



**PRESSURE SWITCHES**  
**PRESSURE DIFFERENCE SWITCHES**  
**VACUUM SWITCHES**  
From 1.5 mbar to 600 bar

# HM Pressure Switches

## INSTALLATION AND OPERATING INSTRUCTIONS



### Kaustubha Udyog (Orion Instruments)

S. No. 36/1/1, Sinhgad Road, Vadgaon Khurd, Pune 411 041 INDIA  
Tel.: +91-(0) 20-24393577  
Telefax : +91-(0) 20-24393577 / 25460486  
Email : ku.pressure@gmail.com / info@orion-instruments.io

Certificate No.: FM72815



Website : [www.orion-instruments.io](http://www.orion-instruments.io)

# INSTALLATION AND OPERATING INSTRUCTIONS FOR HM MODELS

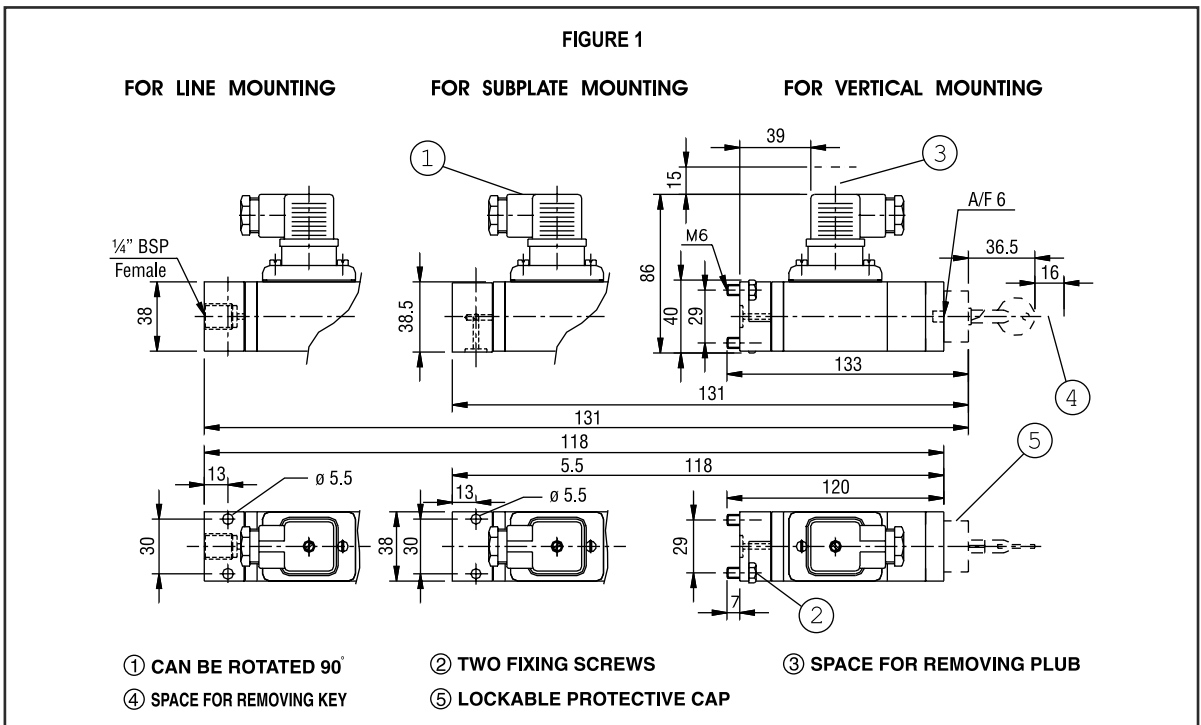
## Construction :

The pressure switch is housed in a die cast aluminium enclosure which conforms to IP65 protection. The pressure capsule of the switch comprises of a housing (either of aluminium, brass or MS), a seal and a piston (EN8 or SS). The electrical changeover is through a snapaction microswitch. The electrical wiring terminates at a terminal strip to DIN 43650.

## Principle of Operation :

The pressure in the pressure capsule is converted into force by means of a calibrated piston, which is balanced by a compression spring from above. When the force generated by the pressure in the pressure capsule exceeds/falls beyond the balancing spring force, an electrical element is actuated.

## Mounting :



Please refer above figure. HM model pressure switches can be mounted in any direction. There are three different mounting options.

### a) LINE MOUNTING :

1/4" BSP threads are provided for these switches. The switches can be mounted using two M5 bolts of appropriate length. They can also be mounted on the manifold by means of an adaptor for hydraulic applications. For process applications, pressure switches can also be supplied with a chemical seal.

### b) SUBPLATE MOUNTING :

The switch can be mounted directly on a manifold by using this arrangement. Use M5 bolts of appropriate length through the mounting holes.

### c) VERTICAL STACKING :

This arrangement is provided for using pressure switches in a stack. The switch can be mounted as a vertical element using the proper size sandwich plates.

## Electrical Connections :

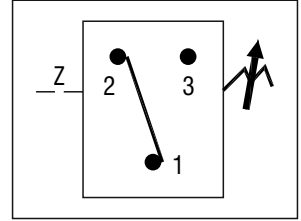
HM model pressure switches will generally have only one SPDT microswitch.

## Wiring :

Connectors to DIN 43650 are provided with every HM model pressure switch.

