



## INSTRUCTIONS FOR TEMPERATURE SWITCHES – VAPOUR PRESSURE SERIES 720, 730 & 770

**(Models 721, 723 & 781; 731, 733 & 734; 771, 773 & 774)**

### GENERAL

The unit is manufactured, checked and supplied in accordance with our published specification, and when installed and used in normal or prescribed applications, with the lid in place and within the parameters set for mechanical and electrical performance, will not cause danger or hazard of life or limb.



within the system is proportional to the applied temperature. This pressure is applied to a bellows which transmits a force, proportional to the temperature, to an operating beam. The beam is restrained by an adjustable spring. When the force on the beam overcomes the spring tension the beam moves and operates a switch or switches. On reduction of the applied temperature, the force applied to the beam also falls, the beam is restored to its original position by the spring and the switch resets.

### INSTALLATION

The instruments are designed to be mounted direct to process (rigid stem) or to a wall or panel using the mounting plate provided (Capillary type). Select the mounting point so as to avoid excessive shock, vibration or temperature fluctuation. Instruments should be mounted to avoid excessive heat transfer from the process lines or adjacent plant. In humid environments where the ambient temperature may fall below 0°C, precautions should be taken to prevent ice formation within the instrument from jamming the mechanism

#### *Capillary Version*

The semi rigid stem is fitted with a sliding compression gland to accommodate different thermowells.

When fitting the instrument lid make sure gaskets and 'O' rings are in good condition and fitted correctly.

#### *Rigid Stem*

The rigid stem is provided with a sliding compression gland for fitment to thermowell. For rigid stem version it is recommended that a portion of flexible conduit be used to prevent undue stresses being applied to the unit.

### WARNING

**Check the connection thread size and specification of the unit to avoid mismatching with the process connection adaptor.**

### HEALTH AND SAFETY AT WORK

#### WARNINGS

1. The users attention is drawn to the fact that, when the unit is "live" with respect to electrical, a hazard may exist if the unit is opened or dismantled.
2. Units must be selected and installed by suitably trained and qualified personnel in accordance with appropriate codes of practice so that the Possibility of failure resulting in injury or damage Caused by misuse or mis-application is avoided.

### OPERATING PRINCIPLE

A closed system containing an equilibrium of liquid and vapour of a suitable, volatile chemical or gas is used to sense the process temperature. The pressure

## WIRING (Fig.1)

Terminations from the switches are identified as NC, COM, NO for each switch. Use cable no larger than 1.5 mm sq. 14A WG) and wire in accordance with standard engineering practices. Ensure electrical connection through a suitable cable gland which will maintain the weatherproof / flameproof rating of the Instrument. Insert bare wires fully into the terminal block and tighten securely. Keep wiring tails to a minimum and check that wires do not interfere with the operating mechanism. Earth the Instrument, using the point provided.

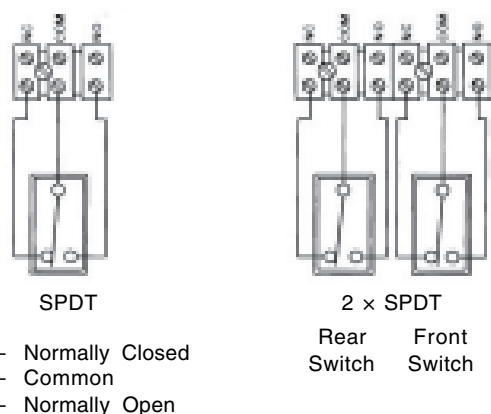


Fig.1

## CERTIFIED ENCLOSURES — 720, 730 & 770 Series

All Series Temperature Switches shall be supplied with certified enclosures to the following standards:

**GM / GA** — Weatherproof to IP:66 IS 2147

**GK** — Flameproof cum weatherproof (Die cast Aluminium) CMRI approved to GR.IIA & IIB of IS 2148 1981 and weatherproof to IP:66. GR.IIC Hydrogen Service optional.

The corresponding International code, applicable to CMRI certificates shall also be included.

## MAINTENANCE

Inspection should be carried out at quarterly to yearly intervals depending upon the operating conditions.

Isolate the unit from the process and power and remove the lid. Check all terminals for tightness. Check tails are not fouled or chafed. Check for internal condensation. Rectify as necessary.

