



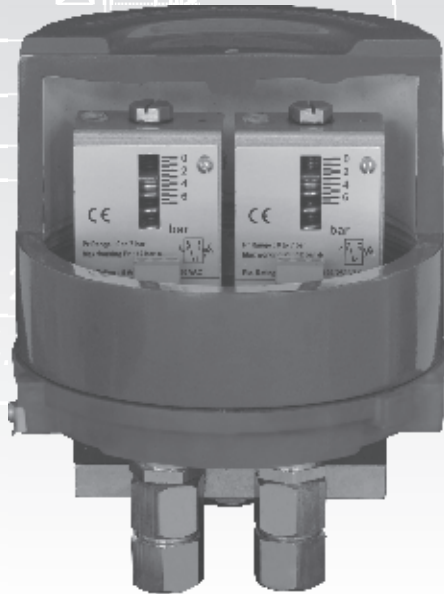
**PRESSURE SWITCHES
PRESSURE DIFFERENCE SWITCHES
VACUUM SWITCHES**

From 1.5 mbar to 600 bar

DS Dual Pressure Switch

118.5
(4.66)

INSTALLATION AND OPERATING INSTRUCTIONS



145
(5.71)

holes
Cable Entry
1/2" NPT(F)
(Options Available)

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INSTALLATION AND OPERATING INSTRUCTIONS FOR DS MODELS

Construction

Dual pressure switches are housed in a cast aluminium enclosure. It has two independent pressure switch assemblies, with two independent scales to show approximate setpoints.

The enclosure conforms to IP66 protection factor. The pressure capsule, at the bottom of the switch, comprises a pressure housing (either of SS316L or any other material like Monel, Hastelloy C etc), and a pair of disc, nylon reinforced rubber / metal diaphragm and a plunger. The electrical changeover is through a snapaction microswitch. 2 SPDT switching can be provided as an option. Other options like hermetically sealed microswitches etc, can be provided on checking feasibility, as per the order.

The pressure in the pressure capsule is diverted to two individual modules and converted to a force which is balanced by individual springs in the pressure switch modules in the main housing. When the force generated by pressure exceeds / falls above / below the spring force, microswitch (es) housed on the modules are actuated.

Separate terminal strip with screwed ends is provided for easy and safe wiring. The cables need to be passed through a conduit entry which is 1/2" NPT/ 3/4" NPT or M20 X 1.5, as selected. The other cable / conduit entry, if not used, needs to be suitably plugged.

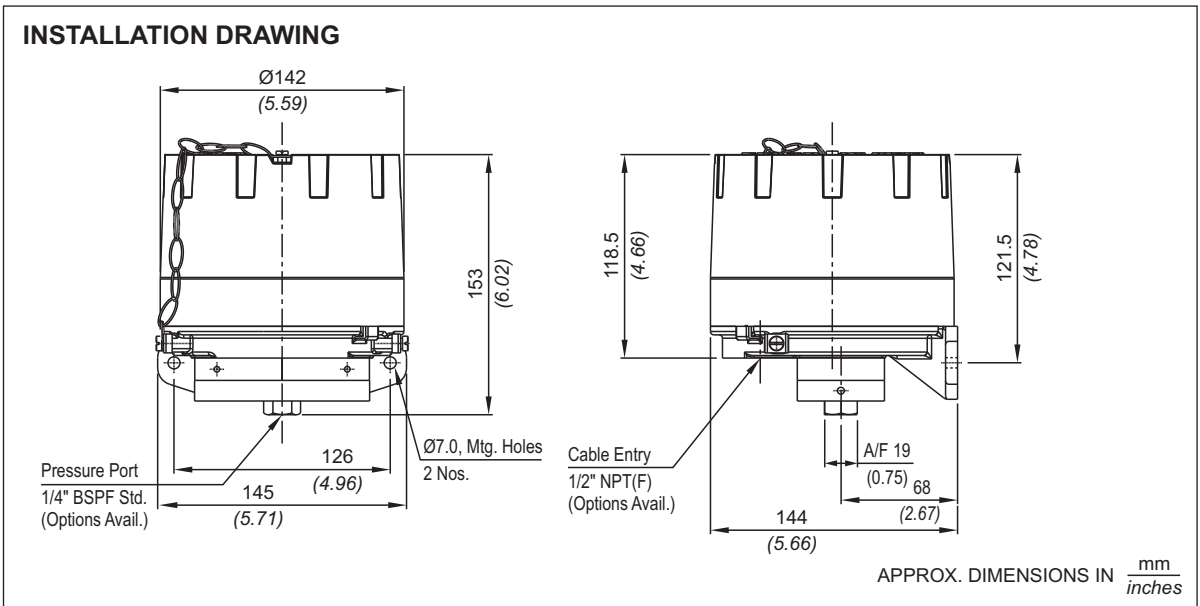
Principle of Operation

The pressure in the pressure capsule is converted into force by means of a reinforced rubber / metal diaphragm and 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 through a bell crank lever mechanism for accurate switching.

Two independent assemblies are provided. Hence the switch can be used for a HI – LO function, a LO – LO function or a HI - HI function.

