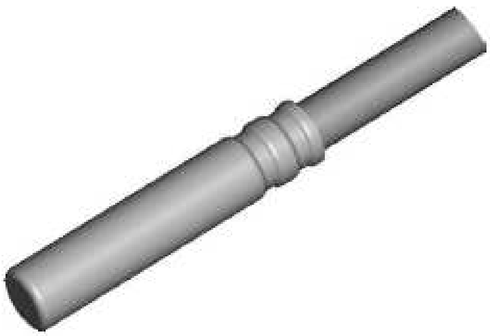
TEMPERATURE PROBE
TYPE ST07



APPLICATION

These temperature probes are suitable to be used as room and external probes in room temperature adjustment systems or in hot water production appliances for heating and domestic use, such as:

- Floor standing boilers
- Wall hung boilers with hot water tank
- Water heaters
- Convectors

ELECTRICAL FEATURES

Operating temperature	All except option H	-40°C ÷ +105°C
	Option H	-30°C ÷ +150°C +200ºC for 60''
Insulation voltage	All except option H	1500 Vac for 1''
	Option H	500 Vac for 1''

ST07 FEATURES with NTC THERMISTOR

Sensor	NTC thermistor (*)		
Options and peculiarity	Opt.	Resistive value	Coefficiente β (25°C – 85°C)
	-	$R_{25°C} = 10k\Omega \pm 1\%$	3435ºK ±1%
	Z	$R_{25°C} = 10k\Omega \pm 1\%$	3977ºK ±1%
	H	$R_{80°C} = 1650\Omega \pm 3\%$	3530°K ± 2%
	(*) Possible versions with different NTC upon request.		

ST07 FEATURES with PTC THERMISTOR

Sensor	PTC thermistor		
Options and peculiarity	Opt. **K**	Resistive value	$R_{25°C} = 1k\Omega \pm 1\%$
		Resistence ratio	$\frac{R_{100°C}}{R_{25°C}} = 1.696$
			$\frac{R_{-55°C}}{R_{25°C}} = 0.490$
		Temperature coefficient @ 25°C	$\alpha = 0.79$ %/°K

PECULIARITY

The sensor is placed in a copper cylindrical body, immersed in an epoxy resin with high thermal conductivity (ST07 probe option H has not epoxy resin) and connected to a bipolar cable enabling to achieve a resistance value.
This value is interpreted differently accorting to the sensing element.
If thermistor is a NTC the resistence value is inversely proportional to the measured temperature and can be calculated through the following formula:

$$R_T = R_{25}\exp[\beta(\tfrac{1}{T}-\tfrac{1}{T_{25}})]$$

where R_{25} is the resistance value at 25°C, T_{25} corresponds to (273,15+25)°K and T is the measured temperature, always expressed in Kelvin degrees.

The formula for the probe with option H is as follow:

$$R_T = R_{80}\exp[\beta(\tfrac{1}{T}-\tfrac{1}{T_{80}})]$$

where R_{80} is the resistance value at 80°C, T_{80} corresponds to (273,15+80)°K e T and T is the measured temperature, always expressed in Kelvin degrees.

Example: calculation of the resistance value of a probe with NTC with β 3435 at a temperature of 60°C:

$$R_{60} = 10k\exp[3435(\tfrac{1}{(60+273.15)}-\tfrac{1}{(25+273.15)})] = 2981\Omega$$

PTC thermistor has a curve less easily approximated by a mathematical equation than a NTC.
To get the equivalent resistance value at a certain temperature it can use the coefficient α or the resistance ratio.
Example: calculation of the resistance value at 60 ° C.
Through the formula

$$R_T = R_{25}e^{\alpha(T-T_{25})}$$

we know that R_{25}=1000Ω and α = 0.79 %; to calculate the resistance value at 60 ° C:

$$R = 1000e^{0.0079*(60-25)} = 1319\Omega$$

OVERALL DIMENSIONS

The following figure 1 shows the probe overall dimensions in mm.

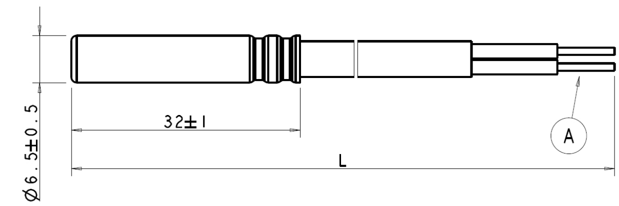


Figure 1

L = length on customer's request.
A = cable finishing can be either skinned, tinned or with a spliced connector 6x0.75mm.
Performing other finishes according to customer requirements. For further information see relevant guide to cable processing.

PART REFERENCES

PROBE TEMP. ST07 X_1 X_2 X_3

- X_3 → Length (L) of a finished temperature probe expressed in cm, including copper cylindrical body
- X_2 → **No letter**: 2X0,5 PVC 105°C CABLE
  C: 2X0,35 SILICONE CABLE
- X_1 → **No letter**: NTC 10K B3435
  Z: NTC 10K B3977
  H: NTC 10K B3530
  K: PTC 1K 25°C; α = 0.79 % /°K

Example:

- **PROBE TEMPERATURE ST07 Z CM112**

PROBE TEMP. ST07	Probe temperature type ST07
Z	With 10K NTC thermistor having B3977
CM112	Cable length 112 cm including copper cylindrical body

NOTES ABOUT PRODUCT DISPOSAL

The device contains electronic components and cannot therefore be disposed of as normal household waste. For the disposal procedure, please refer to the local rules in force for special waste.

ATTENTION -> Company Brahma S.p.A. declines any responsibility for any damage resulting from the Customer's interfering with the device

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