### PROPORTIONAL CONTROLS

#### PROPORTIONAL PRESSURE CONTROLS

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### PROPORTIONAL PRESSURE REDUCING / RELIEVING VALVES

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<th>DIRECT ACTING</th>
<th>GPM</th>
<th>PSI</th>
<th>LPM</th>
<th>BAR</th>
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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.

**HYDRAULIC SYMBOL**

**PERFORMANCE**

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

**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)

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**DIMENSIONS**

![Diagram of dimensions](image-url)

**ORDERING INFORMATION**

<table>
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<tr>
<th>IP-DAR-250</th>
<th>COIL TERMINATION</th>
<th>VOLTAGE</th>
<th>INLET PRESSURE</th>
<th>MAX REGULATED PRESSURE</th>
<th>OPTIONS</th>
<th>BODIES</th>
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<tbody>
<tr>
<td></td>
<td>AJ - AMP Jr. Timer</td>
<td>12 VDC</td>
<td>L - up to 700 PSI (50 bar)</td>
<td>20 bar</td>
<td>AH - HNBR 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>25 bar</td>
<td></td>
<td>N - 1/4&quot; BSP Ports</td>
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</table>

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

HYDRAULIC SYMBOL

PERFORMANCE

Reduced pressure (bar) vs. Current (mA)

Valve Specifications

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nominal Flow</td>
<td>1 GPM (4 LPM) @ 8 bar Delta P</td>
</tr>
<tr>
<td>Max Inlet Pressure “H” version</td>
<td>5000 PSI (345 bar)</td>
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<tr>
<td>Max Inlet Pressure “L” version</td>
<td>700 PSI (50 bar)</td>
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<tr>
<td>Controlled Pressure Range</td>
<td>0 to 25 bar / 0 to 30 bar (see graph)</td>
</tr>
<tr>
<td>Reduced Pressure Tolerance</td>
<td>±5%</td>
</tr>
<tr>
<td>Max Back-Pressure at T Port</td>
<td>20 bar</td>
</tr>
<tr>
<td>Internal Leakage</td>
<td>15 ml/min @ 500 PSI (35 bar) inlet</td>
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<td>35 ml/min @ 5000 PSI (350 bar) inlet</td>
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<td>Viscosity Range</td>
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<tr>
<td>Filtration</td>
<td>ISO 18/15/13</td>
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<tr>
<td>Media Operating Temp. Range</td>
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<tr>
<td>Weight</td>
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<td>Operating Fluid Media</td>
<td>General Purpose Hydraulic Fluid</td>
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<tr>
<td>Cavity</td>
<td>T043</td>
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<tr>
<td>Cavity Tool Kit</td>
<td>K-T043</td>
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<tr>
<td>Flange Mounting Screws and Torque</td>
<td>M4x10 / 3ft-lbs (4 Nm)</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>200÷1500 (12 V coil)</td>
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<tr>
<td></td>
<td>100÷750 (24 V coil)</td>
</tr>
<tr>
<td>PWM or Super-Imposed Dither Freq.</td>
<td>100-200 Hz</td>
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<tr>
<td>Coil Resistance (12 VDC)</td>
<td>5.4 Ohm ±5% at 68°F (20°C)</td>
</tr>
<tr>
<td>Coil Resistance (24 VDC)</td>
<td>22 Ohm ±5% at 68°F (20°C)</td>
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<tr>
<td>Max Power Consumption</td>
<td>12 Watt (20°C)</td>
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<td>Protection Degree</td>
<td>IP 67 according to IEC 529</td>
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<td>Coil Termination</td>
<td>Deutsch-Integral DT04-2P</td>
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<td>AMP Jr. Timer 84-9419</td>
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<tr>
<td>Color Connectors</td>
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PROPORTIONAL CONTROLS

DIMENSIONS

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<tr>
<th>IP-DAR-43C</th>
<th>COIL TERMINATION</th>
<th>VOLTAGE</th>
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<th>MAX REGULATED PRESSURE</th>
<th>OPTIONS</th>
<th>BODIES</th>
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<tbody>
<tr>
<td></td>
<td>AJ - AMP Jr. Timer</td>
<td>12 VDC</td>
<td>L - up to 700 PSI (50 bar)</td>
<td>25 bar</td>
<td>A0 - NBR seals and 300 μm (50 mesh) screen on port 2</td>
<td>Blank - Without body</td>
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<td></td>
<td>DT - Deutsch DT04</td>
<td>24 VDC</td>
<td>H - up to 5000 PSI (350 bar)</td>
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<td>N - 1/4&quot; BSP Ports</td>
<td>S - #6 SAE Ports</td>
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<td>DH - Deutsch DT04 Horizontal</td>
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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 viscosity 46 cSt @ 45°C and PWM 100 Hz

