

PED

PED Limited

150-383
TO
150-387

Thermostats

Series 75



small at this point. If the thermostat is directly over the heater, anticipation effects may be obtained.

This example may be applied just as appropriately to an oven, wax tank, vulcanizer, or other installation. The basic factors of location of the component parts of the system, and characteristics of the medium to be controlled, must all be carefully considered and then balanced.

The essential factor to remember is that the thermostat can react only to the temperature changes to which the shell is subjected.

Current Ratings

For all thermostats, non inductive ratings are as follows:-

- 5A at 240V AC
- 10A at 110V AC
- 2A at 30V DC
- 0.25A at 110V DC

Although the thermostat is a robust switching device its first function is in sensing the temperature to be controlled and if the contacts are subjected to unnecessarily arduous duties performance may be impaired.

Electrical Characteristics

DC applications

When direct current is to be switched a capacitor must be connected in parallel with the switch contacts.

Voltage rating of the selected capacitor should, for safety, be twice the applied voltage. If necessary with DC inductive loads a rectifier diode connected in reverse polarity across the load can be fitted.

Typical capacitor values are:-

- 2A resistive load at 30V DC...0.4 μ F
- 0.25A resistive load at 110V DC...0.01 μ F in series with 50 ohm resistor

Further details available from our Applications Engineering Department.

AC applications

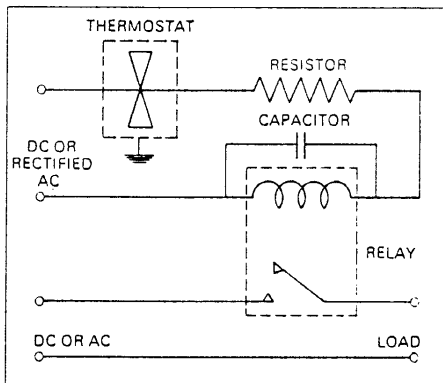
In most cases, where a 110V AC supply is used, a capacitor is not necessary, but we recommend for 240V AC supplies that a 0.1 μ F capacitor be used in parallel with the switch. The following capacitance values are recommended for the conditions stated:

- 110V AC resistive loads...no capacitor
- 240V AC resistive loads...0.1 μ F
- 110—240V AC operating relays, contactors...0.001 to 0.01 μ F
- 15—25V AC operating relays...0.02 μ F
- 110—240V AC operating motors...use a relay

Slave Switching

A relay is a useful component in a thermostat control circuit but due to

thermostat contact action the relay may in some applications not at first energise positively and contact chatter may result. This effect can be minimised by the fitting of a small value capacitor with an associated series resistor, as shown in the circuit diagram. A slugged relay may be used to advantage in these circumstances. The recommended resistor value is 50 ohms.



If it is required to use a contactor in conjunction with a PED thermostat, we again recommend the connection of a small value capacitor, 0.001 to 0.01 μ F across the switch terminals. In cases where the holding current may be high, please contact our Application Department for advice on the value of capacitor to be used.

Handling and Installation

Although the thermostat is robust and sturdy, it must be remembered that it is the outside shell which is the operating element, and distortion of the shell may affect the operation of the whole system.

For the same reason the thermostat must be installed so that free expansion of the shell is allowed and the maximum area is exposed to the medium to be controlled.

It should also be remembered that because the outer shell is the active control element, it is equally sensitive to radiant heat and direct contact heat (since, in its operation it does not rely upon conduction to the inside mechanism).

Note:

This range of thermostats is not hermetically sealed and care should be taken to prevent the ingress of media which could produce contact contamination.

The standard thermostats are not suitable for use in applications where there is a risk of explosion. For further information on such applications please contact our engineering department.

The use of solder and similar substances on the shell will not only lower the efficiency of the instrument,

Setting Instructions

Normally surface thermostats will be set to +40°C approximately and the cartridge thermostats to +22°C approximately.

For further adjustment the following procedures should be adopted.

1. Loosen the thread locking clamp screw.
2. Turn the temperature control screw to the approximate temperature setting.
 - (i) For surface types, one complete turn in a clockwise direction will raise the operating temperature by 100°C (200°F).
 - (ii) For cartridge types one complete turn in an anti-clockwise direction will raise the operating temperature by 40°C (72°F).
3. Tighten the thread locking clamp screw to secure high torque, but not enough to jam the temperature control screw.
4. Install the thermostat and check setting under working conditions.
5. Make final adjustment by forcibly rotating the temperature control screw.

