

Product Technical Information DS_TTC-58M_2109_EN

Series AMBItemp, Model TTC 58M

Thermocouple probe for machinery Bayonet tip. With connection cable



Application

The model TTC 58M is a thermocouple from types J, K, N and T, with isolated or grounded hot-junction and encapsulated in a Aisi 316 bayonet tip.

As process connection, the TTC 58M is manufactured with stainless steel bayonet to suit bayonet adaptor M10/12x1 or 1/4" G to process, supplied as accessory.

Are available a wide range of connection cables, conferring TTC 58M a huge versatility for a wide industrial branches and environmental conditions.

Affordable, reliable and easy to install, ideal for process machinery and auxiliary processes in steel and cement branches, as well as in other industries, at process temperatures from -80°C up to 400°C.

16	Your Advantages				
//	Class 1				
//	Full Aisi 316 construction				
//	Process up to 400°C				
//	Ambient up to 220°C				
~ //	OEM customization				

Informa	Informative Signs					
8	Information	This symbol contains device-oriented information which does not result in personal				
		injury.				
Ð	Checking	This symbol contains procedures and other facts to get the most of the device and which do not result in personal injury.				
A	Caution	This symbol alerts you to a dangerous situation. Failure to avoid this situation can result in damaged device and which do not result in personal injury.				
A	Warning	This symbol alerts you to a dangerous situation. Failure to avoid this situation can result in minor or medium injury.				
•	Danger	This symbol alerts you to a dangerous situation. Failure to avoid this situation will result in serious or fatal injury.				

Product Overview

The AMBItemp TTC 58M is a thermocouple probe that features a flexicouple bayonet connection, a solid machined Aisi 316 bayonet tip and a connection cable, for usage up to 400°C.

The cable can be simply crimped and/or epoxy sealed to achieve maximum ingress protection.

These thermocouples are cable wired through the protective tube.

Are available compensated connectors and different insulation materials and conductor's layup for connection cables to withstand process, environmental and usage conditions.

The bayonet adaptor is an accessory not included in the basic scope of supply but can be ordered with the probe trough the order code selection.

A thermocouple consists of the junction of two different metals at one end called the hot junction, producing an electromotive force when the hot junction and the cold junction at the other end are placed at different temperatures. The hot junction is the part of the thermocouple to be subjected to the process temperature. The cold or reference junction is usually at a lower (ambient) temperature and will compensate for the hot junction. The electromotive force generated by the thermocouple varies with the junction metals. The thermocouple element usually ends at a connection head. However, it can be transferred by compensation cable to other measuring and control instruments. Thermocouples are used for temperature measurement in the range of -270°C to 2200°C.

The mineral insulated thermocouple was initially developed for applications in the nuclear sector, and was later extended to other sectors of the production process. The main reasons that generated its development were the need for a thermocouple with a shorter response time than that obtained with the conventional thermocouple mounted with a protection tube and that the thermo-elements do not come into direct contact with the environment in which they would be inserted.

The manufacture of a thermocouple with mineral insulation cable starts from a conventional thermocouple assembled with a protection tube or sheath. In this process, the thermo-elements are isolated from each other by a compacted powder of magnesium oxide and protected by a metal sheath (originally the protection tube). Thus, despite the fact that a given thermocouple has a permissible range of use for a given process, it must be taken into account whether the material selected for the protective sheath is sufficiently resistant to the type of medium to be immersed. A correct selection of the material for this component, allows establishing a longer period of life for the thermocouple, with greater reliability and lower operating costs.

Mineral-insulated thermocouples can be assembled with the isolated, grounded or exposed measurement junction. If not specified, they will be manufactured with isolated junction.

Consider a conventional thermocouple with a metal protection tube. Realizing that it is subjected to a temperature difference, as part of it is in contact with the process and the other end is in contact with the environment, each of them at its temperature. It is inevitable that through the sensor / protection tube assembly there is a heat flow from the highest temperature to the lowest temperature region. The balance occurs when the heat flow received by the sensor is equal to that lost by the sensor, and in this situation its temperature is not necessarily equal to the process temperature.

Since it is desired to measure the process temperature and the temperature value measured by the sensor is as close as possible to it, it is necessary that in the installation in the process some care is taken when choosing the sensor set and its accessories.

- The sensor / accessory set must have a mass that is as small as possible when compared to the process mass. There is a thermal resistance of the set that can cause a temperature difference between the sensor and the process and the greater the mass of this set, the greater the value of this resistance. Another undesirable phenomenon is when the process has fluctuations in the value of its temperature and by the inertia of the sensor, these fluctuations are attenuated or simply not detected, a fact directly related to the mass of the sensor.
- Another relevant factor is the depth of immersion of the sensor in the medium whose temperature is to be measured. The greater the immersion of the sensor, the lower the temperature gradient that, in the case of a thermocouple, the measurement junction will be subjected to. The consequence is that the temperature of the measuring junction approaches the temperature of the medium. A practical recommendation is that the immersion depth is at least 6 times the value of the external diameter of the set for measurement in liquids and 20 times for air, gases or steam.
- When the thermocouple / extension cable set is installed in the process close to electromagnetic fields, it is very likely that inductions will occur in the set, causing an erroneous reading of the measured temperature values. In this situation, insulated junction thermocouples must be used, with the sheath or protective tube to earth, as well as the extension / compensation cable, which must also be shielded and connected to earth.
- It should be considered that thermocouples in general deteriorate over time, occurring quite significantly when installed in processes at high temperature and in aggressive environments. Therefore, due to the peculiarities of each process, it is necessary to establish a useful life for the sensor and proceed to its preventive replacement or periodic calibration of the set.

Types of Thermocouples

The most common thermocouples used in industrial applications are types, K, J, T, N, S and R. Below is shown the main features for those thermocouples. The types S and R are not featured in this model.

