PS82 – Economical Miniature Vacuum Switches

- 5” to 28” Hg (169 to 948 mbar)

These miniature vacuum switches, based on our proven PS41 series, are designed for demanding applications where space and/or price are strong concerns.

Specifications

<table>
<thead>
<tr>
<th>Options Selected</th>
<th>AC</th>
<th>DC</th>
</tr>
</thead>
<tbody>
<tr>
<td>No option or -RD</td>
<td>5 amps @ 125/250 Volts, 3 amps resistive, 0.5 amp inductive @ 28 Volts</td>
<td></td>
</tr>
<tr>
<td>-G only or -RD with -G</td>
<td>1 amp @ 125 Volts, 0.5 amp inductive @ 28 Volts</td>
<td></td>
</tr>
<tr>
<td>-10A only or -SP without -G</td>
<td>10.1 amps @ 125/250 Volts</td>
<td></td>
</tr>
<tr>
<td>-SP with -G</td>
<td>2 amps @ 125/250 Volts</td>
<td></td>
</tr>
</tbody>
</table>

Recommended Operating Temperature Limits

Electrical Switch Ratings

Note: Switches may function below the cold temperature limit but the set points and deadband will increase. Consult factory for details.

Dimensions

DIN 43650A – Male Half Only

Ingress Protection Option (IP66)
with Flying Leads Factory Set Only

Adjustment screw is located under protective screw.
How To Order
Use the Bold characters from the chart below to construct a product code. Please reference Notes.

PS82 -10 -4MNB -C -H -XX -XXXX

1 Pressure Range Code
Insert Pressure Range Code from Table 1, below.

2 Pressure Fitting
Brass
-2MNB = 1/8˝ NPTM
-4MNB = 1/4˝ NPTM
-2MGB = 1/8˝ BSPM (G type)
-4MGB = 1/4˝ BSPM (G type)
-2MBS = 9/16˝ -20 SAE Male
-4MBS = 9/16˝ -18 SAE Male

316 Stainless Steel
-2MNS = 1/8˝ NPTM
-4MNS = 1/4˝ NPTM
-4MGS = 1/4˝ BSPM (G type)

3 Circuit
-A = SPST/N.O.
-B = SPST/N.C.
-C = SPDT

4 Electrical Termination
-FLXX = Flying Leads
-FLSXX = Flying Leads w/PVC Shrink Tubing
-ELXX = 1/2˝ NPT Male Conduit w/Flying Leads
-CABXX = 18 AWG PVC Cable
-H = DIN 43650A Male Half Only
-HR = Right Angle DIN 43650A Male Half Only
-HC = DIN 43650A 9mm Cable Clamp
-HCR = Right Angle DIN 43650A 9mm Cable Clamp
-HN = DIN 43650A with 1/2˝ Female NPT Conduit
-HNR = Right Angle DIN 43650A with 1/2˝ Female NPT Conduit
-HM = Micro (9.4mm Spacing) DIN Style Male Half Only
-SP = Spade Terminals

5 Options
-10A = 10A @ 125/250 VAC Max. Rating
-V = Viton® Diaphragm
-N = Neoprene Diaphragm
-E = EPDM Diaphragm
-G = Gold Contacts
(for loads less than 12 mA @ 12 VDC)
-RD = Reduced Differential
(25% reduction typical)
-IP = Ingress Protection
-DF = Oil Free Cleaned
-WF = Weather Pack Connector, Female
-WM = Weather Pack Connector, Male
-DE = Deutsch Connector, Male, DT04 Series

6 Fixed Set Point (optional)
A. Specify set point -FS
(in Inches Hg or mBAR, see example)
B. Set Point Actuation
R on Rising Vacuum
F on Falling Vacuum
Example: -FS300MBARF for 300 mBAR Falling
or -FS10INHGR for 10˝ Hg Rising

Notes:
1. Other fittings available. Consult factory.
2. 18˝ is standard. Specify lead length in inches (max. 48˝). e.g. -FL18 or -FL30.
3. 18˝ is standard. Specify lead length in inches (max. 48˝). e.g. -FL18 or -FL30.
4. 36˝ is minimum. Specify cable length in inches. e.g. -CAB36 or -CAB120.
5. DIN connectors require -C SPDT circuit.
6. Requires -10A, -G options (50% increase in deadband typical).
7. Options -10A, -G or -RD cannot be combined.
8. Ingress Protection is available only with -FL, -FLS, -ELS or -GAB Electrical Termination choices. Ingress Protection requires Fixed Set Point -FS.
9. Set Point must be within Pressure Range selected in Step 1.