Pressure Drop
Oil viscosity 46 cSt @ 45°C

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 .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 200-1500 (12 V coil)
100-750 (24 V coil)
PWR 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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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

- BODIES
  Blank - Without body
  N - 3/8" BSP Ports

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**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 “F” Coil: Weatherproof, Thermal Shock, Immersion Safe

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**HYDRAULIC SYMBOL**

![Diagram of EF-PRP valve]

**PERFORMANCE**

![Performance graphs showing current vs. pressure and flow vs. pressure]

---

**VALVE SPECIFICATIONS**

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
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<td>Rated Operating Pressure</td>
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<td>Filtration</td>
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<td>Media Operating Temp. Range</td>
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<td>Weight</td>
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<td>Operating Fluid Media</td>
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<td>Cartridge Torque Requirements</td>
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<td>Seal Kit</td>
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**DIMENSIONS**

![Graph of Flow vs Pressure Drop](image1)

**ORDERING INFORMATION**

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<tr>
<th>OPTIONS</th>
<th>BODIES</th>
<th>VOLTAGE</th>
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<td>Viton, 150-1015 PSI range</td>
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<tr>
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<tr>
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<tr>
<td>Buna, 150-3000 PSI range</td>
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</tr>
</tbody>
</table>

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

**“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

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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

Valve Specifications
- Nominal Flow: 7.9 GPM (30 LPM) @ 3 bar DeltaP
- Max Inlet Pressure: 700 PSI (50 bar)
- Controlled Pressure Range: (see graph)
- Max Internal Leakage: <500 cc/min @ 35 bar
- Viscosity Range: 5 to 5000 cSt
- Filtration: ISO 18/15/13
- Media Operating Temp. Range: -30°C / +100°C
- Weight: .63 lbs (.29 kg)
- Operating Fluid Media: General Purpose Hydraulic Fluid
- Cavity: T059
- Cavity Tools Kit: (form tool, reamer, tap) K-T059
- Flange Mounting Screws and Torque: M6x10 / 4 ft-lbs (6 Nm)

Valve Specification
- 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

Reduced Pressure (bar) vs. Current (mA)

12 V coil, 24 bar inlet pressure

Curve is attained with SAE 40 - Grade oil @ 50°C

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Flanged Retained Product. The coil (12 VDC) is an integral part of the valve and is not serviceable. Inlet pressure up to 50 bar. Max regulated pressure can be increased up to 35 bar (factory preset).
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**DIMENSIONS**

**ORDERING INFORMATION**

**IP-PRZ-59-AM12**

<table>
<thead>
<tr>
<th>OPTIONS</th>
<th></th>
<th>BODIES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Buna Standard</td>
<td>00</td>
<td>Blank</td>
</tr>
<tr>
<td>Buna, Screen</td>
<td>A0</td>
<td>Without Body</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1/4” BSP Ports</td>
</tr>
<tr>
<td></td>
<td></td>
<td>#6 SAE Ports</td>
</tr>
</tbody>
</table>

**NOTE:** screen (on inlet port): mesh 47 (280 µm)
PROPORTIONAL CONTROLS

EG-TRZ-42-L PILOT OPERATED PROPORTIONAL, PRESSURE REDUCING/RELIEVING

DESCRIPTION
Special cavity, 7/8-14 thread, pilot operated proportional pressure reducing/relieving valve.

OPERATION
The EG-TRZ-42-L 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 2 (U). 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
- Hardened parts for long life.
- Efficient wet-armature construction.
- Unitized valve/coil.
- Continuous duty rated solenoid.

HYDRAULIC SYMBOL

PERFORMANCE
Pressure vs. Current characteristic

Inlet pressure 36 bar, Oil viscosity 46 cSt @ 45°C

VALVE SPECIFICATIONS
- Nominal Flow: 7.9 GPM (30 LPM)
- Max Inlet Pressure: 700 PSI (50 bar)
- Controlled Pressure Range: (see graph)
- Max Internal Leakage: 700 cc/min @ 50 bar
- Max Back-Pressure at T Port: 20 bar
- Viscosity Range: 36 to 3000 SSU (3 to 647 cSt)
- Filtration: ISO 18/15/13
- Media Operating Temp. Range: -30°C / +100°C
- Weight: .63 lbs (.29 kg)
- Operating Fluid Media: General Purpose Hydraulic Fluid
- Cartridge Torque Requirements: 16 ft-lbs (30 Nm)
- Valve Coils: T042
- Cavity Tools Kit (form tool, reamer, tap): K-T042