Thermocouple Type K (NICKEL CHROMIUM - NICKEL)								
Positive Element (KP)	Positive Element (KP) Ni90%Cr10% Measurement range -270°C to 1200°C							
Negative Element (KN) Ni95%Mn2%Si1%A12% Thermocouple emf -6,458 mV to 48,838 mV								

Can be used on oxidant and inertial atmospheres. Due to its oxidation resistance is used at high temperatures above 600°C and low temperatures below 0°C. Should not be used on reducer and sulphuric atmospheres. At high temperatures and with low oxygen content, chromium diffusion happens, leading to a thermocouple response curve gap.

Thermocouple Type J (IRON - CONSTANTAN)								
Positive Element (JP) Fe99,5% Measurement range -210°C to 760°C								
Negative Element (JN) Cu55%Ni45% Thermocouple emf -8,096 mV to 42,919 mV								

Can be used in neutral, oxidant or reducer atmospheres. Is not recommendable to be used at relative humidity (RH) atmospheres and at low temperatures (the thermo element JP becomes fragile). Above 540°C, iron suffers oxidation very quickly. Also, not recommendable to be used on sulphur atmospheres above 500°C.

Thermocouple Type T (COPPER - CONSTANTAN)									
Positive Element (TP)	Positive Element (TP) Cu100% Measurement range -270°C to 400°C								
Negative Element (TN)									

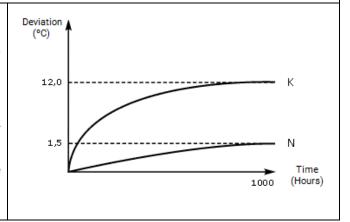
Can be used in neutral, oxidant or reducer atmospheres. It shows very good accuracy, due to copper properties. Above 300°C, the copper oxidation becomes very intense, reducing the thermocouple lifetime and causing deviation on the thermocouple original response curve.

Thermocouple Type N (NICROSIL - NISIL)								
Positive Element (NP)	Ni84,4%Cr14,2%Si1,4%	Measurement range	-270°C a 1300°C					
Negative Element (NN) Ni95,45%Si4,40%Mg0,15% Thermocouple emf -4,345 mV a 47,513 mV								

Newer thermocouple, which is a substitute for type K thermocouple, as it has a much higher resistance to oxidation and in many cases, it is also a substitute for platinum-based thermocouples due to their maximum temperature of use.

The normal operating temperature should not exceed 1100°C. It is recommended for oxidizing, inert or low oxygen atmospheres, as it does not suffer from the greenroot effect.

It must not be exposed to sulphurous atmospheres. The graph shows the temperature deviation suffered by the type N thermocouple compared to the type K in an oxidizing atmosphere at a temperature of 1000°C.



Thermocouple Type S (PLATINUM RHODIUM – PLATINUM)								
Positive Element (SP)	Positive Element (SP) Pt90%Rh10% Measurement range -50°C to 1768°C							
Negative Element (SN)	\							

Can be used on oxidant and inertial atmospheres, with reliability and stability at high temperatures, much higher than other thermocouples limits without platinum thermo-elements. The thermo-elements should not be exposed to metallic vapours or reducer atmospheres. This type of thermo-elements shouldn't be assembled directly in metallic pipes, but using ceramic isolators and protection pipe, alumina based (Al203) with high purity level (99,7%), commercially known as 799 (old 710). Still is possible to manufacture the thermocouple using ceramic pipes with alumina content of 67%, known as 610, but is not recommendable for these platinum types thermocouples. For temperatures above 1500°C is used platinum pipes. Is not recommendable to use these types of thermocouples in temperatures below 0°C, due to response sensor instability.

Thermocouple Type R (PLATINUM RHODIUM – PLATINUM)								
Positive Element (RP)	Positive Element (RP) Pt87%Rh13% Measurement range -50°C to 1768°C							
Negative Element (RN) Pt100% Thermocouple emf -0,226 mV to 21,101 mV								

Has the same thermocouple S features, with approximately 11% more thermoelectric power.



Tolerance Classes

Table 1 shows the tolerance classes (classes 1 and 2), according to the type of thermocouple, temperature of use and deviation, according to IEC 60584.

	Types	R and S	В	J	Т	E	K and N
ss 1	Temperature Range [°C]	0 to 1100 1100 to 1600	-	-40 to 375 375 to 750	-40 to 125 125 to 350	-40 to 375 375 to 800	-40 to 375 375 to 1000
Class	Deviation [°C]	± 1 ± (1 + 0,003(t - 1100)		± 1,5 ± 0,004 (t)	± 0,5 ± 0,004 (t)	± 1,5 ± 0,004 (t)	± 1,5 ± 0,004 (t)
ss 2	Temperature Range [°C]	0 to 600 600 to 1600	600 to 800 800 to 1700	-40 to 333 333 to 750	-40 to 133 133 to 350	-40 to 333 333 to 900	-40 to 333 333 to 1200
Class	Deviation [°C]	± 1,5 ± 0,0025 (t)	± 0,0025 (t) ± 0,005 (t)	± 2,5 ± 0,0075 (t)	± 1,0 ± 0,0075 (t)	± 2,5 ± 0,0075 (t)	± 2,5 ± 0,0075 (t)

Table 1 - Classes of thermocouples according to IEC 60584

P

Colour Codes

	Cond Combi	uctor nations		Stand	dards	
TC Types	+ Leg	- Leg	IEC 60584-3	ANSI Mc96.1	DIN43714	BS 1843
Т	Copper	Constantan	+	+ -	+ -	+ -
J	Iron	Constantan	+	+ -	+	+
E	Nickel - Chromium	Constantan	+ -	-	÷ -	+
K	Nickel - Chromium	Nickel - Aluminum	-	-	-	+
Vx	Copper	Constantan	-	-	-	+
N	Nicrosil	Nisil	+	+ -	NOT DEFINED -	+
S	Platinum - 10% Rhodium	Platinum	+ -	-	+	+ -
R	Platinum - 13% Rhodium	Platinum	+ -	-	+	+
U	Copper	Nickel	+ -	-	+	+ -
В	Platinum - 30% Rhodium	Platinum - 6% Rhodium	-	-	-	NOT DEFINED -
G	Tungsten	Tungsten – 26% Rhenium	NOT DEFINED -	+	NOT DEFINED -	NOT DEFINED -
D	Tungsten – 3% Rhenium	Tungsten – 25% Rhenium	NOT DEFINED -	+	NOT DEFINED -	NOT DEFINED -
С	Tungsten – 5% Rhenium	Tungsten – 26% Rhenium	NOT DEFINED -	+	NOT DEFINED -	NOT DEFINED -

0

Vx is the compensating cable designation for thermocouple type K, also defined as KCA/KCB U is the compensating cable designation for thermocouple types S and R.

