

Sensors PTC (Positive Temperature Coefficient) are temperature-sensitive resistors made of semiconductor ceramics. (Other names: Thermistors, PTC Thermistors / Sensors).

The reproducible change in resistance is used as a physical variable to activate tripping devices, for example. This provides a defined temperature control that serves as a protective function in electrical devices for a wide range of applications, e.g. for switching off the load current, switching on alarm devices, etc.

PTC Thermistors / Sensors PTC

PTC Sensors are designed with basic protective insulation as standard. Thanks to their outstanding quality, our PTC Sensors meet the highest safety and reliability requirements.

Small size and flexible to use

- Ideal for limited installation space
- Ideally suited for direct installation in and on windings
- An extensive range of stranded wires is available
- Multi-ling interconnections with up to 6 sensors in series are possible

Safe

- Manufactured according to DIN 44 081 (single sensor) and DIN 44 082 (triplet sensor) specifications

Reliable

- Very high temperature sensitivity due to low mass
- In the range of the nominal response temperature TREF, the resistance R rises extremely steeply

Extremely durable

- No burn-off, no material fatigue, constant nominal response temperature (over years)

Supply voltage - DC voltage [V, VDC]

PTC Sensors PTC should ideally be operated with almost no current. It is recommended to apply a voltage of approx. 2.5 V DC to 7.5 V DC, preferably pulsed. In this way, the power integral is minimized and the current flow through the Sensors PTC is almost zero => no or very little self-heating!

A larger current flow can lead to self-heating of the sensor and thus to triggering even below the nominal response temperature TREF.

Multiple circuit:

For multiple circuits, the total resistance is calculated from the sum of the individual resistances. The sensors are always connected in series! Example: Resistance of a triplet at room temperature: 3 * (< 250) = < 750 Ohm (standard).

During installation, the PTC Thermistors / PTC Sensors should be:

- As close as possible to the heat source
- inserted parallel to the axis of the winding
- In the case of multi-phase motors, it should be introduced into each winding if possible

Applications

- In and on windings of electric motors, transformers or ballasts
- As a temperature sensor in devices (e.g. in the household or automotive sector, in electronic assemblies on heat sinks or circuit boards)

Note

The data and information provided are based on tests and test series. They are intended as a guide, which is why there may be deviations for individual applications and uses. The suitability for a specific application must be checked by the user in each individual case. We will of course be happy to advise you.

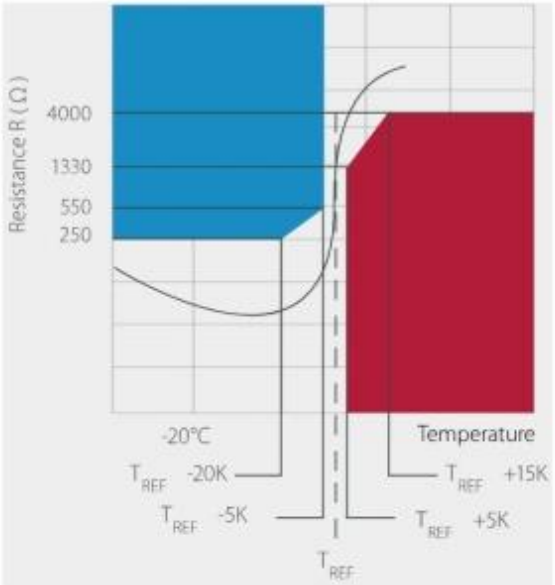
Types

SNM (bearing type) with Mylar®-Nomex® insulation protective cap	**SKM** with Kynar® (PVDF) insulation protection sleeve	**STM** with Teflon® (PTFE) insulation protective sleeve	**LTM (insulated housing)** with aluminum screw-on housing M4x5, max. torque 2 Nm
			

Temperature-resistance characteristic

according to DIN 44081 (single), DIN 44082 Drilling)

General Information



General Information		
TREF = Nominal response temperature TREF = 90 ˚C to 160 ˚C in steps of 10K or 5K		
Temperature T[°C]	**Resistance R according to DIN 44081 (per sensor)**	**Measuring voltage [VDC]**
- 20 ˚C Up to TREF - 20K	20 W to 250 W - Standard -	≤ 2,5 V
TREF - 5K	≤ 550 W	≤ 2,5 V
TREF + 5K	≤ 1330 W	≤ 2,5 V
TREF + 15K	≥ 4'000 W	≤ 7,5 V pulsed
max. permissible operating voltage: Umax = 30 V max. recommended sensor voltage. Umess = 7.5 V Dielectric strength of the insulation: Ueff = 2.5 kV		

$$T_{NF} \Leftrightarrow T_{NAT} \Leftrightarrow T_{REF}$$

R-T characteristic values for other TREFs (nominal response temperatures) - on request -

