

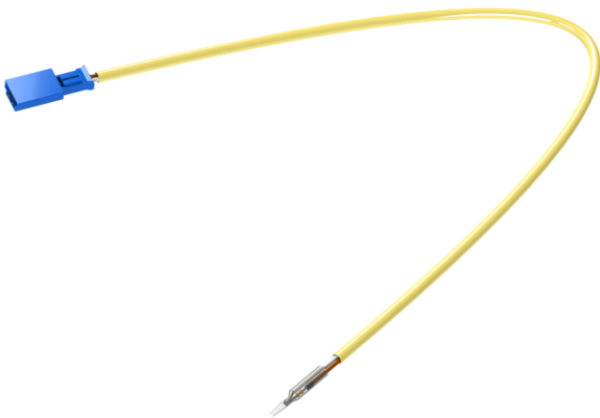
Product Information

► Measuring resistor with the KTY-sensor

Monitoring of motor winding temperature,
basic temperature measurement by using KTY- sensors

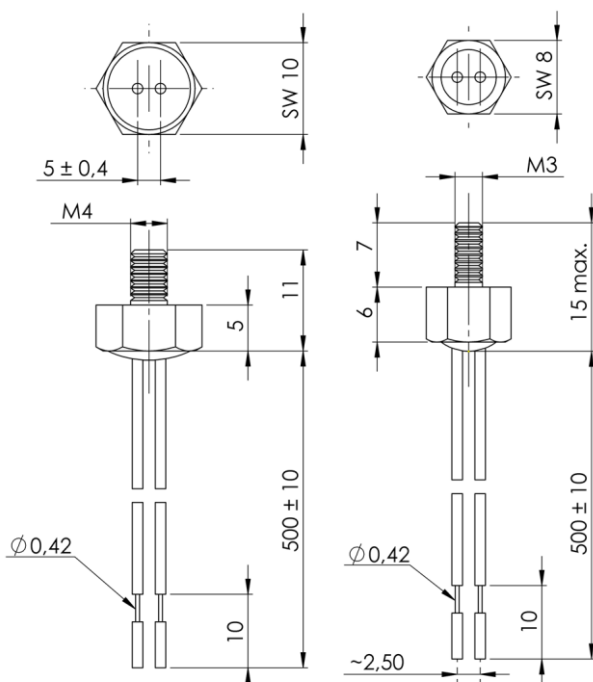
KTY 84-1...

KTY - sensor in windings



Color coding of leads, according to the SIEMENS standards:
AWG24, white=minus
AWG24, brown=plus
or:
AWG24, yellow=minus
AWG24, green=plus

KTY - screw in sensor



- Basic information

The low-cost KTY-sensor is used for precise temperature monitoring, control, and switching in windings, bearings, machines, motors, transformers and many other industrial applications, where errors in measurements have to be excluded.

- Application

With outstanding accuracy and fail-safe operation, they have a wide range of applications in both automotive and industrial markets.

Industrial applications:

- Overheating protection
- Protection for power supplies
- Process temperature control
- Exhaust control
- Toaster control
- Temperature compensation for microprocessors

Automotive applications:

- Oil temperature
- Oil level
- Water temperature
- Diesel injection
- Transmission
- Engine coolant
- Engine air
- Air conditioning

- General function

The silicon temperature sensors in the KTY84-1-series have a nearly linear, positive temperature coefficient of resistance over the complete wide temperature range.

- Advantages

- low cost over a temperature range: -40 ... +300°C
- bigger wanted signal than Pt100
- low weight
- low thermal time constant
- very long operation life
- high long term stability

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- Technical data

Quick reference data:

Sensor resistance R_{100} , $T_{amb} = +100^{\circ}\text{C}$, $I_{cont} = 2\text{mA}$

Parameter	Min.	Max.	Unit	Marking-Code
KTY 84-130	970	1030	Ohm	KT84L
KTY 84-150	950	1050	Ohm	KT84M
KTY 84-151	950	1000	Ohm	KT84O

Limiting values:

In accordance with the absolute maximum rating system (IEC 60134)

Symbol	Parameter	Conditions	Min.	Max.	Einheit
I_{cont}	continuous sensor current	In free air; $T_{amb} = +100^{\circ}\text{C}$ (Note 1)	-	10	mA
		In free air; $T_{amb} = +300^{\circ}\text{C}$	-	2	mA
T_{amb}	ambient operation temperature		-40	+300	$^{\circ}\text{C}$
T_{stg}	Storage Temperature		-55	+300	$^{\circ}\text{C}$

Note 1: For temperatures greater than $+200^{\circ}\text{C}$, a sensor current of $I_{cont} = 2\text{mA}$ must be used.

