



660.025 / 030

Resistance thermo detector for air measurement

Type	: TES 3
Head	: Type C in light metal
Sheath	: AISI 304
Dimensions	: L = 10" (or upon request) Ø 8mm
Connection	: Type M - 1/2" BSP
RTD element	: 1 x PT100 or 2 x PT100 (3 wires)
Max. Temp.	: +300°C



667.060

Thermocouple measurements in laboratory

Light execution for small ovens

Type	: LM-C-R 1'400°C
Head	: Type LM in aluminium
Sheath	: Ceramic 610 (7 x 1mm)
Length	: 140...480mm
Calibration	: S=Pt-Rh 10% / Pt or R= 13%
Wires Ø	: 0.5mm or 0.35mm
Working temp.	: 1'400°C



660.055 / 078

Process measurement high pressure

Head	: Type B in light metal
Sheath	: AISI 316
Dimensions	: Foll. Norms D1 to D6 (280 to 400 mm).
Weld-in well	: Ø 24 - 30 mm down from 9-11-14 mm from bar in AISI 316
Insert	: interchangeable Ø 6mm
Calibration	: PT100 / Fe-Co / Cr-Al (1x or 2x)



660.031 / 054

Process head and well assembly

Head	: Type B in light metal
Sheath	: AISI 316
Dimensions	: L upon request
Ø	: 9 -11 - 14 mm
Connection	: fixed below head or of 140 / 170 mm
Threads	: G / NPT / Metric : standard G 1/2"
Insert	: interchangeable Ø 6-8mm
Calibration	: PT100 / Fe-Co / Cr-Al (1x or 2x)



661.000

Process measurement "Ex" execution

Head	: Type ADF - explosion proof in cast iron for "Ex" - area NEC norm
Thermowell	: Drawn from bar with norm flange in St. St. 316
Extension	: 3 pieces in steel
Insert	: Interchangeable Ø 6mm
Calibration	: PT100 / Fe-Co / Cr-Al (1x or 2x)



669.000

Thermocouple for industrial ovens

Type	: A-CC-B-1'650°C
Head	: Type A in light metal
Connection	: Metal SS holder
Sheath internal	: Ceramic 710 / gasproof pure alumina Ø 15 x 10
Sheath external	: Ceramic 530 porous as thermic shock protection Ø 24 x 18
Element	: Type B - Pt-Rh 10%/Pt-Rh 6% Ø 0.5mm other calibrations available
Working temp.	: 1'650 °C

663.000 / 001
(delivered without cable)

Precision air temperature sensor

663.000	: Indoor temperature
663.001	: Outdoor temperature PT100 with 1 or 1/3 or 1/10 DIN tolerance accuracy < 0.1°C between -30...+50°C
Accuracy	: < 0.1°C between -30...+50°C
System	: 3 or 4 wires



662.000

Thermocouples for plastic industries

METRA delivers all types of thermocouples or resistance thermo detectors for the plastic industry. Including the high quality types with metal sheathed thermocouple.

Calibration	: Fe-Co / Cr-Al / PT100
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Industrial temperature sensors



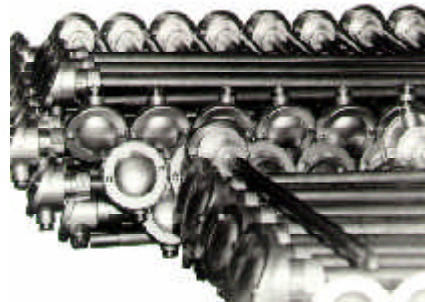
667.000

Sheathed thermocouple

Sensors used in many process systems for instance.

Brick plants working continuously at 1'050°C (1'930°F)

- Sheath** : Inconel 600 max temp. 2'100°F
 - Junction** : Grounded or ungrounded
 - Ø** : 0.5 / 1.0 / 3.0 / 3.2 / 4.5 / 6.0 mm
 - Calibration** : Fe-Co / Cr-Al
- Thermo plugs see group 680



Thermocouple for industrial oven

Type AM-K-1'000°C

- Head** : Type A in light metal
- Sheath** : in refractory SS 310 or 446
- Ø** : 7/8"
- Couple** : Type K Ø 1/8" insulated by pearls in ceramic 610
- Working temp.** : 1'000°C / 1'832°F



Thermocouple for industrial ovens

Type A-C-S- 1'600°C

- Head** : Type A in light metal
- Connection** : through sliding flange on SS holder
- Sheath** : gasproof ceramic 710 - pure alumina Ø 234 x 18mm
- Couple** : Type S-PtRh 10% / Pt Ø 0.5mm
- Working temp.** : 1'600°C / 2'920°F



Thermo-Diesel-Thermocouple for exhaust gases

Electrical connection: High temp. screw connector

- Lag extension** : Steel L = 50 Ø 13mm
- Connection to motor** : M-Mobile 1/2" - 3/8BSP steel
- SEnsor calibration** : Inconel sheathed thermocouple K or J
- Dimensions** : L = 150mm (100 x Ø 13 and 50 x Ø 9mm)
- Range** : 0...800°C (0...+ 1480°F)

METRA INSTRUMENTS manufactures temperature sensors following **ASA** and **DIN** norms.

