

Symaro™

Duct Air Quality Sensors Modbus RTU

QPM2102/MO, QPM2150/MO, QPM2152/MO, QPM2153/MO



Duct air quality sensors with Modbus communication

- Modbus RTU (RS-485)
- Maintenance-free CO₂ sensing element
- No recalibrations required
- On-event addressing via push button together with Climatix™ controllers
- DIP switches setting together with other controllers

Use

The duct sensor is used in air ducts of ventilation and air conditioning plants to enhance room comfort and to optimize energy consumption by providing demand-controlled ventilation. The sensor acquires:

- CO₂ concentrations
- VOC concentrations as an indication of odors in the duct air, such as tobacco smoke, body odor, or material fumes
- The relative humidity of the duct air
- The duct air temperature

NOTICE!

- The sensors cannot be used as safety devices, such as gas or smoke warning devices!
- Do not use sensors outdoors!

Technical design

The cable entry is made via the cable entry gland M16 (IP54) supplied with the sensor, which screws into the housing.

The sensor is fitted with the mounting flange supplied with the sensor. The flange is placed over the immersion rod and then secured to meet the required immersion length.

Type summary

Product number	SSN NO.	CO ₂ measuring range	IAQ & VOC measuring range	Temperature measuring range	Humidity measuring range	Operating voltage	Output signal
QPM2102/MO	S55720-S469	0...2000 ppm	0...100 %	---	---	AC 24 V ±20 %/ DC 13.5...35 V	Modbus RTU
QPM2150/MO	S55720-S470	0...2000 ppm	---	-35...50 °C	---	AC 24 V ±20 %/ DC 13.5...35 V	Modbus RTU
QPM2152/MO	S55720-S471	0...2000 ppm	---	-35...50 °C	0...100 % r.h.	AC 24 V ±20 %/ DC 13.5...35 V	Modbus RTU
QPM2153/MO	S55720-S530	0...2000 ppm	0...100 %	-35...50 °C	0...100 % r.h.	AC 24 V ±20 %/ DC 13.5...35 V	Modbus RTU

Ordering

When ordering, specify name and product number, for example: Duct air quality sensor QPM2102/MO.

The sensor is supplied with mounting flange and cable entry gland M16.

Accessory

Name	Type reference
Filter cap (for replacement)	AQF3101

Notes

Engineering

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, determine the power consumption of the room sensor.

For correct wiring, see the datasheets of the devices with which the sensor is used.
Observe permissible line lengths.

Cable routing and
cable selection

Note that when routing cables, the longer the cables run side by side and the smaller the distance between them, the greater the electrical interference. Shielded cables must be used in environments with EMC problems.

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

Mounting

Mounting location
and orientation

To ensure degree of protection IP54, the sensor must be fitted with the cable entry pointing downward!

Mount the sensor where it can be easily accessed for service.

- If used in connection with steam humidifiers, the distance to the humidifier must be a minimum of 3 m. If permitted by the installation, the distance should be as great as possible, but no more than 10 m.
- Avoid any impact or shock to the sensing elements in the immersion rod.
- To avoid sunlight damage, do not mount the sensor on a rooftop. To ensure correct operation, the sensor's ambient temperature must be in the range of -5...45 °C.

Mounting instruc-
tions

Mounting instructions are enclosed in the package.

Commissioning

The sensor's functions can be checked 30 minutes after applying power.

Disposal



This symbol or any other national label indicate that the product, its packaging, and, where applicable, any batteries may not be disposed of as domestic waste. Delete all personal data and dispose of the item(s) at separate collection and recycling facilities in accordance with local and national legislation.

For additional details, refer to www.siemens.com/bt/disposal.

Function	
Communication	Modbus RTU (RS-485)
Supported baud rate	9600; 19200; 38400; 57600; 76800; 115200
Transmission format	1-8-E-1; 1-8-O-1; 1-8-N-1; 1-8-N-2
Bus termination	120 ohm, jumper selection

For detailed information about specific functions, see Basic documentation (A6V11610643 *).

