

SOLENOID OPERATED DIRECTIONAL CONTROLS



**2W2P NORMALLY CLOSED POPPET VALVES** ..... SD2

**2W2P NORMALLY CLOSED BIDIRECTIONAL POPPET VALVES** ..... SD41

**2W2P NORMALLY CLOSED SPOOL VALVES** ..... SD51

**2W2P NORMALLY OPEN POPPET VALVES** ..... SD60

**2W2P NORMALLY OPEN BIDIRECTIONAL POPPET VALVES** ..... SD86

**2W2P NORMALLY OPEN SPOOL VALVES** ..... SD89

**3W2P SPOOL VALVES** ..... SD98

**4W2P SPOOL VALVES** ..... SD122

**4W3P SPOOL VALVES** ..... SD164

**TRANSMISSION & BRAKE SPOOL VALVES** ..... SD197

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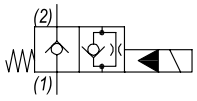
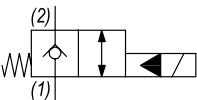
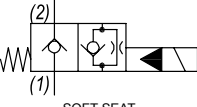


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2 WAY 2 POSITION NORMALLY CLOSED POPPET VALVES

| 2W2P NORMALLY CLOSED   | GPM | PSI  | LPM | BAR | CAVITY    | MODEL         | PAGE |
|--|-----|------|-----|-----|-----------|---------------|------|
|                     | 6   | 4000 | 23  | 276 | 5/8-18    | <b>UA-S2A</b> | SD4  |
|  | 8   | 3500 | 30  | 241 | 3/4-16    | <b>PB-S2A</b> | SD8  |
|  | 12  | 5000 | 45  | 345 | 3/4-16    | <b>HB-S2A</b> | SD10 |
|  | 15  | 3500 | 57  | 241 | 7/8-14    | <b>DE-S2A</b> | SD14 |
|  | 15  | 4000 | 57  | 276 | 7/8-14    | <b>HE-S2A</b> | SD16 |
|  | 25  | 3000 | 95  | 207 | 1 1/16-12 | <b>TT-S2A</b> | SD20 |
|  | 30  | 3500 | 114 | 241 | 1 5/16-12 | <b>SJ-S2A</b> | SD22 |
|  | 40  | 4350 | 151 | 300 | 1 5/16-12 | <b>HJ-S2A</b> | SD24 |
|                     | 8   | 3500 | 30  | 241 | 3/4-16    | <b>PB-S2B</b> | SD26 |
|  | 12  | 5000 | 45  | 345 | 3/4-16    | <b>HB-S2B</b> | SD28 |
|  | 15  | 3500 | 57  | 241 | 7/8-14    | <b>DE-S2B</b> | SD30 |
|  | 15  | 4000 | 57  | 276 | 7/8-14    | <b>HE-S2B</b> | SD32 |
|  | 25  | 3000 | 95  | 207 | 1 1/16-12 | <b>TT-S2B</b> | SD34 |
|  | 25  | 5000 | 95  | 345 | 1 1/16-12 | <b>HT-S2B</b> | SD36 |
|  | 30  | 3500 | 114 | 241 | 1 5/16-12 | <b>SJ-S2B</b> | SD38 |
|  <p>SOFT SEAT</p> | 4   | 3000 | 15  | 207 | 5/8-18    | <b>UA-S2F</b> | SD6  |
|  | 6   | 2500 | 23  | 172 | 3/4-16    | <b>PB-S2F</b> | SD12 |
|  | 10  | 1000 | 38  | 69  | 7/8-14    | <b>DE-S2F</b> | SD18 |

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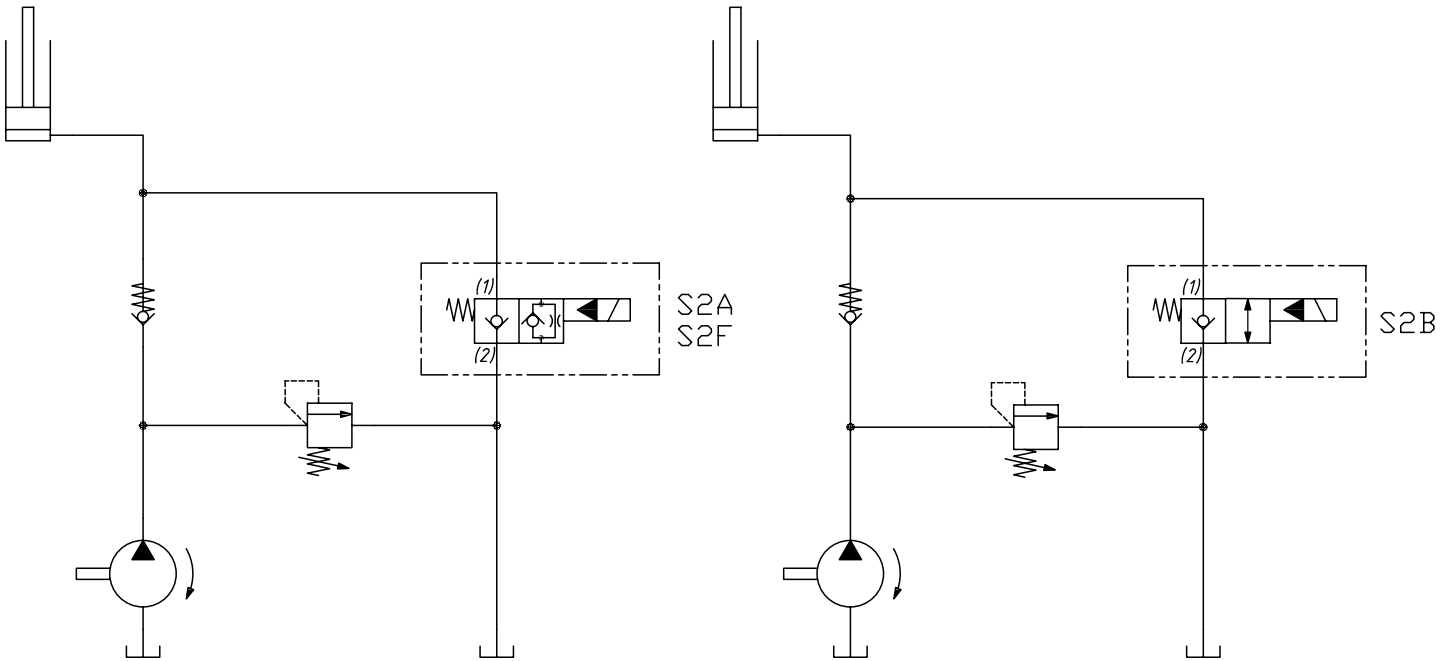
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## TYPICAL SCHEMATIC

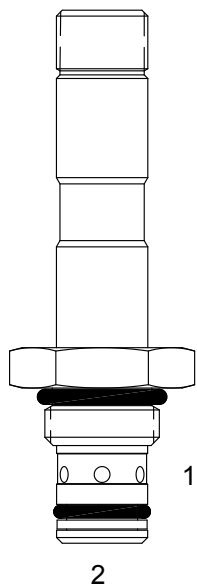
Typical application for the S2A is load holding and lowering in a lift, check and dump circuit.

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.



## 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.

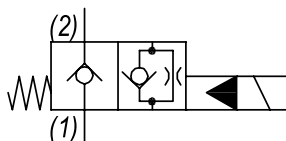
### OPERATION

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.

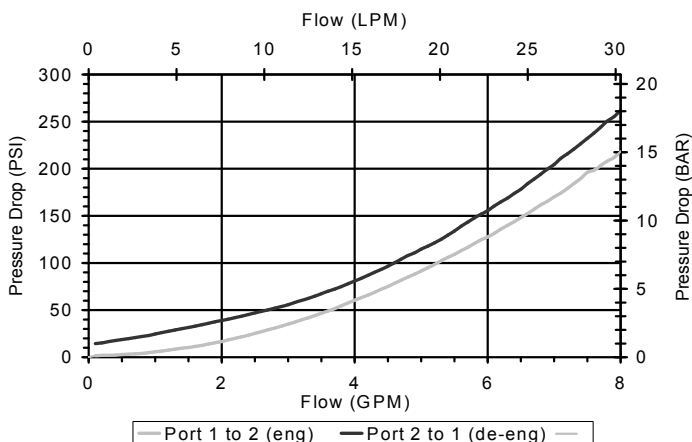
### HYDRAULIC SYMBOL



Uses "P" or "PI" type coils

### 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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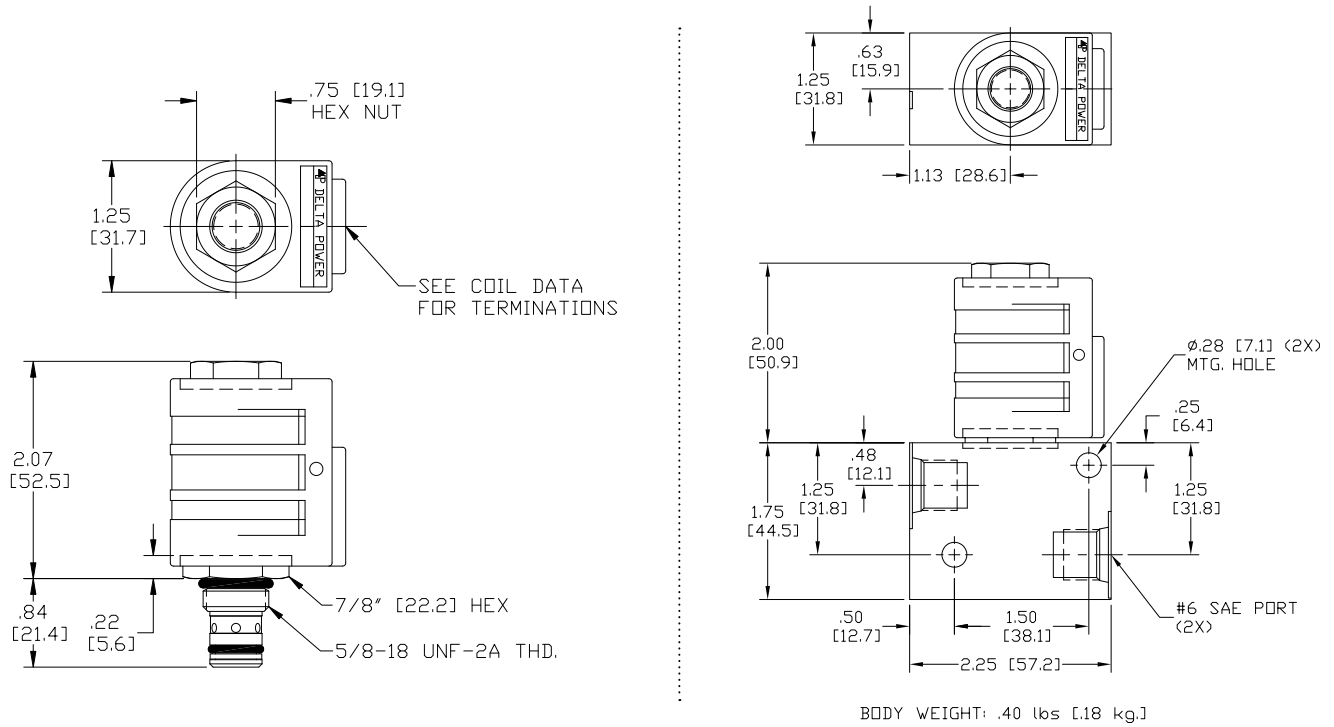


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# SOLENOID OPERATED DIRECTIONAL CONTROLS

## DIMENSIONS



## ORDERING INFORMATION

UA-S2A - - - -

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

### 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 NPTF Ports  
**S** #6 SAE Ports

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

### VOLTAGE

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

### "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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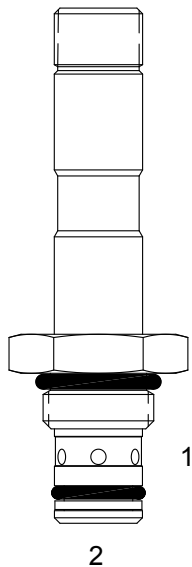


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## UA-S2F PILOT OPERATED POPPET, 2 WAY NORMALLY CLOSED – SOFT SEAT



### 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.

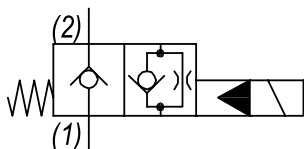
### OPERATION

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.

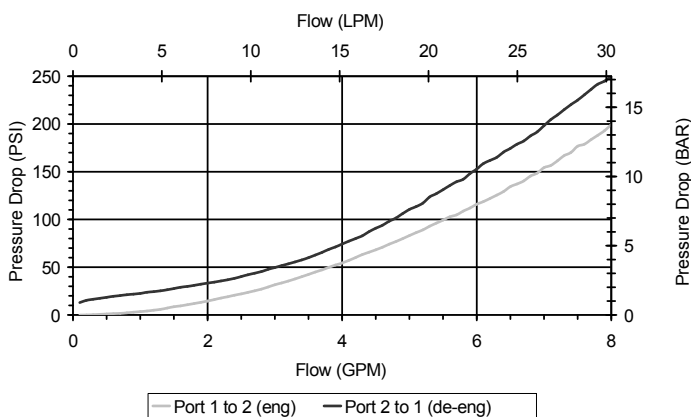
### HYDRAULIC SYMBOL



Uses "P" or "PI" type coils

### 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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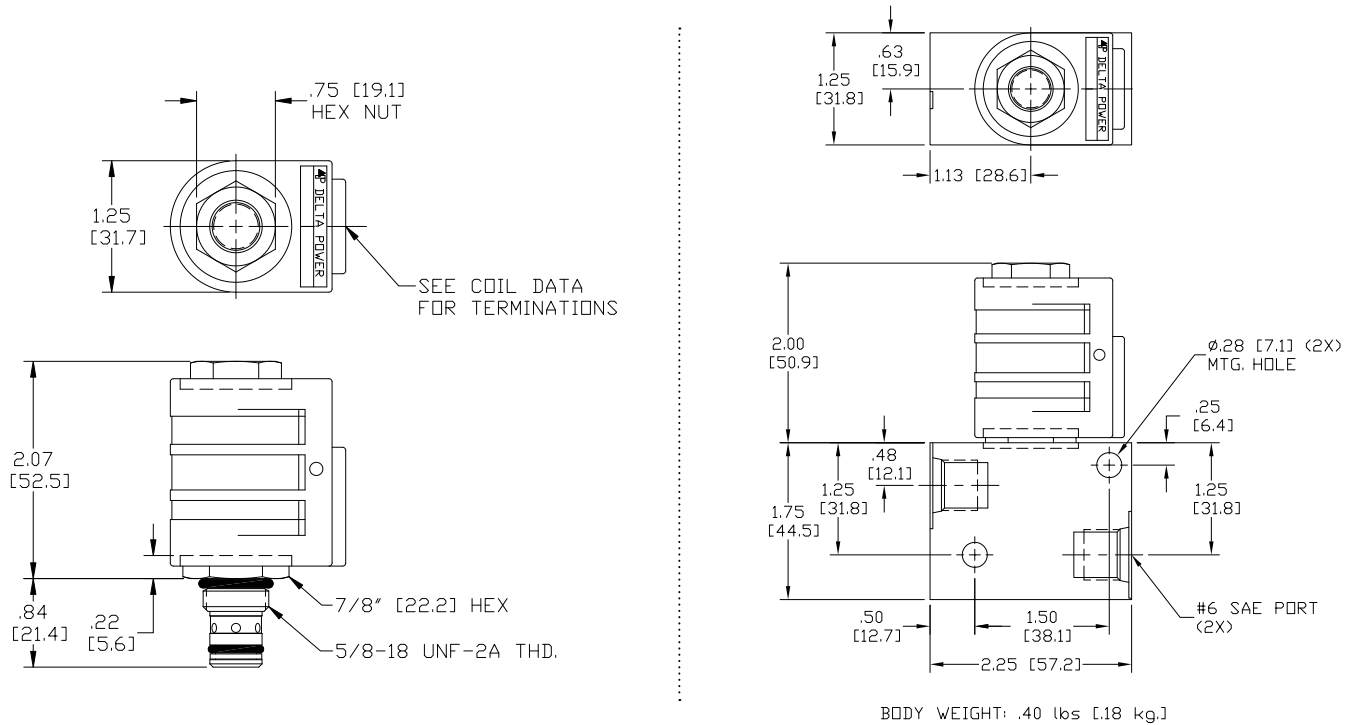
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# SOLENOID OPERATED DIRECTIONAL CONTROLS

## DIMENSIONS



## ORDERING INFORMATION

UA-S2F - - - -

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

### 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 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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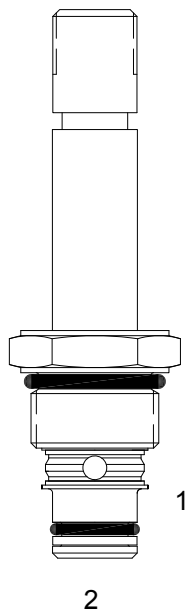


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## PB-S2A PILOT OPERATED POPPET, 2 WAY NORMALLY CLOSED



### 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

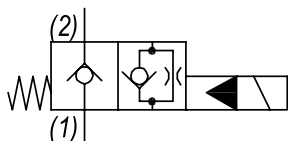
When de-energized the PB-S2A blocks flow from (1) to (2) and allows reverse flow from (2) to (1). When energized the valve allows flow from (1) to (2) and restricts flow from (2) to (1).

**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

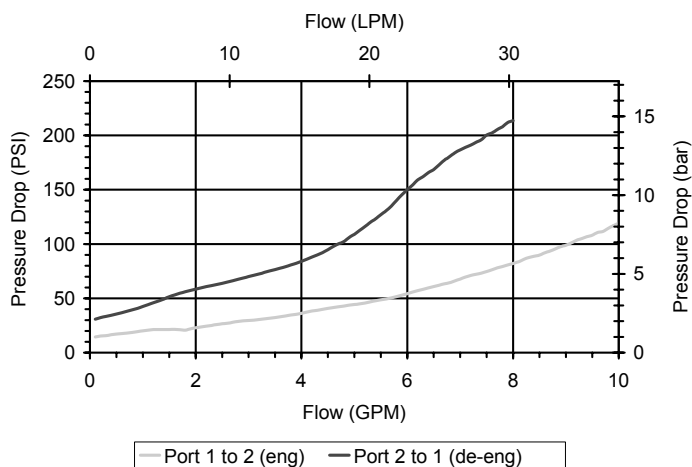
- Hardened parts for long life.
- Efficient wet-armature construction.
- Cartridges are voltage interchangeable.
- Manual override option.
- Industry common cavity.
- Unitized, molded coil design.
- Continuous duty rated solenoid.
- Optional coil voltages and terminations.
- Optional "I" Coil: Weatherproof,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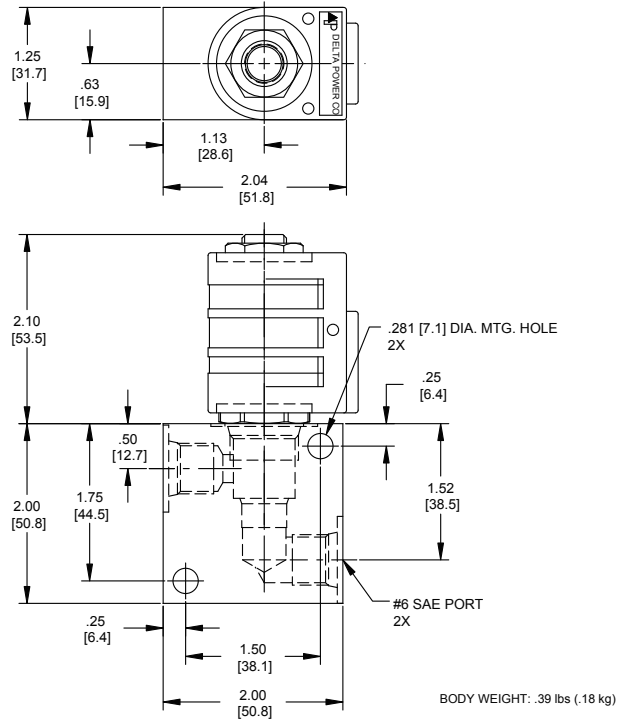
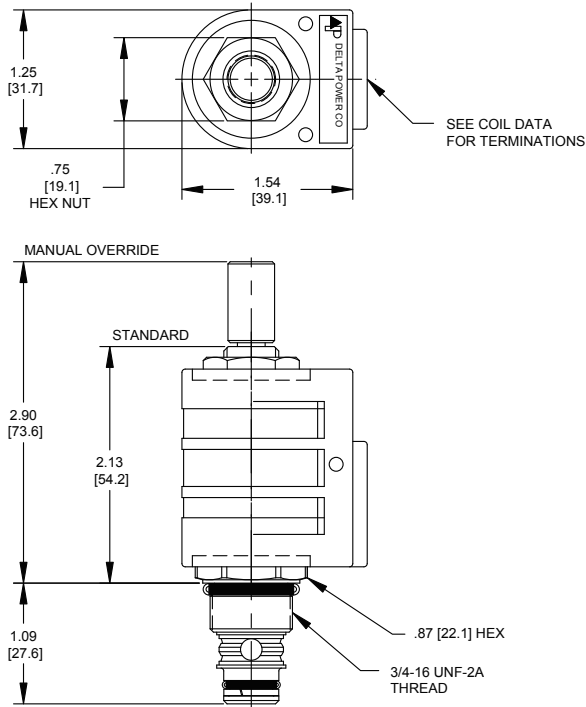
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# SOLENOID OPERATED DIRECTIONAL CONTROLS

## DIMENSIONS



## ORDERING INFORMATION

PB-S2A - - - -

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

### 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)**

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

### BODIES

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

### VOLTAGE

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

### IMMERSION PROOF "P" TYPE

- |                                    |  |   |
|------------------------------------|--|---|
| <b>DL</b> Double Lead              | <b>SS</b> Single Spade                     | <b>IA</b> "I" Coil AMP Superseal - Integral   |
| <b>DT</b> Deutsch on Leads DT04-2P | <b>DS</b> Double Spade                     | <b>ID</b> "I" Coil Deutsch - Integral DT04-2P |
| <b>ML</b> Metri-Pack on Leads      | <b>HC</b> DIN 43650 (Hirschmann) - (AC&DC) | <b>IJ</b> "I" Coil AMP Jr. Timer - Integral   |
| <b>PL</b> Packard on Leads         | <b>CL</b> Conduit Lead - (AC Only)         | <b>IM</b> "I" Coil Metri-Pack - Integral      |
| <b>WL</b> Weatherpack on Leads     | <b>DI</b> Deutsch - Integral DT04-2P       |   |

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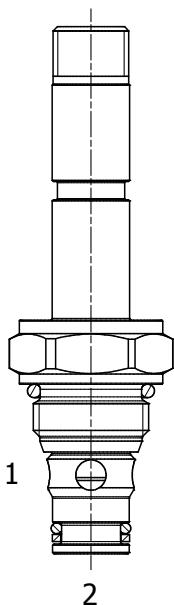


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**HB-S2A PILOT OPERATED POPPET, 2 WAY NORMALLY CLOSED**



**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**

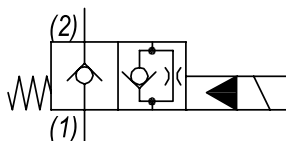
When de-energized the HB-S2A blocks flow from (1) to (2) and allows reverse flow from (2) to (1). When energized the valve allows flow from (1) to (2) and restricts flow from (2) to (1).

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

**FEATURES**

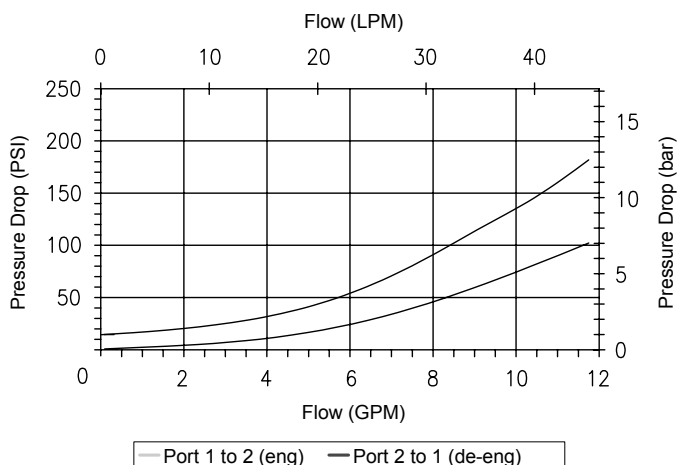
- Hardened parts for long life.
- Efficient wet-armature construction.
- Cartridges are voltage interchangeable.
- Manual override option.
- Industry common cavity.
- Unitized, molded coil design.
- Continuous duty rated solenoid.
- Optional coil voltages and terminations.

**HYDRAULIC SYMBOL**



**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)<br>BUNA seals<br>-4° to 250°F (-20° to 120°C)<br>VITON seals |
| Weight                             | .29 lbs (.13 kg)   |
| Operating Fluid Media              | General Purpose Hydraulic Fluid  |
| Cartridge Torque Requirements      | 35 ft-lbs (47 Nm)  |
| Coil Nut Torque Requirements       | 4-6 ft-lbs (5.4-8.1 Nm)  |
| Cavity                             | POWER 2W   |
| Cavity Tools Kit                   | 40500005   |
| Seal Kit                           | 21191100   |

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



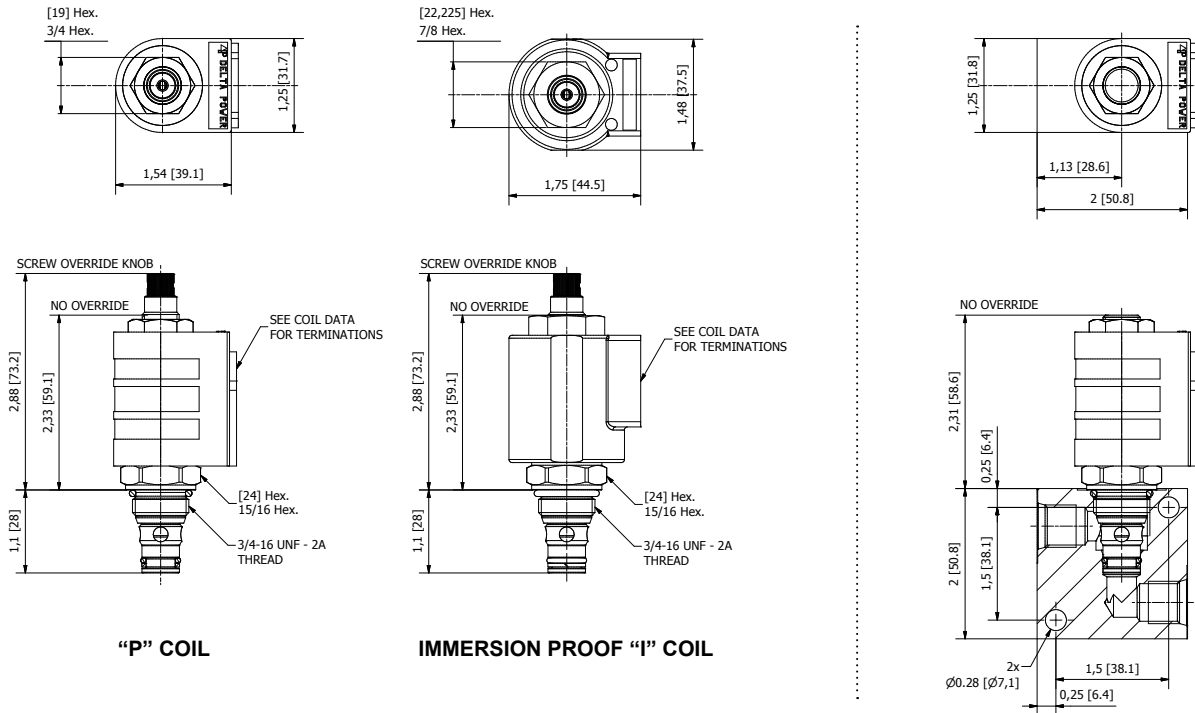
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# SOLENOID OPERATED DIRECTIONAL CONTROLS

## DIMENSIONS



"P" COIL

IMMERSION PROOF "I" COIL

## ORDERING INFORMATION

HB-S2A - - - -

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

### OPTIONS

|                         |    |
|-------------------------|----|
| Buna Standard           | 00 |
| Viton Standard          | V0 |
| Buna, Override          | 0M |
| Viton, Override         | VM |
| Buna, Screen            | A0 |
| Viton, Screen           | W0 |
| Buna, Screen, Override  | B4 |
| Viton, Screen, Override | V4 |

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

### 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 |

Note: Aluminum Body Not durability rated for 5000 PSI (345 bar), consult factory for high pressure body options.

### "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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**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.

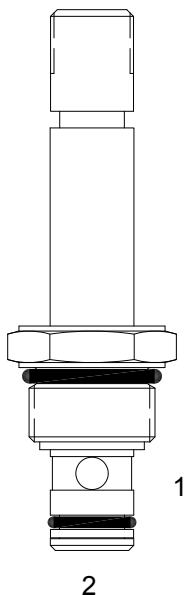
**OPERATION**

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).

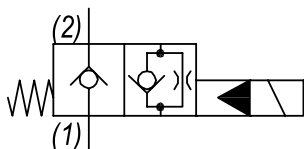
**OPERATION OF MANUAL OVERRIDE OPTION:** to override, pull knob out. On the detented version, after pulling knob out twist 180 degrees and release. The valve will remain in that position.

**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.



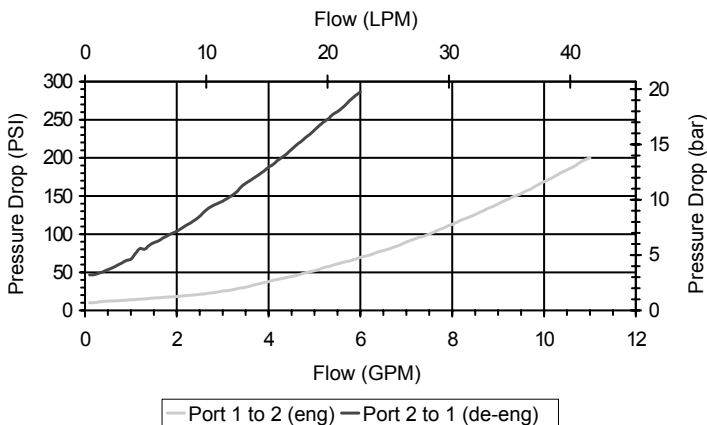
**HYDRAULIC SYMBOL**



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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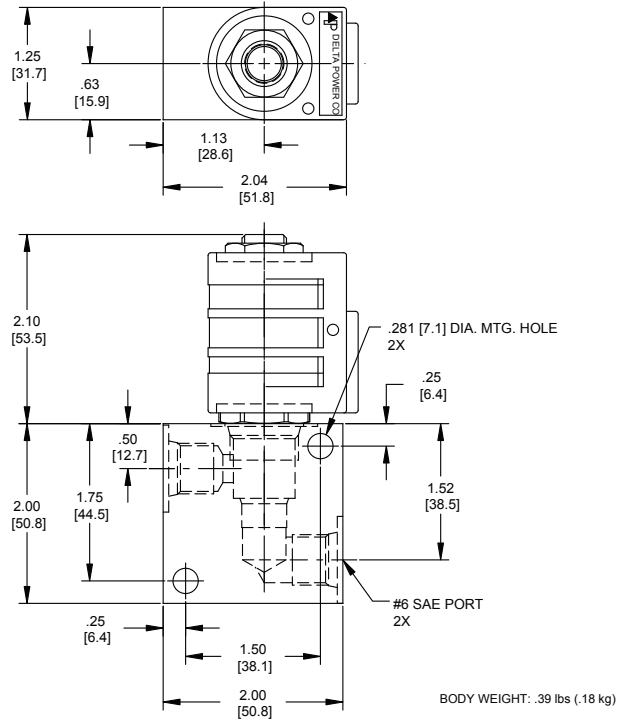
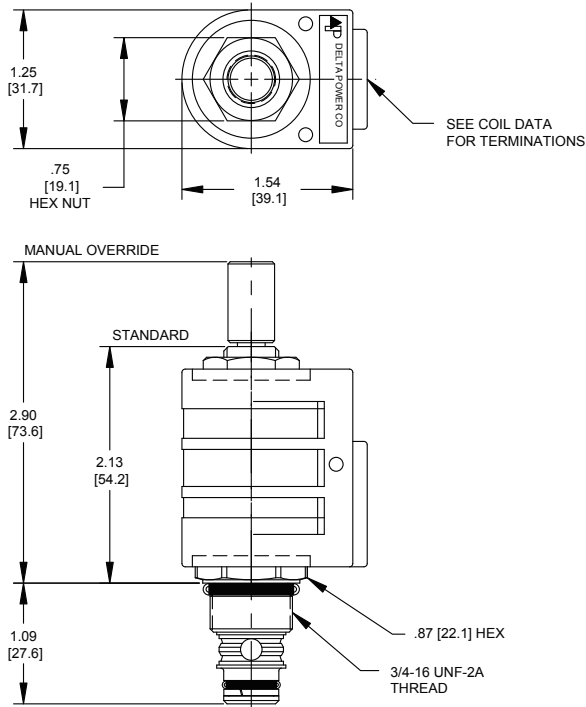


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# SOLENOID OPERATED DIRECTIONAL CONTROLS

## 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)**

**"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

### BODIES

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

### VOLTAGE

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

### IMMERSION PROOF "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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**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.

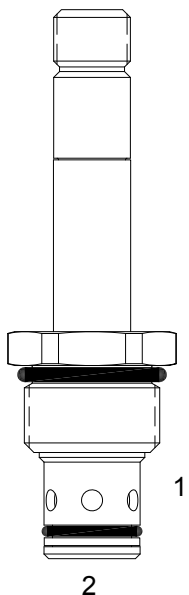
**OPERATION**

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).

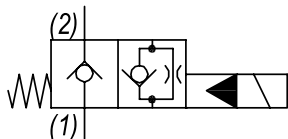
**OPERATION OF MANUAL OVERRIDE OPTION:** to override, turn the manual override screw counterclockwise. To release turn the manual override screw clockwise.

**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.

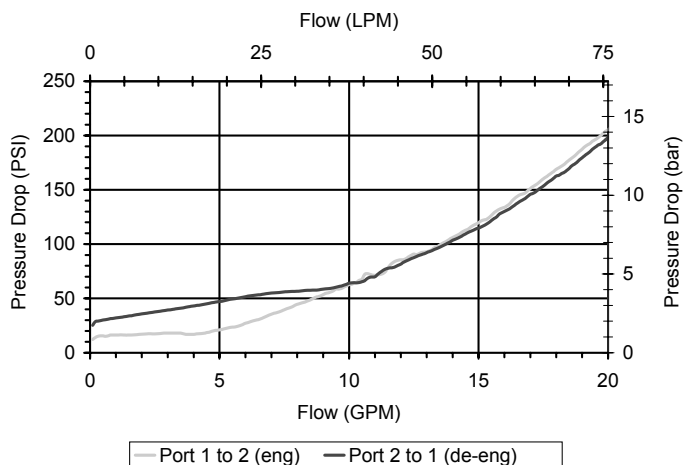


**HYDRAULIC SYMBOL**



**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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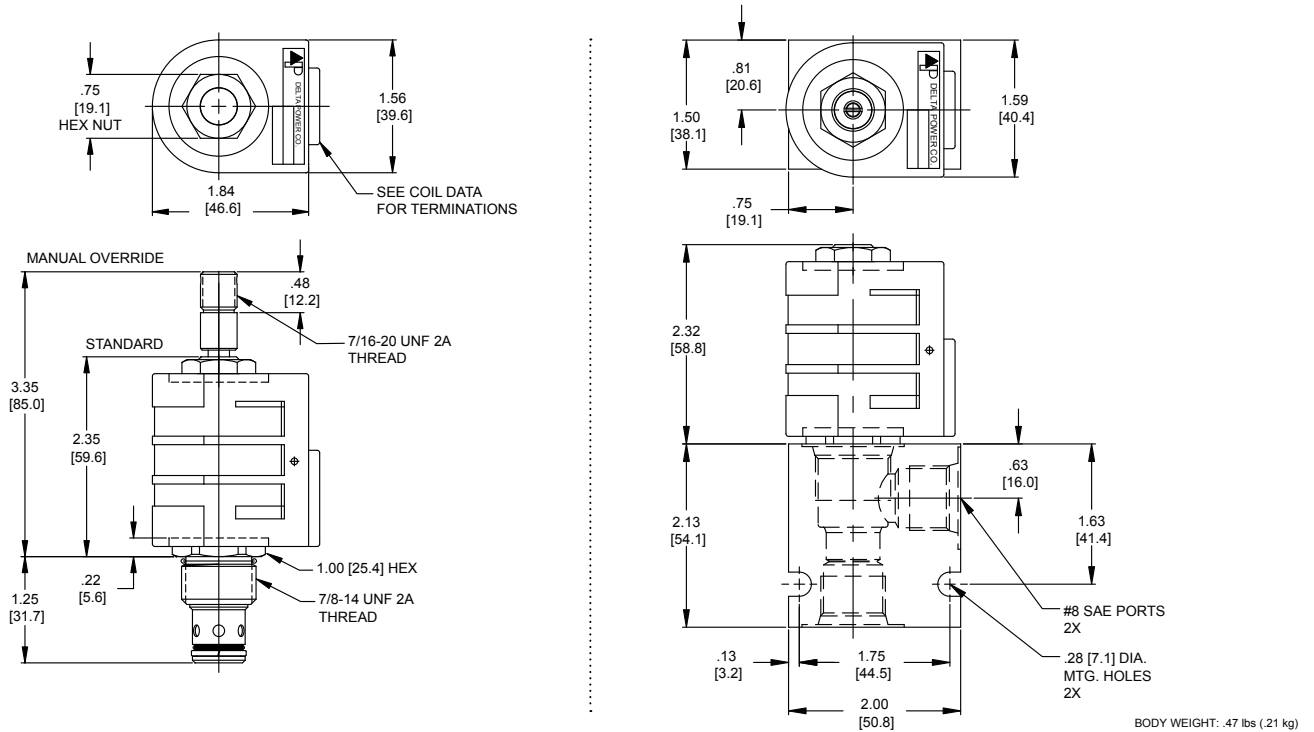
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# SOLENOID OPERATED DIRECTIONAL CONTROLS

## DIMENSIONS



## ORDERING INFORMATION

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

### DE-S2A

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

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

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

| <b>BODIES</b> |                |
|---------------|----------------|
| Blank         | Without Body   |
| <b>N</b>      | 3/8 NPTF Ports |
| <b>S</b>      | #8 SAE Ports   |

| <b>VOLTAGE</b> |         |
|----------------|---------|
| <b>06</b>      | 6 VDC   |
| <b>12</b>      | 12 VDC  |
| <b>24</b>      | 24 VDC  |
| <b>36</b>      | 36 VDC  |
| <b>48</b>      | 48 VDC  |
| <b>25</b>      | 24 VAC  |
| <b>11</b>      | 120 VAC |
| <b>22</b>      | 220 VAC |
| <b>44</b>      | 440 VAC |

|           |                          |
|-----------|--------------------------|
| <b>DL</b> | Double Lead              |
| <b>DT</b> | Deutsch on Leads DT04-2P |
| <b>ML</b> | Metri-Pack on Leads      |
| <b>PL</b> | Packard on Leads         |
| <b>WL</b> | Weatherpack on Leads     |

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

| <b>IMMERSION PROOF "D" TYPE</b> |                                     |
|---------------------------------|-------------------------------------|
| <b>IA</b>                       | "I" Coil AMP Superseal - Integral   |
| <b>ID</b>                       | "I" Coil Deutsch - Integral DT04-2P |
| <b>IJ</b>                       | "I" Coil AMP Jr. Timer - Integral   |
| <b>IM</b>                       | "I" Coil Metri-Pack - Integral      |

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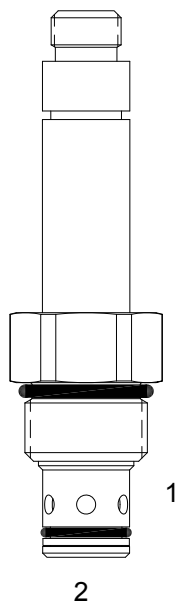


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## HE-S2A PILOT OPERATED POPPET, 2 WAY NORMALLY CLOSED



### 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.

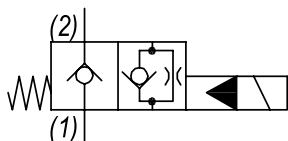
### OPERATION

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.

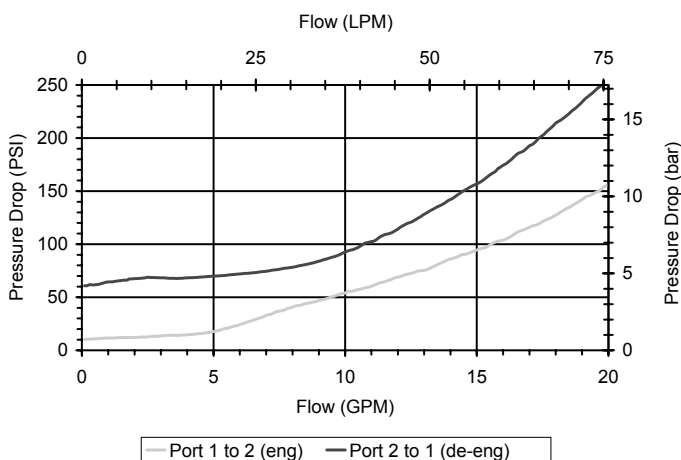
### HYDRAULIC SYMBOL



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                | 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<br>(form tool, reamer, tap) | 40500000                        |
| Seal Kit                                     | 21191200                        |

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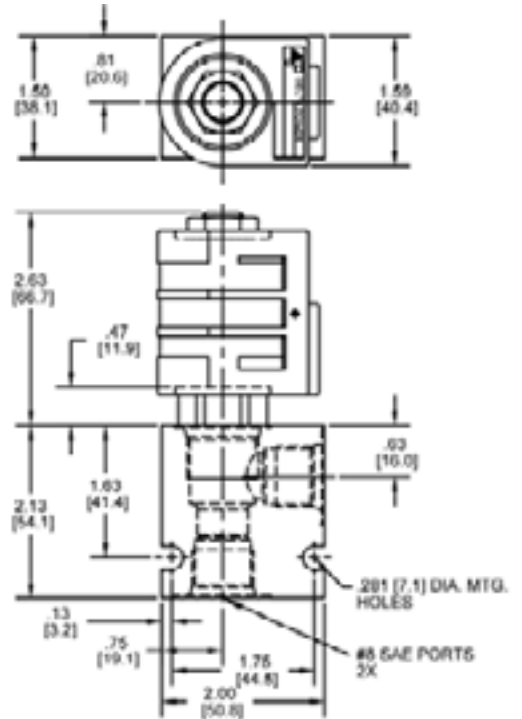
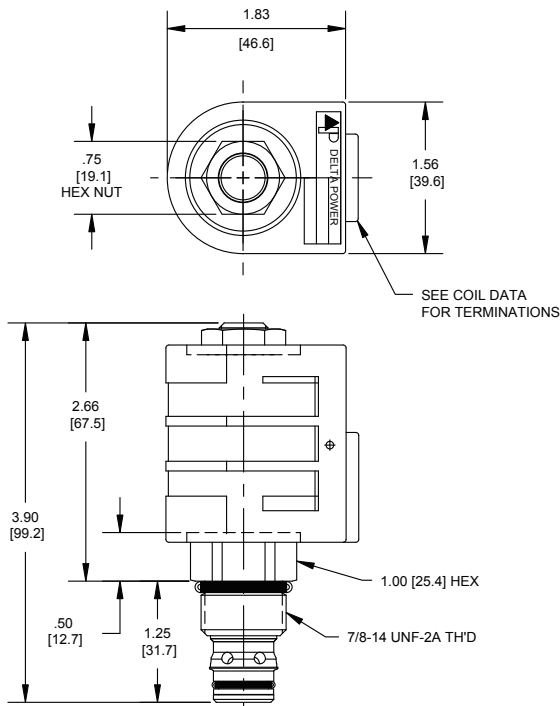


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**DIMENSIONS**



**ORDERING INFORMATION**

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

**HE-S2A**

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

- BODIES**  
 Blank Without Body  
**N** 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** 24 VAC  
**11** 120 VAC  
**22** 220 VAC  
**44** 440 VAC

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

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

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

**IMMERSION PROOF "D" TYPE**

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

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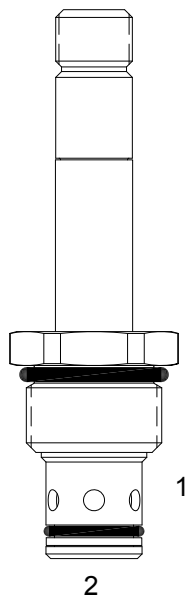


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## DE-S2F PILOT OPERATED POPPET, 2 WAY NORMALLY CLOSED, SOFT SEAT



### 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

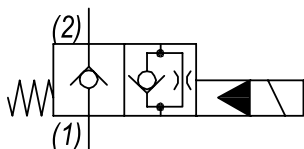
When de-energized the DE-S2F blocks flow from (1) to (2) and allows reverse flow from (2) to (1). When energized the valve allows flow from (1) to (2) but restricts reverse flow from (2) to (1).

**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.

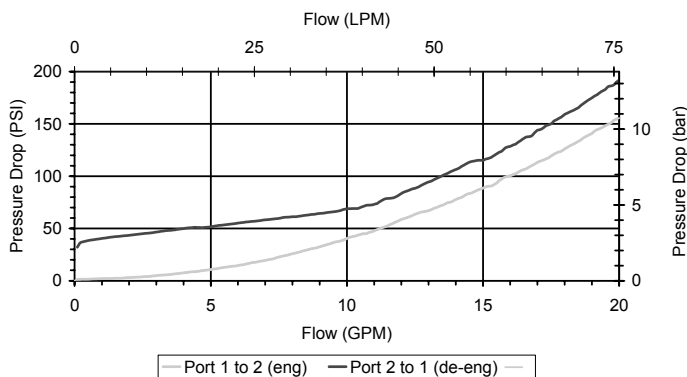
### HYDRAULIC SYMBOL



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                        |

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



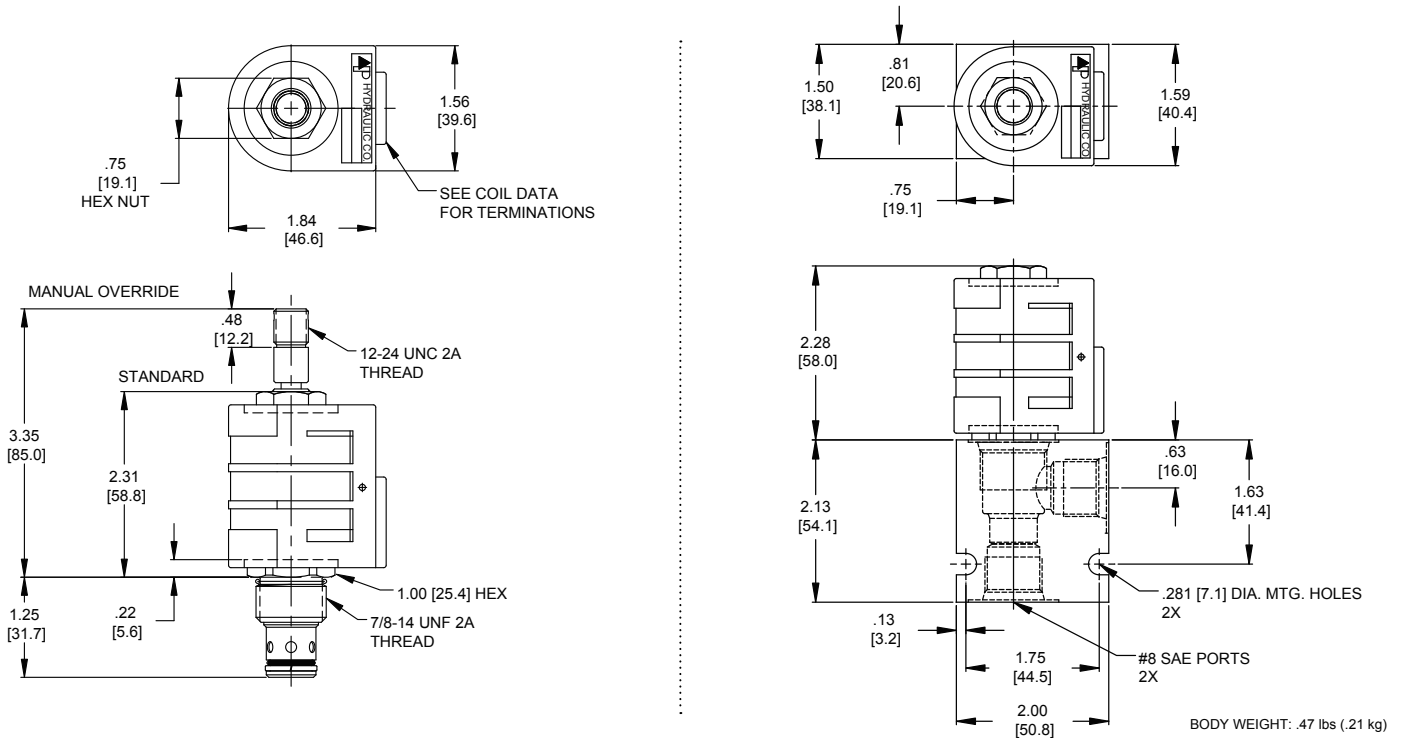
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# SOLENOID OPERATED DIRECTIONAL CONTROLS

## DIMENSIONS



## ORDERING INFORMATION

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

### DE-S2F

#### OPTIONS

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

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

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

|                                    |
|------------------------------------|
| <b>DL</b> Double Lead              |
| <b>DT</b> Deutsch on Leads DT04-2P |
| <b>ML</b> Metri-Pack on Leads      |
| <b>PL</b> Packard on Leads         |
| <b>WL</b> Weatherpack on Leads     |

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

#### BODIES

|                           |
|---------------------------|
| <b>Blank</b> Without Body |
| <b>N</b> 3/8 NPTF Ports   |
| <b>S</b> #8 SAE Ports     |

#### VOLTAGE

|                   |
|-------------------|
| <b>06</b> 6 VDC   |
| <b>12</b> 12 VDC  |
| <b>24</b> 24 VDC  |
| <b>36</b> 36 VDC  |
| <b>48</b> 48 VDC  |
| <b>25</b> 24 VAC  |
| <b>11</b> 120 VAC |
| <b>22</b> 220 VAC |
| <b>44</b> 440 VAC |

#### IMMERSION PROOF "D" TYPE

|   |
|---|
| <b>IA</b> "I" Coil AMP Superseal - Integral   |
| <b>ID</b> "I" Coil Deutsch - Integral DT04-2P |
| <b>IJ</b> "I" Coil AMP Jr. Timer - Integral   |
| <b>IM</b> "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.

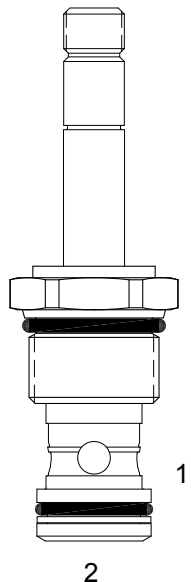
### OPERATION

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).

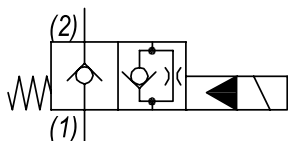
**OPERATION OF MANUAL OVERRIDE OPTION:** to override, pull knob out. On the detented version, after pulling knob out twist 180 degrees and release. The valve will remain in that position.

### 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.

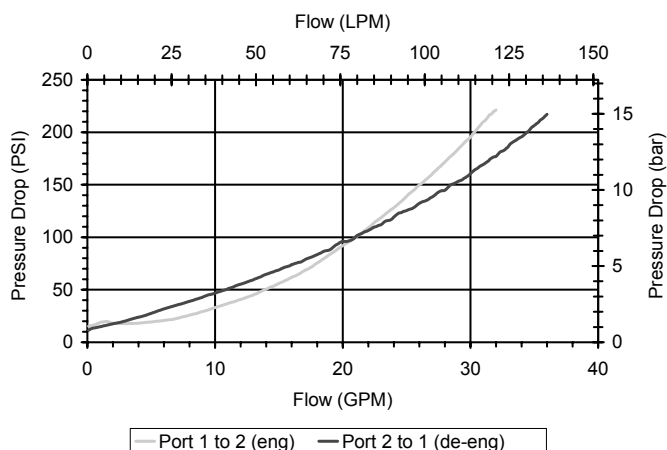


### HYDRAULIC SYMBOL



### 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      | 70 ft-lbs (94.9 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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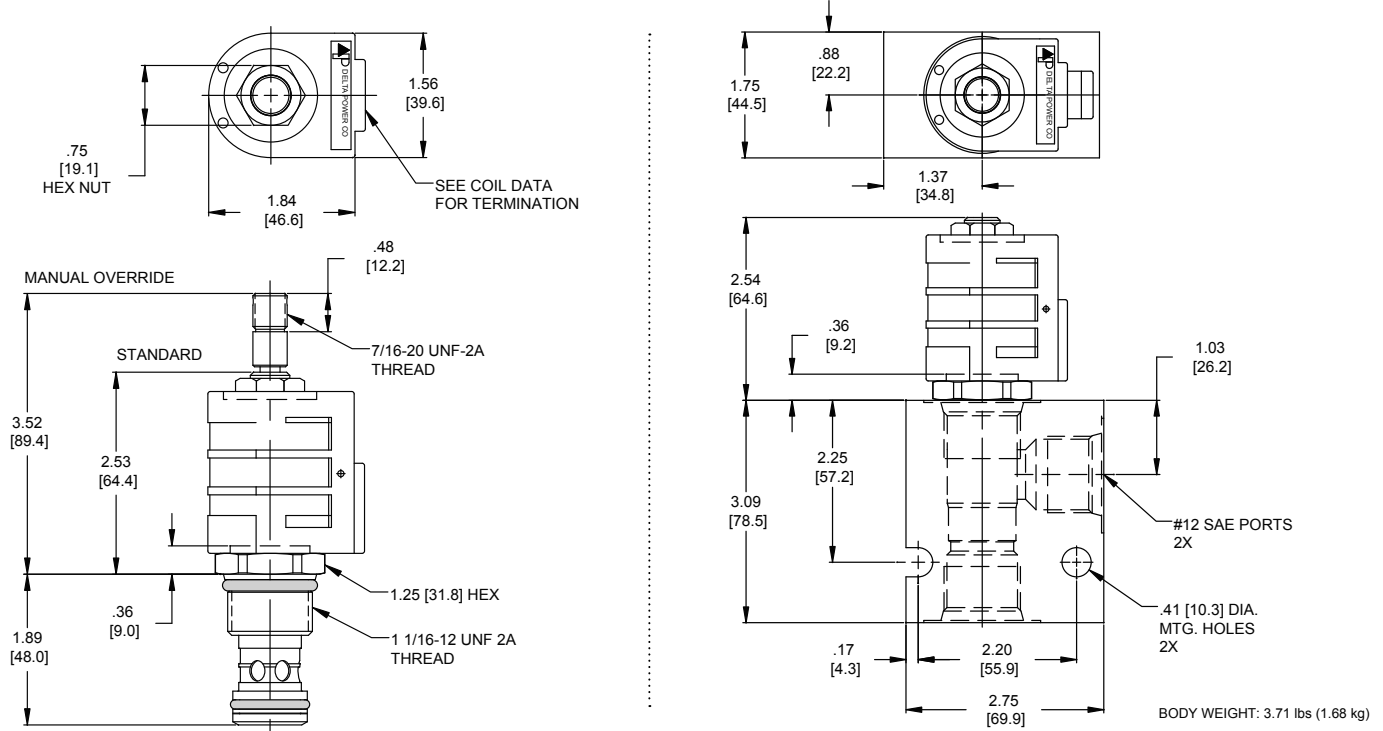


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# SOLENOID OPERATED DIRECTIONAL CONTROLS

## DIMENSIONS



## ORDERING INFORMATION

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

TT-S2A - - - -

### OPTIONS

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

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

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

### BODIES

|          |               |
|----------|---------------|
| Blank    | Without Body  |
| <b>S</b> | #12 SAE Ports |

### VOLTAGE

|           |         |
|-----------|---------|
| <b>06</b> | 6 VDC   |
| <b>12</b> | 12 VDC  |
| <b>24</b> | 24 VDC  |
| <b>36</b> | 36 VDC  |
| <b>48</b> | 48 VDC  |
| <b>25</b> | 24 VAC  |
| <b>11</b> | 120 VAC |
| <b>22</b> | 220 VAC |
| <b>44</b> | 440 VAC |

### IMMERSION PROOF "D" TYPE

|                                    |  |   |
|------------------------------------|--|---|
| <b>DL</b> Double Lead              | <b>SS</b> Single Spade                     | <b>IA</b> "I" Coil AMP Superseal - Integral   |
| <b>DT</b> Deutsch on Leads DT04-2P | <b>DS</b> Double Spade                     | <b>ID</b> "I" Coil Deutsch - Integral DT04-2P |
| <b>ML</b> Metri-Pack on Leads      | <b>HC</b> DIN 43650 (Hirschmann) - (AC&DC) | <b>IJ</b> "I" Coil AMP Jr. Timer - Integral   |
| <b>PL</b> Packard on Leads         | <b>CL</b> Conduit Lead - (AC Only)         | <b>IM</b> "I" Coil Metri-Pack - Integral      |
| <b>WL</b> Weatherpack on Leads     | <b>DI</b> Deutsch - Integral DT04-2P       |   |

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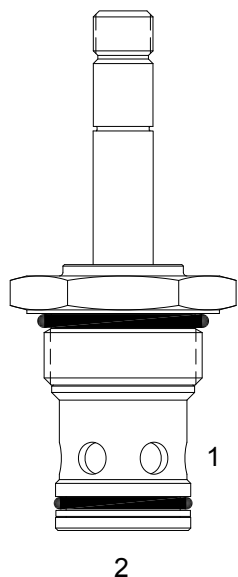


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**SJ-S2A PILOT OPERATED POPPET, 2 WAY NORMALLY CLOSED**



**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**

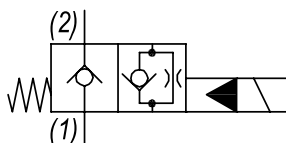
When de-energized the SJ-S2A blocks flow from (1) to (2) and allows reverse flow from (2) to (1). When energized the valve allows flow from (1) to (2) and restricted flow from (2) to (1).

**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**

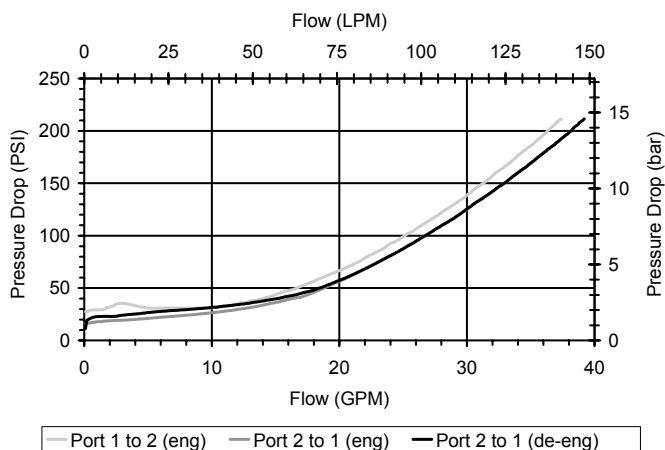
- Hardened parts for long life.
- Efficient wet-armature construction.
- Cartridges are voltage interchangeable.
- Manual override option.
- Industry common cavity.
- Unitized, molded coil design.
- Continuous duty rated solenoid.
- Optional coil voltages and terminations.
- Optional "I" Coil: Weatherproof,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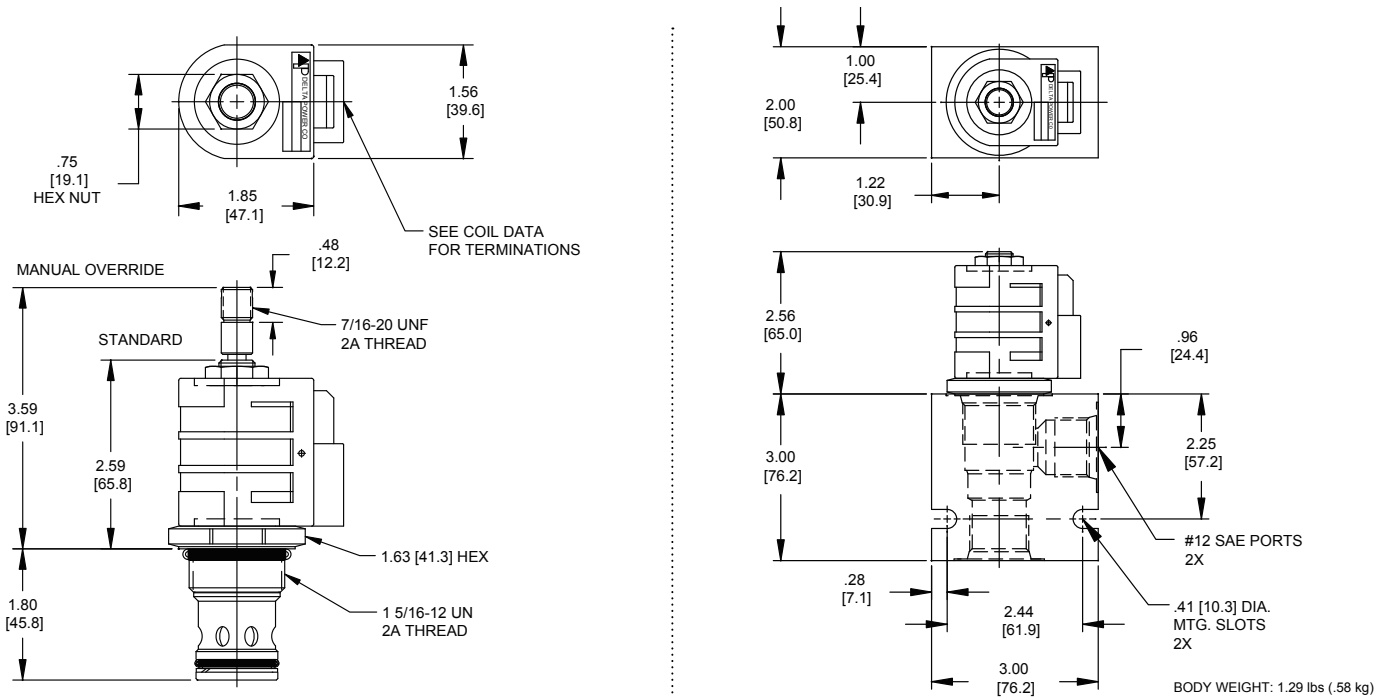
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# SOLENOID OPERATED DIRECTIONAL CONTROLS

## DIMENSIONS



## ORDERING INFORMATION

Approximate Coil Weight: .74 lbs (.33 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** 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** 24 VAC
- 11** 120 VAC
- 22** 220 VAC
- 44** 440 VAC

### "D" COIL TERMINATION

(All DC Except as Noted)

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

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

### IMMERSION PROOF "D" TYPE

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

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## HJ-S2A PILOT OPERATED POPPET, 2 WAY NORMALLY CLOSED

### DESCRIPTION

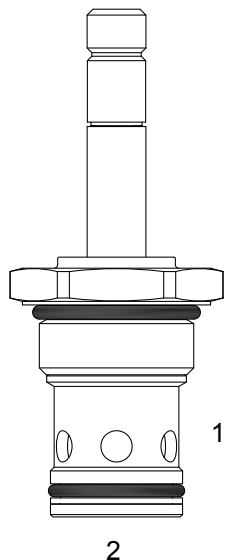
"High Pressure" 16 size, 1 5/16-12 thread, "Super" series, solenoid operated, 2 way normally closed, pilot operated poppet valve with reverse flow de-energized.

### OPERATION

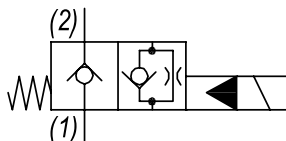
When de-energized the HJ-S2A blocks flow from (1) to (2) and allows reverse flow from (2) to (1). When energized the valve allows flow from (1) to (2) and restricted flow from (2) to (1).

### 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.

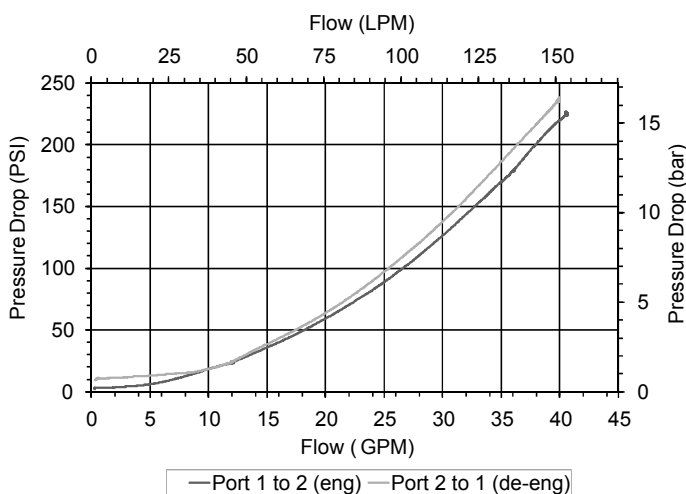


### HYDRAULIC SYMBOL



### 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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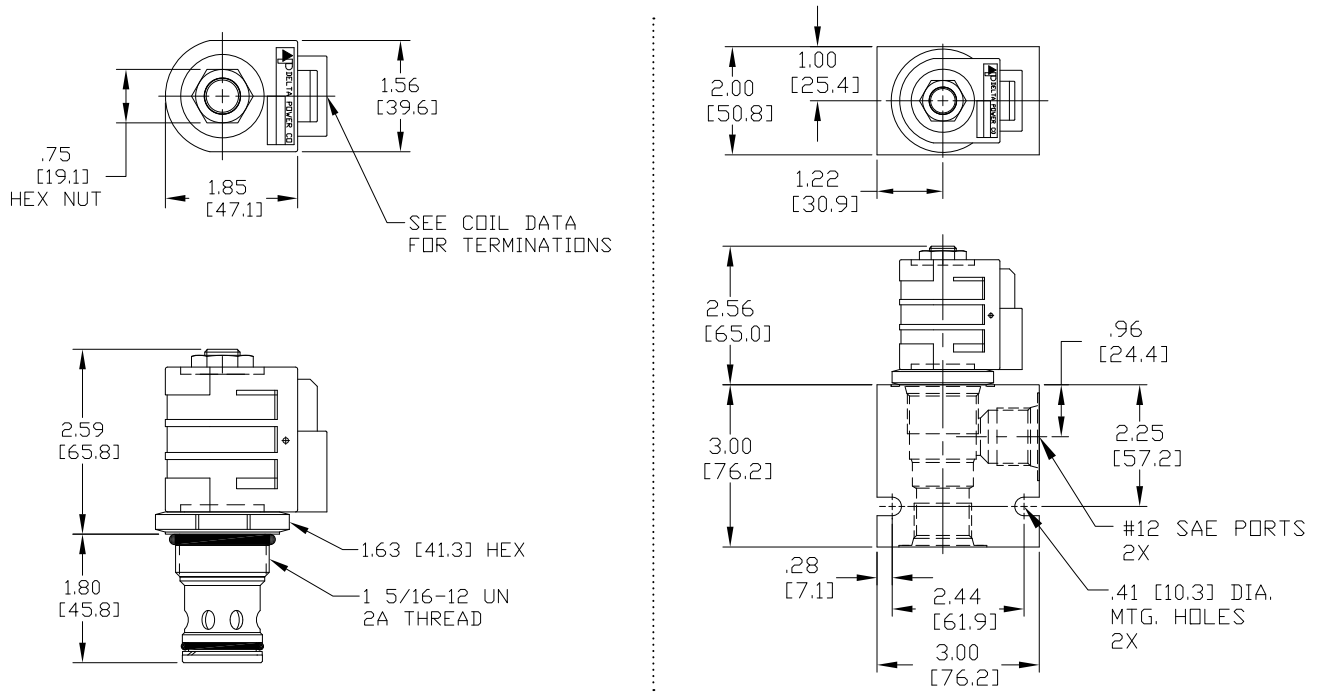


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**DIMENSIONS**



**ORDERING INFORMATION**

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

|                       |    |                    |
|-----------------------|----|--------------------|
| <b>HJ-S2A</b> - - - - |    |                    |
| <b>OPTIONS</b>        |    | <b>BODIES</b>      |
| Buna Standard         | 00 | Blank Without Body |
| Viton Standard        | V0 | N 3/4 NPT Ports    |
|                       |    | S #12 SAE Ports    |
|                       |    | <b>VOLTAGE</b>     |
|                       |    | 06 6 VDC           |
|                       |    | 12 12 VDC          |
|                       |    | 24 24 VDC          |
|                       |    | 36 36 VDC          |
|                       |    | 48 48 VDC          |
|                       |    | 25 24 VAC          |
|                       |    | 11 120 VAC         |
|                       |    | 22 220 VAC         |
|                       |    | 44 440 VAC         |

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

**“D” COIL TERMINATION**  
(All DC Except as Noted)

- |                                    |  |
|------------------------------------|--|
| <b>DL</b> Double Lead              | <b>SS</b> Single Spade                     |
| <b>DT</b> Deutsch on Leads DT04-2P | <b>DS</b> Double Spade                     |
| <b>ML</b> Metri-Pack on Leads      | <b>HC</b> DIN 43650 (Hirschmann) - (AC&DC) |
| <b>PL</b> Packard on Leads         | <b>CL</b> Conduit Lead - (AC Only)         |
| <b>WL</b> Weatherpack on Leads     | <b>DI</b> Deutsch - Integral DT04-2P       |

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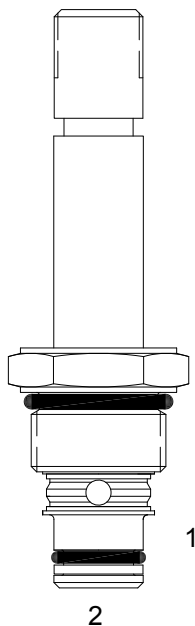


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**PB-S2B PILOT OPERATED POPPET, 2 WAY NORMALLY CLOSED**



**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**

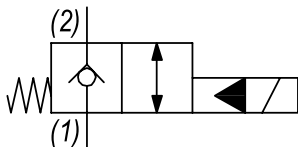
When de-energized the PB-S2B blocks flow from (1) to (2) and allows reverse flow from (2) to (1). When energized the valve allows flow from (1) to (2) and (2) to (1).

