



## Cable Temperature Sensors

## QAP...

### Use

The sensors are used in heating, ventilation and air conditioning plants to acquire the temperature. They are for use with the corresponding accessories as:

- strap-on sensors for pipework
- strap-on sensors for solar collectors
- immersion sensors
- Changeover (from heating to cooling or vice versa)

### Type summary

| <i>Type reference</i> | <i>Sensor element</i> | <i>Cable length</i> | <i>Material connecting cable</i> | <i>Measuring range</i> | <i>Weight (incl. packaging)</i> |
|-----------------------|-----------------------|---------------------|----------------------------------|------------------------|---------------------------------|
| <b>QAP2010.150</b>    | Pt 100                | 1,5 m               | silicone                         | -30...+130 °C          | 0,05 kg                         |
| <b>QAP2012.150</b>    | Pt 1000               | 1,5 m               | silicone                         | -30...+130 °C          | 0,05 kg                         |
| <b>QAP2040.250</b>    | T1                    | 2,5 m               | silicone                         | -30...+130 °C          | 0,07 kg                         |
| <b>QAP21.3</b>        | LG-Ni 1000            | 1,5 m               | silicone                         | -30...+130 °C          | 0,05 kg                         |
| <b>QAP21.3/8000</b>   | LG-Ni 1000            | 8 m                 | silicone                         | -30...+130 °C          | 0,23 kg                         |
| <b>QAP22</b>          | LG-Ni 1000            | 2 m                 | PVC                              | -25...+ 95 °C          | 0,06 kg                         |
| <b>QAP1030.200</b>    | NTC 10k               | 2 m                 | PVC                              | -25...+ 95 °C          | 0,06 kg                         |

## Accessories

| Name                                                                                                                                 | Part number/<br>type reference |
|--------------------------------------------------------------------------------------------------------------------------------------|--------------------------------|
| Protection pocket, Ms63, PN10, immersion length 100 mm                                                                               | <b>ALT-SB100</b> <sup>1)</sup> |
| Cable holder for protection pocket mounting                                                                                          | <b>4 213 1416 0</b>            |
| Changeover mounting kit<br>For fitting on pipes (pipes of about 13...35 mm dia.),<br>consisting of holding piece and cable ties (2x) | <b>ARG22.1</b> <sup>2)</sup>   |
| Aluminium bar<br>Consisting of bar with riveted holder and rubber grommet                                                            | <b>ARG22.2</b>                 |

1) For other protection pocket accessories, refer to Data Sheet N1194.

2) Suited for max. 95 °C. Use cable ties made of metal for temperatures above 95 °C

## Ordering and delivery

When ordering, please give type reference of sensor and part numbers / type reference of the accessories required.

Example: Cable temperature sensor **QAP2010.150**.

The cable temperature sensor is supplied without any mounting accessories. These must be ordered separately.

## Equipment combinations

The cable temperature sensors are suited for use with all types of controllers that can handle the sensor's passive output signal.

## Function

The sensor acquires the temperature via its sensing element. The resistance of the sensing element changes as a function of the ambient temperature.

