

SD-T, Flying lead passive duct temperature sensor

Features

- Temperature measurement for air ducts
- Variable thermistors and PT sensing elements to fit your system
- Simple and secure installation combined with temperature probe according your choice

Applications

- Duct temperature measurement for heating, ventilation and air conditioning applications from -40°C up to 140°C.
- Supervision of critical temperatures

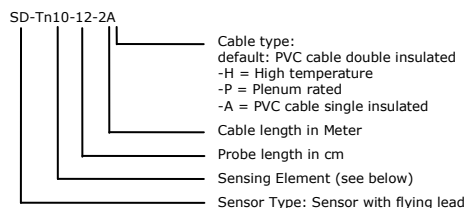
Temperature sensor

The sensor measures the temperature by use of a glass packed thermistor with a negative temperature coefficient (NTC), a platinum film (PT) or a nickel thin layer (NI) based probe. Its resistance changes according to the temperature. The change follows a specified curve. A summary of such curves is printed on the back of this document. Contact our sales department for curves or sensing elements not yet listed below.

Compensating conductor resistance

The length and type of conductors used to connect the sensor to the measuring electronic influences the accuracy of the measurement. Especially for elements with low resistance this has to be taken into account. Compensation needs to be performed by the measurement electronics.

Ordering Code



Standard sensor types

| Item name | Probe | Definition | Probe length cm (in) |
|--------------|-------------------|-------------|--|
| SD-Tn3-x-2 | NTC 3kΩ at 25°C | B25/50 3935 | X = 12, 12cm (4.7) X = 20, 20cm (7.9) |
| SD-Tn10-x-2 | NTC 10kΩ at 25°C | B25/50 3935 | |
| SD-Tn11-x-2 | NTC 10kΩ at 25°C | B25/50 3630 | |
| SD-Tn12-x-2 | NTC 10kΩ at 25°C | B25/50 3380 | |
| SD-Tn20-x-2 | NTC 20kΩ at 25°C | B25/50 4200 | |
| SD-Tn100-x-2 | NTC 100kΩ at 25°C | B25/50 4200 | |
| SD-Tp1-x-2 | PT100 | EN60751 | |
| SD-Tp2-x-2 | PT1000 | EN60751 | |
| SD-Tk5-x-2 | NI1000 | 5000 ppm/K | |

Accessories

Combine with AMI immersion stainless steel pocket for use as immersion sensor.

| Name | Immersion length (L) |
|-----------|----------------------|
| AMI-S05-1 | 5 cm (2") |
| AMI-S07-1 | 7.5 cm (3") |
| AMI-S10-1 | 10 cm (4") |
| AMI-S15-1 | 15 cm (5.9") |
| AMI-S20-1 | 20 cm (7.9") |
| AMI-S30-1 | 30 cm (11.8") |
| AMI-S40-1 | 40 cm (15.7") |

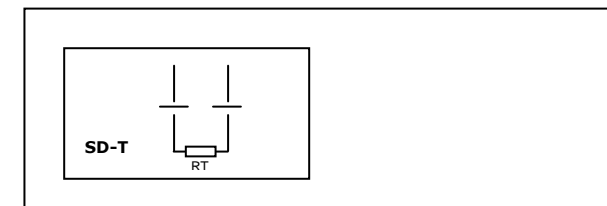
Technical specification

Warning! This device is intended to be used for comfort applications. Where a device failure endangers human life and/or property, it is the responsibility of the owner, designer and installer to add additional safety devices to prevent or detect a system failure caused by such a device failure. The manufacturer of this device cannot be held liable for any damage caused by such a failure. Failure to follow specifications and local regulations may endanger life, cause equipment damage and void warranty.

