

**Multifunctional duct sensors and measuring transducers incl. mounting flange, for humidity, temperature, CO<sub>2</sub> content and air quality (VOC), calibratable, with Modbus connection**

**Patented quality product (patent no. DE 10 2014 010 719.1)**

The maintenance-free, microprocessor-controlled **AERASGARD® AFTM-LQ-CO<sub>2</sub>-Modbus** and **KCO<sub>2</sub> / KLQ - CO<sub>2</sub> / KFTM - CO<sub>2</sub> - Modbus** with Modbus connection, with/without optional display, is designed for duct installation and is used to monitor all measurands of relevance to the climate inside a room. These are the measurands air humidity, temperature, CO<sub>2</sub> concentration as well as air quality (VOC). By using a single device to monitor all four measurands, it is possible to effectively monitor and regulate the entire room climate. It measures CO<sub>2</sub> in the range of 0...5000 ppm, VOC at one of three selectable sensitivity levels LOW / MEDIUM / HIGH, temperatures in the range of -35...+80 °C, as well as relative air humidity from 0...100% r.H.

A digital, long-term stable sensor used as measuring element for relative air humidity and temperature guarantees exact measurement results. The Modbus can be used to retrieve the following parameters: Temperature [°C], relative humidity [% r.H.], air quality (VOC) [%], carbon dioxide (CO<sub>2</sub>) [ppm] and atmospheric pressure [hPa].

The CO<sub>2</sub> content of the air is measured using an optical NDIR sensor (non-dispersive infra-red technology). The detection range of the sensors is calibrated for standard applications such as monitoring residential rooms and conference rooms. Room ventilation on an as-needed basis, improved well-being and customer benefit, increased comfort as well as reduced operating costs through energy conservation are just some of the benefits of employing the AERASGARD® CO<sub>2</sub> sensor.

The explanations above demonstrate that there are applications for CO<sub>2</sub> measurements, for VOC measurements, but from our perspective, above all, for a combination of both measurands. The crucial factor in this respect is that both of these measurands are not convertible into each other and derivations to or from one another cannot be made. An NDIR CO<sub>2</sub> measuring instrument measures selectively and cannot detect any VOC; a VOC mixed gas sensor cannot recognize CO<sub>2</sub> molecules.

**TECHNICAL DATA**

Voltage supply:	24 V AC / DC (± 10 %)
Power consumption:	< 4,8 W / 24 V DC typical; < 6,8 VA / 24 V AC typical; peak current 200 mA
Data points:	Temperature [°C], relative humidity [% r.H.], air quality (VOC) [%], carbon dioxide (CO <sub>2</sub> ) [ppm], atmospheric pressure [hPa]

**HUMIDITY**

Sensors:	<b>digital humidity sensor with integrated temperature sensor,</b> low hysteresis, high long-term stability
Sensor protection:	<b>plastic</b> sinter filter, Ø 16 mm, L = 35 mm, exchangeable (optional <b>metal</b> sinter filter, Ø 16 mm, L = 32 mm)
Measuring range, humidity:	0...100% r. H.
Operating range, humidity:	0...95% r. H. (without dew formation)
Deviation of humidity:	typically <b>± 2.0%</b> (20...80% r. H.) at +25 °C, otherwise ± 3.0 %

**TEMPERATURE**

Measuring range, temperature:	-35...+80 °C
Operating range, temperature:	-10...+60 °C
Deviation, temperature:	typically ± 0.2 K at 25 °C

**AIR QUALITY (VOC)**

Sensor, VOC:	VOC sensor (metal oxide) <b>with automatic calibration</b> (VOC = volatile organic compounds)
Measuring range, VOC:	0...100% air quality; referred to calibrating gas; <b>multi-range switching</b> VOC sensitivity low, medium, high
Measuring accuracy, VOC:	± 20 % of final value (referred to calibrating gas)
Service life:	> 60 months (under normal load conditions)

