



Symaro™

## Immersion Temperature Sensors

## QAE21...

Passive sensors for acquiring the water temperature in pipes and tanks.

### Use

The QAE21... immersion temperature 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	Nominal pressure	Sensing element	Degree of protection
QAE2110.010	Including protection pocket with threaded nipple G ½ A	100 mm	PN 10	Pt 100	IP 54
QAE2110.015	Including protection pocket with threaded nipple G ½ A	150 mm	PN 10	Pt 100	IP 54
QAE2111.015	With clamp for protection pocket <sup>1)</sup>	150 mm	PN <sup>4)</sup>	Pt 100	IP 42 (IP 54) <sup>3)</sup>
QAE2112.015	With clamp for protection pocket <sup>1)</sup>	150 mm	PN <sup>4)</sup>	Pt 1000	IP 42 (IP 54) <sup>3)</sup>
QAE2120.010	Including protection pocket with threaded nipple G ½ A	100 mm	PN 10	LG-Ni 1000	IP 42 (IP 54) <sup>3)</sup>
QAE2120.015	Including protection pocket with threaded nipple G ½ A	150 mm	PN 10	LG-Ni 1000	IP 42 (IP 54) <sup>3)</sup>
QAE2121.010	With clamp for protection pocket <sup>1)</sup>	100 mm	PN <sup>4)</sup>	LG-Ni 1000	IP 42 (IP 54) <sup>3)</sup>
QAE2122.013	Including compression fitting with threaded nipple G ½ A	max. 130 mm <sup>2)</sup>	PN 16	LG-Ni 1000	IP 42 (IP 54) <sup>3)</sup>
QAE2140.010	Including protection pocket with threaded nipple G ½ A	100 mm	PN 10	T1	IP 42 (IP 54) <sup>3)</sup>

1) Protection pocket required

2) Adjustable immersion length

3) IP 54 with cable entry gland M16 (not included as standard)

4) Depending on the type of protection pocket used

## Ordering

When ordering, please give name and type reference, e.g. :

Immersion temperature sensor **QAE2120.010** or protection pocket **ALT-SS100**

## Equipment combinations

All systems or devices capable of acquiring and handling the sensor's passive Pt 100, Pt 1000, LG-Ni 1000 or T1 output signal.

## Function

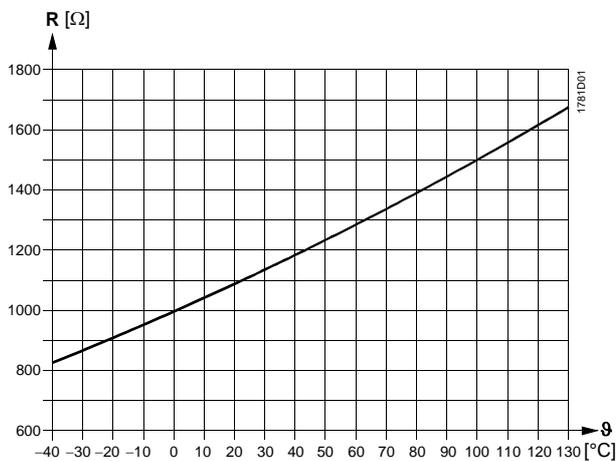
The sensor acquires the medium temperature via its sensing element whose resistance value changes as a function of the temperature.

The signal is delivered for further handling by a suitable controller.

