

HVAC transmitters intelligent sensors sensor controllers &



Temperature



Relative humidity



CO2



Differential pressure



Air quality



Air flow volume



Air flow velocity

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Temperature & relative humidity

Duct, T, rH

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Room, T, rH

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Outdoor T, rH

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Flush mounted, T, rH

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S.1.1.F.2	FCTHX	Intelligent temperature and humidity sensor

Temperature

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Temperature, relative humidity & air quality

Duct, T, rH, TVOC

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Room, T, rH, TVOC

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S.1.7.R.1.2	RSVCH-R	Air quality room transmitter
S.1.7.R.2	RCVCX-R	Intelligent air quality room sensor
S.1.7.R.2.1	RCVCM-R	Intelligent TVOC room sensor
S.1.7.R.2.2	RCVCH-R	Intelligent TVOC room sensor

Outdoor, T, rH, TVOC

S.1.7.O.1	ODVCM-R	Multifunctional transmitter for harsh environments
S.1.7.O.2	OCVCM-R	Intelligent TVOC sensor for harsh environments

Flush mounted, T, rH, TVOC

- S.1.7.F.1 **FCVC8-R** Intelligent air quality sensor
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DSMFX-2R

Multifunctional duct transmitter

The DSMFX-2R series are multifunctional duct transmitters which measure temperature, relative humidity and CO₂ concentration level. Based on the temperature and relative humidity measurements, the dew-point temperature is calculated. The series features a wide range of low voltage power supply and three analogue / modulating outputs. All parameters are accessible via Modbus RTU.

Key features

- Selectable temperature, relative humidity and CO₂ ranges
- 3 selectable analogue / modulating outputs
- Bootloader for updating the firmware via Modbus RTU communication
- Modbus RTU (RS485)
- Innovative self-calibrating algorithm
- Replaceable CO₂ sensor element
- Long-term stability and accuracy

Technical specifications

3 analogue / modulating outputs	0—10 VDC mode: min. load 50 kΩ ($R_L \geq 50 \text{ k}\Omega$)	
	0—20 mA mode: max. load 500 Ω ($R_L \leq 500 \text{ }\Omega$)	
	PWM (open-collector type) mode: 1 kHz, min. load 50 kΩ ($R_L \geq 50 \text{ k}\Omega$), PWM voltage level: 3,3 VDC or 12 VDC	
Typical field of use	Temperature range	-30—70 °C
	Relative humidity range	0—100 % rH (non-condensing)
	CO ₂ range	400—2.000 ppm
Accuracy	± 0,4 °C (range -30—70 °C)	
	± 3% rH (range 0—100 %)	
	± 30 ppm (range 400—2.000 ppm)	
Min. airflow velocity	1 m / s	
Protection standard	Enclosure: IP54, probe: IP20	



Article codes

Article code	Supply	Maximum power consumption	Nominal power consumption	I _{max}
DSMFF-2R	18—34 VDC	2,6 W	1,3 W	145 mA
DSMFG-2R	18—34 VDC / 15—24 VAC ±10%	2,1 W (VAC) / 2,6 W (VDC)	1,3 W (VAC) / 1,48 W (VDC)	155 mA (VAC) / 145 mA (VDC)

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.

Standards

- EMC Directive 2014/30/EC:
 - 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
- RoHS Directive 2011/65/EC



Area of use

Monitoring duct temperature, relative humidity and CO₂ level in HVAC applications

Wiring and connections

Article type	DSMFF-2R	DSMFG-2R	
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 1 for temperature measurement (0—10 VDC / 0—20 mA / PWM)		
GND	Ground AO1	Common ground*	
AO2	Analogue / modulating output 2 for relative humidity measurement (0—10 VDC / 0—20 mA / PWM)		
GND	Ground AO2	Common ground*	
AO3	Analogue / modulating output 3 for CO ₂ measurement (0—10 VDC / 0—20 mA / PWM)		
GND	Ground AO3	Common ground*	
Connections	Spring contact terminal blocks, cable cross section: 1,5 mm ²		

