2W2P NORMALLY CLOSED POPPET VALVES ................................................................. ST2
2W2P NORMALLY CLOSED BIDIRECTIONAL VALVES ........................................... ST41
2W2P NORMALLY CLOSED SPOOL VALVES ............................................................. ST51
2W2P NORMALLY OPEN POPPET VALVES .............................................................. ST60
2W2P NORMALLY OPEN SPOOL VALVES ................................................................. ST89
3W2P SPOOL VALVES ............................................................................................ ST98
4W2P SPOOL VALVES ............................................................................................ ST122
4W3P SPOOL VALVES ............................................................................................ ST164
TRANSMISSION & BRAKE SPOOL VALVES ............................................................. ST197
## 2 WAY 2 POSITION NORMALLY CLOSED POPPET VALVES

<table>
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<tr>
<th>2W2P NORMALLY CLOSED</th>
<th>GPM</th>
<th>PSI</th>
<th>LPM</th>
<th>BAR</th>
<th>CAVITY</th>
<th>MODEL</th>
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<td>23</td>
<td>276</td>
<td>5/8-18</td>
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<td>ST4</td>
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<td>69</td>
<td>7/8-14</td>
<td>DE-S2F</td>
<td>ST18</td>
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</tbody>
</table>

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

PERFORMANCE
Actual Test Data (Cartridge Only)

<table>
<thead>
<tr>
<th>Flow (GPM)</th>
<th>Pressure Drop (PSI)</th>
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<td>6</td>
<td>30</td>
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<table>
<thead>
<tr>
<th>Flow (LPM)</th>
<th>Pressure Drop (BAR)</th>
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<tr>
<td>5</td>
<td>25</td>
</tr>
<tr>
<td>6</td>
<td>30</td>
</tr>
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</table>

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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ORDERING INFORMATION

UA-S2A – – – –

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

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

VOLTAGE (other voltages available on request)
12 12 VDC
24 24 VDC
26 220 VAC with molded full wave rectifier

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

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

Approximate Coil Weight: .30 lbs (.14 kg)
UA-S2F  PILOT OPERATED POPPET, 2 WAY, NORMALLY CLOSED – SOFT SEAT

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

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

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

HYDRAULIC SYMBOL

PERFORMANCE
Actual Test Data (Cartridge Only)

<table>
<thead>
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<th>Flow (GPM)</th>
<th>Pressure Drop (PSI)</th>
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VALVE SPECIFICATIONS

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<th>Value</th>
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<td>3000 PSI (207 bar)</td>
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<td>Typical Internal Leakage (150 SSU)</td>
<td>Negligible</td>
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<tr>
<td>Viscosity Range</td>
<td>36 to 3000 SSU (3 to 647 cSt)</td>
</tr>
<tr>
<td>Filtration</td>
<td>ISO 18/16/13</td>
</tr>
<tr>
<td>Media Operating Temp. Range</td>
<td>32° to 160°F (0° to 70°C)</td>
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<tr>
<td>Weight</td>
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<td>Operating Fluid Media</td>
<td>General Purpose Hydraulic Fluid</td>
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<td>Cartridge Torque Requirements</td>
<td>15 ft-lbs (20.3 Nm)</td>
</tr>
<tr>
<td>Coil Nut Torque Requirements</td>
<td>4-6 ft-lbs (5.4-8.1 Nm)</td>
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<td>Cavity</td>
<td>MINI 2W</td>
</tr>
<tr>
<td>Cavity Form Tool (Finishing)</td>
<td>40500003</td>
</tr>
<tr>
<td>Seal Kit</td>
<td>21191000</td>
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</table>

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**SOLENOID OPERATED DIRECTIONAL CONTROLS**

**DIMENSIONS**

- **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” BSP Ports: S
- #6 SAE Ports

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

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

**WARNING:**

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

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 fl-lbs (34 Nm)
Coil Nut Torque Requirements 4-6 fl-lbs (5.4-8.1 Nm)
Cavity POWER 2W
Cavity Tools Kit (form tool, reamer, tap) 40500005
Seal Kit 21191100

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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)

VOLTAGE (other voltages available on request)

PB-S2A – – – –

BODIES

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

VOLTAGE

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

"P" TYPE "J" COIL TERMINATION

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

Approximate Coil Weight: .42 lbs (.19 kg)
HB-S2A PILOT OPERATED POPPET, 2 WAY NORMALLY CLOSED

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

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

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

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

HYDRAULIC SYMBOL

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

PERFORMANCE
Actual Test Data (Cartridge Only)

VALVE SPECIFICATIONS
Nominal Flow 12 GPM (45 LPM)
Rated Operating Pressure 5000 PSI (345 bar)
Typical Internal Leakage 0-5 drops/min at 5000 PSI (150 SSU) (345 bar)
Viscosity Range 36 to 3000 SSU (3 to 647 cSt)
Filtration ISO 18/16/13
Media Operating Temp. Range -40° to 210°F (-40° to 100°C) BUNA seals
-4° to 250°F (-20° to 120°C) VITON seals
Weight .29 lbs (.13 kg)
Operating Fluid Media General Purpose Hydraulic Fluid
Cartridge Torque Requirements 30-35 ft-lbs (41-47 Nm)
Coil Nut Torque Requirements 3-4.5 ft-lbs (4-6 Nm)
Cavity POWER 2W
Cavity Tools Kit 40500005
Seal Kit 21191100
SOLENOID OPERATED DIRECTIONAL CONTROLS

DIMENSIONS

OPTIONS
Buna Standard 00
Viton Standard V0
Buna, Screw, Override 0K
Viton, Screw, Override VK

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

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

“P” TYPE “J” COIL TERMINATION
JA “J” Coil AMP Superseal - Integral
JD “J” Coil Deutsch - Integral DT04-2P
JJ “J” Coil AMP Jr. Time - Integral
JL “J” Coil Double Lead
JH “J” Coil DIN 43650 (Hirschmann)

WARNING: the specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.
PB-S2F  PILOT OPERATED POPPET, 2 WAY NORMALLY CLOSED, SOFT SEAT

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

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

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

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

HYDRAULIC SYMBOL

PERFORMANCE
Actual Test Data (Cartridge Only)

VALVE SPECIFICATIONS

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<thead>
<tr>
<th>Specification</th>
<th>Value</th>
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<tr>
<td>Rated Operating Pressure</td>
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<td>Typical Internal Leakage</td>
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<td>Viscosity Range</td>
<td>36 to 3000 SSU (3 to 647 cSt)</td>
</tr>
<tr>
<td>Filtration</td>
<td>ISO 18/16/13</td>
</tr>
<tr>
<td>Media Operating Temp. Range</td>
<td>-35° to 200°F (-37° to 93°C)</td>
</tr>
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<td>Weight</td>
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<td>General Purpose Hydraulic Fluid</td>
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<td>Cartridge Torque Requirements</td>
<td>25 ft-lbs (34 Nm)</td>
</tr>
<tr>
<td>Coil Nut Torque Requirements</td>
<td>4-6 ft-lbs (5.4-8.1 Nm)</td>
</tr>
<tr>
<td>Cavity</td>
<td>POWER 2W</td>
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<td>Cavity Tools Kit</td>
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<td>Seal Kit</td>
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OPTIONS

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

VOLTAGE (other voltages available on request)

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

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

"P" TYPE "J" COIL TERMINATION

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

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

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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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)

ORDERING INFORMATION

DE-S2A

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

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

VOLTAGE
- 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
- "I" Coil AMP Superseal - Integral
- "I" Coil Deutsch - Integral DT04-2P
- "I" Coil AMP Jr. Timer - Integral
- "I" Coil Metri-Pack - Integral

DIMENSIONS

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

HYDRAULIC SYMBOL

Uses “L” Coils.

PERFORMANCE
Actual Test Data (Cartridge Only)

Valve Specifications

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nominal Flow</td>
<td>15 GPM (57 LPM)</td>
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<tr>
<td>Rated Operating Pressure</td>
<td>4000 PSI (276 bar)</td>
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<tr>
<td>Typical Internal Leakage (150 SSU)</td>
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<td>Viscosity Range</td>
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<td>Filtration</td>
<td>ISO 18/16/13</td>
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<td>Media Operating Temp. Range</td>
<td>-40° to 250°F (-40° to 120°C)</td>
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<td>Weight</td>
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<td>Operating Fluid Media</td>
<td>General Purpose Hydraulic Fluid</td>
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<td>Cartridge Torque Requirements</td>
<td>30 ft-lbs (40.6 Nm)</td>
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<tr>
<td>Coil Nut Torque Requirements</td>
<td>4-6 ft-lbs (5.4-8.1 Nm)</td>
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<td>Cavity</td>
<td>DELTA 2W</td>
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<td>Cavity Tools Kit</td>
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<tr>
<td>Seal Kit</td>
<td>21191200</td>
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DIMENSIONS

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OPTIONS

- Buna Standard: 00
- Viton Standard: V0

BODIES

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

VOLTAGE (other voltages available on request)

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

"L" COIL TERMINATION

- DL: Double Lead
- HC: DIN 43650 (Hirschmann) - (AC&DC)
- DI: Deutsch - Integral DT04-2P
- LIA: "I" Coil AMP Superseal - Integral
- LID: "I" Coil Deutsch - Integral DT04-2P
- LJ: "I" Coil AMP Jr. Timer - Integral
- LIM: "I" Coil Metri-Pack - Integral

IMMERSION PROOF "L" TYPE

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

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

HYDRAULIC SYMBOL

PERFORMANCE
Actual Test Data (Cartridge Only)

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

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OPTIONS

Bodys

Bodies

VOLTAGE (other voltages available on request)

IMMERSION PROOF “D” TYPE

DE-S2F

Options

Bodies

Voltage

Immersion Proof “D” Type

Approximate Coil Weight: 0.56 lbs (0.25 kg)

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

“V” COIL TERMINATION

(All DC except as noted)

DL Double Lead

(Several types of termination can be attached on leads on request)

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

DI Deutsch - Integral DT04-2P

DIA "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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Technical Information

Delta Power Company

4484 Boeing Drive Rockford, IL 61109 • USA • Phone +1 (815) 397-6628 • Fax +1 (815) 397-2526

mail: delta@delta-power.com • www.delta-power.com

TECNORD

Via Malavolti, 36 • 41122 Modena • ITALY • Phone +39 (059) 254895 • Fax +39 (059) 253512

mail: tecnord@tecnord.com • www.tecnord.com
**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.

**HYDRAULIC SYMBOL**

![Hydraulic Symbol](image)

**PERFORMANCE**

Actual Test Data (Cartridge Only)

<table>
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<th>Flow (GPM)</th>
<th>Pressure Drop (PSI)</th>
<th>Pressure Drop (bar)</th>
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<tr>
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</table>

**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: 0.49 lbs (0.22 kg)
- Operating Fluid Media: General Purpose Hydraulic Fluid
- Cartridge Torque Requirements: 50 ft-lbs (67.8 Nm)
- Coil Nut Torque Requirements: 4-6 ft-lbs (5.4-8.1 Nm)
- Cavity: TECNORD 2W
- Cavity Tools Kit: (form tool, reamer, tap) 40500032
- Seal Kit: 21191300

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OPTIONS

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

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

“V” COIL TERMINATION
(All DC Except as Noted)

- DL: Double Lead (several types of termination can be attached on leads on request)
- HC: DIN 43650 (Hirschmann) - (AC&DC)
- DI: Deutsch - Integral DT04-2P

BODIES

- Blank, Without Body
- N: 3/4” BSP Ports
- S: #12 SAE Ports

VOLTAGE (other voltages available on request)

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

IMMERSION PROOF “D” TYPE

- I: Coil AMP Superseal - Integral
- ID: I Coil Deutsch - Integral DT04-2P
- DJ: I Coil AMP Jr. Timer - Integral
- DI: I Coil Metri-Pack - Integral

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

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

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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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)

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<th>Pressure Drop (PSI)</th>
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<table>
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<th>Flow (GPM)</th>
<th>Pressure Drop (bar)</th>
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VALVE SPECIFICATIONS

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
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<tr>
<td>Nominal Flow</td>
<td>40 GPM (151 LPM)</td>
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<td>Rated Operating Pressure</td>
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<tr>
<td>Typical Internal Leakage (150 SSU)</td>
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<td>Viscosity Range</td>
<td>36 to 3000 SSU (3 to 647 cSt)</td>
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<td>Filtration</td>
<td>ISO 18/16/13</td>
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<td>Media Operating Temp. Range</td>
<td>-40° to 250°F (-40° to 120°C)</td>
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<tr>
<td>Weight</td>
<td>.72 lbs (.32 kg)</td>
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<td>Operating Fluid Media</td>
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<tr>
<td>Cartridge Torque Requirements</td>
<td>115 ft-lbs (156 Nm)</td>
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<tr>
<td>Coil Nut Torque Requirements</td>
<td>4-6 ft-lbs (5.4-8.1 Nm)</td>
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<td>Cavity</td>
<td>SUPER 2W</td>
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<tr>
<td>Cavity Tools Kit</td>
<td>(form tool, reamer, tap)</td>
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<td>Seal Kit</td>
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**DIMENSIONS**

**ORDERING INFORMATION**

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**“D” COIL TERMINATION**

(All DC Except as Noted)

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<td>Packard on Leads</td>
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<tr>
<td>HC</td>
<td>DIN 43650 (Hirschmann) - (AC&amp;DC)</td>
</tr>
<tr>
<td>CL</td>
<td>Conduit Lead - (AC Only)</td>
</tr>
<tr>
<td>DI</td>
<td>Deutsch - Integral DT04-2P</td>
</tr>
</tbody>
</table>

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

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

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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.

HYDRAULIC SYMBOL

PERFORMANCE
Actual Test Data (Cartridge Only)

Valve Specifications

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nominal Flow</td>
<td>8 GPM (30 LPM)</td>
</tr>
<tr>
<td>Rated Operating Pressure</td>
<td>3500 PSI (241 bar)</td>
</tr>
<tr>
<td>Typical Internal Leakage (150 SSU)</td>
<td>0-5 drops/min</td>
</tr>
<tr>
<td>Viscosity Range</td>
<td>36 to 3000 SSU (3 to 647 cSt)</td>
</tr>
<tr>
<td>Filtration</td>
<td>ISO 18/16/13</td>
</tr>
<tr>
<td>Media Operating Temp. Range</td>
<td>-40° to 250°F (-40° to 120°C)</td>
</tr>
<tr>
<td>Weight</td>
<td>.20 lbs (.09 kg)</td>
</tr>
<tr>
<td>Operating Fluid Media</td>
<td>General Purpose Hydraulic Fluid</td>
</tr>
<tr>
<td>Cartridge Torque Requirements</td>
<td>25 ft-lbs (34 Nm)</td>
</tr>
<tr>
<td>Coil Nut Torque Requirements</td>
<td>4-6 ft-lbs (5.4-8.1 Nm)</td>
</tr>
<tr>
<td>Cavity</td>
<td>POWER 2W</td>
</tr>
<tr>
<td>Cavity Tools Kit</td>
<td>(form tool, reamer, tap) 40500005</td>
</tr>
<tr>
<td>Seal Kit</td>
<td>21191100</td>
</tr>
</tbody>
</table>

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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.

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

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

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

PB-S2B – – – –

“P” TYPE “J” COIL TERMINATION
JA ”J” Coil AMP Superseal - Integral
JD ”J” Coil Deutsch - Integral DT04-2P
JJ ”J” Coil AMP Jr. Time - Integral
JL ”J” Coil Double Lead
JH ”J” Coil DIN 43650 (Hirschmann)

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

Approximate Coil Weight: .42 lbs (.19 kg)
HB-S2B PILOT OPERATED, 2 WAY NORMALLY CLOSED WITH REVERSED FLOW ENERGIZED

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

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

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

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

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

PERFORMANCE
Actual Test Data (Cartridge Only)

<table>
<thead>
<tr>
<th>Flow (GPM)</th>
<th>Pressure Drop (PSI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0</td>
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<tr>
<td>1</td>
<td>5</td>
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<td>4</td>
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<td>6</td>
<td>30</td>
</tr>
<tr>
<td>7</td>
<td>35</td>
</tr>
<tr>
<td>8</td>
<td>40</td>
</tr>
</tbody>
</table>

— Port 1 to 2 (eng) — Port 2 to 1 (de-eng) — Port 2 to 1 (eng)

VALVE SPECIFICATIONS
Nominal Flow 12 GPM (45 LPM)
Rated Operating Pressure 5000 PSI (345 bar)
Typical Internal Leakage 0-5 drops/min at 5000 PSI (150 SSU) (345 bar)
Viscosity Range 36 to 3000 SSU (3 to 647 cSt)
Filtration ISO 18/16/13
Media Operating Temp. Range -40° to 210°F (-40° to 100°C) BUNA seals
-4° to 250°F (-20° to 120°C) VITON seals
Weight .29 lbs (.13 kg)
Operating Fluid Media General Purpose Hydraulic Fluid
Cartridge Torque Requirements 30-35 ft-lbs (41-47 Nm)
Coil Nut Torque Requirements 3-4.5 ft-lbs (4-6 Nm)
Cavity POWER 2W
Cavity Tools Kit 40500005
Seal Kit 21191100

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OPTIONS
Buna Standard 00
Viton Standard V0
Buna, Screw, Override 0K
Viton, Screw, Override VK

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

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

“P” TYPE “J” COIL TERMINATION
JA “J” Coil AMP Superseal - Integral
JD “J” Coil Deutsch - Integral DT04-2P
JJ “J” Coil AMP Jr. Time - Integral
JL “J” Coil Double Lead
JH “J” Coil DIN 43650 (Hirschmann)

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DE-S2B  PILOT OPERATED POPPET, 2 WAY NORMALLY CLOSED

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

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

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

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

HYDRAULIC SYMBOL

PERFORMANCE
Actual Test Data (Cartridge Only)

![Performance Graph]

VALVE SPECIFICATIONS

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nominal Flow</td>
<td>15 GPM (57 LPM)</td>
</tr>
<tr>
<td>Rated Operating Pressure</td>
<td>3500 PSI (241 bar)</td>
</tr>
<tr>
<td>Typical Internal Leakage (150 SSU)</td>
<td>0-5 drops/min</td>
</tr>
<tr>
<td>Viscosity Range</td>
<td>36 to 3000 SSU (3 to 647 cSt)</td>
</tr>
<tr>
<td>Filtration</td>
<td>ISO 18/16/13</td>
</tr>
<tr>
<td>Media Operating Temp. Range</td>
<td>-40° to 250°F (-40° to 120°C)</td>
</tr>
<tr>
<td>Weight</td>
<td>.27 lbs (.12 kg)</td>
</tr>
<tr>
<td>Operating Fluid Media</td>
<td>General Purpose Hydraulic Fluid</td>
</tr>
<tr>
<td>Cartridge Torque Requirements</td>
<td>30 ft-lbs (40.6 Nm)</td>
</tr>
<tr>
<td>Coil Nut Torque Requirements</td>
<td>4-6 ft-lbs (5.4-8.1 Nm)</td>
</tr>
<tr>
<td>Cavity</td>
<td>DELTA 2W</td>
</tr>
<tr>
<td>Cavity Tools Kit</td>
<td>form tool, reamer, tap</td>
</tr>
<tr>
<td>Seal Kit</td>
<td>21191200</td>
</tr>
</tbody>
</table>

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**DIMENSIONS**

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

**OPTIONS**

- Buna Standard: 00
- Viton Standard: V0
- Buna, Override, Detent: OM
- Viton, Override, Detent: VM
- Buna, Screen: A0
- Viton, Screen: W0
- Buna, Screen, Override: B2
- Viton, Screen, Override: V2

**BODIES**

- Blank: N
- Without Body: #8 SAE Ports: S

**VOLTAGE**

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

**IMMERSION PROOF “D” TYPE**

- DL: Double Lead
- HC: DIN 43650 (Hirschmann) - (AC&DC)
- DI: Deutsch - Integral DT04-2P
- DIM: “I” Coil Metri-Pack - Integral
- DID: “I” Coil Deutsch - Integral DT04-2P
- DIJ: “I” Coil AMP Jr. Timer - Integral

**“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

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

HYDRAULIC SYMBOL

PERFORMANCE
Actual Test Data (Cartridge Only)

<table>
<thead>
<tr>
<th>Flow (GPM)</th>
<th>Pressure Drop (PSI)</th>
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</thead>
<tbody>
<tr>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>5</td>
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<tr>
<td>10</td>
<td>0</td>
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<tr>
<td>15</td>
<td>0</td>
</tr>
<tr>
<td>20</td>
<td>0</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Flow (LPM)</th>
<th>Pressure Drop (bar)</th>
</tr>
</thead>
<tbody>
<tr>
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<tr>
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<tr>
<td>15</td>
<td>0</td>
</tr>
<tr>
<td>20</td>
<td>0</td>
</tr>
</tbody>
</table>

Valve Specifications

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nominal Flow</td>
<td>15 GPM (57 LPM)</td>
</tr>
<tr>
<td>Rated Operating Pressure</td>
<td>4000 PSI (276 bar)</td>
</tr>
<tr>
<td>Typical Internal Leakage (150 SSU)</td>
<td>0-5 drops/min</td>
</tr>
<tr>
<td>Viscosity Range</td>
<td>36 to 3000 SSU (3 to 647 cSt)</td>
</tr>
<tr>
<td>Filtration</td>
<td>ISO 18/16/13</td>
</tr>
<tr>
<td>Media Operating Temp. Range</td>
<td>-40° to 250°F (-40° to 120°C)</td>
</tr>
<tr>
<td>Weight</td>
<td>.39 lbs (.17 kg)</td>
</tr>
<tr>
<td>Operating Fluid Media</td>
<td>General Purpose Hydraulic Fluid</td>
</tr>
<tr>
<td>Cartridge Torque Requirements</td>
<td>50 ft-lbs (67.8 Nm)</td>
</tr>
<tr>
<td>Coil Nut Torque Requirements</td>
<td>4-6 ft-lbs (5.4-8.1 Nm)</td>
</tr>
<tr>
<td>Cavity</td>
<td>DELTA 2W</td>
</tr>
<tr>
<td>Cavity Tools Kit (form tool, reamer, tap)</td>
<td>40500000</td>
</tr>
<tr>
<td>Seal Kit</td>
<td>21191200</td>
</tr>
</tbody>
</table>

