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Thermocouples with terminal head - Technical information





Thermocouples are adapted to specific applications depending on the temperature range to be measured, the accuracy required and the environment in which they will be used. They are differentiated by letters (Type K, J, N, T, etc....) which correspond to the presence of materials that can measure a certain temperature range.

Type K NiCr-NiAl (NiCr-Ni)

Type N NiCrSi-NiSi

Type J Fe-CuNi

Type T Cu-Cuni

The most commonly used is the type K which is capable of measuring temperatures from - 40°C to + 1200°C. It is made from a chrome and an aluminum wire.

Thermocouple classes

Classes of thermocouples have certain tolerance values and temperature limits of validity. The most common classes are class 1 and class 2.

With class 1 you get more precise measurement values while class 2 provides a wider tolerance values.

Types of terminal heads

Many alternative types of terminal head are available to meet the requirements of various applications. Variations exist in size, material, accommodation, resistance to media, resistance to fire or even explosion and in other parameters.

Common types are shown below but there are many special variants available to meet particular requirements.

Terminal heads are a type of cold end termination which are common on industrial type temperature sensors. A temperature sensor will be encased in a ceramic or metal sheath which will be terminated at the cold end with a terminal head. Inside the head, terminal blocks or temperature transmitters are placed to carry the sensor signal to instrumentation.

These are protected from the external environment as terminal heads often provide good ingress protection (IP) and temperature protection. Most commonly terminal heads are made from aluminum but can be stainless steel, cast iron or plastic depending on the application. There are many standardized designs of head, the most common being KNE, ALA and BUZ.

Inside terminal head



Thermocouples with terminal head - Technical information



Terminal head component breakdown



What is a terminal block?

Terminal block located in a "head" allow for the connection of extension wires. Various materials are used for screw or solder terminations including copper, plated brass and, for the best performance in the case of thermocouples, thermoelement alloys. The various head styles cater for a wide variety of probe diameters and cable entries.

Terminal blocks provide a secure and organized way to terminate multiple wires. The wires are inserted into a clamping mechanism

that holds them in place, making it easier to manage and connect different wires within a circuit. Terminal blocks provide a convenient and secure way to connect thermocouple wires to the measuring instrument or control system when using thermocouples. Terminal blocks are available in 2, 3, 4, and 6 poles with center hole (spring loading).



What is a temperature transmitter?

A temperature transmitter is a device that converts the signal produced by a temperature sensor into a standard instrumentation signal representing a process variable temperature being measured and controlled. The most common transmitter instrumentation output signal is 4 to 20 mA. The signal from the temperature transmitter is sent to a controller that determines what action is required and generates an appropriate output signal.

Controllers are either a PLC or a DCS in process control today.

More on temperature transmitters and terminal blocks. See in the part "Accessories".





TH00 – Thermocouples with terminal head Standard



	*Tube material Stainless steel 316L
Ordering information	
1. Thermocouple:	Additional:
☐ Type K ☐ Type N ☐ Type J ☐ Type T ☐ Type E	Application:
☐ Type R ☐ Type S ☐ Type B ☐ Other:	Operating temperature (min/max):
2. Number of thermocouples:	Type of environment:
3. Class:	Accessories: See the part "Accessories"
Class 1 Class 2	Quantity:
4. Length L (mm):	Note:
5. Diameter Ø (mm):	
6. Junction type: Ungrounded Grounded	
7. Connection head: (see the part "Accessories") Type B Type DAN Type M Type N Type Ex Type NS Other:	
8. Mounting: Wires Terminal block Transmitter (°C): Specify temperature range	

How to order?

4446



TH01 – Thermocouples with terminal head Standard (90° bend)



	*Tube material Stainless steel 32
Ordering information	
1. Thermocouple:	Additional: Application:
☐ Type K ☐ Type N ☐ Type J ☐ Type T ☐ Type E ☐ Type R ☐ Type S ☐ Type B ☐ Other:	Operating temperature (min/max):
2. Number of thermocouples: $\square \times 1 \qquad \square \times 2$	Type of environment:
3. Class:	Accessories: See the part "Accessories"
Class 1 Class 2	Quantity:
4. Lengths L1 and L2 (mm): L1 L2	Note:
5. Diameter Ø (mm):	
6. Junction type: ☐ Ungrounded ☐ Grounded	
7. Connection head: (see the part "Accessories") ☐ Type B ☐ Type DAN ☐ Type M ☐ Type N ☐ Type Ex ☐ Type NS ☐ Other:	
8. Mounting: Wires Terminal block Transmitter (°C): Specify temperature range	

Choose the desired characteristics of your sensor by marking the checkboxes and by filling up the text. You can provide sketches, images,