COIL SPECIFICATIONS
- Current Supply Characteristics: PWM (Pulse Width Modulation)
- Rated Current Range: 100-1000 mA with 12 VDC Coil
- 50-500 mA with 24 VDC Coil
- PWM or Super-Imposed
- Duty Frequency: 150-200 Hz
- Coil Resistance: 7.8 Ohm ±5% at 68°F (20°C) 12 VDC
- 32 Ohm ±5% at 68°F (20°C) 24 VDC
- Max Power Consumption: 18 Watt
**DIMENSIONS**

<table>
<thead>
<tr>
<th>Pressure Drop (bar)</th>
<th>Flow (LPM)</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
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</tr>
<tr>
<td>4</td>
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<tr>
<td>3</td>
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<tr>
<td>2</td>
<td>15</td>
</tr>
<tr>
<td>1</td>
<td>20</td>
</tr>
</tbody>
</table>

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**PROPORTIONAL CONTROLS**

**ORDERING INFORMATION**

- **EG-TRZ-42-L**
- **MAX REGULATED PRESSURE**: 35 bar
- **OPTIONS**: 00 - Buna Standard
- **“A” COIL TERMINATION**: DL - Double Lead
- **VOLTAGE**: 12 - 12 VDC
- **BODIES**: Blank - Without body
- **A0** - Buna Screen
- **HC** - DIN 43650 (Hirschmann)
- **N** - 3/8” BSP Ports
- **JT** - AMP Jr. Timer
- **DT** - Deutsch DT04-2P

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

**WARNING:**
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

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

W 9 / 2020

**Dimensions Diagram**

**Pressure Drop vs. Flow characteristic**

-Oil viscosity 46 cSt @ 45°C

**Flow (LPM)**

0 5 10 15 20 25 30

**Pressure Drop (bar)**

0 1 2 3 4 5
EG-TRZ-42-H  PILOT OPERATED PROPORTIONAL, PRESSURE REDUCING/RELIEVING

DESCRIPTION
Special cavity, 7/8-14 thread, pilot operated proportional pressure reducing/relieving valve.

OPERATION
The EG-TRZ-42-H 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 2 (U). 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
- Hardened parts for long life.
- Efficient wet-armature construction.
- Unitized valve/coil.
- Continuous duty rated solenoid.

HYDRAULIC SYMBOL

PERFORMANCE

Pressure vs. Current characteristic

Oil viscosity 46 cSt @ 45°C

Inlet pressure 210 bar
Inlet pressure 140 bar

VALVE SPECIFICATIONS
- Nominal Flow: 7.9 GPM (30 LPM)
- Max Inlet Pressure: 3500 PSI (241 bar)
- Controlled Pressure Range: (see graph)
- Max Internal Leakage: 1500 ml/min @ 200 bar inlet pressure
- Max Back-Pressure at T Port: 20 bar
- Viscosity Range: 36 to 3000 SSU (3 to 647 cSt)
- Filtration: ISO 18/15/13
- Media Operating Temp. Range: -30°C / +100°C
- Weight: .63 lbs (.29 kg)
- Operating Fluid Media: General Purpose Hydraulic Fluid
- Cartridge Torque Requirements: 16 ft-lbs (30 Nm)
- Cavity: T042
- Cavity Tools Kit (form tool, reamer, tap): K-T042

COIL SPECIFICATIONS
- Current Supply Characteristics: PWM (Pulse Width Modulation)
- Rated Current Range: 100-1200 mA with 12 VDC Coil
- 50-600 mA with 24 VDC Coil
- PWM or Super-Imposed
- Dither Frequency: 150-200 Hz
- Coil Resistance: 6.85 Ohm ±5% at 68°F (20°C) 12 VDC
- 27 Ohm ±5% at 68°F (20°C) 24 VDC
- Max Power Consumption: 21 Watt

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PROPORTIONAL PRESSURE RELIEF VALVES

**NORMALLY CLOSED**

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<th>PSI</th>
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<th>MODEL</th>
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<td>3000</td>
<td>76</td>
<td>207</td>
<td>7/8-14</td>
<td>EE-PRB</td>
<td>PT20</td>
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</table>

**NORMALLY OPEN**

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<th>LPM</th>
<th>BAR</th>
<th>CAVITY</th>
<th>MODEL</th>
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</thead>
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<tr>
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<td>207</td>
<td>7/8-14</td>
<td>EE-PRD</td>
<td>PD22</td>
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<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.

