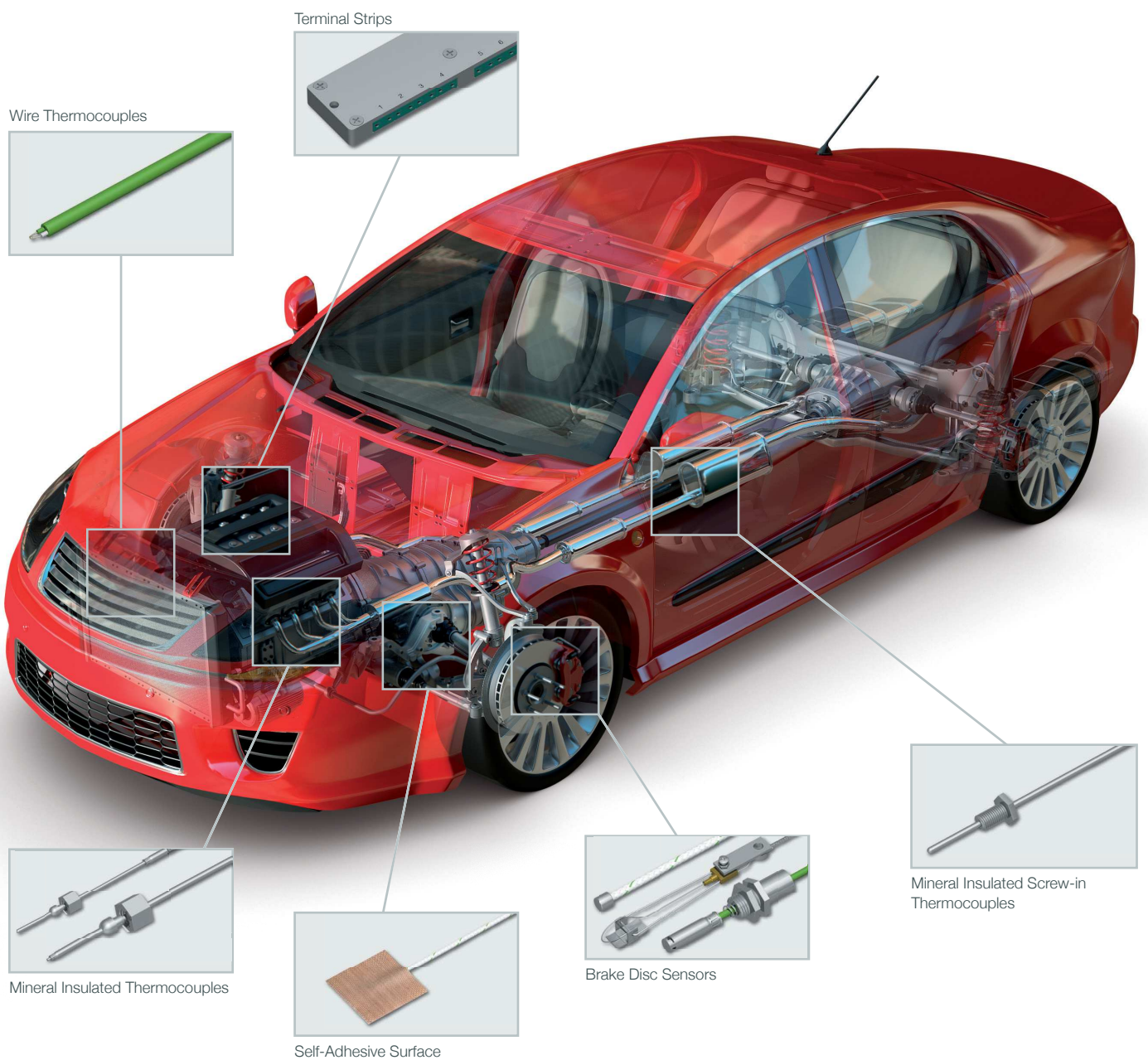


hotcontrol

Automotive Thermocouples – RTDs



Temperature Sensors for Research and Development in the Automotive Industry

hotcontrol

Automotive Thermocouples – RTDs

Components

We provide our customers with an extensive portfolio of technically mature products from the field of heating elements, thermal sensors and control technology. Since 1973, we have manufactured heating elements in Germany, and since 2002, we have been continuously developing our production location in Malta.

The manufactured products are usually individually-tailored to the customer – in extremely small unit numbers or in large quantities, at an attractive price. Our core process is organized highly efficiently using our own software, and we provide customer storage in all significant global markets. We work with our own specialists in order to select the best product for our customers.

