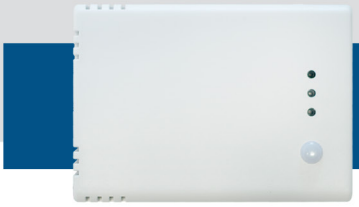


RCMFH-3

Intelligent multifunctional CO_2 room sensor

The RCMFH-3 are intelligent multifunctional room sensors featuring adjustable CO_2, temperature and relative humidity ranges. The used algorithm controls a single analogue / modulating output based on the measured CO_2, T and rH values, which can be used to directly control an EC fan, an AC fan speed controller or an actuator powered damper. They feature 24 VDC power supply and all parameters are accessible via Modbus RTU.

Key features

- Spring contact terminal block or RJ45 connection
- Selectable CO_2, temperature and relative humidity ranges
- Fan speed control based on temperature, humidity and CO_2 measurements
- Bootloader for updating the firmware via Modbus RTU communication
- Modbus RTU communication
- Day / night detection via ambient light sensor
- 3 LEDs for status indication with adjustable light intensity
- Long-term stability and accuracy

Area of use

- Demand controlled ventilation based on temperature, relative humidity and CO_2
- Suitable for residential and commercial buildings
- For indoor use only

Article codes

Article code	Supply voltage	Imax	Connection type
RCMFH-3	24 VDC	40 mA	RJ45 or terminal block

Technical specifications

Analogue / modulating output	0—10 VDC mode	min. load resistance 50 kΩ (R_L ≥ 50 kΩ)
	0—20 mA mode	max. load resistance 500 Ω (R_L ≤ 500 Ω)
	PWM (open-collector type) mode	1 kHz, min. load resistance 50 kΩ (R_L ≥ 50 kΩ), PWM voltage level: 3,3 VDC or 12 VDC
Typical range of use	Temperature	0—50 °C
	Relative humidity	0—95 % rH (non-condensing)
	CO_2 range	400—2.000 ppm
Accuracy		±0,5 ºC (5—50 ºC)
		±6 % rH (20—80 % rH)
	400—2.000 ppm CO_2	±(50 ppm + 3 % of the reading)
	2.001—5.000 ppm CO_2	±(40 ppm + 5 % of the reading)
Protection standard		IP30 (according to EN 60529)

How to configure

SenteraWeb

Via a Sentera Internet Gateway you can connect your installation to the SenteraWeb HVAC cloud and:

- Easily change the parameter settings of the connected devices remotely
- Define users and give them access to monitor the installation via a standard web browser
- Log data - create diagrams and export logged data
- Receive alerts or warnings when measured values exceed alert ranges or when errors occur
- Create different regimes for your ventilation system - e.g. day-night regime

Please refer to the Modbus Register Map of the product for more details regarding the Modbus registers.

Wiring diagram

RJ45 socket (Power over Modbus)

Pin 1	24 VDC	Supply voltage
Pin 2		
Pin 3	A	Modbus RTU communication, signal A
Pin 4		
Pin 5	/B	Modbus RTU communication, signal /B
Pin 6		
Pin 7	GND	Ground, supply voltage
Pin 8		

Terminal Block 1

VIN	Supply voltage 24 VDC
GND	Supply voltage, ground
A	Modbus RTU communication, signal A
/B	Modbus RTU communication, signal /B

Terminal Block 2

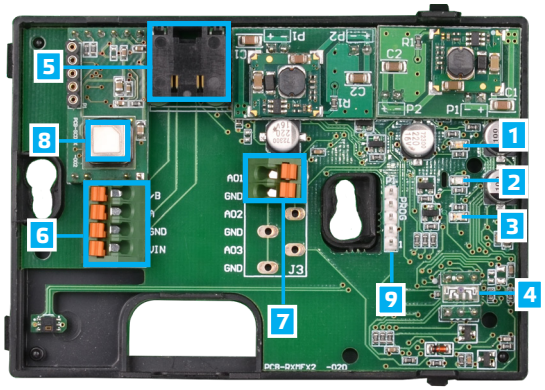
AO1	Analogue / modulating output (0—10 VDC / 0—20 mA / PWM)
GND	Ground AO1

Attention! *The unit needs to be supplied via the RJ45 connector or via the connection terminals. Do not connect the device via the RJ45 connector and the terminal block simultaneously.*

