WORKING INSTRUCTIONS

TROJAN RANGE

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

PF251 - Medium Pressure Switch
PF252 - Medium Pressure Switch
PF253 - High Pressure Switch
PF254 - High Pressure Switch
TF169 - Temperature Switch with Thermowell
TF170 - Temperature Switch without Thermowell
FF502 - Flow Switch

INSTALLATION

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.

Precautions must be taken with regard to th 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 only be carried out by qualified personnel.

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

FAILURE HAZARD

Pressure Switches - Element/primary seal failure.
In the event of the above the process medium will be prevented pressurising the main body and will be vented to atmosphere via a 2mm vent hole.

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.

PROCESS CONNECTIONS

Pressure & Differential Pressure Switches - Various process entries are available, and the installation will vary dependent on exact type. It is recommended that PTFE tape is used on tapered fittings and the use of the correct size of 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 into contact with the process medium.
Suitable pipe sealant or flange gasketting should be incorporated when installing to ensure a good leak free fit.

MATERIALS

The standard materials used in the construction of the **Trojan** series are as follows:-
Main Body and Outer Cover - Black Anodised Aluminium LM25TF
Terminal box - Glass Reinforced Polyester
Wetted Parts - 316 stainless steel or Monel 400.
Diaphragm & 'O' Rings (Pressure Switches) - Nitrile or Viton®.
Thermowells (Temperature Switches) - 316 stainless steel. (other materials available).
Pushrod and Spring Caps - Stainless steel.
External fasteners - Stainless steel.
Internal Fasteners and springs - Zinc plated carbon steel.
Flow plates - Phenolic resin or Gunmetal.

OPERATING TEMPERATURES

The operating temperature restrictions for the **Trojan** series are as follows:-

Ambient :
Operational (all models)
-50°C to +65°C.
Special (on request)
-50°C to +90°C

Storage:
-60°C to +90°C

Process:-

PF251, PF252, PF257 & PF258
-20°C to +150°C - Viton®
-40°C to +90°C - Nitrile

PF253 & PF254
-20°C to +150°C - Viton®
-40°C to +120°C - Nitrile

FF502 0 to +100°C

TF169 & TF170
Refer to temperature range specification.

MOUNTING INSTRUCTIONS

These models have been designed for easy installation and mounting, either directly from the process entry, or using the fixing holes in the back plate. The conduit entry is to the top, process entry to the bottom, the terminal and adjustment access to the front.

When installing direct mounting pressure switches, particular care should be taken to ensure the internal ¼" 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.

ELECTRICAL INSTALLATION

All models incorporate an EExe terminal box with 3 x 20mm conduit entry ports which must be plugged with a suitably certified gland when not utilised.

Connection details are provided on the inside of the terminal box cover and should be carefully studied and the correct mode of operation selected (i.e rising or falling as required).

Terminal cover should not be removed while the switch is live.

Terminals are suitable for cables (single or multi-strand) up to 2.5mm².

SETTING & CALIBRATION

The front cover can be removed by unscrewing 6 x M6 cap head screws and using 2 screws in the jacking positions to ease off the front cover evenly.

The factory set range and switch point setting is detailed on the internal label located inside the outer cover.

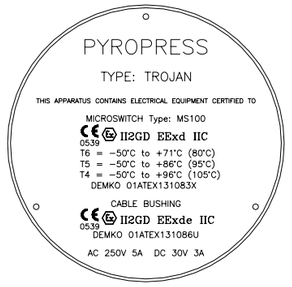
Adjustment can be made by rotating the adjustment screw assembly, with a suitable 3mm dia. pin or Allan key, until the desired set point is reached.

The new setting should be rechecked and the front cover replaced before reconnecting the electrical supply.

All of the above calibrations and settings can be performed by Pyropress before delivery. Please refer to the sales office for details.

ATEX CERTIFICATION

FLAMEPROOF ATEX LABEL



PRESSURE EQUIPMENT DIRECTIVE

Pressure Equipment Directive (PED)
It is now a requirement that all items of pressure equipment and assemblies with a maximum allowable pressure of over 0.5 bar be assessed under the PED. Installers should be aware and address the following sections of the PED.

