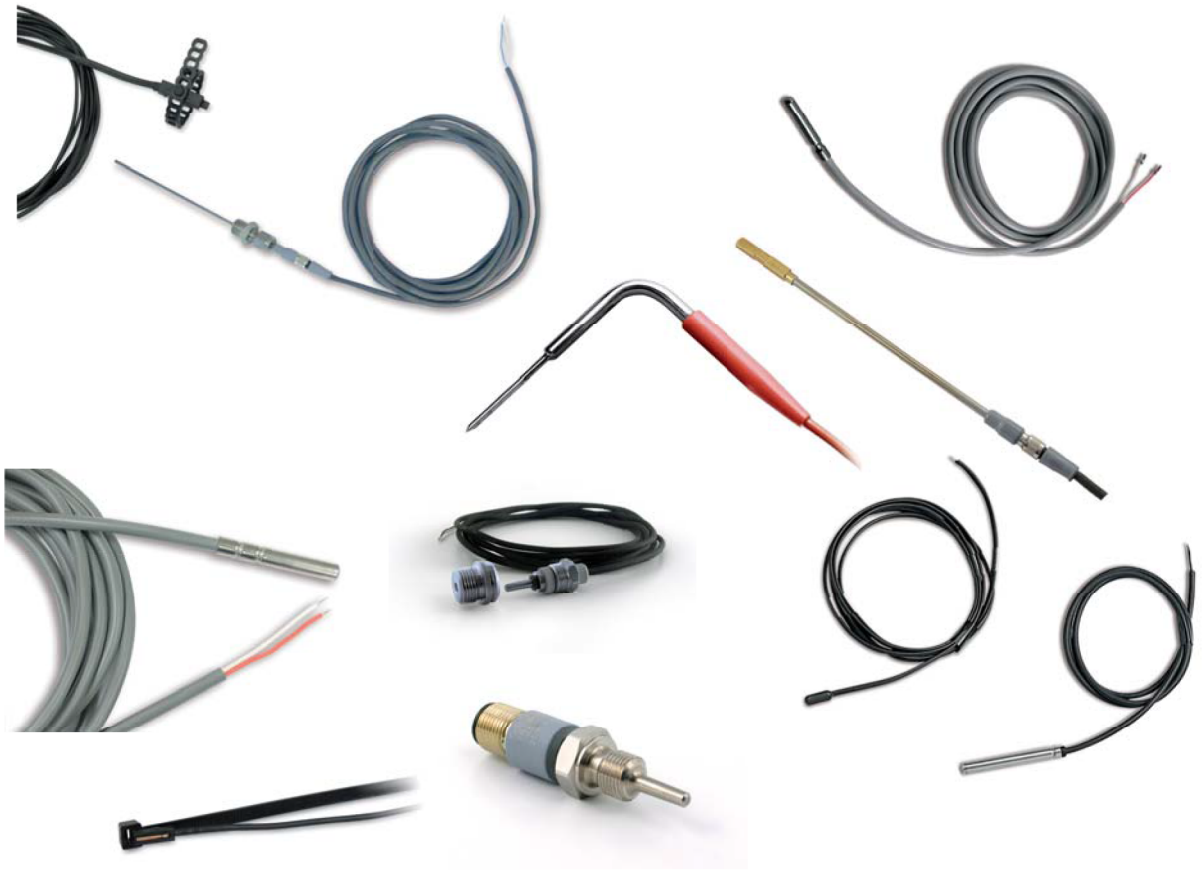
Sensori di temperatura passivi
Passive temperature probes

CAREL



ITA **Manuale d'uso**

ENG **User manual**

LEGGI E CONSERVA QUESTE ISTRUZIONI
READ AND SAVE THESE INSTRUCTIONS



READ CAREFULLY IN THE TEXT!

High Efficiency Solutions

IMPORTANT



CAREL bases the development of its products on decades of experience in HVAC, on the continuous investments in technological innovations to products, procedures and strict quality processes with in-circuit and functional testing on 100% of its products, and on the most innovative production technology available on the market. CAREL and its subsidiaries nonetheless cannot guarantee that all the aspects of the product and the software included with the product respond to the requirements of the final application, despite the product being developed according to start-of-the-art techniques.
The customer (manufacturer, developer or installer of the final equipment) accepts all liability and risk relating to the configuration of the product in order to reach the expected results in relation to the specific final installation and/or equipment.
CAREL may, based on specific agreements, act as a consultant for the positive commissioning of the final unit/application, however in no case does it accept liability for the correct operation of the final equipment/system.

The CAREL product is a state-of-the-art product, whose operation is specified in the technical documentation supplied with the product or can be downloaded, even prior to purchase, from the website www.CAREL.com.
Each CAREL product, in relation to its advanced level of technology, requires setup / configuration / programming / commissioning to be able to operate in the best possible way for the specific application. The failure to complete such operations, which are required/indicated in the user manual, may cause the final product to malfunction; CAREL accepts no liability in such cases.
Only qualified personnel may install or carry out technical service on the product.
The customer must only use the product in the manner described in the documentation relating to the product.

In addition to observing any further warnings described in this manual, the following warnings must be heeded for all CAREL products:

- Prevent the electronic circuits from getting wet. Rain, humidity and all types of liquids or condensate contain corrosive minerals that may damage the electronic circuits. In any case, the product should be used or stored in environments that comply with the temperature and humidity limits specified in the manual.
- Do not install the device in particularly hot environments. Too high temperatures may reduce the life of electronic devices, damage them and deform or melt the plastic parts. In any case, the product should be used or stored in environments that comply with the temperature and humidity limits specified in the manual.
- Do not attempt to open the device in any way other than described in the manual.
- Do not drop, hit or shake the device, as the internal circuits and mechanisms may be irreparably damaged.
- Do not use corrosive chemicals, solvents or aggressive detergents to clean the device.
- Do not use the product for applications other than those specified in the technical manual.

All of the above suggestions likewise apply to the controllers, serial boards, programming keys or any other accessory in the CAREL product portfolio.
CAREL adopts a policy of continual development. Consequently, CAREL reserves the right to make changes and improvements to any product described in this document without prior warning.

The technical specifications shown in the manual may be changed without prior warning.

The liability of CAREL in relation to its products is specified in the CAREL general contract conditions, available on the website www.CAREL.com and/or by specific agreements with customers; specifically, to the extent where allowed by applicable legislation, in no case will CAREL, its employees or subsidiaries be liable for any lost earnings or sales, losses of data and information, costs of replacement goods or services, damage to things or people, downtime or any direct, indirect, incidental, actual, punitive, exemplary, special or consequential damage of any kind whatsoever, whether contractual, extra-contractual or due to negligence, or any other liabilities deriving from the installation, use or impossibility to use the product, even if CAREL or its subsidiaries are warned of the possibility of such damage.

DISPOSAL



INFORMATION FOR USERS ON THE CORRECT HANDLING OF WASTE ELECTRICAL AND ELECTRONIC EQUIPMENT (WEEE)

In reference to European Union directive 2002/96/EC issued on 27 January 2003 and the related national legislation, please note that:

- WEEE cannot be disposed of as municipal waste and such waste must be collected and disposed of separately;
- the public or private waste collection systems defined by local legislation must be used. In addition, the equipment can be returned to the distributor at the end of its working life when buying new equipment;
- the equipment may contain hazardous substances: the improper use or incorrect disposal of such may have negative effects on human health and on the environment;
- the symbol (crossed-out wheeled bin) shown on the product or on the packaging and on the instruction sheet indicates that the equipment has been introduced onto the market after 13 August 2005 and that it must be disposed of separately;
- in the event of illegal disposal of electrical and electronic waste, the penalties are specified by local waste disposal legislation.

Warranty on the materials: 2 years (from the date of production, excluding consumables).

Approval: the quality and safety of CAREL INDUSTRIES Hqs products are guaranteed by the ISO 9001 certified design and production system.

WARNING: separate as much as possible the probe and digital input signal cables from the cables carrying inductive loads and power cables to avoid possible electromagnetic disturbance.
Never run power cables (including the electrical panel wiring) and signal cables in the same conduits.



READ CAREFULLY IN THE TEXT!

HACCP – CAUTION !



When the temperature measurement is important for food safety (i.e. HACCP), only the temperature probes suggested by Carel must be used.
Standards in force may require specific documents to be completed and kept on file, as well as periodical verification of the instruments and sensors used.
In case of doubt, contact the food safety manage or site manager.

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1. INTRODUCTION

1.1 General description

The Carel passive temperature probes are devices that, when connected to the controller, provide a resistance value, which is then converted to a temperature by the electronic controller. These are used in HVAC/R applications, and represent a complete range capable of satisfying a variety of needs in different installations. The probes are made using materials that guarantee constant quality.

The range includes various models that differ based on the performance of the system and the fields of application. The probes have different types of sensor (NTC, PTC, Pt1000), caps, index of protection, cable length, operating ranges and mechanical dimensions.
In addition, models are available for use in hydronic systems, applied directly onto the tubing, which simplify installation and offer a faster response in the reading, improving the wiring of the HVAC/R unit and improving performance.

The probes are used together with Carel electronic controllers (parametric and programmable).

2. NTC TECHNICAL SPECIFICATIONS

2.1 Models NTC*HP*

Storage conditions	-50T105 °C
Operating range	-50T105 °C in air
Connections	Stripped ends, dimensions: 5±1 mm
Sensor	NTC 10 kΩ ±1% a 25 °C Beta 3435
Dissipation factor (in air)	ca. 3 mW/°C
Thermal constant over time (in air)	ca. / approx. 25 s
Cable	Black two-wire flat cable, with tinned copper wire size 0.3 mm2
Sensitive element index of protection	IP67
Sensitive element housing	Polyolefin
Classification according to protection against electric shock (sensitive element & cable)	Basic insulation for 250 Vac
Category of resistance to heat and fire	Flame retardant



Fig. 2.a

* = see table of product codes in price list.

Warning: all measures present in this manual are in millimeters.

2.2 Models NTC*WF*

Storage conditions	-50T105 °C
Operating range	-50T105 °C
Connections	Stripped ends, dimensions: 5±1 mm
Sensor	NTC 10 kΩ ±1% a 25 °C Beta 3435
Dissipation factor (in air)	ca. / approx. 7 mW/°C
Thermal constant over time (in air)	ca. / approx. 10 s
Cable	Two-wire with double sheath, AWG22, tinned copper with electrical resistance ≤63 Ω/km - Insulation: TPE specific for immersion in water on outer sheath, PP/Co inside on wires, OD 3.5 mm max.
Sensitive element index of protection	IP67
Sensitive element housing	AISI 316 steel diameter 4 mm - L= 30 mm
Classification according to protection against electric shock (sensitive element & cable)	Basic insulation for 250 Vac
Category of resistance to heat and fire	Flame retardant

Tab. 2.a

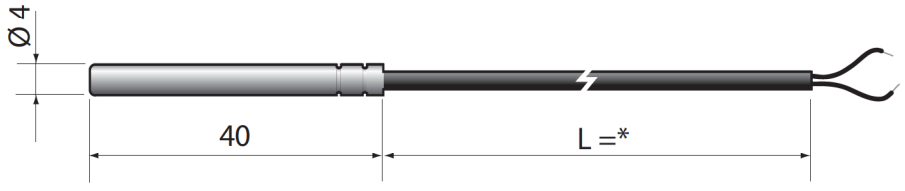


Fig. 2.b

* = see table of product codes in price list

2.3 Models NTC*WH*

Storage conditions	-50T105 °C
Operating range	-50T105 °C
Connections	Stripped ends, dimensions: 5±1 mm
Sensor	NTC 10 kΩ ±1% a 25 °C Beta 3435
Dissipation factor (in air)	ca. / approx. 2,2 mW/°C
Thermal constant over time (in water)	ca. / approx. 30 s
Cable	Two-wire with double sheath, AWG22, tinned copper with electrical resistance ≤63 Ω/km - Insulation: TPE specific for immersion in water on outer sheath, PP/Co inside on wires, OD 3.5 mm max
Sensitive element index of protection	IP68
Sensitive element housing	PP/Co with AISI 316 outer cap
Classification according to protection against electric shock (sensitive element and cable)	Supplementary insulation for 250 Vac;
Category of resistance to heat and fire	Flame retardant
Standard	NSF (only for 1,5-3-6 m versions)

Tab. 2.b

Version 1

* = see table of product codes in price list

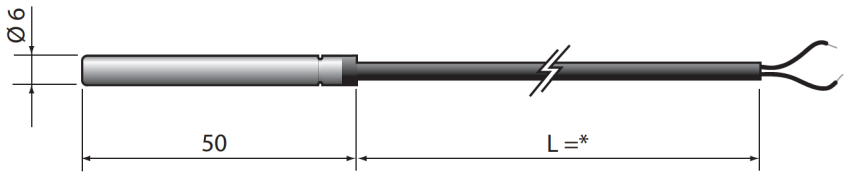


Fig. 2.c

Version 2

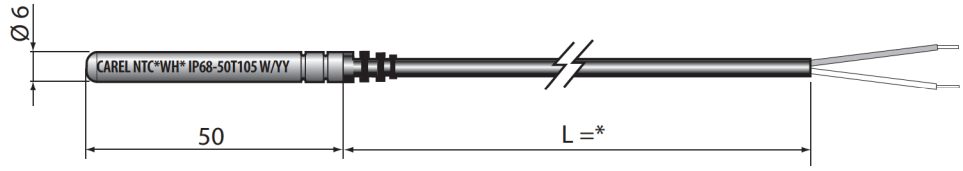


Fig. 2.d

Accessories

- Socket: nickel-coated brass - 1413306AXX

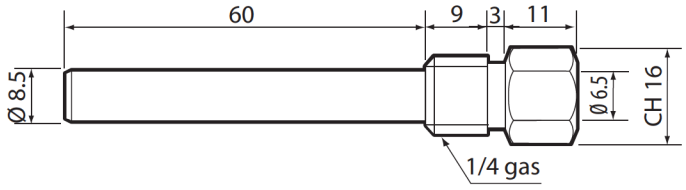


Fig. 2.e

Maximum operating pressure: 35 bar
Temperature: -20…95°C

- Socket 2: AISI 316 - code 1413309AXX

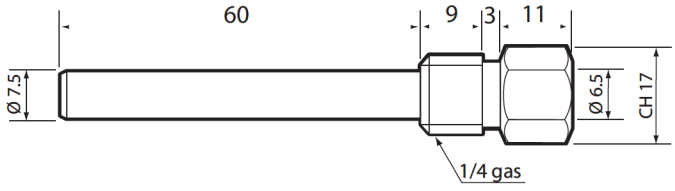


Fig. 2.f

Maximum operating pressure: 40 bar
Temperature: -20…95°C

Note: cable secured with PG7, IP68 cable gland applied to hexagonal end. - kit available complete with socket and cable gland

- Compression fitting with metal olive - code 1309589AXX

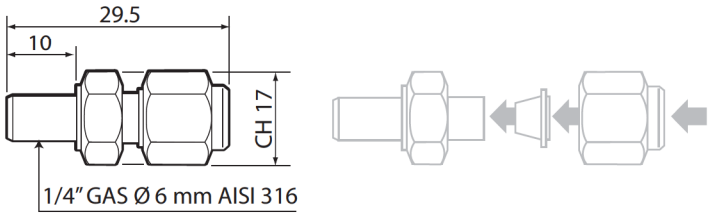


Fig. 2.g

Maximum operating pressure: 40 bar
Temperature: -50….250°C

2.4 Models NTC*WP*

Storage conditions	-50T105 °C
Operating range	-50T105 °C
Connections	Stripped ends, dimensions: 5±1 mm
Sensor	NTC 10 kΩ ±1% a 25 °C Beta 3435
Dissipation factor (in air)	ca. / approx. 2,2 mW/°C
Thermal constant over time (in air)	ca. / approx. 30 s
Cable	Two-wire with double sheath, AWG22, tinned copper with electrical resistance ≤63 Ω/km - Insulation: TPE specific for immersion in water on outer sheath, PP/Co inside on wires, OD 3.5 mm max
Sensitive element index of protection	IP67
Sensitive element housing	PP/Co with AISI 316 outer cap
Classification according to protection against electric shock (sensitive element and cable)	Supplementary insulation for 250 Vac;
Category of resistance to heat and fire	Flame retardant

Tab. 2.c

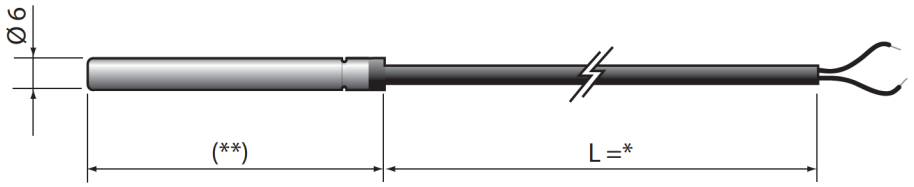


Fig. 2.h

* = see table of product codes in price list; (**) = 100, 200, 300.

