



GENERAL BROCHURE

“We Produce Strategic
Devices for Evolving
Industries”

—
Edition 2023



20 23



ABOUT THE COMPANY

TERMOAPARATURA WROCLAW company was established in 1991 and from the very beginning of its activity has been dealing with production of industrial temperature sensors. The state-of-art technology, sound organizational structure and quality assurance aspects are the key issues of the company making the sensors manufactured and delivered to the market compatible with the up-to-date trends and standards of contemporary technology.

30
Years of Experience

500+
Regular Customers

25
Employees

TABLE OF CONTENT

TERMOAPARATURA WROCLAW is a leading manufacturer of temperature sensors and a distributor of premium signal conditioners. In our 25-years' history, we have become a company renowned not only on the Polish, but also on the international market. We have earned trust of clients from different industry sectors. We are appreciated for constant, high quality of our products, innovative solutions and cutting-edge manufacturing technology.

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Laboratory

Top quality laboratory equipment allows precise verification of sensors and temperature transmitters. We use laboratory ovens to examine sensors in temperatures ranging from -20°C to $+1200^{\circ}\text{C}$. The results of these checks are documented in the form of protocols (in compliance with the PN-EN 10204 standard) and delivered to the clients free of charge with every manufactured sensor.



COMMENT

Quality is not a coincidence.

“We Produce Strategic
Devices for Evolving

Quality CERTIFICATES

We care for our current and future customers, therefore we have decided to implement and certify ISO 9001 Quality Management System.

Constant development of our products by highly qualified engineers contributed to certification of temperature sensors according to the ATEX Directive, IECEx Scheme and EACEx Rules.



CERTIFICATES AND APPROVALS

- QMS Certificate ISO 9001
- QMS Certificate ISO/IEC 80079-34
- Certificate of Health Quality
- ATEX/IECEx/EACEx intrinsically safe Ex ia construction
- ATEX/IECEx/EACEx flameproof Ex db construction
- ATEX/IECEx increased safety Ex eb construction

Industries”

Michał Wachocki
General Manager

CERTIFICATE

QUALITY MANAGEMENT SYSTEM
ACCORDING TO ISO 9001:2015

www.termoapaparatura.com.pl

Product DEVELOPMENT

With the latest 3D technology, we optimize the design process by digitally developing products, from initial sketches to simulation of finished product operation. The application enables virtual prototyping, being much cheaper and quicker than the traditional one. It allows for physical construction of prototypes and introduction of modifications at every stage of the product development. All deficiencies and errors can be eliminated from the model, avoiding production of incorrect components and thus reducing the amount of waste and the manufacturing costs. We draw detailed technical documentation and, on the client's demand, we are able to provide the design and models in many popular formats, including STEP.



RESISTANCE TO VIBRATIONS

Our resistance thermometers are characterized by their outstanding vibration resistance and selected models have been tested in the laboratory of Instytut Automatyki Systemów Energetycznych (Institute for Power Systems Automation).



RESISTANCE TO COMPRESSION

Our sensors were tested for resistance to compression in high temperatures in the laboratory of Politechnika Wrocławska (Wrocław University of Technology).



INSULATION DIELECTRIC STRENGTH TESTS

Our testing devices operate in the range between 500 and 5,000V AC at 50Hz.



PMI TESTS

We use XRF spectroscope to check every incoming raw material in order to verify its chemical composition. At the client's demand, we also use it to test finished products.

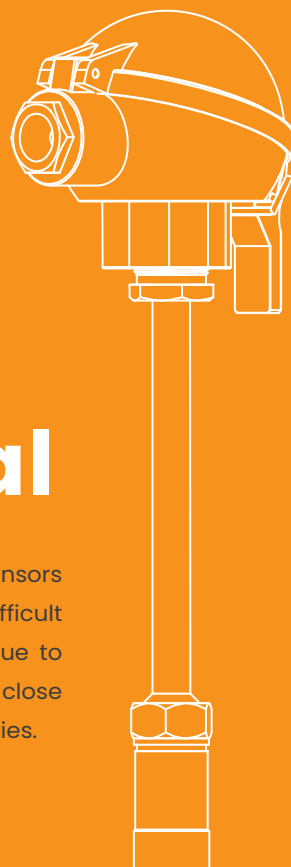
“We Produce Strategic
Devices for Evolving Industries”



COMMENT

WE WORK Professional

We design and manufacture temperature sensors that perform reliably in the most difficult environment conditions, which is possible due to our highly-qualified technical staff and close cooperation with scientific and research entities.



3D DESIGN

A production process of the special temperature sensors for a given customer's application is followed by a design stage that takes place by means of the CAD system, which facilitates elaboration of complex designs that have to be approved by the customer. We use advanced Autodesk® Inventor® software that enables creation of 3D models.



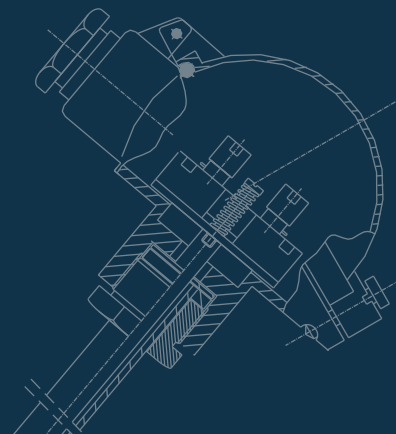
GRAPHIC DESIGN

In addition to our 3D designs, it uses 2D vector drawings. We get help from every aspect of design activities to offer the best to our customers.



SOLUTION PARTNER

Our products are subject to tests and simulations required for the product qualification (FAI). Test results confirm their highest quality and attention to detail in every aspect.



Laser MARKING

Termoaparatura owns a top class laser marking devices that allows permanent marking of the key elements of the produced temperature sensors.

Distinctive features of the laser marking technology are: effective marking or engraving of almost each material plus legibility and durability even for the most demanding applications.



Laser WELDING

Termoaparatura has implemented the laser welding process of the latest generation. This allowed very precise execution of details, compared to traditional methods using welding machines and burners. All welds performed by means of this technology are free from defects, and the material structure beyond the welding area is almost intact.

This technology meets the requirements of the most demanding customers giving the opportunity to weld almost all materials used for temperature measurement.



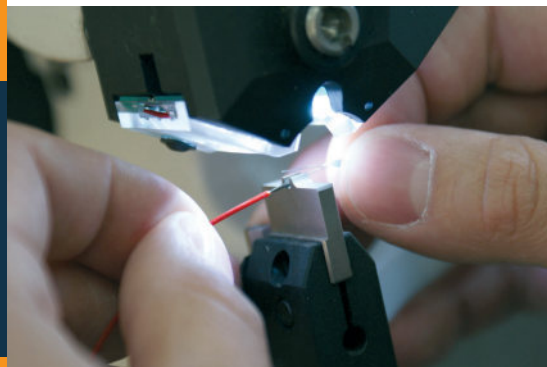


Production

Innovative production process results from the use of cutting-edge technology achievements. Automatic production processes allow for handling our technical operations in a quick and effective manner. Organization of production has been prepared in cooperation with the best specialists from the sector. The standards used by TERMOAPARATURA put the company in the group of domestic and foreign leaders in the branch. Delivery of the highest quality products and thus the most modern and the most effective measuring devices that can be introduced to the market based on the full use of the newest technology is the main goal of TERMOAPARATURA WROCŁAW.



The activity is based on modern technology, efficient organization and attention to quality.



RTD

TC

HEAD SENSORS

Standard sensors with connection heads are of the modular structure, which means that they are composed of elements that can be matched depending on particular needs.