**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**

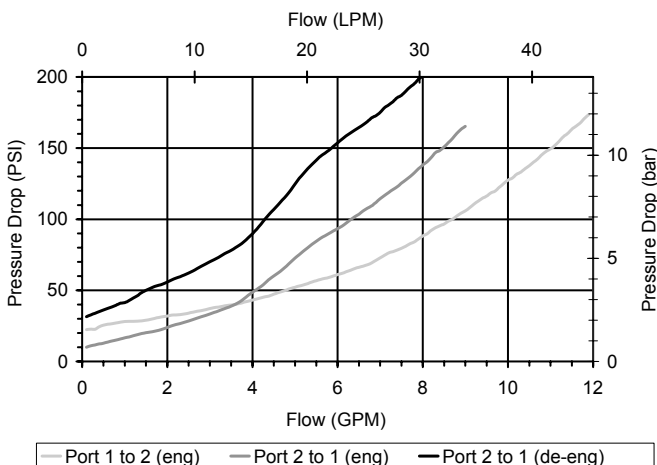
- Hardened parts for long life.
- Efficient wet-armature construction.
- Cartridges are voltage interchangeable.
- Manual override option.
- Industry common cavity.
- Unitized, molded coil design.
- Continuous duty rated solenoid.
- Optional coil voltages and terminations.
- Optional "I" Coil: Weatherproof,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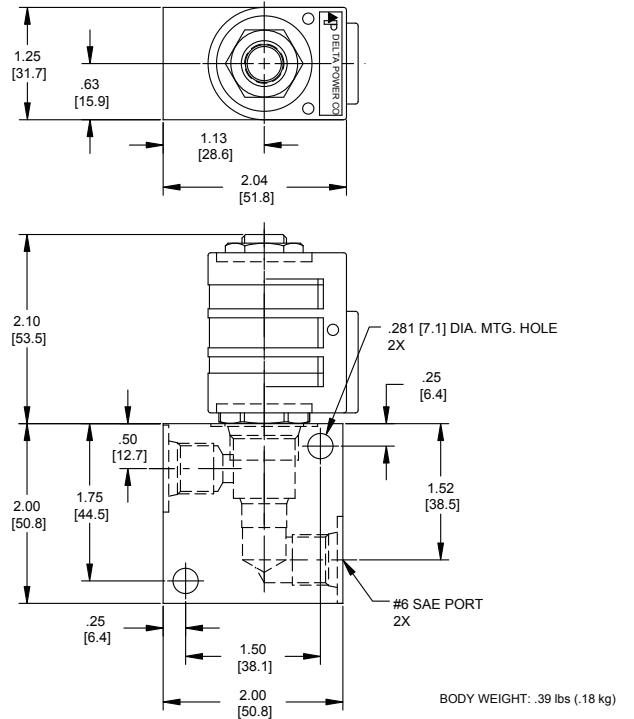
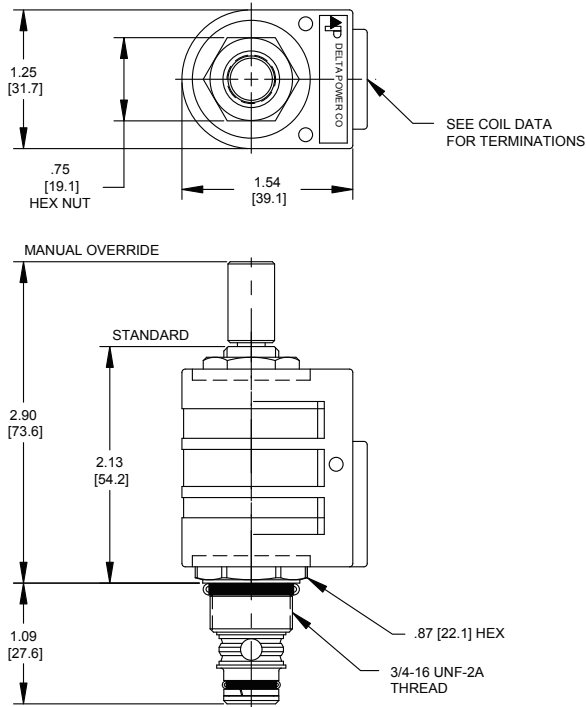
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# SOLENOID OPERATED DIRECTIONAL CONTROLS

## DIMENSIONS



## ORDERING INFORMATION

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

### PB-S2B

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

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

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

|                                    |
|------------------------------------|
| <b>DL</b> Double Lead              |
| <b>DT</b> Deutsch on Leads DT04-2P |
| <b>ML</b> Metri-Pack on Leads      |
| <b>PL</b> Packard on Leads         |
| <b>WL</b> Weatherpack on Leads     |

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

| BODIES       |                |
|--------------|----------------|
| <b>Blank</b> | Without Body   |
| <b>N</b>     | 1/4 NPTF Ports |
| <b>S</b>     | #6 SAE Ports   |

| VOLTAGE   |         |
|-----------|---------|
| <b>06</b> | 6 VDC   |
| <b>12</b> | 12 VDC  |
| <b>24</b> | 24 VDC  |
| <b>36</b> | 36 VDC  |
| <b>48</b> | 48 VDC  |
| <b>25</b> | 24 VAC  |
| <b>11</b> | 120 VAC |
| <b>22</b> | 220 VAC |
| <b>44</b> | 440 VAC |

| IMMERSION PROOF "P" TYPE |                                     |
|--------------------------|-------------------------------------|
| <b>IA</b>                | "I" Coil AMP Superseal - Integral   |
| <b>ID</b>                | "I" Coil Deutsch - Integral DT04-2P |
| <b>IJ</b>                | "I" Coil AMP Jr. Timer - Integral   |
| <b>IM</b>                | "I" Coil Metri-Pack - Integral      |

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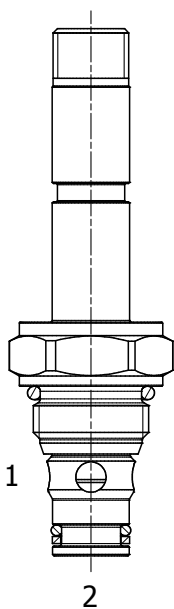


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**HB-S2B** PILOT OPERATED, 2 WAY NORMALLY CLOSED WITH FREE REVERSED FLOW



**DESCRIPTION**

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

**OPERATION**

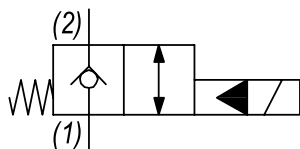
When de-energized the HB-S2B blocks flow from (1) to (2) and allows reverse flow from (2) to (1). When energized the valve allows flow from (1) to (2) and from (2) to (1).

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

**FEATURES**

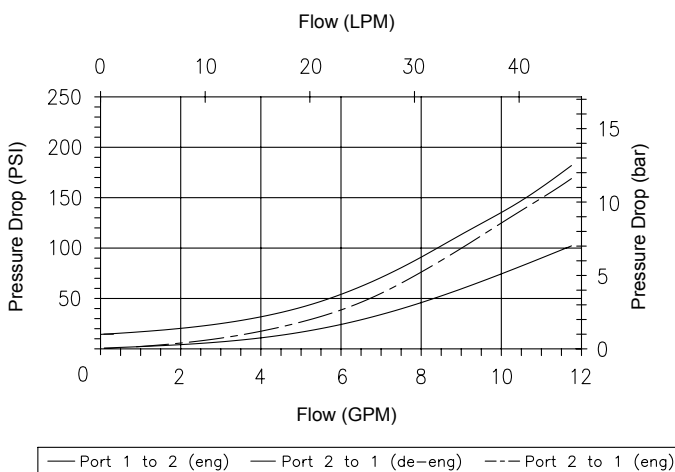
- Hardened parts for long life.
- Efficient wet-armature construction.
- Cartridges are voltage interchangeable.
- Industry common cavity.
- Unitized, molded coil design.
- Continuous duty rated solenoid.
- Optional coil voltages and terminations.
- Optional "I" Coil: Weatherproof, Thermal Shock, Immersion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

**HYDRAULIC SYMBOL**



**PERFORMANCE**

Actual Test Data (Cartridge Only)



**VALVE SPECIFICATIONS**

|                                    |  |
|------------------------------------|--|
| Nominal Flow                       | 12 GPM (45 LPM)  |
| Rated Operating Pressure           | 5000 PSI (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)<br>BUNA seals<br>-4° to 250°F (-20° to 120°C)<br>VITON seals |
| Weight                             | .29 lbs (.13 kg)   |
| Operating Fluid Media              | General Purpose Hydraulic Fluid  |
| Cartridge Torque Requirements      | 35 ft-lbs (47 Nm)  |
| Coil Nut Torque Requirements       | 4-6 ft-lbs (5.4-8.1 Nm)  |
| Cavity                             | POWER 2W   |
| Cavity Tools Kit                   | 40500005   |
| Seal Kit                           | 21191100   |

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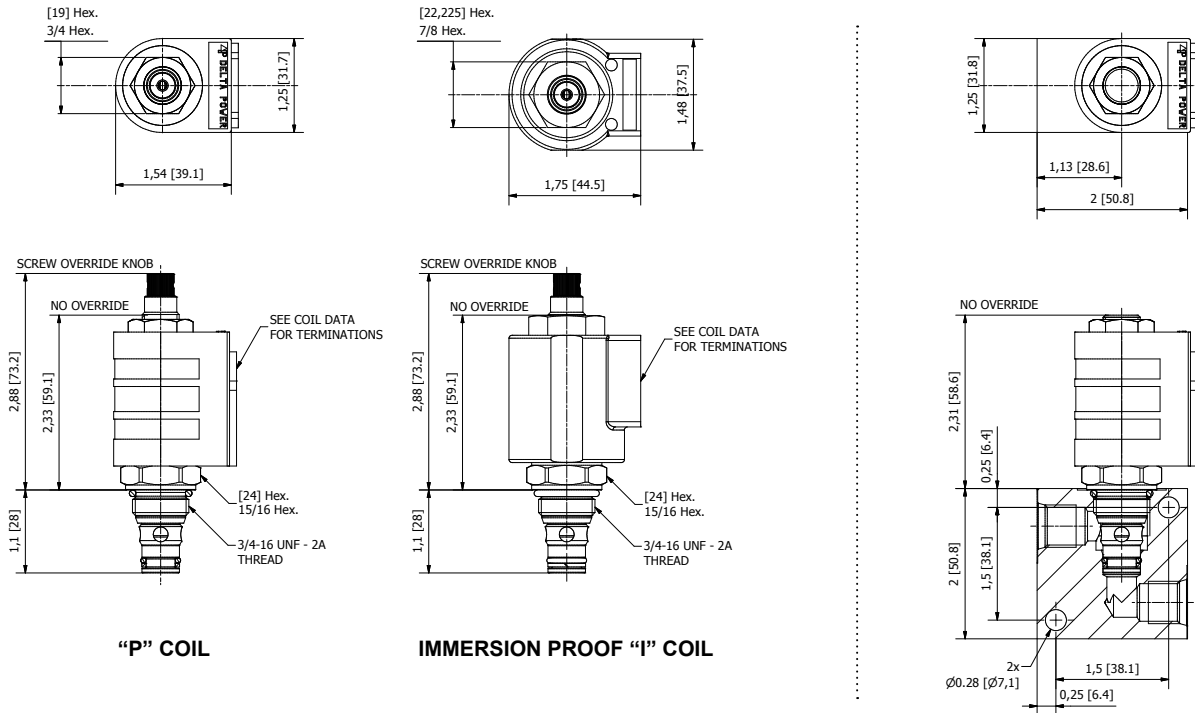


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# SOLENOID OPERATED DIRECTIONAL CONTROLS

## DIMENSIONS



## ORDERING INFORMATION

HB-S2B - - - -

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

| OPTIONS                 |    |
|-------------------------|----|
| Buna Standard           | 00 |
| Viton Standard          | V0 |
| Buna, Override          | 0M |
| Viton, Override         | VM |
| Buna, Screen            | A0 |
| Viton, Screen           | W0 |
| Buna, Screen, Override  | B4 |
| Viton, Screen, Override | V4 |

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

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

Note: Aluminum Body Not durability rated for 5000 PSI (345 bar), consult factory for high pressure body options.

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

### '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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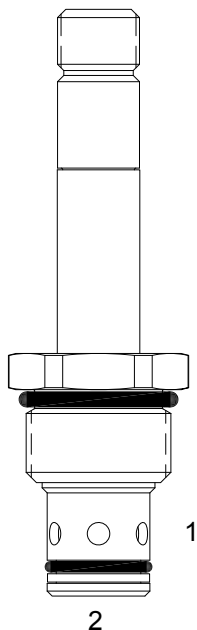


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**DE-S2B PILOT OPERATED POPPET, 2 WAY NORMALLY CLOSED**



**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**

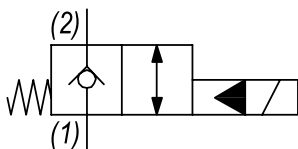
When de-energized the DE-S2B acts as a check valve, allowing flow to pass from (2) to (1), while blocking flow from (1) to (2). When energized the valve opens allowing flow to pass from (1) to (2).

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

**FEATURES**

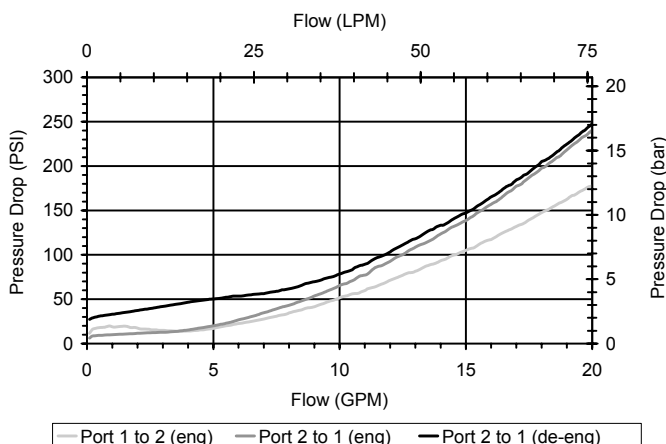
- Hardened parts for long life.
- Efficient wet-armature construction.
- Cartridges are voltage interchangeable.
- Manual override option.
- Industry common cavity.
- Unitized, molded coil design.
- Continuous duty rated solenoid.
- Optional coil voltages and terminations.
- Optional "I" Coil: Weatherproof,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

**HYDRAULIC SYMBOL**



**PERFORMANCE**

Actual Test Data (Cartridge Only)



**VALVE SPECIFICATIONS**

|                                    |                                 |
|------------------------------------|---------------------------------|
| Nominal Flow                       | 15 GPM (57 LPM)                 |
| Rated Operating Pressure           | 3500 PSI (241 bar)              |
| Typical Internal Leakage (150 SSU) | 0-5 drops/min                   |
| Viscosity Range                    | 36 to 3000 SSU (3 to 647 cSt)   |
| Filtration                         | ISO 18/16/13                    |
| Media Operating 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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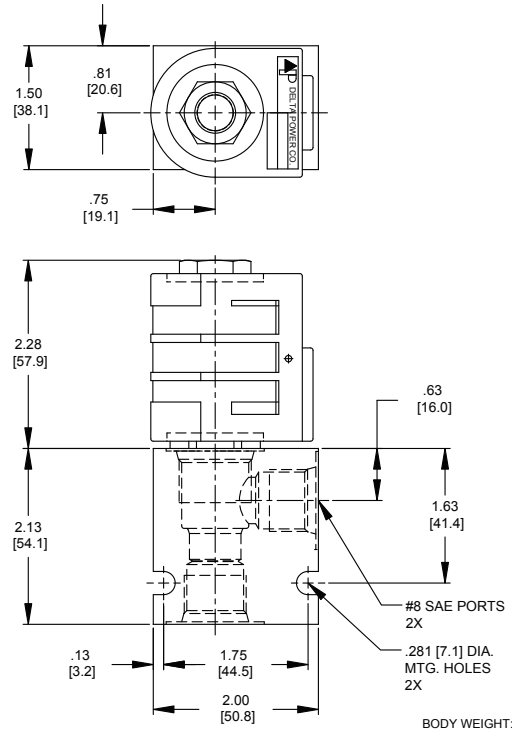
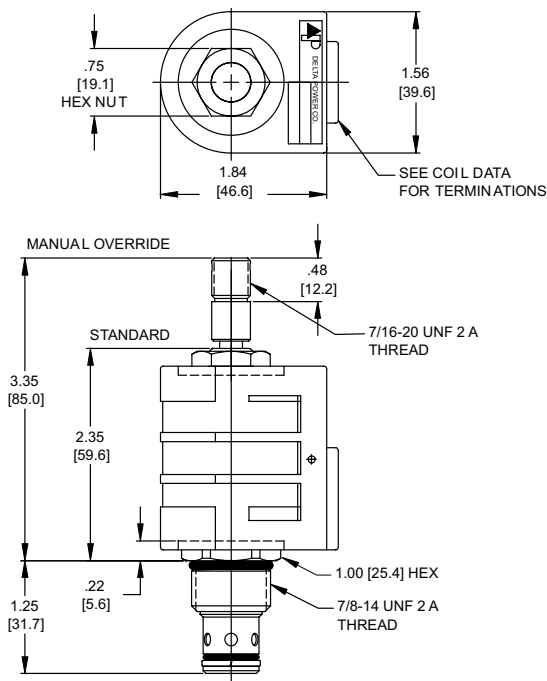
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# SOLENOID OPERATED DIRECTIONAL CONTROLS

## DIMENSIONS



## ORDERING INFORMATION

DE-S2B - - - -

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

### OPTIONS

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

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

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

### BODIES

|          |                |
|----------|----------------|
| Blank    | Without Body   |
| <b>N</b> | 3/8 NPTF Ports |
| <b>S</b> | #8 SAE Ports   |

### VOLTAGE

|           |         |
|-----------|---------|
| <b>06</b> | 6 VDC   |
| <b>12</b> | 12 VDC  |
| <b>24</b> | 24 VDC  |
| <b>36</b> | 36 VDC  |
| <b>48</b> | 48 VDC  |
| <b>25</b> | 24 VAC  |
| <b>11</b> | 120 VAC |
| <b>22</b> | 220 VAC |
| <b>44</b> | 440 VAC |

**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 "D" TYPE

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

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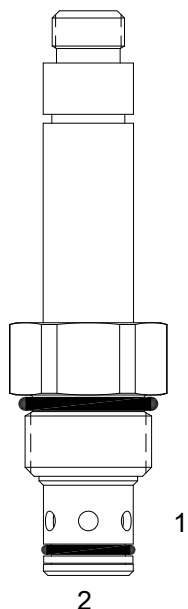


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## HE-S2B PILOT OPERATED POPPET, 2 WAY NORMALLY CLOSED



### 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.

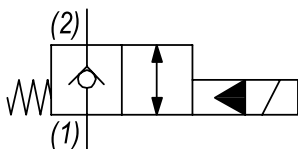
### OPERATION

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.

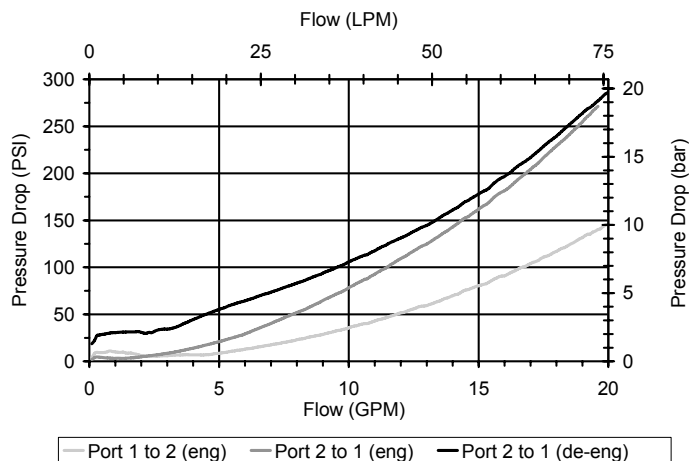
### HYDRAULIC SYMBOL



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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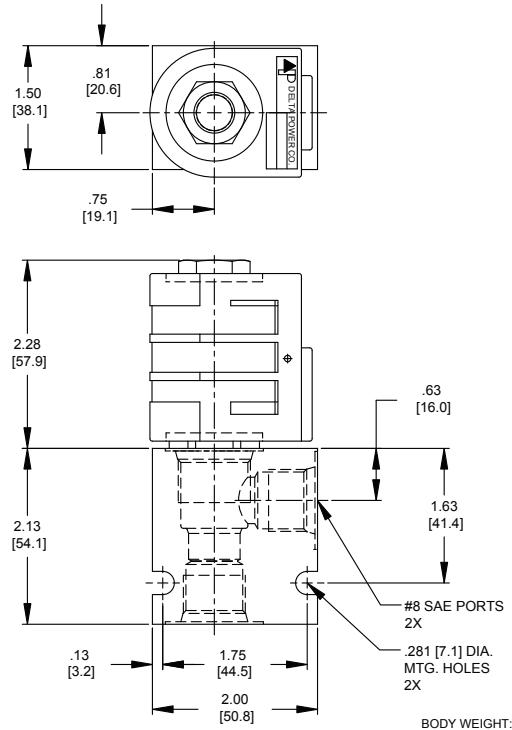
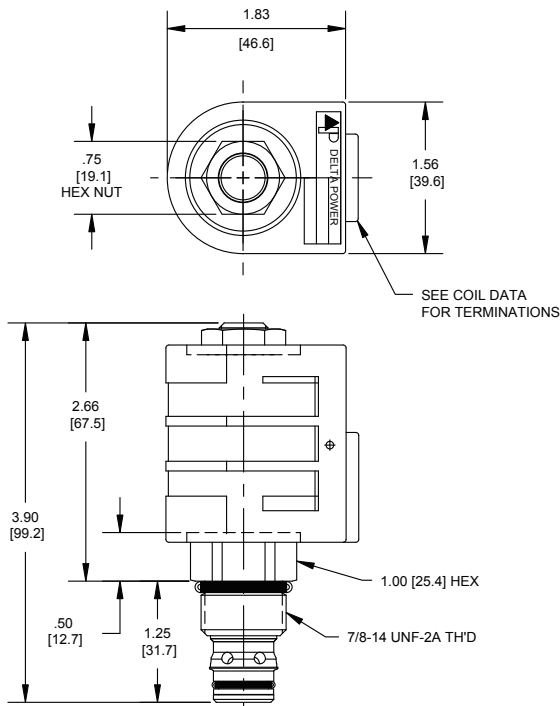
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# SOLENOID OPERATED DIRECTIONAL CONTROLS

## 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** 24 VAC  
**11** 120 VAC  
**22** 220 VAC  
**44** 440 VAC

**“L” COIL TERMINATION**  
 (All DC Except as Noted)

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

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

**IMMERSION PROOF “L” TYPE**  
**IA** “I” Coil AMP Superseal - Integral  
**ID** “I” Coil Deutsch - Integral DT04-2P  
**IJ** “I” Coil AMP Jr. Timer - Integral  
**IM** “I” Coil Metri-Pack - Integral

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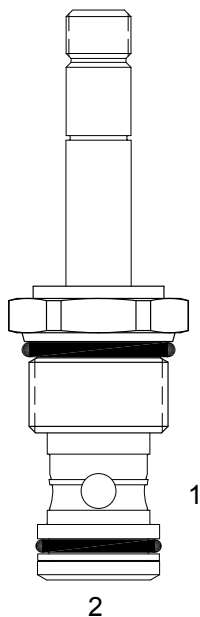


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**TT-S2B PILOT OPERATED POPPET, 2 WAY NORMALLY CLOSED**



**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**

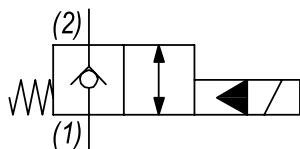
When de-energized the TT-S2B blocks flow from (1) to (2) and allows reverse flow from (2) to (1). When energized the valve allows flow from (1) to (2) and from (2) to (1).

**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**

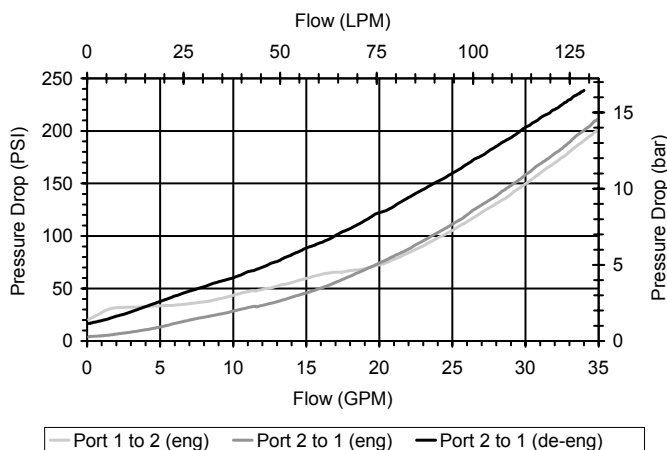
- Hardened parts for long life.
- Efficient wet-armature construction.
- Cartridges are voltage interchangeable.
- Manual override option.
- Industry common cavity.
- Unitized, molded coil design.
- Continuous duty rated solenoid.
- Optional coil voltages and terminations.
- Optional "I" Coil: Weatherproof, 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      | 70 ft-lbs (94.9 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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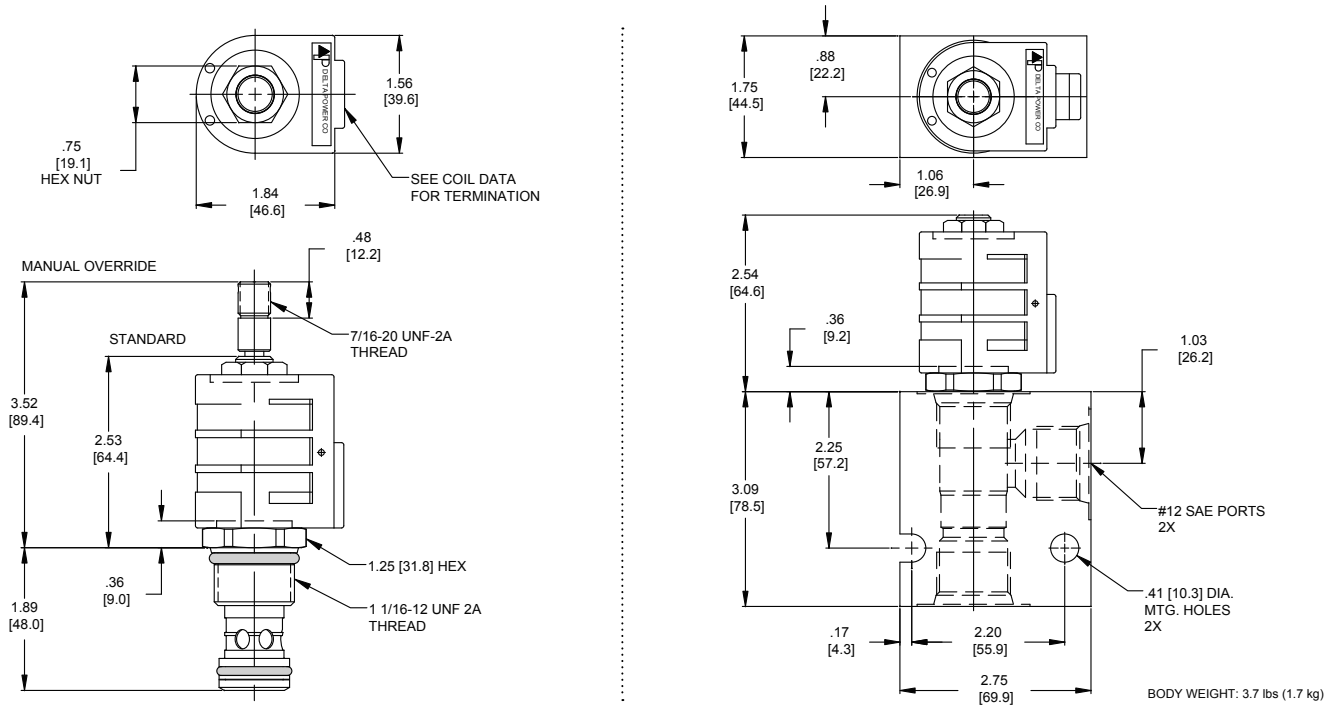
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# SOLENOID OPERATED DIRECTIONAL CONTROLS

## DIMENSIONS



## ORDERING INFORMATION

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

### TT-S2B

#### OPTIONS

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

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

#### "D" COIL TERMINATION

(All DC Except as Noted)

|                                    |
|------------------------------------|
| <b>DL</b> Double Lead              |
| <b>DT</b> Deutsch on Leads DT04-2P |
| <b>ML</b> Metri-Pack on Leads      |
| <b>PL</b> Packard on Leads         |
| <b>WL</b> Weatherpack on Leads     |

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

#### BODIES

|                           |
|---------------------------|
| <b>Blank</b> Without Body |
| <b>S</b> #12 SAE Ports    |

#### VOLTAGE

|                   |
|-------------------|
| <b>06</b> 6 VDC   |
| <b>12</b> 12 VDC  |
| <b>24</b> 24 VDC  |
| <b>36</b> 36 VDC  |
| <b>48</b> 48 VDC  |
| <b>25</b> 24 VAC  |
| <b>11</b> 120 VAC |
| <b>22</b> 220 VAC |
| <b>44</b> 440 VAC |

#### IMMERSION PROOF "D" TYPE

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

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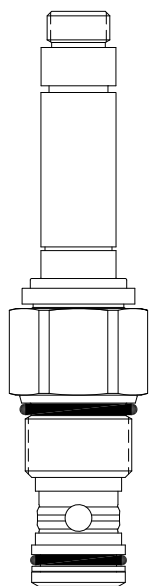


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**HT-S2B PILOT OPERATED POPPET, 2 WAY NORMALLY CLOSED**



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.

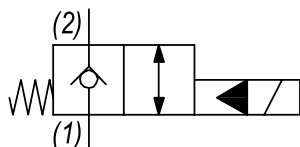
**OPERATION**

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**

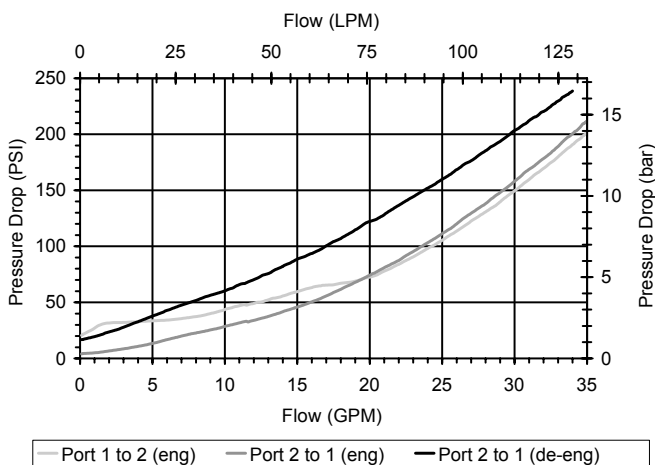
- Hardened parts for long life.
- Efficient wet-armature construction.
- Cartridges are voltage interchangeable.
- Industry common cavity.
- Unitized, molded coil design.
- Continuous duty rated solenoid.
- Optional coil voltages and terminations.

**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      | 70 ft-lbs (94.9 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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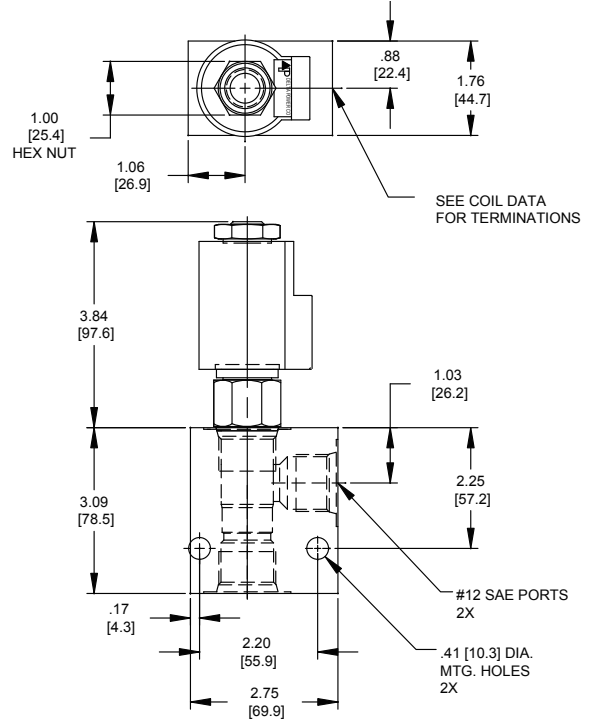
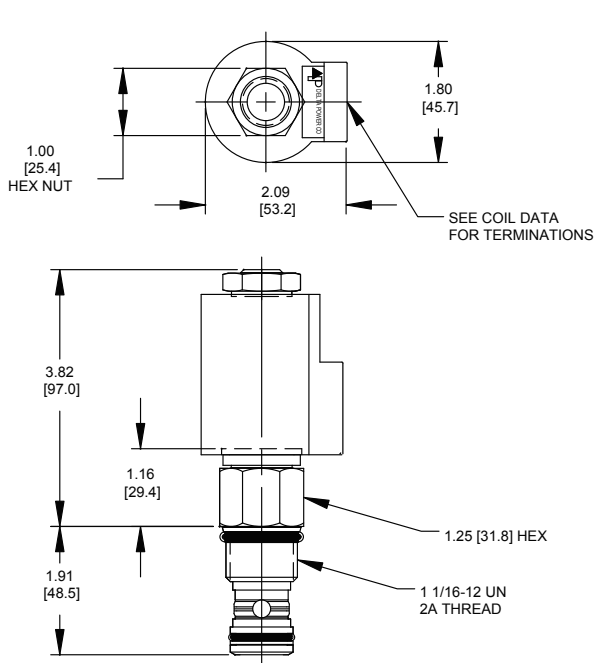


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# SOLENOID OPERATED DIRECTIONAL CONTROLS

## DIMENSIONS



BODY WEIGHT: 3.71 lbs (1.68 kg)

## ORDERING INFORMATION

Approximate Coil Weight: .89 lbs (.41 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**  
 Deutsch on Leads **DT**  
 Metri-Pack on Leads **ML**  
 Packard on Leads **PL**  
 Weatherpack on Leads **WL**  
 Double Spade **DS**  
 DIN 43650 (Hirschmann) - (AC&DC) **HC**

#### BODIES

**Blank** Without Body  
**S** #12 SAE Ports

#### VOLTAGE

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

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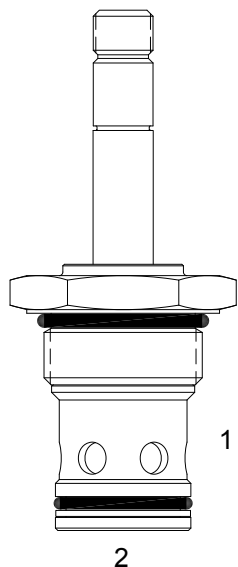


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**SJ-S2B PILOT OPERATED POPPET, 2 WAY NORMALLY CLOSED**



**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**

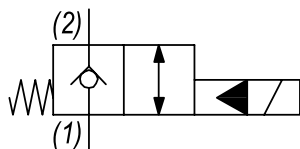
When de-energized the SJ-S2B blocks flow from (1) to (2) and allows reverse flow from (2) to (1). When energized the valve allows flow from (1) to (2) and from (2) to (1).

**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**

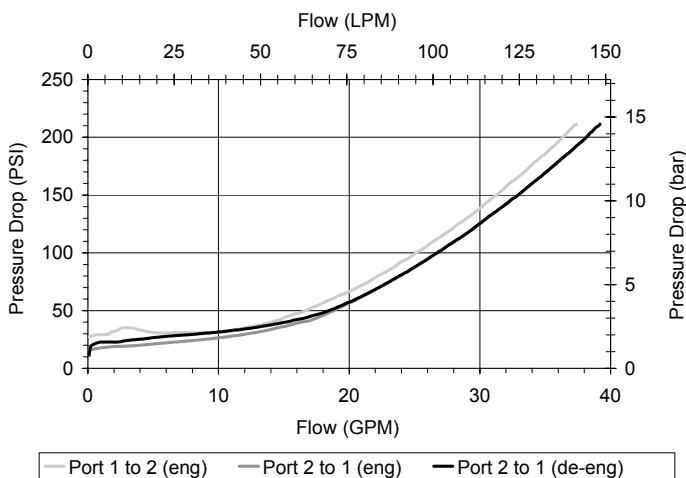
- Hardened parts for long life.
- Efficient wet-armature construction.
- Cartridges are voltage interchangeable.
- Manual override option.
- Industry common cavity.
- Unitized, molded coil design.
- Continuous duty rated solenoid.
- Optional coil voltages and terminations.
- Optional "I" Coil: Weatherproof,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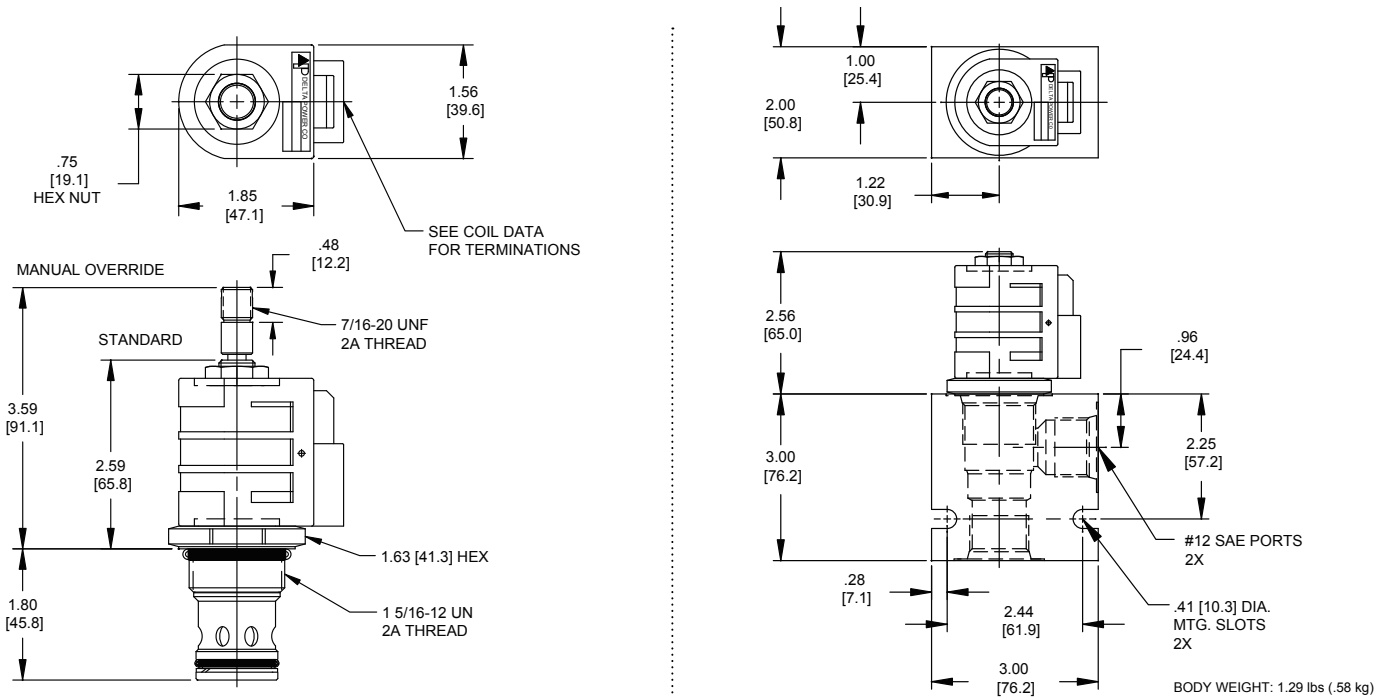
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# SOLENOID OPERATED DIRECTIONAL CONTROLS

## DIMENSIONS



## ORDERING INFORMATION

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

### SJ-S2B

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

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

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

|                                    |
|------------------------------------|
| <b>DL</b> Double Lead              |
| <b>DT</b> Deutsch on Leads DT04-2P |
| <b>ML</b> Metri-Pack on Leads      |
| <b>PL</b> Packard on Leads         |
| <b>WL</b> Weatherpack on Leads     |

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

| <b>BODIES</b>             |  |
|---------------------------|--|
| <b>Blank</b> Without Body |  |
| <b>N</b> 3/4 NPT Ports    |  |
| <b>S</b> #12 SAE Ports    |  |

| <b>VOLTAGE</b>    |  |
|-------------------|--|
| <b>06</b> 6 VDC   |  |
| <b>12</b> 12 VDC  |  |
| <b>24</b> 24 VDC  |  |
| <b>36</b> 36 VDC  |  |
| <b>48</b> 48 VDC  |  |
| <b>25</b> 24 VAC  |  |
| <b>11</b> 120 VAC |  |
| <b>22</b> 220 VAC |  |
| <b>44</b> 440 VAC |  |

| <b>IMMERSION PROOF "D" TYPE</b>               |  |
|---|--|
| <b>IA</b> "I" Coil AMP Superseal - Integral   |  |
| <b>ID</b> "I" Coil Deutsch - Integral DT04-2P |  |
| <b>IJ</b> "I" Coil AMP Jr. Timer - Integral   |  |
| <b>IM</b> "I" Coil Metri-Pack - Integral      |  |

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**SOLENOID OPERATED DIRECTIONAL CONTROLS**

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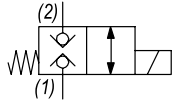
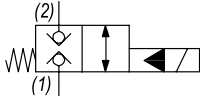
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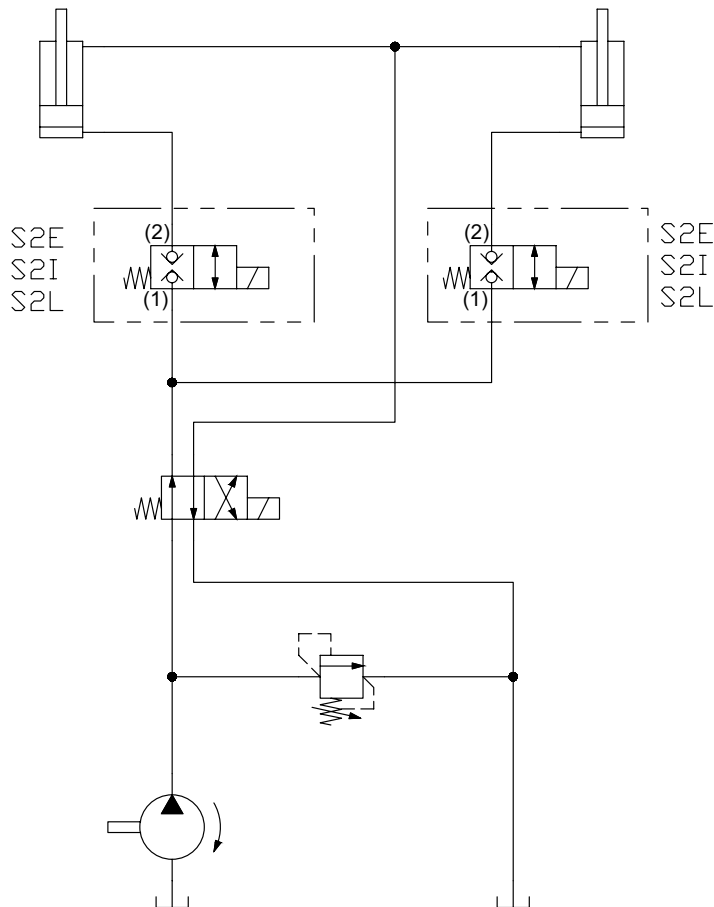
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2 WAY 2 POSITION NORMALLY CLOSED BIDIRECTIONAL POPPET VALVES

| 2W2P NORMALLY CLOSED  | GPM  | PSI  | LPM  | BAR | CAVITY | MODEL         | PAGE |
|---|------|------|------|-----|--------|---------------|------|
|  | 0.20 | 4000 | 0.76 | 276 | 5/8-18 | <b>UA-S2E</b> | SD42 |
|   | 3    | 3600 | 11   | 250 | 3/4-16 | <b>PB-S2I</b> | SD44 |
|   | 3    | 3000 | 11   | 207 | 7/8-14 | <b>DE-S2I</b> | SD46 |
|  | 12   | 5000 | 45   | 345 | 3/4-16 | <b>HB-S2L</b> | SD48 |

TYPICAL SCHEMATIC

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



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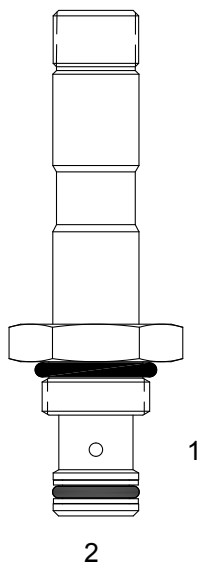


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## UA-S2E POPPET, 2 WAY, NORMALLY CLOSED, BIDIRECTIONAL



### 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).

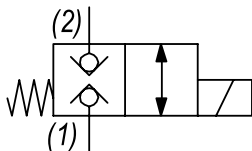
### FEATURES

- 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.



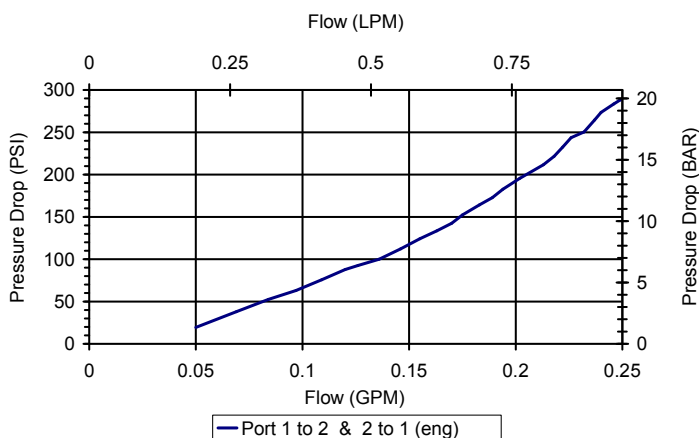
Uses "P" or "PI" type coils

### 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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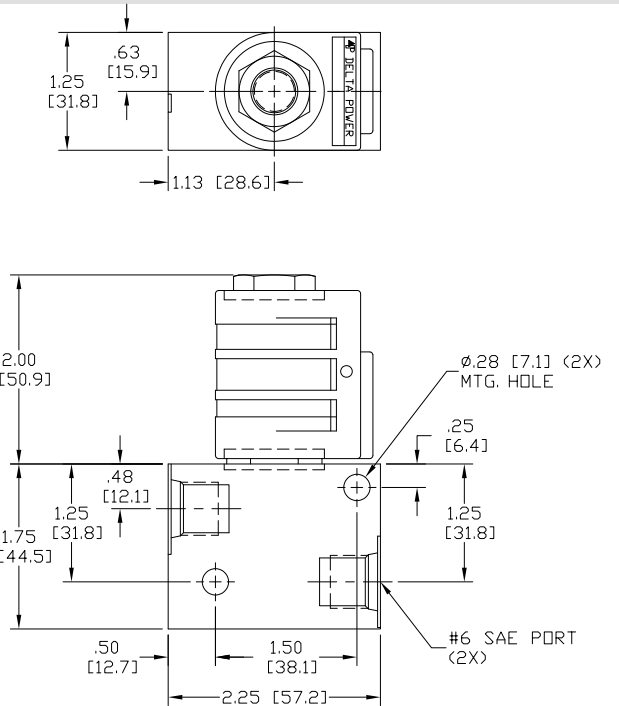
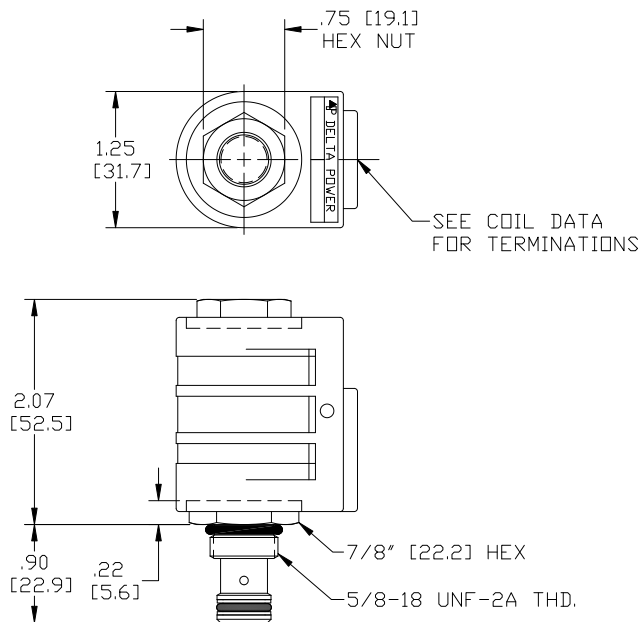
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# SOLENOID OPERATED DIRECTIONAL CONTROLS

## DIMENSIONS



BODY WEIGHT: .40 lbs [1.18 kg.]

## ORDERING INFORMATION

UA-S2E - - - -

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

- 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 NPTF Ports
  - S** #6 SAE Ports

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

**VOLTAGE**

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

**"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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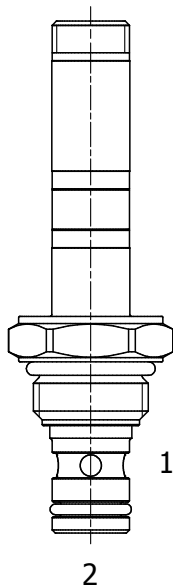


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**PB-S2I** DIRECT ACTING POPPET, 2 WAY, NORMALLY CLOSED, BIDIRECTIONAL



**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**

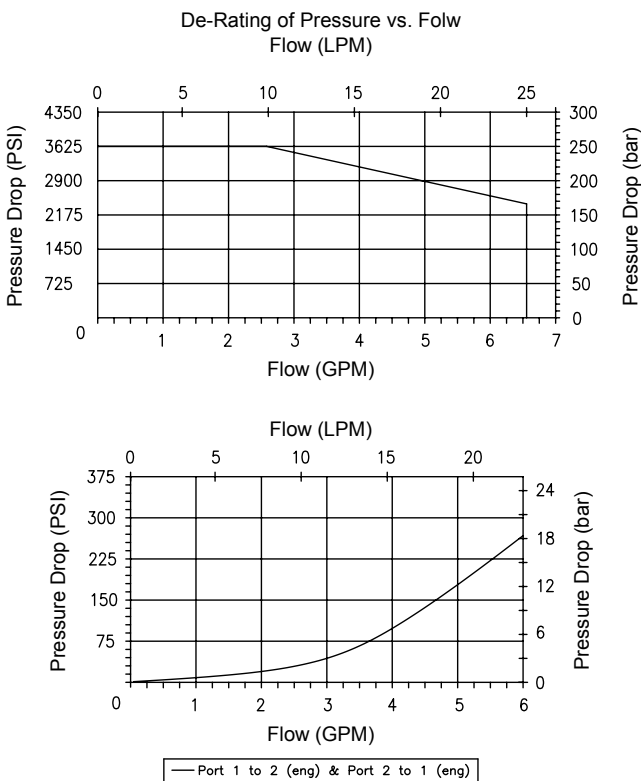
- Hardened parts for long life.
- Efficient wet-armature construction.
- Cartridges are voltage interchangeable.
- Industry common cavity.
- Unitized, molded coil design.
- Continuous duty rated solenoid.
- Optional coil voltages and terminations.



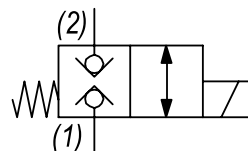
*For higher pressure and higher flow option for this function see HB-S2L*

**PERFORMANCE**

Actual Test Data (Cartridge Only)



**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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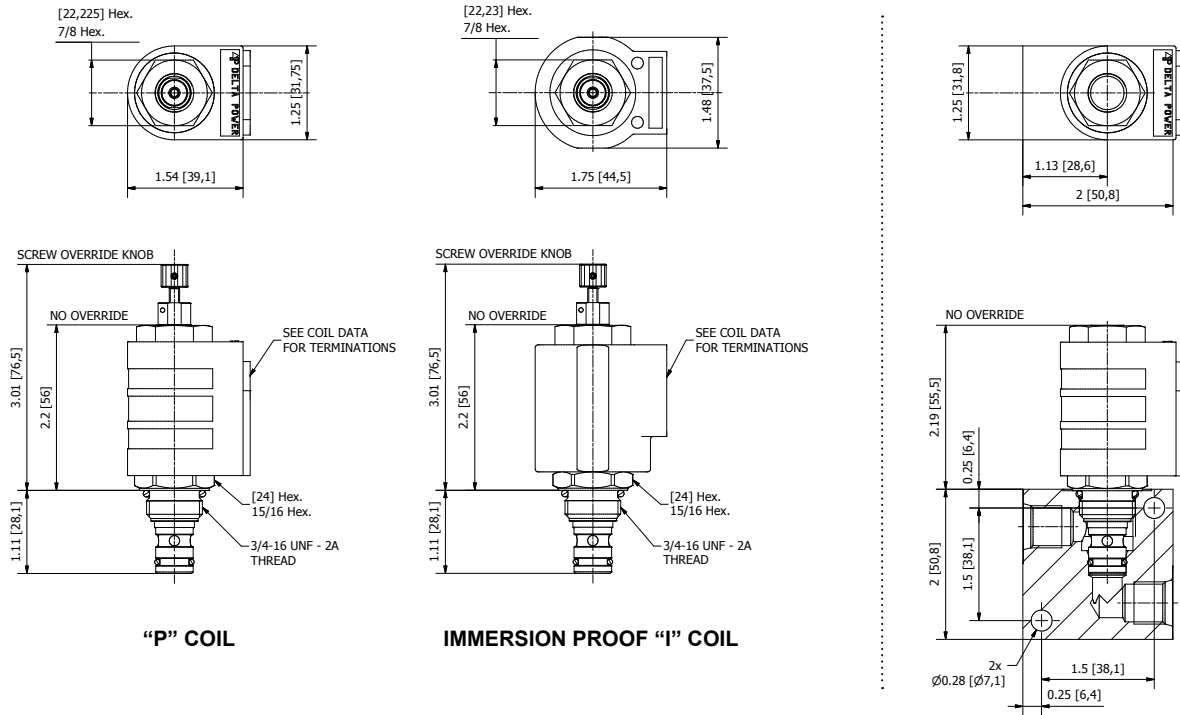
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**DIMENSIONS**



**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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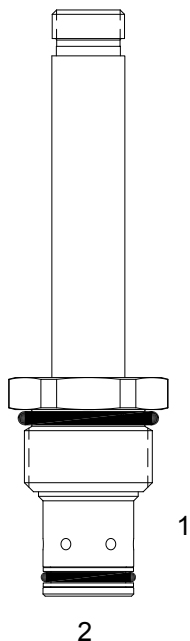


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## DE-S2I DIRECT ACTING POPPET, 2 WAY, NORMALLY CLOSED, BIDIRECTIONAL



### DESCRIPTION

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

### OPERATION

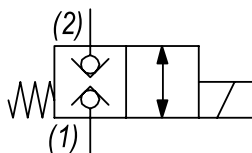
When de-energized the DE-S2I blocks flow from (1) to (2) and (2) to (1). When energized the valve allows flow from (1) to (2) and (2) to (1).

**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.

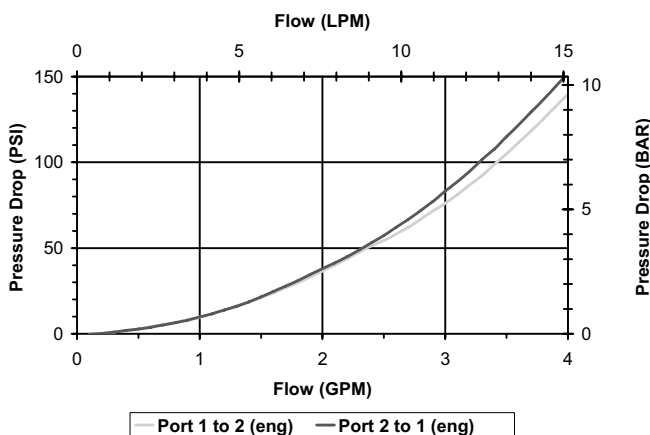
### HYDRAULIC SYMBOL



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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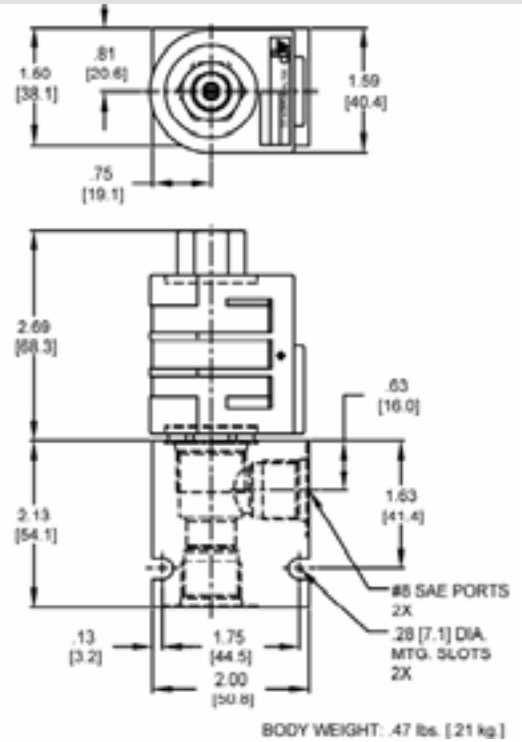
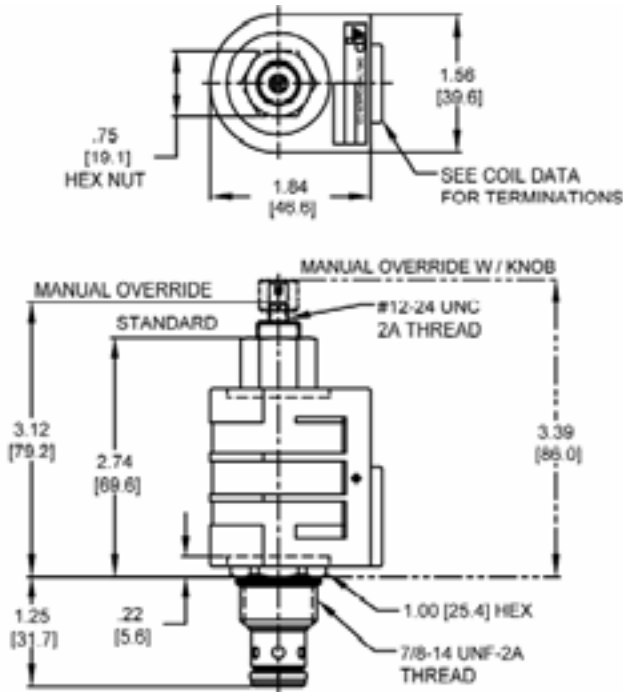


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**DIMENSIONS**



**ORDERING INFORMATION**

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

**"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

**BODIES**

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

**VOLTAGE**

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

**IMMERSION PROOF "D" TYPE**

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

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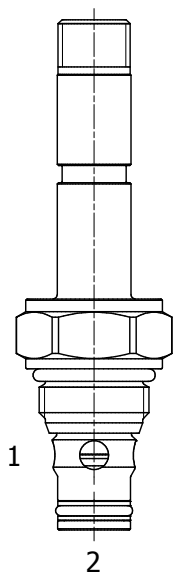


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**HB-S2L PILOTED OPERATED POPPET, 2 WAY NORMALLY CLOSED, BIDIRECTIONAL**



**DESCRIPTION**

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

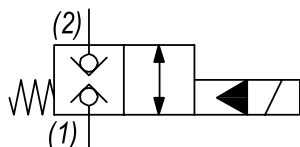
**OPERATION**

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

**FEATURES**

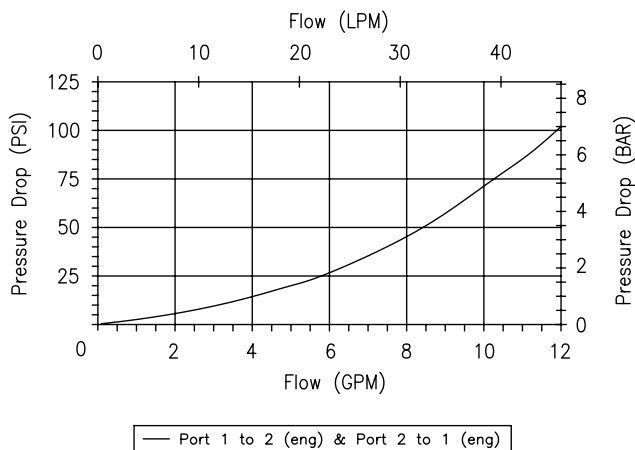
- Hardened parts for long life.
- Efficient wet-armature construction.
- Cartridges are voltage interchangeable.
- Industry common cavity.
- Unitized, molded coil design.
- Continuous duty rated solenoid.
- Optional coil voltages and terminations.
- Optional "I" Coil: Weatherproof, Thermal Shock, Immersion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

**HYDRAULIC SYMBOL**



**PERFORMANCE**

Actual Test Data (Cartridge Only)



**VALVE SPECIFICATIONS**

|                               |                                 |
|-------------------------------|---------------------------------|
| Nominal Flow                  | 12 GPM (45 LPM)                 |
| Rated Operating Pressure      | 5000 PSI (345 bar)              |
| Typical Internal Leakage      | 0-10 drops/min (150 SSU)        |
| 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 | 35 ft-lbs (47 Nm)               |
| Coil Nut Torque Requirements  | 4-6 ft-lbs (5.4-8.1 Nm)         |
| Cavity                        | POWER 2W                        |
| Cavity Tools Kit              | 40500005                        |
| Seal Kit                      | 21191102                        |

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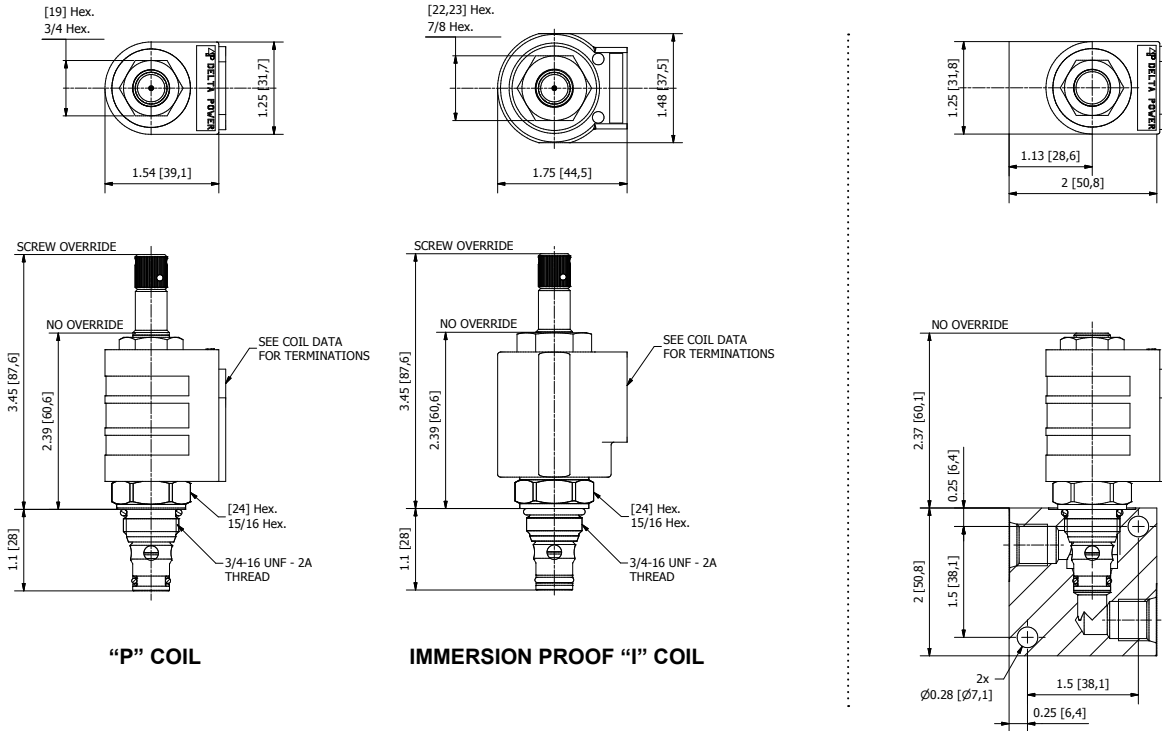


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**DIMENSIONS**



**ORDERING INFORMATION**

|   |  |   |
|---|--|---|
| <p><b>HB - S2L - - -</b></p> <p><b>OPTIONS</b></p> <p>Buna Standard <b>00</b></p> <p>Viton Standard <b>V0</b></p> <p>Buna, Override <b>0M</b></p> <p>Viton, Override <b>VM</b></p> <p>Buna, Screen <b>A0</b></p> <p>Viton, Screen <b>W0</b></p> <p>Buna, Screen, Override <b>B4</b></p> <p>Viton, Screen, Override <b>V4</b></p> <p><b>Note: use screen only if flow direction is from (1) to (2)</b></p> | <p><b>CONSULT FACTORY FOR BODY</b></p> | <p><b>VOLTAGE</b></p> <p><b>06</b> 6 VDC</p> <p><b>12</b> 12 VDC</p> <p><b>24</b> 24 VDC</p> <p><b>36</b> 36 VDC</p> <p><b>48</b> 48 VDC</p> <p><b>25</b> 24 VAC</p> <p><b>11</b> 120 VAC</p> <p><b>22</b> 220 VAC</p> <p><b>44</b> 440 VAC</p> |
|---|--|---|

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

**Note: Aluminum Body Not durability rated for 5000 PSI (345 bar), consult factory for high pressure body options.**

**"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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# SOLENOID OPERATED DIRECTIONAL CONTROLS

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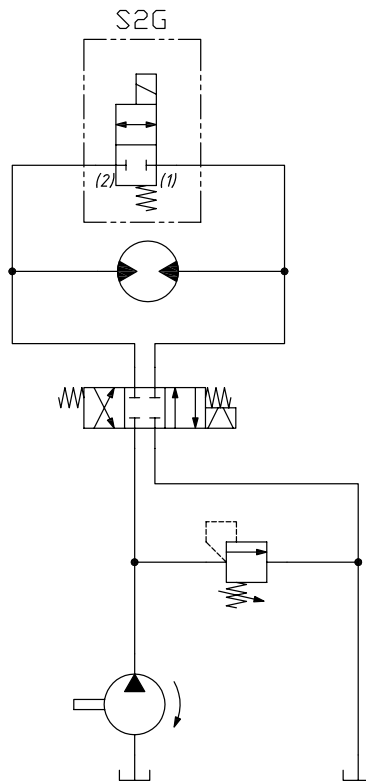
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2 WAY 2 POSITION NORMALLY CLOSED SPOOL VALVES

| 2W2P NORMALLY CLOSED | GPM | PSI  | LPM | BAR | CAVITY | MODEL  | PAGE |
|----------------------|-----|------|-----|-----|--------|--------|------|
|                      | 1.5 | 4000 | 6   | 276 | 5/8-18 | UA-S2G | SD52 |
|                      | 8   | 3000 | 30  | 207 | 3/4-16 | PB-S2G | SD54 |
|                      | 8   | 3000 | 30  | 207 | 7/8-14 | DE-S2G | SD56 |
|                      | 15  | 4000 | 57  | 276 | 7/8-14 | HE-S2G | SD58 |

TYPICAL SCHEMATIC

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



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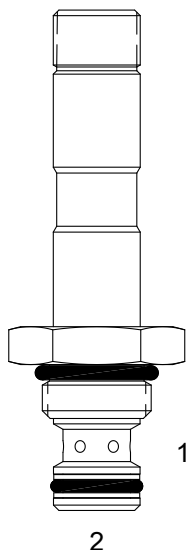


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**UA-S2G DIRECT ACTING SPOOL, 2 WAY NORMALLY CLOSED**



**DESCRIPTION**

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

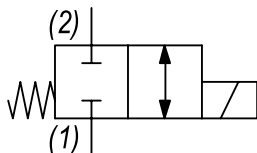
**OPERATION**

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.

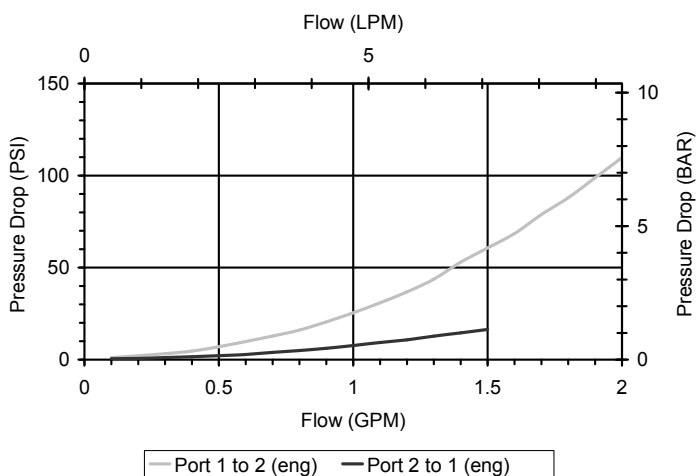
**HYDRAULIC SYMBOL**



Uses "P" or "PI" type coils

**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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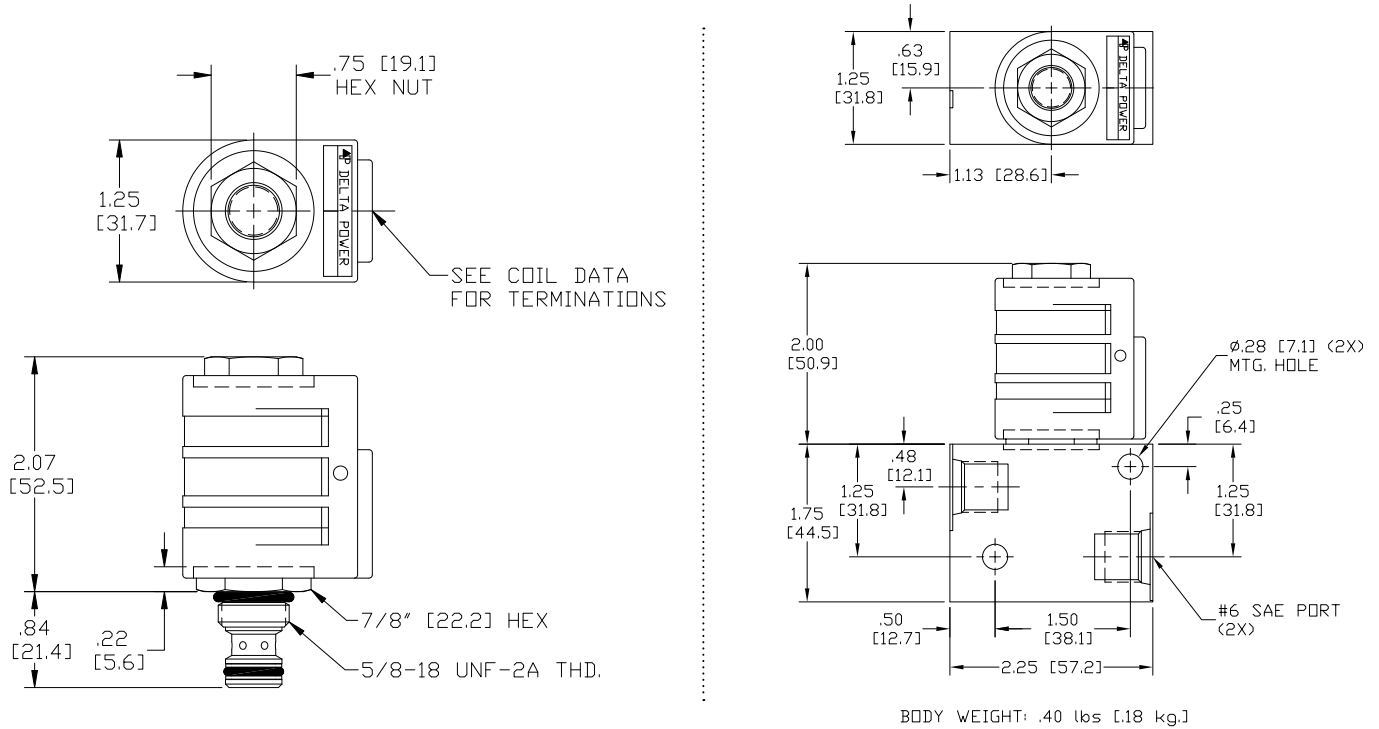


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# SOLENOID OPERATED DIRECTIONAL CONTROLS

## DIMENSIONS



## ORDERING INFORMATION

UA-S2G - - - -

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

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

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

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

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

**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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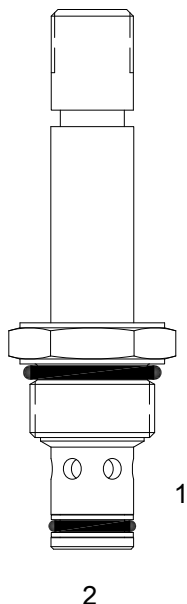


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**PB-S2G DIRECT ACTING SPOOL, 2 WAY NORMALLY CLOSED**



**DESCRIPTION**

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

**OPERATION**

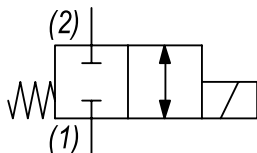
When de-energized the PB-S2G blocks flow from (1) to (2) and (2) to (1). When energized the valve allows flow from (1) to (2) and (2) to (1).