Note: cable secured with PG7, IP68 cable gland applied to hexagonal end. - kit available complete with socket and cable gland

- Compression fitting with metal olive - code 1309589AXX

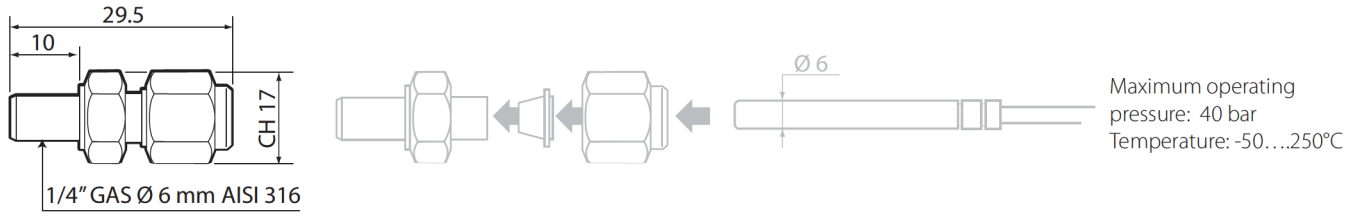


Fig. 2.i

2.5 Models NTC*WG*

Storage conditions	-50T105 °C
Operating range	-50T105 °C
Connections	Stripped ends, dimensions: 5±1 mm
Sensor	NTC 10 kΩ ±1% a 25 °C Beta 3435
Dissipation factor (in air)	ca. / approx. 1 mW/°C
Thermal constant over time (in air)	ca. / approx. 20 s
Cable	Two-wire with double sheath, AWG22, tinned copper with electrical resistance ≤63 Ω/km - Insulation: TPE specific for immersion in water on outer sheath, PP/Co inside on wires, OD 3.5 mm max.
Sensitive element index of protection	IP67 (in resina poliuretanica)
Sensitive element housing	Aluminium 6x6x40
Classification according to protection against electric shock (sensitive element and cable)	Basic insulation for 250 Vac
Category of resistance to heat and fire	Flame retardant

Tab. 2.d

Cap for probe sensor

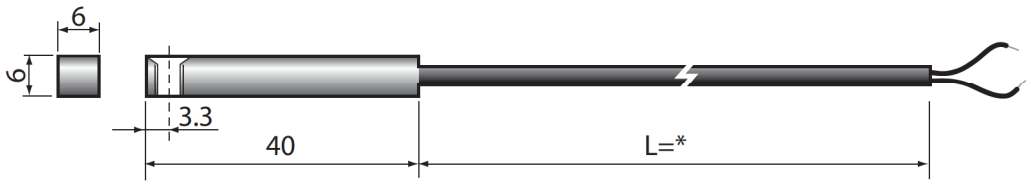


Fig. 2.j

* = see table of product codes in price list

2.6 Models NTC*HT*

Storage conditions	0T150 °C
Operating range	0T150 °C in air
Connections	Stripped ends, dimensions 6±1mm
Sensor	R(25 °C)= 50 kOhm 1%; Beta (25/85)3977±1%
Precision	±0,5 °C; -10T50 °C ±1,0 °C; -50T85 °C ±1,6 °C; +85T120 °C ± 2,1 °C; +120T150 °C
Dissipation factor (in air)	ca. / approx. 3 mW
Thermal constant over time (in air)	ca. / approx. 30 s
Cable	High temperature polyester (diam. 4x2 max.)
Sensitive element index of protection	IP55
Sensitive element housing	High temperature polyester dim. 20x5 mm (available in version with AISI 316 stainless steel cap)
Classification according to protection against electric shock (sensitive element and cable)	Basic insulation for 250 Vac
Category of resistance to heat and fire	In accordance with CEI 20-35
Insulation resistance at 1000 Vdc	>100 mOhm
Dielectric strength	1500 Vac

Tab. 2.e

Note: le sonde NTC*HT non possono essere usate in presenza prolungata di acqua e non devono essere usate a temperature inferiori a 0°.

The index of protection is IP55, therefore it is not suitable to work with frost, ice and condensing humidity. However, if the sensor isnt'work, it can stay up to a minimum temperature of -30 ° C.

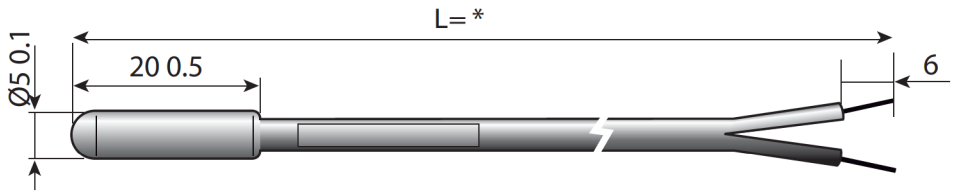


Fig. 2.k

Version with stainless steel cap

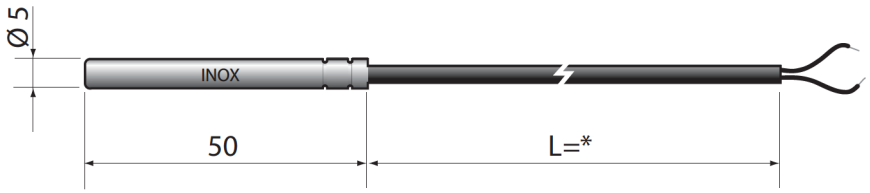


Fig. 2.l

* = see table of product codes in price list

2.7 Models NTC*HF*

Storage conditions	-50T105 °C
Operating range	-50T105 °C
Connections	Stripped ends, dimensions 6±1mm
Sensor	R(25 °C)= 10 kOhm 1%; Beta 3435
Precision	+/- 0.5 °C at 25 °C; +/- 1.0 °C from -50T90 °C
Dissipation factor (in air)	3 mW
Thermal constant over time (in air)	approx. 50 s
Cable	Black, thermoplastic rubber flat cable (diam. 3.6x1.6 max.)
Sensitive element index of protection	IP67
Sensitive element housing	Thermoplastic with fastening clamp
Classification according to protection against electric shock (sensitive element and cable)	Basic insulation for 250 Vac
Category of resistance to heat and fire	UL/HB cable
Insulation resistance at 500 Vdc	>20 mOhm
Dielectric strength	1500 Vac

Tab. 2.f

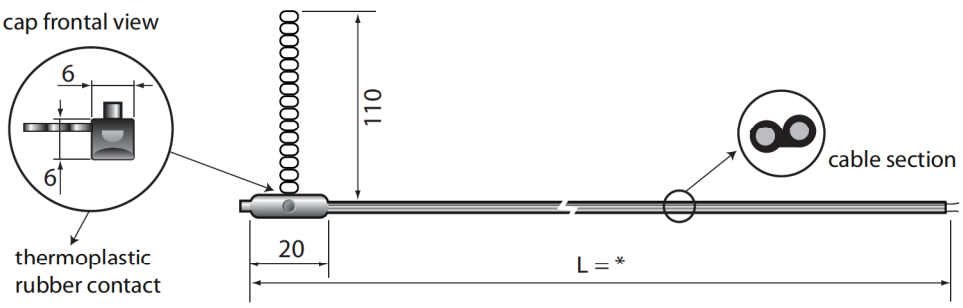


Fig. 2.m

* = see table of product codes in price list

2.8 Models NTC*WS*

Storage conditions	-40T105 °C
Operating range	-40T105 °C
Connections	Terminating pins on the cable
Sensor	R(25 °C)= 10 kOhm 1%; Beta 3435
Precision	+/- 0.5 °C at 25°C; +/- 1.0 °C from -50T90 °C
Dissipation factor (in air)	3 mW
Thermal constant over time (in air)	approx. 50 s
Cable	Black, thermoplastic rubber cable with black-white wires, cross-section 2x0.25 mm² diam. 3.3mm
Sensitive element index of protection	IP67
Sensitive element housing	Copper cap - dimensions 4x16 mm ±1.5% with polyurethane resin packing
Cable tie tension	Typical 250N (position 6 on the tool); Maximum 260N (position 7 on the tool);
Classification according to protection against electric shock (sensitive element and cable)	Basic insulation for 250 Vac
Category of resistance to heat and fire	UL/HB cable
Insulation resistance at 500 Vdc	>20 MOhm 500 Vdc
Dielectric rigidity	1500 Vac

Tab. 2.g

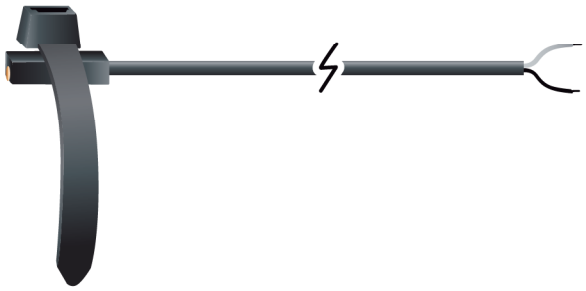


Fig. 2.n



Fig. 2.o

* = see table of product codes in price list



Fig. 2.p

Cable tie tension and cut-off tool with tension adjustment (Carel P/N CM00000006)

Tool for tightening the cable tie at a constant set tension to ensure continuous contact between the sensor and the surface of the pipe.
Cable tie tension can be adjusted simply using the screw at the base of the handle, which moves the index on a scale from 1 to 8. The corresponding force applied is shown in the following table:

Tool	1	2	3	4	5	6	7	8	
	Low			Medium			High		Tollerance
MK6	135	160	180	235	250	250	260	290	± 2

Tab. 2.h

The values are expressed in newtons (N)

NTC*WS sensor assembly instructions using the cable tie tension tool



1) Wrap the cable tie around the pipe and secure it;



2) On the cable tie tension tool (P/N CM00000006) set the tension to 250N (position 6 on the index);



3) Use the tool to tighten and then cut the cable tie;



4) Wrap the electrical cable twice around the pipe;



5) Cover the sensor with thermal insulation for at least 10 cm around the end of the cap and the wound cable;

2.9 Models NTC*LT*

Storage conditions	-80T105 °C
Operating range	-80T105 °C
Connections	M8 male-connector,
Sensor	R(25 °C)= 750 Ohm 1%; Beta 3969
Precision	+/- 0.2 °C at 25°C; +/- 1.15 °C from -80T105 °C
Dissipation factor (in air)	3 mW
Thermal constant over time (in air)	ca. 35 s in water - 10 s in air
Cable	Nickel for mounting clamp
Sensitive element index of protection	IP67
Sensitive element housing	Mineral oxide insulation MgO - sheath 316 - Ø 3mm radius of curvature (exception of the sensitive element)
Cable tie tension	Typical 250N (position 6 on the tool); Maximum 260N (position 7 on the tool);
Classification according to protection against electric shock (sensitive element and cable)	Basic insulation for 250 Vac
Category of resistance to heat and fire Insulation resistance	Flame retardant 100 MOhm @ 500Vdc
Dielectric rigidity	1500 Vac
Maximum operating pressure:	40 bar

Tab. 2.i

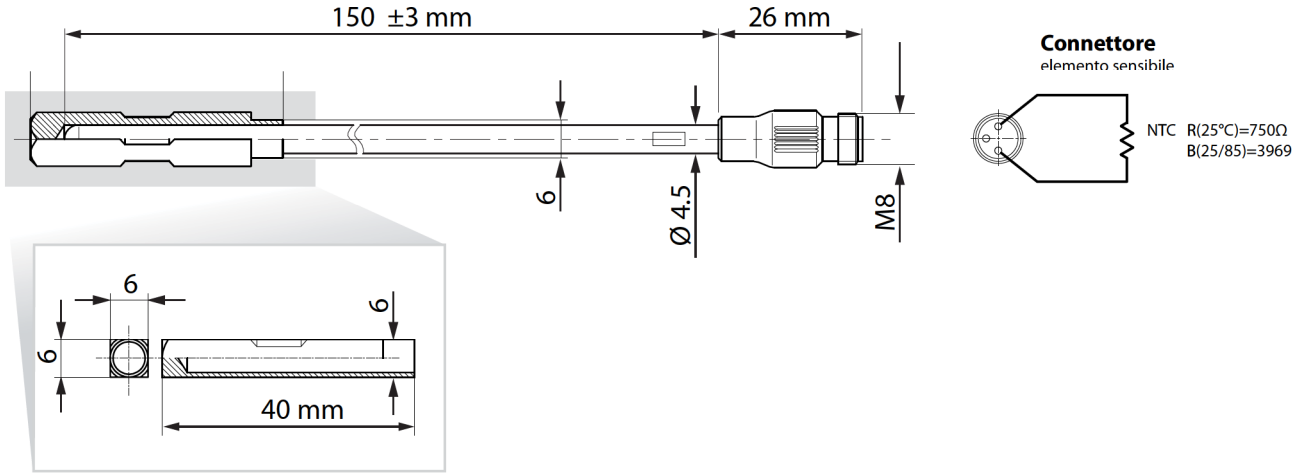


Fig. 2.q

Connection cable P/Ns for NTC*LT sensor

A	TSOPZCV030: silicone cable with M8 connector, 3 m long
	TSOPZCV100: silicone cable with M8 connector, 10 m long
B	TSOPZCV070: silicone cable extension with M8 male/female connector, 7 m long

A

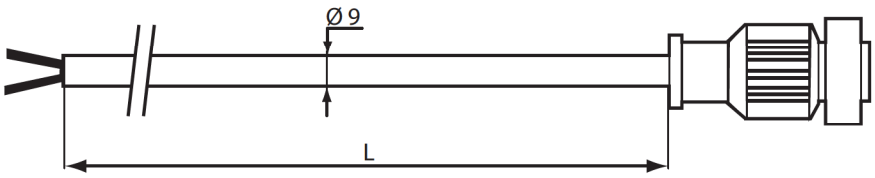


Fig. 2.r

B

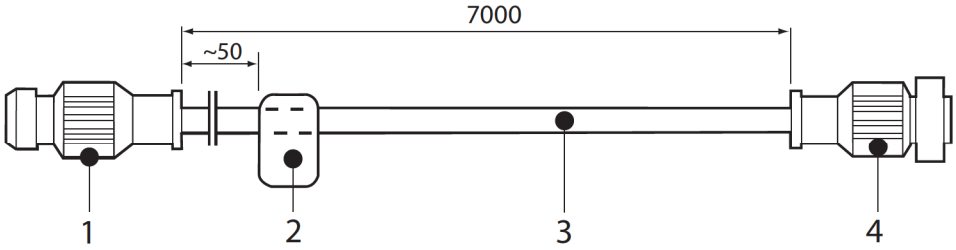


Fig. 2.s

Key:

1	M8 connector
2	rating label
3	24 AWG cable, 2 wires insulated with silicone rubber
4	M8 F connector with moulded cap

NTC*LT sensor assembly instructions using the cable tie tension tool



1) Place the sensor on the pipe, wrap and secure the cable ties around the two ends;



2) On the cable tie tension tool (P/N CM00000006) set the tension to 250N (position 6 on the index);



3) Use the tool to tighten and then cut the cable tie 1209874AXX;



4) Wrap the electrical cable twice around the pipe at the base of the sensor;

5) Cover the sensor with thermal insulation for at least 10 cm around the end of the cap and the wound cable;

2.10 Models NTC*PS*

Storage conditions	-50T105 °C
Operating range	-50T105 °C
Connections	Stripped and soldered ends, dimensions: 4±1 mm
Sensors	NTC 10 kΩ ±1% a 25 °C Beta 3435
Dissipation factor (in air)	2 mW/°C
Thermal constant over time (in air)	ca. / approx. 50 min (V=1 m/s)
Cable	Two-wire with double sheath, AWG22, tinned copper with electrical resistance ≤73.9 Ω/km - Insulation: TPE specific for immersion in water on outer sheath, PP/Co inside on wires, OD 3.30+/-0.10 mm
Sensitive element index of protection	IP67
Case	Santoprene grey RAL7032
	Compatible for food contact
Classification according to protection against electric shock (sensitive element and cable)	Basic insulation for 250 Vac
Category of resistance to heat and fire	Flame retardant

Tab. 2.j

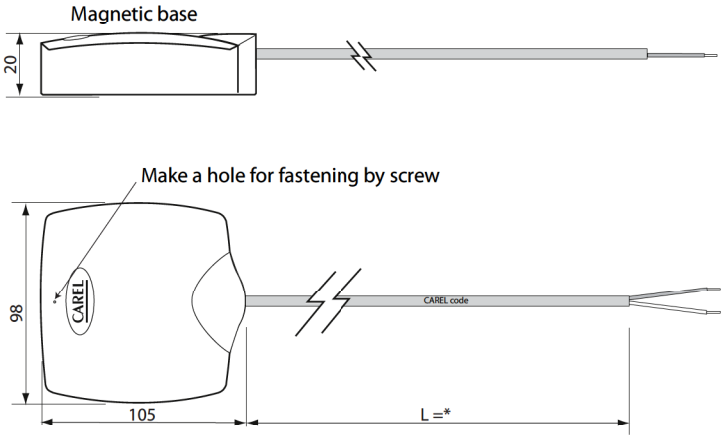


Fig. 2.t

* = see table of product codes in price list

3. NTC IMMERSION PROBE TECHNICAL SPECIFICATIONS

3.1 Models TSN1300000

Immersion probes feature the sensor directly in contact with the liquid, and are installed on the tubing. Wired using the electrical connector.

