Manufacturers of hydraulic cartridge valves
and electro-hydraulic systems
### PROPORTIONAL PRESSURE CONTROLS

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### PROPORTIONAL FLOW CONTROLS

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### PROPORTIONAL PRESSURE REDUCING / RELIEVING VALVES

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<tr>
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<th>PSI</th>
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<th>CAVITY</th>
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</tr>
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<tr>
<td></td>
<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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<tr>
<td></td>
<td>1</td>
<td>700</td>
<td>4</td>
<td>50</td>
<td>slip-in</td>
<td>IP-DAR-43C-L</td>
<td>PD6</td>
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<tr>
<td></td>
<td>1</td>
<td>5000</td>
<td>4</td>
<td>345</td>
<td>slip-in</td>
<td>IP-DAR-43C-H</td>
<td>PD6</td>
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### PILOT OPERATED

<table>
<thead>
<tr>
<th>PILOT OPERATED</th>
<th>GPM</th>
<th>PSI</th>
<th>LPM</th>
<th>BAR</th>
<th>CAVITY</th>
<th>MODEL</th>
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</tr>
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<tbody>
<tr>
<td></td>
<td>15</td>
<td>3000</td>
<td>57</td>
<td>207</td>
<td>7/8-14</td>
<td>EF-PRP</td>
<td>PD10</td>
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<tr>
<td></td>
<td>7.9</td>
<td>700</td>
<td>30</td>
<td>50</td>
<td>slip-in</td>
<td>IP-PRZ-59-AM12</td>
<td>PD12</td>
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<tr>
<td></td>
<td>8</td>
<td>450</td>
<td>30</td>
<td>31</td>
<td>7/8-14</td>
<td>EG-PRZ</td>
<td>PD14</td>
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<td>31</td>
<td>1 1/16-12</td>
<td>ES-PRZ</td>
<td>PD16</td>
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</tbody>
</table>

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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.

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 Ohms ±5% at 68°F (20°C)
(24 VDC) 20 Ohms ±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)

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HYDRAULIC SYMBOL

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

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IP-DAR-250

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**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**

A0 - NBR seals and 300 μm (50 mesh) screen on port 2

**BODIES**

Blank - Without body

N - 1/4" BSP Ports

**TERMINATION**

Deutsch DT04-2P

AMP Junior Timer

**DIMENSIONS**

DT version

AJ version

**NTS**

N°2 M4 screw min. thread depth 10mm

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PROPORTIONAL CONTROLS
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/removing 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
- 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): 2.2 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
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**DIMENSIONS**

**ORDERING INFORMATION**

<table>
<thead>
<tr>
<th>IP-DAR-43C</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></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>
</tr>
<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-armature construction.
- Integral waterproof coil.
- Continuous duty rated solenoid.

HYDRAULIC SYMBOL

PERFORMANCE

Pressure vs. Current Characteristic
Oil viscos-1 5 cSt @ 45°C and PWM 100 Hz

Valve Specifications
Nominal Flow 7.5 GPM (30 LPM) @ 6 bar Delta P
Max Inlet Pressure "L" version 700 PSI (50 bar)
Controlled Pressure Range 0+23 bar / 0+30 bar / 0+35 bar (see graph)
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 0.8 lbs (0.37 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÷750 (24 V coil)
PWM or Super-Imposed Dither Freq. 100÷200 Hz
Coil Resistance 12 VDC 5.4 Ohm ±5% at 68°F (20°C)
(24 VDC 22 Ohm ±5% at 68°F (20°C)
Max Power Consumption 12 Watt (20°C)
Coil Termination Deutsch-Integral DT04-2P (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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**DIMENSIONS**

**ORDERING INFORMATION**

**IP-RDS-222**

- **COIL TERMINATION**
  - AJ - AMP Jr. Timer
  - DT - Deutsch DT04
  - DH - Deutsch DT04 Horizontal