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## Options

<table>
<thead>
<tr>
<th>Options</th>
<th>HE-S2B</th>
<th>HE-S2B</th>
<th>HE-S2B</th>
</tr>
</thead>
<tbody>
<tr>
<td>BODIES</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Blank</td>
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<tr>
<td>Without Body</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>N</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3/8 NPTF Ports</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>S</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>#8 SAE Ports</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

## 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: 25 VAC
- 11: 120 VAC
- 22: 220 VAC
- 44: 440 VAC

## L' 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 “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

## Dimensions

<table>
<thead>
<tr>
<th>Approximate Coil Weight: .68 lbs (.31 kg)</th>
</tr>
</thead>
</table>

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

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

HYDRAULIC SYMBOL

PERFORMANCE
Actual Test Data (Cartridge Only)

Valve Specifications

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nominal Flow</td>
<td>25 GPM (95 LPM)</td>
</tr>
<tr>
<td>Rated Operating Pressure</td>
<td>3000 PSI (207 bar)</td>
</tr>
<tr>
<td>Typical Internal Leakage (150 SSU)</td>
<td>0-5 drops/min</td>
</tr>
<tr>
<td>Viscosity Range</td>
<td>36 to 3000 SSU (3 to 647 cSt)</td>
</tr>
<tr>
<td>Filtration</td>
<td>ISO 18/16/13</td>
</tr>
<tr>
<td>Media Operating Temp. Range</td>
<td>-40° to 250°F (-40° to 120°C)</td>
</tr>
<tr>
<td>Weight</td>
<td>.49 lbs (.22 kg)</td>
</tr>
<tr>
<td>Operating Fluid Media</td>
<td>General Purpose Hydraulic Fluid</td>
</tr>
<tr>
<td>Cartridge Torque Requirements</td>
<td>50 ft-lbs (67.8 Nm)</td>
</tr>
<tr>
<td>Coil Nut Torque Requirements</td>
<td>4-6 ft-lbs (5.4-8.1 Nm)</td>
</tr>
<tr>
<td>Cavity</td>
<td>TECNORD 2W</td>
</tr>
<tr>
<td>Cavity Tools Kit</td>
<td>(form tool, reamer, tap) 40500032</td>
</tr>
<tr>
<td>Seal Kit</td>
<td>21191300</td>
</tr>
</tbody>
</table>

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SOLENOID OPERATED DIRECTIONAL CONTROLS

DIMENSIONS

OPTIONS
Buna Standard 00
Viton Standard V0
Buna, Override, Detent 0M S
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

BODIES
Blank Without Body
N 3/4” BSP Ports
S #12 SAE Ports

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

IMMERSION PROOF “D” TYPE
HC DIN 43650 (Hirschmann) - (AC&DC)
DI Deutsch - Integral DT04-2P
DIA "I" Coil AMP Superseal - Integral
DID "I" Coil Deutsch - Integral DT04-2P
DIJ "I" Coil AMP Jr. Timer - Integral
DIM "I" Coil Metri-Pack - Integral

"V" COIL TERMINATION
(All DC Except as Noted)
DL Double Lead
(several types of termination can be
attached on leads on request)

WARNING: the specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.
HT-S2B  PILOT OPERATED POPPET, 2 WAY NORMALLY CLOSED

DESCRIPTION

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

OPERATION

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

FEATURES

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

HYDRAULIC SYMBOL

PERFORMANCE

Actual Test Data (Cartridge Only)

<table>
<thead>
<tr>
<th>Flow (GPM)</th>
<th>Pressure Drop (PSI)</th>
<th>Flow (LPM)</th>
<th>Pressure Drop (bar)</th>
</tr>
</thead>
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<td>100</td>
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<tr>
<td>30</td>
<td>240</td>
<td>120</td>
<td>79.4</td>
</tr>
<tr>
<td>35</td>
<td>280</td>
<td>140</td>
<td>92.5</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Port 1 to 2 (eng)</th>
<th>Port 2 to 1 (eng)</th>
<th>Port 2 to 1 (de-eng)</th>
</tr>
</thead>
</table>

VALVE SPECIFICATIONS

| Nominal Flow | 25 GPM (95 LPM) |
| Rated Operating Pressure | 5000 PSI (345 bar) |
| Typical Internal Leakage (150 SSU) | 0-8 drops/min |
| Viscosity Range | 36 to 3000 SSU (3 to 647 cSt) |
| Filtration | ISO 18/16/13 |
| Media Operating Temp. Range | -40° to 250°F (-40° to 120°C) |
| Weight | .94 lbs (.43 kg) |
| Operating Fluid Media | General Purpose Hydraulic Fluid |
| Cartridge Torque Requirements | 50 ft-lbs (67.8 Nm) |
| Coil Nut Torque Requirements | 5-7 ft-lbs (6.8-9.5 Nm) |
| Cavity | TECNORD 2W |
| Cavity Tools Kit | (form tool, reamer, tap) | 40500032 |
| Seal Kit | 21191301 |

WARNING: the specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.
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
(DIN 43650 (Hirschmann) - (AC&DC)

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

BODIES
Blank Without Body N
3/4” BSP Ports
S #12 SAE Ports

ORDERING INFORMATION
HT-S2B – – – –

DIMENSIONS

Approximate Coil Weight: .78 lbs (.35 kg)
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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OPTIONS
- Buna Standard 00
- Viton Standard V0
- Buna, Override, Detent OM
- Viton, Override, Detent VM
- Buna, override, Non-Detent B1
- Viton, override, Non-Detent V1
- Buna, Screen, Override, Non-Detent B3
- Viton, Screen, Override, Non-Detent V3
- Buna, Screen, Override, Detent B4
- Viton, Screen, Override, Detent V4

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

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

IMMERSION PROOF “D” TYPE
- DL Double Lead
- HC DIN 43650 (Hirschmann) - (AC&DC)
- DI Deutsch - Integral DT04-2P
- DIA "I" Coil AMP Superseal - Integral
- DID "I" Coil Deutsch - Integral DT04-2P
- DJJ "I" Coil AMP Jr. Timer - Integral
- DIM "I" Coil Metri-Pack - Integral

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2 WAY 2 POSITION NORMALLY CLOSED BIDIRECTIONAL POPPET VALVES

<table>
<thead>
<tr>
<th>2W2P NORMALLY CLOSED</th>
<th>GPM</th>
<th>PSI</th>
<th>LPM</th>
<th>BAR</th>
<th>CAVITY</th>
<th>MODEL</th>
<th>PAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>(2)</td>
<td>0.20</td>
<td>4000</td>
<td>0.76</td>
<td>276</td>
<td>5/8-18</td>
<td>UA-S2E</td>
<td>ST42</td>
</tr>
<tr>
<td>(1)</td>
<td>3</td>
<td>3600</td>
<td>11</td>
<td>250</td>
<td>3/4-16</td>
<td>PB-S2I</td>
<td>ST44</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>3000</td>
<td>11</td>
<td>207</td>
<td>7/8-14</td>
<td>DE-S2I</td>
<td>ST46</td>
</tr>
<tr>
<td></td>
<td>12</td>
<td>5000</td>
<td>45</td>
<td>345</td>
<td>3/4-16</td>
<td>HB-S2L</td>
<td>ST48</td>
</tr>
</tbody>
</table>

TYPICAL SCHEMATIC

Typical application for the S2E, S2I, and S2L is where load holding in both directions is required.
UA-S2E  POPPET, 2 WAY, NORMALLY CLOSED, BIDIRECTIONAL

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

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

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

HYDRAULIC SYMBOL

PERFORMANCE
Actual Test Data (Cartridge Only)

Valve Specifications

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
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<tbody>
<tr>
<td>Nominal Flow</td>
<td>0.20 GPM (0.76 LPM)</td>
</tr>
<tr>
<td>Rated Operating Pressure</td>
<td>4000 PSI (276 bar)</td>
</tr>
<tr>
<td>Typical Internal Leakage (150 SSU)</td>
<td>0-10 drops/min</td>
</tr>
<tr>
<td>Viscosity Range</td>
<td>36 to 3000 SSU (3 to 647 cSt)</td>
</tr>
<tr>
<td>Filtration</td>
<td>ISO 18/16/13</td>
</tr>
<tr>
<td>Media Operating Temp. Range</td>
<td>-40° to 250°F (-40° to 120°C)</td>
</tr>
<tr>
<td>Weight</td>
<td>.18 lbs (.08 kg)</td>
</tr>
<tr>
<td>Operating Fluid Media</td>
<td>General Purpose Hydraulic Fluid</td>
</tr>
<tr>
<td>Cartridge Torque Requirements</td>
<td>15 ft-lbs (20.3 Nm)</td>
</tr>
<tr>
<td>Coil Nut Torque Requirements</td>
<td>4-6 ft-lbs (5.4-8.1 Nm)</td>
</tr>
<tr>
<td>Cavity</td>
<td>MINI 2W</td>
</tr>
<tr>
<td>Cavity Form Tool (Finishing)</td>
<td>40500003</td>
</tr>
<tr>
<td>Seal Kit</td>
<td>21191003</td>
</tr>
</tbody>
</table>

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DIMENSIONS

ORDERING INFORMATION

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

OPTIONS

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

VOLTAGE (other voltages available on request)

12
12 VDC

24
24 VDC

26
220 VAC with molded full wave rectifier

“P” TYPE “J” COIL TERMINATION

JA
“J” Coil AMP Superseal - Integral

JD
“J” Coil Deutsch - Integral DT04-2P

JJ
“J” Coil AMP Jr. Time - Integral

JL
“J” Coil Double Lead

JH
“J” Coil DIN 43650 (Hirschmann)
PB-S2I  DIRECT ACTING POPPET, 2 WAY, NORMALLY CLOSED, BIDIRECTIONAL

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

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

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

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

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

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 0-10 drops/min at 3600 PSI (150 SSU) (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)
Cavity 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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### DIMENSIONS

![Diagram showing dimensions of solenoid operated directional controls bodies.]

### ORDERING INFORMATION

<table>
<thead>
<tr>
<th>PB - S2I</th>
<th>OPTIONS</th>
<th>BODIES</th>
<th>VOLTAGE</th>
<th>IMMERSION PROOF &quot;I&quot; COIL TERMINATION</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Buna Standard 00</td>
<td>Blank Without Body</td>
<td>06 6 VDC</td>
<td>IA &quot;I&quot; Coil AMP Superseal - Integral</td>
</tr>
<tr>
<td></td>
<td>Viton Standard V0</td>
<td>N 1/4 NPTF Ports</td>
<td>12 12 VDC</td>
<td>ID &quot;I&quot; Coil Deutsch - Integral DT04-2P</td>
</tr>
<tr>
<td></td>
<td>Buna Knob 0K</td>
<td>S #6 SAE Ports</td>
<td>24 24 VDC</td>
<td>IJ &quot;I&quot; Coil AMP Jr. Timer - Integral</td>
</tr>
<tr>
<td></td>
<td>Viton Knob VK</td>
<td></td>
<td>36 36 VDC</td>
<td>IM &quot;I&quot; Coil Metri-Pack - Integral</td>
</tr>
</tbody>
</table>

**"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

For Optional Coil Terminations See Coil Section

### WARNING:
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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.
• Efficient wet-armature construction.

HYDRAULIC SYMBOL

PERFORMANCE
Actual Test Data (Cartridge Only)

For higher flows & pressures use Power Cavity HB-S2L

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

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

**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

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

**VOLTAGE**
- Buna, Screen, Override: B2 12 VDC
- Viton, Screen, Override: V2 24 VDC
- Buna, Screen, Override, Knob: B5 220 VAC without internal rectifier

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

**“V” COIL TERMINATION**
(All DC Except as Noted)
- DL: Double Lead
- HC: DIN 43650 (Hirschmann) - (AC&DC)
- DI: Deutsch - Integral DT04-2P
- HC: DIN 43650 (Hirschmann) - (AC&DC)
- DI: Deutsch - Integral DT04-2P
- DIJ: “I” Coil AMP Jr. Timer - Integral
- DIM: “I” Coil Metri-Pack - Integral

**IMMERSION PROOF “D” TYPE**
- DIA: “I” Coil AMP Superseal - Integral
- DID: “I” Coil Deutsch - Integral DT04-2P
- DJ: “I” Coil AMP Jr. Timer - Integral
- DIM: “I” Coil Metri-Pack - Integral

**WARNING:** the specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.
HB-S2L  PILOTED OPERATED POPPET, 2 WAY DOUBLE LOCK NORMALLY CLOSED

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

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

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

HYDRAULIC SYMBOL

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

PERFORMANCE
Actual Test Data (Cartridge Only)

FLOW (GPM)
0 10 20 30 40
FLOW (LPM)
0 125
100
80
60
40
20
0

PRESSURE DROP (PSI)
0 25 50 75 100
40
30
20
10
0

PRESSURE DROP (BAR)
0 4 6 8
40
30
20
10
0

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

VALVE SPECIFICATIONS
Nominal Flow  12 GPM (45 LPM)
Rated Operating Pressure  5000 PSI (345 bar)
Typical Internal Leakage  0-5 drops/min at 5000 PSI (150 SSU) (345 bar)
Viscosity Range  36 to 3000 SSU (3 to 647 cSt)
Filtration  ISO 18/16/13
Media Operating Temp. Range  -40° to 210°F (-40° to 100°C)
BUNA seals
-4° to 250°F (-20° to 120°C)
VITON seals
Weight  .29 lbs (.13 kg)
Operating Fluid Media  General Purpose Hydraulic Fluid
Cartridge Torque Requirements  30-35 ft-lbs (41-47 Nm)
Coil Nut Torque Requirements  3-4.5 ft-lbs (4-6 Nm)
Cavity  POWER 2W
Cavity Tools Kit  40500005
Seal Kit  21191102

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

**JH**

**JJ**

**0K** N1  Buna, Screw, Override  
Viton, Screw, Override

HB-S2L  –  –  –  –  –

**OPTIONS**

- Buna Standard  00  
- Viton Standard  V0  
- Buna, Screw, Override  0K  
- Viton, Screw, Override  VK

**BODIES**

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

**VOLTAGE**

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

**“P” TYPE “J” COIL TERMINATION**

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

**Approximate Coil Weight:** .42 lbs (.19 kg)  
**Note:** Aluminum bodies only for use up to 250 bar

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2 WAY 2 POSITION NORMALLY CLOSED SPOOL VALVES

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

TYPICAL SCHEMATIC

Typical application for the S2G is to provide deceleration or unloading of a hydraulic motor.
**DESCRIPTION**
7 size, 5/8-18 thread, “Mini” series, solenoid operated, 2 way normally closed, spool valve.

**OPERATION**
When de-energized the UA-S2G blocks flow from (1) to (2) and (2) to (1). When energized, the valve allows flow from (1) to (2) and (2) to (1).

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

**HYDRAULIC SYMBOL**

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

<table>
<thead>
<tr>
<th>Flow (GPM)</th>
<th>Pressure Drop (PSI)</th>
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<td>0.5</td>
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<td>30</td>
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<tr>
<td>1.5</td>
<td>45</td>
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<tr>
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<td>60</td>
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<table>
<thead>
<tr>
<th>Flow (LPM)</th>
<th>Pressure Drop (BAR)</th>
</tr>
</thead>
<tbody>
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<td>0</td>
<td>0</td>
</tr>
<tr>
<td>0.5</td>
<td>7</td>
</tr>
<tr>
<td>1</td>
<td>14</td>
</tr>
<tr>
<td>1.5</td>
<td>21</td>
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<tr>
<td>2</td>
<td>28</td>
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</tbody>
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---

- Port 1 to 2 (eng)
- Port 2 to 1 (eng)

**VALVE SPECIFICATIONS**

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
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<tbody>
<tr>
<td>Nominal Flow</td>
<td>1.5 GPM (6 LPM)</td>
</tr>
<tr>
<td>Rated Operating Pressure</td>
<td>4000 PSI (276 bar)</td>
</tr>
<tr>
<td>Typical Internal Leakage (150 SSU)</td>
<td>8 cu in/min (131 ml/min)</td>
</tr>
<tr>
<td>Viscosity Range</td>
<td>36 to 3000 SSU (3 to 647 cSt)</td>
</tr>
<tr>
<td>Filtration</td>
<td>ISO 18/16/13</td>
</tr>
<tr>
<td>Media Operating Temp. Range</td>
<td>-40° to 250°F (-40° to 120°C)</td>
</tr>
<tr>
<td>Weight</td>
<td>.12 lbs (.05 kg)</td>
</tr>
<tr>
<td>Operating Fluid Media</td>
<td>General Purpose Hydraulic Fluid</td>
</tr>
<tr>
<td>Cartridge Torque Requirements</td>
<td>45 ft-lbs (20.3 Nm)</td>
</tr>
<tr>
<td>Coil Nut Torque Requirements</td>
<td>4-6 ft-lbs (5.4-8.1 Nm)</td>
</tr>
<tr>
<td>Cavity</td>
<td>MINI 2W</td>
</tr>
<tr>
<td>Cavity Form Tool (Finishing)</td>
<td>40500003</td>
</tr>
<tr>
<td>Seal Kit</td>
<td>21191002</td>
</tr>
</tbody>
</table>

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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.

**DIMENSIONS**

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

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

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

**VOLTAGE** (other voltages available on request)
- 12: 12 VDC
- 24: 24 VDC
- 26: 220 VAC with molded full wave rectifier

**“P” TYPE “J” COIL TERMINATION**
- JA: “J” Coil AMP Superseal - Integral
- JD: “J” Coil Deutsch - Integral DT04-2P
- JJ: “J” Coil AMP Jr. Time - Integral
- JL: “J” Coil Double Lead
- JH: “J” Coil DIN 43650 (Hirschmann)

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

HYDRAULIC SYMBOL

PERFORMANCE
Actual Test Data (Cartridge Only)

<table>
<thead>
<tr>
<th>Flow (GPM)</th>
<th>Pressure Drop (PSI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0</td>
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<tr>
<td>10</td>
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<td>30</td>
<td>20</td>
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<tr>
<td>40</td>
<td>25</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Flow (GPM)</th>
<th>Pressure Drop (bar)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0</td>
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<tr>
<td>6</td>
<td>10</td>
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<tr>
<td>12</td>
<td>15</td>
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</table>

Valve Specifications

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nominal Flow</td>
<td>8 GPM (30 LPM) from (1) to (2)</td>
</tr>
<tr>
<td></td>
<td>4 GPM (15 LPM) from (2) to (1)</td>
</tr>
<tr>
<td>Rated Operating Pressure</td>
<td>3000 PSI (207 bar)</td>
</tr>
<tr>
<td>Typical Internal Leakage</td>
<td>5 cu in/min (82 ml/min)</td>
</tr>
<tr>
<td>Viscosity Range</td>
<td>36 to 3000 SSU (3 to 647 cSt)</td>
</tr>
<tr>
<td>Filtration</td>
<td>ISO 18/16/13</td>
</tr>
<tr>
<td>Media Operating Temp. Range</td>
<td>-40° to 250°F (-40° to 120°C)</td>
</tr>
<tr>
<td>Weight</td>
<td>.19 lbs (.09 kg)</td>
</tr>
<tr>
<td>Operating Fluid Media</td>
<td>General Purpose Hydraulic Fluid</td>
</tr>
<tr>
<td>Cartridge Torque Requirements</td>
<td>25 ft-lbs (34 Nm)</td>
</tr>
<tr>
<td>Coil Nut Torque Requirements</td>
<td>4-6 ft-lbs (5.4-8.1 Nm)</td>
</tr>
<tr>
<td>Cavity</td>
<td>POWER 2W</td>
</tr>
<tr>
<td>Cavity Tools Kit</td>
<td>(form tool, reamer, tap)</td>
</tr>
<tr>
<td>Seal Kit</td>
<td>40500005</td>
</tr>
<tr>
<td></td>
<td>21191102</td>
</tr>
</tbody>
</table>

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Delta Power Company
4844 Boeing Drive Rockford, IL 61109 • USA • Phone +1 (815) 397-6626 • Fax +1 (815) 397-2526
mail: delta@delta-power.com • www.delta-power.com

TECNORD
Via Malavolti, 36 • 41122 Modena • ITALY • Phone +39 (059) 254895 • Fax +39 (059) 253512
mail: tecnord@tecnord.com • www.tecnord.com
WARNING: the specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

OPTIONS
- Buna Standard
- Viton Standard
- Buna, Override, Detent
- Viton, Override, Detent
- Buna, Screen
- Viton, Screen
- Buna, Override, Non-Detent
- Viton, Override, Non-Detent

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

PB-S2G

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

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

Note: use screen only if flow direction is from (1) to (2)
**DE-S2G**  DIRECT ACTING SPOOL, 2 WAY NORMALLY CLOSED

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

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

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

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

**HYDRAULIC SYMBOL**

![HYDRAULIC SYMBOL](image)

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

<table>
<thead>
<tr>
<th>Flow (LPM)</th>
<th>Pressure Drop (PSI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0</td>
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<tr>
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<td>10</td>
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<td>75</td>
<td>30</td>
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<table>
<thead>
<tr>
<th>Flow (GPM)</th>
<th>Pressure Drop (bar)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0</td>
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<tr>
<td>10</td>
<td>25</td>
</tr>
<tr>
<td>20</td>
<td>50</td>
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</tbody>
</table>

**VALVE SPECIFICATIONS**

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nominal Flow</td>
<td>8 GPM (30 LPM) from (1) to (2)</td>
</tr>
<tr>
<td></td>
<td>5 GPM (19 LPM) from (2) to (1)</td>
</tr>
<tr>
<td>Rated Operating Pressure</td>
<td>3000 PSI (207 bar)</td>
</tr>
<tr>
<td>Typical Internal Leakage (150 SSU)</td>
<td>5 cu in/min (82 ml/min)</td>
</tr>
<tr>
<td>Viscosity Range</td>
<td>36 to 3000 SSU (3 to 647 cSt)</td>
</tr>
<tr>
<td>Filtration</td>
<td>ISO 18/16/13</td>
</tr>
<tr>
<td>Media Operating Temp. Range</td>
<td>-40° to 250°F (-40° to 120°C)</td>
</tr>
<tr>
<td>Weight</td>
<td>.26 lbs (.12 kg)</td>
</tr>
<tr>
<td>Operating Fluid Media</td>
<td>General Purpose Hydraulic Fluid</td>
</tr>
<tr>
<td>Cartridge Torque Requiremants</td>
<td>30 ft-lbs (40.6 Nm)</td>
</tr>
<tr>
<td>Coil Nut Torque Requiremants</td>
<td>4-6 ft-lbs (5.4-8.1 Nm)</td>
</tr>
<tr>
<td>Cavity</td>
<td>DELTA 2W</td>
</tr>
<tr>
<td>Cavity Tools Kit</td>
<td>(form tool, reamer, tap)</td>
</tr>
<tr>
<td>Seal Kit</td>
<td></td>
</tr>
</tbody>
</table>

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**TECNORD**

ST56
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OPTIONS

Bodies

Bodies

VOLTAGE (other voltages available on request)

IMMERSION PROOF “D” TYPE

DE-S2G - - - - -

OPTIONS

Bodies

VOLTAGE (other voltages available on request)

IMMERSION PROOF “D” TYPE

DE-S2G - - - - -

OPTIONS

Bodies

VOLTAGE (other voltages available on request)

IMMERSION PROOF “D” TYPE

DE-S2G - - - - -

OPTIONS

Bodies

VOLTAGE (other voltages available on request)

IMMERSION PROOF “D” TYPE

DE-S2G - - - - -

OPTIONS

Bodies

VOLTAGE (other voltages available on request)

IMMERSION PROOF “D” TYPE

DE-S2G - - - - -

OPTIONS

Bodies

VOLTAGE (other voltages available on request)

IMMERSION PROOF “D” TYPE

DE-S2G - - - - -

OPTIONS

Bodies

VOLTAGE (other voltages available on request)

IMMERSION PROOF “D” TYPE

DE-S2G - - - - -

OPTIONS

Bodies

VOLTAGE (other voltages available on request)

IMMERSION PROOF “D” TYPE

DE-S2G - - - - -

OPTIONS

Bodies

VOLTAGE (other voltages available on request)

IMMERSION PROOF “D” TYPE

DE-S2G - - - - -

OPTIONS

Bodies

VOLTAGE (other voltages available on request)

IMMERSION PROOF “D” TYPE

DE-S2G - - - - -

OPTIONS

Bodies

VOLTAGE (other voltages available on request)

IMMERSION PROOF “D” TYPE

DE-S2G - - - - -

OPTIONS

Bodies

VOLTAGE (other voltages available on request)

IMMERSION PROOF “D” TYPE

DE-S2G - - - - -

OPTIONS

Bodies

VOLTAGE (other voltages available on request)

IMMERSION PROOF “D” TYPE

DE-S2G - - - - -

OPTIONS

Bodies

VOLTAGE (other voltages available on request)

IMMERSION PROOF “D” TYPE

DE-S2G - - - - -

OPTIONS

Bodies

VOLTAGE (other voltages available on request)

IMMERSION PROOF “D” TYPE

DE-S2G - - - - -

OPTIONS
DESCRIPTION

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.