Excess Temperature Cartridge Thermostats

These thermostats must not be subjected to temperatures of more than 55°C (110°F) in excess of the set-point otherwise permanent damage to the unit may result.

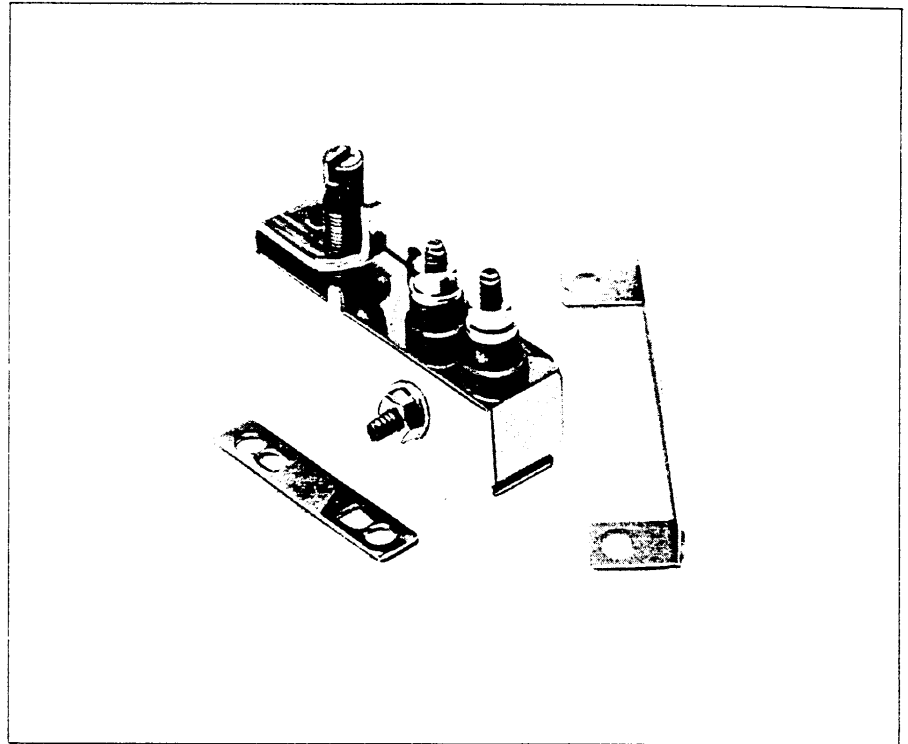
Surface Mounting Thermostats

These thermostats must not be subjected to temperature in excess of 350°C (662°F) or less than -10°C (14°F).

Thermostats

Surface Mounting

- High sensitivity
- High switching capacity
- Adjustable over full operating range
- Stainless steel construction
- Easy installation
- Short reaction time
- Optional method of mounting



Mechanical Specification

Temperature range
40°C to 300°C

Excess Temperature
These thermostats must not be subjected to temperature in excess of 350°C (662°C) or less than -10°C (14°F).

Switching differential
±0.5°C approx. on light non-inductive loads.
±2°C approx. switching 4A at 240V AC

Mounting
The thermostat is fixed in position on the surface being monitored using the clamp or bracket provided.

Important
It is essential for correct operation to only tighten bracket fixing screws sufficient to allow the thermostat case to expand and contract. (See page 4).

Terminations
Connections to the thermostat contacts and earthing points are made by the 6-32 UNC studs shown in drawing. (See page 4).

Electrical Specification

Contact Rating (non inductive)
5A at 240V AC
10A at 110V AC
2A at 30V DC
0.25A at 110V DC

