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PROPORTIONAL PRESSURE CONTROLS

PROPORTIONAL PRESSURE REDUCING / RELIEVING VALVES ................................................................. PD3

PROPORTIONAL PRESSURE RELIEF VALVES ....................................................................................... PD19

PROPORTIONAL FLOW CONTROLS

2 WAY NORMALLY CLOSED PROPORTIONAL FLOW REGULATOR VALVES ....................................... PD27

2 WAY NORMALLY OPEN PROPORTIONAL FLOW REGULATOR VALVES ........................................ PD39

2 WAY NOR. CLOSED PRESSURE COMPENSATED PROP. FLOW REGULATOR VALVES .................. PD43

3 WAY NOR. CLOSED PRESSURE COMPENSATED PROP. FLOW REGULATOR VALVES .................. PD49

4W/3P PROPORTIONAL DIRECTIONAL CONTROL VALVES ............................................................... PD55
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### Direct Acting

<table>
<thead>
<tr>
<th>GPM</th>
<th>PSI</th>
<th>LPM</th>
<th>BAR</th>
<th>CAVITY</th>
<th>MODEL</th>
<th>PAGE</th>
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</thead>
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<tr>
<td>1</td>
<td>700</td>
<td>4</td>
<td>50</td>
<td>slip-in</td>
<td>IP-DAR-250-L</td>
<td>PD4</td>
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### Pilot Operated

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<th>MODEL</th>
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<td>12</td>
<td>3000</td>
<td>45</td>
<td>207</td>
<td>7/8-14</td>
<td>EF-PRP</td>
<td>PD10</td>
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<td>7.9</td>
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<td>IP-PRZ-59-AM12</td>
<td>PD12</td>
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<td>8</td>
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<td>7/8-14</td>
<td>EG-PRZ</td>
<td>PD14</td>
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<tr>
<td>30</td>
<td>450</td>
<td>114</td>
<td>31</td>
<td>1 1/16-12</td>
<td>ES-PRZ</td>
<td>PD16</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.
IP-DAR-250 DIRECT ACTING PROPORTIONAL, PRESSURE REDUCING/RELIEVING, SLIP-IN TYPE

DESCRIPTION
Special cavity, slip-in style flange retained, direct acting proportional, pressure reducing/relieving valve.

OPERATION
The IP-DAR-250 generates a variable pressure in response to a PWM (Pulse Width Modulated) current signal. With no current applied to the proportional solenoid, the inlet port 2 (P) is blocked and the regulated port 3 (C) is vented to port 1 (T). As current is increased, fluid pressure is proportionally controlled at the regulated port 3 (C). On attainment of proportionally determined pressure at 3 (C), the cartridge shifts to block flow at 2 (P), thereby regulating pressure at 3 (C). In this mode, the valve also will relieve 3 (C) to 1 (T) at a variable value over the set reducing pressure.

FEATURES
• Slip-in style.
• Efficient wet-armature construction.
• Integral waterproof coil.
• Continuous duty rated solenoid.

HYDRAULIC SYMBOL

PERFORMANCE
Pressure Vs. Current Characteristic
Oil viscosity 46 cSt @ 45°C

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<tr>
<th>Bar</th>
<th>l (mA)</th>
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<tr>
<td>0</td>
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<tr>
<td>30</td>
<td>400</td>
</tr>
<tr>
<td>40</td>
<td>600</td>
</tr>
</tbody>
</table>

VALVE SPECIFICATIONS
Nominal Flow 1 GPM (4 LPM) @ 8 bar Delta P
Max Inlet Pressure “L” version 700 PSI (50 bar)
Controlled Pressure Range 0±25 bar / 0±30 bar / 0±35 bar (see graph)
Reduced Pressure Tolerance ±5%
Max Back-Pressure at T Port 30 bar
Internal Leakage 15 ml/min @ 500 PSI (35 bar) inlet
Viscosity Range 36 to 3000 SSU (3 to 647 cSt)
Filtration ISO 18/15/13
Media Operating Temp. Range -30°C / +100°C
Weight .43 lbs (.20 kg)
Operating Fluid Media General Purpose Hydraulic Fluid
Cavity T250
Cavity Tool Kit K-T250
Flange Mounting Screws and Torque M4x10 / 3ft-lbs (4 Nm)

COIL SPECIFICATIONS
Current Supply Characteristics PWM (Pulse Width Modulation)
Rated Current Range 200÷1500 (12 V coil)
100÷750 (24 V coil)
PWM or Super-Imposed Dither Freq. 100-200 Hz
Coil Resistance (12 VDC) 4.8 Ohm ±5% at 68°F (20°C)
(24 VDC) 20 Ohm ±5% at 68°F (20°C)
Max Power Consumption 11 Watt (20°C)
Coil Termination Deutsch-Integral DT04-2P (DT)
AMP Jr. Timer 84-9419 (AJ)
Color Connectors Black
Protection Degree (according to IEC 529) IP 69K (DT)
IP 67 (AJ)

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

ORDERING INFORMATION

IP-DAR-250

- COIL TERMINATION
  AJ - AMP Jr. Timer
  DT - Deutsch DT04

- VOLTAGE
  12 VDC
  24 VDC

- INLET PRESSURE
  L - up to 700 PSI (50 bar)

- MAX REGULATED PRESSURE
  20 bar
  25 bar
  32 bar

- OPTIONS
  AH - HNBR seals and 300 µm (50 mesh) screen on port 2
  Blank - Without body

- BODIES
  N - 1/4" BSP Ports

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mail: tecnord@tecnord.com • www.tecnord.com
IP-DAR-43C  DIRECT ACTING PROPORTIONAL, PRESSURE REDUCING/RELIEVING, SLIP-IN TYPE

DESCRIPTION
Special cavity, slip-in style flange retained, direct acting proportional, pressure reducing/relieving valve.

OPERATION
The IP-DAR-43C-AJ12 generates a variable pressure in response to a PWM (Pulse Width Modulated) current signal. With no current applied to the proportional solenoid, the inlet port 2 (P) is blocked and the regulated port 3 (U) is vented to port 1 (T).

As current is increased, fluid pressure is proportionally controlled at the regulated port 3 (U). On attainment of proportionally determined pressure at 3 (U), the cartridge shifts to block flow at 2 (P), thereby regulating pressure at 3 (U). In this mode, the valve also will relieve 3 (U) to 1 (T) at a variable value over the set reducing pressure.

FEATURES
- Slip-in style.
- Efficient wet-armature construction.
- Integral waterproof coil.
- Continuous duty rated solenoid.

Valve Specifications
- Nominal Flow: 1 GPM (4 LPM) @ 8 bar Delta P
- Max Inlet Pressure “H” version: 5000 PSI (345 bar)
- Max Inlet Pressure “L” version: 700 PSI (50 bar)
- Controlled Pressure Range: 0÷25 bar / 0÷30 bar (see graph)
- Reduced Pressure Tolerance: ±5%
- Max Back-Pressure at T Port: 20 bar
- Internal Leakage: 15 ml/min @ 500 PSI (35 bar) inlet
  35 ml/min @ 5000 PSI (350 bar) inlet
- Viscosity Range: 36 to 3000 SSU (3 to 647 cSt)
- Filtration: ISO 18/15/13 (ISO 4406)
- Media Operating Temp. Range: -25°C / +90°C
- Weight: .54 lbs (.25 kg)
- Operating Fluid Media: General Purpose Hydraulic Fluid
- Cavity: T043
- Cavity Tool Kit: K-T043
- Flange Mounting Screws and Torque: M4x10 / torque 3ft-lbs (4 Nm)

Coil Specifications
- Current Supply Characteristics: PWM (Pulse Width Modulation)
- Rated Current Range: 200÷1500 (12V coil)
  100÷750 (24V coil)
- PWM or Super-Imposed Dither Freq.: 100-200 Hz
- Coil Resistance (12 VDC): 5.4 Ohm ±5% at 68°F (20°C)
- Coil Resistance (24 VDC): 22 Ohm ±5% at 68°F (20°C)
- Max Power Consumption: 12 Watt (20°C)
- Protection Degree: IP 67 according to IEC 529
- Coil Termination: Deutsch-Integral DT04-2P
  AMP Jr. Timer 84-9419
- Color Connectors: Black
WARNING: the specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

### ORDERING INFORMATION

<table>
<thead>
<tr>
<th>PART NUMBER</th>
<th>COIL TERMINATION</th>
<th>VOLTAGE</th>
<th>INLET PRESSURE</th>
<th>MAX REGULATED PRESSURE</th>
<th>OPTIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>IP-DAR-43C</td>
<td>AJ - AMP Jr. Timer</td>
<td>1-12 VDC</td>
<td>L - up to 700 PSI (50 bar)</td>
<td>1-25 bar</td>
<td>00 - HNBR standard</td>
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<tr>
<td></td>
<td>DT - Deutsch DT04</td>
<td>2-24 VDC</td>
<td>H - up to 5000 PSI (345 bar)</td>
<td>2-30 bar</td>
<td>A0 - with filter</td>
</tr>
</tbody>
</table>
IP-RDS-222 DIRECT ACTING PROPORTIONAL, PRESSURE REDUCING/RELIEVING, SLIP-IN TYPE

DESCRIPTION
Special cavity, slip-in style flange retained, "step bore" direct acting proportional, pressure reducing/relieving valve.