RTD	DIN 43'730 Thermoresistance	PT 100 ($\Omega/0^{\circ}\text{C}$) NI 100 ($\Omega/0^{\circ}\text{C}$)
T/C	DIN 43'710 Thermocouples	NiCr-Ni (K) Fe/CuNi (J) Cu/CuNi (T) PtRh10/Pt (S) PtRh13/Pt (R) PtRh18 DIN (B)

These **SENSORS** have various **PROTECTION ASSEMBLIES** depending on environment, measured temperature, requested accuracy. The following described sensors are standard, but other dimensions connections and materials can be supplied at short notice.

General specifications

Thermo Resistances RTD

Standard

- Type Pt 100 single or duplex element
fol. DIN 43760
- Accuracy (B) at $0^{\circ}\text{C} \pm 0.3^{\circ}\text{C}$
at $100^{\circ}\text{C} \pm 0.8^{\circ}\text{C}$
- 3 wires (6 for duplex)
- MGO filled, pressed and vibrated
- Protection tube in AISI 304L

Upon request

- Tolerance (A) at $0^{\circ}\text{C} \pm 0.15^{\circ}\text{C}$
at $100^{\circ}\text{C} \pm 0.35^{\circ}\text{C}$
or further reduced 1/2A, 1/4A etc.
- Reduced tip at 4 mm (or 3mm)
for quicker response time
- Protection tube in AISI 316L or 310 or
Any other material.