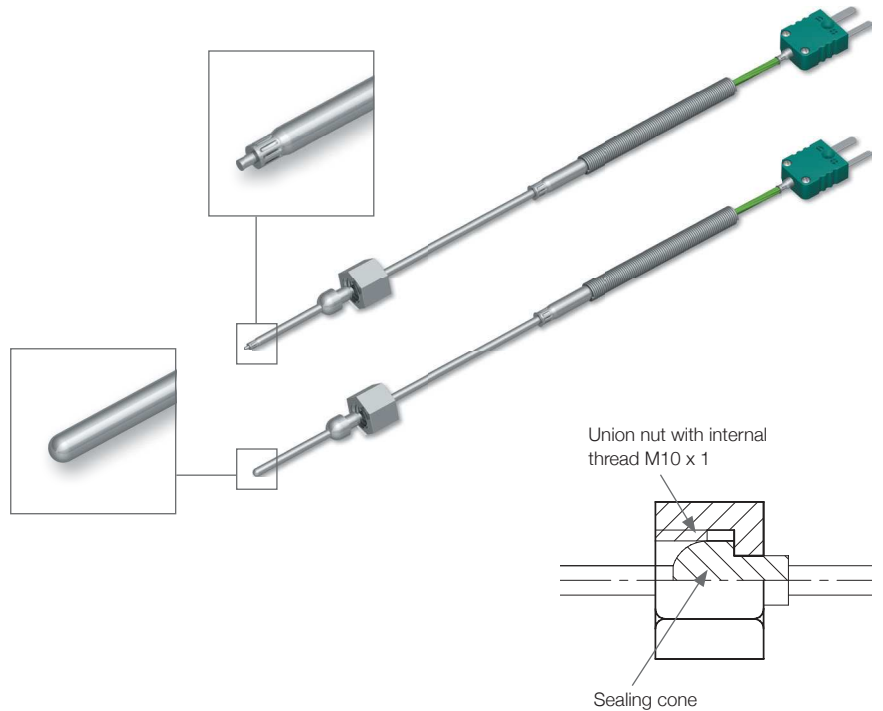
General information for all thermocouples and RTDs

- All dimensions are subject to general tolerances according to DIN 2768-m.
Our tolerances in most cases exceed DIN 2768-m standards. Exact tolerances for your item are available on request.
- All thermocouples can be produced with ANSI color code. Other standards are available on request.
- All dimensions for mineral insulated thermocouples are subject to tolerances according to EN 61515.
- Deviations from the standard are available on request.

Mineral Insulated Thermocouple Mineral Insulated RTD

General applications

- Engine compartment
- Catalytic converter
- Exhaust pipe



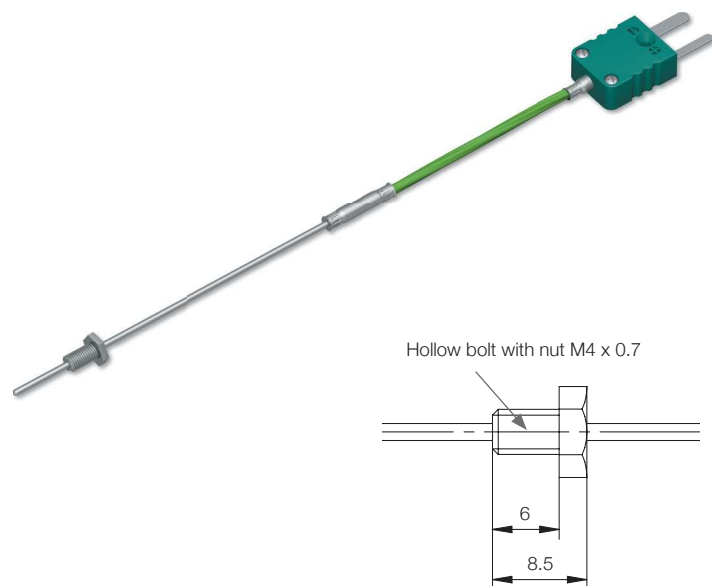
Mineral Insulated Screw-in Thermocouple Mineral Insulated Screw-in RTD

General applications

- Engine compartment
- Turbocharger
- Oil pan
- Exhaust pipe

Options

- Bend protection spring
- Protection tube
- Support pipe



Technical key features	Mineral Insulated Thermocouple Mineral Insulated Screw-in Thermocouple	Mineral Insulated RTD Mineral Insulated Screw-in RTD
Lead cross-section	0.22 mm ²	0.22 mm ²
Minimum bending radius	5.0 x sheath diameter	5.0 x sheath diameter
Classification tolerance	Class 1 or 2 (DIN60584)	Class A or B
Wire circuit	–	2- wire-circuit: class B 3- and 4-wire-circuit: class A or B
Measuring point	Ungrounded or grounded	–