RCMFH-3

Intelligent multifunctional CO_2 room sensor

Indications



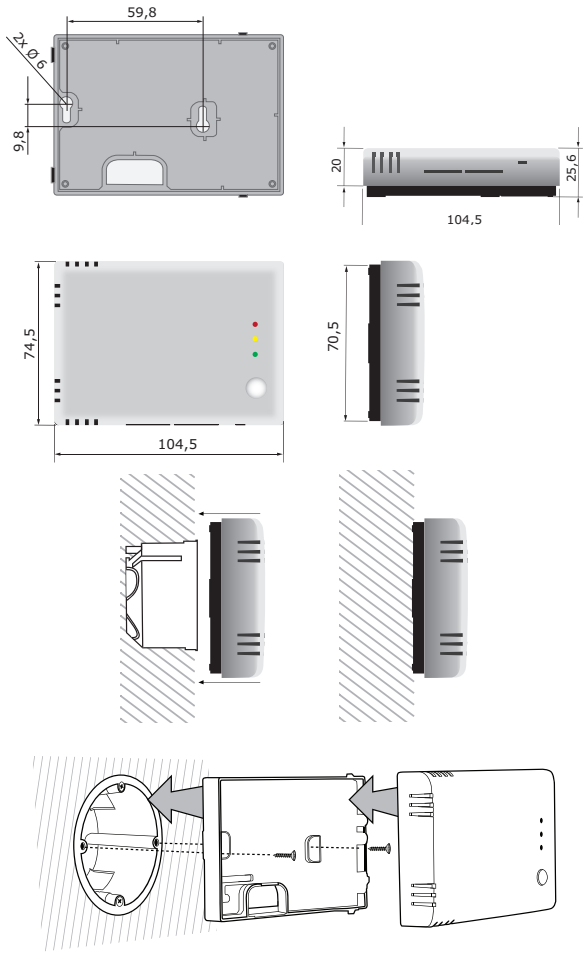
1 - Red LED	On	Measured temperature or relative humidity values are out of range or CO_2 is higher than or equal to Alert 2 level
	Blinking	Communication with one of the sensors fails
2 - Yellow LED	On	Measured temperature or relative humidity values are in the alert range or CO_2 is higher than or equal to Alert 1 level
	Blinking	Modbus communication has stopped and Holding register 8 is activated (Modbus timeout > 0 seconds)
3 - Green LED	On	Measured temperature or relative humidity values are within range or CO_2 level is lower than Alert 1 level
4 - Ambient light sensor		Low light intensity / Active / Standby
5 - RJ45 socket		Modbus communication with connected Master devices and PoM voltage supply (24 VDC)
		Blinking LEDs indicate that packages are transmitted via Modbus RTU communication
6 - Terminal block input connection		24 VDC supply voltage and Modbus RTU signal
7 - Output connection		AO1 - Temperature, relative humidity or CO_2
8 - CO_2 sensor element		To measure CO_2 concentration, self-calibrating
9 - PROG header, P1	 1 2 3 4 5	Put a jumper on pins 1 and 2 and wait for at least 5 seconds to reset the Modbus communication parameters
	 1 2 3 4 5	Put a jumper on pins 3 and 4 and restart the supply to enter bootloader mode

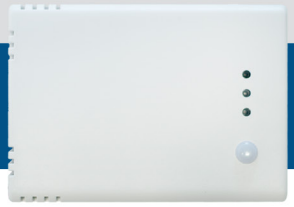
Note: *By default, the LED indicators visualise the measured CO_2 level. When the sensor is in bootloader mode, the green and yellow LEDs flash alternately. During the firmware download, the red LED is flashing additionally.*

Standards

- Low Voltage Directive 2014/35/EU
  - EN 60529:1991 Degrees of protection provided by enclosures (IP Code) Amendment AC:1993 to EN 60529
  - EN 60730-1:2011 Automatic electrical controls for household and similar use - Part 1: General requirements
- EMC Directive 2014/30/EU
  - EN 60730-1:2011 Automatic electrical controls for household and similar use - Part 1: General requirements
  - EN 61000-6-1:2007 Electromagnetic compatibility (EMC) - Part 6-1: Generic standards - Immunity for residential, commercial and light industrial environments
  - EN 61000-6-3:2007 Electromagnetic compatibility (EMC) - Part 6-3: Generic standards - Emission standard for residential, commercial and light-industrial environments Amendments A1:2011 and AC:2012 to EN 61000-6-3
  - EN 61326-1:2013 Electrical equipment for measurement, control and laboratory use - EMC requirements - Part 1: General requirements
  - EN 61326-2-3:2013 Electrical equipment for measurement, control and laboratory use - EMC requirements - Part 2-3: Particular requirements Test configuration, operational conditions and performance criteria for transmitters with integrated or remote signal conditioning.
- WEEE 2012/19/EU
- RoHs Directive 2011/65/EU
  - EN IEC 63000:2018 Technical documentation for the assessment of electrical and electronic products with respect to the restriction of hazardous substances