- **VOLTAGE**
  - 12 VDC
  - 24 VDC

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

- **MAX REGULATED PRESSURE**
  - 23 bar
  - 35 bar

- **OPTIONS**
  - A0 - NBR seals and 300 μm (50 mesh) screen on port 2
  - Blank - Without body

- **BODIES**
  - N - 3/8" BSP Ports

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### 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/relieving 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 “I” Coil: Weatherproof, Thermal Shock, Immersion Safe

#### HYDRAULIC SYMBOL

![Hydraulic Symbol](image)

#### PERFORMANCE

![Performance Graph](image)

#### VALVE SPECIFICATIONS

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nominal Flow</td>
<td>15 GPM (57 LPM)</td>
</tr>
<tr>
<td>Rated Operating Pressure</td>
<td>3000 PSI (207 bar)</td>
</tr>
<tr>
<td>Viscosity Range</td>
<td>36 to 300 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>.59 lbs (.27 kg)</td>
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<tr>
<td>Operating Fluid Media</td>
<td>General Purpose Hydraulic Fluid</td>
</tr>
<tr>
<td>Cartridge Torque Requirements</td>
<td>30 ft-lbs (40.6 Nm)</td>
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<tr>
<td>Cavity</td>
<td>DELTA 3W</td>
</tr>
<tr>
<td>Cavity Form Tool (Finishing)</td>
<td>40500001</td>
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<tr>
<td>Seal Kit</td>
<td>21191206</td>
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**DIMENSIONS**

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**ORDERING INFORMATION**

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

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<th>BODIES</th>
<th>VOLTAGE</th>
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<tbody>
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<td>Buna, 150-1015 PSI range</td>
<td>Blank</td>
<td>06 6 VDC</td>
</tr>
<tr>
<td>Viton, 150-1015 PSI range</td>
<td>N</td>
<td>12 12 VDC</td>
</tr>
<tr>
<td>Buna, 150-2175 PSI range</td>
<td>VA</td>
<td>24 24 VDC</td>
</tr>
<tr>
<td>Viton, 150-2175 PSI range</td>
<td>B</td>
<td>36 36 VDC</td>
</tr>
<tr>
<td>Buna, 150-3000 PSI range</td>
<td>0B</td>
<td>48 48 VDC</td>
</tr>
<tr>
<td>Viton, 150-3000 PSI range</td>
<td>C</td>
<td>25 24 VAC</td>
</tr>
<tr>
<td></td>
<td>0C</td>
<td>11 120 VAC</td>
</tr>
<tr>
<td></td>
<td>VC</td>
<td>22 220 VAC</td>
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<tr>
<td></td>
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<td>44 440 VAC</td>
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**“P” COIL TERMINATION**

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<tr>
<th>DL</th>
<th>Double Lead</th>
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<tbody>
<tr>
<td>DT</td>
<td>Deutsch on Leads DT04-2P</td>
</tr>
<tr>
<td>ML</td>
<td>Metri-Pack on Leads</td>
</tr>
<tr>
<td>PL</td>
<td>Packard on Leads</td>
</tr>
<tr>
<td>WL</td>
<td>Weatherpack on Leads</td>
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</table>

<table>
<thead>
<tr>
<th>SS</th>
<th>Single Spade</th>
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<tbody>
<tr>
<td>DS</td>
<td>Double Spade</td>
</tr>
<tr>
<td>HC</td>
<td>DIN 43650 (Hirschmann) - (AC &amp; DC)</td>
</tr>
<tr>
<td>CL</td>
<td>Conduit Lead – (AC Only)</td>
</tr>
<tr>
<td>DI</td>
<td>Deutsch – Integral DT04-2P</td>
</tr>
</tbody>
</table>

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IP-PRZ-59-AM12 PILOT OPERATED PROPORTIONAL, PRESSURE REDUCING/RELIEVING, 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.

