

# NTC THERMISTORS: TYPE JC

## CLIP-ON PIPE SENSOR

### DESCRIPTION:

A range of temperature sensing elements on a ceramic / metal shoe assembly and held in a polymer housing and provided with connector tabs. The housing is fitted with a spring metal clip for pipe attachment. A water resistant version is also available, incorporating a foam seal and sealed wire outlet holes. The elements available are NTC, PTC, SLN (silicon linear PTC) and PRT (Pt).

### FEATURES:

- Fast time response (1.5s typical)
- Low temperature gradient ( $<1^{\circ}\text{C}$  at  $60^{\circ}\text{C}$ )
- Sensing element electrically isolated from shoe (isolation  $>2\text{M}\Omega$  at  $500\text{V}$ )
- Water resistant version meets IP44 standard (with connector tabs encapsulated)
- Range of clips for pipe diameters 13 to 30mm
- Self-adjusts to irregular pipes
- Offers cost benefits over traditional immersion probes
- Typical applications include gas boiler control, domestic water systems, air conditioners, radiator inlet-outlet, electric showers, vending machines

### GENERAL DATA:

**Minimum operating temperature** .....  $0^{\circ}\text{C}$

**Maximum temperature** .....  $100^{\circ}\text{C}$  (sensor)  
.....  $85^{\circ}\text{C}$  (housing)

**Dissipation factor** .....  $\geq 2\text{mW/K}$   
..... (mounted on copper pipe at  $25^{\circ}\text{C}$ )

**Isolation voltage** .....  $500\text{V d.c.}$

#### Clip force:

.....  $<50\text{N}$  for mounting / de-mounting on pipe  
.....  $5\text{N}$  will not cause rotation on pipe

**Shoe material** ..... Plated brass

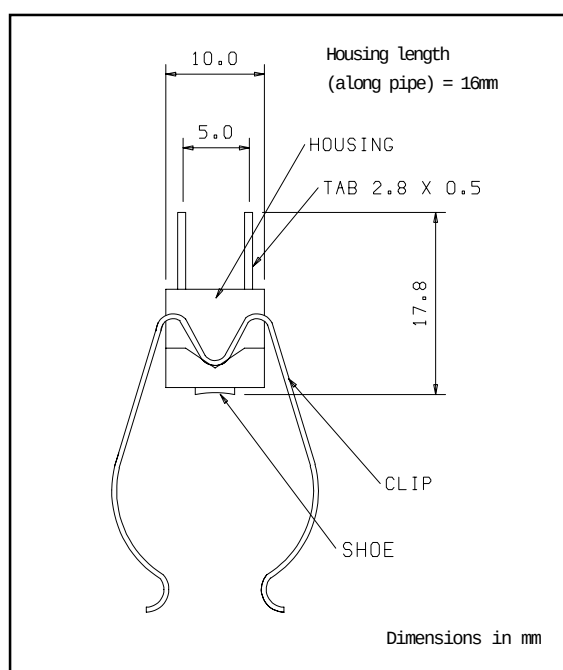
**Body material** ..... Nylon

**Pack quantity & MOQ** ..... 200 pcs

| Sensor type | Response time (seconds)                                                                               |
|-------------|-------------------------------------------------------------------------------------------------------|
| NTC         | $\leq 1.8$ (to 90% voltage change)                                                                    |
| PTC         | $\leq 2$ (to $T_{NF} + 5^{\circ}\text{C}$ - sensor applied to pipe at $T_{NF} + 23^{\circ}\text{C}$ ) |
| SLN         | $\leq 3$ (to 63.2% temperature change)                                                                |
| PRT         | $\leq 3$ (to 63.2% temperature change)                                                                |



### DIMENSIONS:



### OPTIONS:

- Other resistance - temperature characteristics
- Special pipe sizes
- Waterproof version - JW (see separate data sheet)

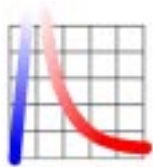
Data sheet D-JC-3

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### NTC DATA:

For codes see below.