***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.

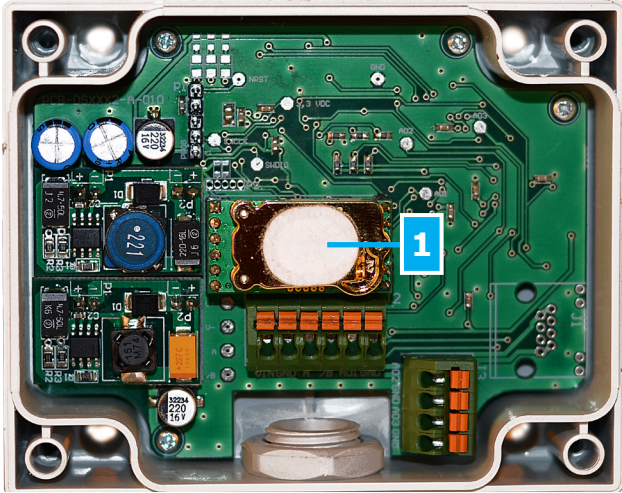
The -G version is intended for 3-wire connection and features a 'common ground'. This means that the ground of the analogue output is internally connected with the ground of the power supply. For this reason, -G and -F types cannot be used together on the same network. Never connect the common ground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

DCMFX-2R

Intelligent multifunctional duct sensor



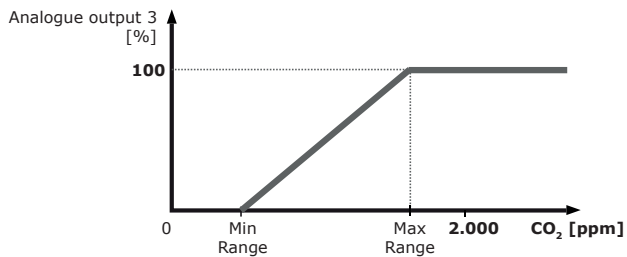
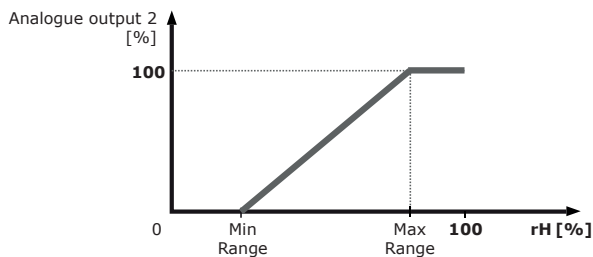
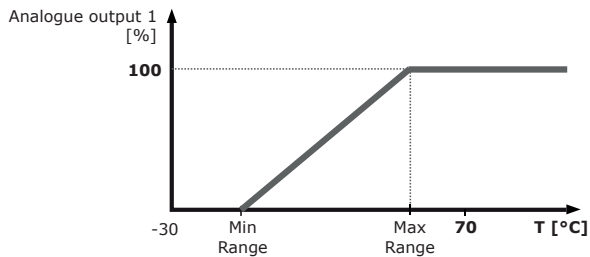
Settings



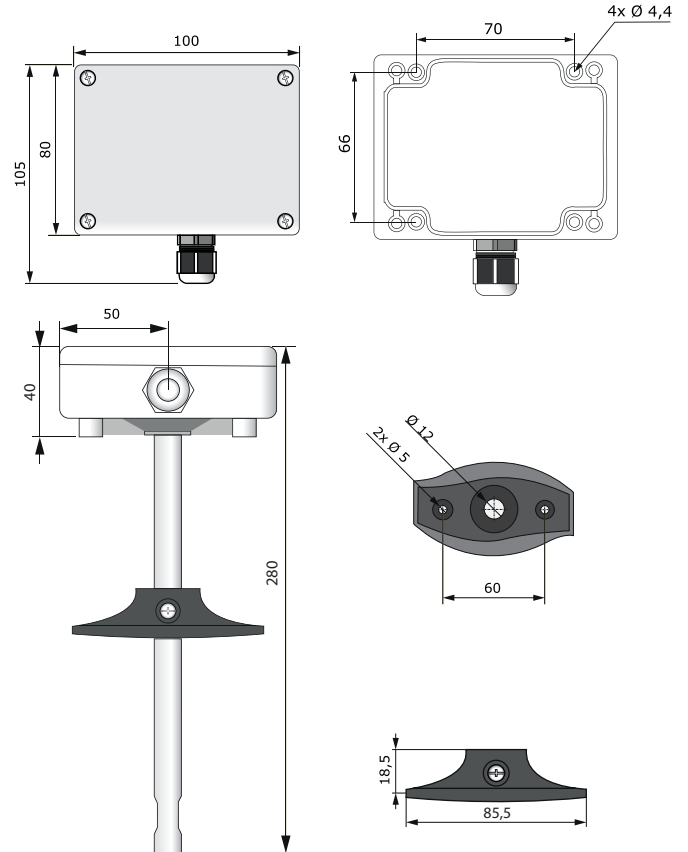
1 - CO₂ sensor element

Replaceable in case of faulty operation

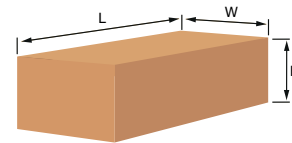
Operational diagram(s)



