



Symaro™

Immersion
Temperature Sensors

QAE2164...
QAE2174...

- Active sensors for acquiring the water temperature in pipes and tanks
- Operating voltage AC 24 V or DC 13.5...35 V
- Signal output DC 0...5 V, DC 0...10 V or 4...20 mA

Use

- The sensors are for use in ventilation and air conditioning plants for:
- Controlling or limiting the flow temperature
 - Limiting the return temperature
 - Controlling the DHW temperature

Type summary

| Type reference | Outfit | Immersion length | Operating voltage | Output signal |
|----------------|--|------------------|------------------------------------|--|
| QAE2164.010 | With clamp for protection pocket ¹⁾ | 100 mm | AC 24 V ± 20 % / DC 13.5...35 V | DC 0...5 V DC 0...10 V 4...20 mA (3-wire) |
| QAE2164.015 | With clamp for protection pocket ¹⁾ | 150 mm | AC 24 V ± 20 % / DC 13.5...35 V | DC 0...5 V DC 0...10 V 4...20 mA (3-wire) |
| QAE2174.010 | With clamp for protection pocket ¹⁾ | 100 mm | DC 13.5...35 V | 4...20 mA (2-wire) |
| QAE2174.015 | With clamp for protection pocket ¹⁾ | 150 mm | DC 13.5...35 V | 4...20 mA (2-wire) |

1) Protection pocket required (not included as standard).

Ordering

When ordering, please give name and type reference, e.g.:
Immersion temperature sensor **QAE2164.010**

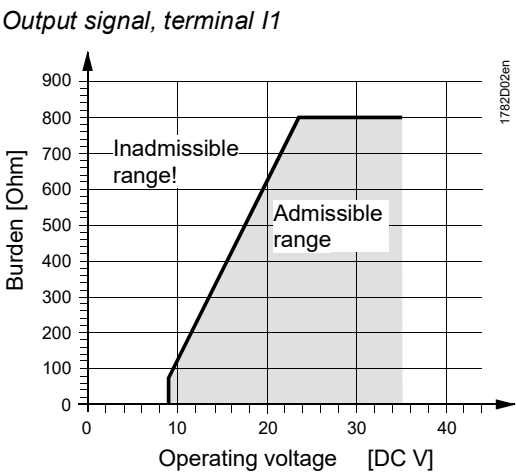
Equipment combinations

All systems or devices that are capable of acquiring and handling the sensor's DC 0...5 V, DC 0...10 V or 4...20 mA output signal.

Function

The immersion temperature sensor acquires the temperature of the medium via its sensing element whose resistance value changes as a function of the temperature. This change is converted to a DC 0...5 V, DC 0...10 V or 4...20 mA output signal, depending on the type of sensor. The output signal corresponds to the selected temperature range.

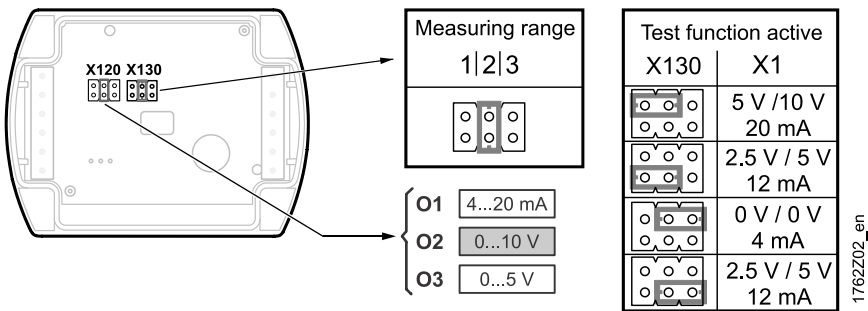
Burden diagram
(QAE2174...)