Vacuum Range Codes

<table>
<thead>
<tr>
<th>Vacuum Range Code</th>
<th>Vacuum Range</th>
<th>Accuracy</th>
<th>Average Deadband*</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>5-15” Hg (169-508 mbar)</td>
<td>±0.71” Hg (24 mbar) +2% of setting</td>
<td>3.05” Hg (103 mbar) +7% of setting</td>
</tr>
<tr>
<td>20</td>
<td>12-28” Hg (406-948mbar)</td>
<td>±1.63” Hg (55 mbar) +2% of setting</td>
<td>6.1” Hg (207 mbar) +8% of setting</td>
</tr>
</tbody>
</table>

* -IP and -EL options are approximate gauge switches. Altitude and temperature changes will result in set point shifts.
From 2 to 6000 PSI (40 mbar to 400 bar), GEMS Pressure Switches Cover A Wide Range of Applications

- General, Vacuum, Specialty
- Field-Adjustable or Factory Set Switches
- High Proof Pressure
- Rugged and Dependable

GEMS offers a choice of pressure switches, from compact cylindrical models for OEM use, to larger, enclosed units for rugged process applications. These switches are ideal for the filtering process of coolants in the machine tool industry, use in transmissions of off-highway vehicles and as redundant systems with existing monitors such as transducers.

Unique Piston/Diaphragm Design

A piston/diaphragm design, incorporating the high proof pressure of piston technology allows these switches to operate with the sensitivity and accuracy of a diaphragm design. Repeatability ranges from 0.25 percent to 5 percent of the set point.

Many Materials To Choose From

Enclosures include aluminum, stainless steel, brass, reinforced plastic and zinc-plated steel. Wetted parts include a diaphragm available in Buna-n, Teflon® coated Kapton®, stainless steel, PTFE, EPDM or Viton® and a pressure port available in stainless steel, brass or zinc-plated steel.

Pressure Switch Option Descriptions

**G**: Gold contacts are usually required for low DC current loads (<12 VDC @ 12 mA) associated with TTL input devices. They provide decreased contact resistance, which results in more reliable switching especially in the presence of an oxidizing atmosphere.

**OF**: Wetted Materials are ultrasonically cleaned to remove oil and debris.

**10A**: 10A option is provided by a microswitch rated 10 Amperes at 250 VAC. This microswitch has a wide movement differential, which results in a larger deadband than listed in the standard catalog pages.

**IP**: Ingress Protection is provided by either an epoxy sealed cap (IP65) or silicon wire seals (IP66). On some models, this option is only available with FS option.

**RB**: Rubber Boot is designed to be cut out for the proper wire or cable size by the customer and sealed with an appropriate sealant in the field.

**WF**: Weatherpack female termination consists of the following Delphi P/N’s: (12045793 Conn “C” Circuit), 12089040 Male Pins and 12015323 Wire Seals.

**DE**: Deutsch male termination consists of the following Deutsch P/N’s: DT04-2P Connector, (DT04-3P “C” Circuit) 1060-16-0122 Male Pins and W(2 or 3)P Wedgelok.

**FS**: GEMS will preset switches to the indicated set point within repeatability limits listed on the specific product catalog page.

**R**: The restrictor option is recommended for hydraulic and pneumatic systems that need a small reduction in pressure pulsations to increase pressure switch life. It is a pressed in part that has an orifice size of 0.045˝ (1.4 mm)

**SR**: The spiral restrictor option heavily dampens pressure pulsations in any hydraulic system, which prevents false signaling and premature wear. It is not recommended for pressure settings below 1500 psig (103 bar) because it slows the response time of the pressure switch depending on fluid viscosity.