Performance Range

Thermocouple

Diameter [mm]	Types	Connection head [mm]	Lead Options	Number of Thermocouples
0.5	K	Ø 6 x 30	GLS/GLS/MB	1 x
0.75	K	Ø 6 x 30	GLS/GLS/MB	1 x
1.0	K	Ø 3.2 x 23	Kapton/Kapton GLS/Kapton GLS/GLS	1 x
1.0	K	Ø 4 x 22	any	1 x
1.5	K	Ø 3.2 x 23	Kapton/Kapton GLS/Kapton GLS/GLS	1 x
1.5	K	Ø 4 x 22	any	1 x
2.0	K	Ø 4 x 22	any	1 x
2.0	K	Ø 6 x 30	GLS/GLS/MB PFA/PFA	2 x
3.0	K	Ø 6 x 30	any	1 x or 2 x
4.5	K	Ø 6 x 30	any	1 x or 2 x
6.0	K	Ø 8 x 50	GLS/GLS/MB	1 x or 2 x

RTD

Diameter [mm]	Types	Connection head [mm]	Lead Options	Number of Thermocouples
2.0	Pt 100, Pt 1000	Ø 6 x 30	any	1 x
3.0	Pt 100, Pt 1000	Ø 6 x 30	any	1 x
4.5	Pt 100, Pt 1000	Ø 6 x 30	any	1 x
6.0	Pt 100, Pt 1000	Ø 8 x 50	any	1 x

Type Specifications

Thermocouple

Type	Materials	Standard	Lead Colors [+/-]	Sheath Material**	Measurement Range
K	NiCr-Ni	IEC 60584	green/white	2.4816	-40 ... +1100 °C -40 to 2010 °F
K*	NiCr-Ni	DIN 43710*	red/green	2.4816	-40 ... +1100 °C -40 to 2010 °F
K	NiCr-Ni	ANSI MC 96.1	yellow/red	2.4816	-40 ... +1100 °C -40 to 2010 °F

RTD

Type	Materials	Standard	Lead Colors [+/-]	Sheath Material**	Measurement Range
Pt 100	Platinum	DIN EN 60751	rot/weiß	1.4404	-50 ... +600 °C -50 to 1120 °F
Pt 1000	Platinum	DIN EN 60751	rot/weiß	1.4404	-50 ... +600 °C -50 to 1120 °F

* obsolete standard, usually for existing installations

Lead Types Thermocouple

Lead Types	Max. Temperature
PFA/PFA	260 °C 500 °F
GLS/GLS (MB*)	400 °C 750 °F
Kapton/Kapton	350 °C 660 °F
GLS/Kapton	350 °C 660 °F
PFA/Kapton	260 °C 500 °F
PFA/PFA/MB	260 °C 500 °F

Material information from the inside to the outside. Duplex MIT available with MB/GLS/GLS and PFA/PFA.

* Glass silk insulated leads with glass silk insulated casing and metal braided protection sleeve.

Lead Types RTD

Lead Types	Max. Temperature
PFA/PFA	260 °C 500 °F
GLS/GLS (MB*)	400 °C 750 °F
Silicone/Silicone	180 °C 356 °F

Material information from the inside to the outside.

* Glass silk insulated leads with glass silk insulated casing and metal braided protection sleeve.

Connection Type Range



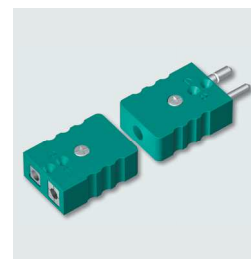
BLANK
Open ends



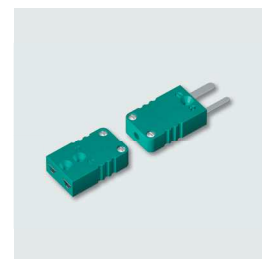
LEAD
Connection head
(260 or 400 °C /
500 or 750 °F) and cable