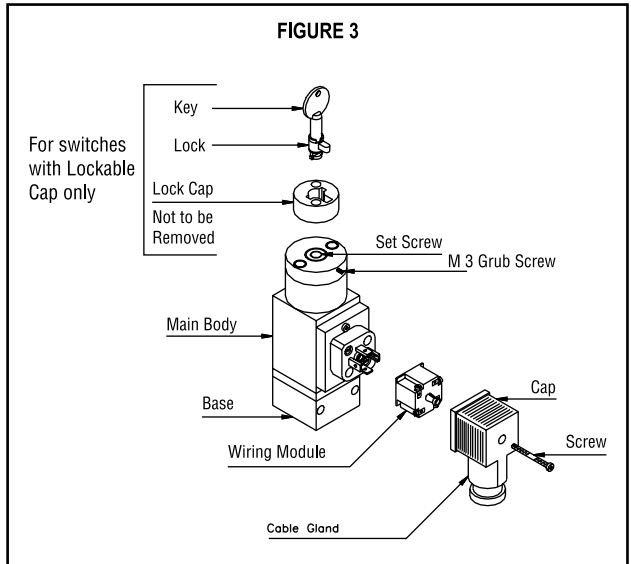
- a) Remove the screw retaining the cap and wiring module.
- b) Remove the cap and wiring module.
- c) The cap will have to be separated from the wiring module. The wiring terminations are embossed on the wiring module. Pass the cable through the cable gland and fit the wires in the screwed ends.
- d) Replace the cap on the module, depending on the direction of the cable desired and fit the module on to the base of the terminal.
- e) Fit the retaining screw on to the cap.

Fig. 2



## SET POINT ADJUSTMENT FOR HM MODELS :

- 1) Remove the lock (for switches with lockable protective cap).
- 2) Loosen the lock-screw (M3 grub screw) on top of set-screw.
- 3) Turn the set-screw to the extreme negative end.
- 4) Apply the desired cutin(lower) / cutout(higher) pressure to the pressure switch.
- 5) Increase the pressure setting by turning the set-screw will changeover contacts.
- 6) Some minor adjustment will be required to achieve the exact cutin(lower) / cutout(higher) point, which can be checked with the help of a proper pressure measurement device.
- 7) Tighten the lock-screw so as to avoid any drift in set-point.
- 8) Replace the lock and remove the key (for switches with lockable protective cap).



**TIP :** The pressure switches are factory set at half the set-point range (unless otherwise specified in Purchase Order). Step 2 can be omitted if the desired set-point is more than the factory setting.

## TROUBLE SHOOTING TIPS

Generally no problems are observed if the pressure switch selection, wiring and the set-point is proper. For a pressure switch selection procedure, please consult our sales office.

For properly selected pressure switches, if following symptoms are observed, the likely causes and remedies are as stated below:

### SYMPTOM 1: SWITCH DOES NOT OPERATE

- 1) Wiring may not be correct. Check electrical connections to the pressure switch, if they are as per wiring diagram.
- 2) Pressure does not reach the pressure port.
  - a) Check if the entry to the pressure capsule is not blocked by frozen process or impurities in the process.
    - i) If this is the case, try freeing the blocked path by a blunt tool in case of scales and impurities.
    - ii) For frozen process, it is advisable to use chemical seals.

**DO NOT OPEN THE PRESSURE CAPSULE IN ANY EVENT**

If the cause is non of the above mentioned probabilities, proceed as per the following steps.

- b) Check the system pressure & setpoint of pressure switch.
  - a) For use of pressure switch for falling setpoints, system pressure has to be greater than the cutout point.
  - b) For use of pressure switch for rising setpoints, the system pressure may not be reaching / exceeding the cutout point.
  - c) Use 'T' connection & connect calibrated pressure guide to the 'T' connection as shown in the figure.
  - d) Adjust the setpoint such that the system pressure is greater than the cutout point of the pressure switch.
  - e) If the switch still does not operate, remove the pressure switch physically from the system. There should be continuity between terminals 1 & 2. If no continuity is observed even after one setscrew rotation, the pressure switch should be returned to the factory.

### SYMPTOM 2 : SHORT WIRING :

Isolate the switch electrically. Check the continuity between terminals and the screws fitted to the body, check the short connection elsewhere in the circuit. If continuity is observed, the wires of the pressure switch have internally touched the body, and the switch should be returned to the factory.

### SYMPTOM 3 : LEAKAGE :

In case leakage is observed, the pressure switch has to be returned to the factory without opening the pressure capsule. Check for the following likely causes and use a new switch taking proper precautions.

- a) System pressure is greater than working pressure : Use an over range protector or a switch with appropriate maximum working pressure.
- b) Incompatible wetted parts : the working medium may not be compatible with wetted parts, which damages the sealing of the process from working parts. Use a chemical seal for the pressure switch or use proper compatible wetted parts.
- c) Excessive process temperature : Process temperature may exceed maximum allowable temperature, which in term damages the diaphragms. Use an impulse tubing of proper length for cooling the process temperature. There may be a pressure drop depending on the length of the impulse tube used. Adjust the setpoint of the pressure switch accordingly.

### SYMPTOM 4 : CHATTERING :

- 1) Check the system pressure for surges. Chattering is observed where the system pressure is close to the cutin / cutout point and the surge pressure exceed the on-off differential. Use a pressure switch with adjustable differential or use surge dampers in your system.
- 2) If there is a relay in the circuit, check if the relay is properly plugged in. Chattering may be due to loose contacts. ■

