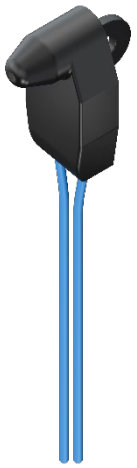
NTC thermistors for temperature measurement

Ambient temperature sensor

Series/Type:
Ordering code: **B58100A0677A000**

Date: 2025-09-15
Version: 1

Applications



- Heating systems
- Industrial electronics
- Automotive electronics

Features

- Full plastic design
- Temperature range -40 °C to 85 °C
- Highly humidity resistant
- Cable based design

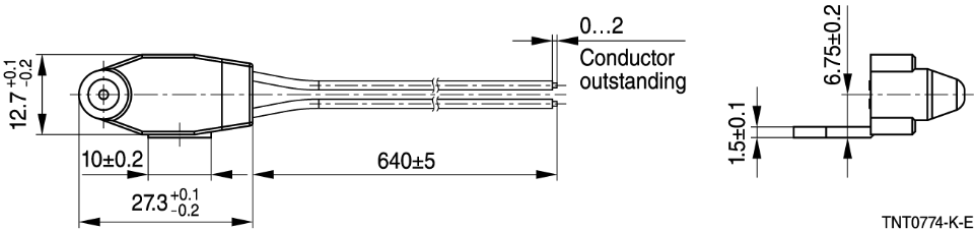
Options

Alternative wire lengths, R/T characteristics and connectors available on request

Delivery mode

Bulk, bundled in plastic bags in cardboard box

Dimensional drawings



Dimensions in mm

General technical data

Climatic category	(IEC 60059-1)		40/85/21	
Lower category temperature			-40	°C
Upper category temperature			852	°C
Max. power rating	(at 25 °C)	P_{25}	60	mW
Rated temperature		T_R	25	°C
Rated resistance		R_R	3000	Ω
Resistance tolerance		ΔR_R	±1	%
B value: $B_{(25/100)}$ // tolerance		$B_{25/100}$	3988 // ±0.5	K // %
R/T curve no. // R_{25}			8016	
Thermal time constant	(in water)	τ_a	< 30	S
Insulation resistance	(at V = 500 V DC)	R_{ins}	> 10	MΩ
Test voltage	(t = 60 s)	V_{test}	500	V AC

Reliability data

Electrical tests

Test	Standard	Test conditions	Criteria	Remarks
Initial RT parameter		-20 °C, 0 °C, 25 °C, 85 °C	RT in tolerance	No visible damage
Thermal response time		Water 25 °C to water 85 °C	τ_{63} < 30 s	No visible damage
Voltage strength		500 V RMS (AC) for 60 s (in metal bath)	I_{leak} < 10 mA $\Delta R_0/R_0$ < 3% $\Delta R_{25}/R_{25}$ < 3%	No flashover
ESD	ISO 100605	ESD network 330 pF / 330 Ω	$\Delta R_0/R_0$ < 3% $\Delta R_{25}/R_{25}$ < 3%	No visible damage

Mechanical tests

Vibration		-40/85 °C Frequency range: 5 …1000 Hz t = 8 h per axis	$\Delta R_0/R_0$ < 3% $\Delta R_{25}/R_{25}$ < 3%	No visible damage

Environmental tests

High temperature storage		T_{HST} (85 ±1) °C for 380 h	$\Delta R_0/R_0$ < 3% $\Delta R_{25}/R_{25}$ < 3%	No visible damage
Low temperature storage		T_{CST} (-40 ±2) °C for 24 h	$\Delta R_0/R_0$ < 2% $\Delta R_{25}/R_{25}$ < 2%	No visible damage
Thermal shock	IEC 60068-1 14 Na	-40 °C / 85 °C, for 200 cycles, transfer time < 10 s, t_{dwell} 60 min	$\Delta R_0/R_0$ < 3% $\Delta R_{25}/R_{25}$ < 3%	No visible damage
Continuous Humidity		85°C / 85% RH, for 180 h, connected/cyclic powered	$\Delta R_0/R_0$ < 3% $\Delta R_{25}/R_{25}$ < 3%	No visible damage
Liquid tightness IPX6K	ISO20653	Water volume flow 75 l/min, water pressure 10 bar, distance 2.5 … 3 m, duration 3 min, not powered	$\Delta R_0/R_0$ < 1% $\Delta R_{25}/R_{25}$ < 1%	No visible damage
High pressure spray test IPX9K	ISO20653	Spraying phase: 25 °C, 2 h Humidity storage: 40 °C / 93% RH for 22 h, 4 cycles Standard storage: 23 °C / RH < 50% for 72 h	$\Delta R_0/R_0$ < 3% $\Delta R_{25}/R_{25}$ < 3%	No visible damage

Note: NTC element qualified according to AEC-Q200 REV D

R/T characteristics

RT/No.	**8016**				
T [°C]	$B_{25/100}$ = 3988 K				
	R_{nom} [Ω]	R_{min} [Ω]	R_{max} [Ω]	$\Delta R/R_{nom}$ [±%]	ΔT [±°C]
40	100950	97301	104600	3.6	0.5
35	72777	70277	75277	3.4	0.5
30	53100	51367	54833	3.3	0.5
25	39111	37899	40322	3.1	0.5
20	29121	28265	29977	2.9	0.5
15	21879	21269	22488	2.8	0.5
10	16599	16161	17037	2.6	0.5
5	12695	12377	13012	2.5	0.5
0	9795	9563.6	10026	2.4	0.5
5	7616.3	7446.3	7786.2	2.2	0.5
10	5970	5844.4	6095.6	2.1	0.4
15	4712.3	4618.9	4805.7	2.0	0.4
20	3747	3677.2	3816.8	1.9	0.4
25	3000	2949.0	3051.0	1.7	0.4
30	2417.1	2372.1	2462.1	1.9	0.4
35	1959,4	1920.9	1997.9	2.0	0.5
40	1598.1	1565.0	1631.2	2.1	0.5
45	1310.6	1282.2	1339.1	2.2	0.6
50	1080.9	1056.4	1105.4	2.3	0.6
55	895.86	874.71	917.02	2.4	0.6
60	746.4	728.09	764.71	2.5	0.7
65	624.91	609.03	640.79	2.5	0.7
70	525.6	511.79	539.41	2.6	0.8
75	444.41	432.37	456.46	2.7	0.8
80	377.4	366.86	387.94	2.8	0.9
85	321.7	312.47	330.94	2.9	0.9

Cautions and warnings

Do not apply continuous pull-force between sensor and wire ends. Consider metal compliance when mounting the sensor. Brass is not suitable for mounting sensor to an aluminum surface as contact corrosion may occur.

Storage

- Store thermistors only in original packaging. Do not open the package prior to storage.
- Storage conditions in original packaging: storage temperature −10 °C to +45 °C, relative humidity 45% up to 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 (SOx, 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 from TDK Electronics.
  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.
- Avoid contamination of thermistor surface during handling. Gloves are recommended.
- 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 of leads

A lead (wire) may be bent 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 18 mm.

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 over-molding processes) when thermistors are sealed, potted or over-molded 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 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 AG.

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