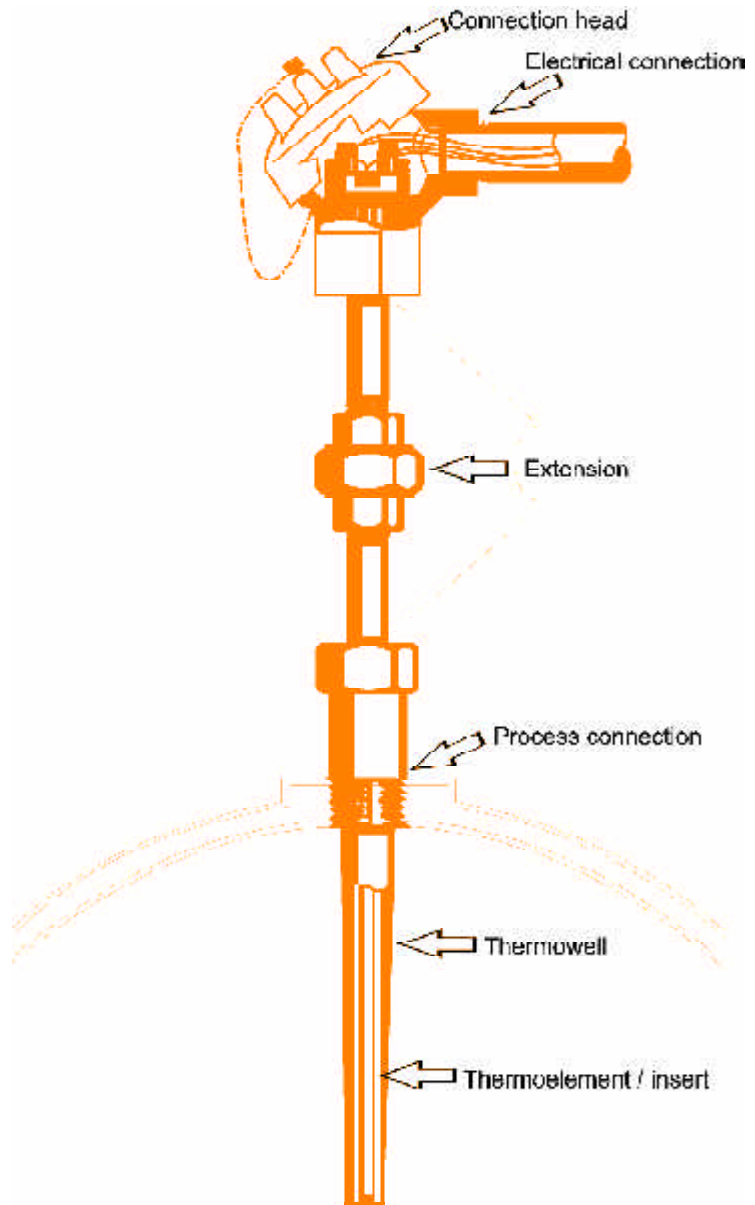
Thermocouples TC

Standard

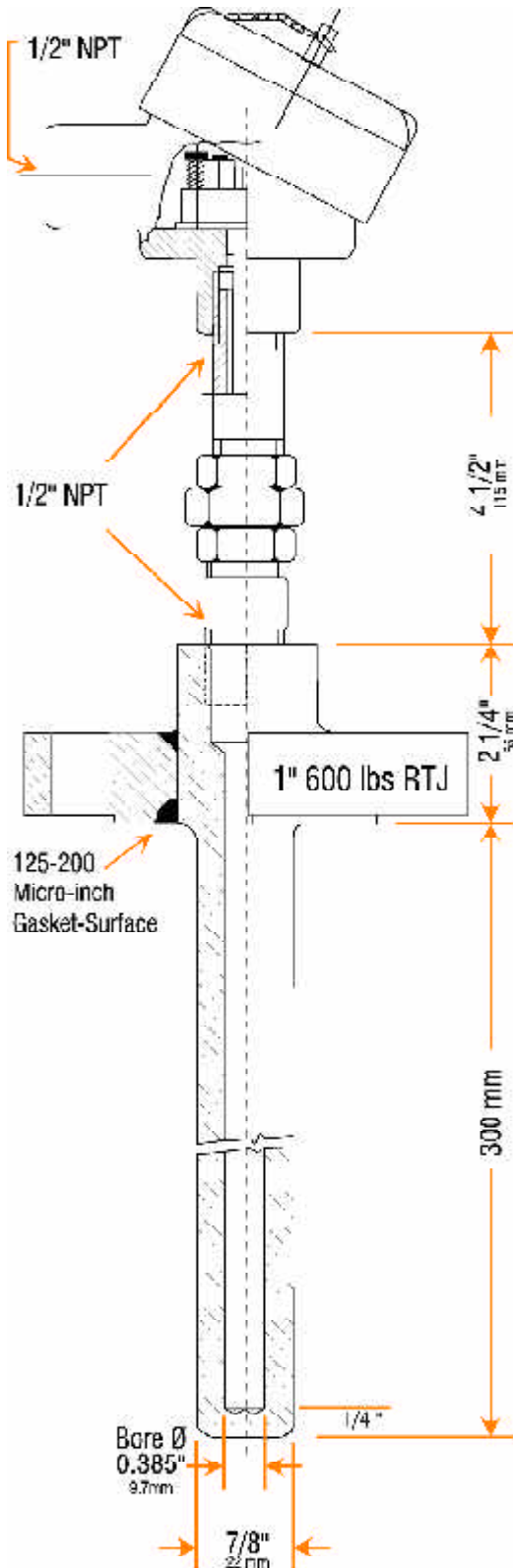
- Type K couple (NiCr-Ni) in sheathed
mineral insulated cable \varnothing 6mm
- Temperature max. $1'100^{\circ}\text{C}$
- Hot junction insulated

Upon request

- Hot junction grounded, or exposed
- calibration J/T/S
- all diameters 1, 2, 3, 8 mm etc.



Example of typical Thermocouple assembly for refineries



THERMOCOUPLE ASSEMBLY

Thermocouple	Calibration	: J - Fe/Co-Iron/Constantan
	According to	: ANSI C96.1
	Gauge wires	: 14 AWG
	Terminal block	: single
Nipple	Size	: 1/2" sched 40
	Length	: 2"
	Union size	: 1/2"
Head	Material	: galvanized carbon steel
	Cover	: screwed weatherproof IP 67 explosionproof EExd 11B + H2TS
	Cable entry	: 1/2" NPT
	Process connection	: 1/2" NPT
	Material	: die cast alloy

FLANGED BAR STOCK WELL

Well	Material well	: 316 st.st.
	Material flange	: 316 st. st.
	Process connection	: flanged complying with ANSI B16.5
	Size/rating/face	: 1" 600 Lbs RTJ (ANSI B 16.5)
	Immersion length	: U = 300 mm
	Construction	: bar stock from rod 1-1/4"
	Surface finish	: 16-32 RMS over 85% of "U" dimension
	Welds	: between flange and well standard welds (TX-A1)
	Q. Dia	: 22 mm (7/8")
	Bore dia.	: 9.7 mm (0.385")