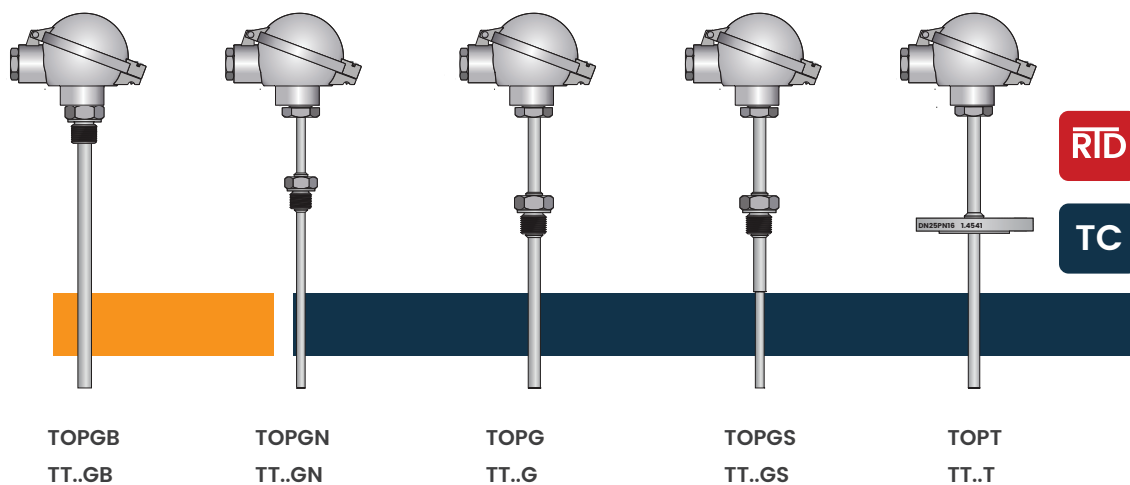
The type of measuring insert plays the main role in the head sensors. This can be either a resistance insert (Pt100, Pt500 or Pt1000) or thermocouple insert (Type J, K, N etc.). Single, double or triple versions of the head-type sensors are available.

The measuring range for the resistance sensors offered is from -200°C to $+850^{\circ}\text{C}$. Response time to changes of temperature for resistance sensors is short, whereas thermocouple sensors are applied for the measuring range from -200°C to $+1800^{\circ}\text{C}$.

Selected types of the head sensors have been elaborated and certified as ATEX certified intrinsically safe Exi and explosionproof Exd sensors.



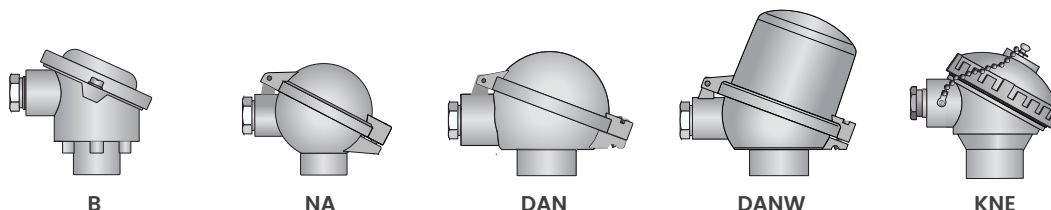
SENSORS WITH CONNECTION HEAD



Model	RTD TC	TOPGB TT..GB	TOPGN TT..GN	TOPG TT..G	TOPGS TT..GS	TOPT TT..T
Sensing element	RTD TC	Pt100, Pt500, Pt1000, Ni100, Ni1000 J / K / N or other				
Measuring range		-50 .. +150°C	-50 .. +600°C *	-50 .. +600°C *	-50 .. +600°C *	-50 .. +600°C *
Class of tolerance	RTD TC	Class A, B, 1/3B (AA), 1/10B according to EN 60751 Class 1, 2 according to EN 60584-1				
Process connection		G1/4"; G1/2"; G3/4" M20x1.5 or other	G1/4"; G1/2"; G3/4" M20x1.5 or other	G1/4"; G1/2"; G3/4" M20x1.5 or other	G3/4" M20x1.5 or other	Flange: DN25 PN40, DN50 PN40
Standard lengths		100, 160, 200, 250, 400, 500 mm	100, 160, 200, 250, 400, 500 mm	100, 160, 200, 250, 400, 500 mm	500 mm	100, 160, 200, 250, 400, 500 mm
Thermowell / Protection tube material		1.4541 (SS321), 1.4571 (SS316Ti), 1.4404 (SS316L)				
Diameters		Ø6, Ø8, Ø9, Ø10, Ø12, Ø15 mm	Ø6, Ø8, Ø9 mm	Ø10, Ø12, Ø15 mm	Ø15, Ø17.2 mm	Ø9, Ø10, Ø12, Ø15 mm
Measuring insert		Mineral insulated (vibrationproof)				
Connection head		B, NA, DAN, DANW, BEG, KSE, KNE or other				
Protection degree (IP)		IP65 .. IP68				
Temperature transmitter		4-20 mA; 0-10 V; HART® protocol, Profibus®PA protocol				

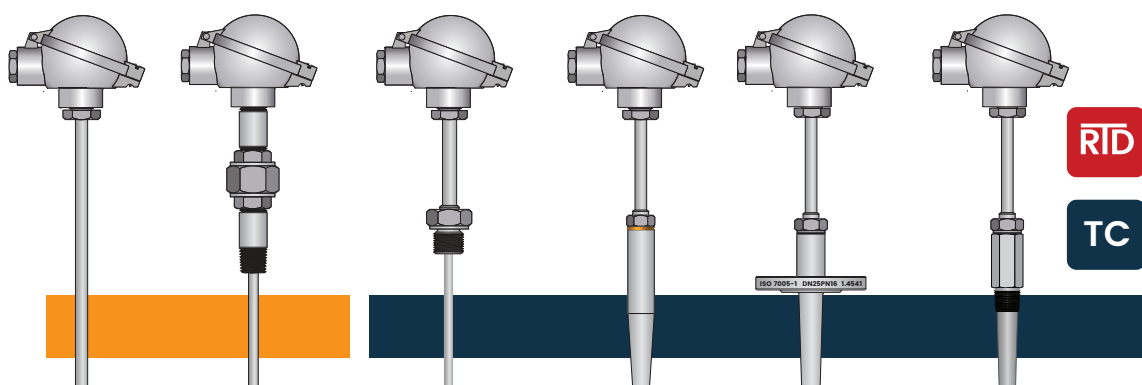
* Measuring range may vary on used sensing element (thin-film or wire-wound sensor)

Connection Heads



Model	B	NA	DAN	DANW	KNE
Material	Aluminium	Aluminium	Aluminium	Aluminium	Aluminium
Protection degree (IP)	IP54	IP65	IP65	IP65	IP65
Closing method	screws	screw or clamp	screw or clamp	screw or clamp	screwed cap