Materials

Below are the characteristics of the materials, available for protective sheath and process connection. Please note this section is merely informative and most of listed materials are not available for this model.

SS 304 (1.4301 / X5CrNi18-10)

AISI 304 is a widely-used austenitic chromium-nickel stainless steel. Stainless steel 304 has excellent corrosion resistance in a wide variety of environments and when in contact with different corrosive media. Pitting and crevice corrosion can occur in environments containing chlorides. Stress corrosion cracking can occur at temperatures over 60°C. Stainless steel 304 has good resistance to oxidation in intermittent service up to 870°C and in continuous service to 900°C. However, continuous use at 425-860°C is not recommended if corrosion resistance in water is required. The steel is common throughout industry particularly in food processing as the material is not susceptible to corrosion from acids found in common foodstuffs. As a consequence, such steel is ideal for items such as sinks, work surfaces, preparation areas and refrigerators. It is also a perfect material for use in the pharmaceutical industry for environments such as clean rooms.

SS 316L (1.4404 / X2CrNiMo17-12-2)

SS 316 is the standard molybdenum-bearing grade, second in importance to 304 amongst the austenitic stainless steels. The molybdenum gives to SS 316 better overall corrosion resistant properties than Grade 304, particularly higher resistance to pitting and crevice corrosion in chloride environments. The SS 316L, the low carbon version of 316 and is immune from sensitization (grain boundary carbide precipitation). Thus, it is extensively used in heavy gauge welded components. The austenitic structure also gives these grades excellent toughness, even down to cryogenic temperatures. Compared to chromium-nickel austenitic stainless steels, 316L stainless steel offers higher creep, stress to rupture and tensile strength at elevated temperatures. SS 316L with excellent corrosion resistance properties in acids (low concentration and temperature phosphoric and sulfuric) in non-oxidizing atmospheres. Maximum temperature of 927°C.

SS 321 (1.4541 / X6CrNiTi18-10)

Stainless steel similar to SS 304 but with titanium compound, which gives it better properties when subjected to welding operations and increasing chemical resistance for use in the food and chemical industry. Characterised by high corrosion resistance in general atmospheric corrosive environments it exhibits excellent resistance to most oxidizing agents, general foodstuffs, sterilizing solutions, dyestuffs, most organic chemicals plus a wide variety of inorganic chemicals, also hot petroleum gases, steam combustion gases, nitric acid, and to a lesser extent sulphuric acid. It displays good oxidation resistance at elevated temperatures has excellent resistance to intergranular corrosion and has excellent weldability. Maximum temperature of 900°C.

Inconel 600 (2.4816 / NiCr15Fe)

Alloy 600 is a nonmagnetic, nickel-based high temperature alloy possessing an excellent combination of high strength, hot and cold workability, and resistance to ordinary form of corrosion. This alloy also displays good heat resistance and freedom from aging or stress corrosion throughout the annealed to heavily cold worked condition range. The high chromium content of alloy 600 raises its oxidation resistance considerably above that of pure nickel, while its high nickel content provides good corrosion resistance under reducing conditions. This alloy exhibits high levels of resistance to stress and salt water, exhaust gases, and most organic acids and compounds. Good resistance to oxidation at high temperatures. Maximum temperature of 1149°C.

SS 446-1 (1.4749 / X18CrN28)

SS 446-1 is a ferritic, heat resisting, stainless chromium steel, characterized by extremely good resistance to reducing sulphurous gases, very good resistance to oxidation in air, good resistance to oil-ash corrosion and good resistance to molten copper, lead and tin. SS 446-1 should be chosen mainly for service at temperatures above 700°C where the excellent resistance of the material to slag corrosion and sulphidizing gases is particularly advantageous. Typical applications for SS 446-1 are recuperators in the metallurgical and glass industries, thermocouple protection tubes, soot blower tubes, injection nozzles and muffle tubes in continuous wire annealing furnaces.

ALLOY C-276 (2.4819 / UNS N10276)

ALLOY C-276 is a Nickel-chromium-molybdenum wrought alloy that is considered the most versatile corrosion resistant alloy available. This alloy is resistant to the formation of grain boundary precipitates in the weld heat-affected zone, thus making it suitable for most chemical process applications in an as welded condition. Alloy C-276 also has excellent resistance to pitting, stress-corrosion cracking and oxidizing atmospheres up to 1030°C. Alloy C-276 has exceptional resistance to a wide variety of chemical environments. Some typical applications of ALLOY C-276 include equipment components in chemical and petrochemical organic chloride processes and processes utilizing halide or acid catalysts. Other industry applications are pulp and paper (digesters and bleach areas), scrubbers and ducting for flue gas desulfurization, pharmaceutical and food processing equipment.

MONEL 400 (2.4361 / UNS N04400)

Monel 400 is a nickel-copper alloy (about 67% Ni – 23% Cu) that is resistant to sea water and steam at high temperatures as well as to salt and caustic solutions. This nickel alloy is particularly resistant to hydrochloric and hydrofluoric acids when they are de-aerated. As would be expected from its high copper content, alloy 400 is rapidly attacked by nitric acid and ammonia systems. A low corrosion rate in rapidly flowing brackish or seawater combined with excellent resistance to stress-corrosion cracking in most freshwaters, and its resistance to a variety of corrosive conditions led to its wide use in marine applications and other non-oxidizing chloride solutions. Monel 400 can be used in temperatures up to 535°C.

