

# PERSEUS TEMPERATURE CAPILLARY

## TF61 & TF62 PERSEUS ATEX & IECEx Exd, Exia & INDUSTRIAL TEMPERATURE SWITCH

This range of switches features a robust high quality housing with 1 or 2 sealed SPDT microswitches and has been designed for use in environments where explosive gases can be present (e.g. gas fields, oil rigs & chemical plants etc). Microswitches can be set for single, dual simultaneous, or dual independently adjustable operation. Environmentally sealed or hermetically sealed microswitch options are available.

The Perseus range has separate electrical and adjustment chambers meaning that set point adjustment can be carried out with the power on and the switch in operation. The stainless steel housing is available with one or two electrical entries.



TEMPERATURE - CAPILLARY



## FEATURES

- ✓ 316 Stainless steel or black anodised aluminium switchcase to IP66 & IP67 standards.
- ✓ Wetted parts NACE MR-01-75 option
- ✓ SIL 2 - IEC61508 proven reliability.
- ✓ Single or dual microswitches option.
- ✓ Settings from -30°C to +240°C  
Standard length 3 metres, others lengths available
- ✓ ATEX/IECEx Flameproof Gas & Dust version  
II 2G Ex db IIC T6...T5 Gb Tamb -50°C to +75°C...+90°C  
II 2D Ex tb IIIC T85°C...T100°C Db  
Tamb-50°C to +75°C T85°C/-50°C to +90°C T100°C
- ✓ ATEX/IECEx Flameproof Gas version  
II 2G Ex db IIC T6...T5 Gb Tamb -50°C to +75°C...+90°C  
(With or without resistors)
- ✓ ATEX/IECEx Intrinsically safe Gas & Dust version  
II 1G Ex ia IIC T6 ...T2 Ga Tamb - 50 to +78°C...+93°C  
II 1D Ex ia IIIC T135°C Da Tamb - 50 to +70°C  
(without resistors)
- ✓ ATEX/IECEx Intrinsically safe Gas version  
II 1G Ex ia IIC T5...T2 Ga  
(Tamb -50°C to +72°C...+122°C)  
(with resistors)

ADJUSTMENT RANGE (°C)	MAXIMUM TEMPERATURE (°C)	DEADBAND (°C)	CAPILLARY CODE	Min. bulb length according to capillary length		
				2m - 4m	5m - 7m	8m - 10m
-30 TO 0	40	<15	40	100	100	100
-20 TO +20	70	<15	41	100	150	200
0 TO 45	80	<15	42	100	150	200
20 TO 90	120	<15	45	100	150	200
70 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)

