

PS93 – General Purpose Differential Pressure Switch

- ▶ 10 to 45 psi (.7 to 3 bar) *formerly PS-D series*
- ▶ Compact Construction
- ▶ Can Be Mounted in Tight Spaces
- ▶ Rugged Housing

The PS93 Series compact design enables them to be mounted in tight spaces. The switches use a piston/diaphragm design which incorporates the high proof pressure of piston technology with the sensitivity of a diaphragm design. The PS93 series switches may be field or factory adjusted via a hex screw inside the low port, protecting them against unauthorized tampering.

Specifications

Operating Temperature	
Buna-N	-4°F to +176°F (-20°C to +80°C)
EPDM¹	-40°F to +176°F (-40°C to +80°C)
Viton^{®1}	+32°F to +176°F (+0°C to +80°C)
Switch²	5 Amp SPDT @ 240 VAC and 24 VDC; 0.5 Amp @ 24 VDC (-G option)
Repeatability	±2% of highest set point @ 68°F (20°C)
Wetted Parts	
Diaphragm	Buna-N (optional EPDM, Viton [®] and Neoprene)
Fitting	Zinc-plated steel (optional Brass or 316 Stainless Steel)
Electrical Termination	DIN 43650A (IP65)
Proof Pressure	500 psi (35 bar)
Approvals	CE
Weight, Approximate	0.75 lbs. (0.35 kg)

Notes:

1. Optional
2. Gold contacts (option G) may be required for less than 12 VDC and 20 mA.

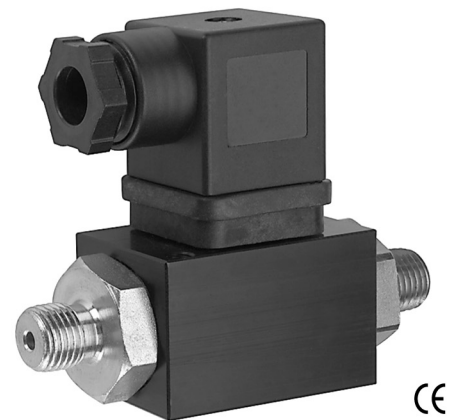
How To Order

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

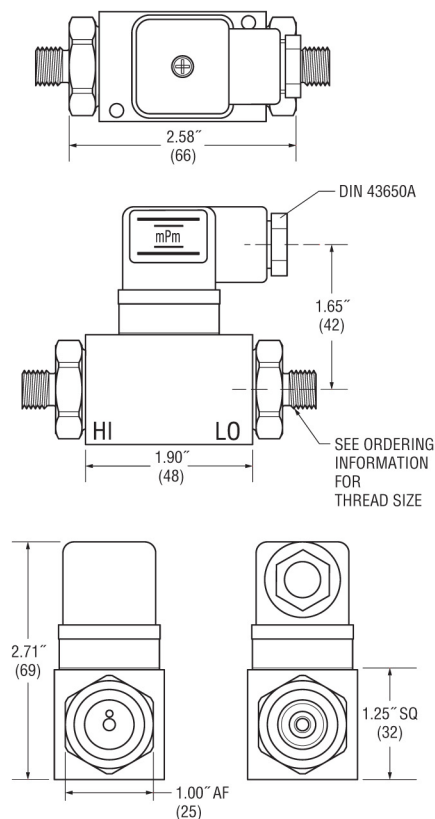
SELECT	PS93	-10	-4MNS/4MNS	-C	-H	-XX	-XXXX
1. Pressure Range Code							
Insert Pressure Range Code from table below right							
2. Pressure Fitting							
High Port							
Low Port							
12L14 Zinc Plated Steel							
-2MNZ 1/8" NPTM;							
-2MGZ 1/8" BSPM;							
-4MNZ 1/4" NPTM;							
-4MGZ 1/4" BSPM;							
-4FNZ 1/4" NPTF;							
-4MSZ 7/16"-20 SAE Male							
316 Stainless Steel							
-4MNS 1/4" NPTM							
3. Circuit							
-C SPDT							
4. Electrical Termination							
-H DIN 43650A Male Half Only (standard); -HC DIN 43650A 9mm Cable Clamp;							
-HN DIN 43650A with 1/2" Female NPT Conduit							
5. Options							
-V Viton [®] Diaphragm; -E EPDM Diaphragm; -N Neoprene Diaphragm;							
-G Gold Contacts (for loads less than 12 mA @ 12 VDC)							
6. Fixed Set Point (optional)							
A. Specify set point -FS (in PSI or BAR, see example) ¹							
B. Set Point Actuation							
R on Rising Pressure; F on Falling Pressure							
Example: -FS1BARF for 1 BAR Falling or -FS10PSIR for 10 PSI Rising							

