

Symaro™

Immersion temperature sensors

QAE3174..., QAE3176...



Immersion temperature sensors

- Active sensors to acquire the water temperature in pipes and tanks
- Operating voltage DC 13.5...35 V
- Signal output 4...20 mA

Use

The sensors are used in ventilation and air conditioning plants to:

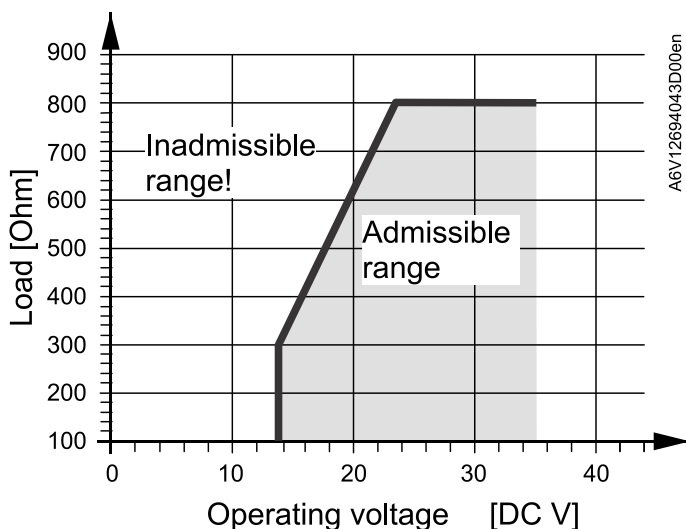
- Control or limit flow temperature
- Limit return temperature
- Control DHW temperature

Functions

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 4...20 mA output signal, depending on the type of sensor. The output signal corresponds to the selected temperature range.

Load diagram

Output signal, terminal I1



Mechanical design

The immersion temperature sensor consists of housing, printed circuit board, connection terminals and immersion rod.

The 2-sectional housing comprises a base and a screwed removable cover. The measuring circuit and the setting element are located on the printed circuit board inside the cover, the connection terminals on the base.

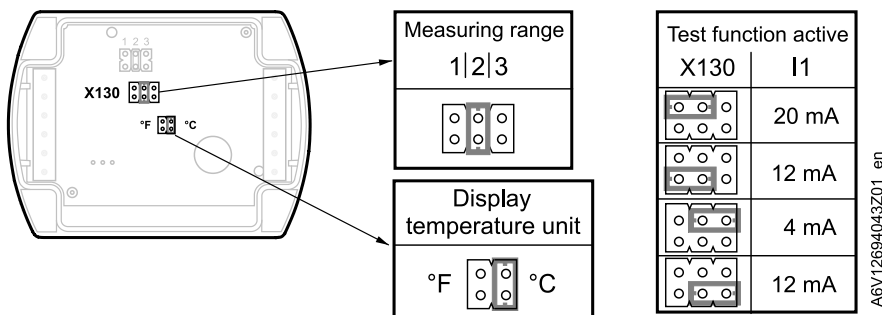
Cable entry is made via the M16 cable entry gland (IP65) supplied with the sensor which can be screwed into the housing. Immersion rod and housing are rigidly connected.

Measured value display

The following measured value is displayed:

- Temperature: in °C or °F

Setting element



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

The different jumper positions indicate the following:

- Temperature measuring range:
Jumper, left position (R1) = 0...70 °C,
Jumper, middle position (R2) = -40...+120 °C (factory setting),
Jumper, right position (R3) = Reserved
- Active test function:
Jumper, horizontal position: The values according to table "Test function active" are provided at the signal output.
- Measured value display:
Jumper, vertical, right position = °C (factory setting)
Jumper, vertical, left position = °F

Fault

In the event of fault, the output signal reaches 4 mA after 60 seconds. The LCD displays **FAIL**.

Type summary

Product number	SSN NO.	Operating voltage	Temperature measuring range	Immersion length	Outfit	Output signal
QAE3174.010	S55720-S537	DC 13.5...35 V	0...70 °C -40...+120 °C	100 mm	With clamp for protection pocket ¹⁾	4...20 mA
QAE3174.015	S55720-S538	DC 13.5...35 V	0...70 °C -40...+120 °C	150 mm	With clamp for protection pocket ¹⁾	4...20 mA
QAE3174D.010	S55720-S547	DC 13.5...35 V	0...70 °C -40...+120 °C	100 mm	With clamp for protection pocket ¹⁾	4...20 mA
QAE3174D.015	S55720-S548	DC 13.5...35 V	0...70 °C -40...+120 °C	150 mm	With clamp for protection pocket ¹⁾	4...20 mA
QAE3176.010	S55720-S539	DC 13.5...35 V	0...70 °C -40...+120 °C	100 mm	With clamp for protection pocket ¹⁾	4...20 mA
QAE3176.015	S55720-S540	DC 13.5...35 V	0...70 °C -40...+120 °C	150 mm	With clamp for protection pocket ¹⁾	4...20 mA

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

Ordering and delivery

When ordering, specify name and product number, e.g.: Immersion temperature sensor QAE3174.010.