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**PROPORTIONAL CONTROLS**

**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**

**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: 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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**Great for fan drive motor control.**

---

**RELIEF PRESSURE vs. CURRENT**
Constant flow 10 LPM (2.6 GPM)

---

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PROPORTIONAL CONTROLS

DIMENSIONS

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**ORDERING INFORMATION**

**OPTIONS**

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<tr>
<th>BODIES</th>
<th>VOL RaGE</th>
<th>VOL TAGE</th>
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<tbody>
<tr>
<td>Blank</td>
<td>Without Body</td>
<td>12VDC</td>
</tr>
<tr>
<td>N</td>
<td>3/8&quot; BSP Ports</td>
<td>12 VDC</td>
</tr>
<tr>
<td>S</td>
<td>#8 SAE Ports</td>
<td>24 VDC</td>
</tr>
<tr>
<td>“F” COIL TERMINATION</td>
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<td></td>
</tr>
<tr>
<td>DIN 43650 (Hirschmann)</td>
<td>12VDC</td>
<td></td>
</tr>
<tr>
<td>Deutsch - Integral DT04-2P</td>
<td>24 VDC</td>
<td></td>
</tr>
<tr>
<td>AMP Jr. Timer</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
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: 100-200Hz (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>
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</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

**PROPORTIONAL CONTROLS**

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**OPTIONS**

- Buna, 100-1020 PSI range: 0A
- Viton, 100-1020 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: Blank
- 3/8" BSP Ports: N
- #8 SAE Ports: S

**VIOLAGE**

- 12 VDC
- 24 VDC

**“P”” COIL TERMINATION**

- DIN 43650 (Hirschmann)
- AMP Superseal
- Deutsch DT04-2P
- AMP Jr. Timer

**ORDERING INFORMATION**

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

**DIMENSIONS**

- Relief Pressure vs. Flow @ 4 Amp
- Pressure Drop vs. Flow

Flow (GPM)

Relief Pressure (PSI)

Pressure Drop (BAR)

Relief Pressure vs. Flow @ 1 amp

EE-PRD-0A EE-PRD-0B EE-PRD-0C

Pressure Drop vs. Flow @ 4 Amp

EE-PRD-0A EE-PRD-0B EE-PRD-0C

(for bodies style and sizes see section “Accessories”)
**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**

![Hydraulic Symbol](image)

**PERFORMANCE**

![Performance Graph](image)

**VALVE SPECIFICATIONS**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Specification</th>
</tr>
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<tbody>
<tr>
<td>Nominal Flow</td>
<td>0-20 GPM (0-76 LPM)</td>
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<tr>
<td>Operating Range</td>
<td>50-3000 PSI (3-207 bar)</td>
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<tr>
<td>Typical Hysteresis</td>
<td>5%</td>
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<tr>
<td>Viscosity Range</td>
<td>36 to 3000 SSU (3 to 647 cSt)</td>
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<tr>
<td>Filtration</td>
<td>ISO 18/16/13</td>
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<tr>
<td>Media Operating Temp. Range</td>
<td>-40°C to 250°F (-40°C to 120°C)</td>
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<tr>
<td>Weight</td>
<td>.30 lbs. (.13 kg)</td>
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<td>Operating Fluid Media</td>
<td>General Purpose Hydraulic Fluid</td>
</tr>
<tr>
<td>Cartridge Torque Requirements</td>
<td>30 ft-lbs (40.6 Nm)</td>
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<tr>
<td>Coil Nut Torque Requirements</td>
<td>4-6 ft-lbs (5.4-8.1 Nm)</td>
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<tr>
<td>Cavity</td>
<td>DELTA 2W</td>
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<td>Cavity Tools Kit</td>
<td>Seal Kit 40050000</td>
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**DIMENSIONS**

![Graph](image1)

![Graph](image2)

**ORDERING INFORMATION**

<table>
<thead>
<tr>
<th>OPTIONS</th>
<th>BODIES</th>
<th>VOLTAGE</th>
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<tbody>
<tr>
<td>Buna, 100-2175 PSI range 0B Blank Without Body 06 6 VDC</td>
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<tr>
<td>Viton, 100-2175 PSI range VB N 3/8” NPT Ports 12 12 VDC</td>
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<tr>
<td>Buna, 100-3000 PSI range 0C S #8 SAE Ports 24 24 VDC</td>
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<td>Approximate Coil Weight: .74 lbs (.33 kg) 48 48 VDC</td>
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</table>

- 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

**“P” COIL TERMINATION**

- SS Single Spade
- DS Double Spade
- HC DIN 43650 (Hirschmann)
- DI Deutsch – Integral DT04-2P
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### 2 WAY NORMALLY CLOSED PROPORTIONAL FLOW CONTROL VALVES