Note:

1. Set Point must be within Pressure Range selected in Step 1 above.



Dimensions



Pressure Range Codes

Pressure Range Code	Pressure Range	Average Dead Band
10	10-25 psi (0.7-1.7 bar)	3-8 psi (0.2-0.4 bar)
20	20-45 psi (1.4-3.1 bar)	5-15 psi (0.35-1 bar)

PS91 – Compact Differential Switch

- ▶ 5 to 25 psi (.3 to 1.7 bar)
- ▶ Unaffected by Static Pressure
- ▶ Robust Packaging for Harsh Applications

The PS91 is a differential pressure switch that is not affected by changes in static pressure (common line pressure). The PS91 is designed for a unique manifold, or supplied with two 1/4" NPT female ports for more general purpose applications. The switch can be adjusted via a central screw on top of the unit. The unit is supplied with a mini-DIN connector in keeping with the compact packaging.

Specifications

Operating Temperature	-40°F to +180°F (-40°C to +80°C)
Switch*	5 Amp @ 24 VDC and 250 VAC; 0.5 Amp @ 24 VDC
Repeatability	±2% of Full Set Point Range @ 70°F (20°C)
Wetted Parts	
Diaphragm	Nitrile standard (optional EPDM and Viton®)
Fitting	Black Anodized Aluminum
Housing	30% Glass Filled Nylon; Buna-N O-rings
Electrical Termination	DIN 43650C IP65; Terminals IP00
Proof Pressure	1500 psi (100 bar)
Approvals	CE
Weight, Approximate	0.10 lbs. (0.045 kg)

*Gold contacts (option G) may be required for less than 12 VDC and 20 mA.

How To Order

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

SELECT	PS91	-10	-4FSA	-C	-HM	-XX	-XXXX
1. Pressure Range Code Insert Pressure Range Code from table below							
2. Pressure Fitting -2FNA 1/8" NPTF Aluminum; -4FSA 7/16"-20 SAE Female, Aluminum; -30MA Manifold Mount, (2) 4.3 mm Dia. Holes, 30.2 mm Dia. B.C., 30% Glass Filled Nylon							
3. Circuit -C SPDT							
4. Electrical Termination -HM DIN 43650C Male Half Only (standard); -HCM DIN 43650C 7 mm Cable Clamp							
5. Options -V Viton® Diaphragm; -E EPDM Diaphragm							
6. Fixed Set Point (optional) A. Specify set point -FS (in PSI or BAR, see example) ¹ B. Set Point Actuation R on Rising Pressure; F on Falling Pressure Example: -FS1BARF for 1 BAR Falling or -FS10PSIR for 10 PSI Rising							

Note:

