Controls Bulletin

Electronic Displacement Control
PVG-100/130 F1 Series

C-Frame

TRB-47861

Electronic Displacement Control
- P-E Normally Open
- P-F Normally Closed
- P-E/F Normally Open with Load Sense
- P-F/F Normally Closed with Load Sense

Oilgear
# Table of Contents

<table>
<thead>
<tr>
<th>Reference Documents</th>
<th>page 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operational Description</td>
<td>3</td>
</tr>
</tbody>
</table>

## Installation Drawings
- P-E Control - Industrial, Mobile 4-5
- P-F Control - Industrial, Mobile 6-7
- P-E/F Control - Industrial, Mobile 8-9
- P-F/F Control - Industrial, Mobile 10-11

## Exploded Views
- P-E Control, P-F Control 12-13
- P-E/F Control, P-F/F Control 14-15

## Cross Section Drawings
- P-E Control, P-F Control 16-17
- P-F Control, P-F/F Control 18-19

## Control Valve
- Exploded View 20
- Cross Section 21

## O-Ring Seals
22

## Screw and Plug Torques
22

## Service Kits
23

## Electrical Connections and Specifications
24

## Pulse Width Modulated (PWM) Examples
25

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**Reference Material**

PVG Open Loop Pumps, Sales .................................................. Bulletin 47019
Specifications and performance data for PVG pumps

PVG Application Guidelines .................................................. Bulletin 847019
Notes and guidelines for proper use of PVG pumps

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Information in this bulletin subject to change without notice. Current versions of the documents referenced in this bulletin may have a letter at the end to denote the revision level. The latest release of any document, including this one, can be found on the Oilgear web site or by contacting your Oilgear representative.

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Technical Reference Bulletin 47861
Operational Description

The **Electronic Displacement Control (EDC)** combines electronic proportional stroke control with mechanical pressure override. There are four configurations for this control P-E Normally Open (N.O.), P-F Normally Closed (N.C.), P-E/F N.O with Load Sense and P-F/F N.C. with Load Sense.

The pump stroke will respond to changes in the electrical command signal sent to the EDC proportional valve, provided that the pressure is below the mechanical override setting. The command signal can be changed in response to external events such as a change in engine RPM, system pressure, horsepower or other externally monitored condition (on graphs below). If the pressure reaches the override setting, the mechanical control overrides the electrical command signal and de-strokes the pump. If the pressure drops back below the setpoint the pump stroke returns to the level set by the proportional command.

**Normally Open P-E Control** - An increase in the command to the proportional valve results in a decrease in pump stroke. Zero command equals Full Stroke provided the outlet pressure is less than the pressure override setting. In the event of a loss of the electrical signal, the P-E control will operate as a standard pressure control.

**Normally Closed P-F Control** - An increase in the command to the proportional valve results in an increase in pump stroke. With Zero command the pump will remain at Neutral.
Installation Drawing P-E Industrial

WEIGHT:
- 124 LBS [56KG] FOR REAR PORT VERSION SHOWN
- 133 LBS [60KG] FOR SIDE PORT VERSION
- 139 LBS [63KG] FOR THRU SHAFT VERSION

OPTIONAL MAXIMUM VOLUME STOP
- .250" INTERNAL HEX
- 1 TURN CW DECREASES DELIVERY 7%
- RANGE 100% TO 0%
- FACTORY SET AT MAXIMUM VOLUME UNLESS SPECIFIED OTHERWISE

LIFTING HOLE
- .375-16 UNF-2B THD.

