

SOLENOID OPERATED DIRECTIONAL CONTROLS



2W2P NORMALLY CLOSED POPPET VALVES	ST2
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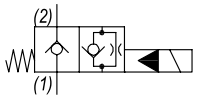
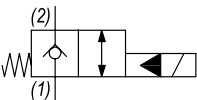
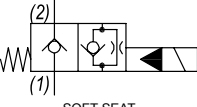


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2 WAY 2 POSITION NORMALLY CLOSED POPPET VALVES

2W2P NORMALLY CLOSED	GPM	PSI	LPM	BAR	CAVITY	MODEL	PAGE
	6	4000	23	276	5/8-18	UA-S2A	ST4
	8	3500	30	241	3/4-16	PB-S2A	ST8
	12	5000	45	345	3/4-16	HB-S2A	ST10
	15	3500	57	241	7/8-14	DE-S2A	ST14
	15	4000	57	276	7/8-14	HE-S2A	ST16
	25	3000	95	207	1 1/16-12	TT-S2A	ST20
	30	3500	114	241	1 5/16-12	SJ-S2A	ST22
	40	4350	151	300	1 5/16-12	HJ-S2A	ST24
	8	3500	30	241	3/4-16	PB-S2B	ST26
	12	5000	45	345	3/4-16	HB-S2B	ST28
	15	3500	57	241	7/8-14	DE-S2B	ST30
	15	4000	57	276	7/8-14	HE-S2B	ST32
	25	3000	95	207	1 1/16-12	TT-S2B	ST34
	25	5000	95	345	1 1/16-12	HT-S2B	ST36
	30	3500	114	241	1 5/16-12	SJ-S2B	ST38
 <p>SOFT SEAT</p>	4	3000	15	207	5/8-18	UA-S2F	ST6
	6	2500	23	172	3/4-16	PB-S2F	ST12
	10	1000	38	69	7/8-14	DE-S2F	ST18

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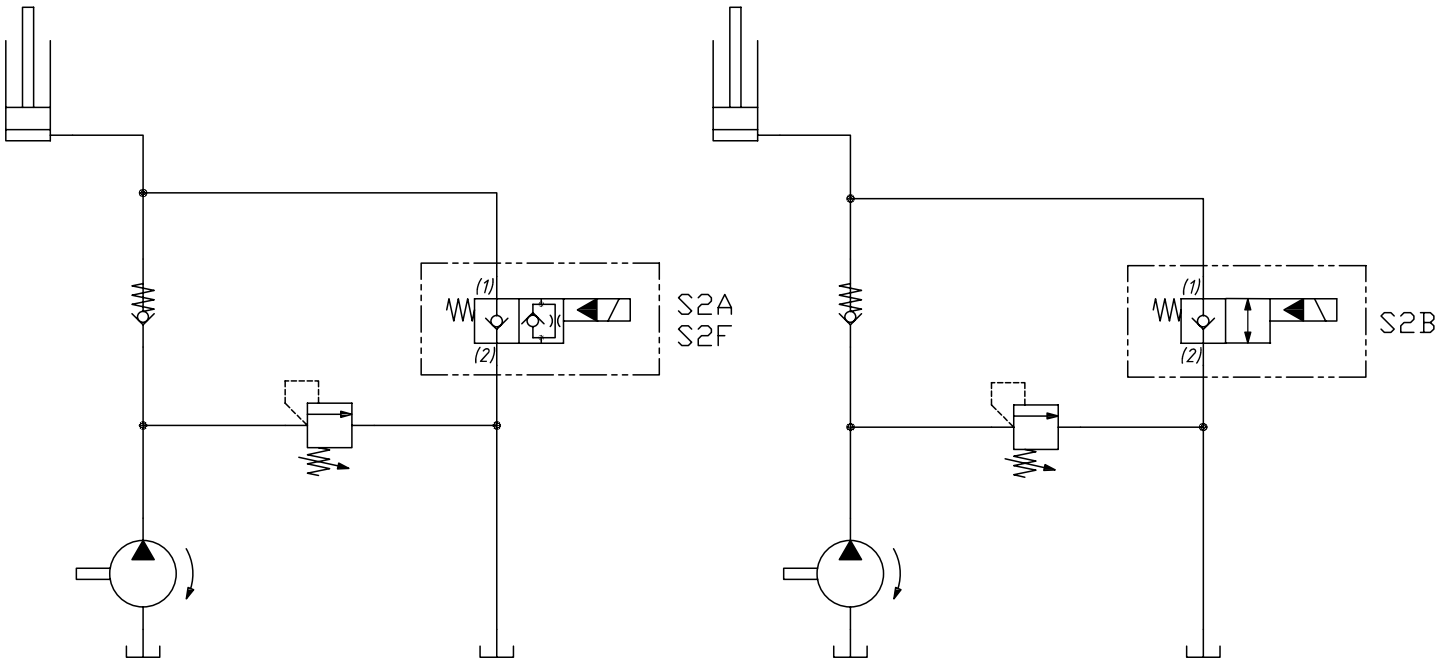
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TYPICAL SCHEMATIC

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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UA-S2A PILOT OPERATED POPPET, 2 WAY, NORMALLY CLOSED

DESCRIPTION

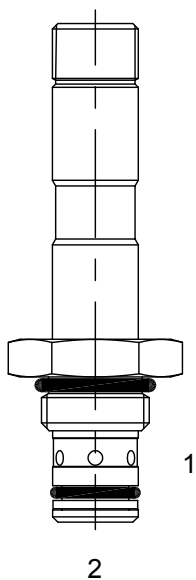
7 size, 5/8-18 thread, "Mini" series, solenoid operated, 2 way normally closed, pilot operated poppet valve with reverse flow de-energized.

OPERATION

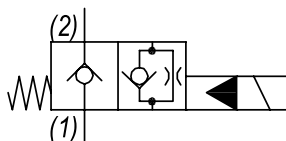
When de-energized the UA-S2A blocks flow from (1) to (2) and allows reverse flow from (2) to (1).
When energized, the valve allows flow from (1) to (2) and restricts flow from (2) to (1).

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.

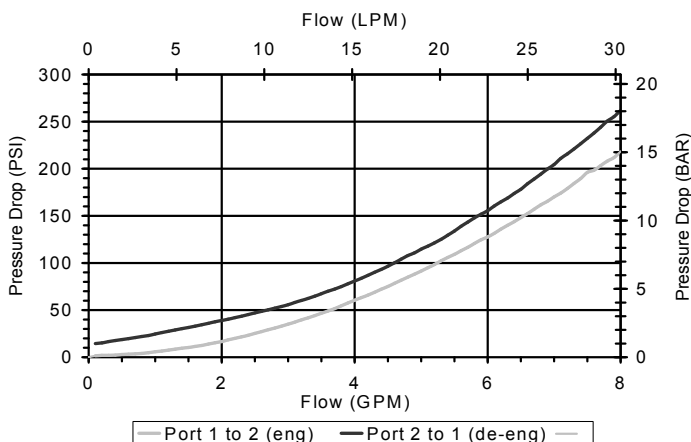


HYDRAULIC SYMBOL



PERFORMANCE

Actual Test Data (Cartridge Only)



VALVE SPECIFICATIONS

Nominal Flow	6 GPM (23 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 Temp. 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	4-6 ft-lbs (5.4-8.1 Nm)
Cavity	MINI 2W
Cavity Form Tool (Finishing)	40500003
Seal Kit	21191000

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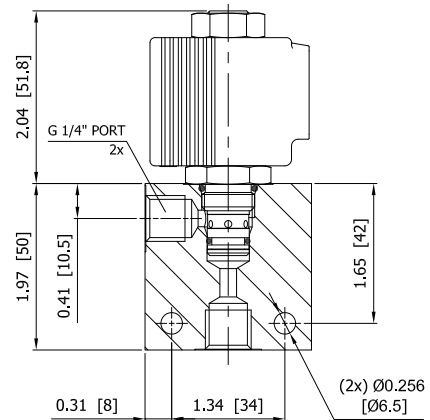
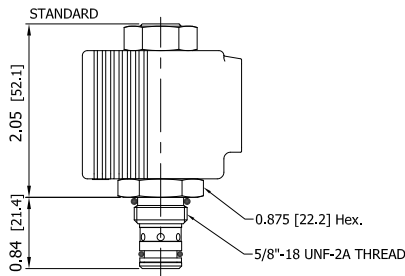
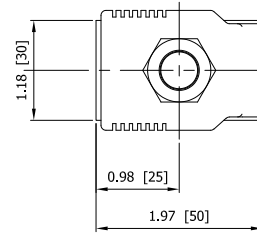
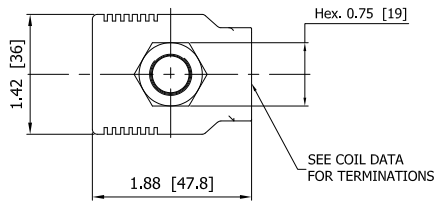
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SOLENOID OPERATED DIRECTIONAL CONTROLS

DIMENSIONS



ORDERING INFORMATION

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

UA-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)

BODIES

- Blank Without Body
- N** 1/4" BSP Ports
- S** #6 SAE Ports

VOLTAGE (other voltages available on request)

- 12** 12 VDC
- 24** 24 VDC
- 26** 220 VAC with molded full wave rectifier

"P" TYPE "J" COIL TERMINATION

- JA** "J" Coil AMP Superseal - Integral
- JD** "J" Coil Deutsch - Integral DT04-2P

JJ "J" Coil AMP Jr. Time - Integral

- JL** "J" Coil Double Lead
- JH** "J" Coil DIN 43650 (Hirschmann)

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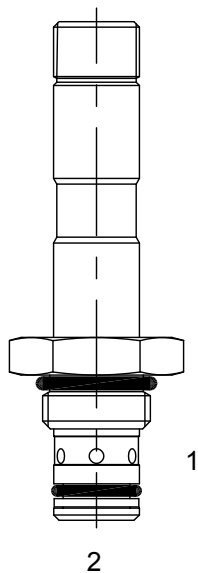


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UA-S2F PILOT OPERATED POPPET, 2 WAY, NORMALLY CLOSED – SOFT SEAT



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.

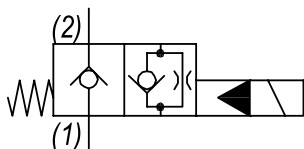
OPERATION

When de-energized the UA-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

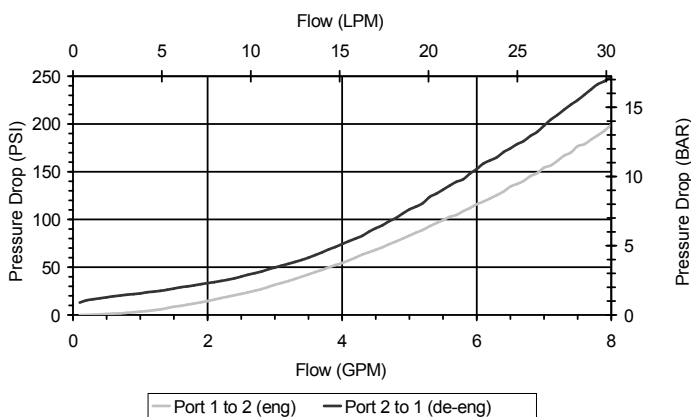
- Soft seat for ultra low leakage.
- Efficient wet-armature construction.
- Cartridges are voltage interchangeable.
- Industry common cavity.
- Unitized, molded coil design.
- Continuous duty rated solenoid.
- Optional coil voltages and terminations.

HYDRAULIC SYMBOL



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)	Negligible
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temp. 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	4-6 ft-lbs (5.4-8.1 Nm)
Cavity	MINI 2W
Cavity Form Tool (Finishing)	40500003
Seal Kit	21191000

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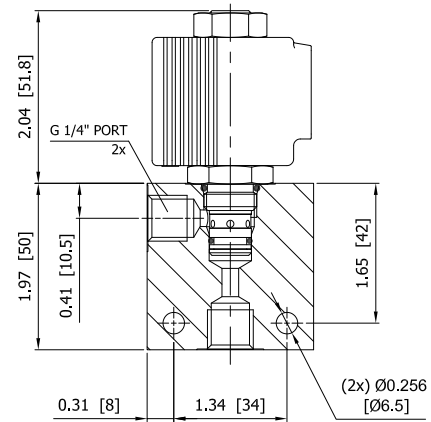
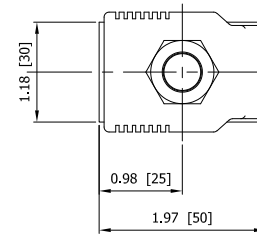
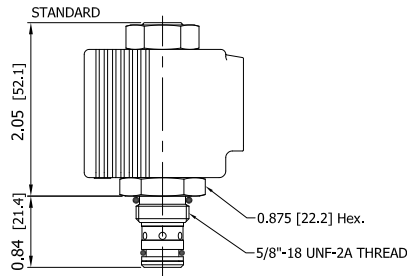
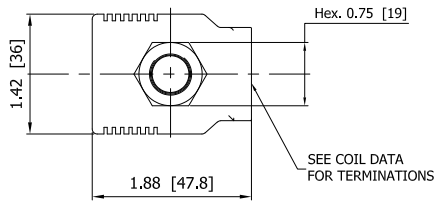
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SOLENOID OPERATED DIRECTIONAL CONTROLS

DIMENSIONS



ORDERING INFORMATION

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

UA-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)

BODIES

- Blank Without Body
- N** 1/4" BSP Ports
- S** #6 SAE Ports

VOLTAGE (other voltages available on request)

- 12** 12 VDC
- 24** 24 VDC
- 26** 220 VAC with molded full wave rectifier

"P" TYPE "J" COIL TERMINATION

- JA** "J" Coil AMP Superseal - Integral
- JD** "J" Coil Deutsch - Integral DT04-2P

JJ "J" Coil AMP Jr. Time - Integral

- JL** "J" Coil Double Lead
- JH** "J" Coil DIN 43650 (Hirschmann)

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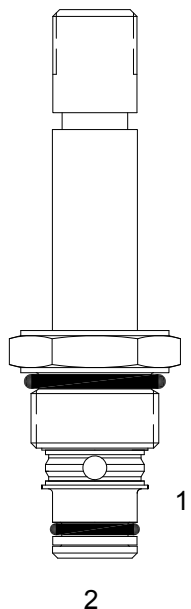


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PB-S2A PILOT OPERATED POPPET, 2 WAY NORMALLY CLOSED



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

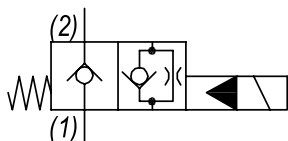
When de-energized the PB-S2A blocks flow from (1) to (2) and allows reverse flow from (2) to (1). When energized the valve allows flow from (1) to (2) and restricts flow from (2) to (1).

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

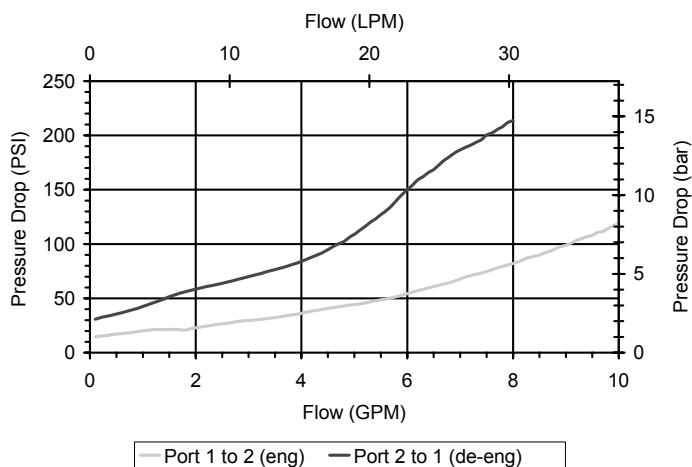
- Hardened parts for long life.
- Efficient wet-armature construction.
- Cartridges are voltage interchangeable.
- Manual override option.
- Industry common cavity.
- Unitized, molded coil design.
- Continuous duty rated solenoid.
- Optional coil voltages and terminations.
- Optional "I" Coil: Weatherproof, 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 Temp. 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 Tools Kit	
(form tool, reamer, tap)	40500005
Seal Kit	21191100

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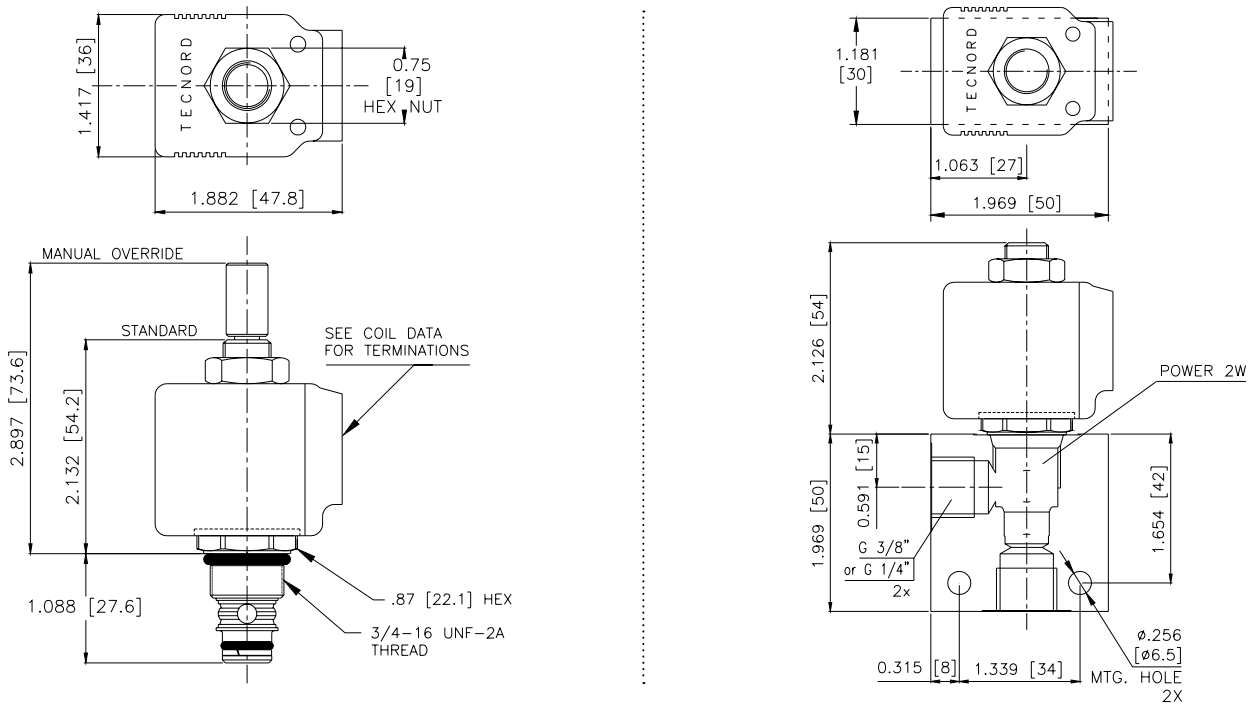


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DIMENSIONS



ORDERING INFORMATION

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

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, 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)

- BODIES**
- Blank** Without Body
 - N** 1/4" BSP Ports
 - N1** 3/8" BSP Ports
 - S** #6 SAE Ports

- VOLTAGE** (other voltages available on request)
- 12** 12 VDC
 - 24** 24 VDC
 - 22** 220 VAC without internal rectifier

"P" TYPE "J" COIL TERMINATION

- JA** "J" Coil AMP Superseal - Integral
- JD** "J" Coil Deutsch - Integral DT04-2P

JJ "J" Coil AMP Jr. Time - Integral

- JL** "J" Coil Double Lead
- JH** "J" Coil DIN 43650 (Hirschmann)

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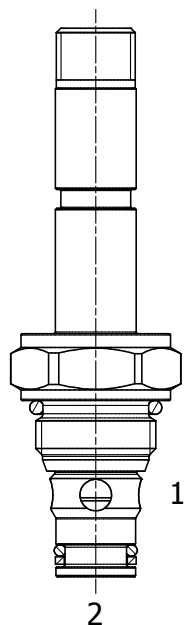


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HB-S2A PILOT OPERATED POPPET, 2 WAY NORMALLY CLOSED



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

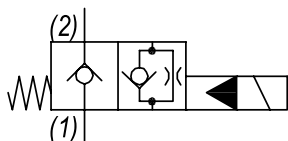
When de-energized the HB-S2A blocks flow from (1) to (2) and allows reverse flow from (2) to (1). When energized the valve allows flow from (1) to (2) and restricts flow from (2) to (1).

OPERATION OF MANUAL OVERRIDE OPTION: to override, turn the manual override screw counterclockwise. 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.

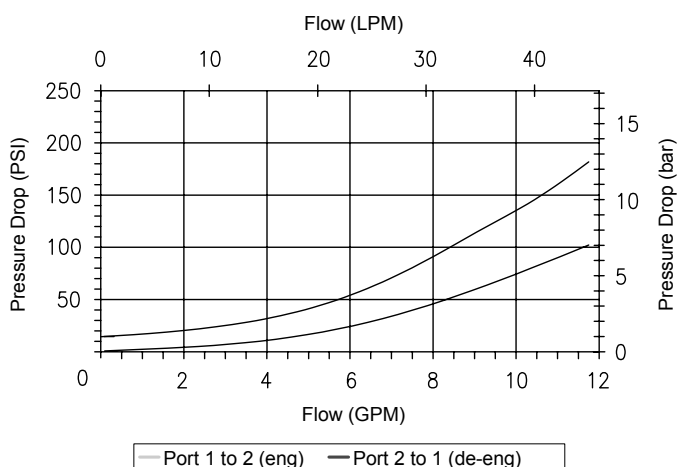
HYDRAULIC SYMBOL



Zinc Nickel plating on all exposed surfaces (>500hours corrosion resistance).

PERFORMANCE

Actual Test Data (Cartridge Only)



VALVE SPECIFICATIONS

Nominal Flow	12 GPM (45 LPM)
Rated Operating Pressure	5000 PSI (345 bar)
Typical Internal Leakage (150 SSU)	0-5 drops/min at 5000 PSI (345 bar)
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temp. 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	30-35 ft-lbs (41-47 Nm)
Coil Nut Torque Requirements	3-4.5 ft-lbs (4-6 Nm)
Cavity	POWER 2W
Cavity Tools Kit	40500005
Seal Kit	21191100

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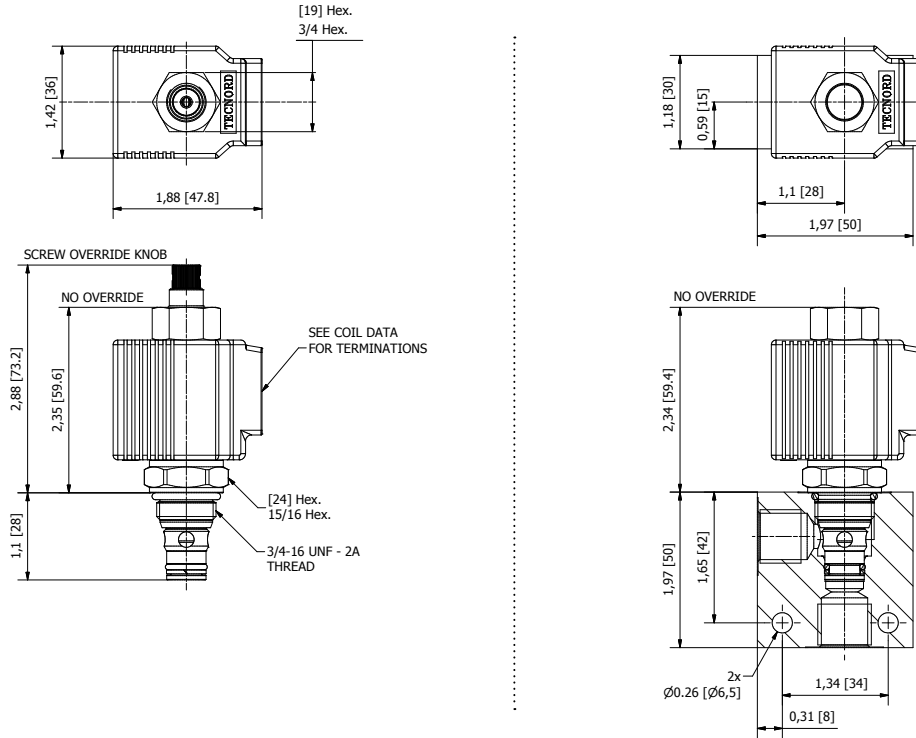


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DIMENSIONS



ORDERING INFORMATION

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

HB-S2A - - - -

- OPTIONS**
- Buna Standard **00**
 - Viton Standard **VO**
 - Buna, Screw, Override **OK**
 - Viton, Screw, Override **VK**

- BODIES**
- Blank Without Body
 - N** 1/4" BSP Ports (aluminum)
 - N1** 3/8" BSP Ports (aluminum)
 - S** #6 SAE Ports (aluminum)
 - H** 1/4" BSP Ports (steel)
 - H1** 3/8" BSP Ports (steel)
 - HS** #6 SAE Ports (steel)

Note: Aluminum bodies only for use up to 250 bar

- VOLTAGE** (other voltages available on request)
- 12** 12 VDC
 - 24** 24 VDC
 - 26** 26 VDC

"P" TYPE "J" COIL TERMINATION

- JA** "J" Coil AMP Superseal - Integral
- JD** "J" Coil Deutsch - Integral DT04-2P

JJ "J" Coil AMP Jr. Time - Integral

- JL** "J" Coil Double Lead
- JH** "J" Coil DIN 43650 (Hirschmann)

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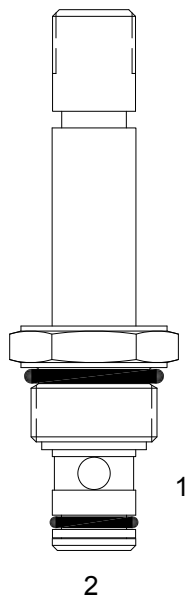
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SOLENOID OPERATED DIRECTIONAL CONTROLS

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

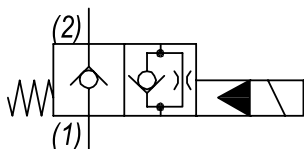
When de-energized the PB-S2F blocks flow from (1) to (2) and allows reverse flow from (2) to (1). When energized the valve allows flow from (1) to (2) and restrict flow from (2) to (1).

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.

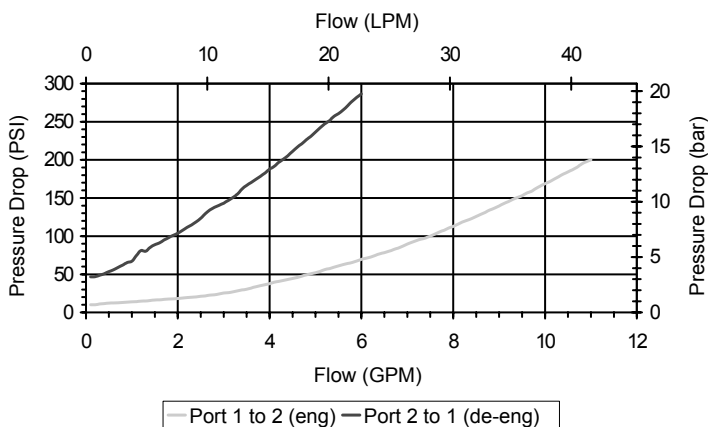
HYDRAULIC SYMBOL



Operational shift limit is 6 GPM (23 LPM).
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 Temp. 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 Tools Kit	
(form tool, reamer, tap)	40500005
Seal Kit	21191100

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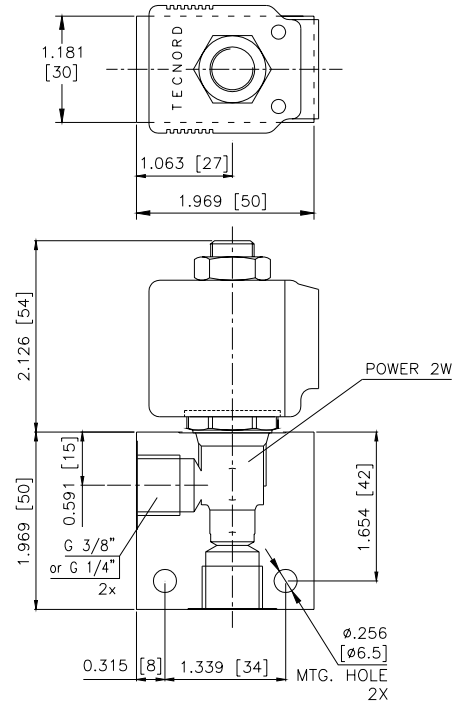
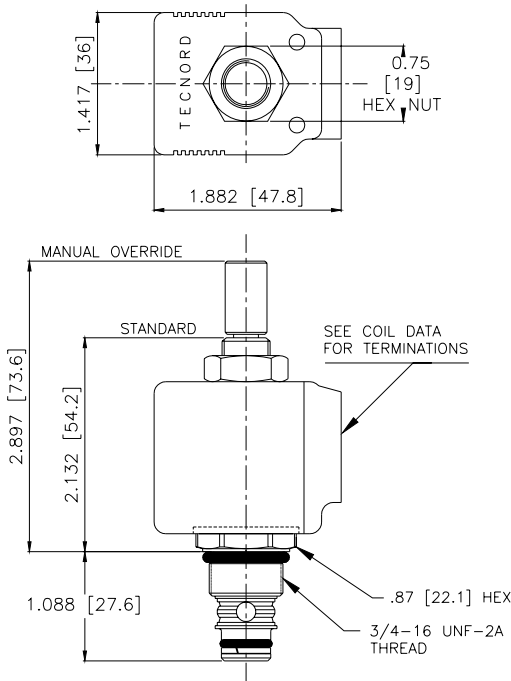


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DIMENSIONS



ORDERING INFORMATION

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

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, 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)

- BODIES**
- Blank** Without Body
 - N** 1/4" BSP Ports
 - N1** 3/8" BSP Ports
 - S** #6 SAE Ports

VOLTAGE (other voltages available on request)

- 12** 12 VDC
- 24** 24 VDC
- 22** 220 VAC without internal rectifier

"P" TYPE "J" COIL TERMINATION

- JA** "J" Coil AMP Superseal - Integral
- JD** "J" Coil Deutsch - Integral DT04-2P

JJ "J" Coil AMP Jr. Time - Integral

- JL** "J" Coil Double Lead
- JH** "J" Coil DIN 43650 (Hirschmann)

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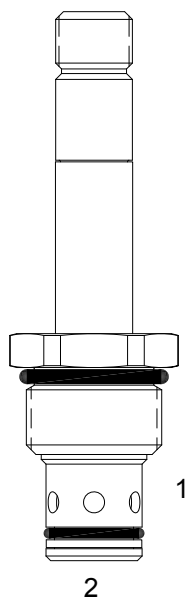


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DE-S2A PILOT OPERATED POPPET, 2 WAY NORMALLY CLOSED



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

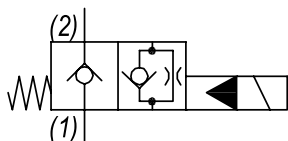
When de-energized the DE-S2A blocks flow from (1) to (2) and allows reverse flow from (2) to (1). When energized the valve allows flow from (1) to (2) and restricts flow from (2) to (1).

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

FEATURES

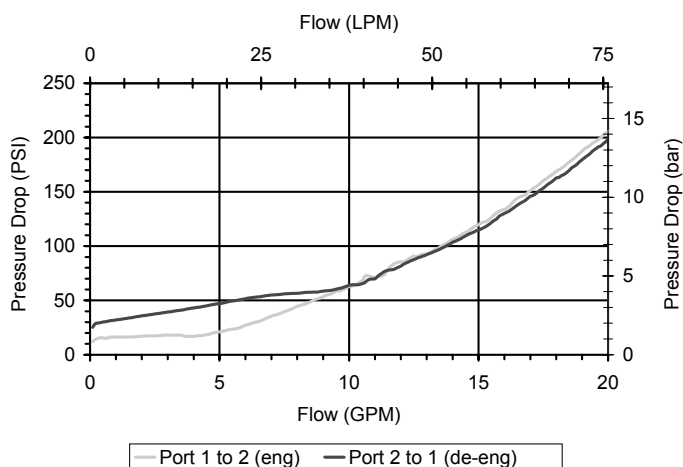
- Hardened parts for long life.
- Efficient wet-armature construction.
- Cartridges are voltage interchangeable.
- Manual override option.
- Industry common cavity.
- Unitized, molded coil design.
- Continuous duty rated solenoid.
- Optional coil voltages and terminations.
- Optional "I" Coil: Weatherproof, 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 Temp. 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 Tools Kit	
(form tool, reamer, tap)	40500000
Seal Kit	21191200

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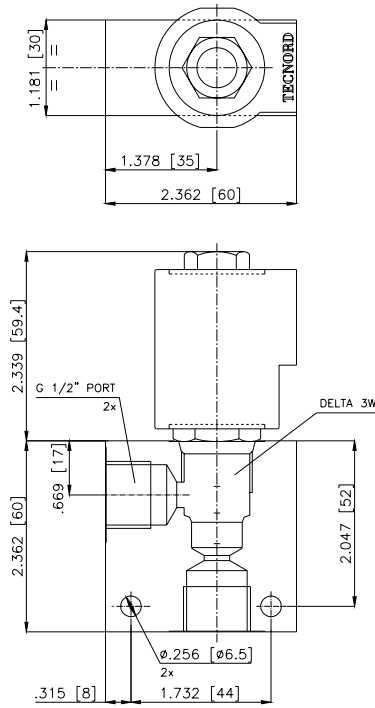
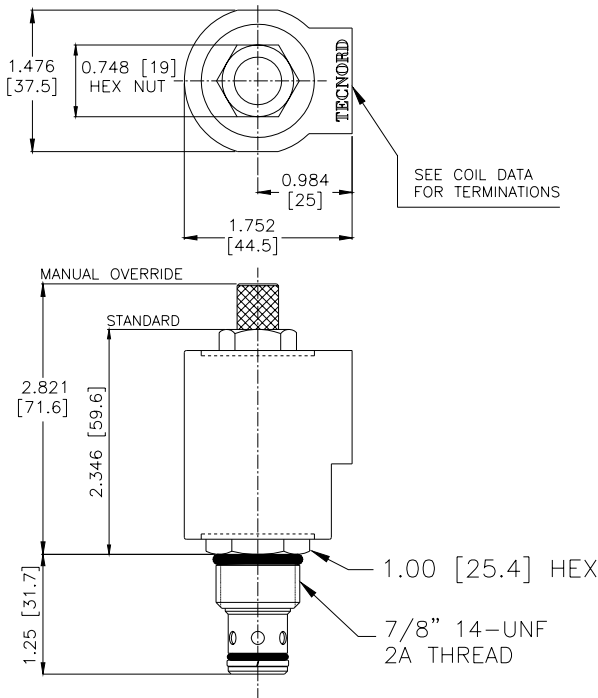


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DIMENSIONS



ORDERING INFORMATION

Approximate Coil Weight: .56 lbs (.25 kg)

DE-S2A - - - -

- 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**

- BODIES**
- Blank Without Body
 - N** 1/2" BSP Ports
 - S** #8 SAE Ports

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

VOLTAGE (other voltages available on request)

- 12** 12 VDC
- 24** 24 VDC
- 22** 220 VAC without internal rectifier

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

DL Double Lead
(several types of termination can be attached on leads on request)

HC DIN 43650 (Hirschmann) - (AC&DC)
DI Deutsch - Integral DT04-2P

IMMERSION PROOF "D" TYPE

- DIA** "1" Coil AMP Superseal - Integral
- DID** "1" Coil Deutsch - Integral DT04-2P
- DIJ** "1" Coil AMP Jr. Timer - Integral
- DIM** "1" Coil Metri-Pack - Integral

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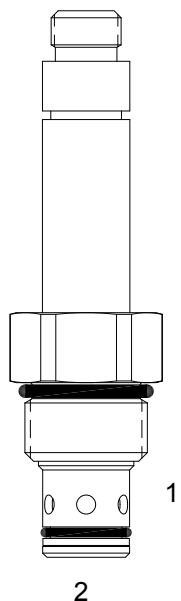


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HE-S2A PILOT OPERATED POPPET, 2 WAY NORMALLY CLOSED



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.

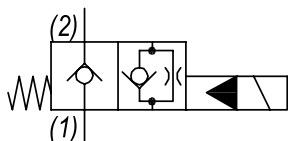
OPERATION

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.

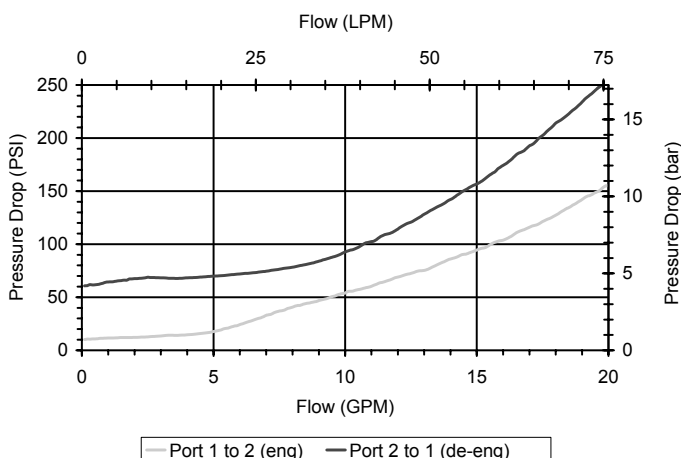
HYDRAULIC SYMBOL



Uses “L” Coils.

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 Temp. Range	-40° to 250°F (-40° to 120°C)
Weight	.39 lbs (.17 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 Tools Kit (form tool, reamer, tap)	40500000
Seal Kit	21191200

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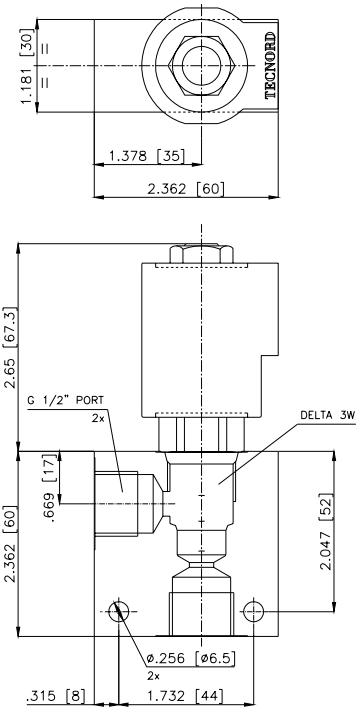
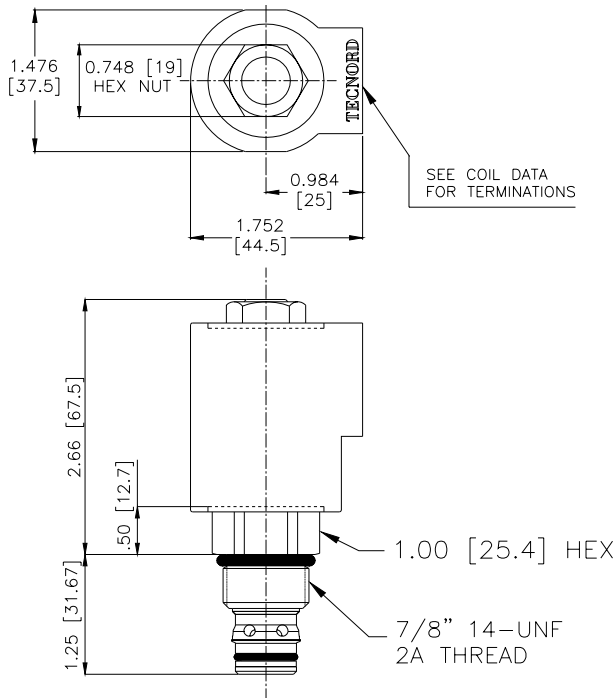


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DIMENSIONS



ORDERING INFORMATION

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

HE-S2A

- OPTIONS**
 Buna Standard **00**
 Viton Standard **V0**

- BODIES**
 Blank Without Body
N 1/2" BSP Ports
S #8 SAE Ports

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

- VOLTAGE** (other voltages available on request)
12 12 VDC
24 24 VDC
22 220 VAC without internal rectifier

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

DL Double Lead
 (several types of termination can be attached on leads on request)

HC DIN 43650 (Hirschmann) - (AC&DC)
DI Deutsch - Integral DT04-2P

IMMERSION PROOF "L" TYPE
LIA "I" Coil AMP Superseal - Integral
LID "I" Coil Deutsch - Integral DT04-2P
LIJ "I" Coil AMP Jr. Timer - Integral
LIM "I" Coil Metri-Pack - Integral

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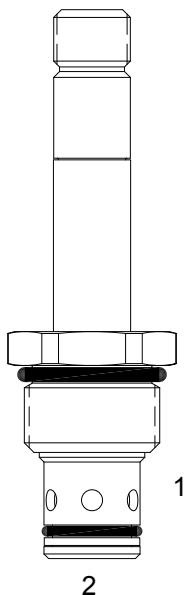


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DE-S2F PILOT OPERATED POPPET, 2 WAY NORMALLY CLOSED, SOFT SEAT



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

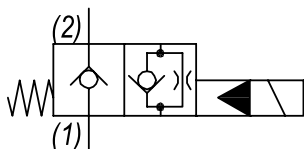
When de-energized the DE-S2F blocks flow from (1) to (2) and allows reverse flow from (2) to (1). When energized the valve allows flow from (1) to (2) but restricts reverse flow from (2) to (1).

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.

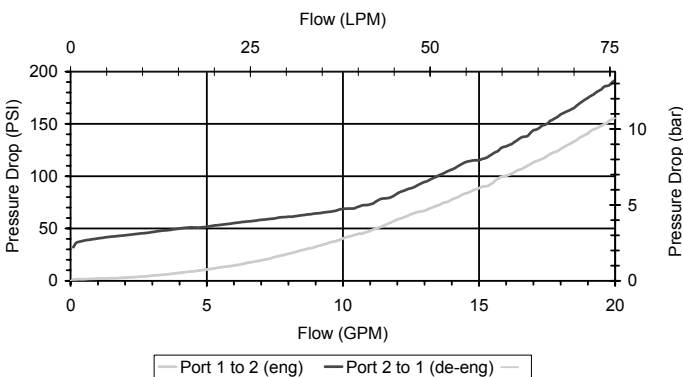
HYDRAULIC SYMBOL



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 Temp. 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 Tools Kit	
(form tool, reamer, tap)	40500000
Seal Kit	21191200

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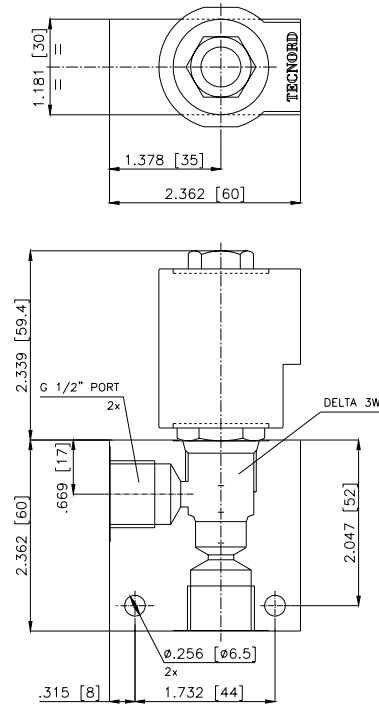
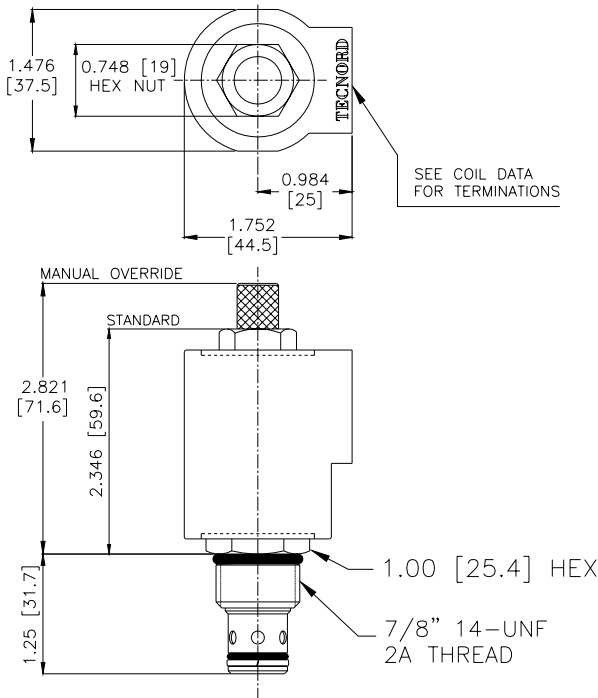


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DIMENSIONS



ORDERING INFORMATION

Approximate Coil Weight: .56 lbs (.25 kg)

DE-S2F - - - -

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)

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

DL Double Lead
(several types of termination can be attached on leads on request)

HC DIN 43650 (Hirschmann) - (AC&DC)
DI Deutsch - Integral DT04-2P

BODIES

- Blank** Without Body
- N** 1/2" BSP Ports
- S** #8 SAE Ports

VOLTAGE (other voltages available on request)

- 12** 12 VDC
- 24** 24 VDC
- 22** 220 VAC without internal rectifier

IMMERSION PROOF "D" TYPE

- DIA** "I" Coil AMP Superseal - Integral
- DID** "I" Coil Deutsch - Integral DT04-2P
- DIJ** "I" Coil AMP Jr. Timer - Integral
- DIM** "I" Coil Metri-Pack - Integral

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TT-S2A PILOT OPERATED POPPET, 2 WAY NORMALLY CLOSED

DESCRIPTION

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

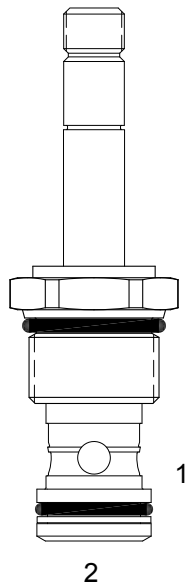
OPERATION

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).

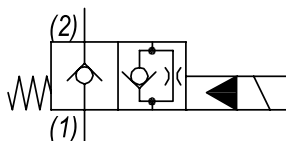
OPERATION OF MANUAL OVERRIDE OPTION: to override, pull knob out. On the detented version, after pulling knob out twist 180 degrees and release. The valve will remain in that position.

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.

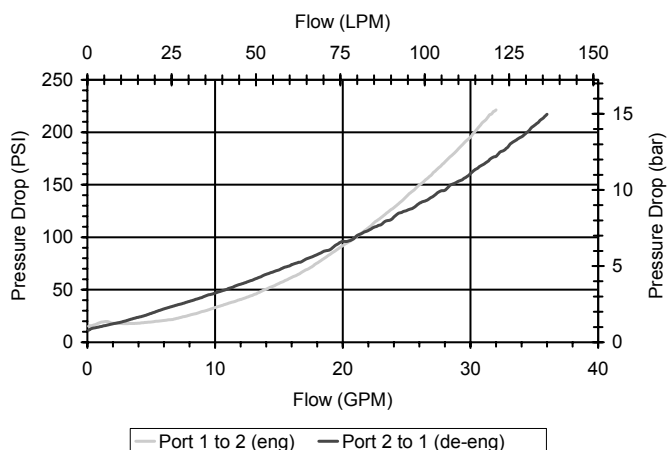


HYDRAULIC SYMBOL



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 Temp. Range	-40° to 250°F (-40° to 120°C)
Weight	.49 lbs (.22 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	TECNORD 2W
Cavity Tools Kit	
(form tool, reamer, tap)	40500032
Seal Kit	21191300

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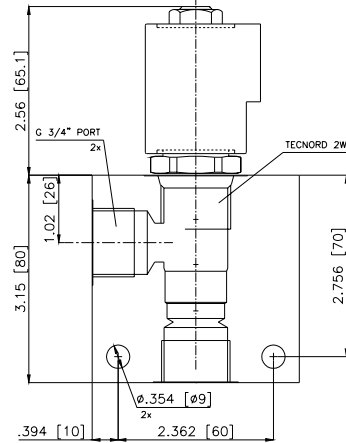
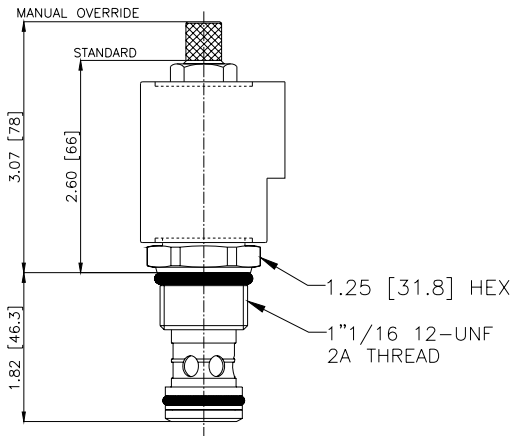
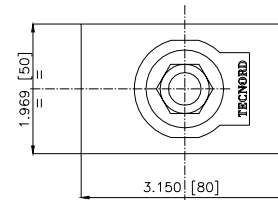
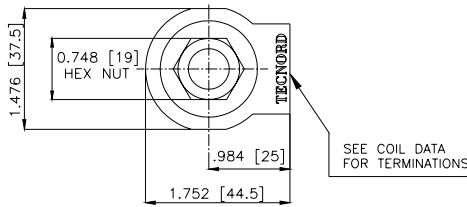


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DIMENSIONS



ORDERING INFORMATION

Approximate Coil Weight: .56 lbs (.25 kg)

TT-S2A

- OPTIONS**
- Buna Standard **00**
 - Viton Standard **V0**
 - Buna, Override, Detent **0M**
 - Viton, Override, Detent **VM**
 - Buna, Screen **A0**
 - Viton, Screen **W0**
 - 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)

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

DL Double Lead
(several types of termination can be attached on leads on request)

HC DIN 43650 (Hirschmann) - (AC&DC)
DI Deutsch - Integral DT04-2P

IMMERSION PROOF "D" TYPE

- DIA** "I" Coil AMP Superseal - Integral
- DID** "I" Coil Deutsch - Integral DT04-2P
- DIJ** "I" Coil AMP Jr. Timer - Integral
- DIM** "I" Coil Metri-Pack - Integral

- BODIES**
- Blank** Without Body
 - N** 3/4" BSP Ports
 - S** #12 SAE Ports

- VOLTAGE** (other voltages available on request)
- 12** 12 VDC
 - 24** 24 VDC
 - 22** 220 VAC without internal rectifier

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

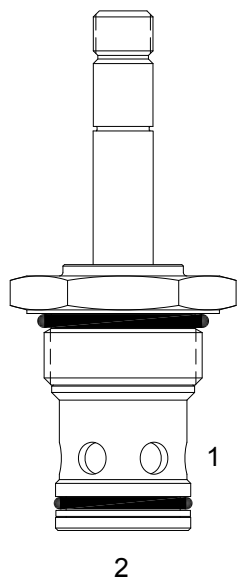


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SJ-S2A PILOT OPERATED POPPET, 2 WAY NORMALLY CLOSED



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

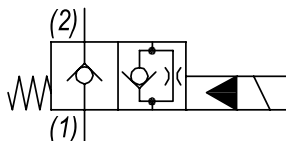
When de-energized the SJ-S2A blocks flow from (1) to (2) and allows reverse flow from (2) to (1). When energized the valve allows flow from (1) to (2) and restricted flow from (2) to (1).

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

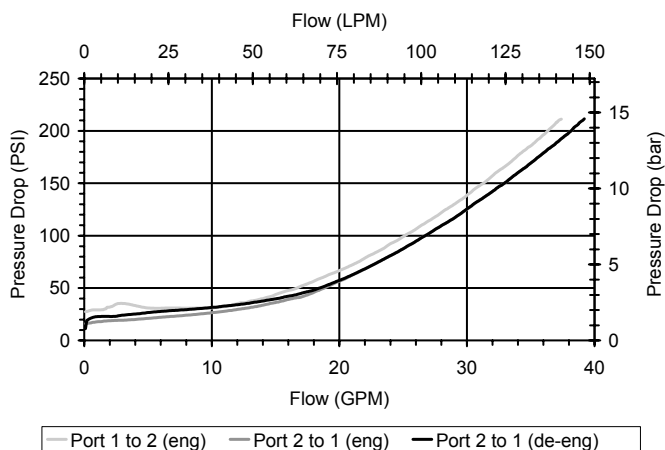
- Hardened parts for long life.
- Efficient wet-armature construction.
- Cartridges are voltage interchangeable.
- Manual override option.
- Industry common cavity.
- Unitized, molded coil design.
- Continuous duty rated solenoid.
- Optional coil voltages and terminations.
- Optional "I" Coil: Weatherproof, 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 Temp. 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 Tools Kit	
(form tool, reamer, tap)	40500017
Seal Kit	21191400

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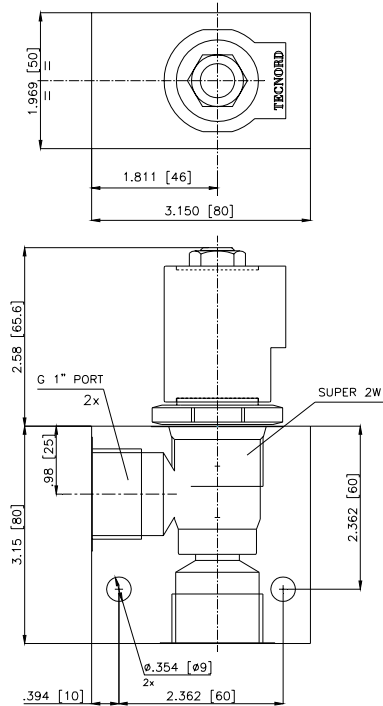
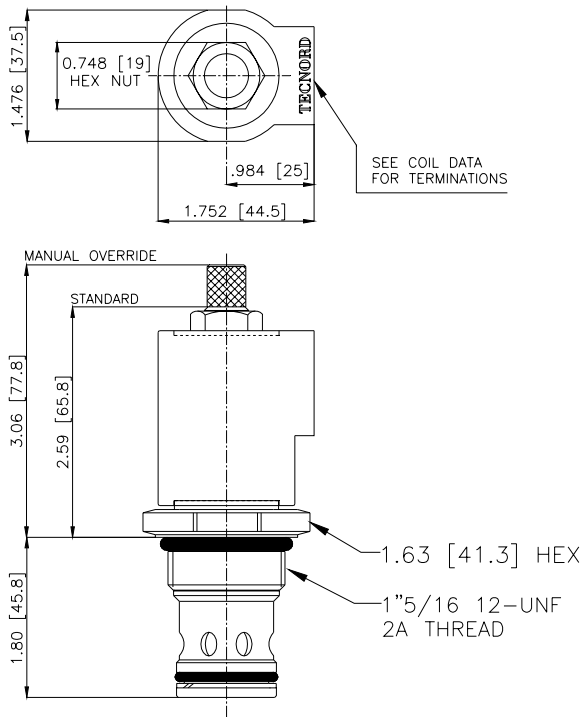


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DIMENSIONS



ORDERING INFORMATION

Approximate Coil Weight: .56 lbs (.25 kg)

SJ-S2A - - - -

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**

BODIES

- Blank** Without Body
- N** 1" BSP Ports
- S** #12 SAE Ports

VOLTAGE (other voltages available on request)

- 12** 12 VDC
- 24** 24 VDC
- 22** 220 VAC without internal rectifier

"V" COIL TERMINATION

(All DC Except as Noted)

DL Double Lead
(several types of termination can be attached on leads on request)

HC DIN 43650 (Hirschmann) - (AC&DC)
DI Deutsch - Integral DT04-2P

DIA "1" Coil AMP Superseal - Integral
DID "1" Coil Deutsch - Integral DT04-2P
DIJ "1" Coil AMP Jr. Timer - Integral
DIM "1" Coil Metri-Pack - Integral

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HJ-S2A PILOT OPERATED POPPET, 2 WAY NORMALLY CLOSED

DESCRIPTION

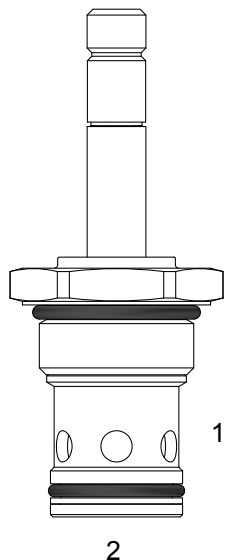
“High Pressure” 16 size, 1 5/16-12 thread, “Super” series, solenoid operated, 2 way normally closed, pilot operated poppet valve with reverse flow de-energized.

OPERATION

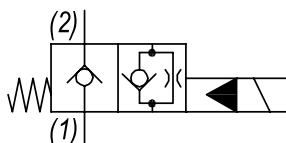
When de-energized the HJ-S2A blocks flow from (1) to (2) and allows reverse flow from (2) to (1). When energized the valve allows flow from (1) to (2) and restricted flow from (2) to (1).

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.

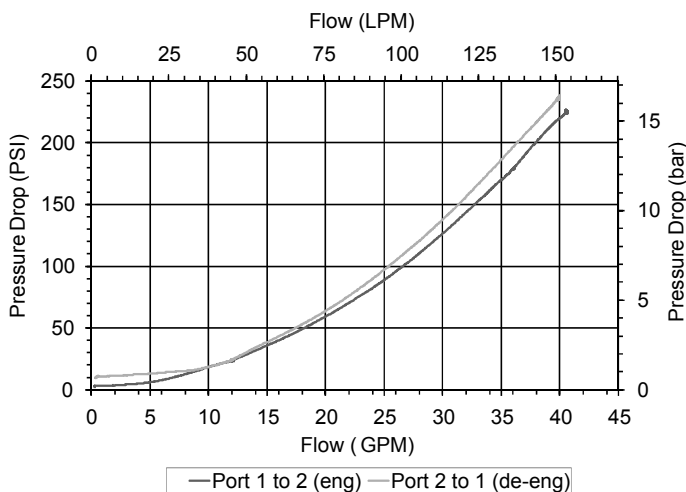


HYDRAULIC SYMBOL



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 Temp. 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 Tools Kit	
(form tool, reamer, tap)	40500017
Seal Kit	21191400

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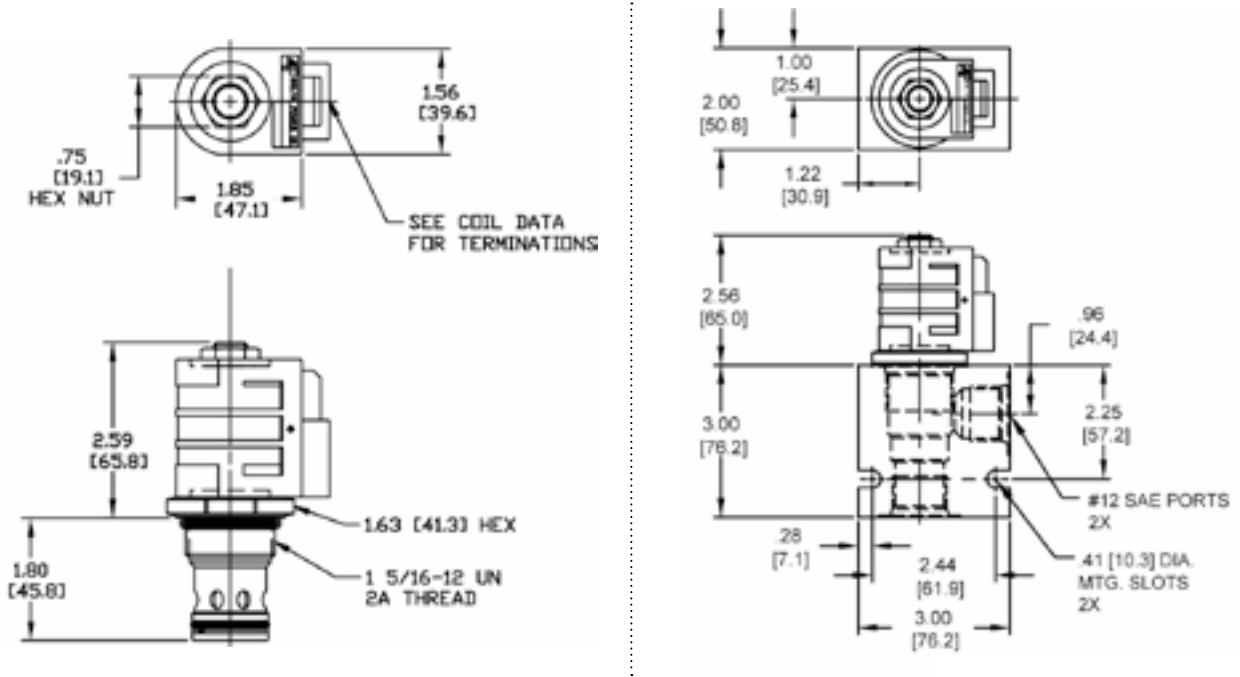


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DIMENSIONS



ORDERING INFORMATION

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

HJ-S2A - - - -		
OPTIONS		BODIES
Buna Standard	00	Blank Without Body
Viton Standard	V0	N 3/4 NPT Ports
		S #12 SAE Ports
		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

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

"D" COIL TERMINATION
(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 (Hirschmann) - (AC&DC) |
| PL Packard on Leads | CL Conduit Lead - (AC Only) |
| WL Weatherpack on Leads | DI Deutsch - Integral DT04-2P |

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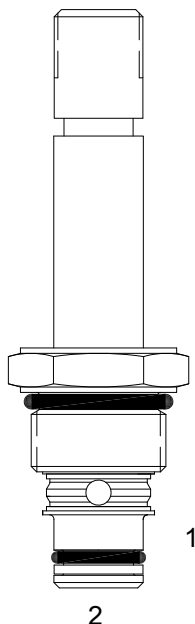


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PB-S2B PILOT OPERATED POPPET, 2 WAY NORMALLY CLOSED



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

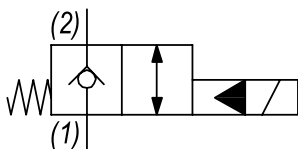
When de-energized the PB-S2B blocks flow from (1) to (2) and allows reverse flow from (2) to (1). When energized the valve allows flow from (1) to (2) and (2) to (1).

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

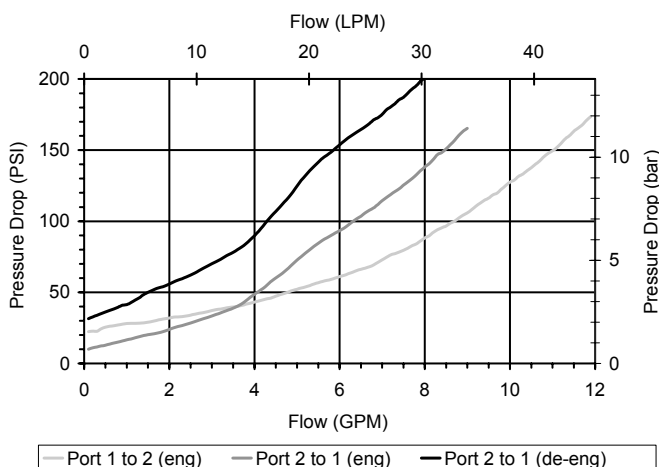
- Hardened parts for long life.
- Efficient wet-armature construction.
- Cartridges are voltage interchangeable.
- Manual override option.
- Industry common cavity.
- Unitized, molded coil design.
- Continuous duty rated solenoid.
- Optional coil voltages and terminations.
- Optional "I" Coil: Weatherproof, 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 Temp. 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 Tools Kit	
(form tool, reamer, tap)	40500005
Seal Kit	21191100

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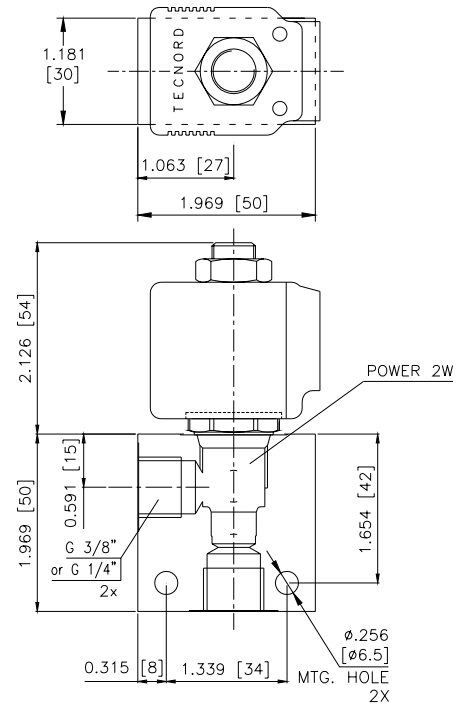
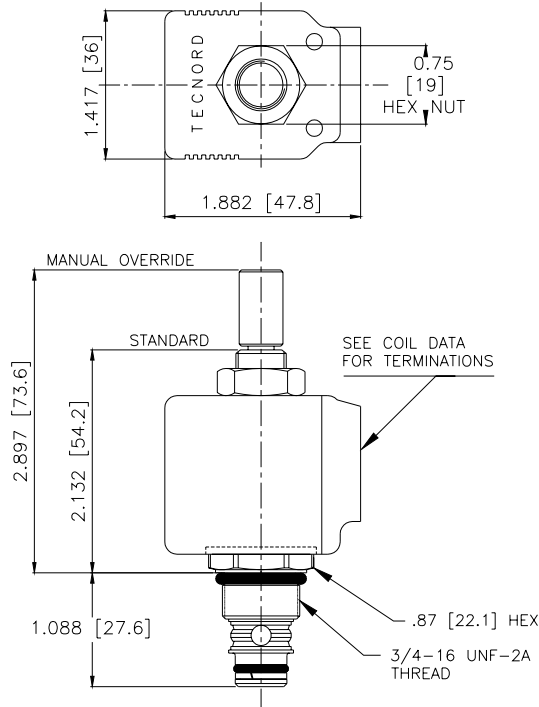


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DIMENSIONS



ORDERING INFORMATION

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

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, 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)

- BODIES**
- Blank** Without Body
 - N** 1/4" BSP Ports
 - N1** 3/8" BSP Ports
 - S** #6 SAE Ports

VOLTAGE (other voltages available on request)

- 12** 12 VDC
- 24** 24 VDC
- 22** 220 VAC without internal rectifier

"P" TYPE "J" COIL TERMINATION

- JA** "J" Coil AMP Superseal - Integral
- JD** "J" Coil Deutsch - Integral DT04-2P

JJ "J" Coil AMP Jr. Time - Integral

- JL** "J" Coil Double Lead
- JH** "J" Coil DIN 43650 (Hirschmann)

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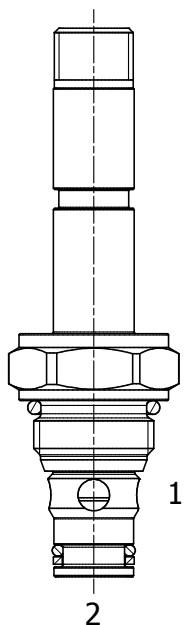


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HB-S2B PILOT OPERATED, 2 WAY NORMALLY CLOSED WITH REVERSED FLOW ENERGIZED



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

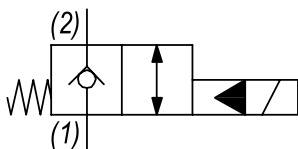
When de-energized the HB-S2B blocks flow from (1) to (2) and allows reverse flow from (2) to (1). When energized the valve allows flow from (1) to (2) and from (2) to (1).

OPERATION OF MANUAL OVERRIDE OPTION: to override, turn the manual override screw counterclockwise. 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.

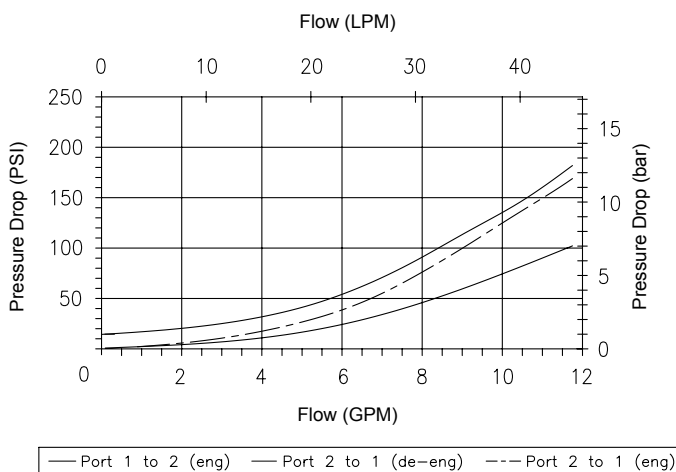
HYDRAULIC SYMBOL



Zinc Nickel plating on all exposed surfaces (>500hours corrosion resistance).