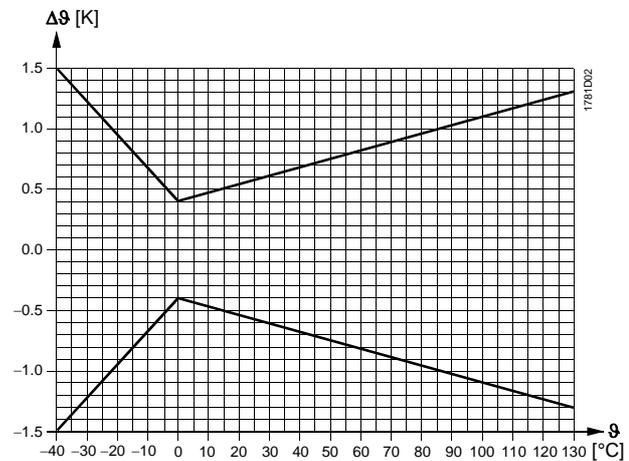
## Sensing elements

### LG-Ni 1000

#### Characteristic

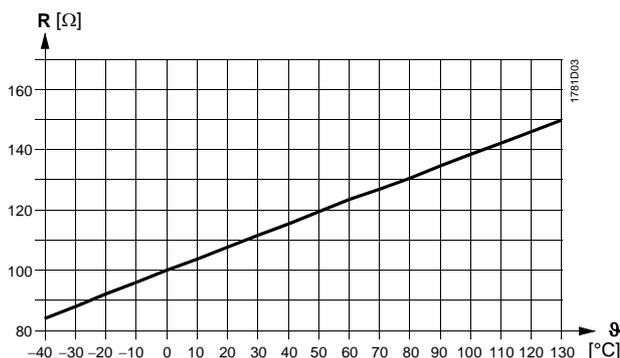


#### Accuracy

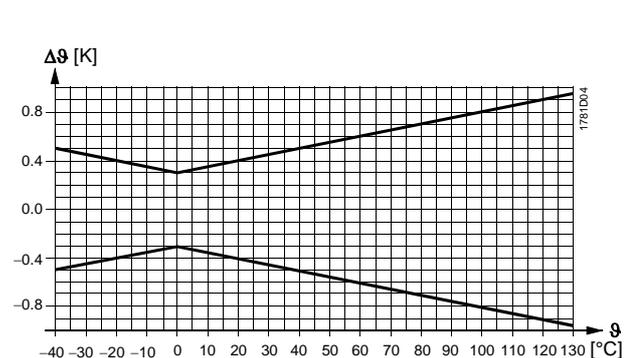


### Pt 100 (class B)

#### Characteristic

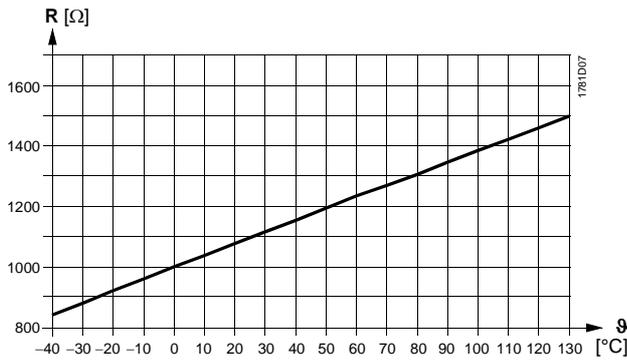


#### Accuracy

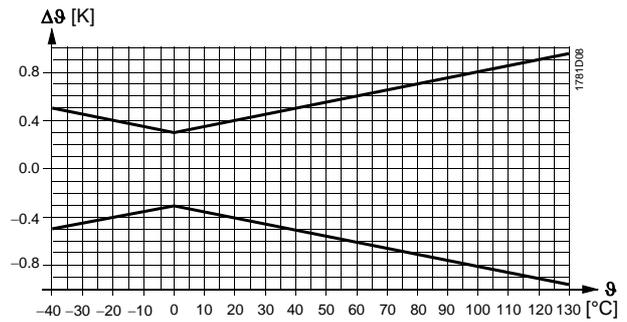


Pt 1000 (class B)

Characteristic

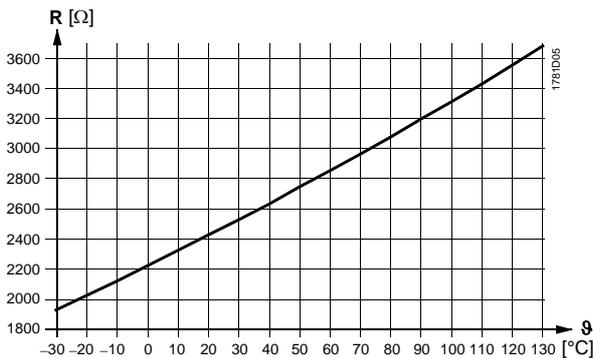


Accuracy

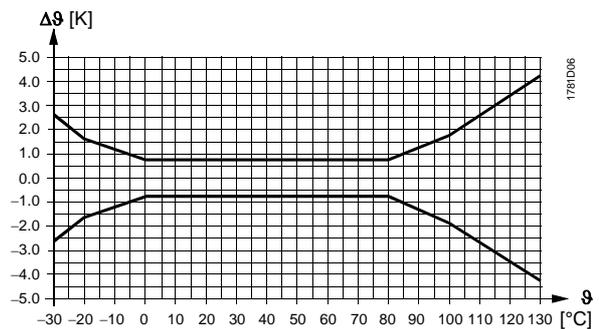


T1 (PTC)