HYDRAULIC SYMBOL

PERFORMANCE

Reduced pressure (bar) vs. Current (mA)
12 V coil, 24 bar inlet pressure

VALVE SPECIFICATIONS

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
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<tbody>
<tr>
<td>Nominal Flow</td>
<td>7.9 GPM (30 LPM) @ 3 bar DeltaP</td>
</tr>
<tr>
<td>Max Inlet Pressure</td>
<td>700 PSI (50 bar)</td>
</tr>
<tr>
<td>Controlled Pressure Range</td>
<td>(see graph)</td>
</tr>
<tr>
<td>Max Internal Leakage</td>
<td>&lt;500 cc/min @ 35 bar</td>
</tr>
<tr>
<td>Viscosity Range</td>
<td>5 to 5000 cSt</td>
</tr>
<tr>
<td>Filtration</td>
<td>ISO 18/15/13</td>
</tr>
<tr>
<td>Media Operating Temp. Range</td>
<td>-25°C / +85°C</td>
</tr>
<tr>
<td>Weight</td>
<td>.63 lbs (.29 kg)</td>
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<tr>
<td>Operating Fluid Media</td>
<td>General Purpose Hydraulic Fluid</td>
</tr>
<tr>
<td>Cavity</td>
<td>T059</td>
</tr>
<tr>
<td>Cavity Tools Kit</td>
<td>K-T059</td>
</tr>
<tr>
<td>Flange Mounting Screws and Torque</td>
<td>M6x10 / 4 ft-lbs (6 Nm)</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>100-900 mA</td>
</tr>
<tr>
<td>Dither Frequency</td>
<td>100-150 Hz</td>
</tr>
<tr>
<td>Coil Resistance (12 VDC)</td>
<td>10 Ohm ±5% at 68°F (20°C)</td>
</tr>
<tr>
<td>Max Power Consumption</td>
<td>14 Watt</td>
</tr>
<tr>
<td>Protection Degree</td>
<td>IP 67 according to IEC 529</td>
</tr>
<tr>
<td>Color Connectors</td>
<td>Green</td>
</tr>
</tbody>
</table>

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

PERFORMANCE

<table>
<thead>
<tr>
<th>% of Maximum Control Current</th>
<th>Pressure (PSI)</th>
<th>Pressure vs. Current Graph for EG-PRZ at 300 Psi Inlet Pressure</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>20</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>40</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>60</td>
<td>15</td>
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<tr>
<td>80</td>
<td>20</td>
<td></td>
</tr>
<tr>
<td>100</td>
<td>25</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>% of Maximum Control Current</th>
<th>Pressure (BAR)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>20</td>
<td>0.66</td>
</tr>
<tr>
<td>40</td>
<td>1.32</td>
</tr>
<tr>
<td>60</td>
<td>1.98</td>
</tr>
<tr>
<td>80</td>
<td>2.64</td>
</tr>
<tr>
<td>100</td>
<td>3.30</td>
</tr>
</tbody>
</table>

VALVE SPECIFICATIONS
- Nominal Flow: 8 GPM (30 LPM)
- Max System Pressure: 450 PSI (31 bar)
- Viscosity Range: 36 to 3000 SSU (3 to 647 cSt)
- Filtration: ISO 18/16/13
- Media Operating Temp. Range: -40° to 250°F (-40° to 120°C)
- Weight: .38 lbs (.17 kg)
- Operating Fluid Media: General Purpose Hydraulic Fluid
- Cartridge Torque Requirements: 12 ft-lbs (16.3Nm)
- Coil Nut Torque Requirements: 4 - 6 ft-lbs (5.4 - 8.1 Nm)
- Cavity: DELTA 4W
- Cavity Form Tool (Finishing): 40500002
- Seal Kit: 21191204

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DIMENSIONS

ORDERING INFORMATION

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

<table>
<thead>
<tr>
<th>OPTIONS</th>
<th>BODIES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Buna Standard 00</td>
<td>Blank (Without Body)</td>
</tr>
<tr>
<td>Viton Standard V0</td>
<td>N (1/4 NPTF Ports)</td>
</tr>
<tr>
<td></td>
<td>S (#6 SAE Ports)</td>
</tr>
</tbody>
</table>

