

Explosion proof type differential pressure switch

Model: P970 (953 series)

Spec. sheet no. PD09-10

Service intended

P970 diaphragm type differential pressure switch can be used in a variety of process lines. Internal micro switch is operated by pressure of various fluids, such as atmospheric pressure and water pressure. The pressure sensing part is a force balanced and piston actuated assembly.



Fluid

Gas and oil

Repeatability

±1.0 % of adjustable range

Adjustable range (mbar, kPa, bar, MPa)

15 kPa to 0.4 MPa

Dead band

Fixed

One SPDT : Approx. 5 % of adjustable range

Two SPDT : Approx. 10 % of adjustable range

Working temperature

Ambient : -40 ~ 65 °C

Fluid : Max. 100 °C

Static pressure

Max. 0.2, 5 MPa

Degree of protection

EN60529/IEC529/IP67



Standard features

Pressure connection

Stainless steel (316SS)

316L SS, Monel and Hastelloy-C

Element

Stainless steel (316L SS)

Monel, Hastelloy-C

Viton (Up to 4 kPa adjustable range)

Case and cover

ALDC 12.1

Silver gray painted aluminium

Process connection

1/4" NPT (F)

Contact

Micro contact type

One SPDT (P970-1B3)

Two SPDT (P970-2B3)(Only available with single setpoint) IECEEx Ex d IIC T6 Gb

Contact rating

SPDT contact rating

AC 125 V / 250 V, 15 A

DC 125 V, 0.4 A for resistance load

DC 125V, 0.03 A for inductive load

Conduit connection

3/4" NPT (F)

Certificates

KCS Ex d IIC T6

ATEX II 2G Ex d IIC T6 Gb

1. Base model

P970 Explosion proof type differential pressure switch

2. Switch form

- 1** One SPDT
- 2** Two SPDT (Only available with single setpoint)

3. Unused character

B3 None

4. Process connection

C $\frac{1}{4}$ "

5. Connection type

D NPT (F)

6. Unit

- H** bar
- I** MPa
- J** kPa
- S** mbar

7. Range

XXX Refer to pressure unit and range table

8. Pressure connection / Element material

- 3** 316SS / 316L SS
- V** 316SS / Viton
- L** 316SS / Hastelloy-C
- K** 316SS / Monel
- Z** Monel / Monel
- H** Hastelloy-C / Hastelloy-C

9. Options

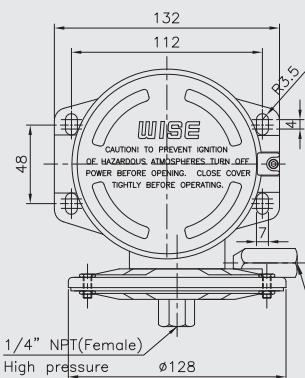
- 0** None
- 1** 3 way / 5 way manifold valve

1	2	3	4	5	6	7	8	9
P970		B3		C	D	H	XXX	3

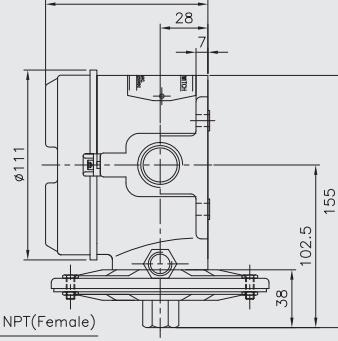
Sample
ordering code

P970 : Type of mounting

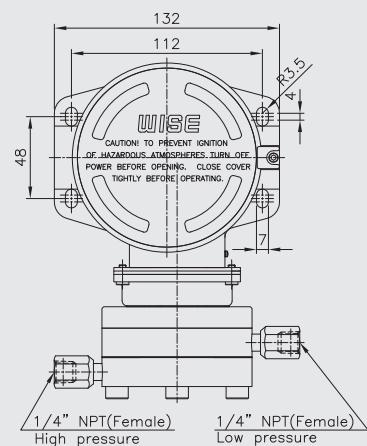
① 30 mmH₂O ~ 1000 mmH₂O



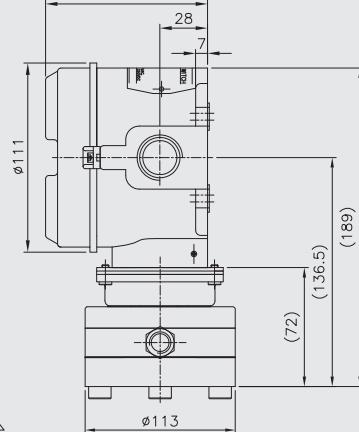
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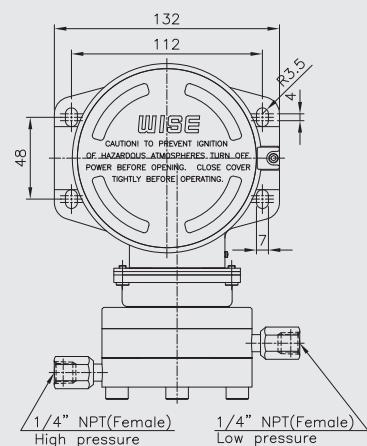
② 100 mmH₂O ~ 1000 mmH₂O