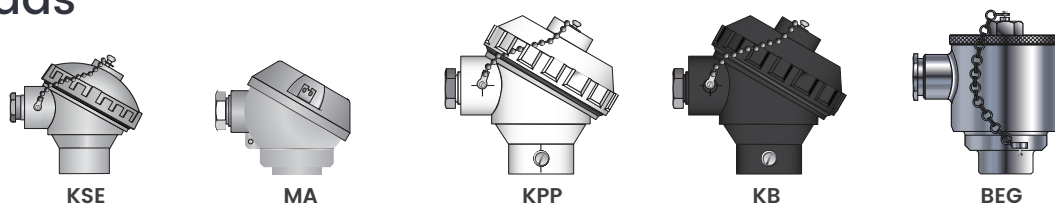
SENSORS WITH CONNECTION HEAD



Model	<div><div>RTD</div><div>TC</div></div>	TOPP TT..P	TOPNUN TT..NUN	TOPWS TT..WS	TOPSW TT..SW	TOPSWT TT..SWT	TOPSWG TT..SWG
Sensing element	<div><div>RTD</div><div>TC</div></div> Pt100, Pt500, Pt1000, Ni100, Ni1000 J / K / N or other						
Measuring range	-50 .. +600°C *						
Class of tolerance	<div><div>RTD</div><div>TC</div></div> Class A, B , 1/3B (AA), 1/10B according to EN 60751 Class 1, 2 according to EN 60584-1						
Process connection	compression fitting	1/2"NPT or other	GI/4"; GI/2"; M12x1.5; M14x1.5; M18x1.5 or other	thermowell for weld-in	flanges acc. to ISO, DIN, ANSI B16.5	M20x1.5; GI/2"; 1/2"NPT or other	
Standard lengths	500, 710, 1000, 1400, 2000 mm	500, 710, 1000, 1400, 2000 mm	100, 140, 200, 260 mm	100/35; 140/65; 200/65; 260/65; 260/125 mm	100, 160, 200,260, 300,400, 500 mm	100, 160, 200, 260, 300, 400, 500 mm	
Thermowell / Protection tube material	1.4541 (SS321), 1.4571 (SS316Ti),			1.4541 (SS321), 1.4571 (SS316Ti), 1.7335 (15HM)	1.4541 (SS321), 1.4571 (SS316Ti), 1.7335 (15HM)	1.4541 (SS321), 1.4571 (SS316Ti), 1.7335 (15HM)	
Diameters	Ø6, Ø8, Ø9, Ø10, Ø12, Ø15 mm	without external protection tube; insert dia. Ø3, Ø6 mm	without external protection tube; insert dia. Ø3, Ø6 mm	Ø18, Ø24, Ø26 mm	Ø15, Ø17.2 mm	custom	
Measuring insert	Mineral insulated (vibrationproof)						
Connection head	B, NA, DAN, DANW, BEG, KSE, KNE or other						
Protection degree (IP)	IP65 .. IP68						
Temperature transmitter	4-20 mA; 0-10 V; HART® protocol Profibus®PA protocol						

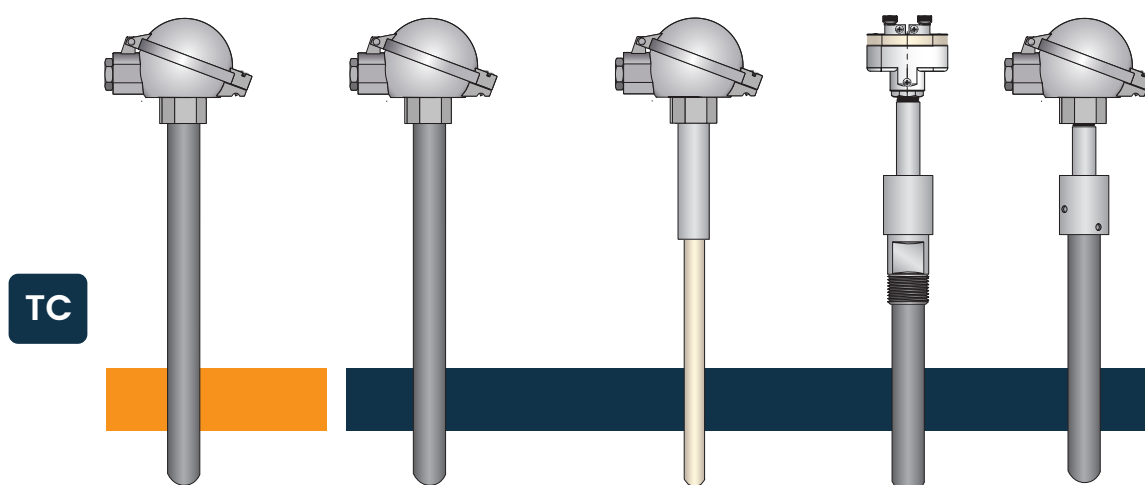
* Measuring range may vary on used sensing element (thin-film or wire-wound sensor)

Connection Heads



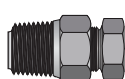
Model	KSE	MA	KPP	KB	BEG
Material	Aluminium	Aluminium	Polipropylen PP	Bakalite	Stainless Steel
Protection degree (IP)	IP65	IP65	IP65	IP65	IP65
Closing method	screwed cap	screws	screwed cap	screwed cap	screwed cap

SENSORS WITH CONNECTION HEAD

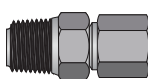


Model	TT..U	TT..CU	TT438 .. TT444	TT446 .. TT449
Sensing element TC	J / K / N or other	J / K / N or other	K / N / S / R / B	K / N / S / R / B
Measuring range	-40°C ... +1200°C	0 .. +1200°C	0 .. +1800°C	0 .. +1200°C
Class of tolerance TC	Class 1, 2 according to EN 60584-1	Class 1, 2 according to EN 60584-1	Class 1, 2 according to EN 60584-1	Class 1, 2 according to EN 60584-1
Process connection	compression fitting	compression fitting	compression fitting	G1/2"; 1/2" NPT or compression fitting
Standard lengths	500, 710, 1000, 1400, 2000 mm	500, 710, 1000, 1400, 2000 mm	500, 710, 1000, 1400, 2000 mm	495, 650, 950, 1250, 1430 mm
Thermowell / Protection tube material	1.4841 (SS314) 1.4762 (SS446) Kanthal® AF	1.4841 (SS314) 1.4762 (SS446) Kanthal® AF	C610 (Al O 60%) C799 (Al O 99.7%)	Syalon 101
Diameters	Ø15, Ø22 mm	Ø15, Ø22 mm	Ø6, Ø8, Ø10, Ø12, Ø15, Ø24 mm	Ø16, Ø25.4, Ø32 mm
Measuring insert	Ceramic insulated insert	Ceramic insulated insert	Ceramic insulated insert	Ceramic insulated insert or Mineral insulated
Connection head	DAN, DANW, DANWdie-LED	DAN, DANW, DANWdie	DAN, DANW	TL, DAN, DANW
Protection degree (IP)	IP53	IP53	IP53	IP00 .. IP68
Temperature transmitter	4-20 mA; HART® protocol, Profibus®/PA protocol			

Compression Fittings and Mounting Brackets



UG1



UG4



UZ11



UZ21

Model	UG1, UG4
Material	1.4301 (SS304), 1.4541 (SS321)
Process thread	G1/8"; G1/4"; G1/2"; G3/4" M8x1; M10x1.5; M12x1; M20x1.5; 1/8"NPT; 1/4"NPT; 1/2"NPT; 3/4"NPT

Model	UZ11, UZ21
Material	1.0401 (painted)
Suitable for pipe diameter	Ø15, Ø22, Ø32 mm