VOLTAGE

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>12</td>
<td>12 VDC (.825 Amps Max.)</td>
</tr>
<tr>
<td>24</td>
<td>24 VDC (.412 Amps Max.)</td>
</tr>
</tbody>
</table>

“P” COIL TERMINATION

(All DC Except as Noted)

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>DL</td>
<td>Double Lead</td>
</tr>
<tr>
<td>DT</td>
<td>Deutsch on Leads DT04-2P</td>
</tr>
<tr>
<td>ML</td>
<td>Metri-Pack on Leads</td>
</tr>
<tr>
<td>PL</td>
<td>Packard on Leads</td>
</tr>
<tr>
<td>WL</td>
<td>Weatherpack on Leads</td>
</tr>
<tr>
<td>SS</td>
<td>Single Spade</td>
</tr>
<tr>
<td>DS</td>
<td>Double Spade</td>
</tr>
<tr>
<td>HC</td>
<td>DIN 43650 (Hirschmann) - (DC)</td>
</tr>
<tr>
<td>DI</td>
<td>Deutsch - Integral DT04-2P</td>
</tr>
</tbody>
</table>

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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

PERFORMANCE

![Pressure vs. Current Graph for ESPRZ at 300 PSI inlet](image)

<table>
<thead>
<tr>
<th>Pressure (PSI)</th>
<th>% of Maximum Control Current</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>60</td>
<td>20</td>
</tr>
<tr>
<td>120</td>
<td>40</td>
</tr>
<tr>
<td>180</td>
<td>60</td>
</tr>
<tr>
<td>240</td>
<td>80</td>
</tr>
<tr>
<td>300</td>
<td>100</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Pressure (BAR)</th>
<th>% of Maximum Control Current</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>5</td>
<td>20</td>
</tr>
<tr>
<td>10</td>
<td>40</td>
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<tr>
<td>15</td>
<td>60</td>
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<tr>
<td>20</td>
<td>80</td>
</tr>
<tr>
<td>25</td>
<td>100</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 (94.9 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>40200043</td>
</tr>
</tbody>
</table>

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Low Wattage coils available. Consult Factory.
### PROPORTIONAL CONTROLS

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

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

**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

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### DIMENSIONS

- **Height:** 2.67 [67.9] in
- **Width:** 2.5 [63.5] in
- **Depth:** 3.9 [99.0] in

---

### ORDERING INFORMATION

**ES-PRZ**

<table>
<thead>
<tr>
<th>OPTIONS</th>
<th>BODIES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Buna Standard</td>
<td>Blank</td>
</tr>
<tr>
<td>Viton Standard</td>
<td>Without Body</td>
</tr>
<tr>
<td><strong>V0</strong></td>
<td>Consult Factory</td>
</tr>
</tbody>
</table>

**“P” COIL TERMINATION**

*(All DC Except as Noted)*

<table>
<thead>
<tr>
<th>VOLTAGE</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>12</td>
<td>12 VDC (.825 Amps Max.)</td>
</tr>
<tr>
<td>24</td>
<td>24 VDC (.412 Amps Max.)</td>
</tr>
</tbody>
</table>

**OPTIONS**

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

**BODIES**

- **S0** Single Spade
- **DS** Double Spade
- **HC** DIN 43650 (Hirschmann) – (DC)
- **DI** Deutsch – Integral DT04-2P

**Approximate Coil Weight:** .42 lbs (.19 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.
### 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>12</td>
<td>3000</td>
<td>45</td>
<td>207</td>
<td>7/8-14</td>
<td>EE-PRD</td>
<td>PD22</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).