TH10 – Thermocouples with terminal head Standard with fixed thread



Ordering information		*Tube and thread material Stainless steel 316L
1. Thermocouple:		Additional:
☐ Type K ☐ Type N ☐ Type J ☐ Type T ☐ ☐ Type R ☐ Type S ☐ Type B ☐ Other:	Type E	Application: Operating temperature (min/max):
2. Number of thermocouples:	x 2	Type of environment:
3. Class:		Accessories: See the part "Accessories"
Class 1 Class 2		Quantity:
4. Length L or L1 (mm):		Note:
5. Diameter Ø (mm): 6. Junction type: Ungrounded Grounded 7. Thread: 1/2" BSPP 1/4" BSPP 1/4" BSPT	□M10	
□ 1/2" NPT □ Other: 8. Connection head: (see the part "Accessories")		
☐ Type B ☐ Type DAN ☐ Type M ☐ Type Ex ☐ Type NS ☐ Other:	☐ Type N	
9. Mounting: Wires Terminal block Transmitter (°C): Specify temperature range		
		neckboxes and by filling up the text. You can provide sketches, images, ditional questions and assistance, feel free to contact us.



TH11 – Thermocouples with terminal head Standard with fixed thread (90° bend) (type 1)



	*Tube and thread material Stainless steel 316L
Ordering information 1. Thermocouple: Type K Type N Type J Type T Type E Type R Type S Type B Other:	9. Connection head: (see the part "Accessories") Type B Type DAN Type M Type N Type Ex Type NS Other:
2. Number of thermocouples: \(\times \text{1} \) \(\times \text{2} \) 3. Class: \(\times \text{Class 1} \) \(\times \text{Class 2} \) 4. Lengths L1 and L2 (mm):	10. Mounting: Wires Terminal block Transmitter (°C): Specify temperature range Additional: Application:
5. Length L or L3 (mm): L L3	Operating temperature (min/max): Type of environment: Accessories: See the part "Accessories" Quantity:
6. Diameter Ø (mm): 7. Junction type: ☐ Ungrounded ☐ Grounded	Note:
8. Thread: 1/2" BSPP	
How to order?	վվա

Choose the desired characteristics of your sensor by marking the checkboxes and by filling up the text. You can provide sketches, images,



TH12 – Thermocouples with terminal head Standard with fixed thread (90° bend) (type 2)

