

Room sensor

QFA66

for relative humidity and temperature

- Operating voltage AC 24 V
- Output signals DC 0...10 V for relative humidity and temperature
- Very high measuring accuracy throughout the entire measuring range
- Capacitive humidity measurement

Use

The QFA66 sensor is used in ventilation and air conditioning plants requiring very high accuracy and short response times for measuring relative humidity. At the same time, the measuring range must cover the entire humidity range of 0...100 %.

Examples:

- storage and production facilities in the paper, textiles, pharmaceutical, food, chemical, electronics industries, etc.
- laboratories
- hospitals
- computer centres
- greenhouses
- with the AQF21.1 accessory for exterior applications¹⁾

1) Acquiring the outside air temperature is restricted; refer to "Technical data"

Accessories

Name	Type
Exterior wall mounting set with radiation shield	AQF21.1

Ordering

Room sensor and exterior wall mounting set must be ordered separately. Please indicate name and type designation when ordering, for example: Room sensor **QFA66**.

Equipment combinations

All systems/devices that can acquire and process the sensor's DC 0...10 V output signals.

Technical design

Relative humidity

The sensor senses relative humidity via a capacitive humidity sensing element whose capacitance varies according to the relative humidity of the ambient air. An electronic circuit converts the sensor's signal to a continuous DC 0...10 V signal, corresponding to a relative humidity of 0...100 %.

Temperature

The sensor senses the temperature via the Pt1000 thin-film measuring element whose electrical resistance varies according to the temperature of the ambient air. This variation is converted to two mutually independent DC 0...10 V signals. One signal corresponds to the 0...50 °C temperature range, the other to the -35...+35 °C range.

Mechanical design

Room sensor QFA66

The room sensor comprises a housing with removable cover and measuring rod. Both housing and rod are made of plastic and are inseparably connected to each other. A rubber seal is installed between the housing and the cover in order to satisfy the requirements of the IP 65 degree of protection for enclosures. The sensing elements are installed in the end of the measuring rod, protected by a screw-on cap with a Coretex filter. The housing accommodates a circuit board with the sensor electronics and connection terminals. The cables are connected via a cable gland screwed to the top of the housing.

The sensor is designed for wall mounting.

AQF21.1 accessories

The AQF21.1 accessories comprise a transmitter mount with mounted radiation shield, a mounting bracket, 4 fillister head screws M4x8 for room sensor mounting, 2 phillips screws of dia. 4,2x38, and 2 S6 dowels for wall mounting.

Exterior wall mounting of the sensor is possible in combination with the QFA66 room sensor. The measuring rod of the QFA66 is thus protected from direct solar radiation and from precipitation. Additionally, forced ventilation prevents heating up of the measuring rod head and resultant false measurements.

Engineering notes

Use a safety extra-low voltage (SELV) transformer with separate windings designed for 100% duty. All mandatory safety guidelines valid at the plant location must be applied to sizing and protecting the transformer.

The connection of the sensor is described in the data sheets of the devices to which it is to be connected (connection for active sensors).

The maximum permissible cable lengths are mandatory.

Fitting notes

Interior mounting

QFA66 without AQF21.1

Mounting location

Mount the sensor on an inside wall (not an outside wall!) of the room to be air conditioned; not in a recess, between shelves, behind curtains, above or close to heat sources; not on walls behind which a flue or chimney is located.

Do not expose the device to solar radiation.

Install the sensor in the occupied area at an approximate height of 1.5 m and at least 50 cm from the next wall.

Caution!

The measuring rod's sensing elements are sensitive to impact. Avoid any such impact on mounting.

Orientation

Do not mount the QFA66 with the measuring rod pointing upward.

Mounting instructions

Mounting instructions are enclosed with the sensor.

Exterior wall mounting

QFA66 with AQF21.1

Mounting location

Exterior wall, preferably on the North or Northwestern side of the building; centre the device on the wall, at least 2.5 m above ground.

Do not mount above or below windows, above doors or ventilation shafts, below balconies or rain gutters.

Orientation

The QFA66 with AQF21.1 must only be mounted in a vertical position (radiation shield on top). Any other orientation is not permitted.