Power supply	
Operating voltage	AC 24 V $\pm 20\%$ or DC 13.5...35 V (SELV) or AC/DC 24 V class 2 (US)
Frequency	50/60 Hz at AC 24 V
External supply line protection (EU)	Fuse slow max. 10 A or Circuit breaker max. 13 A Characteristic B, C, D according to EN 60898 or Power source with current limitation of max. 10 A
Power consumption QPM2102/MO QPM2150/MO, QPM2152/MO QPM2153/MO	< 3 VA < 2.5 VA < 3.3 VA

Functional data (CO₂)	
Measuring range	0...2000 ppm
Measuring accuracy at 23 °C and 1013 hPa	$\leq \pm(50 \text{ ppm} + 2\% \text{ of measured value})$
Temperature dependency in the range of -5...45 °C	$\pm 2 \text{ ppm} / ^\circ\text{C}$ (typically)
Long time drift	< $\pm 5\%$ of measuring range / 5 years (typical)
Time constant t_{63}	< 5 min
Recalibration-free	8 years

Functional data (VOC only and IAQ - maximum selection of CO₂ and VOC with QPM2102/MO)	
Measuring range	0...100 %
Time constant t_{63} VOC	< 13 min (Slow), < 3.5 min (Medium), < 1 min (Fast)

Functional data (Temperature with QPM2150/MO, QPM2152/MO and QPM2153MO)	
Range of use	-5...45 °C
Measuring range	-35...50 °C
Measuring accuracy at DC 24 V in the range of 23 °C 15...35 °C -35...50 °C	±0.3 k (typical) ±0.6 k ±1 k
Time constant t_{63}	< 3.5 min in 2 m/s moved air

Functional data (Humidity with QPM2152/MO and QPM2153/MO)	
Range of use	0...95 % r.h. (non-condensing)
Measuring range	0...100 % r.h.
Measuring accuracy at 23 °C and AC/DC 24 V 0...95 % r.h. 30...70 % r.h.	±5 % r.h. ±3 % r.h. (typical)
Time constant t_{63}	Approx. 20 s

Functional data	
Max. air velocity V_{\max}	10 m/sec

Ambient conditions and protection classification	
Protection degree of housing	IP54 according to EN 60529 in built-in state
Protection class	III according to EN 60730-1
Environmental conditions Transport <ul style="list-style-type: none"> • Climatic conditions <ul style="list-style-type: none"> – Temperature – Humidity • Mechanical conditions Operation <ul style="list-style-type: none"> • Climatic conditions <ul style="list-style-type: none"> – Temperature (housing with electronics) – Humidity • Mechanical conditions 	IEC 60721-3-2 Class 2K3 -25...70 °C < 95 % r.h. Class 2M2 IEC 60721-3-3 Class 3K5 -5...45 °C 0...95 % r.h. (non-condensing) Class 3M2

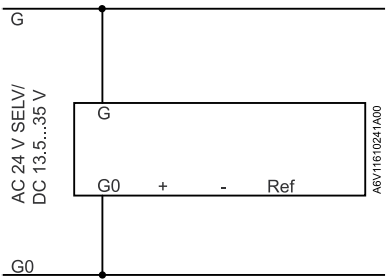
Standards, directives and approvals	
Product standard	EN 60730-1, EN 60730-2-9, EN 61000-6-2, EN 61000-6-3 Automatic electrical controls for household and similar use
Electromagnetic compatibility (Applications)	For use in residential, commerce, light-industrial and industrial environments
EU conformity (CE)	A5W00037934A *)

Standards, directives and approvals	
RCM conformity	A5W00037935A *)
UL	UL 873, http://ul.com/database
UKCA	A5W00188747A *)
Environmental compatibility	The product environmental declaration (QPM2102/MO, QPM2150/MO, QPM2152/MO: A5W90011832*; QPM2153/MO: A5W00161444A*) contains data on environmentally compatible product design and assessments (RoHS compliance, materials composition, packaging, environmental benefit, disposal).

