



INSTRUMENTS
SATRAP DAMA
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Thermocouples Types E, N, T with Head Connection Model TH 204

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Model TH 204

Protection Tube

Construction	Mineral insulator
Mineral insulator	Stainless Steel 310, 316, 321 / Inconel 600
Insertion length "L" in mm	Order in different lengths
Outside diameter "D" in mm	Order in different diameters (%25 mm , ...)
RTD (Pt100 - Pt1000)	Order in different diameters (3 mm , ...)

Connection Head

Material	Alloy Aluminum
Protection Tube Entry	PF1/2", 3/4", NPT1/2", 3/4", BSP1/2", 3/4"
Extension Wire Entry	PF1/2", 3/4", NPT1/2", 3/4", BSP1/2", 3/4"
Protection Class	Typical IP65
Model	KN, KP, DP, DN, BP

Element

Calibration E	Type E (Nickel-Chromium / Copper-Nickel)
Conductor E	Nickel-Chromium (+) / Constantan (-)
Calibration N	Type N (Nicrosil / Nisil)
Conductor N	Nicrosil (+) / Nisil (-)
Calibration T	Type T (Copper / Copper-Nickel)
Conductor T	Copper (+) / Constantan (-)
Accuracy	According IEC 584-1 / DIN 43710
Number of Elements	Simplex (E, N, T) or Duplex (EE, NN, TT)

Installation Compression Fittings

Material	Brass or Stainless Steel
Form	Tapered and Parallel
Thread Pitch	BSPT 1/8", 1/4", 1/2" - BSP 1/8", 1/4", 1/2"

Termination

Standard die cast alloy terminal head (IP65) with ceramic terminal block,

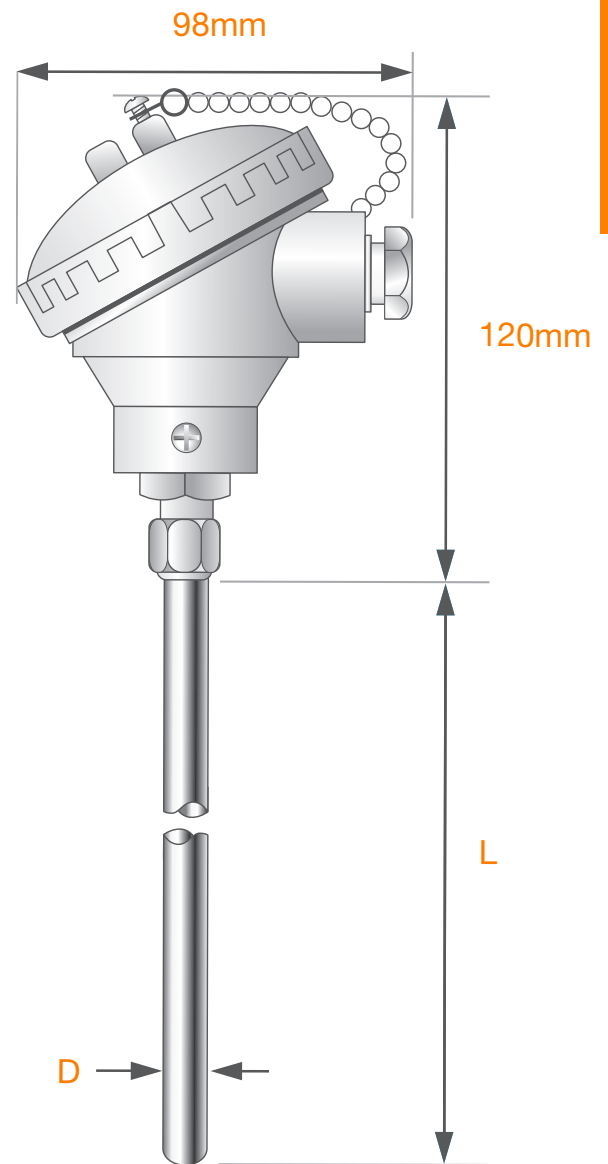
M20 X 1.5mm cable entry gland

Options Other terminal heads are available upon request

Head Mounting 4-20Ma transmitters (replaces terminal block)

Isolated and ATEX Versions also available upon request.

