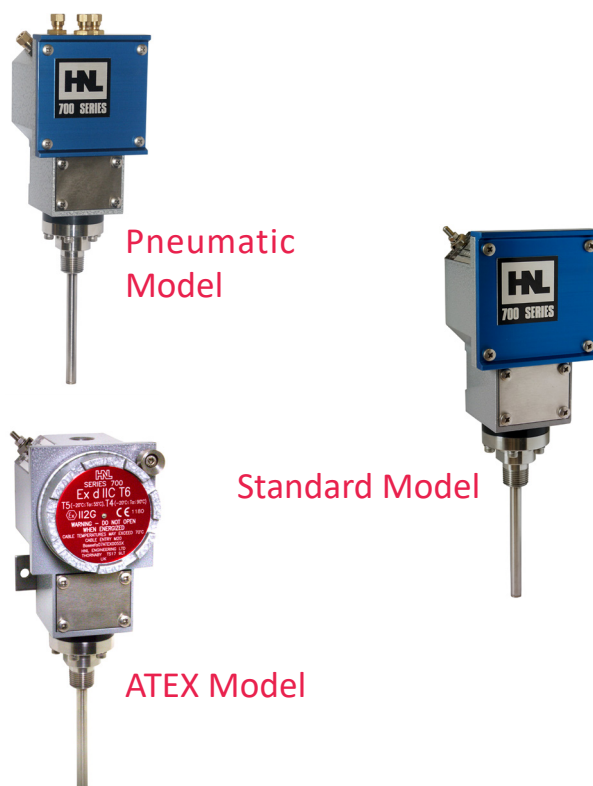


Our *Series 700 Temperature Switch* are designed to compliment the extensive Series 700 Pressure and DP switches. Series 700 Temperature Switches offer accurate, reliable switching in a robust cast enclosure.

General Specification

Ranges:	-50 deg C to 400 deg C
Filling :	Gas or Acetone
Output:	Rototherm precision pilot valve (PPV) provides a final switching differential equal to that obtained by the use of a sensitive electrical microswitch.
Mounting:	Direct allows the switch to be screwed directly into a thermowell Remote where the temperature bulb is secured in the thermowell and connected to the switch housing via a capillary tube
Housing:	Aluminium or Stainless Steel
Temperature System Material:	316 SS
Versions:	Available as Exd, ExnC, Exia, I.S.
Adjustability:	Setpoint adjustments can be made even when the switch is energised.
Accuracy:	<2%



Setpoint Ranges			Temperature		System	Mounting	
Range Code	MIN (°C)	MAX (°C)	MIN (°C)	MAX (°C)	Type	Direct	Remote
78DT	60	150	-30	170	Acetone	•	✓
78NT	-50	150	-50	175	Gas	•	✓
78PT	-50	350	-50	400	Gas	×	✓
78QT	0	200	-50	225	Gas	•	✓
78RT	0	400	-50	400	Gas	×	✓

✓ = available × = not available • = available if housing temperature does not exceed maximum

Main Applications

A **world leader** in temperature switches, Rototherm has become the standard for accurate and reliable measurement across the following industries:



Power
Generation



Oil & Gas



Pharmaceutical



Chemical,
Petrochemical &
Refining

More Technical Information

Scale Accuracy & Setpoint Calibration:

A 0-100% scale is fitted to all switches and provides an approximate indication of the setpoint relative to the range of the switch. The scale is not intended for precise calibration purposes. For precise calibration the scale should be used for initial guidance and the final adjustment made against an instrument sufficiently accurate to meet the site requirements.

Combined Switching Errors & Maximum Working Temperature (MWT):

The sum of the average switching errors and the operating value repeatability will typically not exceed 0.3% of range span, at setpoints of 10%, 50% and 90% of span. The maximum working temperature of the temperature element is detailed in the range table.

Reset (Switching Differential):

There may be some variation in the reset throughout the range of the switch. The figure quoted on page 1 of this data sheet is the basic switching differential value expressed as a percentage of the span at a mid range setpoint.

Ambient Temperature Ratings:

Enclosures are rated for continuous use over the ambient temperature range -20°C to $+85^{\circ}\text{C}$, except where restricted by the min. or max. process temperature shown on the range selection table.

The use of a high T class will reduce the maximum ambient temperature. At T6 the maximum ambient temperature is 40°C for Exd, 65°C for ExnC and 75°C for Exia.