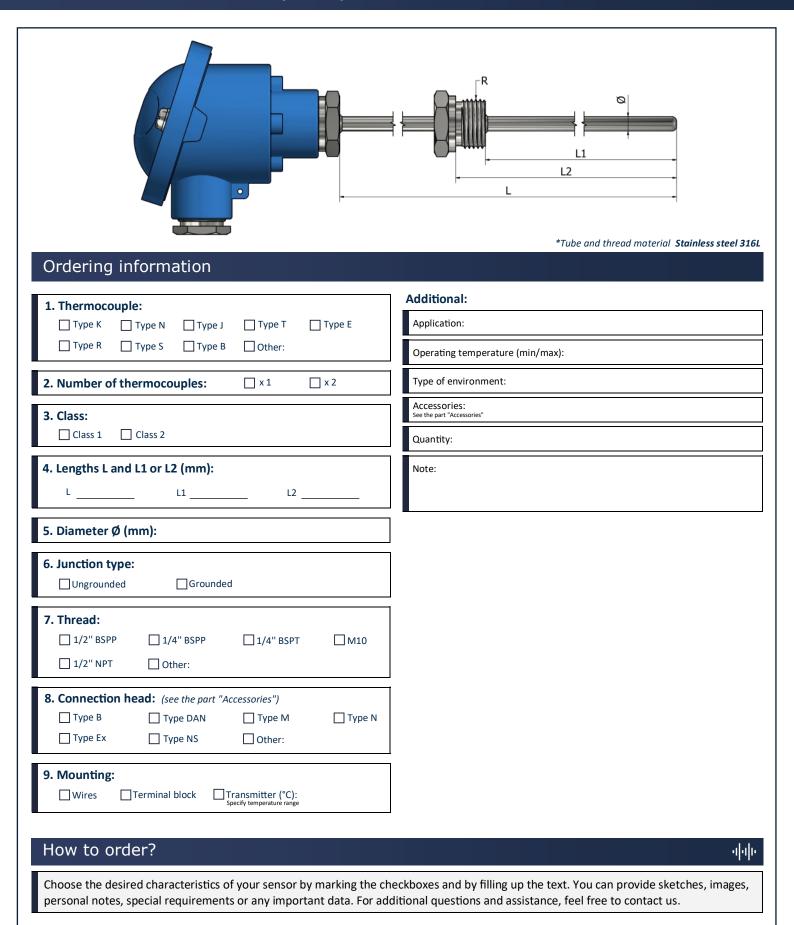


Ordering information	*Tube and thread material Stainless steel 316L
1. Thermocouple: Type K Type N Type J Type T Type E Type R Type S Type B Other:	9. Connection head: (see the part "Accessories") Type B Type DAN Type M Type N Type Ex Type NS Other:
2. Number of thermocouples: \(\times x 1 \) \(\times x 2 \) 3. Class: \(\times \text{Class 1} \) \(\times \text{Class 2} \)	10. Mounting: Wires Terminal block Transmitter (°C): Specify temperature range Additional:
4. Lengths L1 and L2 (mm): L1 L2	Application: Operating temperature (min/max):
5. Length L or L3 (mm): L3	Type of environment: Accessories: See the part "Accessories" Quantity:
6. Diameter Ø (mm): 7. Junction type: Ungrounded Grounded	Note:
8. Thread: 1/2" BSPP	
How to order?	નુંન[-



TH13 – Thermocouples with terminal head Standard with fixed thread (offset)

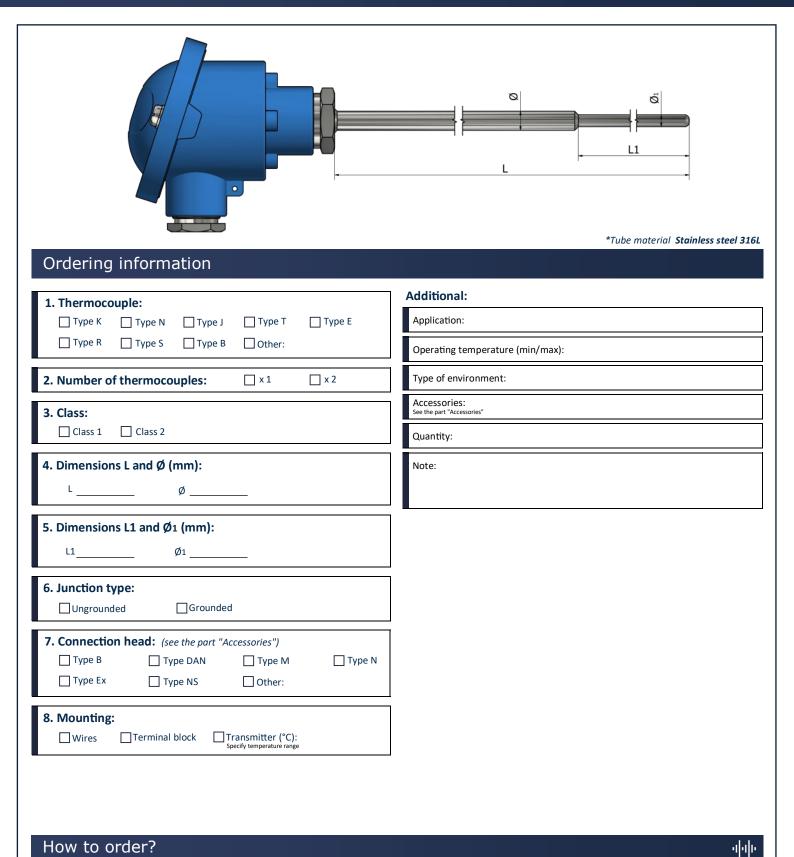






TH20 – Thermocouples with terminal head Reduced tip





Choose the desired characteristics of your sensor by marking the checkboxes and by filling up the text. You can provide sketches, images,



TH21 – Thermocouples with terminal head Pointed tip



	*Tube material Stainless steel 316L
Ordering information	
1. Thermocouple:	Additional:
☐ Type K ☐ Type N ☐ Type J ☐ Type T ☐ Type E	Application:
☐ Type R ☐ Type S ☐ Type B ☐ Other:	Operating temperature (min/max):
2. Number of thermocouples: $\square \times 1$ $\square \times 2$	Type of environment:
3. Class:	Accessories: See the part "Accessories"
Class 1 Class 2	Quantity:
4. Length L (mm):	Note:
5. Diameter Ø (mm):	
6. Junction type: ☐ Ungrounded ☐ Grounded	
7. Connection head: (see the part "Accessories") Type B Type DAN Type M Type N Type Ex Type NS Other:	
8. Mounting: Wires Terminal block Transmitter (°C): Specify temperature range	

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How to order?