Storage conditions	-40T120 °C
Operating range	-40T120 °C
Sensor	NTC 10 kΩ ±1% a 25 °C Beta 3435
Construction	Direct immersion with connection to the 1/8" GAS male process fitting as per UNI 338
Electrical connection	4-pin co-moulded nylon, M12x1 (DIN-VDE0627) metric thread, IP67 max. temp. 90 °C
Thermal constant over time	approx. 5 s in water - 30 s in air
Sensitive element housing	AISI 316
Insulation	100 Mohm a 500 Vcc
Maximum operating pressure	40 bar

Tab. 3.a

Key:

1	NTC sensitive element 10 Kohm
2	Stainless steel socket
3	EX14
4	Co-moulded body
5	M12 male connector

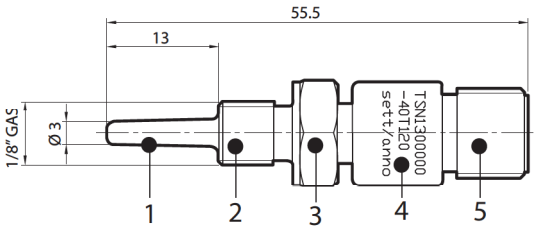


Fig. 3.a

Accessories:

- 4-pin M12 connector for 1/8 GAS sensor - cable length 3 m Code TSOPZCW030

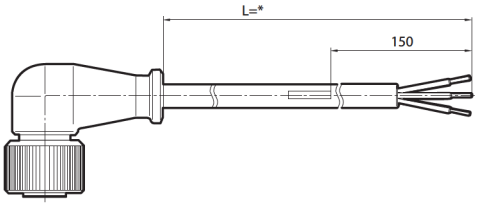
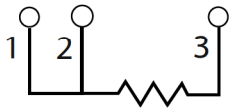


Fig. 3.b

Wiring:



NTC 10kohm

1	red
2	red
3	white

- 4-pin M12 connector for 1/8 GAS sensor code TSOPZCM000
- M12 connector can be assembled on site, recommended cable 3x0.2 mm² with outer sheath.

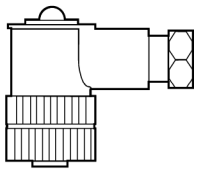
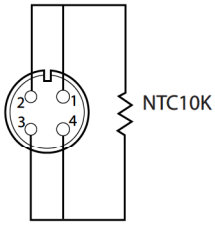


Fig. 3.c

Wiring:

Sensor connector side view



- Probe socket 1/4 Gas Code TSOPZPT000

A	1/8" GAS cyl. fitting for sensor
B	1/4" GAS cyl. process fitting with immersion L= 10.5 mm

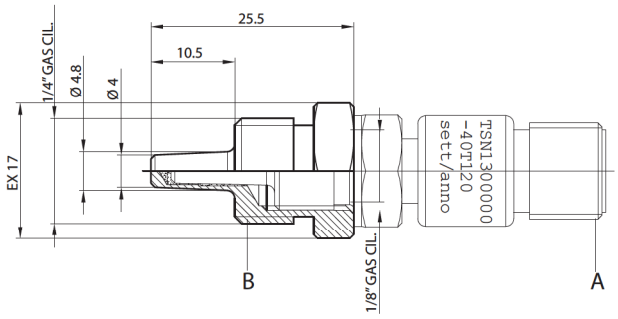


Fig. 3.d

- Welding fitting Code TSOPZCW030

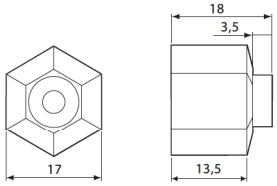


Fig. 3.e

3.2 Models TSC1500030

Immersion probes feature the sensor directly in contact with the liquid and are secured to the tubing using a connector, available in the screw or weldable versions.
The body is nickel-coated brass, index of protection IP67, and the gasket (O-ring) is supplied together with the probe.

Storage conditions	-40T90 °C
Operating range	-40T90 °C
Sensor	NTC 10 kΩ ±1% at 25 °C Beta 3435
Construction	Direct immersion with connection to M14 male process fitting
Cable	2 wires AWG 22, with TPE sheath
Thermal constant over time	approx. 5 s in water - 45 s in air
Sensitive element housing	Nickel-coated brass & grey PA6 co-moulded body
Insulation	100 Mohm at 100 Vdc
Maximum operating pressure	25 bar
Compatible liquids	Water

Tab. 3.b

Key:

1	sensitive element
2	nickel-coated brass locking ring
3	co-moulded body
4	cable marking
5	tinned copper 2-wire cable
6	NTC sensor
7	2015 O-ring
8	nickel-coated brass thermometer socket

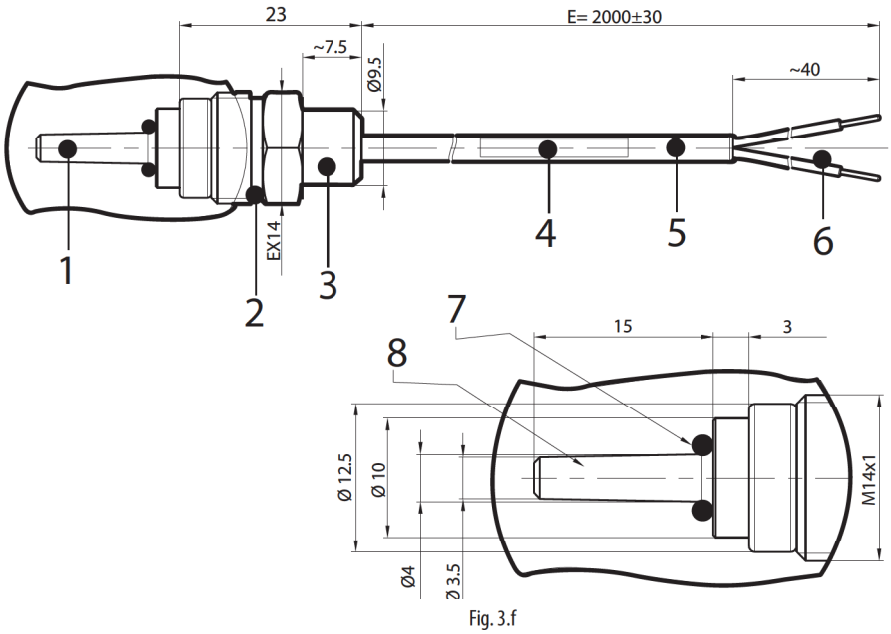
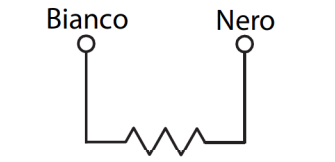


Fig. 3.f

Wiring:



NTC 10 kOhm @ 25 °C ±1%
β(25/85)= 3435

Fig. 3.g

Accessories:

- Adapter from M14 to 3/8 GAS Code TSOPZRV000

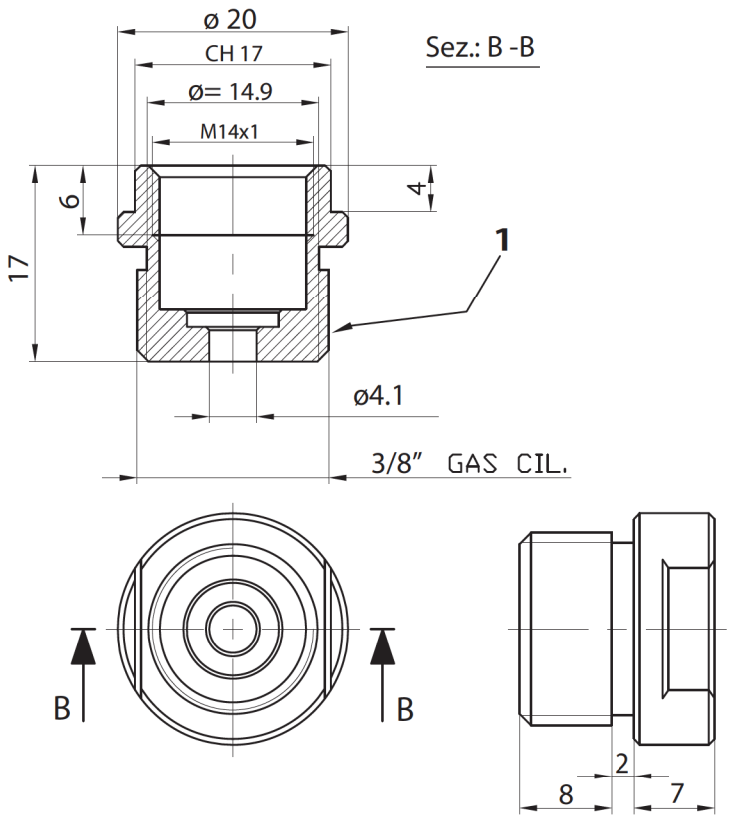


Fig. 3.h

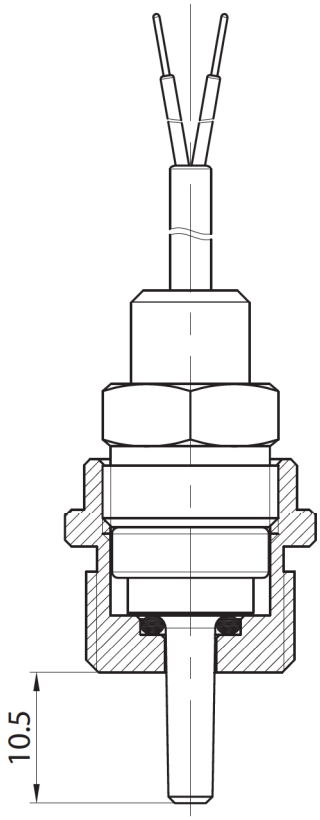


Fig. 3.i

- Weldable adapter for M14 Code TSOPZRS000

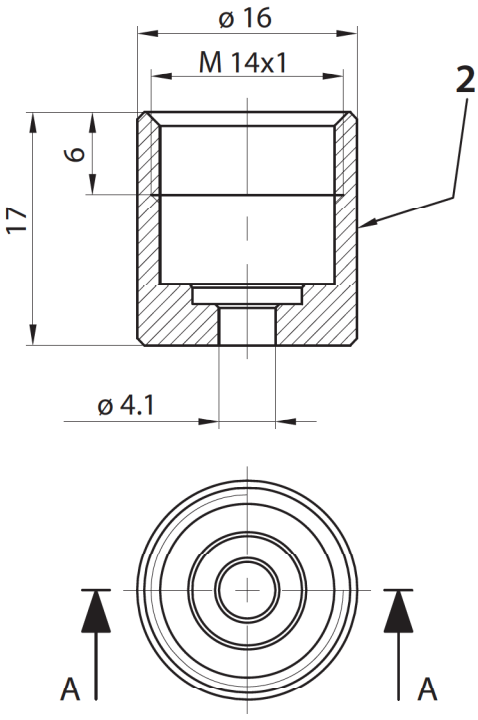


Fig. 3.j

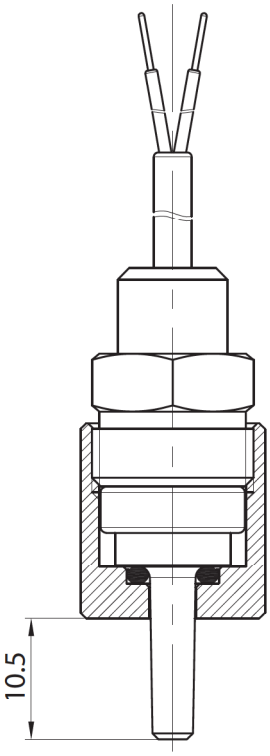


Fig. 3.k

Key:

1	3/8 cyl. threaded fitting with round seat, nickel-coated brass	code: C058042A04
2	weldable cylindrical fitting with round seat, brass	code C058042A03

4. NTC PIERCING PROBE TECHNICAL SPECIFICATIONS

4.1 Models NTC*INF*

Piercing probes with 90° e 180° handle

Storage conditions	-50T90 °C
Operating range	-50T90 °C
Connections	Stripped ends, dimensions: 5±1 mm
Sensor	NTC 10 kOhm ±1% at 25 °C Beta 3435
Dissipation factor (in air)	approx. 2.2 mW/°C
Thermal constant over time (in air)	approx. 45 s
Cable	Two-wire with double sheath, tinned copper wire size 0.35 mm2 with electrical resistance ≤63 Ohm/km
Sensitive element index of protection	IP67
Sensitive element housing	AISI 304 stainless steel with silicone resin filling
Classification according to protection against electric shock (sensitive element and cable)	Insulation: silicone both on outer sheath and inside on wires
Category of resistance to heat and fire	Flame retardant
Food compatibility	Suitable for permanent food contact

