



Temperature and Humidity Sensors

Thermoresistances

Thermocouples

Relative Humidity Sensors

Compensation Cable



Thermoresistances & Thermocouples

Temperature Sensors



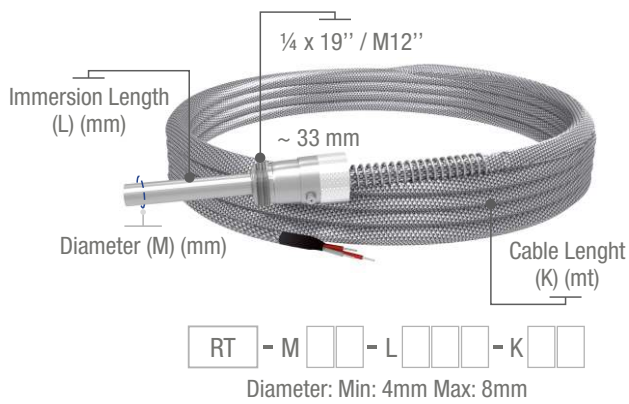
Resistance Thermometers are used widely from -200 to $+850^{\circ}\text{C}$ in different process. Especially at low temperature, resistance thermometers are preferred since their accuracy is much better than thermocouples. Up to 400°C standard types and between $400-850^{\circ}\text{C}$ special types are used. The maximum immersion length of the resistance thermometers should be determined by considering the measurement errors that may be caused by heat transfer occurring along the protecting tube and R/T element. The fluid speed where the resistance thermometer is immersed is a factor affecting the measurement sensitivity. In general, R/T should be perpendicular to the flow direction. Copper conductive cables are used between resistance thermometer head and the instruments. Up to 10 meters, 2×1.5 mm copper cable, up to 150 meters 3×1.5 mm copper cables, after 150 meters 4×1.5 mm copper cable are used.

Straight Thermocouple with metal ceramic protecting tubes are widely used in a variety of processes between -200°C and 1600°C . The maximum operating temperatures given in the catalogue apply to the air where there are no corrosive gases. In general the thermowells chosen for the installation is governed mainly by the corrosion conditions the well will face. The high polish given to all stainless wells provides maximum corrosion resistance. Occasionally, the material consideration is one of the strength rather than corrosion resistance.