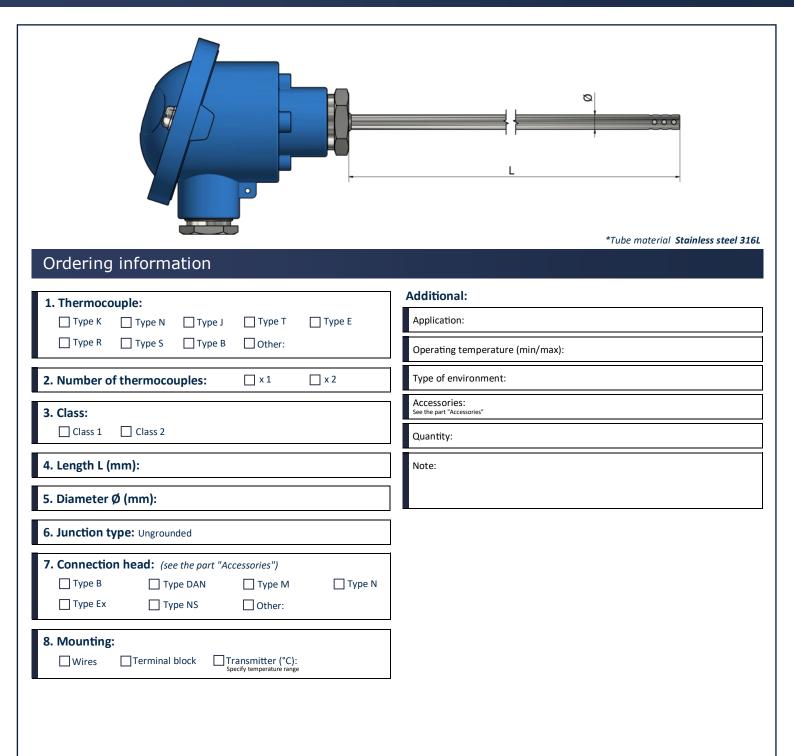
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Choose the desired characteristics of your sensor by marking the checkboxes and by filling up the text. You can provide sketches, images,



TH22 – Thermocouples with terminal head Open air





How to order?

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TH23 – Thermocouples with terminal head Open air with fixed thread



Ordering information	*Tube and thread material Stainless steel 316L
1. Thermocouple:	Additional:
☐ Type K ☐ Type N ☐ Type J ☐ Type E	Application:
☐ Type R ☐ Type S ☐ Type B ☐ Other:	Operating temperature (min/max):
2. Number of thermocouples: $\square \times 1$ $\square \times 2$	Type of environment:
3. Class:	Accessories: See the part "Accessories"
Class 1 Class 2	Quantity:
4. Length L or L1 (mm): L1 5. Diameter Ø (mm):	Note:
6. Junction type: Ungrounded	
7. Thread:	
8. Connection head: (see the part "Accessories") Type B Type DAN Type M Type N Type Ex Type NS Other:	
9. Mounting: Wires Terminal block Transmitter (°C): Specify temperature range	
How to order?	eckboxes and by filling up the text. You can provide sketches, images,



TH24 – Thermocouples with terminal head Open air with reduced tip



Ordering information	*Tube material Stainless steel 316L
	Additional:
1. Thermocouple: ☐ Type K ☐ Type N ☐ Type J ☐ Type T ☐ Type E	Application:
☐ Type R ☐ Type S ☐ Type B ☐ Other:	Operating temperature (min/max):
2. Number of thermocouples: $\square \times 1 \qquad \square \times 2$	Type of environment:
3. Class:	Accessories: See the part "Accessories"
Class 1 Class 2	Quantity:
4. Dimensions L and Ø (mm): Ø	Note:
5. Dimensions L1 and Ø1 (mm): L1 Ø1 6. Junction type: Ungrounded	
7. Connection head: (see the part "Accessories") Type B Type DAN Type M Type N Type Ex Type NS Other:	
8. Mounting: Wires Terminal block Transmitter (°C): Specify temperature range	

How to order?

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TH25 – Thermocouples with terminal head Contact block (surface mount)