SS 310 (1.4845 / X8CrNi25-21)

AISI 310 stainless steel is a high chromium nickel austenitic stainless steel with a high carbon content. It has excellent mechanical properties, high temperature oxidation resistance and heat resistance in continuous service up to 1150°C. AISI 310 is used in various industrial furnaces, steam boilers and petroleum system parts and thermocouple protection tubes. Examples include fire box sheets, furnace linings, boiler baffles, thermocouple wells, aircraft cabin heaters, and jet engine burner liners.

SS 904L (1.4539 / X1NiCrMoCu25-20-5)

Grade 904L stainless steel is a non-stabilized austenitic stainless steel with low carbon content. This high alloy stainless steel is added with copper to improve its resistance to strong reducing acids, such as sulphuric acid. The steel is also resistant to stress corrosion cracking and crevice corrosion. Grade 904L stainless steels have excellent resistance to warm seawater and chloride attack. Grade 904L stainless steels offer good oxidation resistance. However, the structural stability of this grade collapses at high temperatures, particularly above 400°C. major applications of grade 904L stainless steels include pulp and paper processing industries and acetic, phosphoric and sulphuric acid processing plants.

Materials	Maximum Temperature (°C)
Carbon Steel	550
Aisi 446-1	1093
Aisi 304	899
Aisi 310	1147
Hasteloy B	815
Hasteloy C	1038
Monel	893
Nicrobell	1250
Molybdenum	1870
HR-160	1200
Titanium: Oxidant Atmosphere	538
Titanium: Reducer Atmosphere	1260
Tantalum	2349
Thermo-alloy APM	1425
Metal Ceramic LT-1	1375
Recrystalized Silicone Carbide	1600
Platinum	1699

Table 2 - Maximum material service temperature: Indicative temperatures, subject to change according to atmosphere / medium



Installation

The probes AMBItemp TTC 58M are suitable for process machinery or other parts of the process if required. Are easy to install by adjusting the 2-slot bayonet cap in the spring and connecting to the threaded adaptor, see also page 10.

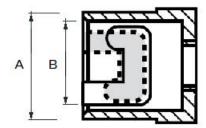
The immersion length has big influence in the instrument accuracy. If the immersion length is small, an additional error may occur and might not be negligible, if there is a big difference between process temperature and ambient temperature. The temperature dissipation happens between process connection and immersed length.

To minimize this error is recommendable as a rule of sump, the immersion length should be at least 10 times the thermowell diameter. Considering the AMBItemp probes, the sensor element is installed in 5-10 mm at end of the tip. According that is recommendable to select an immersion length of 100 mm for a temperature thermowell of 6 mm. If this is not possible, should be selected a diameter or immersion length to comply with the rule.



Is shown below our standard bayonet caps. Please contact us if any of these do not match existing bayonet adaptor.





Order Code Option	Bayonet Cap OD [A]	Bayonet Cap ID [B]	To Suit Spring OD	Number of Slots	Bayonet Cap Material
B2	14.0	12.2	6	2	Aisi 303
C2	14.0	12.2	8	2	Aisi 303
C4	15.5	14.2	8	2	Aisi 303

All dimensions in millimetres (mm)



This product is not intended to be used in oxygen service or in classified zones under ATEX directive.

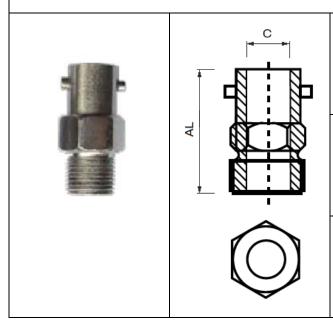


Please note ambient temperature cannot be greater than epoxy sealing and cable maximum temperature.

Process/Bayonet Adaptors

These are our standard bayonet adaptors available for this model.

We welcome any other bayonet adaptor not listed here to suit your application. Please contact us!



Process Connection: M12x1

Length AL: 30 mm Diameter C (ID): 8.5 mm Material: Aisi 316

Order Code Option

B01

Process Connection: M10x1

Length AL: 23 mm Diameter C (ID): 8 mm Material: Aisi 316

Order Code Option

B06

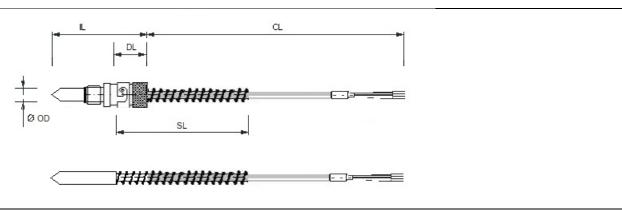
Process Connection: G 1/4" M

Length AL: 25 mm Diameter C (ID): 8 mm Material: Aisi 304

Order Code Option

B08





IL: Immersion length (mm)
DL: Support tube length (mm)

SL: Spring length (mm) CL: Cable length (mm)

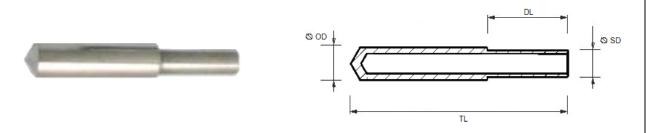


The pictured bayonet adaptor is not included in the basic order code.

Bayonet Tip



Is shown below our standard bayonet tips. Please contact us if any of these do not match your machine requirements.



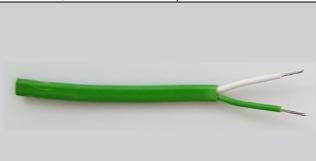
Order Code Option	Total Length [TL]	Support Length Outer Diameter [DL] [OD]		Spring Support [SD]	Bayonet Tip Material			
DC1	28	24	6	4.9	Aisi 316			
DG1	40	15	6	5	Aisi 316			
DG2	40	14.8	6	4.9	Aisi 316			
GF1	38	31	7.8	5.9	Aisi 316			
GF2	38	18	7.8	5.9	Aisi 316			
GJ1	45	18	7.8	5.9	Aisi 316			
HF3	38	31	8	5.9	Aisi 316			
HG2	40	25	8	6	Aisi 316			

All dimensions in millimetres (mm)

Connection Cables

These are the most common thermocouple cables available for this model. We welcome any other cable not listed here to suit your application. Please contact us!