PERFORMANCE

Actual Test Data (Cartridge Only)



VALVE SPECIFICATIONS

Nominal Flow	12 GPM (45 LPM)
Rated Operating Pressure	5000 PSI (345 bar)
Typical Internal Leakage (150 SSU)	0-5 drops/min at 5000 PSI (345 bar)
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temp. 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	30-35 ft-lbs (41-47 Nm)
Coil Nut Torque Requirements	3-4.5 ft-lbs (4-6 Nm)
Cavity	POWER 2W
Cavity Tools Kit	40500005
Seal Kit	21191100

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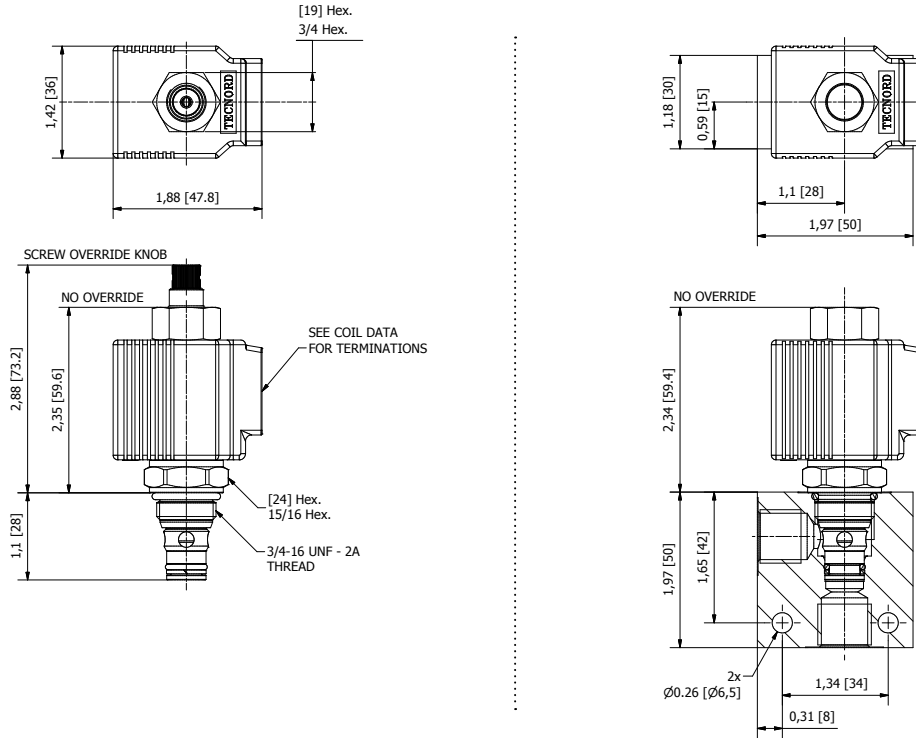


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DIMENSIONS



ORDERING INFORMATION

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

HB-S2B - - - -

- OPTIONS**
- Buna Standard **00**
 - Viton Standard **V0**
 - Buna, Screw, Override **OK**
 - Viton, Screw, Override **VK**

- BODIES**
- Blank Without Body
 - N** 1/4" BSP Ports (aluminum)
 - N1** 3/8" BSP Ports (aluminum)
 - S** #6 SAE Ports (aluminum)
 - H** 1/4" BSP Ports (steel)
 - H1** 3/8" BSP Ports (steel)
 - HS** #6 SAE Ports (steel)

Note: Aluminum bodies only for use up to 250 bar

- VOLTAGE** (other voltages available on request)
- 12** 12 VDC
 - 24** 24 VDC
 - 26** 26 VDC

"P" TYPE "J" COIL TERMINATION

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

W 9 / 2020

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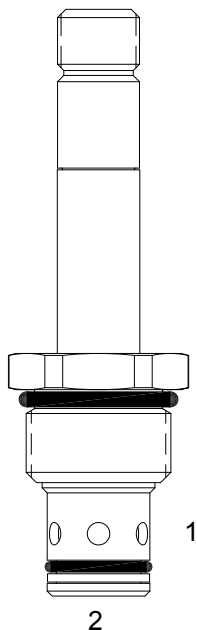


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DE-S2B PILOT OPERATED POPPET, 2 WAY NORMALLY CLOSED



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

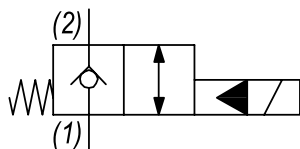
When de-energized the DE-S2B acts as a check valve, allowing flow to pass from (2) to (1), while blocking flow from (1) to (2). When energized the valve opens allowing flow to pass from (1) to (2).

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

FEATURES

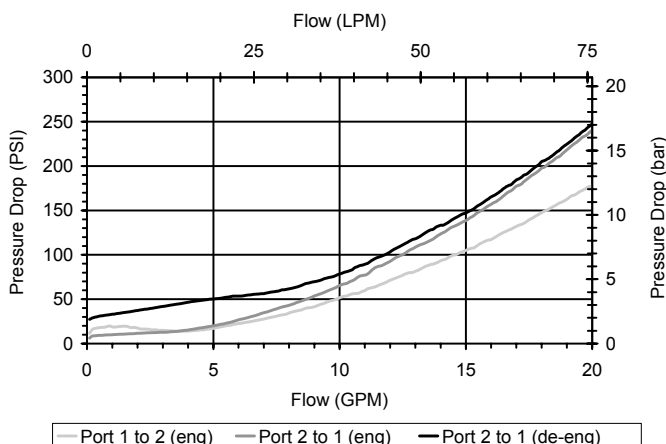
- Hardened parts for long life.
- Efficient wet-armature construction.
- Cartridges are voltage interchangeable.
- Manual override option.
- Industry common cavity.
- Unitized, molded coil design.
- Continuous duty rated solenoid.
- Optional coil voltages and terminations.
- Optional "I" Coil: Weatherproof, 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 Temp. 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 Tools Kit	
(form tool, reamer, tap)	40500000
Seal Kit	21191200

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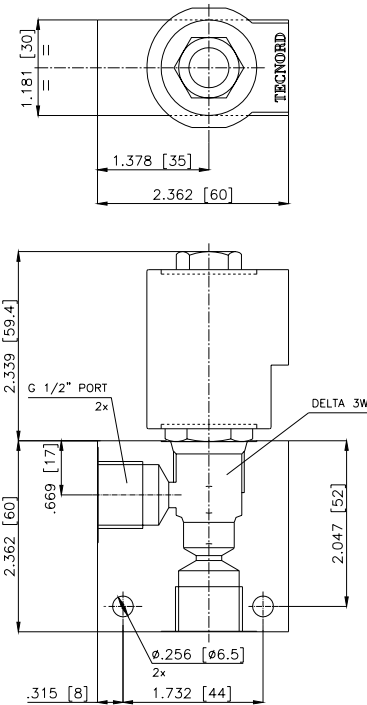
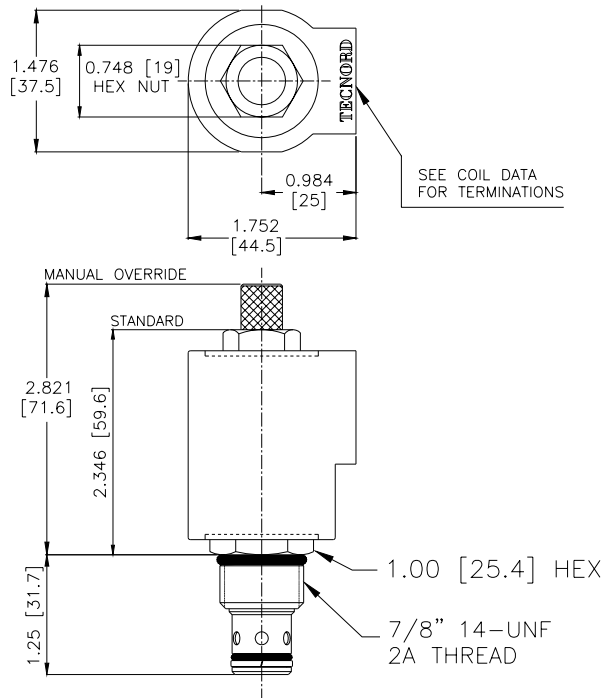


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DIMENSIONS



ORDERING INFORMATION

Approximate Coil Weight: .56 lbs (.25 kg)

DE-S2B

- 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)

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

DL Double Lead
(several types of termination can be attached on leads on request)

HC DIN 43650 (Hirschmann) - (AC&DC)
DI Deutsch - Integral DT04-2P

IMMERSION PROOF "D" TYPE

- DIA** "I" Coil AMP Superseal - Integral
- DID** "I" Coil Deutsch - Integral DT04-2P
- DIJ** "I" Coil AMP Jr. Timer - Integral
- DIM** "I" Coil Metri-Pack - Integral

- BODIES**
- Blank** Without Body
 - N** 1/2" BSP Ports
 - S** #8 SAE Ports

- VOLTAGE** (other voltages available on request)
- 12** 12 VDC
 - 24** 24 VDC
 - 22** 220 VAC without internal rectifier

W 9 / 2020

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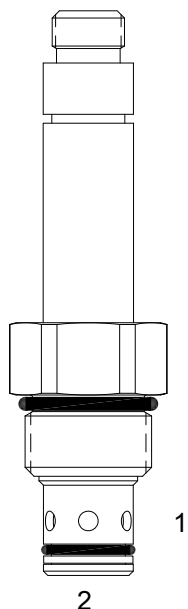


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HE-S2B PILOT OPERATED POPPET, 2 WAY NORMALLY CLOSED



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.

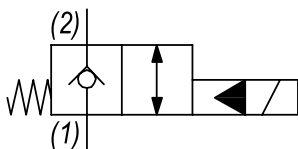
OPERATION

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.

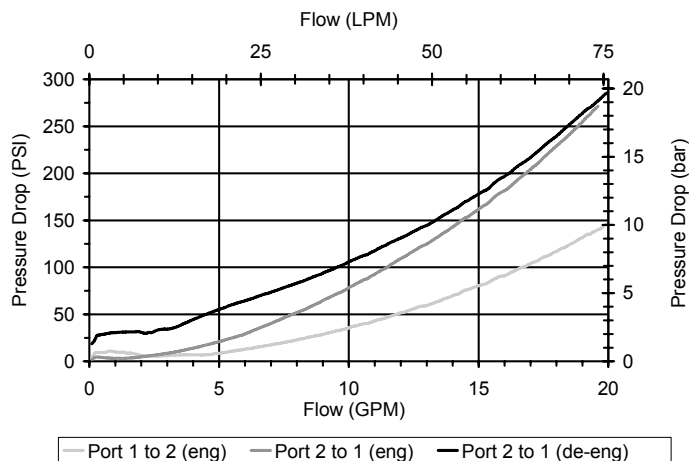
HYDRAULIC SYMBOL



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 Temp. 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 Tools Kit	
(form tool, reamer, tap)	40500000
Seal Kit	21191200

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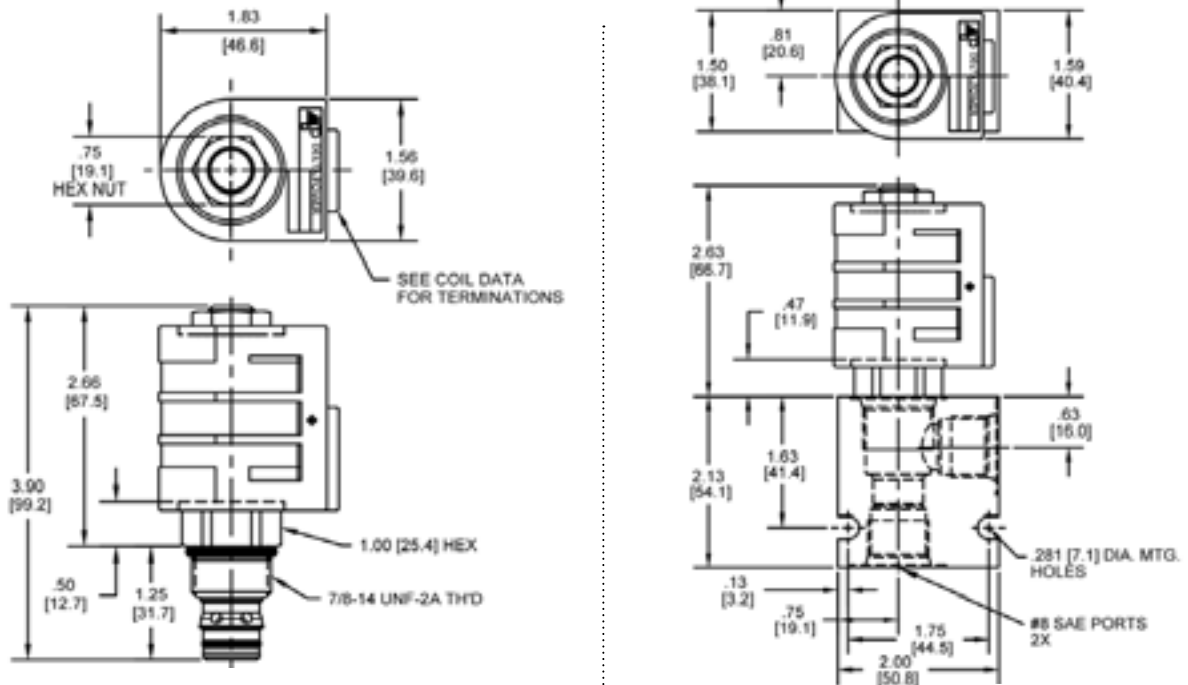
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SOLENOID OPERATED DIRECTIONAL CONTROLS

DIMENSIONS



ORDERING INFORMATION

HE-S2B - - - -

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

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

BODIES
 Blank Without Body
N 3/8 NPTF Ports
S #8 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 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 (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

IMMERSION PROOF "L" TYPE

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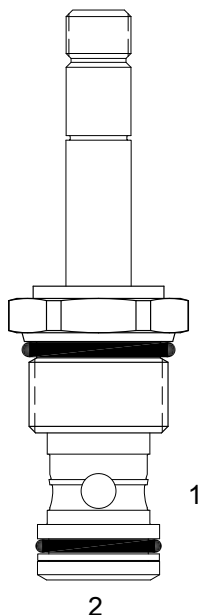


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TT-S2B PILOT OPERATED POPPET, 2 WAY NORMALLY CLOSED



DESCRIPTION

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

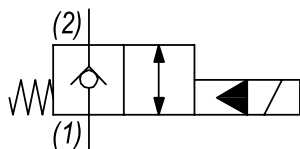
When de-energized the TT-S2B blocks flow from (1) to (2) and allows reverse flow from (2) to (1). When energized the valve allows flow from (1) to (2) and from (2) to (1).

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

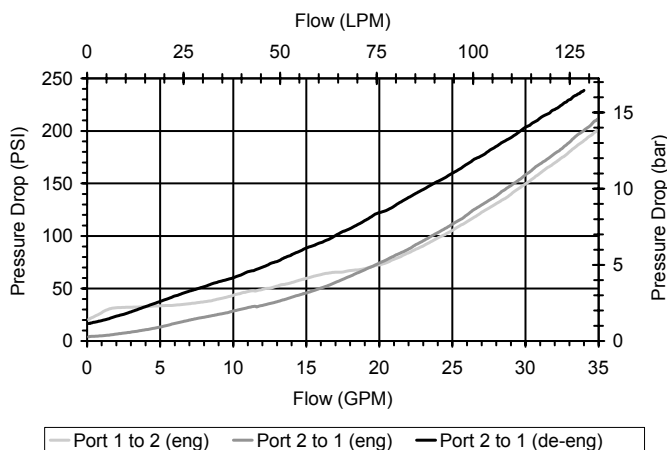
- Hardened parts for long life.
- Efficient wet-armature construction.
- Cartridges are voltage interchangeable.
- Manual override option.
- Industry common cavity.
- Unitized, molded coil design.
- Continuous duty rated solenoid.
- Optional coil voltages and terminations.
- Optional "I" Coil: Weatherproof, 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 Temp. Range	-40° to 250°F (-40° to 120°C)
Weight	.49 lbs (.22 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	TECNORD 2W
Cavity Tools Kit	
(form tool, reamer, tap)	40500032
Seal Kit	21191300

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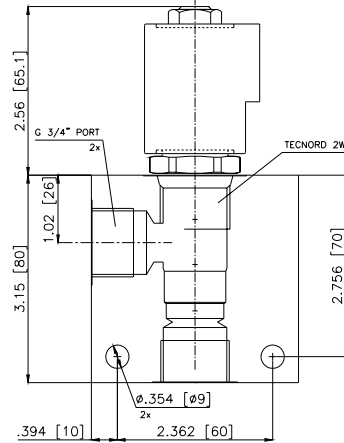
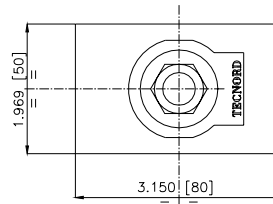
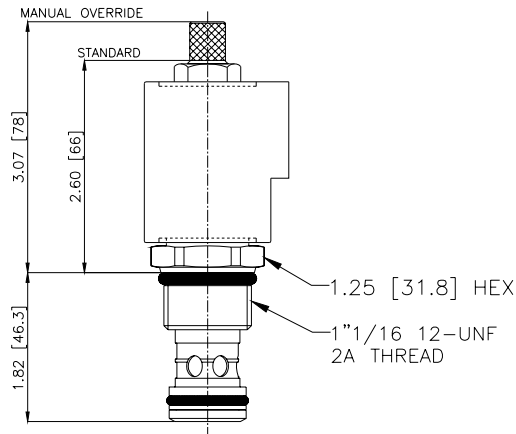
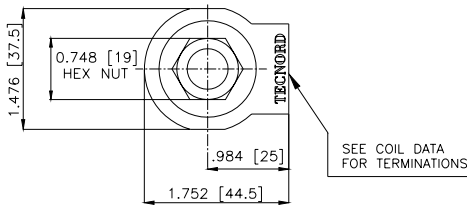


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DIMENSIONS



ORDERING INFORMATION

Approximate Coil Weight: .56 lbs (.25 kg)

TT-S2B

- OPTIONS**
- Buna Standard **00**
 - Viton Standard **V0**
 - Buna, Override, Detent **0M**
 - Viton, Override, Detent **VM**
 - Buna, Screen **A0**
 - Viton, Screen **W0**
 - 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)

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

DL Double Lead
(several types of termination can be attached on leads on request)

HC DIN 43650 (Hirschmann) - (AC&DC)
DI Deutsch - Integral DT04-2P

IMMERSION PROOF "D" TYPE

- DIA** "I" Coil AMP Superseal - Integral
- DID** "I" Coil Deutsch - Integral DT04-2P
- DIJ** "I" Coil AMP Jr. Timer - Integral
- DIM** "I" Coil Metri-Pack - Integral

- BODIES**
- Blank** Without Body
 - N** 3/4" BSP Ports
 - S** #12 SAE Ports

- VOLTAGE** (other voltages available on request)
- 12** 12 VDC
 - 24** 24 VDC
 - 22** 220 VAC without internal rectifier

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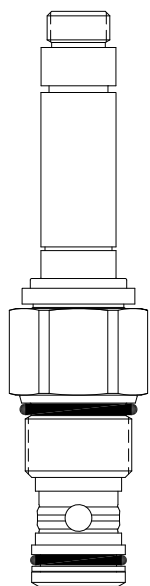


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HT-S2B PILOT OPERATED POPPET, 2 WAY NORMALLY CLOSED



1

2

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.

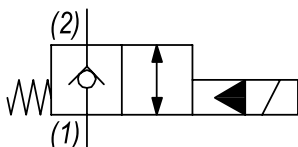
OPERATION

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

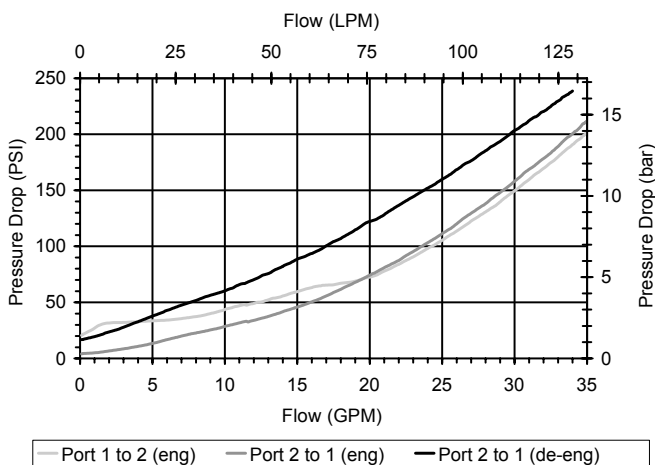
- Hardened parts for long life.
- Efficient wet-armature construction.
- Cartridges are voltage interchangeable.
- Industry common cavity.
- Unitized, molded coil design.
- Continuous duty rated solenoid.
- Optional coil voltages and terminations.

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 Temp. Range	-40° to 250°F (-40° to 120°C)
Weight	.94 lbs (.43 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	50 ft-lbs (67.8 Nm)
Coil Nut Torque Requirements	5-7 ft-lbs (6.8-9.5 Nm)
Cavity	TECNORD 2W
Cavity Tools Kit	
(form tool, reamer, tap)	40500032
Seal Kit	21191301

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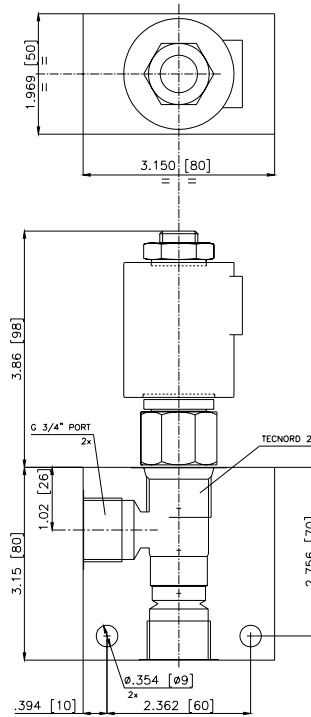
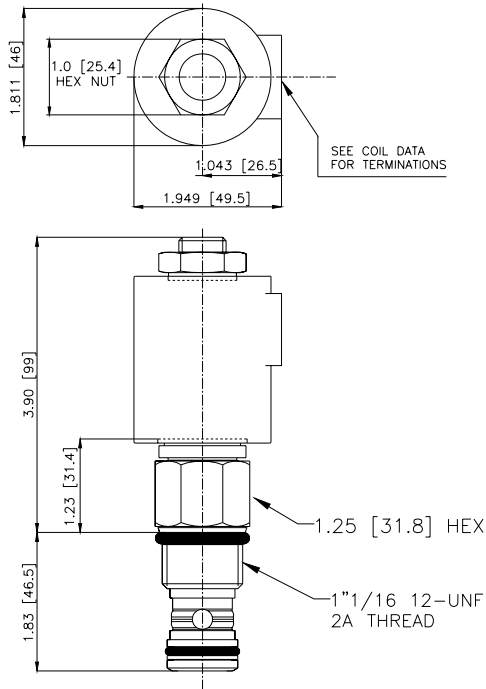


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DIMENSIONS



ORDERING INFORMATION

Approximate Coil Weight: .78 lbs (.35 kg)

HT-S2B

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)

"T" COIL TERMINATION

(All DC Except as Noted)

- Double Lead **DL**
- (several types of termination can be attached on leads on request)
- DIN 43650 (Hirschmann) - (AC&DC) **HC**

BODIES

- Blank Without Body
- N** 3/4" BSP Ports
- S** #12 SAE Ports

VOLTAGE (other voltages available on request)

- 12** 12 VDC
- 24** 24 VDC
- 22** 220 VAC without internal rectifier

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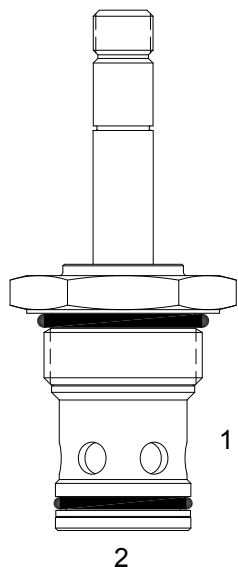


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SJ-S2B PILOT OPERATED POPPET, 2 WAY NORMALLY CLOSED



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

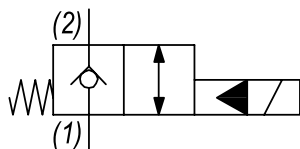
When de-energized the SJ-S2B blocks flow from (1) to (2) and allows reverse flow from (2) to (1). When energized the valve allows flow from (1) to (2) and from (2) to (1).

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

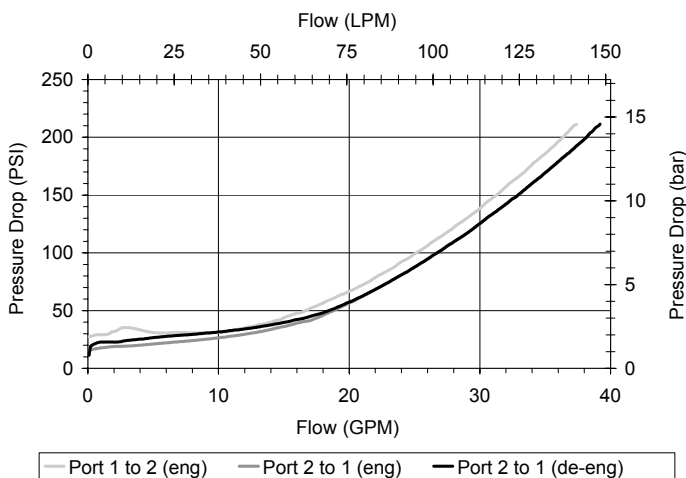
- Hardened parts for long life.
- Efficient wet-armature construction.
- Cartridges are voltage interchangeable.
- Manual override option.
- Industry common cavity.
- Unitized, molded coil design.
- Continuous duty rated solenoid.
- Optional coil voltages and terminations.
- Optional "I" Coil: Weatherproof, 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 Temp. 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 Tools Kit	
(form tool, reamer, tap)	40500017
Seal Kit	21191401

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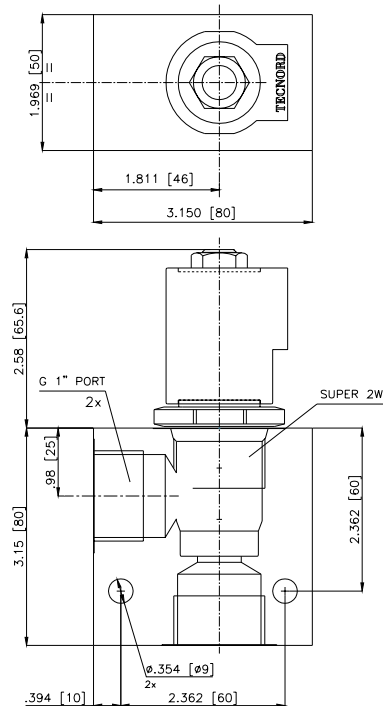
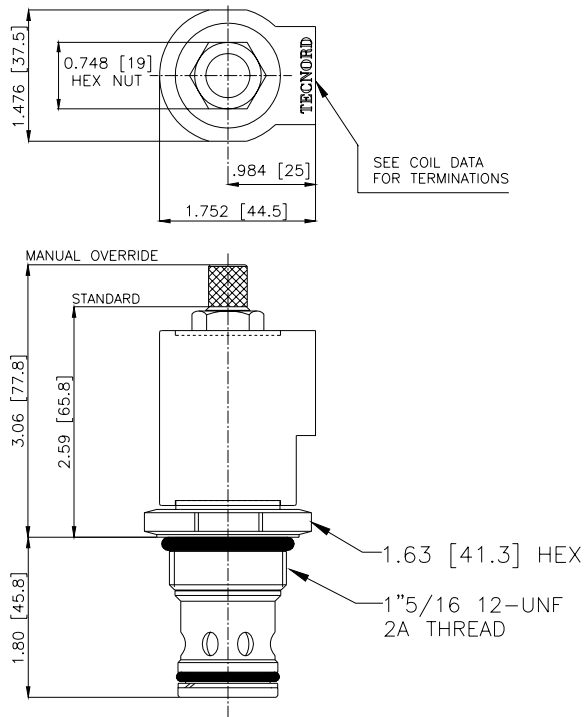


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DIMENSIONS



ORDERING INFORMATION

Approximate Coil Weight: .56 lbs (.25 kg)

SJ-S2B - - - -

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**
- 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)

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

DL Double Lead
(several types of termination can be attached on leads on request)

HC DIN 43650 (Hirschmann) - (AC&DC)
DI Deutsch - Integral DT04-2P

BODIES

- Blank** Without Body
- N** 1" BSP Ports
- S** #12 SAE Ports

VOLTAGE (other voltages available on request)

- 12** 12 VDC
- 24** 24 VDC
- 22** 220 VAC without internal rectifier

IMMERSION PROOF "D" TYPE

- DIA** "I" Coil AMP Superseal - Integral
- DID** "I" Coil Deutsch - Integral DT04-2P
- DIJ** "I" Coil AMP Jr. Timer - Integral
- DIM** "I" Coil Metri-Pack - Integral

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SOLENOID OPERATED DIRECTIONAL CONTROLS

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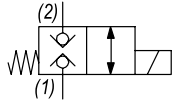
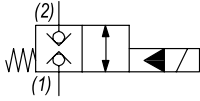


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..... **TECNORD**

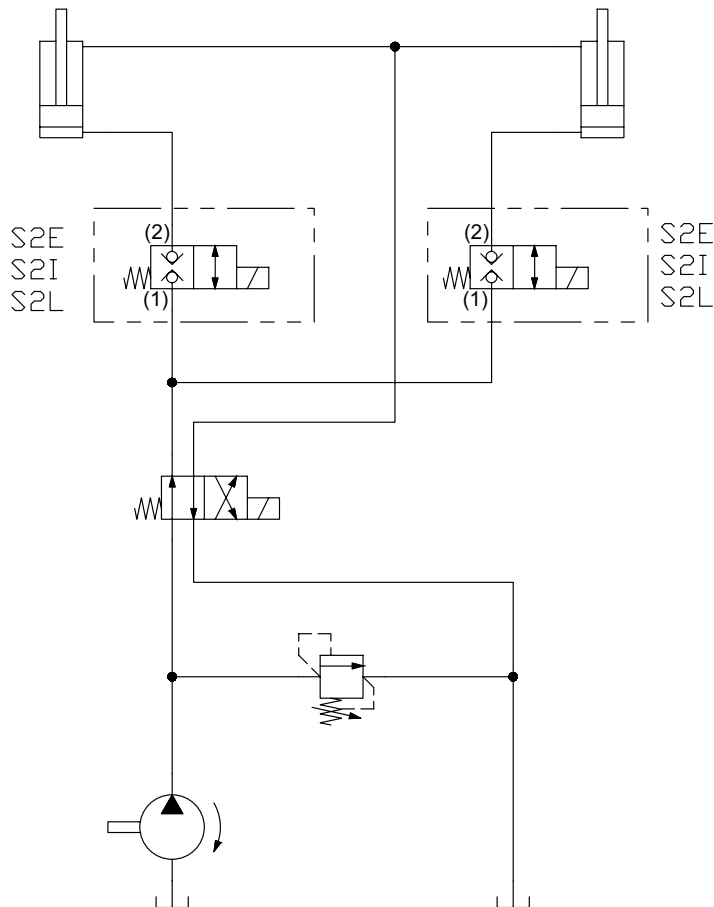
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2 WAY 2 POSITION NORMALLY CLOSED BIDIRECTIONAL POPPET VALVES

2W2P NORMALLY CLOSED	GPM	PSI	LPM	BAR	CAVITY	MODEL	PAGE
	0.20	4000	0.76	276	5/8-18	UA-S2E	ST42
	3	3600	11	250	3/4-16	PB-S2I	ST44
	3	3000	11	207	7/8-14	DE-S2I	ST46
	12	5000	45	345	3/4-16	HB-S2L	ST48

TYPICAL SCHEMATIC

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



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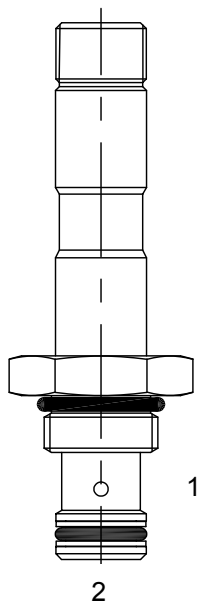


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UA-S2E POPPET, 2 WAY, NORMALLY CLOSED, BIDIRECTIONAL



DESCRIPTION

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

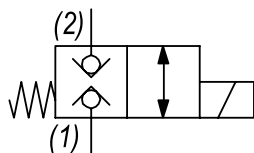
OPERATION

When de-energized the UA-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

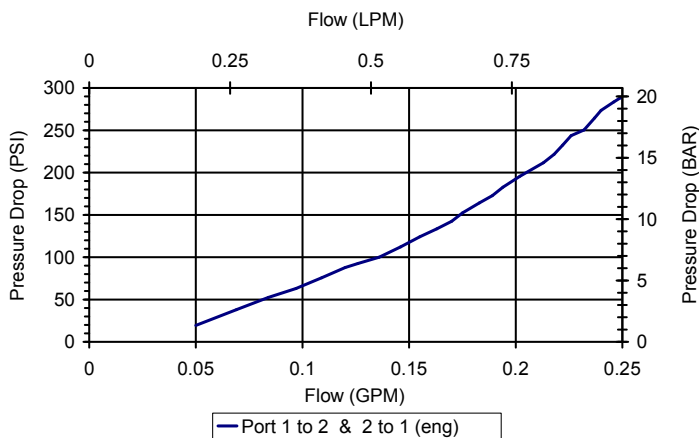
- Hardened parts for long life.
- Efficient wet-armature construction.
- Cartridges are voltage interchangeable.
- Industry common cavity.
- Unitized, molded coil design.
- Continuous duty rated solenoid.
- Optional coil voltages and terminations.

HYDRAULIC SYMBOL



PERFORMANCE

Actual Test Data (Cartridge Only)



VALVE SPECIFICATIONS

Nominal Flow	0.20 GPM (0.76 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 Temp. 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	4-6 ft-lbs (5.4-8.1 Nm)
Cavity	MINI 2W
Cavity Form Tool (Finishing)	40500003
Seal Kit	21191003

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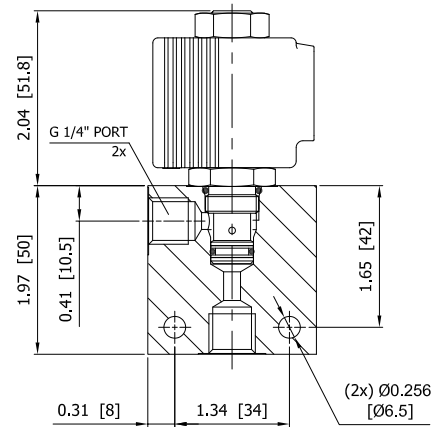
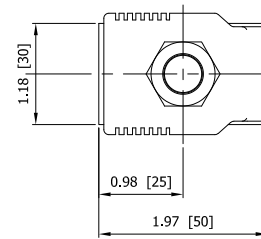
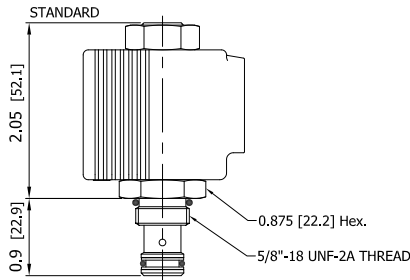
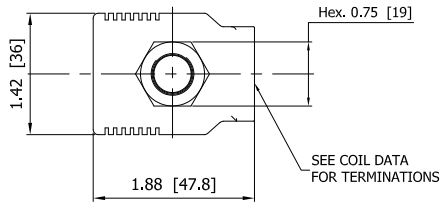
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SOLENOID OPERATED DIRECTIONAL CONTROLS

DIMENSIONS



ORDERING INFORMATION

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

UA-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)

BODIES

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

VOLTAGE (other voltages available on request)

12 12 VDC
24 24 VDC
26 220 VAC with molded full wave rectifier

"P" TYPE "J" COIL TERMINATION

JA "J" Coil AMP Superseal - Integral
JD "J" Coil Deutsch - Integral DT04-2P

JJ "J" Coil AMP Jr. Time - Integral

JL "J" Coil Double Lead
JH "J" Coil DIN 43650 (Hirschmann)

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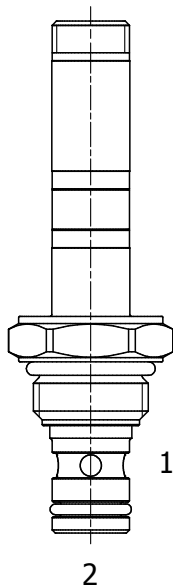


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PB-S2I DIRECT ACTING POPPET, 2 WAY, NORMALLY CLOSED, BIDIRECTIONAL



DESCRIPTION

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



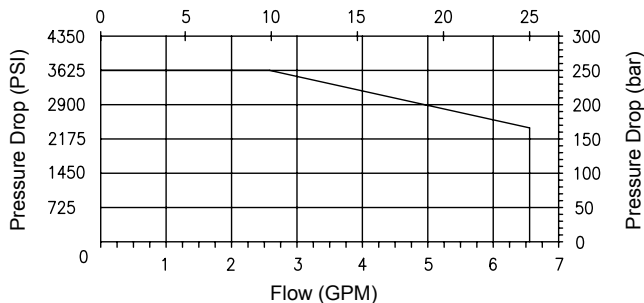
Zinc Nickel plating on all exposed surfaces (>500hours corrosion resistance).

For higher pressure and higher flow option for this function see HB-S2L.

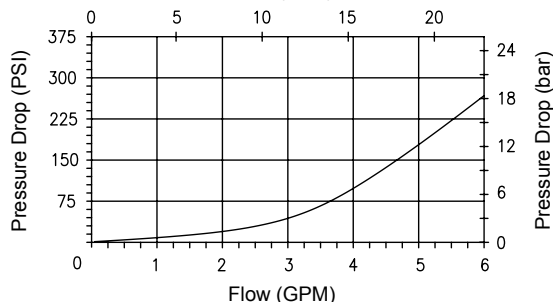
PERFORMANCE

Actual Test Data (Cartridge Only)

De-Rating of Pressure vs. Flow (LPM)

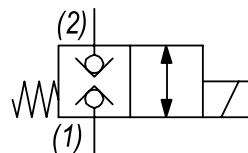


Flow (LPM)



— Port 1 to 2 (eng) & Port 2 to 1 (eng)

HYDRAULIC SYMBOL



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 Temp. 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 Tools Kit	40500005
Seal Kit	Buna Kit: 64900222 Viton Kit: 64900223

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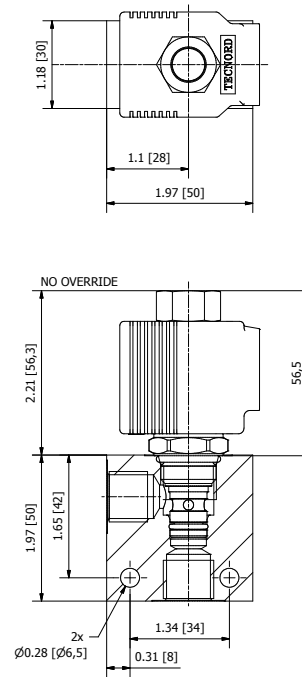
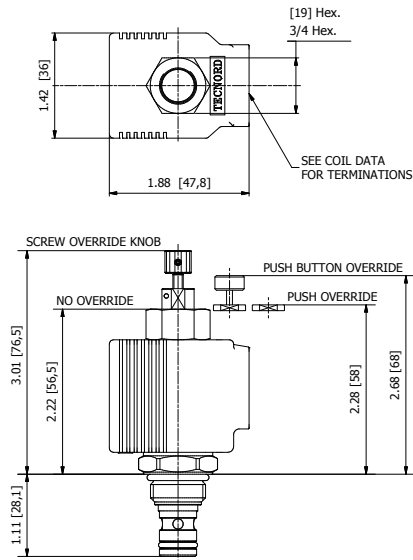


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DIMENSIONS



ORDERING INFORMATION

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

PB - S2I		-	-	-	-
OPTIONS					
Buna Standard	00				
Viton Standard	V0				
Buna Knob	OK				
Viton Knob	VK				
					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

“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 (Hirschmann) - (AC&DC)
- CL** Conduit Lead - (AC Only)
- DI** Deutsch - Integral DT04-2P

IMMERSION PROOF “I” COIL TERMINATION

- 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 Optional Coil Terminations See Coil Section

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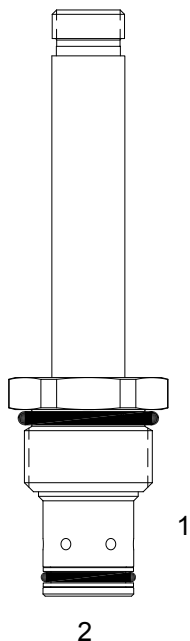


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DE-S2I DIRECT ACTING POPPET, 2 WAY, NORMALLY CLOSED, BIDIRECTIONAL



DESCRIPTION

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

OPERATION

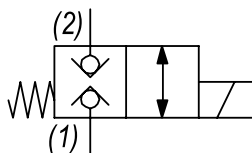
When de-energized the DE-S2I blocks flow from (1) to (2) and (2) to (1). When energized the valve allows flow from (1) to (2) and (2) to (1).

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.

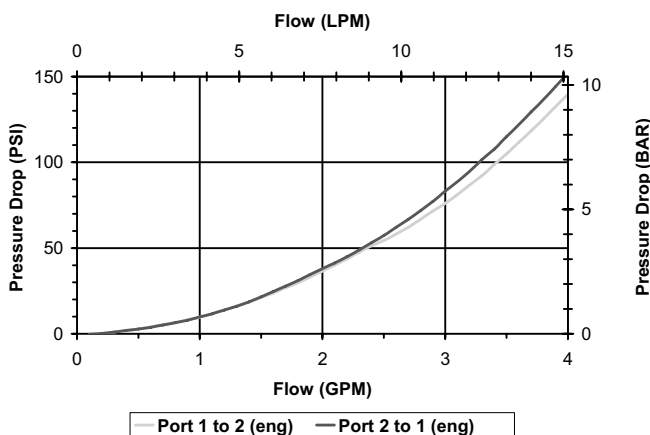
HYDRAULIC SYMBOL



For higher flows & pressures use Power Cavity HB-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 Temp. 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 Tools Kit	
(form tool, reamer, tap)	40500000
Seal Kit	21191202

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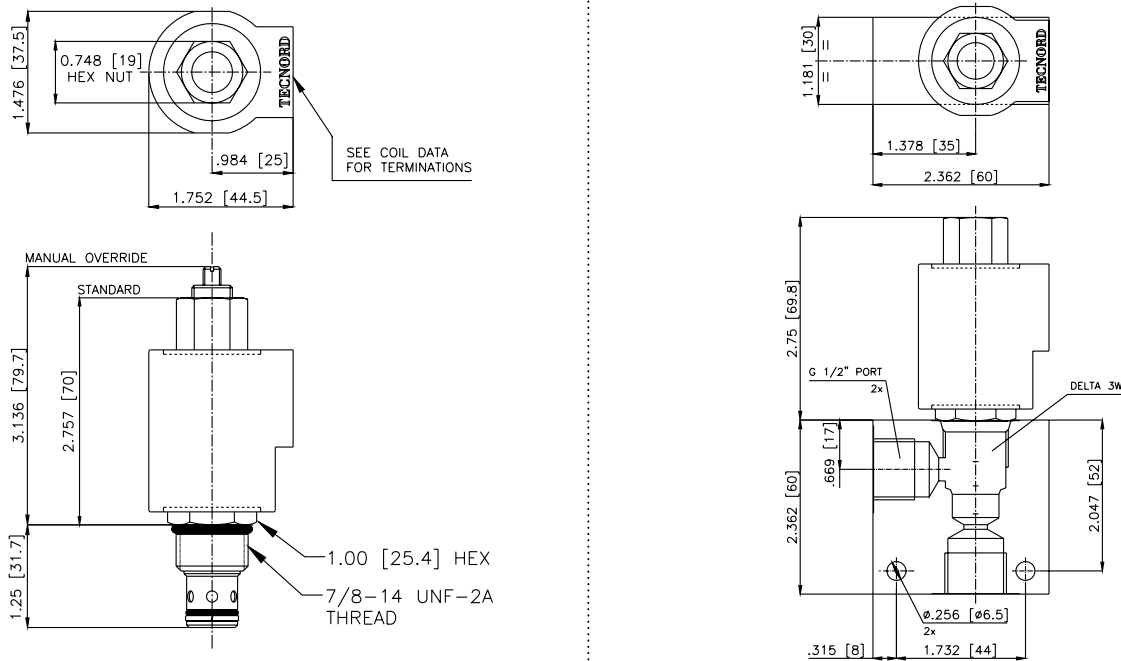


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DIMENSIONS



ORDERING INFORMATION

Approximate Coil Weight: .56 lbs (.25 kg)

DE-S2I - - - -

OPTIONS

- Buna Standard **00**
- Viton Standard **V0**
- Buna, Override, Detent **0M**
- Viton, Override, Detent **VM**
- Buna, Override, Knob **0K**
- Viton, Override, Knob **WK**
- 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)

“V” COIL TERMINATION

(All DC Except as Noted)

- DL** Double Lead
(* several types of termination can be attached on leads on request)

- HC** DIN 43650 (Hirschmann) - (AC&DC)
- DI** Deutsch - Integral DT04-2P

IMMERSION PROOF “D” TYPE

- DIA** “I” Coil AMP Superseal - Integral
- DID** “I” Coil Deutsch - Integral DT04-2P
- DIJ** “I” Coil AMP Jr. Timer - Integral
- DIM** “I” Coil Metri-Pack - Integral

BODIES

- Blank** Without Body
- N** 3/8 NPT Ports
- S** #8 SAE Ports

VOLTAGE (*other voltages available on request)

- 12** 12 VDC
- 24** 24 VDC
- 22** 220 VAC without internal rectifier

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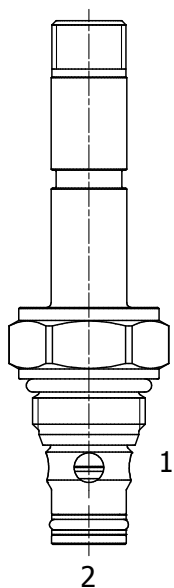


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HB-S2L PILOTED OPERATED POPPET, 2 WAY DOUBLE LOCK NORMALLY CLOSED



DESCRIPTION

8 size, 3/4-16 thread, "Power" series, solenoid operated, 2 way double lock normally closed pilot operated, bidirectional poppet valve.

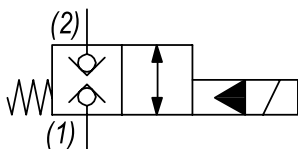
OPERATION

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.

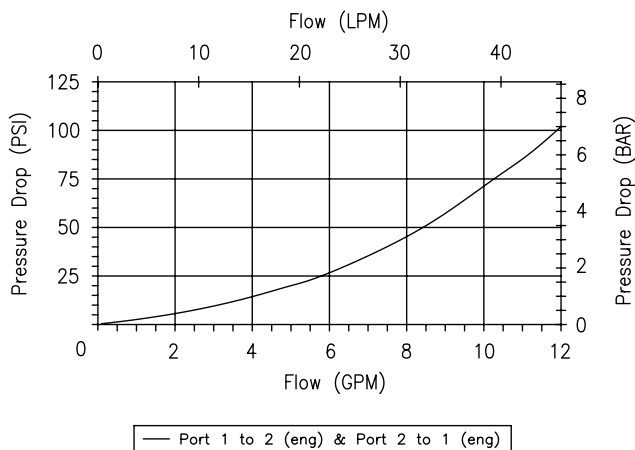
HYDRAULIC SYMBOL



Zinc Nickel plating on all exposed surfaces (>500hours corrosion resistance).

PERFORMANCE

Actual Test Data (Cartridge Only)



VALVE SPECIFICATIONS

Nominal Flow	12 GPM (45 LPM)
Rated Operating Pressure	5000 PSI (345 bar)
Typical Internal Leakage (150 SSU)	0-5 drops/min at 5000 PSI (345 bar)
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temp. 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	30-35 ft-lbs (41-47 Nm)
Coil Nut Torque Requirements	3-4.5 ft-lbs (4-6 Nm)
Cavity	POWER 2W
Cavity Tools Kit	40500005
Seal Kit	21191102

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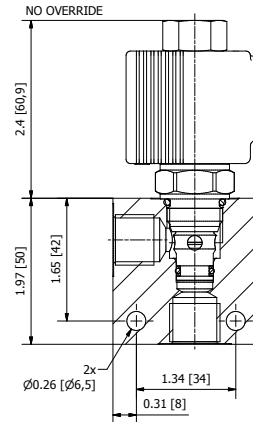
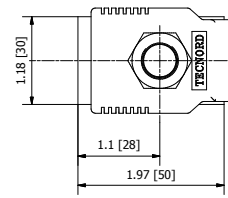
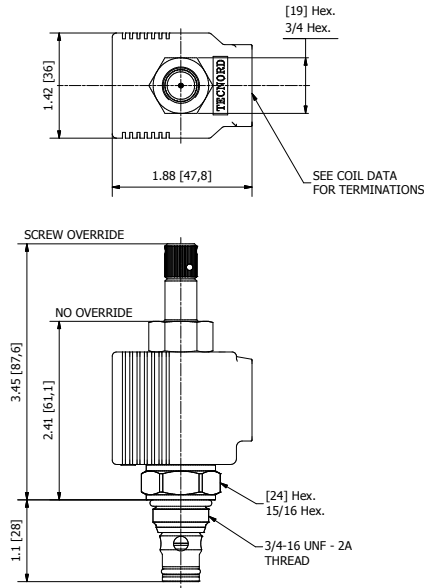


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DIMENSIONS



ORDERING INFORMATION

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

HB-S2L - - - -

- OPTIONS**
- Buna Standard **00**
 - Viton Standard **V0**
 - Buna, Screw, Override **OK**
 - Viton, Screw, Override **VK**

- BODIES**
- Blank Without Body
 - N** 1/4" BSP Ports (aluminum)
 - N1** 3/8" BSP Ports (aluminum)
 - S** #6 SAE Ports (aluminum)
 - H** 1/4" BSP Ports (steel)
 - H1** 3/8" BSP Ports (steel)
 - HS** #6 SAE Ports (steel)

Note: Aluminum bodies only for use up to 250 bar

- VOLTAGE** (other voltages available on request)
- 12** 12 VDC
 - 24** 24 VDC
 - 26** 26 VDC

"P" TYPE "J" COIL TERMINATION

- JA** "J" Coil AMP Superseal - Integral
- JD** "J" Coil Deutsch - Integral DT04-2P

JJ "J" Coil AMP Jr. Time - Integral

- JL** "J" Coil Double Lead
- JH** "J" Coil DIN 43650 (Hirschmann)

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SOLENOID OPERATED DIRECTIONAL CONTROLS

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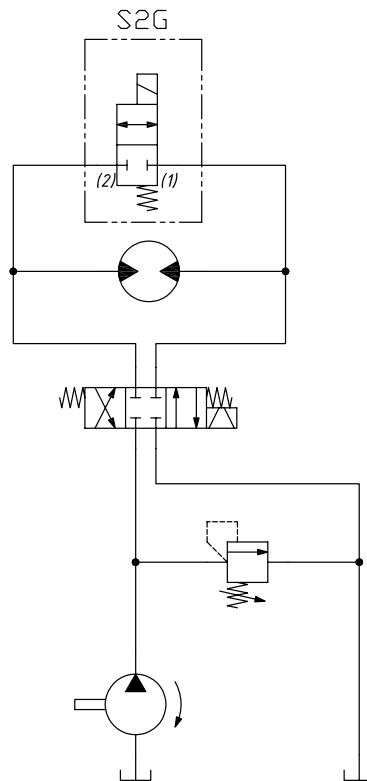
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2 WAY 2 POSITION NORMALLY CLOSED SPOOL VALVES

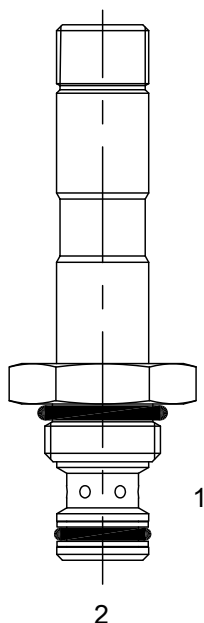
2W2P NORMALLY CLOSED	GPM	PSI	LPM	BAR	CAVITY	MODEL	PAGE
	1.5	4000	6	276	5/8-18	UA-S2G	ST52
	8	3000	30	207	3/4-16	PB-S2G	ST54
	8	3000	30	207	7/8-14	DE-S2G	ST56
	15	4000	57	276	7/8-14	HE-S2G	ST58

TYPICAL SCHEMATIC

Typical application for the S2G is to provide deceleration or unloading of a hydraulic motor.



UA-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.

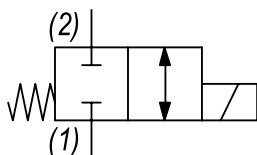
OPERATION

When de-energized the UA-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

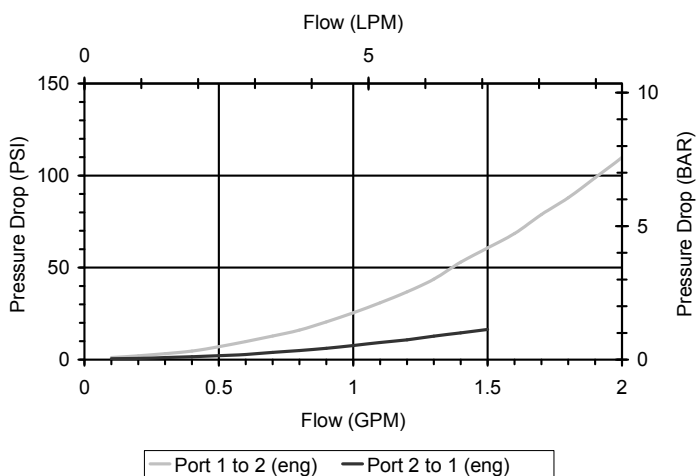
- Efficient wet-armature construction.
- Cartridges are voltage interchangeable.
- Industry common cavity.
- Unitized, molded coil design.
- Continuous duty rated solenoid.
- Optional coil voltages and terminations.

HYDRAULIC SYMBOL



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)
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temp. 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	4-6 ft-lbs (5.4-8.1 Nm)
Cavity	MINI 2W
Cavity Form Tool (Finishing)	40500003
Seal Kit	21191002

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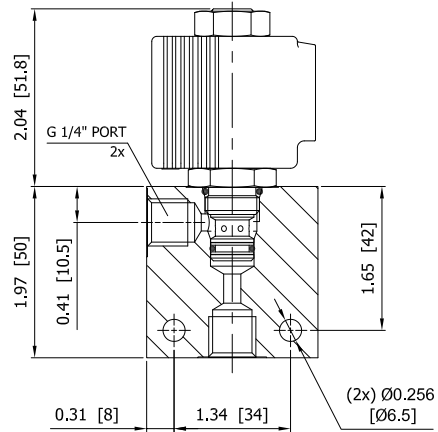
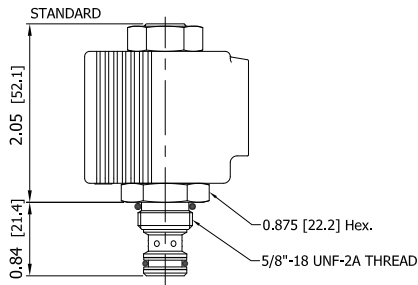
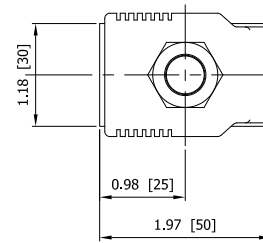
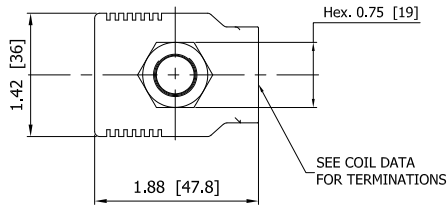


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DIMENSIONS



ORDERING INFORMATION

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

UA-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)

BODIES

- Blank Without Body
- N** 1/4" BSP Ports
- S** #6 SAE Ports

VOLTAGE (other voltages available on request)

- 12** 12 VDC
- 24** 24 VDC
- 26** 220 VAC with molded full wave rectifier

"P" TYPE "J" COIL TERMINATION

- JA** "J" Coil AMP Superseal - Integral
- JD** "J" Coil Deutsch - Integral DT04-2P

JJ "J" Coil AMP Jr. Time - Integral

- JL** "J" Coil Double Lead
- JH** "J" Coil DIN 43650 (Hirschmann)

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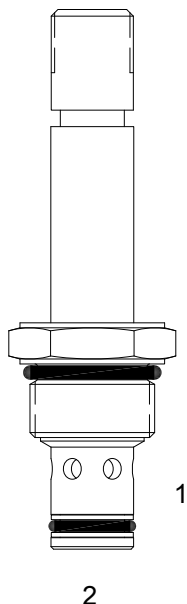


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PB-S2G DIRECT ACTING SPOOL, 2 WAY NORMALLY CLOSED



DESCRIPTION

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

OPERATION

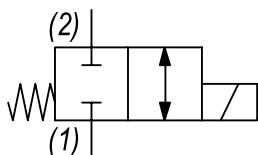
When de-energized the PB-S2G blocks flow from (1) to (2) and (2) to (1). When energized the valve allows flow from (1) to (2) and (2) to (1).

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.

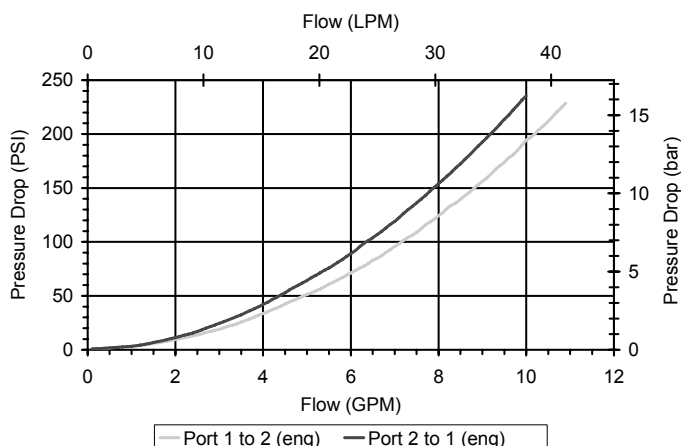
HYDRAULIC SYMBOL



Operational shift limit in (2) to (1) direction is 4 GPM (15 LPM). 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 Temp. 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 Tools Kit	
(form tool, reamer, tap)	40500005
Seal Kit	21191102

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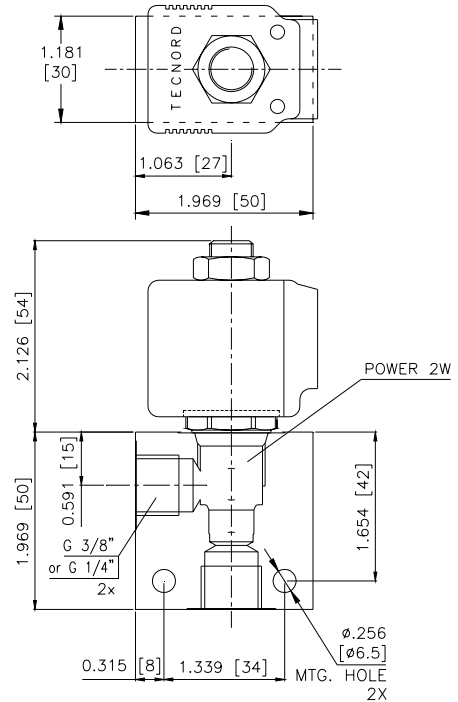
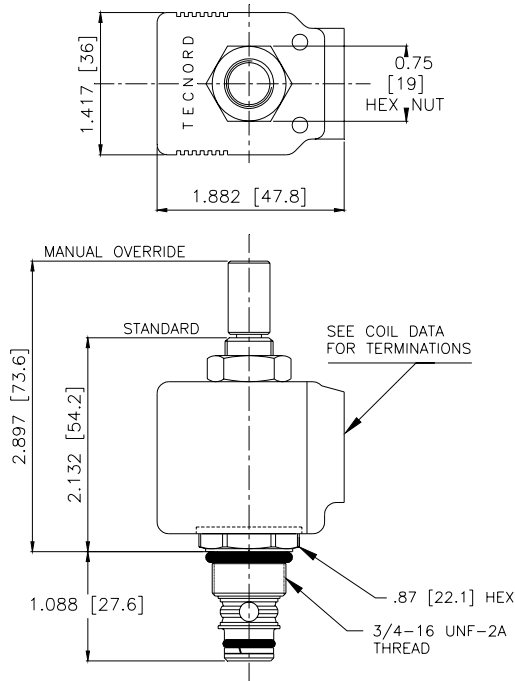


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DIMENSIONS



ORDERING INFORMATION

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

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, 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)

- BODIES**
- Blank** Without Body
 - N** 1/4" BSP Ports
 - N1** 3/8" BSP Ports
 - S** #6 SAE Ports

- VOLTAGE** (other voltages available on request)
- 12** 12 VDC
 - 24** 24 VDC
 - 22** 220 VAC without internal rectifier

"P" TYPE "J" COIL TERMINATION

- JA** "J" Coil AMP Superseal - Integral
- JD** "J" Coil Deutsch - Integral DT04-2P

JJ "J" Coil AMP Jr. Time - Integral

- JL** "J" Coil Double Lead
- JH** "J" Coil DIN 43650 (Hirschmann)

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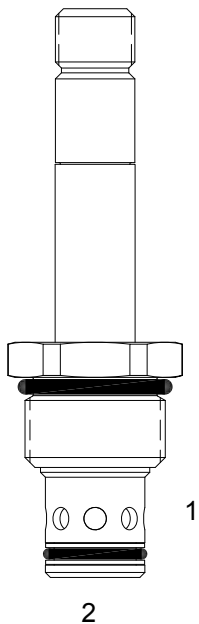


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DE-S2G DIRECT ACTING SPOOL, 2 WAY NORMALLY CLOSED



DESCRIPTION

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

OPERATION

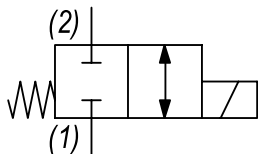
When de-energized the DE-S2G blocks flow from (1) to (2) and (2) to (1). When energized the valve allows flow from (1) to (2) and (2) to (1).

OPERATION OF MANUAL OVERRIDE OPTION: to override, turn the manual override screw counterclockwise. 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.
- Optional "I" Coil: Weatherproof, Thermal Shock, Immersion Safe.

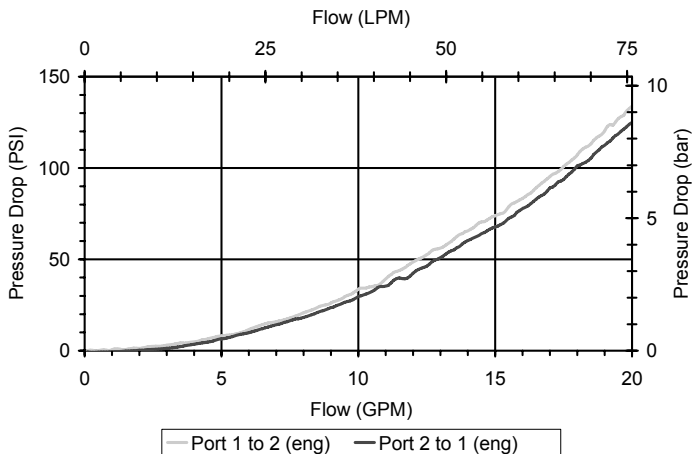
HYDRAULIC SYMBOL



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 Temp. 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 Tools Kit (form tool, reamer, tap)	40500000
Seal Kit	21191202

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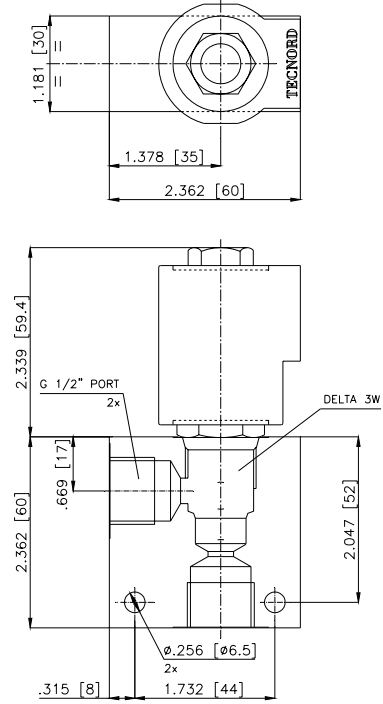
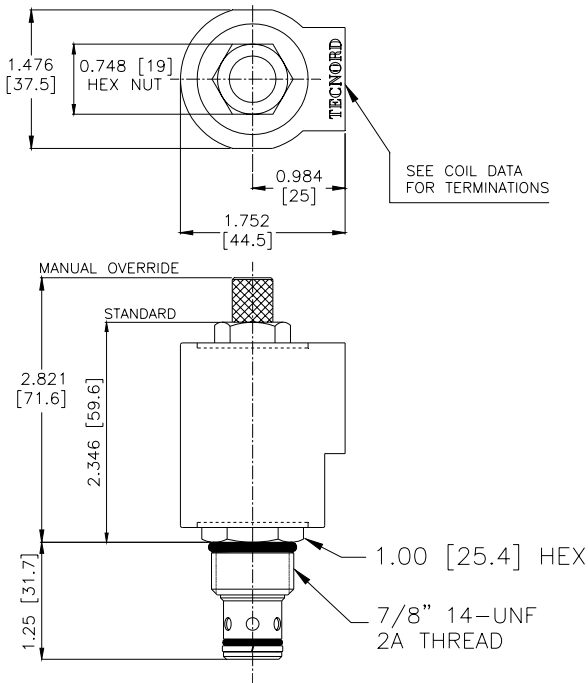


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DIMENSIONS



ORDERING INFORMATION

Approximate Coil Weight: .56 lbs (.25 kg)

DE-S2G

- 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)

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

DL Double Lead
(several types of termination can be attached on leads on request)

HC DIN 43650 (Hirschmann) - (AC&DC)
DI Deutsch - Integral DT04-2P

IMMERSION PROOF "D" TYPE

- DIA** "1" Coil AMP Superseal - Integral
- DID** "1" Coil Deutsch - Integral DT04-2P
- DIJ** "1" Coil AMP Jr. Timer - Integral
- DIM** "1" Coil Metri-Pack - Integral

- BODIES**
- Blank** Without Body
 - N** 1/2" BSP Ports
 - S** #8 SAE Ports

- VOLTAGE** (other voltages available on request)
- 12** 12 VDC
 - 24** 24 VDC
 - 22** 220 VAC without internal rectifier

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HE-S2G DIRECT ACTING SPOOL, 2 WAY NORMALLY CLOSED

DESCRIPTION

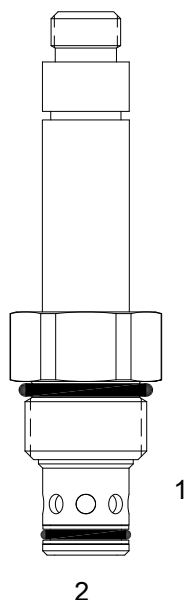
“High Pressure” 10 size, 7/8-14 thread, “Delta” series, solenoid operated, 2 way normally closed, spool valve.

OPERATION

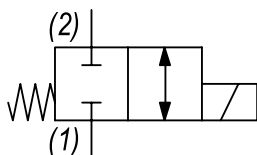
When de-energized the HE-S2G blocks flow from (1) to (2) and (2) to (1). When energized the valve allows flow from (1) to (2) and (2) to (1).

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.



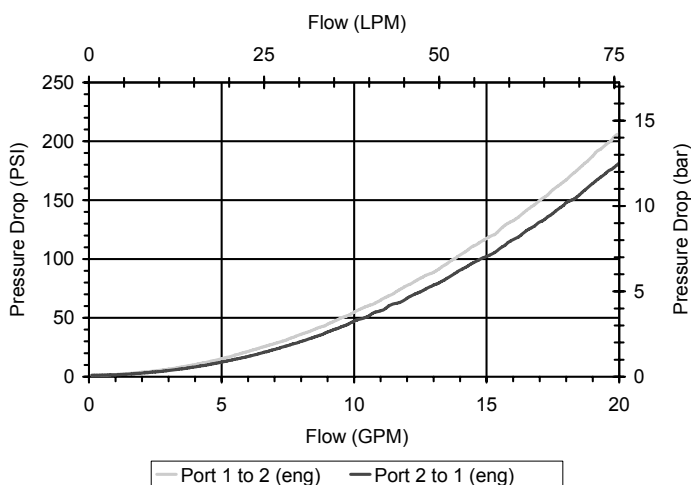
HYDRAULIC SYMBOL



Uses “L” Coils.