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
- Nominal Flow: 0-20 GPM (0-76 LPM)
- Operating Range: 100-3000 PSI (7-207 bar)
- Typical Hysteresis: 10% Max
- Viscosity Range: 36 to 3000 SSU (3 to 647 cSt)
- Filtration: ISO 18/16/13
- Media Operating Temp. Range: -30°C / +100°C
- Weight: .62 lbs (.28 kg)
- Operating Fluid Media: General Purpose Hydraulic Fluid
- Cartridge Torque Requirements: 30 ft-lbs (40.6 Nm)
- Coil Nut Torque Requirements: 2-3 ft-lbs (3-4 Nm)
- Cavity: DELTA 2W
- Cavity Tools Kit (form tool, reamer, tap): 40500000
- Seal Kit: 21191202

COIL SPECIFICATIONS
- Current Supply Characteristics: PWM (Pulse Width Modulation)
- Rated Current Range: 100-1000 mA
- PWM or Super-Imposed Dither Frequency: 120-200 Hz
- Coil Resistance (12 VDC): 7.2 Ohm ±5% at 68°F (20°C)

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DIMENSIONS

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EE-PRB  —  —  —  —  BODIES

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

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

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

ORDERING INFORMATION

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

(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>Feature</th>
<th>Specification</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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Tecnord
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mail: tecnord@tecnord.com • www.tecnord.com
DIMENSIONS

**Relief Pressure vs. Flow @ 4 Amp**
- Flow (LPM)
- Relief Pressure (PSI)
- EE-PRD-0A
- EE-PRD-0B
- EE-PRD-0C

**Pressure Drop vs. Flow**
- Flow (LPM)
- Pressure Drop (PSI)

**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

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

**“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

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

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### 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>PD26</td>
</tr>
<tr>
<td></td>
<td>23.7</td>
<td>3500</td>
<td>90</td>
<td>241</td>
<td>1 1/16-12</td>
<td>ET-P2S</td>
<td>PD28</td>
</tr>
</tbody>
</table>

#### Poppet Type

<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>6.5</td>
<td>3500</td>
<td>25</td>
<td>241</td>
<td>3/4-16</td>
<td>EB-P2A</td>
<td>PD30</td>
</tr>
<tr>
<td></td>
<td>12</td>
<td>3500</td>
<td>45</td>
<td>241</td>
<td>7/8-14</td>
<td>EE-P2A</td>
<td>PD32</td>
</tr>
<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>PD34</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.
EE-P2G 2 WAY NORMALLY CLOSED, PROPORTIONAL FLOW CONTROL VALVE

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>I (mA)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>6</td>
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</tr>
</tbody>
</table>

VALVE SPECIFICATIONS
Flow Range: See curves for various versions
Max System Pressure: 3500 PSI (241 bar)
Leakage: Max 50 cc/min at 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: .58 lbs (.26 kg)
Operating Fluid Media: General Purpose Hydraulic Fluid
Cartridge Torque Requirements: 26 ft-lbs (35 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

COIL SPECIFICATIONS
Current Supply Characteristics: PWM (Pulse Width Modulation)
Rated Current Range: 200-1450 mA
PWM or Super-Imposed Dither Frequency: 100-150 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.
**DIMENSIONS**

**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)

**ORDERING INFORMATION**

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

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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 cSt (217 SSU) @ 50°C (122°F)

Curves are attained with Tecnord QC-CP3 compensator.

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

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

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

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

ORDERING INFORMATION

ET-P2S - - - - -

OPTIONS
Buna Standard C0 Up to 90 l/min
Buna, Screw Type Override (Knob) CS Up to 90 l/min
Buna, Screw Type Override (Grad. Knob) CK Up to 90 l/min

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

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

Approximate Coil Weight: .47 lbs (.21 kg)
**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 Torque Requirements**
37 ft-lbs (50 Nm)

**Coil Nut Torque Requirements**
2-3 ft-lbs (3-4 Nm)

**Cavity**
POWER 2W

**Cavity Tools Kit**
(form tool, reamer, tap) 40500005

**Seal Kit**
21191102

**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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**TECNORD**

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

**ORDERING INFORMATION**

**OPTIONS**
- Buna Standard C0 Up to 25 l/min
- Buna, Screw Type Override (Knob) CS Up to 25 l/min
- Buna, Screw Type Override (Grad. Knob) CK Up to 25 l/min

**BODIES**
- Blank Without Body B
- #8 SAE Ports S

**VOLTAGE**
- 12 VDC
- 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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**PROPORTIONAL CONTROLS**

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

**WARNING:**

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**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.

