

WORKING INSTRUCTIONS

TROJAN RANGE

This working instruction leaflet covers the following ranges 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 the possible operating temperatures present when performing adjustment.

The units must be specified, installed and operated by competent personnel, and their use is 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.

FAILURE HAZARD

Pressure switches.

Element/primary seal failure. In the event of the above the process medium will be prevented from entering and pressurising the main body by a secondary seal and will be vented to atmosphere via 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 to ensure dissipation of heat.

PROCESS CONNECTIONS

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.
Outer Covers – Black anodised LM25TF aluminium.
Terminal Box – Glass Reinforced Polyester.
Wetted Parts - 316 stainless steel or Monel 400.
Pressure Seals (Pressure Switches) – Viton®.
Thermowell (Temperature Switches) – 316 Stainless Steel.
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.

OPERATING TEMPERATURES

The operating temperatures restrictions for the Trojan series are as follows:

Ambient ('T'):

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

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

ATEX II2 G Ex d IIC Certified:
-50 to +71°C T6
-50 to +86°C T5
-50 to +96°C T4

Storage: -50°C to +90°C

Process:

PF251, PF252, PF253, PF254.
Viton® -20°C to +150°C

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 are supplied with a M20 male conduit thread and 1 metre of 0.75mm², 3 core double insulated cable, sealed to IP67.

An Exe certified terminal box with 3 x 20mm conduit entry ports can be supplied as an option.

Connection details are provided on the inside of the switch cover or the inside of the terminal box cover. These details should be studied and 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.

Wiring Designation

1 - Common
2 - Normally closed 1&3 make rising
3 - Normally open 1&2 break rising

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 switch range is detailed on the external switch label, the factory switch setting(s) are detailed on the internal label located either inside the switch cover or terminal box cover.

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

The new setting should be checked and the front cover replaced before re-connecting to the electrical supply.

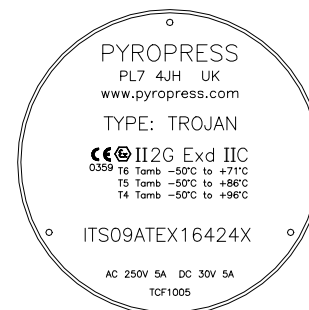
Pyropress can perform all of the above calibrations and settings prior to despatch.

ATEX CERTIFICATION

The Trojan range of switches comply with the following harmonised standards:

EN60079-0: 2006, EN60079-1: 2007

The equipment is designed to satisfy the requirements of Clause 1.2.7 of the Essential Health and Safety Requirements ANNEX II of directive 94/9/EC.



CERTIFICATION LABEL

Conditions of certification apply:

The permanently attached cable associated with the apparatus shall be terminated in accordance with EN60079-14.

Appropriate overload protection must be provided during installation

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 (SEP) 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 installer's responsibility to ensure the device is operated within the published specifications.

Misuse

Notice is drawn to the installation warnings with respect to: Operation outside the specified limits in terms of over pressure or 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 installer's 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 for significant risk, protect as necessary. Clearly mark discharge points.

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 to tightness.

It is recommended that the 'O' rings and diaphragms (on pressure and flow switches) be renewed every 3-5 years, and micro switch assemblies every 5-10 years dependent 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 for signs of diaphragm failure (on pressure & flow switches).

SPARES & REPLACEMENT PARTS

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

Replacement Viton® diaphragm /Bellofram® and 'O' ring kits are available.

Procedures for replacement of spare parts are as follows:

Note: After replacement of parts it is advised to connect the switch to a suitable test device to check for:

(i) leakage via a pressure test to the switches max working pressure.
(ii) the change over state of the microswitch contacts & if necessary re-adjust to obtain the original settings as per calibration & settings section.

PF251 & PF252 Bellofram® and 'O' ring Kit.

Remove 4 off M5 retaining screws securing the process entry, remove Bellofram® and sealing 'O' ring.

Replace Bellofram® and 'O' ring, ensuring correct orientation of the Bellofram® and location of plunger.

Replace process entry taking care to re-tighten the 4 retaining screws evenly to an approximate torque of 6 N.m.

PF252 replace adaptor 'O' ring

PF253 & PF254 Piston 'O' ring Kit.