PRESSURE COMPENSATOR ADJUSTMENT
- .188" INTERNAL HEX
- 1 TURN CW INCREASES SETTING 1160 PSI (80 BAR)
- RANGE: 200 TO 5000 PSI (14 TO 345 BAR) FOR 100
  200 TO 3750 PSI (14 TO 260 BAR) FOR 130
- FACTORY SET AT MINIMUM UNLESS SPECIFIED OTHERWISE

REMOTE PILOT PORT "RP1"
- #4 SAE STR. THD. PORT
- A38-20 UNF-2B THD.
  (SHOWN PLUGGED)
WEIGHT:
124 LBS [56KG] FOR REAR PORT VERSION SHOWN
133 LBS [60KG] FOR SIDE PORT VERSION
139 LBS [63KG] FOR THRU SHAFT VERSION

OPTIONAL MAXIMUM VOLUME STOP
.250” INTERNAL HEX
1 TURN CW DECREASES DELIVERY 7%
RANGE 100% TO 0%
FACTORY SET AT MAXIMUM VOLUME
UNLESS SPECIFIED OTHERWISE

PRESSURE COMPENSATOR ADJUSTMENT
.188” INTERNAL HEX
1 TURN CW INCREASES SETTING 1160 PSI (80 BAR)
RANGE: 200 TO 5000 PSI (14 TO 345 BAR) FOR 100
200 TO 3750 PSI (14 TO 260 BAR) FOR 130
FACTORY SET AT MINIMUM
UNLESS SPECIFIED OTHERWISE

REMOTE PILOT PORT “RP1”
#4 SAE STR. THD. PORT
.438-20 UNF-2B THD.
(SHOWN PLUGGED)

For pump dimensions and specifications see Bulletin 47019
Installation Drawing P-F Industrial

WEIGHT:
126 LBS [57KG] FOR REAR PORT VERSION SHOWN
135 LBS [61KG] FOR SIDE PORT VERSION
141 LBS [64KG] FOR THRU SHAFT VERSION

OPTIONAL MAXIMUM VOLUME STOP
90° INTERNAL HEX
1 TURN CW DECREASES DELIVERY 7%
RANGE 100% TO 0%
FACTORY SET AT MAXIMUM VOLUME UNLESS SPECIFIED OTHERWISE

REMOTE PILOT PORT “RP1”
#4 SAE STR. THD. PORT
.438-20 UNF-2B THD.
(SHOWN PLUGGED)

PRESSURE COMPENSATOR ADJUSTMENT
.188” INTERNAL HEX
1 TURN CW INCREASES SETTING 1160 PSI (80 BAR)
RANGE: 200 TO 5000 PSI (14 TO 345 BAR) FOR 100
200 TO 3750 PSI (14 TO 260 BAR) FOR 130
FACTORY SET AT MINIMUM UNLESS SPECIFIED OTHERWISE

LIFTING HOLE
.375-16 UNF-2B THD.

FOR PUMP DIMENSIONS AND SPECIFICATIONS SEE BULLETIN 47019
**Technical Reference Bulletin 47861**

**Installation Drawing P-F Mobile**

**WEIGHT:**
126 LBS (57KG) FOR REAR PORT VERSION SHOWN
135 LBS (61KG) FOR SIDE PORT VERSION
141 LBS (64KG) FOR THRU SHAFT VERSION

**OPTIONAL MAXIMUM VOLUME STOP**
.250” INTERNAL HEX
1 TURN CW DECREASES DELIVERY 7%
RANGE 100% TO 0%
FACTORY SET AT MAXIMUM VOLUME
UNLESS SPECIFIED OTHERWISE

**PRESSURE COMPENSATOR ADJUSTMENT**
.188” INTERNAL HEX
1 TURN CW INCREASES SETTING 1160 PSI (80 BAR)
RANGE: 200 TO 5000 PSI (14 TO 350 BAR) FOR 100
200 TO 3750 PSI (14 TO 260 BAR) FOR 130
FACTORY SET AT MINIMUM
UNLESS SPECIFIED OTHERWISE

**REMOTE PILOT PORT “RP1”**
#4 SAE STR. THD. PORT
.438-20 UNF-2B THD.
(SHOWN PLUGGED)

**LIFTING HOLE**
.375-16 UNF-2B THD.

**HYDRAULIC CIRCUIT**

For pump dimensions and specifications see Bulletin 47019

Technical Reference Bulletin 47861
WEIGHT:
126 LBS [57KG] FOR REAR PORT VERSION SHOWN
135 LBS [61KG] FOR SIDE PORT VERSION
141 LBS [64KG] FOR THRU SHAFT VERSION