Please use the pressure switch well within the pressure limits specified.

Fig 1.1



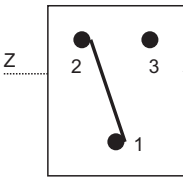
Mounting

The dual pressure switches can be mounted in any direction. Pipe mounting brackets can be provided as an accessory.

- 1) Please refer figure for the appropriate mounting.
- 2) Please use M5 bolts of appropriate length through the mounting holes . If the equipment is subject to vibration, please use rubber washers / pads between the panel and the switch.
2. Connect the pressure tubing to the pressure port. The pressure port size is generally 1/4" B.S.P. female, unless specially ordered otherwise. Other sizes can be obtained via adaptors.

Electrical Connections

Fig. 1.2



Dual Pressure switches will generally have only one SPDT microswitch per pressure switch module.

Pressure switches with two SPDT microswitches can also be provided. For 2 SPDT microswitches, the scale will correspond to one microswitch. The setpoint of the other microswitch will vary and the on-off differential of the other microswitch will depend on the stage difference between the two setpoints.

Please use electrical loads well within the limits specified for the microswitch.

Wiring

- a) Remove the cover.
- b) Pass the cable through the cable gland and connect the wiring to the terminal strip as per your wiring diagram.

The code is as per the details given below:

Left Module		Right Module	
Switch 1		Switch 1	
Common 1 (C1)	L1	Common 1 (C1)	R1
Normally Closed 1 (NC1)	L2	Normally Closed 1 (NC1)	R2
Normally Open 1 (NO1)	L3	Normally Open 1 (NO1)	R3
Switch 2		Switch 2	
Common 2 (C2)	L4	Common 2 (C2)	R4
Normally Closed 2 (NC2)	L5	Normally Closed 2 (NC2)	R5
Normally Open 2 (NO2)	L6	Normally Open 2 (NO2)	R6

OPERATING TEMPERATURES:

The operating condition temperature restrictions for the Flameproof switch FC are as follows:

Ambient : -5 °C to +60 °C

Operational (all models): -5 °C to +80 °C (150 °C for metallic diaphragms)

Note : Switches with temperature ranges beyond the ones specified above can be supplied on request.

storage : -5 °C to +60 °C

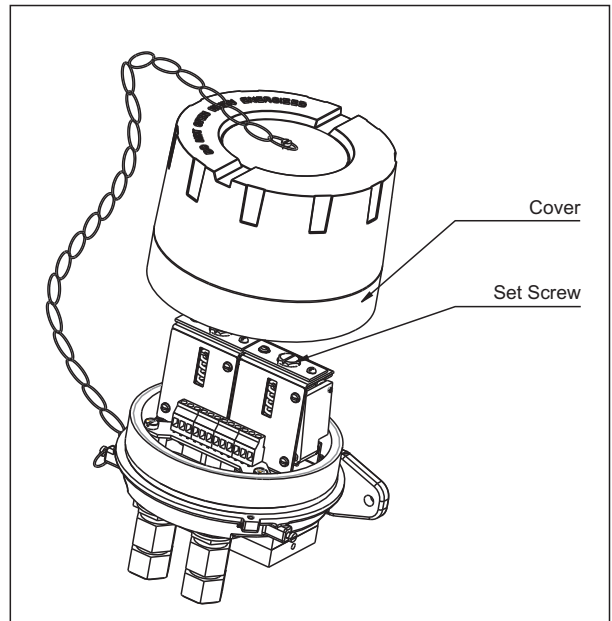
SET POINT ADJUSTMENT:

Please refer Fig. 3

- 1) Remove the setscrew cover.
- 2) Adjust the desired setpoint on the scale . The scale is calibrated for rising setpoints (and will correspond to one of the microswitches for 2 SPDT option)
- 3) Apply the desired cutin (lower) / cutout (higher) pressure to the pressure switch.
- 4) 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.
- 5) Replace the setscrew cover.

Tip.: The pressure switches are factory set at half the setpoint range (unless otherwise specified in a Purchase Order). Step 2

Fig 1.3



ROUTINE MAINTANENCE:

Routine inspection of the installation should take place at regular intervals. It is recommended that the switch is checked and operated every 5 months. Electrical connections and covers should be checked periodically for tightness. It is recommended that the 'O' rings and diaphragms be renewed every 3-5 years, and microswitch assemblies every 5-10 years dependant upon equipment usage.

TROUBLE SHOOTING TIPS:

SYMPTOM 1: SWITCH DOES NOT OPERATE

- 1) Wiring may not be correct. Check electrical connections to the pressure switch, if they are as per the 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 scales 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 none of the above mentioned probabilities, proceed as per the following steps.

- c) Check the system pressure & set point of pressure switch. For use of pressure switch for falling setpoints, system pressure has to be greater than the cutout point.
- d) 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 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. If no continuity is observed between any of the 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, if so, then 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.

SYMPTOM 4 : CHATTERING:

- 1) Check the system pressure for surges. Chattering is observed where the system pressure is close to the cutint/cutout point and the surge pressure exceeds 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 it is properly plugged in. Chattering may be due to loose contacts. ■

Fig 1.4