**CARBON DIOXIDE (CO<sub>2</sub>)**

Sensor, CO <sub>2</sub> :	optical NDIR sensor (non-dispersive infra-red technology) including atmospheric pressure compensation (up to 1100 mbar) <b>with automatic and manual calibration</b>
Measuring range, CO <sub>2</sub> :	0...5000 ppm
Measuring accuracy, CO <sub>2</sub> :	typically ± 30 ppm ± 3 % of measured value
Temperature dependence, CO <sub>2</sub> :	± 5 ppm / °C or ± 0,5 % of measured value / °C (whichever is higher)
Pressure dependence:	± 0.13 % / mm Hg
Long-term stability:	< 2 % in 15 years
Gas exchange:	by diffusion

(continued on next page!)

Display screen (cyclic) **Modbus Tyr 2**



Temperature



Humidity



Air quality (VOC)



Carbon dioxide (CO<sub>2</sub>)

Display screen (static) **Modbus Tyr 2**



Carbon dioxide (CO<sub>2</sub>)



Atmospheric pressure

Programmable display screen **Modbus Tyr 2**

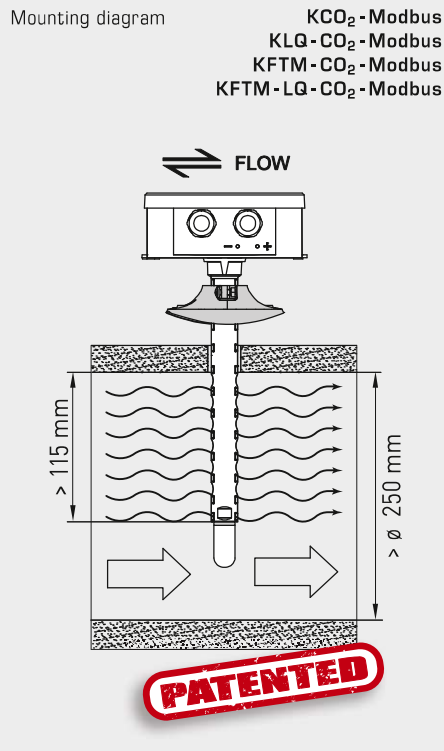




S+S REGELTECHNIK

# AERASGARD® KCO<sub>2</sub> / KLQ - CO<sub>2</sub> - Modbus AERASGARD® KFTM - (LQ) - CO<sub>2</sub> - Modbus

Multifunctional duct sensors and measuring transducers incl. mounting flange, for humidity, temperature, CO<sub>2</sub> content and air quality (VOC), calibratable, with Modbus connection



**MFT-20-K**  
Mounting flange,  
plastic



**KFTM - CO<sub>2</sub> - Modbus**  
**KFTM - LQ - CO<sub>2</sub> - Modbus**  
with plastic sinter filter  
(standard)



**KFTM - CO<sub>2</sub> - Modbus**  
**KFTM - LQ - CO<sub>2</sub> - Modbus**  
with display and  
plastic sinter filter  
(standard)



**SF-K**  
Plastic sinter filter  
(standard)



**SF-M**  
Metal sinter filter  
(optional)

## TECHNICAL DATA

(continued)