**HYDRAULIC SYMBOL**

**PERFORMANCE**

**Pressure Drop**
1 to 2 with valve completely open

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

**VALVE SPECIFICATIONS**

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flow Range</td>
<td>See curves</td>
</tr>
<tr>
<td>Max System Pressure</td>
<td>3500 PSI (241 bar)</td>
</tr>
<tr>
<td>Leakage</td>
<td>0-10 drops / min @ 245 bar</td>
</tr>
<tr>
<td>Hysteresis</td>
<td>±3%</td>
</tr>
<tr>
<td>Viscosity Range</td>
<td>36 to 300 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>.72 lbs (.32 kg)</td>
</tr>
<tr>
<td>Operating Fluid Media</td>
<td>General Purpose Hydraulic Fluid</td>
</tr>
<tr>
<td>Cartridge Torque Requirements</td>
<td>37 ft-lbs (50 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>
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<tr>
<td>Cavity Tools Kit</td>
<td>(form tool, reamer, tap)</td>
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<tr>
<td>Seal Kit</td>
<td>40500000</td>
</tr>
<tr>
<td>Weight</td>
<td>21191200</td>
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**COIL SPECIFICATIONS**

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
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<tbody>
<tr>
<td>Current Supply Characteristics</td>
<td>PWM (Pulse Width Modulation)</td>
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<tr>
<td>Rated Current Range</td>
<td>500-1450 mA</td>
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<tr>
<td>PWM or Super-Imposed</td>
<td></td>
</tr>
<tr>
<td>Dither Frequency</td>
<td>100 Hz</td>
</tr>
<tr>
<td>Coil Resistance (12 VDC)</td>
<td>7.5 Ohm ±5% at 68°F (20°C)</td>
</tr>
</tbody>
</table>

**WARNING:**

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Flow vs. Current at different Pressure Drop

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

Flow (l/min)

Flow (GPM)

Current (Amps)

Flow vs. Current at different Pressure Drop

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

Flow (l/min)

Flow (GPM)

Current (Amps)

**OPTIONS**

<table>
<thead>
<tr>
<th>Buna Standard</th>
<th>A0 Up to 15 l/min</th>
<th>AS Up to 15 l/min</th>
<th>AK Up to 15 l/min</th>
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</thead>
<tbody>
<tr>
<td>Buna, Screw Type Override (Knob)</td>
<td></td>
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<tr>
<td>Buna, Screw Type Override (Grad. Knob)</td>
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</table>

<table>
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<tr>
<th>Buna Standard</th>
<th>B0 Up to 30 l/min</th>
<th>BS Up to 30 l/min</th>
<th>BK Up to 30 l/min</th>
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<tr>
<td>Buna, Screw Type Override (Knob)</td>
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<td></td>
<td></td>
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<tr>
<td>Buna, Screw Type Override (Grad. Knob)</td>
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</table>

<table>
<thead>
<tr>
<th>Buna Standard</th>
<th>C0 Up to 45 l/min</th>
<th>CS Up to 45 l/min</th>
<th>CK Up to 45 l/min</th>
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<tr>
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</tr>
<tr>
<td>Buna, Screw Type Override (Grad. Knob)</td>
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</tr>
</tbody>
</table>

**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

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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  See curves for various versions
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 Torque Requirements  37 ft-lbs (50 Nm)
Coil Nut Torque Requirements  2-3 ft-lbs (3-4 Nm)
Cavity  TECNORD 2W
Cavity Tools Kit  40500032
Seal Kit  21191301

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)

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**

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

**BODIES**

- Blank
- #8 SAE Ports

**VOLTAGE**

- 12 VDC
- 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 3500 30 241 7/8-14</td>
<td>EE-P2H</td>
<td>PD38</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></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)

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  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  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)
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-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>PD42</td>
</tr>
<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>PD44</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 (l/min) vs. CURRENT (mA - PWM @ 100 Hz)

Port (1) must be connected in the manifold to port (3).