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)
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 Temp. Range	-40° to 250°F (-40° to 120°C)
Weight	.39 lbs (.17 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 Tools Kit (form tool, reamer, tap)	40500000
Seal Kit	21191202

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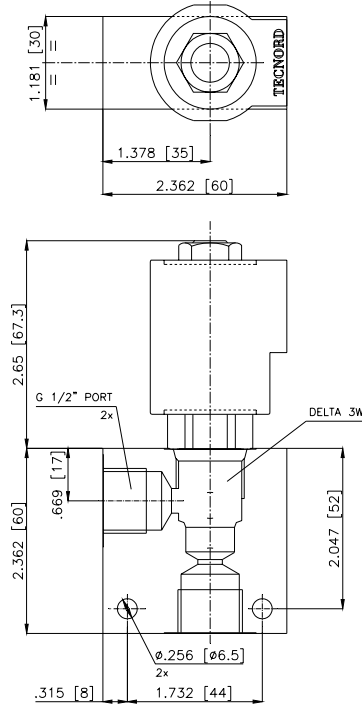
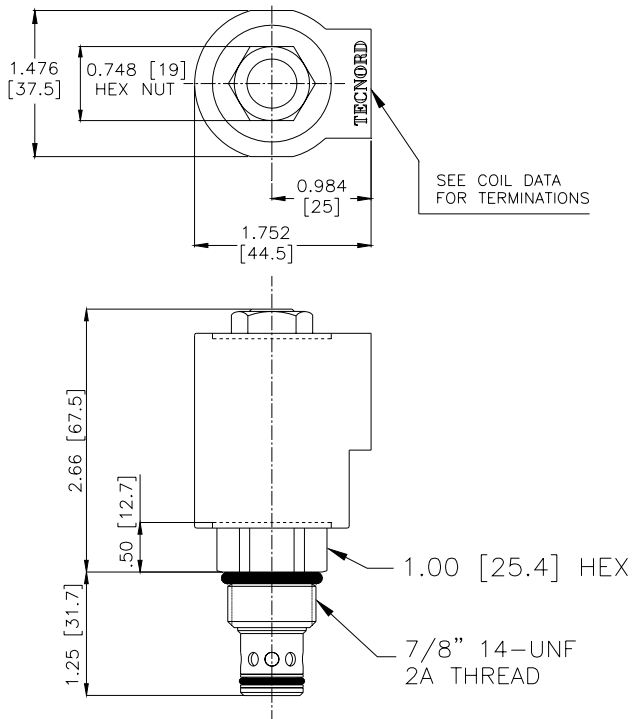


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DIMENSIONS



ORDERING INFORMATION

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

HE-S2G

- OPTIONS**
 Buna Standard **00**
 Viton Standard **V0**

- BODIES**
 Blank Without Body
N 1/2" BSP Ports
S #8 SAE Ports

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

VOLTAGE (other voltages available on request)

- 12** 12 VDC
24 24 VDC
22 220 VAC without internal rectifier

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

DL Double Lead
 (several types of termination can be attached on leads on request)

HC DIN 43650 (Hirschmann) - (AC&DC)
DI Deutsch - Integral DT04-2P

IMMERSION PROOF "L" TYPE
LIA "I" Coil AMP Superseal - Integral
LID "I" Coil Deutsch - Integral DT04-2P
LIJ "I" Coil AMP Jr. Timer - Integral
LIM "I" Coil Metri-Pack - Integral

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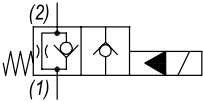
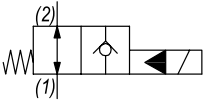
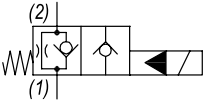
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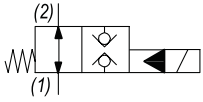
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SOLENOID OPERATED DIRECTIONAL CONTROLS

2 WAY 2 POSITION NORMALLY OPEN POPPET VALVES

2W2P NORMALLY OPEN	GPM	PSI	LPM	BAR	CAVITY	MODEL	PAGE
	10	3500	38	241	3/4-16	PB-S2C	ST62
	12	5000	45	345	3/4-16	HB-S2C	ST64
	15	3500	57	241	7/8-14	DE-S2C	ST68
	30	3000	114	207	1 1/16-12	TT-S2C	ST70
	40	3000	151	207	1 5/16-12	SJ-S2C	ST72
	40	4350	151	300	1 5/16-12	HJ-S2C	ST74
	10	3500	38	241	3/4-16	PB-S2D	ST76
	12	5000	45	345	3/4-16	HB-S2D	ST78
	15	3500	57	241	7/8-14	DE-S2D	ST80
	30	3000	114	207	1 1/16-12	TT-S2D	ST82
	40	3000	151	207	1 5/16-12	SJ-S2D	ST84
	8	2000	30	138	3/4-16	PB-S2J	ST66

2 WAY 2 POSITION NORMALLY OPEN BIDIRECTIONAL POPPET VALVES

2W2P NORMALLY OPEN	GPM	PSI	LPM	BAR	CAVITY	MODEL	PAGE
	12	5000	45	345	3/4-16	HB-S2K	ST86

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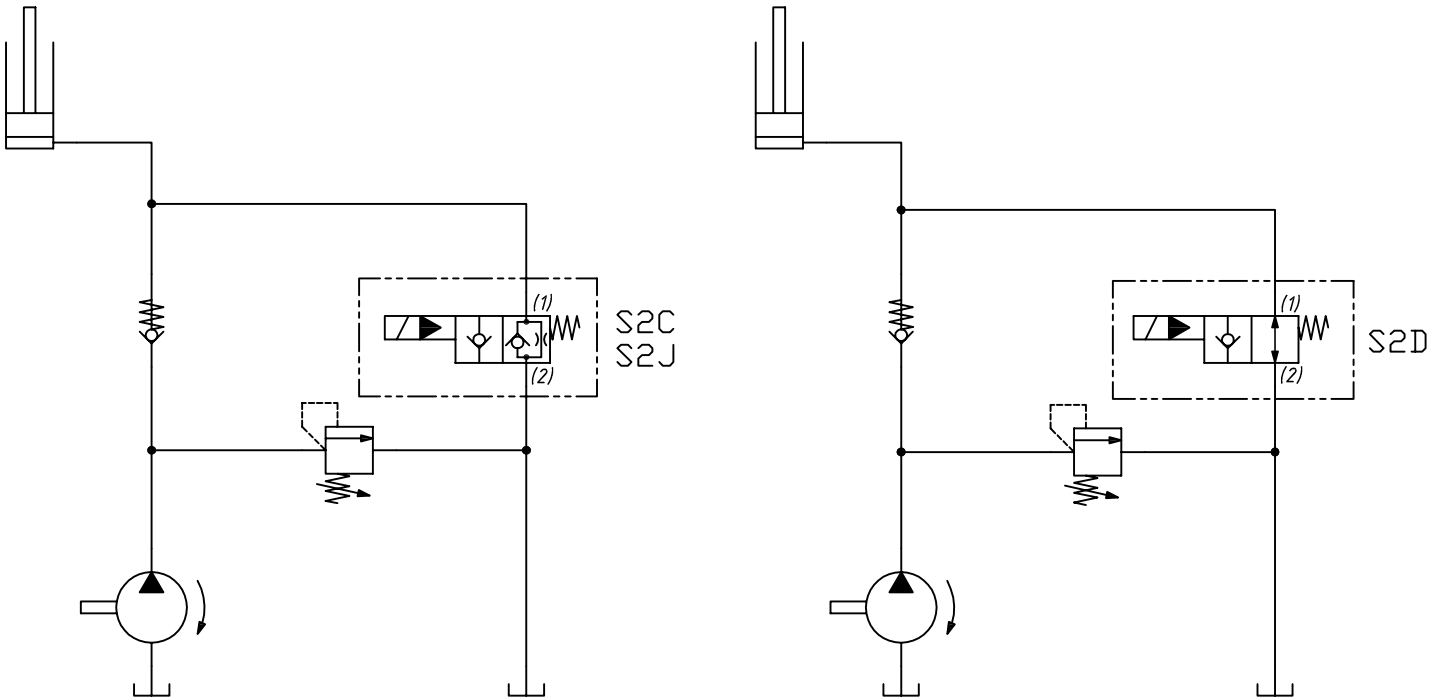
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TYPICAL SCHEMATIC

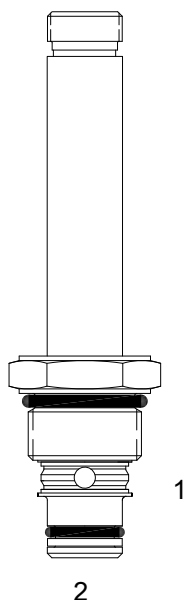
Typical application for the S2C is a pump unloading circuit when high flow and low pressure drop is required.

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.



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

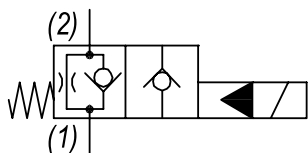
When de-energized the PB-S2C allows flow from (1) to (2) and restricted flow from (2) to (1). When energized the valve blocks flow from (1) to (2) and allows flow from (2) to (1).

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

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.

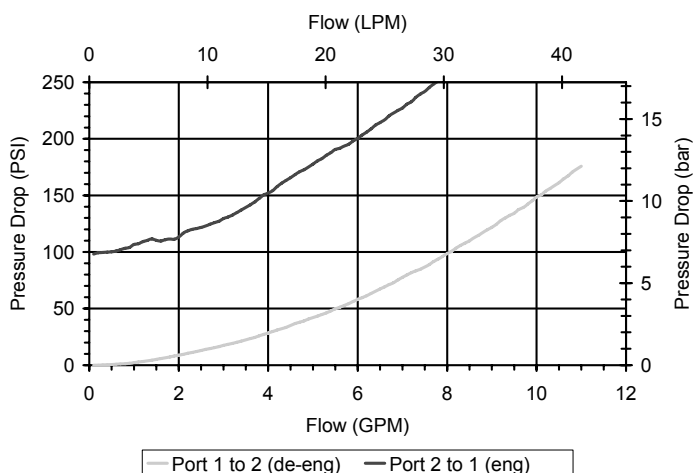
HYDRAULIC SYMBOL



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 Temp. 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 Tools Kit	
(form tool, reamer, tap)	40500005
Seal Kit	21191100

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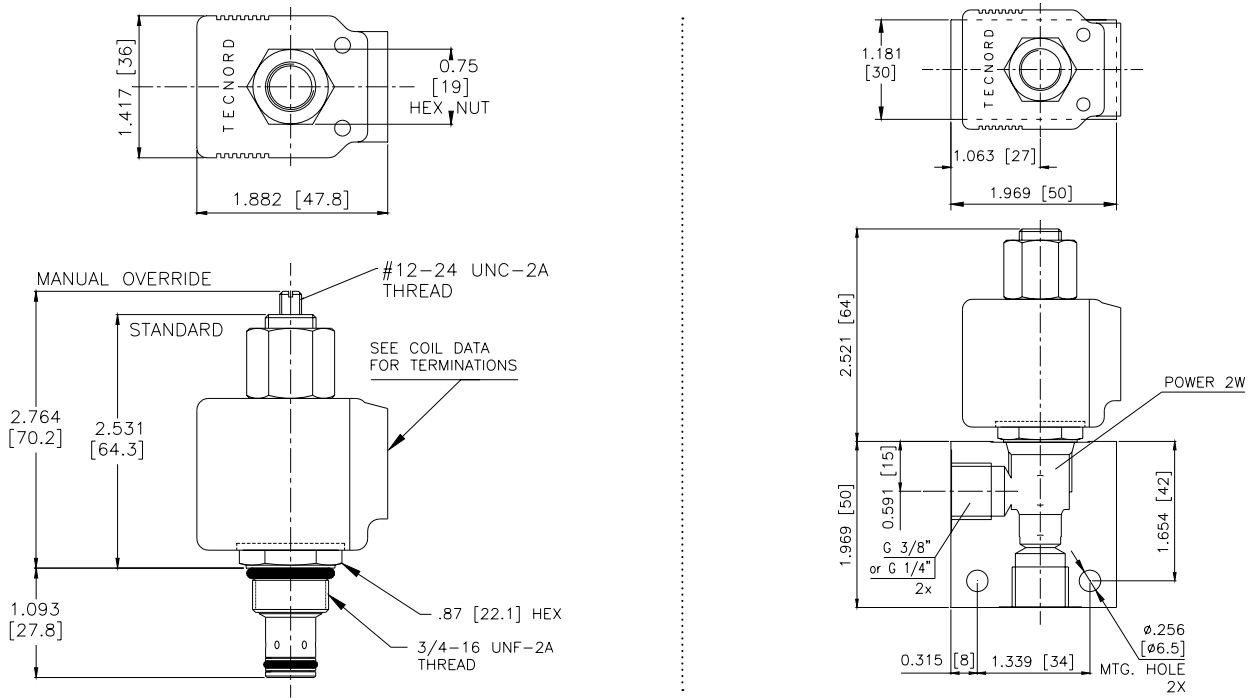


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DIMENSIONS



ORDERING INFORMATION

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

PB-S2C - - - -

OPTIONS

- Buna Standard **00**
- Viton Standard **V0**
- Buna, Override, Detent **0M**
- Viton, Override, Detent **VM**
- Buna, Override, Knob **0K**
- 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)

BODIES

- Blank** Without Body
- N** 1/4" BSP Ports
- N1** 3/8" BSP Ports
- S** #6 SAE Ports

VOLTAGE (other voltages available on request)

- 12** 12 VDC
- 24** 24 VDC
- 22** 220 VAC without internal rectifier

"P" TYPE "J" COIL TERMINATION

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

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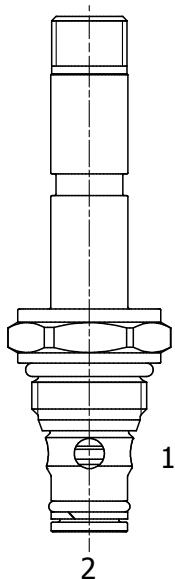


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HB-S2C PILOT OPERATED POPPET, 2 WAY NORMALLY OPEN



DESCRIPTION

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

PUSH TYPE MANUAL OVERRIDE OPTION: to override, push the manual override button.

SCREW TYPE MANUAL OVERRIDE OPTION: to override, turn the manual override screw clockwise.

To release, turn the manual override screw counterclockwise.

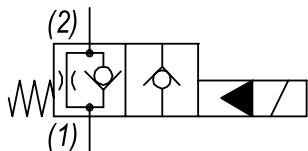
FEATURES

- 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.



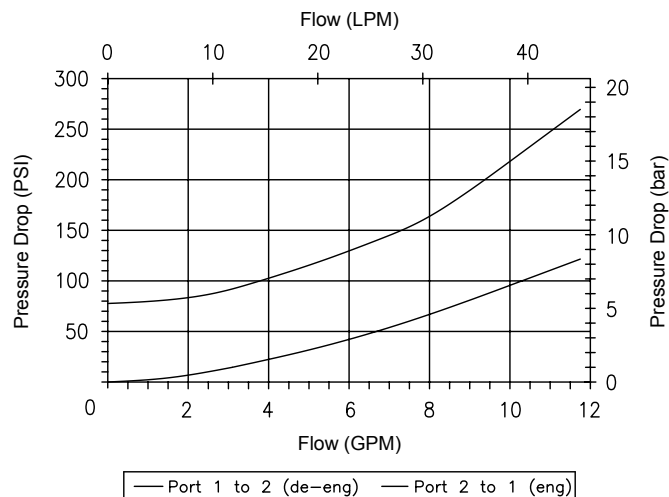
Zinc Nickel plating on all exposed surfaces (>500hours corrosion resistance).

HYDRAULIC SYMBOL



PERFORMANCE

Actual Test Data (Cartridge Only)



VALVE SPECIFICATIONS

Nominal Flow	12 GPM (45 LPM)
Rated Operating Pressure	5000 PSI (345 bar)
Typical Internal Leakage (150 SSU)	0-5 drops/min at 5000 PSI (345 bar)
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temp. 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	30-35 ft-lbs (41-47 Nm)
Coil Nut Torque Requirements	3-4.5 ft-lbs (4-6 Nm)
Cavity	POWER 2W
Cavity Tools Kit	40500005
Seal Kit	21191100

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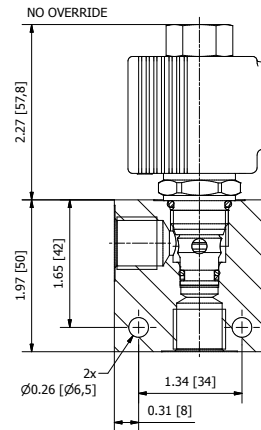
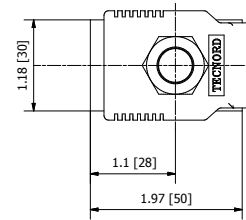
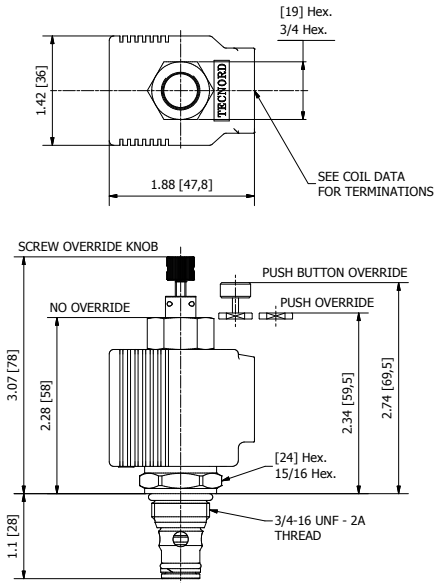


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DIMENSIONS



ORDERING INFORMATION

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

HB-S2C

- OPTIONS**
- Buna Standard **00**
 - Viton Standard **V0**
 - Buna, Push Pin, Override **0P**
 - Viton, Push Pin, Override **VP**
 - Buna, Push Button, Override **0B**
 - Viton, Push Button, Override **VB**
 - Buna, Screw, Override **0K**
 - Viton, Screw, Override **VK**

- BODIES**
- Blank Without Body
 - N** 1/4" BSP Ports (aluminum)
 - N1** 3/8" BSP Ports (aluminum)
 - S** #6 SAE Ports
 - H** 1/4" BSP Ports (steel)
 - H1** 3/8" BSP Ports (steel)

Note: Aluminum bodies only for use up to 250 bar

- VOLTAGE** (other voltages available on request)
- 12** 12 VDC
 - 24** 24 VDC
 - 26** 26 VDC

"P" TYPE "J" COIL TERMINATION

- JA** "J" Coil AMP Superseal - Integral
- JD** "J" Coil Deutsch - Integral DT04-2P

JJ "J" Coil AMP Jr. Time - Integral

- JL** "J" Coil Double Lead
- JH** "J" Coil DIN 43650 (Hirschmann)

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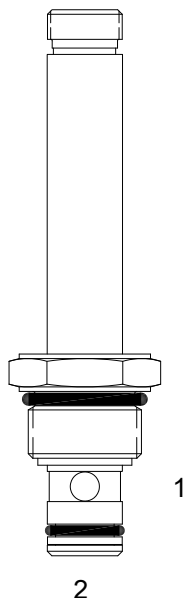
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SOLENOID OPERATED DIRECTIONAL CONTROLS

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

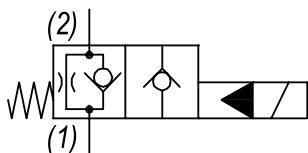
When de-energized the PB-S2J allows flow from (1) to (2) and restricts flow from (2) to (1). When energized the valve blocks flow from (1) to (2) and allows free flow from (2) to (1).

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

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.

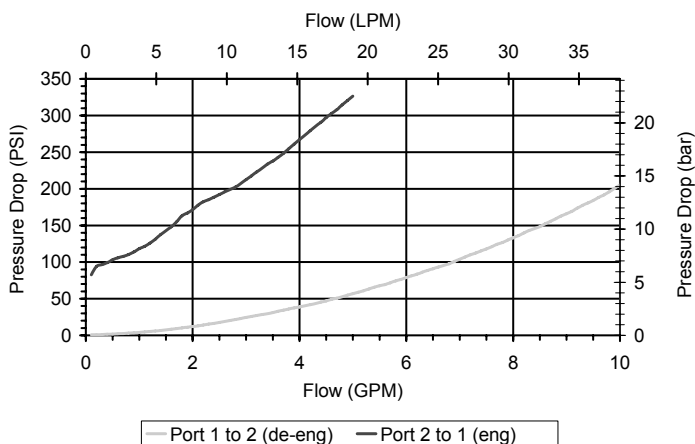
HYDRAULIC SYMBOL



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 Temp. 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 Tools Kit	
(form tool, reamer, tap)	40500005
Seal Kit	21191100

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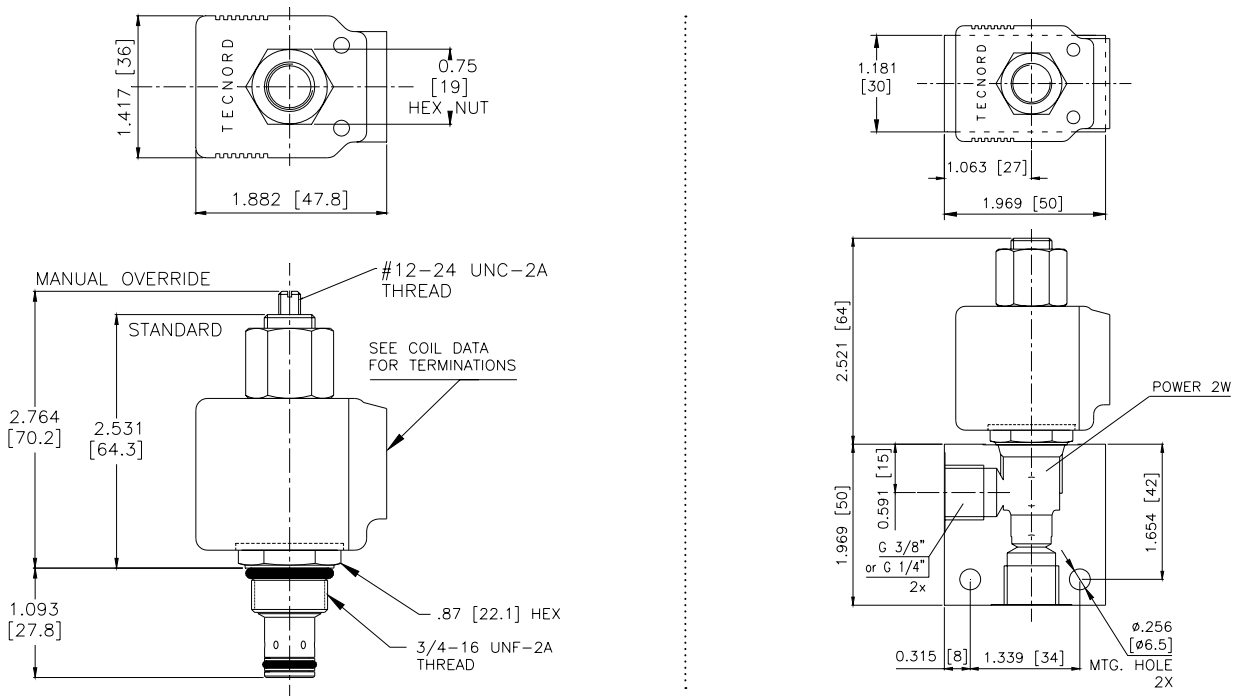


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DIMENSIONS



ORDERING INFORMATION

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

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)

- BODIES**
- Blank** Without Body
 - N** 1/4" BSP Ports
 - N1** 3/8" BSP Ports
 - S** #6 SAE Ports

- VOLTAGE** (other voltages available on request)
- 12** 12 VDC
 - 24** 24 VDC
 - 22** 220 VAC without internal rectifier

"P" TYPE "J" COIL TERMINATION

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

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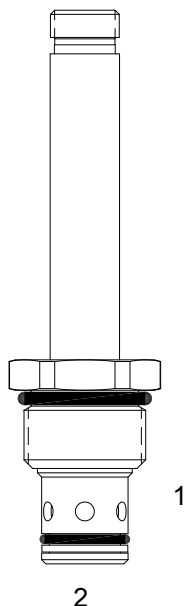


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DE-S2C PILOT OPERATED POPPET, 2 WAY NORMALLY OPEN



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

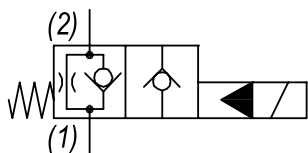
When de-energized the DE-S2C allows flow to pass from (1) to (2), but restricts flow from (2) to (1).
When energized the valve blocks flow from (1) to (2) but allows free reverse flow from (2) to (1).

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

FEATURES

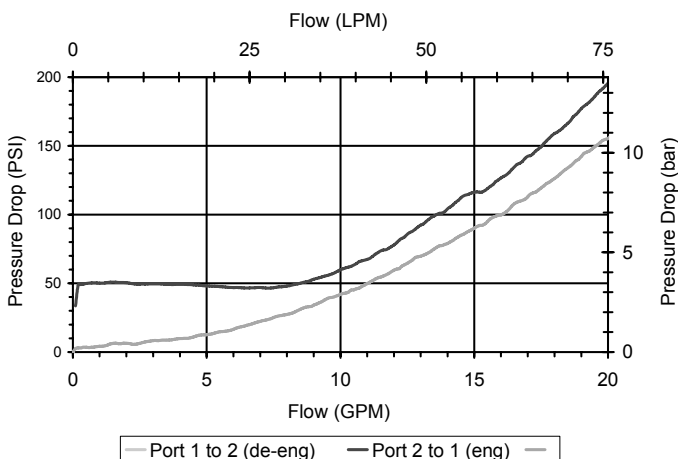
- Hardened parts for long life.
- Efficient wet-armature construction.
- Cartridges are voltage interchangeable.
- Manual override option.
- Industry common cavity.
- Unitized, molded coil design.
- Continuous duty rated solenoid.
- Optional coil voltages and terminations.
- Optional "I" Coil: Weatherproof, 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 Temp. 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 Tools Kit (form tool, reamer, tap)	40500000
Seal Kit	21191200

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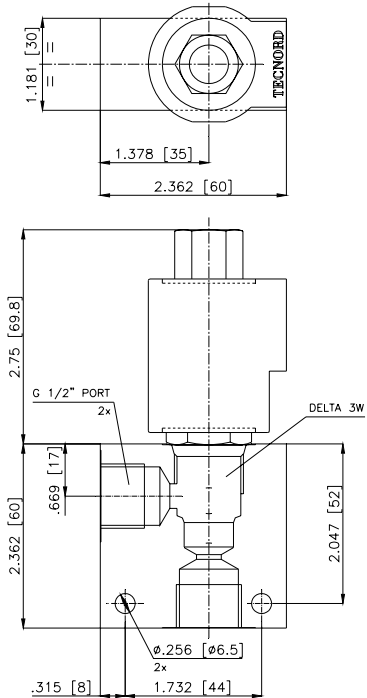
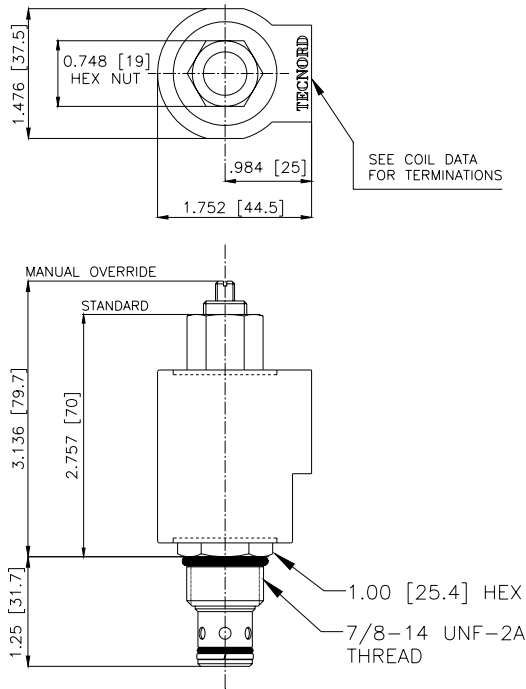


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DIMENSIONS



ORDERING INFORMATION

Approximate Coil Weight: .56 lbs (.25 kg)

DE-S2C - - - -

OPTIONS

- Buna Standard **00**
- Viton Standard **V0**
- Buna, Override, Detent **0M**
- Viton, Override, Detent **VM**
- Buna, Override, Knob **0K**
- 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)

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

DL Double Lead
(several types of termination can be attached on leads on request)

HC DIN 43650 (Hirschmann) - (AC&DC)
DI Deutsch - Integral DT04-2P

BODIES

- Blank** Without Body
- N** 1/2" BSP Ports
- S** #8 SAE Ports

VOLTAGE (other voltages available on request)

- 12** 12 VDC
- 24** 24 VDC
- 22** 220 VAC without internal rectifier

IMMERSION PROOF "D" TYPE

- DIA** "I" Coil AMP Superseal - Integral
- DID** "I" Coil Deutsch - Integral DT04-2P
- DIJ** "I" Coil AMP Jr. Timer - Integral
- DIM** "I" Coil Metri-Pack - Integral

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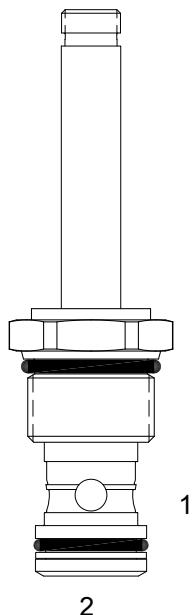


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TT-S2C PILOT OPERATED POPPET, 2 WAY NORMALLY OPEN



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

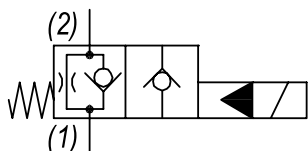
When de-energized the TT-S2C allows flow to pass from (1) to (2), but restricts flow from (2) to (1).
When energized the valve blocks flow from (1) to (2) but allows free reverse flow from (2) to (1).

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

FEATURES

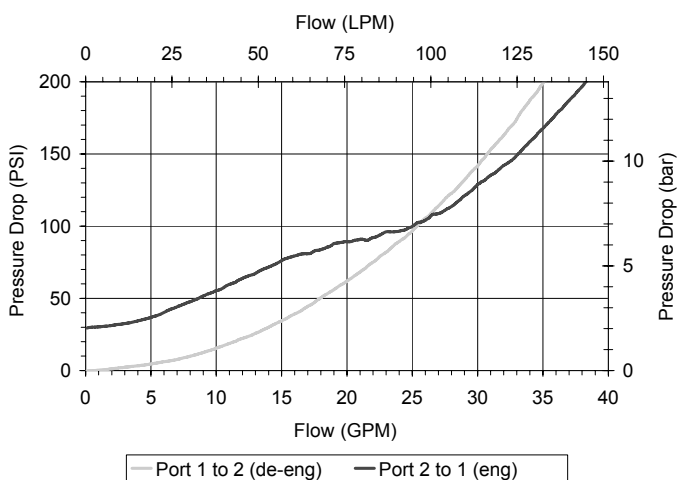
- Hardened parts for long life.
- Efficient wet-armature construction.
- Cartridges are voltage interchangeable.
- Manual override option.
- Industry common cavity.
- Unitized, molded coil design.
- Continuous duty rated solenoid.
- Optional coil voltages and terminations.
- Optional "I" Coil: Weatherproof, 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 Temp. Range	-40° to 250°F (-40° to 120°C)
Weight	.51 lbs (.23 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	TECNORD 2W
Cavity Tools Kit	
(form tool, reamer, tap)	40500032
Seal Kit	21191300

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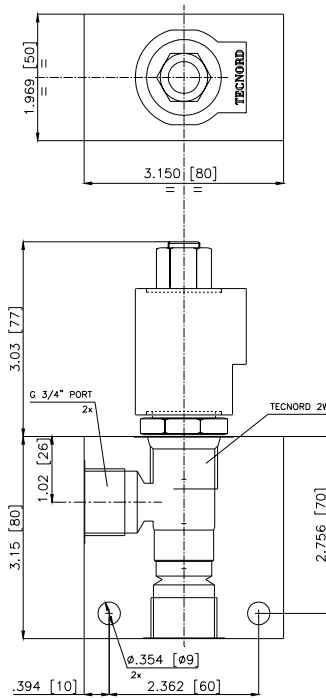
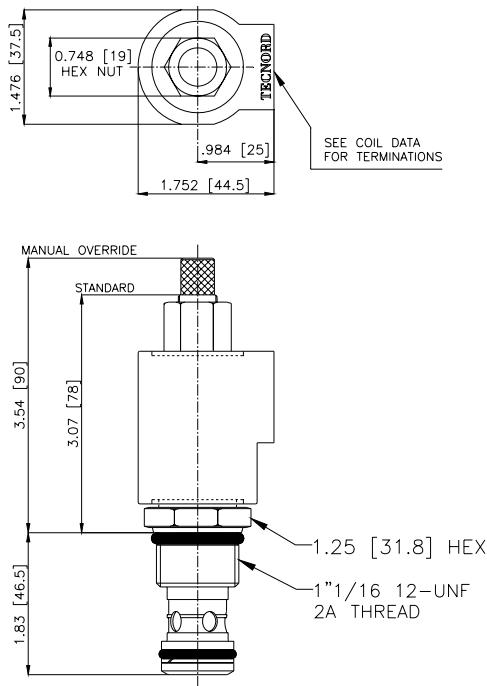


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DIMENSIONS



ORDERING INFORMATION

Approximate Coil Weight: .56 lbs (.25 kg)

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)

- BODIES**
- Blank Without Body
 - N** 3/4" BSP Ports
 - S** #12 SAE Ports

- VOLTAGE** (other voltages available on request)
- 12** 12 VDC
 - 24** 24 VDC
 - 22** 220 VAC without internal rectifier

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

DL Double Lead
(several types of termination can be attached on leads on request)

HC DIN 43650 (Hirschmann) - (AC&DC)
DI Deutsch - Integral DT04-2P

IMMERSION PROOF "D" TYPE

- DIA** "1" Coil AMP Superseal - Integral
- DID** "1" Coil Deutsch - Integral DT04-2P
- DIJ** "1" Coil AMP Jr. Timer - Integral
- DIM** "1" Coil Metri-Pack - Integral

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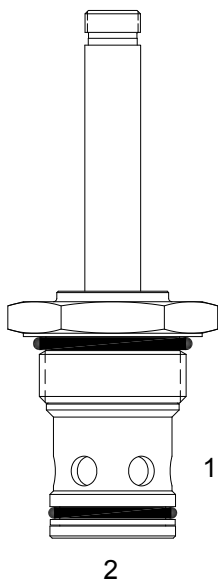


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SJ-S2C PILOT OPERATED POPPET, 2 WAY NORMALLY OPEN



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.

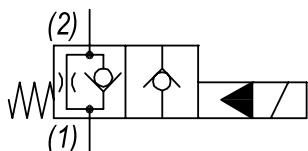
OPERATION

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

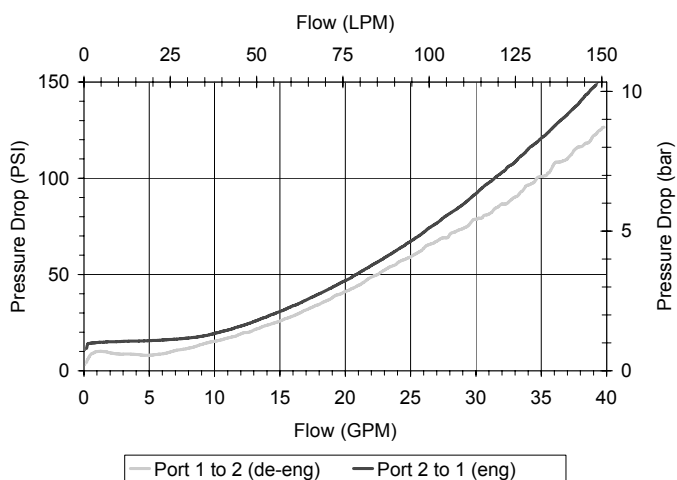
- Hardened parts for long life.
- Efficient wet-armature construction.
- Cartridges are voltage interchangeable.
- Industry common cavity.
- Unitized, molded coil design.
- Continuous duty rated solenoid.
- Optional coil voltages and terminations.
- Optional "I" Coil: Weatherproof, Thermal Shock, Immersion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

HYDRAULIC SYMBOL



PERFORMANCE

Actual Test Data (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 Temp. 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 Tools Kit	
(form tool, reamer, tap)	40500017
Seal Kit	21191400

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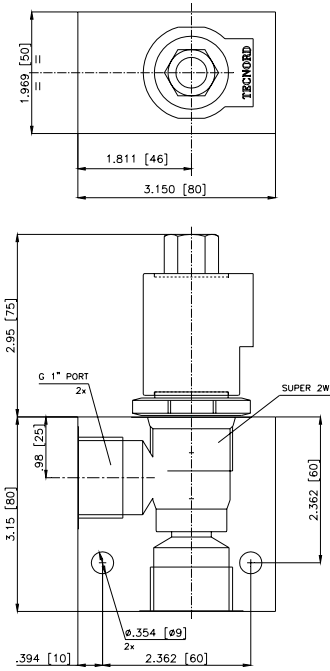
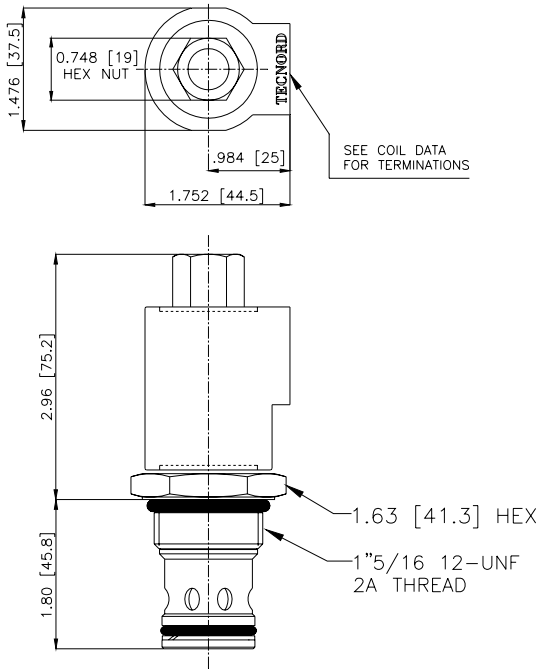


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DIMENSIONS



ORDERING INFORMATION

Approximate Coil Weight: .56 lbs (.25 kg)

SJ-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)

BODIES

- Blank** Without Body
- N** 1" BSP Ports
- S** #12 SAE Ports

VOLTAGE (other voltages available on request)

- 12** 12 VDC
- 24** 24 VDC
- 22** 220 VAC without internal rectifier

"V" COIL TERMINATION

(All DC Except as Noted)

DL Double Lead
(several types of termination can be attached on leads on request)

HC DIN 43650 (Hirschmann) - (AC&DC)
DI Deutsch - Integral DT04-2P

DIA "1" Coil AMP Superseal - Integral
DID "1" Coil Deutsch - Integral DT04-2P
DIJ "1" Coil AMP Jr. Timer - Integral
DIM "1" Coil Metri-Pack - Integral

IMMERSION PROOF "D" TYPE

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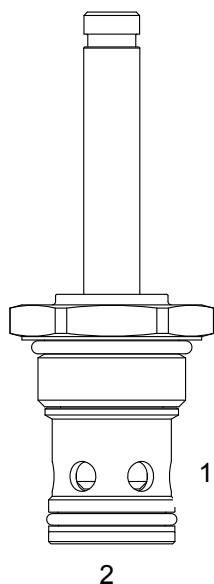


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HJ-S2C PILOT OPERATED POPPET, 2 WAY, NORMALLY OPEN



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.

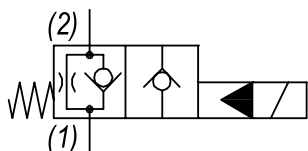
OPERATION

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

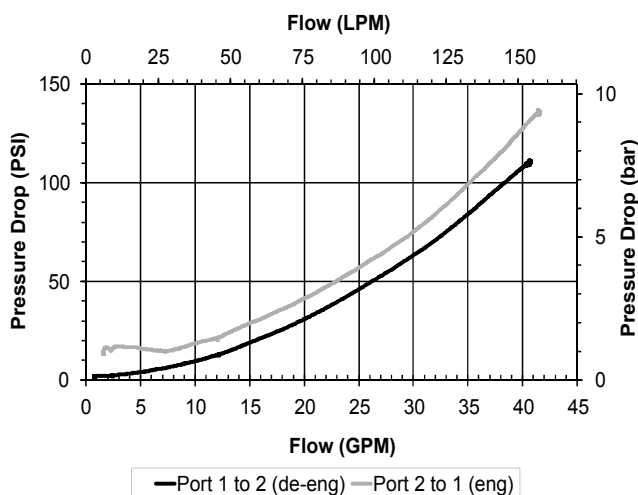
- Hardened parts for long life.
- Efficient wet-armature construction.
- Cartridges are voltage interchangeable.
- Industry common cavity.
- Unitized, molded coil design.
- Continuous duty rated solenoid.
- Optional coil voltages and terminations.

HYDRAULIC SYMBOL



PERFORMANCE

Actual Test Data (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 Temp. 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 Tools Kit	
(form tool, reamer, tap)	40500017
Seal Kit	21191400

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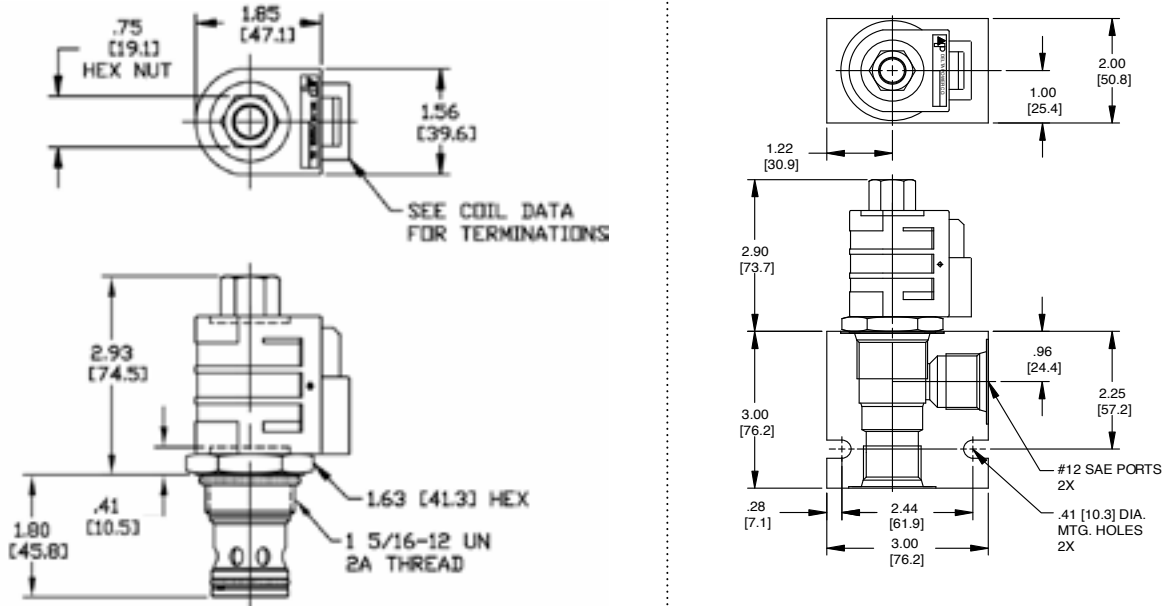


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DIMENSIONS



ORDERING INFORMATION

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

HJ-S2C - - - -		
OPTIONS		BODIES
Buna Standard	00	Blank Without Body
Viton Standard	V0	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 25 VAC
		11 120 VAC
		22 220 VAC
		44 440 VAC

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

“D” COIL TERMINATION
(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 (Hirschmann) - (AC&DC) |
| PL Packard on Leads | CL Conduit Lead - (AC Only) |
| WL Weatherpack on Leads | DI Deutsch - Integral DT04-2P |

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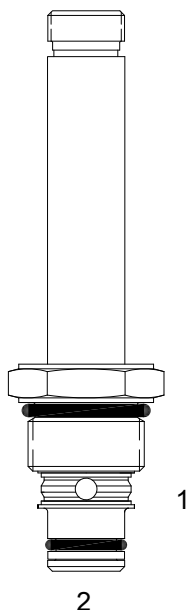


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PB-S2D PILOT OPERATED POPPET, 2 WAY NORMALLY OPEN



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).

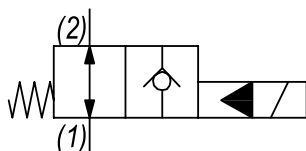
When energized the valve blocks flow from (1) to (2) and allows flow from (2) to (1).

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

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.

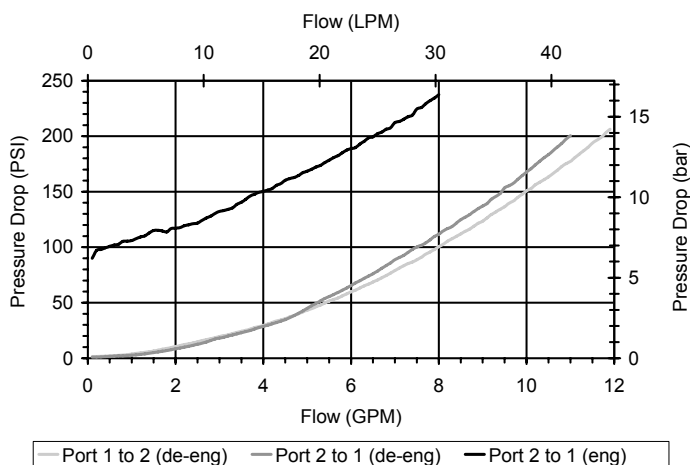
HYDRAULIC SYMBOL



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 Temp. 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 Tools Kit	
(form tool, reamer, tap)	40500005
Seal Kit	21191100

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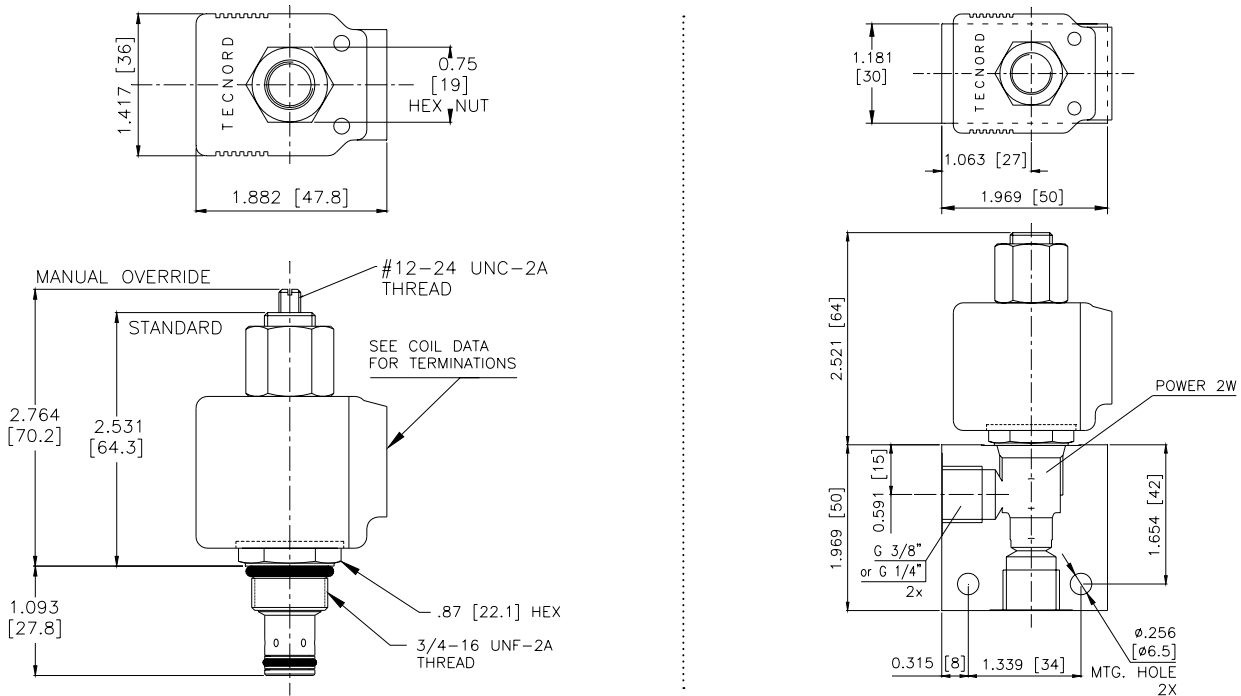


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DIMENSIONS



ORDERING INFORMATION

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

PB-S2D

- OPTIONS**
- Buna Standard **00**
 - Viton Standard **V0**
 - Buna, Override, Detent **0M**
 - Viton, Override, Detent **VM**
 - Buna, Override, Knob **0K**
 - 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)

- BODIES**
- Blank** Without Body
 - N** 1/4" BSP Ports
 - N1** 3/8" BSP Ports
 - S** #6 SAE Ports

- VOLTAGE** (other voltages available on request)
- 12** 12 VDC
 - 24** 24 VDC
 - 22** 220 VAC with molded full wave rectifier

"P" TYPE "J" COIL TERMINATION

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

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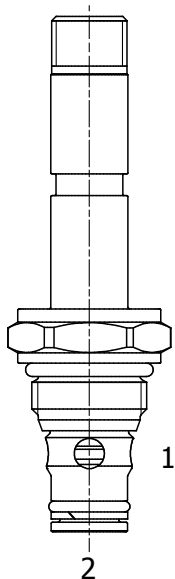


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HB-S2D PILOT OPERATED POPPET, 2 WAY NORMALLY OPEN WITH REVERSE FLOW DE-ENERGIZED



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).

PUSH TYPE MANUAL OVERRIDE OPTION: to override, push the manual override button.

SCREW TYPE MANUAL OVERRIDE OPTION: to override, turn the manual override screw clockwise.

To release, turn the manual override screw counterclockwise.

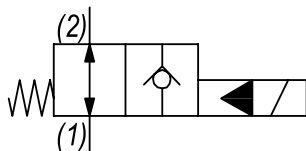
FEATURES

- 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.



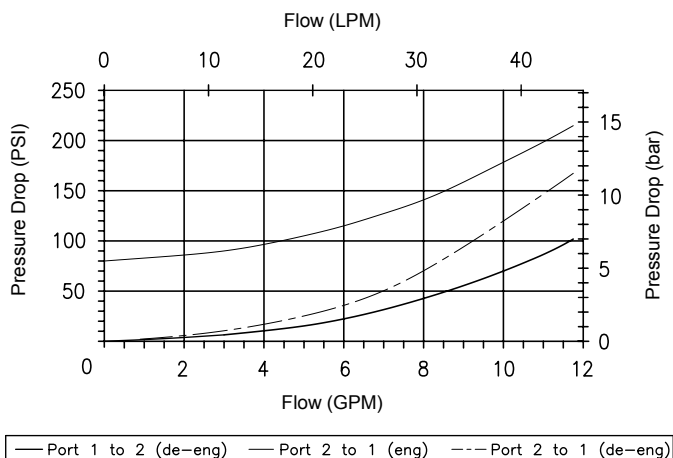
Zinc Nickel plating on all exposed surfaces (>500hours corrosion resistance).

HYDRAULIC SYMBOL



PERFORMANCE

Actual Test Data (Cartridge Only)



VALVE SPECIFICATIONS

Nominal Flow	12 GPM (45 LPM)
Rated Operating Pressure	5000 PSI (345 bar)
Typical Internal Leakage (150 SSU)	0-5 drops/min at 5000 PSI (345 bar)
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temp. 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	30-35 ft-lbs (41-47 Nm)
Coil Nut Torque Requirements	3-4.5 ft-lbs (4-6 Nm)
Cavity	POWER 2W
Cavity Tools Kit	40500005
Seal Kit	21191100

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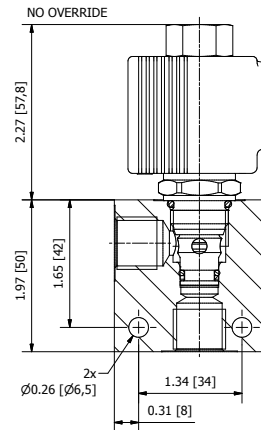
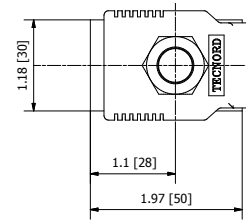
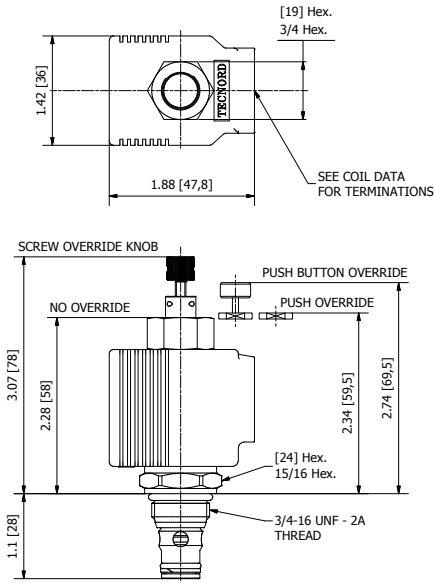


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DIMENSIONS



ORDERING INFORMATION

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

HB-S2D

- OPTIONS**
- Buna Standard **00**
 - Viton Standard **V0**
 - Buna, Push Pin, Override **0P**
 - Viton, Push Pin, Override **VP**
 - Buna, Push Button, Override **0B**
 - Viton, Push Button, Override **VB**
 - Buna, Screw, Override **0K**
 - Viton, Screw, Override **VK**

- BODIES**
- Blank Without Body
 - N** 1/4" BSP Ports (aluminum)
 - N1** 3/8" BSP Ports (aluminum)
 - S** #6 SAE Ports
 - H** 1/4" BSP Ports (steel)
 - H1** 3/8" BSP Ports (steel)

Note: Aluminum bodies only for use up to 250 bar

VOLTAGE (other voltages available on request)

- 12** 12 VDC
- 24** 24 VDC
- 26** 26 VDC

"P" TYPE "J" COIL TERMINATION

- JA** "J" Coil AMP Superseal - Integral
- JD** "J" Coil Deutsch - Integral DT04-2P

JJ "J" Coil AMP Jr. Time - Integral

- JL** "J" Coil Double Lead
- JH** "J" Coil DIN 43650 (Hirschmann)

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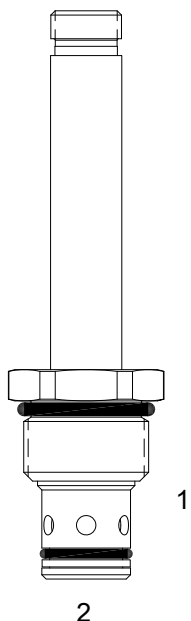


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DE-S2D PILOT OPERATED POPPET, 2 WAY NORMALLY OPEN



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

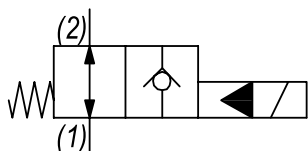
When de-energized the DE-S2D allows flow to pass from (1) to (2) and (2) to (1). When energized the valve blocks flow from (1) to (2) but allows free reverse flow from (2) to (1).

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

FEATURES

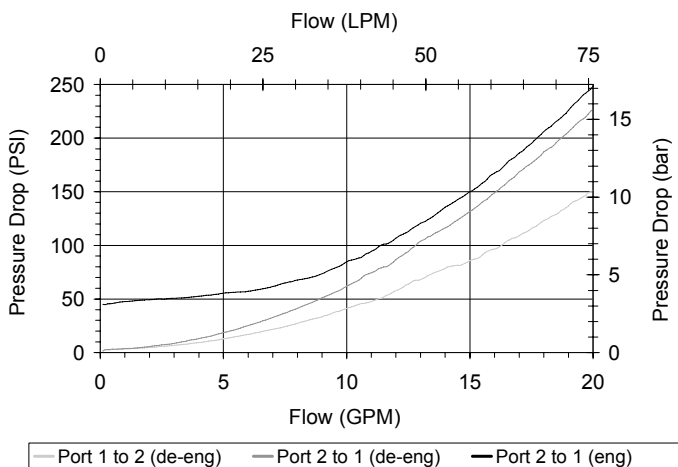
- Hardened parts for long life.
- Efficient wet-armature construction.
- Cartridges are voltage interchangeable.
- Manual override option.
- Industry common cavity.
- Unitized, molded coil design.
- Continuous duty rated solenoid.
- Optional coil voltages and terminations.
- Optional "I" Coil: Weatherproof, 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 Temp. 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 Tools Kit	
(form tool, reamer, tap)	40500000
Seal Kit	21191200

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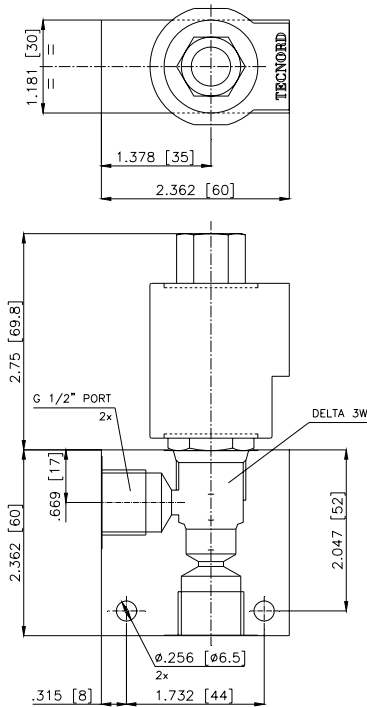
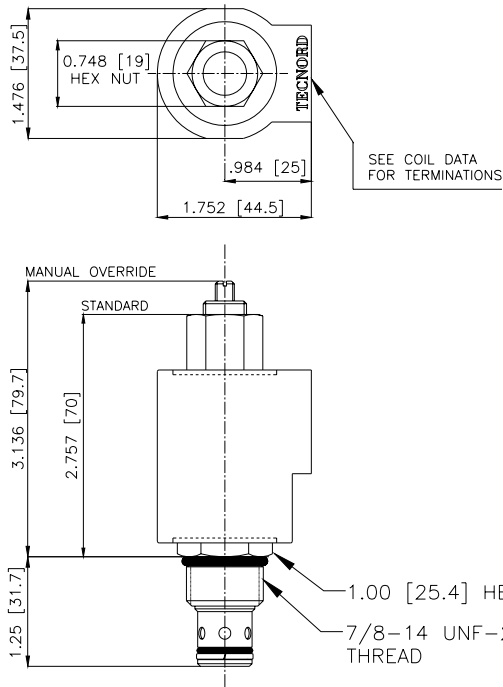


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DIMENSIONS



ORDERING INFORMATION

Approximate Coil Weight: .56 lbs (.25 kg)

DE-S2D

- OPTIONS**
- Buna Standard **00**
 - Viton Standard **V0**
 - Buna, Override, Detent **0M**
 - Viton, Override, Detent **VM**
 - Buna, Override, Knob **0K**
 - 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)

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

DL Double Lead
(several types of termination can be attached on leads on request)

HC DIN 43650 (Hirschmann) - (AC&DC)
DI Deutsch - Integral DT04-2P

IMMERSION PROOF "D" TYPE

- DIA** "1" Coil AMP Superseal - Integral
- DID** "1" Coil Deutsch - Integral DT04-2P
- DIJ** "1" Coil AMP Jr. Timer - Integral
- DIM** "1" Coil Metri-Pack - Integral

- BODIES**
- Blank** Without Body
 - N** 1/2" BSP Ports
 - S** #8 SAE Ports

- VOLTAGE** (other voltages available on request)
- 12** 12 VDC
 - 24** 24 VDC
 - 22** 220 VAC without internal rectifier

W 9 / 2020

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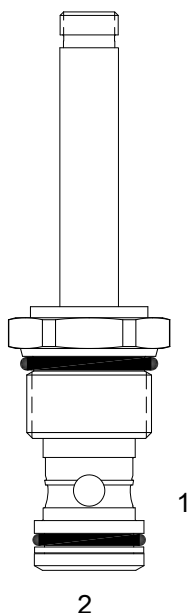


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TT-S2D PILOT OPERATED POPPET, 2 WAY NORMALLY OPEN



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

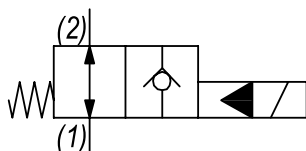
When de-energized the TT-S2D allows flow to pass from (1) to (2) and (2) to (1). When energized the valve blocks flow from (1) to (2) but allows free reverse flow from (2) to (1).

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

FEATURES

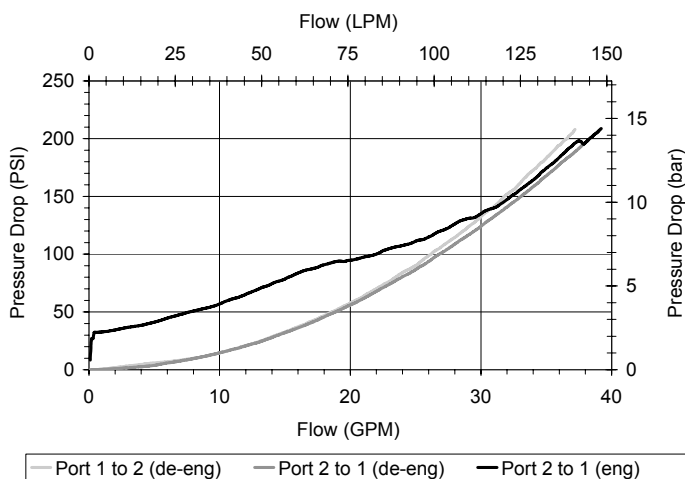
- Hardened parts for long life.
- Efficient wet-armature construction.
- Cartridges are voltage interchangeable.
- Manual override option.
- Industry common cavity.
- Unitized, molded coil design.
- Continuous duty rated solenoid.
- Optional coil voltages and terminations.
- Optional "I" Coil: Weatherproof, 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 Temp. Range	-40° to 250°F (-40° to 120°C)
Weight	.51 lbs (.23 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	TECNORD 2W
Cavity Tools Kit (form tool, reamer, tap)	40500032
Seal Kit	21191300

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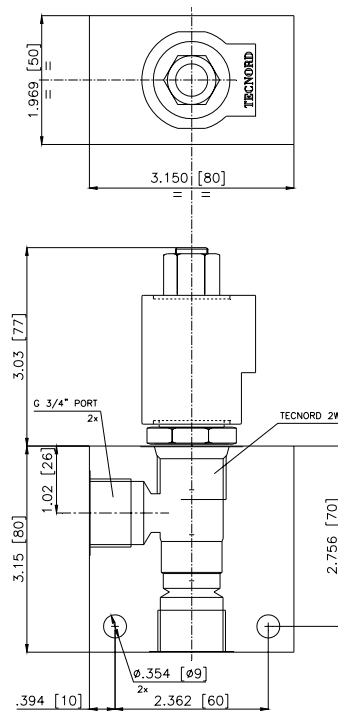
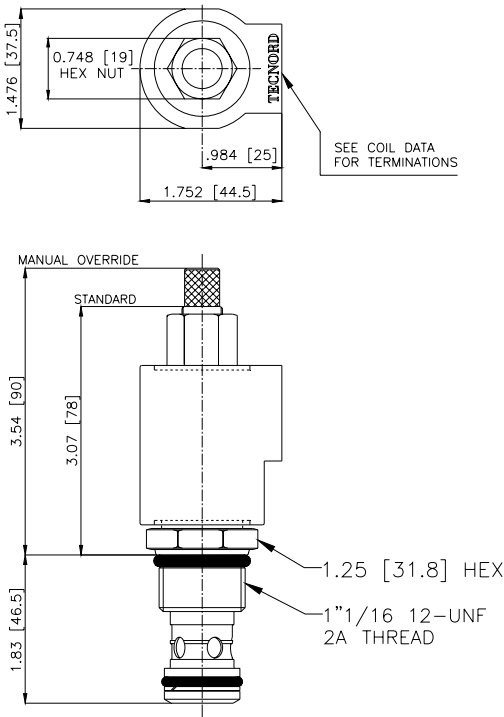


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DIMENSIONS



ORDERING INFORMATION

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

TT-S2D - - - -

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)

BODIES

- Blank** Without Body
- N** 3/4" BSP Ports
- S** #12 SAE Ports

VOLTAGE (other voltages available on request)

- 12** 12 VDC
- 24** 24 VDC
- 22** 220 VAC without internal rectifier

"V" COIL TERMINATION

(All DC Except as Noted)

DL Double Lead
(several types of termination can be attached on leads on request)

HC DIN 43650 (Hirschmann) - (AC&DC)

DI Deutsch - Integral DT04-2P

- IMMERSION PROOF "D" TYPE**
- DIA** "I" Coil AMP Superseal - Integral
 - DID** "I" Coil Deutsch - Integral DT04-2P
 - DIJ** "I" Coil AMP Jr. Timer - Integral
 - DIM** "I" Coil Metri-Pack - Integral

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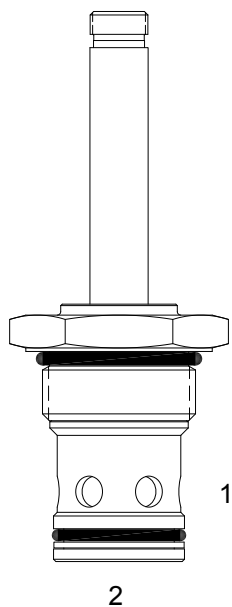


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SJ-S2D PILOT OPERATED POPPET, 2 WAY NORMALLY OPEN



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.

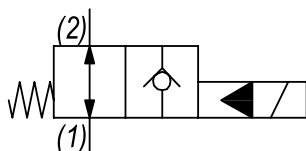
OPERATION

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

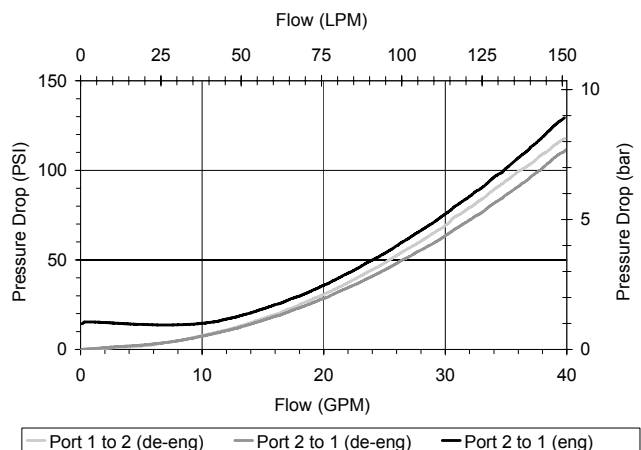
- Hardened parts for long life.
- Efficient wet-armature construction.
- Cartridges are voltage interchangeable.
- Industry common cavity.
- Unitized, molded coil design.
- Continuous duty rated solenoid.
- Optional coil voltages and terminations.
- Optional "I" Coil: Weatherproof, Thermal Shock, Immersion 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 Temp. 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 Tools Kit (form tool, reamer, tap)	40500017
Seal Kit	21191400

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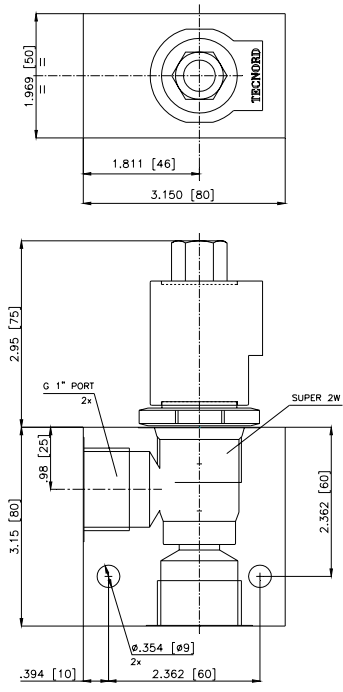
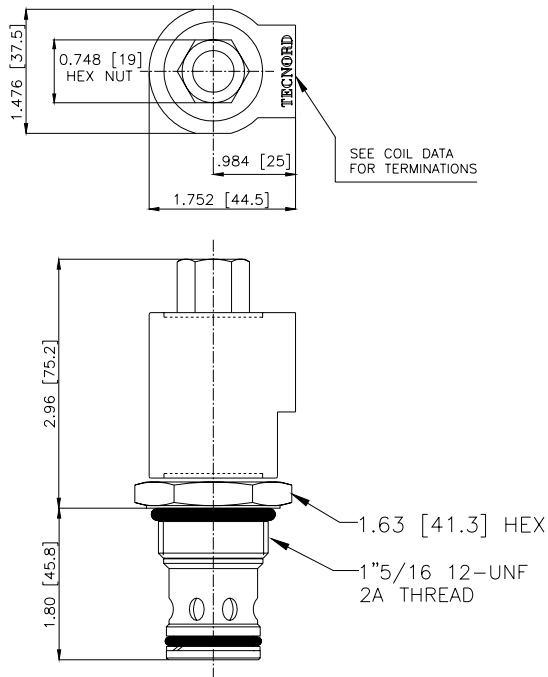


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DIMENSIONS



ORDERING INFORMATION

Approximate Coil Weight: .56 lbs (.25 kg)

SJ-S2D - - - -

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)

BODIES

- Blank** Without Body
- N** 1" BSP Ports
- S** #12 SAE Ports

VOLTAGE (other voltages available on request)

- 12** 12 VDC
- 24** 24 VDC
- 22** 220 VAC without internal rectifier

"V" COIL TERMINATION

(All DC Except as Noted)

DL Double Lead
(several types of termination can be attached on leads on request)

HC DIN 43650 (Hirschmann) - (AC&DC)
DI Deutsch - Integral DT04-2P

DIA "I" Coil AMP Superseal - Integral
DID "I" Coil Deutsch - Integral DT04-2P
DIJ "I" Coil AMP Jr. Timer - Integral
DIM "I" Coil Metri-Pack - Integral

IMMERSION PROOF "D" TYPE

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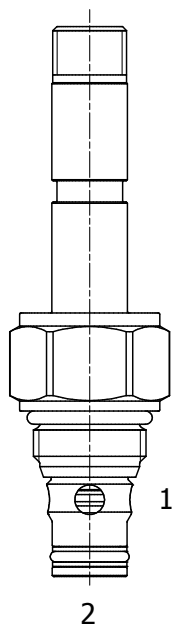


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HB-S2K PILOTED OPERATED POPPET, 2 WAY DOUBLE LOCK NORMALLY OPEN



DESCRIPTION

8 size, 3/4-16 thread, "Power" series, solenoid operated, 2 way double lock normally open, pilot operated bidirectional poppet valve.