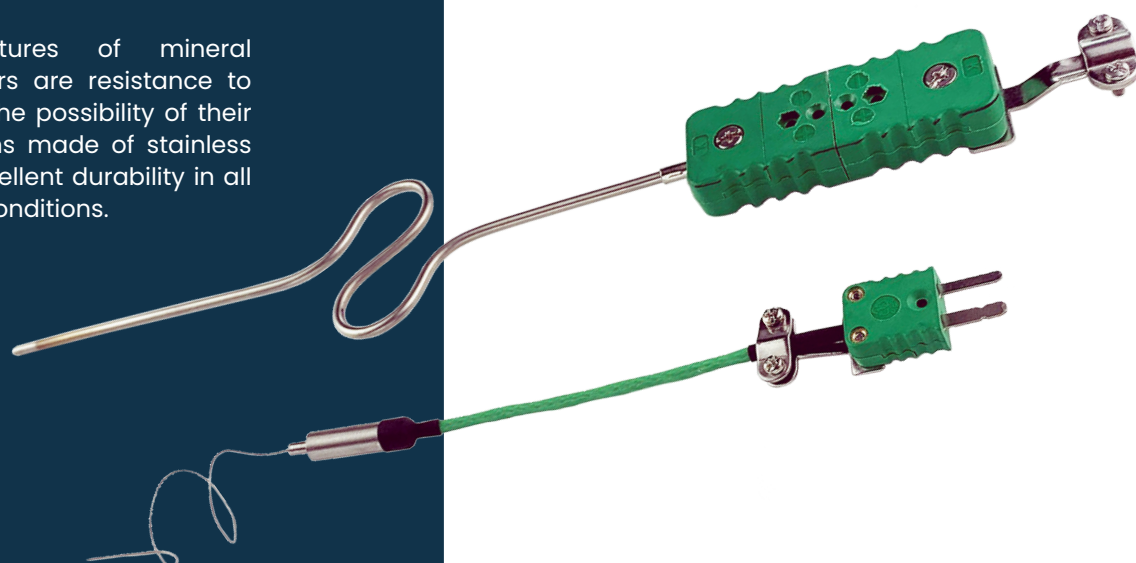
RTD

TC

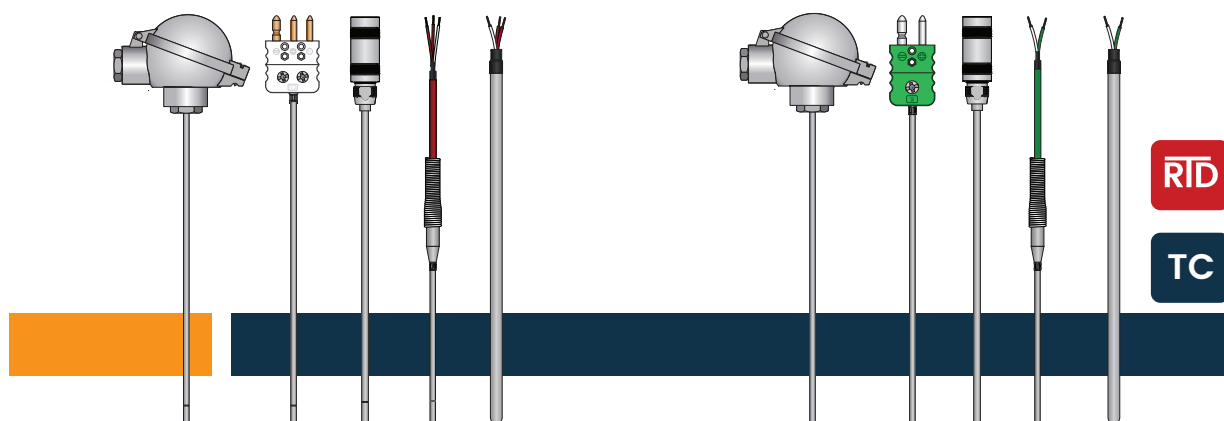
MINERAL INSULATED SENSORS

Sheathed temperature sensors are devices that work very well in hard-to-reach places. Their flexibility and small diameter extend their range of applications. They make it possible to place them wherever there is a need to take precise measurements.

Important features of mineral insulated sensors are resistance to vibrations and the possibility of their bending. Sheaths made of stainless steel ensure excellent durability in all measurement conditions.



MINERAL INSULATED SENSORS



Model

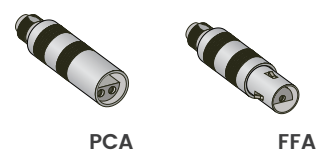
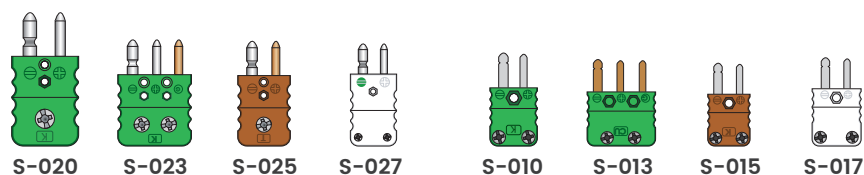
TRP 

TTP 

Sensing element	Pt100, Pt500, Pt1000, Ni100, Ni1000	J / K / N / T / E / R / S
Measuring range	-50 .. +600°C*	-200 .. +1350°C
Class of tolerance	Class A, B, 1/3B (AA), 1/10B	Class 1, 2
Standard	EN 60751	EN 60584-1
Process connection	compression fitting	
Lengths	upon request	
Sheath material	1.4541 (SS321) 1.4401/1.4404 (SS316/SS316L)	1.4541 (SS321), 1.4401/1.4404 (SS316/SS316L), 2.4816 (Inconel® 600), 1.4841 (SS314), 1.4762 (SS446), Pyrosil-D, Hastelloy® X
Sheath diameter	Ø1.5, Ø2.0, Ø3.0, Ø4.5, Ø6.0 mm	Ø0.25, Ø0.5, Ø1.0, Ø1.5, Ø2.0, Ø3.0, Ø3.2, Ø4.5, Ø4.76, Ø6.0 mm
Connection cable	JJ (PVC/PVC) TSL (teflon FEP/silicone) TPSL (teflon FEP/Cu braid/silicone) TT (teflon PFA/teflon PFA) TCuT (teflon PFA / Cu braid/ teflon PFA) GLGLP (fiberglass/fiberglass/steel braid)	JJ (PVC/PVC) TSL (teflon FEP/silicone) TT (teflon PFA/teflon PFA) TCuT (teflon FEP/Cu braid/teflon FEP) GLGLP (fiberglass/fiberglass/steel braid)
Connection head	B, NA, DAN, DANW, BEG, KSE, KNE or other	
Protection degree (IP)	IP65 .. IP68	
Temperature transmitter	4-20 mA; HART® protocol, Profibus®PA protocol	

* Measuring range may vary on used sensing element (thin-film or wire-wound sensor)

Connectors



Model	S-023	S-025	S-027
Material	thermo-plastic	thermo-plastic	Ceramic
Working temp.	+220°C	+350°C	+650°C

Model	S-013	S-015	S-017
Material	thermo-plastic	thermo-plastic	Ceramic
Working temp.	+220°C	+350°C	+650°C