These switches are classified as pressure accessories and are manufactured to Sound Engineering Practice Art.3 (3). The CE mark is for compliance to the ATEX Directive or Low Voltage Directive.

Handling
Notice is drawn to the installation warnings with respect to: Closures and openings, access to the process entry when pressurised, and surface temperature.

Operation
In the case of fluids which may become unstable and/or over-pressure (including surge) and/or over-temperature it is the installers responsibility to ensure that the device is operated within the published specifications and instructions.

Misuse
Notice is drawn to the installation warnings with respect to: operation outside the specified limits in terms of over pressure and temperature.

Degradation of materials, Erosion
Notice is drawn to the requirements of routine maintenance and the expected working life of elastomeric materials

Corrosion / Chemical Attack
It is the installers responsibility to ensure the selection of construction materials from the published specification is compatible with the operating medium.

Mounting, Piping
Provide adequate support, constraint, anchoring, alignment and pre-tensioning to prevent free movement and over stressing of connections and flanges.
Consider condensation within piping and the means of drainage.
Consider potential damage from turbulence and vortices and make allowances for wear if appropriate.
Consider fatigue due to vibration.
Keep appropriate records for maintenance, inspection and repair.

Toxic, Flammable Fluids
For Group 1 gas and fluids (explosive or toxic nature) provide means to isolate and assess size for significant risk, protect as necessary.
Clearly mark discharge points indicating fluid contents.

Mechanical damage
Consider potential damage from objects such as vehicles, falling bodies or adjacent machinery and house or protect as necessary.

Fire
Consider potential damage in the event of external fire and house or protect as necessary.

Supply fault
Consider the consequence of a power supply fault, failure or overload and protect as necessary.

ROUTINE MAINTENANCE

Routine inspection of the installation should take place at regular intervals. It is recommended that the switch is checked and operated every 6 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.

FAULT DIAGNOSIS

If the **Trojan** series fails to operate, the following should be checked:-
The installation of the switch.
Electrical terminals are secure and tight.
The microswitch function is correct.
The mechanical function of the pushrod
Investigate for signs of process leakage
Investigate signs of diaphragm failure.

SPARES & REPLACEMENT PARTS

Replacement Diaphragm kits are available.

Maintenance and overhaul of any type, should only be carried out by qualified personnel, in accordance with current health and safety requirements.

Procedures for replacement of spare parts are as follows:-

PF251 & PF252 Bellofram® kit.
The Bellofram® kit available contains a Bellofram® and 'O' ring.
1. Remove 4 off M5 retaining bolts securing the process entry, remove Bellofram® and sealing O'ring.
2. Replace Bellofram® and 'O' Ring, ensuring correct orientation of Bellofram® and location of plunger.
3. Replace process entry taking care to retighten the 4 retaining bolts evenly to an approximate torque of 6 N.m (4.4 lb.ft.).
4. Connect the microswitch to suitable circuit test device to monitor the change over state of the microswitch.
5. Readjust to the original set point using a calibrated test gauge and appropriate test equipment.

Tooling required:
3mm adjusting dowel,
4mm hex drive (Allen key)
Regulated pressure supply
Circuit tester

PF253 & PF254 Piston and Piston Assemblies.
The internal piston assembly can be unscrewed from housing using a suitable pin spanner (Pyropress Part No. 16913). The 'O' rings and backing rings can now be replaced, it is recommended that a suitable grease (Molyslip) be applied to the replacement parts during re-assembly. Assembly is the reverse of the above, ensuring that the piston nut is tightened securely.
A complete pre-assembled and leak tested replacement piston housing assembly is available.

TF169, TF170 & FF502.
Due to the complexity of the assembly it is recommended that these products are returned to Pyropress for overhaul.

Microswitch Assemblies.
Due to the encapsulation requirements of the ATEX certification, any switch suffering from microswitch failure is considered to be non-repairable and advise should be sort from the sales department at Pyropress.

