



FCVCX-R

Intelligent multifunctional sensor

The FCVCX-R series are intelligent sensors featuring adjustable temperature, relative humidity and TVOC / CO₂eq ranges. Based on this TVOC measurement, an equivalent CO₂ level (CO₂eq) is calculated. The TVOC concentration is an accurate indicator for indoor air quality. Based on the temperature and relative humidity measurements, the dew point is calculated. The used algorithm controls a single analogue / modulating output based on the measured T, rH and TVOC values, which can be used to directly control an EC fan or an actuator powered damper. All parameters are accessible via Modbus RTU.

Key features

- Selectable temperature, relative humidity and TVOC / CO₂eq ranges
- Fan speed control based on T, rH and TVOC
- Flush or surface mounting
- Bootloader for updating the firmware via Modbus RTU communication
- Ambient light sensor with adjustable 'active' and 'standby' level
- Replaceable TVOC / CO₂eq sensor element
- Modbus RTU (RS485)
- 3 LEDs with adjustable light intensity for status indication
- Long-term stability and accuracy

Technical specifications

Analogue / modulating output	0—10 VDC mode: $R_L \geq 50 \text{ k}\Omega$	
	0—20 mA mode: $R_L \leq 500 \text{ }\Omega$	
	PWM (open-collector type) mode: 1 kHz, $R_L \geq 50 \text{ k}\Omega$,	
	PWM voltage level: 3,3 VDC or 12 VDC	
Warm-up time	15 minutes	
Typical field of use	Temperature range	0—50 °C
	Relative humidity range	0—95% rH (non-condensing)
	TVOC range	0—60.000 ppb
Accuracy	$\pm 0,4 \text{ }^\circ\text{C}$ (range 0—50 °C)	
	$\pm 3\%$ rH (range 0—95 %)	
	$\pm 15\%$ TVOC (range 0—60.000 ppb)	
Protection standard	IP30 (according to EN 60529)	

Article codes

Article code	Supply	Imax
FCVCG-R	18—34 VDC	60 mA
	15—24 VAC $\pm 10\%$	122 mA
FCVCF-R	18—34 VDC	60 mA

Area of use

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

Wiring and connections

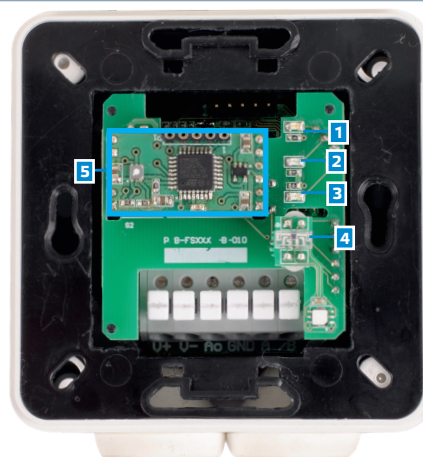
Article type	FCVCF-R	FCVCG-R	
V+	18—34 VDC	18—34 VDC	15—24 VAC ±10%
V-	Ground	Common ground*	AC ~*
A	Modbus RTU (RS485), signal A		
/B	Modbus RTU (RS485), signal /B		
Ao	Analogue / modulating output - T, rH or TVOC (0—10 VDC / 0—20 mA / PWM)		
GND	Ground AO	Common ground*	
Connections	Spring contact 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 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.