Size	0S, 1S, 2S, 3S
Working temp.	up to +200°C

TUBE-SKIN TEMPERATURE SENSORS

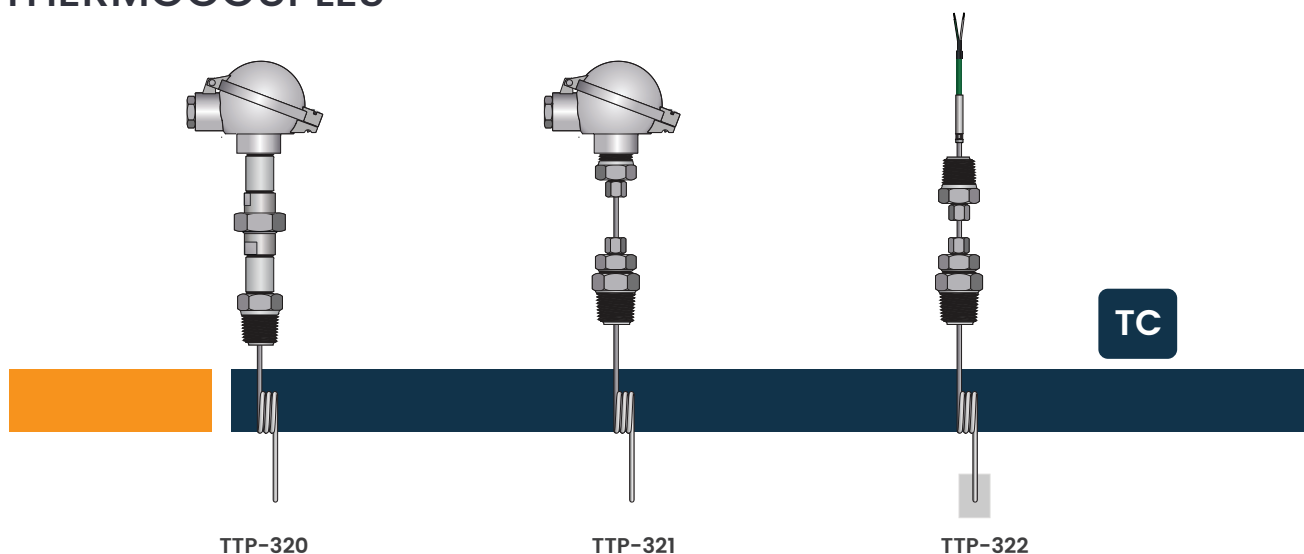
Tube-skin thermocouples measure pipe walls temperature in petrochemical, boiler and super-heater installations used in power generation plants. These devices are exceptionally effective and have a wide range of applications.

They are made of sheathed wire insulated inside with magnesium oxide MgO. Measuring junction is usually grounded to the sheath. Thermocouples are fitted with KNIFE-EDGE or 30x30 mm WELD-PAD tip, which allows a good fit to the shape of the process pipe. Tips for welding can be wider and contoured to the surfaces of the pipe, which facilitates installation on-site. KNIFE-EDGE weld sleeves provide faster response time of the temperature sensor. KNIFE-EDGE tube-skin thermocouples have the diameter of Ø8 to Ø12.7mm and a thick wall.

TERMOAPARATURA WROCŁAW specializes in production of mineral insulated sensors as per the customer's specification. The sensors are applied where quality, accuracy and reliability of measurement matters.

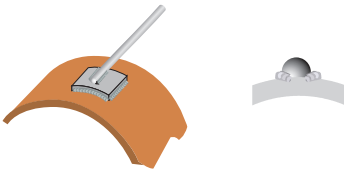
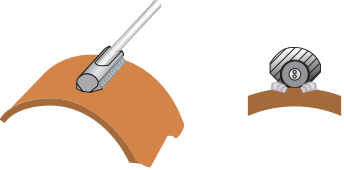
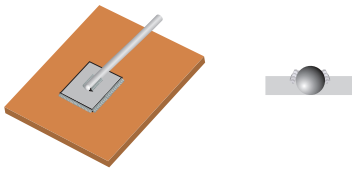


TUBE-SKIN THERMOCOUPLES



Model	TTP-320	TTP-321	TTP-322
Sensing element	TC J / K / N		
Measuring range	-40 .. +1200°C		
Class of tolerance	Class 1, 2		
Standard	EN 60584-1		
Process connection	thermocouple with nipples, adapter and reduction	thermocouple with compression fitting and reduction	thermocouple with compression fitting and reduction
Lengths	upon request		
Sheath material	2.4816 (INCONEL® 600), 1.4401 (AISI316), 1.4841 (AISI314), 1.4762 (AISI446)		
Sheath diameter	Ø8 to Ø12.7 mm		
Connection cable	-	-	insulation TT, TCuT, TFT, GLGLP
Connection head	DAN, DANW, DANWdie	DAN, DANW, DANWdie	-
Protection degree (IP)	IP65 .. IP68		
Temperature transmitter	4-20 mA; HART® protocol, Profibus®PA protocol		N/A

Different tip types

Pad conforming to Pipe Radius	Knife-edge type	Flat Weld Pad
		

RTD

TC

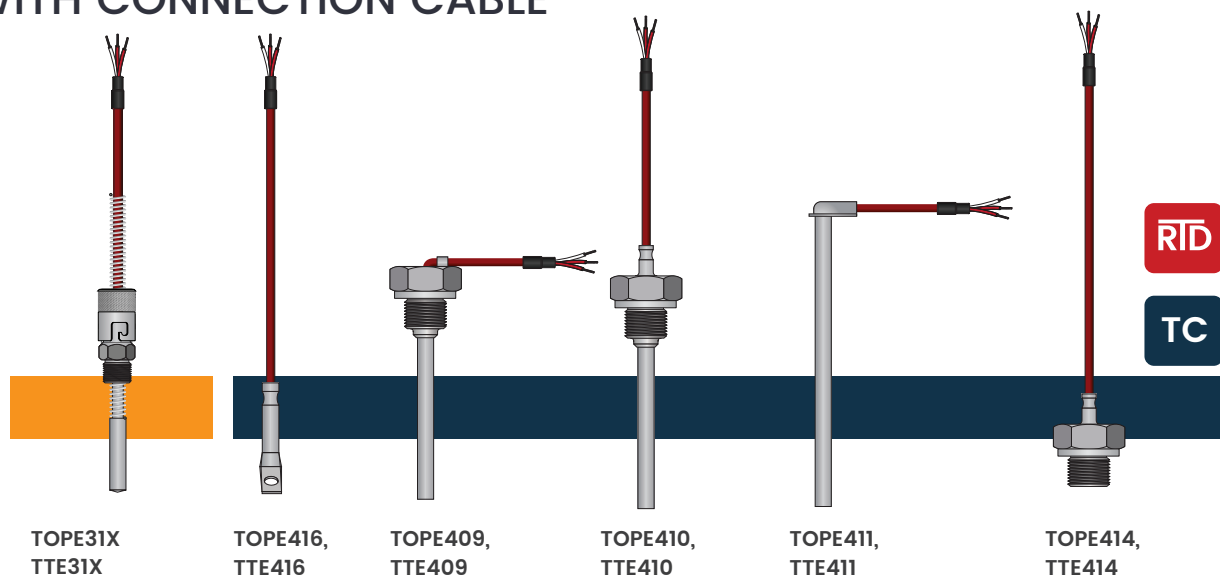
CABLE SENSORS



The cable sensors are used for measurement of the temperature of machine's parts, structural elements in machine-building industry, machine tools, power engineering and for plastics and rubber processing processes, etc. Besides almost unlimited number of special executions of the wired temperature sensors, standard versions are available, which has been presented in our catalogue.

The typical cable resistance sensors can be used in the temperature range from -50°C to $+400^{\circ}\text{C}$, and the cable thermocouple sensors from -40°C to $+600^{\circ}\text{C}$.