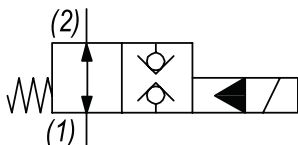
OPERATION

When de-energized the HB-S2K allows flow from (1) to (2) or from (2) to (1). When energized the valve blocks flow from (1) to (2) and block flow from (2) to (1).

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.

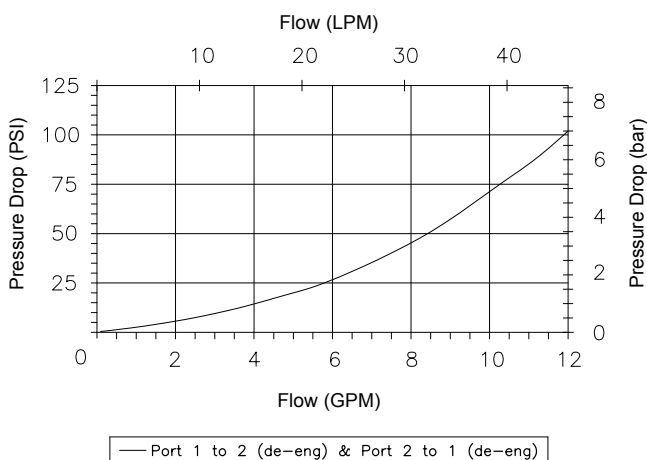
HYDRAULIC SYMBOL



Zinc Nickel plating on all exposed surfaces (>500hours corrosion resistance).

PERFORMANCE

Actual Test Data (Cartridge Only)



VALVE SPECIFICATIONS

Nominal Flow	12 GPM (45 LPM)
Rated Operating Pressure	5000 PSI (345 bar)
Typical Internal Leakage (150 SSU)	0-5 drops/min at 5000 PSI (345 bar)
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temp. 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	30-35 ft-lbs (41-47 Nm)
Coil Nut Torque Requirements	3-4.5 ft-lbs (4-6 Nm)
Cavity	POWER 2W
Cavity Tools Kit	40500005
Seal Kit	21191102

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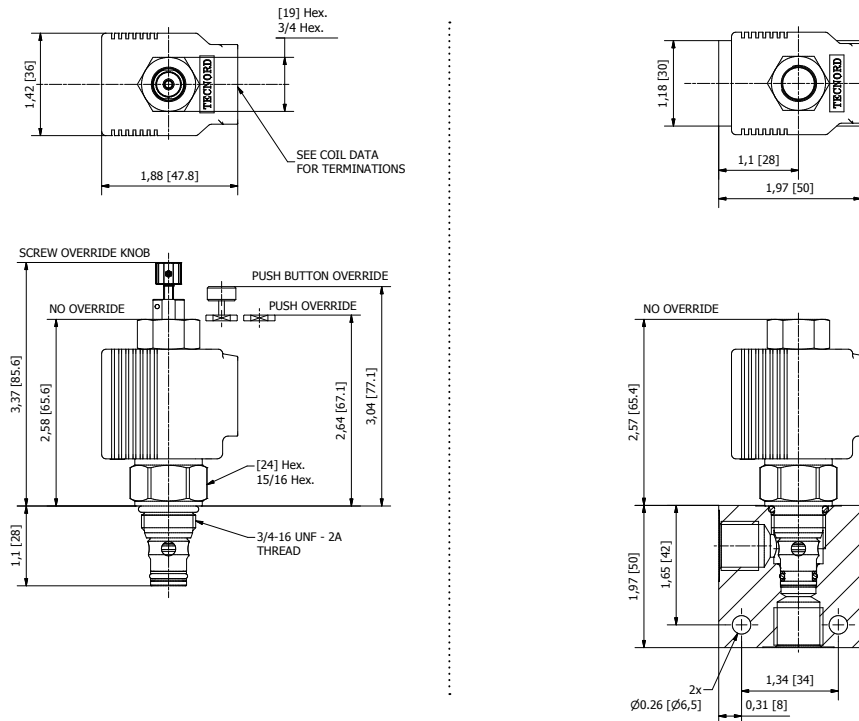


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DIMENSIONS



ORDERING INFORMATION

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

HB-S2K - - - -

OPTIONS

- Buna Standard **00**
- Viton Standard **V0**
- Buna, Push Pin, Override **0P**
- Viton, Push Pin, Override **VP**
- Buna, Push Button, Override **0B**
- Viton, Push Button, Override **VB**
- Buna, Screw, Override **0K**
- Viton, Screw, Override **VK**

BODIES

- Blank Without Body
- N** 1/4" BSP Ports (aluminum)
- N1** 3/8" BSP Ports (aluminum)
- S** #6 SAE Ports
- H** 1/4" BSP Ports (steel)
- H1** 3/8" BSP Ports (steel)

Note: Aluminum bodies only for use up to 250 bar

VOLTAGE (other voltages available on request)

- 12** 12 VDC
- 24** 24 VDC
- 26** 26 VDC

"P" TYPE "J" COIL TERMINATION

- JA** "J" Coil AMP Superseal - Integral
- JD** "J" Coil Deutsch - Integral DT04-2P

JJ "J" Coil AMP Jr. Time - Integral

- JL** "J" Coil Double Lead
- JH** "J" Coil DIN 43650 (Hirschmann)

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SOLENOID OPERATED DIRECTIONAL CONTROLS

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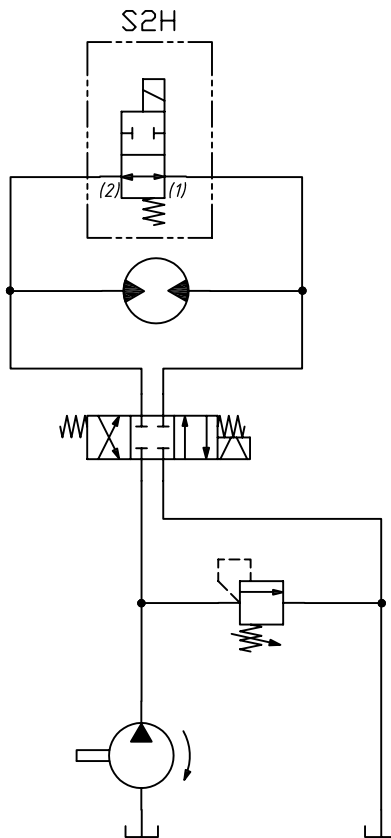
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2 WAY 2 POSITION NORMALLY OPEN SPOOL VALVES

2W2P NORMALLY OPEN	GPM	PSI	LPM	BAR	CAVITY	MODEL	PAGE
	1	4000	4	276	5/8-18	UA-S2H	ST90
	5	3000	19	207	3/4-16	PB-S2H	ST92
	8	3500	30	241	7/8-14	DE-S2H	ST94
	8	4000	30	276	7/8-14	HE-S2H	ST96

TYPICAL SCHEMATIC

Typical application for the S2H is to provide deceleration or unloading of a hydraulic motor.



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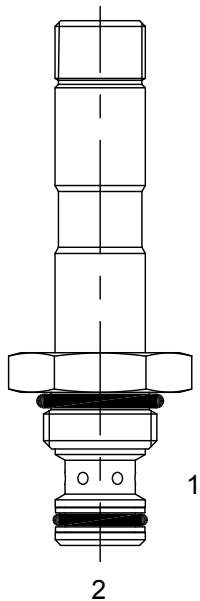


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UA-S2H DIRECT ACTING SPOOL, 2 WAY NORMALLY OPEN



DESCRIPTION

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

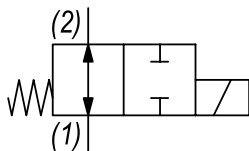
OPERATION

When de-energized the UA-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

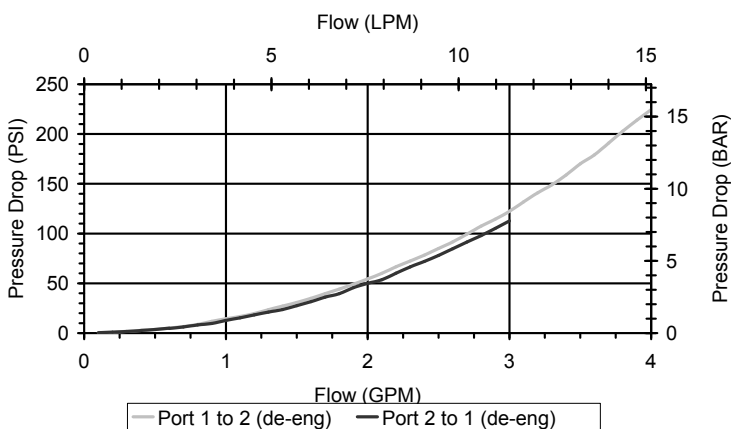
- Hardened parts for long life.
- Efficient wet-armature construction.
- Cartridges are voltage interchangeable.
- Industry common cavity.
- Unitized, molded coil design.
- Continuous duty rated solenoid.
- Optional coil voltages and terminations.

HYDRAULIC SYMBOL



PERFORMANCE

Actual Test Data (Cartridge Only)



VALVE SPECIFICATIONS

Nominal Flow	2 GPM (8 LPM) from (1) to (2) 1 GPM (4 LPM) from (2) to (1)
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 Temp. 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	4-6 ft-lbs (5.4-8.1 Nm)
Cavity	MINI 2W
Cavity Form Tool (Finishing)	40500003
Seal Kit	21191002

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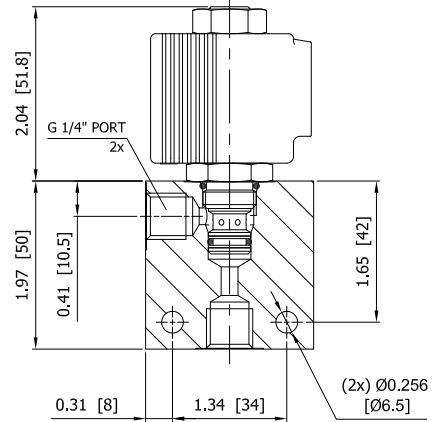
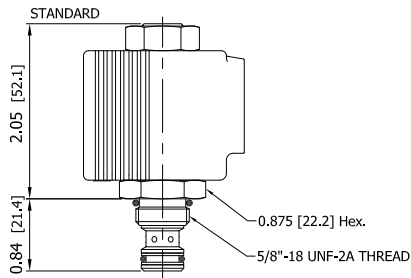
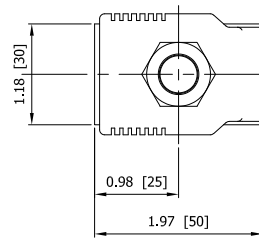
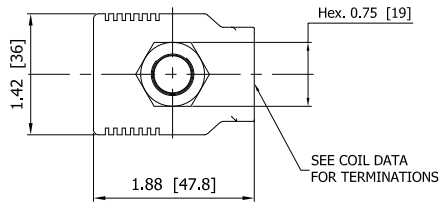
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SOLENOID OPERATED DIRECTIONAL CONTROLS

DIMENSIONS



ORDERING INFORMATION

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

UA-S2H - - - -

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)

BODIES

- Blank Without Body
- N** 1/4" BSP Ports
- S** #6 SAE Ports

VOLTAGE (other voltages available on request)

- 12** 12 VDC
- 24** 24 VDC
- 26** 220 VAC with molded full wave rectifier

"P" TYPE "J" COIL TERMINATION

- JA** "J" Coil AMP Superseal - Integral
- JD** "J" Coil Deutsch - Integral DT04-2P

JJ "J" Coil AMP Jr. Time - Integral

- JL** "J" Coil Double Lead
- JH** "J" Coil DIN 43650 (Hirschmann)

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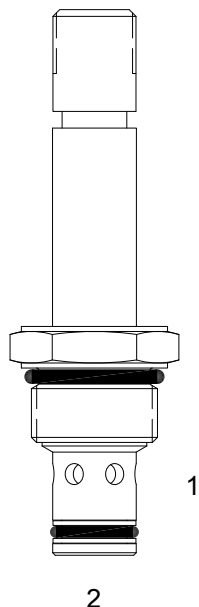


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PB-S2H DIRECT ACTING SPOOL, 2 WAY NORMALLY OPEN



DESCRIPTION

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

OPERATION

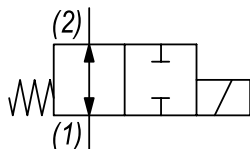
When de-energized the PB-S2H allows flow from (1) to (2) and (2) to (1). When energized the valve allows flow from (1) to (2) and (2) to (1).

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

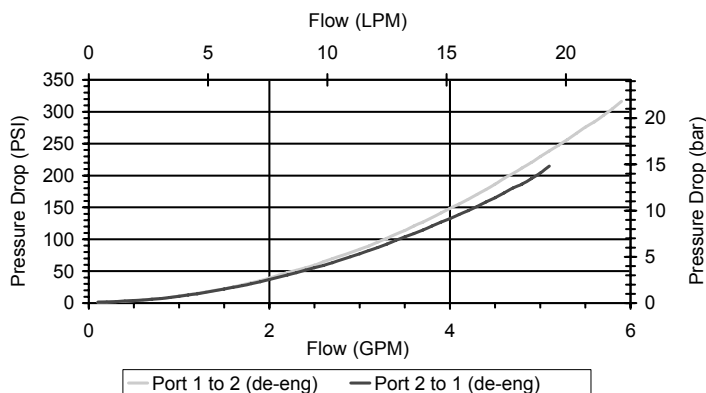
- Hardened parts for long life.
- Efficient wet-armature construction.
- Cartridges are voltage interchangeable.
- Manual override option.
- Industry common cavity.
- Unitized, molded coil design.
- Continuous duty rated solenoid.
- Optional coil voltages and terminations.
- Optional "I" Coil: Weatherproof, Thermal Shock, Imersion 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 Temp. 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 Tools Kit	(form tool, reamer, tap) 40500005
Seal Kit	21191102

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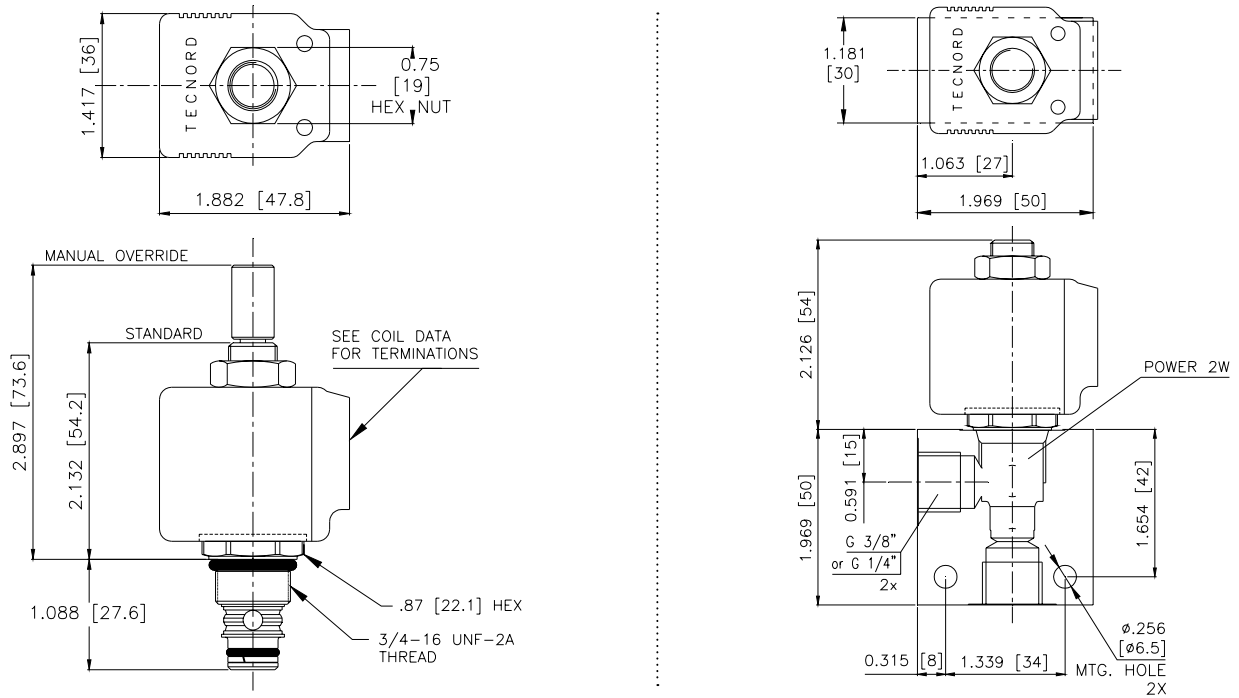
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DIMENSIONS



ORDERING INFORMATION

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

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, 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)

- BODIES**
- Blank** Without Body
 - N** 1/4" BSP Ports
 - N1** 3/8" BSP Ports
 - S** #6 SAE Ports

- VOLTAGE** (other voltages available on request)
- 12** 12 VDC
 - 24** 24 VDC
 - 22** 220 VAC without internal rectifier

"P" TYPE "J" COIL TERMINATION

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

W 9 / 2020

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

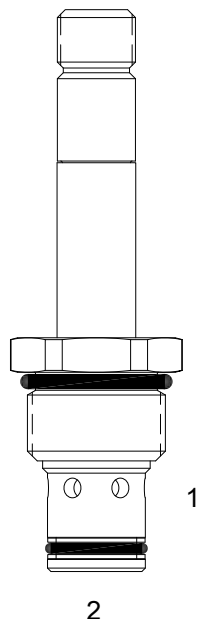


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DE-S2H DIRECT ACTING SPOOL, 2 WAY NORMALLY OPEN



DESCRIPTION

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

OPERATION

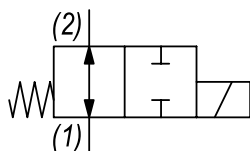
When de-energized the DE-S2H allows flow from (1) to (2) and (2) to (1). When energized the valve blocks flow from (1) to (2) and (2) to (1).

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

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.

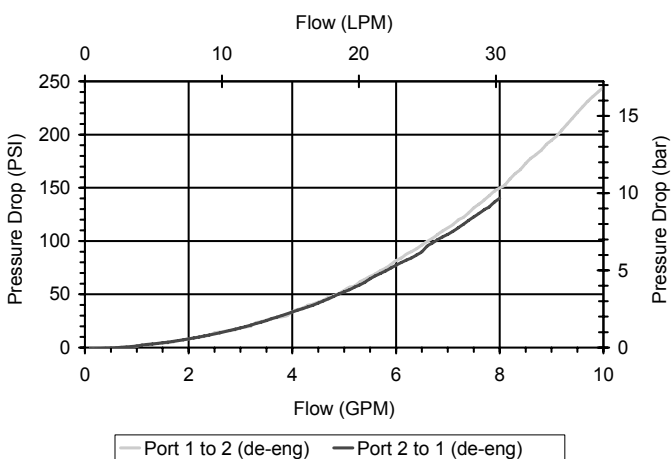
HYDRAULIC SYMBOL



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	3500 PSI (241 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 Temp. 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 Tools Kit	
(form tool, reamer, tap)	40500000
Seal Kit	21191202

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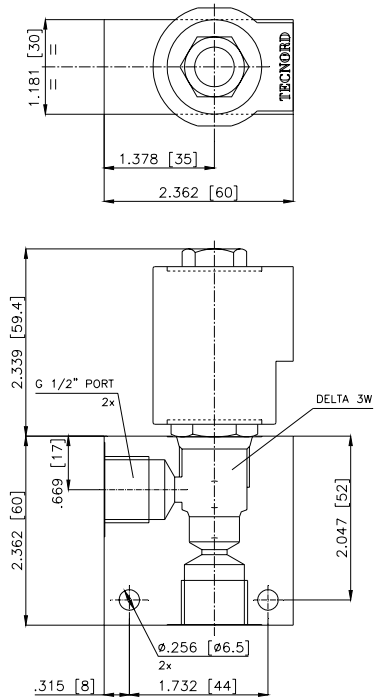
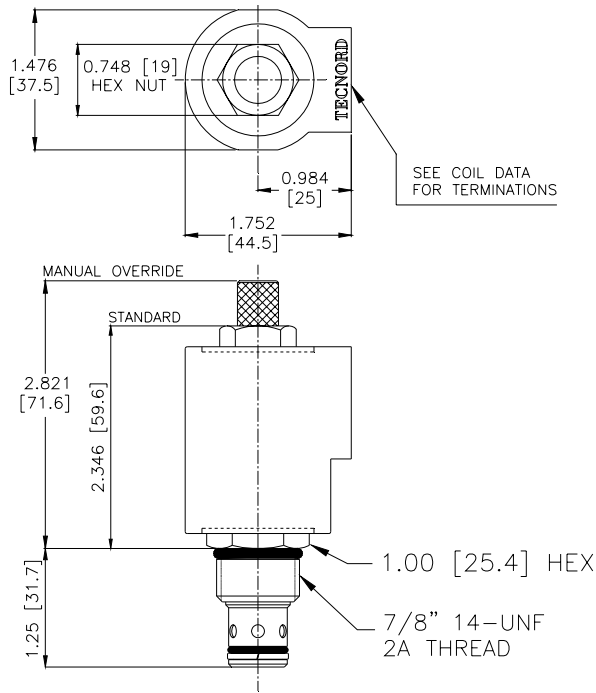


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DIMENSIONS



ORDERING INFORMATION

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

DE-S2H

- 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)

- BODIES**
- Blank** Without Body
 - N** 1/2" BSP Ports
 - S** #8 SAE Ports

- VOLTAGE** (other voltages available on request)
- 12** 12 VDC
 - 24** 24 VDC
 - 22** 220 VAC without internal rectifier

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

DL Double Lead
(several types of termination can be attached on leads on request)

HC DIN 43650 (Hirschmann) - (AC&DC)
DI Deutsch - Integral DT04-2P

IMMERSION PROOF "D" TYPE

- DIA** "I" Coil AMP Superseal - Integral
- DID** "I" Coil Deutsch - Integral DT04-2P
- DIJ** "I" Coil AMP Jr. Timer - Integral
- DIM** "I" Coil Metri-Pack - Integral

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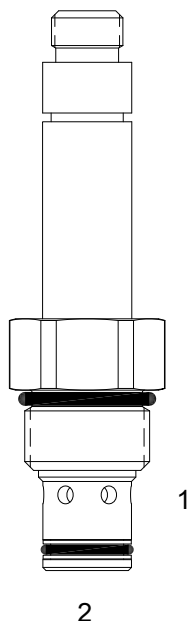


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HE-S2H DIRECT ACTING SPOOL, 2 WAY NORMALLY OPEN



DESCRIPTION

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

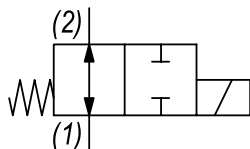
OPERATION

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.

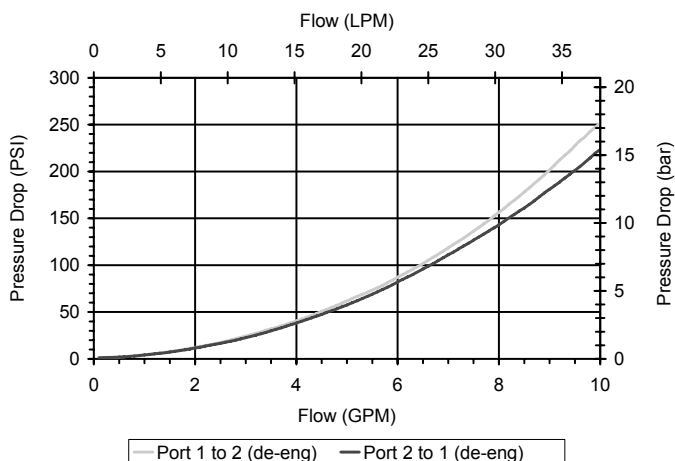
HYDRAULIC SYMBOL



Uses “L” Coils.

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	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 Temp. 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)
Coil Nut Torque Requirements	4-6 ft-lbs (5.4-8.1 Nm)
Cavity	DELTA 2W
Cavity Tools Kit	
(form tool, reamer, tap)	40500000
Seal Kit	21191202

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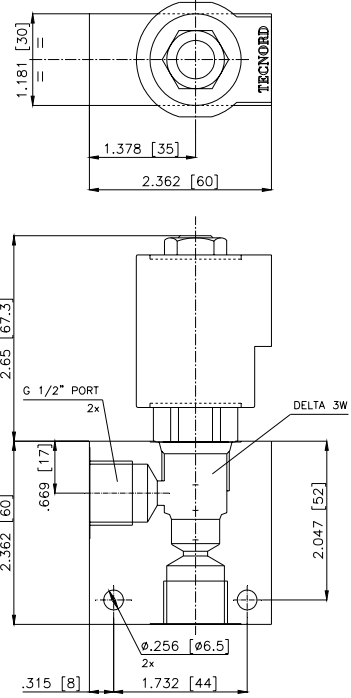
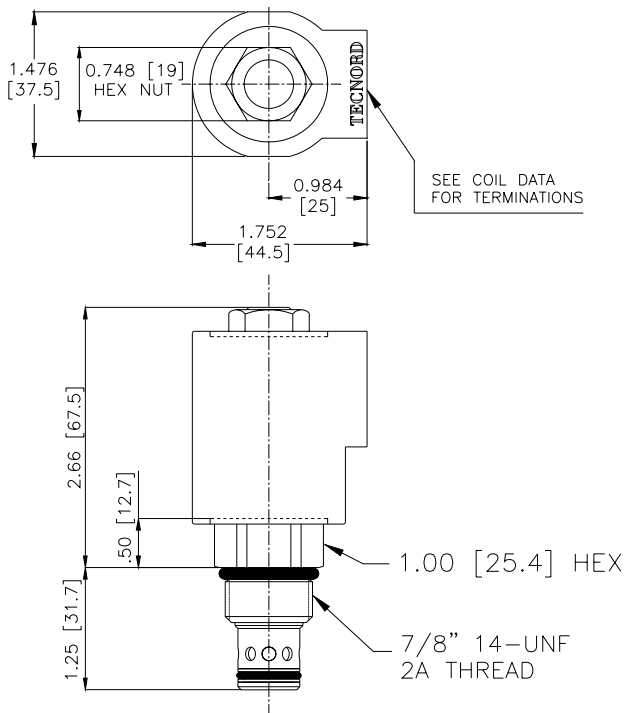


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DIMENSIONS



ORDERING INFORMATION

HE-S2H - - - -

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

BODIES
 Blank Without Body
N 1/2" BSP Ports
S #8 SAE Ports

Approximate Coil Weight: .56 lbs (.25 kg)

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

VOLTAGE (other voltages available on request)

- 12** 12 VDC
- 24** 24 VDC
- 22** 220 VAC without internal rectifier

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

DL Double Lead
 (several types of termination can be attached on leads on request)

HC DIN 43650 (Hirschmann) - (AC&DC)
DI Deutsch - Integral DT04-2P

IMMERSION PROOF "L" TYPE
LIA "I" Coil AMP Superseal - Integral
LID "I" Coil Deutsch - Integral DT04-2P
LIJ "I" Coil AMP Jr. Timer - Integral
LIM "I" Coil Metri-Pack - Integral

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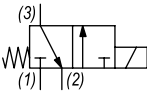
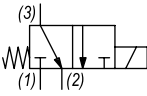
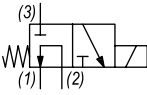
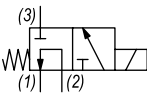
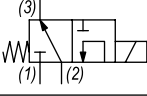
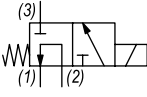
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SOLENOID OPERATED DIRECTIONAL CONTROLS

3 WAY 2 POSITION SPOOL VALVES

3W2P SPOOL	GPM	PSI	LPM	BAR	CAVITY	MODEL	PAGE
	1	4000	4	276	5/8-18	UC-S3A	ST100
	3	3000	11	207	3/4-16	PP-S3A	ST102
	10	3000	38	207	7/8-14	DF-S3A	ST104
	10	4000	38	276	7/8-14	HF-S3A	ST106
	2.5	3000	9.5	207	3/4-16	PP-S3B	ST108
	8	3000	30	207	7/8-14	DF-S3B	ST110
	8	4000	30	276	7/8-14	HF-S3B	ST112
	15	5000	57	345	1 1/16-12	HU-S3E	ST114
	15	5000	57	345	1 1/16-12	HU-S3F	ST116
	3	3000	11	207	3/4-16	PP-S3X	ST118
	3	3000	11	207	3/4-16	PP-S3D	ST120

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3 WAY 2 POSITION SPOOL VALVES

TYPICAL SCHEMATIC

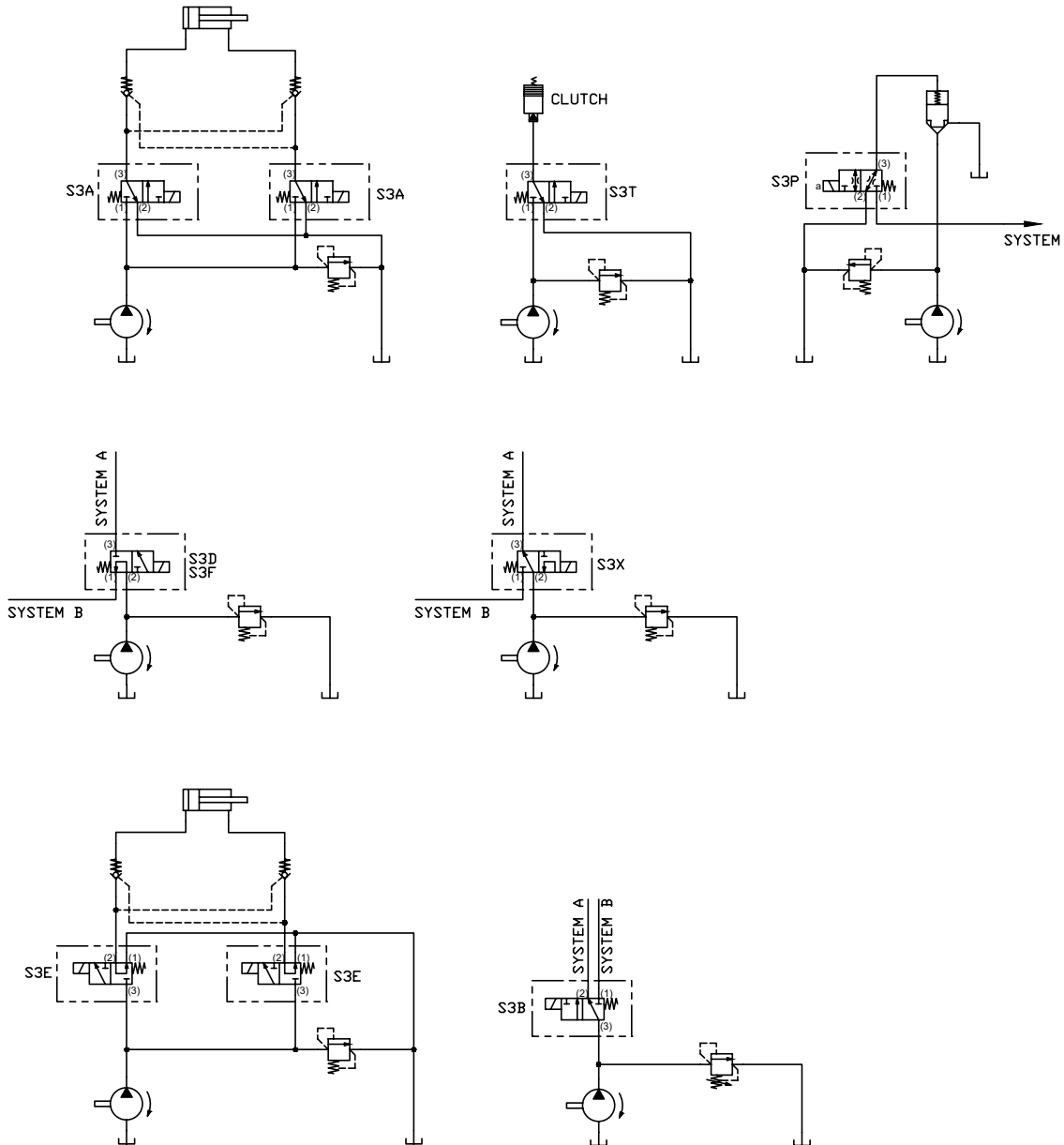
The typical application for the S3A and S3E is to have the pump supply port blocked, with the work port vented to tank.

In the examples shown, two valves are used to make a 4w3p motor center spool valve control function.

The S3T is typically used for clutch and transmission applications.

The MC-S3P is a low flow, low leakage, high pressure valve, used for pilot control of a larger main stage valve.

The S3B, S3D, S3F and S3X valves are often used in selector applications, depending on flow, pressure and porting logic.



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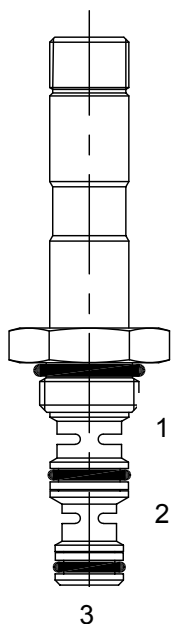


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UC-S3A DIRECT ACTING SPOOL, 3 WAY 2 POSITION



DESCRIPTION

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

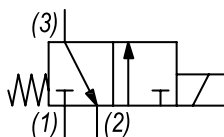
OPERATION

When de-energized the UC-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

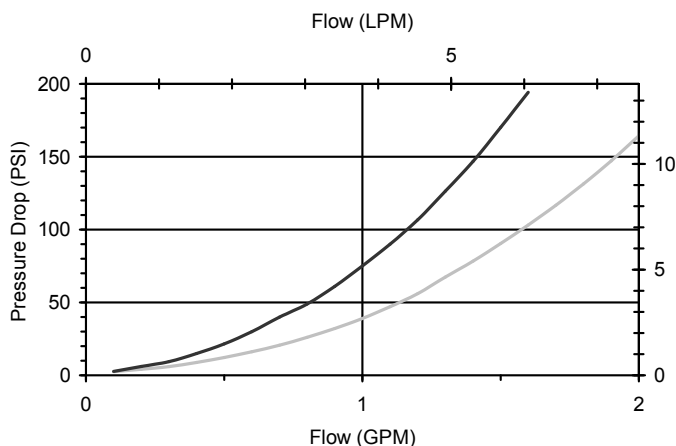
- Hardened parts for long life.
- Efficient wet-armature construction.
- Cartridges are voltage interchangeable.
- Industry common cavity.
- Unitized, molded coil design.
- Continuous duty rated solenoid.
- Optional coil voltages and terminations.

HYDRAULIC SYMBOL



PERFORMANCE

Actual Test Data (Cartridge Only)



VALVE SPECIFICATIONS

Nominal Flow	1 GPM (4 LPM) from (1) to (2) 2 GPM (7.6 LPM) from (2) to (1)
Rated Operating Pressure	3500 PSI (241 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 Temp. 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	4-6 ft-lbs (5.4-8.1 Nm)
Cavity	MINI 3W
Cavity Form Tool (Finishing)	40500004
Seal Kit	21191004

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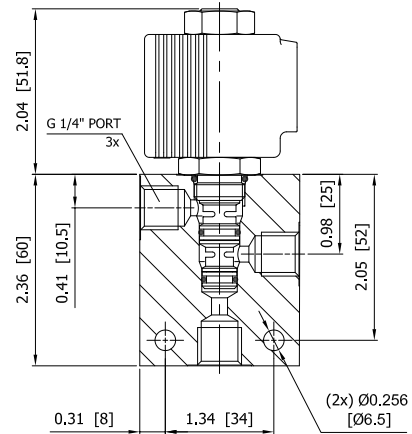
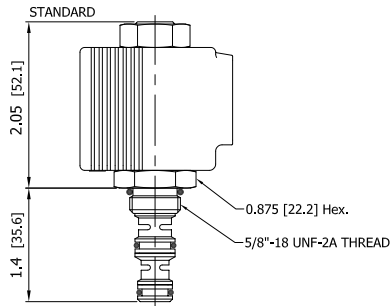
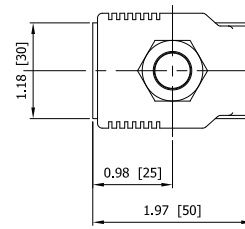
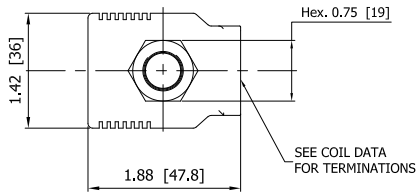
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SOLENOID OPERATED DIRECTIONAL CONTROLS

DIMENSIONS



ORDERING INFORMATION

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

UC-S3A - - - -

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)

BODIES

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

VOLTAGE (other voltages available on request)

12 12 VDC
24 24 VDC
26 220 VAC with molded full wave rectifier

"P" TYPE "J" COIL TERMINATION

JA "J" Coil AMP Superseal - Integral
JD "J" Coil Deutsch - Integral DT04-2P

JJ "J" Coil AMP Jr. Time - Integral

JL "J" Coil Double Lead
JH "J" Coil DIN 43650 (Hirschmann)

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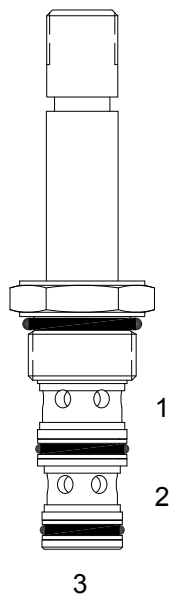


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PP-S3A DIRECT ACTING SPOOL, 3 WAY 2 POSITION



DESCRIPTION

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

OPERATION

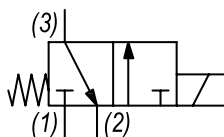
When de-energized the PP-S3A allows flow from (3) to (2) and blocks flow at port (1). When energized the valve allows flow from (1) to (3) and blocks flow at port (2).

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.

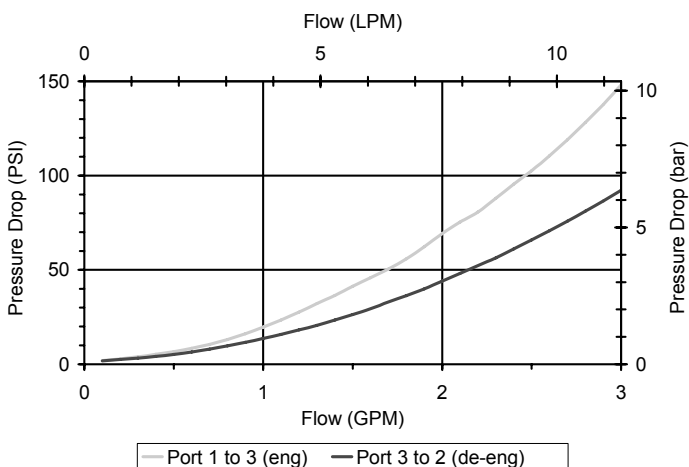
HYDRAULIC SYMBOL



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 Temp. 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 Tools Kit	
(form tool, reamer, tap)	40500024
Seal Kit	21191105

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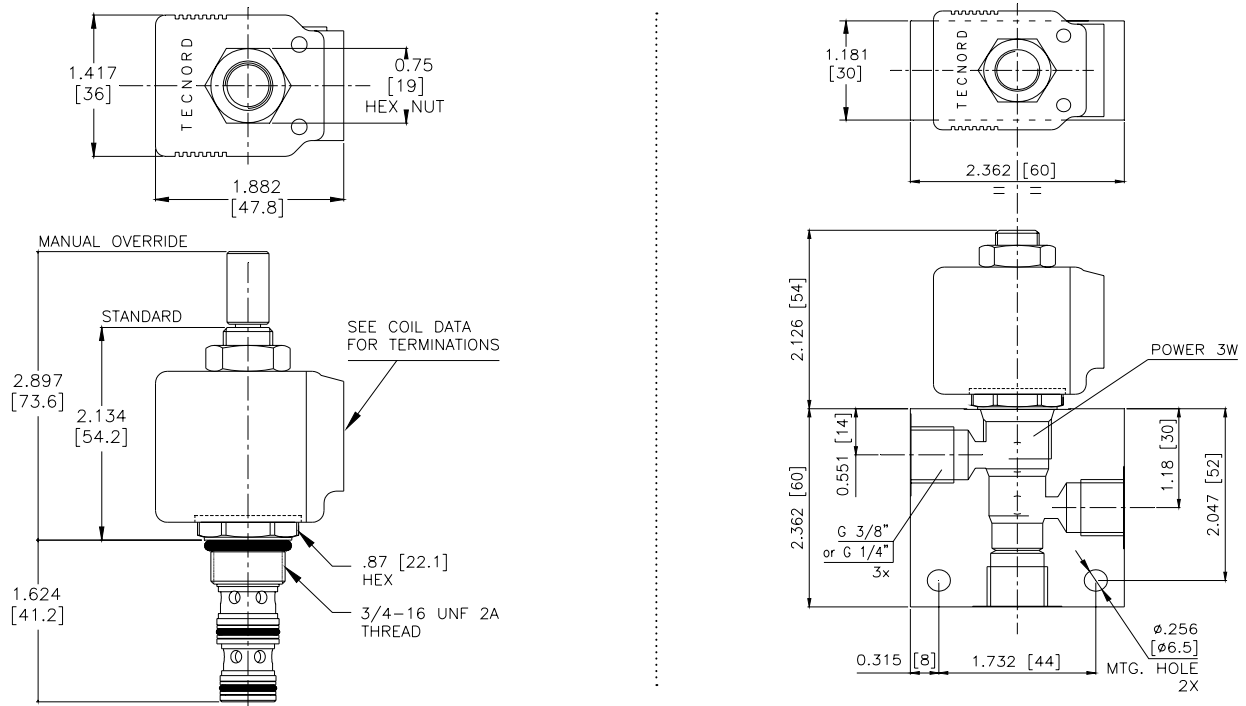


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DIMENSIONS



ORDERING INFORMATION

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

PP-S3A

- OPTIONS**
- Buna Standard **00**
 - Viton Standard **V0**
 - Buna, Override, Detent **0M**
 - Viton, Override, Detent **VM**
 - Buna, Screen **A0**
 - Viton, Screen **W0**
 - 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)

- BODIES**
- Blank** Without Body
 - N** 1/4" BSP Ports
 - N1** 3/8" BSP Ports
 - S** #6 SAE Ports

- VOLTAGE** (other voltages available on request)
- 12** 12 VDC
 - 24** 24 VDC
 - 22** 220 VAC without internal rectifier

"P" TYPE "J" COIL TERMINATION

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

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

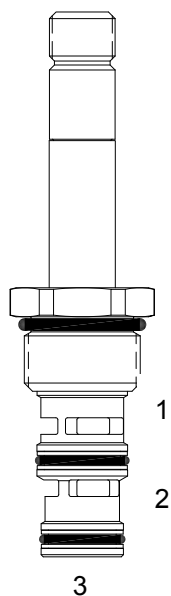


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DF-S3A DIRECT ACTING SPOOL, 3 WAY 2 POSITION



DESCRIPTION

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

OPERATION

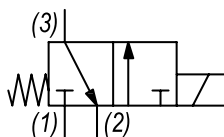
When de-energized the DF-S3A allows flow from (3) to (2) and blocks flow at port (1). When energized the valve allows flow from (1) to (3) and blocks flow at port (2).

OPERATION OF MANUAL OVERRIDE OPTION: to override, turn the manual override screw counterclockwise. 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.
- Optional "I" Coil: Weatherproof, Thermal Shock, Immersion Safe.

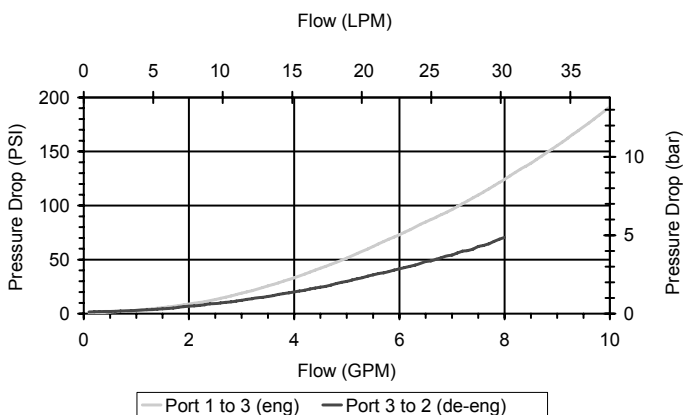
HYDRAULIC SYMBOL



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/min (82 ml/min)
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temp. 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 Tools Kit	
(form tool, reamer, tap)	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.

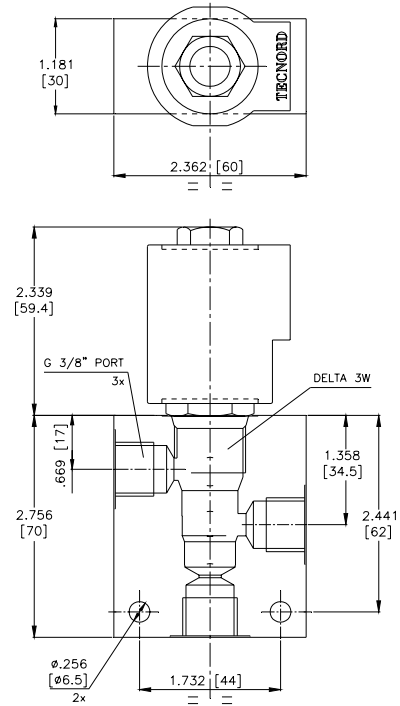
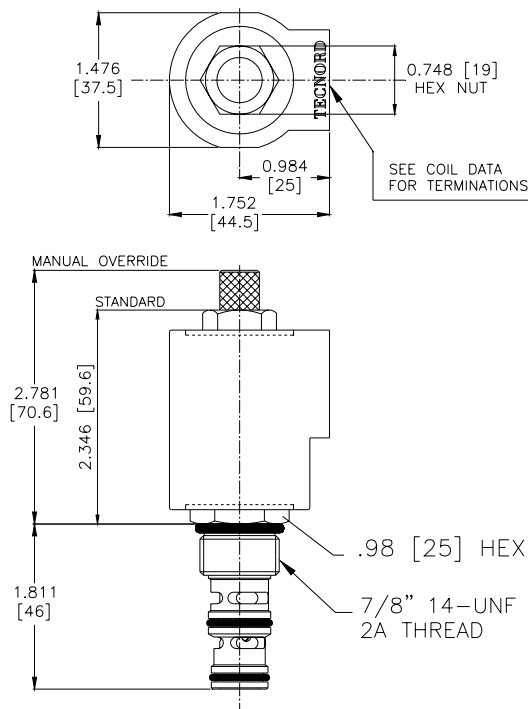


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DIMENSIONS



ORDERING INFORMATION

Approximate Coil Weight: .56 lbs (.25 kg)

DF-S3A

- 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)

- BODIES**
- Blank Without Body
 - N** 3/8" BSP Ports
 - S** #6 SAE Ports

- VOLTAGE** (other voltages available on request)
- 12** 12 VDC
 - 24** 24 VDC
 - 22** 220 VAC without internal rectifier

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

DL Double Lead
(several types of termination can be attached on leads on request)

HC DIN 43650 (Hirschmann) - (AC&DC)
DI Deutsch - Integral DT04-2P

IMMERSION PROOF "D" TYPE

- DIA** "1" Coil AMP Superseal - Integral
- DID** "1" Coil Deutsch - Integral DT04-2P
- DIJ** "1" Coil AMP Jr. Timer - Integral
- DIM** "1" Coil Metri-Pack - Integral

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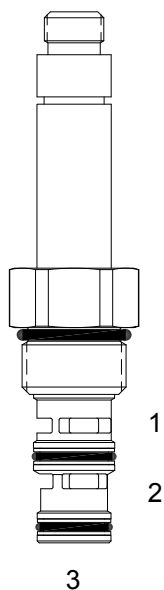


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HF-S3A DIRECT ACTING SPOOL, 3 WAY 2 POSITION



DESCRIPTION

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

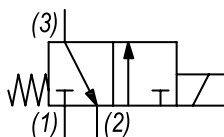
OPERATION

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.

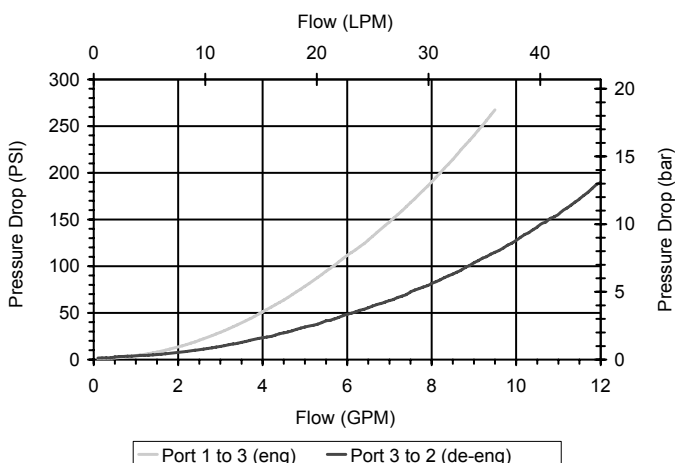
HYDRAULIC SYMBOL



Uses "L" Coils.
Pressure differential between ports should not exceed 3500 PSI.

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/min (131 ml/min)
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temp. Range	-40° to 250°F (-40° to 120°C)
Weight	.40 lbs (.18 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 Tools Kit	
(form tool, reamer, tap)	40500001
Seal Kit	21191210

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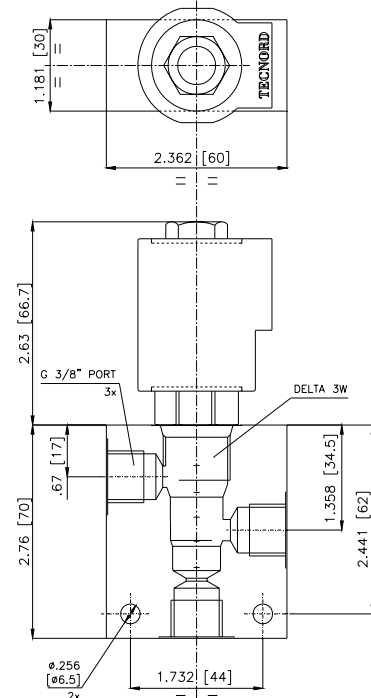
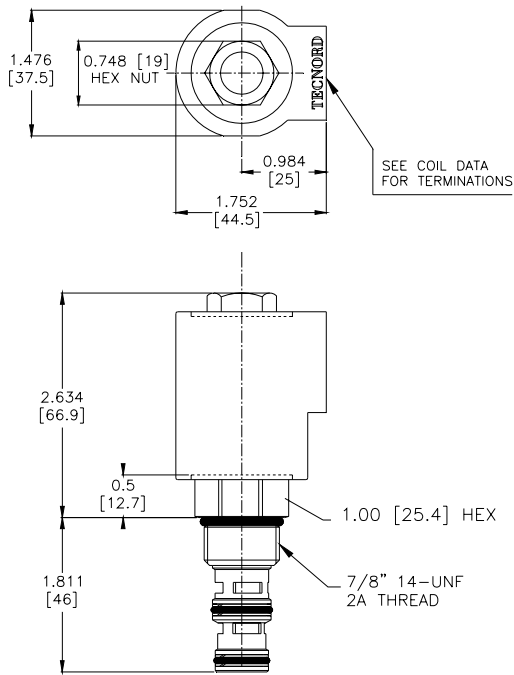


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DIMENSIONS



ORDERING INFORMATION

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

HF-S3A

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

BODIES
 Blank Without Body
N 3/8" BSP Ports
S #6 SAE Ports

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

VOLTAGE (other voltages available on request)
12 12 VDC
24 24 VDC
22 220 VAC without internal rectifier

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

DL Double Lead
 (several types of termination can be attached on leads on request)

HC DIN 43650 (Hirschmann) - (AC&DC)
DI Deutsch - Integral DT04-2P

IMMERSION PROOF "L" TYPE
LIA "I" Coil AMP Superseal - Integral
LID "I" Coil Deutsch - Integral DT04-2P
LIJ "I" Coil AMP Jr. Timer - Integral
LIM "I" Coil Metri-Pack - Integral

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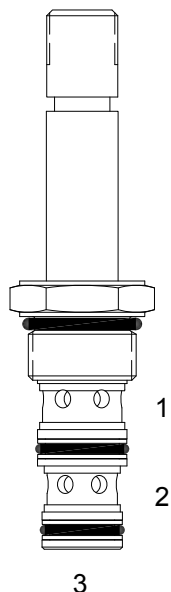


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PP-S3B DIRECT ACTING SPOOL, 3 WAY 2 POSITION



DESCRIPTION

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

OPERATION

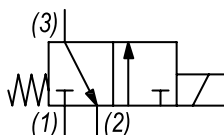
When de-energized the PP-S3B allows flow from (3) to (2) and blocks flow at port (1). When energized the valve allows flow from (3) to (1) and blocks flow at port (2).

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.

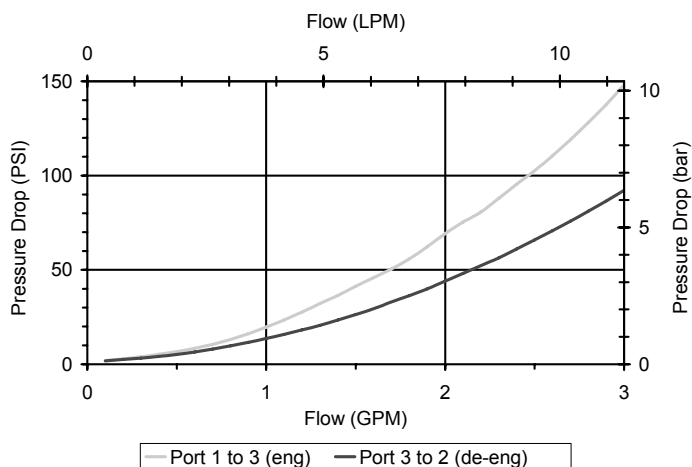
HYDRAULIC SYMBOL



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 Temp. 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 Tools Kit	
(form tool, reamer, tap)	40500024
Seal Kit	21191105

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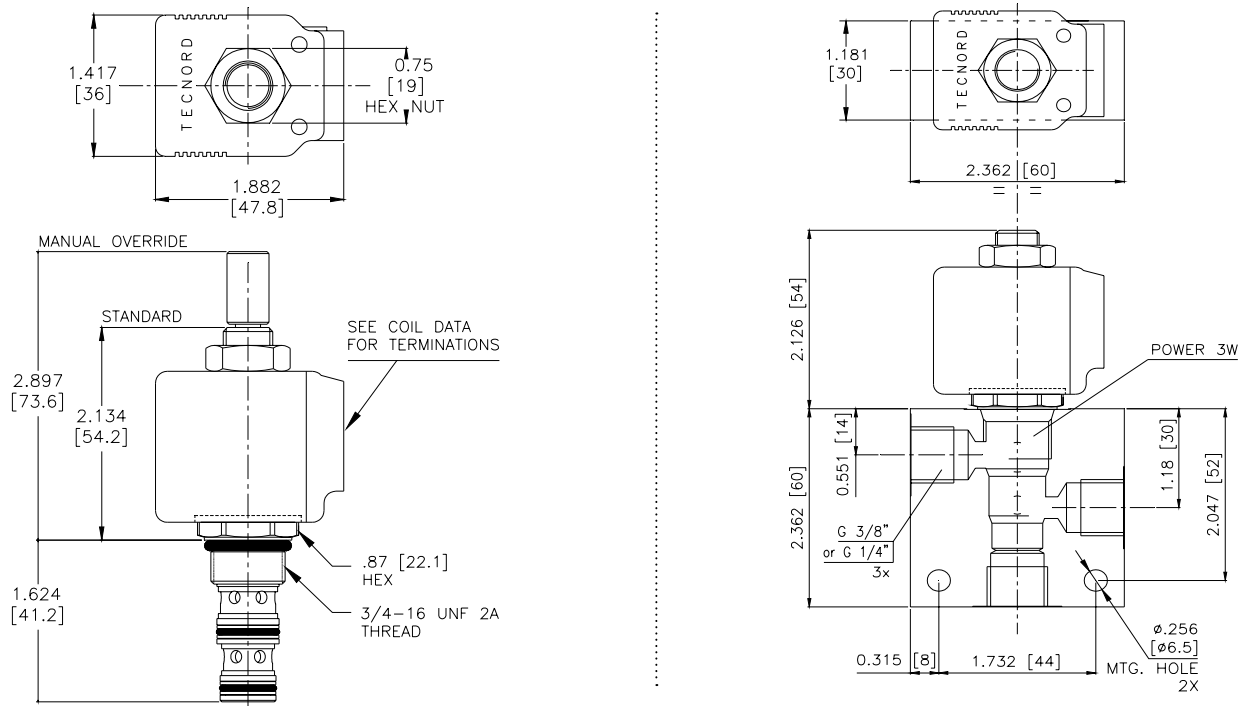


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DIMENSIONS



ORDERING INFORMATION

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

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**

- 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** 25 VAC
 - 11** 120 VAC
 - 22** 220 VAC
 - 44** 440 VAC

"P" TYPE "J" COIL TERMINATION

- JA** "J" Coil AMP Superseal - Integral
- JD** "J" Coil Deutsch - Integral DT04-2P

JJ "J" Coil AMP Jr. Time - Integral

- JL** "J" Coil Double Lead
- JH** "J" Coil DIN 43650 (Hirschmann)

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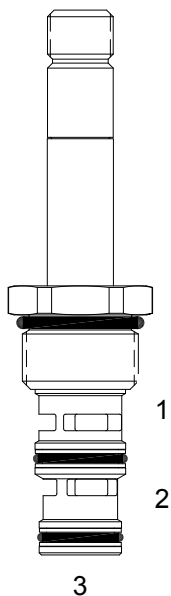


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DF-S3B DIRECT ACTING SPOOL, 3 WAY 2 POSITION, SELECTOR



DESCRIPTION

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

OPERATION

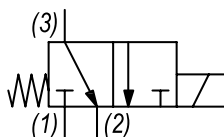
When de-energized the DF-S3B allows flow from (3) to (2) and blocks flow at port (1). When energized the valve allows flow from (3) to (1) and blocks flow at port (2).

OPERATION OF MANUAL OVERRIDE OPTION: to override, turn the manual override screw counterclockwise. 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.
- Optional "I" Coil: Weatherproof, Thermal Shock, Immersion Safe.

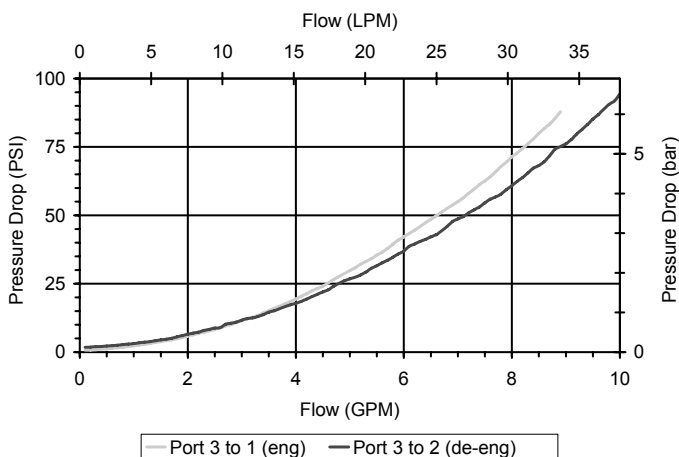
HYDRAULIC SYMBOL



Trapped differentials above 1500 PSI (103 bar) 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/min (82 ml/min)
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temp. 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 Tools Kit	
(form tool, reamer, tap)	40500001
Seal Kit	21191210

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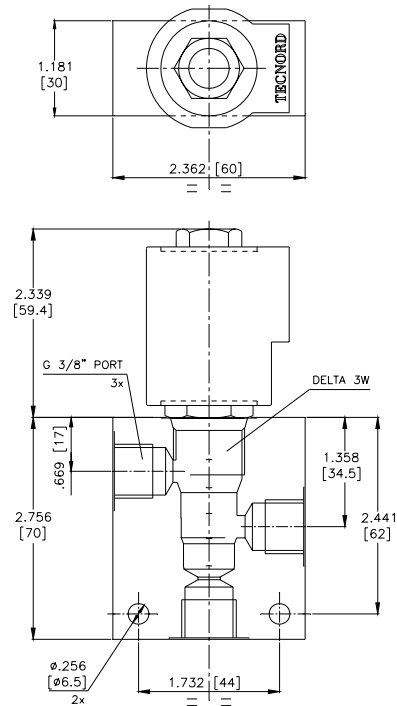
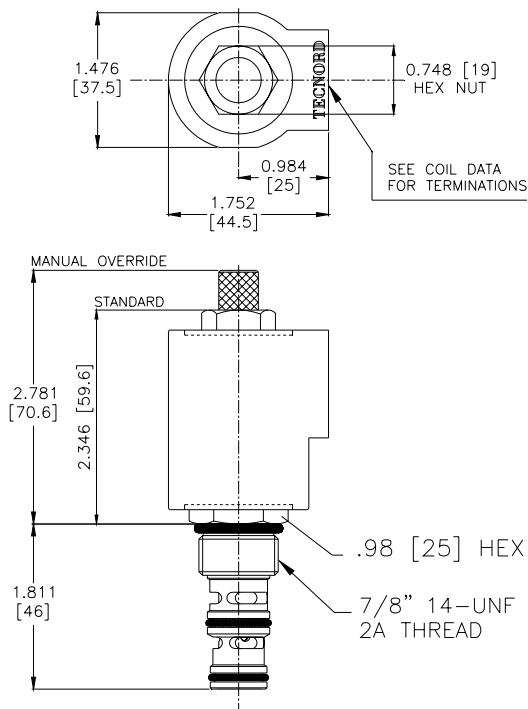


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DIMENSIONS



ORDERING INFORMATION

Approximate Coil Weight: .56 lbs (.25 kg)

DF-S3B

- 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)

- BODIES**
- Blank Without Body
 - N** 3/8" BSP Ports
 - S** #6 SAE Ports

- VOLTAGE** (other voltages available on request)
- 12** 12 VDC
 - 24** 24 VDC
 - 22** 220 VAC without internal rectifier

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

DL Double Lead
(several types of termination can be attached on leads on request)

HC DIN 43650 (Hirschmann) - (AC&DC)
DI Deutsch - Integral DT04-2P

IMMERSION PROOF "D" TYPE

- DIA** "1" Coil AMP Superseal - Integral
- DID** "1" Coil Deutsch - Integral DT04-2P
- DIJ** "1" Coil AMP Jr. Timer - Integral
- DIM** "1" Coil Metri-Pack - Integral

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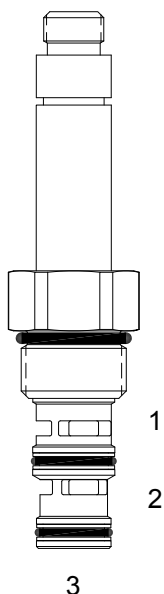


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HF-S3B DIRECT ACTING SPOOL, 3 WAY 2 POSITION, SELECTOR



DESCRIPTION

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

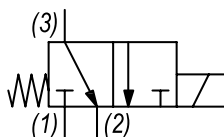
OPERATION

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.

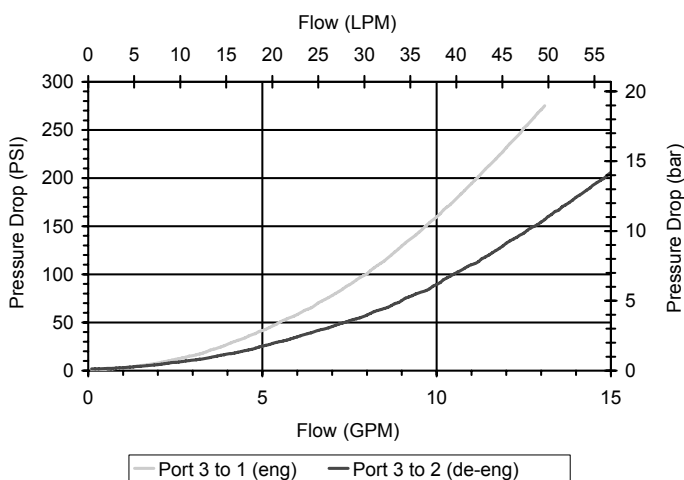
HYDRAULIC SYMBOL



Uses "L" Coils.
Pressure differential between ports should not exceed 3500 PSI.

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/min (131 ml/min)
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temp. Range	-40° to 250°F (-40° to 120°C)
Weight	.40 lbs (.18 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 Tools Kit	
(form tool, reamer, tap)	40500001
Seal Kit	21191210

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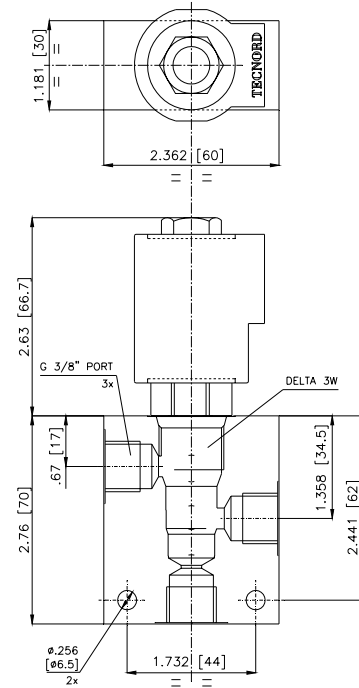
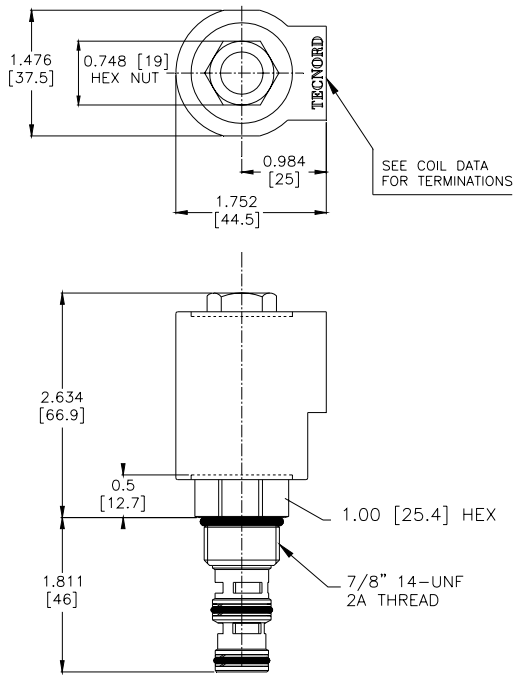


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DIMENSIONS



ORDERING INFORMATION

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

HF-S3B - - - -

OPTIONS

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

BODIES

- Blank Without Body
- N** 3/8" BSP Ports
- S** #6 SAE Ports

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

VOLTAGE (other voltages available on request)

- 12** 12 VDC
- 24** 24 VDC
- 22** 220 VAC without internal rectifier

"L" COIL TERMINATION

(All DC Except as Noted)

DL Double Lead
(several types of termination can be attached on leads on request)

HC DIN 43650 (Hirschmann) - (AC&DC)

DI Deutsch - Integral DT04-2P

LIA

LID

LIJ

LIM

- 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

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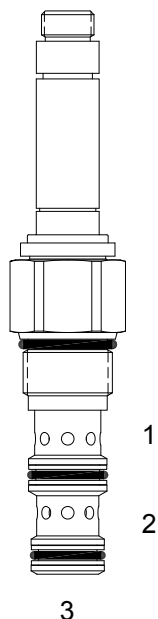


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HU-S3E DIRECT ACTING SPOOL, 3 WAY 2 POSITION, HIGH PRESSURE



DESCRIPTION

12 size, 1 1/16-12 thread, "Tecnord" series, solenoid operated, 3 way 2 position, spool valve.