PVC/PVC, max. ambient temperature 105°C



Shape: Flat twin conductors Core size: 7 wires/0.2 mm per wire Cross-section: 0.22 mm², AWG24

Thermocouple configuration: Simplex, duplex and triplex on

demand

Core insulation: PVC Screen: Without

Overall insulation: PVC, IEC colour code only

OD: 3.7 x 2.3 mm

Cable maximum temperature: 105°C

Order Code Option

X0, where X is TC type (IEC), pictured K0

PVC/screen/PVC, max. ambient temperature 105°C



Shape: Flat twin conductors Core size: 7 wires/0.2 mm per wire Cross-section: 0.22 mm², AWG24

Thermocouple configuration: Simplex, duplex and triplex on

demand

Core insulation: PVC

Screen: Mylar aluminium tape, with copper drain wire

Overall insulation: PVC, IEC colour code only

OD: 4.6 mm

Cable maximum temperature: 105°C

Order Code Option

X1, where X is TC type (IEC), pictured K1

Fibreglass/SS overbraided silicone varnished



Shape: Flat twin conductors

Core size: 11 wires/0.2 mm per wire Cross-section: 0.35 mm2, AWG22

Thermocouple configuration: Simplex, duplex and triplex on

demand

Core insulation: Fibreglass

Overall insulation: Fibreglass, silicone varnished

Armour: stainless steel AISI 304 wire overbraid; IEC colour

code, AINSI on demand

OD: 3.7 mm

Cable maximum temperature: 400°C

Order Code Option

X2, where X is TC type (IEC), pictured J2

PFA twisted pair

Shape: Stranded

Core size: 7 wires/0.2 mm per wire Cross-section: 0.22 mm2, AWG24

Thermocouple configuration: Simplex, duplex and triplex on

demand

Core insulation: PFA, IEC colour code only

Screen: Not applied

Overall insulation: Not applied

OD: 1.0 mm

Wire maximum temperature: 250°C

Order Code Option

X4, where X is TC type (IEC), pictured K4

PFA/PFA flat-twin

Shape: Shape: Flat twin conductors Core size: 7 wires/0.2 mm per wire Cross-section: 0.22 mm², AWG24

Thermocouple configuration: Simplex, duplex and triplex on

demand

Core insulation: PFA Screen: Without

Overall insulation: PFA, IEC colour code only

OD: 2.4 x 1.6 mm

Cable maximum temperature: 250°C

Order Code Option

X6, where X is TC type (IEC), pictured T6

A

When using fibreglass cable, take in consideration probe maximum temperature will be limited to seal temperature.



We do not recommend the usage of PVC cables with process temperature above 90°C.

Thermocouple Connectors

These are our main thermocouple connectors available for this model. We welcome any other connector not listed here to suit your application. Please contact us!



It is available in limited thermocouple types, ceramic body connectors to withstand 500°C.



Type of connector: Standard male

Body material: GPB Thermocouples: J, K, N, T Standards: IEC, ANSI Temperature ratting: 220°C

Order Code Option

BX, where X is TC type (IEC) CX, where X is TC type (ANSI)



Type of connector: Standard female

Body material: GPB Thermocouples: J, K, N, T Standards: IEC; ANSI on demand Temperature ratting: 220°C

Order Code Option

On demand



Type of connector: Miniature Male

Body material: GPB Thermocouples: J, K, N, T Standards: IEC; ANSI on demand Temperature ratting: 220°C

Order Code Option

FX, where X is TC type



Type of connector: Miniature female Body material: GPB

Thermocouples: J, K, N, T Standards: IEC; ANSI on demand Temperature ratting: 220°C

Order Code Option

On demand



Is pictured as example thermocouple connectors of type K, IEC60584 (green). The body colour of connector supplied is according IEC60584-3 or ANSI Mc96.1.

Accessories



To suit connector: Standard and miniature size

Connector: To suit male/female Material: nickel plated brass

Order Code Option

M (miniature) S (standard)



The selection of the cable clamps is available through the optional selection fields and it will be supplied to match the selected connector size.

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Device					
Application	Temperature measurement				
Principle	Thermocouple				
Types	Thermocouple types J, K, N,				
Accuracy	Class 1 IEC60584; Special tolerances and standards on demand				
Configuration	Standard simplex; duplex co	nfiguration on reques	t and quantity de		
	Mineral insulated type J	Min		400°C	
Operating temperature	Mineral insulated type K		-80°C N	Max 400°C	
Operating temperature	Mineral insulated type N	IVIIII	-00 C N	400°C	
	Mineral insulated type T			240°C	
Electrical Specifications					
Output signal	Thermocouple emf	mV			
Insulation resistance	>100 MΩ/250 Vdc @room to (Not for grounded hot-junction		ASTM E780-17, w	hichever is greater	
Mechanical Characterist	ics	,			
		T			
	Bayonet tip	Aisi 316			
	Stop ring	Aisi 316L			
	Bayonet cap	Aisi 303			
	Bayonet spring	Type bell	Carbon steel		
	2a, ener epinig	Straight	Aisi 302		
Materials	Bayonet adaptor HEX	G ¼"	Aisi 304		
	Jayonet adaptor 1127	M10x1 / M12x1	Aisi 316		
		PVC/PVC	0.22mm ² , 7/0.2mm		
		PVC/Mylar/PVC	0.22mm ² , 7/0.2mm		
	Connection cable	PFA	0.22mm², 7/0.2mm		
		PFA/PFA	0.22mm ² , 7/0.2mm		
		FG/FG/SSOB	0.35mm ² , 11/0.2mm		
	Total length	Up to 45 mm, standardized; over 45 mm on request			
	Spring support length	Standardized from 14.8 mm to 31 mm			
Bayonet Tip Dimensions	Cable length	0.5 m to 20 m, customized;			
Dayonet Tip Dimensions		over 20 m on request			
	Diameter	6 mm, 7.8 mm, 8 mm			
	Wall thickness	Min 0.5 mm			
		G ¼ M		25 mm	
Bayonet Adaptor	Process Connection	M10x1	Length AL	23 mm	
		M12X1		30 mm	

Environmental Conditions				
Ambient temperature	Absolute max. 220°C, limited to cable sealing and type			
Storage temperature	0 to 60°C; Contact us for storage conditions out of this range			
Relative humidity	0 to 95 %RH, non-condensing			
Calibration units	°C, °F, K			
Weight	Depending on configuration; standard configurations from 100 g to 1.0 kg			
Protection class	IP66			
(complying with EN 60529)	IP68 epoxy sealed			
Approvals, Certifications	RoHS 2, CE			



Additional Information

Maintenance

The thermocouples assemblies of AMBItemp series do not require a specific maintenance. The only recommendation is to check periodically the sensor integrity and perform an annual recalibration.

