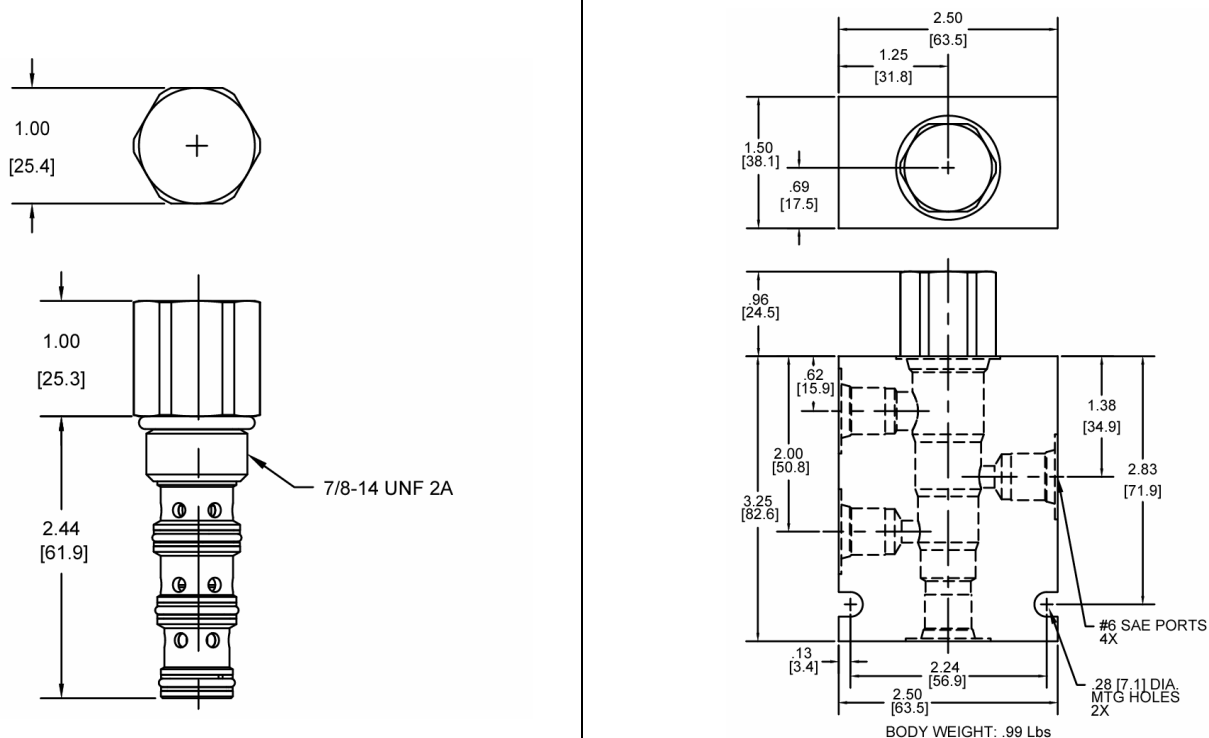
Actual Test Data (Cartridge Only)



VALVE SPECIFICATIONS

Nominal Flow	10 GPM (38 LTR/M)
Rated Operating Pressure	3000 PSI (207 bar)
Typical Internal Leakage (150 SSU)	5 cu in/min (82 ml/min)
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temperature Range	-40° to 250° F (-40° to 120° C)
Weight	.39 lbs. (.18 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	30 ft-lbs (40.6 Nm)
Cavity	DELTA 4W
Cavity Form Tool (Finishing)	40500002
Seal Kit	21191108

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.


DIMENSIONS

ORDERING INFORMATION
DG-PTO
OPTIONS

 Buna Standard
 Viton Standard

00
V0

Blank

N
S
BODIES

 Without Body
 1/4" NPTF PORT
 #6 SAE Ports

SPRING BIAS

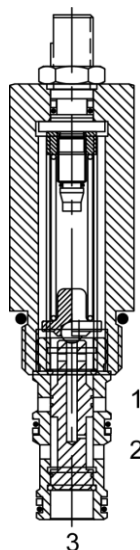
 50 PSI
 180 PSI
 ± 10%

0050
0180

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.



DF-PWE Sequence Valve, Normally Closed, External Pilot



DESCRIPTION

10 size, 7/8-14 thread, "Delta" series, external pilot normally closed, sequence valve.

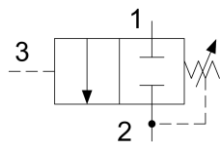
OPERATION

The DF-PWE blocks flow at ports (2) and (1). On attainment of a predetermined pressure at (3) the valve shifts to allow flow from (1) to (2).

FEATURES

- Hardened parts for long life.
- Optional spring ranges to 1500 PSI (103 bar).
- Industry common Cavity.

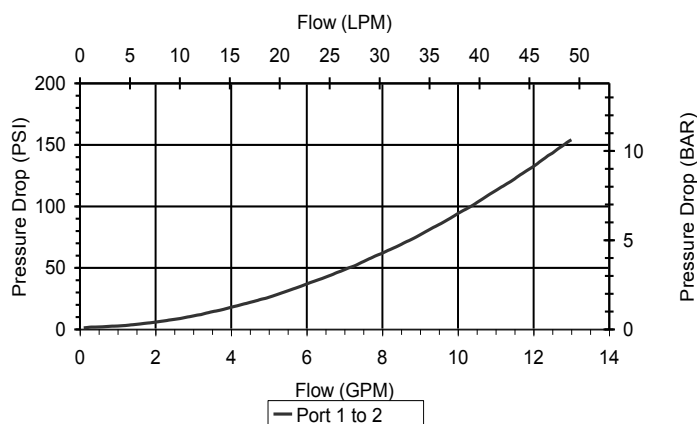
HYDRAULIC SYMBOL



.030 to .060 diameter orifice recommended beneath port (3).

PERFORMANCE

Actual Test Data (Cartridge Only)



VALVE SPECIFICATIONS

Nominal Flow	10 GPM (38 LPM)
Rated Operating Pressure	3000 PSI (207 bar)
Typical Internal Leakage (150 SSU)	5 cu in/min (82 ml/min)
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temperature Range	-40° to 250° F (-40° to 120° C)
Weight	.57 lbs. (.26 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	30 ft-lbs (40.6 Nm)
Cavity	DELTA 3W
Cavity Form Tool (Finishing)	40500001
Seal Kit	21191206

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

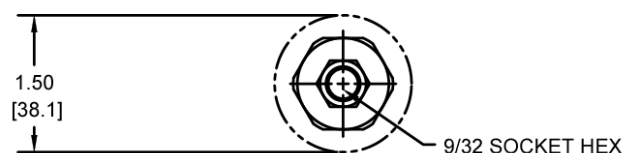
Phone: (815) 397-6628

Fax: (815) 397-2526

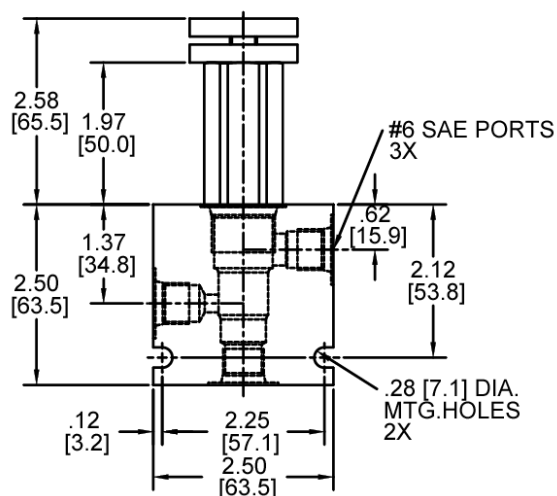
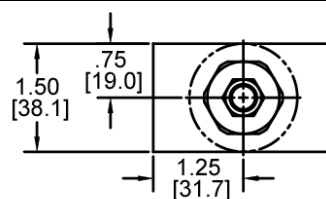
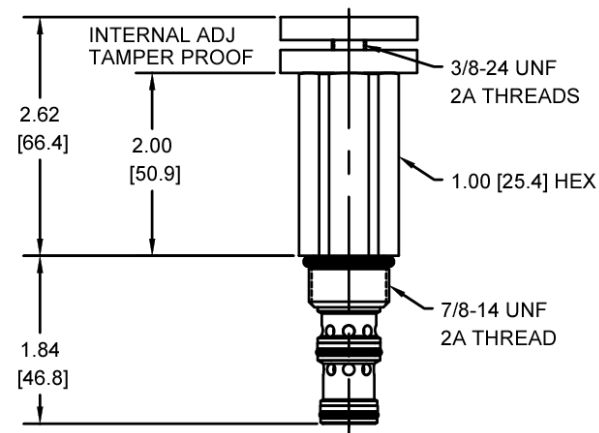
E-mail: delta@delta-power.com



DIMENSIONS



EXTERNAL ADJ.



BODY WEIGHT: .76 lbs. [.35 kg.]

ORDERING INFORMATION

DF-PWE - - -

OPTIONS

Buna Standard **00**
 Viton Standard **V0**
 Buna, Knob **0K**
 Viton, Knob **VK**
 Internal Adj. Buna **0I**
 Internal Adj. Viton **VI**
 Tamper Proof Buna **0T**
 Tamper Proof Viton **VT**

Blank **N**
S

BODIES

Without Body
 1/4 NPTF Ports
 #6 SAE Ports

PRESSURE RANGE

50-425 PSI
 425-1500 PSI

TAMPER PROOF

Fill in 4 Digit Pressure Setting
 Example: 0500-500PSI

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

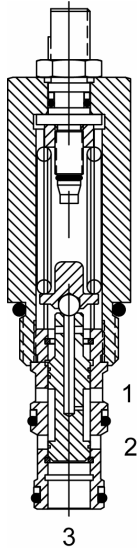
Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com



DF-PWI Sequence Valve, Internal Pilot And Drain



DESCRIPTION

10 size, 7/8-14 thread, "Delta" series, internal pilot and drain, sequence valve.

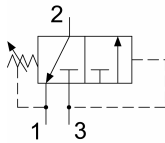
OPERATION

The DF-PWI blocks flow at (3) and allows flow from (2) to (1). On attainment of a predetermined pressure at (3) the valve shifts to allow flow from (3) to (2) and block flow at (1).

FEATURES

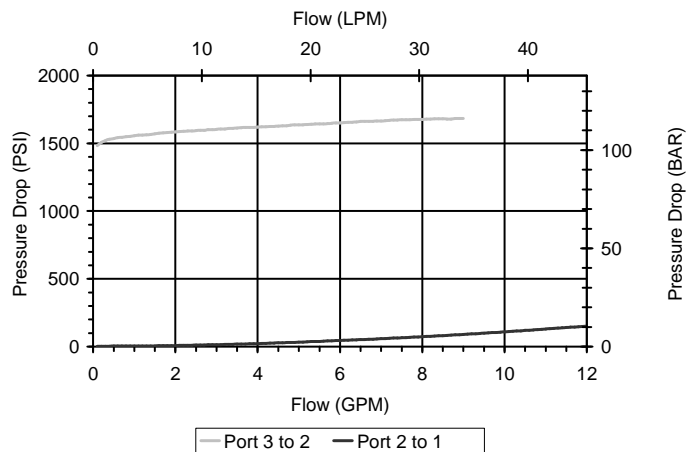
- Hardened parts for long life.
- Optional spring ranges to 1500 PSI (103 bar).
- Industry common Cavity.

HYDRAULIC SYMBOL



PERFORMANCE

Actual Test Data (Cartridge Only)



VALVE SPECIFICATIONS

Nominal Flow	8 GPM (30 LPM)
Rated Operating Pressure	3000 PSI (207 bar)
Typical Internal Leakage (150 SSU)	5 cu in/min (82 ml/min)
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temperature Range	-40° to 250° F (-40° to 120° C)
Weight	.57 lbs. (.26 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	30 ft-lbs (40.6 Nm)
Cavity	DELTA 3W
Cavity Form Tool (Finishing)	40500001
Seal Kit	21191206

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

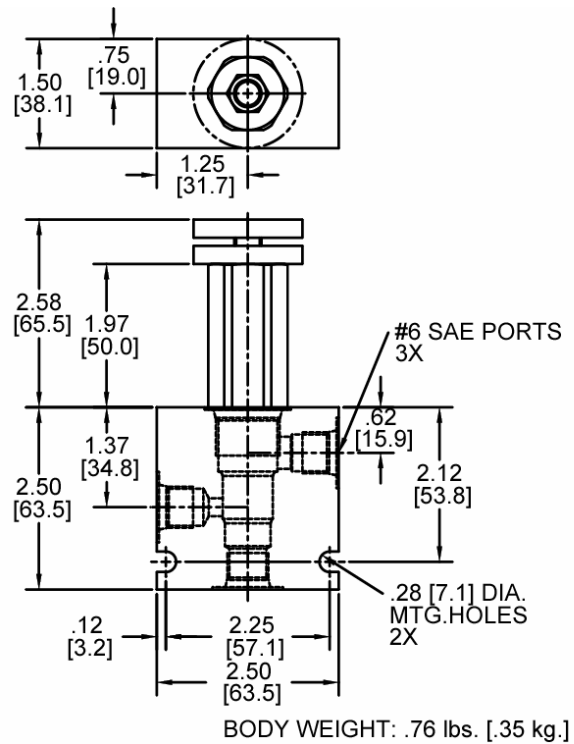
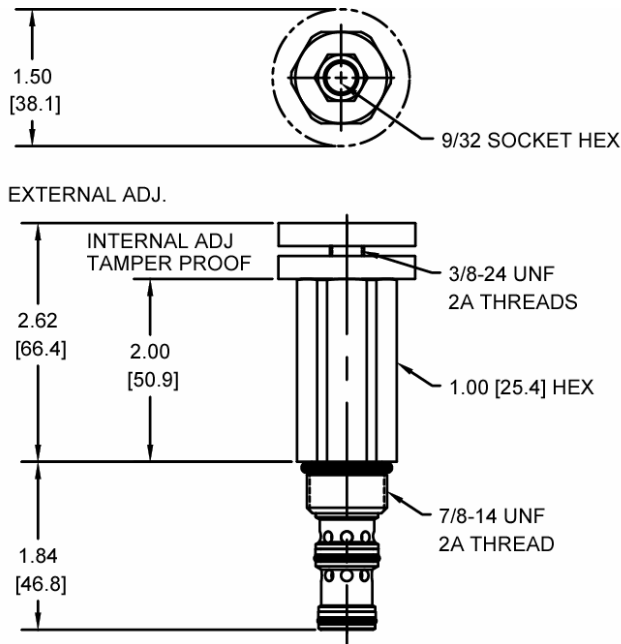
Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com



DIMENSIONS



ORDERING INFORMATION

DF-PWI - - -

OPTIONS

Buna Standard **00**
 Viton Standard **V0**
 Buna, Knob **0K**
 Viton Knob **VK**
 Internal Adj. Buna **0I**
 Internal Adj. Viton **VI**
 Tamper Proof Buna **0T**
 Tamper Proof Viton **VT**

Blank
N
S

BODIES

Without Body
 1/4 NPTF Ports
 #6 SAE Ports

PRESSURE RANGE

50-425 PSI
 425-1500 PSI

TAMPER PROOF

Fill in 4 Digit Pressure Setting
 Example: 0500-500PSI

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com



SL-PWA Sequence Valve, Normally Closed, Internal Pilot

DESCRIPTION

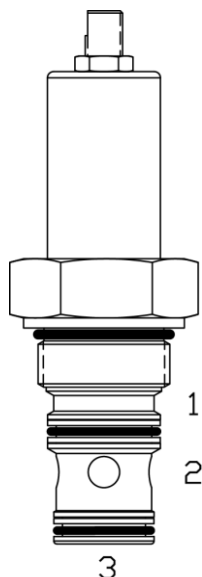
16 size, 1 5/16-12 thread, "Super" series, internal pilot normally closed, sequence valve

OPERATION

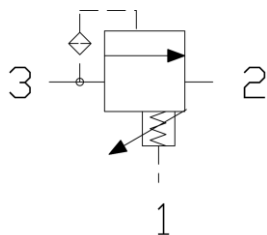
The SL-PWA blocks flow from ports (3) to (2). On attainment of a predetermined pressure at (3) the valve shifts to allow flow from (3) to (2). Port (1) should be a tank line.

FEATURES

- Hardened parts for long life.
- Industry common cavity.

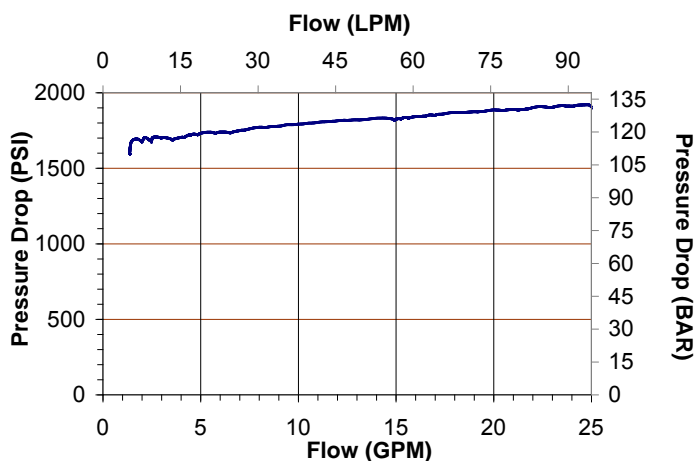


HYDRAULIC SYMBOL



PERFORMANCE

Actual Test Data (Cartridge Only)



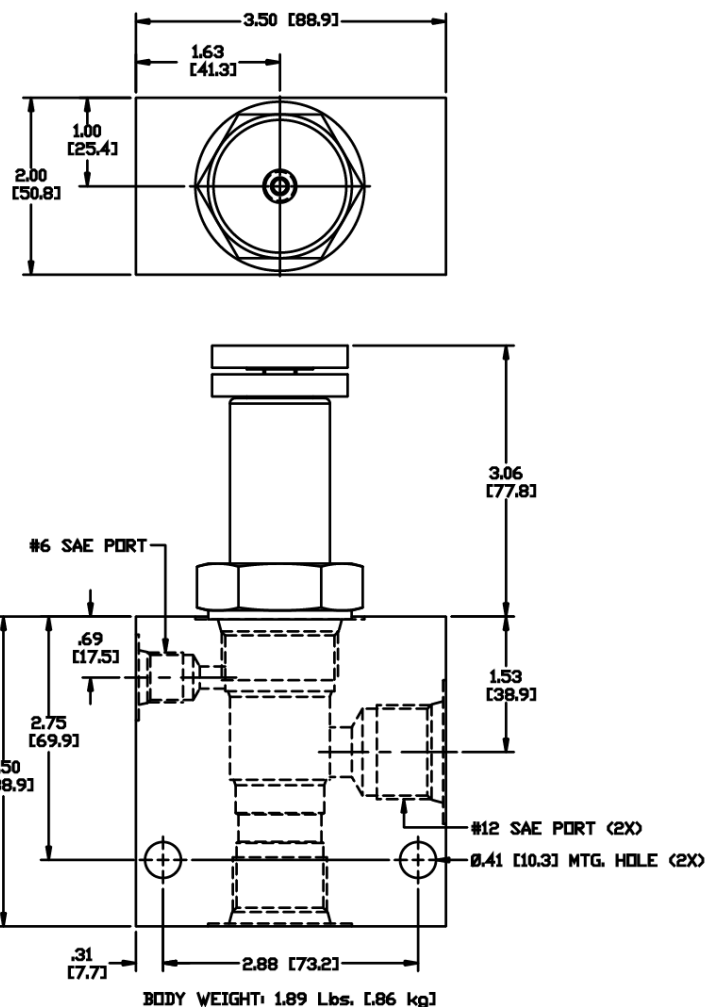
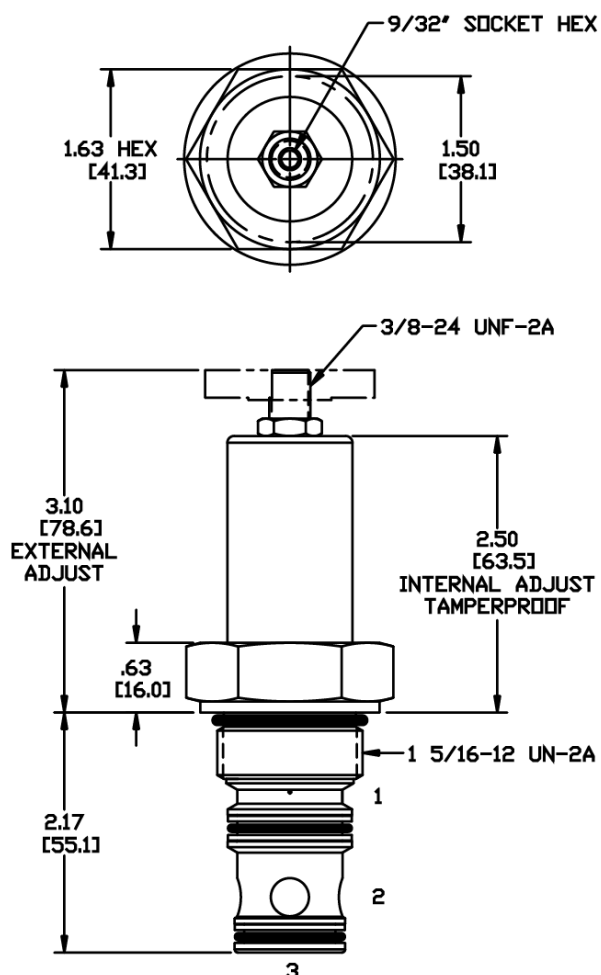
VALVE SPECIFICATIONS

Nominal Flow	40 GPM (151 LPM)
Rated Operating Pressure	3500 PSI (241 bar)
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temperature Range	-40° to 250° F (-40° to 120° C)
Weight	1.15 Lbs. (.52 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	90 ft-lbs (122 Nm)
Cavity	SUPER 3WS
Cavity Form Tool (Finishing)	40500021
Seal Kit	21191404

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.



DIMENSIONS



ORDERING INFORMATION

SL-PWA -

OPTIONS

Buna, Standard
 Viton, Standard
 Buna, Knob
 Viton, Knob
 Buna, Internal Adjust
 Viton, Internal Adjust
 Buna, Tamper Proof
 Viton, Tamper Proof

00
 V0
 0K
 VK
 0I
 VI
 0T
 VT

3000

BODIES

Blank
 S

PRESSURE RANGE/SETTING

500 – 3000 PSI

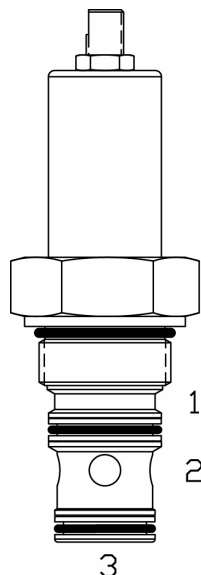
TAMPERPROOF (fill in 4 digit pressure setting)

Example: 2000 = 2000 PSI

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.



SL-PWB Sequence Valve, Normally Closed, Internal Pilot with Reverse Free Flow



DESCRIPTION

16 size, 1 5/16-12 thread, "Super" series, internal pilot normally closed, sequence valve w/ reverse free flow

OPERATION

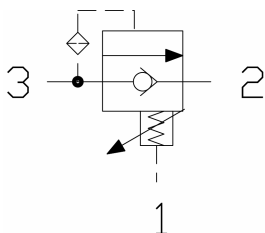
The SL-PWB blocks flow from ports (3) to (2). On attainment of a predetermined pressure at (3) the valve shifts to allow flow from (3) to (2). Port (1) should be a tank line.

Reverse flow from (2) to (3) occurs when the pressure at port (2) is at least 45 PSI (3.1 bar) higher than at port (3).

FEATURES

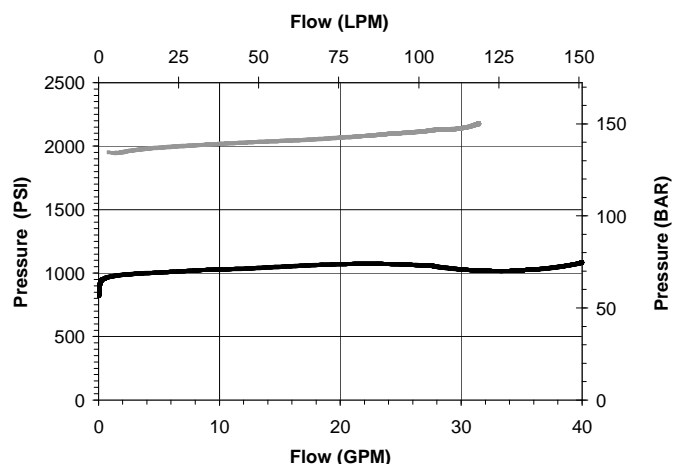
- Hardened parts for long life.
- Industry common cavity.

HYDRAULIC SYMBOL



PERFORMANCE

Actual Test Data (Cartridge Only)



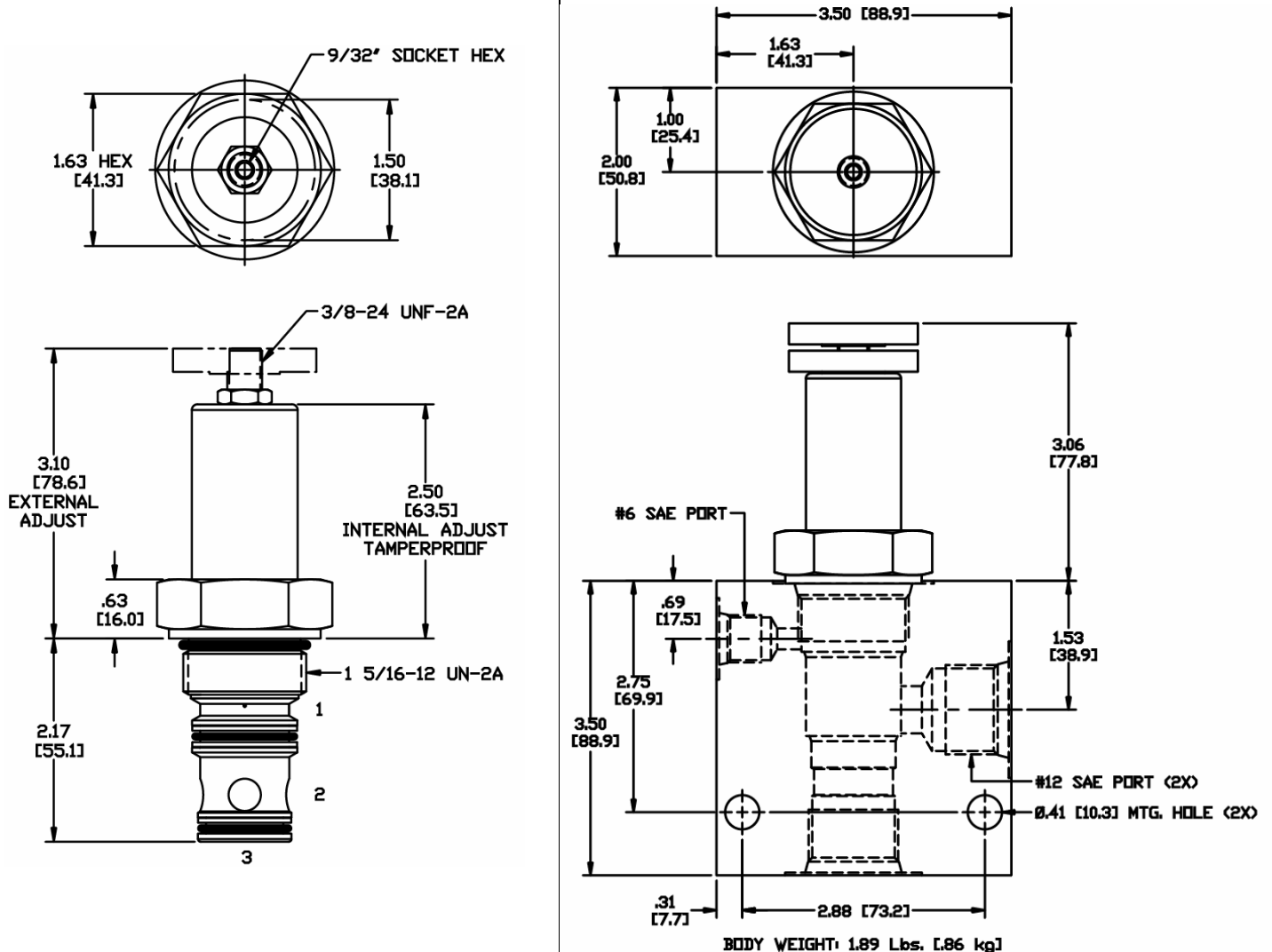
VALVE SPECIFICATIONS

Nominal Flow	40 GPM (151 LPM)
Rated Operating Pressure	3500 PSI (241 bar)
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temperature Range	-40° to 250° F (-40° to 120° C)
Weight	1.15 Lbs. (.52 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	90 ft-lbs (122 Nm)
Cavity	SUPER 3WS
Cavity Form Tool (Finishing)	40500021
Seal Kit	21191404

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.



DIMENSIONS



ORDERING INFORMATION

SL-PWB

OPTIONS

Buna, Standard
Viton, Standard
Buna, Knob
Viton, Knob
Buna, Internal Adjust
Viton, Internal Adjust
Buna, Tamper Proof
Viton, Tamper Proof

00
V0
0K
VK
0I
VI
0T
VT

3000

BODIES

Blank
S
Without Body
#12 SAE Ports

PRESSURE RANGE/SETTING

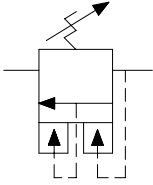
500 – 3000 PSI

TAMPERPROOF (fill in 4 digit pressure setting)

Example: 2000 = 2000 PSI

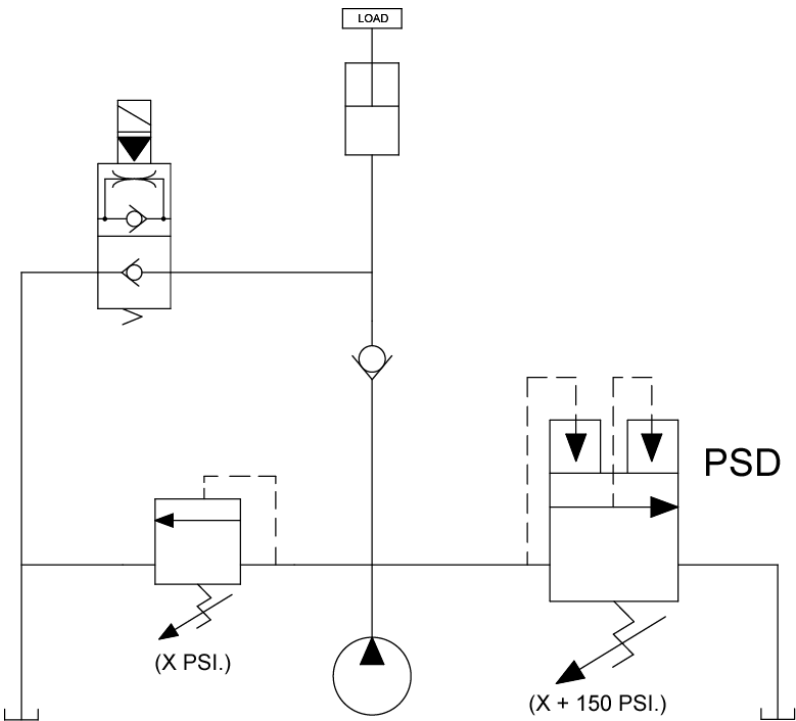
WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

Shut Down Valves

	GPM	PSI	LPM	BAR	MODEL	PAGE
	15	4500	57	310	DE-PSD	438

Typical Schematic

Typical application for the PSD is a system protector, like a relief valve, but once this valve opens it will not reseal until the pressure at port 2 is drained off. This valve is not to be used as a load holding device.



WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

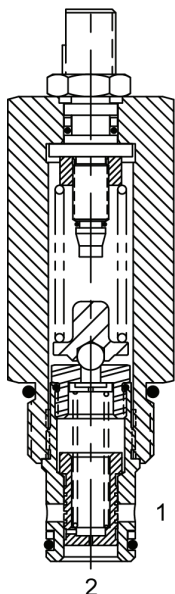
Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com



DE-PSD Pressure Shut Down Valve



DESCRIPTION

10 size, 7/8-14 thread, "Delta" series, pressure shut down valve

OPERATION

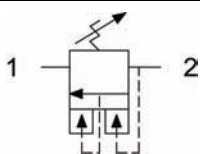
The DE-PSD blocks flow from (2) to (1) until sufficient pressure is present at (2) to open the pilot, thereby forcing the spool to open and allowing flow from (2) to (1).

The valve stays open until the differential pressure from (2) to (1) decreases to less than 50 PSI (3.4 bar).

FEATURES

- Hardened parts for long life.
- Industry common cavity.

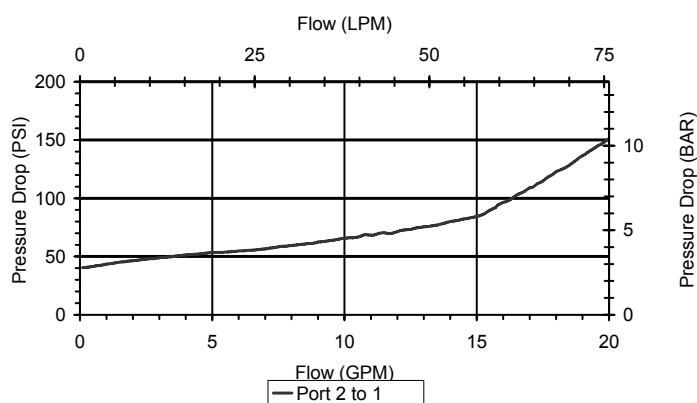
HYDRAULIC SYMBOL



Usually the valve requires flow to be reduced to near zero before the valve will reset.

PERFORMANCE

Actual Test Data (Cartridge Only)



VALVE SPECIFICATIONS

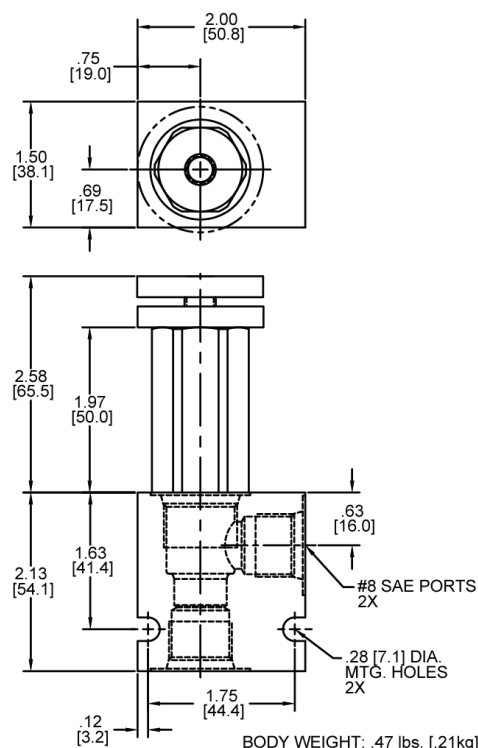
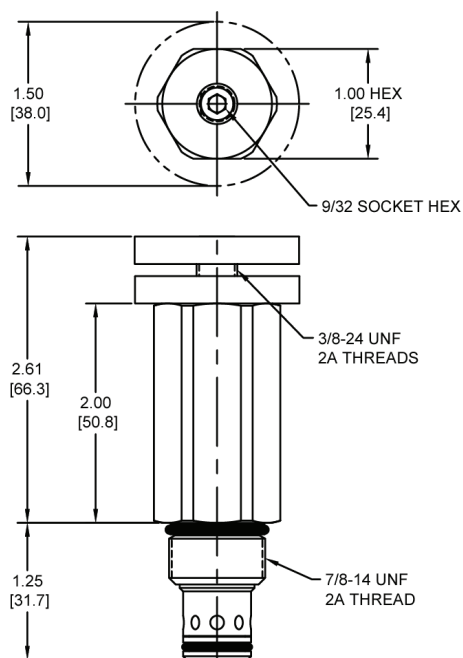
Nominal Flow	15 GPM (57 LPM)
Rated Operating Pressure	4500 PSI (310 bar)
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temperature Range	-40° to 250° F (-40° to 120° C)
Weight	.53 lbs. (.24 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	30 ft-lbs (40.6 Nm)
Cavity	DELTA 2W
Cavity Form Tool (Finishing)	40500000
Seal Kit	21191200

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com


DIMENSIONS

ORDERING INFORMATION
DE-PSD
OPTIONS

Buna Standard
 Viton Standard
 Buna, Knob
 Viton, Knob
 Internally Adj. Buna
 Internally Adj. Viton
 Tamper Proof Buna
 Tamper Proof Viton

00
V0
0K
VK
0I
VI
0T
VT

3000
4500

Blank
N
S

BODIES

Without Body
 3/8 NPTF Ports
 #8 SAE Ports

Note: aluminum, NOT durability rated for 4000 PSI. Consult factory for body options.

PRESSURE RANGE/SETTING

100 – 3000 PSI
 3000 – 4500 PSI

TAMPER PROOF

Fill in 4 Digit Pressure Setting
 Example: 0500-500 PSI

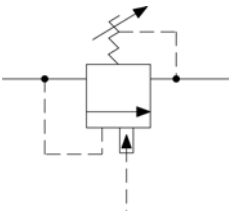
WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

Phone: (815) 397-6628

Fax: (815) 397-2526

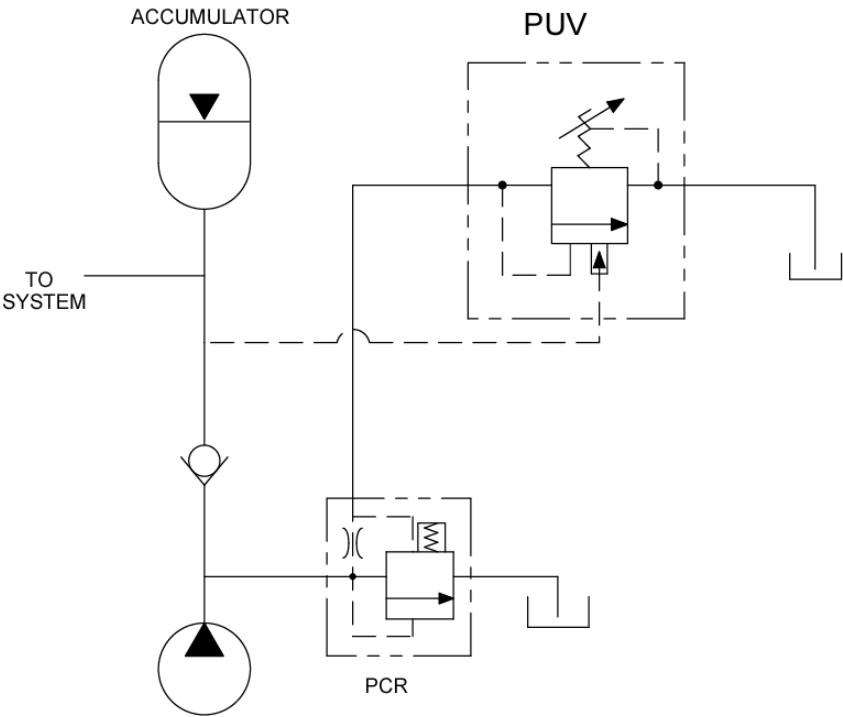
E-mail: delta@delta-power.com

Unloading Valves

	GPM	PSI	LPM	BAR	MODEL	PAGE
	1	4000	4	276	DF-PUV	442

Typical Schematic

Typical application for the PUV is for pump unloading in an accumulator system. When the PUV setting is reached, the PUV opens, venting the PCR valves pilot signal. This unloads the pump until accumulator system pressure drops to 80% of the PUV setting. The PUV closes which blocks the PCR pilot signal to recharge the accumulator and the cycle is repeated. NOTE: Max. PUV flow 1 GPM.



WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com



DF-PUV Pilot Operated Unloading Valve

DESCRIPTION

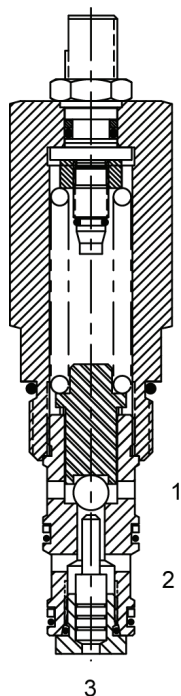
10 size, 7/8-14 thread, "Delta" series, pilot operated unloading valve

OPERATION

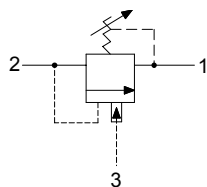
The DF-PUV blocks all ports until pressure at port (2) exceeds pressure setting, or pressure at port (3) is above 80 % of pressure setting.

FEATURES

- Hardened parts for long life.
- Industry common cavity.



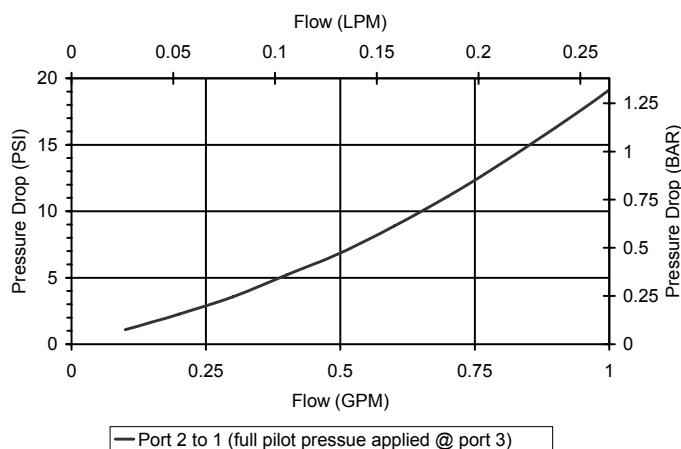
HYDRAULIC SYMBOL



Typical circuits require an orifice to be placed at ports (2) and (3).

PERFORMANCE

Actual Test Data (Cartridge Only)



VALVE SPECIFICATIONS

Nominal Flow	1 GPM (3.8 LPM)
Rated Operating Pressure	4000 PSI (276 bar)
Loading Pressure as % of Unloading Pressure	80% (Ex. If the PUV cracks at 3000 PSI, it will reseal at 2400 PSI)
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temperature Range	-40° to 250° F (-40° to 120° C)
Weight	.60 lbs. (.27 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	30 ft-lbs (40.6 Nm)
Cavity	DELTA 3W
Cavity Form Tool (Finishing)	40500001 (min. pre-drill .563 dia.)
Seal Kit	21191206

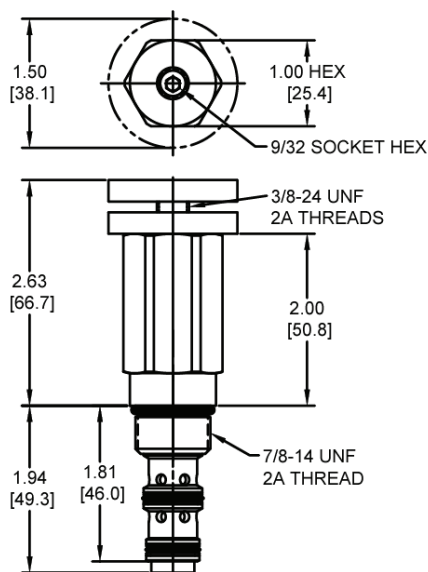
WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

Phone: (815) 397-6628

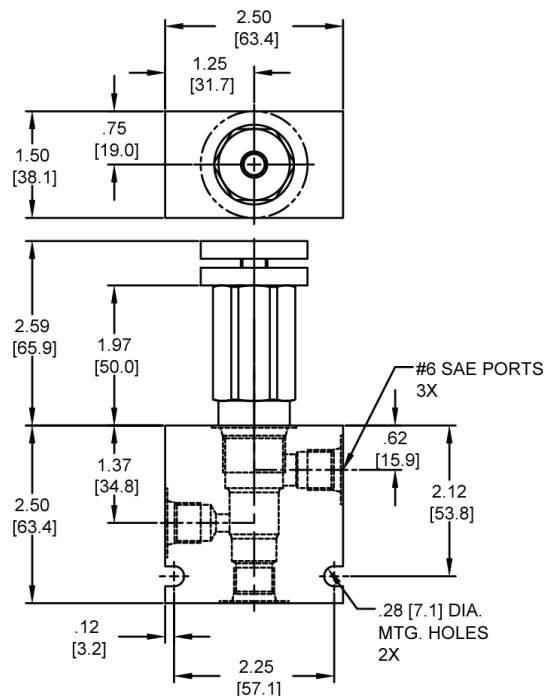
Fax: (815) 397-2526

E-mail: delta@delta-power.com

DIMENSIONS



NOTE: .563 DIA. MINIMUM CAVITY PREDRILL REQUIRED



BODY WEIGHT: .76 lbs [.35 kg.]

ORDERING INFORMATION

DF-PUV -

OPTIONS

Buna Standard **00**
Viton Standard **V0**
Buna, Knob **0K**
Viton, Knob **VK**
Internally Adj. Buna **0I**
Internally Adj. Viton **VI**
Tamper Proof Buna **0T**
Tamper Proof Viton **VT**

3000

Blank **N**
S

BODIES

Without Body
1/4 NPTF Ports
#6 SAE Ports

PRESSURE RANGE/SETTING

Ext./Int. Adjustable

300 – 3000 PSI

Tamper Proof

Fill in 4 Digit Pressure Setting

Example: **0500 – 500 PSI**

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

Phone: (815) 397-6628

Fax: (815) 397-2526

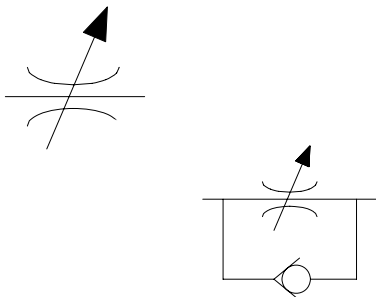
E-mail: delta@delta-power.com



SECTION/Description	Pages
Flow Restrictors, Adjustable (Needle Valves)	447
Pressure Compensated Flow Regulator Valves	465
Priority Flow Regulator Valves	483
Velocity Fuses	491
Flow Divider/Combiner Valves	495

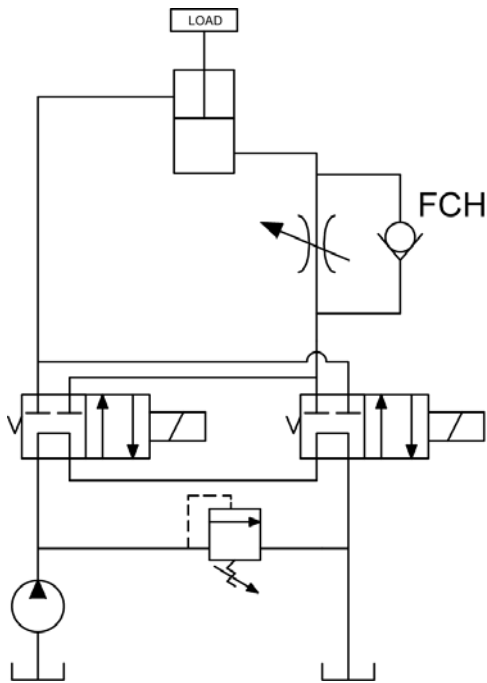
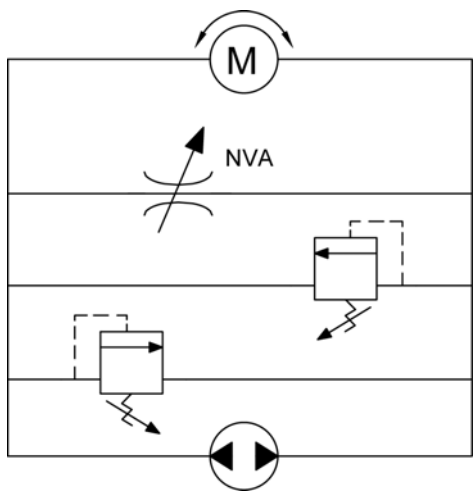
WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

Needle Valves – Flow Restrictors

	GPM	PSI	LPM	BAR	MODEL	PAGE
	12	3500	45	241	DE-FCH	448
	6	3500	23	241	MA-NVA	450
	6	3500	23	241	PB-NVA	452
	10	3500	38	241	DE-NVA	454
	35	5000	132	345	HT-NVA	456
	40	3500	151	241	SJ-NVA	458
	3	3500	11	241	PB-NVB	460
	15	3500	57	241	DE-NVB	462

Typical Schematic

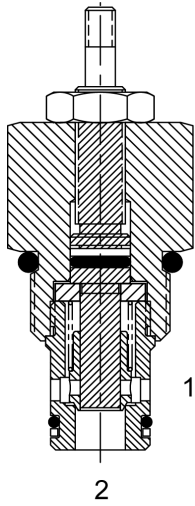
Typical application for the NVA is to meter flow giving speed or full bypass control of a fluid motor.
Typical application for the FCH is to meter flow in one direction while allowing free flow in the opposite direction.



WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.



DE-FCH Adjustable Flow Control Valve, Spool Type, Free Reverse Flow



DESCRIPTION

10 size, 7/8-14 thread, "Delta" adjustable needle flow control valve with free reverse flow.

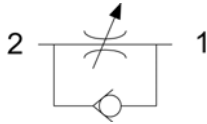
OPERATION

The DE-FCH increases its orifice value from fully closed to fully open by turning screw counterclockwise. When adjusted open the valve regulates flow (1) to (2). When fully closed the valve restricts flow from (1) to (2).

FEATURES

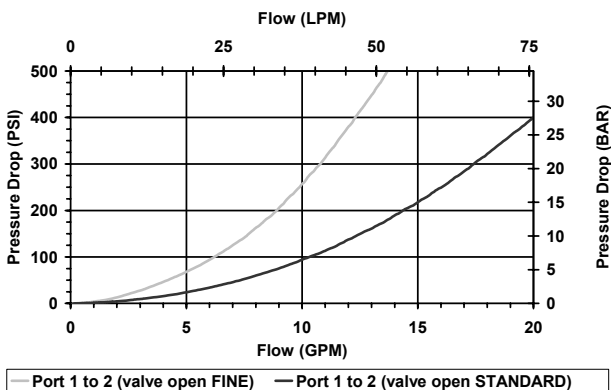
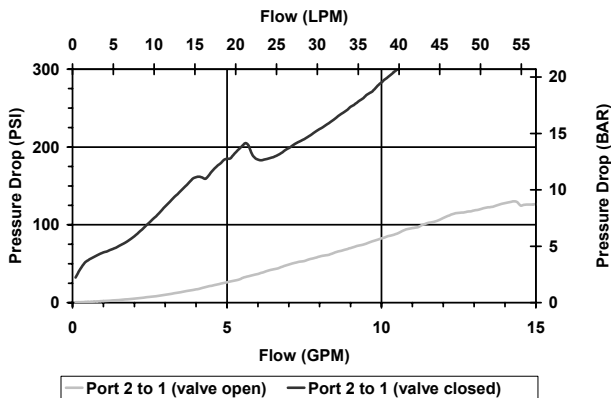
- Hardened parts for long life.
- Industry common cavity.

HYDRAULIC SYMBOL



PERFORMANCE

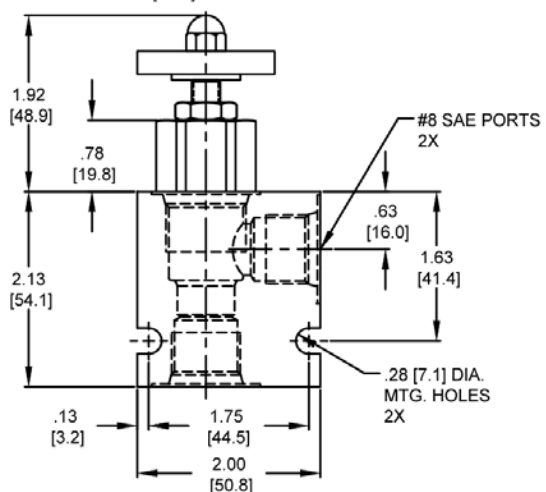
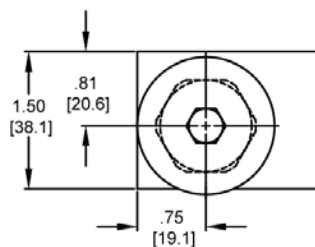
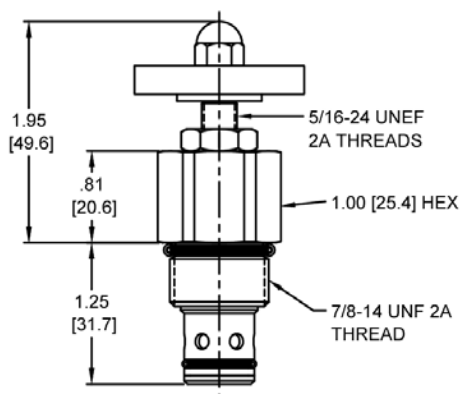
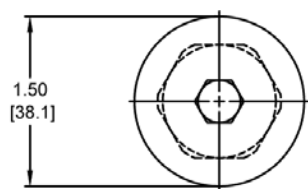
Actual Test Data (Cartridge Only)



VALVE SPECIFICATIONS

Nominal Flow	12 GPM (45 LPM)
Rated Operating Pressure	3500 PSI (241 bar)
Filtration	ISO 18/16/13
Media Operating Temperature Range	-40° to 250° F (-40° to 120° C)
Weight	.32 lbs. (.15 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	30 ft-lbs (40.6 Nm)
Cavity	DELTA 2W
Cavity Form Tool (Finishing)	40500000
Seal Kit	21191200

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.


DIMENSIONS


BODY WEIGHT: .47 lbs. [.21 kg.]

ORDERING INFORMATION
DE-FCH - - - -

OPTIONS

Buna Standard	00
Viton Standard	V0
Buna, Knob	0K
Viton, Knob	VK
Buna, Screen	A0
Viton, Screen	W0
Buna, Screen, Knob	AK
Viton, Screen, Knob	WK

Blank
N
S

BODIES

Without Body
3/8 NPT Ports
#8 SAE Ports

ADJUSTMENTS

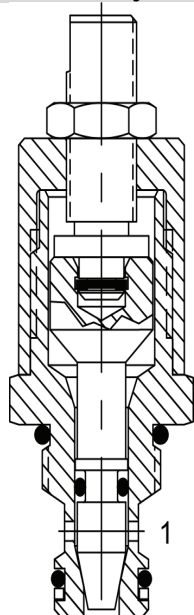
FINE	Fine Adjustment
STRD	Standard Adjustment

**NOTE: Use Screen Only if Flow
Direction is From 1 to 2**

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.



MA-NVA Adjustable Flow Control Valve, Needle Type



DESCRIPTION

7 size, 5/8-18 thread, "Mini" series, needle flow control valve.

OPERATION

The MA-NVA adjusts from fully open to fully closed by turning adjusting screw clockwise. When adjusted open the valve allows flow (1) to (2) and (2) to (1). When fully closed the valve blocks flow from (1) to (2) and (2) to (1).

FEATURES

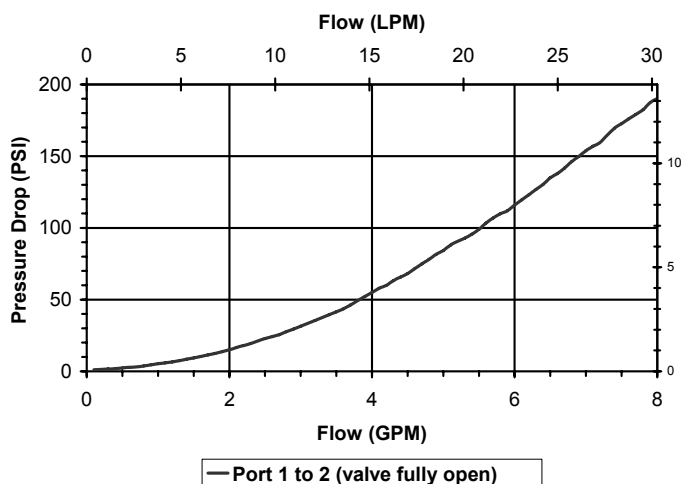
- Hardened parts for long life.
- Industry common cavity.

HYDRAULIC SYMBOL



PERFORMANCE

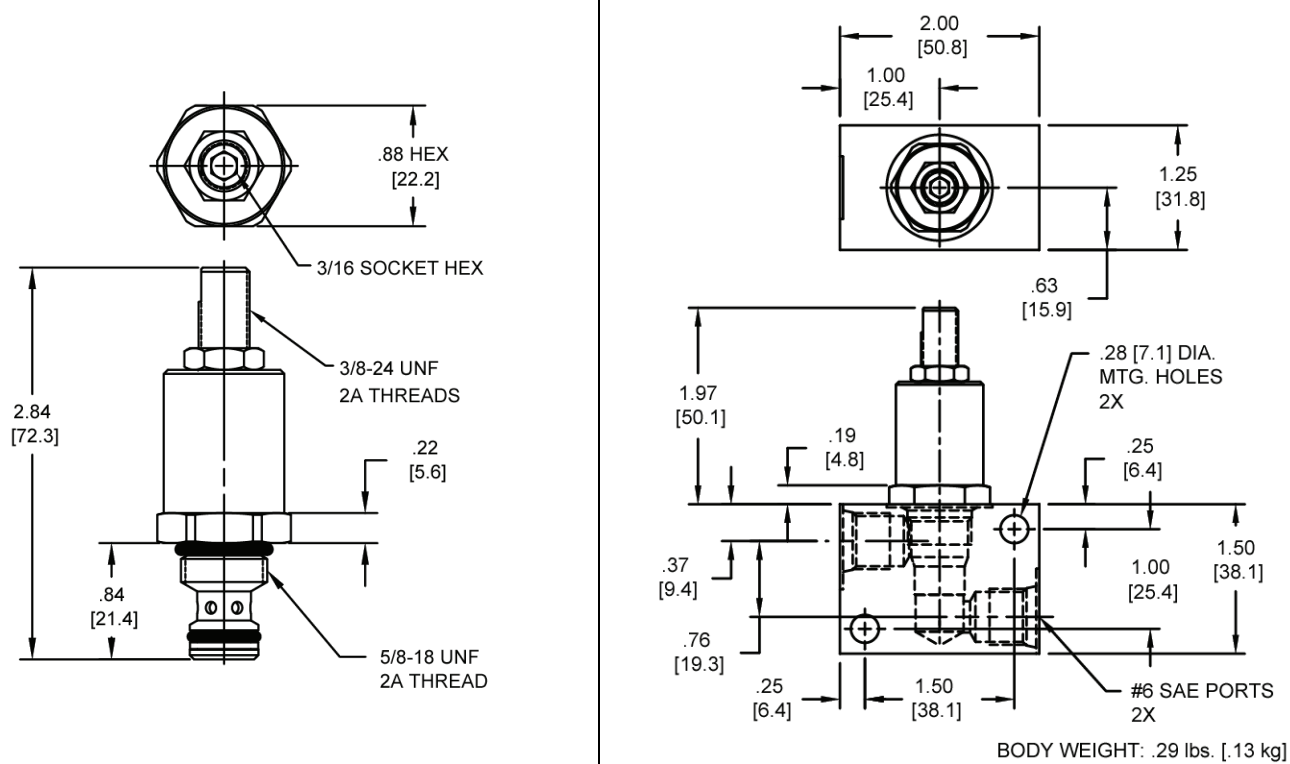
Actual Test Data (Cartridge Only)



VALVE SPECIFICATIONS

Nominal Flow	6 GPM (23 LPM)
Rated Operating Pressure	3500 PSI (241 bar)
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temperature Range	-40° to 250° F (-40° to 120° C)
Weight	24 lbs. (.11 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	15 ft-lbs (20.3 Nm)
Cavity	MINI 2W
Cavity Form Tool (Finishing)	40500003
Seal Kit	21191202

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.


DIMENSIONS

ORDERING INFORMATION
MA-NVA
OPTIONS

 Buna Standard
 Viton Standard
 Buna, Knob
 Viton, Knob

00
V0
0K
VK

 Blank
 N
 S

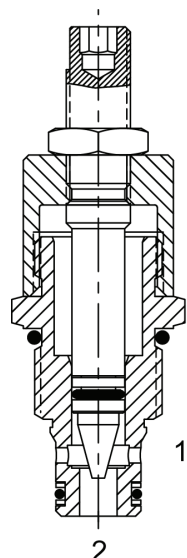
BODIES

 Without Body
 1/4 NPTF Ports
 #6 SAE Ports

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.



PB-NVA Adjustable Flow Control Valve, Needle Type



DESCRIPTION

8 size, 3/4-16 thread, "Power" series, needle flow control.

OPERATION

The PB-NVA adjusts from fully open to fully closed by turning adjusting screw clockwise. When adjusted open the valve allows flow from (1) to (2) and (2) to (1). When fully closed the valve blocks flow from (1) to (2) and (2) to (1).

FEATURES

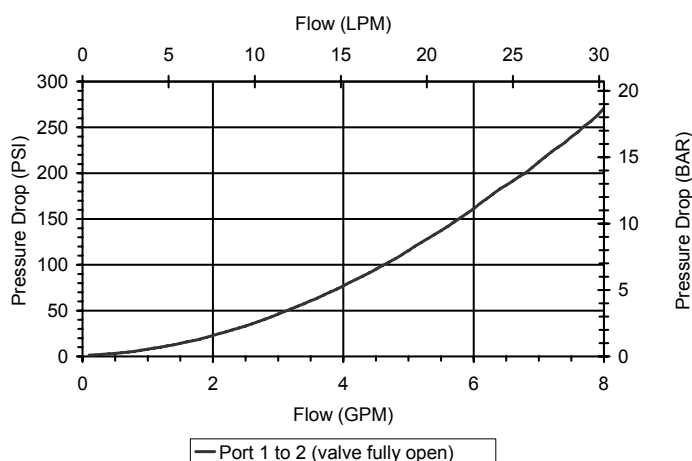
- Hardened parts for long life.
- Industry common cavity.

HYDRAULIC SYMBOL



PERFORMANCE

Actual Test Data (Cartridge Only)



VALVE SPECIFICATIONS

Nominal Flow	6 GPM (23 LPM)
Rated Operating Pressure	3500 PSI (241 bar)
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temperature Range	-40° to 250° F (-40° to 120° C)
Weight	.22 lbs. (.10 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	25 ft-lbs (34 Nm)
Cavity	POWER 2W
Cavity Form Tool (Finishing)	40500005
Seal Kit	21191102

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

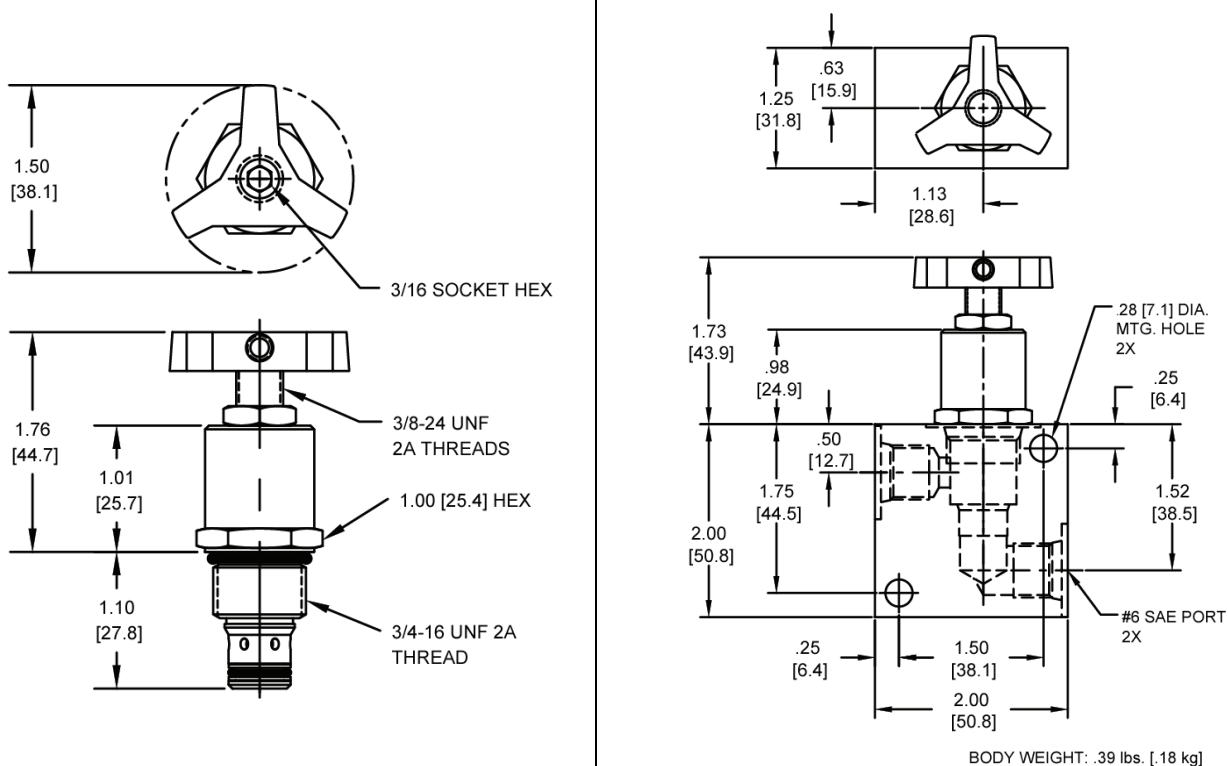
Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com



DIMENSIONS



ORDERING INFORMATION

PB-NVA -

OPTIONS

Buna Standard	00
Viton Standard	V0
Buna, Knob	0K
Viton, Knob	VK
Buna, Screen	A0
Viton, Screen	W0
Buna, Screen, Knob	AK
Viton, Screen, Knob	WK

Blank
N
S

BODIES

Without Body
1/4 NPTF Ports
#6 SAE Ports

NOTE: Use Screen Only if Flow Direction is From 1 to 2

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com



DE-NVA Adjustable Flow Control Valve, Needle Type, Fine Adjust

DESCRIPTION

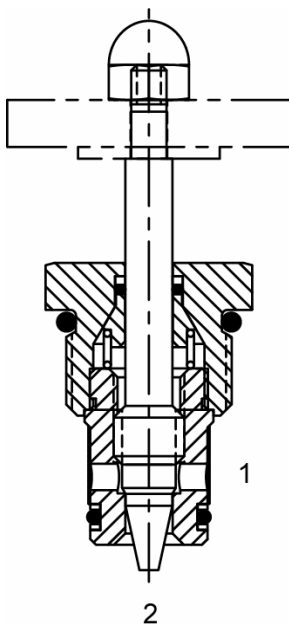
10 size, 7/8-14 thread, "Delta" series fine adjust needle flow control valve.

OPERATION

The DE-NVA adjusts from fully open to fully closed by turning adjusting screw counterclockwise. When adjusted open the valve allows flow (1) to (2) and (2) to (1). When fully closed the valve blocks flow from (1) to (2) and (2) to (1).

FEATURES

- Hardened parts for long life.
- Industry common cavity.

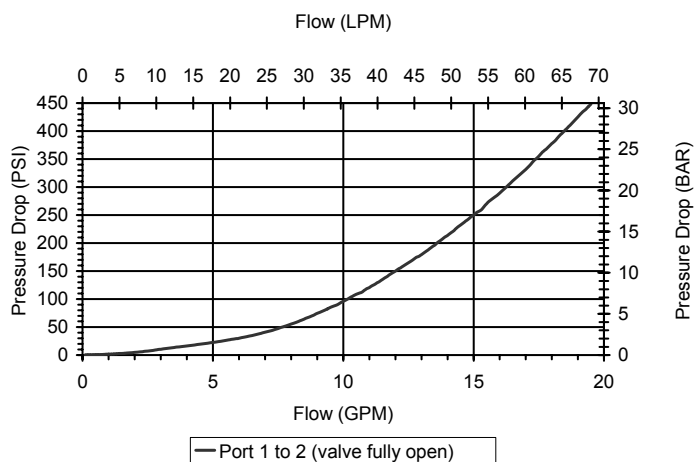


HYDRAULIC SYMBOL



PERFORMANCE

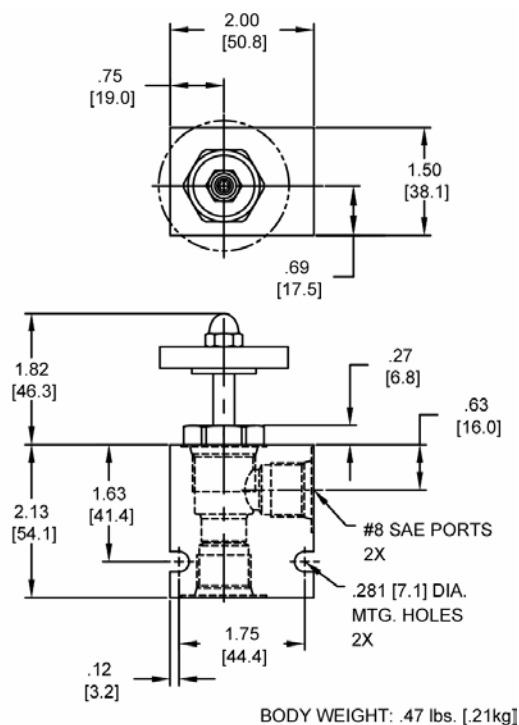
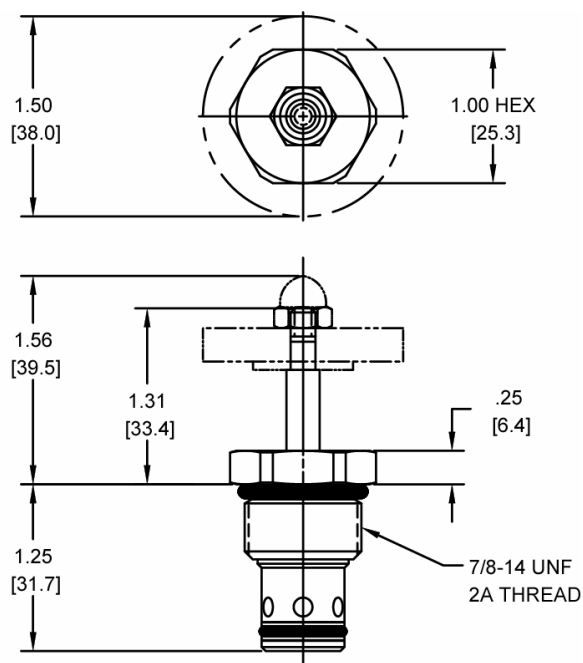
Actual Test Data (Cartridge Only)



VALVE SPECIFICATIONS

Nominal Flow	10 GPM (38 LPM)
Rated Operating Pressure	3500 PSI (241 bar)
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temperature Range	-40° to 250° F (-40° to 120° C)
Weight	.19 lbs. (.09 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	30 ft-lbs (40.6 Nm)
Cavity	DELTA 2W
Cavity Form Tool (Finishing)	40500000
Seal Kit	21191202

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.


DIMENSIONS

ORDERING INFORMATION
DE-NVA - -

OPTIONS

Buna Standard	00
Viton Standard	V0
Buna, Screen	A0
Viton, Screen	W0
Buna, Knob	0K
Viton, Knob	VK
Buna, Knob, Screen	AK
Viton, Knob, Screen	WK

Blank
N
S
BODIES

 Without Body
 3/8 NPTF Ports
 #8 SAE Ports

**NOTE: Use Screen Only if Flow
Direction is From 1 to 2**

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.



HT-NVA Adjustable Flow Control Valve, Needle Type

DESCRIPTION

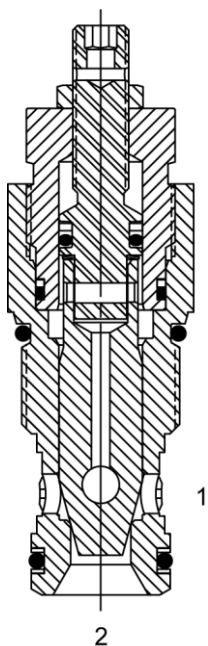
"High Pressure" 12 size, 1 1/16-12 thread, "Tecnord" series, needle flow control valve.

OPERATION

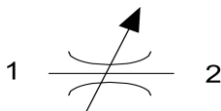
The HT-NVA adjusts from fully open to fully closed by turning adjusting screw clockwise. When adjusted open the valve allows flow (1) to (2) and (2) to (1). When fully closed the valve blocks flow from (1) to (2) and (2) to (1).

FEATURES

- Hardened parts for long life.
- Industry common cavity.



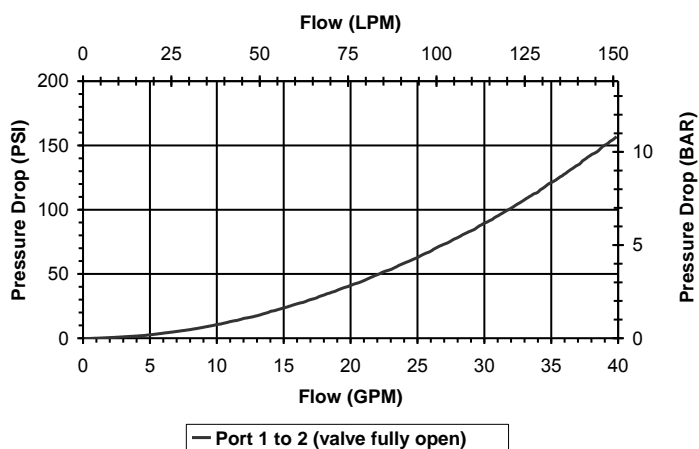
HYDRAULIC SYMBOL



NOTE: Valves with the knob option are NOT to be adjusted under pressure.

PERFORMANCE

Actual Test Data (Cartridge Only)



VALVE SPECIFICATIONS

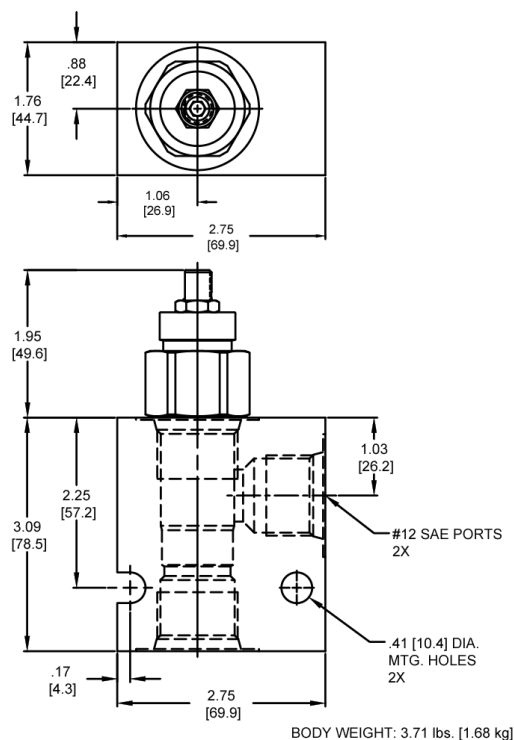
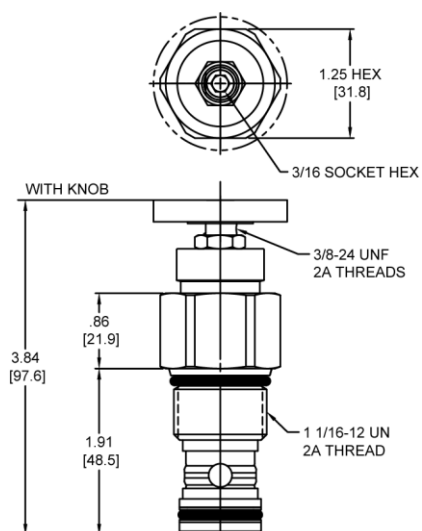
Nominal Flow	35 GPM (132 LPM)
Rated Operating Pressure	5000 PSI (350 bar)
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temperature Range	-40° to 250° F (-40° to 120° C)
Weight	.72 lbs. (.32 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	70 ft-lbs (94.9 Nm)
Cavity	TECNORD 2W
Cavity Form Tool (Finishing)	40500032
Seal Kit	21191302

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Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com


DIMENSIONS

ORDERING INFORMATION
HT-NVA
OPTIONS

Buna Standard	00
Viton Standard	V0
Buna, Screen	A0
Viton, Screen	W0
Buna, Knob	0K
Viton, Knob	VK
Buna, Screen, Knob	AK
Viton, Screen, Knob	WK

 Blank
S
BODIES

 Without Body
 #12 SAE Ports

**NOTE: Use Screen Only if Flow
Direction is From 1 to 2**

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 E-mail: delta@delta-power.com



SJ-NVA Adjustable Flow Control Valve, Needle Type

DESCRIPTION

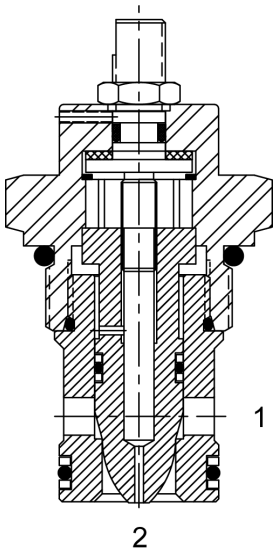
16 size, 1 5/16-12 thread, "Super" series, needle flow control valve.

OPERATION

The SJ-NVA adjusts from fully open to fully closed by turning the adjustment screw clockwise. When adjusted open the valve regulates flow (1) to (2) or (2) to (1). When fully closed the valve blocks flow from (1) to (2) or (2) to (1).

FEATURES

- Hardened parts for long life.
- Industry common cavity.

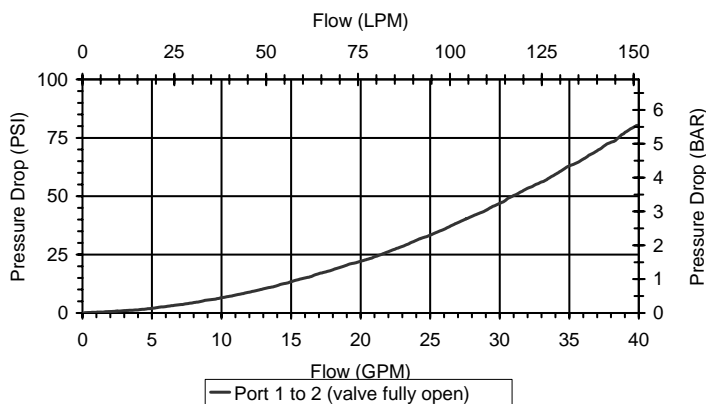


HYDRAULIC SYMBOL



PERFORMANCE

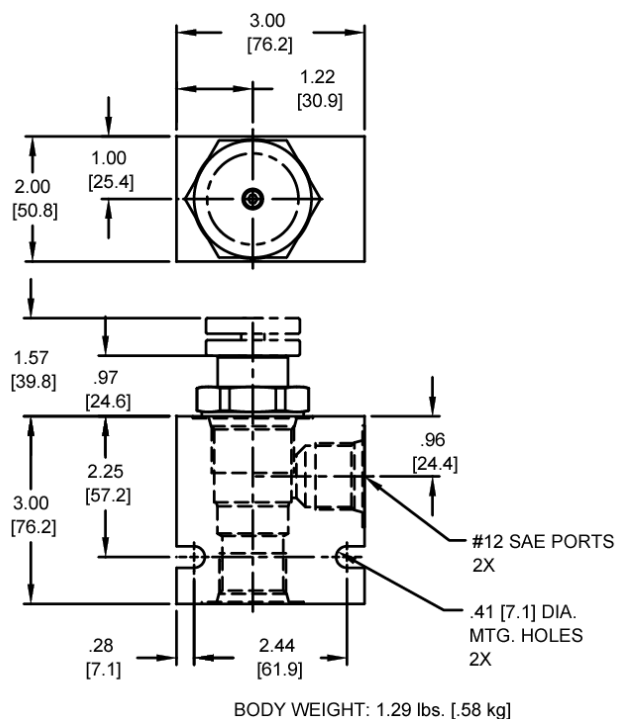
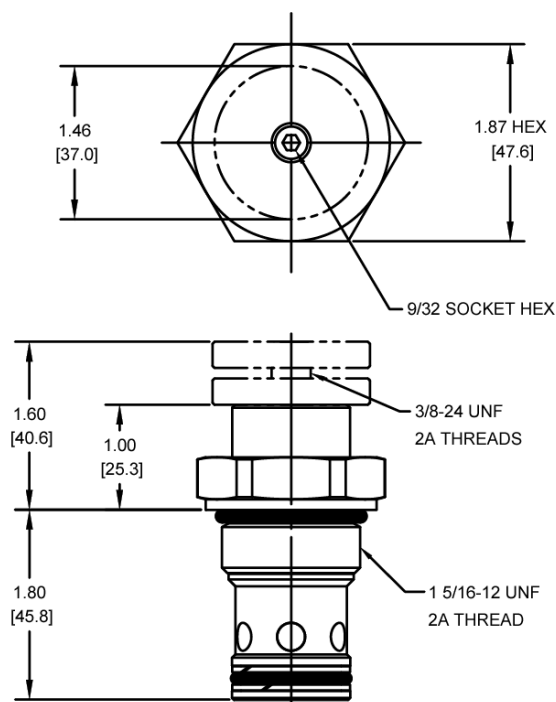
Actual Test Data (Cartridge Only)



VALVE SPECIFICATIONS

Nominal Flow	40 GPM (151 LPM)
Rated Operating Pressure	3500 PSI (241 bar)
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temperature Range	-35° to 200° F (-37.2° to 93.3° C)
Weight	.83 lbs. (.37 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	90 ft-lbs (122 Nm)
Cavity	SUPER 2W
Cavity Form Tool (Finishing)	40500017
Seal Kit	21191402

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.


DIMENSIONS

ORDERING INFORMATION
SJ-NVA

- - -

OPTIONS

Buna Standard	00
Viton Standard	V0
Buna, Knob	0K
Viton, Knob	VK
Internally Adj. Buna	0I
Internally Adj. Viton	VI
Tamper Proof Buna	0T
Tamper Proof Viton	VT

Blank

N

S

BODIES

Without Body
3/4 NPT Ports
12 SAE Ports

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.



PB-NVB Adjustable Flow Control Valve, Needle Type, Fine Adjust

DESCRIPTION

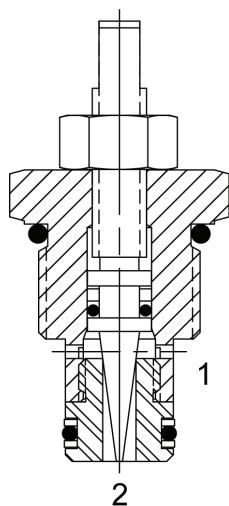
8 size, 3/4-16 thread, "Power" series, fine adjust needle flow control.

OPERATION

The PB-NVB adjusts from fully open to fully closed by turning adjusting screw clockwise. When adjusted open the valve allows flow (1) to (2) and (2) to (1). When fully closed the valve blocks flow from (1) to (2) and (2) to (1).

FEATURES

- Hardened parts for long life.
- Industry common cavity.

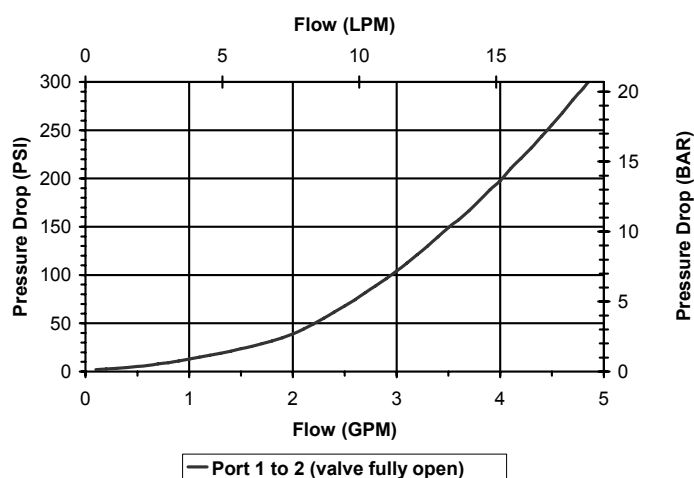


HYDRAULIC SYMBOL



PERFORMANCE

Actual Test Data (Cartridge Only)



VALVE SPECIFICATIONS

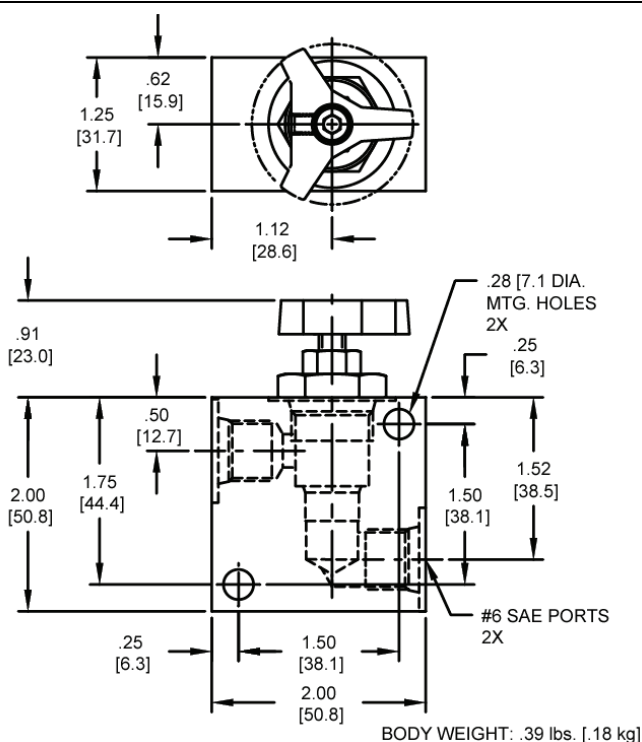
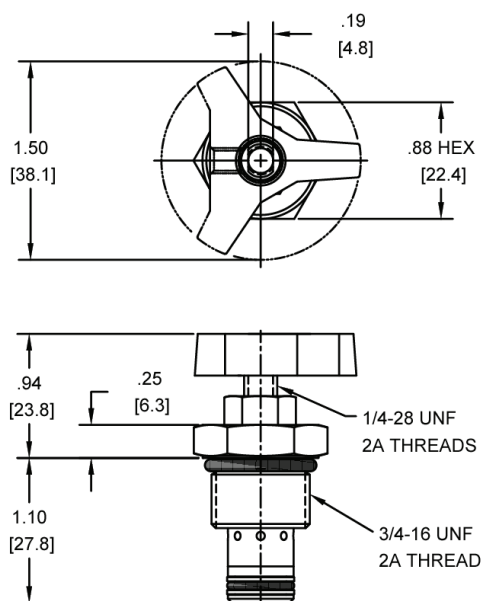
Nominal Flow	3 GPM (11 LPM)
Rated Operating Pressure	3500 PSI (241 bar)
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temperature Range	-40° to 250° F (-40° to 120° C)
Weight	.13 lbs. (.06 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	30 ft-lbs (40.6 Nm)
Cavity	POWER 2W
Cavity Form Tool (Finishing)	40500005
Seal Kit	21191102

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Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com


DIMENSIONS

ORDERING INFORMATION
PB-NVB

<u>OPTIONS</u>		<u>BODIES</u>	
Buna Standard	00	Blank	Without Body
Viton Standard	V0	N	1/4 NPTF Ports
Buna, Knob	0K	S	#6 SAE Ports
Viton, Knob	VK		
Buna, Screen	A0		
Viton, Screen	W0		
Buna, Screen, Knob	AK		
Viton, Screen, Knob	WK		

**NOTE: Use Screen Only if Flow
Direction is From 1 to 2**

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

Phone: (815) 397-6628

Fax: (815) 397-2526

 E-mail: delta@delta-power.com



DE-NVB Adjustable Flow Control Valve, Coarse Adjust

DESCRIPTION

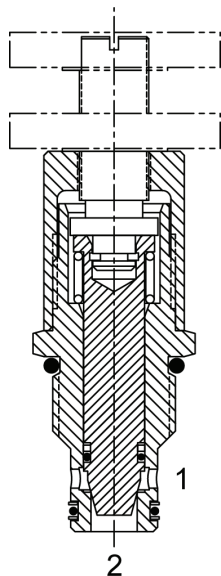
10 size, 7/8-14 thread, "Delta" series, coarse adjust needle flow control valve.

OPERATION

The DE-NVB adjusts from fully open to fully closed by turning adjusting screw clockwise. When adjusted open the valve allows flow (1) to (2) and (2) to (1). When fully closed the valve blocks flow from (1) to (2) and (2) to (1).

FEATURES

- Hardened parts for long life.
- Industry common cavity.

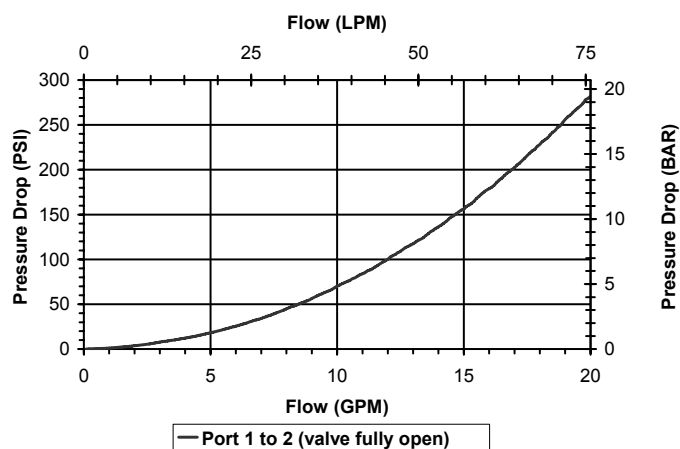


HYDRAULIC SYMBOL



PERFORMANCE

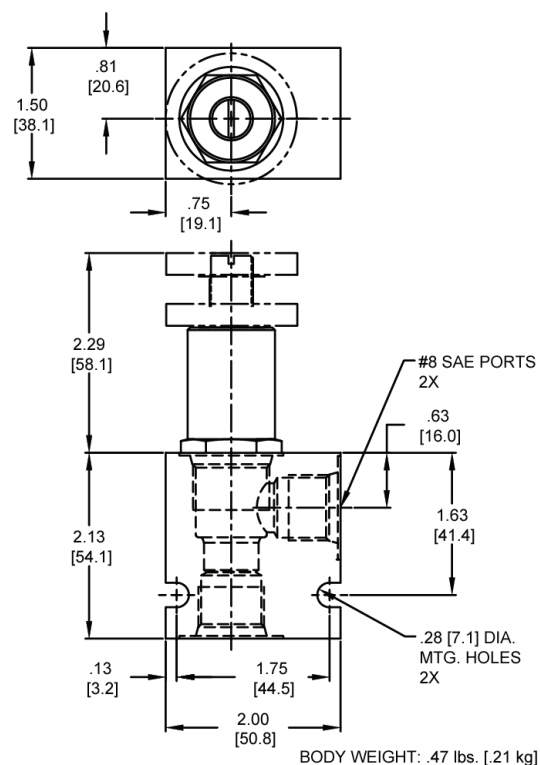
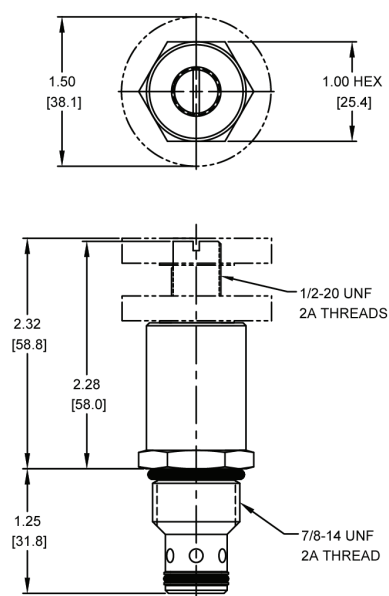
Actual Test Data (Cartridge Only)



VALVE SPECIFICATIONS

Nominal Flow	15 GPM (57 LPM)
Rated Operating Pressure	3500 PSI (241 bar)
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temperature Range	-40° to 250° F (-40° to 120° C)
Weight	.47 lbs. (.21 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	30 ft-lbs (40.6 Nm)
Cavity	DELTA 2W
Cavity Form Tool (Finishing)	40500000
Seal Kit	21191202

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.


DIMENSIONS

ORDERING INFORMATION
DE-NVB - -
OPTIONS

Buna Standard	00
Viton Standard	V0
Buna, Screen	A0
Viton, Screen	W0
Buna, Knob	0K
Viton, Knob	VK
Buna, Knob, Screen	AK
Viton, Knob, Screen	WK

Blank
N
S

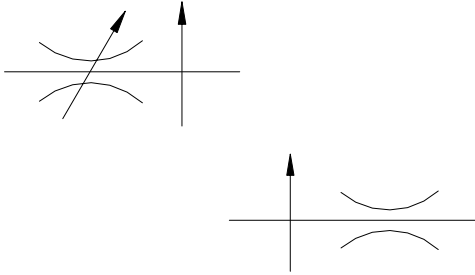
BODIES

Without Body
3/8 NPT Ports
#8 SAE Ports

**NOTE: Use Screen Only if Flow
Direction is From 1 to 2**

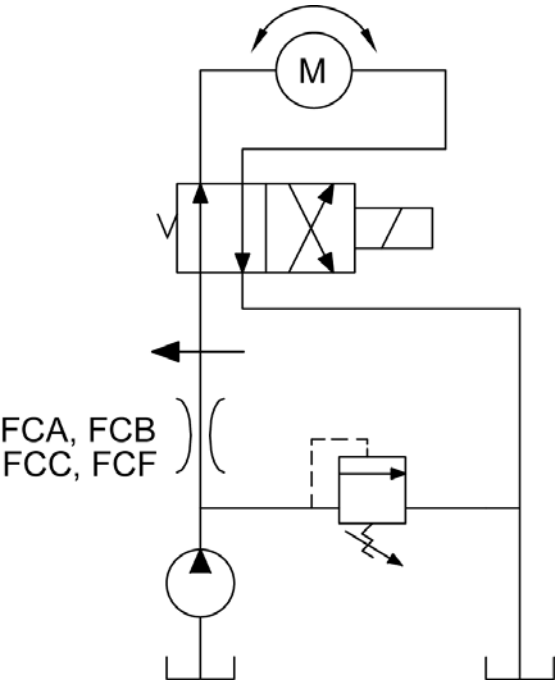
WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

Pressure Compensated Flow Regulator Valves

	GPM	PSI	LPM	BAR	MODEL	PAGE
	3	3000	11	207	MA-FCA	466
	4	3500	15	241	PB-FCA	468
	8	3500	30	241	DE-FCA	470
	20	5000	76	345	HT-FCA	472
	25	3500	95	241	SJ-FCA	474
	8	3500	30	241	DE-FCB	476
	8	3500	30	241	DE-FCC	478
	8	3500	30	241	DE-FCF	480

Typical Schematic

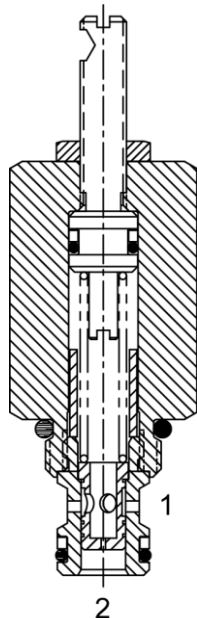
Typical application for the FCA, FCB, FCC, and the FCF is for motor speed control.



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MA-FCA Adjustable Flow Control Valve, Pressure Compensated



DESCRIPTION

7 size, 5/8-18 thread, "Mini" series, pressure compensated, flow control valve.

OPERATION

The cartridge maintains a constant flow rate out of (1) regardless of load pressure changes in the circuit downstream of (1).

The adjustable control differential spring load can be set to customer flow specification (see options for ranges).

The valve begins to respond to load changes when the flow through the valve creates a pressure differential from (2) to (1) greater than 200 PSI with accurate flow maintenance from 200 to 3000 PSI (14 to 207 bar).

Reverse flow (1) to (2) returns through the control orifice and is non-compensated.

The regulated flow increases from low to high with clockwise rotation of the knob.

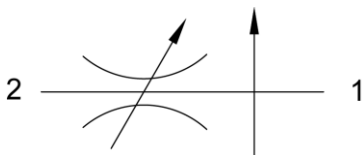
FEATURES

- Hardened parts for long life.
- Industry common cavity.
- Fine low-torque adjustment.



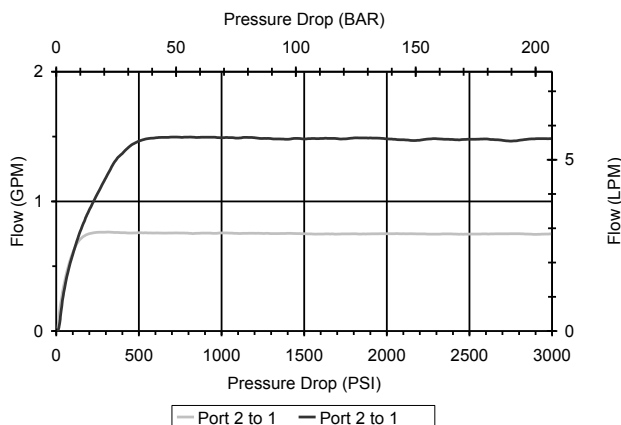
Best stability is obtained with adjustment at highest flow.

HYDRAULIC SYMBOL



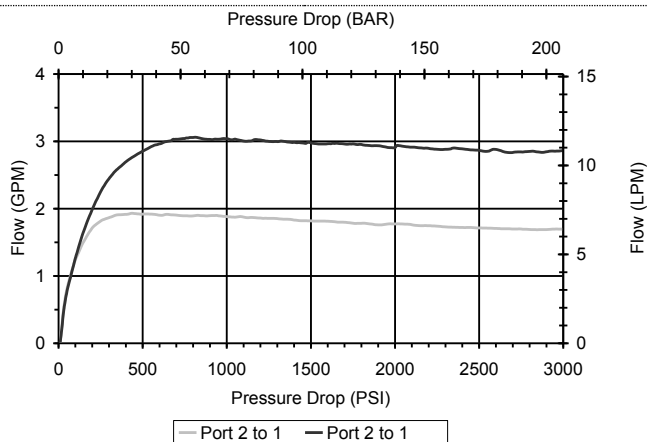
PERFORMANCE

Actual Test Data (Cartridge Only)



VALVE SPECIFICATIONS

Nominal Flow	3 GPM (11 LPM)
Rated Operating Pressure	3000 PSI (207 bar)
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temperature Range	-40° to 250° F (-40° to 120° C)
Weight	.29 lbs. (.13 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	15 ft-lbs (20.3 Nm)
Cavity	MINI 2W
Cavity Form Tool (Finishing)	40500003
Seal Kit	21191000

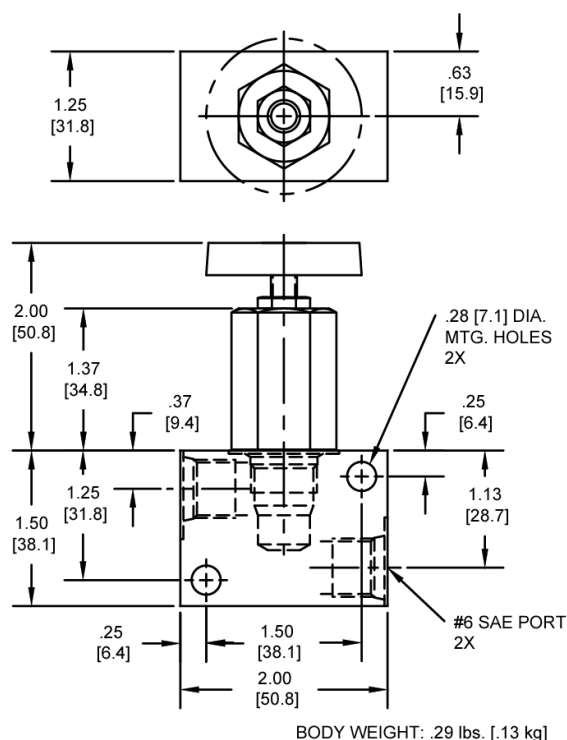
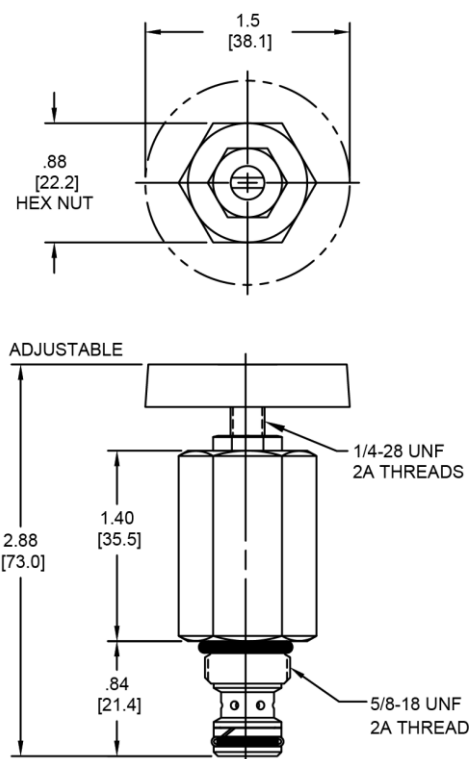


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Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com


DIMENSIONS

ORDERING INFORMATION
MA-FCA
OPTIONS

Buna Standard **00**
 Viton Standard **V0**
 Buna, Knob **0K**
 Viton, Knob **VK**

Blank

N

S

BODIES

Without Body
 1/4 NPTF Ports
 #6 SAE Ports

FLOW

0.17 .08 - .17 GPM
00.5 .25 - .5 GPM
00.9 .5 - .9 GPM
01.5 .75 - 1.5 GPM
02.9 1.9 - 3.0 GPM

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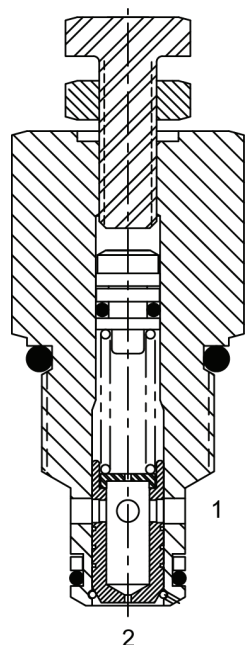
Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com



PB-FCA Adjustable Flow Control Valve, Pressure Compensated



DESCRIPTION

8 size, 3/4-16 thread, "Power" series, pressure compensated, flow control valve.

OPERATION

The cartridge maintains a constant flow rate out of (1) regardless of load pressure changes in the circuit downstream of (1).

The adjustable control differential spring load can be set to customer flow specification (see options for ranges).

The valve begins to respond to load changes when the flow through the valve creates a pressure differential from (2) to (1), greater than 200 PSI (14 bar), with accurate flow maintenance from 200 to 3500 PSI (14 to 241 bar).

Reverse flow (1) to (2) returns through the control orifice and is non-compensated.

The regulated flow increases from low to high with clockwise rotation of the knob.

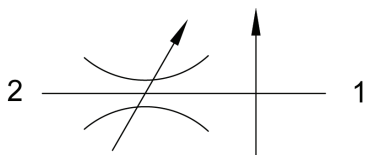
FEATURES

- Hardened parts for long life.
- Industry common cavity.
- Fine low-torque adjustment.



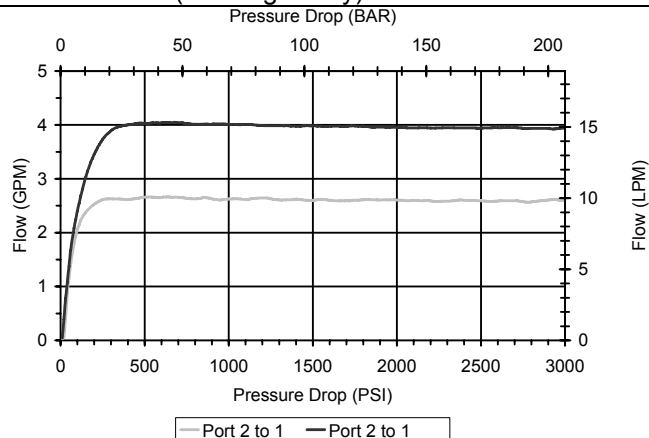
Best stability is obtained with adjustment at highest flow.

HYDRAULIC SYMBOL



PERFORMANCE

Actual Test Data (Cartridge Only)



VALVE SPECIFICATIONS

Nominal Flow	4 GPM (15 LPM)
Rated Operating Pressure	3500 PSI (241 bar)
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temperature Range	-40° to 250° F (-40° to 120° C)
Weight	.26 lbs. (.12 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	25 ft-lbs (33.8 Nm)
Cavity	POWER 2W
Cavity Form Tool (Finishing)	40500005
Seal Kit	21191100

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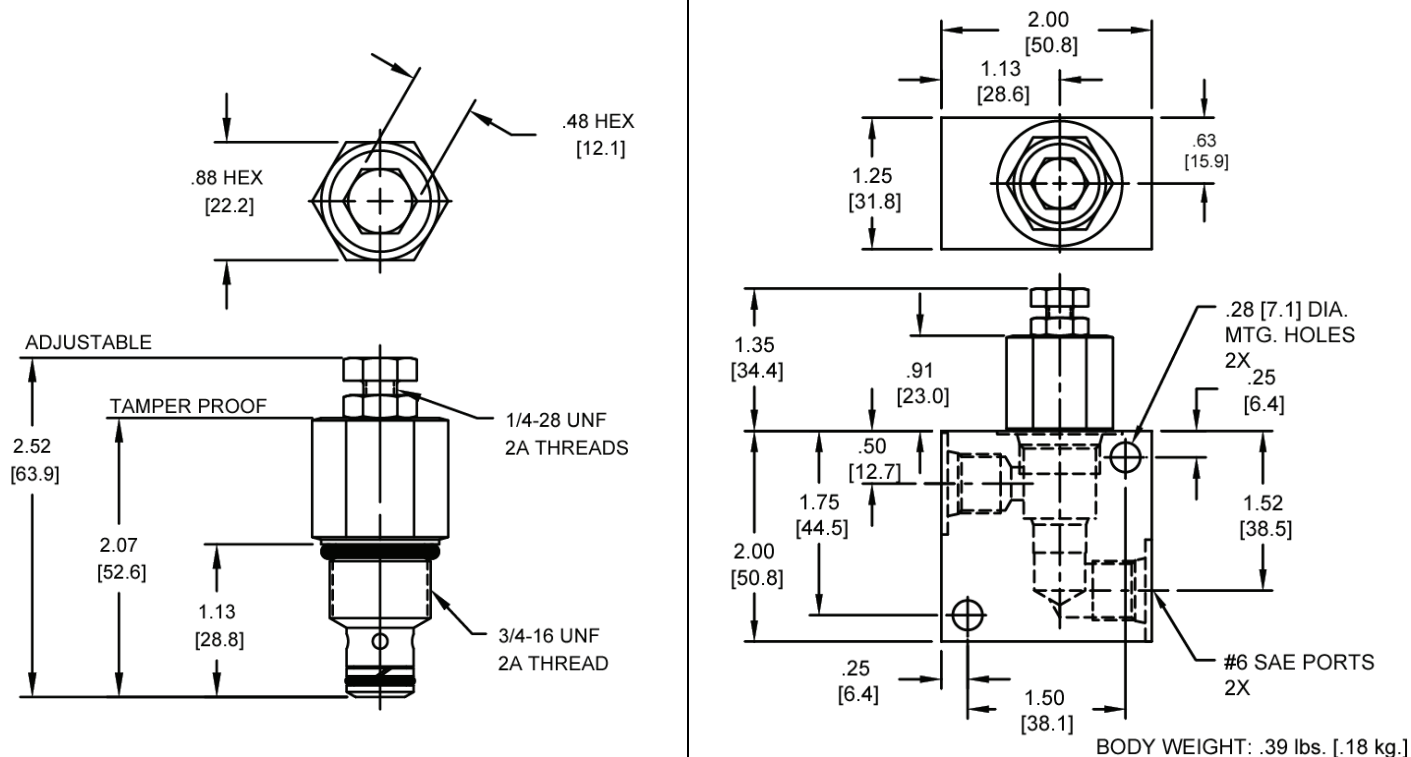
Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com



DIMENSIONS



ORDERING INFORMATION

PB-FCA

OPTIONS

Buna Standard
Viton Standard
Buna Tamper Proof
Viton Tamper Proof

00
V0
0T
VT

Blank

NS

BODIES

Without Body
1/4 NPTF Ports
#6 SAE Ports

FLOW

0.45	.25 - .45 GPM
0.75	.45 - .75 GPM
1.35	.75 – 1.35 GPM
2.65	1.35 – 2.65 GPM
4.00	2.65 – 4.00 GPM

Tamper Proof
Fill in Digit Flow Setting
Example: 02.0 – 2 GPM

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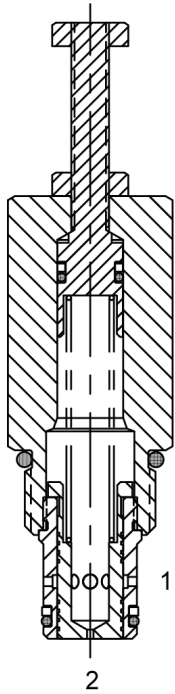
Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com



DE-FCA Adjustable Flow Control Valve, Pressure Compensated



DESCRIPTION

10 size, 7/8-14 thread, "Delta" series, pressure compensated, flow control valve.

OPERATION

The DE-FCA maintains a constant flow rate out of (1) regardless of load pressure changes in the circuit downstream of (1).

The adjustable control (see options for ranges) differential spring load can be set to customer flow specification.

The valve begins to respond to load changes when the flow through the valve creates a pressure differential across the control orifice greater than 100 PSI (6.9 bar), with accurate flow maintenance from 100 to 3500 PSI (6.9 to 241 bar).

Reverse flow (1) to (2) returns through the control orifice and is non-compensated.

The regulated flow increases from low to high with clockwise rotation of the knob.

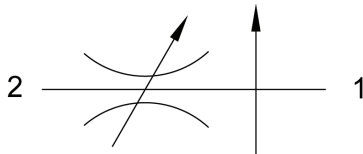
FEATURES

- Hardened parts for long life.
- Industry common cavity.
- Fine low-torque adjustment.



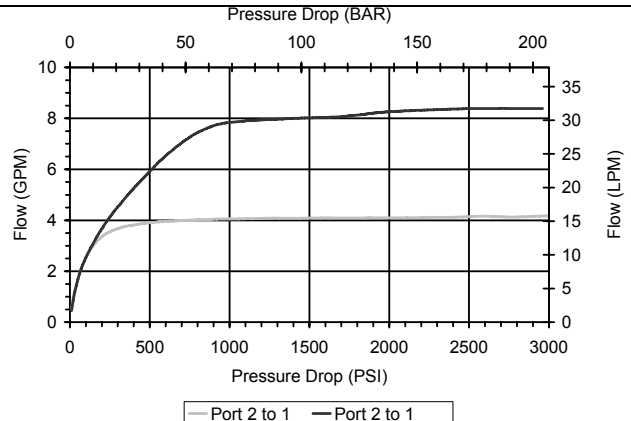
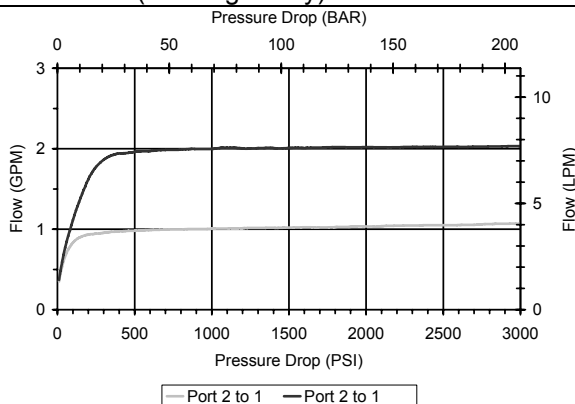
Best stability is obtained with adjustment at highest flow.

HYDRAULIC SYMBOL



PERFORMANCE

Actual Test Data (Cartridge Only)



VALVE SPECIFICATIONS

Max Flow	8 GPM (30 LPM)
Rated Operating Pressure	3500 PSI (241 bar)
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temperature Range	-40° to 250° F (-40° to 120° C)
Weight	.49 lbs. (.22 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	30 ft-lbs (40.6 Nm)
Cavity	DELTA 2W
Cavity Form Tool (Finishing)	40500000
Seal Kit	21191200

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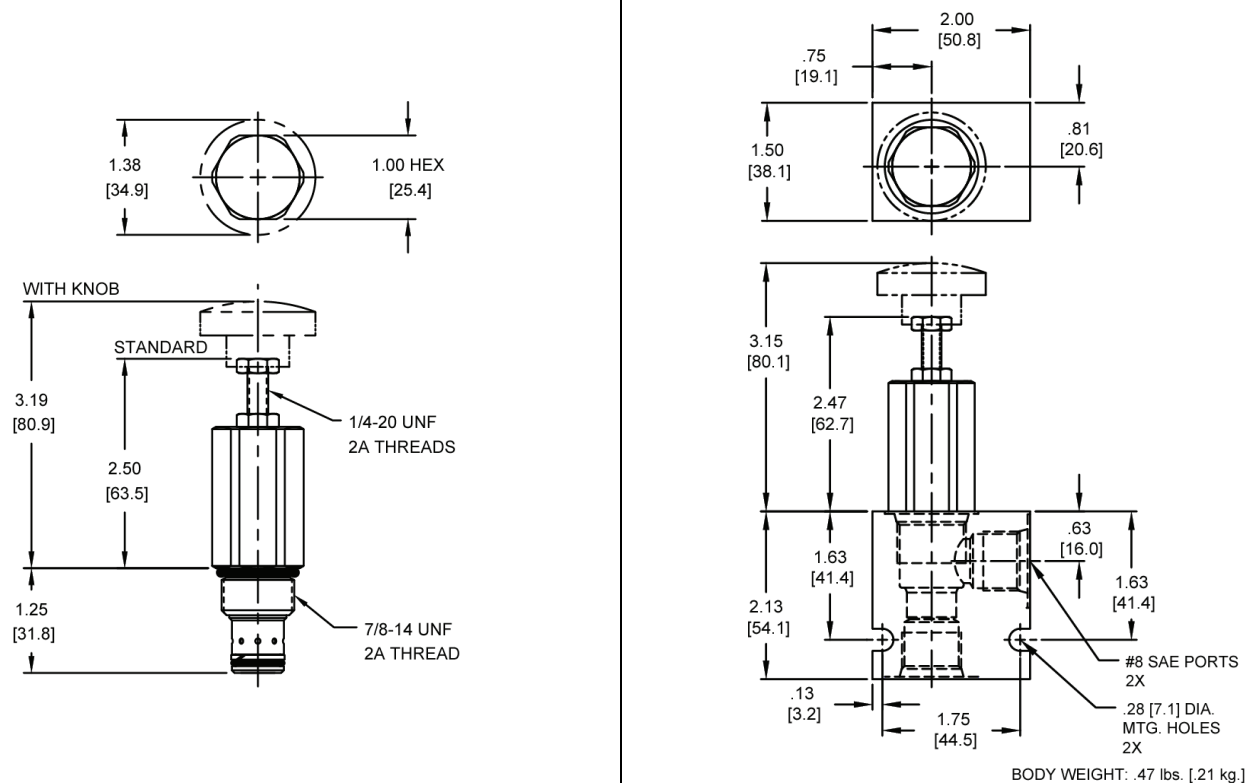
Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com



DIMENSIONS



ORDERING INFORMATION

DE-FCA

OPTIONS

Buna Standard **00**
Viton Standard **V0**
Buna, Knob **0K**
Viton, Knob **VK**

Blank **N**
S

BODIES

Without Body
3/8 NPTF Ports
#8 SAE Ports

FLOW

01.0 .5-1 GPM
02.0 1-2 GPM
04.0 2-4 GPM
08.0 4-8 GPM

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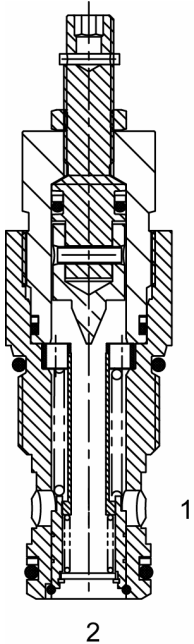
Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com



HT-FCA Adjustable Flow Control Valve, Pressure Compensated



DESCRIPTION

"High Pressure" 12 size, 1 1/16 -12 thread, "Tecnom" series, pressure compensated, flow control valve.

OPERATION

The HT-FCA maintains a constant flow rate out of (1) regardless of load pressure changes in the circuit downstream of (1).

The adjustable control orifice can be set to customer flow specification (see options for ranges).

The valve begins to respond to load changes when the flow through the valve creates a pressure differential across the control orifice. Consult chart to see regulation at high and low adjustment settings.

Reverse flow (1) to (2) returns through the control orifice and is non-compensated.

The regulated flow increases from low to high with clockwise rotation of the adjustment screw.

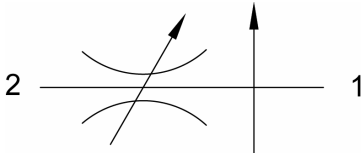
FEATURES

- Hardened parts for long life.
- Industry common cavity.
- Fine low-torque adjustment.



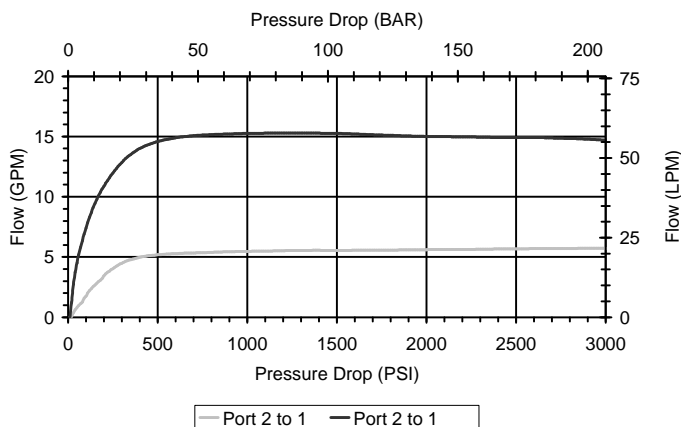
"Fully Adjustable" Valve can adjust down to leakage flow.

HYDRAULIC SYMBOL



PERFORMANCE

Actual Test Data (Cartridge Only)



VALVE SPECIFICATIONS

Max Regulated Flow	20 GPM (76 LPM)
Rated Operating Pressure	5000 PSI (345 bar)
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temperature Range	-40° to 250° F (-40° to 120° C)
Weight	.73 lbs. (.33 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	70 ft-lbs (94.9 Nm)
Cavity	TECNORD 2W
Cavity Form Tool (Finishing)	40500032
Seal Kit	21191300

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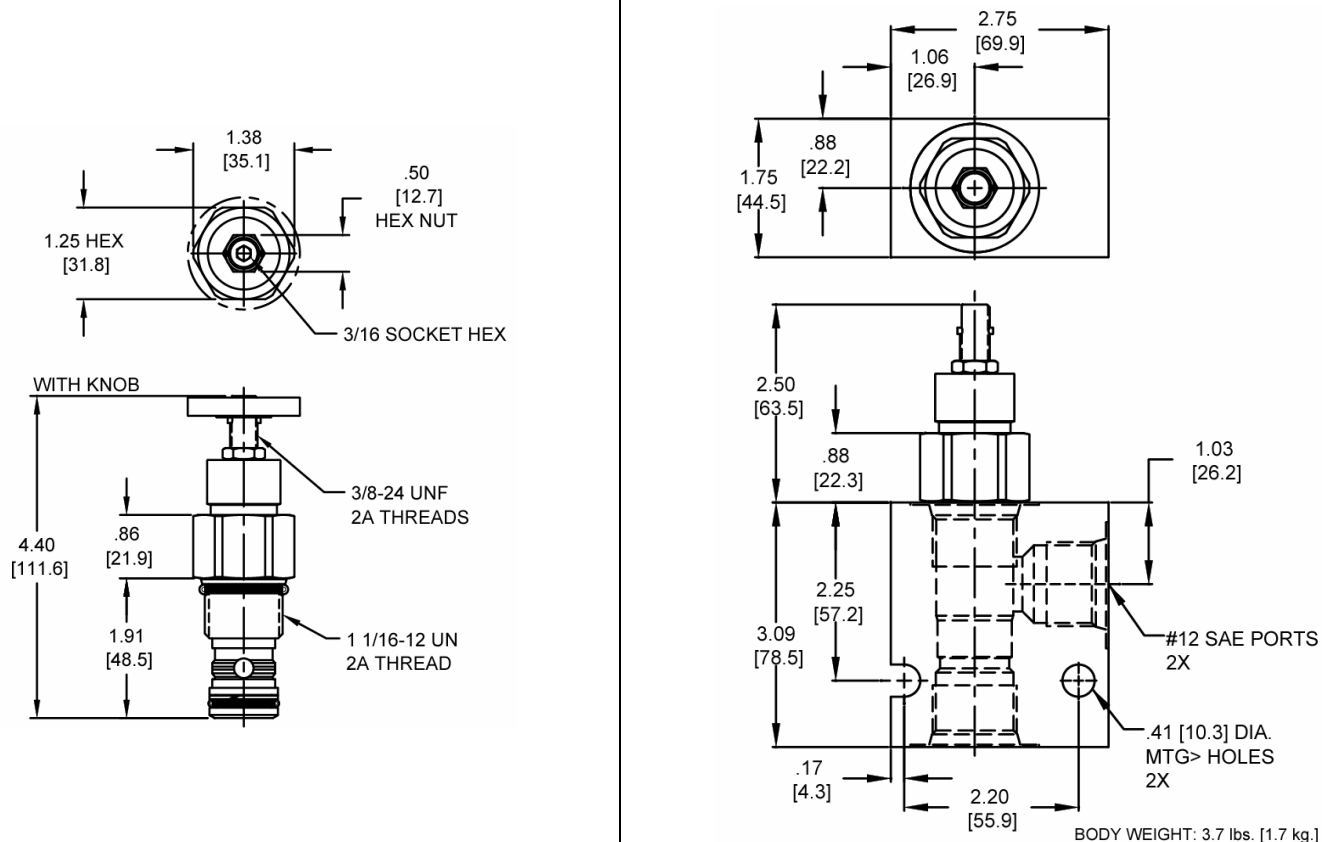
Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com



DIMENSIONS



ORDERING INFORMATION

HT-FCA

OPTIONS

Buna Standard

Viton Standard

Buna, Knob

Viton, Knob

00
V0
0K
VK

Blank

S

BODIES

BODIES

Without Body

#12 SAE Ports

Note: Aluminum NOT durability rated for 4000 PSI. Consult factory for options.

XXXX FLOW
0-20 GPM

Preset

Example: 0015 – 15 GPM +/- 10%

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Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com



SJ-FCA Adjustable Flow Control Valve, Pressure Compensated

DESCRIPTION

16 size, 1 5/16 -12 thread, "Super" series, pressure compensated, flow control valve.

OPERATION

The SJ-FCA maintains a constant flow rate out of (1) regardless of load pressure changes in the circuit downstream of (1).

The adjustable control orifice can be set to customer flow specification (see options for ranges).

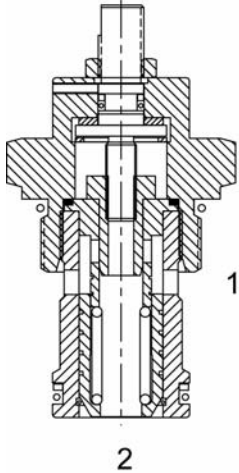
The valve begins to respond to load changes when the flow through the valve creates a pressure differential across the control orifice. Consult chart to see regulation at high and low adjustment settings.

Reverse flow (1) to (2) returns through the control orifice and is non-compensated.

The regulated flow increases from low to high with clockwise rotation of the adjustment knob.

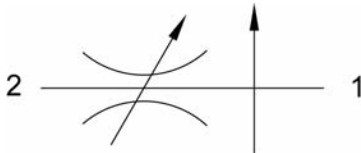
FEATURES

- Hardened parts for long life.
- Industry common cavity.
- Fine low-torque adjustment.



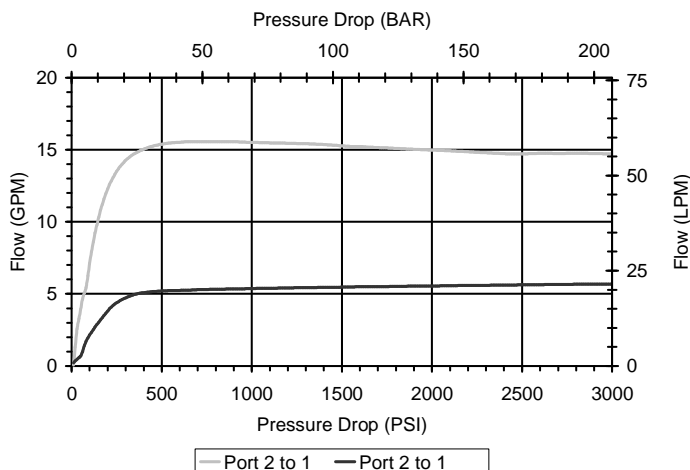
"Fully Adjustable," Valve can be adjusted down to leakage flow.

HYDRAULIC SYMBOL



PERFORMANCE

Actual Test Data (Cartridge Only)



VALVE SPECIFICATIONS

Nominal Flow	25 GPM (95 LPM)
Rated Operating Pressure	3500 PSI (241 bar)
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temperature Range	-40° to 250° F (-40° to 120° C)
Weight	.89 lbs. (.40 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	90 ft-lbs (122 Nm)
Cavity	SUPER 2W
Cavity Form Tool (Finishing)	40500017
Seal Kit	21191400

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

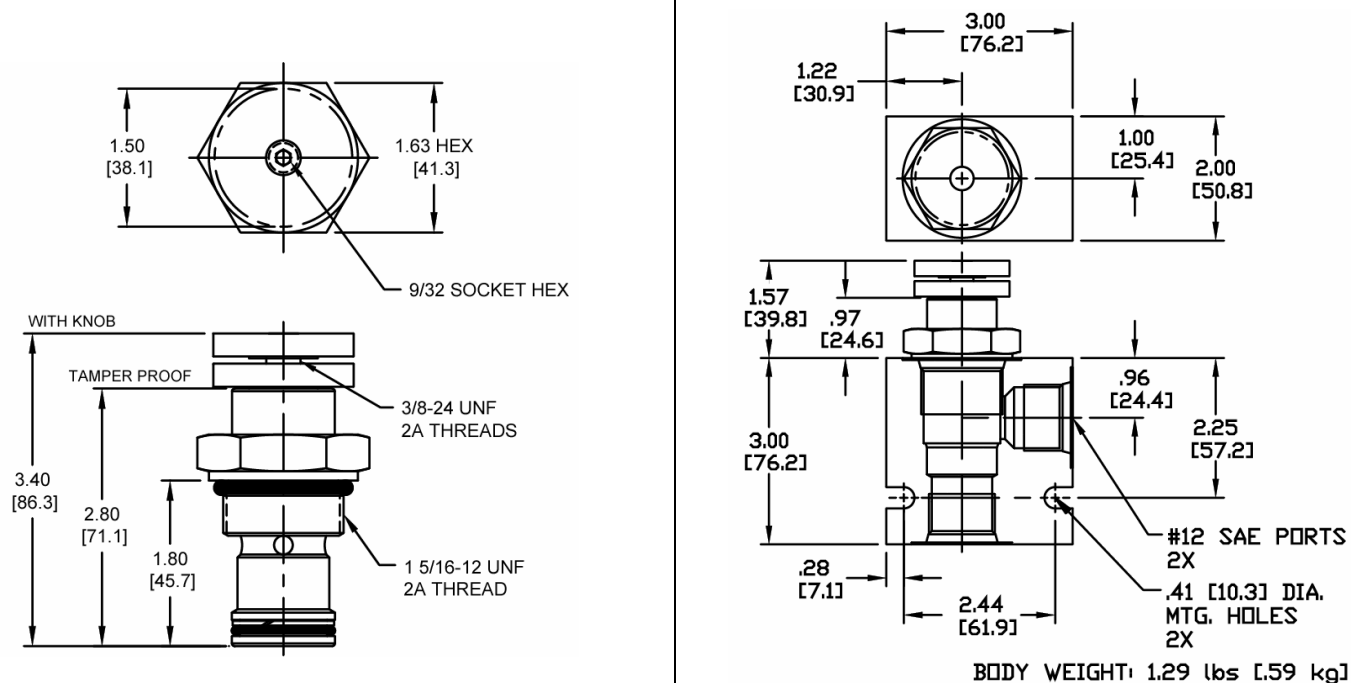
Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com



DIMENSIONS



ORDERING INFORMATION

SJ-FCA

OPTIONS

External Adj. w/locknut Buna **00**

External Adj. w/locknut Viton **V0**

Buna, Knob **0K**

Viton, Knob **VK**

Internally Adj. Buna **0I**

Internally Adj. Viton **VI**

Tamper Proof Buna **0T**

Tamper Proof Viton **VT**

Blank **S**

N

BODIES

Without Body

#12 SAE Ports

3/4 NPT Ports

FLOW SETTING

XXXX 0-25 GPM

Preset & tamper Proof

Example: 0015 – 15 GPM +/- 10%

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Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com



DE-FCB Fixed Flow Control Valve, Pressure Compensated

DESCRIPTION

10 size, 7/8-14 thread, "Delta" series, fixed pressure compensated, flow control valve.

OPERATION

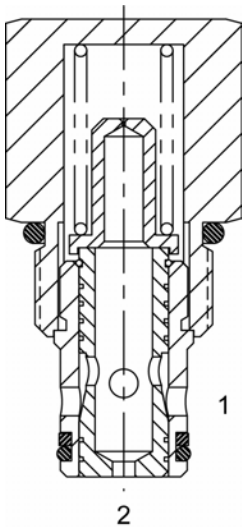
The DE-FCB maintains a constant flow rate out of (1) regardless of load pressure changes in the circuit downstream of (1).

The valve begins to respond to load changes when the flow through the valve creates a pressure differential across the control orifice, in excess of the spring load. Consult chart for regulation performance.

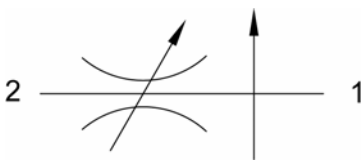
Reverse flow (1) to (2) returns through the control orifice and is non-compensated.

FEATURES

- Industry common cavity.
- Hardened parts for long life.



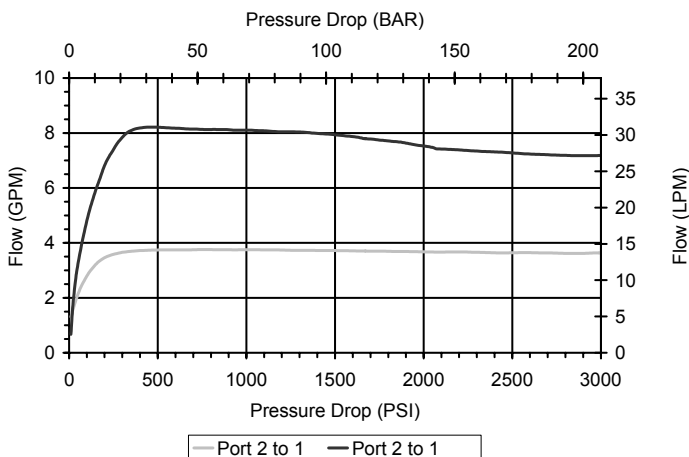
HYDRAULIC SYMBOL



Low pressure drop version for low differential circuits.

PERFORMANCE

Actual Test Data (Cartridge Only)



VALVE SPECIFICATIONS

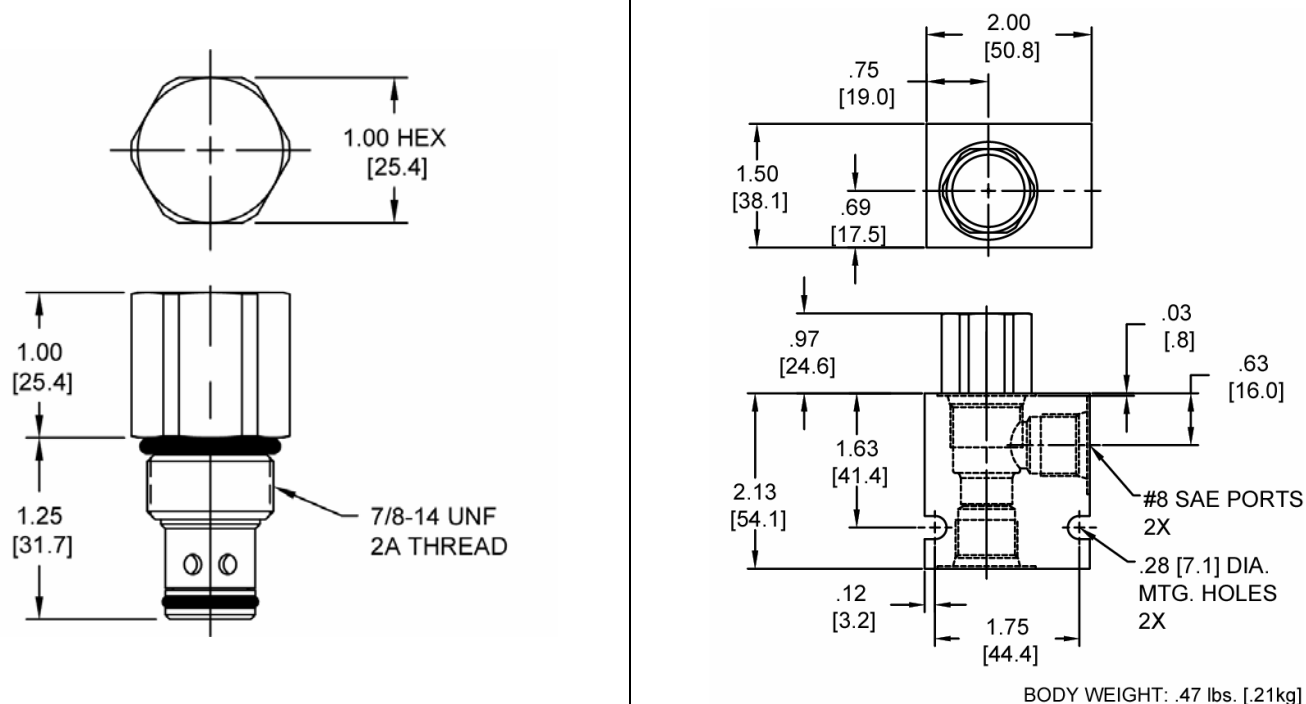
Max Regulated Flow	8 GPM (30 LPM)
Rated Operating Pressure	3500 PSI (241 bar)
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temperature Range	-40° to 250° F (-40° to 120° C)
Weight	.29 lbs. (.13kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	30 ft-lbs (40.6 Nm)
Cavity	DELTA 2W
Cavity Form Tool (Finishing)	40500000
Seal Kit	21191204

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Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com


DIMENSIONS

ORDERING INFORMATION
DE-FCB
OPTIONS
 Buna Standard
 Viton Standard

00
V0
BODIES
 Blank
 N
 S
 Without Body
 3/8 NPT PORTS
 #8 SAE PORTS

FLOW SETTING
01.0 1 GPM
02.0 2 GPM
03.0 3 GPM
04.0 4 GPM
05.0 5 GPM
06.0 6 GPM
07.0 7 GPM
08.0 8 GPM
 +/- 15%

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

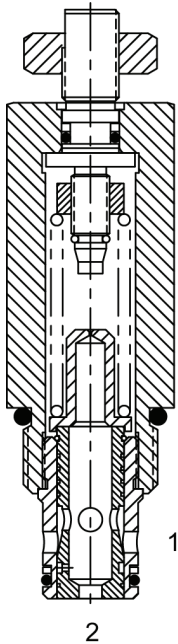
Phone: (815) 397-6628

Fax: (815) 397-2526

 E-mail: delta@delta-power.com



DE-FCC Adjustable Flow Control Valve, Pressure Compensated



DESCRIPTION

10 size, 7/8-14 thread, "Delta" series, pressure compensated, flow control valve.