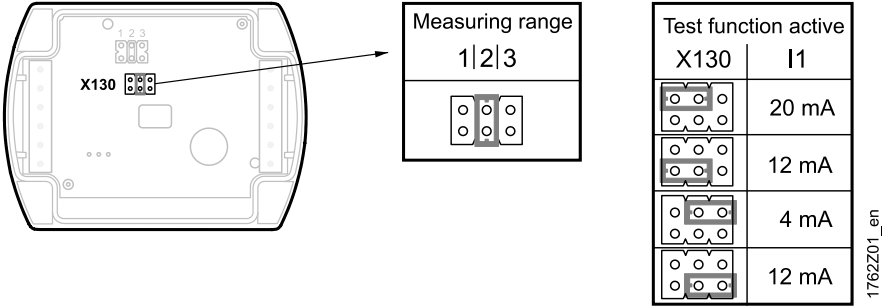
Mechanical design

The immersion temperature sensor consists of housing, printed circuit board, connection terminals and immersion rod.
The 2-sectional housing is comprised of base and removable cover (snap-on design). The measuring circuit and the setting element are located on the printed circuit board inside the cover, the connection terminals on the base.
Cable entry is made via the M16 cable entry gland (IP54) supplied with the sensor which can be screwed into the housing. Immersion rod and housing are rigidly connected.

Setting element
QAE2164...



QAE2174...



The setting element is located inside the cover. It consists of 6 pins and a shorting plug. It is used to select the required measuring range and to activate the test function.

The different plug positions have the following meaning:

- *For the temperature measuring range:*
Shorting plug in the left position (R1) = 0...100 °C,
Shorting plug in the mid position (R2) = –10...+120 °C (factory setting),
Shorting plug in the right position (R3) = 0...70 °C
- *For activating the test function:*
Shorting plug in the horizontal position: The values according to the table "Test function active" will be made available at the signal output.

Fault

QAE2164... In the event of fault, the output signal will reach 0 V (0 mA) after 60 seconds.
QAE2174... In the event of fault, the output signal will reach 4 mA after 60 seconds.

Accessories (not included with standard delivery)

| Name | Material | Nominal pressure | Type of sealing | Immersion length | Type reference |
|---------------------|----------------|------------------|-----------------------------|------------------|-------------------|
| Compression fitting | V4A (1.4571) | PN16 | Threaded with sealing means | --- | AQE2102 |
| Protection pocket | Brass (CuZn37) | PN10 | Threaded with sealing means | 100 mm | ALT-SB100 |
| Protection pocket | Brass (CuZn37) | PN10 | Threaded with sealing means | 150 mm | ALT-SB150 |
| Protection pocket | V4A (1.4571) | PN16 | Threaded with sealing means | 100 mm | ALT-SS100 |
| Protection pocket | V4A (1.4571) | PN16 | Threaded with sealing means | 150 mm | ALT-SS150 |
| Protection pocket | V4A (1.4571) | PN40 | With flange for flat seal | 100 mm | ALT-SSF100 |
| Protection pocket | V4A (1.4571) | PN40 | With flange for flat seal | 150 mm | ALT-SSF150 |

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

Engineering notes

If the nominal pressure exceeds PN10, protection pockets made of stainless steel (V4A) are required. The temperature measuring range must be selected on the sensor, if required.

To power the sensor, a transformer for safety extra low-voltage (SELV) with separate windings for 100 % duty is required. When sizing and electrically protecting the transformer, local safety regulations must be observed.

When sizing the transformer, the power consumption of the temperature sensor must be taken into consideration. For correct wiring, refer to the Data Sheets of the devices with which the sensor is used.

The permissible cable lengths must be observed.

When laying the cables, it must be observed that the longer the cables run side by side and the smaller the distance between them, the greater the electrical interference. Twisted pair cables are required for the secondary supply lines and the signal lines.

Cable routing and cable selection

Mounting and installation notes

Depending on use, the sensor should be located as follows:

- For flow temperature control (heating flow):
 - Directly after the pump if the pump is located in the flow
 - 1.5 to 2 m after the mixing valve if the pump is located in the return
- For return temperature limitation:

In the return at a location where the temperature can be correctly acquired

The sensor should be installed in an elbow such that the immersion rod or the protection pocket faces the direction of flow. The water must be well mixed where the temperature is acquired. This is downstream from the pump or, if the pump is mounted in the return, at least 1.5 m after the mixing point.

The sensor should be mounted such that the cable does not enter from the top.

With all types of sensors, the immersion length must be a minimum of 60 mm!

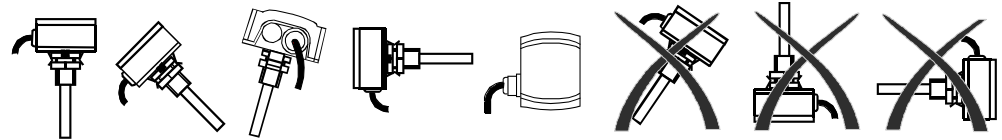
The sensor must not be covered by lagging.