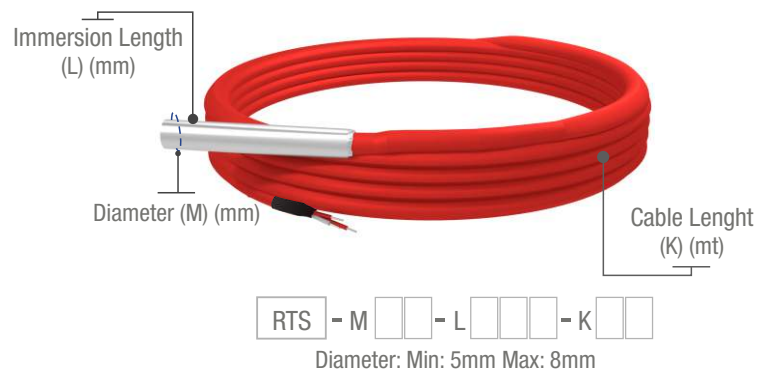
Temperature Sensors

Thermoresistances

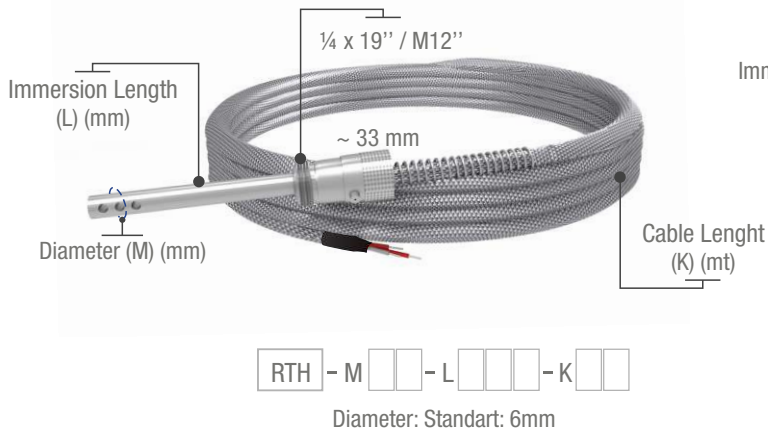
► (RT) Bayonet Type



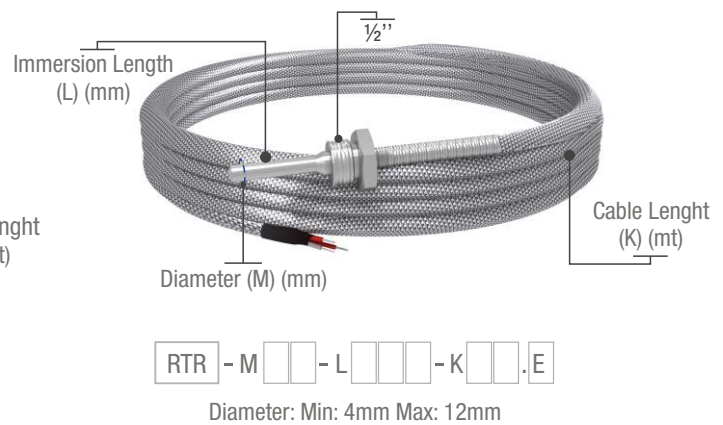
► (RTS) Bayonet Bore Type



► (RTH) Bayonet Air Type



► (RTR) Bayonet Type with Fittingnut

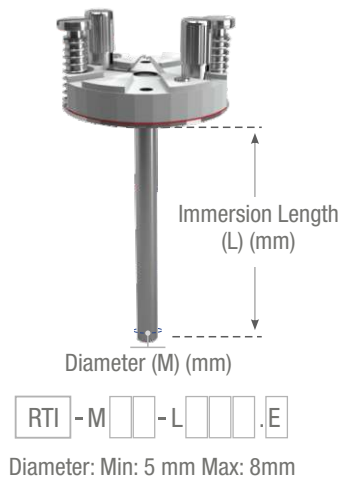


- Max. operating temperature : 400°C for braided wire, 200°C for silicone
- Standard cable types : Fiber glass + fiber glass + braided wire, 3x0,22 mm² / Silicone + Silicone, 3x0,22 mm² ("Si+Si" is added to order code)
- Standard cable length (K) : K01 = 1m, K02 = 2m, K03 = 3 m, K04 = 4m, K05 = 5 m.
- Sensor type : DIN/EN60751 Class "B" 1xPt-100 için E=1 or 2xPt-100 için E=2 (RTR)
- Protection tube material : Nickel coated brass (RT) or AISI304 (DIN1.4301), "316" is added to order code for AISI316 (RTR)
- Connector : 1/4 x 19" (selectable as M12" on ordering)
- Fittingnut (RTR) : 1/2" fittingnut is used for standard production

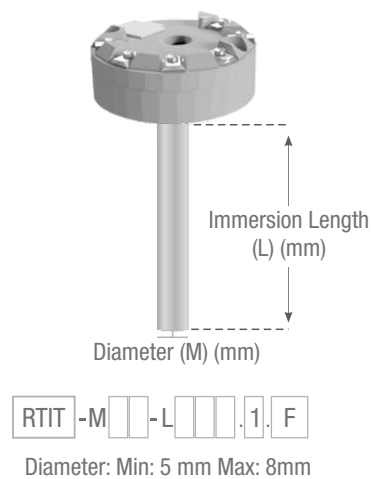
Temperature Sensors

Thermoresistances

► (RTI) Inset Type

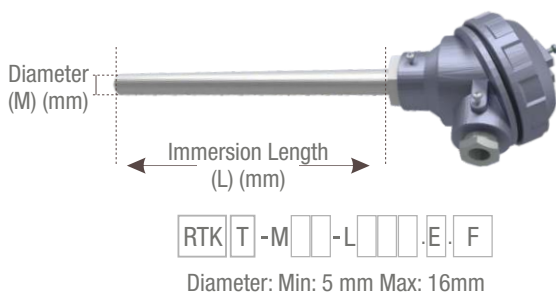


► (RTIT) Inset Type with Transmitter

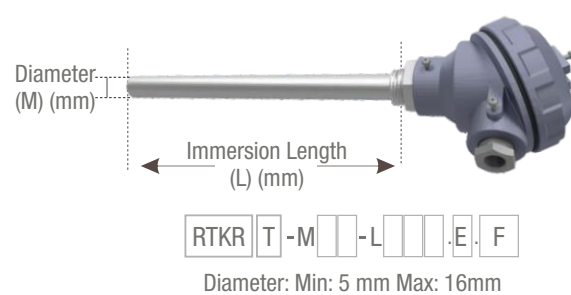


- Max. operating temperature : 500°C
- Protection tube material : AISI304 (DIN1.4301) "316" is added to order code for AISI316
- Sensor type : DIN/EN60751 Class "A" 1xPt-100 E=1 (RTIT) DIN/EN60751 Class "B" 2xPt-100 E=2
- Transmitter (RTIT) : 4...20mA current output, serial connection (Loop Powered) transmitter.
F=Calibration scale must be described on ordering