**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.

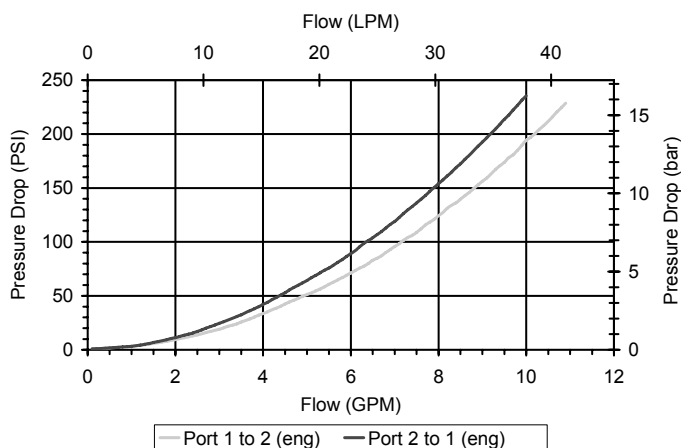
**HYDRAULIC SYMBOL**



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)<br>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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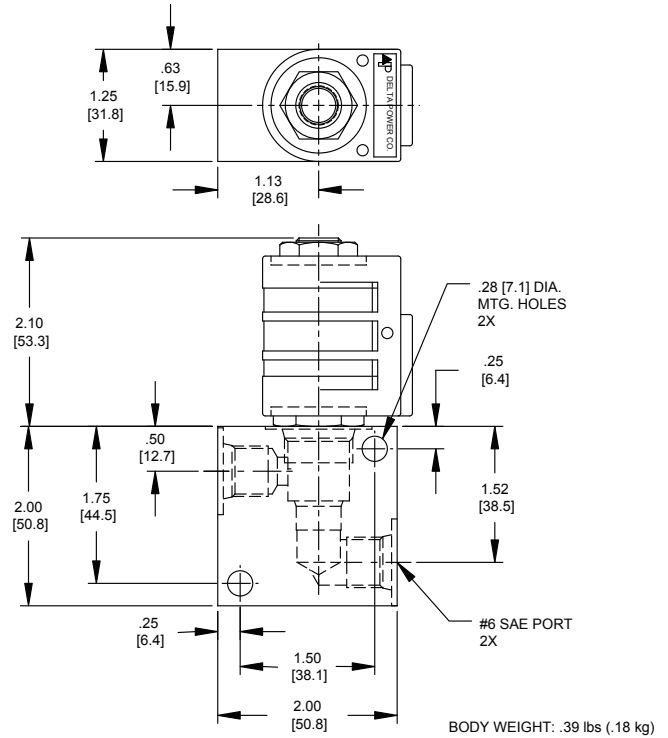
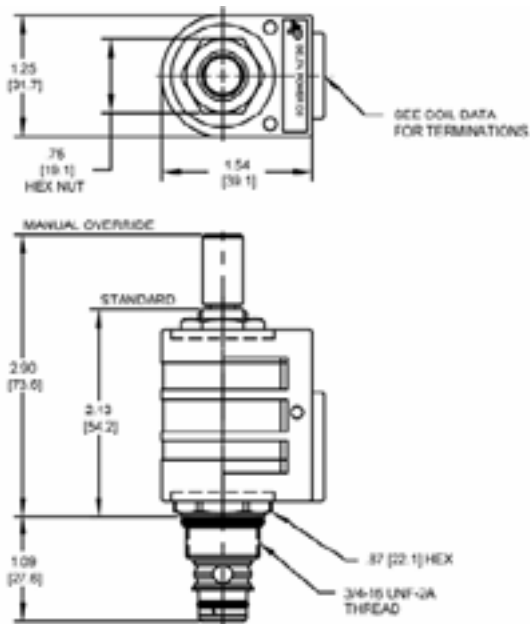
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# SOLENOID OPERATED DIRECTIONAL CONTROLS

## DIMENSIONS



## ORDERING INFORMATION

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

### PB-S2G

#### OPTIONS

|                                    |           |
|------------------------------------|-----------|
| Buna Standard                      | <b>00</b> |
| Viton Standard                     | <b>V0</b> |
| Buna, Override, Detent             | <b>0M</b> |
| Viton, Override, Detent            | <b>VM</b> |
| Buna, Screen                       | <b>A0</b> |
| Viton, Screen                      | <b>W0</b> |
| Buna, Override, Nondetent          | <b>B1</b> |
| Buna, Override, Nondetent          | <b>V1</b> |
| Buna, Screen, Override, Nondetent  | <b>B3</b> |
| Viton, Screen, Override, Nondetent | <b>V3</b> |
| Buna, Screen, Override, Detent     | <b>B4</b> |
| Viton, Screen, Override, Detent    | <b>V4</b> |

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

#### "P" COIL TERMINATION

(All DC Except as Noted)

|                                    |
|------------------------------------|
| <b>DL</b> Double Lead              |
| <b>DT</b> Deutsch on Leads DT04-2P |
| <b>ML</b> Metri-Pack on Leads      |
| <b>PL</b> Packard on Leads         |
| <b>WL</b> Weatherpack on Leads     |

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

#### BODIES

|                           |
|---------------------------|
| <b>Blank</b> Without Body |
| <b>N</b> 1/4 NPTF Ports   |
| <b>S</b> #6 SAE Ports     |

#### VOLTAGE

|                   |
|-------------------|
| <b>06</b> 6 VDC   |
| <b>12</b> 12 VDC  |
| <b>24</b> 24 VDC  |
| <b>36</b> 36 VDC  |
| <b>48</b> 48 VDC  |
| <b>25</b> 24 VAC  |
| <b>11</b> 120 VAC |
| <b>22</b> 220 VAC |
| <b>44</b> 440 VAC |

#### IMMERSION PROOF "P" TYPE

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

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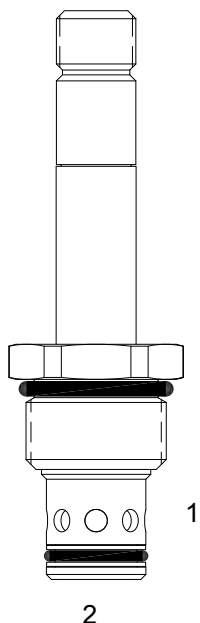


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**DE-S2G DIRECT ACTING SPOOL, 2 WAY NORMALLY CLOSED**



**DESCRIPTION**

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

**OPERATION**

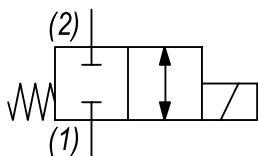
When de-energized the DE-S2G blocks flow from (1) to (2) and (2) to (1). When energized the valve allows flow from (1) to (2) and (2) to (1).

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

**FEATURES**

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

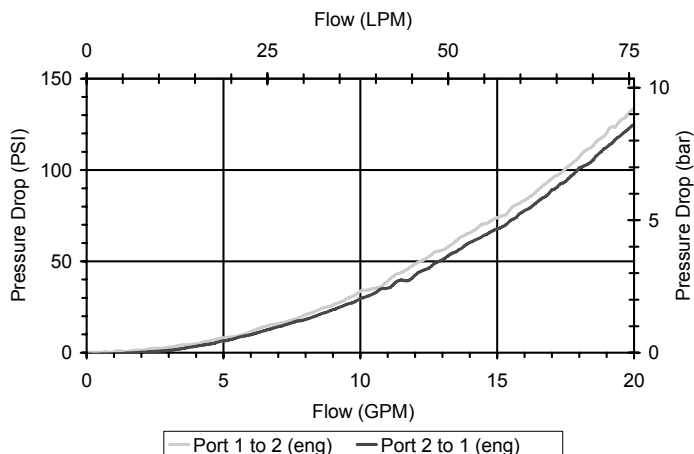
**HYDRAULIC SYMBOL**



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

**PERFORMANCE**

Actual Test Data (Cartridge Only)



**VALVE SPECIFICATIONS**

|  |  |
|--|--|
| Nominal Flow                                 | 8 GPM (30 LPM) from (1) to (2)<br>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<br>(form tool, reamer, tap) | 40500000   |
| Seal Kit                                     | 21191202   |

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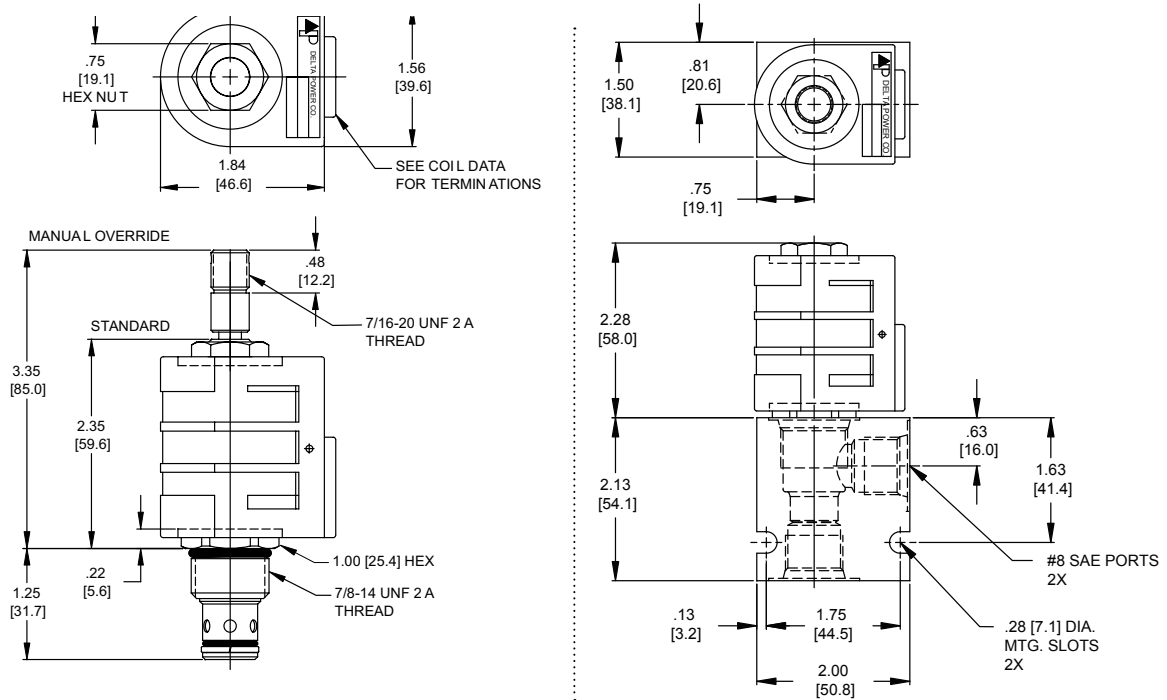
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# SOLENOID OPERATED DIRECTIONAL CONTROLS

## DIMENSIONS



BODY WEIGHT: .47 lbs (.21 kg)

## ORDERING INFORMATION

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

### DE-S2G

#### OPTIONS

|                                    |           |
|------------------------------------|-----------|
| Buna Standard                      | <b>00</b> |
| Viton Standard                     | <b>V0</b> |
| Buna, Override, Detent             | <b>0M</b> |
| Viton, Override, Detent            | <b>VM</b> |
| Buna, Screen                       | <b>A0</b> |
| Viton, Screen                      | <b>W0</b> |
| Buna, Override, Nondetent          | <b>B1</b> |
| Buna, Override, Nondetent          | <b>V1</b> |
| Buna, Screen, Override, Nondetent  | <b>B3</b> |
| Viton, Screen, Override, Nondetent | <b>V3</b> |
| Buna, Screen, Override, Detent     | <b>B4</b> |
| Viton, Screen, Override, Detent    | <b>V4</b> |

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

#### "D" COIL TERMINATION

(All DC Except as Noted)

|                                    |
|------------------------------------|
| <b>DL</b> Double Lead              |
| <b>DT</b> Deutsch on Leads DT04-2P |
| <b>ML</b> Metri-Pack on Leads      |
| <b>PL</b> Packard on Leads         |
| <b>WL</b> Weatherpack on Leads     |

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

#### BODIES

|                           |
|---------------------------|
| <b>Blank</b> Without Body |
| <b>N</b> 3/8 NPTF Ports   |
| <b>S</b> #8 SAE Ports     |

#### VOLTAGE

|                   |
|-------------------|
| <b>06</b> 6 VDC   |
| <b>12</b> 12 VDC  |
| <b>24</b> 24 VDC  |
| <b>36</b> 36 VDC  |
| <b>48</b> 48 VDC  |
| <b>25</b> 24 VAC  |
| <b>11</b> 120 VAC |
| <b>22</b> 220 VAC |
| <b>44</b> 440 VAC |

#### IMMERSION PROOF "D" TYPE

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

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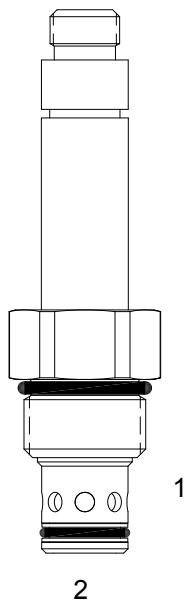


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**HE-S2G DIRECT ACTING SPOOL, 2 WAY NORMALLY CLOSED**



**DESCRIPTION**

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

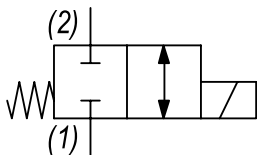
**OPERATION**

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.

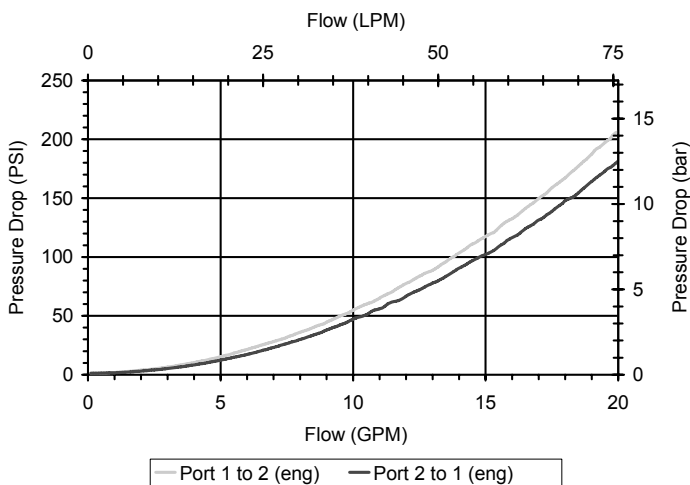
**HYDRAULIC SYMBOL**



Uses “L” Coils.

**PERFORMANCE**

Actual Test Data (Cartridge Only)



**VALVE SPECIFICATIONS**

|                                    |   |
|------------------------------------|---|
| Nominal Flow                       | 15 GPM (57 LPM) from (1) to (2)<br>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      | 35 ft-lbs (47.5 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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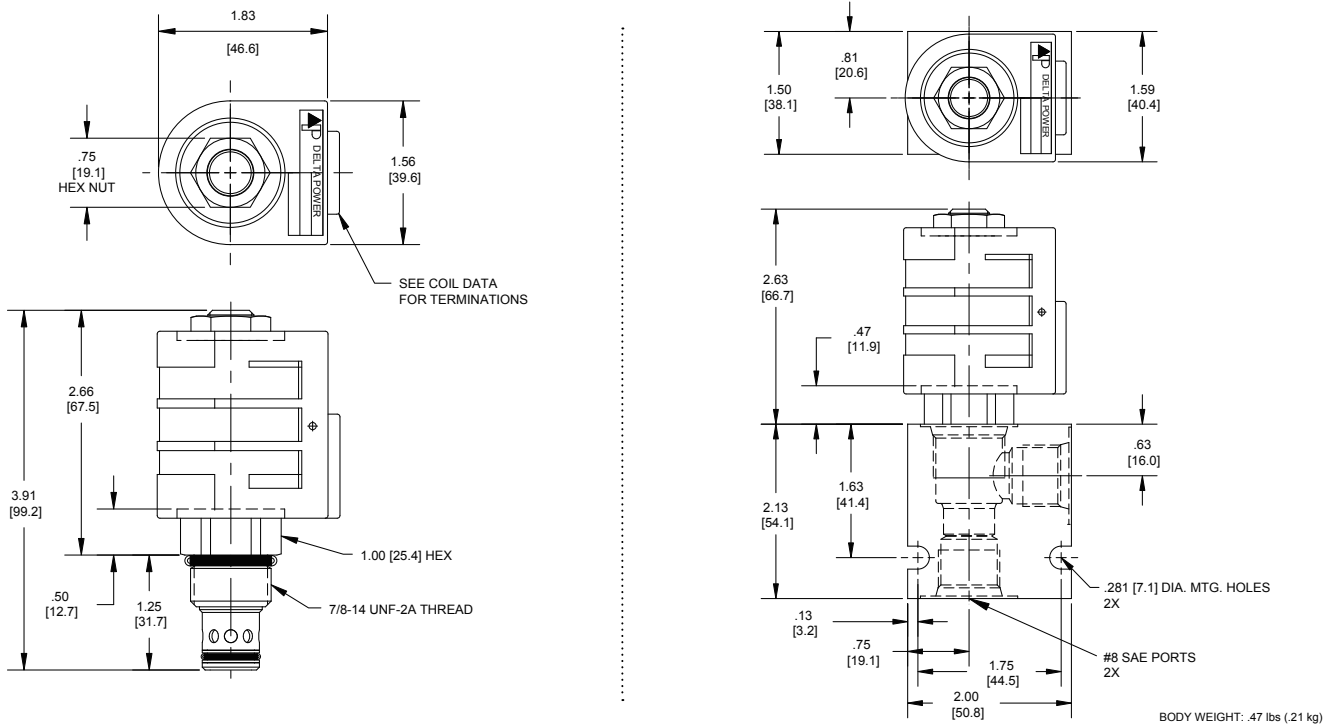
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# SOLENOID OPERATED DIRECTIONAL CONTROLS

## DIMENSIONS



## ORDERING INFORMATION

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

### HE-S2G

#### 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

#### IMMERSION PROOF "L" TYPE

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

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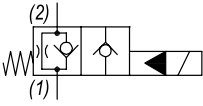
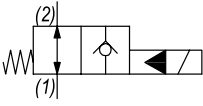
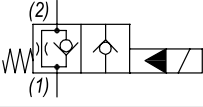
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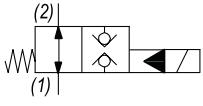
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## SOLENOID OPERATED DIRECTIONAL CONTROLS

### 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    | <b>PB-S2C</b> | SD62 |
|   | 12  | 5000 | 45  | 345 | 3/4-16    | <b>HB-S2C</b> | SD64 |
|   | 15  | 3500 | 57  | 241 | 7/8-14    | <b>DE-S2C</b> | SD68 |
|   | 30  | 3000 | 114 | 207 | 1 1/16-12 | <b>TT-S2C</b> | SD70 |
|   | 40  | 3000 | 151 | 207 | 1 5/16-12 | <b>SJ-S2C</b> | SD72 |
|   | 40  | 4350 | 151 | 300 | 1 5/16-12 | <b>HJ-S2C</b> | SD74 |
|    | 10  | 3500 | 38  | 241 | 3/4-16    | <b>PB-S2D</b> | SD76 |
|   | 12  | 5000 | 45  | 345 | 3/4-16    | <b>HB-S2D</b> | SD78 |
|   | 15  | 3500 | 57  | 241 | 7/8-14    | <b>DE-S2D</b> | SD80 |
|   | 30  | 3000 | 114 | 207 | 1 1/16-12 | <b>TT-S2D</b> | SD82 |
|   | 40  | 3000 | 151 | 207 | 1 5/16-12 | <b>SJ-S2D</b> | SD84 |
|  | 8   | 2000 | 30  | 138 | 3/4-16    | <b>PB-S2J</b> | SD66 |

### 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 | <b>HB-S2K</b> | SD86 |

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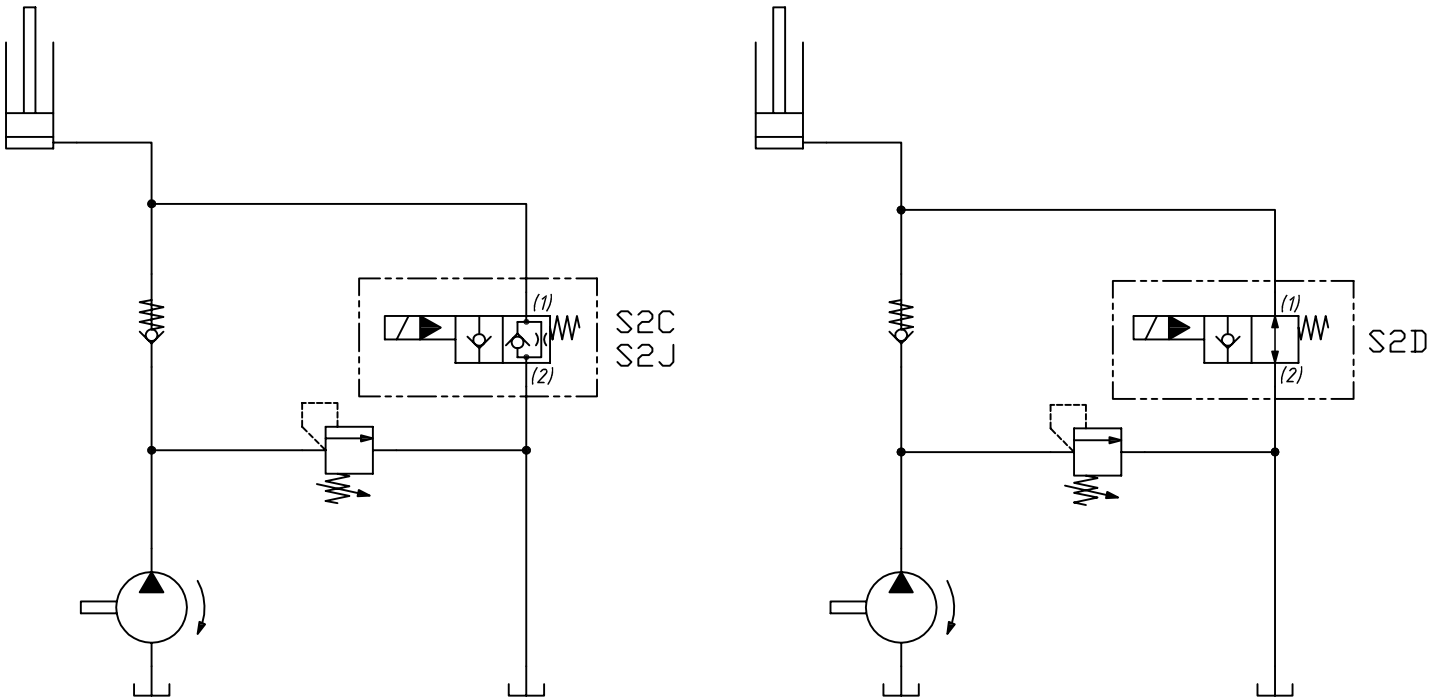


## TYPICAL SCHEMATIC

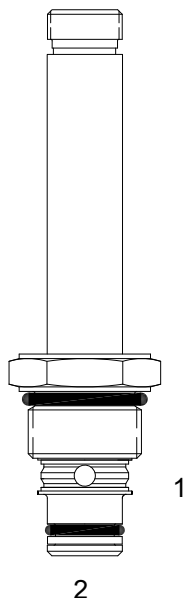
Typical application for the S2C is a pump unloading circuit when high flow and low pressure drop is required.

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

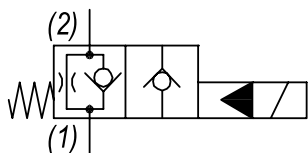
When de-energized the PB-S2C allows flow from (1) to (2) and restricted flow from (2) to (1). When energized the valve blocks flow from (1) to (2) and allows flow from (2) to (1).

**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.

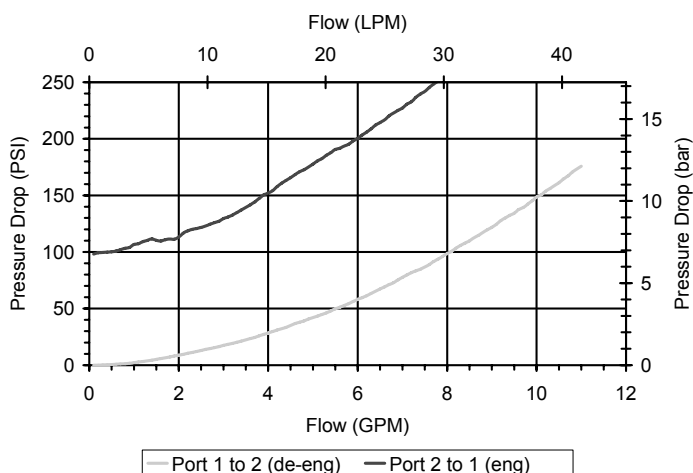
### HYDRAULIC SYMBOL



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<br>(form tool, reamer, tap) | 40500005                        |
| Seal Kit                                     | 21191100                        |

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

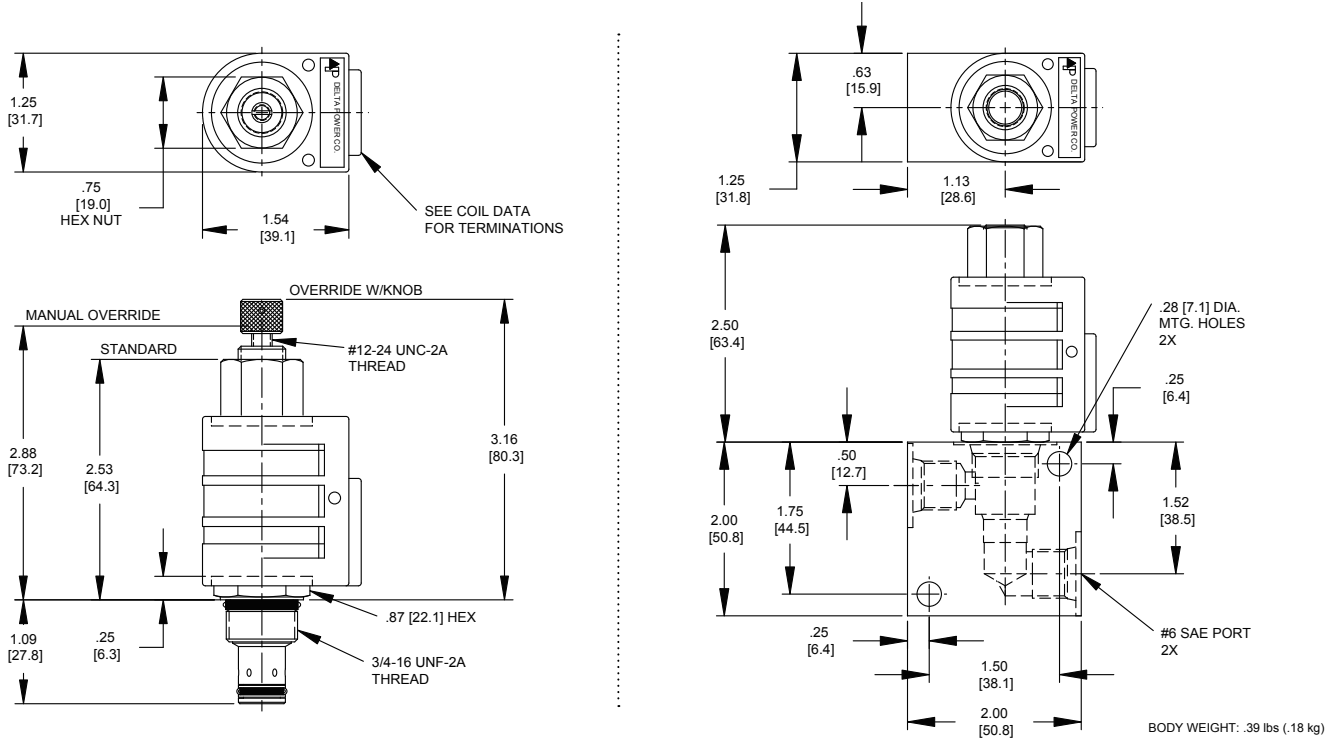


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**DIMENSIONS**



**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)**

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

- 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

- 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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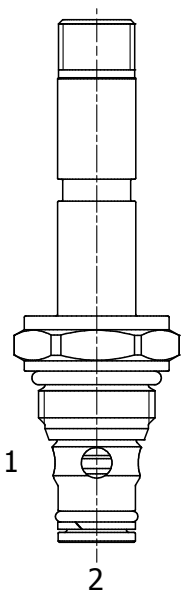


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**HB-S2C PILOT OPERATED POPPET, 2 WAY NORMALLY OPEN**



**DESCRIPTION**

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

**OPERATION**

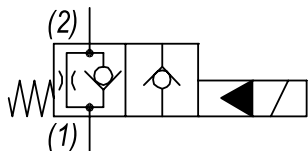
When de-energized the HB-S2C allows flow from (1) to (2) and restricted flow from (2) to (1). When energized the valve blocks flow from (1) to (2) and allows flow from (2) to (1).

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

**FEATURES**

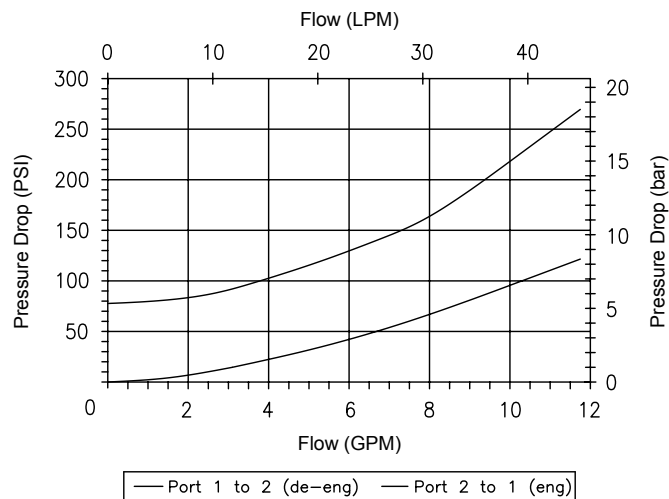
- Hardened parts for long life.
- Efficient wet-armature construction.
- Cartridges are voltage interchangeable.
- Manual override option.
- Industry common cavity.
- Unitized, molded coil design.
- Continuous duty rated solenoid.
- Optional coil voltages and terminations.
- Optional "I" Coil: Weatherproof,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

**HYDRAULIC SYMBOL**



**PERFORMANCE**

Actual Test Data (Cartridge Only)



**VALVE SPECIFICATIONS**

|                                    |                                     |
|------------------------------------|-------------------------------------|
| Nominal Flow                       | 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      | 35 ft-lbs (47 Nm)                   |
| Coil Nut Torque Requirements       | 4-6 ft-lbs (5.4-8.1 Nm)             |
| Cavity                             | POWER 2W                            |
| Cavity Tools Kit                   | 40500005                            |
| Seal Kit                           | 21191100                            |

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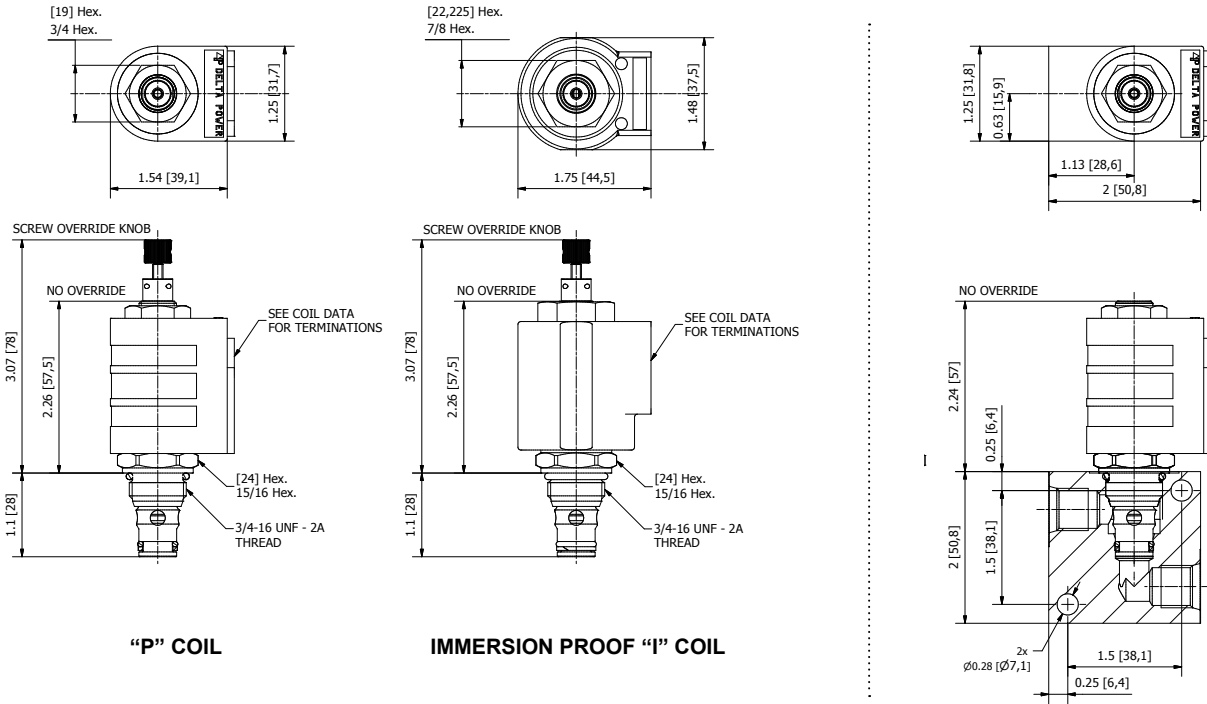
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# SOLENOID OPERATED DIRECTIONAL CONTROLS

## DIMENSIONS



"P" COIL

IMMERSION PROOF "I" COIL

## ORDERING INFORMATION

HB-S2C - - - -

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

### 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** 1/4 NPTF Ports
- S** #6 SAE Ports

Note: Aluminum Body Not durability rated for 5000 PSI (345 bar), consult factory for high pressure body options.

### VOLTAGE

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

### "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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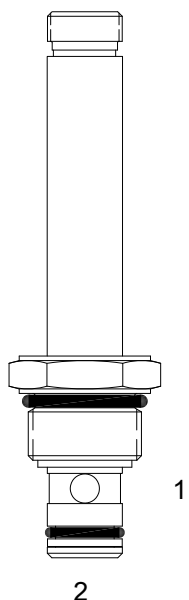


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**PB-S2J PILOT OPERATED POPPET, 2 WAY NORMALLY OPEN, SOFT SEAT**



**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**

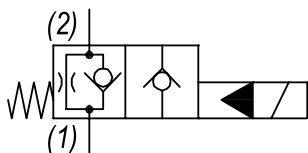
When de-energized the PB-S2J allows flow from (1) to (2) and restricts flow from (2) to (1). When energized the valve blocks flow from (1) to (2) and allows free flow from (2) to (1).

**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.

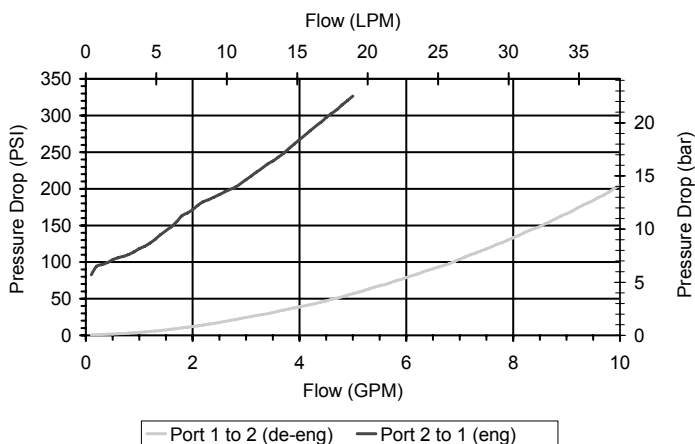
**HYDRAULIC SYMBOL**



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                        |

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



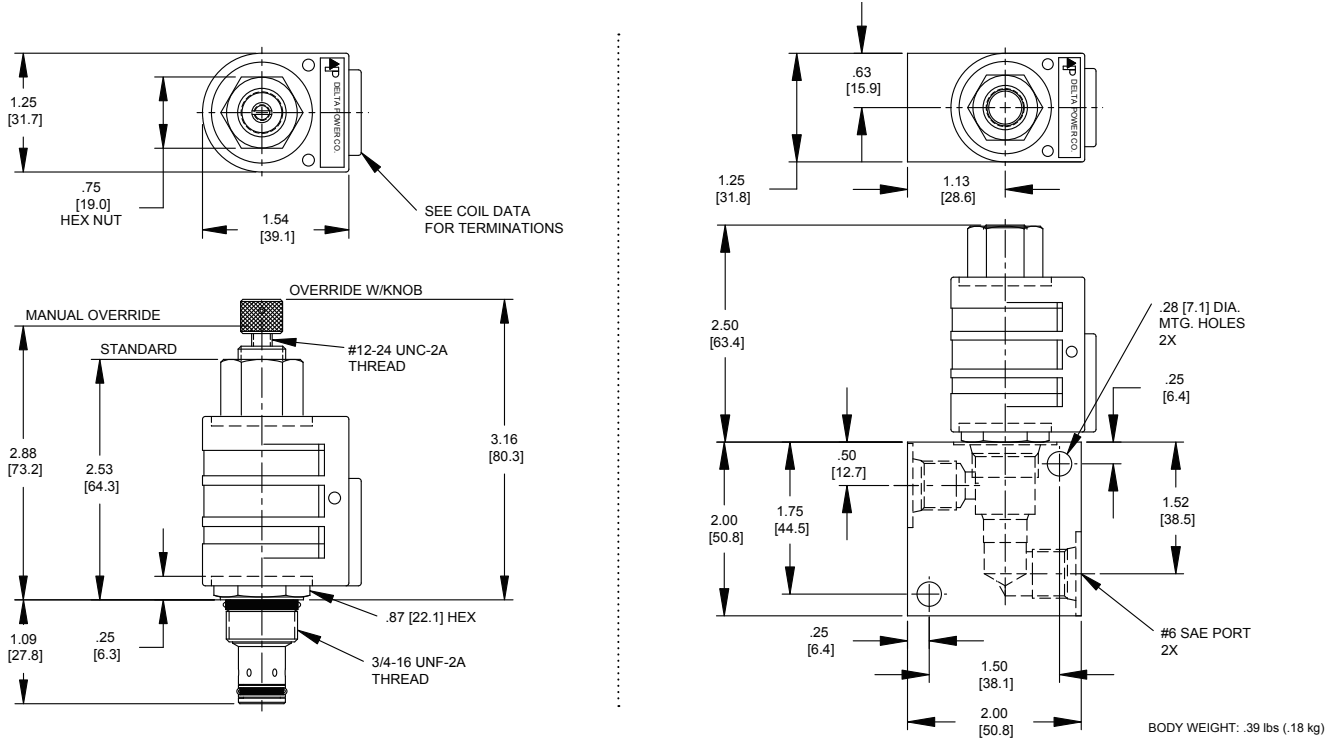
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# SOLENOID OPERATED DIRECTIONAL CONTROLS

## DIMENSIONS



## ORDERING INFORMATION

PB-S2J - - - -

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

### OPTIONS

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

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

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

### BODIES

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

### VOLTAGE

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

### IMMERSION PROOF "P" TYPE

- |                                    |  |   |
|------------------------------------|--|---|
| <b>DL</b> Double Lead              | <b>SS</b> Single Spade                     | <b>IA</b> "I" Coil AMP Superseal - Integral   |
| <b>DT</b> Deutsch on Leads DT04-2P | <b>DS</b> Double Spade                     | <b>ID</b> "I" Coil Deutsch - Integral DT04-2P |
| <b>ML</b> Metri-Pack on Leads      | <b>HC</b> DIN 43650 (Hirschmann) - (AC&DC) | <b>IJ</b> "I" Coil AMP Jr. Timer - Integral   |
| <b>PL</b> Packard on Leads         | <b>CL</b> Conduit Lead - (AC Only)         | <b>IM</b> "I" Coil Metri-Pack - Integral      |
| <b>WL</b> Weatherpack on Leads     | <b>DI</b> Deutsch - Integral DT04-2P       |   |

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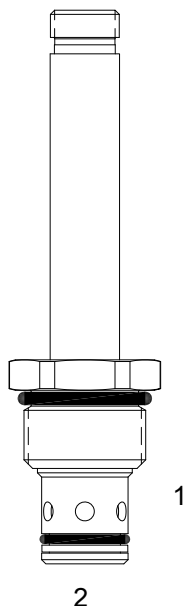


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**DE-S2C PILOT OPERATED POPPET, 2 WAY NORMALLY OPEN**



**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**

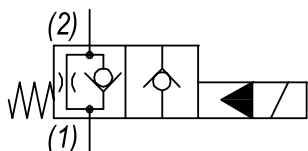
When de-energized the DE-S2C allows flow to pass from (1) to (2), but restricts flow from (2) to (1).  
When energized the valve blocks flow from (1) to (2) but allows free reverse flow from (2) to (1).

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

**FEATURES**

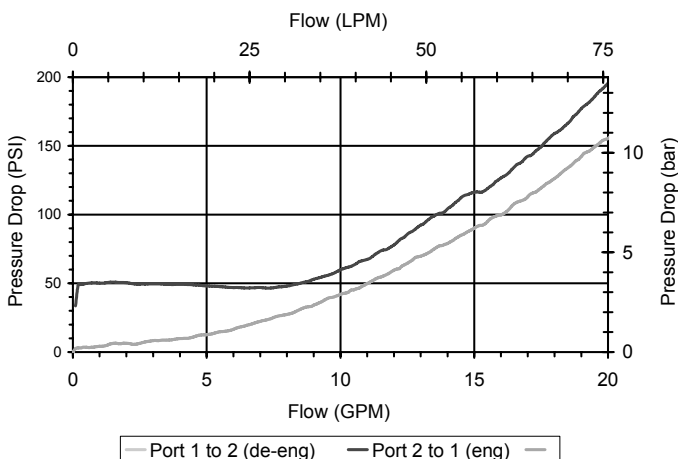
- Hardened parts for long life.
- Efficient wet-armature construction.
- Cartridges are voltage interchangeable.
- Manual override option.
- Industry common cavity.
- Unitized, molded coil design.
- Continuous duty rated solenoid.
- Optional coil voltages and terminations.
- Optional "I" Coil: Weatherproof,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

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



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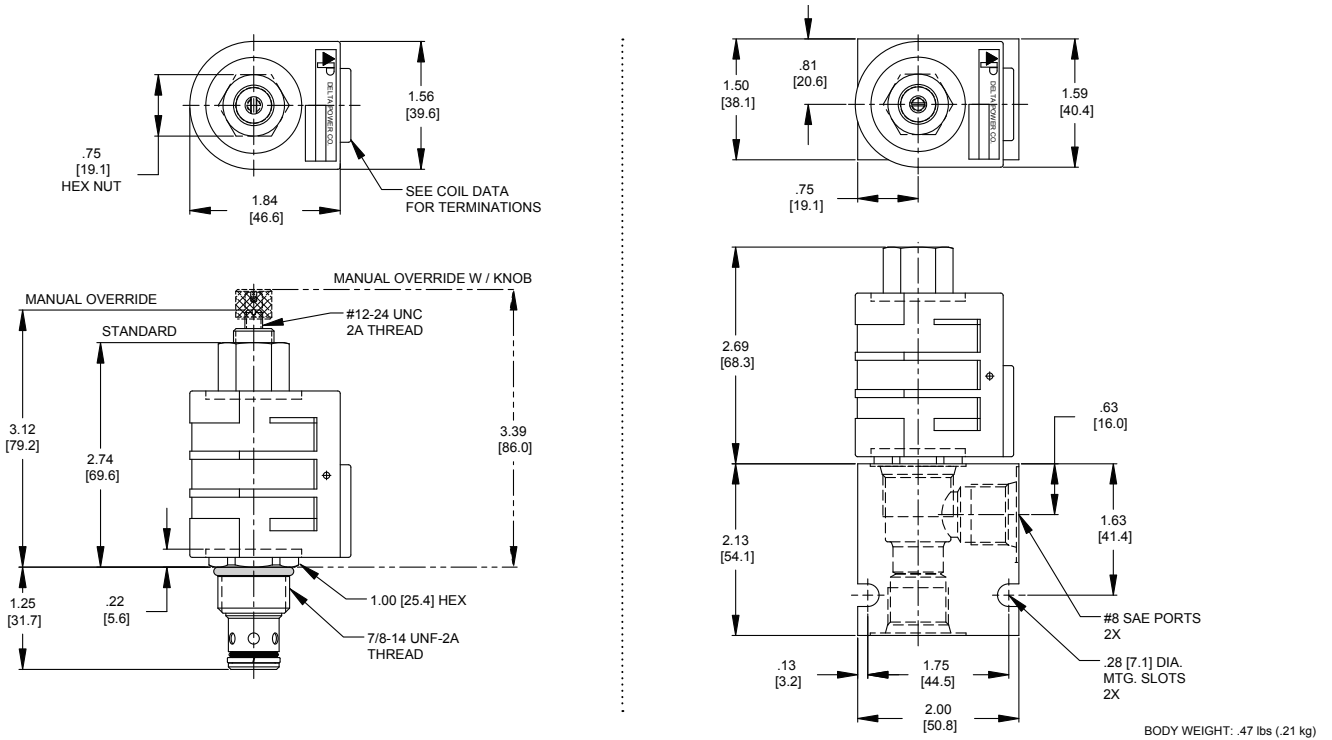


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# SOLENOID OPERATED DIRECTIONAL CONTROLS

## DIMENSIONS



## ORDERING INFORMATION

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

**"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

#### BODIES

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

#### VOLTAGE

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

#### IMMERSION PROOF "D" TYPE

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

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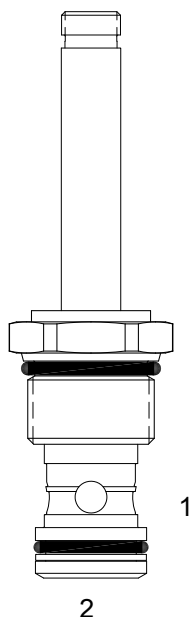


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**TT-S2C PILOT OPERATED POPPET, 2 WAY NORMALLY OPEN**



**DESCRIPTION**

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

**OPERATION**

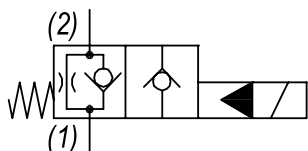
When de-energized the TT-S2C allows flow to pass from (1) to (2), but restricts flow from (2) to (1).  
When energized the valve blocks flow from (1) to (2) but allows free reverse flow from (2) to (1).

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

**FEATURES**

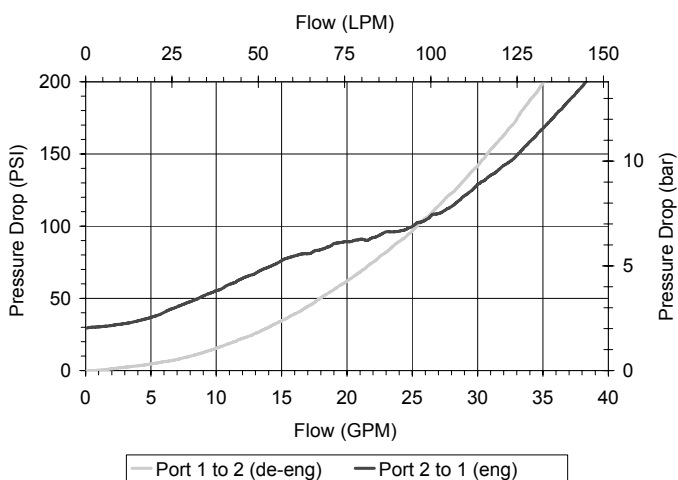
- Hardened parts for long life.
- Efficient wet-armature construction.
- Cartridges are voltage interchangeable.
- Manual override option.
- Industry common cavity.
- Unitized, molded coil design.
- Continuous duty rated solenoid.
- Optional coil voltages and terminations.
- Optional "I" Coil: Weatherproof, 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      | 70 ft-lbs (94.9 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                        |

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



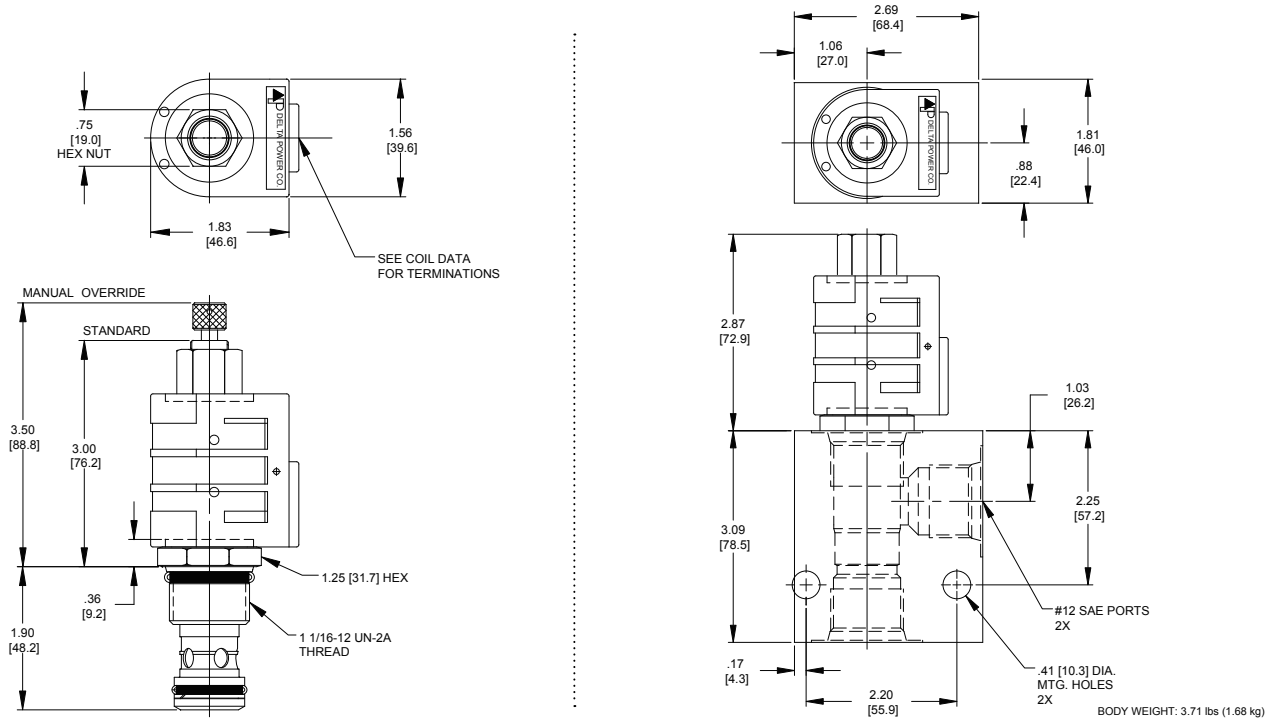
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# SOLENOID OPERATED DIRECTIONAL CONTROLS

## DIMENSIONS



## ORDERING INFORMATION

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

**"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

- BODIES**
- Blank** Without Body
  - S** #12 SAE Ports

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

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

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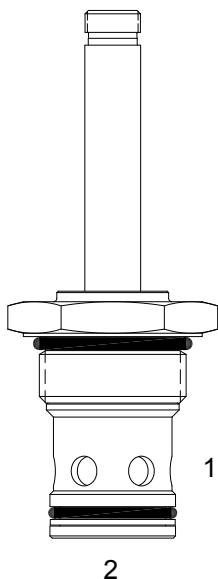


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## SJ-S2C PILOT OPERATED POPPET, 2 WAY NORMALLY OPEN



### 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.

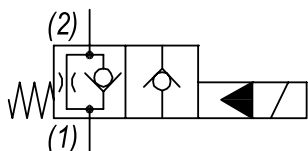
### OPERATION

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

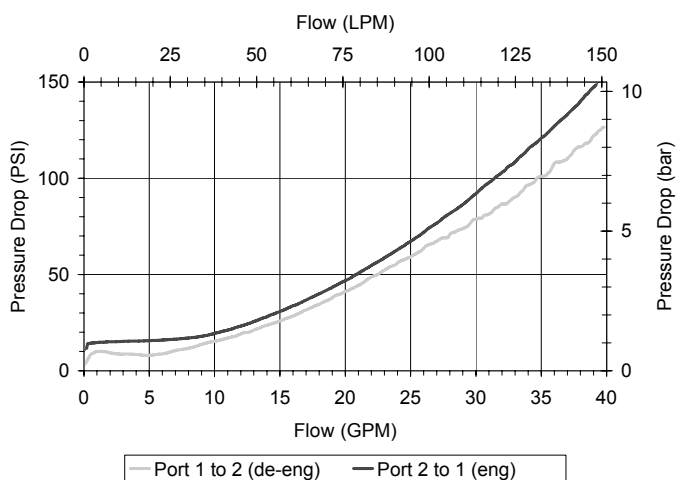
- Hardened parts for long life.
- Efficient wet-armature construction.
- Cartridges are voltage interchangeable.
- Industry common cavity.
- Unitized, molded coil design.
- Continuous duty rated solenoid.
- Optional coil voltages and terminations.
- Optional "I" Coil: Weatherproof, Thermal Shock, Immersion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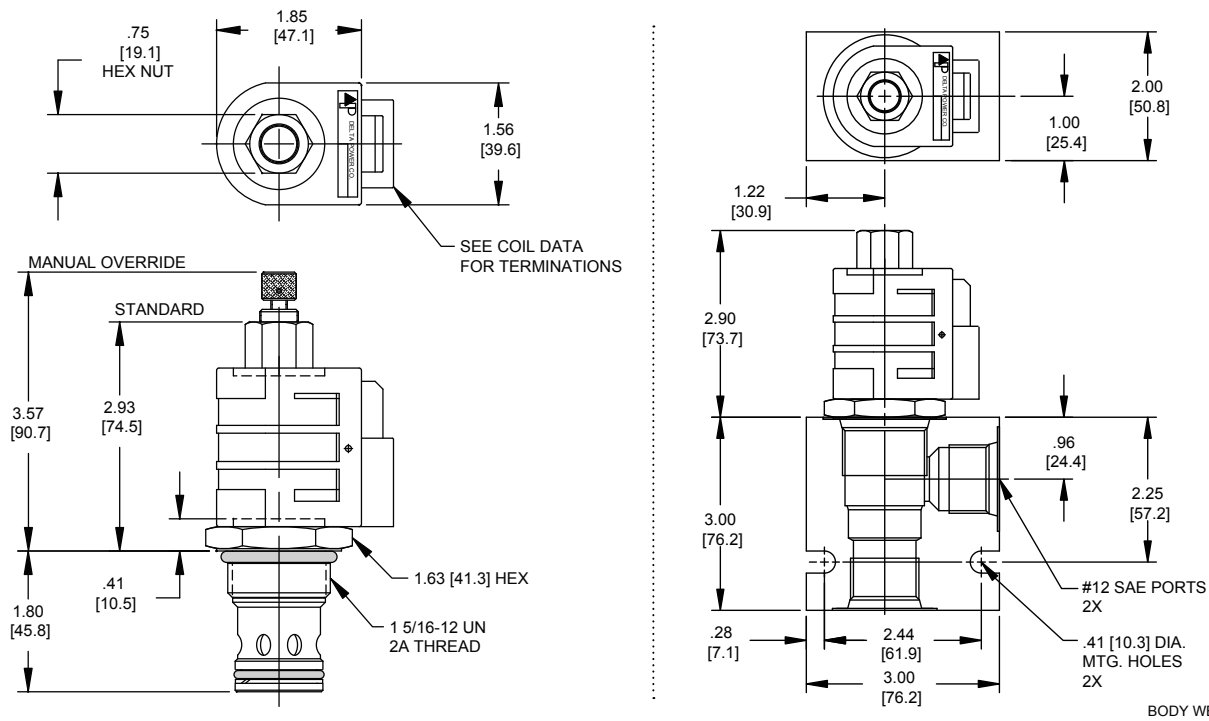
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# SOLENOID OPERATED DIRECTIONAL CONTROLS

## DIMENSIONS



BODY WEIGHT: 1.29 lbs (.58 kg)

## ORDERING INFORMATION

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

SJ-S2C - - - -

### OPTIONS

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

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

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

- DL** Double Lead
- DT** Deutsch on Leads DT04-2P
- 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

### BODIES

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

### VOLTAGE

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

### IMMERSION PROOF "D" TYPE

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

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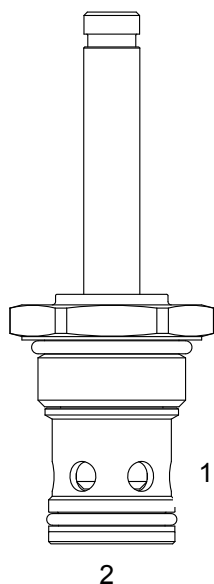


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**HJ-S2C PILOT OPERATED POPPET, 2 WAY NORMALLY OPEN**



**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.

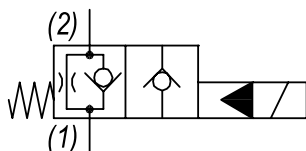
**OPERATION**

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**

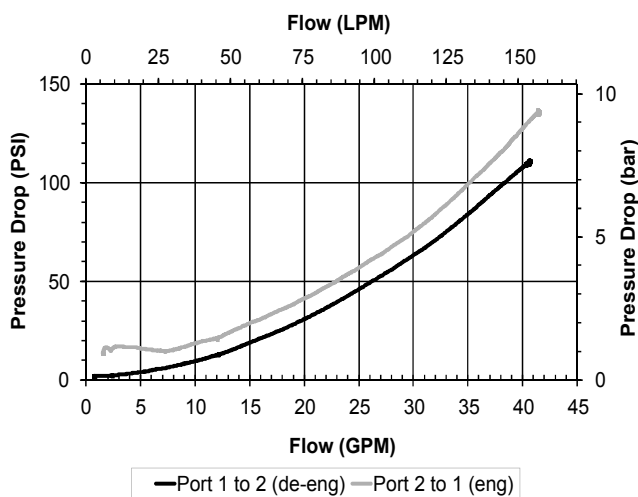
- Hardened parts for long life.
- Efficient wet-armature construction.
- Cartridges are voltage interchangeable.
- Industry common cavity.
- Unitized, molded coil design.
- Continuous duty rated solenoid.
- Optional coil voltages and terminations.

**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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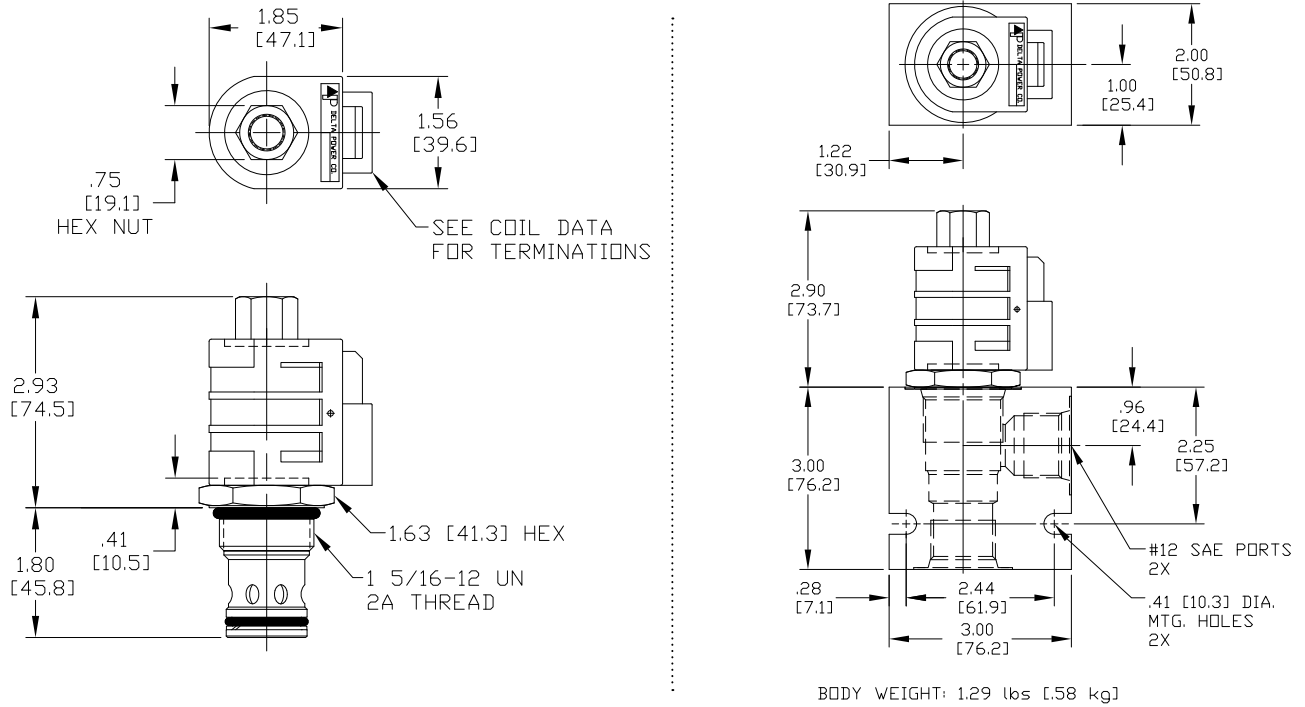
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# SOLENOID OPERATED DIRECTIONAL CONTROLS

## DIMENSIONS



## ORDERING INFORMATION

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

HJ-S2C - - - -

### OPTIONS

Buna Standard 00  
Viton Standard V0

### BODIES

Blank Without Body  
N 3/4 NPTF Ports  
S #12 SAE Ports

### VOLTAGE

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

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

### "D" COIL TERMINATION

(All DC Except as Noted)

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

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

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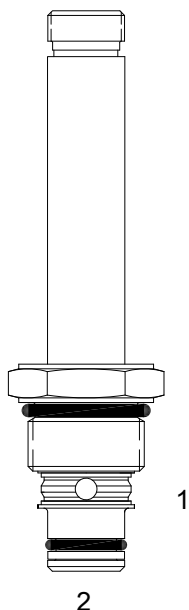


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## PB-S2D PILOT OPERATED POPPET, 2 WAY NORMALLY OPEN



### 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).

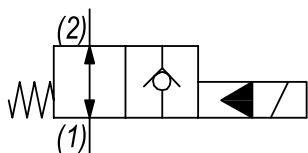
When energized the valve blocks flow from (1) to (2) and allows flow from (2) to (1).

**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.

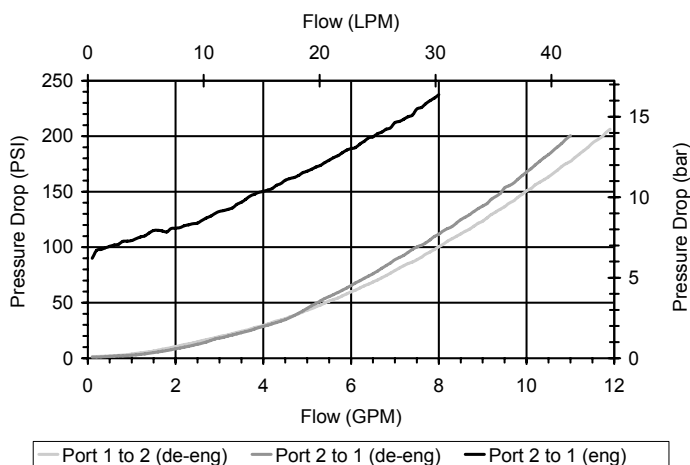
### HYDRAULIC SYMBOL



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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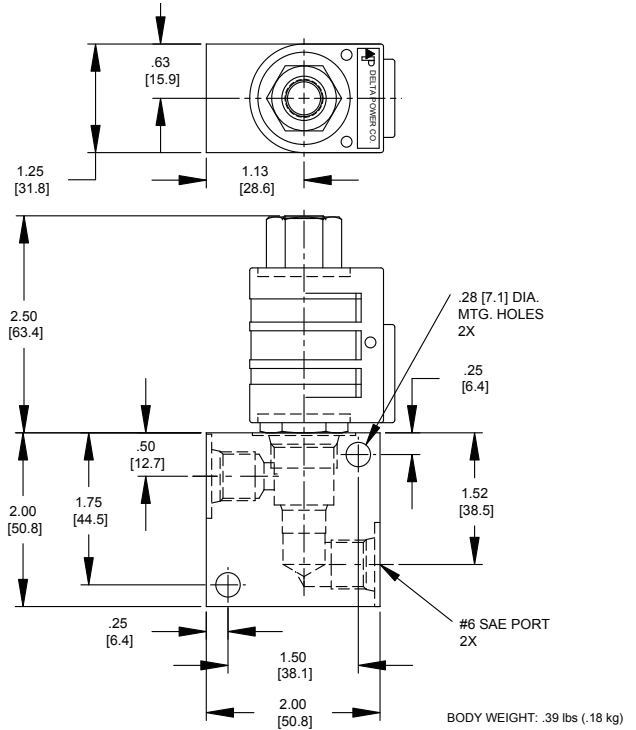
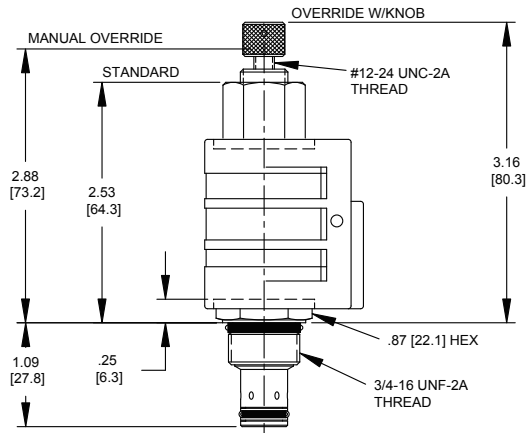
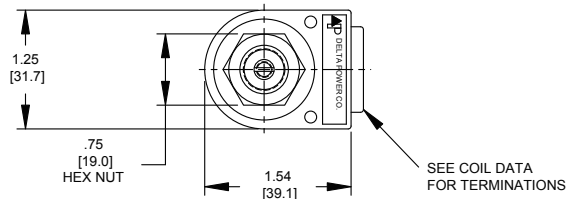


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# SOLENOID OPERATED DIRECTIONAL CONTROLS

## 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)

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

|                                    |
|------------------------------------|
| <b>DL</b> Double Lead              |
| <b>DT</b> Deutsch on Leads DT04-2P |
| <b>ML</b> Metri-Pack on Leads      |
| <b>PL</b> Packard on Leads         |
| <b>WL</b> Weatherpack on Leads     |

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

| BODIES       |                |
|--------------|----------------|
| <b>Blank</b> | Without Body   |
| <b>N</b>     | 1/4 NPTF Ports |
| <b>S</b>     | #6 SAE Ports   |

| VOLTAGE   |         |
|-----------|---------|
| <b>06</b> | 6 VDC   |
| <b>12</b> | 12 VDC  |
| <b>24</b> | 24 VDC  |
| <b>36</b> | 36 VDC  |
| <b>48</b> | 48 VDC  |
| <b>25</b> | 24 VAC  |
| <b>11</b> | 120 VAC |
| <b>22</b> | 220 VAC |
| <b>44</b> | 440 VAC |

| IMMERSION PROOF "P" TYPE |                                     |
|--------------------------|-------------------------------------|
| <b>IA</b>                | "I" Coil AMP Superseal - Integral   |
| <b>ID</b>                | "I" Coil Deutsch - Integral DT04-2P |
| <b>IJ</b>                | "I" Coil AMP Jr. Timer - Integral   |
| <b>IM</b>                | "I" Coil Metri-Pack - Integral      |

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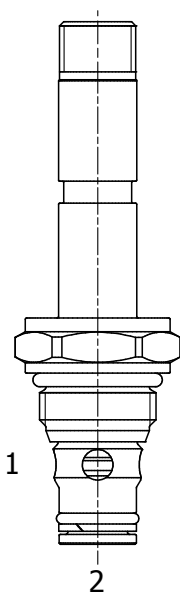


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**HB-S2D PILOT OPERATED POPPET, 2 WAY NORMALLY OPEN**



**DESCRIPTION**

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

**OPERATION**

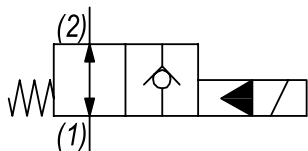
When de-energized the HB-S2D allows flow from (1) to (2) or from (2) to (1). When energized the valve blocks flow from (1) to (2) and allows flow from (2) to (1).