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<td>EE-P2G</td>
<td>PT28</td>
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<td>90</td>
<td>241</td>
<td>1 1/16-12</td>
<td>ET-P2S</td>
<td>PT30</td>
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<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>
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<tbody>
<tr>
<td></td>
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<td>25</td>
<td>241</td>
<td>3/4-16</td>
<td>EB-P2A</td>
<td>PT32</td>
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<tr>
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<td>12</td>
<td>3500</td>
<td>45</td>
<td>241</td>
<td>7/8-14</td>
<td>EE-P2A</td>
<td>PT34</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>PT36</td>
</tr>
</tbody>
</table>
**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)

**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**: -30°C / +100°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**: 400-1400 mA
- **PWM or Super-Imposed Dither Frequency**: 100-150 Hz
- **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

---

**OPTIONS**

- **Bodies**
  - Blank
  - N: 3/4” BSP Ports
  - S: #8 SAE Ports

- **Voltage**
  - 12 VDC
  - 24 VDC

- **Coil Termination**
  - “F” 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, bidirectional proportional flow control valve.

OPERATION
When de-energized the ET-P2S blocks flow at ports (1) and (2). When energized, the valve allows flow from (1) to (2) or from (2) to (1). Flow is proportional to the current applied to the coil, flow regulation happens in both directions, according to below graph. 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)

FLOW VS. CURRENT

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. Range</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 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>TECNORD 2W</td>
</tr>
<tr>
<td>Cavity Tools Kit</td>
<td>(form tool, reamer, tap) 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>

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**DIMENSIONS**

**Pressure Drop**

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

![Pressure Drop Graph](image)

**GRADUATED KNOB**

*STANDARD*

*Hex. 0.87 [22]*

*Hex. 1.26 [32]*

*1 1/16-12 UNF - 2A*

*(for bodies style and sizes see section “Accessories”)*

**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 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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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.

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

HYDRAULIC SYMBOL

PERFORMANCE

Pressure Drop
1 to 2 with valve completely open

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

VALVE SPECIFICATIONS

<table>
<thead>
<tr>
<th>Feature</th>
<th>Specification</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 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>.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>19 ft-lbs (25 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>POWER 2W</td>
</tr>
<tr>
<td>Cavity Tools Kit (form tool, reamer, tap)</td>
<td>40500005</td>
</tr>
<tr>
<td>Seal Kit</td>
<td>21191102</td>
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COIL SPECIFICATIONS

<table>
<thead>
<tr>
<th>Feature</th>
<th>Specification</th>
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<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>100 Hz</td>
</tr>
<tr>
<td>Dither Frequency</td>
<td>100 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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**ORDERING INFORMATION**

<table>
<thead>
<tr>
<th>OPTIONS</th>
<th>BODIES</th>
<th>VOLTAGE</th>
<th>&quot;F&quot; COIL TERMINATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>C0 Up to 25 l/min</td>
<td>Blank</td>
<td>12VDC</td>
<td>HC DIN 43650 (Hirschmann)</td>
</tr>
<tr>
<td>CS Up to 25 l/min</td>
<td>N 3/8&quot; BSP Ports</td>
<td>24VDC</td>
<td>DI Deutsch-Integral DT04-2P</td>
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<tr>
<td>CK Up to 25 l/min</td>
<td>S #8 SAE Ports</td>
<td></td>
<td>JT AMP Jr. Timer</td>
</tr>
</tbody>
</table>

Approximate Coil Weight: 0.47 lbs (0.21 kg)

**NOTES:**

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

**FLOW VS. CURRENT AT DIFFERENT PRESSURE DROP**

**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**
-30°C / +100°C

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

**OPERATING FLUID MEDIA**
General Purpose Hydraulic Fluid

**NOMINAL AC CURRENT REQUIREMENTS**
40-1400 mA

**COIL RESISTANCE (12 VDC)**
7.2 Ohm ±5% at 68°F (20°C)

**VALVE SPECIFICATIONS**

**COIL SPECIFICATIONS**

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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)

<table>
<thead>
<tr>
<th>Current (Amps)</th>
<th>Flow (l/min)</th>
<th>Flow (GPM)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>0,3</td>
<td>10</td>
<td>3.4</td>
</tr>
<tr>
<td>0,6</td>
<td>20</td>
<td>6.8</td>
</tr>
<tr>
<td>0,9</td>
<td>30</td>
<td>10.2</td>
</tr>
<tr>
<td>1,2</td>
<td>40</td>
<td>13.6</td>
</tr>
<tr>
<td>1,5</td>
<td>50</td>
<td>17.0</td>
</tr>
</tbody>
</table>

