

WORKING INSTRUCTIONS

GUARDIAN RANGE

This working instruction leaflet covers the following ranges of switches:-

P1100	Medium Pressure Switch
P1200	Medium Pressure Switch
P1100FD	Flush Diaphragm Pressure Switch
P1300	High Pressure Switch
P1400	High Pressure Switch
P1100 3 & 4"	Low Pressure Switch
V1100	Vacuum Switch
DP1500	Differential Pressure Switch
T1100	Temperature Switch with Thermowell
T1200	Temperature Switch without Thermowell
T1700/T1800	Capillary Temperature Switch
L1100	Horizontal Level Switch
L1200	Vertical Level Switch
L120	Vertical Reed Level Switch
F1100	Flow Switch

HEALTH AND SAFETY AT WORK ACT 1974

WARNING

Your attention is drawn to the electrical potential that will be present if the terminal cover is removed while the switch is connected to a live supply. The electrical supply must be isolated prior to removal of the terminal housing cover.

Similarly, on pressurised process systems, prior to removal of an instrument it should be isolated from the pressurised medium or the system pressure should be relieved.

Note: The two 5 countersink screws holding the square retaining plate on the top of the switch, opposite the process entry should not be removed. Disassembly will effect the operation of the switch, and invalidate the warranty.

The two M5 pan head screws on the same plate, can be removed and used to attach brackets.

Precautions must be taken with regard to the possible operating temperatures present when performing adjustment.

The units must be specified, installed and operated by competent personnel, and their use be limited to within the published specifications. (All hazardous area models must be installed in accordance with BS EN 60079-14).

Unauthorised modification, repair or operation outside the specified limits may invalidate the warranty. Servicing should be carried out by qualified personnel only.

On pressure devices, should pulsation or surges be anticipated, then a suitable pressure snubber should be fitted.

The process medium temperature should not be allowed to exceed that stated in the product data and under the "OPERATING TEMPERATURES" section in this document. If process temperatures in excess of those stated are possible, then the switch should be remote mounted via a length of tubing or pipe to ensure dissipation of heat.

Pressure & Differential Pressure Switches

Various process entries are available, and the installation will vary dependent upon exact type. It is recommended that PTFE tape is used on tapered fittings and the use of the correct size bonded seal on parallel fittings.

Temperature Switches

These are usually provided either with a thermowell having a male screwed connection or a flange to a recognised international standard or with a male screwed fitting allowing the bare sensing probe to come in contact with the process medium.

Suitable pipe sealant or flange gasket should be incorporated when installing to ensure a good leak free fit.

MATERIALS

The materials of construction are as follows: -

Main Body – Black anodised LM25TF aluminium or ANC4B (316) stainless steel.
Outer Covers – 316 stainless steel.
Wetted Parts - 316 stainless steel or Monel 400.
Pressure Seals – Viton® or Nitrile
Environmental Seals - Nitrile
Internal Switch Mechanisms – Stainless steel.
External Fasteners - Stainless steel
Internal Fasteners & Springs – Zinc plated carbon steel.
Flow Plates – Phenolic resin or Gunmetal.

The operating temperatures restrictions for the **Guardian** series are as follows: -

Ambient:

Operational (all models) -10°C to +80°C

Ambient ('T' values as certified for hazardous areas).

ATEX II1G Exia IIC certified.

-50°C to +78°C T6
-50°C to +93°C T5
-50°C to +128°C T4

Storage: -10°C to +80°C

Process:

P1100, P1200, P1100FD, V1100, DP1500.
Viton® -20°C to +150°C
Nitrile -50°C to +90°C

P1300& P1400

Viton® -20°C to +150°C
Nitrile -40°C to +120°C

L1100, L1200, L120 & F1100
0 to +100°C

T1100, T1200, T1700 & T1800

Refer to temperature range specification.

The **Guardian** series has been designed for easy installation in any situation.

The P1100, P1300, T1700 & T1800 can be mounted from the fixings in the body. The case is counter bored and tapped to allow direct fixing through the body. This can be accomplished using 2 off M6 cap head screws, from the switch conduit side, passing through the case and into a panel or bracket. Alternatively the case is tapped M8 to accept bolts from behind into the rear of the switch body.