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

Max. working pressure : 35 bar standard. 420 bar high pressure

**Temperature Limitations :**

Ambient : -40 to +85°C standard

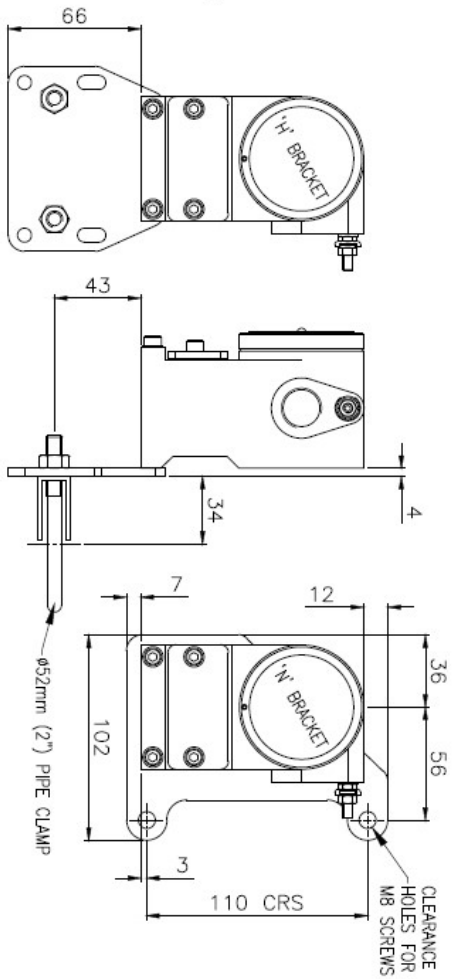
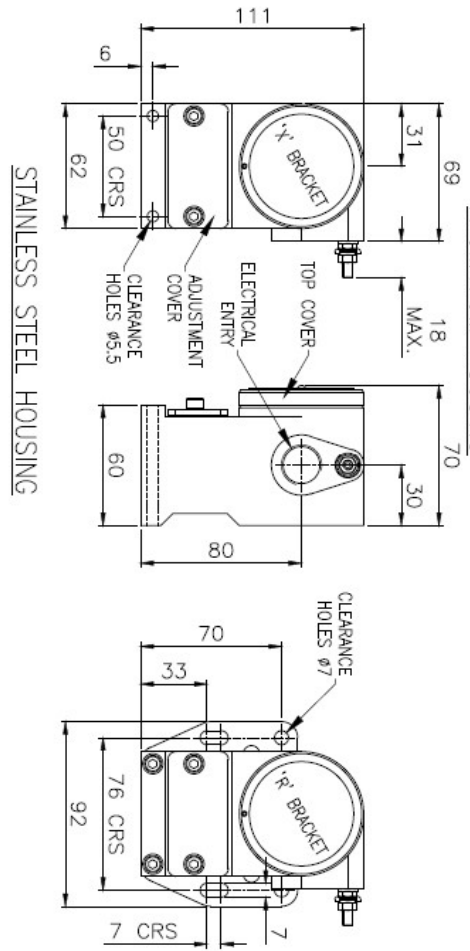
Process : -40 to max on table

