SOLENOID OPERATED DIRECTIONAL CONTROLS

3 Way 2 Position Spool Valves

<table>
<thead>
<tr>
<th>GPM</th>
<th>PSI</th>
<th>LPM</th>
<th>BAR</th>
<th>MODEL</th>
<th>CAVITY</th>
<th>PAGE</th>
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<tbody>
<tr>
<td>1</td>
<td>3000</td>
<td>4</td>
<td>207</td>
<td>MC-S3A</td>
<td>5/8&quot;-18</td>
<td>94</td>
</tr>
<tr>
<td>2</td>
<td>4000</td>
<td>8</td>
<td>276</td>
<td>HC-S3A</td>
<td>5/8&quot;-18</td>
<td>96</td>
</tr>
<tr>
<td>3</td>
<td>3000</td>
<td>11</td>
<td>207</td>
<td>PP-S3A</td>
<td>3/4&quot;-16</td>
<td>98</td>
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<tr>
<td>10</td>
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<td>207</td>
<td>DF-S3A</td>
<td>7/8&quot;-14</td>
<td>100</td>
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<tr>
<td>10</td>
<td>4000</td>
<td>38</td>
<td>276</td>
<td>HF-S3A</td>
<td>7/8&quot;-14</td>
<td>102</td>
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<td>30</td>
<td>207</td>
<td>DF-S3B</td>
<td>7/8&quot;-14</td>
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</tr>
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<td>4000</td>
<td>30</td>
<td>276</td>
<td>HF-S3B</td>
<td>7/8&quot;-14</td>
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<tr>
<td>15</td>
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<td>57</td>
<td>345</td>
<td>HU-S3E</td>
<td>1 1/16&quot;-12</td>
<td>108</td>
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<td>15</td>
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<td>345</td>
<td>HU-S3F</td>
<td>1 1/16&quot;-12</td>
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<td>207</td>
<td>PP-S3X</td>
<td>3/4&quot;-16</td>
<td>114</td>
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<tr>
<td>3</td>
<td>3000</td>
<td>11</td>
<td>207</td>
<td>PP-S3D</td>
<td>3/4&quot;-16</td>
<td>116</td>
</tr>
</tbody>
</table>

Typical Schematic

Typical application for porting option 1 is to operate a spring loaded hydraulic clutch.
Typical application for porting option 2 is single acting cylinder control in a gravity lower circuit.
Typical application for porting option 3 is a selector valve for two different systems or functions.

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a Delta Power Co.
MC-S3A Direct Acting Spool, 3 Way 2 Position

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

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

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

HYDRAULIC SYMBOL
Operational shift limit 1 GPM (3.8 LPM) from (1) to (3) at 3000 PSI and 2 GPM (7.6 LPM) from (3) to (2) with no load.
For shifted flow performance consult chart.
For higher pressures or flows see HC-S3A

PERFORMANCE
Actual Test Data (Cartridge Only)

<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>1</td>
<td>5</td>
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<tr>
<td>2</td>
<td>10</td>
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</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>2</td>
<td>5</td>
</tr>
</tbody>
</table>

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

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a Delta Power Co.
**SOLENOID OPERATED DIRECTIONAL CONTROLS**

**TECNORD**

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An Delta Power Co.

---

### DIMENSIONS

SEE COIL DATA FOR TERMINATIONS

- 1.19 [30.3]
- 0.88 [22.2] HEX
- 1.90 [48.2]
- 0.50 [12.7] HEX NUT
- 2.2 [56.1]
- 1.40 [35.5]

---

### ORDERING INFORMATION

**MC-S3A**

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

**BODIES**
- Without Body
- ¼" BSP Ports N
- #6 SAE Ports S

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

**“M” COIL TERMINATION**
- Double Lead DL
- DIN 43650 (Hirschman) HC

Approximate Coil Weight: .30 lbs/.14 kg.
SOLENOID OPERATED DIRECTIONAL CONTROLS

HC-S3A Direct Acting Spool, 3 Way 2 Position

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

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

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

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

PERFORMANCE
Actual Test Data (Cartridge Only)

<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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<tr>
<td>2</td>
<td>10</td>
</tr>
<tr>
<td>3</td>
<td>15</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Flow (LPM)</th>
<th>Pressure Drop (BAR)</th>
</tr>
</thead>
<tbody>
<tr>
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<td>0</td>
</tr>
<tr>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>10</td>
<td>10</td>
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| Port 1 to 3 (eng) | Port 3 to 2 (de-eng) |