Please contact us for further information!



Technical Information

Thermocouple Type E

The type E thermocouple is composed of a positive leg of chromel (90%Ni, 10%Cr) and a negative leg of Constantan (55%Cu, 45%Ni). The temperature range for this thermocouple is -200 to 900°C (-330 to 1600°F). The type E thermocouple has the highest millivolt (EMF) output of all established thermocouple types. Type E sensors can be used in sub-zero, oxidizing or inert applications but should not be used in sulfurous, vacuum or low oxygen atmospheres.

Thermocouple Type N

Type N thermocouples are made with a Nicrosil (84.1%Ni,14.4% Cr,1.4% Si,0.1% Mg) positive leg and a Nisil (95.6%Ni, 4.4%Si) negative leg. The temperature range for Type N is -270 to 1300°C (-450 to 2372°F). Type N is very similar to Type K except that it is less susceptible to selective oxidation. Type N should not be used in vacuum and or reducing environments in an unsheathed design.

Thermocouple Type T

Type T thermocouples are made with a copper (Cu) positive leg and a Constantan (55%Cu, 45%Ni) negative leg. The temperature range for type T is -200 to 350°C (-328 to 662°F). Type T sensors can be used in oxidizing (below 700°F), reducing or inert applications.

We manufacture type N, E, T thermocouples to your specifications or as replacements to existing sensors. We have manufactured thermocouples for near 15 years and are solely focused on the design and manufacture of temperature sensors.



Thermocouple



Type E Thermocouple Information

The specification below table shows the most common attributes of Type E Thermocouples including temperature range, material, tolerance and sensitivity. Type E has a very high EMF output of 68 $\mu\text{V}/^\circ\text{C}$ which provides a strong signal for instrumentation and a high accuracy. Type E is also non-magnetic. It is very rare thermocouple type and is not used as much as the other types of thermocouple.

Temperature Range

Continuous	0 to +800 °C
Short Term	-40 to +900 °C

Tolerance Class 1

-40 to +375 ± 1.5 °C
375 to 800 $\pm 0.004 \cdot [t]$ °C

Sensitivity

Approximately 68 $\mu\text{V}/^\circ\text{C}$
μV = Micro Volts

Material

Chromel (90%Ni, 10%Cr)
Constantan (55%Cu, 45%Ni)

Tolerance Class 2

-40 to +333 ± 2.5 °C
333 to 900 $\pm 0.0075 \cdot [t]$ °C

Please contact us for further information!

Type N Thermocouple Information

The specification below table shows the most common attributes of Type N Thermocouples including temperature range, material, tolerance and sensitivity. Type N is a relatively new thermocouple type that was made to be an alternative to Type K. It has high stability over time but is more costly than type K at similar temperature ranges. Its sensitivity is about 39 $\mu\text{V}/^\circ\text{C}$, slightly lower compared to type K.

Temperature Range

Continuous	0 to +1100 °C
Short Term	-270 to +1300 °C

Tolerance Class 1

-40 to +375 ± 1.5 °C
375 to 1000 $\pm 0.004 \cdot [t]$ °C

Sensitivity

Approximately 39 $\mu\text{V}/^\circ\text{C}$
μV = Micro Volts

Material

Nicrosil (84.1%Ni, 14.4% Cr, Si, Mg)
Nisil (95.6%Ni, 4.4%Si)

Tolerance Class 2

-40 to +333 ± 2.5 °C
333 to 1200 $\pm 0.0075 \cdot [t]$ °C

Please contact us for further information!



Type T Thermocouple Information

The specification below table shows the most common attributes of Type T Thermocouples including temperature range, material, tolerance and sensitivity. Type T is suited for low temperatures and is used as a cryogenic sensor. This type of thermocouple copes with water present. It has a sensitivity of about $43 \mu\text{V}/^\circ\text{C}$.