Characteristics:

$T_{amb} = 100^{\circ}\text{C}$, in liquid, unless otherwise specified

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Einheit
R_{100}	sensor resistance	$I_{cont} = 2\text{mA}$				
TC	temperature coefficient		-	0,62	-	%/K
R_{250}/R_{100}	resistance ratio	$T_{amb} = +250^{\circ}\text{C}$ und $+100^{\circ}\text{C}$	2,111	2,166	2,221	
R_{25}/R_{100}	resistance ratio	$T_{amb} = 25^{\circ}\text{C}$ und $+100^{\circ}\text{C}$	0,595	0,603	0,611	
τ	thermal time constant (Note 1)	In still air	-	20	-	s
		In still liquid (note 2)	-	1	-	s
		In flowing liquid (note 2)	-	0,5	-	s

Note:

- The thermal time constant is the time taken for the sensor to reach 63.2% of the total temperature difference. For example, if a sensor with a temperature of 25°C is moved to an environment with an ambient temperature of 100°C , the time of the sensor to reach a temperature of 72.4°C is the thermal time constant.

$$T_{63.2\%} = 25^{\circ}\text{C} + 0.632 * (100^{\circ}\text{C} - 25^{\circ}\text{C}) = 72.4^{\circ}\text{C}$$

- Inert liquid, e.g. FC 43 manufactured by the 3M company

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Ambient temperature, corresponding resistance, temperature coefficient and maximum expected temperature error $I_{cont} = 2 \text{ mA}$

Ambient Temperature [°C]	Temp. Coeff. [%K]	KTY84-130				KTY84-150				KTY84-151			
		Resistance [Ω]			Temp. Error [K]	Resistance [Ω]			Temp. Error [K]	Resistance [Ω]			Temp. Error [K]
		Min.	Typ.	Max.		Min.	Typ.	Max.		Min.	Typ.	Max.	
-40	0.84	340	359	379	± 6,48	332	359	386	± 8,85	332	350	368	± 5,79
-30	0.83	370	391	411	± 6,36	362	391	419	± 8,76	362	381	399	± 5,48
-20	0.82	403	424	446	± 6,26	394	424	455	± 8,7	394	414	433	± 5,72
-10	0.80	437	460	483	± 6,16	428	460	492	± 8,65	428	449	469	± 5,62
0	0.79	474	498	522	± 6,07	464	498	532	± 8,61	464	486	507	± 5,51
10	0.77	514	538	563	± 5,98	503	538	574	± 8,58	503	525	547	± 5,41
20	0.75	555	581	607	± 5,89	544	581	618	± 8,55	544	566	589	± 5,31
25	0.74	577	603	629	± 5,84	565	603	641	± 8,54	565	588	611	± 5,25
30	0.73	599	626	652	± 5,79	587	626	665	± 8,53	587	610	633	± 5,2
40	0.71	645	672	700	± 5,69	632	672	713	± 8,5	632	656	679	± 5,08
50	0.70	694	722	750	± 5,59	679	722	764	± 8,46	679	704	728	± 4,96
60	0.68	744	773	801	± 5,47	729	773	817	± 8,42	729	754	778	± 4,83
70	0.66	797	826	855	± 5,34	781	826	872	± 8,37	781	806	831	± 4,68
80	0.64	852	882	912	± 5,21	835	882	929	± 8,31	835	860	885	± 4,53
90	0.63	910	940	970	± 5,06	891	940	989	± 8,25	891	916	942	± 4,37
100	0.61	970	1000	1030	± 4,9	950	1000	1050	± 8,17	950	975	1000	± 4,19
110	0.60	1029	1062	1096	± 5,31	1007	1062	1117	± 8,66	1007	1036	1064	± 4,58
120	0.58	1089	1127	1164	± 5,73	1067	1127	1187	± 9,17	1067	1099	1131	± 4,99
130	0.57	1152	1194	1235	± 6,17	1128	1194	1259	± 9,69	1128	1164	1199	± 5,41
140	0.55	1216	1262	1309	± 6,63	1191	1262	1334	± 10,24	1191	1231	1271	± 5,84
150	0.54	1282	1334	1385	± 7,1	1256	1334	1412	± 10,8	1256	1300	1345	± 6,3
160	0.53	1350	1407	1463	± 7,59	1322	1407	1492	± 11,37	1322	1372	1421	± 6,77
170	0.52	1420	1482	1544	± 8,1	1391	1482	1574	± 11,96	1391	1445	1500	± 7,25
180	0.51	1492	1560	1628	± 8,62	1461	1560	1659	± 12,58	1461	1521	1581	± 7,25
190	0.49	1566	1640	1714	± 9,15	1533	1640	1747	± 13,2	1533	1599	1664	± 8,27
200	0.48	1641	1722	1803	± 9,71	1607	1722	1837	± 13,85	1607	1679	1751	± 8,81
210	0.47	1719	1807	1894	± 10,28	1683	1807	1931	± 14,51	1683	1761	1839	± 9,36
220	0.46	1798	1893	1988	± 10,87	1760	1893	2026	± 15,19	1760	1846	1931	± 9,93
230	0.45	1879	1982	2085	± 11,47	1839	1982	2125	± 15,88	1839	1932	2024	± 10,51
240	0.44	1962	2073	2184	± 12,09	1920	2073	2226	± 16,59	1920	2021	2121	± 11,11
250	0.43	2046	2166	2286	± 12,73	2003	2166	2329	± 17,32	2003	2112	2220	± 11,73
260	0.42	2132	2261	2390	± 11,44	2087	2261	2436	± 18,15	2087	2205	2321	± 12,42
270	0.41	2219	2357	2496	± 14,44	2172	2357	2543	± 19,36	2172	2298	2424	± 13,37
280	0.38	2304	2452	2600	± 15,94	2255	2452	2650	± 21,21	2257	2391	2525	± 14,79
290	0.34	2384	2542	2700	± 18,26	2333	2542	2751	± 24,14	2335	2479	2622	± 16,98
300	0.29	2456	2624	2791	± 22,12	2404	2624	2844	± 29,05	2406	2558	2710	± 20,61