Contact Operation
Open on rise of temperature

Suppression

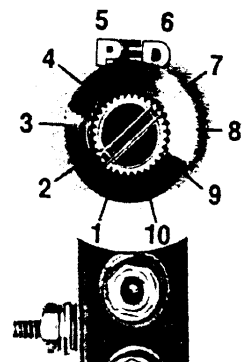
Options

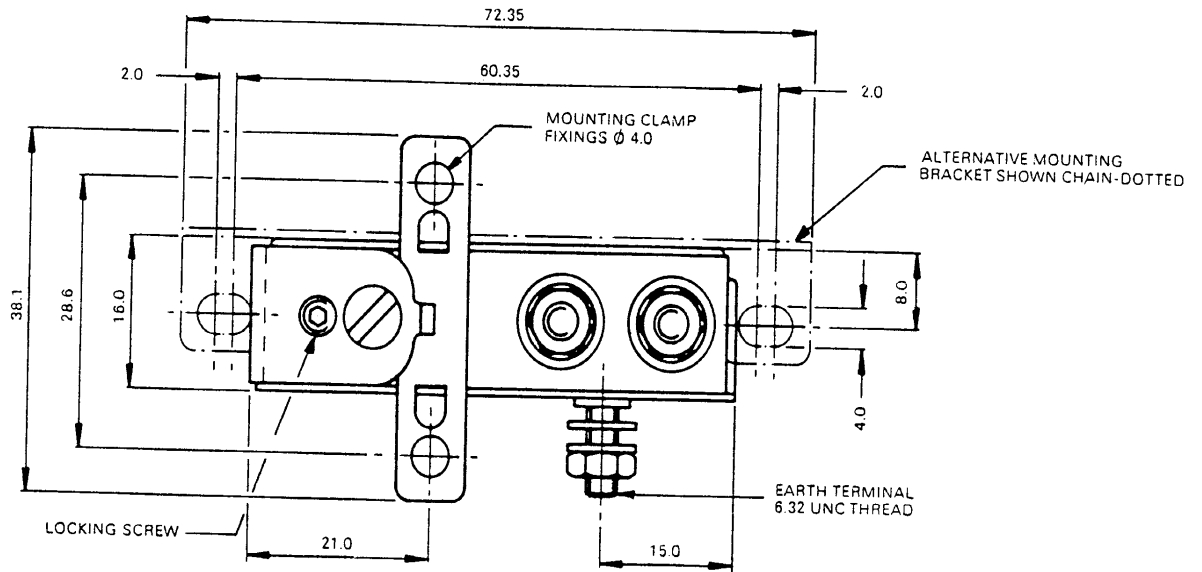
Temperature Setting

Thermostats are normally supplied to switch at +40°C approximately. If requested thermostats can be set at the factory within the temperature range +40°C to 300°C. The normal method of setting is by fixing to a heat conducting platen. Due to the differing conditions in which the thermostat may be required to operate, we prefer to regard this adjustment as an aid to the application, so that only a small correction is necessary to bring the operating point to the desired temperature when finally installed in a customer's equipment. The adjusting screws are clamped after setting. (See page 2).

Knob and Dial

A knob and dial can be supplied for surface mounting thermostats. The dial is marked 0-10 and is normally supplied so that the knob travel is limited to approximately 350°.





NOTE
BRACKET FIXING SCREWS SHOULD ONLY BE LIGHTLY TIGHTENED
TO ALLOW THERMOSTAT CASE TO EXPAND AND CONTRACT.

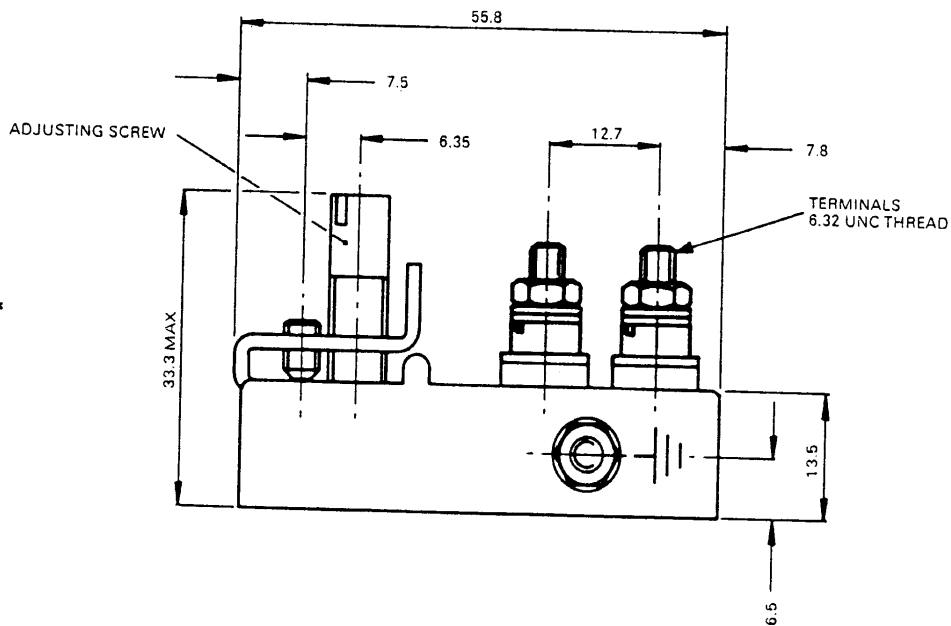


Table 1.