HYDRAULIC SYMBOL

PERFORMANCE

Flow Range  See curves for various versions
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
Operating Fluid Media  General Purpose Hydraulic Fluid
Cartridge Torque Requirements  30 ft-lbs (41 Nm)
Coil Nut Torque Requirements  2-3 ft-lbs (3-4 Nm)
Cavity  T308
Cavity Tools Kit  (form tool, reamer, tap) K-T308

COIL SPECIFICATIONS

Current Supply Characteristics  PWM (Pulse Width Modulation)
Rated Current Range  400-1400 mA
PWM or Super-Imposed
Dither Frequency  100 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.
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.

### Regulated Flow vs. Pressure

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

![Graph showing regulated flow vs. pressure drop](image)

**GRADUATED KNOB**

![Diagram of a graduated knob](image)

---

**DIMENSIONS**

**ORDERING INFORMATION**

- **EG-F2A** — — — — —

**OPTIONS**

- **Buna Standard**
  - A0 Up to 15 l/min
  - B Up to 30 l/min
  - C Up to 45 l/min

- **Buna, Screw Type Override (Knob)**
  - AS Up to 15 l/min
  - BS Up to 30 l/min
  - CS Up to 45 l/min

- **Buna, Screw Type Override (Grad. Knob)**
  - AK Up to 15 l/min
  - BK Up to 30 l/min
  - CK Up to 45 l/min

**BODIES**

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

---

**NOTE:** 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.
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

Flow vs. Current

Valve Specifications

Flow Range  See curves for various versions
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
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  500-1400 mA
PWM or Super-Imposed Dither Frequency  100 Hz
Coil Resistance (12 VDC)  7.2 Ohm ±5% at 68°F (20°C)

Port (1) must be connected in the manifold to port (3).
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.

Flown vs. Current

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

Flow (l/min)

0 300 600 900 1200 1500

Current (mA)

0 20 40 60 80 100

Type C

Type B

Type A

ORDERING INFORMATION

EU-F2A

OPTIONS

Buna Standard A0 Up to 55 l/min
Buna, Screw Type Override (Knob) A5 Up to 55 l/min
Buna, Screw Type Override (Grad. Knob) A6 Up to 55 l/min

Buna Standard B0 Up to 75 l/min
Buna, Screw Type Override (Knob) B5 Up to 75 l/min
Buna, Screw Type Override (Grad. Knob) B6 Up to 75 l/min

Buna Standard C0 Up to 100 l/min
Buna, Screw Type Override (Knob) C5 Up to 100 l/min
Buna, Screw Type Override (Grad. Knob) C6 Up to 100 l/min

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>
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<td>6</td>
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<td>241</td>
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<td>EF-F3G</td>
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<td>241</td>
<td>1/16-12</td>
<td>EU-F3G</td>
<td>PD50</td>
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</tbody>
</table>

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

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)

Coil Nut Torque Requirements
2-3 ft-lbs (3-4 Nm)

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 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.

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ORDERING INFORMATION

**OPTIONS**

- EF-F3G
- B0: Buna Standard, Up to 25 l/min
- BS: Buna, Screw Type Override (Knob), Up to 25 l/min
- BK: Buna, Screw Type Override (Grad. Knob), Up to 25 l/min

**BODIES**

- Blank
- N: 3/8" BSP Ports
- S: #6 SAE Ports

**“F” COIL TERMINATION**

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

**VOLTAGE**

- 12 VDC
- 24 VDC

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

Approximate Coil Weight: .47 lbs (.21 kg)
EU-F3G  3 WAY PRESSURE COMPENSATED PRIORITY TYPE PROP. FLOW REGULATOR

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)

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.

