

Room sensor

for relative humidity and temperature
with calibration certificate

QFA66/C



**Operating voltage AC 24 V, output signals DC 0...10 V,
very high measuring accuracy throughout the entire measuring range,
capacitive humidity measurement,
recalibration service**

Use

The QFA66/C sensor is used in ventilation and air-conditioning plants requiring:

- very high accuracy and reliability for measuring relative humidity and temperature,
- regular recalibration and readjustment of the sensors

Examples:

- storage and production facilities in the paper, textiles, pharmaceutical, chemical, electronics industries, etc.
- laboratories
- hospitals
- computer centres
- greenhouses

Ordering and delivery

Indicate device name and type designation on order: Room Sensor **QFA66/C**.
The coupling of the circular connector (Lumberg RKC 50/11) is delivered uninstalled.

Equipment combinations

All systems and controllers 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 measuring 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	<p>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.</p>
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Mechanical design	<p>The room sensor comprises a housing with a removable cover and an immersion sensor stem. The housing and stem are made of plastic and are inseparably connected to each other. A rubber seal is installed between the housing and cover in order to satisfy the requirements of the IP 65 degree of protection.</p> <p>The sensing elements are installed in the end of the stem, protected by a screw-on cap with a Coretex filter.</p> <p>The housing accommodates a circuit board with the sensor electronics and connection terminals. The cable is connected via a circular connector with a screwed plug. The connector consists of a built-in plug with Pg 11 screw connection and a coupling with a screw fastening. The built-in plug is installed on the housing and electrically connected inside. The coupling is enclosed in the package.</p> <p>The sensor is designed for wall mounting.</p>
Calibration certificate	<p>The sensor is serialised, registered and calibrated before delivery. The corresponding calibration certificate is enclosed.</p>
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Engineering notes	<p>Use a safety extra-low voltage (SELV) transformer with separate windings designed for 100 % duty.</p> <p>The mandatory safety specifications at the plant location shall apply to sizing and protecting the transformer.</p> <p>The connection of the sensor is described in the data sheets of those devices it is to be connected to (connection of active sensors).</p> <p>The maximum permissible cable lengths are mandatory.</p>
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Installation notes	
Location	<p>Install on an inside wall (NOT an outside wall) of the room to be air-conditioned; not in a recess, between shelves, behind curtains or furniture, above or close to heat sources; not on a wall behind which a flue or fireplace is located.</p> <p>Do not expose the device to solar radiation.</p> <p>Install the sensor in the occupied area at an approximate height of 1.5 m and at least 50 cm from the next wall.</p>
<i>Caution!</i>	<p>The measuring rod's sensing elements are sensitive to impact. Avoid any such impact on mounting.</p>
Orientation	<p>Do not install the device with the immersion sensor stem pointing upwards.</p>
Installation instructions	<p>Installation instructions are enclosed with the sensor.</p>
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Commissioning notes	<p>Perform a wiring check on commissioning. The settings required for air conditioning control, compensation and limitation are made at the devices to which the QFA66/C sensor is connected. Do not attempt to make adjustments to the sensor.</p>
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Recalibration service	<p>Landis & Staefa provides a recalibration service¹⁾ for used sensors.</p> <p>The recalibration should be performed at 12 month intervals under "normal" conditions, i.e. within the comfort range for humidity and temperature, and at air contamination levels that are not above average.</p> <p>(Re)calibrated sensors should not be stored longer than 12 months before commissioning.</p> <p>Recalibration or readjustment with repair can be refused if a sensor is more than 10 years old and in poor condition.</p>

Services provided

The recalibration service¹⁾ includes the following:

- Calibration²⁾ with recording of values for humidity (B1) and temperature 0...50 °C (B2)
- Sensor test, including repair and replacement of wear parts; filter every time, sensor elements if required.
- If necessary, readjustment³⁾ and repeat calibration
- Issue and enclosure of a new calibration certificate
- Shipping and registration (the customer gets the same sensor back)

1) The recalibration service is performed and billed under the designation S/QFA66/C

2) The test candidate is connected to a measurement standard. Any deviations found are recorded but not corrected. Calibration is performed at three points for humidity and temperature.

3) The test candidate is connected to a measurement standard. Any deviations found are corrected.