Bus protocol:	Modbus (RTU mode), address range 0... <b>247</b> selectable
Signal filtering:	4 s / 32 s
Ambient temperature:	-10...+60 °C
Response time:	< 2 minutes, minimal flow velocity 0.3 m/s (air)
Electrical connection:	0,2- 1,5 mm <sup>2</sup> , ia push-in terminal
Housing:	plastic, UV-stabilised, material polyamide, 30% glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016), housing cover for display is transparent!
Housing dimensions:	126 x 90 x 50 mm (Tyr 2)
Cable connection:	<b>cable gland</b> , plastic (M 16 x 1,5; with strain relief, exchangeable, inner diameter 10,4 mm) <b>or</b> <b>M12 connector</b> according to DIN EN 61076-2-101 (optional on request)
Protective tube:	<b>PLEUROFORM™</b> , material polyamide (PA6), with torsion protection, ø 20 mm, v <sub>max</sub> = 30 m/s (air) without filter: NL = 202,5 mm / with plastic filter: NL = 235 mm (optional with metal filter: NL = 227 mm)
Process connection:	via mounting flange made of plastic (included in scope of delivery)
Protection class:	III (according to EN 60 730)
Protection type:	<b>IP 65</b> (according to EN 60 529) housing in the built-in state (permeable PLEUROFORM: IP 30)
Standards:	CE conformity, electromagnetic compatibility according to EN 61 326, EMC Directive 2014/ 30 / EU
Optional:	<b>Display with illumination</b> , three-line, cutout approx. 70 x 40 mm (W x H), for displaying actual humidity, actual temperature, air quality and the actual CO <sub>2</sub> content (cyclic) or a selectable parameter (static) or an individually programmable display value (The Modbus interface allows the display to be individually configured in the 7-segment area and in the dot-matrix area.)

**ACCESSORIES** see table

**AERASGARD® KCO<sub>2</sub> / KLQ-CO<sub>2</sub>-Modbus**  
**AERASGARD® KFTM-(LQ)-CO<sub>2</sub>-Modbus**



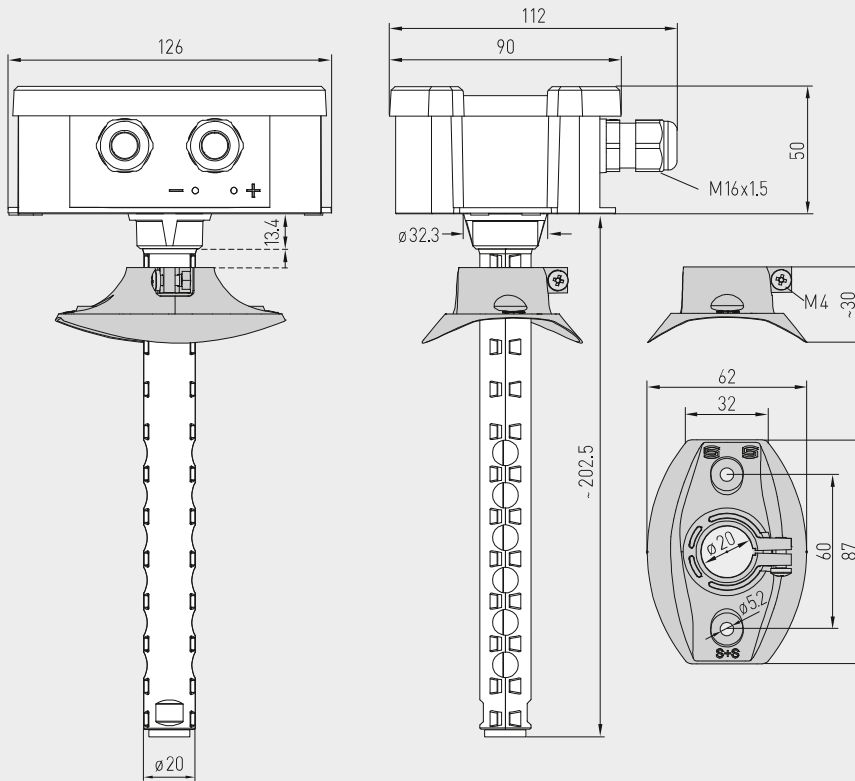
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Dimensional drawing

