



# NTC thermistors for temperature measurement

## Probe assemblies

**Series/Type:** K550  
**Ordering code:** B57550K0104A001  
Date: 2021-10-15  
Version: 1

### Applications

- Temperature measurement for hot gluing machines

### Features

- Usage in high temperature applications up to 230 °C at the sensor head
- Short response time
- 4 x 13 mm stainless steel casing
- FEP-insulated leads of nickel-plated Cu wire (7 x 0.16 mm), AWG 26 (110 mm length)

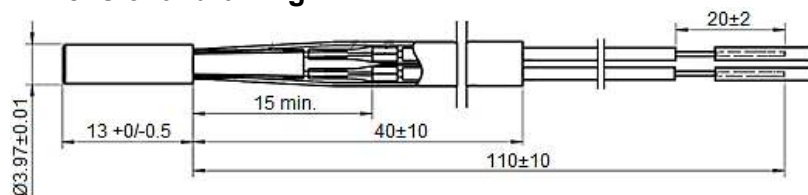
### Options

- Alternative lead lengths on request

### Delivery mode

- Bulk

### Dimensional drawing



Dimensions in mm

### General technical data

Climatic category	(IEC 60068-1)		0/200/56	
Maximum power	(at 25 °C)	$P_{25}$	50	mW
Resistance tolerance		$\Delta R_R/R_R$	±2.5	%
Rated temperature		$T_R$	160	°C
Dissipation factor	(in air)	$\delta_{th}$	approx. 2 <sup>1)</sup>	mW/K
Thermal constant time	(in water)	$\tau_a$	approx. 1.8 <sup>1)</sup>	s
Test voltage	(t = 1 s)	$V_{test}$	1250	V AC

<sup>1)</sup> Depends on mounting situation.

### Electrical specification and ordering code

R25 Ω	No. of R/T characteristic	$B_{25/100}$ K	Wire length in mm	Wire	Ordering code
100.8 k	8304	4092 ±1.5%	110 ±10	AWG 26	B57550K0104A001

**NTC resistance temperature curve**

R/T curve = 8304

 $B_{25/100} = 4092 \pm 1.5\% \text{ K}$ 
 $R_{160} = 1307 \pm 2.5\% \Omega$ 

Temp. [°C]	R_Nom [Ω]	R_Min [Ω]	R_Max [Ω]	ΔR [±%]
0	335050	298690	371400	10.9
5	259740	232610	286880	10.4
10	202880	182470	223280	10.1
15	159600	144150	175050	9.7
20	126420	114640	138200	9.3
25	100800	91759	109830	9.0
30	80879	73901	87856	8.6
35	65292	59874	70710	8.3
40	53017	48786	57248	8.0
45	43292	39971	46614	7.7
50	35543	32922	38163	7.4
55	29332	27254	31410	7.1
60	24328	22673	25983	6.8
65	20275	18951	21599	6.5
70	16975	15912	18039	6.3
75	14277	13419	15135	6.0
80	12059	11364	12753	5.8
85	10228	9663.4	10792	5.5
90	8709.6	8249.6	9169.6	5.3
95	7445.6	7069.4	7821.7	5.1
100	6388.8	6080.3	6697.3	4.8
105	5501.9	5248.2	5755.5	4.6
110	4754.6	4545.4	4963.7	4.4
115	4122.7	3949.8	4295.5	4.2
120	3586.4	3443.3	3729.6	4.0
125	3129.8	3011.0	3248.6	3.8
130	2739.6	2640.8	2838.3	3.6
135	2405.2	2322.9	2487.4	3.4
140	2117.6	2049.1	2186.1	3.2
145	1869.6	1812.4	1926.7	3.1
150	1655.0	1607.3	1702.8	2.9
155	1468.9	1429.0	1508.8	2.7
<b>160</b>	<b>1307.0</b>	<b>1274.3</b>	<b>1339.7</b>	<b>2.5</b>
165	1165.8	1134.2	1197.4	2.7
170	1042.3	1012.4	1072.2	2.9
175	934.03	905.78	962.28	3.0

180	838.87	812.24	865.51	3.2
185	755.04	729.95	780.14	3.3
190	681.02	657.40	704.64	3.5
195	615.51	593.29	637.72	3.6
200	557.40	536.51	578.29	3.7
205	505.75	486.11	525.39	3.9
210	459.74	441.28	478.21	4.0
215	418.68	401.32	436.05	4.1
220	381.97	365.64	398.29	4.3
225	349.07	333.71	364.42	4.4
230	319.54	305.09	333.99	4.5