PRESSURE COMPENSATOR ADJUSTMENT
.188” INTERNAL HEX
1 TURN CW INCREASES SETTING 1160 PSI (80 BAR)
RANGE: 200 TO 5000 PSI (14 TO 345 BAR) FOR 100
200 TO 3750 PSI (14 TO 260 BAR) FOR 130
FACTORY SET AT MINIMUM UNLESS SPECIFIED OTHERWISE

LOAD SENSE ADJUSTER
.188” INTERNAL HEX
1 TURN CW INCREASES SETTING 42 PSI (3 BAR)
RANGE: 200 TO 600 PSI (14 TO 43 BAR)
FACTORY SET AT MINIMUM UNLESS OTHERWISE SPECIFIED

LOAD SENSE PORT
#6 SAE STR. THD. PORT
.562-18 UNF-2B THD.
(SHOWN PLUGGED)

REMOTE PILOT PORT “RP1”
#4 SAE STR. THD. PORT
.438-20 UNF-2B THD.
(SHOWN PLUGGED)

LIFTING HOLE
.375-16 UNF-2B THD.

OPTIONAL MAXIMUM VOLUME STOP
.250” INTERNAL HEX
1 TURN CW DECREASES DELIVERY 7%
RANGE 100% TO 0%
FACTORY SET AT MAXIMUM VOLUME UNLESS SPECIFIED OTHERWISE

REMOTE PILOT PORT “OP1”
#4 SAE STR. THD. PORT
.438-20 UNF-2B THD.
(SHOWN PLUGGED)

LOAD SENSE PORT
#6 SAE STR. THD. PORT
.562-18 UNF-2B THD.

LOAD SENSE PORT
#6 SAE STR. THD. PORT
.562-18 UNF-2B THD.

For pump dimensions and specifications see Bulletin 47019
WEIGHT:
126 LBS [57KG] FOR REAR PORT VERSION SHOWN
135 LBS [61KG] FOR SIDE PORT VERSION
141 LBS [64KG] FOR THRU SHAFT VERSION

OPTIONAL MAXIMUM VOLUME STOP
.250" INTERNAL HEX
1 TURN CW DECREASES DELIVERY 7%
RANGE 100% TO 0%
FACTORY SET AT MAXIMUM VOLUME UNLESS SPECIFIED OTHERWISE

LIFTING HOLE
.375-16 UNF-2B THD.

PRESSURE COMPENSATOR ADJUSTMENT
.188" INTERNAL HEX
1 TURN CW INCREASES SETTING 1160 PSI (80 BAR)
RANGE: 200 TO 5000 PSI (14 TO 345 BAR) FOR 100
200 TO 3750 PSI (14 TO 260 BAR) FOR 130
FACTORY SET AT MINIMUM UNLESS SPECIFIED OTHERWISE

LOAD SENSE ADJUSTER
.188" INTERNAL HEX
1 TURN CW INCREASES DELIVERY 42 PSI (3 BAR)
RANGE: 200 TO 600 PSI (14 TO 43 BAR)
FACTORY SET AT MINIMUM UNLESS OTHERWISE SPECIFIED

REMOTE PILOT PORT "RP1"
#4 SAE STR. THD. PORT
.438-20 UNF-2B THD.
(SHOWN PLUGGED)

LOAD SENSE PORT
#6 SAE STR. THD. PORT
.562-18 UNF-2B THD.

