

NTC Thermistors, Miniature Immersion Sensor



DESIGN SUPPORT TOOLS AVAILABLE



| QUICK REFERENCE DATA | | |
|---|-------------|----------|
| PARAMETER | VALUE | UNIT |
| Resistance value at 25 °C | 10K | Ω |
| Tolerance on R_{25} -value | ± 3 | % |
| $B_{25/85}$ -value | 3984 | K |
| Tolerance on $B_{25/85}$ -value | ± 0.5 | % |
| Operating temperature range at zero dissipation | -25 to +105 | °C |
| Response time $t_{63.2\%}$ of ΔT (air 25°C to water 85°C) | 1.5 | s |
| Dissipation factor δ | | |
| Mounted in still air | 2.8 | mW/K |
| In still water | 5.6 | |
| Maximum power dissipation at 55 °C | 100 | mW |
| Min. dielectric withstanding voltage between terminals and capsule (10 s) | 500 | V_{AC} |
| Insulation resistance at 500 V_{DC} | > 100M | Ω |
| Thermal gradient | < 0.02 | K/K |
| Weight | 2.1 | g |

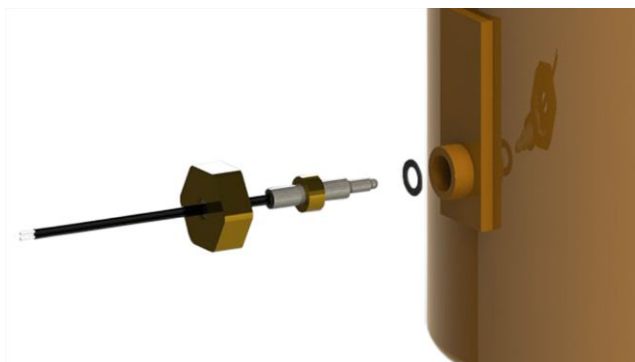


Fig. 1 - Mounting example with sealing ring and screw

FEATURES

- Fast time response for fluid immersion applications
- Reduced thermal gradient, due to the use of small tip dimensions and thin insulated wire
- Sensor for permanent contact with water or other liquids
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912



RoHS
COMPLIANT

APPLICATIONS

Immersion sensor used for temperature measurement, sensing and control in:

- Water boilers
- Heating systems
- Chiller systems
- Water and used water systems
- Water and oil tanks
- Consumer appliances, Coffee machines
- Industrial appliances
- Solar heating systems

DESCRIPTION

Miniature insulated chip NTC thermistor mounted in a SS304 housing with or without brass collar for sealed mounting and twin PVC insulated AWG#30 lead wire connection.

MOUNTING

- The sensor can be mounted by means of a sealing O-ring and screw
- The end wire can be soldered, or crimped to a connector
- Optional connector for Wire-to-Wire or Wire-to-Board connections
- The contact area with the liquid is preferably min 10 mm down from the tip and max to the brass collar location (see Fig. 1 for mounting example)
- Not intended for corrosive or high acidic liquids
- The epoxy lead-wire side can not be in permanent contact with liquids, or water

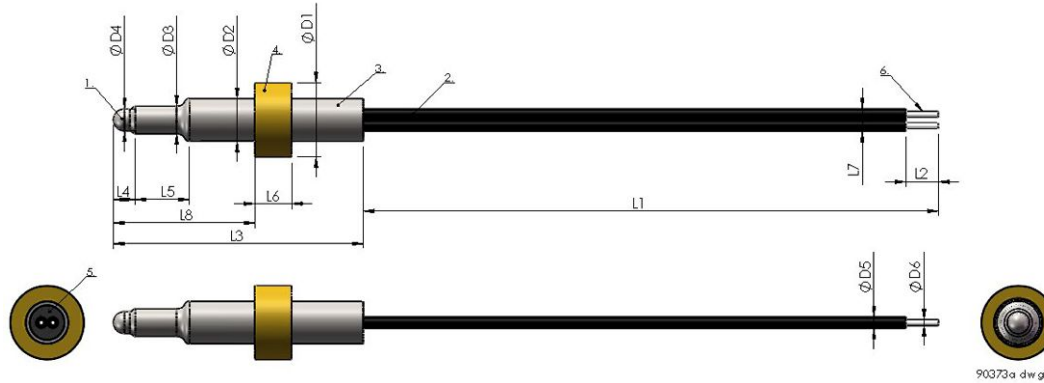
PACKAGING

Available in plastic bags of 250 pieces.