LEMO
LEMO connector (female)
max. 250 °C / 480 °F



Standard
male/female connector
max. 200 °C / 390 °F

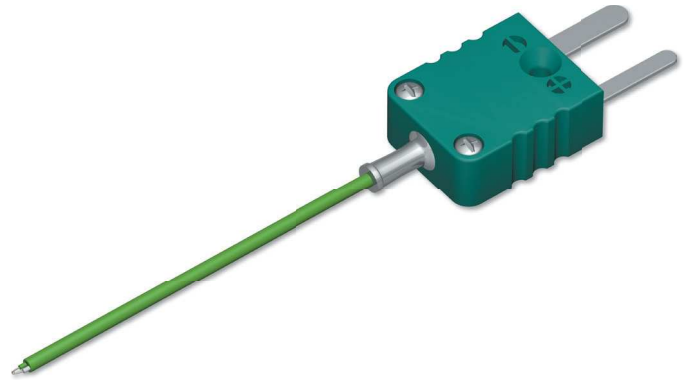


Mini
male/female connector
max. 200 °C / 390 °F

Wire Thermocouple

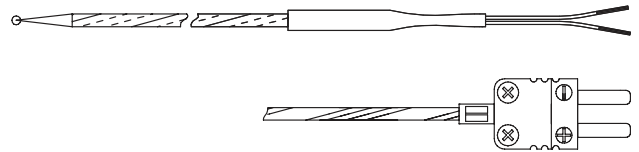
Technical key features

Temperature range	0 to 260 °C / 32 to 500 °F
Sensor structure	Insulated thermo wires joined by welding
Sensor type	Type K
Lead structure	PFA/PFA
Conductor cross section	2 x 0.07 mm ²
Connection	See "Connection Type Range" on preceding pages
Classification tolerance	Class 1



General applications

- Difficult accessible areas with limited space and/or if fast response times are necessary, e.g. engine compartment



Self-Adhesive Surface Thermocouple

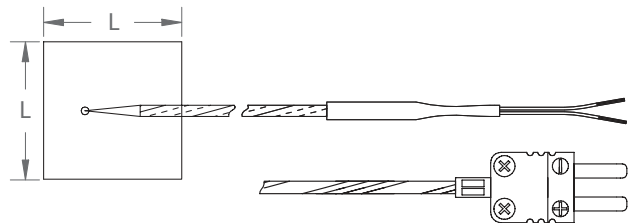
Technical key features

Temperature range	0 to 260 °C / 32 to 500 °F
Sensor structure	Insulated thermo wires joined by welding
Sensor type	Type K
Lead structure	FEP/FEP, GLS/GLS
Conductor cross section	2 x 0.2 mm ²
Connection	See "Connection Type Range" on preceding pages
Classification tolerance	Class 1
Adhesive pad	PTFE impregnated fiber-glass pad, L: 25 mm Temperature resistance 180 °C / 255 °F (Short time load 260 °C / 500 °F)



General applications

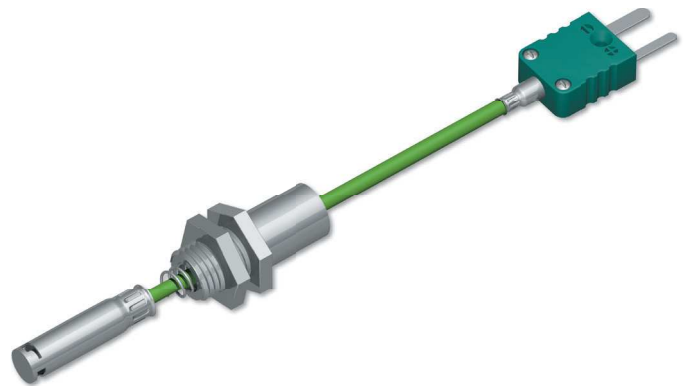
- Quick, space-saving and uncomplicated temperature measurement on surfaces, e. g. on auto interior and boots



Spring Thermocouple

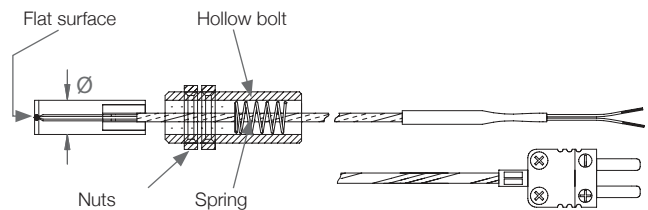
Technical key features

Temperature range	0 to 850 °C / 32 to 1560 °F (at the flat surface)
Diameter	8 mm
Sensor structure	Spring loaded measuring point, fixed on a flat surface M12x1
Sensor type	Type K
Lead structure	PFA/PFA Silicone/Silicone
Conductor cross section	2 x 0.22 mm ²
Connection	See "Connection Type Range" on preceding pages
Measuring point	At bottom, grounded
Classification tolerance	Class 2