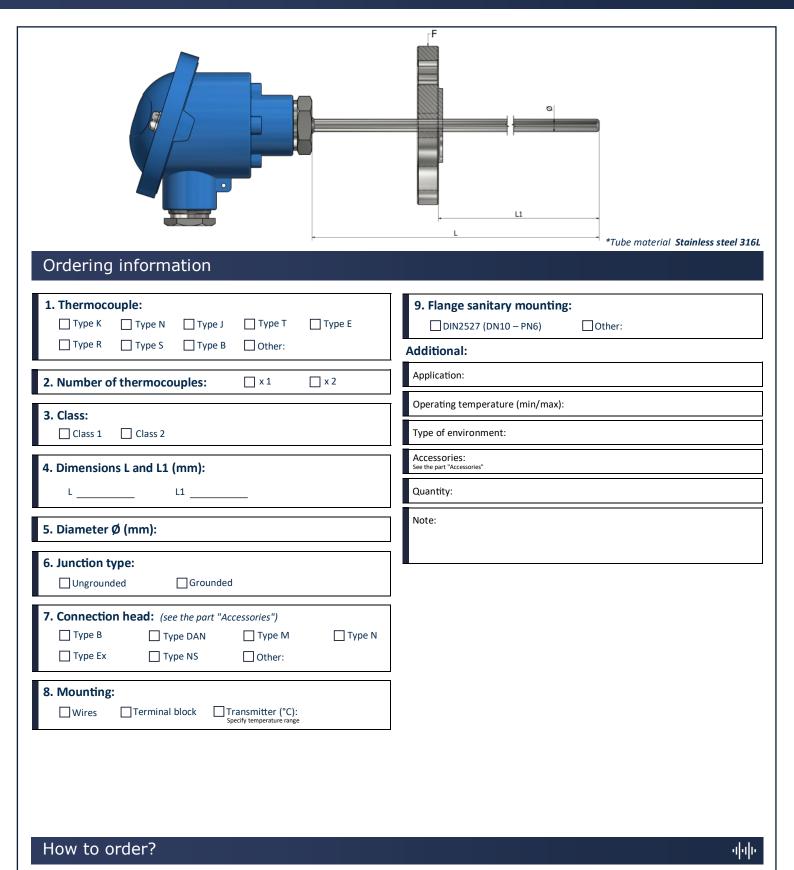
Ordering information	*Tube material Stainless steel 316L
1. Thermocouple: Type K Type N Type J Type T Type E Type R Type S Type B Other:	9. Contact block material: Brass Aluminum Other:
2. Number of thermocouples:	10. Contact block shape: O V-shape Flat
4. Lengths L1 and L2 (mm): L1 L2	Additional: Application:
5. Diameter Ø (mm):	Operating temperature (min/max):
6. Junction type:	Type of environment:
☐Ungrounded ☐Grounded	Accessories: See the part "Accessories"
7. Connection head: (see the part "Accessories")	Quantity:
☐ Type B ☐ Type DAN ☐ Type M ☐ Type N ☐ Type S ☐ Other:	Note:
8. Mounting: Wires Terminal block Transmitter (°C): Specify temperature range	
How to order?	սիլի

Choose the desired characteristics of your sensor by marking the checkboxes and by filling up the text. You can provide sketches, images,



TH30 – Thermocouples with terminal head Flange sanitary mounting



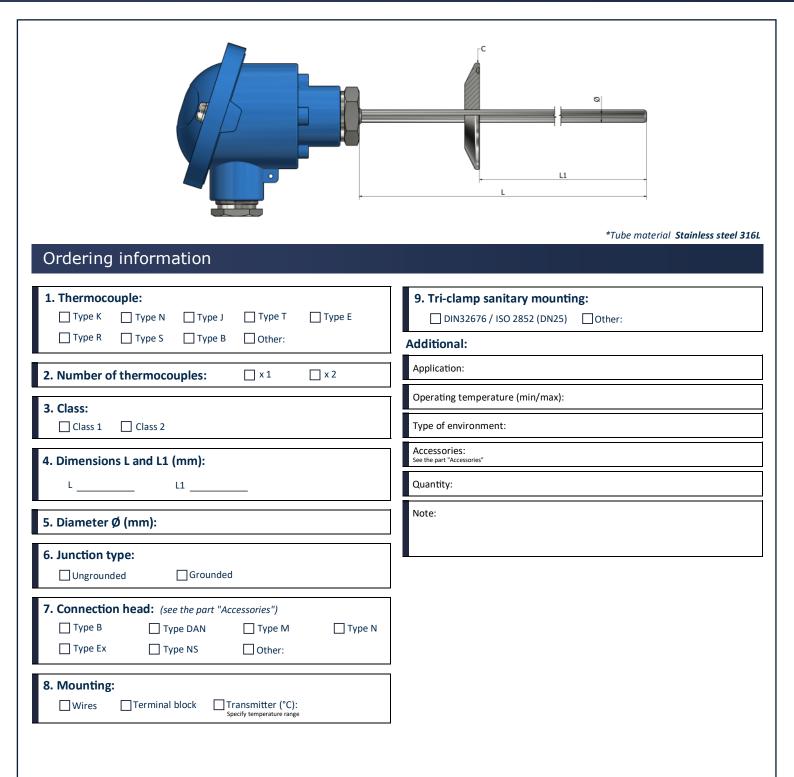


Choose the desired characteristics of your sensor by marking the checkboxes and by filling up the text. You can provide sketches, images,