To fit the sensor, a threaded fitting or T-piece G ½ must be welded into the pipe.

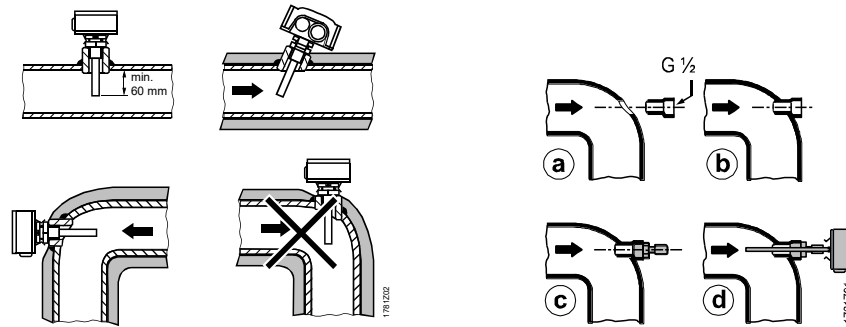
Mounting positions

permitted:

not permitted:



Mounting



Note!

For sensors with non-sealing threaded nipples G ½, sealing means must be used with the threaded connection (e.g. hemp, Teflon tape or similar).

Mounting Instructions are printed on the packaging.

Disposal



This symbol or any other national label indicate that the product, its packaging, and, where applicable, any batteries may not be disposed of as domestic waste. Delete all personal data and dispose of the item(s) at separate collection and recycling facilities in accordance with local and national legislation.

For additional details, refer to www.siemens.com/bt/disposal.

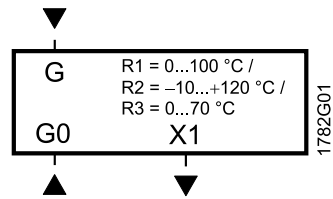
Technical data

| | | |
|---|---|--|
| Power supply | Power supply | Safety extra-low voltage (SELV) |
| | Operating voltage (QAE2164.xxx) | AC 24 V $\pm 20\%$, or DC 13.5...35 V or AC/DC 24 V class 2 (US) |
| | Operating voltage (QAE2174.xxx) | DC 13.5...35 V or DC 24 V class 2 (US) |
| | Frequency | 50/60 Hz at AC 24 V |
| | External supply line protection (EU) | Fuse slow max. 10 A or Circuit breaker max. 13 A Characteristic B, C, D according to EN 60898 or Power source with current limitation of max. 10 A |
| | Power consumption (QAE2164.xxx) | At "U" output signal "I" output signal Max. <1.6 VA Max. <2.0 VA |
| | Power consumption (QAE2174.xxx) | ≤ 1 VA |
| | Max. perm. cable lengths | refer to Data Sheet of the device handling the signal |
| | Measuring ranges | –10...+120 °C (R2 = factory setting), 0...100 °C (R1), 0...70 °C (R3) |
| | Immersion length | refer to "Type summary" |
| Cable lengths for the measuring signal | Sensing element | Pt 1000 class B to DIN EN 60 751 |
| | Time constant | |
| | With pocket | 30 s at 2 m/s |
| | Without pocket | 8 s at 2 m/s |
| | Measuring accuracy in the range of 0...70 °C | ± 1 K |
| | –40...+120 °C | ± 1.4 K |
| | Output signal, linear (terminal X1: QAE2164.xxx) | DC 0...5 V, DC 0...10 V $\hat{=}$ –10...+120 °C (factory setting) or 0...100 °C or 0...70 °C, max. ± 1 mA 4...20 mA $\hat{=}$ –10...+120 °C (factory setting) or 0...100 °C or 0...70 °C, max. ± 1 mA, max. 500 Ohm |
| | Output signal, linear (terminal I1: QAE2174.xxx) | 4...20 mA $\hat{=}$ –10...+120 °C (factory setting) or 0...100 °C or 0...70 °C |
| | Burden | refer to "Function" |
| | Nominal pressure | PN 16 |
| Degree of protection | Protection degree of housing | IP54 according to EN 60529 |
| | Protection class | III according to EN 60730-1 |
| Electrical connections | Connection terminals for | 1 x 2.5 mm ² or 2 x 1.5 mm ² |
| | Cable entry gland (enclosed)) | M 16 x 1.5 |
| Environmental conditions | Operation | IEC 721-3-3 |
| | Climatic conditions | class 3K5 |
| | Temperature (housing) | –40...+70 °C |
| | Humidity (housing) | 5...95 % r.h. |
| | Transport | IEC 721-3-2 |
| | Climatic conditions | class 2K3 |
| | Temperature | –25...+70 °C |
| | Humidity | <95 % r.h. |
| | Mechanical conditions | class 2M2 |