Fixing and dimensions



Packaging



Article	Packaging	Length [mm]	Width [mm]	Height [mm]	Net weight	Gross weight
DSMFX-2R	Unit (1 pc.)	310	115	115	0,16 kg	0,24 kg
	Box (20 pcs.)	590	380	505	3,20 kg	6,03 kg

Global trade item numbers (GTIN)

Packaging	DSMFF-2R	DSMFG-2R
Unit	05401003001912	05401003001929
Box	05401003500699	05401003500705

DSCDG0-4

Duct CO₂ sensor



Description

DSCDG0-4 is a duct sensor that measures carbon dioxide (CO₂), temperature (T) and relative humidity (rH). [NDIR \(non-dispersive infrared\)](#) technology is used to measure the CO₂ level. This technology has a low life-cycle cost and long-term precision and stability.

The ABC self-calibrating algorithm compensates for the gradual drifting of the NDIR CO₂ sensor. This algorithm is designed for applications where CO₂ concentrations drop to outside ambient conditions (±400 ppm) for at least 15 minutes once every 7-day period, which is typically seen during unoccupied periods. The lowest reading during a 7-day period is considered fresh outside air (i.e. the baseline).

Some of the main benefits of DSCDG0-4 are:

- Modbus RTU communication: The sensor has no analogue outputs — all measured values are transmitted via Modbus RTU.
- Access to real-time data: Connect the device to the SenteraWeb cloud platform using a [Sentera internet gateway](#) to receive real-time data about the sensor settings and measurements.
- Easy to install: The built-in pluggable terminal block ensures easy and secure installation.
- Firmware updates: The firmware of the device can be updated effortlessly via the SenteraWeb cloud platform.
- Smooth integration with building management systems (BMS): The sensor can be easily connected to a building management system via Modbus RTU communication.

DSCDG0-4 is specifically designed for installation in air duct systems, making it ideal for applications in commercial, industrial and residential buildings. The sensor provides real-time, reliable data that enables building management systems (BMS) to take actions regarding ventilation control, air quality management and energy consumption optimisation.

Key Features

- Remote access to device data through Modbus RTU communication
- Over-voltage protection of the power supply
- Easy firmware updates via Modbus RTU communication
- Robust enclosure made of Acrylonitrile Butadiene Styrene (ABS) plastic
- Self-calibrating CO₂ sensing element ensuring accurate CO₂ measurements
- Reliable temperature and relative humidity measurements as sensing elements require no calibration

Technical Specifications

Imax	40 mA
Minimum recommended air flow velocity	1 m/s
Output type	No analogue outputs Measurements transmitted via Modbus RTU
Accuracy of measurements:	
Temperature	± 0,4 °C
Relative humidity	± 2,5 % rH
CO ₂ level	± 30 ppm
Measurement ranges:	
Temperature	-30—70 °C
Relative humidity	0—100 % rH
CO ₂ level	0—2.000 ppm
Operating conditions:	
Temperature	-10—50°C
Relative humidity	10—90 % (non-condensing)
Protection standard:	
Enclosure	IP54
Probe	IP20
Enclosure type:	
Material	Acrylonitrile Butadiene Styrene (ABS) plastic
Colour	Grey (RAL 7035)



Article code

Article code	Supply
DSCDG0-4	24 VDC / 24 VAC ± 10%

Connect Devices to SenteraWeb



Via a Sentera Internet Gateway you can connect your installation to the SenteraWeb HVAC cloud and:

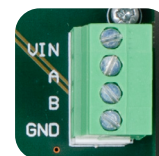
- Easily change the parameter settings of the connected devices remotely.
- Define users and give them access to monitor the installation via a standard web browser.
- Log data - create diagrams and export logged data.
- Receive alerts or warnings when measured values exceed alert ranges or when errors occur.
- Create different regimes for your ventilation system - e.g. day-night regime.

Please refer to the Modbus Register Map of the product for more details regarding the Modbus registers.