Storage : -40 to +85°C

Note : Dual microswitches may increase the stated deadband by 5°C

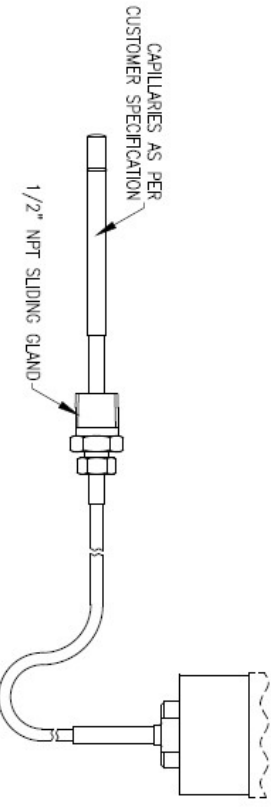
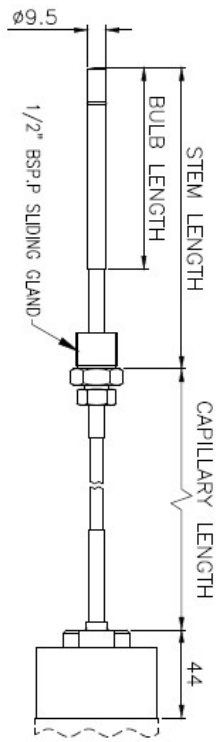
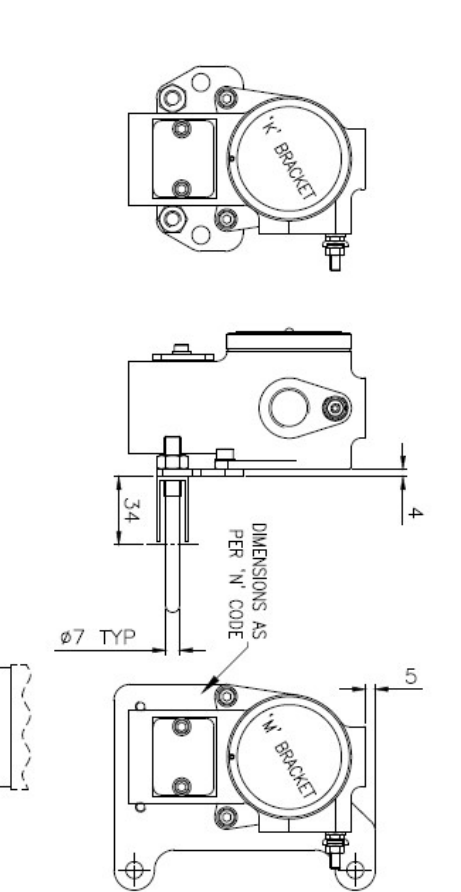
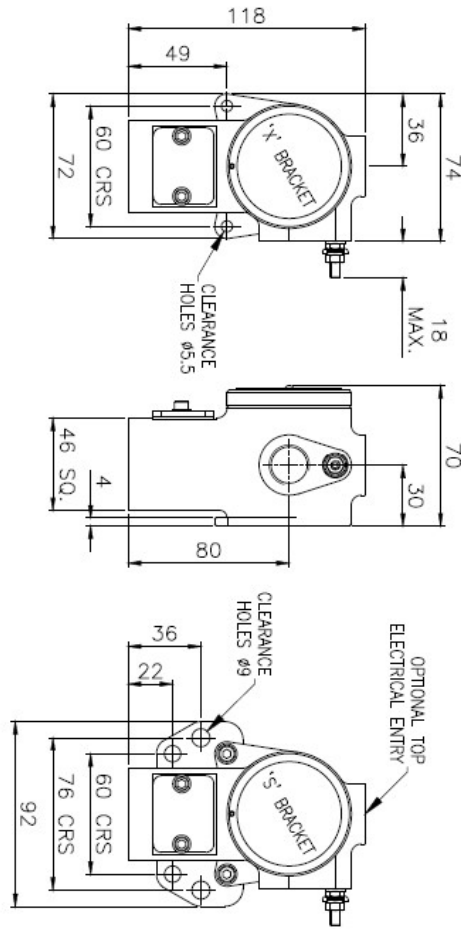
PART NUMBER BREAKDOWN		ELECTRICAL CONNECTION ENTRY	
<b>MICROSWITCH OPTION</b> <b>TF61</b> = 1 X SPDT <b>TF62</b> = 2 X SPDT LINKED <b>TF63</b> = 1 X SPDT ADJUST. DEADBAND <b>TF64</b> = 2 X SPDT INDEPENDENT ADJUST. <b>TF65</b> = 1 X SPDT HERMETIC SEALED <b>TF66</b> = 2 X SPDT HERMETIC SEALED	<b>CAPILLARY CODE</b> REFER TO TABLE ON PREVIOUS PAGE	<b>STEM LENGTH</b> <b>1</b> = 150mm - STANDARD <b>2</b> = 250mm, <b>4</b> = 400mm <b>6</b> = 600mm <small>(150mm NOT AVAILABLE WITH 150mm or 200mm BULB LENGTH)</small> <b>X</b> = STD BRK <b>H</b> = 2" PIPE BRK (ALUM) <b>K</b> = 2" PIPE BRK (ST.ST)	<b>B</b> = RIGHT HAND SIDE <b>L*</b> = DUAL ENTRY <b>T*</b> = DUAL ENTRY (TOP PLUGGED) <b>R*</b> = DUAL ENTRY (SIDE PLUGGED) <b>*STAINLESS STEEL ONLY</b> <b>THERMOWELL LENGTH</b> <b>100</b> = 100mm STANDARD IF NOT REQUIRED LEAVE BLANK
<b>T F 6 1 5 A B / 4 3 - 3 - 1 - 6 / X B _ P A 100</b>			
<b>5</b> = WITH THERMOWELL <b>6</b> = NO THERMOWELL <b>CASE MATERIAL</b> <b>A</b> = ALUMINIUM SWITCHCASE <b>S</b> = 316 STAINLESS STEEL <b>CERTIFICATION</b> <b>O</b> = ATEX/IECEX Exia INTRINSICALLY SAFE <b>B</b> = ATEX/IECEX Exd GAS FLAMEPROOF <b>T</b> = ATEX/IECEX Exd GAS FLAMEPROOF & DUST OPTION <b>A</b> = INDUSTRIAL / MARINE	<b>CAPILLARY LENGTH</b> <b>2</b> METRES MINIMUM <b>3</b> METRES STANDARD <b>10</b> METRES MAXIMUM <b>SLIDING GLAND THREAD</b> <b>3</b> = 1/2" BSP.P <b>6</b> = 1/2" NPT STANDARD <b>ELECTRICAL CONNECTIONS</b> <b>_</b> = M20 LEAVE BLANK <b>C</b> = 1/2" NPT ADAPTER <b>F</b> = M25 ADAPTER <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	<b>THERMOWELL CONNECTION</b> <b>PA</b> = 1/2" BSP.P <b>PB</b> = 1/2" NPT <b>PD</b> = 3/4" BSP.P <b>PE</b> = 3/4" NPT <b>PF</b> = 1" BSP.P <b>PG</b> = 1" NPT	

