

## NTC Thermistors, Miniature Immersion Sensor



### LINKS TO ADDITIONAL RESOURCES



| 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 $\Delta T$ (air 25 °C to water 85 °C)       | 1.5         | s        |
| Dissipation factor $\delta$   |             |          |
| 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        |

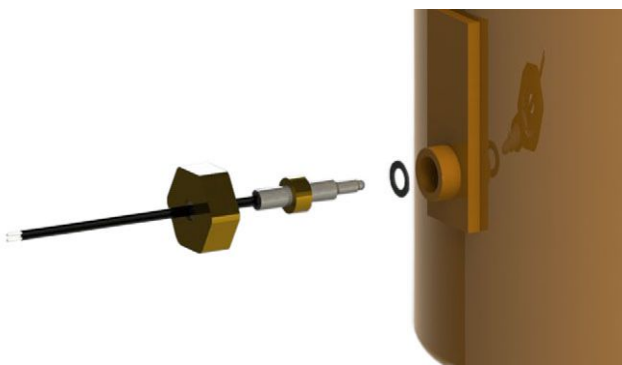


Fig. 1 - Mounting example with sealing ring and screw

### 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](http://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

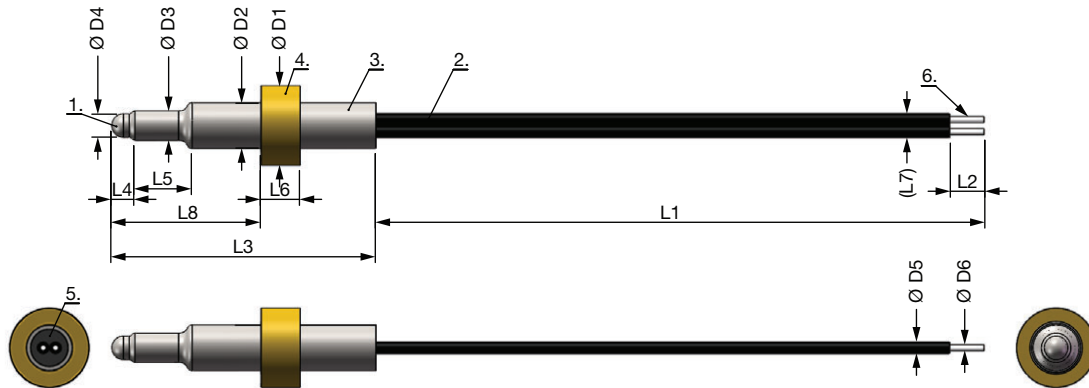
### PACKAGING

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 or connector options
- For complete RT curve computation, visit: [www.vishay.com/thermistors/ntc-rt-calculator/](http://www.vishay.com/thermistors/ntc-rt-calculator/)
- Available in high grade stainless steel SS316

| ELECTRICAL DATA AND ORDERING INFORMATION |                       |                    |                            |                                   |                                  |
|--|-----------------------|--------------------|----------------------------|-----------------------------------|----------------------------------|
| $R_{25}$<br>(Ω)                          | $R_{25}$ -TOL.<br>(%) | $B_{25/85}$<br>(K) | $B_{25/85}$ -TOL.<br>(± %) | 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 ± 1 | 23 ± 0.5 | 2 ± 0.5 | 5 ± 0.5 | 3.4 ± 0.2 | 2.05 | 13 ± 0.5 | 6.8 ± 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-rt-calculator/](http://www.vishay.com/thermistors/ntc-rt-calculator/)

| RESISTANCE TEMPERATURE CHARACTERISTICS |                  |                   |                     |                   |                   |                   |                   |
|--|------------------|-------------------|---------------------|-------------------|-------------------|-------------------|-------------------|
| TEMP.<br>(°C)                          | $R_{(T)}/R_{25}$ | RESISTANCE<br>(Ω) | $\Delta R/R$<br>(%) | $\alpha$<br>(%/K) | $\Delta T$<br>(K) | $R_{MIN.}$<br>(Ω) | $R_{MAX.}$<br>(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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