OPERATION

The DE-FCC maintains a constant flow rate out of (1) regardless of load pressure changes in the circuit downstream of (1).

The adjustable control orifice can be set to customer flow specification (see options for ranges).

The valve begins to respond to load changes when the flow through the valve creates a pressure differential across the control orifice. Consult chart to see regulation at high and low adjustment settings.

Reverse flow (1) to (2) returns through the control orifice and is non-compensated.

The regulated flow increases from low to high with clockwise rotation of the knob.

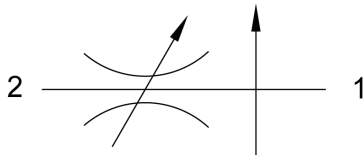
FEATURES

- Hardened parts for long life.
- Industry common cavity.
- Fine low-torque adjustment.



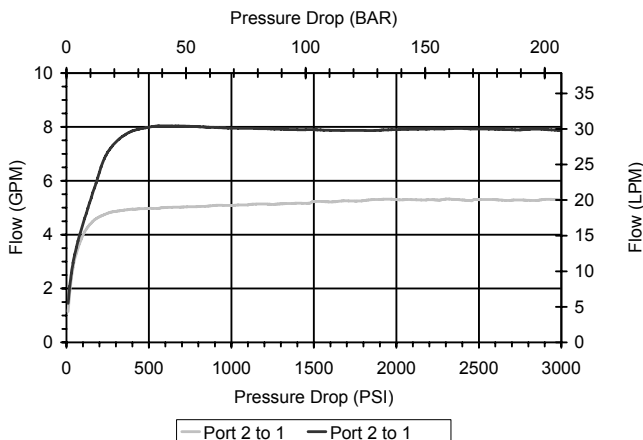
Lowest pressure drop is obtained with adjustment at lowest setting.

HYDRAULIC SYMBOL



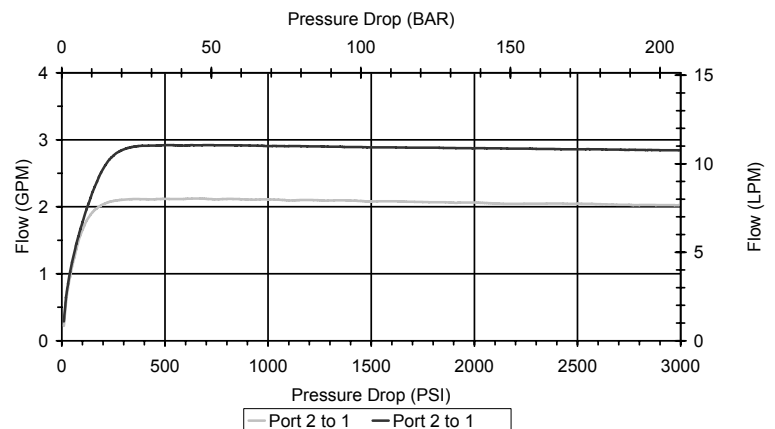
PERFORMANCE

Actual Test Data (Cartridge Only)



VALVE SPECIFICATIONS

Max Regulated Flow	8 GPM (30 LPM)
Rated Operating Pressure	3500 PSI (241 bar)
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temperature Range	-40° to 250° F (-40° to 120° C)
Weight	.51 lbs. (.23 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	30 ft-lbs (40.6 Nm)
Cavity	DELTA 2W
Cavity Form Tool (Finishing)	40500000
Seal Kit	21191200

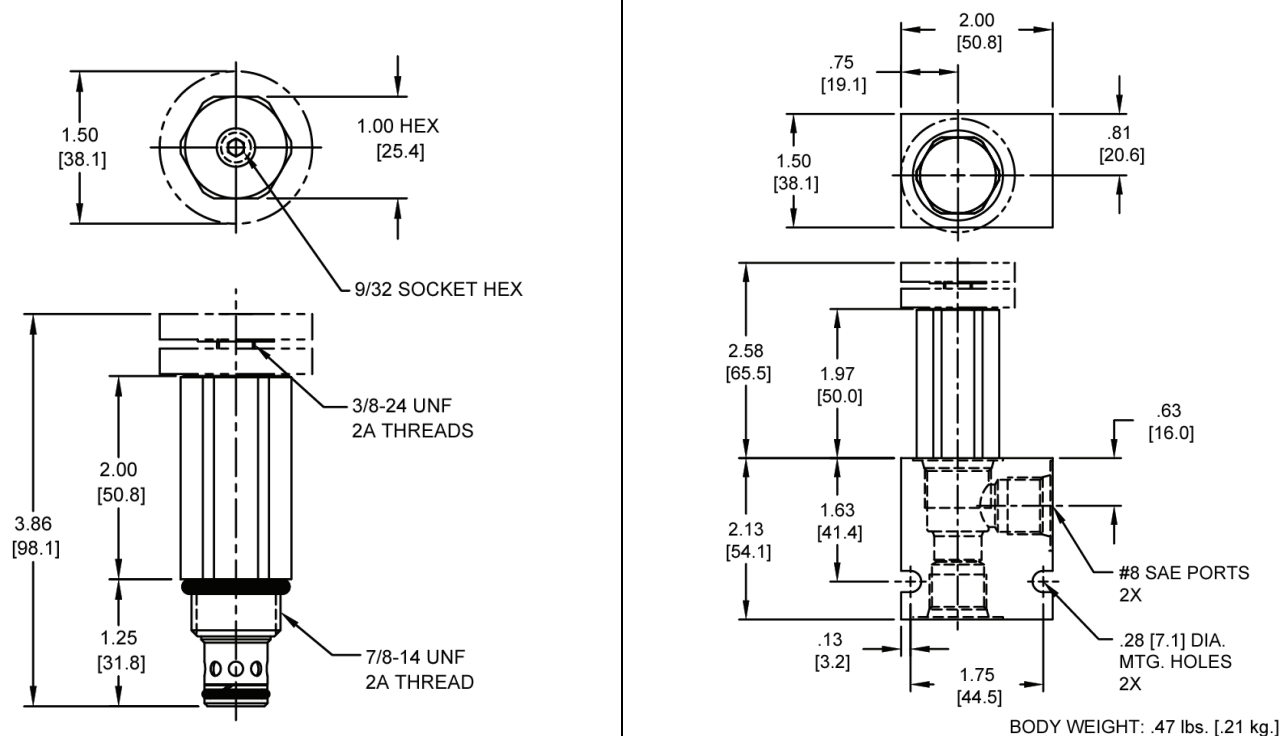


WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com


DIMENSIONS

ORDERING INFORMATION
DE-FCC
OPTIONS

Buna Standard **00**
 Viton Standard **V0**
 Buna, Knob **0K**
 Viton, Knob **VK**

Blank **N**
S

BODIES

Without Body
 3/8 NPTF Ports
 #8 SAE Ports

FLOW

1.16 .80-1.16 GPM
1.62 1.16-1.62 GPM
2.09 1.62-2.09 GPM
2.90 2.09-2.90 GPM
3.82 2.90-3.82 GPM
5.00 3.82-5.00 GPM
8.00 5.00-8.00 GPM

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Phone: (815) 397-6628

Fax: (815) 397-2526

 E-mail: delta@delta-power.com



DE-FCF Fixed Flow Control Valve, Pressure Compensated

DESCRIPTION

10 size, 7/8-14 thread, "Delta" series, fixed pressure compensated, flow control valve.

OPERATION

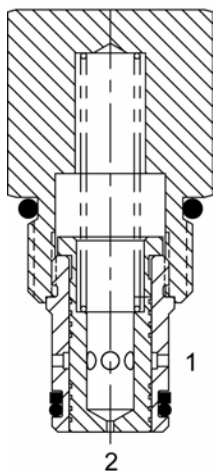
The DE-FCF maintains a constant flow rate out of (1) regardless of load pressure changes in the circuit downstream of (1).

The valve begins to respond to load changes when the flow through the valve creates a pressure differential across the control orifice, in excess of the spring load. Consult chart for regulation performance.

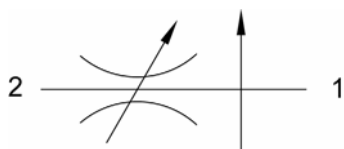
Reverse flow (1) to (2) returns through the control orifice and is non-compensated.

FEATURES

- Hardened parts for long life.
- Industry common cavity.



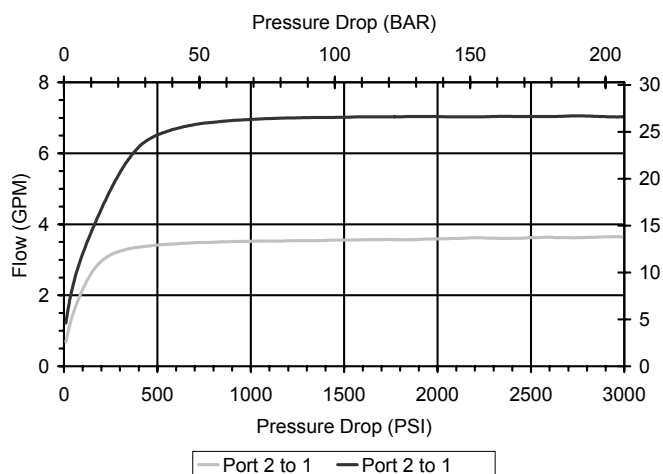
HYDRAULIC SYMBOL



Best stability version for high differential circuits.

PERFORMANCE

Actual Test Data (Cartridge Only)



VALVE SPECIFICATIONS

Max Flow	8 GPM (30 LPM)
Rated Operating Pressure	3500 PSI (241 bar)
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temperature Range	-40° to 250° F (-40° to 120° C)
Weight	.32 lbs. (.14 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	30 ft-lbs (40.6 Nm)
Cavity	DELTA 2W
Cavity Form Tool (Finishing)	40500000
Seal Kit	21191204

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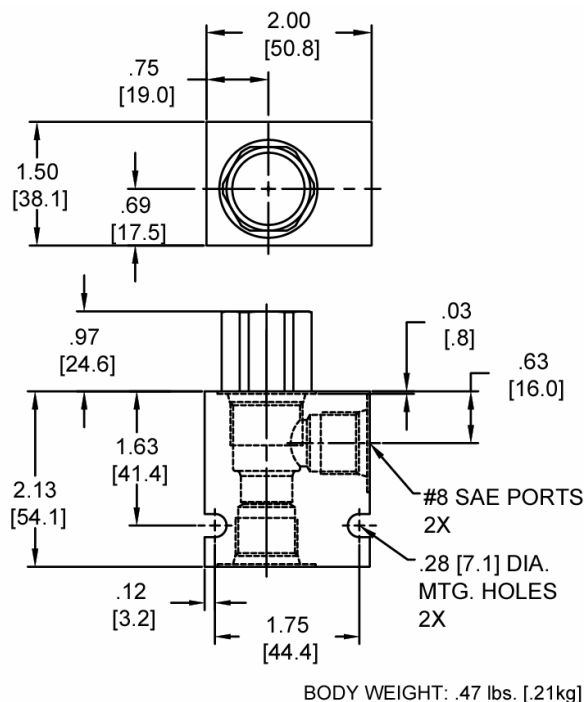
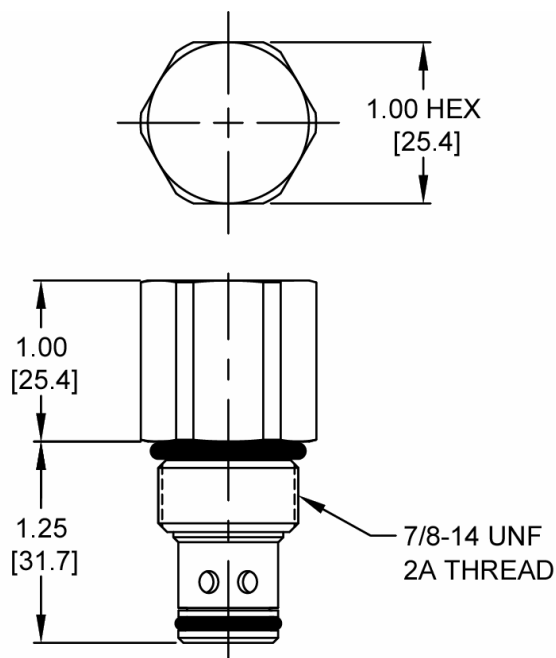
Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com



DIMENSIONS



ORDERING INFORMATION

DE-FCF

OPTIONS
Buna Standard
Viton Standard

00
V0

Blank
N
S

BODIES
Without Body
3/8 NPT PORTS
#8 SAE PORTS

FLOW SETTING

01.0 1 GPM
02.0 2 GPM
03.0 3 GPM
04.0 4 GPM
05.0 5 GPM
06.0 6 GPM
07.0 7 GPM
08.0 8 GPM
+/- 15%

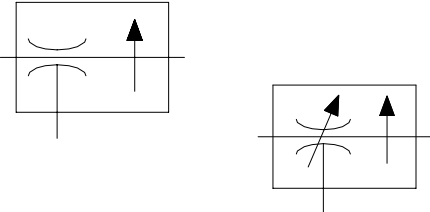
WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

Phone: (815) 397-6628

Fax: (815) 397-2526

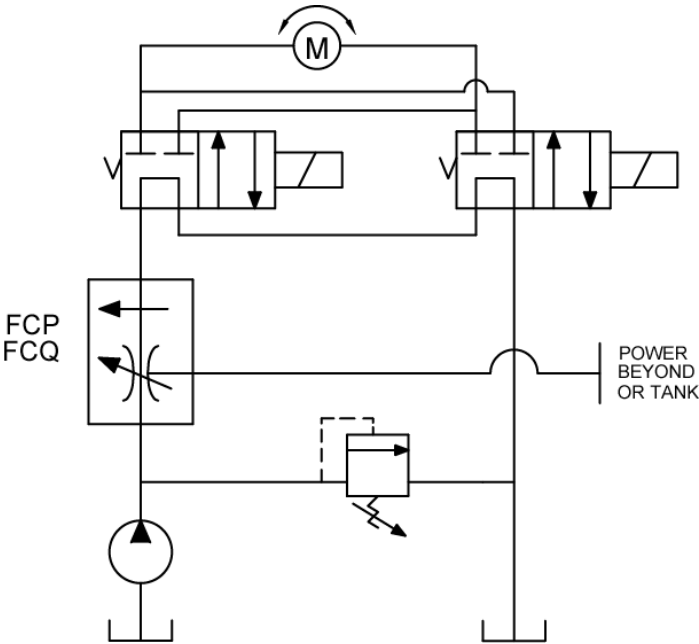
E-mail: delta@delta-power.com

Priority Flow Regulator Valves

	GPM	PSI	LPM	BAR	MODEL	PAGE
	10	3000	38	207	DF-FCP	484
	10	3000	38	207	DF-FCQ	486
	25	3500	95	241	SK-FCQ	488

Typical Schematic

Typical application for the FCP and FCQ is priority flow to the main circuit with balance of flow to tank or power beyond.



WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.



DF-FCP Fixed Priority Flow Control Valve

DESCRIPTION

10 size, 7/8-14 thread, "Delta" series, fixed priority flow control valve.

OPERATION

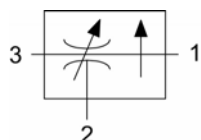
The DF-FCP allows pressure compensated flow from (3) to (1) regulated by the pressure present at (3). Excess flow bypasses out (2).

The spring chamber is constantly vented at (1).

FEATURES

- Hardened parts for long life.
- Industry common cavity.

HYDRAULIC SYMBOL

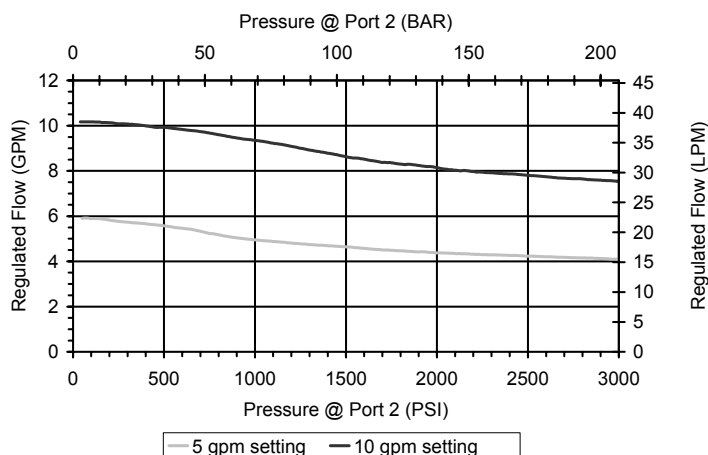
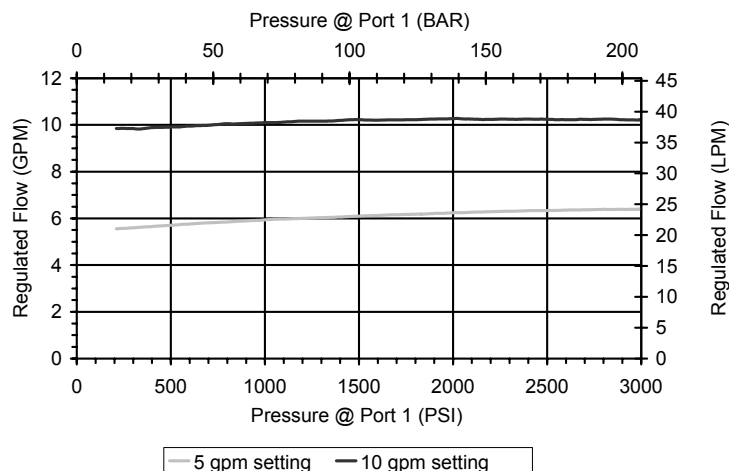


VALVE SPECIFICATIONS

Maximum Flow	10 GPM (38 LPM)
Rated Operating Pressure	3000 PSI (207bar)
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temperature Range	-40° to 250° F (-40° to 120° C)
Weight	.26 lbs. (.12 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	30 ft-lbs (40.6 Nm)
Cavity	DELTA 3W
Cavity Form Tool (Finishing)	40500001
Seal Kit	21191206

PERFORMANCE

Actual Test Data (Cartridge Only)



WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

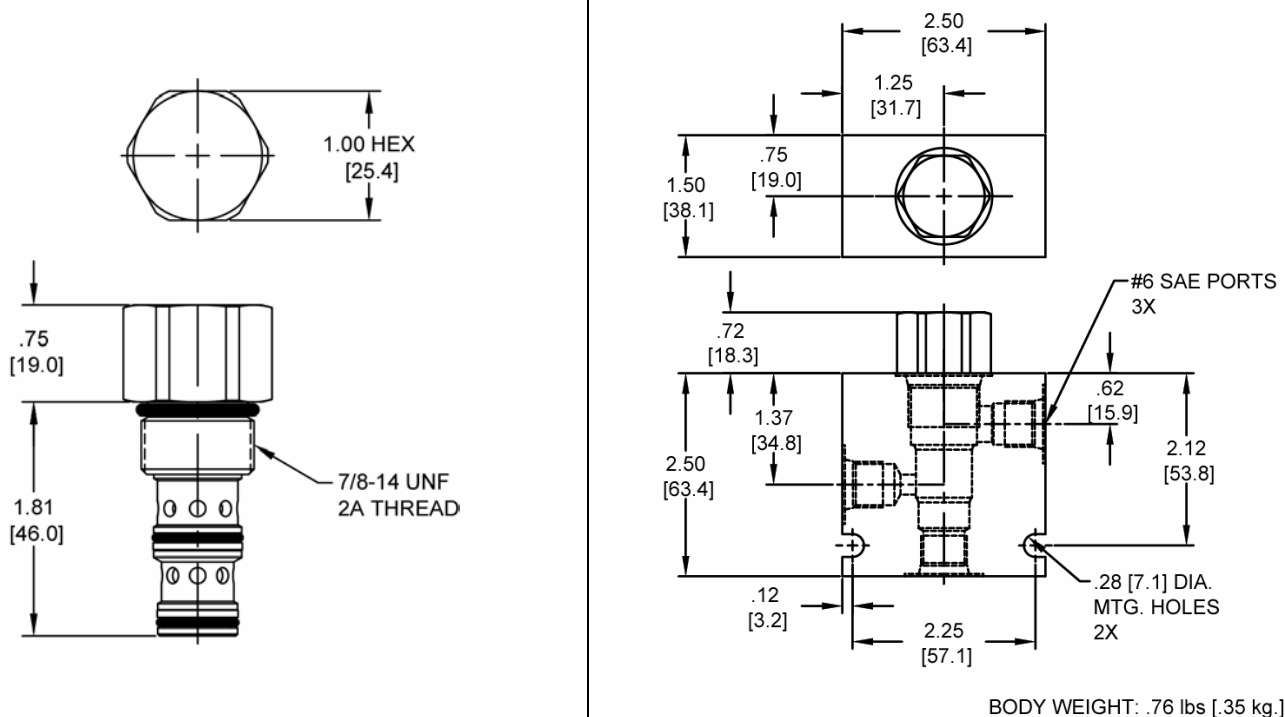
Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com



DIMENSIONS



ORDERING INFORMATION

DF-FCP

OPTIONS

Buna Standard
Viton Standard

00
V0

BODIES

Blank
N 1/4 NPTF Ports
S #6 SAE Ports

FLOW SETTING

01.0 1 GPM
02.0 2 GPM
03.0 3 GPM
04.0 4 GPM
05.0 5 GPM
06.0 6 GPM
07.0 7 GPM
08.0 8 GPM
09.0 9 GPM
10.0 10 GPM
+/- 15%

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

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Fax: (815) 397-2526

E-mail: delta@delta-power.com



DF-FCQ Adjustable Priority Flow Control Valve

DESCRIPTION

10 size, 7/8-14 thread, "Delta" series, adjustable priority flow control valve.

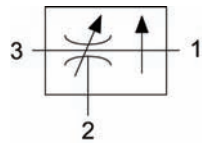
OPERATION

The DF-FCQ allows pressure compensated flow from (3) to (1) regulated by the pressure present at (3). Excess flow bypasses out (2).

FEATURES

- Hardened parts for long life.
- Industry common cavity.

HYDRAULIC SYMBOL



VALVE SPECIFICATIONS

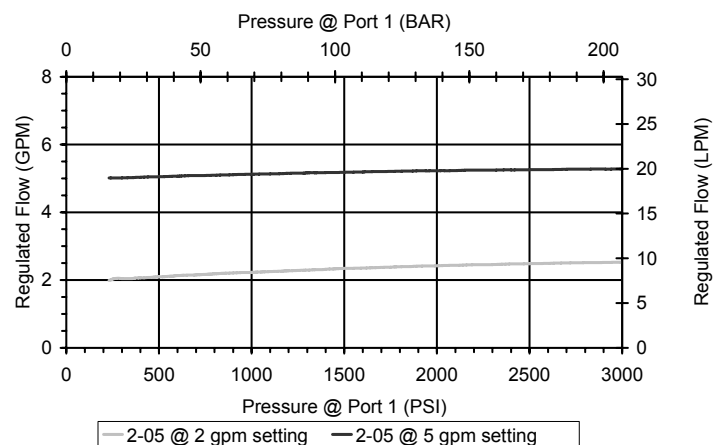
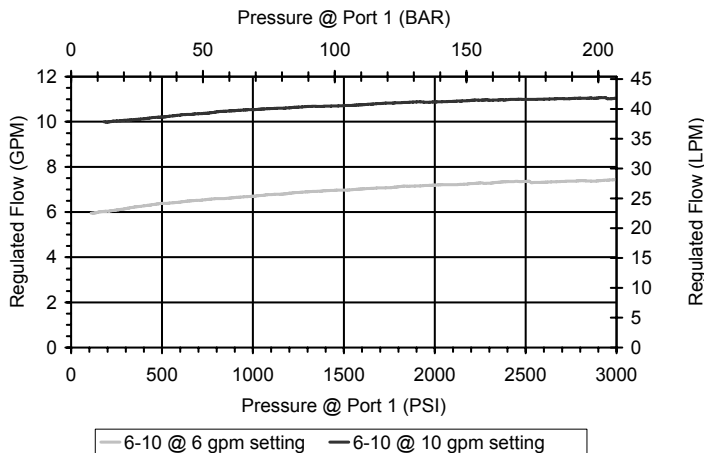
Nominal Flow	10 GPM (38 LPM)
Rated Operating Pressure	3000 PSI (207bar)
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temperature Range	-40° to 250° F (-40° to 120° C)
Weight	.56 lbs. (.25 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	30 ft-lbs (40.6 Nm)
Cavity	DELTA 3W
Cavity Form Tool (Finishing)	40500001
Seal Kit	21191206



Test data shown on this sheet, for condition of port (2) to tank. Data on next page, for condition of port (3) to tank.

PERFORMANCE

Actual Test Data (Cartridge Only)

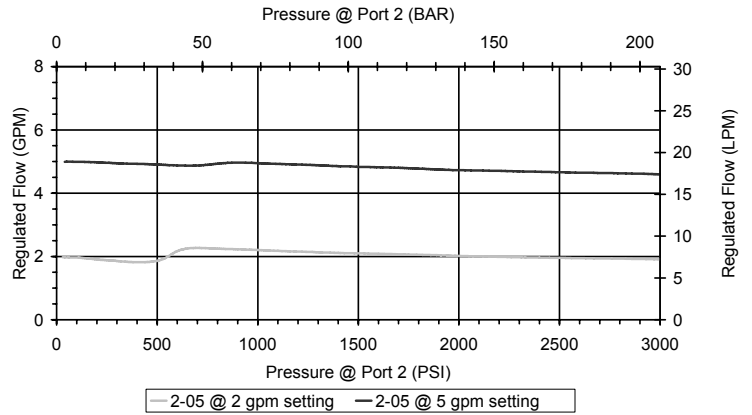
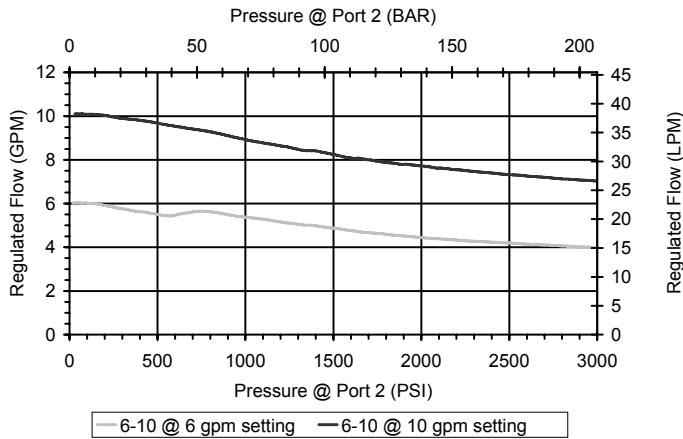


WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

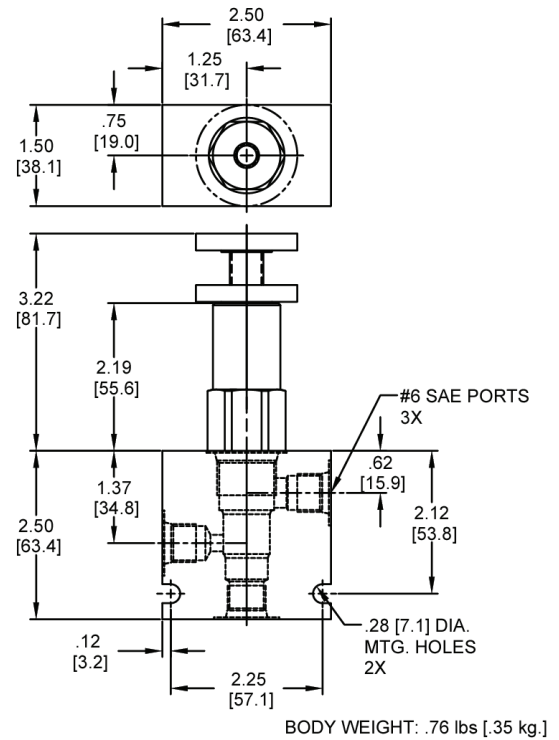
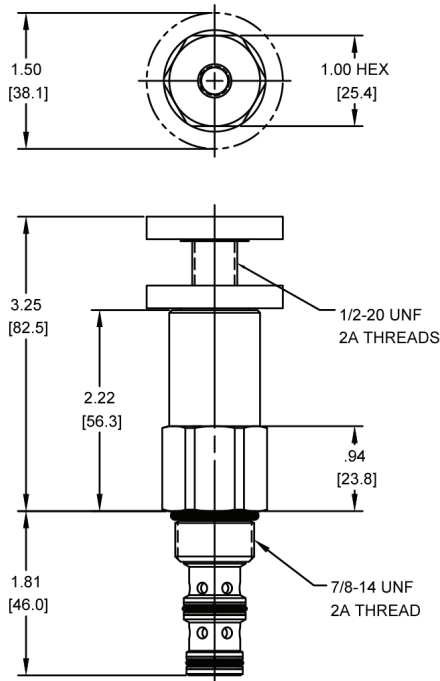
Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com



DIMENSIONS



ORDERING INFORMATION

DF-FCQ

OPTIONS

Buna Standard **00**
Viton Standard **V0**
Buna, Knob **0K**
Viton, Knob **VK**

Blank **N**
S

BODIES

Without Body
1/4 NPTF Ports
#6 SAE Ports

FLOW RANGE

2-05 2 to 5 GPM
6-10 6 to 10 GPM

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com



SK-FCQ Adjustable Priority Flow Control Valve

DESCRIPTION

16 size, 1 5/16-12 thread, "Super" series, adjustable priority flow control valve.

OPERATION

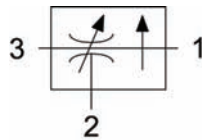
The SK-FCQ allows pressure compensated flow from (3) to (1) regulated by the pressure present at (3). Excess flow bypasses out (2).

The spring chamber is constantly vented at (1).

FEATURES

- Hardened cage and spool for long life.
- Industry common cavity.

HYDRAULIC SYMBOL

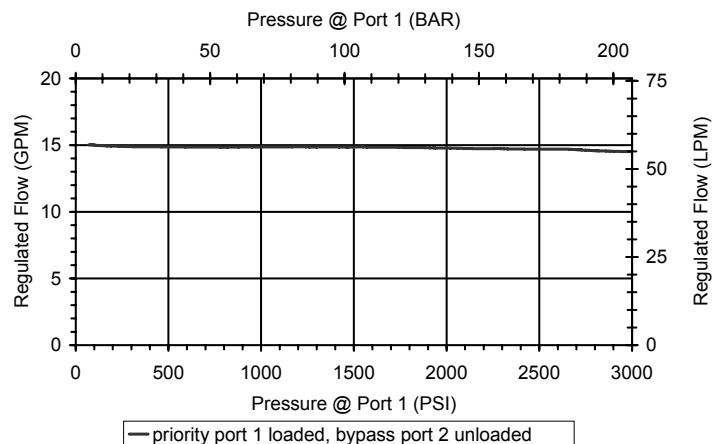
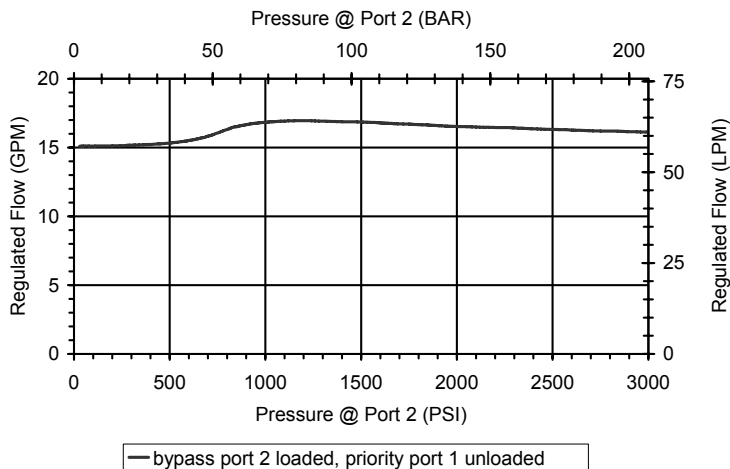


VALVE SPECIFICATIONS

Max Regulated Flow	25 GPM (95 LPM)
Rated Operating Pressure	500-3000 PSI (34-207bar)
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temperature Range	-40° to 250° F (-40° to 120° C)
Weight	.96 lbs. (.44 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	90 ft-lbs (122 Nm)
Cavity	SUPER 3W
Cavity Form Tool (Finishing)	40500018
Seal Kit	21191404

PERFORMANCE

Actual Test Data (Cartridge Only)

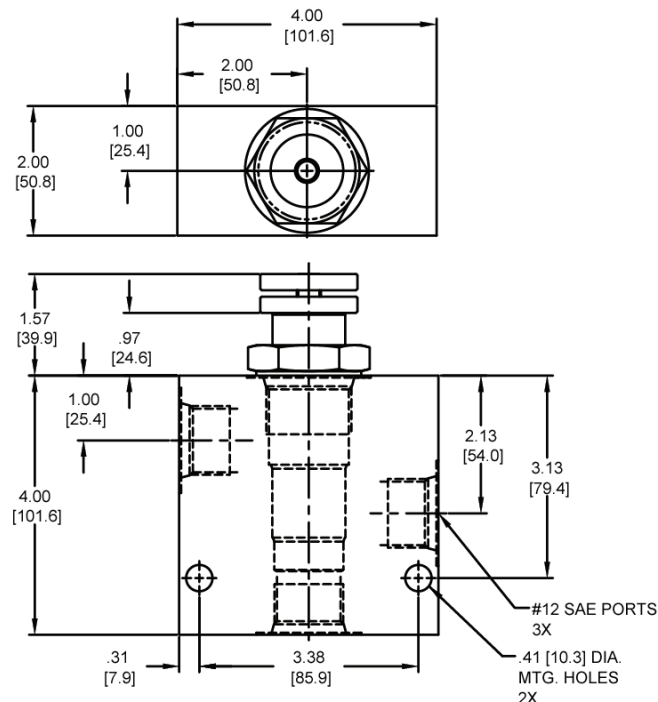
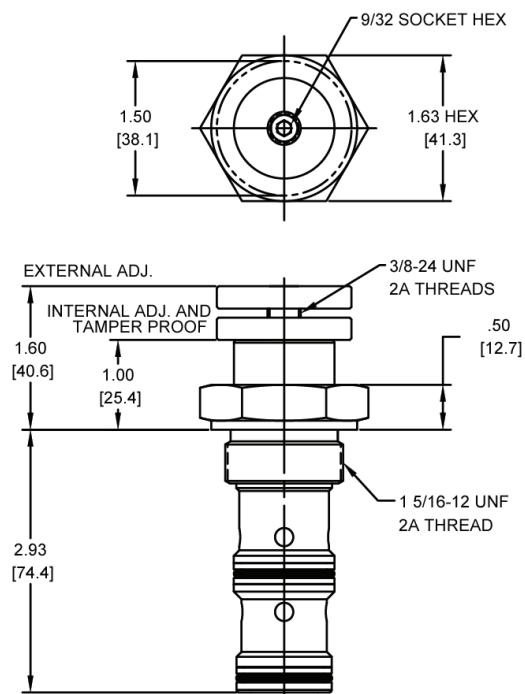


WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com


DIMENSIONS


BODY WEIGHT: 2.46 lbs [1.11 kg]

ORDERING INFORMATION
SK-FCQ

OPTIONS

Buna Standard **00**

Viton Standard **V0**

Buna, Knob **0K**

Viton, Knob **VK**

Internally Adj. Buna **0I**

Internally Adj. Viton **VI**

Tamper Proof Buna **0T**

Tamper Proof Viton **VT**

XXXX

Example

BODIES

Blank

N Without Body

S 3/4 NPTF Ports

S #12 SAE Ports

FLOW SETTING

1 to 25 GPM

PRESET & TAMPER PROOF

0015 = 15 GPM +/- 10%

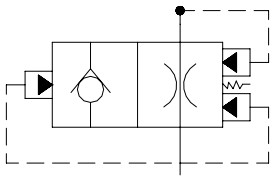
WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

Phone: (815) 397-6628

Fax: (815) 397-2526

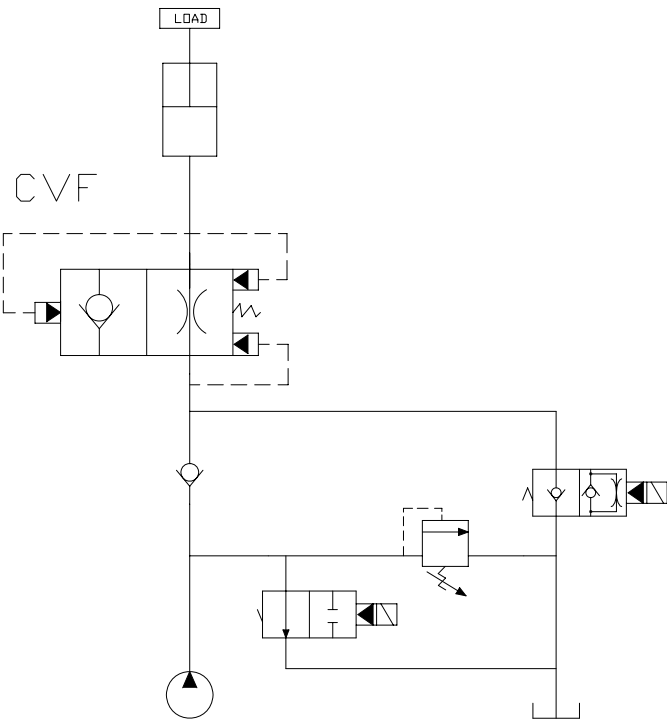
 E-mail: delta@delta-power.com

Velocity Fuses

	GPM	PSI	LPM	BAR	MODEL	PAGE
	10	3000	38	207	DE-CVF	492

Typical Schematic

Typical application for the CVF is to be mounted directly in the bottom of the cylinder and sized 1-2 GPM higher then the lowering speed. Therefore the load will not free fall in the event of line damage. Valve will not re-open until pressure is bled off of port #1.

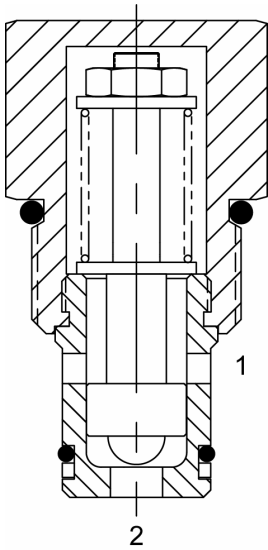


WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com

**DE-CVF Velocity Fuse****DESCRIPTION**

10 size, 7/8-14 thread, "Delta" series, velocity fuse valve.

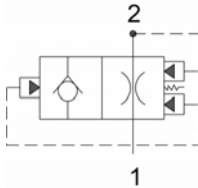
OPERATION

The DE-CVF allows flow to pass from (1) to (2). When velocity exceeds the flow setting the valve shifts and blocks flow from (1) to (2).

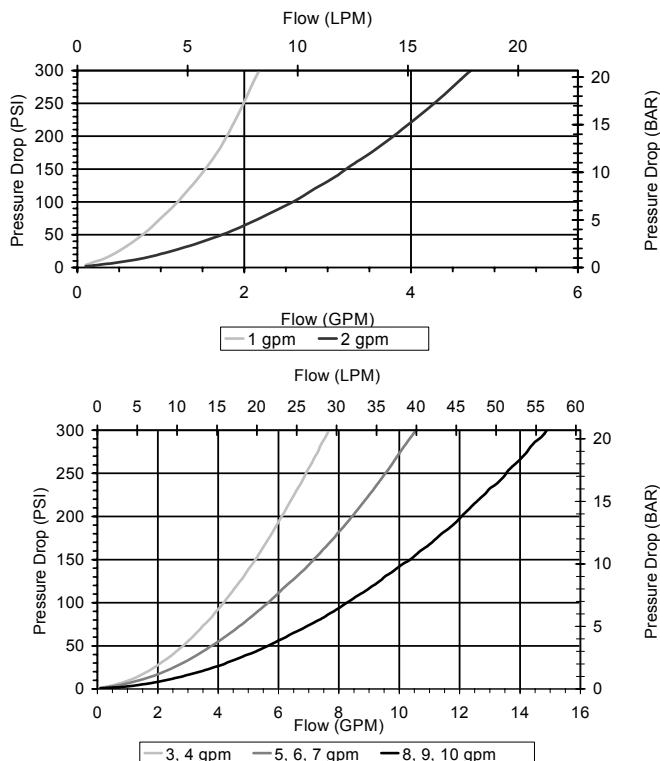
Valve acts like a fixed orifice when passing flow from (2) to (1).

FEATURES

- Hardened parts for long life.
- Industry common cavity.

HYDRAULIC SYMBOL

Curves identify pressure drop in port (2) to (1) direction (non-fuse). Fuse pressure drop is similar at fuse flow, until fuse takes effect (~75-100 PSID).

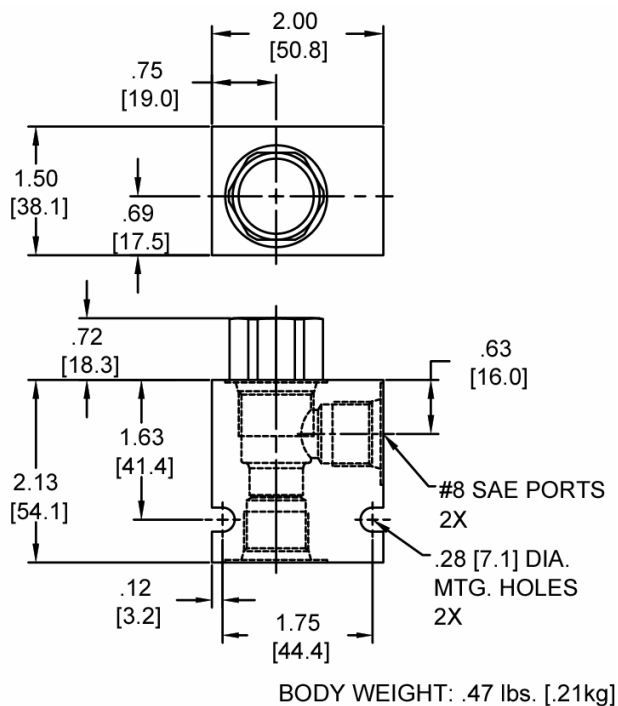
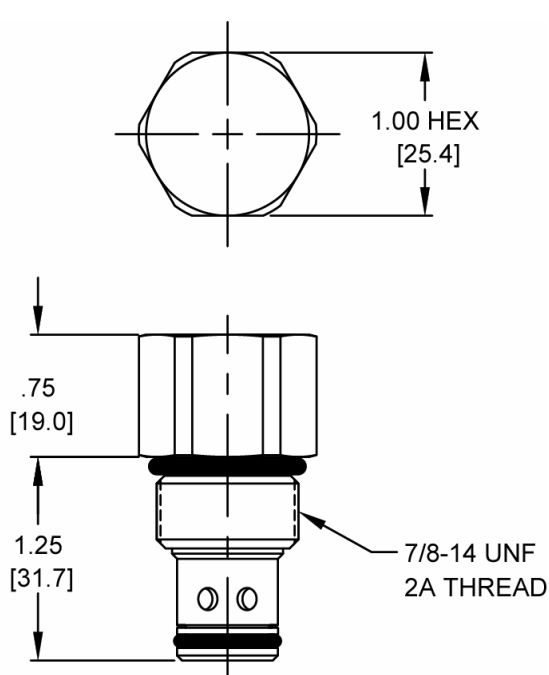
PERFORMANCE**Actual Test Data (Cartridge Only)****VALVE SPECIFICATIONS**

Nominal Flow	10 GPM (38 LPM)
Rated Operating Pressure	3500 PSI (241 bar)
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temperature Range	-40° to 250° F (-40° to 120° C)
Weight	.25 lbs. (.11 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	30 ft-lbs (40.6 Nm)
Cavity	DELTA 2W
Cavity Form Tool (Finishing)	40500000
Seal Kit	21191200

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.



DIMENSIONS



ORDERING INFORMATION

DE-CVF

OPTIONS
Buna Standard
Viton Standard

00
V0

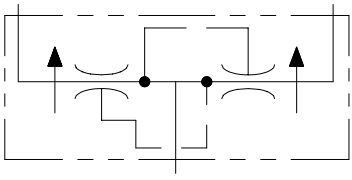
BODIES
Blank
N
S
Without Body
3/8 NPT PORTS
#8 SAE PORTS

FLOW SETTING

01.0 1 GPM
02.0 2 GPM
03.0 3 GPM
04.0 4 GPM
05.0 5 GPM
06.0 6 GPM
07.0 7 GPM
08.0 8 GPM
09.0 9 GPM
10.0 10 GPM
± 10%

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

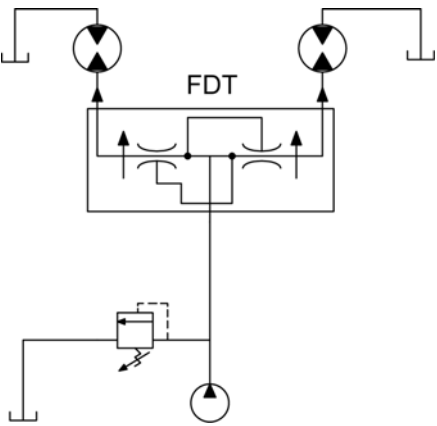
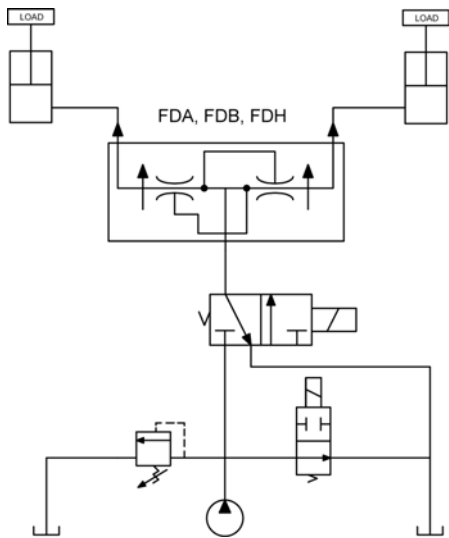
Flow Divider/Combiner Valves

	GPM	PSI	LPM	BAR	MODEL	PAGE
	12	3500	45	241	DG-FDA	496
	30	3500	114	241	SN-FDA	498
	12	3500	45	241	DG-FDB	500
	12	3500	45	241	DG-FDH	502
	12	3500	45	241	DG-FDT	504

Typical Schematic

Typical application for the FDA, FDB, and FDH is to synchronize two independent cylinders or hydraulic motors in both directions.

Typical application for the FDT is to provide positive traction for vehicle transmissions. If one leg loses load, the valve insures flow to the other leg.



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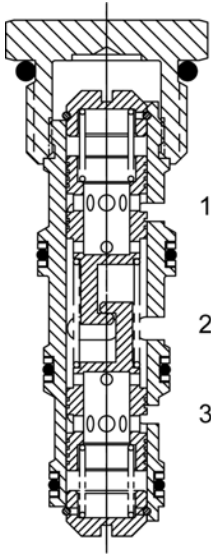
Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com



DG-FDA Flow Divider / Combiner Valve, Spool Type



DESCRIPTION

10 size, 7/8-14 thread "Delta Series", spool type, flow divider/combiner.

OPERATION

In the dividing mode, the DG-FDA will divert input flow from port (2) to ports (3) and (1), based on the ratio specified, regardless of operating pressure.

The DG-FDA will combine input flows from ports (3) and (1), to port (2) by the same ratio.

Should circuit operation result in a blockage of either (3) or (1), the opposite port may also close under certain conditions. Should this potential exist, consult the factory.

FEATURES

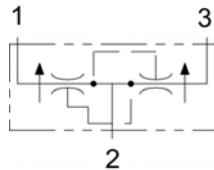
- Hardened parts for long life.
- Industry common cavity.



DO NOT EXCEED MAXIMUM FLOW PER MODEL

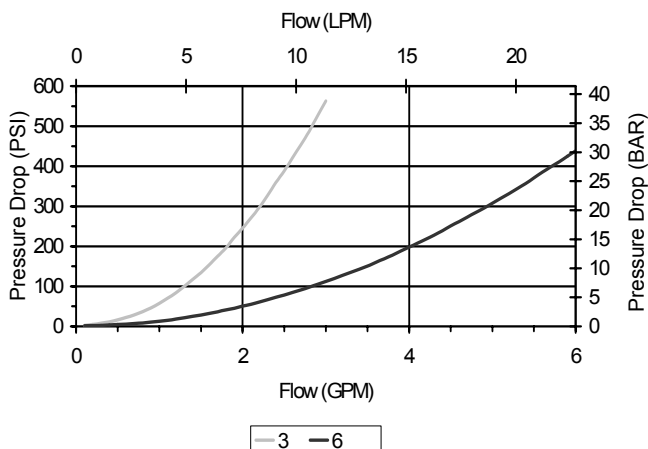
For higher accuracy flow ratio, use DG-FDH

HYDRAULIC SYMBOL



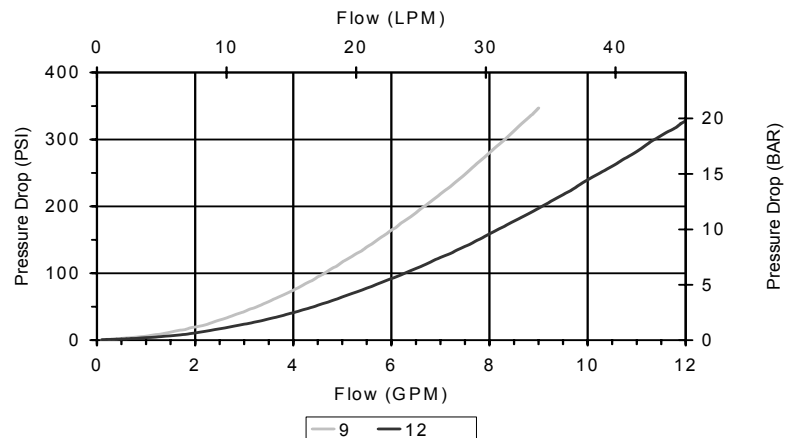
PERFORMANCE

Actual Test Data (Cartridge Only)



VALVE SPECIFICATIONS

Maximum Flow	12 GPM (45 LPM)
Accuracy on Flow Splits	+/- 10% of Max. Rated Inlet Flow
Maximum Operating Pressure	3500 PSI (241 bar)
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temperature Range	-40° to 250° F (-40° to 120° C)
Weight	.21 lbs. (.10 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	30 ft-lbs (40.6 Nm)
Cavity	DELTA 4W
Cavity Form Tool (Finishing)	40500002
Seal Kit	21191214

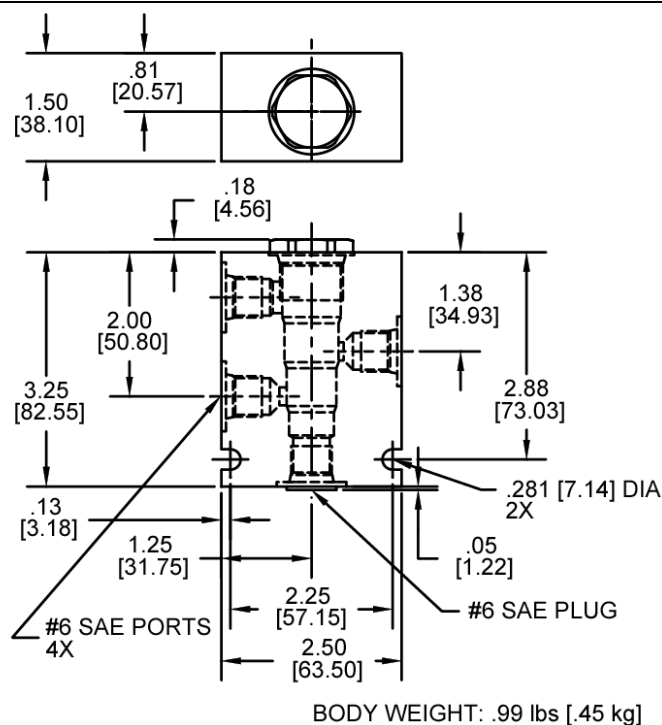
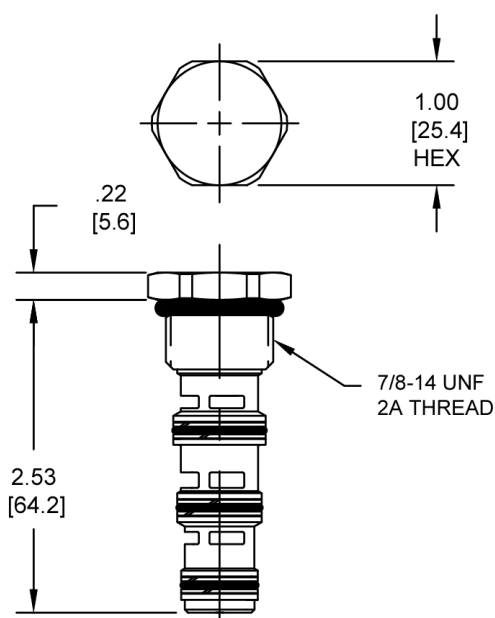


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E-mail: delta@delta-power.com


DIMENSIONS

ORDERING INFORMATION
DG-FDA
OPTIONS

 Buna Standard
 Viton Standard

 00
 0V

SPLITS

50 50-50

 *Consult factory for Splits
 Other than 50 - 50

 Blank
 N
 S

BODIES

 Without Body
 1/4 NPT Ports
 #6 SAE Ports
NOTE: Must Use 4-Way Body

INLET FLOW

 2-3 GPM
 3-6 GPM
 6-9 GPM
 9-12 GPM

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

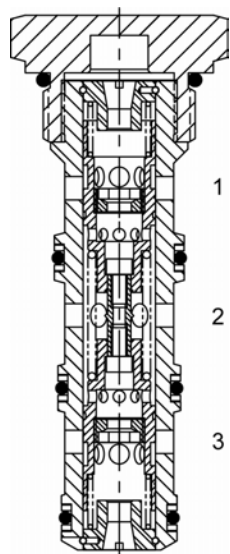
Phone: (815) 397-6628

Fax: (815) 397-2526

 E-mail: delta@delta-power.com



SN-FDA Flow Divider / Combiner Valve, Spool Type



DESCRIPTION

16 size, 1 5/16-12 thread "Super Series," spool-type flow divider/combiner valve.

OPERATION

In the dividing mode, the SN-FDA will divert input flow from port (2) to ports (3) and (1), based on the ratio specified, regardless of operating pressure.

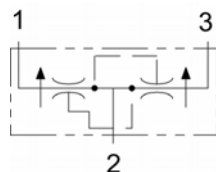
The SN-FDA will combine input flows from ports (3) and (1), to port (2) by same ratio.

Should circuit operation result in a blockage of either (3) or (1), the opposite port may also close under certain conditions. Should this potential exist, consult the factory.

FEATURES

- Hardened parts for long life.
- Industry common cavity.

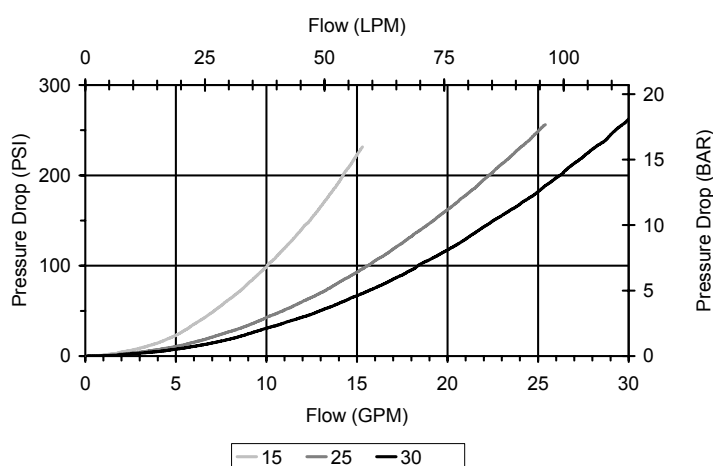
HYDRAULIC SYMBOL



NOTE: DO NOT EXCEED MAXIMUM FLOW PER MODEL

PERFORMANCE

Actual Test Data (Cartridge Only)



VALVE SPECIFICATIONS

Nominal Flow	40 GPM (151 LPM)
Accuracy on Flow Splits	+/- 10% of Max. Rated Inlet Flow
Maximum Operating Pressure	3500 PSI (241 bar)
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temperature Range	-40° to 250° F (-40° to 120° C)
Weight	.95 lbs. (.43 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	90 ft-lbs (122 Nm)
Cavity	SUPER 4W
Cavity Form Tool (Finishing)	40500019
Seal Kit	21191413

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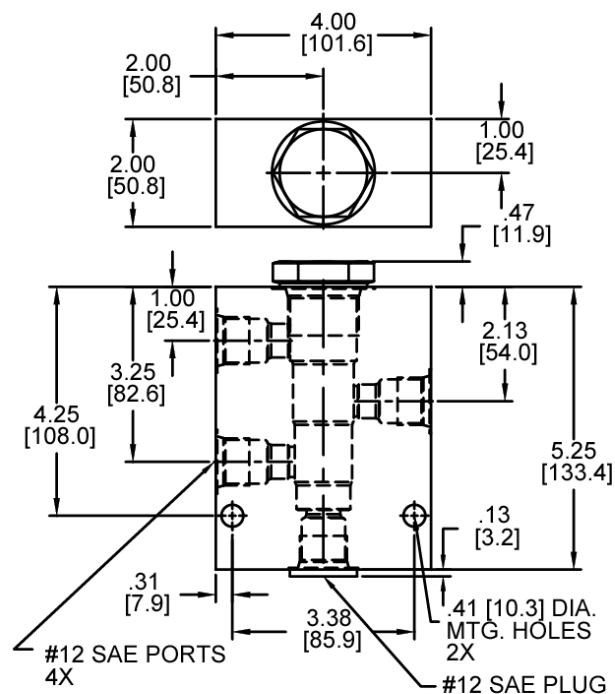
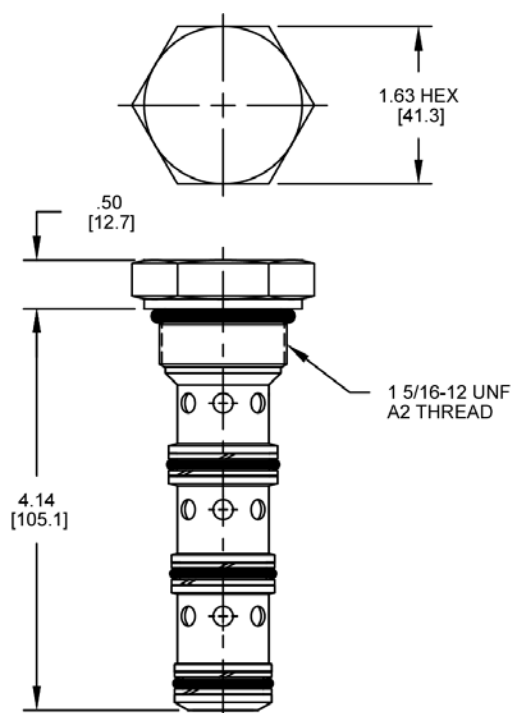
Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com



DIMENSIONS



BODY WEIGHT: 3.21 lbs. [1.46 kg.]

ORDERING INFORMATION

SN-FDA - - - -

OPTIONS

Buna Standard 00
Viton Standard 0V

Blank S

BODIES

Without Body
#12 SAE Ports
NOTE: Must use 4-Way Body

SPLITS

50 50-50

*Consult factory for Splits
Other then 50 - 50

15
25
40

INLET FLOW

8-15 GPM
15-25 GPM
20-40 GPM

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

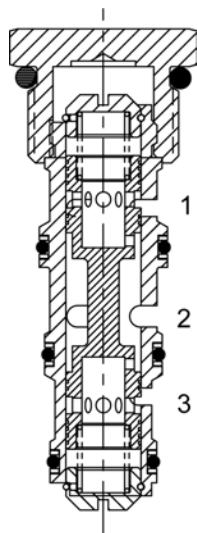
Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com



DG-FDB Flow Divider Valve, Spool Type



DESCRIPTION

10 size, 7/8-14 thread "Delta Series", spool type, flow divider.

OPERATION

The DG-FDB will divert input flow from port (2) to ports (3) and (1), based on the ratio specified, regardless of operating pressure.

Should circuit operation result in a blockage of either (3) or (1), the opposite port may also close under certain conditions. Should this potential exist, consult the factory.

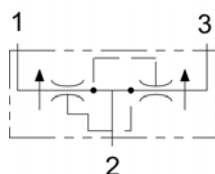
FEATURES

- Hardened parts for long life.
- Industry common cavity.



DO NOT EXCEED MAXIMUM FLOW PER MODEL

HYDRAULIC SYMBOL

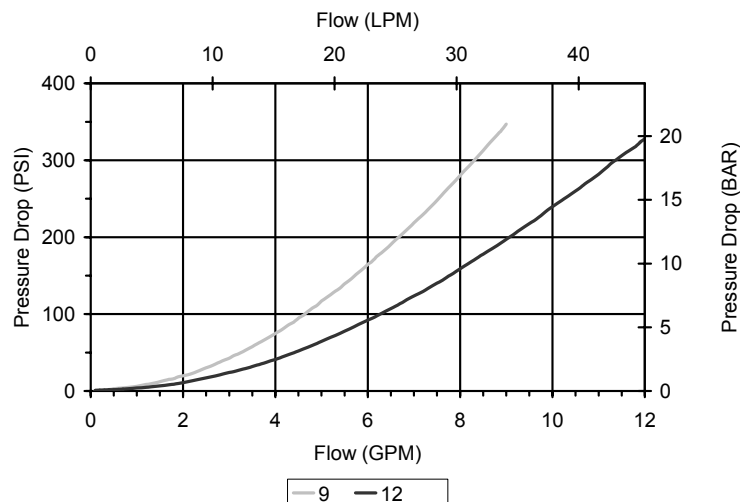
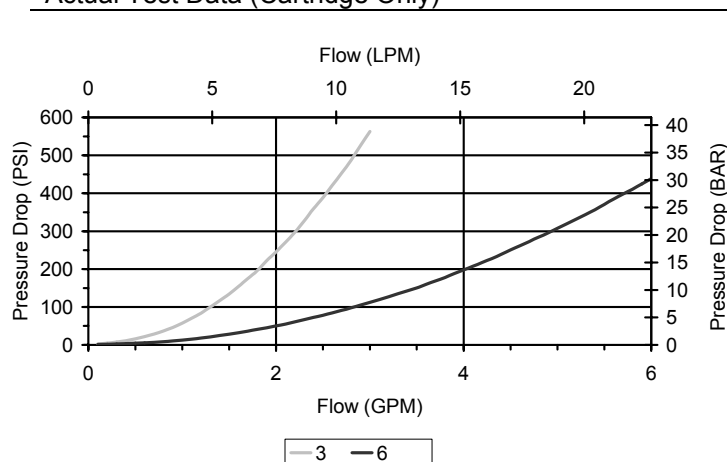


VALVE SPECIFICATIONS

Maximum Flow	12 GPM (45 LPM)
Accuracy on Flow Splits	+/- 10% of Max. Rated Inlet Flow
Maximum Operating Pressure	3500 PSI (241 bar)
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temperature Range	-40° to 250° F (-40° to 120° C)
Weight	.21 lbs. (.10 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	30 ft-lbs (40.6 Nm)
Cavity	DELTA 4W
Cavity Form Tool (Finishing)	40500002
Seal Kit	21191214

PERFORMANCE

Actual Test Data (Cartridge Only)

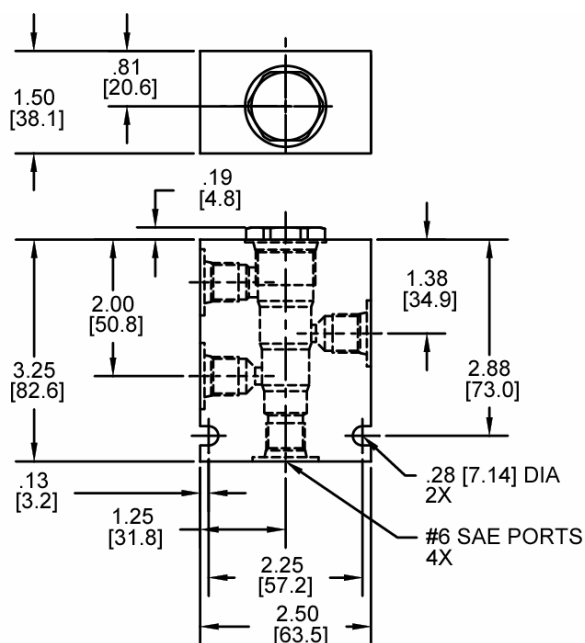
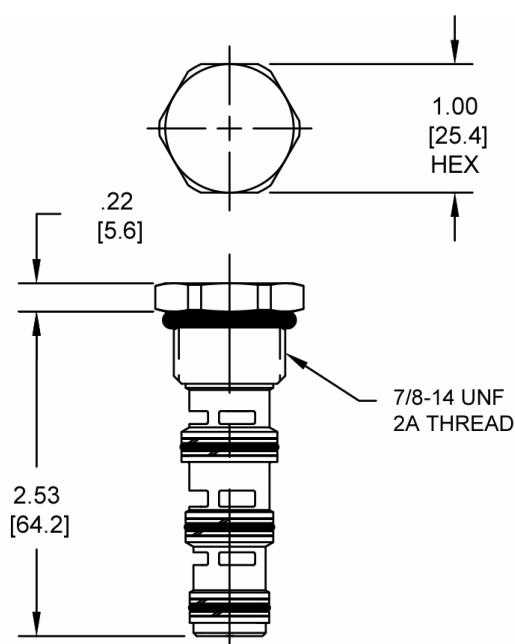


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Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com


DIMENSIONS


BODY WEIGHT: .99 lbs [.45 kg]

ORDERING INFORMATION
DG-FDB
OPTIONS
 Buna Standard 00
 Viton Standard 0V

 Blank
N
S
BODIES

 Without Body
 1/4 NPT Ports
 #6 SAE Ports
NOTE: Must Use 4-Way Body

SPLITS 50 50-50

 *Consult factory for Splits
 Other than 50 - 50

 03
 06
 09
 12

INLET FLOW

 2-3 GPM
 3-6 GPM
 6-9 GPM
 9-12 GPM

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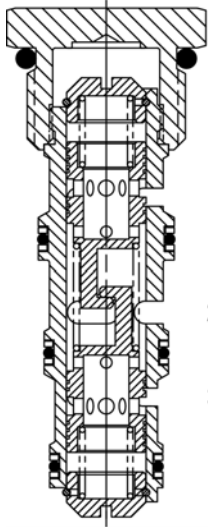
Phone: (815) 397-6628

Fax: (815) 397-2526

 E-mail: delta@delta-power.com



DG-FDH Flow Divider / Combiner Valve, Spool Type



DESCRIPTION

"High Accuracy" 10 size, 7/8-14 thread "Delta Series", spool type, flow divider/combiner.

OPERATION

In the dividing mode, the DG-FDH will divert input flow from port (2) to ports (3) and (1), based on the ratio specified with a high degree of accuracy, regardless of operating pressure.

1 The DG-FDH will combine input flows from ports (3) and (1), to port (2) by the same ratio.

Should circuit operation result in a blockage of either (3) or (1), the opposite port may also close under certain conditions. Should this potential exist, consult the factory.

FEATURES

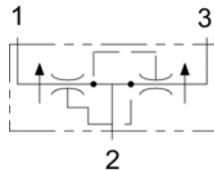
- Hardened parts for long life.
- Industry common cavity.



DO NOT EXCEED MAXIMUM FLOW PER MODEL

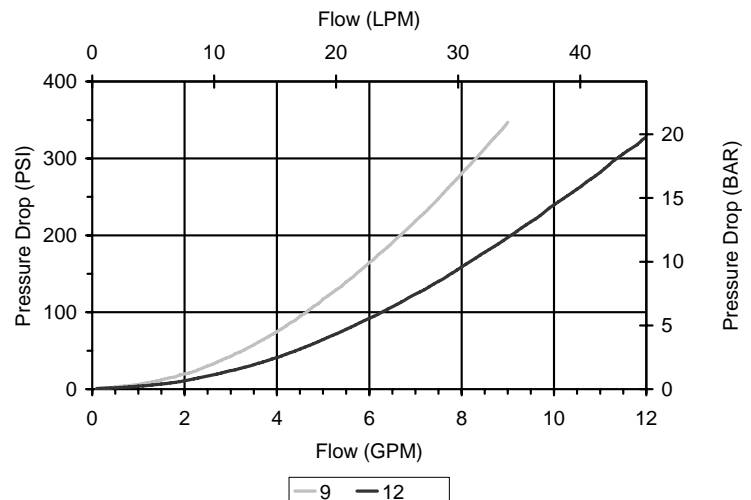
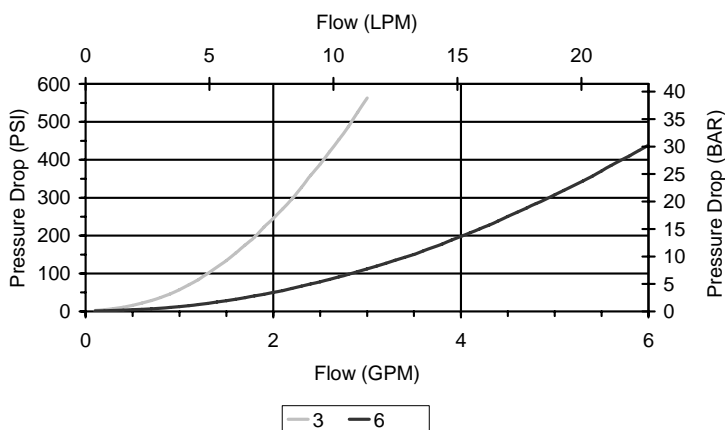
The DG-FDH should be considered if the DG-FDA does not provide the required accuracy.

HYDRAULIC SYMBOL



PERFORMANCE

Actual Test Data (Cartridge Only)

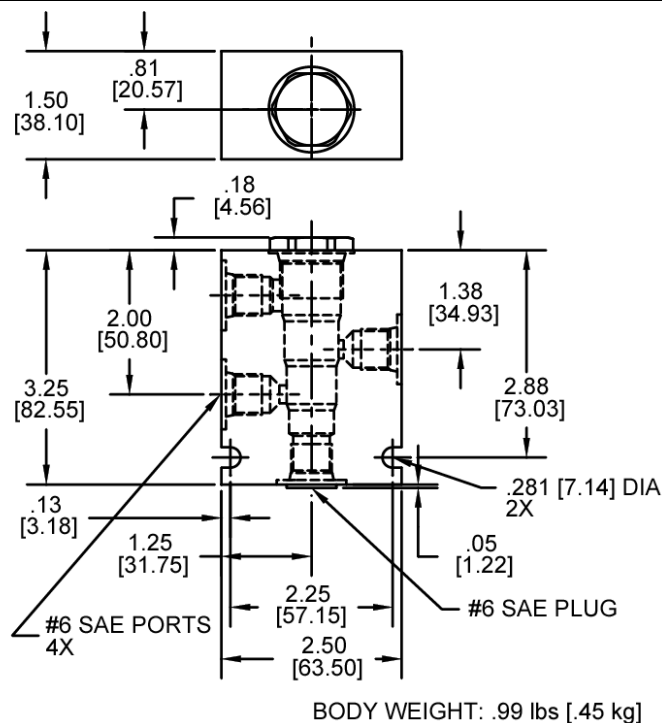
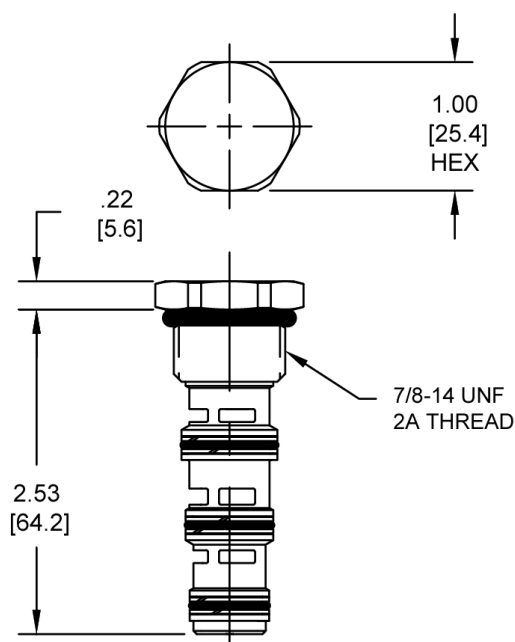


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Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com


DIMENSIONS

ORDERING INFORMATION
DG-FDH
OPTIONS
 Buna Standard 00
 Viton Standard 0V

SPLITS

50 50-50

 *Consult factory for Splits
 Other than 50 - 50

 Blank
N
S
BODIES

 Without Body
 1/4 NPT Ports
 #6 SAE Ports
NOTE: Must Use 4-Way Body

INLET FLOW

 03 2-3 GPM
 06 3-6 GPM
 09 6-9 GPM
 12 9-12 GPM

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

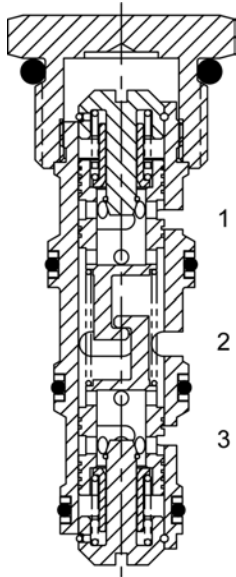
Phone: (815) 397-6628

Fax: (815) 397-2526

 E-mail: delta@delta-power.com



DG-FDT Flow Divider / Combiner Valve, Spool Type



DESCRIPTION

10 size, 7/8-14 thread "Delta Series", spool type, flow divider/combiner, positive traction valve.

OPERATION

In the dividing mode, the DG-FDT will divert input flow from port (2) to ports (3) and (1), based on the ratio specified, regardless of operating pressure.

The DG-FDT will combine input flows from ports (3) and (1).

Should circuit operation result in a blockage of either (3) or (1), the opposite port may also close under certain conditions. Should this potential exist, consult the factory.

FEATURES

- Hardened parts for long life.
- Industry common cavity.

TRACTION FLOW W/ 1 LEG UNLOADED

2-3 GPM VALVE – 0.4 GPM
3-6 GPM VALVE – 0.7 GPM
6-9 GPM VALVE – 1.1 GPM
9-12 GPM VALVE – 1.5 GPM

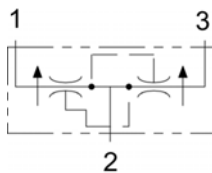


DO NOT EXCEED MAXIMUM FLOW PER MODEL



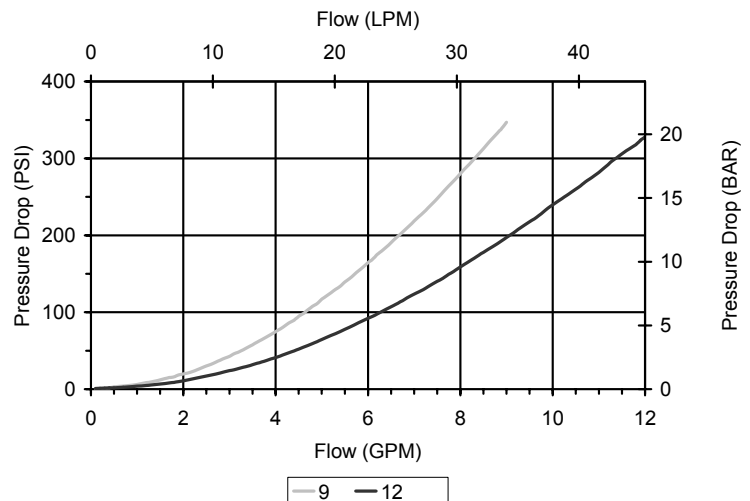
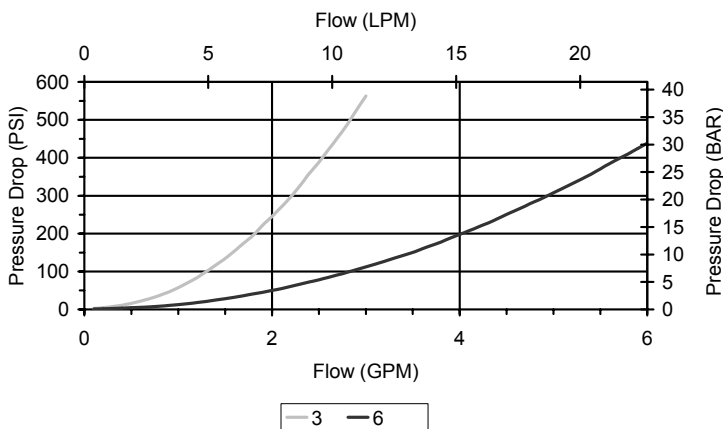
Use where wheel slip (or "drag") needs to be accomplished.

HYDRAULIC SYMBOL



PERFORMANCE

Actual Test Data (Cartridge Only)

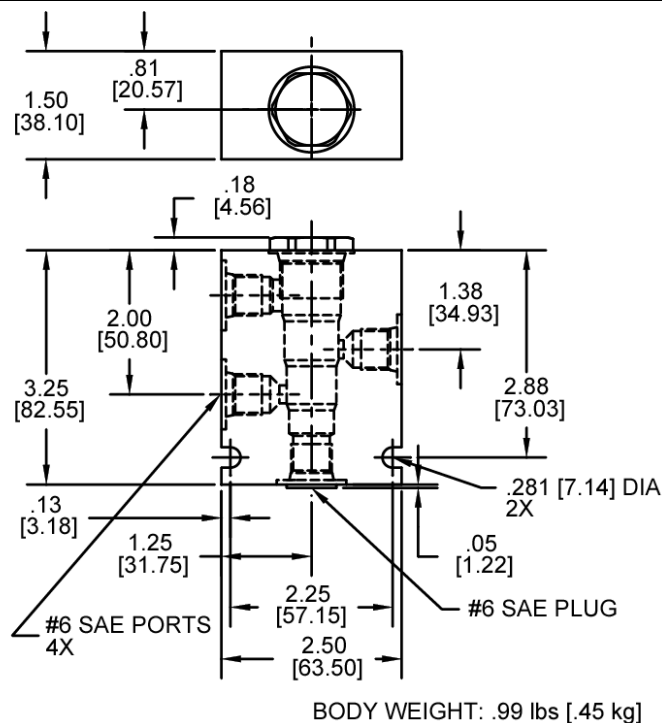
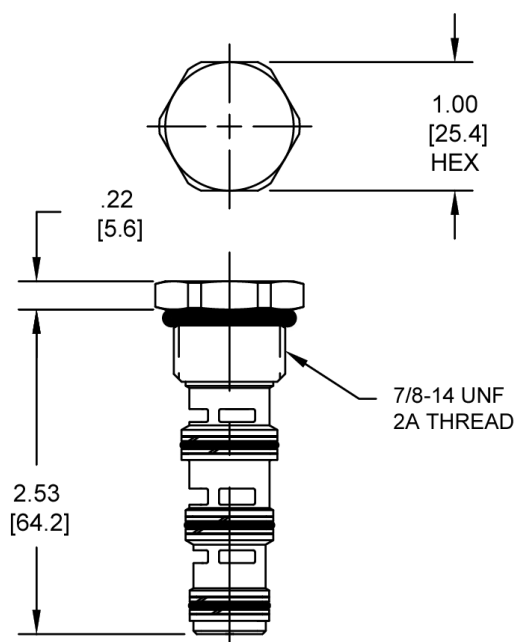


WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com

**DIMENSIONS****ORDERING INFORMATION****DG-FDT**

OPTIONS
Buna Standard
Viton Standard

00
V

Blank
N
S

BODIES

Without Body
1/4 NPT Ports
#6 SAE Ports
NOTE: Must Use 4-Way Body

SPLITS

50 50-50

*Consult factory for Splits
Other than 50 - 50

03
06
09
12

INLET FLOW

2-3 GPM
3-6 GPM
6-9 GPM
9-12 GPM

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

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SECTION/Description	Pages
2W Proportional Flow Regulator Valves	508
Proportional Pressure Reducing / Relieving Valves	527
Proportional Pressure Relief Valves	539


WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.



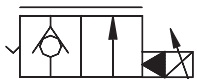
SECTION/Description	Pages
2-way Normally Closed Proportional Flow Regulator Valves	511
2-way Normally Open Proportional Flow Regulator Valves	521

2-way Normally Closed Proportional Flow Regulator Valves

Spool Type

	GPM	PSI	LPM	BAR	MODEL	PAGE
	5.8	3500	22	245	EE-P2G-A	512
	13.2	3500	50	245	EE-P2G-B	512
	13.2	3500	50	245	EE-P2G-C	512

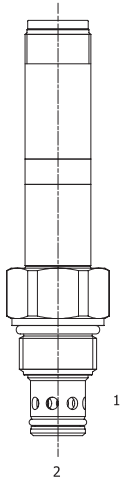
Poppet Type

	GPM	PSI	LPM	BAR	MODEL	PAGE
	6.5	3500	25	245	EB-P2A	514
	4	3500	15	245	EE-P2A-A	516
	8	3500	30	245	EE-P2A-B	516
	12	3500	45	245	EE-P2A-C	516
	17.2	3500	65	245	ET-P2A-A	518
	22.5	3500	85	245	ET-P2A-B	518
	29	3500	110	245	ET-P2A-C	518

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

EE - P2G

2 Way, Normally Closed, Proportional Flow Control Valve



DESCRIPTION

10 size, 7/8-14 thread, "Delta" series, solenoid operated, 2 way normally closed, proportional flow control valve.

OPERATION

When de-energized the EE-P2G blocks flow at ports (1) and (2).

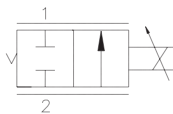
When energized, the valve allows flow from (2) to (1). Flow is proportional to the current applied to the coil. A compensator must be used to create a pressure compensated flow control function.

OPERATION OF MANUAL OVERRIDE OPTION: To override, turn the manual override screw clockwise. To release turn the manual override screw counter-clockwise.

FEATURES

- Efficient wet-armature construction.
- Cartridges are voltage interchangeable.
- Industry common cavity.
- Unitized, molded coil design.
- Continuous duty rated solenoid.
- Optional coil voltages and terminations.

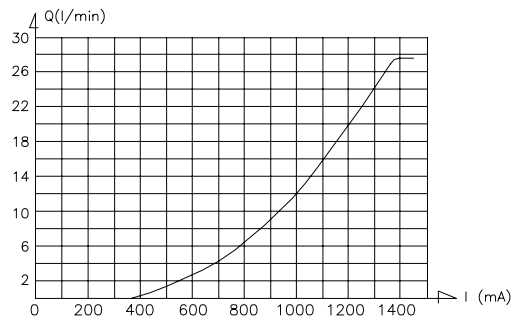
HYDRAULIC SYMBOL



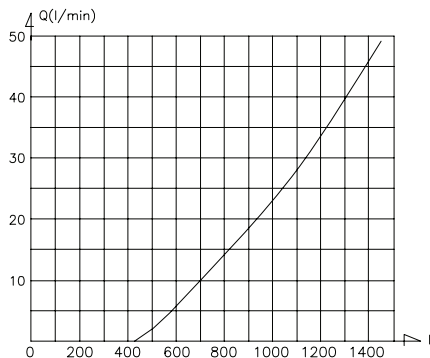
Curves are attained with compensator.

PERFORMANCE

"A" version - Flow (l/min) vs. Current (mA)
(12 V coil; Delta P = 14 bar ; Toil = 40°C)



"B" version - Flow (l/min) vs. Current (mA)
(12 V coil; Delta P = 14 bar ; Toil = 40°C)



VALVE SPECIFICATIONS

Flow range	See curves for various versions
Max System Pressure	3500 PSI (245 bar)
Leakage	max 50 cc/min at 245 bar
Hysteresis	+ / - 3%
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temperature Range	-40° to 250° F (-40° to 120° C)
Weight	.58 lbs. (.26 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	26 ft-lbs (35 Nm)
Coil Nut Torque Requirements	2-3 ft-lbs (3-4 Nm)
Cavity	DELTA 2W
Cavity Tools kit (form tool, reamer, tap)	40500000
Seal Kit	21191200

COIL SPECIFICATIONS

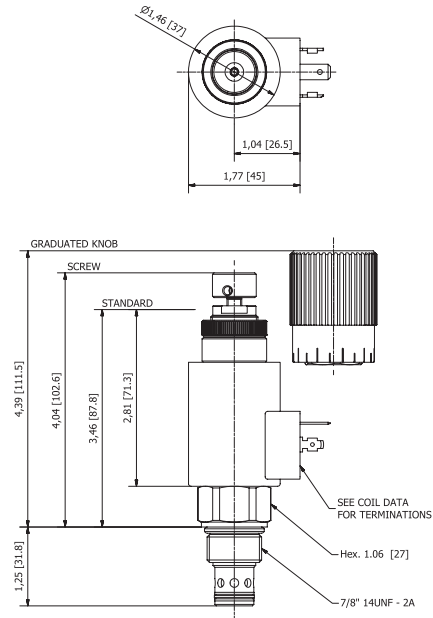
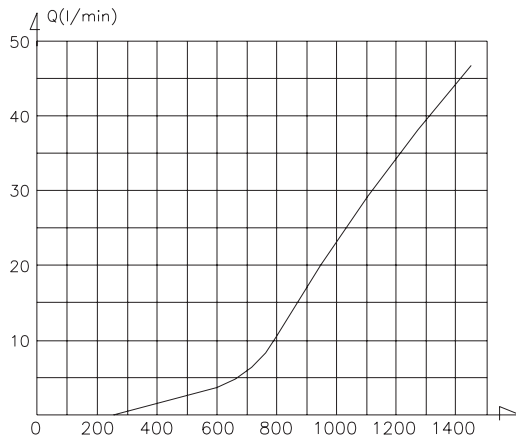
Current Supply Characteristics	PWM (Pulse Width Modulation)
Rated Current Range	200 - 1450 mA
PWM or Super-imposed Dither Frequency	100 - 150 Hz
Coil Resistance (12 Vdc)	7.2 Ohm +/- 5% at 68°F (20°C)

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

PROPORTIONAL FLOW CONTROLS

DIMENSIONS

"C" version - Flow (l/min) vs. Current (mA)
(12 V coil; Delta P = 14 bar ; Toil = 40° C)



(for bodies style and sizes see section "Accessories")

ORDERING INFORMATION

EE - P2G

OPTIONS

Buna, push type override (Standard) **AP** Up to 22 l/min
Buna, screw type override (Knob) **AS** Up to 22 l/min
Buna, screw type override (Grad. Knob) **AK** Up to 22 l/min

Buna, push type override (Standard) **BP** Up to 50 l/min
Buna, screw type override (Knob) **BS** Up to 50 l/min
Buna, screw type override (Grad. Knob) **BK** Up to 50 l/min

Buna, push type override (Standard) **CP** Up to 50 l/min
Buna, screw type override (Knob) **CS** Up to 50 l/min
Buna, screw type override (Grad. Knob) **CK** Up to 50 l/min

Blank
S

BODIES

Without Body
#8 SAE Ports

VOLTAGE

12 12 VDC
24 24 VDC

"F" COIL TERMINATION

HC DIN 43650 (Hirschman)
DI Deutsch-Integral DT04-2P
JT AMP Jr. Timer

NOTES:

- 1) Flows refer to a 14 bar Delta P
- 2) For other seals, consult factory

Approximate Coil Weight: .47lbs. (.21 kg.)

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

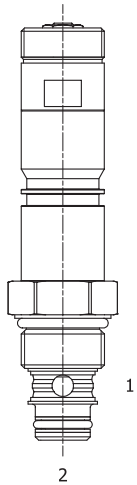
Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com

PROPORTIONAL FLOW CONTROLS

EB - P2A 2 Way, Normally Closed, Proportional Flow Control Valve



DESCRIPTION

8 size, 3/4-16 thread, solenoid operated, 2 way normally closed poppet style, proportional flow control valve.

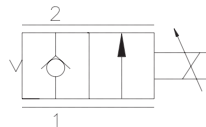
OPERATION

When de-energized the EB-P2A blocks flow from (1) to (2) and allows reverse flow from (2) to (1). When energized, the valve allows flow from (1) to (2). Flow is proportional to current applied to the coil. A compensator must be used to create a pressure compensated flow control function.

FEATURES

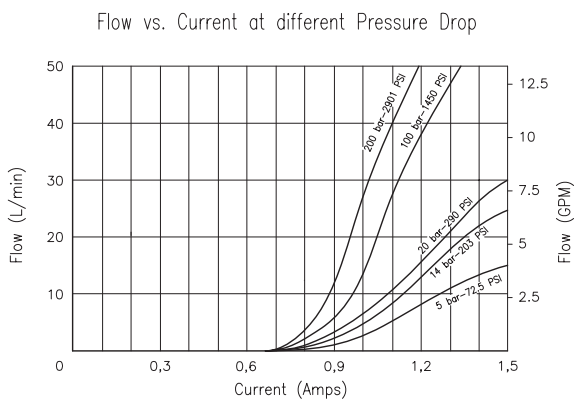
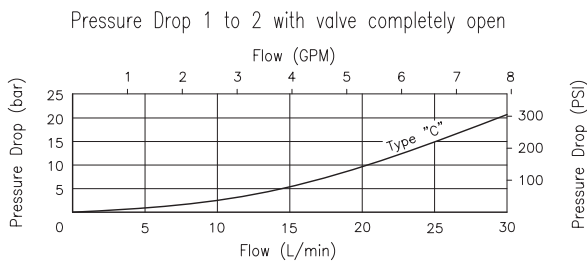
- Efficient wet-armature construction.
- Cartridges are voltage interchangeable.
- Industry common cavity.
- Unitized, molded coil design.
- Continuous duty rated solenoid.
- Optional coil voltages and terminations.

HYDRAULIC SYMBOL



Curves are attained without pressure compensator.
The valve can work with a pressure drop up to 200 bar.

PERFORMANCE



Coil 12 VDC - hyd. oil 26cSt(121SSU)@40°C(104°F)

VALVE SPECIFICATIONS

Flow range	See curves
Max System Pressure	3500 PSI (245 bar)
Leakage	0 - 10 drops / min @245 bar
Hysteresis	+/- 3 %
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temperature Range	-40° to 250° F (-40° to 120° C)
Weight	.72 lbs. (.32 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	37 ft-lbs (50 Nm)
Coil Nut Torque Requirements	2-3 ft-lbs (3-4 Nm)
Cavity	POWER 2W
Cavity Tools kit (form tool, reamer, tap)	40500005
Seal Kit	21191102
COIL SPECIFICATIONS	
Current Supply Characteristics	PWM
Rated Current Range	500 - 1450 mA
PWM or Super-imposed Dither Frequency	100 Hz
Coil Resistance (12 Vdc)	7,5 Ohm +/- 5% at 68°F (20°C)

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

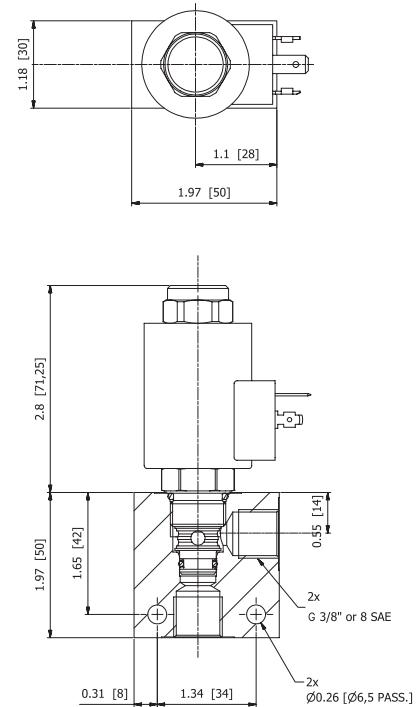
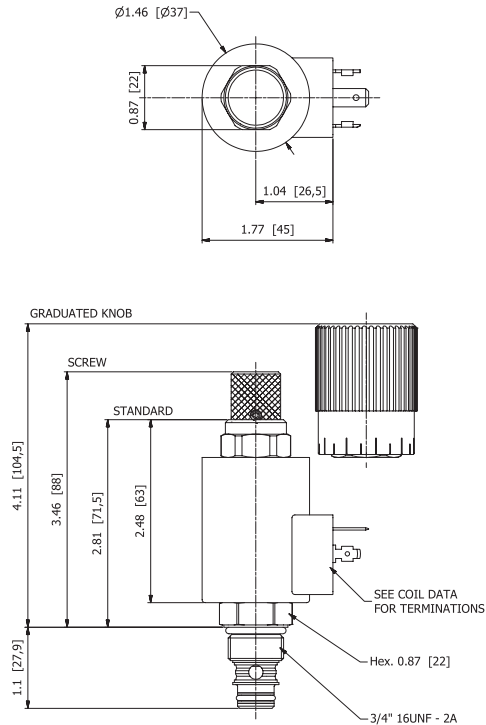
Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com

PROPORTIONAL FLOW CONTROLS

DIMENSIONS



(for bodies style and sizes see section "Accessories")

ORDERING INFORMATION

EB - P2A

OPTIONS

Buna (Standard) **C0** Up to 25 l/min
Buna, screw type override (Knob) **CS** Up to 25 l/min
Buna, screw type override (Grad. Knob) **CK** Up to 25 l/min

Blank

S

BODIES

Without Body
#8 SAE Ports

VOLTAGE

12 12 VDC
24 24 VDC

HC
DI
JT

"F" COIL TERMINATION
DIN 43650 (Hirschman)
Deutsch-Integral DT04-2P
AMP Jr. Timer

NOTES:

- 1) Flow refer to a 14 bar Delta P
- 2) For other seals, consult factory

Approximate Coil Weight: .47lbs. (.21 kg.)

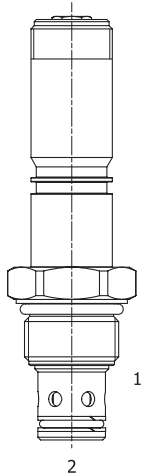
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Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com

EE - P2A 2 Way, Normally Closed, Proportional Flow Control Valve



DESCRIPTION

10 size, 7/8-14 thread, solenoid operated, 2 way normally closed poppet style, proportional flow control valve.

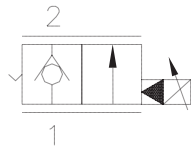
OPERATION

When de-energized the EE-P2A blocks flow from (1) to (2) and allows reverse flow from (2) to (1). When energized, the valve allows flow from (1) to (2). Flow is proportional to current applied to the coil. A compensator must be used to create a pressure compensated flow control function.

FEATURES

- Efficient wet-armature construction.
- Cartridges are voltage interchangeable.
- Industry common cavity.
- Unitized, molded coil design.
- Continuous duty rated solenoid.
- Optional coil voltages and terminations.

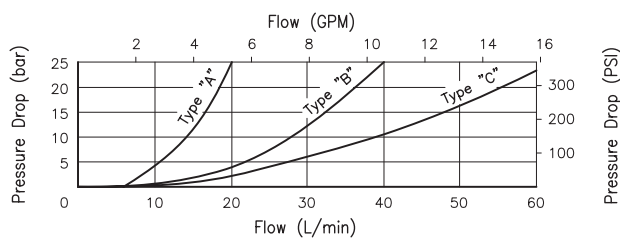
HYDRAULIC SYMBOL



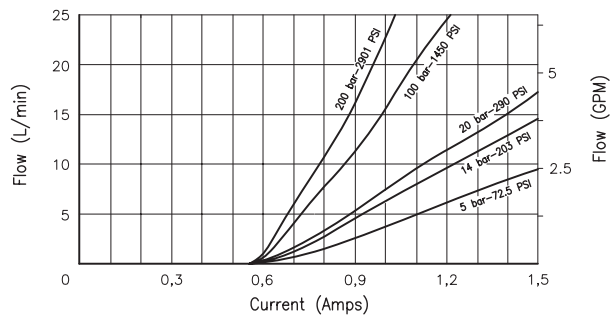
Curves are attained without pressure compensator.
The valve can work with a pressure drop up to 200 bar

PERFORMANCE

Pressure Drop 1 to 2 with valve completely open



Flow vs. Current at different Pressure Drop



Poppet type A - Coil 12 VDC
hyd. oil 26cSt(121SSU)@40°C(104°F)

VALVE SPECIFICATIONS

Flow range	See curves
Max System Pressure	3500 PSI (245 bar)
Leakage	0 - 10 drops / min @245 bar
Hysteresis	+/- 3 %
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temperature Range	-40° to 250° F (-40° to 120° C)
Weight	.72 lbs. (.32 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	37 ft-lbs (50 Nm)
Coil Nut Torque Requirements	2-3 ft-lbs (3-4 Nm)
Cavity	DELTA 2W
Cavity Tools kit (form tool, reamer, tap)	40500000
Seal Kit	21191200

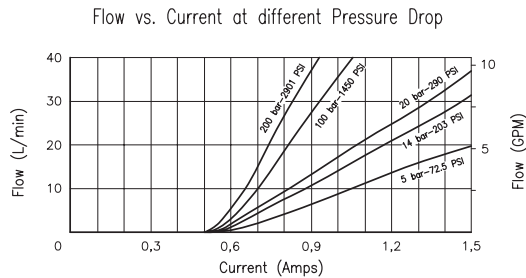
COIL SPECIFICATIONS

Current Supply Characteristics	PWM
Rated Current Range	500 - 1450 mA
PWM or Super-imposed Dither Frequency	100 Hz
Coil Resistance (12 Vdc)	7,5 Ohm +/- 5% at 68°F (20°C)

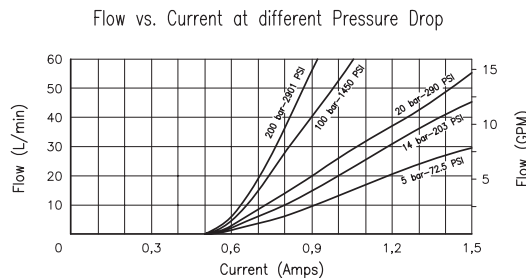
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PROPORTIONAL FLOW CONTROLS

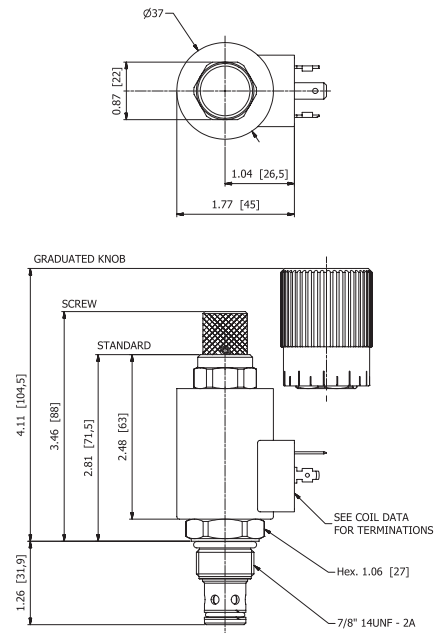
DIMENSIONS



Poppet type B - Coil 12 VDC
hyd. oil 26cSt(121SSU)@40°C(104°F)



Poppet type C - Coil 12 VDC
hyd. oil 26cSt(121SSU)@40°C(104°F)



(for bodies style and sizes see section "Accessories")

ORDERING INFORMATION

EE - P2A

OPTIONS

- | | | |
|--|--------------------------|----|
| Buna standard | A0 Up to 15 l/min | 12 |
| Buna, screw type override (Knob) | AS Up to 15 l/min | |
| Buna, screw type override (Grad. Knob) | AK Up to 15 l/min | |
| Buna standard | B0 Up to 30 l/min | 24 |
| Buna, screw type override (Knob) | BS Up to 30 l/min | |
| Buna, screw type override (Grad. Knob) | BK Up to 30 l/min | |
| Buna standard | C0 Up to 45 l/min | HC |
| Buna, screw type override (Knob) | CS Up to 45 l/min | |
| Buna, screw type override (Grad. Knob) | CK Up to 45 l/min | |

Blank
S

BODIES

Without Body
#8 SAE Ports

VOLTAGE

12 VDC
24 VDC

"F" COIL TERMINATION

DIN 43650 (Hirschman)
Deutsch-Integral DT04-2P
AMP Jr. Timer

NOTES:

- 1) Flows refer to a 14 bar Delta P
- 2) For other seals, consult factory

Approximate Coil Weight: .47lbs. (.21 kg.)

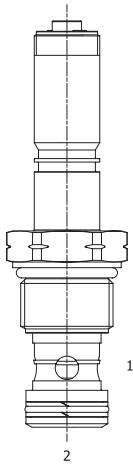
WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com

ET - P2A 2 Way, Normally Closed, Proportional Flow Control Valve



DESCRIPTION

12 size, 1 1/16-12 thread, solenoid operated, 2 way normally closed poppet style, proportional flow control valve.

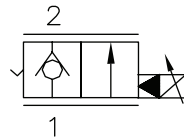
OPERATION

When de-energized the ET-P2A blocks flow from (1) to (2) and allows reverse flow from(2) to (1).
When energized, the valve allows flow from (1) to (2). Flow is proportional to current applied to the coil. A compensator must be used to create a pressure compensated flow control function.

FEATURES

- Efficient wet-armature construction.
- Cartridges are voltage interchangeable.
- Industry common cavity.
- Unitized, molded coil design.
- Continuous duty rated solenoid.
- Optional coil voltages and terminations.

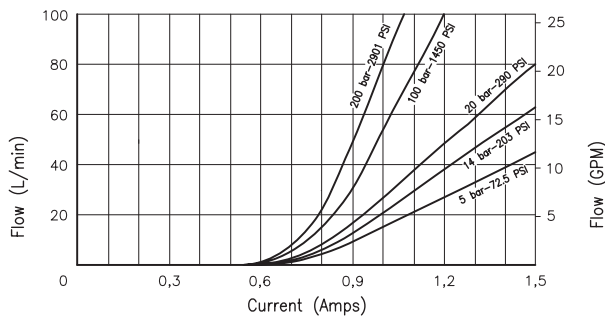
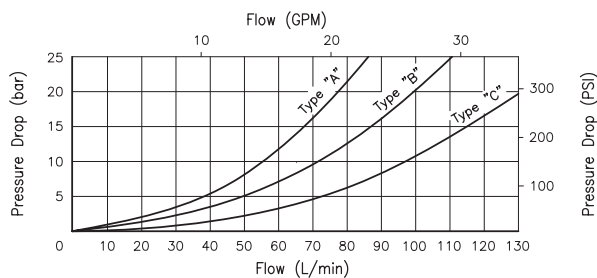
HYDRAULIC SYMBOL



Curves are attained without pressure compensator.
The valve can work with a pressure drop up to 200 bar

PERFORMANCE

Pressure Drop 1 to 2 with valve completely open



Poppet type A – Coil 12 VDC
hyd. oil 26cSt(121SSU)@40°C(104°F)

VALVE SPECIFICATIONS

Flow range	See curves for various versions
Max System Pressure	3500 PSI (245 bar)
Leakage	0 - 10 drops / min @ 245 bar
Hysteresis	+/- 3 %
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temperature Range	-40° to 250 ° F (-40 ° to 120 ° C)
Weight	.72 lbs. (.32 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	37 ft-lbs (50 Nm)
Coil Nut Torque Requirements	2-3 ft-lbs (3-4 Nm)
Cavity	TECNORD 2W
Cavity Tools kit (form tool, reamer, tap)	40500000
Seal Kit	21191200

COIL SPECIFICATIONS

Current Supply Characteristics	PWM
Rated Current Range	500 – 1450 mA
PWM or Super-imposed Dither Frequency	100 Hz
Coil Resistance (12 Vdc)	7,5 Ohm +/- 5% at 68 °F (20 °C)

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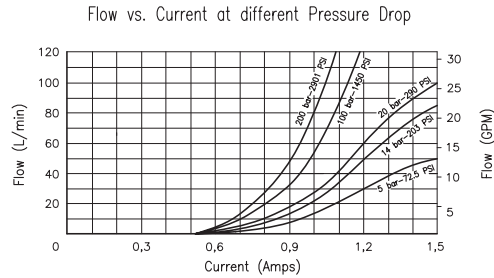
Phone: (815) 397-6628

Fax: (815) 397-2526

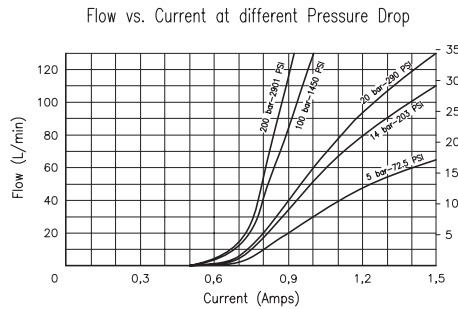
E-mail: delta@delta-power.com

PROPORTIONAL FLOW CONTROLS

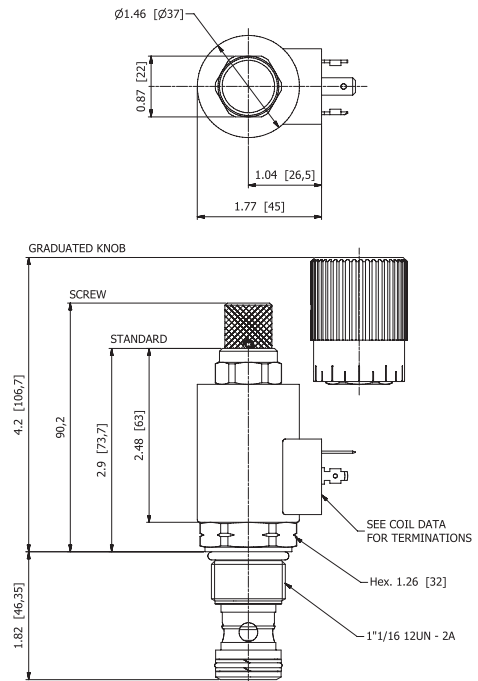
DIMENSIONS



Poppet type B - Coil 12 VDC
hyd. oil 26cSt(121SSU)@40°C(104°F)



Poppet type C - Coil 12 VDC
hyd. oil 26cSt(121SSU)@40°C(104°F)



(for bodies style and sizes see section "Accessories")

ORDERING INFORMATION

ET - P2A

OPTIONS

- Buna standard **A0** Up to 65 l/min
- Buna, screw type override (Knob) **AS** Up to 65 l/min
- Buna, screw type override (Grad. Knob) **AK** Up to 65 l/min
- Buna standard **B0** Up to 85 l/min
- Buna, screw type override (Knob) **BS** Up to 85 l/min
- Buna, screw type override (Grad. Knob) **BK** Up to 85 l/min
- Buna standard **C0** Up to 110 l/min
- Buna, screw type override (Knob) **CS** Up to 110 l/min
- Buna, screw type override (Grad. Knob) **CK** Up to 110 l/min

Blank

BODIES

Without Body
#8 SAE Ports

VOLTAGE

12
24

"F" COIL TERMINATION

DIN 43650 (Hirschman)
Deutsch-Integral DT04-2P
AMP Jr. Timer

HC
DI
JT

NOTES:

- 1) Flows refer to a 14 bar Delta P
- 2) For other seals, consult factory

Approximate Coil Weight: .47lbs. (.21 kg.)

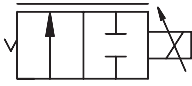
WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

Phone: (815) 397-6628

Fax: (815) 397-2526

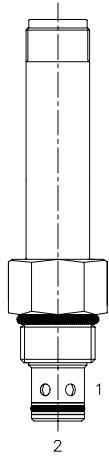
E-mail: delta@delta-power.com

2 Way Normally Open Proportional Flow Regulator Valves

Spool Type					GE	
					MODEL	PAGE
	GPM	PSI	LPM	BAR		
	8	3500	30	245	EE-P2H	522

PROPORTIONAL FLOW CONTROLS

EE-P2H 2 Way, Normally Open, Proportional Flow Control Valve



DESCRIPTION

10 size, 7/8-14 thread, solenoid operated, 2 way normally open, proportional flow control valve.

OPERATION

When de-energized the EE-P2H allows flow from (1) to (2).

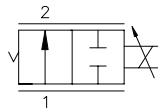
When fully energized, the valve blocks flow at port (1) and (2). Flow is proportional to current applied to the coil. A compensator must be used to create a pressure compensated flow control function.

OPERATION OF MANUAL OVERRIDE OPTION: To override, turn the manual override screw clockwise. To release turn the manual override screw counter-clockwise.

FEATURES

- Efficient wet-armature construction.
- Cartridges are voltage interchangeable.
- Industry common cavity.
- Unitized, molded coil design.
- Continuous duty rated solenoid.
- Optional coil voltages and terminations.

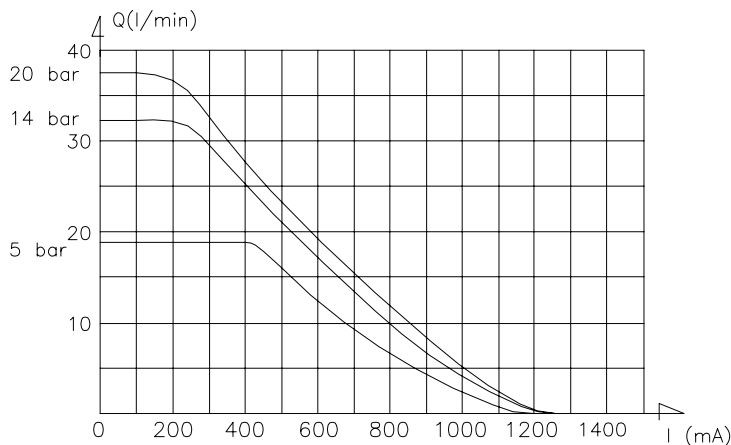
HYDRAULIC SYMBOL



Curve is attained with compensator at with various settings.

PERFORMANCE

Flow (l/min) vs. Current (mA)
(12 V coil; Delta P = 5, 14, 20 bar; Toil = 40°C)



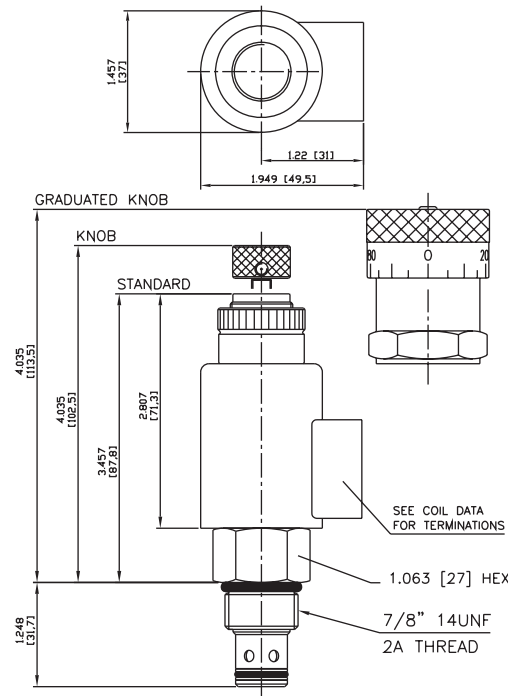
VALVE SPECIFICATIONS

Flow range	See curve
Max System Pressure	3500 PSI (245 bar)
Leakage	max 100 cc/min at 245 bar
Hysteresis	+ / - 4%
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temperature Range	-40° to 250 ° F (-40 ° to 120° C)
Weight	.58 lbs. (.26 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	26 ft-lbs (35 Nm)
Coil Nut Torque Requirements	2-3 ft-lbs (3-4 Nm)
Cavity	DELTA 2W
Cavity Tools kit (form tool, reamer, tap)	40500000
Seal Kit	21191200
COIL SPECIFICATIONS	
Current Supply Characteristics	PWM
Rated Current Range	0 – 1450 mA
PWM or Super-imposed Dither Frequency	100 - 150 Hz
Coil Resistance (12 Vdc)	7,5 Ohm +/- 5% at 68 °F (20°C)

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.



DIMENSIONS



(for bodies style and sizes see section "Accessories")

ORDERING INFORMATION

EE - P2H - - - - -			
OPTIONS			BODIES
Buna, push type override (Standard)	0P		Blank
Buna, screw type override(Knob)	0S		S
Buna, screw type override(Grad. Knob)	0K		
			VOLTAGE
		12	12 VDC
		24	24 VDC
		"F" COIL TERMINATION	
	HC	DIN 43650 (Hirschman)	
	DI	Deutsch - Integral DT04-2P	
	JT	AMP Jr. Timer	

NOTE: for other seals, consult factory

Approximate Coil Weight: .47lbs. (.21 kg.)

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.



SECTION/Description	Pages
Proportional Pressure Reducing / Relieving Valves	527
Proportional Pressure Relief Valves	539

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

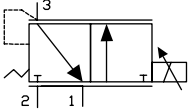
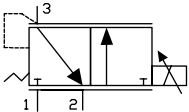
Phone: (815) 397-6628

Fax: (815) 397-2526

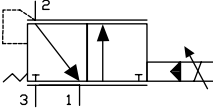
E-mail: delta@delta-power.com

Proportional Pressure Reducing / Relieving Valves

Direct Acting

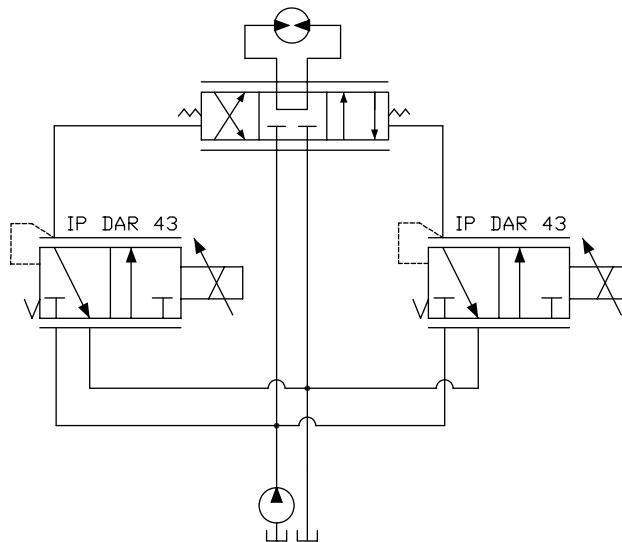
	GPM	PSI	LPM	BAR	MODEL	PAGE
	0.8	5000	3	345	IP-DAR-43C-H	528
	0.8	700	3	50	IP-DAR-43C-L	528
	2	500	8	35	EC-PRV	530

Pilot Operated

	GPM	PSI	LPM	BAR	MODEL	PAGE
	7.5	700	28	50	IP-PRZ-59	532
	8	450	30	27.5	EG-PRZ	534
	30	450	114	27.5	ES-PRZ	536

Typical Schematic

Typical application for the IP DAR 43 is the control of a metering spool on a directional valve.



IP-DAR-43-C Direct Acting Proportional, Pressure Reducing/Relieving, Slip-in type

DESCRIPTION

Special cavity, slip-in style flange retained, direct acting proportional, pressure reducing/relieving valve.

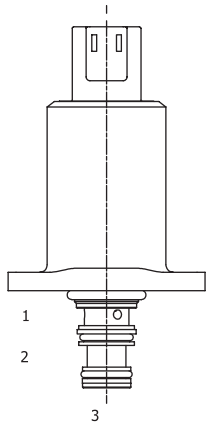
OPERATION

The IP-DAR-43-C generates a variable pressure in response to a PWM (Pulse Width Modulated) current signal. With no current applied to the proportional solenoid, the inlet port 2 is blocked and the regulated port 3 is vented to port 1.

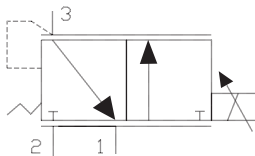
As current is increased, fluid pressure is proportionally controlled at the regulated port 3. On attainment of proportionally determined pressure at 3, the cartridge shifts to block flow at 2, thereby regulating pressure at 3. In this mode, the valve also will relieve 3 to 1 at a variable value over the set reducing pressure.

FEATURES

- Slip-in style
- Efficient wet-armature construction
- Integral waterproof coil
- Continuous duty rated solenoid



HYDRAULIC SYMBOL



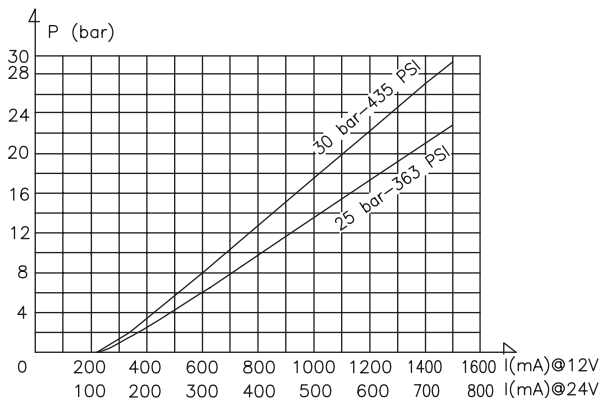
Flanged retained product.

The coil is an integral part of the valve and is not serviceable.

Tank Pressure level above zero is additive to the valves expected reduced pressure value.

PERFORMANCE

Reduced pressure (bar) vs. current (mA)
(12 V and 24 V coil)



VALVE SPECIFICATIONS

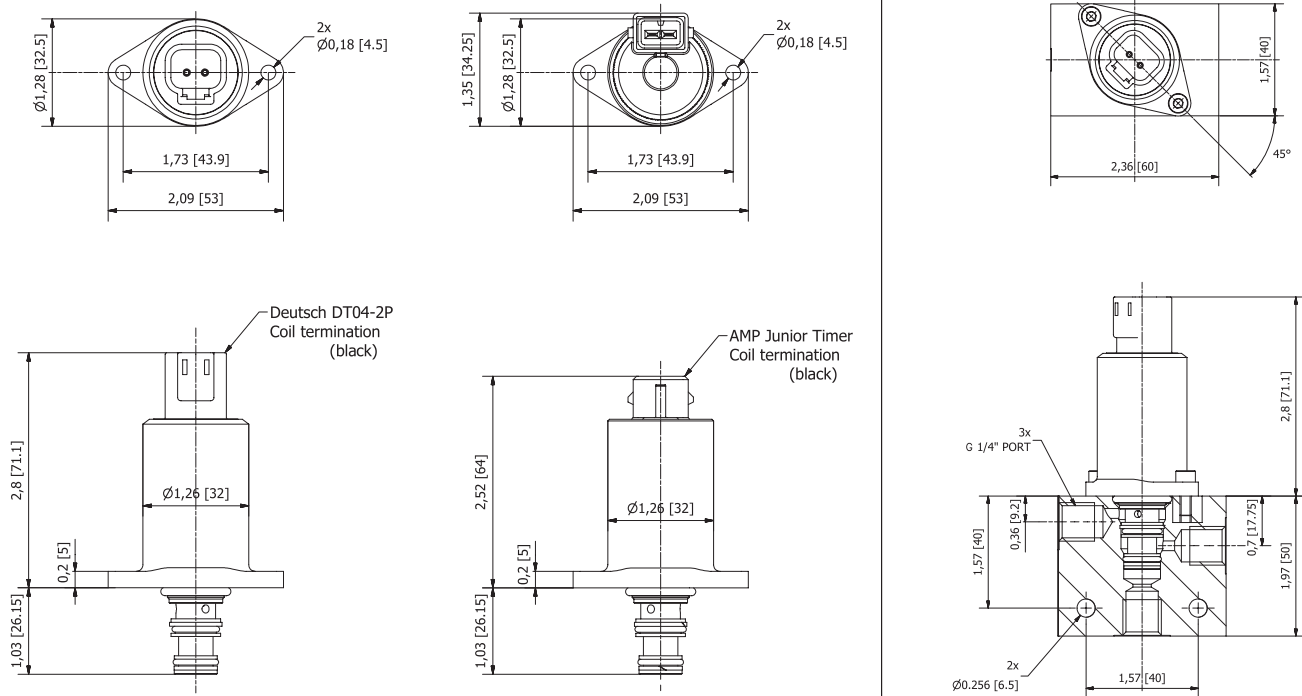
Nominal Flow	1 GPM (3.8 LPM) @ 8 bar Delta P
Max Inlet Pressure "H" version	5000 PSI (350 bar)
Max Inlet Pressure "L" version	700 PSI (50 bar)
Controlled pressure range	0+25 bar / 0+30 bar (see graph)
Reduced pressure tolerance	+ / - 5%
Max. Back-pressure at T port	20 bar
Internal Leakage	15ml/min@ 500PSI (35 bar) inlet 35ml/min@ 5000PSI(350bar) inlet
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/15 (ISO 4406)
Media Operating Temp. Range	-25°C / +90° C
Weight	.54 lbs. (.25 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cavity	T043
Cavity Tool Kit	K-T043
Flange mounting screws	M4x10 / torque 3ft-lbs (4 Nm)

COIL SPECIFICATIONS

Current Supply Characteristics	PWM (Pulse Width Modulation)
Rated Current Range	200+1500 (12 V coil) 100+750 (24 V coil)
PWM or Super-imposed Dither Frequency	100 - 200 Hz
Coil Resistance (12 Vdc)	5.4 Ohm +/- 5% at 68°F (20°C)
Coil Resistance (24 Vdc)	22 Ohm +/- 5% at 68°F (20°C)
Max. Power consumption	12 Watt (20°C)
Protection Degree	IP 67 according to IEC 529
Coil Termination	Deutsch-Integral DT04-2P Amp Junior Timer 84-9419
Color Connectors	Black

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

DIMENSIONS



ORDERING INFORMATION

IP - DAR - 43 - C -

COIL TERMINATION	VOLTAGE	INLET PRESSURE	MAX. REGULATED PRESSURE	OPTIONS
AJ - Amp J. timer	1 - 12 Vdc	L - up to 700 PSI (50 bar)	1 - 25 bar	00 - HNBR standard
DT - Deutsch DT04	2 - 24 Vdc	H - up to 5000 PSI (350 bar)	2 - 30 bar	A0 - with filter

NOTE: screen (on inlet port): mesh 50 (300 μ m)

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

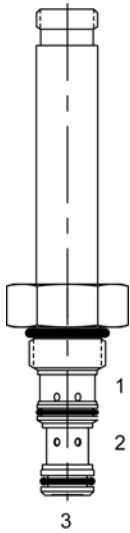
Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com



EC-PRV 3 Way 2 Position, Proportional Pressure Reducing/Relieving Valve



DESCRIPTION

7 size, 5/8-18 thread, "Mini" series, solenoid operated, 3 way 2 position, proportional pressure reducing/relieving valve.

OPERATION

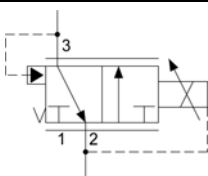
When de-energized the EC-PRV allows flow from (3) to (2) and blocks flow at (1).

As current is increased, fluid pressure is proportionally controlled at the regulated port 3. On attainment of proportionally determined pressure at 3, the cartridge shifts to block flow at 1, thereby regulating pressure at 3. In this mode, the valve also will relieve 3 to 2 at a variable value over the set reducing pressure.

FEATURES

- Efficient wet-armature construction.
- Cartridges are voltage interchangeable.
- Industry common cavity.
- Unitized, molded coil design.
- Continuous duty rated solenoid.
- Optional coil voltages and terminations.

HYDRAULIC SYMBOL

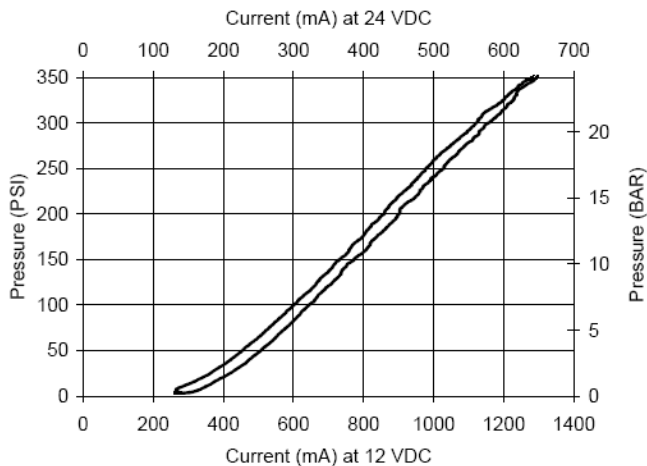


Other configurations for other pressure ranges available. Consult Factory for electrical signal recommendations.

Tank Pressure level above zero is additive to the valves expected reduced pressure value.

PERFORMANCE

Actual Test Data (Cartridge Only)



ABOVE CURVE IS WITH HYDRAULIC OIL 150 SSU AT 100° F

VALVE SPECIFICATIONS

Nominal Flow	2 GPM (8 LPM)
Max Operating Pressure	500 PSI (35 bar)
Max Differential Pressure	300 PSI (21 bar)
Typical Hysteresis	5%
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temperature Range	-40° to 250° F (-40° to 120° C)
Weight	.18 lbs. (.08 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	15 ft-lbs (20.3 Nm)
Coil Nut Torque Requirements	3-5 ft-lbs (4.1-6.8 Nm)
Cavity	MINI 3W
Cavity Form Tool (Finishing)	40500004
Seal Kit	21191010

COIL SPECIFICATIONS

Current Supply Characteristics	PWM (Pulse Width Modulation)
Rated Current Range	200-1200mA (12Volt) 100-600mA (24 Volt)
PWM or Superimposed Dither Frequency	100-150 Hz
Coil Resistance (12 VDC)	7.5 Ohm +/- 5% @ 68F (20C)
Coil Resistance (24 VDC)	30.5 Ohm +/- 5% @ 68F (20C)

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

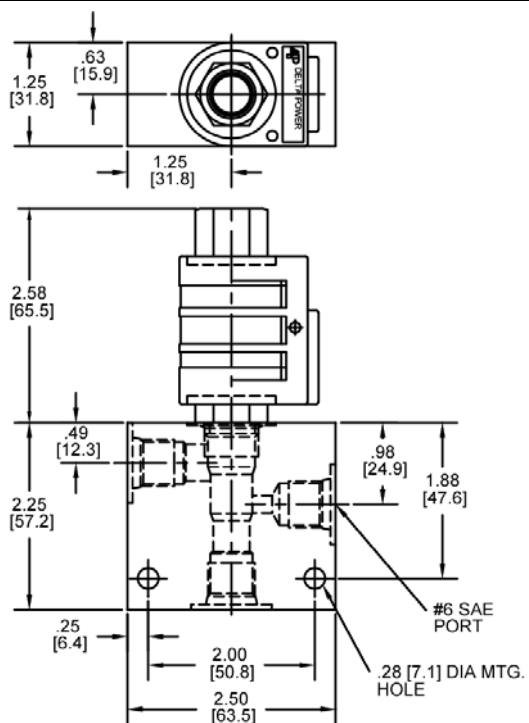
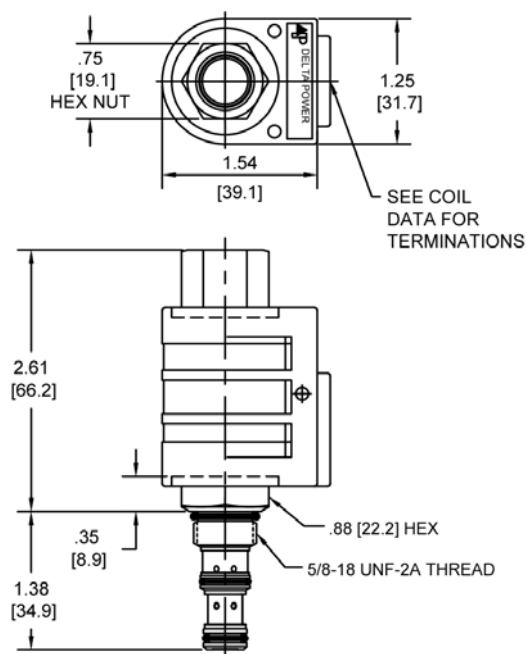
Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com



DIMENSIONS



BODY WEIGHT: .59 lbs.

ORDERING INFORMATION

EC-PRV

OPTIONS

Buna Standard **00**
 Viton Standard **V0**
 Buna, Screen **A0**
 Viton, Screen **W0**

BODIES

Without Body
 1/4 NPTF Ports
 #6 SAE Ports

VOLTAGE

12 VDC
 24 VDC

Note: Use screen only if flow direction is from (1) to (2).

"P" COIL TERMINATION

DL Double Lead
DT Deutsch on Leads DT04-2P
ML Metri-Pack on Leads
PL Packard on Leads
WL Weatherpack on Leads

SS Single Spade
DS Double Spade
HC DIN 43650 (Hirschman) - (DC)
DI Deutsch - Integral DT04-2P

Approximate Coil Weight: .42 lbs. (.19 kg.)

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

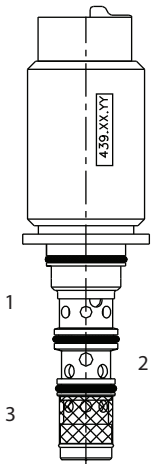
Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com

PROPORTIONAL PRESSURE CONTROLS

IP-PRZ-59-MP12 Pilot Operated Proportional, Pressure Reducing/Relieving, Slip-in type



DESCRIPTION

Special cavity, flange retained, slip-in proportional pressure reducing/relieving valve.

OPERATION

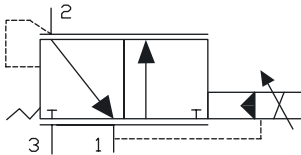
The IP-PRZ-59 generates a variable pressure in response to a PWM (Pulse Width Modulated) current signal. With no current applied to the proportional solenoid, the inlet port 3 is blocked and the regulated port 2 is vented to port 1.

As current is increased, fluid pressure is proportionally controlled at the regulated port 2. On attainment of proportionally determined pressure at 2, the cartridge shifts to block flow at 3, thereby regulating pressure at 2. In this mode, the valve also will relieve 2 to 1 at a variable value over the set reducing pressure.

FEATURES

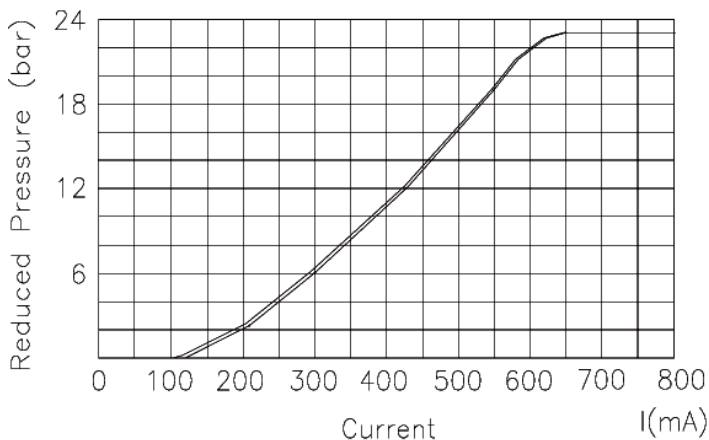
- Economical slip-in style
- Integral waterproof coil
- Efficient wet-armature construction.
- Hardened parts for long life.

HYDRAULIC SYMBOL



PERFORMANCE

Reduced pressure (bar) vs. current (mA)
(12 V coil, 24 bar inlet pressure)



Curve is attained with SAE 40
Grade oil @ 50° C

Flanged Retained Product.

The coil (12 Vdc) is an integral part of the valve and is not serviceable.

Inlet pressure up to 50 bar.

Max regulated pressure can be increased up to 35 bar (factory preset)

Tank Pressure level above zero is additive to the valves expected reduced pressure value.



VALVE SPECIFICATIONS

Nominal Flow	7,9 GPM (30 LPM)@ 3 bar Delta P
Max Inlet Pressure	700 PSI (50 bar)
Controlled pressure range	(see graph)
Max internal leakage	< 500 cc/min @ 35 bar
Viscosity Range	5 to 5000 cSt
Filtration	ISO 18/15/13
Media Operating Temperature Range	-25°C / +85°C
Weight	.63 lbs. (.29 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cavity	T059
Cavity tools Kit (form tool, reamer, tap)	K-T059
Flange mounting screws and torque	M6x10 / 4 ft-lbs (6 Nm)

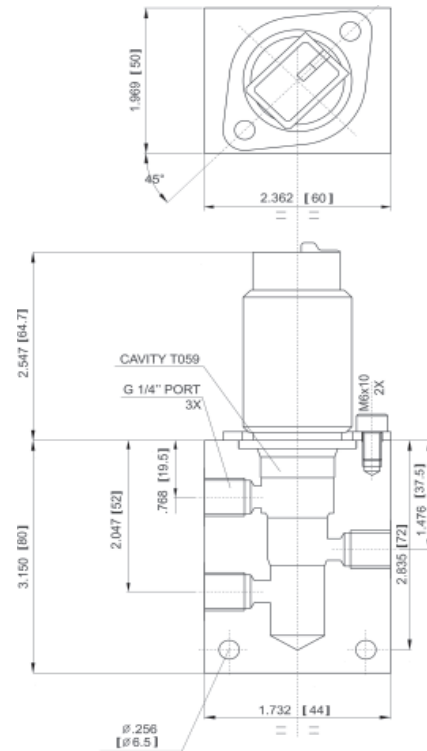
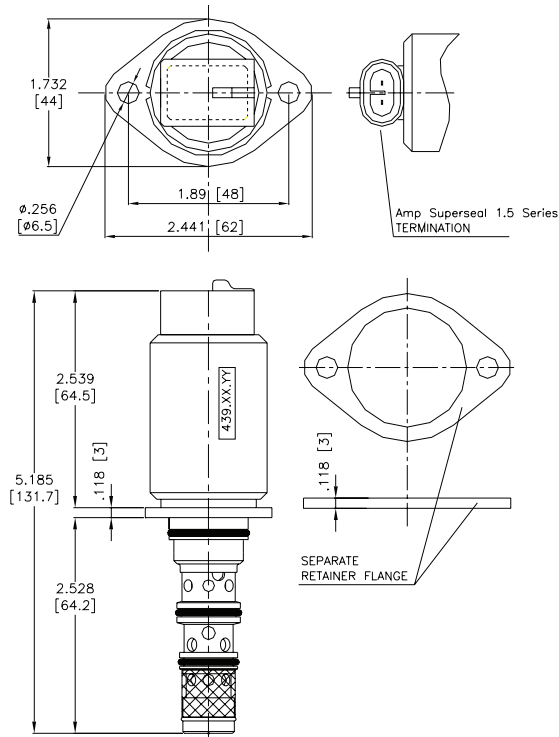
COIL SPECIFICATIONS

Current Supply Characteristics	PWM
Rated Current Range	100 – 900 mA
PWM or Super-imposed Dither Frequency	100 - 150 Hz
Coil Resistance (12 Vdc)	10 Ohm +/- 5% at 68 °F (20 °C)
Max. Power Consumption	14 Watt
Protection Degree	IP 67 according to IEC 529
Coil Termination	Amp Superseal 1.5 Series 282080-1 type
Connector Color	Green

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

PROPORTIONAL FLOW CONTROLS

DIMENSIONS



ORDERING INFORMATION

IP - PRZ - 59 - AM12 -			
<u>OPTIONS</u>			<u>BODIES</u>
Buna Standard	00	Blank	Without Body
Buna, Screen	A0	S	#6 SAE Ports

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

**EG-PRZ 3 Way, Proportional Pressure Reducing Control Valve****DESCRIPTION**

10 size, 7/8-14 thread, "Delta" series, solenoid operated, proportional pressure reducing control valve

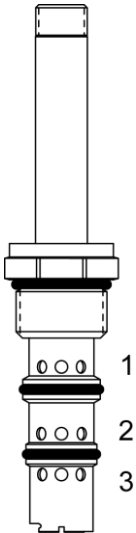
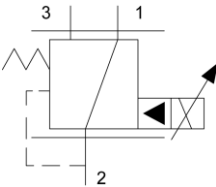
OPERATION

When de-energized the EG-PRZ allows flow from (2) to (1) and blocks flow at (3).