HYDRAULIC SYMBOL

(2) 
\[ \begin{array}{c} \text{(1)} \\ \end{array} \]
Uses “L” Coils.

PERFORMANCE
Actual Test Data (Cartridge Only)

<table>
<thead>
<tr>
<th>Flow (GPM)</th>
<th>Pressure Drop (PSI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
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<tr>
<td>15</td>
<td>15</td>
</tr>
<tr>
<td>20</td>
<td>20</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Flow (LPM)</th>
<th>Pressure Drop (bar)</th>
</tr>
</thead>
<tbody>
<tr>
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<td>25</td>
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<tr>
<td>50</td>
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<tr>
<td>75</td>
<td>75</td>
</tr>
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</table>

Port 1 to 2 (eng) — Port 2 to 1 (eng)

VALVE SPECIFICATIONS

<table>
<thead>
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<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nominal Flow</td>
<td>15 GPM (57 LPM) from (1) to (2)</td>
</tr>
<tr>
<td></td>
<td>6 GPM (23 LPM) from (2) to (1)</td>
</tr>
<tr>
<td>Rated Operating Pressure</td>
<td>4000 PSI (276 bar)</td>
</tr>
<tr>
<td>Typical Internal Leakage</td>
<td>8 cu in/min (131 ml/min)</td>
</tr>
<tr>
<td>Viscosity Range</td>
<td>36 to 3000 SSU (3 to 647 cSt)</td>
</tr>
<tr>
<td>Filtration</td>
<td>ISO 18/16/13</td>
</tr>
<tr>
<td>Media Operating Temp. Range</td>
<td>-40° to 250°F (-40° to 120°C)</td>
</tr>
<tr>
<td>Weight</td>
<td>.39 lbs (.17 kg)</td>
</tr>
<tr>
<td>Operating Fluid Media</td>
<td>General Purpose Hydraulic Fluid</td>
</tr>
<tr>
<td>Cartridge Torque Requirements</td>
<td>30 ft-lbs (40.6 Nm)</td>
</tr>
<tr>
<td>Coil Nut Torque Requirements</td>
<td>4-6 ft-lbs (5.4-8.1 Nm)</td>
</tr>
<tr>
<td>Cavity</td>
<td>DELTA 2W</td>
</tr>
<tr>
<td>Cavity Tools Kit</td>
<td>405000000</td>
</tr>
<tr>
<td>Seal Kit</td>
<td>21191202</td>
</tr>
</tbody>
</table>

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**SOLENOID OPERATED DIRECTIONAL CONTROLS**

**DIMENSIONS**

![Diagram of solenoid operated directional controls]

**ORDERING INFORMATION**

<table>
<thead>
<tr>
<th>OPTIONS</th>
<th>BODIES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Buna Standard</td>
<td>Blank Without Body</td>
</tr>
<tr>
<td>Viton Standard</td>
<td>N 1/2&quot; BSP Ports</td>
</tr>
<tr>
<td></td>
<td>S  #8 SAE Ports</td>
</tr>
</tbody>
</table>

**VOLTAGE** (other voltages available on request)

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

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

- DL Double Lead (several types of termination can be attached on leads on request)
- HC DIN 43650 (Hirschmann) - (AC&DC)
- DI Deutsch - Integral DT04-2P
- LIA "I" Coil AMP Superseal - Integral
- LID "I" Coil Deutsch - Integral DT04-2P
- LJ "I" Coil AMP Jr. Timer - Integral
- LIM "I" Coil Metri-Pack - Integral

**IMMERSION PROOF “L” TYPE**

- DL Double Lead
- HC DIN 43650 (Hirschmann) - (AC&DC)
- DI Deutsch - Integral DT04-2P
- LIA "I" Coil AMP Superseal - Integral
- LID "I" Coil Deutsch - Integral DT04-2P
- LJ "I" Coil AMP Jr. Timer - Integral
- LIM "I" Coil Metri-Pack - Integral

**Approximate Coil Weight**: 0.68 lbs (0.31 kg)

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# 2 Way 2 Position Normally Open Poppet Valves

<table>
<thead>
<tr>
<th>2W2P Normally Open</th>
<th>GPM</th>
<th>PSI</th>
<th>LPM</th>
<th>BAR</th>
<th>CAVITY</th>
<th>MODEL</th>
<th>PAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>10</td>
<td>3500</td>
<td>38</td>
<td>241</td>
<td>3/4-16</td>
<td>PB-S2C</td>
<td>ST62</td>
</tr>
<tr>
<td></td>
<td>12</td>
<td>5000</td>
<td>45</td>
<td>345</td>
<td>3/4-16</td>
<td>HB-S2C</td>
<td>ST64</td>
</tr>
<tr>
<td></td>
<td>15</td>
<td>3500</td>
<td>57</td>
<td>241</td>
<td>7/8-14</td>
<td>DE-S2C</td>
<td>ST68</td>
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<td>3000</td>
<td>114</td>
<td>207</td>
<td>1 1/16-12</td>
<td>TT-S2C</td>
<td>ST70</td>
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<td></td>
<td>40</td>
<td>3000</td>
<td>151</td>
<td>207</td>
<td>1 5/16-12</td>
<td>SJ-S2C</td>
<td>ST72</td>
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<td></td>
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<td>300</td>
<td>1 5/16-12</td>
<td>HJ-S2C</td>
<td>ST74</td>
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</tbody>
</table>

# 2 Way 2 Position Normally Open Bidirectional Poppet Valves

<table>
<thead>
<tr>
<th>2W2P Normally Open</th>
<th>GPM</th>
<th>PSI</th>
<th>LPM</th>
<th>BAR</th>
<th>CAVITY</th>
<th>MODEL</th>
<th>PAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>12</td>
<td>5000</td>
<td>45</td>
<td>345</td>
<td>3/4-16</td>
<td>HB-S2K</td>
<td>ST86</td>
</tr>
</tbody>
</table>

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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.

TYPICAL SCHEMATIC
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

![Hydraulic Symbol](image)

PERFORMANCE
Actual Test Data (Cartridge Only)

<table>
<thead>
<tr>
<th>Flow (GPM)</th>
<th>Pressure Drop (PSI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>10</td>
<td>5</td>
</tr>
<tr>
<td>20</td>
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<tr>
<td>30</td>
<td>15</td>
</tr>
<tr>
<td>40</td>
<td>20</td>
</tr>
</tbody>
</table>

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

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

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

DIMENSIONS

OPTIONS

Bodies

VOLTAGE (other voltages available on request)

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

PB-S2C

“P” TYPE “J” COIL TERMINATION

Approximate Coil Weight: .42 lbs (.19 kg)
**HB-S2C PILOT OPERATED POPPET, 2 WAY NORMALLY OPEN**

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

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

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

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

To release, turn the manual override screw counterclockwise.

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

**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: 0-5 drops/min at 5000 PSI (150 SSU) (345 bar)
- Viscosity Range: 36 to 3000 SSU (3 to 647 cSt)
- Filtration: ISO 18/16/13
- Media Operating Temp. Range: -40° to 210°F (-40° to 100°C) BUNA seals, -4° to 250°F (-20° to 120°C) VITON seals
- Weight: .29 lbs (.13 kg)
- Operating Fluid Media: General Purpose Hydraulic Fluid
- Cartridge Torque Requirements: 30-35 ft-lbs (41-47 Nm)
- Coil Nut Torque Requirements: 3-4.5 ft-lbs (4-6 Nm)
- Cavity: POWER 2W
- Cavity Tools Kit: 40500005
- Seal Kit: 21191100

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

SOLENOID OPERATED DIRECTIONAL CONTROLS

DIMENSIONS

ORDERING INFORMATION

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

Note: Aluminum bodies only for use up to 250 bar

VOLTAGE (other voltages available on request)

12 12 VDC
24 24 VDC
26 26 VDC

“P” TYPE “J” COIL TERMINATION

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

OPTIONS

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

BODIES

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

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.
PB-S2J PILOT OPERATED POPPET, 2 WAY NORMALLY OPEN, SOFT SEAT

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

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

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

Actual Test Data (Cartridge Only)

PERFORMANCE

Valve Specifications

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nominal Flow</td>
<td>8 GPM (30 LPM)</td>
</tr>
<tr>
<td>Rated Operating Pressure</td>
<td>2000 PSI (138 bar)</td>
</tr>
<tr>
<td>Typical Internal Leakage (150 SSU)</td>
<td>Negligible</td>
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<tr>
<td>Viscosity Range</td>
<td>36 to 3000 SSU (3 to 647 cSt)</td>
</tr>
<tr>
<td>Filtration</td>
<td>ISO 18/16/13</td>
</tr>
<tr>
<td>Media Operating Temp.</td>
<td>-35° to 200°F (-37° to 93°C)</td>
</tr>
<tr>
<td>Weight</td>
<td>.21 lbs (.10 kg)</td>
</tr>
<tr>
<td>Operating Fluid Media</td>
<td>General Purpose Hydraulic Fluid</td>
</tr>
<tr>
<td>Cartridge Torque Requirements</td>
<td>25 ft-lbs (34 Nm)</td>
</tr>
<tr>
<td>Coil Nut Torque Requirements</td>
<td>4-6 ft-lbs (5.4-8.1 Nm)</td>
</tr>
<tr>
<td>Cavity</td>
<td>POWER 2W</td>
</tr>
<tr>
<td>Cavity Tools Kit</td>
<td>(form tool, reamer, tap) 40500005</td>
</tr>
<tr>
<td>Seal Kit</td>
<td>21191100</td>
</tr>
</tbody>
</table>

Unshifted limit 6 GPM (23 LPM) from (1) to (2) energized. For shifted flow performance consult chart.
WARNING: the specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

OPTIONS

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

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

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

"P" TYPE "J" COIL TERMINATION

PB-S2J – – – –

OPTIONS

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

BODIES

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

DIMENSIONS

Approximate Coil Weight: .42 lbs (.19 kg)
DESCRIPTION
10 size, 7/8-14 thread, “Delta” series, solenoid operated, 2 way normally open, pilot operated poppet valve with free reverse flow energized.

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

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

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

HYDRAULIC SYMBOL

PERFORMANCE
Actual Test Data (Cartridge Only)

VALVE SPECIFICATIONS
Nominal Flow 15 GPM (57 LPM)
Rated Operating Pressure 3500 PSI (241 bar)
Typical Internal Leakage (150 SSU) 0-5 drops/min
Viscosity Range 36 to 3000 SSU (3 to 647 cSt)
Filtration ISO 18/16/13
Media Operating Temp. Range -40° to 250°F (-40° to 120°C)
Weight .29 lbs (.13 kg)
Operating Fluid Media General Purpose Hydraulic Fluid
Cartridge Torque Requirements 30 ft-lbs (40.6 Nm)
Coil Nut Torque Requirements 4-6 ft-lbs (5.4-8.1 Nm)
Cavity DELTA 2W
Cavity Tools Kit (form tool, reamer, tap) 40500000
Seal Kit 21191200
OPTIONS
- Buna Standard
- Viton Standard
- Buna, Override, Detent
- Viton, Override, Detent
- Buna, Override, Knob
- Viton, Override, Knob
- Buna, Screen
- Viton, Screen
- Buna, Screen, Override
- Viton, Screen, Override
- Buna, Screen, Override, Knob
- Viton, Screen, Override, Knob

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

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

“V” COIL TERMINATION
(All DC Except as Noted)
- DL Double Lead
  (several types of termination can be attached on leads on request)
- HC DIN 43650 (Hirschmann) - (AC&DC)
- DI Deutsch - Integral DT04-2P
- DIA "I" Coil AMP Superseal - Integral
- DID "I" Coil Deutsch - Integral DT04-2P
- DIJ "I" Coil AMP Jr. Timer - Integral
- DIM "I" Coil Metri-Pack - Integral

IMMERSION PROOF “D” TYPE
- DL
- HC
- DI
- DIA
- DID
- DIJ
- DIM

DE-S2C - - - -

DIMENSIONS

ORDERING INFORMATION

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

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

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

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

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

HYDRAULIC SYMBOL

PERFORMANCE
Actual Test Data (Cartridge Only)

<table>
<thead>
<tr>
<th>Flow (GPM)</th>
<th>Pressure Drop (PSI)</th>
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<td>125</td>
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<td>150</td>
<td>150</td>
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<table>
<thead>
<tr>
<th>Flow (LPM)</th>
<th>Pressure Drop (bar)</th>
</tr>
</thead>
<tbody>
<tr>
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<tr>
<td>125</td>
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<td>150</td>
<td>150</td>
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VALVE SPECIFICATIONS

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nominal Flow</td>
<td>30 GPM (114 LPM)</td>
</tr>
<tr>
<td>Rated Operating Pressure</td>
<td>3000 PSI (207 bar)</td>
</tr>
<tr>
<td>Typical Internal Leakage (150 SSU)</td>
<td>0-10 drops/min</td>
</tr>
<tr>
<td>Viscosity Range</td>
<td>36 to 3000 SSU (3 to 647 cSt)</td>
</tr>
<tr>
<td>Filtration</td>
<td>ISO 18/16/13</td>
</tr>
<tr>
<td>Media Operating Temp. Range</td>
<td>-40° to 250°F (-40° to 120°C)</td>
</tr>
<tr>
<td>Weight</td>
<td>.51 lbs (.23 kg)</td>
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<tr>
<td>Operating Fluid Media</td>
<td>General Purpose Hydraulic Fluid</td>
</tr>
<tr>
<td>Cartridge Torque Requirements</td>
<td>50 ft-lbs (67.8 Nm)</td>
</tr>
<tr>
<td>Coil Nut Torque Requirements</td>
<td>4-6 ft-lbs (5.4-8.1 Nm)</td>
</tr>
<tr>
<td>Cavity</td>
<td>TECNORD 2W</td>
</tr>
<tr>
<td>Cavity Tools Kit</td>
<td>(form tool, reamer, tap)</td>
</tr>
<tr>
<td>Seal Kit</td>
<td>40500032</td>
</tr>
<tr>
<td></td>
<td>21191300</td>
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SOLENOID OPERATED DIRECTIONAL CONTROLS

OPTIONS

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

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

IMMERSION PROOF “D” TYPE

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

DIMENSIONS

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

ORDERING INFORMATION

TT-S2C

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

“V” COIL TERMINATION
(All DC Except as Noted)

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

**HYDRAULIC SYMBOL**

![Hydraulic Symbol](image)

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

### OPTIONS

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

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

**IMMERSION PROOF “D” TYPE**
- "I" Coil AMP Superseal - Integral
- "I" Coil Deutsch - Integral DT04-2P
- "I" Coil AMP Jr. Timer - Integral
- "I" Coil Metri-Pack - Integral

### ORDERING INFORMATION

**SJ-S2C** - - - - -

### DIMENSIONS

**“V” COIL TERMINATION**
(All DC Except as Noted)
- DL Double Lead
  (several types of termination can be attached on leads on request)
- HC DIN 43650 (Hirschmann) - (AC&DC)
- DI Deutsch - Integral DT04-2P
- DIA "I" Coil AMP Superseal - Integral
- DID "I" Coil Deutsch - Integral DT04-2P
- DJ "I" Coil AMP Jr. Timer - Integral
- DIM "I" Coil Metri-Pack - Integral

Approximate Coil Weight: .56 lbs (.25 kg)
HJ-S2C  PILOT OPERATED POPPET, 2 WAY, NORMALLY OPEN