► RTK (Terminal Block Type) RTKT (Terminal Block with Fittingnut Type)



► RTKR (Terminal Block with Transmitter Type) RTKRT (Terminal Block with Fittingnut and Transmitter Type)

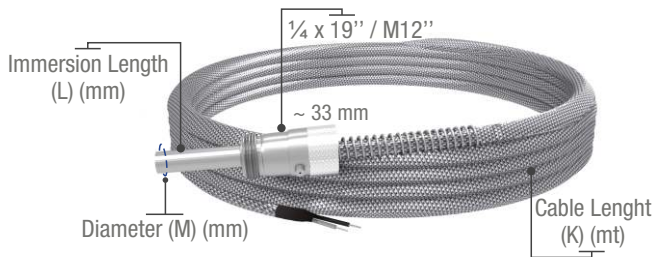


- Max. operating temperature : 500°C
- Protection tube material : AISI304 (DIN1.4301) "316" is added to order code for AISI316
- Sensor type : DIN/EN60751 Class "A" 1xPt-100 for E=1 (RTKT, RTKRT) / DIN/EN60751 Class "B" 2xPt-100 for E=2
- Transmitter (RTIT) : 4...20mA current output, serial connection (Loop Powered) transmitter.
F=Calibration scale must be described on ordering

Temperature Sensors

Thermocouples

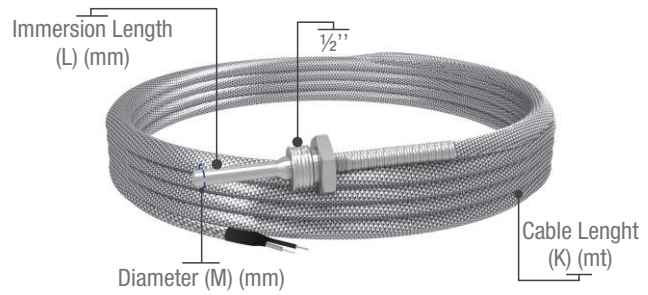
► (TC) Bayonet Tipi



TC - M [] [] - L [] [] [] - K [] [] [] . E

Diameter : Min: 3mm Max: 8mm

► (TCR) Bayonet Rekorlu Tip



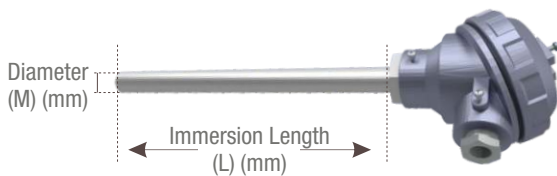
TCR - M [] [] - L [] [] [] - K [] [] [] . E

Diameter : Min: 3mm Max: 12mm

- Max. operating temperature : 400°C for braided wire 200°C for silicone
- Standard cable types : Fiber glass + fiber glass + braided wire, 2x0,22 mm²
Silicone + Silicone, 2x0,22 mm² ("Si+Si" is added to order code)
- Standard cable length (K) : K01 = 1m, K02 = 2m, K03 = 3 m, K04 = 4m, K05 = 5 m.
- Sensor type : DIN/IEC-584 "J" FeCu-Ni E=J, DIN/IEC-584 "K" NiCr-Ni E=K
- Protection tube material : Nickel coated brass brass or AISI304 (DIN1.4301)
- Connector (TC) : 1/4 x 19" (selectable as M12" on ordering)
- Fittingnut (TCR) : 1/2" fittingnut is used for standard production

► TCK (Terminal Block Type)

TCKT (Terminal Block with Fittingnut Type)

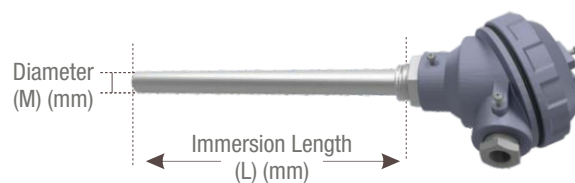


TCK T - M [] [] - L [] [] [] . E . F

Diameter : Min: 3mm Max: 22mm

► TCKR (Terminal Block with Transmitter Type)