OPERATION
The IP-RDS-222 generates a variable pressure in response to a PWM ( Pulse Width Modulated) current signal. With no current applied to the proportional solenoid, the inlet port 1 (P) is blocked and the regulated port 2 (C) is vented to port 3 (T). As current is increased, fluid pressure is proportionally controlled at the regulated port 2 (C). On attainment of proportionally determined pressure at 2 (C), the cartridge shifts to block flow at 1 (P), thereby regulating pressure at 2 (C). In this mode, the valve also will relieve 2 (C) to 3 (T) at a variable value over the set reducing pressure.

FEATURES
- Slip-in style.
- Efficient wet-armure construction.
- Integral waterproof coil.
- Continuous duty rated solenoid.

Flanged retained product. The coil is an integral part of the valve and is not serviceable. Eventual tank pressure exceeding 0 bar, has to be added to reduced pressure value.

VALVE SPECIFICATIONS
- Nominal Flow: 7.5 GPM (30 LPM) @ 6 bar Delta P
- Max Inlet Pressure: 700 PSI (50 bar)
- Controlled Pressure Range: 0 to 23 bar / 0 to 35 bar
- Reduced Pressure Tolerance: ±5%
- Max Back-Pressure at T Port: 25 bar
- Internal Leakage: 15 ml/min @ 500 PSI (35 bar) inlet
- Viscosity Range: 36 to 3000 SSU (3 to 647 cSt)
- Filtration: ISO 18/15/13
- Media Operating Temp. Range: -30°C / +100°C
- Weight: 58 lbs (.27 kg)
- Operating Fluid Media: General Purpose Hydraulic Fluid
- Cavity: T222
- Cavity Tool Kit: K-T222
- Flange Mounting Screws and Torque: M4x10 / 3ft-lbs (4 Nm)

COIL SPECIFICATIONS
- Current Supply Characteristics: PWM (Pulse Width Modulation)
- Rated Current Range: 200 to 1500 (12 V coil)
  100 to 750 (24 V coil)
- PWM or Super-Imposed Dither Freq.: 100-200 Hz
- Coil Resistance (12 VDC): 4.9 Ohm ±5% at 68°F (20°C)
  12 Ohm ±5% at 68°F (20°C)
- Max Power Consumption: 12 Watt (20°C)
- Coil Termination: Deutsch-Integral D04-2P (DT & DH)
  AMP Jr. Timer 84-9419 (AJ)
- Color Connectors: Black
- Protection Degree: (according to IEC 529)
  IP 69K (DT & DH)
  IP 67 (AJ)

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PROPORTIONAL CONTROLS

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

<table>
<thead>
<tr>
<th>DT version</th>
<th>AJ version</th>
<th>DH version</th>
</tr>
</thead>
<tbody>
<tr>
<td>[Diagram of DT version]</td>
<td>[Diagram of AJ version]</td>
<td>[Diagram of DH version]</td>
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</table>

**ORDERING INFORMATION**

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<th>IP-RDS-222</th>
<th>COIL TERMINATION</th>
<th>VOLTAGE</th>
<th>INLET PRESSURE</th>
<th>MAX REGULATED PRESSURE</th>
<th>OPTIONS</th>
<th>BODIES</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>AJ - AMP Jr. Timer</td>
<td>12 VDC</td>
<td>L - up to 700 PSI (50 bar)</td>
<td>23 bar</td>
<td>A0 - NBR seals and 300 µm (50 mesh) screen on port 2</td>
<td>Blank - Without body</td>
</tr>
<tr>
<td></td>
<td>DT - Deutsch DT04</td>
<td>24 VDC</td>
<td></td>
<td>30 bar</td>
<td></td>
<td>N - 3/8&quot; BSP Ports</td>
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<tr>
<td></td>
<td>DH - Deutsch DT04 Horizontal</td>
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<td>35 bar</td>
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</table>

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PROPORTIONAL CONTROLS

EF-PRP  3 WAY 2 POSITION, PILOT OPERATED, PRESSURE REDUCING, RELIEVING VALVE

DESCRIPTION
10 size, 7/8-14 thread, “Delta” series, pilot operated, 3 way 2 position, proportional pressure reducing/releasing valve.

OPERATION
When de-energized and with a passive load at port (3), the EF-PRP passes sufficient flow from port (2) to port (3) to regulate a minimum pressure of approximately 3-10 bar (45-145 PSI). With a supplied flow from an external source into port (3) the valve will regulate the minimum pressure as shown on curve below by bypassing flow to port (1). When energized, the actuator creates a force proportional to the applied current to then determine the pressure that will be regulated at port (3). Oil is supplied from port (2) to port (3) until desired pressure is reached. If pressure at port (3) exceeds desired level, excess oil is vented to port (1) until desired level is reached. Pressures at port (1) are additive to regulated pressure at port (3).

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

HYDRAULIC SYMBOL

PERFORMANCE

VALVE SPECIFICATIONS

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
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<tr>
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<tr>
<td>Rated Operating Pressure</td>
<td>3000 PSI (207 bar)</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>
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<tr>
<td>Weight</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>
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<tr>
<td>Cavity</td>
<td>DELTA 3W</td>
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<tr>
<td>Cavity Form Tool (Finishing)</td>
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<tr>
<td>Seal Kit</td>
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**WARNING:**

- **Regulated Pressure (PSI)**
- **Regulated Pressure (BAR)**
- **Flow (GPM)**
- **Flow (LPM)**

**OPTIONS**
- Buna, 150-1015 PSI range: 0A
- Viton, 150-1015 PSI range: VA
- Buna, 150-2175 PSI range: 0B
- Viton, 150-2175 PSI range: VB
- Buna, 150-3000 PSI range: 0C
- Viton, 150-3000 PSI range: VC

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

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

**“P” COIL TERMINATION**
- DL: Double Lead
- DT: Deutsch on Leads DT04-2P
- ML: Metri-Pack on Leads
- PL: Packard on Leads
- WL: Weatherpack on Leads

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

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

**ORDERING INFORMATION**

**EF-PRP**

**DIMENSIONS**

**TECNORD**

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mail: tecnord@tecnord.com • www.tecnord.com
IP-PRZ-59-AM12 PILOT OPERATED PROPORTIONAL, PRESSURE REDUCING/RELEIVING, SLIP-IN TYPE

DESCRIPTION
Special cavity, flange retained, slip-in proportional pressure reducing/relieving valve.

OPERATION
The IP-PRZ-59-AM12 generates a variable pressure in response to a PWM (Pulse Width Modulated) current signal. With no current applied to the proportional solenoid, the inlet port 3 (P) is blocked and the regulated port 2 (U) is vented to port 1 (T). As current is increased, fluid pressure is proportionally controlled at the regulated port 3 (P). On attainment of proportionally determined pressure at 2 (U), the cartridge shifts to block flow at 3 (P), thereby regulating pressure at 2 (U). In this mode, the valve also will relieve 2 (U) to 1 (T) at a variable value over the set reducing pressure.

FEATURES
- Economical slip-in style.
- Integral waterproof coil.
- Efficient wet-armature construction.
- Hardened parts for long life.

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

HYDRAULIC SYMBOL

PERFORMANCE
Reduced pressure (bar) vs. Current (mA)

COIL SPECIFICATIONS

Current Supply Characteristics
PWM (Pulse Width Modulation)
Rated Current Range 100-900 mA
PWM or Super-Imposed
Dither Frequency 100-150 Hz
Coil Resistance (12 VDC) 10 Ohm ±5% at 68°F (20°C)
Max Power Consumption 14 Watt
Protection Degree IP 67 according to IEC 529
Coil Termination AMP Superseal 1.5 Series 282080-1 Type
Color Connectors Green

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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

<table>
<thead>
<tr>
<th>BODIES</th>
<th>OPTIONS</th>
<th>DIMENSIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Buna Standard</td>
<td>00</td>
<td>Buna, Screen</td>
</tr>
<tr>
<td>Blank</td>
<td>S</td>
<td>Without Body</td>
</tr>
</tbody>
</table>

**DIMENSIONS**

![Diagram of the proportional controls](image)
### DESCRIPTION
10 size, 7/8-14 thread, “Delta” series, solenoid operated, proportional pressure reducing control valve.

### OPERATION
When de-energized the EG-PRZ allows flow from (2) to (1) and blocks flow at (3). When energized, the cartridge’s spool lifts to open (3) to (2) and blocks flow at (1). Outlet pressure is proportional to current applied to the coil.