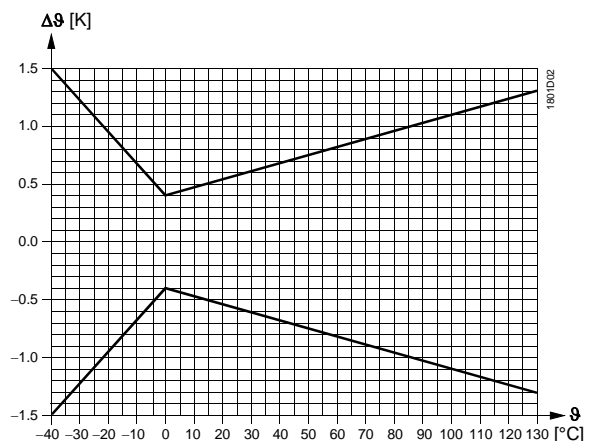
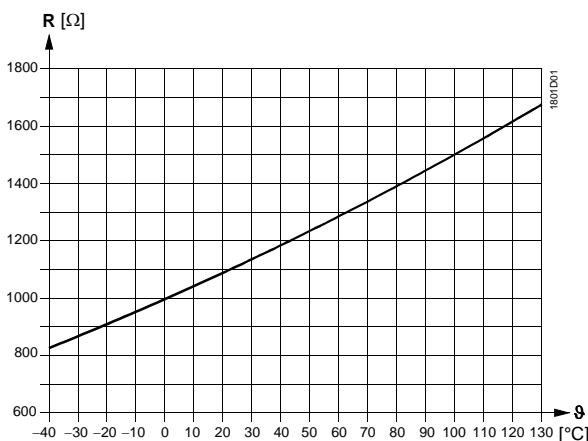
The resistance value is used for further handling by a suitable controller.

## Sensing elements

LG-Ni 1000

Characteristic:

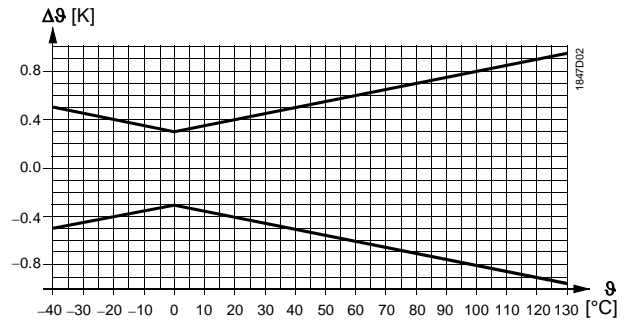
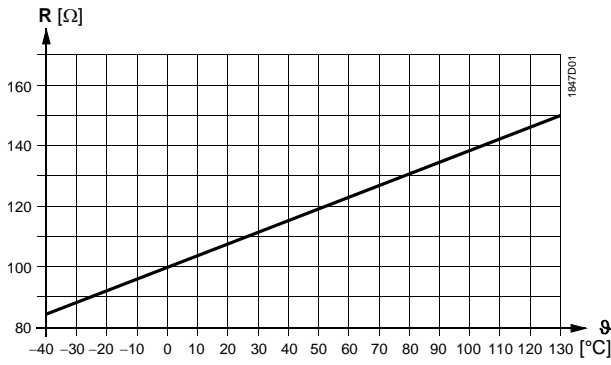
Accuracy:



Pt 100 (class B)

Characteristic:

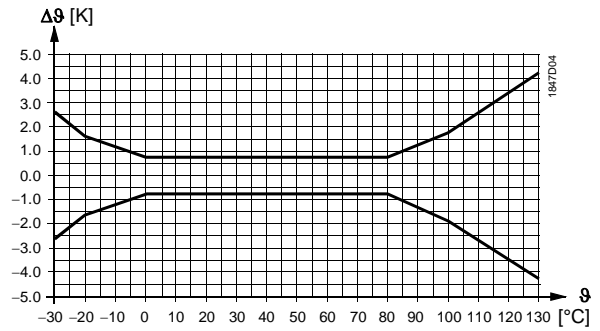
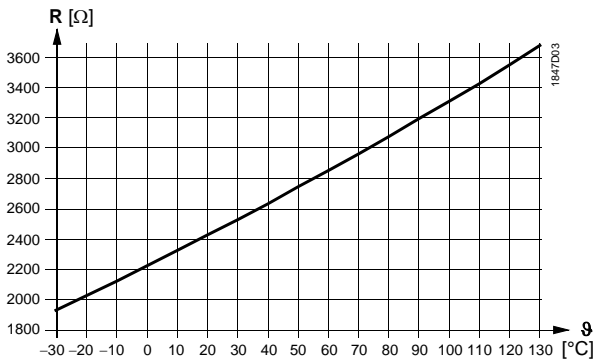
Accuracy:



Pt 1000 (class B)

Characteristic:

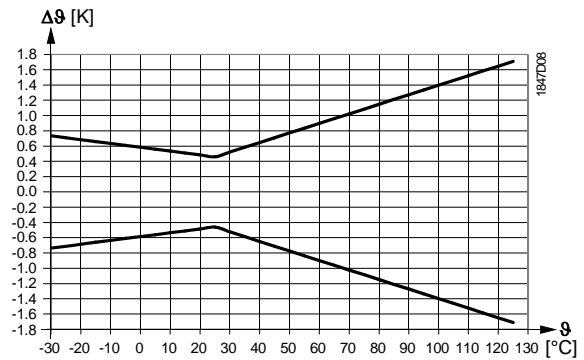
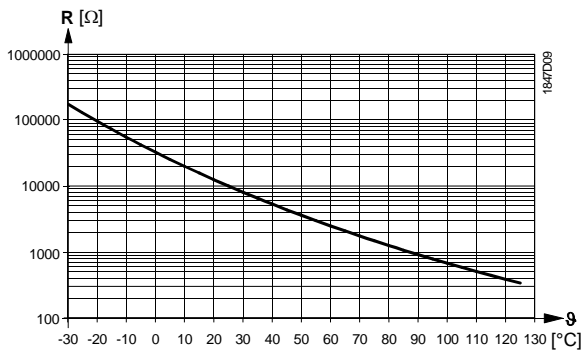
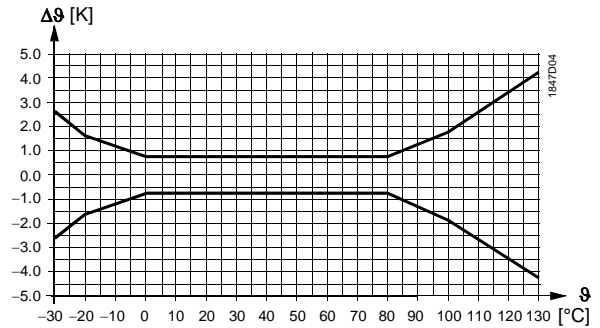
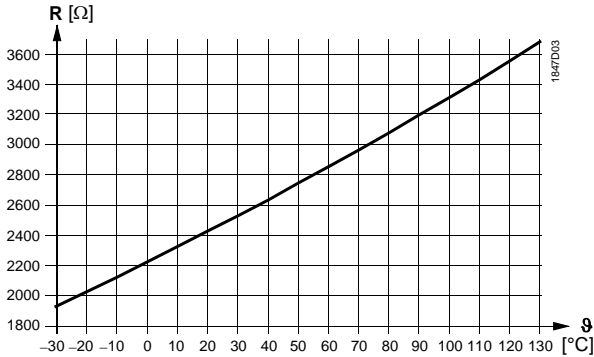
Accuracy:



T1 (PTC)

Characteristic:

Accuracy:



Legend

- R Resistance in Ohm
- $\theta$  Temperature in degrees Celsius
- $\Delta\theta$  Temperature differential in Kelvin

## Mechanical design

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The sensor consists of sleeve (40.5 mm in length), sensing element and 2-core connecting cable. The sensing element is encapsulated in the sleeve so that it is mechanically and electrically protected. The sleeve also ensures strain relief for the connecting cable. The end of the cable carries ferrules for easy connection.

Different accessories are available for fixing the sensor.

## Engineering notes

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The permissible cable lengths are dependent on the type of controller with which the sensor is used. They are specified in the Data Sheet of the relevant controller.

## Mounting and installation notes

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The connecting cable should always be connected to a conduit box.

When mounted in a protection pocket, the sensor must always be fixed in the pocket by means of the cable holder.