TCKRT (Terminal Block with Fittingnut and Transmitter Type)



TCKR T - M [] [] - L [] [] [] . E . F

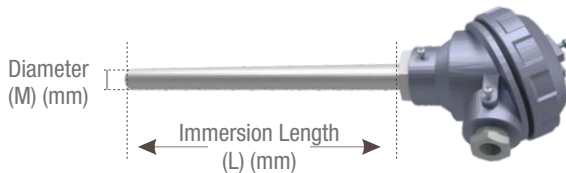
Diameter : Min: 3mm Max: 22mm

- Max. operating temperature : "K" type 1200°C (M22), 900°C (M16), 800°C (M10) "K" and J tipi" 600°C (M06, M08)
- Protection tube material : AISI304 (DIN1.4301)"316" is added to order code for AISI316
- Sensor type : DIN/IC-584 "J" FeCu-Ni E=1.J,
DIN/IC-584 "K" FeCu-Ni E=1.K,
DIN/IC-584 2x"J" FeCu-Ni E=2.J, (TCK, TCKR)
DIN/IC-584 2x"K" FeCu-Ni E=2.K, (TCK, TCKR)
- Transmitter (TCKT or TCKRT) : 4...20mA current output, serial connection (Loop Powered) transmitter.
F=Calibration scale must be described on ordering

Temperature Sensors

Thermocouples

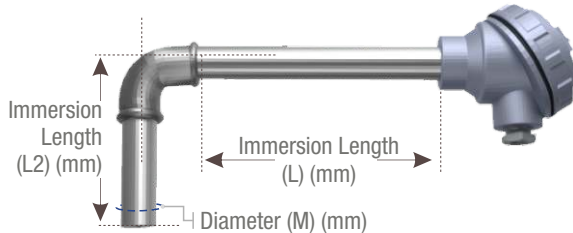
- ▶ TCKM (Terminal Block Type)
- ▶ TCKMT (Terminal Block with Transmitter Type)



TCKM T -M -L .1.K . F

Diameter : Standard: 6mm

- ▶ (TCKL) Terminal Block Type "L" Type
- ▶ (TCKLT) Terminal Block Type "L" Type Transmitter Type

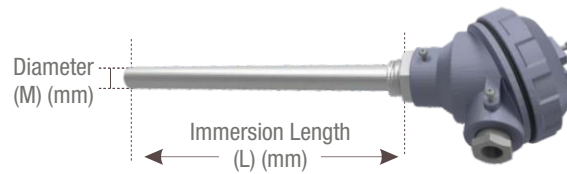


TCKL T -M -L L1 x L2 .E . F

Diameter : Min: 16mm Max: 22mm

- Max. operating temperature :** 700°C
- Protection tube material :** AISI304 Stainless steel
- Sensor type :** DIN/IEC-584 "J" NiCr-Ni E=1.J,
DIN/IEC-584 "K" NiCr-Ni E=1.K,
2x "J" FeCu-Ni E=2.J (TCKK)
2x "K" NiCr-Ni E=2.K (TCKK)
- Transmitter (TCKLT) :** 4...20mA current output, serial connection (Loop Powered) transmitter.
F=Calibration scale must be described on ordering

- ▶ TCKRM (Terminal Block with Fittingnut Type)
- ▶ TCKRMT (Terminal Block with Fittingnut and Transmitter Type)

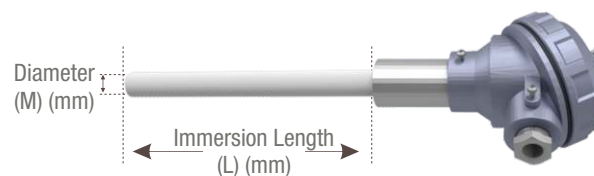


TCKRM T -M -L .1.K . F

Diameter : Standard: 6mm

- Max. operating temperature :** 1200°C
- Protection tube material :** AISI310 (DIN1.4845) "inconel" is added to order code for INCONEL600
- Sensor type :** DIN/IEC-584 "K" NiCr-Ni E=1.K,
- Transmitter (TCKMT ve TCKRMT) :** 4...20mA current output, serial connection (Loop Powered) transmitter.
F=Calibration scale must be described on ordering