Remove 4 off M5 retaining screws; remove the piston assembly from the switch head. Remove the adaptor / dowty seal from the piston. Withdraw the piston (do not interfere with the screw mechanism), remove the locknut from the housing using a suitable pin spanner (Pyropress part No 16913), Remove the piston guide & piston support & outer 'O' ring from the housing, remove 'O' rings & backing rings (note the order in which they are fitted) from the lock nut & piston support.

After applying a suitable grease (Molyslip®) fit the replacement 'O' rings & backing rings to the lock nut & piston support in the correct order. Fit the replacement outer 'O' ring to the lock nut, locate the piston guide onto the outer 'O' ring / lock nut ensuring the centre hole chamfer of the guide is facing upwards, locate the piston support onto the guide, apply suitable grease (Molyslip®) to piston & refit to assembly. Refit assembly into housing. Tighten securely. Refit adaptor & replacement dowty seal.

Refit the piston assembly to switch head using M5 screws tightened down evenly to 6 N.m (4.4lb.ft).

A complete pre-assembled and leak tested replacement piston housing assembly is available; refer to Pyropress sales department for information.

TF169 & TF170 Temperature. FF503 Flow. Due to the complexity of these assemblies, it is recommended that these products are returned to Pyropress for overhaul.

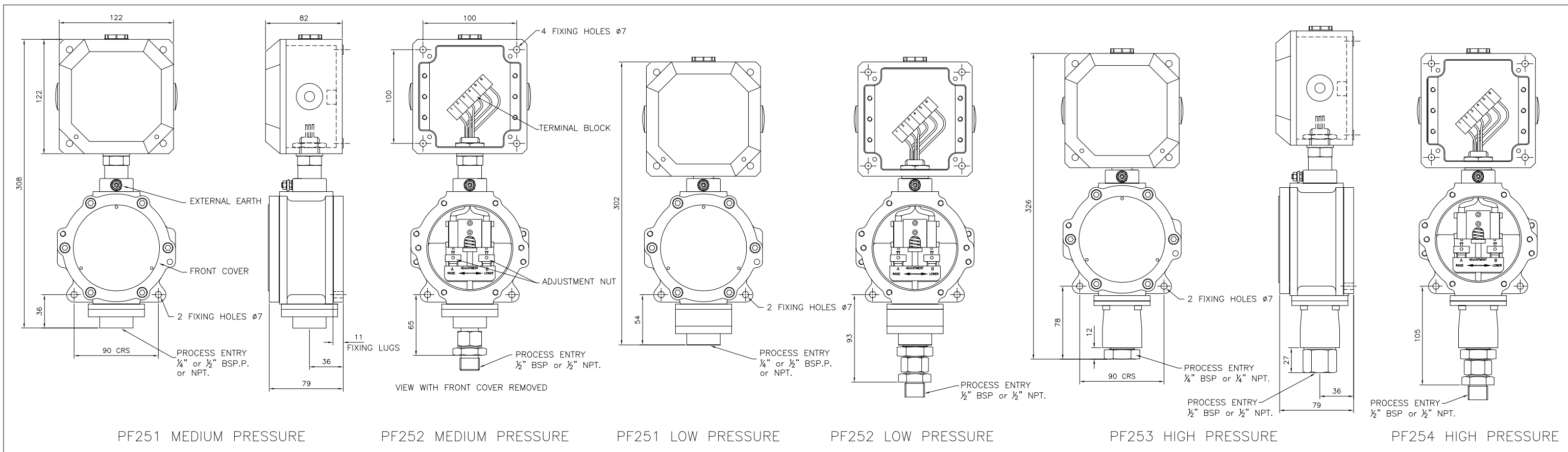
Microswitch Assemblies.

Due to the ATEX certification of the Cable Gland, any switch suffering from microswitch failure is considered to be non-user repairable. Therefore any switch requiring microswitch overhaul should be returned to Pyropress for investigation and repair.

Microswitch Assemblies.

Due to the ATEX certification of the Cable Gland, any switch suffering from microswitch failure is considered to be non-user repairable. Therefore any switch requiring microswitch overhaul should be returned to Pyropress for investigation and repair.