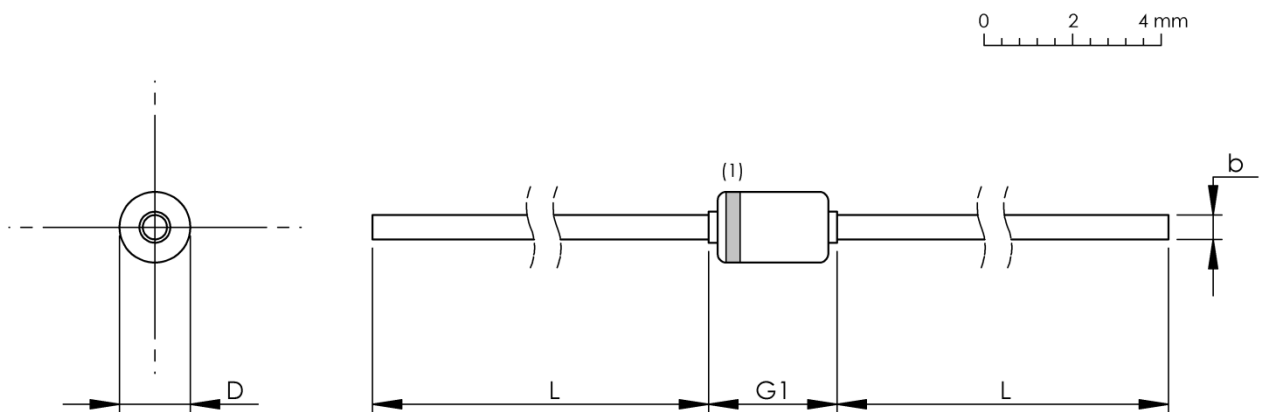
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- Mechanical data



DIMENSIONS (mm are the original dimensions)

UNIT	b max.	D max.	G1 max.	L min.
mm	0,55	1,6	3,04	25,4

Note (1): The marking band indicates the cathode.

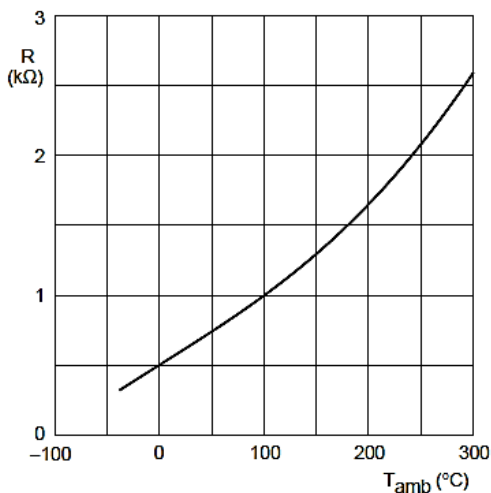
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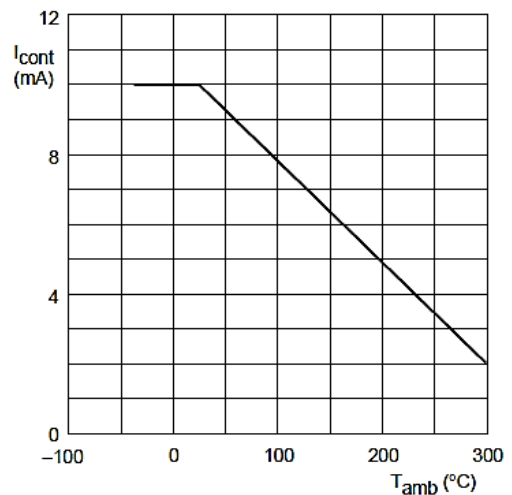
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- Characteristic curves of KTY 84

