

# TITAN CAPILLARY

## TEMPERATURE TF175 & TF176 TITAN ATEX/IECEX Exd, Exia & INDUSTRIAL CAPILLARY TEMPERATURE SWITCH

The standard range represents the basic models to cover temperature applications spanning -40 to +240°C. The TF175 is supplied fitted with a threaded thermowell, the TF176 has no thermowell but is supplied with a sliding gland. Capillary is 316 stainless steel armoured and is available from 2 to 10 metres in length.



## FEATURES

- ✓ 316 stainless steel or black anodised aluminium switchcase to IP66 standards.
- ✓ Settings from -40 to 240°C.
- ✓ Single or dual microswitch option.
- ✓ ATEX/IECEX Flameproof version CE II2G Exd IIB + H2 T6...T2 Gb Ta-60 to +75°C...90°C
- ✓ Internal adjustment scale.
- ✓ Rigid stem option available (see TF171 & TF172 data sheet).
- ✓ Wetted parts NACE MR-01-75 option.
- ✓ ATEX/IECEX Intrinsically safe version CE II1G Exia IIC T6...T2 Ga Ta -50 to +78°C...128°C

ADJUSTMENT RANGE (°C)	MAXIMUM TEMPERATURE (°C)	DEADBAND (°C)	CAPILLARY CODE	Min. bulb length according to capillary length		
				2m - 4m	5m - 7m	8m - 10m
-40 TO -0	40	<10	40	100	100	100
-20 TO +20	70	<10	41	100	150	200
0 TO 45	80	<10	42	100	150	200
20 TO 90	120	<15	45	100	150	200
40 TO 100	145	<15	43	100	100	100
60 TO 120	145	<15	43	100	100	100
100 TO 180	200	<15	44	100	100	100
160 TO 240	280	<15	46	100	100	100

(Dimensions in mm)

**Repeatability :** +/-1.5% of range (at operating temperature up to 40°C).

**Temperature limitations :**  
 Ambient : -30 to +85°C standard  
 Process : -40 to max on table  
 Storage : -40 to +85°C

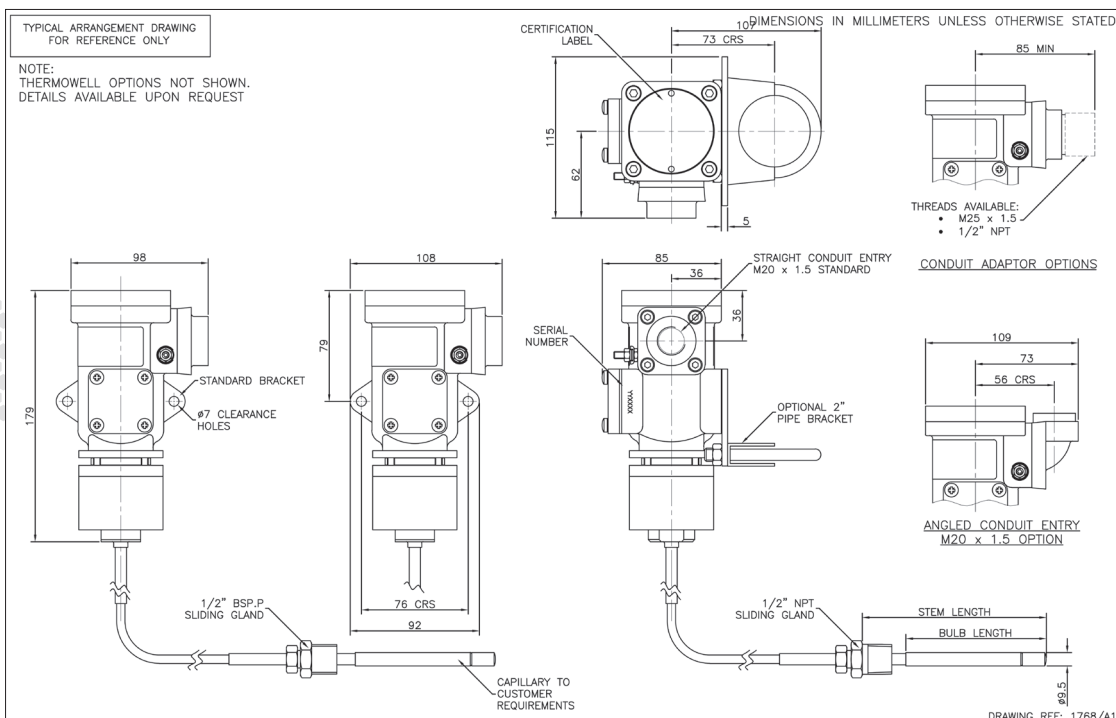
**Calibration rate :** without thermowell, at 2°C per minute rate of change.