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

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

<table>
<thead>
<tr>
<th>Current (Amps)</th>
<th>Flow (l/min)</th>
<th>Flow (GPM)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>0,3</td>
<td>10</td>
<td>3.4</td>
</tr>
<tr>
<td>0,6</td>
<td>20</td>
<td>6.8</td>
</tr>
<tr>
<td>0,9</td>
<td>30</td>
<td>10.2</td>
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<tr>
<td>1,2</td>
<td>40</td>
<td>13.6</td>
</tr>
<tr>
<td>1,5</td>
<td>50</td>
<td>17.0</td>
</tr>
</tbody>
</table>

### ORDERING INFORMATION

**EE-P2A**

**OPTIONS**

- **Bodies**
  - Blank (Without Body)
  - N 3/4" BSP Ports
  - S #8 SAE Ports

- **Bodies**
  - Buna Standard
  - A0 Up to 15 l/min
  - B0 Up to 30 l/min
  - C0 Up to 45 l/min

- **Bodies**
  - Buna, Screw Type Override (Knob)
  - A5 Up to 15 l/min
  - B5 Up to 30 l/min
  - C5 Up to 45 l/min

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

**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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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

Flow vs. Current at different Pressure Drop

<table>
<thead>
<tr>
<th>Pressure Drop (bar)</th>
<th>Flow (GPM)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>25</td>
</tr>
<tr>
<td>5</td>
<td>20</td>
</tr>
<tr>
<td>10</td>
<td>15</td>
</tr>
<tr>
<td>20</td>
<td>10</td>
</tr>
<tr>
<td>30</td>
<td>5</td>
</tr>
</tbody>
</table>

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 -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 2W
Cavity Tools Kit (form tool, reamer, tap) 40500032
Seal Kit 21191301

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)

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
A0 Up to 65 l/min
Buna, Screw Type Override (Knob)
A5 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)
B5 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)
C5 Up to 110 l/min
Buna, Screw Type Override (Grad. Knob)
CK Up to 110 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
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.
<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>8</td>
<td>3500</td>
<td>30</td>
<td>241</td>
<td>7/8-14</td>
<td>EE-P2H</td>
<td>PT40</td>
</tr>
</tbody>
</table>
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; Toil = 40°C

VALUES 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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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

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 N 3/8” 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.
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>PT44</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>PT46</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.

HYDRAULIC SYMBOL

PERFORMANCE

Flow (l/min) vs. Current (mA - PWM @ 100 Hz)

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.
**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)

---

**ORDERING INFORMATION**

**OPTIONS**

<table>
<thead>
<tr>
<th>Boda</th>
<th>Description</th>
<th>Flow Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>A0</td>
<td>Buna Standard</td>
<td>Up to 15 l/min</td>
</tr>
<tr>
<td>A1</td>
<td>Buna, Screw Type Override (Knob)</td>
<td>Up to 15 l/min</td>
</tr>
<tr>
<td>A2</td>
<td>Buna, Screw Type Override (Grad. Knob)</td>
<td>Up to 15 l/min</td>
</tr>
<tr>
<td>B0</td>
<td>Buna Standard</td>
<td>Up to 30 l/min</td>
</tr>
<tr>
<td>B1</td>
<td>Buna, Screw Type Override (Knob)</td>
<td>Up to 30 l/min</td>
</tr>
<tr>
<td>B2</td>
<td>Buna, Screw Type Override (Grad. Knob)</td>
<td>Up to 30 l/min</td>
</tr>
<tr>
<td>C0</td>
<td>Buna Standard</td>
<td>Up to 45 l/min</td>
</tr>
<tr>
<td>C1</td>
<td>Buna, Screw Type Override (Knob)</td>
<td>Up to 45 l/min</td>
</tr>
<tr>
<td>C2</td>
<td>Buna, Screw Type Override (Grad. Knob)</td>
<td>Up to 45 l/min</td>
</tr>
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</table>

**BODIES**

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Blank</td>
<td>Without Body</td>
</tr>
<tr>
<td>N</td>
<td>3/8” BSP Ports</td>
</tr>
<tr>
<td>S</td>
<td>#6 SAE Ports</td>
</tr>
</tbody>
</table>

**VOLTAGE**

<table>
<thead>
<tr>
<th>Code</th>
<th>Voltage</th>
</tr>
</thead>
<tbody>
<tr>
<td>12</td>
<td>12 VDC</td>
</tr>
<tr>
<td>24</td>
<td>24 VDC</td>
</tr>
</tbody>
</table>