Tab. 4.a

NTCINF600*

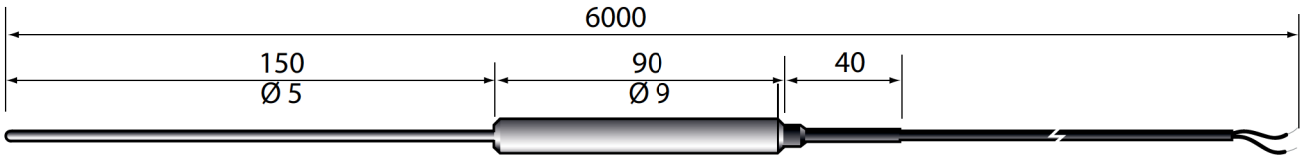


Fig. 4.a

NTCINF610*

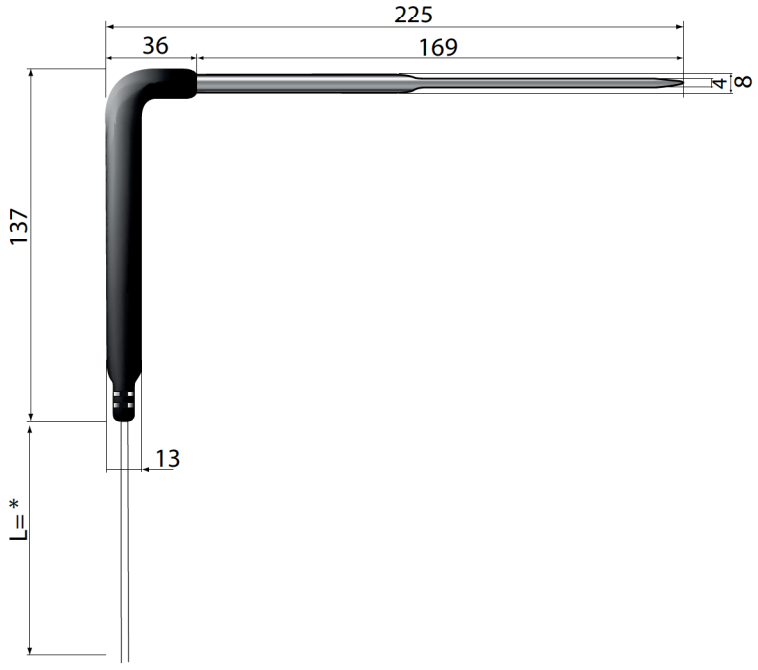


Fig. 4.b

* = see table of product codes in price list

4.2 Models NTCINF0340 and NTCINF0640

Piercing probe with 90° handle and heating system

Storage conditions	-50T90 °C
Operating range	-50T90 °C
Connections	Stripped ends, with terminals
Sensor	NTC 10 kOhm ±1% at 25 °C Beta 3435
Thermal constant over time (in air)	approx. 45 s
Cable	Food-safe thermoplastic sheath with 4 wires size 0.15 mm^2
Wires colours	White-black, NTC / red, electric heater.
Maximum heater voltage	24 Vac (20 W)
Electrical resistance of heater	7 Ohm ±0,6
Cable lenght	3 m
Sensitive element index of protection	IP67
Sensitive element housing	AISI 316 stainless steel. Length 100 mm diam. 4 mm. With pointed tip.
Cap filler	Aluminium
Classification according to protection against electric shock (sensitive element and cable)	Insulation: Outer sheath, and inside on wires
Category of resistance to heat and fire	Flame retardant
Insulation resistance	20 Mohm 500 Vcc
Dielectric strength	500 Vac
Food compatibility	Suitable for permanent food contact

Tab. 4.b

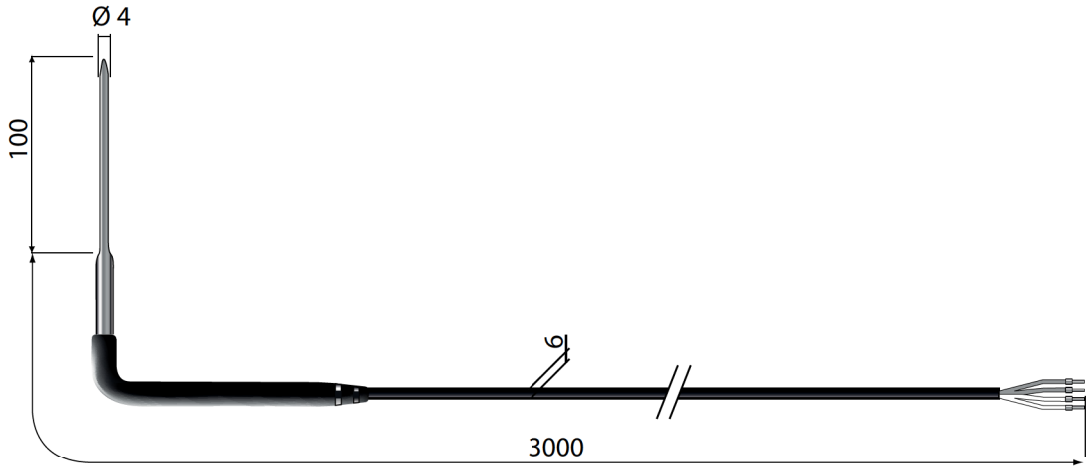


Fig. 4.c

a	red, electric heater
b	white/black, NTC

4.3 Models NTCINF0150

Piercing probe with 180° thermoplastic rubber handle and spiral cable

Storage conditions	-40T90 °C
Operating range	-40T90 °C
Connections	Tripped ends with pins
Sensor	NTC 10 kOhm ±1% at 25°C Beta 3435
Thermal constant over time (in air)	approx. 45 s
Cable	Spiral black cable, 2 wires, diam. 4mm
Colours	white-red, 2x0.22mm^2
Cable length	1.5 m, extendable up to 3m
Sensitive element index of protection	IP67
Sensitive element housing	AISI 316 stainless steel, 150 mm long, diam. 4 mm, with rounded tip
Packing	Polyurethane resin
Classification according to protection against electric shock (sensitive element and cable)	Insulation: external sheath and on wires
Category of resistance to heat and fire	No fire propagation
Isolation resistor	20 MOhm 500 Vdc
Rigidity	2000 Vac
Food compatibility	Suitable for permanent food contact

Tab. 4.c

Mechanical drawing

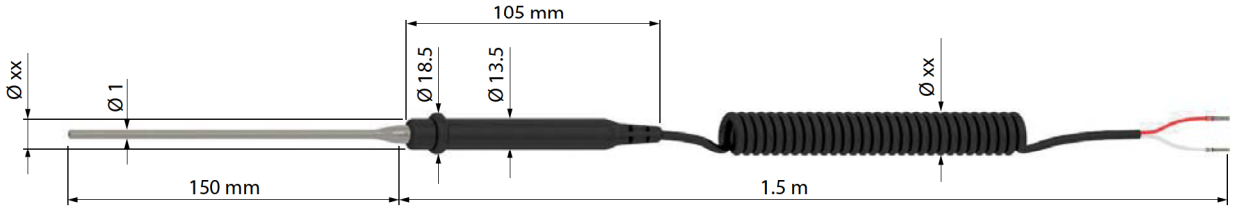


Fig. 4.d

5. TABLE OF TEMPERATURE VALUES

5.1 Table of temperature-resistance values for NTC sensor 10K@25°C ß 3435

Temp.	Resistance value		
	Max.	Typical	Min.
°C	KΩ	KΩ	KΩ
-50	344,60	329,50	314,90
-49	325,00	310,90	297,30
-48	306,60	293,50	280,90
-47	289,40	277,20	265,40
-46	273,40	262,00	251,00
-45	258,30	247,70	237,40
-44	244,20	234,30	224,70
-43	231,00	221,70	212,80
-42	218,60	209,90	201,60
-41	207,00	198,90	191,00
-40	196,00	188,50	181,10
-39	185,50	178,50	171,60
-38	175,60	169,00	162,60
-37	166,30	160,20	154,20
-36	157,60	151,90	146,30
-35	149,40	144,10	138,80
-34	141,70	136,70	131,80
-33	134,50	129,80	125,20
-32	127,70	123,30	119,00
-31	121,20	117,10	113,10
-30	115,20	111,30	107,50
-29	109,40	105,70	102,20
-28	103,90	100,50	97,20
-27	98,68	95,52	92,45
-26	93,80	90,84	87,97
-25	89,20	86,43	83,73
-24	84,85	82,26	79,74
-23	80,76	78,33	75,96
-22	76,89	74,61	72,39
-21	73,23	71,10	69,01
-20	69,77	67,77	65,82
-19	66,44	64,57	62,74
-18	63,30	61,54	59,83
-17	60,32	58,68	57,07
-16	57,51	55,97	54,46
-15	54,85	53,41	51,99
-14	52,33	50,98	49,65
-13	49,95	48,68	47,43
-12	47,69	46,50	45,32
-11	45,55	44,43	43,33
-10	43,52	42,47	41,43
-9	41,55	40,57	39,60
-8	39,69	38,77	37,86
-7	37,92	37,06	36,21
-6	36,25	35,44	34,64
-5	34,66	33,90	33,15
-4	33,15	32,44	31,73
-3	31,72	31,05	30,39
-2	30,36	29,73	29,11
-1	29,06	28,48	27,89
0	27,83	27,28	26,74
1	26,65	26,13	25,62
2	25,52	25,03	24,55
3	24,44	23,99	23,54
4	23,42	23,00	22,57
5	22,45	22,05	21,66
6	21,53	21,15	20,78
7	20,64	20,30	19,95
8	19,81	19,48	19,15
9	19,01	18,70	18,39
10	18,25	17,96	17,67
11	17,51	17,24	16,97
12	16,81	16,56	16,30
13	16,14	15,90	15,67
14	15,50	15,28	15,06
15	14,89	14,69	14,48
16	14,31	14,12	13,92
17	13,75	13,58	13,39
18	13,22	13,06	12,89
19	12,72	12,56	12,40
20	12,24	12,09	11,94
21	11,77	11,63	11,50
22	11,32	11,20	11,07
23	10,90	10,78	10,66
24	10,49	10,38	10,27
25	10,10	10,00	9,90
26	9,73	9,63	9,53
27	9,38	9,28	9,18
28	9,04	8,94	8,84
29	8,72	8,62	8,52
30	8,41	8,31	8,21
31	8,11	8,01	7,92
32	7,83	7,73	7,63
33	7,55	7,45	7,36
34	7,29	7,19	7,10
35	7,04	6,94	6,85
36	6,79	6,70	6,61
37	6,56	6,47	6,37
38	6,34	6,25	6,15
39	6,12	6,03	5,94
40	5,92	5,83	5,74
41	5,72	5,63	5,54
42	5,53	5,44	5,35
43	5,34	5,26	5,17
44	5,17	5,08	4,99
45	5,00	4,91	4,83
46	4,83	4,75	4,67
47	4,68	4,59	4,51
48	4,52	4,44	4,36
49	4,38	4,30	4,22
50	4,24	4,16	4,08
51	4,10	4,03	3,95
52	3,97	3,90	3,82
53	3,85	3,77	3,70
54	3,73	3,65	3,58
55	3,61	3,54	3,46
56	3,50	3,43	3,35
57	3,39	3,32	3,25
58	3,28	3,22	3,15
59	3,18	3,12	3,05
60	3,09	3,02	2,95
61	2,99	2,93	2,86
62	2,90	2,84	2,77
63	2,82	2,75	2,69
64	2,73	2,67	2,61
65	2,65	2,59	2,53
66	2,57	2,51	2,45
67	2,50	2,44	2,38
68	2,42	2,36	2,31
69	2,35	2,30	2,24
70	2,28	2,23	2,17
71	2,22	2,16	2,11
72	2,15	2,10	2,05
73	2,09	2,04	1,99
74	2,03	1,98	1,93
75	1,98	1,92	1,87
76	1,92	1,87	1,82
77	1,87	1,82	1,77
78	1,81	1,77	1,72
79	1,76	1,72	1,67
80	1,72	1,67	1,62
81	1,67	1,62	1,58
82	1,62	1,58	1,53
83	1,58	1,53	1,49
84	1,54	1,49	1,45
85	1,49	1,45	1,41
86	1,45	1,41	1,37
87	1,42	1,37	1,33
88	1,38	1,34	1,30
89	1,34	1,30	1,26
90	1,31	1,27	1,23
91	1,27	1,23	1,19
92	1,24	1,20	1,16
93	1,21	1,17	1,13
94	1,17	1,14	1,10
95	1,14	1,11	1,07
96	1,12	1,08	1,04
97	1,09	1,05	1,02
98	1,06	1,02	0,99
99	1,03	1,00	0,97
100	1,01	0,97	0,94
101	0,98	0,95	0,92
102	0,96	0,92	0,89
103	0,93	0,90	0,87
104	0,91	0,88	0,85
105	0,89	0,86	0,83
106	0,87	0,84	0,81
107	0,84	0,82	0,79
108	0,82	0,80	0,77
109	0,80	0,78	0,75
110	0,79	0,76	0,73

Tab. 5.a

5.2 Table of temperature-resistance values for NTC sensor 50K@25°C ß 3977

Temp.	Resistance value		
	Max.	Typical	Min.
°C	KΩ	KΩ	KΩ
0	165239	161638	158036
1	157036	153694	150352
2	149288	146187	143086
3	141965	139088	136211
4	135043	132375	129706
5	128498	126023	123548
6	122307	120012	117717
7	116449	114321	112194
8	110904	108932	106961
9	105654	103827	102001
10	100682	98990	97298
11	95971	94405	92838
12	91507	90057	88608
13	87276	85934	84593
14	83263	82022	80782
15	79456	78310	77163
16	75845	74786	73727
17	72417	71440	70462
18	69163	68261	67359
19	66073	65241	64410
20	63137	62372	61606
21	60348	59643	58939
22	57697	57049	56401
23	55177	54582	53987
24	52780	52234	51688
25	50500	50000	49500
26	48373	47873	47373
27	46348	45848	45349
28	44417	43920	43422
29	42577	42082	41587
30	40823	40332	39840
31	39151	38663	38174
32	37556	37072	36588
33	36034	35554	35075
34	34581	34107	33633
35	33195	32726	32258
36	31871	31408	30945
37	30607	30150	29694
38	29400	28949	28499
39	28246	27802	27358
40	27143	26706	26269
41	26090	25659	25229
42	25082	24659	24235
43	24118	23702	23286
44	23197	22787	22378
45	22315	21913	21511
46	21471	21076	20681
47	20663	20275	19888
48	19890	19509	19129
49	19149	18776	18402
50	18440	18074	17707

Temp.	Resistance value		
	Max.	Typical	Min.
°C	KΩ	KΩ	KΩ
51	17760	17401	17042
52	17109	16757	16405
53	16485	16140	15795
54	15887	15549	15211
55	15314	14982	14651
56	14764	14439	14114
57	14236	13918	13600
58	13730	13418	13107
59	13244	12939	12634
60	12778	12479	12181
61	12330	12038	11746
62	11901	11615	11329
63	11488	11208	10928
64	11092	10818	10544
65	10711	10443	10175
66	10345	10083	9821
67	9993	9737	9481
68	9655	9405	9154
69	9330	9085	8840
70	9018	8778	8538
71	8717	8483	8248
72	8428	8199	7969
73	8150	7926	7701
74	7882	7663	7443
75	7625	7410	7195
76	7377	7167	6957
77	7138	6933	6727
78	6908	6707	6506
79	6686	6490	6294
80	6473	6281	6089
81	6267	6080	5892
82	6069	5886	5702
83	5878	5699	5520
84	5694	5519	5343
85	5517	5345	5174
86	5346	5178	5010
87	5181	5017	4853
88	5022	4861	4701
89	4868	4711	4554
90	4720	4566	4413
91	4577	4427	4277
92	4439	4292	4145
93	4306	4162	4019
94	4177	4037	3896
95	4053	3916	3778
96	3933	3799	3664
97	3817	3686	3554
98	3705	3577	3448
99	3597	3471	3346
100	3492	3369	3246
101	3391	3271	3151

Temp.	Resistance value		
	Max.	Typical	Min.
°C	KΩ	KΩ	KΩ
102	3293	3176	3058
103	3199	3084	2969
104	3108	2995	2883
105	3019	2909	2799
106	2934	2826	2719
107	2851	2746	2641
108	2771	2668	2565
109	2694	2593	2492
110	2619	2520	2422
111	2547	2450	2354
112	2477	2382	2288
113	2409	2316	2224
114	2343	2252	2162
115	2279	2191	2102
116	2218	2131	2044
117	2158	2073	1988
118	2100	2017	1934
119	2044	1962	1881
120	1989	1910	1830
121	1937	1859	1781
122	1886	1809	1733
123	1836	1761	1687
124	1788	1715	1642
125	1742	1670	1598
126	1697	1626	1556
127	1653	1584	1515
128	1610	1543	1476
129	1569	1503	1437
130	1529	1465	1400
131	1490	1427	1364
132	1453	1391	1329
133	1416	1355	1295
134	1381	1321	1262
135	1346	1288	1230
136	1313	1256	1199
137	1280	1224	1168
138	1249	1194	1139
139	1218	1164	1111
140	1189	1136	1083
141	1160	1108	1056
142	1132	1081	1030
143	1104	1055	1005
144	1078	1029	980
145	1052	1004	956
146	1027	980	933
147	1003	957	911
148	979	934	889
149	956	912	868
150	933	890	847

Tab. 5.b

5.3 Table of temperature-resistance values for NTC sensor 750 Ohm @25°C ß 3969

°C	Ohms
-80	577421.72
-79	527949.43
-78	483039.76
-77	442244.46
-76	405161.84
-75	371431.66
-74	340730.65
-73	312768.50
-72	287284.35
-71	264043.66
-70	242835.52
-69	223469.52
-68	205774.90
-67	189597.20
-66	174797.23
-65	161249.35
-64	148840.08
-63	137466.39
-62	127036.93
-61	117466.39
-60	108679.25
-59	100606.67
-58	93186.24
-57	86361.37
-56	80080.67
-55	74297.50
-54	68969.45
-53	64057.99
-52	59528.05
-51	55347.72
-50	51489.92
-49	47922.16
-48	44626.30
-47	41578.30
-46	38758.05
-45	36147.17
-44	33728.89
-43	31487.85
-42	29410.02
-41	27482.54