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

**FEATURES**

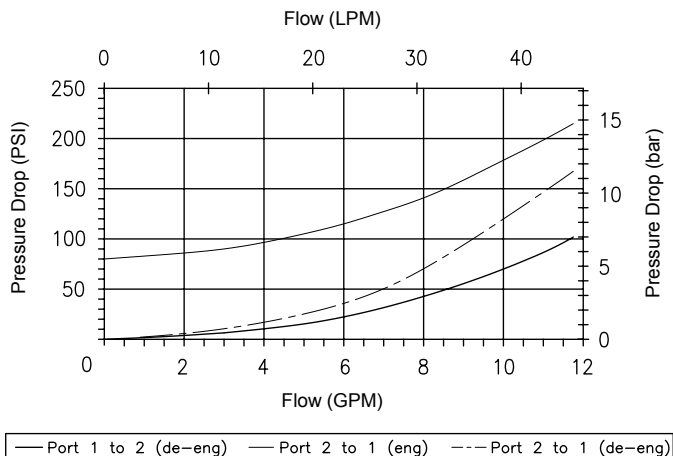
- Hardened parts for long life.
- Efficient wet-armature construction.
- Cartridges are voltage interchangeable.
- Manual override option.
- Industry common cavity.
- Unitized, molded coil design.
- Continuous duty rated solenoid.
- Optional coil voltages and terminations.
- Optional "I" Coil: Weatherproof,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

**HYDRAULIC SYMBOL**



**PERFORMANCE**

Actual Test Data (Cartridge Only)



**VALVE SPECIFICATIONS**

|                                    |  |
|------------------------------------|--|
| Nominal Flow                       | 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)<br>BUNA seals<br>-4° to 250°F (-20° to 120°C)<br>VITON seals |
| Weight                             | .29 lbs (.13 kg)   |
| Operating Fluid Media              | General Purpose Hydraulic Fluid  |
| Cartridge Torque Requirements      | 35 ft-lbs (47 Nm)  |
| Coil Nut Torque Requirements       | 4-6 ft-lbs (5.4-8.1 Nm)  |
| Cavity                             | POWER 2W   |
| Cavity Tools Kit                   | 40500005   |
| Seal Kit                           | 21191100   |

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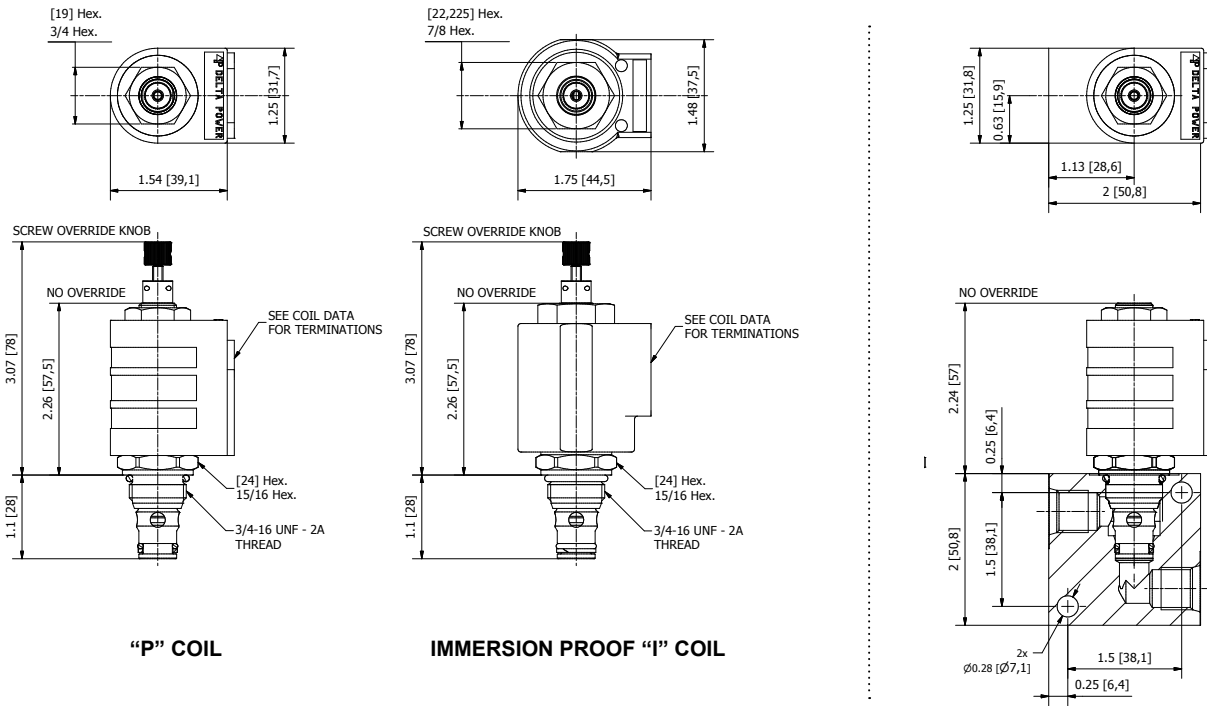


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**DIMENSIONS**



“P” COIL

IMMERSION PROOF “I” COIL

**ORDERING INFORMATION**

HB-S2D - - - -

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

**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** 1/4 NPTF Ports
- S** #6 SAE Ports

Note: Aluminum Body Not durability rated for 5000 PSI (345 bar), consult factory for high pressure body options.

**VOLTAGE**

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

**“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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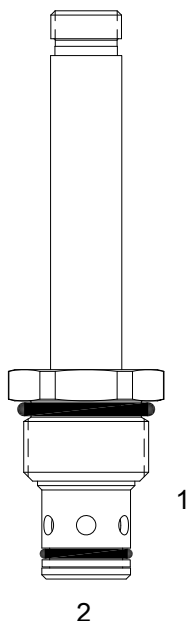


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## DE-S2D PILOT OPERATED POPPET, 2 WAY NORMALLY OPEN



### 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

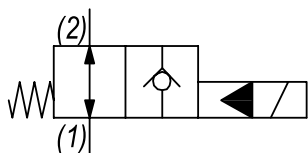
When de-energized the DE-S2D allows flow to pass from (1) to (2) and (2) to (1). When energized the valve blocks flow from (1) to (2) but allows free reverse flow from (2) to (1).

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

### FEATURES

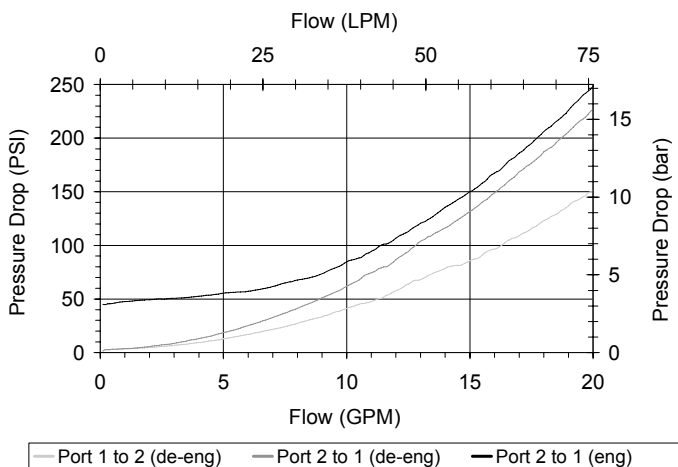
- Hardened parts for long life.
- Efficient wet-armature construction.
- Cartridges are voltage interchangeable.
- Manual override option.
- Industry common cavity.
- Unitized, molded coil design.
- Continuous duty rated solenoid.
- Optional coil voltages and terminations.
- Optional "I" Coil: Weatherproof,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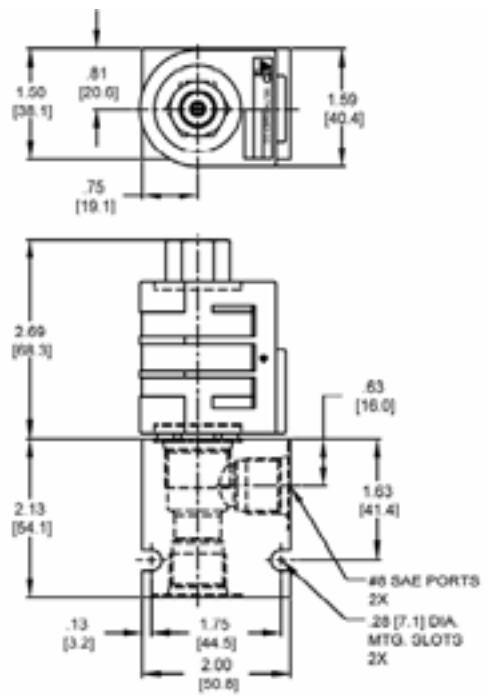
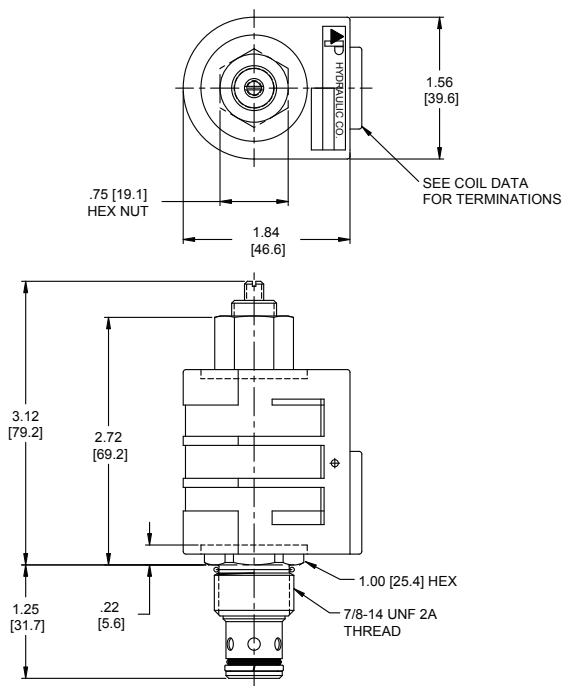


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**DIMENSIONS**



**ORDERING INFORMATION**

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

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

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

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

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

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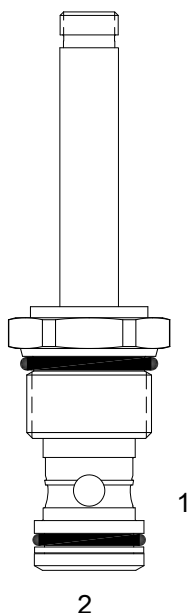


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**TT-S2D PILOT OPERATED POPPET, 2 WAY NORMALLY OPEN**



**DESCRIPTION**

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

**OPERATION**

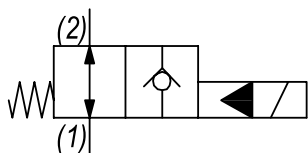
When de-energized the TT-S2D allows flow to pass from (1) to (2) and (2) to (1). When energized the valve blocks flow from (1) to (2) but allows free reverse flow from (2) to (1).

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

**FEATURES**

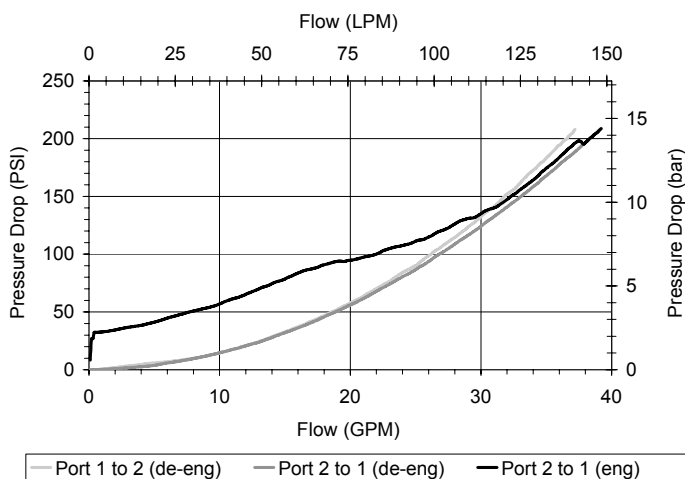
- Hardened parts for long life.
- Efficient wet-armature construction.
- Cartridges are voltage interchangeable.
- Manual override option.
- Industry common cavity.
- Unitized, molded coil design.
- Continuous duty rated solenoid.
- Optional coil voltages and terminations.
- Optional "I" Coil: Weatherproof, 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                | 70 ft-lbs (94.9 Nm)             |
| Coil Nut Torque Requirements                 | 4-6 ft-lbs (4.5-8.1 Nm)         |
| Cavity                                       | TECNORD 2W                      |
| Cavity Tools Kit<br>(form tool, reamer, tap) | 40500032                        |
| Seal Kit                                     | 21191300                        |

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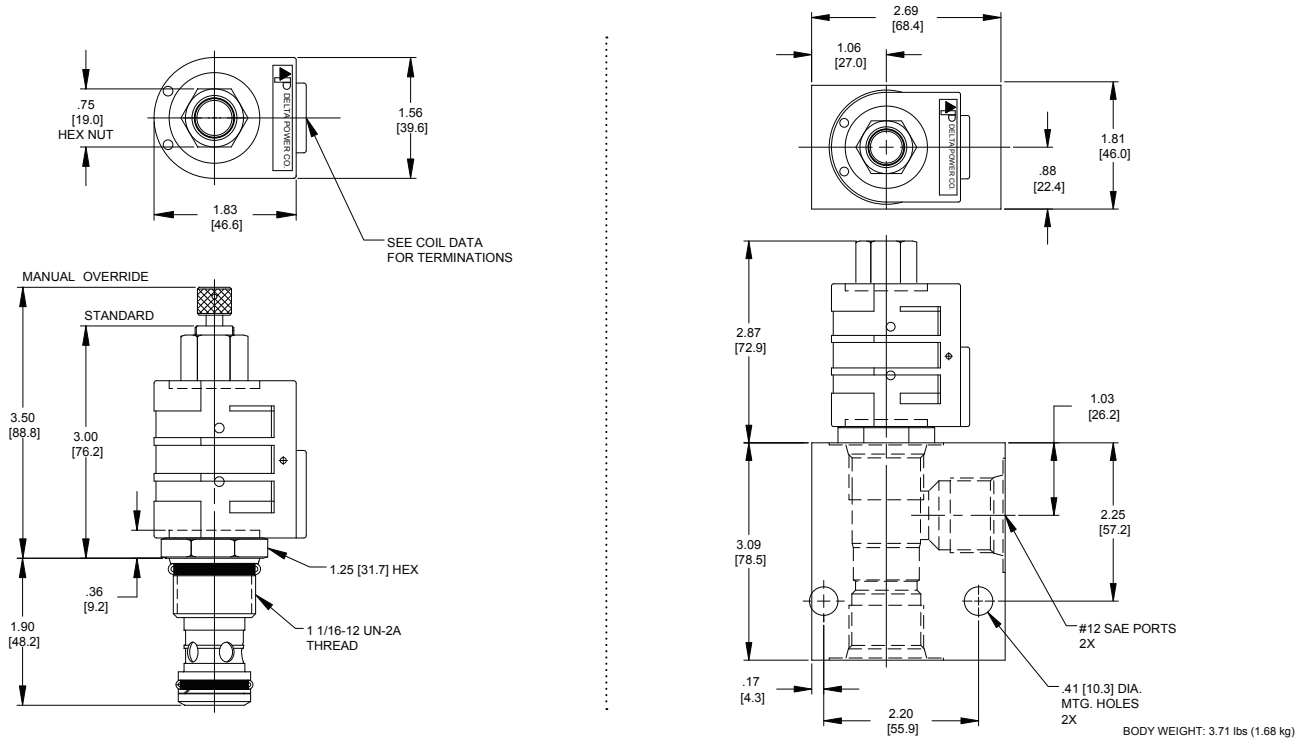
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# SOLENOID OPERATED DIRECTIONAL CONTROLS

## 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)**

**"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

### BODIES

- Blank** Without Body
- S** #12 SAE Ports

### VOLTAGE

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

### IMMERSION PROOF "D" TYPE

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

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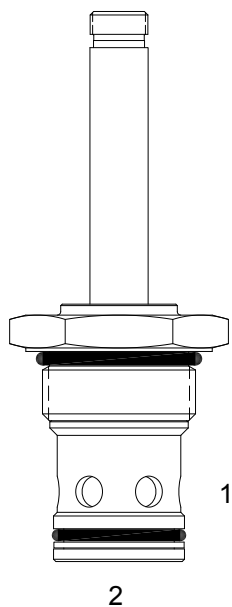


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**SJ-S2D PILOT OPERATED POPPET, 2 WAY NORMALLY OPEN**



**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.

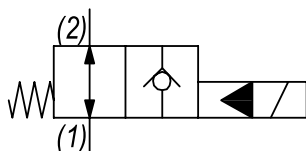
**OPERATION**

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**

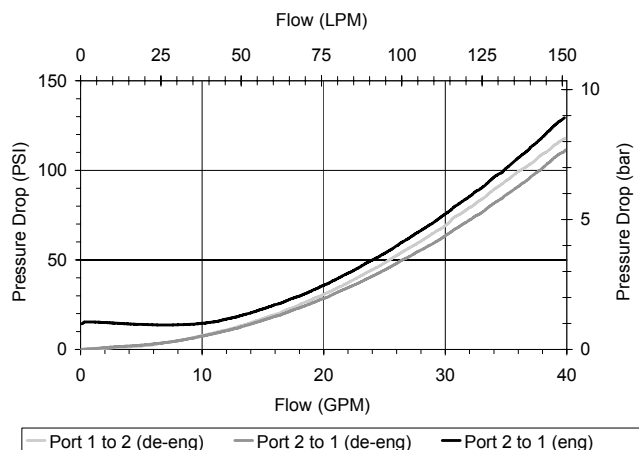
- Hardened parts for long life.
- Efficient wet-armature construction.
- Cartridges are voltage interchangeable.
- Industry common cavity.
- Unitized, molded coil design.
- Continuous duty rated solenoid.
- Optional coil voltages and terminations.
- Optional "I" Coil: Weatherproof, Thermal Shock, Immersion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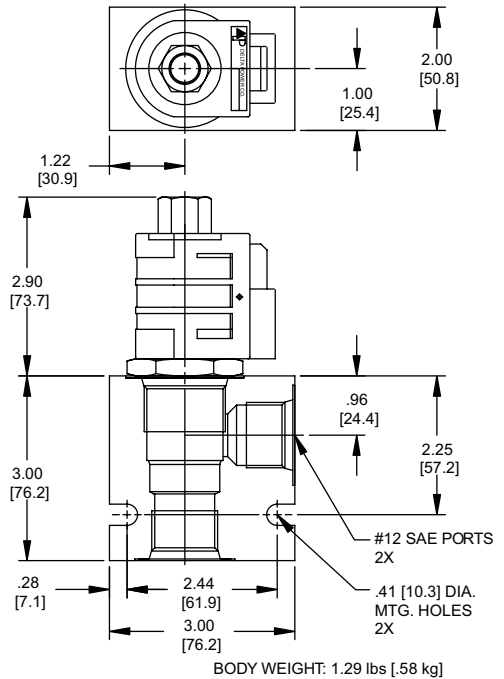
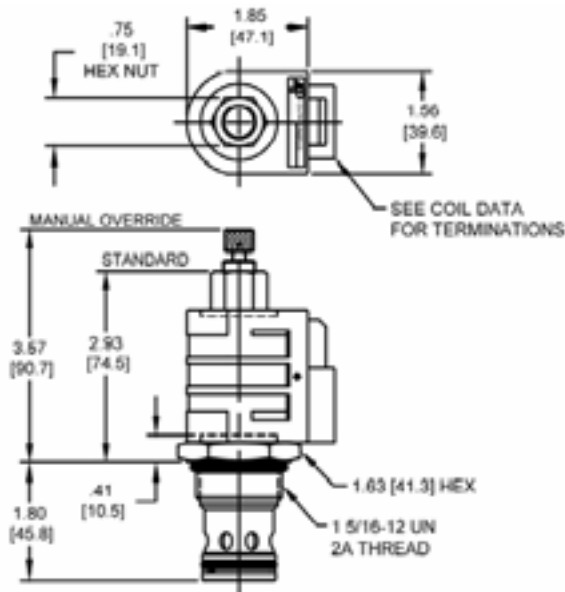


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# SOLENOID OPERATED DIRECTIONAL CONTROLS

## DIMENSIONS



## ORDERING INFORMATION

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

SJ-S2D - - - -

### OPTIONS

- Buna Standard **00**
- Viton Standard **V0**
- Buna, Override **0K**
- Viton, Override **VK**
- 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)

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

### BODIES

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

### VOLTAGE

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

### IMMERSION PROOF "D" TYPE

- 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

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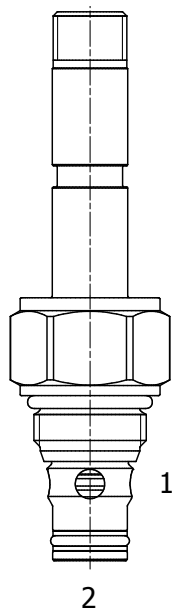


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**HB-S2K PILOTED OPERATED POPPET, 2 WAY DOUBLE LOCK NORMALLY OPEN**



**DESCRIPTION**

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

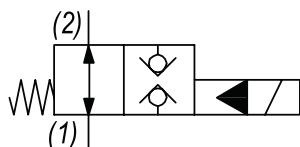
**OPERATION**

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**

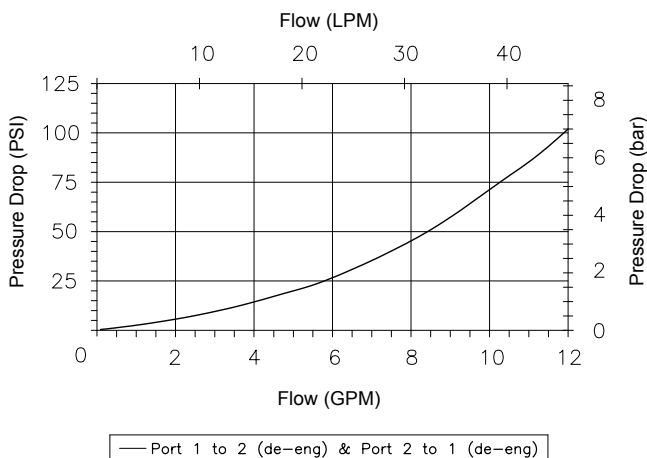
- Hardened parts for long life.
- Efficient wet-armature construction.
- Cartridges are voltage interchangeable.
- Manual override option.
- Industry common cavity.
- Unitized, molded coil design.
- Continuous duty rated solenoid.
- Optional coil voltages and terminations.
- 720 hour salt spray protection.

**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)<br>BUNA seals<br>-4° to 250°F (-20° to 120°C)<br>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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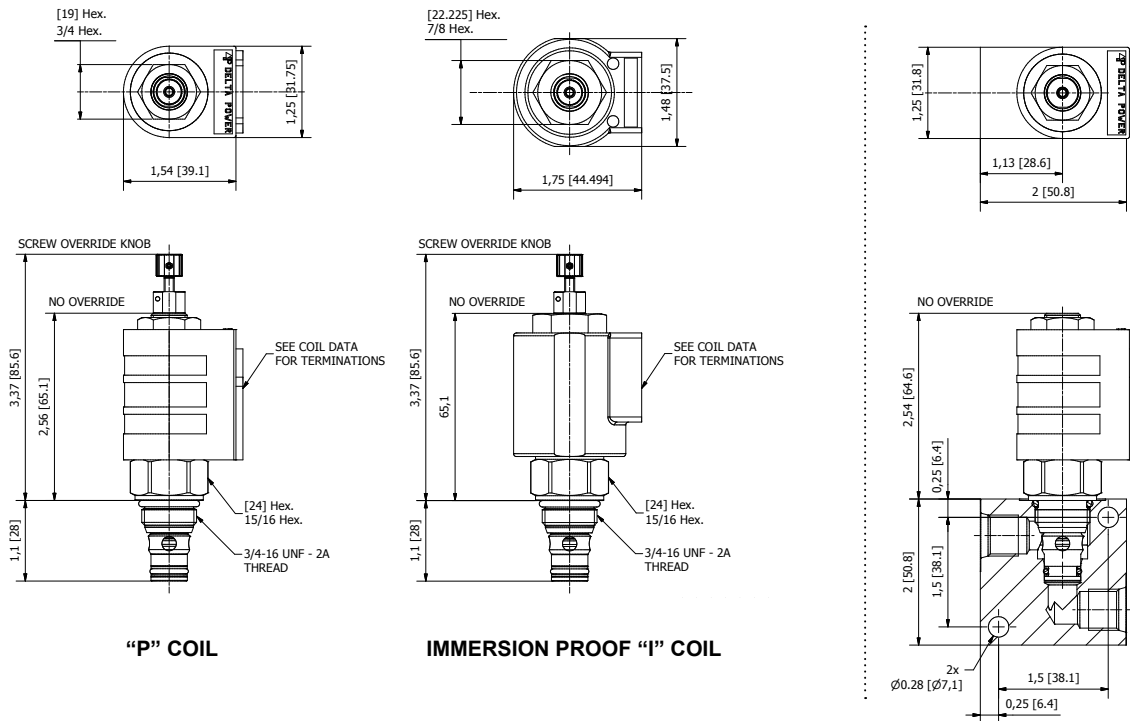


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**DIMENSIONS**



“P” COIL

IMMERSION PROOF “I” COIL

**ORDERING INFORMATION**

**HB - S2K - - - -**

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

|                               |           |  |                |                |
|-------------------------------|-----------|--|----------------|----------------|
| <b>OPTIONS</b>                |           |  | <b>BODIES</b>  |                |
| Buna Standard                 | <b>00</b> |  | <b>Blank</b>   | Without Body   |
| Viton Standard                | <b>V0</b> |  | <b>N</b>       | 1/4 NPTF Ports |
| Buna, Override, Knob          | <b>OK</b> |  | <b>S</b>       | #6 SAE Ports   |
| Viton, Override, Knob         | <b>VK</b> |  |                |                |
| Buna, Screen                  | <b>A0</b> |  |                |                |
| Viton, Screen                 | <b>W0</b> |  |                |                |
| Buna, Screen, Override, Knob  | <b>B5</b> |  |                |                |
| Viton, Screen, Override, Knob | <b>V5</b> |  |                |                |
|                               |           |  | <b>VOLTAGE</b> |                |
|                               |           |  | <b>06</b>      | 6 VDC          |
|                               |           |  | <b>12</b>      | 12 VDC         |
|                               |           |  | <b>24</b>      | 24 VDC         |
|                               |           |  | <b>36</b>      | 36 VDC         |
|                               |           |  | <b>48</b>      | 48 VDC         |
|                               |           |  | <b>25</b>      | 24 VAC         |
|                               |           |  | <b>11</b>      | 120 VAC        |
|                               |           |  | <b>22</b>      | 220 VAC        |
|                               |           |  | <b>44</b>      | 440 VAC        |

**Note: Aluminum Body Not durability rated for 5000 PSI (345 bar), consult factory for high pressure body options.**

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

**“P” COIL TERMINATION**

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

**IMMERSION PROOF “I” COIL TERMINATION**

- 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

For Optional Coil Terminations See Coil Section

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**SOLENOID OPERATED DIRECTIONAL CONTROLS**

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

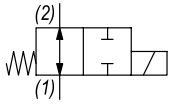


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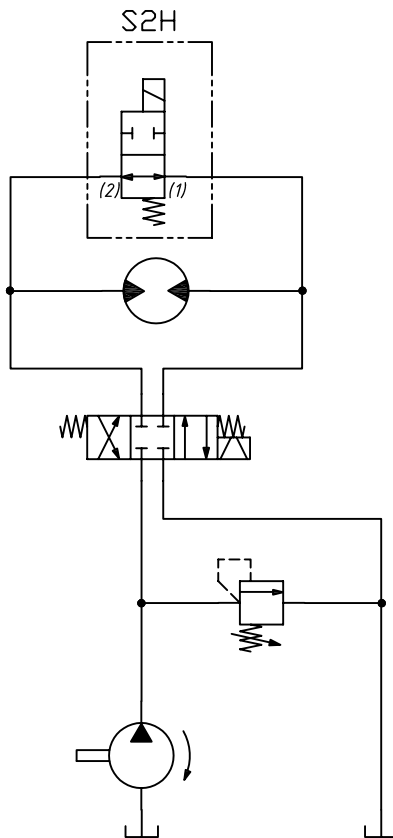
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2 WAY 2 POSITION NORMALLY OPEN SPOOL VALVES

| 2W2P NORMALLY OPEN  | GPM | PSI  | LPM | BAR | CAVITY | MODEL  | PAGE |
|---|-----|------|-----|-----|--------|--------|------|
|  | 1   | 4000 | 4   | 276 | 5/8-18 | UA-S2H | SD90 |
|   | 5   | 3000 | 19  | 207 | 3/4-16 | PB-S2H | SD92 |
|   | 8   | 3500 | 30  | 241 | 7/8-14 | DE-S2H | SD94 |
|   | 8   | 4000 | 30  | 276 | 7/8-14 | HE-S2H | SD96 |

TYPICAL SCHEMATIC

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



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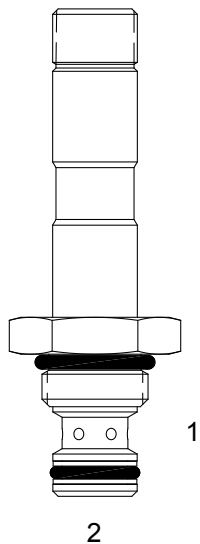


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**UA-S2H DIRECT ACTING SPOOL, 2 WAY NORMALLY OPEN**



**DESCRIPTION**

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

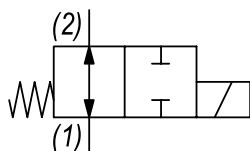
**OPERATION**

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.

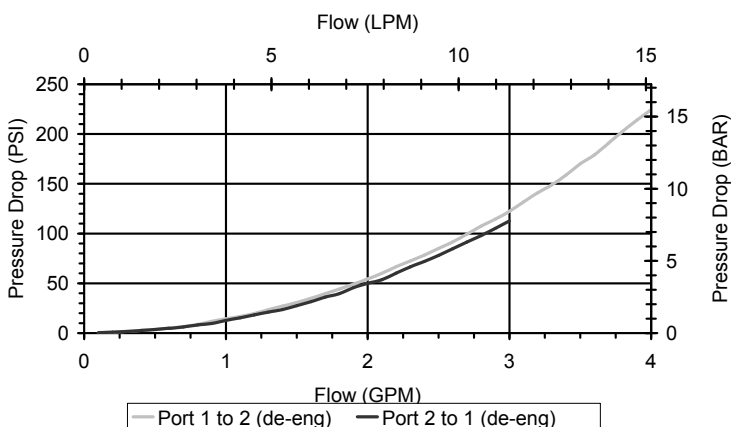
**HYDRAULIC SYMBOL**



Uses "P" or "PI" type coils

**PERFORMANCE**

Actual Test Data (Cartridge Only)



**VALVE SPECIFICATIONS**

|                                    |  |
|------------------------------------|--|
| Nominal Flow                       | 2 GPM (8 LPM) from (1) to (2)<br>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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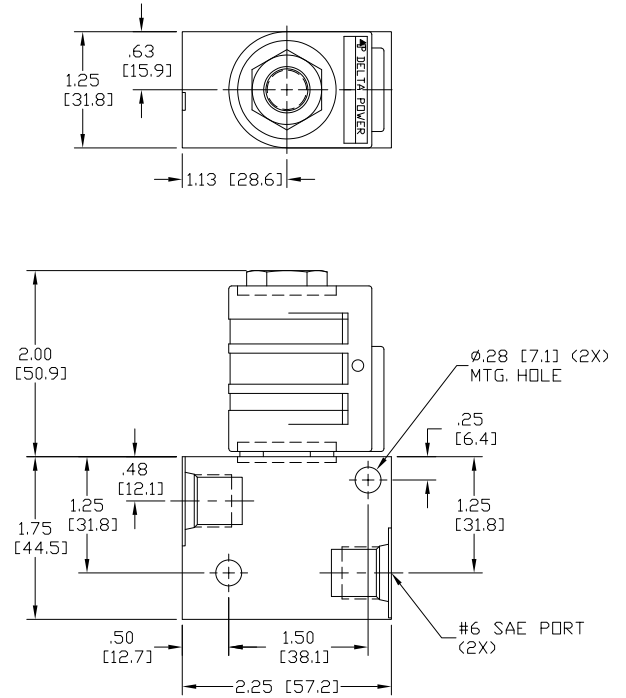
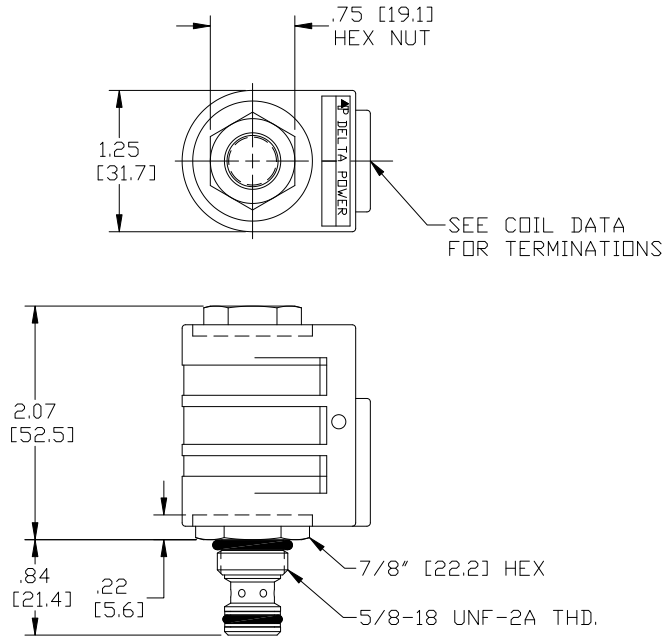
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# SOLENOID OPERATED DIRECTIONAL CONTROLS

## DIMENSIONS



BDDY WEIGHT: .40 lbs [18 kg.]

## ORDERING INFORMATION

UA-S2H - - - -

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

- 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 NPTF Ports
  - S** #6 SAE Ports

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

**VOLTAGE**

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

**"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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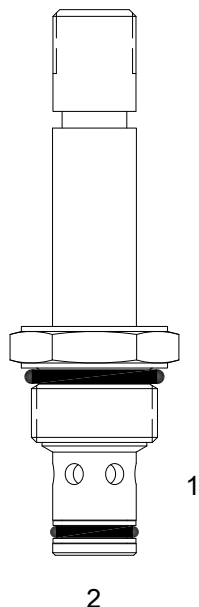


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**PB-S2H DIRECT ACTING SPOOL, 2 WAY NORMALLY OPEN**



**DESCRIPTION**

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

**OPERATION**

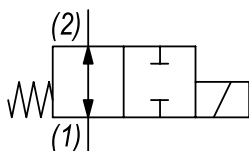
When de-energized the PB-S2H allows flow from (1) to (2) and (2) to (1). When energized the valve blocks flow from (1) to (2) and (2) to (1).

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

**FEATURES**

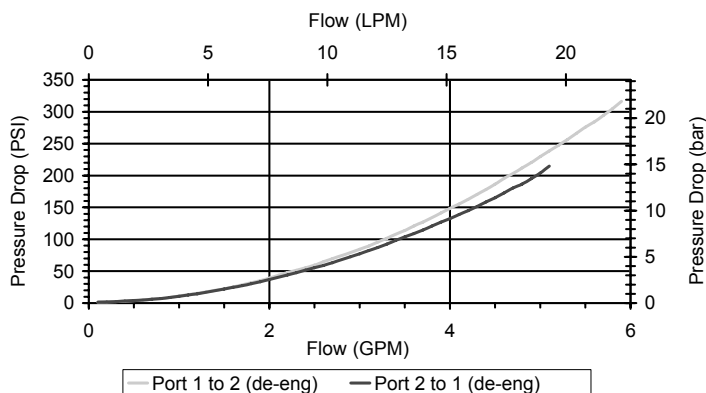
- Hardened parts for long life.
- Efficient wet-armature construction.
- Cartridges are voltage interchangeable.
- Manual override option.
- Industry common cavity.
- Unitized, molded coil design.
- Continuous duty rated solenoid.
- Optional coil voltages and terminations.
- Optional "I" Coil: Weatherproof,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

**HYDRAULIC SYMBOL**



**PERFORMANCE**

Actual Test Data (Cartridge Only)



**VALVE SPECIFICATIONS**

|                                    |  |
|------------------------------------|--|
| Nominal Flow                       | 5 GPM (19 LPM) from (1) to (2)<br>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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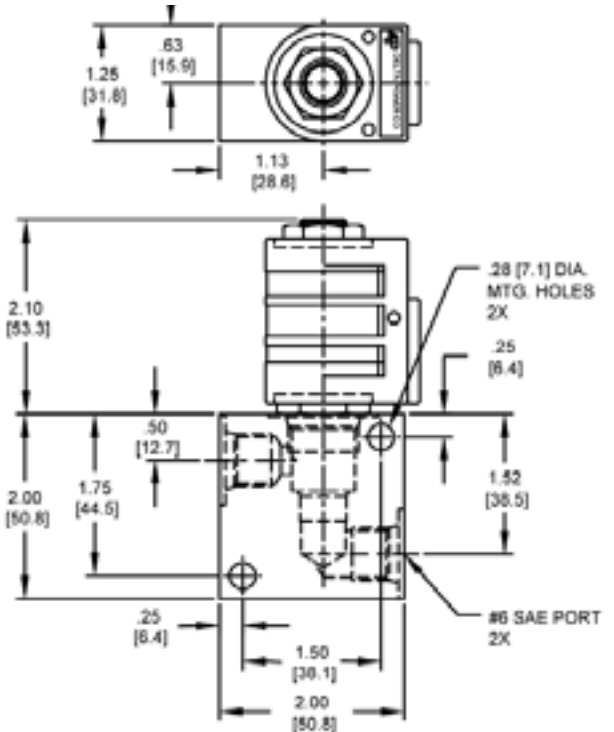
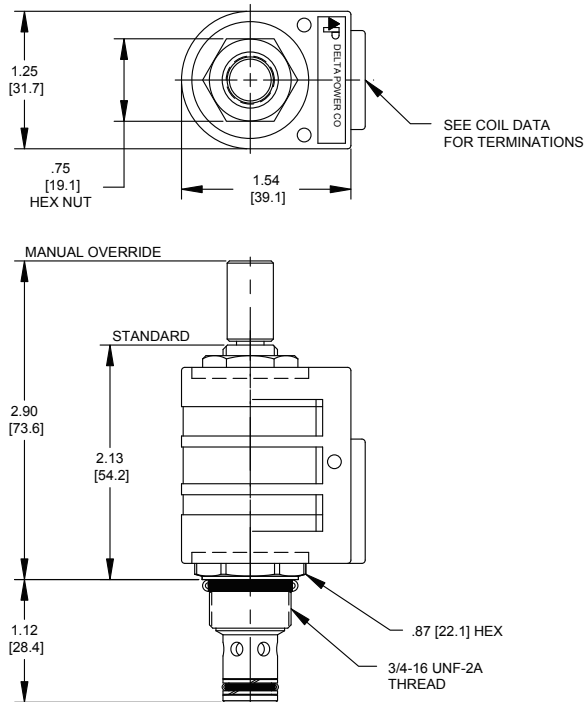
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**DIMENSIONS**



**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, Nondetent **B1**
- Buna, Override, Nondetent **V1**
- Buna, Screen, Override, Nondetent **B3**
- Viton, Screen, Override, Nondetent **V3**
- Buna, Screen, Override, Detent **B4**
- Viton, Screen, Override, Detent **V4**

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

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

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

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

**BODIES**

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

**VOLTAGE**

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

**IMMERSION PROOF "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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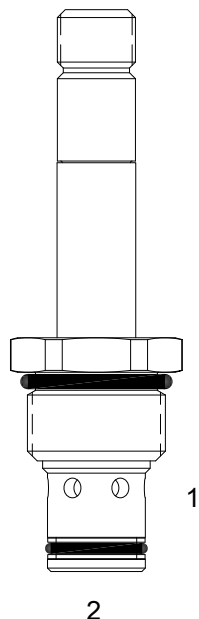


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**DE-S2H DIRECT ACTING SPOOL, 2 WAY NORMALLY OPEN**



**DESCRIPTION**

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

**OPERATION**

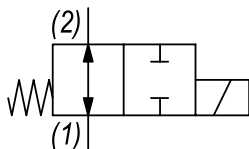
When de-energized the DE-S2H allows flow from (1) to (2) and (2) to (1). When energized the valve blocks flow from (1) to (2) and (2) to (1).

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

**FEATURES**

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

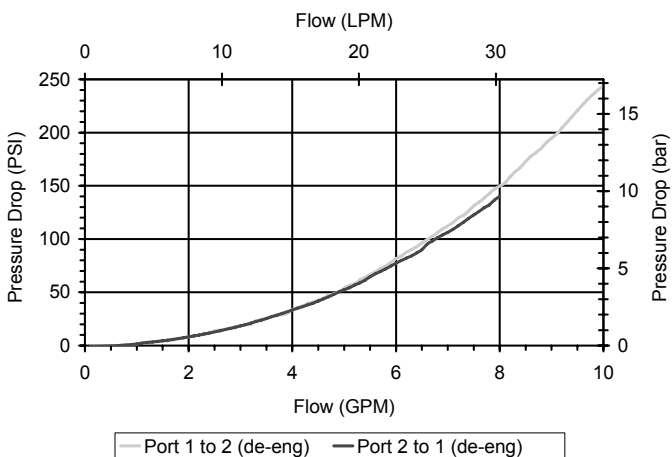
**HYDRAULIC SYMBOL**



For higher pressure systems see HE-S2H.

**PERFORMANCE**

Actual Test Data (Cartridge Only)



**VALVE SPECIFICATIONS**

|                                    |  |
|------------------------------------|--|
| Nominal Flow                       | 8 GPM (30 LPM) from (1) to (2)<br>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)   |
| Seal Kit                           | 40500000<br>21191202   |

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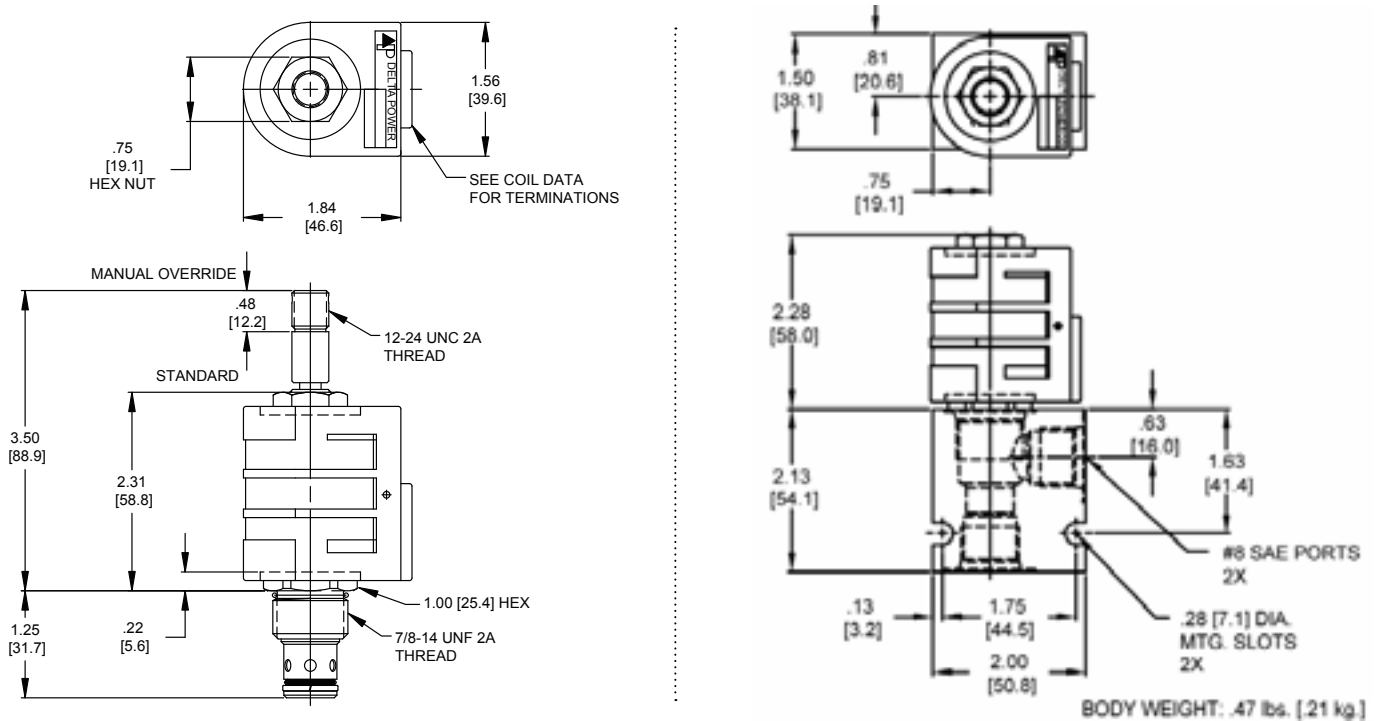


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**DIMENSIONS**



**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, Override, Nondetent **B1**
- Buna, Override, Nondetent **V1**
- Buna, Screen, Override, Nondetent **B3**
- Viton, Screen, Override, Nondetent **V3**
- Buna, Screen, Override, Detent **B4**
- Viton, Screen, Override, Detent **V4**

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

**"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

**BODIES**

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

**VOLTAGE**

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

**IMMERSION PROOF "D" TYPE**

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

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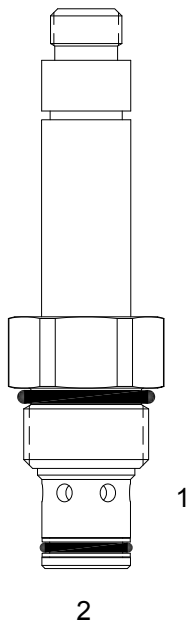


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**HE-S2H DIRECT ACTING SPOOL, 2 WAY NORMALLY OPEN**



**DESCRIPTION**

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

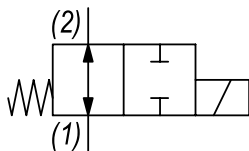
**OPERATION**

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.

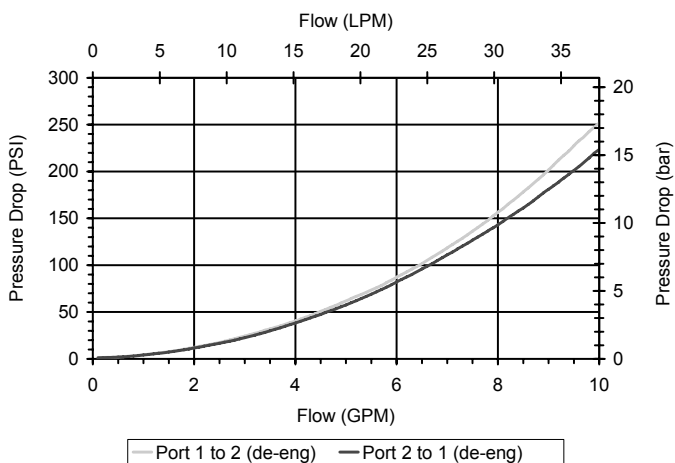
**HYDRAULIC SYMBOL**



Uses “L” Coils.

**PERFORMANCE**

Actual Test Data (Cartridge Only)



**VALVE SPECIFICATIONS**

|                                    |  |
|------------------------------------|--|
| Nominal Flow                       | 8 GPM (30 LPM) from (1) to (2)<br>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      | 35 ft-lbs (47.5 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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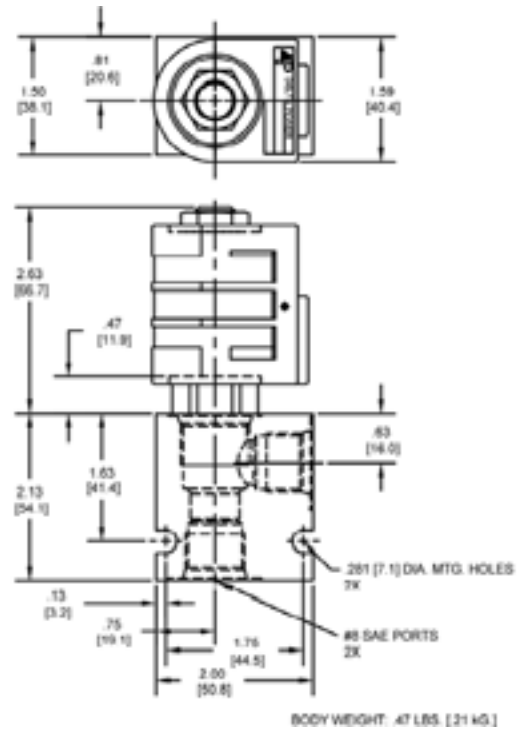
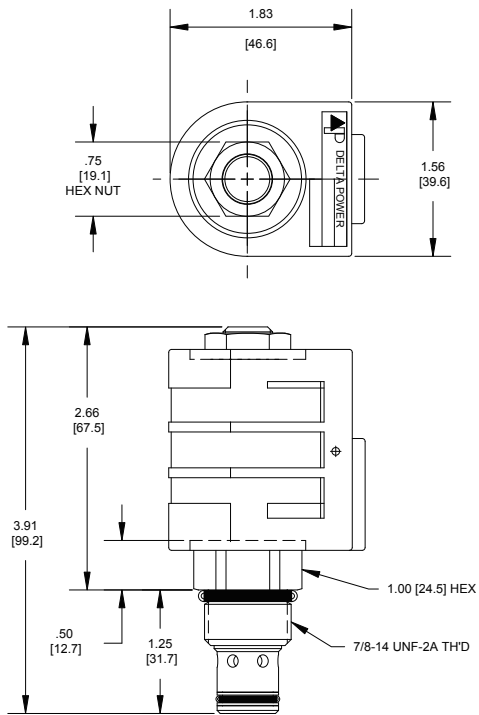
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# SOLENOID OPERATED DIRECTIONAL CONTROLS

## DIMENSIONS



## ORDERING INFORMATION

### HE-S2H

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

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

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

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

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

**"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

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

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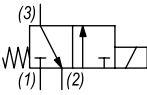
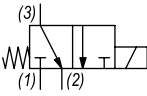
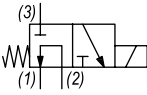
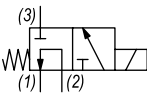
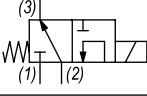
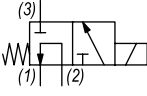
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## SOLENOID OPERATED DIRECTIONAL CONTROLS

### 3 WAY 2 POSITION SPOOL VALVES

| 3W2P SPOOL  | GPM | PSI  | LPM | BAR | CAVITY    | MODEL         | PAGE  |
|---|-----|------|-----|-----|-----------|---------------|-------|
|    | 1   | 3500 | 4   | 241 | 5/8-18    | <b>UC-S3A</b> | SD100 |
|   | 3   | 3000 | 11  | 207 | 3/4-16    | <b>PP-S3A</b> | SD102 |
|   | 10  | 3000 | 38  | 207 | 7/8-14    | <b>DF-S3A</b> | SD104 |
|   | 10  | 4000 | 38  | 276 | 7/8-14    | <b>HF-S3A</b> | SD106 |
|    | 2.5 | 3000 | 9.5 | 207 | 3/4-16    | <b>PP-S3B</b> | SD108 |
|   | 8   | 3000 | 30  | 207 | 7/8-14    | <b>DF-S3B</b> | SD110 |
|   | 8   | 4000 | 30  | 276 | 7/8-14    | <b>HF-S3B</b> | SD112 |
|    | 15  | 5000 | 57  | 345 | 1 1/16-12 | <b>HU-S3E</b> | SD114 |
|    | 15  | 5000 | 57  | 345 | 1 1/16-12 | <b>HU-S3F</b> | SD116 |
|   | 3   | 3000 | 11  | 207 | 3/4-16    | <b>PP-S3X</b> | SD118 |
|  | 3   | 3000 | 11  | 207 | 3/4-16    | <b>PP-S3D</b> | SD120 |

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3 WAY 2 POSITION SPOOL VALVES

TYPICAL SCHEMATIC

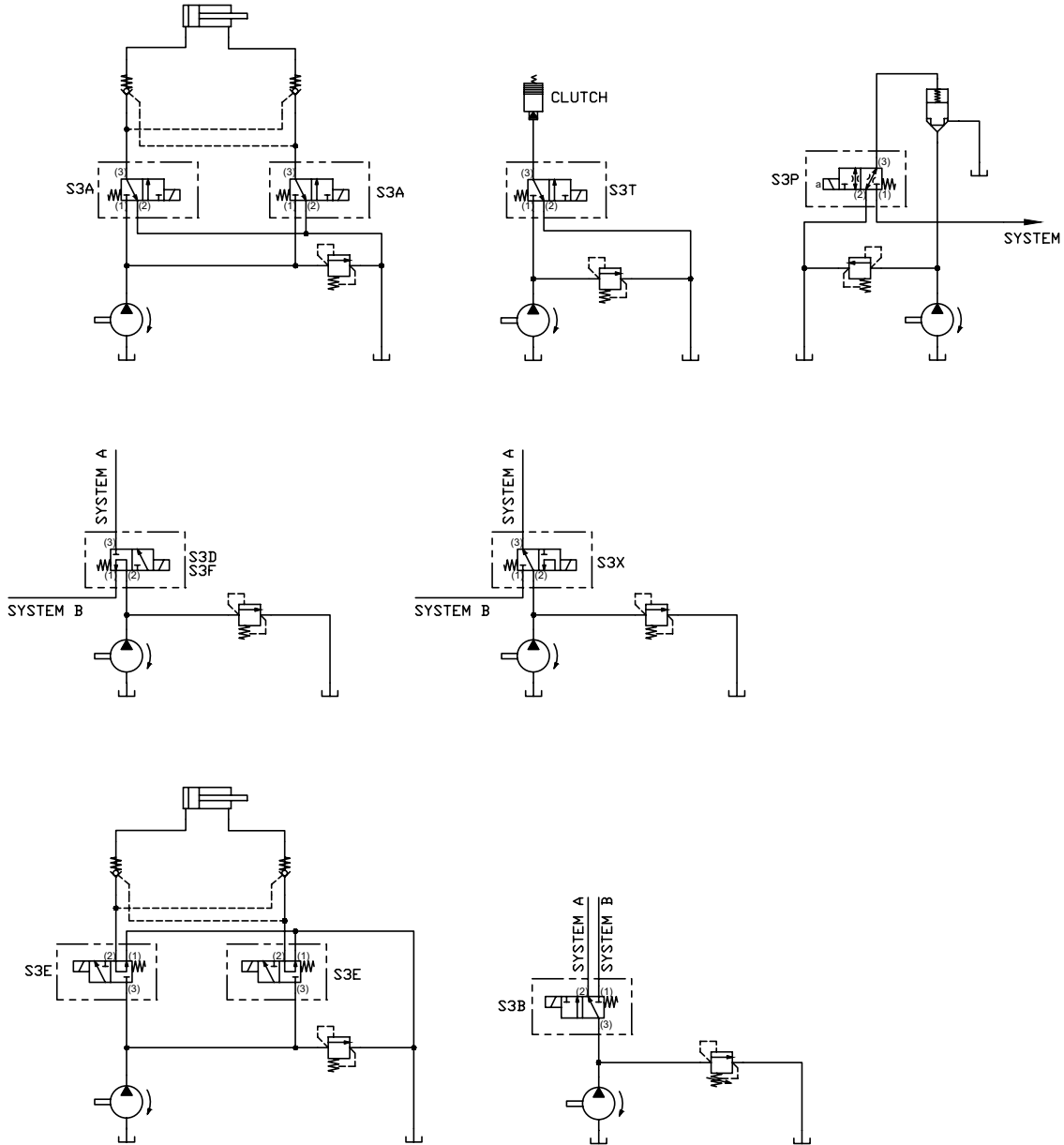
The typical application for the S3A and S3E is to have the pump supply port blocked, with the work port vented to tank.

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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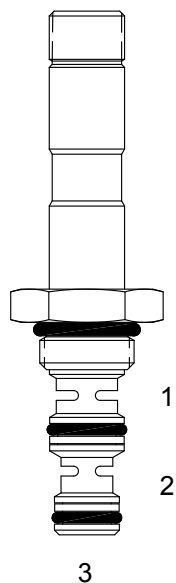


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**UC-S3A DIRECT ACTING SPOOL, 3 WAY 2 POSITION**



**DESCRIPTION**

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

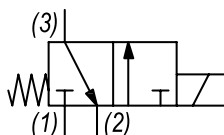
**OPERATION**

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.

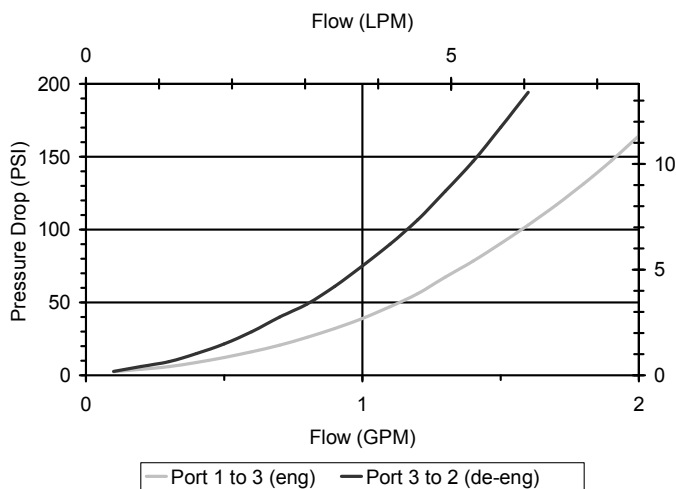
**HYDRAULIC SYMBOL**



Uses "P" or "PI" type coils

**PERFORMANCE**

Actual Test Data (Cartridge Only)



**VALVE SPECIFICATIONS**

|                                    |  |
|------------------------------------|--|
| Nominal Flow                       | 1 GPM (4 LPM) from (1) to (3)<br>2 GPM (7.6 LPM) from (3) to (2) |
| 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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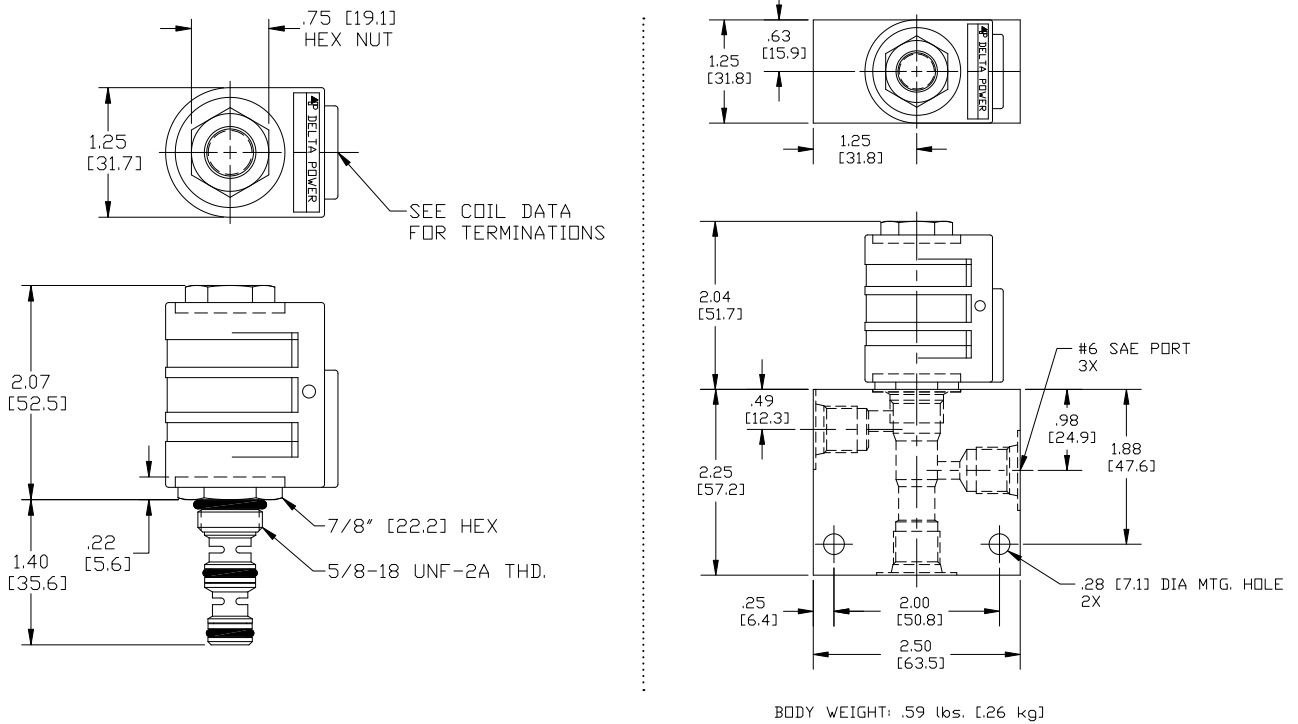


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# SOLENOID OPERATED DIRECTIONAL CONTROLS

## DIMENSIONS



## ORDERING INFORMATION

UC-S3A - - - -

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

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

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

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

**VOLTAGE**

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

**"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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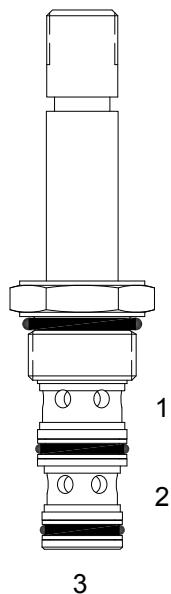


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## PP-S3A DIRECT ACTING SPOOL, 3 WAY 2 POSITION



### DESCRIPTION

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

### OPERATION

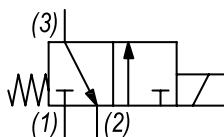
When de-energized the PP-S3A allows flow from (3) to (2) and blocks flow at port (1). When energized the valve allows flow from (1) to (3) and blocks flow at port (2).

**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.

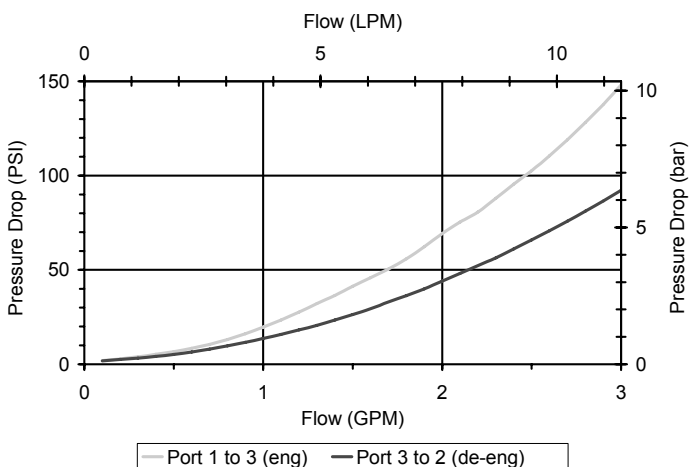
### HYDRAULIC SYMBOL



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                           | 21191104                        |

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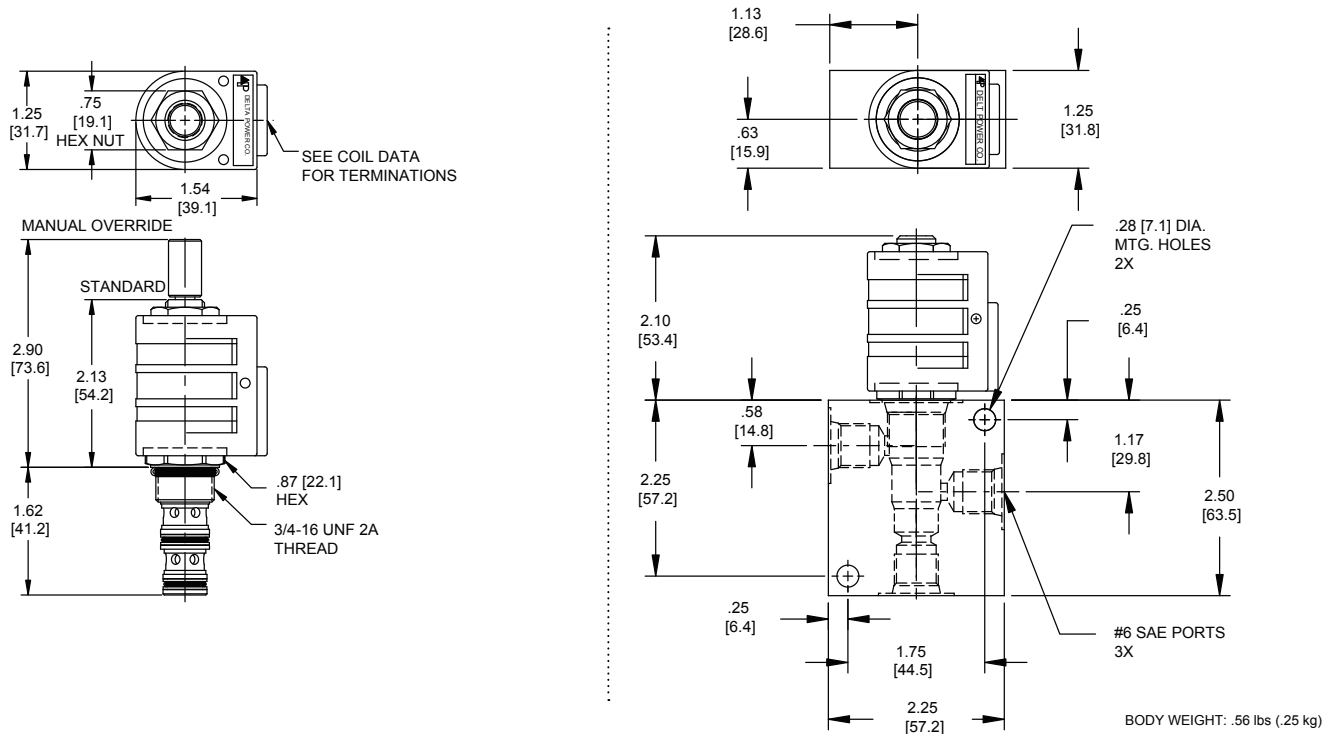
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# SOLENOID OPERATED DIRECTIONAL CONTROLS

## 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, Nondetent **B1**
- Buna, Override, Nondetent **V1**
- Buna, Screen, Override, Nondetent **B3**
- Viton, Screen, Override, Nondetent **V3**
- Buna, Screen, Override, Detent **B4**
- Viton, Screen, Override, Detent **V4**

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

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

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

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

#### BODIES

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

#### VOLTAGE

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

#### IMMERSION PROOF "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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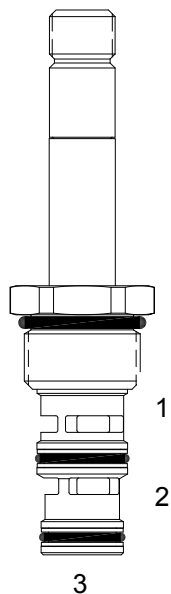


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## DF-S3A DIRECT ACTING SPOOL, 3 WAY 2 POSITION



### DESCRIPTION

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

### OPERATION

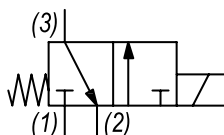
When de-energized the DF-S3A allows flow from (3) to (2) and blocks flow at port (1). When energized the valve allows flow from (1) to (3) and blocks flow at port (2).

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

### FEATURES

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

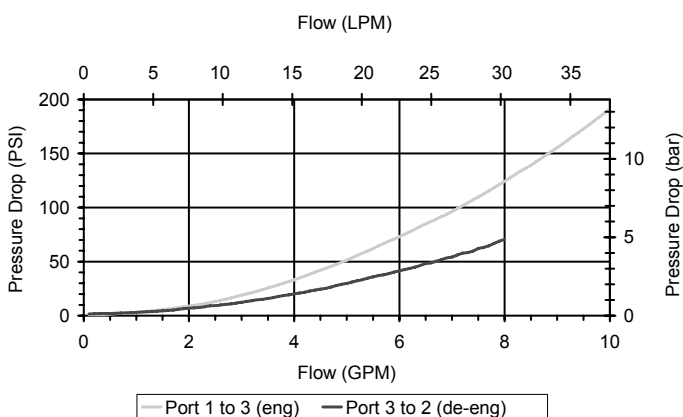
### HYDRAULIC SYMBOL



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

### PERFORMANCE

Actual Test Data (Cartridge Only)



### VALVE SPECIFICATIONS

|                                    |                                 |
|------------------------------------|---------------------------------|
| Nominal Flow                       | 10 GPM (38 LPM)                 |
| Rated Operating Pressure           | 3000 PSI (207 bar)              |
| Typical Internal Leakage (150 SSU) | 5 cu in/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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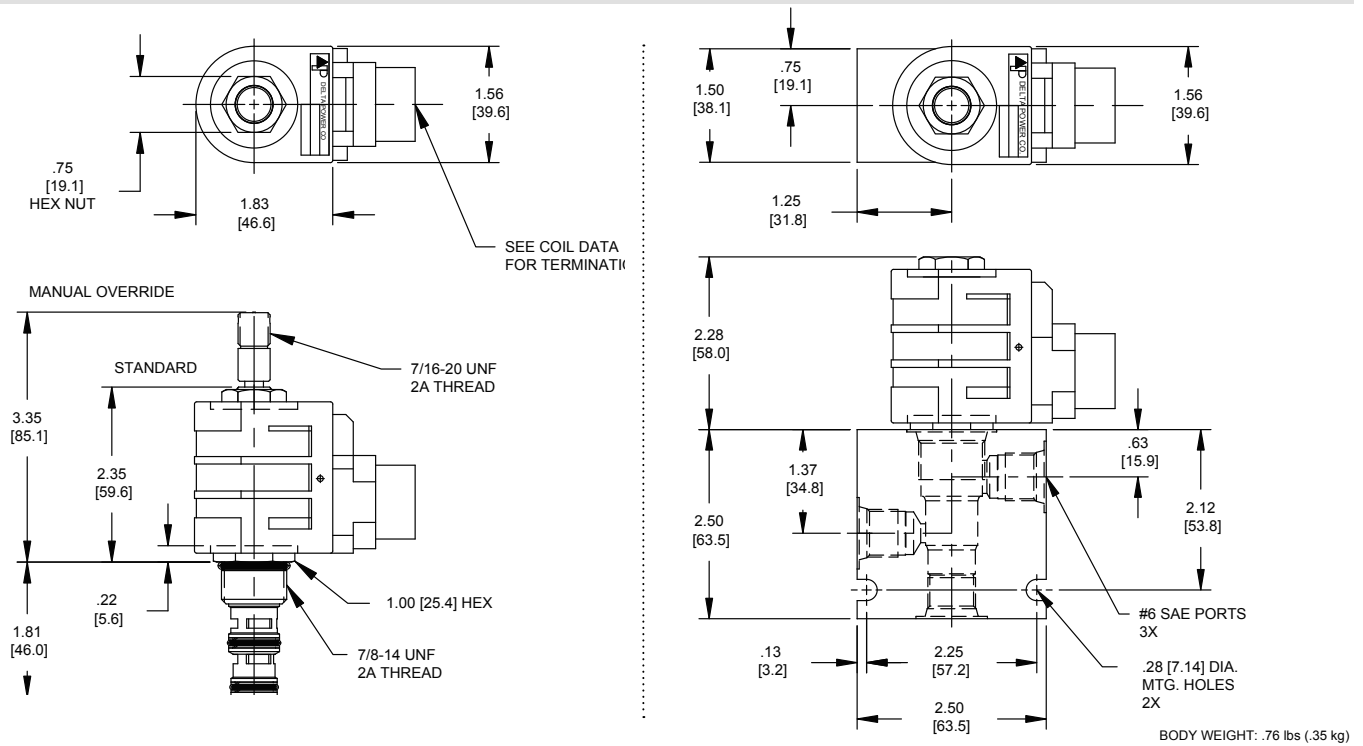
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# SOLENOID OPERATED DIRECTIONAL CONTROLS

## DIMENSIONS



## ORDERING INFORMATION

Approximate Coil Weight: .74 lbs (.33 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, Override, Nondetent **B1**
- Buna, Override, Nondetent **V1**
- Buna, Screen, Override, Nondetent **B3**
- Viton, Screen, Override, Nondetent **V3**
- Buna, Screen, Override, Detent **B4**
- Viton, Screen, Override, Detent **V4**

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

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

#### 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

- 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 "D" TYPE

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

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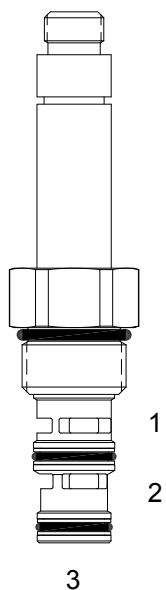


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## HF-S3A DIRECT ACTING SPOOL, 3 WAY 2 POSITION



### DESCRIPTION

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

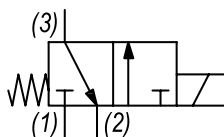
### OPERATION

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.