DESCRIPTION

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

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

```
<table>
<thead>
<tr>
<th>OPTIONS</th>
<th>BODIES</th>
<th>VOLTAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Buna Standard</td>
<td>Blank Without Body</td>
<td>06 6 VDC</td>
</tr>
<tr>
<td>Viton Standard</td>
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<td>12 12 VDC</td>
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<tr>
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<td>24 24 VDC</td>
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<td>11 120 VAC</td>
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<td>22 220 VAC</td>
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<td>44 440 VAC</td>
</tr>
</tbody>
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```

**“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

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

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

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

**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)

<table>
<thead>
<tr>
<th>Flow (GPM)</th>
<th>Pressure Drop (PSI)</th>
</tr>
</thead>
<tbody>
<tr>
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</tr>
<tr>
<td>10</td>
<td>5</td>
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<tr>
<td>20</td>
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<tr>
<td>30</td>
<td>15</td>
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<td>40</td>
<td>20</td>
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</tbody>
</table>

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.

**VALVE SPECIFICATIONS**

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nominal Flow</td>
<td>10 GPM (38 LPM)</td>
</tr>
<tr>
<td>Rated Operating Pressure</td>
<td>3500 PSI (241 bar)</td>
</tr>
<tr>
<td>Typical Internal Leakage (150 SSU)</td>
<td>0-5 drops/min</td>
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<tr>
<td>Viscosity Range</td>
<td>36 to 3000 SSU (3 to 647 cSt)</td>
</tr>
<tr>
<td>Filtration</td>
<td>ISO 18/16/13</td>
</tr>
<tr>
<td>Media Operating Temp. Range</td>
<td>-40° to 250°F (-40° to 120°C)</td>
</tr>
<tr>
<td>Weight</td>
<td>.22 lbs (.10 kg)</td>
</tr>
<tr>
<td>Operating Fluid Media</td>
<td>General Purpose Hydraulic Fluid</td>
</tr>
<tr>
<td>Cartridge Torque Requirements</td>
<td>25 ft-lbs (34 Nm)</td>
</tr>
<tr>
<td>Coil Nut Torque Requirements</td>
<td>4-6 ft-lbs (5.4-8.1 Nm)</td>
</tr>
<tr>
<td>Cavity</td>
<td>POWER 2W</td>
</tr>
<tr>
<td>Cavity Tools Kit</td>
<td>(form tool, reamer, tap) 40500005</td>
</tr>
<tr>
<td>Seal Kit</td>
<td>21191100</td>
</tr>
</tbody>
</table>

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

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

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

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

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

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

Approximate Coil Weight: .42 lbs (.19 kg)
DESCRIPTION
8 size, 3/4-16 thread, “Power” series, solenoid operated, 2 way normally open, pilot operated poppet valve with reverse flow energized and de-energized.

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

PUSH TYPE MANUAL OVERRIDE OPTION: to override, push the manual override button.
SCREW TYPE MANUAL OVERRIDE OPTION: to override, turn the manual override screw clockwise.
To release, turn the manual override screw counterclockwise.

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

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  0-5 drops/min at 5000 PSI (150 SSU) (345 bar)
Viscosity Range  36 to 3000 SSU (3 to 647 cSt)
Filtration  ISO 18/16/13
Media Operating Temp. Range  -40° to 210°F (-40° to 100°C)
BUNA seals  -4° to 250°F (-20° to 120°C)
VITON seals
Weight  .29 lbs (.13 kg)
Operating Fluid Media  General Purpose Hydraulic Fluid
Cartridge Torque Requirements  30-35 ft-lbs (41-47 Nm)
Coil Nut Torque Requirements  3-4.5 ft-lbs (4-6 Nm)
Cavity  POWER 2W
Cavity Tools Kit  40500005
Seal Kit  21191100

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### ORDERING INFORMATION

<table>
<thead>
<tr>
<th>OPTIONS</th>
<th>BODIES</th>
<th>VOLTAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Buna Standard</td>
<td>Blank Without Body</td>
<td>12 12 VDC</td>
</tr>
<tr>
<td>Viton Standard</td>
<td>N 1/4&quot; BSP Ports (aluminum)</td>
<td>24 24 VDC</td>
</tr>
<tr>
<td>Buna, Push Pin, Override</td>
<td>N1 3/8&quot; BSP Ports (aluminum)</td>
<td>26 26 VDC</td>
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<tr>
<td>Viton, Push Pin, Override</td>
<td>S #6 SAE Ports</td>
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</tr>
<tr>
<td>Buna, Push Button, Override</td>
<td>H 1/4&quot; BSP Ports (steel)</td>
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<tr>
<td>Viton, Push Button, Override</td>
<td>H1 3/8&quot; BSP Ports (steel)</td>
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<tr>
<td>Viton, Screw, Override</td>
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<tr>
<td>Buna, Screw, Override</td>
<td>0P</td>
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<tr>
<td>Viton, Screw, Override</td>
<td>0K</td>
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</tr>
<tr>
<td></td>
<td>VK</td>
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</table>

**“P” TYPE “J” COIL TERMINATION**

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

**DIMENSIONS**

 approximate Coil Weight: 0.42 lbs (.19 kg)

**Note:** Aluminum bodies only for use up to 250 bar

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

HYDRAULIC SYMBOL

PERFORMANCE
Actual Test Data (Cartridge Only)

Valve Specifications

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nominal Flow</td>
<td>15 GPM (57 LPM)</td>
</tr>
<tr>
<td>Rated Operating Pressure</td>
<td>3500 PSI (241 bar)</td>
</tr>
<tr>
<td>Typical Internal Leakage</td>
<td>0-5 drops/min</td>
</tr>
<tr>
<td>Viscosity Range</td>
<td>36 to 3000 SSU (3 to 647 cSt)</td>
</tr>
<tr>
<td>Filtration</td>
<td>ISO 18/16/13</td>
</tr>
<tr>
<td>Media Operating Temp. Range</td>
<td>-40° to 250°F (-40° to 120°C)</td>
</tr>
<tr>
<td>Weight</td>
<td>.29 lbs (.13 kg)</td>
</tr>
<tr>
<td>Operating Fluid Media</td>
<td>General Purpose Hydraulic Fluid</td>
</tr>
<tr>
<td>Cartridge Torque Requirements</td>
<td>30 ft-lbs (40.6 Nm)</td>
</tr>
<tr>
<td>Coil Nut Torque Requirements</td>
<td>4-6 ft-lbs (5.4-8.1 Nm)</td>
</tr>
<tr>
<td>Cavity</td>
<td>DELTA 2W</td>
</tr>
<tr>
<td>Cavity Tools Kit</td>
<td>(form tool, reamer, tap)</td>
</tr>
<tr>
<td>Seal Kit</td>
<td>21191200</td>
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### Ordering Information

<table>
<thead>
<tr>
<th>Options</th>
<th>Bodies</th>
<th>Voltage</th>
<th>Immersion Proof “D” Type</th>
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</thead>
<tbody>
<tr>
<td>Buna Standard 00</td>
<td>Blank N 1/2” BSP Ports</td>
<td>12 12 VDC</td>
<td>“I” Coil AMP Superseal - Integral</td>
</tr>
<tr>
<td>Viton Standard V0</td>
<td>Without Body</td>
<td>24 24 VDC</td>
<td>“I” Coil Deutsch - Integral DT04-2P</td>
</tr>
<tr>
<td>Buna, Override, Detent 0M</td>
<td></td>
<td></td>
<td>“I” Coil AMP Jr. Timer - Integral</td>
</tr>
<tr>
<td>Viton, Override, Detent VM</td>
<td></td>
<td></td>
<td>“I” Coil Metri-Pack - Integral</td>
</tr>
<tr>
<td>Buna, Override, Knob OK</td>
<td></td>
<td>22 220 VAC without internal rectifier</td>
<td></td>
</tr>
<tr>
<td>Viton, Override, Knob VK</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Buna, Screen A0</td>
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<tr>
<td>Viton, Screen W0</td>
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<td></td>
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</tr>
<tr>
<td>Buna, Screen, Override B2</td>
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<td></td>
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</tr>
<tr>
<td>Viton, Screen, Override V2</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Buna, Screen, Override Knob B5</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Viton, Screen, Override Knob V5</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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

**“V” Coil Termination**
(All DC Except as Noted)

- DL Double Lead
- HC DIN 43650 (Hirschmann) - (AC&DC)
- DI Deutsch - Integral DT04-2P
- DIA “I” Coil AMP Superseal - Integral
- DID “I” Coil Deutsch - Integral DT04-2P
- DJ “I” Coil AMP Jr. Timer - Integral
- DIM “I” Coil Metri-Pack - Integral

**Approximate Coil Weight:** .56 lbs (.25 kg)
DESCRIPTION
12 size, 1 1/16-12 thread, "Tecnord" series, solenoid operated, 2 way normally open, pilot operated poppet valve with free reverse flow energized and de-energized.

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

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

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

HYDRAULIC SYMBOL

PERFORMANCE
Actual Test Data (Cartridge Only)

<table>
<thead>
<tr>
<th>Flow (GPM)</th>
<th>Pressure Drop (PSI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0</td>
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<tr>
<td>10</td>
<td>5</td>
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<tr>
<td>20</td>
<td>10</td>
</tr>
<tr>
<td>30</td>
<td>15</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Flow (LPM)</th>
<th>Pressure Drop (bar)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
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<tr>
<td>25</td>
<td>5</td>
</tr>
<tr>
<td>50</td>
<td>10</td>
</tr>
<tr>
<td>75</td>
<td>15</td>
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VALVE SPECIFICATIONS

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nominal Flow</td>
<td>30 GPM (114 LPM)</td>
</tr>
<tr>
<td>Rated Operating Pressure</td>
<td>3000 PSI (207 bar)</td>
</tr>
<tr>
<td>Typical Internal Leakage (150 SSU)</td>
<td>0-10 drops/min</td>
</tr>
<tr>
<td>Viscosity Range</td>
<td>36 to 3000 SSU (3 to 647 cSt)</td>
</tr>
<tr>
<td>Filtration</td>
<td>ISO 18/16/13</td>
</tr>
<tr>
<td>Media Operating Temp. Range</td>
<td>-40°F to 250°F (-40°C to 120°C)</td>
</tr>
<tr>
<td>Weight</td>
<td>.51 lbs (.23 kg)</td>
</tr>
<tr>
<td>Operating Fluid Media</td>
<td>General Purpose Hydraulic Fluid</td>
</tr>
<tr>
<td>Cartridge Torque Requirements</td>
<td>50 ft-lbs (67.8 Nm)</td>
</tr>
<tr>
<td>Coil Nut Torque Requirements</td>
<td>4-6 ft-lbs (5.4-8.1 Nm)</td>
</tr>
<tr>
<td>Cavity</td>
<td>TECNORD 2W</td>
</tr>
<tr>
<td>Cavity Tools Kit</td>
<td>40500032 (form tool, reamer, tap)</td>
</tr>
<tr>
<td>Seal Kit</td>
<td>21191300</td>
</tr>
</tbody>
</table>
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**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)

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

**IMMERSION PROOF “D” TYPE**
- DL: Double Lead
- HC: DIN 43650 (Hirschmann) - (AC&DC)
- DI: Deutsch - Integral DT04-2P
- DIA: "I" Coil AMP Superseal - Integral
- DID: "I" Coil Deutsch - Integral DT04-2P
- DJ: "I" Coil AMP Jr. Timer - Integral
- DIM: "I" Coil Metri-Pack - Integral

**ORDERING INFORMATION**

**DIMENSIONS**

**TECNORD**
Via Malavolti, 36 • 41122 Modena • ITALY • Phone +39 (059) 254895 • Fax +39 (059) 253512
mail: tecnord@tecnord.com • www.tecnord.com
**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.

**HYDRAULIC SYMBOL**

![Hydraulic Symbol]

**PERFORMANCE**

Actual Test Data (Cartridge Only)

<table>
<thead>
<tr>
<th>Flow (GPM)</th>
<th>Pressure Drop (PSI)</th>
<th>Pressure Drop (bar)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
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<tr>
<td>10</td>
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<td>69</td>
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<td>30</td>
<td>15</td>
<td>103</td>
</tr>
<tr>
<td>40</td>
<td>20</td>
<td>137</td>
</tr>
</tbody>
</table>

**VALVE SPECIFICATIONS**

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nominal Flow</td>
<td>40 GPM (151 LPM)</td>
</tr>
<tr>
<td>Rated Operating Pressure</td>
<td>3000 PSI (207 bar)</td>
</tr>
<tr>
<td>Typical Internal Leakage (150 SSU)</td>
<td>0-10 drops/min</td>
</tr>
<tr>
<td>Viscosity Range</td>
<td>36 to 3000 SSU (3 to 647 cSt)</td>
</tr>
<tr>
<td>Filtration</td>
<td>ISO 18/16/13</td>
</tr>
<tr>
<td>Media Operating Temp. Range</td>
<td>-40° to 250°F (-40° to 120°C)</td>
</tr>
<tr>
<td>Weight</td>
<td>.74 lbs (.33 kg)</td>
</tr>
<tr>
<td>Operating Fluid Media</td>
<td>General Purpose Hydraulic Fluid</td>
</tr>
<tr>
<td>Cartridge Torque Requirements</td>
<td>90 ft-lbs (122 Nm)</td>
</tr>
<tr>
<td>Coil Nut Torque Requirements</td>
<td>4-6 ft-lbs (5.4-8.1 Nm)</td>
</tr>
<tr>
<td>Cavity</td>
<td>SUPER 2W</td>
</tr>
<tr>
<td>Cavity Tools Kit</td>
<td>(form tool, reamer, tap) 40500017</td>
</tr>
<tr>
<td>Seal Kit</td>
<td>21191400</td>
</tr>
</tbody>
</table>
OPTIONS
Buna Standard  00
Viton Standard   V0
Buna, Screen  A0
Viton, Screen  W0

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

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

“V” COIL TERMINATION
(All DC Except as Noted)
DL  Double Lead  (several types of termination can be attached on leads on request)
HC  DIN 43650 (Hirschmann) - (AC&DC)
DI  Deutsch - Integral DT04-2P
DIA  “I” Coil AMP Superseal - Integral
DID  “I” Coil Deutsch - Integral DT04-2P
DIJ  “I” Coil AMP Jr. Timer - Integral
DIM  “I” Coil Metri-Pack - Integral

IMMERSION PROOF “D” TYPE

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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.

PERFORMANCE
Actual Test Data (Cartridge Only)

VALVE SPECIFICATIONS
Nominal Flow 12 GPM (45 LPM)
Rated Operating Pressure 5000 PSI (345 bar)
Typical Internal Leakage 0-5 drops/min at 5000 PSI (150 SSU) (345 bar)
Viscosity Range 36 to 3000 SSU (3 to 647 cSt)
Filtration ISO 18/16/13
Media Operating Temp. Range -40° to 210°F (-40° to 100°C)
BUNA seals
-4° to 250°F (-20° to 120°C) VITON seals
Weight .29 lbs (.13 kg)
Operating Fluid Media General Purpose Hydraulic Fluid
Cartridge Torque Requirements 30-35 ft-lbs (41-47 Nm)
Coil Nut Torque Requirements 3-4.5 ft-lbs (4-6 Nm)
Cavity POWER 2W
Cavity Tools Kit 40500005
Seal Kit 21191102

Zinc Nickel plating on all exposed surfaces (>500hours corrosion resistance).
SOLENOID OPERATED DIRECTIONAL CONTROLS

DIMENSIONS

ORDERING INFORMATION

HB-S2K  -  -  -  -  -

OPTIONS

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

BODIES

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

VOLTAGE (other voltages available on request)

12  12 VDC
24  24 VDC
26  26 VDC

"P" TYPE "J" COIL TERMINATION

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

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

Note: Aluminum bodies only for use up to 250 bar

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Delta Power Company
4484 Boeing Drive Rockford, IL 61109 • USA • Phone +1 (815) 397-6628 • Fax +1 (815) 397-2526
mail: delta@delta-power.com • www.delta-power.com

Tecnord
Via Malavolti, 36 • 41122 Modena • ITALY • Phone +39 (059) 254895 • Fax +39 (059) 253512
mail: tecnord@tecnord.com • www.tecnord.com
WARNING: the specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.
2 WAY 2 POSITION NORMALLY OPEN SPOOL VALVES

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

TYPICAL SCHEMATIC

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

UA-S2H  DIRECT ACTING SPOOL, 2 WAY NORMALLY OPEN

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

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

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

HYDRAULIC SYMBOL

PERFORMANCE
Actual Test Data (Cartridge Only)

<table>
<thead>
<tr>
<th>Flow (GPM)</th>
<th>Pressure Drop (PSI)</th>
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</thead>
<tbody>
<tr>
<td>250</td>
<td>0</td>
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<td>200</td>
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<tr>
<td>150</td>
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<td>100</td>
<td>15</td>
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<tr>
<td>50</td>
<td>20</td>
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<tr>
<td>0</td>
<td>25</td>
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<table>
<thead>
<tr>
<th>Flow (LPM)</th>
<th>Pressure Drop (BAR)</th>
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</thead>
<tbody>
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<td>15</td>
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<tr>
<td>50</td>
<td>20</td>
</tr>
<tr>
<td>0</td>
<td>25</td>
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</tbody>
</table>

| Port 1 to 2 (de-eng) | Port 2 to 1 (de-eng) |

VALVE SPECIFICATIONS

<table>
<thead>
<tr>
<th>Nominal Flow</th>
<th>2 GPM (8 LPM) from (1) to (2)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1 GPM (4 LPM) from (2) to (1)</td>
</tr>
<tr>
<td>Rated Operating Pressure</td>
<td>4000 PSI (276 bar)</td>
</tr>
<tr>
<td>Typical Internal Leakage (150 SSU)</td>
<td>8 cu in/min (131 ml/min)</td>
</tr>
<tr>
<td>Viscosity Range</td>
<td>36 to 3000 SSU (3 to 647 cSt)</td>
</tr>
<tr>
<td>Filtration</td>
<td>ISO 18/16/13</td>
</tr>
<tr>
<td>Media Operating Temp. Range</td>
<td>-40° to 250°F (-40° to 120°C)</td>
</tr>
<tr>
<td>Weight</td>
<td>.12 lbs (.05 kg)</td>
</tr>
<tr>
<td>Operating Fluid Media</td>
<td>General Purpose Hydraulic Fluid</td>
</tr>
<tr>
<td>Cartridge Torque Requirements</td>
<td>15 ft-lbs (20.3 Nm)</td>
</tr>
<tr>
<td>Coil Nut Torque Requirements</td>
<td>4-6 ft-lbs (5.4-8.1 Nm)</td>
</tr>
<tr>
<td>Cavity</td>
<td>MINI 2W</td>
</tr>
<tr>
<td>Cavity Form Tool (Finishing)</td>
<td>40500003</td>
</tr>
<tr>
<td>Seal Kit</td>
<td>21191002</td>
</tr>
</tbody>
</table>

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ORDERING INFORMATION

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

<table>
<thead>
<tr>
<th>OPTIONS</th>
<th>BODIES</th>
<th>VOLTAGE (other voltages available on request)</th>
</tr>
</thead>
<tbody>
<tr>
<td>UA-S2H</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Buna Standard</td>
<td>Blank</td>
<td>12 VDC</td>
</tr>
<tr>
<td>Viton Standard</td>
<td>Without Body</td>
<td>24 VDC</td>
</tr>
<tr>
<td>Buna, Screen</td>
<td>1/4&quot; BSP Ports</td>
<td>26 220 VAC with molded full wave rectifier</td>
</tr>
<tr>
<td>Viton, Screen</td>
<td>#6 SAE Ports</td>
<td></td>
</tr>
</tbody>
</table>

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

“P” TYPE “J” COIL TERMINATION

<table>
<thead>
<tr>
<th>JA</th>
<th>“J” Coil AMP Superseal - Integral</th>
</tr>
</thead>
<tbody>
<tr>
<td>JD</td>
<td>“J” Coil Deutsch - Integral DT04-2P</td>
</tr>
<tr>
<td>JJ</td>
<td>“J” Coil AMP Jr. Time - Integral</td>
</tr>
<tr>
<td>JL</td>
<td>“J” Coil Double Lead</td>
</tr>
<tr>
<td>JH</td>
<td>“J” Coil DIN 43650 (Hirschmann)</td>
</tr>
</tbody>
</table>

DIMENSIONS

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

OPTIONS

- Buna Standard
- Viton Standard
- Buna, Screen
- Viton, Screen

BODIES

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

VOLTAGE (other voltages available on request)

- 12 VDC
- 24 VDC
- 26 220 VAC with molded full wave rectifier
**PB-S2H** DIRECT ACTING SPOOL, 2 WAY NORMALLY OPEN

**DESCRIPTION**

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

**OPERATION**

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

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

**FEATURES**

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

**HYDRAULIC SYMBOL**

![Hydraulic Symbol](image)

**PERFORMANCE**

Actual Test Data (Cartridge Only)

<table>
<thead>
<tr>
<th>Port 1 to 2 (de-eng)</th>
<th>Port 2 to 1 (de-eng)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flow (GPM)</td>
<td>Flow (LPM)</td>
</tr>
<tr>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>10</td>
<td>10</td>
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<tr>
<td>15</td>
<td>15</td>
</tr>
<tr>
<td>20</td>
<td>20</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Flow (GPM)</th>
<th>Pressure Drop (PSI)</th>
<th>Pressure Drop (bar)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>2</td>
<td>5</td>
<td>20</td>
</tr>
<tr>
<td>4</td>
<td>350</td>
<td>240</td>
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<tr>
<td>6</td>
<td>370</td>
<td>250</td>
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</table>

**VALVE SPECIFICATIONS**

<table>
<thead>
<tr>
<th>Nominal Flow</th>
<th>5 GPM (19 LPM) from (1) to (2)</th>
</tr>
</thead>
<tbody>
<tr>
<td>3 GPM (11 LPM) from (2) to (1)</td>
<td></td>
</tr>
<tr>
<td>Rated Operating Pressure</td>
<td>3000 PSI (207 bar)</td>
</tr>
<tr>
<td>Typical Internal Leakage (150 SSU)</td>
<td>5 cu in/min (82 ml/min)</td>
</tr>
<tr>
<td>Viscosity Range</td>
<td>36 to 3000 SSU (3 to 647 cSt)</td>
</tr>
<tr>
<td>Filtration</td>
<td>ISO 18/16/13</td>
</tr>
<tr>
<td>Media Operating Temp. Range</td>
<td>-40° to 250°F (-40° to 120°C)</td>
</tr>
<tr>
<td>Weight</td>
<td>.19 lbs (.09 kg)</td>
</tr>
<tr>
<td>Operating Fluid Media</td>
<td>General Purpose Hydraulic Fluid</td>
</tr>
<tr>
<td>Cartridge Torque Requirements</td>
<td>25 ft-lbs (34 Nm)</td>
</tr>
<tr>
<td>Coil Nut Torque Requirements</td>
<td>4-6 ft-lbs (5.4-8.1 Nm)</td>
</tr>
<tr>
<td>Cavity</td>
<td>POWER 2W</td>
</tr>
<tr>
<td>Cavity Tools Kit</td>
<td>(form tool, reamer, tap)</td>
</tr>
<tr>
<td>Seal Kit</td>
<td>21191102</td>
</tr>
</tbody>
</table>

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---

Delta Power Company
4484 Boeing Drive Rockford, IL 61109 • USA • Phone +1 (815) 397-6628 • Fax +1 (815) 397-2526
mail: delta@delta-power.com • www.delta-power.com

TECNORD
Via Malavolti, 38 • 41122 Modena • ITALY • Phone +39 (059) 254895 • Fax +39 (059) 253512
mail: tecnord@tecnord.com • www.tecnord.com
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OPTIONS
- Buna Standard
- Viton Standard
- Buna, Override, Detent
- Viton, Override, Detent
- Buna, Screen
- Viton, Screen
- Buna, Override, Non-Detent
- Viton, Override, Non-Detent
- Buna, Screen, Override, Non-Detent
- Viton, Screen, Override, Non-Detent

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

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

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

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

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

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

**OPERATION**

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

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

**FEATURES**

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

**HYDRAULIC SYMBOL**

For higher pressure systems see HE-S2H.

**PERFORMANCE**

Actual Test Data (Cartridge Only)

**VALVE SPECIFICATIONS**

- Nominal Flow: 8 GPM (30 LPM) from (1) to (2), 4 GPM (15 LPM) from (2) to (1)
- Rated Operating Pressure: 3500 PSI (241 bar)