ALUMINIUM HOUSING



DIMENSIONS IN MILLIMETERS UNLESS OTHERWISE STATED

STAINLESS STEEL HOUSING



NOTE: SWITCHES CAN BE SUPPLIED WITH THERMOWELLS IF REQUIRED

## INDUSTRIAL SWITCHES

### INTRODUCTION

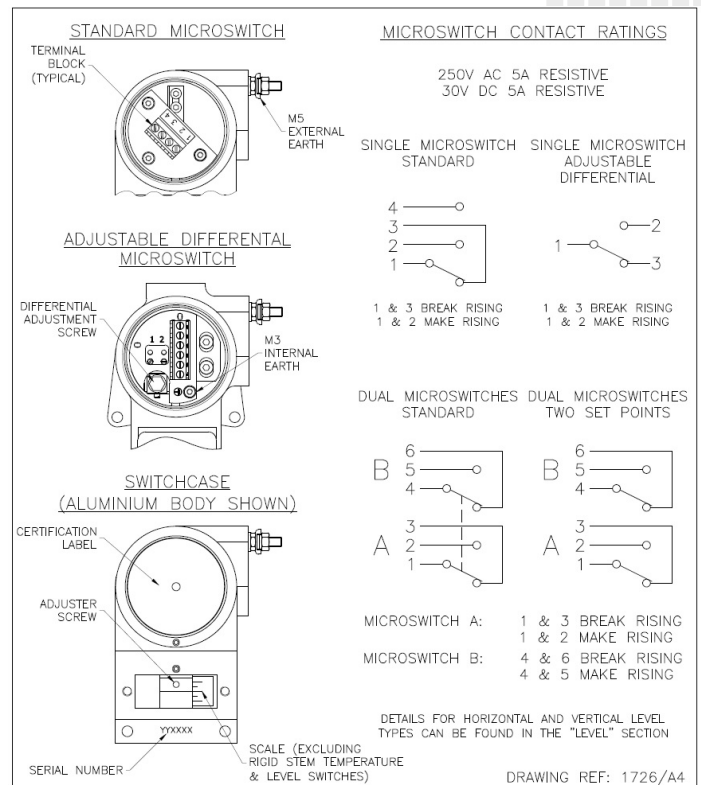
The Perseus **pressure, vacuum, differential pressure, temperature, and level** switches are designed for use in environments where explosive gases and dust can be present (e.g. Gas fields, Oil rigs and Chemical plants etc.) and have been ATEX and IECEx certified as detailed overleaf (SIL2 - IEC 61508 proven reliability).