°C	Ohms
-40	25693.65
-39	32432.58
-38	22489.43
-37	21055.15
-36	19721.40
-35	18480.57
-34	17325.63
-33	16250.14
-32	15248.17
-31	14314.26
-30	13443.41
-29	12630.97
-28	11872.71
-27	11164.69
-26	10503.29
-25	9885.19
-24	9307.28
-23	8766.74
-22	8260.92
-21	7787.41
-20	7343.85
-19	6928.47
-18	6539.04
-17	6173.88
-16	5831.34
-15	5509.89
-14	5208.12
-13	4924.70
-12	4658.43
-11	4408.16
-10	4172.85
-9	3951.51
-8	3743.25
-7	3547.21
-6	3362.61
-5	3188.72
-4	3024.86
-3	2870.40
-2	2724.74
-1	2587.33

°C	Ohms
0	2457.67
1	2335.27
2	2219.68
3	2110.50
4	2007.32
5	1909.80
6	1817.58
7	1730.35
8	1647.82
9	1569.70
10	1495.74
11	1425.69
12	1359.32
13	1296.43
14	1236.81
15	1180.27
16	1126.64
17	1075.75
18	1027.45
19	981.59
20	938.04
21	896.67
22	857.36
23	819.99
24	784.46
25	750.00
26	718.52
27	687.93
28	658.81
29	631.09
30	604.69
31	579.54
32	555.57
33	532.73
34	510.95
35	490.18
36	470.37
37	451.47
38	433.43
39	416.21

°C	Ohms
40	399.77
41	384.06
42	369.06
43	354.73
44	341.03
45	327.93
46	315.40
47	303.42
48	291.96
49	281.00
50	270.50
51	260.45
52	250.83
53	241.61
54	232.78
55	224.32
56	216.22
57	208.44
58	200.99
59	193.84
60	186.99
61	180.41
62	174.10
63	168.04
64	162.22
65	156.64
66	151.27
67	146.12
68	141.17
69	136.41
70	131.84
71	127.44
72	123.21
73	119.15
74	115.23
75	111.47
76	107.85
77	104.36
78	101.01
79	97.78

°C	Ohms
80	94.66
81	91.67
82	88.78
83	86.00
84	83.32
85	80.73
86	78.24
87	75.84
88	73.52
89	71.29
90	69.13
91	67.05
92	65.04
93	63.10
94	61.23
95	59.43
96	57.68
97	56.00
98	54.37
99	52.80
100	51.28
101	49.81
102	48.39
103	47.02
104	45.69
105	44.41

Tab. 5.c

6. PT100 PROBE TECHNICAL SPECIFICATIONS

6.1 Models PT100

Storage conditions	-50T250 °C
Operating range elemento sensibile	PT100000A1: -50 °C…+250 °C PT100000A2 : 0 °C…+400 °C
Sensor	Pt100 Class B in accordance with DIN IEC751, 3 wire
Precision	+/- class B=(0,005xt)+0,3, a 100°C = ±0,8°C
Connections aliment. e uscita	Stripped ends, dimensions 6±1mm
Cable	PT100000A1: silicone rubber HALOGEN COMPOUNDS ≤ 1.1 x 10-3 mg/g PT100000A2: 3x0.5 mm2 fibreglass wire and secondary insulation
Dissipation factor (in air)	0,3 K/mW at 0 °C
Thermal constant over time (in air)	ca./approx 20 s
Category of resistance to heat and fire	Range -20 °C +200°C for PT100000A1, +500 °C for PT100000A2
Insulation resistance	>500 Mohm / 250 V
Dielectric strength	250 Vac (code PT100000A1 only) not applicabie for PT100000A2
Primary insulation (porbe and cable)	250 Vac
Sensitive element index of protection	IP65
Sensitive element housing	AISI 316 stainless steel

Tab. 6.a



Fig. 6.a

* = see table of product codes in price list
** = 3-wires cable compensates for the resistance introduced by the cable

7. TABLE OF TEMPERATURE VALUES PT100 PROBE

7.1 Table of temperature values PT100 Probe Class B

R (0) = 100,00 Ω α = 0,003 850 1/°C

°C	0	1	2	3	4	5	6	7	8	9	10	°C
-50	80,31	79,91	79,51	79,11	78,72	78,32	77,92	77,52	77,13	76,73	76,33	-50
-40	84,27	83,88	83,48	83,08	82,69	82,29	81,89	51,50	81,10	80,70	80,31	-40
-30	88,22	87,83	87,43	87,04	86,64	86,25	85,85	85,46	85,06	84,67	84,27	-30
-20	92,16	91,77	91,37	90,98	90,59	90,19	89,80	89,40	89,01	88,62	88,22	-20
-10	96,09	95,69	95,30	94,91	94,52	94,12	93,73	93,34	92,95	92,55	92,16	-10
0	100,00	99,61	99,22	98,83	98,44	98,04	97,65	97,26	96,87	96,48	96,09	0
0	100,00	100,390	100,78	101,17	101,56	101,95	102,34	102,73	103,12	103,51	103,90	0
10	103,90	104,29	104,68	105,07	105,46	105,85	106,24	106,63	107,02	107,40	107,79	10
20	107,79	108,18	108,57	108,96	109,35	109,73	110,12	110,51	110,90	111,28	111,67	20
30	111,67	112,06	112,45	112,83	113,22	113,61	113,99	114,38	114,77	115,15	115,54	30
40	115,54	115,93	116,31	116,70	117,08	117,47	117,85	118,24	118,62	119,01	119,40	40
50	119,40	119,78	120,16	120,55	120,93	121,32	121,70	122,09	122,47	122,86	123,24	50
60	123,24	123,62	124,01	124,39	124,77	125,16	125,54	125,92	123,31	126,69	127,07	60
70	127,07	127,45	127,84	128,22	128,60	128,98	129,37	129,75	130,13	130,51	130,89	70
80	130,89	131,27	131,66	132,04	132,42	132,80	133,18	133,56	133,94	134,32	134,70	80
90	134,70	135,08	135,46	135,84	136,22	136,60	136,98	137,36	137,74	138,12	138,50	90
100	138,50	138,88	139,26	139,64	140,02	140,39	140,77	141,15	141,53	141,91	142,29	100
110	142,29	142,66	143,04	143,42	143,80	144,17	144,55	144,93	145,31	145,68	146,06	110
120	146,06	146,44	146,81	147,19	147,57	147,94	148,32	148,70	149,07	149,45	149,82	120
130	149,82	150,20	150,57	150,95	151,33	151,70	152,08	152,45	152,83	153,20	153,58	130
140	153,58	153,95	154,32	154,70	155,07	155,45	155,82	156,19	156,57	156,94	157,31	140
150	157,31	157,69	158,06	158,43	158,81	159,18	159,55	159,93	160,30	160,67	161,04	150
160	161,04	161,42	161,79	162,16	162,53	162,90	163,27	163,65	164,02	164,39	164,76	160
170	164,76	165,13	165,50	165,87	166,24	166,61	166,98	167,35	167,72	168,09	168,46	170
180	168,46	168,83	169,20	169,57	169,94	170,31	170,68	171,05	171,42	171,79	172,16	180
190	172,16	172,53	172,90	173,26	173,63	174,00	174,37	174,74	175,10	175,47	175,84	190
200	175,84	176,21	176,57	176,94	177,31	177,68	178,04	178,41	178,78	179,14	179,51	200
210	179,51	179,88	180,24	180,61	180,97	181,34	181,71	182,07	182,44	182,80	183,17	210
220	183,17	183,53	183,90	184,26	184,63	184,99	185,36	185,72	186,09	186,45	186,82	220
230	186,82	187,18	187,54	187,91	188,27	188,63	189,00	189,36	189,72	190,09	190,45	230
240	190,45	190,81	191,18	191,54	191,90	192,26	192,63	192,99	193,35	193,71	194,07	240
250	194,07	194,44	194,80	195,16	195,52	195,88	196,24	196,60	196,96	197,33	197,69	250
260	197,69	198,05	198,41	198,77	199,13	199,49	199,85	200,21	200,57	200,93	201,29	260
270	201,29	201,65	202,01	202,36	202,72	203,08	203,44	203,80	204,16	204,52	204,88	270
280	204,88	205,23	205,59	205,95	206,31	206,67	207,02	207,38	207,74	208,10	208,45	280
290	208,45	208,81	209,17	209,52	209,88	210,24	210,59	210,95	211,31	211,66	212,02	290
300	212,02	212,37	212,73	213,09	213,44	213,80	214,15	214,51	214,86	215,22	215,57	300
310	215,57	215,93	216,28	216,64	216,99	217,35	217,70	218,05	218,41	218,76	219,12	310
320	219,12	219,47	219,82	220,18	220,53	220,88	221,24	221,59	221,94	222,29	222,65	320

Tab. 7.a

8. PT1000 PROBE TECHNICAL SPECIFICATIONS

8.1 Models PT1*HP*

Storage conditions	-50T105 °C in air
Operating range	-50T105 °C in air
Connections	Stripped ends, dimensions: 5±1 mm
Sensor	Pt1000 - Class B
Dissipation factor (in air)	ca. 3 mW/°C
Costante term. nel tempo (in air)	ca. / approx. 20 s
Cable	Black two-wire flat cable, with tinned copper wire size 0.3 mm^2
Sensitive element index of protection	IP67
Sensitive element housing	Polyolefin
Classification according to protection against electric shock (sensitive element and cable)	Basic insulation for 250 Vac
Category of resistance to heat and fire	Flame retardant

Tab. 8.a

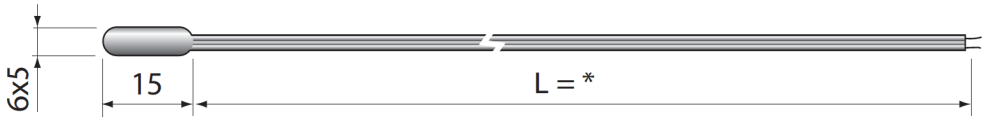


Fig. 8.a

* = see table of product codes in price list

8.2 Models PT1*WF*

Storage conditions	-50T105 °C
Operating range	-50T105 °C
Connections	Stripped ends, dimensions: 5±1 mm
Sensor	Pt1000 - Class B
Dissipation factor (in air)	ca. / approx. 7 mW/°C
Thermal constant over time (in air)	ca. / approx. 15 s
Cable	Two-wire with double sheath, AWG22, tinned copper with electrical resistance ≤63 Ω/km - Insulation: TPE specific for immersion in water on outer sheath, PP/Co inside on wires, OD 3.5 mm max.
Sensitive element index of protection	IP67
Sensitive element housing	AISI 316 steel diameter 4 mm - L= 30 mm
Classification according to protection against electric shock (sensitive element & cable)	Basic insulation for 250 Vac
Category of resistance to heat and fire	Flame retardant

Tab. 8.b

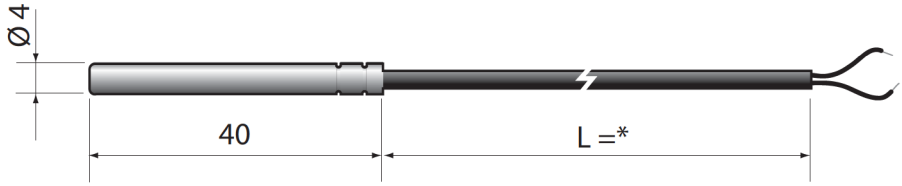


Fig. 8.b

* = see table of product codes in price list

8.3 Models PT1*WP*

Storage conditions	-50T105 °C
Operating range	-50T105 °C
Connections	Stripped ends, dimensions: 5±1 mm
Sensor	Pt1000 - Class B
Dissipation factor (in air)	ca. / approx. 2,2 mW/°C
Thermal constant over time (in air)	ca. / approx. 25 s
Cable	Two-wire with double sheath, AWG22, tinned copper with electrical resistance ≤63 Ω/km - Insulation: TPE specific for immersion in water on outer sheath, PP/Co inside on wires, OD 3.5 mm max.
Sensitive element index of protection	IP67
Sensitive element housing	PPcop. with AISI 316 outer cap
Classification according to protection against electric shock (sensitive element and cable)	Insulation supplementare per 250 Vac;
Category of resistance to heat and fire	Flame retardant

Tab. 8.c

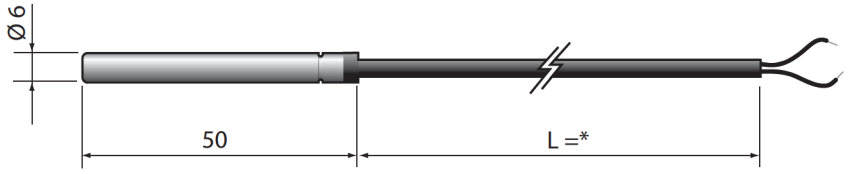


Fig. 8.c

* = see table of product codes in price list

Accessories

- Socket: nickel-coated brass - 1413306AXX

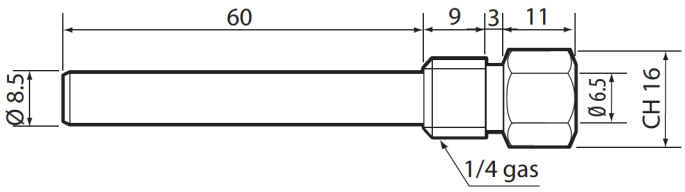


Fig. 8.d

Maximum operating pressure 35 bar
Temperature -20…95°C

- Socket 2: AISI 316 - code 1413309AXX

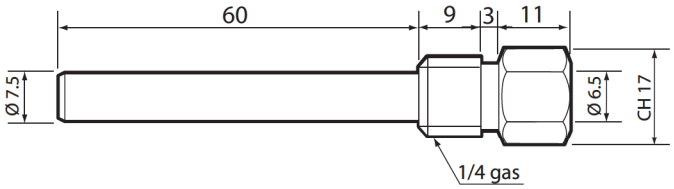


Fig. 8.e

Maximum operating pressure 40 bar
Temperature -20...95 °C

Note:
- cable secured with PG7 - IP68 cable gland applied to hexagonal end
- kit available complete with socket and cable gland

- Compression fitting with metal olive - code 1309589AXX

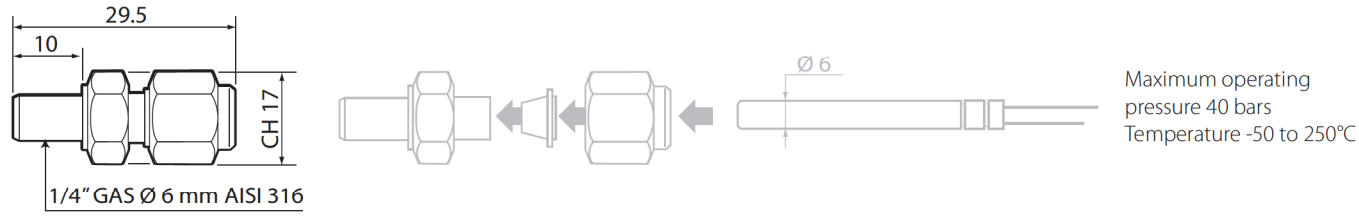


Fig. 8.f

Maximum operating pressure 40 bars
Temperature -50 to 250°C

8.4 Models PT1*HT*

Storage conditions	-50T250 °C
Operating range	-50T250 °C
Connections	with crimped metal terminals
Sensor	Pt1000 - Class B (2 wires)
Dissipation factor (in air)	ca. / approx. 7 mW/°C
Thermal constant over time (in air)	ca. / approx.20 s (V=2m/s)
Cable	White Teflon with two cables red and white Section. 2x0.22 mm2 Ø3 mm
Sensitive element index of protection	IP67
Sensitive element housing	Silicone resin
Materiale cappuccio	Stainless steel Aisi 304
Dimensioni cappuccio	6x40 mm
Classification according to protection against electric shock (sensitive element and cable)	additional insulation
Category of resistance to heat and fire	Flame retardant
Resistenza Insulation	20 Mohm 500 Vcc
Dielectric rigidity	2000Vac

