SENTERA CONTROLS

FCCOX-R

Intelligent CO/NO_2 sensor

The FCCOX-R series are intelligent sensors featuring adjustable temperature, relative humidiy and CO/NO_2 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
- Silicon based sensor elements for measuring CO/NO_2
- Fan speed control based on T, rH and CO/NO_2
- Inset or surface mounting
- Bootloader for updating the firmware via Modbus RTU communication
- Ambient light sensor with adjustable 'active' and 'standby' level
- Replaceable CO / NO_2 sensor element
- Modbus RTU communication
- 3 LEDs with adjustable light intensity for status indication
- Long-term stability and accuracy

Technical specifications

Analogue / modulating output	0—10 VDC mode: $R_L \geq 50$ kΩ	
	0—20 mA mode: $R_L \leq 500$ Ω	
	PWM (open-collector type) mode: $R_L \geq 50$ kΩ, PWM voltage level: 3,3 VDC or 12 VDC	
Warm-up time	1 hour	
Typical range 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)	

Article codes

Article code	Power supply	Imax
FCCOG-R	18—34 VDC	77 mA
	15—24 VAC ±10%	140 mA
FCCOF-R	18—34 VDC	77 mA

Wiring and connections

Article code	FCCOF-R	FCCOG-R	
V+	18—34 VDC	18—34 VDC	15—24 VAC ± 10 %
V-	Ground	Common ground	AC ~
A	Modbus RTU (RS485), signal A		
/B	Modbus RTU (RS485), signal /B		
Ao	Analogue / modulating output (0—10 VDC / 0—20 mA / PWM)		
GND	Ground AO	Common ground	
Connections	Spring contact terminal block, cable cross section: 2,5 mm²; pitch 5 mm; shielded cable		

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

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

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)
3 - Green LED	On	Measured temperature, relative humidity or CO / NO_2 values are within range
	Blinking	Sensor warming up
4 - Ambient light sensor		Low light intensity / Active / Standby
5 - CO / NO_2 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.*

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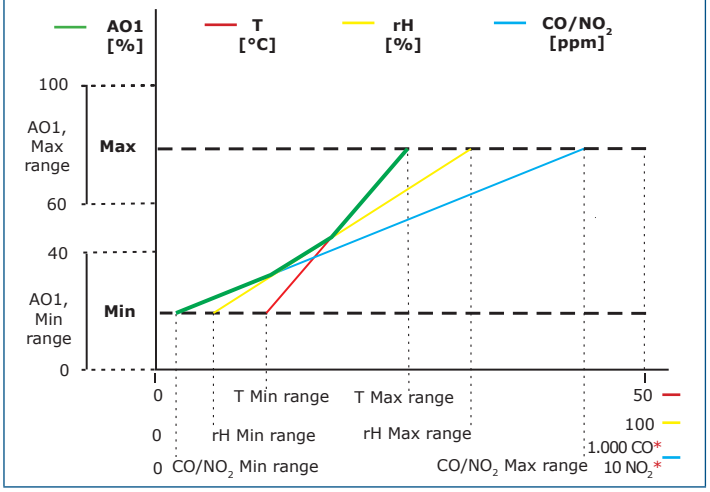
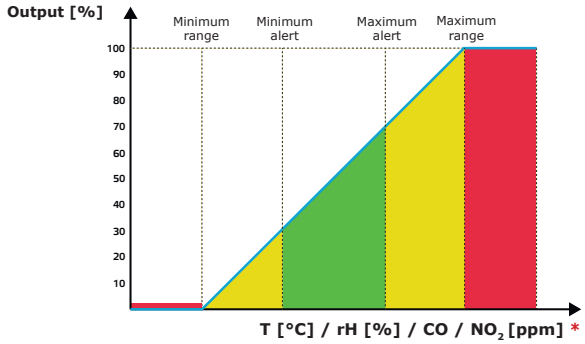
Operational diagram



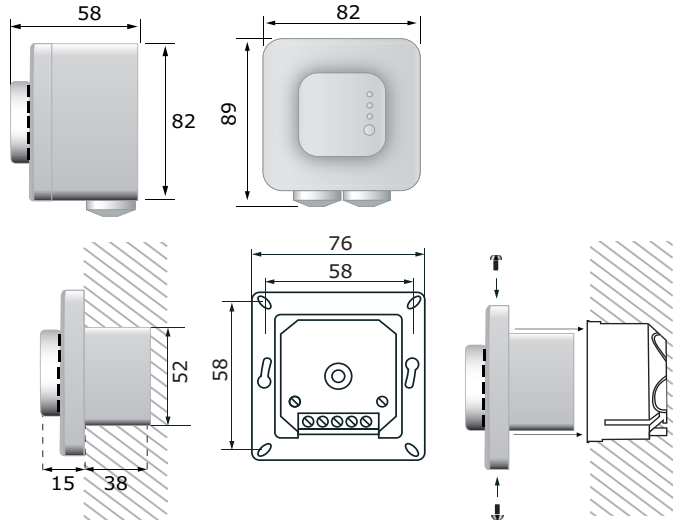
CO and NO_2 measurements will return 0 ppm during warm-up time.

***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.*

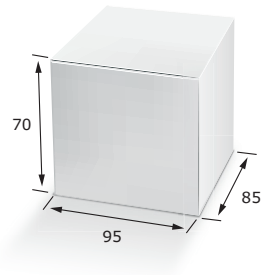


***LED indications - T, rH or CO (default) / NO_2**

Fixing and dimensions



Packaging



Article	Packaging	Length [mm]	Width [mm]	Height [mm]	Net weight	Gross weight
FCCOF-R FCCOG-R	Unit (1 pc.)	95	85	70	0,2 kg	0,21 kg
	Carton (10 pcs.)	492	182	84	2 kg	2,3 kg
	Box (60 pcs.)	590	380	280	12 kg	14,2 kg

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 2012/19/EU
- RoHs Directive 2011/65/EU

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Global trade item numbers (GTIN)		
Packaging	**FCCOF-R**	**FCCOG-R**
Unit	05401003006184	05401003006191
Carton	05401003300718	05401003300725
Box	05401003501122	05401003501139

Area of use

- Ventilation based on temperature, relative humidity and CO/NO_2 levels in parking lots and garages
- Suitable for residential and commercial buildings
- For indoor use only

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.