For pump dimensions and specifications see Bulletin 47019
WEIGHT:
- 129 LBS [59KG] FOR REAR PORT VERSION SHOWN
- 138 LBS [63KG] FOR SIDE PORT VERSION
- 144 LBS [65KG] FOR THRU SHAFT VERSION

Pressurce Compensator Adjustment
- .188” INTERNAL HEX
- 1 TURN CW INCREASES SETTING 1160 PSI (80 BAR)
- RANGE: 200 TO 5000 PSI (14 TO 345 BAR) FOR 100
- 200 TO 3750 PSI (14 TO 260 BAR) FOR 130
- FACTORY SET AT MINIMUM UNLESS SPECIFIED OTHERWISE

Remote Pilot Port “RP1”
- #4 SAE STR. THD. PORT .438-20 UNF-2B THD.
- (SHOWN PLUGGED)

Optional Maximum Volume Stop
- .250” INTERNAL HEX
- 1 TURN CW DECREASES DELIVERY 7% RANGE 100% TO 0%
- FACTORY SET AT MAXIMUM VOLUME UNLESS SPECIFIED OTHERWISE

For pump dimensions and specifications see Bulletin 47019
WEIGHT:
129 LBS [59KG] FOR REAR PORT VERSION SHOWN
138 LBS [65KG] FOR SIDE PORT VERSION
144 LBS [66KG] FOR THRU SHAFT VERSION

OPTIONAL MAXIMUM VOLUME STOP
.250" INTERNAL HEX
1 TURN CW DECREASES DELIVERY 7% RANGE 100% TO 0%
FACTORY SET AT MAXIMUM VOLUME UNLESS SPECIFIED OTHERWISE

PRESSURE COMPENSATOR ADJUSTMENT
.188" INTERNAL HEX
1 TURN CW INCREASES SETTING 1160 PSI (80 BAR)
RANGE: 200 TO 5000 PSI (14 TO 345 BAR) FOR 100
200 TO 3750 PSI (14 TO 260 BAR) FOR 130
FACTORY SET AT MINIMUM UNLESS SPECIFIED OTHERWISE

LOAD SENSE ADJUSTER
.188" INTERNAL HEX
1 TURN CW INCREASES SETTING 42 PSI (3 BAR)
RANGE: 200 TO 600 PSI (14 TO 43 BAR)
FACTORY SET AT MINIMUM UNLESS OTHERWISE SPECIFIED

REMOTE PILOT PORT "RP1"
#4 SAE STR. THD. PORT .438-20 UNF-2B THD.
(SHOWN PLUGGED)

LOAD SENSE PORT
#6 SAE STR. THD. PORT .562-18 UNF-2B THD.

For pump dimensions and specifications see Bulletin 47019
FOR OPTIONAL "SN" MAX. VOLUME REPLACE ITEMS 323 & 336 WITH THESE PARTS.
FOR OPTIONAL "SN"
MAX. VOL. STOP REPLACE ITEMS 323 & 336 WITH THESE PARTS.
Cross Section P-F/F

Technical Reference Bulletin 47861
All of the items shown in this view are included in Item 351D which is part of the proportional control valve service kit.
### O-Ring Seals

<table>
<thead>
<tr>
<th>Item Number</th>
<th>AS 568A Number</th>
<th>Shore A Durometer</th>
<th>Viton</th>
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<td>-250</td>
<td>70</td>
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<td>314</td>
<td>-137</td>
<td>Teflon</td>
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<tr>
<td>330</td>
<td>-013</td>
<td>90</td>
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<tr>
<td>331</td>
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<td>334</td>
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<td>359</td>
<td>-016</td>
<td>90</td>
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</tbody>
</table>