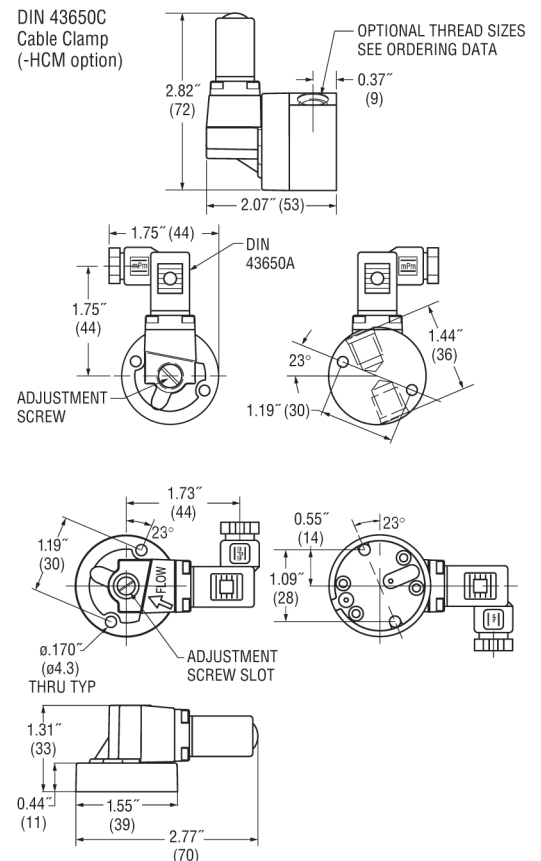
1. Set Point must be within Pressure Range selected in Step 1 above.

Pressure Range Table

Pressure Range Code	Pressure Range	Average Dead Band
10	5-15 psid (0.35-1.0 bar)	2-5 psi (0.15-0.3 bar)
20	12-25 psid (0.8-1.7 bar)	4-7 psi (0.25-0.5 bar)



Dimensions

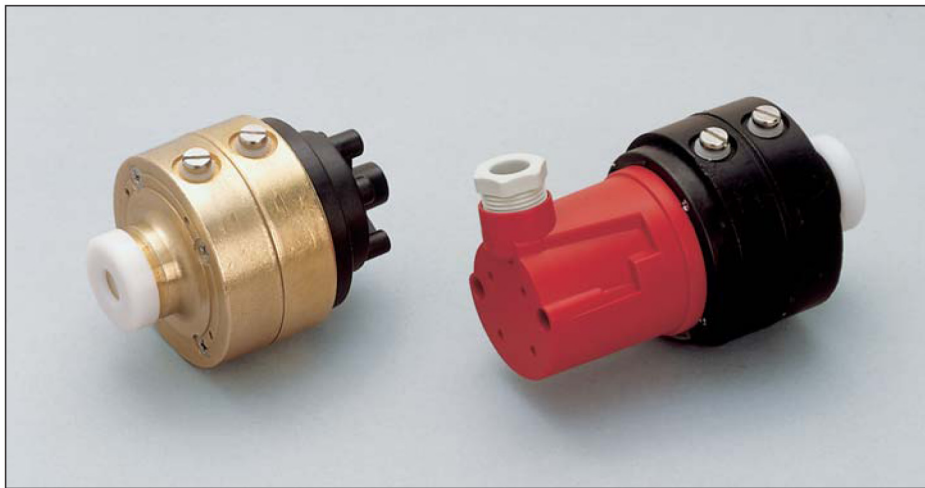


630

Differential pressure, vacuum, overpressure switch

6 mbar to 5.5 bar

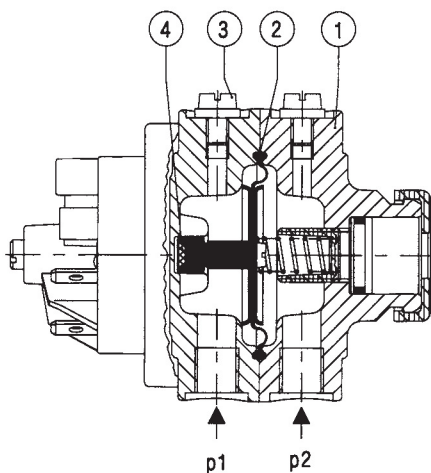




Technical overview

Differential pressure, vacuum and overpressure switches of type series 630 are suitable for monitoring neutral and slightly aggressive liquids and gases. Switching element isolated from medium.

Ideal for use as flow monitor in sanitary piping/ heating installations or for level monitoring in general in process technology applications. Extremely rugged construction with high functionality due to 10/20 bar safety margin in both pressure chambers.