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

### HYDRAULIC SYMBOL
![Hydraulic Symbol](image)

### PERFORMANCE

![Pressure vs. Current Graph for EG-PRZ at 300 Psi Inlet Pressure](image)

<table>
<thead>
<tr>
<th>% of Maximum Control Current</th>
<th>Pressure (PSI)</th>
<th>Pressure (BAR)</th>
</tr>
</thead>
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<tr>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>20</td>
<td>60</td>
<td>4.1</td>
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<tr>
<td>40</td>
<td>120</td>
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<td>16.8</td>
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<td>100</td>
<td>300</td>
<td>21</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)</td>
</tr>
<tr>
<td>Max System Pressure</td>
<td>450 PSI (31 bar)</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>.38 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>12 ft-lbs (16.3 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>DELTA 4W</td>
</tr>
<tr>
<td>Cavity Form Tool (Finishing)</td>
<td>40500002</td>
</tr>
<tr>
<td>Seal Kit</td>
<td>21191204</td>
</tr>
</tbody>
</table>

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**ORDERING INFORMATION**

**OPTIONS**

- Buna Standard: 00
- Viton Standard: V0

**BODIES**

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

**VOLTAGE**

- 12 VDC (.825 Amps Max.): 12
- 24 VDC (.412 Amps Max.): 24

**“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) - (DC)
- DI: Deutsch - Integral DT04-2P

Approximate Coil Weight: .42 lbs (.19 kg)
ES-PRZ  PROPORTIONAL PRESSURE REDUCING CONTROL VALVE

DESCRIPTION
12 size, 1 1/16-12 thread, “Tecnord” series, solenoid operated, proportional pressure reducing control valve.

OPERATION
When de-energized the ES-PRZ allows flow from (2) to (1) and blocks flow at (3). When energized, the cartridge’s spool lifts to open (3) to (2) and blocks flow at (1). Outlet pressure is proportional to current applied to the coil.

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

HYDRAULIC SYMBOL

Low Wattage coils available. Consult Factory.

PERFORMANCE

Pressure vs. Current Graph for ES-PRZ at 300 PSI inlet

![Graph](image)

<table>
<thead>
<tr>
<th>Pressure vs. Current Graph for ES-PRZ at 300 PSI inlet</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image" alt="Graph" /></td>
</tr>
</tbody>
</table>

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>Max System Pressure</td>
<td>450 PSI (31 bar)</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>.67 lbs (.3 kg)</td>
</tr>
<tr>
<td>Operating Fluid Media</td>
<td>General Purpose Hydraulic Fluid</td>
</tr>
<tr>
<td>Cartridge Torque Requirements</td>
<td>70 ft-lbs (94.9Nm)</td>
</tr>
<tr>
<td>Coil Nut Torque Requirements</td>
<td>4-6 ft-lbs (5.4-8.1Nm)</td>
</tr>
<tr>
<td>Cavity</td>
<td>40200043</td>
</tr>
</tbody>
</table>

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PROPORTIONAL PRESSURE RELIEF VALVES

<table>
<thead>
<tr>
<th>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>20</td>
<td>3000</td>
<td>76</td>
<td>207</td>
<td>7/8-14</td>
<td>EE-PRB</td>
<td>PD20</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>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>20</td>
<td>3000</td>
<td>76</td>
<td>207</td>
<td>7/8-14</td>
<td>EE-PRD</td>
<td>PD22</td>
</tr>
<tr>
<td></td>
<td>20</td>
<td>3000</td>
<td>76</td>
<td>207</td>
<td>7/8-14</td>
<td>EE-SRD</td>
<td>PD24</td>
</tr>
</tbody>
</table>

TYPICAL SCHEMATIC

Typical application for the PRL and PRB is for fan or motor speed control.
EE-PRB 2 WAY NORMALLY CLOSED, PROPORTIONAL RELIEF VALVE

**DESCRIPTION**

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

**OPERATION**

The EE-PRB blocks flow from (2) to (1) until sufficient pressure is present at (2) to offset a spring induced force. As solenoid current is increased, it offsets a portion of this force, resulting in a lower relief pressure. Can be infinitely adjusted across a prescribed range in response to a PWM (Pulse Width Modulated) current. Pressure output is inversely proportional to the current input. With full current applied to the solenoid, the valve will free flow from (2) to (1), at approximately 100 PSI (7 bar).

*Note: backpressure on port (1) becomes additive to the pressure setting at a 1:1 ratio.*

**FEATURES**

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

**HYDRAULIC SYMBOL**

**PERFORMANCE**

**Relief pressure vs. Current**

Costant flow 10 LPM (2.6 GPM)

**VALVE SPECIFICATIONS**

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nominal Flow</td>
<td>0÷20 GPM (0÷76 LPM)</td>
</tr>
<tr>
<td>Operating Range</td>
<td>100-3000 PSI (7-207 bar)</td>
</tr>
<tr>
<td>Typical Hysteresis</td>
<td>10% Max</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>-30°C / +100°C</td>
</tr>
<tr>
<td>Weight</td>
<td>.62 lbs (.28 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>2-3 ft-lbs (3-4 Nm)</td>
</tr>
<tr>
<td>Cavity</td>
<td>DELTA 2W</td>
</tr>
<tr>
<td>Cavity Tools Kit</td>
<td>40500000</td>
</tr>
<tr>
<td>Seal Kit</td>
<td>21191202</td>
</tr>
</tbody>
</table>

**COIL SPECIFICATIONS**

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Current Supply Characteristics</td>
<td>PWM (Pulse Width Modulation)</td>
</tr>
<tr>
<td>Rated Current Range</td>
<td>100÷1000 mA</td>
</tr>
<tr>
<td>PWM or Super-Imposed</td>
<td></td>
</tr>
<tr>
<td>Dither Frequency</td>
<td>120÷200 Hz</td>
</tr>
<tr>
<td>Coil Resistance (12 VDC)</td>
<td>7.2 Ohm ±5% at 68°F (20°C)</td>
</tr>
</tbody>
</table>

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**DIMENSIONS**

**EE-PRB**

**OPTIONS**

- Buna, 100-1015 PSI range (7-70 bar) **0A**
- Viton, 100-1015 PSI range (7-70 bar) **VA**
- Buna, 100-2175 PSI range (7-150 bar) **0B**
- Viton, 100-2175 PSI range (7-150 bar) **VB**
- Buna, 100-3000 PSI range (7-207 bar) **0C**
- Viton, 100-3000 PSI range (7-207 bar) **VC**

**BODIES**

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

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

- 12 VDC
- 24 VDC

**“F” COIL TERMINATION**

- DIN 43650 (Hirschmann) **HC**
- Deutsch - Integral DT04-2P **DI**
- AMP Jr. Timer **JT**

**ORDERING INFORMATION**

**RELIEF PRESSURE VS. FLOW - NO CURRENT APPLIED**

- Constant flow 10 LPM (2.6 GPM)

**PRESSURE DROP VS. FLOW**

- Coil energized

**FOR TERMINATIONS**

- DIN 43650 (Hirschmann) **HC**
- Deutsch - Integral DT04-2P **DI**
- AMP Jr. Timer **JT**

**APPROXIMATE COIL WEIGHT: .47 lbs (.21 kg)**

**WARNING:** for bodies style and sizes see section “Accessories”
EE-PRD  2 WAY NORMALLY OPEN, PROPORTIONAL RELIEF VALVE

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

OPERATION
The EE-PRD blocks flow from (2) to (1) until sufficient pressure is present at (2) to offset the electrically induced solenoid force. Can be infinitely adjusted across a prescribed range using a variable electric input. Pressure output is proportional to DC current input. This valve is intended for use as a pressure limiting device in demanding applications.

With no current applied to the solenoid, the valve will free flow from (2) to (1) at approximately 50 PSI.

Note: backpressure on port (1) becomes additive to the pressure setting at a 1:1 ratio.

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

If low voltage is expected on the machine, 12 or 24 Volt systems will require the use of 10 volt or 20 volt coils respectively. Consult Factory for availability of these coil options.

For best performance valve must be purged of air. Locate below reservoir or add check valve to return. Recommended vehicle installation is Tube Up or Horizontal after purging. Fastest purging position during bleed/start-up is with tube up.

PWM frequency: 100-200 Hz (200 Hz recommended). For lower minimum or other ranges consult factory.

HYDRAULIC SYMBOL

PERFORMANCE

Valve Specifications

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nominal Flow</td>
<td>0-20 GPM (0-76 LPM)</td>
</tr>
<tr>
<td>Operating Range</td>
<td>50-3000 PSI (3-207 bar)</td>
</tr>
<tr>
<td>Typical Hysteresis</td>
<td>5%</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°C to 250°F (-40°C to 120°C)</td>
</tr>
<tr>
<td>Weight</td>
<td>.30 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) 40500000</td>
</tr>
<tr>
<td>Seal Kit</td>
<td>21191202</td>
</tr>
</tbody>
</table>

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**DIMENSIONS**

**ORDERING INFORMATION**

**OPTIONS**
- Buna, 100-1200 PSI range: 0A
- Viton, 100-1200 PSI range: VA
- Buna, 100-2175 PSI range: 0B
- Viton, 100-2175 PSI range: VB
- Buna, 100-3000 PSI range: 0C
- Viton, 100-3000 PSI range: VC

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

**VOLTAGE**
- 06: 6 VDC
- 12: 12 VDC
- 24: 24 VDC
- 36: 36 VDC
- 48: 48 VDC

**“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)
- DI: Deutsch – Integral DT04-2P

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

OPERATION
The EE-SRD blocks flow from (2) to (1) until sufficient pressure is present at (2) to offset the lower of: the electrically induced solenoid force or the preset maximum setting. Can be infinitely adjusted across a prescribed range using a variable electric input. Pressure output is proportional to DC current input. This valve is intended for use as a pressure limiting device in demanding applications. Can be used as a solenoid operated relief valve. With no current applied to the solenoid, the valve will free flow from (2) to (1) at approximately 50 PSI.