Area of Use

- Demand controlled ventilation based on CO₂ concentration, temperature and relative humidity
- Air quality monitoring in air ducts

Wiring and Connections



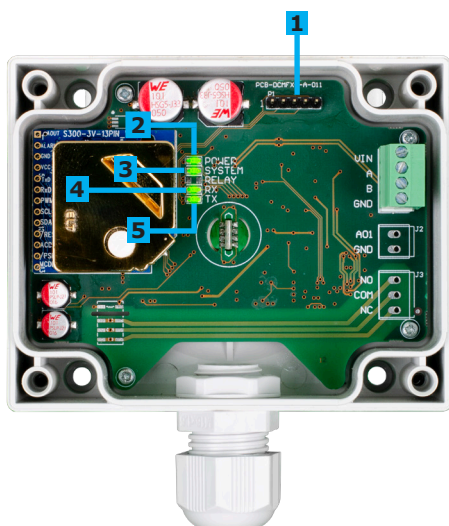
VIN	24 VDC / 24 VAC ± 10%
A	Modbus RTU (RS485), signal A
B	Modbus RTU (RS485), signal /B
GND	Common ground
Connector type	Pluggable screw terminal block
Cable characteristics	Cat5 or EIB cable

DSCDG0-4

Duct CO₂ sensor



Settings and Indications



1 - PROG header, P1



Put a jumper onto pins 1 and 2 and wait for at least 5 seconds to reset the Modbus communication parameters

On-board LED indication

2 - Power ON indication

On

Internal power supply (3,3 VDC) of the device is OK

3 - System indications

On

Device is powered; System is OK

Slow blinking

Device is powered; System error
Blinking frequency:
1 time per second / 1 Hz

Fast blinking

Device is powered; Bootloader mode
Blinking frequency:
2 times per second / 2 Hz

4 - RX indication

Blink

Modbus request from master (client) is received

5 - TX indication

Blink

Modbus response from the device is transmitted

Standards

- Electromagnetic Compatibility Directive 2014/30/EU
- Low Voltage Directive 2014/35/EU
- WEEE 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



Global Trade Item Numbers 14 (GTIN 14)

Packaging	DSCDG0-4
Unit (1 pc.)	5401003018972
Box (20 pcs.)	5401003504444
Palette (320 pcs.)	5401003701461

Temperature Diagram

Temperature [°C]	70	Alarm
T alarm maximum (HR16)		Alert
T alert maximum (HR14)		OK
T alert minimum (HR13)		Alert
T alarm minimum (HR15)		Alarm
	-30	

Relative Humidity Diagram

rH [%]	100	Alarm
RH alarm maximum (HR26)		Alert
RH alert maximum (HR24)		OK
RH alert minimum (HR23)		Alert
RH alarm minimum (HR25)		Alarm
	0	

Dew Point Diagram

Dew point delta [°C]		OK
Dew point delta alert sub-threshold (HR33)		Alert
Dew point delta alarm sub-threshold (HR34)		Alarm
	0	

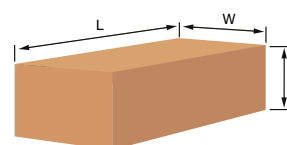
CO₂ Level Diagram

CO ₂ level	2000	Alarm
CO ₂ level alarm threshold (HR54)		Alert
CO ₂ level alert threshold (HR53)		OK
	0	

Note: HR — Holding register

All above-mentioned parameters are holding registers and can be accessed through Modbus RTU communication via SenteraWeb.