Factory Calibration Protocol

This factory quality protocol is supplied with every unit. This acts as an inspection report that shows compliance with DIN/EN 60584 essential points. One measurement point is issued for the effect.

Factory Calibration Certificate

The factory calibration certificate must be ordered with the device. The measurement points according to customer specifications and inside device operating temperature range.

Accessories

As accessory or spare part, we have available a set of bayonet adaptors, miniature and standard connectors and cable clamps. You can also order a stainless-steel TAG plate.

Delivery Time

For small quantities, less than 10 pieces with basic options, the delivery times are likely 4 to 5 working days or express manufacturing (48h) with feasibility according configuration and required quantities.



How to Order

Sign		Instruction
Tick	<	Single option selection field necessary
Double tick	%	Multiple option selection field available
Added extra	\oplus	Not mandatory selection field

Order Code		Description			
3.2.2.2000					
TTC 58M-		Thermocouple Probe Series AMBItemp Model TTC 58M			
	The same and the s				
010	~	Thermocouple Type and Configuration; Class; Hot-junction			
F		Thermocouple type K simplex; Cl 1 IEC60584; hot-junction grounded			
G		Thermocouple type J simplex; Cl 1 IEC60584; hot-junction grounded			
J		Thermocouple type J simplex; Cl 1 IEC60584; Isolated hot-junction			
K		Thermocouple type K simplex; Cl 1 IEC60584; Isolated hot-junction			
N		Thermocouple type N simplex; Cl 1 IEC60584; Isolated hot-junction			
Т		Thermocouple type T simplex; Cl 1 IEC60584; Isolated hot-junction			
Υ		Special version on request			
020	>	Bayonet Tip Design and Material			
DC1		TL 28mm, DL 24mm, OD 6mm, SD 4.9mm			
DG1		TL 40mm, DL 15mm, OD 6mm, SD 5mm			
DG2		TL 40mm, DL 14.8mm, OD 6mm, SD 4.9mm			
GF1		TL 38mm, DL 31mm, OD 7.8mm, SD 5.9mm			
GF2		TL 38mm, DL 18mm, OD 7.8mm, SD 5.9mm			
GJ1		TL 45mm, DL 18mm, OD 7.8mm, SD 5.9mm			
HF3		TL 38mm, DL 31mm, OD 8mm, SD 5.9mm			
HG2		TL 40mm, DL 25mm, OD 8.0mm, SD 6.0mm			
YY9					
030	/	Bayonet Cap Design and Material			
B2		2-Slot, OD 14.0 mm/ ID 12.2 mm (A/B) to suit 6 mm OD spring, SS303			
C2		2-Slot, OD 14.0 mm/ ID 12.2 mm (A/B) to suit 8 mm OD spring, SS303			
C4		2-Slot, OD 15.5 mm/ ID 14.2 mm (A/B) to suit 8 mm OD spring, SS303			
Y9		Special version on request			
Not all options	are l	isted here. Please contact us know current production plan for this device			
040	~	Bayonet Spring Design and Material			
B2		Type bell with 100 mm, carbon steel			
B4		Type bell with 200 mm, carbon steel			
S1		Straight with 50 mm, Aisi 302			
S2		Straight with 100 mm, Aisi 302			
S3		Straight with 150 mm, Aisi 302			
S4		Straight with 200 mm, Aisi 302			
Y9		Special version on request			
Not all options	are l	isted here. Please contact us know current production plan for this device			

How to Order (continuation)