<table>
<thead>
<tr>
<th>VALVE SPECIFICATIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nominal Flow</td>
</tr>
<tr>
<td>Rated Operating Pressure</td>
</tr>
<tr>
<td>Typical Internal Leakage</td>
</tr>
<tr>
<td>Viscosity Range</td>
</tr>
<tr>
<td>Filtration</td>
</tr>
<tr>
<td>Media Operating Temperature Range</td>
</tr>
<tr>
<td>Weight</td>
</tr>
<tr>
<td>Operating Fluid Media</td>
</tr>
<tr>
<td>Cartridge Torque</td>
</tr>
<tr>
<td>Cartridge Torque Requirements</td>
</tr>
<tr>
<td>Cavity</td>
</tr>
<tr>
<td>Cavity Tools kit (form tool, reamer, tap)</td>
</tr>
<tr>
<td>Seal Kit</td>
</tr>
</tbody>
</table>

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*a Delta Power Co.*
**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>Flow (LPM)</th>
<th>Pressure Drop (PSI)</th>
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</thead>
<tbody>
<tr>
<td>1</td>
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<tr>
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<td>5</td>
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<tr>
<td>3</td>
<td>10</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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<td>1</td>
<td>5</td>
</tr>
<tr>
<td>2</td>
<td>10</td>
</tr>
<tr>
<td>3</td>
<td>15</td>
</tr>
</tbody>
</table>

**VALVE SPECIFICATIONS**

- Nominal Flow: 3 GPM (11 LPM)
- Rated Operating Pressure: 3000 PSI (207 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 Temperature Range: -40° to 250° F (-40° to 120° C)
- Weight: 23 lbs. (.10 kg)
- Operating Fluid Media: General Purpose Hydraulic Fluid
- Cartridge Torque Requirements: 25 ft-lbs (34 Nm)
- Coil Nut Torque Requirements: 4-6 ft-lbs (5.4-8.1 Nm)
- Cavity: POWER 3W
- Cavity Tools kit (form tool, reamer, tap): 40500024
- Seal Kit: 21191105

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a Delta Power Co.
**SOLENOID OPERATED DIRECTIONAL CONTROLS**

**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**

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
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</thead>
<tbody>
<tr>
<td>Nominal Flow</td>
<td>10 GPM (38 LPM)</td>
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<tr>
<td>Rated Operating Pressure</td>
<td>3000 PSI (207 bar)</td>
</tr>
<tr>
<td>Typical Internal Leakage</td>
<td>5 cu/in per 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 Temperature</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>
</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 (form tool, reamer, tap)</td>
<td>40500001</td>
</tr>
<tr>
<td>Seal Kit</td>
<td>21191210</td>
</tr>
</tbody>
</table>

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SOLENOID OPERATED DIRECTIONAL CONTROLS

DIMENSIONS

ORDERING INFORMATION

DF-S3A

OPTIONS

Buna Standard 00
Viton Standard V0
Buna, Override OM
Viton, Override VM
Viton, Screen W0
Viton, Screen, Override B3

BODIES

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

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).

"V" COIL TERMINATION

DL Double Lead (* several types of termination can be attached on leads on request)
HC Din 43650 (Hirschman)
DI Deutsch – Integral DT04-2P

IMMERSION PROOF “D” TYPE

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

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

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a Delta Power Co.
**Solenoid Operated Directional Controls**

**HF-S3A Direct Acting Spool, 3 Way 2 Position**

**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” Coil.

**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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<td>0</td>
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<tr>
<td>6</td>
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<tr>
<td>8</td>
<td>16</td>
</tr>
<tr>
<td>10</td>
<td>20</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Flow (LPM)</th>
<th>Pressure Drop (BAR)</th>
</tr>
</thead>
<tbody>
<tr>
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<td>0</td>
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<tr>
<td>10</td>
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<td>20</td>
<td>32</td>
</tr>
<tr>
<td>30</td>
<td>48</td>
</tr>
<tr>
<td>40</td>
<td>64</td>
</tr>
</tbody>
</table>

**Valve Specifications**

- Nominal Flow: 10 GPM (38 LPM)
- Rated Operating Pressure: 4500 PSI (315 bar)
- Typical Internal Leakage: 8 cu/in per min (131 ml/min)
- Viscosity Range: 36 to 3000 SSU (3 to 647 cSt)
- Filtration: ISO 18/16/13
- Media Operating Temperature Range: -40° to 250° F (-40° to 120° C)
- Weight: .40 lbs. (.18 kg)
- Operating Fluid Media: General Purpose Hydraulic Fluid
- Cartridge Torque: 30 ft-lbs (40.6 Nm)
- Requirements: 6-6 ft-lbs (5.4-8.1 Nm)
- Cavity: DELTA 3W
- Cavity Tools Kit: 40500001
- Seal Kit: 21191210