Selection Guide

<table>
<thead>
<tr>
<th>Pressure Range</th>
<th>Proof Pressure</th>
<th>Switch</th>
<th>Notes</th>
<th>Series</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Subminiature Pressure Switches</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0.75 to 15 psi (52 to 1034 mbar)</td>
<td>150 psi (10 bar)</td>
<td>SPST, SPDT</td>
<td>—</td>
<td>PS11</td>
<td>I-3</td>
</tr>
<tr>
<td>5 to 150 psi (0.35 to 10 bar)</td>
<td>500 psi (35 bar)</td>
<td>SPST</td>
<td>Kapton® Diaphragm</td>
<td>PS31</td>
<td>I-5</td>
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<tr>
<td>5 to 100 psi (0.35 to 7 bar)</td>
<td>500 psi (35 bar)</td>
<td>SPST</td>
<td>Elastomer Diaphragm</td>
<td>PS32</td>
<td>I-7</td>
</tr>
<tr>
<td>50 to 300 psi (3.45 to 20 bar)</td>
<td>500 psi (35 bar)</td>
<td>SPST</td>
<td>Kapton® Diaphragm</td>
<td>PS51</td>
<td>I-5</td>
</tr>
<tr>
<td>15 to 3000 psi (1.03 to 207 bar)</td>
<td>6000 psi (414 bar)</td>
<td>SPST</td>
<td>—</td>
<td>PS61</td>
<td>I-11</td>
</tr>
<tr>
<td>5 to 6000 psi (0.35 to 414 bar)</td>
<td>7500 psi (517 bar)</td>
<td>SPST, SPDT, DPST, DPDT</td>
<td>—</td>
<td>PS75</td>
<td>I-19</td>
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<tr>
<td>Miniature Pressure Switches</td>
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<tr>
<td>3.5 to 100 psi (0.24 to 7 bar)</td>
<td>350 psi (24 bar)</td>
<td>SPST, SPDT</td>
<td>—</td>
<td>PS41</td>
<td>I-9</td>
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<tr>
<td>10 to 5000 psi (0.7 to 344 bar)</td>
<td>6000 psi (414 bar)</td>
<td>SPST, SPDT</td>
<td>—</td>
<td>PS71</td>
<td>I-15</td>
</tr>
<tr>
<td>10 to 750 psi (0.7 to 52 bar)</td>
<td>3000 psi (207 bar)</td>
<td>SPST, SPDT</td>
<td>—</td>
<td>PS72</td>
<td>I-17</td>
</tr>
<tr>
<td>15 to 1750 psi (1 to 121 bar)</td>
<td>4500 psi (310 bar)</td>
<td>SPST, DPDT</td>
<td>—</td>
<td>PS76</td>
<td>I-21</td>
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<tr>
<td>Vacuum Switches</td>
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<tr>
<td>1.5 to 15° Hg (51 to 508 mbar)</td>
<td>150 psi (10 bar)</td>
<td>SPST, SPDT</td>
<td>—</td>
<td>PS81</td>
<td>I-23</td>
</tr>
<tr>
<td>5° to 28° Hg (169 to 948 mbar)</td>
<td>350 psi (24 bar)</td>
<td>SPST, SPDT</td>
<td>—</td>
<td>PS82</td>
<td>I-25</td>
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<tr>
<td>Solid-State Switches</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>0 to 6000 psi (0 to 400 bar)</td>
<td>See Specs</td>
<td>SPST, Relay or Transistor</td>
<td>Solid-State</td>
<td>PS98</td>
<td>I-27</td>
</tr>
</tbody>
</table>

Plastic Diaphragms*

Option K or Standard Teflon® Coated Kapton® (Polyimide) Diaphragm

Teflon® is compatible with almost every liquid and gaseous media. Kapton® has very stable physical properties over a wide temperature range. This results in pressure switches that exhibit very little set point shift due to temperature extremes. Kapton® possesses exceptional fatigue strength but is very stiff which results in wider but more stable deadbands than most elastomers.

Elastomer Diaphragms*

Elastomers offer incredible sensitivity coupled with extremely long life. This results in stable set points over the life of the pressure switch as well as tight deadbands. Their biggest weakness is the increase in modulus (stiffening) that occurs at lower temperatures. This results in pressure switch set points to shift higher and deadbands to increase with decreasing temperature. They also exhibit more hysteresis than Kapton® diaphragms.

Standard: Nitrile (Buna-N). Typically specified on water and petroleum based hydraulic oils.

Option E: EPDM (Ethylene Propylene) Diaphragm. Typically used with phosphate ester based hydraulic fluids, brake fluids, ketones, steam and hot water.

Option N: Neoprene (Chloroprene) Diaphragm. Typically specified for refrigerant systems.


* See individual product data sheets for temperature ranges.