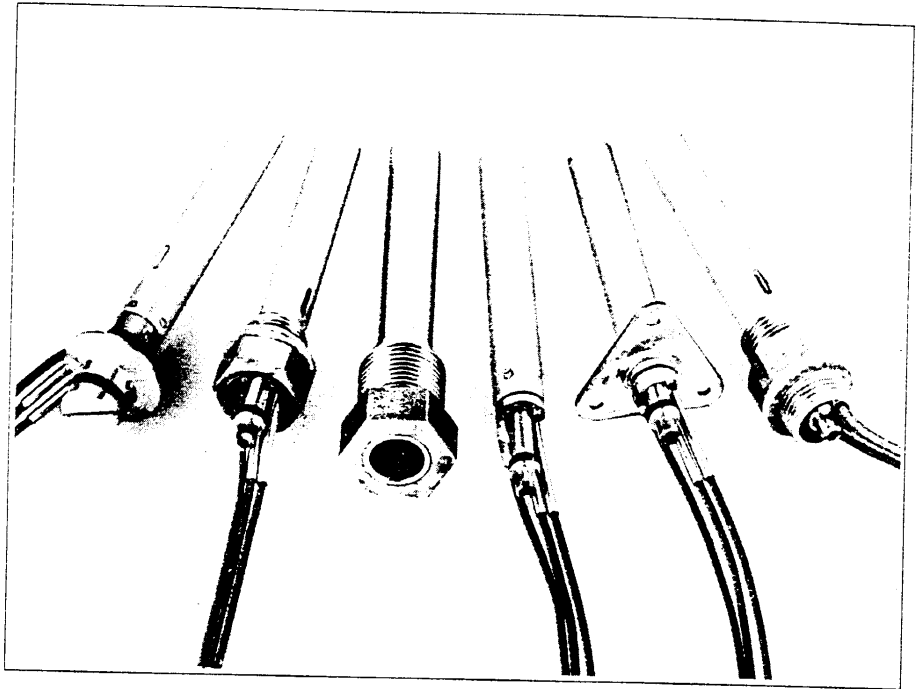
Thermostat Description	Temperature Range	Contact Action Below Set-point	Ordering Code
Surface Mounting Stainless Steel Body with Mounting Clamp and Bracket	+40°C to +300°C	Normally closed	75 100

Table 2. Accessories

Description	Ordering Code
Knob and Dial Assembly for Surface Mounted Thermostats	75 004 160 011

Thermostats Cartridge Type

- High sensitivity
- High switching capacity
- Adjustable over full operating range
- Choice of mountings
- Easy installation
- Choice of sizes
- Short reaction time
- Availability of options



Mechanical Specification

Temperature range
Brass shell -70°C to $+200^{\circ}\text{C}$
Stainless steel shell $+40^{\circ}\text{C}$ to $+300^{\circ}\text{C}$

Excess Temperature
These thermostats must not be

Options

Temperature Setting

Thermostats are normally supplied to switch at $+22^{\circ}\text{C}$ approximately. Thermostats can be temperature set at the factory to a customers

Straight Pattern Types

The standard straight pattern unit is designed for insertion into a reamed hole drilled directly into the container of the medium to be controlled. To prevent the cartridge from rotating when the adjusting sleeve is turned, the hole should have a slot into which the pin projecting from the cartridge shell can be located. This pin is also used for location purposes when the cartridge is inserted into a thermowell. The diameter of the mounting hole should be $16.1\text{mm} \pm 0.05$.