Pyropress Engineering Company Ltd. Sales Office: +44 (0) 1752 339866 Fax: +44 (0) 1572 336681 E-mail: sales@pyropress.com Website: www.pyropress.com



PF251 MEDIUM PRESSURE

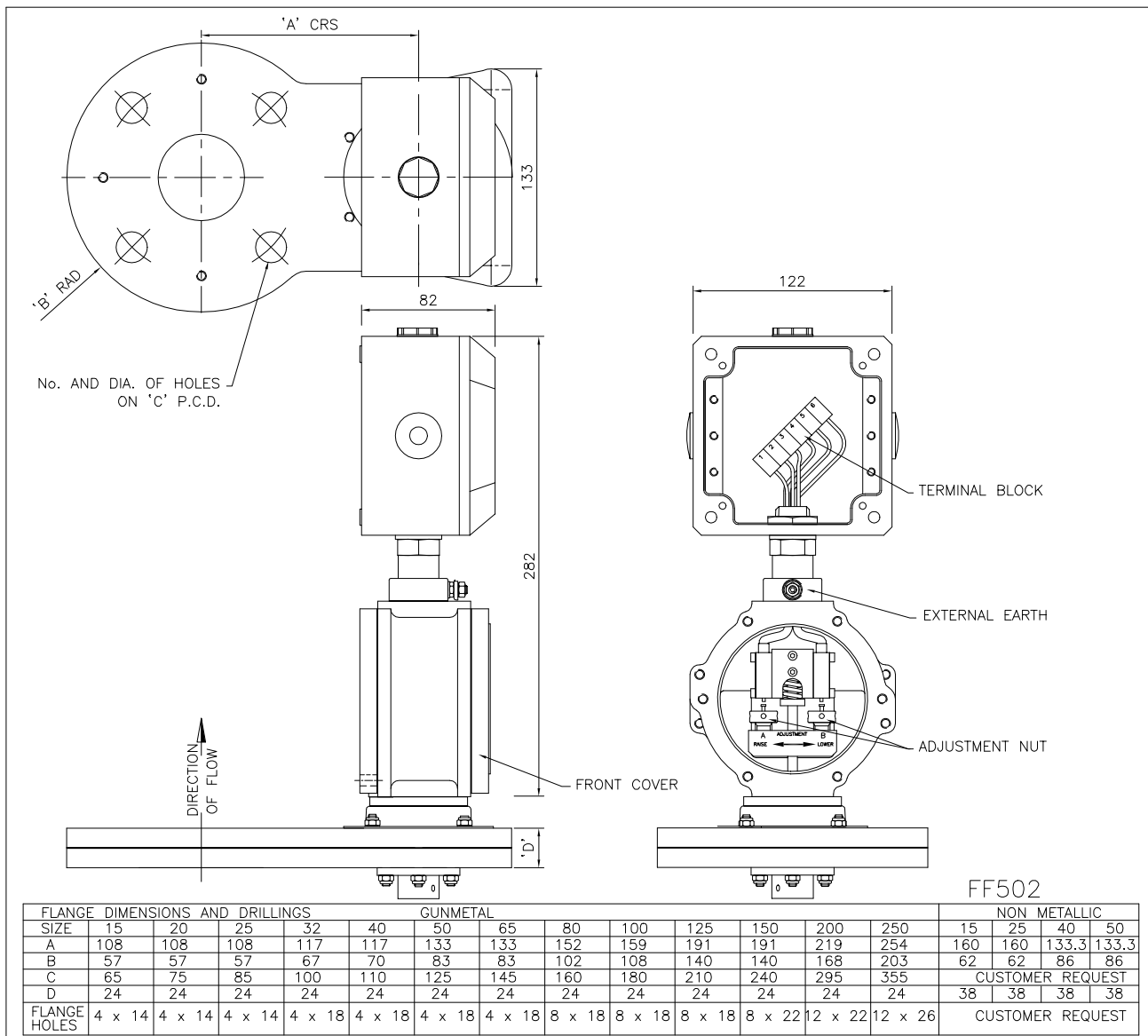
PF252 MEDIUM PRESSURE

PF251 LOW PRESSURE