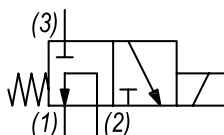
OPERATION

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.

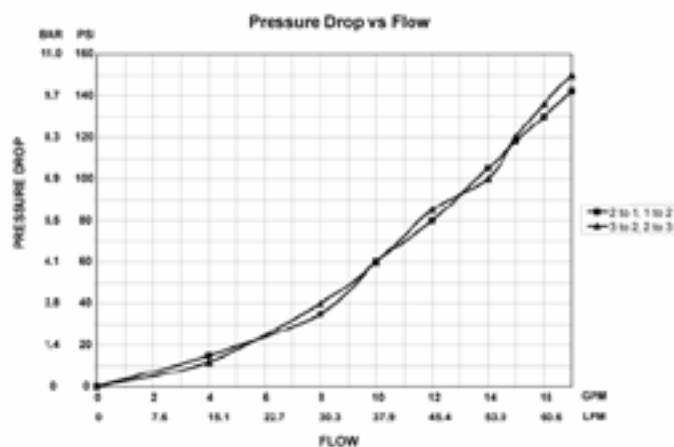
HYDRAULIC SYMBOL



Common usage is inlet at port (3).
See HU-S3F for port (2) or port (1) inlet.

PERFORMANCE

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)	8 cu in/min @ 3000 PSI
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temp. 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	50 ft-lbs (67.8 Nm)
Coil Nut Torque Requirements	5-7 ft-lbs (6.8-9.5 Nm)
Cavity	TECNORD 3W
Cavity Tools Kit	
(form tool, reamer, tap)	40500034
Seal Kit	21191305

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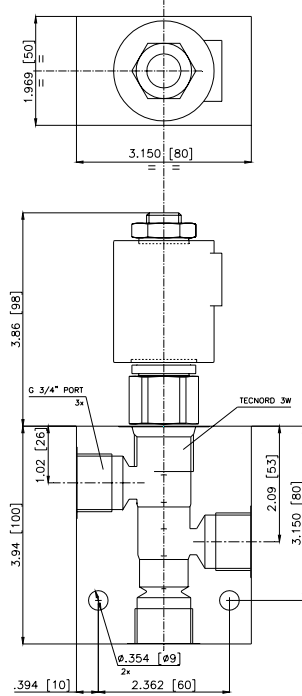
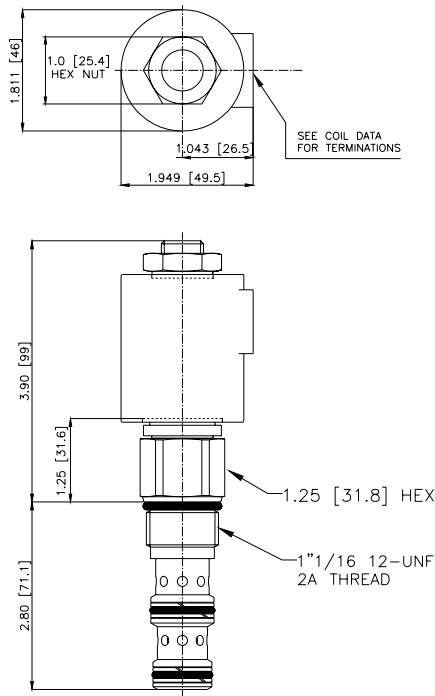


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TECNORD

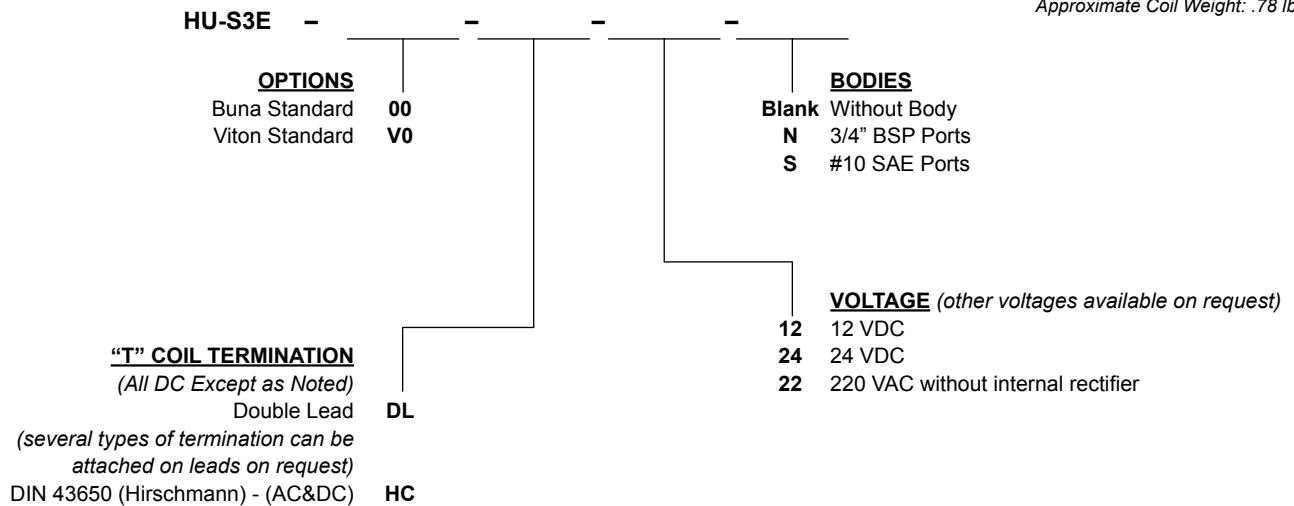
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DIMENSIONS



ORDERING INFORMATION

Approximate Coil Weight: .78 lbs (.35 kg)



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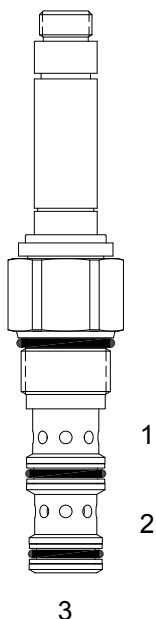


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HU-S3F DIRECT ACTING SPOOL, 3 WAY 2 POSITION, HIGH PRESSURE



DESCRIPTION

12 size, 1 1/16-12 thread, "Tecnord" series, solenoid operated, 3 way 2 position, spool valve. This valve is recommend, if flow in port (1) or port (2).

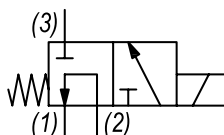
OPERATION

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.

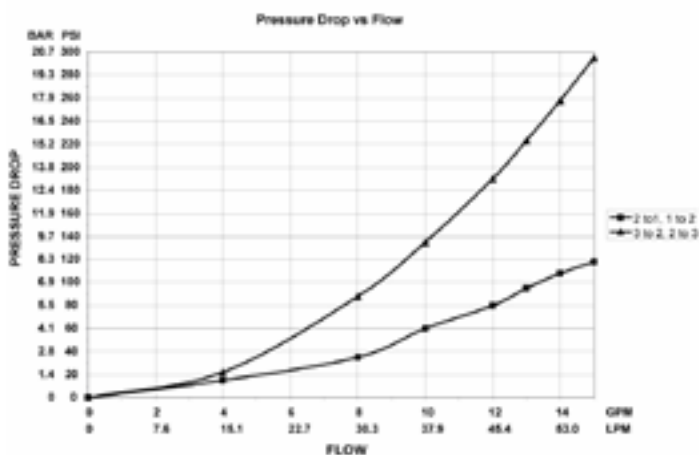
HYDRAULIC SYMBOL



Recommended usage is inlet at port (1) or (2). See HU-S3E for port (3) inlet.

PERFORMANCE

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)	8 cu in/min @ 3000 PSI
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temp. 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	50 ft-lbs (67.8 Nm)
Coil Nut Torque Requirements	5-7 ft-lbs (6.8-9.5 Nm)
Cavity	TECNORD 3W
Cavity Tools Kit	
(form tool, reamer, tap)	40500034
Seal Kit	21191305

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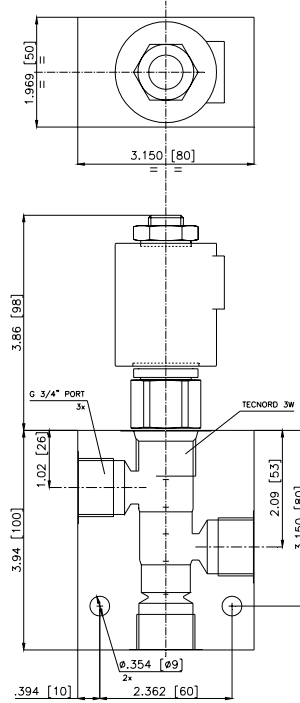
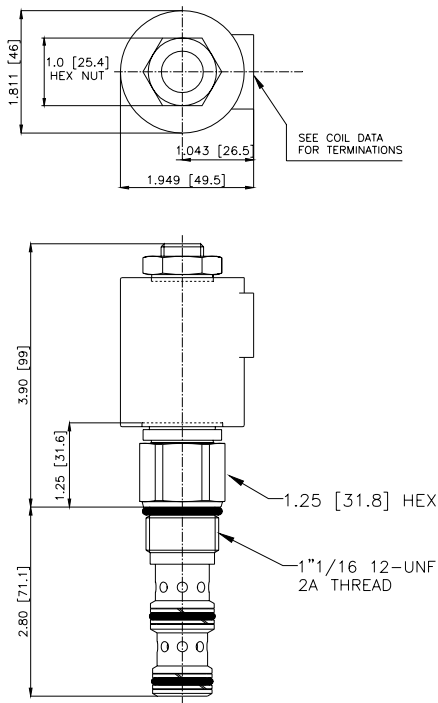


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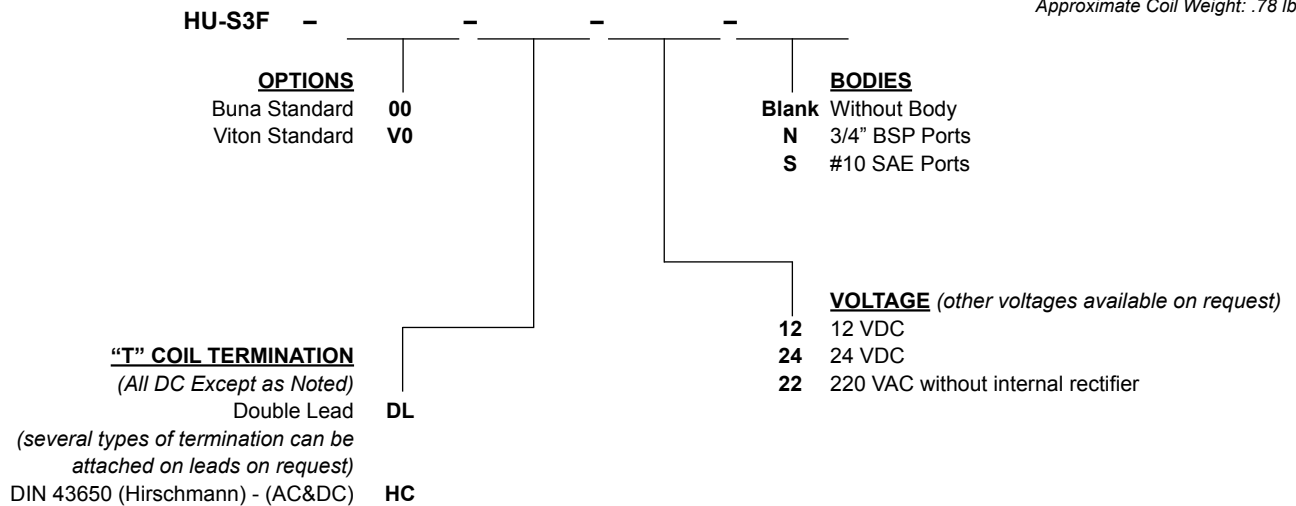
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DIMENSIONS



ORDERING INFORMATION

Approximate Coil Weight: .78 lbs (.35 kg)



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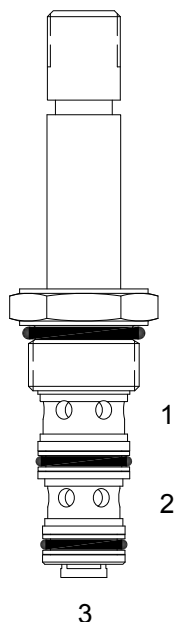


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PP-S3X DIRECT ACTING SPOOL, 3 WAY 2 POSITION, SELECTOR



DESCRIPTION

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

OPERATION

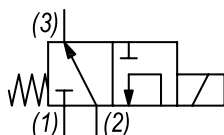
When de-energized the PP-S3X allows flow from (2) to (3) and blocks flow at port (1). When energized the valve allows flow from (2) to (1) and blocks flow at port (3).

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.

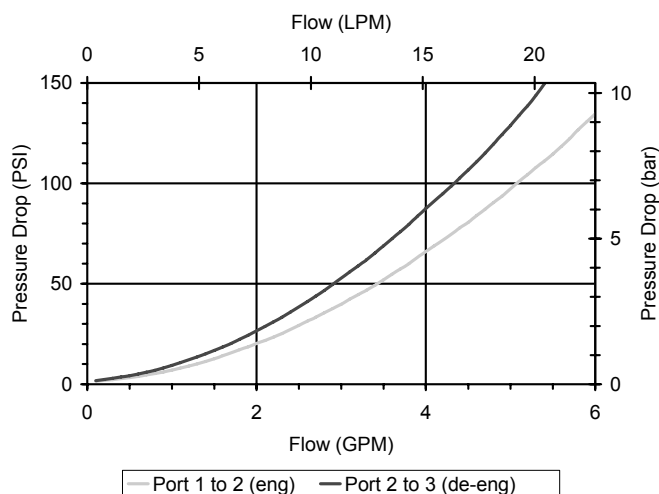
HYDRAULIC SYMBOL



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 Temp. 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 Tools Kit	
(form tool, reamer, tap)	40500024
Seal Kit	21191105

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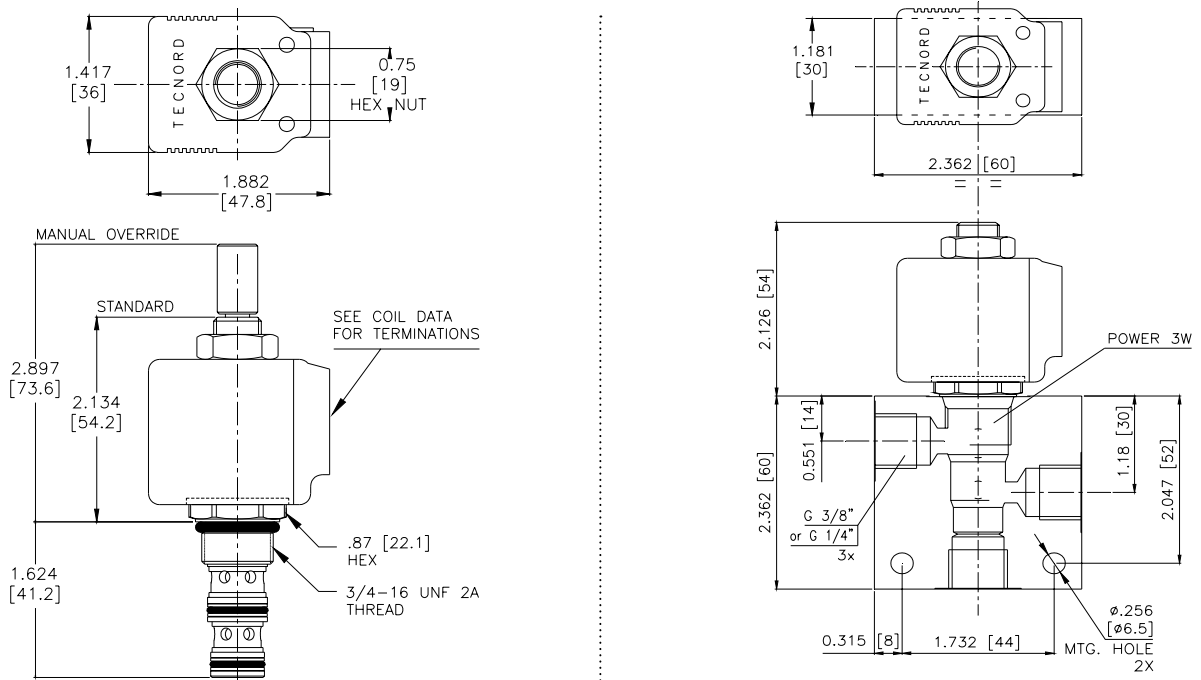


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DIMENSIONS



ORDERING INFORMATION

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

PP-S3X

- OPTIONS**
- Buna Standard **00**
 - Viton Standard **V0**
 - Buna, Override, Detent **0M**
 - Viton, Override, Detent **VM**
 - Buna, Screen **A0**
 - Viton, Screen **W0**
 - 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)

- BODIES**
- Blank** Without Body
 - N** 1/4" BSP Ports
 - N1** 3/8" BSP Ports
 - S** #6 SAE Ports

- VOLTAGE** (other voltages available on request)
- 12** 12 VDC
 - 24** 24 VDC
 - 22** 220 VAC without internal rectifier

"P" TYPE "J" COIL TERMINATION

- JA** "J" Coil AMP Superseal - Integral
- JD** "J" Coil Deutsch - Integral DT04-2P

JJ "J" Coil AMP Jr. Time - Integral

- JL** "J" Coil Double Lead
- JH** "J" Coil DIN 43650 (Hirschmann)

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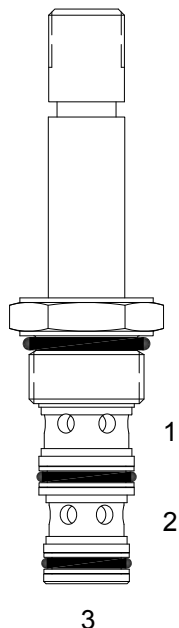


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PP-S3D DIRECT ACTING SPOOL, 3 WAY 2 POSITION, SELECTOR



DESCRIPTION

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

OPERATION

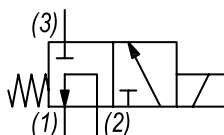
When de-energized the PP-S3D allows flow from (2) to (1) and blocks flow at port (3). When energized the valve allows flow from (2) to (3) and blocks flow at port (1).

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.

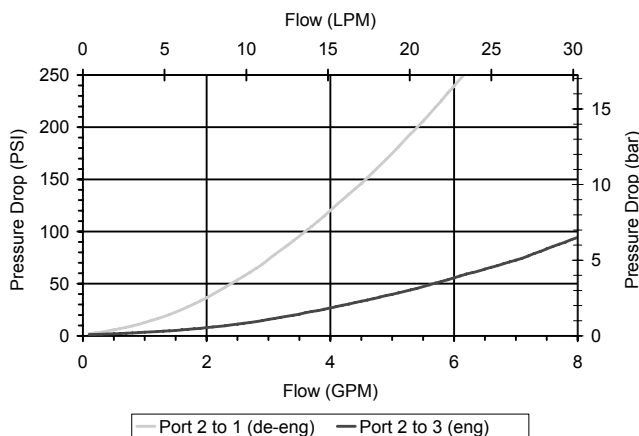
HYDRAULIC SYMBOL



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 Temp. 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 Tools Kit	
(form tool, reamer, tap)	40500024
Seal Kit	21191105

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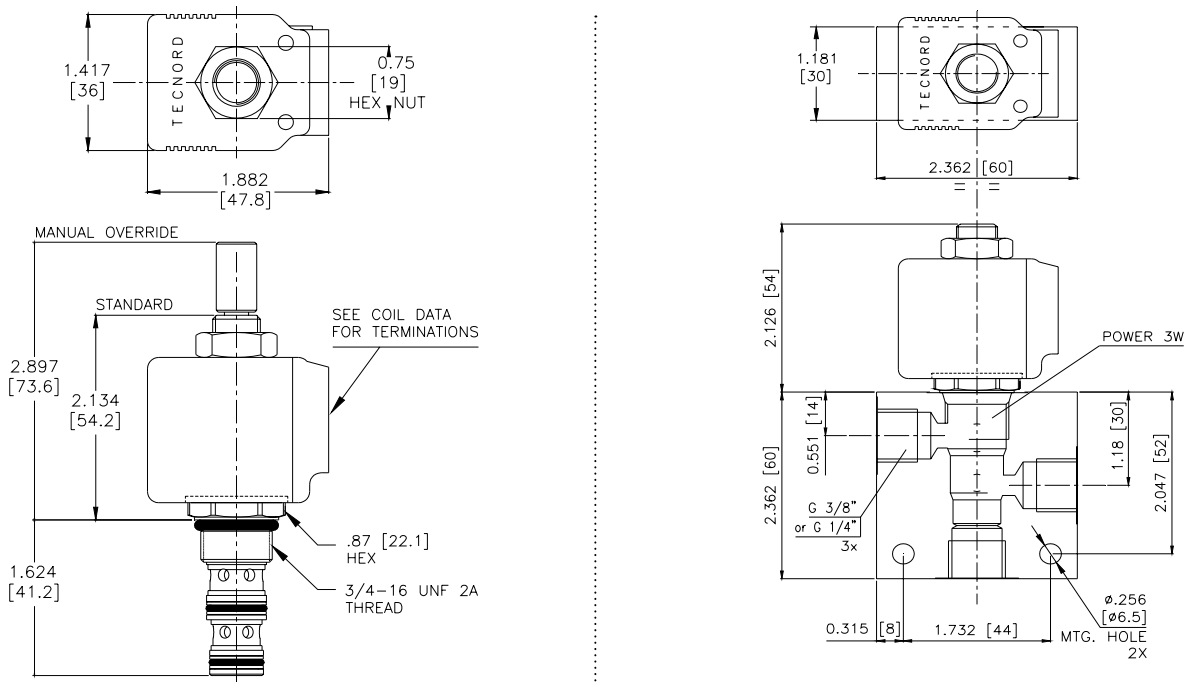


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DIMENSIONS



ORDERING INFORMATION

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

PP-S3D - - - -

- OPTIONS**
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 - Viton Standard **V0**
 - Buna, Override, Detent **0M**
 - Viton, Override, Detent **VM**
 - Buna, Screen **A0**
 - Viton, Screen **W0**
 - 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)

- BODIES**
- Blank** Without Body
 - N** 1/4" BSP Ports
 - N1** 3/8" BSP Ports
 - S** #6 SAE Ports

- VOLTAGE** (other voltages available on request)
- 12** 12 VDC
 - 24** 24 VDC
 - 22** 220 VAC without internal rectifier

"P" TYPE "J" COIL TERMINATION

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JJ "J" Coil AMP Jr. Time - Integral

- JL** "J" Coil Double Lead
- JH** "J" Coil DIN 43650 (Hirschmann)

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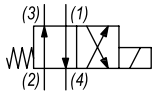
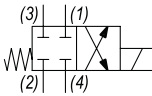
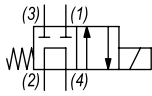
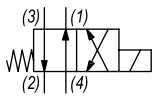
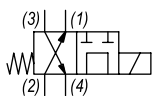
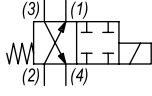
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SOLENOID OPERATED DIRECTIONAL CONTROLS

4 WAY 2 POSITION SPOOL VALVES

4W2P SPOOL	GPM	PSI	LPM	BAR	CAVITY	MODEL	PAGE
	1	4000	4	276	5/8-18	UD-S4A	ST124
	4	3000	15	207	3/4-16	PQ-S4A	ST126
	10	3500	38	241	7/8-14	DG-S4A	ST128
	10	4000	38	276	7/8-14	HG-S4A	ST130
	15	5000	57	345	1 1/16-12	HV-S4A	ST132
	1.5	4000	6	276	5/8-18	UD-S4B	ST134
	4	3000	15	207	3/4-16	PQ-S4B	ST136
	10	3000	38	207	7/8-14	DG-S4B	ST138
	10	4000	38	276	7/8-14	HG-S4B	ST140
	4	3000	15	207	3/4-16	PQ-S4C	ST142
	8	3000	30	207	7/8-14	DG-S4C	ST144
	8	4000	30	276	7/8-14	HG-S4C	ST146
	2.5	3000	9.5	207	3/4-16	PQ-S4D	ST148
	6	3000	23	207	7/8-14	DG-S4D	ST150
	8	4000	30	276	7/8-14	HG-S4D	ST152
	6	3000	23	207	7/8-14	DG-S4E	ST154
	8	4000	30	276	7/8-14	HG-S4E	ST156
	15	5000	57	345	1 1/16-12	HV-S4E	ST158
	6	3000	23	207	7/8-14	DG-S4F	ST160
	6	4000	23	276	7/8-14	HG-S4F	ST162

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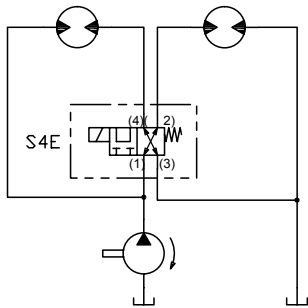
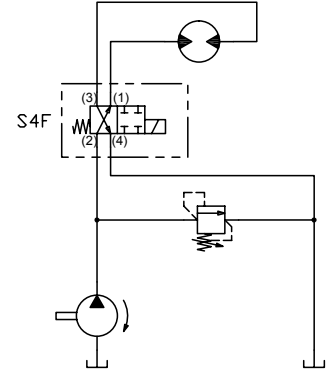
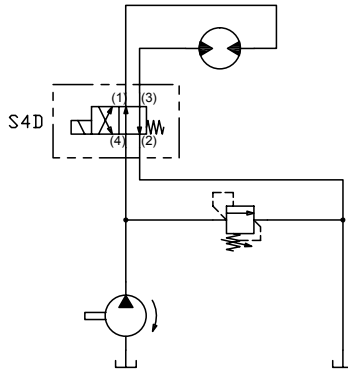
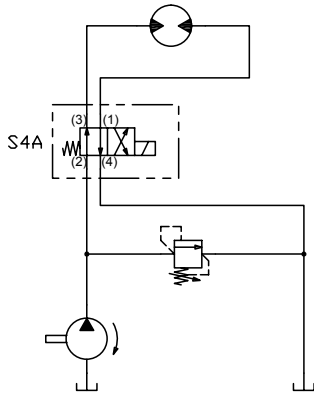
TYPICAL SCHEMATIC

Typical application for the S4A, S4D, and S4F is directional motor or cylinder control.

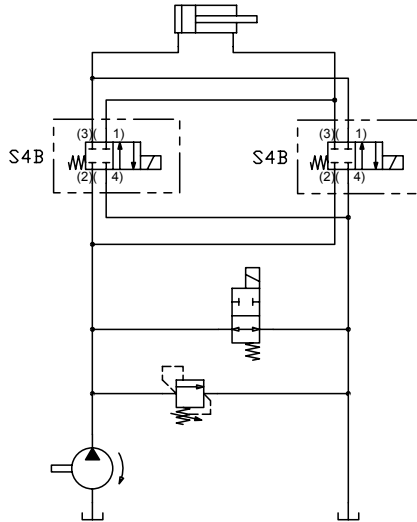
Typical application for the S4B is directional motor or cylinder control in a parallel circuit.

Typical application for the S4C is directional motor or cylinder control in a series circuit.

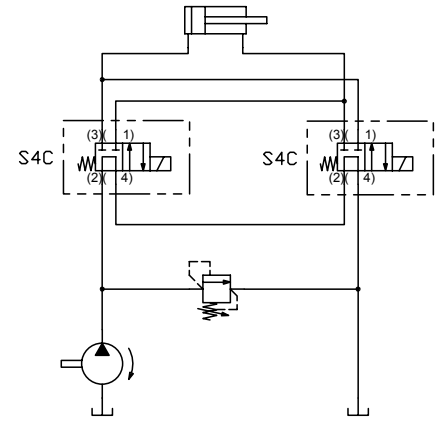
Typical application for the S4E is motor control in a series/parallel circuit.



MOTOR CONTROL - SERIES/PARALLEL CIRCUIT

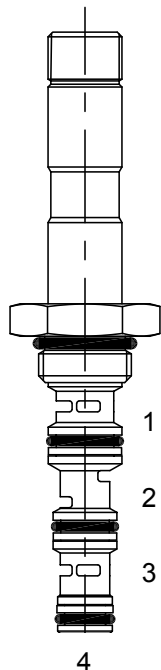


PARALLEL CIRCUIT



SERIES CIRCUIT

UD-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

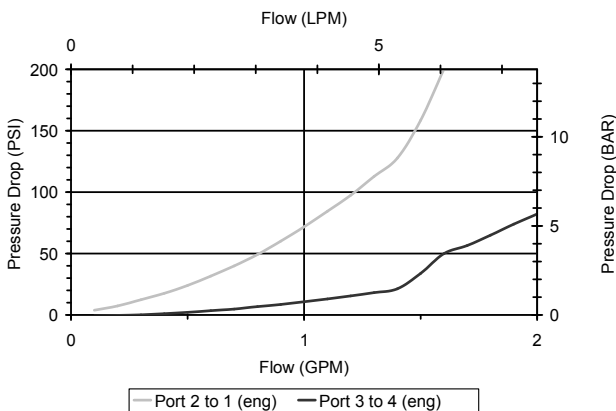
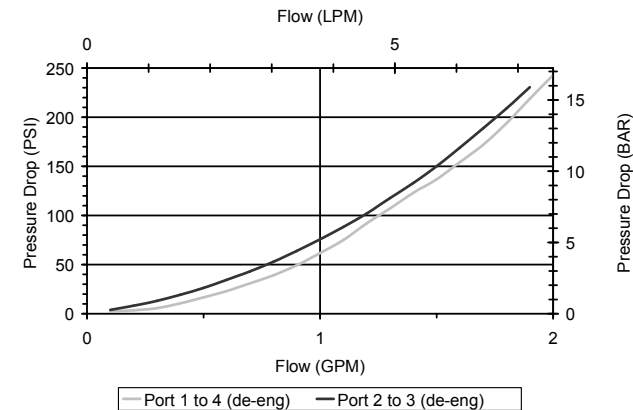
When de-energized the UD-S4A allows flow from (1) to (4) and (2) to (3). When energized, the valve allows flow from (2) to (1) and (3) to (4).

FEATURES

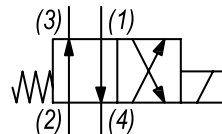
- Hardened parts for long life.
- Efficient wet-armature construction.
- Cartridges are voltage interchangeable.
- Industry common cavity.
- Unitized, molded coil design.
- Continuous duty rated solenoid.
- Optional coil voltages and terminations.

PERFORMANCE

Actual Test Data (Cartridge Only)



HYDRAULIC SYMBOL



VALVE SPECIFICATIONS

Nominal Flow	1 GPM (4 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 Temp. 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	4-6 ft-lbs (5.4-8.1 Nm)
Cavity	MINI 4W
Cavity Form Tool (Finishing)	40500006
Seal Kit	21191008

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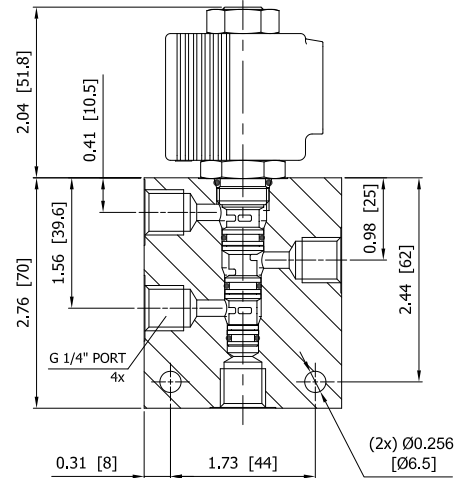
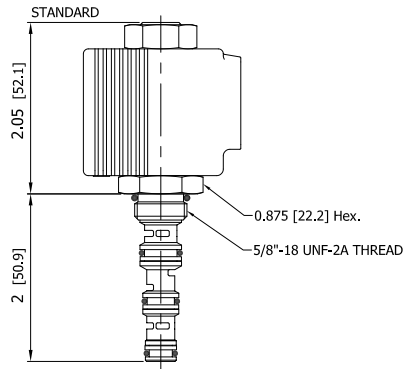
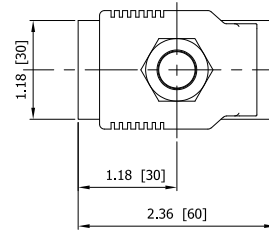
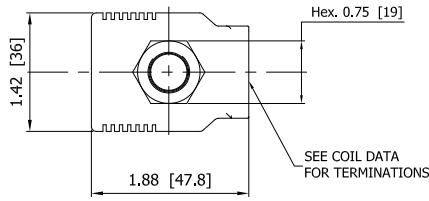
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SOLENOID OPERATED DIRECTIONAL CONTROLS

DIMENSIONS



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

ORDERING INFORMATION

UD-S4A - - - -

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)

BODIES

- Blank** Without Body
- N** 1/4" BSP Ports
- S** #6 SAE Ports

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

VOLTAGE (other voltages available on request)

- 12** 12 VDC
- 24** 24 VDC
- 26** 220 VAC with molded full wave rectifier

"P" TYPE "J" COIL TERMINATION

- JA** "J" Coil AMP Superseal - Integral
- JD** "J" Coil Deutsch - Integral DT04-2P

JJ "J" Coil AMP Jr. Time - Integral

- JL** "J" Coil Double Lead
- JH** "J" Coil DIN 43650 (Hirschmann)

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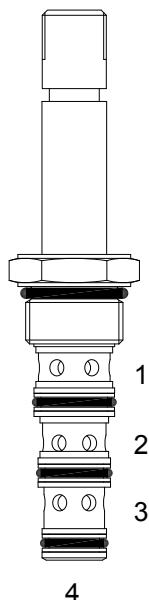


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PQ-S4A DIRECT ACTING SPOOL, 4 WAY 2 POSITION



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

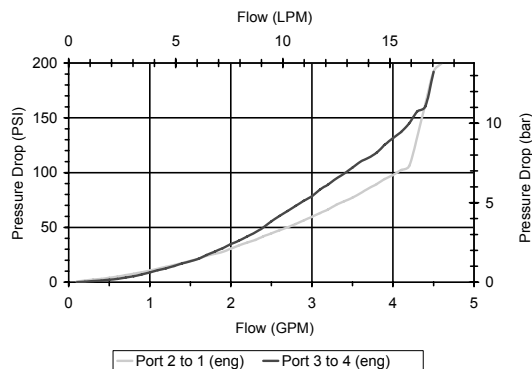
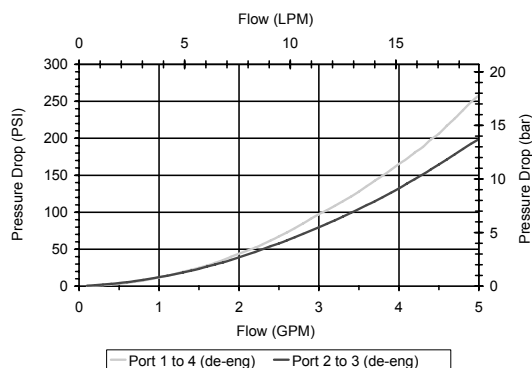
- Hardened parts for long life.
- Efficient wet-armature construction.
- Cartridges are voltage interchangeable.
- Manual override option.
- Industry common cavity.
- Unitized, molded coil design.
- Continuous duty rated solenoid.
- Optional coil voltages and terminations.
- Optional "I" Coil: Weatherproof,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



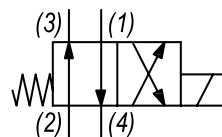
Modes of shift operation to 6 GPM, Consult Factory.

PERFORMANCE

Actual Test Data (Cartridge Only)



HYDRAULIC SYMBOL



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)
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temp. 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 Tools Kit	
(form tool, reamer, tap)	40500029
Seal Kit	21191108

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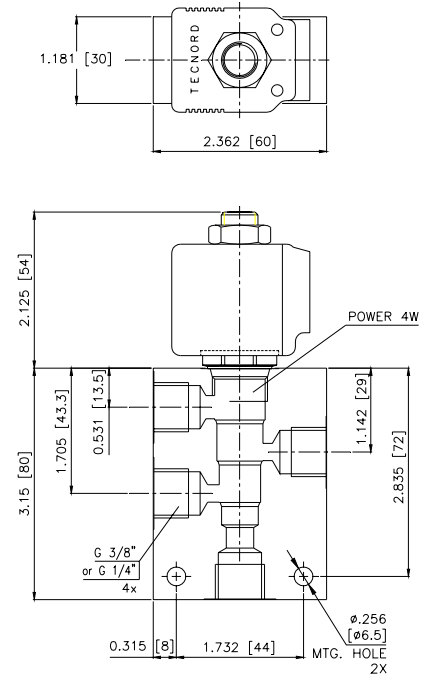
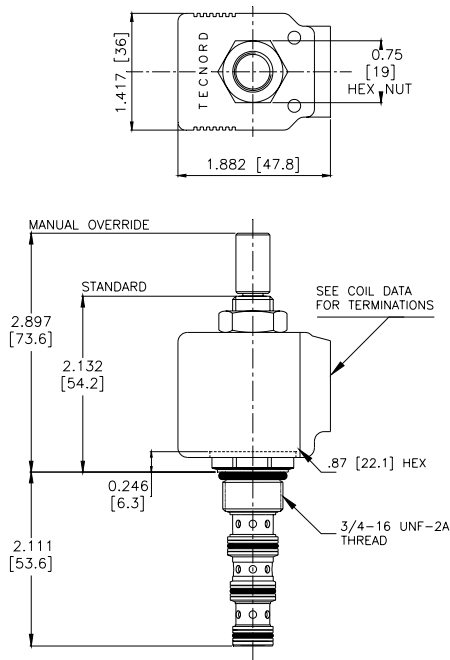


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DIMENSIONS



ORDERING INFORMATION

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

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**

BODIES

- Blank** Without Body
- N** 1/4" BSP Ports
- N1** 3/8" BSP Ports
- S** #6 SAE Ports

VOLTAGE (other voltages available on request)

- 12** 12 VDC
- 24** 24 VDC
- 22** 220 VAC without internal rectifier

"P" TYPE "J" COIL TERMINATION

- JA** "J" Coil AMP Superseal - Integral
- JD** "J" Coil Deutsch - Integral DT04-2P

JJ "J" Coil AMP Jr. Time - Integral

- JL** "J" Coil Double Lead
- JH** "J" Coil DIN 43650 (Hirschmann)

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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).

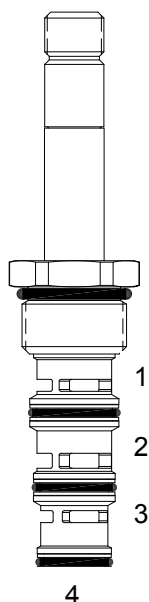
OPERATION OF MANUAL OVERRIDE OPTION: to override, turn the manual override screw counterclockwise. To release, turn the manual override screw clockwise.

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.
- Optional "I" Coil: Weatherproof, Thermal Shock, Immersion Safe.

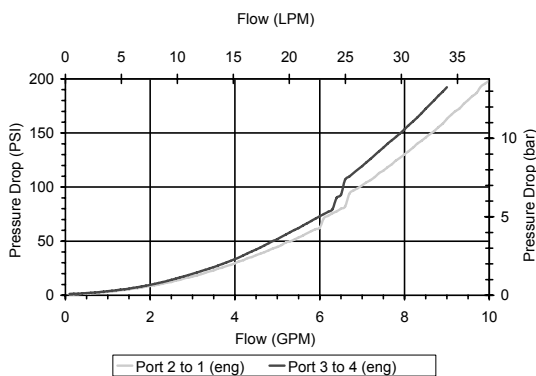
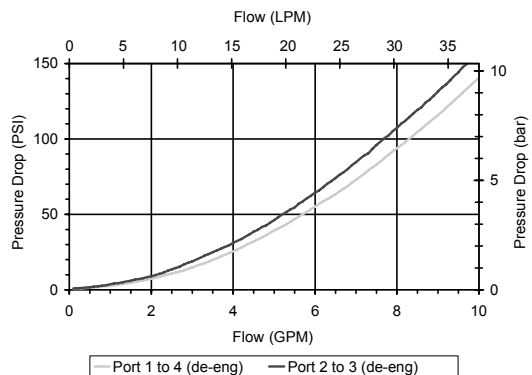


For higher pressures see HG-S4A.

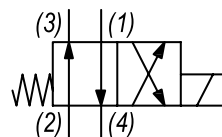


PERFORMANCE

Actual Test Data (Cartridge Only)



HYDRAULIC SYMBOL



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)
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temp. 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 Tools Kit (form tool, reamer, tap)	40500002
Seal Kit	21191214

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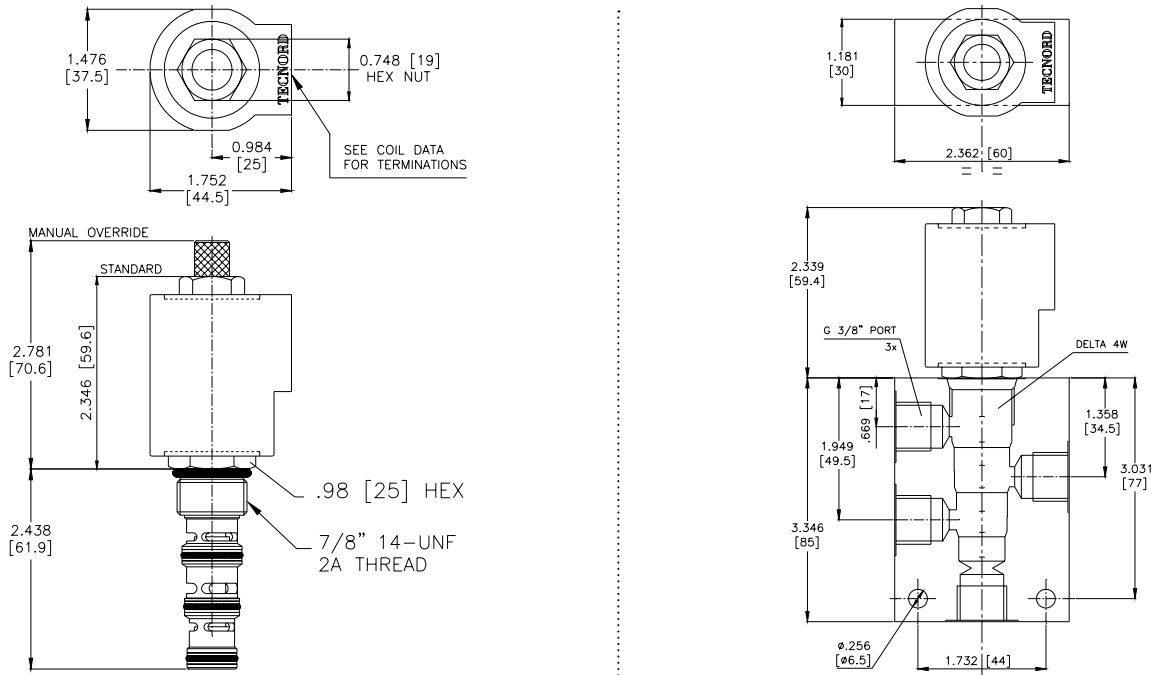


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DIMENSIONS



ORDERING INFORMATION

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

DG-S4A

- OPTIONS**
- Buna Standard **00**
 - Viton Standard **VO**
 - Buna, Override, Detent **0M**
 - Viton, Override, Detent **VM**

- BODIES**
- Blank** Without Body
 - N** 3/8" BSP Ports
 - S** #6 SAE Ports

VOLTAGE (other voltages available on request)

- 12** 12 VDC
- 24** 24 VDC
- 22** 220 VAC without internal rectifier

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

DL Double Lead
(several types of termination can be attached on leads on request)

HC DIN 43650 (Hirschmann) - (AC&DC)
DI Deutsch - Integral DT04-2P

DIA "I" Coil AMP Superseal - Integral
DID "I" Coil Deutsch - Integral DT04-2P
DIJ "I" Coil AMP Jr. Timer - Integral
DIM "I" Coil Metri-Pack - Integral

IMMERSION PROOF "D" TYPE

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HG-S4A DIRECT ACTING SPOOL, 4 WAY 2 POSITION, CRISS CROSS

DESCRIPTION

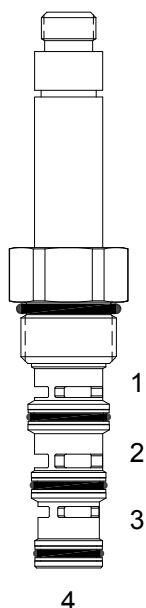
"High Pressure" 10 size, 7/8-14 thread, "Delta" series, 4 way 2 position, side flow spool valve.

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

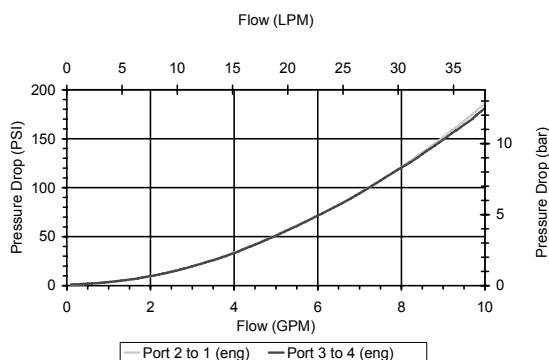
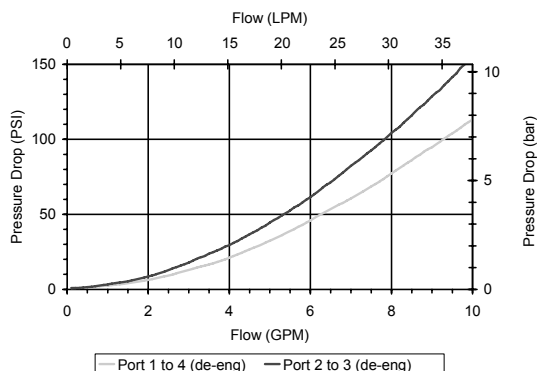
- Hardened parts for long life.
- Efficient wet-armature construction.
- Cartridges are voltage interchangeable.
- Industry common cavity.
- Unitized, molded coil design.
- Continuous duty rated solenoid.
- Optional coil voltages and terminations.
- Optional "I" Coil: Weatherproof, Thermal Shock, Immersion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



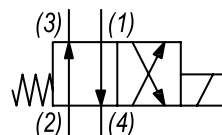
Uses "L" Coils.
Pressure differential between ports should not exceed 3000 PSI.

PERFORMANCE

Actual Test Data (Cartridge Only)



HYDRAULIC SYMBOL



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 Temp. Range	-40° to 250°F (-40° to 120°C)
Weight	.44 lbs (.20 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 Tools Kit (form tool, reamer, tap)	40500002
Seal Kit	21191214

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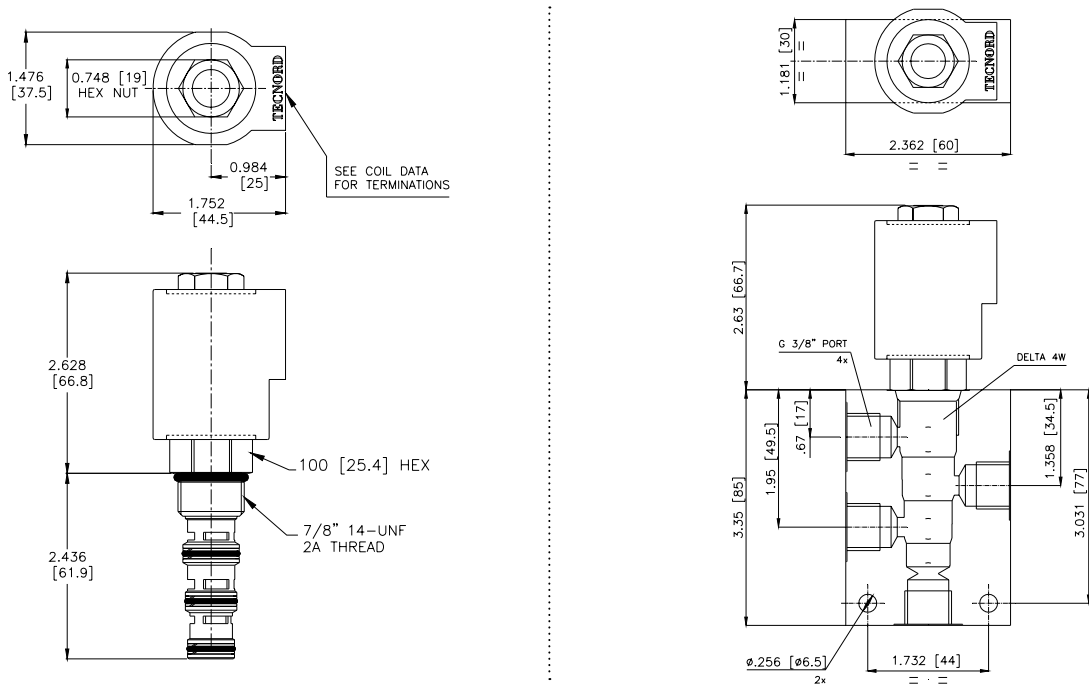


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DIMENSIONS



ORDERING INFORMATION

HG-S4A - - - -

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

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

BODIES
 Blank Without Body
N 3/8" BSP Ports
S #6 SAE Ports

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

VOLTAGE (other voltages available on request)
12 12 VDC
24 24 VDC
22 220 VAC without internal rectifier

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

DL Double Lead
 (several types of termination can be attached on leads on request)

HC DIN 43650 (Hirschmann) - (AC&DC)
DI Deutsch - Integral DT04-2P

IMMERSION PROOF "L" TYPE
LIA "I" Coil AMP Superseal - Integral
LID "I" Coil Deutsch - Integral DT04-2P
LIJ "I" Coil AMP Jr. Timer - Integral
LIM "I" Coil Metri-Pack - Integral

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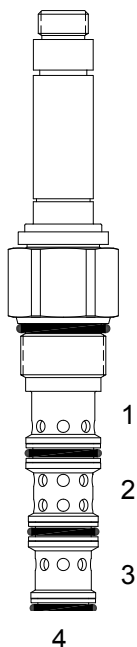


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HV-S4A DIRECT ACTING SPOOL, 4 WAY 2 POSITION, CRISS CROSS



DESCRIPTION

“High pressure” 12 size, 1 1/16-12 thread, “Tecnorm” series, solenoid operated, 4 way 2 position, criss cross side flow spool valve.

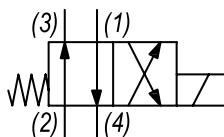
OPERATION

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

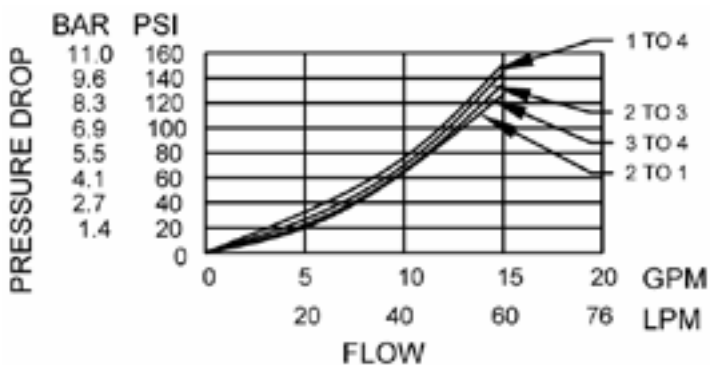
- Hardened parts for long life.
- Efficient wet-armature construction.
- Cartridges are voltage interchangeable.
- Industry common cavity.
- Unitized, molded coil design.
- Continuous duty rated solenoid.
- Optional coil voltages and terminations.

HYDRAULIC SYMBOL



PERFORMANCE

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)	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 Temp. 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	50 ft-lbs (67.8 Nm)
Coil Nut Torque Requirements	5-7 ft-lbs (6.8-9.5 Nm)
Cavity	TECNORD 4W
Cavity Tools Kit	
(form tool, reamer, tap)	40500035
Seal Kit	21191309

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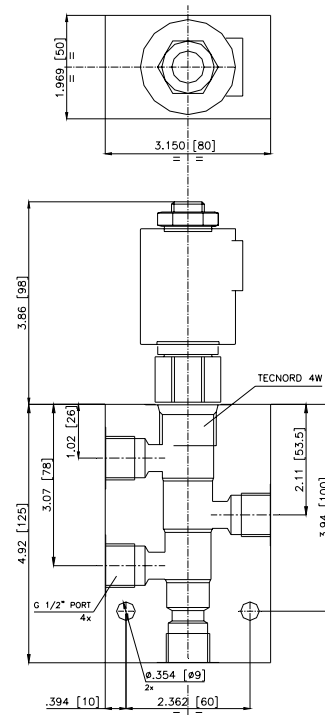
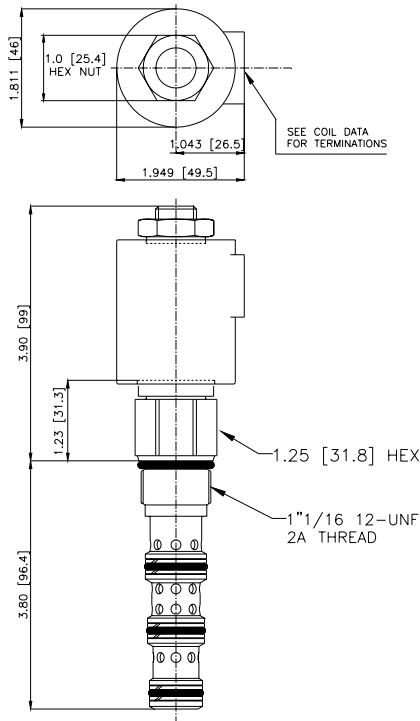


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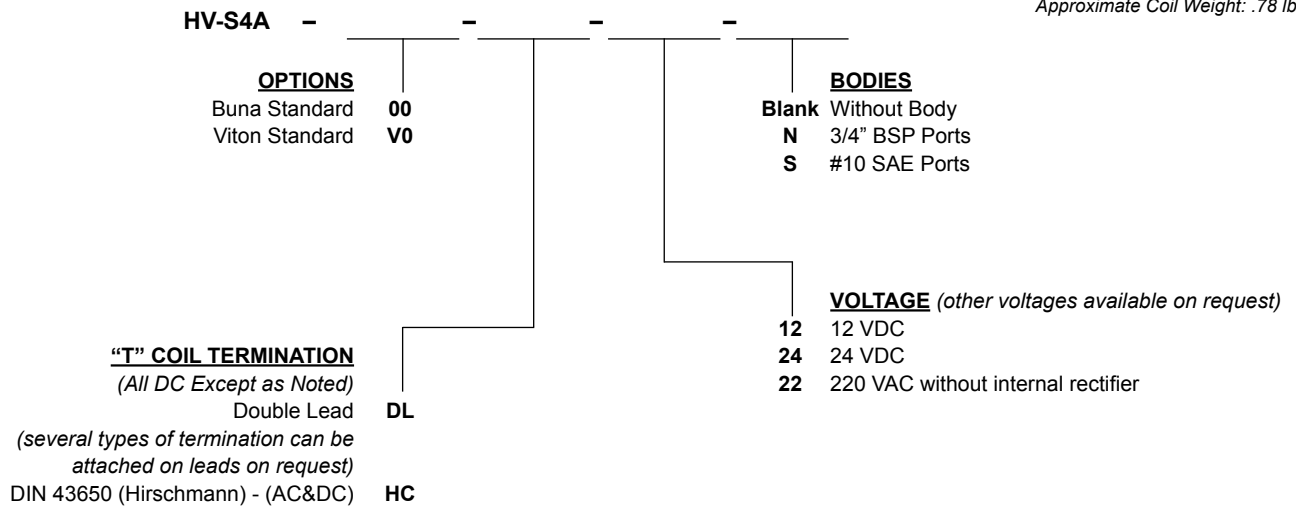
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DIMENSIONS



ORDERING INFORMATION

Approximate Coil Weight: .78 lbs (.35 kg)



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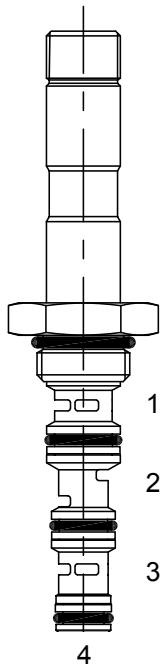


4484 Boeing Drive Rockford, IL 61109 • USA • Phone +1 (815) 397-6628 • Fax +1 (815) 397-2526
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UD-S4B DIRECT ACTING SPOOL, 4 WAY 2 POSITION, CLOSED CENTER



DESCRIPTION

7 size, 5/8-18 thread, "Mini" series, solenoid operated, 4 way 2 position, closed center spool valve.

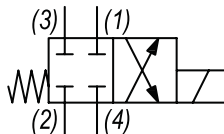
OPERATION

When de-energized the UD-S4B blocks flow at all ports. When energized, the valve allows flow from (2) to (1) and (3) to (4).

FEATURES

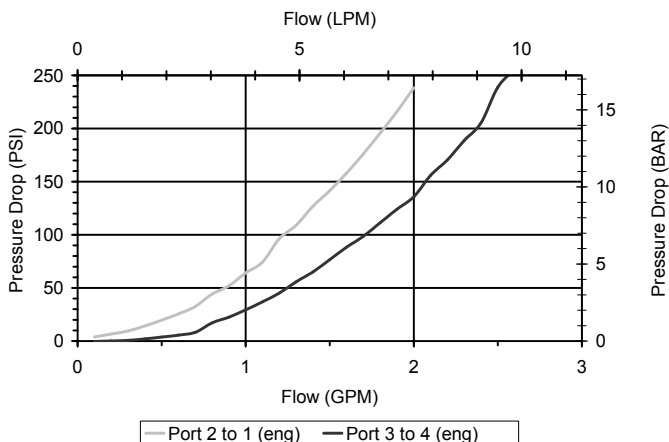
- Hardened parts for long life.
- Efficient wet-armature construction.
- Cartridges are voltage interchangeable.
- Industry common cavity.
- Unitized, molded coil design.
- Continuous duty rated solenoid.
- Optional coil voltages and terminations.

HYDRAULIC SYMBOL



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)
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temp. 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	4-6 ft-lbs (5.4-8.1 Nm)
Cavity	MINI 4W
Cavity Form Tool (Finishing)	40500006
Seal Kit	21191008

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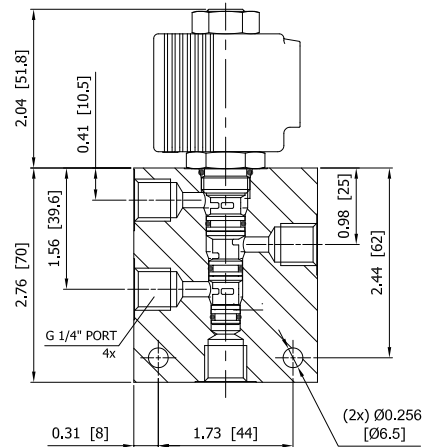
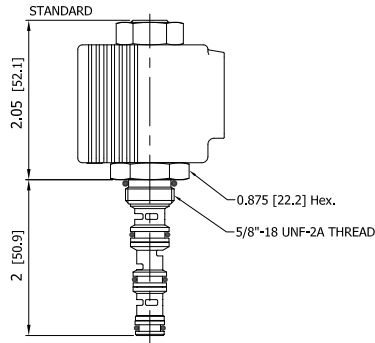
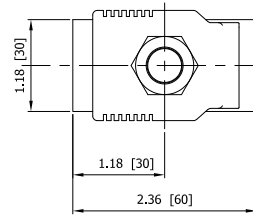
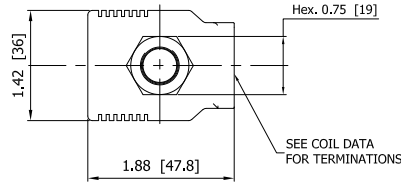
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SOLENOID OPERATED DIRECTIONAL CONTROLS

DIMENSIONS



ORDERING INFORMATION

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

UD-S4B - - - -

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)

BODIES

- Blank Without Body
- N** 1/4" BSP Ports
- S** #6 SAE Ports

VOLTAGE (other voltages available on request)

- 12** 12 VDC
- 24** 24 VDC
- 26** 220 VAC with molded full wave rectifier

"P" TYPE "J" COIL TERMINATION

- JA** "J" Coil AMP Superseal - Integral
- JD** "J" Coil Deutsch - Integral DT04-2P

JJ "J" Coil AMP Jr. Time - Integral

- JL** "J" Coil Double Lead
- JH** "J" Coil DIN 43650 (Hirschmann)

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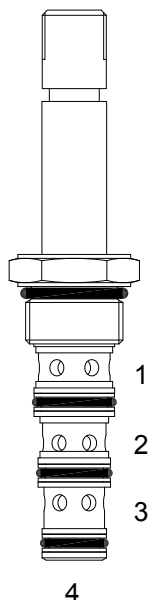


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PQ-S4B DIRECT ACTING SPOOL, 4 WAY 2 POSITION, CLOSED CENTER



DESCRIPTION

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

OPERATION

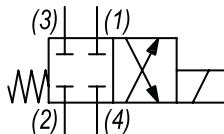
When de-energized the PQ-S4B blocks flow at all ports. When energized the valve allows flow from (2) to (1) and from (3) to (4).

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.

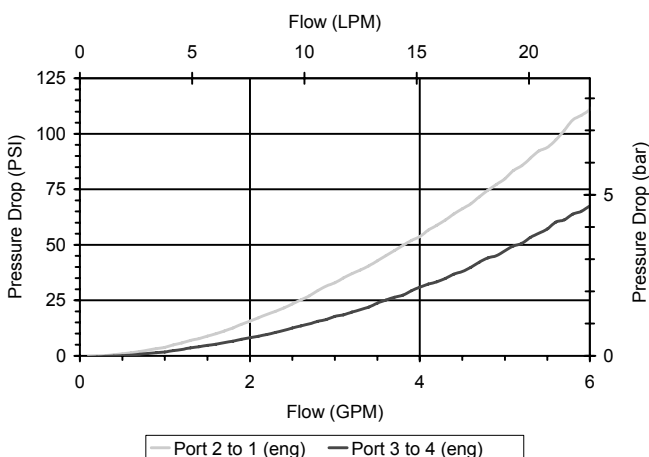
HYDRAULIC SYMBOL



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)
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temp. 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 Tools Kit	
(form tool, reamer, tap)	40500029
Seal Kit	21191108

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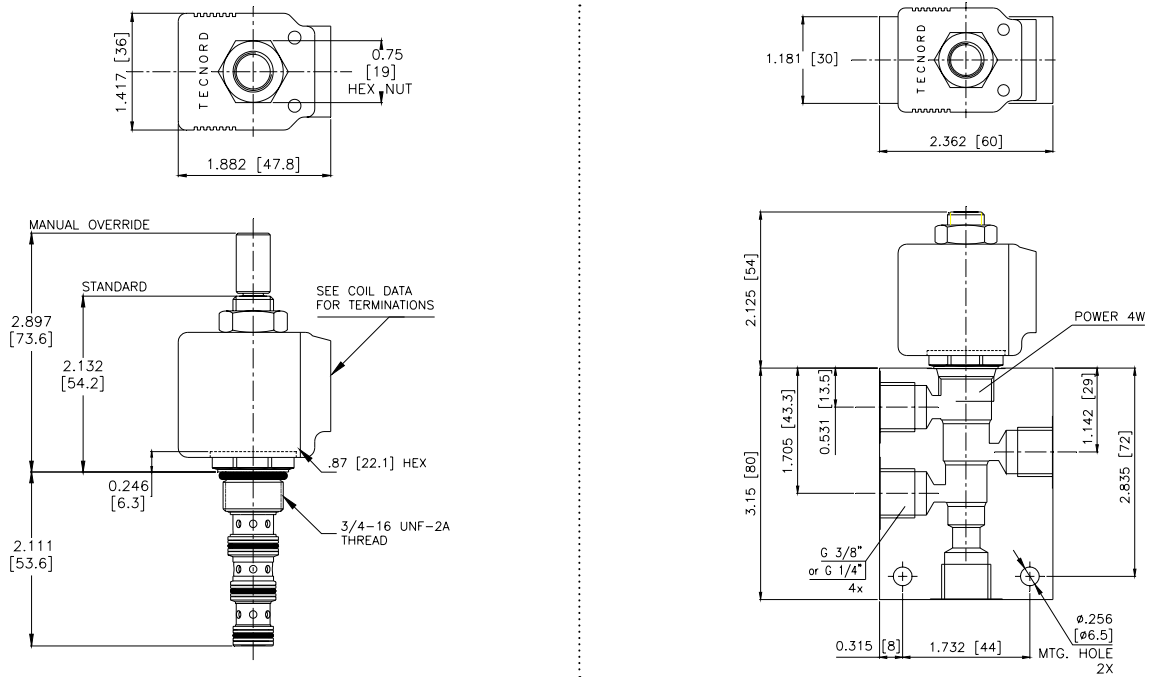


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DIMENSIONS



ORDERING INFORMATION

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

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**

- BODIES**
- Blank** Without Body
 - N** 1/4" BSP Ports
 - N1** 3/8" BSP Ports
 - S** #6 SAE Ports

VOLTAGE (other voltages available on request)

- 12** 12 VDC
- 24** 24 VDC
- 22** 220 VAC without internal rectifier

"P" TYPE "J" COIL TERMINATION

- JA** "J" Coil AMP Superseal - Integral
- JD** "J" Coil Deutsch - Integral DT04-2P

JJ "J" Coil AMP Jr. Time - Integral

- JL** "J" Coil Double Lead
- JH** "J" Coil DIN 43650 (Hirschmann)

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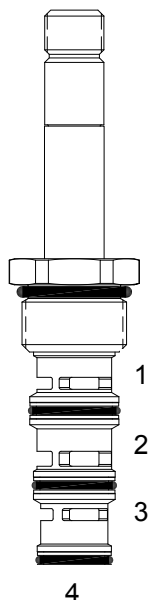


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DG-S4B DIRECT ACTING SPOOL, 4 WAY 2 POSITION, CLOSED CENTER



DESCRIPTION

10 size, 7/8-14 thread, "Delta" series, solenoid operated, 4 way 2 position, closed center spool valve.

OPERATION

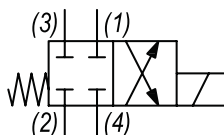
When de-energized the DG-S4B blocks flow at all ports. When energized the valve allows flow from (2) to (1) and (3) to (4).

OPERATION OF MANUAL OVERRIDE OPTION: to override, turn the manual override screw counterclockwise. 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.
- Optional "I" Coil: Weatherproof, Thermal Shock, Immersion Safe.