- Typical Internal Leakage: 5 cu in/min (82 ml/min)
- Viscosity Range: 36 to 3000 SSU (3 to 647 cSt)
- Filtration: ISO 18/16/13
- Media Operating Temp. Range: -40° to 250°F (-40° to 120°C)
- Weight: .26 lbs (.12 kg)
- Operating Fluid Media: General Purpose Hydraulic Fluid
- Cartridge Torque Requirements: 30 ft-lbs (40.6 Nm)
- Coil Nut Torque Requirements: 4-6 ft-lbs (5.4-8.1 Nm)
- Cavity: DELTA 2W
- Cavity Tools Kit: (form tool, reamer, tap) 40500000
- Seal Kit: 21191202

---

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**OPTIONS**

- Buna Standard: 00
- Viton Standard: V0
- Buna, Override, Detent: OM
- Viton, Override, Detent: VM
- Buna, Screen: A0
- Viton, Screen: W0
- Buna, Screen, Override: B2
- Viton, Screen, Override: V2

**BODIES**

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

**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
- HC: DIN 43650 (Hirschmann) - (AC&DC)
- DI: Deutsch - Integral DT04-2P
- DIA: “I” Coil AMP Superseal - Integral
- DID: “I” Coil Deutsch - Integral DT04-2P
- DIJ: “I” Coil AMP Jr. Timer - Integral
- DIM: “I” Coil Metri-Pack - Integral

**DIMENSIONS**

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

**WARNING:** The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.
HE-S2H  DIRECT ACTING SPOOL, 2 WAY NORMALLY OPEN

DESCRIPTION

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.

HYDRAULIC SYMBOL

PERFORMANCE
Actual Test Data (Cartridge Only)

VALVE SPECIFICATIONS
Nominal Flow  8 GPM (30 LPM) from (1) to (2)  4 GPM (15 LPM) from (2) to (1)
Rated Operating Pressure  4000 PSI (276 bar)
Typical Internal Leakage (150 SSU) 8 cu in/min (131 ml/min)
Viscosity Range  36 to 3000 SSU (3 to 647 cSt)
Filtration  ISO 18/16/13
Media Operating Temp. Range  -40° to 250°F (-40° to 120°C)
Weight  .38 lbs (.17 kg)
Operating Fluid Media  General Purpose Hydraulic Fluid
Cartridge Torque Requirements  30 ft-lbs (40.6 Nm)
Coil Nut Torque Requirements  4-6 ft-lbs (5.4-8.1 Nm)
Cavity  DELTA 2W
Cavity Tools Kit
(form tool, reamer, tap)  40500000
Seal Kit  21191202

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Note: Aluminum, NOT durability rated for 4000 PSI. Consult factory for body options.
### 3 WAY 2 POSITION SPOOL VALVES

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

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

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

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

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

**HYDRAULIC SYMBOL**

**PERFORMANCE**

<table>
<thead>
<tr>
<th>Flow (GPM)</th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pressure Drop (PSI)</td>
<td>0</td>
<td>50</td>
<td>100</td>
<td>150</td>
<td>200</td>
<td>250</td>
</tr>
</tbody>
</table>

**VALVE SPECIFICATIONS**

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nominal Flow</td>
<td>1 GPM (4 LPM) from (1) to (2)</td>
</tr>
<tr>
<td></td>
<td>2 GPM (7.6 LPM) from (2) to (1)</td>
</tr>
<tr>
<td>Rated Operating Pressure</td>
<td>3500 PSI (241 bar)</td>
</tr>
<tr>
<td>Typical Internal Leakage (150 SSU)</td>
<td>8 cu in/min (131 ml/min)</td>
</tr>
<tr>
<td>Viscosity Range</td>
<td>36 to 3000 SSU (3 to 647 cSt)</td>
</tr>
<tr>
<td>Filtration</td>
<td>ISO 18/16/13</td>
</tr>
<tr>
<td>Media Operating Temp. Range</td>
<td>-40° to 250°F (-40° to 120°C)</td>
</tr>
<tr>
<td>Weight</td>
<td>.14 lbs (.06 kg)</td>
</tr>
<tr>
<td>Operating Fluid Media</td>
<td>General Purpose Hydraulic Fluid</td>
</tr>
<tr>
<td>Cartridge Torque Requirements</td>
<td>15 ft-lbs (20.3 Nm)</td>
</tr>
<tr>
<td>Coil Nut Torque Requirements</td>
<td>4-6 ft-lbs (5.4-8.1 Nm)</td>
</tr>
<tr>
<td>Cavity</td>
<td>MINI 3W</td>
</tr>
<tr>
<td>Cavity Form Tool (Finishing)</td>
<td>40500004</td>
</tr>
<tr>
<td>Seal Kit</td>
<td>21191004</td>
</tr>
</tbody>
</table>

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DIMENSIONS

ORDERING INFORMATION

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

UC-S3A  -  -  -  -

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

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

VOLTAGE (other voltages available on request)
12     12 VDC
24     24 VDC
26     220 VAC with molded full wave rectifier

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

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

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)

<table>
<thead>
<tr>
<th>Pressure Drop (PSI)</th>
<th>Flow (GPM)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>1</td>
<td>1.5</td>
</tr>
<tr>
<td>2</td>
<td>3</td>
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<tr>
<td>3</td>
<td>4.5</td>
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<tr>
<td>4</td>
<td>6</td>
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<table>
<thead>
<tr>
<th>Pressure Drop (bar)</th>
<th>Flow (LPM)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>1</td>
<td>1.5</td>
</tr>
<tr>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>3</td>
<td>4.5</td>
</tr>
<tr>
<td>4</td>
<td>6</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Port 1 to 3 (eng)</th>
<th>Port 3 to 2 (de-eng)</th>
</tr>
</thead>
</table>

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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**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

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

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

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

Approximate Coil Weight: .42 lbs (.19 kg)
**DF-S3A  DIRECT ACTING SPOOL, 3 WAY 2 POSITION**

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

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

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

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

**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 (40.6Nm)
- **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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**DIMENSIONS**

<table>
<thead>
<tr>
<th>Option</th>
<th>Body</th>
<th>Voltage</th>
<th>Immersion Proof</th>
</tr>
</thead>
<tbody>
<tr>
<td>Buna Standard 00</td>
<td>Blank</td>
<td>12 VDC</td>
<td>DL</td>
</tr>
<tr>
<td>Viton Standard V0</td>
<td>Without Body</td>
<td>24 VDC</td>
<td>DL (several types of termination can be attached on leads on request)</td>
</tr>
<tr>
<td>Buna, Override, Detent 0M</td>
<td>N</td>
<td>220 VAC without internal rectifier</td>
<td>DL</td>
</tr>
<tr>
<td>Viton, Override, Detent VM</td>
<td>S</td>
<td></td>
<td>DL</td>
</tr>
<tr>
<td>Buna, Screen A0</td>
<td></td>
<td></td>
<td>DL</td>
</tr>
<tr>
<td>Viton, Screen W0</td>
<td></td>
<td></td>
<td>DL</td>
</tr>
<tr>
<td>Buna, Screen, Override B2</td>
<td></td>
<td></td>
<td>DL</td>
</tr>
<tr>
<td>Viton, Screen, Override V2</td>
<td></td>
<td></td>
<td>DL</td>
</tr>
</tbody>
</table>

**ORDERING INFORMATION**

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

- **OPTIONS**
  - Buna Standard
  - Viton Standard
  - Buna, Override, Detent
  - Viton, Override, Detent
  - Buna, Screen
  - Viton, Screen
- **BODIES**
  - Blank
  - Without Body
  - N: 3/8" BSP Ports
  - S: #6 SAE Ports
- **VOLTAGE** (other voltages available on request)
  - 12: 12 VDC
  - 24: 24 VDC
  - 22: 220 VAC without internal rectifier

**“V” COIL TERMINATION**

- DL: Double Lead
  - (several types of termination can be attached on leads on request)
- HC: DIN 43650 (Hirschmann) - (AC&DC)
- DI: Deutsch - Integral DT04-2P
- DIA: "I" Coil AMP Superseal - Integral
- DID: "I" Coil Deutsch - Integral DT04-2P
- DJ: "I" Coil AMP Jr. Timer - Integral
- DIM: "I" Coil Metri-Pack - Integral
**DESCRIPTION**


**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.

**HYDRAULIC SYMBOL**

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

**PERFORMANCE**

Actual Test Data (Cartridge Only)

**VALVE SPECIFICATIONS**

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nominal Flow</td>
<td>10 GPM (38 LPM)</td>
</tr>
<tr>
<td>Rated Operating Pressure</td>
<td>4000 PSI (276 bar)</td>
</tr>
<tr>
<td>Typical Internal Leakage (150 SSU)</td>
<td>8 cu in/min (131 ml/min)</td>
</tr>
<tr>
<td>Viscosity Range</td>
<td>36 to 3000 SSU (3 to 647 cSt)</td>
</tr>
<tr>
<td>Filtration</td>
<td>ISO 18/16/13</td>
</tr>
<tr>
<td>Media Operating Temp. Range</td>
<td>-40°F to 250°F (-40°C to 120°C)</td>
</tr>
<tr>
<td>Weight</td>
<td>.40 lbs (.18 kg)</td>
</tr>
<tr>
<td>Operating Fluid Media</td>
<td>General Purpose Hydraulic Fluid</td>
</tr>
<tr>
<td>Cartridge Torque Requirements</td>
<td>30 ft-lbs (40.6 Nm)</td>
</tr>
<tr>
<td>Coil Nut Torque Requirements</td>
<td>4-6 ft-lbs (5.4-8.1 Nm)</td>
</tr>
<tr>
<td>Cavity</td>
<td>DELTA 3W</td>
</tr>
<tr>
<td>Cavity Tools Kit</td>
<td>(form tool, reamer, tap) 40500001</td>
</tr>
<tr>
<td>Seal Kit</td>
<td>21191210</td>
</tr>
</tbody>
</table>

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**OPTIONS**
- Buna Standard
- Viton Standard

**BODIES**
- Blank
- N: 3/8” BSP Ports
- S: #6 SAE Ports

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

**IMMERSION PROOF “L” TYPE**
- "L" Coil AMP Superseal - Integral
- "L" Coil Deutsch - Integral DT04-2P
- "L" Coil AMP Jr. Timer - Integral
- "L" Coil Metri-Pack - Integral

**DIMENSIONS**
- Approximate Coil Weight: .68 lbs (.31 kg)

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

**WARNING:**
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**DELTA POWER COMPANY**
4484 Boeing Drive Rockford, IL 61109 • USA • Phone +1 (815) 397-6628 • Fax +1 (815) 397-2526
mail: delta@delta-power.com • www.delta-power.com

**TECNORD**
Via Malavolti, 36 • 41122 Modena • ITALY • Phone +39 (059) 254895 • Fax +39 (059) 253512
mail: tecnord@tecnord.com • www.tecnord.com
PP-S3B  DIRECT ACTING SPOOL, 3 WAY 2 POSITION

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

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

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

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

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

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

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

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

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

**“P” TYPE “J” COIL TERMINATION**
- JA: “J” Coil AMP Superseal - Integral
- JD: “J” Coil Deutsch - Integral DT04-2P
- JJ: “J” Coil AMP Jr. Time - Integral
- JL: “J” Coil Double Lead
- JH: “J” Coil DIN 43650 (Hirschmann)

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**Approximate Coil Weight:** .42 lbs (.19 kg)
DF-S3B  DIRECT ACTING SPOOL, 3 WAY 2 POSITION, SELECTOR

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

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

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

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

HYDRAULIC SYMBOL

PERFORMANCE
Actual Test Data (Cartridge Only)

Valve Specifications

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nominal Flow</td>
<td>8 GPM (30 LPM)</td>
</tr>
<tr>
<td>Rated Operating Pressure</td>
<td>3000 PSI (207 bar)</td>
</tr>
<tr>
<td>Typical Internal Leakage</td>
<td>5 cu in/min (82 ml/min)</td>
</tr>
<tr>
<td>Viscosity Range</td>
<td>36 to 3000 SSU (3 to 647 cSt)</td>
</tr>
<tr>
<td>Filtration</td>
<td>ISO 18/16/13</td>
</tr>
<tr>
<td>Media Operating Temp. Range</td>
<td>-40° to 250°F (-40° to 120°C)</td>
</tr>
<tr>
<td>Weight</td>
<td>.28 lbs (.12 kg)</td>
</tr>
<tr>
<td>Operating Fluid Media</td>
<td>General Purpose Hydraulic Fluid</td>
</tr>
<tr>
<td>Cartridge Torque Requirements</td>
<td>30 ft-lbs (40.6 Nm)</td>
</tr>
<tr>
<td>Coil Nut Torque Requirements</td>
<td>4-6 ft-lbs (5.4-8.1 Nm)</td>
</tr>
<tr>
<td>Cavity</td>
<td>DELTA 3W</td>
</tr>
<tr>
<td>Cavity Tools Kit</td>
<td>40500001</td>
</tr>
<tr>
<td>Seal Kit</td>
<td>21191210</td>
</tr>
</tbody>
</table>
**DIMENSIONS**

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

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

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

**“V” COIL TERMINATION**
(All DC Except as Noted)
- DL: Double Lead
  (several types of termination can be attached on leads on request)
- HC: DIN 43650 (Hirschmann) - (AC&DC)
- DI: Deutsch - Integral DT04-2P
- DIA: “I” Coil AMP Superseal - Integral
- DID: “I” Coil Deutsch - Integral DT04-2P
- DIJ: “I” Coil AMP Jr. Timer - Integral
- DIM: “I” Coil Metri-Pack - Integral

**IMMERSION PROOF “D” TYPE**

**ORDERING INFORMATION**

Approximate Coil Weight: .56 lbs (.25 kg)
HF-S3B  DIRECT ACTING SPOOL, 3 WAY 2 POSITION, SELECTOR

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

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

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

HYDRAULIC SYMBOL

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

PERFORMANCE
Actual Test Data (Cartridge Only)

![Performance Graph]

VALVE SPECIFICATIONS

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nominal Flow</td>
<td>8 GPM (30 LPM)</td>
</tr>
<tr>
<td>Rated Operating Pressure</td>
<td>4000 PSI (276 bar)</td>
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<tr>
<td>Typical Internal Leakage</td>
<td>8 cu in/min (131 ml/min)</td>
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<tr>
<td>Viscosity Range</td>
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</tr>
<tr>
<td>Media Operating Temp. Range</td>
<td>-40° to 250°F (-40° to 120°C)</td>
</tr>
<tr>
<td>Weight</td>
<td>.40 lbs (.18 kg)</td>
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<tr>
<td>Operating Fluid Media</td>
<td>General Purpose Hydraulic Fluid</td>
</tr>
<tr>
<td>Cartridge Torque Requirements</td>
<td>30 ft-lbs (40.6 Nm)</td>
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<tr>
<td>Coil Nut Torque Requirements</td>
<td>4-6 ft-lbs (5.4-8.1 Nm)</td>
</tr>
<tr>
<td>Cavity</td>
<td>DELTA 3W</td>
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<td>Cavity Tools Kit</td>
<td>Kit 40500001</td>
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<td>Seal Kit</td>
<td>21191210</td>
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Approximate Coil Weight: .68 lbs (.31 kg)

OPTIONS

Bodies

Bodies

Blank
Viton Standard
Without Body
V0
N
3/8" BSP Ports
S
#6 SAE Ports

VOLTAGE (other voltages available on request)

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

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

DL Double Lead
DH Double Head
(Several types of termination can be attached on leads on request)

HF-S3B

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

DI Deutsch - Integral DT04-2P

LI A Coil AMP Superseal - Integral
LID "I" Coil Deutsch - Integral DT04-2P
LIU "I" Coil AMP Jr. Timer - Integral
LIM "I" Coil Metri-Pack - Integral

IMMERSION PROOF “L” TYPE
**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)

![Pressure drop vs flow graph]

**VALVE SPECIFICATIONS**

- Nominal Flow: 15 GPM (57 LPM)
- Rated Operating Pressure: 5000 PSI (345 bar)
- Typical Internal Leakage (150 SSU): 8 cu in/min @ 3000 PSI
- Viscosity Range: 36 to 3000 SSU (3 to 647 cSt)
- Filtration: ISO 18/16/13
- Media Operating Temp. Range: -40° to 250°F (-40° to 120°C)
- Weight: 1.01 lbs (.46 kg)
- Operating Fluid Media: General Purpose Hydraulic Fluid
- Cartridge Torque Requirements: 50 ft-lbs (67.8 Nm)
- Coil Nut Torque Requirements: 5-7 ft-lbs (6.8-9.5 Nm)
- Cavity: TECNORD 3W
- Cavity Tools Kit (form tool, reamer, tap): 40500034
- Seal Kit: 21191305

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OPTIONS
Buna Standard 00
Viton Standard V0

BODIES
Blank Without Body
N 3/4” BSP Ports
S #10 SAE Ports

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

“T” COIL TERMINATION
(All DC Except as Noted)
Double Lead DL

DIMENSIONS

ORDERING INFORMATION

Approximate Coil Weight: .78 lbs (.35 kg)
HU-S3F DIRECT ACTING SPOOL, 3 WAY 2 POSITION, HIGH PRESSURE

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

OPERATION
When de-energized the HU-S3F allows flow from (2) to (1) and blocks flow at port (3). When energized the valve allows flow from (2) to (3) and blocks flow at port (1).

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

HYDRAULIC SYMBOL

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

PERFORMANCE
Actual Test Data (Cartridge Only)

VALVE SPECIFICATIONS

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
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</thead>
<tbody>
<tr>
<td>Nominal Flow</td>
<td>15 GPM (57 LPM)</td>
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<tr>
<td>Rated Operating Pressure</td>
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<td>Typical Internal Leakage (150 SSU)</td>
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<tr>
<td>Viscosity Range</td>
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<td>Filtration</td>
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<td>Media Operating Temp. Range</td>
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<tr>
<td>Operating Fluid Media</td>
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<td>Cartridge Torque Requirements</td>
<td>50 ft-lbs (67.8 Nm)</td>
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<td>Coil Nut Torque Requirements</td>
<td>5-7 ft-lbs (6.8-9.5 Nm)</td>
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<tr>
<td>Cavity</td>
<td>TECNORD 3W</td>
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<td>Cavity Tools Kit</td>
<td>40500034</td>
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<tr>
<td>Seal Kit</td>
<td>21191305</td>
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</table>

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TECNORD
Via Malavolti, 36 • 41122 Modena • ITALY • Phone +39 (059) 254895 • Fax +39 (059) 253512
mail: tecnord@tecnord.com • www.tecnord.com

Delta Power Company
4484 Boeing Drive Rockford, IL 61109 • USA • Phone +1 (815) 397-6626 • Fax +1 (815) 397-2526
mail: delta@d Delta Power.com • www.delta-power.com

Page ST116
OPTIONS

Bodies

Buna Standard 00
Viton Standard V0

Voltage (other voltages available on request)

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

“T” Coil Termination (All DC Except as Noted)

Double Lead DL

VOLTAGE

OPTIONS

Bodies

Blank Without Body
N 3/4” BSP Ports
S #10 SAE Ports

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

DIMENSIONS

ORDERING INFORMATION

HU-S3F - - - -

Delta Power Company
4484 Boeing Drive Rockford, IL 61109 • USA • Phone +1 (815) 397-6628 • Fax +1 (815) 397-2526
mail: delta@delta-power.com • www.delta-power.com

TECNORD
Via Malavolti, 36 • 41122 Modena • ITALY • Phone +39 (059) 254895 • Fax +39 (059) 253512
mail: tecnord@tecnord.com • www.tecnord.com

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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.

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
WARNING: the specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.
### PP-S3D DIRECT ACTING SPOOL, 3 WAY 2 POSITION, SELECTOR

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

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

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

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

#### HYDRAULIC SYMBOL
![Hydraulic symbol diagram](image)

**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)

![Flow vs Pressure Drop graph](image)

- Flow (GPM): 0 to 8
- Pressure Drop (PSI): 0 to 30
- Flow (LPM): 0 to 15
- Pressure Drop (bar): 0 to 20

- Port 2 to 1 (de-eng)
- Port 2 to 3 (eng)

#### 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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OPTIONS

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<th>Body Type</th>
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<tr>
<td>Viton Standard</td>
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<td>Viton, Screen, Override, Detent</td>
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VOLTAGE (other voltages available on request)

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

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

"P" TYPE "J" COIL TERMINATION

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<tr>
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<td>JD</td>
<td>&quot;J&quot; Coil Deutsch - Integral DT04-2P</td>
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<td>JJ</td>
<td>&quot;J&quot; Coil AMP Jr. Time - Integral</td>
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<td>JL</td>
<td>&quot;J&quot; Coil Double Lead</td>
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<td>JH</td>
<td>&quot;J&quot; Coil DIN 43650 (Hirschmann)</td>
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ORDERING INFORMATION

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

DIMENSIONS
### 4 WAY 2 POSITION SPOOL VALVES

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<th>PSI</th>
<th>LPM</th>
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</table>

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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.
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)

<table>
<thead>
<tr>
<th>Flow (GPM)</th>
<th>Pressure Drop (PSI)</th>
<th>Port 1 to 4 (de-eng)</th>
<th>Port 2 to 3 (de-eng)</th>
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<table>
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<th>Flow (LPM)</th>
<th>Pressure Drop (PSI)</th>
<th>Port 1 to 4 (de-eng)</th>
<th>Port 2 to 3 (de-eng)</th>
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<tr>
<td>4</td>
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</table>

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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DIMENSIONS

ORDERING INFORMATION

UD-S4A - - - - -

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

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

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

VOLTAGE (other voltages available on request)
12 12 VDC
24 24 VDC
26 220 VAC with molded full wave rectifier

“P” TYPE “J” COIL TERMINATION
JA “J” Coil AMP Superseal - Integral
JD “J” Coil Deutsch - Integral DT04-2P
JJ “J” Coil AMP Jr. Time - Integral
JL “J” Coil Double Lead
JH “J” Coil DIN 43650 (Hirschmann)

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

**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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**SOLENOID OPERATED DIRECTIONAL CONTROLS**

**DIMENSIONS**

![Diagram of solenoid operated directional controls]

**OPTIONS**

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

**BODIES**

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

**VOLTAGE**

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

**“P” TYPE “J” COIL TERMINATION**

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

**ORDERING INFORMATION**

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

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