Packaging



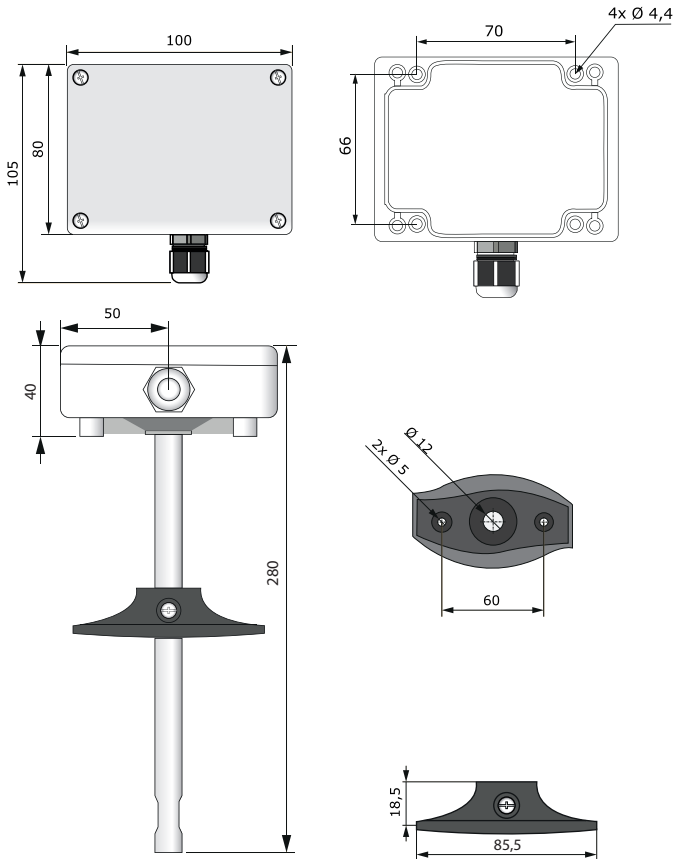
Article	Packaging	Length	Width	Height	Net	Gross
	Unit (1 pc.)	310 mm	110 mm	110 mm	0,15 kg	0,28 kg
DSCDG0-4	Box (20 pcs.)	590 mm	380 mm	505 mm	3,02 kg	6,68 kg
	Palette (320 pcs.)	1200 mm	800 mm	2170 mm	48,32 kg	126,32 kg

DSCDG0-4

Duct CO₂ sensor



Fixing and Dimensions





DCMFX-2R

Intelligent CO₂ duct sensor

The DCMFX-2R series are intelligent multifunctional duct sensors featuring adjustable temperature, relative humidity and CO₂ ranges. The used algorithm controls a single analogue / modulating output based on the measured T, rH and CO₂ 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 blocks
- Selectable temperature, relative humidity and CO₂ ranges
- Fan speed control based on T, rH and CO₂
- Bootloader for updating the firmware via Modbus RTU communication
- Modbus RTU communication
- Replaceable CO₂ sensor element
- 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: $R_L \leq 500 \Omega$	
	PWM mode: 1 kHz, $R_L \geq 50 \text{ k}\Omega$, PWM voltage level: 3,3 or 12 VDC	
Typical range of use	Temperature range	-30—70 °C
	Relative humidity range	0—100 % rH (non-condensing)
	CO ₂ range	400—2.000 ppm
Accuracy	$\pm 0,4 \text{ }^\circ\text{C}$ (range -30—70 °C)	
	$\pm 3\%$ rH (range 0—100 %)	
	$\pm 30 \text{ ppm}$ (range 400—2.000 ppm)	
Min. airflow velocity	1 m / s	
Protection standard	Enclosure: IP54, probe: IP20	

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.

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



Article codes

Article code	Supply	Imax
DCMFF-2R	18—34 VDC	110 mA
DCMFG-2R	18—34 VDC /	110 mA
	15—24 VAC $\pm 10\%$	120 mA

Area of use

- Demand controlled ventilation based on temperature, relative humidity and CO₂
- Suitable for mounting in air ducts

Wiring and connections

Article type	DCMFF-2R	DCMFG-2R	
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 AO		Common ground
Connections	Spring contact terminal blocks, cable cross section: 1,5 mm ²		

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.

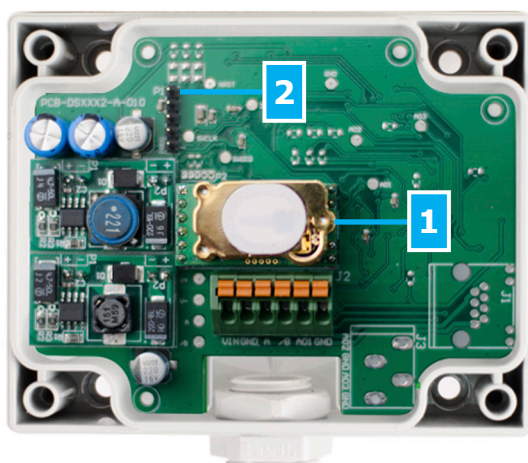
The -G version is intended for 3-wire connection and features a 'common ground'. This means that the ground of the analogue output is internally connected with the ground of the power supply. For this reason, -G and -F types cannot be used together on the same network. Never connect the common ground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