Note: Backpressure on port (1) becomes additive to the pressure setting at a 1:1 ratio.

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

HYDRAULIC SYMBOL

PERFORMANCE

Valve Specifications

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nominal Flow</td>
<td>0-20 GPM (0-76 LPM)</td>
</tr>
<tr>
<td>Operating Range</td>
<td>50-3000 PSI (3-207 bar)</td>
</tr>
<tr>
<td>Typical Hysteresis</td>
<td>5%</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°C to 250°F (-40°C to 120°C)</td>
</tr>
<tr>
<td>Weight</td>
<td>.30 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>Seal Kit 21191202</td>
</tr>
<tr>
<td>(form tool, reamer, tap)</td>
<td>40500000</td>
</tr>
</tbody>
</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
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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.
### 2 WAY NORMALLY CLOSED PROPORTIONAL FLOW CONTROL VALVES

#### SPOOL TYPE

<table>
<thead>
<tr>
<th>SPOOL TYPE</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>13.2</td>
<td>3500</td>
<td>50</td>
<td>241</td>
<td>7/8-14</td>
<td>EE-P2G</td>
<td>PD28</td>
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<td></td>
<td>23.7</td>
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<td>90</td>
<td>241</td>
<td>1 1/16-12</td>
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#### POPPET TYPE

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<th>POPPET TYPE</th>
<th>GPM</th>
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<th>LPM</th>
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<th>CAVITY</th>
<th>MODEL</th>
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<td></td>
<td>12</td>
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<td>45</td>
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<td>7/8-14</td>
<td>EE-P2A</td>
<td>PD34</td>
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<tr>
<td></td>
<td>29</td>
<td>3500</td>
<td>110</td>
<td>241</td>
<td>1 1/16-12</td>
<td>ET-P2A</td>
<td>PD36</td>
</tr>
</tbody>
</table>

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**DESCRIPTION**

10 size, 7/8-14 thread, “Delta” series, solenoid operated, 2 way normally closed, proportional flow control valve.

**OPERATION**

When de-energized the EE-P2G blocks flow at ports (1) and (2). When energized, the valve allows flow from (2) to (1). Flow is proportional to the current applied to the coil. A compensator must be used to create a pressure compensated flow control function.

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

**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**

Flow vs. Current - “A” Version

Coil 12 VDC - Delta P = 14 bar - Oil 26 cSt (121 SSU) @ 50°C (104°F)

<table>
<thead>
<tr>
<th>Q (l/min)</th>
<th>0</th>
<th>2</th>
<th>4</th>
<th>6</th>
<th>8</th>
<th>10</th>
<th>12</th>
<th>14</th>
<th>16</th>
<th>18</th>
<th>20</th>
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<th>24</th>
<th>26</th>
<th>28</th>
<th>30</th>
</tr>
</thead>
<tbody>
<tr>
<td>l (mA)</td>
<td>0</td>
<td>2</td>
<td>4</td>
<td>6</td>
<td>8</td>
<td>10</td>
<td>12</td>
<td>14</td>
<td>16</td>
<td>18</td>
<td>20</td>
<td>22</td>
<td>24</td>
<td>26</td>
<td>28</td>
<td>30</td>
</tr>
</tbody>
</table>

**FLOW RANGE**

See curves for various versions

**MAX SYSTEM PRESSURE**

3500 PSI (241 bar)

**LEAKAGE**

Max 50 cc/min at 245 bar

**HYSTERESIS**

±3%

**VISCOITY RANGE**

36 to 3000 SSU (3 to 647 cSt)

**FILTRATION**

ISO 18/16/13

**MEDIA OPERATING TEMP. RANGE**

-40°C to 250°F (-40°C to 120°C)

**WEIGHT**

.58 lbs (.26 kg)

**OPERATING FLUID MEDIA**

General Purpose Hydraulic Fluid

**CARTRIDGE TORQUE REQUIREMENTS**

26 ft-lbs (35 Nm)

**COIL TURQUE REQUIREMENTS**

2.3 ft-lbs (3.4 Nm)

**CAVITY**

DELTA 2W

**CAVITY TOOLS KIT**

(form tool, reamer, tap) 40500000

**SEAL KIT**

21191200

**COIL SPECIFICATIONS**

Current Supply Characteristics

PWM (Pulse Width Modulation)

Rated Current Range

200-1450 mA

PWM or Super-Imposed

100-150 Hz

Dither Frequency

Coil Resistance (12 VDC)

7.2 Ohm ±5% at 68°F (20°C)

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Flow vs. Current - “B” Version
Coil 12 VDC - Delta P = 14 bar - Oil 26 cSt (121 SSU) @ 50°C (104°F)

Flow vs. Current - “C” Version
Coil 12 VDC - Delta P = 14 bar - Oil 26 cSt (121 SSU) @ 50°C (104°F)

NOTE: non linear characteristics

ORDERING INFORMATION

EE-P2G - - - - -

OPTIONS
Buna, Push Type Override Standard AP Up to 22 l/min
Buna, Screw Type Override (Knob) AS Up to 22 l/min
Buna, Screw Type Override (Grad. Knob) AK Up to 22 l/min

Buna, Push Type Override Standard BP Up to 50 l/min
Buna, Screw Type Override (Knob) BS Up to 50 l/min
Buna, Screw Type Override (Grad. Knob) BK Up to 50 l/min

Buna, Push Type Override Standard CP Up to 50 l/min
Buna, Screw Type Override (Knob) CS Up to 50 l/min
Buna, Screw Type Override (Grad. Knob) CK Up to 50 l/min

BODIES
Blank Without Body
S #8 SAE Ports

VOLTAGE
12 12 VDC
24 24 VDC

“F” COIL TERMINATION
HC DIN 43650 (Hirschmann)
DI Deutsch-Integral DT04-2P
JT AMP Jr. Timer

NOTES: 1) Flows refer to a 14 bar Delta P
2) For other seals, consult factory
ET-P2S  2 WAY NORMALLY CLOSED, PROPORTIONAL FLOW CONTROL VALVE

**DESCRIPTION**
12 size, 1 1/16-12 thread, “Tecnord” series, solenoid operated, 2 way normally closed, proportional flow control valve.

**OPERATION**
When de-energized the ET-P2S blocks flow at ports (2) and (1). When energized, the valve allows flow from (1) to (2). Flow is proportional to the current applied to the coil. A compensator must be used to create a pressure compensated flow control function.

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

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

---

**HYDRAULIC SYMBOL**

**PERFORMANCE**

**Flow vs. Current**
 Coil 12 VDC - Press. Drop = 14 bar - Oil 46 cSI (217 SSU) @ 50°C (122°F)

```
<table>
<thead>
<tr>
<th>Current (mA)</th>
<th>Flow (LPM)</th>
<th>Flow (GPM)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>200</td>
<td>0.025</td>
<td>0.015</td>
</tr>
<tr>
<td>400</td>
<td>0.05</td>
<td>0.03</td>
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<tr>
<td>600</td>
<td>0.075</td>
<td>0.045</td>
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<tr>
<td>800</td>
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<tr>
<td>1000</td>
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<td>0.075</td>
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<tr>
<td>1200</td>
<td>0.15</td>
<td>0.09</td>
</tr>
<tr>
<td>1400</td>
<td>0.175</td>
<td>0.105</td>
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</table>
```

---

**VALVE SPECIFICATIONS**

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flow Range</td>
<td>See curves for various versions</td>
</tr>
<tr>
<td>Max System Pressure</td>
<td>3500 PSI (241 bar)</td>
</tr>
<tr>
<td>Leakage</td>
<td>Max 50 cc/min at 245 bar</td>
</tr>
<tr>
<td>Hysteresis</td>
<td>±3%</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.</td>
<td>-30°C / +100°C</td>
</tr>
<tr>
<td>Weight</td>
<td>.72 lbs (.32 kg)</td>
</tr>
<tr>
<td>Operating Fluid Media</td>
<td>General Purpose Hydraulic Fluid</td>
</tr>
<tr>
<td>Cartridge Torque</td>
<td>37 ft-lbs (50 Nm)</td>
</tr>
<tr>
<td>Nut Torque Requirements</td>
<td>2-3 ft-lbs (3-4 Nm)</td>
</tr>
<tr>
<td>Cavity</td>
<td>TECNORD 2W</td>
</tr>
<tr>
<td>Cavity Tools Kit</td>
<td>40500032</td>
</tr>
<tr>
<td>Seal Kit</td>
<td>21191200</td>
</tr>
</tbody>
</table>

---

**COIL SPECIFICATIONS**

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Current Supply Characteristics</td>
<td>PWM (Pulse Width Modulation)</td>
</tr>
<tr>
<td>Rated Current Range</td>
<td>400-1400 mA</td>
</tr>
<tr>
<td>PWM or Super-Imposed</td>
<td></td>
</tr>
<tr>
<td>Dither Frequency</td>
<td>100-150 Hz</td>
</tr>
<tr>
<td>Coil Resistance (12 VDC)</td>
<td>7.2 Ohm ±5% at 68°F (20°C)</td>
</tr>
</tbody>
</table>
DIMENSIONS

**Pressure Drop**

With valve fully open - Oil 46 cSt (217 SSU) @ 50°C (122°F)

---

**GRADUATED KNOB**

---

**NOTES:**

1) Flows refer to a 14 bar Delta P
2) For other seals, consult factory

---

**ORDERING INFORMATION**

**ET-P2S**

---

**OPTIONS**

- Buna Standard
- Buna, Screw Type Override (Knob)
- Buna, Screw Type Override (Grad. Knob)

---

**BODIES**

- Blank Without Body
- N 3/4” BSP Ports
- S #8 SAE Ports

---

**VOLTAGE**

- 12 12 VDC
- 24 24 VDC

---

**“F” COIL TERMINATION**

- HC DIN 43650 (Hirschmann)
- DI Deutsch-Integral DT04-2P
- JT AMP Jr. Timer

---

**Approximate Coil Weight:** .47 lbs (.21 kg)

---

**WARNING:** The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.
**EB-P2A 2 WAY NORMALLY CLOSED, PROPORTIONAL FLOW CONTROL VALVE**

**DESCRIPTION**
8 size, 3/4-16 thread, solenoid operated, 2 way normally closed poppet style, proportional flow control valve.