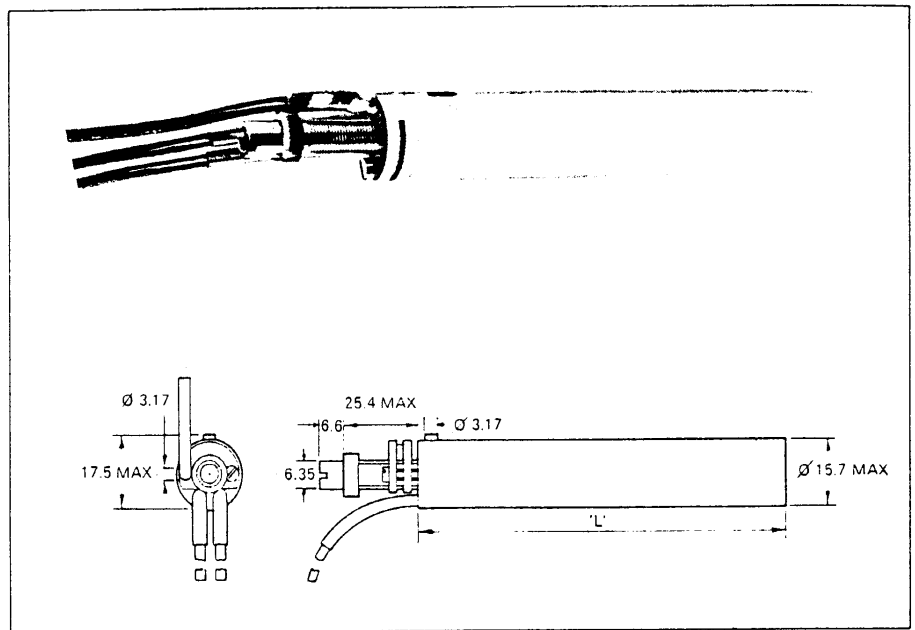


Table 3.

Thermostat Description *	Shell Length 'L' mm	Temperature Range	Contact Action Below Set-Point	Ordering Code
Straight Pattern Brass Shell	79.4	-70°C to +200°C	Normally Closed	75 200 111 611
Straight Pattern Brass Shell	93.7	-70°C to +200°C	Normally Closed	75 200 121 612
Straight Pattern Brass Shell	93.7	-70°C to +200°C	Normally Open	75 200 121 512
Straight Pattern Stainless Steel Shell	79.4	+40°C to +300°C	Normally Closed	75 200 211 621
Straight Pattern Stainless Steel Shell	93.7	+40°C to +300°C	Normally Closed	75 200 221 622
Straight Pattern Stainless Steel Shell	93.7	+40°C to +300°C	Normally Open	75 200 221 522

*Fitted with 200mm lead length.

Flanged Pattern Types

The flanged pattern has three holes to facilitate mounting against any flat surface. This method of mounting permits the temperature sensitive shell of the unit to be inserted fully into the medium, while the lead wires and adjusting sleeve remain accessible.

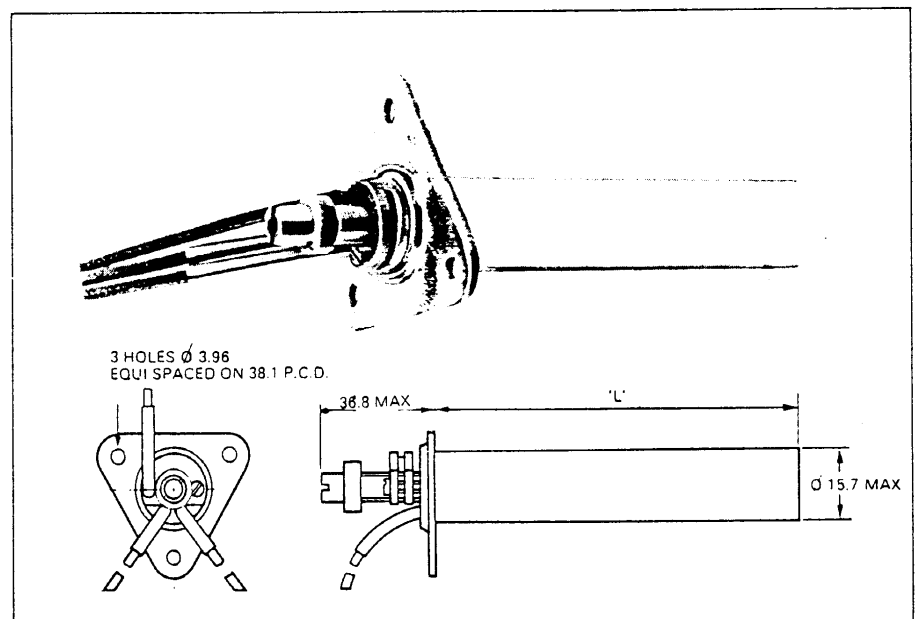


Table 4.