Nominal response temperatures and color coding of the cables

Connecting cables (external)/connecting cables (internal),

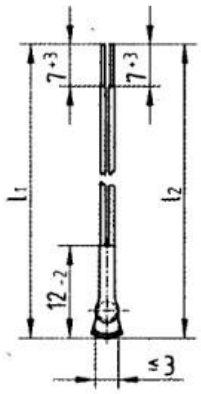
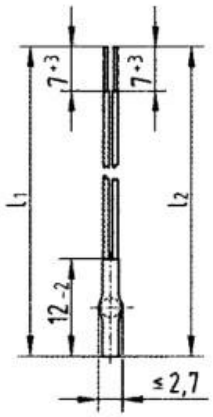
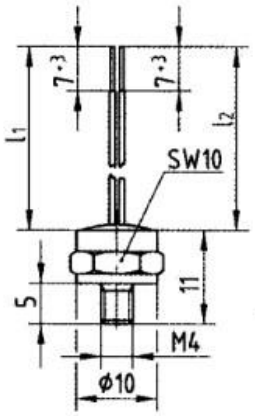
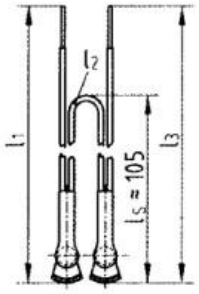
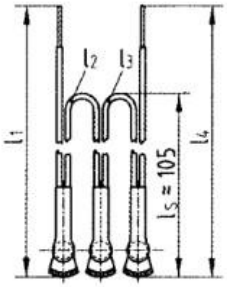
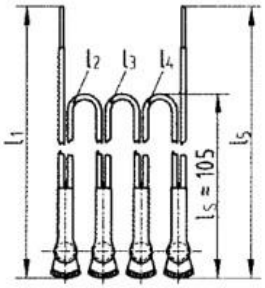
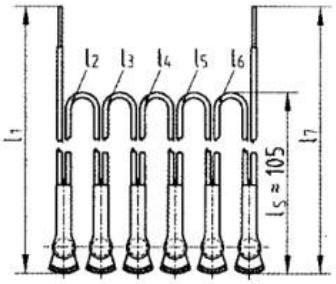
(values in italics do not correspond to DIN 44081/DIN 44082)

The connecting cables for multiple interconnections are yellow as standard. Cable colors may vary in hue! Other color combinations on request.

60°C	70°C	80°C	90°C	100°C	105°C	110°C	115°C	120°C	125°C	130°C
white	white	white	green	rot	blue	brown	blue	gray	rot	blue
gray	brown	white	green	rot	gray	brown	green	gray	green	blue

135°C	140°C	145°C	150°C	155°C	160°C	165°C	170°C	180°C	190°C
rot	white	white	black	blue	blue	blue	white	white	black
brown	blue	black	black	black	rot	brown	green	rot	brown

Wiring

Single circuit SNM	Single circuit SKM/STM	Single circuit LTM	
			
Twin connection	**Triplet connection**	**Quadruplet connection**	**Six-terminal connection**
			