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

**OPERATION**

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

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

**FEATURES**

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

---

**PERFORMANCE**

Actual Test Data (Cartridge Only)

**HYDRAULIC SYMBOL**

For higher pressures see HG-S4A.

**VALVE SPECIFICATIONS**

- Nominal Flow: 10 GPM (38 LPM)
- Rated Operating Pressure: 3500 PSI (241 bar)
- Typical Internal Leakage (150 SSU): 5 cu in/min (82 ml/min)
- Viscosity Range: 36 to 3000 SSU (3 to 647 cSt)
- Filtration: ISO 18/16/13
- Media Operating Temp. Range: -40° to 250°F (-40° to 120°C)
- Weight: .32 lbs (.15 kg)
- Operating Fluid Media: General Purpose Hydraulic Fluid
- Cartridge Torque Requirements: 30 ft-lbs (40.6 Nm)
- Coil Nut Torque Requirements: 4-6 ft-lbs (5.4-8.1 Nm)
- Cavity: DELTA 4W
- Cavity Tools Kit (form tool, reamer, tap): 40500002
- Seal Kit: 21191214
SOLENOID OPERATED DIRECTIONAL CONTROLS

DIMENSIONS

OPTIONS

Bodies

VOLTAGE

IMMERSION PROOF "D" TYPE

“V” COIL TERMINATION
(All DC Except as Noted)

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

DG-S4A - - - - -

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

DI Deutsch - Integral DT04-2P

DIA "I" Coil AMP Superseal - Integral

DID "I" Coil Deutsch - Integral DT04-2P

DIJ "I" Coil AMP Jr. Timer - Integral

DIM "I" Coil Metri-Pack - Integral

Bodies

Blank Without Body

N 3/8" BSP Ports

S #6 SAE Ports

VOLTAGE (other voltages available on request)

12 12 VDC

24 24 VDC

22 220 VAC without internal rectifier

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.
HG-S4A  DIRECT ACTING SPOOL, 4 WAY 2 POSITION, CRIS CROSS

DESCRIPTION

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.

PERFORMANCE
Actual Test Data (Cartridge Only)

<table>
<thead>
<tr>
<th>Flow (GPM)</th>
<th>Pressure Drop (PSI)</th>
</tr>
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<tr>
<td>0</td>
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</tr>
<tr>
<td>10</td>
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<td>20</td>
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<td>40</td>
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<table>
<thead>
<tr>
<th>Flow (LPM)</th>
<th>Pressure Drop (PSI)</th>
</tr>
</thead>
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<tr>
<td>20</td>
<td>20</td>
</tr>
</tbody>
</table>

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°F to 250°F (-40° to 120°C)
- Weight: .44 lbs (.20 kg)
- Operating Fluid Media: General Purpose Hydraulic Fluid
- Cartridge Torque Requirements: 30 ft-lbs (40.6 Nm)
- Coil Nut Torque Requirements: 4-6 ft-lbs (5.4-8.1 Nm)
- Cavity: DELTA 4W
- Cavity Tools Kit: (form tool, reamer, tap) 40500002
- Seal Kit: 21191214

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

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

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

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

IMMERSION PROOF “L” TYPE

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

OPTIONS

Bodies
Blank Without Body N 3/8” BSP Ports
Viton Standard V0 #6 SAE Ports

VOLTAGE (other voltages available on request)

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

Note: Aluminum, NOT durability rated for 4000 PSI. Consult factory for body options.
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  50 ft-lbs (67.8 Nm)
Coil Nut Torque Requirements  5-7 ft-lbs (6.8-9.5 Nm)
Cavity  TECNORD 4W
Cavity Tools Kit (form tool, reamer, tap)  40500035
Seal Kit  21191309

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

- Buna Standard
- Viton Standard

BODIES

- Blank
- N 3/4" BSP Ports
- S #10 SAE Ports

VOLTAGE (other voltages available on request)

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

DIMENSIONS

ORDERING INFORMATION

- HV-S4A

- BLANK
- N 3/4" BSP Ports
- S #10 SAE Ports

"T" COIL TERMINATION

(All DC Except as Noted)

- Double Lead

DOUBLE LEAD

(Several types of termination can be attached on leads on request)

DIN 43650 (Hirschmann) - (AC&DC)

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

<table>
<thead>
<tr>
<th>Flow (LPM)</th>
<th>Pressure Drop (PSI)</th>
<th>Pressure Drop (BAR)</th>
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<td>0</td>
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<tr>
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<tr>
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</tr>
</tbody>
</table>

![Graph showing flow vs. pressure drop]

**VALVE SPECIFICATIONS**

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
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</thead>
<tbody>
<tr>
<td>Nominal Flow</td>
<td>1.5 GPM (6 LPM)</td>
</tr>
<tr>
<td>Rated Operating Pressure</td>
<td>4000 PSI (276 bar)</td>
</tr>
<tr>
<td>Typical Internal Leakage (150 SSU)</td>
<td>8 cu in/min (131 ml/min)</td>
</tr>
<tr>
<td>Viscosity Range</td>
<td>36 to 3000 SSU (3 to 647 cSt)</td>
</tr>
<tr>
<td>Filtration</td>
<td>ISO 18/16/13</td>
</tr>
<tr>
<td>Media Operating Temp. Range</td>
<td>-40° to 250°F (-40° to 120°C)</td>
</tr>
<tr>
<td>Weight</td>
<td>.15 lbs (.07 kg)</td>
</tr>
<tr>
<td>Operating Fluid Media</td>
<td>General Purpose Hydraulic Fluid</td>
</tr>
<tr>
<td>Cartridge Torque Requirements</td>
<td>15 ft-lbs (20.3 Nm)</td>
</tr>
<tr>
<td>Coil Nut Torque Requirements</td>
<td>4-6 ft-lbs (5.4-8.1 Nm)</td>
</tr>
<tr>
<td>Cavity</td>
<td>MINI 4W</td>
</tr>
<tr>
<td>Cavity Form Tool (Finishing)</td>
<td>40500006</td>
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<tr>
<td>Seal Kit</td>
<td>21191008</td>
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</table>

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DIMENSIONS

ORDERING INFORMATION

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

UD-S4B

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

BODIES
Blank
1/4" BSP Ports N
#6 SAE Ports S

VOLTAGE (other voltages available on request)
12 12 VDC
24 24 VDC
26 220 VAC with molded full wave rectifier

"P" TYPE "J" COIL TERMINATION

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

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

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**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.

**HYDRAULIC SYMBOL**

![Diagram of PQ-S4B valve]

**PERFORMANCE**

Actual Test Data (Cartridge Only)

![Graph showing flow and pressure drop]

**VALVE SPECIFICATIONS**

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nominal Flow</td>
<td>4 GPM (15 LPM)</td>
</tr>
<tr>
<td>Rated Operating Pressure</td>
<td>3000 PSI (207 bar)</td>
</tr>
<tr>
<td>Typical Internal Leakage</td>
<td>5 cu in/min (82 ml/min)</td>
</tr>
<tr>
<td>Viscosity Range</td>
<td>36 to 3000 SSU (3 to 647 cSt)</td>
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<tr>
<td>Filtration</td>
<td>ISO 18/16/13</td>
</tr>
<tr>
<td>Media Operating Temp. Range</td>
<td>-40° to 250°F (-40° to 120°C)</td>
</tr>
<tr>
<td>Weight</td>
<td>.24 lbs (.11 kg)</td>
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<tr>
<td>Operating Fluid Media</td>
<td>General Purpose Hydraulic Fluid</td>
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<tr>
<td>Cartridge Torque Requirements</td>
<td>25 ft-lbs (34 Nm)</td>
</tr>
<tr>
<td>Coil Nut Torque Requirements</td>
<td>4-6 ft-lbs (5.4-8.1 Nm)</td>
</tr>
<tr>
<td>Cavity</td>
<td>POWER 4W</td>
</tr>
<tr>
<td>Cavity Tools Kit</td>
<td>(form tool, reamer, tap)</td>
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<tr>
<td>Seal Kit</td>
<td>40500029</td>
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<tr>
<td></td>
<td>21191108</td>
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</table>

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**OPTIONS**

<table>
<thead>
<tr>
<th>BODIES</th>
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</thead>
<tbody>
<tr>
<td>Blank</td>
<td>Without Body</td>
<td></td>
</tr>
<tr>
<td>N</td>
<td>1/4&quot; BSP Ports</td>
<td></td>
</tr>
<tr>
<td>N1</td>
<td>3/8&quot; BSP Ports</td>
<td></td>
</tr>
<tr>
<td>S</td>
<td>#6 SAE Ports</td>
<td></td>
</tr>
</tbody>
</table>

**VOLTAGE** (other voltages available on request)

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

**DIMENSIONS**

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

**ORDERING INFORMATION**

<table>
<thead>
<tr>
<th>OPTIONS</th>
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</thead>
<tbody>
<tr>
<td>Buna Standard</td>
<td>00</td>
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<tr>
<td>Viton Standard</td>
<td>V0</td>
<td></td>
</tr>
<tr>
<td>Buna, Override, Detent</td>
<td>0M</td>
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<tr>
<td>Viton, Override, Detent</td>
<td>VM</td>
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</tr>
<tr>
<td>Buna, Override, Non-Detent</td>
<td>B1</td>
<td></td>
</tr>
<tr>
<td>Viton, Override, Non-Detent</td>
<td>V1</td>
<td></td>
</tr>
</tbody>
</table>

**“P” TYPE “J” COIL TERMINATION**

<table>
<thead>
<tr>
<th>“P” TYPE “J” COIL TERMINATION</th>
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</tr>
</thead>
<tbody>
<tr>
<td>JA</td>
<td>“J” Coil AMP Superseal - Integral</td>
</tr>
<tr>
<td>JD</td>
<td>“J” Coil Deutsch - Integral DT04-2P</td>
</tr>
<tr>
<td>JJ</td>
<td>“J” Coil AMP Jr. Time - Integral</td>
</tr>
<tr>
<td>JL</td>
<td>“J” Coil Double Lead</td>
</tr>
<tr>
<td>JH</td>
<td>“J” Coil DIN 43650 (Hirschmann)</td>
</tr>
</tbody>
</table>
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.

HYDRAULIC SYMBOL

PERFORMANCE
Actual Test Data (Cartridge Only)

<table>
<thead>
<tr>
<th>Flow (GPM)</th>
<th>Pressure Drop (PSI)</th>
<th>Pressure Drop (bar)</th>
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</thead>
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<td>0.3</td>
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<tr>
<td>10</td>
<td>0.9</td>
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</tbody>
</table>

For higher pressures see HG-S4B. Operational shift limit, 10 GPM (38 LPM). For shift performance consult chart.

VALVE SPECIFICATIONS
Nominal Flow 10 GPM (38 LPM)
Rated Operating Pressure 3000 PSI (207 bar)
Typical Internal Leakage (150 SSU) 5 cu in/min (82 ml/min) per path
Viscosity Range 36 to 3000 SSU (3 to 647 cSt)
Filtration ISO 18/16/13
Media Operating Temp. Range -40° to 250°F (-40° to 120°C)
Weight .32 lbs (.15 kg)
Operating Fluid Media General Purpose Hydraulic Fluid
Cartridge Torque Requirements 30 ft-lbs (40.6 Nm)
Coil Nut Torque Requirements 4-6 ft-lbs (5.4-8.1 Nm)
Cavity DELTA 4W
Cavity Tools Kit (form tool, reamer, tap) 40500002
Seal Kit 21191214

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OPTIONS
- BODIES
  - DL Double Lead
  - HC DIN 43650 (Hirschmann) - (AC&DC)
  - DI Deutsch - Integral DT04-2P
  - DID "I" Coil Deutsch - Integral DT04-2P
  - DJ "I" Coil AMP Jr. Timer - Integral
  - DIM "I" Coil Metri-Pack - Integral

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

DIMENSIONS

ORDERING INFORMATION

DG-S4B

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

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

“V” COIL TERMINATION
(All DC Except as Noted)
- DL Double Lead
- HC DIN 43650 (Hirschmann) - (AC&DC)
- DI Deutsch - Integral DT04-2P
- DID "I" Coil Deutsch - Integral DT04-2P
- DJ "I" Coil AMP Jr. Timer - Integral
- DIM "I" Coil Metri-Pack - Integral

IMMERSION PROOF “D” TYPE
- "I" Coil AMP Superseal - Integral

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

HYDRAULIC SYMBOL

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

PERFORMANCE
Actual Test Data (Cartridge Only)

<table>
<thead>
<tr>
<th>Flow (GPM)</th>
<th>Pressure Drop (PSI)</th>
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<table>
<thead>
<tr>
<th>Flow (LPM)</th>
<th>Pressure Drop (bar)</th>
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<td>0</td>
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<td>30</td>
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<td>20</td>
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VALVE SPECIFICATIONS

Nominal Flow 10 GPM (38 LPM)
Rated Operating Pressure 4000 PSI (276 bar)
Typical Internal Leakage (150 SSU) 10 cu in/min (164 ml/min) per path
Viscosity Range 36 to 3000 SSU (3 to 647 cSt)
Filtration ISO 18/16/13
Media Operating Temp. Range -40° to 250°F (-40° to 120°C)
Weight .44 lbs (.20 kg)
Operating Fluid Media General Purpose Hydraulic Fluid
Cartridge Torque Requirements 30 ft-lbs (40.6 Nm)
Coil Nut Torque Requirements 4-6 ft-lbs (5.4-8.1 Nm)
Cavity DELTA 4W
Cavity Tools Kit (form tool, reamer, tap) 40500002
Seal Kit 21191214

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

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

**OPTIONS**

**BODIES**

**VOLTAGE** (other voltages available on request)

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

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

**IMMERSION PROOF “L” TYPE**

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

HG-S4B – – – –

<table>
<thead>
<tr>
<th>OPTIONS</th>
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<td>Viton Standard</td>
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<th>Blank</th>
<th>Without Body</th>
<th>3/8” BSP Ports</th>
<th>#6 SAE Ports</th>
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<th>VOLTAGE</th>
<th>12 VDC</th>
<th>24 VDC</th>
<th>220 VAC without internal rectifier</th>
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<table>
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<th>IMMERSION PROOF “L” TYPE</th>
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<tr>
<td>LI</td>
<td>&quot;I&quot; Coil Deutsch - Integral DT04-2P</td>
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<tr>
<td>LJ</td>
<td>&quot;I&quot; Coil AMP Jr. Timer - Integral</td>
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<tr>
<td>LM</td>
<td>&quot;I&quot; Coil Metri-Pack - Integral</td>
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**DIMENSIONS**

HG-S4B – – – –

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**ORDERING INFORMATION**

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

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

**PERFORMANCE**

Actual Test Data (Cartridge Only)

![Graph showing flow vs pressure drop]

**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 fl-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.
**DIMENSIONS**

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

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

**VOLTAGE** (other voltages available on request)
- 12V DC: 12
- 24V DC: 24
- 220V AC without internal rectifier: 22

**“P” TYPE “J” COIL TERMINATION**
- JA: “J” Coil AMP Superseal - Integral
- JD: “J” Coil Deutsch - Integral DT04-2P
- JJ: “J” Coil AMP Jr. Time - Integral
- JL: “J” Coil Double Lead
- JH: “J” Coil DIN 43650 (Hirschmann)

**WARNING:** the specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.
**DG-S4C**  
**DIRECT ACTING SPOOL, 4 WAY 2 POSITION, TANDEM CENTER**

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

### OPERATION
When de-energized the DG-S4C allows flow between (2) and (4), and blocks flow at ports (1) and (3).  
When energized the valve allows flow from (2) to (3) and (1) to (4).  
**OPERATION OF MANUAL OVERRIDE OPTION:** to override, turn the manual override screw counterclockwise.  
To release turn the manual override screw clockwise.

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

### PERFORMANCE
**Actual Test Data (Cartridge Only)**

**HYDRAULIC SYMBOL**

![Diagram of DG-S4C](image)

**VALVE SPECIFICATIONS**

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
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</thead>
<tbody>
<tr>
<td>Nominal Flow</td>
<td>8 GPM (30 LPM)</td>
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<tr>
<td>Rated Operating Pressure</td>
<td>3000 PSI (207 bar)</td>
</tr>
<tr>
<td>Typical Internal Leakage (150 SSU)</td>
<td>5 cu in/min (82 ml/min) per path</td>
</tr>
<tr>
<td>Viscosity Range</td>
<td>36 to 3000 SSU (3 to 647 cSt)</td>
</tr>
<tr>
<td>Filtration</td>
<td>ISO 18/16/13</td>
</tr>
<tr>
<td>Media Operating Temp. Range</td>
<td>-40° to 250°F (-40° to 120°C)</td>
</tr>
<tr>
<td>Weight</td>
<td>.31 lbs (.14 kg)</td>
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<tr>
<td>Operating Fluid Media</td>
<td>General Purpose Hydraulic Fluid</td>
</tr>
<tr>
<td>Cartridge Torque Requirements</td>
<td>30 ft-lbs (40.6 Nm)</td>
</tr>
<tr>
<td>Coil Nut Torque Requirements</td>
<td>4-6 ft-lbs (5.4-8.1 Nm)</td>
</tr>
<tr>
<td>Cavity</td>
<td>DELTA 4W</td>
</tr>
<tr>
<td>Cavity Tools Kit</td>
<td>(form tool, reamer, tap)</td>
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<td></td>
<td>405000002</td>
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<td>Seal Kit</td>
<td>21191214</td>
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**For higher pressures see HG-S4C. Operational shift limit, 8 GPM (30 LPM). For shift performance consult chart.**

---

**Delta Power Company**  
4484 Boeing Drive Rockford, IL 61109 • USA • Phone +1 (815) 397-6626 • Fax +1 (815) 397-2526  
mail: delta@delta-power.com • www.delta-power.com

**Tecnord**  
Via Malavolti, 36 • 41122 Modena • ITALY • Phone +39 (059) 254895 • Fax +39 (059) 253512  
mail: tecnord@tecnord.com • www.tecnord.com
OPTIONS
Buna Standard 00
Viton Standard V0
Buna, Override, Detent 0M
Viton, Override, Detent VM

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

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

“V” COIL TERMINATION
(All DC Except as Noted)
DL Double Lead
(Several types of termination can be attached on leads on request)

IMMERSION PROOF “D” TYPE
HC DIN 43650 (Hirschmann) - (AC&DC)
DI Deutsch - Integral DT04-2P
DIA "I" Coil AMP Superseal - Integral
DID "I" Coil Deutsch - Integral DT04-2P
DIJ "I" Coil AMP Jr. Timer - Integral
DIM "I" Coil Metri-Pack - Integral

DIMENSIONS

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

TECNORD •
4484 Boeing Drive Rockford, IL 61109 • USA • Phone +1 (815) 397-6628 • Fax +1 (815) 397-2526
mail: delta@delta-power.com • www.delta-power.com

TECNORD
SOLENOID OPERATED DIRECTIONAL CONTROLS

ORDERING INFORMATION
DG-S4C - - - - –

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

**HYDRAULIC SYMBOL**

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

**PERFORMANCE**

Actual Test Data (Cartridge Only)

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<th>Pressure Drop (bar)</th>
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<tr>
<td>1</td>
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<tr>
<td>2</td>
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<tr>
<td>3</td>
<td>30</td>
</tr>
<tr>
<td>4</td>
<td>40</td>
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**VALVE SPECIFICATIONS**

<table>
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<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nominal Flow</td>
<td>8 GPM (30 LPM)</td>
</tr>
<tr>
<td>Rated Operating Pressure</td>
<td>4000 PSI (276 bar)</td>
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<tr>
<td>Typical Internal Leakage (150 SSU)</td>
<td>10 cu in/min (164 ml/min) per path</td>
</tr>
<tr>
<td>Viscosity Range</td>
<td>36 to 3000 SSU (3 to 647 cSt)</td>
</tr>
<tr>
<td>Filtration</td>
<td>ISO 18/16/13</td>
</tr>
<tr>
<td>Media Operating Temp. Range</td>
<td>-40° to 250°F (-40° to 120°C)</td>
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<tr>
<td>Weight</td>
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<tr>
<td>Operating Fluid Media</td>
<td>General Purpose Hydraulic Fluid</td>
</tr>
<tr>
<td>Cartridge Torque Requirements</td>
<td>30 ft-lbs (40.6 Nm)</td>
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<tr>
<td>Coil Nut Torque Requirements</td>
<td>4-6 ft-lbs (5.4-8.1 Nm)</td>
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<tr>
<td>Cavity</td>
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<td>Cavity Tools Kit</td>
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<td>Seal Kit</td>
<td>21191214</td>
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**Note:** Aluminum, NOT durability rated for 4000 PSI. Consult factory for body options.

**OPTIONS**
- Boda Standard: 00
- Viton Standard: V0

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

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

**“L” COIL TERMINATION**
(All DC Except as Noted)
- DL: Double Lead
  (several types of termination can be attached on leads on request)
- HC: DIN 43650 (Hirschmann) - (AC&DC) DI: Deutsch - Integral DT04-2P
- LIA: "I" Coil AMP Superseal - Integral
- LID: "I" Coil Deutsch - Integral DT04-2P
- LJ: "I" Coil AMP Jr. Timer - Integral
- LIM: "I" Coil Metri-Pack - Integral

**DIMENSIONS**

**ORDERING INFORMATION**

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

HG-S4C - - - -

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

**PERFORMANCE**

**Actual Test Data (Cartridge Only)**

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<td>3</td>
<td>0</td>
</tr>
<tr>
<td>4</td>
<td>0</td>
</tr>
</tbody>
</table>

**HYDRAULIC SYMBOL**

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

**VALVE SPECIFICATIONS**

- Nominal Flow: 2.5 GPM (9.5 LPM)
- Rated Operating Pressure: 3000 PSI (207 bar)
- Typical Internal Leakage (150 SSU): 5 cu in/min (82 ml/min) per path
- Viscosity Range: 36 to 3000 SSU (3 to 647 cSt)
- Filtration: ISO 18/16/13
- Media Operating Temp. Range: -40° to 250°F (-40° to 120°C)
- Weight: .24 lbs (.11 kg)
- Operating Fluid Media: General Purpose Hydraulic Fluid
- Cartridge Torque Requirements: 25 ft-lbs (34 Nm)
- Coil Nut Torque Requirements: 4-6 ft-lbs (5.4-8.1 Nm)
- Cavity: POWER 4W
- Cavity Tools Kit: (form tool, reamer, tap) 40500029
- Seal Kit: 21191108

**WARNING:** Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.
SOLENOID OPERATED DIRECTIONAL CONTROLS

DIMENSIONS

ORDERING INFORMATION

PQ-S4D - - - -

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

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

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

"P" TYPE "J" COIL TERMINATION

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

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

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

**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.

For higher pressures see HG-S4D. Operational shift limit, 6 GPM (23 LPM). For shift performance consult chart.
WARNING: the specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.
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.

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

OPTIONS
- Boda Standard 00
- Viton Standard V0

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

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

“L” COIL TERMINATION (All DC Except as Noted)