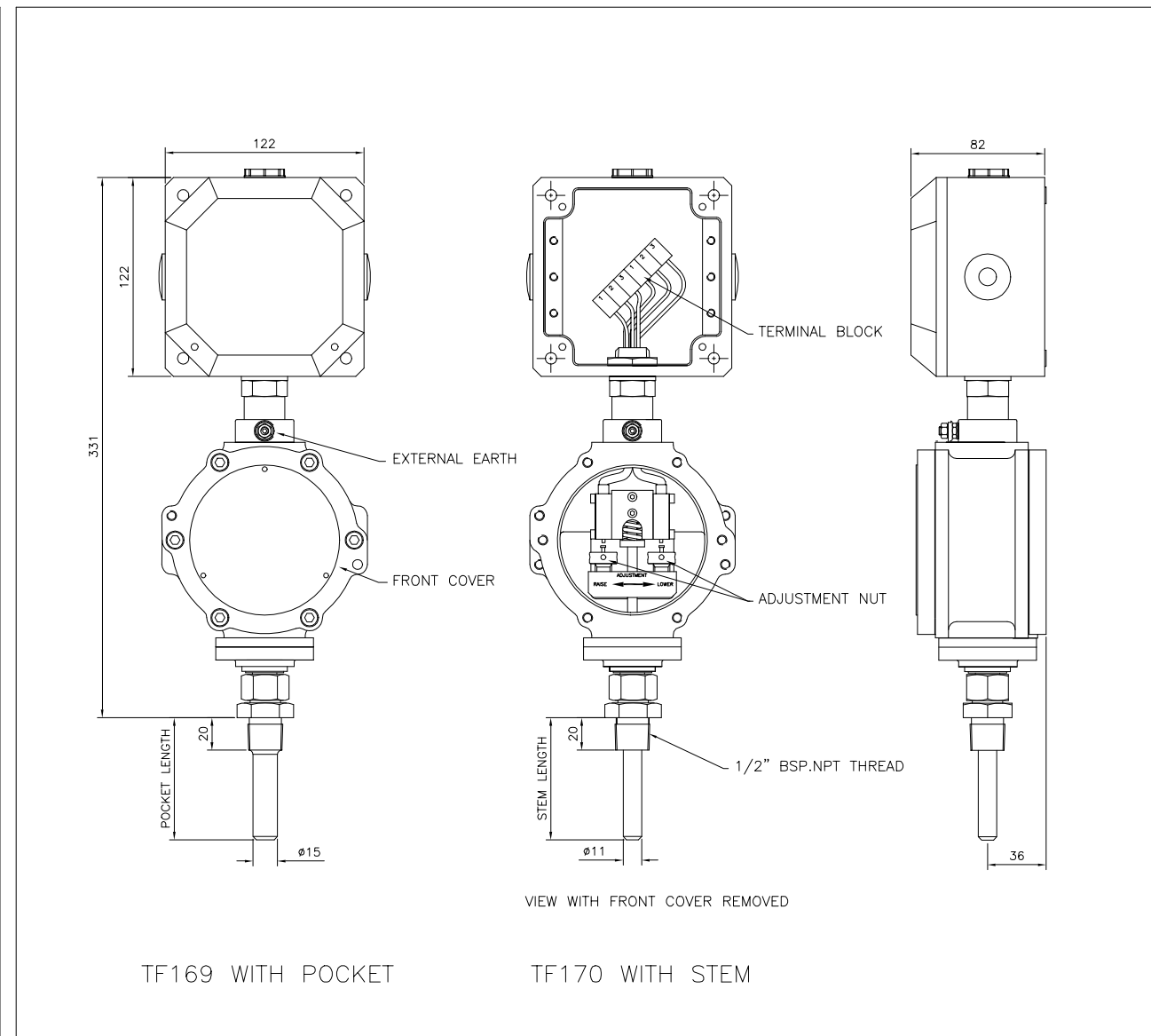
PF252 LOW PRESSURE

PF253 HIGH PRESSURE

PF254 HIGH PRESSURE



FF502



TF169 WITH POCKET

TF170 WITH STEM

MICROSWITCH CONTACT RATING
 250V AC 5AMP RESISTIVE / 5AMP INDUCTIVE
 30V DC 5AMP RESISTIVE / 3AMP INDUCTIVE