Thermostat Description *	Shell Length 'L' mm	Temperature Range	Contact Action Below Set-Point	Ordering Code
Flanged Pattern Brass Shell	76.2	-70°C to +200°C	Normally Closed	75 200 113 611
Flanged Pattern Brass Shell	90.5	-70°C to +200°C	Normally Closed	75 200 123 612
Flanged Pattern Brass Shell	90.5	-70°C to +200°C	Normally Open	75 200 123 512
Flanged Pattern Stainless Steel Shell	76.2	+40°C to +300°C	Normally Closed	75 200 213 621
Flanged Pattern Stainless Steel Shell	90.5	+40°C to +300°C	Normally Closed	75 200 223 622
Flanged Pattern Stainless Steel Shell	90.5	+40°C to +300°C	Normally Open	75 200 223 522

*Fitted with 200mm lead length.

Hexagon-Head Pattern Types

These units are supplied with a 1/2 inch B.S.P. thread. This allows the cartridge to be inserted directly into the medium either through a tapped hole in the container casing or, if the casing is thin, into a suitable boss. As with the flange pattern types, the adjusting screw and lead wires remain accessible.

Tighten to a torque of approximately 20 ft lbs.

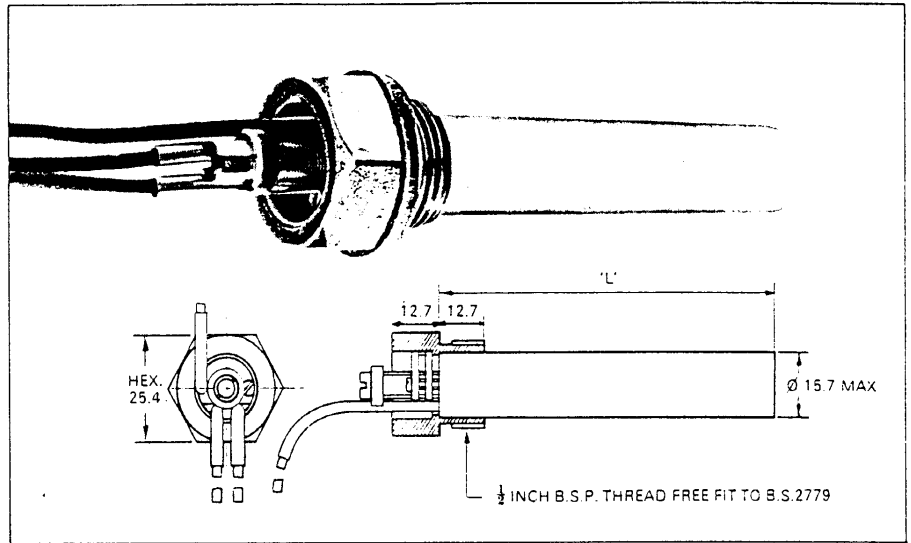


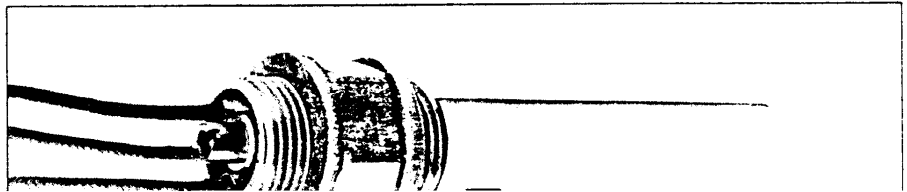
Table 5.