**“F” COIL TERMINATION**

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>HC</td>
<td>DIN 43650 (Hirschmann)</td>
</tr>
<tr>
<td>DI</td>
<td>Deutsch-Integral DT04-2P</td>
</tr>
<tr>
<td>JT</td>
<td>AMP Jr. Timer</td>
</tr>
</tbody>
</table>

**DIMENSIONS**

**GRADUATED KNOB**

*See coil data for terminations*

---

**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.
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.

HYDRAULIC SYMBOL

PERFORMANCE
Regulated Flow vs. Pressure

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>0-10 drops / min @ 245 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. Range</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 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>TECNORD 3W</td>
</tr>
<tr>
<td>Cavity Tools Kit</td>
<td>(form tool, reamer, tap) 40500034</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>500-1400 mA</td>
</tr>
<tr>
<td>PWM or Super-Imposed Dither</td>
<td>100 Hz</td>
</tr>
<tr>
<td>Frequency</td>
<td>100 Hz</td>
</tr>
</tbody>
</table>

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.

PROPORTIONAL CONTROLS

DIMENSIONS

Flow vs. Current

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

Current (mA)

Flow (l/min)

300 600 900 1200 1500

0 20 40 60 80 100 120

Flow vs. Current

Ordinary Port (Knob)

Ordinary Port (Grad. knob)

Graduated Knob

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

ORDERING INFORMATION

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

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>
<td>PT50</td>
</tr>
<tr>
<td></td>
<td>16</td>
<td>3500</td>
<td>60</td>
<td>241</td>
<td>1/16-12</td>
<td>EU-F3G</td>
<td>PT52</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.
**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**

<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>10 cu-in/min @ 3000 PSI</td>
</tr>
<tr>
<td></td>
<td>160 cc/min @ 207 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>Weight</td>
<td>.49 lbs (.22 kg)</td>
</tr>
<tr>
<td>Operating Fluid Media</td>
<td>General Purpose Hydraulic Fluid</td>
</tr>
<tr>
<td>Cartridge Torque</td>
<td>30 ft-lbs (41 Nm)</td>
</tr>
<tr>
<td>Nut Torque Requirements</td>
<td>2-3 ft-lbs (3-4 Nm)</td>
</tr>
<tr>
<td>Cavity</td>
<td>DELTA 3W</td>
</tr>
<tr>
<td>Cavity Tools Kit</td>
<td>(form tool, reamer, tap)</td>
</tr>
<tr>
<td></td>
<td>40500001</td>
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</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>120-140 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**

**Pressure Drop 3—2 (bar)**

![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)

![Pres. Compensation Graph]

**ORDERING INFORMATION**

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

**OPTIONS**

- **EF-F3G**
- **BODIES**
  - Blank
  - 3/8” BSP Ports
  - #6 SAE Ports
- **“F” COIL TERMINATION**
  - DIN 43650 (Hirschmann)
  - Deutsch-Integral DT04-2P
  - AMP Jr. Timer
- **VOLTAGE**
  - 12 VDC
  - 24 VDC

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

**EU-F3G 3 WAY PRESSURE COMPENSATED PRIORITY TYPE PROPORTIONAL 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

*Flow vs. Current*

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

**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>15.7 cu-in/min @ 3000 PSI</td>
</tr>
<tr>
<td></td>
<td>250 cc/min @ 207 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. Range</td>
<td>-30°C / +100°C</td>
</tr>
<tr>
<td>Weight</td>
<td>.75 lbs (.34 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>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>TECNORD 3W</td>
</tr>
<tr>
<td>Cavity Tools Kit</td>
<td>(form tool, reamer, tap)</td>
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<tr>
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<td>40500034</td>
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**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>120-140 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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PROPORTIONAL CONTROLS

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

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)

ORDERING INFORMATION

EU-F3G

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

COils
C0 Up to 60 l/min
CS Up to 60 l/min
CK Up to 60 l/min

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

VOLTAGE
HC 12 VDC
DI 24 VDC

BODIES
Blank Without Body
N ¾” BSP Ports
S #8 SAE Ports

NOTES: 1) For other flow settings, consult factory.
2) For other seals, consult factory.
### 4W/3P Proportional Directional Control Valves

<table>
<thead>
<tr>
<th>MOTOR 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>![Diagram 1]</td>
<td>3</td>
<td>3500</td>
<td>11</td>
<td>241</td>
<td>3/4-16</td>
<td>EQ-S4M</td>
<td>PT56</td>
</tr>
<tr>
<td></td>
<td>6</td>
<td>3500</td>
<td>23</td>
<td>241</td>
<td>7/8-14</td>
<td>EG-S4M</td>
<td>PT58</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>CYLINDER 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>![Diagram 2]</td>
<td>3</td>
<td>3500</td>
<td>11</td>
<td>241</td>
<td>3/4-16</td>
<td>EQ-S4P</td>
<td>PT60</td>
</tr>
<tr>
<td></td>
<td>6</td>
<td>3500</td>
<td>23</td>
<td>241</td>
<td>7/8-14</td>
<td>EG-S4P</td>
<td>PT62</td>
</tr>
</tbody>
</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.