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SOLENOID OPERATED DIRECTIONAL CONTROLS

TECNORD

DIMENSIONS

HF-S3A - - - 

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 
(*several types of termination can be attached on leads on request) 
HC DIN 43650 (Hirschman) (AC&DC) 
DI Deutsch – integral DT04-2P 

IMMERSION PROOF “L” TYPE
LIJ “I” Coil AMP Jr. Timer - Integral 
LIM “I” Coil Metri-Pack – Integral 
LII “I” Coil AMP Superseal - Integral 
LID “I” Coil Deutsch – integral DT04-2P 

Approximate Coil Weight: .69 lbs / .31 kg

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DESCRIPTION

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

OPERATION

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

OPERATION OF MANUAL OVERRIDE OPTION: To override, 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

Trapped differentials above 1500 PSI from ports 2 to 1 can create shift issues near flow rating. (Differentials to 3000 psi from 1 to 2 are not an issue.)

For higher pressures consult HF-S3B.

PERFORMANCE

Actual Test Data (Cartridge Only)

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

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

VALVE SPECIFICATIONS

- Nominal Flow: 8 GPM (30 LPM)
- Rated Operating Pressure: 3000 PSI (207 bar)
- Typical Internal Leakage: 5 cu/in per min (82 ml/min)
- Viscosity Range: 36 to 3000 SSU (3 to 647 cSt)
- Filtration: ISO 18/16/13
- Media Operating Temperature Range: -40° to 250° F (-40° to 120° C)
- Weight: 0.28 lbs. (0.12 kg)
- Operating Fluid Media: General Purpose Hydraulic Fluid
- Cartridge Torque Requirements: 30 ft-lbs (40.6 Nm)
- Coil Nut Torque Requirements: 4-6 ft-lbs (5.4-8.1 Nm)
- Cavity: DELTA 3W
- Cavity Tools Kit (form tool, reamer, tap): 40500001
- Seal Kit: 21191210

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TECNORD
Phone +39 059 254895  Fax +39 059 253512  E-mail: tecnord@tecnord.com

a Delta Power Co.
SOLENOID OPERATED DIRECTIONAL CONTROLS

HF-S3B Direct Acting Spool, 3 Way 2 Position, Selector

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

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

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

HYDRAULIC SYMBOL

Uses “L” Coil.

PERFORMANCE
Actual Test Data (Cartridge Only)

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

<table>
<thead>
<tr>
<th>VALVE SPECIFICATIONS</th>
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<tbody>
<tr>
<td>Nominal Flow</td>
</tr>
<tr>
<td>Rated Operating Pressure</td>
</tr>
<tr>
<td>Typical Internal Leakage (150 SSU)</td>
</tr>
<tr>
<td>Viscosity Range</td>
</tr>
<tr>
<td>Filtration</td>
</tr>
<tr>
<td>Media Operating</td>
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<tr>
<td>Weight</td>
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<tr>
<td>Operating Fluid Media</td>
</tr>
<tr>
<td>Cartridge Torque</td>
</tr>
<tr>
<td>Requirements</td>
</tr>
<tr>
<td>Cavity</td>
</tr>
<tr>
<td>Cavity Tools kit (form tool, reamer, tap)</td>
</tr>
<tr>
<td>Seal Kit</td>
</tr>
</tbody>
</table>

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a Delta Power Co.
SOLENOID OPERATED DIRECTIONAL CONTROLS

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TECNORD
Phone +39 059 254895   Fax +39 059 253512   E-mail: tecnord@tecnord.com

a Delta Power Co.
Solenoid Operated Directional Controls

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

<table>
<thead>
<tr>
<th>Pressure Drop vs Flow</th>
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<tbody>
<tr>
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<td>PSI</td>
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Valve Specifications