When energized, the cartridge's spool lifts to open (3) to (2) and blocks flow at (1). Outlet pressure is proportional to current applied to the coil.

FEATURES

- Efficient wet-armature construction.
- Cartridges are voltage interchangeable.
- Industry common cavity.
- Unitized, molded coil design.
- Continuous duty rated solenoid.
- Optional coil voltages and terminations.
- Optional "I" Coil: Weatherproof, Thermal Shock, Immersion Safe.

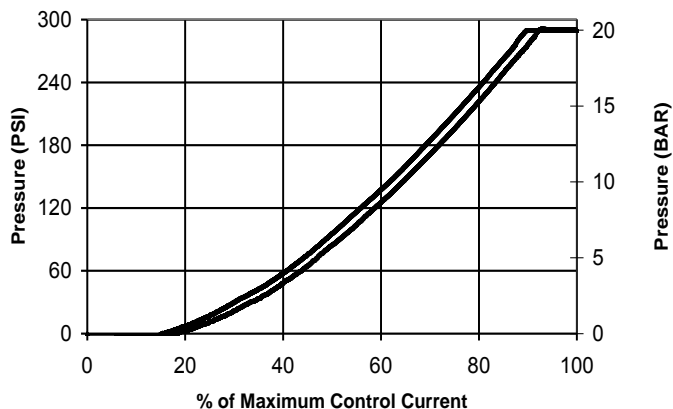
**HYDRAULIC SYMBOL**

Note: Low Wattage coils are available. Consult Factory

PERFORMANCE

Actual Test Data (Cartridge Only)

Pressure vs Current Graph for EGPRZ at 300 psi inlet pressure

**VALVE SPECIFICATIONS**

Nominal Flow	8 GPM (30 LPM)
Max System Pressure	450 PSI (31 bar)
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temperature Range	-40° to 250° F (-40° to 120° C)
Weight	.38 lbs. (.17 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	12 ft-lbs (16.3 Nm)
Coil Nut Torque Requirements	4 - 6 ft-lbs (5.4 - 8.1 Nm)
Cavity	DELTA 4W
Cavity Form Tool (Finishing)	40500002
Seal Kit	21191204

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

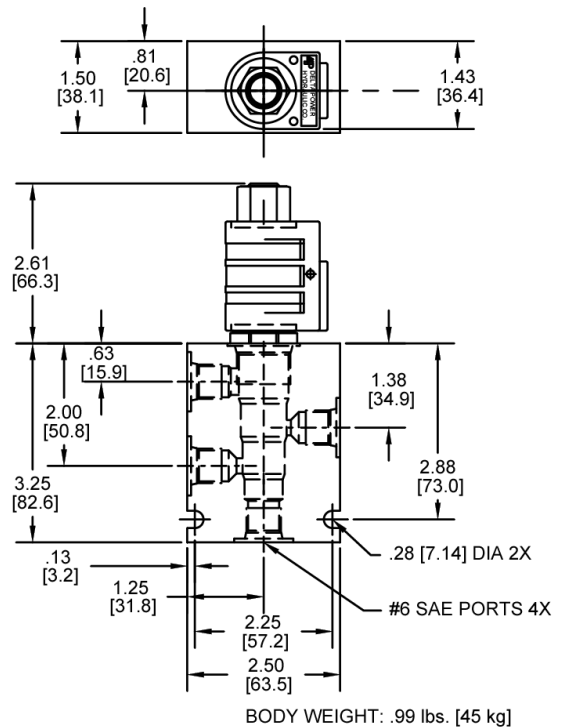
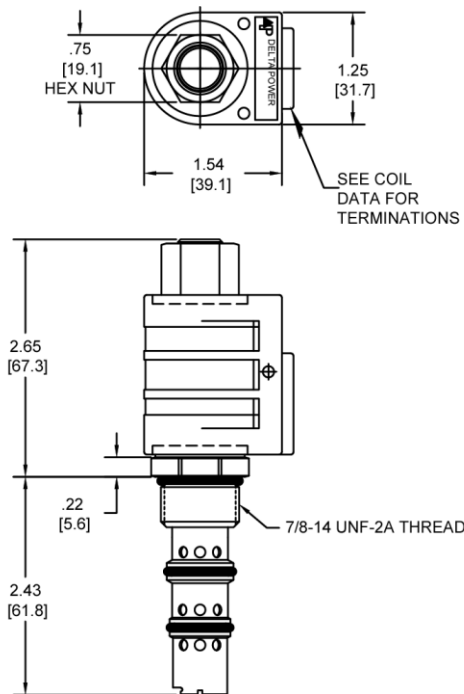
Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com



DIMENSIONS



ORDERING INFORMATION

EG-PRZ -

OPTIONS

Buna Standard 00
Viton Standard V0

Blank
N
S

BODIES

Without Body
1/4 NPTF Ports
#6 SAE Ports

VOLTAGE

12 VDC (.825 Amps Max.)
24 VDC (.412 Amps Max.)

"P" COIL TERMINATION

(All DC Except as Noted)

DL Double Lead
DT Deutsch on Leads DT04-2P
ML Metri-Pack on Leads
PL Packard on Leads
WL Weatherpack on Leads

SS Single Spade
DS Double Spade
HC DIN 43650 (Hirschman) - (DC)
DI Deutsch - Integral DT04-2P

IA "I" Coil AMP Superseal - Integral
ID "I" Coil Deutsch - Integral DT04-2P
IJ "I" Coil AMP Jr. Timer - Integral
IM "I" Coil Metri-Pack - Integral

Approximate Coil Weight: .42 lbs. (.19 kg.)

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

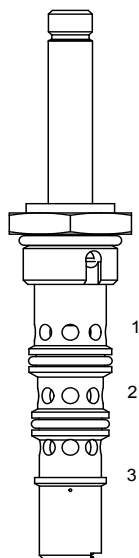
Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com



ES-PRZ Proportional Pressure Reducing Control Valve



DESCRIPTION

12 size, 1 1/16-12 thread, "Tecnord" series, solenoid operated, proportional pressure reducing control valve

OPERATION

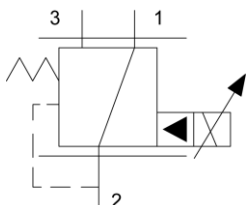
When de-energized the ES-PRZ allows flow from (2) to (1) and blocks flow at (3).

When energized, the cartridge's spool lifts to open (3) to (2) and blocks flow at (1). Outlet pressure is proportional to current applied to the coil.

FEATURES

- Efficient wet-armature construction.
- Cartridges are voltage interchangeable.
- Unitized, molded coil design.
- Continuous duty rated solenoid.
- Optional coil voltages and terminations.
- Optional "I" Coil: Weatherproof, Thermal Shock, Immersion Safe.

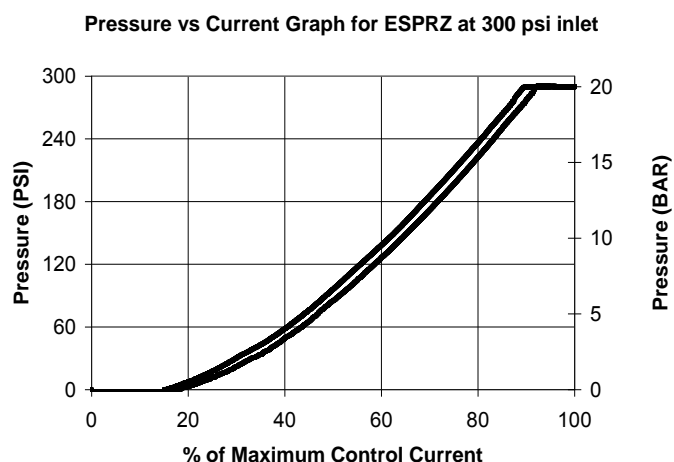
HYDRAULIC SYMBOL



Note: Low Wattage coils available. Consult Factory

PERFORMANCE

Actual Test Data (Cartridge Only)



VALVE SPECIFICATIONS

Nominal Flow	30 GPM (114 LPM)
Max System Pressure	450 PSI (31 bar)
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temperature Range	-40° to 250° F (-40° to 120 ° C)
Weight	.67 lbs. (.3 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	70 ft-lbs (94.9 Nm)
Coil Nut Torque Requirements	4 – 6 ft-lbs (5.4 – 8.1 Nm)
Cavity	40200043
Seal Kit	

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

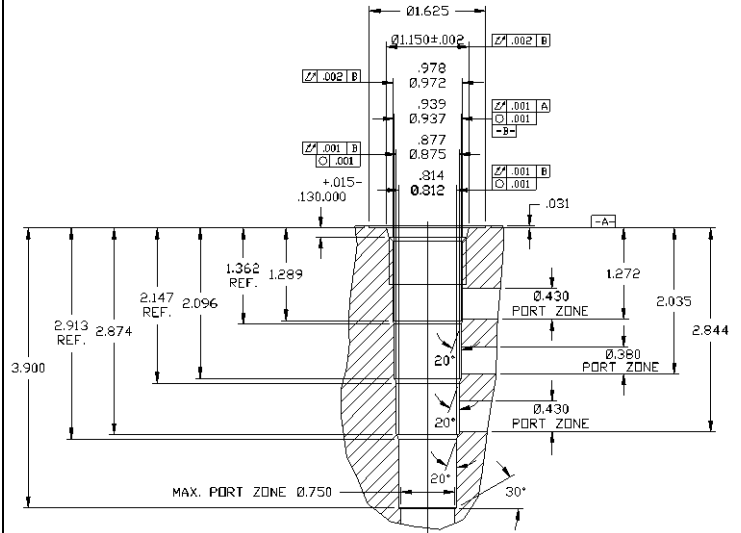
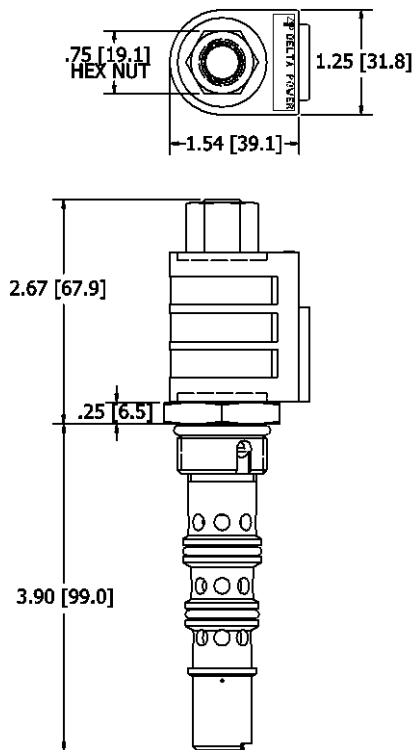
Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com



DIMENSIONS



ORDERING INFORMATION

ES-PRZ

OPTIONS

Buna Standard
Viton Standard

00
V0

Blank
*

BODIES

Without Body
Consult Factory

VOLTAGE

12 VDC (.825 Amps Max.)
24 VDC (.412 Amps Max.)

"P" COIL TERMINATION

(All DC Except as Noted)

DL Double Lead
DT Deutsch on Leads DT04-2P
ML Metri-Pack on Leads
PL Packard on Leads
WL Weatherpack on Leads

SS Single Spade
DS Double Spade
HC DIN 43650 (Hirschman) - (DC)
DI Deutsch - Integral DT04-2P

IA "I" Coil AMP Superseal - Integral
ID "I" Coil Deutsch - Integral DT04-2P
IJ "I" Coil AMP Jr. Timer - Integral
IM "I" Coil Metri-Pack - Integral

Approximate Coil Weight: .42 lbs. (.19 kg.)

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

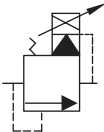
Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com

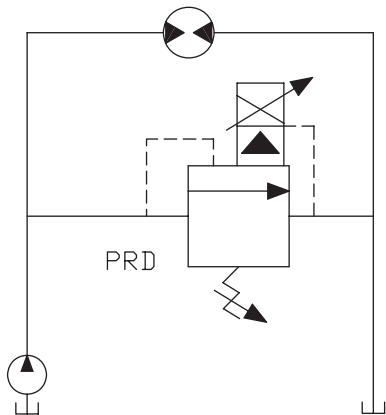
Proportional Pressure Relief Valves

Normally open

	GPM	PSI	LPM	BAR	MODEL	PAGE
	12	3000	45	207	EE-PRD	540

Typical Schematic

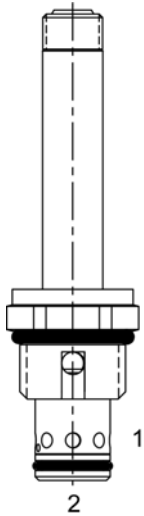
Typical application for the PRD is for system pressure level control.



WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.



EE-PRD 2 Way, Normally Open, Proportional Relief Valve



DESCRIPTION

10 size, 7/8-14 thread, "Delta" series, solenoid operated, 2 way normally open, hydraulic relief valve.

OPERATION

The EE-PRD blocks flow from (2) to (1) until sufficient pressure is present at (2) to offset the electrically induced solenoid force.

Can be infinitely adjusted across a prescribed range using a variable electric input. Pressure output is proportional to DC current input. This valve is intended for use as a pressure limiting device in demanding applications.

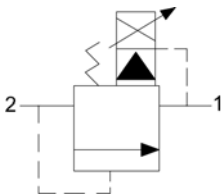
With no current applied to the solenoid, the valve will free flow from (2) to (1) at approximately 100 PSI.

Note: Backpressure on port (1) becomes additive to the pressure setting at a 1:1 ratio.

FEATURES

- Efficient wet-armature construction.
- Cartridges are voltage interchangeable.
- Industry common cavity.
- Unitized, molded coil design.
- Continuous duty rated solenoid.
- Optional coil voltages and terminations.

HYDRAULIC SYMBOL



Uses "P" Power coil.

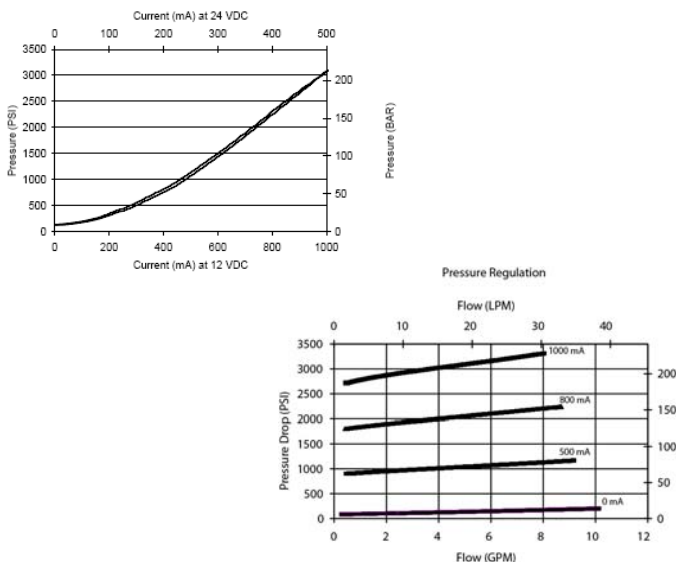
Consult Factory for I coil performance curves.

For best performance valve must be purged of air.

Locate below reservoir or add check valve to return.

PERFORMANCE

Actual Test Data (Cartridge Only)



VALVE SPECIFICATIONS

Nominal Flow	0-12 GPM (0-45 LPM)
Operating Range	100-3000 PSI (3-207 bar)
Typical Hysteresis	5%
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temperature Range	-40° to 250° F (-40° to 120° C)
Weight	.30 lbs. (.13 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	30 ft-lbs (40.6 Nm)
Coil Nut Torque Requirements	4-6 ft-lbs (5.4-8.1 Nm)
Cavity	DELTA 2W
Cavity Form Tool (Finishing)	40500000
Seal Kit	21191202

COIL SPECIFICATION

Current Supply Characteristics	PWM (Pulse Width Modulation) or Variable DC
Rated Current Range	00-1000mA (12Volt) 500mA (24 Volt)
PWM or Superimposed Dither Frequency	200 Hz or Higher
Coil Resistance (12 VDC) Coil Resistance (24 VDC)	7.5 Ohm +/- 5% @ 68F (20C) 30.5 Ohm +/- 5% @ 68F (20C)

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

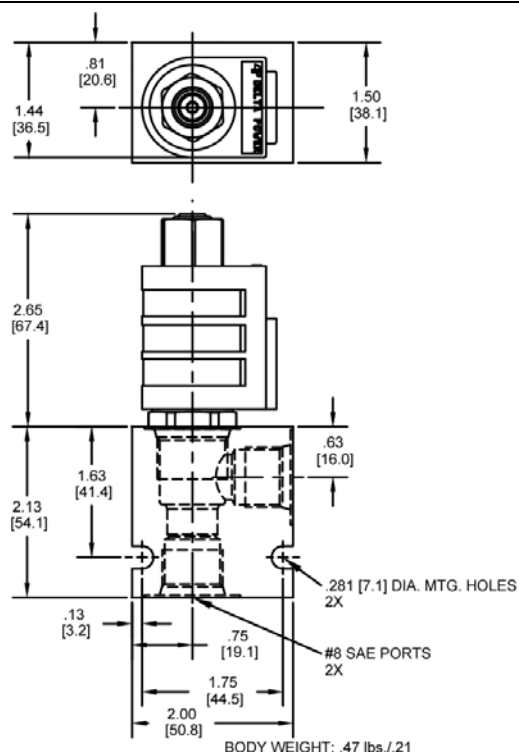
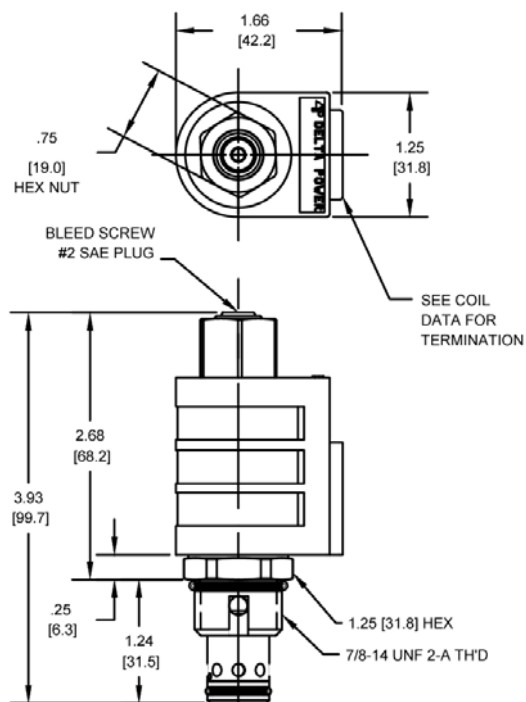
Phone: (815) 397-6628

Fax: (815) 397-2526

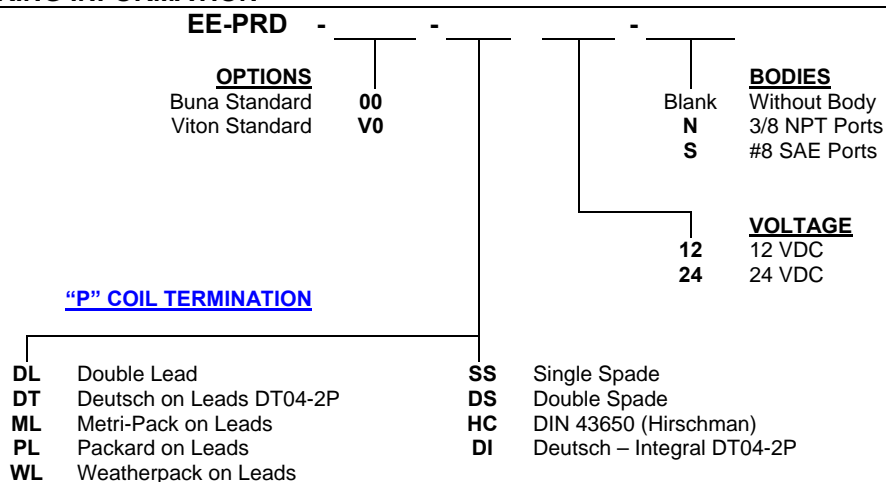
E-mail: delta@delta-power.com



DIMENSIONS



ORDERING INFORMATION



Approximate Coil Weight: .42 lbs. (.19 kg.)

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

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Fax: (815) 397-2526

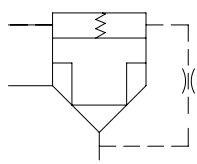
E-mail: delta@delta-power.com



SECTION/Description	Pages
Logic Elements	545

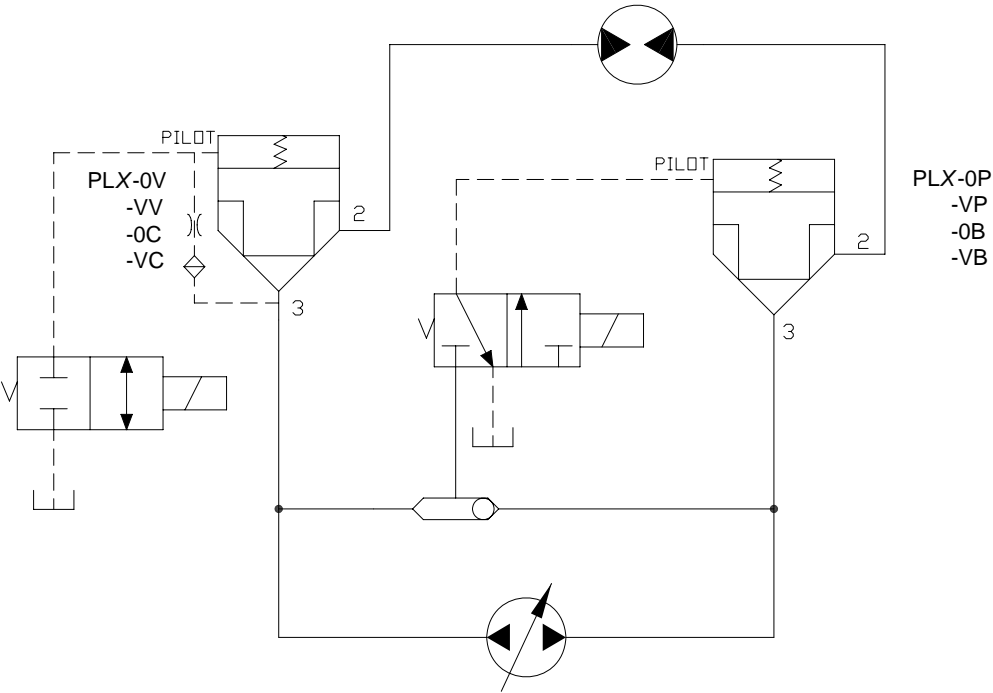
WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

Logic Elements

	GPM	PSI	LPM	BAR	MODEL	PAGE
	40	3500	154	241	SL-PLA	546
	40	3500	154	241	SL-PLB	548
	40	3500	154	241	SL-PLC	550

Typical Schematic

Typical application for the PLA, PLB, and PLC is on a circuit as bi-directional pilot operated 2 way valve with either vent to open or pilot to close from an external source.



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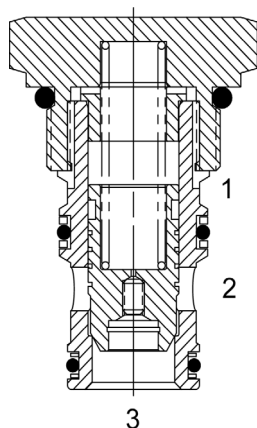
Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com



SL-PLA Super Series, Logic Valve



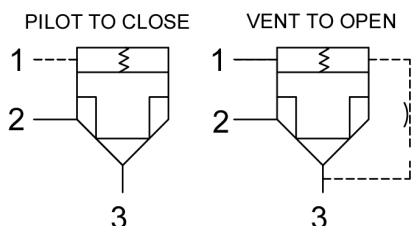
DESCRIPTION

16 size, 1 5/16-12 thread, "Super" series, logic valve

OPERATION

The SL-PLA with an orifice between ports (3) and (1) maintains a constant flow rate from (3) regardless of load pressure changes in the system upstream of (3), or in the bypass leg at (2) as long as pressure at (2) is less than (1). Used for basic blocking applications.

HYDRAULIC SYMBOL



FEATURES

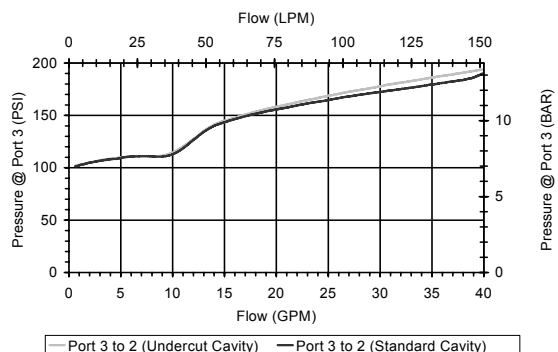
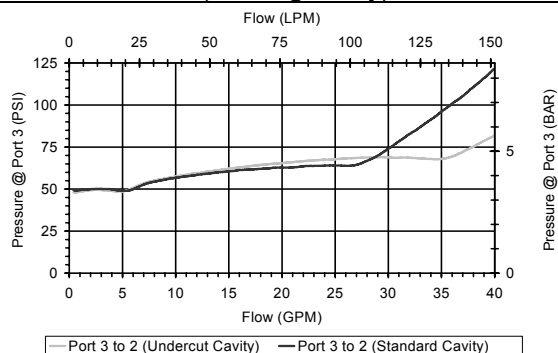
- Hardened parts for long life.
- Industry common cavity.



For bidirectional applications see SL-PLC. For metering see SL-PCA or SL-PCB.

PERFORMANCE

Actual Test Data (Cartridge Only)



VALVE SPECIFICATIONS

Nominal Flow	40 GPM (151 LPM)
Rated Operating Pressure	3500 PSI (241 bar)
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temperature Range	-40° to 250° F (-40° to 120° C)
Weight	.69 lbs. (.31 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	90 ft-lbs. (122 Nm)
Cavity	SUPER 3WS
Cavity Form Tool (Finishing)	40500021
Seal Kit	21191409
Seat Ratio	Area of the pilot is 1.2 times the area of the seat at Port 3.

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

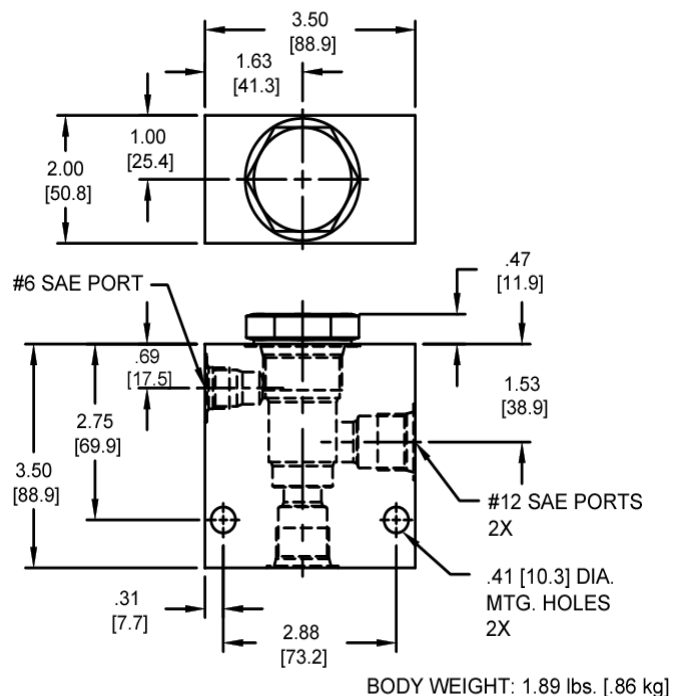
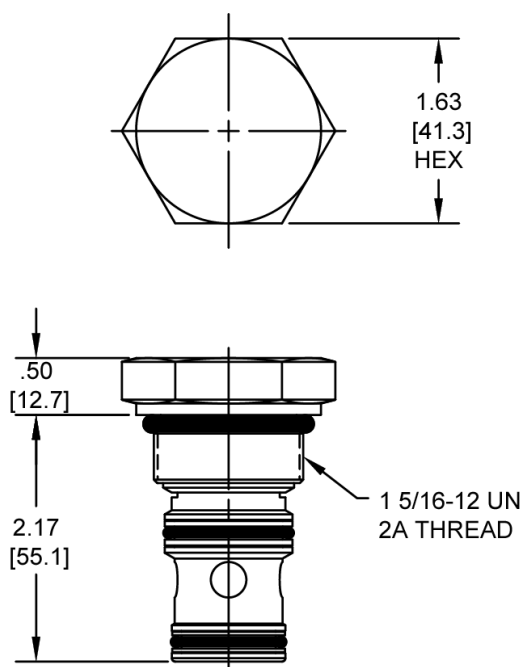
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Fax: (815) 397-2526

E-mail: delta@delta-power.com



DIMENSIONS



ORDERING INFORMATION

SL-PLA -

OPTIONS

Buna Pilot to Close **0P**
 Buna Vent to Open **0V**
 Viton Pilot to Close **VP**
 Viton Vent to Open **VV**
 Buna Pilot to Close w/seals **0B**
 Buna Vent to Open w/seals **0C**
 Viton Pilot to Close w/seals **VB**
 Viton Vent to Open w/seals **VC**

Blank
S

BODIES

Without Body
 #12 SAE Ports

PRESSURE SETTING

0020 20 PSI
0050 50 PSI
0100 100 PSI
0150 150 PSI

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

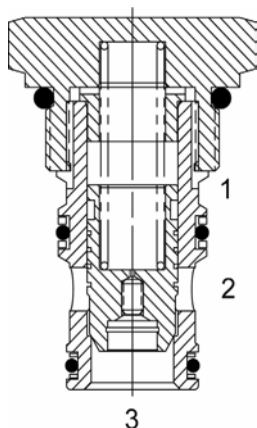
Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com



SL-PLB Super Series, Logic Valve



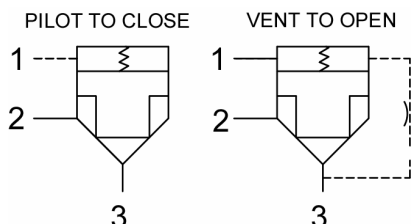
DESCRIPTION

16 size, 1 5/16-12 thread, "Super" series, logic valve

OPERATION

The SL-PLB with an orifice between ports (3) and (1) maintains a constant flow rate from (3) regardless of load pressure changes in the system upstream of (3), or in the bypass leg at (2) as long as pressure at (2) is less than (1). Used for basic blocking applications.

HYDRAULIC SYMBOL



FEATURES

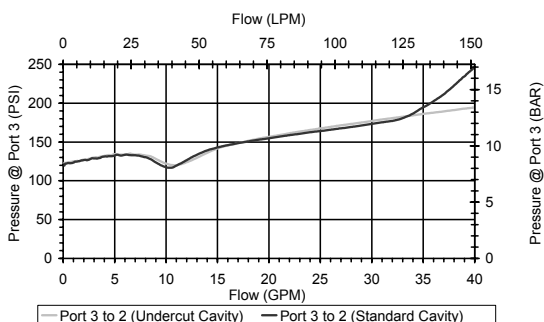
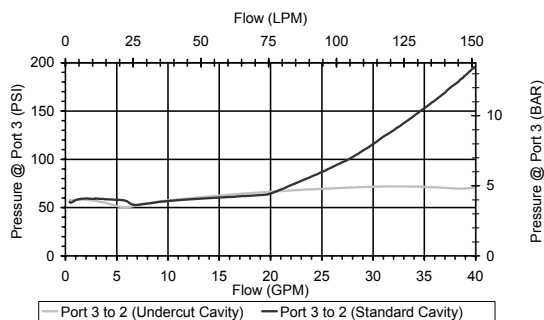
- Hardened parts for long life.
- Industry common cavity.



For bidirectional applications see SL-PLC. For metering see SLPCA or SL-PCB.

PERFORMANCE

Actual Test Data (Cartridge Only)



VALVE SPECIFICATIONS

Nominal Flow	40 GPM (151 LPM)
Rated Operating Pressure	3500 PSI (241 bar)
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temperature Range	-40° to 250° F (-40° to 120° C)
Weight	.69 lbs. (.31 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	90 ft-lbs (122 Nm)
Cavity	SUPER 3WS
Cavity Form Tool (Finishing)	40500021
Seal Kit	21191409
Seat Ratio	Area of the Pilot is 1.5 times the area of the seat at Port 3

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

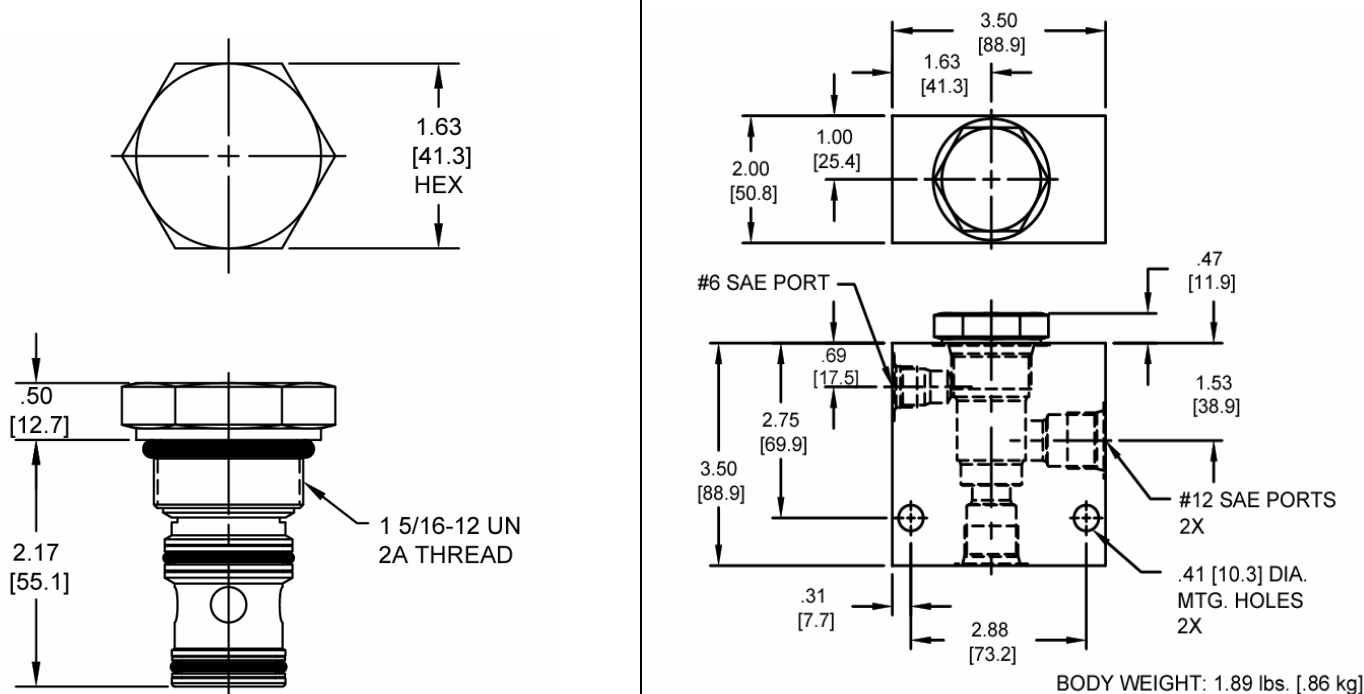
Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com



DIMENSIONS



ORDERING INFORMATION

SL-PLB

OPTIONS		BODIES	
Buna Pilot to Close	0P	Blank	Without Body
Buna Vent to Open	0V	S	#12 SAE Ports
Viton Pilot to Close	VP		
Viton Vent to Open	VV		
Buna Pilot to Close w/seals	0B		
Buna Vent to Open w/seals	0C		
Viton Pilot to Close w/seals	VB		
Viton Vent to Open w/seals	VC		

PRESSURE SETTING

0020	20 PSI
0050	50 PSI
0100	100 PSI
0150	150 PSI

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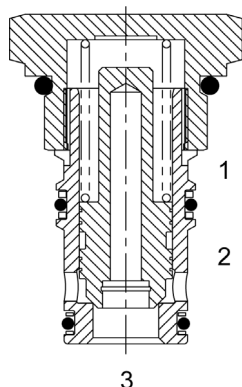
SL-PLC Super Series, Logic Valve

DESCRIPTION

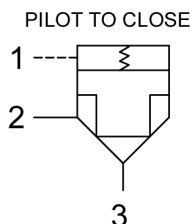
16 size, 1 5/16-12 thread, "Super" series, logic valve

OPERATION

The SL-PLC with an orifice between ports (3) and (1) maintains a constant flow rate from (3) regardless of load pressure changes in the system upstream of (3), or in the bypass leg at (2) as long as pressure at (2) is less than (1). Used for basic bidirectional blocking applications.



HYDRAULIC SYMBOL



FEATURES

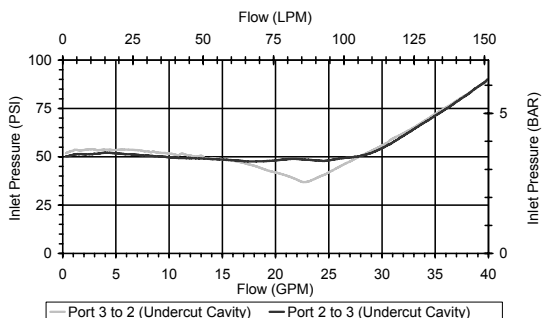
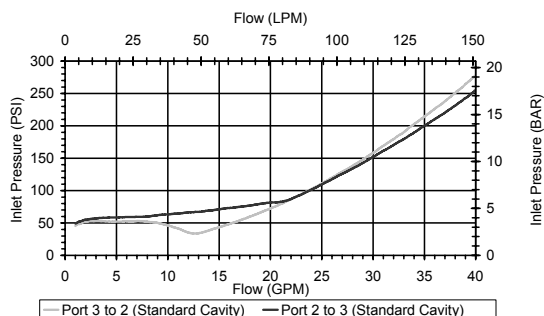
- Hardened parts for long life.
- Industry common cavity.



For metering see SL-PCA or SL-PCB.

PERFORMANCE

Actual Test Data (Cartridge Only)



VALVE SPECIFICATIONS

Nominal Flow	40 GPM (151 LPM)
Rated Operating Pressure	3500 PSI (241 bar)
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temperature Range	-40° to 250° F (-40° to 120° C)
Weight	.65 lbs. (.29 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	90 ft-lbs. (122 Nm)
Cavity	SUPER 3WS
Cavity Form Tool (Finishing)	40500021
Seal Kit	21191409
Seat Ratio	Area of the Pilot is 2 times the area of the seat at Port 3

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

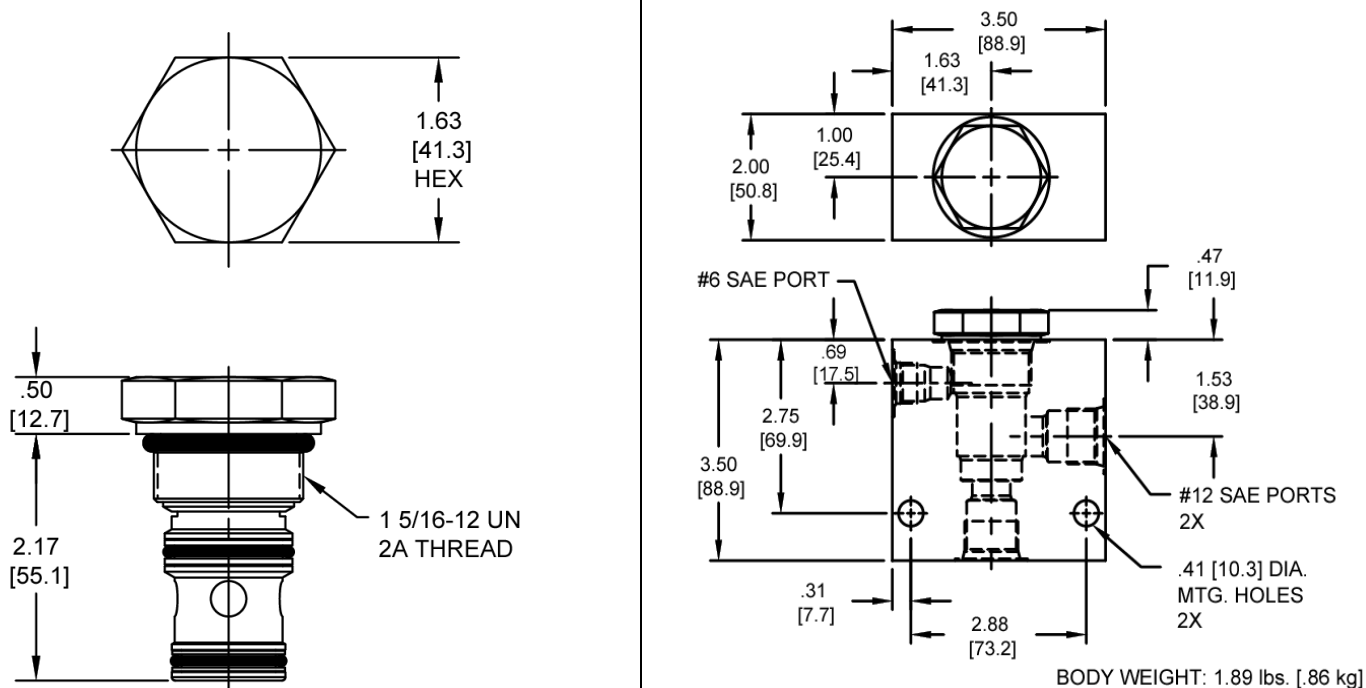
Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com



DIMENSIONS



ORDERING INFORMATION

SL-PLC

OPTIONS
Buna Pilot to Close
Viton Pilot to Close
Buna Pilot to Close w/seals
Viton Pilot to Close w/seals

0P
VP
0B
VB

Blank
S

BODIES
Without Body
#12 SAE Ports

PRESSURE SETTING

0020 20 PSI
0050 50 PSI
0100 100 PSI
0150 150 PSI

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SECTION/Description	Pages
Mini Series Single Pilot Operated Check Valve	554
Mini Series Double Pilot Operated Check Valve	556
Power Series Single Pilot Operated Check Valve	558
Power Series Double Pilot Operated Check Valve	560
Delta Series Single Pilot Operated Check Valve	562
Delta Series Double Pilot Operated Check Valve	564
Delta Series Double Pilot Operated Check Valve with Thermal Relief	566
Super Series Single Pilot Operated Check Valve	568
Super Series Double Pilot Operated Check Valve	570

Continued Next Page...

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.



SECTION/Description	Pages
Pre-Engineered Circuit, Option Model A	572
Load Holding Solenoid Operated, RV w/Adj. Press. Comp. Flow Control, RV w/Fixed Press. Comp. Flow Control, Unloading w/flow control, Lift Circuit w/RV, RV w/Flow Control, Unloading w/ Fixed Press. Comp. Flow Control Speed Control	
Pre-Engineered Circuit, Option Model B	574
Lift, Check, & Dump. Startup Circuit, Lift, Check & Dump w/RV	
Pre-Engineered Circuit, Option Model C	576
Dual RV, Dump, Flow Divider, Motor Speed Control, Selector, Hydrostatic (Anti-Cav)	
Pre-Engineered Circuit, Option Model D	578
NC Poppet Valve, Single RV, Needle Flow Control, Flow Control w/Free Flow Check, NO Spool valve, Crossover RV	
Pre-Engineered Circuit, Option Model E	580
Adj. Flow Control NC Poppet Dual Speed Circuit, Adj. Press. Comp. Flow Control NC Poppet Dual Speed Circuit, Press. Comp. Flow Control & Check Valve, Adj. Press. Comp. Flow Control NO Poppet Dual Speed Circuit, Adj. Flow Control NO Poppet Dual Speed Circuit, Press. Comp Flow Control and Check, Adj. Flow Control NC Spool Valve Dual Speed Circuit	
Pre-Engineered Circuit, Option Model F	582
Dual Sequence Valve Manifold	
Pre-Engineered Circuit, Option Model G	584
Rectifier Circuit	
Pre-Engineered Circuit, Option Model H	586
4w3p Open Center, 4w3p Closed Center	
Pre-Engineered Circuit, Option Model I	588
3way valve, Manual Lift Check & Dump, NC Poppet Valve and RV, Lift Check & Dump, Pump Check & RV, Needle Flow Control & Check, NO Poppet & Check, NO Poppet & RV	
Pre-Engineered Circuit, Option Model J	590
4w3p Tandem Center	
Pre-Engineered Circuit, Option Model K	592
2 NC Poppet Valves, NO Poppet Valve & Needle Valve, 2 NC Poppet Valves, NC Poppet Valve & Adj.Press. Comp Flow Control	
Pre-Engineered Circuit, Option Model L	594
Dual Counterbalance Circuit	
Pre-Engineered Circuit, Option Model M	596
Single 4:1 PO Check Circuit	
Pre-Engineered Circuit, Option Model N (Banjo Bolt)	598
Velocity Fuse, NC Poppet Valve, Adj. Press. Comp. Flow Control, Needle Valve, NO Spool Valve	
Pre-Engineered Circuit, Option Model O	600
Single Counterbalance Circuit	
Pre-Engineered Circuit, Option Model P	602
Lift Circuit w/Needle Valve & RV, Lift Circuit w/Press. Comp Flow Control & RV, Lift Circuit w/Bypass & Needle Valve, Lift Circuit w/Bypass & Press. Comp Flow Control	
Pre-Engineered Circuit, Option Model Q	604
Dual 3 way Valves	
Pre-Engineered Circuit, Option Model R	606
Single RV Circuit	
Pre-Engineered Circuit, Option Model S	608
Crossover Relief, Mower Breakaway, Unloading & RV	
Pre-Engineered Circuit, Option Model TA	610
Pump Unloading Circuit	

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.



MS-POC Single Pilot Operated Check Valve

DESCRIPTION

7 size, 5/8-18 thread, "Mini" series, pilot operated check valve.

OPERATION

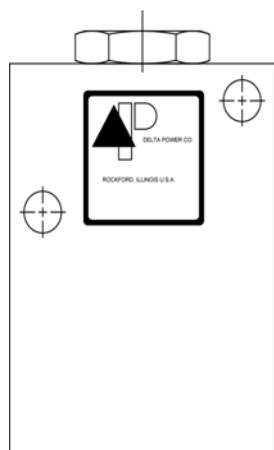
The MS-POC allows flow to pass from (V) to (C) and blocks flow from (C) to (V). When pilot pressure is applied to pilot port the valve allows flow from (C) to (V).

The valve has a 6.7:1 pilot ratio, so at least .149 of the load pressure is required at the (PILOT) port to open the flow passage to allow flow from ports (C).

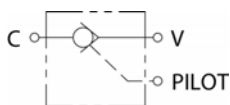
The check is spring-biased at 50 psi (3.4 bar) to assure holding in static or no-load conditions.

FEATURES

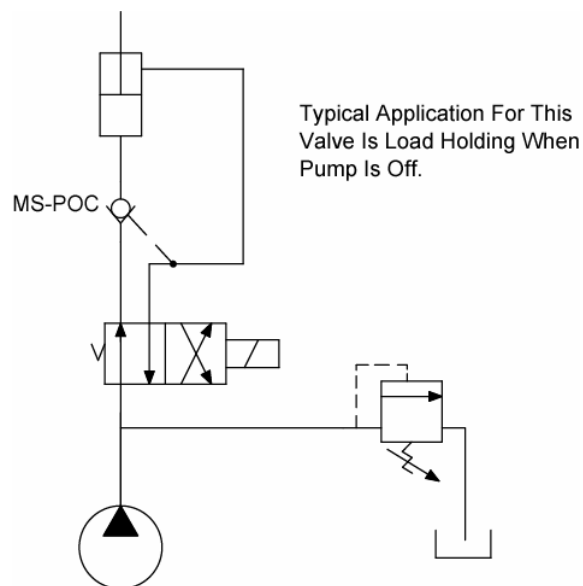
- Hardened internal parts for long life.
- Anodized aluminum body for corrosion protection.



HYDRAULIC SYMBOL



TYPICAL SCHEMATIC



VALVE SPECIFICATIONS

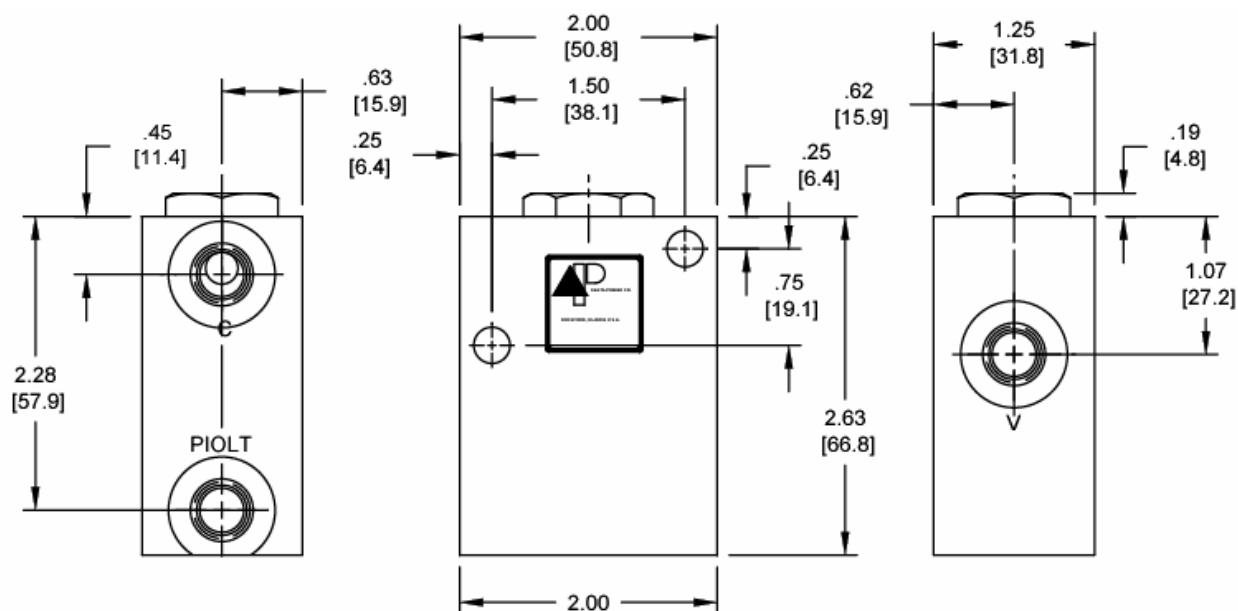
Nominal Flow	5 GPM (19 LPM)
Rated Operating Pressure	3000 PSI (207 bar)
Typical Internal Leakage (150 SSU)	0-5 drops/min
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	30 micron nominal
Pilot Ratio	6.7:1
Media Operating Temperature Range	-40° to 250° F (-40° to 120° C)
Weight	.7 lbs. (.30 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	15 ft-lbs (20.3 Nm)
Cartridge Crack Pressure	50 PSI (3.4 bar)

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

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Fax: (815) 397-2526

E-mail: delta@delta-power.com


DIMENSIONS


SAE PORTS SHOWN
 MTG. HOLES ARE .28 DIA.
 O-RINGS ARE STANDARD ON PISTON ASSEMBLY
 CHECK VALVE USED IS A MA-CVA

ORDERING INFORMATION

MS-POC - - -		
OPTIONS		BODIES
Buna Standard	B	1/4 NPTF Ports
Viton Standard	V	#4 SAE Ports
	N	
	S	

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

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Fax: (815) 397-2526

 E-mail: delta@delta-power.com



PS-POC Single Pilot Operated Check Valve

DESCRIPTION

8 size, 3/4-16 thread, "Power" series, pilot operated check valve.

OPERATION

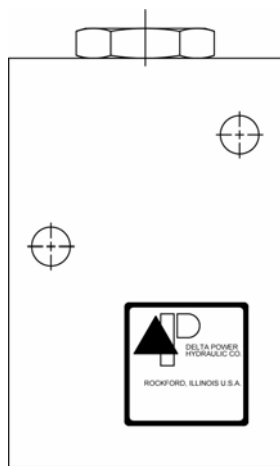
The PS-POC allows flow to pass from (V) to (C) and blocks flow from (C) to (V). When pilot pressure is applied to pilot port the valve allows flow from (C) to (V).

The valve has a 4:1 pilot ratio, so at least .250 of the load pressure is required at the (PILOT) port to open the flow passage to allow flow from ports (C).

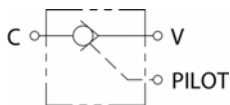
The check is spring-biased at 50 psi (3.4 bar) to assure holding in static or no-load conditions.

FEATURES

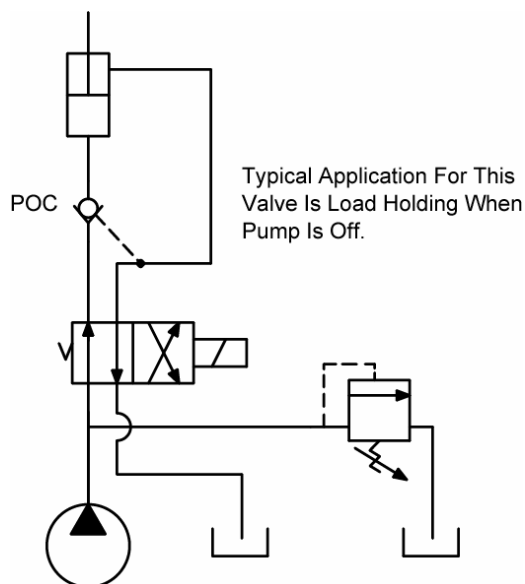
- Hardened internal parts for long life.
- Anodized aluminum body for corrosive protection.



HYDRAULIC SYMBOL



TYPICAL SCHEMATIC



VALVE SPECIFICATIONS

Nominal Flow	10 GPM (38 LPM)
Rated Operating Pressure	3500 PSI (241 bar)
Typical Internal Leakage (150 SSU)	0-5 drops/min
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	30 micron nominal
Pilot Ratio	4:1
Media Operating Temperature Range	-40° to 250° F (-40° to 120° C)
Weight	1.0 lbs. (.45 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	25 ft-lbs (34 Nm)
Cartridge Crack Pressure	50 PSI (3.4 bar)

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

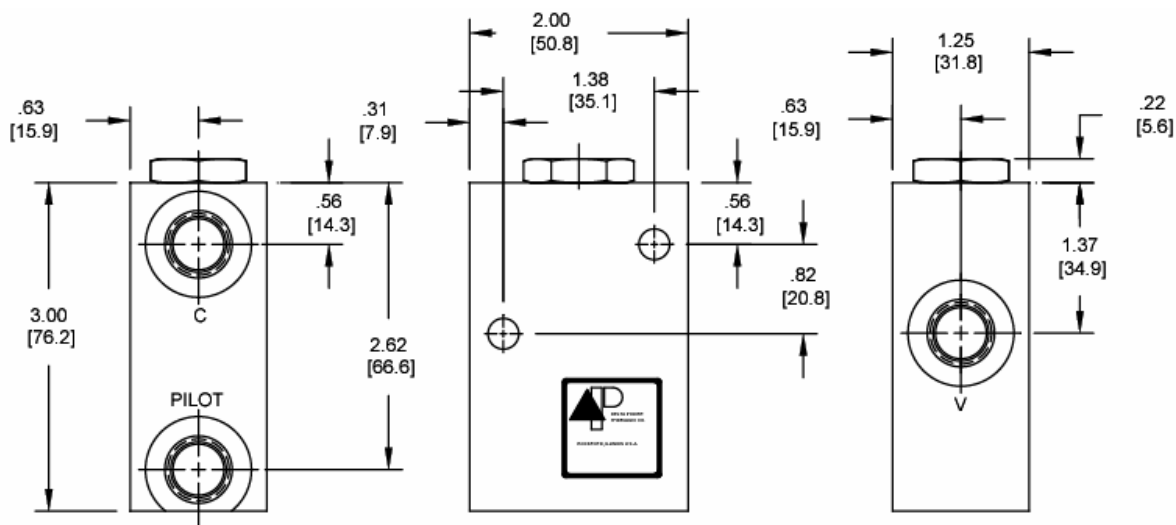
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Fax: (815) 397-2526

E-mail: delta@delta-power.com



DIMENSIONS



SAE PORTS SHOWN
 MTG. HOLES ARE .28 DIA.
 O-RINGS ARE STANDARD ON PISTON ASSEMBLY
 CHECK VALVE USED IS A PB-CVC

ORDERING INFORMATION

PS-POC - -

OPTIONS	B	N	BODIES
Buna Standard	V	S	1/4 NPTF Ports
Viton Standard			#6 SAE Ports

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

Phone: (815) 397-6628

Fax: (815) 397-2526

 E-mail: delta@delta-power.com

**DS-POC Single Pilot Operated Check Valve****DESCRIPTION**

10 size, 7/8-14 thread, "Delta" series, pilot operated check valve.

OPERATION

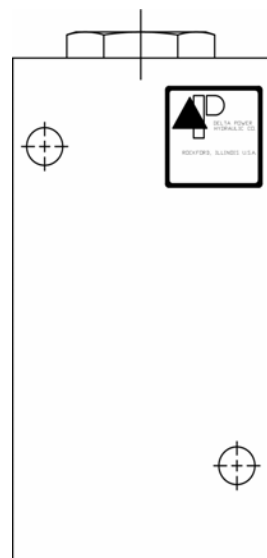
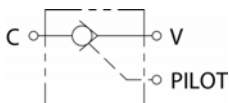
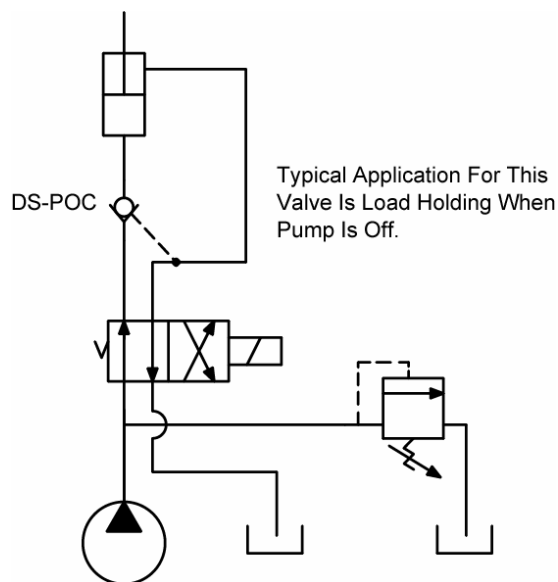
The DS-POC allows flow to pass from (V) to (C) and blocks flow from (C) to (V). When pilot pressure is applied to pilot port the valve allows flow from (C) to (V).

The valve has a 4:1 pilot ratio, so at least .250 of the load pressure is required at the (PILOT) port to open the flow passage to allow flow from ports (C).

The check is spring-biased at 90 psi (6.2 bar) to assure holding in static or no-load conditions.

FEATURES

- Hardened internal parts for long life.
- Anodized aluminum body for corrosive protection.

**HYDRAULIC SYMBOL****TYPICAL SCHEMATIC****VALVE SPECIFICATIONS**

Nominal Flow	15 GPM (57 LPM)
Rated Operating Pressure	3500 PSI (241 bar)
Typical Internal Leakage (150 SSU)	0-5 drops/min
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	30 micron nominal
Pilot Ratio	4:1
Media Operating Temperature Range	-40° to 250° F (-40° to 120° C)
Weight	1.1 lbs. (.50 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	30 ft-lbs (40.6 Nm)
Cartridge Crack Pressure	90 PSI (6.2 bar)

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

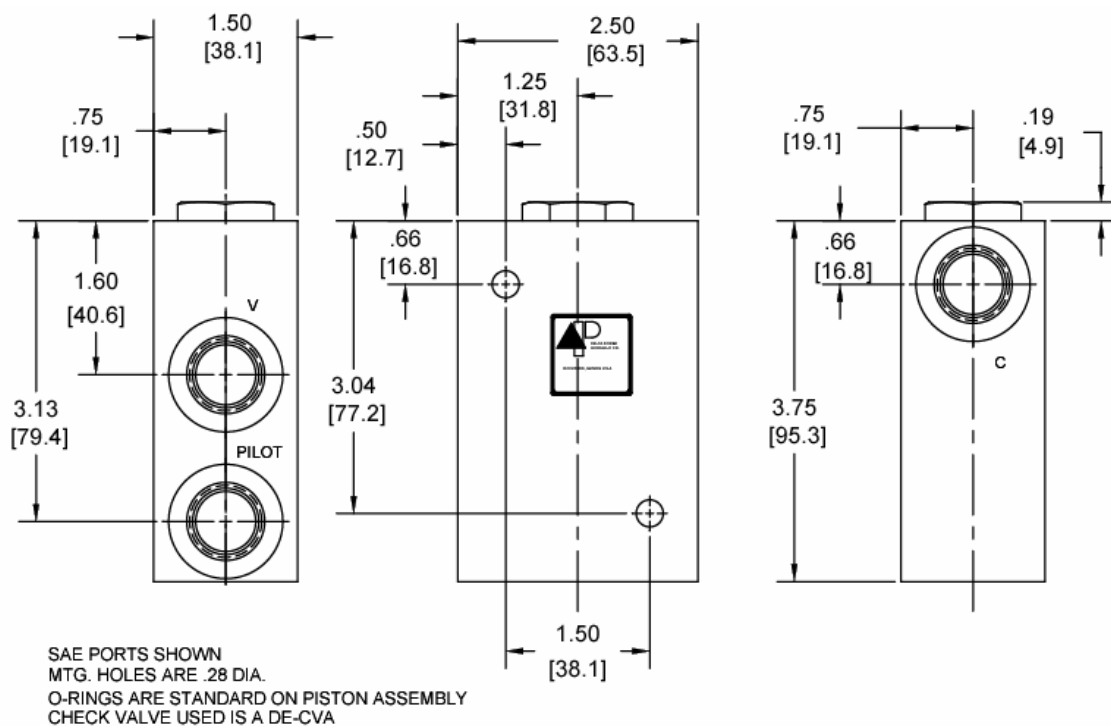
Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com



DIMENSIONS



ORDERING INFORMATION

DS-POC

OPTIONS
 Buna Standard
 Viton Standard

B
V

N
S

BODIES
 3/8 NPTF Ports
 #8 SAE Ports

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

Phone: (815) 397-6628

Fax: (815) 397-2526

 E-mail: delta@delta-power.com



SS-POC Single Pilot Operated Check Valve

DESCRIPTION

16 size, 1 5/16-12 thread, "Super" series, pilot operated check valve.

OPERATION

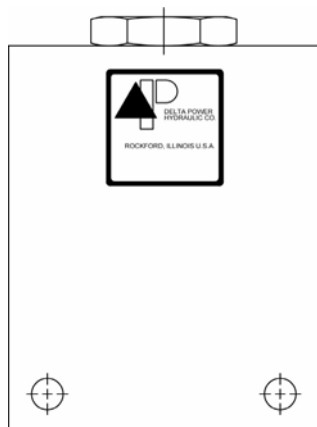
The SS-POC allows flow to pass from (V) to (C) and blocks flow from (C) to (V). When pilot pressure is applied to pilot port the valve allows flow from (C) to (V).

The valve has a 3.7:1 pilot ratio, so at least .270 of the load pressure is required at the (PILOT) port to open the flow passage to allow flow from ports (C).

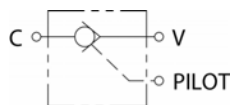
The check is spring-biased at 50 psi (3.4 bar) to assure holding in static or no-load conditions.

FEATURES

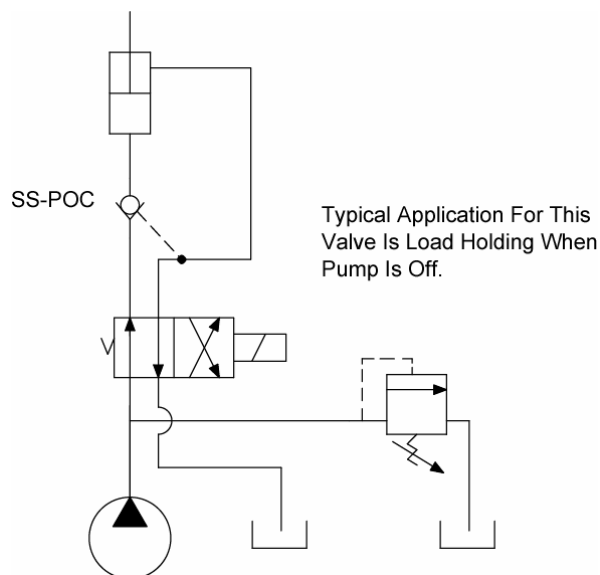
- Hardened internal parts for long life.
- Anodized aluminum body for corrosive protection.



HYDRAULIC SYMBOL



TYPICAL SCHEMATIC



VALVE SPECIFICATIONS

Nominal Flow	40 GPM (151 LPM)
Rated Operating Pressure	3500 PSI (241 bar)
Typical Internal Leakage (150 SSU)	0-5 drops/min
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	30 micron nominal
Pilot Ratio	3.7 : 1
Media Operating Temperature Range	-40° to 250° F (-40° to 120° C)
Weight	4.3 lbs. (2.0 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	90 ft-lbs (122 Nm)
Cartridge Crack Pressure	50 PSI (3.4 bar)

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

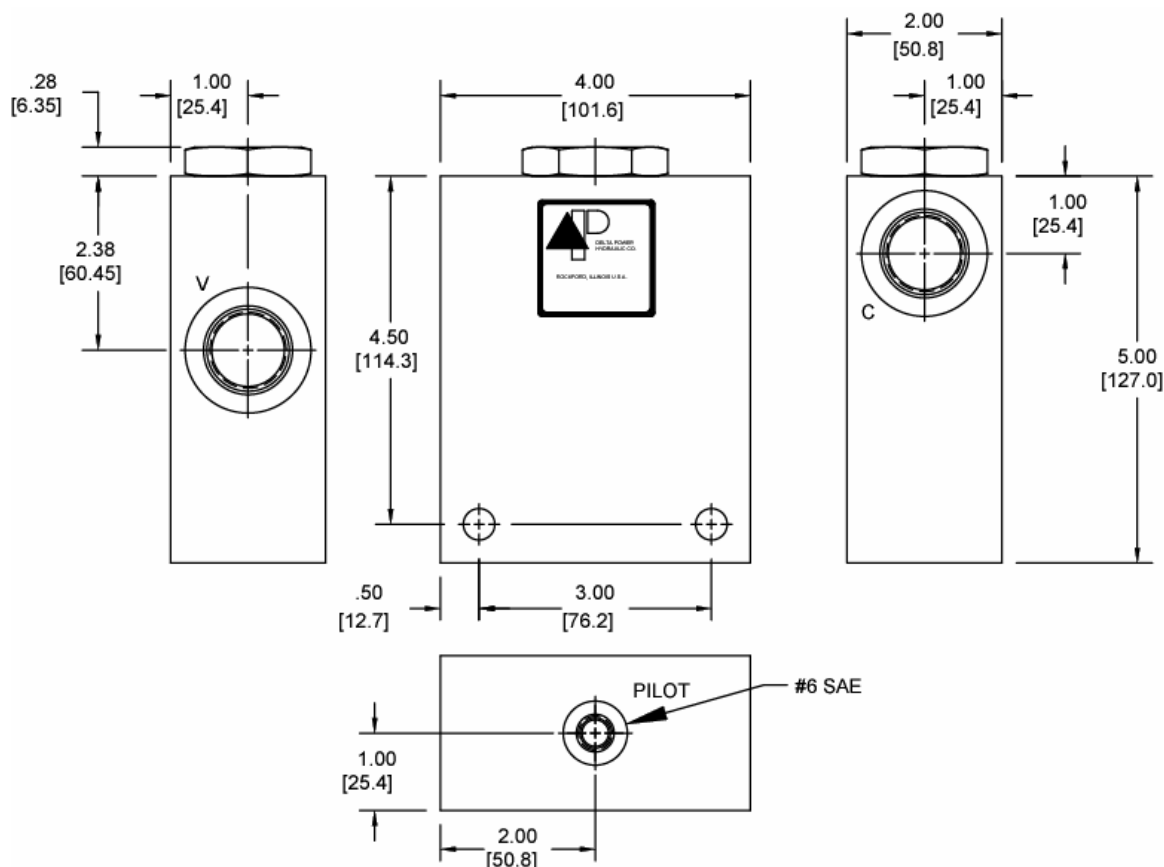
Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com



DIMENSIONS



SAE PORTS SHOWN
 MTG. HOLES ARE .41 DIA.
 O-RINGS ARE STANDARD ON PISTON ASSEMBLY
 CHECK VALVE USED IS A SJ-CVA

ORDERING INFORMATION

SS-POC - -

OPTIONS	B	S	BODIES
Buna Standard			#12 SAE Ports
Viton Standard	V		

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com

**MD-POC Double Pilot Operated Check Valve****DESCRIPTION**

7 size, 5/8-18 thread, "Mini" series, double pilot operated check valve.

OPERATION

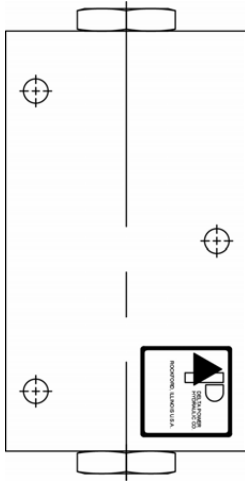
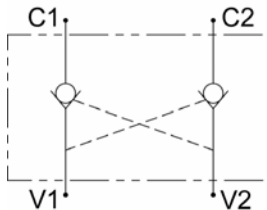
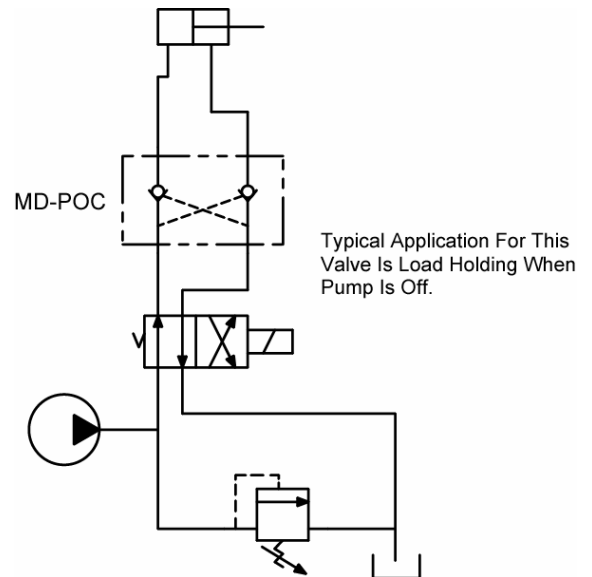
The MD-POC allows flow to pass from (V1) to (C1) and (V2) to (C2). The valve blocks flow from (C1) to (V1) and from (C2) to (V2). Blocked flow is released when pilot pressure is applied to port opposite valve (V1) and/or port (V2) accordingly.

The valve has a 6.7:1 pilot ratio, so at least .141 of the load pressure at port (C1) or (C2) is required at the pilot lines (ports (V2) or (V1) respectively) to open the flow passage to allow flow from ports (C1) or (C2) respectively.

The check is spring-biased at 50 psi (3.4 bar) to assure holding in static or no-load conditions.

FEATURES

- Hardened internal parts for long life.
- Anodized aluminum body for corrosion protection.

**HYDRAULIC SYMBOL****TYPICAL SCHEMATIC****VALVE SPECIFICATIONS**

Nominal Flow	5 GPM (19 LPM)
Rated Operating Pressure	3500 PSI (241 bar)
Typical Internal Leakage (150 SSU)	0-5 drops/min
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	30 micron nominal
Pilot Ratio	6.7 : 1
Media Operating Temperature Range	-40° to 250° F (-40° to 120° C)
Weight	.92 lbs. (.42kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	15 ft-lbs (20.3 Nm)
Cartridge Crack Pressure	50 PSI (3.4 bar)

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

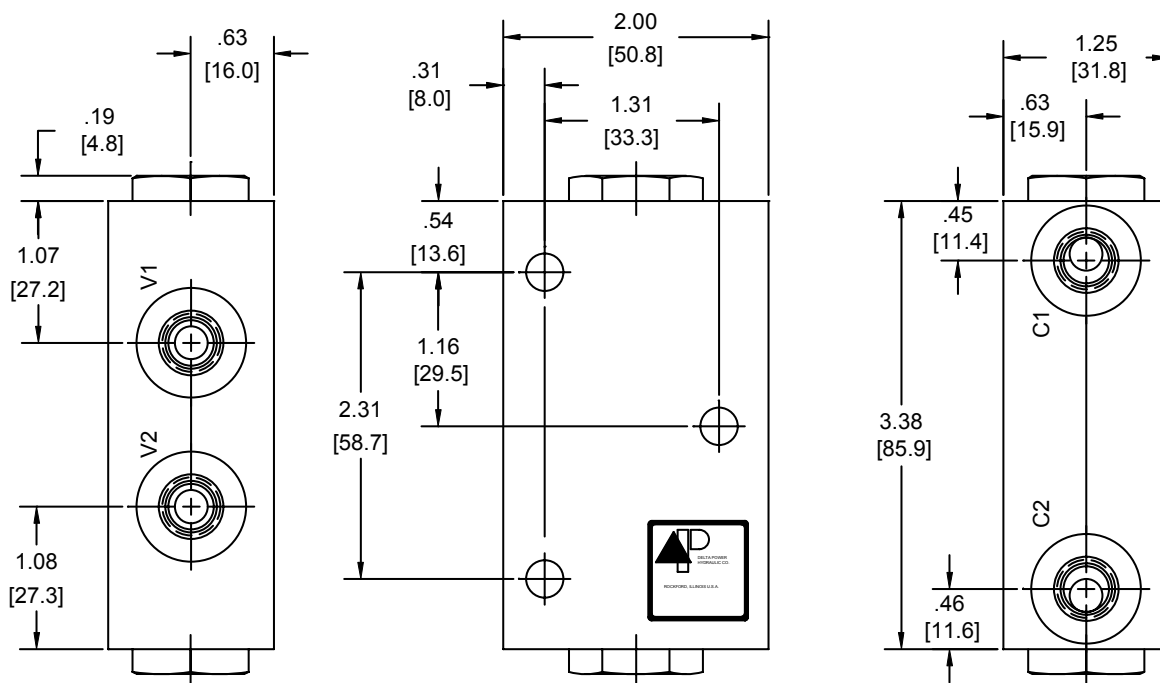
Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com



DIMENSIONS



SAE PORTS SHOWN
 MTG. HOLES ARE .28 DIA.
 NOTE: DIMENSIONS IN BRACKETS ARE MILLIMETERS
 O-RINGS ARE STANDARD ON PISTON ASSEMBLY
 CHECK VALVE USED IS A MA-CVA

ORDERING INFORMATION

MD-POC

OPTIONS
 Buna Standard
 Viton Standard

B
V

N
S

BODIES
 1/4 NPTF Ports
 #4 SAE Ports

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com

**PD-POC Double Pilot Operated Check Valve****DESCRIPTION**

8 size, 3/4-16 thread, "Power" series, double pilot operated check valve.

OPERATION

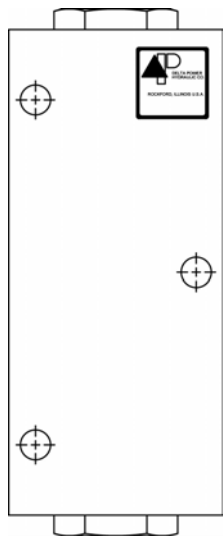
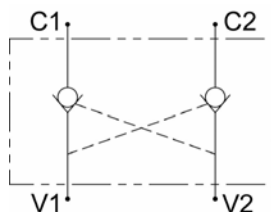
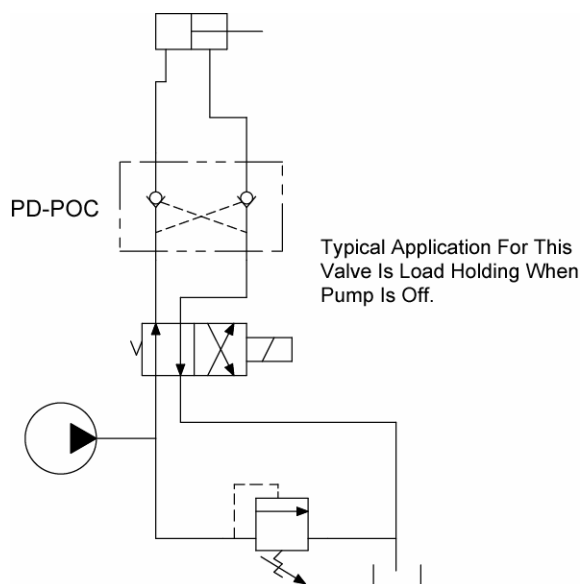
The PD-POC allows flow to pass from (V1) to (C1) and (V2) to (C2). The valve blocks flow from (C1) to (V1) and from (C2) to (V2). Blocked flow is released when pilot pressure is applied to port opposite valve (V1) and/or port (V2) accordingly.

The valve has a 4:1 pilot ratio, so at least .250 of the load pressure at port (C1) or (C2) is required at the pilot lines (ports (V2) or (V1) respectively) to open the flow passage to allow flow from ports (C1) or (C2) respectively.

The check is spring-biased at 50 psi (3.4 bar) to assure holding in static or no-load conditions.

FEATURES

- Hardened internal parts for long life.
- Anodized aluminum body for corrosion protection.

**HYDRAULIC SYMBOL****TYPICAL SCHEMATIC****VALVE SPECIFICATIONS**

Nominal Flow	10 GPM (38 LPM)
Rated Operating Pressure	3500 PSI (241 bar)
Typical Internal Leakage (150 SSU)	0-5 drops/min
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	30 micron nominal
Pilot Ratio	4 : 1
Media Operating Temperature Range	-40° to 250° F (-40° to 120° C)
Weight	1.2 lbs. (.53kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	25 ft-lbs (34 Nm)
Cartridge Crack Pressure	50 PSI (3.4 bar)

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

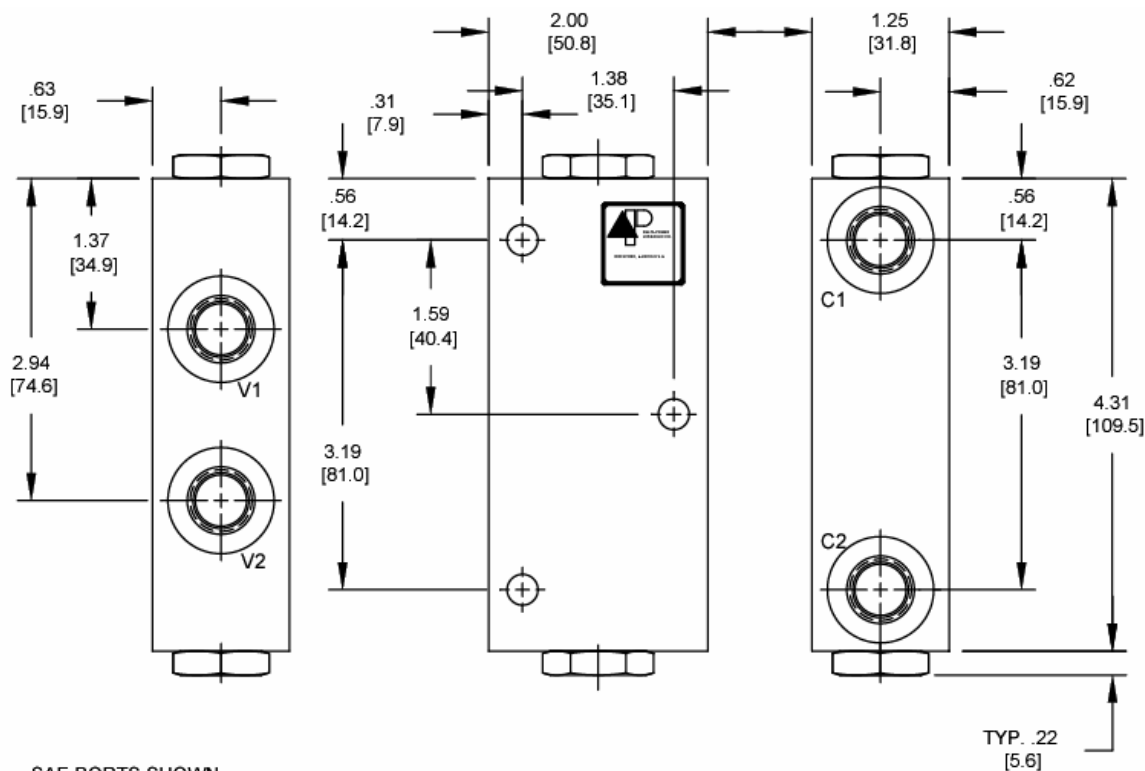
Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com



DIMENSIONS



ORDERING INFORMATION

PD-POC

OPTIONS
Buna Standard
Viton Standard

B
V

N
S

BODIES
1/4 NPTF Ports
#6 SAE Ports

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com

**DD-POC Double Pilot Operated Check Valve****DESCRIPTION**

10 size, 7/8-14 thread, "Delta" series, double pilot operated check valve.

OPERATION

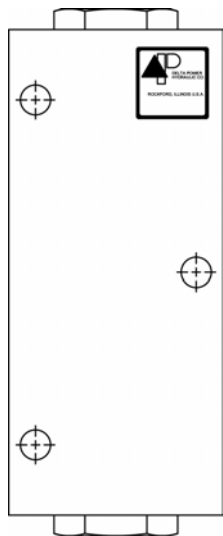
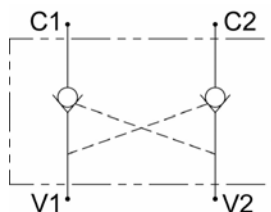
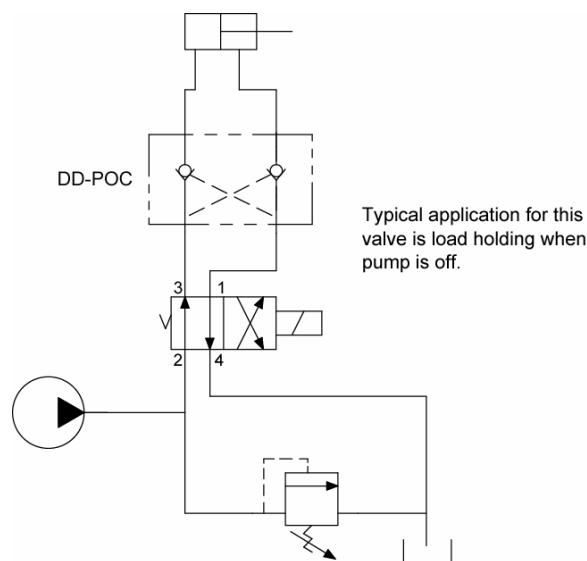
The DD-POC allows flow to pass from (V1) to (C1) and (V2) to (C2). The valve blocks flow from (C1) to (V1) and from (C2) to (V2). Blocked flow is released when pilot pressure is applied to port opposite valve (V1) and/or port (V2) accordingly.

The valve has a 4:1 pilot ratio, so at least .250 of the load pressure at port (C1) or (C2) is required at the pilot lines (ports (V2) or (V1) respectively) to open the flow passage to allow flow from ports (C1) or (C2) respectively.

The check is spring-biased at 90 psi (6.2 bar) to assure holding in static or no-load conditions.

FEATURES

- Hardened internal parts for long life.
- Anodized aluminum body for corrosive protection.

**HYDRAULIC SYMBOL****TYPICAL SCHEMATIC****VALVE SPECIFICATIONS**

Nominal Flow	15 GPM (57 LPM)
Rated Operating Pressure	3500 PSI (241 bar)
Typical Internal Leakage (150 SSU)	0-5 drops/min
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	30 micron nominal
Pilot Ratio	4 : 1
Media Operating Temperature Range	-40° to 250° F (-40° to 120° C)
Weight	1.5 lbs. (.63 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	30 ft-lbs (40.6 Nm)
Cartridge Crack Pressure	90 PSI (6.2 bar)

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

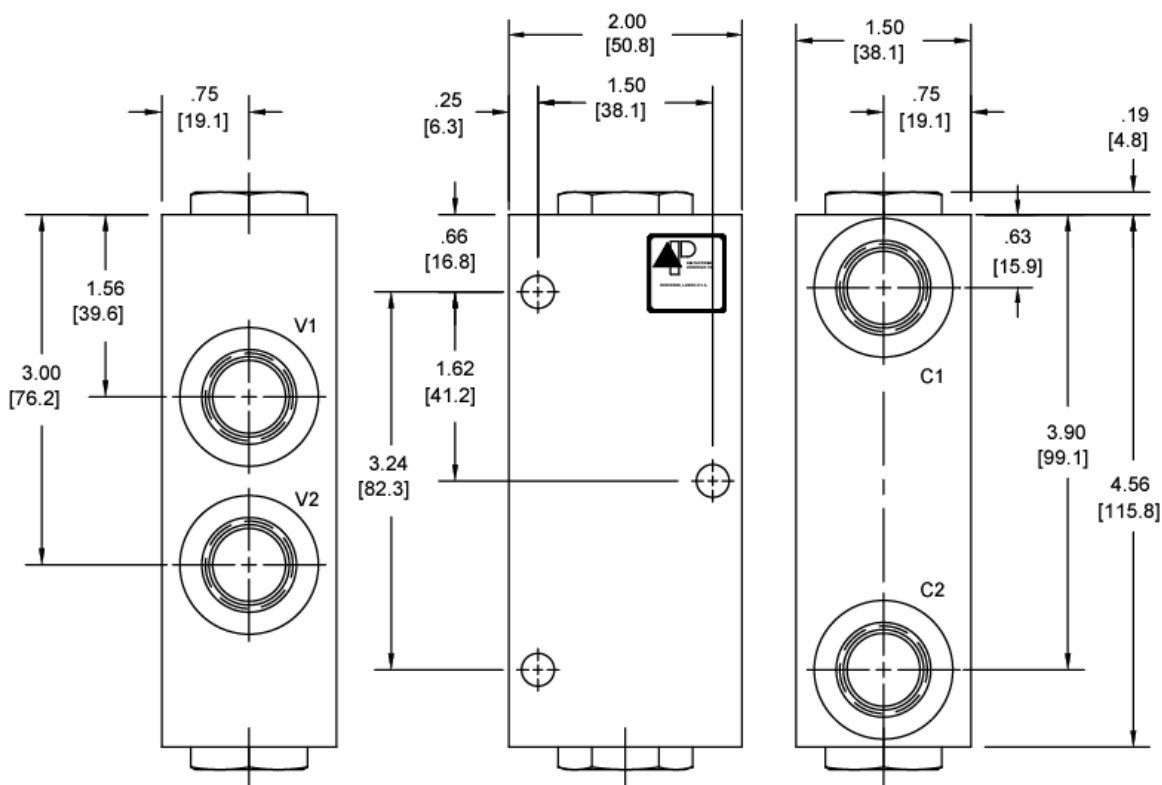
Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com



DIMENSIONS



SAE PORTS SHOWN
 MTG. HOLES ARE .28 DIA.
 O-RINGS ARE STANDARD ON PISTON ASSEMBLY
 CHECK VALVE USED IS A DE-CVA

ORDERING INFORMATION

DD-POC

OPTIONS
 Buna Standard
 Viton Standard

B
V

N
S

BODIES
 3/8 NPTF Ports
 #8 SAE Ports

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com

SD-POC Double Pilot Operated Check Valve

DESCRIPTION

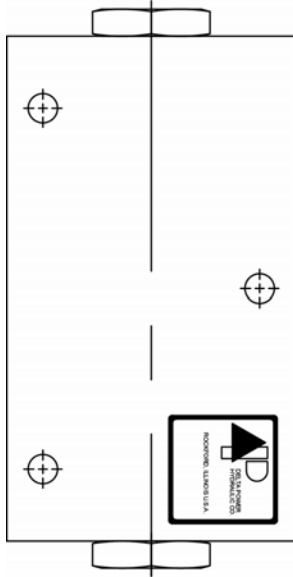
16 size, 1 5/16-12 thread, "Super" series, double pilot operated check valve.

OPERATION

The SD-POC allows flow to pass from (V1) to (C1) and (V2) to (C2). The valve blocks flow from (C1) to (V1) and from (C2) to (V2). Blocked flow is released when pilot pressure is applied to port opposite valve (V1) and/or port (V2) accordingly.

The valve has a 3.7:1 pilot ratio, so at least .267 of the load pressure at port (C1) or (C2) is required at the pilot lines (ports (V2) or (V1) respectively to open the flow passage to allow flow from ports (C1) or (C2) respectively.

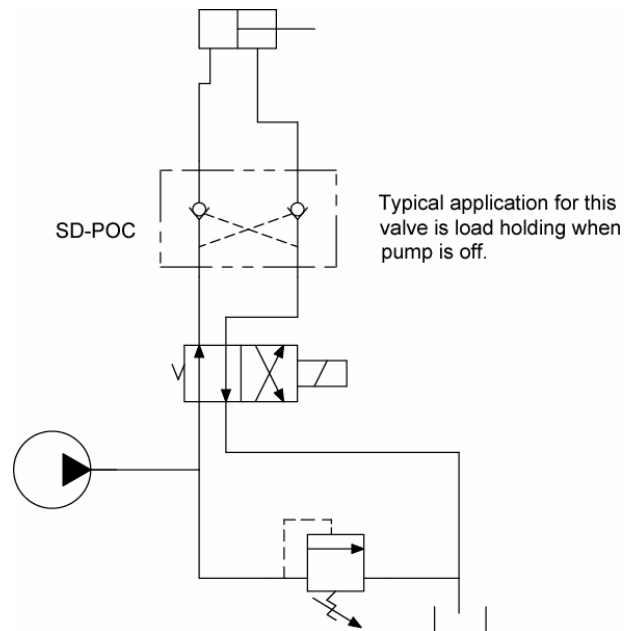
The check is spring-biased at 50 psi (3.4 bar) to assure holding in static or no-load conditions.



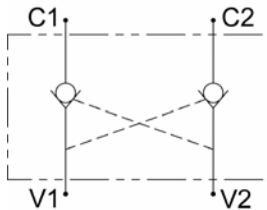
FEATURES

- Hardened internal parts for long life.
- Anodized aluminum body for corrosive protection.

TYPICAL SCHEMATIC



HYDRAULIC SYMBOL



VALVE SPECIFICATIONS

Nominal Flow	40 GPM (151 LPM)
Rated Operating Pressure	3500 PSI (241 bar)
Typical Internal Leakage (150 SSU)	0-5 drops/min
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	30 micron nominal
Pilot Ratio	3.7 : 1
Media Operating Temperature Range	-40° to 250° F (-40° to 120° C)
Weight	6.0 lbs. (2.7kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	90 ft-lbs (122 Nm)
Cartridge Crack Pressure	50 PSI (3.4 bar)

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

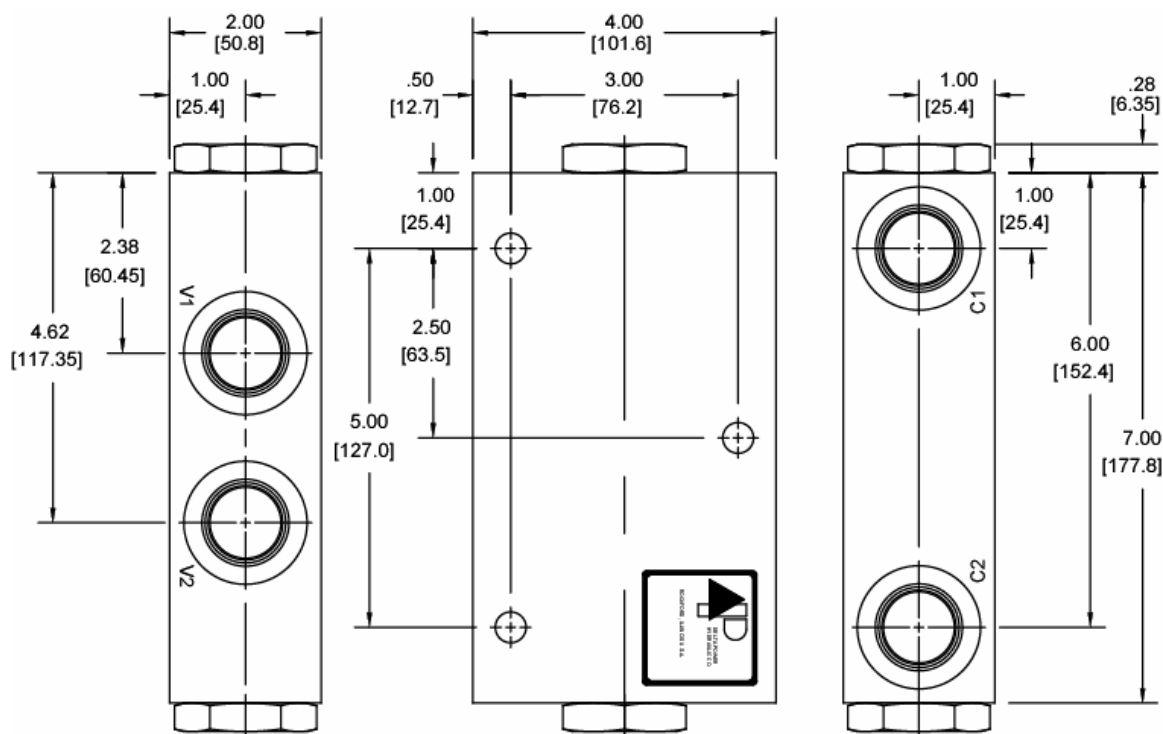
Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com



DIMENSIONS



SAE PORTS SHOWN
 MTG. HOLES ARE .41 DIA.
 O-RINGS ARE STANDARD ON PISTON ASSEMBLY
 CHECK VALVE USED IS A SJ-CVA

ORDERING INFORMATION

SD-POC

OPTIONS
 Buna Standard
 Viton Standard

B
V

S

BODIES
 #12 SAE Ports

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

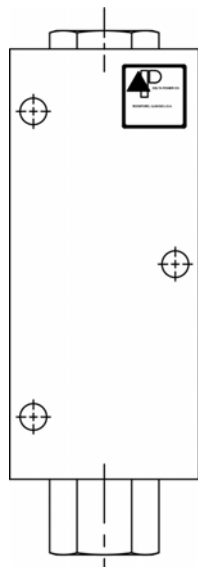
Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com



DD-POT Double Pilot Operated Check Valve W/Thermal Relief Valve



DESCRIPTION

10 size, 7/8-14 thread, "Delta" series, double pilot operated check valve with thermal relief valve.

OPERATION

The DD-POT allows flow to pass from (V1) to (C1) and (V2) to (C2). The valve blocks flow from (C1) to (V1) and from (C2) to (V2). Blocked flow is released when pilot pressure is applied to port opposite valve (V1) and/or port (V2) accordingly. Also "C2 port is protected by thermal relief.

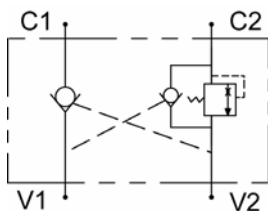
The valve has a 4:1 pilot ratio, so at least .250 of the load pressure at port (C1) or (C2) is required at the pilot lines (ports (V2) or (V1) respectively to open the flow passage to allow flow from ports (C1) or (C2) respectively.

The check is spring-biased at 90 psi (6.2 bar) to assure holding in static or no-load conditions.

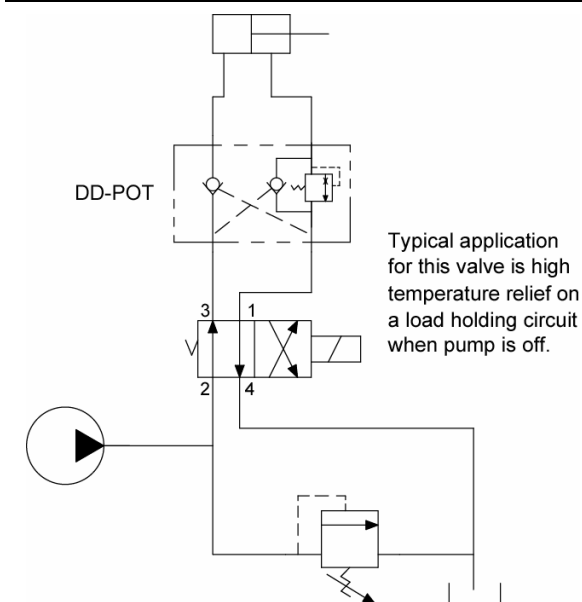
FEATURES

- Hardened internal parts for long life.
- Anodized aluminum body for corrosive protection.

HYDRAULIC SYMBOL



TYPICAL SCHEMATIC



VALVE SPECIFICATIONS

Nominal Flow	15 GPM (57 LPM)
Rated Operating Pressure	4000 PSI (276 bar)
Typical Internal Leakage (150 SSU)	0-5 drops/min
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	30 micron nominal
Pilot Ratio	4 : 1
Media Operating Temperature Range	-40° to 250° F (-40° to 120° C)
Weight	1.4 lbs. (.63 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	30 ft-lbs (40.6 Nm)
Cartridge Crack Pressure	90 PSI (6.2 bar)

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

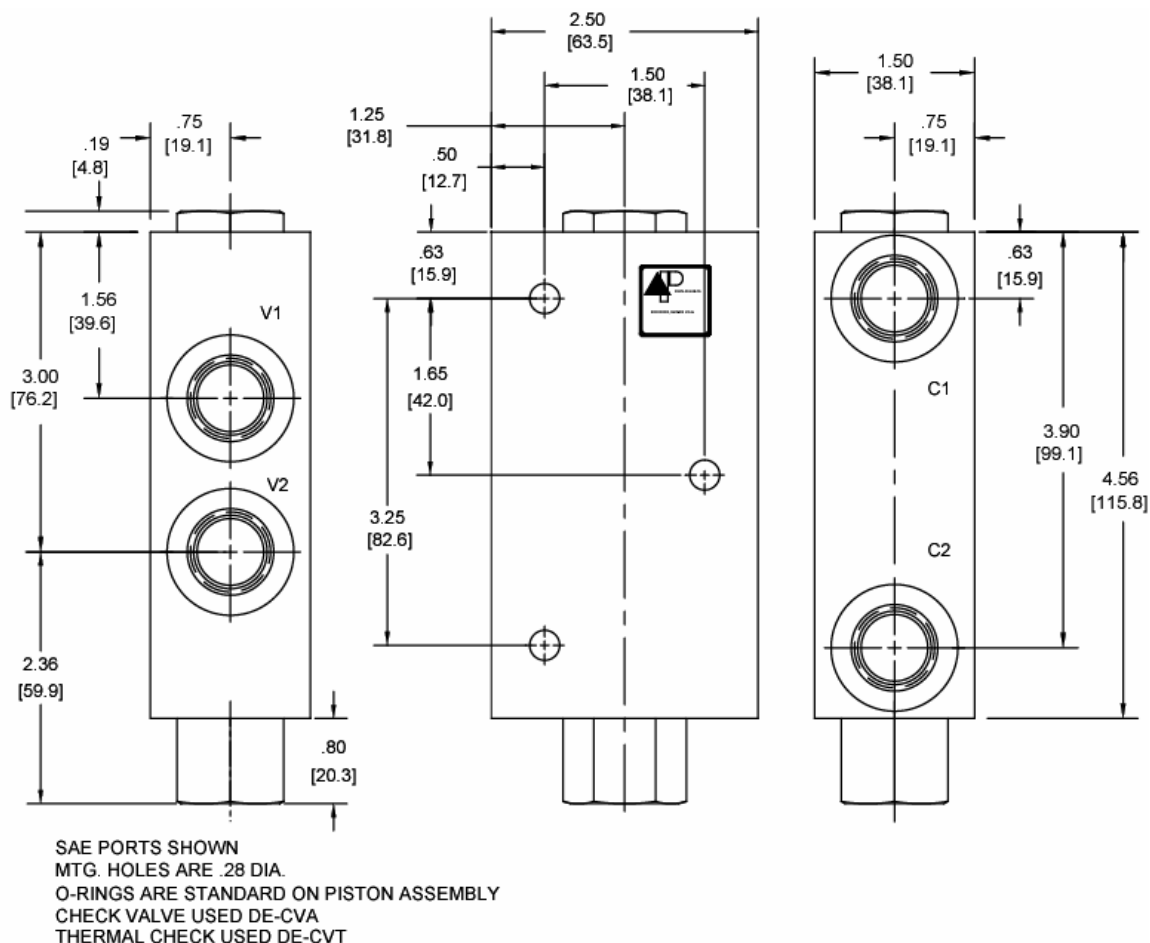
Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com



DIMENSIONS



ORDERING INFORMATION

DD-POT				-	-	
<u>OPTIONS</u>						<u>BODIES</u>
Buna Standard	B					3/8 NPTF Ports
Viton Standard	V					#8 SAE Ports
		N				
		S				

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

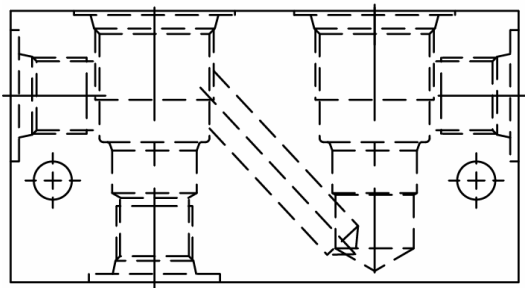
Phone: (815) 397-6628

Fax: (815) 397-2526

 E-mail: delta@delta-power.com

**Pre-Engineered Circuit, Option Model A***

BASE BODY - 20200001 = #6 SAE



BODY WEIGHT: .83 lbs. [.37 kg.]

DESCRIPTION

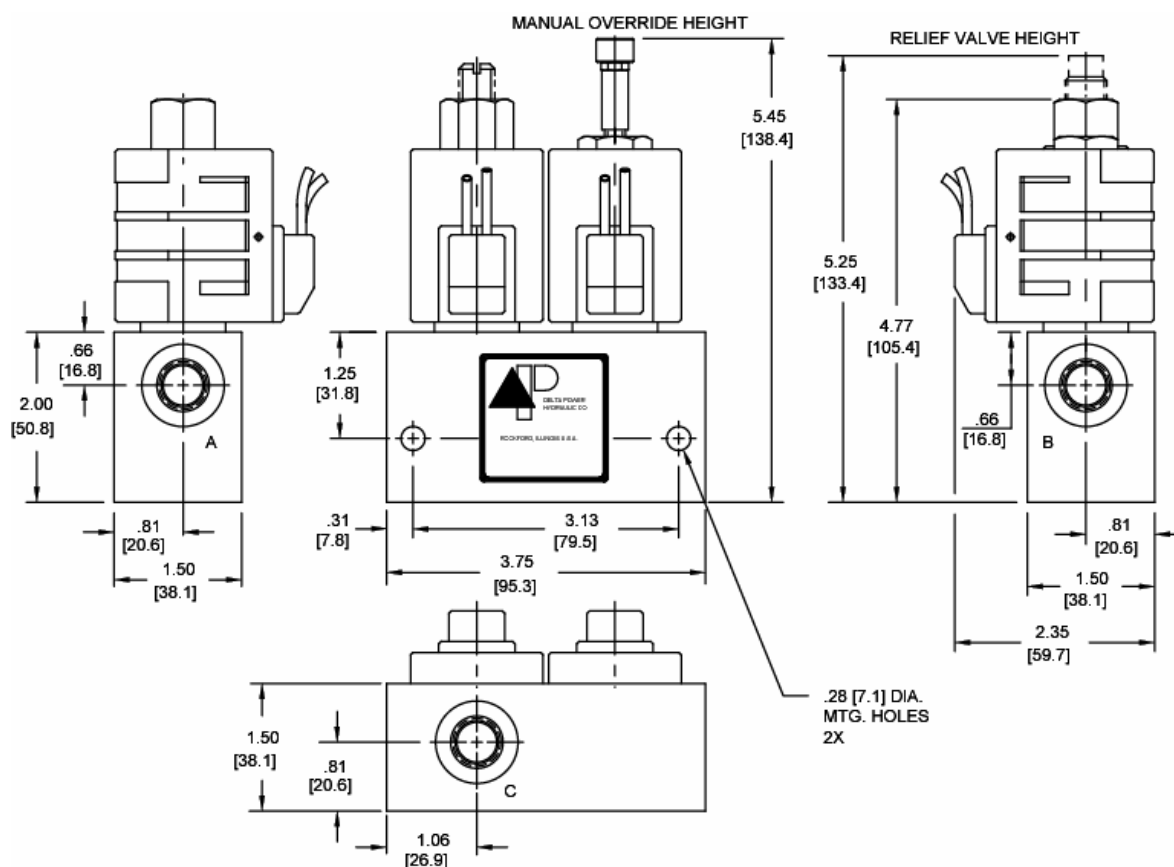
Pre-engineered circuit, option model A*

OPERATION

See options chart for specific operation

VALVE SPECIFICATIONS

Nominal Flow	See Options Chart for Flow Range
Rated Operating Pressure	See Options Chart for Pressure Range
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	30 micron nominal
Media Operating Temperature Range	-40° to 250° F (-40° to 120° C)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Size	Delta Series 7/8-14 Thread.
Cartridge Torque Requirements	30 ft-lbs (40.6 Nm)
Coil Torque Nut Requirements	4-6 ft-lbs. (5.4-8.1 Nm)

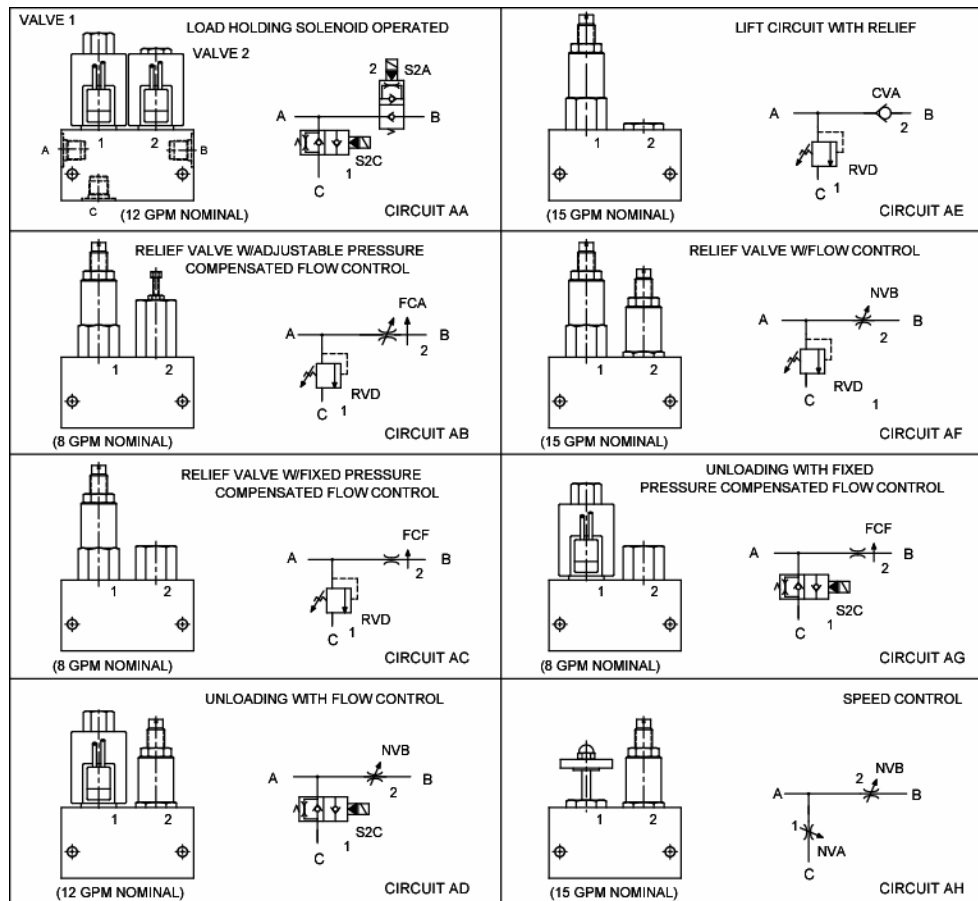
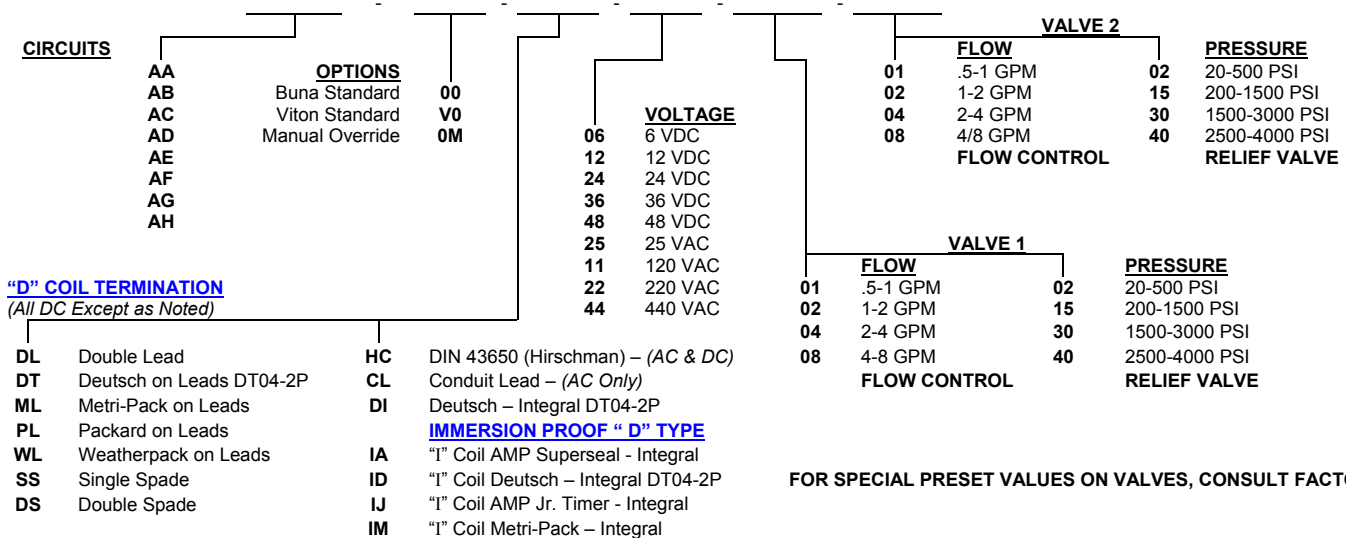
DIMENSIONS

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com


OPTIONS CHART

ORDERING INFORMATION


FOR SPECIAL PRESET VALUES ON VALVES, CONSULT FACTORY

Approximate Coil Weight: .74 lbs (.33 kg.)

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

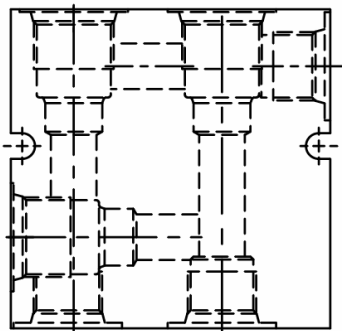
Phone: (815) 397-6628

Fax: (815) 397-2526

 E-mail: delta@delta-power.com

**Pre-Engineered Circuit, Option Model B***

BASE BODY - 20200002 = #8 SAE



BODY WEIGHT: 1.2 lbs. [.54 kg.]

DESCRIPTION

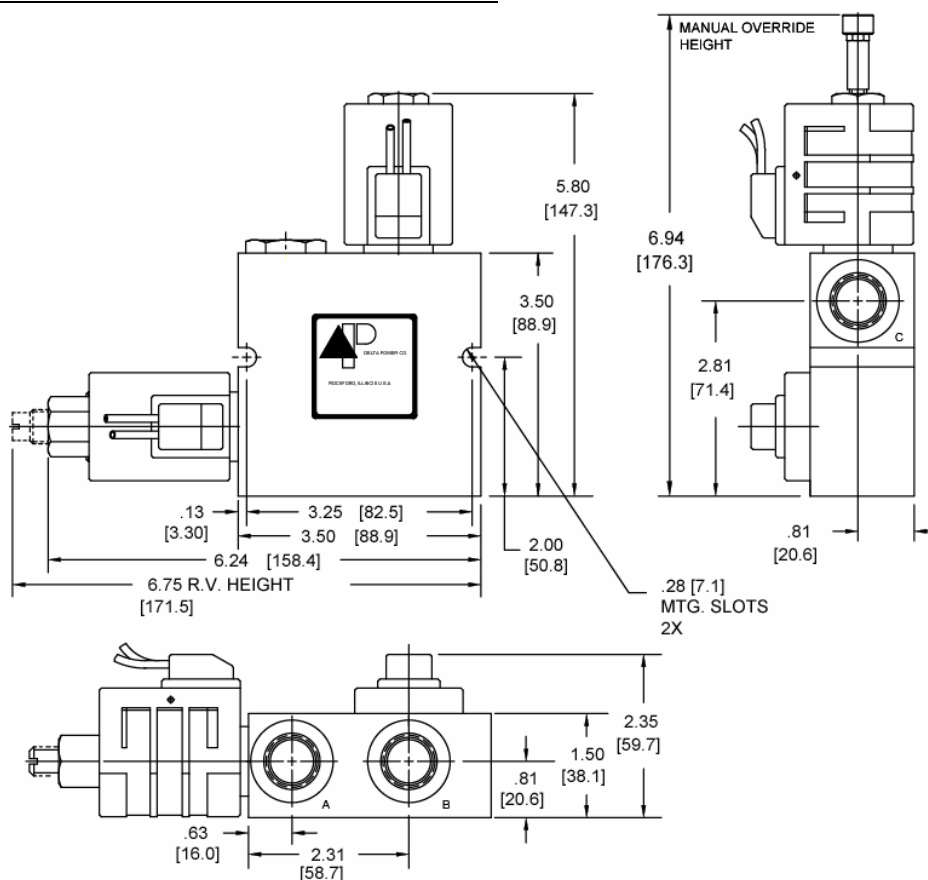
Pre-engineered circuit, option model B*

OPERATION

See options chart for specific operation

VALVE SPECIFICATIONS

Nominal Flow	12 GPM (48 LPM)
Rated Operating Pressure	3500 PSI (241 bar)
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	30 micron nominal
Media Operating Temperature Range	-40° to 250° F (-40° to 120° C)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Size	Delta Series 7/8-14 Thread.
Cartridge Torque Requirements	30 ft-lbs (40.6 Nm)
Coil Torque Nut Requirements	4-6 ft-lbs. (5.4-8.1 Nm)

DIMENSIONS

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Figure 10 displays four hydraulic circuit diagrams for a lift system, each showing a hydraulic cylinder (VALVE 1) and a lift valve (VALVE 2).

- Circuit BA: LIFT, CHECK, & DUMP**
 - The lift valve (VALVE 2) is controlled by a 3-position valve (S2C/S2A) with positions 1, 2, and 3.
 - Position 1: Lift (A to B).
 - Position 2: Check (A to C).
 - Position 3: Dump (B to C).
- Circuit BC: LIFT, CHECK, & DUMP WITH RELIEF VALVE**
 - The lift valve (VALVE 2) is controlled by a 3-position valve (S2C/S2A) with positions 1, 2, and 3.
 - Position 1: Lift (A to B).
 - Position 2: Check (A to C).
 - Position 3: Dump (B to C).
 - A relief valve (RVD) is connected to the dump line (B to C) to prevent overpressure.
- Circuit BB: START UP CIRCUIT**
 - The lift valve (VALVE 2) is controlled by a 3-position valve (S2C/S2A) with positions 1, 2, and 3.
 - Position 1: Lift (A to B).
 - Position 2: Check (A to C).
 - Position 3: Dump (B to C).
 - An air bleed valve (AIR BLEED) is connected to the lift line (A to B) to remove air from the system.
- Circuit BC (continued): LIFT, CHECK, & DUMP WITH RELIEF VALVE**
 - The lift valve (VALVE 2) is controlled by a 3-position valve (S2C/S2A) with positions 1, 2, and 3.
 - Position 1: Lift (A to B).
 - Position 2: Check (A to C).
 - Position 3: Dump (B to C).
 - A relief valve (RVD) is connected to the dump line (B to C) to prevent overpressure.

CIRCUITS

BA
BB
BC

OPTIONS
Buna Standard
Viton Standard
Manual Override

00
V0
0M

VOLTAGE
06 6 VDC
12 12 VDC
24 24 VDC
36 36 VDC
48 48 VDC
25 25 VAC
11 120 VAC
22 220 VAC
44 440 VAC

“D” COIL TERMINATION
(All DC Except as Noted)

DL Double Lead
DT Deutsch on Leads DT04-2P
ML Metri-Pack on Leads
PL Packard on Leads
WL Weatherpack on Leads
SS Single Spade
DS Double Spade

HC DIN 43650 (Hirschman) – (AC & DC)
CL Conduit Lead – (AC Only)
DI Deutsch – Integral DT04-2P
IA “I” Coil AMP Superseal - Integral
ID “I” Coil Deutsch – Integral DT04-2P
IJ “I” Coil AMP Jr. Timer - Integral
IM “I” Coil Metri-Pack – Integral

VALVE 2

FLOW
01 .5-1 GPM
02 1-2 GPM
04 2-4 GPM
08 4/8 GPM

PRESSURE
02 20-500 PSI
15 200-1500 PSI
30 1500-3000 PSI
40 2500-4000 PSI

FLOW CONTROL
RELIEF VALVE

VALVE 1

FLOW
01 .5-1 GPM
02 1-2 GPM
04 2-4 GPM
08 4-8 GPM

PRESSURE
02 20-500 PSI
15 200-1500 PSI
30 1500-3000 PSI
40 2500-4000 PSI

FLOW CONTROL
RELIEF VALVE

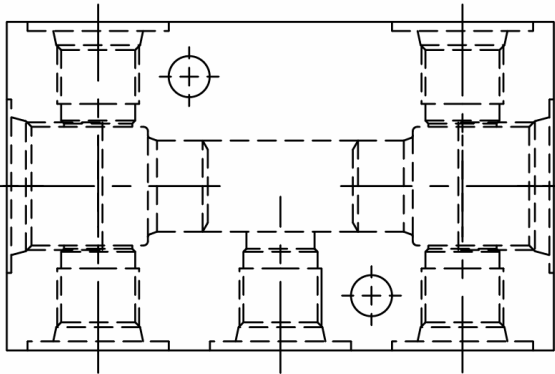
FOR SPECIAL PRESET VALUES ON VALVES, CONSULT FACTORY

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Pre-Engineered Circuit, Option Model C*

BASE BODY - 20200003 = #6 SAE



BODY WEIGHT: .83 lbs. [.37 kg.]

DESCRIPTION

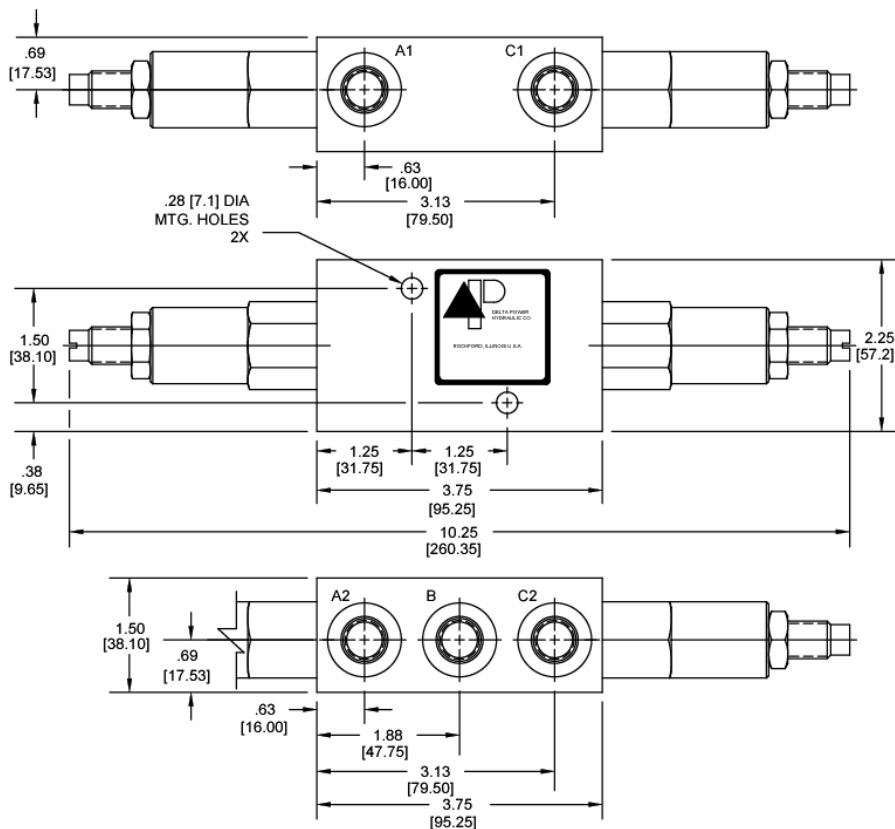
Pre-engineered circuit, option model C*

OPERATION

See options chart for specific operation

VALVE SPECIFICATIONS

Nominal Flow	See Options Chart for Flow Range
Rated Operating Pressure	See Options Chart for Pressure Ranges
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	30 micron nominal
Media Operating Temperature Range	-40° to 250° F (-40° to 120° C)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Size	Delta Series 7/8-14 Thread.
Cartridge Torque Requirements	30 ft-lbs (40.6 Nm)
Coil Torque Nut Requirements	4-6 ft-lbs. (5.4-8.1 Nm)

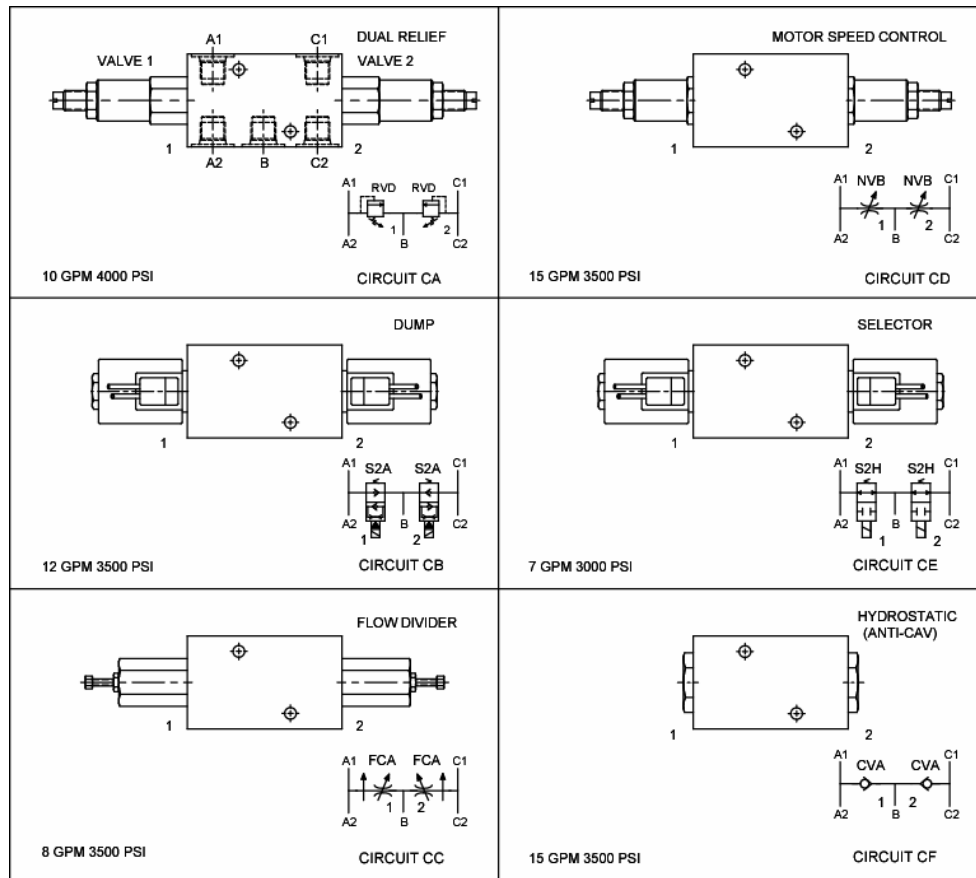
DIMENSIONS


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OPTIONS CHART

ORDERING INFORMATION

CIRCUITS		OPTIONS		VOLTAGE		VALVE 2		PRESSURE	
CA		Buna Standard	00	06	6 VDC	01	.5-1 GPM	02	20-500 PSI
CB		Viton Standard	V0	12	12 VDC	02	1-2 GPM	15	200-1500 PSI
CC		Manual Override	0M	24	24 VDC	04	2-4 GPM	30	1500-3000 PSI
CD				36	36 VDC	08	4/8 GPM	40	2500-4000 PSI
CE				48	48 VDC	FLOW CONTROL		RELIEF VALVE	
CF				25	25 VAC	VALVE 1			
<u>"D" COIL TERMINATION</u> (All DC Except as Noted)				11	120 VAC	01	.5-1 GPM	02	20-500 PSI
				22	220 VAC	02	1-2 GPM	15	200-1500 PSI
				44	440 VAC	04	2-4 GPM	30	1500-3000 PSI
						08	4-8 GPM	40	2500-4000 PSI
DL	Double Lead	HC	DIN 43650 (Hirschman) – (AC & DC)			FLOW CONTROL		RELIEF VALVE	
DT	Deutsch on Leads DT04-2P	CL	Conduit Lead – (AC Only)			FOR SPECIAL PRESET VALUES ON VALVES, CONSULT FACTORY			
ML	Metri-Pack on Leads	DI	Deutsch – Integral DT04-2P						
PL	Packard on Leads	<u>IMMERSION PROOF "D" TYPE</u>							
WL	Weatherpack on Leads	IA	"I" Coil AMP Superseal - Integral						
SS	Single Spade	ID	"I" Coil Deutsch – Integral DT04-2P						
DS	Double Spade	IJ	"I" Coil AMP Jr. Timer - Integral						
		IM	"I" Coil Metri-Pack – Integral						

Approximate Coil Weight: .74 lbs (.33 kg.)

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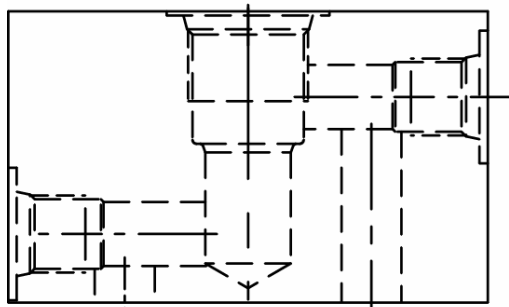
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**Pre-Engineered Circuit, Option Model D***

BASE BODY - 20200004 = #6 SAE



BODY WEIGHT: .83 lbs. [.37 kg.]

DESCRIPTION

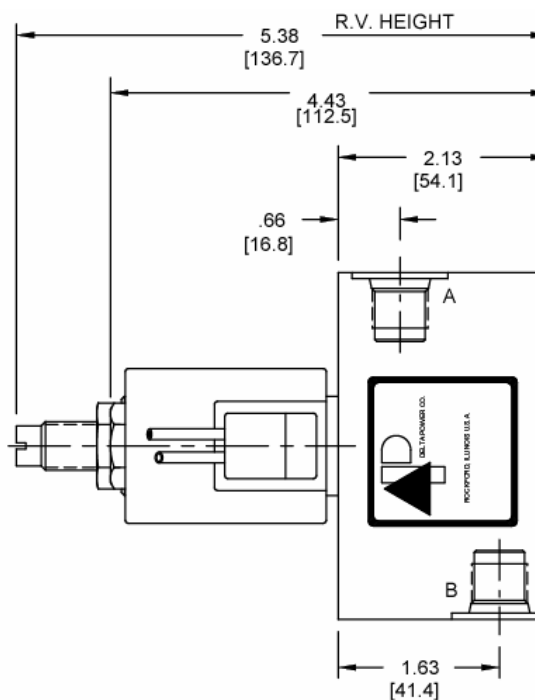
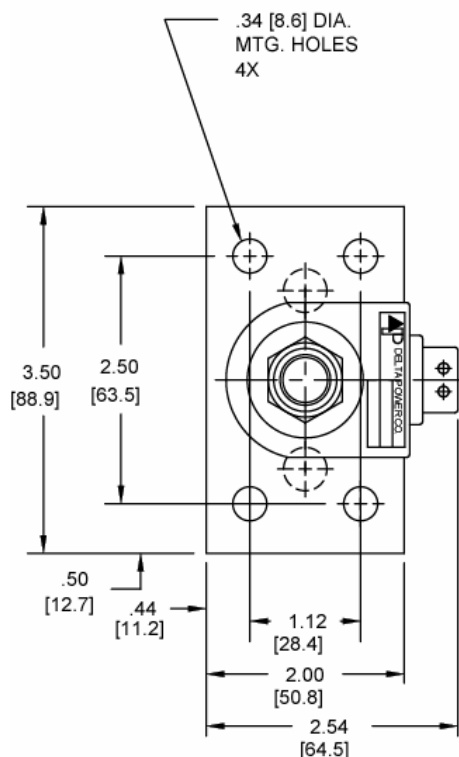
Pre-engineered circuit, option model D*

OPERATION

See options chart for specific operation

VALVE SPECIFICATIONS

Nominal Flow	See Options Chart for Flow Range
Rated Operating Pressure	See Options Chart for Pressure Ranges
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	30 micron nominal
Media Operating Temperature Range	-40° to 250° F (-40° to 120° C)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Size	Delta Series 7/8-14 Thread.
Cartridge Torque Requirements	30 ft-lbs (40.6 Nm)
Coil Torque Nut Requirements	4-6 ft-lbs. (5.4-8.1 Nm)

DIMENSIONS

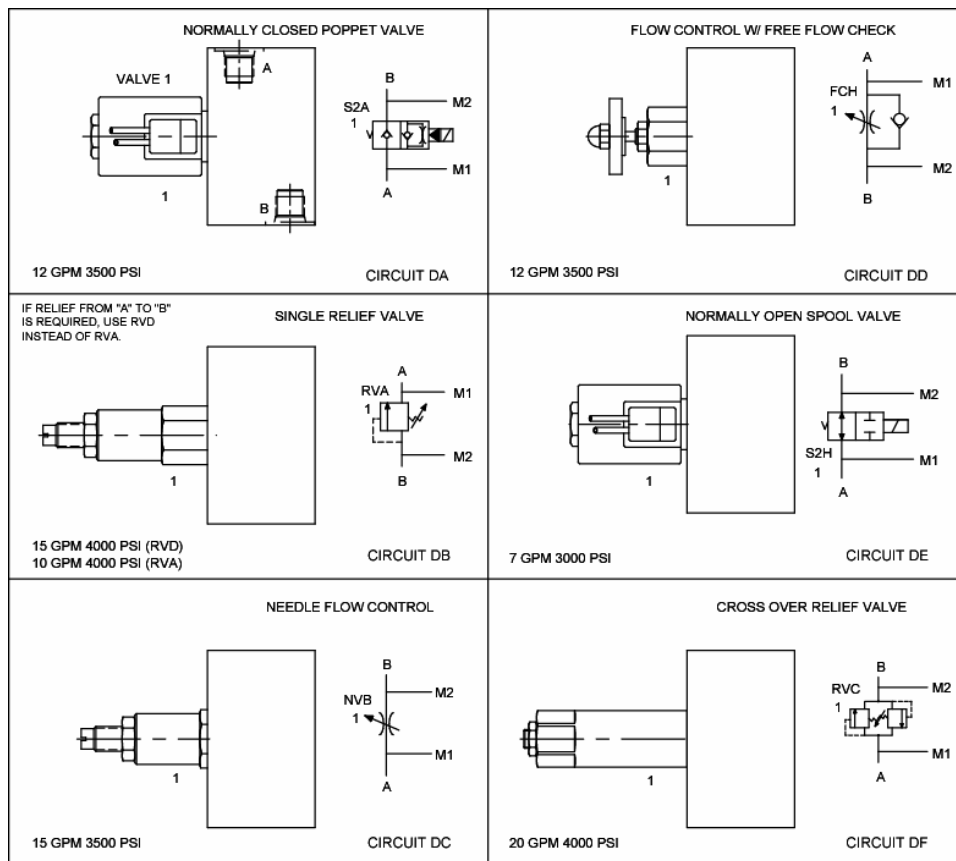
NOTE:
THIS ASSEMBLY WILL MOUNT ON
WHITE "RS"; EATON "H,S, & T"; SAUER DANFOSS
"DH & DS"; AND PARKER "TC" MOTORS

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

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OPTIONS CHART

ORDERING INFORMATION

CIRCUITS			OPTIONS		VOLTAGE		VALVE 1		PRESSURE	
DA		Buna Standard	00		06	6 VDC	01	.5-1 GPM	02	20-500 PSI
DB		Viton Standard	V0		12	12 VDC	02	1-2 GPM	15	200-1500 PSI
DC		Manual Override	0M		24	24 VDC	04	2-4 GPM	30	1500-3000 PSI
DD					36	36 VDC	08	4-8 GPM	40	2500-4000 PSI
DE					48	48 VDC	FLOW CONTROL		RELIEF VALVE	
DF					25	25 VAC	FOR SPECIAL PRESET VALUES ON VALVES, CONSULT FACTORY			
					11	120 VAC				
					22	220 VAC				
					44	440 VAC				

Approximate Coil Weight: .74 lbs (.33 kg.)

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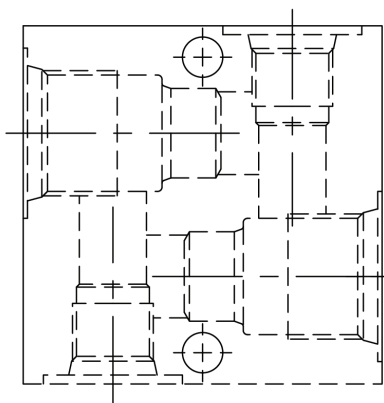
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**Pre-Engineered Circuit, Option Model E***

BASE BODY - 20200005 = #6 SAE



BODY WEIGHT: .75 lbs. [.34 kg.]