HYDRAULIC SYMBOL

PERFORMANCE
Flow vs. Current

![Flow vs. Current Graph]

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

Flow vs. Current

![Flow vs. Current Graph]

Valve Specifications

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Specification</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>10 cu-in/min</td>
</tr>
<tr>
<td></td>
<td>160 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. Range</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>18 ft-lbs (26 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>POWER 4W</td>
</tr>
<tr>
<td>Cavity Tools Kit</td>
<td>(form tool, reamer, tap)</td>
</tr>
<tr>
<td></td>
<td>40500029</td>
</tr>
</tbody>
</table>

Coil Specifications

<table>
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<tr>
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<tbody>
<tr>
<td>Current Supply Characteristics</td>
<td>PWM (Pulse Width Modulation)</td>
</tr>
<tr>
<td>Rated Current Range</td>
<td>400-1300 mA</td>
</tr>
<tr>
<td>PWM or Super-Imposed</td>
<td></td>
</tr>
<tr>
<td>Dither Frequency</td>
<td>100-200 Hz</td>
</tr>
<tr>
<td>Coil Resistance (12 VDC)</td>
<td>6.85 Ohm ±5% at 68°F (20°C)</td>
</tr>
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**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

**VALVE SPECIFICATIONS**

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</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>
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</tr>
<tr>
<td>Cavity</td>
<td>DELTA 4W</td>
</tr>
<tr>
<td>Cavity Tools Kit</td>
<td>(form tool, reamer, tap) 40500002</td>
</tr>
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**COIL SPECIFICATIONS**

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<td></td>
</tr>
<tr>
<td>Dither Frequency</td>
<td>100-200 Hz</td>
</tr>
<tr>
<td>Coil Resistance (12 VDC)</td>
<td>5.6 Ohm ±5% at 68°F (20°C)</td>
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</tbody>
</table>
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**

**OPTIONS**
Buna Standard B0 Up to 22 l/min

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

**VOLTAGE**
12 12 VDC
24 24 VDC
22 220 VAC

**“W” COIL TERMINATION**
DL Double Lead
HC DIN 43650 (Hirschmann)
DI Deutsch-Integral DT04-2P

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

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**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**

![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 14bar

- From 2 to 3
- From 2 to 1

**Flow Range**

<table>
<thead>
<tr>
<th>Flow (l/min)</th>
<th>Current (mA)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>200</td>
</tr>
<tr>
<td>2</td>
<td>400</td>
</tr>
<tr>
<td>4</td>
<td>600</td>
</tr>
<tr>
<td>6</td>
<td>800</td>
</tr>
<tr>
<td>8</td>
<td>1000</td>
</tr>
<tr>
<td>10</td>
<td>1200</td>
</tr>
</tbody>
</table>

**COIL SPECIFICATIONS**

- Current Supply Characteristics: PWM (Pulse Width Modulation)
- Rated Current Range: 400-1300 mA
- PWM or Super-Imposed: 100-200 Hz
- Dither Frequency: 6.85 Ohm ±5% at 68°F (20°C)

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TECNORD

PROPORTIONAL CONTROLS

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 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.

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

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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
Flow Range
Max System Pressure
Leakage
250 cc/min bar @ 210 bar
Hysteresis
Viscosity Range
Filtration
ISO 18/16/13
Media Operating Temp. Range
-30°C / +100°C
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DELTA 4W
Cavity Tools Kit
(form tool, reamer, tap) 40500002

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Current Supply Characteristics
PWM (Pulse Width Modulation)
Rated Current Range
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PWM or Super-Imposed
Dither Frequency
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Coil Resistance (12 VDC)
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**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)

**OPTIONS**
- EG-S4P
- Blank
- B0 Up to 22 l/min

**BODIES**
- Blank
- N 3/8” BSP Ports
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**VOLTAGE**
- 12 12 VDC
- 24 24 VDC
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**“W” COIL TERMINATION**
- DL Double Lead
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