**Reliability data**

Test	Test conditions	$\Delta R_{25}/R_{25}$ (typical)	Remarks
Storage in dry heat	Sensor tip placed into hot metal plate and component body at room temperature Temperature: 230 °C Duration: 1000 h	< 3%	
Storage in coldness	Storage at lower category temperature Temperature: 0 °C Duration: 1000 h	< 3%	
Storage in damp heat, steady state	Temperature of air: 40 °C Relative humidity of air: 93% Duration: 56 days	< 3%	
Rapid change of temperature in air	Lower test temperature: 0 °C (time: ~5 min) Upper test temperature: 200 °C (time: ~5 min) Time to change from lower to upper temperature: < 30 s Number of cycling: 100	< 3%	
Voltage proof test	The sensors placed in a vessel containing metallic balls of 1 mm diameter (with total immersed head) at ambient temperature. The applied voltage is 1250 V <sub>AC</sub> /1 s/0.5 mA		No flash over
Insulation test	The sensors placed in a vessel containing metallic balls of 1 mm diameter (with total immersed head) at ambient temperature. The applied voltage is 500 V <sub>DC</sub> .		Above 100 MΩ

## Cautions and warnings

### Storage

- Store thermistors only in original packaging. Do not open the package prior to storage.
- Storage conditions in original packaging: storage temperature  $-25\text{ °C} \dots +45\text{ °C}$ , relative humidity  $\leq 75\%$  annual mean,  $< 95\%$  maximum 30 days per annum, dew precipitation is inadmissible.
- Do not store thermistors where they are exposed to heat or direct sunlight. Otherwise, the packing material may be deformed or components may stick together, causing problems during mounting.
- Avoid contamination of thermistor surface during storage, handling and processing.
- Avoid storage of thermistors in harmful environments like corrosive gases (SO<sub>x</sub>, Cl etc).
- Use the components as soon as possible after opening the factory seals, i.e. the polyvinyl-sealed packages.
- Solder thermistors within the time specified after shipment.  
For leaded components this is 24 months.

### Handling

- NTC thermistors must not be dropped. Chip-offs or any other damage must not be caused during handling of NTCs.
- Do not touch components with bare hands. Gloves are recommended.
- Avoid contamination of thermistor surface during handling.
- Washing processes may damage the product due to the possible static or cyclic mechanical loads (e.g. ultrasonic cleaning). They may cause cracks to develop on the product and its parts, which might lead to reduced reliability or lifetime.

### Bending/Twisting

- Bending on wire is permitted at a minimum distance of twice the wire's diameter plus 4 mm from the component head or housing. When bending ensure the wire is mechanically relieved at the component head or housing. The bending radius should be at least eight times the wire's diameter.
- Twisting is prohibited as it may cause cracks and or reduce bonding between insulation and coating/potting material.

### Soldering

- Use resin-type flux or non-activated flux.
- Insufficient preheating may cause ceramic cracks.
- Rapid cooling by dipping in solvent is not recommended.
- Complete removal of flux is recommended.

## Mounting

- Ensure that no thermo-mechanical stress occurs due to production processes (curing or overmolding processes) when thermistors are sealed, potted or overmolded or during their subsequent operation. The maximum temperature of the thermistor must not be exceeded. Ensure that the materials used (sealing/potting compound and plastic material) are chemically neutral.
- Electrodes/contacts must not be scratched or damaged before/during/after the mounting process.
- Contacts and housing used for assembly with the thermistor must be clean before mounting.
- Ensure that adjacent materials are designed for operation at temperatures comparable to the surface temperature of the thermistor. Be sure that surrounding parts and materials can withstand the temperature.
- Avoid contamination of the thermistor surface during processing.
- The connections of sensors (e.g. cable end, wire end, plug terminal) may only be exposed to an environment with normal atmospheric conditions.
- Tensile forces on cables or leads must be avoided during mounting and operation.
- Bending or twisting of cables or leads directly on the thermistor body is not permissible.
- Avoid using chemical substances as mounting aids. It must be ensured that no water or other liquids enter the NTC thermistors (e.g. through plug terminals). In particular, water based substances (e.g. soap suds) must not be used as mounting aids for sensors.

## Operation

- Use thermistors only within the specified operating temperature range.
- Use thermistors only within the specified power range.
- Environmental conditions must not harm the thermistors. Only use the thermistors under normal atmospheric conditions or within the specified conditions.
- Ensure that no significant thermo-mechanical stress occurs during operation due to the mounting situation. Fixtures must not overstress the sensor by an excessive mechanical preload.
- Contact of NTC thermistors with any liquids and solvents shall be prevented. It must be ensured that no water enters the NTC thermistors (e.g. through plug terminals). For measurement purposes (checking the specified resistance vs. temperature), the component must not be immersed in water but in suitable liquids (e.g. Galden).
- Avoid dewing and condensation unless thermistor is specified for these conditions.
- Bending or twisting of cables and/or wires is not permissible during operation of the sensor in the application.
- Be sure to provide an appropriate fail-safe function to prevent secondary product damage caused by malfunction.

This listing does not claim to be complete, but merely reflects the experience of TDK Electronics.

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## Important notes

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Release 2020-06