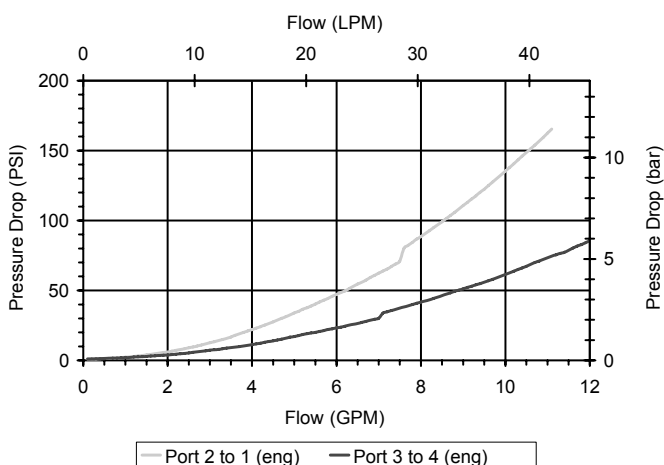
HYDRAULIC SYMBOL



For higher pressures see HG-S4B. Operational shift limit, 10 GPM (38 LPM). 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 Temp. 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 Tools Kit	
(form tool, reamer, tap)	40500002
Seal Kit	21191214

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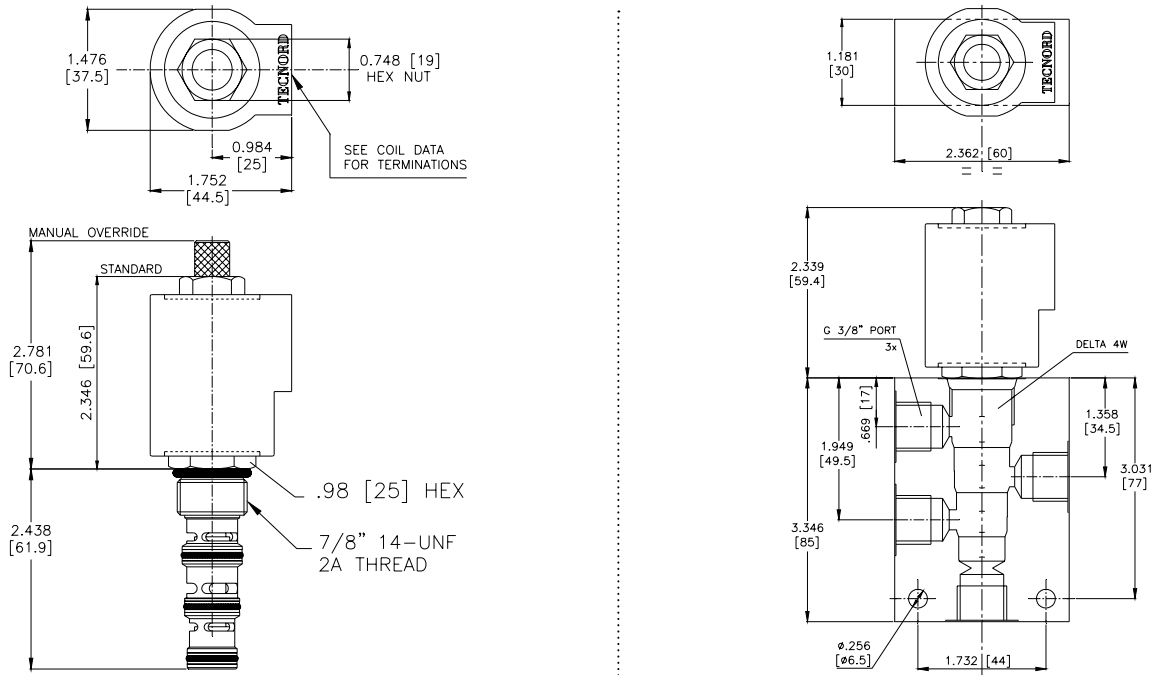


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DIMENSIONS



ORDERING INFORMATION

Approximate Coil Weight: .56 lbs (.25 kg)

DG-S4B

- OPTIONS**
- Buna Standard **00**
 - Viton Standard **VO**
 - Buna, Override, Detent **0M**
 - Viton, Override, Detent **VM**

- BODIES**
- Blank Without Body
 - N** 3/8" BSP Ports
 - S** #6 SAE Ports

VOLTAGE (other voltages available on request)

- 12** 12 VDC
- 24** 24 VDC
- 22** 220 VAC without internal rectifier

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

DL Double Lead
(several types of termination can be attached on leads on request)

HC DIN 43650 (Hirschmann) - (AC&DC)
DI Deutsch - Integral DT04-2P

IMMERSION PROOF "D" TYPE

- DIA** "I" Coil AMP Superseal - Integral
- DID** "I" Coil Deutsch - Integral DT04-2P
- DIJ** "I" Coil AMP Jr. Timer - Integral
- DIM** "I" Coil Metri-Pack - Integral

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HG-S4B DIRECT ACTING SPOOL, 4 WAY 2 POSITION, CLOSED CENTER

DESCRIPTION

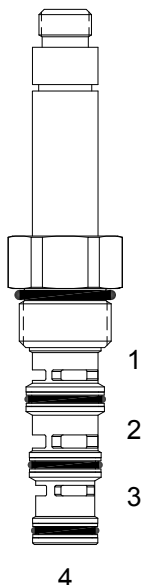
“High Pressure” 10 size, 7/8-14 thread, “Delta” series, solenoid operated, 4 way 2 position closed center spool valve.

OPERATION

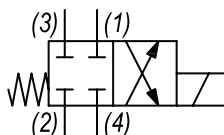
When de-energized the HG-S4B blocks flow at all ports. When energized the valve allows flow from (2) to (1) and from (3) to (4).

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.



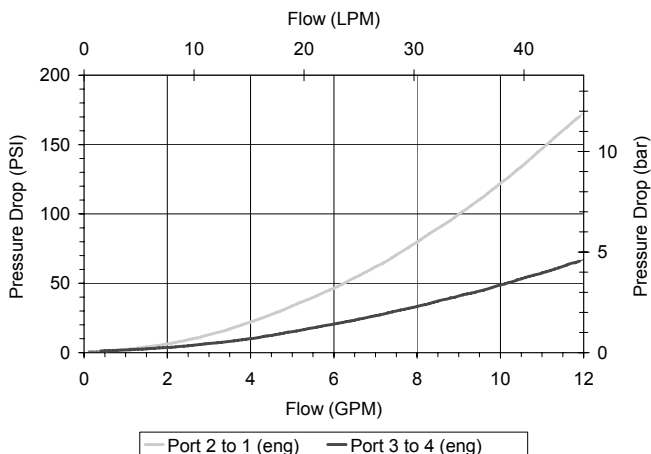
HYDRAULIC SYMBOL



Uses “L” Coils.
Pressure differential between ports should not exceed 3000 PSI.

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 Temp. Range	-40° to 250°F (-40° to 120°C)
Weight	.44 lbs (.20 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 Tools Kit (form tool, reamer, tap)	40500002
Seal Kit	21191214

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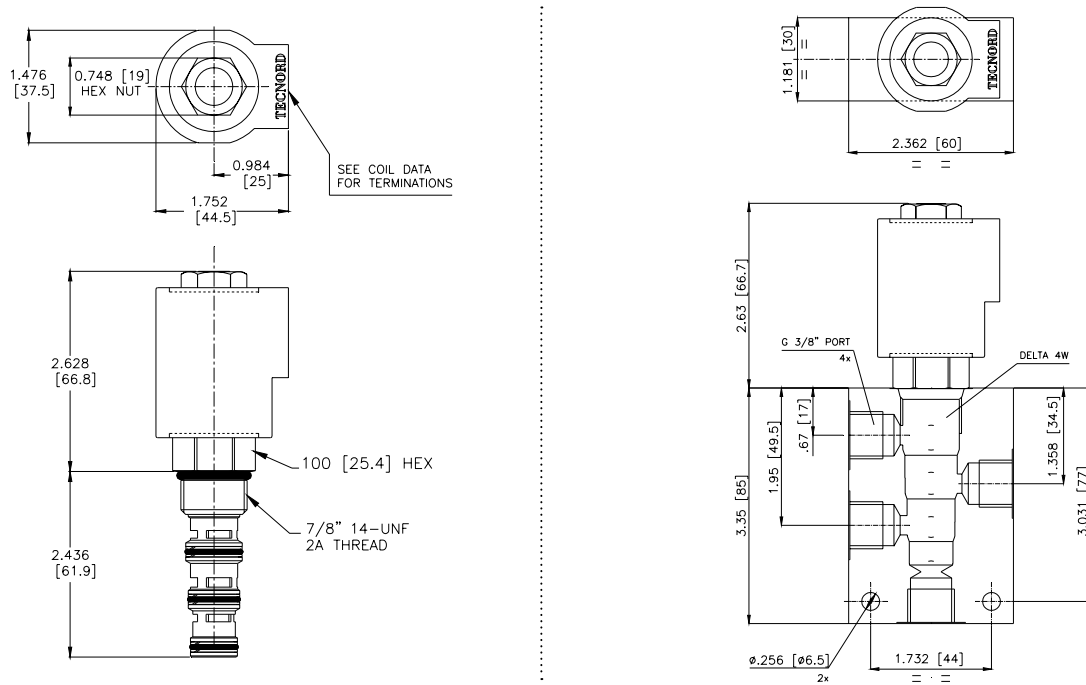


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DIMENSIONS



ORDERING INFORMATION

HG-S4B - - - -

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

BODIES
 Blank Without Body
N 3/8" BSP Ports
S #6 SAE Ports

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

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

VOLTAGE (other voltages available on request)
12 12 VDC
24 24 VDC
22 220 VAC without internal rectifier

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

DL Double Lead
 (several types of termination can be attached on leads on request)

HC DIN 43650 (Hirschmann) - (AC&DC)
DI Deutsch - Integral DT04-2P

IMMERSION PROOF "L" TYPE
LIA "I" Coil AMP Superseal - Integral
LID "I" Coil Deutsch - Integral DT04-2P
LIJ "I" Coil AMP Jr. Timer - Integral
LIM "I" Coil Metri-Pack - Integral

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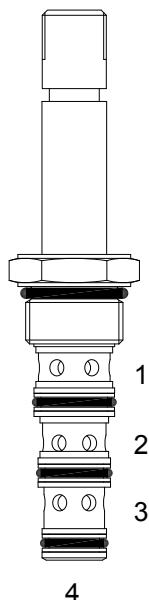


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PQ-S4C DIRECT ACTING SPOOL, 4 WAY 2 POSITION, TANDEM CENTER



DESCRIPTION

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

OPERATION

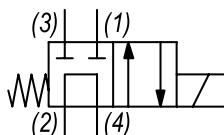
When de-energized the PQ-S4C allows flow between (2) and (4), blocks flow at (1) and (3). When energized the valve allows flow from (2) to (3) and from (1) to (4).

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

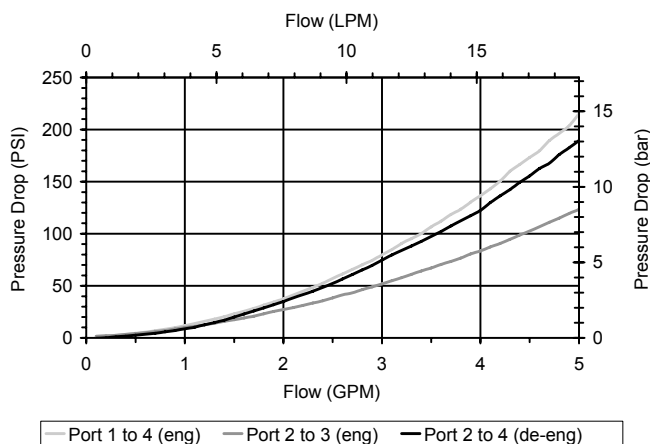
- Hardened parts for long life.
- Efficient wet-armature construction.
- Cartridges are voltage interchangeable.
- Manual override option.
- Industry common cavity.
- Unitized, molded coil design.
- Continuous duty rated solenoid.
- Optional coil voltages and terminations.
- Optional "I" Coil: Weatherproof, 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 Temp. 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 Tools Kit	
(form tool, reamer, tap)	40500029
Seal Kit	21191108

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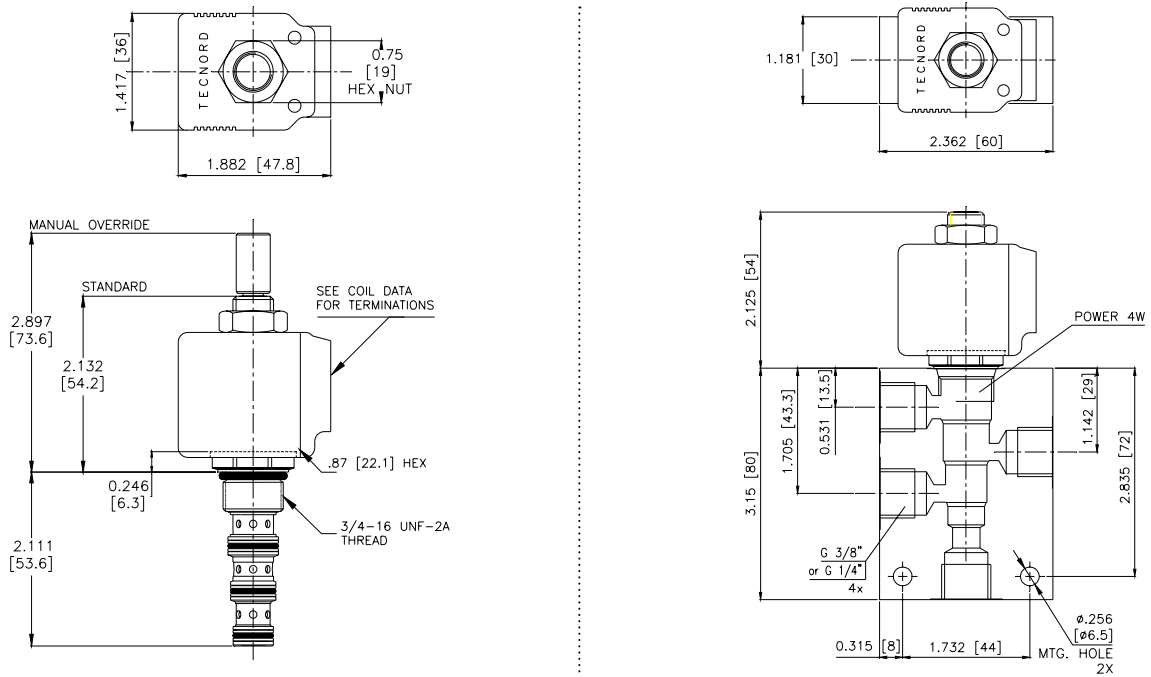


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DIMENSIONS



ORDERING INFORMATION

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

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**

- BODIES**
- Blank Without Body
 - N** 1/4" BSP Ports
 - N1** 3/8" BSP Ports
 - S** #6 SAE Ports

VOLTAGE (other voltages available on request)

- 12** 12 VDC
- 24** 24 VDC
- 22** 220 VAC without internal rectifier

"P" TYPE "J" COIL TERMINATION

- JA** "J" Coil AMP Superseal - Integral
- JD** "J" Coil Deutsch - Integral DT04-2P

- JJ** "J" Coil AMP Jr. Time - Integral

- JL** "J" Coil Double Lead
- JH** "J" Coil DIN 43650 (Hirschmann)

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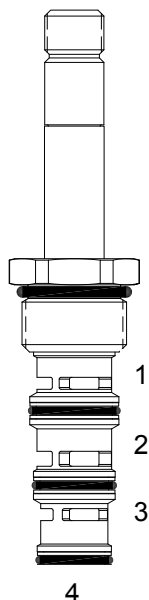


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DG-S4C DIRECT ACTING SPOOL, 4 WAY 2 POSITION, TANDEM CENTER



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).

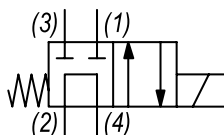
OPERATION OF MANUAL OVERRIDE OPTION: to override, turn the manual override screw counterclockwise.

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.
- Optional "I" Coil: Weatherproof, Thermal Shock, Immersion Safe.

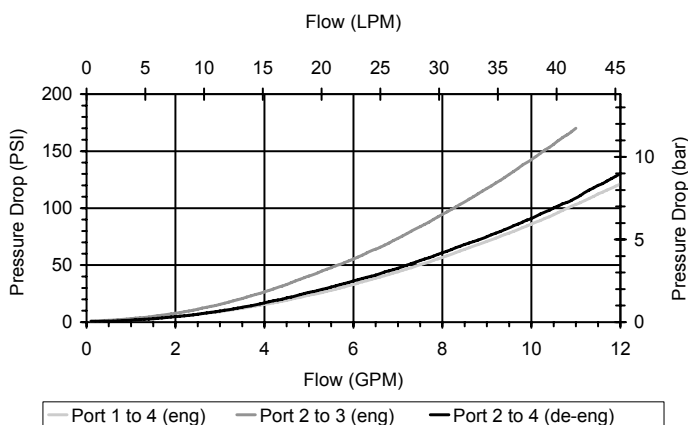
HYDRAULIC SYMBOL



For higher pressures see HG-S4C. Operational shift limit, 8 GPM (30 LPM). 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 Temp. 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 Tools Kit	
(form tool, reamer, tap)	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.

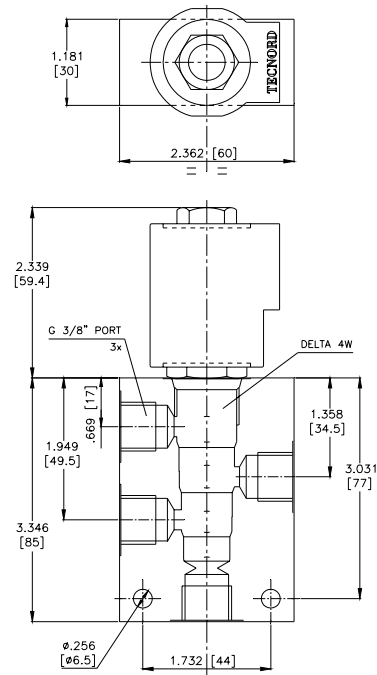
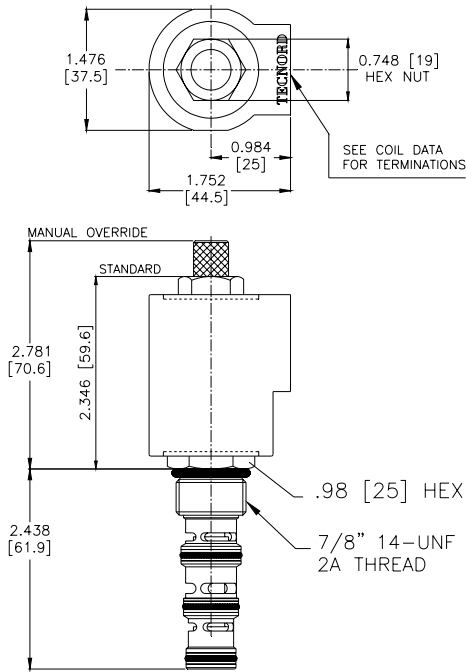


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DIMENSIONS



ORDERING INFORMATION

Approximate Coil Weight: .56 lbs (.25 kg)

DG-S4C

- OPTIONS**
- Buna Standard **00**
 - Viton Standard **VO**
 - Buna, Override, Detent **0M**
 - Viton, Override, Detent **VM**

- BODIES**
- Blank Without Body
 - N** 3/8" BSP Ports
 - S** #6 SAE Ports

- VOLTAGE** (other voltages available on request)
- 12** 12 VDC
 - 24** 24 VDC
 - 22** 220 VAC without internal rectifier

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

DL Double Lead
(several types of termination can be attached on leads on request)

HC DIN 43650 (Hirschmann) - (AC&DC)
DI Deutsch - Integral DT04-2P

IMMERSION PROOF "D" TYPE

- DIA** "I" Coil AMP Superseal - Integral
- DID** "I" Coil Deutsch - Integral DT04-2P
- DIJ** "I" Coil AMP Jr. Timer - Integral
- DIM** "I" Coil Metri-Pack - Integral

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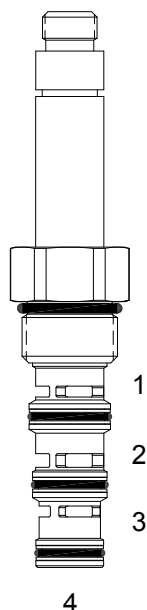


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HG-S4C DIRECT ACTING SPOOL, 4 WAY 2 POSITION, TANDEM CENTER



DESCRIPTION

"High Pressure" 10 size, 7/8-14 thread, "Delta" series, solenoid operated, 4 way 2 position tandem center spool valve.

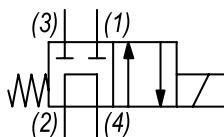
OPERATION

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.

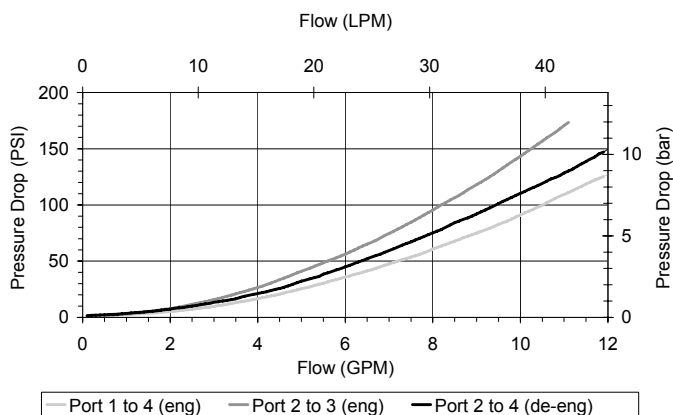
HYDRAULIC SYMBOL



Uses "L" Coils.
Pressure differential between ports should not exceed 3000 PSI.

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 Temp. Range	-40° to 250°F (-40° to 120°C)
Weight	.43 lbs (.20 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 Tools Kit	
(form tool, reamer, tap)	40500002
Seal Kit	21191214

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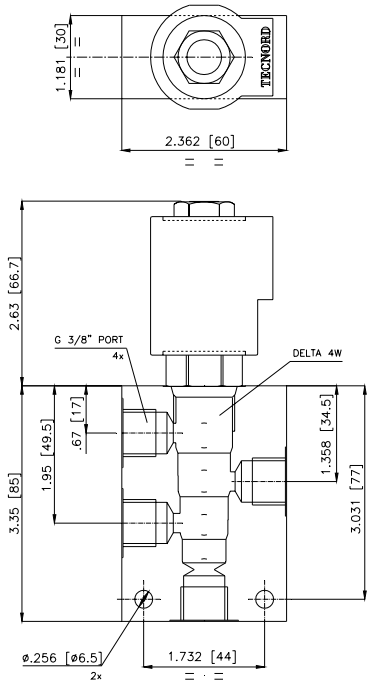
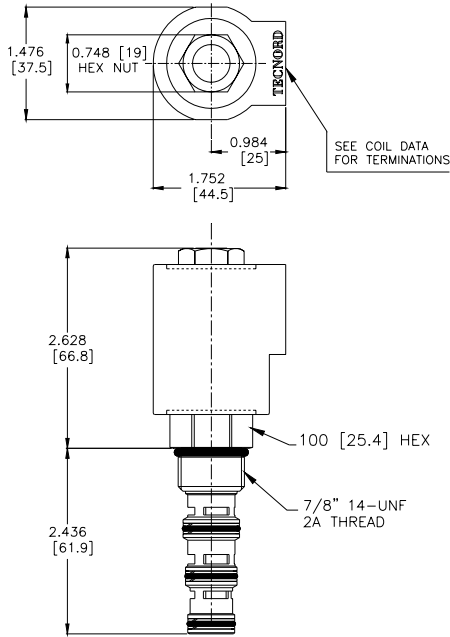


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DIMENSIONS



ORDERING INFORMATION

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

HG-S4C

- OPTIONS**
 Buna Standard **00**
 Viton Standard **V0**

- BODIES**
 Blank Without Body
N 3/8" BSP Ports
S #6 SAE Ports

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

- VOLTAGE** (other voltages available on request)
12 12 VDC
24 24 VDC
22 220 VAC without internal rectifier

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

DL Double Lead
 (several types of termination can be attached on leads on request)

HC DIN 43650 (Hirschmann) - (AC&DC)
DI Deutsch - Integral DT04-2P

IMMERSION PROOF "L" TYPE
LIA "I" Coil AMP Superseal - Integral
LID "I" Coil Deutsch - Integral DT04-2P
LIJ "I" Coil AMP Jr. Timer - Integral
LIM "I" Coil Metri-Pack - Integral

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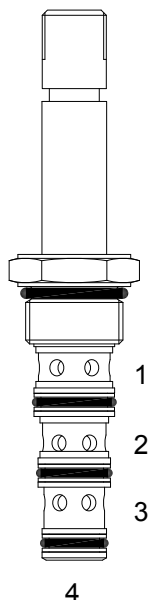


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PQ-S4D DIRECT ACTING SPOOL, 4 WAY 2 POSITION, CRISS CROSS



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

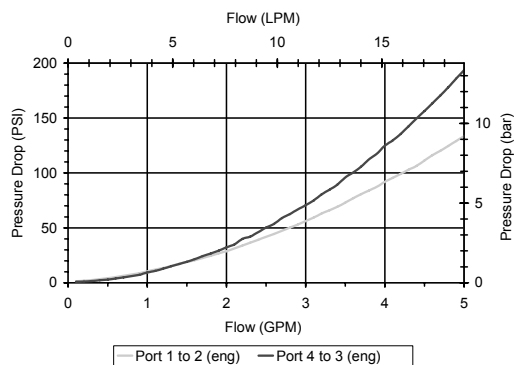
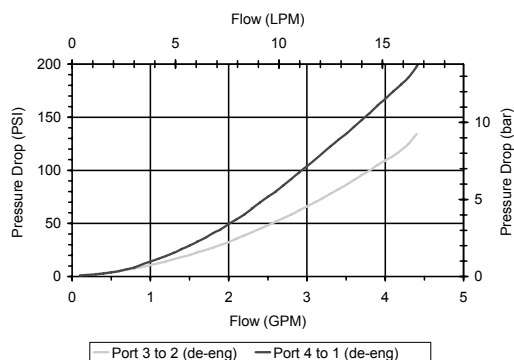
- Hardened parts for long life.
- Efficient wet-armature construction.
- Cartridges are voltage interchangeable.
- Manual override option.
- Industry common cavity.
- Unitized, molded coil design.
- Continuous duty rated solenoid.
- Optional coil voltages and terminations.
- Optional "I" Coil: Weatherproof,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



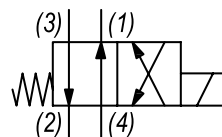
Modes of shift operation to 3 GPM, Consult Factory.

PERFORMANCE

Actual Test Data (Cartridge Only)



HYDRAULIC SYMBOL



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) per path
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temp. 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 Tools Kit (form tool, reamer, tap)	40500029
Seal Kit	21191108

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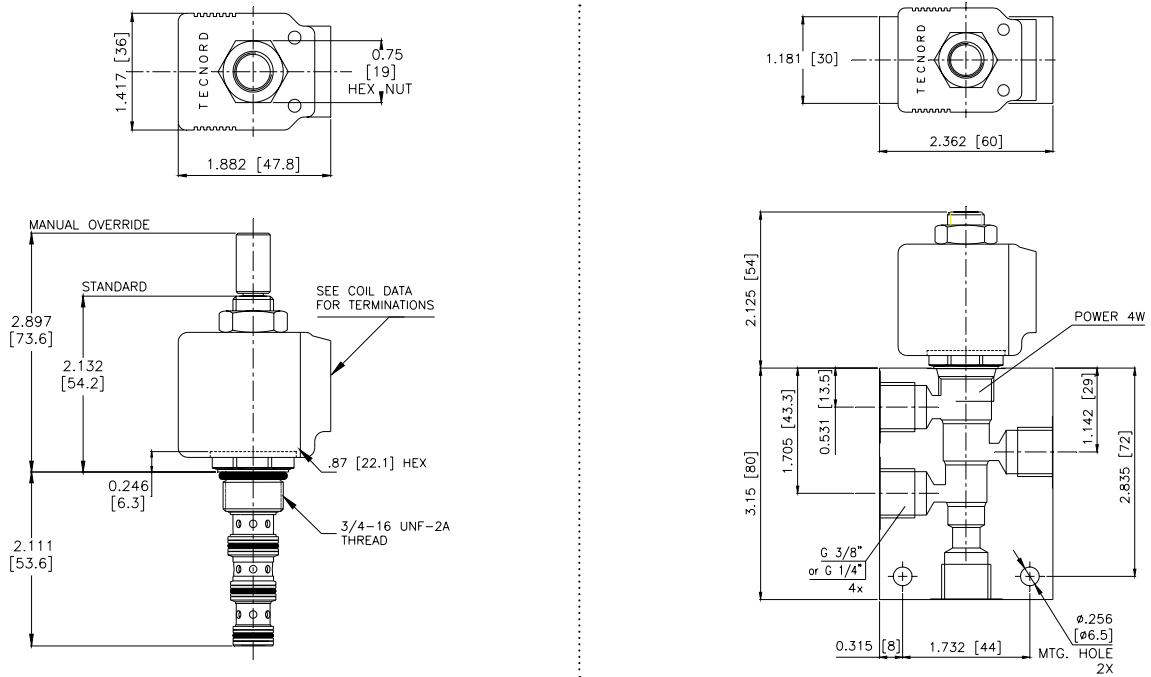


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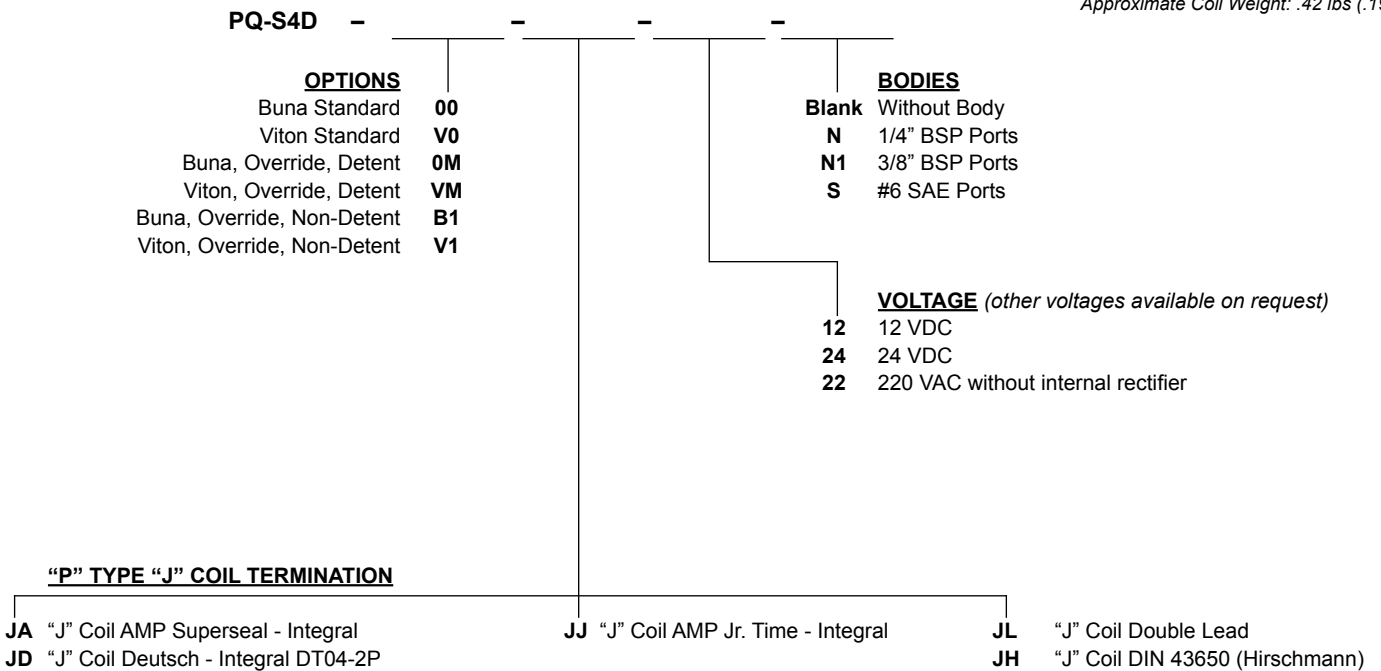
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DIMENSIONS



ORDERING INFORMATION

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



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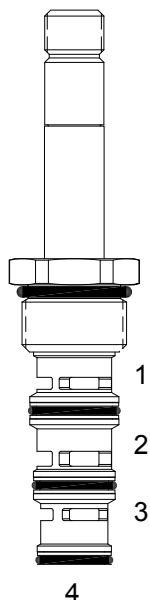


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DG-S4D DIRECT ACTING SPOOL, 4 WAY 2 POSITION, CRISS CROSS



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

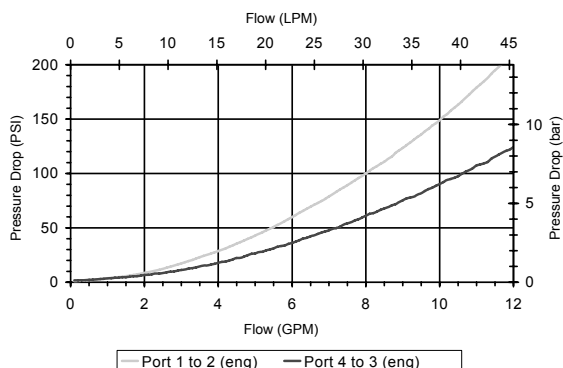
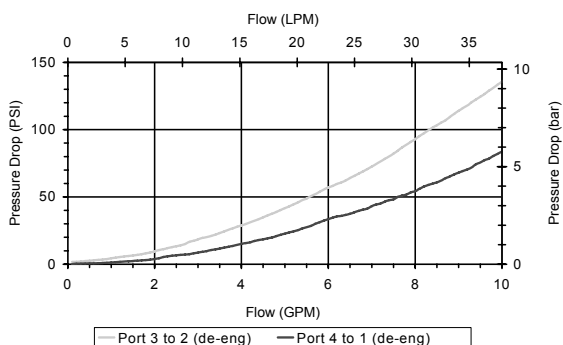
- Hardened parts for long life.
- Efficient wet-armature construction.
- Cartridges are voltage interchangeable.
- Manual override option.
- Industry common cavity.
- Unitized, molded coil design.
- Continuous duty rated solenoid.
- Optional coil voltages and terminations.
- Optional "I" Coil: Weatherproof,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



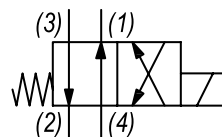
For higher pressures see HG-S4D. Operational shift limit, 6 GPM (23 LPM). For shift performance consult chart.

PERFORMANCE

Actual Test Data (Cartridge Only)



HYDRAULIC SYMBOL



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 Temp. 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 Tools Kit	
(form tool, reamer, tap)	40500002
Seal Kit	21191214

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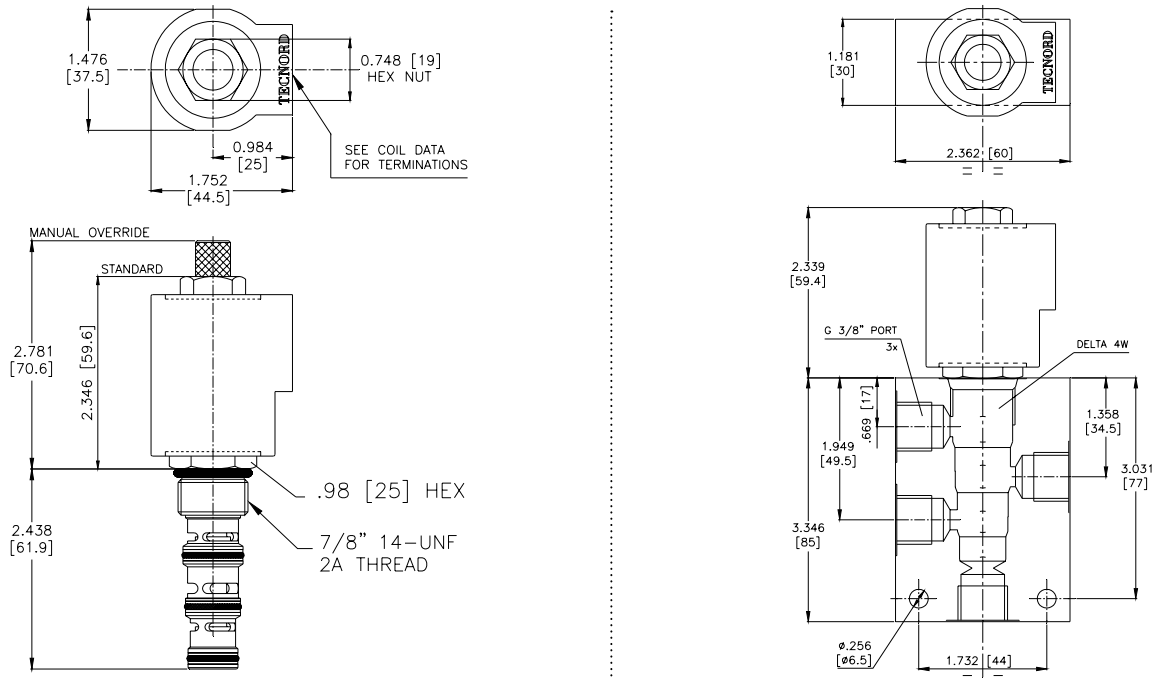


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DIMENSIONS



ORDERING INFORMATION

Approximate Coil Weight: .56 lbs (.25 kg)

DG-S4D

- OPTIONS**
- Buna Standard **00**
 - Viton Standard **V0**
 - Buna, Override, Detent **0M**
 - Viton, Override, Detent **VM**

- BODIES**
- Blank** Without Body
 - N** 3/8" BSP Ports
 - S** #6 SAE Ports

- VOLTAGE** (other voltages available on request)
- 12** 12 VDC
 - 24** 24 VDC
 - 22** 220 VAC without internal rectifier

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

DL Double Lead
(several types of termination can be attached on leads on request)

HC DIN 43650 (Hirschmann) - (AC&DC)
DI Deutsch - Integral DT04-2P

IMMERSION PROOF "D" TYPE

- DIA** "I" Coil AMP Superseal - Integral
- DID** "I" Coil Deutsch - Integral DT04-2P
- DIJ** "I" Coil AMP Jr. Timer - Integral
- DIM** "I" Coil Metri-Pack - Integral

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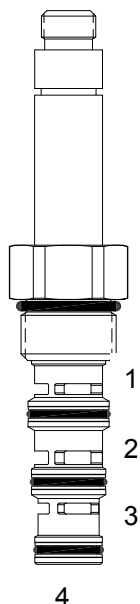


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HG-S4D DIRECT ACTING SPOOL, 4 WAY 2 POSITION, BOTTOM FLOW



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

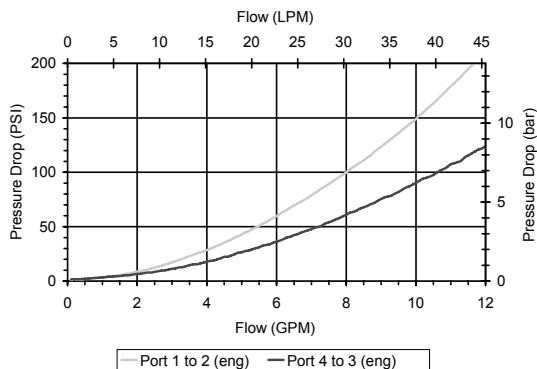
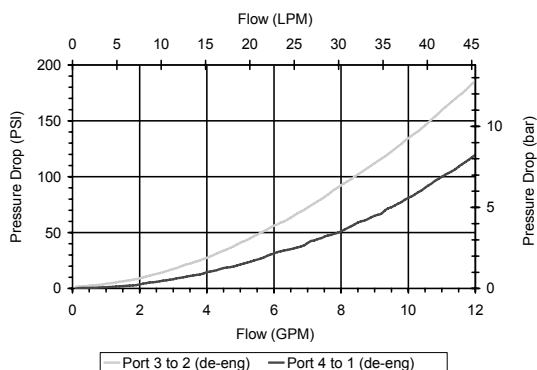
- Hardened parts for long life.
- Efficient wet-armature construction.
- Cartridges are voltage interchangeable.
- Industry common cavity.
- Unitized, molded coil design.
- Continuous duty rated solenoid.
- Optional coil voltages and terminations.
- Optional "I" Coil: Weatherproof, Thermal Shock, Immersion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



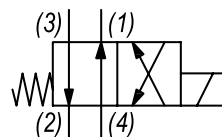
Uses "L" Coils.
Pressure differential between ports should not exceed 3000 PSI.

PERFORMANCE

Actual Test Data (Cartridge Only)



HYDRAULIC SYMBOL



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 Temp. Range	-40° to 250°F (-40° to 120°C)
Weight	.43 lbs (.20 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 Tools Kit (form tool, reamer, tap)	40500002
Seal Kit	21191214

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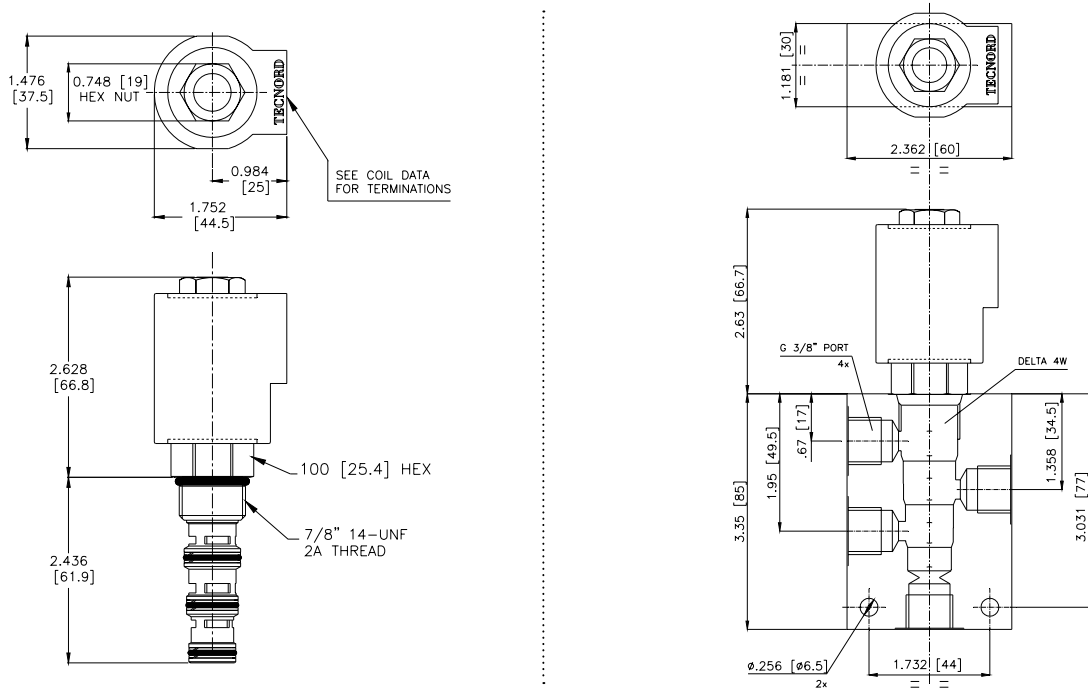


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DIMENSIONS



ORDERING INFORMATION

HG-S4D - - - -

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

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

BODIES
 Blank Without Body
N 3/8" BSP Ports
S #6 SAE Ports

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

VOLTAGE (other voltages available on request)

- 12** 12 VDC
- 24** 24 VDC
- 22** 220 VAC without internal rectifier

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

DL Double Lead
 (several types of termination can be attached on leads on request)

HC DIN 43650 (Hirschmann) - (AC&DC)
DI Deutsch - Integral DT04-2P

IMMERSION PROOF "L" TYPE
LIA "I" Coil AMP Superseal - Integral
LID "I" Coil Deutsch - Integral DT04-2P
LIJ "I" Coil AMP Jr. Timer - Integral
LIM "I" Coil Metri-Pack - Integral

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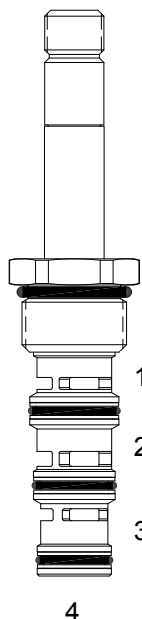


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DG-S4E DIRECT ACTING SPOOL, 4 WAY 2 POSITION, SERIES/PARALLEL



DESCRIPTION

10 size, 7/8-14 thread, "Delta" series, solenoid operated, 4 way 2 position, series/parallel spool valve.

OPERATION

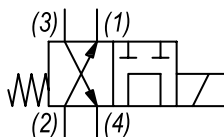
When de-energized the DG-S4E allows flow from (2) and (1), and (3) to (4). When energized the valve allows flow (2) to (4) and blocks the flow at (1) and (3).

OPERATION OF MANUAL OVERRIDE OPTION: to override, turn the manual override screw counterclockwise. 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.
- Optional "I" Coil: Weatherproof, Thermal Shock, Immersion Safe.

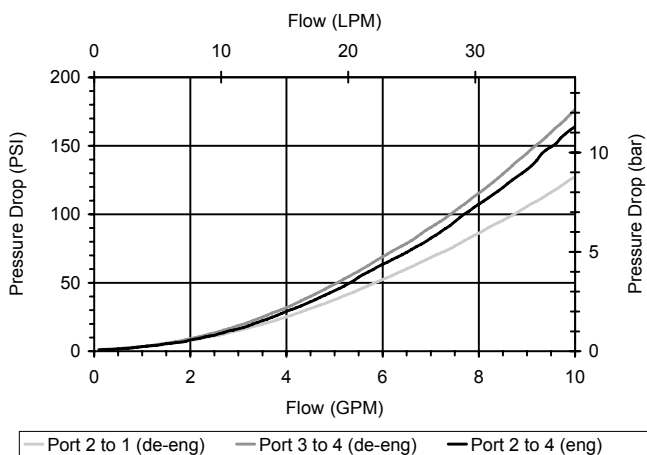
HYDRAULIC SYMBOL



For higher pressures see HG-S4E. Operational shift limit, 6 GPM (23 LPM). 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 Temp. 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 Tools Kit	
(form tool, reamer, tap)	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.

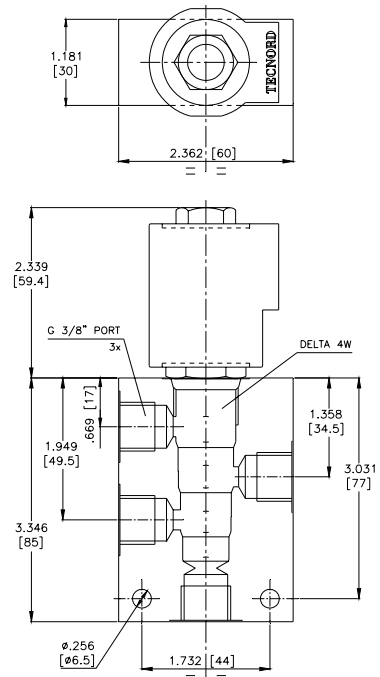
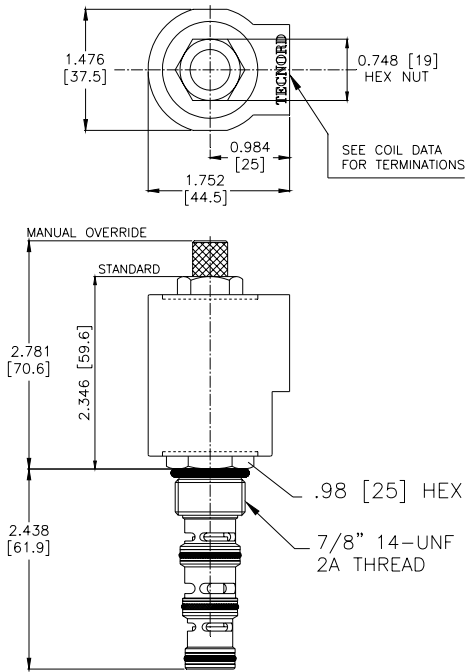


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DIMENSIONS



ORDERING INFORMATION

Approximate Coil Weight: .56 lbs (.25 kg)

DG-S4E

- OPTIONS**
- Buna Standard **00**
 - Viton Standard **VO**
 - Buna, Override, Detent **0M**
 - Viton, Override, Detent **VM**

- BODIES**
- Blank Without Body
 - N** 3/8" BSP Ports
 - S** #6 SAE Ports

- VOLTAGE** (other voltages available on request)
- 12** 12 VDC
 - 24** 24 VDC
 - 22** 220 VAC without internal rectifier

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

DL Double Lead
(several types of termination can be attached on leads on request)

HC DIN 43650 (Hirschmann) - (AC&DC)
DI Deutsch - Integral DT04-2P

IMMERSION PROOF "D" TYPE

- DIA** "I" Coil AMP Superseal - Integral
- DID** "I" Coil Deutsch - Integral DT04-2P
- DIJ** "I" Coil AMP Jr. Timer - Integral
- DIM** "I" Coil Metri-Pack - Integral

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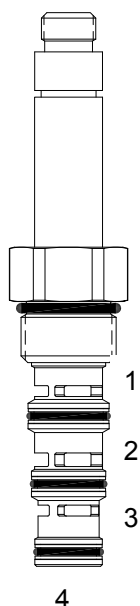


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HG-S4E DIRECT ACTING SPOOL, 4 WAY 2 POSITION, SERIES/PARALLEL



DESCRIPTION

“High Pressure” 10 size, 7/8-14 thread, “Delta” series, solenoid operated, 4 way 2 position series/parallel spool valve.

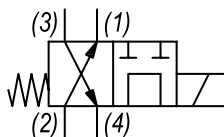
OPERATION

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.

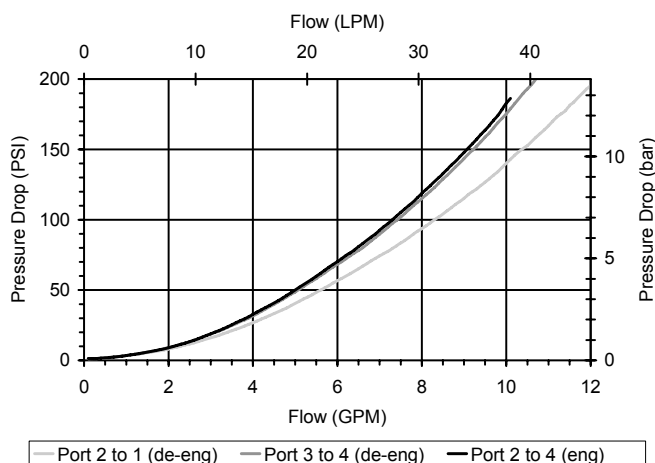
HYDRAULIC SYMBOL



Uses “L” Coils.
Pressure differential between ports should not exceed 3000 PSI.

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 Temp. Range	-40° to 250°F (-40° to 120°C)
Weight	.43 lbs (.20 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 Tools Kit	
(form tool, reamer, tap)	40500002
Seal Kit	21191214

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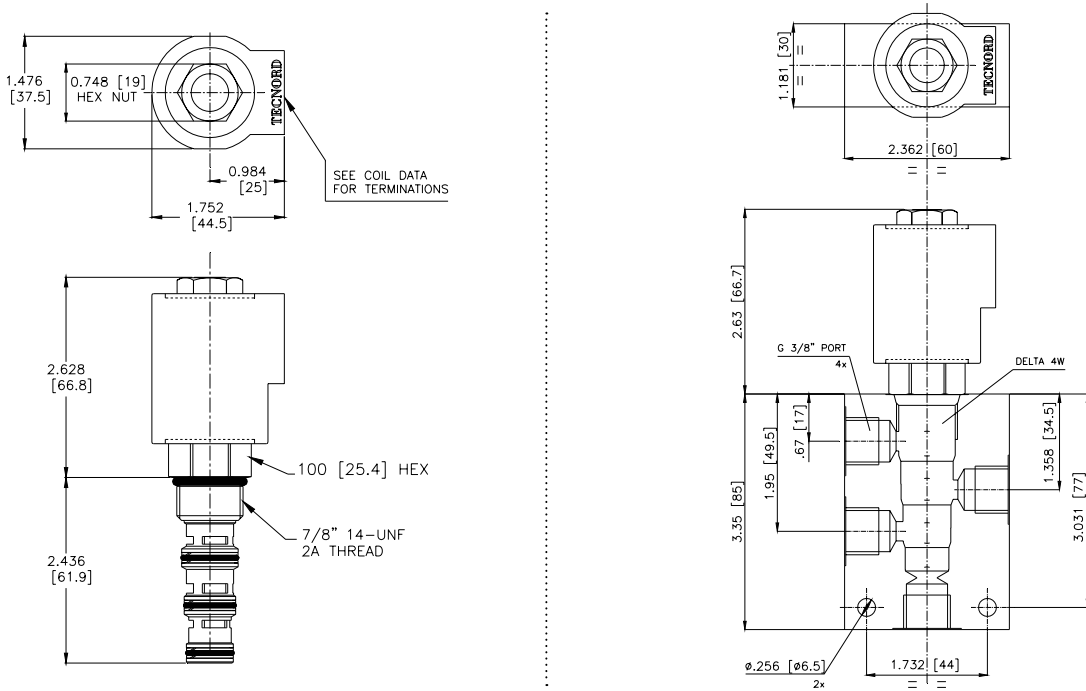


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DIMENSIONS



ORDERING INFORMATION

HG-S4E - - - -

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

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

BODIES
 Blank Without Body
N 3/8" BSP Ports
S #6 SAE Ports

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

VOLTAGE (other voltages available on request)

- 12** 12 VDC
- 24** 24 VDC
- 22** 220 VAC without internal rectifier

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

DL Double Lead
 (several types of termination can be attached on leads on request)

HC DIN 43650 (Hirschmann) - (AC&DC)
DI Deutsch - Integral DT04-2P

IMMERSION PROOF "L" TYPE
LIA "I" Coil AMP Superseal - Integral
LID "I" Coil Deutsch - Integral DT04-2P
LIJ "I" Coil AMP Jr. Timer - Integral
LIM "I" Coil Metri-Pack - Integral

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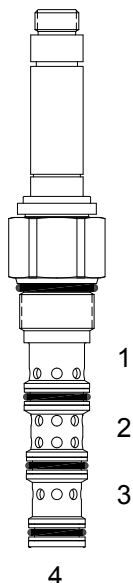


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HV-S4E DIRECT ACTING SPOOL, 4 WAY 2 POSITION, SERIES/PARALLEL



DESCRIPTION

“High pressure” 12 size, 1 1/16-12 thread, “Tecnord” series, solenoid operated, 4 way 2 position, series/parallel flow spool valve.

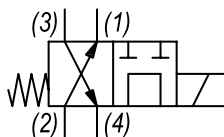
OPERATION

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

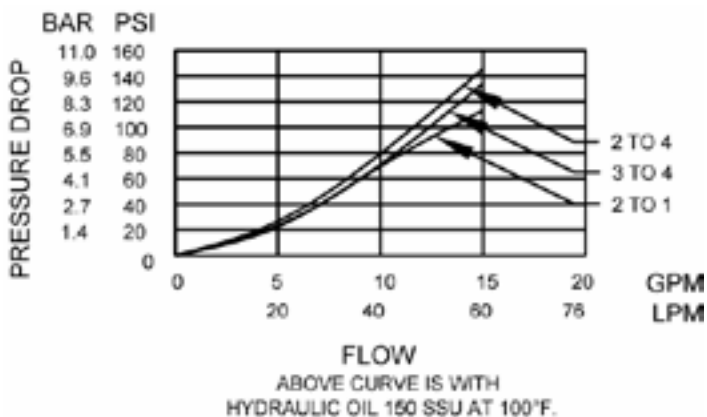
- Hardened parts for long life.
- Efficient wet-armature construction.
- Cartridges are voltage interchangeable.
- Industry common cavity.
- Unitized, molded coil design.
- Continuous duty rated solenoid.
- Optional coil voltages and terminations.

HYDRAULIC SYMBOL



PERFORMANCE

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)	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 Temp. 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	50 ft-lbs (67.8 Nm)
Coil Nut Torque Requirements	5-7 ft-lbs (6.8-9.5 Nm)
Cavity	TECNORD 4W
Cavity Tools Kit	
(form tool, reamer, tap)	40500035
Seal Kit	21191309

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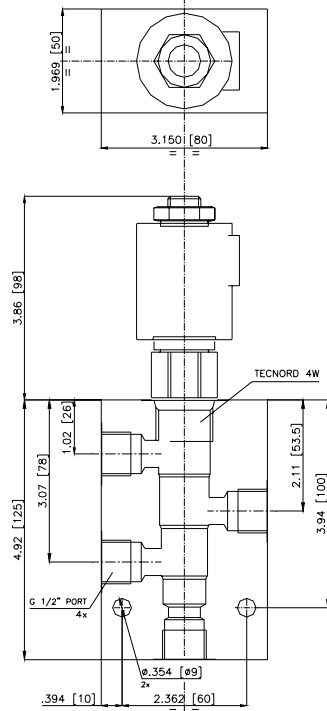
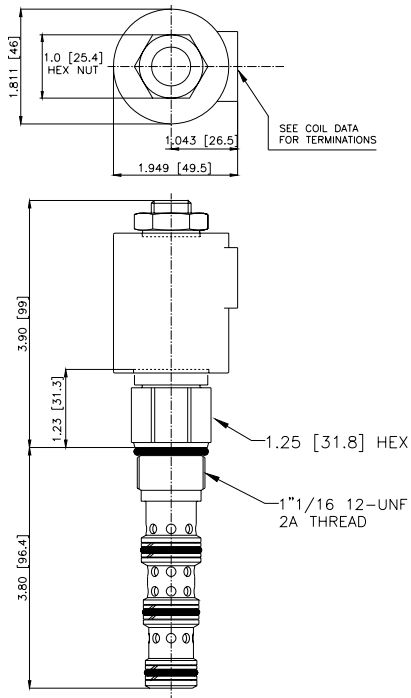


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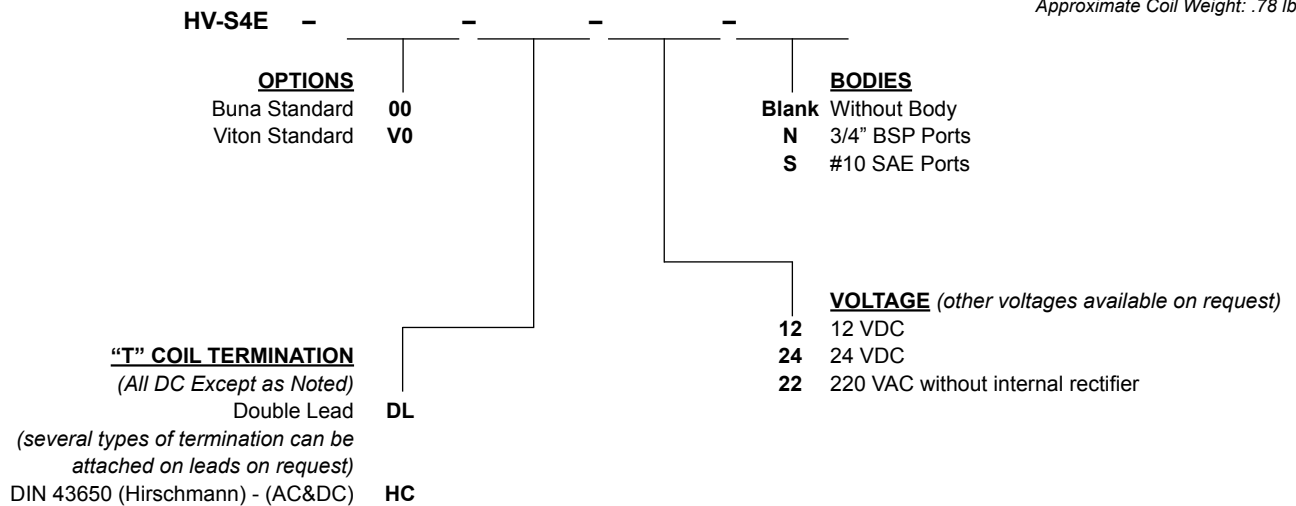
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DIMENSIONS



ORDERING INFORMATION

Approximate Coil Weight: .78 lbs (.35 kg)



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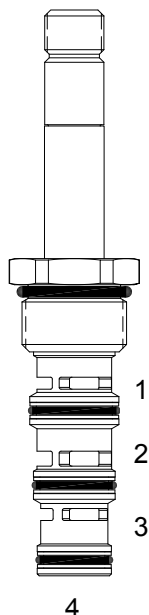


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DG-S4F DIRECT ACTING SPOOL, 4 WAY 2 POSITION, ENERGIZED TO BLOCK



DESCRIPTION

10 size, 7/8-14 thread, "Delta" series, solenoid operated, 4 way 2 position, energized to block spool valve.

OPERATION

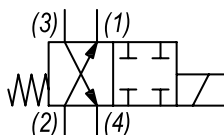
When de-energized the DG-S4F allows flow from (2) and (1), and from (3) to (4). When energized the valve blocks flow at all ports.

OPERATION OF MANUAL OVERRIDE OPTION: to override, turn the manual override screw counterclockwise. 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.
- Optional "I" Coil: Weatherproof, Thermal Shock, Immersion Safe.

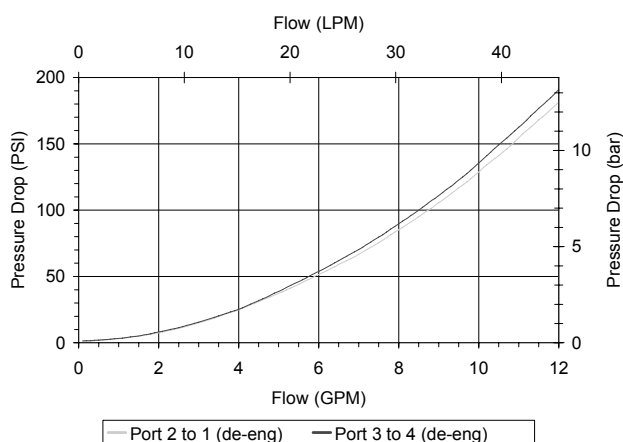
HYDRAULIC SYMBOL



For higher pressures see HG-S4F. Operational shift limit, 6 GPM (23 LPM). 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 Temp. 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 Tools Kit (form tool, reamer, tap)	40500002
Seal Kit	21191214

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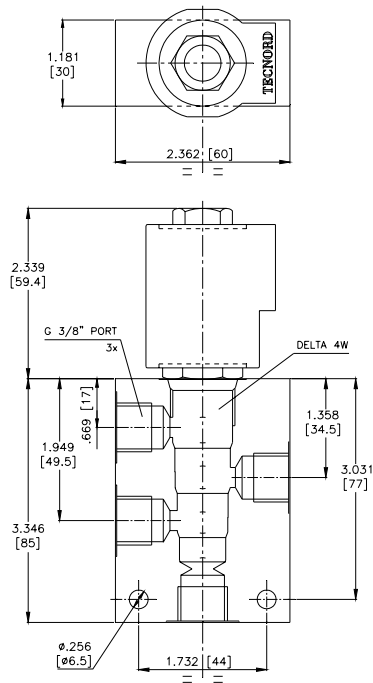
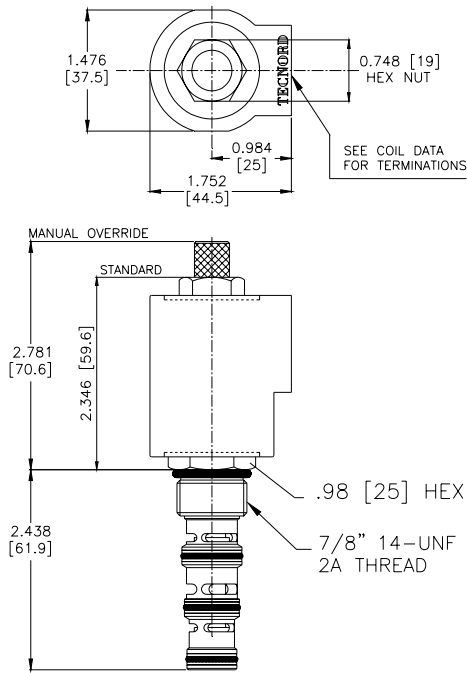


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DIMENSIONS



ORDERING INFORMATION

Approximate Coil Weight: .56 lbs (.25 kg)

DG-S4F

- 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**

- BODIES**
- Blank Without Body
 - N** 3/8" BSP Ports
 - S** #6 SAE Ports

- VOLTAGE** (other voltages available on request)
- 12** 12 VDC
 - 24** 24 VDC
 - 22** 220 VAC without internal rectifier

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

DL Double Lead
(several types of termination can be attached on leads on request)

HC DIN 43650 (Hirschmann) - (AC&DC)
DI Deutsch - Integral DT04-2P

IMMERSION PROOF "D" TYPE

- DIA** "I" Coil AMP Superseal - Integral
- DID** "I" Coil Deutsch - Integral DT04-2P
- DIJ** "I" Coil AMP Jr. Timer - Integral
- DIM** "I" Coil Metri-Pack - Integral

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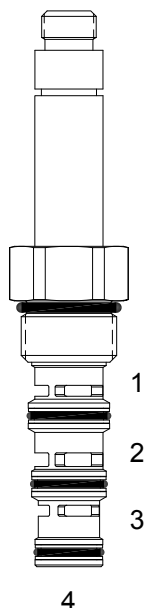


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HG-S4F DIRECT ACTING SPOOL, 4 WAY 2 POSITION, ENERGIZED TO BLOCK



DESCRIPTION

"High Pressure" 10 size, 7/8-14 thread, "Delta" series, solenoid operated, 4 way 2 position energized to block spool valve.

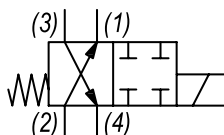
OPERATION

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.

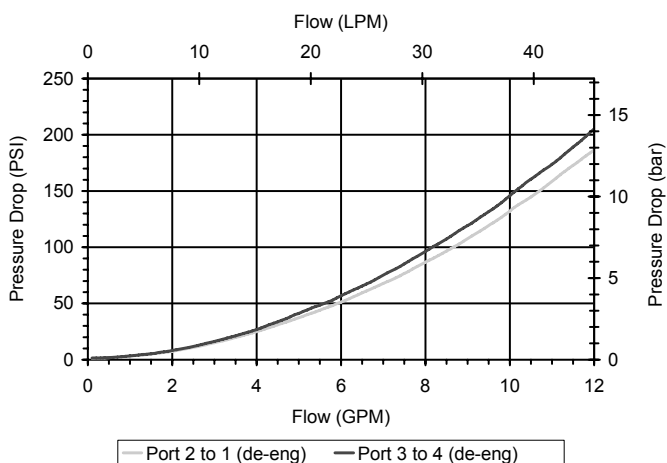
HYDRAULIC SYMBOL



Uses "L" Coils.
Pressure differential between ports should not exceed 3000 PSI.