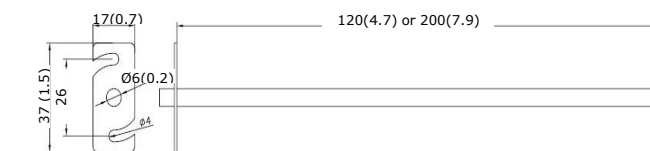
| | | | |
|----------------------------|---|---|---|
| Sensing probe | Thermistor: Range: (Probe only) Accuracy: -40...0°C (-40...32°F): 0...50°C (32...122°F): 50...100°C (122...212°F): > 100°C (> 212°F): | NTC -70...150°C (-94...302°F) 0.5 K 0.2 K 0.5 K 1 K | |
| | Platinum-film: Range: (Probe only) Accuracy | PT according EN 60751 -70...200°C (-94...392°F) EN 60751, Class B | |
| | Nickel thin layer: Range: (Probe only) Accuracy | 1000 Ω at 0°C, 5000 ppm/K -60...200°C (-76...392°F) DIN 43760 | |
| Cable | Standard Size Insulation material Operating Temperature Ratings | 2 x 0.20 mm ² (AWG 24) PVC -40...80°C (-40...176°F) UL758, 1581/CSA C22.2 No 210.2 | |
| | High temperature Size Insulation material Operating temperature Ratings | -H 2 x 0.35 mm ² (AWG 22) FEP -60...200°C (-76...392°F) ULR/CSA C22.2 No 210.2 | |
| | Plenum rated Size Insulation material Operating temperature Ratings | -P 2 x 0.5 mm ² (AWG 20) Plenum PVC -20...75°C (-4...167°F) UL C(UL) PLENUM CMP OR E355847 FPLP UL | |
| | Single insulated PVC Size Insulation material Operating Temperature Ratings | -A 2 x 0.20 mm ² (AWG 24) PVC -40...80°C (-40...176°F) UL758,1581 CSA C22.2 No.210.2 | |
| | Environment | Operation Climatic conditions Temperature depends on cable type Transport & storage Climatic conditions Temperature Humidity Mechanical conditions | To IEC 721-3-3 class 3K5 See above To IEC 721-3-2 and IEC 721-3-1 class 3K3 and class 1K3 -40...80°C (-40...176°F) < 95% RH non-condensing class 2M2 |
| Standards | | conform according to EMC Standard 89/336/EEC EMEI Standard 73/23/EEC | |
| | | EN 61 000-6-1/ EN 61 000-6-3 | |
| | | Automatic electrical controls for household and similar use Special requirement on temperature dependent controls | EN 60 730-1 EN 60 730- 2- 9 |
| | | Pollution class | Normal acc. to EN 60730, RoHS compliant |
| Housing | Degree of protection | IP65 to EN 60529 | |
| | Safety class | III (IEC 60536) | |
| | Probe | Stainless Steel | |
| | Dimensions (Diameter x L) | ø 6 x 120 mm (ø 0.2 x 4.7 in) ø 6 x 200 mm (ø 0.2 x 7.9 in) | |
| Weight (including package) | 45 g (1.6 oz) SD-Txxx-12-zv 73 g (2.6 oz) SD-Txxx-20-zv | | |

Wiring & installation

Wiring diagram



Dimensions [mm] (in)



Installation

Duct probes should be installed directly on the duct, in an area where the air stream is well mixed:

- Locate a supply air sensor two or three meters downstream from the nearest fan and coil.
- Mount the return air sensor close to the air inlet but downstream from a return fan if one is present.
- To install the sensor, drill a 8 mm hole in the duct and insert the assembled base plate with probe into the air stream. Secure the base plate to the duct with two sheet -metal screws.

To install immersion sensors,

- Weld a nut to the water pipe according to local regulations.
- Fix an AMI immersion pocket to the nut
- Insert the probe into the immersion pocket

For AMI-Sx-1 only: Secure the probe with the horizontal fixing screw of the AMI immersion pocket.

Resistance Table for Thermistors (NTC)