These switches are manufactured from a high quality casting which offers robust construction and protection to IP66 & IP67 for use within heavily polluted industrial 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.

Perseus Exd switches must be installed in accordance with BS EN 60079-14

### CALIBRATION

The design features a simple form of adjustment against a calibrated scale. This enables a user to order switches set at a predetermined point or stock a mid range setting and adjust switches to suit the particular application. The set point can be safely adjusted with the switch electrically live. Adjustment is made by removing the access cover and rotating the set point adjuster using a suitable tommy bar or allen key. The setting is read from the centre of the set point adjuster against the scale. Rotation to the left will increase the set point and to the right decrease it.



Perseus Stainless steel switchcase with dual electrical connection option



# TECHNICAL SPECIFICATION

**Switchcase & covers:** 316 Stainless steel or black anodised aluminium case and 316 stainless steel adjustment cover.

**Microswitch:** 1 x SPCO/SPDT or 2 x SPCO/SPDT gold flashed silver contacts. Single switch is available with adjustable deadband option. Dual switches are either mechanically linked to provide DPDT switching action (switches could be up to 3% apart, reset levels may differ) or independently adjustable. Microswitches are environmentally sealed as standard, hermetically sealed can be supplied as an option. Dual microswitches may increase deadband.

**Microswitch rating:** 5 Amps @ 250 VAC resistive, 2 Amps @ 250VAC inductive

5 Amps @ 30VDC resistive, 3 Amps @ 30 VDC inductive

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

**Electrical Conduit Entry:** One or two M20 x 1.5 ISO. ½" NPT or M25 via adaptors (2 entries only with SS housing)

**Environmental Protection:** IP66 & IP67 in accordance with BS EN 60529 : 1992 & IEC 60529 : 2001.

**Vibration and shock parameters:** Switches were subjected Lloyds Register Test Specification 1, section 13 BS EN 60068-2-6 : 1996 (Test Fc vibration) and BS EN 60068-2-27 : 1995 (Test Ea shock).

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

**Process:** Diaphragm actuated (unless otherwise stated) -30 to +100°C (Nitrile) or -20 to +150 Deg.C (Viton).

Piston actuated -30 to 100°C (Nitrile), -20 to +150°C (Viton), -50 to +150°C (PTFE) or -35 to +100°C (EPDM).

**Ambient:** -40 to +85°C.

**Storage:** -40 to +85 °C (For temperature, level and flow switches please refer to specific pages).

**ATEX & IECEx Flameproof Gas & Dust :** II 2G Ex db IIC T6...T5 Gb. Tamb -50°C to +75°C...+90°C

II 2D Ex tb IIIC T85°C...T100°C Db - Tamb -50°C to +75°C T85°C/-50°C to + 90°C T100°C

**ATEX & IECEx Flameproof Gas** (with/without resistors) II 2G Ex db IIC T6...T5 Gb - Tamb -50°C to +75°C...+90°C T5

Special conditions for safe use. 1) Under rated conditions, the cable temperature can reach 9K above ambient temperature, ensure selection of correctly rated cable for the application. 2) Flameproof joints not intended for repair.

**ATEX/IECEx Exia Intrinsically Safe Gas & dust** (without resistors)

II 1G Ex ia IIC T6...T2 Ga - Tamb -50°C to +78°C...+93°C (see certificate)

II 1D Ex ia IIIC T135°C Da - Tamb -50°C to +70°C

**ATEX/IECEx Exia Intrinsically Safe Gas** (with resistors)

II 1G Ex ia IIC T5...T2 Ga - Tamb -50°C to +72°C...+122°C (see certificate)

Special conditions for safe use. 1) For Ga installations - The equipment may be constructed using aluminium for the housing and internal parts and may only be used when the ignition hazardous assessment shows there is no risk of ignition from incendeive impact or abrasion sparks.

**Accuracy:** +/-1% at 20°C.

Continuous development may result in changes to specification 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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