RCCOX-R

Intelligent CO / NO_2 room sensor

The RCCOX-R are intelligent multifunctional room sensors with adjustable temperature, relative humidity, CO and NO2 ranges. The used algorithm controls a single analogue / modulating output based on the measured T, rH and CO/NO_2 values, which can be used to directly control an EC fan, an AC fan speed controller or an actuator powered damper. All parameters are accessible via Modbus RTU.

Key features

- Spring contact terminal block
- Selectable temperature, relative humidity and CO / NO_2 ranges
- Fan speed control based on T, rH and CO / NO_2 measurements
- Silicon based sensor elements for measuring CO and NO_2
- Bootloader for updating the firmware via Modbus RTU communication
- Ambient light sensor with adjustable 'active' and 'standby' level
- Modbus RTU communication
- Replaceable CO / NO_2 sensor module
- 3 LEDs with adjustable light intensity for status indication
- Long-term stability and accuracy

Area of use

- Demand controlled ventilation based on temperature, relative humidity and CO / NO_2
- Suitable for residential and commercial buildings
- For indoor use only

Technical specifications

Analogue / modulating output	0—10 VDC mode: min. load 50 kΩ (R_L ≥ 50 kΩ)	
	0—20 mA mode: max. load 500 Ω (R_L ≤ 500 Ω)	
	PWM mode: PWM Frequency: 1 kHz, min. load 50 kΩ (R_L ≥ 50 kΩ);PWM voltage level 3,3 VDC or 12 VDC	
Warm-up time	1 hour	
Typical field of use	Temperature range	0—50 °C
	Relative humidity range	0—95 % rH (non-condensing)
	CO range	0—1.000 ppm
	NO_2 range	0—10 ppm
Accuracy	± 0,4 °C (range 0—50 °C)	
	± 3% rH (range 0—100 %)	
Protection standard	IP30 (according to EN 60529)	

Standards

CE

- 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 transducers with integrated or remote signal conditioning
- WEEE Directive 2012/19/EU
- RoHs Directive 2011/65/EU

Article codes

Article code	Supply	Imax
RCCOG-R	18—34 VDC	55 mA
	15—24 VAC ±10%	60 mA
RCCOF-R	18—34 VDC	55 mA

Wiring and connections

Article type	RCCOF-R	RCCOG-R	
VIN	18—34 VDC	18—34 VDC	15—24 VAC ±10%
GND	Ground	Common ground	AC ~
A	Modbus RTU (RS485), signal A		
/B	Modbus RTU (RS485), signal /B		
AO1	Analogue / modulating output (0—10 VDC / 0—20 mA / PWM)		
GND	Ground AO1	Common ground	
Connections	Spring contact terminal blocks, cable cross section: 1,5 mm²		

Attention! *The -F version of the product is not suited for 3-wire connection. It has separate grounds for power supply and analogue output. Connecting both grounds together might result in incorrect measurements. Minimum 4 wires are required to connect -F type sensors.*

The -G version is intended for 3-wire connection and features a 'common ground'. This means that the ground of the analogue output is internally connected with the ground of the power supply. For this reason, -G and -F types cannot be used together on the same network. Never connect the common ground of -G type articles to other devices powered by a DC voltage. Doing so might cause permanent damage to the connected devices!

Modbus registers

The Sensistant Modbus configurator allows you to easily monitor and/or configure Modbus parameters.

The parameters of the unit can be monitored / configured through the 3SModbus software platform. You can download it from the following link:

https://www.sentera.eu/en/3SMCenter

For more information about the Modbus registers, please refer to the product Modbus Register Map.

SENTERA CONTROLS

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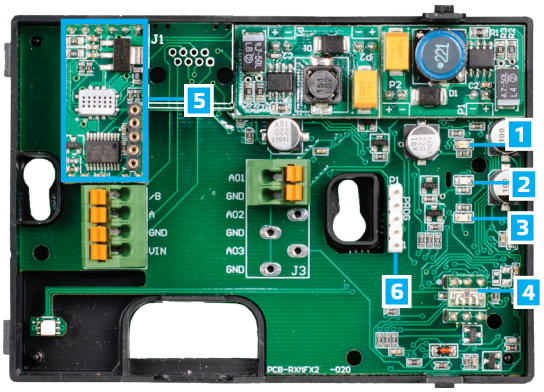
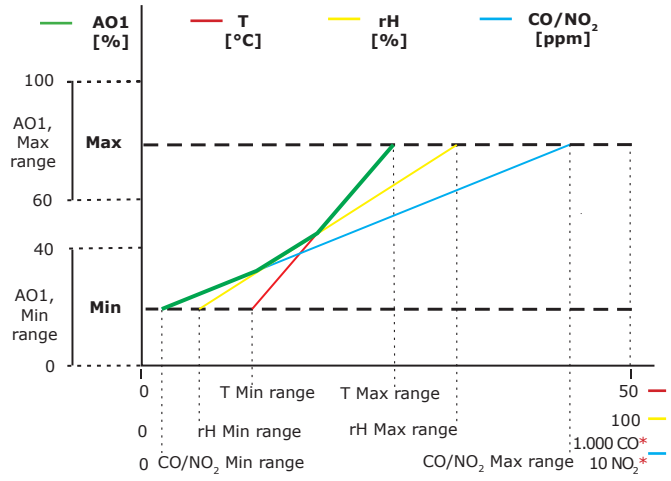
Indications