- DL Double Lead (several types of termination can be attached on leads on request)
- HC DIN 43650 (Hirschmann) - (AC&DC)
- DI Deutsch - Integral DT04-2P

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

Approximate Coil Weight: .68 lbs (.31 kg)
DG-S4E  DIRECT ACTING SPOOL, 4 WAY 2 POSITION, SERIES/PARALLEL

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

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

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

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

HYDRAULIC SYMBOL

PERFORMANCE
Actual Test Data (Cartridge Only)

VALVE SPECIFICATIONS
Nominal Flow 6 GPM (23 LPM)
Rated Operating Pressure 3000 PSI (207 bar)
Typical Internal Leakage (150 SSU) 5 cu in/min (82 ml/min) per path
Viscosity Range 36 to 3000 SSU (3 to 647 cSt)
Filtration ISO 18/16/13
Media Operating 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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### OPTIONS

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</tr>
<tr>
<td>N</td>
<td>3/8” BSP Ports</td>
</tr>
<tr>
<td>S</td>
<td>#6 SAE Ports</td>
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</tbody>
</table>

### BODIES

- Buna Standard
- Viton Standard
- Buna, Override, Detent
- Viton, Override, Detent

### VOLTAGE

- 12 VDC
- 24 VDC
- 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)
HG-S4E  DIRECT ACTING SPOOL, 4 WAY 2 POSITION, SERIES/PARALLEL

DESCRIPTION

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.

HYDRAULIC SYMBOL

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

PERFORMANCE
Actual Test Data (Cartridge Only)

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| Port 2 to 1 (de-eng) | Port 3 to 4 (de-eng) | Port 2 to 4 (eng) |

| Port 2 to 1 (de-eng) | Port 3 to 4 (de-eng) | Port 2 to 4 (eng) |

| Port 2 to 1 (de-eng) | Port 3 to 4 (de-eng) | Port 2 to 4 (eng) |

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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ORDERING INFORMATION

HG-S4E  

OPTIONS
- Buna Standard 00
- Viton Standard V0

BODIES
- Blank (Without Body)
- N 3/8” BSP Ports
- S #6 SAE Ports

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

“L” COIL TERMINATION
(All DC Except as Noted)
- DL Double Lead
- HC DIN 43650 (Hirschmann) - (AC&DC)
- DI Deutsch - Integral DT04-2P

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

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

Approximate Coil Weight: .68 lbs (.31 kg)
HV-S4E  DIRECT ACTING SPOOL, 4 WAY 2 POSITION, SERIES/PARALLEL

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

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

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

HYDRAULIC SYMBOL

PERFORMANCE
Actual Test Data (Cartridge Only)

VALVE SPECIFICATIONS
Nominal Flow 15 GPM (57 LPM)
Rated Operating Pressure 5000 PSI (345 bar)
Typical Internal Leakage (150 SSU) 8 cu in/min (131 ml/min) per path
Viscosity Range 36 to 3000 SSU (3 to 647 cSt)
Filtration ISO 18/16/13
Media Operating Temp. Range -40° to 250°F (-40° to 120°C)
Weight 1.09 lbs (.49 kg)
Operating Fluid Media General Purpose Hydraulic Fluid
Cartridge Torque Requirements 50 ft-lbs (67.8 Nm)
Coil Nut Torque Requirements 5-7 ft-lbs (6.8-9.5 Nm)
Cavity TECNORD 4W
Cavity Tools Kit (form tool, reamer, tap) 40500035
Seal Kit 21191309
**OPTIONS**

- Buna Standard
- Viton Standard

**DIMENSIONS**

- HV-S4E
- 1.25 [31.8] HEX
- 1 1/16 12-UNF 2A THREAD

**ORDERING INFORMATION**

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

- **BODIES**
  - Blank Without Body
  - N 3/4" BSP Ports
  - S #10 SAE Ports

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

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***HV-S4E***

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

**TECNORD**

Via Malavolti, 36 • 41122 Modena • ITALY • Phone +39 (059) 254895 • Fax +39 (059) 253512

mail: tecnord@tecnord.com • www.tecnord.com

**Delta Power Company**

4484 Boeing Drive Rockford, IL 61109 • USA • Phone +1 (815) 397-6628 • Fax +1 (815) 397-2526

mail: delta@delta-power.com • www.delta-power.com
DG-S4F  DIRECT ACTING SPOOL, 4 WAY 2 POSITION, ENERGIZED TO BLOCK

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

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

OPERATION OF MANUAL OVERRIDE OPTION: to override, 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

For higher pressures see HG-S4F. Operational shift limit, 6 GPM (23 LPM). For shift performance consult chart.

PERFORMANCE
Actual Test Data (Cartridge Only)

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Flow (LPM)

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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 fl-lbs (40.6 Nm)
Coil Nut Torque Requirements 4-6 fl-lbs (5.4-8.1 Nm)
Cavity DELTA 4W
Cavity Tools Kit (form tool, reamer, tap) 40500002
Seal Kit 21191214

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DIMENSIONS

OPTIONS
- Buna Standard: 00
- Viton Standard: V0
- Buna, Override, Detent: 0M
- Viton, Override, Detent: VM
- Buna, Override, Non-Detent: B1
- Viton, Override, Non-Detent: V1

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

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

“V” COIL TERMINATION
- DL: Double Lead
- (several types of termination can be attached on leads on request)

IMMERSION PROOF “D” TYPE
- HC: DIN 43650 (Hirschmann) - (AC&DC)
- DI: Deutsch - Integral DT04-2P
- DIA: “I” Coil AMP Superseal - Integral
- DID: “I” Coil Deutsch - Integral DT04-2P
- DJ: “I” Coil AMP Jr. Timer - Integral
- DIM: “I” Coil Metri-Pack - Integral
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.

HYDRAULIC SYMBOL

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

PERFORMANCE
Actual Test Data (Cartridge Only)

<table>
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<th>Flow (GPM)</th>
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| Port 2 to 1 (de-eng) | Port 3 to 4 (de-eng) |

VALVE SPECIFICATIONS

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<tr>
<td>Rated Operating Pressure</td>
<td>4000 PSI (276 bar)</td>
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<td>Typical Internal Leakage</td>
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<td>Viscosity Range</td>
<td>36 to 3000 SSU (3 to 647 cSt)</td>
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<td>Filtration</td>
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<td>Media Operating Temp. Range</td>
<td>-40° to 250°F (-40° to 120°C)</td>
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<td>Coil Nut Torque Requirements</td>
<td>4-6 ft-lbs (5.4-8.1 Nm)</td>
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<td>Cavity</td>
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**Note:** Aluminum, NOT durability rated for 4000 PSI. Consult factory for body options.

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

- DL: Double Lead (several types of termination can be attached on leads on request)
- HC: DIN 43650 (Hirschmann) - (AC&DC)
- DI: Deutsch - Integral DT04-2P
- LI: "I" Coil AMP Superseal - Integral
- LID: "I" Coil Deutsch - Integral DT04-2P
- LJ: "I" Coil AMP Jr. Timer - Integral
- LIM: "I" Coil Metri-Pack - Integral

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

**IMMERSION PROOF “L” TYPE**
- DL Double Lead
- HC DIN 43650 (Hirschmann) - (AC&DC)
- DI Deutsch - Integral DT04-2P
- LI "I" Coil AMP Superseal - Integral
- LID "I" Coil Deutsch - Integral DT04-2P
- LJ "I" Coil AMP Jr. Timer - Integral
- LIM "I" Coil Metri-Pack - Integral

**DIMENSIONS**

**ORDERING INFORMATION**

HG-S4F

- OPTIONS
  - Buna Standard: 00
  - Viton Standard: V0

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

- VOLTAGE
  - 12: 12 VDC
  - 24: 24 VDC
  - 22: 220 VAC without internal rectifier

Approximate Coil Weight: .68 lbs (.31 kg)
## 4 WAY 3 POSITION SPOOL VALVES

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<th>PSI</th>
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<td>ST194</td>
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</table>

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

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.
## ORDERING INFORMATION

**VQ-S4M**

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**VOLTAGE** (other voltages available on request)

- 12 VDC
- 24 VDC
- 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
- "I" Coil AMP Superseal - Integral
- "I" Coil Deutsch - Integral DT04-2P
- "I" Coil AMP Jr. Timer - Integral
- "I" Coil Metri-Pack - Integral

**DIMENSIONS**

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

**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.
**DIMENSIONS**

![Diagram of SOLENOID OPERATED DIRECTIONAL CONTROLS]

**ORDERING INFORMATION**

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<td>#6 SAE Ports</td>
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**VOLTAGE** (other voltages available on request)

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

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

- DL Double Lead
- HC DIN 43650 (Hirschmann) - (AC&DC)
- DI Deutsch - Integral DT04-2P
- DIA "I" Coil AMP Superseal - Integral
- DID "I" Coil Deutsch - Integral DT04-2P
- DJU "I" Coil AMP Jr. Timer - Integral
- DIM "I" Coil Metri-Pack - Integral

**IMMERSION PROOF “D” TYPE**

- DL Double Lead
- HC DIN 43650 (Hirschmann) - (AC&DC)
- DI Deutsch - Integral DT04-2P
- DIA "I" Coil AMP Superseal - Integral
- DID "I" Coil Deutsch - Integral DT04-2P
- DJU "I" Coil AMP Jr. Timer - Integral
- DIM "I" Coil Metri-Pack - Integral

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

PERFORMANCE
Actual Test Data (Cartridge Only)

USES “L” Coil. Flow rating is at 1000 PSID maximum differential loading.

HYDRAULIC SYMBOL

VALVE SPECIFICATIONS
Nominal Flow 6.5 GPM (25 LPM)
Rated Operating Pressure 3000 PSI (207 bar)
Typical Internal Leakage (150 SSU) 5 cu in/min (82 ml/min) per path
Viscosity Range 36 to 3000 SSU (3 to 647 cSt)
Filtration ISO 18/16/13
Media Operating Temp. Range -40” to 250°F (-40° to 120°C)
Weight .51 lbs (.23 kg)
Operating Fluid Media General Purpose Hydraulic Fluid
Cartridge Torque Requirements 30 ft-lbs (40.6 Nm)
Coil Nut Torque Requirements 4-6 ft-lbs (5.4-8.1 Nm)
Cavity DELTA 4W
Cavity Tools Kit (form tool, reamer, tap) 40500002
Seal Kit 21191214

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

**DIMENSIONS**

#### OPTIONS
- Buna Standard: 00
- Viton Standard: V0
- Buna, Override, Detent: 0M
- Viton, Override, Detent: VM
- Buna, Push Only Override: 0P
- Viton, Push Only Override: VP

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

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

#### "L" COIL TERMINATION
(All DC Except as Noted)
- DL: Double Lead
  - (several types of termination can be attached on leads on request)
- HC: DIN 43650 (Hirschmann) - (AC&DC)
- DI: Deutsch - Integral DT04-2P

#### IMMERSION PROOF "L" TYPE
- LIA: "I" Coil AMP Superseal - Integral
- LID: "I" Coil Deutsch - Integral DT04-2P
- LJ: "I" Coil AMP Jr. Timer - Integral
- LIM: "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.
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.

HYDRAULIC SYMBOL

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

PERFORMANCE
Actual Test Data (Cartridge Only)

Valve Specifications

Nominal Flow 5 GPM (19 LPM)
Rated Operating Pressure 3000 PSI (207 bar)
Typical Internal Leakage (150 SSU) 5 cu in/min (82 ml/min) per path
Viscosity Range 36 to 3000 SSU (3 to 647 cSt)
Filtration ISO 18/16/13
Media Operating 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
SOLENOID OPERATED DIRECTIONAL CONTROLS

ORDERING INFORMATION

**OPTIONS**

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<td>Buna, Push Only Override</td>
<td>22 220 VAC without internal rectifier</td>
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<tr>
<td>Viton, Push Only Override</td>
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</table>

**“V” COIL TERMINATION**

- 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
- DIJ "I" Coil AMP Jr. Timer - Integral
- DIM "I" Coil Metri-Pack - Integral

**IMMERSION PROOF “D” TYPE**

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

**DIMENSIONS**

- PQ-S4N
- BODIES
- OPTIONS
- VOLTAGE (other voltages available on request)
- “V” COIL TERMINATION
- IMMERSION PROOF “D” TYPE

---

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

PERFORMANCE
Actual Test Data (Cartridge Only)

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Valve Specifications
Nominal Flow 6 GPM (23 LPM)
Rated Operating Pressure 3000 PSI (207 bar)
Typical Internal Leakage (150 SSU) 5 cu in/min (82 ml/min) per path
Viscosity Range 36 to 3000 SSU (3 to 647 cSt)
Filtration ISO 18/16/13
Media Operating Temp. Range -40° to 250°F (-40° to 120°C)
Weight .52 lbs (.23 kg)
Operating Fluid Media General Purpose Hydraulic Fluid
Cartridge Torque Requirements 30 ft-lbs (40.6 Nm)
Coil Nut Torque Requirements 4-6 ft-lbs (5.4-8.1 Nm)
Cavity DELTA 4W
Cavity Tools Kit (form tool, reamer, tap) 40500002
Seal Kit 21191214

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Via Malavolti, 36 • 41122 Modena • ITALY • Phone +39 (059) 254895 • Fax +39 (059) 253512
mail: tecnord@tecnord.com • www.tecnord.com

Delta Power Company
4484 Boeing Drive Rockford, IL 61109 • USA • Phone +1 (815) 397-6628 • Fax +1 (815) 397-2526
mail: delta@delta-power.com • www.delta-power.com
DIMENSIONS

OPTIONS
- Buna Standard 00
- Viton Standard V0
- Buna, Override, Detent OM
- Viton, Override, Detent VM
- Buna, Push Only Override 0P
- Viton, Push Only Override VP

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

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

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

"L" COIL TERMINATION
(All DC Except as Noted)
- Double Lead DL
- Deutsch - Integral DT04-2P DI
- DIN 43650 (Hirschmann) - (AC&DC) HC
- "I" Coil AMP Superseal - Integral LIA
- "I" Coil Deutsch - Integral DT04-2P LID
- "I" Coil AMP Jr. Timer - Integral LJJ
- "I" Coil Metri-Pack - Integral LIM

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

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

PERFORMANCE
Actual Test Data (Cartridge Only)

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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.
**DIMENSIONS**

**ORDERING INFORMATION**

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<td>Packard on Leads</td>
<td></td>
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<tr>
<td>WL</td>
<td>Weatherpack on Leads</td>
<td>SS</td>
<td>Single Spade</td>
<td></td>
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<tr>
<td>DS</td>
<td>Double Spade</td>
<td>HC</td>
<td>DIN 43650 (Hirschmann) - (AC&amp;DC)</td>
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</tr>
<tr>
<td>CL</td>
<td>Conduit Lead - (AC Only)</td>
<td>DI</td>
<td>Deutsch - Integral DT04-2P</td>
<td></td>
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<thead>
<tr>
<th>IMMERSION PROOF &quot;P&quot; TYPE</th>
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<tbody>
<tr>
<td>IA</td>
<td>&quot;I&quot; Coil AMP SuperSeal - Integral</td>
<td>ID</td>
<td>&quot;I&quot; Coil Deutsch - Integral DT04-2P</td>
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<tr>
<td>IU</td>
<td>&quot;I&quot; Coil AMP Jr. Timer - Integral</td>
<td>IM</td>
<td>&quot;I&quot; Coil Meter-Pack - Integral</td>
<td></td>
</tr>
</tbody>
</table>

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

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

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) 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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ORDERING INFORMATION

PQ-S4R

OPTIONS

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

VOLTAGE

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

"P" COIL TERMINATION

(All DC Except as Noted)

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

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

DELTA POWER CO.

1.25 [31.7]
1.25 [31.7]

6.3
[15.9]

1.25
[31.8]

1.25
[39.1]

SEE COIL DATA
FOR TERMINATIONS.

DELTA POWER CO.

4.82
[122.3]

28 [7.1] DIA.
MTG. HOLES
2X

0.25
[6.4]

2.10
[53.3]

65
[16.5]

.88 [22.2] HEX

S1

S2

3/4-16 UNF
2A THREAD

.59
[15.1]

5.90
[149.9]

4.85
[123.1]

1.75
[44.5]

2.25
[57.2]

BODY WEIGHT: .87 lbs (.39 kg)

DELTA POWER CO.
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.

PERFORMANCE
Actual Test Data (Cartridge Only)

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<tr>
<th>Flow (GPM)</th>
<th>Pressure Drop (PSI)</th>
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<tr>
<td>5</td>
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<tr>
<td>10</td>
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<tr>
<td>15</td>
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<td>20</td>
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<table>
<thead>
<tr>
<th>Flow (LPM)</th>
<th>Pressure Drop (PSI)</th>
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<tbody>
<tr>
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<tr>
<td>5</td>
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<td>10</td>
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<tr>
<td>15</td>
<td>15</td>
</tr>
<tr>
<td>20</td>
<td>20</td>
</tr>
</tbody>
</table>

HYDRAULIC SYMBOL

Valve Specifications
Nominal Flow 3 GPM (11 LPM)
Rated Operating Pressure 3000 PSI (207 bar)
Typical Internal Leakage (150 SSU) 5 cu in/min (82 ml/min) per path
Viscosity Range 36 to 3000 SSU (3 to 647 cSt)
Filtration ISO 18/16/13
Media Operating Temp. Range -40° to 250°F (-40° to 120°C)
Weight .42 lbs (.19 kg)
Operating Fluid Media General Purpose Hydraulic Fluid
Cartridge Torque Requirements 25 ft-lbs (34 Nm)
Coil Nut Torque Requirements 4-6 ft-lbs (5.4-8.1 Nm)
Cavity POWER 4W
Cavity Tools Kit (form tool, reamer, tap) 40500029
Seal Kit 21191108

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

TECNORD
Via Malavolti, 36 • 41122 Modena • ITALY • Phone +39 (059) 254895 • Fax +39 (059) 253512
mail: tecnord@tecnord.com • www.tecnord.com

TECNORD
4484 Boeing Drive Rockford, IL 61109 • USA • Phone +1 (815) 397-6626 • Fax +1 (815) 397-2526
mail: delta@delta-power.com • www.delta-power.com

Page ST180
WARNING: the specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

DIMENSIONS

OPTIONS
Buna Standard
Viton Standard
Buna, Push Only Override
Viton, Push Only Override

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

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

“V” COIL TERMINATION
(All DC Except as Noted)
DL
Double Lead
(several types of termination can be attached on leads on request)

IMMERSION PROOF “D” TYPE
HC
DIN 43650 (Hirschmann) - (AC&DC)
DI
Deutsch - Integral DT04-2P
DIA
”I” Coil AMP Superseal - Integral
DID
”I” Coil Deutsch - Integral DT04-2P
DIJ
”I” Coil AMP Jr. Timer - Integral
DIM
”I” Coil Metri-Pack - Integral

ORDERING INFORMATION

PQ-S4O

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

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

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

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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DIMENSIONS

OPTIONS
Buna Standard 00
Viton Standard V0
Buna, Override, Detent OM
Viton, Override, Detent VM
Buna, Push Only Override 0P
Viton, Push Only Override VP

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

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

“L” COIL TERMINATION
(All DC Except as Noted)
DL Double Lead
(several types of termination can be attached on leads on request)

IMMERSION PROOF “L” TYPE
“T” Coil AMP Superseal - Integral
“T” Coil Deutsch - Integral DT04-2P
“T” Coil AMP Jr. Timer - Integral
“T” Coil Metri-Pack - Integral
**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.

**PERFORMANCE**

Actual Test Data (Cartridge Only)

![Graph](image)

**HYDRAULIC SYMBOL**

![Symbol](image)

**VALVE SPECIFICATIONS**

<table>
<thead>
<tr>
<th>Specification</th>
<th>Specification</th>
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</thead>
<tbody>
<tr>
<td>Nominal Flow</td>
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<tr>
<td>Rated Operating Pressure</td>
<td>3000 PSI (207 bar)</td>
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<tr>
<td>Typical Internal Leakage (150 SSU)</td>
<td>5 cu in/min (82 ml/min) per path</td>
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<tr>
<td>Viscosity Range</td>
<td>36 to 3000 SSU (3 to 647 cSt)</td>
</tr>
<tr>
<td>Filtration</td>
<td>ISO 18/16/13</td>
</tr>
<tr>
<td>Media Operating Temp. Range</td>
<td>-40°F to 250°F (-40°C to 120°C)</td>
</tr>
<tr>
<td>Weight</td>
<td>.42 lbs (.19 kg)</td>
</tr>
<tr>
<td>Operating Fluid Media</td>
<td>General Purpose Hydraulic Fluid</td>
</tr>
<tr>
<td>Cartridge Torque Requirements</td>
<td>25 ft-lbs (34 Nm)</td>
</tr>
<tr>
<td>Coil Nut Torque Requirements</td>
<td>4-6 ft-lbs (5.4-8.1 Nm)</td>
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<tr>
<td>Cavity</td>
<td>POWER 4W</td>
</tr>
<tr>
<td>Cavity Tools Kit</td>
<td>(form tool, reamer, tap)</td>
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<td>405000029</td>
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<tr>
<td>Seal Kit</td>
<td>21191108</td>
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**DIMENSIONS**

**ORDERING INFORMATION**

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

<table>
<thead>
<tr>
<th>OPTIONS</th>
<th>BODIES</th>
<th>VOLTAGE</th>
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<tbody>
<tr>
<td>Buna Standard 00</td>
<td>Blank Without Body</td>
<td>06 6 VDC</td>
</tr>
<tr>
<td>Viton Standard V0</td>
<td>N 1/4 NPTF Ports</td>
<td>12 12 VDC</td>
</tr>
<tr>
<td>Buna, Push Only Override 0P</td>
<td>S #6 SAE Ports</td>
<td>24 24 VDC</td>
</tr>
<tr>
<td>Viton, Push Only Override VP</td>
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<td>36 36 VDC</td>
</tr>
<tr>
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<td>48 48 VDC</td>
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<td>25 25 VAC</td>
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<td></td>
<td>22 220 VAC</td>
</tr>
<tr>
<td></td>
<td></td>
<td>44 440 VAC</td>
</tr>
</tbody>
</table>

**“D” COIL TERMINATION**

(All DC Except as Noted)

- DL Double Lead
- DT Deutsch on Leads DT04-2P
- ML Metri-Pack 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

DELTA POWER COMPANY

4484 Boeing Drive Rockford, IL 61109 • USA • Phone +1 (815) 397-6628 • Fax +1 (815) 397-2526

mail: delta@delta-power.com • www.delta-power.com

TECNORD

Via Malavolti, 36 • 41122 Modena • ITALY • Phone +39 (059) 254895 • Fax +39 (059) 253512

mail: tecnord@tecnord.com • www.tecnord.com
**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.

**VALVE SPECIFICATIONS**
- **Nominal Flow**: 3.5 GPM (13.2 LPM)
- **Rated Operating Pressure**: 3000 PSI (207 bar)