DCMFX-2R

Intelligent CO₂ duct sensor

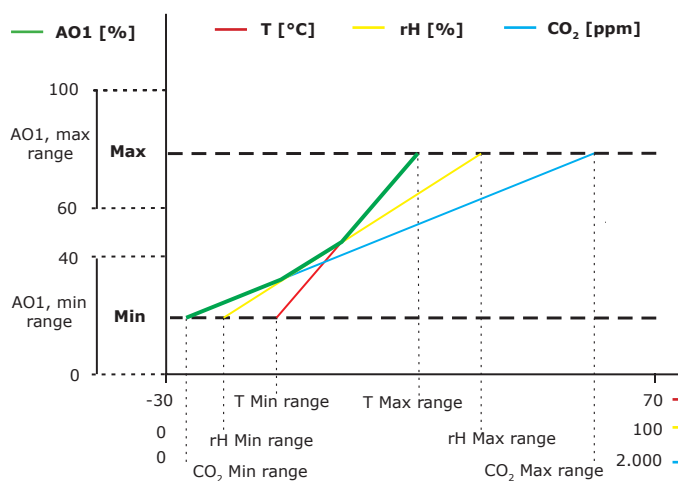


Settings



1 - CO ₂ sensor element		Replaceable in case of faulty operation
2 - 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 supply to enter bootloader mode

Operational diagram(s)

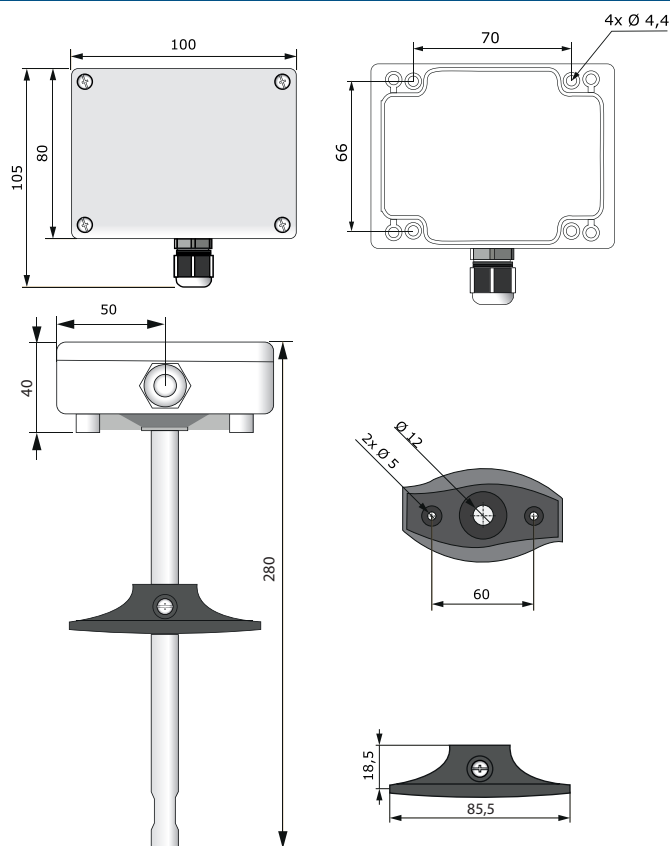


Note: The output changes automatically depending on the highest of the T, rH or CO₂ values, i.e. the highest of the three output values controls the output. See the green line in the operational diagram above. One or multiple sensors can be deactivated. E.g. it is also possible to control the output based on the measured CO₂ values only.

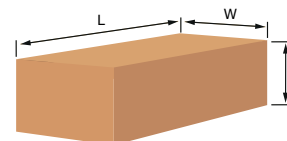
Global trade item numbers (GTIN)

Packaging	DCMFF-2R	DCMFG-2R
Unit	05401003000670	05401003000687
Box	05401003500187	05401003500194
Pallet	05401003700006	05401003700013

Fixing and dimensions



Packaging



Article	Packaging	Length [mm]	Width [mm]	Height [mm]	Net weight	Gross weight
DCMFF-2R DCMFG-2R	Unit (1 pc.)	312	108	112	0,15 kg	0,26 kg
	Box (20 pcs.)	590	380	505	3,04 kg	6,32 kg
	Pallet (320 pcs.)	1,200	800	2,016	48,6 kg	117,5 kg

DCMFM-2R

Intelligent CO₂ duct sensor

The DCMFM-2R is an intelligent duct sensor featuring adjustable temperature, relative humidity and CO₂ ranges. The used algorithm generates an output value based on the measured T, rH and CO₂ levels, which can be used to directly control an EC fan, an AC fan speed controller or an actuator powered damper. It is Power over Modbus supplied and all parameters are accessible via Modbus RTU.