1 - Red LED	On	Measured temperature, relative humidity or CO/NO_2 values are out of range
	Blinking	Communication with one of the sensors fails
2 - Yellow LED	On	Measured temperature, relative humidity or CO/NO_2 values are in the alert range
	Blinking	Modbus communication has stopped and HR8 is activated (Modbus timeout > 0 seconds)
3 - Green LED	On	Measured temperature, relative humidity or CO/NO_2 values are within range
	Blinking	CO/NO_2 sensor is warming up
4 - Ambient light sensor		Low light intensity / Active / Standby
5 - CO/NO2 sensor element		Replaceable in case of faulty operation
6 - PROG header, P1	1 2 3 4 5	Put a jumper onto 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 onto pins 3 and 4 and restart the power supply to enter bootloader mode

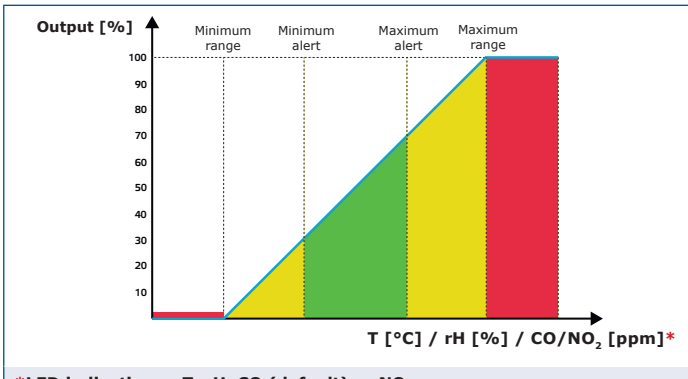
Note: *By default, the LED indicators visualise the measured CO level. When the sensor is in bootloader mode, the green and yellow LEDs flash alternately. During the firmware download, the red LED is flashing additionally.*

Operational diagram



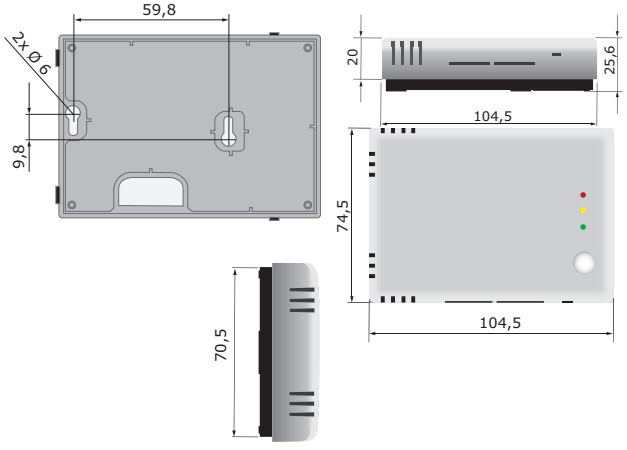
**CO and NO_2 measurements will return 0 ppm during warm-up time.*

***Note:** The output changes automatically depending on the highest of the T, rH or CO/NO_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 value only. It is not possible to control the output based on the measured CO and NO_2 levels simultaneously.*

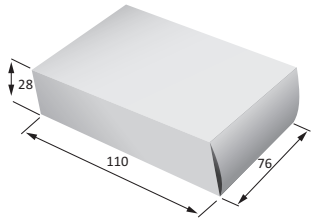


***LED indications - T, rH, CO (default) or NO_2**

Fixing and dimensions



Packaging



Article	Packaging	Length [mm]	Width [mm]	Height [mm]	Net weight	Gross weight
RCCOF-R RCCOG-R	Unit (1 pc.)	110	76	28	0,09 kg	0,11 kg
	Carton (24 pcs.)	492	182	84	2,14 kg	2,80 kg
	Box (144 pcs.)	510	410	270	12,81 kg	18,07 kg

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Global trade item numbers (GTIN)		
Packaging	**RCCOF-R**	**RCCOG-R**
Unit	05401003018217	05401003018224
Carton	05401003302712	05401003302729
Box	05401003503942	05401003503959