Dpstar Group

Green Mark Precision Temperature Sensor

HVAC-R

Compliance With Ashrae Guideline 22:2015 And SS591:2015

MALTEC GREENMARK

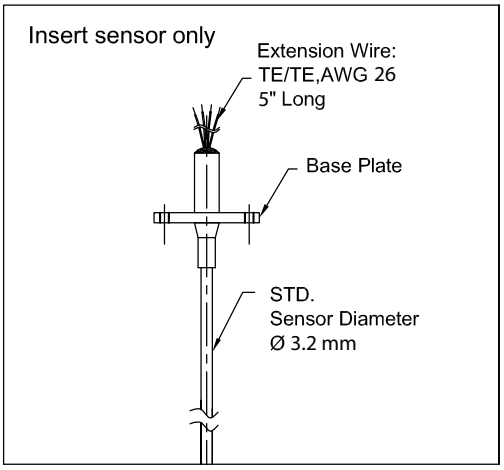
Certificate No.: MY06/00890

Certificate No.: MY06/0193

Maltec TX-25 is resistance thermometer designed for HVAC application. Exposed sensor tip will allow to get faster response from the process temperature and temperature readings are even more accurate based in sensor type. Thermowell will protect the sensor tip to get better accuracy at stable position rather than the vibration which can be occurred due to certain noise level of environment. It will also support the running process at certain period of changing sensor and test plug will play the essential role for thermowell to prevent the particles coming from outside of process into the thermowell during the absent of sensor.

Features

- Tailer made for HVAC application
- Assembled with vibration-proof
- Open-ended threaded thermowell for fast response and reliable sensor
- Manufactured as per SS591 (GREEN MARK STANDARD)
- PT100, $^{1}/_{10}$ (±0.03°C at 0°C) accuracy – IEC751
- NTC Thermistor 10K, ±0.05°C (0 to 50°C) accuracy and also available variance coefficients (A, B, C) upon request



Optional

- Stainless Steel Test Plug, max pressure 1000 psi (Brass Test Plug available upon request)
- Stainless Steel Ball Valve, max pressure 1000psi

Standard Lead Wire

All standard RTD sensor is stranded as Teflon insulation. Teflon insulated leads are rated at 200 °C Maximum.

Connection Head Type

Recommended to use polypropylene material rather than die cast aluminium in order to prevent heat loss which will cause when it is passing through the housing. Standard colour for polypropylene is white and die cast aluminium head is available as either blue or silver upon requested.

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The Calendar - Van Dusen Coefficients

A, B and C for a standard sensor are stated in IEC751. If a standard sensor is not available or if a greater accuracy is required then can be obtained from the coefficients in the standard, the coefficients can be measured individually from each sensor.

The simple coefficient can be determined as below,

$$R_T = R_0[1 + AT + BT^2 + (t - 100)CT^3] \quad (1)$$

In which C is only applicable when t < 0°C.

$$A = \alpha + \frac{\alpha\delta}{100}$$

$$B = \frac{-\alpha\delta}{100^2}$$

$$C = \frac{-\alpha\beta}{100^4}$$

According to this equation the error will be less then 0.03°C in the measurement of temperature between 0 to 50°C ranges.
Tolerance of PT 100, 1/10 DIN, as per IEC 60751.

Temp (°C)	Resistance (Ω)	Tolerance (±°C)
0.01	100.004	0.03
15.00	105.849	0.0375
29.765	111.581	0.0498

Thermistors are temperature sensors that are made from a variety of metal-oxide semiconductors materials. The semiconductors material used determines the temperature range, sensitivity and resistances ranges involved in its applications.

In order to achieve the accurate temperature reading, the resistance/temperature curve of the device also need to use the Steinhard-Hart equation and coefficients for approxmiation.

