

S-T, Passive Temperature Sensor with flying lead

Features

- Thermistors, NI1000 and PT sensing elements to fit your system
- Simple installation
- Wide range of temperature probes
- Including 2 m (6.5 ft) cable (other cable lengths on request)

Applications

- Measure temperature for heating, ventilation and air conditioning applications
- As frost protection sensor
- As input for standard controls equipment



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

S-Tn10-2P-C	
	Sensing tip shape
	default: cylindrical, flattened on one side
	-C = Cylindrical tip
	Cable type:
	default: PVC cable double insulated
	-H = High temperature
	-P = Plenum rated
	-A = PVC cable single insulated
	Cable length in Meter
	Sensing Element
	Sensor Type: Sensor with flying lead

Ordering standard sensors

Item Name	Item Code	Probe	Definition	Cable length
S-Tn3-2	40-20 0007	NTC 3k Ω at 25°C (77°F)	B _{25/50} 3935	2m, (6.5ft)
S-Tn5-2	40-20 0019	NTC 5k Ω at 25°C (77°F)	B _{25/50} 3470	
S-Tn10-2	40-20 0001	NTC 10k Ω at 25°C (77°F)	B _{25/50} 3935	
S-Tn11-2	40-20 0008	NTC 10k Ω at 25°C (77°F)	B _{25/50} 3630	
S-Tn12-2	40-20 0088	NTC 10k Ω at 25°C (77°F)	B _{25/50} 3380	
S-Tn20-2	40-20 0009	NTC 20k Ω at 25°C (77°F)	B _{25/50} 4200	
S-Tn100-2	40-20 0010	NTC 100k Ω at 25°C (77°F)	B _{25/50} 4200	
S-Tp1-2	40-20 0011	PT100	EN 60751	
S-Tp2-2	40-20 0012	PT1000	EN 60751	
S-Tk5-2	40-20 0013	NI1000	5000 ppm/K	

Ordering sensors with high temperature cable

S-Tn10-2H	40-20 0154	NTC 10k Ω at 25°C (77°F)	B _{25/50} 3935	2m, (6.5ft)
S-Tp1-2H	40-20 0155	PT100	EN 60751	
S-Tp2-2H	40-20 0156	PT1000	EN 60751	
S-Tk5-2H	40-20 0157	NI1000	5000 ppm/K	
S-Tp2-5H	40-20 0158	PT1000	EN 60751	5m (16ft)
S-Tn10-6H	40-20 0104	NTC 10k Ω at 25°C (77°F)	B _{25/50} 3935	6m (20ft)

Ordering sensors with plenum rated cable

S-Tn10-2P-C	40-20 0109	NTC 10k Ω at 25°C (77°F)	B _{25/50} 3935	2m, (6.5ft)
S-Tn10-6P-C	40-20 0110	NTC 10k Ω at 25°C (77°F)	B _{25/50} 3935	6m (20ft)

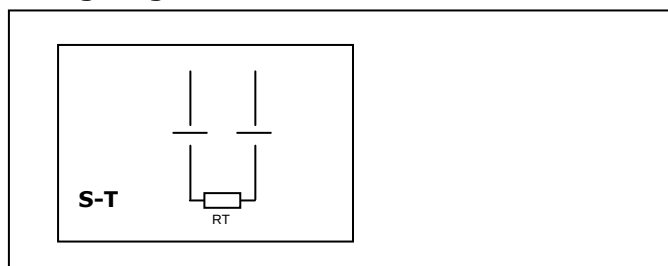
Technical Specification

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.

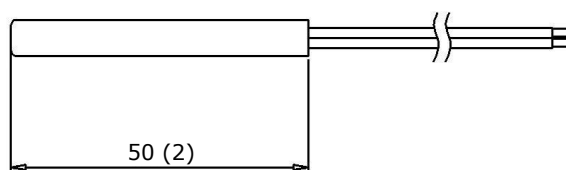
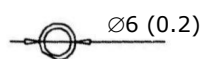
Failure to follow specifications and local regulations may endanger life, cause equipment damage and void warranty.

Sensing Probe	Thermistor:	NTC
	Range: (Probe only)	-70...150°C (-94...302°F)
	Accuracy: -40...0°C (-40...32°F):	0.5 K
	0...50°C (32...122°F):	0.2 K
	50...100°C (122...212°F):	0.5 K
	> 100°C (> 212°F):	1 K
	Platinum-Film:	PT according EN 60751
	Range: (Probe only)	-70...200°C (-94...392°F)
	Accuracy	EN 60751, Class B
	Nickel Thin Layer:	1000Ω at 0°C, 5000 ppm/K
	Range: (Probe only)	-60...200°C (-76...392°F)
	Accuracy	DIN 43760
Cable	Standard	
	Size	2 x 0.20 mm ² (AWG 24)
	Insulation material	PVC
	Operating Temperature	-40...80°C (-40...176°F)
	Ratings	UL758, 1581/CSA C22.2 No 210.2
	High temperature	-H
	Size	2 x 0.35 mm ² (AWG 22)
	Insulation material	FEP
	Operating temperature	-60...200°C (-76...392°F)
	Ratings	ULR/CSA C22.2 No 210.2
	Plenum rated	-P
	Size	2 x 0.5 mm ² (AWG 20)
Environment	Insulation material	Plenum PVC
	Operating temperature	-20...75°C (-4...167°F)
	Ratings	UL C(UL) PLENUM CMP OR E355847 FPLP UL
	Operation	To IEC 721-3-3
	Climatic conditions	class 3K5
	Temperature depends on cable type	See above
	Humidity	< 95% RH non-condensing
	Transport & Storage	To IEC 721-3-2 and IEC 721-3-1
	Climatic conditions	class 3K3 and class 1K3
	Temperature	-40...80°C (-40...176°F)
	Humidity	< 95% RH non-condensing
	Mechanical conditions	class 2M2
Standards	 conform according to	
	EMC Standard 89/336/EEC	EN 61000-6-1/ EN 61000-6-3
	Product standards	
	Automatic electrical controls for household and similar use	EN 60730-1
	Special requirement on temperature dependent controls	EN 60730-2-9
	Safety class	III (IEC 60536)
Housing	Probe	Stainless steel
	Dimensions (Diameter x L)	ø 6 x 50 mm (ø 0.25 x 2 in)
	Weight (including package)	70g (2.5 oz)

Wiring Diagram



Dimension [mm](in)



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