For missing earth see individual wiring, each available in SNM, SKM, STM version

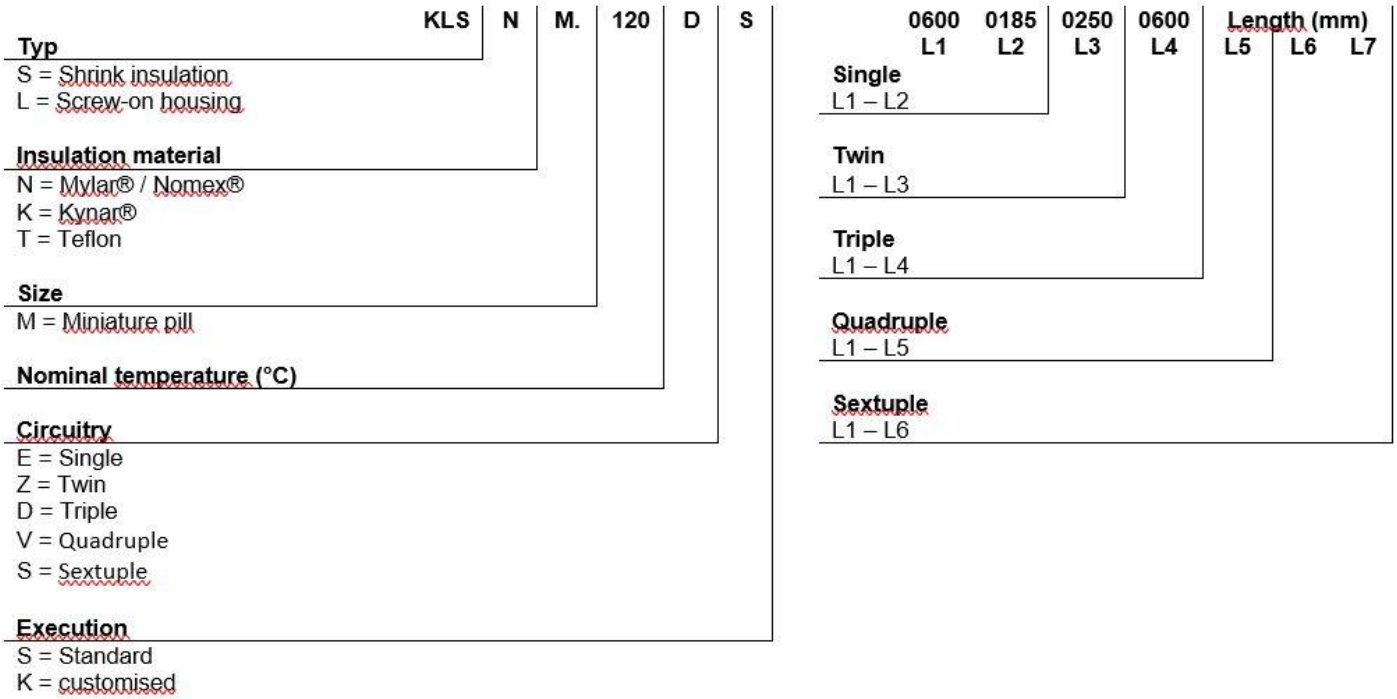
Single PTC Thermistors / Sensors SNM				Triple PTC Thermistors / Sensors SNM			
Cable lengths		520 mm		Cable lengths		520/185/185/520mm	
Standard cross-section		0.25 mm2		Standard cross-section		0.25 mm2	
Art. No.		**TREF °C**	**Standard colors**	**Art. No.**		**TREF°C**	**Standard colors**
KLSNMES060	♦	60±5	white-grey	**KLSNMDS060**		60±5	white-yellow-yellow-grey
KLSNMES090	♦	90±5	green-green	**KLSNMDS090**		90±5	green-yellow-yellow-green
KLSNMES100	♦	100±5	red-red	**KLSNMDS100**		100±5	red-yellow-yellow-red
KLSNMES105		105±5	blue-grey	**KLSNMDS105**		105±5	blue-yellow-yellow-grey
KLSNMES110	♦	110±5	brown-brown	**KLSNMDS110**	♦	110±5	brown-yellow-yellow-brown
KLSNMES115		115±5	blue-green	**KLSNMDS115**		115±5	blue-yellow-yellow-green
KLSNMES120	♦	120±5	gray-gray	**KLSNMDS120**	♦	120±5	gray-yellow-yellow-gray
KLSNMES125		125±5	red-green	**KLSNMDS125**		125±5	red-yellow-yellow-green
KLSNMES130	♦	130±5	blue-blue	**KLSNMDS130**	♦	130±5	blue-yellow-yellow-blue
KLSNMES135		135±5	red-brown	**KLSNMDS135**		135±5	red-yellow-yellow-brown
KLSNMES140	♦	140±5	white-blue	**KLSNMDS140**	♦	140±5	white-yellow-yellow-blue
KLSNMES145		145±5	white-black	**KLSNMDS145**		145±5	white-yellow-yellow-black
KLSNMES150	♦	150±5	black-black	**KLSNMDS150**	♦	150±5	black-yellow-yellow-black
KLSNMES155	♦	155±5	blue-black	**KLSNMDS155**	♦	155±5	blue-yellow-yellow-black
KLSNMES160	♦	160±5	blue-red	**KLSNMDS160**		160±5	blue-yellow-yellow-red
KLSNMES165		165±5	blue-brown	**KLSNMDS165**		165±5	blue-yellow-yellow-brown
KLSNMES170	♦	170±5	white-green	**KLSNMDS170**	♦	170±5	white-yellow-yellow-green
KLSNMES180	♦	180±5	white-red	**KLSNMDS180**	♦	180±5	white-yellow-yellow-red
KLSNMES190		190±5	black-brown	**KLSNMDS190**		190±5	black-yellow-yellow-brown

♦ Stock types

Note:

Orders without details of cable lengths are carried out in accordance with DIN 44081 and DIN 44082 specifications.

- External cables -> 520 mm
- Internal cables-> 185 mm (e.g. triplets)



Examples:	
KLSTM.120.DS Triple connection: PTFE (Teflon®) cap Standard: Standard: TREF = 120°CKLSKM.110.ZS.0300.0200.0400 Twin connection: Kynar® cap Standard: TREF = 110°C L1 = 300 mm, L2 = 200mm L3 = 400 mm	**KLSKM.110.ZS.0300.0200.0400** Twin connection: Kynar® cap standard: TREF = 110°C L1 = 300 mm, L2 = 200mm L3 = 400 mm KLLTM.090.ES.0400.0400 Individual connection: Aluminum screw-on housing Standard: TREF = 90°C 520 mm long external lines (L1+L4) 185 mm long internal lines (L2+L3) on both sides.

Customized versions

Version K (customer-specific) - possible deviations on request

- Color coding
- Cable insulation material or cable cross-section
- Dielectric strength of the insulation
- (suitable e.g. for installation in protection class II applications)
- Cable end assembly
- Connection technology
- Components used with UL listing