General applications

- Temperature recording on the brake disc or other rotating surfaces



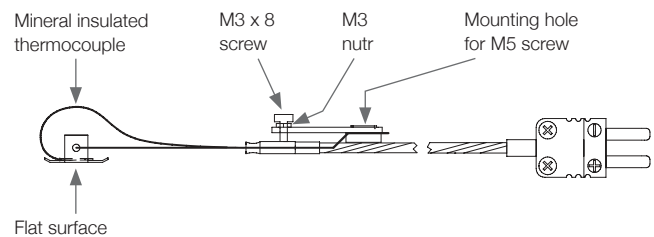
Friction Thermocouple

Technical key features	
Temperature range	0 to 850 °C / 32 to 1560 °F (at the flat surface)
Sensor structure	Bent mineral insulated thermocouple, Ø 0.5 mm, fixed on the flat surface
Sensor type	Type K
Lead structure	Mineral insulated thermocouple with free ends and metal braided sleeving
Contact pressure	Variably adjustable
Connection	Compensation connector or mini compensation connector
Measuring point	At bottom, ungrounded
Classification tolerance	Class 1



General applications

- Temperature recording on the brake disc or other rotating surfaces



Insert Thermocouple (Brake Disc)

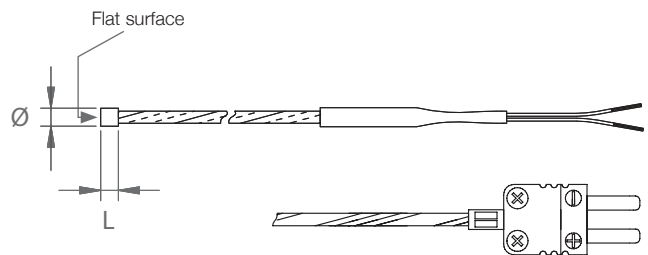
Technical key features

Temperature range	0 to 850 °C / 32 to 1560 °F (at the flat surface)
Diameter	3 mm
Length L	3 mm
Sensor type	Type K
Lead structure	GLS/GLS (high temperature resistant, max. Temp. 600 °C / 1110 °F)
Conductor cross section	2 x 0.2 mm ²
Connection	See "Connection Type Range" on preceding pages
Measuring point	At bottom, grounded
Classification tolerance	Class 2



General applications

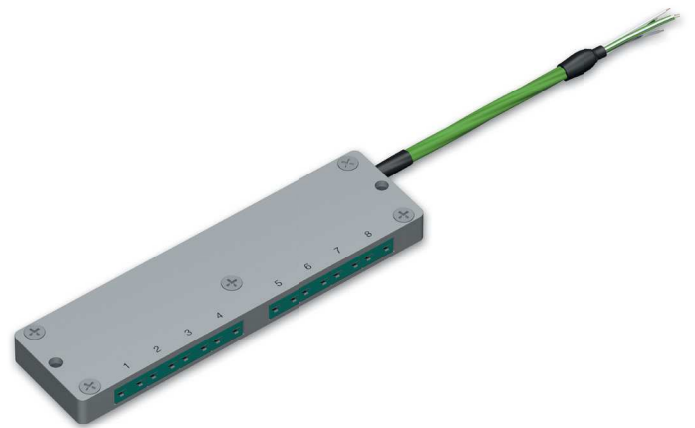
- Temperature recording in the brake disc
(For installation into the brake disc)



Terminal Strip

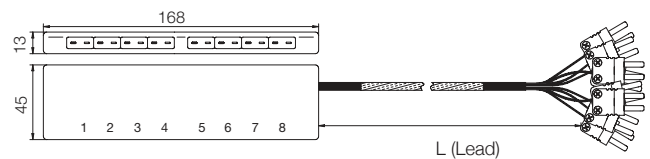
Technical key features	
Temperature range of the female connectors	0 to 200 °C / 32 to 390 °F
Housing material	Aluminium
Number of female connectors	4 (2 or 4 pins) 8 (2 or 4 pins) 16 (2 pins)
Sensor types	Thermocouples: Type J, K RTDs: all types
Lead structure	FEP/FEP, FEP/MB*/FEP, PFA/PFA, PFA/MB*/PFA
Lead cross-section	2 x 0.22 mm ²
Connection	See "Connection Type Range" on preceding pages

*metal braided



General applications

- Consolidates several connection leads to reduce wiring effort and save space





hotset

Hotset GmbH
Hueckstraße 16
58511 Lüdenscheid
Germany

Telefon +49 / 23 51 / 43 02-0
Fax +49 / 23 51 / 43 02-25

www.hotset.com