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 Temp. Range	-40° to 250°F (-40° to 120°C)
Weight	.44 lbs (.20 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 Tools Kit (form tool, reamer, tap)	40500002
Seal Kit	21191214

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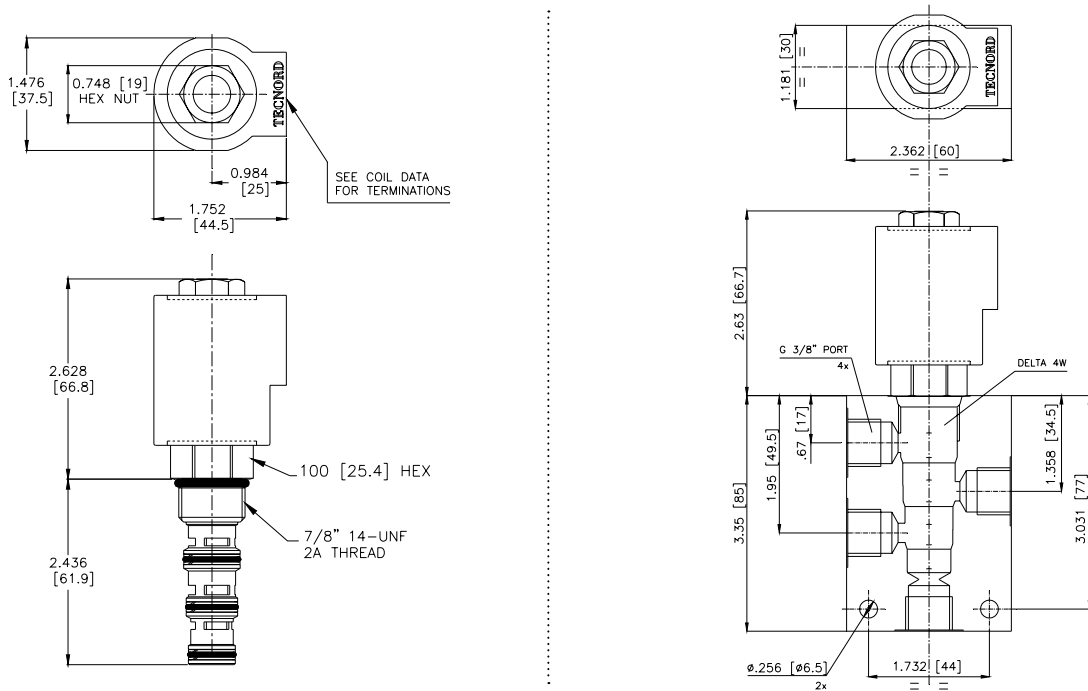


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DIMENSIONS



ORDERING INFORMATION

HG-S4F - - - -

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

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

BODIES
 Blank Without Body
N 3/8" BSP Ports
S #6 SAE Ports

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

VOLTAGE (other voltages available on request)
12 12 VDC
24 24 VDC
22 220 VAC without internal rectifier

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

DL Double Lead
 (several types of termination can be attached on leads on request)

HC DIN 43650 (Hirschmann) - (AC&DC)
DI Deutsch - Integral DT04-2P

IMMERSION PROOF "L" TYPE
LIA "I" Coil AMP Superseal - Integral
LID "I" Coil Deutsch - Integral DT04-2P
LIJ "I" Coil AMP Jr. Timer - Integral
LIM "I" Coil Metri-Pack - Integral

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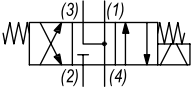
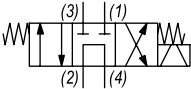
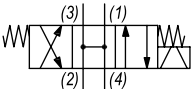
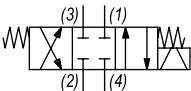
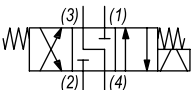
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SOLENOID OPERATED DIRECTIONAL CONTROLS

4 WAY 3 POSITION SPOOL VALVES

4W3P SPOOL	GPM	PSI	LPM	BAR	CAVITY	MODEL	PAGE
	3	3000	11	207	3/4-16	VQ-S4M	ST166
	5	3000	19	207	3/4-16	PQ-S4M	ST168
	6.5	3000	25	207	7/8-14	DG-S4M	ST170
	5	3000	19	207	3/4-16	PQ-S4N	ST172
	6	3000	23	207	7/8-14	DG-S4N	ST174
	2.5	3000	9.5	207	3/4-16	VQ-S4R	ST176
	3	3000	11	207	3/4-16	PQ-S4R	ST178
	3	3000	11	207	3/4-16	PQ-S4O	ST180
	8	3000	30	207	7/8-14	DG-S4O	ST182
	5	3000	19	207	3/4-16	PQ-S4T	ST184
	3.5	3000	13.2	207	3/4-16	VQ-S4Q	ST186
	5	3000	19	207	3/4-16	PQ-S4P	ST188
	8	3000	30	207	7/8-14	DG-S4P	ST190
	6	3000	23	207	3/4-16	PQ-S4Q	ST192
	6	3000	23	207	7/8-14	DG-S4S	ST194

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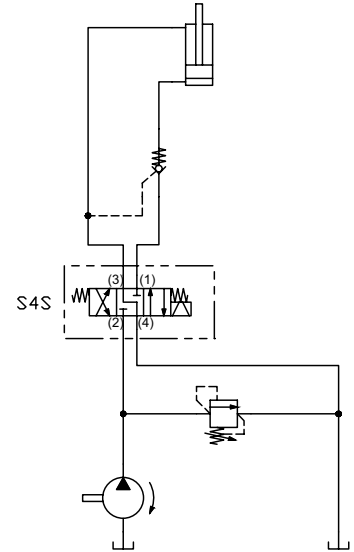
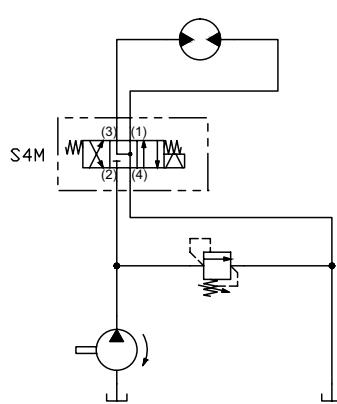
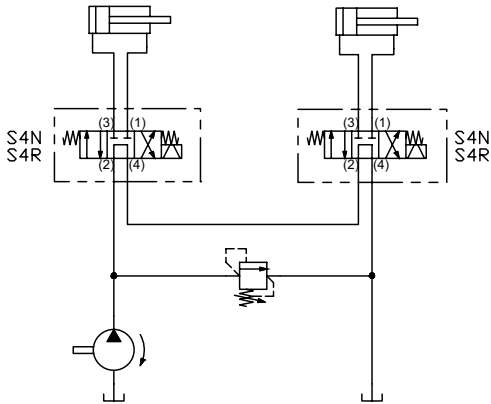
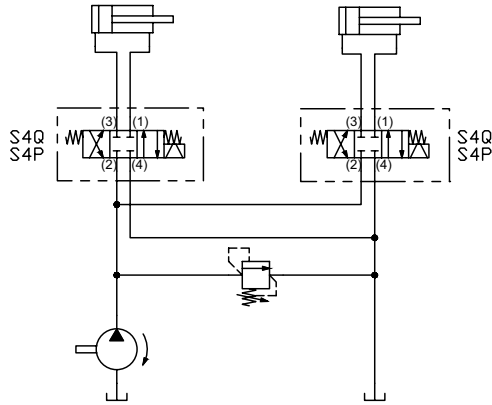
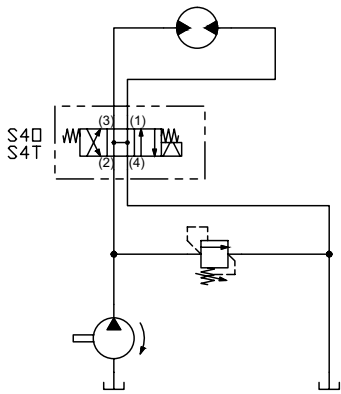
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TYPICAL SCHEMATIC

Typical application for the S4O and S4T "Open Center" valve is a bidirectional 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.



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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

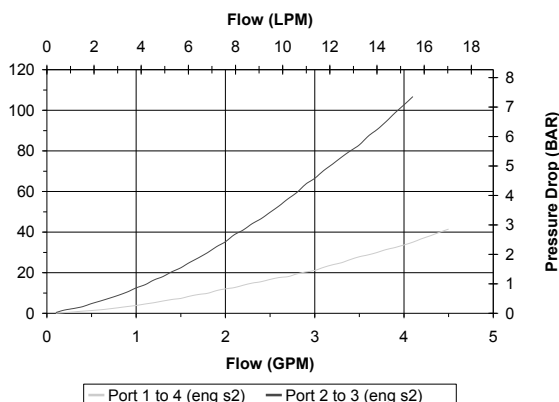
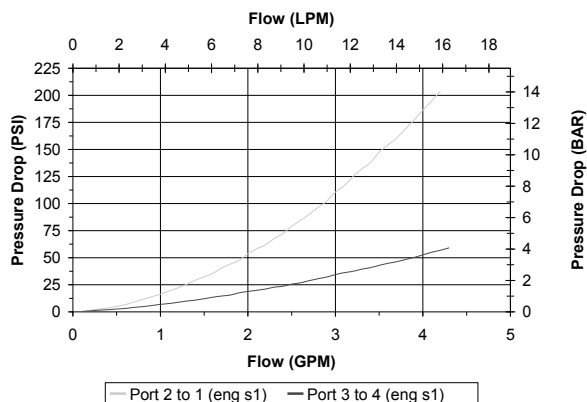
When de-energized the VQ-S4M allows flow between (1), (3) and (4), blocks flow at (2). When outer coil (S1) is energized the valve allows flow from (2) to (1) and from (3) to (4). When inner coil (S2) is energized the valve allows flow from (2) to (3) and from (1) to (4).

FEATURES

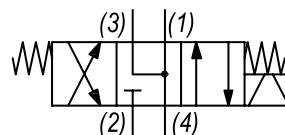
- Hardened parts for long life.
- Efficient wet-armature construction.
- Cartridges are voltage interchangeable.
- Industry common cavity.
- Unitized, molded coil design.
- Continuous duty rated solenoid.
- Optional coil voltages and terminations.
- Optional "I" Coil: Weatherproof, Thermal Shock, Immersion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

PERFORMANCE

Actual Test Data (Cartridge Only)



HYDRAULIC SYMBOL



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 Temp. 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

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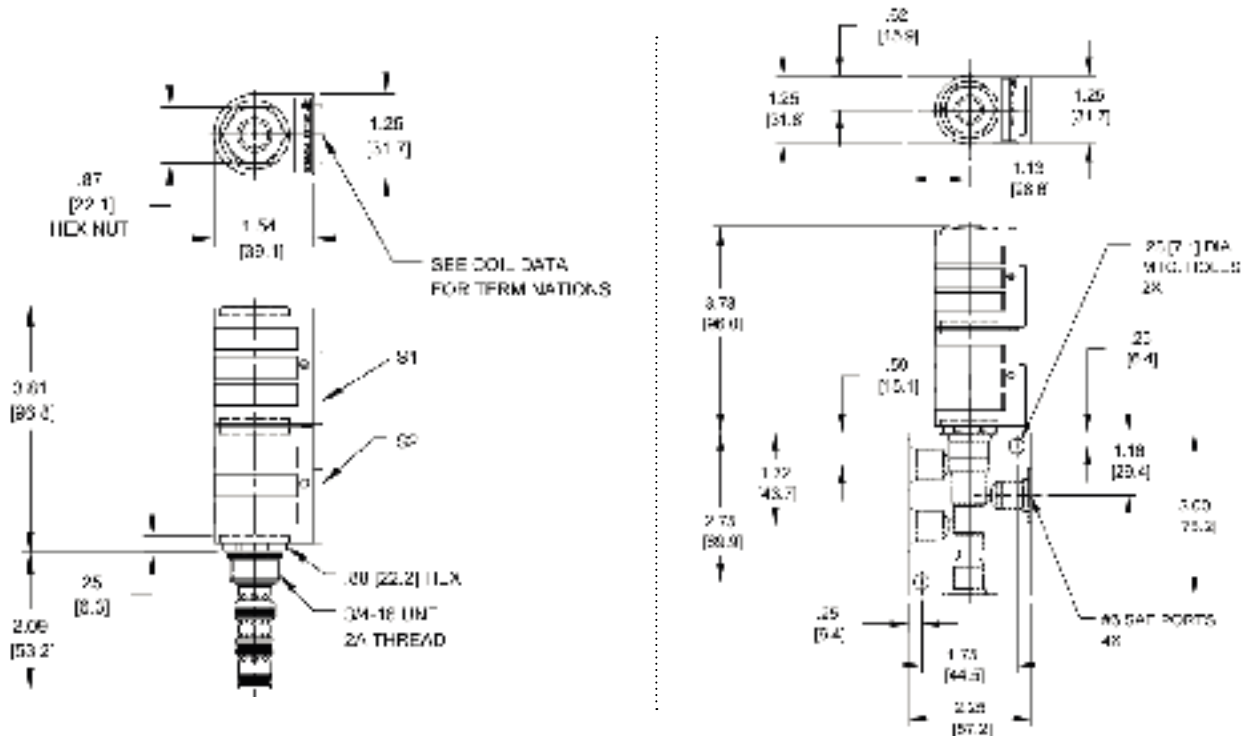


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DIMENSIONS



ORDERING INFORMATION

Approximate Coil Weight: .56 lbs (.25 kg)

VQ-S4M

- OPTIONS**
- Buna Standard **00**
 - Viton Standard **V0**
 - Buna, Push Only Override **0P**
 - Viton, Push Only Override **VP**

- BODIES**
- Blank** Without Body
 - N** 1/4" BSP Ports
 - N1** 3/8" BSP Ports
 - S** #6 SAE Ports

- VOLTAGE** (other voltages available on request)
- 12** 12 VDC
 - 24** 24 VDC
 - 22** 220 VAC without internal rectifier

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

DL Double Lead
(several types of termination can be attached on leads on request)

HC DIN 43650 (Hirschmann) - (AC&DC)
DI Deutsch - Integral DT04-2P

IMMERSION PROOF "D" TYPE

- DIA** "I" Coil AMP Superseal - Integral
- DID** "I" Coil Deutsch - Integral DT04-2P
- DIJ** "I" Coil AMP Jr. Timer - Integral
- DIM** "I" Coil Metri-Pack - Integral

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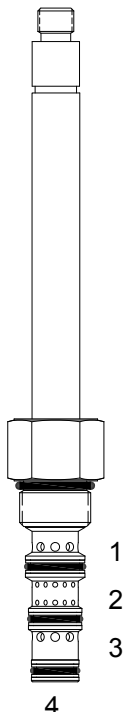


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PQ-S4M DIRECT ACTING SPOOL, 4 WAY 3 POSITION, MOTOR CENTER



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

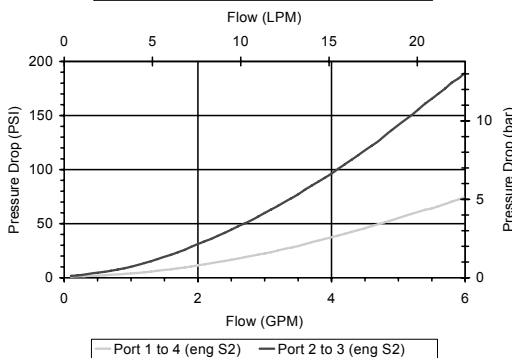
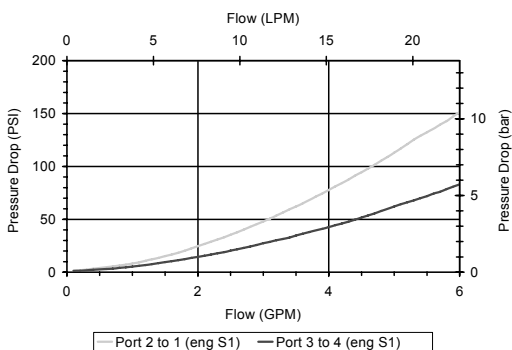
- Hardened parts for long life.
- Efficient wet-armature construction.
- Cartridges are voltage interchangeable.
- Industry common cavity.
- Optional manual "push only" override.
- Unitized, molded coil design.
- Continuous duty rated solenoid.
- Optional coil voltages and terminations.
- Optional "I"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



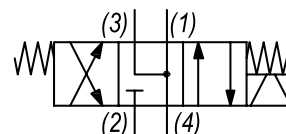
Uses "V" coils. "OP" override is a push only non-detented button that actuates (S2) direction.

PERFORMANCE

Actual Test Data (Cartridge Only)



HYDRAULIC SYMBOL



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 Temp. 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 Tools Kit	
(form tool, reamer, tap)	40500029
Seal Kit	21191108

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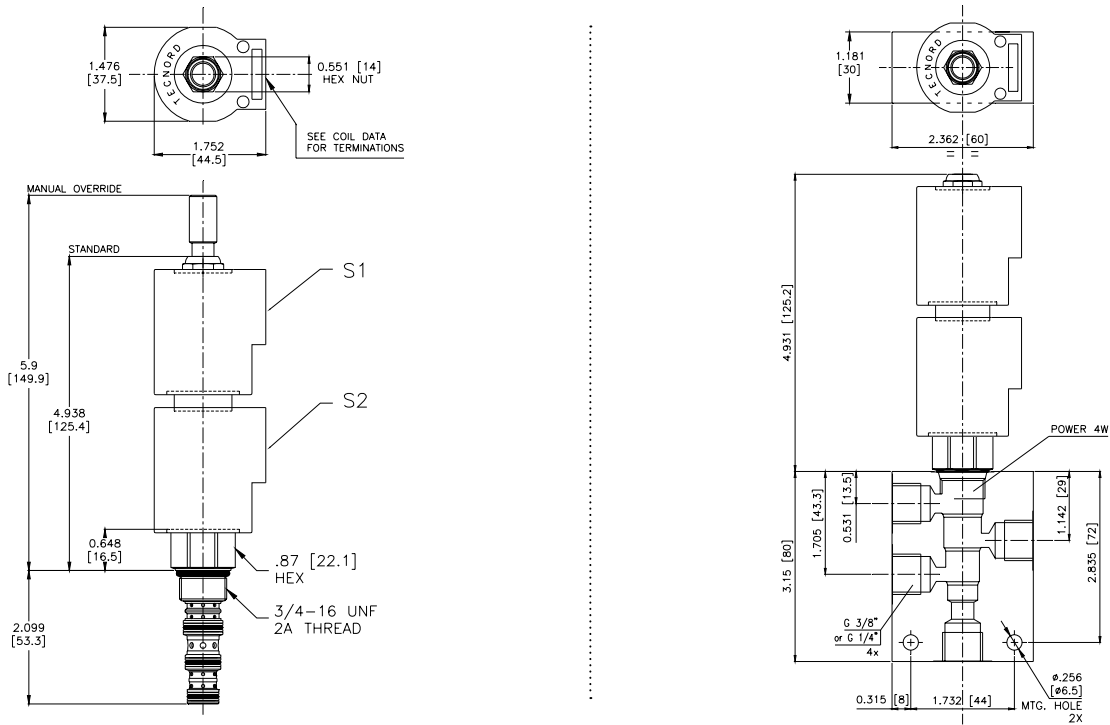


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DIMENSIONS



ORDERING INFORMATION

Approximate Coil Weight: .56 lbs (.25 kg)

PQ-S4M - - - -

OPTIONS

- Buna Standard **00**
- Viton Standard **V0**
- Buna, Push Only Override **0P**
- Viton, Push Only Override **VP**

BODIES

- Blank Without Body
- N** 1/4" BSP Ports
- N1** 3/8" BSP Ports
- S** #6 SAE Ports

VOLTAGE (other voltages available on request)

- 12** 12 VDC
- 24** 24 VDC
- 22** 220 VAC without internal rectifier

"V" COIL TERMINATION

(All DC Except as Noted)

- DL** Double Lead
(several types of termination can be attached on leads on request)

- HC** DIN 43650 (Hirschmann) - (AC&DC)
- DI** Deutsch - Integral DT04-2P

IMMERSION PROOF "D" TYPE

- DIA** "I" Coil AMP Superseal - Integral
- DID** "I" Coil Deutsch - Integral DT04-2P
- DIJ** "I" Coil AMP Jr. Timer - Integral
- DIM** "I" Coil Metri-Pack - Integral

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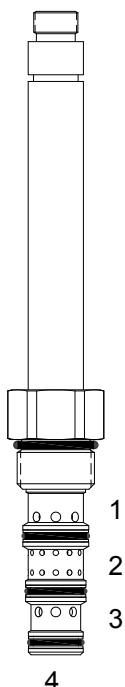


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DG-S4M DIRECT ACTING SPOOL, 4 WAY 3 POSITION, MOTOR CENTER



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: Bidirectional 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

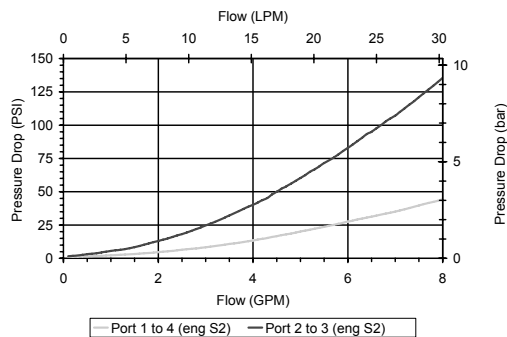
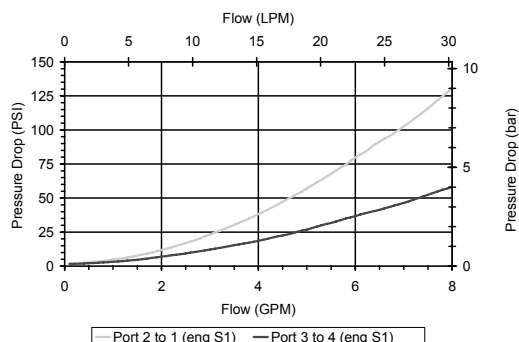
- Hardened parts for long life.
- Efficient wet-armature construction.
- Cartridges are voltage interchangeable.
- Manual override option.
- Industry common cavity.
- Unitized, molded coil design.
- Continuous duty rated solenoid.
- Optional coil voltages and terminations.
- Optional "I" Coil: Weatherproof,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



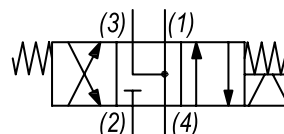
Uses "L" Coil. Flow rating is at 1000 PSID maximum differential loading.

PERFORMANCE

Actual Test Data (Cartridge Only)



HYDRAULIC SYMBOL



VALVE SPECIFICATIONS

Nominal Flow	6.5 GPM (25 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 Temp. 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 Tools Kit	
(form tool, reamer, tap)	40500002
Seal Kit	21191214

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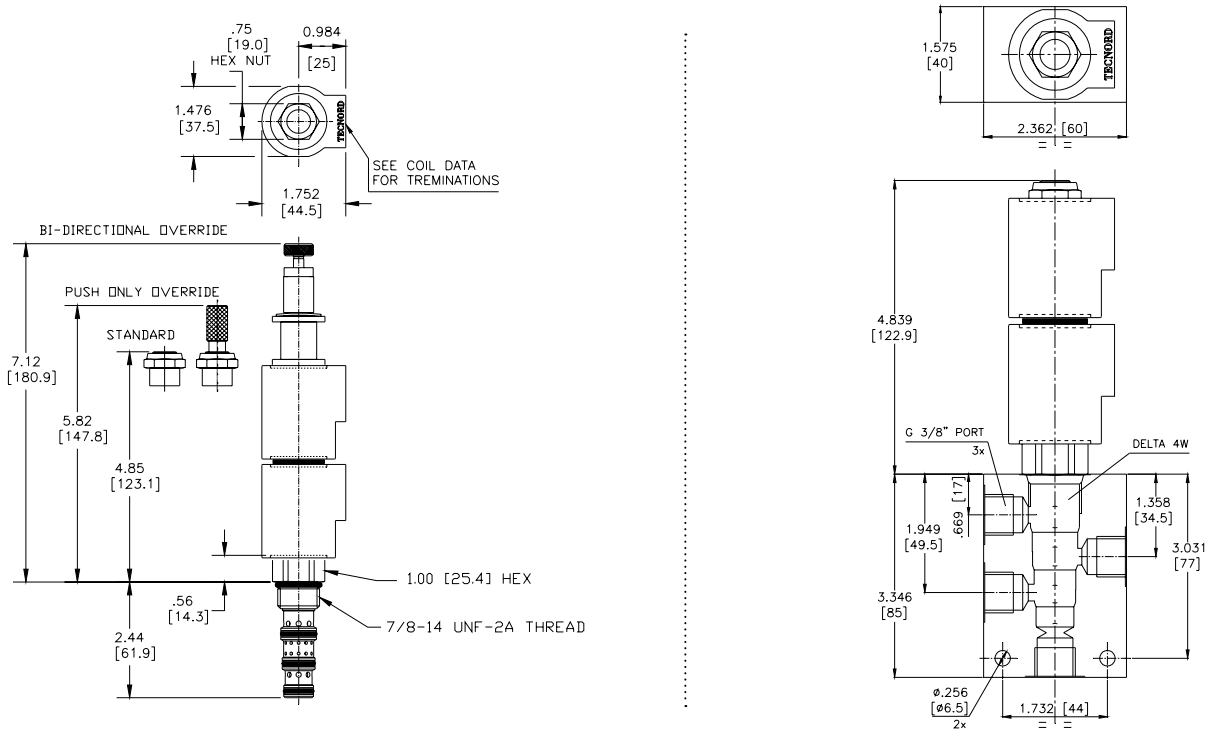


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DIMENSIONS



ORDERING INFORMATION

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

DG-S4M

- OPTIONS**
- Buna Standard **00**
 - Viton Standard **VO**
 - Buna, Override, Detent **0M**
 - Viton, Override, Detent **VM**
 - Buna, Push Only Override **0P**
 - Viton, Push Only Override **VP**

- BODIES**
- Blank Without Body
 - N** 3/8" BSP Ports
 - S** #6 SAE Ports

- VOLTAGE** (other voltages available on request)
- 12** 12 VDC
 - 24** 24 VDC
 - 22** 220 VAC without internal rectifier

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

DL Double Lead
(several types of termination can be attached on leads on request)

HC DIN 43650 (Hirschmann) - (AC&DC)
DI Deutsch - Integral DT04-2P

IMMERSION PROOF "L" TYPE

- LIA** "I" Coil AMP Superseal - Integral
- LID** "I" Coil Deutsch - Integral DT04-2P
- LIJ** "I" Coil AMP Jr. Timer - Integral
- LIM** "I" Coil Metri-Pack - Integral

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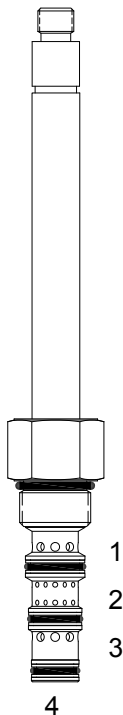


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PQ-S4N DIRECT ACTING SPOOL, 4 WAY 3 POSITION, TANDEM CENTER



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

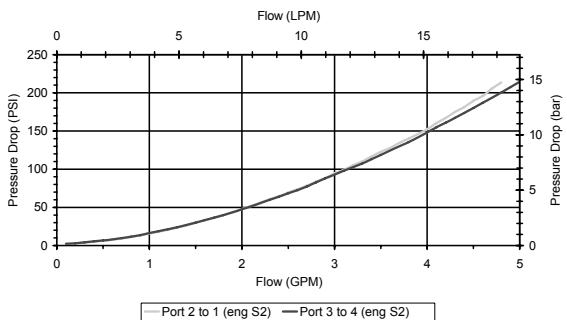
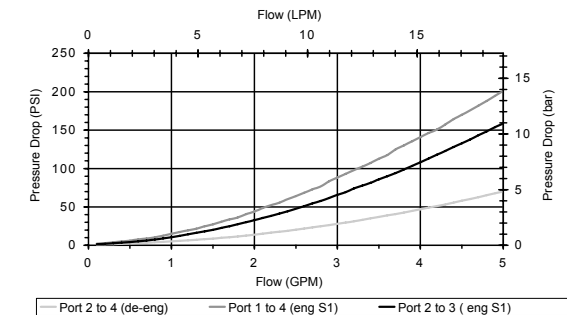
- Hardened parts for long life.
- Efficient wet-armature construction.
- Cartridges are voltage interchangeable.
- Industry common cavity.
- Optional manual "push only" override.
- Unitized, molded coil design.
- Continuous duty rated solenoid.
- Optional coil voltages and terminations.
- Optional "I"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



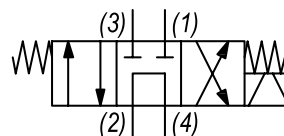
Uses "V" coils. "OP" override is a push only non-detented button that actuates (S2) direction.

PERFORMANCE

Actual Test Data (Cartridge Only)



HYDRAULIC SYMBOL



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 Temp. 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 Tools Kit	
(form tool, reamer, tap)	40500029
Seal Kit	21191108

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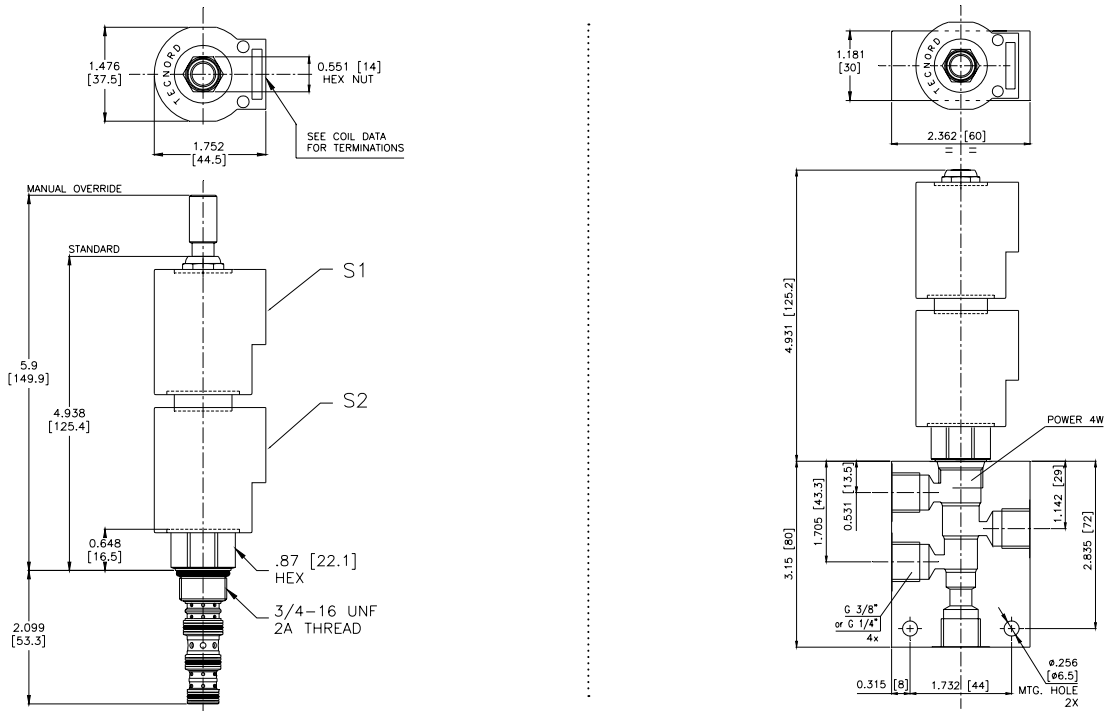


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DIMENSIONS



ORDERING INFORMATION

Approximate Coil Weight: .56 lbs (.25 kg)

PQ-S4N - - - -

OPTIONS

- Buna Standard **00**
- Viton Standard **V0**
- Buna, Push Only Override **0P**
- Viton, Push Only Override **VP**

BODIES

- Blank** Without Body
- N** 1/4" BSP Ports
- N1** 3/8" BSP Ports
- S** #6 SAE Ports

VOLTAGE (other voltages available on request)

- 12** 12 VDC
- 24** 24 VDC
- 22** 220 VAC without internal rectifier

"V" COIL TERMINATION

(All DC Except as Noted)

DL Double Lead
(several types of termination can be attached on leads on request)

HC DIN 43650 (Hirschmann) - (AC&DC)
DI Deutsch - Integral DT04-2P

DIA "I" Coil AMP Superseal - Integral
DID "I" Coil Deutsch - Integral DT04-2P
DIJ "I" Coil AMP Jr. Timer - Integral
DIM "I" Coil Metri-Pack - Integral

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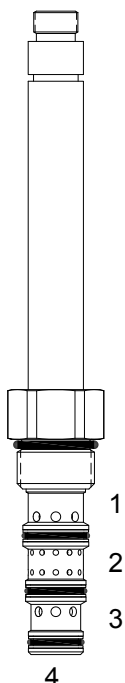


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DG-S4N DIRECT ACTING SPOOL, 4 WAY 3 POSITION, TANDEM CENTER



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: Bidirectional 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

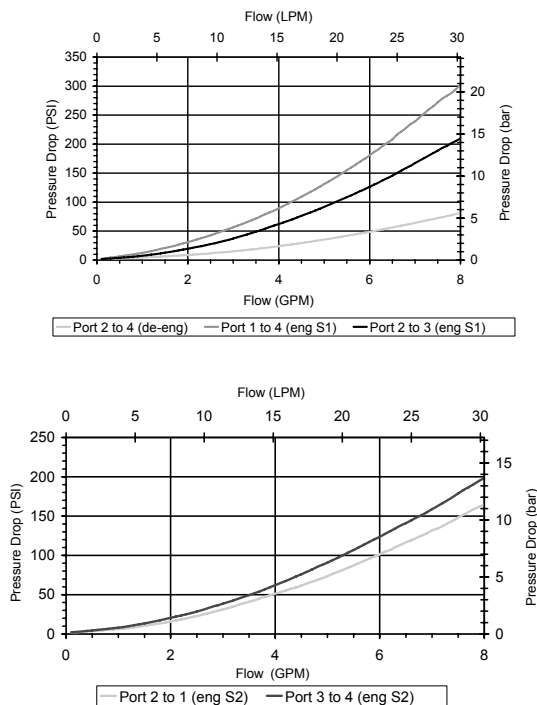
- Hardened parts for long life.
- Efficient wet-armature construction.
- Cartridges are voltage interchangeable.
- Manual override option.
- Industry common cavity.
- Unitized, molded coil design.
- Continuous duty rated solenoid.
- Optional coil voltages and terminations.
- Optional "I" Coil: Weatherproof,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



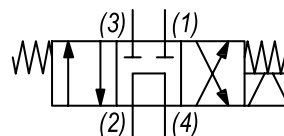
Uses "L" Coils.

PERFORMANCE

Actual Test Data (Cartridge Only)



HYDRAULIC SYMBOL



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 Temp. 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)
Coil Nut Torque Requirements	4-6 ft-lbs (5.4-8.1 Nm)
Cavity	DELTA 4W
Cavity Tools Kit (form tool, reamer, tap)	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.

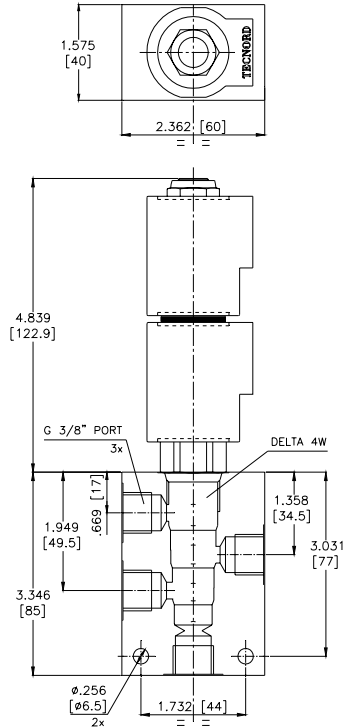
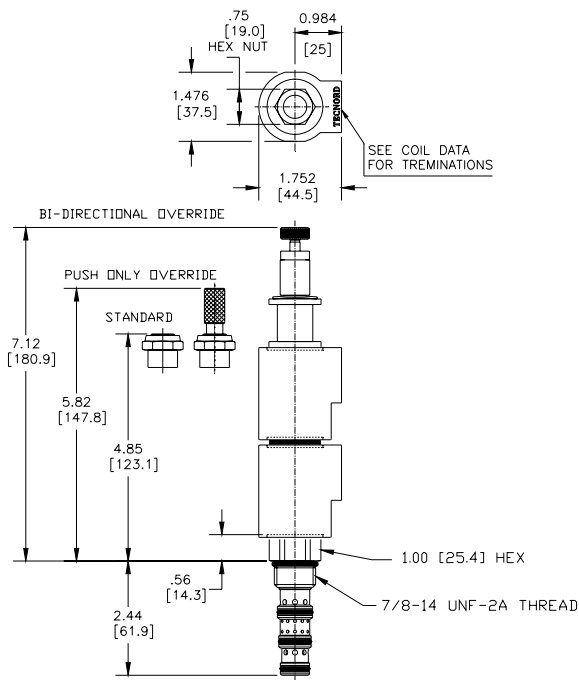


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DIMENSIONS



ORDERING INFORMATION

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

DG-S4N

- OPTIONS**
- Buna Standard **00**
 - Viton Standard **VO**
 - Buna, Override, Detent **0M**
 - Viton, Override, Detent **VM**
 - Buna, Push Only Override **0P**
 - Viton, Push Only Override **VP**

- BODIES**
- Blank Without Body
 - N** 3/8" BSP Ports
 - S** #6 SAE Ports

VOLTAGE (other voltages available on request)

- 12** 12 VDC
- 24** 24 VDC
- 22** 220 VAC without internal rectifier

"L" COIL TERMINATION

(All DC Except as Noted)

DL Double Lead
(several types of termination can be attached on leads on request)

HC DIN 43650 (Hirschmann) - (AC&DC)
DI Deutsch - Integral DT04-2P

IMMERSION PROOF "L" TYPE

- LIA** "I" Coil AMP Superseal - Integral
- LID** "I" Coil Deutsch - Integral DT04-2P
- LIJ** "I" Coil AMP Jr. Timer - Integral
- LIM** "I" Coil Metri-Pack - Integral

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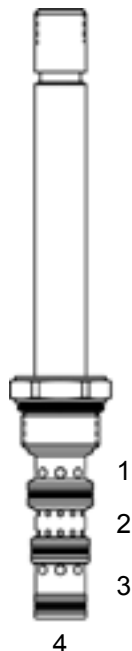


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VQ-S4R DIRECT ACTING SPOOL, 4 WAY 3 POSITION, TANDEM CENTER



DESCRIPTION

Low Profile 8 size, 3/4-16 thread, "Power" series, solenoid operated, 4W3P, tandem center spool valve.

OPERATION

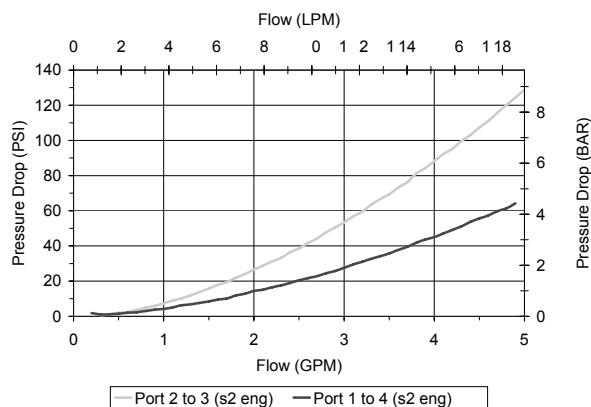
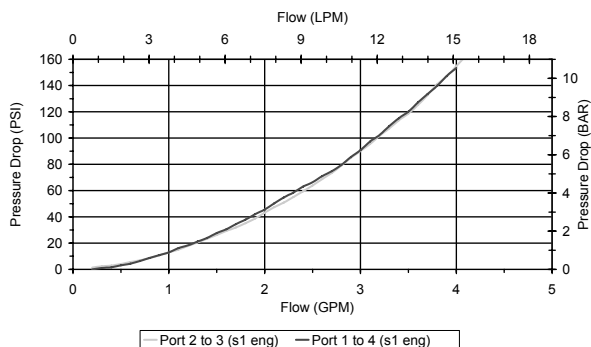
When de-energized the VQ-S4R allows flow between (2) and (4), ports (1) and (3) are blocked. When outer coil (S1) is energized the valve allows flow from (2) to (3) and from (1) to (4). When inner coil (S2) is energized the valve allows flow from (2) to (1) and from (3) to (4).

FEATURES

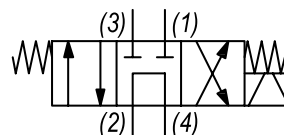
- Hardened parts for long life.
- Efficient wet-armature construction.
- Cartridges are voltage interchangeable.
- Industry common cavity.
- Unitized, molded coil design.
- Continuous duty rated solenoid.
- Optional coil voltages and terminations.
- Optional "I" Coil: Weatherproof, Thermal Shock, Immersion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

PERFORMANCE

Actual Test Data (Cartridge Only)



HYDRAULIC SYMBOL



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 Temp. 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

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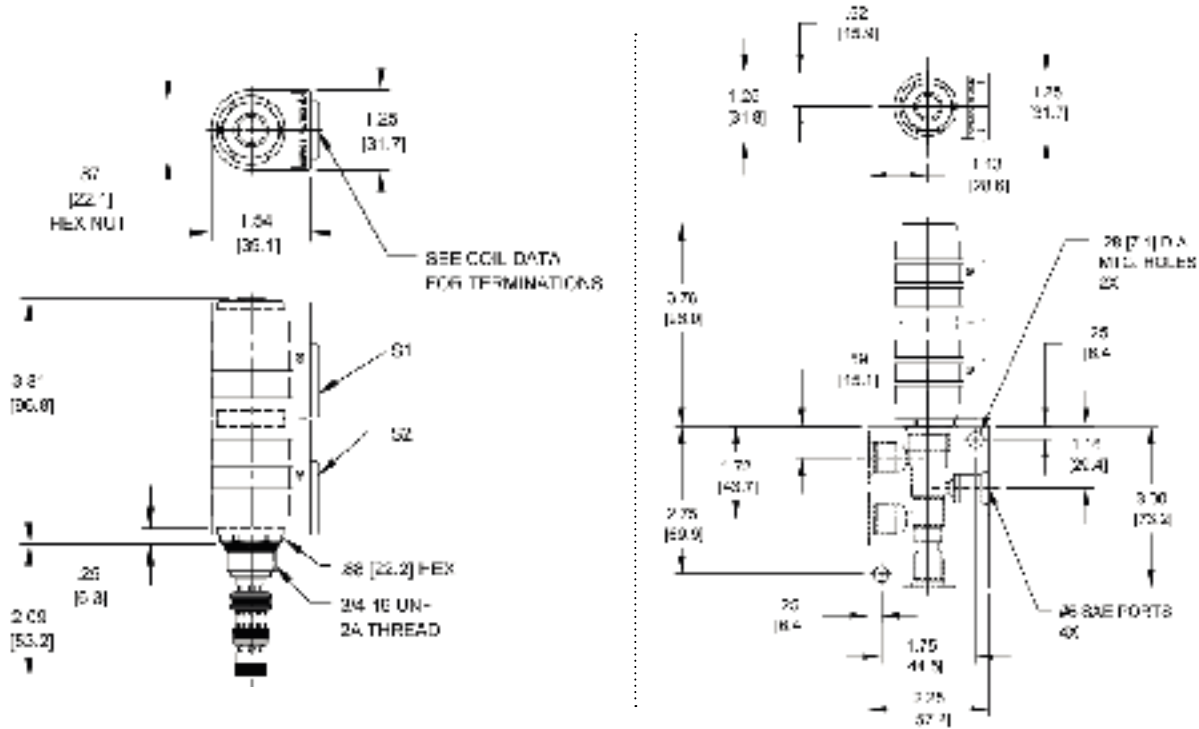


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DIMENSIONS



ORDERING INFORMATION

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

VQ-S4R

- OPTIONS**
 Buna Standard **00**
 Viton Standard **V0**

- 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

“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

- 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

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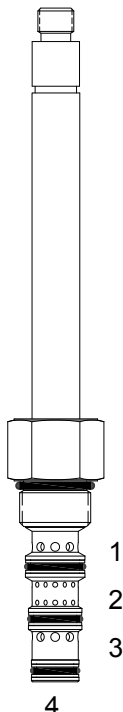


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PQ-S4R DIRECT ACTING SPOOL, 4 WAY 3 POSITION, TANDEM CENTER



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

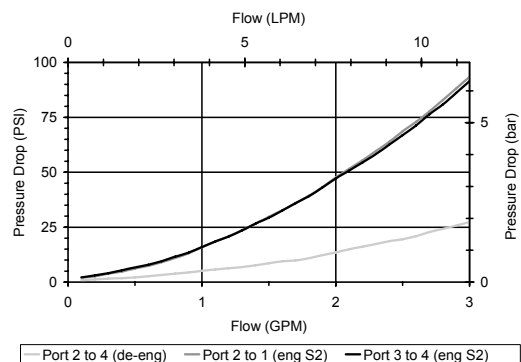
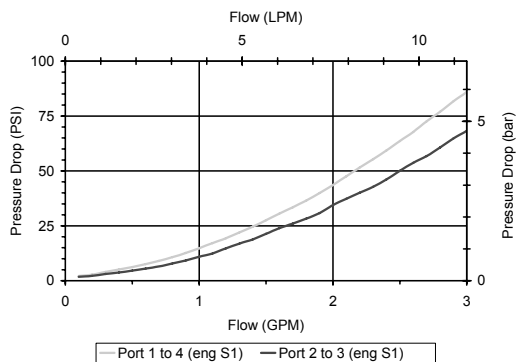
- Hardened parts for long life.
- Efficient wet-armature construction.
- Cartridges are voltage interchangeable.
- Industry common cavity.
- Optional manual "push only" override.
- Unitized, molded coil design.
- Continuous duty rated solenoid.
- Optional coil voltages and terminations.



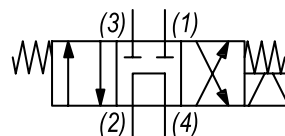
Uses "P" Power coil. For higher flow see PQ-S4N. "OP" override is a push only non-detented button that actuates (S2) direction. For "T" coil environmental protection option, consult factory for special build configuration per Delta Standard 40295013.

PERFORMANCE

Actual Test Data (Cartridge Only)



HYDRAULIC SYMBOL



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 Temp. 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 Tools Kit	
(form tool, reamer, tap)	40500029
Seal Kit	21191108

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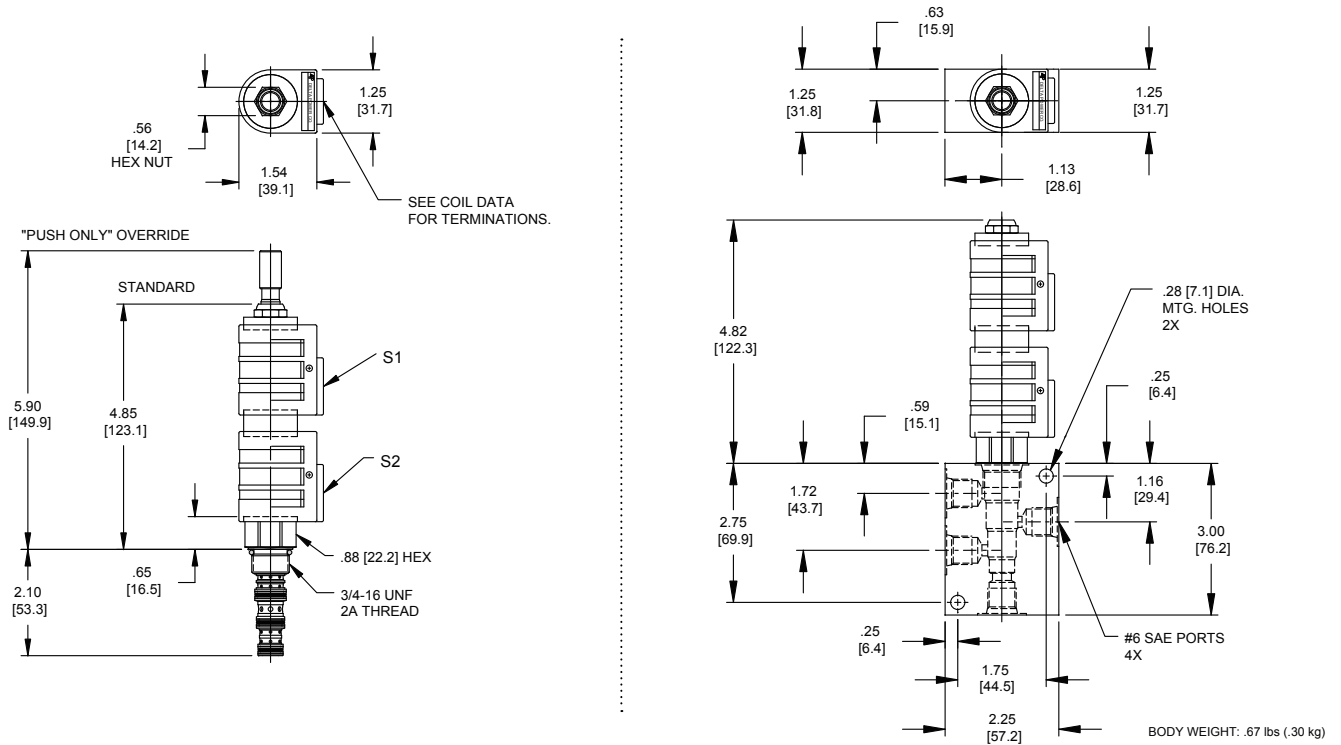
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SOLENOID OPERATED DIRECTIONAL CONTROLS

DIMENSIONS



ORDERING INFORMATION

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

PQ-S4R - - - -

OPTIONS

- Buna Standard **00**
- Viton Standard **V0**
- Buna, Push Only Override **0P**
- Viton, Push Only Override **VP**

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** 25 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 (Hirschmann) - (AC&DC)
- CL** Conduit Lead - (AC Only)
- DI** Deutsch - Integral DT04-2P

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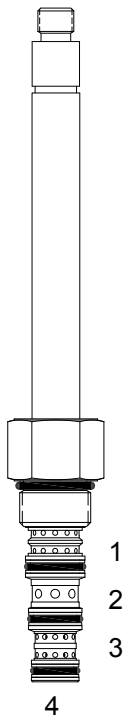


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PQ-S4O DIRECT ACTING SPOOL, 4 WAY 3 POSITION, OPEN CENTER



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

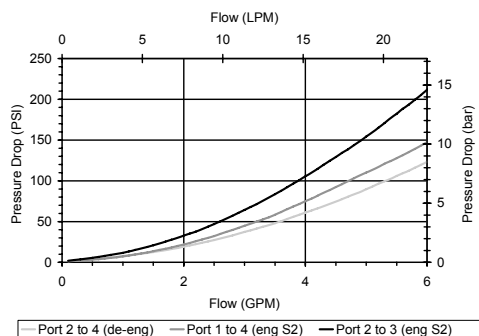
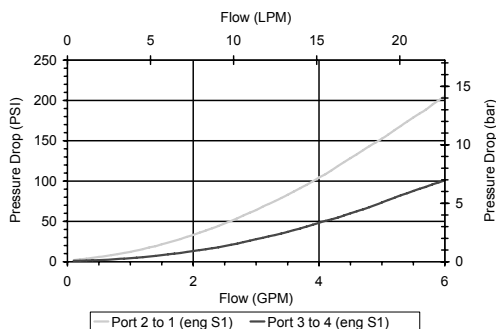
- Hardened parts for long life.
- Efficient wet-armature construction.
- Cartridges are voltage interchangeable.
- Industry common cavity.
- Optional manual "push only" override.
- Unitized, molded coil design.
- Continuous duty rated solenoid.
- Optional coil voltages and terminations.
- Optional "I"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



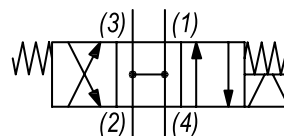
Uses "P" Power coil. For higher flow see PQ-S4T. "OP" override is a push only non-detented button that actuates (S2) direction. For "I" coil environmental protection options, consult factory for special build configuration per Delta Standard 40295013.

PERFORMANCE

Actual Test Data (Cartridge Only)



HYDRAULIC SYMBOL



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 Temp. 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 Tools Kit	
(form tool, reamer, tap)	40500029
Seal Kit	21191108

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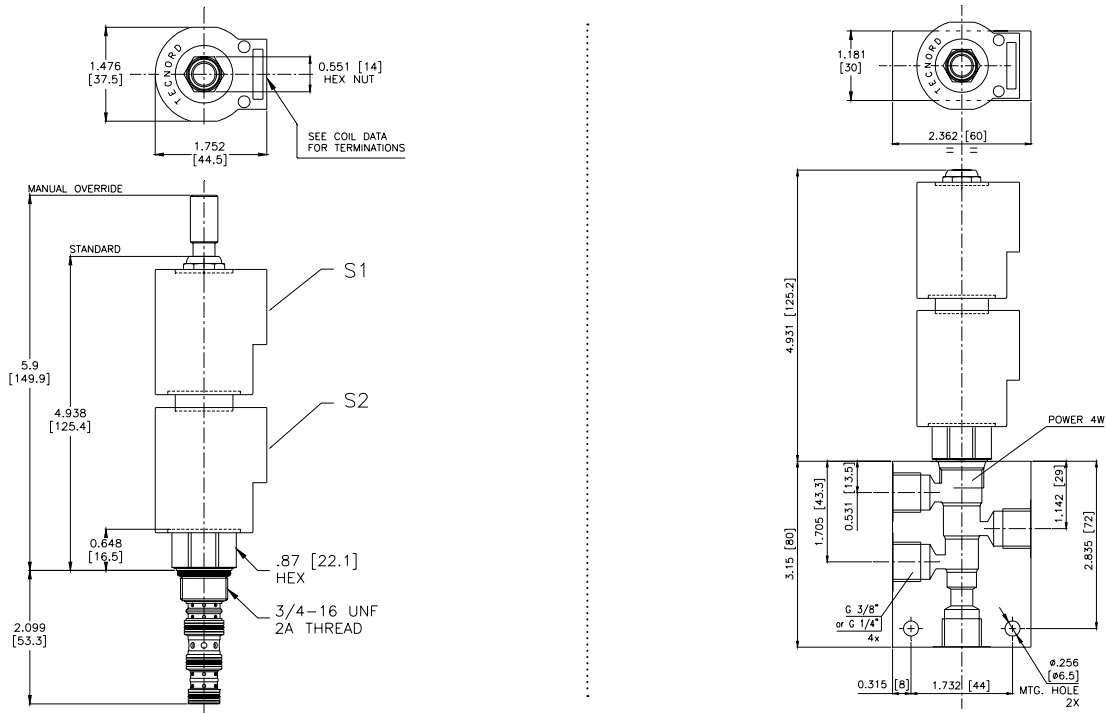


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DIMENSIONS



ORDERING INFORMATION

Approximate Coil Weight: .56 lbs (.25 kg)

PQ-S40

- OPTIONS**
- Buna Standard **00**
 - Viton Standard **V0**
 - Buna, Push Only Override **0P**
 - Viton, Push Only Override **VP**

- BODIES**
- Blank Without Body
 - N** 1/4" BSP Ports
 - N1** 3/8" BSP Ports
 - S** #6 SAE Ports

VOLTAGE (other voltages available on request)

- 12** 12 VDC
- 24** 24 VDC
- 22** 220 VAC without internal rectifier

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

DL Double Lead
(several types of termination can be attached on leads on request)

HC DIN 43650 (Hirschmann) - (AC&DC)
DI Deutsch - Integral DT04-2P

IMMERSION PROOF "D" TYPE

- DI** "I" Coil AMP Superseal - Integral
- DID** "I" Coil Deutsch - Integral DT04-2P
- DIJ** "I" Coil AMP Jr. Timer - Integral
- DIM** "I" Coil Metri-Pack - Integral

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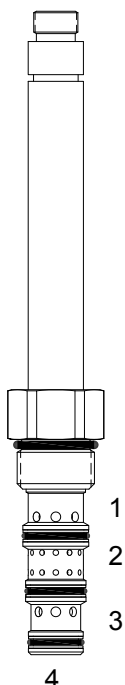


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DG-S4O DIRECT ACTING SPOOL, 4 WAY 3 POSITION, OPEN CENTER



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: Bidirectional 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

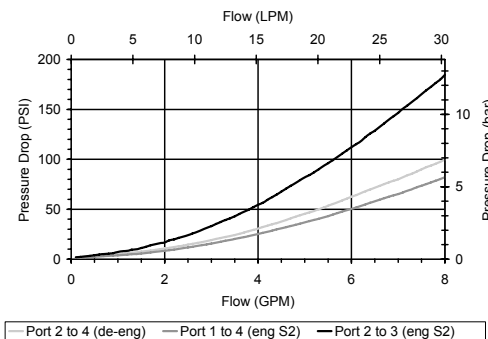
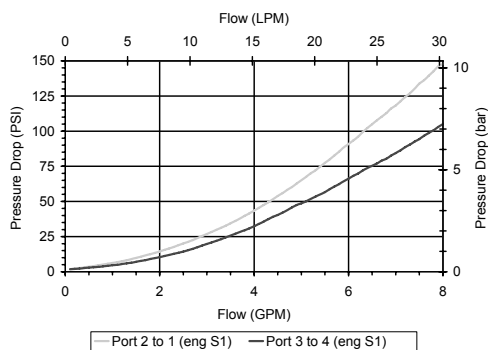
- Hardened parts for long life.
- Efficient wet-armature construction.
- Cartridges are voltage interchangeable.
- Manual override option.
- Industry common cavity.
- Unitized, molded coil design.
- Continuous duty rated solenoid.
- Optional coil voltages and terminations.
- Optional "I" Coil: Weatherproof,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



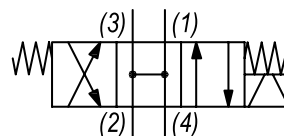
Uses "L" Coils.

PERFORMANCE

Actual Test Data (Cartridge Only)



HYDRAULIC SYMBOL



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 Temp. 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 (5.4-8.1 Nm)
Cavity	DELTA 4W
Cavity Tools Kit	
(form tool, reamer, tap)	40500002
Seal Kit	21191214

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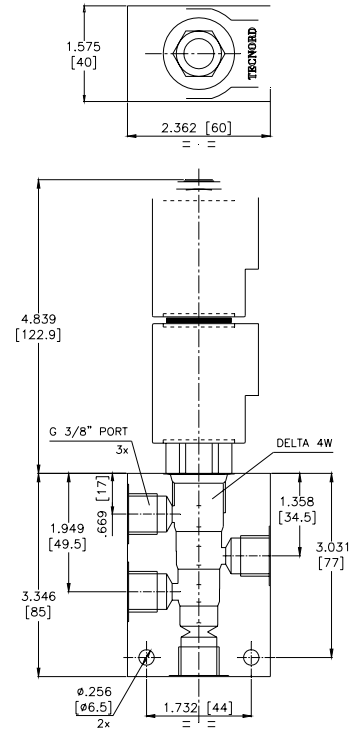
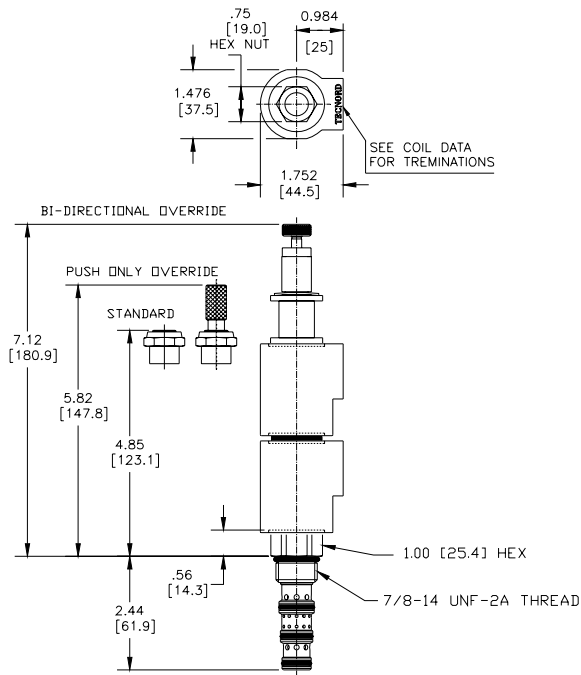


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DIMENSIONS



ORDERING INFORMATION

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

DG-S40

- OPTIONS**
- Buna Standard **00**
 - Viton Standard **VO**
 - Buna, Override, Detent **0M**
 - Viton, Override, Detent **VM**
 - Buna, Push Only Override **0P**
 - Viton, Push Only Override **VP**

- BODIES**
- Blank Without Body
 - N** 3/8" BSP Ports
 - S** #6 SAE Ports

VOLTAGE (other voltages available on request)

- 12** 12 VDC
- 24** 24 VDC
- 22** 220 VAC without internal rectifier

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

DL Double Lead
(several types of termination can be attached on leads on request)

HC DIN 43650 (Hirschmann) - (AC&DC)
DI Deutsch - Integral DT04-2P

IMMERSION PROOF "L" TYPE

- LIA** "I" Coil AMP Superseal - Integral
- LID** "I" Coil Deutsch - Integral DT04-2P
- LIJ** "I" Coil AMP Jr. Timer - Integral
- LIM** "I" Coil Metri-Pack - Integral

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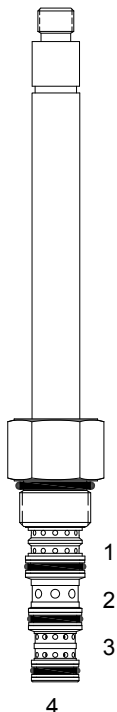


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PQ-S4T DIRECT ACTING SPOOL, 4 WAY 3 POSITION, OPEN CENTER



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

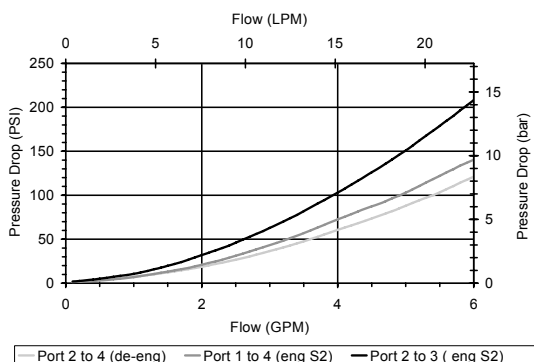
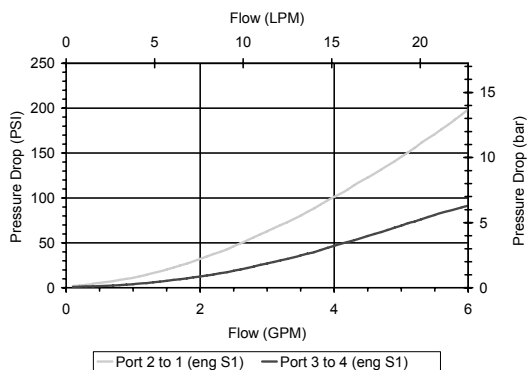
- Hardened parts for long life.
- Efficient wet-armature construction.
- Cartridges are voltage interchangeable.
- Industry common cavity.
- Optional manual "push only" override.
- Unitized, molded coil design.
- Continuous duty rated solenoid.
- Optional coil voltages and terminations.



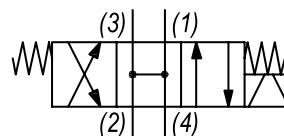
Uses "D" Delta coil "OP" override is a push only non-detented button that actuates (S2) direction.

PERFORMANCE

Actual Test Data (Cartridge Only)



HYDRAULIC SYMBOL



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 Temp. 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 Tools Kit	
(form tool, reamer, tap)	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.

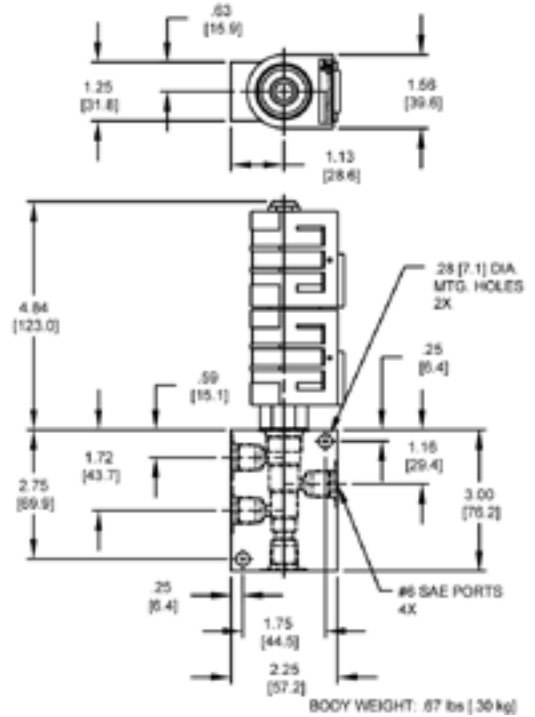
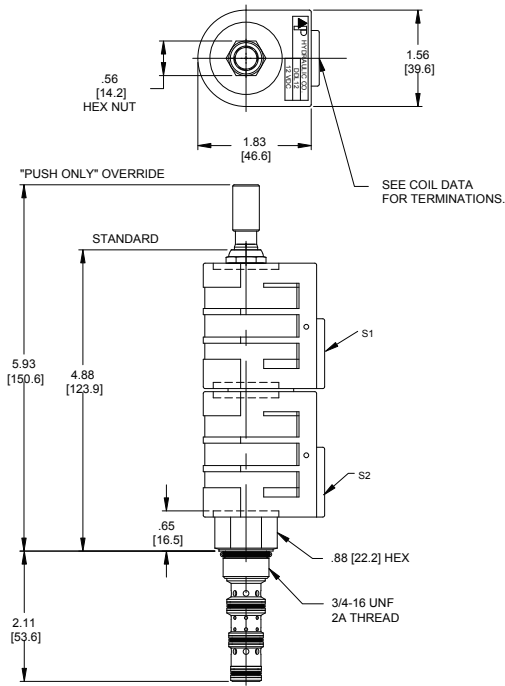


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DIMENSIONS



ORDERING INFORMATION

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

PQ-S4T

- OPTIONS**
- Buna Standard **00**
 - Viton Standard **V0**
 - Buna, Push Only Override **0P**
 - Viton, Push Only Override **VP**

- 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** 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 (Hirschmann) - (AC&DC)
- CL** Conduit Lead - (AC Only)
- DI** Deutsch - Integral DT04-2P

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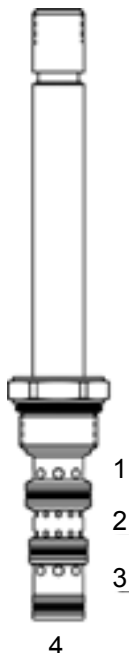


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VQ-S4Q DIRECT ACTING SPOOL, 4 WAY 3 POSITION, CLOSED CENTER



DESCRIPTION

Low Profile 8 size, 3/4-16 thread, "Power" series, solenoid operated, 4W3P, closed center spool valve.

OPERATION

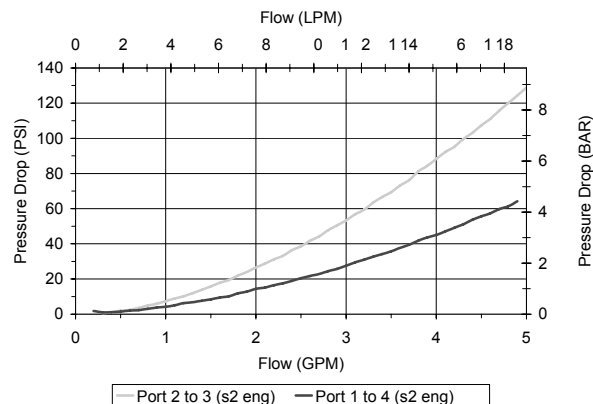
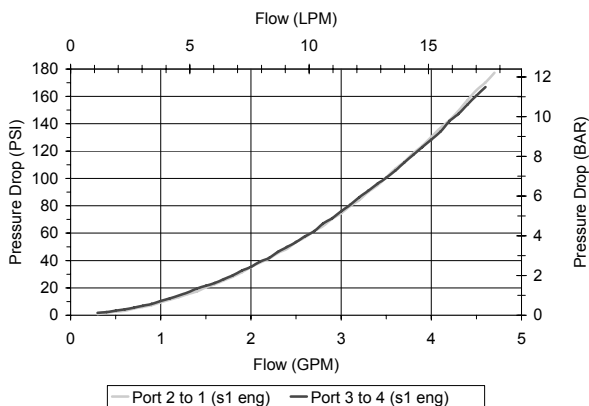
When de-energized the VQ-S4Q blocks flow to all ports. When outer coil (S1) is energized the valve allows flow from (2) to (1) and from (3) to (4). When inner coil (S2) is energized the valve allows flow from (2) to (3) and from (1) to (4).