Characteristic



Accuracy



Legend

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

Mechanical design

The immersion temperature sensors consist of the following components:

- Two-sectional plastic housing comprised of base with connection terminals and removable cover (snap-on design)
- Immersion rod complete with sensing element

The connection terminals can be accessed after removing the cover. With the QAE2110.010 and QAE2110.015, cable entry is made via a cable entry gland M16. With the other types of sensors, cable entry is via a grommet which, if required, can be replaced by a cable entry gland M16 (IP 54).

Accessories (not included in standard delivery)

Name	Material	Nominal pressure	Type of sealing	Immersion length	Type reference
Compression fitting	V4A (1.4571)	PN 16	Threaded with sealing means	---	<b>AQE2102</b>
Protection pocket	Brass (CuZn37)	PN 10	Threaded with sealing means	100 mm	<b>ALT-SB100</b>
Protection pocket	Brass (CuZn37)	PN 10	Threaded with sealing means	150 mm	<b>ALT-SB150</b>
Protection pocket	V4A (1.4571)	PN 16	Threaded with sealing means	100 mm	<b>ALT-SS100</b>
Protection pocket	V4A (1.4571)	PN 16	Threaded with sealing means	150 mm	<b>ALT-SS150</b>
Protection pocket	V4A (1.4571)	PN 40	With flange for flat seal	100 mm	<b>ALT-SSF100</b>
Protection pocket	V4A (1.4571)	PN 40	With flange for flat seal	150 mm	<b>ALT-SSF150</b>

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

If the nominal pressure exceeds PN10 or the medium temperature exceeds 130 °C, a protection pocket made of stainless steel (V4A) is required.

Mounting and installation notes

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

- For flow temperature control:
  - In the 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.

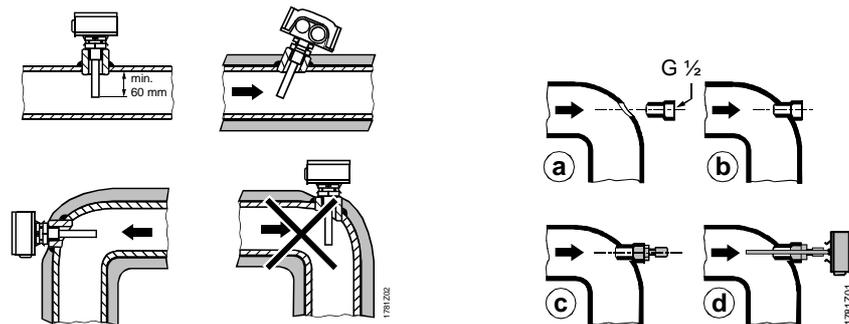
The sensor should be mounted such that the cable does not enter from the top.

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



Note!

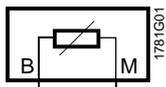
- For sensors with non-sealing threaded nipples G ½, sealing means must be used with the threaded connection (e.g. hemp, Teflon tape or similar)
- Tighten compression fitting of the QAE2122.0130 on the sensor's immersion rod
  - *When tightening for the first time:*  
Turn the nut about 1 ½ turns until strong resistance is felt. Then, slightly loosen the nut again and retighten ¼ turn
  - *For premounted compression fittings or repeated fitting:*  
Screw the nut on until finger-tight. Then, tighten with a spanner ¼ turn for the final fit

Mounting Instructions are printed on the packaging.