Fixing and dimensions

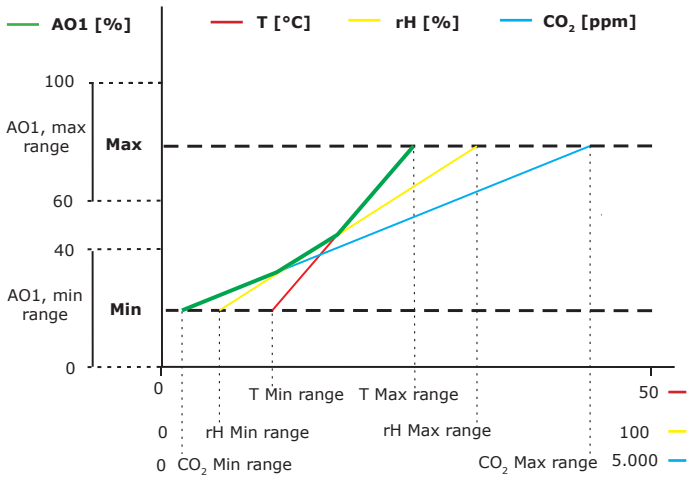




RCMFH-3

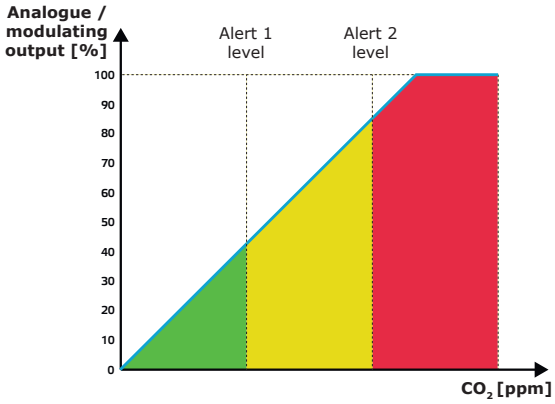
Intelligent multifunctional CO_2 room sensor

Operational diagrams

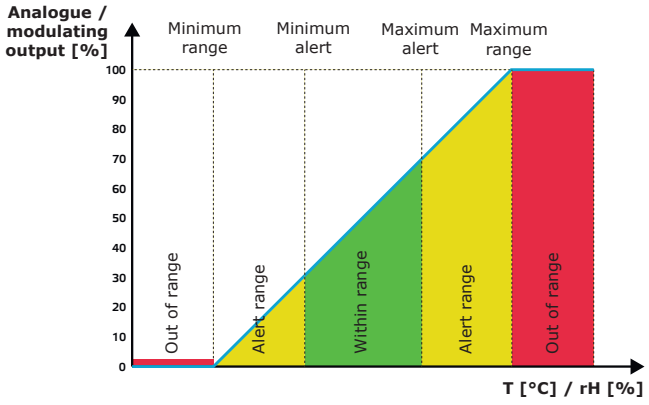


Note: *The output changes automatically depending on the highest of the T, rH or CO_2 values, i.e. the highest of the three output values controls the output. See the green line in the operational diagram above. One or multiple sensors can be deactivated. E.g. it is also possible to control the output based on the measured CO_2 value only.*

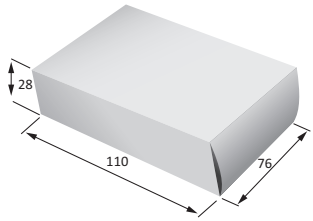
LED indication of CO_2 sensor (default setting)



LED indication of temperature and humidity sensors



Packaging



Article	Packaging	Length [mm]	Width [mm]	Height [mm]	Net weight	Gross weight
RCMFH-3	Unit (1 pc.)	110	76	28	0,094 kg	0,107 kg
	Carton (24 pcs.)	492	182	84	2,256 kg	2,718 kg
	Box (144 pcs.)	514	414	274	13,536 kg	17,298 kg

Global trade item numbers (GTIN)

Packaging	RCMFH-3
Unit	05401003018903
Carton	05401003302996
Box	05401003504420