Thermostat Description *	Shell Length 'L' mm	Temperature Range	Contact Action Below Set-Point	Ordering Code
Hex-Head Pattern Brass Shell	79.4	-70°C to +200°C	Normally Closed	75 200 112 611
Hex-Head Pattern Brass Shell	93.7	-70°C to +200°C	Normally Closed	75 200 122 612
Hex-Head Pattern Brass Shell	93.7	-70°C to +200°C	Normally Open	75 200 122 512
Hex-Head Pattern Stainless Steel Shell	79.4	+40°C to +300°C	Normally Closed	75 200 212 621
Hex-Head Pattern Stainless Steel Shell	93.7	+40°C to +300°C	Normally Closed	75 200 222 622
Hex-Head Pattern Stainless Steel Shell	93.7	+40°C to +300°C	Normally Open	75 200 222 522

*Fitted with 200mm lead length.

Coupling-Head Pattern Types

The coupling-head feature is primarily intended for temperature control of closed gas or liquid systems. The pipe thread is 1/2 inch B.S.P. and can be screwed directly into a tapped hole or boss in the container wall. The



Accessories

Thermowell

for use with Straight Pattern
Thermostats

Manufactured of stainless steel. Thermowells provide a protective shield for cartridge thermostats in applications wherein pressure may exceed 30lb/in² (2kg/cm²) or in which brass shelled thermostats may come into contact with corrosive fluids or where a risk of unwanted electrolytic action may exist. Further advantages are: protection from external damage and elimination of the need to drain the container before withdrawing the thermostat.

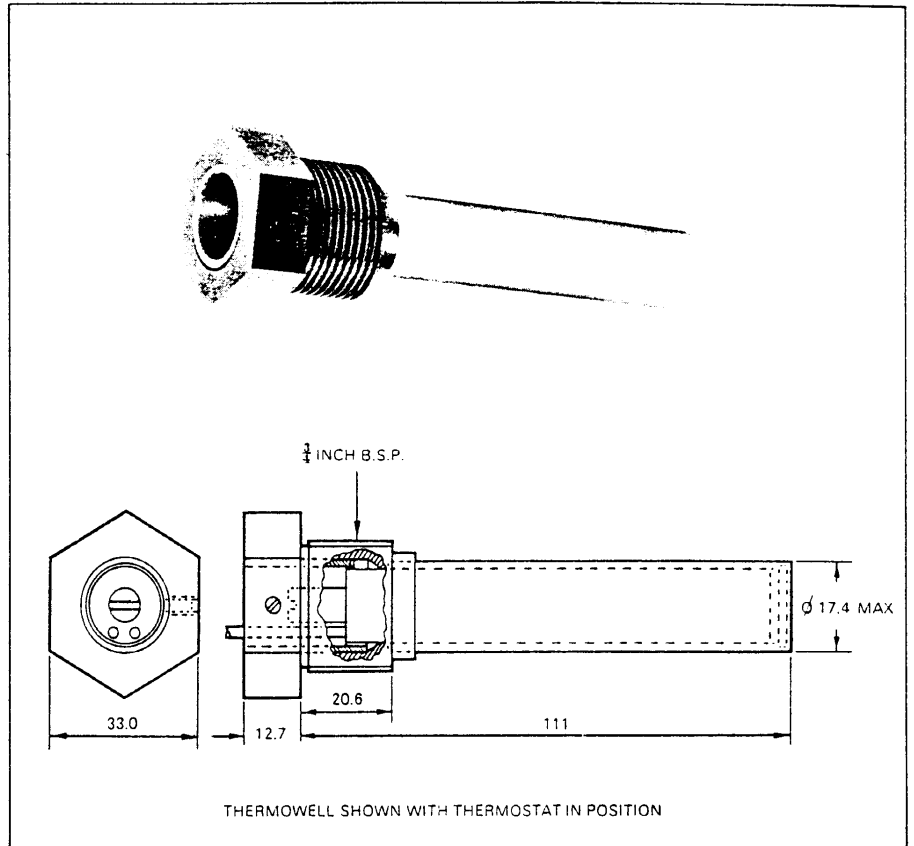


Table 7.

Description	Ordering Code
Thermowell Stainless Steel Protective Shield	75 300 * * * * *
Knob and Dial for Straight and Flanged Cartridge Thermostat	75 004 160 010

Ordering Information

See Tables and Description.

All dimensions in Millimetres.

PED reserve the right to change without prior notice the information contained in this brochure, whilst every effort is made to ensure details are correct at time of print. PED cannot be held responsible for any errors contained within.

Health & Safety at Work etc., Act 1974

Some of our products are capable of being operated by and capable of switching high voltages and/or currents. Care must therefore be exercised in the use of such products.



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