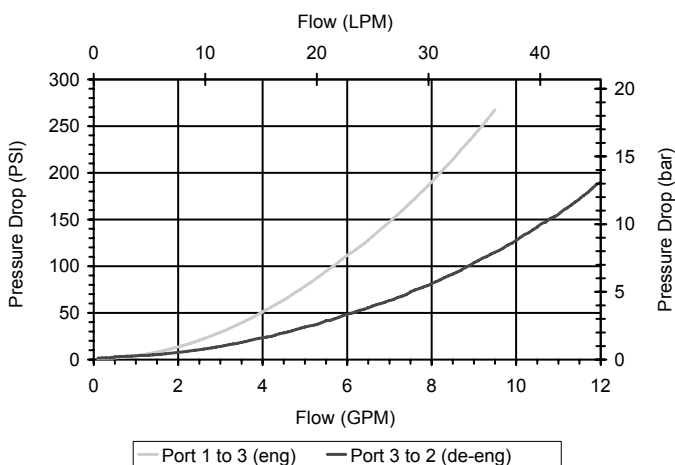
### HYDRAULIC SYMBOL



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                        |

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



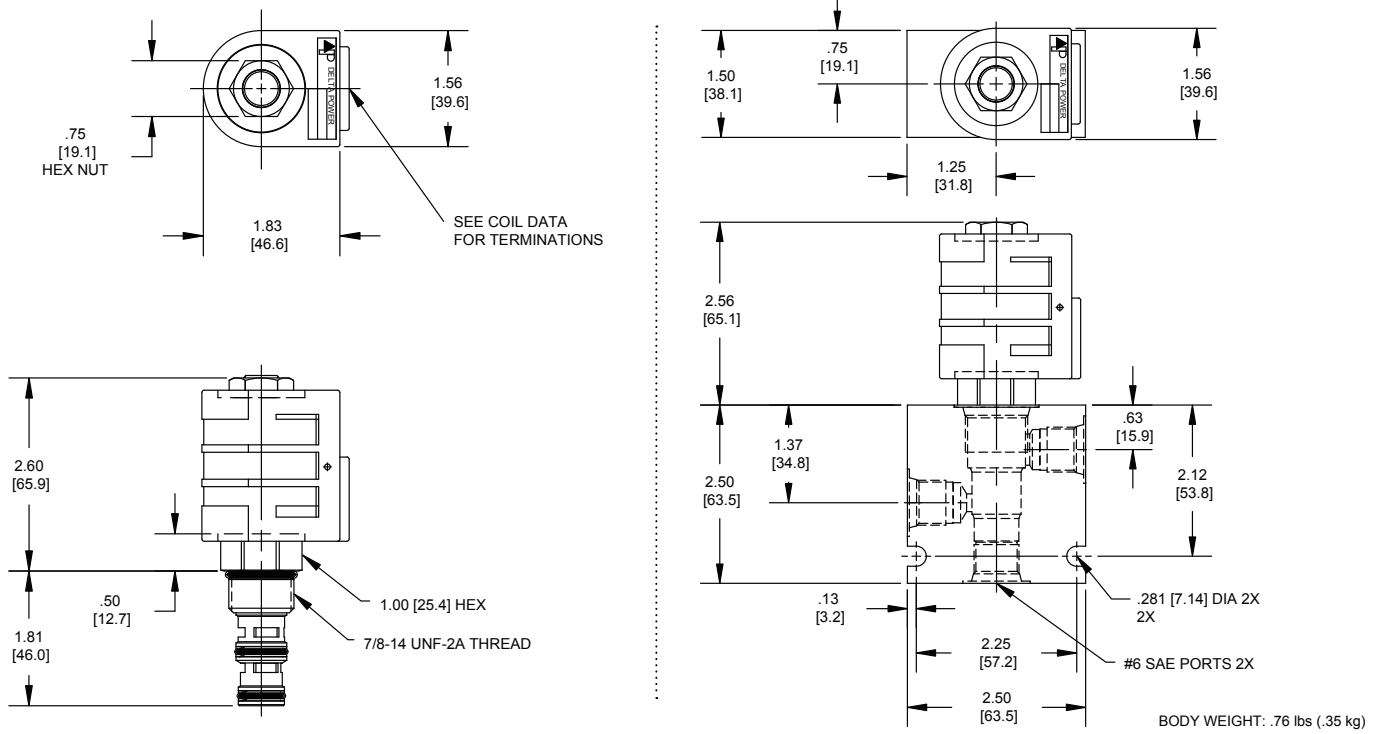
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# SOLENOID OPERATED DIRECTIONAL CONTROLS

## DIMENSIONS



## ORDERING INFORMATION

HF-S3A

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

**OPTIONS**  
 Buna Standard 00  
 Viton Standard V0

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

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

**VOLTAGE**

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

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

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

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

**IMMERSION PROOF "L" TYPE**

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

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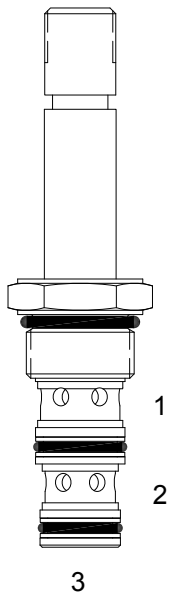


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PP-S3B DIRECT ACTING SPOOL, 3 WAY 2 POSITION



**DESCRIPTION**

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

**OPERATION**

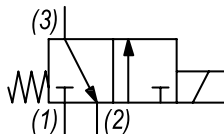
When de-energized the PP-S3B allows flow from (3) to (2) and blocks flow at port (1). When energized the valve allows flow from (3) to (1) and blocks flow at port (2).

**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.

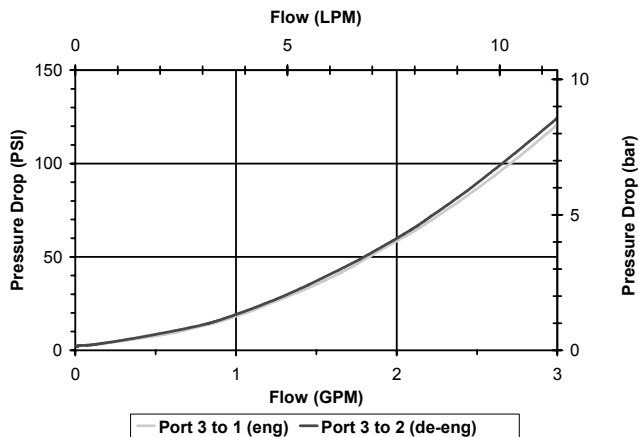
HYDRAULIC SYMBOL



*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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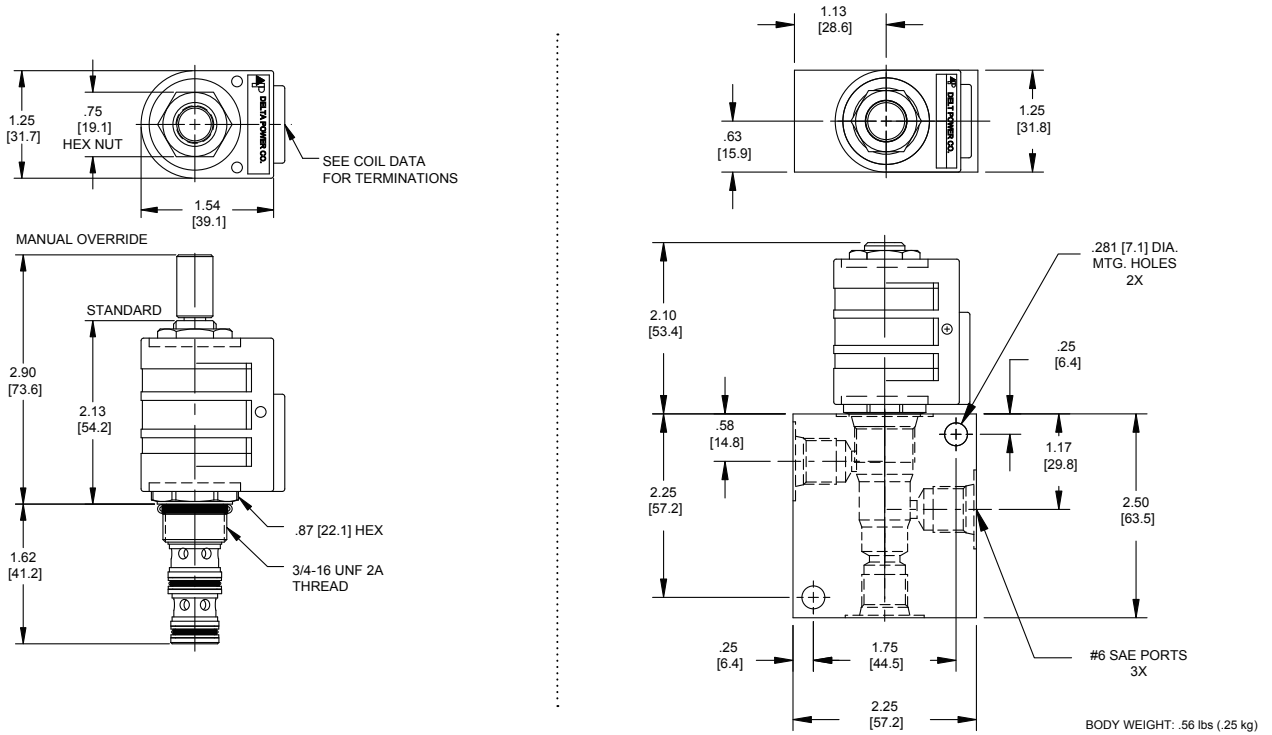


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# SOLENOID OPERATED DIRECTIONAL CONTROLS

## DIMENSIONS



## ORDERING INFORMATION

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

PP-S3B

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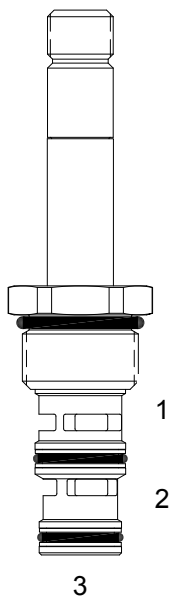


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## DF-S3B DIRECT ACTING SPOOL, 3 WAY 2 POSITION, SELECTOR



### DESCRIPTION

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

### OPERATION

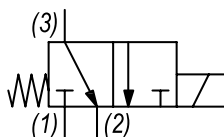
When de-energized the DF-S3B allows flow from (3) to (2) and blocks flow at port (1). When energized the valve allows flow from (3) to (1) and blocks flow at port (2).

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

### FEATURES

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

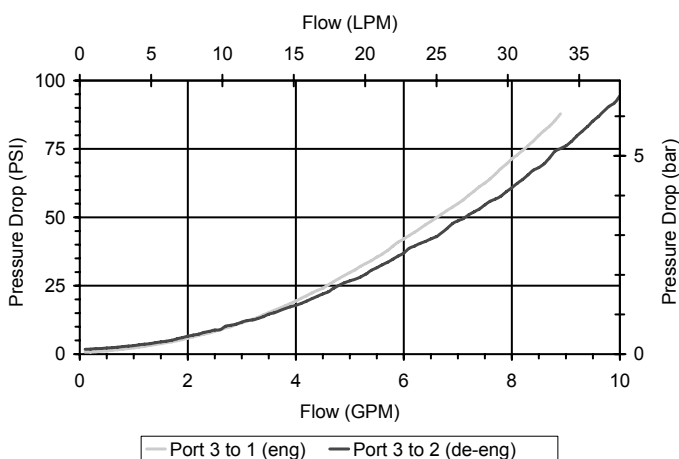
### HYDRAULIC SYMBOL



Trapped differentials above 1500 PSI (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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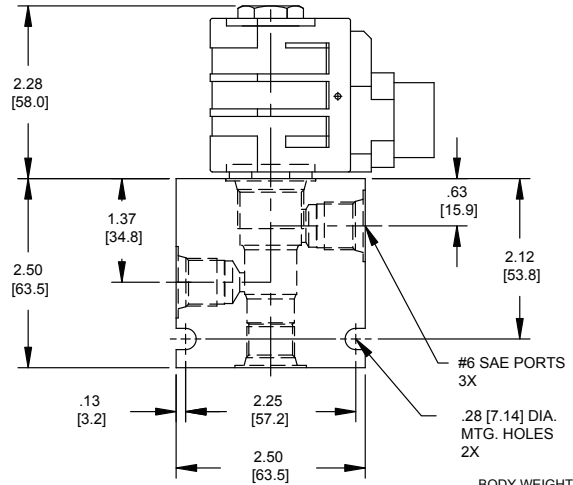
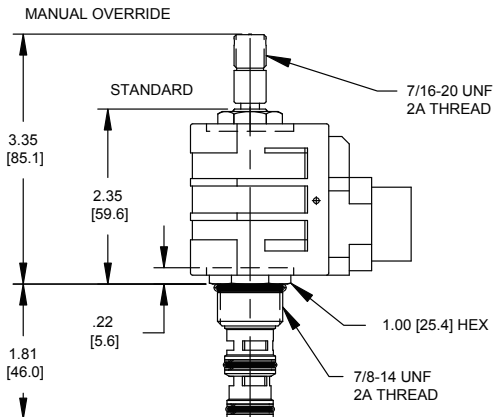
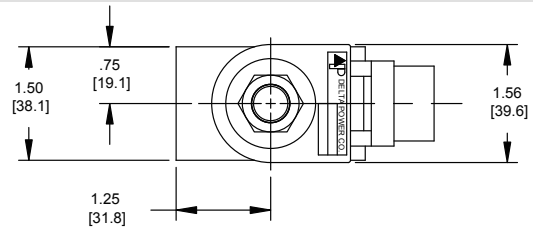
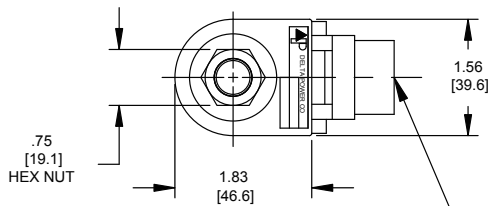
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# SOLENOID OPERATED DIRECTIONAL CONTROLS

## DIMENSIONS



BODY WEIGHT: .76 lbs (.35 kg)

## ORDERING INFORMATION

Approximate Coil Weight: .74 lbs (.33 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, Override, Nondetent **B1**
- Buna, Override, Nondetent **V1**
- Buna, Screen, Override, Nondetent **B3**
- Viton, Screen, Override, Nondetent **V3**
- Buna, Screen, Override, Detent **B4**
- Viton, Screen, Override, Detent **V4**

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

#### "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

#### BODIES

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

#### VOLTAGE

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

#### IMMERSION PROOF "D" TYPE

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

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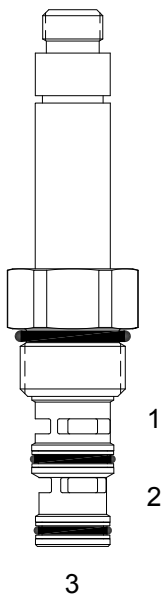


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**HF-S3B DIRECT ACTING SPOOL, 3 WAY 2 POSITION**



**DESCRIPTION**

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

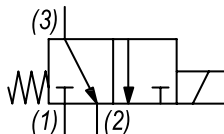
**OPERATION**

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.

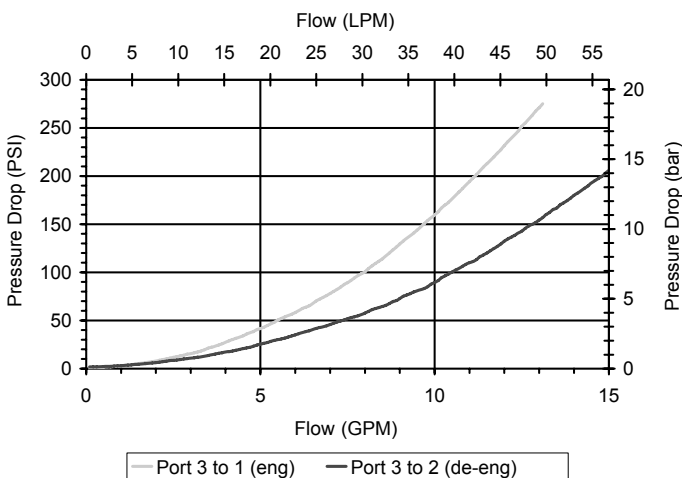
**HYDRAULIC SYMBOL**



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

**PERFORMANCE**

Actual Test Data (Cartridge Only)



**VALVE SPECIFICATIONS**

|                                    |                                 |
|------------------------------------|---------------------------------|
| Nominal Flow                       | 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      | 35 ft-lbs (47.5 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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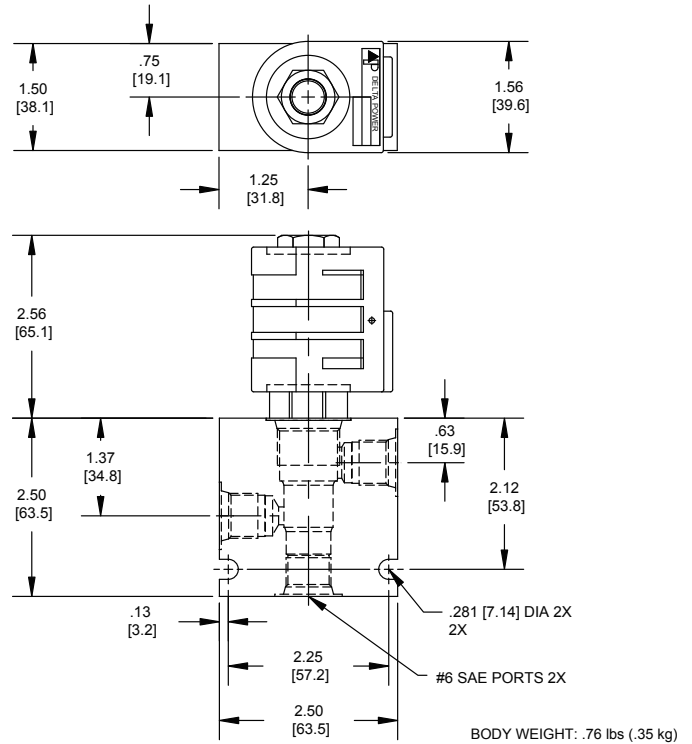
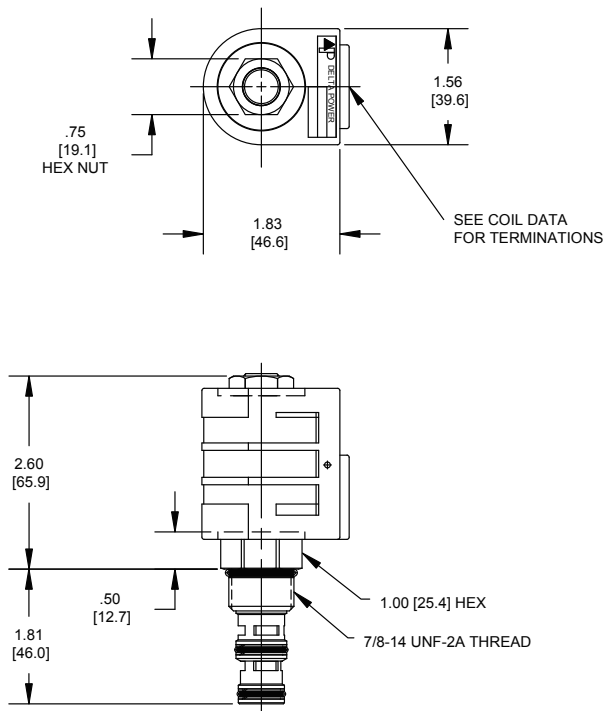
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# SOLENOID OPERATED DIRECTIONAL CONTROLS

## DIMENSIONS



## ORDERING INFORMATION

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

### HF-S3B

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

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

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

### VOLTAGE

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

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

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

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

### IMMERSION PROOF "L" TYPE

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

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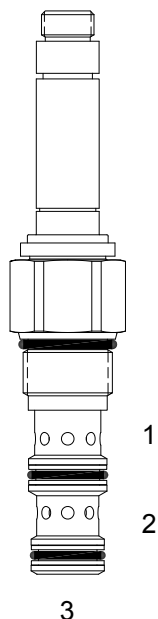


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## HU-S3E DIRECT ACTING SPOOL, 3 WAY 2 POSITION, HIGH PRESSURE



### DESCRIPTION

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

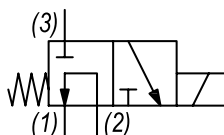
### OPERATION

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.

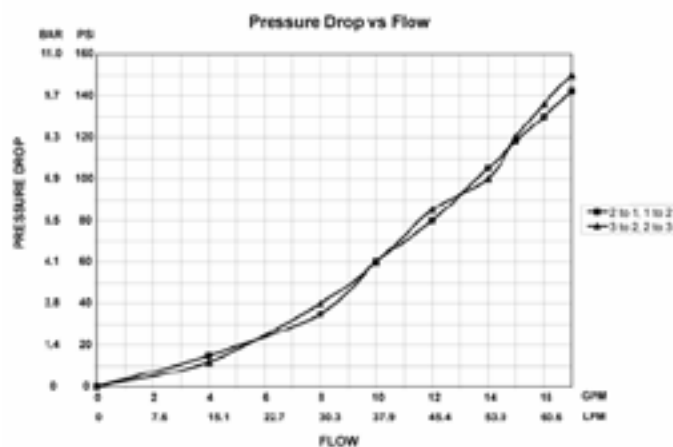
### HYDRAULIC SYMBOL



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      | 70 ft-lbs (94.9 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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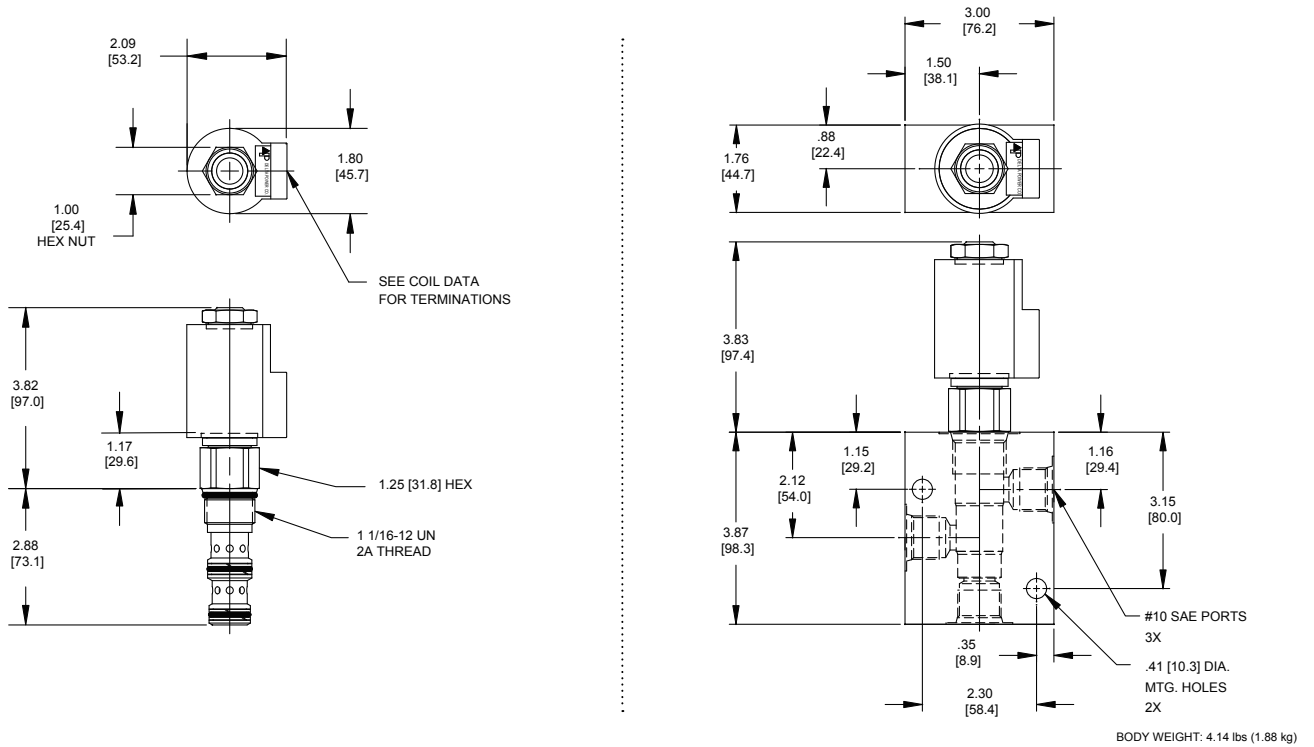
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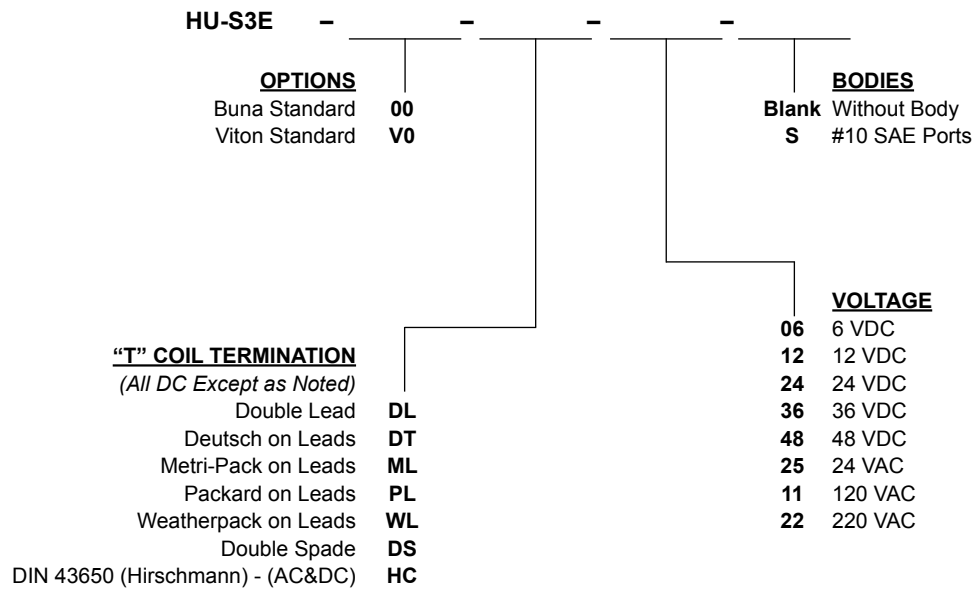
# SOLENOID OPERATED DIRECTIONAL CONTROLS

## DIMENSIONS



## ORDERING INFORMATION

Approximate Coil Weight: .89 lbs (.41 kg)



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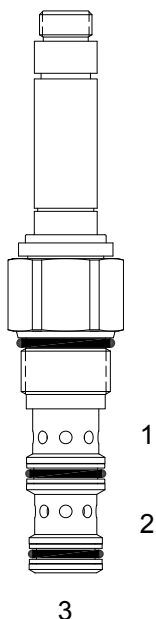


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## HU-S3F DIRECT ACTING SPOOL, 3 WAY 2 POSITION, HIGH PRESSURE



### DESCRIPTION

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

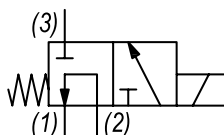
### OPERATION

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.

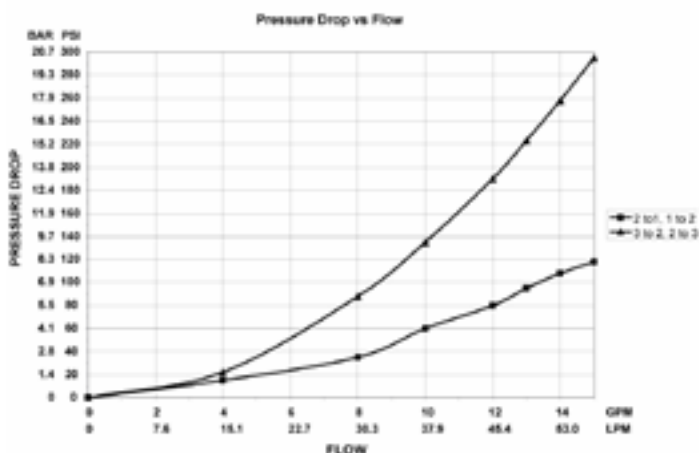
### HYDRAULIC SYMBOL



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      | 70 ft-lbs (94.9 Nm)             |
| Coil Nut Torque Requirements       | 5-7 ft-lbs (6.8-9.5 Nm) Maximum |
| Cavity                             | TECNORD 3W                      |
| Cavity Tools Kit                   |                                 |
| (form tool, reamer, tap)           | 40500034                        |
| Seal Kit                           | 21191305                        |

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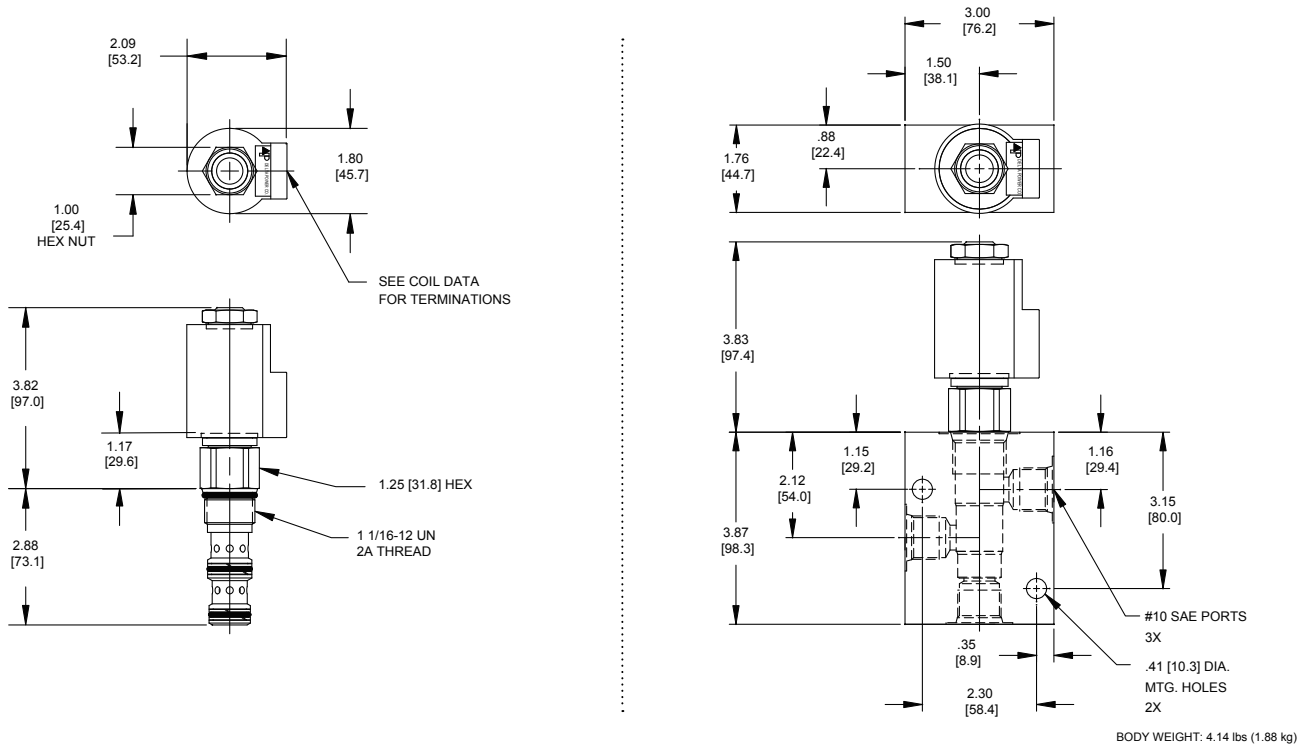
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## TECNORD

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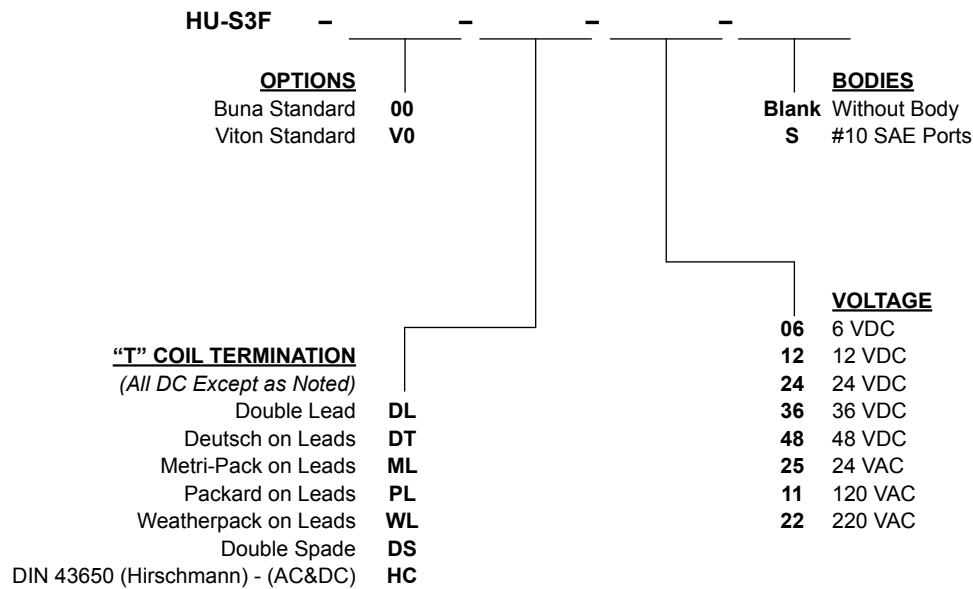


**DIMENSIONS**



**ORDERING INFORMATION**

Approximate Coil Weight: .89 lbs (.41 kg)



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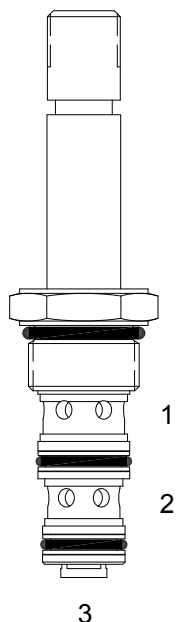


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## PP-S3X DIRECT ACTING SPOOL, 3 WAY 2 POSITION, SELECTOR



### DESCRIPTION

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

### OPERATION

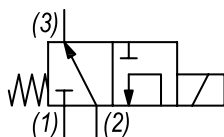
When de-energized the PP-S3X allows flow from (2) to (3) and blocks flow at port (1). When energized the valve allows flow from (2) to (1) and blocks flow at port (3).

**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.

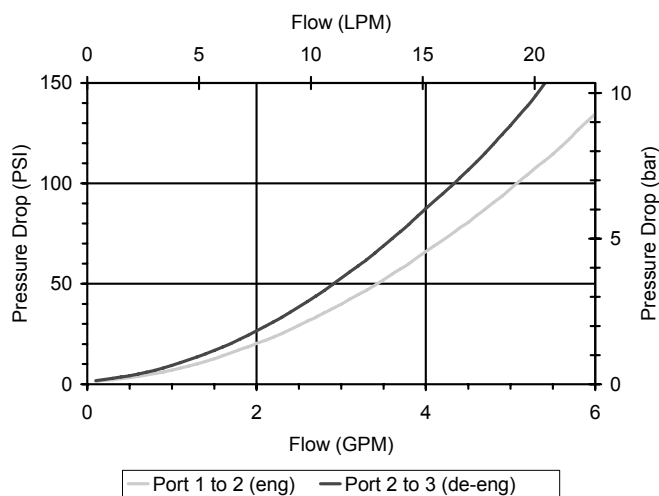
### HYDRAULIC SYMBOL



*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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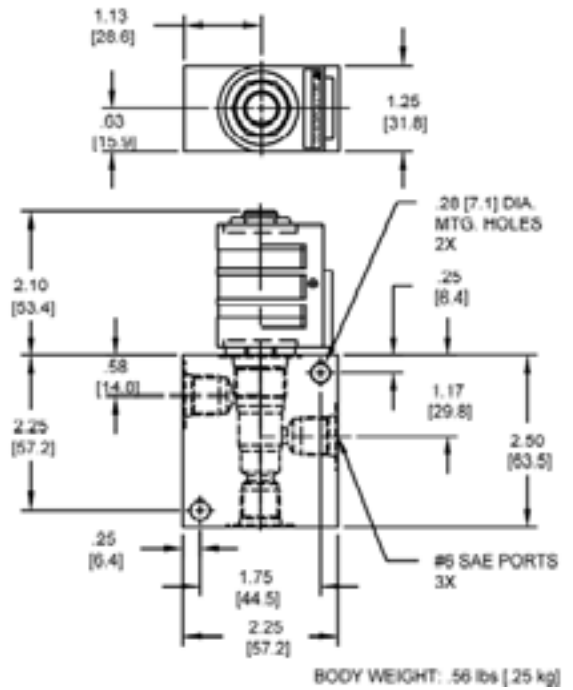
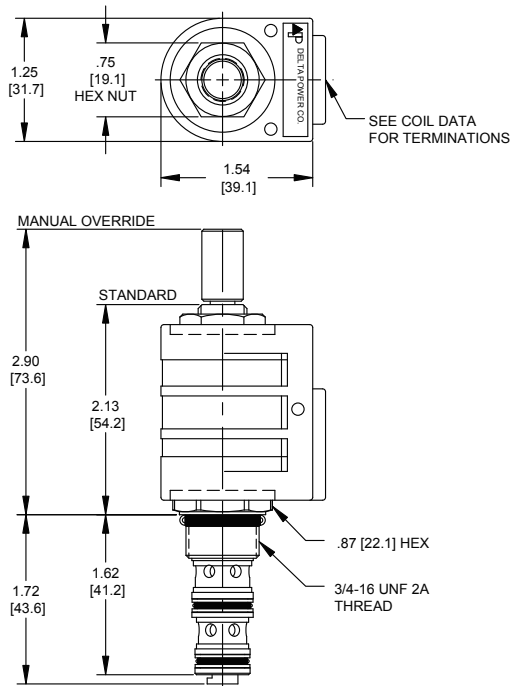


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**DIMENSIONS**



**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, Nondetent **B1**
  - Buna, Override, Nondetent **V1**
  - Buna, Screen, Override, Nondetent **B3**
  - Viton, Screen, Override, Nondetent **V3**
  - Buna, Screen, Override, Detent **B4**
  - Viton, Screen, Override, Detent **V4**

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

**“P” COIL TERMINATION**  
(All DC Except as Noted)

- 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

- 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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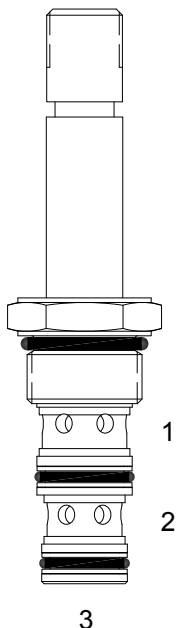


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PP-S3D DIRECT ACTING SPOOL, 3 WAY 2 POSITION



**DESCRIPTION**

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

**OPERATION**

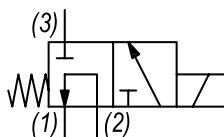
When de-energized the PP-S3D allows flow from (2) to (1) and blocks flow at port (3). When energized the valve allows flow from (2) to (3) and blocks flow at port (1).

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

**FEATURES**

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

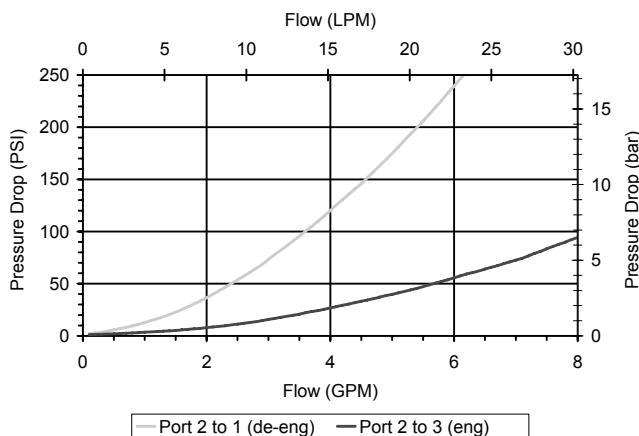
HYDRAULIC SYMBOL



Operational shift limit 3 GPM (11 LPM) from (2) or (3). Consult factory for flow in (1) that exceed 3 GPM. For shifted flow performance consult chart.

PERFORMANCE

Actual Test Data (Cartridge Only)



VALVE SPECIFICATIONS

|                                    |                                 |
|------------------------------------|---------------------------------|
| Nominal Flow                       | 3 GPM (11 LPM)                  |
| Rated Operating Pressure           | 3000 PSI (207 bar)              |
| Typical Internal Leakage (150 SSU) | 5 cu in/min (82 ml/min)         |
| Viscosity Range                    | 36 to 3000 SSU (3 to 647 cSt)   |
| Filtration                         | ISO 18/16/13                    |
| Media Operating 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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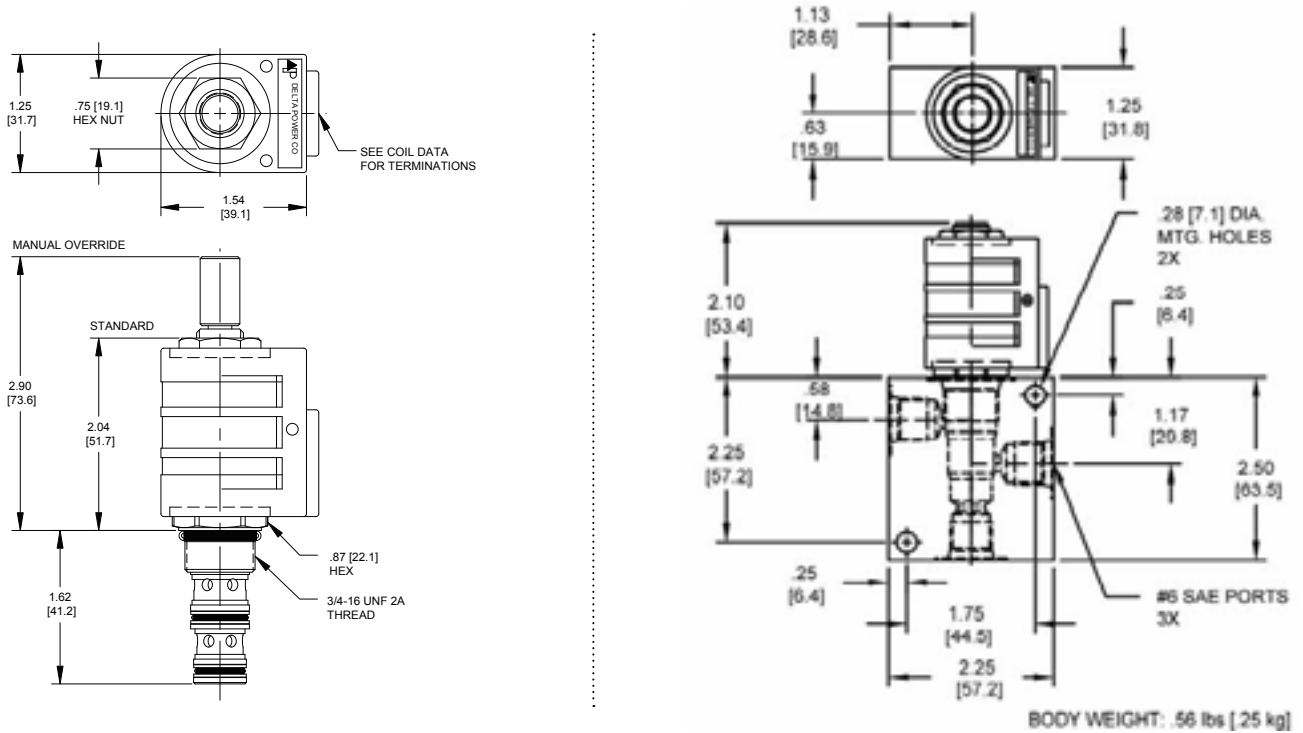


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**DIMENSIONS**



**ORDERING INFORMATION**

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

**PP-S3D**

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

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

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

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

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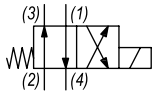
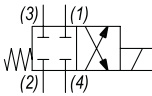
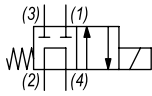
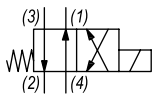
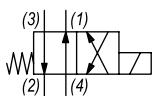
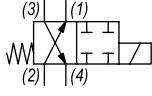
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## SOLENOID OPERATED DIRECTIONAL CONTROLS

### 4 WAY 2 POSITION SPOOL VALVES

| 4W2P SPOOL  | GPM | PSI  | LPM | BAR | CAVITY    | MODEL         | PAGE  |
|---|-----|------|-----|-----|-----------|---------------|-------|
|    | 1   | 4000 | 4   | 276 | 5/8-18    | <b>UD-S4A</b> | SD124 |
|   | 4   | 3000 | 15  | 207 | 3/4-16    | <b>PQ-S4A</b> | SD126 |
|   | 10  | 3500 | 38  | 241 | 7/8-14    | <b>DG-S4A</b> | SD128 |
|   | 10  | 4000 | 38  | 276 | 7/8-14    | <b>HG-S4A</b> | SD130 |
|   | 15  | 5000 | 57  | 345 | 1 1/16-12 | <b>HV-S4A</b> | SD132 |
|    | 1.5 | 4000 | 6   | 276 | 5/8-18    | <b>UD-S4B</b> | SD134 |
|   | 4   | 3000 | 15  | 207 | 3/4-16    | <b>PQ-S4B</b> | SD136 |
|   | 10  | 3000 | 38  | 207 | 7/8-14    | <b>DG-S4B</b> | SD138 |
|   | 10  | 4000 | 38  | 276 | 7/8-14    | <b>HG-S4B</b> | SD140 |
|    | 4   | 3000 | 15  | 207 | 3/4-16    | <b>PQ-S4C</b> | SD142 |
|   | 8   | 3000 | 30  | 207 | 7/8-14    | <b>DG-S4C</b> | SD144 |
|   | 8   | 4000 | 30  | 276 | 7/8-14    | <b>HG-S4C</b> | SD146 |
|   | 2.5 | 3000 | 9.5 | 207 | 3/4-16    | <b>PQ-S4D</b> | SD148 |
|   | 6   | 3000 | 23  | 207 | 7/8-14    | <b>DG-S4D</b> | SD150 |
|   | 8   | 4000 | 30  | 276 | 7/8-14    | <b>HG-S4D</b> | SD152 |
|  | 6   | 3000 | 23  | 207 | 7/8-14    | <b>DG-S4E</b> | SD154 |
|   | 8   | 4000 | 30  | 276 | 7/8-14    | <b>HG-S4E</b> | SD156 |
|   | 15  | 5000 | 57  | 345 | 1 1/16-12 | <b>HV-S4E</b> | SD158 |
|  | 6   | 3000 | 23  | 207 | 7/8-14    | <b>DG-S4F</b> | SD160 |
|   | 6   | 4000 | 23  | 276 | 7/8-14    | <b>HG-S4F</b> | SD162 |

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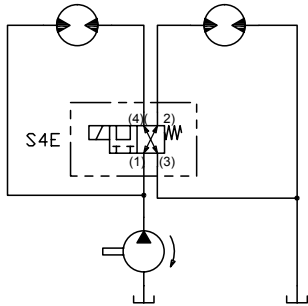
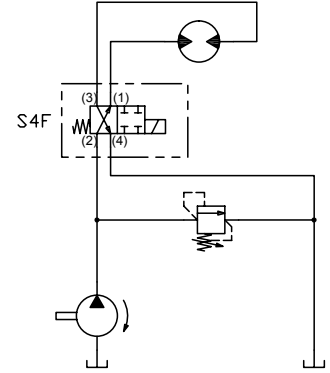
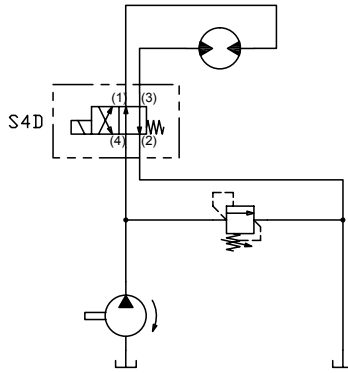
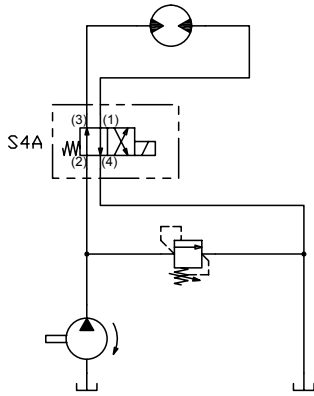
## TYPICAL SCHEMATIC

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

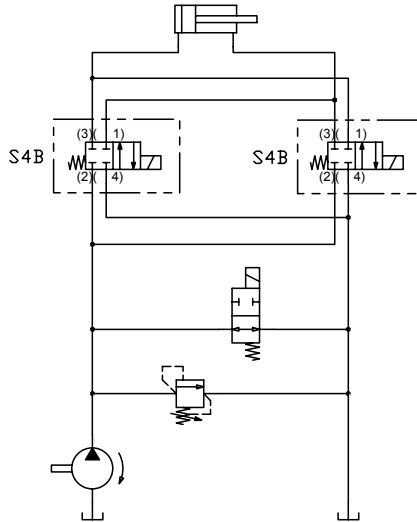
Typical application for the S4B is directional motor or cylinder control in a parallel circuit.

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

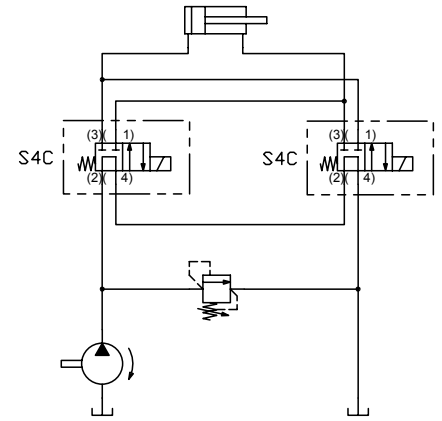
Typical application for the S4E is motor control in a series/parallel circuit.



MOTOR CONTROL - SERIES/PARALLEL CIRCUIT

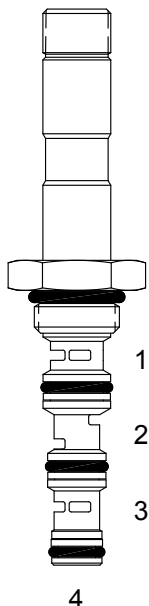


PARALLEL CIRCUIT



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**

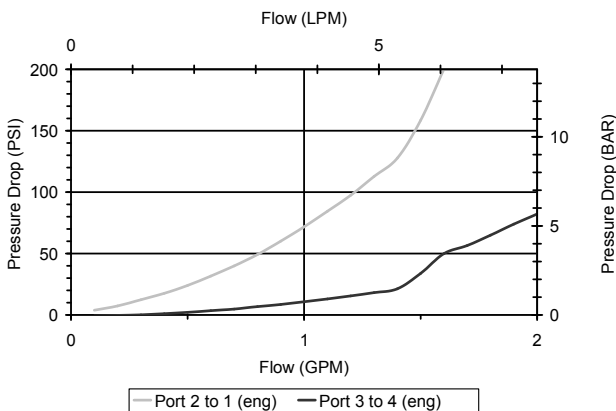
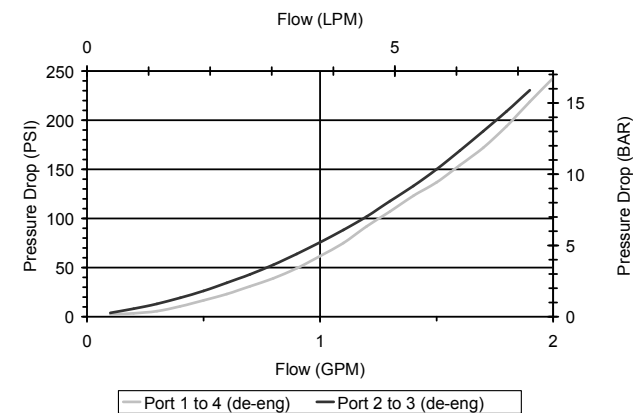
When de-energized the UD-S4A allows flow from (1) to (4) and (2) to (3). When energized, the valve allows flow from (2) to (1) and (3) to (4).

**FEATURES**

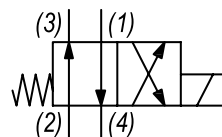
- Hardened parts for long life.
- Efficient wet-armature construction.
- Cartridges are voltage interchangeable.
- Industry common cavity.
- Unitized, molded coil design.
- Continuous duty rated solenoid.
- Optional coil voltages and terminations.

**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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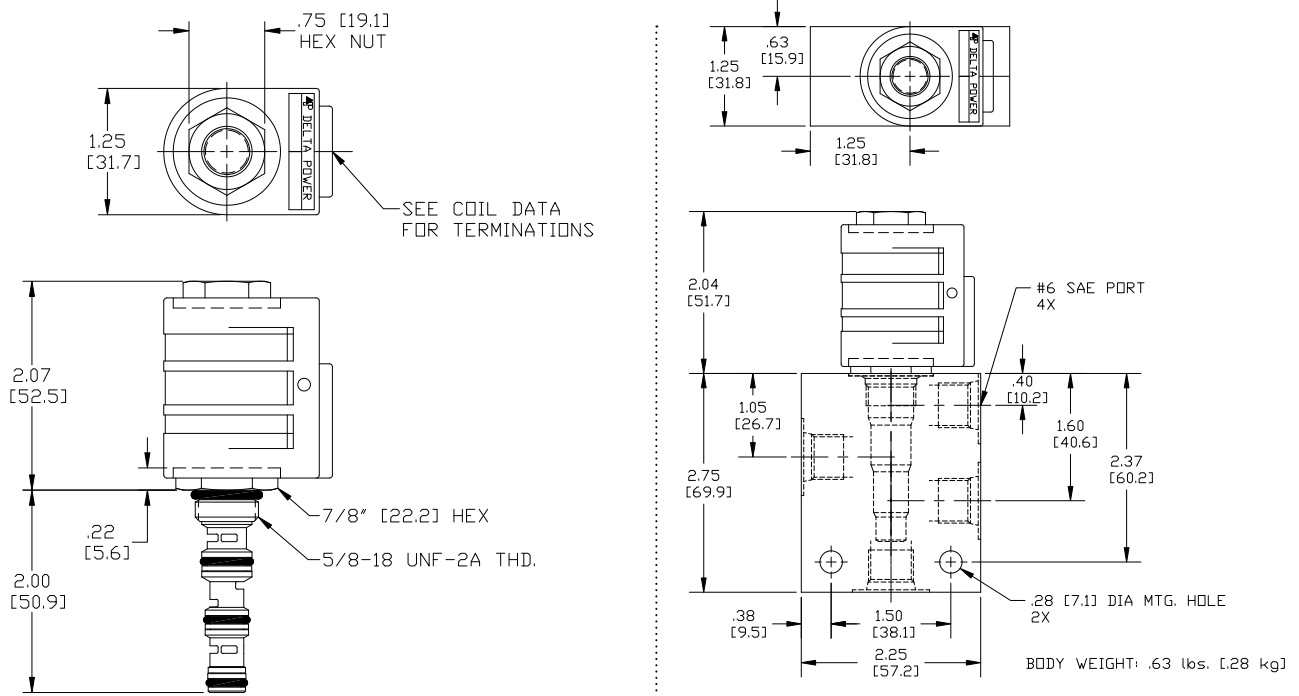


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# SOLENOID OPERATED DIRECTIONAL CONTROLS

## DIMENSIONS



## ORDERING INFORMATION

UD-S4A - - - -

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

**OPTIONS**  
 Buna Standard 00  
 Viton Standard V0

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

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

**VOLTAGE**

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

**"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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**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.

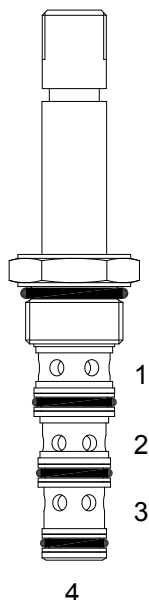
**OPERATION**

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**

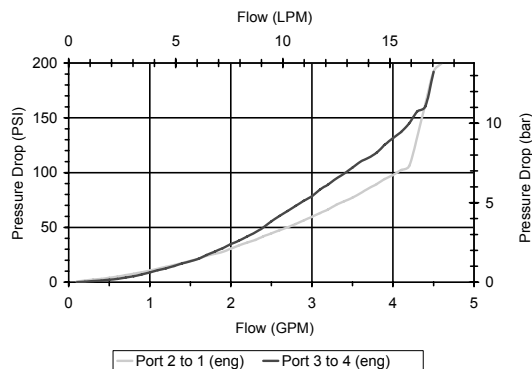
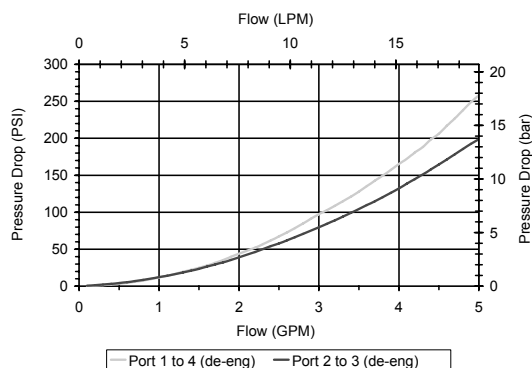
- Hardened parts for long life.
- Efficient wet-armature construction.
- Cartridges are voltage interchangeable.
- Manual override option.
- Industry common cavity.
- Unitized, molded coil design.
- Continuous duty rated solenoid.
- Optional coil voltages and terminations.
- Optional "I" Coil: Weatherproof,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



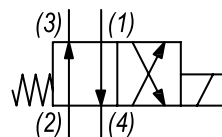
*Modes of shift operation to 6 GPM, Consult Factory.*

**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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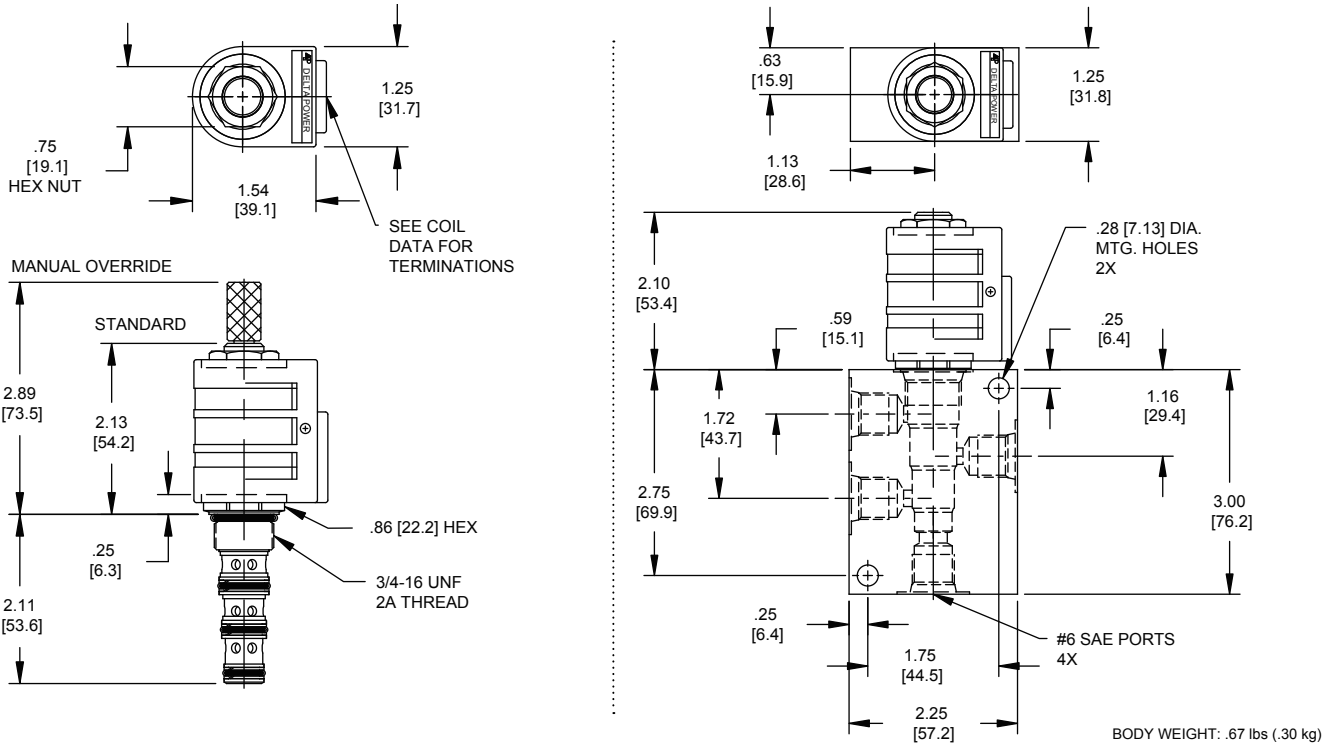
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# SOLENOID OPERATED DIRECTIONAL CONTROLS

## DIMENSIONS



## ORDERING INFORMATION

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

PQ-S4A - - - -

### OPTIONS

|                           |           |
|---------------------------|-----------|
| Buna Standard             | <b>00</b> |
| Viton Standard            | <b>V0</b> |
| Buna, Override, Detent    | <b>0M</b> |
| Viton, Override, Detent   | <b>VM</b> |
| Buna, Override, Nondetent | <b>B1</b> |
| Buna, Override, Nondetent | <b>V1</b> |

### BODIES

|              |                |
|--------------|----------------|
| <b>Blank</b> | Without Body   |
| <b>N</b>     | 1/4 NPTF Ports |
| <b>S</b>     | #6 SAE Ports   |

### VOLTAGE

|           |         |
|-----------|---------|
| <b>06</b> | 6 VDC   |
| <b>12</b> | 12 VDC  |
| <b>24</b> | 24 VDC  |
| <b>36</b> | 36 VDC  |
| <b>48</b> | 48 VDC  |
| <b>25</b> | 24 VAC  |
| <b>11</b> | 120 VAC |
| <b>22</b> | 220 VAC |
| <b>44</b> | 440 VAC |

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

|           |                          |
|-----------|--------------------------|
| <b>DL</b> | Double Lead              |
| <b>DT</b> | Deutsch on Leads DT04-2P |
| <b>ML</b> | Metri-Pack on Leads      |
| <b>PL</b> | Packard on Leads         |
| <b>WL</b> | Weatherpack on Leads     |

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

### IMMERSION PROOF "P" TYPE

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

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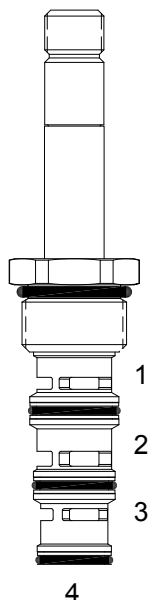


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## DG-S4A DIRECT ACTING SPOOL, 4 WAY 2 POSITION



### 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, pull knob out. On the detented version, after pulling knob out twist 180 degrees and release. The valve will remain in that position..

### FEATURES

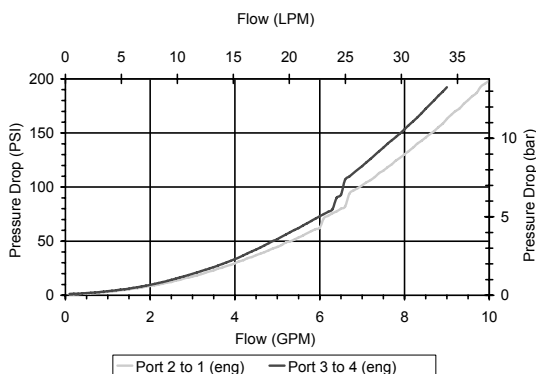
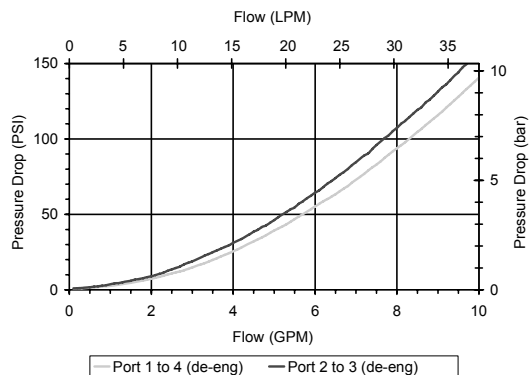
- Hardened parts for long life.
- Efficient wet-armature construction.
- Cartridges are voltage interchangeable.
- Manual override option.
- Industry common cavity.
- Unitized, molded coil design.
- Continuous duty rated solenoid.
- Optional coil voltages and terminations.
- Optional "I" Coil: Weatherproof,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



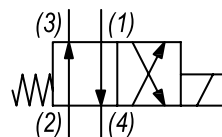
For higher pressures see HG-S4A.

### PERFORMANCE

Actual Test Data (Cartridge Only)



### HYDRAULIC SYMBOL



### VALVE SPECIFICATIONS

|                                    |                                 |
|------------------------------------|---------------------------------|
| Nominal Flow                       | 10 GPM (38 LPM)                 |
| Rated Operating Pressure           | 3500 PSI (241 bar) per path     |
| 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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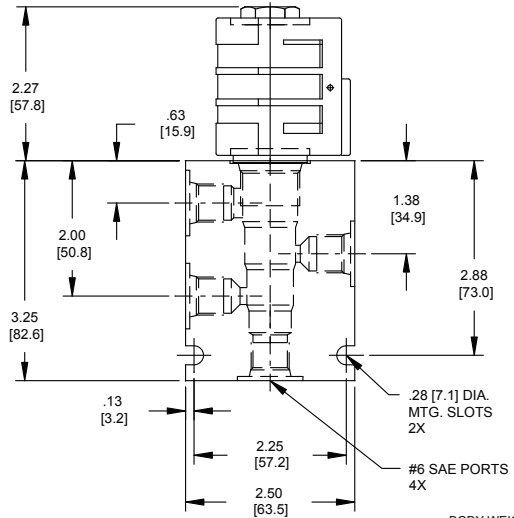
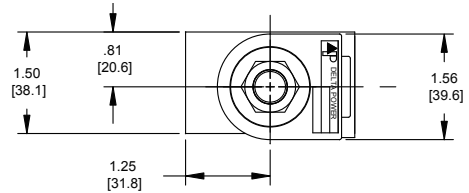
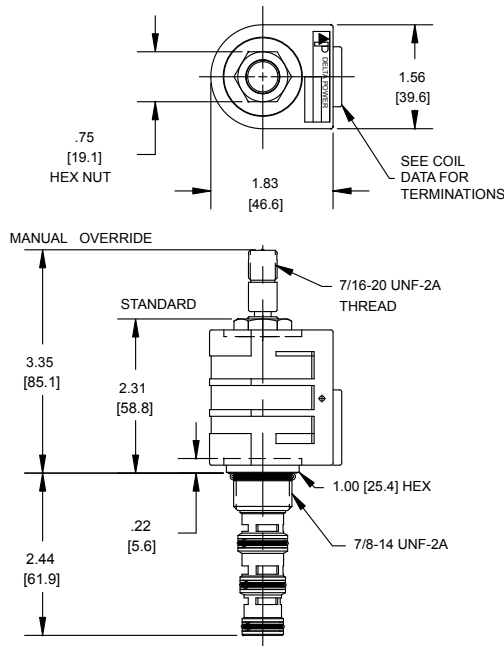
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# SOLENOID OPERATED DIRECTIONAL CONTROLS

## DIMENSIONS



BODY WEIGHT: .99 lbs (.45 kg)

## ORDERING INFORMATION

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

### DG-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 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

**"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

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

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

### DESCRIPTION

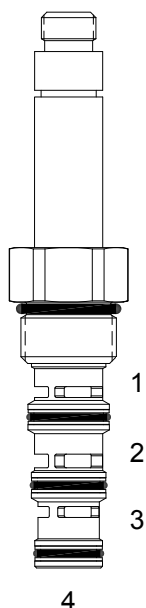
"High Pressure" 10 size, 7/8-14 thread, "Delta" series, 4 way 2 position, side flow spool valve.