Key features

- 24 VDC power supply via RJ45 (PoM)
- Selectable temperature, relative humidity and CO₂ ranges
- Bootloader for updating the firmware via Modbus RTU communication
- Modbus RTU communication
- Replaceable CO₂ sensor element
- Long-term stability and accuracy

Technical specifications

Supply voltage	24 VDC, Power over Modbus	
Maximum power consumption	1,08 W	
Nominal power consumption	0,81 W	
Typical range of use	Temperature range	-30—70 °C
	Relative humidity range	0—100 % rH (non-condensing)
	CO ₂ range	400—2.000 ppm
Accuracy	± 0,4 °C (range -30—70 °C)	
	± 3% rH (range 0—100 % rH)	
	± 30 ppm (range 400—2.000 ppm)	
Min. airflow velocity	1 m/s	
Protection standard	Enclosure: IP54, probe: IP20	

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.

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
- RoHS Directive 2011/65/EC



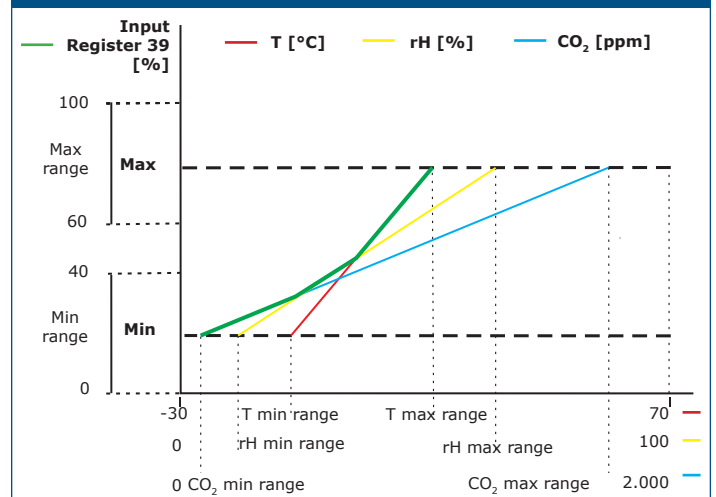
Article codes

	Supply	Connection	Imax
DCMFM-2R	24 VDC, PoM	RJ45	45 mA

Area of use

- Demand controlled ventilation based on temperature, relative humidity and CO₂
- Suitable for mounting in air ducts

Operational diagram(s)



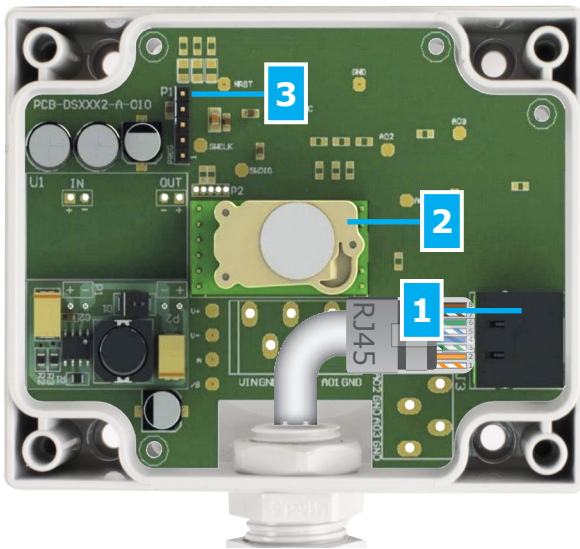
Note: The output changes automatically depending on the highest of the T, rH or CO₂ values, i.e. the highest of the three output values controls the output signal. See the green line in the operational diagram above. One or multiple sensors can be deactivated. E.g. it is also possible to control the output based on the measured CO₂ value only.

DCMFM-2R

Intelligent CO₂ duct sensor



Settings



1 - RJ45 socket		Plug the communication and power cable into the socket
2 - CO ₂ sensor element		Replaceable in case of faulty operation
3 - 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

