

Pressure switch, model PS01-W1



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Prior to starting any work, read the operating instructions!  
Keep for later use!

# 1. General information

**PS01-W1** Pressure switch is a simple electro mechanical device operating on basic principles of Levers and opposing forces. Three essential elements, various combinations of which form the basics for presenting hundreds of variants to suit a variety of industrial applications are :

1. Sensing element which can be either of sealed piston or diaphragm (metallic or elastomer)
2. Spring, to determine the range setpoint
3. Snap-acting microswitch, available in a wide variety.

## General

The instrument is manufactured, checked and supplied in accordance with our published specification. When installed and used in normal or prescribed applications with the lid in place and within the parameters set for mechanical / electrical performance, will not cause danger or hazard to life or limb.

## Storage

- Storage temperature -10°C to +60°C.

## Safety warnings

- Opening or dismantling when pressure switch is live with respect to electrical or pressure will result in a hazard.
- Pressure switch must be selected and installed by suitably trained and qualified persons in accordance with appropriate codes of practice to avoid failure resulting in injury or damage due to misuse or misapplication.

## Note:

The instrument is calibrated within the claimed accuracy with precision and skill. Therefore tampering or adjustment of striker screw or any other component where there is red paint seal will lead to malfunctioning.

## 2. Installation guidelines

### Handling prior to fitting

- Check the instrument connection thread size to avoid mismatch with pressure port.

### Mounting / Connection / Precaution

1. Position gaskets / O ring correctly while the covers are fixed. Cover mounting screws must be tight.
2. Properly seal the electrical entries and cables with correct weatherproof cable gland.
3. Do not exceed stated maximum working pressure & maximum temperature. The sensing element will be permanently damaged if the applied pressure exceeds the maximum working pressure.
4. Connected electrical load should not exceed stated maximum electrical capacity in both ampere and voltage.
5. Do not establish pressure connection by rotating the housing. Hold the hexagon of the sensor with suitable spanner and tighten.
6. Flush the pipe system before fitting. Ensure that no stress is produced on the sensor process connection and are sealed without leak.
7. Mount the instrument firmly and rigidly either directly on the pressure pipe line or on a vibration free wall, panel or pipe barrier. The instruments are for vertical mounting. Any tilt may lead to set point shift.
8. If process temperature is higher than the **following permissible maximum temperature** it can be brought down by using longer pressure (impulse) piping.  
**Permissible ambient temperature**

- -10°C ... +60°C

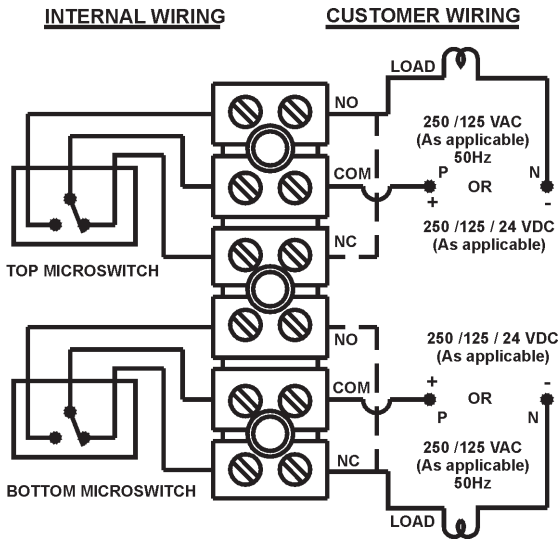
#### Permissible medium temperature

- -20°C ... +110°C for SS and Buna-N
- -20°C ... +95°C for Neoprene
- -20°C ... +130°C for EPDM
- -20°C ... +200°C for Silicone

9. For steam application use condenser coil or a syphon
10. For air application, use proper filters (dust collectors) to ensure that the process line is not clogged with accumulation of dust / foreign particles.
11. Ensure that suitable dampener / snubber is used in rapidly fluctuating pressure input.
12. Necessary fasteners and mounting bracket are provided with the instrument for panel / wall / 2" pipe mounting option. Following items are provided  
For panel / wall mounting : 2 screws  
For 2" pipe mounting : U bolt, nut, washers and mounting bracket

### 3. Electrical connection

Fig.1



The terminal blocks are suitable for 2.5 Sq.mm wires.