**OPERATION**
When de-energized the EB-P2A blocks flow from (1) to (2) and allows reverse flow from (2) to (1). When energized, the valve allows flow from (1) to (2). Flow is proportional to current applied to the coil. A compensator must be used to create a pressure compensated flow control function.

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

**FLOW RANGE**
See curves

**MAX SYSTEM PRESSURE**
3500 PSI (241 bar)

**LEAKAGE**
0-10 drops / min @ 245 bar

**HYSTERESIS**
±3%

**VISCOSITY RANGE**
36 to 3000 SSU (3 to 647 cSt)

**FILTRATION**
ISO 18/16/13

**MEDIA OPERATING TEMP. RANGE**
-40°C to 250°F (-40°C to 120°C)

**WEIGHT**
.72 lbs (.32 kg)

**OPERATING FLUID MEDIA**
General Purpose Hydraulic Fluid

**CARTRIDGE TORK REQUIREMENTS**
37 ft-lbs (50 Nm)

**COIL NUT TORK REQUIREMENTS**
2-3 ft-lbs (3-4 Nm)

**CAVITY**
POWER 2W

**CAVITY TOOLS KIT**
(form tool, reamer, tap) 40500005

**SEAL KIT**
21191102

**CURVE ATTAINED WITHOUT PRESSURE COMPENSATOR. THE VALVE CAN WORK WITH A PRESSURE DROP UP TO 200 BAR.**

**PERFORMANCE**

**FLOW VS. CURRENT AT DIFFERENT PRESSURE DROP**
Coil 12 VDC - hyd. - Oil 26 cSt (121 SSU) @ 40°C (104°F)

**COIL SPECIFICATIONS**
- Current Supply Characteristics: PWM (Pulse Width Modulation)
- Rated Current Range: 500 - 1450 mA
- Dither Frequency: 100 Hz
- Coil Resistance (12 VDC): 7.5 Ohm ±5% at 68°F (20°C)
WARNING: the specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

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ORDERING INFORMATION

EB-P2A

OPTIONS
Buna Standard
Buna, Screw Type Override (Knob)
Buna, Screw Type Override (Grad. Knob)

CO Up to 25 l/min
CS Up to 25 l/min
CK Up to 25 l/min

BODIES
Blank
Without Body
#8 SAE Ports

VOLTAGE
12
24

"F" COIL TERMINATION
HC DIN 43650 (Hirschmann)
DI Deutsch-Integral DT04-2P
JT AMP Jr. Timer

NOTES: 1) Flows refer to a 14 bar Delta P
2) For other seals, consult factory

Approximate Coil Weight: .47 lbs (.21 kg)
EE-P2A  2 WAY NORMALLY CLOSED, PROPORTIONAL FLOW CONTROL VALVE

DESCRIPTION
10 size, 7/8-14 thread, solenoid operated, 2 way normally closed poppet style, proportional flow control valve.

OPERATION
When de-energized the EE-P2A blocks flow from (1) to (2) and allows reverse flow from (2) to (1). When energized, the valve allows flow from (1) to (2). Flow is proportional to current applied to the coil. A compensator must be used to create a pressure compensated flow control function.

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

Curves are attained without pressure compensator. The valve can work with a pressure drop up to 200 bar.

FLOW RANGE
See curves

MAX SYSTEM PRESSURE
3500 PSI (241 bar)

LEAKAGE
0-10 drops / min @ 245 bar

HYSTERESIS
±3%

VISCOITY RANGE
36 to 3000 SSU (3 to 647 cSt)

FILTRATION
ISO 18/16/13

MEDIA OPERATING TEMP. RANGE
-40°C to 250°F (-40°C to 120°C)

WEIGHT
.72 lbs (.32 kg)

OPERATING FLUID MEDIA
General Purpose Hydraulic Fluid

CARTRIDGE TORQUE REQUIREMENTS
37 ft-lbs (50 Nm)

COIL NUT TORQUE REQUIREMENTS
2-3 ft-lbs (3-4 Nm)

CAVITY
DELTA 2W

CAVITY TOOLS KIT
(form tool, reamer, tap) 40500000

SEAL KIT
21191200

PWM CURRENT SUPPLY CHARACTERISTICS
PWM (Pulse Width Modulation)

RATED CURRENT RANGE
500-1450 mA

DITHER FREQUENCY
100 Hz

COIL RESISTANCE (12 VDC)
7.5 Ohm ±5% at 68°F (20°C)
WARNING: the specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

### ORDERING INFORMATION

**EE-P2A**

**OPTIONS**
- Buna Standard
- Buna, Screw Type Override (Knob)
- Buna, Screw Type Override (Grad. Knob)

**BODIES**
- Blank
- #8 SAE Ports

**VOLTAGE**
- 12 VDC
- 24 VDC

**“F” COIL TERMINATION**
- DIN 43650 (Hirschmann)
- Deutsch-Integral DT04-2P
- AMP Jr. Timer

**NOTES:**
1) Flows refer to a 14 bar Delta P
2) For other seals, consult factory

---

**DIMENSIONS**

**Flow vs. Current at different Pressure Drop**

*Poppet type B - Coil 12 VDC - hyd. oil 26 cSt (121 SSU) @ 40°C (104°F)*

**Flow vs. Current at different Pressure Drop**

*Poppet type C - Coil 12 VDC - hyd. oil 26 cSt (121 SSU) @ 40°C (104°F)*

---

**PRODUCT 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
ET-P2A 2 WAY NORMALLY CLOSED, PROPORTIONAL FLOW CONTROL VALVE

DESCRIPTION
12 size, 1 1/16-12 thread, solenoid operated, 2 way normally closed poppet style, proportional flow control valve.

OPERATION
When de-energized the ET-P2A blocks flow from (1) to (2) and allows reverse flow from (2) to (1). When energized, the valve allows flow from (1) to (2). Flow is proportional to current applied to the coil. A compensator must be used to create a pressure compensated flow control function.

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

HYDRAULIC SYMBOL

PERFORMANCE

Pressure Drop
1 to 2 with valve completely open

Flow vs. Current at different Pressure Drop
Poppet type A - Coil 12 VDC - hyd. oil 26 cSt (121 SSU) @ 40°C (104°F)

VALVE SPECIFICATIONS

- Flow Range
- Max System Pressure
- Leakage
- Hysteresis
- Viscosity Range
- Filtration
- Media Operating Temp. Range
- Weight
- Operating Fluid Media
- Cartridge Torque Requirements
- Coils Nut Torque Requirements
- Cavity
- Current Supply Characteristics
- Rated Current Range
- PWM or Super-Imposed
- Dither Frequency
- Coil Resistance (12 VDC)

COIL SPECIFICATIONS

Current Supply Characteristics: PWM (Pulse Width Modulation)
Rated Current Range: 500 - 1450 mA
PWM or Super-Imposed
Dither Frequency: 100 Hz
Coil Resistance (12 VDC): 7.5 Ohm ±5% at 68°F (20°C)

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DIMENSIONS

Flow vs. Current at different Pressure Drop
Poppet type B - Coil 12 VDC - hyd. oil 26 cSt (121 SSU) @ 40°C (104°F)

Flow vs. Current at different Pressure Drop
Poppet type C - Coil 12 VDC - hyd. oil 26 cSt (121 SSU) @ 40°C (104°F)

ORDERING INFORMATION

ET-P2A – – – – –

OPTIONS
Buna Standard
A0 Up to 65 l/min
Buna, Screw Type Override (Knob)
AS Up to 65 l/min
Buna, Screw Type Override (Grad. Knob)
AK Up to 65 l/min

Buna Standard
B0 Up to 85 l/min
Buna, Screw Type Override (Knob)
BS Up to 85 l/min
Buna, Screw Type Override (Grad. Knob)
BK Up to 85 l/min

Buna Standard
C0 Up to 110 l/min
Buna, Screw Type Override (Knob)
CS Up to 110 l/min
Buna, Screw Type Override (Grad. Knob)
CK Up to 110 l/min

BODIES
Blank
S #8 SAE Ports

VOLTAGE
12 12 VDC
24 24 VDC

“F” COIL TERMINATION
HC DIN 43650 (Hirschmann)
DI Deutsch-Integral DT04-2P
JT AMP Jr. Timer

NOTES:
1) Flows refer to a 14 bar Delta P
2) For other seals, consult factory

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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.
### 2 Way Normally Open Proportional Flow Control Valves

<table>
<thead>
<tr>
<th>SPOOL TYPE</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>8</td>
<td>3500</td>
<td>30</td>
<td>241</td>
<td>7/8-14</td>
<td>EE-P2H</td>
<td></td>
<td>PD40</td>
</tr>
</tbody>
</table>
EE-P2H  2 WAY NORMALLY OPEN, PROPORTIONAL FLOW CONTROL VALVE

DESCRIPTION
10 size, 7/8-14 thread, solenoid operated, 2 way normally open, proportional flow control valve.

