AERASGARD® RCO2 / RLQ-CO2-Modbus
AERASGARD® RFTM-LQ-PS-CO2-Modbus

Multifunctional room sensor and measuring transducer
for humidity, temperature, air quality (VOC), fine dust (PM) and CO2 content,
calibratable, with Modbus connection

S+S REGELTECHNIK

Multifunctional indoor climate sensor **AER**ASGARD® **RFTM-LQ-PS-CO2-Modbus** (maximum expansion level) with Modbus connection, in an elegant plastic housing with snap-on lid, base with 4-hole attachment, optionally with / without display, type variant **RFTM-CO2-Modbus** optionally with / without setpoint potentiometer. The room sensor is used for detecting the air humidity (0…100 % RH), room temperature (0…+50 °C), air quality (VOC) (0…100 %), the fine dust (PM) (0…1000 µg/m³) and CO2 content (0…5000 ppm) as well as a room control unit (% setpoint). International system of units **SI** (default) can be changed to **imperial** (via Modbus). The following parameters can be accessed via the Modbus: Temperature, relative humidity, air quality (VOC), fine dust (PM) and carbon dioxide (CO2). Use just one device to monitor and control the entire indoor climate effectively. This enables energy-saving room ventilation on an as-needed basis, thereby reducing operating costs and improving well-being. It is used in offices, hotels, convention centres, apartments, shops, etc. One sensor for every 30 m² of room area is recommended.

A long-term stable, **digital humidity and temperature sensor** guarantees exact measurement results. The air quality is determined based on a (VOC) **mixed gas sensor**. The CO2 content of the air is measured using an optical **NDIR sensor** (non-dispersive infra-red technology). An optical **fine dust sensor** precisely detects **particulate (PM)** of the size category 0.3 to 10 micrometres.

Innovative Modbus sensor with galvanically separated RS485-Modbus-interface, selectable bus termination resistance, DIP switch for setting the bus parameters and bus address in current-free state, internal LEDs for telegram status display, two separate push-in terminals and two-line display (illuminated; with customised programming in the 7-segment and dot-matrix range). The sensor is factory-calibrated; an environmental precision adjustment by an expert is possible.

RFTM-CO2-Modbus-P
with display and potentiometer

TECHNICAL DATA

Power supply:	24 V AC / DC (± 10 %)
Power consumption:	typically < 4.4 W / 24 V DC; < 6.4 VA / 24 V AC; peak current 200 mA
System of units:	**SI** (default) or **imperial** (can be changed via Modbus)
Data points:	temperature [°C] [°F], relative humidity [% RH], fine dust (PM) [µg/m³], air quality (VOC) [%], carbon dioxide (CO2) [ppm], setpoint potentiometer [%]

HUMIDITY & TEMPERATURE

Sensor:	**digital humidity sensor with integrated temperature sensor,** low hysteresis, high long-term stability
Measuring range:	0…100 % RH (humidity) 0…+50 °C (temperature)
Deviation, humidity:	typically **± 2,0** % (20…80 % RH) at +25 °C, otherwise ± 3,0 %
Deviation, temperature:	typically ± 0,2 K at +25 °C

AIR QUALITY (VOC)

Sensor (VOC):	**VOC sensor** (metal oxide) **with automatic calibration** (VOC = volatile organic compounds)
Measuring range (VOC):	0…100 % air quality; with reference to calibration gas; multi-range switching VOC sensitivity low, medium, high
Measuring accuracy (VOC):	typically ± 20 % final value (with reference to the calibration gas)
Service life (VOC):	> 60 months (under normal load conditions)

FINE DUST (PM)

Sensor (PM):	optical **particulate sensor** (**PM** = particulate matter), **fine-dust sensor** with laser- and soiling-resistant technology
Measuring range (PM):	0…1000 µg/m³
Particle size (PM):	**PM 2.5** (0.3…2.5 µm); **PM 10** (0.3…10 µm)
Measuring accuracy (PM):	typically ± 10 µg/m³ (± 10 % of measured value) at PM 2.5 typically ± 25 µg/m³ (± 25 % of measured value) at PM 10
Long-term stability (PM):	± 1.25 µg/m³ (± 1.25 % of measured value/year)
Service life (PM):	> 10 years

CARBON DIOXIDE (CO2)