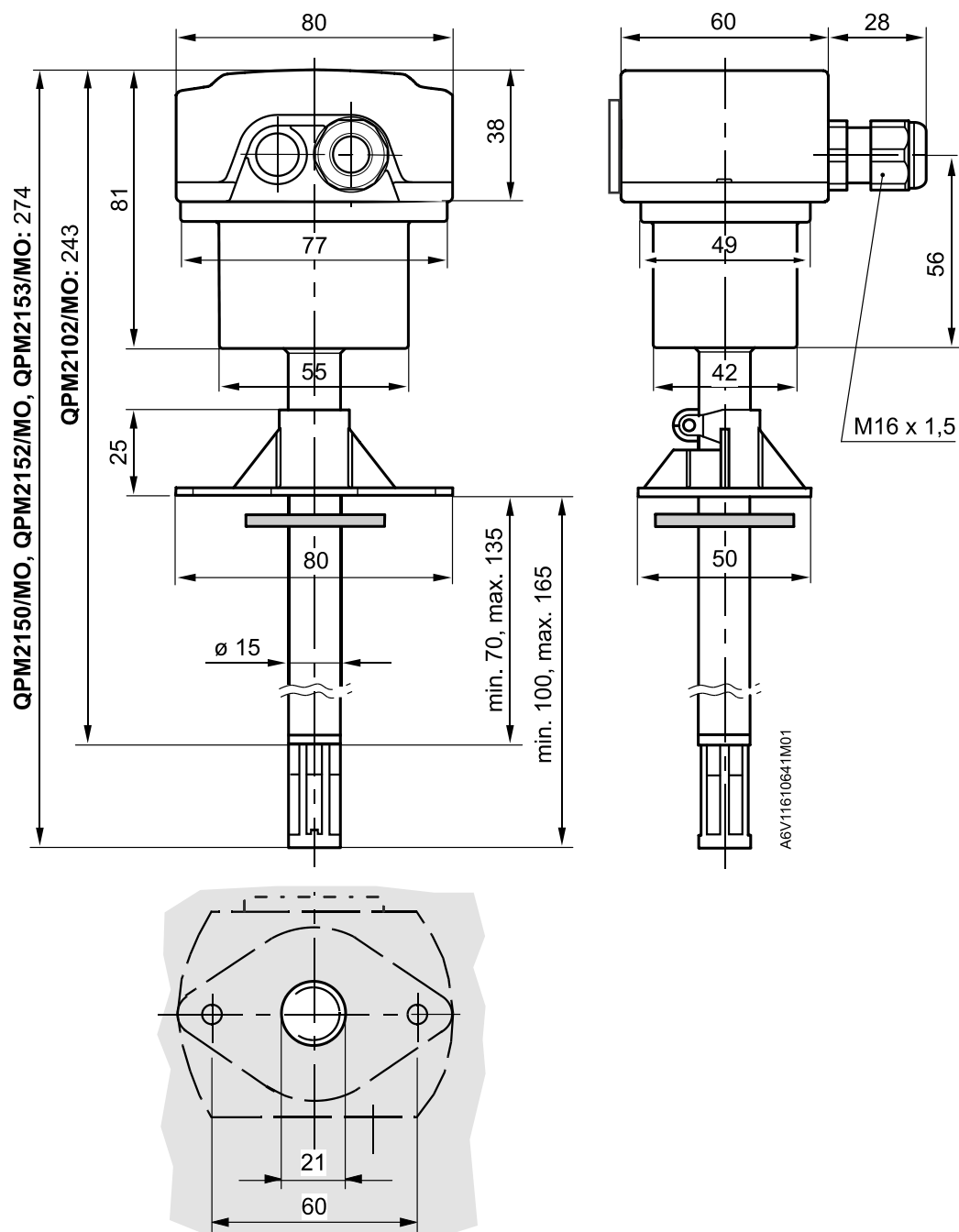
General	
Cable lengths for measuring signals Perm. cable lengths	See data sheet of the device handling the signal
Electrical connections screw terminals	1 × 2.5 mm ² or 2 × 1.5 mm ²
Materials and colors	
Base	Polycarbonate, RAL 7001 (silver-grey)
Cover	Polycarbonate, RAL 7035 (light-grey)
Immersion rod	Polycarbonate, RAL 7001 (silver-grey)
Filter cap	Polycarbonate, RAL 7001 (silver-grey)
Mounting flange	PA 66 – GF35 (black)
Cable entry gland	PA, RAL 7035 (light-grey)
Sensor (complete assembly)	Silicone-free
Packaging	Corrugated cardboard
Weight including package QPM2102/MO QPM2150/MO QPM2152/MO QPM2153/MO	Approx. 263.6 g Approx. 268.1 g Approx. 267.2 g Approx. 268 g

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

Connection terminals



- G Operating voltage AC 24 V ±20 % or DC 13.5...35 V
- G0 Ground
- + RS485 Modbus A
- RS485 Modbus B
- Ref GND_ISO



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Smart Infrastructure
Global Headquarters
Theilerstrasse 1a
CH-6300 Zug
+41 58 724 2424
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