<table>
<thead>
<tr>
<th>Nominal Flow</th>
<th>15 GPM (57 LPM)</th>
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</thead>
<tbody>
<tr>
<td>Rated Operating Pressure</td>
<td>5000 PSI (345 bar)</td>
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<tr>
<td>Typical Internal Leakage (150 SSU)</td>
<td>8 cu in/min @ 3000 PSI</td>
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<tr>
<td>Viscosity Range</td>
<td>36 to 300 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 Temperature Range</td>
<td>-40° to 250° F (-40° to 120° C)</td>
</tr>
<tr>
<td>Weight</td>
<td>1.01 lbs. (.46 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>5-7 ft-lbs (6.8-9.5 Nm)</td>
</tr>
<tr>
<td>Cavity</td>
<td>TECNORD 3W</td>
</tr>
<tr>
<td>Cavity Tools kit (form tool, reamer, tap)</td>
<td>40500034</td>
</tr>
<tr>
<td>Seal Kit</td>
<td>21191305</td>
</tr>
</tbody>
</table>

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TECNORD
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a Delta Power Co.
SOLENOID OPERATED DIRECTIONAL CONTROLS

DIMENSIONS

ORDERING INFORMATION

HU-S3E

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
(*several types of termination can be attached on leads on request)
DIN 43650 (Hirschman) – (AC & DC) HC

Approximate Coil Weight: .78 lbs / .35 kg

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a Delta Power Co.
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**
Common usage is inlet at port 1 or 2. See HU-S3E for port 3 inlet.

**PERFORMANCE**

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

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a Delta Power Co.
HC-S3P Direct Acting Spool, 3 Way 2 Position, Pilot Control, Low Leakage

DESCRIPTION


OPERATION

When de-energized the HC-S3P blocks flow at (1) and allows flow from (3) to (2). When energized the valve allows flow from (1) to (3) and blocks flow at (2).

FEATURES

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

HYDRAULIC SYMBOL

Great for pilot control, low leakage.

PERFORMANCE

Actual Test Data (Cartridge Only)

<table>
<thead>
<tr>
<th>Flow (GPM)</th>
<th>Pressure Drop (PSI)</th>
</tr>
</thead>
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<tr>
<td>0.6</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>0.5</td>
<td>0.5</td>
</tr>
<tr>
<td>0.6</td>
<td>0.6</td>
</tr>
</tbody>
</table>

Valve Specifications

- Nominal Flow: 0.3 GPM (1.13 LPM)
- Rated Operating Pressure: 4000 PSI (276 bar)
- Typical Internal Leakage: 3 cu in/min (49 ml/min)
- Viscosity Range: 36 to 3000 SSU (3 to 647 cSt)
- Filtration: ISO 18/16/13
- Media Operating Temperature Range: -40° to 250° F (-40° to 120° C)
- Weight: 0.15 lbs. (.07 kg)
- Operating Fluid Media: General Purpose Hydraulic Fluid
- Cartridge Torque Requirements: 15 ft-lbs (20.3 Nm)
- Coil Nut Torque Requirements: 3-5 ft-lbs (4.1-6.8 Nm)
- Cavity: MINI 3W
- Cavity Tools kit (form tool, reamer, tap): 40500004
- Seal Kit: 21191004

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a Delta Power Co.
SOLENOID OPERATED DIRECTIONAL CONTROLS

TECNORD

PHONE +39 059 253512     FAX +39 059 253512                E-MAIL: TECNORD@TECNORD.com

DIMENSIONS

See coil data for terminations

ORDERING INFORMATION

HC-S3P

OPTIONS
Buna Standard 00
Viton Standard V0

“M” COIL TERMINATION
Double Lead DL
(* several types of termination can be attached on leads on request)
DIN 43650 (Hirschman) HC

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

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

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

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TECNORD a Delta Power Co.
SOLENOID OPERATED DIRECTIONAL CONTROLS

PP-S3X Direct Acting Spool, 3 Way 2 Position, Selector

DESCRIPTION

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

OPERATION

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

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

FEATURES

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

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)

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

<table>
<thead>
<tr>
<th>Flow (GPM)</th>
<th>Pressure Drop (PSI)</th>
<th>Flow (GPM)</th>
<th>Pressure Drop (BAR)</th>
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<table>
<thead>
<tr>
<th>VALVE SPECIFICATIONS</th>
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</thead>
<tbody>
<tr>
<td>Nominal Flow</td>
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<tr>
<td>Rated Operating Pressure</td>
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<tr>
<td>Typical Internal Leakage (150 SSU)</td>
</tr>
<tr>
<td>Viscosity Range</td>
</tr>
<tr>
<td>Filtration</td>
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<tr>
<td>Media Operating Temperature Range</td>
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<tr>
<td>Weight</td>
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<tr>
<td>Operating Fluid Media</td>
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<tr>
<td>Cartridge Torque Requirements</td>
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<tr>
<td>Coil Nut Torque Requirements</td>
</tr>
<tr>
<td>Cavity</td>
</tr>
<tr>
<td>Cavity Tools kit (form tool, reamer, tap)</td>
</tr>
<tr>
<td>Seal Kit</td>
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a Delta Power Co.
SOLENOID OPERATED DIRECTIONAL CONTROLS

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a Delta Power Co.