Sensor (CO2):	optical **NDIR sensor** (non-dispersive infra-red technology) **with manual calibration** (via zero button), **with automatic calibration** (can be deactivated via Modbus)
Measuring range (CO2):	0…5000 ppm
Measuring accuracy (CO2):	typically ± 30 ppm (± 3 % of measured value)
Temperature dependence (CO2):	± 5 ppm per °C or ± 0.5 % of measured value per °C (whichever is greater)
Pressure dependence (CO2):	± 0.13 % per mm Hg
Long-term stability (CO2):	< 2 % in 15 years
Gas exchange (CO2):	Diffusion

Display screen standard — Modbus (Baldur)

Carbon dioxide (CO2) [ppm]

Air quality (VOC) [%]

Temperature [°C] [°F]

Humidity [% RH]

Fine dust (PM) [µg/m³]

**Display screen programmable** — Modbus (Baldur)

Symbols

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Dimensional drawing [mm]   Housing **Baldur 2**

34.6
32.6
98
98
TK: ø60

R xx CO2 - Modbus
without display

SI IMP
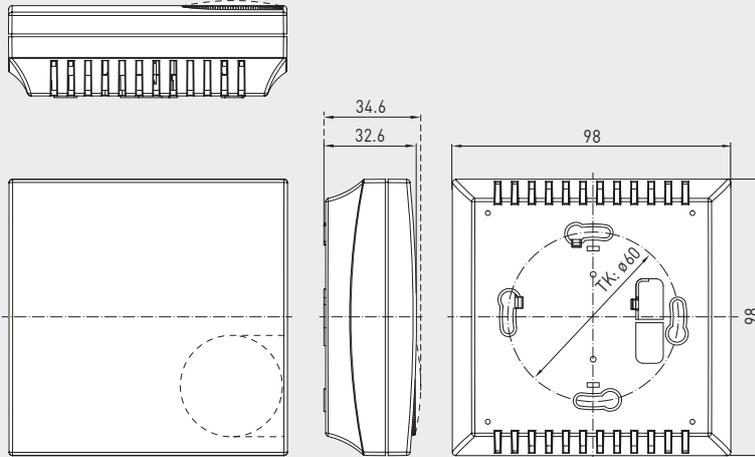
RFTM - LQ - PS - CO2 - Modbus
with display
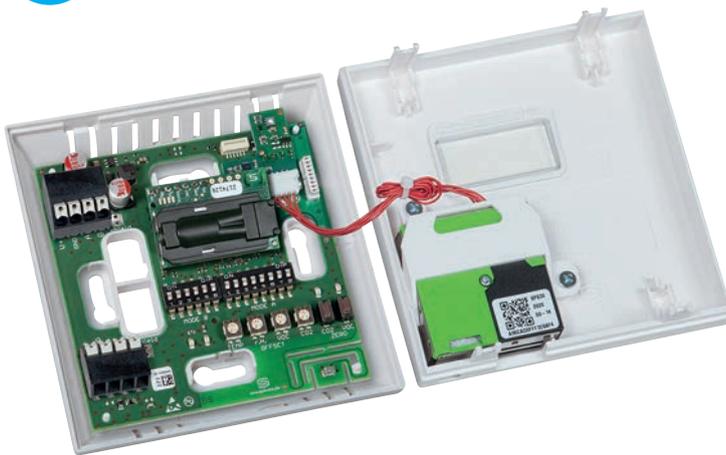
TECHNICAL DATA		(continued)
Bus protocol:	Modbus (RTU mode), address range 0...**247** selectable	
Baud rate:	9600, 19200, 38400 Baud	
Signal filtering:	4 s / 32 s	
Warm up time:	approx. 1 hour	
Response time:	< 2 minutes	
Ambient temperature:	0...+ 50 °C	
Permissible air humidity:	0...95 % RH (non-precipitating air)	
Electrical connection:	0.2 - 1.5 mm², via push-in terminal	
Housing:	plastic, material ABS, colour pure white (similar to RAL 9010)	
Dimensions:	98 x 98 x 33 mm (Baldur 2)	
Mounting:	wall mounting or on in-wall flush box, Ø 55 mm, base with 4 holes, for attachment to vertically or horizontally installed in-wall flush boxes for rear cable entry, with predetermined breaking point for top/bottom cable entry for surface-mounted installation	
Protection class:	III (according to EN 60 730)	
Protection type:	**IP 30** (according to EN 60 529)	
Standards:	CE conformity, electromagnetic compatibility according to EN 61 326, EMC Directive 2014 / 30 / EU, Low Voltage Directive 2014 / 35 / EU	
Optional:	**Display with illumination,** 2-line, cutout approx. 36 x 15 mm (W x H), to display actual humidity, actual temperature, air quality, of the fine-dust and CO2 content (cyclic) or a selectable parameter (static) or an individually programmable display value	