Legend to cross-section drawing

- | | |
|----|--------------------------------|
| 1 | Pressure case |
| 2 | Diaphragm |
| 3 | Vent |
| 4 | Permanent magnet |
| P1 | Higher pressure / lower vacuum |
| P2 | Lower pressure / higher vacuum |

The distinct advantages

- High overpressure safety margin at both connections (P1 + P2) up to 10/20 bar
- Functionally simple, rugged mechanics with high operating reliability
- Also for slightly aggressive liquids and gases
- Specially economical version with switching points adjusted in the factory
- Repeatability up to ± 0.4 mbar

Pressure ranges

See order code selection table

System pressure (overload)

Max. system pressure and overload on one side ($P1 > P2$)

with range up to	≤ 200 mbar: 10 bar
with range	150 ... 5500 mbar: 20 bar

Setting ranges

See graphic on the back

Lowest turn-on pressure

6 mbar

Switching point and switching difference adjustable

Smallest switching difference 3 mbar

Repeatability

$\pm 5\%$ of the switching point of type A, F diaphragm material, but as a minimum ± 0.4 mbar
 $\pm 10\%$ of the switching point of type C, E diaphragm material, but as a minimum ± 0.8 mbar

Temperature range

Medium and ambient temperature with diaphragm:

NBR-based	0 ... + 80 °C
FPM	- 10 ... + 80 °C
EPDM	- 10 ... + 80 °C
Q (Silicon)	- 40 ... + 80 °C

Case construction

Anodized aluminium, brass, brass chemically nickel-plated

Weight

With aluminium base	380 g
With base brass / nickel-plated brass	1000 g

Installation arrangement

Unrestricted. For switching points calibrated in the factory indicate installation arrangement. In case of liquid media vent screw at top, i.e. connections down (IP 40 with cover fig. 1)

Pressure connections

Thread G 1/8

Diaphragm

A NBR-based	C FPM
E EPDM	F Silicon

Parts coming into contact with the medium, to base and diaphragm:

X 12 CrMoS 17	1.4104
X 5 CrNi 18 9	1.4301
X 12 CrNi 17 7	1.4310

Steel category A2 for screws, Polyacetate-C, Polyamide

Electrical connections

Screw terminals (option), AMP tab connectors 6.3 mm

With cover: Cable gland Pg 9/11

Contact system

Changeover contact

Contact material / Loading

Nominal voltage, type of current	VAC 250
Nominal current for resistive loading	1 A
Nominal voltage for motor loading	0.5 A
Contact material	AgCdO

Type of protection

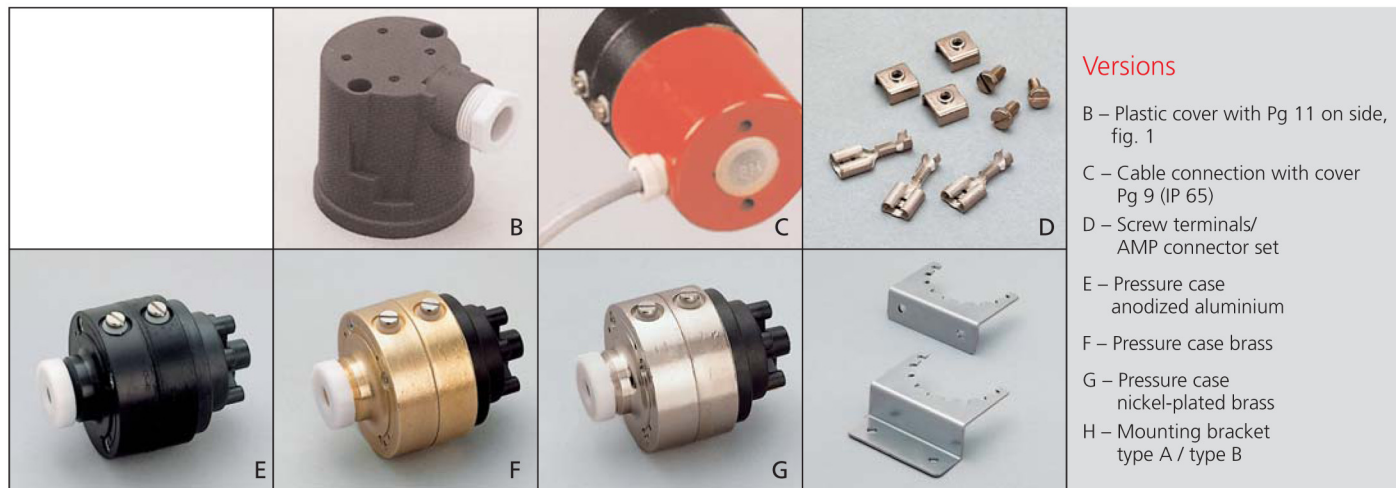
Without cover	IP 00
With cover (for installation arrangement electrical connections upward), picture B	IP 54
With cover, picture C	IP 65