DESCRIPTION

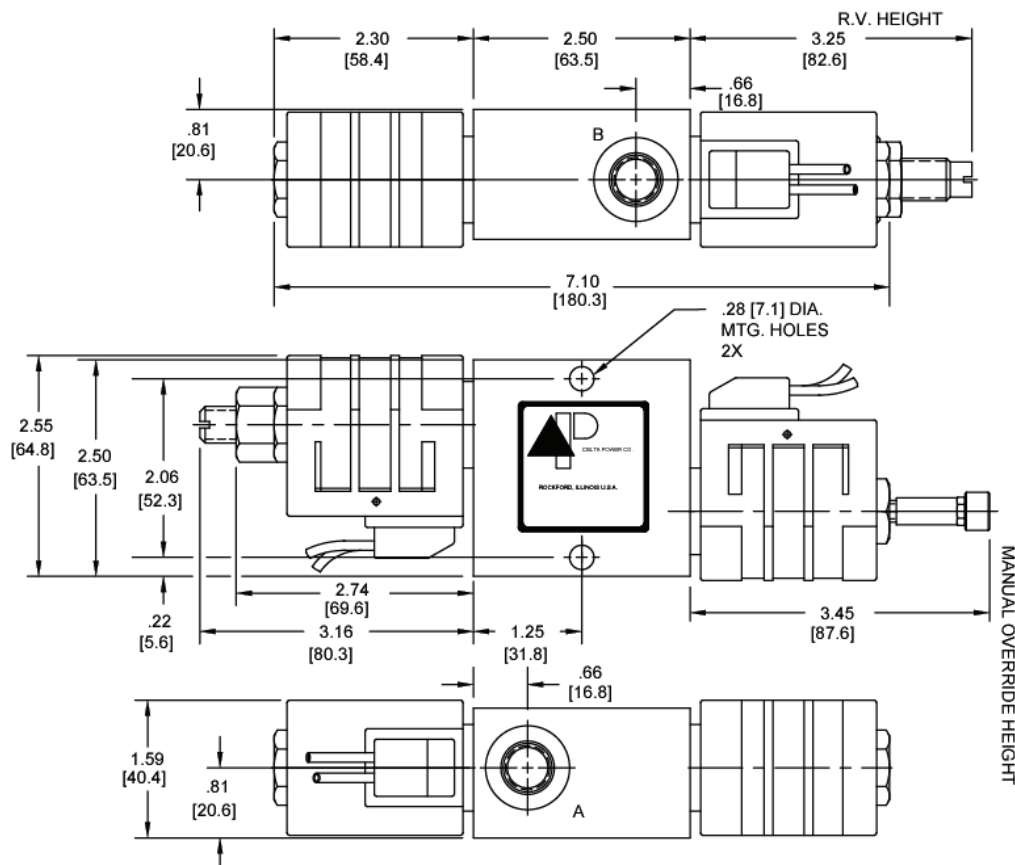
Pre-engineered circuit, option model E*

OPERATION

See options chart for specific operation

VALVE SPECIFICATIONS

Nominal Flow	See Options Chart for Flow Range
Rated Operating Pressure	3500 PSI (241 bar)
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	30 micron nominal
Media Operating Temperature Range	-40° to 250° F (-40° to 120° C)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Size	Delta Series 7/8-14 Thread.
Cartridge Torque Requirements	30 ft-lbs (40.6 Nm)
Coil Torque Nut Requirements	4-6 ft-lbs. (5.4-8.1 Nm)

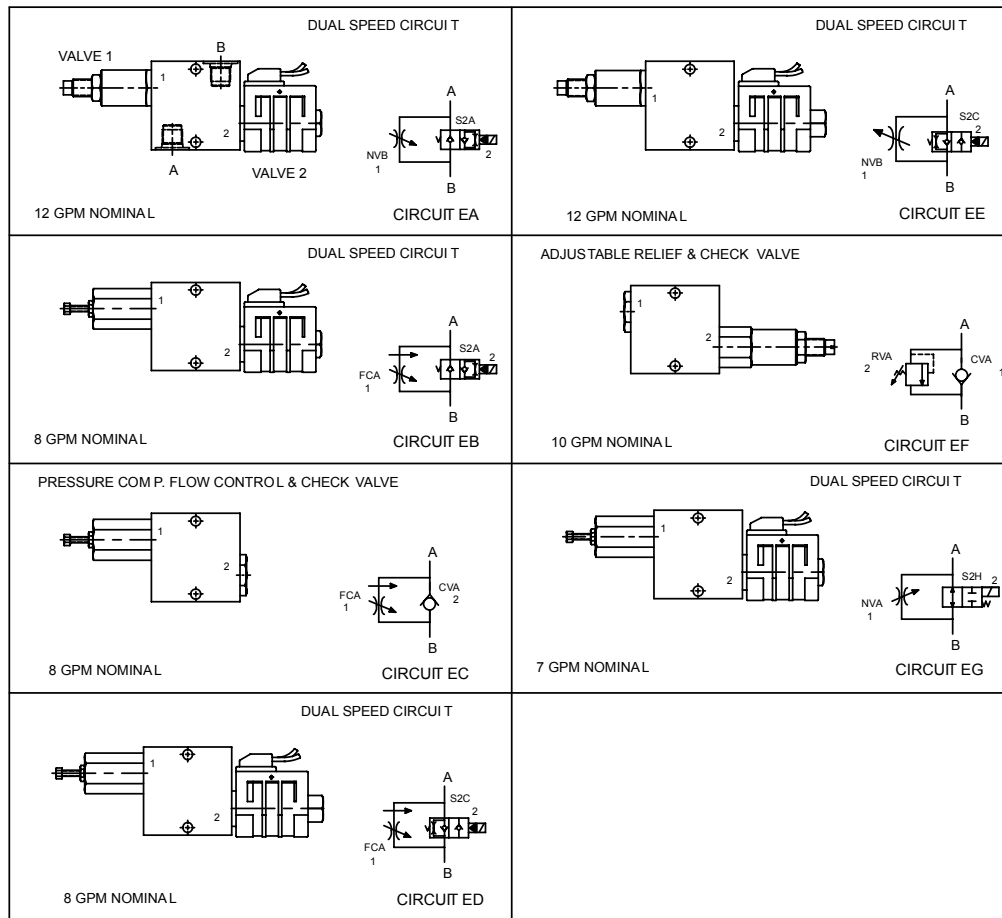
DIMENSIONS

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OPTIONS CHART

ORDERING INFORMATION

CIRCUITS		OPTIONS		VOLTAGE		VALVE 2		PRESSURE			
EA		Buna Standard	00	06	6 VDC	01	.5-1 GPM	02	20-500 PSI		
EB		Viton Standard	V0	12	12 VDC	02	1-2 GPM	15	200-1500 PSI		
EC		Manual Override	0M	24	24 VDC	04	2-4 GPM	30	1500-3000 PSI		
ED				36	36 VDC	08	4/8 GPM	40	2500-4000 PSI		
EE				48	48 VDC	FLOW CONTROL		RELIEF VALVE			
EF				25	25 VAC						
EG				11	120 VAC						
"D" COIL TERMINATION <i>(All DC Except as Noted)</i>				22	220 VAC						
				44	440 VAC						
								VALVE 1			
								FLOW		PRESSURE	
DL	Double Lead	HC	DIN 43650 (Hirschman) – (AC & DC)	01	.5-1 GPM	02	20-500 PSI				
DT	Deutsch on Leads DT04-2P	CL	Conduit Lead – (AC Only)	02	1-2 GPM	15	200-1500 PSI				
ML	Metri-Pack on Leads	DI	Deutsch – Integral DT04-2P	04	2-4 GPM	30	1500-3000 PSI				
PL	Packard on Leads	IMMERSION PROOF "D" TYPE			08	4-8 GPM	40	2500-4000 PSI			
WL	Weatherpack on Leads	IA	"I" Coil AMP Superseal - Integral								
SS	Single Spade	ID	"I" Coil Deutsch – Integral DT04-2P								
DS	Double Spade	IJ	"I" Coil AMP Jr. Timer - Integral								
		IM	"I" Coil Metri-Pack – Integral								
FOR SPECIAL PRESET VALUES ON VALVES, CONSULT FACT											

FOR SPECIAL PRESET VALUES ON VALVES, CONSULT FACTORY

Approximate Coil Weight: .74 lbs (.33 kg.)

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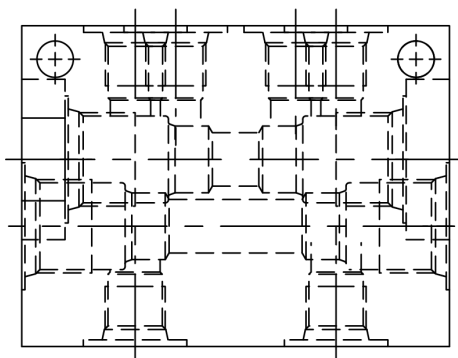
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Pre-Engineered Circuit, Option Model F*

BASE BODY - 20200006 = #6 SAE



BODY WEIGHT: 1.5 lbs. [.68 kg.]

DESCRIPTION

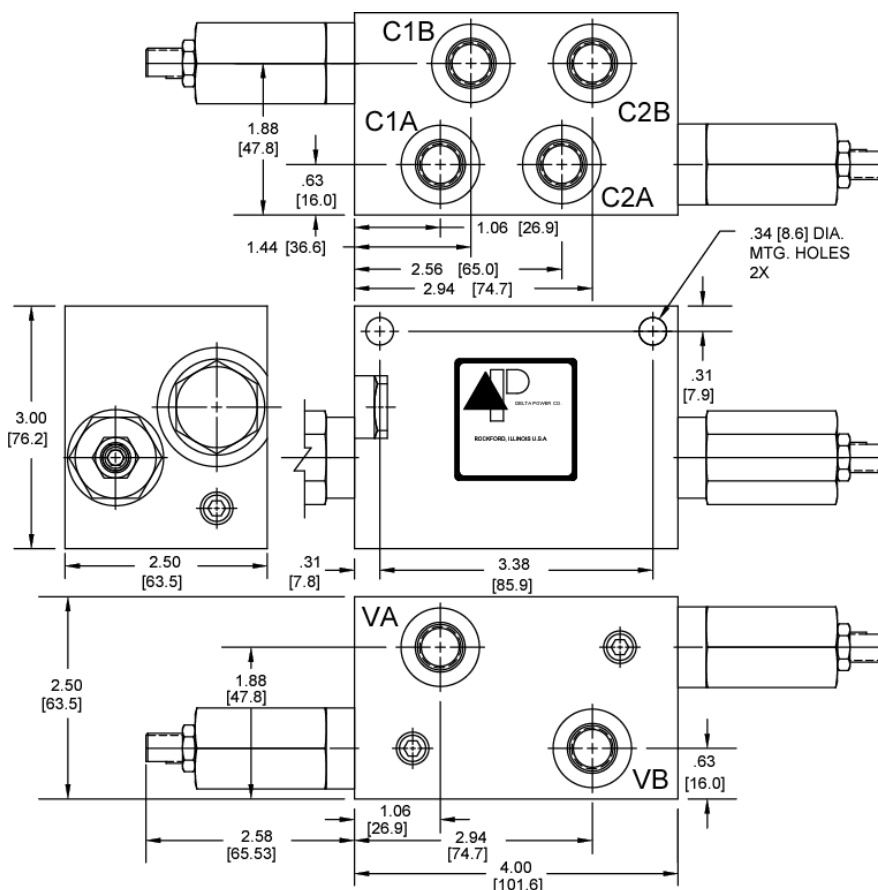
Pre-engineered circuit, option model F*

OPERATION

See typical schematic for specific operation.

VALVE SPECIFICATIONS

Nominal Flow	9 GPM (34 LPM)
Rated Operating Pressure	50-1500 PSI (4-103 bar)
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	30 micron nominal
Media Operating Temperature Range	-40° to 250° F (-40° to 120° C)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Size	Delta Series 7/8-14 Thread.
Cartridge Torque Requirements	30 ft-lbs (40.6 Nm)

DIMENSIONS


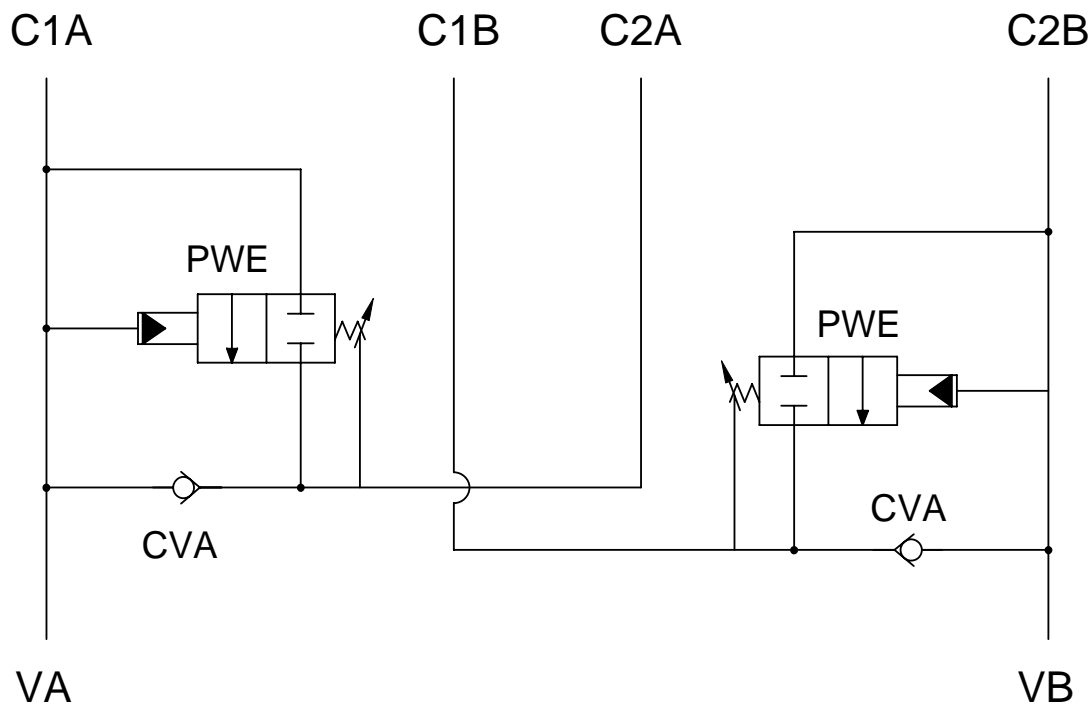
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TYPICAL SCHEMATIC



DUAL SEQUENCE VALVE MANIFOLD
AUTOMATICALLY CONTROLS THE
SEQUENCING OF TWO CYLINDERS.

CIRCUIT FA

ORDERING INFORMATION

CIRCUITS	FA	OPTIONS	00 V0	04 15	VALVE 2 PRESSURE
					50-425 PSI 400-1500 PSI
		Buna Standard Viton Standard			
				04 15	VALVE 1 PRESSURE 50-425 400-1500 PSI

FOR SPECIAL PRESET VALUES ON VALVES, CONSULT FACTORY

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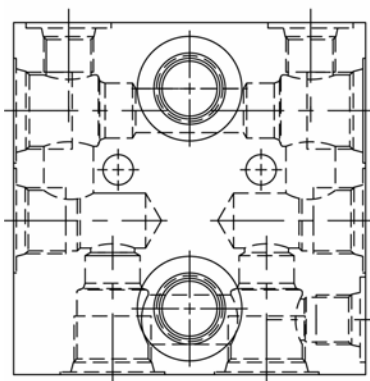
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Pre-Engineered Circuit, Option Model G*

BASE BODY - 20200007 = #8 SAE



BODY WEIGHT: 1.36 lbs. [.62 kg.]

DESCRIPTION

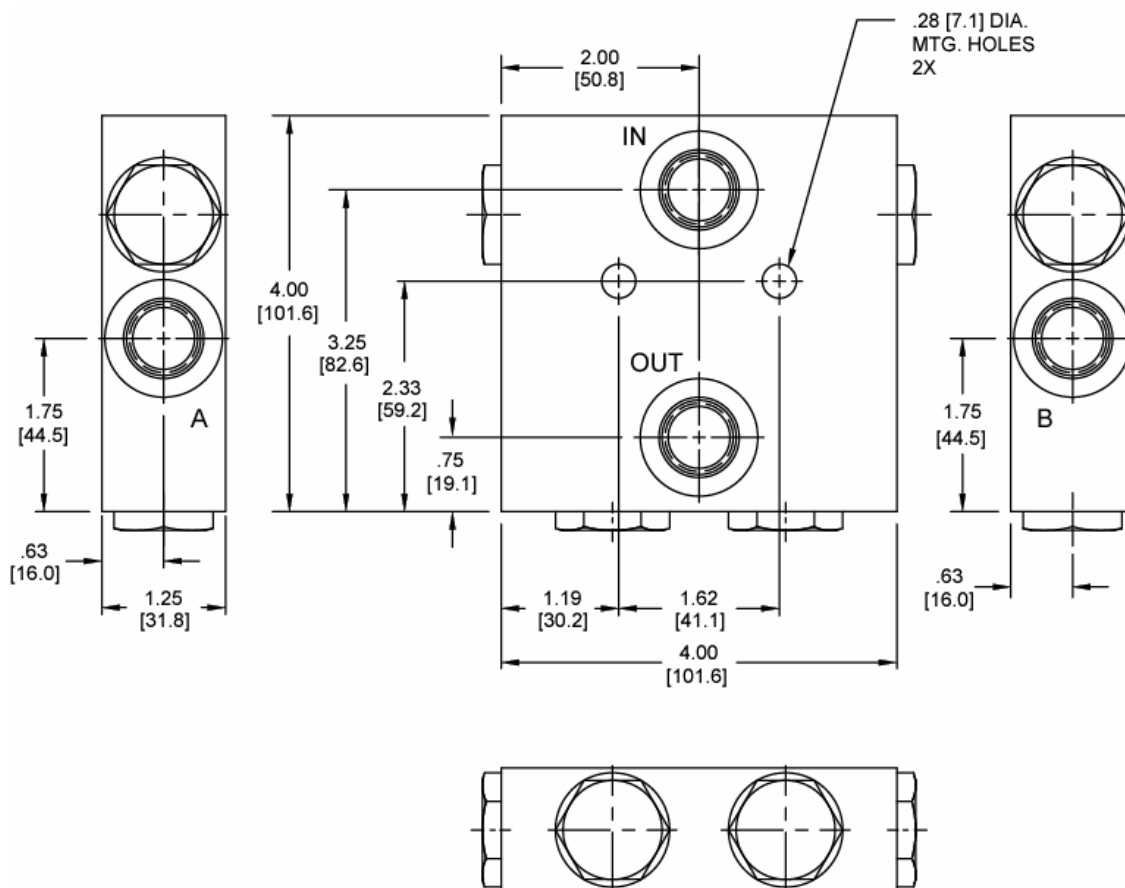
Pre-engineered circuit, option model G*

OPERATION

See typical schematic for specific operation

VALVE SPECIFICATIONS

Nominal Flow	15 GPM (57 LPM)
Rated Operating Pressure	3500 PSI (241 bar)
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	30 micron nominal
Media Operating Temperature Range	-40° to 250° F (-40° to 120° C)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Size	Delta Series 7/8-14 Thread.
Cartridge Torque Requirements	30 ft-lbs (40.6Nm)

DIMENSIONS


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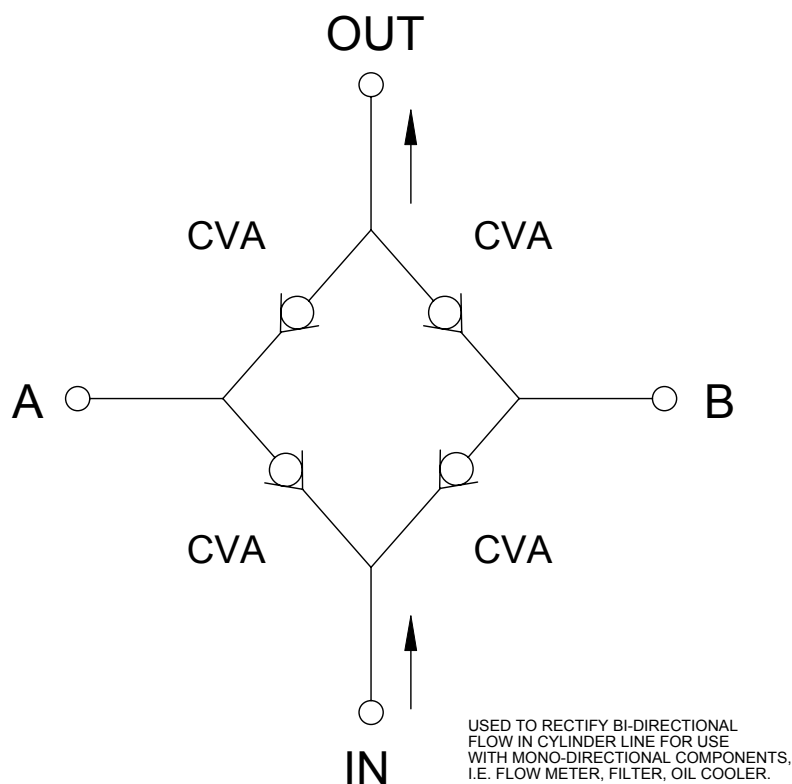
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TYPICAL SCHEMATIC



CIRCUIT GA RECTIFIER CIRCUIT

ORDERING INFORMATION

<u>CIRCUITS</u>	<u>GA</u>	<u>OPTIONS</u>	<u>CRACK PRESSURE</u>
		Buna Standard	10
		Viton Standard	10 PSI
		00	
		V0	

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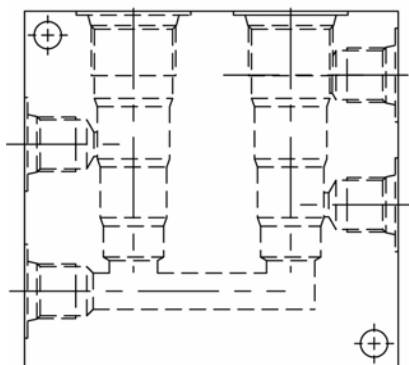
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Pre-Engineered Circuit, Option Model H*

BASE BODY - 20200008 = #6 SAE



BODY WEIGHT: 1.50 lbs. [.68 kg.]

DESCRIPTION

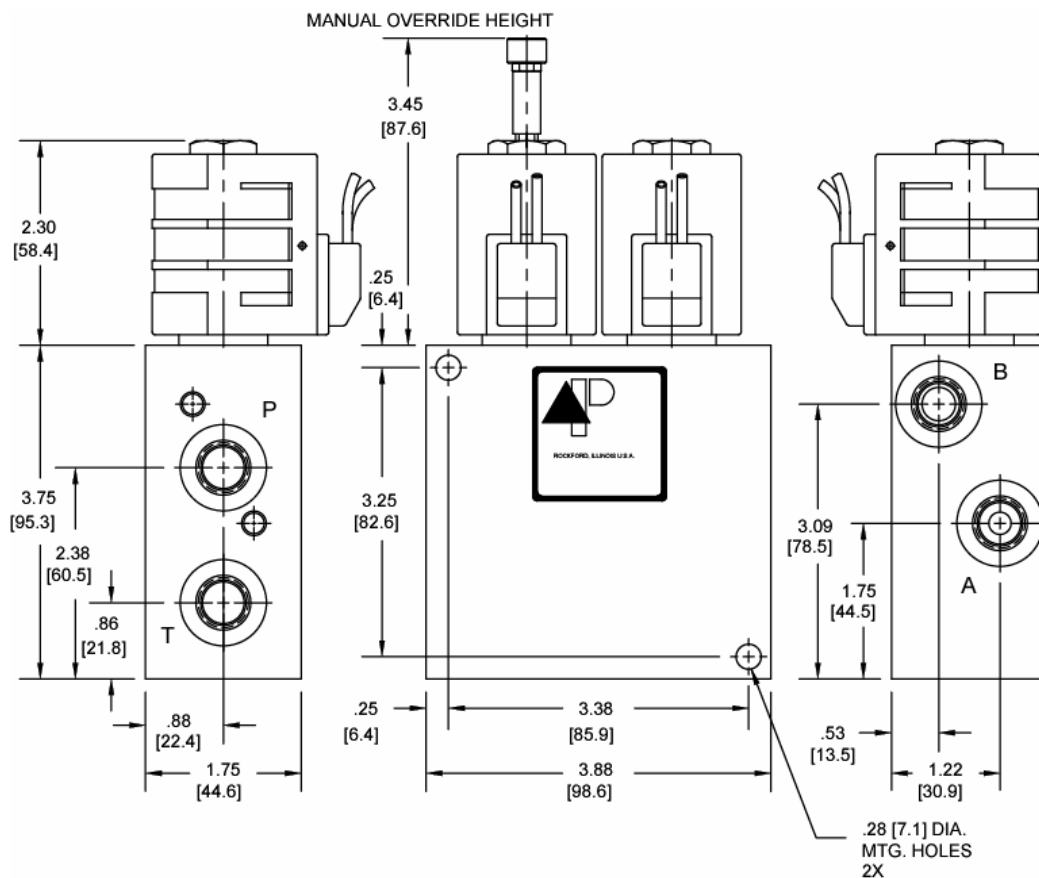
Pre-engineered circuit, option model H*

OPERATION

See options chart for specific operation

VALVE SPECIFICATIONS

Nominal Flow	8 GPM (30 LPM)
Rated Operating Pressure	3000 PSI (207 bar)
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	30 micron nominal
Media Operating Temperature Range	-40° to 250° F (-40° to 120° C)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Size	Delta Series 7/8-14 Thread.
Cartridge Torque Requirements	30 ft-lbs (40.6 Nm)
Coil Torque Nut Requirements	4-6 ft-lbs. (5.4-8.1 Nm)

DIMENSIONS


WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

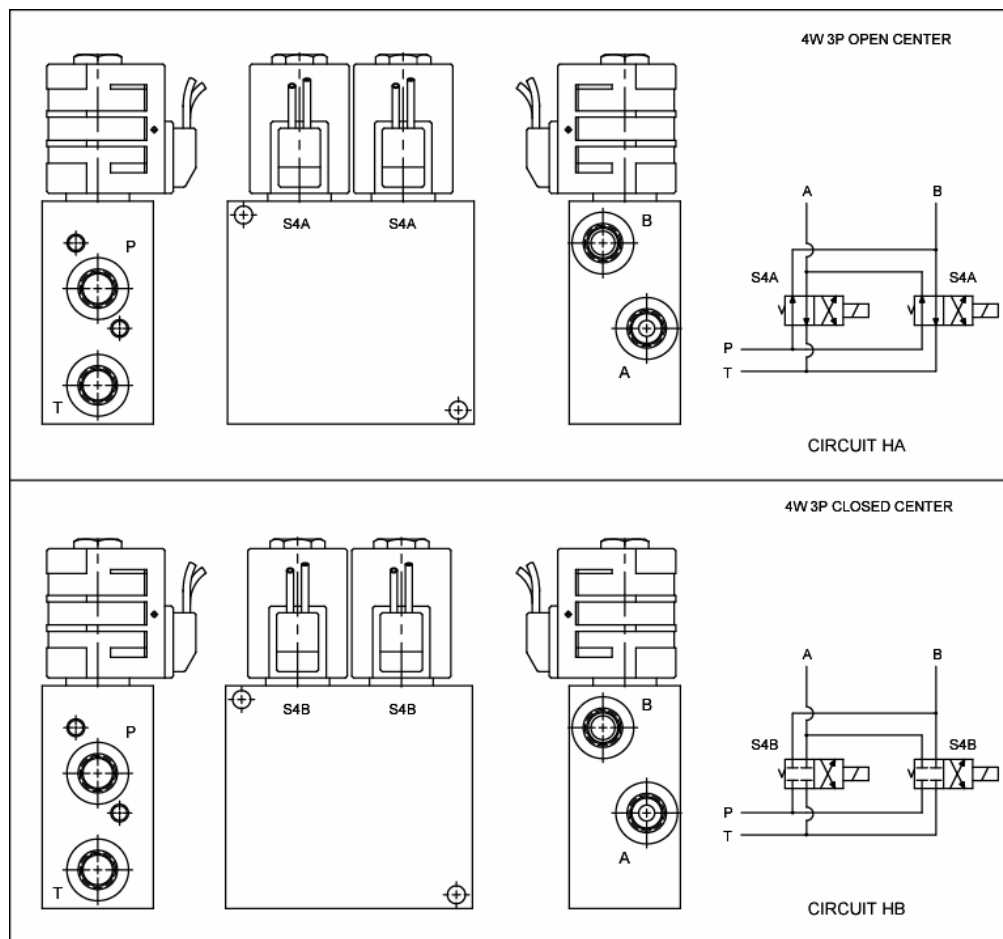
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OPTIONS CHART



ORDERING INFORMATION

CIRCUITS		VOLTAGE	
	HA HB	06	6 VDC
		12	12 VDC
		24	24 VDC
		36	36 VDC
		48	48 VDC
		25	25 VAC
		11	120 VAC
		22	220 VAC
		44	440 VAC
OPTIONS			
	Buna Standard	00	
	Viton Standard	V0	
	Buna, Override	0M	
"D" COIL TERMINATIONS (All DC Except as Noted)			
DL	Double Lead	SS	Single Spade
DT	Deutsch on Leads DT04-2P	DS	Double Spade
ML	Metri-Pack on Leads	HC	DIN 43650 (Hirschman) – (AC & DC)
PL	Packard on Leads	CL	Conduit Lead – (AC Only)
WL	Weatherpack on Leads	DI	Deutsch – Integral DT04-2P
		IA	"I" Coil AMP Superseal - Integral
		ID	"I" Coil Deutsch – Integral DT04-2P
		IJ	"I" Coil AMP Jr. Timer - Integral
		IM	"I" Coil Metri-Pack – Integral

Approximate Coil Weight: .74 lbs/.33 kg.

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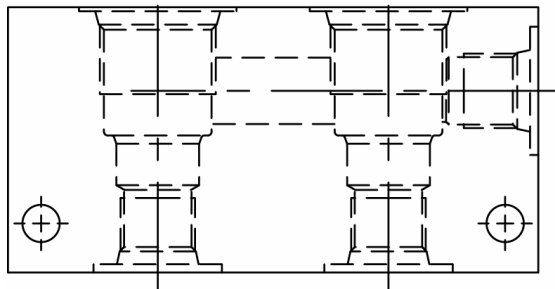
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**Pre-Engineered Circuit, Option Model I***

BASE BODY - 20200009 = #6 SAE



BODY WEIGHT: .83 lbs. [.37 kg.]

DESCRIPTION

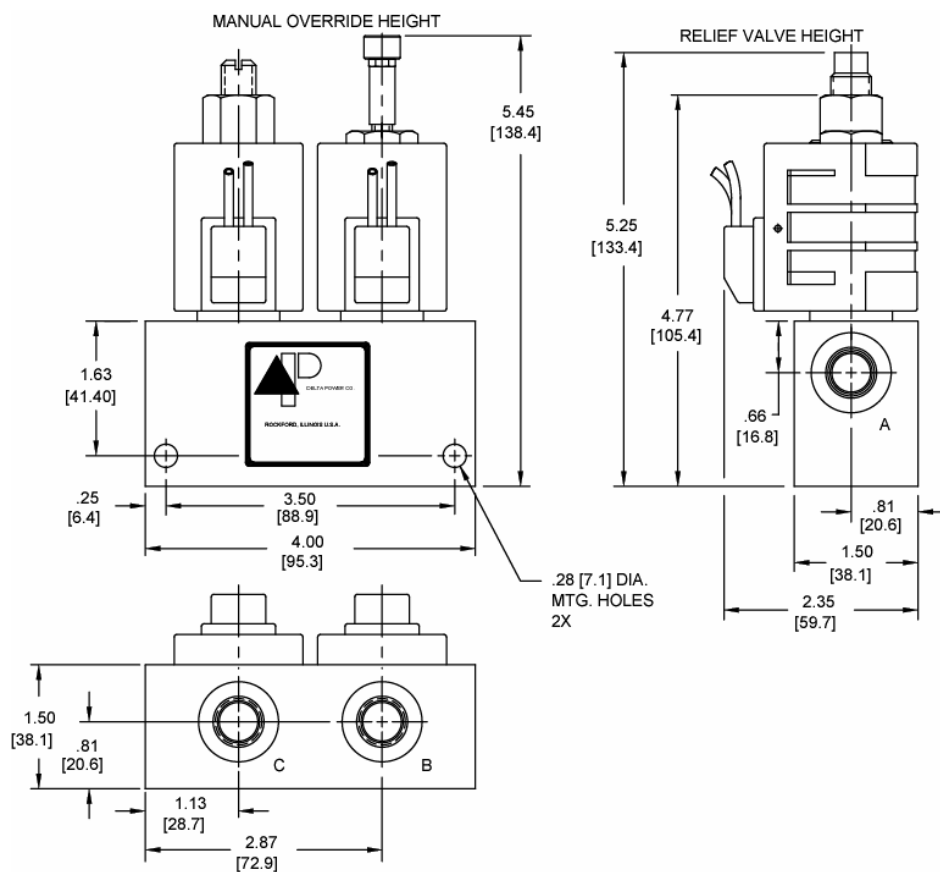
Pre-engineered circuit, option model I*

OPERATION

See model options for specific operation (back)

VALVE SPECIFICATIONS

Nominal Flow	12 GPM (45 LPM)
Rated Operating Pressure	3500 PSI (241 bar)
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	30 micron nominal
Media Operating Temperature Range	-40° to 250° F (-40° to 120° C)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Size	Delta Series 7/8-14 Thread.
Cartridge Torque Requirements	30 ft-lbs (40.6 Nm)
Coil Torque Nut Requirements	4-6 ft-lbs. (5.4-8.1 Nm)

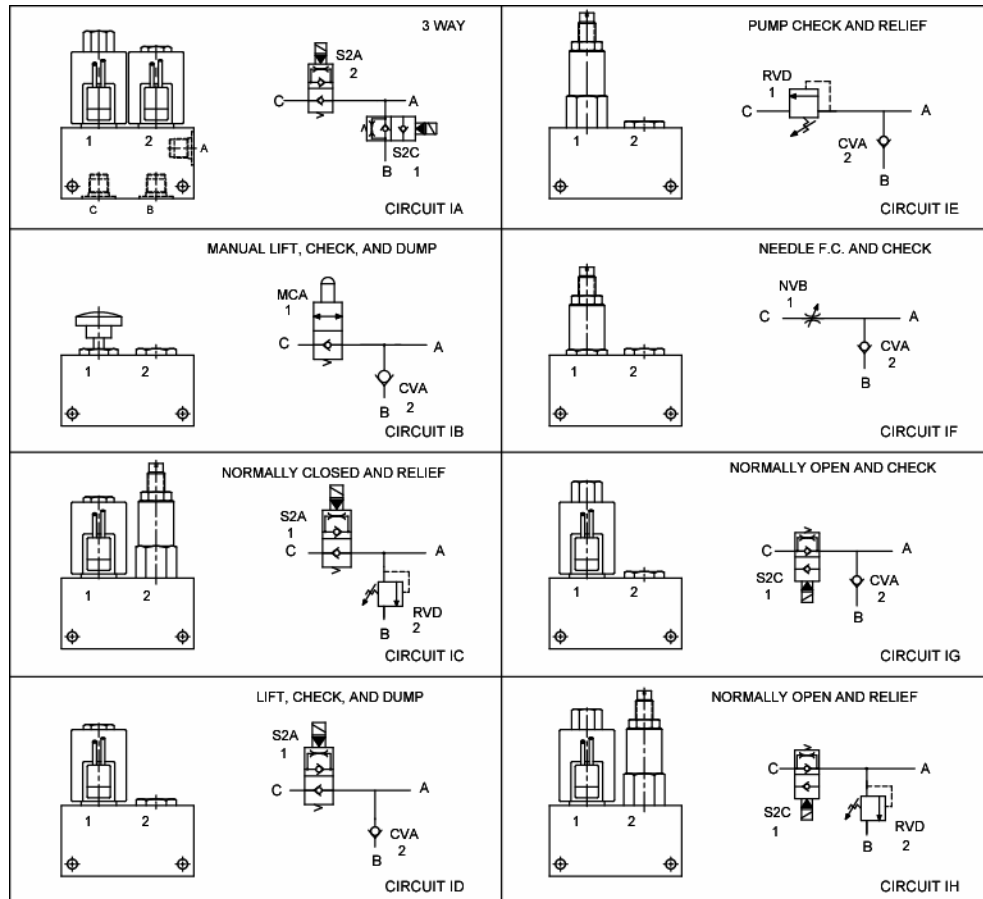
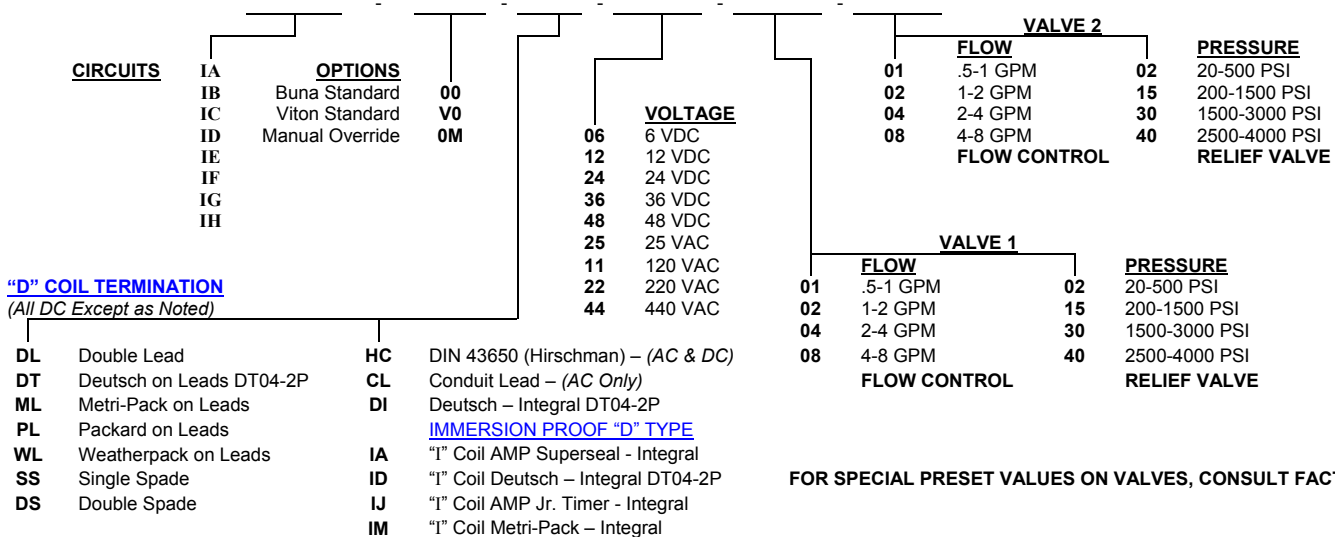
DIMENSIONS

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OPTIONS CHART

ORDERING INFORMATION


FOR SPECIAL PRESET VALUES ON VALVES, CONSULT FACTORY

Approximate Coil Weight: .74 lbs (.33 kg.)

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

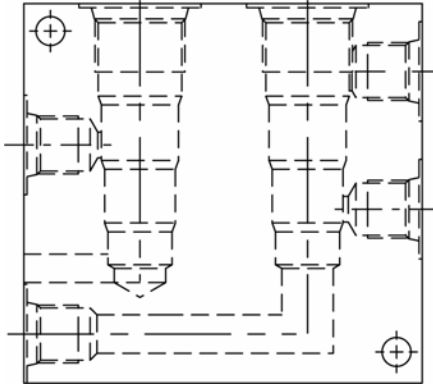
Phone: (815) 397-6628

Fax: (815) 397-2526

 E-mail: delta@delta-power.com


Pre-Engineered Circuit, Option Model J*

BASE BODY - 20200010 = #6 SAE



BODY WEIGHT: 1.50 lbs. [.68 kg.]

DESCRIPTION

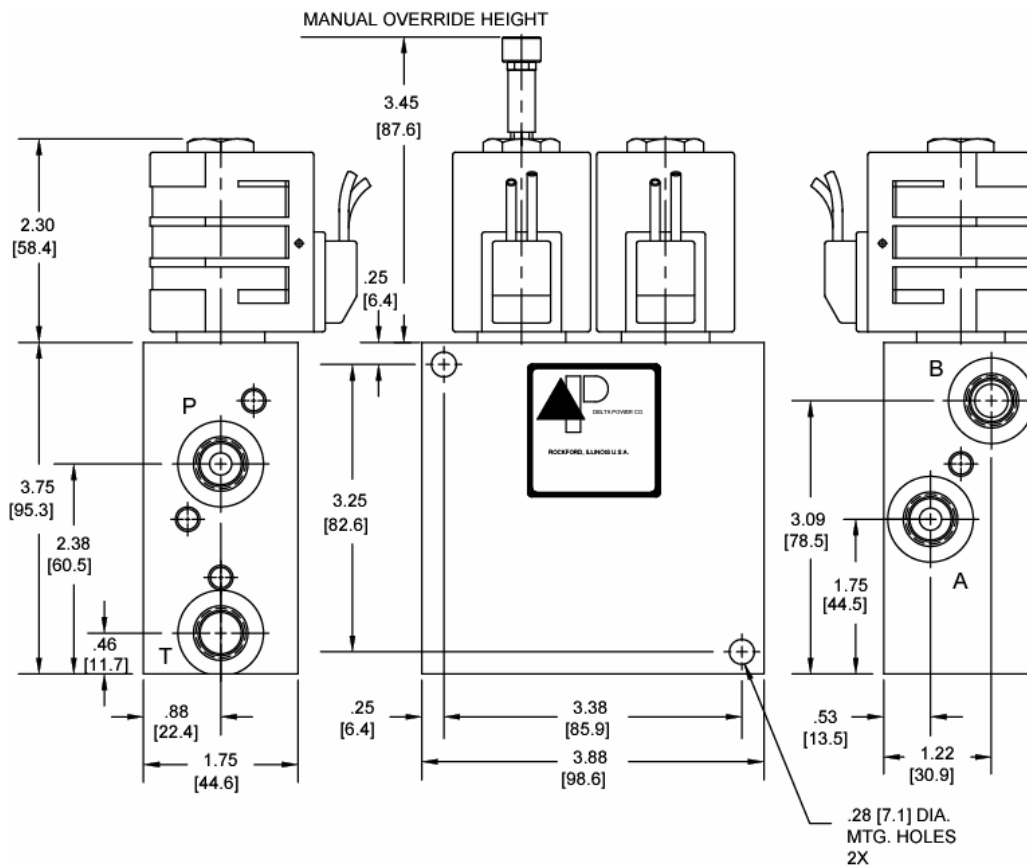
Pre-engineered circuit, option model J*

OPERATION

See typical schematic for specific operation.

VALVE SPECIFICATIONS

Nominal Flow	8 GPM (30 LPM)
Rated Operating Pressure	3000 PSI (207 bar)
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	30 micron nominal
Media Operating Temperature Range	-40° to 250° F (-40° to 120° C)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Size	Delta Series 7/8-14 Thread.
Cartridge Torque Requirements	30 ft-lbs (40.6 Nm)
Coil Torque Nut Requirements	4-6 ft-lbs. (5.4-8.1 Nm)

DIMENSIONS


WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

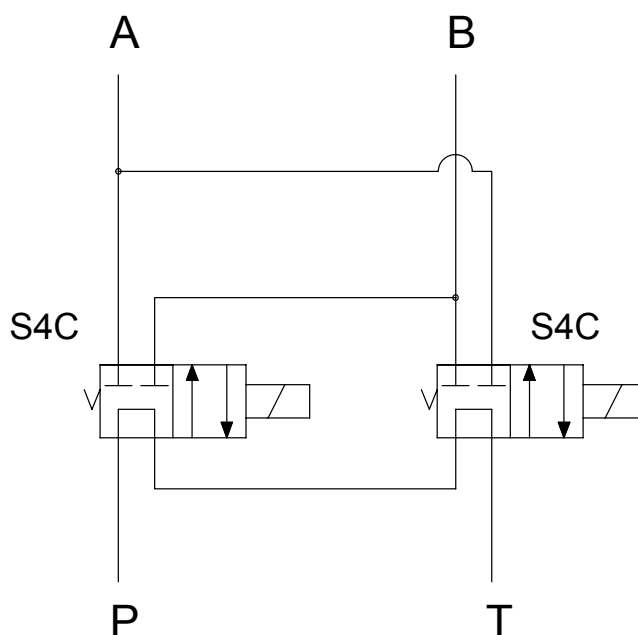
Phone: (815) 397-6628

Fax: (815) 397-2526

 E-mail: delta@delta-power.com



TYPICAL SCHEMATIC

4W 3P TANDEM CENTER

CIRCUIT JA

ORDERING INFORMATION

<u>CIRCUITS</u>		<u>VOLTAGE</u>	
JA		06	6 VDC
		12	12 VDC
		24	24 VDC
		36	36 VDC
		48	48 VDC
		25	25 VAC
		11	120 VAC
		22	220 VAC
		44	440 VAC
<u>OPTIONS</u>			
Buna Standard	00		
Viton Standard	V0		
Buna, Override	0M		
<u>"D" COIL TERMINATIONS</u> (All DC Except as Noted)			
DL	Double Lead	SS	Single Spade
DT	Deutsch on Leads DT04-2P	DS	Double Spade
ML	Metri-Pack on Leads	HC	DIN 43650 (Hirschman) – (AC & DC)
PL	Packard on Leads	CL	Conduit Lead – (AC Only)
WL	Weatherpack on Leads	DI	Deutsch – Integral DT04-2P
		IA	"I" Coil AMP Superseal - Integral
		ID	"I" Coil Deutsch – Integral DT04-2P
		IJ	"I" Coil AMP Jr. Timer - Integral
		IM	"I" Coil Metri-Pack – Integral

Approximate Coil Weight: .74 lbs/.33 kg.

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

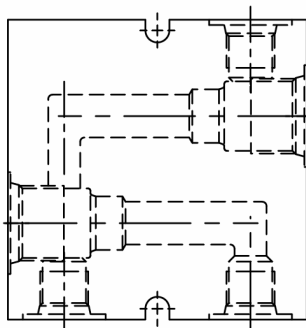
Phone: (815) 397-6628

Fax: (815) 397-2526

 E-mail: delta@delta-power.com

**Pre-Engineered Circuit, Option Model K***

BASE BODY - 20200011 = #6 SAE



BODY WEIGHT: 1.50 lbs. [.68 kg.]

DESCRIPTION

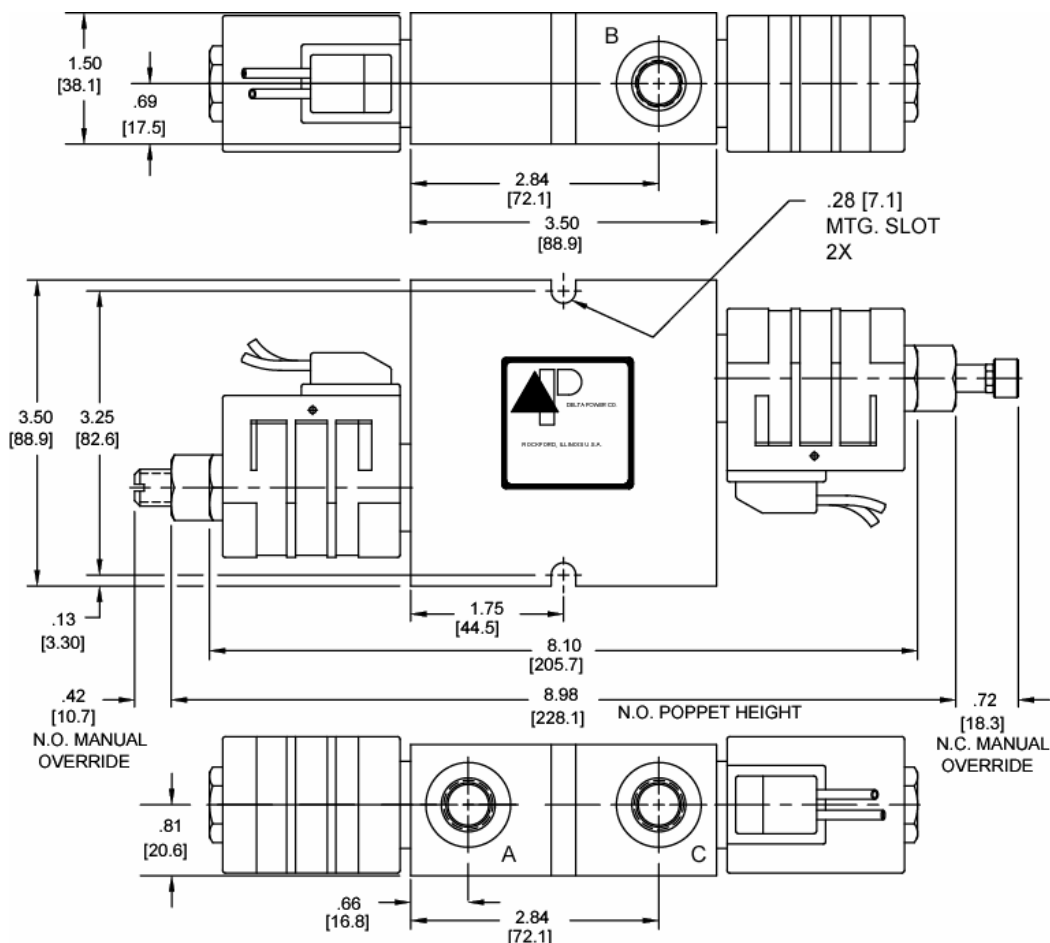
Pre-engineered circuit, option model K*

OPERATION

See options chart for specific operation

VALVE SPECIFICATIONS

Nominal Flow	See Options Chart for Flow Range
Rated Operating Pressure	See Options Chart for Pressure Range
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	30 micron nominal
Media Operating Temperature Range	-40° to 250° F (-40° to 120° C)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Size	Delta Series 7/8-14 Thread.
Cartridge Torque Requirements	30 ft-lbs (40.6 Nm)
Coil Torque Nut Requirements	4-6 ft-lbs. (5.4-8.1 Nm)

DIMENSIONS

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

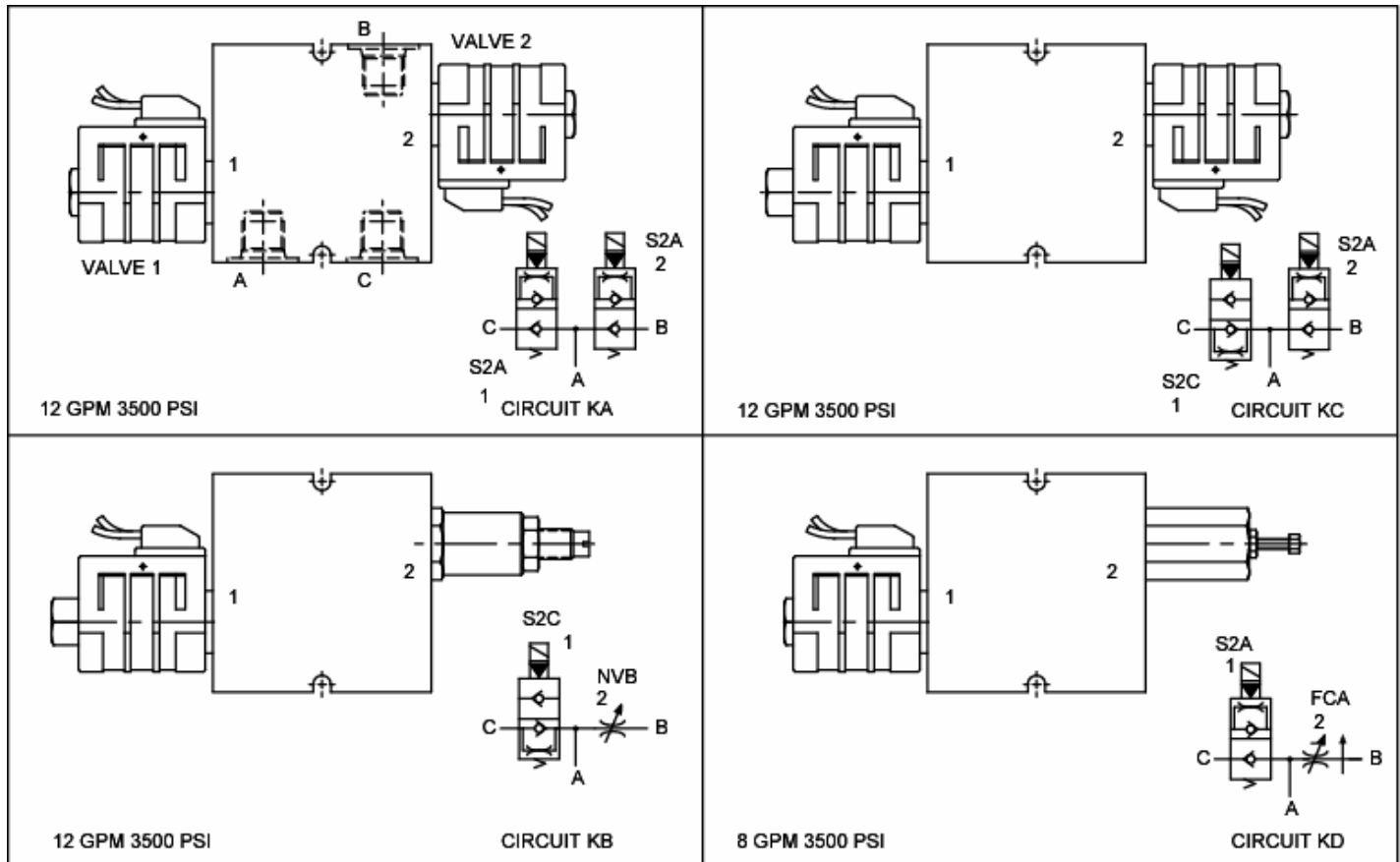
Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com



OPTIONS CHART



ORDERING INFORMATION

CIRCUITS		OPTIONS		VOLTAGE		VALVE 2		PRESSURE RANGE	
KA		Buna Standard	00	06	6 VDC	01	.5-1 GPM	02	20-500 PSI
KB		Viton Standard	V0	12	12 VDC	02	1-2 GPM	15	200-1500 PSI
KC		Manual Override	OM	24	24VDC	04	2-4 GPM	30	1500-3000 PSI
KD				36	36 VDC	08	4-8 GPM	40	2500-4000 PSI
KE				48	48 VDC	FLOW CONTROL			RELIEF VALVE
				25	25 VAC	VALVE 1		PRESSURE RANGE	
				11	120 VAC	01	.5-1 GPM	02	20-500 PSI
				22	220 VAC	02	1-2 GPM	15	200-1500 PSI
				44	440 VAC	04	2-4 GPM	30	1500-3000 PSI
						08	4-8 GPM	40	2500-4000 PSI
						FLOW CONTROL			RELIEF VALVE

"D" COIL TERMINATION

(All DC Except as Noted)

DL	Double Lead	HC	DIN 43650 (Hirschman) - (AC & DC)
DT	Deutsch on Leads DT04-2P	CL	Conduit Lead - (AC Only)
ML	Metri-Pack on Leads	DI	Deutsch - Integral DT04-2P
PL	Packard on Leads		IMMERSION PROOF "D" TYPE
WL	Weatherpack on Leads	IA	"I" Coil AMP Superseal - Integral
SS	Single Spade	ID	"I" Coil Deutsch - Integral DT04-2P
DS	Double Spade	IJ	"I" Coil AMP Jr. Timer - Integral
		IM	"I" Coil Metri-Pack - Integral

FOR SPECIAL PRESET VALUES ON VALVES, CONSULT FACTORY

Approximate Coil Weight: .74 lbs (.33 kg.)

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

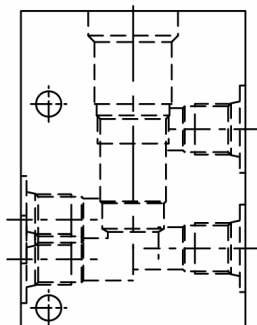
Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com


Pre-Engineered Circuit, Option Model L*

BASE BODY - 20200012 = #6 SAE



BODY WEIGHT: 1.80 lbs. [.82 kg.]

DESCRIPTION

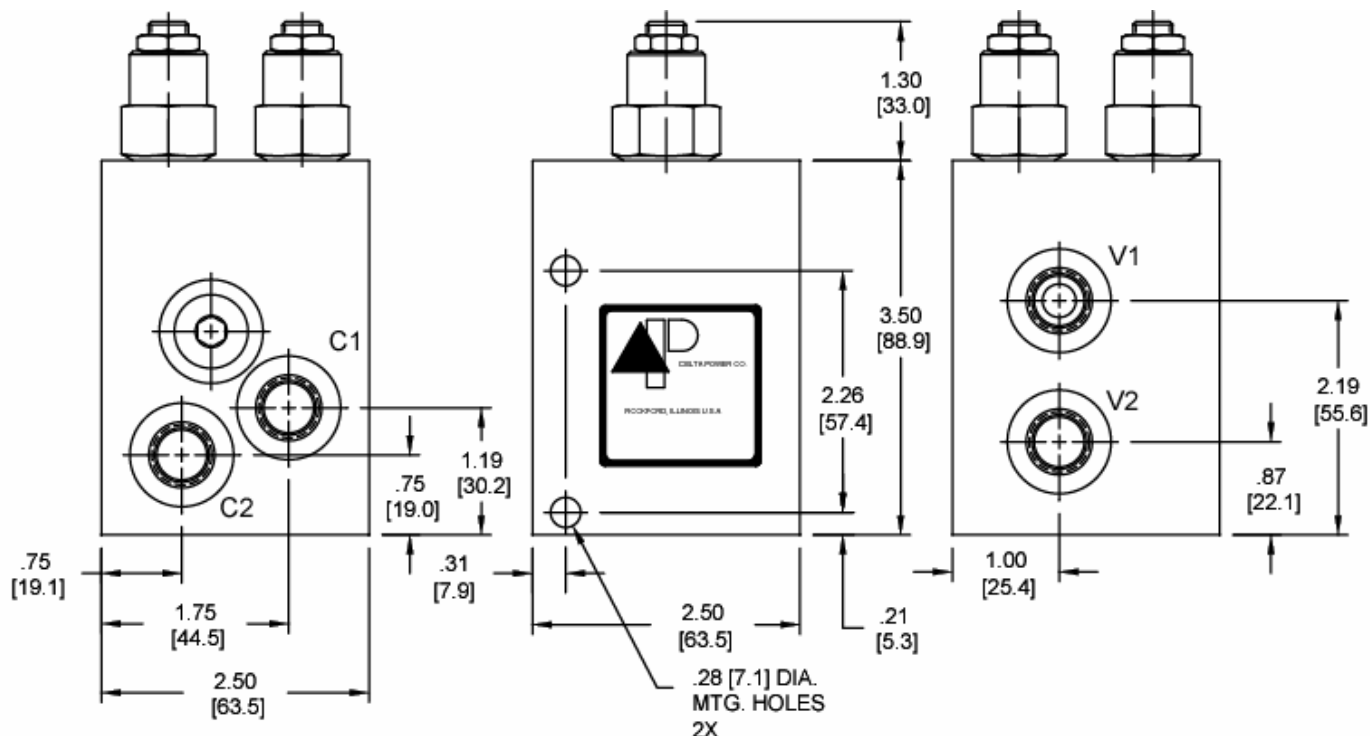
Pre-engineered circuit, option model L*

OPERATION

See typical schematic for specific operation.

VALVE SPECIFICATIONS

Nominal Flow	15 GPM (60 LPM)
Rated Operating Pressure	See Options Chart for Pressure Range
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	30 micron nominal
Media Operating Temperature Range	-40° to 250° F (-40° to 120° C)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Size	Special Series M20X1.5-H6 Thread
Cartridge Torque Requirements	30 ft-lbs (40.6 Nm)

DIMENSIONS


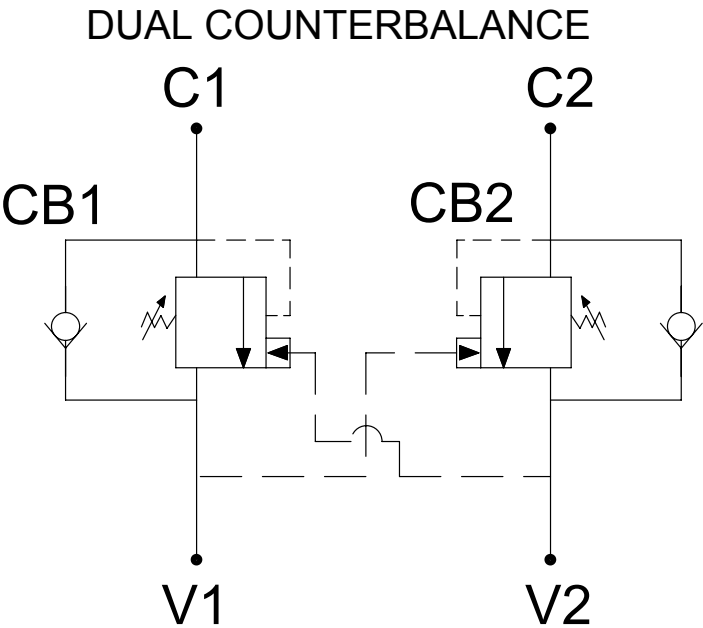
WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

Phone: (815) 397-6628

Fax: (815) 397-2526

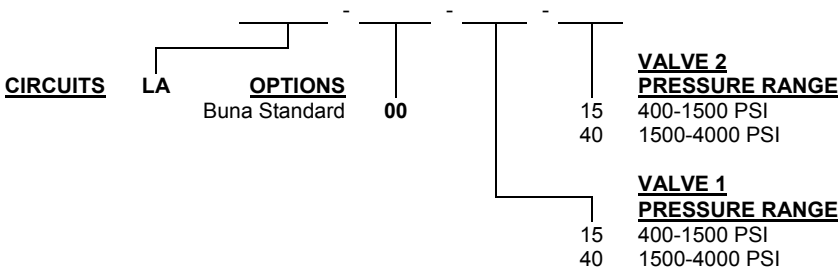
 E-mail: delta@delta-power.com

TYPICAL SCHEMATIC



CIRCUIT LA

ORDERING INFORMATION



Note: Aluminum Bodies are NOT durability rated for 4000 PSI (276 bar). Consult factory for body options.

FOR SPECIAL PRESET VALUES ON VALVES, CONSULT FACTORY

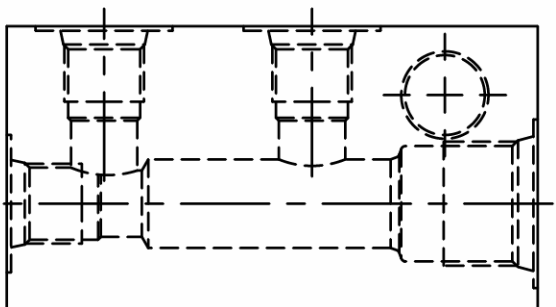
Approximate Coil Weight: .74 lbs (.33 kg.)

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com

**Pre-Engineered Circuit, Option Model M*****BASE BODY - 20200013 = #6 SAE**

BODY WEIGHT: 1.09 lbs. [.49 kg.]

DESCRIPTION

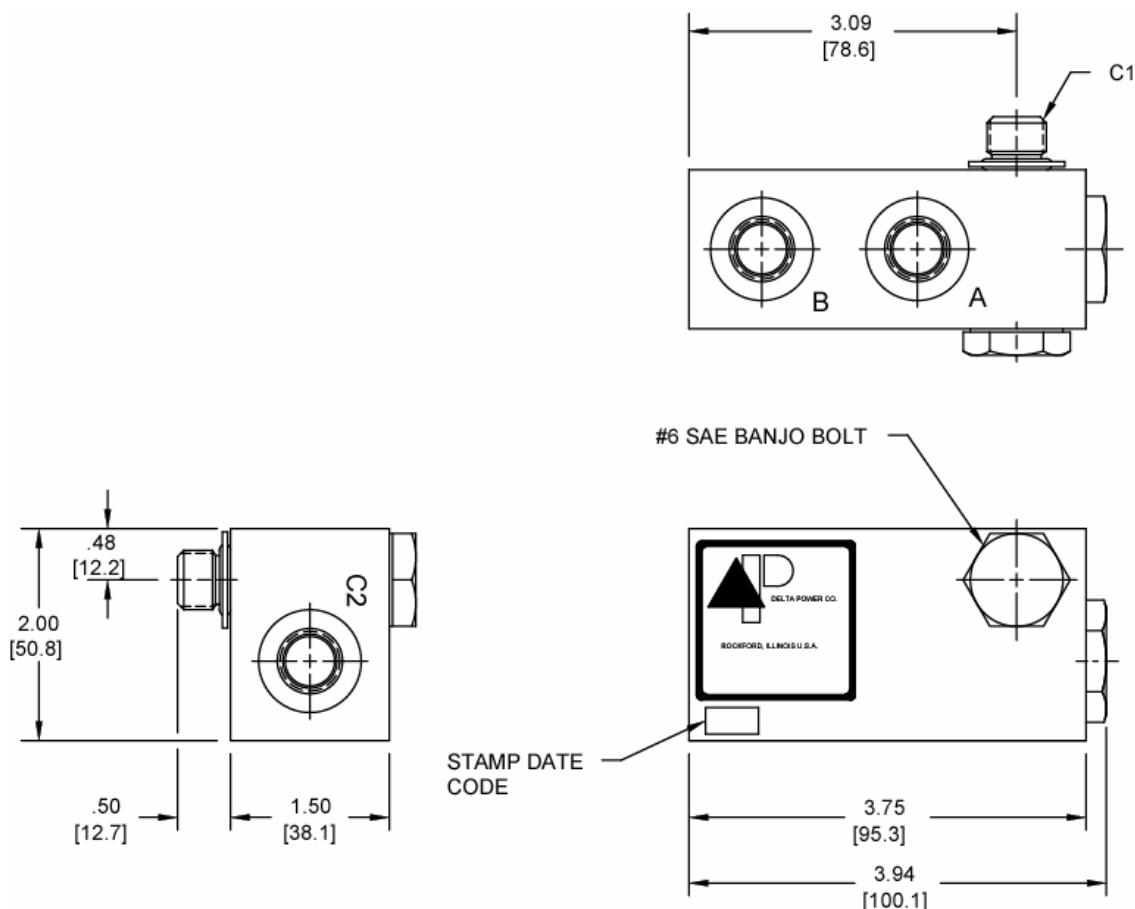
Pre-engineered circuit, option model M*

OPERATION

See typical schematic for specific operation.

VALVE SPECIFICATIONS

Nominal Flow	12 GPM (45 LPM)
Rated Operating Pressure	3500 PSI (241 bar)
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	30 micron nominal
Media Operating Temperature Range	-40° to 250° F (-40° to 120° C)
Operating Fluid Media	General Purpose Hydraulic Fluid
Ratio	4 : 1
Cartridge Size	M20 X 1.5
Cartridge Torque Requirements	30 ft-lbs (40.6 Nm)

DIMENSIONS

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

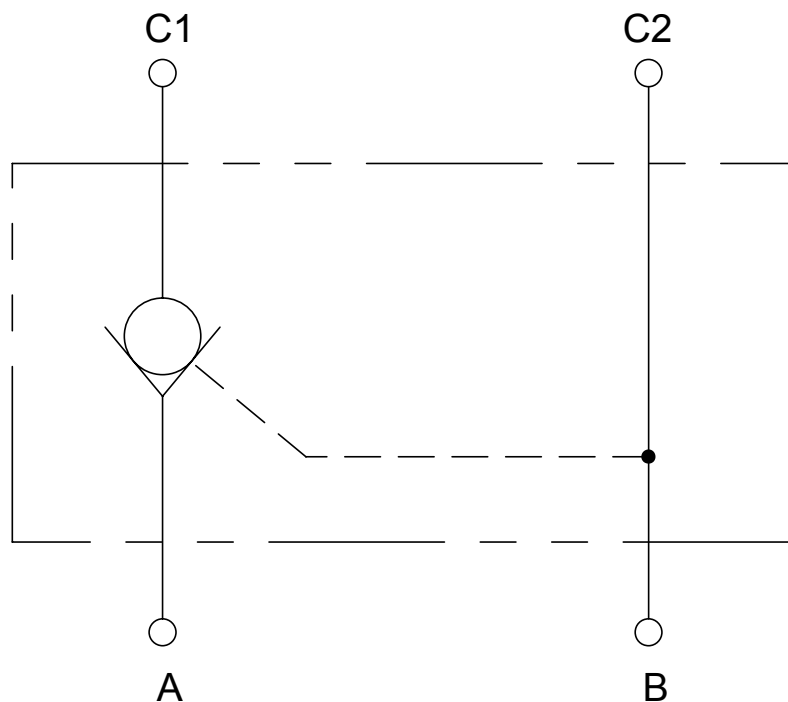
Phone: (815) 397-6628

Fax: (815) 397-2526

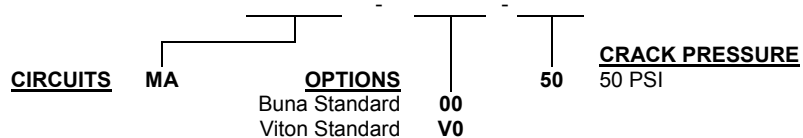
E-mail: delta@delta-power.com



TYPICAL SCHEMATIC

**P.O. CHECK CIRCUIT
4:1 RATIO****CIRCUIT MA**

ORDERING INFORMATION

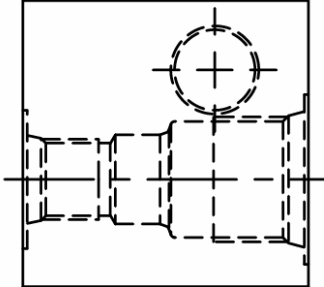


WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com


Pre-Engineered Circuit, Option Model N*
BASE BODY - 20200014 = #6 SAE


BODY WEIGHT: 1.09 lbs. [.49 kg.]

DESCRIPTION

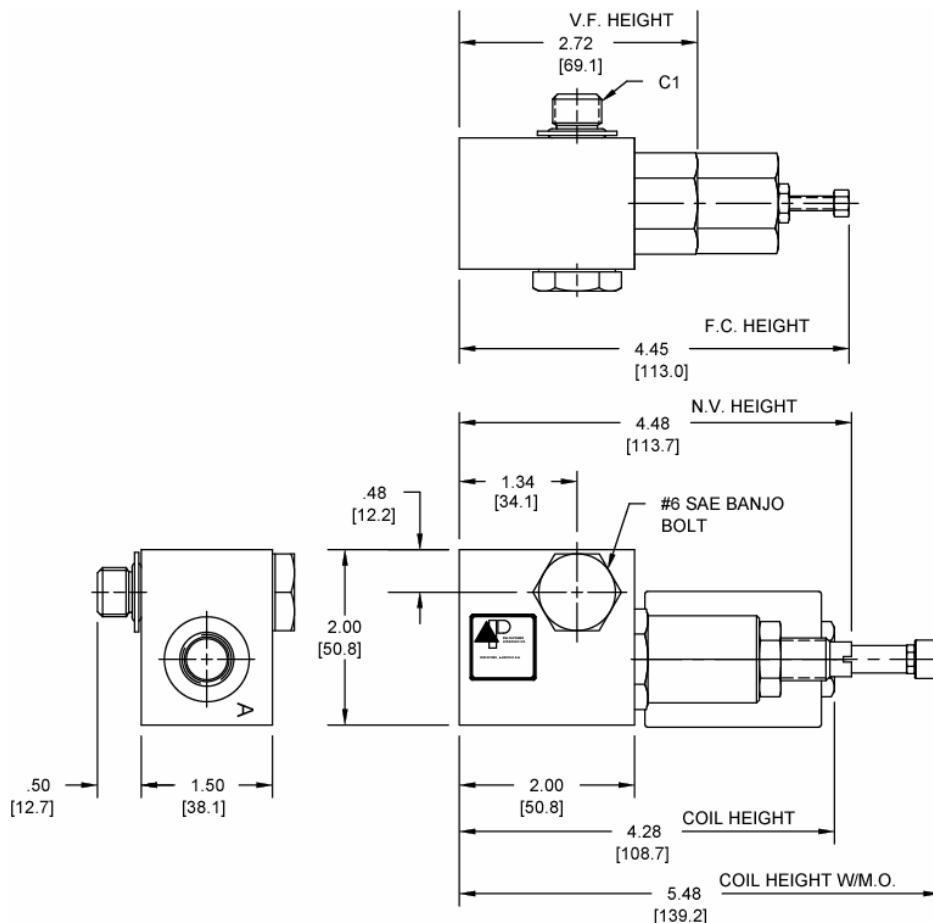
Pre-engineered circuit, option model N*

OPERATION

See options chart for specific operation

VALVE SPECIFICATIONS

Nominal Flow	See Options Chart for Flow Range
Rated Operating Pressure	See Options Chart for Pressure Range
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	30 micron nominal
Media Operating Temperature Range	-40° to 250° F (-40° to 120° C)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Size	Delta Series 7/8-14 Thread.
Cartridge Torque Requirements	30 ft-lbs (40.6 Nm)
Coil Torque Nut Requirements	4-6 ft lbs. (5.4-8.1 Nm)

DIMENSIONS


WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

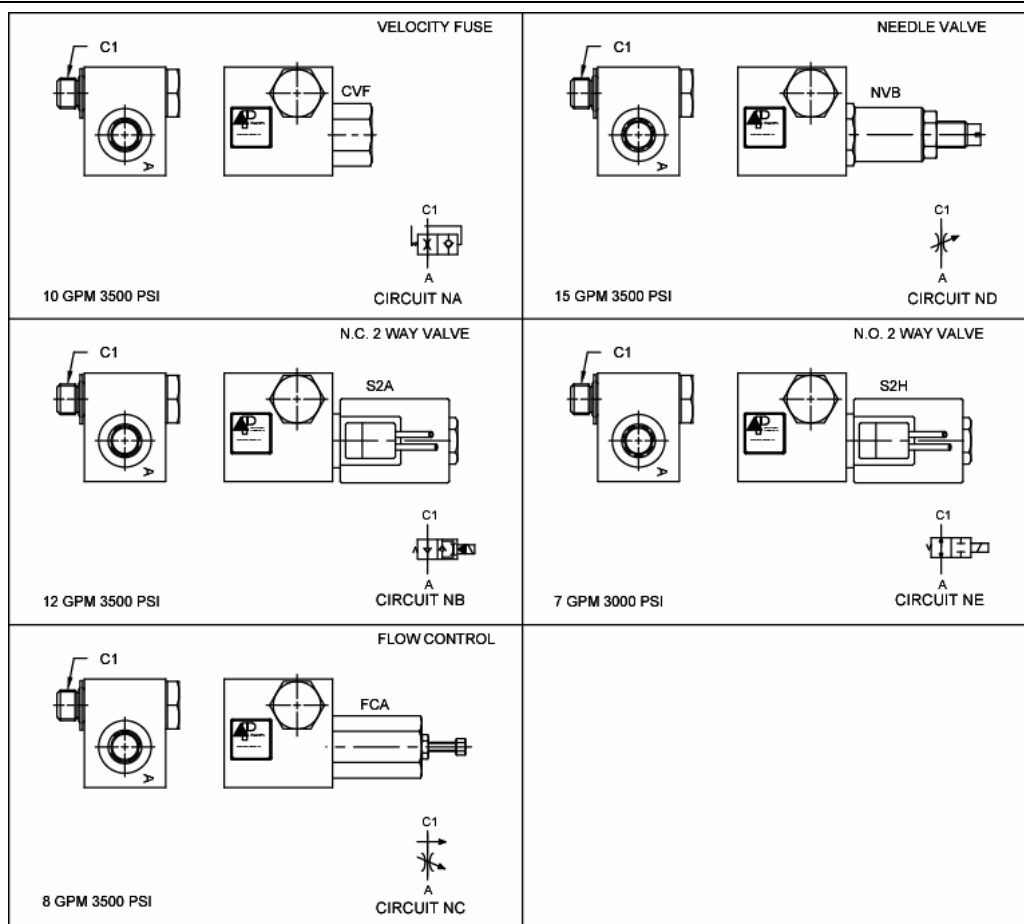
Phone: (815) 397-6628

Fax: (815) 397-2526

 E-mail: delta@delta-power.com



OPTIONS CHART



ORDERING INFORMATION

CIRCUITS		OPTIONS		VALVE 1		PRESSURE	
NA		Buna Standard	00	01	1 GPM	02	20-500 PSI
NB		Viton Standard	V0	02	2 GPM	15	250-1500 PSI
NC		Manual Override	OM	03	3 GPM	30	1500-3000 PSI
ND				04	4 GPM	40	2500-4000 PSI
NE				05	5 GPM		RELIEF VALVE
				06	6 GPM		
				07	7 GPM		
				08	8 GPM		
				09	9 GPM		
				10	10 GPM		
					FLOW CONTROL		

"D" COIL TERMINATION
(All DC Except as Noted)

DL Double Lead
DT Deutsch on Leads DT04-2P
ML Metri-Pack on Leads
PL Packard on Leads
WL Weatherpack on Leads

SS Single Spade
DS Double Spade
HC DIN 43650 (Hirschman) – (AC & DC)
CL Conduit Lead – (AC Only)
DI Deutsch – Integral DT04-2P

IMMERSION PROOF "D" TYPE
IA "I" Coil AMP Superseal - Integral
ID "I" Coil Deutsch – Integral DT04-2P
IJ "I" Coil AMP Jr. Timer - Integral
IM "I" Coil Metri-Pack – Integral

FOR SPECIAL PRESET VALUES ON VALVES, CONSULT FACTORY

Approximate Coil Weight: .74 lbs/.33 kg.

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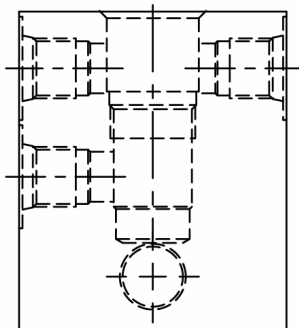
Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com


Pre-Engineered Circuit, Option Model O*

BASE BODY - 20200015 = #6 SAE



BODY WEIGHT: 1.09 lbs. [.49 kg.]

DESCRIPTION

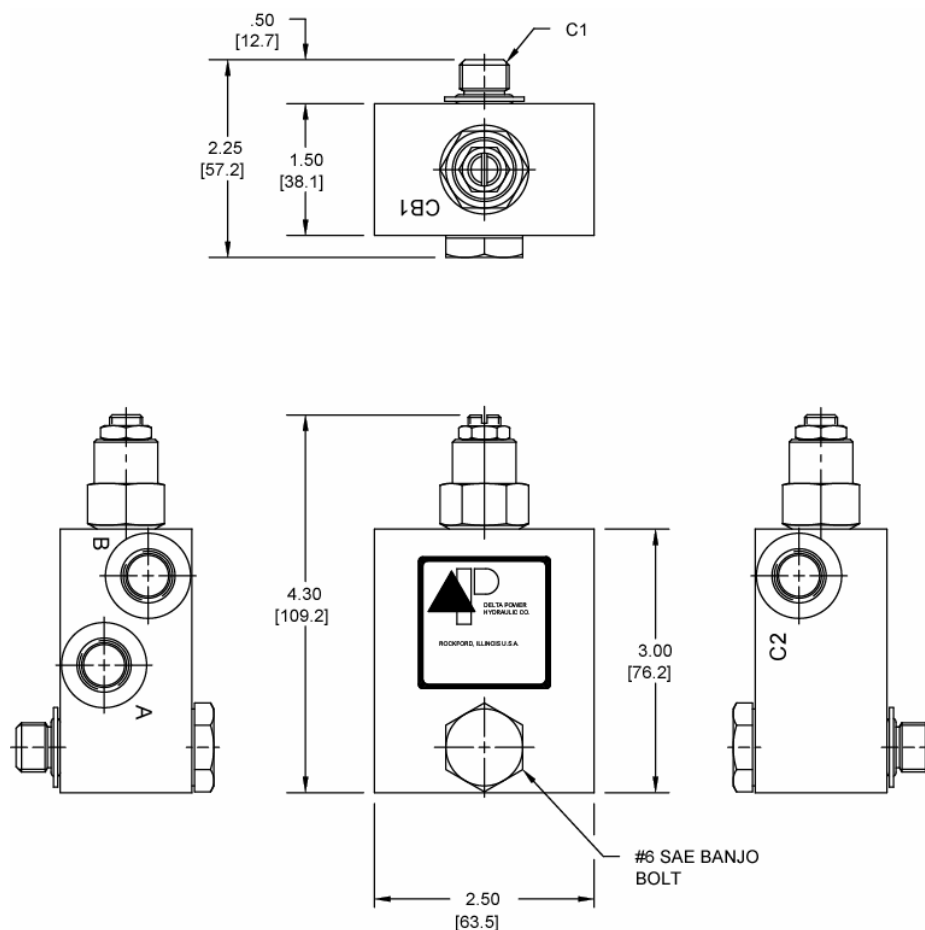
Pre-engineered circuit, option model O*

OPERATION

See options chart for specific operation

VALVE SPECIFICATIONS

Nominal Flow	15 GPM (57 LPM)
Rated Operating Pressure	3500 PSI (241 bar)
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	30 micron nominal
Media Operating Temperature Range	-40° to 250° F (-40° to 120° C)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Size	M20 X 1.5
Cartridge Torque Requirements	30 ft-lbs (40.6 Nm)

DIMENSIONS


WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

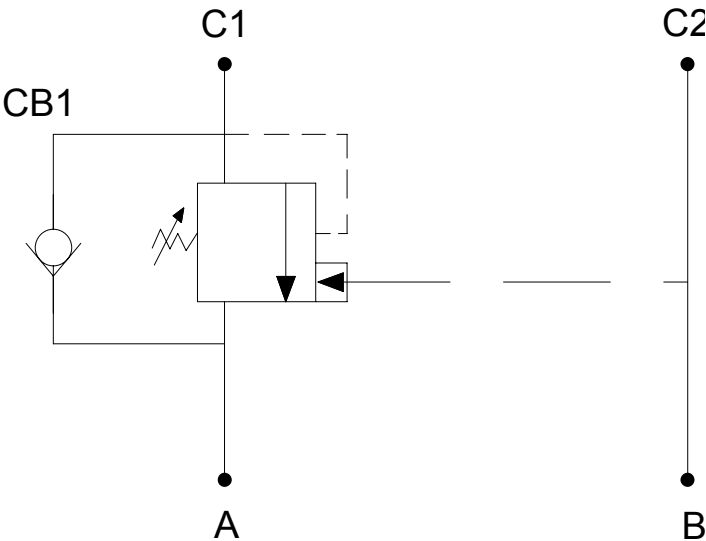
Phone: (815) 397-6628

Fax: (815) 397-2526

 E-mail: delta@delta-power.com

TYPICAL SCHEMATIC

COUNTERBALANCE



CIRCUIT OA

ORDERING INFORMATION

CIRCUITS	OA	OPTIONS	00	15	PRESSURE RANGE
		Buna Standard	V0	40	400 – 1500 PSI
		Viton Standard			1500 – 4000 PSI

FOR SPECIAL PRESET VALUES ON VALVES, CONSULT FACTORY

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

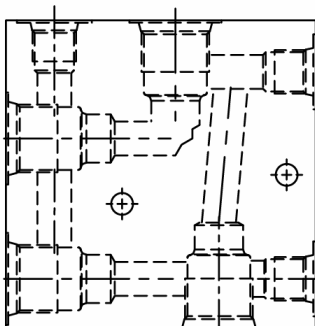
Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com


Pre-Engineered Circuit, Option Model P*

BASE BODY - 20200017 = #6 SAE



BODY WEIGHT: 1.5 lbs. [.68 kg.]

DESCRIPTION

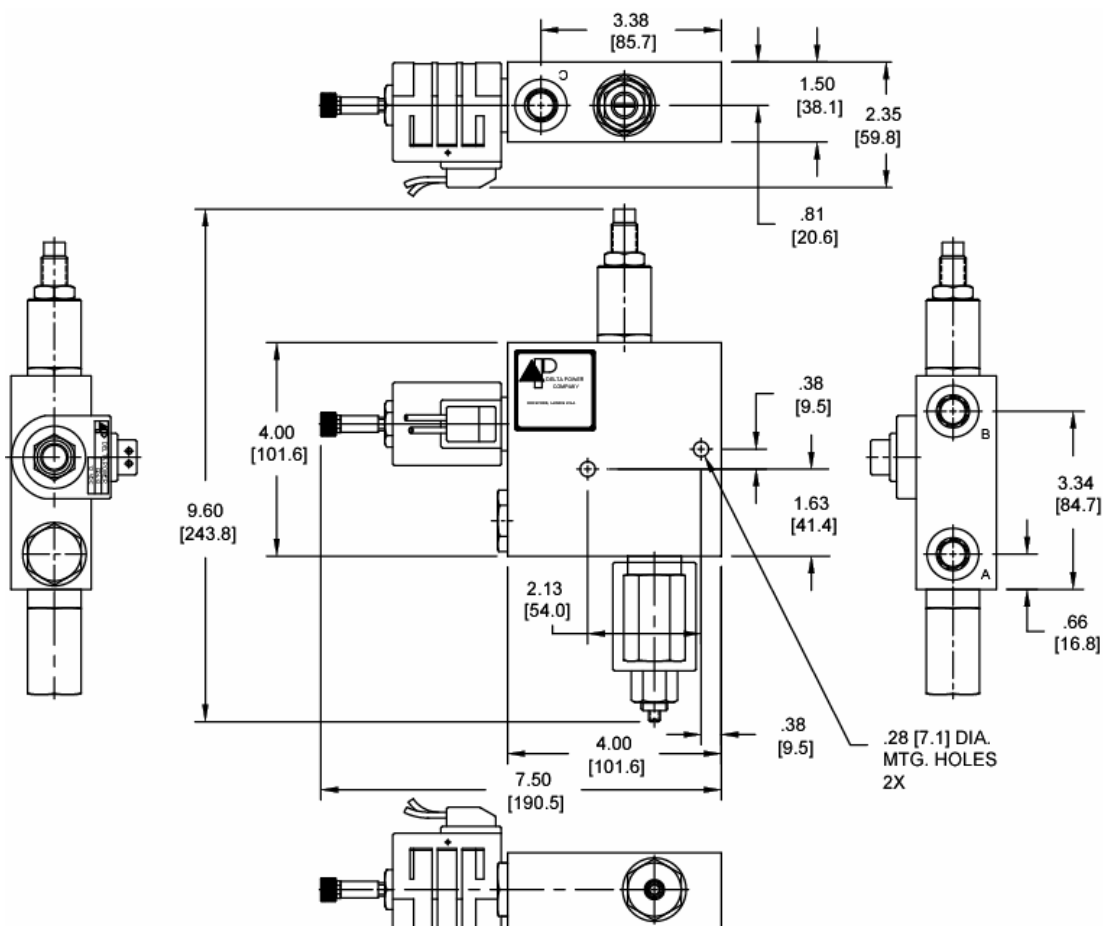
Pre-engineered circuit, option model P*

OPERATION

See options chart for specific operation (back)

VALVE SPECIFICATIONS

Nominal Flow	See Options Chart for Flow Range
Rated Operating Pressure	See Options Chart for Pressure Range
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	30 micron nominal
Media Operating Temperature Range	-40° to 250° F (-40° to 120° C)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Size	Delta Series 7/8-14 Thread.
Cartridge Torque Requirements	30 ft-lbs (40.6 Nm)
Coil Torque Nut Requirements	4-6 ft-lbs. (5.4-8.1 Nm)

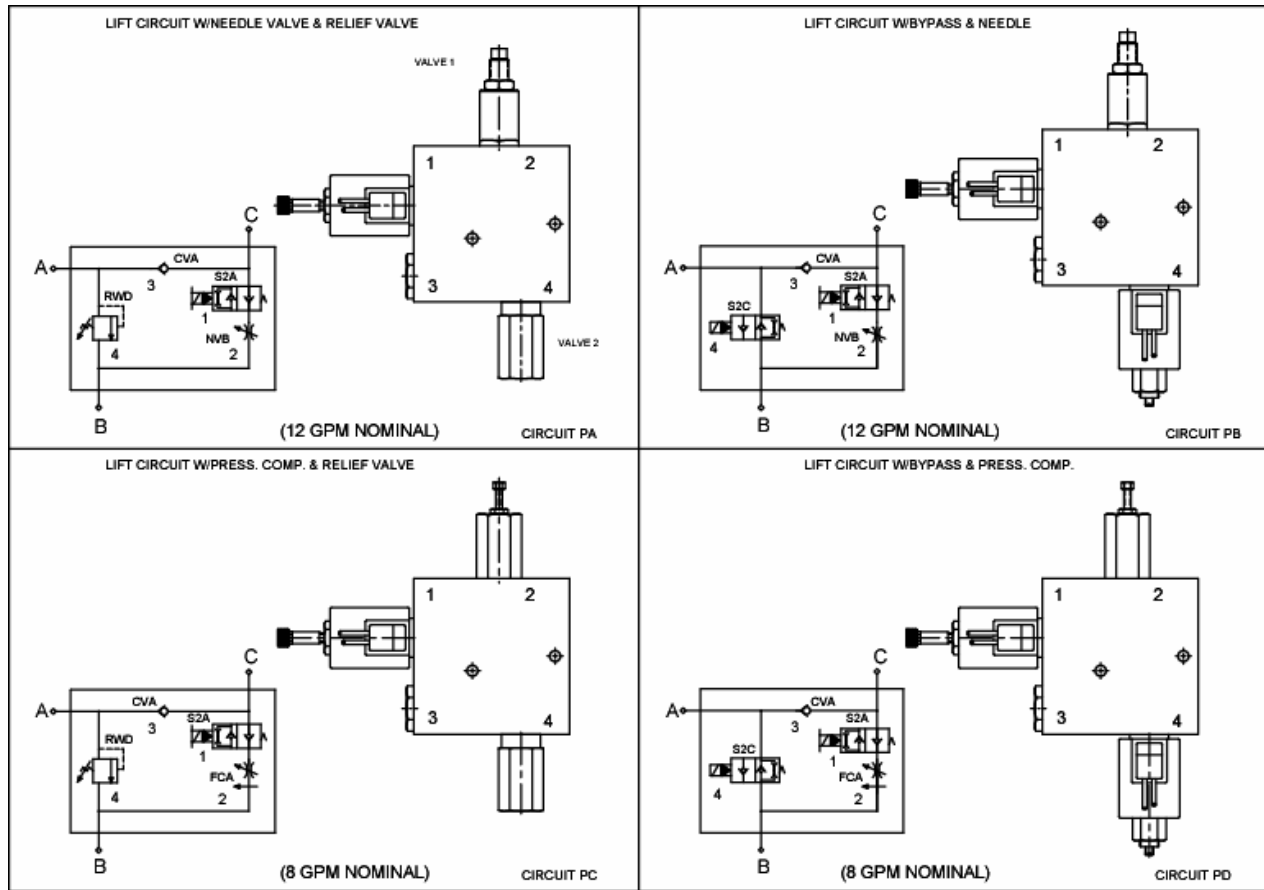
DIMENSIONS


WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

Phone: (815) 397-6628

Fax: (815) 397-2526

 E-mail: delta@delta-power.com


OPTIONS CHART

ORDERING INFORMATION

CIRCUITS	PA PB PC PD	OPTIONS Buna Standard Viton Standard Manual Override	00 V0 0M	VOLTAGE 06 6 VDC 12 12 VDC 24 24 VDC 36 36 VDC 48 48 VDC 25 25 VAC 11 120 VAC 22 220 VAC 44 440 VAC	VALVE 2		PRESSURE 100-700 PSI 100-3000 PSI 3000-4000 PSI RELIEF VALVE
					FLOW 01 .5-1 GPM 02 1-2 GPM 04 2-4 GPM 08 4-8 GPM	FLOW CONTROL	
"D" COIL TERMINATION (All DC Except as Noted)	DL DT ML PL WL SS DS	HC CL DI IA ID IJ IM			VALVE 1		PRESSURE 100-700 PSI 100-3000 PSI 3000-4000 PSI RELIEF VALVE
					FLOW 01 .5-1 GPM 02 1-2 GPM 04 2-4 GPM 08 4-8 GPM	FLOW CONTROL	

FOR SPECIAL PRESET VALUES ON VALVES, CONSULT FACTORY

Approximate Coil Weight: .74 lbs (.33 kg.)

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

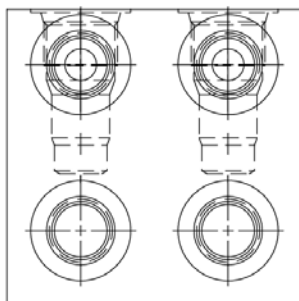
Phone: (815) 397-6628

Fax: (815) 397-2526

 E-mail: delta@delta-power.com

**Pre-Engineered Circuit, Option Model Q***

BASE BODY - 20200018 = #8 SAE



BODY WEIGHT: 1.50 lbs. [.68 kg.]

DESCRIPTION

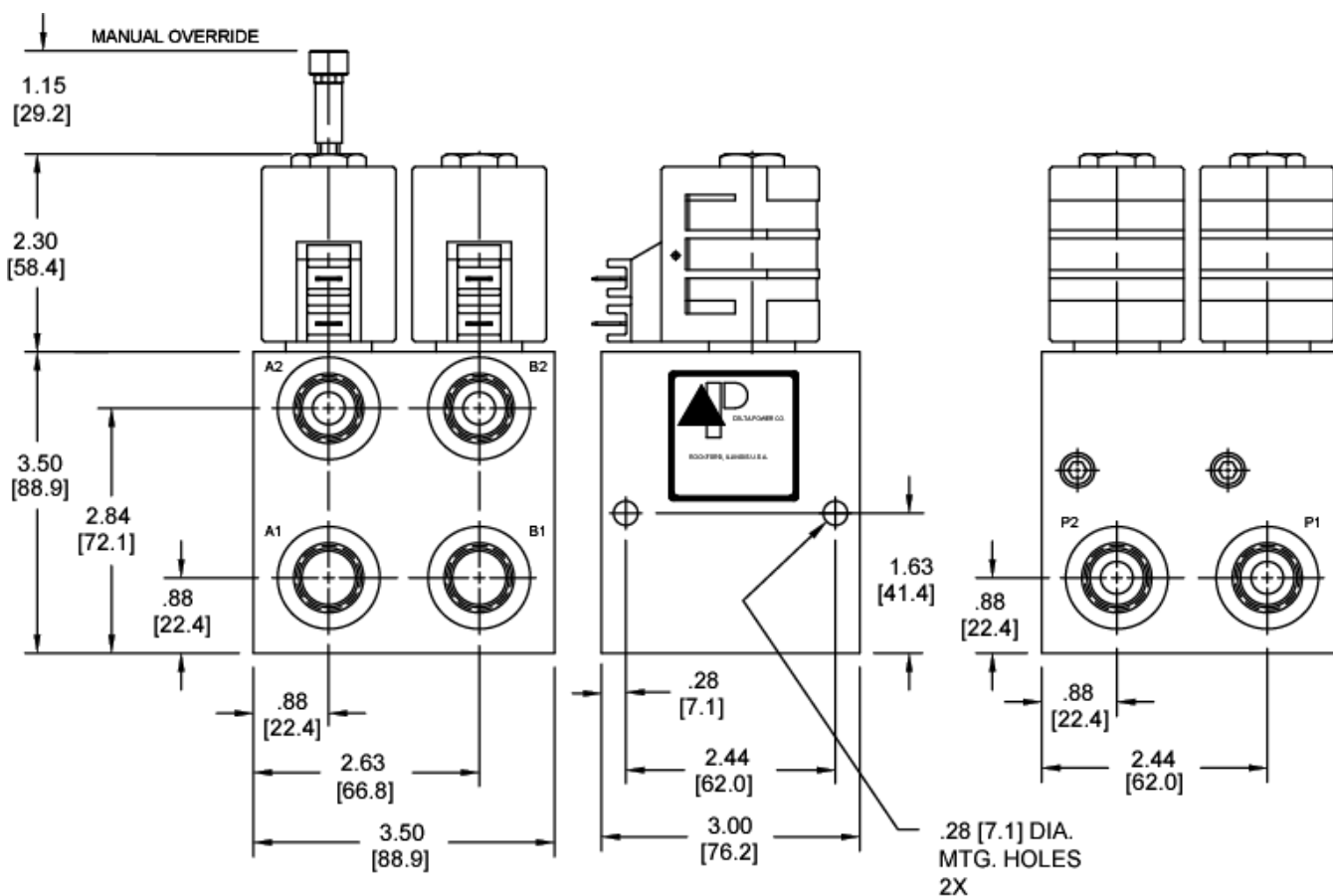
Pre-engineered circuit, option model Q*

OPERATION

See typical schematic for specific operation

VALVE SPECIFICATIONS

Nominal Flow	8 GPM (30 LPM)
Rated Operating Pressure	400-3500 PSI (28-241 bar)
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	30 micron nominal
Media Operating Temperature Range	-40° to 250° F (-40° to 120° C)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Size	Delta Series 7/8-14 Thread.
Cartridge Torque Requirements	30 ft-lbs (40.6 Nm)
Coil Torque Nut Requirements	4-6 ft-lbs. (5.4-8.1 Nm)

DIMENSIONS

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

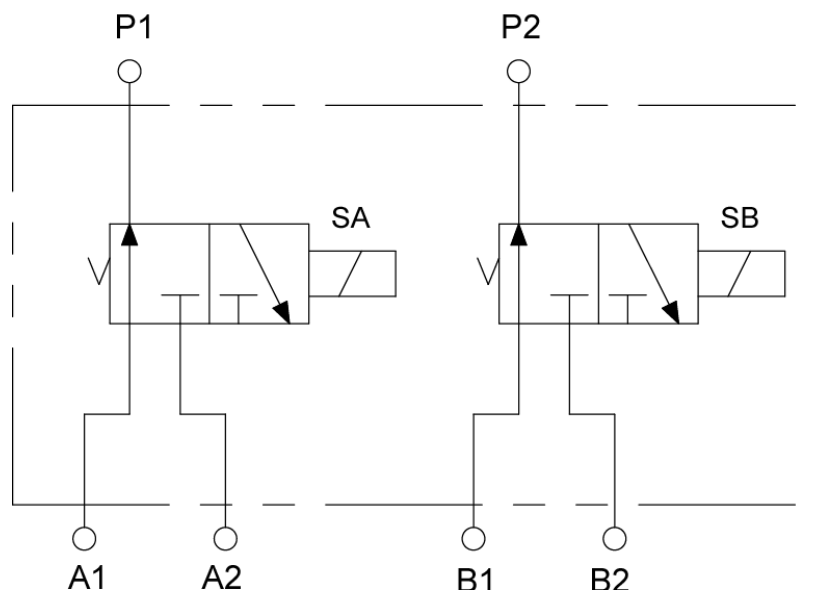
Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com



OPTIONS CHART



CIRCUIT QA

ORDERING INFORMATION

CIRCUITS	A	OPTIONS	00 V0 0M	VOLTAGE	06 12 24 36 48 25 11 22 44	SS DS HC CL DI	IMMERSION PROOF COILS
		Buna Standard Viton Standard Manual Override		6 VDC 12 VDC 24VDC 36 VDC 48 VDC 25 VAC 120 VAC 220 VAC 440 VAC			
"D" COIL TERMINATION <i>(All DC Except as Noted)</i>							
DL	Double Lead					SS	Single Spade
DT	Deutsch on Leads DT04-2P					DS	Double Spade
ML	Metri-Pack on Leads					HC	DIN 43650 (Hirschman) – (AC & DC)
PL	Packard on Leads					CL	Conduit Lead – (AC Only)
WL	Weatherpack on Leads					DI	Deutsch – Integral DT04-2P
						IA	"I" Coil AMP Superseal - Integral
						ID	"I" Coil Deutsch – Integral DT04-2P
						IJ	"I" Coil AMP Jr. Timer - Integral
						IM	"I" Coil Metri-Pack – Integral

Approximate Coil Weight: .74 lbs/.33 kg.

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

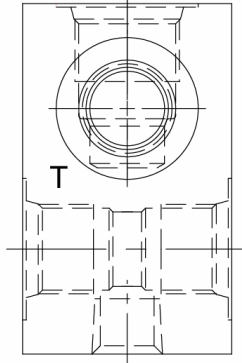
Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com

**Pre-Engineered Circuit, Option Model R***

BASE BODY - 20200019 = #8 SAE



BODY WEIGHT: .66 lbs. [.30 kg.]

DESCRIPTION

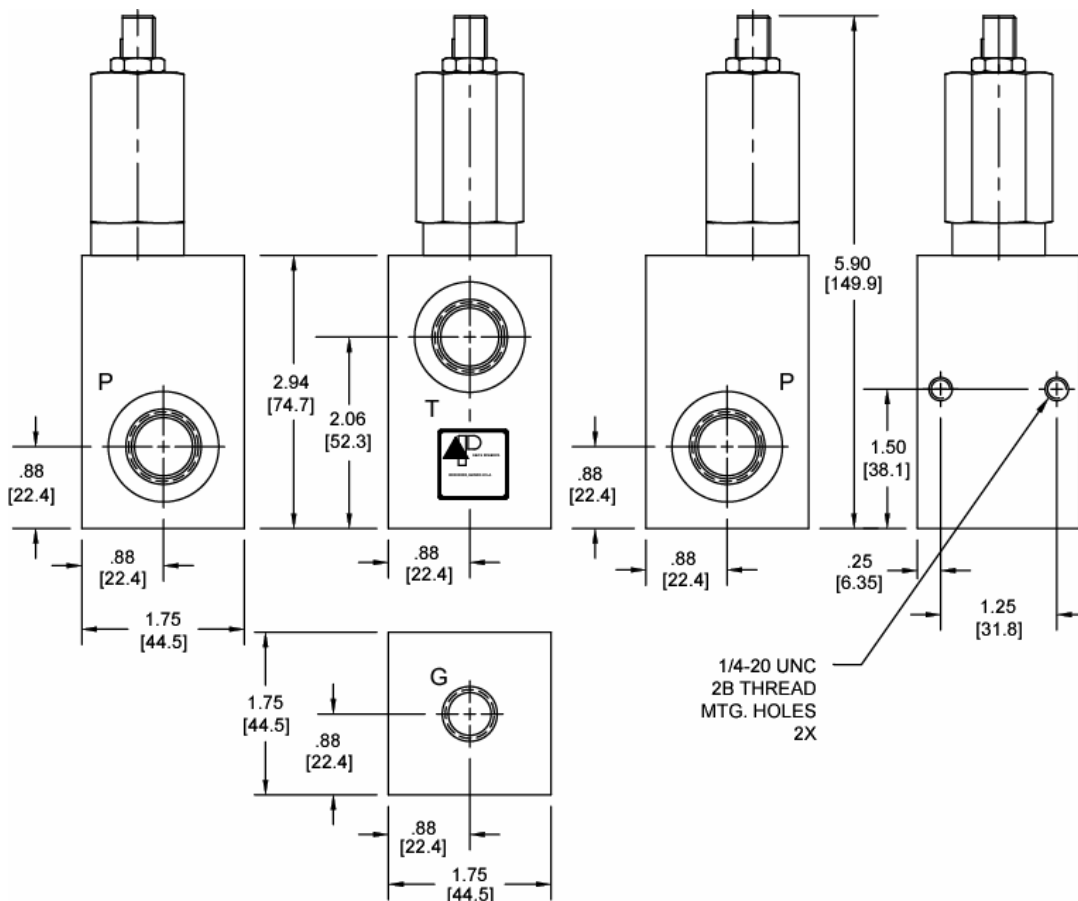
Pre-engineered circuit, option model R*

OPERATION

See typical schematic for specific operation.

VALVE SPECIFICATIONS

Nominal Flow	15 GPM (57 LPM)
Rated Operating Pressure	4000 PSI (276 bar)
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	30 micron nominal
Media Operating Temperature Range	-40° to 250° F (-40° to 120° C)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Size	Delta Series 7/8-14 Thread.
Cartridge Torque Requirements	30 ft-lbs (40.6 Nm)

DIMENSIONS

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

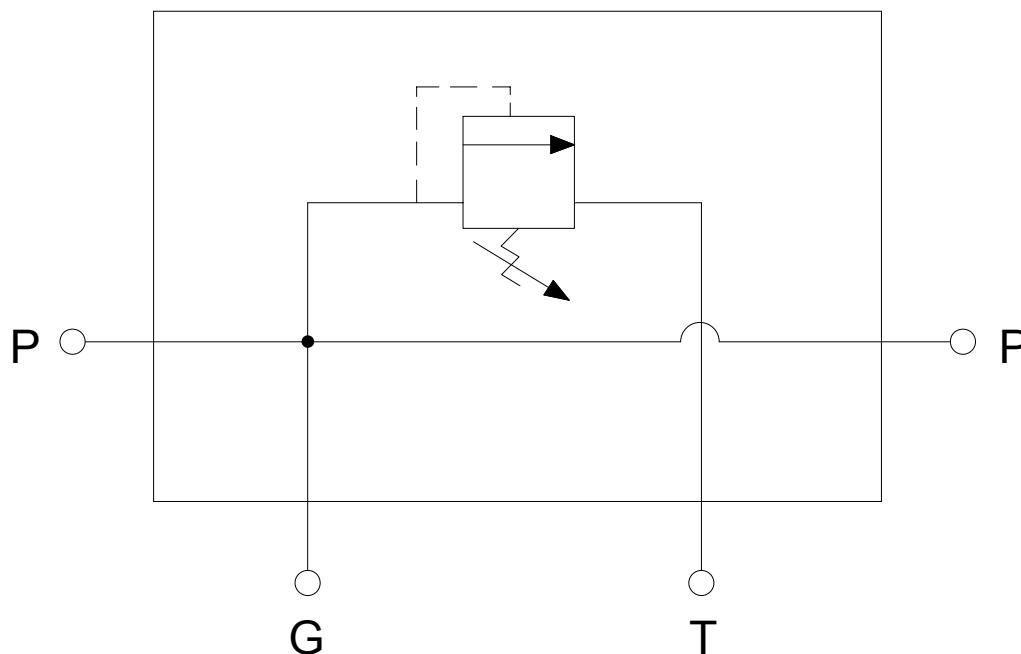
Phone: (815) 397-6628

Fax: (815) 397-2526

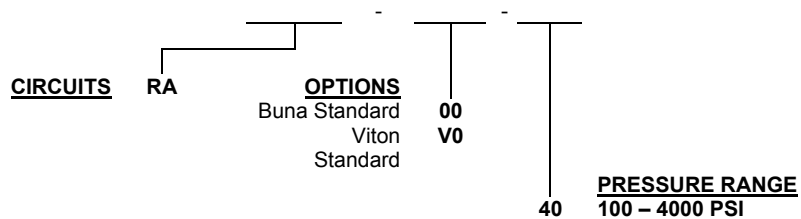
E-mail: delta@delta-power.com



TYPICAL SCHEMATIC


CIRCUIT RA

ORDERING INFORMATION

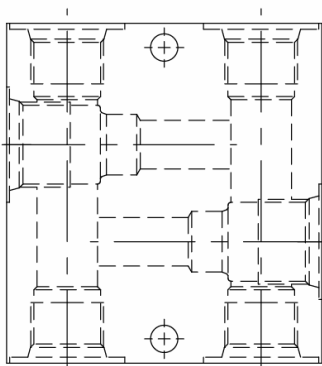

FOR SPECIAL PRESET VALUES ON VALVES, CONSULT FACTORY

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Pre-Engineered Circuit, Option Model S*
BASE BODY - 20200020 = #8 SAE


BODY WEIGHT: 1.2 lbs. [.54 kg.]

DESCRIPTION

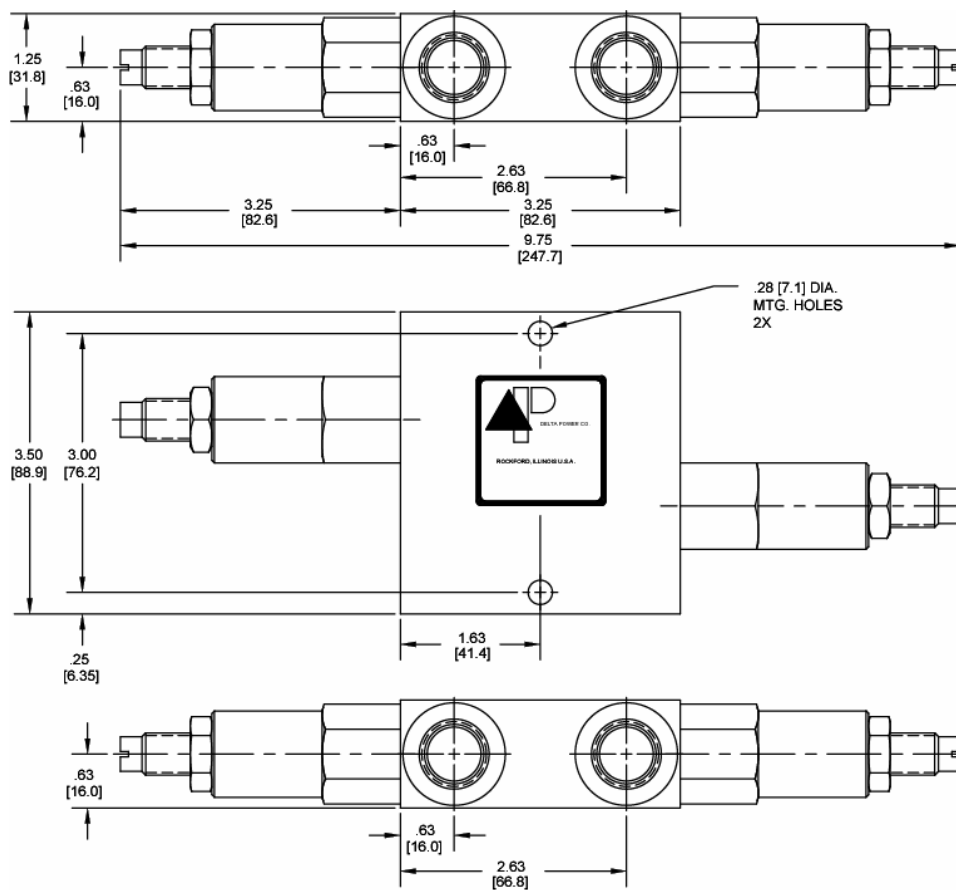
Pre-engineered circuit, option model S*

OPERATION

See options chart for specific operation

VALVE SPECIFICATIONS

Nominal Flow	See Option Chart for Flow Range
Rated Operating Pressure	See Option Chart for Pressure Range
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	30 micron nominal
Media Operating Temperature Range	-40° to 250° F (-40° to 120° C)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Size	Delta Series 7/8-14 Thread.
Cartridge Torque Requirements	30 ft-lbs (40.6 Nm)
Coil Torque Nut Requirements	6 ft-lbs. (8.1 Nm)

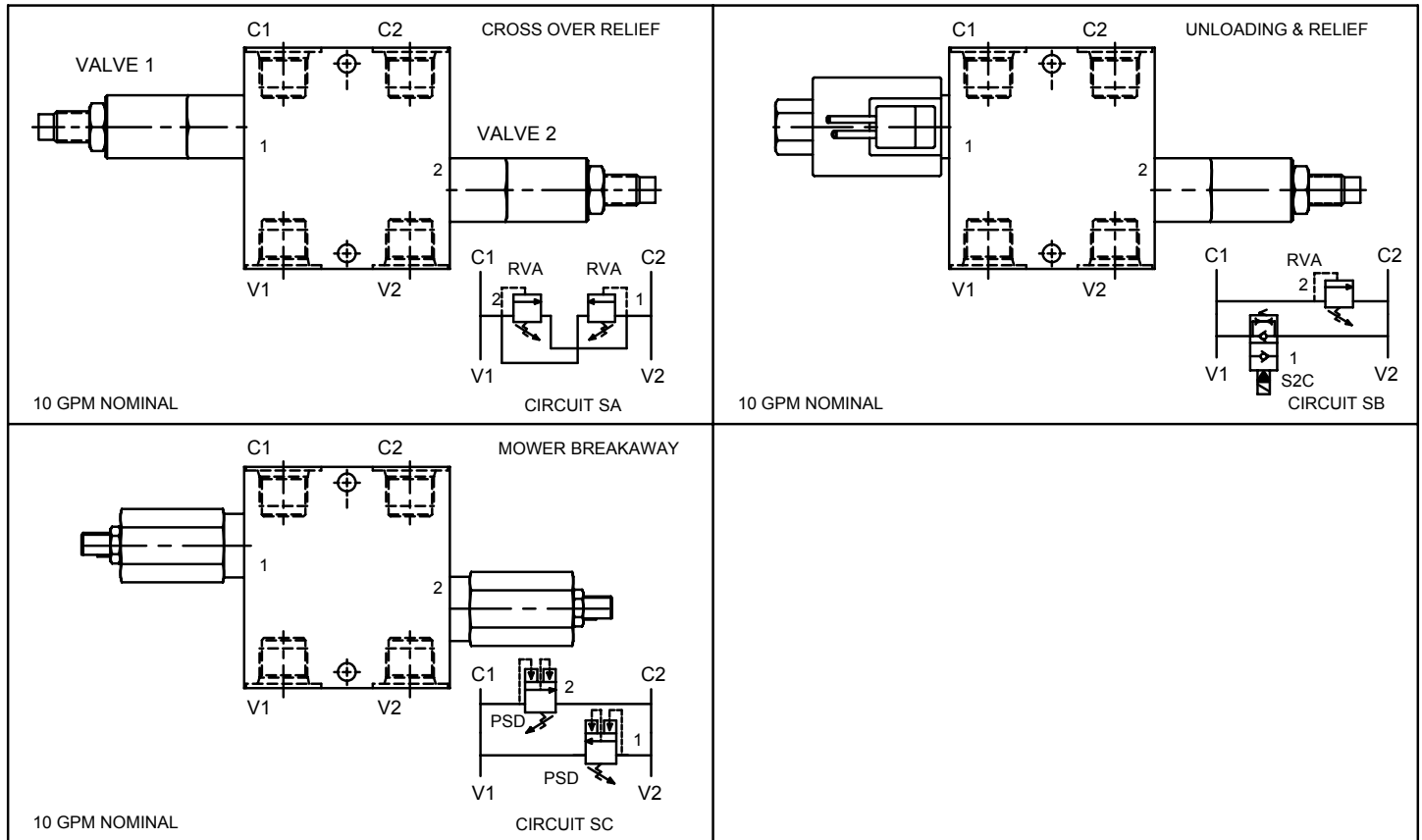
DIMENSIONS


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OPTIONS CHART

ORDERING INFORMATION

CIRCUITS		OPTIONS		VOLTAGE		VALVE 2		PRESSURE	
SA		Buna Standard	00	06	6 VDC	01	.5-1 GPM	15	150-1500 PSI
SB		Viton Standard	V0	12	12 VDC	02	1-2 GPM	30	1500-3000 PSI
SC				24	24 VDC	04	2-4 GPM	40	2500-4000 PSI
				36	36 VDC	08	4-8 GPM		RELIEF VALVE
				48	48 VDC		FLOW CONTROL		
				25	25 VAC				
				11	120 VAC		VALVE 1		
				22	220 VAC	01	.5-1 GPM	15	150-1500 PSI
				44	440 VAC	02	1-2 GPM	30	1500-3000 PSI
						04	2-4 GPM	40	2500-4000 PSI
						08	4-8 GPM		RELIEF VALVE
							FLOW CONTROL		

"D" COIL TERMINATION
 (All DC Except as Noted)

DL	Double Lead	HC	DIN 43650 (Hirschman) – (AC & DC)
DT	Deutsch on Leads DT04-2P	CL	Conduit Lead – (AC Only)
ML	Metri-Pack on Leads	DI	Deutsch – Integral DT04-2P
PL	Packard on Leads		IMMERSION PROOF "D" TYPE
WL	Weatherpack on Leads	IA	"I" Coil AMP Superseal - Integral
SS	Single Spade	ID	"I" Coil Deutsch – Integral DT04-2P
DS	Double Spade	IJ	"I" Coil AMP Jr. Timer - Integral
		IM	"I" Coil Metri-Pack – Integral

Approximate Coil Weight: .74 lbs (.33 kg.)

FOR SPECIAL PRESET VALUES ON VALVES, CONSULT FACTORY

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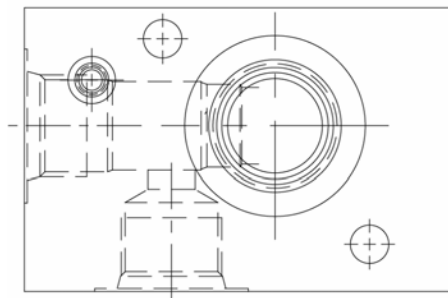
Fax: (815) 397-2526

E-mail: delta@delta-power.com



Pre-Engineered Circuit, Option Model TA

BASE BODY - 20200022 = #12 SAE



BODY WEIGHT: 3.48 lbs. [1.57 kg.]

DESCRIPTION

16 size, 1 5/16-12 thread, "Super" series, pilot operated ball check valve.

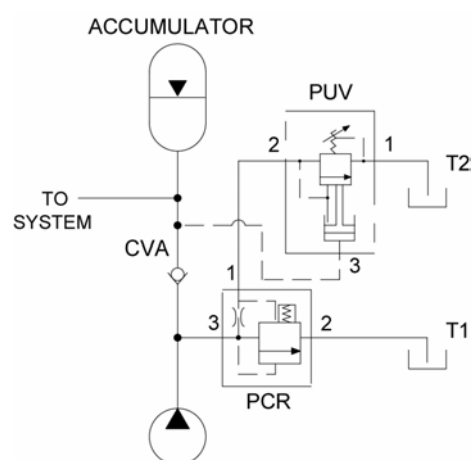
OPERATION

The TA allows flow to pass from (V1) to (C1) and (V2) to (C2). The valve blocks flow from (C1) to (V1) and from (C2) to (V2). Blocked flow is released when pilot pressure is applied to port opposite valve (V1) and/or port (V2) accordingly.

FEATURES

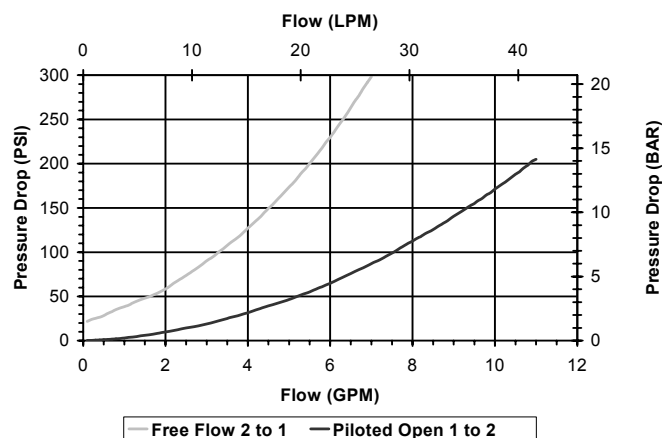
- Hardened internal parts for long life.
- Anodized aluminum body for corrosive protection.

TYPICAL SCHEMATIC



PERFORMANCE

Actual Test Data (Cartridge Only)



VALVE SPECIFICATIONS

Nominal Flow	20 GPM (76 LPM)
Rated Operating Pressure	3000 PSI (207 bar)
Typical Internal Leakage (150 SSU)	0-5 drops min
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	30 micron nominal
Pilot Ratio	3.7 : 1
Media Operating Temperature Range	-40° to 250° F (-40° to 120° C)
Weight	4.3 lbs. (2.0 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	30 ft-lbs (40.6 Nm)
Cartridge Crack Pressure	50 PSI (3.4 bar)

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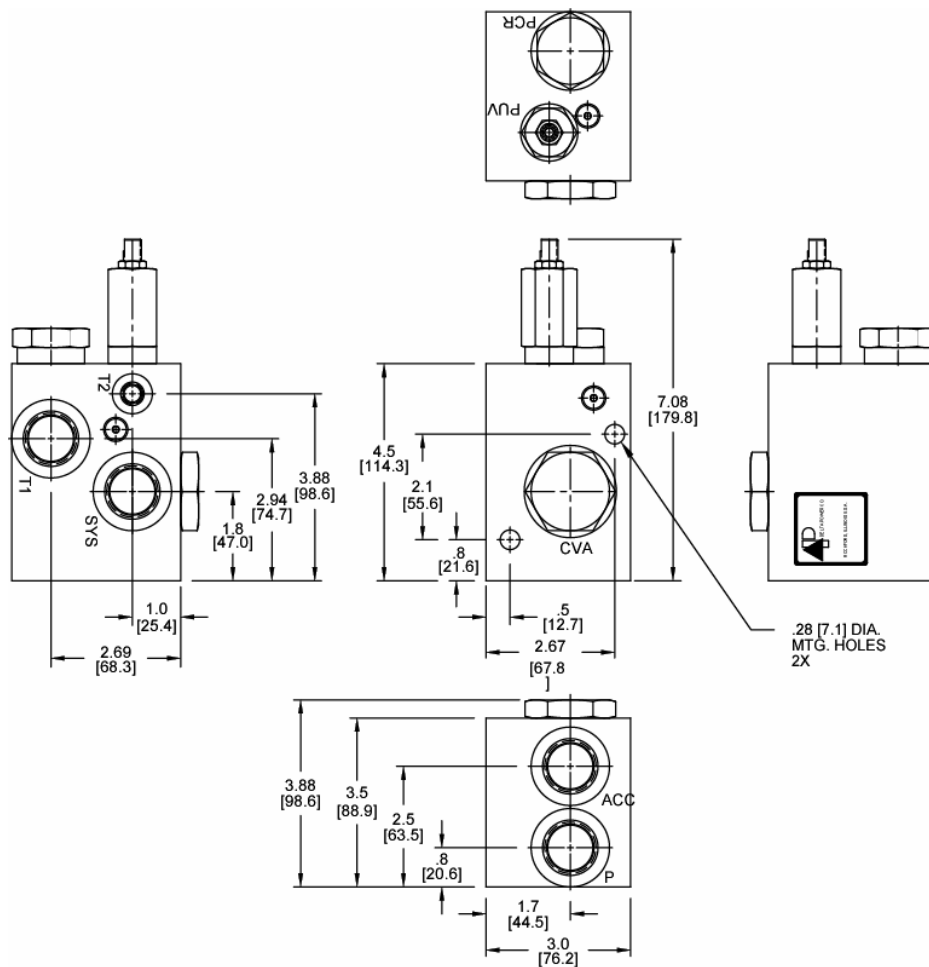
Phone: (815) 397-6628

Fax: (815) 397-2526

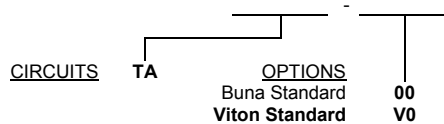
E-mail: delta@delta-power.com



DIMENSIONS



ORDERING INFORMATION



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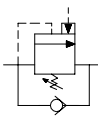
E-mail: delta@delta-power.com



SECTION/Description	Pages
Counterbalance Valves	615
In-Line Valves	619
Motorized Valves	629
Hand Pumps	637
Selector Valves	647
Transmission “Low Pressure” Solenoid Valves	651
Unitized Valves	659

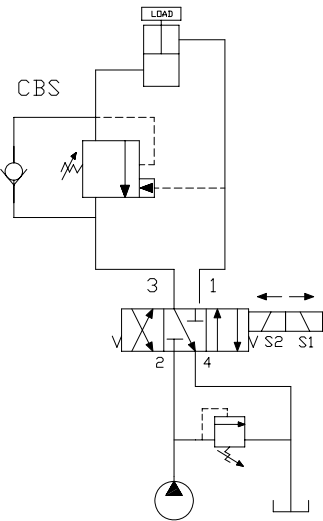
WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

Counterbalance Valves

	GPM	PSI	LPM	BAR	MODEL	PAGE
	15	4000	57	276	QS-CBS	616

Typical Schematic

Typical application is for CBS is to counterbalance a load in a load holding circuit.



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QS-CBS Counterbalance Valve, 3:1 Ratio

DESCRIPTION

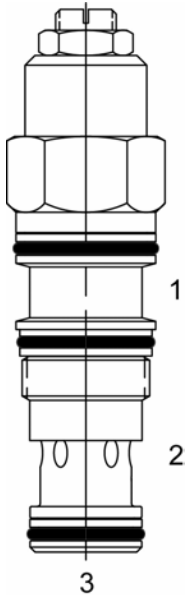
M20 X 1.5 thread, counterbalance valve, 3:1 ratio.

OPERATION

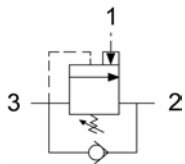
The QS-CBS check valve allows free flow from the directional valve (2) to the load (1) while a direct-acting, pilot-assisted relief valve controls flow from port 3 to port 2. Pilot assist at port 1 lowers the effective setting of the relief valve at a rate determined by the pilot ratio (3:1).

FEATURES

- Hardened parts for long life.
- Industry common metric cavity.

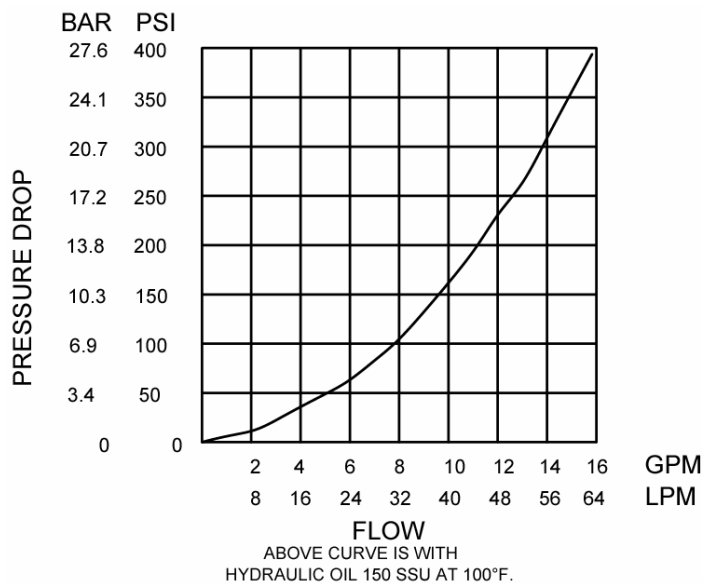


HYDRAULIC SYMBOL



Counterbalance valves with pilot assist are meant to control an overrunning load. Other names for this valve include motion control valve and over center valve.

PERFORMANCE



VALVE SPECIFICATIONS

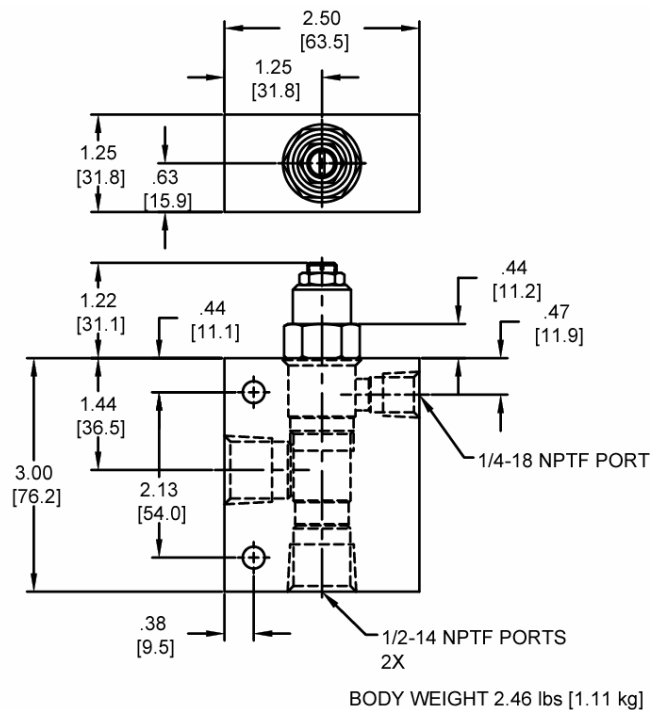
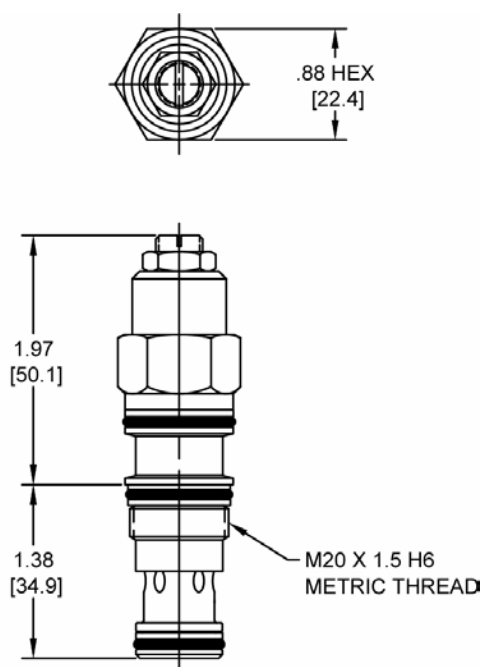
Nominal Flow	15 GPM (57 LPM)
Rated Operating Pressure	4000 PSI (276 bar)
Typical Internal Leakage (150 SSU)	0-10 drops/min
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temperature Range	-40° to 250° F (-40° to 120° C)
Weight	.33 lbs. (.15 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	30 ft-lbs (40.6 Nm)
Cavity	QS SPECIAL 3W
Cavity Form Tool (Finishing)	40500012
Seal Kit	21170016

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DIMENSIONS

ORDERING INFORMATION
QS-CBS
OPTIONS
 Buna Standard

00

 Blank
N
BODIES
 Without Body
 1/2 NPT Ports

PRESSURE RANGE/SETTING
1500
4000

 400 – 1500 PSI
 1000 – 4000 PSI

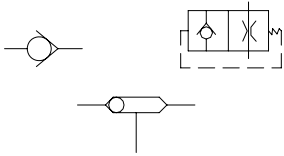
WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

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In-Line Valves

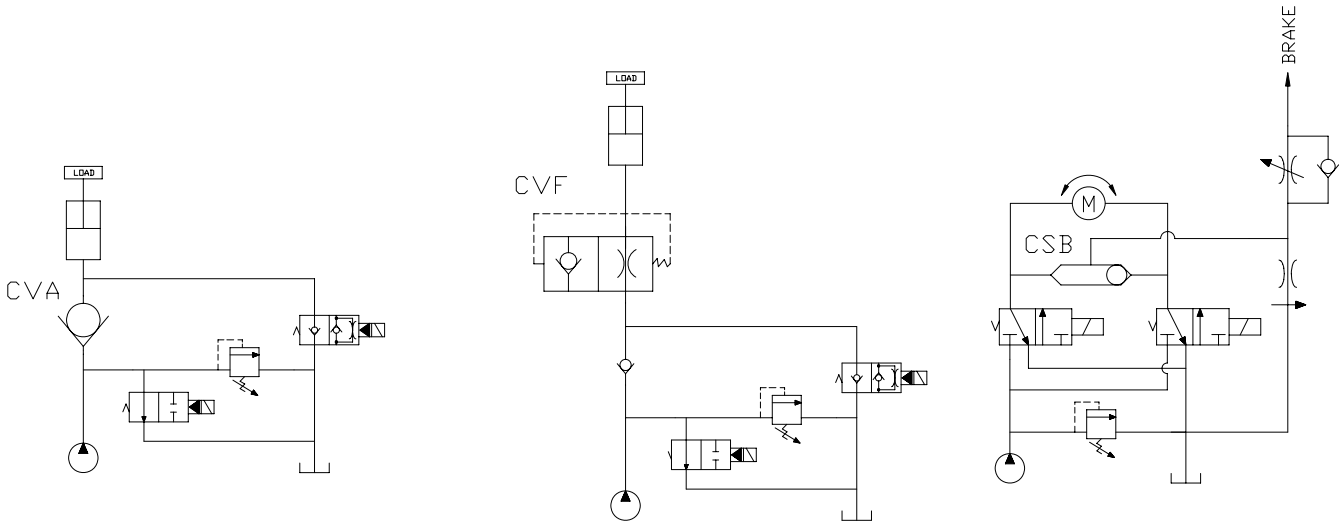
	GPM	PSI	LPM	BAR	MODEL	PAGE
	8	3000	30	207	IM-CVA	620
	6	3000	23	207	IM-CVF-11	622
	6	3000	23	207	IM-CVF-13	624
	10	3500	38	241	IM-CSB	626

Typical Schematic

Typical application is the CVA is load holding in a lift, check and dump circuit.

Typical application for the CVF is to mounted directly in the bottom of a cylinder and sized 1-2 GPM higher then the lowering speed. There fore the load will not free fall in the event of line damage. Valve will not re-open until pressure is bled off port (1).

Typical application for the CSB is load sense with motor circuit with a spring loaded brake.



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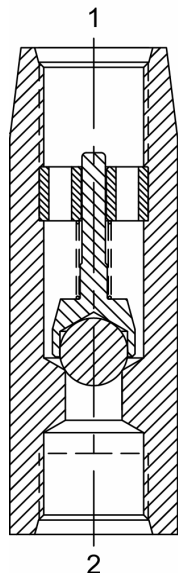
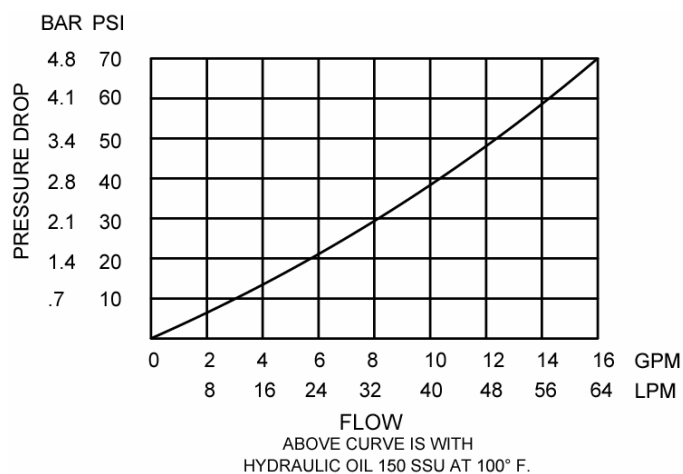
**IM-CVA Inline Check Valve****DESCRIPTION**

#8 SAE, inline check valve.

OPERATION

The IM-CVA allows flow from (2) to (1), while normally blocking oil flow from (1) to (2).

The valve has a guided check ball, which is spring-biased closed until sufficient pressure is applied at (2) to open to (1).

**FEATURES****HYDRAULIC SYMBOL****PERFORMANCE****VALVE SPECIFICATIONS**

Nominal Flow	8 GPM (30 LPM)
Rated Operating Pressure	3000 PSI (207 bar)
Typical Internal Leakage (150 SSU)	0-5 drops/min
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temperature Range	-40° to 250° F (-40° to 120° C)
Weight	.53 lbs. (.24 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid

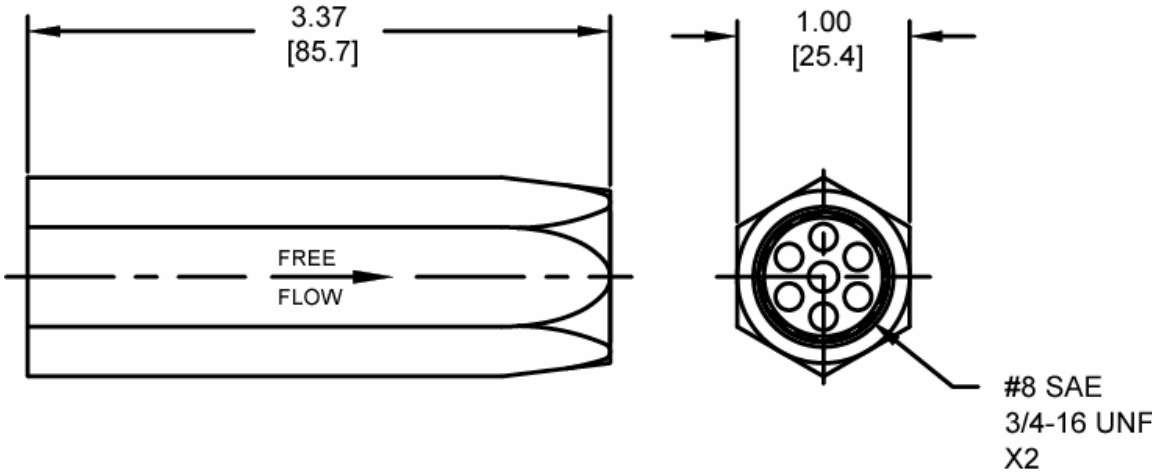
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DIMENSIONS



ORDERING INFORMATION

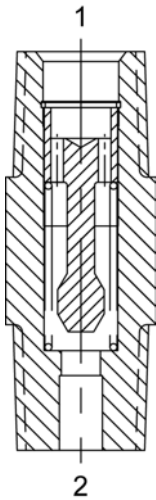
IM-CVA		-	-	
<u>OPTIONS</u>				<u>CRACK PRESSURE</u>
Standard	00	0005	5 PSI	
		0025	25 PSI	
		0050	50 PSI	
		0075	75 PSI	

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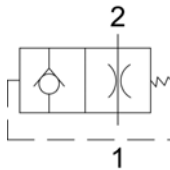
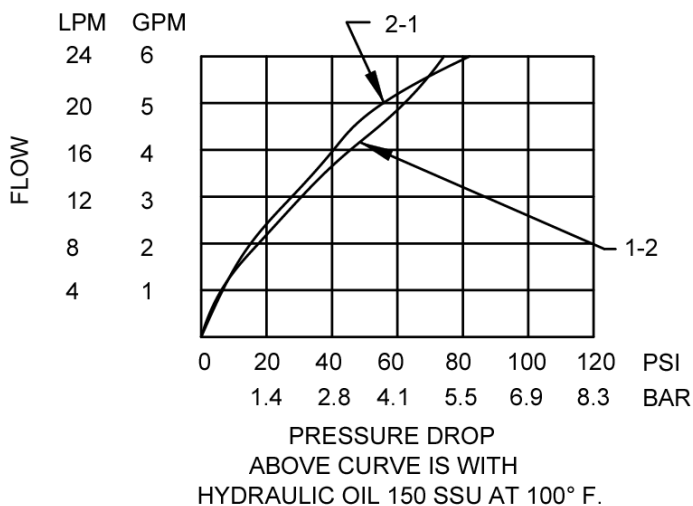
E-mail: delta@delta-power.com

**IM-CVF-11 Inline Velocity Fuse****DESCRIPTION**

3/8 NPTF thread, inline velocity fuse.