## Technical data

Functional data	Measuring range	-30...+130 °C	
	Sensing element	refer to "Type summary"	
	Time constant		
	With protection pocket	approx. 30 s	
	Without protection pocket	approx. 8 s	
	Measuring accuracy	refer to "Function"	
Protective data	Immersion length	refer to "Type summary"	
	Nominal pressure	refer to "Type summary"	
	Degree of protection of housing	refer to "Type summary"	
	Safety class	III to EN 60 730	
	Electrical connections	Screw terminals for	1 x 2.5 mm <sup>2</sup> or x 1.5 mm <sup>2</sup>
		Cable entry via	
Grommet		for 5.5...7.2 mm dia. cable	
Cable entry gland	M 16 x 1.5		
Environmental conditions	Perm. cable lengths	refer to Data Sheet of controller	
	Operation	to IEC 721-3-3	
	Climatic condition	class 3K5	
	Temperature (housing)	-40...+70 °C	
	Humidity (housing)	5...95 % r.h.	
	Transport	to EC 721-3-2	
Climatic condition	class 2K3		
Temperature	-25...+70 °C		
Humidity	<95 % r.h.		
Mechanical environmental 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	
	Protection pocket	brass (CuZn37)	
	Compression fitting	stainless steel 1.4404, 1.4435, 1.4571	
	Cable entry gland M 16 x 1.5	PA, RAL 7035 (light-grey)	
Weight	Packaging	corrugated cardboard	
	Incl. packaging		
	QAE2110.010	approx. 0.21 kg	
	QAE2110.015	approx. 0.23 kg	
	QAE2111.015	approx. 0.15 kg	
	QAE2112.015	approx. 0.15 kg	
	QAE2120.010	approx. 0.21 kg	
	QAE2120.015	approx. 0.23 kg	
	QAE2121.010	approx. 0.13 kg	
	QAE2122.013	approx. 0.19 kg	
QAE2140.010	approx. 0.21 kg		

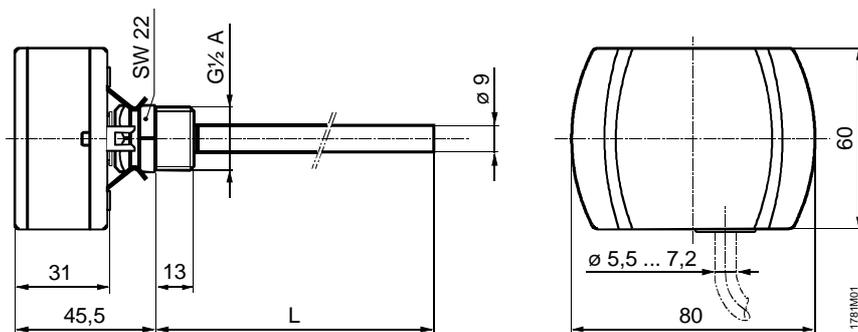
**Internal diagram**



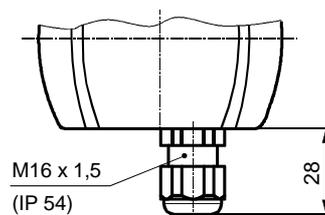
The internal diagram is identical for all types of immersion temperature sensors covered by this Data Sheet.  
The connecting wires are interchangeable.

**Dimensions (in mm)**

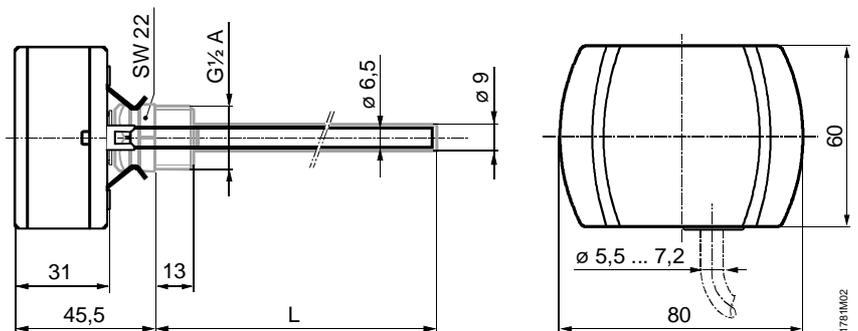
- QAE2110.010**
- QAE2111.015**
- QAE2120.010**
- QAE2120.015**
- QAE2140.010**



Typ	L
QAE2110.010	100 mm
QAE2110.015	150 mm
QAE2120.010	100 mm
QAE2120.015	150 mm
QAE2140.010	100 mm



- QAE2111.015**
- QAE2121.010**
- QAE2112.015**



Typ	L
QAE2111.015	150 mm
QAE2121.010	100 mm
QAE2112.015	150 mm

- QAE2122.013**