Temperature Range

Continuous	-185 to +300 °C
Short Term	-250 to +400 °C

Tolerance Class 1

-40 to +125 ± 0.5°C
125 to 350 ± 0.004*[t]°C

Sensitivity

Approximately 43 $\mu\text{V}/^\circ\text{C}$
μV = Micro Volts

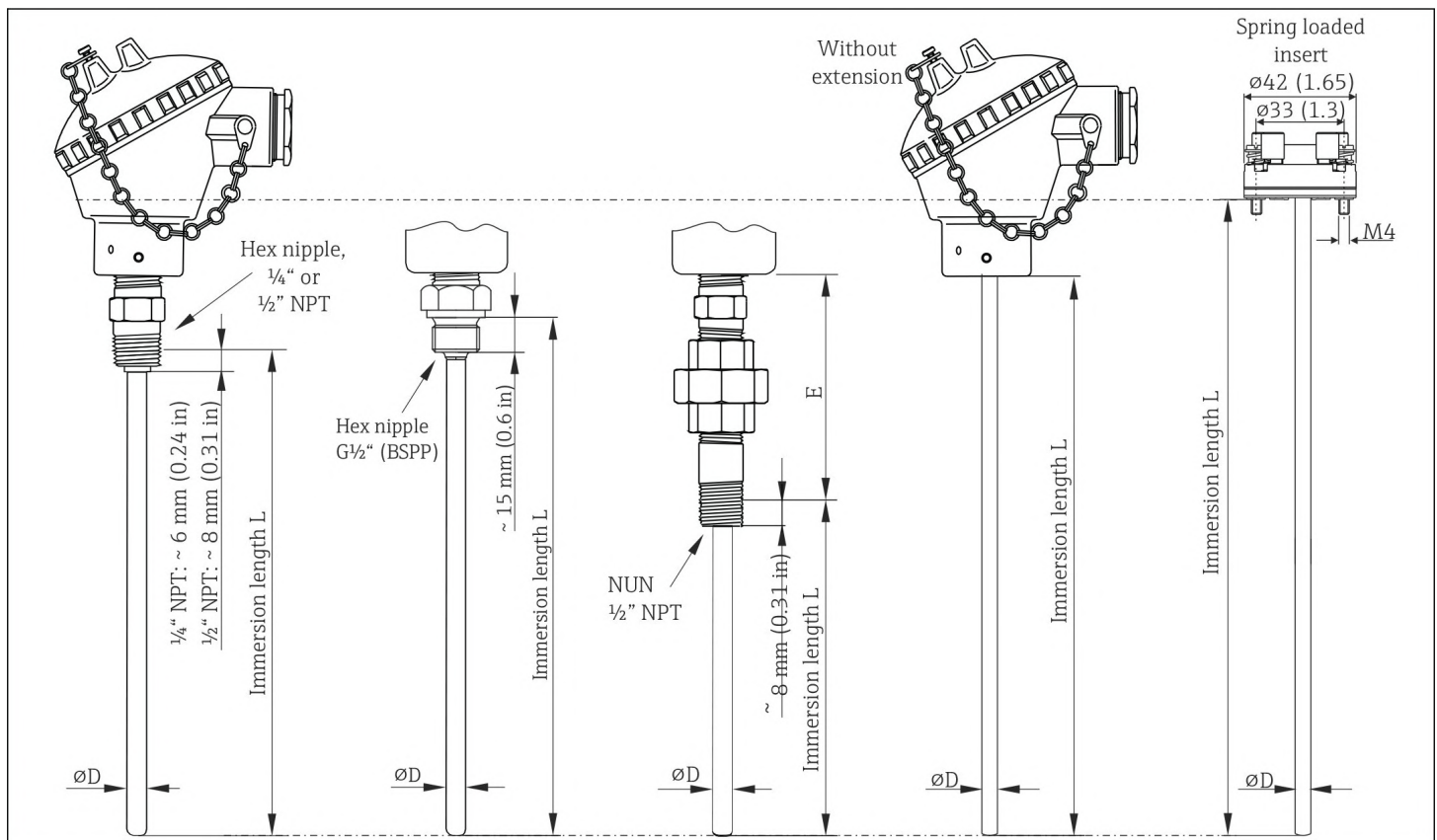
Material

Copper (Cu)
Constantan (55%Cu, 45%Ni)

Tolerance Class 2

-40 to +133 ± 1.0°C
133 to 350 ± 0.0075*[t]°C

Please contact us for further information!



Components Thermocouple with Head Connection



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