Tab. 8.d

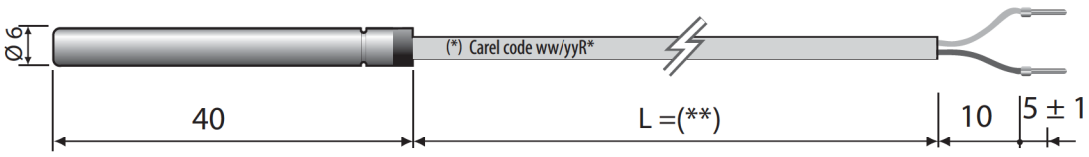


Fig. 8.g

Note:
(*) ww/yyR*:
ww = week of production;
yy = year of production;
R* = Revision.
(**) see table of product codes in price list

8.5 Models PT1*HF

Probe with fastening clamp

Storage conditions	-50T105 °C
Sensitive element operating range	-50T105 °C
Connections	Stripped ends, dimensions 6±1mm
Sensor	Pt1000 Class B
Precision	+/- 0.8 °C; -50T90 °C
Dissipation factor (in air)	3 mW
Thermal constant over time (in air) Cable	approx. 15 s Black thermoplastic rubber flat cable (diam. 3.6x1.6 max.)
Sensitive element index of protection	IP67
Sensitive element housing	Thermoplastic with fastening clamp
Classification according to protection against electric shock (sensitive element & cable)	Basic insulation for 250 Vac
Category of resistance to heat and fire	UL/HB cable
Insulation resistance at 1000 Vdc	>20 Mohm
Dielectric strength	1500 Vac

Tab. 8.e

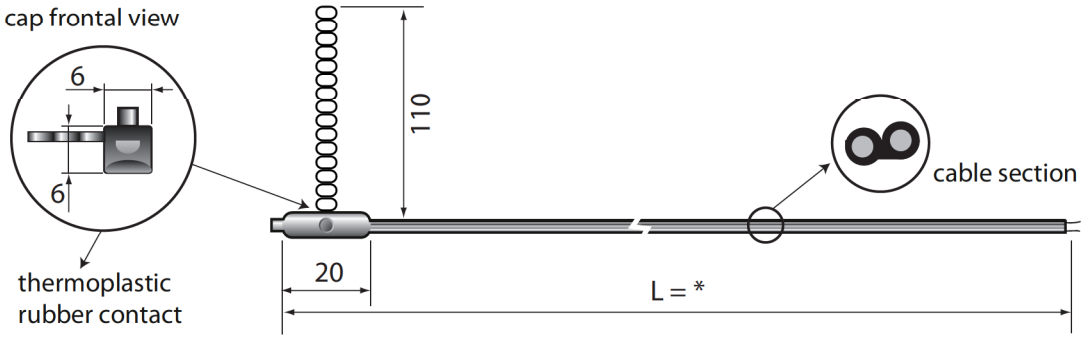


Fig. 8.h

* = see table of product codes in price list

8.6 Models PT1*PS*

Storage conditions	-50T105 °C
Operating range	-50T105 °C
Connections	Stripped and soldered ends, dimensions: 4±1 mm
Sensor	Pt1000 Class B
Dissipation factor (in air)	2 mW/°C
Thermal constant over time (in air)	approx. 50 min (V=1 m/s)
Cable	Two-wire with double sheath, AWG22, tinned copper with resistance ≤73.9Ω/km - Insulation: TPE specific for immersion in water on outer sheath, PP/co inside on wires, OD 3.30+/-0.10 mm
Sensitive element index of protection	IP67
Case	RAL7032 grey Santoprene Food safe
	Supplementary insulation for 250 Vac
Classification according to protection against electric shock (sensitive element and cable)	Flame retardant
Category of resistance to heat and fire	Flame retardant

Tab. 8.f

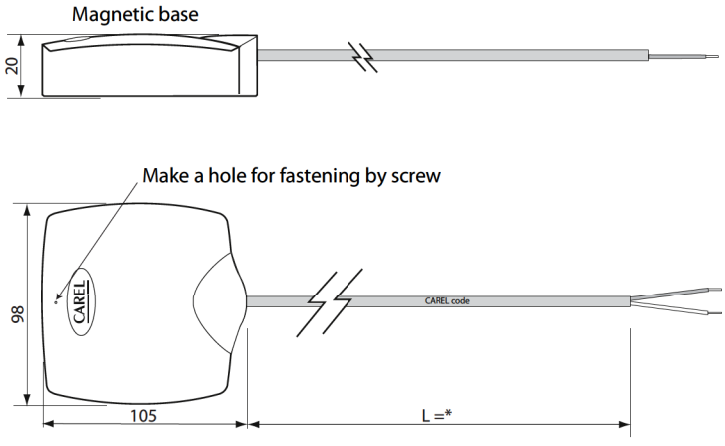


Fig. 8.i

* = see table of product codes in price list

9. PT1000 IMMERSION PROBE TECHNICAL SPECIFICATIONS

9.1 Models TST1300000

Immersion probes feature the sensor directly in contact with the liquid, and are installed on the tubing. Wired using the electrical connector.

Storage conditions	-40T120 °C
Operating range	-40T120 °C
Sensor	Pt1000 Class B
Construction	Direct immersion with connection to the 1/8" GAS male process fitting as per UNI 338
Electrical connection	4-pin co-moulded nylon, M12x1 (DIN-VDE0627) metric thread, IP67 max. temp. 90°C
Thermal constant over time	ca. / approx. 5 s in water - 30 s in air
Sensitive element housing	AISI 316
Insulation	100 Mohm a 500 Vcc
Maximum operating pressure	40 bar

Tab. 9.a

Key:

1	sensitive element NTC 10 Kohm
2	stainless steel socket
3	EX14
4	co-moulded body
5	M12 male connector

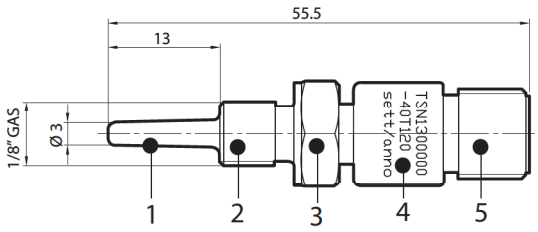


Fig. 9.a

Accessories:

- 4-pin M12 connector for 1/8 GAS sensor - cable length 3 m Code TSOPZCW030

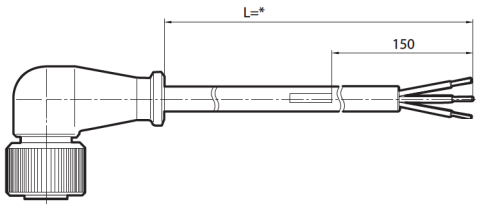
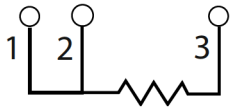


Fig. 9.b

Wiring:



PT1000

1	red
2	red
3	white

- 4-pin M12 connector for 1/8 GAS sensor
  Code TSOPZCM000
- M12 connector can be assembled on site, recommended cable 3x0.2 mm² with outer sheath.

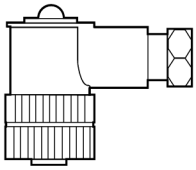
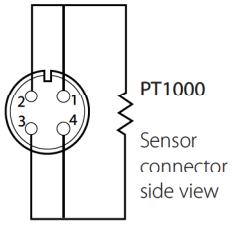


Fig. 9.c

Wiring:

Note: the three-wire connection for the Pt100 must be used when the controller is fitted accordingly. If not, the ends are to be connected together on the same terminal.



- Welding fitting Code TSOPZP T000

A	Compact thermistor with 1/8" GAS cyl. fitting
B	1/4" GAS cyl. process fitting with immersion L= 10.5 mm

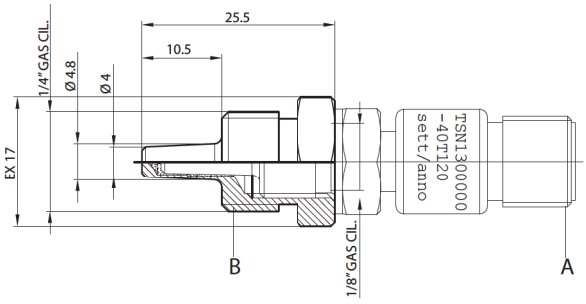


Fig. 9.d

- Welding fitting Code TSOPZRT000

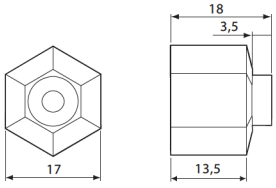


Fig. 9.e

9.2 Models TSM1500B30

Immersion probes feature the sensor directly in contact with the liquid and are secured to the tubing using a connector, available in the screw or weldable versions.
The body is nickel-coated brass, index of protection IP67, and the gasket (O-ring) is supplied together with the probe.

Storage conditions	-40T90 °C
Operating range	-40T90 °C
Sensor	Pt1000 Class B
Construction	Direct immersion with connection to the M14 male process
Cable	2 wires AWG 22, with sheath in TPE
Thermal constant over time	ca. / approx. 5 s in water - 45 s in air
Sensitive element housing	Nickel-coated brass & grey PA6 co-moulded body
Insulation	100 Mohm a 100 Vcc
Maximum operating pressure	25 bar
Compatible liquids	Water

Tab. 9.b

Key:

1	sensitive element
2	nickel-coated brass locking ring
3	co-moulded body
4	cable marking
5	tinned copper 2-wire cable
6	NTC sensor
7	2015 O-ring
8	nickel-coated brass thermometer socket

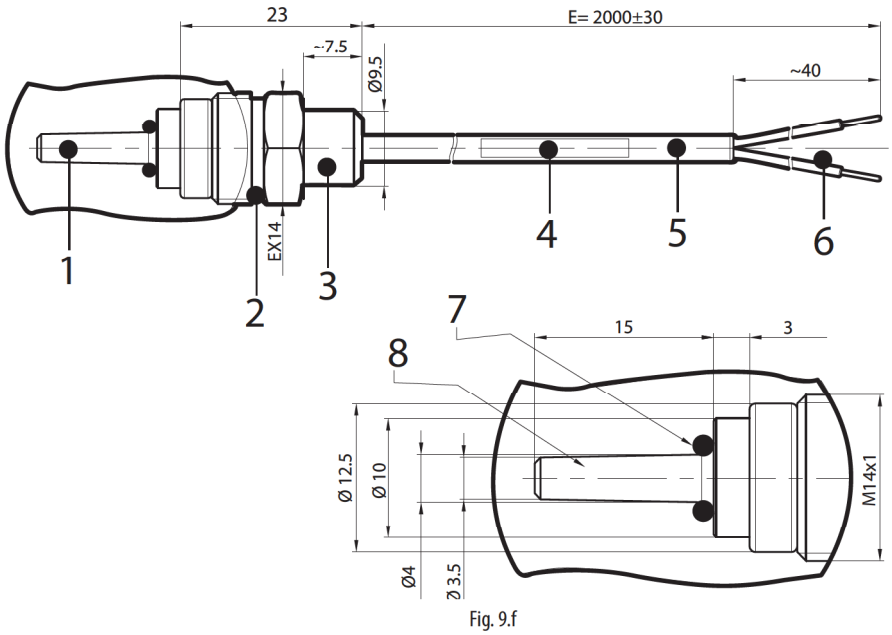


Fig. 9.f

Wiring:

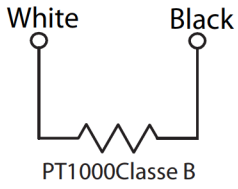


Fig. 9.g

Accessories:

- Adapter from M14 to 3/8 GA Code TSOPZRV000

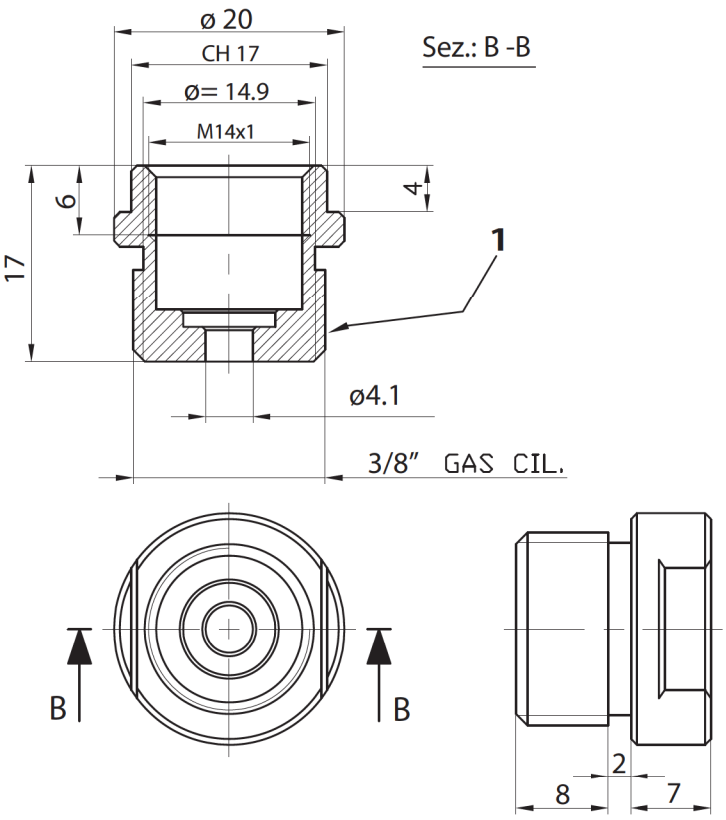


Fig. 9.h

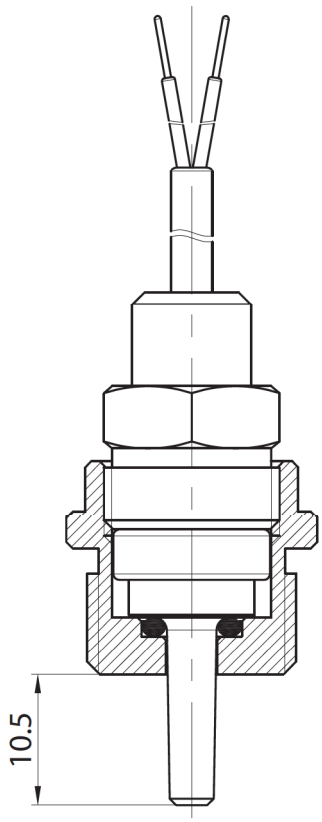


Fig. 9.i

- Weldable adapter for M14 Code TSOPZRS000

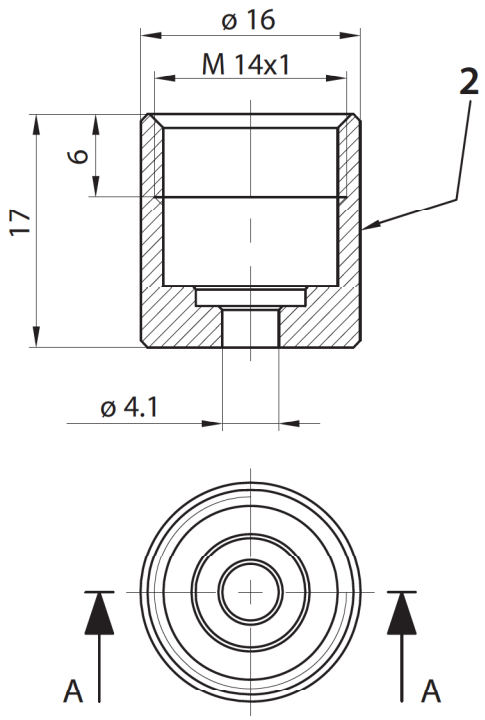


Fig. 9.j

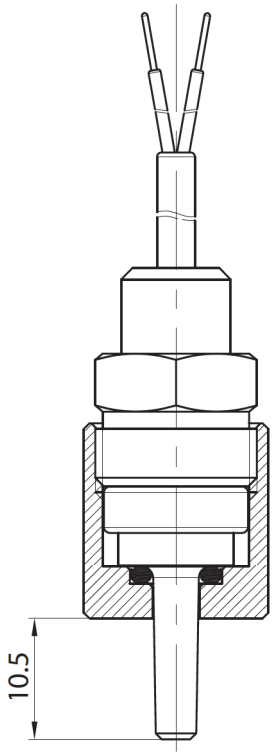


Fig. 9.k

Key:

1	3/8 cyl. threaded fitting with round seat, nickel coated brass	cod: C058042A04
2	weldable cylindrical fitting with round seat, brass	cod. C058042A03

9.3 Models TSQ15MAB00

Storage conditions	-50T350 °C
Operating range	-50T350 °C
Connections	3-pin DIN connector
Sensor	Pt1000 Class B
Thermal constant over time	approx. 2.5 s in water - 10 s in air
Cable cod.TSOPZCV030 & cod.TSOPZCV100 & extension cable cod. TSOPZCV070	silicone cable L= 3 m, 10 m (max. temp. = 180 °C) with 3-pin DIN connector (max. conn. temp.= 90 °C) as for DIN-VDE0627 with M8x1 screw coupling.
Optional compression fitting TSOPZFGD30	AISI 316, 1/4 gas (see paragraph 4.4)
Index of protection connessione	IP65
Sensitive element housing	AISI 316 steel
Insulation resistance	Insulation at 100 Vdc > 100 mOhm
Maximum operating pressure	40 bar
Category of resistance to heat and fire	flame retardant

Tab. 9.c

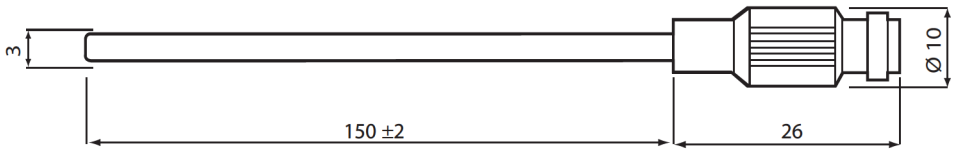


Fig. 9.l

Accessories:

A	TSOPZCV030:	silicone cable with M8 connector, length 3 m
	TSOPZCV100:	silicone cable with M8 connector, length 10 m
B	TSOPZCV070:	silicone extension cable with M8 male/female connector, length 7 m
C	TSOPZFGD30:	compression fitting suitable for 3 mm

A

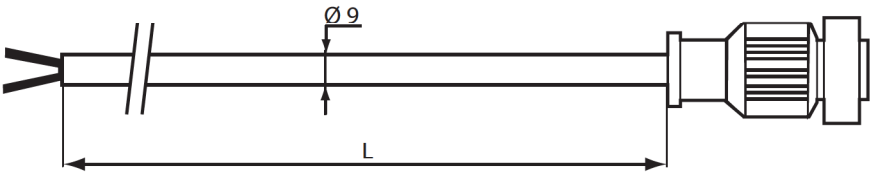


Fig. 9.m

B

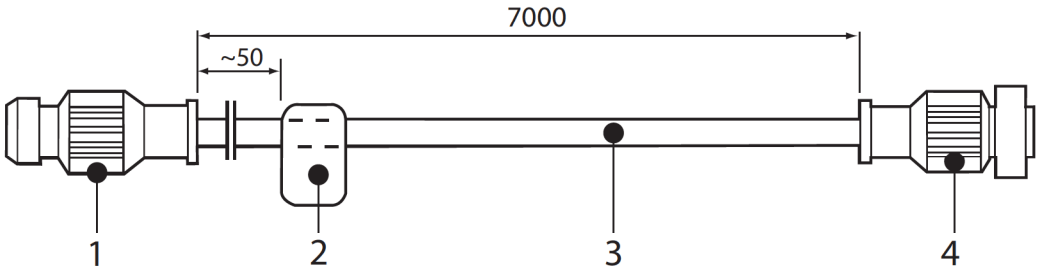


Fig. 9.n

C

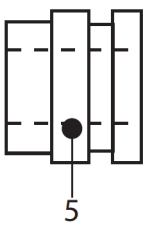


Fig. 9.o

Key:

1	M8 connector
2	rating label
3	24 AWG 2 wire cable insulated with silicone rubber
4	M8 co-moulded connector
5	1/4" compression fitting - D= 3 mm, AISI316 steel

10. PT1000 PIERCING PROBE TECHNICAL SPECIFICATIONS

10.1 Models PT1INF0340

Piercing probe with "L" handle and heating system.

Storage conditions	-50T200 °C
Operating range	-50T200 °C
Connections	Stripped ends, with terminals
Sensor	Pt1000 Class B
Thermal constant over time (in air)	approx. 45 s
Cable	Food-safe thermoplastic sheath with 4 wires size 0.15 mm2
Wires colours	White-black, PT1000 / red, electric heater.
Maximum heater voltage	24 Vac
Electrical resistance of heater Cable lenght	7 Ohm ±0,6 3 m
Sensitive element index of protection	IP67
Sensitive element housing	AISI 316 stainless steel. Length 100 mm diam. 4 mm. With pointed tip
Cap filler	Aluminium
Classification according to protection against electric shock (sensitive element & cable)	Insulation: Outer sheath, and inside on wires
Category of resistance to heat and fire	Flame retardant
Insulation resistance	20 Mohm 500 Vcc
Dielectric strength	500 Vac
Food compatibility	Suitable for permanent food contact

Tab. 10.a

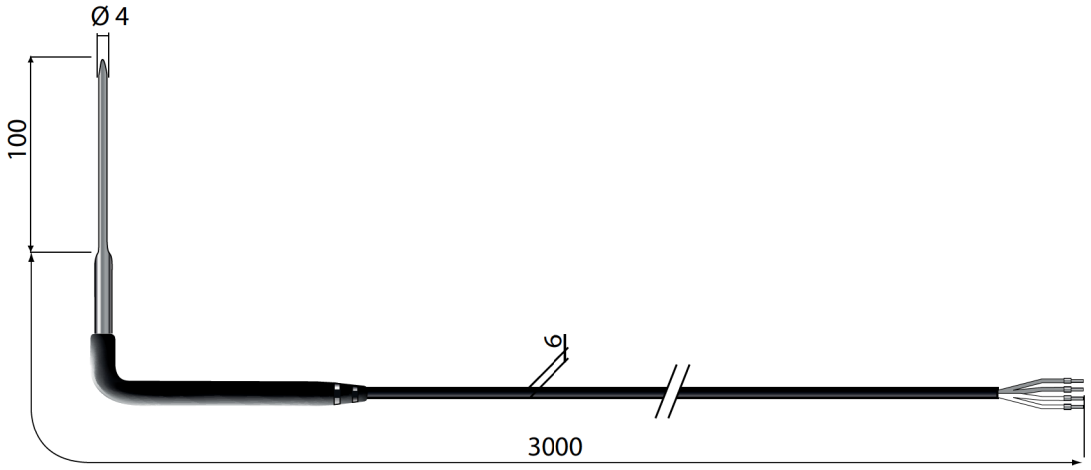


Fig. 10.a

Key:

a	red, electric heater
b	white/white, NTC

11. TABLE OF PT1000 PROBE VALUES

11.1 Table of temperature-resistance values for PT1000 probe class B

R (0) = 1000.00 Ω

α = 0.003 850 1/°C

Temper. [°C]	Resist. [W]	Temper. [°C]	Resist. [W]	Temper. [°C]	Resist. [W]	Temper. [°C]	Resist. [W]	Temper. [°C]	Resist. [W]	Temper. [°C]	Resist. [W]
-196	202,47	-125	500,60	-54	787,17	17	1066,27	88	1339,46	159	1606,82
-195	206,77	-124	504,70	-53	791,14	18	1070,16	89	1343,26	160	1610,54
-194	211,08	-123	508,81	-52	795,12	19	1074,05	90	1347,07	161	1614,27
-193	215,38	-122	512,91	-51	799,09	20	1077,94	91	1350,87	162	1617,99
-192	219,67	-121	517,00	-50	803,06	21	1081,82	92	1354,68	163	1621,71
-191	223,97	-120	521,10	-49	807,03	22	1085,70	93	1358,48	164	1625,43
-190	228,25	-119	525,19	-48	811,00	23	1089,59	94	1362,28	165	1629,15
-189	232,54	-118	529,28	-47	814,97	24	1093,47	95	1366,08	166	1632,86
-188	236,82	-117	533,37	-46	818,94	25	1097,35	96	1369,87	167	1636,58
-187	241,10	-116	537,46	-45	822,90	26	1101,23	97	1373,67	168	1640,30
-186	245,38	-115	541,54	-44	826,87	27	1105,10	98	1377,47	169	1644,01
-185	249,65	-114	545,62	-43	830,83	28	1108,98	99	1381,26	170	1647,72
-184	253,92	-113	549,70	-42	834,79	29	1112,86	100	1385,06	171	1651,43
-183	258,19	-112	553,78	-41	838,75	30	1116,73	101	1388,85	172	1655,14
-182	262,45	-111	557,86	-40	842,71	31	1120,60	102	1392,64	173	1658,85
-181	266,71	-110	561,93	-39	846,66	32	1124,47	103	1396,43	174	1662,56
-180	270,96	-109	566,00	-38	850,62	33	1128,35	104	1400,22	175	1666,27
-179	275,22	-108	570,07	-37	854,57	34	1132,21	105	1404,00	176	1669,97
-178	279,47	-107	574,14	-36	858,53	35	1136,08	106	1407,79	177	1673,68
-177	283,71	-106	578,21	-35	862,48	36	1139,95	107	1411,58	178	1677,38
-176	287,96	-105	582,27	-34	866,43	37	1143,82	108	1415,36	179	1681,08
-175	292,20	-104	586,33	-33	870,38	38	1147,68	109	1419,14	180	1684,78
-174	296,43	-103	590,39	-32	874,32	39	1151,55	110	1422,93	181	1688,48
-173	300,67	-102	594,45	-31	878,27	40	1155,41	111	1426,71	182	1692,18
-172	304,90	-101	598,50	-30	882,22	41	1159,27	112	1430,49	183	1695,88
-171	309,13	-100	602,56	-29	886,16	42	1163,13	113	1434,26	184	1699,58
-170	313,35	-99	606,61	-28	890,10	43	1166,99	114	1438,04	185	1703,27
-169	317,57	-98	610,66	-27	894,04	44	1170,85	115	1441,82	186	1706,96
-168	321,79	-97	614,71	-26	897,98	45	1174,70	116	1445,59	187	1710,66
-167	326,01	-96	618,76	-25	901,92	46	1178,56	117	1449,37	188	1714,35
-166	330,22	-95	622,80	-24	905,86	47	1182,41	118	1453,14	189	1718,04
-165	334,43	-94	626,84	-23	909,80	48	1186,27	119	1456,91	190	1721,73
-164	338,64	-93	630,88	-22	913,73	49	1190,12	120	1460,68	191	1725,42
-163	342,84	-92	634,92	-21	917,67	50	1193,97	121	1464,45	192	1729,10
-162	347,04	-91	638,96	-20	921,60	51	1197,82	122	1468,22	193	1732,79
-161	351,24	-90	643,00	-19	925,53	52	1201,67	123	1471,98	194	1736,48
-160	355,43	-89	647,03	-18	929,46	53	1205,52	124	1475,75	195	1740,16
-159	359,63	-88	651,06	-17	933,39	54	1209,36	125	1479,51	196	1743,84
-158	363,82	-87	655,09	-16	937,32	55	1213,21	126	1483,28	197	1747,52
-157	368,00	-86	659,12	-15	941,24	56	1217,05	127	1487,04	198	1751,20
-156	372,19	-85	663,15	-14	945,17	57	1220,90	128	1490,80	199	1754,88
-155	376,37	-84	667,17	-13	949,09	58	1224,74	129	1494,56	200	1758,56
-154	380,55	-83	671,20	-12	953,02	59	1228,58	130	1498,32	201	1762,24
-153	384,72	-82	675,22	-11	956,94	60	1232,42	131	1502,08	202	1765,91
-152	388,89	-81	679,24	-10	960,86	61	1236,26	132	1505,83	203	1769,59
-151	393,06	-80	683,25	-9	964,78	62	1240,09	133	1509,59	204	1773,26
-150	397,23	-79	687,27	-8	968,70	63	1243,93	134	1513,34	205	1776,93
-149	401,40	-78	691,29	-7	972,61	64	1247,77	135	1517,10	206	1780,60
-148	405,56	-77	695,30	-6	976,53	65	1251,60	136	1520,85	207	1784,27
-147	409,72	-76	699,31	-5	980,44	66	1255,43	137	1524,60	208	1787,94
-146	413,88	-75	703,32	-4	984,36	67	1259,26	138	1528,35	209	1791,61
-145	418,03	-74	707,33	-3	988,27	68	1263,09	139	1532,10	210	1795,28
-144	422,18	-73	711,34	-2	992,18	69	1266,92	140	1535,84	211	1798,94
-143	426,33	-72	715,34	-1	996,09	70	1270,75	141	1539,59	212	1802,60
-142	430,48	-71	719,34	0	1000,00	71	1274,58	142	1543,33	213	1806,27
-141	434,62	-70	723,35	1	1003,91	72	1278,40	143	1547,08	214	1809,93
-140	438,76	-69	727,35	2	1007,81	73	1282,23	144	1550,82	215	1813,59
-139	442,90	-68	731,34	3	1011,72	74	1286,05	145	1554,56	216	1817,25
-138	447,04	-67	735,34	4	1015,62	75	1289,87	146	1558,30	217	1820,91
-137	451,17	-66	739,34	5	1019,53	76	1293,70	147	1562,04	218	1824,56
-136	455,31	-65	743,33	6	1023,43	77	1297,52	148	1565,78	219	1828,22
-135	459,44	-64	747,32	7	1027,33	78	1301,33	149	1569,52	220	1831,88
-134	463,56	-63	751,31	8	1031,23	79	1305,15	150	1573,25	221	1835,53
-133	467,69	-62	755,30	9	1035,13	80	1308,97	151	1576,99	222	1839,18
-132	471,81	-61	759,29	10	1039,03	81	1312,78	152	1580,72	223	1842,83
-131	475,93	-60	763,28	11	1042,92	82	1316,60	153	1584,45	224	1846,48
-130	480,05	-59	767,26	12	1046,82	83	1320,41	154	1588,18	225	1850,13
-129	484,16	-58	771,25	13	1050,71	84	1324,22	155	1591,91	226	1853,78
-128	488,28	-57	775,23	14	1054,60	85	1328,03	156	1595,64	227	1857,43
-127	492,39	-56	779,21	15	1058,49	86	1331,84	157	1599,37	228	1861,07
-126	496,49	-55	783,19	16	1062,38	87	1335,65	158	1603,09	229	1864,72

Temper. [°C]	Resist. [W]
230	1868,36
231	1872,00
232	1875,64
233	1879,28
234	1882,92
235	1886,56
236	1890,19
237	1893,83
238	1897,46
239	1901,10
240	1904,73
241	1908,36
242	1911,99
243	1915,62
244	1919,24
245	1922,87
246	1926,49
247	1930,12
248	1933,74
249	1937,36
250	1940,98
251	1944,60
252	1948,22
253	1951,83
254	1955,45
255	1959,06
256	1962,68
257	1966,29
258	1969,90
259	1973,51
260	1977,12
261	1980,73
262	1984,33
263	1987,94
264	1991,54
265	1995,14
266	1998,75
267	2002,35
268	2005,95
269	2009,54
270	2013,14
271	2016,74
272	2020,33
273	2023,93
274	2027,52
275	2031,11
276	2034,70
277	2038,29
278	2041,88
279	2045,46
280	2049,05

Temper. [°C]	Resist. [W]
281	2052,63
282	2056,22
283	2059,80
284	2063,38
285	2066,96
286	2070,54
287	2074,11
288	2077,69
289	2081,27
290	2084,84
291	2088,41
292	2091,98
293	2095,55
294	2099,12
295	2102,69
296	2106,26
297	2109,82
298	2113,39
299	2116,95
300	2120,52
301	2124,08
302	2127,64
303	2131,20
304	2134,75
305	2138,31
306	2141,87
307	2145,42
308	2148,97
309	2152,52
310	2156,08
311	2159,62
312	2163,17
313	2166,72
314	2170,27
315	2173,81
316	2177,36
317	2180,90
318	2184,44
319	2187,98
320	2191,52
321	2195,06
322	2198,60
323	2202,13
324	2205,67
325	2209,20
326	2212,73
327	2216,26
328	2219,79
329	2223,32
330	2226,85
331	2230,38

Temper. [°C]	Resist. [W]
332	2233,90
333	2237,43
334	2240,95
335	2244,47
336	2247,99
337	2251,51
338	2255,03
339	2258,55
340	2262,06
341	2265,58
342	2269,09
343	2272,60
344	2276,12
345	2279,63
346	2283,14
347	2286,64
348	2290,15
349	2293,66
350	2297,16
351	2300,66
352	2304,17
353	2307,67
354	2311,17
355	2314,67
356	2318,16
357	2321,66
358	2325,16
359	2328,65
360	2332,14
361	2335,64
362	2339,13
363	2342,62
364	2346,10
365	2349,59
366	2353,08
367	2356,56
368	2360,05
369	2363,53
370	2367,01
371	2370,49
372	2373,97
373	2377,45
374	2380,93
375	2384,40
376	2387,88
377	2391,35
378	2394,82
379	2398,29
380	2401,76
381	2405,23
382	2408,70

Temper. [°C]	Resist. [W]
383	2412,17
384	2415,63
385	2419,10
386	2422,56
387	2426,02
388	2429,48
389	2432,94
390	2436,40
391	2439,86
392	2443,31
393	2446,77
394	2450,22
395	2453,67
396	2457,13
397	2460,58
398	2464,03
399	2467,47
400	2470,92
401	2474,37
402	2477,81
403	2481,25
404	2484,70
405	2488,14
406	2491,58
407	2495,02
408	2498,45
409	2501,89
410	2505,33
411	2508,76
412	2512,19
413	2515,62
414	2519,06
415	2522,48
416	2525,91
417	2529,34
418	2532,77
419	2536,19
420	2539,62
421	2543,04
422	2546,46
423	2549,88
424	2553,30
425	2556,72
426	2560,13
427	2563,55
428	2566,96
429	2570,38
430	2573,79
431	2577,20
432	2580,61
433	2584,02

Temper. [°C]	Resist. [W]
434	2587,43
435	2590,83
436	2594,24
437	2597,64
438	2601,05
439	2604,45
440	2607,85
441	2611,25
442	2614,65
443	2618,04
444	2621,44
445	2624,83
446	2628,23
447	2631,62
448	2635,01
449	2638,40
450	2641,79
451	2645,18
452	2648,57
453	2651,95
454	2655,34
455	2658,72
456	2662,10
457	2665,48
458	2668,86
459	2672,24
460	2675,62
461	2679,00
462	2682,37
463	2685,74
464	2689,12
465	2692,49
466	2695,86
467	2699,23
468	2702,60
469	2705,97
470	2709,33
471	2712,70
472	2716,06
473	2719,42
474	2722,78
475	2726,14
476	2729,50
477	2732,86
478	2736,22
479	2739,57
480	2742,93
481	2746,28
482	2749,63
483	2752,98
484	2756,33

Temper. [°C]	Resist. [W]
485	2759,68
486	2763,03
487	2766,38
488	2769,72
489	2773,07
490	2776,41
491	2779,75
492	2783,09
493	2786,43
494	2789,77
495	2793,11
496	2796,44
497	2799,78
498	2803,11
499	2806,44
500	2809,78

Tab. 11.a

12. PTC TECHNICAL SPECIFICATIONS

12.1 Models PTC0150000 – PTC0600000

Storage conditions	0T150 °C
Operating range	0T150 °C
Connections	Stripped ends, dimensions 6±1mm
Sensor	SEN.KTY81/121-20/5
Precision	± 2 °C; 0T50 °C; ± 3 °C; -50T90 °C; ± 4 °C; 90T120 °C.
Dissipation factor (in air)	3 mW
Thermal constant over time (in air)	ca. 15 s
Cable	Silicone
Sensitive element index of protection	IP65
Sensitive element housing	Dim. 40x6 mm
Classification according to protection against electric shock (sensitive element and cable)	Basic insulation for 250 Vac
Insulation resistance at 500 Vdc	>20 MOhm
Dielectric strength	2000 Vac

Tab. 12.b

12.2 Models PTC015W000 - PTC060W000 - PTC060WA00

Storage conditions	-50T100 °C
Operating range	-50T100 °C
Connections	Stripped ends, dimensions 6±1mm
Sensor	SEN.KTY81/121-20/5
Precision	± 2 °C; 0T50 °C; ± 3 °C; -50T90 °C; ± 4 °C; 90T120 °C.
Dissipation factor (in air)	3 mW
Thermal constant over time (in air)	ca. 15 s
Cable	Siliconico
Sensitive element index of protection	IP67
Sensitive element housing	Dim. 40x6 mm - 180x6 mm (PTC060WA00)
Classification according to protection against electric shock (sensitive element and cable)	Basic insulation for 250 Vac
Insulation resistance at 500 Vdc	>20 mOhm
Dielectric strength	2000 Vac

Tab. 12.c

12.3 Models PTC03000W1 - PTC03003000D1 - PTC03000G1

Storage conditions	-30T105 °C	
Operating range	PTC03000W1	Range -30*105 °C
	PTC03000D1	Range -30*105 °C
	PTC03000G1	Range -50*120 °C
Connections	Stripped ends, dimensions 6±1mm	
Sensor	SEN.KTY81/121-20/5	
Precision	± 2 °C; 0T50 °C; ± 3 °C; -50T90 °C; ± 4 °C; 90T120 °C	
Dissipation factor (in air)	3 m	
Thermal constant over time (in air)	approx. 15 s	
Cable	Black PVC (PTC03000D1) Grey silicone (PTC03000G1) White PVC (PTC03000W1)	
Sensitive element index of protection	IP67	
Sensitive element housing	Dim. 40x6 mm	
Classification according to protection against electric shock (sensitive element & cable)	Basic insulation for 250 Vac	
Insulation resistance at 500 Vdc	>20 mOhm	
Dielectric strength	2000 Vac	

Tab. 12.d

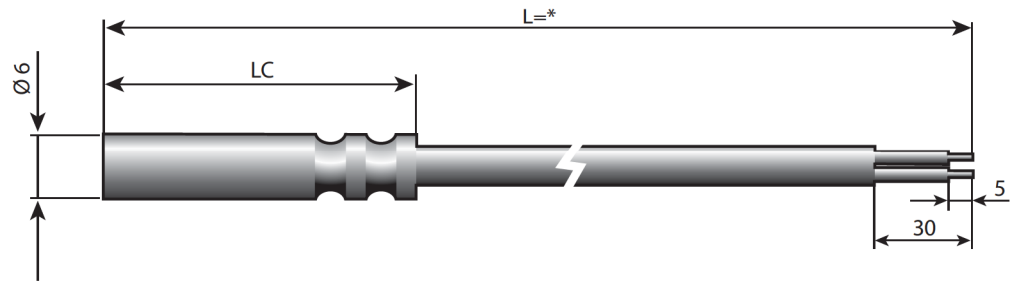


Fig. 12.b

* = see table of product codes in price list

Accessories

- Socket: nickel-coated brass - 1413306AXX

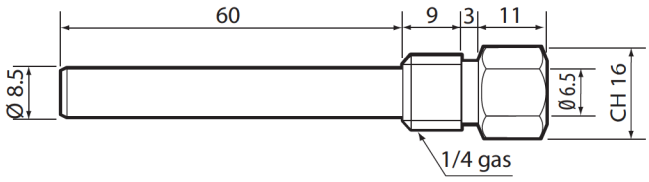


Fig. 12.c

Maximum operating pressure 35 bar
Temperature -20…95°C

- Socket 2: AISI 316 - code 1413309AXX

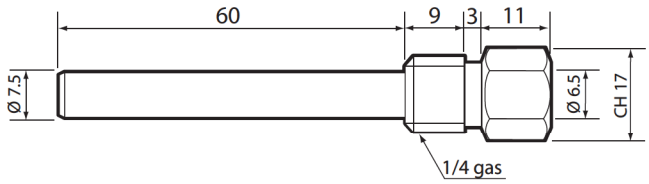


Fig. 12.d

Maximum operating pressure 40 bar
Temperature -20…95°C

Note:
- cable secured with PG7 - IP68 cable gland applied to hexagonal end
- kit available complete with socket and cable gland

- Compression fitting with metal olive - code 1309589AXX

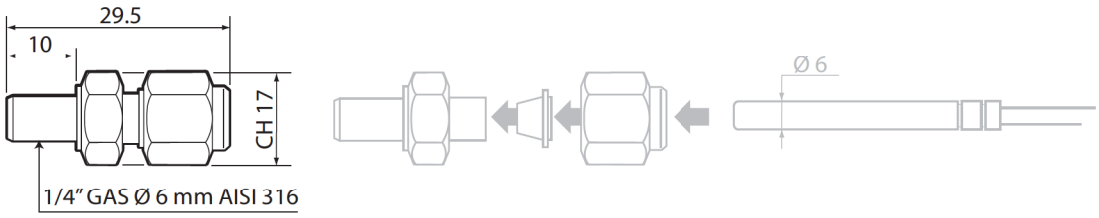


Fig. 12.e

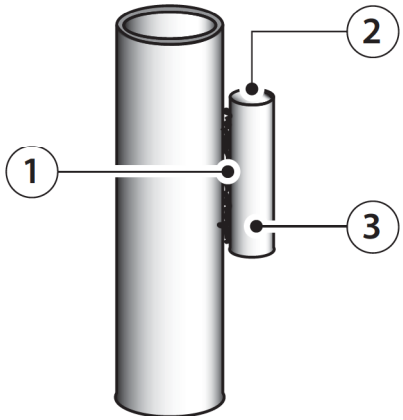
Maximum operating pressure 40 bars
Temperature -50 to 250°C

13. TEMPERATURE SENSOR INSTALLATION INSTRUCTIONS

1



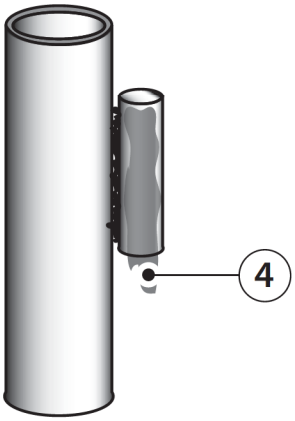
2



1. welding of socket to pipe
2. closed end of socket at top
3. tubular section ID 6 mm - min. length 70 mm

Weld the socket so as to create good thermal contact.

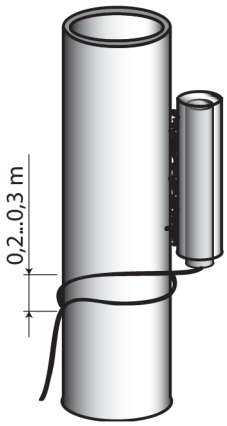
3



4. conductive paste

Fill the socket with conductive paste.

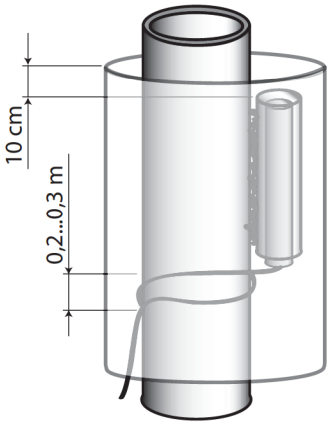
4



Insert the sensor completely into the socket.

Wrap 0.2-0.3 m of cable around the pipe.

5



Make sure the contact area is thermally insulated.

Note: if installing on a horizontal pipe, the same precautions apply, however without restrictions for the closed end of the socket.

14. LIGHT SENSOR TECHNICAL SPECIFICATIONS

14.1 Models PSOPZLHT00

Storage conditions	-20T70 °C
Operating range elemento sensibile	-20T70 °C
Sensor	Perkin Elmer optoelectronics A906011 sensor
Capsule material	Transparent polypropylene with epoxy resin
Cable	Black PVC diam 4.6 mm
Power and output connections	Stripped ends, dimensions 6±1mm
Insulation resistance	20 Mohm 500 V
Dielectric strength	2000 Vac
Sensitive element housing	Transparent polypropylene
Sensitive element housing	Dim. 7x26 mm

Tab. 14.e

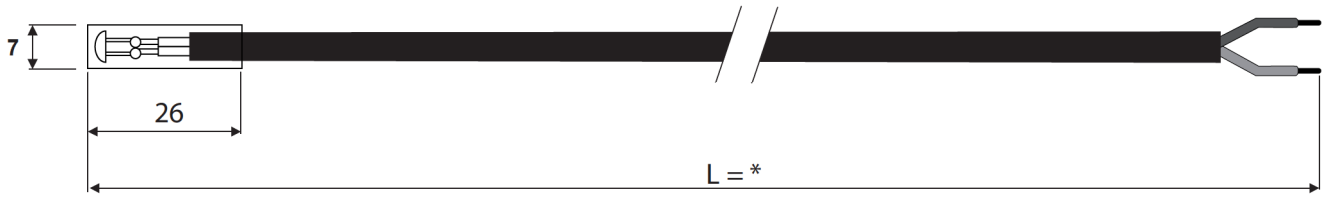


Fig. 14.a

14.2 Sensitive element specifications

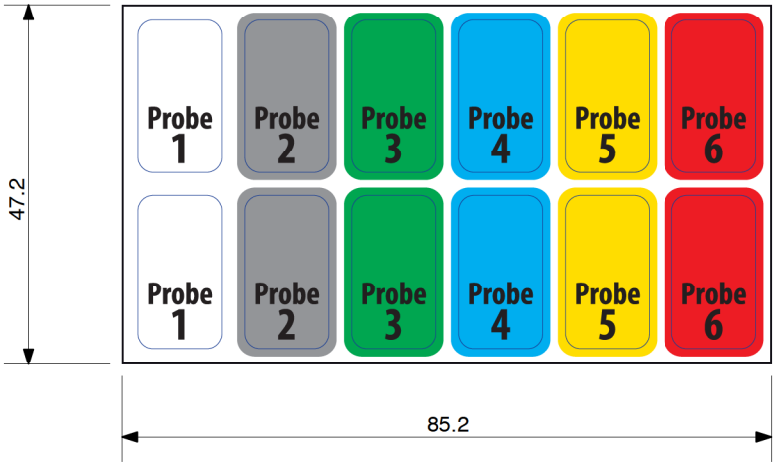
Type	R10	R100	R01	R05	Vmax	Pmax	γ10/100	λpeak
unit	KΩ	KΩ typ.	M Ωmin	MΩ min	V	mW	typ	nm
A 9060 11	9...20	3,5	0,06	0,18	150	90	0,65	600

Tab. 14.a

15. ACCESSORIES

Coloured labels to be applied to the end of the sensors and simplify connection to the controller for installers

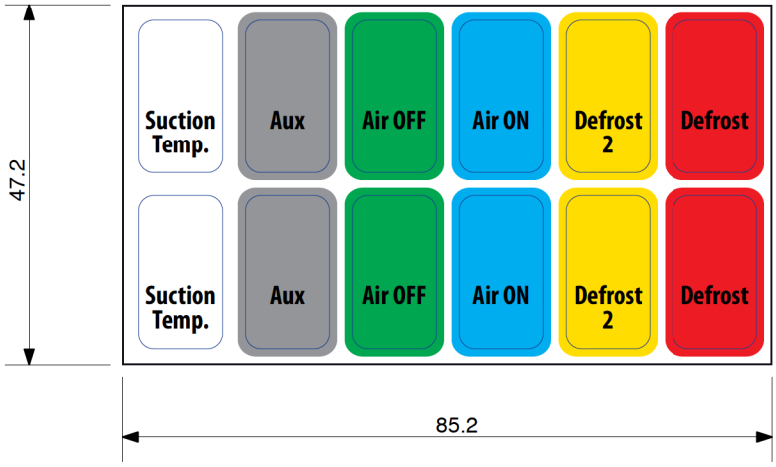
For refrigeration applications



Cod. 62C588A005

Fig. 15.a

For general applications



Cod. 62C588A006

Fig. 15.b

Example



Fig. 15.c

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CAREL

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