OPERATION
When de-energized the EE-P2H allows flow from (1) to (2). When fully energized, the valve blocks flow at port (1) and (2). Flow is proportional to current applied to the coil. A compensator must be used to create a pressure compensated flow control function.

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

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
Flow (l/min) vs. Current (mA)
Coil 12 VDC - Delta P = 5, 14, 20 bar; Tol = 40°C

Flow Range  See curve
Max System Pressure  3500 PSI (241 bar)
Leakage  Max 100 cc/min at 245 bar
Hysteresis  ±4%
Viscosity Range  36 to 3000 SSU (3 to 647 cSt)
Filtration  ISO 18/16/13
Media Operating Temp. Range  -40°C to 250°F (-40°C to 120°C)
Weight  .58 lbs (.26 kg)
Operating Fluid Media  General Purpose Hydraulic Fluid
Coil Nut Torque Requirements  2-3 ft-lbs (3-4 Nm)
Cavity Tools Kit  (form tool, reamer, tap)  40500000
Seal Kit  21191200

COIL SPECIFICATIONS
Current Supply Characteristics  PWM (Pulse Width Modulation)
Rated Current Range  0 - 1450 mA
PWM or Super-Imposed
Dither Frequency  100-150 Hz
Coil Resistance (12 VDC)  7.5 Ohm ±5% at 68°F (20°C)

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W6 / 2020

ORDERING INFORMATION

Approximate Coil Weight: .47 lbs (.21 kg)

EE-P2H – – – – –

OPTIONS
Buna, Push Type Override Standard 0P
Buna, Screw Type Override (Knob) 0S
Buna, Screw Type Override (Grad. Knob) 0K

BODIES
Blank Without Body S #8 SAE Ports

VOLTAGE
12 12 VDC
24 24 VDC

“F” COIL TERMINATION
HC DIN 43650 (Hirschmann)
DI Deutsch-Integral DT04-2P
JT AMP Jr. Timer

NOTE: for other seals, consult factory.
WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described herein. Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.
### 2 Way Normally Closed Pressure Compensated Proportional Flow Regulator Valves

<table>
<thead>
<tr>
<th>POPPET TYPE</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>3500</td>
<td>45</td>
<td>241</td>
<td>7/8-14</td>
<td>EG-F2A</td>
<td>PD44</td>
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<tr>
<td></td>
<td>26</td>
<td>3500</td>
<td>100</td>
<td>241</td>
<td>1/16-12</td>
<td>EU-F2A</td>
<td>PD46</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.
**EG-F2A  2 WAY PRESSURE COMPENSATED PROPORTIONAL FLOW REGULATOR**

**DESCRIPTION**

**OPERATION**
EG-F2A maintains a constant flow rate out of (2) regardless of load pressure variations in the circuit downstream of (1). When coil is not energized, there is no regulated flow out of (2). The valve begins to respond to load variations when the flow through the valve creates a pressure differential across the control spool. Reverse flow from (2) to (1) returns through the control spool and is not compensated.

**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.
- Industry common cavity.
- Excellent linearity and low hysteresis characteristics.
- Cartridges are voltage interchangeable.
- Optional coil voltages and terminations available.
- Unitized, molded coil design.
- Continuous duty rated solenoid.

---

**FLOW (lt/min) vs. CURRENT (mA - PWM @ 100 Hz)**

<table>
<thead>
<tr>
<th>Q (lt/min)</th>
<th>I (mA)</th>
</tr>
</thead>
<tbody>
<tr>
<td>50</td>
<td>300</td>
</tr>
<tr>
<td>45</td>
<td>400</td>
</tr>
<tr>
<td>40</td>
<td>500</td>
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<td>25</td>
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<tr>
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<tr>
<td>10</td>
<td>1300</td>
</tr>
<tr>
<td>5</td>
<td>1400</td>
</tr>
<tr>
<td>0</td>
<td>1500</td>
</tr>
</tbody>
</table>

**HYDRAULIC SYMBOL**

**PERFORMANCE**

**COIL SPECIFICATIONS**
- Current Supply Characteristics: PWM (Pulse Width Modulation)
- Rated Current Range: 400-1400 mA
- PWM or Super-Imposed: 100 Hz
- Dither Frequency: 100 Hz
- Coil Resistance (12 VDC): 7.2 Ohm ±5% at 68°F (20°C)

---

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**Regulated Flow vs. Pressure**

Coil 12 VDC - 130 Hz PWM - Oil 26 cSt (121 SSU) @ 50°C (104°F)

<table>
<thead>
<tr>
<th>Pressure Drop (bar)</th>
<th>Regulated Flow (l/min)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>5</td>
<td>5</td>
</tr>
</tbody>
</table>

**ORDERING INFORMATION**

Approximate Coil Weight: .47 lbs (.21 kg)

**OPTIONS**

- Buna Standard
- Buna, Screw Type Override (Knob)
- Buna, Screw Type Override (Grad. Knob)
- Up to 15 l/min
- Up to 30 l/min
- Up to 45 l/min

**BODIES**

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

**VOLTAGE**

- 12 VDC
- 24 VDC

**“F” COIL TERMINATION**

- HC DIN 43650 (Hirschmann)
- DI Deutsch-Integral DT04-2P
- JT AMP Jr. Timer

NOTE: for other seals, consult factory.
EU-F2A 2 WAY PRESSURE COMPENSATED PROPORTIONAL FLOW REGULATOR

DESCRIPTION
12 size, 1" 1/16-12 thread, “Tecnord” series, solenoid operated, normally closed, poppet style, restrictive type 2 ways pressure compensated proportional flow regulator.

OPERATION
EU-F2A maintains a constant flow rate out of (2) regardless of load pressure variations in the circuit downstream of (1). When coil is not energized, there is no regulated flow out of (2). The valve begins to respond to load variations when the flow through the valve creates a pressure differential across the control spool. Reverse flow from (2) to (1) returns through the control spool and is not compensated. The manual override increases flow by counter-clockwise rotation of the manual override knob.

FEATURES
- Hardened parts for long-life.
- Industry common cavity.
- Excellent linearity and low hysteresis characteristics.
- Cartridges are voltage interchangeable.
- Optional coil voltages and terminations available.
- Unitized, molded coil design.
- Continuous duty rated solenoid.

Regulated Flow vs. Pressure

Max System Pressure 3500 PSI (241 bar)
Leakage 0-10 drops / min @ 245 bar
Hysteresis ±5%
Viscosity Range 36 to 3000 SSU (3 to 647 cSt)
Filtration ISO 18/16/13
Media Operating Temp. Range -30°C / +100°C
Weight .72 lbs (.32 kg)
Operating Fluid Media General Purpose Hydraulic Fluid
Coil Nut Torque Requirements 2-3 ft-lbs (3-4 Nm)
Cavity TECNORD 3W
Cavity Tools Kit (form tool, reamer, tap) 40500034

Coil Specifications
Current Supply Characteristics PWM (Pulse Width Modulation)
Rated Current Range 500-1400 mA
PWM or Super-Imposed 100 Hz
Dither Frequency 7.2 Ohm ±5% at 68°F (20°C)
WARNING: the specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

Flow vs. Current
Coil 12 VDC - Oil 26 cSt (121 SSU) @ 40°C (104°F)

Flow (l/min)

Current (mA)

OPTIONS
EU-F2A – – – – –

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

Voltage
12 12 VDC
24 24 VDC

"F" Coil Termination
HC DIN 43650 (Hirschmann)
DI Deutsch-Integral DT04-2P
JT AMP Jr. Timer

NOTE: for other seals, consult factory.
WARNING: the specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.
3 WAY NORMALLY CLOSED PRESSURE COMPENSATED PROPORTIONAL FLOW REGULATOR VALVES

<table>
<thead>
<tr>
<th>SPOOL TYPE</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>3500</td>
<td>23</td>
<td>241</td>
<td>7/8-14</td>
<td>EF-F3G</td>
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<td>16</td>
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<td>60</td>
<td>241</td>
<td>1/16-12</td>
<td>EU-F3G</td>
<td>PD52</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.
**DESCRIPTION**
10 size, 7/8-14 thread, “Delta” series, solenoid operated, normally closed, spool style, 3 ways priority type pressure compensated proportional flow regulator. It can also be used as a restrictive-type 2 way, pressure-compensated flow regulator when the bypass line (port 2) is blocked.

**OPERATION**
EF-F3G maintains a constant flow rate out of (1) regardless of load pressure variations in the circuit downstream of (3) and regardless bypass pressure variations in the circuit downstream of (2). Excess flow bypasses out of (2). When coil is not energized, there is no regulated flow out of (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.
- Industry common cavity.
- Excellent linearity and low hysteresis characteristics.
- Cartridges are voltage interchangeable.
- Optional coil voltages and terminations available.
- Unitized, molded coil design.
- Continuous duty rated solenoid.