| °C | °F | Tn3 [kΩ] | Tn5 [kΩ] | Tn10 [kΩ] | Tn11 [kΩ] | Tn12 [kΩ] | Tn20 [kΩ] | Tn100 [kΩ] |
|---------------------------|-----|----------|----------|-----------|-----------|-----------|-----------|------------|
| B_{25/50} | | 3935 | 3470 | 3935 | 3630 | 3380 | 4200 | 4200 |
| B_{25/85} | | 3974 | 3535 | 3974 | 3687 | 3435 | 4260 | 4260 |
| B_{25/100} | | 3988 | 3526 | 3988 | 3715 | 3455 | 4285 | 4285 |
| Signal type → | | NTC 3k | NTC 5k | NTC 10k-2 | NTC-10k-3 | | NTC 20k | NTC 100k |
| -50 | -58 | 201,1 | 161,9 | 670,2 | 441,3 | 329,2 | 1711 | 8558 |
| -40 | -40 | 100,9 | 89,49 | 336,4 | 239,7 | 188,4 | 814,0 | 4095 |
| -30 | -22 | 53,09 | 54,07 | 177,0 | 135,3 | 111,3 | 415,6 | 2077 |
| -20 | -4 | 29,12 | 33,21 | 97,08 | 78,91 | 67,74 | 220,6 | 1105 |
| -10 | 14 | 16,60 | 21,07 | 55,33 | 47,54 | 42,45 | 122,4 | 612,4 |
| 0 | 32 | 9,795 | 13,73 | 32,65 | 29,49 | 27,28 | 70,20 | 351,0 |
| 10 | 50 | 5,969 | 9,041 | 19,90 | 18,79 | 17,96 | 41,56 | 207,8 |
| 20 | 68 | 3,747 | 6,064 | 12,49 | 12,26 | 12,09 | 25,34 | 126,7 |
| 25 | 77 | 3,000 | 5,000 | 10,00 | 10,00 | 10,00 | 20,00 | 100,00 |
| 30 | 86 | 2,417 | 4,139 | 8,057 | 8,194 | 8,313 | 15,88 | 79,43 |
| 40 | 104 | 1,598 | 2,875 | 5,327 | 5,592 | 5,828 | 10,21 | 51,06 |
| 50 | 122 | 1,081 | 2,032 | 3,603 | 3,893 | 4,161 | 6,718 | 33,60 |
| 60 | 140 | 0,746 | 1,463 | 2,488 | 2,760 | 3,021 | 4,518 | 22,59 |
| 70 | 158 | 0,525 | 1,069 | 1,751 | 1,990 | 2,229 | 3,100 | 15,50 |
| 80 | 176 | 0,376 | 0,792 | 1,255 | 1,458 | 1,669 | 2,168 | 10,84 |
| 90 | 194 | 0,275 | 0,601 | 0,915 | 1,084 | 1,266 | 1,542 | 7,707 |
| 100 | 212 | 0,203 | 0,464 | 0,678 | 0,817 | 0,973 | 1,114 | 5,571 |
| 110 | 230 | 0,536 | 0,354 | 0,512 | 0,624 | 0,752 | 0,818 | 4,092 |
| 120 | 248 | 0,123 | 0,272 | 0,410 | 0,481 | 0,605 | 0,609 | 3,046 |
| 130 | 266 | 0,097 | 0,212 | 0,322 | 0,380 | 0,487 | 0,460 | 2,298 |
| 140 | 284 | 0,077 | 0,169 | 0,257 | 0,300 | 0,395 | 0,351 | 1,755 |
| 150 | 302 | 0,063 | 0,137 | 0,210 | 0,240 | 0,325 | 0,271 | 1,356 |

Resistance Table for Platinum Film and NI1000 Elements

| °C | °F | Tp1 [Ω] | Tp2 [Ω] | Tk5 [Ω] | Tk6 [Ω] |
|-----|-----|--------------------|---------------------|-------------------|------------------|
| | | PT100 DIN 60751 | PT1000 DIN 60751 | NI1000, K=5000 | NI1000 K=6180 |
| -50 | -58 | 80,28 | 803,0 | 790,88 | 742,55 |
| -40 | -40 | 84,27 | 843,0 | 830,84 | 791,31 |
| -30 | -22 | 88,22 | 882,0 | 871,69 | 841,46 |
| -20 | -4 | 92,16 | 922,0 | 913,48 | 892,96 |
| -10 | 14 | 96,09 | 961,0 | 956,24 | 945,82 |
| 0 | 32 | 100,00 | 1000,0 | 1000 | 1000 |
| 10 | 50 | 103,90 | 1039,0 | 1044,79 | 1055,52 |
| 20 | 68 | 107,79 | 1078,0 | 1090,65 | 1111,36 |
| 30 | 86 | 111,67 | 1117,0 | 1137,62 | 1170,56 |
| 40 | 104 | 115,54 | 1155,0 | 1185,71 | 1230,11 |
| 50 | 122 | 119,40 | 1194,0 | 1234,98 | 1291,05 |
| 60 | 140 | 123,24 | 1232,0 | 1285,45 | 1353,40 |
| 70 | 158 | 127,07 | 1270,5 | 1337,15 | 1417,21 |
| 80 | 176 | 130,89 | 1309,0 | 1390,12 | 1482,50 |
| 90 | 194 | 134,70 | 1347,0 | 1444,39 | 1549,34 |
| 100 | 212 | 138,50 | 1385,0 | 1500,00 | 1617,79 |
| 110 | 230 | 142,29 | 1423,0 | 1556,98 | 1687,89 |
| 120 | 248 | 146,06 | 1460,5 | 1615,37 | 1759,72 |
| 130 | 266 | 149,80 | 1498,0 | 1675,19 | 1833,35 |
| 140 | 284 | 153,60 | 1536,0 | 1736,48 | 1908,87 |
| 150 | 302 | 157,30 | 1573,0 | 1799,27 | 1986,35 |
| 160 | 320 | 161,05 | 1610,5 | 1863,60 | 2065,89 |
| 170 | 338 | 164,75 | 1647,5 | 1929,50 | 2147,58 |
| 180 | 356 | 168,45 | 1684,5 | 1997,00 | 2231,53 |
| 190 | 374 | 172,15 | 1721,5 | 2066,15 | 2317,83 |
| 200 | 392 | 175,85 | 1758,5 | 2136,96 | 2406,60 |