FEATURES

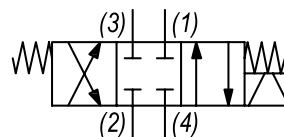
- Hardened parts for long life.
- Efficient wet-armature construction.
- Cartridges are voltage interchangeable.
- Industry common cavity.
- Unitized, molded coil design.
- Continuous duty rated solenoid.
- Optional coil voltages and terminations.
- Optional "I" Coil: Weatherproof, Thermal Shock, Immersion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

PERFORMANCE

Actual Test Data (Cartridge Only)



HYDRAULIC SYMBOL



VALVE SPECIFICATIONS

Nominal Flow	3.5 GPM (13.2 LPM)
Rated Operating Pressure	3000 PSI (207 bar)
Typical Internal Leakage (150 SSU)	10 cu in/min (63 ml/min) per path
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temp. 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

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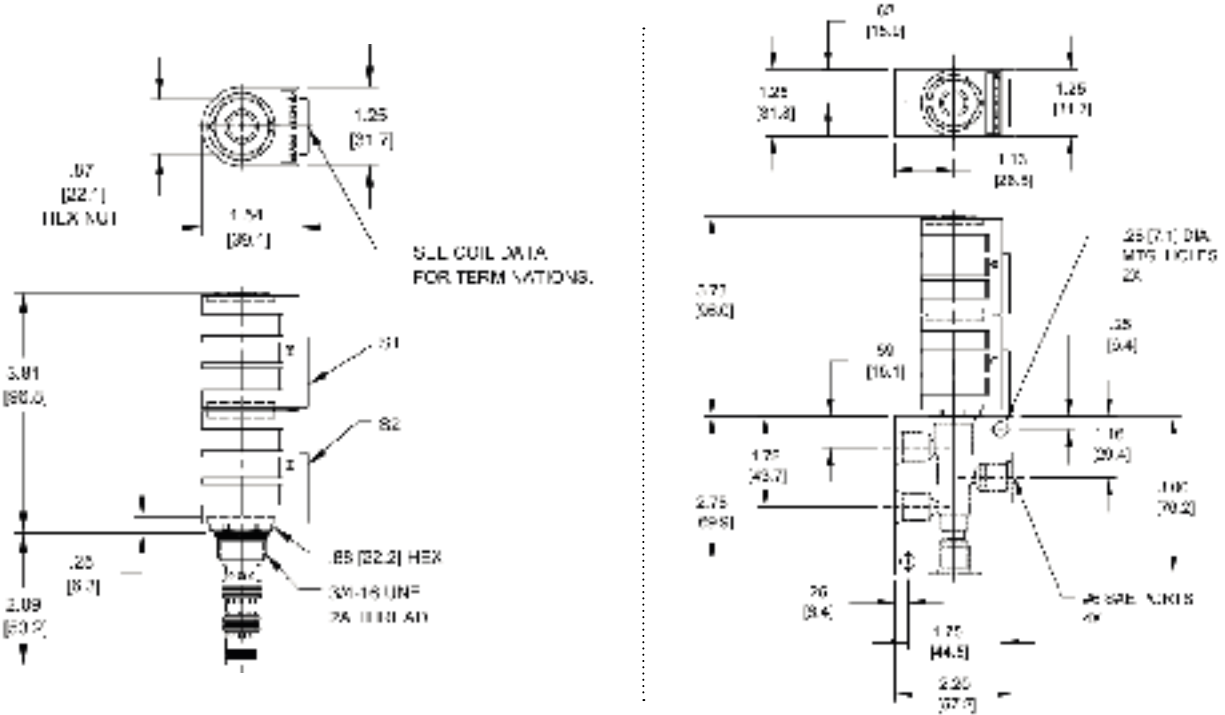


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DIMENSIONS



ORDERING INFORMATION

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

VQ-S4Q

- OPTIONS**
 Buna Standard **00**
 Viton Standard **V0**

- 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

"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

- 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

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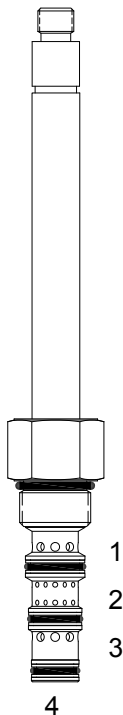


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PQ-S4P DIRECT ACTING SPOOL, 4 WAY 3 POSITION, CLOSED CENTER



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

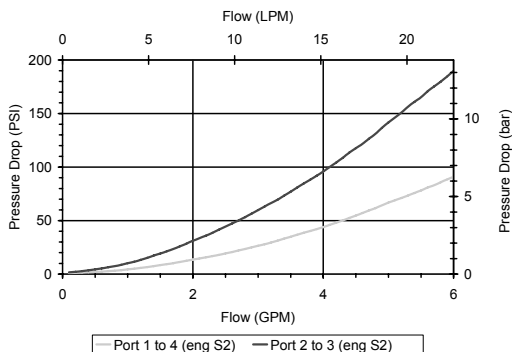
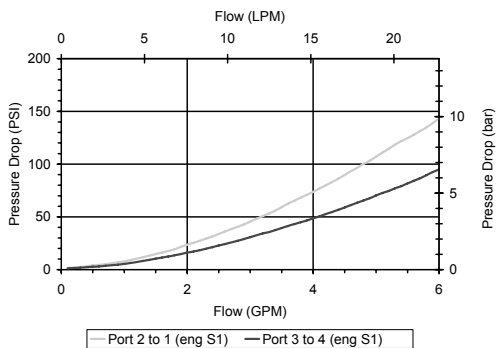
- Hardened parts for long life.
- Efficient wet-armature construction.
- Cartridges are voltage interchangeable.
- Industry common cavity.
- Optional manual "push only" override.
- Unitized, molded coil design.
- Continuous duty rated solenoid.
- Optional coil voltages and terminations.
- Optional "I"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



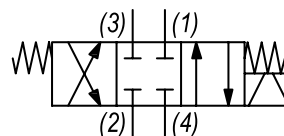
Uses "V" coils. "OP" override is a push only non-detented button that actuates (S2) direction.

PERFORMANCE

Actual Test Data (Cartridge Only)



HYDRAULIC SYMBOL



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 Temp. 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 Tools Kit	
(form tool, reamer, tap)	40500029
Seal Kit	21191108

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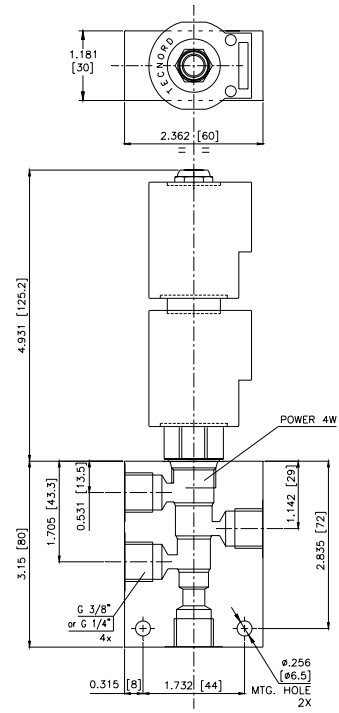
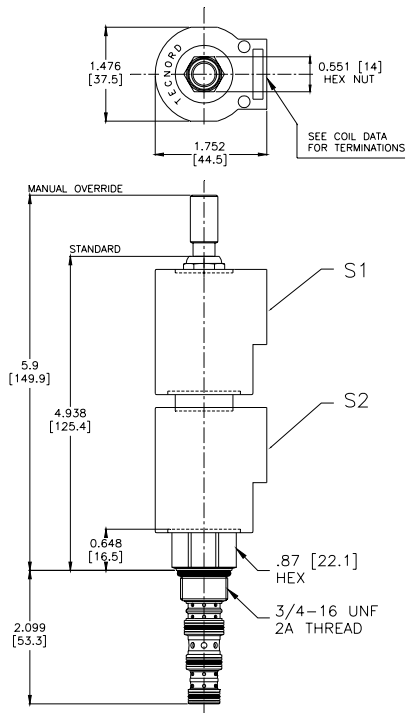


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DIMENSIONS



ORDERING INFORMATION

Approximate Coil Weight: .56 lbs (.25 kg)

PQ-S4P

- OPTIONS**
- Buna Standard **00**
 - Viton Standard **V0**
 - Buna, Push Only Override **0P**
 - Viton, Push Only Override **VP**

- BODIES**
- Blank** Without Body
 - N** 1/4" BSP Ports
 - N1** 3/8" BSP Ports
 - S** #6 SAE Ports

- VOLTAGE** (other voltages available on request)
- 12** 12 VDC
 - 24** 24 VDC
 - 22** 220 VAC without internal rectifier

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

DL Double Lead
(several types of termination can be attached on leads on request)

HC DIN 43650 (Hirschmann) - (AC&DC)
DI Deutsch - Integral DT04-2P

IMMERSION PROOF "D" TYPE

- DIA** "I" Coil AMP Superseal - Integral
- DID** "I" Coil Deutsch - Integral DT04-2P
- DIJ** "I" Coil AMP Jr. Timer - Integral
- DIM** "I" Coil Metri-Pack - Integral

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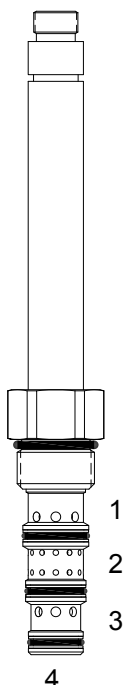


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DG-S4P DIRECT ACTING SPOOL, 4 WAY 3 POSITION, CLOSED CENTER



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: Bidirectional 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

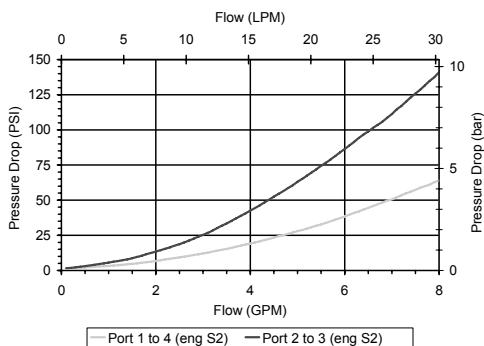
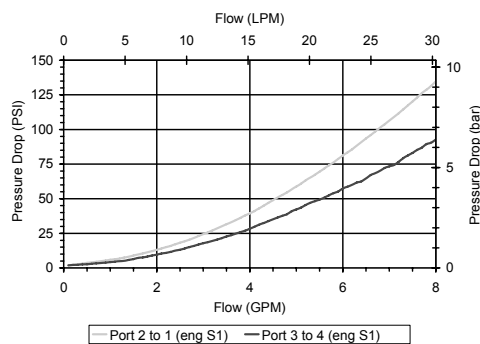
- Hardened parts for long life.
- Efficient wet-armature construction.
- Cartridges are voltage interchangeable.
- Manual override option.
- Industry common cavity.
- Unitized, molded coil design.
- Continuous duty rated solenoid.
- Optional coil voltages and terminations.
- Optional "I" Coil: Weatherproof,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



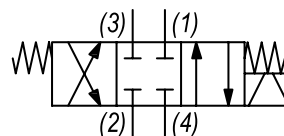
Uses "L" Coil. Flow rating is at 1000 PSID maximum differential loading.

PERFORMANCE

Actual Test Data (Cartridge Only)



HYDRAULIC SYMBOL



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 Temp. 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)
Coil Nut Torque Requirements	4-6 ft-lbs (5.4-8.1 Nm)
Cavity	DELTA 4W
Cavity Tools Kit	
(form tool, reamer, tap)	40500002
Seal Kit	21191214

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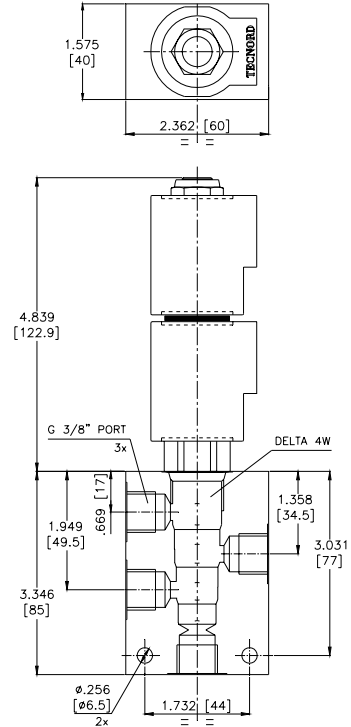
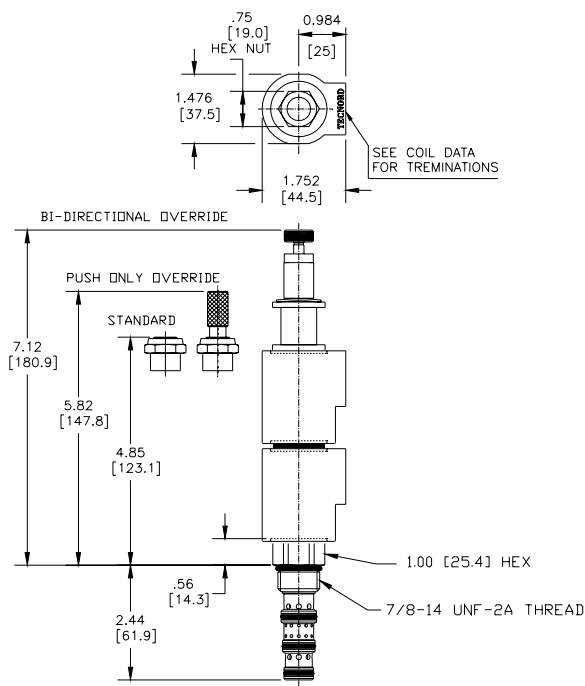


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DIMENSIONS



ORDERING INFORMATION

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

DG-S4P

- OPTIONS**
- Buna Standard **00**
 - Viton Standard **VO**
 - Buna, Override, Detent **0M**
 - Viton, Override, Detent **VM**
 - Buna, Push Only Override **0P**
 - Viton, Push Only Override **VP**

- BODIES**
- Blank Without Body
 - N** 3/8" BSP Ports
 - S** #6 SAE Ports

- VOLTAGE** (other voltages available on request)
- 12** 12 VDC
 - 24** 24 VDC
 - 22** 220 VAC without internal rectifier

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

DL Double Lead
(several types of termination can be attached on leads on request)

HC DIN 43650 (Hirschmann) - (AC&DC)
DI Deutsch - Integral DT04-2P

IMMERSION PROOF "L" TYPE

- LIA** "I" Coil AMP Superseal - Integral
- LID** "I" Coil Deutsch - Integral DT04-2P
- LIJ** "I" Coil AMP Jr. Timer - Integral
- LIM** "I" Coil Metri-Pack - Integral

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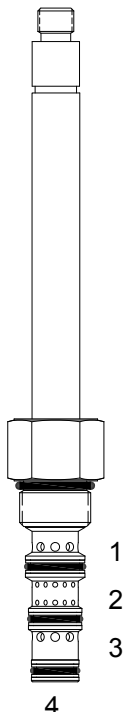


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PQ-S4Q DIRECT ACTING SPOOL, 4 WAY 3 POSITION, CLOSED CENTER



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

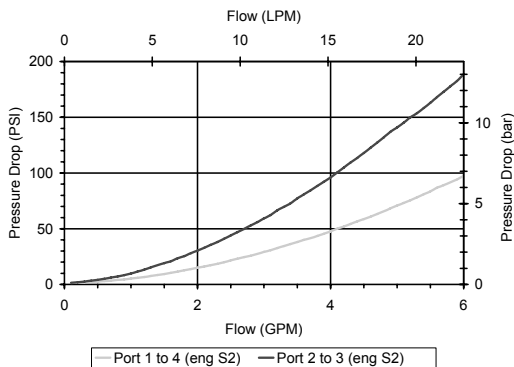
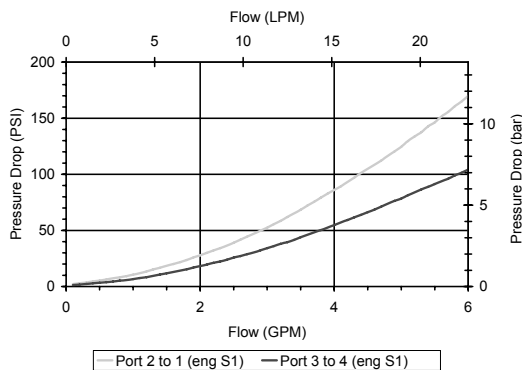
- Hardened parts for long life.
- Efficient wet-armature construction.
- Cartridges are voltage interchangeable.
- Industry common cavity.
- Optional manual "push only" override.
- Unitized, molded coil design.
- Continuous duty rated solenoid.
- Optional coil voltages and terminations.



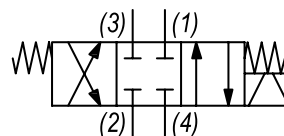
Uses "P" Power coil. For higher flow see PQ-S4P. Flow rating based on maximum differential load of 1000 PSI. "OP" override is a push only non-detented button that actuates (S2) direction. For "T" coil environmental protection option, consult factory for special build configuration per Delta Standard 40295013.

PERFORMANCE

Actual Test Data (Cartridge Only)



HYDRAULIC SYMBOL



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 Temp. 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 Tools Kit	
(form tool, reamer, tap)	40500029
Seal Kit	21191108

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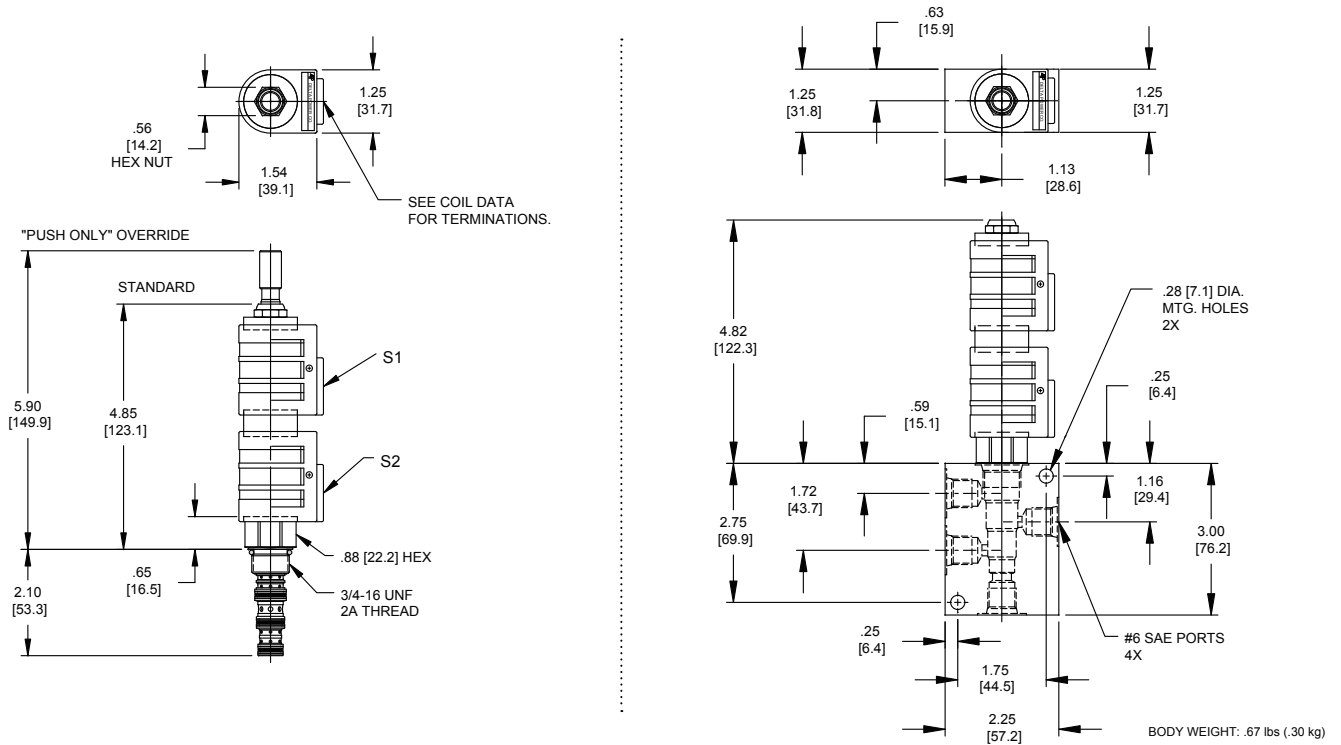
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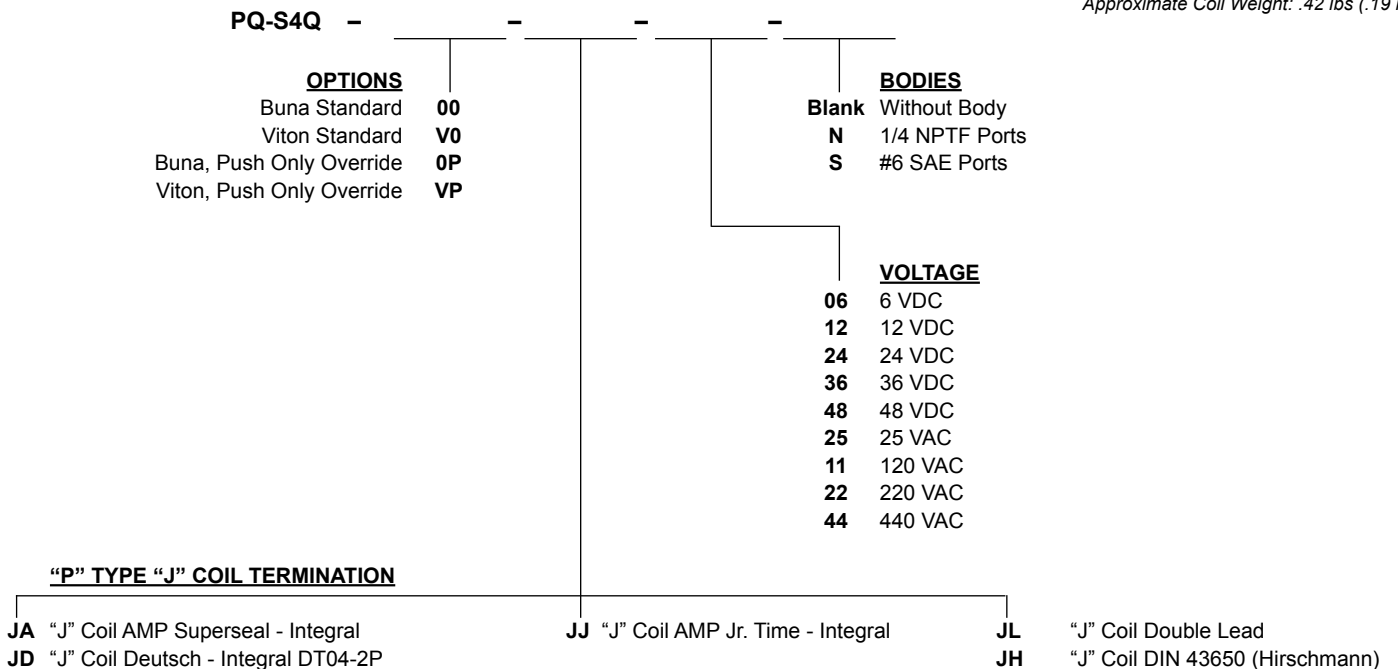
SOLENOID OPERATED DIRECTIONAL CONTROLS

DIMENSIONS



ORDERING INFORMATION

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



W9 / 2020

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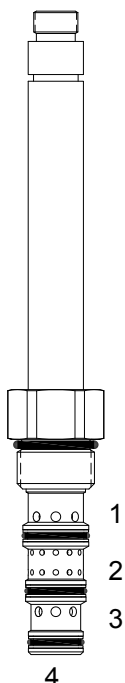


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DG-S4S SPOOL OPERATED, 4 WAY 3 POSITION, SCOTCH CENTER



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: Push Only Override - Spring biased in neutral center position, when pushed the valve shifts in the (S2) direction.

FEATURES

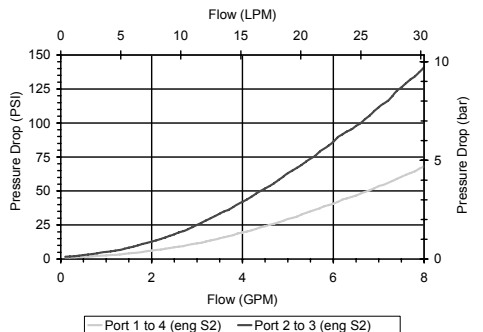
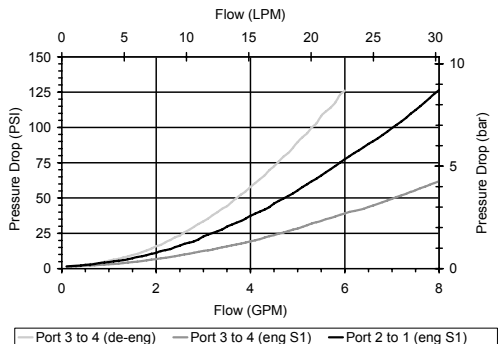
- Hardened parts for long life.
- Efficient wet-armature construction.
- Cartridges are voltage interchangeable.
- Manual override option.
- Industry common cavity.
- Unitized, molded coil design.
- Continuous duty rated solenoid.
- Optional coil voltages and terminations.
- Optional "I" Coil: Weatherproof,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



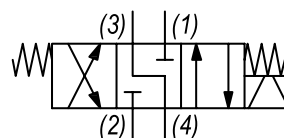
Uses "L" Coil. Flow rating is at 1000 PSID maximum differential loading.

PERFORMANCE

Actual Test Data (Cartridge Only)



HYDRAULIC SYMBOL



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 Temp. 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)
Coil Nut Torque Requirements	4-6 ft-lbs (5.4-8.1 Nm)
Cavity	DELTA 4W
Cavity Tools Kit	
(form tool, reamer, tap)	40500002
Seal Kit	21191214

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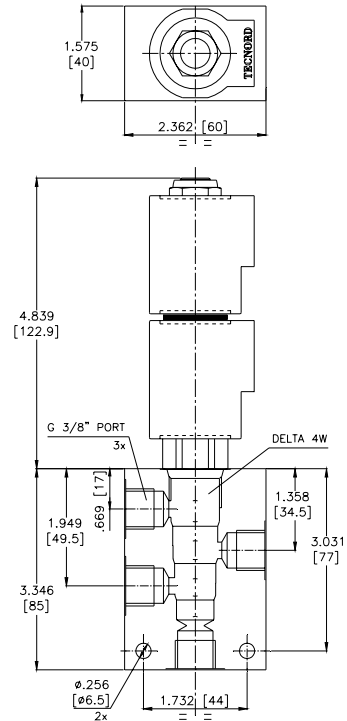
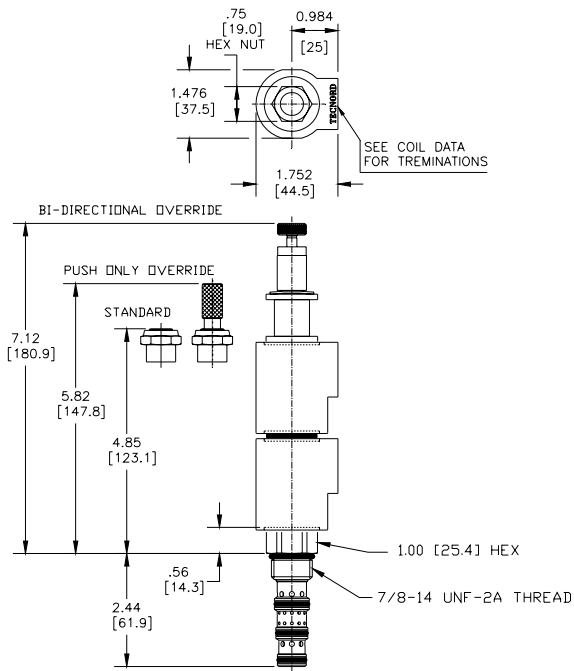


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DIMENSIONS



ORDERING INFORMATION

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

DG-S4S

- OPTIONS**
- Buna Standard **00**
 - Viton Standard **V0**
 - Buna, Push Only Override **0P**
 - Viton, Push Only Override **VP**

- BODIES**
- Blank** Without Body
 - N** 3/8" BSP Ports
 - S** #6 SAE Ports

VOLTAGE (other voltages available on request)

- 12** 12 VDC
- 24** 24 VDC
- 22** 220 VAC without internal rectifier

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

DL Double Lead
(several types of termination can be attached on leads on request)

HC DIN 43650 (Hirschmann) - (AC&DC)
DI Deutsch - Integral DT04-2P

IMMERSION PROOF "L" TYPE

- LIA** "I" Coil AMP Superseal - Integral
- LID** "I" Coil Deutsch - Integral DT04-2P
- LIJ** "I" Coil AMP Jr. Timer - Integral
- LIM** "I" Coil Metri-Pack - Integral

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SOLENOID OPERATED DIRECTIONAL CONTROLS

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SOLENOID OPERATED DIRECTIONAL CONTROLS

TRANSMISSION & BRAKE SPOOL VALVES

SCREW-IN STYLE	GPM	PSI	LPM	BAR	CAVITY	MODEL	PAGE
	3	1000	11	70	5/8-18	TC-S3A	ST198
	3	1500	11	103	5/8-18	UC-S3T	ST206
	6	1000	23	70	7/8-14	TF-S3A	ST208
	6	1000	23	70	7/8-14	TF-S3D	ST202
	5	1000	19	70	7/8-14	TG-S4A	ST212

SLIP-IN STYLE, FLANGED RETAINED	GPM	PSI	LPM	BAR	CAVITY	MODEL	PAGE
	6	1000	23	70	Special	IF-S3A-57	ST200
	6	1000	23	70	Special	IF-S3D-57	ST204
	1.5	700	6	50	Special	IC-S3D-43	ST210
	5	1000	19	70	Special	IG-S4A-58	ST214

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TECNORD

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TC-S3A DIRECT ACTING SPOOL, 3 WAY 2 POSITION, TRANSMISSION & BRAKE

DESCRIPTION

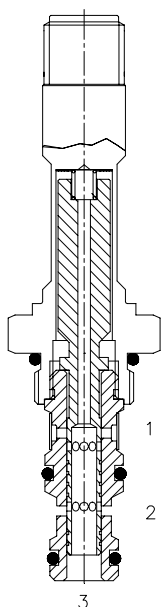
7 size, 5/8-18 thread, "Mini" series, solenoid operated, 3 way 2 position, transmission & brake spool valve.

OPERATION

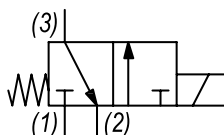
When de-energized the TC-S3A blocks flow at (1) and allows flow from (3) to (2). When energized the valve allows flow from (1) to (3) and blocks flow at (2).

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.



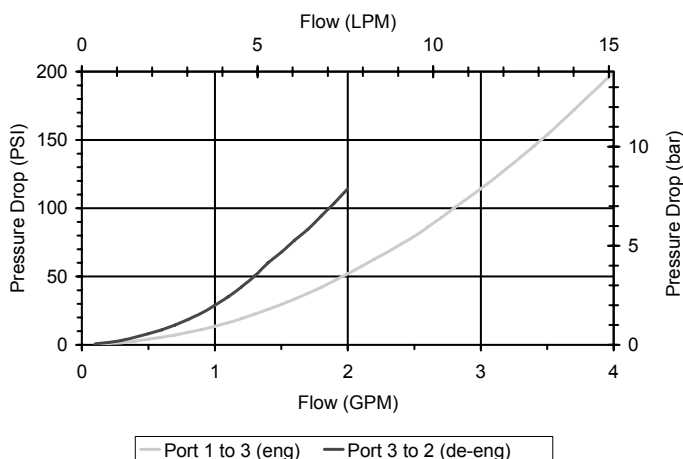
HYDRAULIC SYMBOL



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	3 GPM (11 LPM) from (1) to (3) 2 GPM (7.6 LPM) from (3) to (2)
Rated Operating Pressure	1000 PSI (70 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 Temp. 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	3-4 ft-lbs (4.1-5.4 Nm)
Cavity	MINI 3W
Cavity form Tool (finishing)	40500004
Seal Kit	21191006

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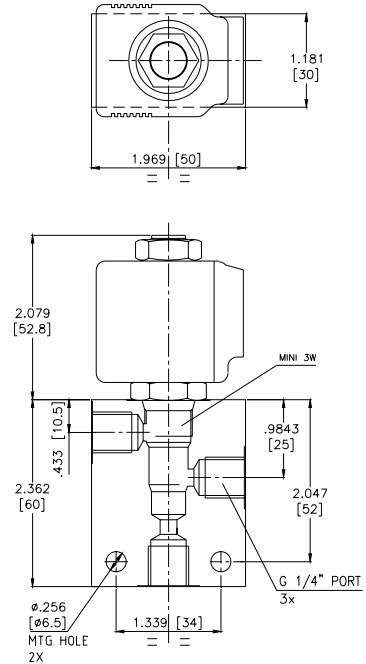
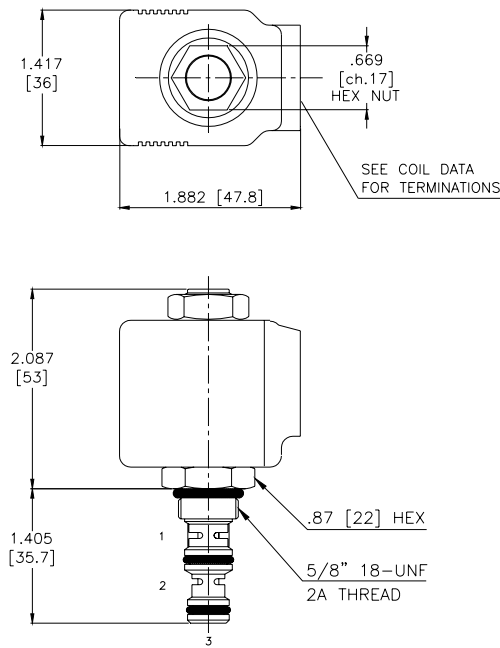


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DIMENSIONS



ORDERING INFORMATION

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

TC-S3A - - - -

OPTIONS

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

BODIES

- Blank Without Body
- N** 1/4" BSP Ports
- S** #6 SAE Ports

VOLTAGE (other voltages available on request)

- 12** 12 VDC
- 24** 24 VDC
- 22** 220 VAC without internal rectifier

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

"P" TYPE "J" COIL TERMINATION

- JA** "J" Coil AMP Superseal - Integral
- JD** "J" Coil Deutsch - Integral DT04-2P

JJ "J" Coil AMP Jr. Time - Integral

- JL** "J" Coil Double Lead
- JH** "J" Coil DIN 43650 (Hirschmann)

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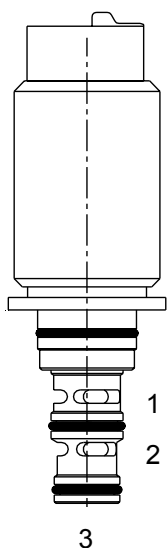
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SOLENOID OPERATED DIRECTIONAL CONTROLS

IF-S3A-57-MP12 DIRECT ACTING SPOOL, 3 WAY 2 POSITION, TRANSMISSION & BRAKE, SLIP-IN STYLE



DESCRIPTION

Special cavity, solenoid operated, 3 way 2 position spool type, flanged retained hydraulic valve.

OPERATION

When de-energized the IF-S3A-57-MP12 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).

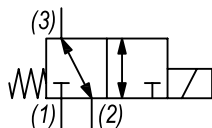
FEATURES

- Economical slip-in style.
- Efficient wet-armature construction.
- Unitized valve/coil.
- Continuous duty rated solenoid.



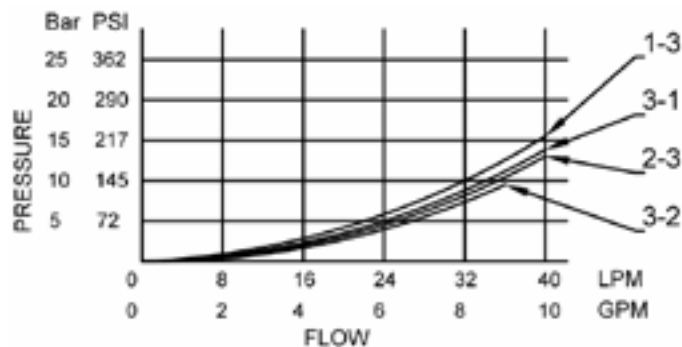
Flanged Retained Product. Coil is an integral part of the valve and is not serviceable.

HYDRAULIC SYMBOL



PERFORMANCE

Actual Test Data (Cartridge Only)



VALVE SPECIFICATIONS

Nominal Flow	6 GPM (23 LPM)
Max Operating Pressure	1000 PSI (70 bar)
Typical Internal Leakage (150 SSU)	3 cu in/min (50 ml/min)
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temp. Range	-35° to 200°F (-37.2° to 93.3°C)
Weight	.75 lbs (.34 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cavity	T057 (Special)
Cavity Tools Kit	K-T057
Flange PN	13.2501.032/A
Flange mounting screws and torque	M6x10 / 4 ft-lbs (6 Nm)

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)
Temperature Range	-40°F to 230°F (-40°C) to (110°C)
Coil Resistance	7.3 Ohm ±5% at 68°F (20°C)
Coil Termination	AMP Superseal - Integral
Protection Degree	IP 67

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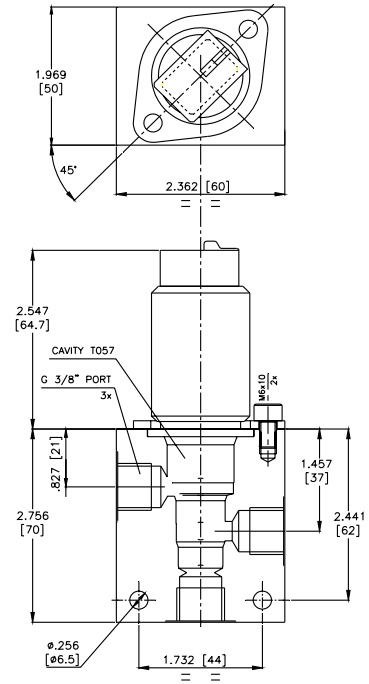
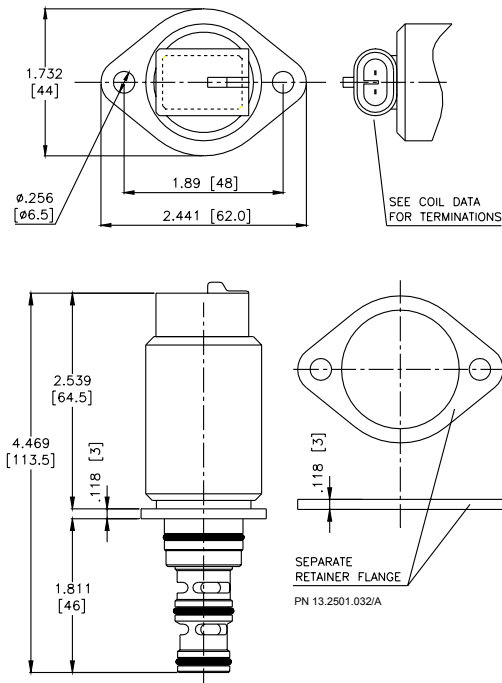


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DIMENSIONS



ORDERING INFORMATION

IF-S3A-57-MP12 -

- BODIES**
Blank Without Body
N 3/8" BSP Ports
S #8 SAE Ports

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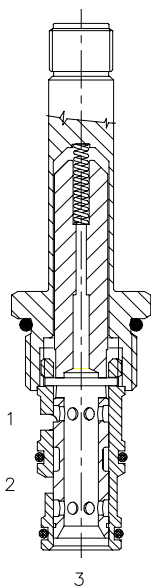


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TF-S3D DIRECT ACTING SPOOL, 3 WAY 2 POSITION, TRANSMISSION & BRAKE



DESCRIPTION

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

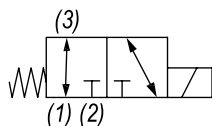
OPERATION

When de-energized the TF-S3D allows flow from (3) to (1) and blocks flow at port (2). When energized the valve allows flow from (3) to (2) and blocks flow at port (1).

FEATURES

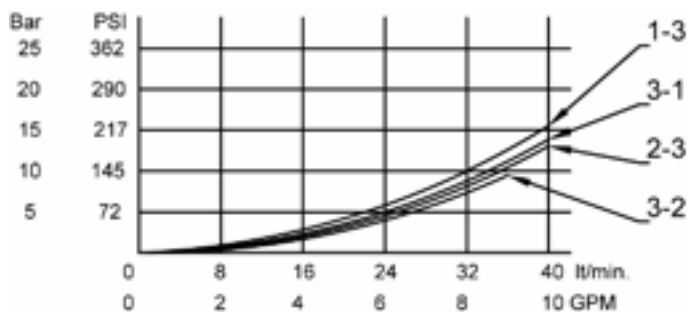
- Hardened parts for long life.
- Efficient wet-armature construction.
- Cartridges are voltage interchangeable.
- Industry common cavity.
- Unitized, molded coil design.
- Continuous duty rated solenoid.
- Optional coil voltages and terminations.
- Optional "I" Coil: Weatherproof, Thermal Shock, Immersion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

HYDRAULIC SYMBOL



PERFORMANCE

Actual Test Data (Cartridge Only)



VALVE SPECIFICATIONS

Nominal Flow	6 GPM (23 LPM)
Rated Operating Pressure	1000 PSI (70 bar)
Typical Internal Leakage (150 SSU)	3 cu in/min (50 ml/min)
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temp. 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	3-4 ft-lbs (4.1-5.4 Nm)
Cavity	DELTA 3W
Cavity Tools Kit	
(form tool, reamer, tap)	40500001
Seal Kit	21191210

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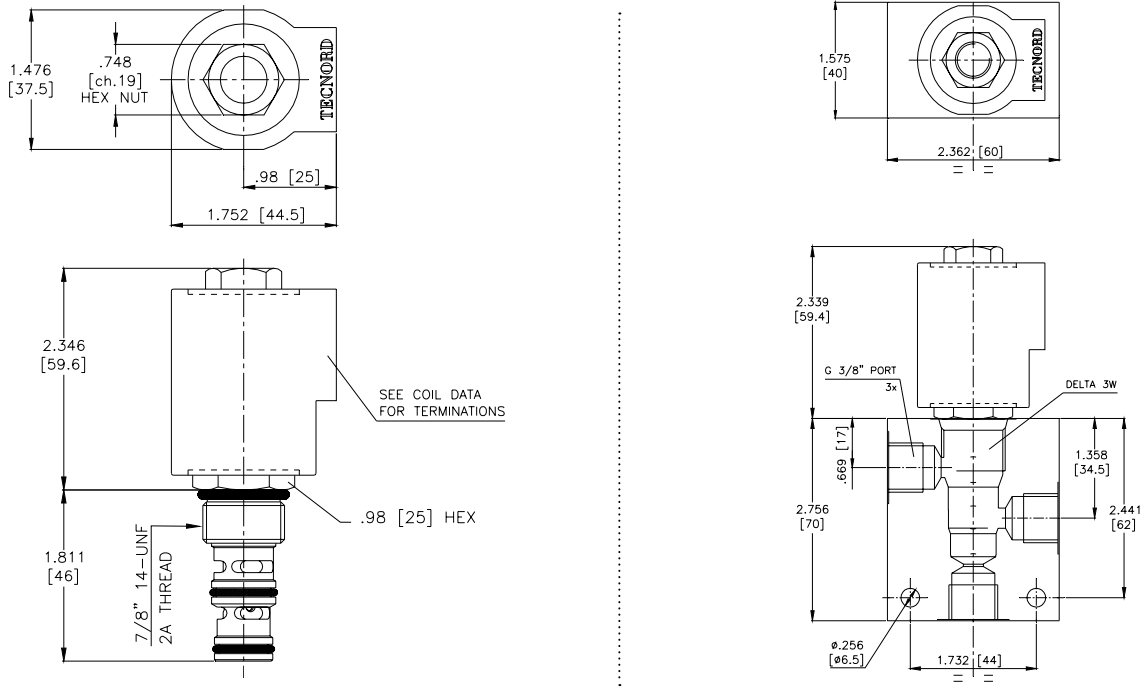


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DIMENSIONS



ORDERING INFORMATION

Approximate Coil Weight: .56 lbs (.25 kg)

TF-S3D - - - -

OPTIONS

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

BODIES

- Blank** Without Body
- N** 3/8" BSP Ports
- S** #8 SAE Ports

VOLTAGE (other voltages available on request)

- 12** 12 VDC
- 24** 24 VDC
- 22** 220 VAC without internal rectifier

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

"V" COIL TERMINATION

(All DC Except as Noted)

DL Double Lead
(several types of termination can be attached on leads on request)

HC DIN 43650 (Hirschmann) - (AC&DC)
DI Deutsch - Integral DT04-2P

IMMERSION PROOF "D" TYPE
DIA "1" Coil AMP Superseal - Integral
DID "1" Coil Deutsch - Integral DT04-2P
DIJ "1" Coil AMP Jr. Timer - Integral
DIM "1" Coil Metri-Pack - Integral

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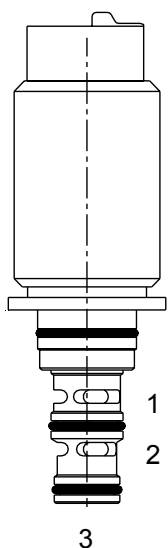
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SOLENOID OPERATED DIRECTIONAL CONTROLS

IF-S3D-57-MP12 DIRECT ACTING SPOOL, 3 WAY 2 POSITION, TRANSMISSION & BRAKE, SLIP-IN STYLE



DESCRIPTION

Special cavity, solenoid operated, 3 way 2 position spool type, flanged retained hydraulic valve.

OPERATION

When de-energized the IF-S3D-57-MP12 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).

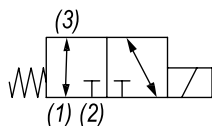
FEATURES

- Economical slip-in style.
- Efficient wet-armature construction.
- Unitized valve/coil.
- Continuous duty rated solenoid.



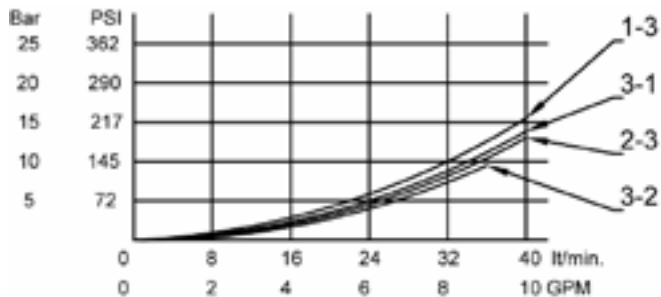
Flanged Retained Product. Coil is an integral part of the valve and is not serviceable.

HYDRAULIC SYMBOL



PERFORMANCE

Actual Test Data (Cartridge Only)



VALVE SPECIFICATIONS

Nominal Flow	6 GPM (23 LPM)
Max Operating Pressure	1000 PSI (70 bar)
Typical Internal Leakage (150 SSU)	3 cu in/min (50 ml/min)
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temp. Range	-35° to 200°F (-37.2° to 93.3°C)
Weight	.75 lbs (.34 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cavity	T057 (Special)
Cavity Tools Kit	K-T057
Flange PN	13.2501.032/A
Flange mounting screws and torque	M6x10 / 4 ft-lbs (6 Nm)

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)
Temperature Range	-40°F to 230°F (-40°C) to (110°C)
Coil Resistance	7.3 Ohm ±5% at 68°F (20°C)
Coil Termination	AMP Superseal - Integral
Protection Degree	IP 67

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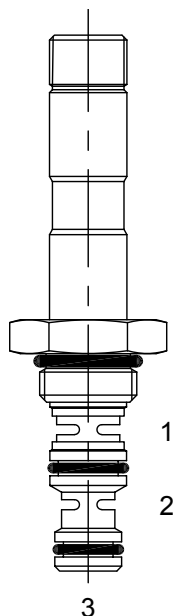


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UC-S3T DIRECT ACTING SPOOL, 3 WAY 2 POSITION, TRANSMISSION & BRAKE



DESCRIPTION

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

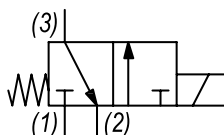
OPERATION

When de-energized the UC-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

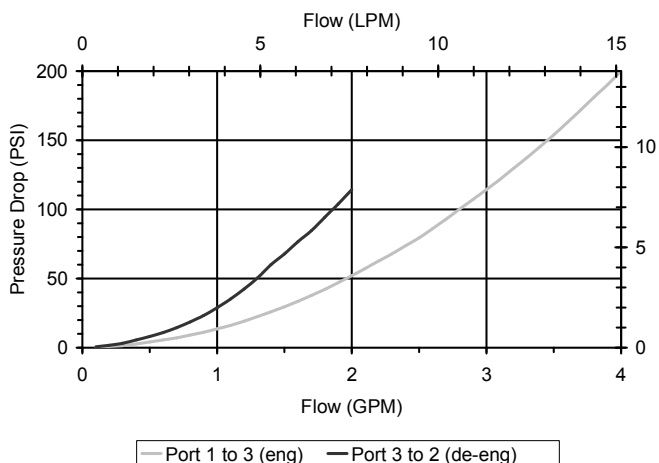
- Hardened parts for long life.
- Efficient wet-armature construction.
- Cartridges are voltage interchangeable.
- Industry common cavity.
- Unitized, molded coil design.
- Continuous duty rated solenoid.
- Optional coil voltages and terminations.

HYDRAULIC SYMBOL



PERFORMANCE

Actual Test Data (Cartridge Only)



VALVE SPECIFICATIONS

Nominal Flow	3 GPM (11 LPM) from (1) to (3) 2 GPM (8 LPM) from (3) to (2)
Rated Operating Pressure	1500 PSI (103 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 Temp. 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	4-6 ft-lbs (5.4-8.1 Nm)
Cavity	MINI 3W
Cavity Form Tool (Finishing)	40500004
Seal Kit	21191006

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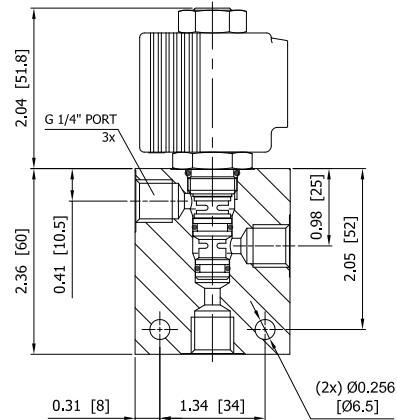
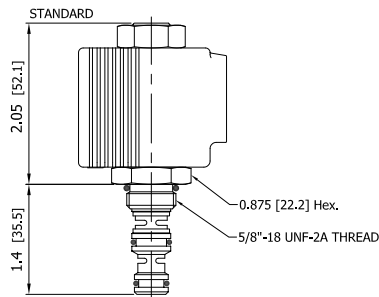
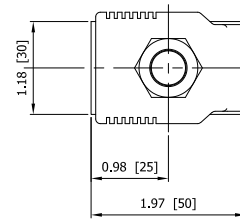
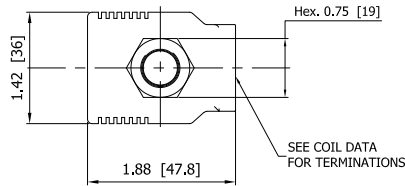
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SOLENOID OPERATED DIRECTIONAL CONTROLS

DIMENSIONS



ORDERING INFORMATION

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

UC-S3T - - - -

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)

BODIES

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

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

VOLTAGE (other voltages available on request)

12 12 VDC
24 24 VDC
26 220 VAC with molded full wave rectifier

"P" TYPE "J" COIL TERMINATION

JA "J" Coil AMP Superseal - Integral
JD "J" Coil Deutsch - Integral DT04-2P

JJ "J" Coil AMP Jr. Time - Integral

JL "J" Coil Double Lead
JH "J" Coil DIN 43650 (Hirschmann)

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TF-S3A DIRECT ACTING SPOOL, 3 WAY 2 POSITION, TRANSMISSION & BRAKE

DESCRIPTION

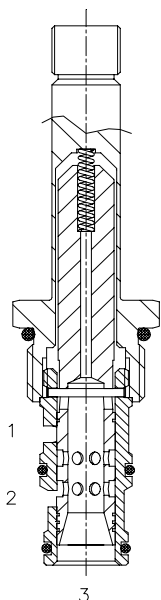
10 size, 7/8-14 thread, "Delta" series, solenoid operated, 3 way 2 position, transmission & brake, spool valve.

OPERATION

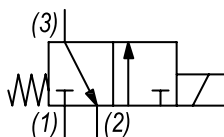
When de-energized the TF-S3A allows flow from (3) to (2) and blocks flow at port (1). When energized the valve allows flow from (1) to (3) and blocks flow at port (2).

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.

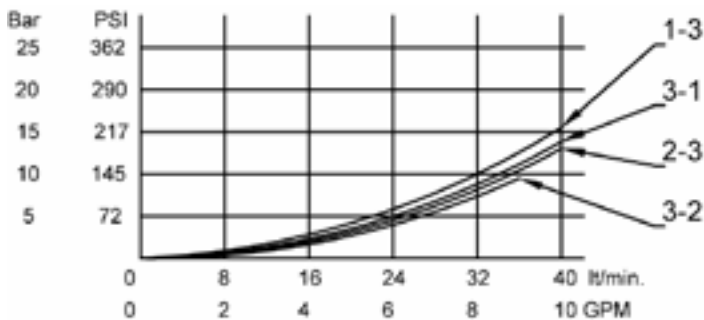


HYDRAULIC SYMBOL



PERFORMANCE

Actual Test Data (Cartridge Only)



VALVE SPECIFICATIONS

Nominal Flow	6 GPM (23 LPM)
Rated Operating Pressure	1000 PSI (70 bar)
Typical Internal Leakage (150 SSU)	3 cu in/min (50 ml/min)
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temp. 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	3-4 ft-lbs (4.1-5.4 Nm)
Cavity	DELTA 3W
Cavity Tools Kit (form tool, reamer, tap)	40500001
Seal Kit	21191210

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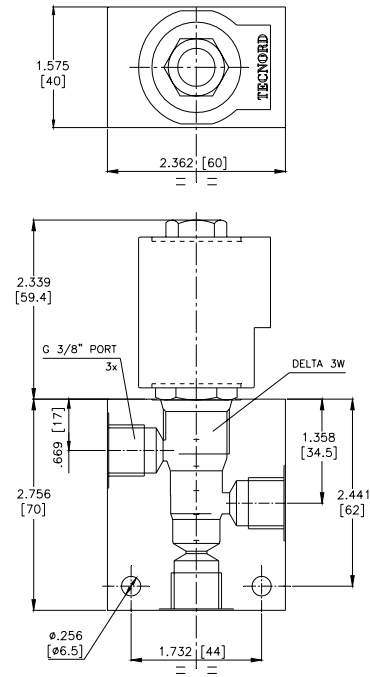
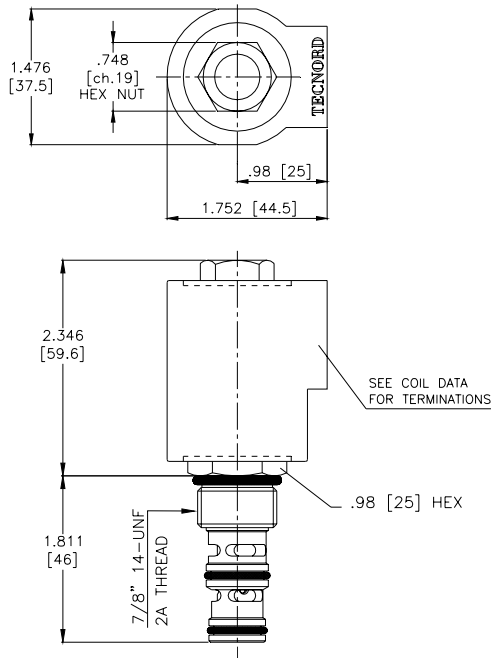


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DIMENSIONS



ORDERING INFORMATION

Approximate Coil Weight: .56 lbs (.25 kg)

TF-S3A - - - -

OPTIONS

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

BODIES

- Blank** Without Body
- N** 3/8" BSP Ports
- S** #8 SAE Ports

VOLTAGE (other voltages available on request)

- 12** 12 VDC
- 24** 24 VDC
- 22** 220 VAC without internal rectifier

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

"V" COIL TERMINATION

(All DC Except as Noted)

DL Double Lead
(several types of termination can be attached on leads on request)

HC DIN 43650 (Hirschmann) - (AC&DC)
DI Deutsch - Integral DT04-2P

DIA "1" Coil AMP Superseal - Integral
DID "1" Coil Deutsch - Integral DT04-2P
DIJ "1" Coil AMP Jr. Timer - Integral
DIM "1" Coil Metri-Pack - Integral

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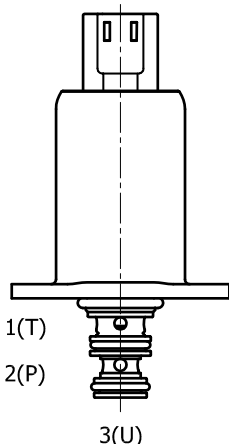


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IC-S3D-43 DIRECT ACTING SPOOL, 3 WAY 2 POSITION, SELECTOR



DESCRIPTION

Special cavity, solenoid operated, 3 way 2 position spool type, flanged retained hydraulic valve.

OPERATION

When de-energized the IC-S3D-43 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).

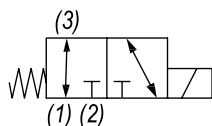
FEATURES

- Hardened parts for long life.
- Slip-in style.
- Efficient wet-armature construction.
- Integral waterproof coil.
- Continuous duty rated solenoid.
- Optional coil voltages and terminations.



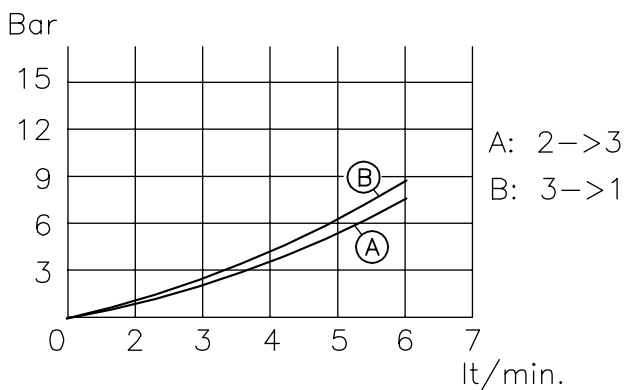
Flanged Retained Product. Coil is an integral part of the valve and is not serviceable.

HYDRAULIC SYMBOL



PERFORMANCE

Actual Test Data (Cartridge Only)



VALVE SPECIFICATIONS

Nominal Flow	1.5 GPM (6 LPM) @ 8 bar Delta P
Max Inlet Pressure	700 PSI (50 bar)
Max Back-Pressure at T Port	20 bar
Internal Leakage	15 ml/min @ 500 PSI (35 bar) inlet
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temp. Range	-30°C / +100°C
Weight	.54 lbs (.25 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cavity	T043
Cavity Tool Kit	K-T043
Flange Mounting Screws and Torque	M4x10 / 3ft-lbs (4 Nm)

COIL SPECIFICATIONS

Coil Resistance (12 VDC)	7 Ohm ±5% at 68°F (20°C)
Coil Resistance (24 VDC)	25 Ohm ±5% at 68°F (20°C)
Protection Degree	IP 67 according to IEC 529
Coil Termination	Deutsch-Integral DT04-2P AMP Jr. Timer 84-9419
Color Connectors	Black

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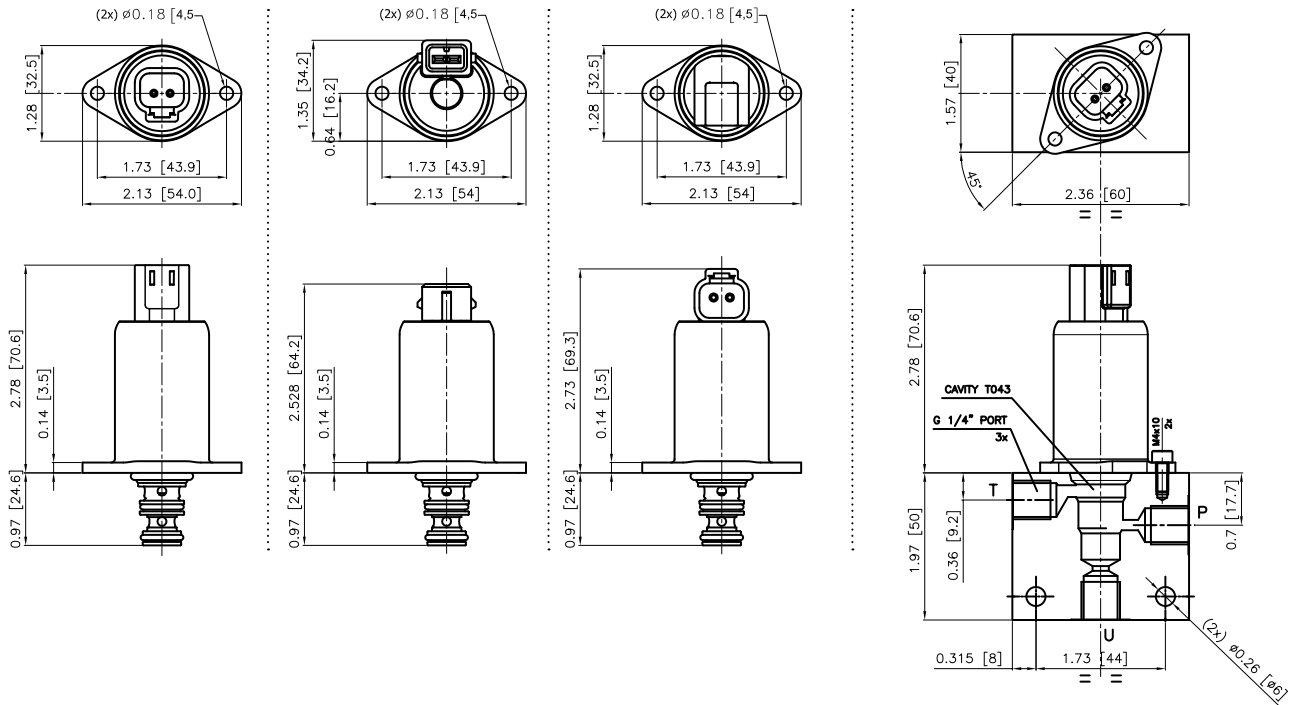


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DIMENSIONS



ORDERING INFORMATION

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

IC-S3D-43	—	—	—	—
<u>COIL TERMINATION</u>	<u>VOLTAGE</u>	<u>OPTIONS</u>	<u>BODIES</u>	
AJ - AMP Jr. Timer	12 VDC	00 - NBR seals	Blank - Without body	
DT - Deutsch DT04	24 VDC		N - 1/4" BSP Ports	
DH - Deutsch DT04 Horizontal			S - #6 SAE Ports	

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TG-S4A DIRECT ACTING SPOOL, 4 WAY 2 POSITION, TRANSMISSION & BRAKE

DESCRIPTION

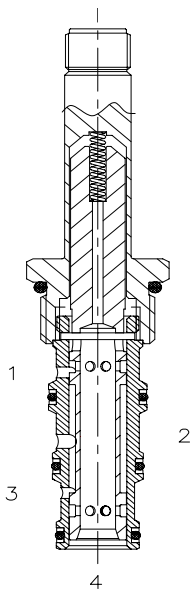
10 size, 7/8-14 thread, "Delta" series, solenoid operated, 4 way 2 position, transmission & brake, spool valve.

OPERATION

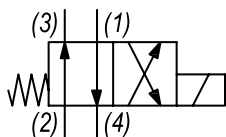
When de-energized the TG-S4A allows flow between (1) to (4) and (2) to (3). When energized the valve allows flow between (2) to (1) and (3) to (4).

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.

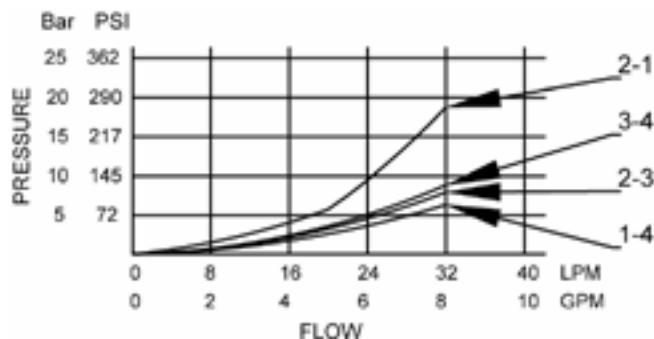


HYDRAULIC SYMBOL



PERFORMANCE

Actual Test Data (Cartridge Only)



VALVE SPECIFICATIONS

Nominal Flow	5 GPM (19 LPM)
Rated Operating Pressure	1000 PSI (70 bar)
Typical Internal Leakage (150 SSU)	1.2 cu in/min (20 ml/min) per path
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temp. 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	3-4 ft-lbs (4.1-5.4 Nm)
Cavity	DELTA 4W
Cavity Tools Kit	
(form tool, reamer, tap)	40500002
Seal Kit	21191214

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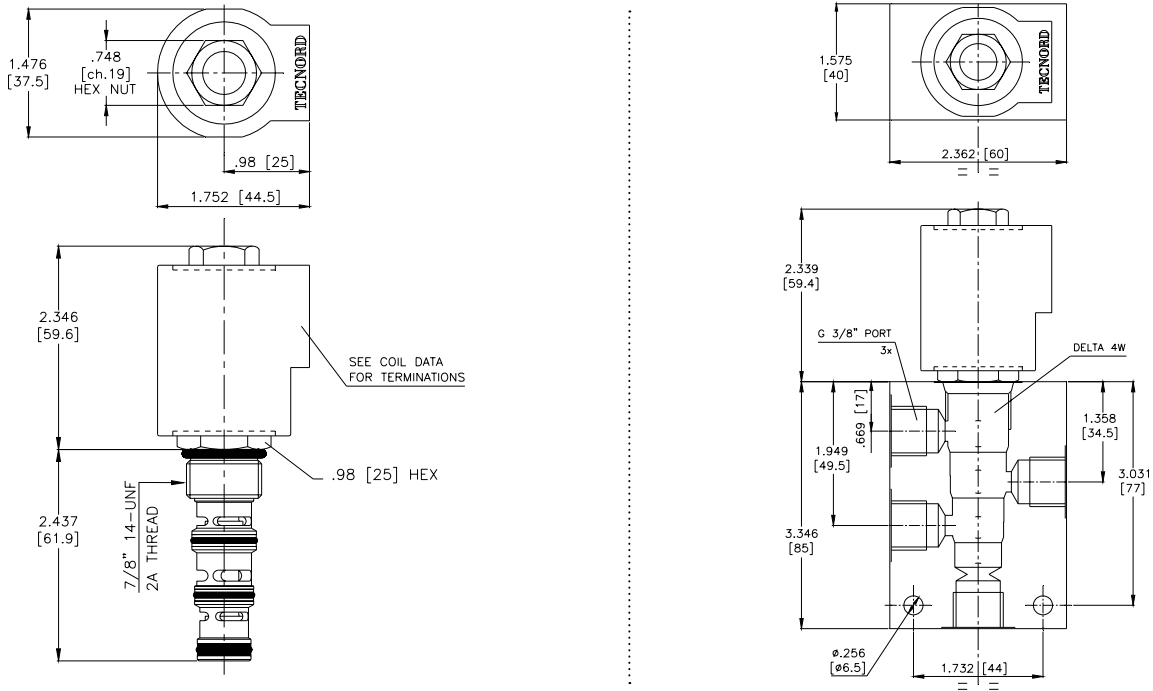


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DIMENSIONS



ORDERING INFORMATION

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

TG-S4A

- OPTIONS**
- Buna Standard **00**
 - Viton Standard **V0**

- BODIES**
- Blank Without Body
 - N** 3/8" BSP Ports
 - S** #8 SAE Ports

VOLTAGE (other voltages available on request)

- 12** 12 VDC
- 24** 24 VDC
- 22** 220 VAC without internal rectifier

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

DL Double Lead
(several types of termination can be attached on leads on request)

HC DIN 43650 (Hirschmann) - (AC&DC)
DI Deutsch - Integral DT04-2P

IMMERSION PROOF "D" TYPE

- DIA** "1" Coil AMP Superseal - Integral
- DID** "1" Coil Deutsch - Integral DT04-2P
- DIJ** "1" Coil AMP Jr. Timer - Integral
- DIM** "1" Coil Metri-Pack - Integral

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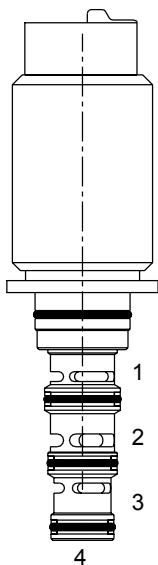


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IG-S4A-58-MP12-A DIRECT ACTING SPOOL, 4 WAY 2 POSITION, TRANSMISSION VALVE, SLIP-IN STYLE



DESCRIPTION

Special cavity, solenoid operated, 4 way 2 position 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).

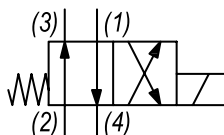
FEATURES

- Economical slip-in style.
- Efficient wet-armature construction.
- Unitized valve/coil.
- Continuous duty rated solenoid.



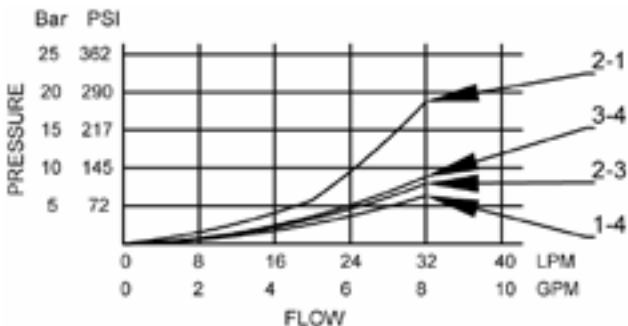
Consult Factory for Valve retention options.
Flanged Retained Product.

HYDRAULIC SYMBOL



PERFORMANCE

Actual Test Data (Cartridge Only)



VALVE SPECIFICATIONS

Nominal Flow	5 GPM (19 LPM)
Max Operating Pressure	1000 PSI (70 bar)
Typical Internal Leakage (150 SSU)	3 cu in/min (50 ml/min)
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temp. Range	-35° to 200°F (-37.2° to 93.3°C)
Weight	.75 lbs (.34 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cavity	T058 (Special)
Cavity Tools Kit	K-T058
Flange PN	13.1501.032/A
Flange mounting screws and torque	M6x10 / 4 ft-lbs (6 Nm)

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)
Temperature Range	-40°F to 230°F (-40°C) to (110°C)
Coil Resistance	7.3 Ohm ±5% at 68°F (20°C)
Coil Termination	AMP Superseal - Integral
Protection Degree	IP 67

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SOLENOID OPERATED DIRECTIONAL CONTROLS

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