SENSORS WITH CONNECTION CABLE



Sensing element		Pt100, Pt500, Pt1000, Ni100, Ni1000		J / K / N / T / E
Measuring range*		-50 .. +400°C		-40 .. +400°C
Class of tolerance		Class A, B, 1/3B, 1/10B		Class 1, 2
Standard		EN 60751		EN 60584-1, EN 60584-2
Process connection	compression fitting or welded threaded adapter G1/8"; G1/4"; G1/2"; G3/4", M8x1, M10x1, M12x1; M14x1.5; M16x1.5; M18x1.5; M20x1.5; or other, f.e. NPT			
Lengths	upon request			
Protection tube material		1.4301 (SS304), 1.4404 (SS316L), 1.4541 (SS321)		1.4301 (SS304), 1.4404 (SS316L), 1.4541 (SS321)
Protection tube diameter	Ø3.0, Ø4.0, Ø5.0, Ø5.2, Ø5.8, Ø6.0, Ø7.0, Ø8.0, Ø9.0, Ø10.0, Ø12.0 mm			

* Measuring range may vary on selected cable insulation

RTD Cables

Material	Code	Construction	Max.
	JJ	conductors: PVC jacket: PVC	up to +105°C
	TSL	conductors: teflon® FEP jacket: silicone	up to +180°C
	TPSL	conductors: teflon® FEP shield: Cu braid jacket: silicone	up to +180°C
	TT	conductors: teflon® PFA jacket: teflon® PFA	up to +260°C
	TCuT	conductors: teflon® PFA shield: Cu braid jacket: teflon® PFA	up to +260°C
	GLGLP	conductors: fiberglass jacket: fiberglass armour: steel braid	up to +400°C

TC Cables

Material	Code	Construction	Max.
	JJ	conductors: PVC jacket: PVC	up to +105°C
	TSL	conductors: teflon® FEP jacket: silicone	up to +180°C
	TCuT	conductors: teflon® FEP shield: Cu braid jacket: teflon® FEP	up to +205°C
	GLGLP	conductors: fiberglass jacket: fiberglass armour: steel braid	up to +400°C

STATOR SLOT TEMPERATURE SENSORS

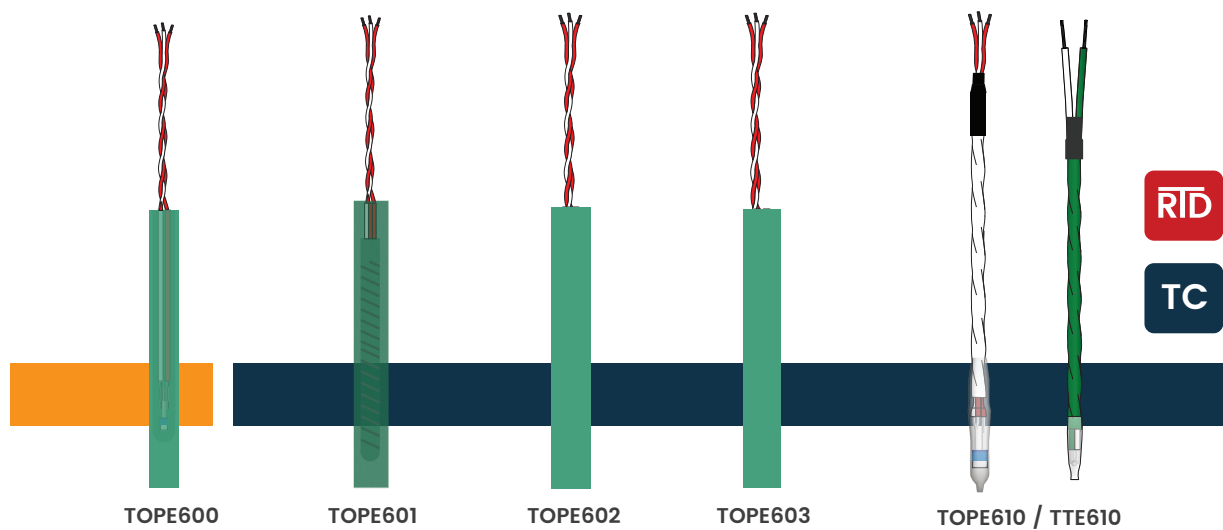
These types of sensors are designed for use in motors and generators. They are placed in the slots of the windings to precisely monitor the temperature. This is to protect the insulation from overheating. Measuring devices are located at the hottest point of the winding.

We offer sensors in a wide range of versions to choose from. The customer can choose the dimensions he is interested in (also non-standard) and choose the type of cables to suit his needs.

We deliver sensors in temperature class F (155°C) and H (180°C).





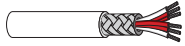


STATOR SLOT TEMPERATURE SENSORS



Model		
	TOPE600	TOPE601
	TOPE602	TOPE603
	TOPE610 / TTE610	
Sensing element	Pt100, Pt500, Pt1000, Ni100, Ni1000	J / K / N / T / E
Measuring range	-60 .. +155°C (Class F) -60 .. +180°C (Class H)	-60 .. +180°C (Class H)
Class of tolerance	Class A, B	Class 1, 2
Standard	EN 60751	EN 60584-1, EN 60584-2
Housing material	Epoxy-glass (EP GC 203/308), semi-conductive laminate	
Dielectrical strength	2.5 kVAC, 50 Hz / 60 sec. 5.0 kVAC, 50 Hz / 60 sec.	

RTD Cables

Material	Code	Construction	Max.
	TW	conductors: teflon® PFA	up to +260°C
	SLCUSL	conductors: silicone shield: Cu braid jacket: silicone	up to +180°C
	SLSL	conductors: silicone jacket: silicone	up to +180°C
	TT	conductors: teflon® PFA jacket: teflon® PFA	up to +260°C
	TCuT	conductors: teflon® PFA shield: Cu braid jacket: teflon® PFA	up to +260°C



CUSTOM TEMPERATURE SENSOR

More than half of the sensors we manufacture are devices specially adapted to the specific requirements of the application. These are primarily devices that ensure the safety of the installation in which they are used.

In addition to standard devices, which are available in our permanent offer, we also offer special executions of each type of sensor.

These include, among others, sensors like:

- multipoint,
- tube-skin thermocouples,
- bearing temperature sensors,
- stator slot thermometers.

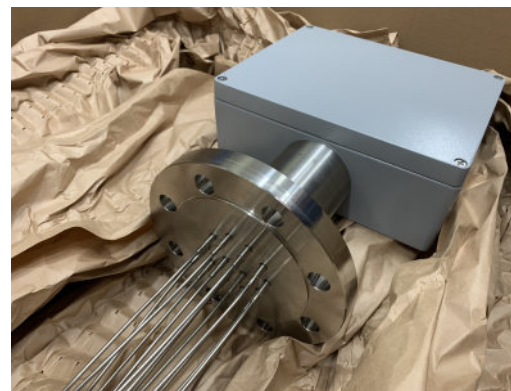
We provide ATEX, IECEx, EAC Ex executions based on certificates in accordance with Directive 2014/34/EU (ATEX), IECEx Scheme and EAC Ex TR-CU 012/2011 (Eurasian Customs Union).



CUSTOM TEMPERATURE SENSORS

Multipoint temperature sensors

Multipoint thermocouples are used in catalytic cracking, lime kilns, distillation columns, pressure reaction vessels and many other applications. Complete sensors may be freely miniaturised; their length can reach 30 m (bendable version without pipe thermowell), with 12 or more sensors installed.



Bearing temperature sensors

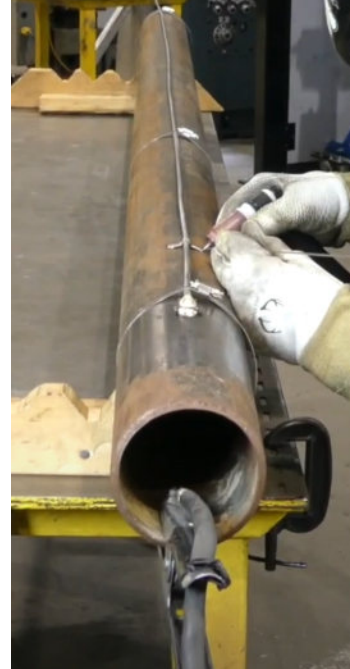
These sensors are used mainly in the power generation industry to measure the temperature of steam and gas turbine bearings.