PART NUMBER BREAKDOWN			
<b>B</b> = ATEX/IECEX Exd CERTIFIED <b>O</b> = ATEX/IECEX Exia CERTIFIED <b>A</b> = INDUSTRIAL	<b>CAPILLARY CODE</b> REFER TO TABLE ON PREVIOUS PAGE	<b>STEM LENGTH</b> 1 = 150mm - STANDARD 2 = 250mm, 4 = 400mm 6 = 600mm (150mm NOT AVAILABLE WITH 150mm OR 200mm BULB LENGTH)	<b>ELECTRICAL ENTRY</b> <b>A</b> = M20 STRAIGHT <b>B</b> = M20 ANGLED <b>C</b> = 1/2" NPT STRAIGHT <b>F</b> = M25 STRAIGHT
<b>TF175</b> = WITH THERMOWELL <b>TF176</b> = WITHOUT THERMOWELL		<b>A</b> = STD BRK <b>E</b> = 2" PIPE BRK	<b>THERMOWELL LENGTH</b> 100 = 100mm STANDARD IF NOT REQUIRED LEAVE BLANK
<b>T F 1 7 5 S 1 B / 4 3 - 3 - 1 - 6 / A A P A 1 0 0</b>			
<b>A</b> = ALUMINIUM CASE <b>S</b> = STAINLESS STEEL CASE	<b>CAPILLARY LENGTH</b> 2 METRES MINIMUM 10 METRES MAXIMUM	<b>THERMOWELL CONNECTION</b> <b>PA</b> = 1/2" BSP.P <b>PB</b> = 1/2" NPT <b>PC</b> = 3/8" BSP.P <b>PD</b> = 3/4" BSP.P <b>PE</b> = 3/4" NPT <b>PF</b> = 1" BSP.P <b>PG</b> = 1" NPT	
<b>1</b> = 1 x SPDT SWITCH	<b>SLIDING GLAND THREAD</b> <b>3</b> = 1/2" BSP.P <b>6</b> = 1/2" NPT	<b>THERMOWELL CONNECTION (HIGH PRESSURE)</b> <b>HA</b> = 1/2" BSP.P <b>HB</b> = 1/2" NPT <b>HC</b> = 3/8" BSP.P <b>HD</b> = 3/4" BSP.P <b>HE</b> = 3/4" NPT <b>HF</b> = 1" BSP.P <b>HG</b> = 1" NPT	

Thermowell and stem material :  
 316 stainless steel

Thermowells can be provided flanged or screwed to suit the application. All exotic metals can be catered for. Material certificates and wake frequency vibration analysis calculations can be provided.

Max working pressure :  
 35 bar - standard  
 420 bar – upon request



# TITAN (XPB) ATEX & IECEx Exd, Exia

## INDUSTRIAL SWITCHES

### INTRODUCTION

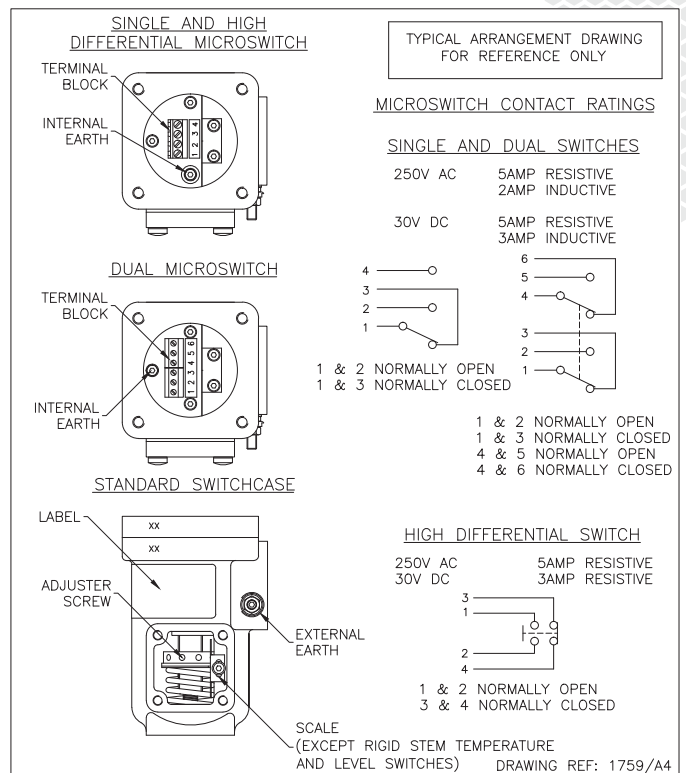
The Titan **pressure, differential pressure, temperature, level and flow** switches are designed for use in environments where explosive gases can be present (e.g. Gas fields, Oil rigs and Chemical plants etc.) and have been ATEX and IECEx certified as detailed overleaf. (SIL 2 - IEC61508 proven reliability).