Exposure of the enclosure to direct sunlight should be such that the heat gain due to absorption of radiant energy does not cause the enclosure temperature to exceed the recommended maximum.

In addition it must be ensured that heat conduction from the process will not cause the switch enclosure to operate outside the stated ambient temperature limits. When using direct mounted switches at high temperatures, they should be fitted into a thermowell with a large 'T' length. Alternatively use a remote mounted switch.

Dimensions:

Housing 175 x 100 x 90 mm approx.

Gas Filled System:

The pressure in a gas filled system is dependent upon both the temperature of the bulb and the temperature of the fill outside of the bulb (in the capillary and pressure chamber). Consequently changes in ambient temperature will affect the switching point of the switch. This effect can be minimised by selecting the largest bulb and the shortest capillary.

Temperature Coefficient:

For a 150 x 12mm dia. bulb with a 1.5m capillary gas filled system the switching point will typically change by 1°C for each 10°C change in ambient temperature. An increase in ambient temperature will reduce the switching point.

Thermowells:

Rototherm can supply, with your Series 700 temperature switches, a wide range of thermowells for most applications. Please contact Sales support with your requirements.

Standards:

Pneumatic and Standard Model satisfy the requirements of the Low Voltage Directive 73/23/EEC as amended by directive 93/68/EEC by compliance with standards EN60947-1:1991 and EN60947-5-1:1991.

ATEX Model complies with standard EN60947-5-1:2004 in addition to the standards listed for hazardous area certification.

Exd SWITCHES (Cert. No: Baseefa07ATEX0055X)
Enclosures are certified Exd IIC T4/T5/T6 to EN 60079-0 & EN 60079-1.

ExnC SWITCHES (Cert. No: BASEEFA14ATEX0183X)
Enclosures are certified ExnC IIC T4/T5/T6 & IP66 100°C to EN60079-0 & EN 60079-15.

Exia SWITCHES (Cert. No: Baseefa06ATEX0231X)
Enclosures are certified Exia IIC T5/T6 to EN 60079-0 & EN 50020.

I.S. COMPATIBLE Series 700 switches are classified as simple apparatus, allowing use in an I.S. circuit without individual certification.

Ordering Information

Temperature Switch	STANDARD →	78DT	1	14	1	XX	12	XX	NPT
Range Code	78DT	78DT							
	78NT	78NT							
	78PT	78PT							
	78QT	78QT							
	78RT	78RT							
Certification	Standard		1						
	ExnC		3						
	Exd IIC T4/T5/T6 (Flameproof)		5						
	Exia IIC T5/T6		6						
	Simple Apparatus I.S. Circuits		7						
	Pneumatic		8						
Housing Material	Aluminium Housing with Epoxy Hardened with stoved enamel finish			14					
	Austenitic stainless steel housing with self finish			44					
Bulkhead Connections	1/8" NPT int. or M20 x 1.5 top cable entry*				1				
OR	Nut & Olive for 1/4" outside diameter (o.d.) tube or 2x M20 x 1.5 cable entries*				2				
Electrical Connections (ATEX)	Nut & Resilient Seal for 1/4" or 6mm (o.d.) tube or 1/2" NPT INT. top cable entry*				6				
	Nut & Olive for 6mm (o.d.) tube or 2x1/2" NPT INT. cable entries*				7				
Output Switch	See tables on next page: 1 for Pneumatic Model / 2 for ATEX & Standard Model					XX			
Bulb Diameter	12 mm.						12		
Bulb Length	in mm.							XX	
Temperature System -									
Direct Mounting Thread	1/2" NPT Male								NPT
OR	1/2" BSP.T Male								BSP
	in metres								XX
Capillary Length (in m)									

For any other options, please contact us sales@rototherm.co.uk or +44 (0)1656 740551

STANDARD & ATEX MODEL

Notes on Output Switch Selection:

- Gold contact microswitches are especially well suited for low voltages and currents, or for applications with low switching frequencies or sulphurous atmospheres. When heavier loads need to be switched preference should usually be given to silver contacts.
- The use of twin switches will increase the basic reset by 1%. The combined reset band must not exceed 7%.
- When twin switches are set up to operate as DPDT, simultaneous operation on both rising and falling pressures cannot be guaranteed due to mechanical variations between individual microswitches.
- The use of output switch codes 1A, 2A, 1B and 2B will increase the basic reset by 3%.
- Output switch code 01 cannot be used with an enclosure having two electrical entries. Numbered bullet

General Notes for all models:

- The preferred mounting attitude of these switches is with the centreline of the switch vertical. The bulb on the remote mounted switches (with a capillary) can be mounted at any attitude.
- At the preferred mounting attitude dust and weatherproof ratings are IP66 to BS EN 60529 (IEC 60529).
- For direct mounted switches the bulb length dimension is taken from the bottom of the tapered mounting thread to the end of the bulb. This is commonly referred to as the 'U' length.