### 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

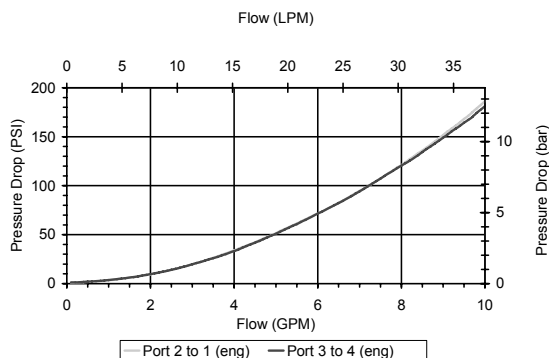
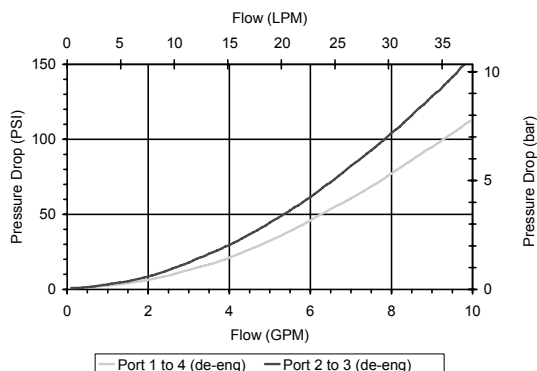
- Hardened parts for long life.
- Efficient wet-armature construction.
- Cartridges are voltage interchangeable.
- Industry common cavity.
- Unitized, molded coil design.
- Continuous duty rated solenoid.
- Optional coil voltages and terminations.
- Optional "I" Coil: Weatherproof, Thermal Shock, Immersion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



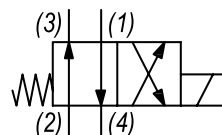
Uses "L" Coils.  
Pressure differential between ports should not exceed 3000 PSI.

### 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<br>(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.



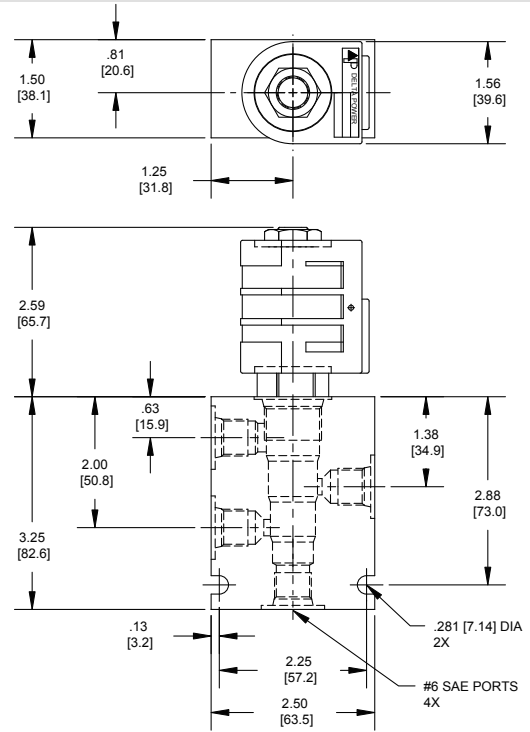
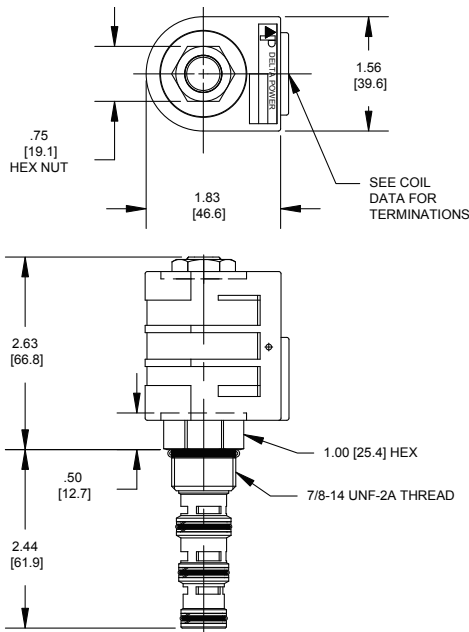
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# SOLENOID OPERATED DIRECTIONAL CONTROLS

## DIMENSIONS



## ORDERING INFORMATION

### HG-S4A

**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

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

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

**"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

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

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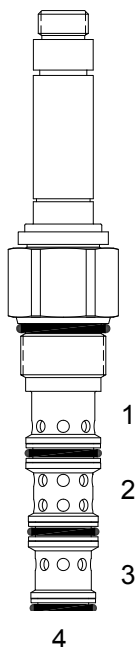


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**HV-S4A DIRECT ACTING SPOOL, 4 WAY 2 POSITION, CRISS CROSS**



**DESCRIPTION**

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

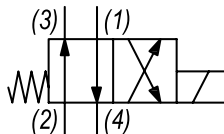
**OPERATION**

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**

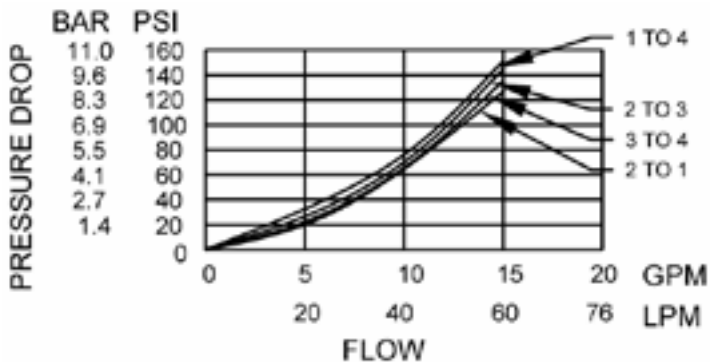
- Hardened parts for long life.
- Efficient wet-armature construction.
- Cartridges are voltage interchangeable.
- Industry common cavity.
- Unitized, molded coil design.
- Continuous duty rated solenoid.
- Optional coil voltages and terminations.

**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      | 70 ft-lbs (94.9 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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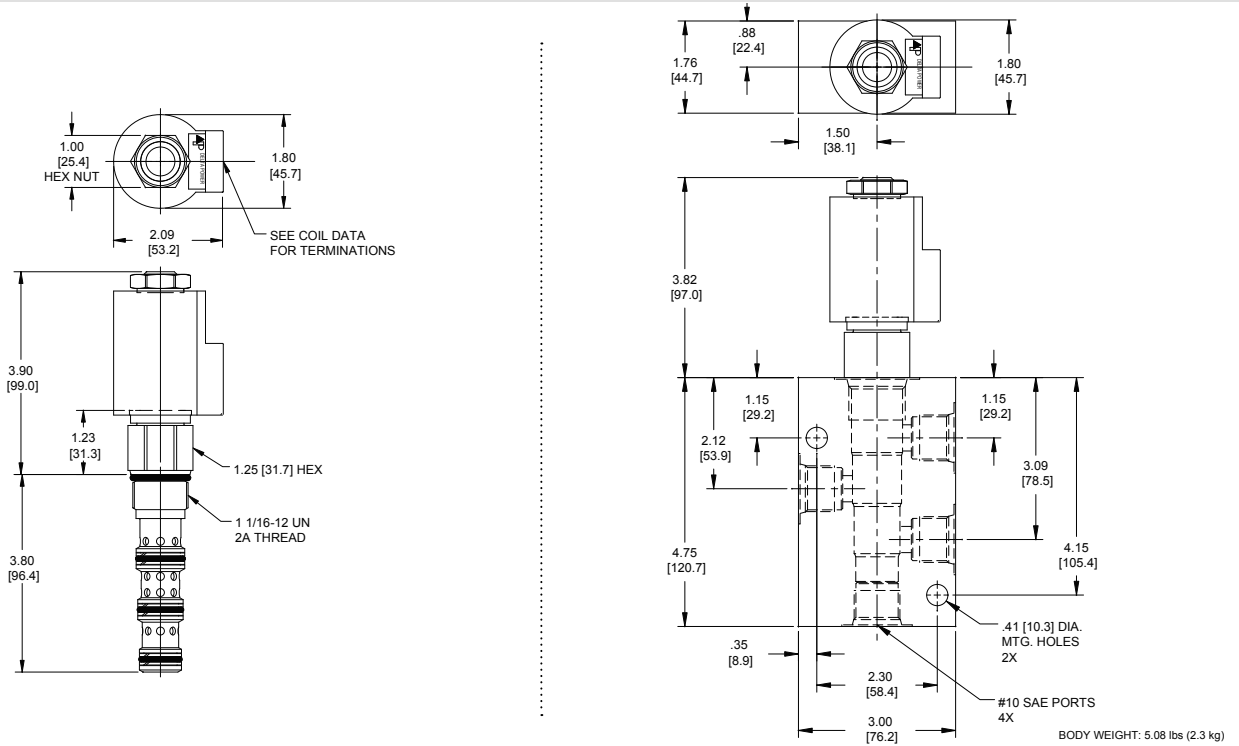


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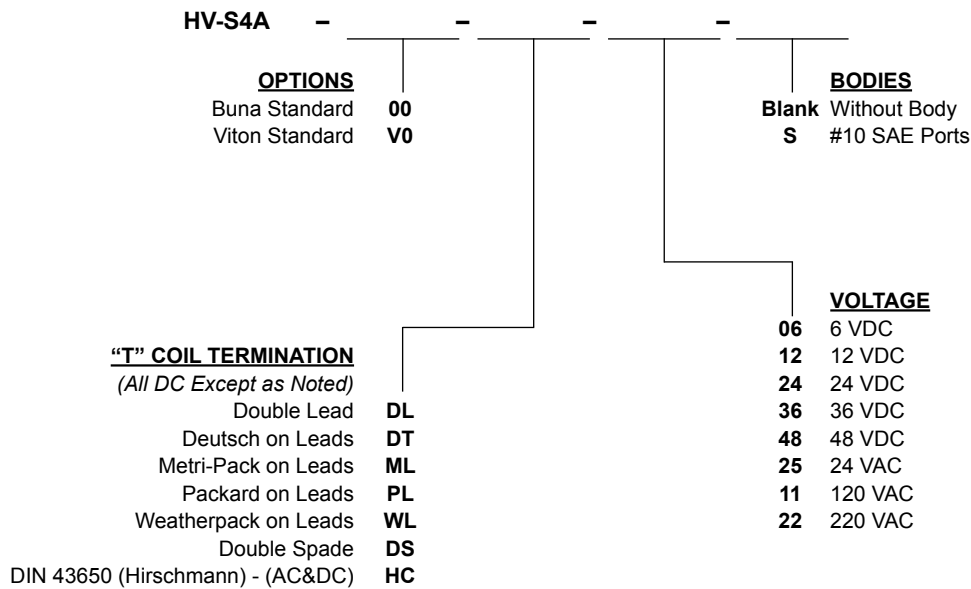
# SOLENOID OPERATED DIRECTIONAL CONTROLS

## DIMENSIONS



## ORDERING INFORMATION

Approximate Coil Weight: .89 lbs (.41 kg)



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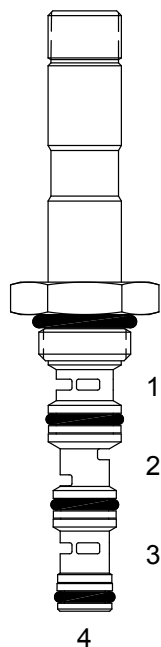


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**UD-S4B** DIRECT ACTING SPOOL, 4 WAY 2 POSITION, CLOSED CENTER



**DESCRIPTION**

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

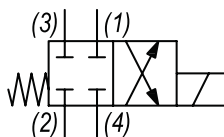
**OPERATION**

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**

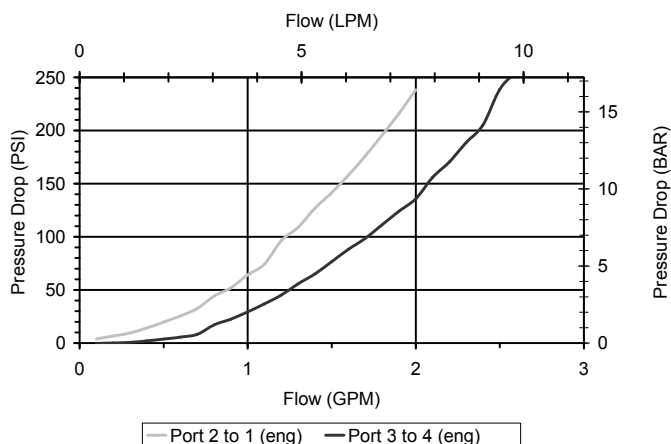
- Hardened parts for long life.
- Efficient wet-armature construction.
- Cartridges are voltage interchangeable.
- Industry common cavity.
- Unitized, molded coil design.
- Continuous duty rated solenoid.
- Optional coil voltages and terminations.

**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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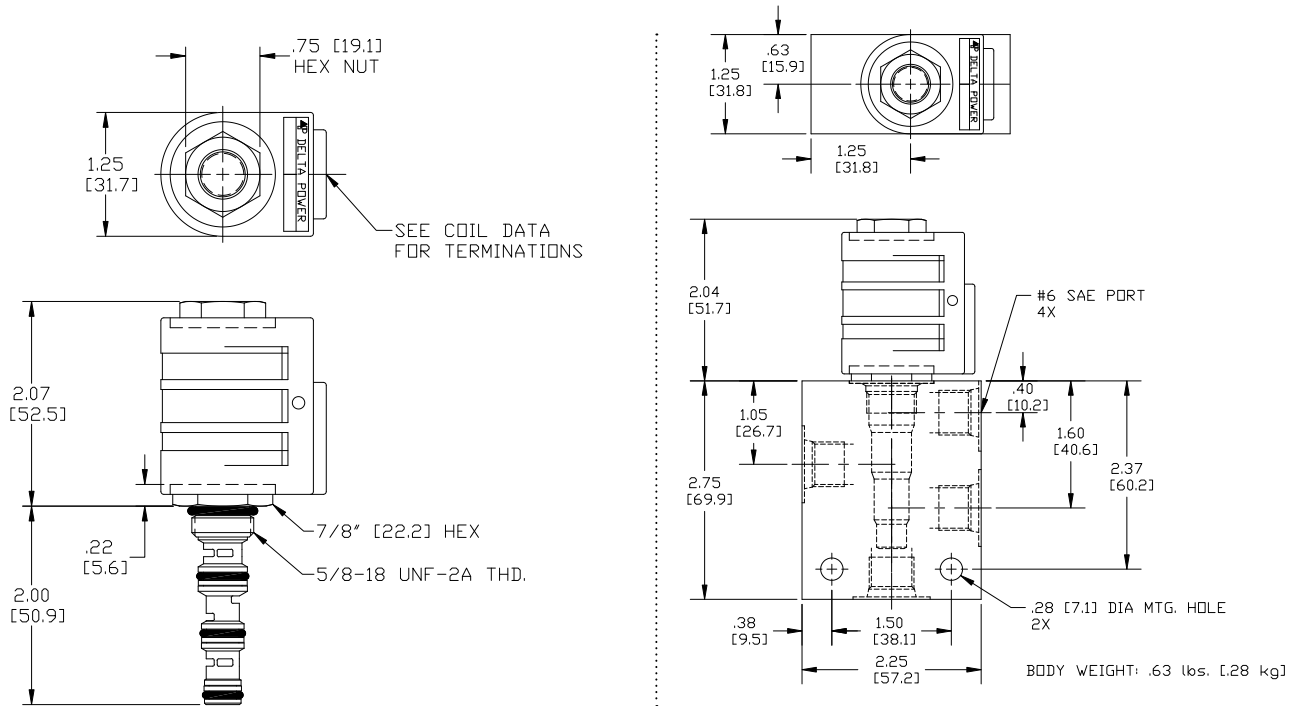
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# SOLENOID OPERATED DIRECTIONAL CONTROLS

## DIMENSIONS



## ORDERING INFORMATION

UD-S4B - - - -

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

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

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

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

**VOLTAGE**

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

**"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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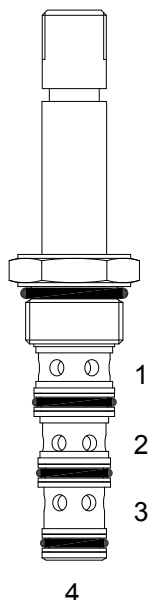


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## PQ-S4B DIRECT ACTING SPOOL, 4 WAY 2 POSITION, CLOSED CENTER



### DESCRIPTION

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

### OPERATION

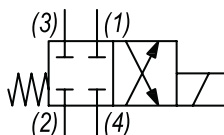
When de-energized the PQ-S4B blocks flow at all ports. When energized the valve allows flow from (2) to (1) and from (3) to (4).

**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.

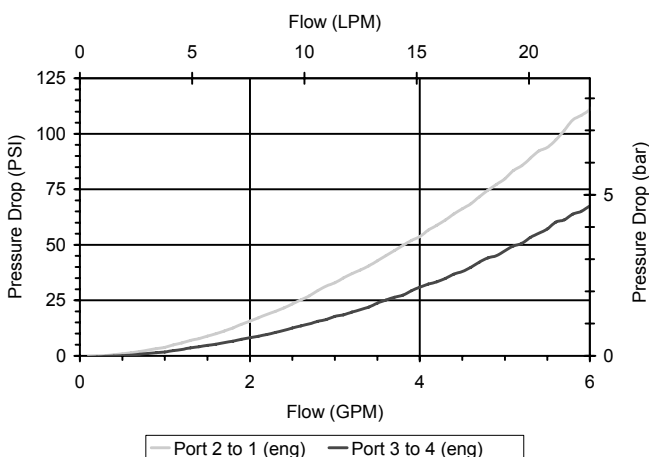
### HYDRAULIC SYMBOL



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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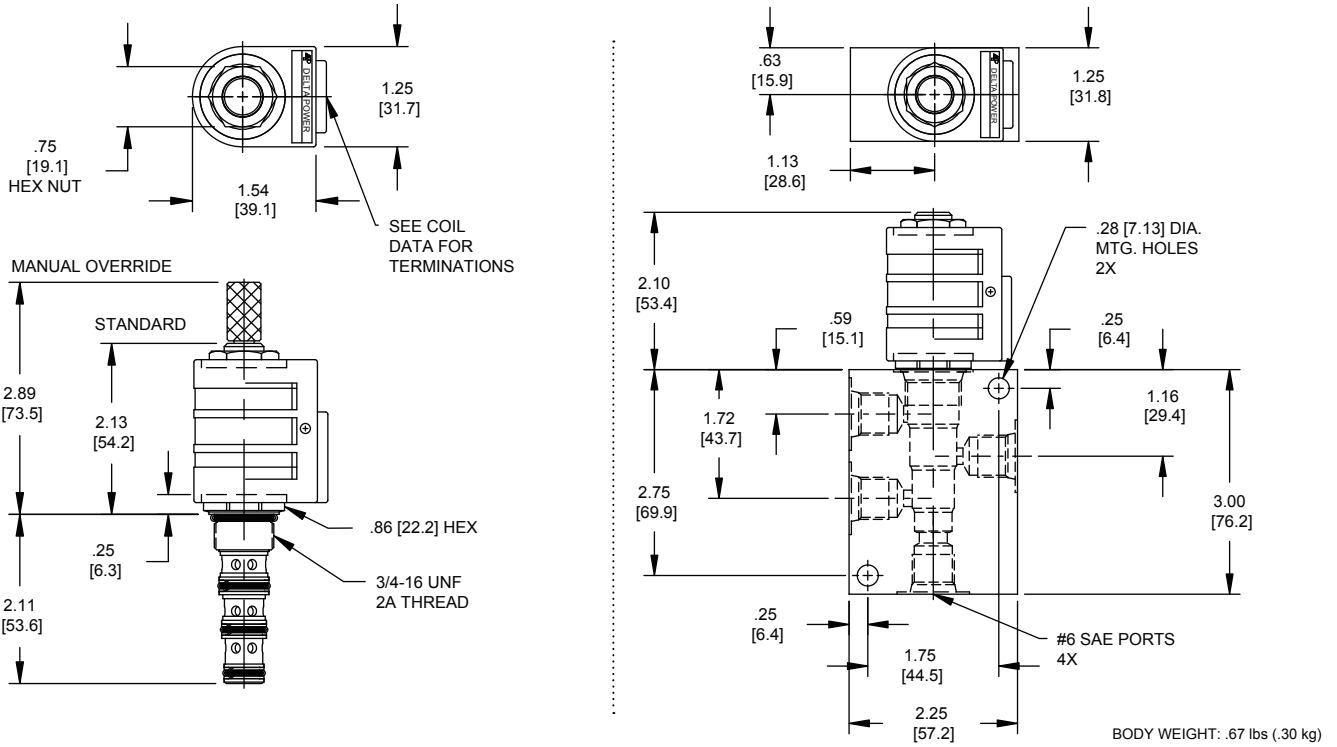
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# SOLENOID OPERATED DIRECTIONAL CONTROLS

## 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, Nondetent | B1 |
| Buna, Override, Nondetent | 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      | 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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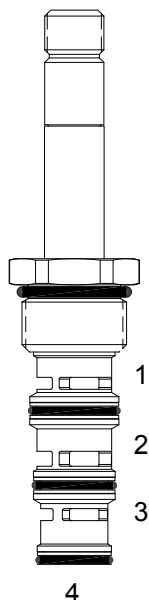


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**DG-S4B DIRECT ACTING SPOOL, 4 WAY 2 POSITION, CLOSED CENTER**



**DESCRIPTION**

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

**OPERATION**

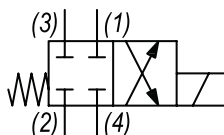
When de-energized the DG-S4B blocks flow at all ports. When energized the valve allows flow from (2) to (1) and (3) to (4).

**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.

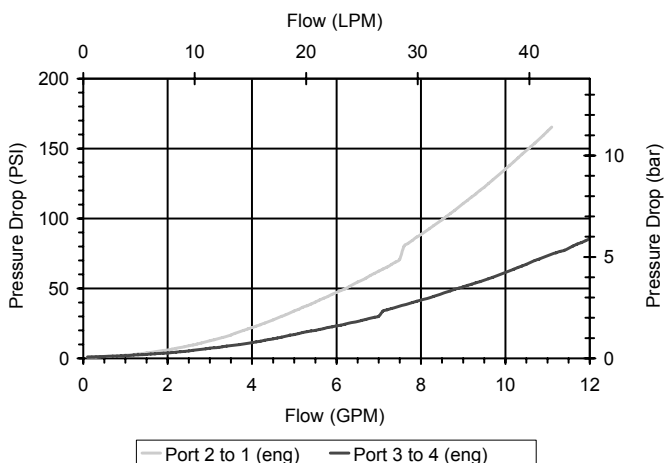
**HYDRAULIC SYMBOL**



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<br>(form tool, reamer, tap) | 40500002                         |
| Seal Kit                                     | 21191214                         |

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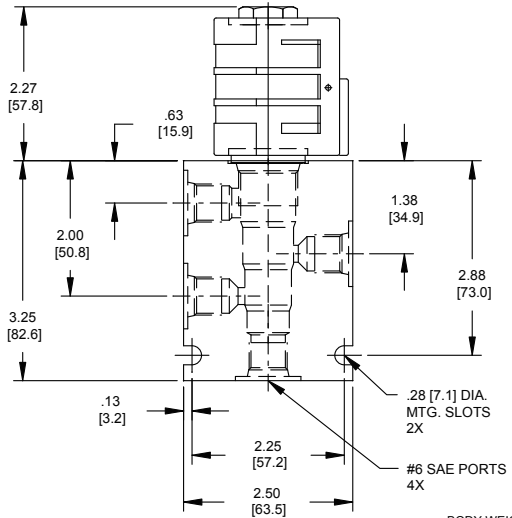
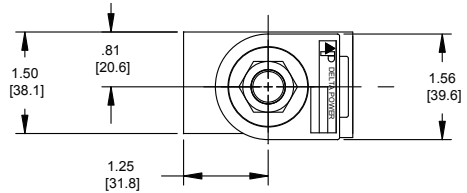
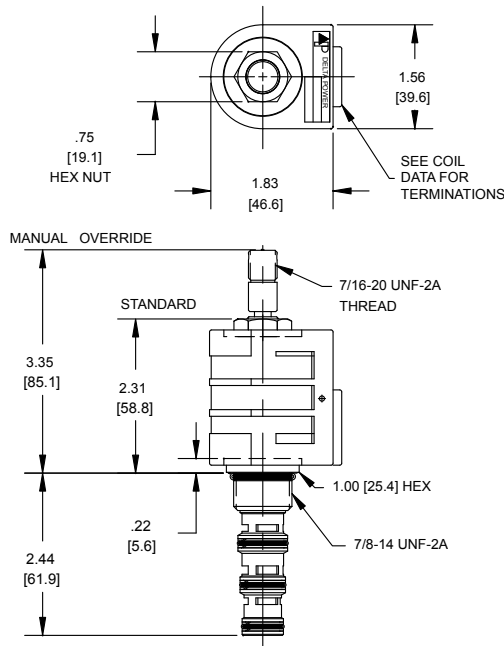
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# SOLENOID OPERATED DIRECTIONAL CONTROLS

## DIMENSIONS



BODY WEIGHT: .99 lbs (.45 kg)

## ORDERING INFORMATION

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

### DG-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 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 |

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

|                                    |
|------------------------------------|
| <b>DL</b> Double Lead              |
| <b>DT</b> Deutsch on Leads DT04-2P |
| <b>ML</b> Metri-Pack on Leads      |
| <b>PL</b> Packard on Leads         |
| <b>WL</b> Weatherpack on Leads     |

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

| IMMERSION PROOF "D" TYPE |                                       |
|--------------------------|---------------------------------------|
| <b>IA</b>                | "I" Coil AMP Superseal - Integral     |
| <b>ID</b>                | "I" Coil - Deutsch - Integral DT04-2P |
| <b>IJ</b>                | "I" Coil AMP Jr. Timer - Integral     |
| <b>IM</b>                | "I" Coil - Metri-Pack - Integral      |

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

### DESCRIPTION

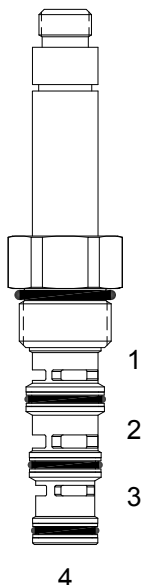
"High Pressure" 10 size, 7/8-14 thread, "Delta" series, solenoid operated, 4 way 2 position closed center spool valve.

### OPERATION

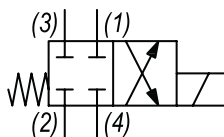
When de-energized the HG-S4B blocks flow at all ports. When energized the valve allows flow from (2) to (1) and from (3) to (4).

### 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.



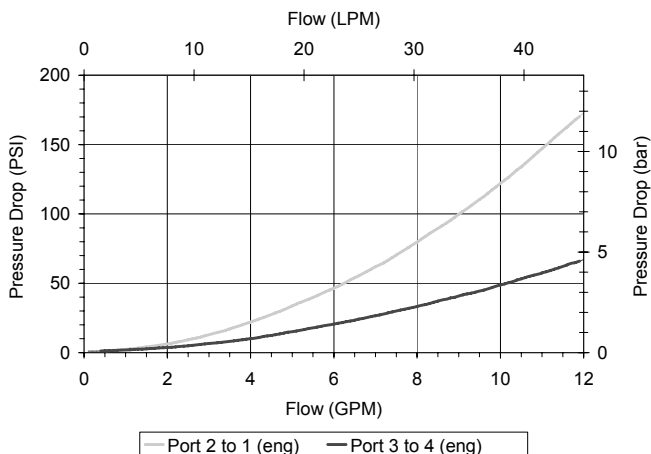
### HYDRAULIC SYMBOL



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<br>(form tool, reamer, tap) | 40500002                           |
| Seal Kit                                     | 21191214                           |

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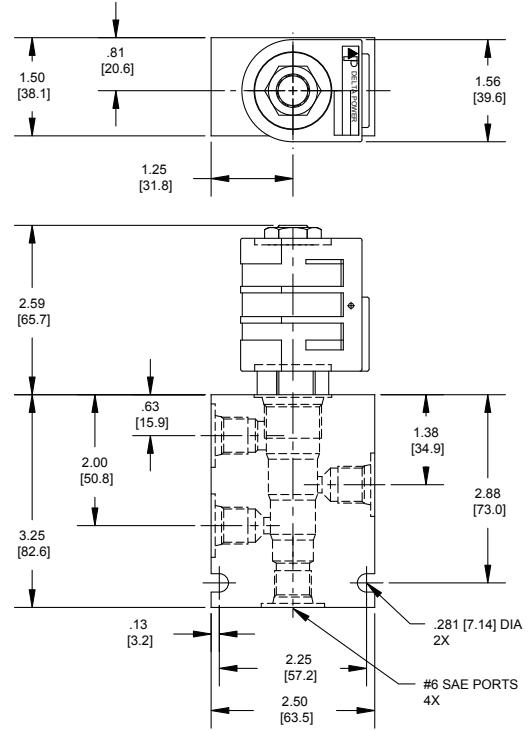
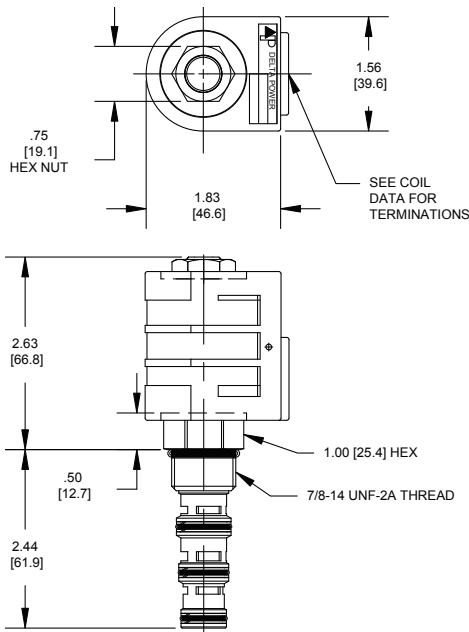


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# SOLENOID OPERATED DIRECTIONAL CONTROLS

## DIMENSIONS



BODY WEIGHT: .99 lbs (.45 kg)

## ORDERING INFORMATION

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

### HG-S4B

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

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

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

### VOLTAGE

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

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

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

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

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

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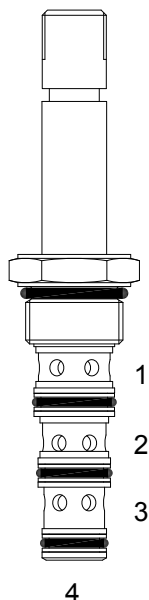


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**PQ-S4C DIRECT ACTING SPOOL, 4 WAY 2 POSITION, TANDEM CENTER**



**DESCRIPTION**

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

**OPERATION**

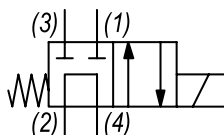
When de-energized the PQ-S4C allows flow between (2) and (4), blocks flow at (1) and (3). When energized the valve allows flow from (2) to (3) and from (1) to (4).

**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**

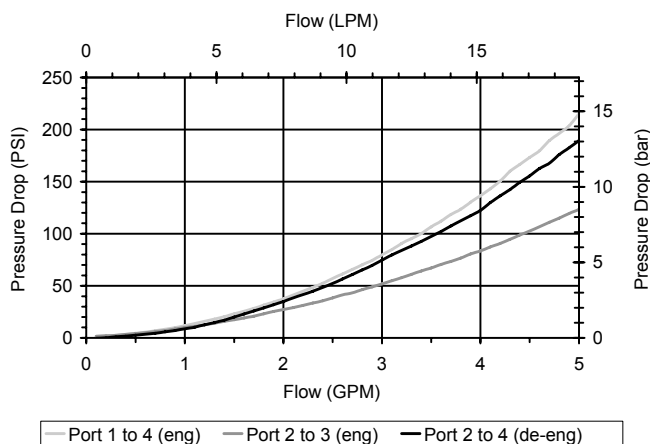
- Hardened parts for long life.
- Efficient wet-armature construction.
- Cartridges are voltage interchangeable.
- Manual override option.
- Industry common cavity.
- Unitized, molded coil design.
- Continuous duty rated solenoid.
- Optional coil voltages and terminations.
- Optional "I" Coil: Weatherproof,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

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



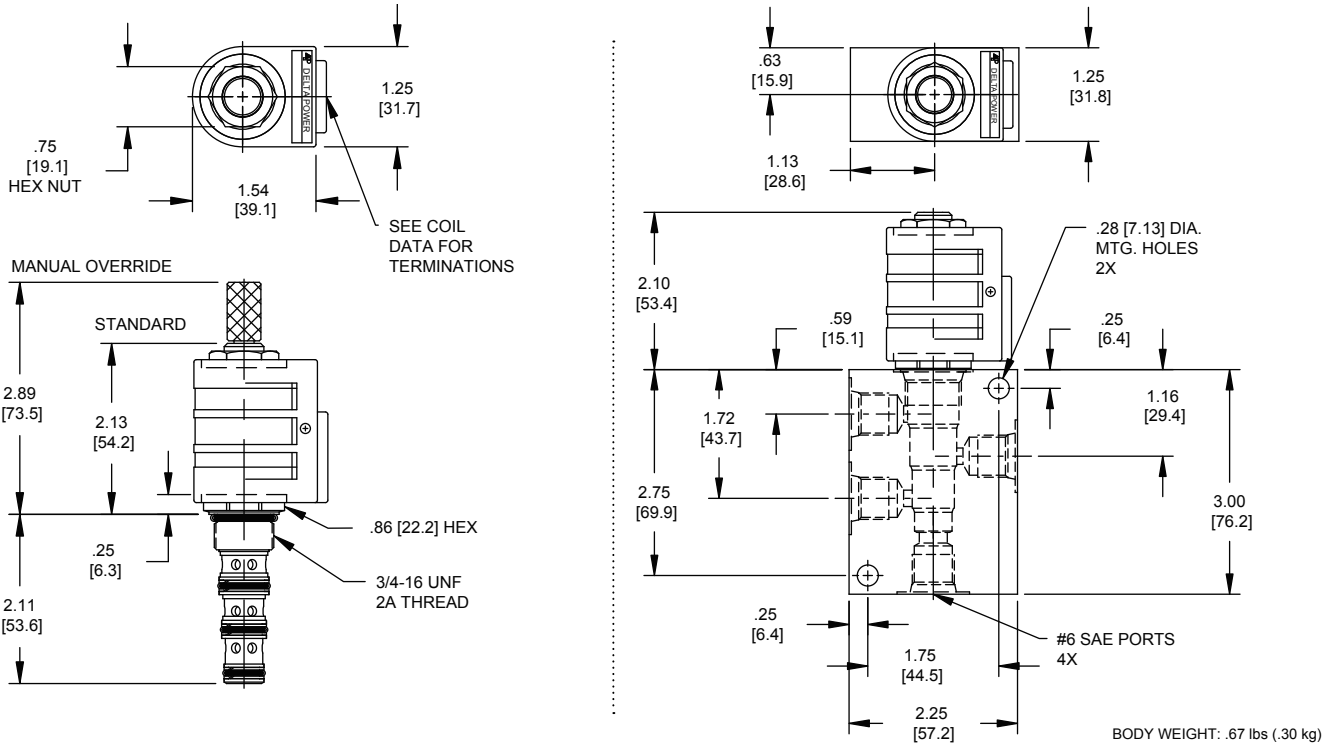
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# SOLENOID OPERATED DIRECTIONAL CONTROLS

## 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, Nondetent **B1**
  - Buna, Override, Nondetent **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** 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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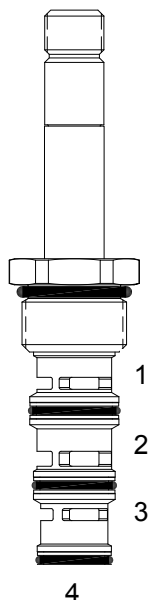


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## DG-S4C DIRECT ACTING SPOOL, 4 WAY 2 POSITION, TANDEM CENTER



### DESCRIPTION

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

### OPERATION

When de-energized the DG-S4C allows flow between (2) and (4), and blocks flow at ports (1) and (3).

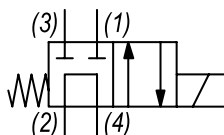
When energized the valve allows flow from (2) to (3) and (1) to (4).

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

### FEATURES

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

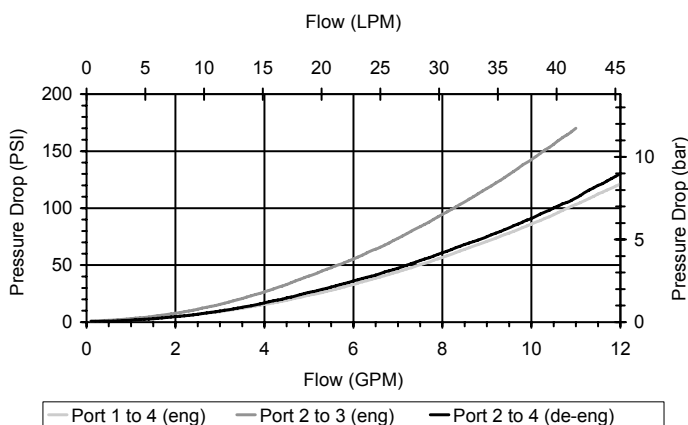
### HYDRAULIC SYMBOL



For higher pressures see HG-S4C. Operational shift limit, 8 GPM (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                         |

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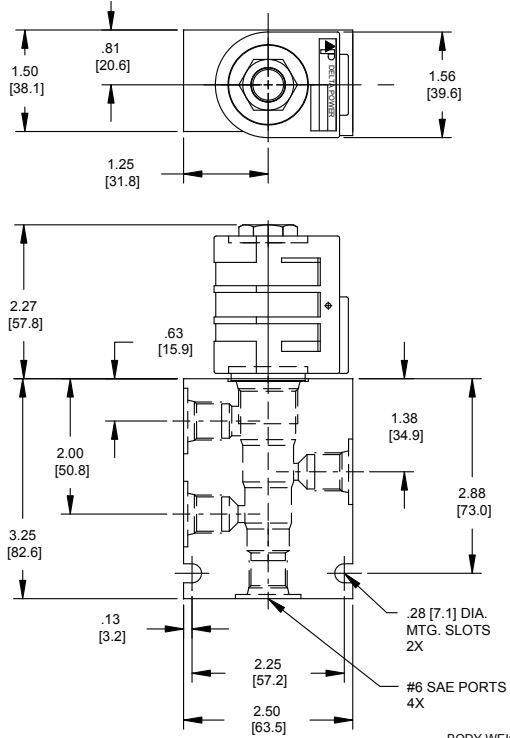
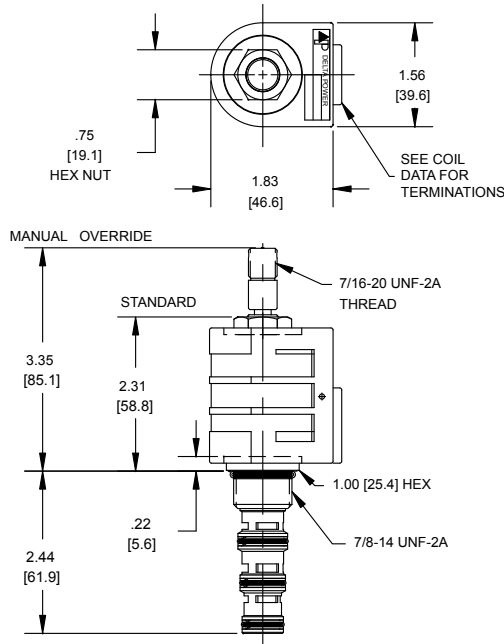
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# SOLENOID OPERATED DIRECTIONAL CONTROLS

## DIMENSIONS



BODY WEIGHT: .99 lbs (.45 kg)

## ORDERING INFORMATION

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

### DG-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 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 |

### "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

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

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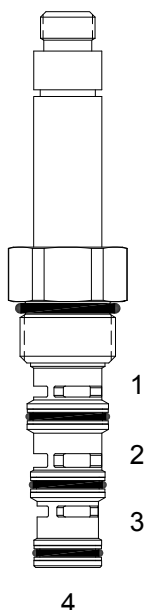


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**HG-S4C DIRECT ACTING SPOOL, 4 WAY 2 POSITION, TANDEM CENTER**



**DESCRIPTION**

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

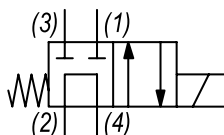
**OPERATION**

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.

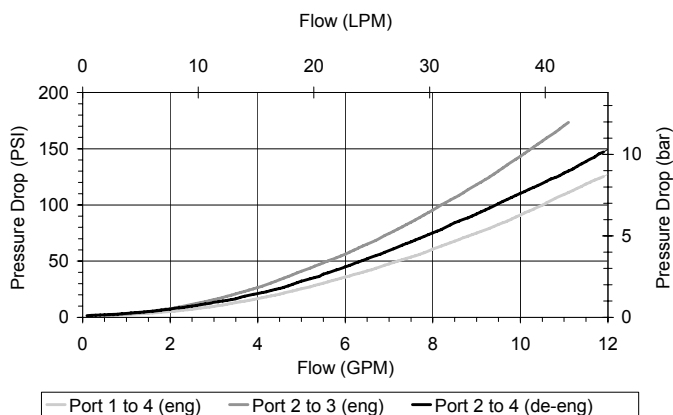
**HYDRAULIC SYMBOL**



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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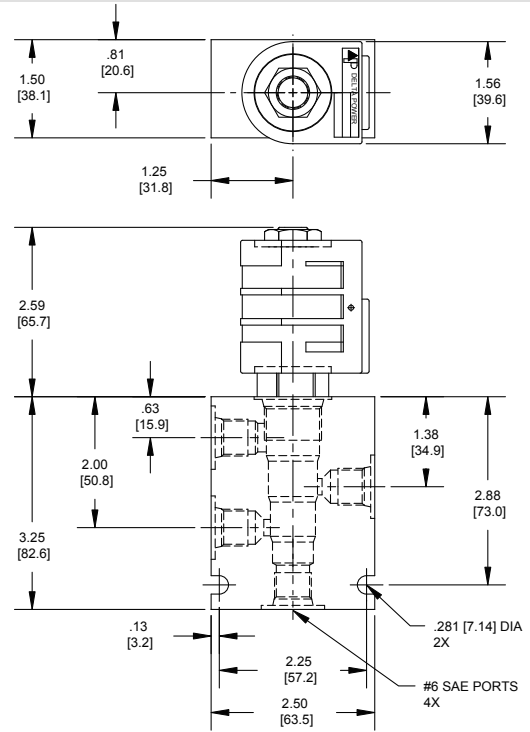
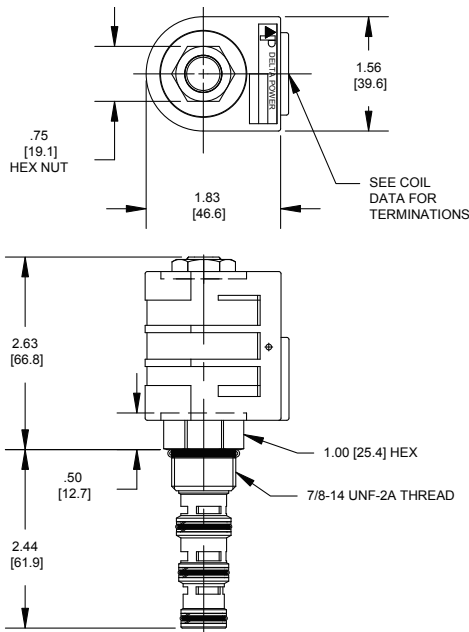
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# SOLENOID OPERATED DIRECTIONAL CONTROLS

## DIMENSIONS



BODY WEIGHT: .99 lbs (.45 kg)

## ORDERING INFORMATION

### HG-S4C

**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

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

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

**"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

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

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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).

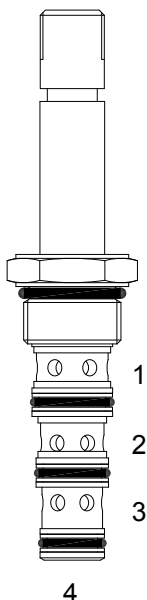
**OPERATION OF MANUAL OVERRIDE OPTION:** to override, pull knob out. On the detented version, after pulling knob out twist 180 degrees and release. The valve will remain in that position.

**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.

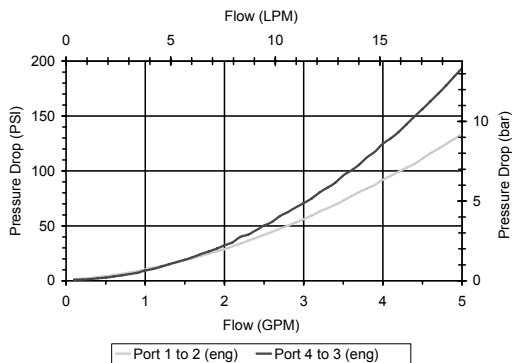
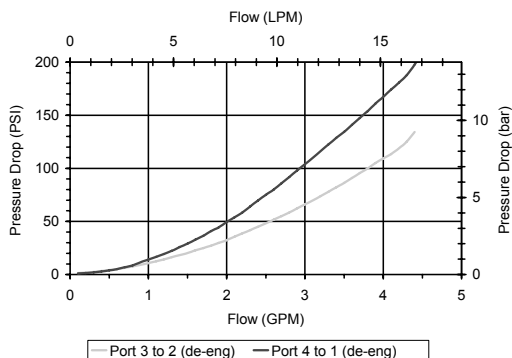


*Modes of shift operation to 3 GPM, Consult Factory.*

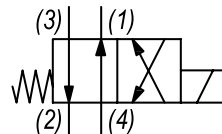


**PERFORMANCE**

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<br>(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.



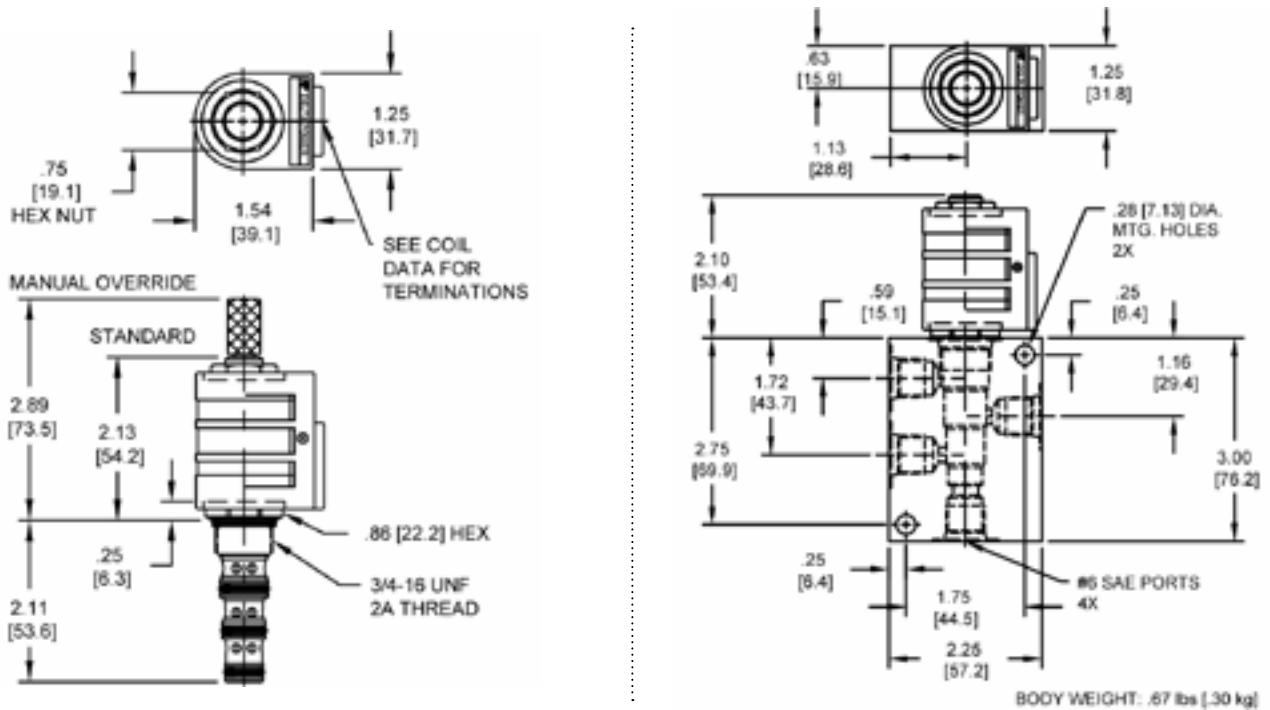
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**DIMENSIONS**



**ORDERING INFORMATION**

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

**PQ-S4D**

**OPTIONS**

- Buna Standard **00**
- Viton Standard **V0**
- Buna, Override, Detent **0M**
- Viton, Override, Detent **VM**
- Buna, Override, Nondetent **B1**
- Buna, Override, Nondetent **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** 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 “D” TYPE**

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

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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).

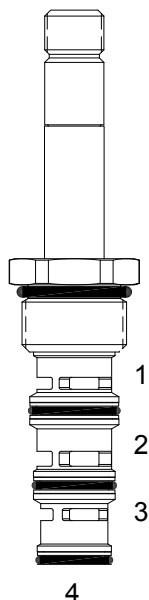
**OPERATION OF MANUAL OVERRIDE OPTION:** to override, pull knob out. On the detented version, after pulling knob out twist 180 degrees and release. The valve will remain in that position.

**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.

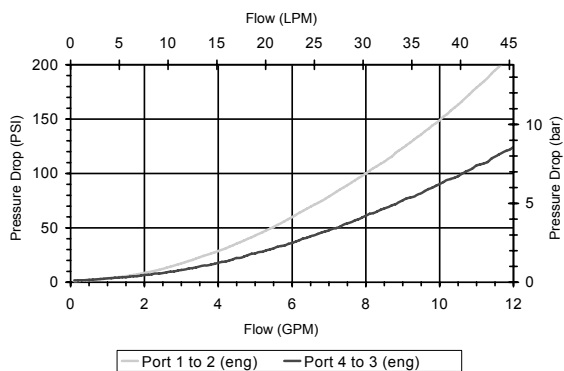
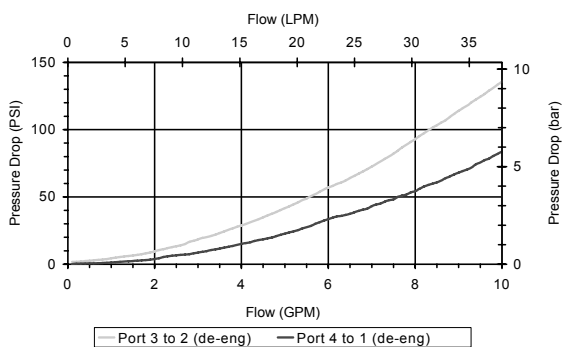


For higher pressures see HG-S4D. Operational shift limit, 6 GPM (23 LPM). For shift performance consult chart.

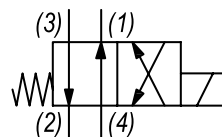


**PERFORMANCE**

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                         |

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



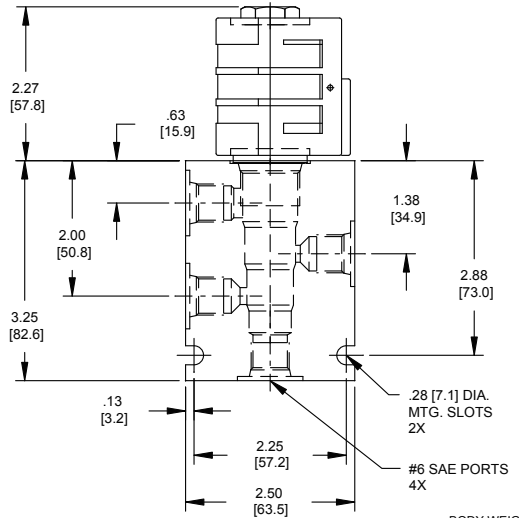
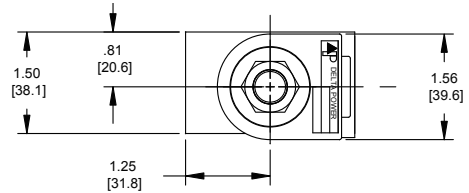
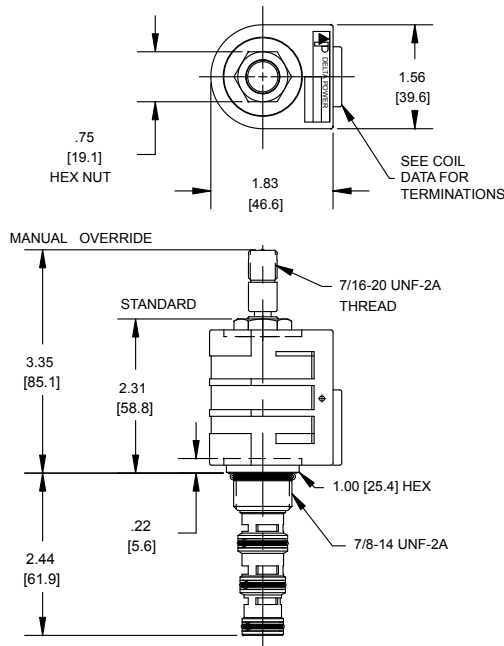
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# SOLENOID OPERATED DIRECTIONAL CONTROLS

## DIMENSIONS



BODY WEIGHT: .99 lbs (.45 kg)

## ORDERING INFORMATION

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

### DG-S4D

- OPTIONS**
- Buna Standard **00**
  - Viton Standard **V0**
  - Buna, Override **0M**
  - Viton, Override **VM**
  - Buna, Override, Non-detent **B1**
  - Viton, Override, Non-detent **V1**

- 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

**"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

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

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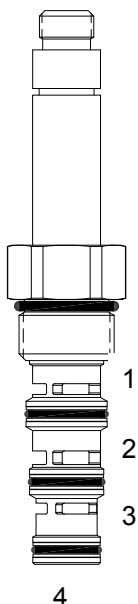


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**HG-S4D DIRECT ACTING SPOOL, 4 WAY 2 POSITION, BOTTOM FLOW**



**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**

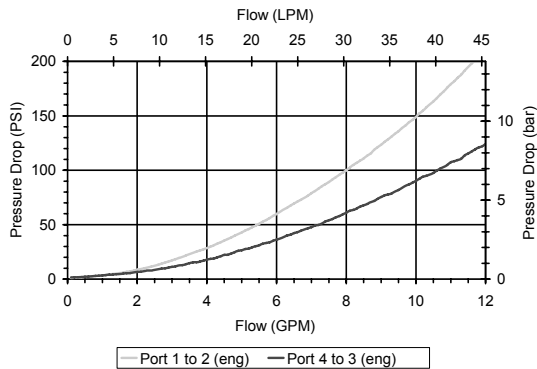
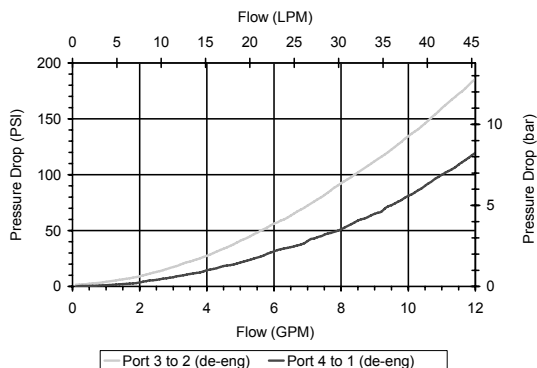
- Hardened parts for long life.
- Efficient wet-armature construction.
- Cartridges are voltage interchangeable.
- Industry common cavity.
- Unitized, molded coil design.
- Continuous duty rated solenoid.
- Optional coil voltages and terminations.
- Optional “I” Coil: Weatherproof, Thermal Shock, Immersion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



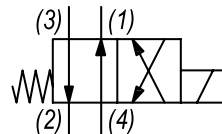
Uses “L” Coils.  
Pressure differential between ports should not exceed 3000 PSI.

**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      | 35 ft-lbs (47.5 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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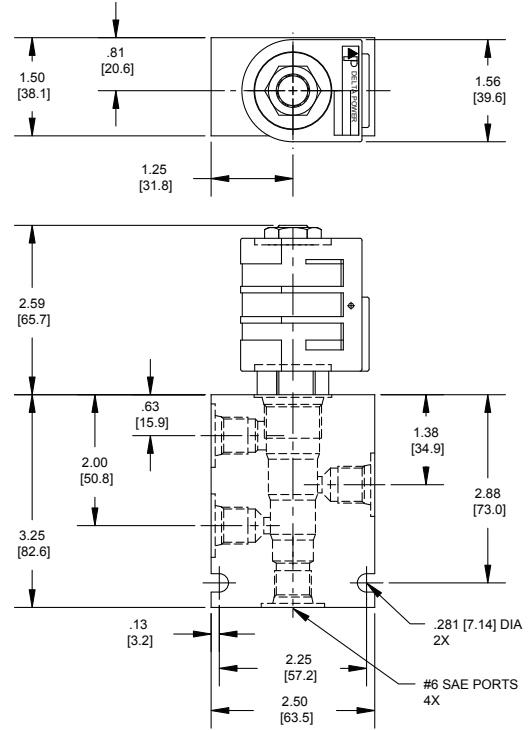
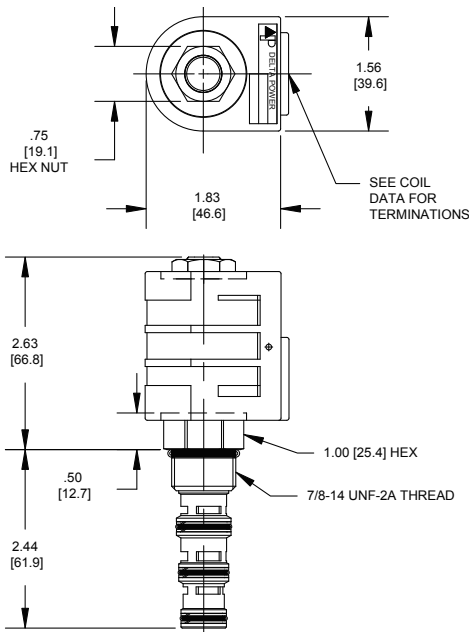
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# SOLENOID OPERATED DIRECTIONAL CONTROLS

## DIMENSIONS



## ORDERING INFORMATION

### HG-S4D

**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

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

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

**"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

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

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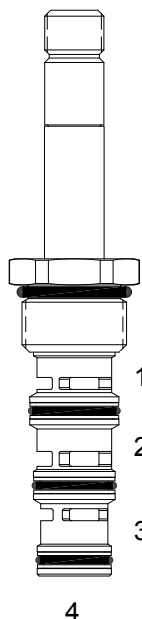


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**DG-S4E DIRECT ACTING SPOOL, 4 WAY 2 POSITION, SERIES/PARALLEL**



**DESCRIPTION**

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

**OPERATION**

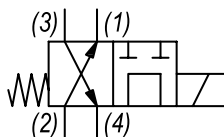
When de-energized the DG-S4E allows flow from (2) and (1), and (3) to (4). When energized the valve allows flow (2) to (4) and blocks the flow at (1) and (3).

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

**FEATURES**

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

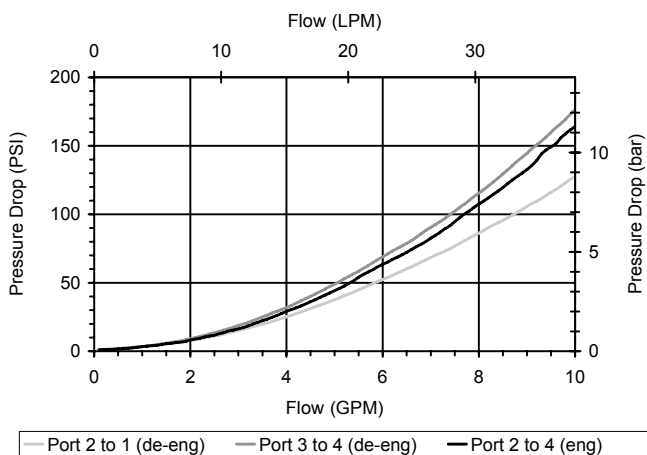
**HYDRAULIC SYMBOL**



For higher pressures see HG-S4E. Operational shift limit, 6 GPM (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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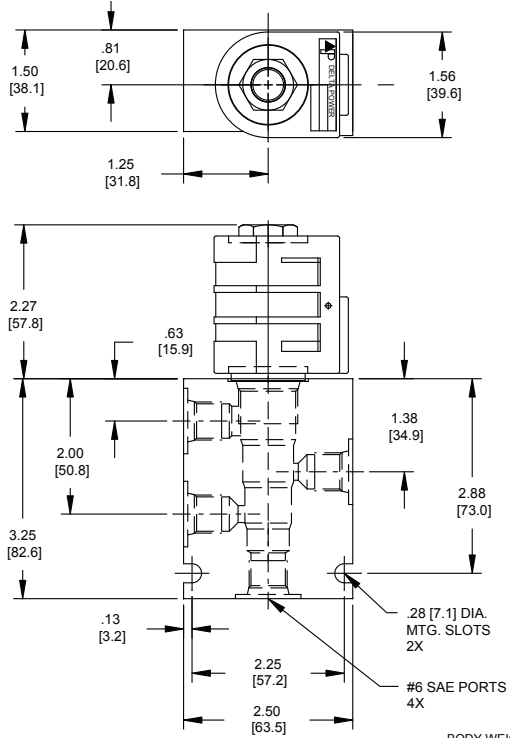
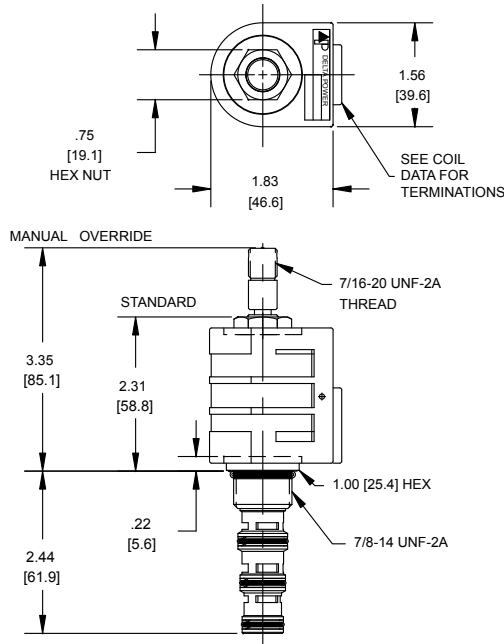
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# SOLENOID OPERATED DIRECTIONAL CONTROLS

## DIMENSIONS



BODY WEIGHT: .99 lbs (.45 kg)

## ORDERING INFORMATION

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

### DG-S4E

- OPTIONS**
- Buna Standard **00**
  - Viton Standard **V0**
  - Buna, Override **0M**
  - Viton, Override **VM**
  - Buna, Override, Non-detent **B1**
  - Viton, Override, Non-detent **V1**

- 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

**"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

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

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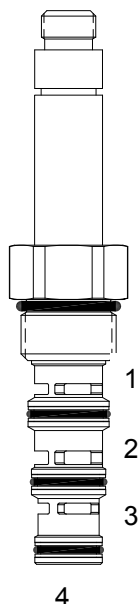


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**HG-S4E DIRECT ACTING SPOOL, 4 WAY 2 POSITION, SERIES/PARALLEL**



**DESCRIPTION**

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

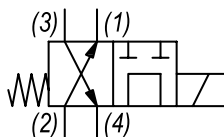
**OPERATION**

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.

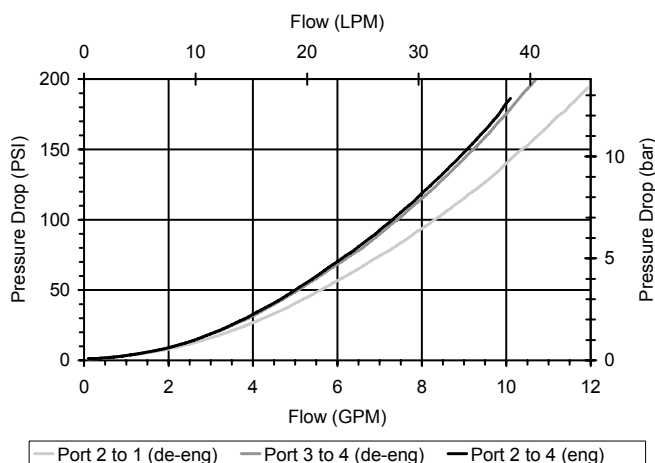
**HYDRAULIC SYMBOL**



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                           |

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



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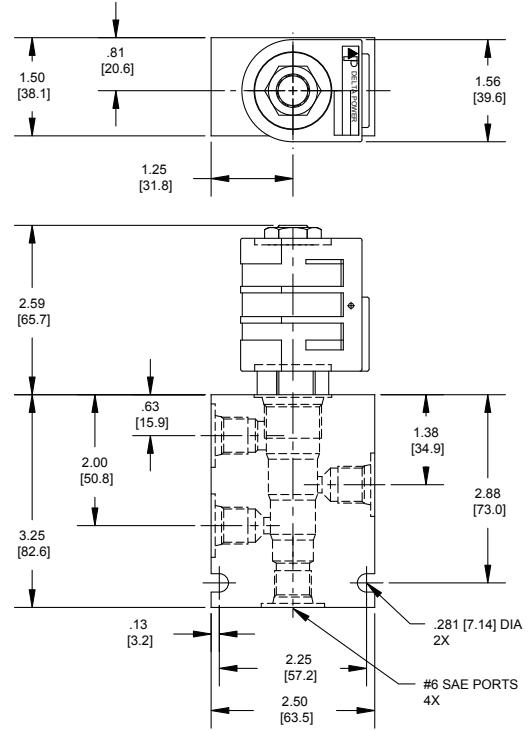
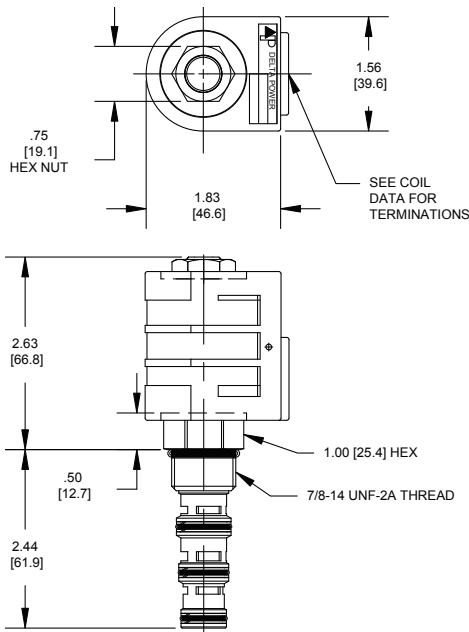


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# SOLENOID OPERATED DIRECTIONAL CONTROLS

## DIMENSIONS



## ORDERING INFORMATION

### HG-S4E

**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

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

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

**"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

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

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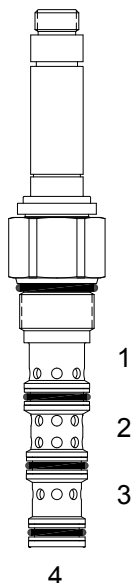


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**HV-S4E DIRECT ACTING SPOOL, 4 WAY 2 POSITION, SERIES/PARALLEL**



**DESCRIPTION**

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

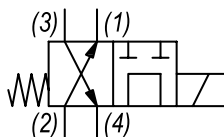
**OPERATION**

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**

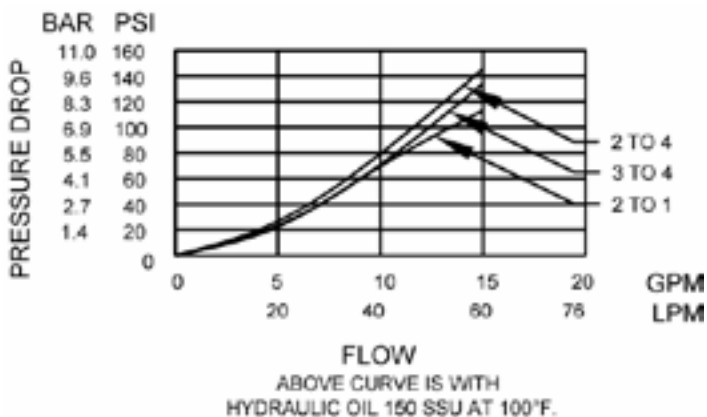
- Hardened parts for long life.
- Efficient wet-armature construction.
- Cartridges are voltage interchangeable.
- Industry common cavity.
- Unitized, molded coil design.
- Continuous duty rated solenoid.
- Optional coil voltages and terminations.

**HYDRAULIC SYMBOL**



**PERFORMANCE**

Actual Test Data (Cartridge Only)



**VALVE SPECIFICATIONS**

|                                    |   |
|------------------------------------|---|
| Nominal Flow                       | 15 GPM (57 LPM) from (2) to (4)<br>8 GPM (30 LPM) from (4) to (2) |
| Rated Operating Pressure           | 5000 PSI (345 bar)  |
| Typical Internal Leakage (150 SSU) | 8 cu in/min (131 ml/min) per path                                 |
| Viscosity Range                    | 36 to 3000 SSU (3 to 647 cSt)                                     |
| Filtration                         | ISO 18/16/13  |
| Media Operating 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      | 70 ft-lbs (94.9 Nm)   |
| Coil Nut Torque Requirements       | 5-7 ft-lbs (6.8-9.5 Nm) Maximum                                   |
| Cavity                             | TECNORD 4W  |
| Cavity Tools Kit                   |   |
| (form tool, reamer, tap)           | 40500035  |
| Seal Kit                           | 21191309  |

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



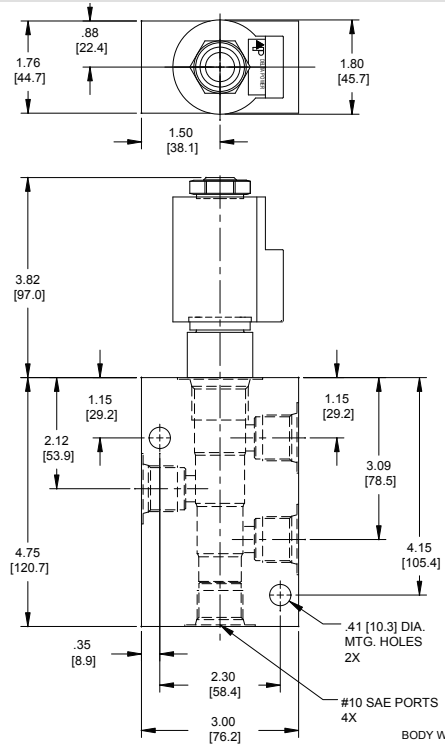
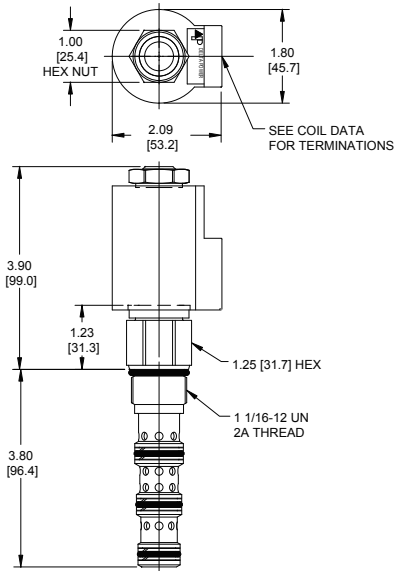
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# SOLENOID OPERATED DIRECTIONAL CONTROLS

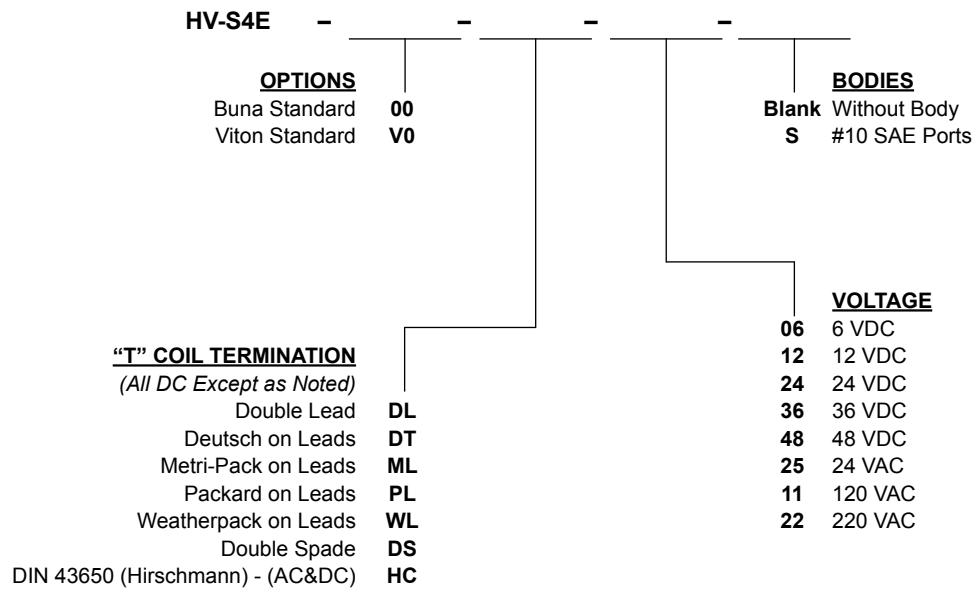
## DIMENSIONS



BODY WEIGHT: 5.08 lbs (2.3 kg)

## ORDERING INFORMATION

Approximate Coil Weight: .89 lbs (.41 kg)



W 26 / 2019

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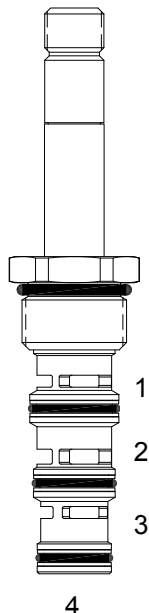


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**DG-S4F DIRECT ACTING SPOOL, 4 WAY 2 POSITION, ENERGIZED TO BLOCK**



**DESCRIPTION**

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

**OPERATION**

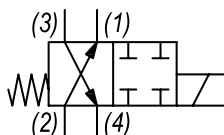
When de-energized the DG-S4F allows flow from (2) and (1), and from (3) to (4). When energized the valve blocks flow at all ports.