### Screw and Plug Torques

<table>
<thead>
<tr>
<th>Item Number</th>
<th>Description</th>
<th>Head Size / Type</th>
<th>Tightening Torque</th>
</tr>
</thead>
<tbody>
<tr>
<td>306</td>
<td>PLUG, END</td>
<td>7/8” external</td>
<td>50 ft-lb (68 Nm)</td>
</tr>
<tr>
<td>308</td>
<td>SEAT</td>
<td>7/16” external</td>
<td>200 in-lb (23 Nm)</td>
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<tr>
<td>309</td>
<td>BONNET, PRESSURE COMPENSATOR</td>
<td>1” external</td>
<td>80 ft-lb (108 Nm)</td>
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<tr>
<td>315</td>
<td>SCREW, SHC, 1/2-13 UNC</td>
<td>3/8” internal</td>
<td>100 ft-lb (136 Nm)</td>
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<tr>
<td>316A</td>
<td>SCREW, SHC, 1/2-13 UNC 3.25 Long</td>
<td>3/8” internal</td>
<td>100 ft-lb (136 Nm)</td>
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<tr>
<td>316B</td>
<td>SCREW, SHC, 1/2-13 UNC 1.25 Long</td>
<td>3/8” internal</td>
<td>100 ft-lb (136 Nm)</td>
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<td>319</td>
<td>PLUG, .062 NPT</td>
<td>5/32” internal</td>
<td>48 in-lb (5 Nm)</td>
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<tr>
<td>321</td>
<td>PLUG, #4 HP</td>
<td>3/16” internal</td>
<td>120 in-lb (14 Nm)</td>
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<tr>
<td>322</td>
<td>PLUG, END, COMPENSATOR VALVE</td>
<td>7/8” external</td>
<td>50 ft-lb (68 Nm)</td>
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<td>323</td>
<td>PLUG, #12 HP</td>
<td>9/16” internal</td>
<td>85 ft-lb (115 Nm)</td>
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<td>325</td>
<td>ORIFICE, .062 NPT-.040 DIA</td>
<td>5/32” internal</td>
<td>48 in-lb (5 Nm)</td>
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<td>342</td>
<td>PLUG, #3 HP</td>
<td>1/8” internal</td>
<td>45 in-lb (5 Nm)</td>
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<tr>
<td>351</td>
<td>BONNET, LOAD SENSE</td>
<td>1 1/4” external</td>
<td>85 ft-lb (115 Nm)</td>
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<td>354</td>
<td>SEAT, LOAD SENSE</td>
<td>5/8” external</td>
<td>70 +10 in-lb (8 +1,13 Nm)</td>
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<td>356</td>
<td>SCREW, SHC #10-24 1.50 Long</td>
<td>5/32” internal</td>
<td>57 in-lb (6 Nm)</td>
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<tr>
<td>364</td>
<td>SCREW, CPS #10-24 0.19 Long</td>
<td>5/32” internal</td>
<td>20 in-lb (2 Nm)</td>
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<tr>
<td>391C</td>
<td>BONNET, MAX. VOL. STOP</td>
<td>1 1/4” external</td>
<td>85 ft-lb (115 Nm)</td>
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<tr>
<td>351D</td>
<td>SCREW, SHC #10-24 0.50 Long</td>
<td>5/32” internal</td>
<td>57 in-lb (6 Nm)</td>
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<tr>
<td></td>
<td>ASM, SOLENOID CONTROL</td>
<td>5/8” external **</td>
<td>15 ft-lb (20 Nm)</td>
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<tr>
<td>353D</td>
<td>PLUG, #2 HP</td>
<td>1/8” internal</td>
<td>45 in-lb (5 Nm)</td>
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<tr>
<td>354D</td>
<td>PLUG, #4 HP</td>
<td>3/16” internal</td>
<td>120 in-lb (14 Nm)</td>
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<tr>
<td>355D</td>
<td>PLUG, #8 HP</td>
<td>5/16” internal</td>
<td>45 ft-lb (61 Nm)</td>
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<td>362D</td>
<td>ORIFICE, .062 NPT-.062 (PVG-100)</td>
<td>5/32” internal</td>
<td>48 in-lb (5 Nm)</td>
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<tr>
<td></td>
<td>ORIFICE, .062 NPT-.089 (PVG-130)</td>
<td>5/32” internal</td>
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* Teflon Backup Ring