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mail: tecnord@tecnord.com • www.tecnord.com
### Regulated Flow vs. Pressure

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

#### Regulated Flow (l/min)

- 10
- 20
- 30
- 40
- 50

#### Pressure Drop (bar)

- 0
- 50
- 100
- 150
- 200
- 250

### Pressure Compensation from Inlet to Work Port or Bypass Port

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

#### Regulated Flow (l/min)

- 10
- 20
- 30
- 40
- 50
- 60
- 70
- 80
- 90
- 100

#### Pressure Drop (bar)

- 0
- 50
- 100
- 150
- 200
- 250

**NOTES:**

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

---

**DIMENSIONS**

---

**ORDERING INFORMATION**

**EU-F3G**

**OPTIONS**

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

**BODIES**

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

**“Z” COIL TERMINATION**

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

**VOLTAGE**

- 12 VDC
- 24 VDC

**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.
### 4W/3P Proportional Directional Control Valves

#### Motor Spool Type

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<th>LPM</th>
<th>BAR</th>
<th>CAVITY</th>
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<tr>
<td>3</td>
<td>3500</td>
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<td>241</td>
<td>3/4-16</td>
<td>EQ-S4M</td>
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<td>7/8-14</td>
<td>EG-S4M</td>
<td>PD56</td>
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#### Cylinder Spool Type

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<td>241</td>
<td>3/4-16</td>
<td>EQ-S4P</td>
<td>PD58</td>
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<td>241</td>
<td>7/8-14</td>
<td>EG-S4P</td>
<td>PD60</td>
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</table>
**EQ-S4M** 4 WAY 3 POSITION, MOTOR SPOOL, PROPORTIONAL DIRECTIONAL VALVE

**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.

**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

**HYDRAULIC SYMBOL**

**VALVE SPECIFICATIONS**
- Flow Range: See curves for various versions
- Max System Pressure: 3500 PSI (241 bar)
- Leakage: 10 cu-in/min
- 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)

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ORDERING INFORMATION

EQ-S4M – – – – –

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

BODIES
Blank
Without Body
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.

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)

(4 bodies style and sizes see section “Accessories”)
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 vs. Current Graph](image)

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.

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

EG-S4M

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.

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

8 size, 3/4-16 thread, “Power” series, solenoid operated, 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**

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

**PERFORMANCE**

**Flow vs. Current**

From 2 to 3

From 2 to 1

**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.
**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**

**EQ-S4P**

**OPTIONS**

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

**BODIES**

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

**VOLTAGE**

12  
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.

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**DIMENSIONS**

**ORDERING INFORMATION**

**EQ-S4P**

**OPTIONS**

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

**BODIES**

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

**VOLTAGE**

12  
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.

**HYDRAULIC SYMBOL**

- (3) (1)
- (2) (4)

**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

**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>15 cu-in/min</td>
</tr>
<tr>
<td></td>
<td>250 cc/min bar @ 210 bar</td>
</tr>
<tr>
<td>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.</td>
<td>-30°C / +100°C</td>
</tr>
<tr>
<td>Operating Fluid Media</td>
<td>General Purpose Hydraulic Fluid</td>
</tr>
<tr>
<td>Cartridge Torque Requirements</td>
<td>25 ft-lbs (34 Nm)</td>
</tr>
<tr>
<td>Coil Nut Torque Requirements</td>
<td>2-3 ft-lbs (3-4 Nm)</td>
</tr>
<tr>
<td>Cavity</td>
<td>DELTA 4W</td>
</tr>
<tr>
<td>Cavity Tools Kit</td>
<td>(form tool, reamer, tap) 405000002</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 Dither</td>
<td>100-200 Hz</td>
</tr>
<tr>
<td>Frequency</td>
<td>5.6 Ohm ±5% at 68°F (20°C)</td>
</tr>
</tbody>
</table>

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ORDERING INFORMATION

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.

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)

NOTE: for other seals, consult factory.

ORDERING INFORMATION

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

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Buna Standard B0 Up to 22 l/min

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S #6 SAE Ports

VOLTAGE
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