

PS71 – General Purpose Mini Pressure Switches

▶ 10 to 5000 psi (0.7 to 344 bar)

These versatile general purpose switches with snap action microswitches can be used in a wide range of hydraulic and pneumatic applications. Their proven piston/diaphragm design offers outstanding accuracy over a very wide pressure range with an outstanding 6000 psi proof pressure. Their modular construction allows Gems to offer a large number of standard pressure fittings in two materials as well as numerous electrical ratings and terminations. Users can easily configure this model to meet their needs.

Specifications

Switch	SPST; SPDT
Repeatability	See Table 1
Wetted Parts	
Diaphragm	Nitrile (optional EPDM, Viton® or Neoprene)
Fitting	Zinc-Plated Steel (Optional 316 SS)
Electrical Termination	DIN 43650A IP65; Spade Terminals IP00; Flying Leads IP65; Conduit with Flying Leads IP65; IP option IP66
Proof Pressure	6000 psi (414 bar)
Burst Pressure	9000 psi (600 bar)
Approvals	CE, UL Approved units available
Weight, Approximate	0.4 lbs. (0.15 kg)

Recommended Operating Temperature Limits

Diaphragm Material	Options Selected		
	No option, -10A, -SP or -RD	-RD or -RD and -G	-SP or -10A
Nitrile	15°F to 185°F (-9°C to +85°C)	15°F to 250°F (-9°C to +121°C)	15°F to 212°F (-9°C to +100°C)
Viton®	0°F to 185°F (-18°C to +85°C)	0°F to 250°F (-18°C to +121°C)	0°F to 212°F (-18°C to +100°C)
EPDM	-10°F to +185°F (-23°C to +85°C)	-10°F to +250°F (-23°C to +121°C)	-10°F to +212°F (-23°C to +100°C)
Neoprene	-10°F to +185°F (-23°C to +85°C)	-10°F to +250°F (-23°C to +121°C)	-10°F to +212°F (-23°C to +100°C)

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

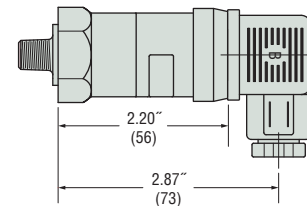
Electrical Switch Ratings

Options Selected	AC	DC
No option or -RD	5 amps @ 125/250 Volts	5 amps resistive, 3 amps inductive @ 28 Volts
-G only or -RD with -G	1 amp @ 125 Volts	1 amp resistive, 0.5 amp inductive @ 28 Volts
-10A only or -SP without -G	10.1 amps @ 125/250 Volts	—
-SP with -G	2 amps @ 125/250 Volts	—

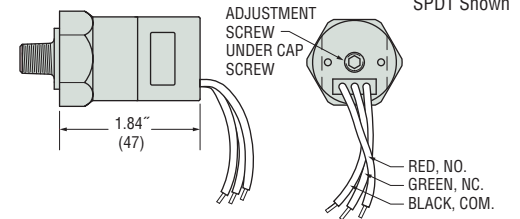


Dimensions

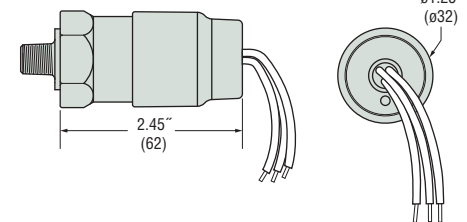
DIN 43650A with Cable Clamp



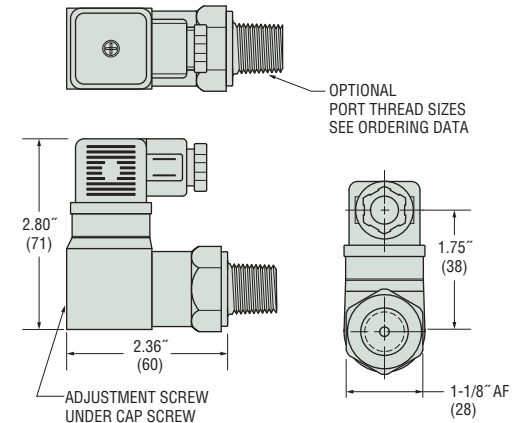
Flying Lead



IP66 Option



Right Angle DIN 43650A with Cable Clamp



How To Order

Use the **Bold** characters from the chart below to construct a product code. Please reference Notes.



① Pressure Range Code

Insert Pressure Range Code from Table 1, below.

② Pressure Fitting¹

12L14 Zinc-Plated Steel

- 2MNZ=1/8" NPTM
- 4MNZ=1/4" NPTM
- 8MNZ=1/2" NPTM
- 2MGZ=1/8" BSPM (G type)
- 4MGZ=1/4" BSPM (G type)
- 4MSZ=7/16"-20 SAE Male
- 6MSZ=9/16"-18 SAE Male
- M10Z=M10 x 1.0, Straight
- M12Z=M12 x 1.5, Straight
- M14Z=M14 x 1.5, Straight

316 Stainless Steel

- 2MNS=1/8" NPTM
- 4MNS=1/4" NPTM
- 2MGS=1/8" BSPM (G type)
- 4MGS=1/4" BSPM (G type)

③ Circuit

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

④ Electrical Termination

- SP=Spade Terminals²
- FLXX=Flying Leads³
- FLSXX=Flying Leads w/PVC Shrink Tubing³
- ELXX=1/2" NPT Male Conduit w/Flying Leads⁴
- CABXX=18 AWG PVC Cable⁵
 - H=DIN 43650A Male Half Only⁶
 - HR=Right Angle DIN 43650A Male Half Only⁶
 - HC=DIN 43650A 9mm Cable Clamp⁶
 - HCR=Right Angle DIN 43650A 9mm Cable Clamp⁶
 - HN=DIN 43650A with 1/2" Female NPT Conduit⁶
 - HNR=Right Angle DIN 43650A with 1/2" Female NPT Conduit⁶

