FCMFG-R

Intelligent CO^2sensor

Description

FCMFG-R is an intelligent sensor featuring adjustable temperature, relative humidity and CO_2 ranges. The used algorithm controls a single analogue / modulating output based on the measured T, rH and CO_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 clamp terminal block
- Adjustable temperature, relative humidity and CO_2 ranges
- Fan speed control based on T, rH and CO_2
- Inset or surface mounting
- Ambient light sensor with adjustable 'active' and 'standby' level
- Replaceable CO_2 sensor element
- Modbus RTU (RS485) communication
- 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_2
- Suitable for residential and commercial buildings
- For indoor use only

Standards

- Low Voltage Directive 2014/35/EU
- Electromagnetic Compatibility (EMC) Directive 2014/30/EU
- WEEE Directive 2012/19/EU
- Commission Delegated Directive (EU) 2015/863 (RoHS 3) of 31 March 2015 amending Annex II to Directive 2011/65/EU of the European Parliament and of the Council as regards the list of restricted substances

Wiring and Connections

V+	Supply voltage 24 VDC / 24 VAC ± 10 %	Cable cross section: 0,75–2,5 mm²
V-		
Ao	Analogue / modulating output 0—10 VDC / 0—20 mA / PWM	Cable cross section: 0,5–2,5 mm²
GND		
A, /B	Modbus RTU (RS485)	Cat5 or EIB cable

Article Codes

Article code	Supply voltage
FCMFG-R	24 VDC / 24 VAC ± 10 %

Technical Specifications

Analogue / modulating output	0—10 VDC mode	load resistance: $R_L \geq 50$ kΩ
	0—20 mA mode	load resistance: $R_L \leq 500$ Ω
	PWM mode	frequency = 1 kHz load resistance ≥ 50 kΩ pull-up voltage level = 3,3 VDC or 12 VDC
Operating conditions	Temperature	0—50 °C
	Relative humidity	0—95 % rH (non-condensing)
	CO_2	400—2.000 ppm
Storage temperature		-10—60 °C
Accuracy of measurements	Temperature	±0,4 °C in range 5—50 °C ±0,8 °C in range -20—50 °C
	Relative humidity	±3 % RH in range 20—80 % ±5 % RH in range 5—95 %
	CO_2	±(45 ppm + 3%) in the range 400—2.000 ppm
Protection standard		IP30 (according to EN 60529)
Enclosure	Material	Acrylonitrile Butadiene Styrene (ABS) plastic
	Colour	white (outer) and black (inner)

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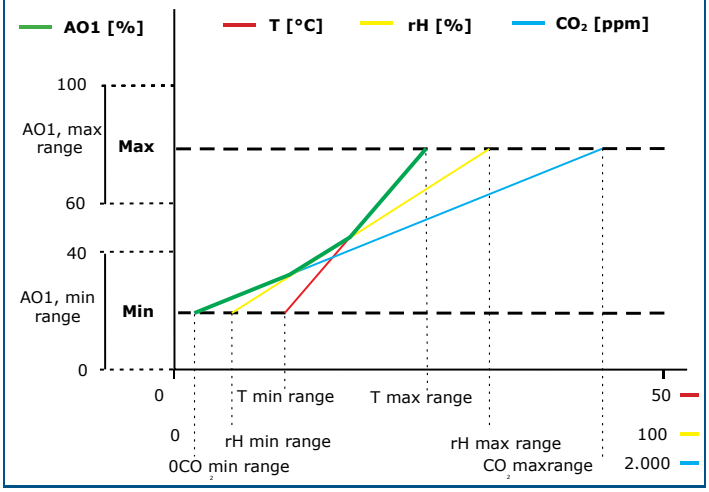
Settings and Indications

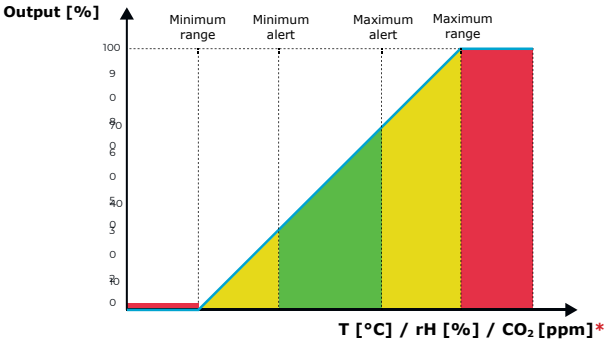
1 - Red LED	On	Measured temperature, relative humidity or CO_2 values are out of range
	Blinking	Communication with one of the sensors fails
2 - Yellow LED	On	Measured temperature, relative humidity or CO_2 values are in the alert range
	Blinking	Modbus communication has stopped and HR8 is activated (Modbus timeout > 0 seconds)
3 - Green LED	On	Measured temperature, relative humidity or CO_2 values are within range
4 - Ambient light sensor		Low light intensity / Active / Standby
5 - CO_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

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.*

Operational Diagram



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 indications - T, rH or CO_2 (default)**

Fixing and Dimensions