OPERATION

The IM-CVF-11 allows flow to pass between (1) and (2). When oil velocity from (1) to (2) exceeds the flow setting, the valve shifts and blocks flow from (1) to (2).

FEATURES**HYDRAULIC SYMBOL****PERFORMANCE****VALVE SPECIFICATIONS**

Nominal Flow Max.	6 GPM (23 LPM)
Rated Operating Pressure	3500 PSI (241 bar)
Typical Internal Leakage (150 SSU)	0 – 5 drops/min
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temperature Range	-40° to 250° F (-40° to 120° C)
Weight	.18 lbs. (.08 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

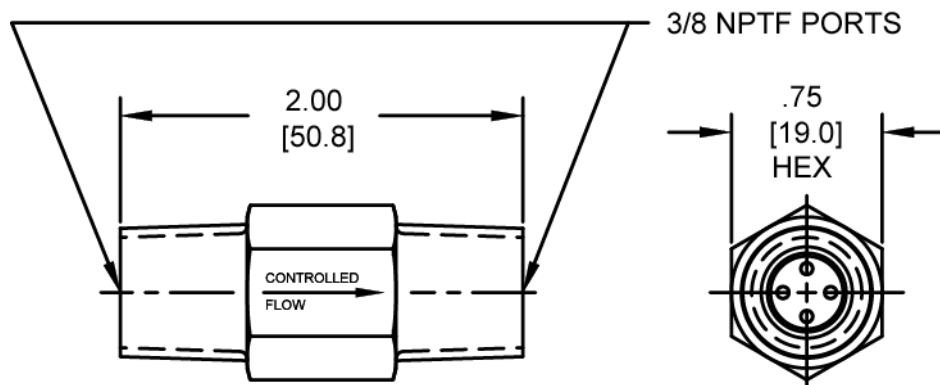
Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com



DIMENSIONS



ORDERING INFORMATION

IM-CVF - 11 -

01.0	1 GPM
02.0	2 GPM
03.0	3 GPM
04.0	4 GPM
05.0	5 GPM
06.0	6 GPM

FLOW SETTINGS

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

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IM-CVF-13 Inline Velocity Fuse

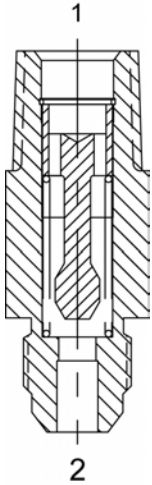
DESCRIPTION

3/8 NPTF (1) and #6 3/8 JIC (2) thread, inline velocity fuse.

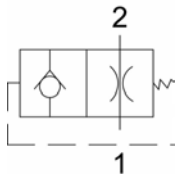
OPERATION

The IM-CVF-13 allows flow to pass between (1) and (2). When oil velocity from (1) to (2) exceeds the flow setting, the valve shifts and blocks flow from (1) to (2).

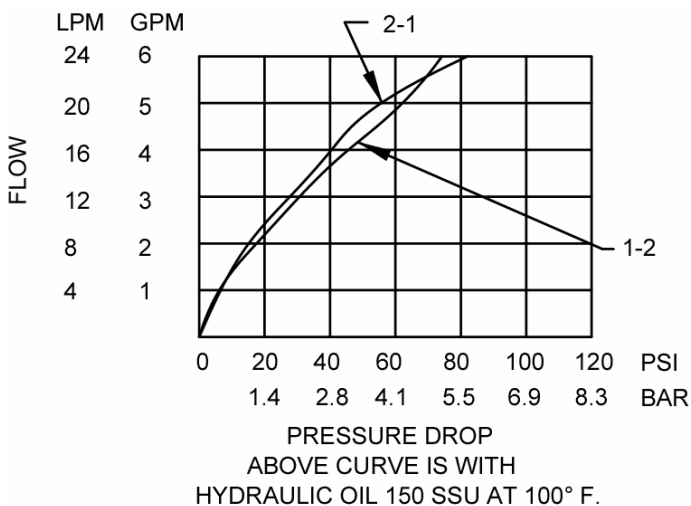
FEATURES



HYDRAULIC SYMBOL



PERFORMANCE



VALVE SPECIFICATIONS

Nominal Flow Max.	6 GPM (23 LPM)
Rated Operating Pressure	3000 PSI (207 bar)
Typical Internal Leakage (150 SSU)	0 – 5 drops/min
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temperature Range	-40° to 250° F (-40° to 120° C)
Weight	.16 lbs. (.07 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

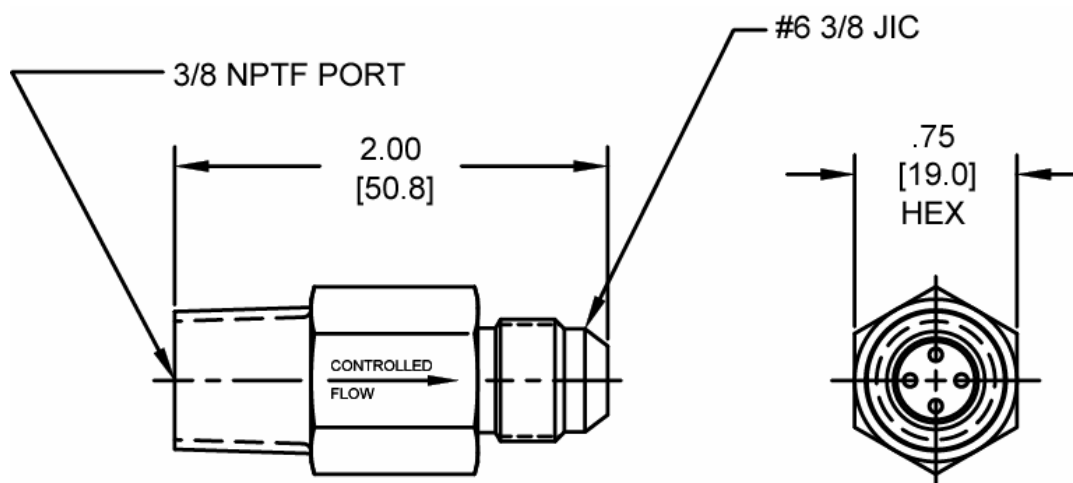
Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com



DIMENSIONS



ORDERING INFORMATION

IM-CVF - 13 -

01.0	1 GPM
02.0	2 GPM
03.0	3 GPM
04.0	4 GPM
05.0	5 GPM
06.0	6 GPM

FLOW SETTINGS

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

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E-mail: delta@delta-power.com

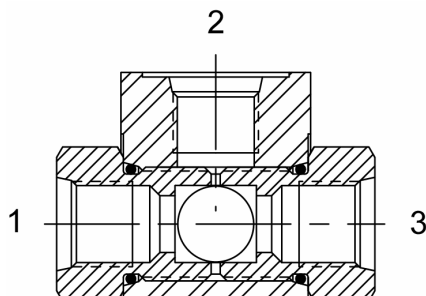
**IM-CSB Inline Shuttle Valve****DESCRIPTION**

#6 SAE, inline shuttle valve.

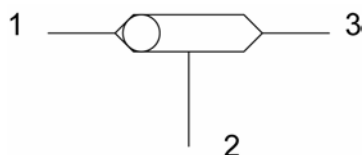
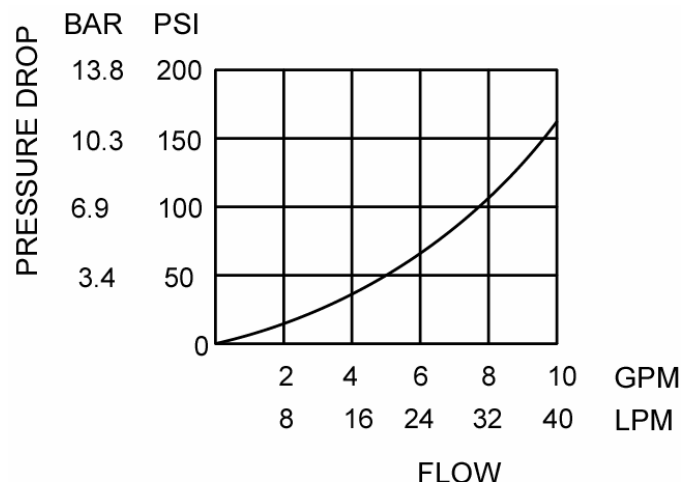
OPERATION

The IM-CSB allows flow from the higher pressure of (1) or (3) to (2).

The valve is commonly used as a load sense to direct oil from the pressure side of a bidirectional hydraulic motor to a pressure released hydraulic brake.

**FEATURES**

- Hardened parts for long life.

HYDRAULIC SYMBOL**PERFORMANCE**

ABOVE CURVE IS WITH
HYDRAULIC OIL 150 SSU AT 100°F.

VALVE SPECIFICATIONS

Nominal Flow	10 GPM (38 LPM)
Rated Operating Pressure	3500 PSI (241 bar)
Typical Internal Leakage (150 SSU)	1 cu in/min (16 ml/min)
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temperature Range	-40° to 250° F (-40° to 120° C)
Weight	.28 lbs. (.13 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid

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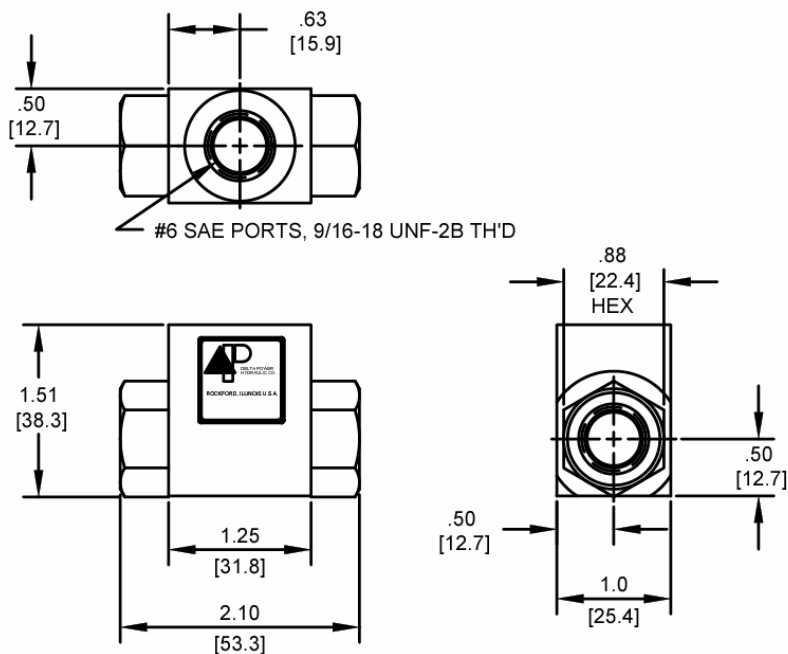
Phone: (815) 397-6628

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DIMENSIONS



ORDERING INFORMATION

IM-CSB -

Buna Standard	00
Viton Standard	V0

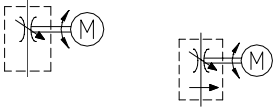
WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

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Fax: (815) 397-2526

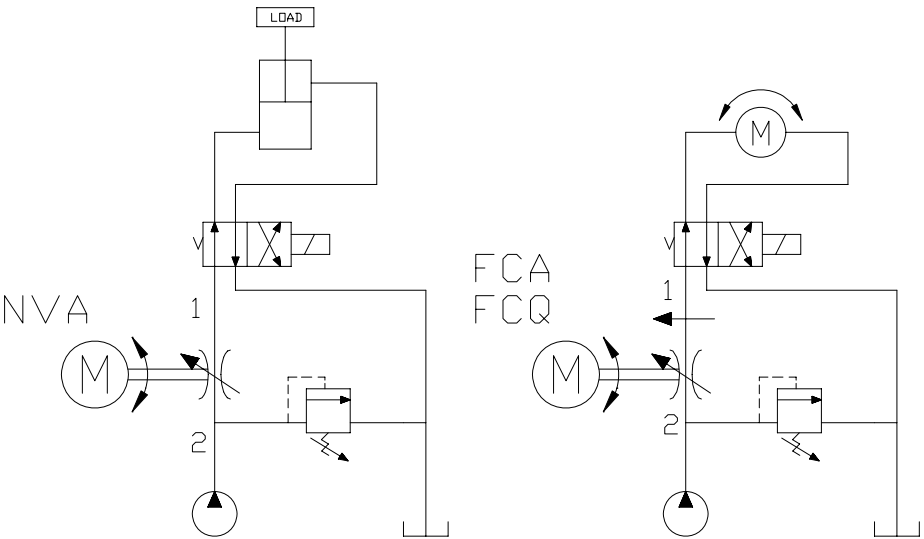
E-mail: delta@delta-power.com

Motorized Valves

	GPM	PSI	LPM	BAR	MODEL	PAGE
	15	3500	57	241	AE-NVA	630
	25	3500	95	241	AJ-FCA	632
	25	3500	95	241	AK-FCQ	634

Typical Schematic

Typical application for the NVA is to adjust metered flow to control speed or full bypass of a fluid motor or cylinder.
Typical application for the FCA and FCQ is to adjust pressure compensated flow to control speed of a fluid motor or cylinder.



WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

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AE-NVA Motorized Needle Flow Control Valve

DESCRIPTION

10 size, 7/8-14 thread, "Delta" series, motorized needle flow control valve.

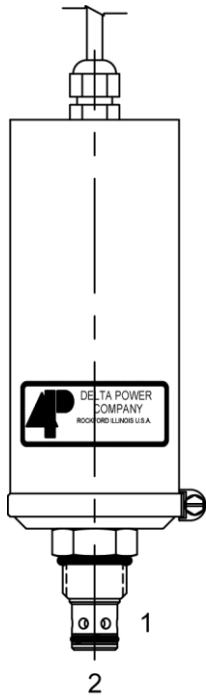
OPERATION

The AE-NVA can be adjusted to any position between fully open and fully closed by applying electrical power to the motor.

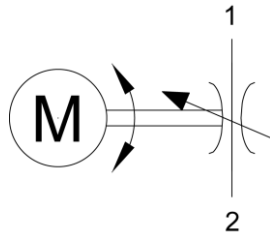
The amount of valve opening does not change unless the electric motor is activated. When adjusted open, the valve allows flow from (1) to (2) and (2) to (1). When fully closed the valve blocks flow from (1) to (2) and (2) to (1).

FEATURES

- Hardened parts for long life.
- Industry common cavity.



HYDRAULIC SYMBOL



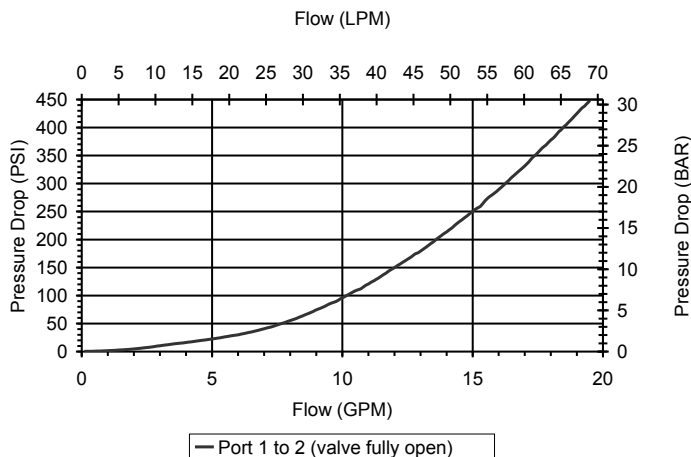
VALVE SPECIFICATIONS

Nominal Flow	10 GPM (38 LPM)
Rated Operating Pressure	3500 PSI (241 bar)
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temperature Range	-40° to 250° F (-40° to 120° C)
Weight	1.68 lbs. (.76 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	30 ft-lbs (40.6 Nm)
Travel Time at Rated Voltage	10-12 sec Min to Max Setting
Power Requirements	5 Watts
Allowable Input Voltage	80% - 120% of Rated
Cavity	DELTA 2W
Cavity Form Tool (Finishing)	40500000
Seal Kit	21191200



Product when adjusted fully closed does not close to zero flow. (.5 to 1 GPM @ 200 PSI)

PERFORMANCE

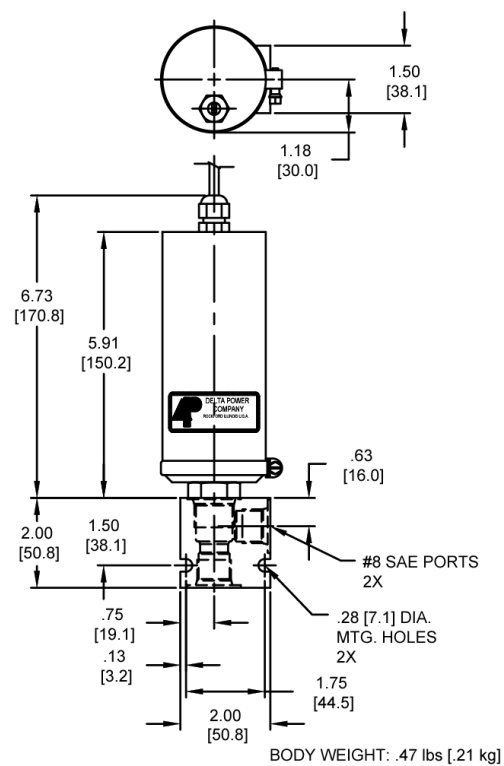
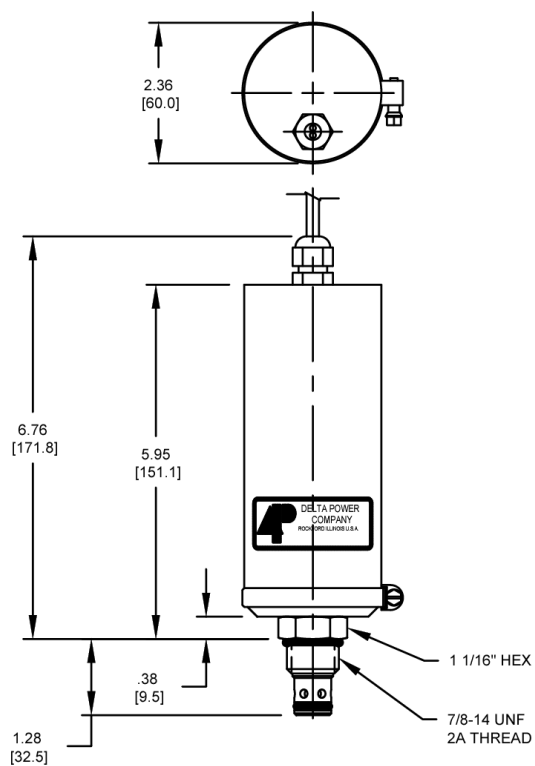


WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com


DIMENSIONS

ORDERING INFORMATION

AE-NVA - - - - -			
OPTIONS			BODIES
Buna Standard	00	Blank	Without Body
		N	3/8 NPT Ports
		S	# 8 SAE Ports
TERMINATION		VOLTAGE	
Dual Lead, 22" Long	DL	12	12 VDC

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

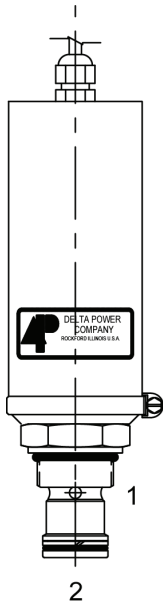
Phone: (815) 397-6628

Fax: (815) 397-2526

 E-mail: delta@delta-power.com



AJ-FCA Motorized Adjustable Pressure Compensated Flow Control



DESCRIPTION

16 size, 1 5/16 -12 thread, "Super" series, motorized adjustable pressure compensated flow control valve. A screw-in, cartridge-style, adjustable orifice, pressure compensated, hydraulic flow regulating valve.

OPERATION

The AJ-FCA maintains a constant flow rate out of (1) regardless of load pressure changes in the circuit downstream of (1).

The adjustable control orifice can be set to customer flow specification. (see options for ranges)

The valve begins to respond to load changes when the flow through the valve creates a pressure differential across the control orifice greater than 100 PSI (6.9 bar), with accurate flow maintenance from 100 to 3500 PSI (6.9 to 240 bar).

Reverse flow (1) to (2) returns through the control orifice and is non-compensated.

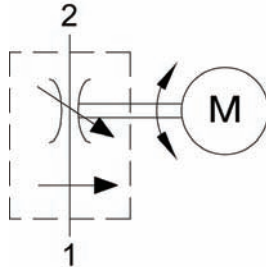
FEATURES

- Hardened parts for long life.
- Industry common cavity.
- Fine low-torque adjustment.

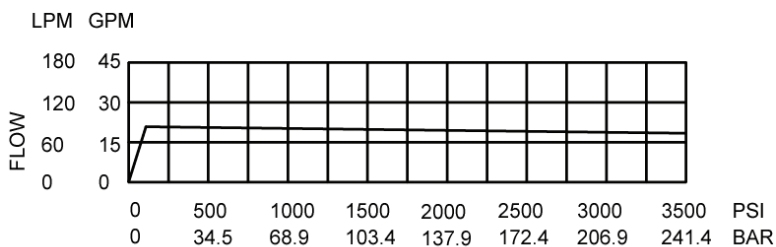


Note: When used as a bypass flow control in applications. Where the priority flow port will be blocked by external valving, bypass pressure drop will increase unless a small amount of leakage is provided for the priority port. Consult factory.

HYDRAULIC SYMBOL



PERFORMANCE



ABOVE CURVE IS WITH
HYDRAULIC OIL 150 SSU AT 100°F.

VALVE SPECIFICATIONS

Nominal Flow	25 GPM (95 LPM)
Rated Operating Pressure	3500 PSI (241 bar)
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temperature Range	-40° to 250° F (-40° to 120° C)
Weight	2.12 lbs. (.96 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	90 ft-lbs (122 Nm)
Flow Range	25 to 25 GPM
Travel Time at Rated Voltage	18 sec Min to Max Setting
Power Requirements	5 Watts
Allowable Input Voltage	80% to 120% of Rated
Cavity	SUPER 2W
Cavity Form Tool (Finishing)	40500017
Seal Kit	21191400

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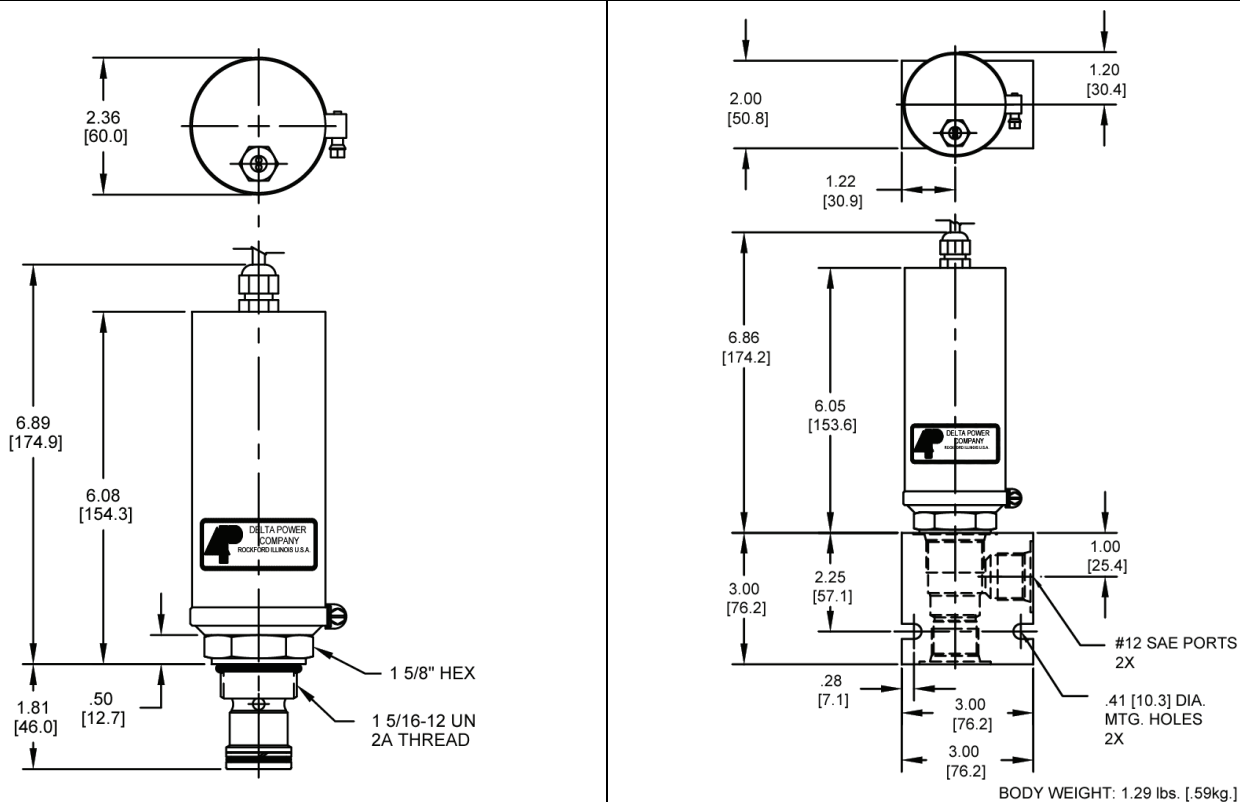
Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com



DIMENSIONS



ORDERING INFORMATION

AJ-FCA -

OPTIONS
Buna Standard

00

Blank
N
S

BODIES

Without Body
3/4 NPT Ports
12 SAE Ports

TERMINATION

Dual Lead, 22" Long

DL

12

VOLTAGE

12 VDC

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

Phone: (815) 397-6628

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AK-FCQ Motorized Adjustable Priority Flow Control Valve

DESCRIPTION

16 size, 1 5/16-12 thread, "Super" series, motorized adjustable priority flow control valve.

OPERATION

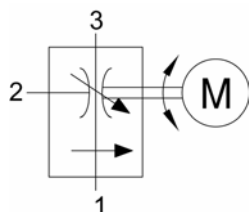
The AK-FCQ allows pressure compensated flow from (3) to (1) regulated by the pressure present at (3). Excess flow bypasses out (2).

The spring chamber is constantly vented at (1).

FEATURES

- Hardened parts for long life.
- Industry common cavity.

HYDRAULIC SYMBOL



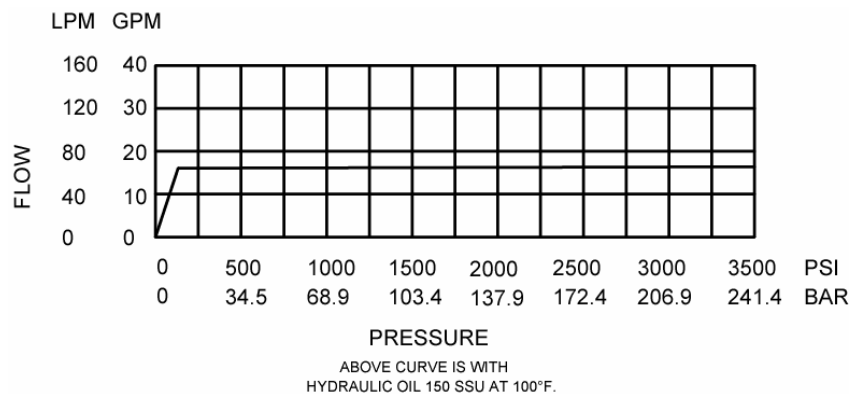
VALVE SPECIFICATIONS

Max Regulated Flow	25 GPM (95 LPM)
Rated Operating Pressure	3500 PSI (241 bar)
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temperature Range	-40° to 250° F (-40° to 120° C)
Weight	2.34 lbs. (1.06 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	90 ft-lbs (122 Nm)
Priority Flow Range	.25 GPM to 25 GPM
Travel Time at Rated Voltage	18 sec Min to Max Setting
Power Requirements	5 Watts
Allowable Input Voltage	80% - 120% of Rated
Cavity	SUPER 3W
Cavity Form Tool (Finishing)	40500018
Seal Kit	21191404



Note: When used as a bypass flow control in applications. Where the priority flow port will be blocked by external valving, bypass pressure drop will increase unless a small amount of leakage is provided for the priority port. Consult factory.

PERFORMANCE



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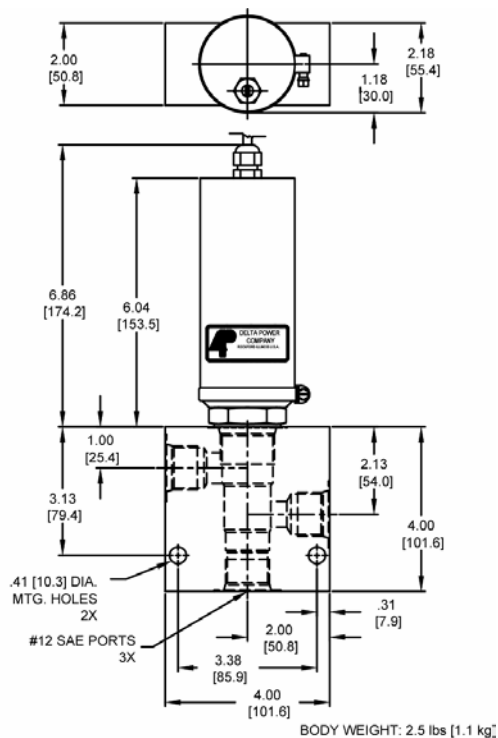
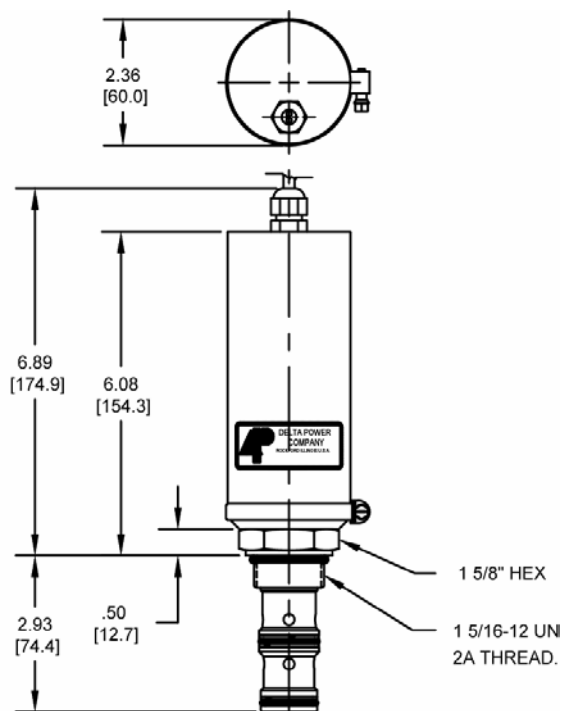
Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com



DIMENSIONS



ORDERING INFORMATION

AK-FCQ				-	-	-	-	-
<u>OPTIONS</u>								<u>BODIES</u>
Buna Standard	00						Blank	Without Body
							S	# 12 SAE Ports
<u>TERMINATION</u>								<u>VOLTAGE</u>
Dual Lead, 22" Long		DL		12				12 VDC

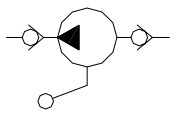
WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

Phone: (815) 397-6628

Fax: (815) 397-2526

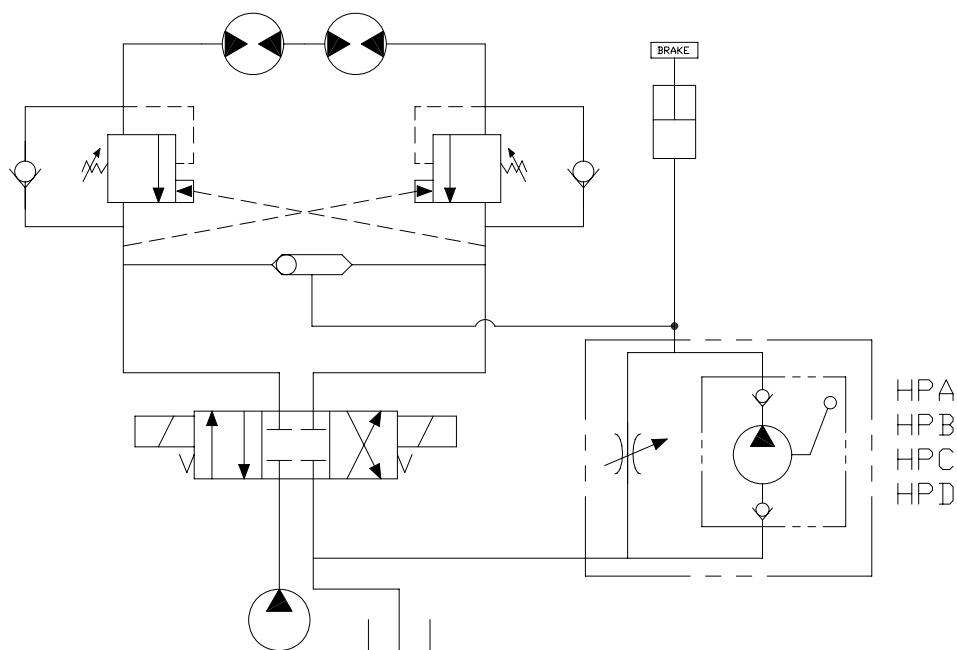
E-mail: delta@delta-power.com

Hand Pumps

	GPM	PSI	LPM	BAR	MODEL	PAGE
	--	500	--	34	DE-HPA	638
	--	2000	--	138	DE-HPB	640
	--	500	--	34	DE-HPC	642
	--	2000	--	138	DE-HPD	644

Typical Schematic

Typical application for the HPA, HPB, HPC, and HPD is to supply pressure to release brake pressure for towing.

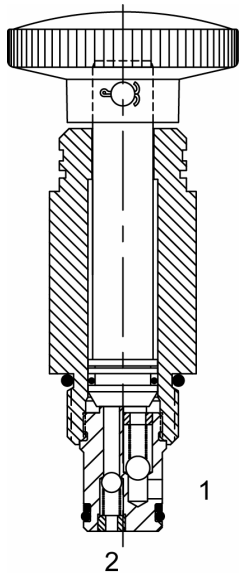


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Phone: (815) 397-6628

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E-mail: delta@delta-power.com

**DE-HPA Hand Pump****DESCRIPTION**

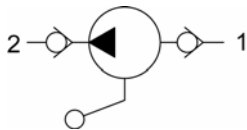
10 size, 7/8-14 thread, "Delta" series, cartridge type, plunger hand pump.

OPERATION

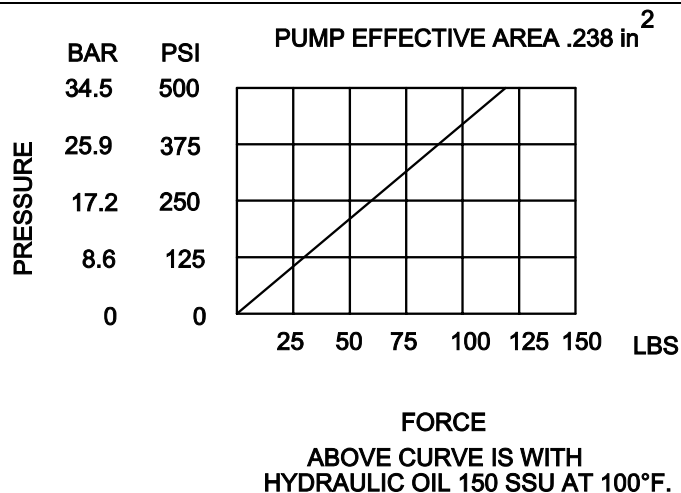
The DE-HPA hand pump when pulled primes thru Port (1) and when pushed pressurizes outlet port (2).

FEATURES

- Hardened parts for long life.
- Industry common cavity.

HYDRAULIC SYMBOL

This product is not intended as a load holding device.

PERFORMANCE**VALVE SPECIFICATIONS**

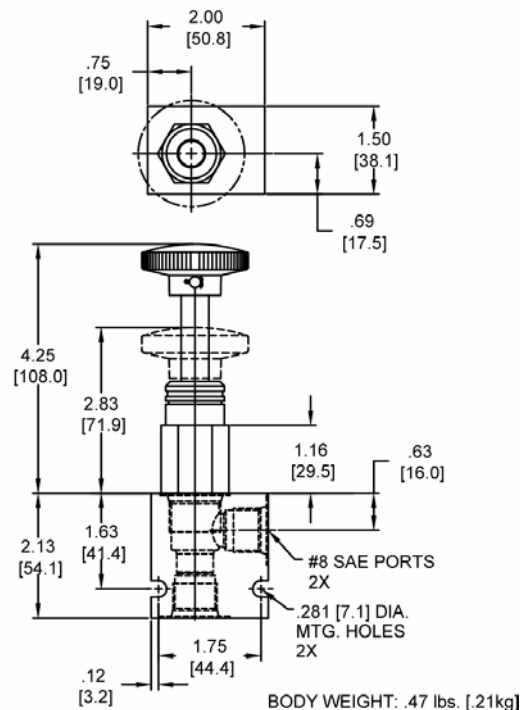
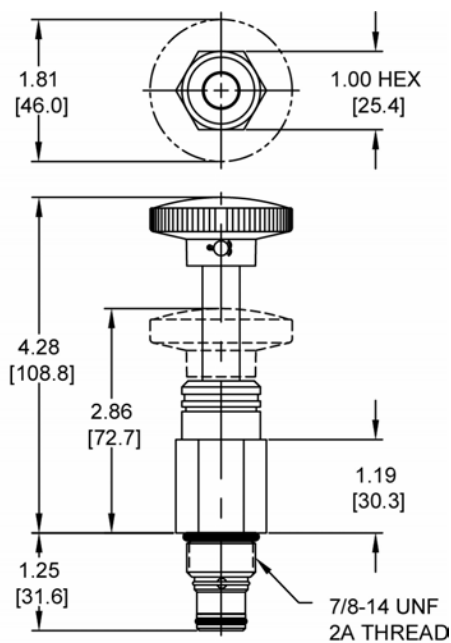
Nominal Flow	.35 cu in/stroke
Rated Operating Pressure	500 PSI (34 bar)
Typical Internal Leakage (150 SSU)	0-10 drops/min
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temperature Range	-40° to 250° F (-40° to 120° C)
Weight	.57 lbs. (.26 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	30 ft-lbs (40.6 Nm)
Cavity	DELTA 2W
Cavity Form Tool (Finishing)	40500000
Seal Kit	21191200

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com


DIMENSIONS

ORDERING INFORMATION
DE-HPA - -

OPTIONS

 Buna, Knob
 Viton, Knob

OK
VK

Blank

N
S
BODIES

 Without Body
 3/8 NPTF Ports
 #8 SAE Ports

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 E-mail: delta@delta-power.com

**DE-HPB Hand Pump****DESCRIPTION**

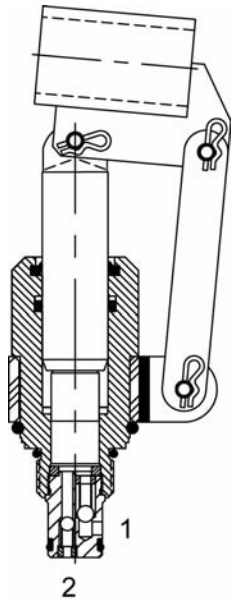
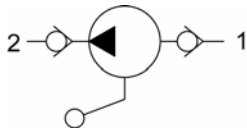
10 size, 7/8-14 thread, "Delta" series, screw in, cartridge type, hand pump.

OPERATION

The DE-HPB hand pump when pipe handle is lifted, primes thru port (1) and when pushed provides flow pressure to outlet port (2).

FEATURES

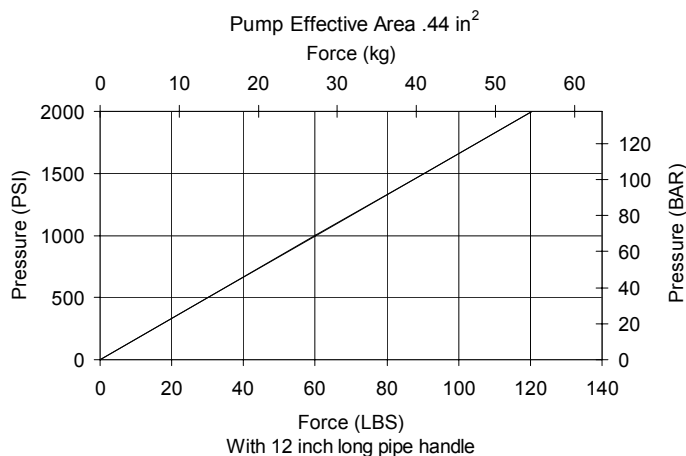
- Large displacement per stroke.
- Industry common cavity.

**HYDRAULIC SYMBOL**

This product is not intended as a load holding device.

Linkage is not to be removed.

24" handle not supplied.

PERFORMANCE**VALVE SPECIFICATIONS**

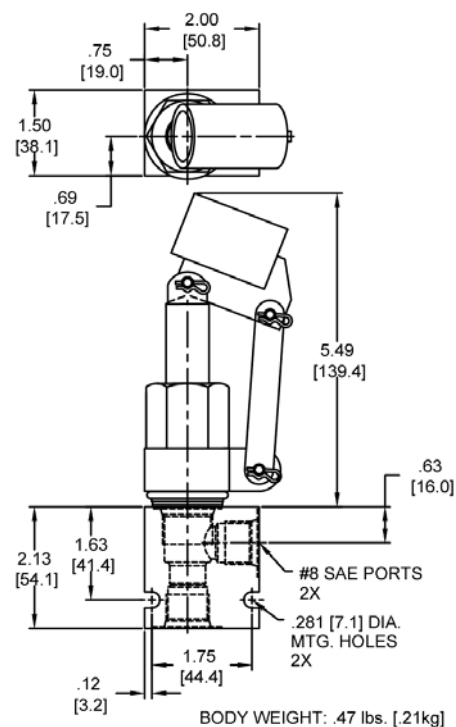
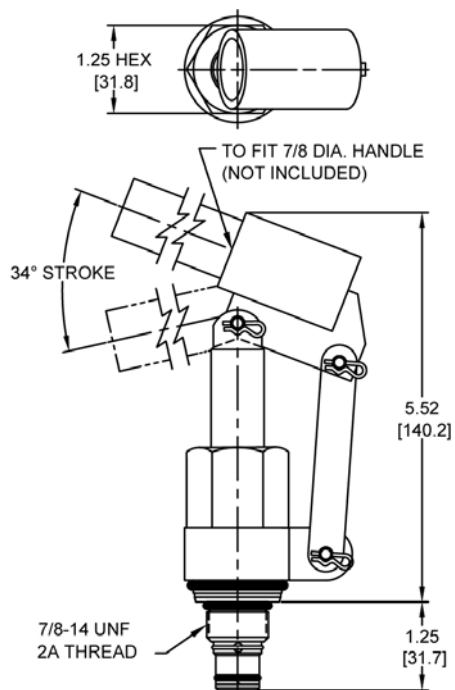
Nominal Flow	.39 cu in/stroke
Rated Operating Pressure	3000 PSI (207 bar)
Typical Internal Leakage (150 SSU)	0 – 10 drops/min
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temperature Range	-40° to 250° F (-40° to 120° C)
Weight	1.5 lbs. (.69 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	30 ft-lbs (40.6 Nm)
Cavity	DELTA 2W
Cavity Form Tool (Finishing)	40500000
Seal Kit	21191200

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

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Fax: (815) 397-2526

E-mail: delta@delta-power.com


DIMENSIONS

ORDERING INFORMATION
DE-HPB
OPTIONS

 Buna, Linkage
 Viton, Linkage

OL
VL

 Blank
N
S
BODIES

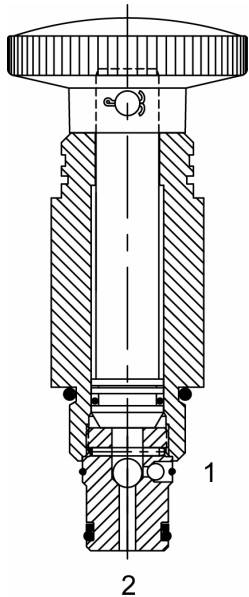
 Without Body
 3/8 NPTF Ports
 #8 SAE Ports

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

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 E-mail: delta@delta-power.com

**DE-HPC Hand Pump****DESCRIPTION**

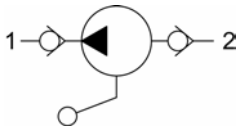
10 size, 7/8-14 thread, "Delta" series, cartridge type, plunger hand pump.

OPERATION

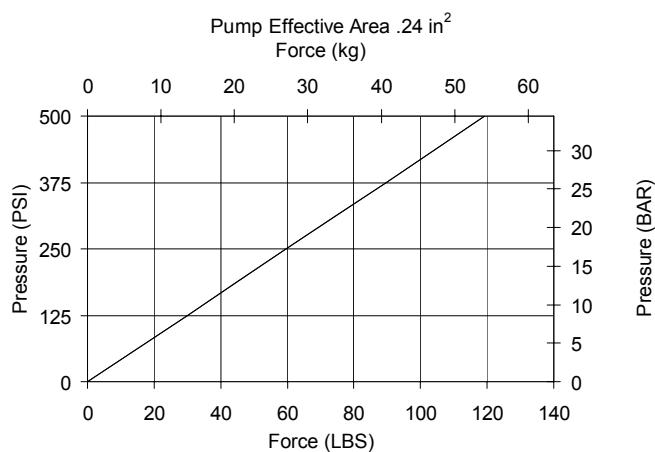
The DE-HPC hand pump when pulled primes thru Port (2) and when pushed provide flow pressure to outlet port (1).

FEATURES

- Small profile.
- Industry common cavity.
- Large displacement per stroke.

HYDRAULIC SYMBOL

This product is not intended as a load holding device.

PERFORMANCE**VALVE SPECIFICATIONS**

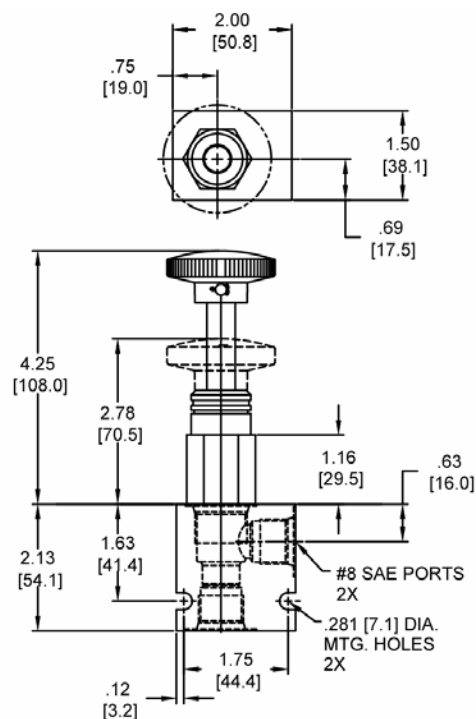
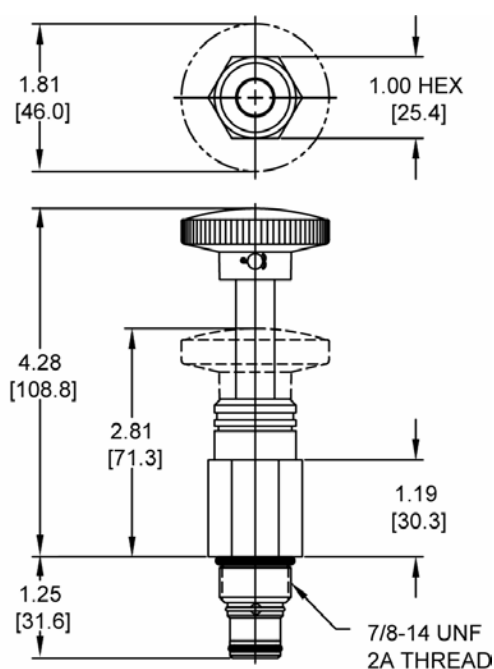
Nominal Flow	.35 cu in/stroke
Rated Operating Pressure	500 PSI (34 bar)
Typical Internal Leakage (150 SSU)	0 - 10 drops/min
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temperature Range	-40° to 250° F (-40° to 120° C)
Weight	.57 lbs. (.26 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	30 ft-lbs (40.6 Nm)
Cavity	DELTA 2W
Cavity Form Tool (Finishing)	40500000
Seal Kit	21191200

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Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com


DIMENSIONS


BODY WEIGHT: .47 lbs. [.21kg]

ORDERING INFORMATION

DE-HPC - -

OPTIONS

 Buna, Knob
 Viton, Knob

OK
VK

 Blank
N
S
BODIES

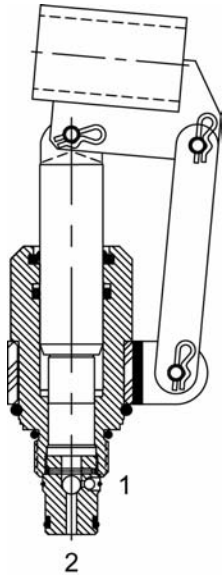
 Without Body
 3/8 NPTF Ports
 #8 SAE Ports

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

Phone: (815) 397-6628

Fax: (815) 397-2526

 E-mail: delta@delta-power.com

**DE-HPD Hand Pump****DESCRIPTION**

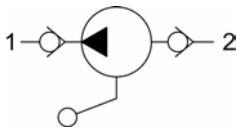
10 size, 7/8-14 thread, "Delta" series, cartridge type, hand pump.

OPERATION

The DE-HPD hand pump when pipe handle is lifted, primes thru port (2) and when pushed provides flow pressure to outlet port (1).

FEATURES

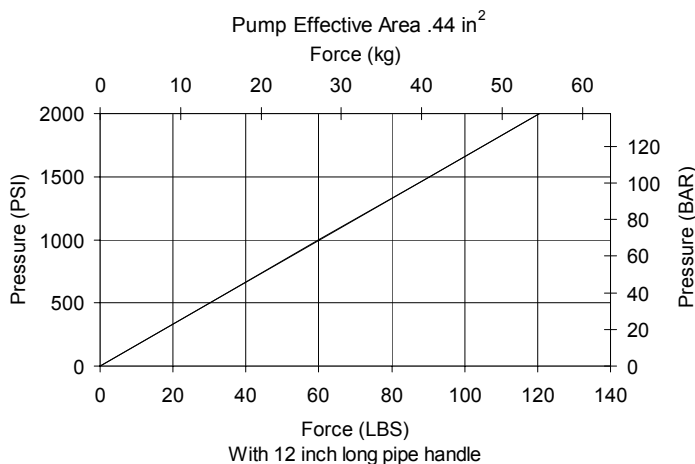
- Large displacement per stroke.
- Industry common cavity.

HYDRAULIC SYMBOL

This product is not intended as a load holding device.

Linkage is not to be removed.

24" handle not supplied.

PERFORMANCE**VALVE SPECIFICATIONS**

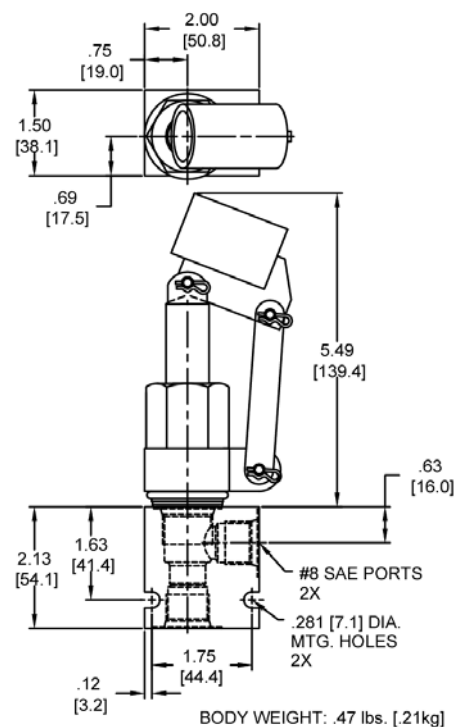
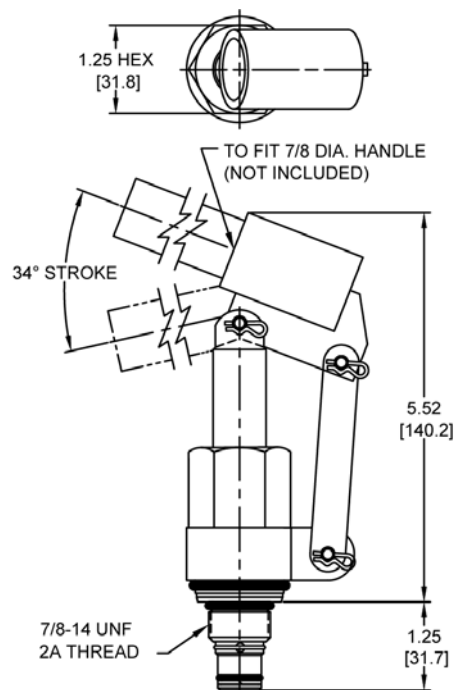
Nominal Flow	.39 cu in/stroke
Rated Operating Pressure	3000 PSI (207 bar)
Typical Internal Leakage (150 SSU)	0-10 drops per min
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temperature Range	-40° to 250° F (-40° to 120° C)
Weight	1.5 lbs. (.69 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	30 ft-lbs (40.6 Nm)
Cavity	DELTA 2W
Cavity Form Tool (Finishing)	40500000
Seal Kit	21191200

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Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com


DIMENSIONS

ORDERING INFORMATION
DE-HPD
OPTIONS

 Buna, Linkage
 Viton, Linkage

OL
VL

 Blank
N
S
BODIES

 Without Body
 3/8 NPTF Ports
 #8 SAE Ports

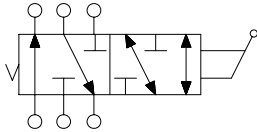
WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

Phone: (815) 397-6628

Fax: (815) 397-2526

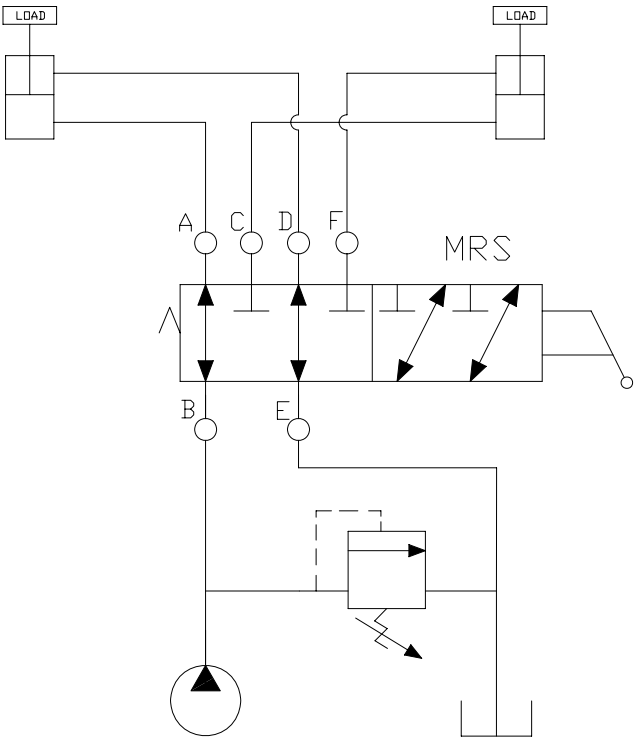
 E-mail: delta@delta-power.com

Selector Valves

	GPM	PSI	LPM	BAR	MODEL	PAGE
	25	3000	95	207	QS-MRS	648

Typical Schematic

Typical application for the MRS is to manually select flow path between cylinders. Valve is closed center with all ports blocked in center position.



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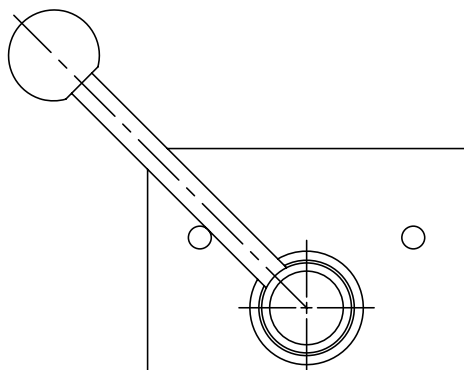
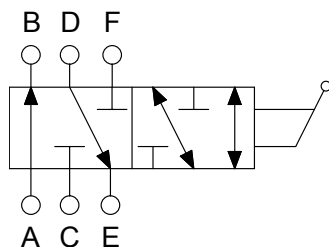
E-mail: delta@delta-power.com


QS-MRS Rotary Selector Valve
DESCRIPTION

6 port rotary selector valve.

OPERATION

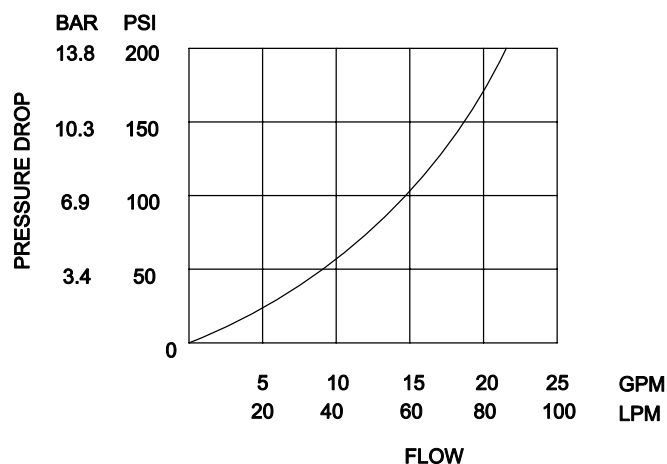
The QS-MRS when rotated counter-clockwise allows flow from (A) to (B) & (D) to (E) and blocks (C) & (F). When rotated clockwise, the valve directs flow from (C) to (B) & (F) to (E) and block flow at (A) & (D).

FEATURES

HYDRAULIC SYMBOL


May be used as metering product.

All ports closed in transition.

See chart for fully open and fully closed pressure drop.

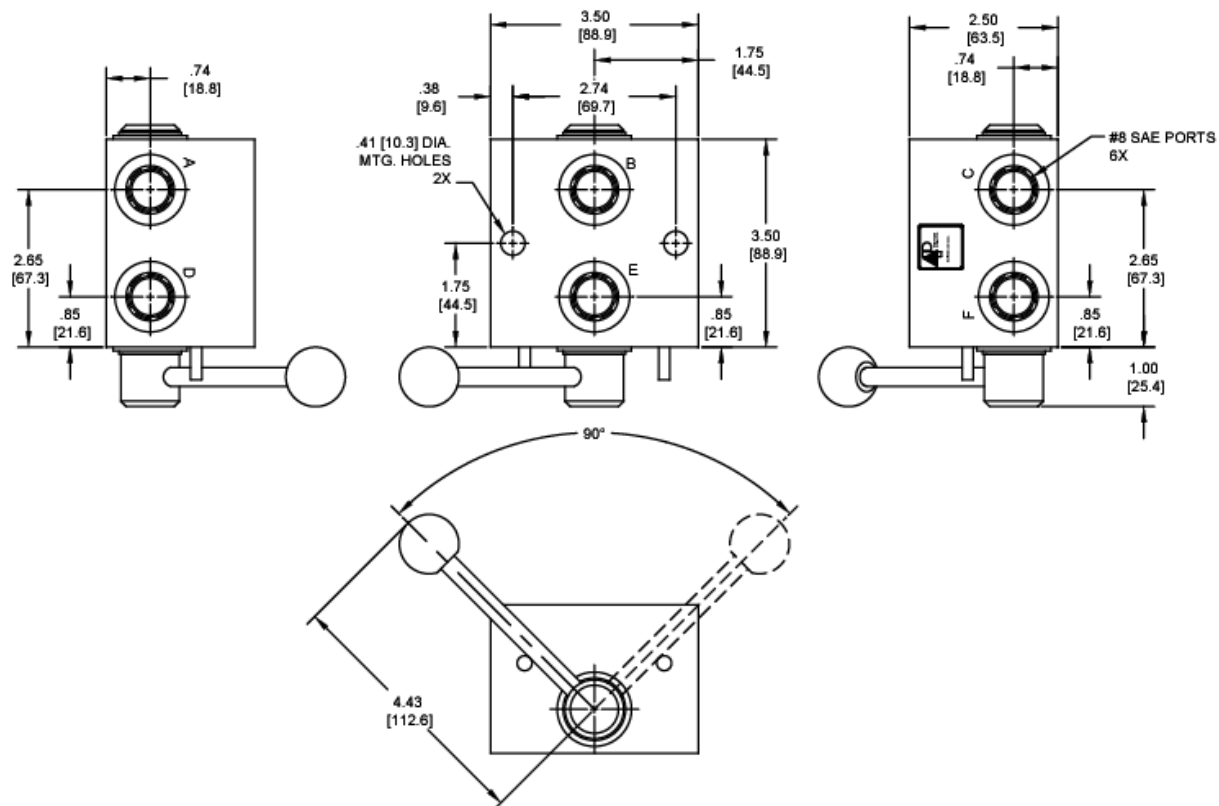
PERFORMANCE


ABOVE CURVE IS WITH
HYDRAULIC OIL 150 SSU AT 100°F.

VALVE SPECIFICATIONS

Nominal Flow	25 GPM (95 LTR/M)
Rated Operating Pressure	3000 PSI (207 bar)
Typical Internal Leakage (150 SSU)	1 cu in/min (16 ml/min)
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temperature Range	-40° to 250° F (-40° to 120° C)
Weight	3.42 lbs (1.55 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid

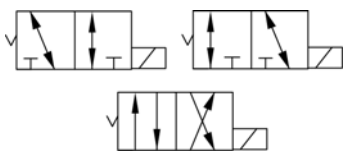
WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.


DIMENSIONS

ORDERING INFORMATION

QS-MRS - - -			
OPTIONS		BODY	
Buna Standard	00	1/2" NPT PORTS	
Viton Standard	V0	#8 SAE	
		N	
		S	

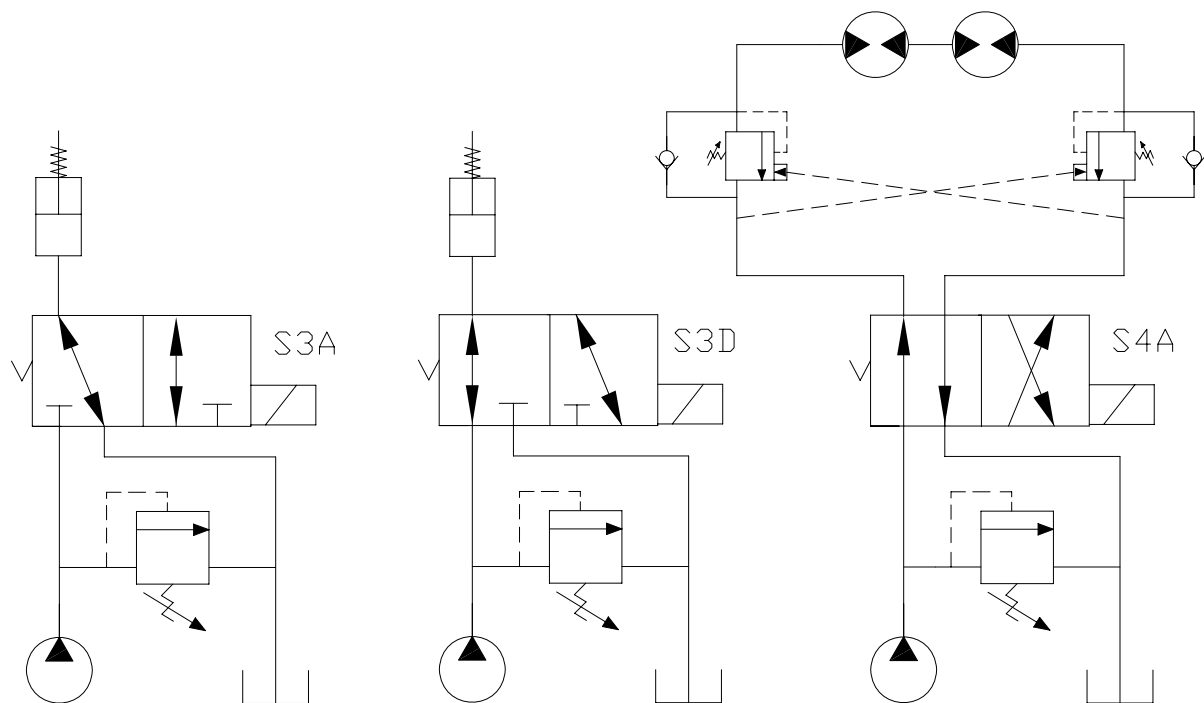
WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

Transmission “Low Pressure” Solenoid Valves

	GPM	PSI	LPM	BAR	MODEL	PAGE
	6	1000	23	69	QF-S3A	652
	6	1000	23	69	QF-S3D	654
	5	1000	20	69	QG-S4A	656

Typical Schematic

Typical application for the S3A and the S3D is in a clutch or transmission application.
Typical application for the S4A is in a transmission or braking application.



WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com

**QF-S3A Direct Acting Spool, 3 Way 2 Position****DESCRIPTION**

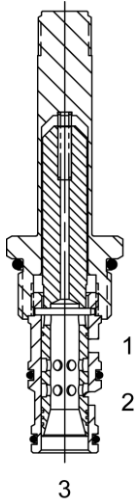
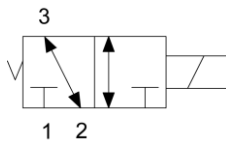
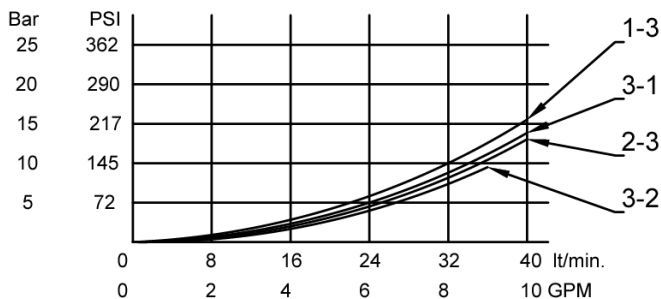
10 size, 7/8-14 thread, "Delta" series, solenoid operated, 3 way 2 position, spool valve.

OPERATION

When de-energized the QF-S3A allows flow between (2) and (3) and blocks flow at port (1). When energized the valve allows flow between (1) and (3) and blocks flow at port (2).

FEATURES

- Hardened parts for long life.
- Efficient wet-armature construction.
- Cartridges are voltage interchangeable.
- Industry common cavity.
- Unitized, molded coil design.
- Continuous duty rated solenoid.
- Optional coil voltages and terminations.
- Optional "I" Coil: Weatherproof, Thermal Shock, Immersion Safe.

**HYDRAULIC SYMBOL****PERFORMANCE**

Above Curve with Hydraulic Oil 150 SSU at 100°F

VALVE SPECIFICATIONS

Nominal Flow	6 GPM (23 LPM)
Rated Operating Pressure	1000 PSI (70 bar)
Typical Internal Leakage (150 SSU)	3 cu in/min (49 ml/min)
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temperature Range	-40° to 200° F (-40° to 120° C)
Weight	.30 lbs (.14 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	30 ft-lbs (40 Nm)
Coil Nut Torque Requirements	4-6ft-lbs (5.4-8.1Nm)
Cavity	DELTA 3W
Cavity Form Tool (Finishing)	40500001
Seal Kit	21191210

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

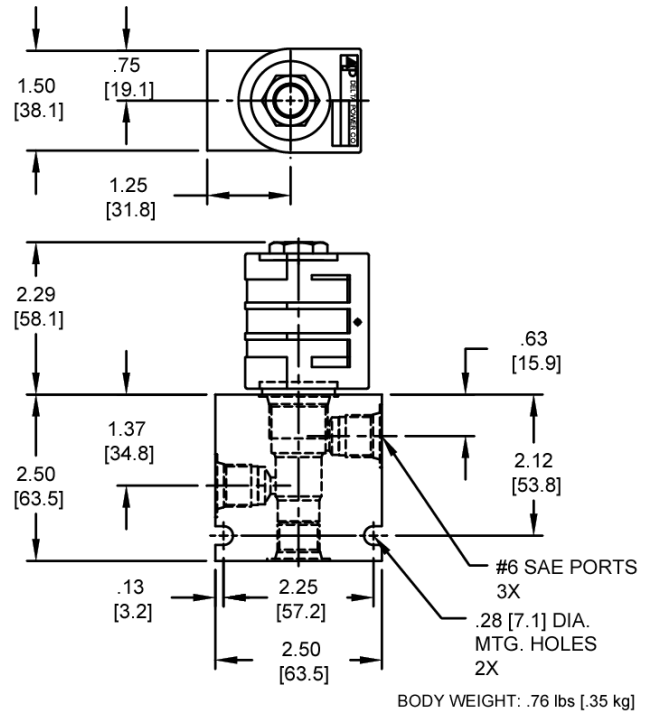
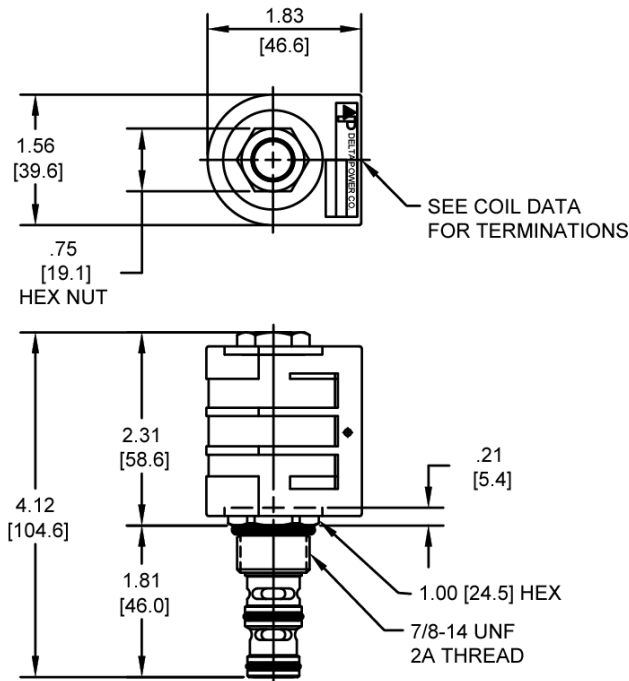
Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com



DIMENSIONS



ORDERING INFORMATION

QF-S3A - - - -

OPTIONSBuna Standard
Viton Standard00
V0

Blank

N
S**BODIES**Without Body
1/4 NPTF Ports
#6 SAE Ports**VOLTAGE**06 6 VDC
12 12 VDC
24 24 VDC
36 36 VDC
48 48 VDC
25 24 VAC
11 120 VAC
22 220 VAC
44 440 VAC**"D" COIL TERMINATION**

(All DC Except as Noted)

DL Double Lead
DT Deutsch on Leads DT04-2P
ML Metri-Pack on Leads
PL Packard on Leads
WL Weatherpack on LeadsSS Single Spade
DS Double Spade
HC DIN 43650 (Hirschman) - (AC & DC)
CL Conduit Lead - (AC Only)
DI Deutsch - Integral DT04-2P**IMMERSION PROOF "D" TYPE**"I" Coil AMP Superseal - Integral
"I" Coil Deutsch - Integral DT04-2P
"I" Coil AMP Jr. Timer - Integral
"I" Coil Metri-Pack - Integral

Approximate Coil Weight: .74 lbs/.33 kg.

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

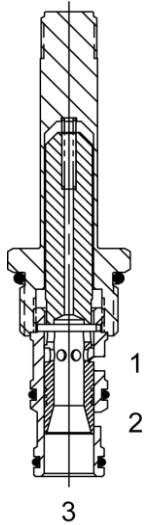
Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com



QF-S3D Direct Acting Spool, 3 Way 2 Position



DESCRIPTION

10 size, 7/8-14 thread, "Delta" series, solenoid operated, 3 way 2 position, spool valve.

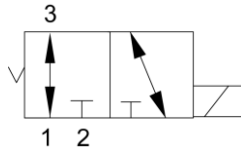
OPERATION

When de-energized the QF-S3D allows flow between (1) and (3) and blocks flow at port (2). When energized the valve allows flow between (2) and (3) and blocks flow at port (1).

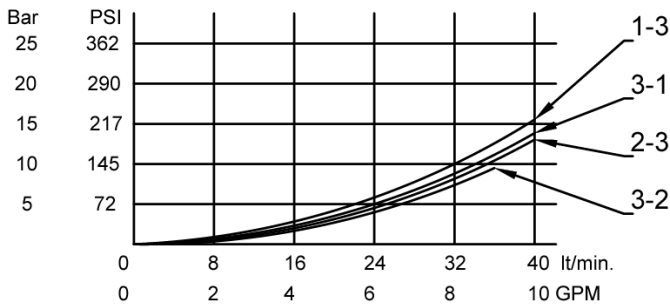
FEATURES

- Hardened parts for long life.
- Efficient wet-armature construction.
- Cartridges are voltage interchangeable.
- Industry common cavity.
- Unitized, molded coil design.
- Continuous duty rated solenoid.
- Optional coil voltages and terminations.
- Optional "I" Coil: Weatherproof, Thermal Shock, Immersion Safe.

HYDRAULIC SYMBOL



PERFORMANCE



Above Curve with Hydraulic Oil 150 SSU at 100°F

VALVE SPECIFICATIONS

Nominal Flow	6 GPM (23 LPM)
Rated Operating Pressure	1000 PSI (70 bar)
Typical Internal Leakage (150 SSU)	3 cu in/min (49 ml/min)
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temperature Range	-35° to 200° F (-37.2° to 93.3° C)
Weight	.30 lbs (.13 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	30 ft-lbs (40 Nm)
Coil Nut Torque Requirements	4-6 ft-lbs (5.4-8.1Nm)
Cavity	DELTA 3W
Cavity Form Tool (Finishing)	40500001
Seal Kit	21191210

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

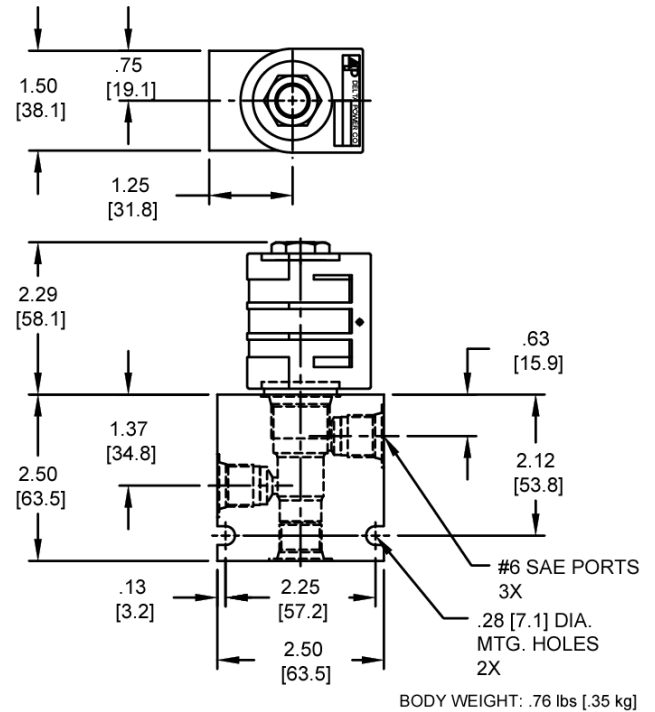
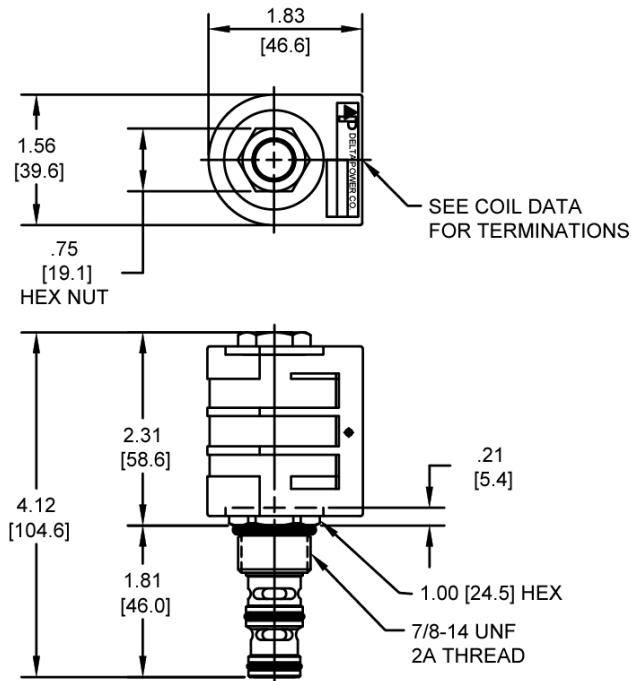
Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com



DIMENSIONS



ORDERING INFORMATION

QF-S3D -

OPTIONS

Buna Standard
Viton Standard00
V0

BODIES

Blank
N
S
Without Body
1/4 NPTF Ports
#6 SAE Ports

VOLTAGE

06 6 VDC
12 12 VDC
24 24 VDC
36 36 VDC
48 48 VDC
25 24 VAC
11 120 VAC
22 220 VAC
44 440 VAC"D" COIL TERMINATION

(All DC Except as Noted)

DL Double Lead
DT Deutsch on Leads DT04-2P
ML Metri-Pack on Leads
PL Packard on Leads
WL Weatherpack on LeadsSS Single Spade
DS Double Spade
HC DIN 43650 (Hirschman) - (AC & DC)
CL Conduit Lead - (AC Only)
DI Deutsch - Integral DT04-2PIMMERSION PROOF "D" TYPEIA "I" Coil AMP Superseal - Integral
ID "I" Coil Deutsch - Integral DT04-2P
IJ "I" Coil AMP Jr. Timer - Integral
IM "I" Coil Metri-Pack - Integral

Approximate Coil Weight: .74 lbs/.33 kg.

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

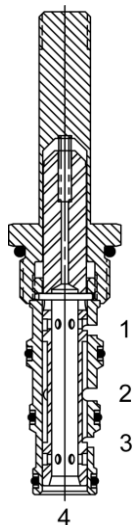
Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com



QG-S4A Direct Acting Spool, 4 Way 2 Position



DESCRIPTION

10 size, 7/8 -14 thread, "Delta" series, solenoid operated, 4 way 2 position spool valve.

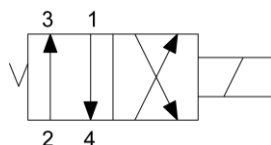
OPERATION

When de-energized the QG-S4A allows flow from (1) to (4) and from (2) to (3). When energized the valve allows flow from (2) to (1) and from (3) to (4).

FEATURES

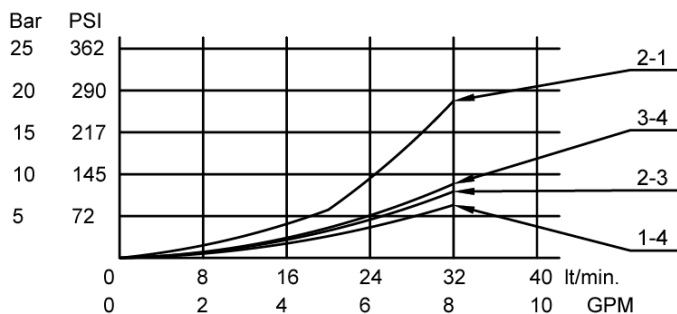
- Hardened parts for long life.
- Efficient wet-armature construction.
- Cartridges are voltage interchangeable.
- Industry common cavity.
- Unitized, molded coil design.
- Continuous duty rated solenoid.
- Optional coil voltages and terminations.
- Optional "I" Coil: Weatherproof, Thermal Shock, Immersion Safe.

HYDRAULIC SYMBOL



Intended for transmission and brake applications.

PERFORMANCE



Above curve with hydraulic oil 150 SSU at 100°F

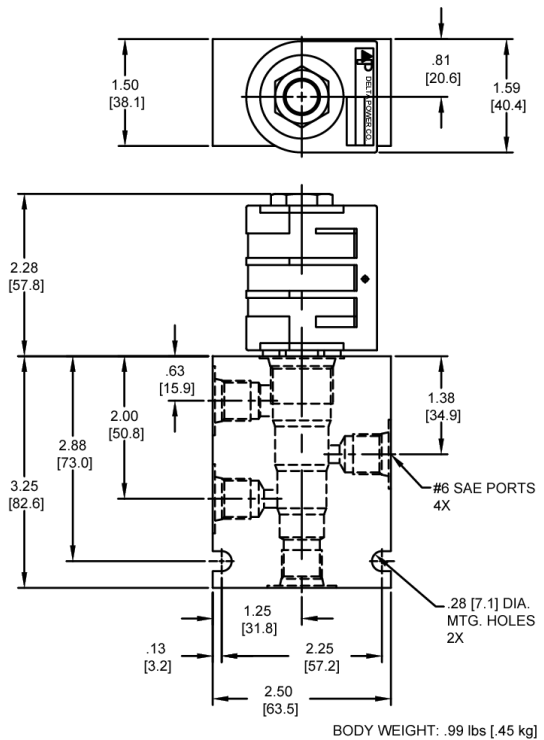
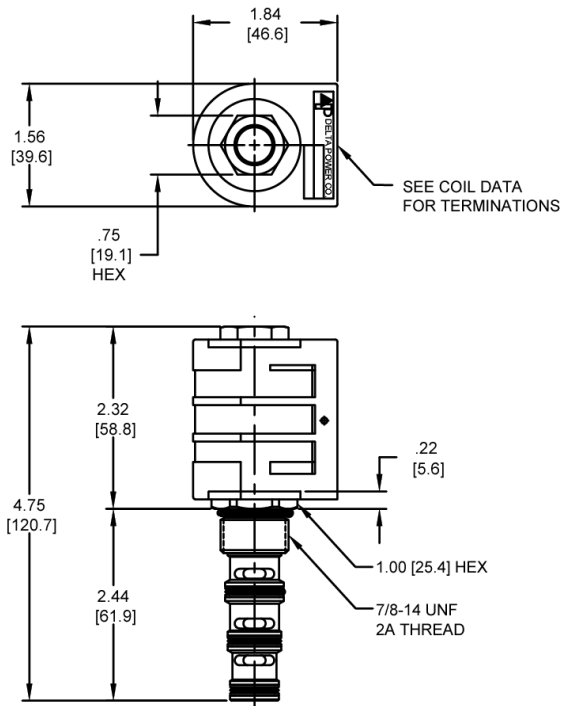
VALVE SPECIFICATIONS

Nominal Flow	5 GPM (19 LPM)
Rated Operating Pressure	1000 PSI (70 bar)
Typical Internal Leakage (150 SSU)	3 cu in/min (49 ml/min)
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temperature Range	-40° to 250° F (-40° to 120° C)
Weight	1.00 lbs. (.44 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	30 ft-lbs (40 Nm)
Coil Nut Torque Requirements	4-6 ft-lbs (5.4-8.1 Nm)
Cavity	DELTA 4W
Cavity Form Tool (Finishing)	40500035
Seal Kit	21191309

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.



DIMENSIONS



ORDERING INFORMATION

QG-S4A -

OPTIONS

Buna Standard 00
Viton Standard V0

Blank N
S

BODIES

Without Body
1/4 NPTF Ports
#6 SAE Ports

VOLTAGE

06 6 VDC
12 12 VDC
24 24 VDC
36 36 VDC
48 48 VDC
25 24 VAC
11 120 VAC
22 220 VAC
44 440 VAC

"D" COIL TERMINATION

(All DC Except as Noted)

DL Double Lead
DT Deutsch on Leads DT04-2P
ML Metri-Pack on Leads
PL Packard on Leads
WL Weatherpack on Leads

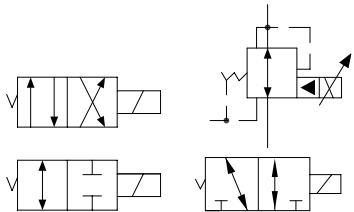
SS Single Spade
DS Double Spade
HC DIN 43650 (Hirschmann) - (AC & DC)
CL Conduit Lead (AC Only)
DI Deutsch - Integral DT04-2P

IA "I" Coil AMP Superseal - Integral
ID "I" Coil Deutsch - Integral DT04-2P
IJ "I" Coil AMP Jr. Timer - Integral
IM "I" Coil Metri-Pack - Integral

Approximate Coil Weight: .74 lbs/.33 kg.

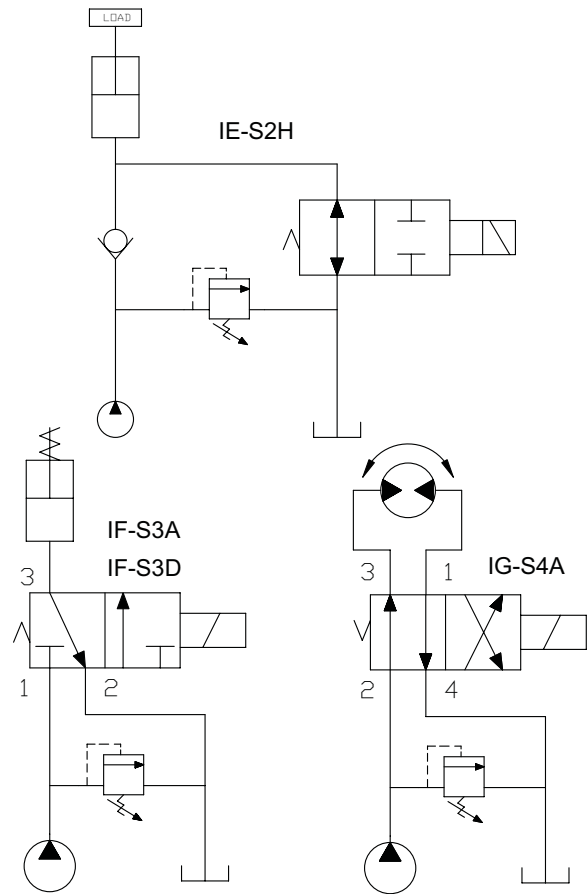
WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

Unitized Valves

	GPM	PSI	LPM	BAR	MODEL	PAGE
	6	1000	23	70	IE-S2H-56-MP12-A	660
	6	1000	23	70	IF-S3A-57-MP12-A	662
	6	1000	23	70	IF-S3D-57-MP12-A	664
	5.3	1000	20	70	IG-S4A-58-MP12-A	666

Typical Schematic

Typical application for the IE-S2H-56-MP123-A is a pump unloading valve.
Typical application for the IF-S3A and S3D-57-MP12-A is to operate a spring loaded hydraulic clutch.
Typical application for the IG-S4A-58-MP12-A is directional motor or cylinder control.

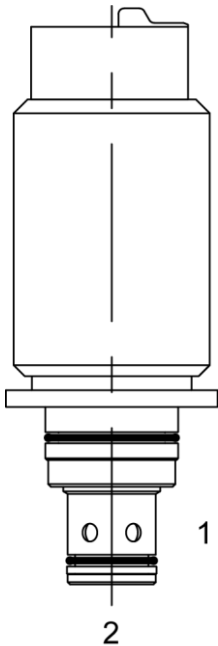


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Phone: (815) 397-6628

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IE-S2H-56-MP12-A 2W 2P, N.O. Transmission & Brake Application Spool Valve

DESCRIPTION

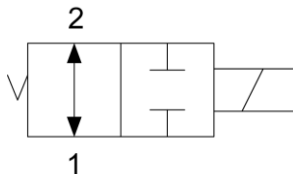
Special series, solenoid operated, 2 way normally open, transmission and brake spool type flanged retained hydraulic valve.

OPERATION

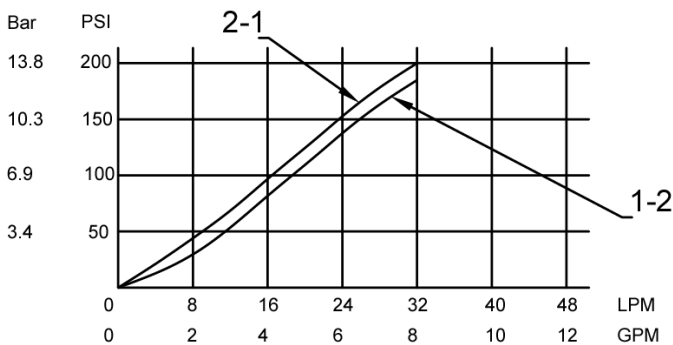
When de-energized the IE-S2H-56-MP12-A allows flow from (2) to (1) and (1) to (2). When energized the valve blocks flow at both ports.

FEATURES

- Efficient wet-armature construction.
- Cartridges are voltage interchangeable.
- Unitized valve/coil.
- Continuous duty rated solenoid.
- Optional coil voltages and terminations.

HYDRAULIC SYMBOL


Note: Consult Factory for Valve retention options.
Flanged Retained Product.

PERFORMANCE


ABOVE CURVE WITH HYDRAULIC OIL 150 SSU AT 100°F

VALVE SPECIFICATIONS

Nominal Flow	6 GPM (23 LPM)
Max Operating Pressure	1000 PSI (70 bar)
Typical Internal Leakage	50 ml/min
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temperature Range	-35° to 200° F (-37.2° to 93.3° C)
Weight	.73 lbs. (.33 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cavity	Special
Cavity Form Tool (Finishing)	T056
Seal Kit	Special

COIL SPECIFICATIONS

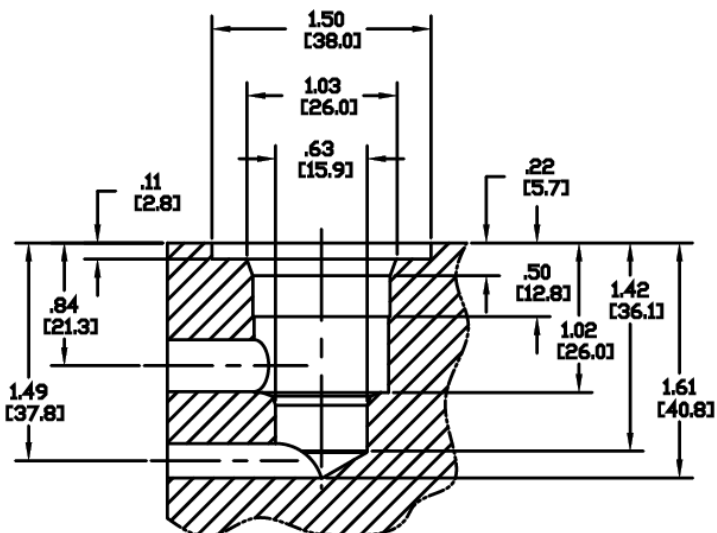
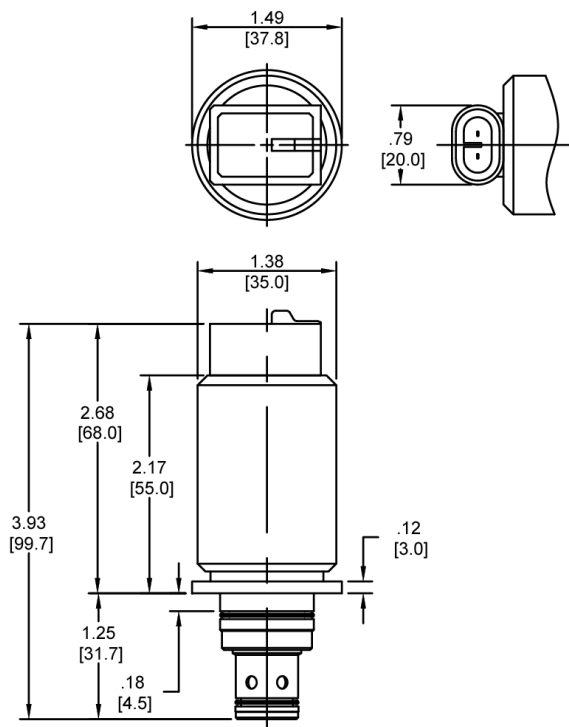
Nominal Operating Voltage	12 VDC +/- 5%
Pull-in Voltage	8.5 VDC at 212°F (100°C)
Peak Voltage	25 VDC for 5 min at 50°F (10°C)
Operating Temperature Range	-40° to 230°F (-40° to 110°C)
Coil Resistance	7.3 ohms +/- 5% at 68°F (20°C)
Coil Termination	Amp Superseal - Intergal
Connector Color	Black

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

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Fax: (815) 397-2526

E-mail: delta@delta-power.com

**DIMENSIONS**

**DIMENSIONS FOR
REFERENCE ONLY**

**FOR SPECIFIC CAVITY
INFORMATION CONSULT FACTORY**

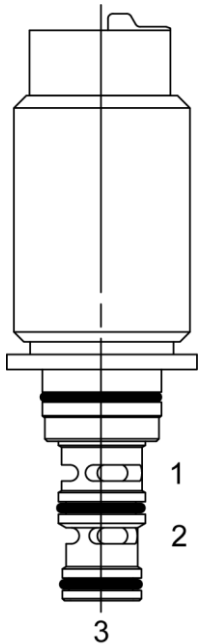
ORDERING INFORMATION**IE-S2H-56-MP12-A**

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com


IF-S3A-57-MP12-A 3W 2P, N.O. Transmission & Brake Application Spool Valve

DESCRIPTION

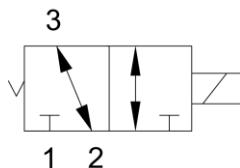
Special series, solenoid operated, 3 way normally open, transmission and brake spool type flanged retained hydraulic valve.

OPERATION

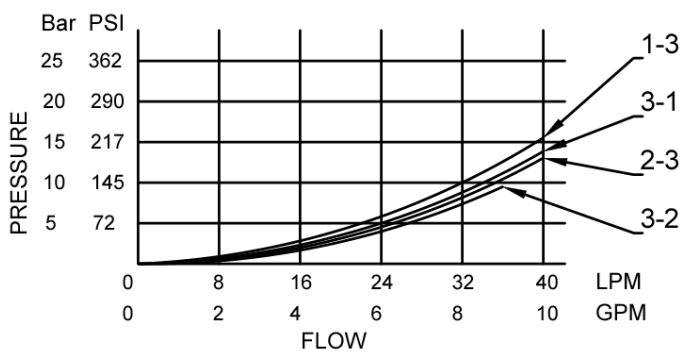
When de-energized the IF-S3A-57-MP12-A allows flow from (2) to (3) and (3) to (2), and blocks flow at (1). When energized the valve allows flow from (1) to (3) and blocks flow at port (2).

FEATURES

- Efficient wet-armature construction.
- Cartridges are voltage interchangeable.
- Unitized valve/coil.
- Continuous duty rated solenoid.
- Optional coil voltages and terminations.

HYDRAULIC SYMBOL


Note: Consult Factory for Valve retention options.
Flanged Retained Product.

PERFORMANCE


Above curve with hydraulic oil 150 SSU at 100°F

VALVE SPECIFICATIONS

Nominal Flow	6 GPM (23 LPM)
Max Operating Pressure	1000 PSI (70 bar)
Typical Internal Leakage	50 ml/min
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temperature Range	-35° to 200° F (-37.2° to 93.3° C)
Weight	.75 lbs. (.34 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cavity	Special
Cavity Form Tool (Finishing)	T057
Seal Kit	Special

COIL SPECIFICATIONS

Nominal Operating Voltage	12 VDC +/- 5%
Pull-in Voltage	8.5 VDC at 212°F (100°C)
Peak Voltage	25 VDC for 5 min at 50°F (10°C)
Operating Temperature Range	-40°F to 230°F (-40°C to 110°C)
Coil Resistance	7.3 ohms +/- 5% at 68°F (20°C)
Coil Termination	Amp Superseal - Intergal
Connector Color	Black

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

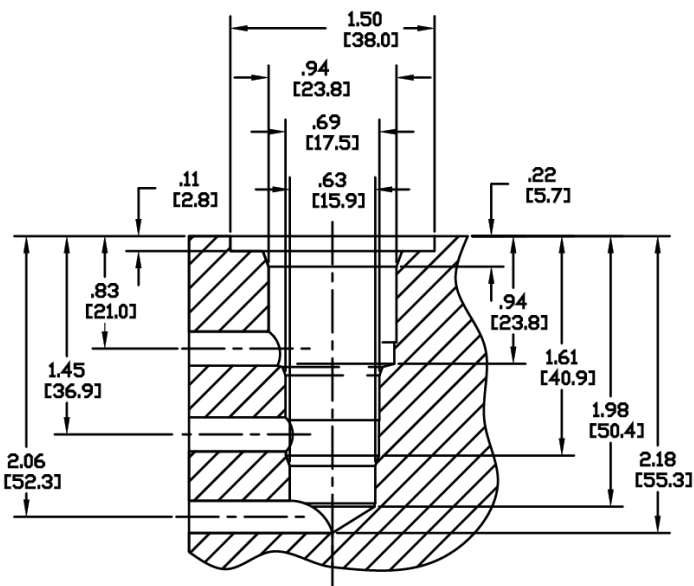
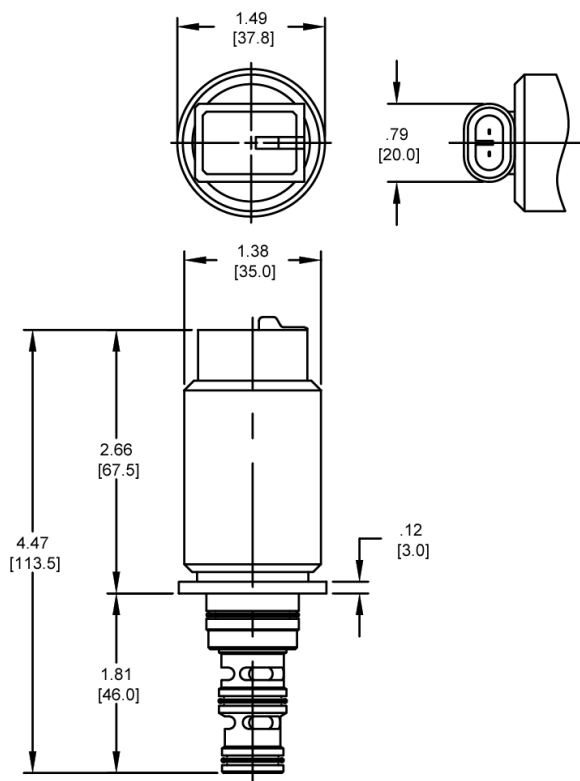
Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com



DIMENSIONS



DIMENSIONS FOR
REFERENCE ONLY

FOR SPECIFIC CAVITY
INFORMATION CONSULT
FACTORY

ORDERING INFORMATION

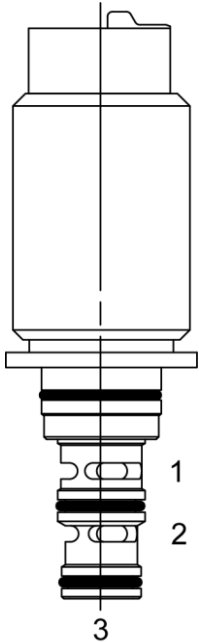
IF-S3A-57-MP12-A

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

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Fax: (815) 397-2526

E-mail: delta@delta-power.com


IF-S3D-57-MP12-A 3W 2P, N.O. Transmission & Brake Application Spool Valve

DESCRIPTION

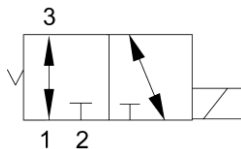
Special series, solenoid operated, 3 way 2 position, transmission and brake spool type flanged retained hydraulic valve.

OPERATION

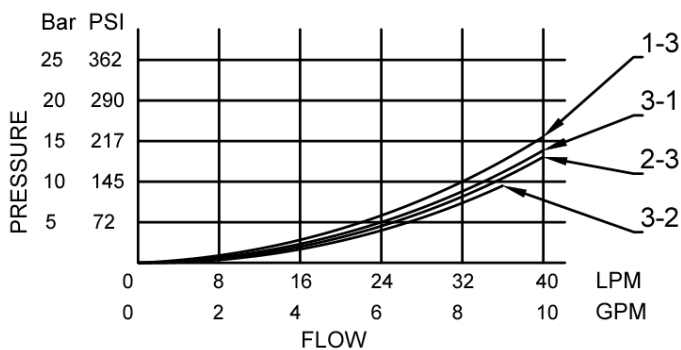
When de-energized the IF-S3D-57-MP12-A allows flow from (1) to (3) and (3) to (1), and blocks flow at (2). When energized the valve allows flow from (3) to (2) and (2) to (3) blocks flow at port (1).

FEATURES

- Efficient wet-armature construction.
- Cartridges are voltage interchangeable.
- Unitized valve/coil.
- Continuous duty rated solenoid.
- Optional coil voltages and terminations.

HYDRAULIC SYMBOL


Note: Consult Factory for Valve retention options.
Flanged Retained Product.

PERFORMANCE


Above curve with hydraulic oil 150 SSU at 100°F

VALVE SPECIFICATIONS

Nominal Flow	6 GPM (23 LPM)
Max Operating Pressure	1000 PSI (70 bar)
Typical Internal Leakage	50 ml/min
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temperature Range	-35° to 200° F (-37.2° to 93.3° C)
Weight	.75 lbs. (.34 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cavity	Special
Cavity Form Tool (Finishing)	T057
Seal Kit	Special

COIL SPECIFICATIONS

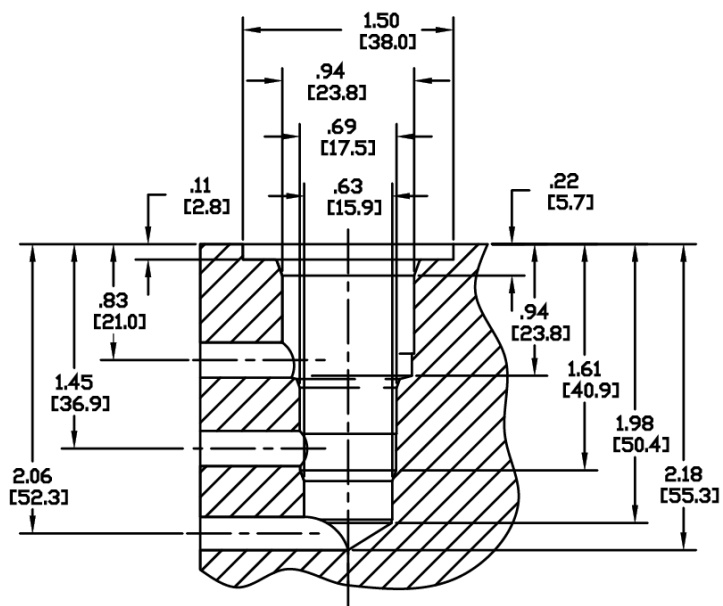
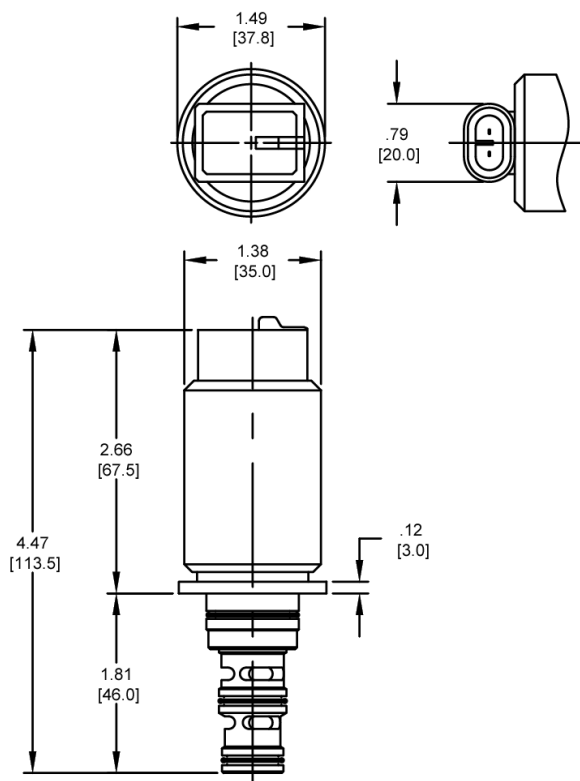
Nominal Operating Voltage	12 VDC +/- 5%
Pull-in Voltage	8.5 VDC at 212°F (100°C)
Peak Voltage	25 VDC for 5 min at 50°F (10°C)
Operating Temperature Range	-40°F to 250°F (-40°C) to (110°C)
Coil Resistance	7.3 ohms +/- 5% at 68°F (20°C)
Coil Termination	Amp Superseal - Intergal
Connector Color	Black

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

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Fax: (815) 397-2526

E-mail: delta@delta-power.com

**DIMENSIONS**

DIMENSIONS FOR
REFERENCE ONLY

FOR SPECIFIC CAVITY
INFORMATION CONSULT
FACTORY

ORDERING INFORMATION

IF-S3D-57-MP12-A

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

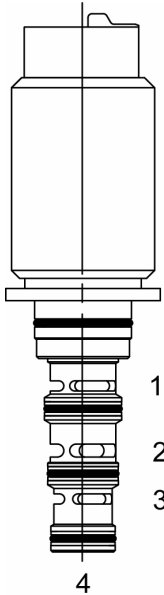
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E-mail: delta@delta-power.com



IG-S4A-58-MP12-A 4W 2P Slip-in Transmission Spool Valve



DESCRIPTION

Special series, solenoid operated, 4 way 2 position, transmission spool type, flanged retained hydraulic valve.

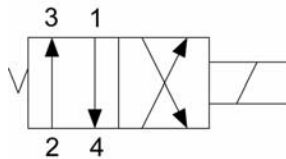
OPERATION

When de-energized the IG-S4A-58-MP12-A allows flow from (2) to (3) and from (1) to (4). When energized the valve allows flow from (2) to (1) and from (3) to (4).

FEATURES

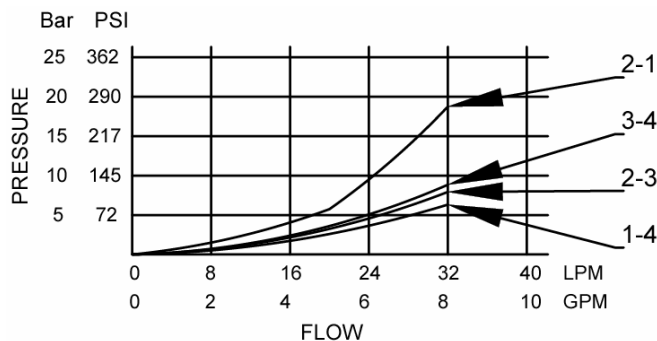
- Efficient wet-armature construction.
- Cartridges are voltage interchangeable.
- Unitized valve/coil.
- Continuous duty rated solenoid.
- Optional coil voltages and terminations.

HYDRAULIC SYMBOL



Note: Consult Factory for Valve retention options.
Flanged Retained Product.

PERFORMANCE



Above curve with hydraulic oil 150 SSU at 50°F

VALVE SPECIFICATIONS

Nominal Flow	5.28 GPM (20 LPM)
Max Operating Pressure	1000 PSI (70 bar)
Typical Internal Leakage	50 ml/min
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temperature Range	-35° to 200° F (-37.2° to 93.3° C)
Weight	.75 lbs. (.34 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cavity	Special
Cavity Form Tool (Finishing)	T058
Seal Kit	Special

COIL SPECIFICATIONS

Nominal Operating Voltage	12 VDC +/- 5%
Pull-in Voltage	8.5 VDC at 212°F (100°C)
Peak Voltage	25 VDC for 5 min at 50°F (10°C)
Operating Temperature Range	-40° to 230°F (-40° to 110°C)
Coil Resistance	7.3 ohms +/- 5% at 68°F (20°C)
Coil Termination	Amp Superseal - Intergal
Connector Color	Black

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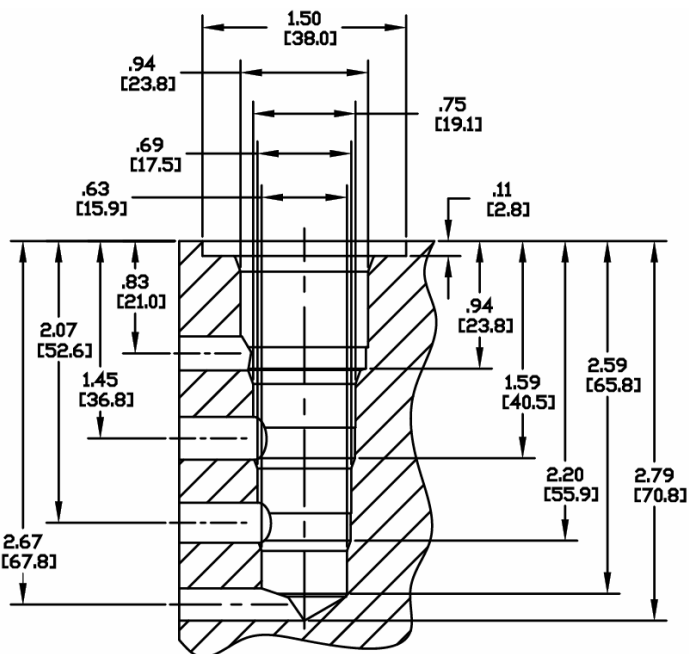
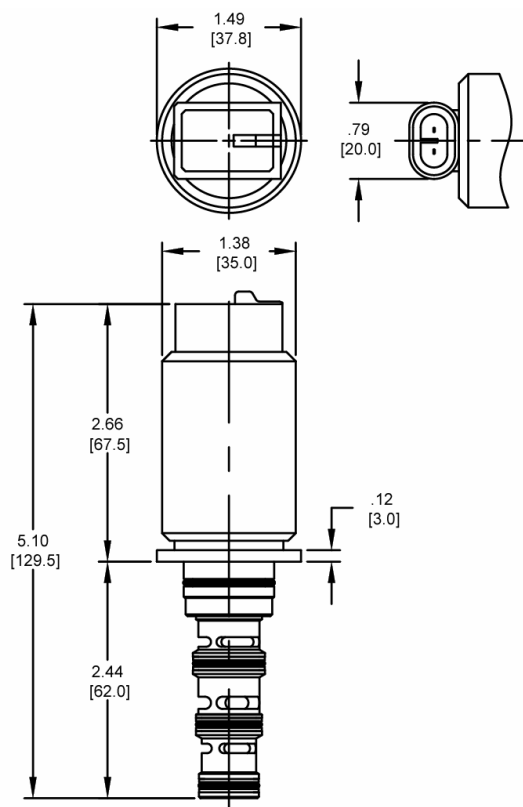
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E-mail: delta@delta-power.com



DIMENSIONS



DIMENSIONS FOR
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FACTORY

ORDERING INFORMATION

IG-S4A-58-MP12-A

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**SECTION/Description****Pages**

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Standard Bodies

BODY	PORT SIZE	P/N	STYLE/SIZE	A	B	C	D	E	F
AN	1/4 NPT	30102126	2W-5/8	1.25	2.0	1.5	1.00	1.00	1.50
AS	#6 SAE	30102346	2W-5/8	1.25	2.0	1.5	1.00	1.00	1.50
CN	1/4 NPT	30102097	3W-5/8	1.25	2.0	2.25	1.0	1.875	1.50
CS	#6SAE	30102373	3W-5/8	1.25	2.5	2.25	1.25	1.875	2.0
DN	1/4 NPT	30102110	4W-5/8	1.25	2.0	2.75	1.0	2.375	1.5
DS	#6SAE	30102288	4W-5/8	1.25	2.0	2.75	1.125	2.375	1.5
BN	1/4 NPT	30102127	2W-3/4	1.25	2.0	2.0	1.00	1.50	1.50
BS	#6 SAE	30102466	2W-3/4	1.25	2.0	2.0	1.125	1.50	1.50
PN	1/4 NPT	30102534	3W-3/4	1.25	2.25	2.5	1.125	2.0	1.75
PS	#6 SAE	30102533	3W-3/4	1.25	2.25	2.5	1.125	2.0	1.75
QN	1/4 NPT	30102536	4W-3/4	1.25	2.25	3.0	1.125	2.50	1.75
QS	#6 SAE	30102535	4W-3/4	1.25	2.25	3.0	1.125	2.50	1.75
EN	3/8 NPT	30102006	2W-7/8	1.5	2.0	2.125	1.00	1.625	1.50
ES	#8 SAE	30102359	2W-7/8	1.5	2.0	2.0	1.25	1.50	1.75
FN	1/4 NPT	30102015	3W-7/8	1.5	2.0	2.5	1.0	1.50	1.50
FS	#6 SAE	30102360	3W-7/8	1.5	2.5	2.5	1.25	2.125	2.25
GN	1/4 NPT	30102014	4W-7/8	1.5	2.0	3.25	1.0	2.125	1.50
GS	#6 SAE	30102367	4W-7/8	1.5	2.5	3.25	1.25	2.875	2.25
TS	#12 SAE	30102813	2W-1 1/16	1.75	2.75	3.09	1.69	.84	2.20
US	#10 SAE	30102815	3W-1 1/16	1.75	3.00	3.87	1.50	2.00	2.30
RS	#10 SAE	30102638	SHORT 3W-1 1/16	2.0	3.00	3.25	1.50	2.70	2.38
VS	#10 SAE	30102816	4W-1 1/16	1.75	3.00	4.75	1.50	3.00	2.30
JN	3/4 NPT	30102334	2W-1 5/16	2.0	3.0	3.0	1.875	2.25	2.438
JS	#12 SAE	30102331	2W-1 5/16	2.0	3.0	3.0	1.875	2.25	2.438
KS	#12 SAE	30102576	3W-1 5/16	2.0	4.0	4.0	2.0	3.125	3.38
LS	#12 SAE	30102575	SHORT 3W-1 5/16	2.0	3.5	3.5	1.875	2.75	2.88
NS	#12 SAE	30102577	4W-1 5/16	2.0	4.0	5.25	2.0	4.25	3.38
OS	#12 SAE	30102589	5W-1 5/16	2.0	4.0	5.75	2.0	4.75	3.38

THE FOLLOWING BODIES ARE NON-STANDARD PORT SIZES,
CONTACT FACTORY FOR PRICE AND AVAILABILITY

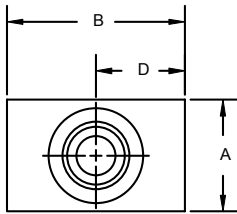
E1/2	1/2 NPT	30102336	2W-7/8	1.5	2.5	2.5	1.50	2.0	2.0
E#6	#6 SAE	30102364	2W-7/8	1.5	2.0	2.0	1.25	1.50	1.75
F3/8	3/8 NPT	30102370	3W-7/8	1.5	2.0	2.5	1.25	2.125	2.25
F#8	#8 SAE	30102354	3W-7/8	1.5	2.50	2.75	1.25	2.125	2.00
G#8	#8 SAE	30102362	4W-7/8	1.5	2.5	3.25	1.25	2.875	2.25
J14	#14 SAE	30102332	2W-1 5/16	2.0	3.0	3.0	1.875	2.25	2.438
J16	#16 SAE	30102333	2W-1 5/16	2.0	3.0	3.0	1.875	2.25	2.438

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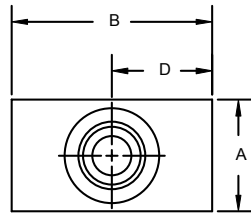
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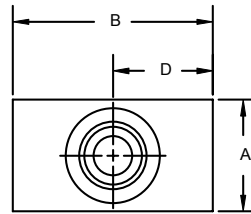
 E-mail: delta@delta-power.com


Standard Bodies


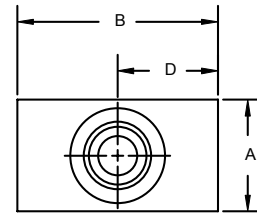
AN, AS, BN, BS



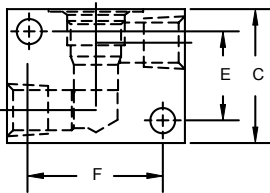
CN, CS, KS, LS, RS



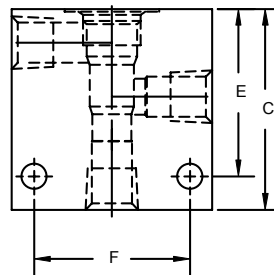
DN - DS - NS



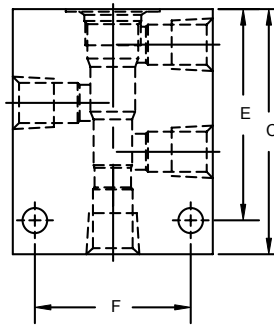
OS



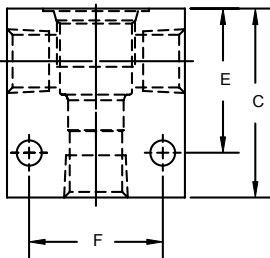
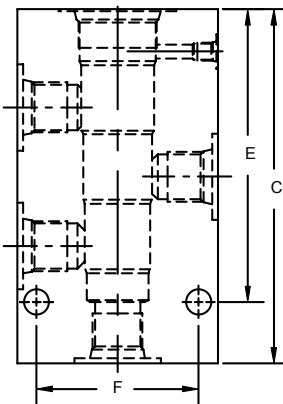
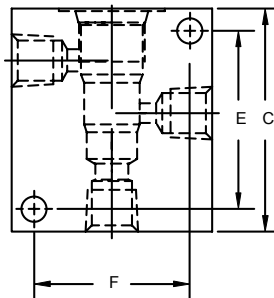
EN, E1/2, E#6



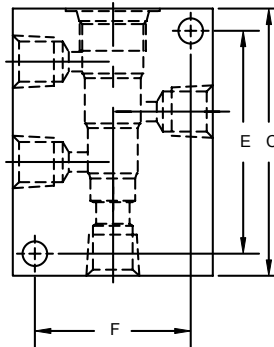
PN, PS, FN, US



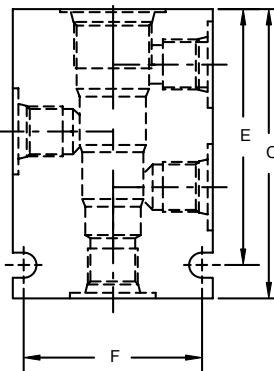
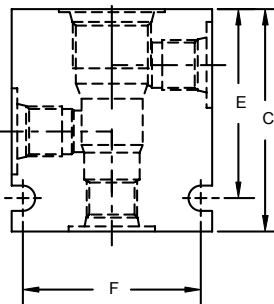
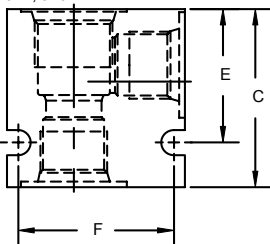
QN, QS, GN, VS, G#8

ES, JN, JS, TS,
J14, J16

FS



GS



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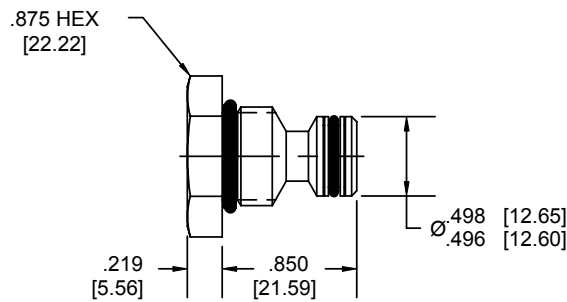
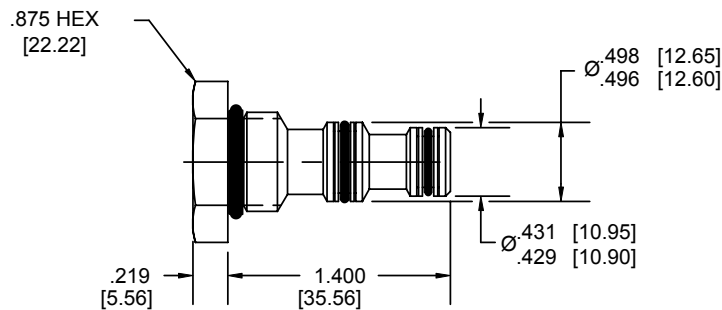
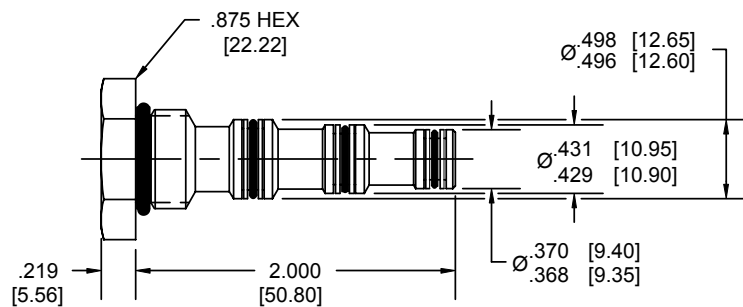
Fax: (815) 397-2526

E-mail: delta@delta-power.com



Mini Series Cavity Plugs

NOTE: DIMENSIONS IN BRACKETS ARE MILLIMETERS


 2W 2P CAVITY PLUG
 MA SERIES

 3W 2P CAVITY PLUG
 MC SERIES

 4W 2P CAVITY PLUG
 MD SERIES

ORDERING INFORMATION

Standard Model Number

 2 Way
 3 Way
 4 Way

MA
MC
MD
00
V0

Options

 Standard Buna
 Standard Viton

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

Phone: (815) 397-6628

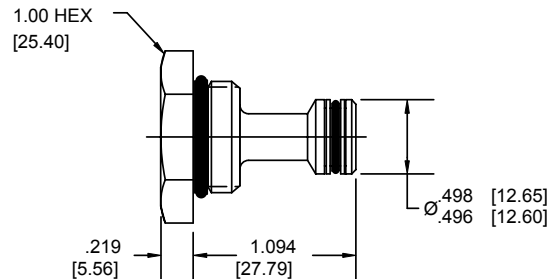
Fax: (815) 397-2526

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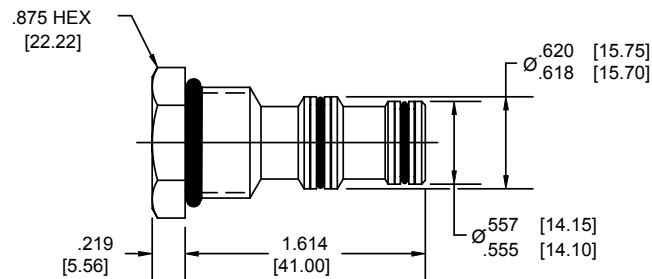


Power Series Cavity Plugs

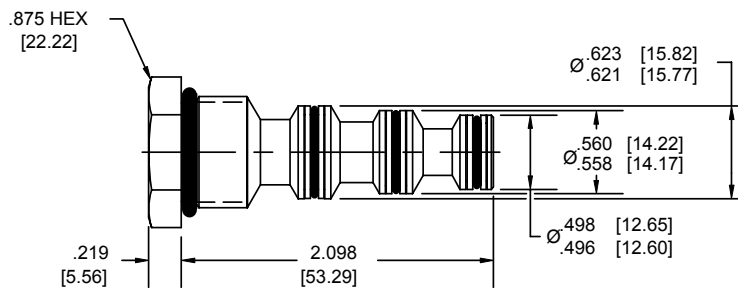
NOTE: DIMENSIONS IN BRACKETS ARE MILLIMETERS



2W 2P CAVITY PLUG
PB SERIES



3W 2P CAVITY PLUG
PP SERIES



4W 2P CAVITY PLUG
PQ SERIES

ORDERING INFORMATION

Standard Model Number

2 Way
3 Way
4 Way

PB
PP
PQ

00
V0

Options

Standard Buna
Standard Viton

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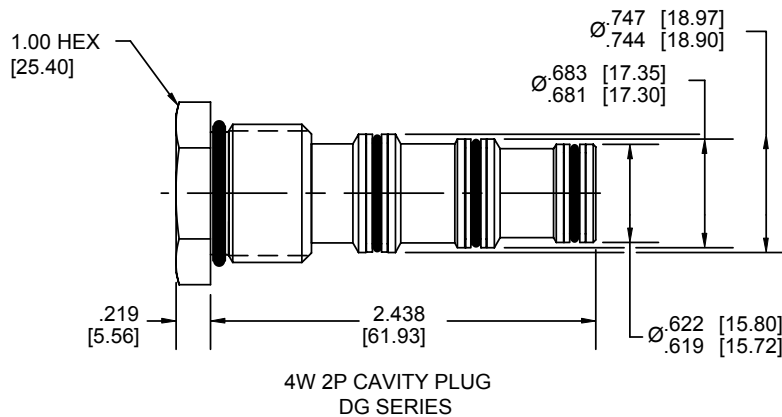
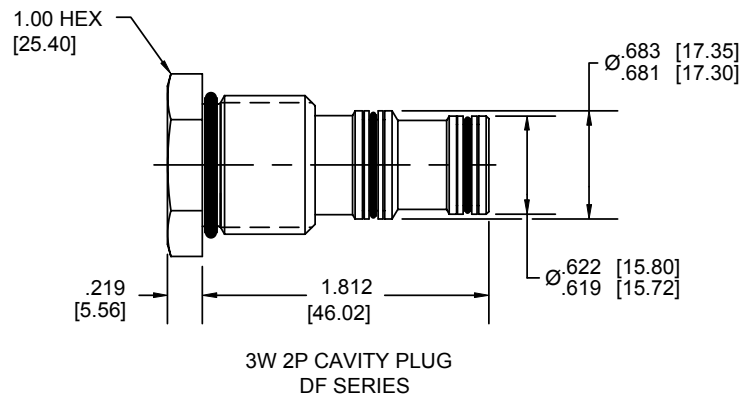
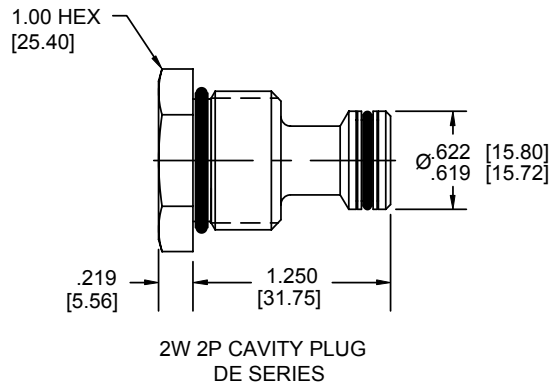
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Delta Series Cavity Plugs

NOTE: DIMENSIONS IN BRACKETS ARE MILLIMETERS



ORDERING INFORMATION

Standard Model Number

 2 Way
 3 Way
 4 Way

 DE
 DF
 DG

 00
 V0

Options

 Standard Buna
 Standard Viton

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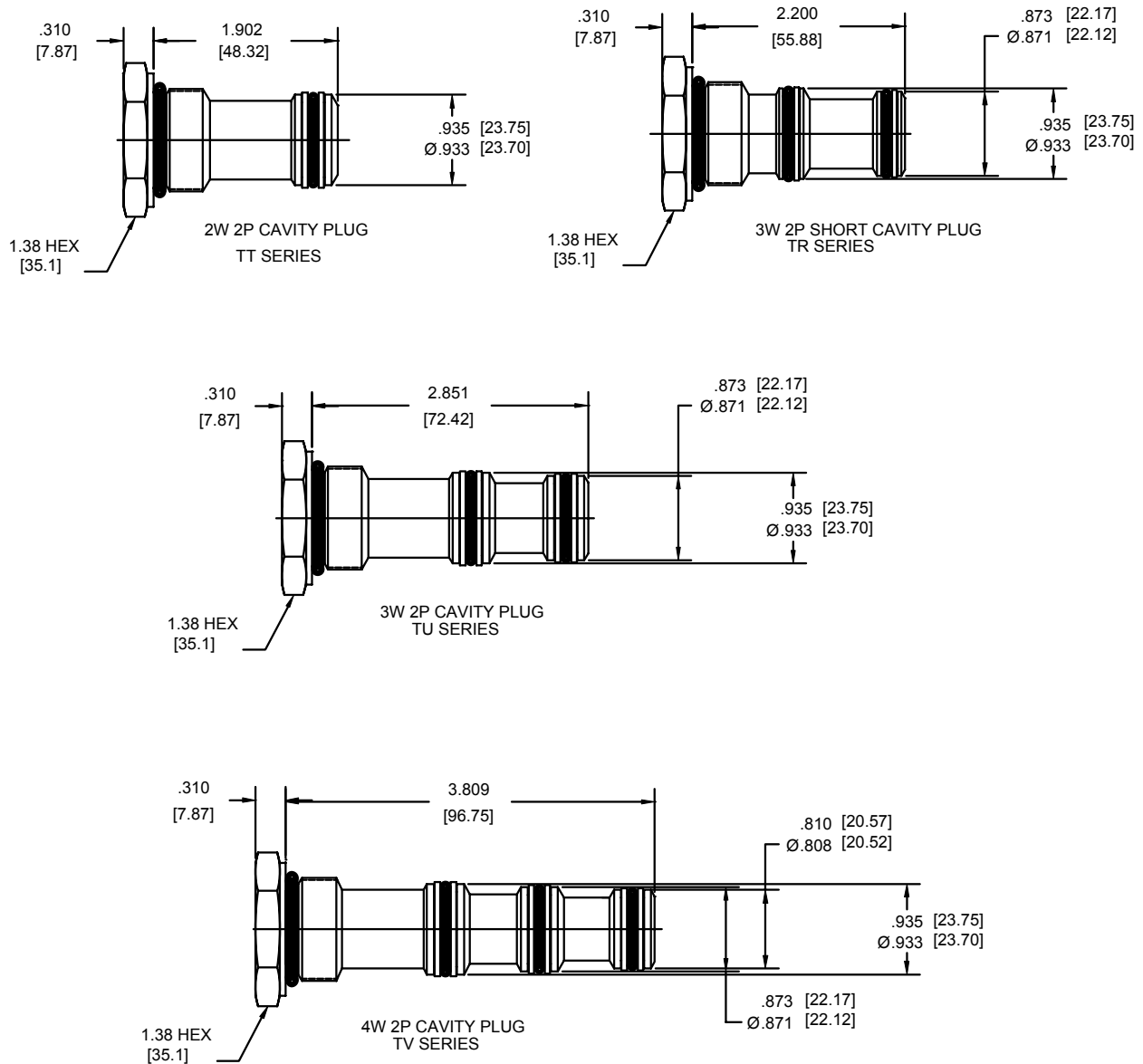
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 E-mail: delta@delta-power.com



Tecnord Series Cavity Plugs

NOTE: DIMENSIONS IN BRACKETS ARE MILLIMETERS



ORDERING INFORMATION

Standard Model Number

2 Way
3 Way
3 Way Short
4 Way

TT
TU
TR
TV

00
V0

Options

Standard Buna
Standard Viton

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

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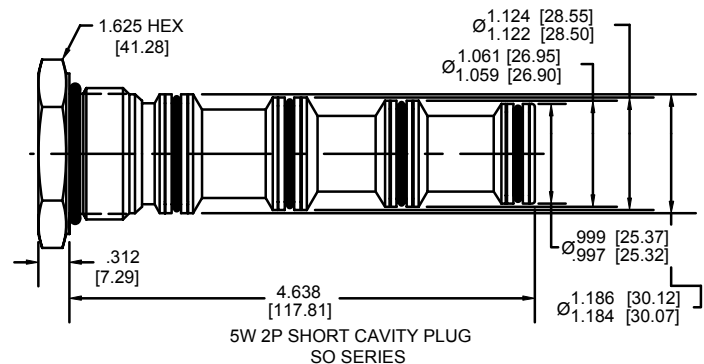
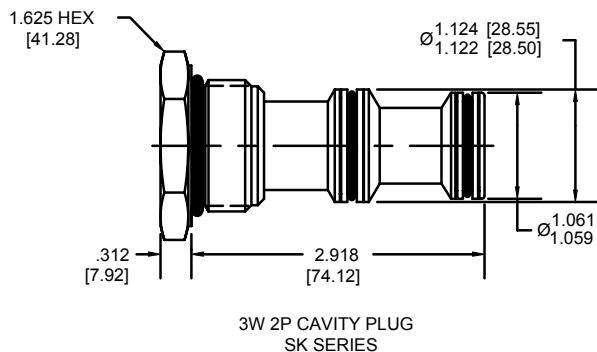
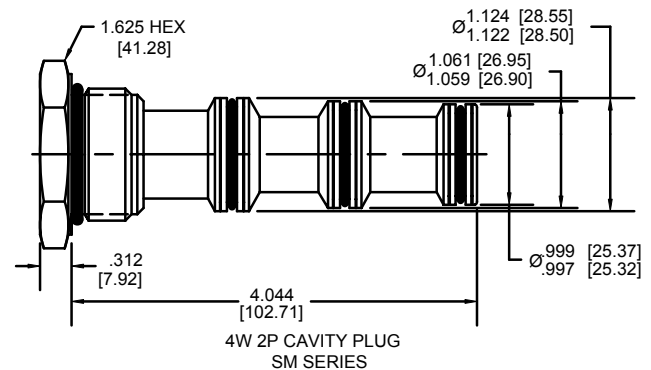
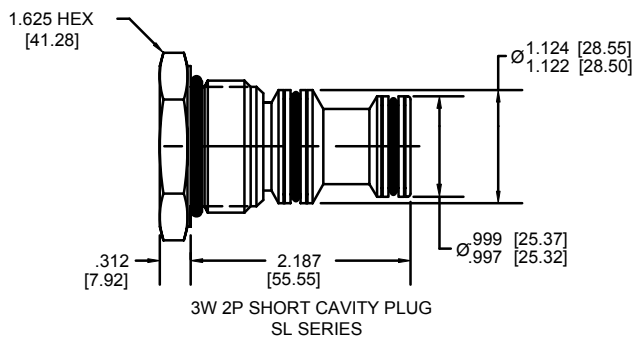
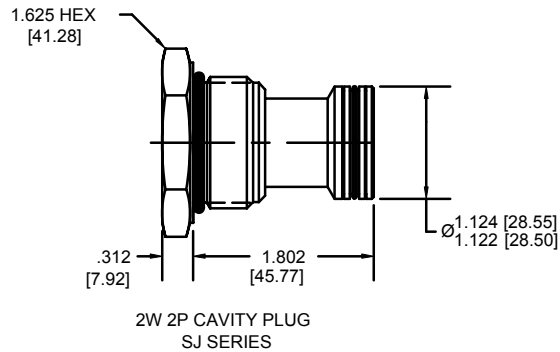
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E-mail: delta@delta-power.com



Super Series Cavity Plugs

NOTE: DIMENSIONS IN BRACKETS ARE MILLIMETERS



ORDERING INFORMATION

Standard Model Number

2 Way
3 Way Short
3 Way
4 Way
5 Way Short

SJ
SL
SK
SM
SO

00
V0

Options

Standard Buna
Standard Viton

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

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Manual Override Options

Pull Type Manual Override Option

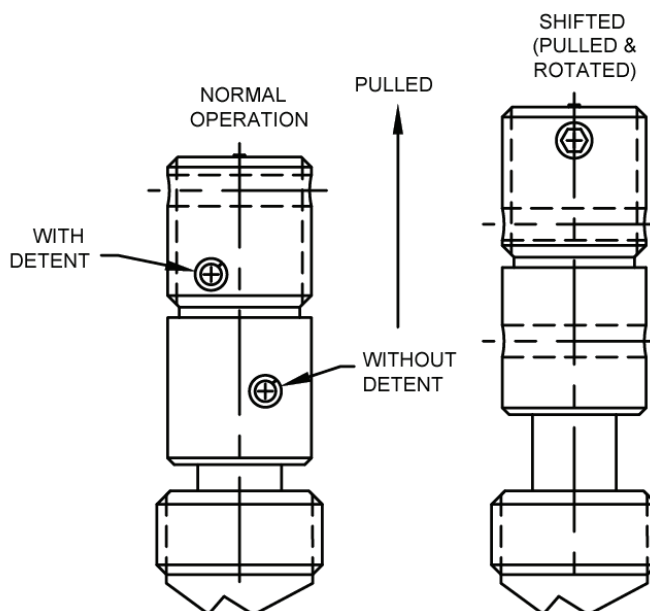
Standard override option for pull type solenoid valves.