$$\frac{1}{T} = a + bIn(R) + c(In(R))^3$$

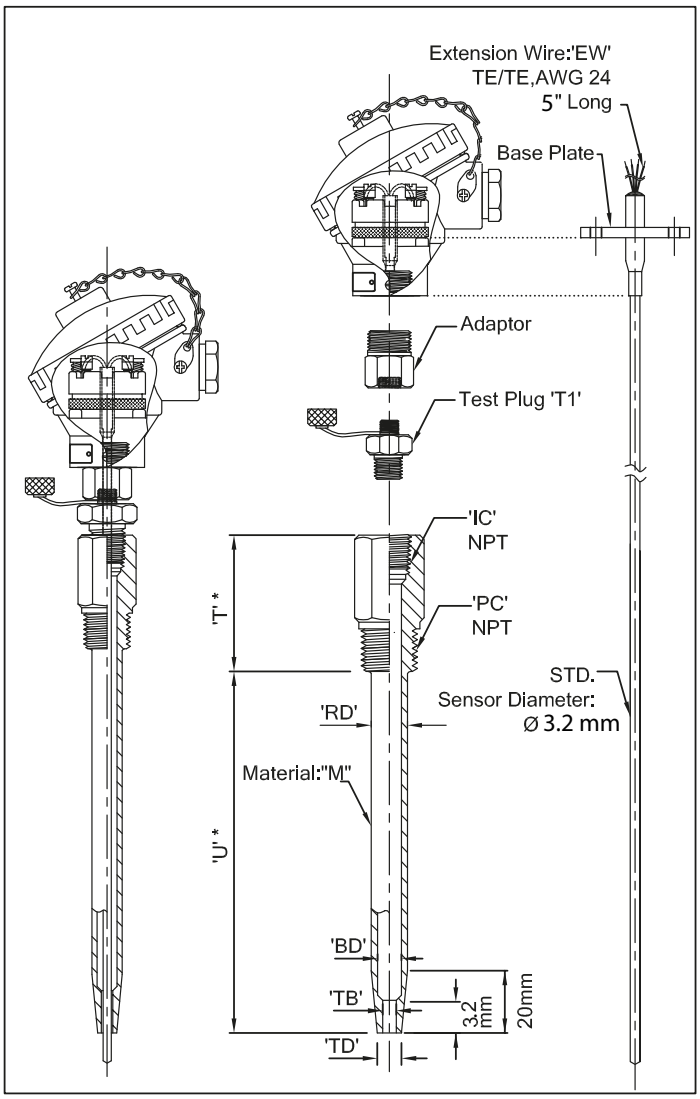
$$a = \left(\frac{1}{T_o}\right) - \left(\frac{1}{B}\right)In(R_o) \qquad b = \left(\frac{1}{B}\right) \qquad c = 0$$

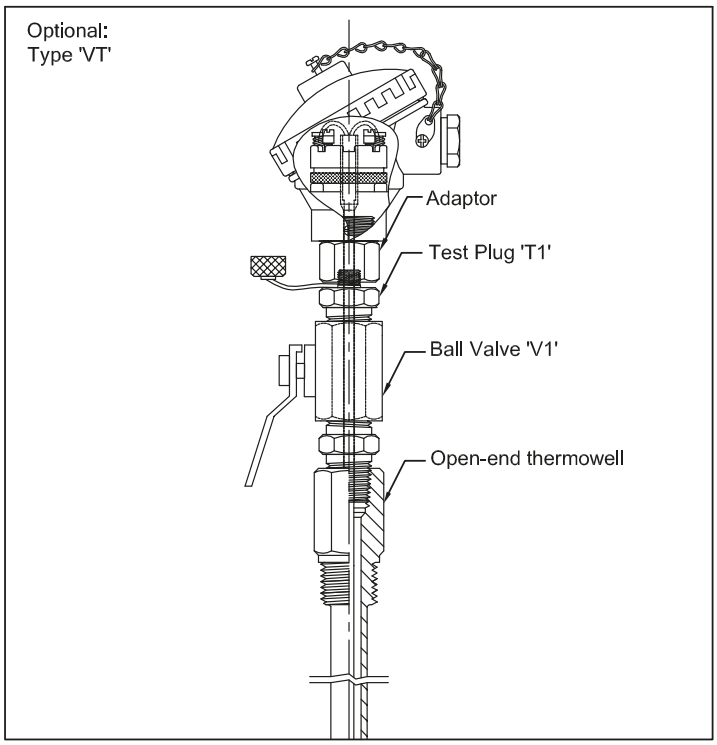
Where the temperature are in Kelvin and R_o is the resistance at temperature T_o (25°C=298, 15°K)
According to this equation the error will be less than 0.03°C in the measurement of temperature between 0 to 50°C ranges.