DIMENSIONS

ORDERING INFORMATION

PP-S3X

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

BODIES
Blank Without Body
N ¼" BSP Ports
N1 3/8" BSP Ports
S #6 SAE Ports

VOLTAGE (*other voltages available on request)
Buna, Override, Non-detent 12 12 VDC
12
Viton, Override, Non-detent 24 24 VDC
24
Buna, Screen, Override, Detent 22 220 VAC without internal rectifier
22
Viton, Screen, Override, Detent 22

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

“K” COIL TERMINATION

(All DC Except as Noted)

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

HC DIN 43650 (Hirschman) – (AC & DC)
DI Deutsch – Integral DT04-2P
PIA "I" Coil AMP Superseal - Integral
PID "I" Coil Deutsch – Integral DT04-2P
PIJ "I" Coil AMP Jr. Timer - Integral
PIM "I" Coil Metri-Pack – Integral

APPROXIMATE COIL WEIGHT: .42 lbs. (.19 kg.)
**Solenoid Operated Directional Controls**

**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**

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

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

**VALVE SPECIFICATIONS**
- **Nominal Flow:** 3 GPM (11 LPM)
- **Rated Operating Pressure:** 3000 PSI (207 bar)
- **Typical Internal Leakage (150 SSU):** 5 cu in/min (82 ml/min)
- **Viscosity Range:** 36 to 3000 SSU (3 to 647 cSt)
- **Temperature Range:** -40°C to 250°C (-40°F 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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**SOLENOID OPERATED DIRECTIONAL CONTROLS**

**TECNORD**

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*a Delta Power Co.*

---

**DIMENSIONS**

---

**ORDERING INFORMATION**

**PP-S3D**

<table>
<thead>
<tr>
<th>OPTIONS</th>
<th>BODIES</th>
<th>VOLTAGE</th>
<th>IMMERSION PROOF “P” TYPE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Buna Standard</td>
<td>Blank</td>
<td>Without Body</td>
<td>“I” Coil AMP Super Seal - Integral</td>
</tr>
<tr>
<td>Viton Standard</td>
<td>N</td>
<td>¼” BSP Ports</td>
<td>“I” Coil Deutsch – Integral DT04-2P</td>
</tr>
<tr>
<td>Buna, Override</td>
<td>V0</td>
<td>3/8” BSP Ports</td>
<td>“I” Coil AMP Jr. Timer - Integral</td>
</tr>
<tr>
<td>Viton, Override</td>
<td>VM</td>
<td>#6 SAE Ports</td>
<td>“I” Coil Metri-Pack – Integral</td>
</tr>
<tr>
<td>Buna, Screen</td>
<td>A0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Viton, Screen</td>
<td>W0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Buna, Override, Non-detent</td>
<td>B1</td>
<td>12</td>
<td>“I” Coil AMP Super Seal - Integral</td>
</tr>
<tr>
<td>Viton, Override, Non-detent</td>
<td>V1</td>
<td>24</td>
<td>“I” Coil Deutsch – Integral DT04-2P</td>
</tr>
<tr>
<td>Buna, Screen, Override, Non-detent</td>
<td>B3</td>
<td>22</td>
<td>“I” Coil AMP Jr. Timer - Integral</td>
</tr>
<tr>
<td>Viton, Screen, Non-detent</td>
<td>B4</td>
<td></td>
<td>“I” Coil Metri-Pack – Integral</td>
</tr>
<tr>
<td>Buna, Screen, Detent</td>
<td>V3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Viton, Screen, Detent</td>
<td>V4</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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

**“K” COIL TERMINATION**

(All DC Except as Noted)

- DL: Double Lead
- HC: DIN 43650 (Hirschman) – (AC & DC)
- DI: Deutsch – Integral DT04-2P
- PIA: “I” Coil AMP Super Seal - Integral
- PID: “I” Coil Deutsch – Integral DT04-2P
- PIJ: “I” Coil AMP Jr. Timer - Integral
- PIM: “I” Coil Metri-Pack – Integral

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

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