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	---	AQE2102
Protection pocket	Brass (CuZn37)	PN 10	Threaded with sealing means	100 mm	ALT-SB100
Protection pocket	Brass (CuZn37)	PN 10	Threaded with sealing means	150 mm	ALT-SB150
Protection pocket	V4A (1.4571)	PN 16	Threaded with sealing means	100 mm	ALT-SS100
Protection pocket	V4A (1.4571)	PN 16	Threaded with sealing means	150 mm	ALT-SS150
Protection pocket	V4A (1.4571)	PN 40	With flange for flat seal	100 mm	ALT-SSF100
Protection pocket	V4A (1.4571)	PN 40	With flange for flat seal	150 mm	ALT-SSF150

Equipment combinations

All systems or devices capable of acquiring and handling the sensor's 4...20 mA output signal.

Notes

Engineering

If 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.

Powering the sensor requires a transformer for safety extra-low-voltage (SELV) with separate windings for 100 % duty. When sizing and protecting the transformer, comply with all local safety regulations.

When sizing the transformer, consider the sensor's power consumption.

For correct wiring, see the related device data sheets.

Observe all permissible line lengths.

Cable routing and cable selection

Note that when routing cables, the longer the cable runs and the closer the cables, the greater electrical interference. Use shielded cables in EMC-prone environments.

Twisted pair cables are required for both secondary supply lines and signal lines.

Mounting

Depending on use, install the sensor as follows:

- For flow temperature control (heating flow):
 - Directly after the pump if the pump is in the flow
 - 1.5 to 2 m after the mixing valve if the pump is in the return
- For return temperature limitation:
 - In the return where the temperature can be correctly acquired

Install the sensor in an elbow so 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 behind the mixing point.

Mount the sensor so that the cable does not enter from the top.

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

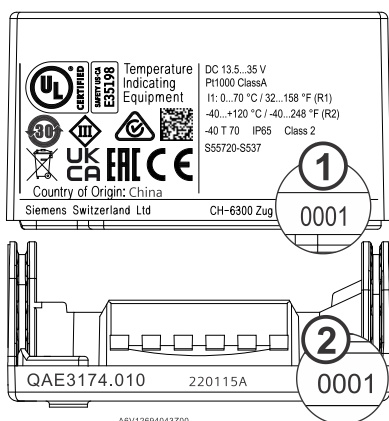
The sensor must not be covered by lagging.

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

NOTICE

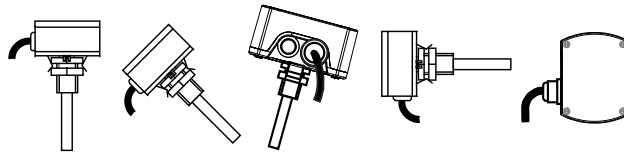


Make sure the cover housing is installed on the corresponding base (same printed number locates at ① ②) during mounting. Otherwise, accuracy may be affected.



Mounting positions

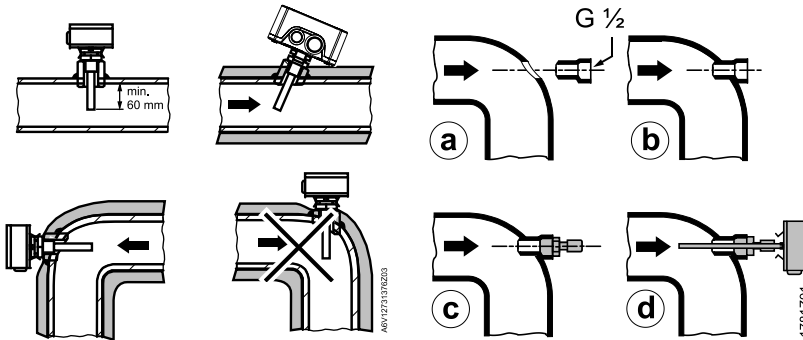
permitted:



not permitted:



Mounting



Note!

For sensors with non-sealing threaded nipples G 1/2, use sealing means with threaded connection (e.g. hemp, Teflon tape or similar).

Mounting instructions

Mounting instructions are provided in the packaging.

Disposal



The device is considered an electronic device for disposal in accordance with European Directive and may not be disposed of as domestic waste.

- Use only designated channels for disposing the devices.
- Comply with all local and currently applicable laws and regulations.

Warranty

Technical data on specific applications are valid only together with Siemens products listed under "Equipment combinations". Siemens rejects any and all warranties in the event that third-party products are used.