It is recommended that instruments used to provide an alarm are operated periodically to ensure they are functioning correctly. If further maintenance is required, seek advice from SWITZER before attempting repair or replacement of parts.

### GK – Flameproof Enclosures

Threading and contact surfaces must be lightly lubricated using a non-setting, non-corrosive anti-seize compound compatible with the Nitrile lid seal such as Molybdenum

di Sulphide spray. Do not use copper bearing grease on aluminium. Screw on lid hand tight making sure that mating surfaces of the lid and enclosure are in contact. Re-tighten the lid lock screw.

## WARNING

It is a safety requirement that at least 5 full threads are engaged when the unit is in operation. Never operate the unit unless this condition is met. Do not use grease or lubricants not compatible with the environment or process.

## GM / GA Weatherproof — Enclosures

If lid gasket is dried out or damaged, replace with new greased gasket.

## OPERATION

Temperature switches are supplied calibrated against falling temperature unless otherwise specified. Setpoint adjustment refers to falling temperature. Switching differential is the difference between setpoint and the operating value on rising temperature.

Refer table for details of Thermal System and Functional features.

Instrument Model	Thermal System	On-Off Differential
721 / 771	Flexible Capillary + Armour	Fixed
723 / 773	Flexible Capillary + Armour	Adjustable
781 / 774 (Dual Setpoint)	Flexible Capillary + Armour	Fixed
731	Rigid Stem	Fixed
733	Rigid Stem	Adjustable
734 (Dual Setpoint)	Rigid Stem	Fixed

## Caution

For 720 & 730 Series, it is advisable to avoid the condition where the ambient temperature is within  $\pm 5^{\circ}\text{C}$  of the sensed temperature, as this will increase the switching differential.

When this situation can not be arrived opt for 770 Series.

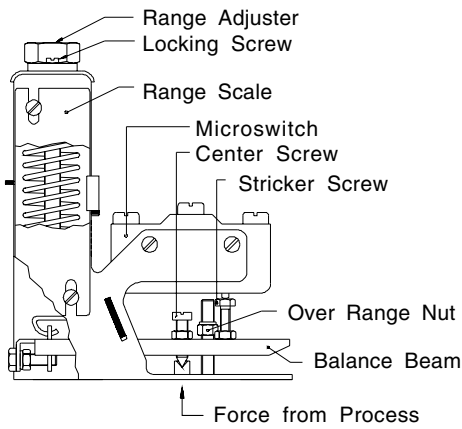
## SETPOINT ADJUSTMENTS

**For Models 721 / 731, 771 / 773 / 723 / 733 (Fig.2)**

1. Isolate the instrument from the power supply.
2. Remove the instrument lid.
3. Loosen the locking screw. (Near range adjuster knob)
4. Rotate the 20mm A/F hexagon head range adjuster knob to move the indicator along the calibrated

scale. Rotate clockwise to increase the setpoint and counter clockwise to decrease the setpoint.

5. Retighten the locking screw taking care not to over-tighten.
6. Replace the instrument lid.

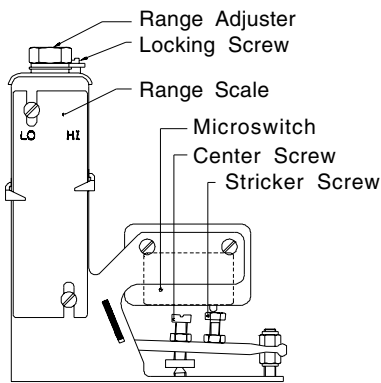


**Fig.2**

**For Models 781 / 734 / 774 (Fig.3)**

Models 781 and 734 are provided with two micro switches which can be set independently against individual scales using special dual beam mechanism. This fulfills the need for HI-LO switching. Adjust as follows.