The P1200, P1100FD, P1400 & F1100 are mounted from the process entry.

The P1100 3 & 4", V1100 & DP1500 are mounted via their integral mounting bracket.

The T1100 is mounted from the supplied thermowell.

The T1200 is mounted from the supplied stem head.

The L1100, L1200 & L120 are mounted via their level head assemblies.

All switches (*except the DP1500 Diaphragm Code 08) can be mounted in any orientation to suit, without effecting accuracy, set point or operation.

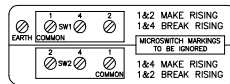
*DP1500 Diaphragm Code 08 should be mounted with switch case beneath the pressure plates.

When installing direct mounting pressure switches, particular care should be taken to ensure the internal 1/2" nipple is not loosened during the positioning or tightening procedure. If the unit is likely to be subjected to high shock levels or physical loads then additional supports should be incorporated.

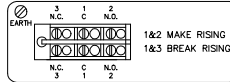
The **Guardian** series incorporates a M20 conduit entry in the switch housing. Access to the terminals is gained by removing the terminal cover, adjacent to the conduit entry. Connection details are provided on the inside of the cover and should be studied to make sure the correct mode of operation is selected. This will vary dependent on whether rising or falling operation is required.

Options of single or dual microswitches are available, refer to diaphragm for details.

Standard Microswitch



Double Pole Microswitch



The design allows easy access to the screw terminals, which are directly on the rear of the microswitches. These are located behind the terminal cover, which is located, closest to the conduit entry. Terminals are suitable for cables, single or multi strand up to 2.5mm² or 4BA crimp eyelets.

The cover should be replaced making sure that the gasket is properly seated.

Options of 1 or 2 SPDT micro switches are available.

For specific wiring details please refer to product drawings on reverse.

The **Guardian** range is certified to be installed in a CAT1 (Zone 0) environment, when supplied from an approved Intrinsically Safe Interface that is compatible with the following electrical parameters:

Ui: 28Vdc
Ii: 93mA
Pi: 0.65W
Ci: 0 nF
Li: 0mH

The **Guardian** series are supplied pre calibrated, a scale has been provided for on site adjustment. Basic setting of the set point for all microswitch combinations is carried out from behind the pressure adjustment cover. The factory set range is indicated on the external switch label. Switch point setting is detailed on the rear of the pressure adjustment cover.

1) SINGLE SET POINT

P1100, P1200, P1300, P1400, P1100FD, V1100, DP1500, T1700, T1800 & F1100.

The scale plate is situated at the bottom right hand corner of the mechanism and is read against the centre line of the red 'indicator disc'. Before adjustment is made to the switch, the M4 locking grub screw must first be released; this is situated on the face of the switch housing. Adjustment can then be made by rotating the adjuster screw and red indicator ring assembly, with a suitable 3mm diameter Tommy Bar or Allen Key, until the desired set point is reached. The M4 locking grub screw should then be re-tightened to prevent any possibility of movement of the set point.

T1100 & T1200.

The operating point is read from the middle of the 'V' cutout against the calibration scale plate. Before adjustment is made to the switch the locking ring must first be released, this is situated under the set point adjuster. Adjustment can then be made by rotating the adjuster screw with a suitable 3mm diameter Tommy Bar or Allen Key. The locking ring should then be re-tightened to prevent any possibility of movement of the set point.

2) DUAL SET POINTS

Where dual set points are specified the microswitches can be set to operate simultaneously or set independently within the limits specified in the sales literature. All switches are fitted with a standard adjuster and depending on the span required between the two operating points, the pressure switch can be fitted with a secondary adjuster, which further increases this span. It should be noted that the calibrated scale only indicates the lowest operating point, which is always set on the first microswitch. Adjustment of the second microswitch can only be made after correctly setting the lowest set point. The procedures detailed below should be followed.

Standard Adjuster.

The second set point cannot be set against the internal scale plate and should be adjusted with the assistance of appropriate measurement equipment. Adjustment is made by turning the M4 setting grub screw located on the pivot plate, on the conduit entry side of the main push rod, viewed from the adjustment side. Clockwise rotation reduces the second set point, while counter clockwise rotation increases the setting.

Secondary Adjuster.

The second set point can be set against a nominal