TH31 – Thermocouples with terminal head Tri-clamp sanitary mounting





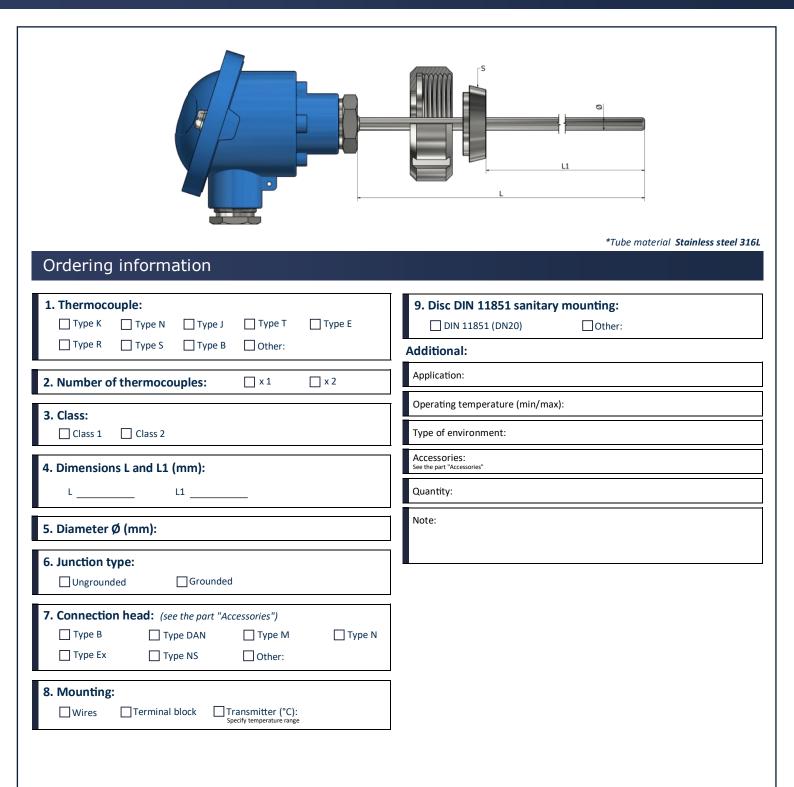
How to order?

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TH32 – Thermocouples with terminal head Disc DIN 11851 (screw-on) sanitary mounting





How to order?

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TH40 – Thermocouples with terminal head Exchangeable insert



	*Tube material Stainless steel 316L
Ordering information	
1. Thermocouple: Type K Type N Type J Type T Type E Type R Type S Type B Other:	8. Type of exchangeable insert:
2. Number of thermocouples: $\square \times 1 \qquad \square \times 2$	
3. Class: Class 1 Class 2	☐ Wires ☐ Terminal block ☐ Transmitter (°C): T Specify temperature range
4. Length L (mm):	Additional:
5. Diameter Ø (mm):	Application:
6. Junction type: Ungrounded Grounded	Operating temperature (min/max): Type of environment:
7. Connection head: (see the part "Accessories") Type B Type DAN Type M Type NS Other:	Accessories: See the part "Accessories" Quantity:
	Note:
How to order?	
Choose the desired characteristics of your sensor by marking the che personal notes, special requirements or any important data. For add	eckboxes and by filling up the text. You can provide sketches, images,