Mounting instructions

Mounting instructions are enclosed with the AQF21.1.

Commissioning notes

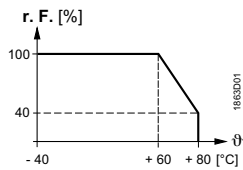
Perform a wiring check on commissioning.

The settings required for control, compensation, and limitation are made at the devices to which the QFA66 sensor is connected.

Do not attempt to make adjustments to the sensor.

Technical data

Humidity sensor



Measuring accuracy at 20 °C in the range of 0...90 % r. h.	±2 % r. h.
in the range of 90...100 % r. h.	±3 % r. h.
Temperature dependence in the range of -10...+50 °C	<0,05 % r. h./°C
Reduction of the humidity measuring range above 60 °C at the sensor head	see graphic to the left
Time constant t_{90}	ca. 20 s

Temperature sensor

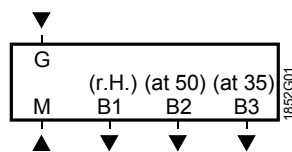
Sensing element	Pt1000 Class A
Measuring accuracy at 20 °C	±0.3 K
Time constant t_{63}	ca. 20 s

General device data

Power supply	Operating voltage (SELV)	AC 24 V ±20 %
	Frequency	50/60 Hz
	Power consumption	≤1 VA
Output signals	Humidity (terminal B1)	
	Voltage	DC 0...10 V \cong 0...100 % r. h.;
	Current	max. ±1 mA
	Temperature (terminal B2)	
	Voltage	DC 0...10 V \cong 0...50 °C;
	Current	max. ±1 mA
	Temperature (terminal B3)	
	Voltage	DC 0...10 V \cong -35...+35 °C;
	Current	max. ±1 mA
Cable lengths for the measuring signals	Perm. cable lengths with	
	0.6 mm dia. copper cable	50 m
	1 mm ² copper cable	150 m
	1.5 mm ² copper cable	300 m
Electrical connections	Terminals	screw terminals, max. 2 x 1,5 mm ²
Protective data	Safety class	III to EN 60 730
	Degree of protection of housing	IP 65 to EN 60 529
Environmental conditions	Operation	to IEC 721-3-3
	Climatic conditions	
	Temperature	
	Housing and electronics	-20...+60 °C ¹⁾
	Sensor head	-40...+80 °C ¹⁾
	Humidity	0...100 % r. h.
	Transport	to IEC 721-3-2
	Climatic conditions	class 2K3
	Temperature	-25...+70 °C
	Humidity	<95 % r. h.
	Mechanical conditions	class 2M2

Material and colors	QFA66		
	Housing cover	Polycarbonat, RAL 7035 (light grey)	.
	Measuring rod (sensor sleeve)	Polycarbonat, RAL 7001 (silver grey)	.
	Screw-on cap (filter cap)	Polycarbonat, RAL 5014 (pigeon blue)	.
	Housing bottom	Polycarbonat, RAL 7001 (silver grey)	.
	Cable gland screwed	Polyamid, RAL 7001 (silver grey)	.
	AQF21.1		.
	Mounting bracket, transmitter mount	powder coated thin sheet, RAL 7035 (light grey)	.
	Radiation shield	Polyamid, RAL 9003 (signal withe)	.
	Packaging		.
	Folded bottom box	corrugated cardboard	.
	Sensor and Accessories (entirely)	silicon-free	.
Norms and standards	Electromagnetic compatibility		
	Emmissions	EN 50 081-1	
	Immunity	EN 50 082-1	
	CE conformity to EMC directive	89/336/EEC	
Wight without (incl.) packing	QFA66	0.146 kg (0.260 kg)	.
	AQF21.1	0.317 kg (0.438 kg)	.

