

# Averaging Temperature Sensor

## 133TMP

### INTRODUCTION

The 133TMP Averaging Temperature Sensor is designed to enable measurement of average temperature of product stored in bulk storage tanks.

The sensor consists of a number of insulated RTDs (Resistance Temperature Devices) of equal resistance located at fixed intervals along the sensor length. The lowest RTD is located 150 mm above sensor bottom.

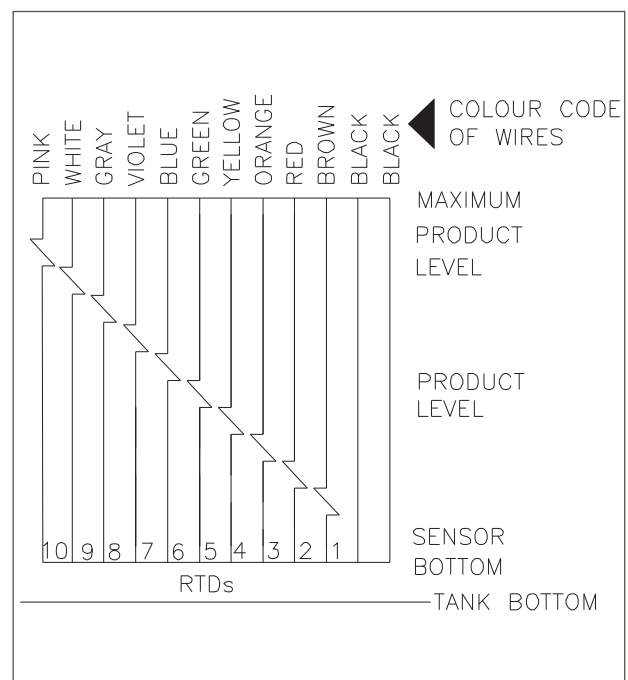
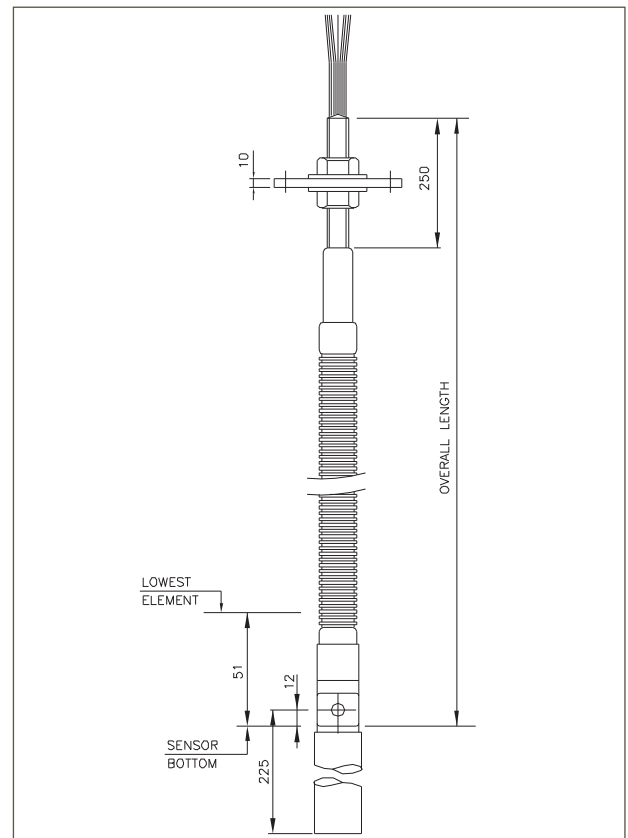
All RTDs are enclosed in a flexible SS 316 sheath.

The top fitting comprises a SS pipe with 250 mm length 1/2" BSP threads for the fine adjustment of sensor position on mounting flange.

A lock ring and nut are provided as standard.

The bottom fitting incorporates a lug for attaching a counter weight.

The sensor is connected to SBEM's Smart Tank Data Transmitter or Servo Gauge, which has an inbuilt RTD selector to select all RTDs immersed minimum 200 mm inside the product.



## SPECIFICATIONS

### MEASURING RANGE:

-20°C to +90°C

### RTDs:

Pt 100 grade A as per DIN 43760/ BS 1904. Accuracy over the range 0°C to 70°C is  $\pm 0.2^\circ\text{C}$

### RTD INTERVALS:

Choice of 1M, 2M or 3M intervals. (Refer table below)

### OVERALL LENGTH OF SENSOR:

Depends on tank height (see mounting diagrams)

Overall length = (A - 125 mm) for cone roof tank & floating Roof tank - mounting type 1

= (A - 425 mm) for floating roof tank - mounting type 2

### NO. OF RTDs:

Depends on maximum product level

### SHEATH:

Thin wall austenitic convolute tube in SS 316, which can withstand eternal pressures up to 25 Kg/cm<sup>2</sup>

### ELECTRICAL CONNECTION:

5 meter flying leads of colour-coded PTFE insulated wires protected by additional sleeving where they leave the sensor top. These wires are terminated in a junction box.