050	/	Sealing; Ingress Protection			
С		Cable crimped, PTFE; IP66			
E		Epoxy seal, max. 220°C; IP68			
S		Cable crimped, epoxy seal, max. 220°C; IP68			
Υ		Special version on request			
060	\	Cable Length			
0		1000 mm			
1		1500 mm			
2		2000 mm			
3		2500 mm			
4		3000 mm			
5		5000 mm			
6		10000 mm			
7		15000 mm			
8		20000 mm			
X		Customized length			
9		Special version on request			
070	~	Type of Connection Cable			
070 J0	✓	Thermocouple J; IEC60584; PVC/PVC, max. ambient temperature 105°C			
	✓				
J0	✓	Thermocouple J; IEC60584; PVC/PVC, max. ambient temperature 105°C			
J0 J1	✓	Thermocouple J; IEC60584; PVC/PVC, max. ambient temperature 105°C Thermocouple J; IEC60584; PVC/screen/PVC, max. ambient temperature 105°C			
J0 J1 J2	✓	Thermocouple J; IEC60584; PVC/PVC, max. ambient temperature 105°C Thermocouple J; IEC60584; PVC/screen/PVC, max. ambient temperature 105°C Thermocouple J; IEC60584; Fibreglass/SS overbraided silicone varnished			
J0 J1 J2 J6 K0	✓	Thermocouple J; IEC60584; PVC/PVC, max. ambient temperature 105°C Thermocouple J; IEC60584; PVC/screen/PVC, max. ambient temperature 105°C Thermocouple J; IEC60584; Fibreglass/SS overbraided silicone varnished Thermocouple J; IEC60584; PFA/PFA flat-twin Thermocouple K; IEC60584; PVC/PVC, max. ambient temperature 105°C Thermocouple K; IEC60584; PVC/screen/PVC, max. ambient temperature 105°C			
J0 J1 J2 J6 K0 K1	✓ 	Thermocouple J; IEC60584; PVC/PVC, max. ambient temperature 105°C Thermocouple J; IEC60584; PVC/screen/PVC, max. ambient temperature 105°C Thermocouple J; IEC60584; Fibreglass/SS overbraided silicone varnished Thermocouple J; IEC60584; PFA/PFA flat-twin Thermocouple K; IEC60584; PVC/PVC, max. ambient temperature 105°C			
J0 J1 J2 J6 K0 K1 K2	/	Thermocouple J; IEC60584; PVC/PVC, max. ambient temperature 105°C Thermocouple J; IEC60584; PVC/screen/PVC, max. ambient temperature 105°C Thermocouple J; IEC60584; Fibreglass/SS overbraided silicone varnished Thermocouple J; IEC60584; PFA/PFA flat-twin Thermocouple K; IEC60584; PVC/PVC, max. ambient temperature 105°C Thermocouple K; IEC60584; PVC/screen/PVC, max. ambient temperature 105°C Thermocouple K; IEC60584; Fibreglass/SS overbraided silicone varnished Thermocouple K; IEC60584; PFA twisted pair			
J0 J1 J2 J6 K0 K1 K2 K4	/	Thermocouple J; IEC60584; PVC/PVC, max. ambient temperature 105°C Thermocouple J; IEC60584; PVC/screen/PVC, max. ambient temperature 105°C Thermocouple J; IEC60584; Fibreglass/SS overbraided silicone varnished Thermocouple J; IEC60584; PFA/PFA flat-twin Thermocouple K; IEC60584; PVC/PVC, max. ambient temperature 105°C Thermocouple K; IEC60584; PVC/screen/PVC, max. ambient temperature 105°C Thermocouple K; IEC60584; Fibreglass/SS overbraided silicone varnished Thermocouple K; IEC60584; PFA twisted pair Thermocouple K; IEC60584; PFA/PFA flat-twin			
J0 J1 J2 J6 K0 K1 K2 K4	✓ ————————————————————————————————————	Thermocouple J; IEC60584; PVC/PVC, max. ambient temperature 105°C Thermocouple J; IEC60584; PVC/screen/PVC, max. ambient temperature 105°C Thermocouple J; IEC60584; Fibreglass/SS overbraided silicone varnished Thermocouple J; IEC60584; PFA/PFA flat-twin Thermocouple K; IEC60584; PVC/PVC, max. ambient temperature 105°C Thermocouple K; IEC60584; PVC/screen/PVC, max. ambient temperature 105°C Thermocouple K; IEC60584; Fibreglass/SS overbraided silicone varnished Thermocouple K; IEC60584; PFA twisted pair Thermocouple K; IEC60584; PFA/PFA flat-twin Thermocouple N; IEC60584; PVC/screen/PVC, max. ambient temperature 105°C			
J0 J1 J2 J6 K0 K1 K2 K4 K6	✓ ————————————————————————————————————	Thermocouple J; IEC60584; PVC/PVC, max. ambient temperature 105°C Thermocouple J; IEC60584; PVC/screen/PVC, max. ambient temperature 105°C Thermocouple J; IEC60584; Fibreglass/SS overbraided silicone varnished Thermocouple J; IEC60584; PFA/PFA flat-twin Thermocouple K; IEC60584; PVC/PVC, max. ambient temperature 105°C Thermocouple K; IEC60584; PVC/screen/PVC, max. ambient temperature 105°C Thermocouple K; IEC60584; Fibreglass/SS overbraided silicone varnished Thermocouple K; IEC60584; PFA twisted pair Thermocouple K; IEC60584; PFA/PFA flat-twin Thermocouple N; IEC60584; PVC/screen/PVC, max. ambient temperature 105°C Thermocouple N; IEC60584; Fibreglass/SS overbraided silicone varnished			
J0 J1 J2 J6 K0 K1 K2 K4 K6 N1 N2		Thermocouple J; IEC60584; PVC/PVC, max. ambient temperature 105°C Thermocouple J; IEC60584; PVC/screen/PVC, max. ambient temperature 105°C Thermocouple J; IEC60584; Fibreglass/SS overbraided silicone varnished Thermocouple J; IEC60584; PFA/PFA flat-twin Thermocouple K; IEC60584; PVC/PVC, max. ambient temperature 105°C Thermocouple K; IEC60584; PVC/screen/PVC, max. ambient temperature 105°C Thermocouple K; IEC60584; Fibreglass/SS overbraided silicone varnished Thermocouple K; IEC60584; PFA/PFA flat-twin Thermocouple K; IEC60584; PVC/screen/PVC, max. ambient temperature 105°C Thermocouple N; IEC60584; Fibreglass/SS overbraided silicone varnished Thermocouple N; IEC60584; Fibreglass/SS overbraided silicone varnished Thermocouple T; IEC60584; PVC/PVC, max. ambient temperature 105°C			
J0 J1 J2 J6 K0 K1 K2 K4 K6 N1 N2 T0		Thermocouple J; IEC60584; PVC/PVC, max. ambient temperature 105°C Thermocouple J; IEC60584; PVC/screen/PVC, max. ambient temperature 105°C Thermocouple J; IEC60584; Fibreglass/SS overbraided silicone varnished Thermocouple J; IEC60584; PFA/PFA flat-twin Thermocouple K; IEC60584; PVC/PVC, max. ambient temperature 105°C Thermocouple K; IEC60584; PVC/screen/PVC, max. ambient temperature 105°C Thermocouple K; IEC60584; Fibreglass/SS overbraided silicone varnished Thermocouple K; IEC60584; PFA twisted pair Thermocouple K; IEC60584; PFA/PFA flat-twin Thermocouple N; IEC60584; PVC/screen/PVC, max. ambient temperature 105°C Thermocouple N; IEC60584; Fibreglass/SS overbraided silicone varnished Thermocouple T; IEC60584; PVC/PVC, max. ambient temperature 105°C Thermocouple T; IEC60584; PVC/Screen/PVC, max. ambient temperature 105°C			
J0 J1 J2 J6 K0 K1 K2 K4 K6 N1 N2 T0 T1 T4		Thermocouple J; IEC60584; PVC/PVC, max. ambient temperature 105°C Thermocouple J; IEC60584; PVC/screen/PVC, max. ambient temperature 105°C Thermocouple J; IEC60584; Fibreglass/SS overbraided silicone varnished Thermocouple J; IEC60584; PFA/PFA flat-twin Thermocouple K; IEC60584; PVC/PVC, max. ambient temperature 105°C Thermocouple K; IEC60584; PVC/screen/PVC, max. ambient temperature 105°C Thermocouple K; IEC60584; Fibreglass/SS overbraided silicone varnished Thermocouple K; IEC60584; PFA twisted pair Thermocouple K; IEC60584; PFA/PFA flat-twin Thermocouple N; IEC60584; PVC/screen/PVC, max. ambient temperature 105°C Thermocouple N; IEC60584; Fibreglass/SS overbraided silicone varnished Thermocouple T; IEC60584; PVC/PVC, max. ambient temperature 105°C Thermocouple T; IEC60584; PVC/Screen/PVC, max. ambient temperature 105°C Thermocouple T; IEC60584; PVC/Screen/PVC, max. ambient temperature 105°C Thermocouple T; IEC60584; PVC/Screen/PVC, max. ambient temperature 105°C			
J0 J1 J2 J6 K0 K1 K2 K4 K6 N1 N2 T0 T1 T4 T6		Thermocouple J; IEC60584; PVC/PVC, max. ambient temperature 105°C Thermocouple J; IEC60584; PVC/screen/PVC, max. ambient temperature 105°C Thermocouple J; IEC60584; Fibreglass/SS overbraided silicone varnished Thermocouple J; IEC60584; PFA/PFA flat-twin Thermocouple K; IEC60584; PVC/PVC, max. ambient temperature 105°C Thermocouple K; IEC60584; PVC/screen/PVC, max. ambient temperature 105°C Thermocouple K; IEC60584; Fibreglass/SS overbraided silicone varnished Thermocouple K; IEC60584; PFA twisted pair Thermocouple K; IEC60584; PFA/PFA flat-twin Thermocouple N; IEC60584; PVC/screen/PVC, max. ambient temperature 105°C Thermocouple N; IEC60584; Fibreglass/SS overbraided silicone varnished Thermocouple T; IEC60584; PVC/PVC, max. ambient temperature 105°C Thermocouple T; IEC60584; PVC/Screen/PVC, max. ambient temperature 105°C Thermocouple T; IEC60584; PVC/Screen/PVC, max. ambient temperature 105°C Thermocouple T; IEC60584; PFA twisted pair Thermocouple T; IEC60584; PFA twisted pair			
J0 J1 J2 J6 K0 K1 K2 K4 K6 N1 N2 T0 T1 T4 T6 Y9		Thermocouple J; IEC60584; PVC/PVC, max. ambient temperature 105°C Thermocouple J; IEC60584; PVC/screen/PVC, max. ambient temperature 105°C Thermocouple J; IEC60584; Fibreglass/SS overbraided silicone varnished Thermocouple J; IEC60584; PFA/PFA flat-twin Thermocouple K; IEC60584; PVC/PVC, max. ambient temperature 105°C Thermocouple K; IEC60584; PVC/screen/PVC, max. ambient temperature 105°C Thermocouple K; IEC60584; Fibreglass/SS overbraided silicone varnished Thermocouple K; IEC60584; PFA twisted pair Thermocouple K; IEC60584; PFA/PFA flat-twin Thermocouple N; IEC60584; PVC/screen/PVC, max. ambient temperature 105°C Thermocouple N; IEC60584; Fibreglass/SS overbraided silicone varnished Thermocouple T; IEC60584; PVC/PVC, max. ambient temperature 105°C Thermocouple T; IEC60584; PVC/Screen/PVC, max. ambient temperature 105°C Thermocouple T; IEC60584; PVC/Screen/PVC, max. ambient temperature 105°C Thermocouple T; IEC60584; PVC/Screen/PVC, max. ambient temperature 105°C			