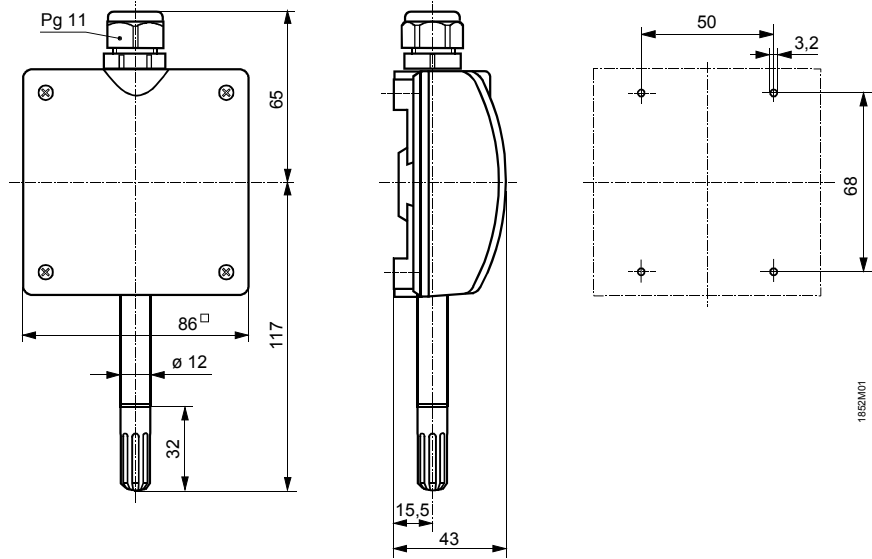
Connection terminals



G	System potential AC 24 V (safety extra-low voltage SELV)
M	System ground, measuring ground
B1	Output, DC 0...10 V measuring signal for relative humidity 0...100 %
B2	Output, DC 0...10 V measuring signal for temperature 0...50 °C
B3	Output, DC 0...10 V measuring signal for temperature -35...+35 °C

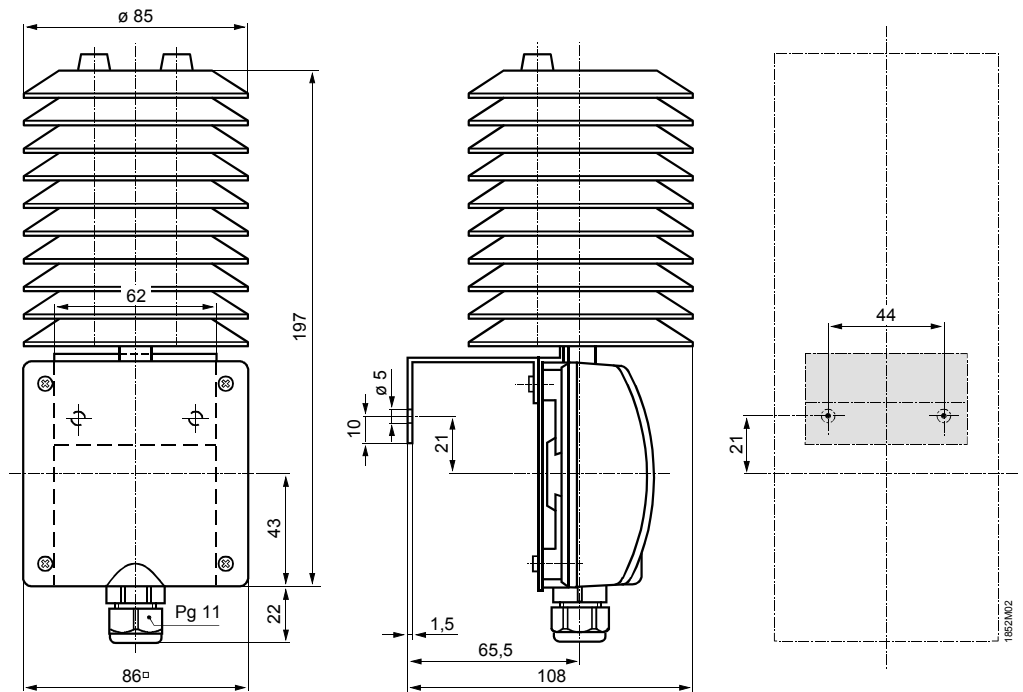
Dimensions

QFA66



1852M01

QFA666 with AQF21.1



1852M02

Dimensions in mm