⑤ Options⁷

- V=Viton® Diaphragm
- E=EPDM Diaphragm
- N=Neoprene Diaphragm
- 10A=10A @ 125/250 VAC Max. Rating
- G=Gold Contacts
(for loads less than 12 mA @ 12 VDC)
- RD=Reduced Differential
(25% reduction typical)
- IP=Ingress Protection⁸
- OF=Oil Free Cleaned⁹
- R=Restrictor (low damping coefficient) Brass
- SR=Spiral Restrictor (high damping coefficient)
300 Series Stainless Steel¹⁰
- 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 PSI or BAR, see example)¹¹
- B. Set Point Actuation
R on Rising Pressure
F on Falling Pressure
Example: **-FS2BARF** for 2 BAR Falling
or **-FS20PSIR** for 20 PSI Rising

Notes:

1. Other fittings available. Consult factory.
2. 20% increase in deadband typical.
3. 1/8" is standard. Specify lead length in inches (max. 48"). e.g. **-FL18** or **-FLS30**.
4. 1/8" is standard. Specify lead length in inches (max. 48"). e.g. **-EL18** or **-EL30**.
5. 36" is minimum. Specify cable length in inches. e.g. **-CAB36** or **-CAB120**.
6. DIN connectors require **-C** SPDT circuit.
7. Options **-10A**, **-G** or **-RD** cannot be combined.
8. Ingress Protection is available only with **-FL**, **-FLS** or **-CAB** Electrical Termination choices. Ingress Protection requires Fixed Set Point **-FS**.
9. Requires stainless steel housing.
10. **-SR** will result in wider deadbands and slower response time.
11. Set Point must be within Pressure Range selected in Step 1.

Table 1 — Pressure Range Codes

Pressure Range Code	Pressure Range	Accuracy*	Average Deadband**
10	10-30 psi (0.7-2.1 bar)	±1.5 psi (0.103 bar) +2% of setting	3.5 psi (0.28 bar) +11% of setting
20	25-75 psi (1.7-5.2 bar)	±2.5 psi (0.172 bar) +2% of setting	3.5 psi (0.28 bar) +11% of setting
30	65-300 psi (4.5-20.7 bar)	±5.0 psi (0.345 bar) +2% of setting	20 psig (1.38 bar) +11% of setting
40	250-1000 psi (17.2-69.0 bar)	±15 psi (1.03 bar) +2% of setting	45 psig (3.10 bar) +12% of setting
50	1000-3000 psi (69-206.8 bar)	±30 psi (2.06 bar) +3% of setting	70 psig (4.83 bar) +12% of setting
60	2500-5000 psi (172.4-344.7 bar)	±50 psi (3.45 bar) +4% of setting	140 psi (9.65 bar) +13% of setting

* Accuracy and set point of units may change due to the effects of temperature.

** These numbers are for the standard microswitch. With either the **-SP** or **-10A** option, the values are typically 20% greater than those listed. With the **-RD** option, the values will be typically 25% less than those listed. In certain applications deadband can be tailored and controlled to customer specifications. Consult factory for details.

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), 12089188 Female Pins and 12015323 Wire Seals.

WM: Weatherpack male termination consists of the following Delphi P/N's: 12010973 Connector, (12010717 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

	Pressure Range	Proof Pressure	Switch	Notes	Series	Page
Subminiature Pressure Switches	0.75 to 15 psi (52 to 1034 mbar)	150 psi (10 bar)	SPST, SPDT	—	PS11	I-3
	5 to 150 psi (0.35 to 10 bar)	500 psi (35 bar)	SPST	Kapton® Diaphragm	PS31	I-5
	5 to 100 psi (0.35 to 7 bar)	500 psi (35 bar)		Elastomer Diaphragm	PS32	I-7
	50 to 300 psi (3.45 to 20 bar)	500 psi (35 bar)	SPST	Kapton® Diaphragm	PS51	I-5
				Elastomer Diaphragm	PS52	I-7
	15 to 3000 psi (1.03 to 207 bar)	6000 psi (414 bar)	SPST	—	PS61	I-11
				PS62	I-13	
	5 to 6000 psi (0.35 to 414 bar)	7500 psi (517 bar)	SPST, SPDT, DPST, DPDT	—	PS75	I-19
Miniature Pressure Switches	3.5 to 100 psi (0.24 to 7 bar)	350 psi (24 bar)	SPST, SPDT	—	PS41	I-9
	10 to 5000 psi (0.7 to 344 bar)	6000 psi (414 bar)	SPST, SPDT	—	PS71	I-15
	10 to 750 psi (0.7 to 52 bar)	3000 psi (207 bar)	SPST, SPDT	—	PS72	I-17
	15 to 1750 psi (1 to 121 bar)	4500 psi (310 bar)	SPST, DPDT	—	PS76	I-21
Vacuum Switches	1.5" to 15" Hg (51 to 508 mbar)	150 psi (10 bar)	SPST, SPDT	—	PS81	I-23
	5" to 28" Hg (169 to 948 mbar)	350 psi (24 bar)	SPST, SPDT	—	PS82	I-25
Solid-State Switches	0 to 6000psi (0 to 400 bar)	See Specs	SPST, Relay or Transistor	Solid-State	PS98	I-27

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 V: Viton® (Fluoroelastomer)

Diaphragm. Typically used with alcohols, diesters, solvents, acids and synthetic oils. Also used for high vacuum service.

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.