They are resistant to extreme conditions in industrial rotating equipment and their use is critical. Rising temperatures may indicate breakdown of the lubricating oil film. Quick identification of this condition allows machine shutdown and maintenance before catastrophic failure of the bearing itself.



Tube-Skin thermocouples

Tube-skin thermocouples measure pipe walls temperature in petrochemical, boiler and super-heater installations used in power generation plants. These devices are exceptionally effective and have a wide range of applications.



Steam and gas turbine thermocouples

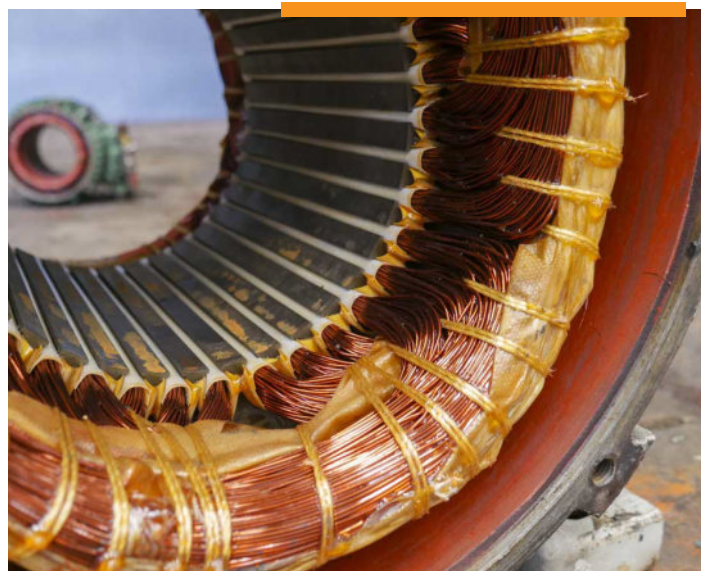
Wide range of thermocouples available for temperature measurement of bearings, cases and shells. Mostly customized solutions to provide accurate and consistent temperature readings.



Stator Slot RTDs

We offer sensors in a wide range of versions to choose from. The customer can choose the dimensions he is interested in (also non-standard) and choose the type of cables to suit his needs.

We deliver sensors in temperature class F (155°C) and H (180°C) as an intrinsically safe Exi and increased safety Exe models.



ACCESSORIES

Our product range includes not only high-class sensors, but also accessories for their assembly. We offer products that simplify the installation of measuring devices and ensure the stability and functionality of each element.

You will find, among others:

- compression fittings
- thermowells
- cooling necks
- adaptors for weld-in
- fixing elements
- connection heads
- terminal blocks
- cable glands

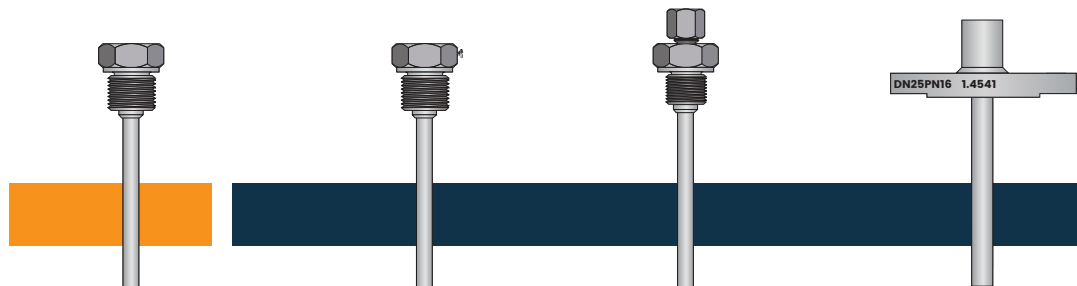
Each of the products is available in many different variants, so you can easily match it to the specific application and conditions it must meet.



ACCESSORIES

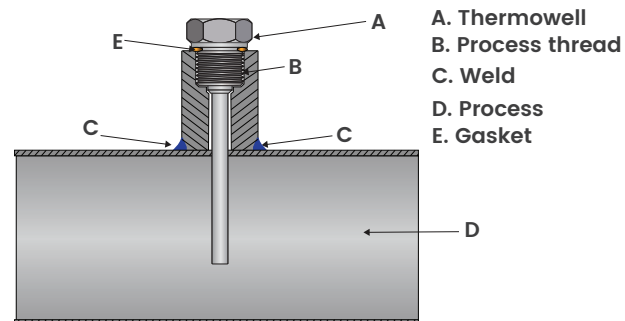
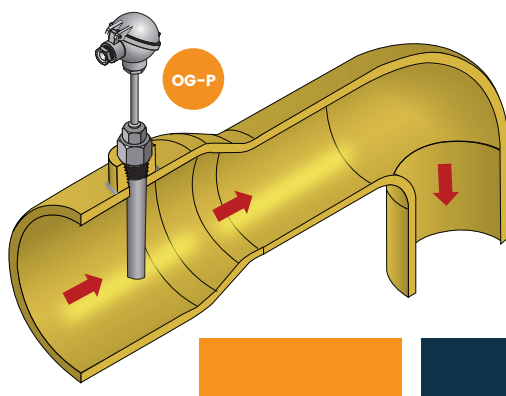
TUBULAR THERMOWELLS

OG serie



Model	OG-P, Tubular thermowell	OG-S, Tubular thermowell	OG-UG, Tubular thermowell	OG-K, Tubular thermowell
Material	1.4301 (SS304) 1.4401 (SS316) 1.4404 (SS316L) 1.4541 (SS321) 1.4571 (SS316Ti) Hastelloy® C-22, C-276 Titanium and others			
Process connection	GI/2", 1/2"NPT, M20x1.5 or other	GI/2", 1/2"NPT, M20x1.5 or other	GI/2", 1/2"NPT, M20x1.5 or other	flanges according to EN 1092-1, ANSI B16.5
Instrument connection	GI/2", 1/2"NPT, M20x1.5 or other	fitted by side screw	nut with inner sealing adopted for diameter of the instrument	GI/2", 1/2"NPT, M20x1.5 or other
Immersion lengths	from 50 mm to 2500 mm	from 50 mm to 2500 mm	from 50 mm to 2500 mm	from 50 mm to 2500 mm
Diameter	Ø6, Ø8, Ø9, Ø10, Ø11, Ø12, Ø15 mm	Ø6, Ø8, Ø9, Ø10, Ø11, Ø12, Ø15 mm	Ø6, Ø8, Ø9, Ø10, Ø11, Ø12, Ø15 mm	Ø6, Ø8, Ø9, Ø10, Ø11, Ø12, Ø15 mm