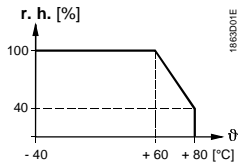
Technical data

General device data

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 $\hat{=}$ 0...100 % r. h.;
Current	max. ±1 mA
Temperature (terminal B2)	
Voltage	DC 0...10 V $\hat{=}$ 0...50 °C;
Current	max. ±1 mA
Temperature (terminal B3)	
Voltage	DC 0...10 V $\hat{=}$ -35...+35 °C;
Current	max. ±1 mA
Permissible cable lengths	
Copper cable 0,6 mm dia.	50 m
Copper cable 1,0 mm ²	150 m
Copper cable 1,5 mm ²	300 m
Insulation class	III as per EN 60 730
Degree of protection provided by enclosure	IP 65 as per EN 60 529
Environmental conditions	
Operation as per	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.
Transportation as per	IEC 721-3-2
Climatic conditions	Class 2K3
Temperature	-25...+70 °C
Humidity	<95 % r.h.
Mechanical conditions	Class 2M2
Electromagnetic compatibility	
Emissions	EN 50 081-1
Immunity	EN 50 082-1
CE conformity to EMC directive	89/336/EEC
Service life	10 years
Material	
Housing	PC
Cable gland	Poliamid
Colour	
Housing cover	RAL 7035 (light grey)
Housing bottom, measuring rod, cable gland	RAL 7001 (silver)
Filter cap and device labelling	RAL 5014 (pigeon blue)
Weight	approx. 0.136 kg

1) Temperature range limitations in the additional specifications are mandatory.

Humidity sensor



Measuring accuracy at 20 °C
 in the range 0...90 % r.h.
 in the range 90...100 % r.h.

Temperature dependency
 in the range -10...+50 °C

Reduction of the humidity measuring range
 at temp. above 60 °C at sensor head

Time constant t_{90}

±2 % r.h.

±3 % r.h.

<0,05 % r.h./°C

see illustration in margin
 approx. 20 s

Temperature sensor

Sensing element

Measuring accuracy in the range 20 °C

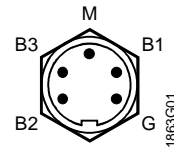
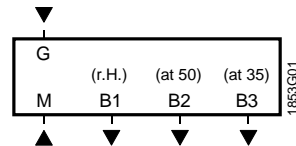
Time constant t_{63}

Pt1000 Class A

±0,3 K

ca. 20 s

Connection terminals



Front view:
 Built-in plug

G System potential AC 24 V (safety extra-low voltage SELV)

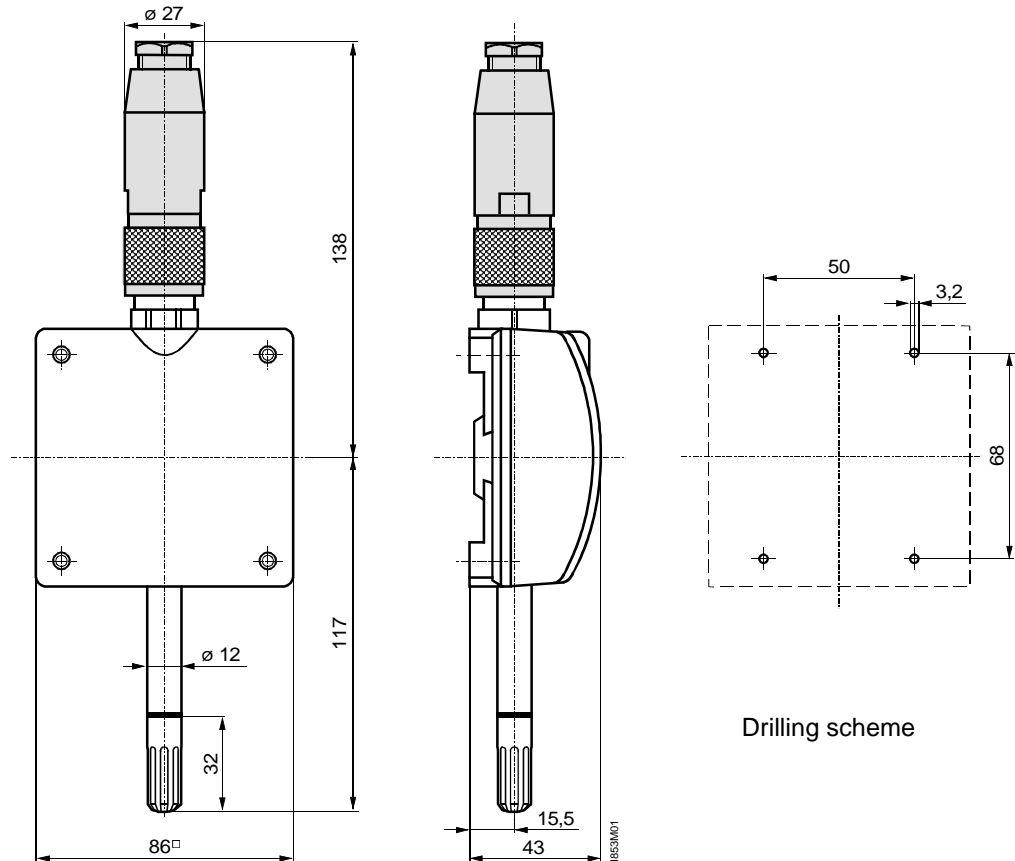
M System ground, measuring ground

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



Drilling scheme