| Code        | Nominal resistance |      |      | Tolerances |      |      |      |      |      | B 25/85<br><br>K | Identification<br>colour dot |
|-------------|--------------------|------|------|------------|------|------|------|------|------|------------------|------------------------------|
|             | 25°C               | 60°C | 85°C | 25°C       |      | 60°C |      | 85°C |      |                  |                              |
|             | Ω                  | Ω    | Ω    | ±%         | ±°C  | ±%   | ±°C  | ±%   | ±°C  |                  |                              |
| JC502C3R5/X | 4990               | 1250 | 540  | 6.46       | 1.48 | 5.00 | 1.40 | 5.90 | 1.87 | 3960 ± 1%        | Orange                       |
| JC103C3R5/X | 9983               | 2500 | 1079 | 6.46       | 1.48 | 5.00 | 1.40 | 5.90 | 1.87 | 3960 ± 1%        | None                         |
| JC103C4R5/X | 9925               | 3000 | 1441 | 6.26       | 1.67 | 5.00 | 1.60 | 5.77 | 2.09 | 3435 ± 1%        | Yellow                       |

### PTC DATA:

Maximum applied voltage ..... 30V

Maximum applied voltage for temperature sensing ..... 2.5V

For codes see below.

|         | T <sub>NF</sub> | -20 to T <sub>NF</sub> - 20°C |        | 25°C  |        | T <sub>NF</sub> - 5°C |        | T <sub>NF</sub> + 5°C |        | T <sub>NF</sub> + 23°C |        | Identification<br>Dots |
|---------|-----------------|-------------------------------|--------|-------|--------|-----------------------|--------|-----------------------|--------|------------------------|--------|------------------------|
|         |                 | Ω                             | V d.c. | Ω     | V d.c. | Ω                     | V d.c. | Ω                     | V d.c. | Ω                      | V d.c. |                        |
| JC060/K | 60°C            | <=250                         | 2.5    | <=100 | 0.2    | <=570                 | 2.5    | >=570                 | 2.5    | >=10000                | 2.5    | W hite/G rey           |
| JC070/K | 70°C            | <=250                         | 2.5    | <=100 | 0.2    | <=570                 | 2.5    | >=570                 | 2.5    | >=10000                | 2.5    | W hite/B rown          |
| JC080/K | 80°C            | <=250                         | 2.5    | <=100 | 0.2    | <=570                 | 2.5    | >=570                 | 2.5    | >=10000                | 2.5    | W hite/W hite          |

### SILISTOR DATA:

Code ..... JC202SLN1/X

Measurements made at 1mA

|                          | 25°C        | 60°C            | 85°C            |
|--------------------------|-------------|-----------------|-----------------|
| Resistance<br>Ω          | 1980 - 2020 | 2577.1 - 2641.3 | 3024.2 - 3146.5 |
| Temperature<br>Deviation | ±1.27°C     | ±2.28°C         | ±3.0°C          |

For resistances at other temperatures use:

$$R_T = R_{25} (1 + \alpha (T-25) + \beta (T-25)^2)$$

Where:  $\alpha = 7.88 \cdot 10^{-3} \text{ K}^{-1}$ ;  $\beta = 1.937 \cdot 10^{-5} \text{ K}^{-2}$  and T°C

### PRT DATA:

Tolerance ..... Class A

Code ..... JC102PRTA/X

Refer to separate tables for RvT

|                             | 0    | 25   | 60   | 85   |
|-----------------------------|------|------|------|------|
| Resistance Ω                | 1000 | 1097 | 1232 | 1328 |
| Temperature<br>Deviation °C | 0.15 | 0.2  | 0.27 | 0.32 |

### CODING FOR PIPE SIZE:

Clip size is specified by replacing X in the codes above as shown in the table on the right. To specify water-resistant version, add suffix M:

e.g. JC502C3R5/17M.

| X  | Pipe diameter range mm |
|----|------------------------|
| 13 | 13 - 15                |
| 17 | 17 - 18.5              |
| 20 | 20 - 22                |
| 28 | 28 - 30                |

Data sheet D-JC-3

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