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S+S REGELTECHNIK

Schematic diagram — R xx - Modbus

Plug for display
Sensor VOC
Plug for Sensor PS
Sensor CO2

U+ GND A B shield
1 2 3 4

ON DIP B
1 2 3 4 5 6
mode

ON DIP A
1 2 3 4 5 6 7 8
address

U+ GND A B shield
1 2 3 4

°C r.H. VOC CO2
offset

CO2 VOC
zero

Schematic diagram with potentiometer — RFTM - CO2 - Modbus - P

Plug for display
Sensor VOC
Sensor CO2

U+ GND A B shield
1 2 3 4

ON DIP B
1 2 3 4 5 6
mode

ON DIP A
1 2 3 4 5 6 7 8
address

Potentio-meter

U+ GND A B shield
1 2 3 4

CO2 zero
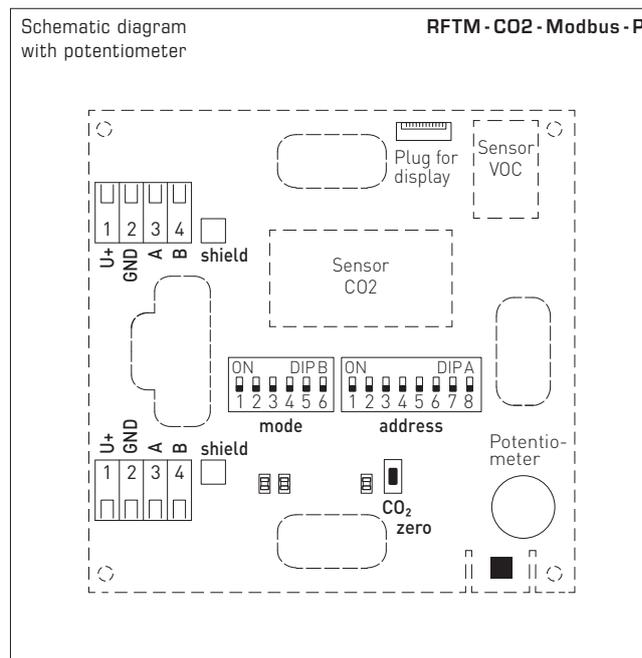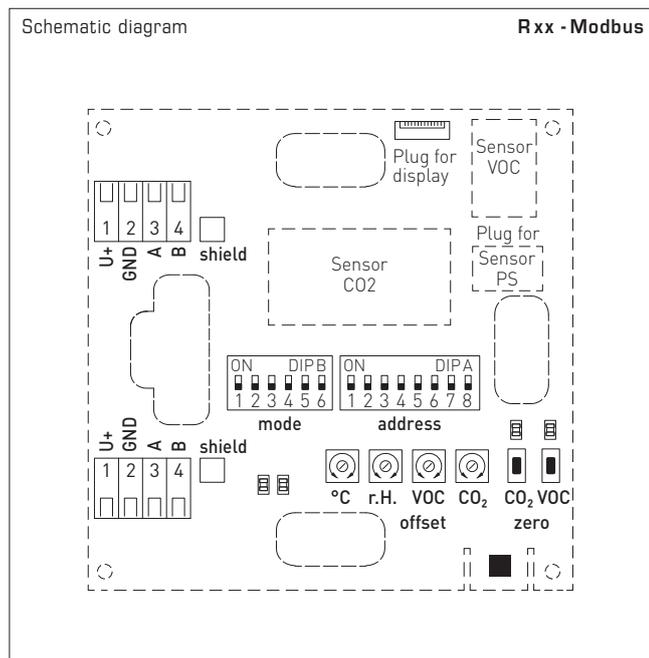
Display screen standard (cyclic)

552 ppm
Carbon dioxide (CO2)

52 %
Air quality (VOC)

24.8 °C
Temperature [°C]

82.0 °F
Temperature [°F]

43.2 % RH
Humidity

68 µg
Fine dust (PM)

Display screen alternative (static)

552 1 PPM
Carbon dioxide (CO2)

52 2 %
Air quality (VOC)

24.8 3 °C
Temperature [°C]

82.0 3 °F
Temperature [°F]

43.2 4 % RH
Humidity

68 6 µg/m³
Fine dust (PM)

Display screen programmable — Modbus (Baldur)

88:88 %
Symbols

The Modbus interface allows the display to be **individually** configured both in the 7-segment range and in the dot-matrix range.
For improved legibility, backlighting is provided.

