1862P01

Duct Sensor QFM66

for relative humitidy (high accuracy) and temperature

Operating voltage AC 24 V
Output signals DC 0...10 V

Use

In ventilating and air conditioning plants for acquiring
- relative humidity and
- temperature in air ducts

The QFM66 is used in plants where relative humidity needs to be acquired with great accuracy and short response times and where the measuring range must cover the entire humidity range of 0...100 %.

Requirements of this kind must be satisfied especially in the following applications:
- Warehouses for paper, textiles, foodstuff, and similar
- Laboratories
- Operating theatres in hospitals
- Computer rooms
- Indoor swimming pools
- Greenhouses

The QFM66 is used as a
- control sensor in the supply air or extract air
- limit sensor for maximum limitation of supply air humidity after a steam humidifier
- measuring sensor, e.g. for measured value indication or for interfacing with a building management system
- sensor for enthalpy and absolute humidity, together with the AQF61.1 (refer to data sheet 1899)

Ordering

When ordering, please give name and type reference: duct sensor **QFM66.**

Equipment combinations

All systems and devices that are capable of acquiring and handling the sensor's DC 0...10 V output signals.

Technical design

Relative humidity

The sensor senses the relative humidity with the help of a capacitive humidity measuring element whose electrical capacitance changes in function of the relative humidity of the ambient air.
The electronic measuring circuit converts the sensor's signal to a continuous DC 0...10 V signal, corresponding to 0...100 % relative humidity.

Temperature

The sensor acquires the temperature with the aid of the Pt1000 thin-film measuring element whose electrical resistance changes in function of the temperature of the ambient air.
The change in resistance is converted to two independently acting DC 0...10 V signals. One of them corresponds to the temperature range of 0...50 °C, the other to –35...+35 °C.

Mechanical design

The duct sensor is comprised of housing, removable cover and sensor stem. Housing and sensor stem are made of plastic and are rigidly connected to one another.
Between the housing and the cover there is a seal which is required to ensure degree of protection IP65.
The housing accommodates the measuring circuit and the connection terminals. The cable is introduced through the cable gland supplied with the sensor, which can be fitted to the bottom of the housing.
The sensing elements are located at the end of the sensor stem and are protected by a sleeve with a coretex filter.
The sensor has been designed for duct mounting. It can be fitted in two different ways:

- The flange supplied with the sensor is placed over the stem and secured in accordance with the required immersion depth.
- Without the mounting flange (making use of the maximum immersion depth).

Engineering notes

The transformer used must be suitable for safety extra low voltage (SELV). It must have separate windings and be suited for 100 % duty.
The transformer must be sized and fused in complicance with local safety regulations.
For the connection of the sensor, refer to the data sheets of the units with which the sensor is used (connection of active sensors).
The maximum permissible line lengths should be observed.

Fitting notes

Location

The sensor should be mounted in the middle of the duct wall. If used in connection with steam humidifiers, the minimum distance after the humidifier should be 3 m, the maximum distance 10 m.
If the application involves dew point shifting, the sensor must be fitted in the extract air duct.
Only the flange must be fitted to the duct wall. The sensor is then inserted through the flange and engaged.

Caution!

- The seal between housing and cover must not be removed, or else degree of protection IP 65 will be no longer ensured.
- The measuring rod's sensing elements are sensitive to impact. Avoid any such impact on mounting.

Fitting instructions

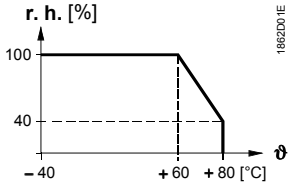
Fitting instructions are printed on the sensor's packing.

Commissioning notes

Check the wiring before commissioning the plant. The settings required for control, compensation or limitation are made at the units to which the QFM66 is connected. No settings or adjustments can or may be made at the sensor itself.

