



# FCMF8-R

## Intelligent multifunctional sensor

The FCMF8-R series are intelligent sensors featuring adjustable temperature, relative humidity and CO<sub>2</sub> ranges. The used algorithm controls a single analogue / modulating output based on the measured T, rH and CO<sub>2</sub> 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

- Universal input voltage: 85–264 VAC / 50–60 Hz
- Selectable temperature, relative humidity and CO<sub>2</sub> ranges
- Fan speed control based on temperature, relative humidity and CO<sub>2</sub>
- Inset or surface mounting
- Bootloader for updating the firmware via Modbus RTU communication
- Ambient light sensor with adjustable 'active' and 'standby' level
- Replaceable CO<sub>2</sub> 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: min. load 50 kΩ (R <sub>L</sub> ≥ 50 kΩ)	
	0–20 mA mode: max. load 500 Ω (R <sub>L</sub> ≤ 500 Ω)	
	PWM (open-collector type) mode: 1 kHz, min. load 50 kΩ (R <sub>L</sub> ≥ 50 kΩ), PWM voltage level: 3,3 VDC or 12 VDC	
Typical field of use	Temperature range	0–50 °C
	Relative humidity range	0–95 % rH (non-condensing)
	CO <sub>2</sub> range	400–2.000 ppm
Accuracy		± 0,4 °C (range 0–50 °C)
		± 3% rH (range 0–100 % rH)
		± 30 ppm (range 400–2.000 ppm)
Protection standard	IP30 (according to EN 60529)	

### Area of use

- Demand controlled ventilation based on temperature, relative humidity and CO<sub>2</sub>
- Suitable for residential and commercial buildings
- For indoor use only

### Wiring and connections

<b>L</b>	Power supply, line (85–264 VAC / 50–60 Hz)
<b>N</b>	Power supply, neutral
<b>Ao</b>	Analogue / modulating output - T, rH or CO <sub>2</sub> (0–10 VDC / 0–20 mA / PWM)
<b>GND</b>	Ground Ao
<b>A</b>	Modbus RTU (RS485), signal A
<b>/B</b>	Modbus RTU (RS485), signal /B
<b>Connections</b>	Spring contact terminal block, cable cross section: 2,5 mm <sup>2</sup> ; pitch 5 mm; shielded cable

### Article codes

Article code	Supply	Imax
<b>FCMF8-R</b>	85–264 VAC / 50–60 Hz	45 mA



### Indications

1 - Red LED	On	Measured temperature, relative humidity or CO <sub>2</sub> values are out of range
	Blinking	
2 - Yellow LED	On	Measured temperature, relative humidity or CO <sub>2</sub> values are in the alert range
	Blinking	
3 - Green LED	On	Measured temperature, relative humidity or CO <sub>2</sub> values are within range
4 - Ambient light sensor		Low light intensity / Active / Standby
5 - CO <sub>2</sub> sensor element		Replaceable in case of faulty operation
6 - PROG header, P1		Put a jumper onto pins 1 and 2 and wait for at least 5 seconds to reset the Modbus communication parameters
		Put a jumper onto pins 3 and 4 and restart the supply to enter bootloader mode

**Note:** By default, the LED indicators visualise the measured CO<sub>2</sub> 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.



## FCMF8-R Intelligent multifunctional sensor

### Modbus registers



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

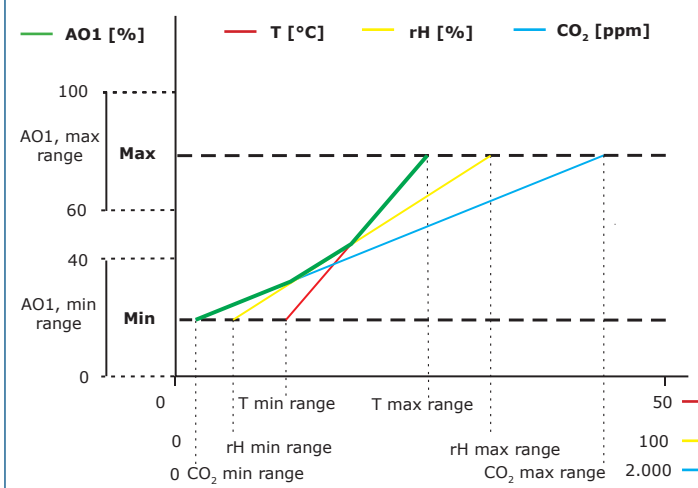
The parameters of the unit can be monitored / configured through the 3SModbus software platform. You can download it from the following link:

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

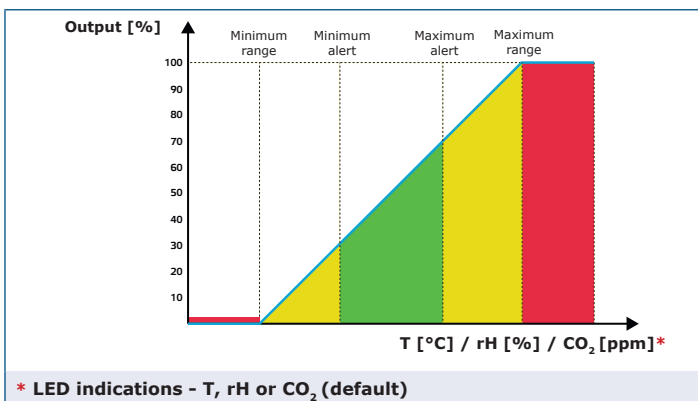


For more information about the Modbus registers, please refer to the product Modbus Register Map.

### Operational diagram



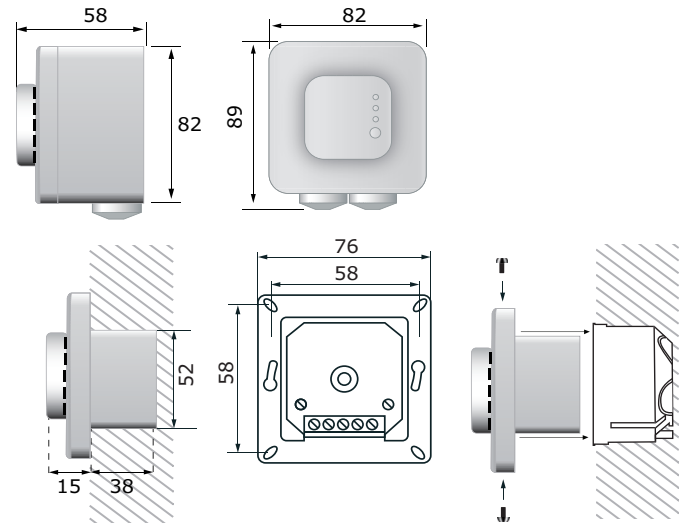
**Note:** The output changes automatically depending on the highest of the T, rH or CO<sub>2</sub> values, i.e. the highest of the three values controls the output. See the green line in the operational diagram above. One or multiple sensors can be deactivated. E.g. it is also possible to control the output based on the measured CO<sub>2</sub> value only.



### Global trade item numbers (GTIN)

Packaging	FCMF8-R
Unit	05401003006207
Carton	05401003300732
Box	05401003501146

### Fixing and dimensions

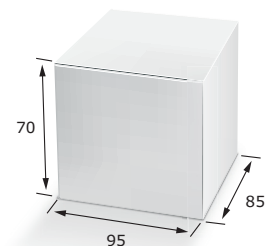


### Standards

- Low Voltage Directive 2014/35/EC
  - 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/EC:
  - 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/EC
- RoHS Directive 2011/65/EC

### Packaging



Article	Packaging	Length [mm]	Width [mm]	Height [mm]	Net weight	Gross weight
FCMF8-R	Unit (1 pc.)	95	85	70	0,213 kg	0,215 kg
	Carton (10 pcs.)	492	182	84	2,13 kg	2,41 kg
	Box (60 pcs.)	590	380	280	12,80 kg	14,88 kg