Indications



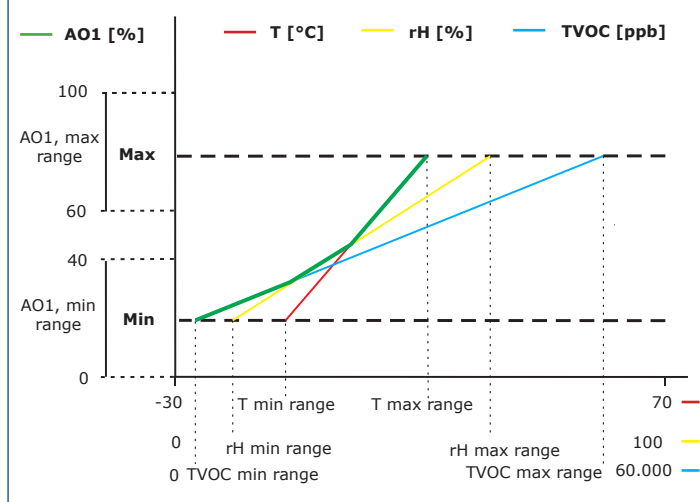
1 - Red LED	Continuous	Measured temperature, relative humidity or TVOC / CO ₂ eq are out of range
	Blinking	Communication with one of the sensors fails
2 - Yellow LED	On	Measured temperature, relative humidity or TVOC / CO ₂ eq are in the alert range
3 - Green LED	On	Measured temperature, relative humidity or TVOC / CO ₂ eq are within range
4 - Ambient light sensor		Low light intensity / Active / Standby
5 - TVOC / CO ₂ eq sensor element		Replaceable in case of faulty operation

FCVCX-R

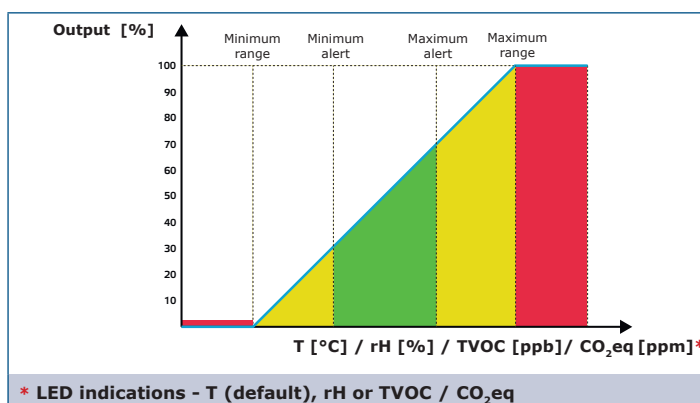
Intelligent multifunctional sensor



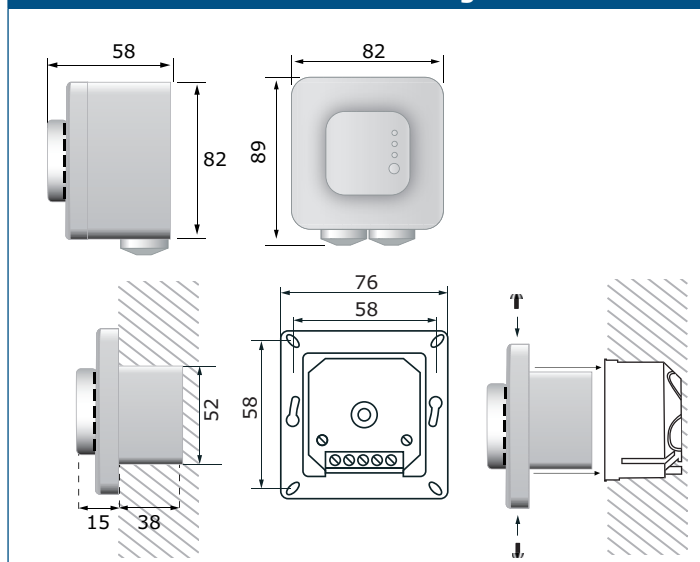
Operational diagram



Note: The output changes automatically depending on the highest T, rH or TVOC values, i.e. the highest of three output values controls the output. See the green line in the operational diagram above.



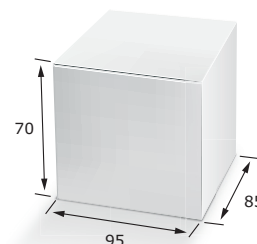
Fixing and dimensions



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/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/EC
- RoHS Directive 2011/65/EC

Packaging



Article	Packaging	Length [mm]	Width [mm]	Height [mm]	Net weight	Gross weight
FCVCF-R FCVCG-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

Global trade item numbers (GTIN)

Packaging	FCVCF-R	FCVCG-R
Unit	05401003006276	05401003006283
Carton	05401003300800	05401003300817
Box	05401003501214	05401003501221

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 3S Modbus 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.