PNEUMATIC MODEL

Notes on Output Switch Selection:

- Output codes 61, 64 and 81 are 3 port valves. These have a separate pilot bulkhead in addition to the 3 bulkheads for the valve. Generally the centre bulkhead is the output and the other two bulkheads are the switched supply and the vent. Swapping these two connections determines if the output pressure is present on a falling or rising process pressure.
- Output codes 67 and 68 are two port valves, having a supply and output bulkhead. They are designed not to vent continuously (above or below the setpoint) and are particularly suited to operation using natural gas for the pilot supply. All other output switch codes have a continuous consumption of pilot gas in at least one state (above or below the setpoint). A bulkhead is provided to the switch enclosure that enables gas vented during operation of the valve to be piped away. The use of output switch codes 67 and 68 will increase the basic reset by typically 1%.
- Output code 71 is a two port valve, with two bulkhead connections, the pilot supply and the output.
- All output switches must be supplied with a clean, dry and filtered inert gas at the recommended pilot pressure for correct operation.

Table 1. Order Coding - Pneumatic Output Switches:

Order Switch Codes			
Code	Pilot Pressure	Output Switch Rating	Notes
61	3 to 8 bar	Vacuum to 8 bar	Pilot operated, spring return, 3 port sliding pool relay valve - fixed differential
64	2 to 8 bar	Vacuum to 8 bar	Pilot operated, bistable, 3 port sliding spool relay valve - adjustable differential (12% max.)
67	1 to 4 bar	As pilot	Non-bleed valve, Supply pressure fed forward above the setpoint (0/1) - fixed differential
68	1 to 4 bar	As pilot	Non-bleed valve, Supply pressure fed forward below the setpoint (1/0) - fixed differential
71	1.4 to 1.7 bar	As pilot	Pilot operated valve, switching supply on rising (0/1) or falling (1/0) setpoint - fixed differential
81	1.4 to 1.7 bar	0 to 2 bar	Pilot operated, spring return, 3 port diaphragm seal valve - fixed differential

Table 2. Order Coding - Standard & ATEX Output Switches:

Code	Twin Switch 2 x SPDT	Output Switch Rating	Contact Material	Notes
01	-	250/480 Vac 10A, 28 Vdc 4A	Silver	Adjustable differential microswitch (5 to 12% of span)
13	23	250 Vac 4A, 28 Vdc 2A	Silver	HNL standard low differential microswitches
14	24	125 Vac 800mA, 28 Vdc 800mA	Gold	
15	25	125 Vac 800mA, 28 Vdc 800mA	Gold	Environment free encapsulated low differential microswitches
17	27	250 Vac 4A, 28 Vdc 2A	Silver	
1A	2A	250 Vac 6A, 28 Vdc 2.5 A	Silver	HNL standard encapsulated microswitches

Technical Certification

- Certificate of conformity
- Factory Test Certificate
- Factory Calibration Certificate (3 point)
- Factory Calibration Certificate (5 point)
- Material Certificate

Export Documentation

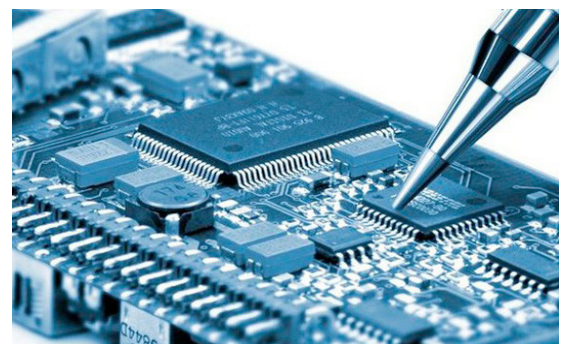
- Certificate of Origin
- EUR1
- ATR

Calibration and After-Sales Support

- Fully trained field service personnel
- Use of UKAS certified calibration equipment
- 5 day turnaround
- Fixed pricing
- Approved manufacturer parts
- Full post-service reports
- 12 month warranty



ISO9001:2015
FM11958



For more information, please contact our service team
services@rototherm.co.uk