Example of installation



SOLID MACHINED

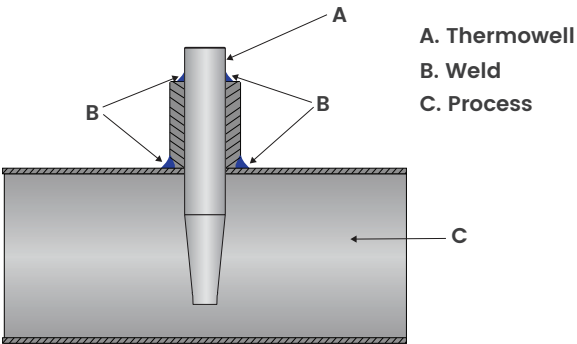
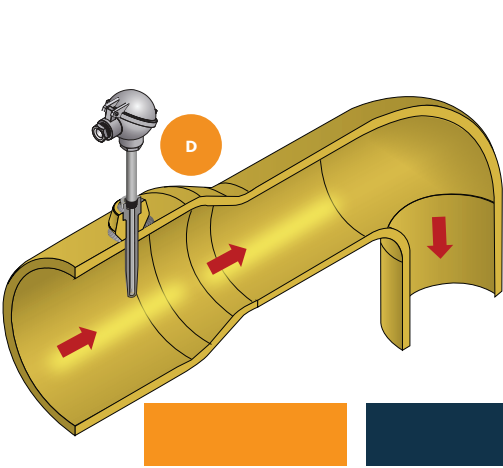
THERMOWELLS

Drilled (solid machined) D,DS Series



Model	D, DS, Solid machined	DF, Solid machined
Material	1.4401 (SS316) 1.4404 (SS316L) 1.4541 (SS321) 1.4571 (SS316Ti) 1.5415 (16Mo3) 1.7335 (15HM) 1.7380 (10H2M)	1.4401 (SS316) 1.4404 (SS316L) 1.4541 (SS321) 1.4571 (SS316Ti) 1.5415 (16Mo3) 1.7335 (15HM) 1.7380 (10H2M)
Process thread	M14x1.5, M18x1.5, G1/2", 1/2"NPT or other	M14x1.5, M18x1.5, G1/2", 1/2"NPT or other
Process connection	suitable for weld-in	flanges according to EN 1092-1, ANSI B16.5
Diameter	Ø3.5 mm, Ø7 mm or other	Ø3.5 mm, Ø7 mm or other
Standard	DIN 43772 form 4	DIN 43772 form 4F

Example of installation



SOLID MACHINED

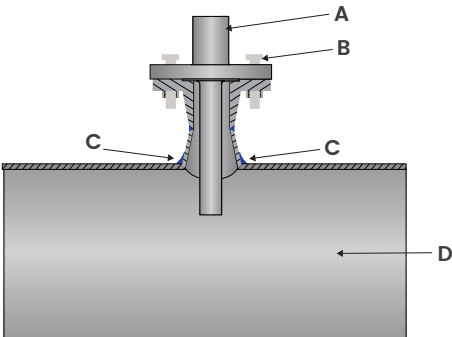
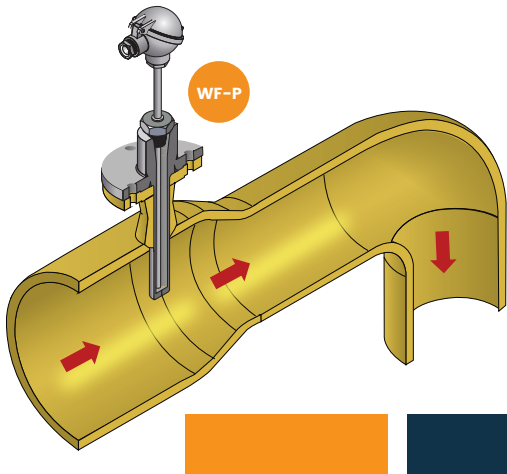
THERMOWELLS

Drilled (solid machined) WF Series



Model	WF-P, solid machined	WF-Z, solid machined
Material	1.4401 (SS316) 1.4404 (SS316L) 1.4541 (SS321) 1.4571 (SS316Ti) 1.5415 (16Mo3) 1.7335 (15HM) 1.7380 (10H2M)	1.4401 (SS316) 1.4404 (SS316L) 1.4541 (SS321) 1.4571 (SS316Ti) 1.5415 (16Mo3) 1.7335 (15HM) 1.7380 (10H2M)
Process connection	flanges according to EN 1092-1, ANSI B16.5	
Instrument connection	G1/2", M20x1.5, 1/2"NPT and other	G1/2", M20x1.5, 1/2"NPT and other
Diameter	upon request	upon request

Example of installation

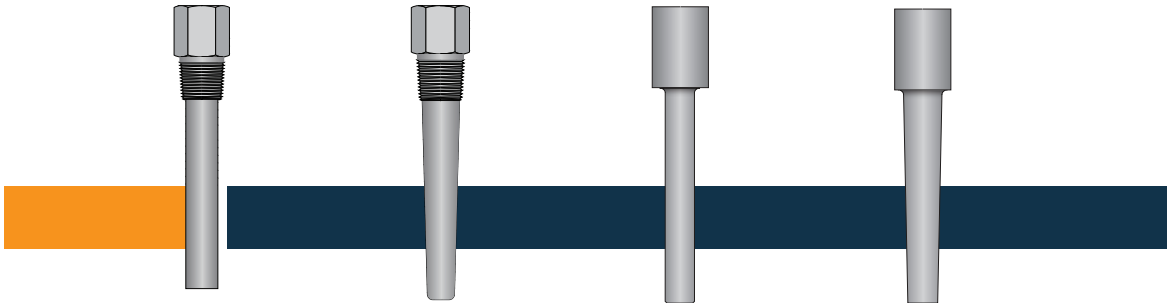


- A. Thermowell
- B. Bolt/washers
- C. Well
- D. Process

SOLID MACHINED

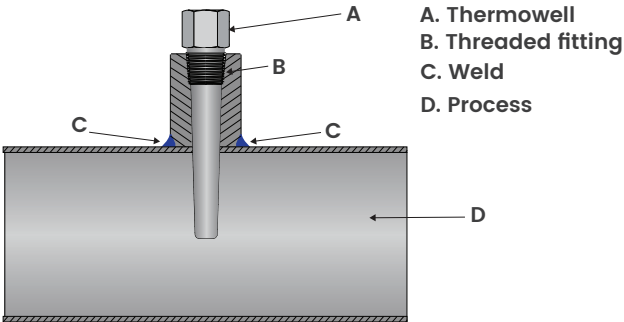
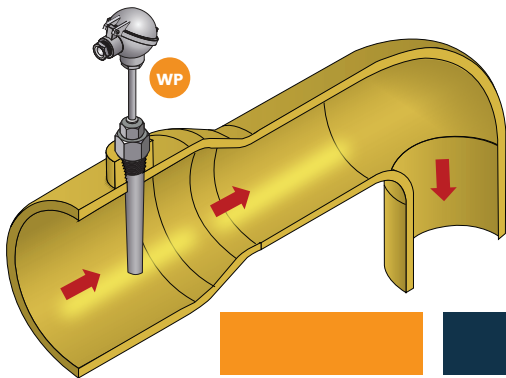
THERMOWELLS

Drilled (solid machined) W Series



Model	W-WP, solid machined	W-WZ, solid machined	W-WWP, solid machined	W-WWZ, solid machined
Material	1.4401 (AISI316) 1.4404 (AISI316L) 1.4541 (SS321) 1.4571 (SS316Ti) 1.5415 (16Mo3) 1.7335 (15HM) 1.7380 (10H2M)			
Process connection	GI/2", M20x1.5, 1/2"NPT and other	GI/2", M20x1.5, 1/2"NPT and other	suitable for weld-in	suitable for weld-in
Instrument connection	GI/2", M20x1.5, 1/2"NPT and other	GI/2", M20x1.5, 1/2"NPT and other	GI/2", M20x1.5, 1/2"NPT and other	GI/2", M20x1.5, 1/2"NPT and other
Diameter	upon request	upon request	upon request	upon request

Example of installation





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Disclaimer:

We are continually improving our products.

As a result, technical information in this document is subject to change.