From
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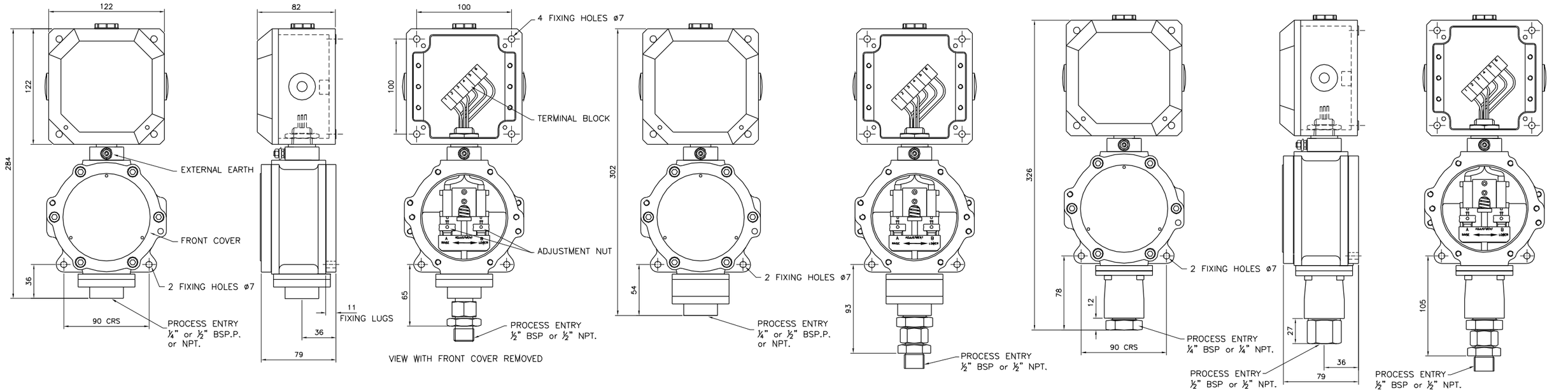
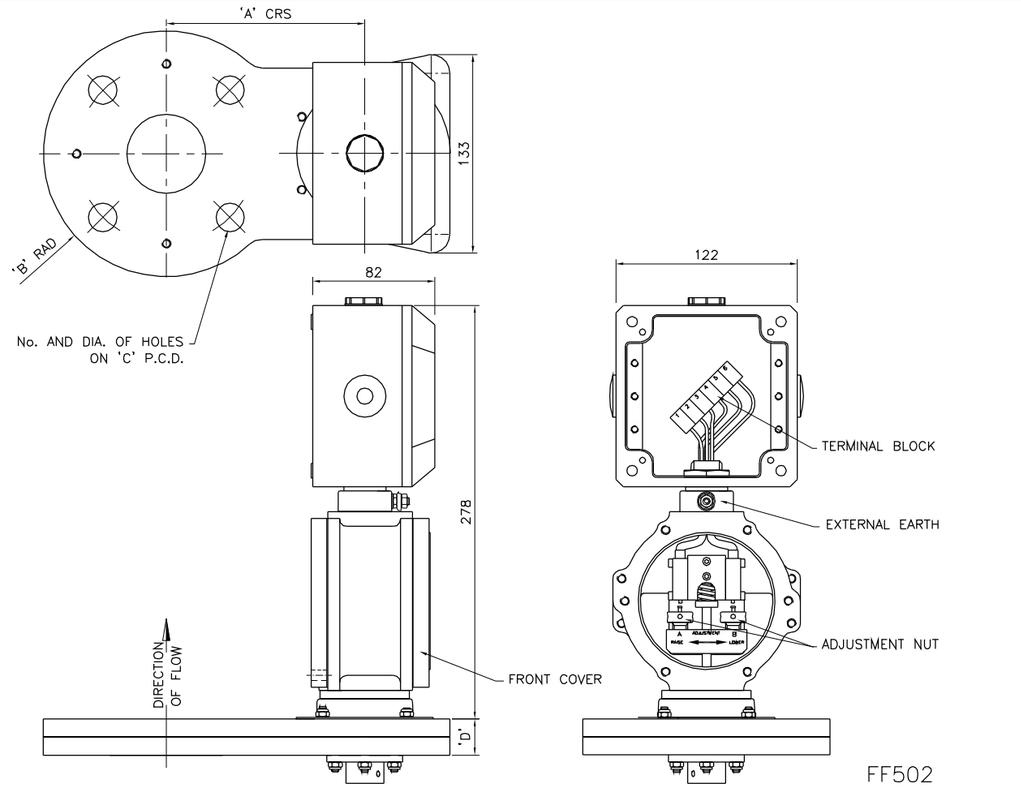
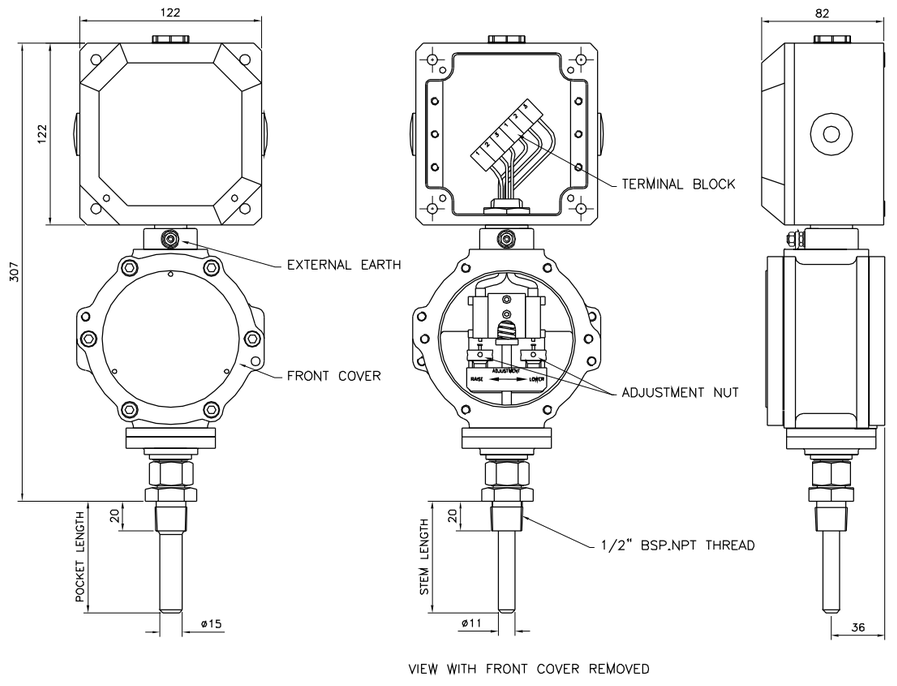