- ▶ (TCKK) Klemens Terminalli Tip,
- ▶ (TCKKT) Klemens Terminalli Tip



TCKK T -M -L .E . F

Diameter : Min: 15mm Max: 24mm

- Max. operating temperature :** 1200°C for "K" NiCr-Ni
1600°C for "S" Pt10%Rh-PT
1600°C for "R" Pt13%Rh-PT
- Wire Diameter :** 3,00mm for "K" type 0,35mm for "S" and "R" type
- Protection tube material :** KER610 Ceramic
- Sensor type :** DIN/IEC-584 "K" NiCr-Ni E=1.K,
DIN/IEC-584 "S" Pt10%Rh-Pt E=1.S,
DIN/IEC-584 "R" Pt13%Rh-Pt E=1.R,
2x "K" NiCr-Ni E=2.K (TCKK),
2x "S" Pt10%Rh-Pt E=2.S (TCKK),
2x "R" Pt10%Rh-Pt E=2.R (TCKK)
- Transmitter (TCKKT) :** 4...20mA current output, serial connection (Loop Powered) transmitter.
F=Calibration scale must be described on ordering

Compensation Cable



- Silicone + fiber glass + braided wire, 2 x 0,75 mm² IEC584 "J" FeCu-Ni
- Silicone + fiber glass + braided wire, 2 x 0,75 mm² IEC584 "K" FeCu-Ni
- Silicone + fiber glass + braided wire, 2 x 1,50 mm² IEC584 "J" FeCu-Ni
- Silicone + fiber glass + braided wire, 2 x 1,50 mm² IEC584 "K" NiCr-Ni
- Silicone + fiber glass + braided wire, 2 x 1,50 mm² IEC584 "S" Pt10%Rh-Pt

Pronem
midi



Pronem
midi



Pronem
mini



Relative Humidity Sensors

Pronem
mini / midi / lcd-midi



Pronem
midi-lcd



Pronem
midi-lcd



Technical Specifications

Measuring range (RH)	: %0...100
Measuring range (T) (°C)	: -20°C...+80°C
Measuring range (T) (°F)	: -4°F...+176°F (for Pronem Midi LCD type)
Accuracy (RH)	: ±2 %RH (Typ)@23°C %0...100
Accuracy (T)	: ±0,3°C (Typ)@23°C
Stability (RH)	: <0,5 %RH/year (Typ)
Stability (T)	: <0,04°C/year (Typ)
Analogue Out. Sign. Accuracy (Voltage)	: ±%0,1
Analogue Out. Sign. Accuracy (Current)	: ±%0,5

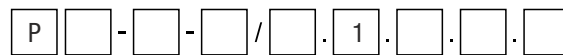
Working Conditions

Operating Temperature	: -40°C...+85°C
Height	: Up to 2000 m.

Standard Features

- 2 analogue outputs for temperature and humidity
- High output accuracy
- Small and useful design
- Long-term stability
- Low thermal drift
- Current or voltage output signal selection for temperature and humidity analogue output type

PRONEM MIDI

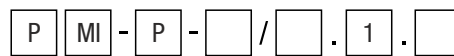


Main Model	
Temperature and Relative Humidity Transmitter	P
Sub Model	
PRONEM midi	MD
PRONEM midi LCD	MDL
PRONEM midi LCD with Backlight	MDLB
Installation Type	
Wall	W
Channel	D
Relative Humidity Signal Output	
RS-485	0
4-20 mA	H0
0-10V	H1
2-10V	H2

Communication	
None	0
RS-485 (isolated)	1

Option	
Communication ID with switch (ID:200...207)	Null
Communication ID with software (ID: 1...247)	250
Tube Length	
None	0
59 mm	1
159 mm	2
Supply Voltage	
16...32 VDC	1
Temperature Signal Output	
RS-485	0
4-20 mA	T0
0-10V	T1
2-10V	T2

PRONEM MINI



Main Model	
Temperature and Relative Humidity Transmitter	P
Sub Model	
PRONEM mini	MI
Installation Type	
Portable	P
Relative Humidity Signal Output	
RS-485	0
4-20 mA	H0
0-10V	H1
2-10V	H2

Communication	
None	0
RS-485 (Non-isolated)	2

Supply Voltage	
16...32 VDC	1

Temperature Signal Output	
RS-485	0
4-20 mA	T0
0-10V	T1
2-10V	T2