**HYDRAULIC SYMBOL**

**PERFORMANCE**

**Flow vs. Current**
Coil 12 VDC - 130 Hz PWM - Oil 26 cSt (121 SSU) @ 50°C (104°F)

**VALVE SPECIFICATIONS**
- Flow Range: See curves for various versions
- Max System Pressure: 3500 PSI (241 bar)
- Leakage: 10 cu-in/min @ 3000 PSI, 160 cc/min @ 207 bar
- Hysteresis: ±5%
- Viscosity Range: 36 to 3000 SSU (3 to 647 cSt)
- Filtration: ISO 18/16/13
- Media Operating Temp. Range: -30°C / +100°C
- Weight: .49 lbs (.22 kg)
- Operating Fluid Media: General Purpose Hydraulic Fluid
- Cartridge Torque Requirements: 30 ft-lbs (41 Nm)
- Operating Fluid Media: General Purpose Hydraulic Fluid
- Cavity: DELTA 3W
- Cavity Tools Kit: (form tool, reamer, tap) 40500001

**COIL SPECIFICATIONS**
- Current Supply Characteristics: PWM (Pulse Width Modulation)
- Rated Current Range: 400-1400 mA
- PWM or Super-Imposed: 120-140 Hz
- Dither Frequency: 120-140 Hz
- Coil Resistance (12 VDC): 7.2 Ohm ±5% at 68°F (20°C)
**DIMENSIONS**

**Pressure Drop 3–2 (bar)**

Oil 26 cSt (121 SSU) @ 50°C (104°F)

![Pressure Drop Graph]

**Regulated Flow vs. Pressure**

2 WAYS - Coil 12 VDC - 130 Hz PWM - Oil 26 cSt (121 SSU) @ 50°C (104°F)

![Regulated Flow Graph]

**Pres. Compensation from Inlet to Work Port or Bypass Port**

3 WAYS - Coil 12 VDC - 130 Hz PWM - Oil 26 cSt (121 SSU) @ 50°C (104°F)

![Pressure Compensation Graph]

**ORDERING INFORMATION**

Approximate Coil Weight: .47 lbs (.21 kg)

<table>
<thead>
<tr>
<th>OPTIONS</th>
<th>EF-F3G</th>
<th>BODIES</th>
<th>VOLTAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Buna Standard</td>
<td>-</td>
<td>Blank</td>
<td>HC DIN 43650 (Hirschmann)</td>
</tr>
<tr>
<td>Buna, Screw Type Override (Knob)</td>
<td>-</td>
<td>Without Body</td>
<td>DI Deutsch-Integral DT04-2P</td>
</tr>
<tr>
<td>Buna, Screw Type Override (Grad. Knob)</td>
<td>-</td>
<td>#6 SAE Ports</td>
<td>JT AMP Jr. Timer</td>
</tr>
<tr>
<td>BS Up to 25 l/min</td>
<td>-</td>
<td>12 VDC</td>
<td></td>
</tr>
<tr>
<td>BK Up to 25 l/min</td>
<td>-</td>
<td>24 VDC</td>
<td></td>
</tr>
</tbody>
</table>

**NOTES:**
1) For other flow settings, consult factory.
2) For other seals, consult factory.

**WARNING:**

The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.
DESCRIPTION
12 size, 1” 1/16-12 thread, “Tecnord” series, solenoid operated, normally closed, spool style, 3 ways priority type pressure compensated proportional flow regulator. It can also be used as a restrictive-type 2 way, pressure-compensated flow regulator when the bypass line (port 2) is blocked.

OPERATION
EU-F3G maintains a constant flow rate out of (1) regardless of load pressure variations in the circuit downstream of (3) and regardless bypass pressure variations in the circuit downstream of (2). Excess flow bypasses out of (2). When coil is not energized, there is no regulated flow out of (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.
• Industry common cavity.
• Excellent linearity and low hysteresis characteristics.
• Cartridges are voltage interchangeable.
• Optional coil voltages and terminations available.
• Unitized, molded coil design.
• Continuous duty rated solenoid.

HYDRAULIC SYMBOL

PERFORMANCE
Flow vs. Current
Coil 12 VDC - 130 Hz PWM - Oil 26 cSt (121 SSU) @ 50°C (104°F)

0 300 600 900 1200 1500 1800
0 10 20 30 40 50 60 70 80

Flow Range  See curves for various versions
Max System Pressure  3500 PSI (241 bar)
Leakage  15.7 cu-in/min @ 3000 PSI, 250 cc/min @ 207 bar
Hysteresis  ±5%
Viscosity Range  36 to 3000 SSU (3 to 647 cSt)
Filtration  ISO 18/16/13
Media Operating Temp. Range  -30°C / +100°C
Weight  .75 lbs (.34 kg)
Operating Fluid Media  General Purpose Hydraulic Fluid
Cartridge Torque Requirements 37 ft-lbs (50 Nm)
Coil Nut Torque Requirements 2-3 ft-lbs (3-4 Nm)
Cavity  TECNORD 3W
Cavity Tools Kit (form tool, reamer, tap) 40500034

COIL SPECIFICATIONS
Current Supply Characteristics  PWM (Pulse Width Modulation)
Rated Current Range  400-1400 mA
PWM or Super-Imposed Dither Frequency  120-140 Hz
Coil Resistance (12 VDC)  7.2 Ohm ±5% at 68°F (20°C)

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

**DIMENSIONS**

![Regulated Flow vs. Pressure](image)

**ORDERING INFORMATION**

**EU-F3G**

**OPTIONS**

- Buna Standard: C0 Up to 60 l/min
- Buna, Screw Type Override (Knob): CS Up to 60 l/min
- Buna, Screw Type Override (Grad. Knob): CK Up to 60 l/min

**BODIES**

- Blank: Without Body
- N: 3/4” BSP Ports
- S: #8 SAE Ports

**“Z” COIL TERMINATION**

- DIN 43650 (Hirschmann): HC
- Deutsch-Integral DT04-2P: DI
- AMP Jr. Timer: JT

**VOLTAGE**

- 12 VDC: 12
- 24 VDC: 24

**NOTES:**

1. For other flow settings, consult factory.
2. For other seals, consult factory.

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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.
## PROPORTIONAL CONTROLS

### 4W/3P PROPORTIONAL DIRECTIONAL CONTROL VALVES

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<tr>
<th>MOTOR SPOOL TYPE</th>
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<td>11</td>
<td>241</td>
<td>3/4-16</td>
<td>EQ-S4M</td>
<td>PD56</td>
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<td>241</td>
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<th>CYLINDER SPOOL TYPE</th>
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<td>EG-S4P</td>
<td>PD62</td>
</tr>
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</table>

## WARNING:
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**DESCRIPTION**

8 size, 3/4-16 thread, “Power” series, solenoid operated, 4 way 3 position, Motor Spool, proportional directional valve.

**OPERATION**

EQ-S4M, when de-energized, blocks flow at (2) and allows flow between (1), (3) and (4). When coil (S1) is energized, flow is allowed from (3) to (4), and from (2) to (1). When coil (S2) is energized, flow is allowed from (3) to (2), and from (4) to (1). Flow is proportional to the current applied to the coil. A compensator must be used to create a pressure compensated flow control function.

**FEATURES**

- Hardened parts for long-life.
- Industry common cavity.
- Excellent linearity and low hysteresis characteristics.
- Cartridges are voltage interchangeable.
- Optional coil voltages and terminations available.
- Unitized, molded coil design.
- Continuous duty rated solenoid.

**HYDRAULIC SYMBOL**

![Hydraulic Symbol](image)

**PERFORMANCE**

**Flow vs. Current**

Coil 12VDC – 100 Hz PWM – Oil 26cSt (121 SSU) @ 50°C (122°F)

Operating curves made with circuit having a pressure drop of 14 bar

**VALVE SPECIFICATIONS**

- Flow Range: See curves for various versions
- Max System Pressure: 3500 PSI (241 bar)
- Leakage: 10 cu-in/min
- 160 cc/min bar @ 210 bar
- Hysteresis: ±5%
- Viscosity Range: 36 to 3000 SSU (3 to 647 cSt)
- Filtration: ISO 18/16/13
- Media Operating Temp. Range: -30°C / +100°C
- Operating Fluid Media: General Purpose Hydraulic Fluid
- Cartridge Torque Requirements: 18 ft-lbs (26 Nm)
- Coil Nut Torque Requirements: 2-3 ft-lbs (3-4 Nm)
- Cavity: POWER 4W
- Cavity Tools Kit (form tool, reamer, tap): 40500029

**COIL SPECIFICATIONS**

- Current Supply Characteristics: PWM (Pulse Width Modulation)
- Rated Current Range: 400-1300 mA
- PWM or Super-Imposed Dither Frequency: 100-200 Hz
- Coil Resistance (12 VDC): 6.85 Ohm ±5% at 68°F (20°C)
### WARNING:
The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

### DIMENSIONS

#### Pressure Drop vs. Flow
Oil 26cSt (121 SSU)@ 50°C (122°F)

<table>
<thead>
<tr>
<th>Flow (l/min)</th>
<th>Pressure Drop (bar)</th>
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<tr>
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<td>8</td>
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</tr>
<tr>
<td>10</td>
<td>2</td>
</tr>
<tr>
<td>12</td>
<td>4</td>
</tr>
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</table>

#### Pressure Compensation from Inlet to Work Port
Oil 26cSt (121 SSU)@ 50°C (122°F)

<table>
<thead>
<tr>
<th>Differential Pressure (bar)</th>
<th>Regulated Flow (l/min)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>15</td>
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<td>8</td>
<td>6</td>
</tr>
<tr>
<td>12</td>
<td>3</td>
</tr>
</tbody>
</table>

(For bodies style and sizes see section “Accessories”)

### ORDERING INFORMATION

**EQ-S4M**

**OPTIONS**
- B0 Up to 8 l/min
- C0 Up to 12 l/min

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

**VOLTAGE**
- 12 VDC
- 24 VDC

**“PJ” COIL TERMINATION**
- JH DIN 43650 (Hirschmann)
- JD Deutsch-Integral DT04-2P
- JA AMP Superseal
- JJ AMP Jr. Timer

**NOTE:** For other seals, consult factory.

**Approximate Coil Weight:** .47 lbs (.21 kg)

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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.
DESCRIPTION
10 size, 7/8-14 thread, “Delta” series, solenoid operated, 4 way 3 position, Motor Spool, proportional directional valve.