DESIGN-IN SUPPORT

- Other resistance curves and tolerances are available on request
- Consult Vishay for other lead length
- For complete RT curve computation, visit: www.vishay.com/thermistors/ntc-curve-list/

| ELECTRICAL DATA AND ORDERING INFORMATION | | | | | |
|--|-----------------------|--------------------|----------------------------|-----------------------------------|----------------------------------|
| R_{25} (Ω) | R_{25} -TOL. (%) | $B_{25/85}$ (K) | $B_{25/85}$ -TOL. (± %) | DESCRIPTION | SAP MATERIAL AND ORDERING NUMBER |
| 10 000 | ± 3 | 3984 | 0.5 | NTC Immersion 10K 3 % 3984K 0.5 % | NTCAIMME3C90373 |
| 10 000 | ± 3 | 3984 | 0.5 | NTC 10K 3 % 3984K 0.5 % no ring | NTCAIMME3C90686 |

DIMENSIONS in millimeters


| L1 | L2 | L3 | L4 | L5 | L6 | L7 | L8 | Ø D1 | Ø D2 | Ø D3 | Ø D4 | Ø D5 | Ø D6 |
|-------------|----|-------------|------------|------------|--------------|------|-------------|------------------|--------------|--------------|------------|------|------|
| 200 ± 20 | 4 | 23 ± 0.5 | 2 ± 0.5 | 5 ± 0.5 | 3.4 ± 0.2 | 2.05 | 13 ± 0.5 | 6.8 + 0/- 0.1 | 3.9 ± 0.1 | 2.5 ± 0.2 | 2 ± 0.2 | 1 | 0.3 |

Notes

- (1) Vishay Thermistor chip NTC, epoxy insulated
- (2) PVC cable, single insulated 105 °C, 300 V rated, Awg #30 multi-stranded twin
- (3) Stainless steel (SS304) housing
- (4) Brass collar (not present on the NTCAIMME3C90686 type)
- (5) Epoxy potting resin
- (6) Pre-tinned end wire stripped

 For complete Curve Computation, visit: www.vishay.com/thermistors/ntc-curve-list/

| RESISTANCE TEMPERATURE CHARACTERISTICS | | | | | | | |
|--|------------------|-------------------|---------------------|-------------------|-------------------|-------------------|-------------------|
| TEMP. (°C) | $R_{(T)}/R_{25}$ | RESISTANCE (Ω) | $\Delta R/R$ (%) | α (%/K) | ΔT (K) | $R_{MIN.}$ (Ω) | $R_{MAX.}$ (Ω) |
| -25 | 12.990 | 129 900 | 4.39 | -5.99 | 0.73 | 124 202 | 135 598 |
| -20 | 9.676 | 96 761 | 4.22 | -5.79 | 0.73 | 92 675 | 100 848 |
| -15 | 7.276 | 72 765 | 4.07 | -5.61 | 0.73 | 69 806 | 75 723 |
| -10 | 5.522 | 55 218 | 3.92 | -5.43 | 0.72 | 53 056 | 57 380 |
| -5 | 4.227 | 42 268 | 3.77 | -5.26 | 0.72 | 40 674 | 43 861 |
| 0 | 3.262 | 32 624 | 3.63 | -5.10 | 0.71 | 31 440 | 33 808 |
| 5 | 2.538 | 25 381 | 3.49 | -4.94 | 0.71 | 24 494 | 26 268 |
| 10 | 1.990 | 19 897 | 3.36 | -4.80 | 0.70 | 19 227 | 20 566 |
| 15 | 1.571 | 15 711 | 3.24 | -4.65 | 0.70 | 15 202 | 16 220 |
| 20 | 1.249 | 12 493 | 3.12 | -4.52 | 0.69 | 12 103 | 12 882 |
| 25 | 1.000 | 10 000 | 3.00 | -4.39 | 0.68 | 9700.0 | 10 300 |
| 30 | 0.8056 | 8056.0 | 3.11 | -4.26 | 0.73 | 7805.1 | 8306.8 |
| 35 | 0.6530 | 6529.7 | 3.22 | -4.14 | 0.78 | 6319.3 | 6740.2 |
| 40 | 0.5324 | 5323.9 | 3.33 | -4.03 | 0.83 | 5146.6 | 5501.1 |
| 45 | 0.4365 | 4365.3 | 3.43 | -3.92 | 0.88 | 4215.4 | 4515.1 |
| 50 | 0.3599 | 3598.7 | 3.53 | -3.81 | 0.93 | 3471.6 | 3725.8 |
| 55 | 0.2982 | 2982.3 | 3.63 | -3.71 | 0.98 | 2874.0 | 3090.5 |
| 60 | 0.2484 | 2483.8 | 3.72 | -3.61 | 1.03 | 2391.3 | 2576.3 |
| 65 | 0.2079 | 2078.7 | 3.81 | -3.51 | 1.09 | 1999.4 | 2157.9 |
| 70 | 0.1748 | 1747.7 | 3.90 | -3.42 | 1.14 | 1679.5 | 1815.9 |
| 75 | 0.1476 | 1475.9 | 3.99 | -3.34 | 1.20 | 1417.1 | 1534.8 |
| 80 | 0.1252 | 1251.8 | 4.07 | -3.25 | 1.25 | 1200.8 | 1302.8 |
| 85 | 0.1066 | 1066.1 | 4.15 | -3.17 | 1.31 | 1021.8 | 1110.4 |
| 90 | 0.09116 | 911.59 | 4.23 | -3.09 | 1.37 | 873.01 | 950.16 |
| 95 | 0.07825 | 782.46 | 4.31 | -3.02 | 1.43 | 748.75 | 816.17 |
| 100 | 0.06741 | 674.11 | 4.38 | -2.94 | 1.49 | 644.56 | 703.66 |
| 105 | 0.05828 | 582.84 | 4.46 | -2.87 | 1.55 | 556.87 | 608.82 |



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