How to Order (continuation)

080	~	Thermocouple Connector, TC Type, Standard		
AA		Not selected, cable leads with crimped tips		
AB		Not selected, standard cable leads		
BJ		Standard male GPB connector, TC J, IEC60584/ANSI Mc96.1 (black)		
BK		Standard male GPB connector, TC K, IEC60584 (green)		
CK		Standard male GPB connector, TC K, ANSI Mc96.1 (yellow)		
FJ		Miniature male GPB connector, TC J, IEC60584/ANSI Mc96.1 (black)		
FK		Miniature male GPB connector, TC K, IEC60584 (green)		
FN		Miniature male GPB connector, TC N, IEC60584 (pink)		
FT		Miniature male GPB connector, TC T, IEC60584 (brown)		
Y9		Special version on request		
Not all options	are l	isted here. Please contact us know current production plan for this device		
⊕ 090	\	Accessory Mounted		
B01		Bayonet Adaptor M12x1, 2-pins, HEX, ID 8.5 mm x L 30 mm, SS316		
B06		Bayonet Adaptor M10x1, 2-pins, HEX, ID 8.0 mm x L 23 mm, SS316		
B08		Bayonet Adaptor G ¼" M, 2-pins, HEX, ID 8.0 mm x L 25 mm, SS304		
Not all options	are l	isted here. Please contact us know current production plan for this device		
① 100	~	Cable Clamp		
М		To suit miniature connector		
S		To suit Standard connector		
① ₁₁₀	/	Label and Product Documentation Language		
EN		English		
FR		French		
PT		Portuguese		
⊕ 120	✓	Additional Specifications		
Y9		Special version on request		
<u> </u>		•		

Selection Example

Bayonet thermocouple probe type J with isolated hot-junction up to 200° C, Delta Sensor tip design HF3, to suit 8 mm spring. With stainless steel bayonet adaptor G $\frac{1}{4}$ ".

Connection cable with 2.5 m, Fiberglass sheath, stainless steel overbraided.

Order code	TTC 58M-JHF3C2B4C3J2AB+B08EN
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Contact

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