This override is offered with or without the detent option.

With detent option, pull and rotate 180 degrees, when released the override will remain in that position.

To return to the normal operating position, Rotate knob 180 degrees and release.

Without the detent option, knob must be pulled and held to maintain override position.



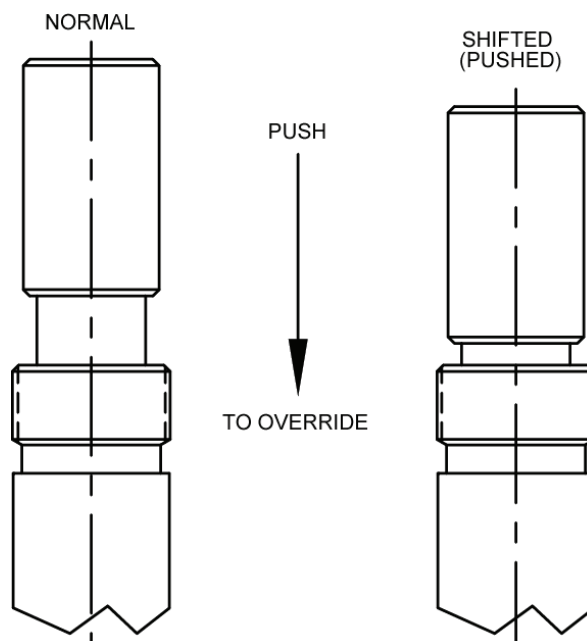
Push Type Manual Override Option

Standard push type override option used for 4W3P valves.

To activate override option, push knob and Hold, when released, the valve returns to normal operation position.

Note: override option only functions in the push (S1 coil) direction.

This override option is intended for emergency use only and is not intended for continuous duty operation.



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Manual Override Options

Rotary Type Manual Override Option

Standard rotary override option for normally open valves.

This override option is offered with or without a knob.

To activate override option, fully rotate using a flat tip screwdriver or the knob in a clockwise direction.

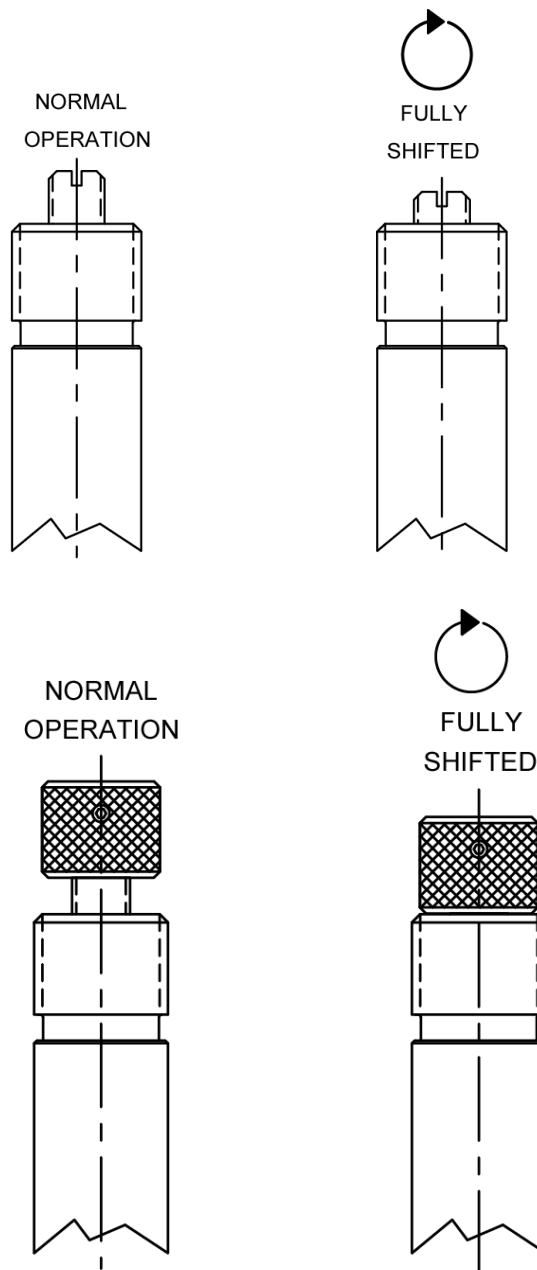
To de-activate override, fully rotate using a flat tip screwdriver or the knob in a counter clockwise direction.

Note: Not rotating override fully in either direction will result in partial shifting of valve.

WARNING: Over torque of manual override could result in valve damage.

NOTE: Rotary Pull Type Manual Override Option (Pull type Valves-Reference Models HB-S2A & HB-S2B)

Because HB-S2A & HB-S2B are Pull type Valves, “fully in” is the normal state and “fully out” is “fully shifted” state so opposite of what is shown in image.”



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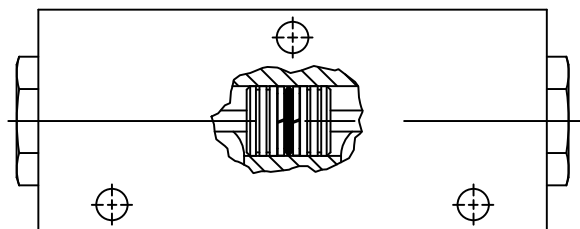
Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com



Pilot Piston Assemblies



DESCRIPTION

These pistons are used in a manifold to create pilot operated valve assemblies, such as pilot operated checks.

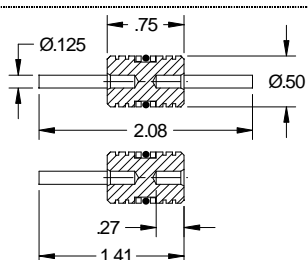
FEATURES

- O-rings on piston are optional.
- One piece design or pressed fit dowel pins
- Single or double pilot piston options.

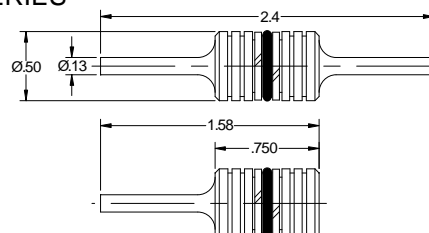
PISTON SPECIFICATIONS

VALVE SERIES	SEAT DIAMETER	PILOT RATIO
MINI	.193	6.7:1
POWER	.250	4:1
DELTA	.312	4:1
SUPER	.590	3.7:1

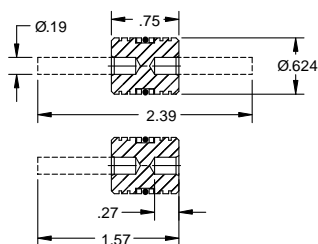
MINI SERIES



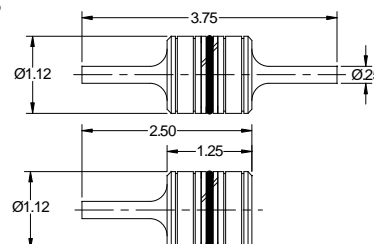
POWER SERIES



DELTA SERIES



SUPER SERIES



CAVITY INFORMATION

Series	Bore Diameter	Double - Spotface Dim.	Single - Spotface Dim.
	A	B	C
MINI	.500/.502	3.313	2.031
POWER	.500/.502	4.250	2.406
DELTA	.625/.627	4.500	2.750
SUPER	1.126/1.128	6.938	4.000

ORDERING INFORMATION

PISTON
 MINI Series .500 DIA
 POWER Series .500 DIA
 DELTA Series .625 DIA
 SUPER Series 1.12 DIA

M
P
D
S

B
V
O

SEALS

Buna
Viton
Omit

PILOT PIN OPTIONS

Single
Double

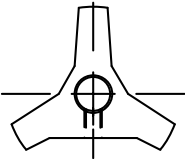
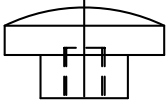
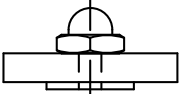
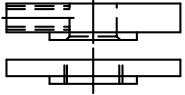

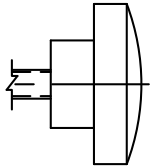

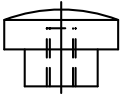
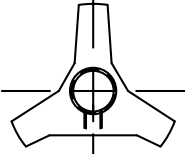
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Phone: (815) 397-6628

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Standard Knob Assemblies

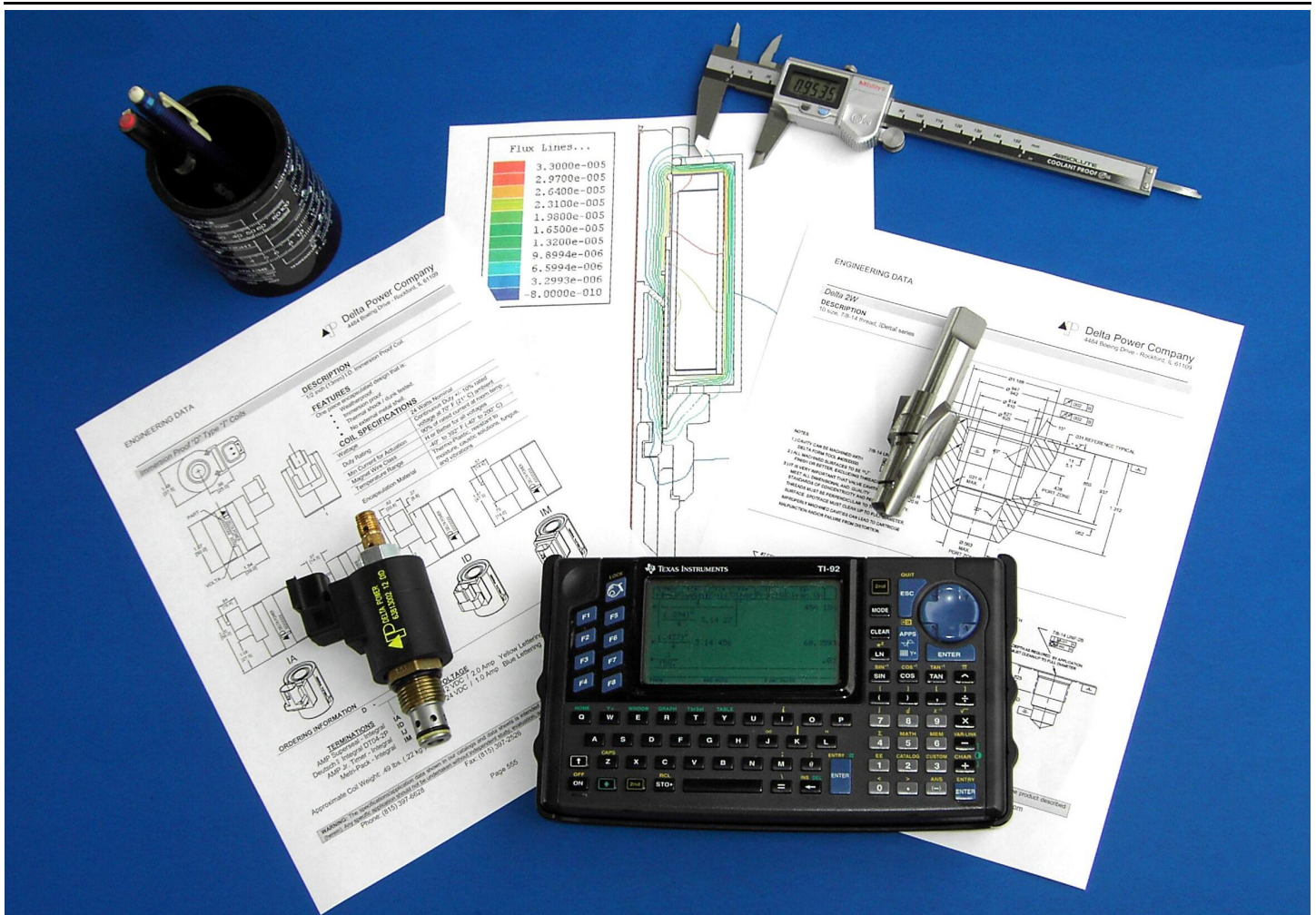
	22020047 34502032 66700059	MINI SERIES
	34502000	DELTA SERIES
	22020005 34502006 36202008	DELTA SERIES
	22020004 34502004 34502003 66700027	DELTA SERIES
	22020003 34502003 66700027	DELTA SERIES
	34502008	DELTA SERIES
	22020049 34502017 34502017 66700059	DELTA SERIES SUPER SERIES
	34502024	POWER SERIES
	22020058 34502019 66700059	POWER SERIES

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SECTION/Description	Pages
Cavities	683
Coil Data	707
Torque Specifications	725
CADD Insertion Codes	726
Valve Mnemonic Codes	729

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Cavity Data

SERIES	SI E	THREAD SI E	FORM TOOL	PAGE
MINI 2 WAY	7	5/8-18 UNF 2-B	40500003	684
MINI 3 WAY	7	5/8-18 UNF 2-B	40500004	685
MINI 4 WAY	7	5/8-18 UNF 2-B	40500006	686
POWER 2 WAY	8	3/4-16 UNF 2-B	40500005	687
POWER 3 WAY	8	3/4-16 UNF 2-B	40500024	688
POWER 4 WAY	8	3/4-16 UNF 2-B	40500029	689
DELTA 2 WAY	10	7/8-14 UNF 2-B	40500000	690
DELTA 2 WAY SPECIAL	10	7/8-14 UNF 2-B	40500028	691
DELTA 3 WAY	10	7/8-14 UNF 2-B	40500001	692
DELTA 4 WAY	10	7/8-14 UNF 2-B	40500002	693
TECNORD 2 WAY	12	1 1/16-12 UN 2-B	40500032	694
TECNORD 3 WAY SHORT	12	1 1/16-12 UN 2-B	40500033	695
TECNORD 3 WAY	12	1 1/16-12 UN 2-B	40500034	696
TECNORD 4 WAY	12	1 1/16-12 UN 2-B	40500035	697
TECNORD 5 WAY SHORT	12	1 1/16-12 UN 2-B	40500037	698
SUPER 2 WAY	16	1 5/16-12 UNF 2-B	40500017	699
SUPER 3 WAY SHORT	16	1 5/16-12 UNF 2-B	40500021	700
SUPER 3 WAY	16	1 5/16-12 UNF 2-B	40500018	701
SUPER 4 WAY	16	1 5/16-12 UNF 2-B	40500019	702
SUPER 5 WAY SHORT	16	1 5/16-12 UNF 2-B	40500020	703
SUPER 5 WAY	16	1 5/16-12 UNF 2-B	40500038	704
QS SPECIAL 3W	10	M20 X 1.5-H6	40500012	705

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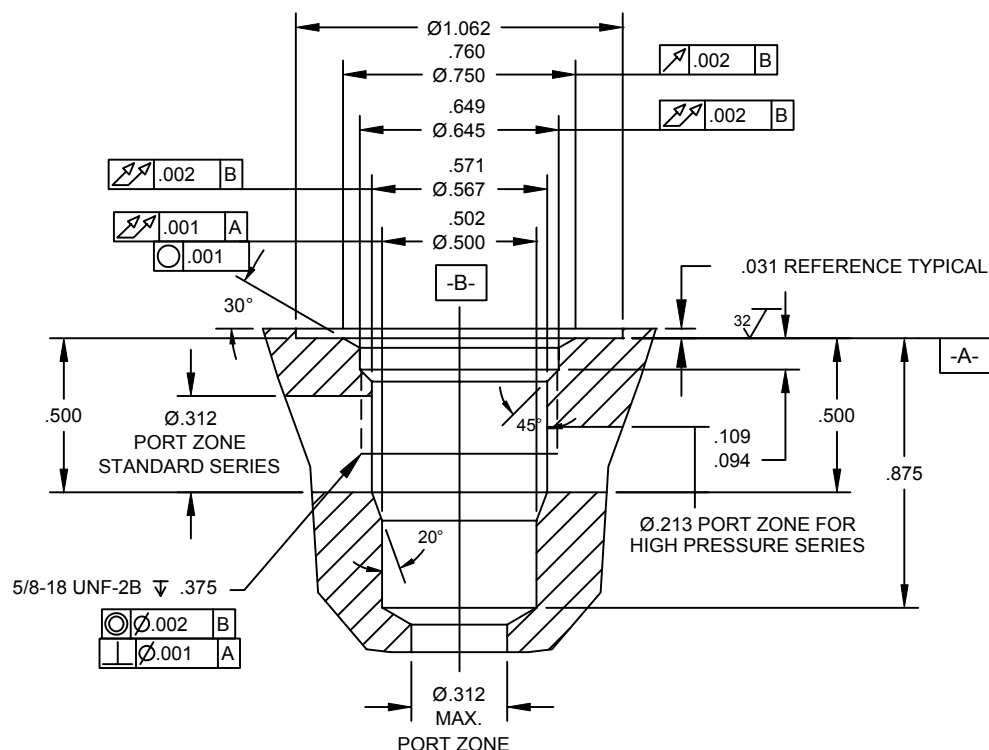
 E-mail: delta@delta-power.com



Mini 2W

DESCRIPTION

7 size, 5/8-18 thread, "Mini" series



NOTES:

- 1.) CAVITY CAN BE MACHINED WITH DELTA FORM TOOL #40500003.
- 2.) ALL MACHINED SURFACES TO BE $32 \sqrt{\text{R}}$ FINISH OR BETTER, EXCLUDING THREADS.
- 3.) IT IS VERY IMPORTANT THAT VALVE CAVITIES MEET ALL DIMENSIONAL AND QUALITY STANDARDS OF CONCENTRICITY AND PERPENDICULARITY. THREADS MUST BE PERPENDICULAR TO THE SPOTFACE SURFACE. SPOTFACE MUST CLEAN UP TO FULL DIAMETER. IMPROPERLY MACHINED CAVITIES CAN LEAD TO CARTRIDGE MALFUNCTION AND/OR FAILURE FROM DISTORTION.
- 4.) PORT ZONE IS Ø.213 MAXIMUM AT PORT #1 ONLY FOR HIGH PRESSURE SERIES MINI VALVES (HA-****.**).

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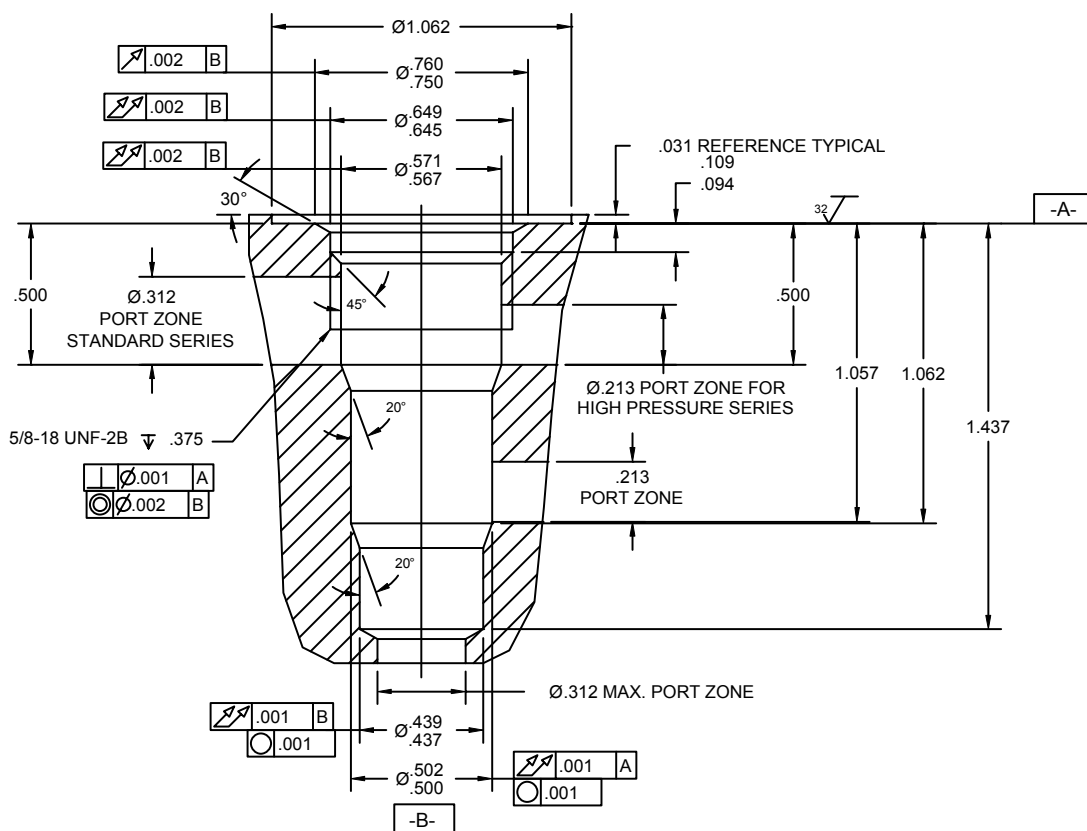
E-mail: delta@delta-power.com



Mini 3W

DESCRIPTION

7 size, 5/8-18 thread, "Mini" series



NOTES:

- 1.) CAVITY CAN BE MACHINED WITH DELTA FORM TOOL #40500004.
- 2.) ALL MACHINED SURFACES TO BE $32\sqrt{}$ FINISH OR BETTER, EXCLUDING THREADS.
- 3.) IT IS VERY IMPORTANT THAT VALVE CAVITIES MEET ALL DIMENSIONAL AND QUALITY STANDARDS OF CONCENTRICITY AND PERPENDICULARITY. THREADS MUST BE PERPENDICULAR TO THE SPOTFACE SURFACE. SPOTFACE MUST CLEAN UP TO FULL DIAMETER. IMPROPERLY MACHINED CAVITIES CAN LEAD TO CARTRIDGE MALFUNCTION AND/OR FAILURE FROM DISTORTION.
- 4.) PORT ZONE IS $\varnothing .213$ MAXIMUM AT PORT #1 ONLY FOR HIGH PRESSURE SERIES MINI VALVES (HA-***-***).

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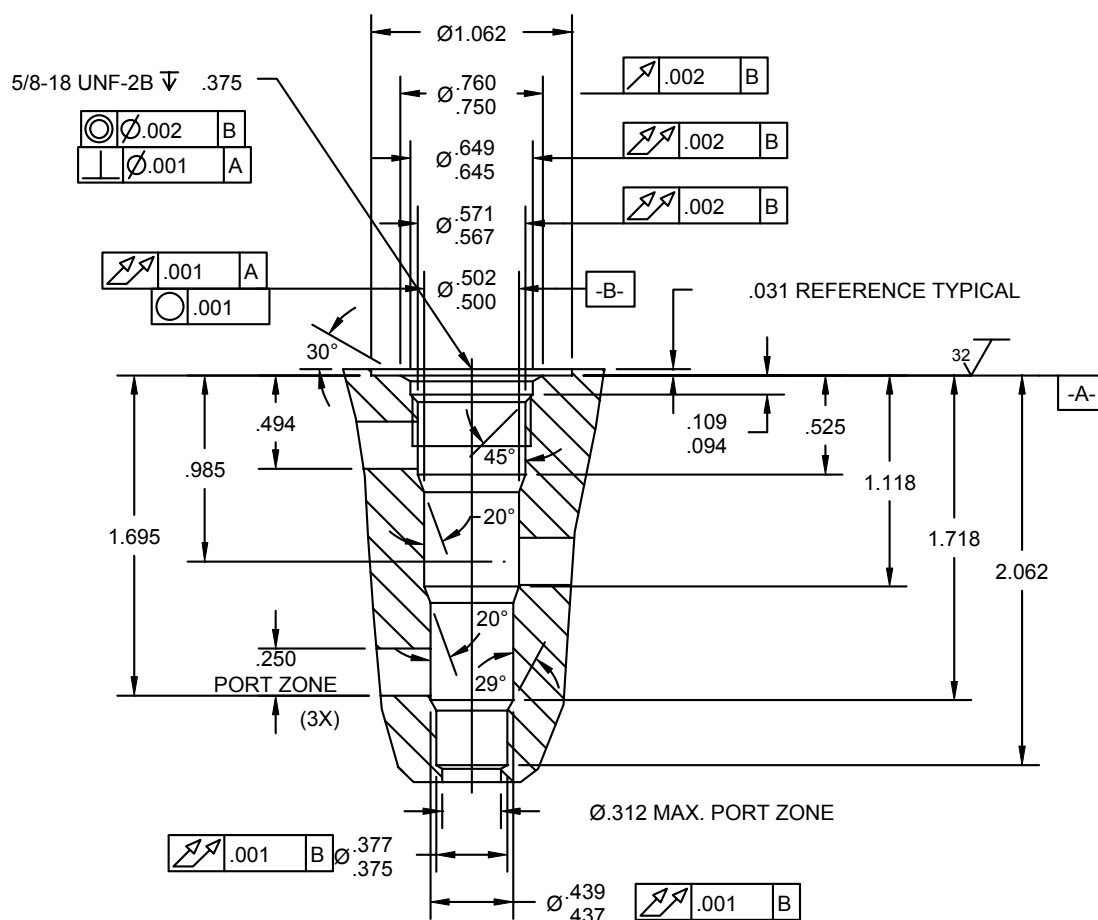
E-mail: delta@delta-power.com



Mini 4W

DESCRIPTION

7 size, 5/8-18 thread, "Mini" series



NOTES:

- 1.) CAVITY CAN BE MACHINED WITH DELTA FORM TOOL #40500006.
- 2.) ALL MACHINED SURFACES TO BE $\sqrt{32}$ FINISH OR BETTER, EXCLUDING THREADS.
- 3.) IT IS VERY IMPORTANT THAT VALVE CAVITIES MEET ALL DIMENSIONAL AND QUALITY STANDARDS OF CONCENTRICITY AND PERPENDICULARITY. THREADS MUST BE PERPENDICULAR TO THE SPOTFACE SURFACE. SPOTFACE MUST CLEAN UP TO FULL DIAMETER. IMPROPERLY MACHINED CAVITIES CAN LEAD TO CARTRIDGE MALFUNCTION AND/OR FAILURE FROM DISTORTION.

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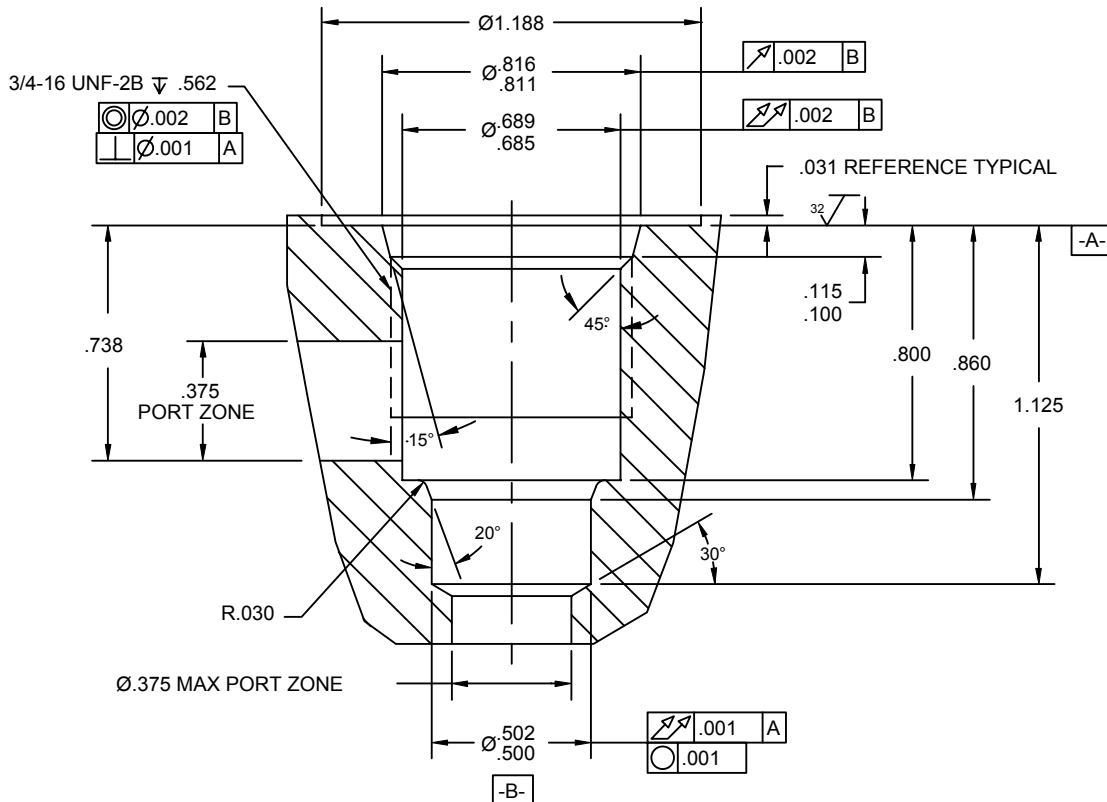
Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com


Power 2W
DESCRIPTION

8 size, 3/4-16 thread, "Power" series


NOTES:

- 1.) CAVITY CAN BE MACHINED WITH
DELTA FORM TOOL #40500005.
- 2.) ALL MACHINED SURFACES TO BE
FINISH OR BETTER, EXCLUDING THREADS. $\sqrt{32}$
- 3.) IT IS VERY IMPORTANT THAT VALVE CAVITIES
MEET ALL DIMENSIONAL AND QUALITY
STANDARDS OF CONCENTRICITY AND PERPENDICULARITY.
THREADS MUST BE PERPENDICULAR TO THE SPOTFACE
SURFACE. SPOTFACE MUST CLEAN UP TO FULL DIAMETER.
IMPROPERLY MACHINED CAVITIES CAN LEAD TO CARTRIDGE
MALFUNCTION AND/OR FAILURE FROM DISTORTION.

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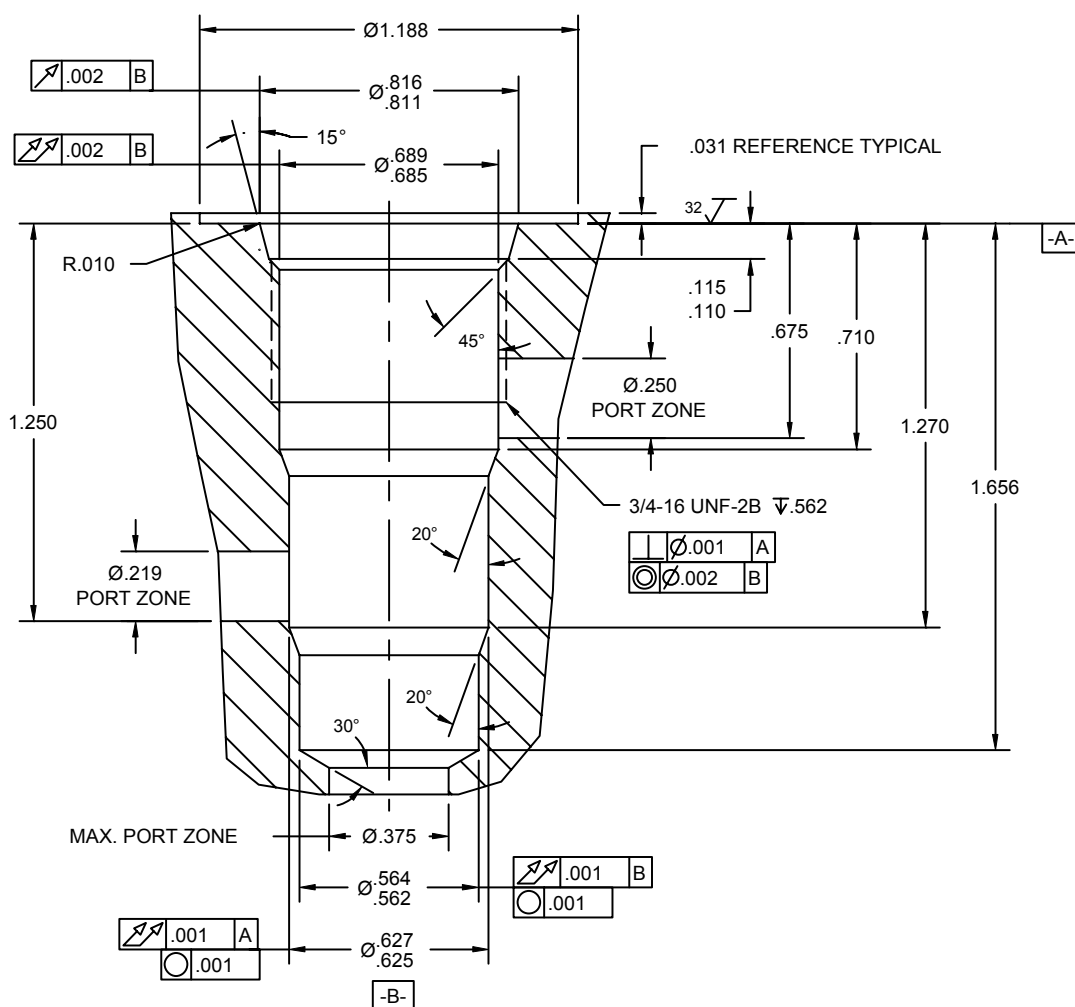
 E-mail: delta@delta-power.com



Power 3W

DESCRIPTION

8 size, 3/4-16 thread, "Power" series



NOTES:

- 1.) CAVITY CAN BE MACHINED WITH DELTA FORM TOOL #40500024.
- 2.) ALL MACHINED SURFACES TO BE $\sqrt{32}$ FINISH OR BETTER, EXCLUDING THREADS.
- 3.) IT IS VERY IMPORTANT THAT VALVE CAVITIES MEET ALL DIMENSIONAL AND QUALITY STANDARDS OF CONCENTRICITY AND PERPENDICULARITY. THREADS MUST BE PERPENDICULAR TO THE SPOTFACE SURFACE. SPOTFACE MUST CLEAN UP TO FULL DIAMETER. IMPROPERLY MACHINED CAVITIES CAN LEAD TO CARTRIDGE MALFUNCTION AND/OR FAILURE FROM DISTORTION.

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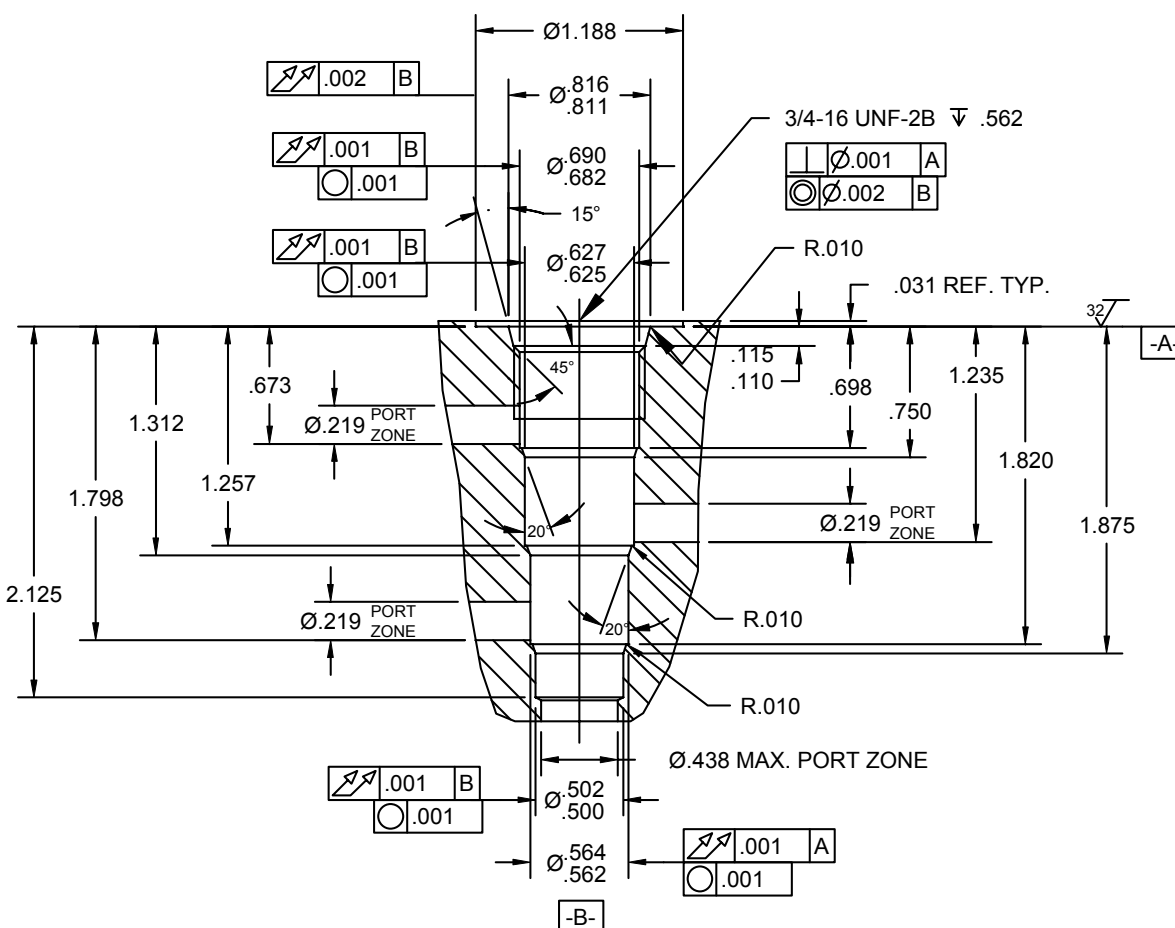
E-mail: delta@delta-power.com



Power 4W

DESCRIPTION

8 size, 3/4-16 thread, "Power" series



NOTES:

- 1.) CAVITY CAN BE MACHINED WITH
DELTA FORM TOOL #40500029.
- 2.) ALL MACHINED SURFACES TO BE $\sqrt{32}$
FINISH OR BETTER, EXCLUDING THREADS.
- 3.) IT IS VERY IMPORTANT THAT VALVE
CAVITIES MEET ALL DIMENSIONAL AND
QUALITY STANDARDS OF CONCENTRICITY AND
PERPENDICULARITY. THREADS MUST BE
PERPENDICULAR TO THE SPOTFACE SURFACE.
SPOTFACE MUST CLEAN UP TO FULL DIAMETER.

IMPROPERLY MACHINED CAVITIES CAN LEAD TO
CARTRIDGE MALFUNCTION AND/OR FAILURE FROM DISTORTION.

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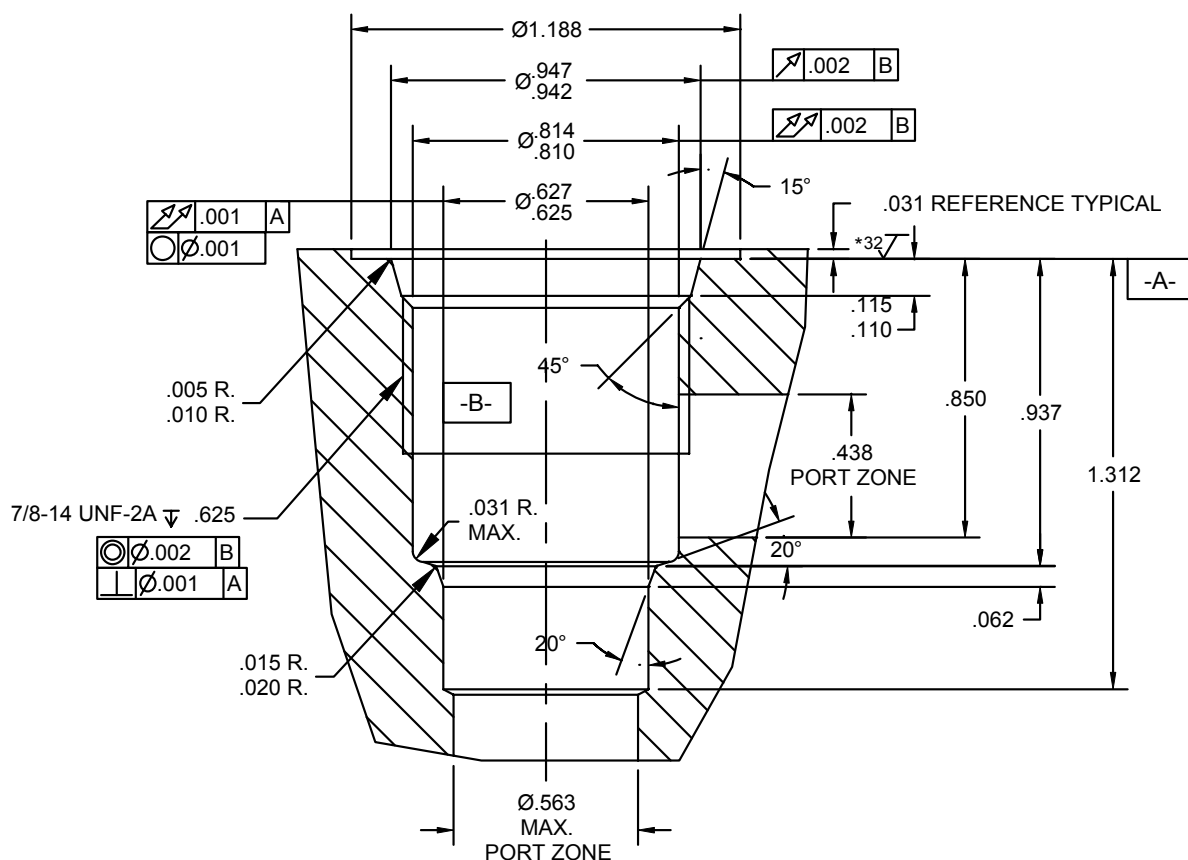
E-mail: delta@delta-power.com



Delta 2W

DESCRIPTION

10 size, 7/8-14 thread, "Delta" series



NOTES:

- 1.) CAVITY CAN BE MACHINED WITH DELTA FORM TOOL #40500000.
- 2.) ALL MACHINED SURFACES TO BE ³² \sqrt FINISH OR BETTER, EXCLUDING THREADS.
- 3.) IT IS VERY IMPORTANT THAT VALVE CAVITIES MEET ALL DIMENSIONAL AND QUALITY STANDARDS OF CONCENTRICITY AND PERPENDICULARITY. THREADS MUST BE PERPENDICULAR TO THE SPOTFACE SURFACE. SPOTFACE MUST CLEAN UP TO FULL DIAMETER. IMPROPERLY MACHINED CAVITIES CAN LEAD TO CARTRIDGE MALFUNCTION AND/OR FAILURE FROM DISTORTION.

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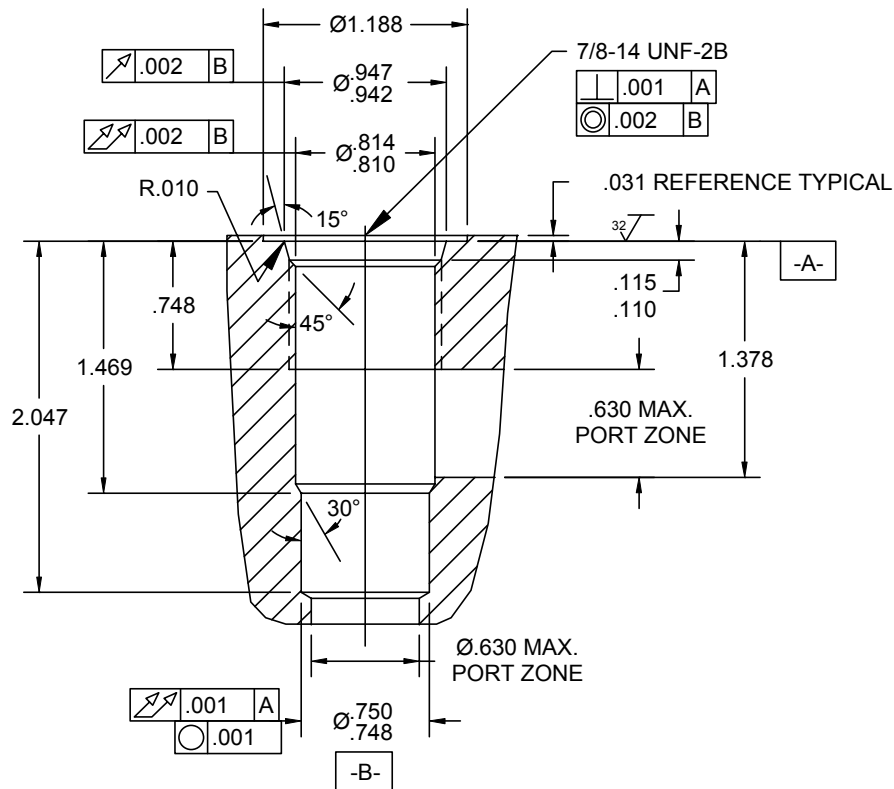
Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com


Delta 2WS
DESCRIPTION

10 size, 7/8-14 thread, Special "Delta" series


NOTES:

- 1.) CAVITY CAN BE MACHINED WITH
DELTA FORM TOOL #40500028.
- 2.) ALL MACHINED SURFACES TO BE $32\sqrt{\text{ }}$
FINISH OR BETTER, EXCLUDING THREADS.
- 3.) IT IS VERY IMPORTANT THAT VALVE CAVITIES
MEET ALL DIMENSIONAL AND QUALITY
STANDARDS OF CONCENTRICITY AND PERPENDICULARITY.
THREADS MUST BE PERPENDICULAR TO THE SPOTFACE
SURFACE. SPOTFACE MUST CLEAN UP TO FULL DIAMETER.
IMPROPERLY MACHINED CAVITIES CAN LEAD TO CARTRIDGE
MALFUNCTION AND/OR FAILURE FROM DISTORTION.

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Fax: (815) 397-2526

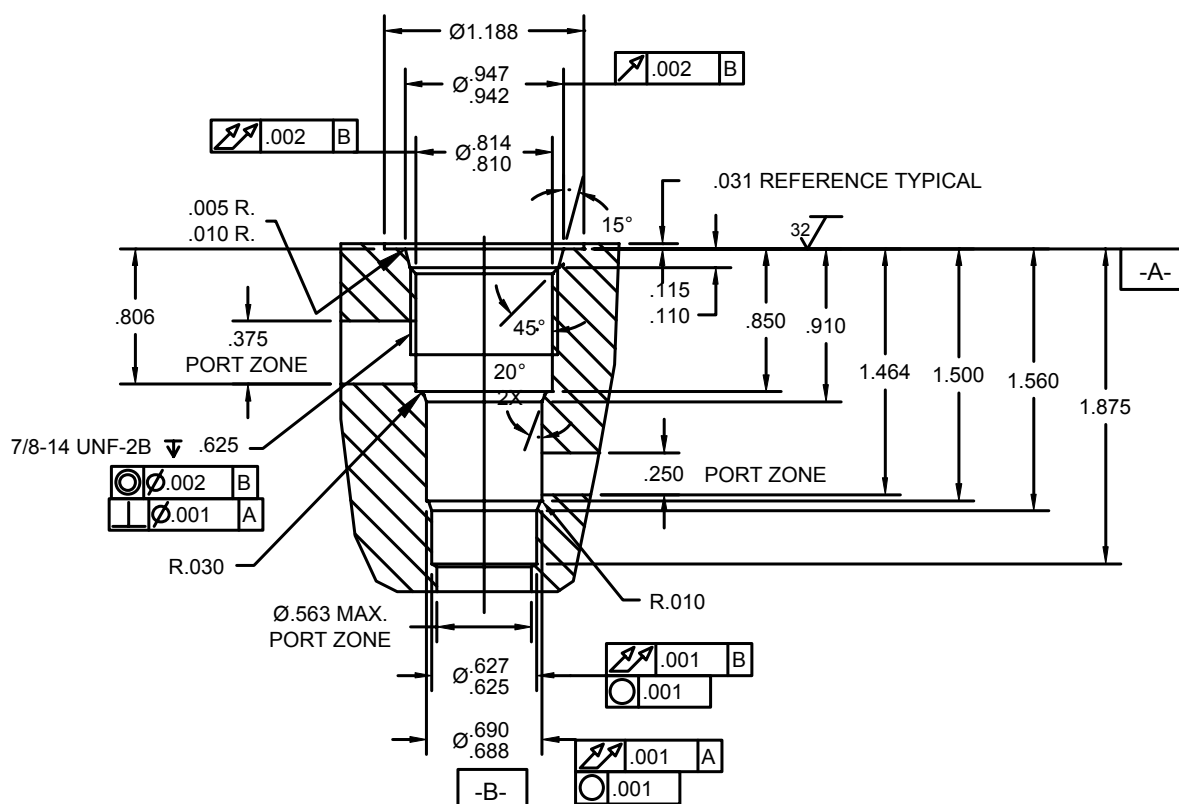
 E-mail: delta@delta-power.com




Delta 3W

DESCRIPTION

10 size, 7/8-14 thread, "Delta" series



NOTES:

- 1.) CAVITY CAN BE MACHINED WITH DELTA FORM TOOL #40500001.
- 2.) ALL MACHINED SURFACES TO BE ³² FINISH OR BETTER, EXCLUDING THREADS.
- 3.) IT IS VERY IMPORTANT THAT VALVE CAVITIES MEET ALL DIMENSIONAL AND QUALITY STANDARDS OF CONCENTRICITY AND PERPENDICULARITY. THREADS MUST BE PERPENDICULAR TO THE SPOTFACE SURFACE. SPOTFACE MUST CLEAN UP TO FULL DIAMETER. IMPROPERLY MACHINED CAVITIES CAN LEAD TO CARTRIDGE MALFUNCTION AND/OR FAILURE FROM DISTORTION.

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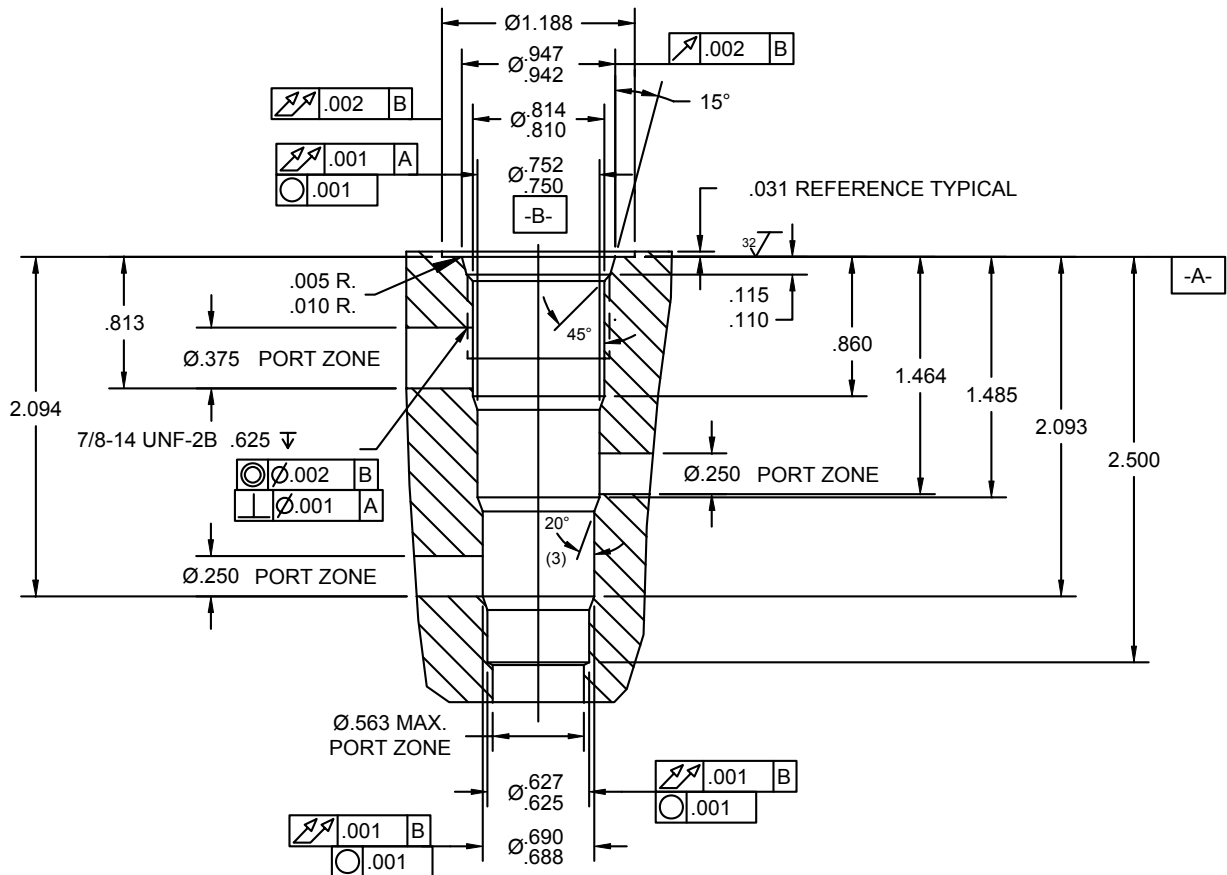
Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com


Delta 4W
DESCRIPTION

10 size, 7/8-14 thread, "Delta" series


NOTES:

- 1.) CAVITY CAN BE MACHINED WITH DELTA FORM TOOL #40500002.
- 2.) ALL MACHINED SURFACES TO BE $\sqrt{.001}$ FINISH OR BETTER, EXCLUDING THREADS.
- 3.) IT IS VERY IMPORTANT THAT VALVE CAVITIES MEET ALL DIMENSIONAL AND QUALITY STANDARDS OF CONCENTRICITY AND PERPENDICULARITY. THREADS MUST BE PERPENDICULAR TO THE SPOTFACE SURFACE. SPOTFACE MUST CLEAN UP TO FULL DIAMETER. IMPROPERLY MACHINED CAVITIES CAN LEAD TO CARTRIDGE MALFUNCTION AND/OR FAILURE FROM DISTORTION.

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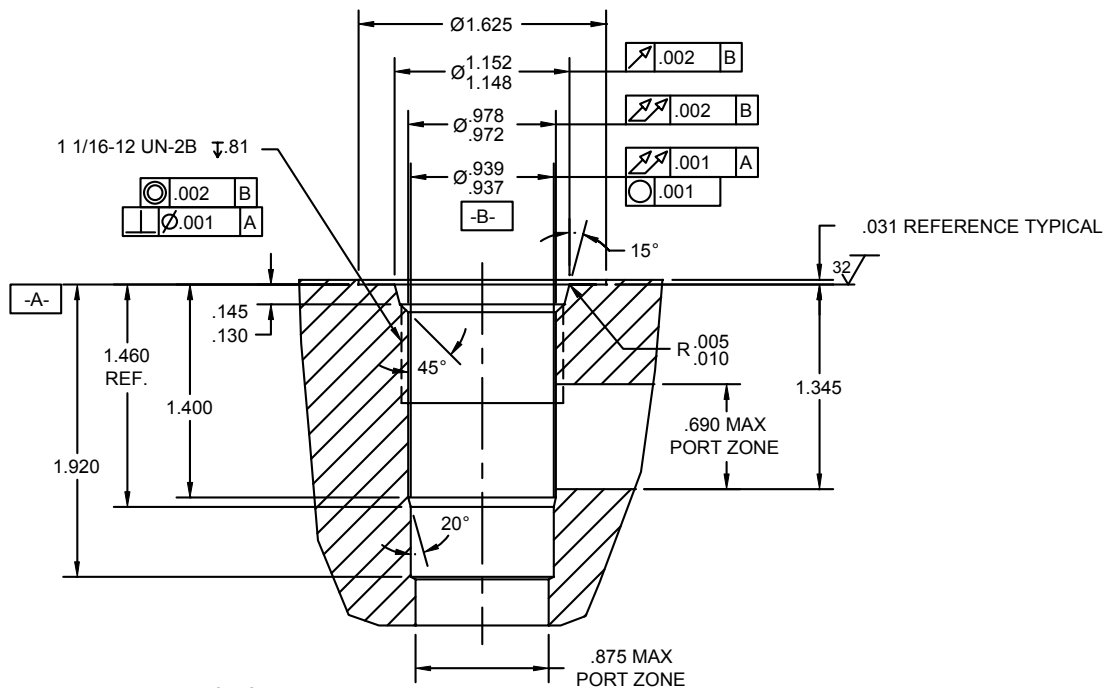
Phone: (815) 397-6628

Fax: (815) 397-2526

 E-mail: delta@delta-power.com


Tecnord 2W
DESCRIPTION

12 Size, 1 1/16-12 thread "Tecnord" series


NOTES:

- 1.) CAVITY CAN BE MACHINED WITH DELTA FORM TOOL #40500032.
- 2.) ALL MACHINED SURFACES TO BE 32 FINISH OR BETTER, EXCLUDING THREADS.
- 3.) IT IS VERY IMPORTANT THAT VALVE CAVITIES MEET ALL DIMENSIONAL AND QUALITY STANDARDS OF CONCENTRICITY AND PERPENDICULARITY. THREADS MUST BE PERPENDICULAR TO THE SPOTFACE SURFACE. SPOTFACE MUST CLEAN UP TO FULL DIAMETER. IMPROPERLY MACHINED CAVITIES CAN LEAD TO CARTRIDGE MALFUNCTION AND/OR FAILURE FROM DISTORTION.

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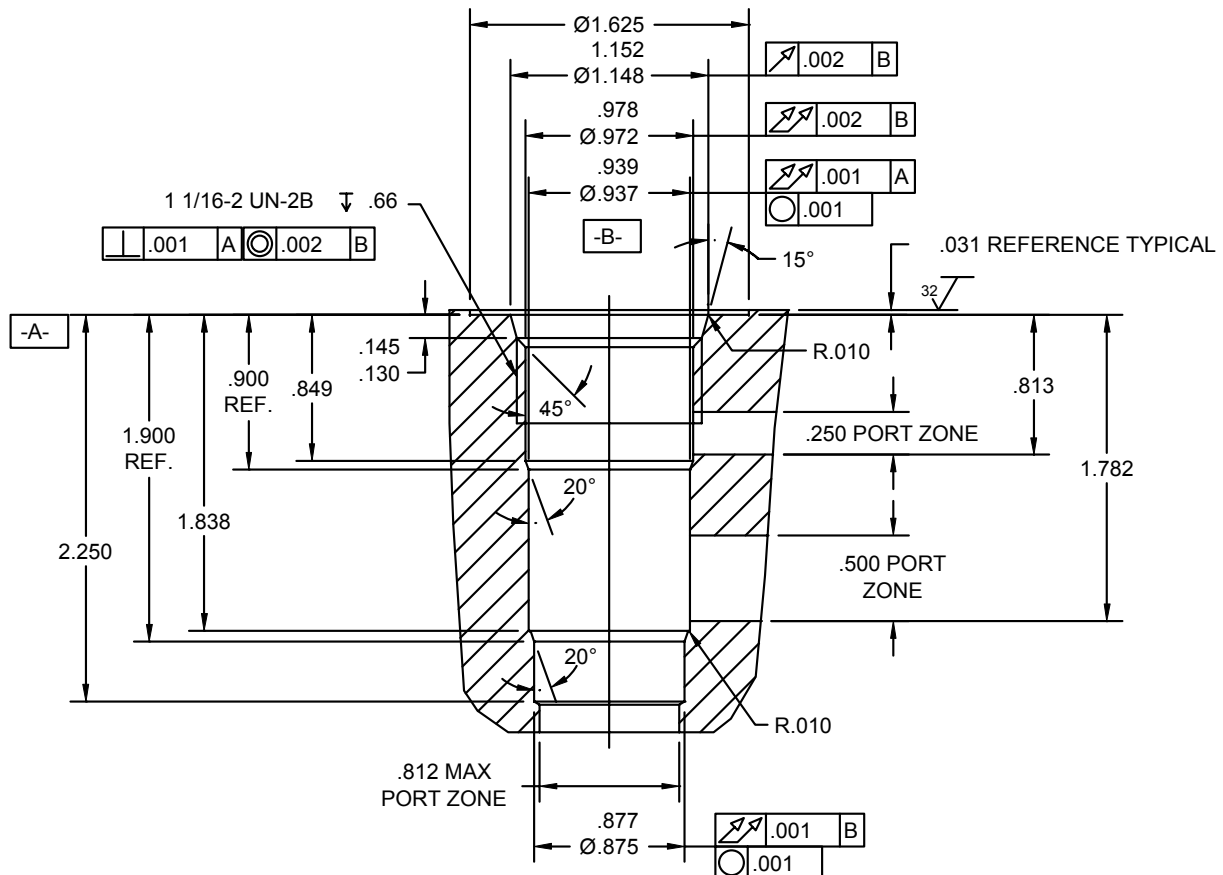
Phone: (815) 397-6628

Fax: (815) 397-2526

 E-mail: delta@delta-power.com


Tecnord 3WS
DESCRIPTION

12 Size, 1 1/16-12 thread "Tecnord" series


NOTES:

- 1.) CAVITY CAN BE MACHINED WITH DELTA FORM TOOL #40500033.
- 2.) ALL MACHINED SURFACES TO BE 32° FINISH OR BETTER, EXCLUDING THREADS.
- 3.) IT IS VERY IMPORTANT THAT VALVE CAVITIES MEET ALL DIMENSIONAL AND QUALITY STANDARDS OF CONCENTRICITY AND PERPENDICULARITY. THREADS MUST BE PERPENDICULAR TO THE SPOTFACE SURFACE. SPOTFACE MUST CLEAN UP TO FULL DIAMETER. IMPROPERLY MACHINED CAVITIES CAN LEAD TO CARTRIDGE MALFUNCTION AND/OR FAILURE FROM DISTORTION.

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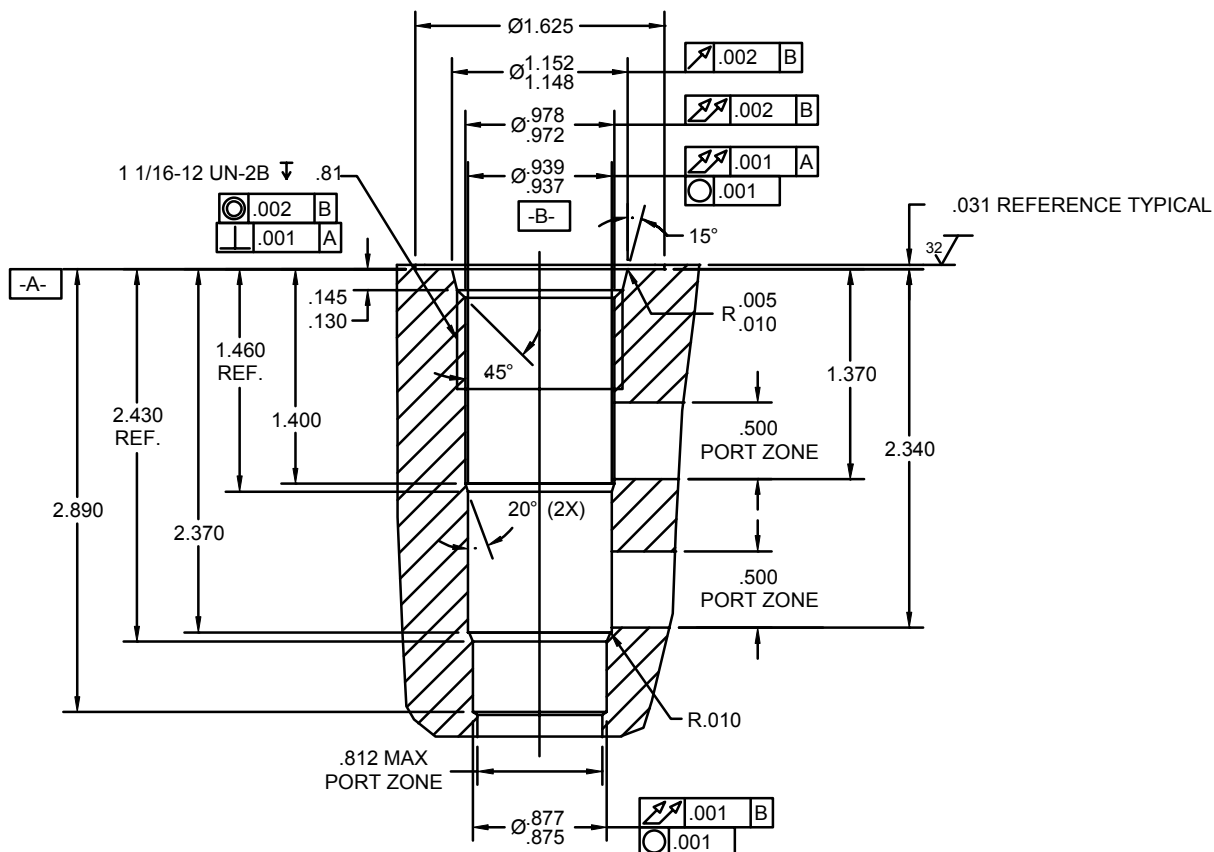
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Fax: (815) 397-2526

 E-mail: delta@delta-power.com


Tecnord 3W
DESCRIPTION

12 Size, 1 1/16-12 thread "Tecnord" series


NOTES:

- 1.) CAVITY CAN BE MACHINED WITH DELTA FORM TOOL #40500034.
- 2.) ALL MACHINED SURFACES TO BE $\sqrt{32}$ FINISH OR BETTER, EXCLUDING THREADS.
- 3.) IT IS VERY IMPORTANT THAT VALVE CAVITIES MEET ALL DIMENSIONAL AND QUALITY STANDARDS OF CONCENTRICITY AND PERPENDICULARITY. THREADS MUST BE PERPENDICULAR TO THE SPOTFACE SURFACE. SPOTFACE MUST CLEAN UP TO FULL DIAMETER. IMPROPERLY MACHINED CAVITIES CAN LEAD TO CARTRIDGE MALFUNCTION AND/OR FAILURE FROM DISTORTION.

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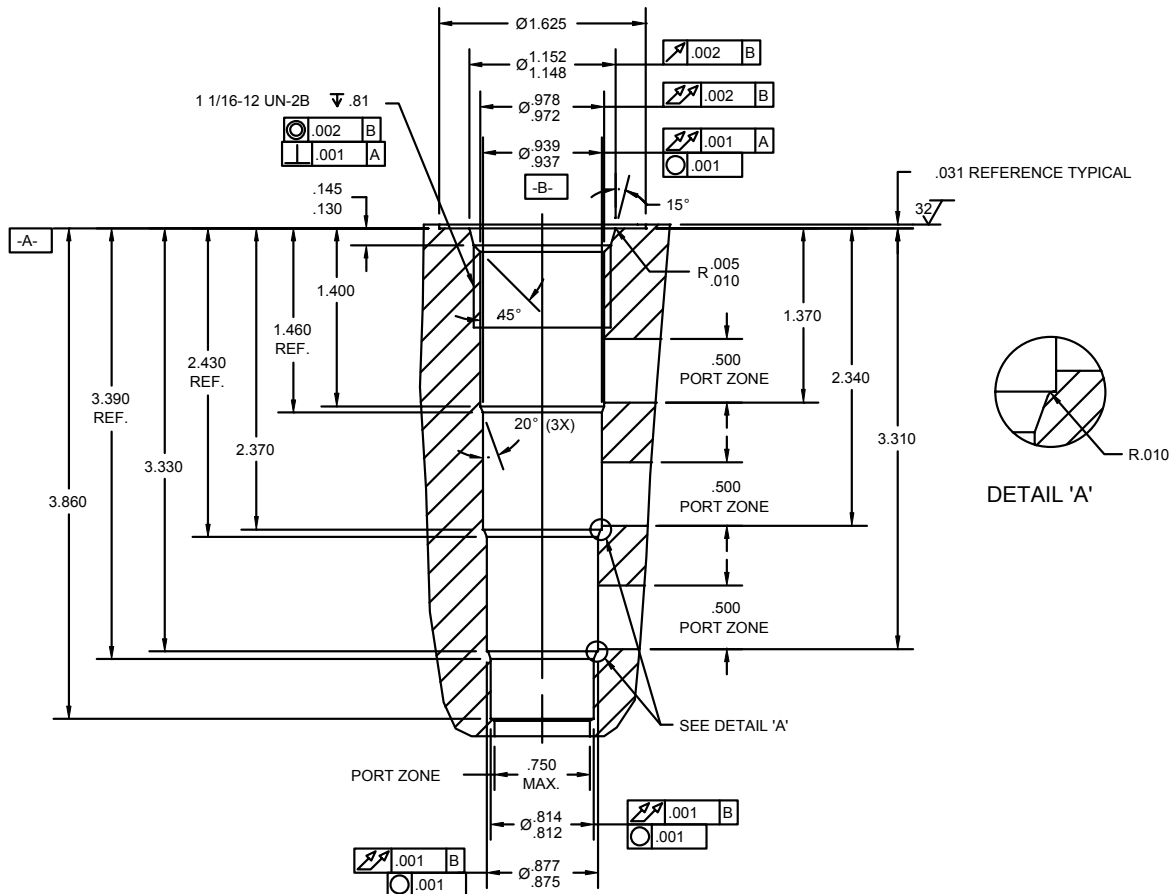
Phone: (815) 397-6628

Fax: (815) 397-2526

 E-mail: delta@delta-power.com


Tecnord 4W
DESCRIPTION

12 Size, 1 1/16-12 thread "Tecnord" series


NOTES:

- 1.) CAVITY CAN BE MACHINED WITH
DELTA FORM TOOL #40500035.
- 2.) ALL MACHINED SURFACES TO BE $32\sqrt{\text{ }}$
FINISH OR BETTER, EXCLUDING THREADS.
- 3.) IT IS VERY IMPORTANT THAT VALVE
CAVITIES MEET ALL DIMENSIONAL AND
QUALITY STANDARDS OF CONCENTRICITY AND
PERPENDICULARITY. THREADS MUST BE
PERPENDICULAR TO THE SPOTFACE SURFACE.
SPOTFACE MUST CLEAN UP TO FULL DIAMETER.
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Phone: (815) 397-6628

Fax: (815) 397-2526

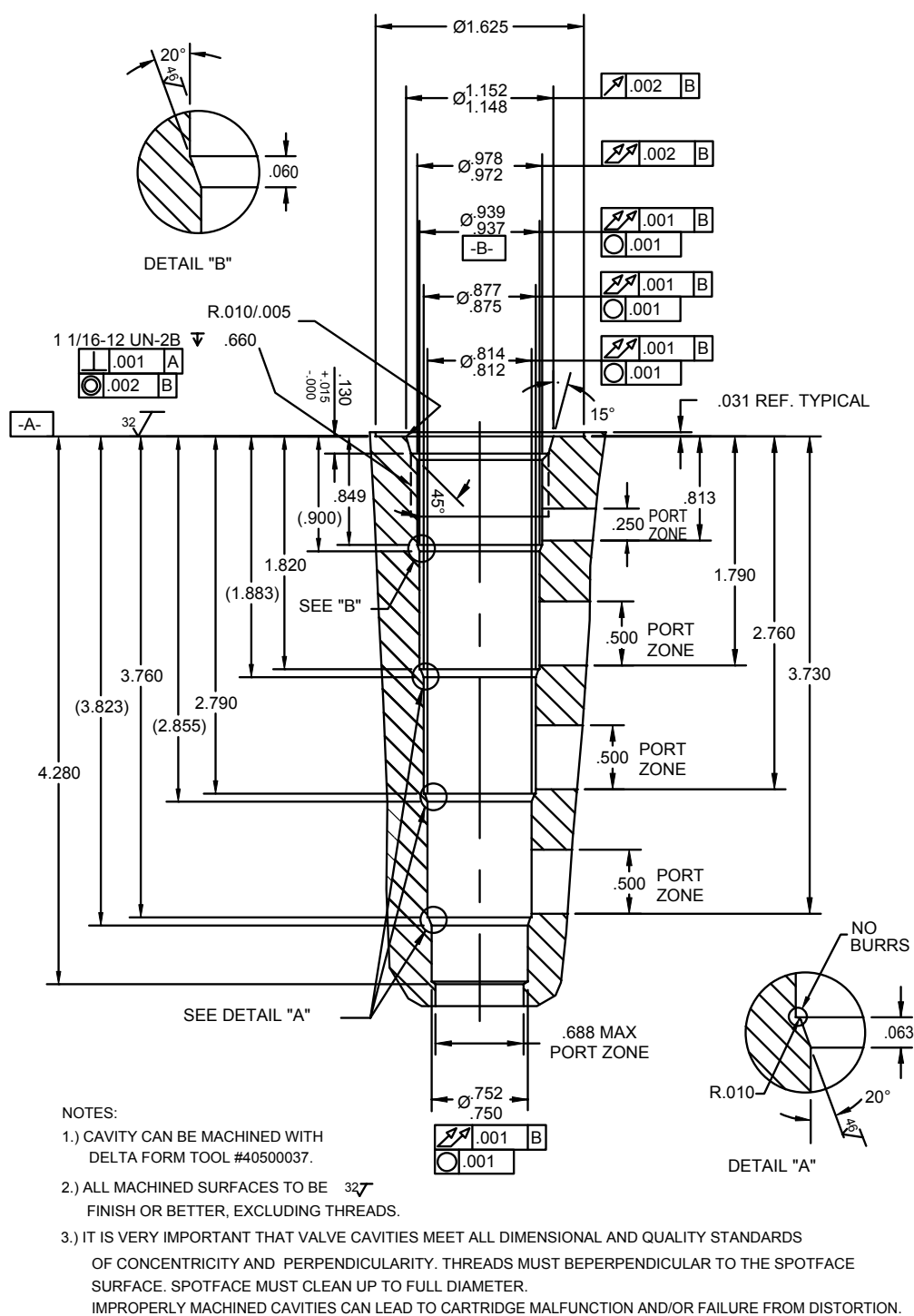
 E-mail: delta@delta-power.com



Tecnord 5WS

DESCRIPTION

12 Size, 1 1/16-12 thread "Tecnord" series



WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

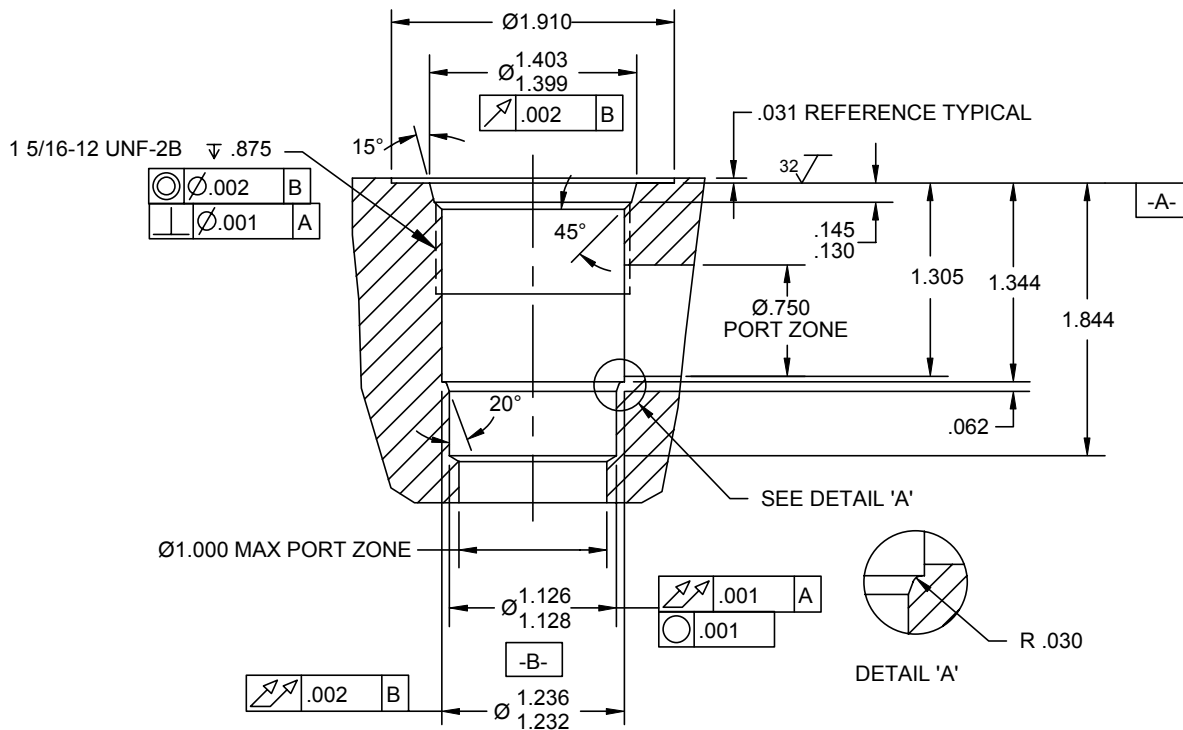
Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com


Super 2W
DESCRIPTION

16 Size, 1 5/16-12 thread "Super" series


NOTES:

- 1.) CAVITY CAN BE MACHINED WITH DELTA FORM TOOL #40500017.
- 2.) ALL MACHINED SURFACES TO BE $32\sqrt{\text{ }}$ FINISH OR BETTER, EXCLUDING THREADS.
- 3.) IT IS VERY IMPORTANT THAT VALVE CAVITIES MEET ALL DIMENSIONAL AND QUALITY STANDARDS OF CONCENTRICITY AND PERPENDICULARITY. THREADS MUST BE PERPENDICULAR TO THE SPOTFACE SURFACE. SPOTFACE MUST CLEAN UP TO FULL DIAMETER. IMPROPERLY MACHINED CAVITIES CAN LEAD TO CARTRIDGE MALFUNCTION AND/OR FAILURE FROM DISTORTION.

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

Phone: (815) 397-6628

Fax: (815) 397-2526

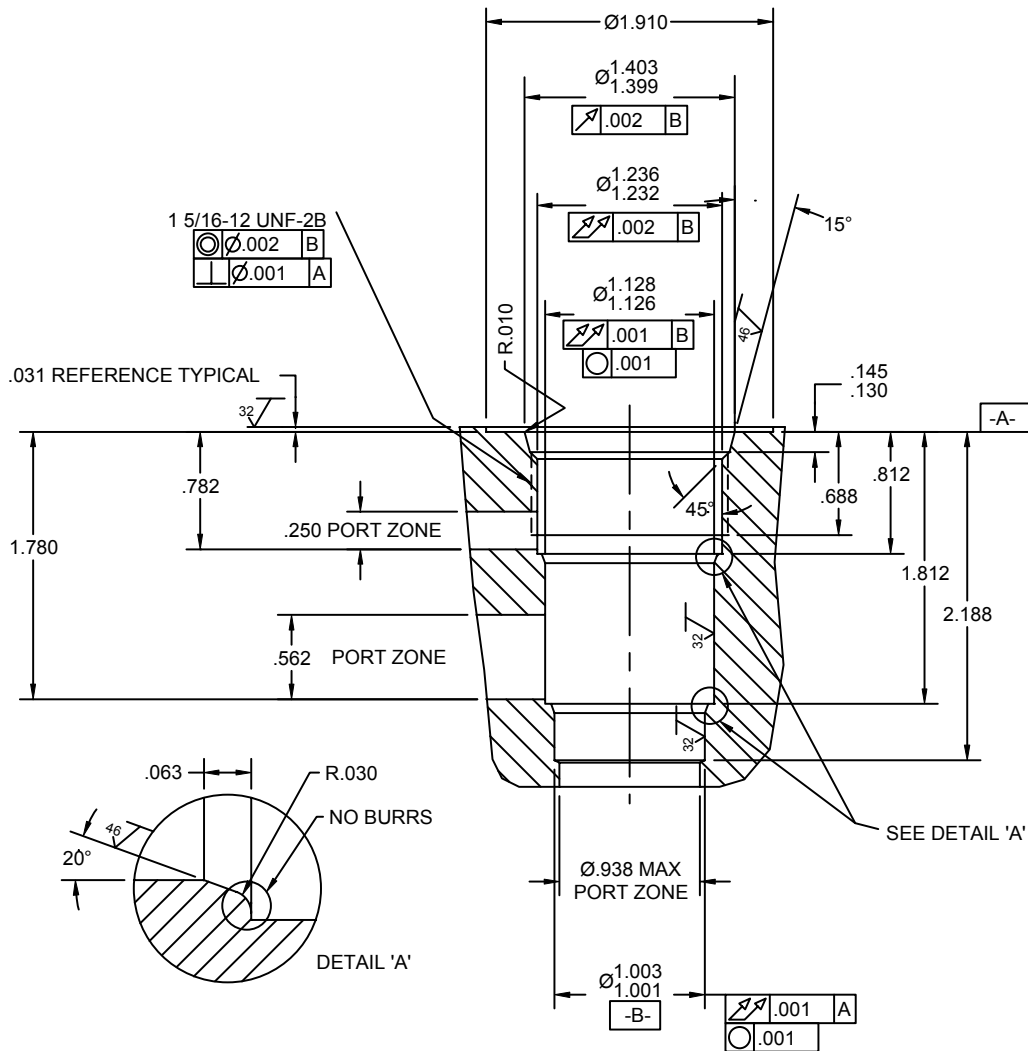
 E-mail: delta@delta-power.com



Super 3WS

DESCRIPTION

16 Size, 1 5/16-12 thread "Super" series



NOTES:

- 1.) CAVITY CAN BE MACHINED WITH DELTA FORM TOOL #40500021.
- 2.) ALL MACHINED SURFACES TO BE $32\sqrt{}$ FINISH OR BETTER, EXCLUDING THREADS.
- 3.) IT IS VERY IMPORTANT THAT VALVE CAVITIES MEET ALL DIMENSIONAL AND QUALITY STANDARDS OF CONCENTRICITY AND PERPENDICULARITY. THREADS MUST BE PERPENDICULAR TO THE SPOTFACE SURFACE. SPOTFACE MUST CLEAN UP TO FULL DIAMETER. IMPROPERLY MACHINED CAVITIES CAN LEAD TO CARTRIDGE MALFUNCTION AND/OR FAILURE FROM DISTORTION.

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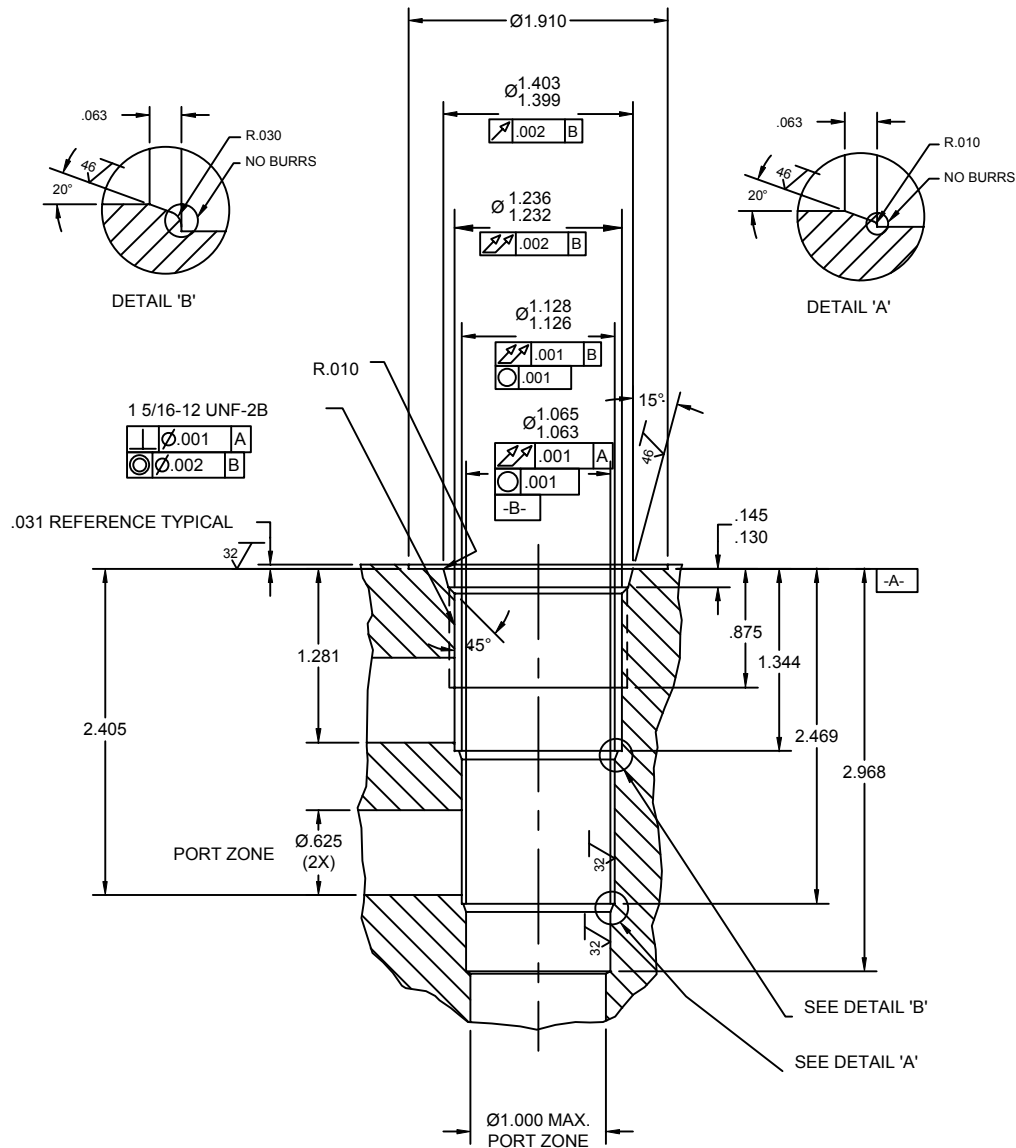
Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com


Super 3W
DESCRIPTION

16 Size, 1 5/16-12 thread "Super" series


NOTES:

- 1.) CAVITY CAN BE MACHINED WITH DELTA FORM TOOL #40500018.
- 2.) ALL MACHINED SURFACES TO BE $32\sqrt{\text{ }}$ FINISH OR BETTER, EXCLUDING THREADS.
- 3.) IT IS VERY IMPORTANT THAT VALVE CAVITIES MEET ALL DIMENSIONAL AND QUALITY STANDARDS OF CONCENTRICITY AND PERPENDICULARITY. THREADS MUST BE PERPENDICULAR TO THE SPOTFACE SURFACE. SPOTFACE MUST CLEAN UP TO FULL DIAMETER. IMPROPERLY MACHINED CAVITIES CAN LEAD TO CARTRIDGE MALFUNCTION AND/OR FAILURE FROM DISTORTION.

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

Phone: (815) 397-6628

Fax: (815) 397-2526

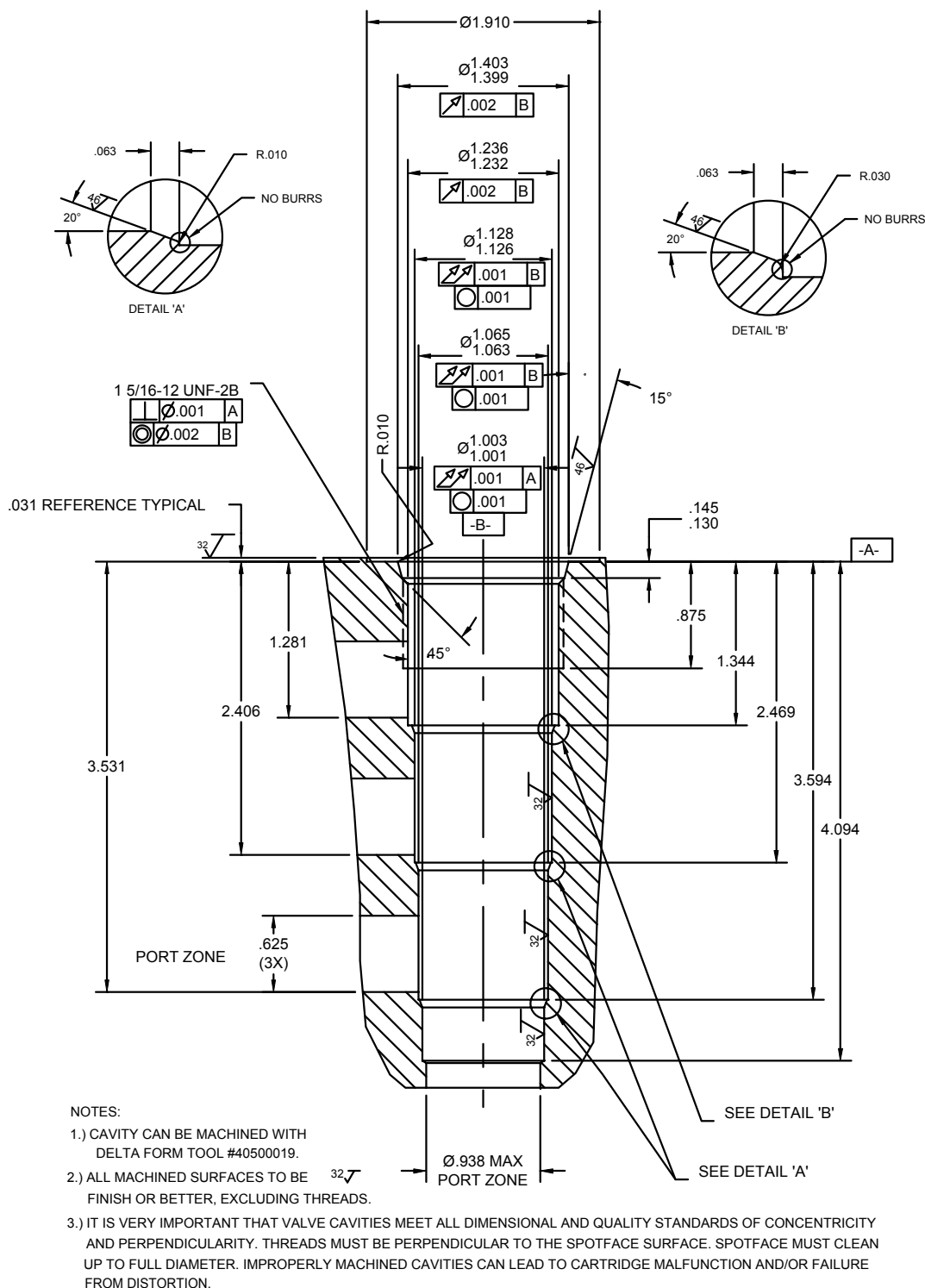
 E-mail: delta@delta-power.com



Super 4W

DESCRIPTION

16 Size, 1 5/16-12 thread "Super" series



WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

Phone: (815) 397-6628

Fax: (815) 397-2526

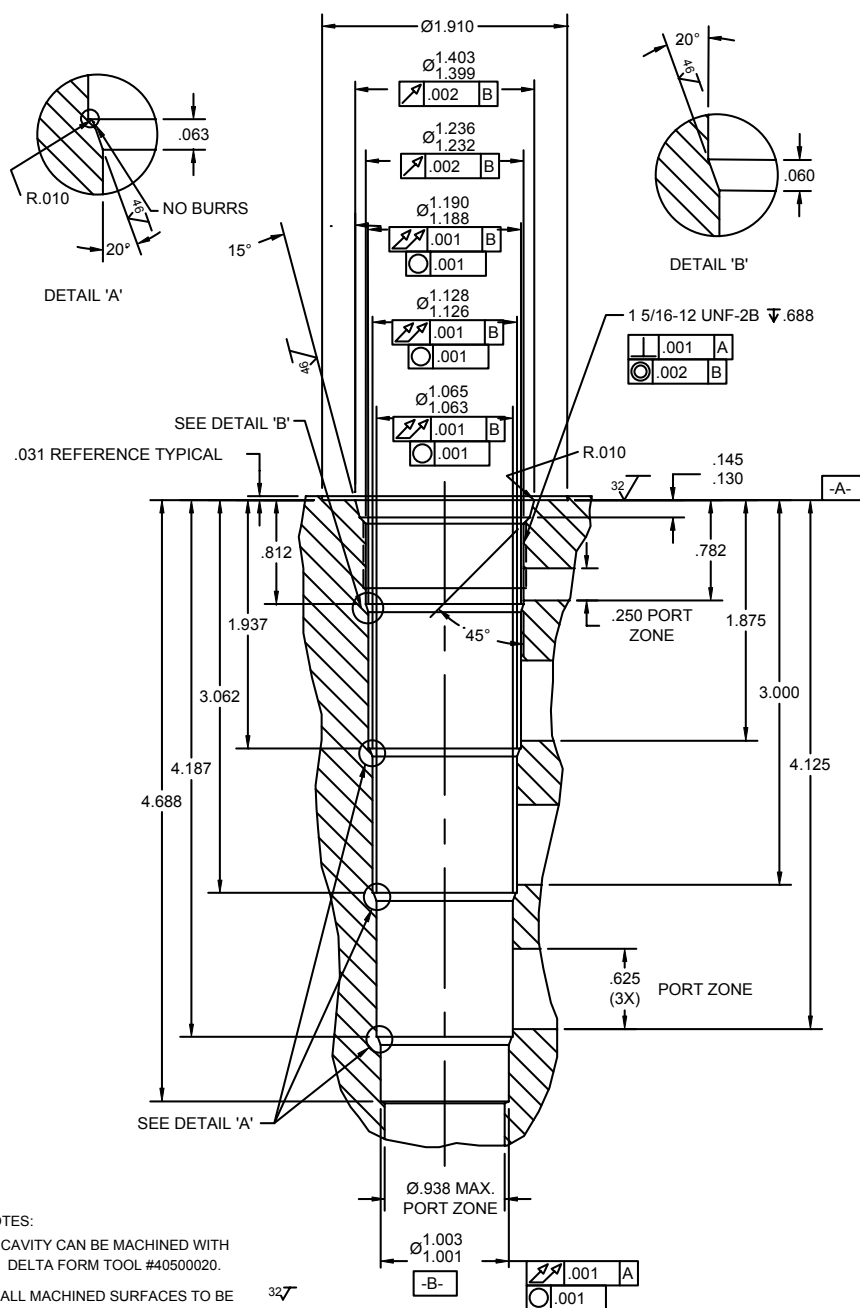
E-mail: delta@delta-power.com



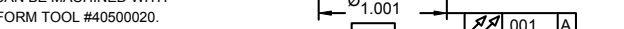
Super 5WS

DESCRIPTION

16 Size, 1 5/16-12 thread "Super" series



NOTES:

- 1.) CAVITY CAN BE MACHINED WITH DELTA FORM TOOL #40500020.
- 2.) ALL MACHINED SURFACES TO BE $32\sqrt{}$ FINISH OR BETTER, EXCLUDING THREADS.
- 3.) IT IS VERY IMPORTANT THAT VALVE CAVITIES MEET ALL DIMENSIONAL AND QUALITY STANDARDS OF CONCENTRICITY AND PERPENDICULARITY. THREADS MUST BE PERPENDICULAR TO THE SPOTFACE SURFACE. SPOTFACE MUST CLEAN UP TO FULL DIAMETER.
- IMPROPERLY MACHINED CAVITIES CAN LEAD TO CARTRIDGE MALFUNCTION AND/OR FAILURE FROM DISTORTION.
- 
- The technical drawing shows a cross-section of a valve cavity. The top surface is dimensioned with a diameter of $\varnothing 1.003$ and a tolerance of ± 0.001 . Below this, a rectangular feature is labeled '-B-'. To the right, a circular feature is shown with a surface finish symbol (a square with a diagonal line and a circle) and a tolerance of ± 0.001 . A spotface is indicated by a circle with a cross-hatch pattern and a tolerance of ± 0.001 . The drawing also includes a section line 'A' and a surface finish symbol (a square with a diagonal line and a circle) for the top surface.

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

Phone: (815) 397-6628

Fax: (815) 397-2526

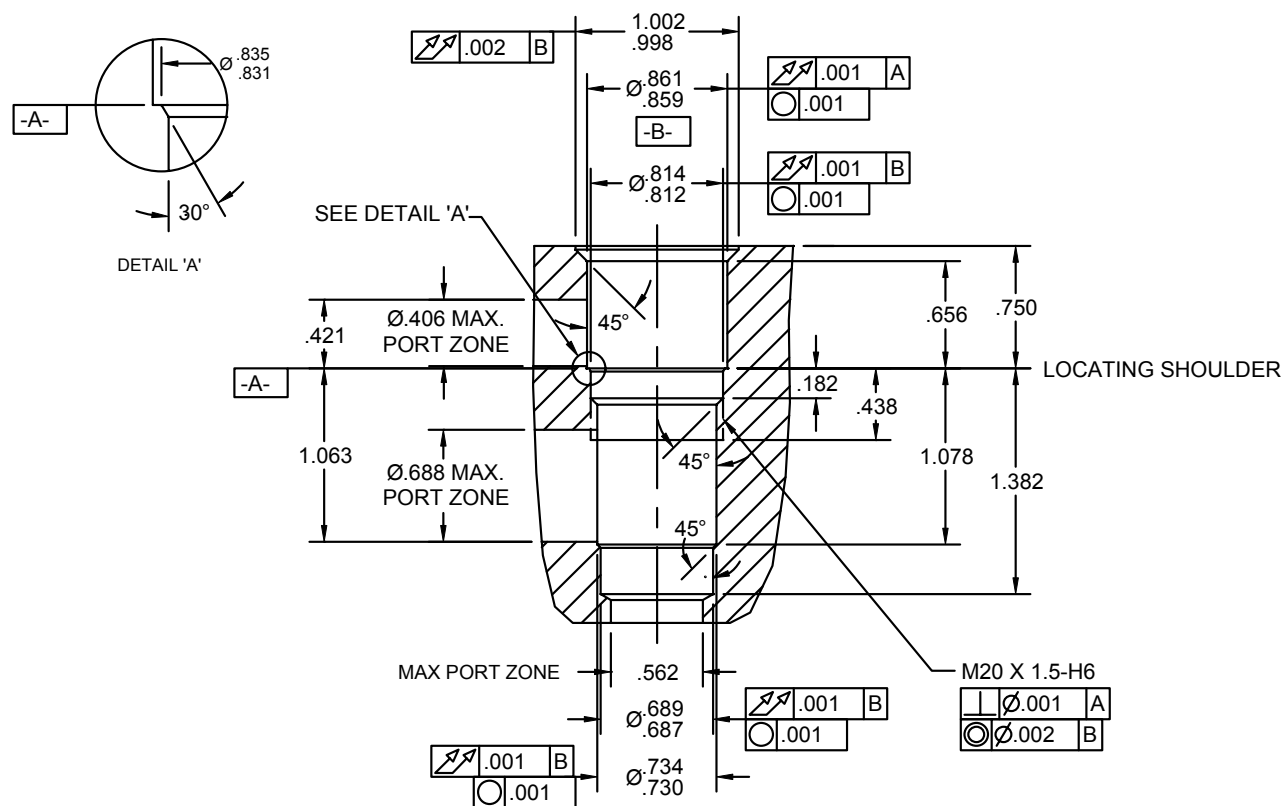
E-mail: delta@delta-power.com



QS SPECIAL 3W

DESCRIPTION

METRIC M20-1.5-H6 Thread "Special" series



NOTES:

- 1.) CAVITY CAN BE MACHINED WITH DELTA FORM TOOL #40500012.
 - 2.) ALL MACHINED SURFACES TO BE $32\sqrt{}$ FINISH OR BETTER, EXCLUDING THREADS.
 - 3.) IT IS VERY IMPORTANT THAT VALVE CAVITIES MEET ALL DIMENSIONAL AND QUALITY STANDARDS OF CONCENTRICITY AND PERPENDICULARITY. THREADS MUST BE PERPENDICULAR TO THE SPOTFACE SURFACE. SPOTFACE MUST CLEAN UP TO FULL DIAMETER.
- IMPROPERLY MACHINED CAVITIES CAN LEAD TO CARTRIDGE MALFUNCTION AND/OR FAILURE FROM DISTORTION.

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

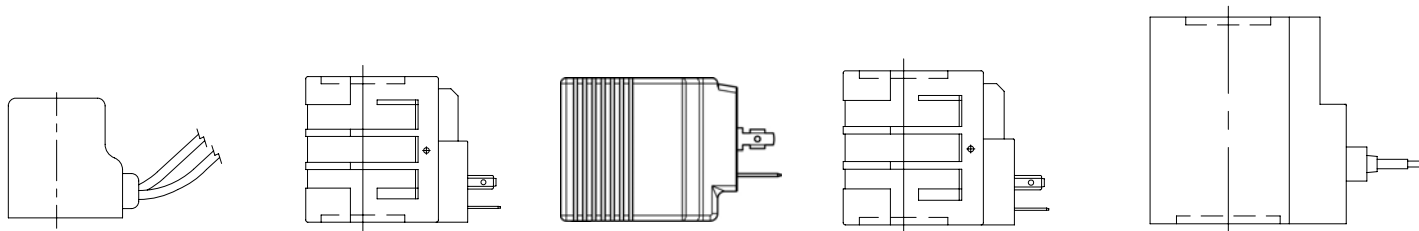
Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com

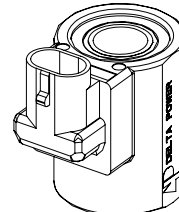
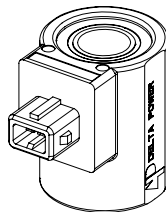
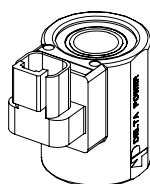


Coil Data



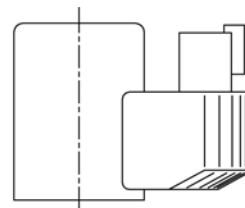
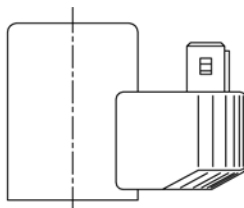
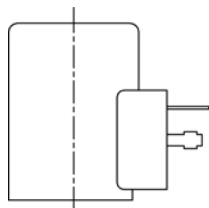
STANDARD COILS

TYPE	ID	WIDTH	HEIGHT	PAGE
M	13/32" [10.1]	1.25" [31.8]	1.47" [37.3]	708
P	1/2" [12.7]	1.25" [31.8]	1.78" [45.3]	710
PJ (Tecnord)	1/2" [12.7]	1.42" [36.0]	1.52" [38.5]	712
D	1/2" [12.7]	1.56" [39.6]	2.03" [51.6]	714
L	5/8" [15.9]	1.56" [39.6]	2.03" [51.6]	716
T	3/4" [19.1]	1.96" [49.7]	2.38" [60.6]	718



IMMERSION PROOF "I" COILS

TYPE	ID	WIDTH	HEIGHT	PAGE
PI	1/2" [13]	1.48" [37.5]	1.70" [43.1]	720
DI	1/2" [13]	1.48" [37.5]	1.97" [50]	711
LI	5/8" [16]	1.48" [37.5]	1.97" [50]	722



Standard Proportional "F" Type Coils (Tecnord)

TYPE	ID	WIDTH	HEIGHT	PAGE
F	3/4" [19.1]	1.46 [37]	1.96" [50]	724

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

Phone: (815) 397-6628

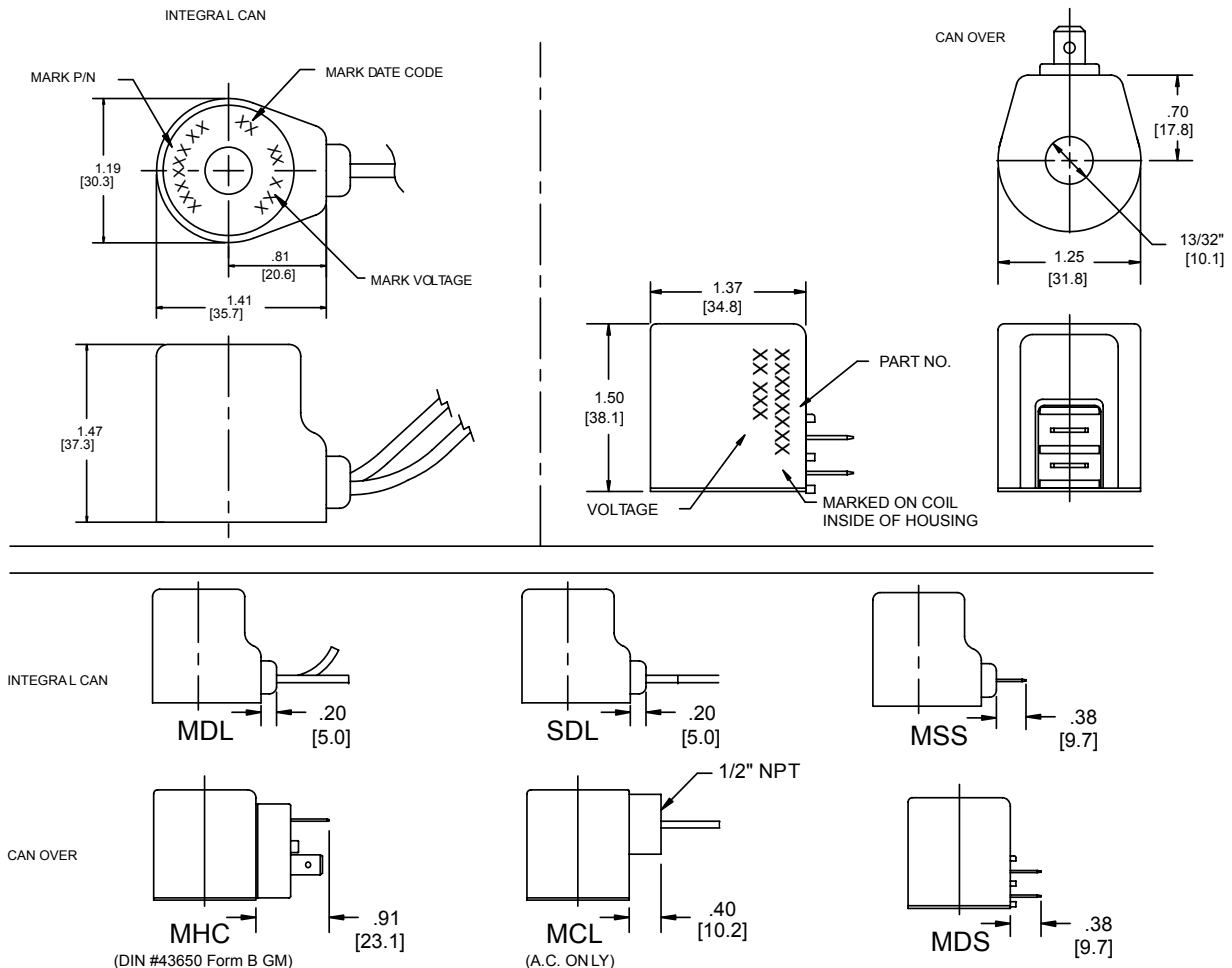
Fax: (815) 397-2526

 E-mail: delta@delta-power.com



Standard "M" Type Coils

FEATURES: 13/32" I.D.

 Numerous terminals and voltages.
 Heavy gauge color coded
 lead wire.


ORDERING INFORMATION

M - * * - * *

 WHEN ORDERING
 FILL IN ALL BOXES

1: BASIC MODEL NO.	2: TERMINATION	3: VOLTAGE
M-Type coil	(ALL COILS DC VOLTAGE EXCEPT AS NOTED) DL - Double Lead DT - Deutsch on Leads DT04-2 P ML - Metri-Pack on Leads (12162000) PL - Packard on Leads (150 Series) WL - Weatherpack on Leads (12010972) SS - Single Spade DS - Double Spade HC - DIN 43650 (Hirschman) - (AC/DC) CL - Conduit Lead - (AC ONLY) 20 WATT STD. COIL	06 -6VDC 12 -12VDC 24 -24VDC 36 -36VDC 48 -48VDC 25 -24VAC 11 -110VAC 13 -125VAC 22 -220VAC 23 -250VAC 44 -440VAC

FEB. 2005

APPROXIMATE COIL WEIGHT: .24 lbs./ 11 kg.

REV G

APPROXIMATE COIL, CAN, BTM., & NU T ASS'Y WEIGHT: .33 lbs./ 15 kg.

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Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com



Standard "M" Type Coils

Coil Model Numbers:

Termination	MDL	MSL	MDS	MSS	MHC	MCL		
Description	Double Lead	Single Lead	Double Spade	Single Spade	Hirschmann Connector	Double Lead Conduit	Lead Wire Color	AC Voltage Range
Voltage Amp							ORANGE	
Voltage Amp	12VDC 1.7	12VDC 1.7	12VDC 1.7	12VDC 1.7	12VDC 1.7		YELLOW	
Voltage Amp	24VDC .86	24VDC .86	24VDC .86		24VDC .86		BLUE	
Voltage Amp	36VDC .57			36VDC .57	36VDC .57		GREEN	
Voltage Amp	48VDC .45						BROWN	
Voltage Amp			24VAC .74		24VAC .74	24VAC .74	BLUE/ BLACK	
Voltage Amp			110VAC * .17		110VAC * .17	110VAC * .17	RED/ WHITE	* 100VAC 115VAC
Voltage Amp							RED	* 115VAC 130VAC
Voltage Amp			220VAC * .10		220VAC * .10	220VAC * .10	BLACK/ WHITE	* 200VAC 230VAC
Voltage Amp							VIOLET/ WHITE	* 225VAC 260VAC
Voltage Amp							VIOLET	* 400VAC 460VAC

Specifications:

Wattage: 20 watts nominal.

Duty Rating: Continuous duty $\pm 10\%$ rated voltage at 70 °F (21 °C) ambient.
Intermittent duty for higher ambient temperature.

Minimum Current for Actuation: 80% of rated current at room temperature.

Magnet Wire Class: N for all voltages.

Temperature Range: -40°F (-40°C) to 392°F (200°C)

Lead Wires: 18 gauge, 22"-24" long, 600 volt rating, with strain relief.

Encapsulating Material: Glass filled polyester, resistant to moisture, caustic solutions, fungus and vibration. Material temperature range is -40 °F (-40°C) to 392 °F (200°C).

Note: Delta Power A.C. Coils incorporate integrally molded full wave rectifiers which are rated for reverse voltage peaks of 1000 volts maximum.

A.C. Coils are rated 50/60 HZ.

* Optimum operating voltage noted.

Conduit connectors on A.C. coils have a maximum torque spec of 3 Ft. Lbs.

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com



Standard "P" Type Coils

FEATURES:

One piece water resistant encapsulated design.
 Numerous terminals and voltages.
 Coil interchangeability with Delta Series and Super Series valves.
 Heavy gauge color coded lead wire.

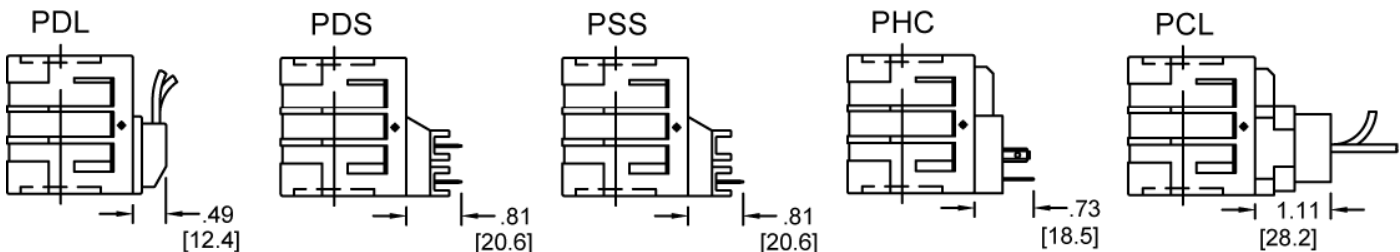
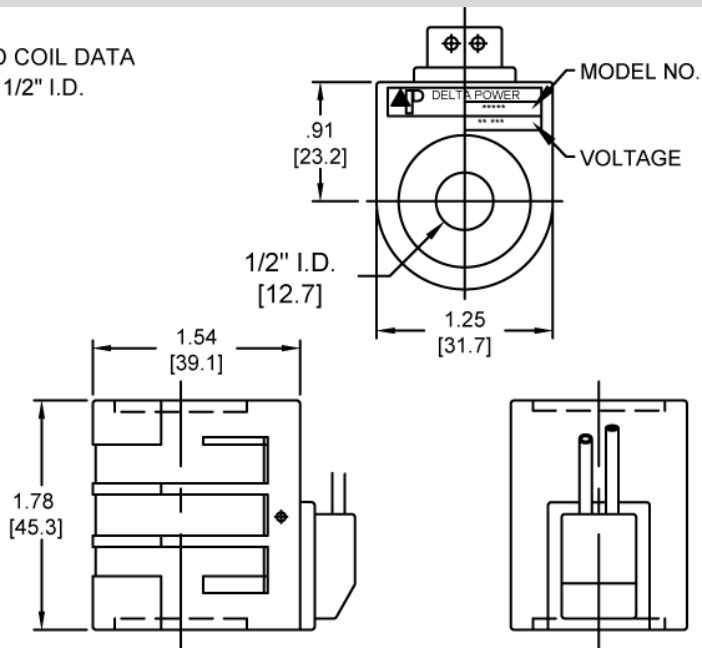
Reversible coil (can be installed on cartridges in both directions with equal efficiency.)

NOTE:

- FOR COIL SELECTION IN EXTREME CONDITIONS, PLEASE LOOK AT OUR "I" COIL LINE OF ENVIRONMENTAL COILS.
- FOR PB-S2I, HB-S2C & HB-S2D USE NUT 36202090.

STANDARD COIL DATA

P-Type coil 1/2" I.D.

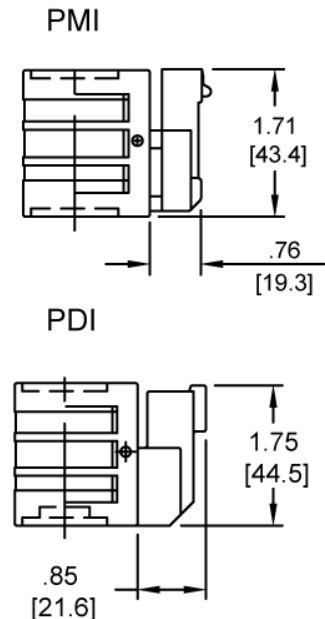


ORDERING INFORMATION

P - * * - * *

WHEN ORDERING
FILL IN ALL BOXES

1: BASIC MODEL NO.	2: TERMINATION	3: VOLTAGE
P-Type One Piece Encapsulated Coil	DL - Double Lead DT - Deutsch on Leads DT04-2P DI - Deutsch - Integral DT04-2P ML - Metri-Pack on Leads (12162000) MI - Metri-Pack - Integral (12162000) PL - Packard on Leads (150 Series) WL - Weatherpack on Leads (12010972) SS - Single Spade DS - Double Spade HC - DIN 43650 (Hirschman) - (AC/DC) CL - Conduit Lead - (AC ONLY) 19 WATT STD. COIL	06 -6VDC 12 -12VDC 24 -24VDC 36 -36VDC 48 -48VDC 25 -24VAC 11 -110VAC 13 -125VAC 22 -220VAC 23 -250VAC 44 -440VAC



FEB. 2005
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(ALL COILS DC VOLTAGE EXCEPT AS NOTED)
 APPROXIMATE COIL ASSEMBLY WEIGHT: .72 lbs./32 kg.

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com



Standard "P" Type Coils

Coil Model Numbers:

Termination	PDL	PSL	PDS	PSS	PHC	PCL		
Description	Double Lead	Single Lead	Double Spade	Single Spade	Hirschmann Connector	Double Lead Conduit	Lead Wire Color	AC Voltage Range
Voltage Amp	6VDC 3.5						ORANGE	
Voltage Amp	12VDC 1.6	12VDC 1.6	12VDC 1.6	12VDC 1.6	12VDC 1.6		YELLOW	
Voltage Amp	24VDC .78		24VDC .78	24VDC .78	24VDC .78		BLUE	
Voltage Amp	36VDC .57				36VDC .57		GREEN	
Voltage Amp	48VDC .40		48VDC .40				BROWN	
Voltage Amp			24VAC .92		24VAC .92	24VAC .92	BLUE/ BLACK	
Voltage Amp					110VAC * .19	110VAC * .19	RED/ WHITE	* 100VAC 115VAC
Voltage Amp					125VAC * .17	125VAC * .17	RED	* 115VAC 130VAC
Voltage Amp					220VAC * .10	220VAC * .10	BLACK/ WHITE	* 200VAC 230VAC
Voltage Amp					250VAC * .08	250VAC * .08	VIOLET/ WHITE	* 225VAC 260VAC
Voltage Amp					440VAC * .05	440VAC * .05	VIOLET	* 400VAC 460VAC

Specifications:

Wattage: 19 watts nominal.

Duty Rating: Continuous duty $\pm 10\%$ rated voltage at 120°F (49°C) ambient.

Minimum Current for Actuation: 80% of rated current at room temperature.

Magnet Wire Class: N for all voltages.

Temperature Range: -40°F (-40°C) to 392°F (200°C)

Lead Wires: 18 gauge, 24" long, 600 volt rating, with strain relief.

Encapsulating Material: Glass filled polyester, resistant to moisture, caustic solutions, fungus and vibrations. Temperature range is -40° (-40°C) to 392°F (200°C).

Color Identification: Black

Note: Delta Power A.C. Coils incorporate integrally molded full wave rectifiers which are rated for reverse voltage peaks of 1000 volts maximum.

A.C. Coils are rated 50/60 HZ.

* Optimum operating voltage noted.

Conduit connectors on A.C. coils have a maximum torque spec of 5 Ft. Lbs.

Arc Suppression Diode Available

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

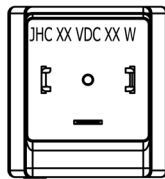
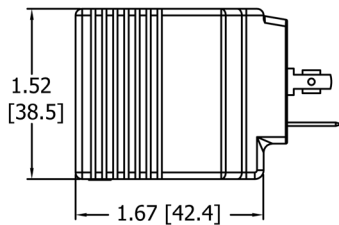
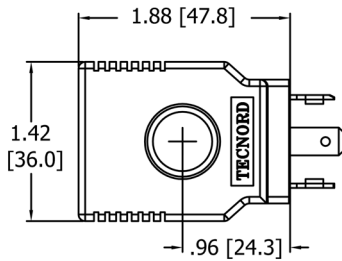
Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com



"P" Type "J" Coils



DESCRIPTION

1/2 inch (13mm) I.D. Coil.

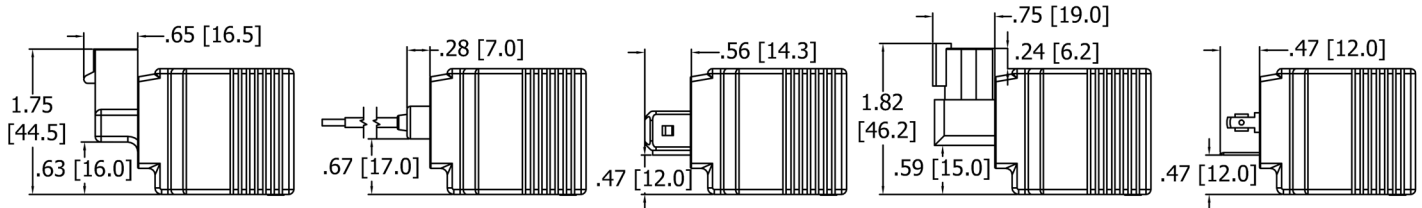
FEATURES

One piece encapsulated design that is:

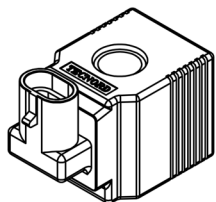
- Weatherproof. (When applied with o-rings.)
- No external metal shell.

COIL SPECIFICATIONS

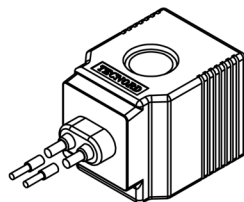
Wattage	21 Watts Nominal
Duty Rating	Continuous Duty +/- 10% rated voltage at 120° F (49° C) ambient
Min Current for Actuation	80% of rated current at room temp.
Magnet Wire Class	H or Better for all voltages
Temperature Range	-40° to 392° F (-40° to 200° C)
Encapsulation Material	Thermo-Plastic, resistant to moisture, caustic solutions, fungus, and vibrations



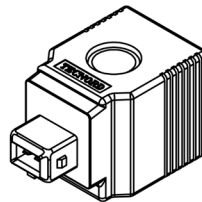
JA



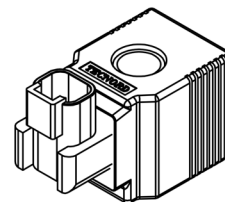
JL



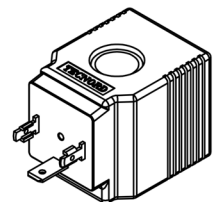
JJ



JD



JH



ORDERING INFORMATION

P - - -			VOLTAGE
TERMINATIONS			
AMP Superseal - Integral	JA	12	12 VDC / 1.75 Amp
Deutsch - Integral DT04-2P	JD	24	24 VDC / .875 Amp
AMP Jr. Timer - Integral	JJ		
Metri-Pack - Integral	JM		
Double Lead	JL		
DIN 43650 (Hirschman)	JH		
Approximate Coil Weight: .43 lbs. (.19 kg.)			

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com



Standard "D" Type Coils

FEATURES:

One piece water resistant encapsulated design.

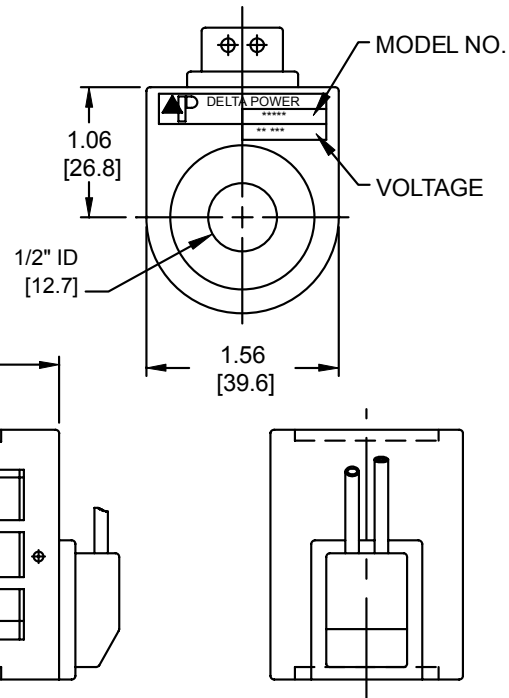
Numerous terminals and voltages.

Heavy gauge color coded lead wire.

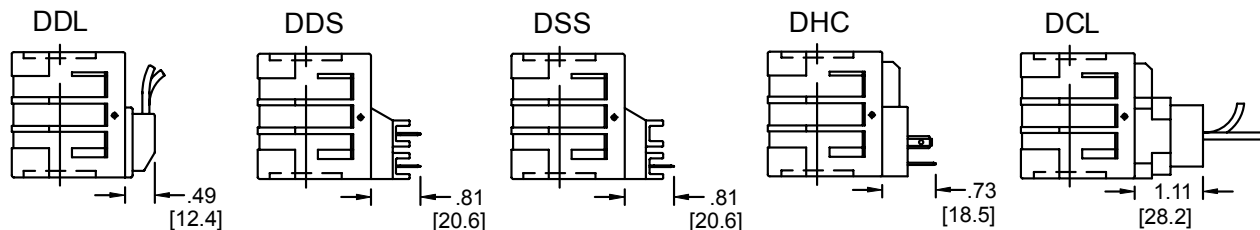
Each coil is reversible
(can be installed on cartridges in both directions with equal efficiency.)

STANDARD COIL DATA

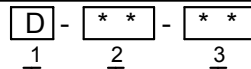
D-Type coil 1/2" I.D.



NOTE:
FOR COIL SELECTION IN EXTREME
CONDITIONS, PLEASE LOOK AT
OUR "I" COIL LINE OF
ENVIRONMENTAL COILS



ORDERING INFORMATION



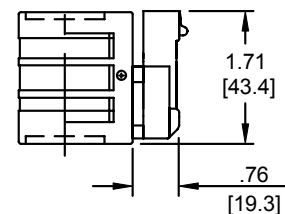
WHEN ORDERING
FILL IN ALL BOXES

1: BASIC MODEL NO.	2: TERMINATION	3: VOLTAGE
D-Type One Piece Encapsulated Coil	DL - Double Lead DT - Deutsch on Leads DT04-P DI - Deutsch - Integral DT04-P ML - Metri-Pack on Leads (12162000) MI - Metri-Pack - Integral (12162000) PL - Packard on Leads (150 Series) WL - Weatherpack on Leads (12010972) SS - Single Spade DS - Double Spade HC - DIN 43650 (Hirschman) - (AC/DC) CL - Conduit Lead - (AC ONLY)	06 -6VDC 12 -12VDC 24 -24VDC 36 -36VDC 48 -48VDC 25 -24VAC 11 -110VAC 13 -125VAC 22 -220VAC 23 -250VAC 44 -440VAC
	22 WATT STD. COIL	

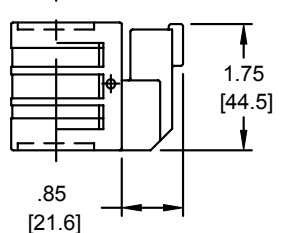
FEB. 2005
REV F

(ALL COILS DC VOLTAGE EXCEPT AS NOTED)
APPROXIMATE COIL ASSEMBLY WEIGHT: .72 lbs./ .32 kg.

DMI



DDI



WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com



Standard "D" Type Coils

Coil Model Numbers:

Termination	DDL	DSL	DDS	DSS	DHC	DCL		
Description	Double Lead	Single Lead	Double Spade	Single Spade	Hirschmann Connector	Double Lead Conduit	Lead Wire Color	AC Voltage Range
Voltage Amp	6VDC 3.7	6VDC 3.7	6VDC 3.7	6VDC 3.7	6VDC 3.7		ORANGE	
Voltage Amp	12VDC 1.8	12VDC 1.8	12VDC 1.8	12VDC 1.8	12VDC 1.8		YELLOW	
Voltage Amp	24VDC .90	24VDC .90	24VDC .90	24VDC .90	24VDC .90		BLUE	
Voltage Amp	36VDC .62	36VDC .62	36VDC .62	36VDC .62	36VDC .62		GREEN	
Voltage Amp	48VDC .47	48VDC .47	48VDC .47	48VDC .47	48VDC .47		BROWN	
Voltage Amp			24VAC 1.2		24VAC 1.2	24VAC 1.2	BLUE/ BLACK	
Voltage Amp					110VAC *.23	110VAC *.23	RED/ WHITE	* 100VAC 115VAC
Voltage Amp					125VAC *.17	125VAC *.17	RED	* 115VAC 130VAC
Voltage Amp					220VAC *.11	220VAC *.11	BLACK/ WHITE	* 200VAC 230VAC
Voltage Amp					250VAC *.10	250VAC *.10	VIOLET/ WHITE	* 225VAC 260VAC
Voltage Amp					440VAC *.05	440VAC *.05	VIOLET	* 400VAC 460VAC

Specifications:

Wattage: 22 watts nominal.

Duty Rating: Continuous duty $\pm 10\%$ rated voltage at 120°F (49°C) ambient.

Minimum Current for Actuation: 80% of rated current at room temperature.

Magnet Wire Class: N for all voltages.

Temperature Range: -40°F (-40°C) to 392°F (200°C).

Lead Wires: 18 gauge, 24" long, 600 volt rating, with strain relief.

Encapsulating Material: Glass filled polyester, resistant to moisture, caustic solutions, fungus and vibrations. Material temperature range is -40°F (-40°C) to 392°F (200°C).

Color Identification: Black

Note: Delta Power A.C. Coils incorporate integrally molded full wave rectifiers which are rated for reverse voltage peaks of 1000 volts maximum.

A.C. Coils are rated 50/60 HZ.

* Optimum operating voltage noted.

Conduit connectors on A.C. coils have a maximum torque spec of 5 Ft. Lbs.

Arc Suppression Diode Available

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com



Standard "L" Type Coils

FEATURES:

One piece water resistant encapsulated design.

Numerous terminals and voltages.

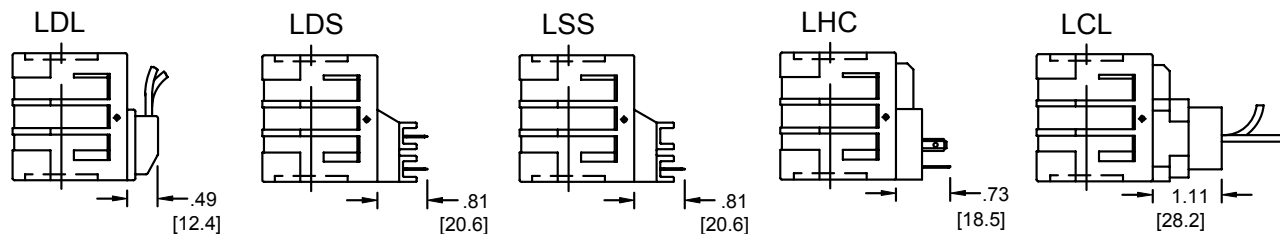
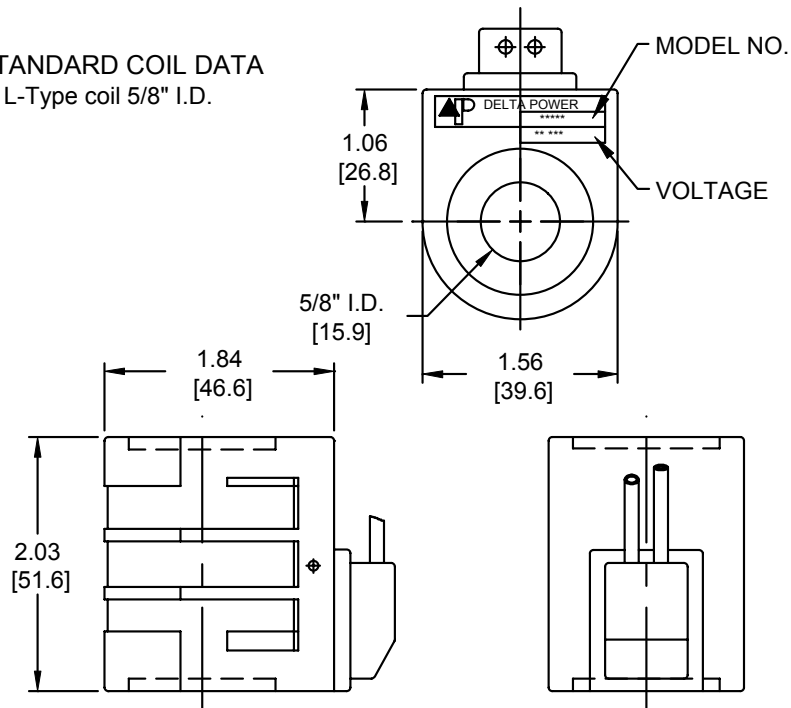
Heavy gauge color coded lead wire.

Each coil is reversible
(can be installed on
cartridges in both
directions with equal
efficiency.)

NOTE:
FOR COIL SELECTION IN EXTREME
CONDITIONS, PLEASE LOOK AT
OUR "I" COIL LINE OF
ENVIRONMENTAL COILS

STANDARD COIL DATA

L-Type coil 5/8" I.D.



ORDERING INFORMATION

L - * * - * *

1

2

3

WHEN ORDERING
FILL IN ALL BOXES

1: BASIC MODEL NO.	2: TERMINATION	3: VOLTAGE
L-Type One Piece Encapsulated Coil	DL - Double Lead DT - Deutsch on Leads DT04-2P DI - Deutsch - Integral DT04-2P ML - Metri-Pack on Leads (12162000) MI - Metri-Pack - Integral (12162000) PL - Packard on Leads (150 Series) WL - Weatherpack on Leads (12010972) SS - Single Spade DS - Double Spade HC - DIN 43650 (Hirschman) - (AC/DC) CL - Conduit Lead - (AC ONLY) 22 WATT STD. COIL	06 -6VDC 12 -12VDC 24 -24VDC 36 -36VDC 48 -48VDC 25 -24VAC 11 -110VAC 13 -125VAC 22 -220VAC 23 -250VAC 44 -440VAC

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(ALL COILS DC VOLTAGE EXCEPT AS NOTED)
APPROXIMATE COIL ASSEMBLY WEIGHT: .63 lbs./29 kg.

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com



Standard "L" Type Coils

Coil Model Numbers:

Termination	LDL	LDS	LHC	LCL		
Description	Double Lead	Double Spade	Hirschmann Connector	Double Lead Conduit	Lead Wire Color	AC Voltage Range
Voltage Amp	12VDC 1.8	12VDC 1.8	12VDC 1.8		YELLOW	
Voltage Amp	24VDC .9	24VDC .9	24VDC .9		BLUE	
Voltage Amp					GREEN	
Voltage Amp					BROWN	
Voltage Amp					BLUE/ BLACK	
Voltage Amp			110VAC * .16	110VAC * .16	RED/ WHITE	* 100VAC 115VAC
Voltage Amp					RED	* 115VAC 130VAC
Voltage Amp			220VAC * .08	220VAC * .08	BLACK/ WHITE	* 200VAC 230VAC
Voltage Amp					VIOLET/ WHITE	* 225VAC 260VAC
Voltage Amp					VIOLET	* 400VAC 460VAC

Data in this chart reflects current usage. Additional terminations, connections and suppression devices are available. Consult the factory for special applications.

Specifications:

Wattage: 22 watts nominal.

Duty Rating: Continuous duty $\pm 10\%$ rated voltage at 120°F (49°C) ambient.

Minimum Current for Actuation: 80% of rated current at room temperature.

Magnet Wire Class: N for all voltages.

Temperature Range: -40°F (-40°C) to 392°F (200°C).

Lead Wires: 18 gauge, 24" long, 600 volt rating, with strain relief.

Encapsulating Material: Glass filled polyester, resistant to moisture, caustic solutions, fungus and vibrations. Material temperature range is -40°F (-40°C) to 392°F (200°C).

Color Identification: Black

Note: Delta Power A.C. Coils incorporate integrally molded full wave rectifiers which are rated for reverse voltage peaks of 1000 volts maximum.

A.C. Coils are rated 50/60 HZ.

* Optimum operating voltage noted.

Conduit connectors on A.C. coils have a maximum torque spec of 5 Ft. Lbs.