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

**FEATURES**

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

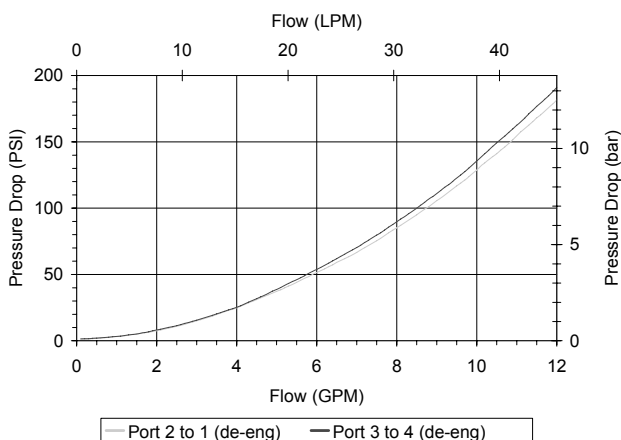
**HYDRAULIC SYMBOL**



For higher pressures see HG-S4F. Operational shift limit, 6 GPM (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<br>(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.



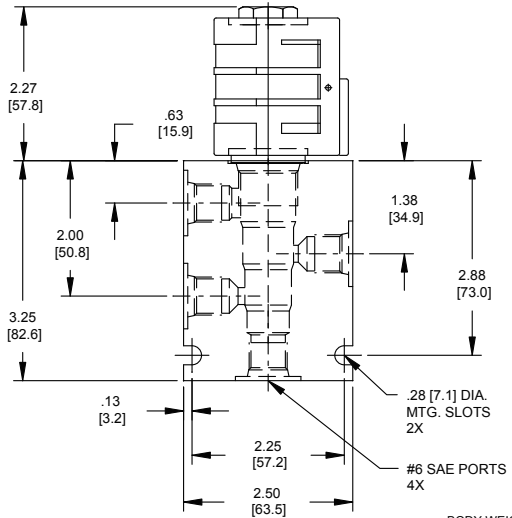
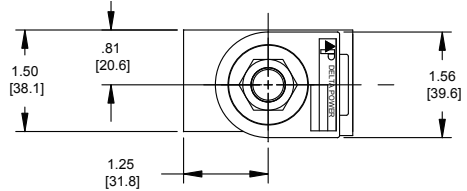
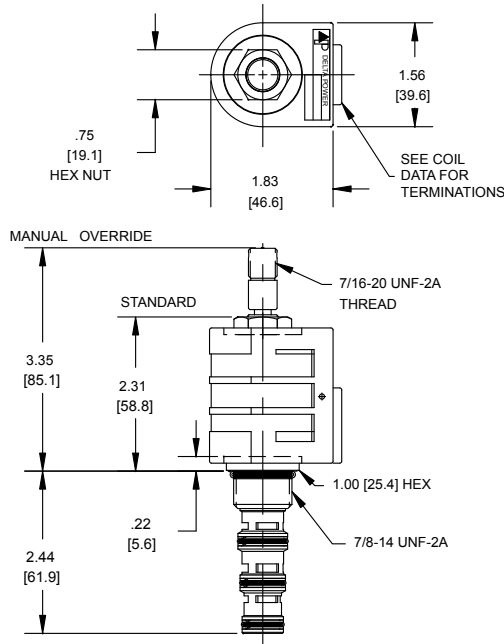
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# SOLENOID OPERATED DIRECTIONAL CONTROLS

## DIMENSIONS



BODY WEIGHT: .99 lbs (.45 kg)

## ORDERING INFORMATION

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

### DG-S4F

#### OPTIONS

- Buna Standard **00**
- Viton Standard **V0**
- Buna, Override **0M**
- Viton, Override **VM**
- Buna, Override, Non-detent **B1**
- Viton, Override, Non-detent **V1**

#### 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

#### "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

#### IMMERSION PROOF "D" TYPE

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

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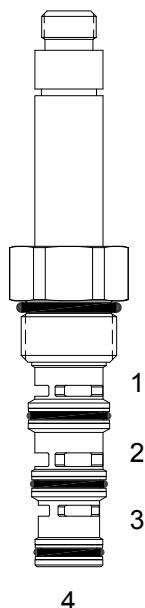


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## HG-S4F DIRECT ACTING SPOOL, 4 WAY 2 POSITION, ENERGIZED TO BLOCK



### DESCRIPTION

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

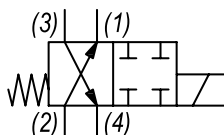
### OPERATION

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.

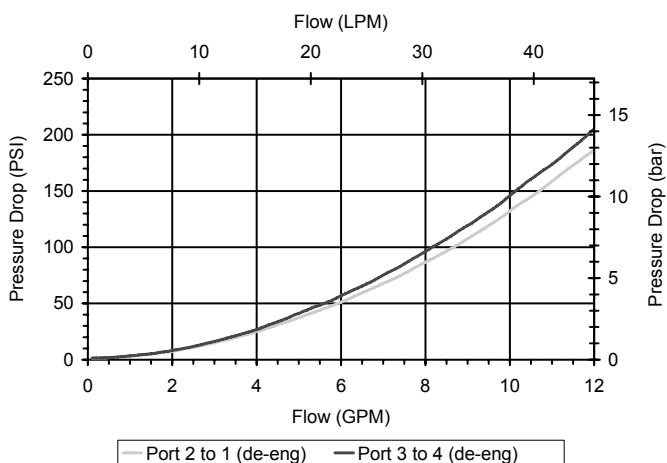
### HYDRAULIC SYMBOL



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                | 35 ft-lbs (47.5 Nm)                |
| Coil Nut Torque Requirements                 | 4-6 ft-lbs (5.4-8.1 Nm)            |
| Cavity                                       | DELTA 4W                           |
| Cavity Tools Kit<br>(form tool, reamer, tap) | 40500002                           |
| Seal Kit                                     | 21191214                           |

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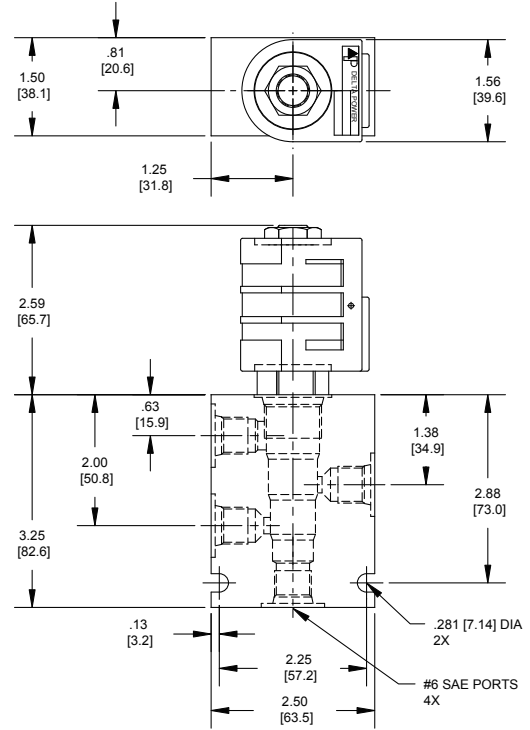
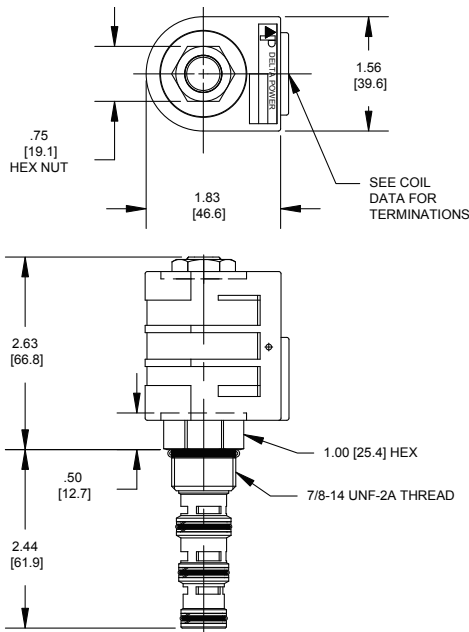
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# SOLENOID OPERATED DIRECTIONAL CONTROLS

## DIMENSIONS



BODY WEIGHT: .99 lbs (.45 kg)

## ORDERING INFORMATION

### HG-S4F

**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

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

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

### "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

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

W 26/2019

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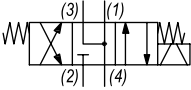
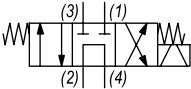
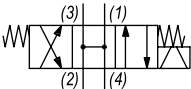
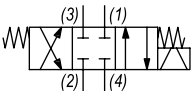
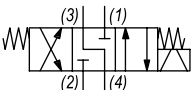
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## SOLENOID OPERATED DIRECTIONAL CONTROLS

### 4 WAY 3 POSITION SPOOL VALVES

| 4W3P SPOOL  | GPM | PSI  | LPM  | BAR | CAVITY | MODEL         | PAGE  |
|---|-----|------|------|-----|--------|---------------|-------|
|    | 3   | 3000 | 11   | 207 | 3/4-16 | <b>VQ-S4M</b> | SD166 |
|   | 5   | 3000 | 19   | 207 | 3/4-16 | <b>PQ-S4M</b> | SD168 |
|   | 6   | 3000 | 23   | 207 | 7/8-14 | <b>DG-S4M</b> | SD170 |
|    | 5   | 3000 | 19   | 207 | 3/4-16 | <b>PQ-S4N</b> | SD172 |
|   | 6   | 3000 | 23   | 207 | 7/8-14 | <b>DG-S4N</b> | SD174 |
|   | 2.5 | 3000 | 9.5  | 207 | 3/4-16 | <b>VQ-S4R</b> | SD176 |
|   | 3   | 3000 | 11   | 207 | 3/4-16 | <b>PQ-S4R</b> | SD178 |
|    | 3   | 3000 | 11   | 207 | 3/4-16 | <b>PQ-S4O</b> | SD180 |
|   | 8   | 3000 | 30   | 207 | 7/8-14 | <b>DG-S4O</b> | SD182 |
|   | 5   | 3000 | 19   | 207 | 3/4-16 | <b>PQ-S4T</b> | SD184 |
|  | 3.5 | 3000 | 13.2 | 207 | 3/4-16 | <b>VQ-S4Q</b> | SD186 |
|   | 5   | 3000 | 19   | 207 | 3/4-16 | <b>PQ-S4P</b> | SD188 |
|   | 8   | 3000 | 30   | 207 | 7/8-14 | <b>DG-S4P</b> | SD190 |
|   | 6   | 3000 | 23   | 207 | 3/4-16 | <b>PQ-S4Q</b> | SD192 |
|  | 6   | 3000 | 23   | 207 | 7/8-14 | <b>DG-S4S</b> | SD194 |

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**TECNORD**

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## TYPICAL SCHEMATIC

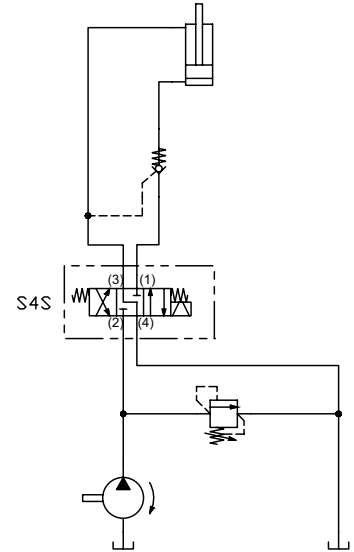
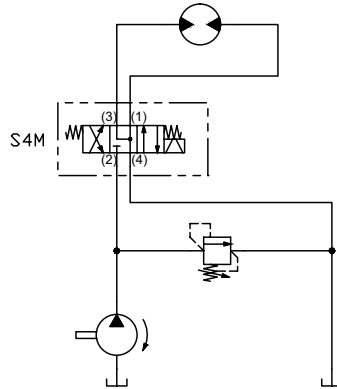
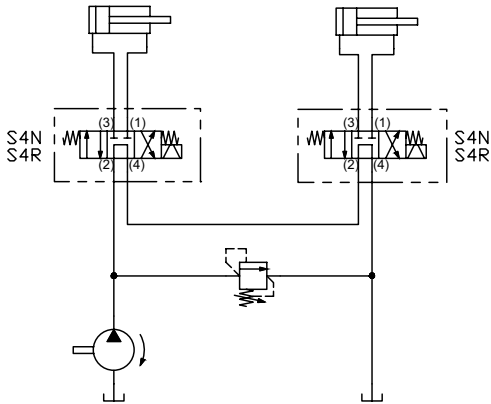
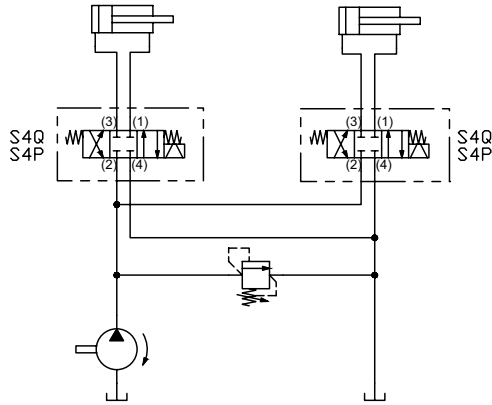
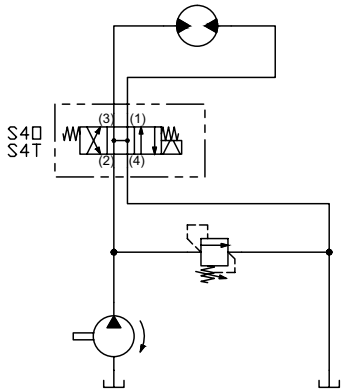
Typical application for the S4O and S4T "Open Center" valve is a bidirectional fluid motor control with coasting.

Typical application for the S4Q and S4P "Closed Center" valve is a parallel circuit for cylinder control.

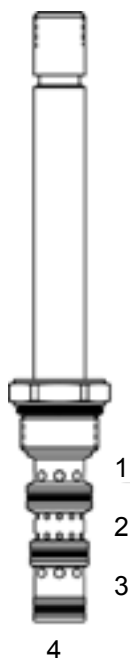
Typical application for the S4N and S4R "Tandem Center" valve is a series circuit with power beyond.

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.



**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**

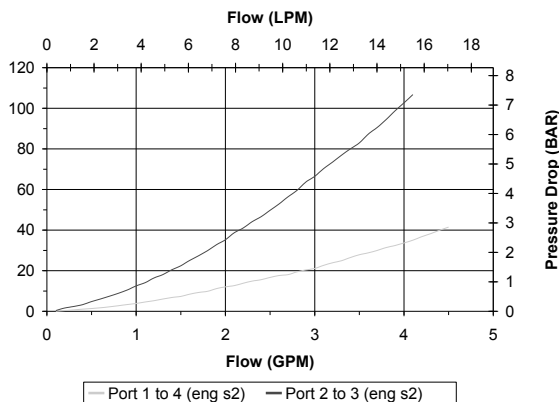
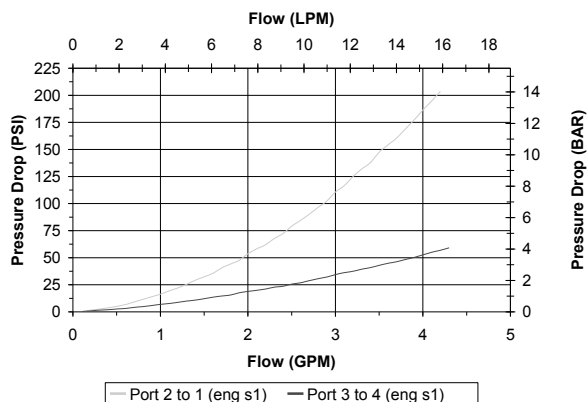
When de-energized the VQ-S4M allows flow between (1), (3) and (4), blocks flow at (2). When outer coil (S1) is energized the valve allows flow from (2) to (1) and from (3) to (4). When inner coil (S2) is energized the valve allows flow from (2) to (3) and from (1) to (4).

**FEATURES**

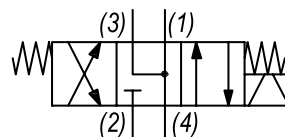
- Hardened parts for long life.
- Efficient wet-armature construction.
- Cartridges are voltage interchangeable.
- Industry common cavity.
- Unitized, molded coil design.
- Continuous duty rated solenoid.
- Optional coil voltages and terminations.
- Optional "I" Coil: Weatherproof, Thermal Shock, Immersion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

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



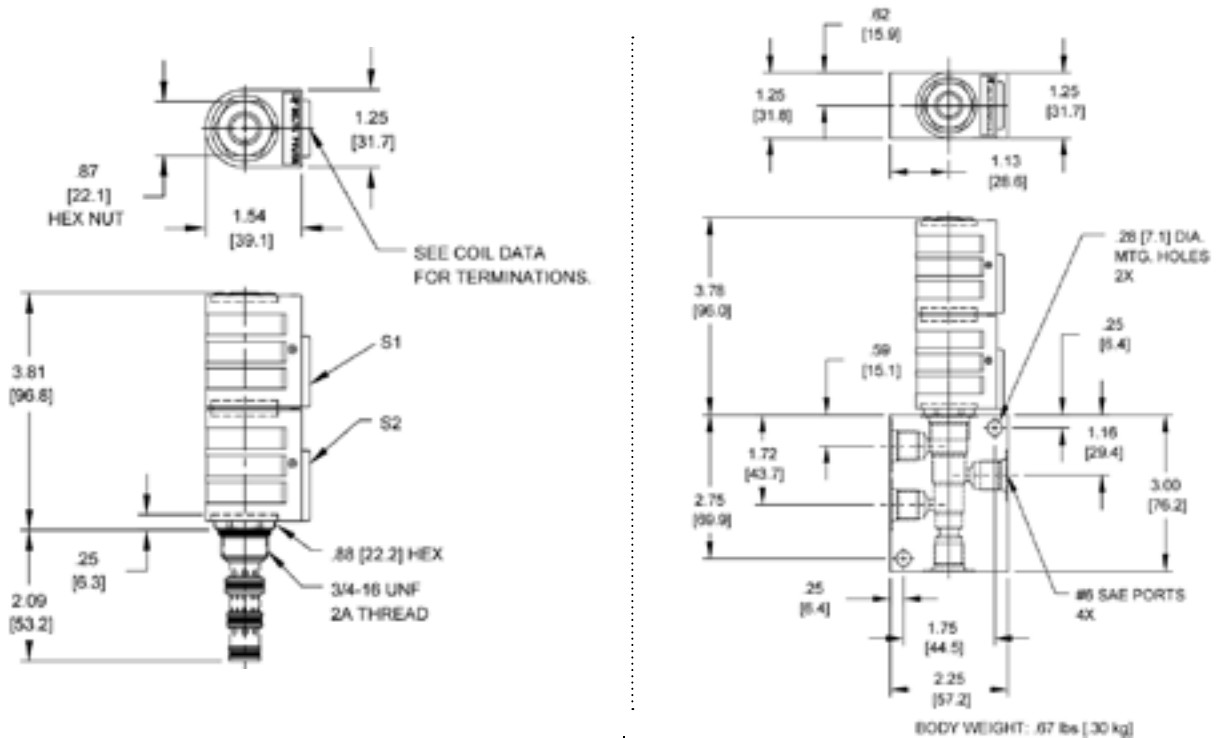
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W 26 / 2012 / 019

**DIMENSIONS**



**ORDERING INFORMATION**

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

**VQ-S4M**

- 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

W 26 / 2019

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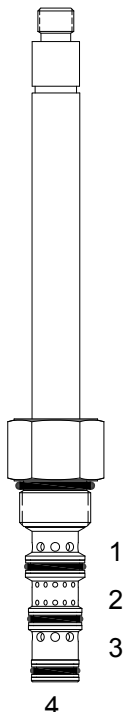


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## PQ-S4M DIRECT ACTING SPOOL, 4 WAY 3 POSITION, MOTOR CENTER



### 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.

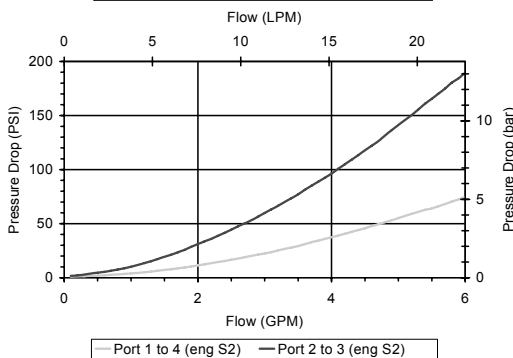
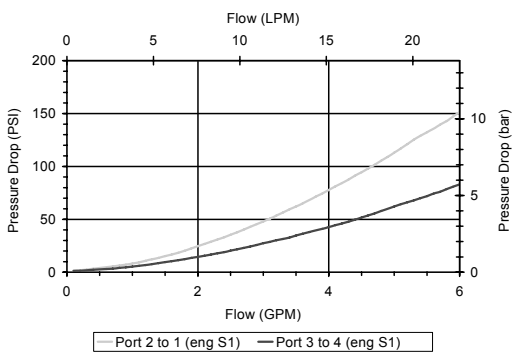


Uses "D" Delta coil. Flow rating based on maximum differential load of 1000 PSI.

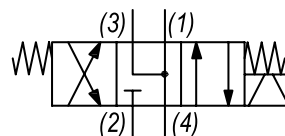
"OP" override is a push only nondetented button that actuates (S2) direction.

### 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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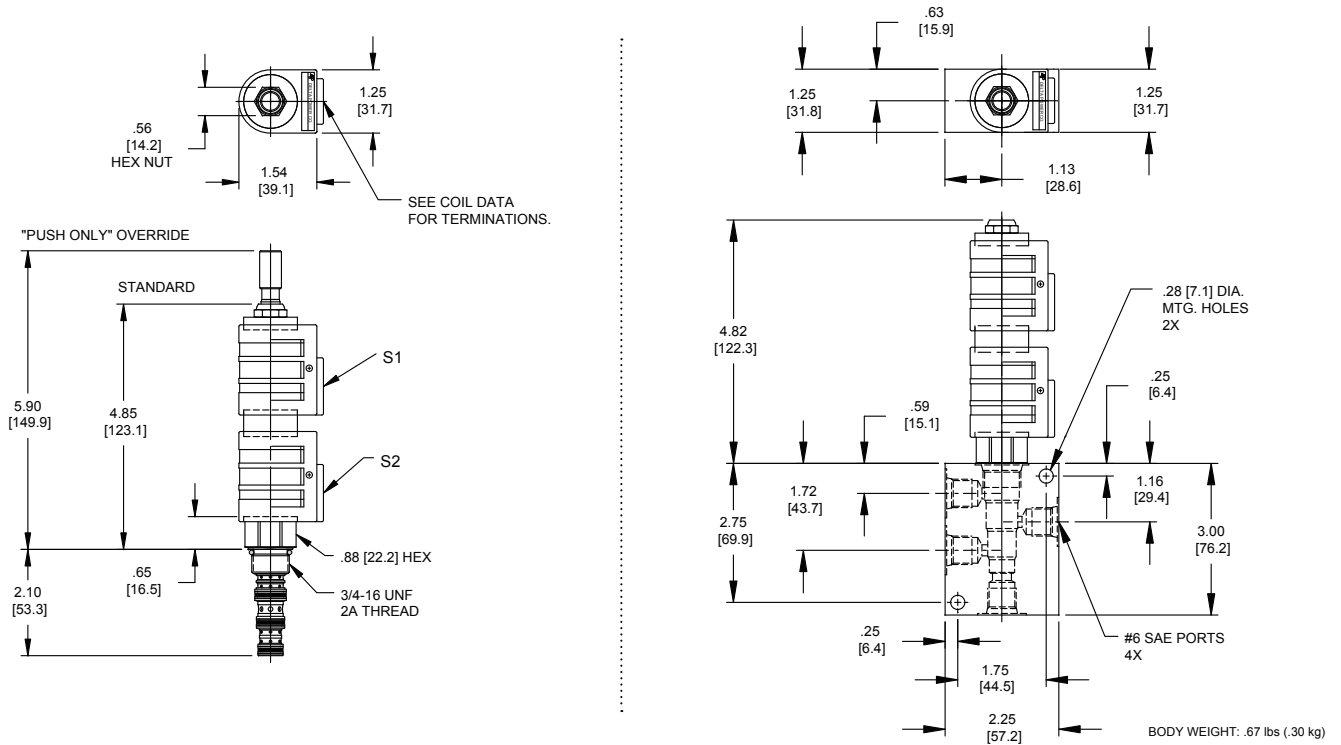
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# SOLENOID OPERATED DIRECTIONAL CONTROLS

## DIMENSIONS



## ORDERING INFORMATION

Approximate Coil Weight: .74 lbs (.33 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 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

### "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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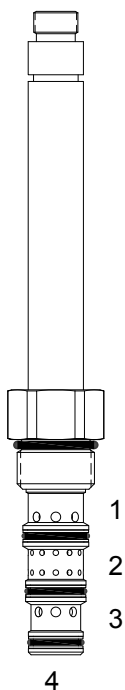


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**DG-S4M DIRECT ACTING SPOOL, 4 WAY 3 POSITION, MOTOR CENTER**



**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**

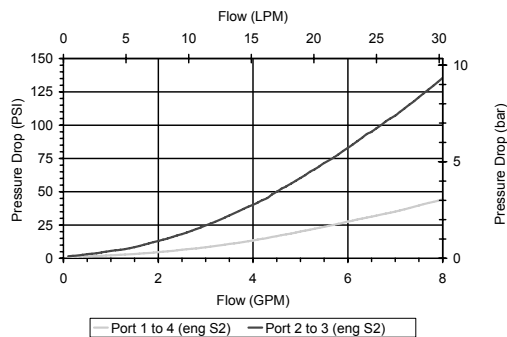
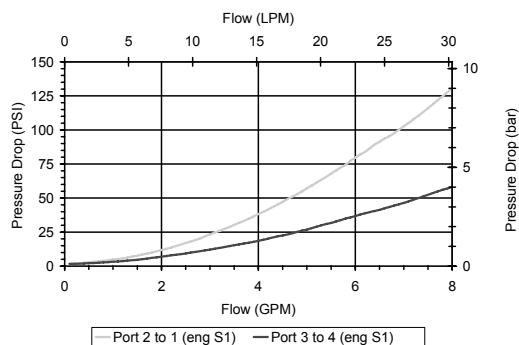
- Hardened parts for long life.
- Efficient wet-armature construction.
- Cartridges are voltage interchangeable.
- Manual override option.
- Industry common cavity.
- Unitized, molded coil design.
- Continuous duty rated solenoid.
- Optional coil voltages and terminations.
- Optional "I" Coil: Weatherproof,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



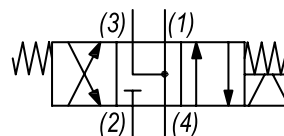
Uses "L" Coil. Flow rating is at 1000 PSID maximum differential loading.

**PERFORMANCE**

Actual Test Data (Cartridge Only)



**HYDRAULIC SYMBOL**



**VALVE SPECIFICATIONS**

|                                    |                                  |
|------------------------------------|----------------------------------|
| Nominal Flow                       | 6 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                             | .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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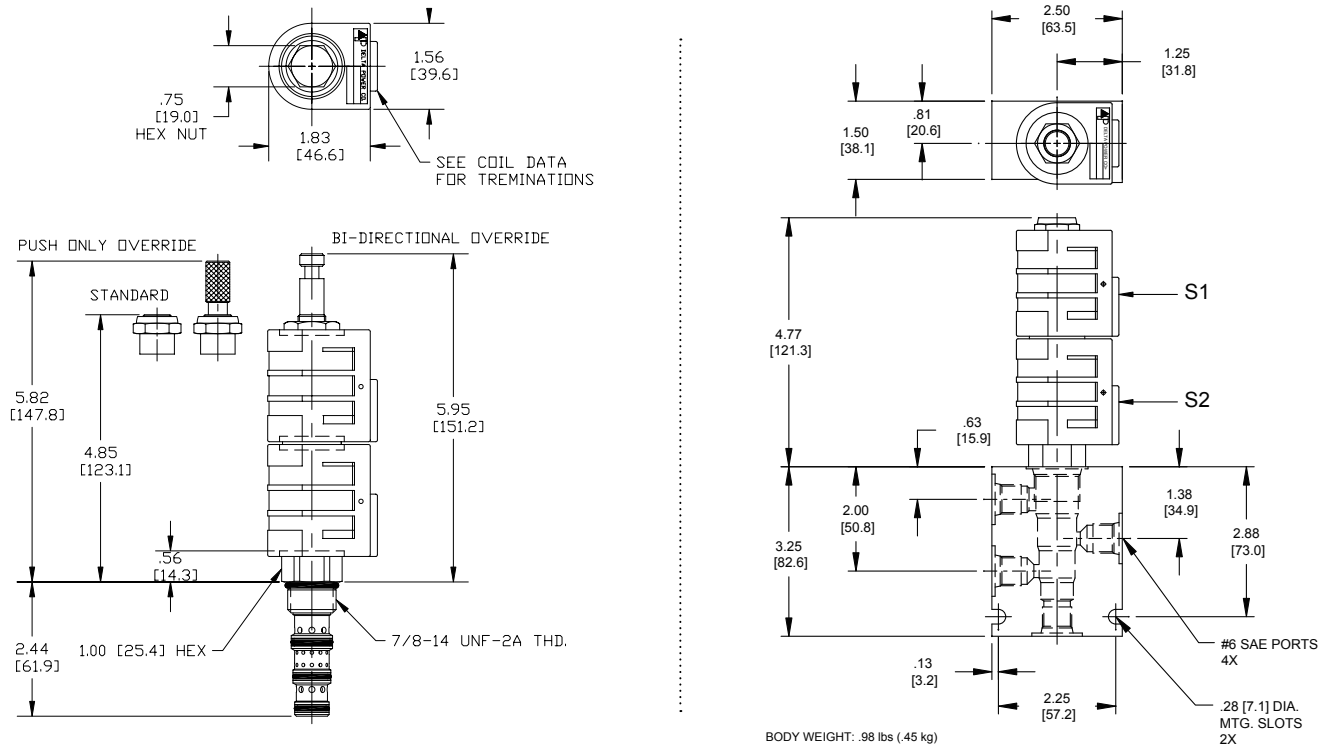
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# SOLENOID OPERATED DIRECTIONAL CONTROLS

## DIMENSIONS



## ORDERING INFORMATION

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

### DG-S4M

#### OPTIONS

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

#### NO COIL ASSEMBLED ONTO VALVE

If "L" coils will be used – leave blank  
If "I" coils will be used – use "I"

#### "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

#### BODIES

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

#### VOLTAGE

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

#### IMMERSION PROOF "L" TYPE

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

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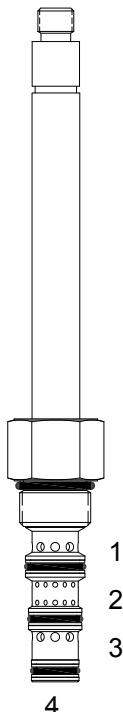


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**PQ-S4N DIRECT ACTING SPOOL, 4 WAY 3 POSITION, TANDEM CENTER**



**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**

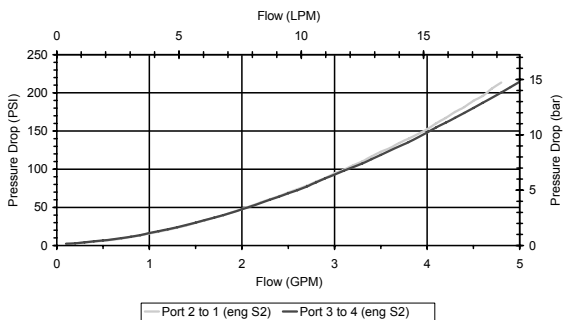
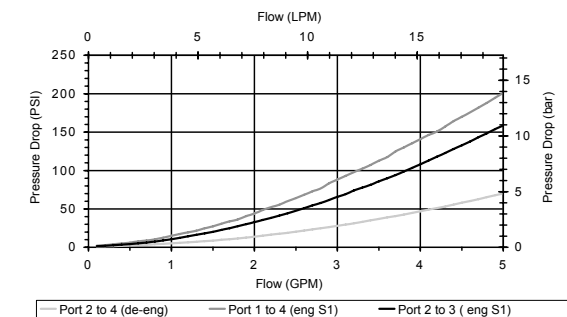
- Hardened parts for long life.
- Efficient wet-armature construction.
- Cartridges are voltage interchangeable.
- Industry common cavity.
- Optional manual "push only" override.
- Unitized, molded coil design.
- Continuous duty rated solenoid.
- Optional coil voltages and terminations.



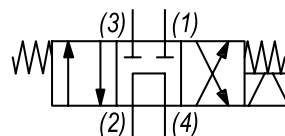
Uses "D" Delta coil. "OP" override is a push only non-detented button that actuates (S2) direction.

**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                         |

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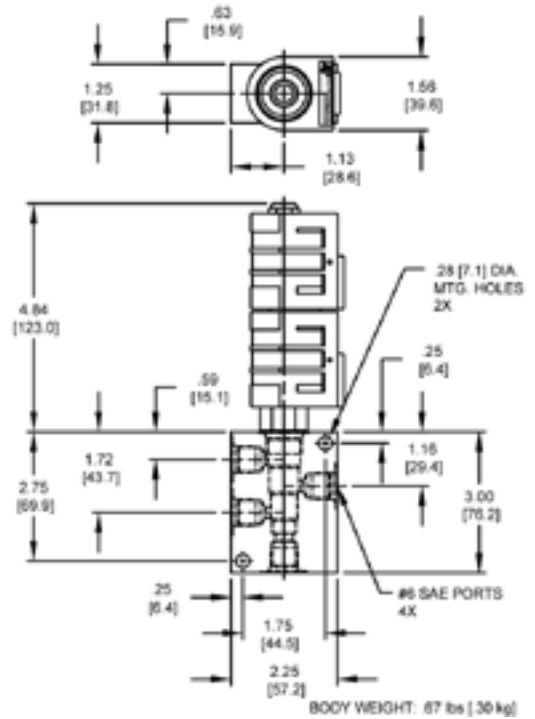
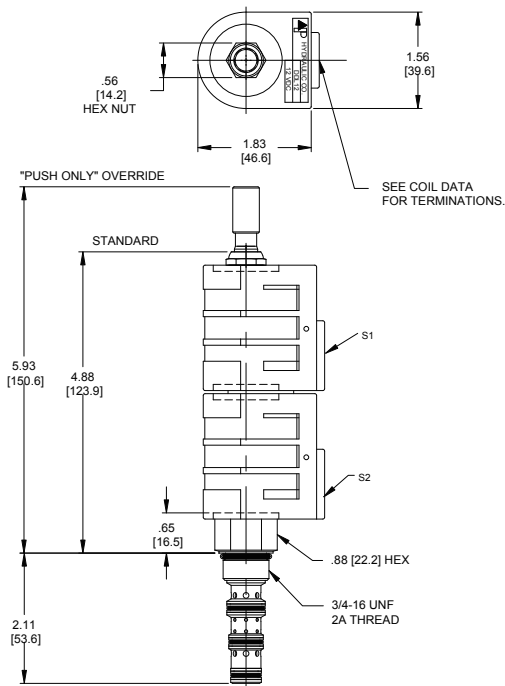
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**DIMENSIONS**



**ORDERING INFORMATION**

Approximate Coil Weight: .74 lbs (.33 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 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

**"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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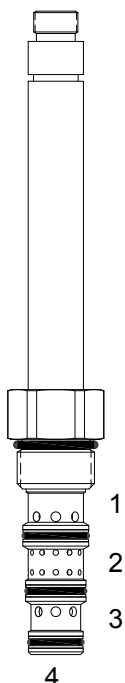


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**DG-S4N DIRECT ACTING SPOOL, 4 WAY 3 POSITION, TANDEM CENTER**



**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**

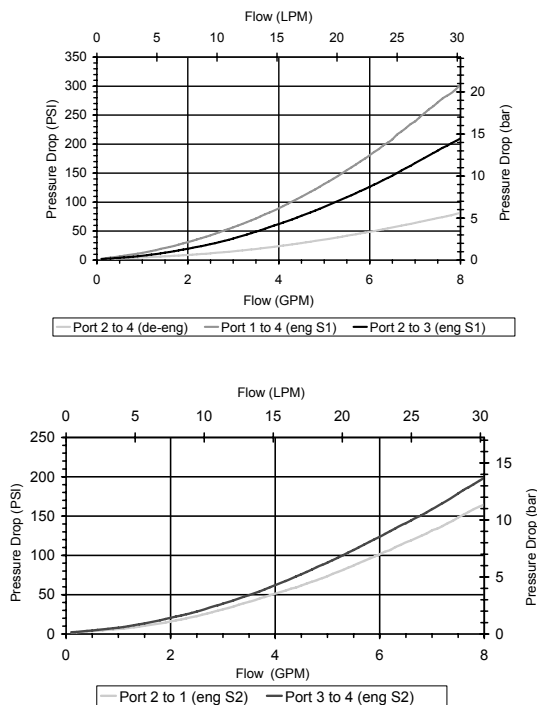
- Hardened parts for long life.
- Efficient wet-armature construction.
- Cartridges are voltage interchangeable.
- Manual override option.
- Industry common cavity.
- Unitized, molded coil design.
- Continuous duty rated solenoid.
- Optional coil voltages and terminations.
- Optional "I" Coil: Weatherproof,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



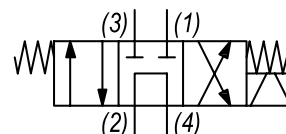
Uses "L" Coils.

**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<br>(form tool, reamer, tap) | 40500002                         |
| Seal Kit                                     | 21191214                         |

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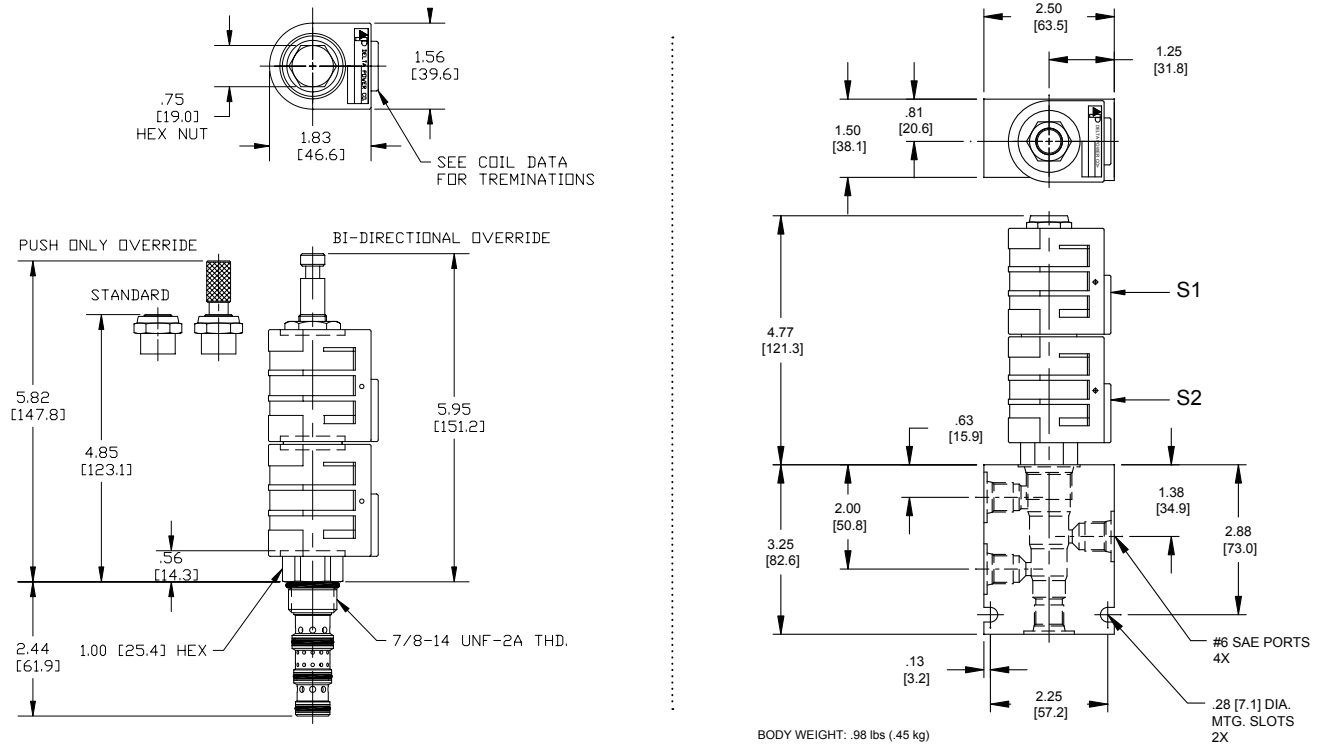
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# SOLENOID OPERATED DIRECTIONAL CONTROLS

## DIMENSIONS



## ORDERING INFORMATION

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

### DG-S4N

#### OPTIONS

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

#### NO COIL ASSEMBLED ONTO VALVE

If "L" coils will be used – leave blank  
If "I" coils will be used – use "I"

#### "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

#### BODIES

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

#### VOLTAGE

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

#### IMMERSION PROOF "L" TYPE

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

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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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**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**

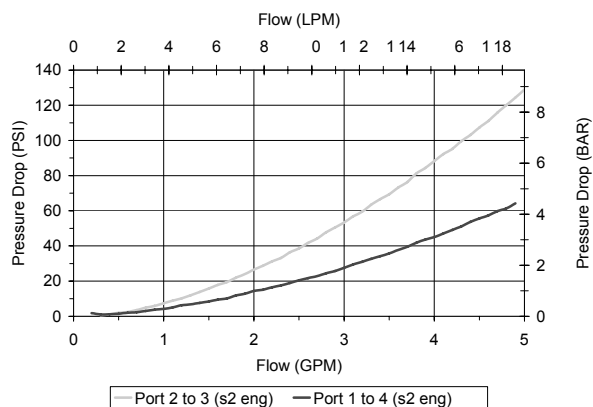
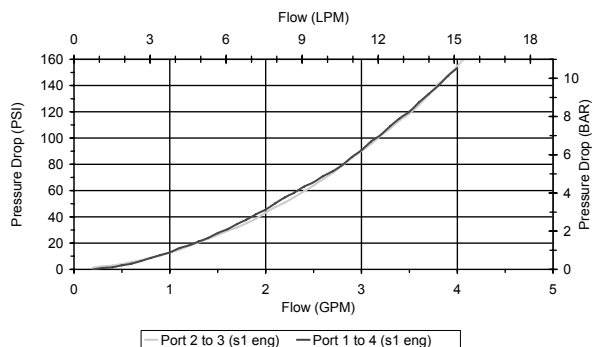
When de-energized the VQ-S4R allows flow between (2) and (4), ports (1) and (3) are blocked. When outer coil (S1) is energized the valve allows flow from (2) to (3) and from (1) to (4). When inner coil (S2) is energized the valve allows flow from (2) to (1) and from (3) to (4).

**FEATURES**

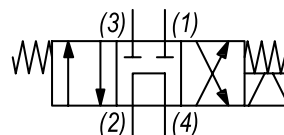
- Hardened parts for long life.
- Efficient wet-armature construction.
- Cartridges are voltage interchangeable.
- Industry common cavity.
- Unitized, molded coil design.
- Continuous duty rated solenoid.
- Optional coil voltages and terminations.
- Optional "I" Coil: Weatherproof, Thermal Shock, Immersion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

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

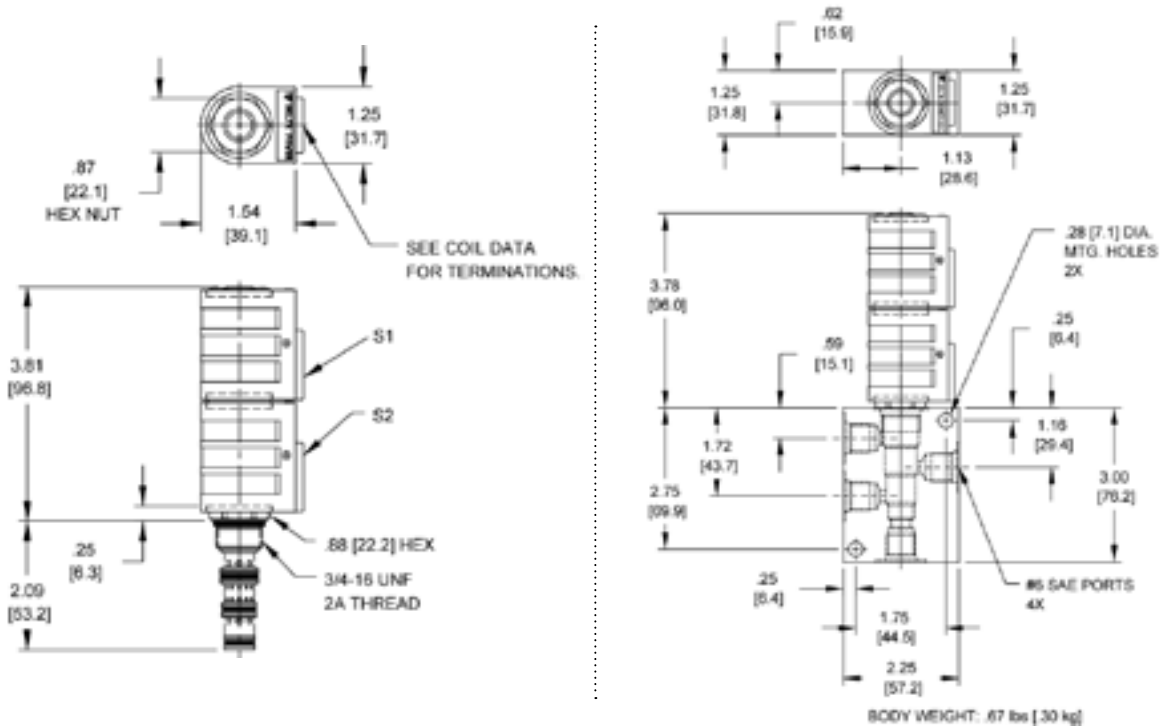


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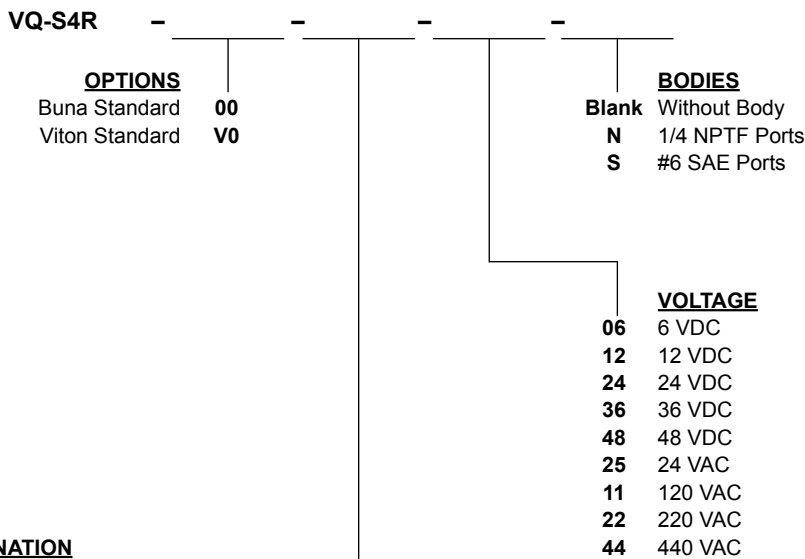
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**DIMENSIONS**



**ORDERING INFORMATION**

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



**“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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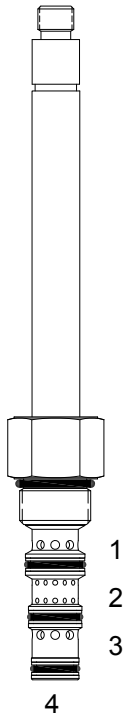


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**PQ-S4R DIRECT ACTING SPOOL, 4 WAY 3 POSITION, TANDEM CENTER**



**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**

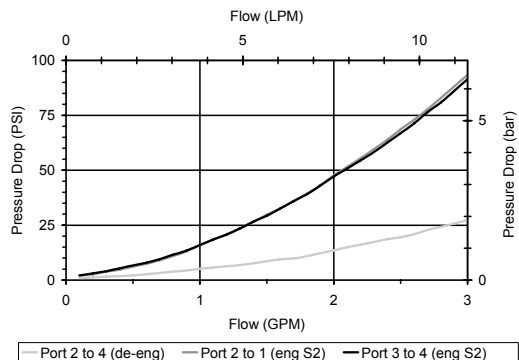
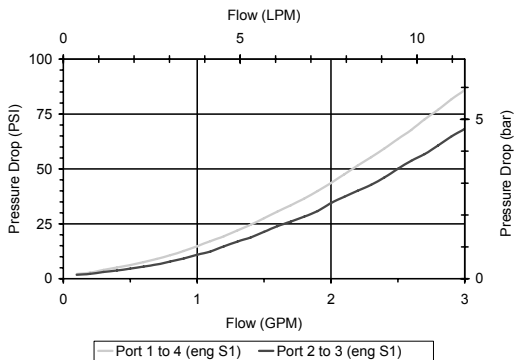
- Hardened parts for long life.
- Efficient wet-armature construction.
- Cartridges are voltage interchangeable.
- Industry common cavity.
- Optional manual "push only" override.
- Unitized, molded coil design.
- Continuous duty rated solenoid.
- Optional coil voltages and terminations.



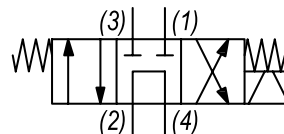
Uses "P" Power coil. For higher flow see PQ-S4N. "OP" override is a push only non-detented button that actuates (S2) direction. For "T" coil environmental protection option, consult factory for special build configuration per Delta Standard 40295013.

**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                         |

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



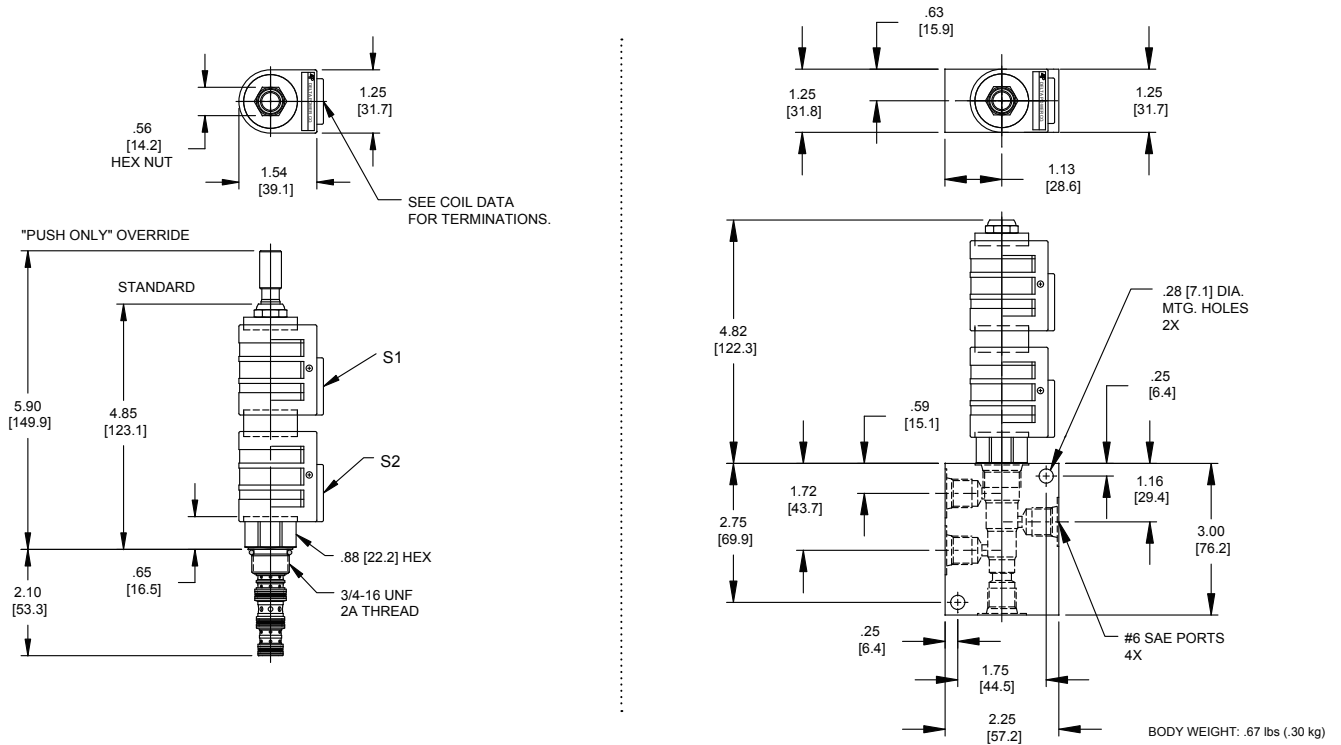
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# SOLENOID OPERATED DIRECTIONAL CONTROLS

## 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** 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 "D" TYPE

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

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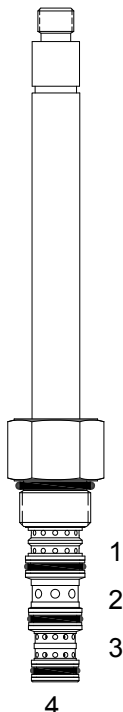


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**PQ-S4O DIRECT ACTING SPOOL, 4 WAY 3 POSITION, OPEN CENTER**



**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**

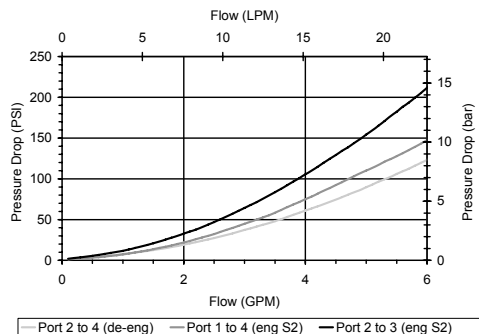
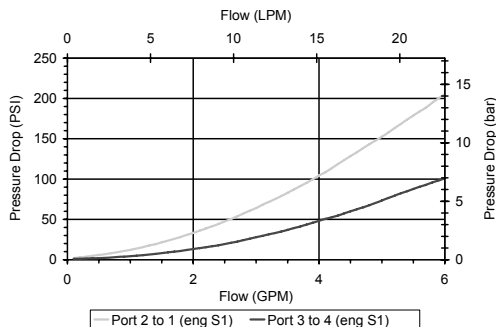
- Hardened parts for long life.
- Efficient wet-armature construction.
- Cartridges are voltage interchangeable.
- Industry common cavity.
- Optional manual "push only" override.
- Unitized, molded coil design.
- Continuous duty rated solenoid.
- Optional coil voltages and terminations.



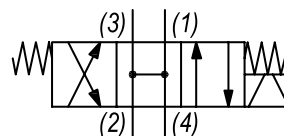
Uses "P" Power coil. For higher flow see PQ-S4T. "OP" override is a push only non-detented button that actuates (S2) direction. For "T" coil environmental protection options, consult factory for special build configuration per Delta Standard 40295013.

**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                         |

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



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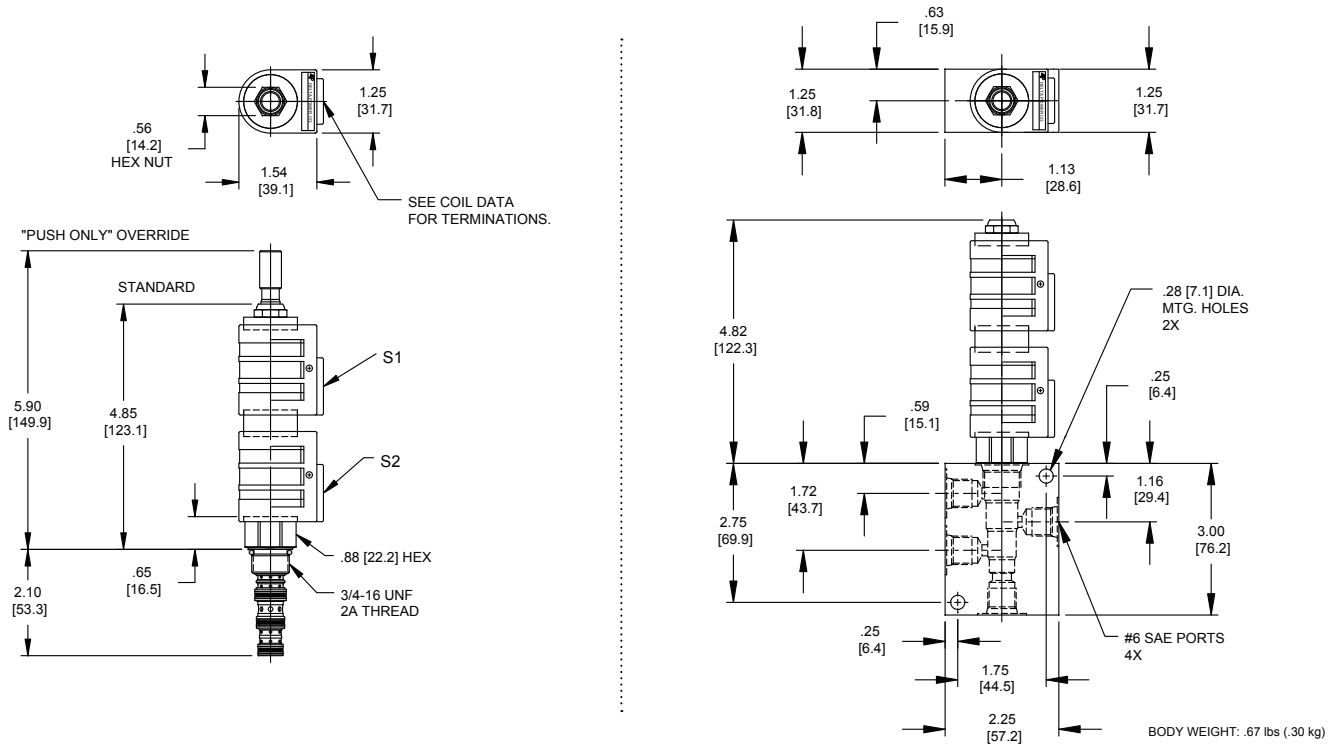


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# SOLENOID OPERATED DIRECTIONAL CONTROLS

## DIMENSIONS



## ORDERING INFORMATION

Approximate Coil Weight: .42 lbs (.19 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 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 "D" TYPE

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

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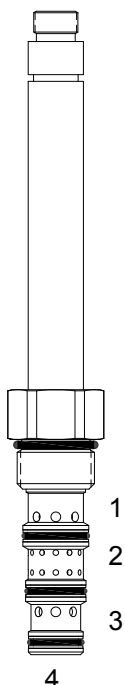


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**DG-S4O** DIRECT ACTING SPOOL, 4 WAY 3 POSITION, OPEN CENTER



**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**

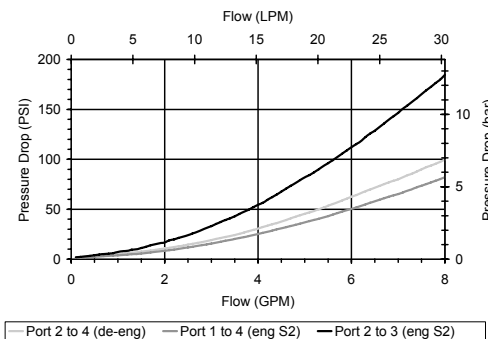
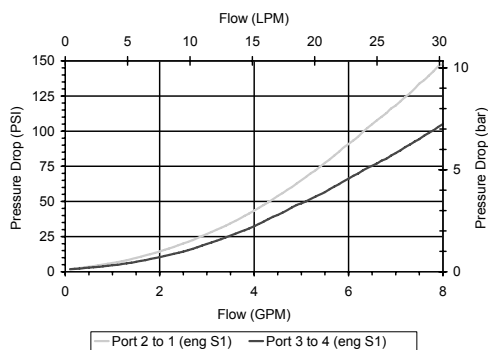
- Hardened parts for long life.
- Efficient wet-armature construction.
- Cartridges are voltage interchangeable.
- Manual override option.
- Industry common cavity.
- Unitized, molded coil design.
- Continuous duty rated solenoid.
- Optional coil voltages and terminations.
- Optional "I" Coil: Weatherproof,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



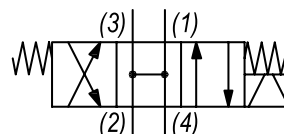
Uses "L" Coils.

**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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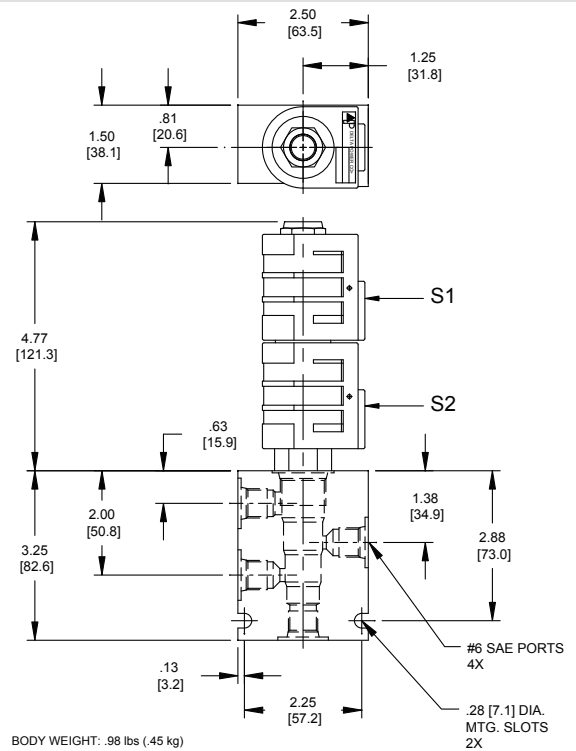
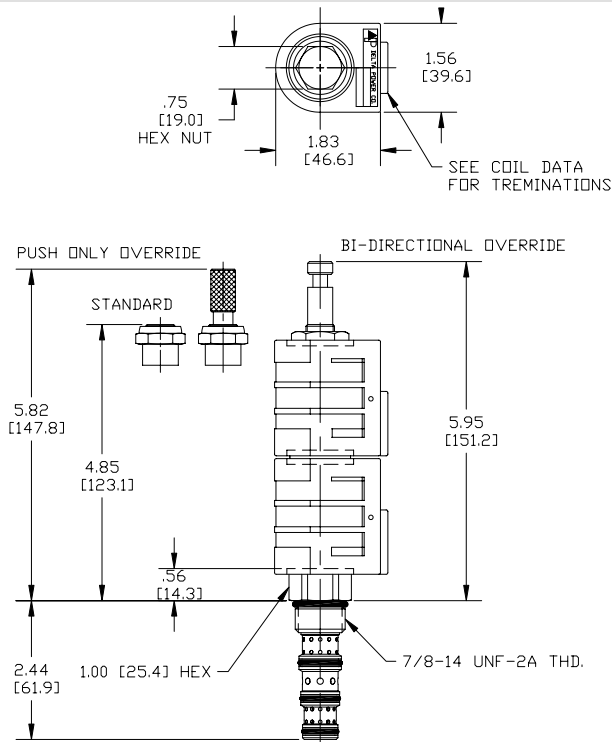
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# SOLENOID OPERATED DIRECTIONAL CONTROLS

## DIMENSIONS



## ORDERING INFORMATION

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

### DG-S40

#### OPTIONS

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

#### NO COIL ASSEMBLED ONTO VALVE

If "L" coils will be used – leave blank  
If "I" coils will be used – use "I"

#### "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

#### BODIES

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

#### VOLTAGE

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

#### IMMERSION PROOF "L" TYPE

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

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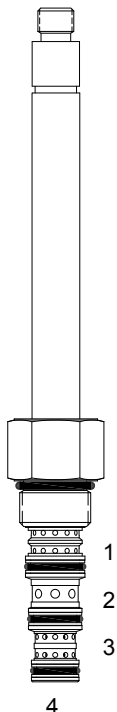


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**PQ-S4T DIRECT ACTING SPOOL, 4 WAY 3 POSITION, OPEN CENTER**



**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**

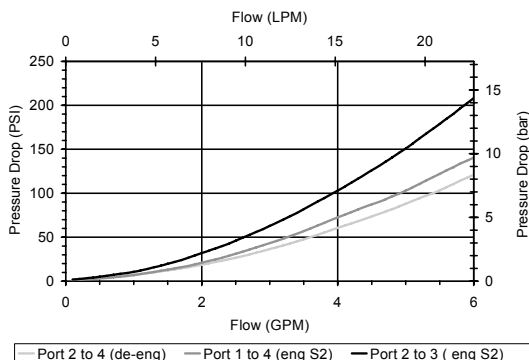
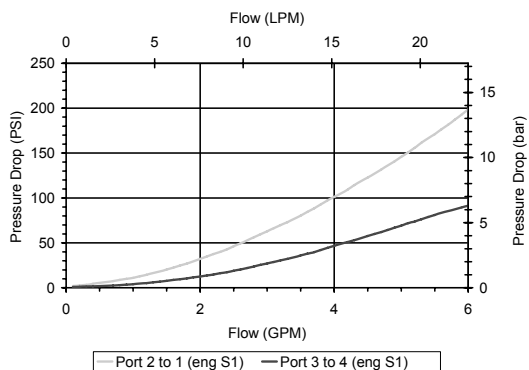
- Hardened parts for long life.
- Efficient wet-armature construction.
- Cartridges are voltage interchangeable.
- Industry common cavity.
- Optional manual "push only" override.
- Unitized, molded coil design.
- Continuous duty rated solenoid.
- Optional coil voltages and terminations.



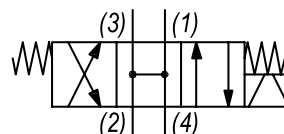
Uses "D" Delta coil "OP" override is a push only non-detented button that actuates (S2) direction.

**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.

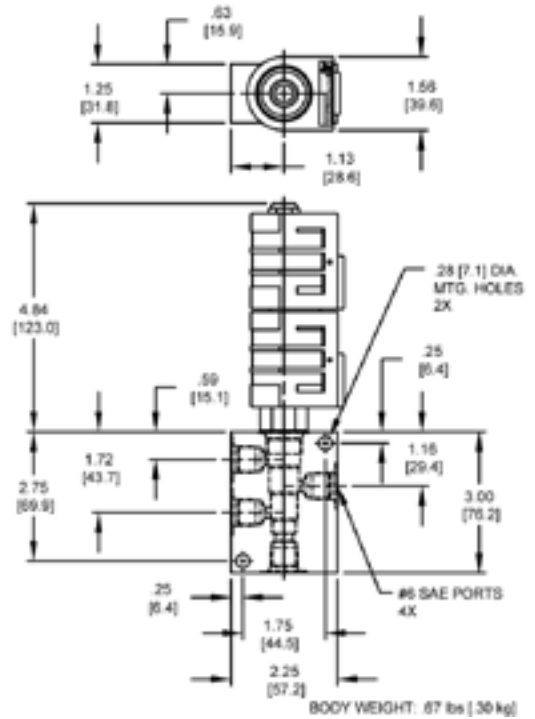
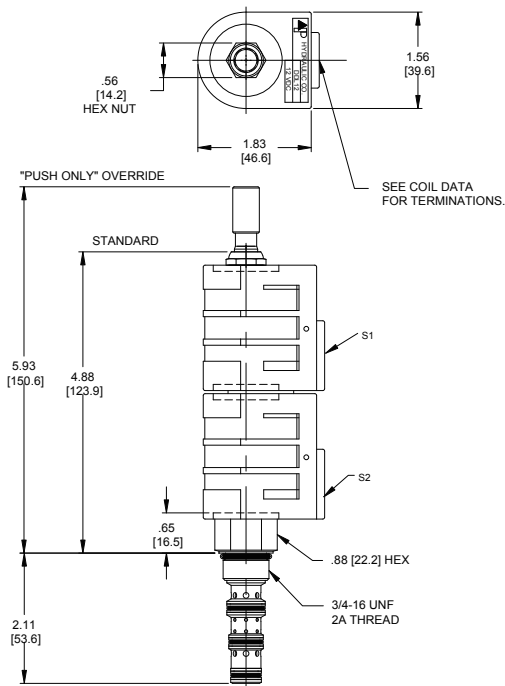


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**DIMENSIONS**



**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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**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**

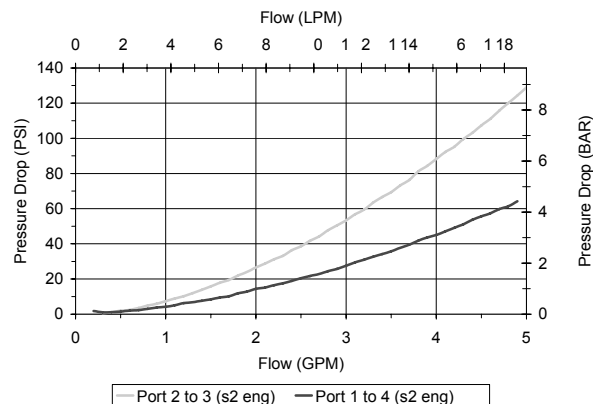
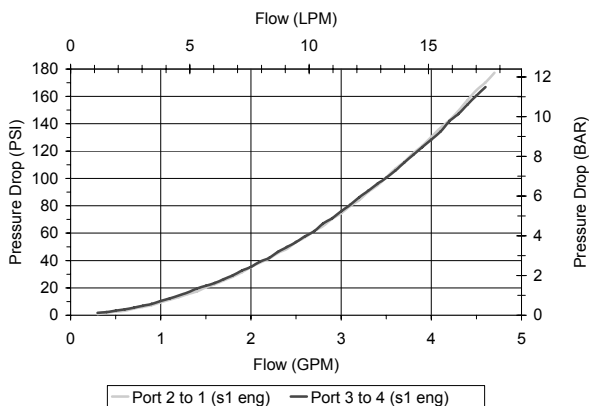
When de-energized the VQ-S4Q blocks flow to all ports. When outer coil (S1) is energized the valve allows flow from (2) to (1) and from (3) to (4). When inner coil (S2) is energized the valve allows flow from (2) to (3) and from (1) to (4).