These switches are manufactured from a high quality casting which offers robust construction and protection to IP66 for use within heavily polluted industrial and marine environments. A special feature of the instruments is the separation of the flameproof and adjustment compartments allowing for safe on-site adjustment of the set point with power on and the switch in operation.

The TITAN Exd certified switches must be installed in accordance with BS EN 60079-14. The certification allows for mounting against a wall or bulkhead with the minimum flamepath distances specified not being applicable.

### CALIBRATION

The design features a simple form of calibration adjustment against a scale plate. This allows users to either order units with a specific setting, or stock a mid range setting and then adjust to suit the application. This can be set safely with the switch supply live. On removal of the adjustment cover the adjusting ring can be turned with a small Tommy bar or Allen key. The setting is read from the centre of the red pointer ring against the calibrated scale plate. Rotation to the left will increase the set point and to the right decrease the set point. The adjustment mechanism incorporates a friction device to ensure set point will not change under vibration conditions.



# TECHNICAL SPECIFICATION

**Switchcase and covers:** 316 stainless steel or black anodised aluminium.

**Microswitch:** 1 x SPCO/SPDT or 2 x SPCO/SPDT gold flashed silver contacts. Dual switches are mechanically linked to provide DPDT switching action, reset of switches could be up to 3% apart. Dual microswitches may increase deadband by a factor of two.

**Microswitch rating :** 5 Amps @ 250 VAC resistive, 2 Amps @ 250 VAC inductive.  
5 Amps @ 30 VDC resistive, 3 Amps @ 30 VDC inductive.

**Electrical connections :** Terminals suitable for cable 0.5 - 2.5 mm<sup>2</sup>.  
(Max 1.5mm<sup>2</sup> for dual microswitch version)

**Electrical Conduit Entry:** M20 x 1.5 straight or angled entry. ½" NPT via adaptors

**Environmental Protection:** IP66 in accordance with BS EN 60529

**Vibration and shock parameters:** Switches were subjected to Ministry of Defence Type Approval System Test Vibration DGS 350 Paras 0602 & 0603. Shock – BR3021

**Temperature Limitations:** Pressure, Vacuum and Differential Pressure.

**Process:** Diaphragm actuated (unless otherwise stated) -30 to +100°C (Nitrile) or -20 to +150°C (Viton). Piston actuated -30 to +100°C (Nitrile) or -20 to +150°C (Viton), -40 to 150°C (PTFE) or -35 to +100°C (EPDM).

**Ambient:** -50 to +85°C (standard). Storage : -60 to +85° Deg C.

(For temperature, level and flow switches please refer to specific pages).

**Certification:** Switches can be supplied for gas environments (dust must be specified at time of enquiry).

**ATEX/IECEX certified Exd Flameproof - Gas** (with or without resistors)

CE Ex II2G Exd IIB + H2T6 Ta -60 to +75°C, T5 Ta +90°C

Special conditions for safe use. 1) No modifications must be made to the flamepaths of the unit without consultation of the drawings listed on the certificate. 2) Suitably rated cable must be selected based on t Class shown above. 3) Fasteners of yield strength 240Nmm<sup>2</sup> or greater are to be utilised. 4) Only suitably certified Ex d IIC Gb cable glands are to be used.

**ATEX/IECEX certified Exia Intrinsically Safe - Gas**

CE Ex II1G Exia IIC T6 Ta -50 to +78°C, T5 Ta +93°C, T4 Ta +128°

CE Ex II1G Exia IIC T5 Ta -50 to +72°C, T4 Ta +122°C (with resistors)

Special conditions for safe use. (Category 1, Zone 0) Aluminium may only be used when the ignition hazardous assessment shows that there is no risk of ignition from incendive, impact or abraision sparks.

**Accuracy:** +/-1% at 20°C

Continuous development may result in changes to specifications without prior notice.

## ABOUT PYROPRESS

Our products are designed to work in demanding and hazardous environments which require fast and cost effective solutions in instrumentation and control.

Pyropress control sensors provide safe and reliable electrical switching of alarm or control circuits in response to changes in temperature, pressure, differential pressure, vacuum, flow and level conditions.

## QUALITY

To support the design of state of the art products the company has invested heavily in the latest CNC technology.

We are able to produce our own components to a high degree of accuracy assuring a reliable and consistent quality product.

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