**KCO<sub>2</sub>-Modbus**  
**KLQ-CO<sub>2</sub>-Modbus**

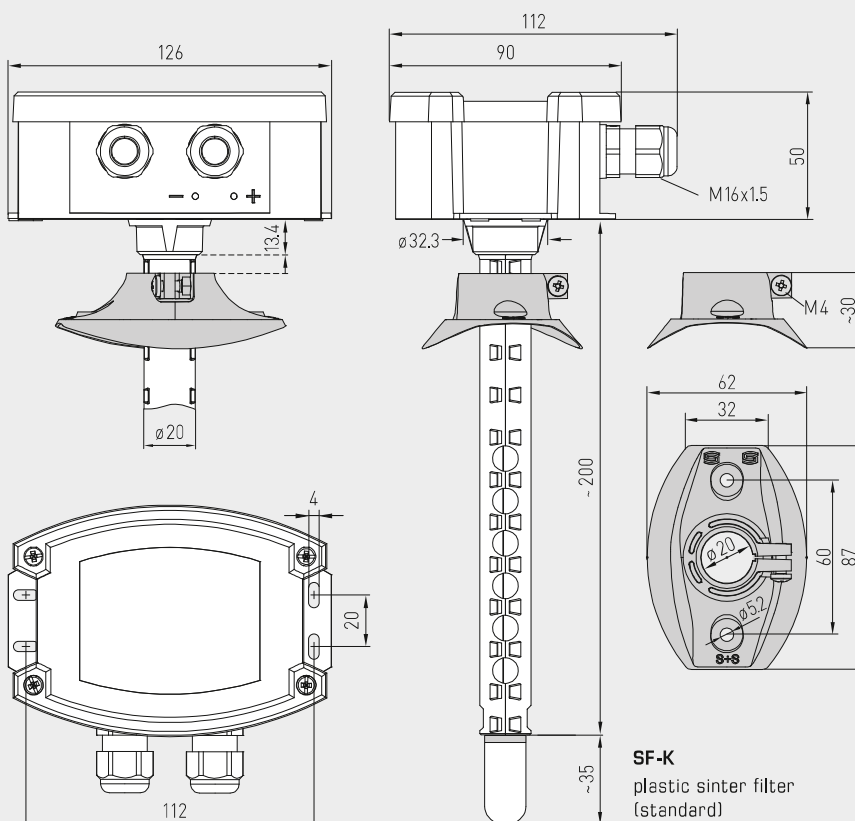
**KCO<sub>2</sub>-Modbus**  
**KLQ-CO<sub>2</sub>-Modbus**



Dimensional drawing

**KFTM-CO<sub>2</sub>-Modbus**  
**KFTM-LQ-CO<sub>2</sub>-Modbus**

**KFTM-CO<sub>2</sub>-Modbus**  
**KFTM-LQ-CO<sub>2</sub>-Modbus**



**SF-M**  
metal sinter filter  
(optional)



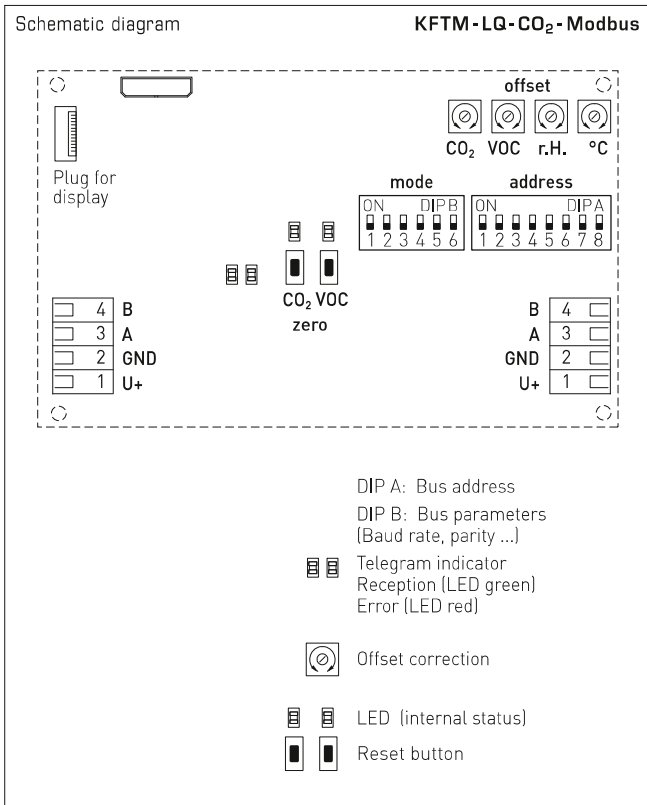
**SF-K**  
plastic sinter filter  
(standard)