1. Isolate the instrument from the power supply.
2. Remove the instrument lid.
3. Loosen the M3 locking screw (near the adjuster knob).
4. Rotate the rear adjuster knob to move the Indicator on the right hand (HI) calibrated scale. Rotate clockwise to increase the setpoint and counter clockwise to decrease the setpoint.
5. Rotate the front adjuster knob to move the indicator on the left hand (LO) calibrated scale. Rotate clockwise to increase the setpoint and counter clockwise to decrease the setpoint.
6. Tighten the locking screw.
7. Replace instrument lid

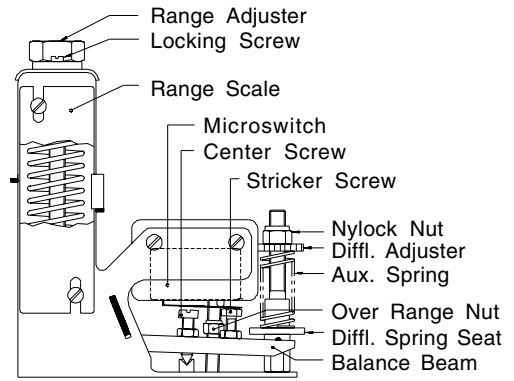


**Fig.3**

**SWITCHING DIFFERENTIAL ADJUSTMENT**

**For Models 723 / 733 (Fig.4)**

1. Isolate the instrument from the power supply.
2. Remove the instrument lid.
3. Rotate the differential adjuster knob in the clockwise direction to increase the differential and counter clockwise to decrease the differential.
4. Replace the instrument lid.



**Fig.4**

**GENERAL PRECAUTIONS**

**Ensure that**

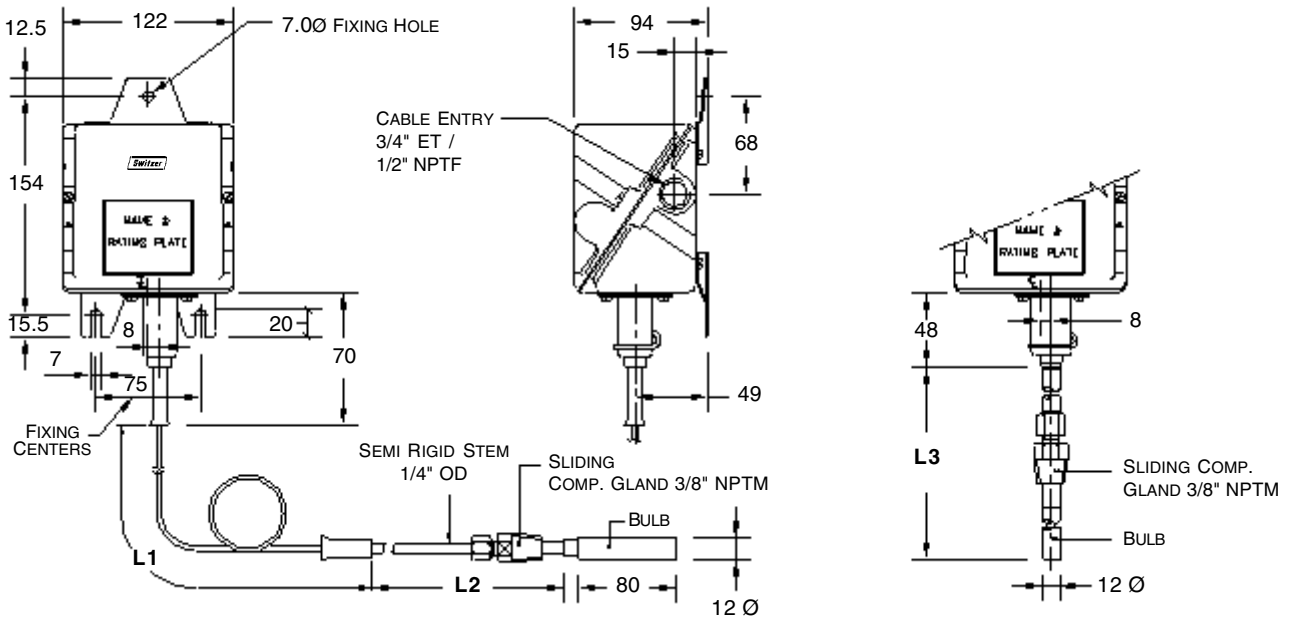
1. Correct positioning of gaskets when covers are fixed.
2. Electrical entries and cables are properly sealed with correct cable gland and gasket.
3. Process temperature should not exceed the specified maximum working temperature.
4. Connected electrical load never exceeds declared maximum electrical capacity both in Amperes and Volts.
5. The sliding compression gland is tightened fully after ensuring that the immersion length is maintained, as varying the immersion length is impossible once compression gland is fully tightened due to crimping of the olive in the gland.
6. A master gauge of accuracy more than  $\pm 0.5\%$  is to be used for setting accuracy will be the same as that of the master gauge used.
7. The lock screws are loosened before the range spring screw is operated and tightened again after the setpoint is achieved.
8. Outdoor installations are with sufficient protections against aggressive air, dust, temperature and water.
9. Instrument is mounted rigidly to avoid shock and vibration.