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

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E-mail: delta@delta-power.com



Standard "T" Type Coils

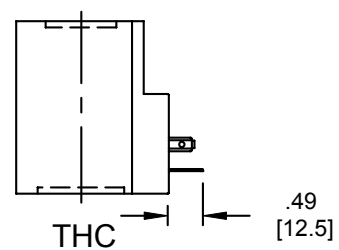
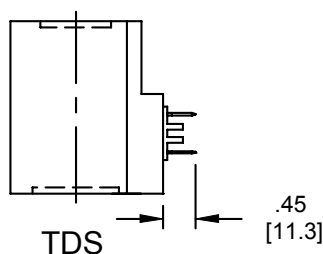
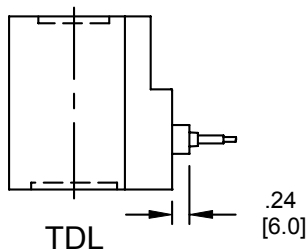
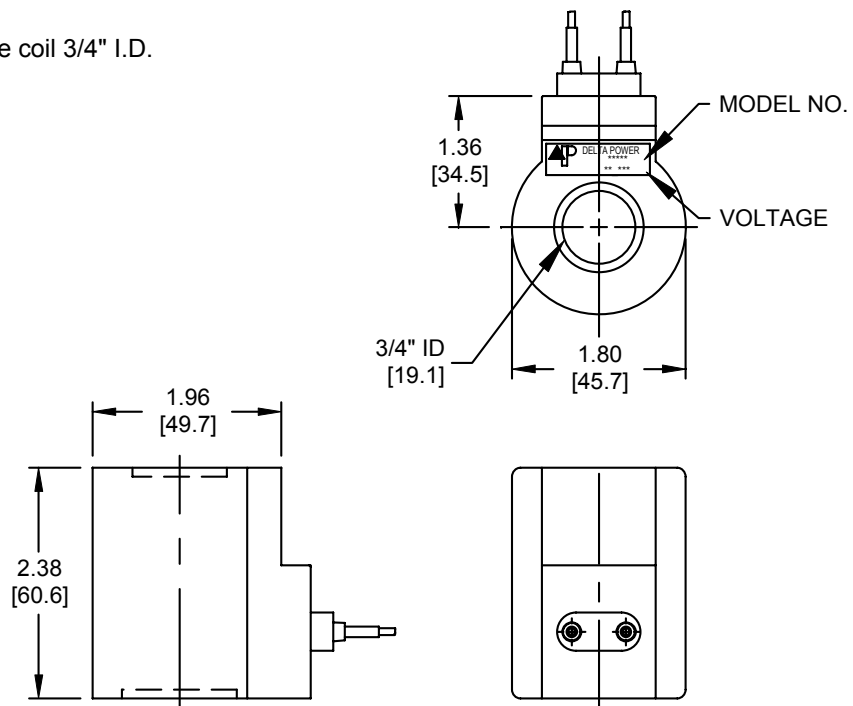
T-Type coil 3/4" I.D.

FEATURES:

One piece water resistant encapsulated design.

Numerous terminals and voltages.

Each coil is not reversible



ORDERING INFORMATION

WHEN ORDERING
FILL IN ALL BOXES

T - * * - * *

1

2

3

1: BASIC MODEL NO.	2: TERMINATION	3: VOLTAGE
T-Type One Piece Encapsulated Coil	DL - Double Lead DT - Deutsch on Leads DT04-2P ML - Metri-Pack on Leads (12162000) PL - Packard on Leads (150 Series) WL - Weatherpack on Leads (12010972) DS - Double Spade HC - DIN 43650 (Hirschman) - (AC/DC) 28 WATT STD. COIL	06 -6VDC 12 -12VDC 24 -24VDC 36 -36VDC 48 -48VDC 25 -24VAC 11 -110VAC 22 -220VAC

FEB. 2005

REV H

(ALL COILS DC VOLTAGE EXCEPT AS NOTED)

APPROXIMATE COIL ASSEMBLY WEIGHT: .90 lbs./ .41 kg.

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com


Standard "T" Type Coils

Coil Model Numbers:

Termination	TDL	TDS	THC		
Description	Double Lead	Double Spade	Hirschmann Connector	Lead Wire Color	AC Voltage Range
Voltage Amp	12VDC 2.33	12VDC 2.33	12VDC 2.33	BLACK	
Voltage Amp	24VDC 1.17	24VDC 1.17	24VDC 1.17	RED	
Voltage Amp	36VDC .78	36VDC .78	36VDC .78	BLUE	
Voltage Amp	48VDC .58	48VDC .58	48VDC .58	GREEN	
Voltage Amp			25VAC 1.75	RED/ BLUE	25VAC
Voltage Amp					
Voltage Amp			120VAC .31	RED/ BLUE	115VAC 130VAC
Voltage Amp					
Voltage Amp			240VAC .15	RED/ BLUE	225VAC 260VAC
Voltage Amp					

Data in this chart reflects current usage. Additional terminations, connections and suppression devices are available. Consult the factory for special applications.

Specifications:

Wattage: 28 watts nominal.

Duty Rating: Continuous duty $\pm 10\%$ rated voltage at 120°F (49°C) ambient.

Magnet Wire Class: N for all voltages.

Temperature Range: -40°F (-40°C) to 392°F (200°C).

Lead Wires: 18 gauge, 24" long, 600 volt rating, with strain relief.

Encapsulating Material: Glass filled polyester, resistant to moisture, caustic solutions, fungus and vibrations. Material temperature range is -40°F (-40°C) to 392°F (200°C).

Color Identification: Black

Note: Delta Power A.C. Coils incorporate integrally molded full wave rectifiers which are rated for reverse voltage peaks of 1000 volts maximum.
A.C. Coils are rated 50/60 HZ.

* Optimum operating voltage noted.

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

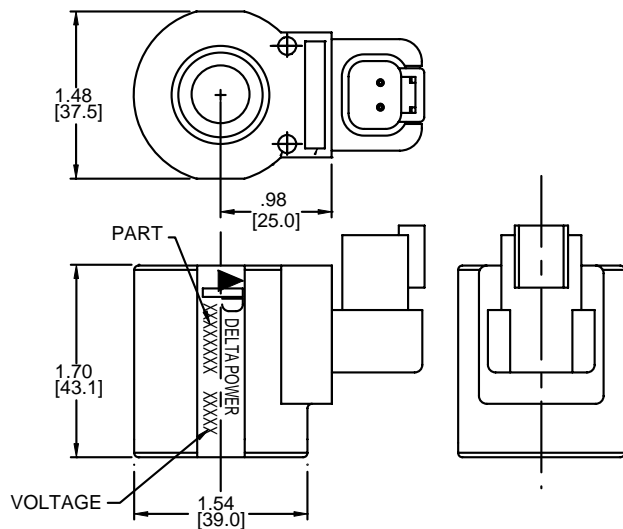
Phone: (815) 397-6628

Fax: (815) 397-2526

 E-mail: delta@delta-power.com



Immersion Proof "P" Type "I" Coils



DESCRIPTION

1/2 inch (13mm) I.D. Short Immersion Proof Coil.

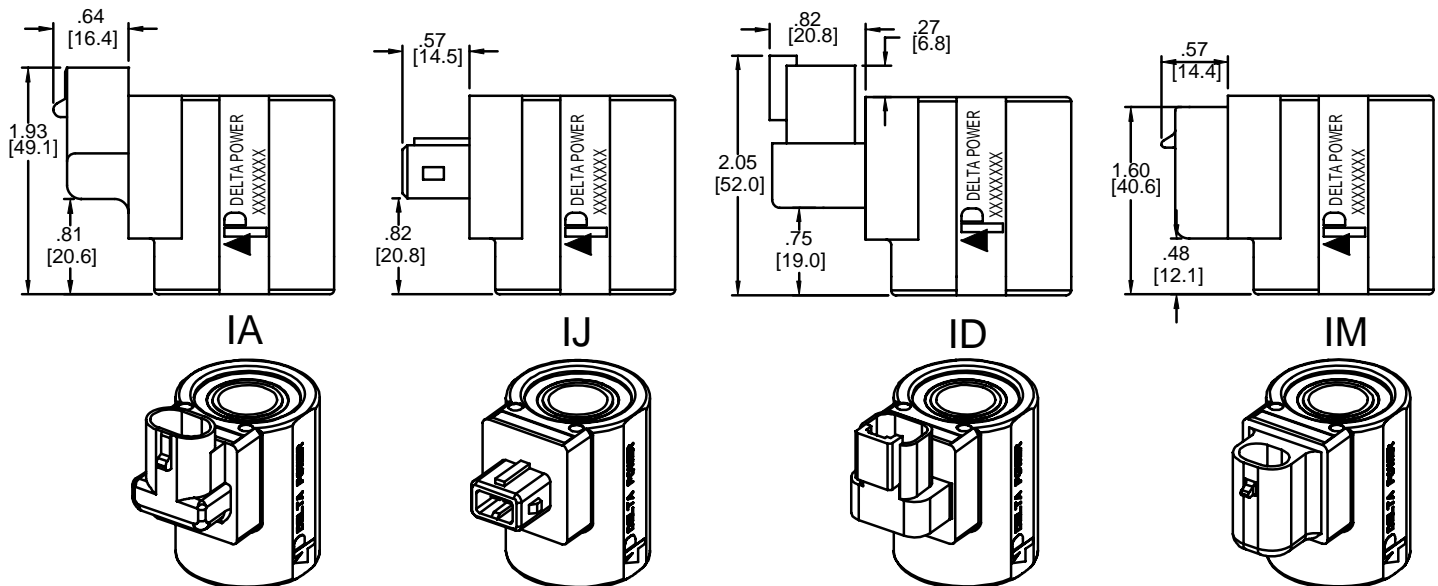
FEATURES

One piece encapsulated design that is:

- Weatherproof.
- Immersion proof.
- Thermal shock / dunk tested.
- No external metal shell.

COIL SPECIFICATIONS

Wattage	20 Watts Nominal
Duty Rating	Continuous Duty +/- 10% rated voltage at 120° F (49° C) ambient
Min Current for Actuation	80% of rated current at room temp.
Magnet Wire Class	H or Better for all voltages
Temperature Range	-40° to 392° F (-40° to 200° C)
Encapsulation Material	Thermo-Plastic, resistant to moisture, caustic solutions, fungus, and vibrations



ORDERING INFORMATION

TERMINATIONS		VOLTAGE	
AMP Superseal - Integral	IA	12	12 VDC / 1.6 Amp Yellow Lettering
Deutsch - Integral DT04-2P	ID	24	24 VDC / .80 Amp Blue Lettering
AMP Jr. Timer - Integral	IJ		
Metri-Pack - Integral	IM		

NOTE: Pull type valves require nut 36202073 in lieu of standard nut.
 Push type valves require nut 36202071 in lieu of standard nut,
 except for PB-S2I, HB-S2C & HB-S2D use nut 36202090.

Approximate Coil Weight: .43 lbs. (.19 kg.)

Patent Pending

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

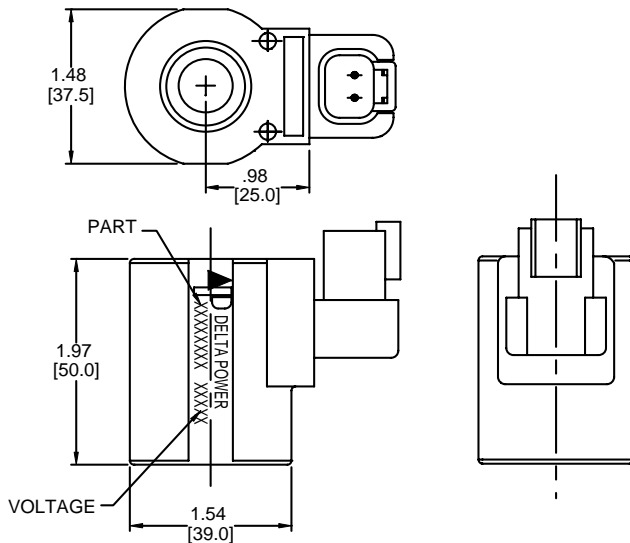
Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com



Immersion Proof "D" Type "I" Coils



DESCRIPTION

1/2 inch (13mm) I.D. Immersion Proof Coil.

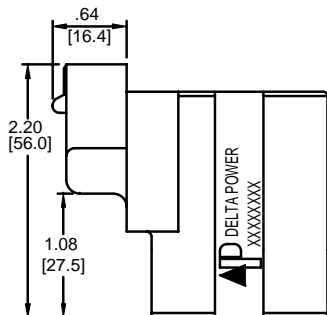
FEATURES

One piece encapsulated design that is:

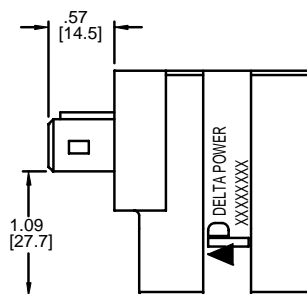
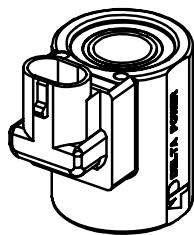
- Weatherproof.
- Immersion proof.
- Thermal shock / dunk tested.
- No external metal shell.

COIL SPECIFICATIONS

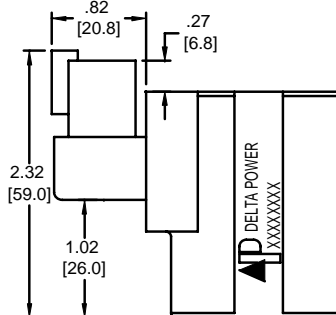
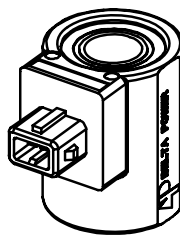
Wattage	24 Watts Nominal
Duty Rating	Continuous Duty +/- 10% rated voltage at 70° F (21° C) ambient
Min Current for Actuation	90% of rated current at room temp.
Magnet Wire Class	H or Better for all voltages
Temperature Range	-40° to 392° F (-40° to 200° C)
Encapsulation Material	Thermo-Plastic, resistant to moisture, caustic solutions, fungus, and vibrations



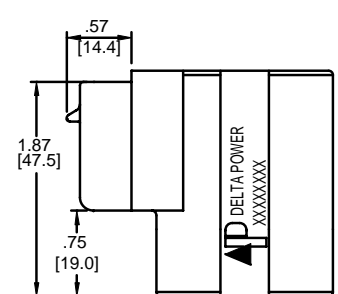
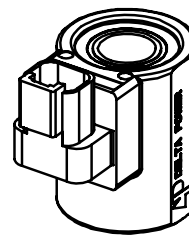
IA



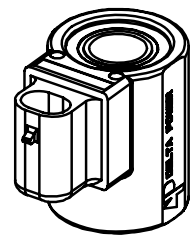
IJ



ID



IM



ORDERING INFORMATION

D - - -

TERMINATIONS

AMP Superseal - Integral
 Deutsch - Integral DT04-2P
 AMP Jr. Timer - Integral
 Metri-Pack - Integral

IA
 ID
 IJ
 IM

VOLTAGE

12 VDC / 2.0 Amp Yellow Lettering
 24 VDC / 1.0 Amp Blue Lettering

NOTE: Pull type valves require nut 36202073 in lieu of standard nut.
 Push type valves require nut 36202071 in lieu of standard nut.

Approximate Coil Weight: .49 lbs. (.22 kg.)

Patent Pending

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com



Immersion Proof "L" Type "I" Coils

DESCRIPTION

5/8 inch (16mm) I.D. Immersion Proof Coil.

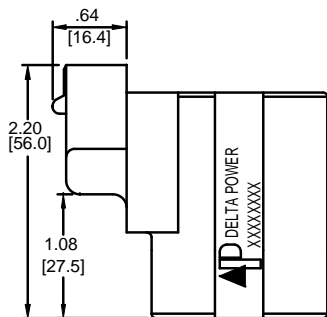
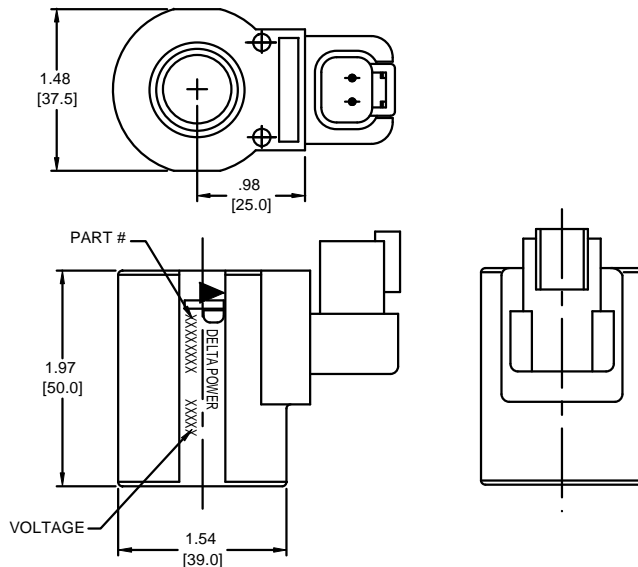
FEATURES

One piece encapsulated design that is:

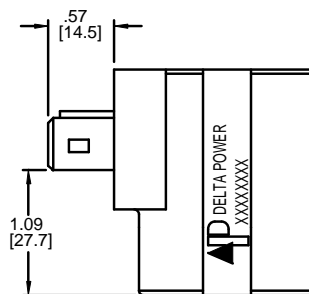
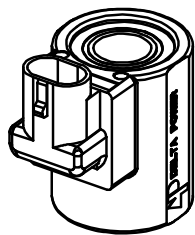
- Weatherproof.
- Immersion proof.
- Thermal shock / dunk tested.
- No external metal shell.

COIL SPECIFICATIONS

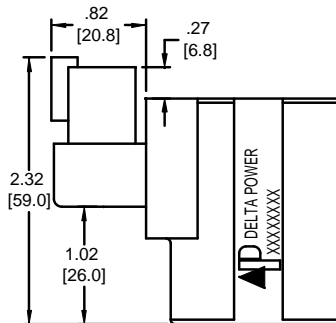
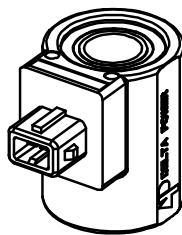
Wattage	26 Watts Nominal
Duty Rating	Continuous Duty +/- 10% rated voltage at 120° F (49° C) ambient
Min Current for Actuation	80% of rated current at room temp.
Magnet Wire Class	H or Better for all voltages
Temperature Range	-40° to 392° F (-40° to 200° C)
Encapsulation Material	Thermo-Plastic, resistant to moisture, caustic solutions, fungus, and vibrations



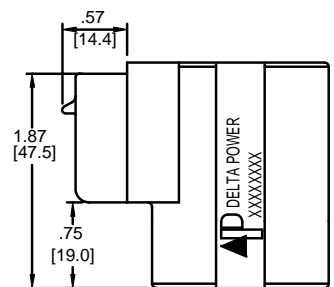
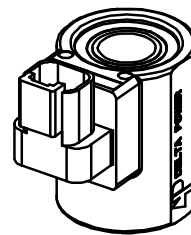
IA



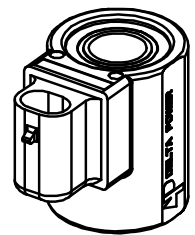
IJ



ID



IM

**ORDERING INFORMATION**

L - - -

TERMINATIONS

AMP Superseal - Integral
 Deutsch - Integral DT04-2P
 AMP Jr. Timer - Integral
 Metri-Pack - Integral

IA
 ID
 IJ
 IM

12
 24

VOLTAGE

12 VDC / 2.2 Amp Yellow Lettering
 24 VDC / 1.1 Amp Blue Lettering

NOTE: Pull type valves require nut 36202073 in lieu of standard nut.
 Push type valves require nut 36202071 in lieu of standard nut.

Approximate Coil Weight: .49 lbs. (.22 kg.)

Patent Pending

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

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E-mail: delta@delta-power.com



Standard "F" Type Coils

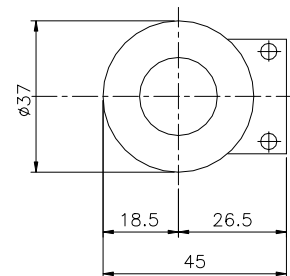
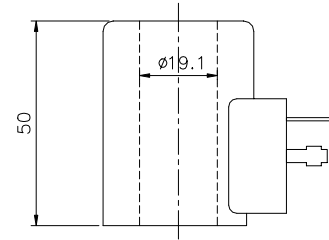
Features :

One piece water resistant encapsulated design.

Numerous terminals and voltages available

Internal arc suppression diodes available on request

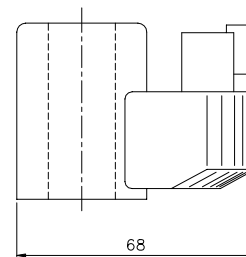
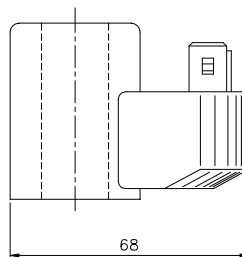
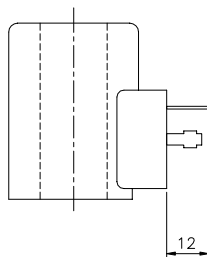
Color identification : metallic envelope



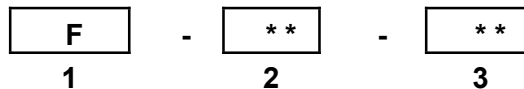
FHC

FJT

FDT



Ordering information



1 MODEL	2 TERMINATION	3 VOLTAGE
F (proportional coil type)	HC - DIN 43650 (Hirschmann) DI - Deutsch – Integral DT04-2P JT Amp Junior Timer	12 – 12 VDC 24 – 24 VDC 22 – 220 VAC without internal rectifier (for HC termination only)

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.



Standard "F" Proportional Type Coils

<i>Termination</i>	<i>FHC</i>	<i>FDI</i>	<i>FJT</i>
<i>Description</i>	<i>Hirschmann connector</i>	<i>Deutsch Integral</i>	<i>Amp Junior Timer</i>
<i>Voltage / Amp</i>	12 V / 1,66 A	12 V / 1,66 A	12 V / 1,66 A
<i>Voltage / Amp</i>	24 V / 0,83 A	24 V / 0,83 A	24 V / 0,83 A
<i>Voltage / Amp</i>	220 VAC rectified / 0,10 A		

Specifications :

Wattage : 20 Watts nominal

Duty rating : continuous duty +/- 10% rated voltage at 120 °F (49 °C) ambient.

Minimum current for actuation: 80% of rated current at room temperature.

Magnet wire insulation : class H (200 °C)

Heat insulation : class H (180° C)

Ambient temperature range : - 30 °C - + 60 ° C

Protection degree : IP 65 (with connector and suitable seals)

Lead wires : 600 Volt rating, with strain relief

Encapsulating material : glass filled polyester, resistant to moisture, caustic solutions, fungus and vibration.

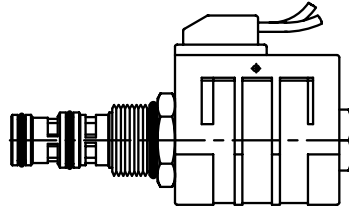
Metallic parts protected against oxidation.

AC coils do not include the rectifier, supply voltage must be externally rectified

Approximate coil weight : .49 lbs / .22 Kg



General Cartridge Valve Installation Notes



CARTRIDGES

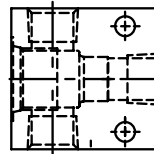
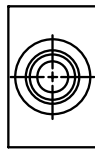
Inspect the cartridge to assure there is no external contaminant present.

Check O-rings and back-up rings to assure they are intact and in the correct position. The O-rings should always be toward the high pressure port or between doubled back-up rings on bi-directional applications.

COILS

It is sometimes easier to remove the coil from the cartridge valve to install terminations or make connections with conduit, etc. If this is the case, reinstall the coil by tightening the coil nut to 4-6 ft lbs per spec sheet.

CAUTION: DO NOT OVER TORQUE
Tube will be stretched and damaged, causing valve to fail.



VALVE BODIES

Check the cartridge brochure to assure correct plumbing.

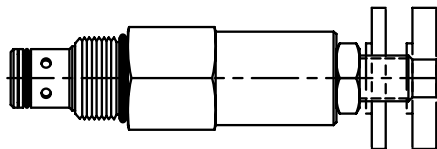
Inspect the cavity for burrs and any irregular machining which would damage O-rings at assembly.

Shims may be required behind the block for panel mounting.

ASSEMBLY

Dip the cartridge in clean oil before installing.

Screw the cartridge in by hand until the top O-ring is touching the manifold, then wrench tighten to the proper torque specification given below.



TORQUE SPECIFICATIONS

Final Cartridge Tightening

Series	
5/8 MINI	10-15 ft-lbs
3/4 POWER	20-25 ft-lbs
7/8 DELTA	25-30 ft lbs
1 1/16 TECNORD	60-70 ft-lbs
1 5/16 SUPER	80-90 ft-lbs

Adjusting Holding Parts:

Part	Torques
Nut	3-5 ft-lbs
Knob	3-5 ft-lbs
Cap	2-3 ft-lbs

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CAD Insertion Codes - 2D

MECHANICAL VALVES																	
<p>The insertion codes for mechanical valves are based on the first seven digits of the valve mnemonic code number. The eighth digit represents the direction of the view.</p>																	
<p>INSERTION CODES</p> <table style="margin-left: auto; margin-right: auto;"> <tr> <td>M</td><td>A</td><td>R</td><td>V</td><td>A</td><td>K</td><td>E</td> </tr> <tr> <td>D</td><td>E</td><td>F</td><td>C</td><td>A</td><td>O</td><td>S</td> </tr> </table> <p>Mnemonic: _____</p> <p>Always use 0 (zero)</p>	M	A	R	V	A	K	E	D	E	F	C	A	O	S	<p>View codes:</p> <p>E = End (top) view F = Front or back view S = Side view</p> <p>Mnemonic option codes:</p> <p>0 = no visible options K = Knob I = Internal adjustment T = Tamper proof</p>		
M	A	R	V	A	K	E											
D	E	F	C	A	O	S											
DERVA0KE (END)		DERVA0KF (FRONT)															
DERVA0KS (SIDE)																	
SOLENOID VALVES																	
COIL VIEWS																	
<p>View code:</p> <p>E = End (top) F = Front * B = Back R = Right L = Left</p>	<p>Series code:</p> <p>M = Mini P = Power A = Power 4W3P Delta Coil B = Power 4W3P Power Coil D = Delta L = Delta 4W3P T = Technord "D" Type Coil H = Technord "T" Type Coil High Pressure S = Super</p>	<p>CODE</p> <p>F D D L</p>	<p>Connector code: *</p> <p>DL = Double Lead SL = Single Lead DS = Double Spade SS = Single Spade DP = Double Post SP = Single Post HC = Hirschmann CL = Conduit Lead DC = Deutsch Integral Connector IA = Integral Amp Superseal ID = Integral Deutsch IM = Integral Amp Jr. IM = Integral Metri-Pack</p>														
<p>* The connector code is not used for back views.</p> <p>For Proportional Valve views: <u>EEPRD00</u> <u>DL</u> <u>L</u></p> <p>Model Number</p>		<p>IMMERSION COILS</p> <p>View code:</p> <p>Connector code: *</p>															
BACK		FRONT															
LEFT		RIGHT															
END																	
MANUAL OVERRIDES																	
<p>View code:</p> <p>C = Normally Closed O = Normally Open P = 4W3P Push-only B = Bi-directional</p>	<p>CODE</p> <p>F D</p> <p>Series code:</p> <p>P = Power PI = Power w/ "I" Coil D = Delta DI = Delta w/ "I" Coil T = Technord S = Super</p>																
CD		PP															
NORMALLY OPEN VALVE COIL NUTS																	
FMNUT SMNUT		FNUT SNUT															
MINI SERIES NUT		POWER, DELTA, TECNORD AND SUPER SERIES NUT															
FINUT		SINUT															
POWER, DELTA, AND TECNORD IMMERSION COIL NUTS																	
HYDRAULIC SYMBOLS																	
C V A	S2A																
Third, fourth, and fifth digits of mnemonic.																	


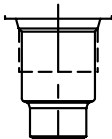


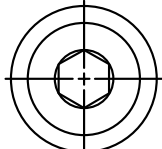


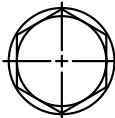

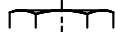

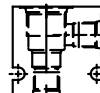

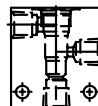
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CAD Insertion Codes -2D

CAVITIES		PORTS	
<div>View code: <div>E 0 0 0 0</div><div>E = End (top) S = Side H = Hidden (side)</div><div>Last four digits of form tool P/N.</div></div> <div><div></div><div>E0000</div><div></div><div>S0000</div></div>		<div>Port code: <div>S E 1 2 N E 3 4</div><div>S = SAE N = NPT</div><div>Size code</div></div> <div>View code: <div>E = End (top) S = Side H = Hidden (side)</div></div> <div><div></div><div>NE3-4</div><div></div><div>NS3-4</div></div> <div><div>SAE SIZES AVAILABLE</div><div><div>#2 SAE #8 SAE #20 SAE</div><div>#3 SAE #10 SAE #24 SAE</div><div>#4 SAE #12 SAE #32 SAE</div><div>#5 SAE #14 SAE</div><div>#6 SAE #16 SAE</div></div></div> <div><div>NPT SIZES AVAILABLE</div><div><div>1/16" NPT 1" NPT</div><div>1/8" NPT 1 1/4" NPT</div><div>1/4" NPT 1 1/2" NPT</div><div>3/8" NPT 2" NPT</div><div>1/2" NPT</div></div><div>NPT Examples: 1/16-27 = 1-16 3/4-14 = 3-4 1 1/4-11 1/2 = 11-4</div></div>	
PLUGS			
<div><div>SAE PLUGS</div><div>Size code: <div>1 2 S S</div><div>View code: <div>S = Side E = End (top)</div></div></div><div><div></div><div>12ES</div><div></div><div>12SS</div></div><div><div>SIZES AVAILABLE</div><div><div>#2 SAE #8 SAE #20 SAE</div><div>#3 SAE #10 SAE #24 SAE</div><div>#4 SAE #12 SAE #32 SAE</div><div>#5 SAE #14 SAE</div><div>#6 SAE #16 SAE</div></div></div></div>		<div><div>NPT PLUGS</div><div>Size code: <div>3 4 E N</div></div><div><div></div><div>3-4EN</div></div><div><div>SIZES AVAILABLE</div><div><div>1/16" NPT 1" NPT</div><div>1/8" NPT 1 1/4" NPT</div><div>1/4" NPT 1 1/2" NPT</div><div>3/8" NPT 2" NPT</div><div>1/2" NPT</div></div></div></div>	
<div><div>CAVITY PLUGS</div><div>Series code: <div>P E</div><div>View code: <div>F = Front S = Side E = End (top)</div></div></div><div><div></div><div>END</div><div></div><div>SIDE</div><div></div><div>FRONT</div></div></div>			
BODIES			
<div><div>Series code: <div>D 2 W S M 3 W N</div><div>M = Mini P = Power D = Delta T = Tecnord S = Super</div></div><div>Port code: <div>S = SAE N = NPT</div></div><div>Style code: <div>2W = two way 3W = three way 4W = four way 5W = five way</div></div></div>		<div><div></div><div>D2WS</div><div></div><div></div><div>M3WN</div><div></div></div>	
CONSULT FACTORY FOR FORMAT AVAILABILITY			

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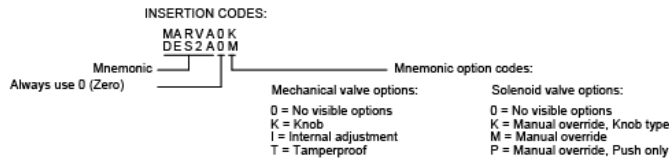
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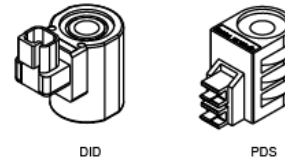
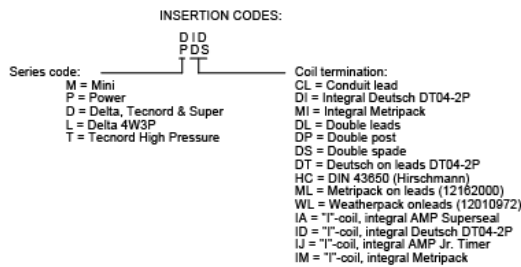
E-mail: delta@delta-power.com


CAD Insertion Codes -3D

CARTRIDGE VALVES



COILS



COIL NUTS

MINI Series:
 Normally open: 36202005
 Normally closed: 36202018

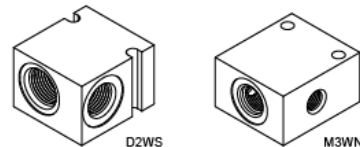
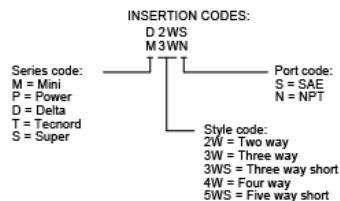
POWER, DELTA, TECNORD & SUPER Series:
 Normally open: 36202020
 Normally closed: 36202017
 Normally open w/"I"-coil: 36202071
 Normally closed w/"I"-coil: 36202073

TECNORD High Pressure Series:
 Normally closed: 36202059

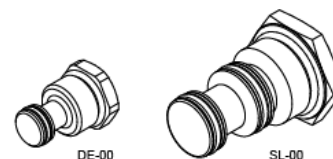
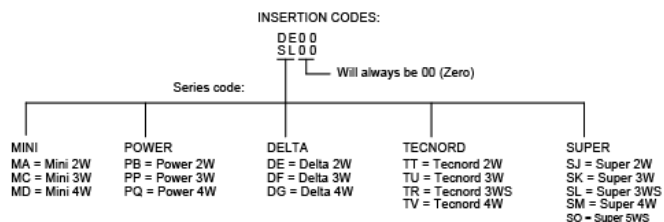
4W3P Coil nuts:
 Power Series: 36202047
 Delta Series: 36202046



BODIES



CAVITY PLUGS



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Valve Mnemonic Code

First letter is the valve Series.

M = MINI (5/8")

P = POWER (3/4")

D = DELTA (7/8")

T = TECNORD (1 1/16")

S = SUPER (1 5/16")

I = INLINE/UNITIZED

E = ELECTRONIC PROPORTIONAL

A = MOTORIZED

Q = SPECIALS

H = 4000/5000 PSI RATED

The second letter is the cavity.

	MINI	POWER	DELTA	TECNORD	SUPER
2 Way	A	B	E	T	J
3 Way	C	P	F	U	K
3 Way Short				R	L
4 Way	D	Q	G	V	N
5 Way Short				X	O
5 Way					I

M = INLINE

S = SPECIAL

The third letter is the type of valve.

R = RELIEF

C = CHECK & LOAD HOLDING

N = NEEDLE

P = PRESSURE CONTROLLED

S = SOLENOID

M = MANUAL

F = FLOW CONTROL

The third, fourth, and fifth characters combined describe the valve function. It is these characters that are stamped on the valve.

EXAMPLES:

S2A = SOLENOID 2 WAY POPPET

S3A = SOLENOID 3 WAY SPOOL

S4A = SOLENOID 4 WAY CRISS SPOOL

RVA = RELIEF DIRECT ACTING

MCB = MAN NC DETENT

P2A = PROPORTIONAL 2 WAY

PRP = PRESSURE REDUCING

CVC = GUIDED BALL CHECK

FCH = FLOW CONT REV FLOW

NVB = NEEDLE COARSE ADJ

The sixth and seventh characters combined cover the o-ring, screen, override, knob, and other options.

EXAMPLE: 00 = STANDARD DEFAULT CONFIGURATION

VK = VITON O-RINGS, KNOB ADJUSTMENT

B3 = BUNA, SCREEN, OVERRIDE NONDETENT

The eighth through eleventh characters describe the solenoid, flow range, or pressure range. Pressure or flow is specified as a range or a particular setting.

DL12 = DUAL LEAD 12VDC

DS24 = DUAL SPADE 24VDC

HC24 = HIRSCHMANN 24VDC

CL11 = CONDUIT LEAD 120VAC

0005 = 5 PSI CRACK

1500 = 1500 MAX PRESS

03.0 = 3 G.P.M. MAX FLOW

6-10 = 6 TO 10 G.P.M. FLOW RANGE

The final character is the body port style.

N = NPT

S = SAE

M A
D E
- -
3 R
4 V
5 A
- -
6 V
7 K
- -
8 H
9 C
10 1
11 2
- -
12 N S

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Section / Description	page
REFERENCE TABLE	732
PWM DRIVERS	733
MACHINE MANAGEMENT SYSTEMS	749
FINGERTIP PROPORTIONAL CONTROL LEVER AND SWITCHES	763
HEAVY DUTY MULTI-AXIS JOYSTICKS	779
ERGONOMIC GRIPS	794

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REFERENCE TABLE

Description	Tecnod P/N	PWM DRIVERS											MACHINE MANAGEMENT SYSTEMS										
		Power Supply Range	Digital Inputs	Optoisolated Digital Inputs	Analog Inputs	Total Number of Inputs	Signal Digital Outputs	Low Side Power Outputs	High Side Power Outputs	Analog Outputs	PWM Outputs	Total Number of Outputs	RS232 (interface needed)	RS485	CANbus Interface	Connection for Display	Setting by Switches	Setting by Console	Setting by PC	Setting by Trimmers			
PWM card 1 coil, 1 channel	EC-PWM-A1-MPC1-*	8.5-30 V			1	1				1	1									☺			
PWM card 2 coils, 1 channel	EC-PWM-A2-MPC1-*	8-32 V			1	1				1 (max 3.5 A)	2 (NOT simultaneous)	3								☺			
PWM card 4 coils, 2 channels	EC-PWM-P4-MPC2-H	9-30 V			8	8				1 (max 5 A)	4 (max 2 simultaneous)	5	☺	☺						☺			
PWM card 8 coils, 4 channels (factory preset)	EC-PWM-08-MPC4-H	9-30 V	2		6	8					8 (max 4 simultaneous)	8											
PWM card 8 coils, 4 channels (programmable)	EC-PWM-P8-MPC4-H	9-30 V		2 (PNP, optional)	8	8-10			4 (optional, max 5 A)		8 (max 4 simultaneous)	8-12	☺	☺						☺			
MMS 10 inputs, 12 outputs	EC-MMS-1012-H	9-30 V	2		8	10				11 (max 3.5 A)	1	12	☺	☺						☺			
MMS 5 inputs, 16 outputs	EC-MMS-0516-H	8.5-30 V	4 (2 if 16 output are used)		1	3-5				16 (max 3.5 A) (13 if 4 dig. inputs and 1 PWM are used)	1	16		☺	☺		☺						
MMS 20 inputs, 20 outputs	EC-MMS-2020-H	8.5-30 V	10 (12 if RS485 not used)		8	18-20				14 (max 3.5 A)	6 (0-5 V)	20	☺	☺				☺					
MMS 48 inputs, 20 outputs (coding card)	EC-MMS-4820-H	8.5-40 V	32		16	48	16 (max 700 mA)			4 (max 3.5 A) (3 if PWM is used)	1 (1.5 A max)	20		☺	☺					☺			
MMS 62 inputs, 52 outputs (main unit)	EC-MMS-6252-H	8.5-40 V	40		16 (0-5 V) 6 (0-20 mA)	62	10 (max 700 mA)			8 (max 5 A) (4 if PWM is used) 28 (max 3.5 A)	4 (2 A max)	52	☺	☺	☺					☺			
MMS 15 inputs, 21 outputs (main unit)	EC-MMS-1521-H	8-32 V	4 (8 if 4 pow. outs not used)		11	15-19		2		18 (max 3.5 A) (6 if PWM is used)	12 (3 A max)	21		☺	☺					☺			

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PWM Driver

	Description	Page
EC-PWM-A1-MPC1-P	1 PWM output for single solenoid valve wire connection	734
EC-PWM-A1-MPC1-D	1 PWM output for single solenoid valve din plug for coil mounting	736
EC-PWM-A1-MPC1-E	1 PWM output for 1 single solenoid valve male DIN plug connection	738
EC-PWM-A2-MPC1-*	1 PWM output for 1 dual solenoid valve wire connection	740
EC-PWM-P4-MPC2-H	2 PWM outputs for 2 dual solenoid valves programmable	742
EC-PWM-08-MPC4-H	4 PWM outputs for 4 dual solenoid valves fixed settings	744
EC-PWM-P8-MPC4-H	4 PWM outputs for 4 dual solenoid valves programmable	746

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EC-PWM-A1-MPC1-P PWM Driver

DESCRIPTION

Microprocessor-based PWM electronic driver for remote control of a single proportional solenoid valve.

OPERATION

The EC-PWM-A1-MPC1-P proportional valve driver receives a command signal from a potentiometer, PLC or other control systems, and supplies a solenoid with a PWM (*Pulse Width Modulated*) current proportional to the input signal. An auxiliary power supply (+5 V) is provided as a reference for the command signal.

Adjustments of "Imin/Imax", "Ramp time", "Deadband" and "Dither" can be carried out directly from a key-pad integrated on the front panel.

Mounting option: panel-mounting style with INPUT/OUTPUT multi-core sheathed cable.

FEATURES

- The current in the solenoid is independent from any change in the coil resistance or in the supply voltage.
- The inherent superimposed dither frequency helps to overcome friction and stiction effects in the controlled device.
- Power supply line is protected against reversed polarity and load dump.
- Input is protected against short circuits to GND and power supply.
- Output is protected against short circuits, over-current and over-temperature.
- The EC-PWM-A1-MPC1 is completely potted.
- Electro Magnetic Compatibility (EMC): EN 61000-6-2 (Immunity), EN 61000-6-3 (Emissions).

SPECIFICATIONS

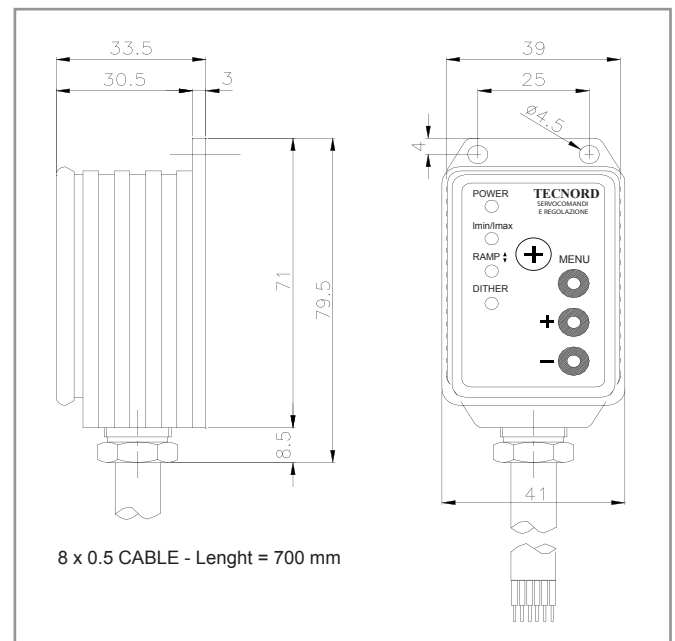
• Operating voltage:	8.5 ÷ 30 vdc
• Max current consumption:	100 mA (no load applied)
• Operating temperature:	-25°C / +85°C
• Degree of protection:	IP 67
• Input impedance:	50 kΩ
• Analog input signals available:	0 ÷ 5 V 0 ÷ 10 V 0 ÷ 20 mA
• Typical ctrl pot resistance:	2 ÷ 47 kΩ
• Current output range (PWM):	100 ÷ 3000 mA
• PWM dither frequency:	55 ÷ 200 Hz (adjustable)
• Ramp time:	0.05 ÷ 5 s (adjustable)
• Max. current from auxiliary +5 V:	15 mA

APPLICATIONS

- Primary applications are the control of proportional pressure reducing valves and proportional flow regulators to attain smooth acceleration/deceleration and fine-metering control of electro-hydraulic functions.



DIMENSIONS



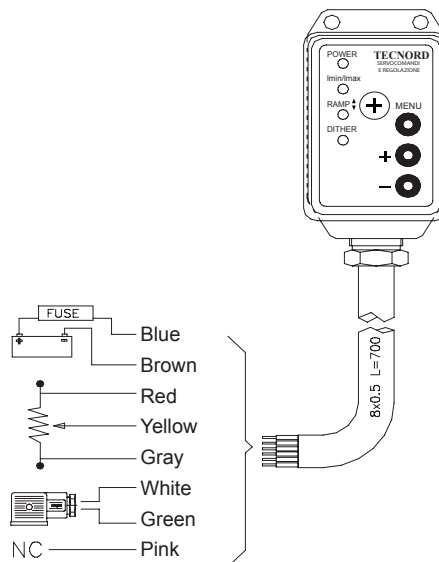
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EC-PWM-A1-MPC1-P PWM Driver
CIRCUIT BOARD PINOUT - WIRING DIAGRAM
Wiring Colours

Blue	+Battery
Brown	-Battery (GND)
Red	Command signal supply (+5 V)
Yellow	Command signal in
Gray	Command signal GND
White	Proportional coil output
Green	Proportional coil current feedback line
Pink	Spare / Not used

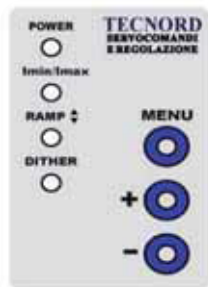
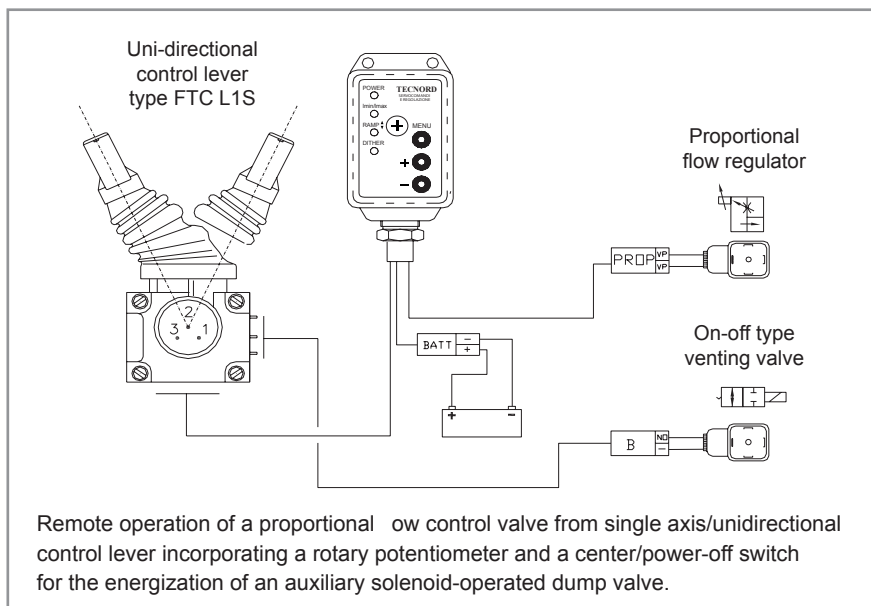
Note

A 5A fuse must be inserted on the BLUE wire connecting the PWM driver to the power source.


ADJUSTMENTS

The following adjustments can be made directly from the front key-pad by selecting the 3-pushpins in various combinations:

- **Imin (minimum output current)**
- **Imax (maximum output current)**
- **Ramp-up time**
- **Ramp-down time**
- **Dither frequency**


APPLICATION EXAMPLE

ORDERING INFORMATION
EC-PWM-A1-MPC1-P
A = Adjustable
P = Panel mounting

Part numbers	Version
23.0409.045	0-5 V
23.0409.087	0-10 V
23.0409.136	0-20 mA

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EC-PWM-A1-MPC1-D PWM Driver

DESCRIPTION

Microprocessor-based PWM electronic driver for remote control of a single proportional solenoid valve.

OPERATION

The EC-PWM-A1-MPC1-D proportional valve driver receives a command signal from a potentiometer, PLC or other control systems, and supplies a solenoid with a PWM (*Pulse Width Modulated*) current proportional to the input signal.

An auxiliary power supply (+5 V) is provided as a reference for the command signal.

Adjustments of "Imin/Imax", "Ramp time", "Deadband" and "Dither" can be carried out directly from a key-pad integrated on the front panel.

Mounting option: female DIN 43650 socket on valve's side and sheathed exit cable to connect to power source and remote control devices.

FEATURES

- The current in the solenoid is independent from any change in the coil resistance or in the supply voltage.
- The inherent superimposed dither frequency helps to overcome friction and stiction effects in the controlled device.
- Power supply line is protected against reversed polarity and load dump.
- Input is protected against short circuits to GND and power supply.
- Output is protected against short circuits, over-current and over-temperature.
- The EC-PWM-A1-MPC1 is completely potted.
- Electro Magnetic Compatibility (EMC): EN 61000-6-2 (Immunity), EN 61000-6-3 (Emissions).

SPECIFICATIONS

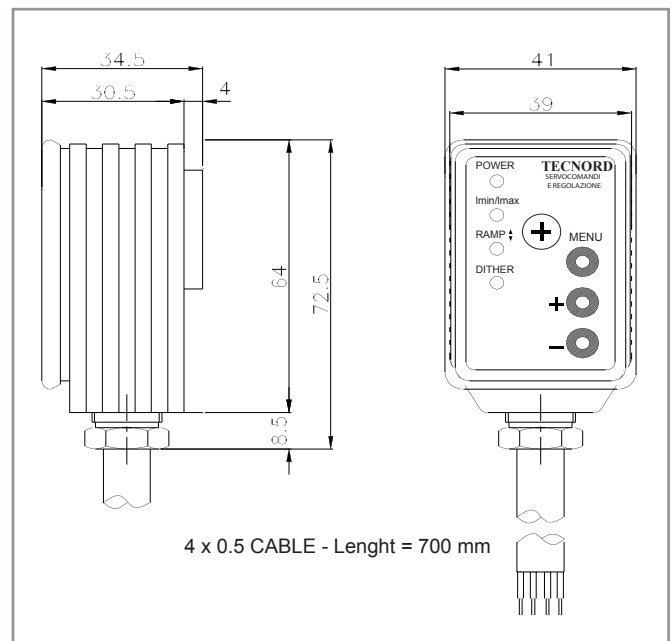
• Operating voltage:	8.5 ÷ 30 vdc
• Max current consumption:	100 mA (no load applied)
• Operating temperature:	-25°C / +85°C
• Degree of protection:	IP 67
• Input impedance:	50 kΩ
• Analog input signals available:	0 ÷ 5 V 0 ÷ 10 V 0 ÷ 20 mA
• Typical ctrl pot resistance:	2 ÷ 47 kΩ
• Current output range (PWM):	100 ÷ 3000 mA
• PWM dither frequency:	55 ÷ 200 Hz (adjustable)
• Ramp time:	0.05 ÷ 5 s (adjustable)
• Max. current from auxiliary +5 V:	15 mA

APPLICATIONS

- Primary applications are the control of proportional pressure reducing valves and proportional flow regulators to attain smooth acceleration/deceleration and fine-metering control of electro-hydraulic functions.



DIMENSIONS



WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

EC-PWM-A1-MPC1-D PWM Driver
CIRCUIT BOARD PINOUT - WIRING DIAGRAM
Power supply wiring colours

Blue (+) Positive from power source

Yellow/Green (-) Negative from (GND)

Remote potentiometer wiring colours

Black Command signal supply (+5 V)

Brown Command signal in

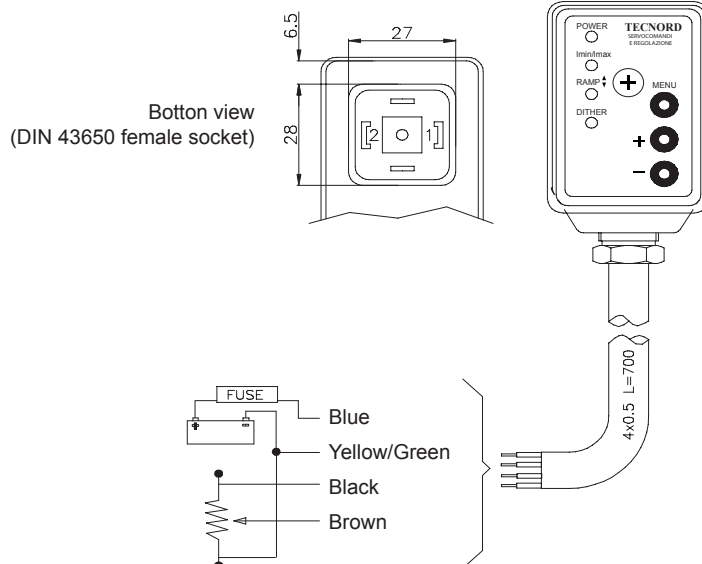
Proportional valve connector pins

1 Proportional coil output

2 Proportional coil current feedback line

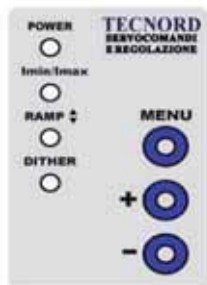
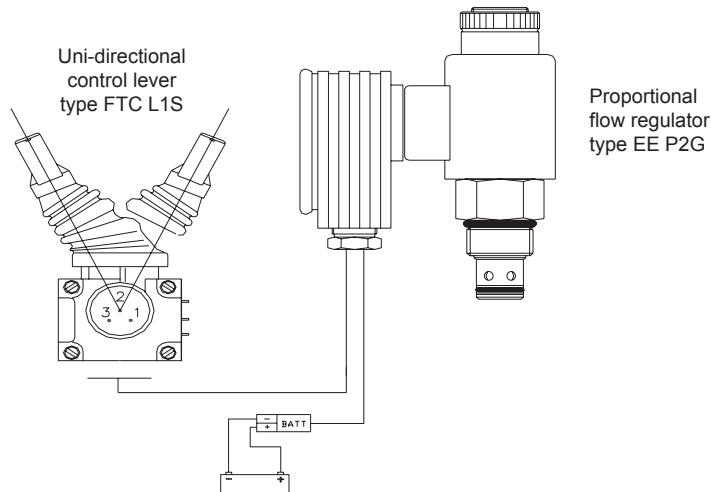
Note

A 5A fuse must be inserted on the BLUE wire connecting the PWM driver to the power source.


ADJUSTMENTS

The following adjustments can be made directly from the front key-pad by selecting the 3-pushpins in various combinations:

- **Imin (minimum output current)**
- **Imax (maximum output current)**
- **Ramp-up time**
- **Ramp-down time**
- **Dither frequency**


APPLICATION EXAMPLE


Remote operation of a proportional flow control valve from single axis/unidirectional control lever incorporating a rotary potentiometer and a center/power-off switch.

ORDERING INFORMATION
EC-PWM-A1-MPC1-D

A = Adjustable

P = DIN 43650 socket connector

Part numbers	Version
23.0409.046	0-5 V
23.0409.065	0-10 V
23.0409.077	0-20 mA

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

EC-PWM-A1-MPC1-E PWM Driver

DESCRIPTION

Microprocessor-based PWM electronic driver for remote control of a single proportional solenoid valve.

OPERATION

The EC-PWM-A1-MPC1-E proportional valve driver receives a command signal from a potentiometer, PLC or other control systems, and supplies a solenoid with a PWM (*Pulse Width Modulated*) current proportional to the input signal. An auxiliary power supply (+5 V) is provided as a reference for the command signal. Adjustments of "Imin/Imax", "Ramp time", "Deadband" and "Dither" can be carried out directly from a key-pad integrated on the front panel.

Mounting option: female DIN 43650 socket on valve's side and male DIN 43650 plug to connect to power source and remote control devices.

FEATURES

- The current in the solenoid is independent from any change in the coil resistance or in the supply voltage.
- The inherent superimposed dither frequency helps to overcome friction and stiction effects in the controlled device.
- Power supply line is protected against reversed polarity and load dump.
- Input is protected against short circuits to GND and power supply.
- Output is protected against short circuits, over-current and over-temperature.
- The EC-PWM-A1-MPC1 is completely potted.
- Electro Magnetic Compatibility (EMC): EN 61000-6-2 (Immunity), EN 61000-6-3 (Emissions).



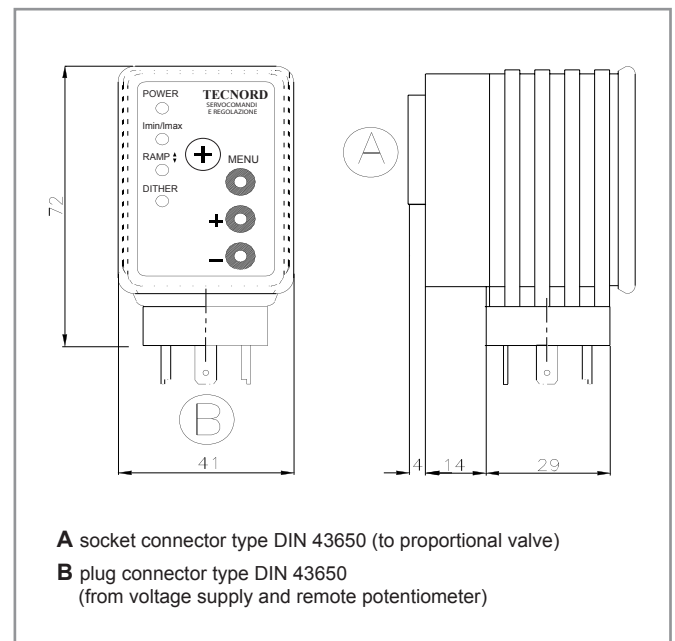
DIMENSIONS

SPECIFICATIONS

• Operating voltage:	8.5 ÷ 30 vdc
• Max current consumption:	100 mA (no load applied)
• Operating temperature:	-25°C / +85°C
• Degree of protection:	IP 67
• Input impedance:	50 kΩ
• Analog input signals available:	0 ÷ 5 V 0 ÷ 10 V 0 ÷ 20 mA
• Typical ctrl pot resistance:	2 ÷ 47 kΩ
• Current output range (PWM):	100 ÷ 3000 mA
• PWM dither frequency:	55 ÷ 200 Hz (adjustable)
• Ramp time:	0.05 ÷ 5 s (adjustable)
• Max. current from auxiliary +5 V:	15 mA

APPLICATIONS

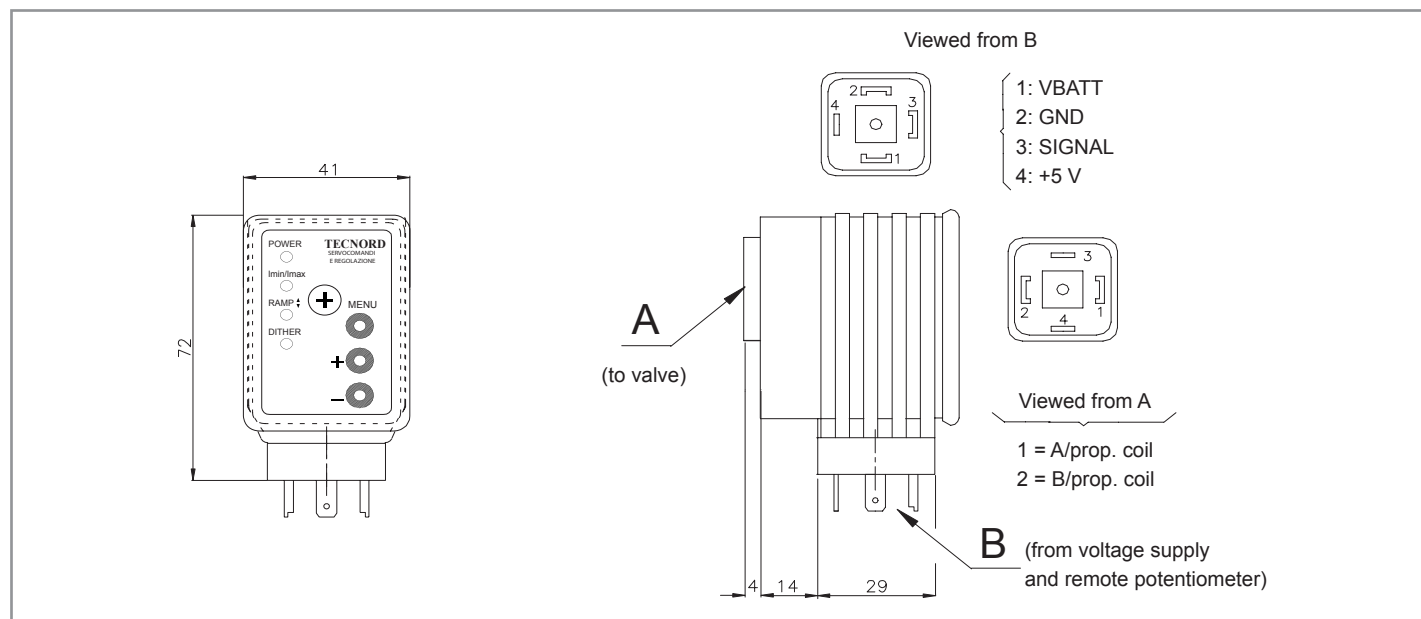
- Primary applications are the control of proportional pressure reducing valves and proportional flow regulators to attain smooth acceleration/deceleration and fine-metering control of electro-hydraulic functions.



WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

EC-PWM-A1-MPC1-E PWM Driver

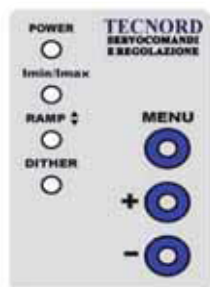
CIRCUIT BOARD PINOUT - WIRING DIAGRAM



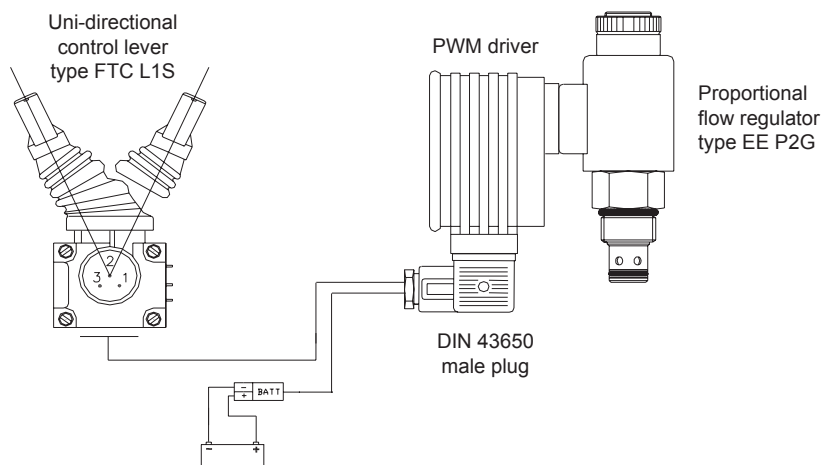
ADJUSTMENTS

The following adjustments can be made directly from the front key-pad by selecting the 3-pushpins in various combinations:

- Imin (minimum output current)
- Imax (maximum output current)
- Ramp-up time
- Ramp-down time
- Dither frequency



APPLICATION EXAMPLE



Remote operation of a proportional flow control valve from single axis/unidirectional control lever incorporating a rotary potentiometer.

ORDERING INFORMATION

EC-PWM-A1-MPC1-E

A = Adjustable

E = DIN 43650 plug connector

Part numbers	Version
23.0409.089	0-5 V
23.0409.047	0-10 V
23.0409.137	0-20 mA

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

EC-PWM-A2-MPC1-* PWM Driver

DESCRIPTION

Microprocessor-based PWM electronic driver for remote control of a dual-coil proportional solenoid valve.

OPERATION

The EC-PWM-A2-MPC1 proportional valve driver supplies a double solenoid with a PWM (*Pulse Width Modulated*) current proportional to the input signal from a potentiometer, PLC or other control systems.

Proportional valve A is controlled with an input command signal varying from 2.5 to 4.5 Volt.

Proportional valve B is controlled with an input command signal varying from 2.5 to 0.5 Volt. An auxiliary on-off type solenoid can be energised anytime the input signal goes out of the 2.25-2.75 V range.

FEATURES

- The current in the solenoid is independent from any change in the coil resistance or in the supply voltage.
- The inherent superimposed dither frequency helps to overcome friction and stiction effects in the controlled device.
- Supply line is protected against reversed polarity.
- Input is protected against short circuits to GND and supply.
- Outputs are protected against short circuits, reversed polarity, over-current and over-temperature.
- The EC-PWM-A2 circuit is potted inside a plastic enclosure suitable for panel mounting by means of 2 set screws.
- Electro Magnetic Compatibility (EMC): EN 61000-6-2 (Immunity), EN 61000-6-3 (Emissions).



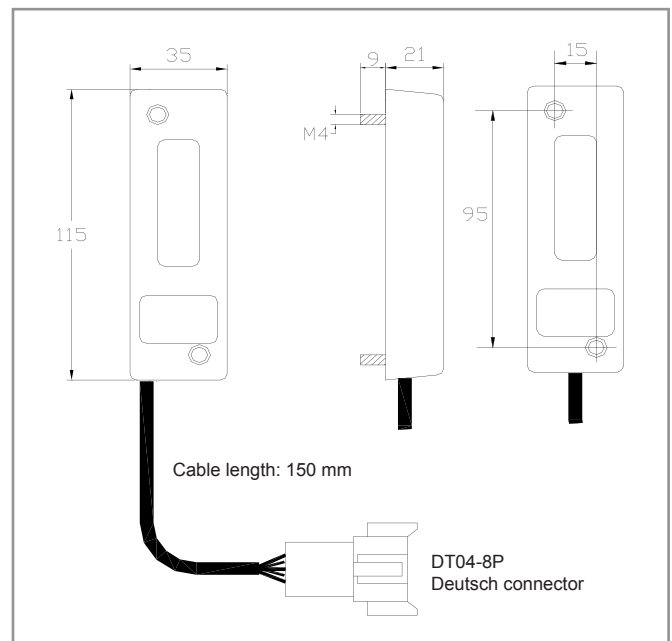
SPECIFICATIONS

• Operating voltage:	8 ÷ 32 vdc
• Max current consumption:	100 mA (no load applied)
• Operating temperature:	-25°C / +85°C
• Degree of protection:	IP 68
• Input impedance:	40 kΩ
• Analog input signals:	0.5 - 2.5 - 4.5 vdc
• Typical ctrl pot resistance:	2 ÷ 10 kΩ
• Current output range (PWM):	100 ÷ 1500 mA
• Current on-off output:	max 1800 mA
• PWM dither frequency:	100 Hz
• Resolution:	10 bits
• DT04-8P Deutsch connector (male contacts)	

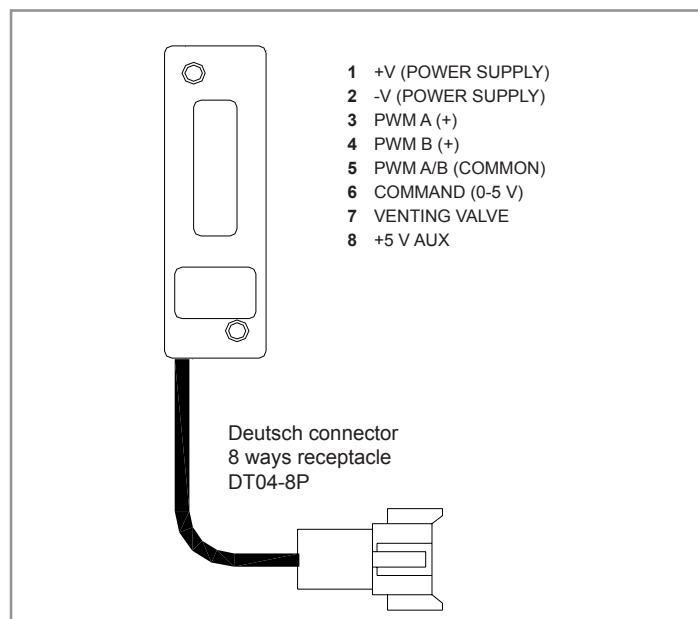
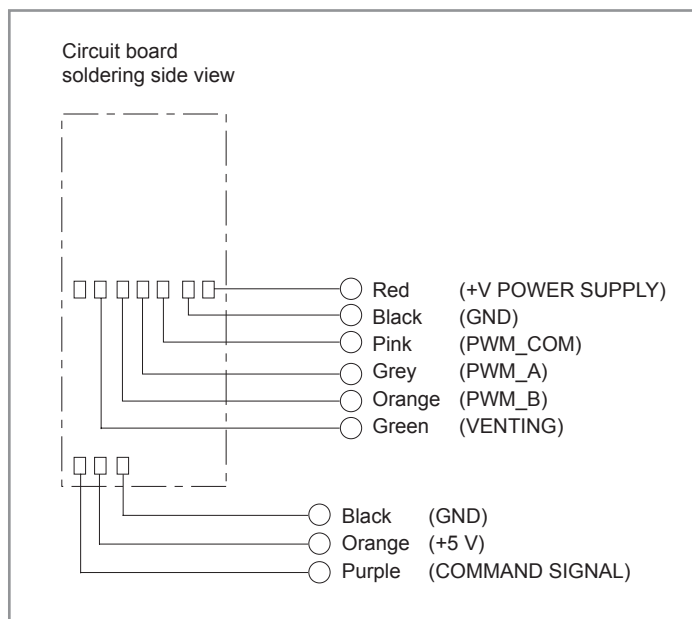
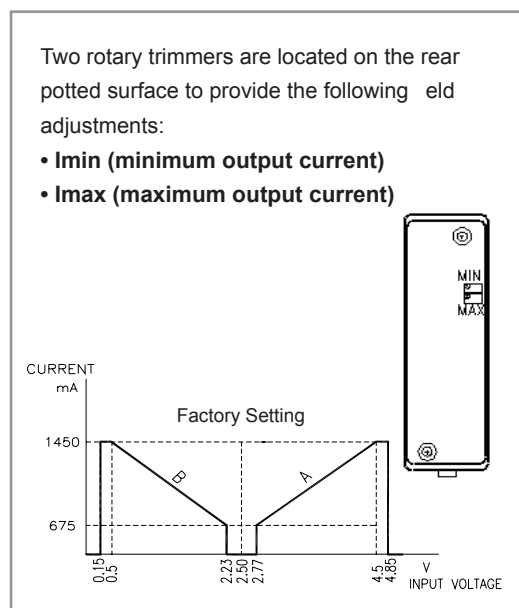
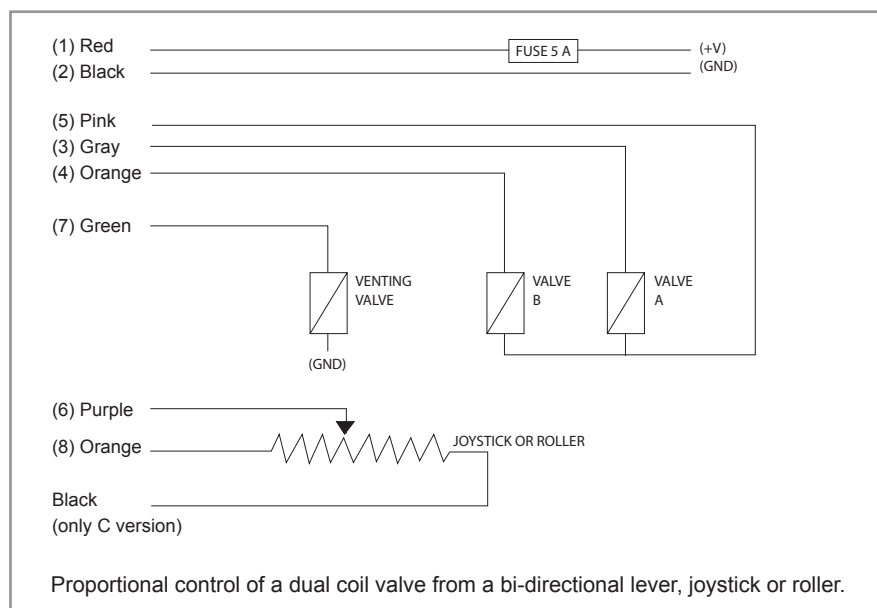
APPLICATIONS

- 12 vdc and 24 vdc systems.
- Remote control of proportional valves.
- Field-adjustable applications.
- Control of a proportional bi-directional valve with a venting valve.

DIMENSIONS



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EC-PWM-A2-MPC1-* PWM Driver
H VERSION - PINOUT

C VERSION - WIRING DIAGRAM

ADJUSTMENTS

APPLICATION EXAMPLE

ORDERING INFORMATION
EC-PWM-A2-MPC1-*
A = trimmer Adjustable version

H = potted plastic Housing

C = Circuit board only

Part numbers	Version
23.0409.138	H
23.0409.109	C

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

Phone: (815) 397-6628

Fax: (815) 397-2526

 E-mail: delta@delta-power.com

EC-PWM-P4-MPC2-H PWM Driver

DESCRIPTION

Microprocessor-based PWM driver for remote control of 2 dual-coil proportional solenoid valves.

OPERATION

The EC-PWM-P4-MPC2-H proportional valve driver supplies up to two dual-coil proportional valves with PWM (*Pulse Width Modulated*) current proportional to input signals coming from potentiometers, PLC or other control systems.

The control characteristics (I_{min}/I_{max} , ramps, deadbands, dither) are configurable via PC connected with a RS232 serial line to a configuration kit and PC interface of Tecnord supply.

FEATURES

- The current in the solenoid is independent from any change in the coil resistance or in the supply voltage.
- The inherent superimposed dither frequency helps to overcome friction and stiction effects in the controlled device.
- Supply line is protected against reversed polarity and load dump.
- Inputs are protected against short circuits to GND and supply.
- Outputs are protected against short circuits, reversed polarity, over-current and over-temperature.
- The EC-PWM-P4-MPC2-H is completely potted.
- Electro Magnetic Compatibility (EMC): EN 61000-6-2 (Immunity), EN 61000-6-3 (Emissions).



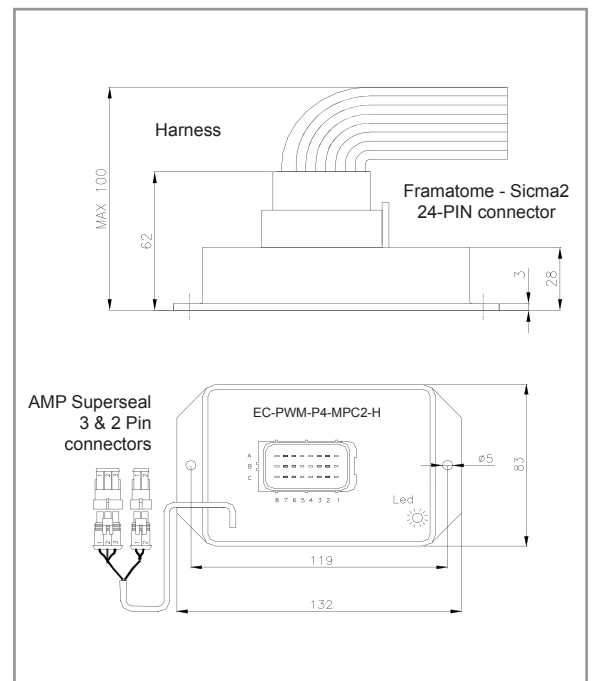
SPECIFICATIONS

• Operating voltage:	9 ÷ 30 vdc
• Max current consumption:	100 mA (no load applied)
• Operating temperature:	-25°C / +85°C
• Degree of protection:	IP 67
• Input impedance:	100 kΩ
• Analog inputs:	4 x 0-5 V
• Typical ctrl pot resistance:	1 ÷ 10 kΩ
• Digital inputs:	analog inputs can be used as digital
• Resolution:	10 bit
• PWM outputs channels:	2 x dual-coil proportional valves
• Current output range (PWM):	100 ÷ 1500 mA (3 A version available)
• PWM dither frequency:	75 ÷ 250 Hz (adjustable)
• On-off digital output:	1 (1500 mA)

APPLICATIONS

- Specifically designed for applications requiring accurate adjustments and calibrations.
- 12 vdc and 24 vdc systems.
- Remote control of non-feedback proportional valves.
- Control of a proportional bi-directional valve with a venting valve.

DIMENSIONS

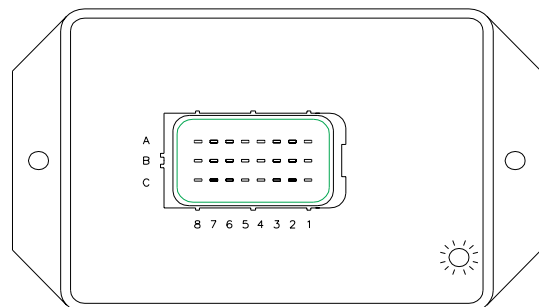


WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

EC-PWM-P4-MPC2-H PWM Driver

CIRCUIT BOARD PINOUT - WIRING DIAGRAM

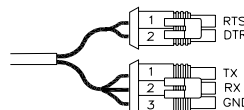
Connector type: framatome SICMA2



- A**
- 1 ON-OFF OUTPUT
 - 2 NOT CONNECTED
 - 3 NOT CONNECTED
 - 4 NOT CONNECTED
 - 5 NOT CONNECTED
 - 6 NOT CONNECTED
 - 7 ANALOG INPUT FOR FUNCTION 1 (TO DRIVE EV1A/B)
 - 8 FEEDBACK FOR EV1A/B

- B**
- 1 +V (POWER SUPPLY)
 - 2 NOT CONNECTED
 - 3 NOT CONNECTED
 - 4 ANALOG INPUT FOR FUNCTION 2 (TO DRIVE EV2A/B)
 - 5 NOT CONNECTED
 - 6 FEEDBACK FOR EV2A/B
 - 7 NOT CONNECTED
 - 8 NOT CONNECTED

Connector type: AMP-Seal



For software download

- 1 RTS
- 2 DTR

For calibration and adjustments

- 1 TX
- 2 RX
- 3 GND

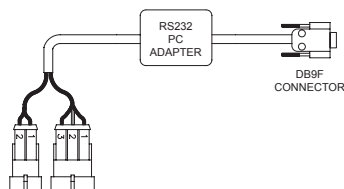
- C**
- 1 -V (POWER SUPPLY - GND)
 - 2 +5 VDC EXTERNAL SUPPLY VOLTAGE
 - 3 ANALOG INPUT - SPARE
 - 4 ANALOG INPUT - SPARE
 - 5 EV1A PROP. COIL OUTPUT (+)
 - 6 EV1B PROP. COIL OUTPUT (+)
 - 7 EV2A PROP. COIL OUTPUT (+)
 - 8 EV2B PROP. COIL OUTPUT (+)

ADJUSTMENTS

Adjustments can be effected via RS232 serial line to modify the following work parameters:

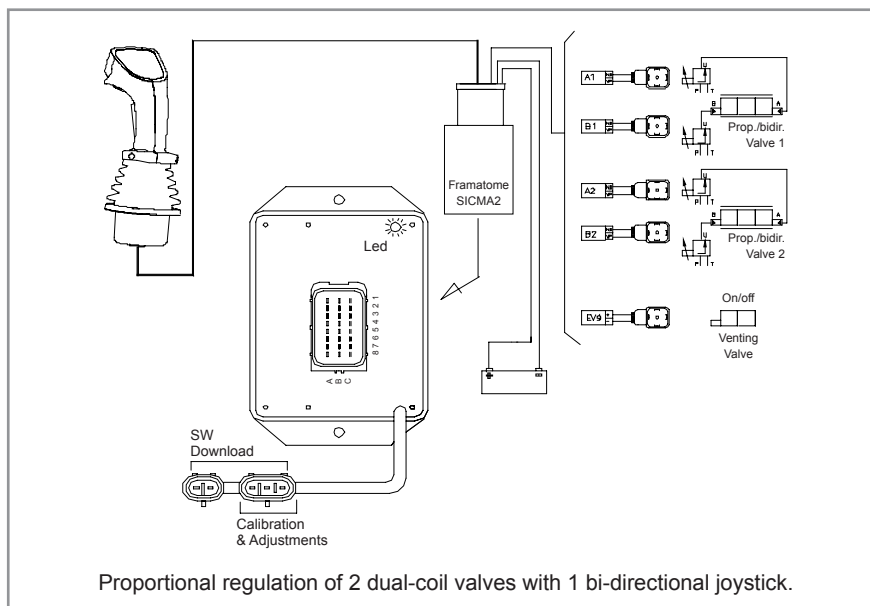
- Imin (minimum output current)
- Imax (maximum output current)
- Ramp-up time
- Ramp-down time
- Dither frequency

Ordering information for the configuration kit:
20.1001.026 RS232 interface card including PC configuration software tool on CD.



USB / RS232 interface available on request.

APPLICATION EXAMPLE



ORDERING INFORMATION

EC-PWM-P4-MPC2-H

P = Programmable

H = potted plastic Housing

Part numbers	Version
23.0409.237	1.5 A
23.0409.238	3 A

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Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com

EC-PWM-08-MPC4-H PWM Driver

DESCRIPTION

Microprocessor-based PWM driver for remote control of 4 dual-coil proportional solenoid valves.

OPERATION

The EC-PWM-08-MPC4 proportional valve driver supplies up to four dual-coil proportional solenoid valves with PWM (*Pulse Width Modulated*) current proportional to the input signals coming from potentiometers, PLC or other control systems.

PWM currents are factory pre-set and cannot be adjusted.

FEATURES

- The current in the solenoid is independent from any change in the coil resistance or in the supply voltage.
- The inherent superimposed dither frequency helps to overcome friction and stiction effects in the controlled device.
- Supply line is protected against reversed polarity and load dump.
- Inputs are protected against short circuits to GND and supply.
- Outputs are protected against short circuits, reversed polarity, over-current and over-temperature.
- The EC-PWM-08-MPC4-H is completely potted.
- Electro Magnetic Compatibility (EMC): EN 61000-6-2 (Immunity), EN 61000-6-3 (Emissions).



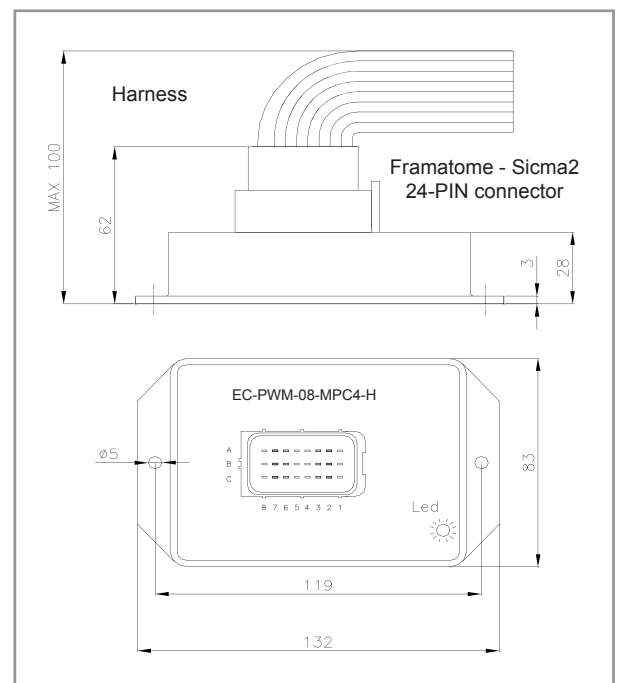
SPECIFICATIONS

• Operating voltage:	9 ÷ 30 vdc
• Max current consumption:	100 mA (no load applied)
• Operating temperature:	-40°C / +100°C
• Degree of protection:	IP 67
• Input impedance:	100 kΩ
• Analog inputs:	6 x 0-5 V
• Typical ctrl pot resistance:	1 ÷ 10 kΩ
• Digital inputs:	2 x PNP (Active High)
• Resolution:	10 bit
• PWM outputs channels:	4 x dual-coil proportional valves
• Current output range (PWM):	100 ÷ 1500 mA
• PWM dither frequency:	75 ÷ 250 Hz (factory pre-set, standard 100 Hz)

APPLICATIONS

- Specifically designed for applications with factory-set working parameters and requiring no field-adjustments.
- 12 vdc and 24 vdc systems.
- Remote control of proportional valves.
- Control of a 4 functions proportional bi-directional system.

DIMENSIONS

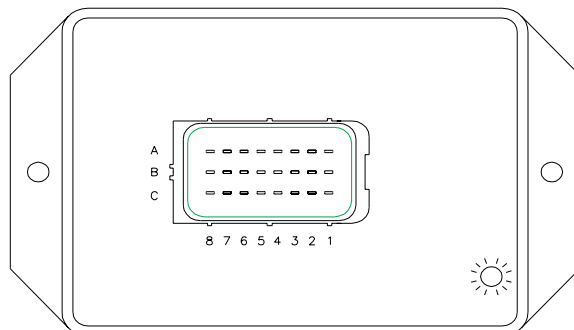


WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

EC-PWM-08-MPC4-H PWM Driver

CIRCUIT BOARD PINOUT - WIRING DIAGRAM

Connector type: framatome SICMA2



A	B	C
1 EV4A PROP. COIL OUTPUT FEEDBACK (-)	1 +V (POWER SUPPLY)	1 -V (POWER SUPPLY - GND)
2 EV4B PROP. COIL OUTPUT FEEDBACK (-)	2 ANALOG INPUT - SPARE	2 +5 VDC EXTERNAL SUPPLY VOLTAGE
3 EV3A PROP. COIL OUTPUT FEEDBACK (-)	3 ANALOG INPUT - SPARE	3 DIGITAL INPUT - SPARE
4 EV3B PROP. COIL OUTPUT FEEDBACK (-)	4 ANALOG INPUT FOR FUNCTION 2 (TO DRIVE EV2A/B)	4 DIGITAL INPUT - SPARE
5 ANALOG INPUT FOR FUNCTION 4 (TO DRIVE EV4A/B)	5 ANALOG INPUT - SPARE	5 EV1A PROP. COIL OUTPUT FEEDBACK (-)
6 ANALOG INPUT FOR FUNCTION 3 (TO DRIVE EV3A/B)	6 COMMON COMMAND FOR EV2A/B (+)	6 EV1B PROP. COIL OUTPUT FEEDBACK (-)
7 ANALOG INPUT FOR FUNCTION 1 (TO DRIVE EV1A/B)	7 COMMON COMMAND FOR EV4A/B (+)	7 EV2A PROP. COIL OUTPUT FEEDBACK (-)
8 COMMON COMMAND FOR EV1A/B (+)	8 COMMON COMMAND FOR EV3A/B (+)	8 EV2B PROP. COIL OUTPUT FEEDBACK (-)

ADJUSTMENTS

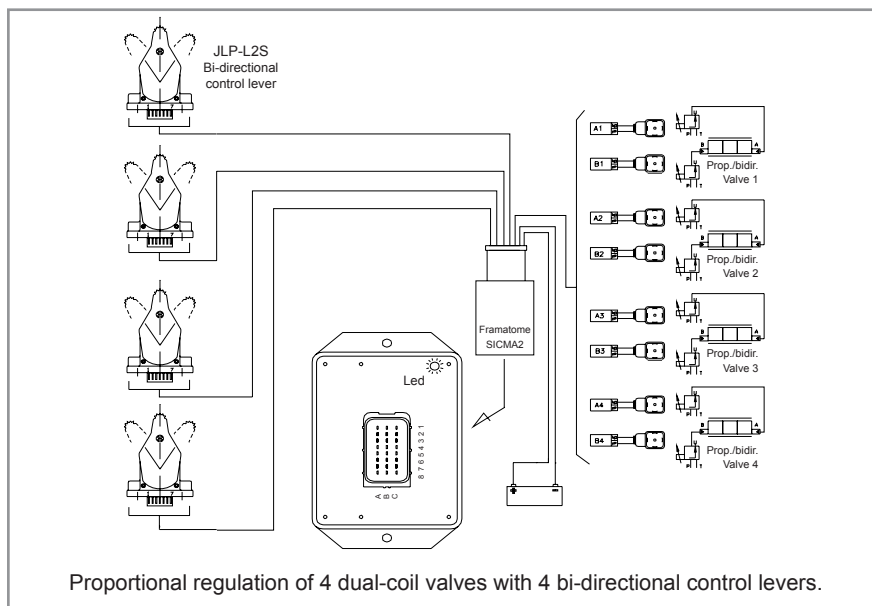
Factory pre-set for:

- **I_{min}** (minimum output current)
- **I_{max}** (maximum output current)
- **Ramp-up time**
- **Ramp-down time**
- **Dither frequency**

Factory pre-set values for the standard version p/n 23.0409.170:

- **I_{min} = 100 mA**
- **I_{max} = 1500 mA**
- **Ramp-up/-down time = 0 sec**
- **Dither frequency = 100 Hz**

APPLICATION EXAMPLE



ORDERING INFORMATION

EC-PWM-08-MPC4-H

0 = factory pre-set

H = potted plastic Housing

Part numbers	Version
23.0409.170	1.5 A

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com

EC-PWM-P8-MPC4-H PWM Driver

DESCRIPTION

Microprocessor-based PWM driver for remote control of 4 dual-coil proportional solenoid valves.

OPERATION

The EC-PWM-P8-MPC4 proportional valve driver supplies up to four dual-coil proportional solenoid valves with PWM (*Pulse Width Modulated*) current proportional to the input signals coming from potentiometers, PLC or other control systems. The control characteristics (I_{min}/I_{max} , ramps, deadbands, dither) are configurable via PC connected with a RS232 serial line to a configuration kit and PC interface of Tecnord supply.

FEATURES

- The current in the solenoid is independent from any change in the coil resistance or in the supply voltage.
- The inherent superimposed dither frequency helps to overcome friction and stiction effects in the controlled device.
- Supply line is protected against reversed polarity and load dump.
- Inputs are protected against short circuits to GND and supply.
- Outputs are protected against short circuits, reversed polarity, over-current and over-temperature.
- The EC-PWM-P8-MPC4-H is completely potted.
- Electro Magnetic Compatibility (EMC): EN 61000-6-2 (Immunity), EN 61000-6-3 (Emissions).



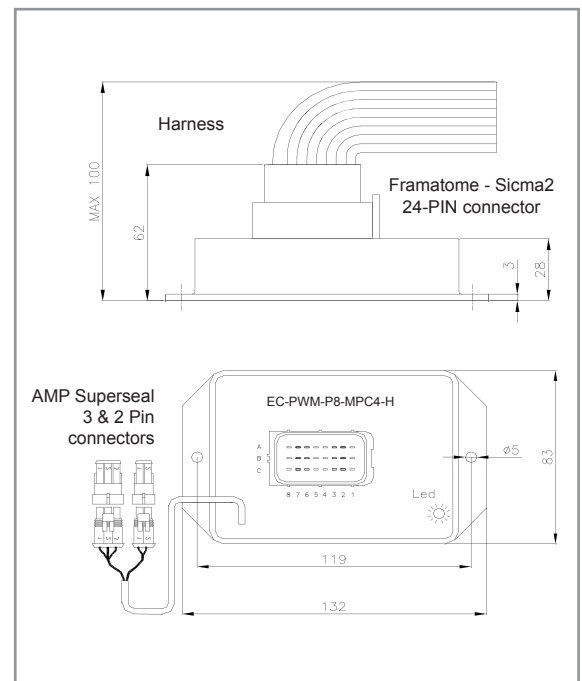
SPECIFICATIONS

• Operating voltage:	9 ÷ 30 vdc
• Max current consumption:	100 mA (no load applied)
• Operating temperature:	-25°C / +85°C
• Degree of protection:	IP 67
• Input impedance:	100 kΩ
• Analog inputs:	8 x 0-5 V
• Typical ctrl pot resistance:	1 ÷ 10 kΩ
• Digital inputs:	analog inputs can be used as digital
• Resolution:	10 bit
• PWM outputs channels:	4 x dual-coil proportional valves
• Current output range (PWM):	100 ÷ 1500 mA (3 A version available)
• PWM dither frequency:	75 ÷ 250 Hz (adjustable)

APPLICATIONS

- Specifically designed for applications requiring accurate adjustments and calibrations.
- 12 vdc and 24 vdc systems.
- Remote control of non-feedback proportional valves.
- Control of a proportional bi-directional valve with a venting valve.

DIMENSIONS

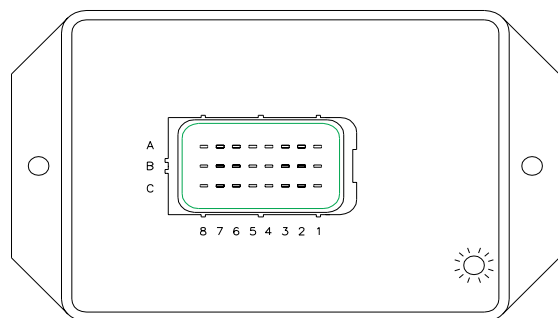


WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

EC-PWM-P8-MPC4-H PWM Driver

CIRCUIT BOARD PINOUT - WIRING DIAGRAM

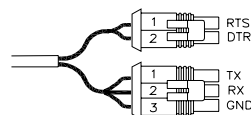
Connector type: framatome SICMA2



- A**
- 1 EV4A PROP. COIL OUTPUT (+)
 - 2 EV4B PROP. COIL OUTPUT (+)
 - 3 EV3A PROP. COIL OUTPUT (+)
 - 4 EV3B PROP. COIL OUTPUT (+)
 - 5 ANALOG INPUT FOR FUNCTION 4 (TO DRIVE EV4A/B)
 - 6 ANALOG INPUT FOR FUNCTION 3 (TO DRIVE EV3A/B)
 - 7 ANALOG INPUT FOR FUNCTION 1 (TO DRIVE EV1A/B)
 - 8 FEEDBACK FOR EV1A/B

- B**
- 1 +V (POWER SUPPLY)
 - 2 NOT CONNECTED
 - 3 ANALOG INPUT - SPARE
 - 4 ANALOG INPUT FOR FUNCTION 2 (TO DRIVE EV2A/B)
 - 5 ANALOG INPUT - SPARE
 - 6 FEEDBACK FOR EV2A/B
 - 7 FEEDBACK FOR EV4A/B
 - 8 FEEDBACK FOR EV3A/B

Connector type: AMP-Seal



For software download

- 1 RTS
- 2 DTR

For calibration and adjustments

- 1 TX
- 2 RX
- 3 GND

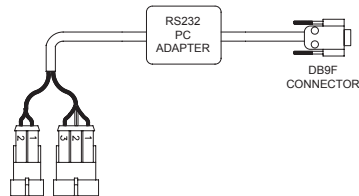
- C**
- 1 -V (POWER SUPPLY - GND)
 - 2 +5 VDC EXTERNAL SUPPLY VOLTAGE
 - 3 ANALOG INPUT - SPARE
 - 4 ANALOG INPUT - SPARE
 - 5 EV1A PROP. COIL OUTPUT (+)
 - 6 EV1B PROP. COIL OUTPUT (+)
 - 7 EV2A PROP. COIL OUTPUT (+)
 - 8 EV2B PROP. COIL OUTPUT (+)

ADJUSTMENTS

Adjustments can be effected via RS232 serial line to modify the following work parameters:

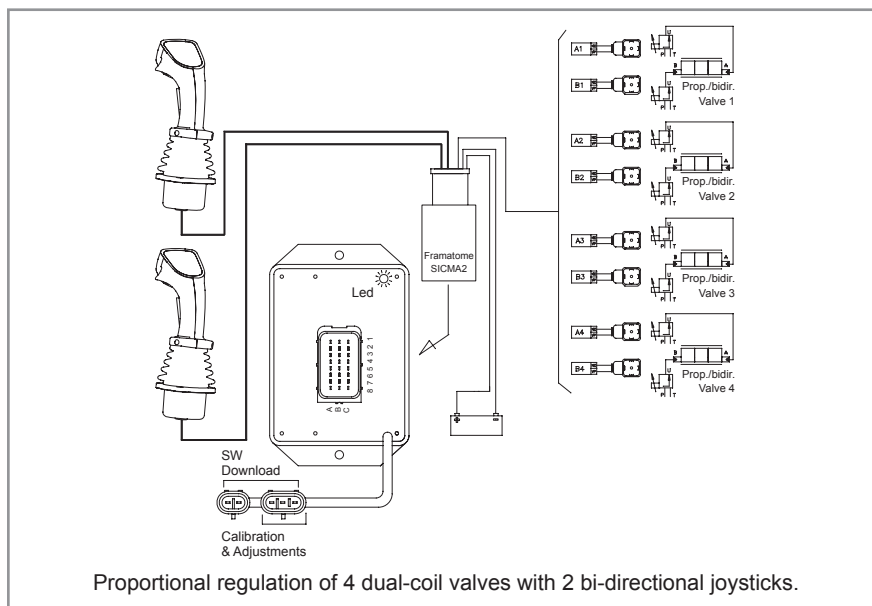
- **Imin (minimum output current)**
- **Imax (maximum output current)**
- **Ramp-up time**
- **Ramp-down time**
- **Dither frequency**

Ordering information for the configuration kit:
20.1001.026 RS232 interface card including PC configuration software tool on CD.



USB / RS232 interface available on request.

APPLICATION EXAMPLE



ORDERING INFORMATION

EC-PWM-P8-MPC4-H

P = Programmable

H = potted plastic Housing

Part numbers	Version
23.0409.081	1.5 A
23.0409.071	3 A

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

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Machine Management Systems

	Description	Page
EC-MMS-1012-H	10 inputs, 12 outputs meter-in systems controller	750
EC-MMS-2020-H	20 inputs, 20 outputs RS232 / RS 485 interface	752
EC-MMS-1521-H	15 inputs, 21 outputs CANbus interface	754
EC-MMS-4820-H	48 inputs, 20 outputs RS 485 / CANbus interface	756
EC-MMS-0516-H	5 inputs, 16 outputs Deutsch connection / RS 485 interface	758
EC-MMS-6252-H	62 inputs, 52 output RS485 / CANbus interface	760

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

EC-MMS-1012-H Machine Management System

DESCRIPTION

Digital MMS (*Machine Management System*) with built-in advanced safety and fault detection features for integrated control of mobile equipment functions.

OPERATION

10 inputs and 12 outputs are managed by this small-size unit. PWM current outputs are eld-adjustable and their setting is stored in a EEPROM memory. Parameters can be loaded via software from a standard PC connected with a RS232 serial line.

It can be used as a stand-alone controller for both meter-in systems (up to 5 functions) and bi-directional proportional systems (up to 4 functions). Additional output for a safety venting valve is available.

FEATURES

- Supply line is protected against reversed polarity and overvoltage.
- Inputs are protected against short circuits to GND and power supply.
- Outputs are protected against short circuits, reversed polarity, over-current and over-temperature.
- 3-wires RS232 serial interface.
- Auxiliary +5 V supply for control devices (e.g. potentiometers).
- Performance level c capability according to ISO 13849, due to high reliability of components and embedded diagnostics.
- Electro Magnetic Compatibility (EMC): EN 61000-6-2 (Immunity), EN 61000-6-3 (Emissions).

SPECIFICATIONS

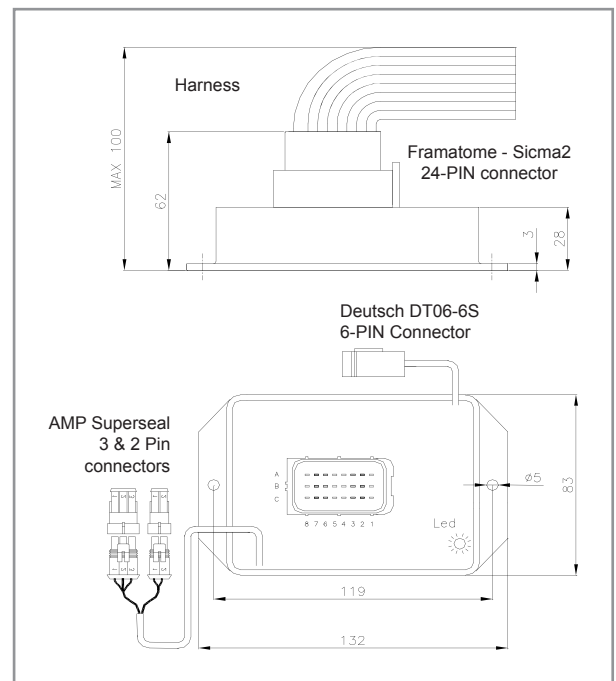
• Operating voltage:	9 ÷ 30 vdc
• Max current consumption:	100 mA (no load applied)
• Operating temperature:	-25°C / +85°C
• Degree of protection:	IP 67
• Input impedance:	100 kΩ
• Analog inputs (10 bits):	8 (0-5 V)
• Typical ctrl pot resistance:	1 ÷ 10 kΩ
• Digital inputs:	2
• High side power outputs:	12 (3.5 A max)
• Inputs for current feedback:	4
• Current output range (PWM):	100 ÷ 1500 mA
• PWM dither frequency:	60 ÷ 200 Hz

APPLICATIONS

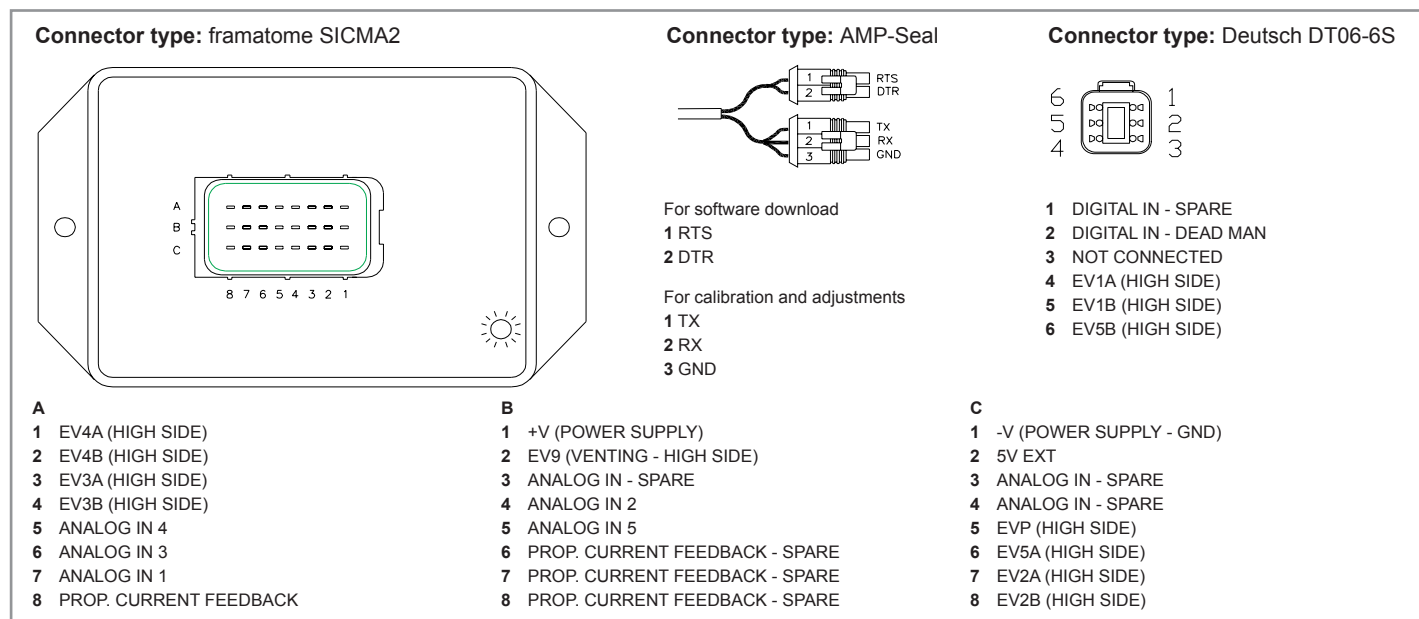
- 12 vdc and 24 vdc systems.
- Remote control of non-feedback proportional and on-off valves.
- Specically designed for applications requiring accurate adjustments and calibrations.
- Control of up to 4 proportional bi-directional valves plus a venting valve and additional 3 auxiliary outputs.
- Control of up to 5 functions in meter-in con guration (10 on-off valves plus 1 proportional valve and 1 venting valve).



DIMENSIONS



WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

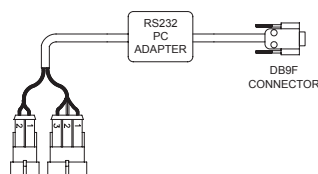
EC-MMS-1012-H Machine Management System
CIRCUIT BOARD PINOUT - WIRING DIAGRAM (reference: meter-in layout)

ADJUSTMENTS

Adjustments can be effected via RS232 serial line to modify the following work parameters:

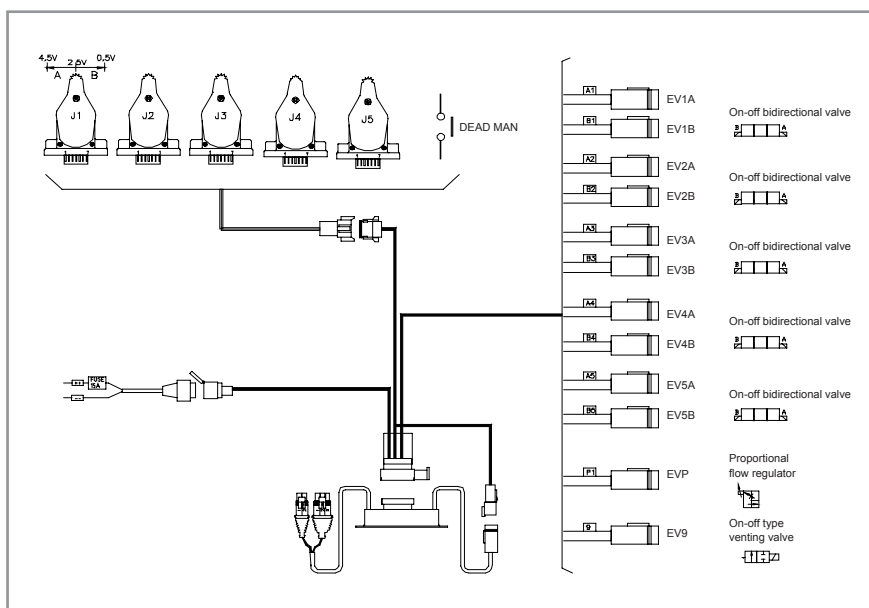
- Imin (minimum output current)
- Imax (maximum output current)
- Ramp-up time
- Ramp-down time
- Dither frequency

Ordering information for the configuration kit:

20.1001.026 RS232 interface card including PC configuration software tool on CD.



USB / RS232 interface available on request.

APPLICATION EXAMPLE

ORDERING INFORMATION
EC-MMS-1012-H

1012 = 10 inputs - 12 outputs

H = potted plastic Housing for panel mounting

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

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EC-MMS-2020-H Machine Management System

DESCRIPTION

Digital MMS (*Machine Management System*) with built-in advanced safety and fault detection features for integrated control of mobile equipment functions.

OPERATION

20 inputs and 20 outputs are managed by this small-size unit. Analog outputs are field-adjustable and their setting is stored in an EEPROM memory and can be loaded via software from a standard PC connected through an RS232 serial line.

It can be used as a stand-alone controller or in conjunction with other MMS electronic units like Tecnord's Mod. MMS-4820.



FEATURES

- Power supply line is protected against reversed polarity and overvoltage.
- Inputs are protected against short circuits to GND and supply.
- Outputs are protected against short circuits, reversed polarity, over-current and over-temperature.
- 3-wires RS232 serial interface and 2-wires RS485 serial interface.
- Especially designed to drive up to 6 electro-hydraulic proportional actuators Tecnord type MLT-FD4/5.
- Auxiliary +5 V supply for control devices (e.g. potentiometers).
- Performance level c capability according to ISO 13849, due to high reliability of components and embedded diagnostics.
- Electro Magnetic Compatibility (EMC): EN 61000-6-2 (Immunity), EN 61000-6-3 (Emissions).

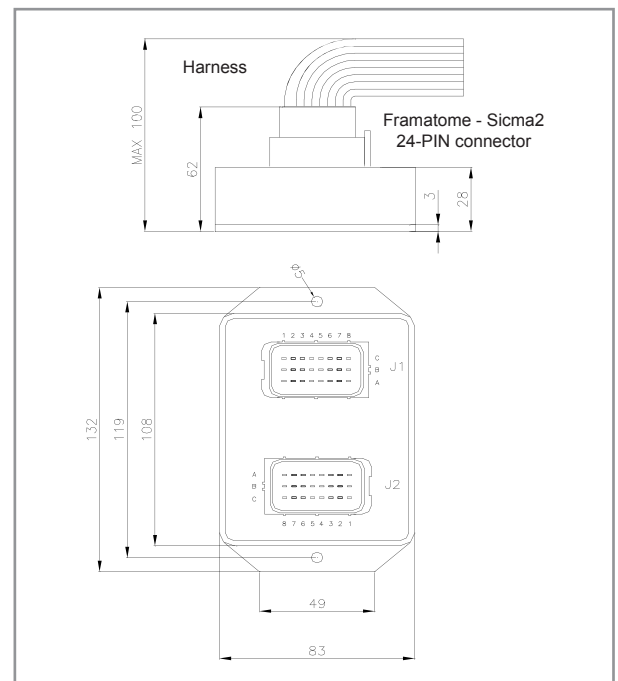
SPECIFICATIONS

• Operating voltage:	8.5 ÷ 30 vdc
• Max current consumption:	0.5 A (no load applied)
• Operating temperature:	-25°C / +85°C
• Degree of protection:	IP 67
• Input impedance:	100 kΩ
• Analog inputs (10 bits):	8 (0-5 V)
• Typical ctrl pot resistance:	1 ÷ 10 kΩ
• Digital inputs:	12
• High side power outputs:	14 (3.5 A max)
• Max current load on all outputs:	10 A
• Analog outputs:	6 (0-5 V)

APPLICATIONS

- 12 vdc and 24 vdc systems.
- Closed loop systems with electro-hydraulic proportional actuators.
- General purpose applications requiring field-adjustments.
- Two or more MMS boards can be interconnected by means of 2-wires RS485 serial lines where rotating joints or cable are installed.

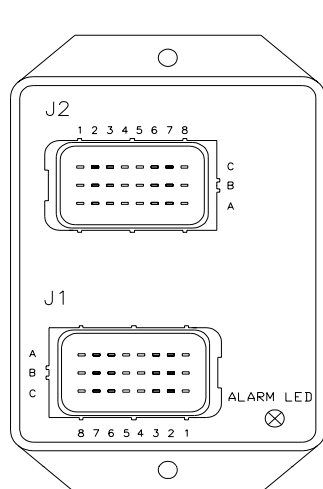
DIMENSIONS



WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

EC-MMS-2020-H Machine Management System
CIRCUIT BOARD PINOUT - WIRING DIAGRAM

Connector type: framatome SICMA2


J1
A

- 1 ANALOG IN 2
- 2 ANALOG IN 5
- 3 DIGITAL IN 0
- 4 DIGITAL IN 2
- 5 DIGITAL IN 4
- 6 DIGITAL IN 7
- 7 DIGITAL IN 9
- 8 RS232 TX

B

- 1 ANALOG IN 1
- 2 ANALOG IN 4
- 3 ANALOG IN 7
- 4 DIGITAL IN 1
- 5 DIGITAL IN 3
- 6 DIGITAL IN 6
- 7 DIGITAL IN 8
- 8 RS232 RX

C

- 1 ANALOG IN 0
- 2 ANALOG IN 3
- 3 ANALOG IN 6
- 4 5V EXT
- 5 RS232 GND
- 6 DIGITAL IN 5
- 7 DIGITAL IN 10
- 8 DIGITAL IN 11

J2
A

- 1 OUT 0
- 2 OUT 1
- 3 OUT 2
- 4 OUT 3
- 5 OUT 4
- 6 OUT 5
- 7 ANALOG OUT 4
- 8 -V (POWER SUPPLY - GND)

B

- 1 OUT 7
- 2 RS485 BUS-
- 3 ANALOG OUT 0
- 4 RS485 BUS+
- 5 ANALOG OUT 2
- 6 ANALOG OUT 1
- 7 ANALOG OUT 5
- 8 +V (POWER SUPPLY)

C

- 1 OUT 6
- 2 OUT 9
- 3 OUT 8
- 4 OUT 11
- 5 OUT 10
- 6 OUT 13
- 7 OUT 12
- 8 ANALOG OUT 3

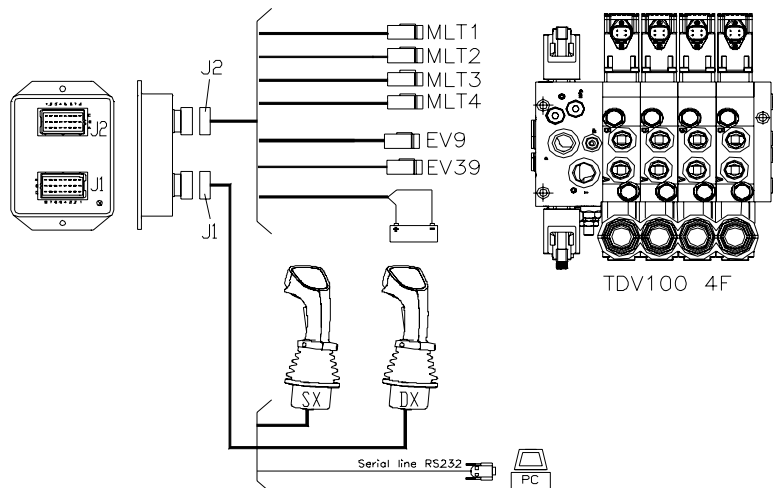
ADJUSTMENTS

Adjustments can be effected via RS232 serial line to modify the following work parameters:

- Vmin (minimum output voltage)
- Vmax (maximum output voltage)
- Ramp-up time
- Ramp-down time



Ask for: PC configuration electronic units calibration tool (see page 42).

APPLICATION EXAMPLE


Electro-hydraulic multi-function system requiring individual calibration of each semi-function to meet specific working or safety-related conditions.

ORDERING INFORMATION
EC-MMS-2020-H

2020 = 20 inputs - 20 outputs

H = potted plastic Housing for panel mounting

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

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EC-MMS-1521-H Machine Management System Controller

new
DESCRIPTION

MMS (*Machine Management System*) controller in rugged aluminum enclosure dual microprocessor, CANbus, built-in safety and fault-detection features for integrated control of complex functions in mobile equipment applications.

OPERATION

It is normally used as the main control unit in a complete management system. Two microprocessors and advanced diagnostics for safety applications. The EC-MMS-1521 comes with an aluminium casing, a silicon rubber gasket and connectors, designed to ensure power dissipation, robustness and tightness required in severe environment conditions. Software download available.

FEATURES

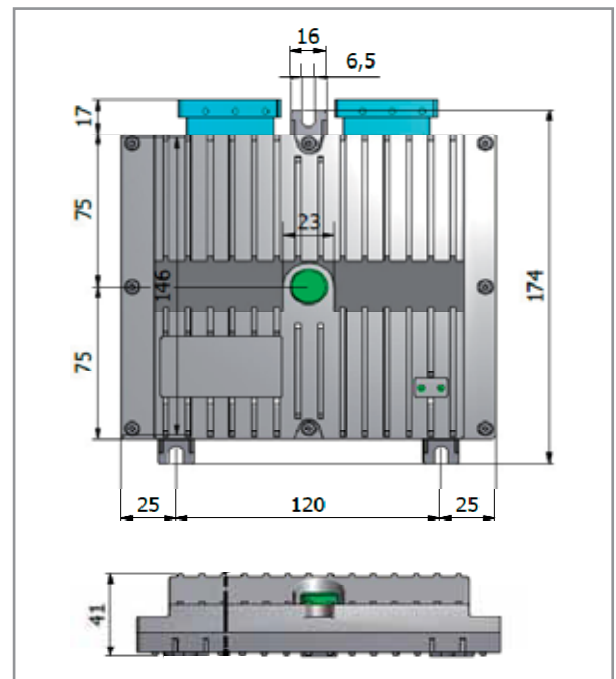
- Robust aluminum enclosure.
- Power supply is protected against reversed polarity (external fuse required) and overvoltage.
- Inputs are protected against short circuits to GND and power supply.
- Outputs protected against short circuits, over-current and over-temperature.
- 2 CANbus connections.
- PWM drivers with current feedback.
- +5 V auxiliary power supply for external control devices.
- Performance level d capability according to ISO 13849, thanks to redundant microcontroller and embedded diagnostics.
- Electro Magnetic Compatibility (EMC): EN 61000-6-2 (Immunity), EN 61000-6-3 (Emissions).
- Reserved power supply pins for safety power outputs.
- Optional add-on inclinometer.
- Optional real time clock for data logging.

SPECIFICATIONS

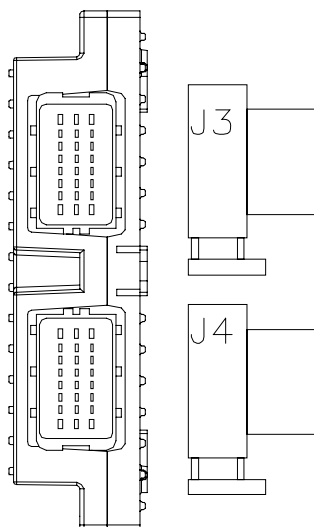
• Operating voltage:	8 ÷ 32 vdc
• Max. current consumption:	< 400 mA (no load applied)
• Operating temperature:	-40°C / +105°C
• Degree of protection:	IP 69
• Analog inputs (16 bits):	3 (0-5 V)
• Analog inputs (10 bits):	8 (0-5 V)
• Digital (frequency) inputs:	4
• High side power outputs:	18 (6 if PWM outputs are used)
• Low side power outputs (LS):	2
• PWM outputs with current feedback (3A):	12
• Analog voltage outputs (0-5 V):	1
• Pins selectable as power OUT or digital IN:	6
• Inputs with SW selectable pull-up:	4
• CANbus lines:	2 (ISO 11898, CAN 2.0A/B)
• Available bus speed:	up to 1 Mbit/s

APPLICATIONS

- Main ECU for aerial platforms, cranes, telehandlers, agriculture vehicles.
- 12 vdc and 24 vdc systems.
- Two or more MMS boards can be interconnected through the CANbus line.


DIMENSIONS


WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

EC-MMS-1521-H Machine Management System Controller
new
CIRCUIT BOARD PINOUT - WIRING DIAGRAM
Connector type: framatome SICMA2

J3 (GREY)

- | | |
|----------|-----------|
| A | |
| 1 | VHS4 |
| 2 | OUT_PWM7 |
| 3 | OUT_PWM2 |
| 4 | OUT_PWM3 |
| 5 | DIG INT 1 |
| 6 | DIG INT 0 |
| 7 | OUT_PWM4 |
| 8 | VHS3 |

- | | |
|----------|--------------|
| B | |
| 1 | LS1 |
| 2 | OUT_PWM6 |
| 3 | ANALOG IN 8 |
| 4 | ANALOG IN 10 |
| 5 | DIG INT 3 |
| 6 | DIG INT 2 |
| 7 | OUT_PWM5 |
| 8 | VHS2 |

- | | |
|----------|-------------|
| C | |
| 1 | LS0 |
| 2 | 5V EXT |
| 3 | ANALOG IN 9 |
| 4 | CAN L 1 |
| 5 | CAN H 1 |
| 6 | CAN L 2 |
| 7 | CAN H 2 |
| 8 | VHS1 |

J4 (BLACK)

- | | |
|----------|-------------------|
| A | |
| 1 | OUT 4 |
| 2 | OUT 5 |
| 3 | OUT 0 |
| 4 | OUT 1 |
| 5 | OUT_PWM8 |
| 6 | OUT_PWM9 |
| 7 | OUT_PWM10 |
| 8 | +V (POWER SUPPLY) |

- | | |
|----------|-------------------------|
| B | |
| 1 | OUT 2 |
| 2 | OUT 3 |
| 3 | ANALOG IN 1 |
| 4 | ANALOG IN 3 |
| 5 | ANALOG IN 5 |
| 6 | ANALOG IN 7 |
| 7 | OUT_PWM11 |
| 8 | -V (POWER SUPPLY - GND) |

- | | |
|----------|-------------------------|
| C | |
| 1 | OUT_PWM0 |
| 2 | OUT_PWM1 |
| 3 | ANALOG IN 0 |
| 4 | ANALOG IN 2 |
| 5 | ANALOG IN 4 |
| 6 | ANALOG IN 6 |
| 7 | OUT AN 0 |
| 8 | -V (POWER SUPPLY - GND) |

ADJUSTMENTS

Adjustments can be effected via CANbus interface to modify the following work parameters:

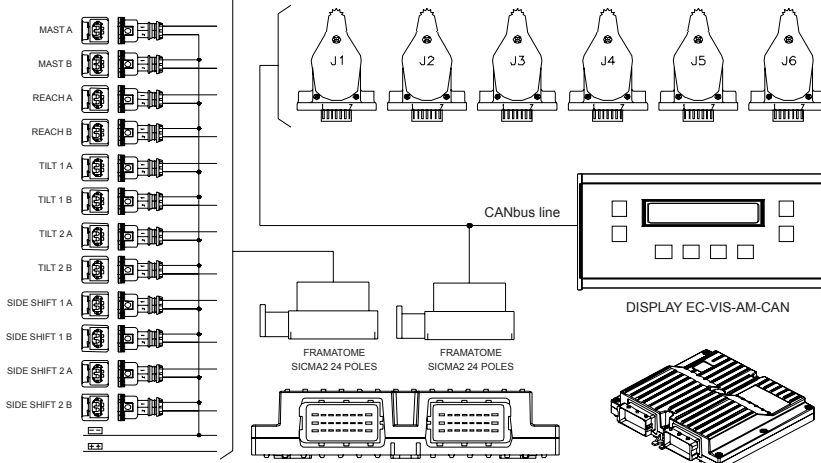
- **Imin (minimum output current)**
- **Imax (maximum output current)**
- **Ramp-up time**
- **Ramp-down time**



Ask for: PC configuration electronic units calibration tool (see page 42).

APPLICATION EXAMPLE

Electric motor variable RPM control



Forklift control system.

ORDERING INFORMATION

EC-MMS-1521-H

1521 = 15 inputs - 21 outputs

H = aluminium Housing

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

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EC-MMS-4820-H Machine Management System

DESCRIPTION

MMS (*Machine Management System*) coding card with CANbus and RS485 interface and built-in advanced safety and fault-detection features for integrated control of mobile equipment functions.

OPERATION

The MMS-4820 can be lodged inside any remote control box or panel to make command signals compatible with CANbus networks or RS485 serial lines.

It can be used as a stand-alone controller for Tecnord's Multidrom MLT/FD5 CANbus-controlled electro-hydraulic proportional actuators.

It can be used as a remote coding card for RS485 serial line connection to other MMS electronic units like Tecnord's Mod. MMS-2020.

FEATURES

- Power supply line is protected against reversed polarity and overvoltage.
- Inputs are protected against short circuits to GND and supply.
- Outputs are protected against short circuits, reversed polarity, over-current and over-temperature.
- 2-wires CANbus or RS485 serial interface.
- Performance level d capability according to ISO 13849, thanks to microprocessor redundancy.
- Electro Magnetic Compatibility (EMC): EN 61000-6-2 (Immunity), EN 61000-6-3 (Emissions).
- Auxiliary +5 V supply for control devices (e.g. potentiometers).

SPECIFICATIONS

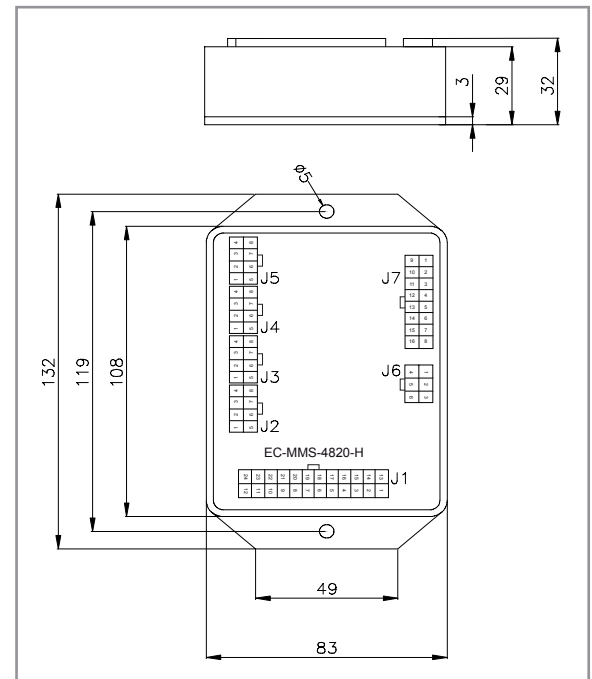
• Operating voltage:	8.5 ÷ 40 vdc
• Max current consumption:	0.5 A (no load applied)
• Operating temperature:	-25°C / +85°C
• Degree of protection:	IP 54
• Input impedance:	100 kΩ
• Analog inputs (10 bits):	16 (0-5 V)
• Typical ctrl pot resistance:	1 ÷ 10 kΩ
• Digital inputs:	32
• High side power outputs:	4 (3.5 A max)
• Max current load on all outputs:	5 A
• High side signal outputs:	16 (0.7 A max)
• Inputs for current feedback:	1
• Current output range (PWM):	100 ÷ 1500 mA
• PWM dither frequency:	60 ÷ 200 Hz (adjustable)

APPLICATIONS

- 12 vdc and 24 vdc systems.
- Control panel management.
- Field-adjustable applications.
- Closed loop systems with electro-hydraulic digital actuators.
- Two or more MMS boards can be interconnected by means of 2-wires RS485 serial lines or CANbus where rotating joints or cable reels are installed.



DIMENSIONS

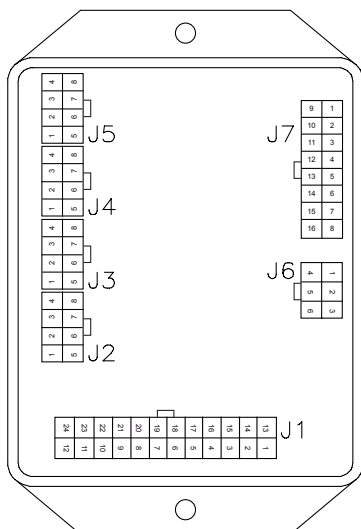


WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

EC-MMS-4820-H Machine Management System

CIRCUIT BOARD PINOUT - WIRING DIAGRAM

Connector type: Molex MINI t



- J1**
 1 +V (POWER SUPPLY)
 2 5V EXT
 3 CANH / RS485+
 4 CANL / RS485-
 5÷12 ANALOG IN [1÷8]
 13 -V (POWER SUPPLY - GND)
 14 PROG1 (#1 MICROCONTROLLER)
 15 PROG2 (#2 MICROCONTROLLER)
 16 RESET
 17÷24 ANALOG IN [9÷16]

- J2 ÷ J5**
 1÷8 DIGITAL IN [1÷32]

- J6**
 1 POWER OUT 1
 2 GND
 3 PWM CURRENT FEEDBACK
 4 POWER OUT 2
 5 POWER OUT 3
 6 POWER OUT 4

- J7**
 1÷16 SIGNAL OUT [1÷16]

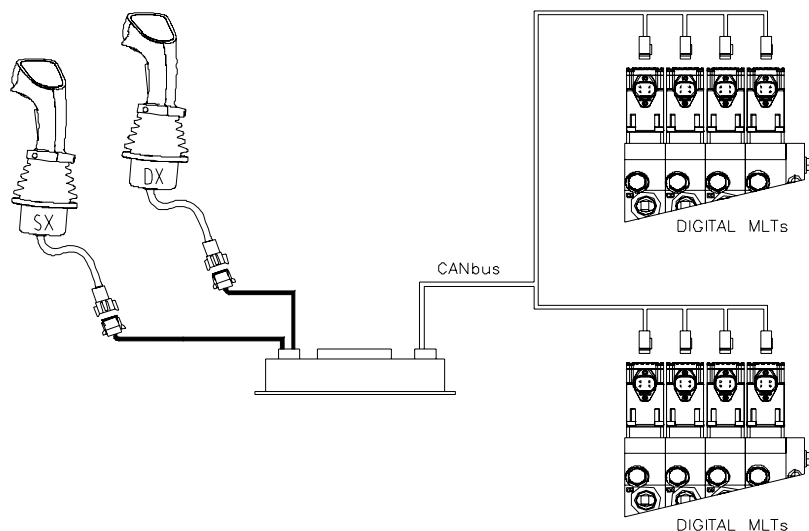
ADJUSTMENTS

Adjustments through RS485 serial line and CANbus interface.



Ask for: PC configuration electronic units calibration tool (see page 42).

APPLICATION EXAMPLE



Electro-hydraulic system with MLT digital actuators controlled via 2-wires CANbus line.

ORDERING INFORMATION

EC-MMS-4820-H

4820 = 48 inputs - 20 outputs

H = potted plastic Housing for panel mounting

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

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EC-MMS-0516-H Machine Management System

DESCRIPTION

MMS (*Machine Management System*) controller with built-in advanced safety and fault-detection features to be used as a remote de-coding card for RS485 serial line connection to other MMS electronic units. Tecnord's main use is as radio receiver for combined on-off and proportional control.

OPERATION

The MMS-0516 is provided with display and push-buttons to configure the control characteristics (Imin/Imax, ramps, deadbands, dither) of its PWM output channel. It can be used as a stand-alone controller for meter-in applications where a single PWM channel and various on-off outputs are required or in conjunction with other MMS electronic units like Tecnord's Mod. MMS-4820. Auxiliary safety microprocessor as option.

FEATURES

- Power supply line is protected against reversed polarity and overvoltage.
- Inputs are protected against short circuits to GND and supply.
- Outputs are protected against short circuits, reversed polarity, over-current and over-temperature.
- 2-wires RS485 serial interface.
- The current in the solenoid is independent of change in the coil resistance and in supply voltage variations.
- Performance level c capability according to ISO 13849, due to high reliability of components and embedded diagnostics.
- Electro Magnetic Compatibility (EMC): EN 61000-6-2 (Immunity), EN 61000-6-3 (Emissions).

SPECIFICATIONS

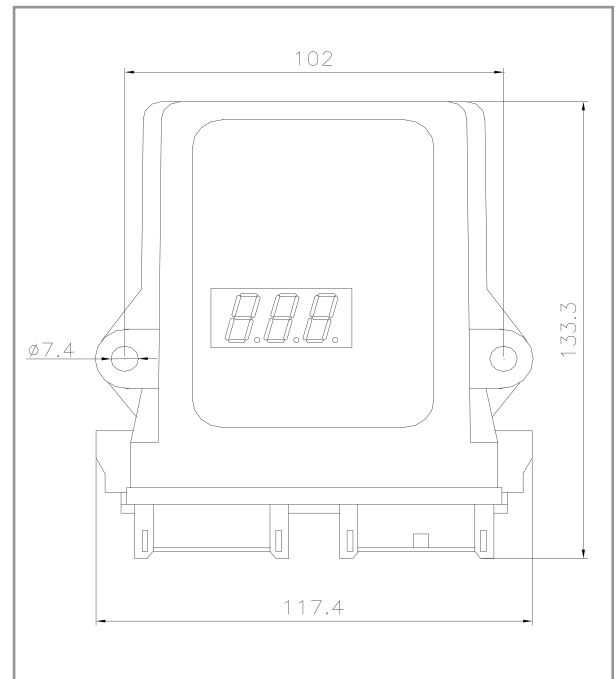
• Operating voltage:	8.5 ÷ 30 vdc
• Max current consumption:	0.2 A (no load applied)
• Operating temperature:	-25°C / +85°C
• Degree of protection:	IP 65 (with housing)
• Input impedance:	100 kΩ
• Analog inputs (10 bits):	1 (0-5 V)
• Typical ctrl pot resistance:	1 ÷ 10 kΩ
• Digital inputs:	4 (2 if 16 outputs are used)
• High side power outputs:	16 (3.5 A max)
• Max current load on all outputs:	10 A
• Inputs for current feedback:	1
• Current output range (PWM):	100 ÷ 1500 mA
• PWM dither frequency:	60 ÷ 200 Hz

APPLICATIONS

- 12 vdc and 24 vdc systems.
- For hand held terminal cable/radio applications.
- Field-adjustable applications.
- Two or more MMS boards can be interconnected by means of 2-wires RS485 serial lines where rotating joints or cable reels are installed.



DIMENSIONS

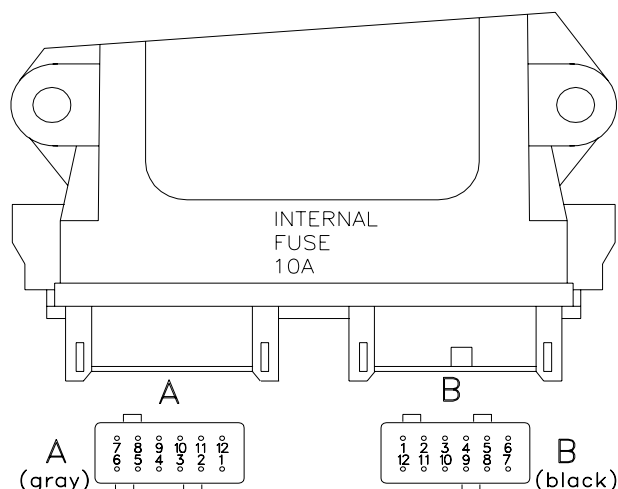


WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

EC-MMS-0516-H Machine Management System

CIRCUIT BOARD PINOUT - WIRING DIAGRAM

Connector type: Deutsch - EEC-325-4B



A (GREY)

- 1 ANALOG IN
- 2 PROP. CURRENT FEEDBACK
- 3 -V (POWER SUPPLY-GND)
- 4 OUT 13 (HIGH SIDE)
- 5 OUT 14 (HIGH SIDE)
- 6 +V (POWER SUPPLY)
- 7 OUT 12 (HIGH SIDE)
- 8 OUT 11 (HIGH SIDE)
- 9 OUT 10 (HIGH SIDE)
- 10 OUT 9 (HIGH SIDE)
- 11 OUT 8 (HIGH SIDE)
- 12 OUT 7 (HIGH SIDE)

B (BLACK)

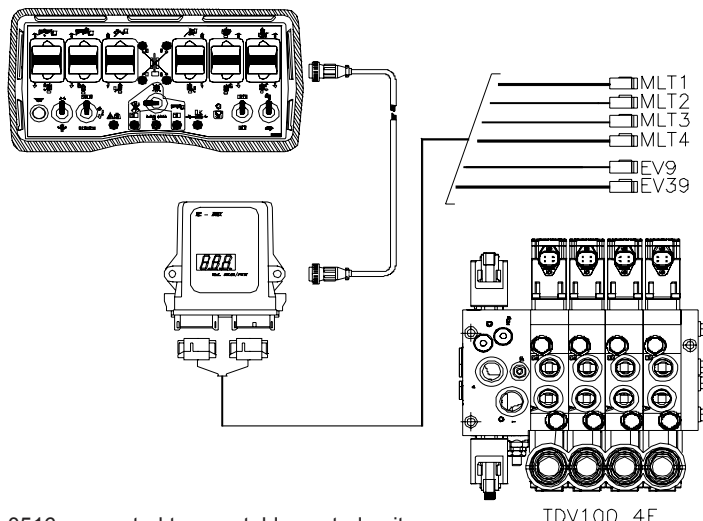
- 1 OUT 6 (HIGH SIDE)
- 2 OUT 5 (HIGH SIDE)
- 3 OUT 4 (HIGH SIDE)
- 4 OUT 3 (HIGH SIDE)
- 5 OUT 2 (HIGH SIDE)
- 6 OUT 1 (HIGH SIDE)
- 7 RS485 BUS+
- 8 RS485 BUS-
- 9 DIGITAL IN 4 / OUT 15
- 10 DIGITAL IN 3 / OUT 16
- 11 DIGITAL IN 2
- 12 DIGITAL IN 1

ADJUSTMENTS

Adjustments through integrated display and pushbuttons possible after removing the electronic board from inside the enclosure.



APPLICATION EXAMPLE



MMS-0516 connected to a portable control unit through a RS485 line Radio connection as option.

ORDERING INFORMATION

EC-MMS-0516-H

0516 = 5 inputs - 16 outputs

H = potted plastic Housing for panel mounting

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

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EC-MMS-6252-H Machine Management System Controller

DESCRIPTION

MMS (*Machine Management System*) controller with built-in advanced safety and fault-detection features for integrated control of a high number of functions in mobile equipment applications.

OPERATION

It is normally used as the main control unit in a complete machine management system. Two microprocessors and advanced diagnostics for safety applications. CANbus communication. Serial connection for software download.