## 4. Operation

Process pressure when applied to the sensing element creates a force which overcomes the force of a pre-tensioned spring and in turn moves a balancing arm to effect a minimal movement to actuate the microswitch.

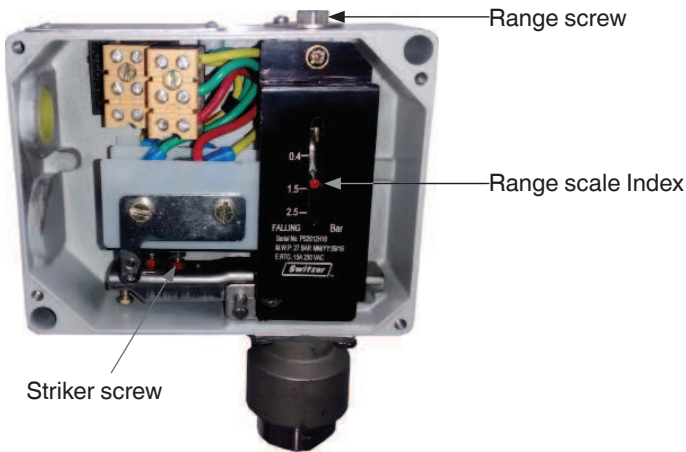
Contacts gets reset when the force of the sensing element becomes less than that of the spring load.

The instrument reset point can be varied by adjusting the differential spring in low ranges (available as option).

### Fixed on-off differential models

- Rotate the range adjustment screw clockwise to increase the switching point. Rotating anti-clockwise will decrease the switching point.
- After setting, re-fix the locking device back in position to prevent unauthorised adjustment of the setpoint.
- The center screw and the striker screw are precisely adjusted and factory-set using thread lock sealant. Alteration of centre screw height will disturb the contact established between the sensor and the balance beam. Disturbance of striker screw will result in microswitch not acting properly or result in setpoint shift.

Fig.2



### Sensing of switching points

Fix the instrument on to a calibrator setup with a master gauge of accuracy better than 1% to set the actuation point.

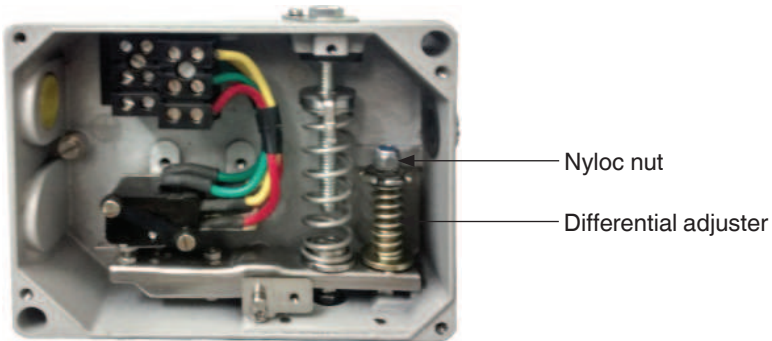
Setpoint should be preferably in the mid of the adjustable range span.

### Adjustable on-off differential models

On-off differential value can be adjusted for a wider value from about 10 to 15% of the FSR to a maximum of 60% as specified against each range. The minimum value will vary with different switch combinations. This adjustment is achieved by an auxiliary spring brought into action when the switch actuating plate moves up before it operates the microswitch. Adjustment of the load of the spring decides the pressure difference between the on point and off point.

### Adjustable on-off differential models

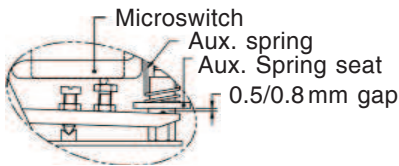
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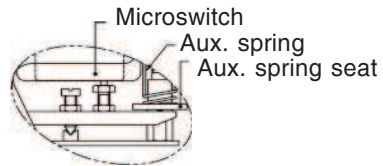
- a) In adjustable differential model set the lower switching point first. Release the aux. spring to be free by lifting up the nyloc nut and the Diffl. Adjuster. Using the range adjuster set the lower switching point. Then load the aux. spring by turning in the Diffl. Adjuster clockwise to set the upper switching point.
- b) Adjusting the differential adjuster will shift only the upper switching point i.e. the switching pressure difference (on-off differential) alone changes. A clockwise rotation will increase upper switching point and anti-clockwise rotation will decrease it.
- c) The upper switching point should not exceed the maximum range value.
- d) After setting the differential, tighten the Nyloc nut to lock the differential adjuster to prevent loosening during operation.