By default, the display indicates the measurements with the corresponding units **cyclically** and consecutively:

CO2 content, **air quality** (VOC), **temperature**, **relative humidity**, **fine dust** (PM).

The **Modbus** configuration can be used to program an **alternative output variable** instead of the standard display. In this case, the first line indicates the value and index while the second line indicates the corresponding unit **statically**. The index identifies the display type:

Index 1 = carbon dioxide (CO2) [ppm]
Index 2 = air quality (VOC) [%]
Index 3 = temperature [°C] [°F]
Index 4 = relative humidity [% RH]
Index 6 = fine dust (PM) [µg/m³]

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calibratable, with Modbus connection

RFTM-CO2-Modbus-P
with setpoint potentiometer
(room control unit)

RFTM-LQ-PS-CO2-Modbus
with display

R xx CO2-Modbus
without display

AERASGARD® Rxx-Modbus	Room sensor and measuring transducer for humidity, temperature, air quality (VOC), fine dust (PM) and CO2 content, *Deluxe*							
Type / WG02	Measuring Range					Display ☼=P	Item No.	Price
	Humidity	Temperature*	PM	CO2	VOC			
RCO2-Modbus								
RCO2-Modbus	–	–	–	5000 ppm	–		1501-61B0-6001-200	272,61 €
RCO2-Modbus **LCD**	–	–	–	5000 ppm	–	■	1501-61B0-6021-200	322,46 €
RLQ-CO2-Modbus								
RLQ-CO2-Modbus	–	–	–	5000 ppm	0...100 %		1501-61B1-6001-500	399,60 €
RLQ-CO2-Modbus **LCD**	–	–	–	5000 ppm	0...100 %	■	1501-61B1-6021-500	449,43 €
RFTM-PS-Modbus								
RFTM-PS-Modbus	0...100 % RH	0...+50 °C	0...1000 µg/m³	–	–		1501-2116-6001-200	371,54 €
RFTM-PS-Modbus **LCD**	0...100 % RH	0...+50 °C	0...1000 µg/m³	–	–	■	1501-2116-6021-200	426,92 €
RFTM-CO2-Modbus								
RFTM-CO2-Modbus	0...100 % RH	0...+50 °C	–	5000 ppm	–		1501-61B6-6001-200	321,67 €
RFTM-CO2-Modbus **LCD**	0...100 % RH	0...+50 °C	–	5000 ppm	–	■	1501-61B6-6021-200	371,26 €
RFTM-CO2-Modbus-P								
RFTM-CO2-Modbus-**P**	0...100 % RH	0...+50 °C	–	5000 ppm	–	☼	1501-61B6-6501-271	355,97 €
RFTM-CO2-Modbus-**P LCD**	0...100 % RH	0...+50 °C	–	5000 ppm	–	☼ ■	1501-61B6-6521-271	405,80 €
RFTM-LQ-CO2-Modbus								
RFTM-LQ-CO2-Modbus	0...100 % RH	0...+50 °C	–	5000 ppm	0...100 %		1501-61B8-6001-500	435,89 €
RFTM-LQ-CO2-Modbus **LCD**	0...100 % RH	0...+50 °C	–	5000 ppm	0...100 %	■	1501-61B8-6021-500	485,72 €
RFTM-LQ-PS-CO2-Modbus								
RFTM-LQ-PS-CO2-Modbus	0...100 % RH	0...+50 °C	0...1000 µg/m³	5000 ppm	0...100 %		1501-2119-6001-500	563,13 €
RFTM-LQ-PS-CO2-Modbus **LCD**	0...100 % RH	0...+50 °C	0...1000 µg/m³	5000 ppm	0...100 %	■	1501-2119-6021-500	612,95 €
Housing variant "P":	**Room control unit** with potentiometer (standard printing is a widening arrow with central position unfilled)							
Note:	These units must **not** be used as safety-relevant devices!							
*	International system of units **SI** (default) can be changed to **imperial** (via Modbus).							

ACCESSORIES			
KA2-Modbus	Communication adapter (USB/RS485) for system connection	1906-1200-0000-100	213,99 €
LA-Modbus	Line termination device (with terminating resistor) as an active bus termination	1906-1300-0000-100	79,81 €