** Load Sense Only

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Control Valve Exploded View

* Item 18
** Item 19
## Service Kits

<table>
<thead>
<tr>
<th>Description</th>
<th>Kit No.</th>
<th>Series</th>
<th>Items Included (quantity is 1 unless noted)</th>
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<tbody>
<tr>
<td><strong>Control Piston and Spring</strong></td>
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<tr>
<td>N.O. P-E, P-E/F</td>
<td>L723987-006</td>
<td>F1</td>
<td>302, 303, 329</td>
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<td>N.C. P-F, P-F/F</td>
<td>L723987-007</td>
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<tr>
<td><strong>Pressure Compensator Relief</strong></td>
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<td>P-E, P-F, P-E/F, P-F/F</td>
<td>L723987-101</td>
<td>F1</td>
<td>307, 308, 312(4), 327, 333</td>
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<td><strong>Load Sense / Pressure Compensator Relief</strong></td>
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<td><strong>Pressure Compensator Spool</strong></td>
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<td>P-E, P-F, P-E/F, P-F/F</td>
<td>L723987-202</td>
<td>F1</td>
<td>305, 328</td>
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<td><strong>Pressure Compensator Adjustor</strong></td>
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<td>L300574HS07</td>
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<td><strong>Load Sense Adjustor</strong></td>
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<td>P-E/F, P-F/F</td>
<td>L318966-002</td>
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<td><strong>Adjustable Maximum Volume Stop</strong></td>
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<td>P-E, P-F, P-E/F, P-F/F</td>
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<td><strong>Control Seal Kit</strong></td>
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<td><strong>End Cap Assembly</strong></td>
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<td><strong>Proportional Control Valve Assembly</strong></td>
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<td>P-E, P-E/F - 13V Mobile</td>
<td>L520340-305</td>
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<td>P-E, P-E/F - 27V Mobile</td>
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<td>P-F, P-F/F - 24V Industrial</td>
<td>L520341-304</td>
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<td>P-F, P-F/F - 13V Mobile</td>
<td>L520341-305</td>
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<td>P-F, P-F/F - 27V Mobile</td>
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<td><strong>Proportional Amplifier</strong></td>
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<td>407932-902</td>
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<td>P-E, P-F, P-E/F, P-F/F - 13V and 27V Mobile</td>
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* P-E, P-E/F Control Valve Assemblies
** P-F, P-F/F Control Valve Assemblies
Amplifier Connections-Industrial Coil Only

A 0 Volt Supply
B 24 Volt Supply
C Signal 0 Volt
D 3 to 8 Volt Command*
E Unused
F Unused

* For use with 4-20mA command source, install a 500Ω resistor between terminals C and D. Functional command range would be 6mA - 16mA (3 to 8 volt).

Signal 0V and Supply 0V are internally linked. If 0 Volt signals are linked outside of connector use only 0 Volt supply terminal.

Solenoid Connections

1 + Signal
2 0V Signal

Mating connector for Mobile Solenoid: Deutsch DT04-2P
Mating connector for Industrial Solenoid: Hirschmann GDM 209

Specifications

<table>
<thead>
<tr>
<th></th>
<th>Industrial 24V</th>
<th>Mobile 24V</th>
<th>Mobile 12V</th>
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<tbody>
<tr>
<td>Supply Voltage</td>
<td>24 Volt DC +0.5V</td>
<td>27 Volt DC</td>
<td>13 Volt DC</td>
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<td></td>
<td>fused at 1.5 A</td>
<td>fused at 1.5 A</td>
<td>fused at 2.5 A</td>
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<tr>
<td>Control Signal</td>
<td>3 to 8 VDC =</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>(Amplifier Only)</td>
<td>100% to 0% stroke</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>PWM* Switching</td>
<td>150 Hz</td>
<td>180 Hz</td>
<td>180 Hz</td>
</tr>
<tr>
<td>Frequency</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maximum Continuous</td>
<td>1 A</td>
<td>1 A</td>
<td>2 A</td>
</tr>
<tr>
<td>Current</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Operating Temperature</td>
<td>-5°C to 70°C</td>
<td>-5°C to 70°C</td>
<td>-5°C to 70°C</td>
</tr>
<tr>
<td>Nominal Coil</td>
<td>24 Ω</td>
<td>28 Ω</td>
<td>7 Ω</td>
</tr>
<tr>
<td>Resistance</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* Pulse Width Modulated
PWM Examples

**Industrial**

**Mobile**

PWM: 75% On 25% Off

PWM: 50% On 50% Off

PWM: 25% On 75% Off