- e) **Precaution:** The switch actuating screw on the balancing arm is critically adjusted. Disturbance of this would result in malfunctioning while on-off differential adjustments are made. If accidentally disturbed, to reset microswitch adjust the striker screw height such that the balancing arm is not in contact with auxillary spring seat during switch de-actuation thereby ensuring that the auxillary spring remains unloaded during de-actuation. Refer Fig.3.



**Fig.3 : Switch at 'off' position Aux spring load not acting**



**Fig.4 : Switch at 'on' position Aux spring load acting**

For actuation of the microswitch, the balance beam has to lift the aux. spring seat which is pre-loaded with the desired value of wide band On-Point. Ref Fig.4

### Notes

- 1) In the instruments with 2 SPDT switches for DPDT action, the synchronization of actuation is achieved within practical limits. The switches are synchronized as per customer preference either on falling or on rising pressure. If no preference is indicated, synchronization is done on fall in pressure at factory.
- 2) ON & OFF set point should not exceed the upper or lower range of scale value
- 3) Ensure that impulse pipework applies no stress on sensing element housing and use spanners to hold pressure port/ housing when connections are made.
- 4) Use the instrument only for the medium specified.

### Maintenance

Inspections should be carried out at quarterly to yearly intervals depending upon operating conditions.

Isolate instrument from process and power before removing lid. Check terminals for tightness. Check that cable tails are not fouled or chafed. Check for internal condensation and rectify.

It is recommended that the instruments are checked for calibration/operation once a year. However, in critical applications, microswitch is to be operated and checked more frequently to ensure correct functioning.

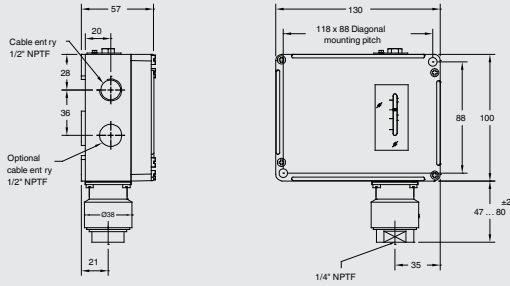
Process lines are to be periodically checked for accumulation of dust / foreign particles to avoid clogging. Clogging would render the instrument non-functioning as the sensing element shall not have free movement during pressure fluctuations.

In the case of diaphragm operated instruments, do not attempt dismantling the sensing diaphragm as it would permanently disturb the factory settings. Special jigs are needed for reassembly and hence replacement is not recommended at the user end. However, cleaning of the diaphragm chamber can be performed by flushing with a cleaning fluid, which is compatible with the diaphragm and its housing material.

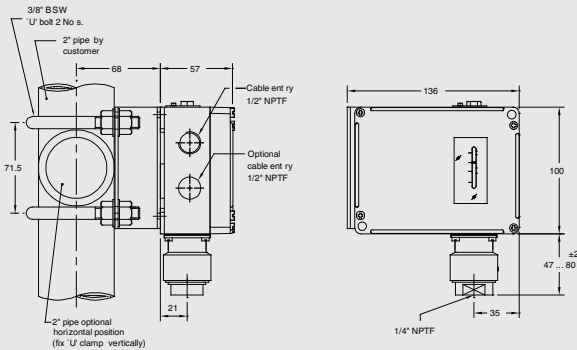
Vent or Drain periodically.

# 7. Mounting dimensions

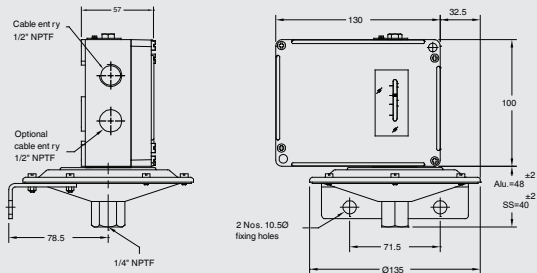
## High range direct or panel mousing



## High range 2" pipe mousing



## Low range surface mousing



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