Technical data

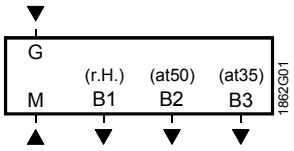
Humidity sensor



	Range of use	0...100 % r. h.
	Measuring accuracy at 20 °C	
	In the range 0...90 % r. h.	±2 %
	In the range 90...100 % r. h.	±3 %
	Temperature dependency	
	In the range –10...+50 °C	≤0.05 % r. h./K
	Reduction of the humidity measuring range	
	At temp. above 60 °C at sensor head	see illustration in margin
	Time constant	approx. 20 s
Temperature sensor	Range of use	–35...+50 °C
	Measuring accuracy at 20 °C	±0.5 K
	Measuring element	Pt1000 Class A
	Time constant	approx. 20 s
General data		
Supply	Operating voltage	AC 24 V ±20 %
	Safety extra low voltage (SELV) to	EN 60 730
	Frequency	50 or 60 Hz
	Power consumption	≤1 VA
Output signals	Humidity signal (terminal B1)	DC 0...10 V ≙ 0...100 % r. h., ±1 mA max.
	Temperature signal (terminal B2)	DC 0...10 V ≙ 0...50 °C, ±1 mA max.
	Temperature signal (terminal B3)	DC 0...10 V ≙ –35...+35 °C, ±1 mA max.
Perm. line lengths	Copper cable	
	0.6 mm dia.	50 m
	1.0 mm^2	150 m
	1.5 mm^2	300 m
Electric connection	Connection terminals for	2 × 1.5 mm^2 max.
	Cable gland	Pg 11
Prodective data	Housing protection	IP 65 to IEC 529
	Protection class	III to EN 60 730
Environmental conditions	Operation to	IEC 721-3-3
	Climatic conditions	class 3K5
	Temperature	
	Housing with electronics	–20...+60 °C
	Sensor head	–40...+80 °C
	Humidity	0...100 % r. h.
	Transportation to	IEC 721-3-2
	Climatic conditions	class 2K3
	Temperature	–25...+70 °C
	Humidity	<95 % r. h.
	Mechanical ambient conditions	class 2M2
Material and colors	Housing base	polycarbonat, RAL 7001 (silver-grey)
	Housing cover	polycarbonat, RAL 7035 (light-grey)
	Sensor pipe	polycarbonat, RAL 7001 (silver-grey)
	Sensor head	polycarbonat, RAL 5014
	Mounting flange	polycarbonat, RAL 7001 (silver-grey)
	Sensor (entirely)	silicon-free
	Packaging	corrugated board

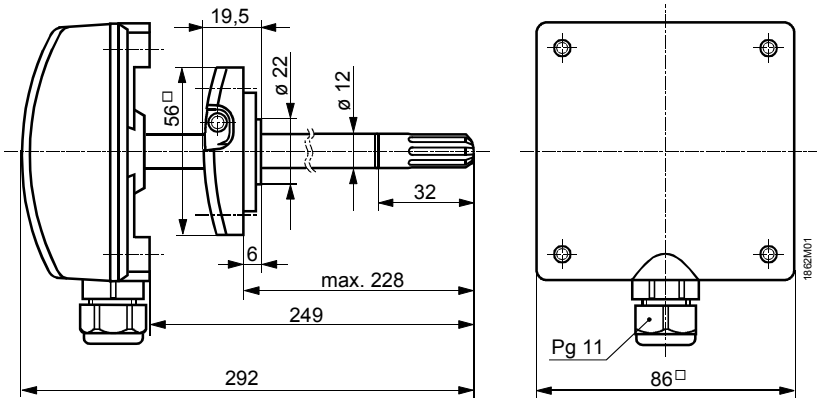
Norms and standards	Product safety	
	Automatic electrical controls for household and similar use	EN 60 730-1
	Electromagnetic compatibility	
	Immunity	EN 61 000-6-2
	Emissions	EN 50 081-1
	CE conformity to	
	EMC directive	89/336/EEC
	Low voltage directive	73/23/EEC
Weight	Incl. packaging	approx. 0.280 kg

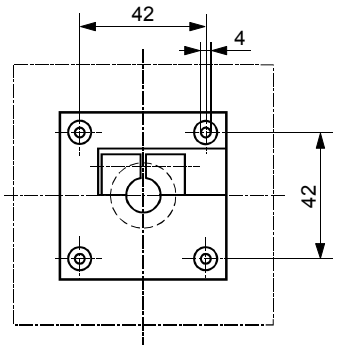
Connection terminals



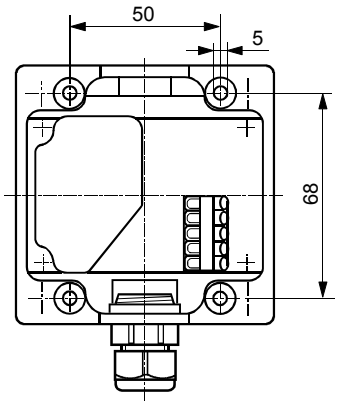
G	System potential AC 24 V (SELV)
M	Sytem neutral, measuring neutral
B1	Output for DC 0...10 V measuring signal (for 0...100 % r. h.)
B2	Output for DC 0...10 V measuring signal (for 0...50 °C)
B3	Output for DC 0...10 V measuring signal (for –35...+35 °C)

Dimensions (in mm)

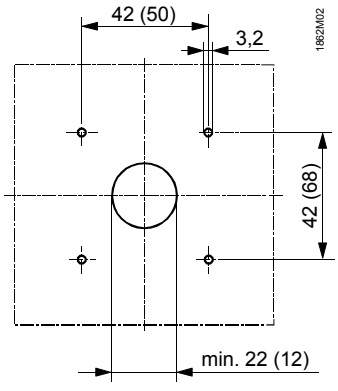




With mounting flange



Without mounting flange



Fixing holes with (without) mounting flange