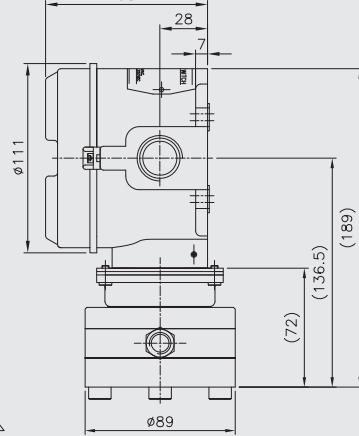
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③ 10 ~ 400 kPa



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Pressure switch

A bi-stable electro mechanical device than actuates/deactuates one or more electrical switching element at a predetermined discrete pressure upon rising or falling.

Adjustable range

The span of pressure between upper and lower limits within which the pressure switch can be adjusted to actuate/deactuate. It is expressed for increasing pressure.

Setpoint

That discrete pressure at which the pressure switch is adjusted to actuate/deactuate on rising or falling pressure. It must fall with the adjustable range and be called out as increasing.

Dead band

The difference in pressure between the increasing set point and the decreasing setpoint.

Working pressure

The maximum input pressure that can be continuously applied to the pressure switch without causing permanent change of setpoint, leakage or material failure.

Repeatability

The ability of a pressure switch to successively operate at a set point that is approached from a starting point in the same direction and returns to the starting point over three consecutive cycles to establish a pressure profile.

The closeness of the measures set point values is normally expressed as a percentage of full scale (maximum adjustable range pressure).

Pressure range table

Code	Adjustable setting range			Working pressure	Flange size
	H : bar	I : MPa	J : kPa		
932	0.002 ~ 0.015		0.2 ~ 1.5	2	128
994	0.01 ~ 0.15		1 ~ 15		
907	0.1 ~ 0.25		10 ~ 25	5	113
909	0.2 ~ 0.35		20 ~ 35		
910	0.3 ~ 0.5		30 ~ 50		
922	0.4 ~ 2	0.04 ~ 0.2		50	88 ~ 98
905	1.5 ~ 4	0.15 ~ 0.4			

Micro contact

General

The micro contact has a large switching capacity with high repeat accuracy. The contact mechanism is a crossbar type with gold alloy contacts, which ensures highly reliable operations for micro loads.

Characteristics

Item	Micro switch
Operating speed	0.01 mm to 1 m/s
Mechanical operating frequency	240 operations/min
Insulation resistance	100 MΩ 1 min at 500 VDC
Contact resistance	0.015 Ω max
Shock resistance	100 m/sec ² max
Ambient temperature	-25 ~ 80 °C
Ambient humidity	35 ~ 85 % RH

Specifications

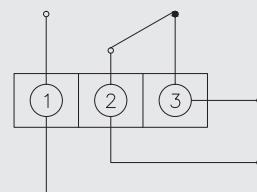
Rated voltage	Non inductive load (A)				Inductive load (A)			
	Resistive load		Lamp load		Inductive load		Motor load	
	NC	NO	NC	NO	NC	NO	NC	NO
125 V AC	15	3	1.5		15		5	2.5
250 V AC	15	2.5	1.25		15		3	1.5
8 V DC	15	3	1.5		15		5	2.5
30 V DC	2	2	1.4		1		1	1
125 V DC	0.4	0.4	0.4		0.03		0.03	0.03
250 V DC	0.2	0.2	0.2		0.02		0.02	0.02

SPDT switching element

Single-pole, double throw (SPDT) has three connection : C-common, NO-normally open and NC-normally close, which allows the switching element to be electrically to the circuit NO or NC state.

One SPDT

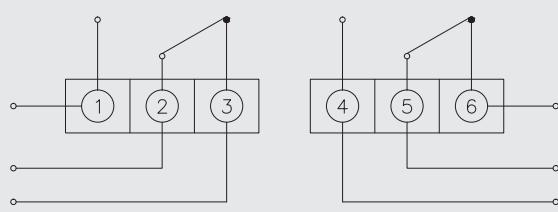
Pressure reach the upper or lower limit setpoint, circuit closed and opened.



①:NO ②:COM ③:NC

Two SPDT

Pressure reach the upper or lower limit setpoint, two circuit simultaneous closed and opened.



①,④:NO ②,⑤:COM ③,⑥:NC

NO : Normal open

NC : Normal close

Memo