# MOUNTING DIMENSIONS

## WEATHERPROOF ENCLOSURE — STYLE 'GM'

MODELS 721, 723, 771, 773, 774 & 781

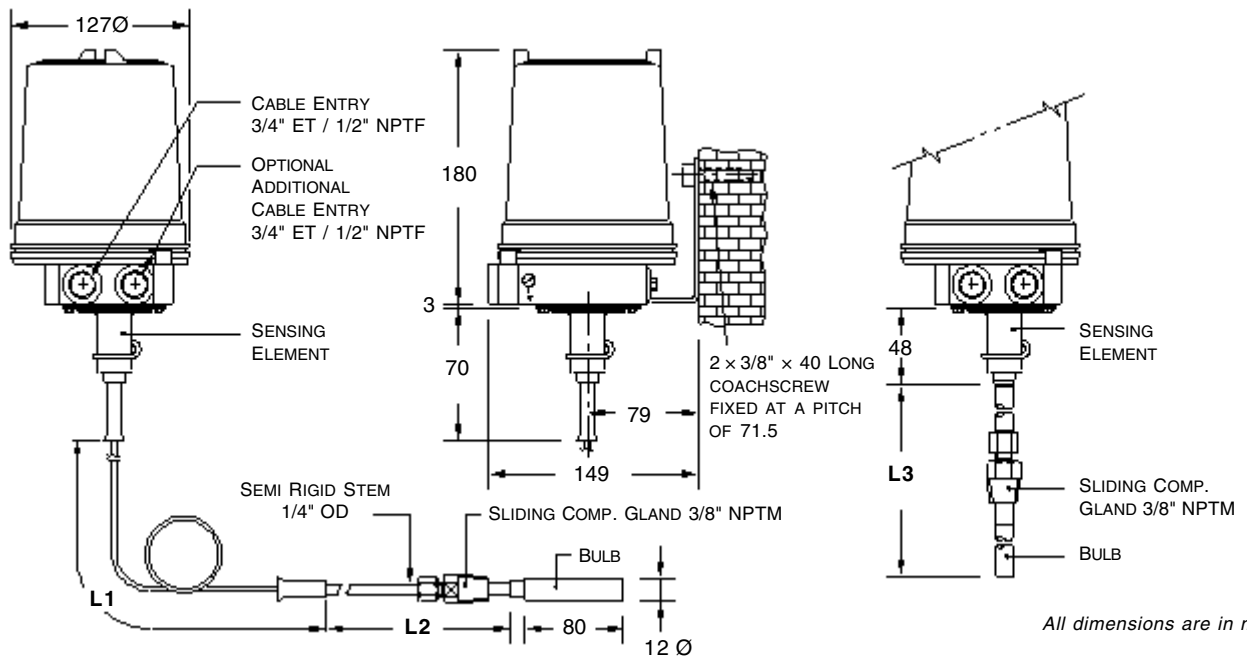
MODELS 731, 733 & 734



## FLAMEPROOF ENCLOSURE — STYLE 'GK'

MODELS 721, 723, 771, 773, 774 & 781

MODELS 731, 733 & 734



All dimensions are in mm

### NOTES:

- Dim L1, L2 varies depending on armoured capillary length
  - Use certified weatherproof cable gland for GM enclosure
  - It is mandatory to use certified flameproof cum weatherproof cable gland for flameproof enclosures.
- L1 — Length of armoured SS capillary 3 Mtrs. or 6 Mtrs.  
 L2 — Length of semi rigid stem 250 mm or 500 mm (excludes compression gland length)  
 L3 — Length of rigid stem including bulb 250 mm,



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