Power supply	
Operating voltage	DC 13.5...35 V or DC 24 V class 2 (US)
External supply line protection	Fuse slow max. 10 A or Circuit breaker max. 13 A Characteristic B, C, D as per EN 60898 or Power source with current limitation of max. 10 A
Power consumption	< 0.7 W

Functional data	
Temperature sensor	
Measuring range	-40...+120 °C (R2 = factory setting) 0...70 °C (R1)
Measuring accuracy @20 °C in the range of 0...70 °C -40...+120 °C	±0.2 K ±1 K ±1.4 K
Time constant With pocket Without pocket	30 s at 2 m/s 8 s at 2 m/s
Immersion length	See Type summary [► 3]
Sensing element	Pt 1000 class A to DIN EN 60 751
Output signal, linear (terminal I1: Load	4...20 mA $\hat{=}$ -40...+120 °C (factory setting) or 0...70 °C See Functions [► 2]
Nominal pressure	PN 16

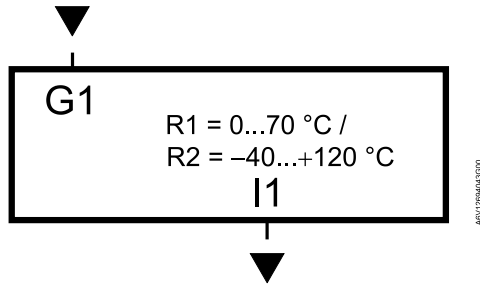
Ambient conditions and protection classification	
Protection degree of housing	IP65 as per EN 60529
Protection class	III as per EN 60730-1
Environmental conditions Transport Climatic conditions Temperature Humidity Mechanical conditions Operation Climatic conditions Temperature (housing) No LCD LCD-display readable Humidity (housing)	 -25...+70 °C < 95 % r.h. Class 2M2 -40...+70 °C -25...+70 °C 5...95 % r.h.

Standards, directives and approvals	
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 conformity	A5W00205393A *)
UL	UL 873, http://ul.com/database
UKCA	A5W00204748A *)
Environmental compatibility	The product environmental declaration (A5W00193763A *) contains data on environmentally compatible product design and assessments (RoHS compliance, materials composition, packaging, environmental benefit, disposal).

General	
Cable lengths for measuring signals Max. perm. cable lengths	See data sheet of the device handling the signal
Electrical connections screw terminals	1 × 2.5 mm ² or 2 × 1.5 mm ²
Cable entry gland (enclosed)	M 16 × 1.5
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)
Packaging	Corrugated cardboard
Weight including packaging QAE3174.010 QAE3174.015 QAE3174D.010 QAE3174D.015 QAE3176.010 QAE3176.015	Approx. 181 g Approx. 187 g Approx. 193 g Approx. 199 g Approx. 181 g Approx. 187 g

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

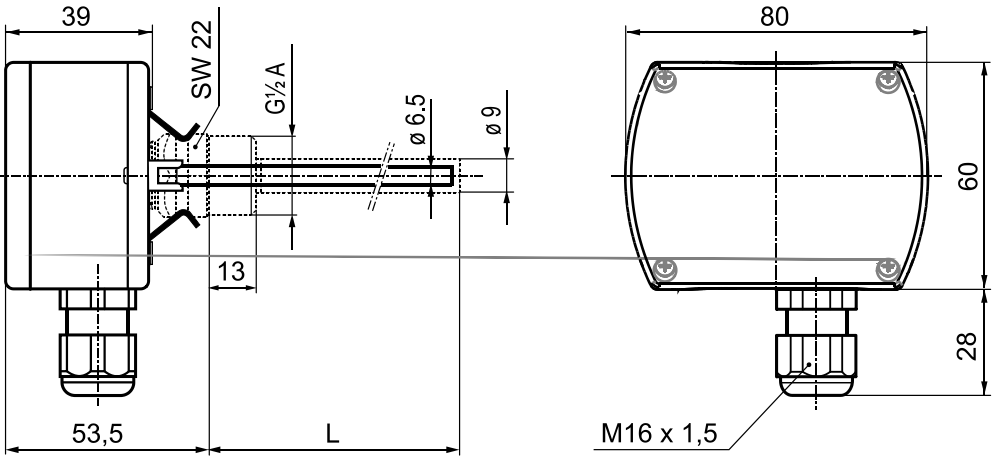
Connection terminals



G1 Operating voltage DC 13.5...35 V

I1 Signal output 4...20 mA for measuring range -40...+120 °C (factory setting) or 0...70 °C

Dimensions



Type	L
QAE3174.010	100
QAE3174.015	150
QAE3174D.010	100
QAE3174D.015	150
QAE3176.010	100
QAE3176.015	150

Dimensions in mm

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