TH41 – Thermocouples with terminal head Exchangeable insert with fixed thread

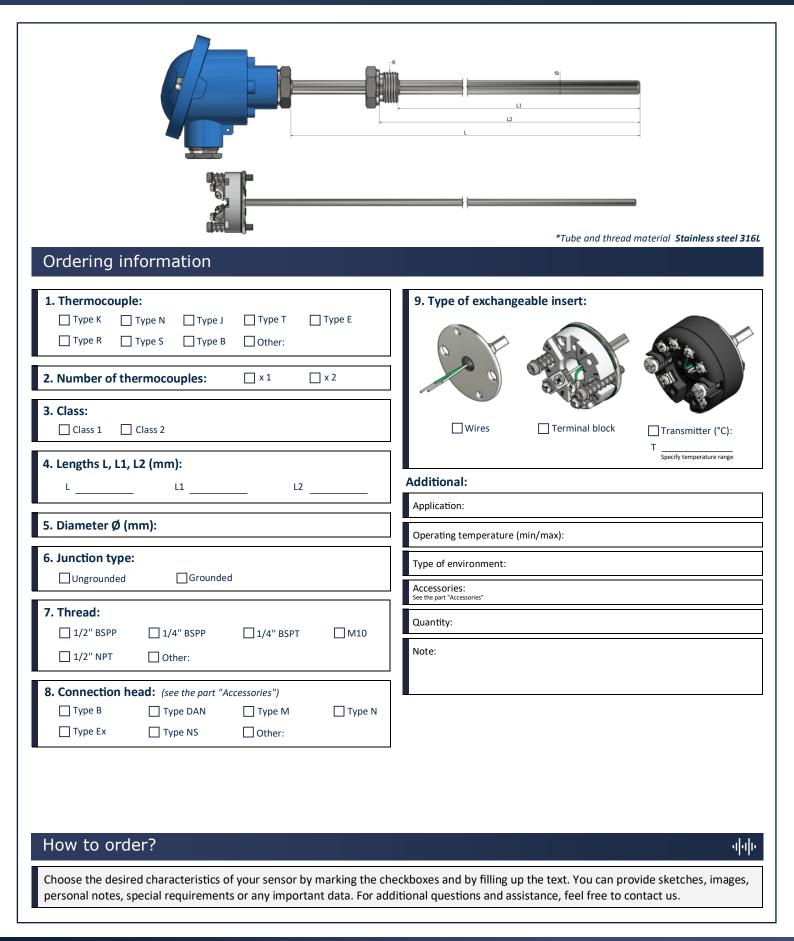


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Oudaving information	*Tube and thread material Stainless steel 316L
Ordering information 1. Thermocouple: Type K Type N Type J Type T Type E Type R Type S Type B Other:	9. Type of exchangeable insert:
2. Number of thermocouples:	☐ Wires ☐ Terminal block ☐ Transmitter (°C):
4. Length L or L1 (mm): L1 5. Diameter Ø (mm):	Additional: Application:
6. Junction type: ☐ Ungrounded ☐ Grounded	Operating temperature (min/max): Type of environment: Accessories:
7. Thread:	See the part "Accessories" Quantity: Note:
8. Connection head: (see the part "Accessories") Type B Type DAN Type M Type N Type Ex Type NS Other:	
How to order? Choose the desired characteristics of your sensor by marking the characteristics of your sensor by	neckboxes and by filling up the text. You can provide sketches, images, ditional questions and assistance, feel free to contact us.



TH42 – Thermocouples with terminal head Exchangeable insert with fixed thread (offset)







TH50 – Thermocouples with terminal head For aggressive environments



	*Fitting material PTFE (260°C) *Tube material Stainless steel 316L with PTFE protection (260°C)
Ordering information	
1. Thermocouple: Type K Type N Type J Type T Type E Type R Type S Type B Other:	Additional: Application: Operating temperature (min/max):
2. Number of thermocouples: $\square \times 1 \qquad \square \times 2$	Type of environment:
3. Class: Class 1 Class 2 4. Length L (mm):	Accessories: See the part "Accessories" Quantity: Note:
5. Diameter Ø (mm):	
6. Junction type: Ungrounded Grounded	
7. Connection head: (see the part "Accessories") Type B Type DAN Type M Type N Type Ex Type NS Other:	
8. Mounting: Wires Terminal block Transmitter (°C): Specify temperature range	

How to order?





TH51 – Thermocouples with terminal head For aggressive environments with fixed thread



Ordering information		*Thread material PTFE (260°C) *Tube material Stainless steel 316L with PTFE protection
1. Thermocouple:	□ T F	Additional: Application:
☐ Type K ☐ Type N ☐ Type J ☐ Type T ☐ Type R ☐ Type S ☐ Type B ☐ Other:	Type E	Operating temperature (min/max):
2. Number of thermocouples: \(\subseteq \times 1 \)	□ x 2	Type of environment:
3. Class:		Accessories: See the part "Accessories"
Class 1 Class 2		Quantity:
4. Length L or L1 (mm):		Note:
5. Diameter Ø (mm): 6. Junction type:	M10	
8. Connection head: (see the part "Accessories") Type B Type DAN Type M Type Ex Type NS Other:	☐ Type N	
9. Mounting: Wires Terminal block Transmitter (°C): Specify temperature range		
		neckboxes and by filling up the text. You can provide sketches, images, lditional questions and assistance, feel free to contact us.