Instructions for mounting in induction or fan coil units:

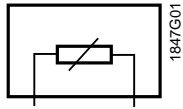
The sensor should be fitted in the location specified by the manufacturer of the terminal unit. If there is no such specification, it must be fitted in the return air flow where it captures the temperature of the room air drawn in. It should be fitted as high as possible to minimize the floor effect. The sensor must be protected against heat radiation from the terminal unit.

## Technical data

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|                          |                                           |                                                                                           |
|--------------------------|-------------------------------------------|-------------------------------------------------------------------------------------------|
| Functional data          | Measuring range                           | refer to "Type summary"                                                                   |
|                          | Sensing element                           | refer to "Type summary"                                                                   |
|                          | Time constant                             |                                                                                           |
|                          | Sensor with ARG22.1 (attached to pipe)    | approx. 25 s                                                                              |
|                          | Sensor with protection pocket             | <30 s                                                                                     |
|                          | Sensor with ARG22.2 in air at $v = 3$ m/s | <1 min                                                                                    |
|                          | Measurement accuracy                      | refer to "Function"                                                                       |
|                          | Type of measurement and output            | passive                                                                                   |
| Protective data          | Degree of protection                      | IP 65 to IEC 529                                                                          |
|                          | Safety class                              | III to EN 60730                                                                           |
| Electrical connections   | Connecting cable                          | 2-core, interchangeable                                                                   |
|                          | Cross-sectional area                      | $2 \times 0.34 \text{ mm}^2$                                                              |
|                          | Length                                    | see "Type summary"                                                                        |
|                          | Perm. cable lengths                       | refer to "Engineering notes"                                                              |
| Environmental conditions | Permissible ambient temperature           |                                                                                           |
|                          | for silicone cables                       | $-30 \dots +140 \text{ }^\circ\text{C}$                                                   |
|                          | for PVC cables                            | $-25 \dots +95 \text{ }^\circ\text{C}$ , Short-time (2 h/d) $+110 \text{ }^\circ\text{C}$ |
|                          | Perm. ambient humidity                    | 95 % r. h.                                                                                |
| Materials                | Sensor sleeve                             | stainless steel 1.4571 (V4A)                                                              |
|                          | Connecting cables                         | refer to "Type summary"                                                                   |
|                          | Packaging                                 | corrugated cardboard                                                                      |
| Weight                   | Incl. packaging                           | refer to "Type summary"                                                                   |

## Internal diagram

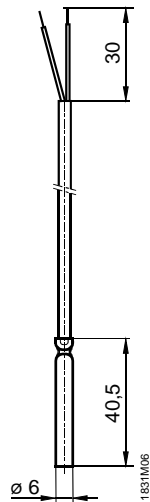


The internal diagram is identical for all types of cable temperature sensors covered by this Data Sheet.

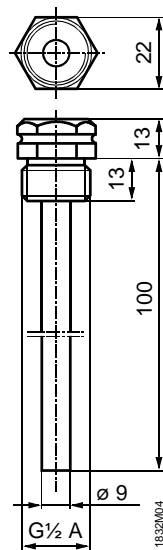
The connecting wires are interchangeable.

## Dimensions

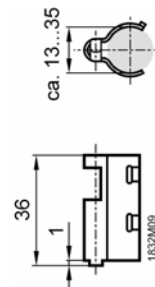
Sensor  
QAP...



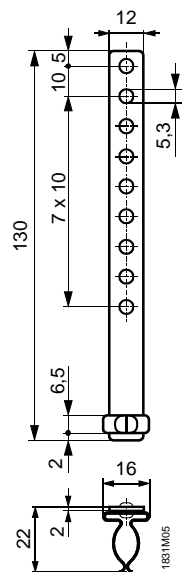
Protection pocket  
ALT-SB100



Changeover  
mounting kit  
for fitting on  
pipes  
ARG22.1



Aluminium bar  
ARG22.2



Dimension in mm