### APPLICABLE TRANSMITTERS:

Sensor can be connected to the SBEM's -

1. Smart Tank Data Transmitter, Model 133-35
2. Servo Gauge, Model 139M

Transmitter automatically selects all RTDs immersed minimum 200 mm inside product level & averages them.

### CABLING:

From Junction Box of Sensor to Transmitter - 1.5 mm<sup>2</sup> copper, armoured cable up to 7 core. One 7 core cable is sufficient for up to 5 RTD sensor, 2 cables are required if sensor RTDs are more than 5.

| RTD's<br>SELECTED | PRODUCT LEVEL (mm) |               |               |
|-------------------|--------------------|---------------|---------------|
|                   | 1M INTERVAL        | 2M INTERVAL   | 3M INTERVAL   |
| 1                 | 601 - 1600         | 601 - 2600    | 601 - 3600    |
| 1 TO 2            | 1601 - 2600        | 2601 - 4600   | 3601 - 6600   |
| 1 TO 3            | 2601 - 3600        | 4601 - 6600   | 6601 - 9600   |
| 1 TO 4            | 3601 - 4600        | 6601 - 8600   | 9601 - 12600  |
| 1 TO 5            | 4601 - 5600        | 8601 - 10600  | 12601 - 15600 |
| 1 TO 6            | 5601 - 6600        | 10601 - 12600 | 15601 - 18600 |
| 1 TO 7            | 6601 - 7600        | 12601 - 14600 | 18601 - 21600 |
| 1 TO 8            | 7601 - 8600        | 14601 - 16600 | 21601 - 24600 |
| 1 TO 9            | 8601 - 9600        | 16601 - 18600 | 24601 - MAX.  |
| 1 TO 10           | 9601 - MAX.        | 18601 - MAX.  | -             |

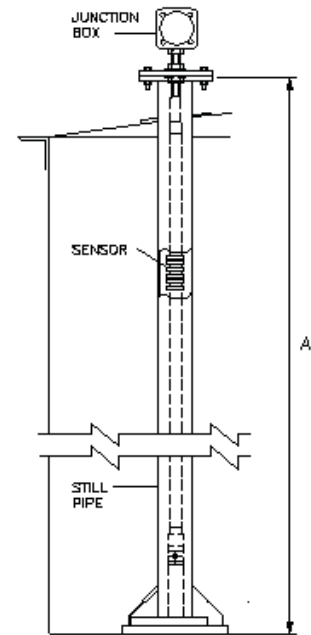
| FOR EXAMPLE: If product level is 7000 mm |               |
|--|---------------|
| RTD Interval                             | RTDs selected |
| 1 M                                      | 1 to 7        |
| 2 M                                      | 1 to 4        |
| 3 M                                      | 1 to 3        |

\* Note: For customized intervals, refer factory

## MOUNTING

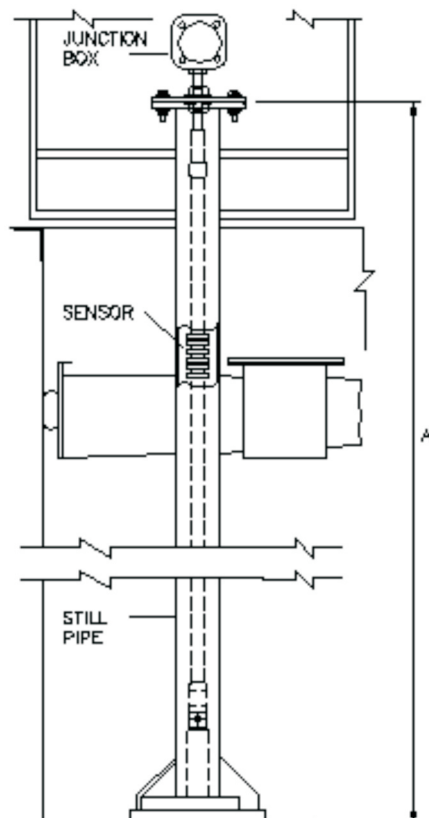
### ON CONE ROOF TANK :

On 2" ANSI B 16.5, 150 lb. FF flange on tank roof. A 2" still pipe \* is recommended but not essential. (accessories 2, 3 & 5 are required).