FEATURES

- Robust metal enclosure and complete potting.
- Power supply line is protected against reversed polarity and overvoltage.
- Inputs are protected against short circuits to GND and supply.
- Outputs are protected against short circuits, reversed polarity, over-current and over-temperature.
- Dual microprocessor for advanced diagnostics capability.
- Serial communication ports: CANbus, RS485, RS232.
- Optional add-on inclinometer.
- +5 V auxiliary power supply for external control devices.
- Performance level d capability according to ISO 13849, thanks to redundant microcontroller and embedded diagnostics.
- Electro Magnetic Compatibility (EMC): EN 61000-6-2 (Immunity), EN 61000-6-3 (Emissions).

SPECIFICATIONS

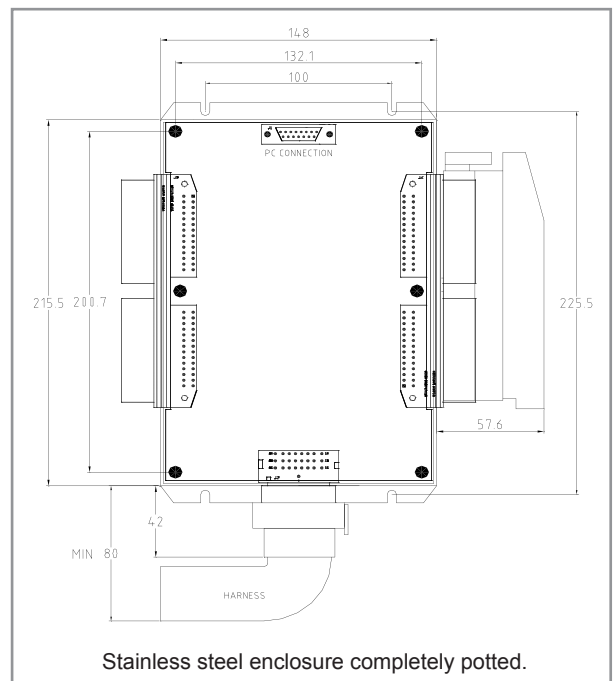
• Operating voltage:	8.5 ÷ 32 vdc
• Max current consumption:	400 mA (no load applied)
• Operating temperature:	-25°C / +85°C
• Degree of protection:	IP 67
• Input impedance:	100 kΩ
• Analog inputs (10 bits):	16 (0-5 V) 6 (0-20 mA)
• Typical ctrl pot resistance:	1 ÷ 10 kΩ
• High side power outputs:	8 (5 A max) 28 (3.5 A max)
• High side signal outputs:	10 (0.7 A max)
• Digital inputs:	40
• Max current load on all outputs:	16 A
• Inputs for current feedback:	4
• Current output range (PWM):	100 ÷ 1600 mA
• Analog voltage outputs:	6 (0-5 V)

APPLICATIONS

- 12 vdc and 24 vdc systems.
- Main ECU for aerial platforms, cranes, telehandlers, agric. machines.
- Field-adjustable applications.
- Two or more MMS boards can be interconnected by means of 2-wires RS485 serial lines or CANbus.



DIMENSIONS



WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

EC-MMS-6252-H Machine Management System Controller

CIRCUIT BOARD PINOUT - WIRING DIAGRAM

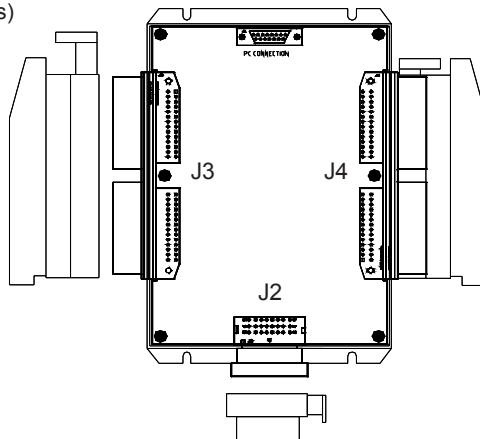
Main Connectors type: SICMA2/DCS1 (56 poles)

Auxiliary connector type: SICMA2 (24 poles)

PC connector type: DB15 female

J3

- 1 CAN BUS
- 4 ANALOG INPUTS (0÷20 MA)
- 8 ANALOG INPUTS (0÷5 V)
- 24 ANALOG INPUTS
- 10 DIGITAL OUTPUTS (0.7 A)
- 1 RS485
- 2 +5 V AUX
- 2 +VBATT
- 2 GND



J4

- 2 CAN BUS
- 2 ANALOG INPUTS (0÷20 MA)
- 2 ANALOG INPUTS (0÷5 V)
- 16 DIGITAL INPUTS
- 18 DIGITAL OUTPUTS (3.5 A)
- 8 DIGITAL OUTPUTS (5 A)
- 4 CURRENT FEEDBACKS
- 2 GND

J2

- 6 ANALOG INPUTS (0÷5 V)
- 10 DIGITAL OUTPUTS (3.5 A)
- 6 ANALOG OUTPUTS (0÷5 V)
- 2 GND

For wiring schematics consult factory.

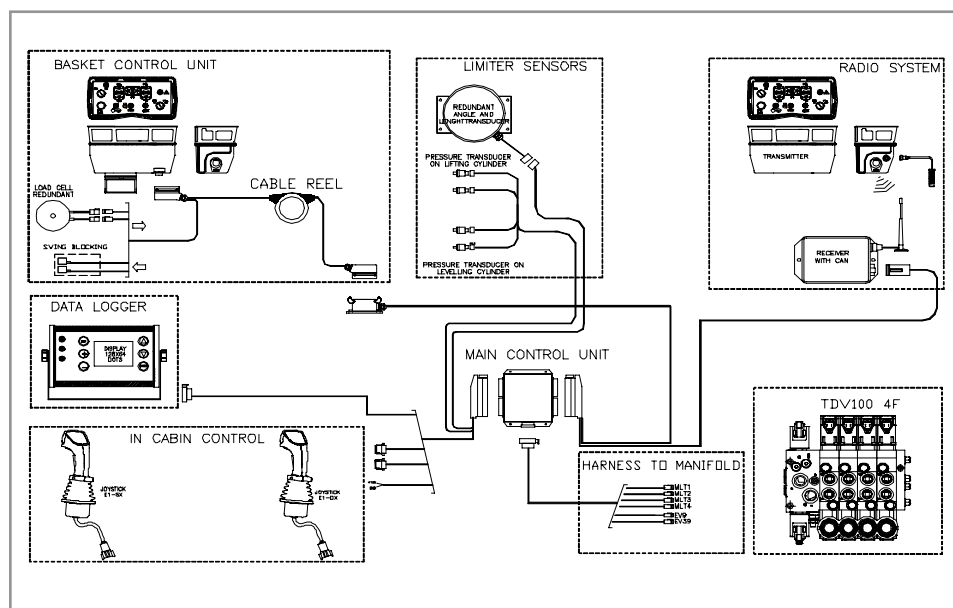
ADJUSTMENTS

Adjustment of working parameters can be effected: via RS232 serial line or via CAN bus interface.



Ask for: PC configuration electronic units calibration tool (see page 42).

APPLICATION EXAMPLE



ORDERING INFORMATION

EC-MMS-6252-H

6252 = 62 inputs - 52 output

H = stainless steel Housing

Two configuration available:
 Standard (2 main connectors)
 Full (all connectors)

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

Phone: (815) 397-6628

Fax: (815) 397-2526

E-mail: delta@delta-power.com

Fingertip Proportional Control Levers and Switches

Description	Technical information page	Ordering information page
FTC proportional control lever	764	767
FTH contactless proportional control lever	768	770
JLP proportional control lever	771	773
FPR proportional roller switch	774	777
PRS proportional rocker switch	776	777

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

FTC-L1S Fingertip Proportional Control Lever

FEATURES

- Single axis / uni-directional.
- 3-pins rotary potentiometer.
- Optional enable switch.

MECHANICAL SPECIFICATIONS

- Lever deflection angle: $50^\circ \pm 1^\circ$
- Electrical angle: $50^\circ \pm 1^\circ$
- Operating temperature range: $-25^\circ\text{C} / +80^\circ\text{C}$
- Protection class: IP 65 (above panel)
- Life: 3 million cycles

ELECTRICAL SPECIFICATIONS

3-pins rotary potentiometer

- Electrical power rating: 0.25 W @ 25°C
- Ohmic resistance: / A = 50% of V_{in} 1 k $\Omega \pm 20\%$
- / D = 90% of V_{in} 5 k $\Omega \pm 20\%$
- Max. operating input voltage (V_{in}): 48 V or ± 24 V
- Min. load impedance on pin 2 (signal): 50 k Ω
- Max. operating current on pin 2: 1 mA
- Output voltage: see graph
- Linearity (resistive track): 2% or better
- Connection type: 0 = solder type (no connector)
1 = AMP Modu I/ 4 poles connector
(mating connector kit included)

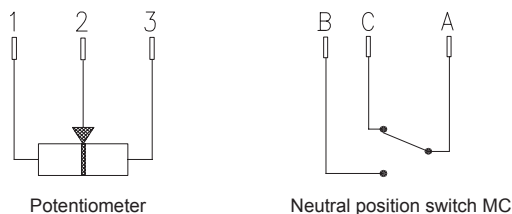
Neutral position switch (electromechanical type)

- Contact: silver plated (solder type)
- Max. operating input voltage: 48 V or ± 24 V
- Max. operating current: 1.5 A / inductive
- Neutral position switch threshold angle: $+4^\circ$
- Protection class: IP 55 (IP 67 available on request)

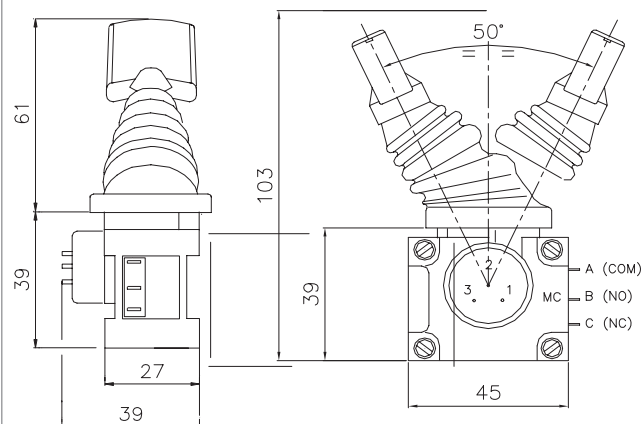
POTENTIOMETER & SWITCHES OPTIONS

	Reference codes	
Output signal	S = 50% V_{in}	S = 90% V_{in}
3-pin pot	A (Std)	D
3-pin pot & enable switch	B	E

ELECTRICAL CONNECTIONS

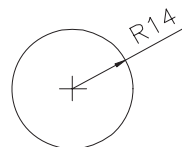


OVERALL DIMENSIONS



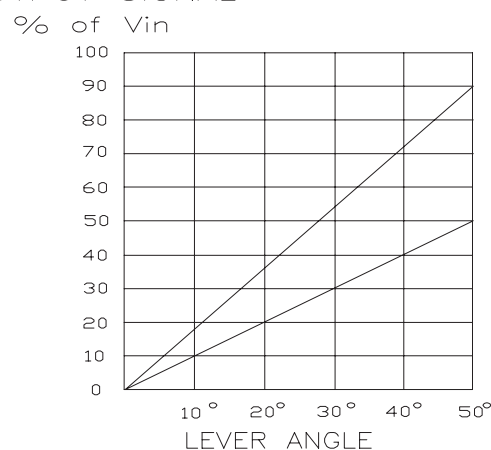
Shown with paddle type grip. Small cylindrical grip KC type also available, with optional dead man push button.

PANEL CUTOUT



OUTPUT SIGNAL CONTROL CHARACTERISTIC

OUTPUT SIGNAL



>> ORDERING INFORMATION: see page 764

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

FTC-L2S Fingertip Proportional Control Lever

FEATURES

- Single axis / bi-directional.
- 3-pins rotary potentiometers.
- Optional center / power-off or bi-directional switches.

MECHANICAL SPECIFICATIONS

- Lever deflection angle: $\pm 25^\circ \pm 1^\circ$
- Electrical angle: $\pm 25^\circ \pm 1^\circ$
- Operating temperature range: $-25^\circ\text{C} / +80^\circ\text{C}$
- Protection class: IP 65 (above panel)
- Life: 3 million cycles

ELECTRICAL SPECIFICATIONS

3-pins rotary potentiometer

- Electrical power rating: 0.25 W @ 25°C
- Ohmic resistance: / A = 50% of V_{in} 1 k $\Omega \pm 20\%$
/ D = 90% of V_{in} 5 k $\Omega \pm 20\%$
- Max. operating input voltage (V_{in}): 48 V or ± 24 V
- Min. load impedance on pin 2 (signal): 50 k Ω
- Max. operating current on pin 2: 1 mA
- Output voltage: see graph
- Linearity (resistive track): 2% or better
- Connection type: 0 = solder type (no connector)
1 = AMP Modu I/ 4 poles connector
(mating connector kit included)

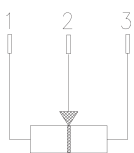
Center / bi-directional switches (electromechanical type)

- Contacts: silver plated (solder type)
- Max. operating input voltage: 48 V or ± 24 V
- Max. operating current: 1.5 A/inductive
- Neutral position switch threshold angle: $+4^\circ$
- Protection class: IP 55

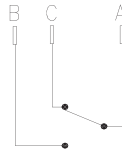
POTENTIOMETER & SWITCHES OPTIONS

Output signal	Reference codes	
	S = 50% V_{in}	S = 90% V_{in}
3-pin potentiometer	A	D
3-pin pot & center switch	B	E (Std)
3-pin pot & bi-directional switch	C	F

ELECTRICAL CONNECTIONS

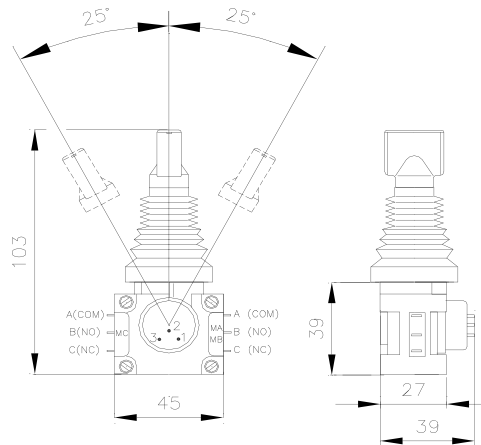


Potentiometer



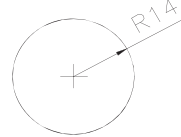
Same schematic for MA, MB (bi-directional switches) or MC (center switch)

OVERALL DIMENSIONS

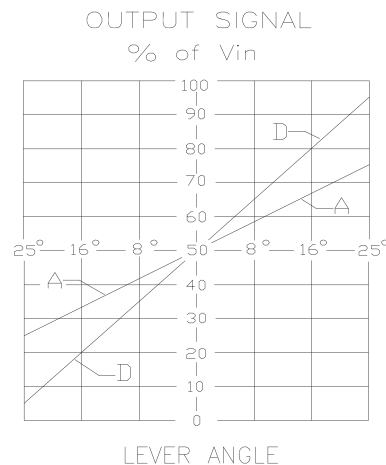


Shown with paddle type grip. Small cylindrical grip KC type also available, with optional dead man push button.

PANEL CUT-OUT



OUTPUT SIGNAL CONTROL CHARACTERISTIC



3-pins potentiometer configuration

>> ORDERING INFORMATION: see page 764

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

FTC-L2S Fingertip Proportional Control Lever

FEATURES

- Single axis / bi-directional.
- 4-pins rotary potentiometer.
- Optional center / power-off or bi-directional switches.

MECHANICAL SPECIFICATIONS

- Lever deflection angle: $\pm 25^\circ \pm 1^\circ$
- Electrical angle: $\pm 25^\circ \pm 1^\circ$
- Operating temperature range: $-25^\circ\text{C} / +80^\circ\text{C}$
- Protection class: IP 65 (above panel)
- Life: 3 million cycles

ELECTRICAL SPECIFICATIONS

3-pins rotary potentiometer

- Electrical power rating: 0.25 W @ 25°C
- Ohmic resistance: / G = 40% of V_{in} 1 k $\Omega \pm 20\%$
/ L = 100% of V_{in} 5 k $\Omega \pm 20\%$
- Max. operating input voltage (V_{in}): 48 V or ± 24 V
- Min. load impedance on pin 2 (signal): 50 k Ω
- Max. operating current on pin 2: 1 mA
- Output voltage: see graph
- Linearity (resistive track): 2% or better
- Connection type: 0 = solder type (no connector)
1 = AMP Modu I/ 4 poles connector
(mating connector kit included)

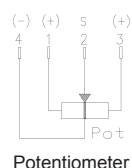
Center / bi-directional switches (electromechanical type)

- Contacts: silver plated (solder type)
- Max. operating input voltage: 48 V or ± 24 V
- Max. operating current: 1.5 A/inductive
- Neutral position switch threshold angle: $+4^\circ$
- Protection class: IP 55 (IP 67 available on request)

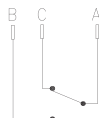
POTENTIOMETER & SWITCHES OPTIONS

Output signal	Reference codes	
	S = 40% V_{in}	S = 100% V_{in}
4-pin potentiometer	G	L
4-pin pot & center switch	H	M
4-pin pot & bi-directional switches	I	N (Std)
4-pin pot & bi-dir. switches & center switch	None	X

ELECTRICAL CONNECTIONS

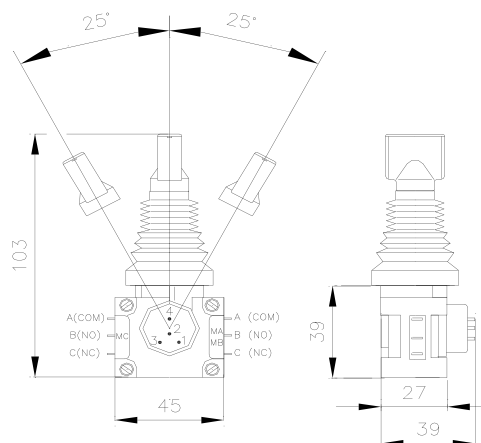


Potentiometer



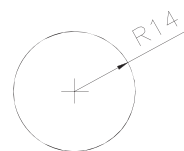
Same schematic for MA, MB (bi-directional switches) or MC (center switch)

OVERALL DIMENSIONS

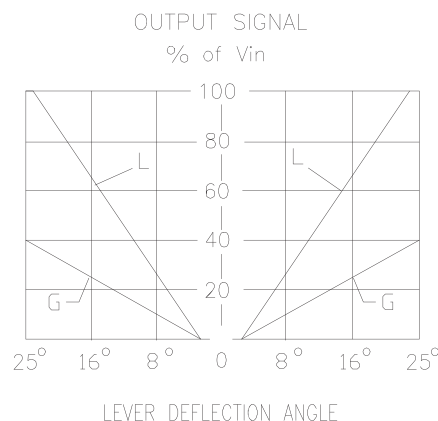


Shown with paddle type grip. Small cylindrical grip KC type also available, with optional dead man push button.

PANEL CUT-OUT



OUTPUT SIGNAL CONTROL CHARACTERISTIC



4-pins potentiometer configuration

>> ORDERING INFORMATION: see page 764

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

FTC Proportional Control Lever Ordering Information

JOYSTICK FAMILY & TYPE		MAIN BODY CONFIGURATION		Y-Y AXIS CONTROL CONFIGURATION		TYPE OF GRIP		POT. CONNECTOR TYPE		
FTC	Mini control lever	L1S	Single axis, uni-directional	3-pls rotary potentiometer	A	Only potentiometer	IP	Paddle type	0	None (only pin, solder type)
		L2S	Single axis, bi-directional		B	Pot & Center switch	KC	Cylindric type	1	4 poles electronic board on pot. AMP MODU I connector (AMP p/n 280610/1) Mating connector kit included
				4-pls rotary potentiometer	C	Pot & Bi-direct. switches	KC1	Cylindric type with "dead man" option	2	8 poles electronic board on pot. and bi-directional switch AMP MODU I connector (AMP p/n 280612/1) Mating connector kit included
					D	Only potentiometer				
				E	Pot & Center switch					
				F	Pot & Bi-direct. switches					
				G	Only potentiometer					
				H	Pot & Center switch					
				I	Pot & Bi-direct. switches					
				L	Only potentiometer					
				M	Pot & Center switch					
				N	Pot & Bi-direct. switches					
				X	Pot & Bi-direct. & Center switches					

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FTH-L1S *Contactless Fingertip Proportional Control Lever*
FEATURES

- Single axis / uni-directional.
- Contactless, hall effect sensor.
- Optional "out of neutral" switch.
- Optional dual sensor (redundant).

MECHANICAL SPECIFICATIONS

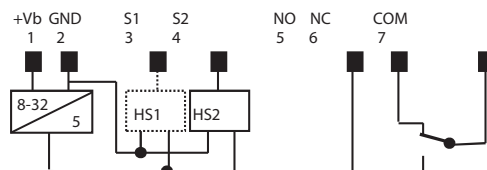
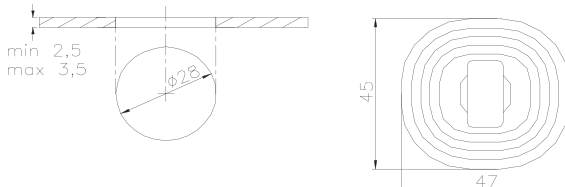
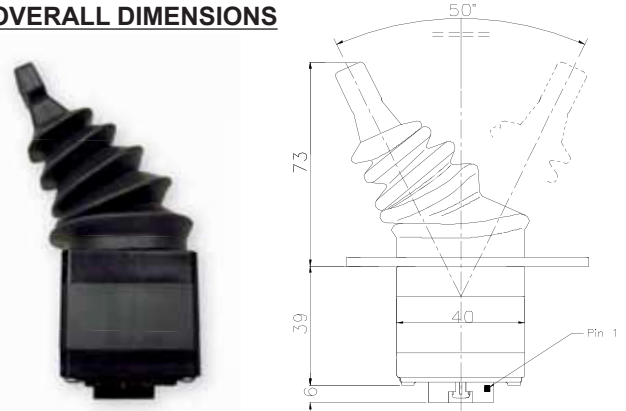
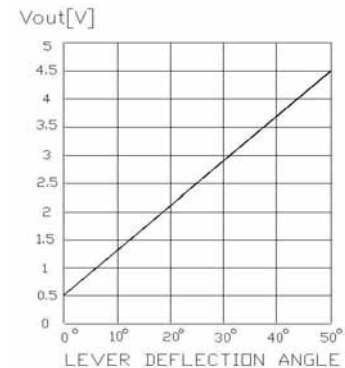
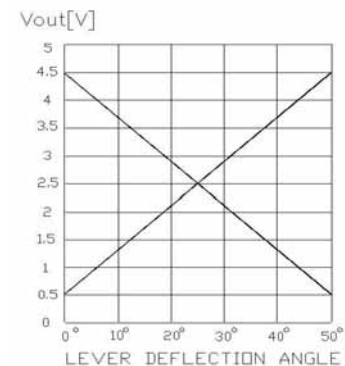
- Lever deflection angle: $50^\circ \pm 1^\circ$
- Electrical angle: $50^\circ \pm 1^\circ$
- Operating temperature range: $-25^\circ\text{C} / +80^\circ\text{C}$
- Protection class: IP 67
- Life: > 3 million cycles (without switch)
- Connector: molex CGRID/SL, 7 male pins

ELECTRICAL SPECIFICATIONS
Linear, hall-effect sensor

- Power supply voltage: $8 \div 32$ vdc
- Current consumption: < 15 mA (30 mA with 2 sensors)
- Output signal in neutral: < 0.1 V
- Output signal range: $0.5 \text{ V} \div 4.5 \text{ V}$
- Tolerance on output signal: $\pm 0.1 \text{ V}$
- Linearity: < 2%
- Max. output current: 1 mA
- Directional switch operating voltage: < 48 vdc
- Directional switch max. current: 1 A

Neutral position switch (electromechanical type)

- Contacts: silver plated (solder type)
- Max. operating input voltage: 48 V or $\pm 24 \text{ V}$
- Max. operating current: 1 A
- Neutral position switch threshold angle: 7°
- Protection class: IP 67

ELECTRICAL CONNECTIONS
(HS1: optional)

PANEL CUT-OUT AND MOUNTING

OVERALL DIMENSIONS

OUTPUT SIGNAL CONTROL CHARACTERISTIC
FTH-L1S / SN (single channel)

FTH-L1S / TW (dual channel)

>> ORDERING INFORMATION: see page 765

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

FTH-L2S Contactless Fingertip Proportional Control Lever

FEATURES

- Single axis / bi-directional.
- Contactless, hall effect sensor.
- Optional "out of neutral" switch.
- Optional dual sensor (redundant).

MECHANICAL SPECIFICATIONS

• Lever deflection angle:	$\pm 25^\circ \pm 1^\circ$
• Electrical angle:	$\pm 25^\circ \pm 1^\circ$
• Operating temperature range:	$-25^\circ\text{C} / +85^\circ\text{C}$
• Protection class:	IP 67
• Life:	> 3 million cycles (without switch)
• Connector:	molex CGRID/SL, 7 male pins

ELECTRICAL SPECIFICATIONS

Linear, hall-effect sensor

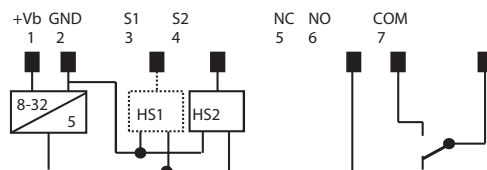
• Power supply voltage:	$8 \div 32 \text{ vdc}$
• Current consumption:	< 15 mA (30 mA with 2 sensors)
• Output signal in neutral:	$2.50 \text{ V} \pm 0.1 \text{ V}$
• Output signal range:	$0.5 \text{ V} \div 4.5 \text{ V}$
• Tolerance on output signal:	$\pm 0.1 \text{ V}$
• Linearity:	< 2%
• Max. output current:	1 mA
• Directional switch operating voltage:	< 48 vdc
• Directional switch max. current:	1 A

Neutral position switch (electromechanical type)

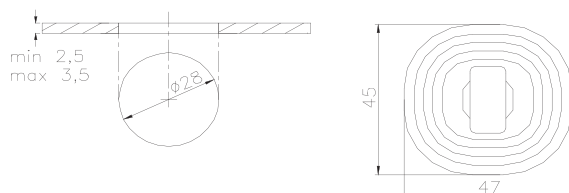
• Contacts:	silver plated (solder type)
• Max. operating input voltage:	48 V or $\pm 24 \text{ V}$
• Max. operating current:	1 A
• Neutral position switch threshold angle:	7°
• Protection class:	IP 67

ELECTRICAL CONNECTIONS

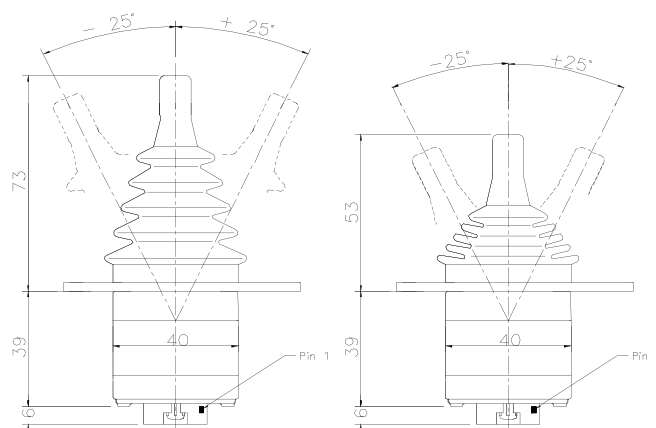
(HS1: optional)



PANEL CUT-OUT AND MOUNTING



OVERALL DIMENSIONS



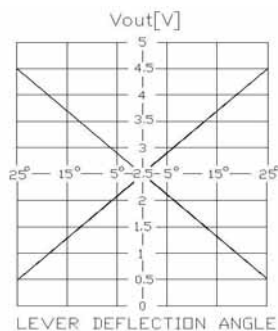
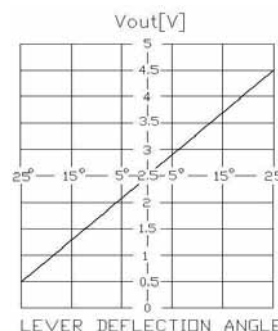
Paddle type high

Paddle type low

OUTPUT SIGNAL CONTROL CHARACTERISTIC

FTH-L2S / SN (single channel)

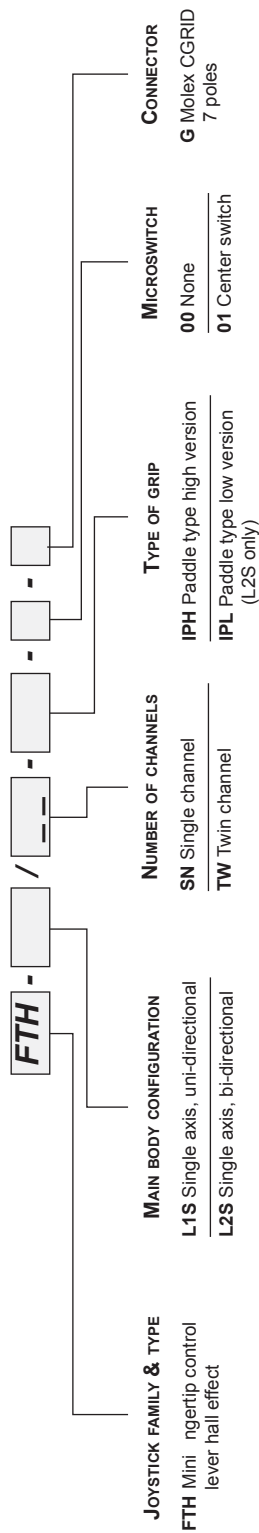
FTH-L2S / TW (dual channel)



>> **ORDERING INFORMATION:** see page 765

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

FTH Contactless Proportional Control Lever *Ordering Information*



WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

JLP-L2S Fingertip Proportional Control Lever

FEATURES

- Single axis / bi-directional, panel mounting style.
- 3 & 4-pins potentiometer configuration.
- Bi-directional switches.

MECHANICAL SPECIFICATIONS

- Lever deflection angle: $\pm 32^\circ \pm 1^\circ$
- Electrical angle: $\pm 30^\circ \pm 1^\circ$
- Operating temperature range: $-25^\circ\text{C} / +85^\circ\text{C}$
- Protection class: IP 65 (above panel)
- Life: 3 million cycles
- Fixing screws included: 2 - M4x16

ELECTRICAL SPECIFICATIONS

Potentiometer

- Electrical power rating: 0.25 W @ 25°C
- Ohmic resistance: / A = 50% of V_{in} 8 k $\Omega \pm 20\%$
/ Q = 80% of V_{in} 5 k $\Omega \pm 20\%$
/ R = 100% of V_{in} 4 k $\Omega \pm 20\%$
- Max. operating input voltage (V_{in}): 48 V or ± 24 V
- Min. load impedance on pin 5 (signal): 50 k Ω
- Max. operating current on pin 5: 1 mA
- Output voltage: see graph
- Linearity (resistive track): 2% or better

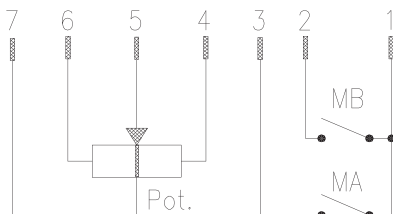
Directional switches

- Typical track resistance: 150 Ohm
- Max. operating input voltage: 48 V or ± 24 V
- Min. load impedance on pins 2&3: 50 k Ω
- Max. operating current on pins 2&3: 1 mA
- Directional switches threshold angle: $\pm 4^\circ$
- Connector type: Mod. D Dubox P.N. 76382.407 wiring
Mod. G Molex C-Grid P.N. 50-57-9407

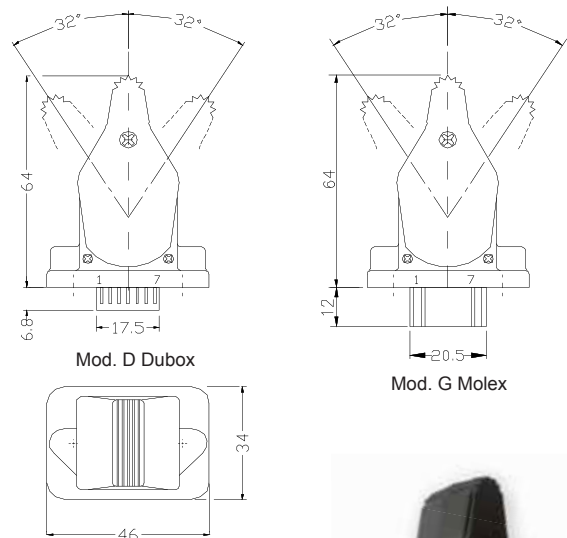
POTENTIOMETER & SWITCHES OPTIONS

Output signal	Reference codes		
	S = 80% V_{in}	S = 100% V_{in}	S = 50% V_{in}
3-4 pins pot & bi-dir. switch	Q	R	C

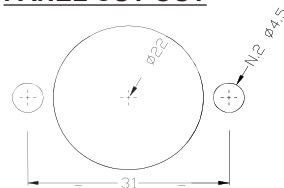
ELECTRICAL CONNECTIONS



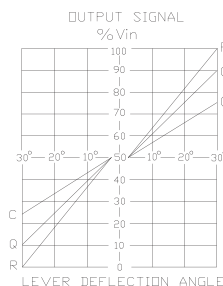
OVERALL DIMENSIONS



PANEL CUT-OUT

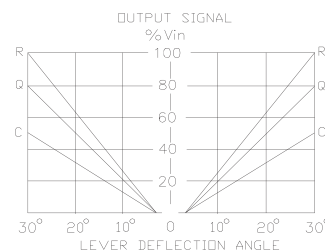


OUTPUT SIGNAL CONTROL CHARACTERISTIC



4	(+)
5	Signal
6	(-)
7	NC

3-pins configuration wiring



4	(+)
5	Signal
6	(+)
7	(-)

4-pins configuration wiring

>> ORDERING INFORMATION: see page 766

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

JLP-L2S Twin Channel Fingertip Proportional Control Lever

FEATURES

- Single axis / bi-directional, panel mounting style.
- Twin channel potentiometer joystick.
- Redundancy on the 100% of the stroke.

MECHANICAL SPECIFICATIONS

- Lever deflection angle: $\pm 32^\circ \pm 1^\circ$
- Electrical angle: $\pm 30^\circ \pm 1^\circ$
- Operating temperature range: $-25^\circ\text{C} / +85^\circ\text{C}$
- Protection class: IP 65 (above panel)
- Life: 3 million cycles
- Fixing screws included: 2 - M4x16

ELECTRICAL SPECIFICATIONS

Potentiometer

- Electrical power rating: 0.25 W @ 25°C
- Total resistance between pin 1 and 3: $2\text{ k}\Omega \pm 20\%$
- Nominal voltage supply (V_{in}): 10 V
- Tolerance between track 1 and 2: $\pm 4\%$ of V_{cc}
- Output voltage: see graph
- Load resistance: 100 k Ω - nominal
50 k Ω - minimum
- Linearity (resistive track): 2% or better

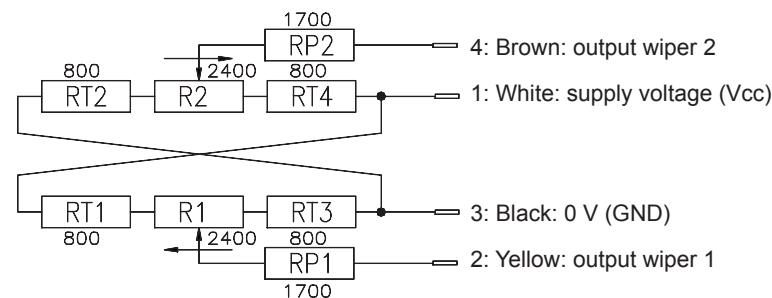
POTENTIOMETER & SWITCHES OPTIONS

	Reference codes	
Output signal	S = 60% V_{in}	
3 pins potentiometer	V	

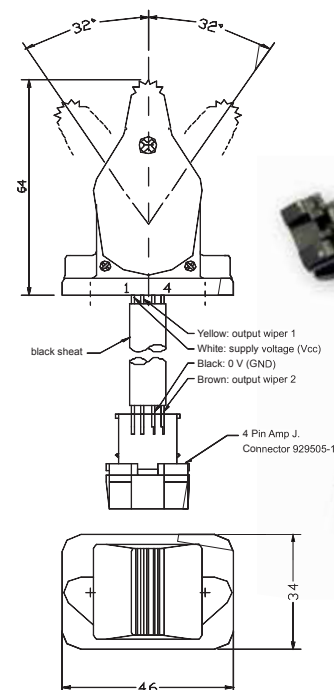
- Connector type: AMP JPT P.N. 929505-1

ELECTRICAL CONNECTIONS

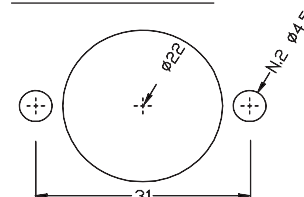
(pinout)



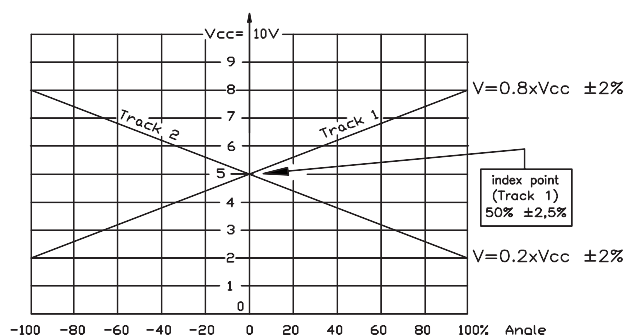
OVERALL DIMENSIONS



PANEL CUT-OUT



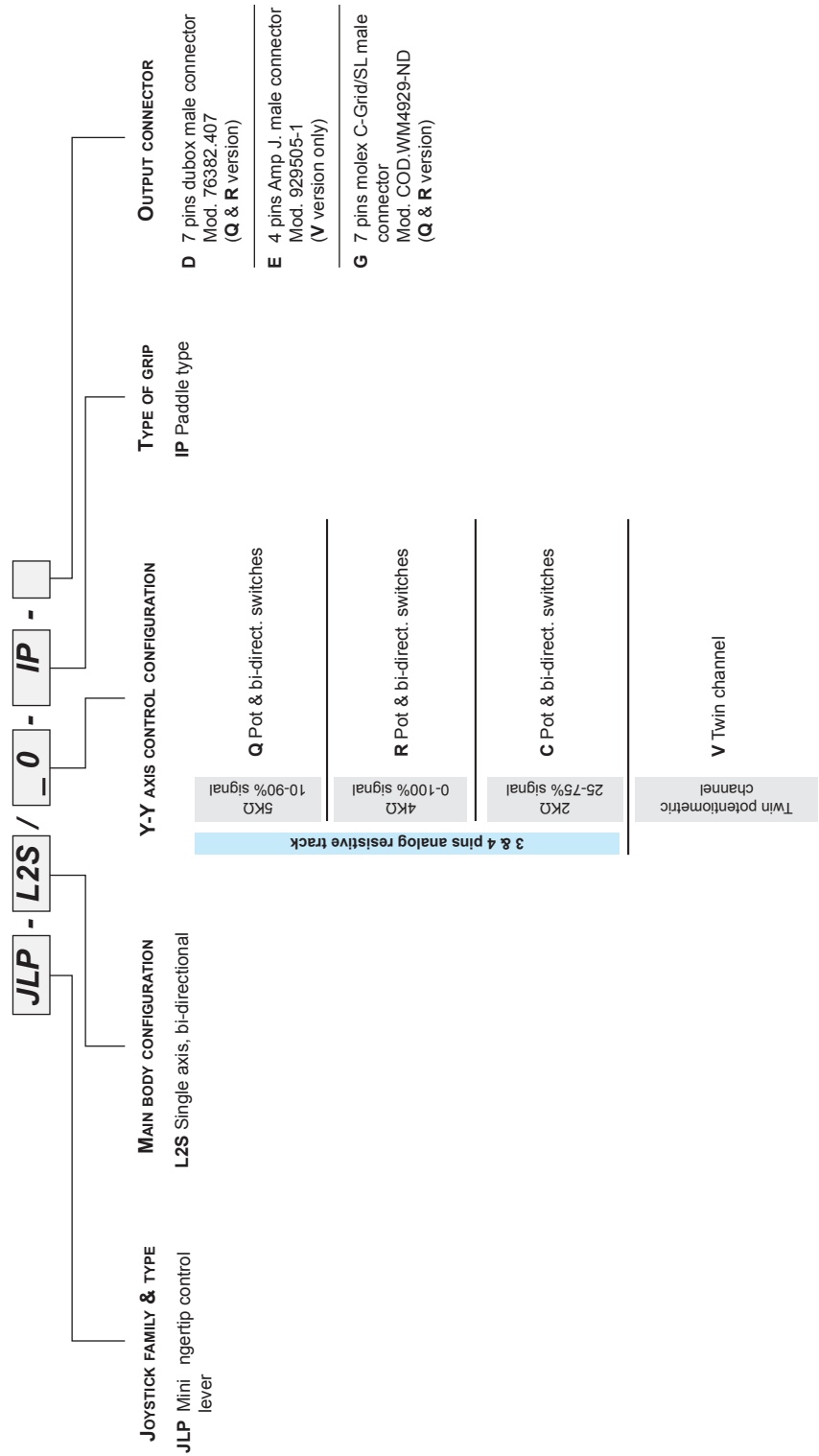
OUTPUT SIGNAL CONTROL CHARACTERISTIC



>> ORDERING INFORMATION: see page 766

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

JLP Proportional Control Lever Ordering Information



FPR Proportional Roller Switch with Hall Effect Sensor

FEATURES

- Mini proportional roller switch with optimum ergonomic design for panel-mounting.
- High performance hall effect sensor circuitry.
- Twin channel configuration for redundancy.

MECHANICAL SPECIFICATIONS

• Rotation angle:	$\pm 30^\circ$
• Body material:	acetal resin / te on compound
• Colours available:	yellow, grey, blue, green
• Rubber gaiter material:	EPDM / 35-45 shore - A
• Operating temperature range:	-25°C / +85°C
• Environmental protection:	IP 68 (above panel)
• Life:	> 5.000.000 cycles

ELECTRICAL SPECIFICATIONS

• Signal output @ rest:	2.5 vdc ± 0.1 V
• Supply voltage:	H - Version = 8 \div 32 vdc 0 - Version = 5 vdc $\pm 5\%$
• Full output signal range:	0.5 - 4.5 V, ± 0.2 V
• Current consumption at rest:	SNCH (S1 only) 15 mA TWCH (S1/S2) 25 mA
• Rated output current:	1 mA
• Connection type:	wiring leads: coloured at cable 100 mm connector: molex Mini t 4 poles P.N. 5559-4P connector: Deutsch 3 poles P.N. DTO4-3P

ELECTRICAL CONNECTIONS

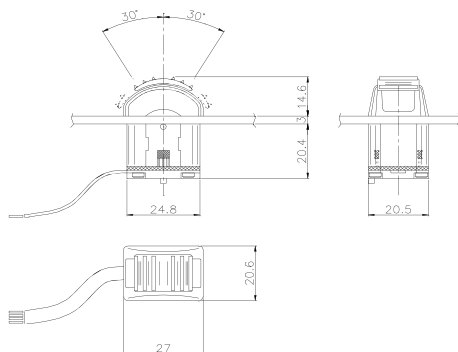
FPR - L2S - SNCH (single chan.)

- (1) Yellow: +5 vdc
 (2) Orange: (-) ground
 (3) Red: output 1 (S1)
 (4) Brown: not used

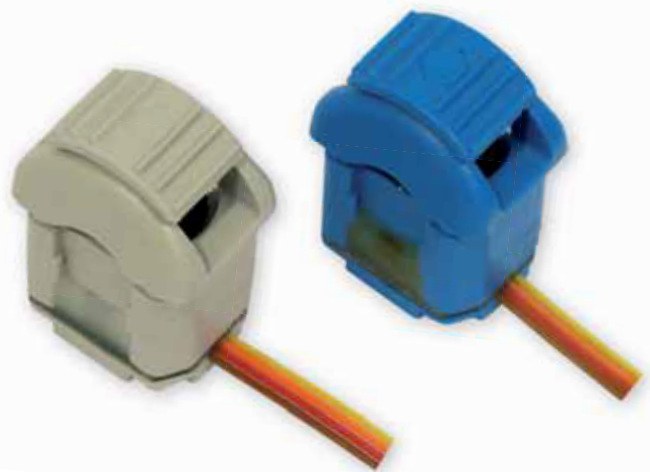
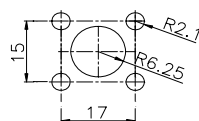
FPR - L2S - TWCH (twin chan.)

- (1) Yellow: + 5 vdc
 (2) Orange: (-) ground
 (3) Red: output 1 (S1)
 (4) Brown: output 1 (S2)

OVERALL DIMENSIONS

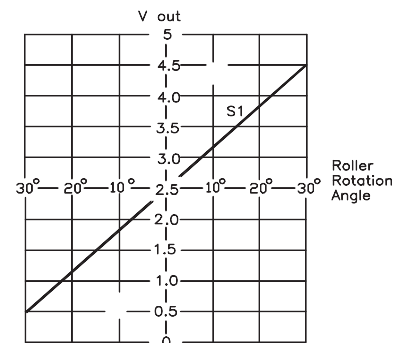


PANEL CUT-OUT

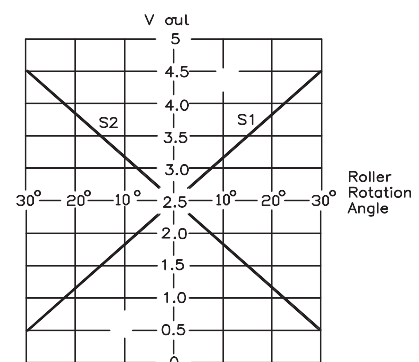


OUTPUT SIGNAL CONTROL CHARACTERISTIC

FPR - L2S - SNCH (single channel)



FPR - L2S - TWCH (twin channel)



>> ORDERING INFORMATION: see page 767

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

FPR-PWM Proportional Roller Switch with PWM Driver

FEATURES

- Mini proportional roller switch with optimum ergonomic design for panel-mounting.
- High performance hall effect sensor circuitry.
- PWM electronic driver integrated into the roller for remote control of a dual-coil proportional solenoid valve.

MECHANICAL SPECIFICATIONS

• Rotation angle:	±30°
• Main body material:	acetal resin / te on compound
• Colours available:	yellow, grey, blue
• Rubber gaiter material:	EPDM / 35-45 shore - A
• Operating temperature range:	-25°C / +85°C
• Environmental protection:	IP 68 (above panel)
• Life:	> 5.000.000 cycles

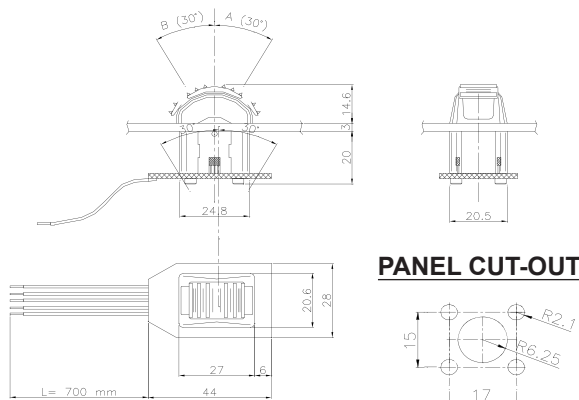
ELECTRICAL SPECIFICATIONS

• Supply voltage:	8 ÷ 32 vdc
• Current consumption with no load:	100 mA
• PWM dither frequency:	100 Hz
• Connection type:	ying leads:
	connector:
	GLX 0.5 sqmm
	molex mini t 6 poles P.N. 5559-6P
• Wire lenght:	700 mm
• Current output range (PWM):	100 ÷ 1500 mA @ 12 vdc

ELECTRICAL CONNECTIONS

- | | |
|-------------|----------------------|
| (1) Red: | +Battery |
| (2) Black: | -Battery (GND) |
| (3) Orange: | PWM Valve A+ |
| (4) Gray: | PWM Valve B+ |
| (5) White: | PWM A- / B- (common) |
| (6) | not used |

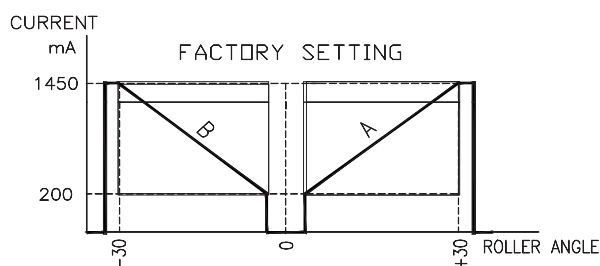
OVERALL DIMENSIONS



PANEL CUT-OUT



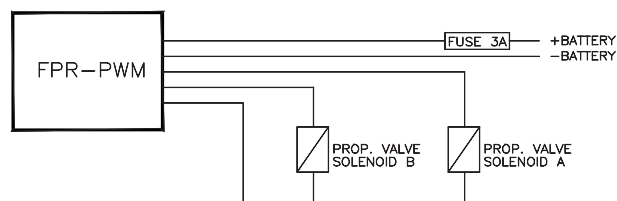
PWM OUTPUT CHARACTERISTIC EXAMPLE



The following values are factory set:

- Imin (minimum output current)
- Imax (maximum output current)
- Dither

APPLICATION EXAMPLE



Ordering code: 23.0409.160

(Imin = 200mA, Imax = 1500mA, PWM = 100Hz)

>> **ORDERING INFORMATION:** see page 767

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PRS Proportional Rocker Switch

FEATURES

- Optimum ergonomic design for panel-mounting.
- 3 & 4 pins potentiometer configuration.
- Bi-directional switches.
- High performance resistive track.

MECHANICAL SPECIFICATIONS

- Rotation angle: $\pm 20^\circ$
- Main body material: acetal resin / te on compound
- Rubber gaiter material (black colour): EPDM / 35-45 shore - A
- Operating temperature range: $-25^\circ\text{C} / +85^\circ\text{C}$
- Environmental protection: IP 66 (above panel)
- Life: $> 1.000.000$ cycles

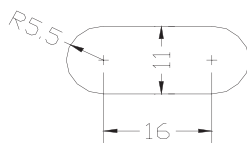
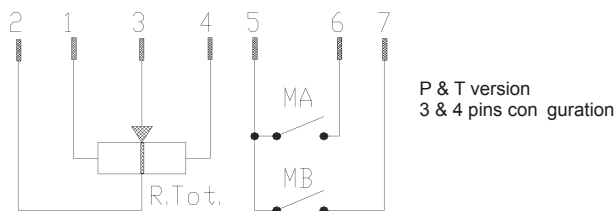
ELECTRICAL SPECIFICATIONS

- Potentiometer configuration: 3 & 4 pins w/bi-dir. switches
- Electrical power rating: $0.5\text{ W @ } 25^\circ\text{C}$
- Ohmic resistance: $5\text{ k}\Omega \pm 20\%$
- Max. operating input voltage (V_{in}): $48\text{ V or } \pm 24\text{ V}$
- Min. load impedance on pin 5 (signal): $50\text{ k}\Omega$
- Rated output current: 1 mA
- Min resistive load on bi-dir. switched outputs: $50\text{ k}\Omega$
- Output voltage: see graph
- Linearity (resistive track): 2% or better
- Prewired exit cable: 250 mm

POTENTIOMETER & SWITCHES OPTIONS

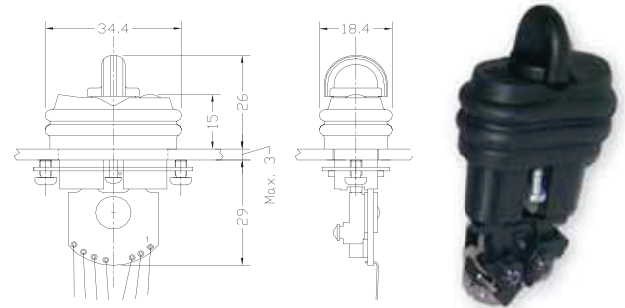
Output signal	Reference codes	
	S = $75\% V_{in}$	S = $100\% V_{in}$
3-4-pins pot & bi-directional switches	P	T

ELECTRICAL CONNECTIONS

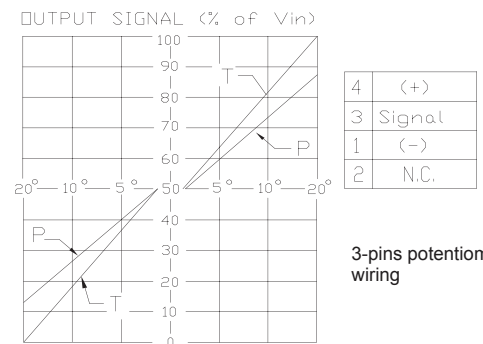


PANEL CUT-OUT

OVERALL DIMENSIONS

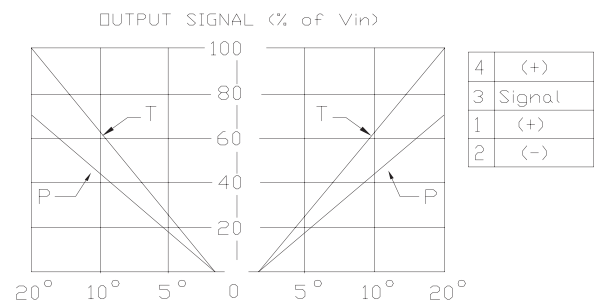


OUTPUT SIGNAL CONTROL CHARACTERISTIC



3-pins potentiometer wiring

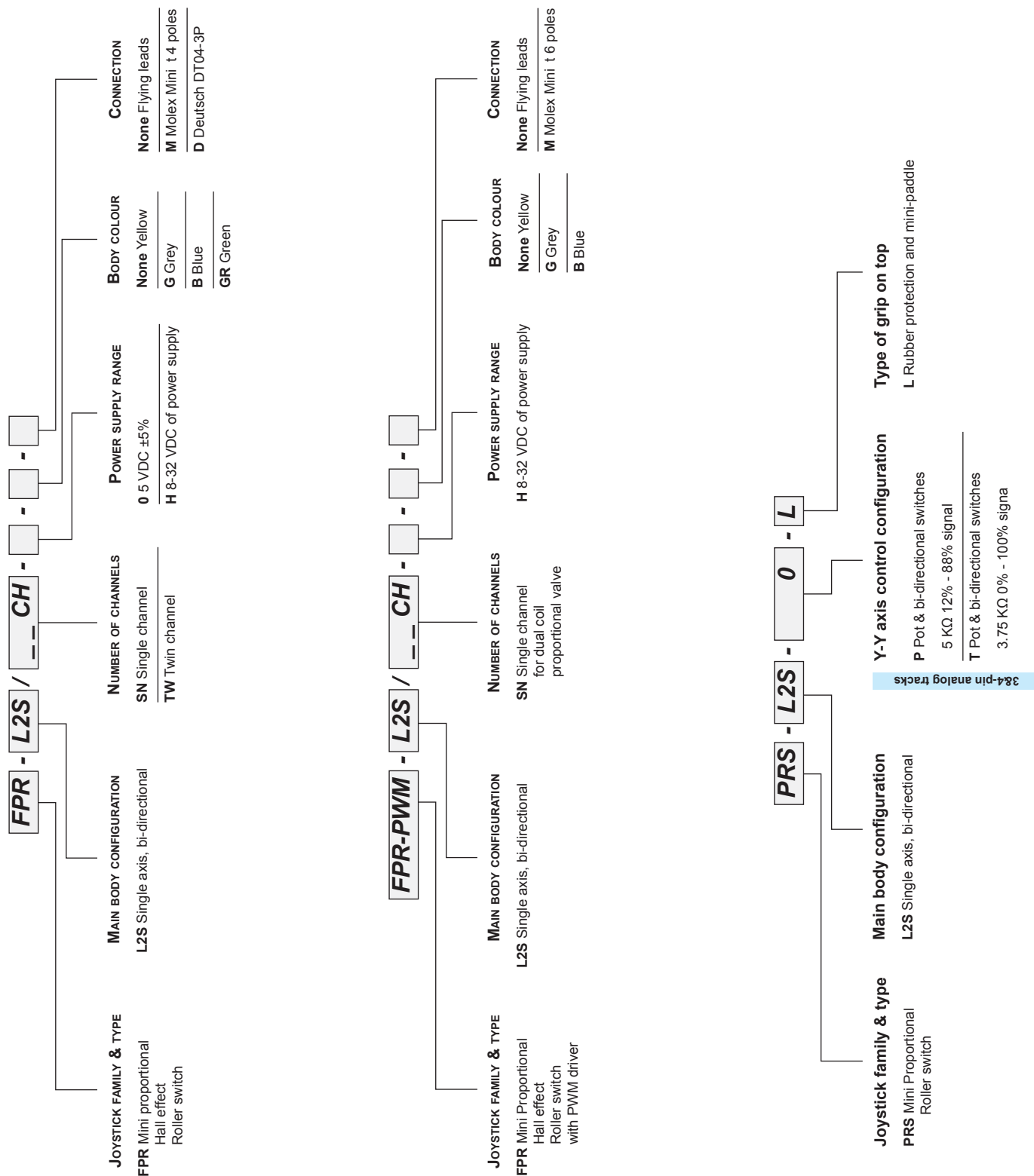
ROCKER SWITCH ROTATION ANGLE



4 pins configuration wiring

>> ORDERING INFORMATION: see page 767

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

FPR/PRS Fingertip Proportional Switches *Ordering Information*


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Heavy Duty Multi-Axis Joysticks

Description	Technical information page	Ordering information page
JMF Type (potentiometric joystick body)	780	784
JHM Type (hall effect joystick body)	785	793

Note: 1) The joystick base does not include the grip.
2) The joystick base includes the rubber gaiter.

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

JMF Heavy Duty Multi-Axis Potentiometric Joystick (joystick base only)
FEATURES

The JMF potentiometric joystick controller has been designed for use in mobile and industrial field application. The potentiometer in use, available with 3 or 4-pins configuration, grants precision and a long working life. When coupled with an **M** range of ergonomic multi-function handles, up to 5 proportional axes and 9 on-off push buttons can be integrated in the same joystick. Power directional switches are available.

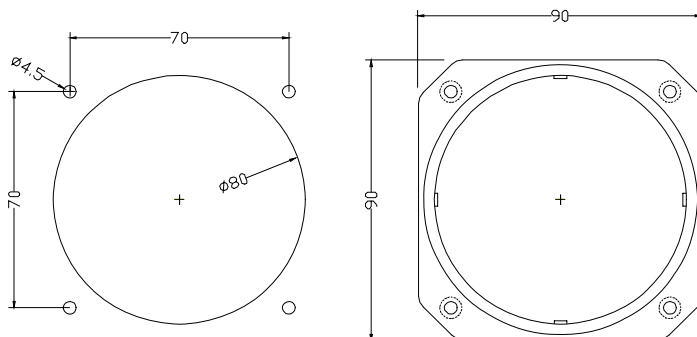
MECHANICAL SPECIFICATIONS

• Lever deflection angle:	$\pm 25^\circ \pm 1^\circ$
• Electrical angle:	$\pm 25^\circ \pm 1^\circ$
• Operating temperature range:	$-25^\circ\text{C} / +80^\circ\text{C}$
• Protection class (above panel):	up to IP 67, depending on grip
• Life:	3 million cycles

POTENTIOMETER & SWITCHES OPTIONS (Y-Y and X-X Axis)

	Reference codes	
	S = 50% V _{in}	S = 90% V _{in}
Output signal		
3-pins pot	A	D
3-pins pot & bi-directional switches	C	F (Std)

	Reference codes	
	S = 40% V _{in}	S = 100% V _{in}
Output signal		
4-pins pot	G	L
4-pins pot & bi-directional switches	I	N (Std)

PANEL CUT-OUT AND MOUNTING

AVAILABLE JOYSTICK MOVEMENTS

*Option L1S	Single axis control / Uni-directional
*Option L2S	Single axis control / Bi-directional
Option L4C	Cross axis control / Bi-directional
Option L4D	Multi axis control / Bi-directional

* friction lock option available for L1S and L2S



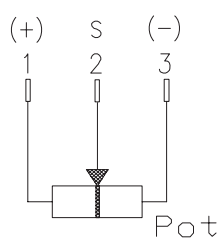
WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

JMF Heavy Duty Multi-Axis Potentiometric Joystick (joystick base only)
ELECTRICAL SPECIFICATIONS
Directional switches (electromechanical type)

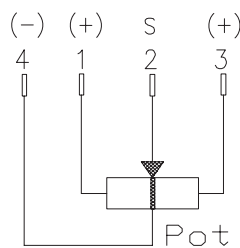
- Contacts: silver plated
- Max. operating input voltage: 125/250 Vac
- Max. operating current: 16 A (5 A on request)*
- Pot. connector type: 0 = None (solder type)
1 = AMP Modu I/4 poles
- Neutral position switch threshold angle: $\pm 10^\circ$ ($\pm 5^\circ$ on request)*
- Protection class: IP 55
(specials available on request)

Rotary potentiometer

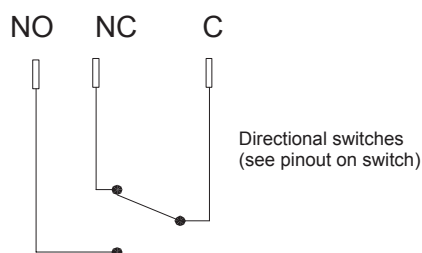
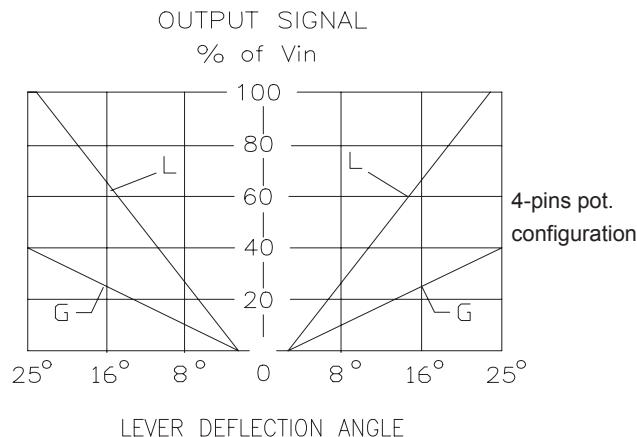
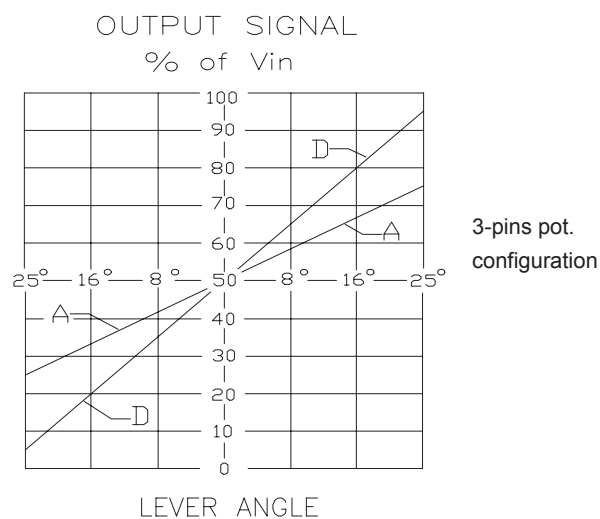
- Electrical power rating: 0.25 W @ 25°C
- Ohmic resistance: / A = 50% of V_{in} 1 k Ω $\pm 20\%$
(3-pins version) / D = 90% of V_{in} 5 k Ω $\pm 20\%$
- Ohmic resistance: / G = 40% of V_{in} 10 k Ω $\pm 20\%$
(4-pins version) / L = 100% of V_{in} 5 k Ω $\pm 20\%$
- Max. operating input voltage (V_{in}): 48 V or ± 24 V
- Min. load impedance on pin 2 (signal): 50 k Ω
- Max. operating current on pin 2: 1 mA
- Output voltage: see graphs
- Linearity (resistive track): 2% or better
- Protection class: IP 67

ELECTRICAL CONNECTIONS (for solder type connector)


3-pins potentiometer



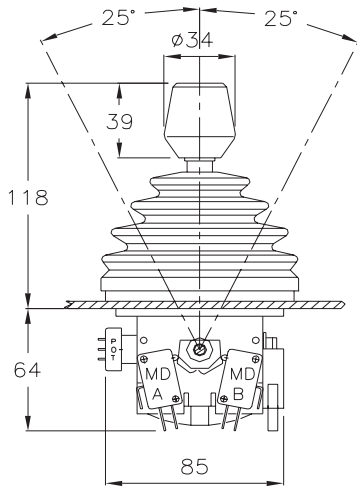
4-pins potentiometer


**OUTPUT SIGNAL
CONTROL CHARACTERISTICS**


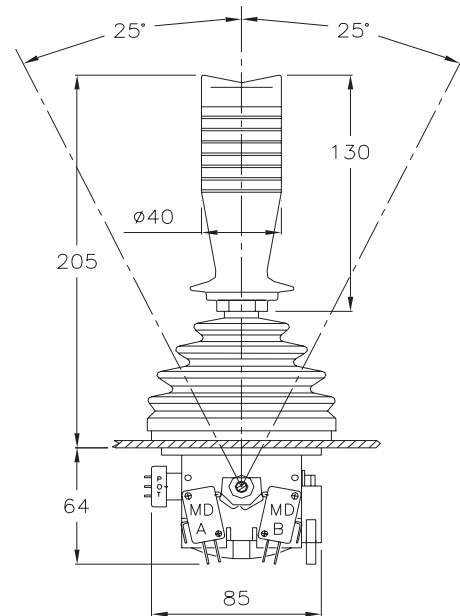
>> AVAILABLE GRIPS: see page 798

>> ORDERING INFORMATION: see page 780

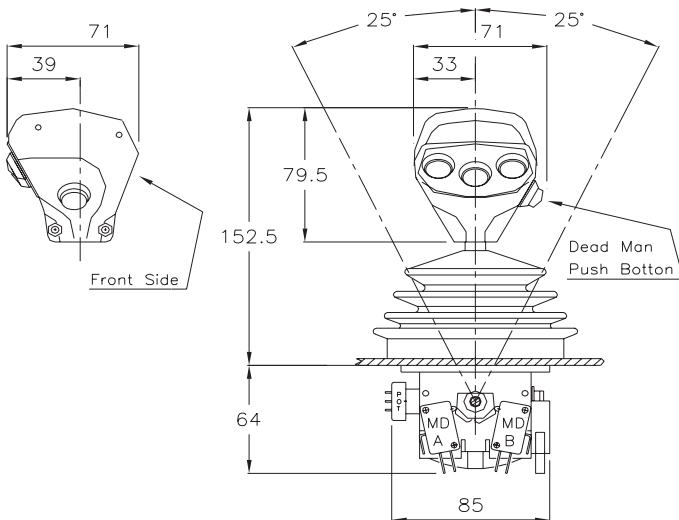
WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

JMF Heavy Duty Multi-Axis Potentiometric Joystick
JMF joystick with grips - configuration examples with overall dimensions


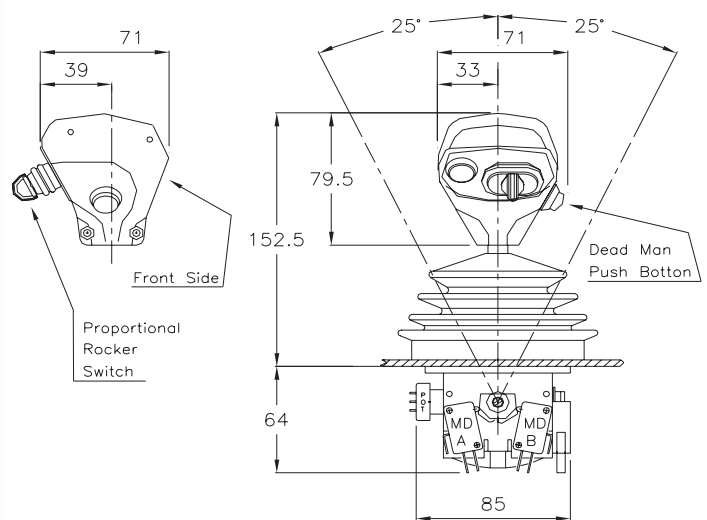
JMF base with IL handle
 Complete code: **JMF-L4C/NN-IL 0000**



JMF base with IC handle
 Complete code: **JMF-L4C/NN-IC 0200**



JMF base with IE type handle
 Complete code: **JMF-L4C/NN-IE A3P9 0000**

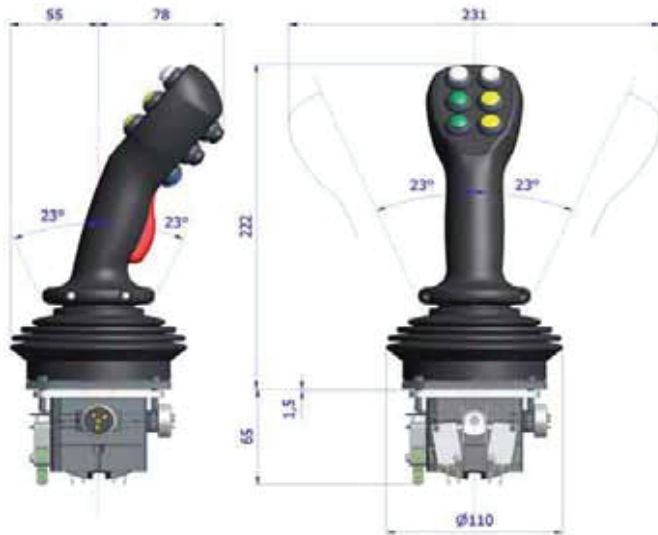


JMF base with IE type handle
 Complete code: **JMF-L4C/NN-IE A1P9 1PRS**

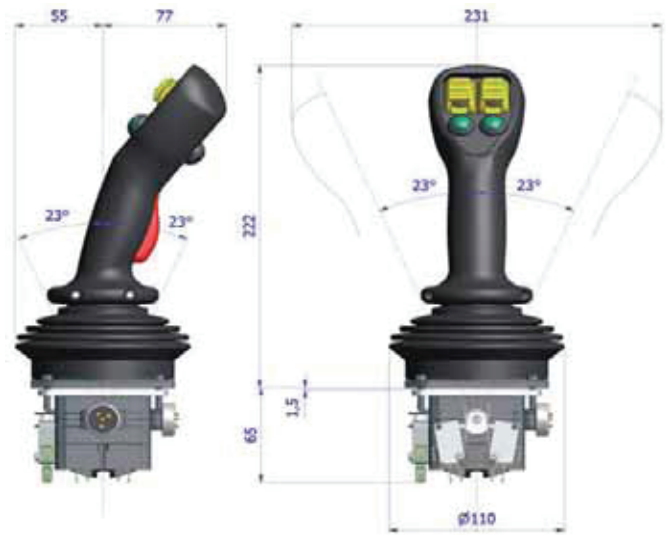
WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

JMF Heavy Duty Multi-Axis Potentiometric Joystick

JMF joystick with grips - configuration examples with overall dimensions



JMF base with MS type handle
 Complete code: **JMF-L4C/NN-MS A6P9 R3P9**



JMF base with MS type handle
 Complete code: **JMF-L4C/NN-MS A2P9 2FPR R1P9**



JMF base with MG type handle
 Complete code: **JMF-L4C/NN-MG A4P9 R1P9**



JMF base with MG type handle
 Complete code: **JMF-L4C/NN-MG A2P9 1FPR R1P9**

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

JMF Heavy Duty Multi-Axis Joystick Ordering Information

JOYSTICK FAMILY & TYPE	MAIN BASE CONFIGURATION	YY / XX AXES CONTROL CONFIG.		TYPE OF GRIP		GRIP CONFIGURATION	POT. CONNECTOR TYPE
		YY	XX	IL	IC		
JMF Heavy duty / Multi-axis joystick controller	L1SF Single axis, uni-directional with friction lock	0 No Pot & switches on Y/X axis		IL Cylindrical knob		Refer to the Grip ordering information for zz e kk axes (push-buttons & proportional controls on grips).	0 Flying leads 25 cm length
	L2S Single axis, bi-directional	2 Only Bi-dir. switches on Y/X axis		IC Cylindrical			1 4 poles electronic board on potentiometer AMP MODU I connector (AMP p/n 280610/1) mating connector kit included
	L2SF Single axis, bi-directional with friction lock	3-pins rotary potentiometer 1 KΩ 5%-95% signal	A Only potentiometer	IE Multi-function ergonomic			
	L4C Dual axes, cross movement		C Pot & Bi-direct. switches	MS Multi-function ergonomic symmetric			
	L4D Dual axes, all diagonals		D Only potentiometer	MG Multi-Function ergonomic right hand			
			F Pot & Bi-direct. switches				
		4-pins rotary potentiometer 10 KΩ 0%-100% signal	G Only potentiometer				
			I Pot & Bi-direct. switches				
			L Only potentiometer				
			N Pot & Bi-direct. switches				

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

JHM Heavy Duty Multi-Axis Hall Effect Joystick (joystick base only)
FEATURES

The JHM joystick controller has been designed for use in mobile and industrial Field applications. The use of the hall effect sensor, which eliminates any contact between moving electrical parts, improves overall resolution, precision and life. A complete line of built-in electronic drivers, generating on-off, proportional and CANbus control signals, guarantees the highest controllability of any type of electro-hydraulic system.

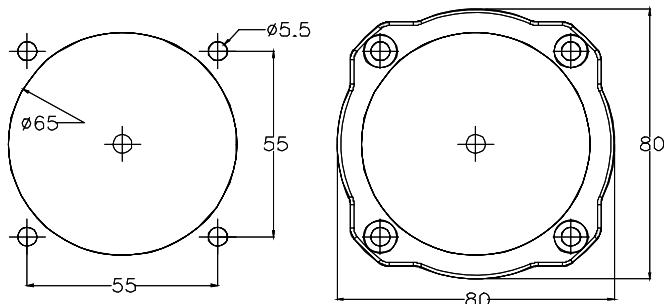
When coupled with an ergonomic multi-function handle of the **M** range, up to 5 proportional axes and 9 on-off push buttons can be integrated in the same joystick. As further option, the JHM is also available with a magnetic position detent on the Y - or X - axis.

MECHANICAL SPECIFICATIONS

• Main body material:	aluminium
• Boot material:	NBR / Shore 50 - UV proof
• Lever deflection angle:	$\pm 22^\circ \pm 1^\circ$
• Electrical angle:	$\pm 22^\circ \pm 1^\circ$
• Operating temperature range:	$-25^\circ\text{C} / +80^\circ\text{C}$
• Protection class (above panel):	up to IP 67, depending on grip
• Life:	> 5 million cycles

ELECTRICAL SPECIFICATIONS

• Sensor:	hall effect contactless technology
• Supply voltage:	ANL version = 5 vdc $\pm 5\%$ other versions = $8 \div 32$ vdc
• Current consumption @ rest:	25 mA (sensor only)
• Connector type:	Deutsch DT04-12P other types available on request
• Output signal configuration:	see next pages for all versions

PANEL CUT-OUT AND MOUNTING

AVAILABLE JOYSTICK MOVEMENTS

Option L2S	Single axis control / Bi-directional
Option L4C	Cross axis control / Bi-directional
Option L4D	Multi axis control / Bi-directional

Shown with MS grip



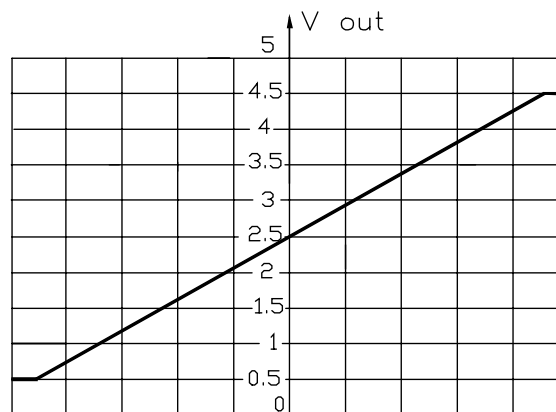
>> **AVAILABLE GRIPS:** see page 798

>> **ORDERING INFORMATION:** see page 781

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

JHM Heavy Duty Multi-Axis Hall Effect Joystick (joystick base only)
ANL & ANH VERSIONS
(basic version)

- Current consumption @ rest: < 25 mA (sensor only)
- Supply voltage: ANL - version = 5 vdc $\pm 5\%$
ANH - version = 8 \div 32 vdc
- Signal output @ rest: 2.5 vdc ± 0.2 V
- Output signal range: 0.5 \div 4.5 V ± 0.2 V (see graph)
- Rated output current: 1 mA
- Protections (ANH version): overvoltage and reversed polarity

**Output signal
control characteristics**


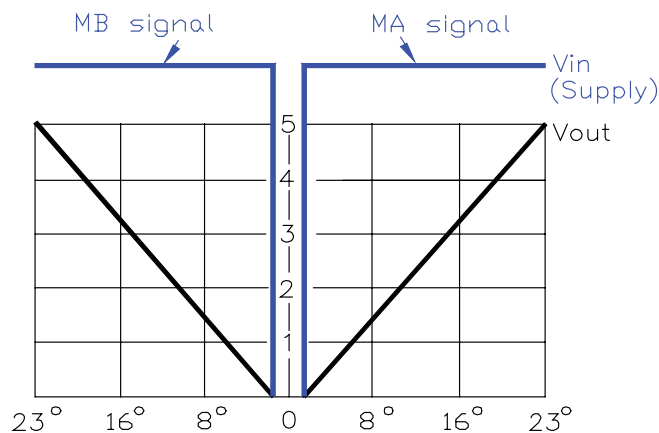
Lever de ection angle

AVS VERSION
(center tap output signal with digital directional signals)

- Current consumption @ rest: < 150 mA (without external load)
- Supply voltage (Vin): 8 \div 32 vdc
- Signal output @ rest: 0 V
- Output signal range: 0 \div 5 V ± 0.2 V (see graph)
- Rated output current: 1 mA

(MA and MB signals on graph)

- Digital directional outputs on both axes: 0 / Vin (0.7 A max)
- Digital directional outputs switching angle: between 2° and 5°

**Output signal
control characteristics**


Lever de ection angle

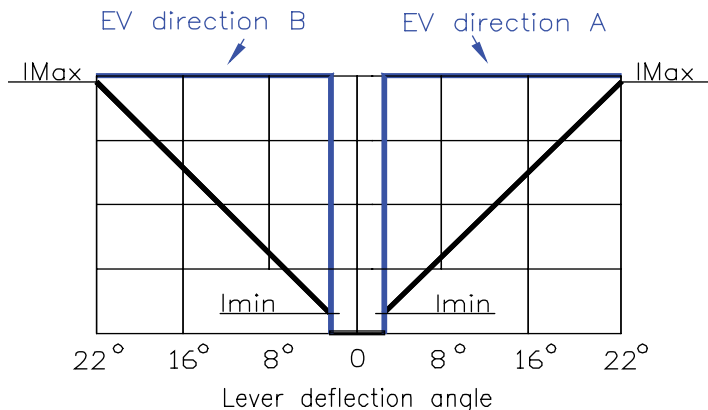
WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

JHM Heavy Duty Multi-Axis Hall Effect Joystick (joystick base only)

TCN VERSION (1 PWM output in combination with up to 5 on-off outputs)

- Supply voltage: $8 \div 32$ vdc
- Current consumption @ rest: < 250 mA
- PWM output: 1 x single proportional solenoid valves
- Current output range (PWM): 100 to 1600 mA (3 A available on request)
- Dither frequency: 60 to 250 Hz (100 Hz factory preset)
- Adjustable ramp time: 0.05 to 5 s
- Power digital outputs: 5 (3.5 A)
- Adjustments: via PC, RS232 serial line connection, using the Tecnord calibration and configuration tool (see picture below)

OUTPUT SIGNAL CONTROL CURVE



- Imin and digital outputs activation: between 2° and 5°

ADJUSTABLE PARAMETERS

The following parameters are adjustable via RS232 serial line by means of a specific calibration and configuration tool.

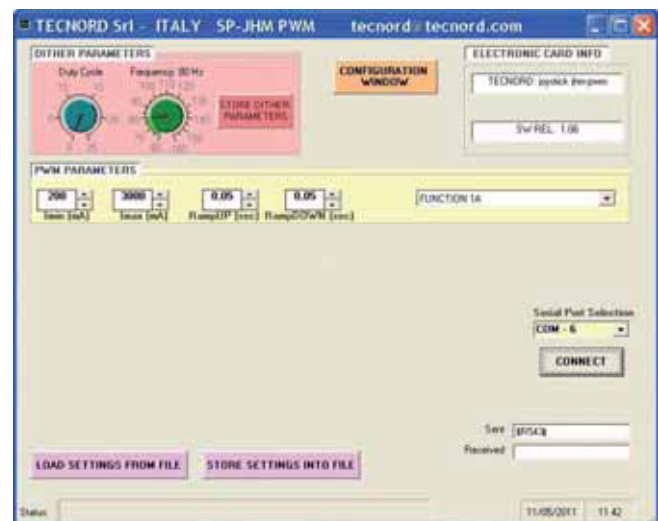
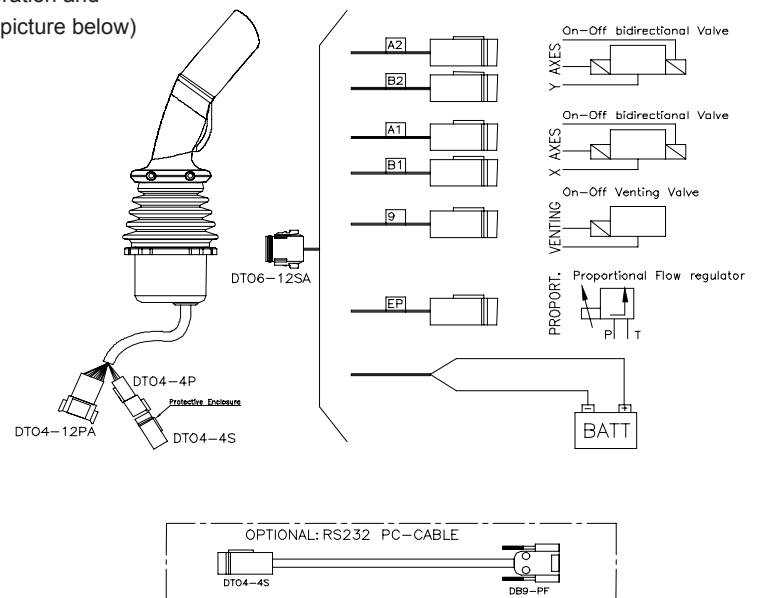
By use of the configuration window:

- Operation mode.
- Deadman push button enable.
- Joystick functions: axes reverse and enable, virtual cross movement.
- Setpoint selection (for 360° movement only).
- Output assignment on-off auxiliary valves.

By use of the calibration window:

- Operating parameters: Imin, IMax, Ramps.

APPLICATION EXAMPLE (shown with MS grip)



WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

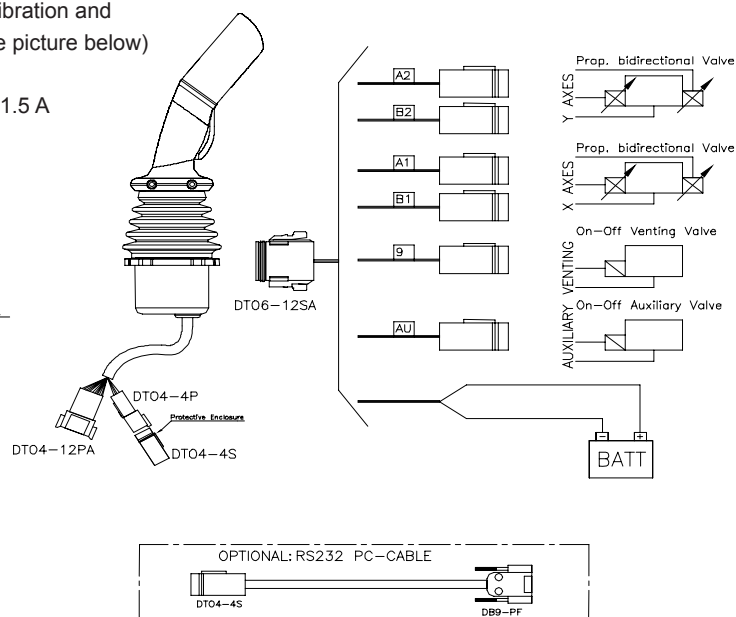
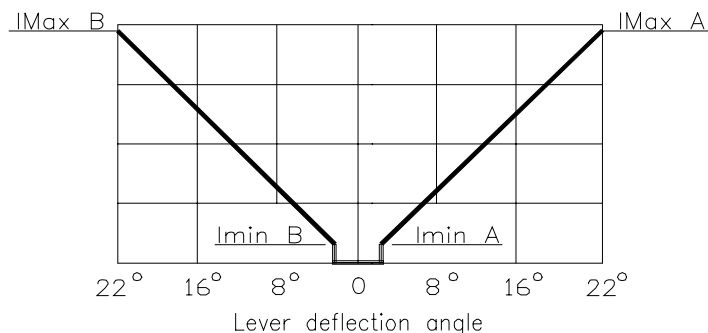
JHM Heavy Duty Multi-Axis Hall Effect Joystick (joystick base only)

PWM VERSION (2 PWM output channels)

- Supply voltage: 8 ÷ 32 vdc
- Current consumption @ rest: 250 mA
- PWM output: 2 x dual proportional solenoid valves
- Current output range (PWM): 100 to 1600 mA (3 A available on request)
- Dither frequency: 60 to 250 Hz (100 Hz factory preset)
- Adjustable ramp time: 0.05 to 5 s
- Power digital outputs: 2 (3.5 A)
- Adjustments: via PC, RS232 serial line connection, using the Tecnord calibration and configuration tool (see picture below)

Notes: 1) 3rd axis available using FPR-PWM roller switch - I_{max} = 1.5 A
 2) the base height is 60 mm instead of the standard 46 mm

OUTPUT SIGNAL CONTROL CURVE



- Imin and venting valve activation: between 2° and 5°

ADJUSTABLE PARAMETERS

The following parameters are adjustable via RS232 serial line by means of a specific calibration and configuration tool.

By use of the configuration window:

- Operation mode.
- Deadman push button enable.
- Joystick functions: axes reverse and enable, virtual cross movement.
- Setpoint selection (for 360° movement only).
- Output assignment on-off auxiliary valves.

By use of the calibration window:

- Operating parameters: Imin, Imax, Ramps.



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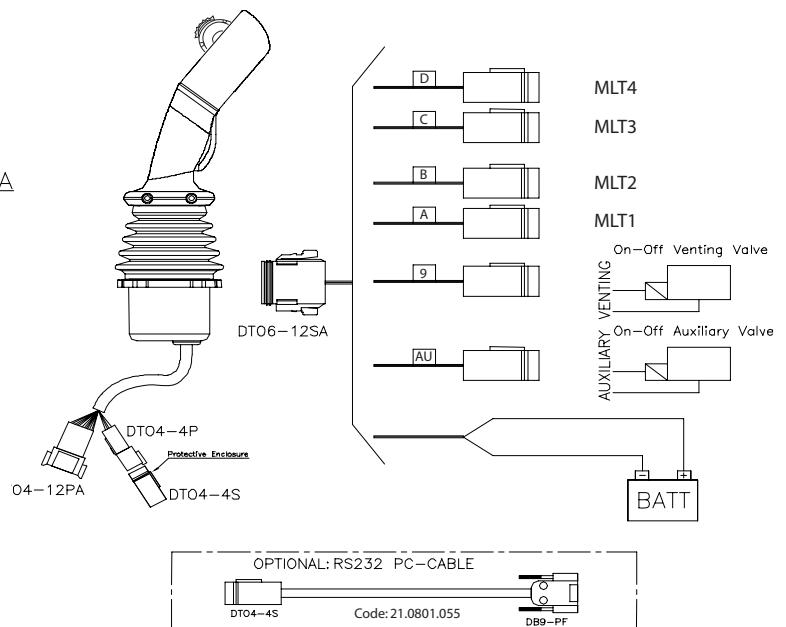
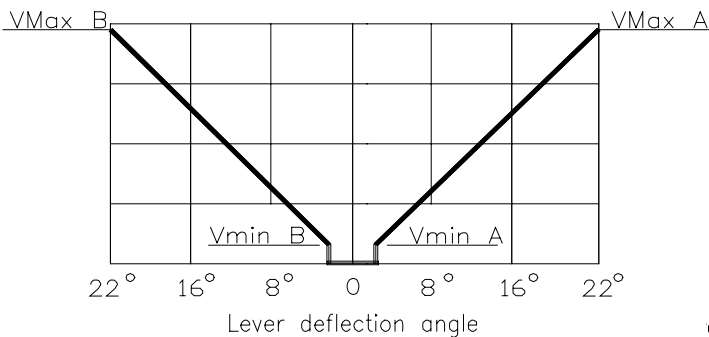
JHM Heavy Duty Multi-Axis Hall Effect Joystick (joystick base only)

MLT VERSION (output adjustable signal for closed loop proportional actuators)

- | | |
|-------------------------------|--|
| • Supply voltage: | 8 ÷ 32 vdc |
| • Current consumption @ rest: | 250 mA |
| • Analog outputs: | 4 |
| • Output signal range: | linear signal 0.9 ÷ 4.1 V
2 ÷ 6 V or ratiometric output
available on request |
| • Rated output current: | 15 mA |
| • Power digital outputs: | 4 (0.7 A) |
| • Digital inputs available: | 2 |
| • Adjustments: | via RS232 serial line |

APPLICATION EXAMPLE (shown with MS grip)

OUTPUT SIGNAL CONTROL CURVE



- Vmin and venting valve activation: between 2° and 5°

ADJUSTABLE PARAMETERS

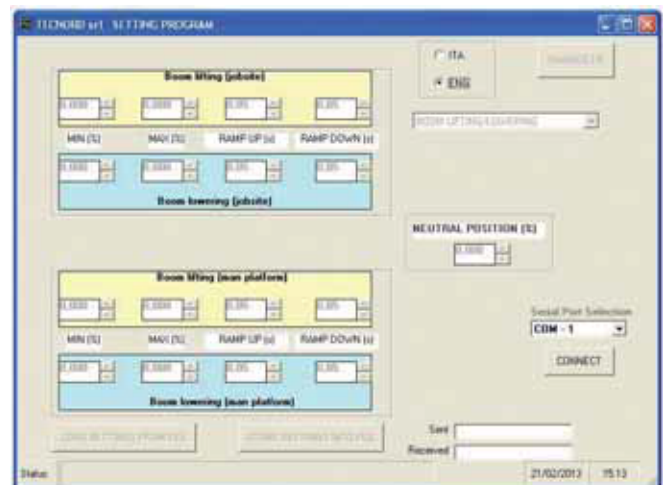
The following parameters are adjustable via RS232 serial line by means of a specific calibration and configuration tool.

By use of the configuration window:

- Operation mode.
- Deadman push button enable.
- Joystick functions: axes reverse and enable, virtual cross movement.
- Setpoint selection (for 360° movement only).
- Output assignement on-off auxiliary valves.

By use of the calibration window:

- Operating parameters: Imin, Imax, Ramp up, Ramp down.



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JHM Heavy Duty Multi-Axis Hall Effect Joystick (joystick base only)
CANBUS VERSION (with interface for CANbus line)

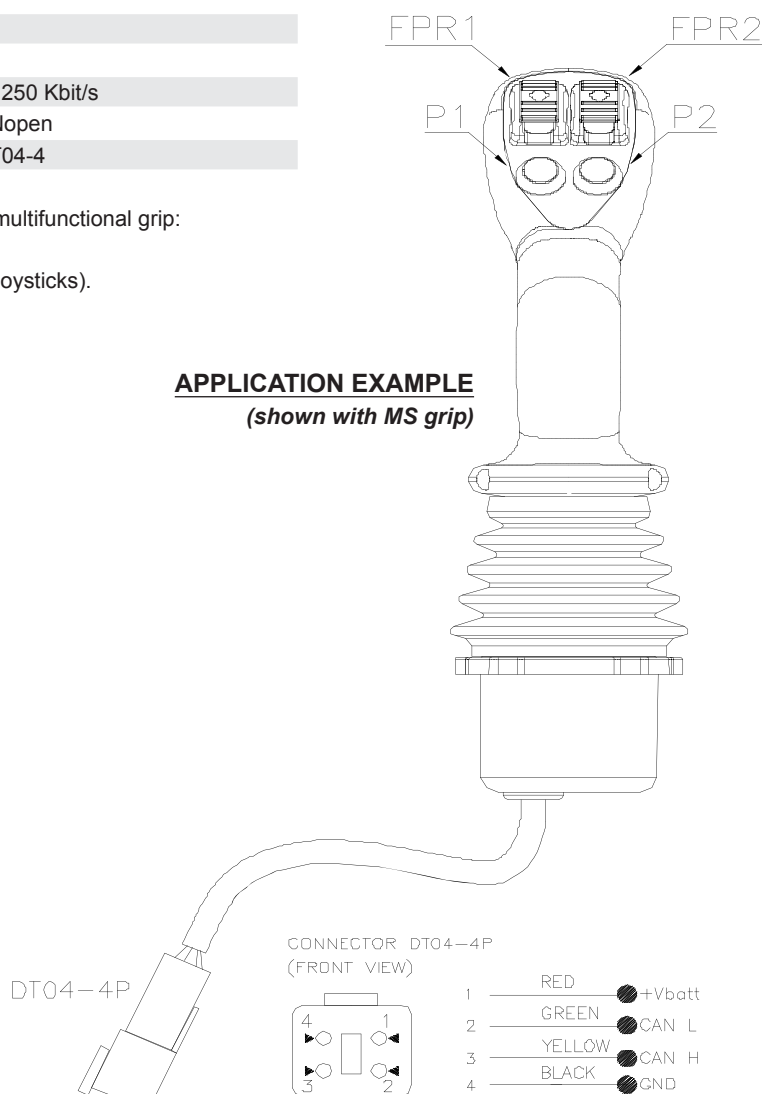
• Supply voltage:	8 ÷ 32 vdc
• Current consumption @ rest:	< 250 mA
• Physical layer:	ISO 11898, 250 Kbit/s
• Protocol:	J1939/ CANopen
• Connector type:	Deutsch DT04-4

With CANbus link, following signals can be managed on the multifunctional grip:

- 4 digital outputs 0.7A (LEDs, detent coils, buzzers, etc).
- 6 analog voltage input 0-5 V (proportional rollers and mini-joysticks).
- 6 digital inputs (push buttons, toggles, etc).


APPLICATION EXAMPLE

(shown with MS grip)


ADJUSTABLE PARAMETERS

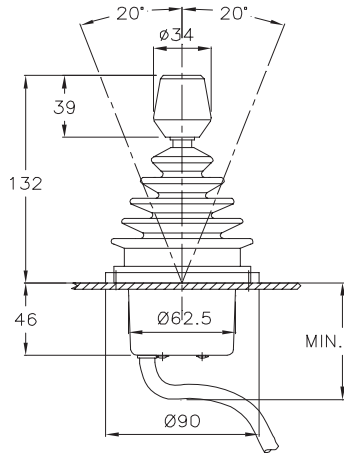
The following parameters are adjustable via RS232 serial line by means of a specific calibration and configuration tool and an hardware interface device (see picture).

By use of the configuration window:

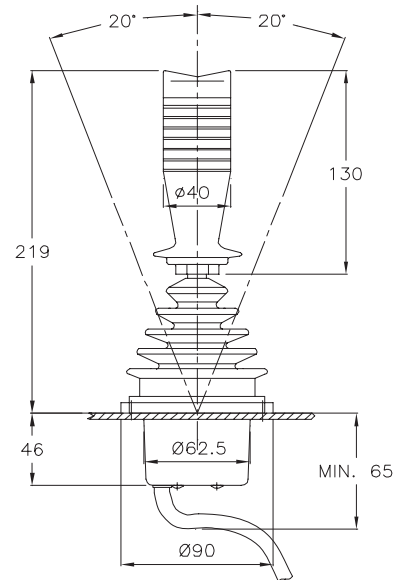
- Node ID



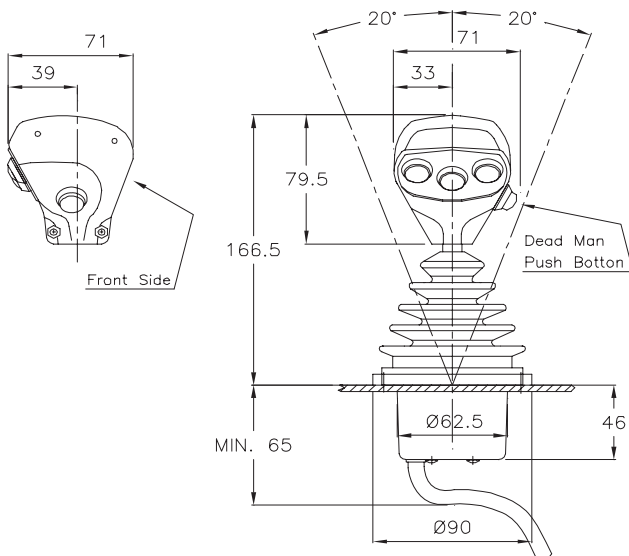
WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

JHM Heavy Duty Multi-Axis Hall Effect Joystick
JHM joystick with grips - configuration examples with overall dimensions


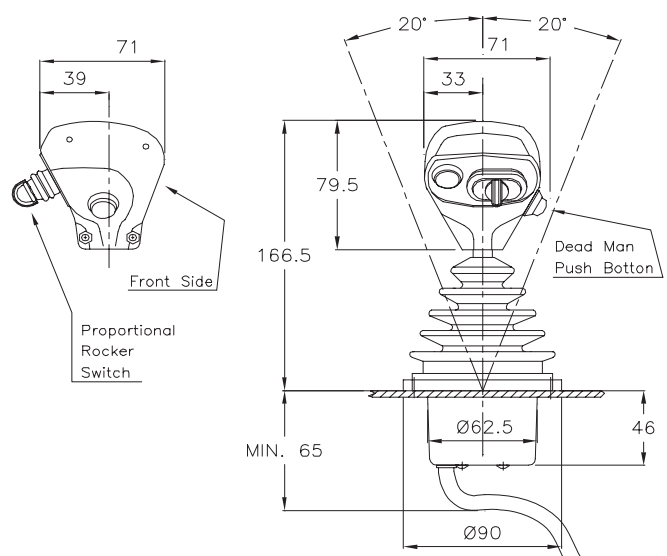
JHM base with IL handle
 Complete code: **JHM-L4D/ANH-IL 0000**



JHM base with IC handle
 Complete code: **JHM-L4D/ANH-IC 0200**



JHM base with IE type handle
 Complete code: **JHM-L4D/ANH-IE A4P9 0000**



JMF base with IE type handle
 Complete code: **JHM-L4D/ANH-IE A1P9 1PRS**

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JHM Heavy Duty Multi-Axis Hall Effect Joystick
JHM joystick with grips - configuration examples with overall dimensions


JHM base with MS type handle
 Complete code: **JHM L4D/ANH-MS A6P9 R3P9**



JHM base with MS type handle
 Complete code: **JHM L4D/ANH-MS A2P9 2FPR R1P9**



JHM base with MG type handle
 Complete code: **JHM L4D/ANH-MG A4P9 R1P9**



JHM base with MG type handle
 Complete code: **JHM L4D/ANH-MG A2P9 1FPR 0000**

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

JHM Heavy Duty Multi-Axis Joystick Ordering Information

JOYSTICK FAMILY & TYPE	MAIN BASE CONFIGURATION	YY / XX AXES CONTROL CONFIG.	TYPE OF GRIP	GRIP CONFIGURATION	POT. CONNECTOR TYPE
JHM Heavy duty / Multi-axis hall effect type joystick controller	L2S Single axis, bi-directional	ANIL Analog signal 0.5>2.5>4.5 VDC power supply range = 5 VDC ±5%	IL Cylindrical knob	Refer to the grip ordering information for zz e kk axes (push-buttons & proportional controls on grips).	3 Flying leads 25 cm length
	L4C Dual axes, cross movement	ANH Analog signal 0.5>2.5>4.5 VDC power supply range = 8-32 VDC	IC Cylindrical		4 Male connector, 12 poles, Deutsch DT04-12P, 15 cm cable length
	L4D Dual axes, all diagonals	AVS Center tap output signal with digital directional signals	IE Multi-function ergonomic		5 Male connector, 4 poles, Deutsch DT04 4P, 15 cm cable length (for CANbus version only)
		TCN 1 PWM output in combination with up to 4 on-off channels	MS Multi-function ergonomic symmetric		
		PWM Pulse with modulation current output factory preset or set via PC	MG Multi-function ergonomic right hand		
		MLT adjustable output signal for closed loop prop. actuators			
		CAN CANbus version for connection to CANbus line J1939 protocol			

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Ergonomic Grips

Description	Technical information page	Ordering information page
IL type (cylindrical knob)	795	797
IC type (cylindrical)	795	797
IE type (ergonomic, gear type, multi-functions)	796	797
MS type (ergonomic, symmetric, multi-functions)	798	801
MG type (ergonomic, right hand, multi-functions)	802	805

Note: 1) Ergonomic grips can be used as stand alone devices.
2) Grips do not include rubber gaiter and retainer ring, which must be ordered separately.

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

IL - IC Grips

IL - CYLINDRICAL KNOB

MECHANICAL SPECIFICATIONS

- Body material: bakelite
- Colour: black
- Operating temperature range: -20°C / +60°C
- Connecting hub: female thread / M14 x 1.5

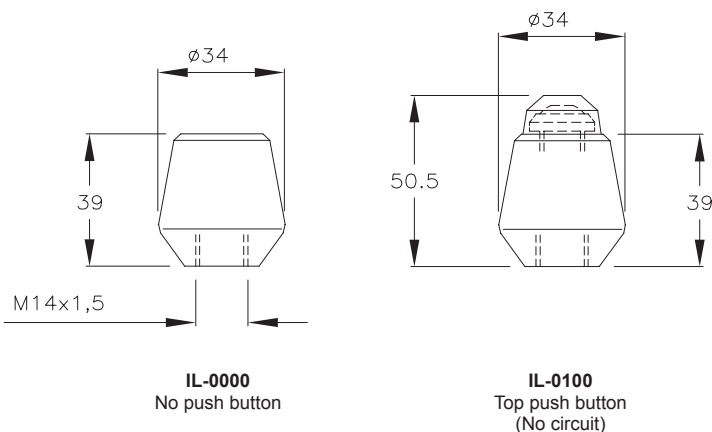
ELECTRICAL SPECIFICATIONS

- Prewired exit cable: 250 mm
- Insulating cable material: PVC

TOP PUSH BUTTON

- Rated amperage: 3 A inductive
- Life: > 100.000 cycles
- Protection class: IP 64

OVERALL DIMENSIONS



IC - CYLINDRICAL GRIP

MECHANICAL SPECIFICATIONS

- Body material: nylon
- Bottom rubber material: neoprene
- Colour: black
- Operating temperature range: -20°C / +60°C
- Connecting hub: female thread / M14 x 1.5

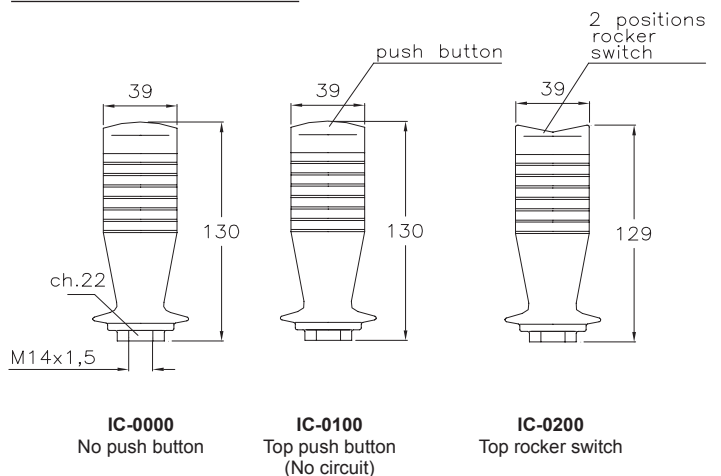
ELECTRICAL SPECIFICATIONS

- Prewired exit cable: 250 mm
- Insulating cable material: PVC

PUSH BUTTON AND ROCKER SWITCH

- Contacts: silver plated
- Rated amperage: 16 A / 250 vac
3 A / 24 vdc
- Electrical life: > 100.000 cycles
- Mechanical life: > 3.000.000 cycles
- Protection class: IP 54

OVERALL DIMENSIONS



>> **ORDERING INFORMATION:** see page 795

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

IE Multi-Function Ergonomic Grip

MECHANICAL SPECIFICATIONS

- Material: thermoplastic
- Colour: black
- Operating temperature range: -25°C / +85°C
- Connecting hub: female thread / M10 x 1.5
- Protection class: IP 65 (plain grip)

ELECTRICAL SPECIFICATIONS

- Prewired exit cable: 250 mm

Available push buttons and switches

P9 - Push buttons

- No of push buttons on rear panel: up to 3
- Rated amperage: 3 Amp inductive
- Life: > 100.000 cycles
- Available colours: red, blue, yellow, black, green, white

A - Side dead man push button

see above specifications
for P9 push button

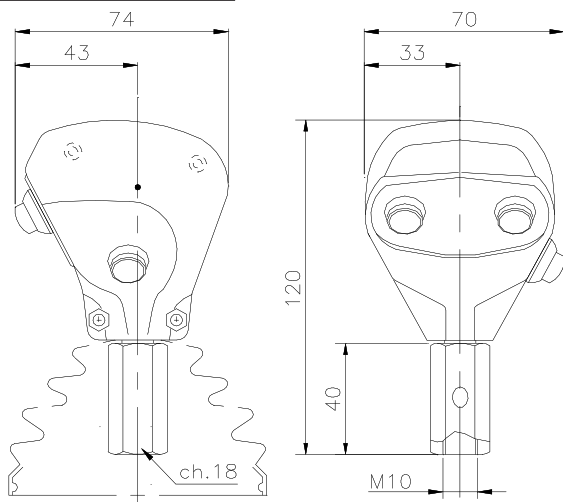
FPR - Proportional roller

- Output signal: see FPR data sheet
3-pins connection
hall effect contactless sensor

PRS - Proportional rocker switch

- Output signal: see PRS data sheet
3-pins resistive pot
4-pins with bidirectional switches

OVERALL DIMENSIONS



FEATURES

- Multi-functions ergonomic grip gear type with on-off and proportional switches.
- Easy adaptability to existing joystick control lever.

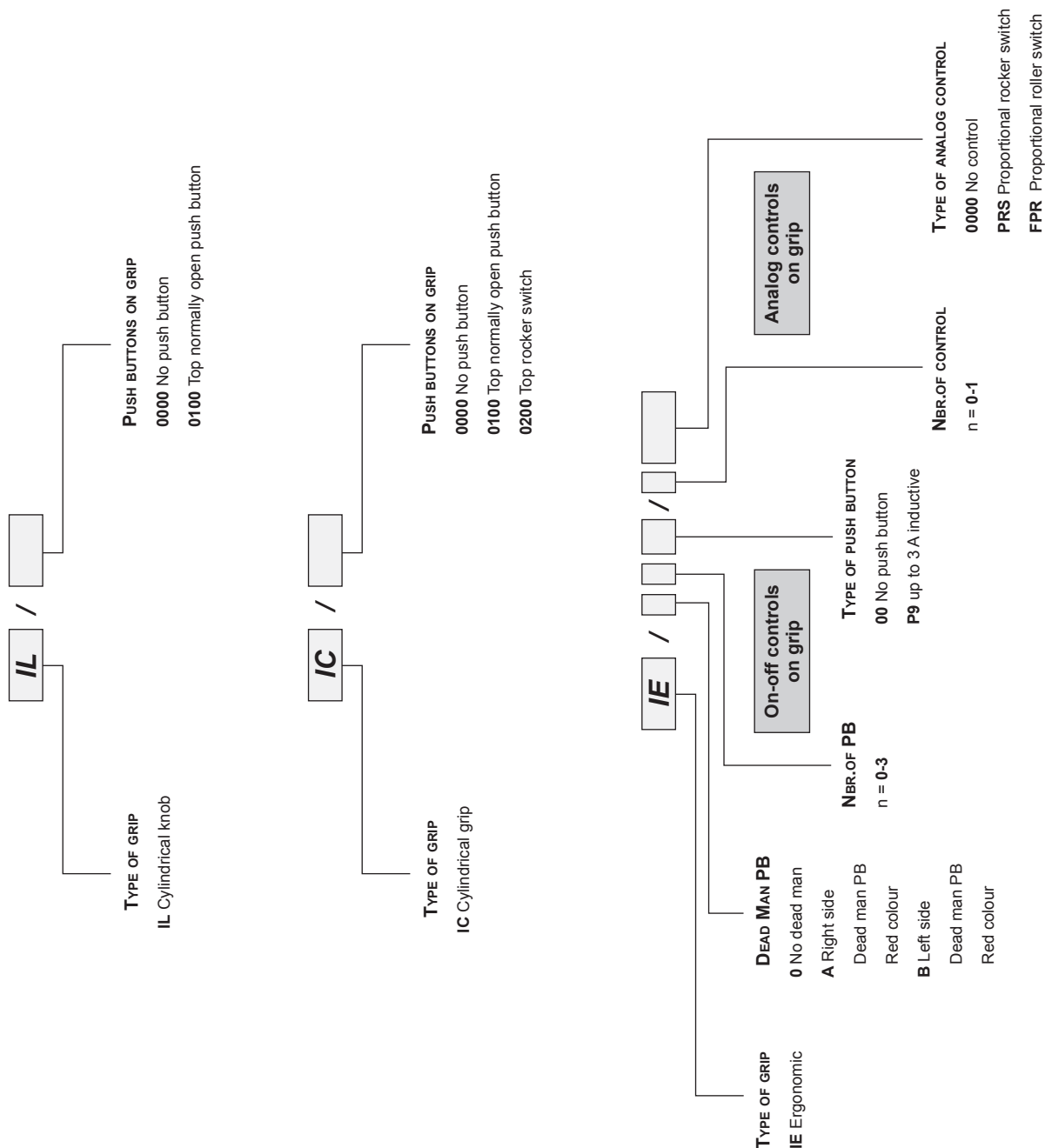


CONFIGURATION EXAMPLES

	D-man P/B	Rear P/B	Rear PRS
IE-0000-0000	0	0	0
IE-A000-0000	yes	0	0
IE-A1P9-0000	yes	1xP9	0
IE-A2P9-0000	yes	2xP9	0
IE-A3P9-0000	yes	3xP9	0
IE-0000-1PRS	0	0	1xPRS
IE-A1P9-1PRS	yes	1xP9	1xPRS
IE-0000-1FPR	0	0	1xFPR
IE-A1P9-1FPR	yes	1xP9	1xFPR

>> ORDERING INFORMATION: see page 795

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

IL / IC / IE Grips *Ordering Information*


WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

MS Multi-Function Ergonomic Symmetric Grip

FEATURES

- Optimum ergonomic design.
- High performance switches.

MECHANICAL SPECIFICATIONS

- Material: thermoplastic
- Colour: black
- Operating temperature range: -25°C / +85°C
- Protection class: IP 65 with plain grip
(IP 67 with special assembly on request) IP 54 with dead man trigger option
- Connecting hub: female thread / M14 x 1.5

ELECTRICAL SPECIFICATIONS

- Prewired exit cable: 250 mm

A - Dead man push button

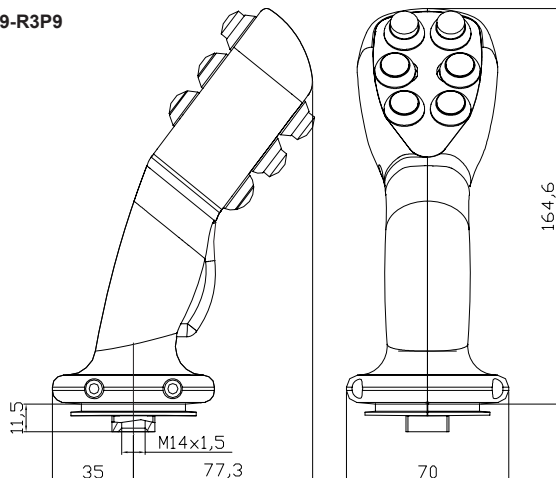
- Rated amperage: up to 3 A inductive
- Protection class (microswitch): IP 67

P9 - Push buttons

- Operational life: > 100.000 cycles
- Rated amperage: up to 5 A resistive
up to 3 A inductive
- Protection class: IP 64 (IP 68 available)
- Available colours: red, blue, yellow, black, green, white
- Button and bezel material: thermoplastic
- Contacts: gold plated silver alloy

OVERALL DIMENSIONS

Mod.
MS-A6P9-R3P9



CONFIGURATION EXAMPLES

	D-man P/B	Front P/B	Rear P/B
MS-0000-0000	0	0	
MS-A000-0000-0000	yes	0	
MS-A1P9-0000-0000	yes	1xP9	
MS-A2P9-0000-0000	yes	2xP9	
MS-A3P9-0000-0000	yes	3xP9	
MS-A4P9-0000-0000	yes	4xP9	
MS-A5P9-0000-0000	yes	5xP9	
MS-A6P9-0000-0000	yes	6xP9	
MS-A6P9-0000-R1P9	yes	6xP9	1xP9
MS-A6P9-0000-R2P9	yes	6xP9	2xP9
MS-A6P9-0000-R3P9	yes	6xP9	3xP9

>> ORDERING INFORMATION: see page 796

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MS Multi-Function Ergonomic Symmetric Grip

FEATURES

- Optimum ergonomic design.
- High performance switches.

MECHANICAL SPECIFICATIONS

- Material: thermoplastic
- Colour: black
- Operating temperature range: -25°C / +85°C
- Protection class: IP 65 with plain grip
(IP 67 with special assembly on request) IP 54 with dead man trigger option
- Connecting hub: female thread / M14 x 1.5

ELECTRICAL SPECIFICATIONS

- Prewired exit cable: 250 mm

A - Dead man push button

- Rated amperage: up to 3 A inductive
- Protection class (microswitch): IP 67

P9 - Push buttons

- Operational life: > 100.000 cycles
- Rated amperage: up to 5 A resistive
up to 3 A inductive
- Protection class: IP 64 (IP 68 available)
- Available colours: red, blue, yellow, black, green, white
- Button and bezel material: thermoplastic
- Contacts: gold plated silver alloy

FPR - Proportional roller

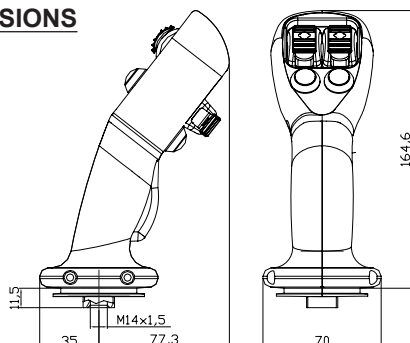
- Output signal: see FPR data sheet
3-pins connection
hall effect contactless sensor

PRS - Proportional rocker switch

- Output signal: see PRS data sheet
3-pins resistive pot
4-pins center tap

OVERALL DIMENSIONS

Mod.
MS-A2P9-2FPR-F1P9



Back

CONFIGURATION EXAMPLES

	D-man P/B	Front P/B	Front FPR	Rear P/B	Rear FPR
MS-01P9-1FPR-0000	0	1xP9	1xFPR		
MS-A2P9-1FPR-0000	yes	2xP9	1xFPR		
MS-A3P9-1FPR-R1P9	yes	3xP9	1xFPR	1xP9	
MS-A4P9-1FPR-R2P9	yes	4xP9	1xFPR	2xP9	
MS-A4P9-1FPR-F1P9	yes	4xP9	1xFPR	1xP9	1xFPR
MS-A4P9-1FPR-F2P9	yes	4xP9	1xFPR	2xP9	1xFPR
MS-A2P9-2FPR-0000	yes	2xP9	2xFPR	0	
MS-A2P9-2FPR-R1P9	yes	2xP9	2xFPR	1xP9	
MS-A2P9-2FPR-R2P9	yes	2xP9	2xFPR	2xP9	
MS-A2P9-2FPR-F1P9	yes	2xP9	2xFPR	1xP9	1xFPR
MS-A2P9-2FPR-F2P9	yes	2xP9	2xFPR	2xP9	1xFPR
MS-A000-3FPR-0000	yes	0	3xFPR	0	
MS-A000-3FPR-R1P9	yes	0	3xFPR	1xP9	
MS-A000-3FPR-R2P9	yes	0	3xFPR	2xP9	

>> ORDERING INFORMATION: see page 796

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MS Multi-Function Ergonomic Symmetric Grip

FEATURES

- Optimum ergonomic design.
- Internal PWM driver.

MECHANICAL SPECIFICATIONS

- Material: thermoplastic
- Colour: black
- Operating temperature range: -25°C / +85°C
- Protection class: IP 65 with plain grip
(IP 67 with special assembly on request) IP 54 with dead man trigger option
- Connecting hub: female thread / M14 x 1.5

ELECTRICAL SPECIFICATIONS

- Prewired exit cable: 250 mm

A - Dead man push button

- Rated amperage: up to 3 A inductive
- Protection class (microswitch): IP 67

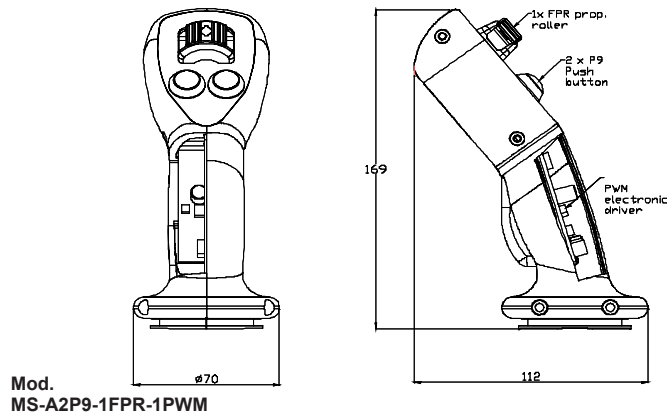
P9 - Push buttons

- Operational life: > 100.000 cycles
- Rated amperage: up to 5 A resistive
up to 3 A inductive
- Protection class: IP 64 (IP 68 available)
- Available colours: red, blue, yellow, black, green, white
- Button and bezel material: thermoplastic
- Contacts: gold plated silver alloy

FPR - Proportional roller

- Output signal: see FPR data sheet
3-pins connection
hall effect contactless sensor

OVERALL DIMENSIONS



PWM - Pulse width modulated output current driver for a dual coil proportional valve

- Supply voltage: 8-32 Volt
- Max. current draw: 100 mA
- Current output range: factory set btw 0 and 1500 mA
- PWM diather frequency: 100 Hz
- Operating temperature range: -25°C / +85°C

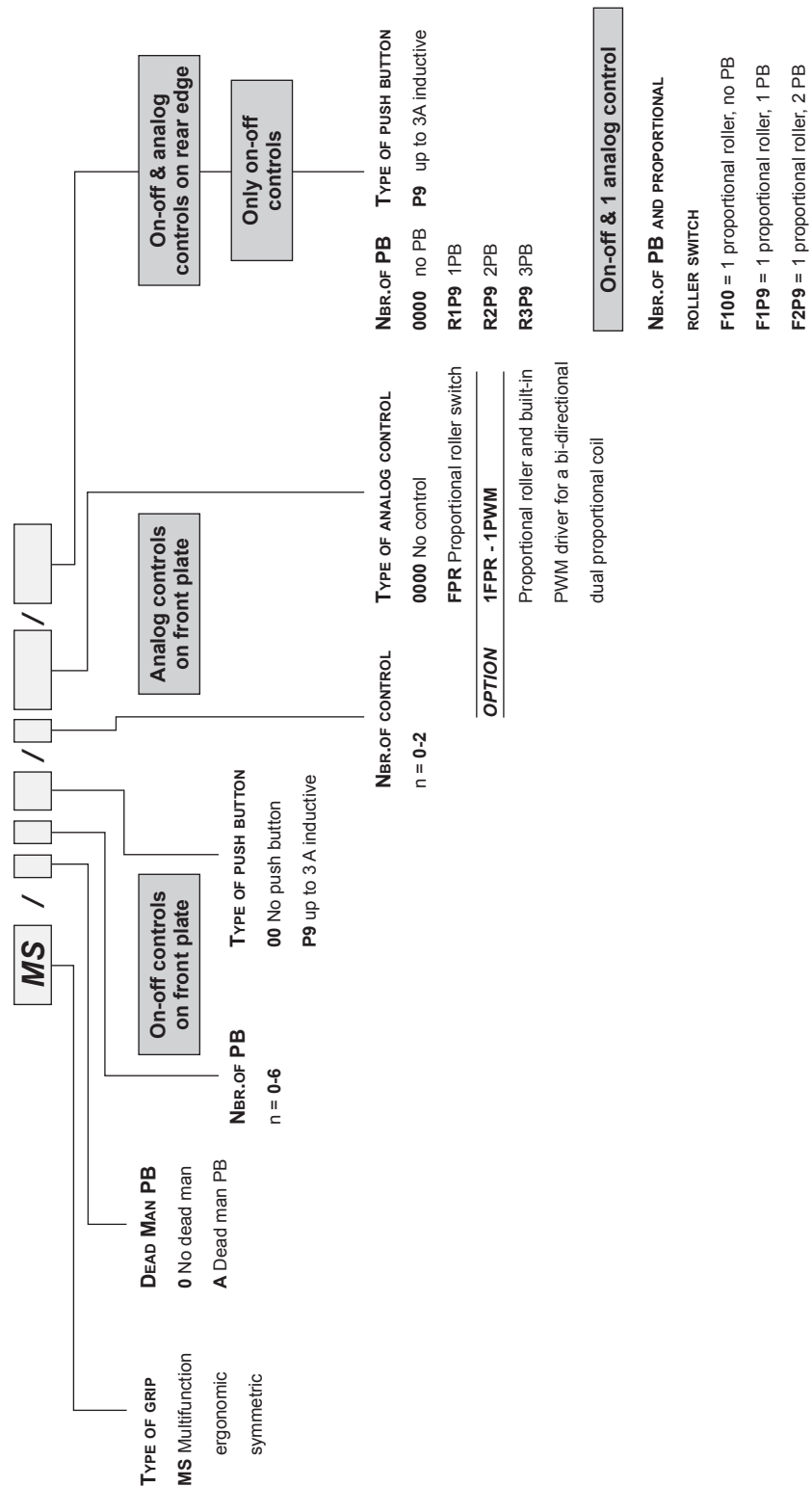
CONFIGURATION EXAMPLES

	D-man P/B	Front P/B	Front FPR
MS-01P9-1FPR-1PWM	0	1xP9	1xFPR
MS-A2P9-1FPR-1PWM	yes	2xP9	1xFPR
MS-A3P9-1FPR-1PWM	yes	3xP9	1xFPR
MS-A4P9-1FPR-1PWM	yes	4xP9	1xFPR

>> ORDERING INFORMATION: see page 796

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MS Ergonomic Symmetric Grip Ordering Information



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MG Multi-Function Ergonomic Symmetric Grip

FEATURES

- Optimum ergonomic design.
- High performance switches.

MECHANICAL SPECIFICATIONS

- Material: thermoplastic
- Colour: black
- Operating temperature range: -25°C / +85°C
- Protection class: IP 65 with plain grip
(IP 67 with special assembly on request) IP 54 with dead man trigger option
- Connecting hub: female thread / M14 x 1.5

ELECTRICAL SPECIFICATIONS

- Prewired exit cable: 250 mm

A - Dead man push button

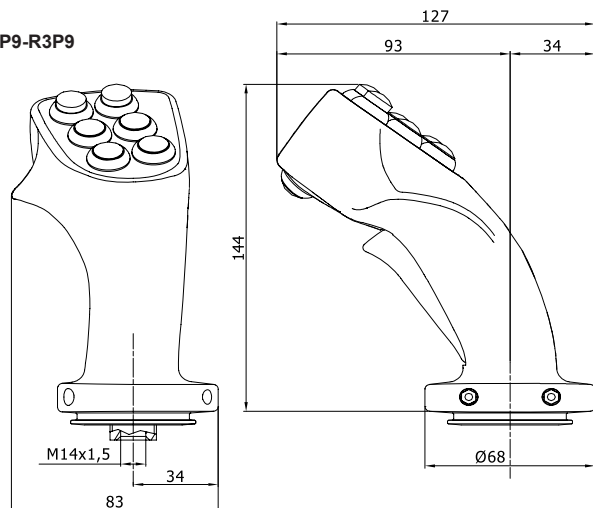
- Rated amperage: up to 3 A inductive
- Protection class (microswitch): IP 67

P9 - Push buttons

- Operational life: up to 100.000 cycles
- Rated amperage: up to 5 A resistive
up to 3 A inductive
- Protection class: IP 64 (IP 68 available)
- Available colours: red, blue, yellow, black, green, white
- Button and bezel material: thermoplastic
- Contacts: gold plated silver alloy

OVERALL DIMENSIONS

Mod.
MG-A6P9-R3P9



CONFIGURATION EXAMPLES

	D-man P/B	Front P/B	Rear P/B
MG-0000-0000	0	0	
MG-A000-0000-0000	yes	0	
MG-A1P9-0000-0000	yes	1xP9	
MG-A2P9-0000-0000	yes	2xP9	
MG-A3P9-0000-0000	yes	3xP9	
MG-A4P9-0000-0000	yes	4xP9	
MG-A5P9-0000-0000	yes	5xP9	
MG-A6P9-0000-0000	yes	6xP9	
MG-A6P9-0000-R1P9	yes	6xP9	1xP9
MG-A6P9-0000-R2P9	yes	6xP9	2xP9
MG-A6P9-0000-R3P9	yes	6xP9	3xP9

>> ORDERING INFORMATION: see page 797

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

MG Multi-Function Ergonomic Right Hand Grip

FEATURES

- Optimum ergonomic design.
- High performance switches.

MECHANICAL SPECIFICATIONS

- Material: thermoplastic
- Colour: black
- Operating temperature range: -25°C / +85°C
- Protection class: IP 65 with plain grip
(IP 67 with special assembly on request) IP 54 with dead man trigger option
- Connecting hub: female thread / M14 x 1.5

ELECTRICAL SPECIFICATIONS

- Prewired exit cable: 250 mm

A - Dead man push button

- Rated amperage: up to 3 A inductive
- Protection class (microswitch): IP 67

P9 - Push buttons

- Operational life: up to 100.000 cycles
- Rated amperage: up to 5 A resistive
up to 3 A inductive
- Protection class: IP 64 (IP 68 available)
- Available colours: red, blue, yellow, black, green, white
- Button and bezel material: thermoplastic
- Contacts: gold plated silver alloy

FPR - Proportional roller

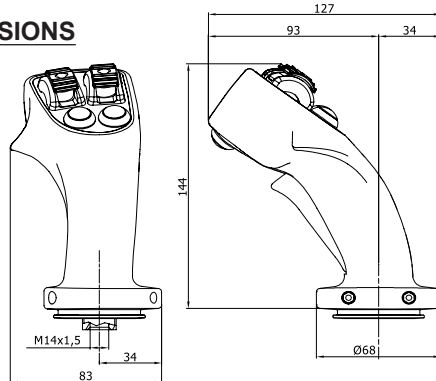
- Output signal: see FPR data sheet
3-pins connection
hall effect contactless sensor

PRS - Proportional rocker switch

- Output signal: see PRS data sheet
3-pins resistive pot
4-pins center tap

OVERALL DIMENSIONS

Mod.
MG-A000-3FPR



CONFIGURATION EXAMPLES

	D-man P/B	Front P/B	Front FPR	Rear P/B	Rear FPR
MG-01P9-1FPR-0000	0	1xP9	1xFPR		
MG-A2P9-1FPR-0000	yes	2xP9	1xFPR		
MG-A3P9-1FPR-R1P9	yes	3xP9	1xFPR	1xP9	
MG-A4P9-1FPR-R2P9	yes	4xP9	1xFPR	2xP9	
MG-A4P9-1FPR-F1P9	yes	4xP9	1xFPR	1xP9	1xFPR
MG-A4P9-1FPR-F2P9	yes	4xP9	1xFPR	2xP9	1xFPR
MG-A2P9-2FPR-0000	yes	2xP9	2xFPR	0	
MG-A2P9-2FPR-R1P9	yes	2xP9	2xFPR	1xP9	
MG-A2P9-2FPR-R2P9	yes	2xP9	2xFPR	2xP9	
MG-A2P9-2FPR-F1P9	yes	2xP9	2xFPR	1xP9	1xFPR
MG-A2P9-2FPR-F2P9	yes	2xP9	2xFPR	2xP9	1xFPR
MG-A000-3FPR-0000	yes	0	3xFPR	0	
MG-A000-3FPR-R1P9	yes	0	3xFPR	1xP9	
MG-A000-3FPR-R2P9	yes	0	3xFPR	2xP9	

>> ORDERING INFORMATION: see page 797

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MG Multi-Function Ergonomic Right Hand Grip

FEATURES

- Optimum ergonomic design.
- Internal PWM driver.

MECHANICAL SPECIFICATIONS

- Material: thermoplastic
- Colour: black
- Operating temperature range: -25°C / +85°C
- Protection class: IP 65 with plain grip
(IP 67 with special assembly on request) IP 54 with dead man trigger option
- Connecting hub: female thread / M14 x 1.5

ELECTRICAL SPECIFICATIONS

- Prewired exit cable: 250 mm

A - Dead man push button

- Rated amperage: up to 3 A inductive
- Protection class (microswitch): IP 67

P9 - Push buttons

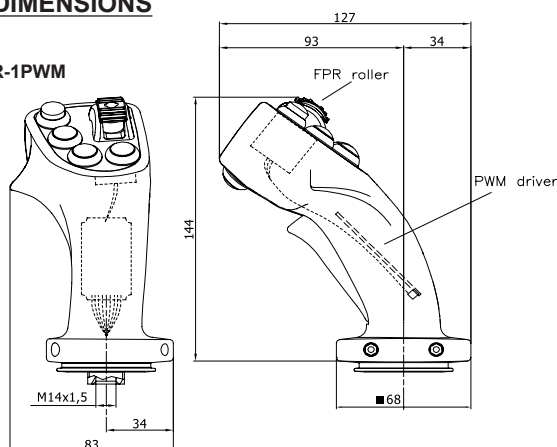
- Operational life: up to 100.000 cycles
- Rated amperage: up to 5 A resistive
up to 3 A inductive
- Protection class: IP 64 (IP 68 available)
- Available colours: red, blue, yellow, black, green, white
- Button and bezel material: thermoplastic
- Contacts: gold plated silver alloy

FPR - Proportional roller

- Output signal: see FPR data sheet
3-pins connection
hall effect contactless sensor

OVERALL DIMENSIONS

Mod.
MG-A4P9-1FPR-1PWM



PWM - Pulse width modulated output current driver for a dual coil proportional valve

- Supply voltage: 8-32 Volt
- Max. current draw: 100 mA
- Current output range: factory set btw 0 and 1500 mA
- PWM dither frequency: 100 Hz
- Operating temperature range: -25°C / +85°C

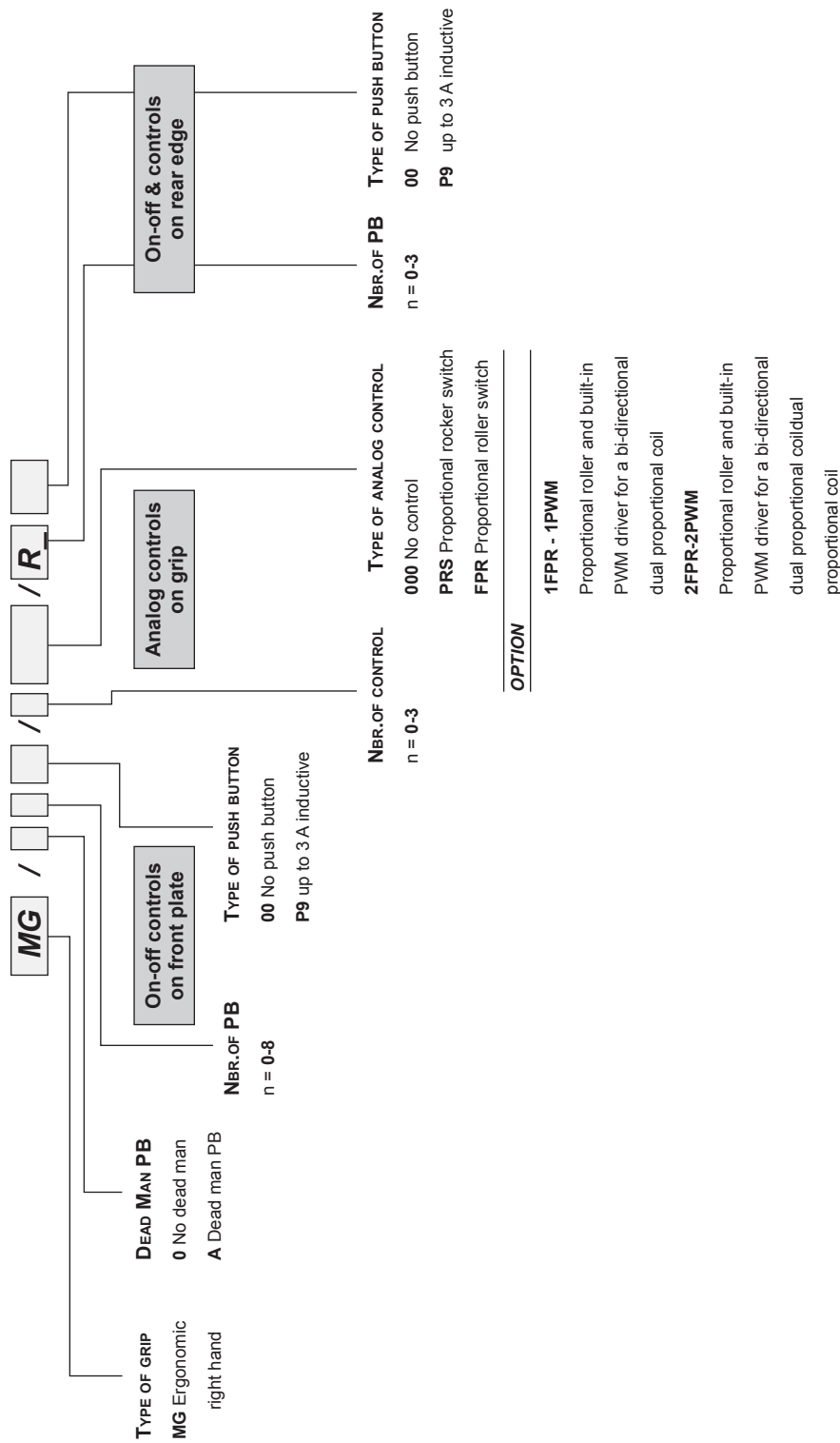
CONFIGURATION EXAMPLES

	D-man P/B	Front P/B	Front FPR	PWM	Rear P/B
MG-01P9-1FPR-1PWM	0	1xP9	1xFPR	1xPWM	
MG-A2P9-1FPR-1PWM	yes	2xP9	1xFPR	1xPWM	
MG-A3P9-1FPR-1PWM	yes	3xP9	1xFPR	1xPWM	
MG-A4P9-1FPR-1PWM	yes	4xP9	1xFPR	1xPWM	
MG-A4P9-1FPR-1PWM-R1P9	yes	4xP9	1xFPR	1xPWM	1xP9
MG-A4P9-1FPR-1PWM-R2P9	yes	4xP9	1xFPR	1xPWM	2xP9

>> ORDERING INFORMATION: see page 797

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MG Ergonomic Grip Ordering Information



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