Service life

Mechanical and electrical service life: 10^6 switching cycles, if the permitted switching difference is respected according to the diagram on the back.

Accessories

See order code selection table



Versions

- B – Plastic cover with Pg 11 on side, fig. 1
 C – Cable connection with cover Pg 9 (IP 65)
 D – Screw terminals/AMP connector set
 E – Pressure case anodized aluminium
 F – Pressure case brass
 G – Pressure case nickel-plated brass
 H – Mounting bracket type A / type B

Order code selection table

630. X X X X X X X X X

Pressure ranges¹

System pressure / Overload on one side (P1)

6 ... 20 mbar	10 bar
15 ... 60 mbar	10 bar
40 ... 200 mbar	10 bar
150 ... 1000 mbar	20 bar
1 ... 3 bar	20 bar
2 ... 5.5 bar	20 bar

9	1
9	2
9	3
9	4
9	5
9	6

Contact material

AgCdO

0

Pressure case

Anodized aluminium, black
 Brass
 Nickel-plated brass

0
 1
 2

Diaphragm material

Type A – NBR-based
 Type C – FPM
 Type E – EPDM
 Type F – Q (Silicon)

0
 1
 2
 3

Cover Pg 9 on side / bracket

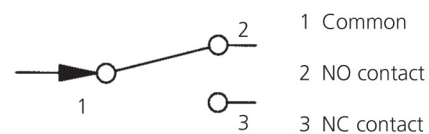
without cover, without bracket
 without cover, with bracket type A
 without cover, with bracket type B
 with plastic cover (Pg 11), without bracket (IP 54)
 with plastic cover (Pg 11), with bracket type A (IP 54)
 with plastic cover (Pg 11), with bracket type B (IP 54)
 with special cover (Pg 9), without bracket (IP 65)
 with special cover (Pg 9), with bracket type A (IP 65)
 with special cover (Pg 9), with bracket type B (IP 65)

0
 1
 2
 3
 4
 5
 6
 7
 8

Accessories

Plastic cover with Pg 11 lateral	IP 54	Fig. 1	1	0	1	1	3	4
Plastic cover with Pg 9 lateral	IP 65	Fig. 2	1	0	5	2	9	4
O-ring			1	0	3	3	4	2
AMP connector set			1	0	3	4	7	9
Screw terminal set			1	0	3	4	9	1

¹ Other pressure ranges on request



A p-v diagram showing a thermodynamic cycle on a grid. The vertical axis is pressure p in bar, ranging from 1800 to 5800 with major ticks every 200 units and minor ticks every 100 units. The horizontal axis is specific volume v in m^3/kg , ranging from 400 to 1600 with major ticks every 200 units and minor ticks every 100 units. The cycle consists of four states connected by four processes:

- State 1: $p_1 = 2000$ bar, $v_1 = 500$ m^3/kg
- Process 1-2: Isobaric expansion at $p = 2000$ bar to $v_2 = 1000$ m^3/kg
- Process 2-3: Isobaric expansion at $p = 5500$ bar to $v_3 = 1500$ m^3/kg
- Process 3-4: Isobaric compression at $p = 5500$ bar to $v_4 = 900$ m^3/kg
- Process 4-1: Isobaric compression at $p = 2000$ bar back to $v_1 = 500$ m^3/kg

The cycle is a rectangle on the p-v diagram with vertices at (500, 2000), (1000, 2000), (1500, 5500), and (900, 5500).