PF251 MEDIUM PRESSURE PF252 MEDIUM PRESSURE PF251 LOW PRESSURE PF252 LOW PRESSURE PF253 HIGH PRESSURE PF254 HIGH PRESSURE



FF502

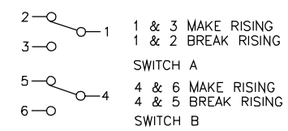
FLANGE DIMENSIONS AND DRILLINGS	GUNMETAL													NON METALLIC			
SIZE	15	20	25	32	40	50	65	80	100	125	150	200	250	15	25	40	50
A	108	108	108	117	117	133	133	152	159	191	191	219	254	160	160	133.3	133.3
B	57	57	57	67	70	83	83	102	108	140	140	168	203	62	62	86	86
C	65	75	85	100	110	125	145	160	180	210	240	295	355	CUSTOMER REQUEST			
D	24	24	24	24	24	24	24	24	24	24	24	24	24	38	38	38	38
FLANGE HOLES	4 x 14	4 x 14	4 x 14	4 x 18	4 x 18	4 x 18	4 x 18	8 x 18	8 x 18	8 x 18	8 x 18	8 x 22	12 x 22	12 x 26	CUSTOMER REQUEST		



TF169 WITH POCKET TF170 WITH STEM

MICROSWITCH CONTACT RATING

250V AC 5AMP RESISTIVE / 5AMP INDUCTIVE
30V DC 5AMP RESISTIVE / 3AMP INDUCTIVE



1 & 3 MAKE RISING
1 & 2 BREAK RISING
SWITCH A

4 & 6 MAKE RISING
4 & 5 BREAK RISING
SWITCH B