Resistance @+25°C = 10,000 Ohm (10k Ω) Nominal

Temperature coefficient @+25°C = -4.4%/°C

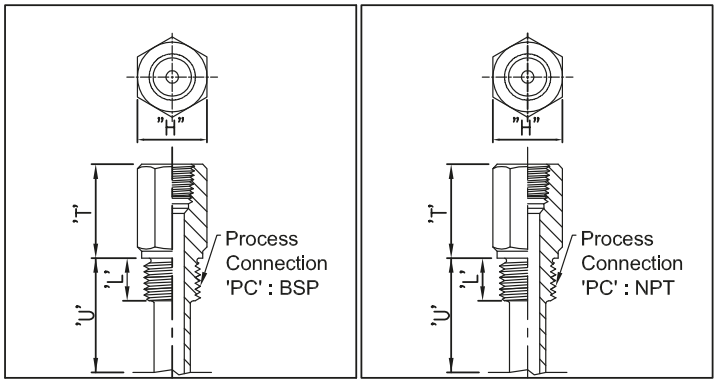
Temp (°C)	Resistance (Ω)	Tolerance (±°C)
0.01	32650	0.05
15.00	15711	0.05
29.765	8139	0.05





*For process connection type 'BSP'

*For process connection type 'NPT'



BSP :
(British Standard Pipe Thread)

NPT :
(National Pipe Thread)

Process Connection	Hex F/F Size:'H'	Thread Length:'L'
½" BSP	28.5 mm	14 mm
¾" BSP	31.75 mm	16 mm

Process Connection	Hex F/F Size:'H'	Thread Length:'L'
½" NPT	25.4 mm	19 mm
¾" NPT	28.5 mm	19 mm

U = Insertion length
T = Lagging length
BD = Bore diameter
TB = Tip bore diameter
RD = Root diameter
TD = Tip diameter
M = Material
PC = Process connection
IC = Instrument connection
V1 = Ball valve
T1 = Test plug
L = Thread length
EW = Extension wire

Process Connection,
NPT or BSP, measurement system of insertion length 'U' and lagging length 'T' will reflect upon the selected connection type.

Sensor Type													
R	RTD , PT 100 , 1/10 DIN , ±0.03℃ at 0℃												
10K	Thermistor 10 K , ±0.05℃ at (0 to 50℃)												
	Tolerance Type												
	1	± 0.03°C at 0 °C (For 1/10 DIN) , IEC 751											
	2	± 0.05°C at (0 to 50 °C) For Thermistor 10K											
		Sensor Sheath											
		PL1	Tubing-RTD-Ø 3.2 mm -Single-4 Wires-SS 316										
		PL2	Tubing-10K Thermister-Ø 3.2 mm -Single-2 Wires-SS 316										
			*Note: 10K Thermistor, 4 wires available upon request										
			Wire Junction										
			U	Ungrounded (Std for this design)									
				Complete design									
				TW	With Open-end Thread thermowell								
				NTW	Thermowell is not required								
				BP	Base plate and terminal block								
				W1	Epoxy holder and lead wire (TE/TE, AWG 26) , 125 mm (STD)								
					(Note : 150 mm , 200 mm , 250 mm and 300 mm are avaliable as option)								
					Process connection (PC)								
					PC1	1/2" NPT M							
					PC2	1/2" BSP M							
					-	Not Applicable							
					Other	Special version to be specified							
						Thermowell Stem Dimensions							
						TWL	Root Dia : Ø14 mm , Tip Dia : Ø10.5 mm , Bore Dia : Ø6.6 mm						
						-	Not Applicable						
						Other	Special version, to be specified						
							Thermowell Insertion Length/Sensor Length if thermowell is not require						
							XXXX	To be specified (e.g 0125 mm for 125 mm long)					
								Lagging length “T”					
								T	45 mm (STD)				
								Other	Special version to be specified				
									Accessories				
									T1	Test Plug Size : 1/4 " NPT M , Material : SS 316			
									V1	Ball valve Size : 1/4" NPT F , Material : SS 316			
									VT	Ball valve (V) and Test plug (T) , size : 1/4" NPT			
									-	Not Applicable			
									Other	Special version, to be specified			
										Housing / Enclosure			
										H1	Weather Proof , IP65, Polypropylene , White colour		
										H2	Weather Proof , IP65, Die Cast Aluminum , Blue colour		
										H3	Weather Proof ,IP 65, Die Cast Aluminum , Silver colour		
										-	Connection head is not required		
										Other	Special version to be specified		
											Accessories (from customer to assembly with)		
											PR	Head mounted transmitter	
											-	Not Applicable	
												Documents (Optional)	
												Calibration Certificate, Three points (0°C to 50°C)	
												1	SAM Accredited ISO17025 Calibration
TX-25													← Order Code
	1	2	3	4	5	6	7	8	9	10	11	12	13

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