- **Typical Internal Leakage (150 SSU)**: 10 cu in/min (63 ml/min) per path
- **Viscosity Range**: 36 to 3000 SSU (3 to 647 cSt)
- **Filtration**: ISO 18/16/13
- **Media Operating Temp. Range**: -40° to 250°F (-40° to 120°C)
- **Weight**: .42 lbs (.19 kg)
- **Operating Fluid Media**: General Purpose Hydraulic Fluid
- **Cartridge Torque Requirements**: 25 ft-lbs (34 Nm)
- **Coil Nut Torque Requirements**: 4-6 ft-lbs (5.4-8.1 Nm)
- **Cavity**: POWER 4W
- **Cavity Form Tool (Finishing)**: 40500029
- **Seal Kit**: 21191108

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DIMENSIONS

ORDERING INFORMATION

VQ-S4Q

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<td>Viton Standard</td>
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<td>11 120 VAC</td>
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<td>22 220 VAC</td>
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<tr>
<td>44 440 VAC</td>
</tr>
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"P" COIL TERMINATION

(All DC Except as Noted)

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<tr>
<td>Double Lead</td>
<td>Deutsch on Leads DT04-2P</td>
<td>Metri-Pack on Leads</td>
<td>Packard on Leads</td>
<td>Weatherpack on Leads</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>SS</th>
<th>DS</th>
<th>HC</th>
<th>CL</th>
<th>DI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Single Spade</td>
<td>Double Spade</td>
<td>DIN 43650 (Hirschmann) - (AC&amp;DC)</td>
<td>Conduit Lead - (AC Only)</td>
<td>Deutsch - integral DT04-2P</td>
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</tbody>
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<table>
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<th>IMMERSION PROOF &quot;P&quot; TYPE</th>
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<tbody>
<tr>
<td>IA</td>
</tr>
<tr>
<td>&quot;I&quot; Coil AMP Superseal - Integral</td>
</tr>
</tbody>
</table>

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

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Delta Power Company
4484 Boeing Drive Rockford, IL 61109 • USA • Phone +1 (815) 397-6628 • Fax +1 (815) 397-2526
mail: delta@delta-power.com • www.delta-power.com

TECNORD
Via Malavolti, 36 • 41122 Modena • ITALY • Phone +39 (059) 254895 • Fax +39 (059) 253512
mail: tecnord@tecnord.com • www.tecnord.com
**PQ-S4P**  DIRECT ACTING SPOOL, 4 WAY 3 POSITION, CLOSED CENTER

**DESCRIPTION**
8 size, 3/4-16 thread, “Power” series, solenoid operated, 4 way 3 position, closed center spool valve.

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

**OPERATION OF MANUAL OVERRIDE OPTION:** push Only Override - Spring biased in neutral center position, when pushed the valve shifts in the (S2) direction.

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

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

**HYDRAULIC SYMBOL**

**VALVE SPECIFICATIONS**

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
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<td>Nominal Flow</td>
<td>5 GPM (19 LPM)</td>
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<tr>
<td>Rated Operating Pressure</td>
<td>3000 PSI (207 bar)</td>
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<tr>
<td>Typical Internal Leakage</td>
<td>5 cu in/min (82 ml/min) per path</td>
</tr>
<tr>
<td>Viscosity Range</td>
<td>36 to 3000 SSU (3 to 647 cSt)</td>
</tr>
<tr>
<td>Filtration</td>
<td>ISO 18/16/13</td>
</tr>
<tr>
<td>Media Operating Temp. Range</td>
<td>-40° to 250°F (-40° to 120°C)</td>
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<tr>
<td>Weight</td>
<td>.42 lbs (.19 kg)</td>
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<tr>
<td>Operating Fluid Media</td>
<td>General Purpose Hydraulic Fluid</td>
</tr>
<tr>
<td>Cartridge Torque Requirements</td>
<td>25 ft-lbs (34 Nm)</td>
</tr>
<tr>
<td>Coil Nut Torque Requirements</td>
<td>4-6 ft-lbs (5.4-8.1 Nm)</td>
</tr>
<tr>
<td>Cavity</td>
<td>Power 4W</td>
</tr>
<tr>
<td>Cavity Tools Kit</td>
<td>(form tool, reamer, tap)</td>
</tr>
<tr>
<td>Seal Kit</td>
<td>40500029</td>
</tr>
<tr>
<td></td>
<td>21191108</td>
</tr>
</tbody>
</table>

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A   

TECNORD

4484 Boeing Drive Rockford, IL 61109 • USA • Phone +1 (815) 397-6626 • Fax +1 (815) 397-2526
mail: delta@delta-power.com • www.delta-power.com

Via Malavolti, 36 • 41122 Modena • ITALY • Phone +39 (059) 254895 • Fax +39 (059) 253512
mail: tecnord@tecnord.com • www.tecnord.com
DIMENSIONS

OPTIONS
- Buna Standard
- Viton Standard
- Buna, Push Only Override
- Viton, Push Only Override

BODIES
- Blank
- 1/4" BSP Ports
- 3/8" BSP Ports
- #6 SAE Ports

VOLTAGE
- 12 VDC
- 24 VDC
- 220 VAC without internal rectifier

“V” COIL TERMINATION
- DL Double Lead
- HC DIN 43650 (Hirschmann) - (AC&DC)
- DI Deutsch - Integral DT04-2P
- DIJ "I" Coil AMP Jr. Timer - Integral
- DIM "I" Coil Metri-Pack - Integral

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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Approximate Coil Weight: .56 lbs (.25 kg)
DG-S4P DIRECT ACTING SPOOL, 4 WAY 3 POSITION, CLOSED CENTER

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

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

OPERATION OF MANUAL OVERRIDE OPTION: Bidirectional Override - Spring biased in neutral center position, when pushed the valve shifts in the (S2) direction, when pulled the valve shifts in the S1 direction.
Push Only Override - Spring biased in neutral center position, when pushed the valve shifts in the (S2) direction.

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

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°F 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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DIMENSIONS

OPTIONS
Buna Standard 00
Viton Standard V0
Buna, Override, Detent 0M
Viton, Override, Detent VM
Buna, Push Only Override 0P
Viton, Push Only Override VP

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

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

“L” COIL TERMINATION
(All DC Except as Noted)
DL Double Lead
( several types of termination can be attached on leads on request)

IMMERSION PROOF “L” TYPE
HC DIN 43650 (Hirschmann) - (AC&DC)
DI Deutsch - Integral DT04-2P
LIA "I" Coil AMP Superseal - Integral
LID "I" Coil Deutsch - Integral DT04-2P
LIJ "I" Coil AMP Jr. Timer - Integral
LIM "I" Coil Metri-Pack - Integral

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SOLENOID OPERATED DIRECTIONAL CONTROLS

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 “I” 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.
DIMENSIONS

*PUSH ONLY* OVERRIDE

STANDARD

S1

.56 [14.2] HEX M6T

1.25 [31.7]

SEE COIL DATA FOR TERMINATIONS.

S2

.88 [22.2] HEX

3/4-16 UNF 2A THREAD

ORDERING INFORMATION

PQ-S4Q

OPTIONS

Buna Standard
Viton Standard
Buna, Push Only Override
Viton, Push Only Override

BODIES

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

VOLTAGE

6 VDC
12 VDC
24 VDC
36 VDC
48 VDC
25 VAC
110 VAC
220 VAC
440 VAC

"P" TYPE "J" COIL TERMINATION

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

JJ "J" Coil AMP Jr. Time - Integral

JL "J" Coil Double Lead

JH "J" Coil DIN 43650 (Hirschmann)

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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.

PERFORMANCE
Actual Test Data (Cartridge Only)

<table>
<thead>
<tr>
<th>Port 3 to 4 (de-eng)</th>
<th>Port 3 to 4 (eng S1)</th>
<th>Port 2 to 1 (eng S1)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flow (LPD)</td>
<td>Pressure Drop (PSI)</td>
<td>Pressure Drop (bar)</td>
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<tr>
<td>0</td>
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<tr>
<td>30</td>
<td>30</td>
<td>30</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Port 1 to 4 (eng S2)</th>
<th>Port 2 to 3 (eng S2)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flow (GPM)</td>
<td>Pressure Drop (PSI)</td>
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<tr>
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<td>0</td>
</tr>
<tr>
<td>5</td>
<td>5</td>
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<td>25</td>
<td>25</td>
</tr>
<tr>
<td>30</td>
<td>30</td>
</tr>
</tbody>
</table>

HYDRAULIC SYMBOL

USES “L” Coil. Flow rating is at 1000 PSID maximum differential loading.

VALVE SPECIFICATIONS

| Nominal Flow    | 6 GPM (23 LPM)    |
| Rated Operating Pressure | 3000 PSI (207 bar) |
| Typical Internal Leakage (150 SSU) | 5 cu in/min (82 ml/min) per path |
| Viscosity Range | 36 to 3000 SSU (3 to 647 cSt) |
| Filtration      | ISO 18/16/13      |
| Media Operating 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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SOLENOID OPERATED DIRECTIONAL CONTROLS

DIMENSIONS

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

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

VOLTAGE
- 12 VDC
- 24 VDC
- 220 VAC without internal rectifier

"L" COIL TERMINATION
- Double Lead DL (several types of termination can be attached on leads on request)
- DIN 43650 (Hirschmann) - (AC&DC) HC
- Deutsch - Integral DT04-2P DI
- "I" Coil AMP Superseal - Integral LIA
- "I" Coil Deutsch - Integral DT04-2P LID
- "I" Coil AMP Jr. Timer - Integral LJ
- "I" Coil Metri-Pack - Integral LIM

IMMERSION PROOF "L" TYPE

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

Approximate Coil Weight: .68 lbs (.31 kg)
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## TRANSMISSION & BRAKE SPOOL VALVES

<table>
<thead>
<tr>
<th>SCREW-IN STYLE</th>
<th>GPM</th>
<th>PSI</th>
<th>LPM</th>
<th>BAR</th>
<th>CAVITY</th>
<th>MODEL</th>
<th>PAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>3</td>
<td>1000</td>
<td>11</td>
<td>70</td>
<td>5/8-18</td>
<td>TC-S3A</td>
<td>ST198</td>
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<tr>
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<td>11</td>
<td>103</td>
<td>5/8-18</td>
<td>UC-S3T</td>
<td>ST206</td>
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<td></td>
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<td>1000</td>
<td>23</td>
<td>70</td>
<td>7/8-14</td>
<td>TF-S3A</td>
<td>ST208</td>
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<tr>
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<td>6</td>
<td>1000</td>
<td>23</td>
<td>70</td>
<td>7/8-14</td>
<td>TF-S3D</td>
<td>ST202</td>
</tr>
<tr>
<td></td>
<td>5</td>
<td>1000</td>
<td>19</td>
<td>70</td>
<td>7/8-14</td>
<td>TG-S4A</td>
<td>ST212</td>
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<table>
<thead>
<tr>
<th>SLIP-IN STYLE, FLANGED RETAINED</th>
<th>GPM</th>
<th>PSI</th>
<th>LPM</th>
<th>BAR</th>
<th>CAVITY</th>
<th>MODEL</th>
<th>PAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>6</td>
<td>1000</td>
<td>23</td>
<td>70</td>
<td>Special</td>
<td>IF-S3A-57</td>
<td>ST200</td>
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<td>6</td>
<td>1000</td>
<td>23</td>
<td>70</td>
<td>Special</td>
<td>IF-S3D-57</td>
<td>ST204</td>
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<td>50</td>
<td>Special</td>
<td>IC-S3D-43</td>
<td>ST210</td>
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<td>5</td>
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<td>19</td>
<td>70</td>
<td>Special</td>
<td>IG-S4A-58</td>
<td>ST214</td>
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</table>

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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**

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

**VALVE SPECIFICATIONS**
- Nominal Flow
  - 3 GPM (11 LPM) from (1) to (3)
  - 2 GPM (7.6 LPM) from (3) to (2)
- Rated Operating Pressure
  - 1000 PSI (70 bar)
- Typical Internal Leakage (150 SSU)
  - 5 cu in/min (82 ml/min)
- Viscosity Range
  - 36 to 3000 SSU (3 to 647 cSt)
- Filtration
  - ISO 20/18/15
- Media Operating Temp. Range
  - -40° to 250°F (-40° to 120°C)
- Weight
  - .14 lbs (.06 kg)
- Operating Fluid Media
  - General Purpose Hydraulic Fluid
- Cartridge Torque Requirements
  - 15 ft-lbs (20.3 Nm)
- Coil Nut Torque Requirements
  - 3-4 ft-lbs (4.1-5.4 Nm)
- Cavity
  - MINI 3W
- Cavity form Tool (finishing)
  - 40500004
- Seal Kit
  - 21191006

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

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OPTIONS
BODIES
Buna Standard 00 Blank
Viton Standard V0 Without Body

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

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

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

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

**HYDRAULIC SYMBOL**

<table>
<thead>
<tr>
<th>1</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
</tr>
<tr>
<td>3</td>
</tr>
<tr>
<td>(1)</td>
</tr>
<tr>
<td>(2)</td>
</tr>
<tr>
<td>(3)</td>
</tr>
</tbody>
</table>

**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°F to 200°F (-37.2°C 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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DIMENSIONS

ORDERING INFORMATION

IF-S3A-57-MP12 -

BODIES
Blank
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.

HYDRAULIC SYMBOL

PERFORMANCE
Actual Test Data (Cartridge Only)

<table>
<thead>
<tr>
<th>Nominal Flow</th>
<th>6 GPM (23 LPM)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rated Operating Pressure</td>
<td>1000 PSI (70 bar)</td>
</tr>
<tr>
<td>Typical Internal Leakage (150 SSU)</td>
<td>3 cu in/min (50 ml/min)</td>
</tr>
<tr>
<td>Viscosity Range</td>
<td>36 to 3000 SSU (3 to 647 cSt)</td>
</tr>
<tr>
<td>Filtration</td>
<td>ISO 18/16/13</td>
</tr>
<tr>
<td>Media Operating Temp. Range</td>
<td>-40° to 250°F (-40° to 120°C)</td>
</tr>
<tr>
<td>Weight</td>
<td>.28 lbs (.12 kg)</td>
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<tr>
<td>Operating Fluid Media</td>
<td>General Purpose Hydraulic Fluid</td>
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<tr>
<td>Cartridge Torque Requirements</td>
<td>30 ft-lbs (40.6 Nm)</td>
</tr>
<tr>
<td>Coil Nut Torque Requirements</td>
<td>3-4 ft-lbs (4.1-5.4 Nm)</td>
</tr>
<tr>
<td>Cavity</td>
<td>DELTA 3W</td>
</tr>
<tr>
<td>Cavity Tools Kit (form tool, reamer, tap)</td>
<td>40500001</td>
</tr>
<tr>
<td>Seal Kit</td>
<td>21191210</td>
</tr>
</tbody>
</table>

WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.
### OPTIONS
- Buna Standard: 00
- Viton Standard: V0
- Buna, Screen: A0
- Viton, Screen: W0

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

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

### “V” COIL TERMINATION
(All DC Except as Noted)
- DL: Double Lead
  (several types of termination can be attached on leads on request)
- HC: DIN 43650 (Hirschmann) - (AC&DC)
- DI: Deutsch - Integral DT04-2P
- DIA: "I" Coil AMP Superseal - Integral
- DID: "I" Coil Deutsch - Integral DT04-2P
- DJ: "I" Coil AMP Jr. Timer - Integral
- DIM: "I" Coil Metri-Pack - Integral

### DIMENSIONS

See coil data for terminations

### ORDERING INFORMATION

TF-S3D - - - -

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

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**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.

---

**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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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)

<table>
<thead>
<tr>
<th>Flow (GPM)</th>
<th>Pressure Drop (PSI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>1</td>
<td>20</td>
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<tr>
<td>2</td>
<td>40</td>
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<tr>
<td>3</td>
<td>60</td>
</tr>
<tr>
<td>4</td>
<td>80</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Flow (LPM)</th>
<th>Pressure Drop (BAR)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>5</td>
<td>10</td>
</tr>
<tr>
<td>10</td>
<td>20</td>
</tr>
<tr>
<td>15</td>
<td>30</td>
</tr>
</tbody>
</table>

Valve: Port 1 to 3 (eng) — Port 3 to 2 (de-eng)

VALVE SPECIFICATIONS

<table>
<thead>
<tr>
<th>Nominal Flow</th>
<th>3 GPM (11 LPM) from (1) to (3)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2 GPM (8 LPM) from (3) to (2)</td>
</tr>
<tr>
<td>Rated Operating Pressure</td>
<td>1500 PSI (103 bar)</td>
</tr>
<tr>
<td>Typical Internal Leakage (150 SSU)</td>
<td>8 cu in/min (131 ml/min)</td>
</tr>
<tr>
<td>Viscosity Range</td>
<td>36 to 3000 SSU (3 to 647 cSt)</td>
</tr>
<tr>
<td>Filtration</td>
<td>ISO 18/16/13</td>
</tr>
<tr>
<td>Media Operating Temp. Range</td>
<td>-40° to 250°F (-40° to 120°C)</td>
</tr>
<tr>
<td>Weight</td>
<td>.14 lbs (.06 kg)</td>
</tr>
<tr>
<td>Operating Fluid Media</td>
<td>General Purpose Hydraulic Fluid</td>
</tr>
<tr>
<td>Cartridge Torque Requirements</td>
<td>15 ft-lbs (20.3 Nm)</td>
</tr>
<tr>
<td>Coil Nut Torque Requirements</td>
<td>4-6 ft-lbs (5.4-8.1 Nm)</td>
</tr>
<tr>
<td>Cavity</td>
<td>MINI 3W</td>
</tr>
<tr>
<td>Cavity Form Tool (Finishing)</td>
<td>405000004</td>
</tr>
<tr>
<td>Seal Kit</td>
<td>21191006</td>
</tr>
</tbody>
</table>

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DIMENSIONS

ORDERING INFORMATION

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

OPTIONS

<table>
<thead>
<tr>
<th>UC-S3T</th>
<th>-</th>
<th>-</th>
<th>-</th>
<th>-</th>
</tr>
</thead>
<tbody>
<tr>
<td>OPTIONS</td>
<td>Buna Standard</td>
<td>00</td>
<td>Viton Standard</td>
<td>V0</td>
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</tbody>
</table>

BODIES

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>BODIES</td>
<td>Blank</td>
<td>N</td>
<td>1/4&quot; BSP Ports</td>
</tr>
<tr>
<td>Without Body</td>
<td>S</td>
<td>#6 SAE Ports</td>
<td>(2x) [0.256 [0.665]]</td>
</tr>
</tbody>
</table>

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

VOLTAGE (other voltages available on request)

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>VOLTAGE</td>
<td>12</td>
<td>24</td>
<td>26</td>
</tr>
<tr>
<td>12 VDC</td>
<td>24 VDC</td>
<td>220 VAC with molded full wave rectifier</td>
<td></td>
</tr>
</tbody>
</table>

"P" TYPE "J" COIL TERMINATION

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>&quot;P&quot; TYPE &quot;J&quot; COIL TERMINATION</td>
<td>JA</td>
<td>JD</td>
<td>JJ</td>
</tr>
<tr>
<td>&quot;J&quot; Coil AMP Superseal - Integral</td>
<td>&quot;J&quot; Coil Deutsch - Integral DT04-2P</td>
<td>&quot;J&quot; Coil AMP Jr. Time - Integral</td>
<td>&quot;J&quot; Cable Double Lead</td>
</tr>
</tbody>
</table>

Note: Aluminum, NOT durability rated for 4000 PSI. Consult factory for body options.
**TF-S3A** DIRECT ACTING SPOOL, 3 WAY 2 POSITION, TRANSMISSION & BRAKE

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

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

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

### HYDRAULIC SYMBOL

---

### PERFORMANCE
Actual Test Data (Cartridge Only)

### VALVE SPECIFICATIONS

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nominal Flow</td>
<td>6 GPM (23 LPM)</td>
</tr>
<tr>
<td>Rated Operating Pressure</td>
<td>1000 PSI (70 bar)</td>
</tr>
<tr>
<td>Typical Internal Leakage (150 SSU)</td>
<td>3 cu in/min (50 ml/min)</td>
</tr>
<tr>
<td>Viscosity Range</td>
<td>36 to 3000 SSU (3 to 647 cSt)</td>
</tr>
<tr>
<td>Filtration</td>
<td>ISO 18/16/13</td>
</tr>
<tr>
<td>Media Operating Temp. Range</td>
<td>-40° to 250°F (-40° to 120°C)</td>
</tr>
<tr>
<td>Weight</td>
<td>.28 lbs (.12 kg)</td>
</tr>
<tr>
<td>Operating Fluid Media</td>
<td>General Purpose Hydraulic Fluid</td>
</tr>
<tr>
<td>Cartridge Torque Requirements</td>
<td>30 ft-lbs (40.6 Nm)</td>
</tr>
<tr>
<td>Coil Nut Torque Requirements</td>
<td>3-4 ft-lbs (4.1-5.4 Nm)</td>
</tr>
<tr>
<td>Cavity</td>
<td>DELTA 3W</td>
</tr>
<tr>
<td>Cavity Tools Kit (form tool, reamer, tap)</td>
<td>40500001</td>
</tr>
<tr>
<td>Seal Kit</td>
<td>21191210</td>
</tr>
</tbody>
</table>

---

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

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

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

“V” COIL TERMINATION
(All DC Except as Noted)
DL Double Lead
(Several types of termination can be attached on leads on request)

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

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

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

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

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

HYDRAULIC SYMBOL

PERFORMANCE
Actual Test Data (Cartridge Only)

<table>
<thead>
<tr>
<th>Bar</th>
<th>lt/min.</th>
<th>A: 2-&gt;3</th>
<th>B: 3-&gt;1</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>2</td>
<td>B</td>
<td>A</td>
</tr>
<tr>
<td>3</td>
<td>5</td>
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</tr>
<tr>
<td>6</td>
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<tr>
<td>9</td>
<td>12</td>
<td></td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>15</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

VALVE SPECIFICATIONS
- Nominal Flow: 1.5 GPM (6 LPM) @ 8 bar Delta P
- Max Inlet Pressure: 700 PSI (50 bar)
- Max Back-Pressure at T Port: 20 bar
- Internal Leakage: 15 ml/min @ 500 PSI (35 bar) inlet
- Viscosity Range: 36 to 3000 SSU (3 to 647 cSt)
- Filtration: ISO 18/16/13
- Media Operating Temp. Range: -30°C / +100°C
- Weight: .54 lbs (.25 kg)
- Operating Fluid Media: General Purpose Hydraulic Fluid
- Cavity: T043
- Cavity Tool Kit: K-T043
- Flange Mounting Screws and Torque: M4x10 / 3ft-lbs (4 Nm)

COIL SPECIFICATIONS
- coil resistance (12 VDC): 7 Ohm ±5% at 68°F (20°C)
- coil resistance (24 VDC): 25 Ohm ±5% at 68°F (20°C)
- Protection Degree: IP 67 according to IEC 529
- Coil Termination: Deutsch-Integral DT04-2P
- AMP Jr. Timer 84-9419
- Color Connectors: Black

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**DIMENSIONS**

**ORDERING INFORMATION**

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

<table>
<thead>
<tr>
<th>IC-S3D-43</th>
<th>COIL TERMINATION</th>
<th>12 VDC</th>
<th>OPTIONS</th>
<th>BODIES</th>
</tr>
</thead>
<tbody>
<tr>
<td>AJ - AMP Jr. Timer</td>
<td>DT - Deutsch DT04</td>
<td>24 VDC</td>
<td>00 - NBR seals</td>
<td>Blank - Without body</td>
</tr>
<tr>
<td></td>
<td>DT - Deutsch DT04 Horizontal</td>
<td></td>
<td></td>
<td>N - 1/4&quot; BSP Ports</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>S - #6 SAE Ports</td>
</tr>
</tbody>
</table>

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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.

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

**DIMENSIONS**

**ORDERING INFORMATION**

TG-S4A

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

HYDRAULIC SYMBOL
(3) \(\rightarrow\) (1)
(2) \(\rightarrow\) (4)

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
WARNING: the specifications/application data shown in our catalogs and data sheets are intended only 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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