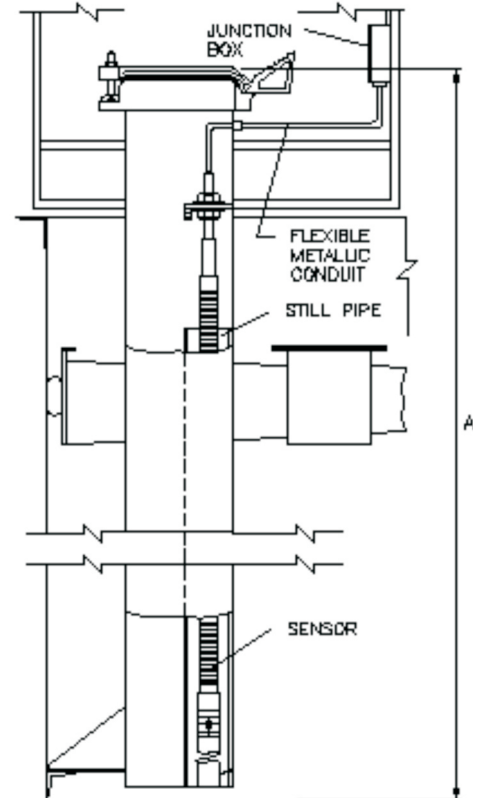


### ON FLOATING ROOF TANK : 2 types of mounting -

**Type 1** - On 2" ANSI B 16.5, 150 lb. FF flange with a 2" still pipe \* passing through the pontoon section of the floating roof. (accessories 1, 2, 3 & 5 are required).



**Type 2** - On a mounting plate welded above a 2" still pipe \* which is welded inside the 8" manual gauging pipe. (accessories 1, 2, 4 & 5 are required).



\* Still pipe extends to within 100 mm of tank bottom and has 2 rows of Ø 12.5 mm holes at 300 mm pitch.  
NOTE : Flange / Still pipe above 2" can be used with matching accessories.

## ACCESSORIES

### 1. JUNCTION BOX

Flame proof & weatherproof (cast Al. LM6) junction box for termination of temperature sensor wires & connection of cables to transmitter. This junction box has -

- (a) 13 nos. CST 2.5 terminals suitable for up to 2.5 mm<sup>2</sup> conductor.
- (b) ½" BSP (F) entry for fitting junction box on sensor top (on cone roof tank or floating roof tank - mounting type 1)  
For floating roof tank - mounting type 2, this entry is NPT for Fitting flexible metallic conduit carrying the wires of sensor.
- (c) 1 or 2 nos. ½" NPT (F) or ¾" UNF (F) entries for cable glands for cable to transmitter. 1 entry is sufficient for upto 5 RTD sensor, 2 entries are required if sensor RTDs are more than 5.

### 2. CABLE GLANDS

Flameproof & weatherproof double compression cable glands to suit entries on junction box & cable size.  
Material of construction - Brass (nickel-plated) / AL. / SS.  
specify gland connection size, cable OD & UAD (under armour diameter) & gland material.

### 3. FLANGE, GASKET & LOCK NUTS

(For installing sensor on cone roof tank or floating roof tank - mounting type 1)  
Flange - 2" ANSI B 16.5, 150 lb FF in CS.  
Gasket to match flange.  
Gasket material - AFR oil quality.  
2 nos. ½" BSP lock nuts to mount junction box on sensor top.

### 4. MOUNTING PLATE, SOCKET & FLEXIBLE METALLIC CONDUIT

(For installing sensor on floating roof tank mounting type 2)  
Mounting plate in CS suitable for 2" still pipe welded inside 8" manual gauging pipe.  
Socket in CS ½" NPT (F) to route wires of sensor to junction box.  
Flexible metallic conduit with wire braiding in SS - ½" conduit with ½" NPT (M) end fittings. (to protect wires of sensor & enable connection from socket on manual gauging pipe to junction box on handrail of gauger's platform).

### 5. COUNTERWEIGHT WITH FITTINGS

To keep the sensor hanging vertical. Length 225 mm, φ 45mm.  
Material of construction - CS / SS 304 / SS 316 (specify material).

## ORDERING CODE

| MODEL<br>133 TMP |  |      |  |              | AVERAGING TEMPERATURE SENSOR |              |  |                               |  |
|------------------|--|------|--|--------------|------------------------------|--------------|--|-------------------------------|--|
|                  |  | CODE |  | RTD INTERVAL |                              |              |  |                               |  |
|                  |  | 1    |  | 1 meter      |                              |              |  |                               |  |
|                  |  | 2    |  | 2 meters     |                              |              |  |                               |  |
|                  |  | 3    |  | 3 meters     |                              |              |  |                               |  |
|                  |  |      |  | CODE         |                              | NO. OF RTD's |  |                               |  |
|                  |  |      |  | 01 - 10      |                              |              |  |                               |  |
|                  |  |      |  |              |                              | CODE         |  | OVERALL LENGTH OF SENSOR (mm) |  |
|                  |  |      |  |              |                              | (5 digit)    |  |                               |  |
| 133 TMP          |  | 1    |  | 10           |                              | 16500        |  | TYPICAL MODEL NO.             |  |



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