**FEATURES**

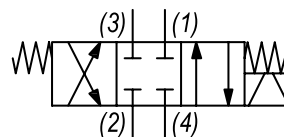
- Hardened parts for long life.
- Efficient wet-armature construction.
- Cartridges are voltage interchangeable.
- Industry common cavity.
- Unitized, molded coil design.
- Continuous duty rated solenoid.
- Optional coil voltages and terminations.
- Optional "I" Coil: Weatherproof, Thermal Shock, Immersion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

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

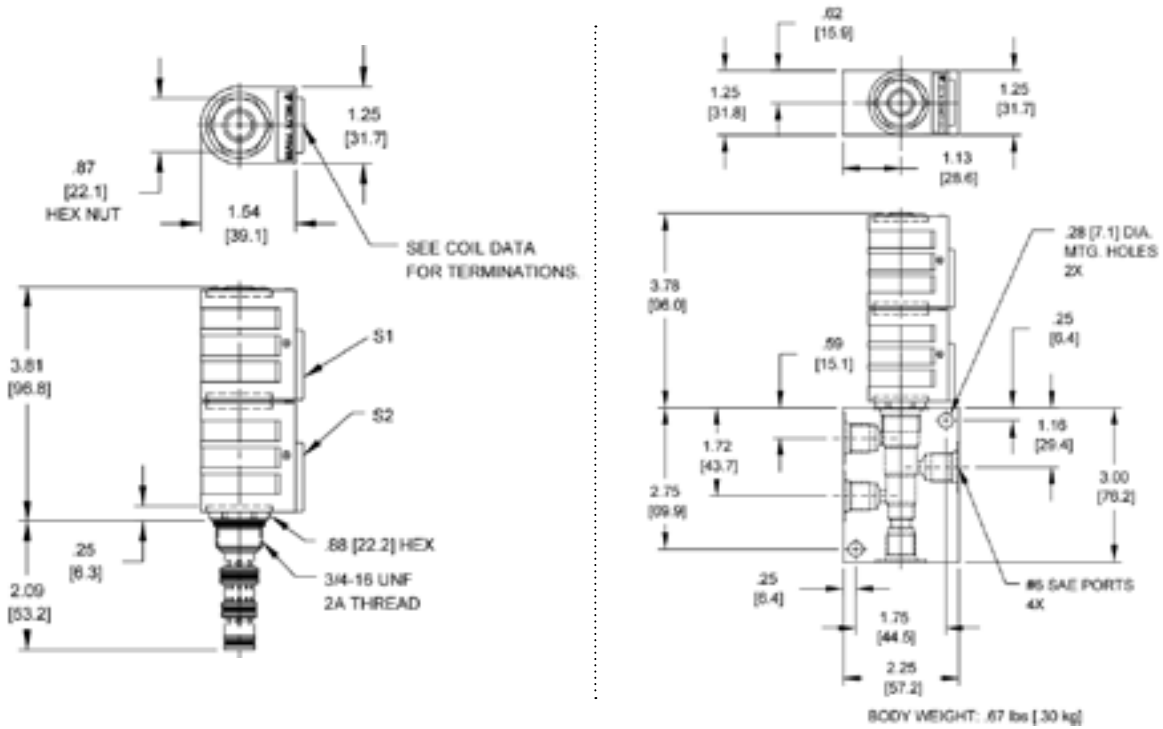


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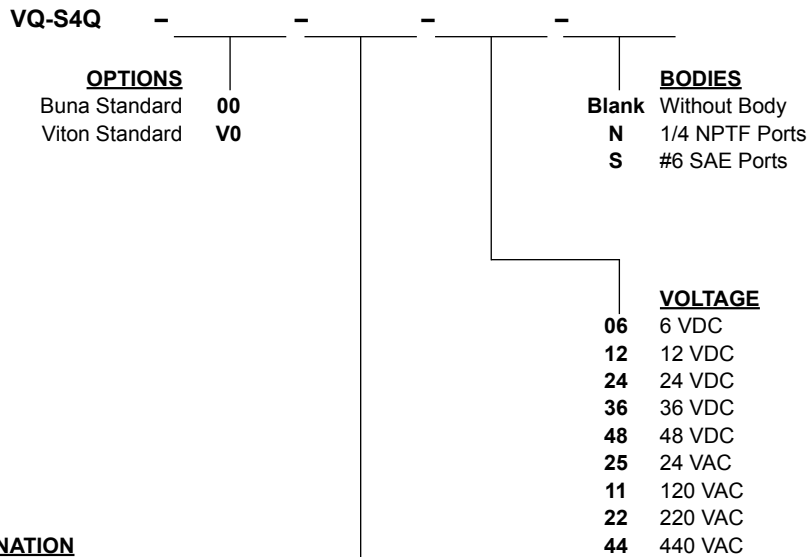
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**DIMENSIONS**



**ORDERING INFORMATION**

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



**“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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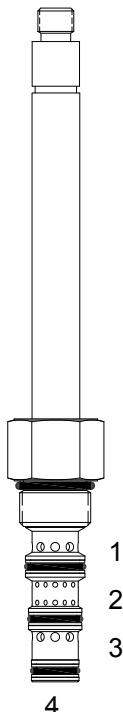


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**PQ-S4P DIRECT ACTING SPOOL, 4 WAY 3 POSITION, CLOSED CENTER**



**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**

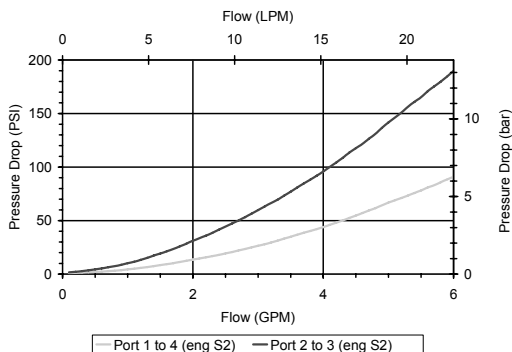
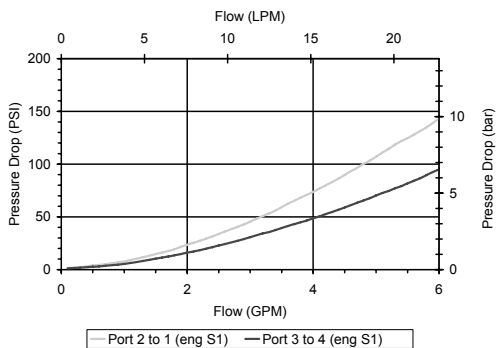
- Hardened parts for long life.
- Efficient wet-armature construction.
- Cartridges are voltage interchangeable.
- Industry common cavity.
- Optional manual "push only" override.
- Unitized, molded coil design.
- Continuous duty rated solenoid.
- Optional coil voltages and terminations.



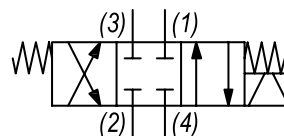
Uses "D" Delta coil. Flow rating based upon on maximum differential load of 1000 PSI. "OP" override is a push only non-detented button that actuates (S2) direction.

**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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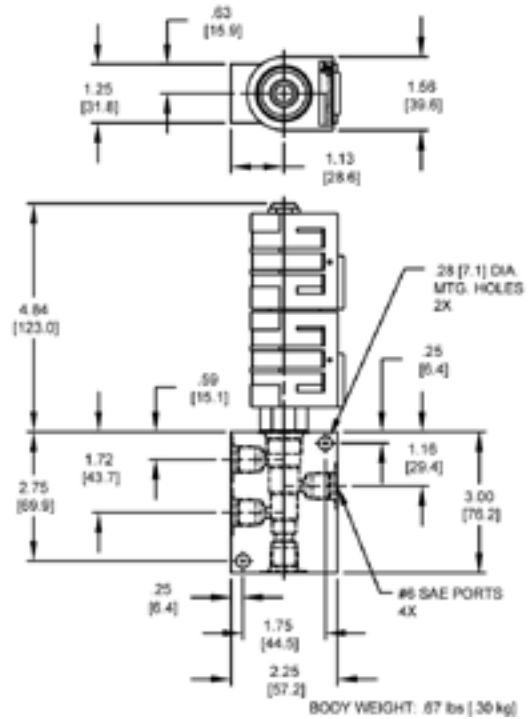
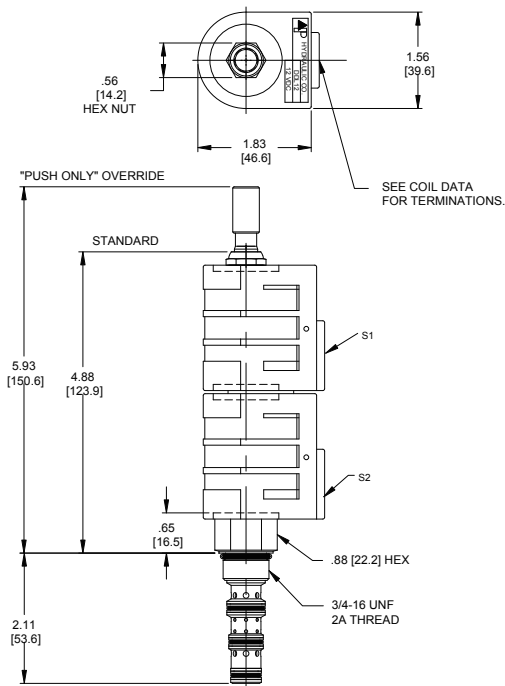
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**DIMENSIONS**



**ORDERING INFORMATION**

Approximate Coil Weight: .74 lbs (.33 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 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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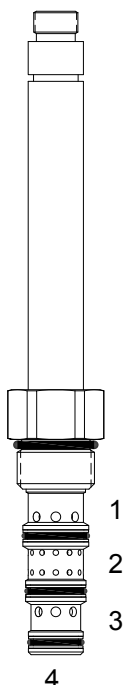


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**DG-S4P** DIRECT ACTING SPOOL, CLOSED CENTER, 4 WAY 3 POSITION, CLOSED CENTER



**DESCRIPTION**

10 size, 7/8-14 thread, "Delta" series, solenoid operated, 4 way 3 position, closed center spool valve.

**OPERATION**

When de-energized the DG-S4P blocks flow at all ports. When outer coil (S1) is energized the valve allows flow from (2) to (1) and from (3) to (4). When inner coil (S2) is energized the valve allows flow from (2) to (3) and from (1) to (4).

**OPERATION OF MANUAL OVERRIDE OPTION:** 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**

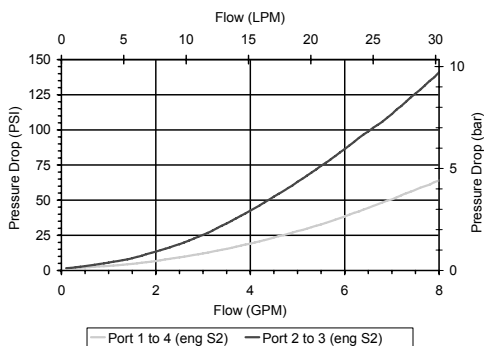
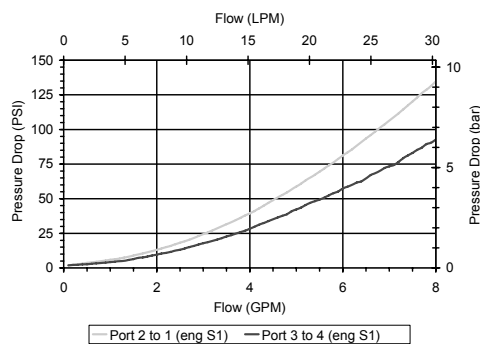
- Hardened parts for long life.
- Efficient wet-armature construction.
- Cartridges are voltage interchangeable.
- Manual override option.
- Industry common cavity.
- Unitized, molded coil design.
- Continuous duty rated solenoid.
- Optional coil voltages and terminations.
- Optional "I" Coil: Weatherproof,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



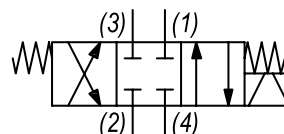
Uses "L" Coil. Flow rating is at 1000 PSID maximum differential loading.

**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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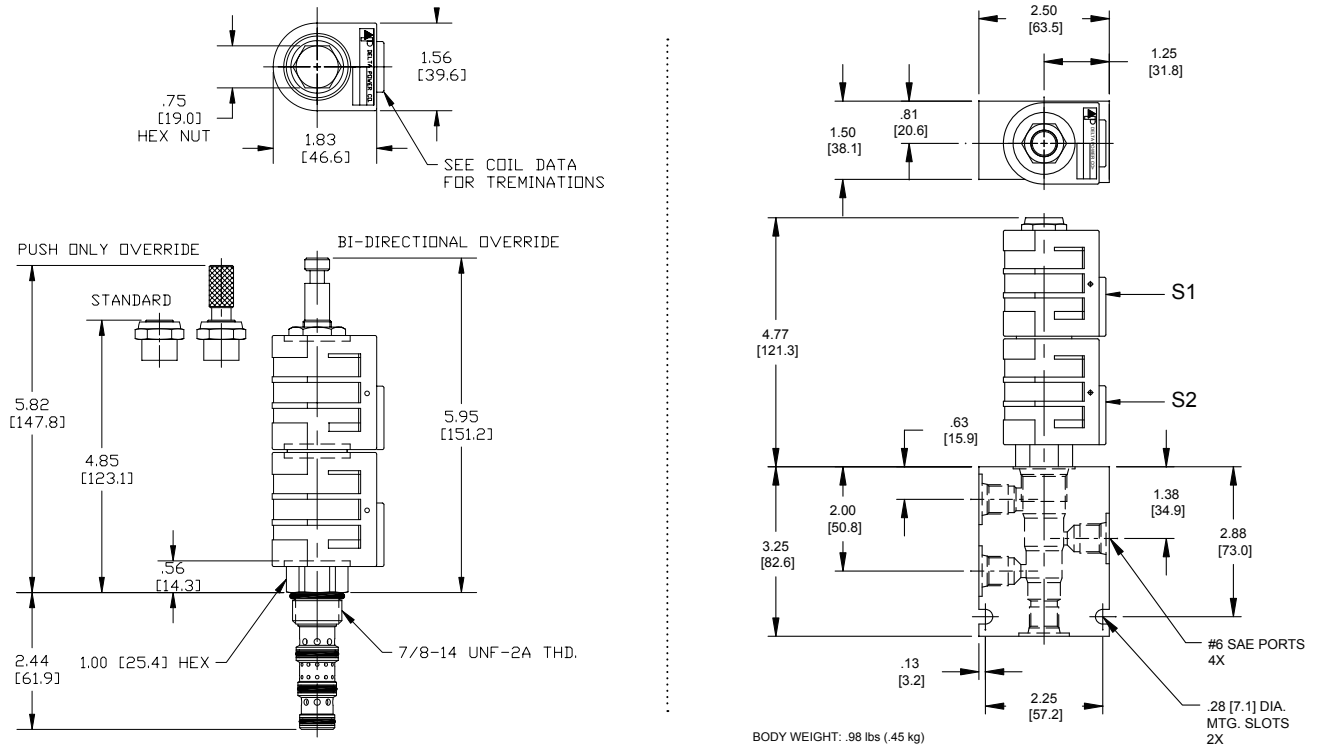
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# SOLENOID OPERATED DIRECTIONAL CONTROLS

## DIMENSIONS



## ORDERING INFORMATION

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

### DG-S4P

#### OPTIONS

|                           |           |
|---------------------------|-----------|
| Buna Standard             | <b>00</b> |
| Viton Standard            | <b>VO</b> |
| Buna, Override            | <b>0M</b> |
| Viton, Override           | <b>VM</b> |
| Buna, Push Only Override  | <b>0P</b> |
| Viton, Push Only Override | <b>VP</b> |

#### NO COIL ASSEMBLED ONTO VALVE

If "L" coils will be used – leave blank  
If "I" coils will be used – use "I"

#### "L" COIL TERMINATION

(All DC Except as Noted)

|                                    |
|------------------------------------|
| <b>DL</b> Double Lead              |
| <b>DT</b> Deutsch on Leads DT04-2P |
| <b>ML</b> Metri-Pack on Leads      |
| <b>PL</b> Packard on Leads         |
| <b>WL</b> Weatherpack on Leads     |

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

#### BODIES

|                           |
|---------------------------|
| <b>Blank</b> Without Body |
| <b>N</b> 1/4 NPTF Ports   |
| <b>S</b> #6 SAE Ports     |

#### VOLTAGE

|                   |
|-------------------|
| <b>06</b> 6 VDC   |
| <b>12</b> 12 VDC  |
| <b>24</b> 24 VDC  |
| <b>36</b> 36 VDC  |
| <b>48</b> 48 VDC  |
| <b>25</b> 24 VAC  |
| <b>11</b> 120 VAC |
| <b>22</b> 220 VAC |
| <b>44</b> 440 VAC |

#### IMMERSION PROOF "L" TYPE

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

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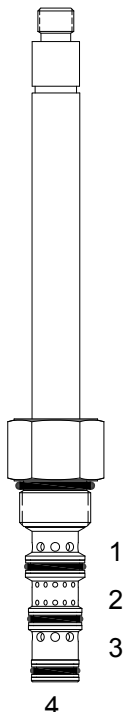


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**PQ-S4Q DIRECT ACTING SPOOL, 4 WAY 3 POSITION, CLOSED CENTER**



**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**

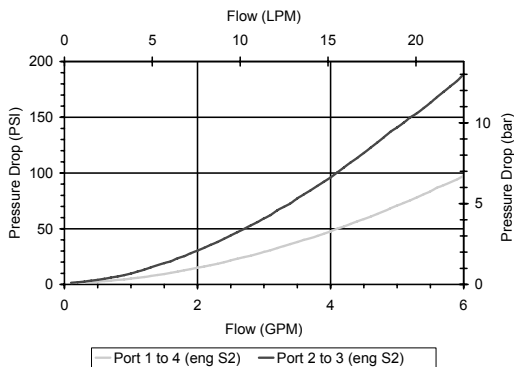
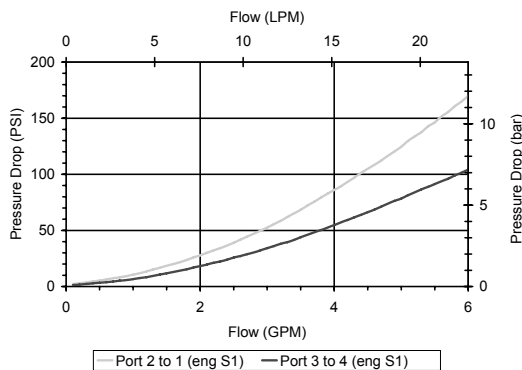
- Hardened parts for long life.
- Efficient wet-armature construction.
- Cartridges are voltage interchangeable.
- Industry common cavity.
- Optional manual "push only" override.
- Unitized, molded coil design.
- Continuous duty rated solenoid.
- Optional coil voltages and terminations.



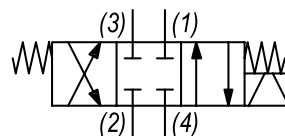
Uses "P" Power coil. For higher flow see PQ-S4P. Flow rating based on maximum differential load of 1000 PSI. "OP" override is a push only non-detented button that actuates (S2) direction. For "T" coil environmental protection option, consult factory for special build configuration per Delta Standard 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                         |

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



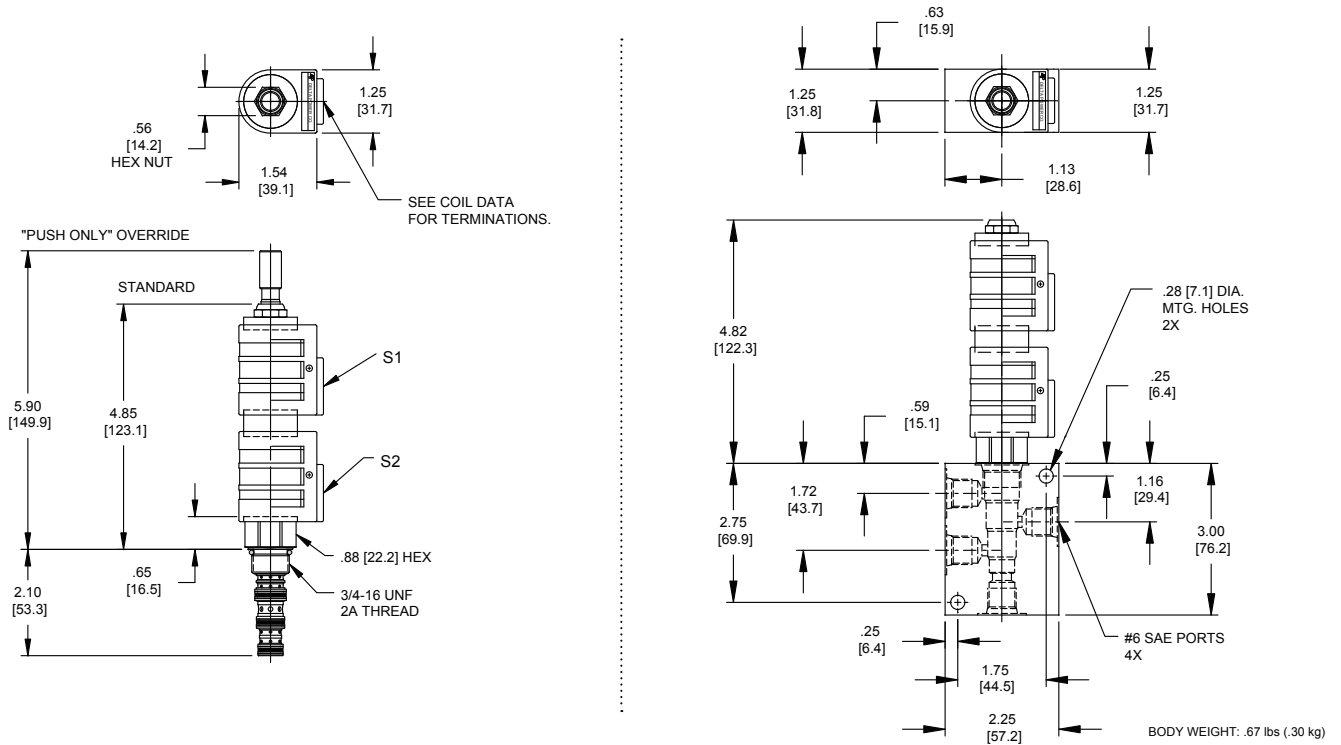
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# SOLENOID OPERATED DIRECTIONAL CONTROLS

## DIMENSIONS



## ORDERING INFORMATION

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

PQ-S4Q - - - -

### 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** 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 "D" TYPE

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

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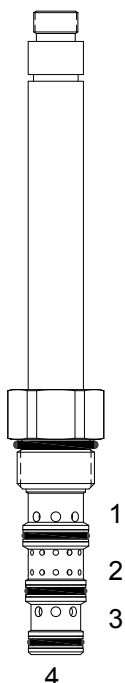


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## DG-S4S SPOOL OPERATED, 4 WAY 3 POSITION, SCOTCH CENTER



### 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

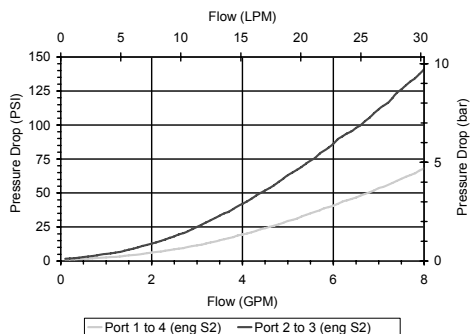
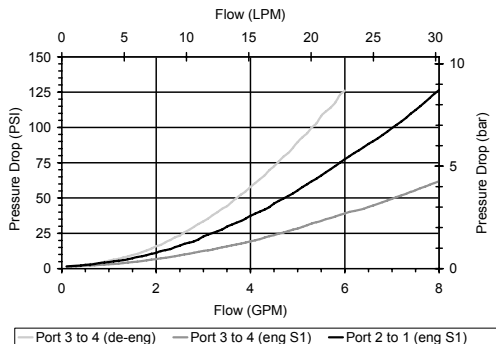
- Hardened parts for long life.
- Efficient wet-armature construction.
- Cartridges are voltage interchangeable.
- Manual override option.
- Industry common cavity.
- Unitized, molded coil design.
- Continuous duty rated solenoid.
- Optional coil voltages and terminations.
- Optional "I" Coil: Weatherproof,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



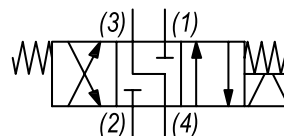
Uses "L" Coil. Flow rating is at 1000 PSID maximum differential loading.

### 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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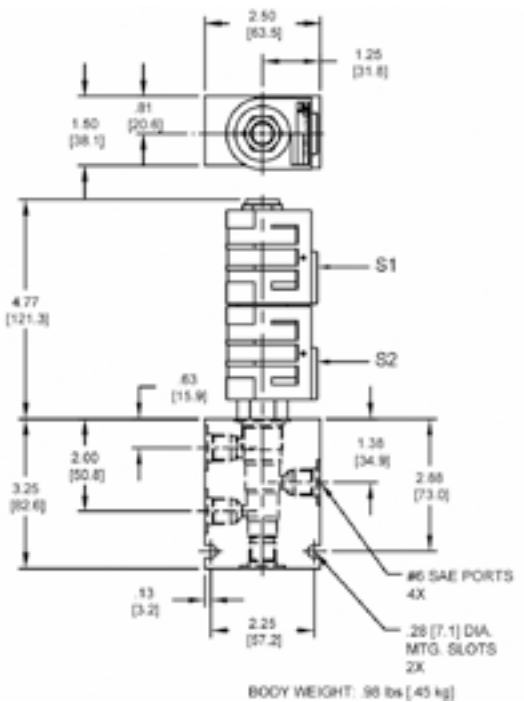
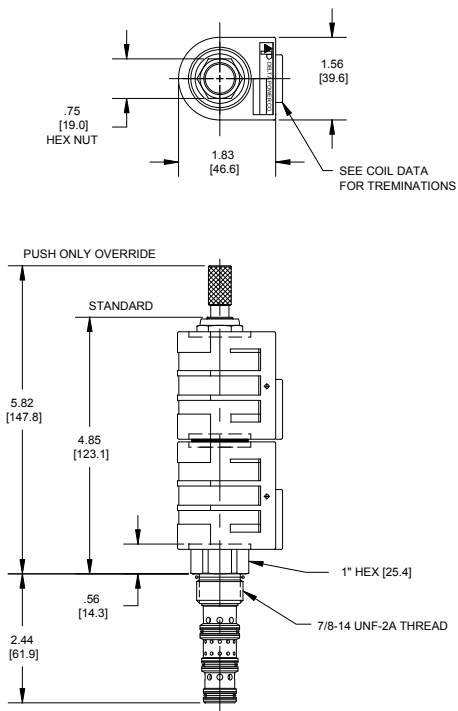


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**DIMENSIONS**



**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** 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

**“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

- IMMERSION PROOF “L” TYPE**  
**IA** “I” Coil AMP Superseal - Integral  
**ID** “I” Coil Deutsch - Integral DT04-2P  
**IJ** “I” Coil AMP Jr. Timer - Integral  
**IM** “I” Coil Metri-Pack - Integral

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**SOLENOID OPERATED DIRECTIONAL CONTROLS**

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TRANSMISSION & BRAKE SPOOL VALVES

| SCREW-IN STYLE | GPM | PSI  | LPM | BAR | CAVITY | MODEL  | PAGE  |
|----------------|-----|------|-----|-----|--------|--------|-------|
|                | 3   | 1000 | 11  | 70  | 5/8-18 | TC-S3A | SD198 |
|                | 3   | 1500 | 11  | 103 | 5/8-18 | UC-S3T | SD206 |
|                | 8   | 1500 | 30  | 103 | 7/8-14 | DF-S3T | SD208 |
|                | 6   | 1000 | 23  | 70  | 7/8-14 | TF-S3D | SD202 |
|                | 5   | 1000 | 19  | 70  | 7/8-14 | TG-S4A | SD212 |

| SLIP-IN STYLE, FLANGED RETAINED | GPM | PSI  | LPM | BAR | CAVITY  | MODEL     | PAGE  |
|---------------------------------|-----|------|-----|-----|---------|-----------|-------|
|                                 | 6   | 1000 | 23  | 70  | Special | IF-S3A-57 | SD200 |
|                                 | 6   | 1000 | 23  | 70  | Special | IF-S3D-57 | SD204 |
|                                 | 1.5 | 700  | 6   | 50  | Special | IC-S3D-43 | SD210 |
|                                 | 5   | 1000 | 19  | 70  | Special | IG-S4A-58 | SD214 |

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## TC-S3A DIRECT ACTING SPOOL, 3 WAY 2 POSITION, TRANSMISSION & BRAKE

### DESCRIPTION

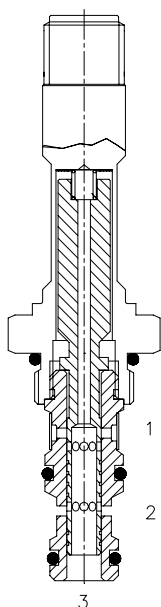
7 size, 5/8-18 thread, "Mini" series, solenoid operated, 3 way 2 position, transmission & brake spool valve.

### OPERATION

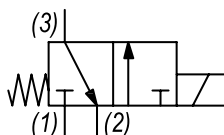
When de-energized the TC-S3A blocks flow at (1) and allows flow from (3) to (2). When energized the valve allows flow from (1) to (3) and blocks flow at (2).

### 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.



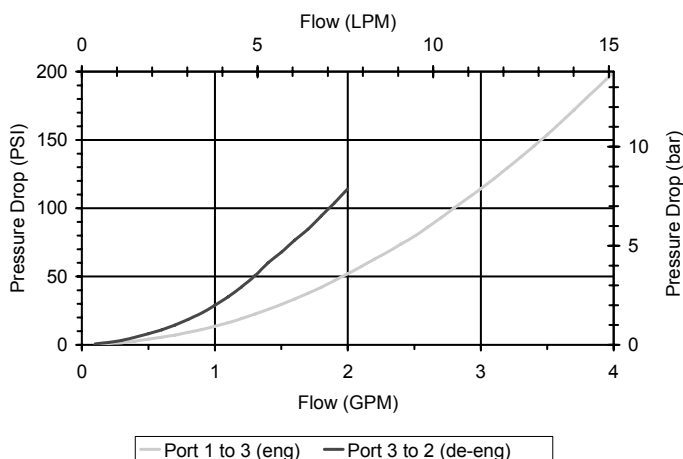
### HYDRAULIC SYMBOL



*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)<br>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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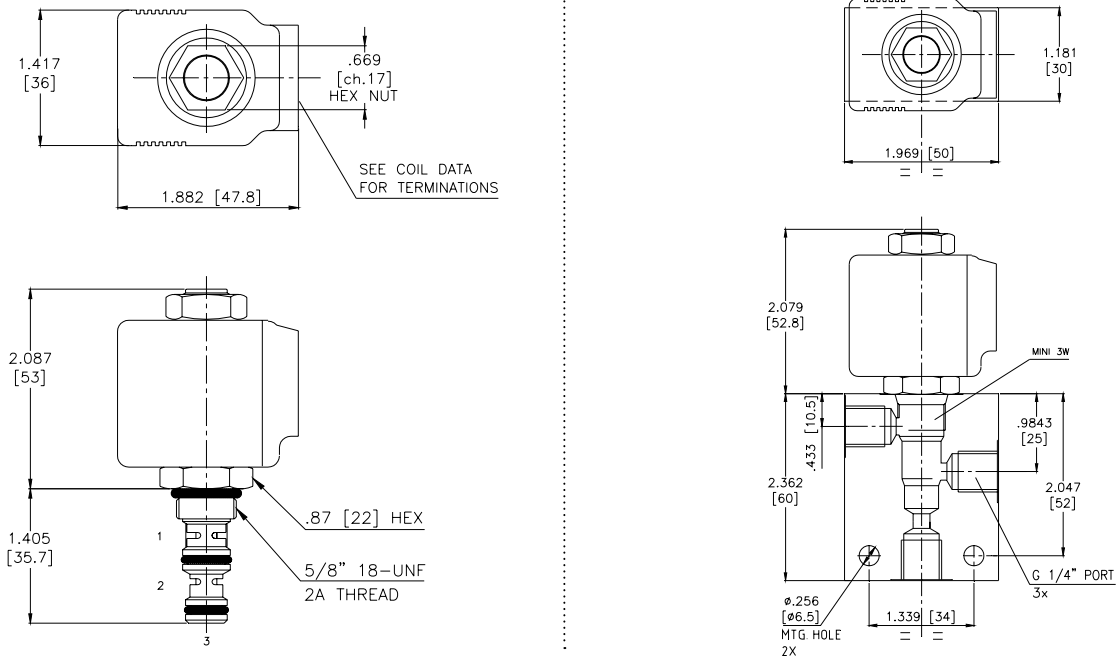
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# SOLENOID OPERATED DIRECTIONAL CONTROLS

## 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)**

### "K" 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 "P" TYPE**  
**PIA** "I" Coil AMP Superseal - Integral  
**PID** "I" Coil Deutsch - Integral DT04-2P  
**PIJ** "I" Coil AMP Jr. Timer - Integral  
**PIM** "I" Coil Metri-Pack - Integral

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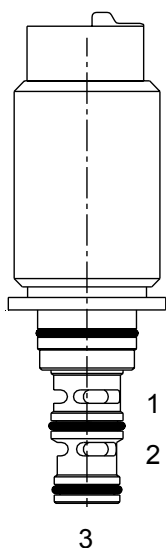
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## SOLENOID OPERATED DIRECTIONAL CONTROLS

### 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).

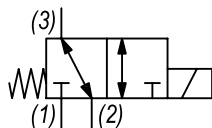
#### FEATURES

- Economical slip-in style.
- Efficient wet-armature construction.
- Unitized valve/coil.
- Continuous duty rated solenoid.



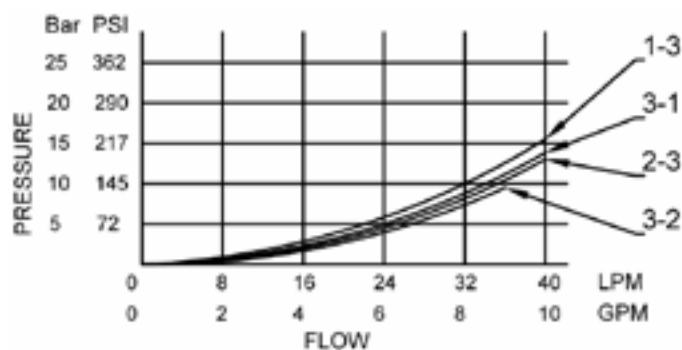
*Flanged Retained Product. Coil is an integral part of the valve and is not serviceable.*

#### 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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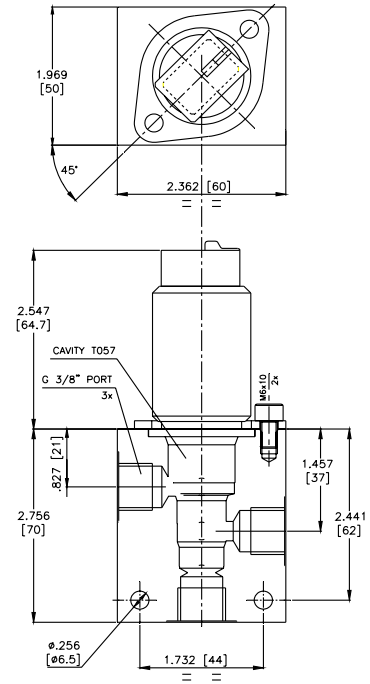
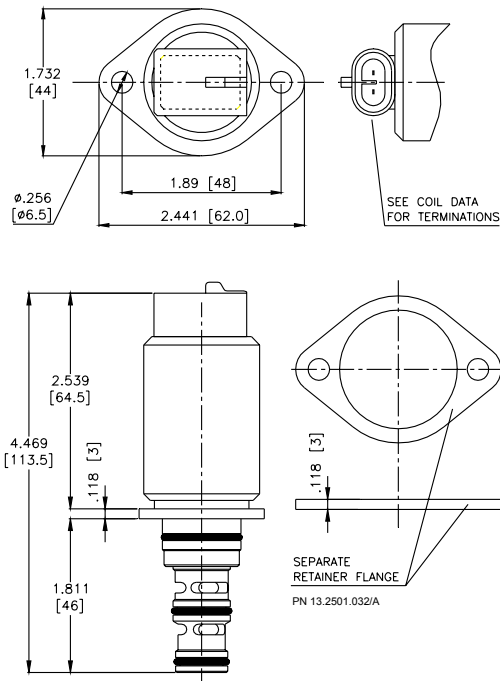


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## DIMENSIONS



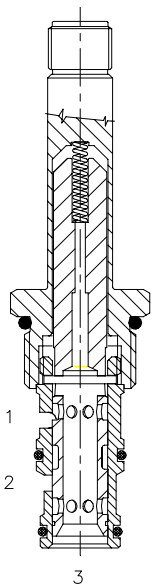
## ORDERING INFORMATION

**IF-S3A-57-MP12** -

### BODIES

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

**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.

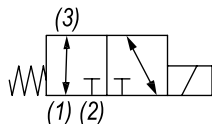
**OPERATION**

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**

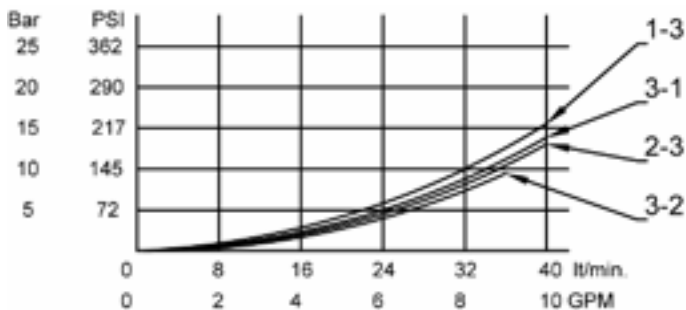
- Hardened parts for long life.
- Efficient wet-armature construction.
- Cartridges are voltage interchangeable.
- Industry common cavity.
- Unitized, molded coil design.
- Continuous duty rated solenoid.
- Optional coil voltages and terminations.
- Optional "I" Coil: Weatherproof, Thermal Shock, Immersion 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<br>(form tool, reamer, tap) | 40500001                        |
| Seal Kit                                     | 21191210                        |

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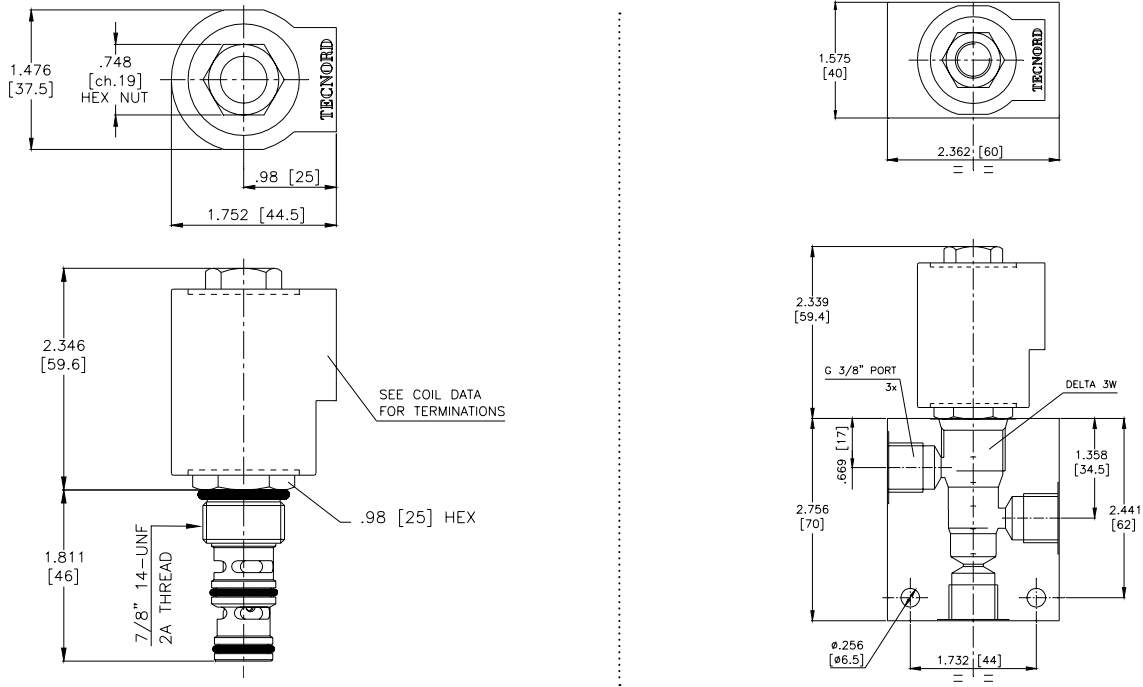


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**DIMENSIONS**



**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

**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** "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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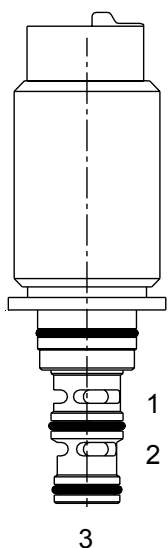


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**IF-S3D-57-MP12 DIRECT ACTING SPOOL, 3 WAY 2 POSITION, TRANSMISSION & BRAKE, SLIP-IN STYLE**



**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).

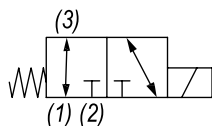
**FEATURES**

- Economical slip-in style.
- Efficient wet-armature construction.
- Unitized valve/coil.
- Continuous duty rated solenoid.



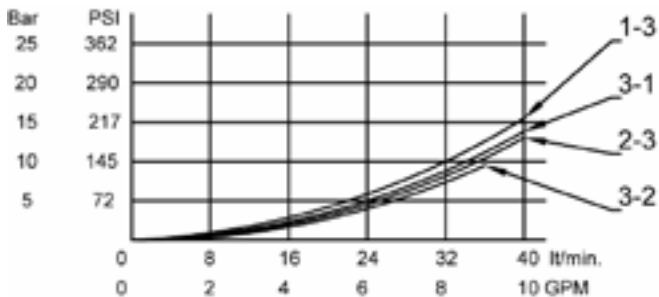
*Flanged Retained Product. Coil is an integral part of the valve and is not serviceable.*

**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                             |

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



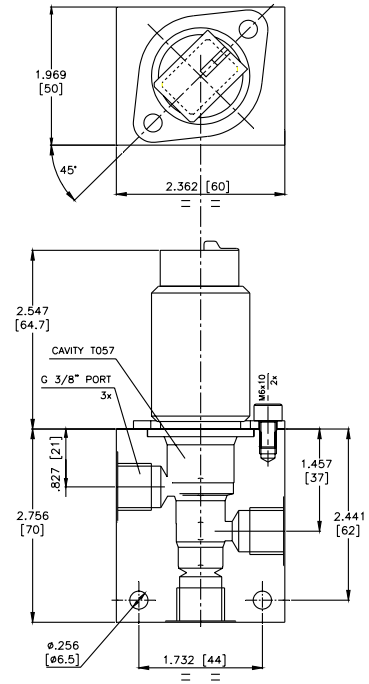
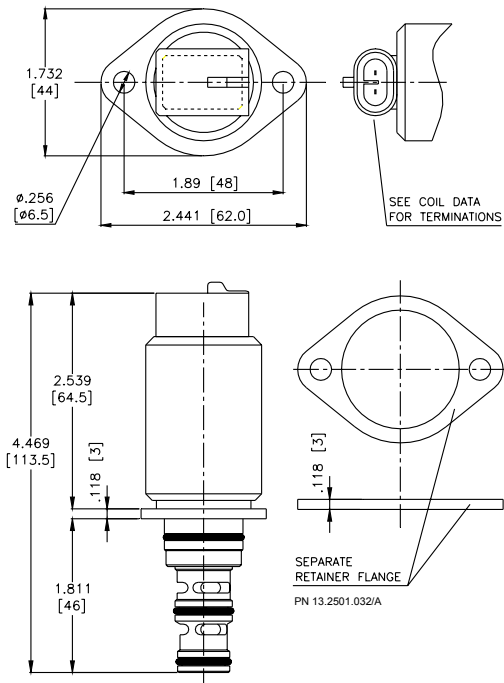
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**DIMENSIONS**



**ORDERING INFORMATION**

- IF-S3D-57-MP12** -
- BODIES**
  - Blank** Without Body
  - N** 3/8" BSP Ports
  - S** #8 SAE Ports

W 26/ 2019

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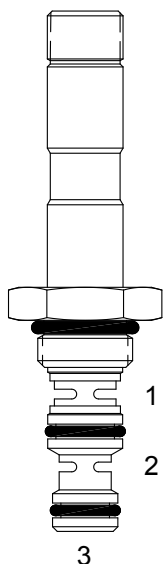


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**UC-S3T DIRECT ACTING SPOOL, 3 WAY 2 POSITION, TRANSMISSION & BRAKE**



**DESCRIPTION**

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

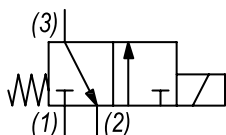
**OPERATION**

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**

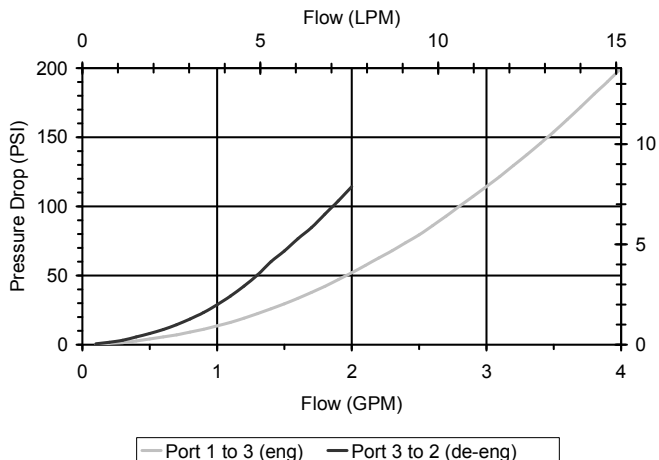
- Hardened parts for long life.
- Efficient wet-armature construction.
- Cartridges are voltage interchangeable.
- Industry common cavity.
- Unitized, molded coil design.
- Continuous duty rated solenoid.
- Optional coil voltages and terminations.

**HYDRAULIC SYMBOL**



**PERFORMANCE**

Actual Test Data (Cartridge Only)



**VALVE SPECIFICATIONS**

|                                    |   |
|------------------------------------|---|
| Nominal Flow                       | 3 GPM (11 LPM) from (1) to (3)<br>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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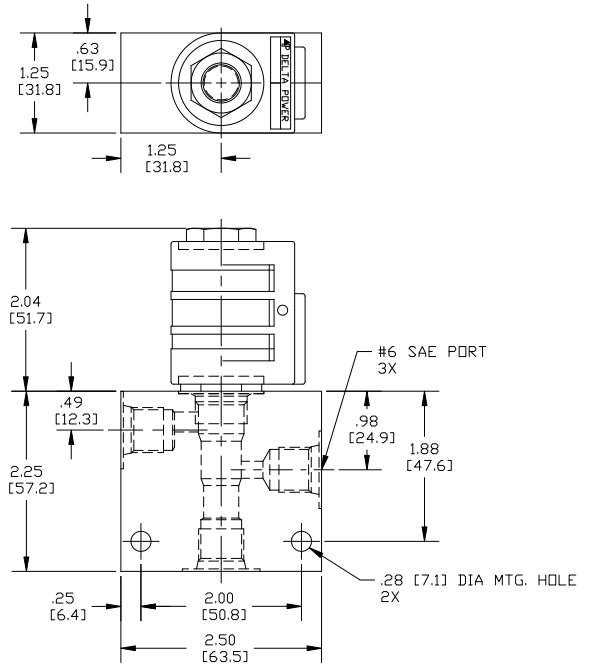
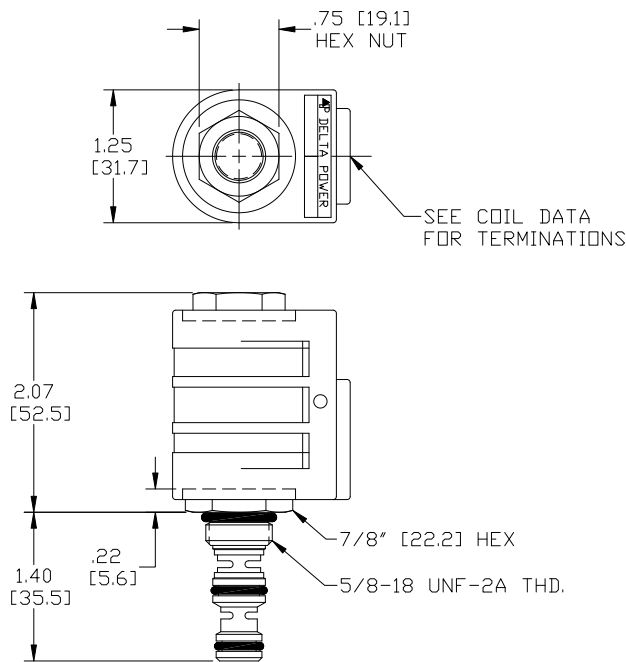
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# SOLENOID OPERATED DIRECTIONAL CONTROLS

## DIMENSIONS



BODY WEIGHT: .59 lbs. [.26 kg]

## ORDERING INFORMATION

UC-S3T - - - -

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

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

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

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

**VOLTAGE**

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

**"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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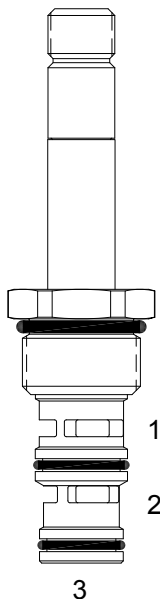


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**DF-S3T DIRECT ACTING SPOOL, 3 WAY 2 POSITION, TRANSMISSION & BRAKE**



**DESCRIPTION**

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

**OPERATION**

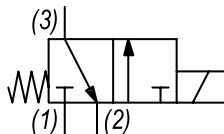
When de-energized the DF-S3T allows flow from (3) to (2) and blocks flow at port (1). When energized the valve allows flow from (1) to (3) and blocks flow at port (2).

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

**FEATURES**

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

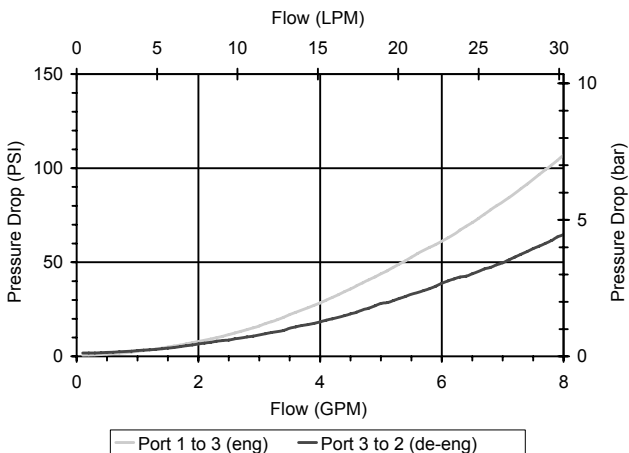
**HYDRAULIC SYMBOL**



*Contamination Tolerant Product.*  
This valve is designed for transmission and brake applications. Consult factory for alternate low wattage coil options.

**PERFORMANCE**

Actual Test Data (Cartridge Only)



**VALVE SPECIFICATIONS**

|                                    |                                 |
|------------------------------------|---------------------------------|
| Nominal Flow                       | 8 GPM (30 LPM)                  |
| Rated Operating Pressure           | 1500 PSI (103 bar)              |
| Typical Internal Leakage (150 SSU) | 5 cu in/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                           | 21191204                        |

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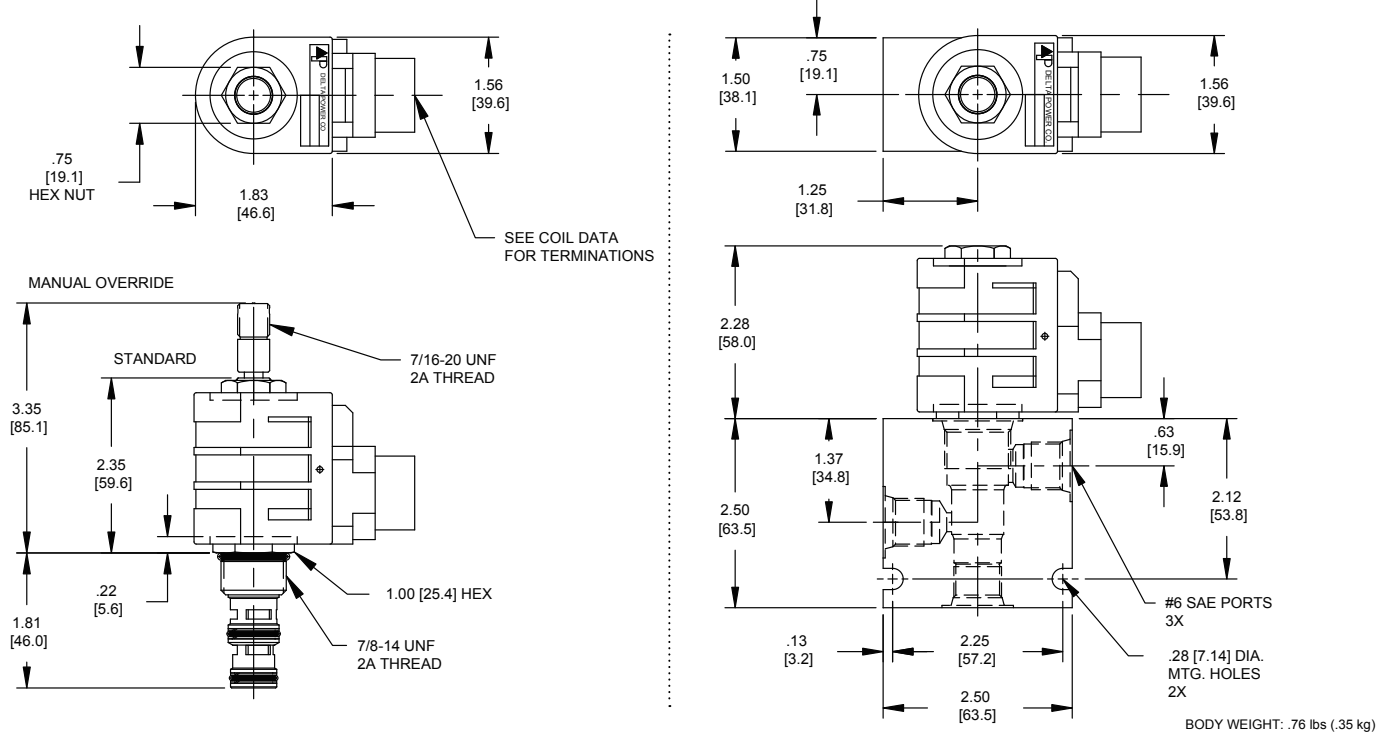
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# SOLENOID OPERATED DIRECTIONAL CONTROLS

## DIMENSIONS



## ORDERING INFORMATION

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

DF-S3T - - - -

### OPTIONS

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

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

### "D" COIL TERMINATION

(All DC Except as Noted)

|                                    |
|------------------------------------|
| <b>DL</b> Double Lead              |
| <b>DT</b> Deutsch on Leads DT04-2P |
| <b>ML</b> Metri-Pack on Leads      |
| <b>PL</b> Packard on Leads         |
| <b>WL</b> Weatherpack on Leads     |

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

### BODIES

|                           |
|---------------------------|
| <b>Blank</b> Without Body |
| <b>N</b> 1/4 NPTF Ports   |
| <b>S</b> #6 SAE Ports     |

### VOLTAGE

|                   |
|-------------------|
| <b>06</b> 6 VDC   |
| <b>12</b> 12 VDC  |
| <b>24</b> 24 VDC  |
| <b>36</b> 36 VDC  |
| <b>48</b> 48 VDC  |
| <b>25</b> 24 VAC  |
| <b>11</b> 120 VAC |
| <b>22</b> 220 VAC |
| <b>44</b> 440 VAC |

### IMMERSION PROOF "D" TYPE

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

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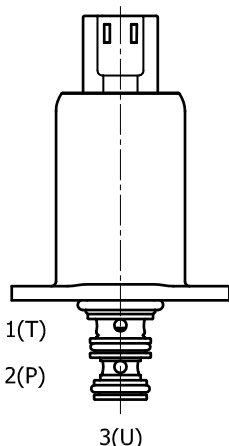


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**IC-S3D-43 DIRECT ACTING SPOOL, 3 WAY 2 POSITION, SELECTOR**



**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).

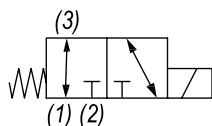
**FEATURES**

- Hardened parts for long life.
- Slip-in style.
- Efficient wet-armature construction.
- Integral waterproof coil.
- Continuous duty rated solenoid.
- Optional coil voltages and terminations.



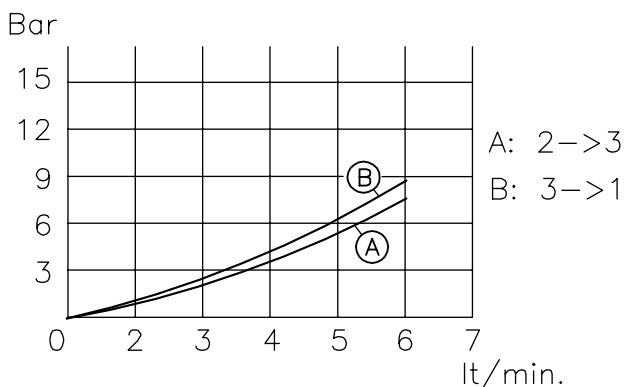
*Flanged Retained Product. Coil is an integral part of the valve and is not serviceable.*

**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<br>AMP Jr. Timer 84-9419 |
| Color Connectors         | Black   |

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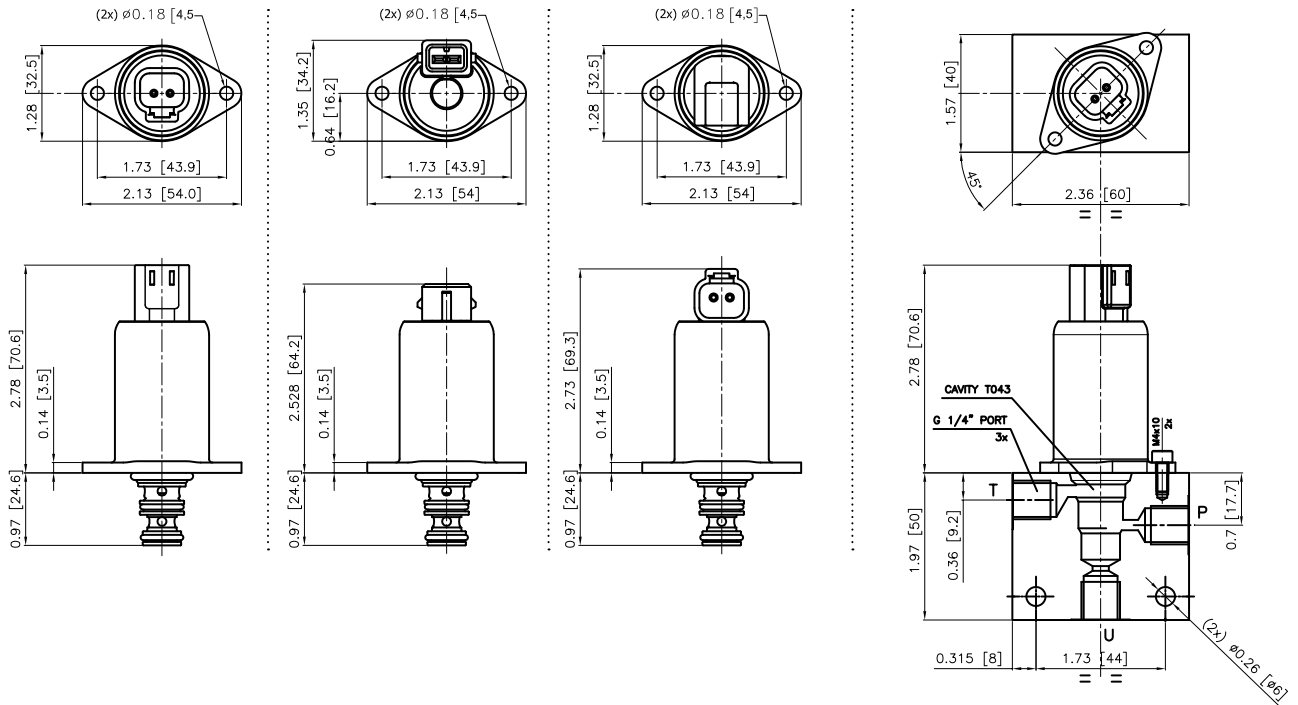


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**DIMENSIONS**



**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**

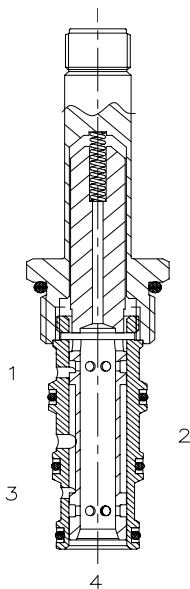
10 size, 7/8-14 thread, "Delta" series, solenoid operated, 4 way 2 position, transmission & brake, spool valve.

**OPERATION**

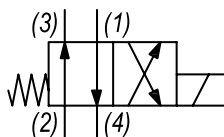
When de-energized the TG-S4A allows flow between (1) to (4) and (2) to (3). When energized the valve allows flow between (2) to (1) and (3) to (4).

**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.

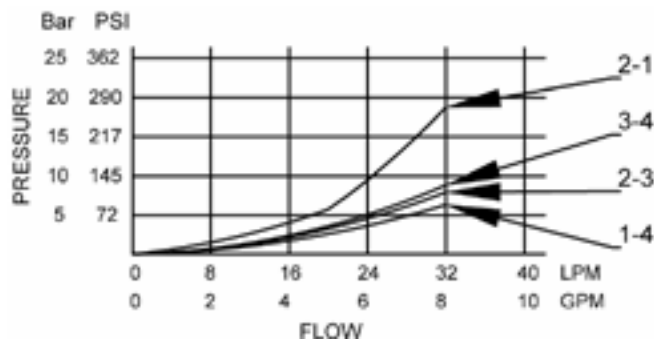


**HYDRAULIC SYMBOL**



**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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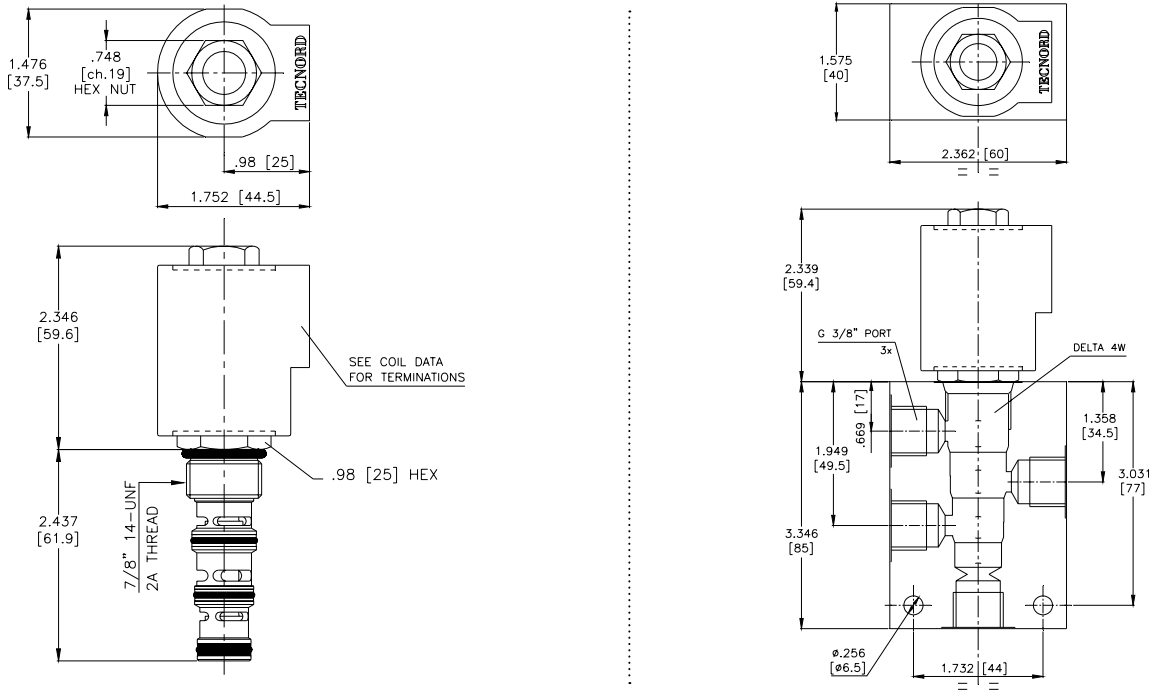
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**DIMENSIONS**



**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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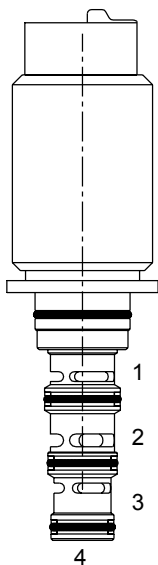


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## IG-S4A-58-MP12-A DIRECT ACTING SPOOL, 4 WAY 2 POSITION, TRANSMISSION VALVE, SLIP-IN STYLE



### 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).

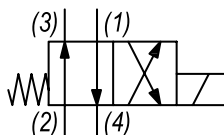
### FEATURES

- Economical slip-in style.
- Efficient wet-armature construction.
- Unitized valve/coil.
- Continuous duty rated solenoid.



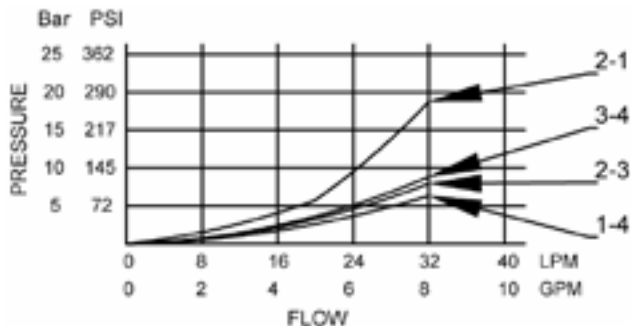
Consult Factory for Valve retention options.  
Flanged Retained Product.

### 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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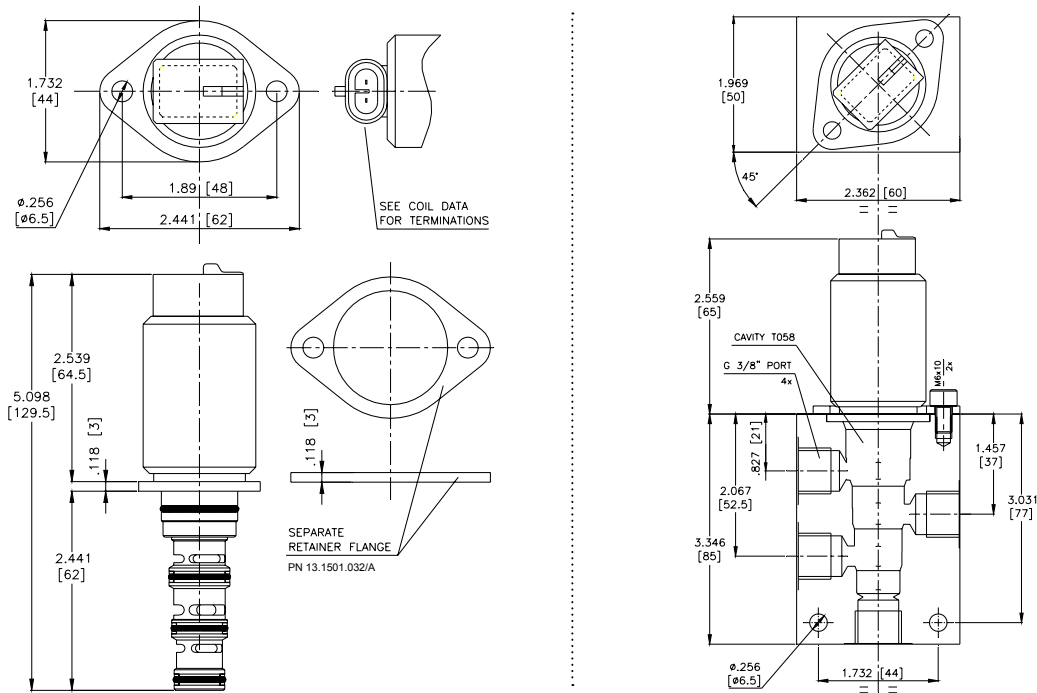


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DIMENSIONS



ORDERING INFORMATION

IG-S4A-58-MP12-A -

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

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# SOLENOID OPERATED DIRECTIONAL CONTROLS

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