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# AERASGARD® KCO<sub>2</sub> / KLQ - CO<sub>2</sub> - Modbus AERASGARD® KFTM - (LQ) - CO<sub>2</sub> - Modbus

Multifunctional duct sensors and measuring transducers incl. mounting flange, for humidity, temperature, CO<sub>2</sub> content and air quality (VOC), calibratable, with Modbus connection



**KFTM-LQ-CO<sub>2</sub>-Modbus**  
with display



<b>AERASGARD® KCO<sub>2</sub>-Modbus</b>	Duct sensor for CO <sub>2</sub> content, <i>Deluxe</i>
<b>AERASGARD® KLQ - CO<sub>2</sub> - Modbus</b>	Duct sensor for air quality (VOC) and CO <sub>2</sub> content, <i>Deluxe</i>
<b>AERASGARD® KFTM - CO<sub>2</sub> - Modbus</b>	Multifunctional duct sensor for humidity, temperature and CO <sub>2</sub> content, <i>Deluxe</i>
<b>AERASGARD® KFTM - LQ - CO<sub>2</sub> - Modbus</b>	Multifunctional duct sensor for humidity, temperature, air quality (VOC) and CO <sub>2</sub> content, <i>Deluxe</i>

Type / WG02	Measuring Range		CO <sub>2</sub>	VOC	Display	Item No.
	Humidity	Temperature				
<b>KCO<sub>2</sub>-Modbus</b>						
KCO2 MODBUS	–	–	5000 ppm	–		1501-8110-6001-200
KCO2 MODBUS LCD	–	–	5000 ppm	–	■	1501-8110-6071-200
<b>KLQ - CO<sub>2</sub>-Modbus</b>						
KLQ-CO2 MODBUS	–	–	5000 ppm	0...100%		1501-8111-6001-200
KLQ-CO2 MODBUS LCD	–	–	5000 ppm	0...100%	■	1501-8111-6071-200
<b>KFTM - CO<sub>2</sub>-Modbus</b>						
KFTM-CO2 MODBUS	0...100% r.H.	–35...+80 °C	5000 ppm	–		1501-8116-6001-200
KFTM-CO2 MODBUS LCD	0...100% r.H.	–35...+80 °C	5000 ppm	–	■	1501-8116-6071-200
<b>KFTM - LQ - CO<sub>2</sub>-Modbus</b>						
KFTM-LQ-CO2 MODBUS	0...100% r.H.	–35...+80 °C	5000 ppm	0...100%		1501-8118-6001-200
KFTM-LQ-CO2 MODBUS LCD	0...100% r.H.	–35...+80 °C	5000 ppm	0...100%	■	1501-8118-6071-200
Note:	This unit <b>must not</b> be used as safety-relevant device!					
Optional:	Cable connection with <b>M12 connector</b> according to DIN EN 61076-2-101					on request
<b>ACCESSORIES</b>						
<b>KA2-Modbus</b>	<b>Communication adapter</b> (USB/RS485) for system connection					1906-1200-0000-100
<b>LA-Modbus</b>	<b>Line termination device</b> (with terminating resistor) as an active bus termination					1906-1300-0000-100
<b>SF-M</b>	<b>Metal sinter filter</b> , Ø 16 mm, L=32 mm, exchangeable, stainless steel <b>V4A</b> (1.4404)					7000-0050-2200-100
<b>MFT-20-K</b>	<b>Mounting flange</b> , plastic (included in the scope of delivery)					7000-0031-0000-000

For further information, see last chapter Accessories!