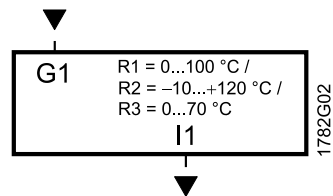
| | | |
|-----------------------------|---|--|
| Materials and colors | Base | polycarbonate, RAL 7001 (silver-grey) |
| | Cover | polycarbonate, RAL 7035 (light-grey) |
| | Immersion rod | stainless steel to DIN 17 440 steel 1.4571 |
| | Cable entry gland | PA, RAL 7035 (light-grey) |
| Directives and Standards | Packaging | corrugated cardboard |
| | Product standard | EN 60730-1 Automatic electrical controls for household and similar use |
| | Electromagnetic compatibility (Applications) | For use in residential, commerce, light-industrial and industrial environments |
| | EU Conformity (CE) | CE1T1782xx *) |
| | RCM Konformität | 8000078879 *) |
| | UL | UL 873, http://ul.com/database |
| | UKCA | A5W00188720A *) |
| Environmental compatibility | The product environmental declaration CE1E1762*) contains data on environmentally compatible product design and assessments (RoHS compliance, materials composition, packaging, environmental benefit, disposal). | |
| Weight | Incl. packaging | |
| | QAE2164.010 | approx. 0.14 kg |
| | QAE2164.015 | approx. 0.16 kg |
| | QAE2174.010 | approx. 0.14 kg |
| | QAE2174.015 | approx. 0.16 kg |

*) The documents can be downloaded from <http://siemens.com/bt/download>.

QAE2164...

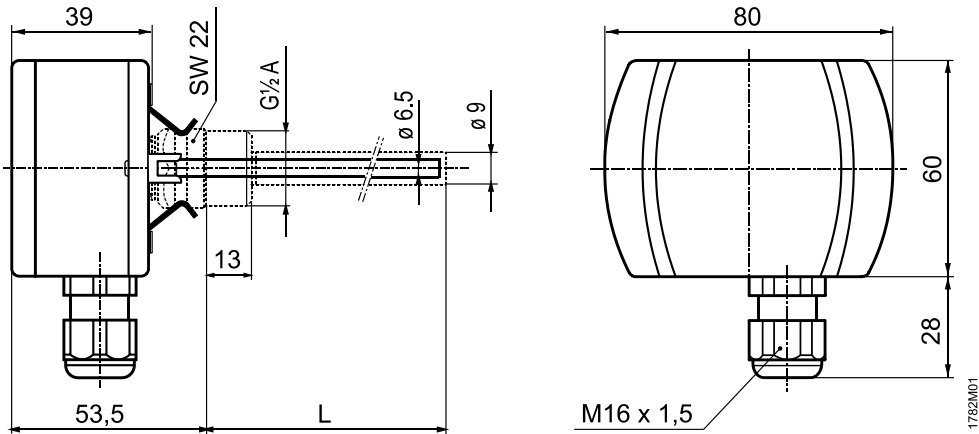


QAE2174...



- | | |
|-------|--|
| G, G0 | Operating voltage AC 24 V (SELV) or DC 13.5...35 V |
| G1 | Operating voltage DC 13.5...35 V |
| I1 | Signal output 4...20 mA for measuring range -10...+120 °C (factory setting), 0...100 °C or 0...70 °C |
| X1 | Signal output DC 0...5 V, DC 0...10 V, 4...20 mA for measuring range -10...+120 °C (factory setting), 0...100 °C or 0...70 °C |

Dimensions



| Type | L |
|-------------|-----|
| QAE2164.010 | 100 |
| QAE2164.015 | 150 |
| QAE2174.010 | 100 |
| QAE2174.015 | 150 |

Dimensions in mm

Issued by
Siemens Switzerland Ltd
Smart Infrastructure
Global Headquarters
Theilerstrasse 1a
CH-6300 Zug
Tel. +41 58 724 2424
www.siemens.com/buildingtechnologies