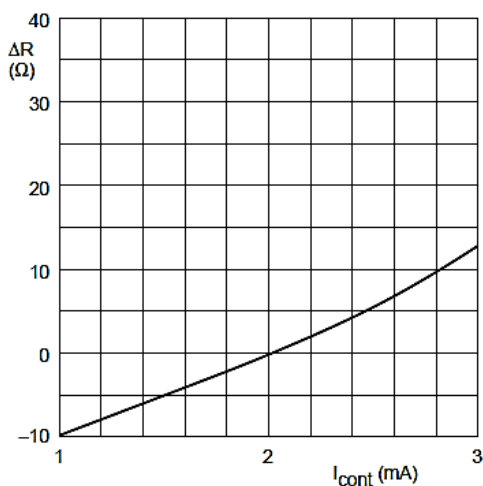


$I_{cont} = 2 \text{ mA}$

Sensor resistance as a function of ambient temperature; average values.

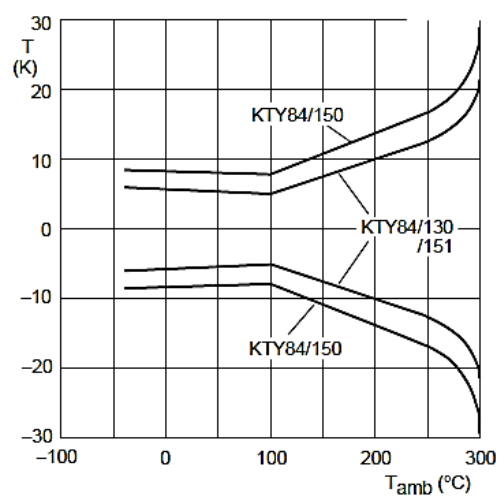


Maximum operating current for safe operation



$T_{amb} = 100^\circ\text{C}$

Deviation of sensor resistance as a function of operating current in still liquid.



Maximum expected temperature error (ΔT).

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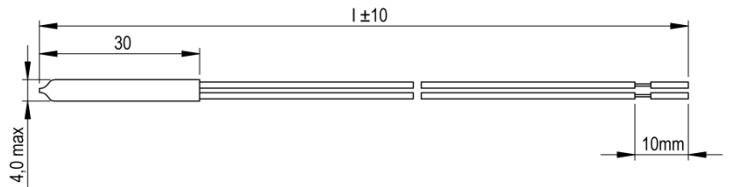
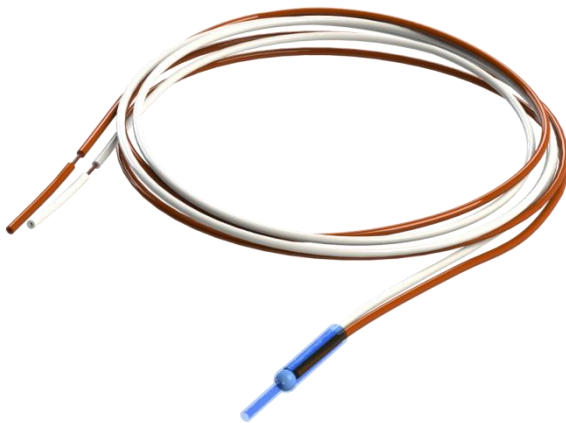
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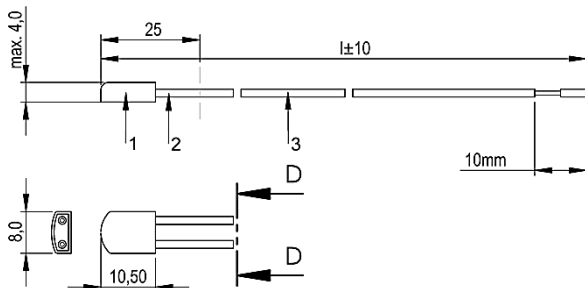
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- KTY-sensors:

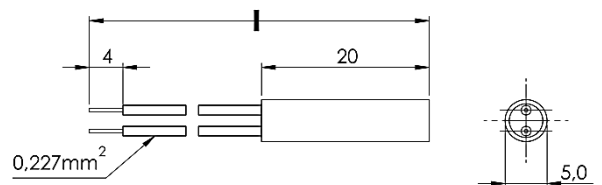
examples of KTY-thermistor-housings



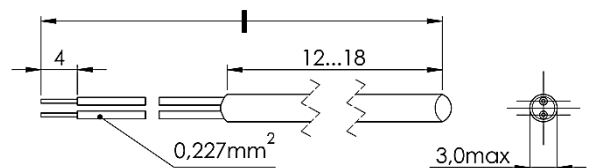
Shrink tube housing for monitoring windings



- 1 = KTY-sensor, insulated twice, in stainless steel or PPS-housing
- 2 = Terminal: stranded silver copper wire insulated with Teflon (PTFE), AWG 24 or AWG 26 according to the manufacturers choice; optional: AWG 20
- 3 = additional shrink tube (optional)



KTY-thermistor in ceramics or stainless steel



KTY-Thermistor in ceramics or brass-housing

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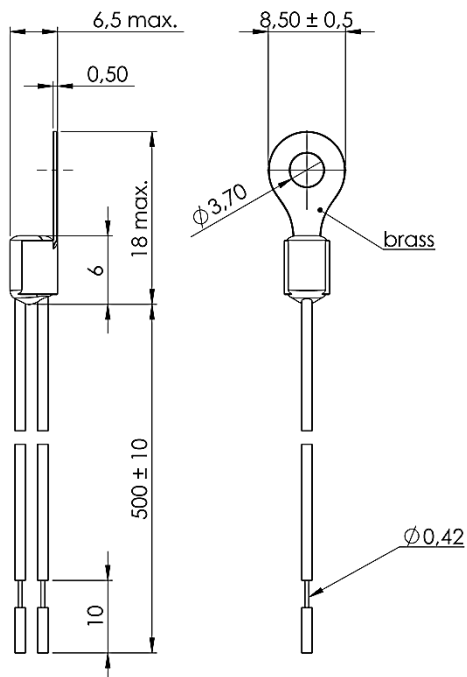
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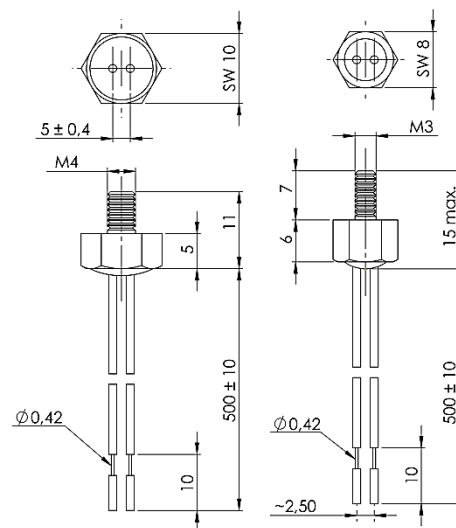
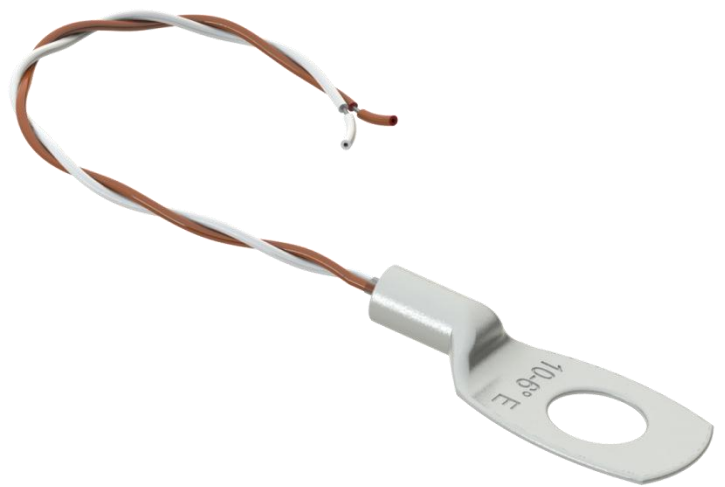
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- KTY-sensors:

examples of KTY-thermistor-housings



KTY-sensor in cable shoe surface sensor



Screw-in sensors in alu-housing
SW10-M4 SM8-M3

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Responsibility:

No responsibility will be accepted for thermistors which have not been installed and tested according to the relevant standards as previously listed in our data sheet.

Due to the ongoing research and development program, product specification may be subject to change, at the manufacturers discretion.

For further advice and information contact: