IMMERSION TEMPERATURE PROBES
TYPE ST06 - ST6B - ST09

APPLICATION

These temperature probes are suitable to equip temperature adjustment systems installed in hot water generators for heating and domestic use, such as:

- Floor standing boilers
- Wall hung boilers
- Water heaters
- Instantaneous water heaters

They are called "immersion probes", because once they are installed they are in direct contact with the fluid to be controlled, ensuring the shortest reaction time to temperature variations with the consequent advantage of a precise temperature adjustment.

MECHANICAL FEATURES

- Probe body
  - Brass CW602N
  - Stainless steel AISI 316L
- Fixing ST06
  - UNI 1/8 GAS thread, wrench 13
- Fixing ST09
  - UNI 1/8 GAS thread, wrench 15
  - with sealing O-Ring 9,25x1,78 (OR 2037)
- Connectors:
  - ST06 and ST06B
    - Connector (*) Lumberg MSF p.2.5
    - Operating temperature -40°C ÷ +110°C
    - +140°C for 30 minutes
  - ST09
    - Connector (*) Molex 5273 p.3.96
    - Operating temperature -40°C ÷ +105°C
  - ST09 option M/1
    - Connector (*) Amp Modu 1 p.3.96
    - Operating temperature -40°C ÷ +105°C
  - ST09 option L
    - Connector (*) Lumberg MSF p.2.5
    - Operating temperature -40°C ÷ +110°C
    - +140°C for 30 minutes

(*) Possible versions with different connectors upon request.
**ELECTRICAL FEATURES**

- Sensor: NTC thermistor
- Resistance value at 25°C: 10kΩ ± 1%
- β coefficient (25°C – 85°C) (**): 3435ºK ±1% or 3977ºK ±1%, option Z
- Reaction time: < 3 s
- Isolation voltage:
  - ST06-ST09-ST09 M/1-ST09 L: 3750 Vac for 1 second
  - ST6B: 1500 Vac for 1 second

(**) Possible versions with different NTC upon request.

**FORMULAS**

The following formula enables to calculate the resistance value of the NTC sensor at a T temperature expressed in Kelvin degrees:

\[
R_T = R_{25} \exp(\beta \left(\frac{1}{T} - \frac{1}{25}\right))
\]

Example: calculation of the resistance value of a probe with NTC with \(\beta\) 3435 at a temperature of 60°C.

\[
R_{60} = 10k \exp(3435 \left(\frac{1}{60} - \frac{1}{25}\right)) = 298 \Omega
\]

**CONSTRUCTION**

These probes consist of a metal body to be screwed to the pipe. The sensor is incorporated in the metal body, immersed in epoxy resin with high thermal conductivity and connected to two terminals from which the resistance signal is sensed (this value is inversely proportional to the measured temperature according to the formula appearing in the paragraph “Electrical features”). The ST6B probe differs from the ST06 model in the way it is made. The employed materials and the particular production process allow the probe to bear higher thermal stress which results in a longer life of the same.

**ASSEMBLY**

These probes must be screwed with a max. tightening torque of 5 Nm.

**OVERALL DIMENSIONS**

Fig. 1, 2, 3 and 4 show the overall dimensions of these probes in mm.
PART REFERENCES

SONDA TEMP. TIPO STX0 X1 X2 G1/8 CH13 W

- No letter: Brass body (CW602N)
- INOX: Stainless steel (AISI 316L)
- Wrench13
- UNI 1/8 gas

- ROSSA: red 2-Pole connector for option X1 = ‘no letter’
- NERA: black 2-Pole connector for option X1 = Z
- No letter: NTC 10K B3435
- Z: NTC 10K B3977

06: standard appliances (isolation voltage 3750Vac)
6B: application with high thermal stress (isolation voltage 1500Vac)

Esempio:

- SONDA TEMP.ST6B BIANCA G1/8 CH13 INOX
  SONDA TEMP.ST6B Temperature probe type ST6B
  Operating temperature – 40°C ÷ +110°C
  + 140°C per 30 minuti
  with 10K NTC having B3435
  BIANCA with white 2-Pole connector
  G1/8 UNI 1/8 gas thread
  CH13 Wrench 13
  INOX with stainless steel body

SONDA TEMP. TIPO ST09 X1 X2 G1/8 CH15

- Wrench 15
- UNI 1/8 gas thread

- No letter: 2-POLE Molex connector CS 5273
- M/1: green 2-POLE AMP MODU 1 connector
- L: Lumberg MSF 2-Pole connector:
  - Red for option X1 = ‘no letter’
  - Black for option X1 = Z

- No letter: NTC 10K B3435
- Z: NTC 10K B3977

Example:

- SONDA TEMP.ST09 Z G1/8 CH15
  SONDA TEMP.ST09 Temperature probe type ST09
  Z With 10K NTC having B3977
  G1/8 2-pole Molex connector CS 5273
  CH15 UNI 1/8 gas thread
  Wrench 15

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

BRAHMA S.p.A.
Via del Pontiere, 31
37045 Legnago (VR) - ITALY
Tel. +39 0442 635211 - Fax +39 0442 25683
http://www.brahma.it
E-mail: brahma@brahma.it

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