OPERATION
EG-S4M, when de-energized, blocks flow at (2) and allows flow between (1), (3) and (4). When coil (S1) is energized, flow is allowed from (3) to (4), and from (2) to (1). When coil (S2) is energized, flow is allowed from (3) to (2), and from (4) to (1). Flow is proportional to the current applied to the coil. A compensator must be used to create a pressure compensated flow control function.

FEATURES
• Hardened parts for long-life.
• Industry common cavity.
• Excellent linearity and low hysteresis characteristics.
• Cartridges are voltage interchangeable.
• Optional coil voltages and terminations available.
• Unitized, molded coil design.
• Continuous duty rated solenoid.

HYDRAULIC SYMBOL

PERFORMANCE
Flow vs. Current
Coil 12 VDC - 100 Hz PWM - Oil 26 cSt (121 SSU) @ 50°C (122°F)
Operating curves made with circuit having a pressure drop of 14bar

Flow Range See curves for various versions
Max System Pressure 3500 PSI (241 bar)
Leakage 15 cu-in/min
250 cc/min bar @ 210 bar
Hysteresis ±5%
Viscosity Range 36 to 3000 SSU (3 to 647 cSt)
Filtration ISO 18/16/13
Media Operating Temp. Range -30°C / +100°C
Operating Fluid Media General Purpose Hydraulic Fluid
Cartridge Torque Requirements 25 ft-lbs (34 Nm)
Coil Nut Torque Requirements 2-3 ft-lbs (3-4 Nm)
Cavity DELTA 4W
Cavity Tools Kit (form tool, reamer, tap) 40500002

COIL SPECIFICATIONS
Current Supply Characteristics PWM (Pulse Width Modulation)
Rated Current Range 400-1400 mA
PWM or Super-Imposed
Dither Frequency 100-200 Hz
Coil Resistance (12 VDC) 5.6 Ohm ±5% at 68°F (20°C)

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

**DIMENSIONS**

**Pressure Drop vs. Flow**
Oil 26cSt (121 SSU) @ 50°C (122°F)

<table>
<thead>
<tr>
<th>Flow (l/min)</th>
<th>Pressure Drop (bar)</th>
</tr>
</thead>
<tbody>
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<tr>
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<tr>
<td>3</td>
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<tr>
<td>1</td>
<td>4</td>
</tr>
</tbody>
</table>

**Pressure Compensation from Inlet to Work Port**
Oil 26cSt (121 SSU) @ 50°C (122°F)

<table>
<thead>
<tr>
<th>Differential Pressure (bar)</th>
<th>Regulated Flow (l/min)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>26</td>
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<td>5</td>
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<td>25</td>
<td>5</td>
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<tr>
<td>30</td>
<td>2.5</td>
</tr>
</tbody>
</table>

**ORDERING INFORMATION**

**S4M**

**Options**
- Buna Standard
- Blank Up to 22 l/min

**Bodies**
- Without Body
- 3/8” BSP Ports
- #6 SAE Ports

**Voltage**
- 12 VDC
- 24 VDC

**"L" Coil Termination**
- DIN 43650 (Hirschmann)
- Deutsch-Integral DT04-2P

**NOTE:** for other seals, consult factory.

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

**DELTA POWER COMPANY**
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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
8 size, 3/4-16 thread, “Power” series, solenoid operated, 4 way 3 position, Cylinder Spool, proportional directional valve.

OPERATION
EQ-S4P, when de-energized, blocks flow to all ports. When coil (S1) is energized, flow is allowed from (3) to (4), and from (2) to (1). When coil (S2) is energized, flow is allowed from (3) to (2), and from (4) to (1). Flow is proportional to the current applied to the coil. A compensator must be used to create a pressure compensated flow control function.

FEATURES
- Hardened parts for long-life.
- Industry common cavity.
- Excellent linearity and low hysteresis characteristics.
- Cartridges are voltage interchangeable.
- Optional coil voltages and terminations available.
- Unitized, molded coil design.
- Continuous duty rated solenoid.

HYDRAULIC SYMBOL

PERFORMANCE
Flow vs. Current
Coil 12VDC – 100 Hz PWM – Oil 26cSt (121 SSU) @ 50°C (122°F)
Operating curves made with circuit having a pressure drop of 14bar

VALVE SPECIFICATIONS
Flow Range
Max System Pressure
Leakage
Hysteresis
Viscosity Range
Filtration
Media Operating Temp. Range
Operating Fluid Media
Cartridge Torque Requirements
Coil Nut Torque Requirements
Cavity
Cavity Tools Kit
(CTK 40500029)

COIL SPECIFICATIONS
Current Supply Characteristics
Rated Current Range
PWM or Super-Imposed
Dither Frequency
Coil Resistance (12 VDC)

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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

Pressure Drop vs. Flow
Oil 26cSt (121 SSU)@ 50°C (122°F)

Pressure Compensation from Inlet to Work Port
Oil 26cSt (121 SSU)@ 50°C (122°F)

ORDERING INFORMATION

Approximate Coil Weight: .47 lbs (.21 kg)

EQ-S4P

OPTIONS
Buna Standard
B0 Up to 8 l/min
Buna Standard
C0 Up to 12 l/min

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

VOLTAGE
12 12 VDC
24 24 VDC

“PJ” COIL TERMINATION
JH DIN 43650 (Hirschmann)
JD Deutsch-Integral DT04-2P
JA AMP Superseal
JJ AMP Jr. Timer

NOTE: for other seals, consult factory.
DESCRIPTION
10 size, 7/8-14 thread, "Delta" series, solenoid operated, 4 way 3 position, Cylinder Spool, proportional directional valve.

OPERATION
EG-S4P, when de-energized, blocks flow to all ports. When coil (S1) is energized, flow is allowed from (3) to (4), and from (2) to (1). When coil (S2) is energized, flow is allowed from (3) to (2), and from (4) to (1). Flow is proportional to the current applied to the coil. A compensator must be used to create a pressure compensated flow control function.

FEATURES
• Hardened parts for long-life.
• Industry common cavity.
• Excellent linearity and low hysteresis characteristics.
• Cartridges are voltage interchangeable.
• Optional coil voltages and terminations available.
• Unitized, molded coil design.
• Continuous duty rated solenoid.

PERFORMANCE
Flow vs. Current
Coil 12 VDC - 100 Hz PWM - Oil 26 cSt (121 SSU) @ 50°C (122°F)
Operating curves made with circuit having a pressure drop of 14bar

HYDRAULIC SYMBOL

VALVE SPECIFICATIONS
Flow Range See curves for various versions
Max System Pressure 3500 PSI (241 bar)
Leakage 15 cu-in/min
250 cc/min bar @ 210 bar
Hysteresis ±5%
Viscosity Range 36 to 3000 SSU (3 to 647 cSt)
Filtration ISO 18/16/13
Media Operating Temp. Range -30°C / +100°C
Operating Fluid Media General Purpose Hydraulic Fluid
Cartridge Torque Requirements 25 ft-lbs (34 Nm)
Coil Nut Torque Requirements 2-3 ft-lbs (3-4 Nm)
Cavity DELTA 4W
Cavity Tools Kit (form tool, reamer, tap) 40500002

COIL SPECIFICATIONS
Current Supply Characteristics PWM (Pulse Width Modulation)
Rated Current Range 400-1400 mA
PWM or Super-Imposed
Dither Frequency 100-200 Hz
Coil Resistance (12 VDC) 5.6 Ohm ±5% at 68°F (20°C)
WARNING: the specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

ORDERING INFORMATION

Approximate Coil Weight: .47 lbs (.21 kg)

EG-S4P – – – – –

OPTIONS
Buna Standard B0 Up to 22 l/min

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

VOLTAGE
12 12 VDC
24 24 VDC

“L” COIL TERMINATION
HC DIN 43650 (Hirschmann)
DT Deutsch-Integral DT04-2P

NOTE: for other seals, consult factory.