TH60 – Thermocouples with terminal head Spring loaded

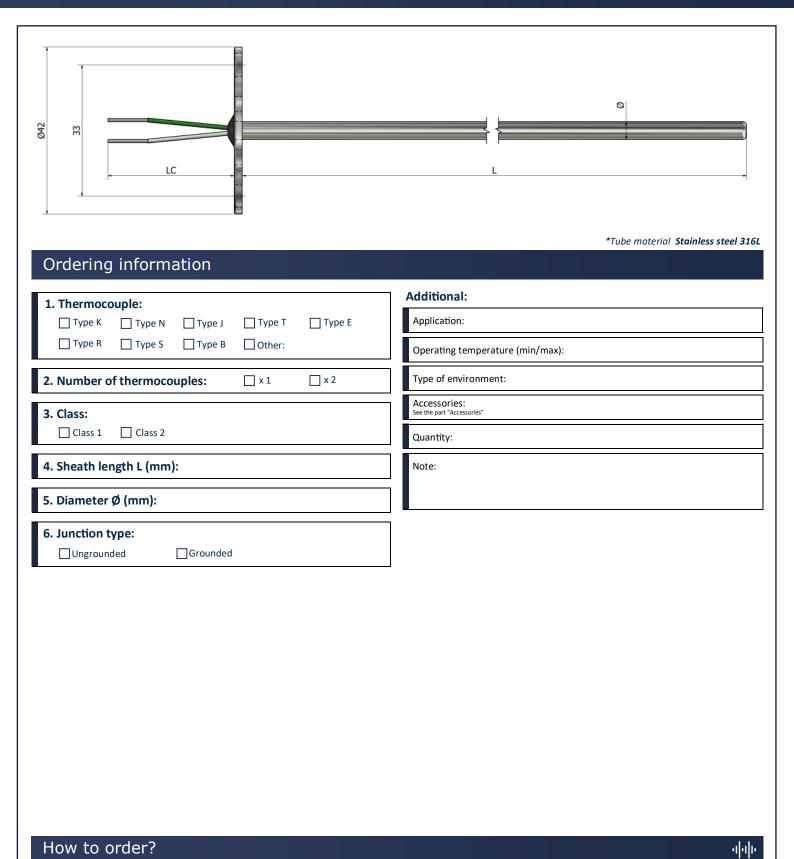


	L1 *Tube and thread material Stainless steel 316L
Ordering information	
1. Thermocouple:	Additional:
☐ Type K ☐ Type N ☐ Type J ☐ Type T ☐ Type E	Application:
☐ Type R ☐ Type S ☐ Type B ☐ Other:	Operating temperature (min/max):
2. Number of thermocouples: $\square \times 1$ $\square \times 2$	Type of environment:
3. Class:	Accessories: See the part "Accessories"
Class 1 Class 2	Quantity:
4. Lengths L1, L2, L3 (mm): L1 L2 L3	Note:
5. Diameter Ø (mm): 6. Junction type: Grounded	
7. Thread: 1/2" BSPP	
8. Connection head: (see the part "Accessories") Type B Type DAN Type M Type N Type Ex Type NS Other:	
9. Mounting: Wires Terminal block Transmitter (°C): Specify temperature range	
How to order? Choose the desired characteristics of your sensor by marking the characteristics of your sensor by marking the characteristics or any important data. For additional contents of the characteristics of your sensor by marking the characteristics of your sensor by marking the characteristics of your sensor by marking the characteristics.	eckboxes and by filling up the text. You can provide sketches, images,



TI00 – Thermocouples with terminal head Disc plate insert





Choose the desired characteristics of your sensor by marking the checkboxes and by filling up the text. You can provide sketches, images,



TI01 – Thermocouples with terminal head Insert with terminal block (spring loaded)



33	
Ordering information	*Tube material Stainless steel 316L
1. Thermocouple:	Additional: Application: Operating temperature (min/max):
2. Number of thermocouples: \Bigcup x1 \Bigcup x2	Type of environment:
3. Class: Class 1 Class 2	Accessories: See the part "Accessories" Quantity:
4. Sheath length L (mm):	Note:
5. Diameter Ø (mm): 6. Junction type: Ungrounded Grounded	

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How to order?

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Choose the desired characteristics of your sensor by marking the checkboxes and by filling up the text. You can provide sketches, images,



TI02 – Thermocouples with terminal head Insert with transmitter block (spring loaded)



33	L	*Tube material Stainless steel 316L
Ordering information		rabe material Stamess steel 310L
1. Thermocouple: Type K Type N Type J Type T Type R Type S Type B Other:	Additional: Application: Operating temperature (min/max):	
2. Number of thermocouples: $\square \times 1$	Type of environment:	
3. Class: Class 1 Class 2 4. Sheath length L (mm):	Accessories: See the part "Accessories" Quantity: Note:	
5. Diameter Ø (mm): 6. Junction type: Grounded		
7. Transmitter (°C): Specify temperature range How to order?		-վ-վի-

Choose the desired characteristics of your sensor by marking the checkboxes and by filling up the text. You can provide sketches, images,