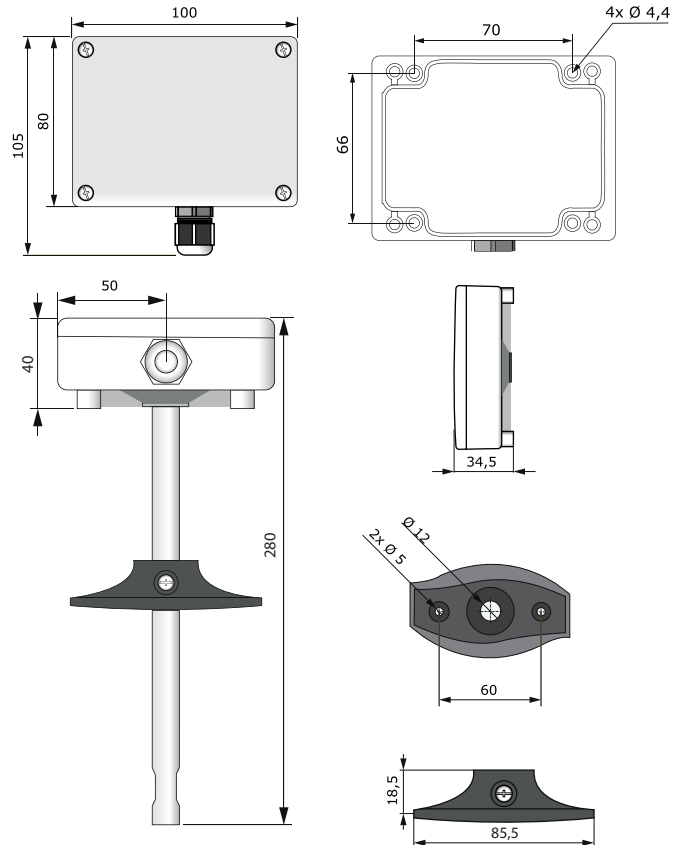
Wiring and connections

24 VDC	Supply voltage 24 VDC
GND	Ground
A	Modbus RTU communication, signal A
/B	Modbus RTU communication, signal /B

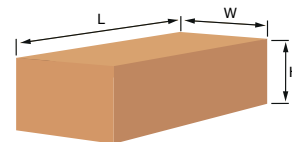
Global trade item numbers (GTIN)

Packaging	DCMFM-2R
Unit	05401003000694
Box	05401003500200
Pallet	05401003700020

Fixing and dimensions



Packaging



Article	Packaging	Length [mm]	Width [mm]	Height [mm]	Net weight	Gross weight
DCMFM-2R	Unit (1 pc.)	310	115	115	0,20 kg	0,308 kg
	Box (20 pcs.)	590	380	505	4 kg	4,20 kg
	Pallet (320 pcs.)	1,200	800	2,016	64 kg	64 kg



RSMFX-3

Multifunctional CO₂ room transmitter

The RSMFX-3 series are multifunctional room transmitters which measure CO₂ concentration levels, temperature, relative humidity and ambient light. They have three analogue / modulating outputs for temperature, relative humidity and CO₂ and a wide range of low voltage power supply. Through Modbus RTU, all parameters are accessible.

Key features

- Selectable CO₂, temperature and relative humidity ranges
- 3 selectable analogue / modulating outputs
- A bootloader for firmware updates using Modbus RTU communication
- Ambient light sensor with adjustable 'active' and 'standby' level
- Modbus RTU communication
- 3 LEDs with adjustable light intensity for status indication
- Long-term stability and accuracy
- Spring clamp terminal blocks

Area of use

- Monitoring indoor temperature, relative humidity and CO₂ levels in HVAC applications
- Suitable for residential and commercial buildings
- For indoor use only

Article codes

Article code	Supply voltage	I _{max}	Connection type
RSMFF-3	24 VDC	80 mA	Terminal block
RSMFG-3	24 VDC	60 mA	
	24 VAC ±10%	120 mA	

Technical specifications

3 analogue / modulating outputs	0—10 VDC mode	min. load resistance 50 kΩ (R _L ≥ 50 kΩ)
	0—20 mA mode	max. load resistance 500 Ω (R _L ≤ 500 Ω)
	PWM (open-collector type) mode	1 kHz, min. load resistance 50 kΩ (R _L ≥ 50 kΩ), PWM voltage level: 3,3 VDC or 12 VDC
Typical range of use	Temperature	0—50 °C
	Relative humidity	0—95 % rH (non-condensing)
	CO ₂ range	400—2.000 ppm ±0,5 °C (5—50 °C) ±6 % rH (20—80 % rH)
Accuracy	400—2.000 ppm CO ₂	±(50 ppm + 3 % of the reading)
	2.001—5.000 ppm CO ₂	±(40 ppm + 5 % of the reading)
Protection standard	IP30 (according to EN 60529)	

How to configure



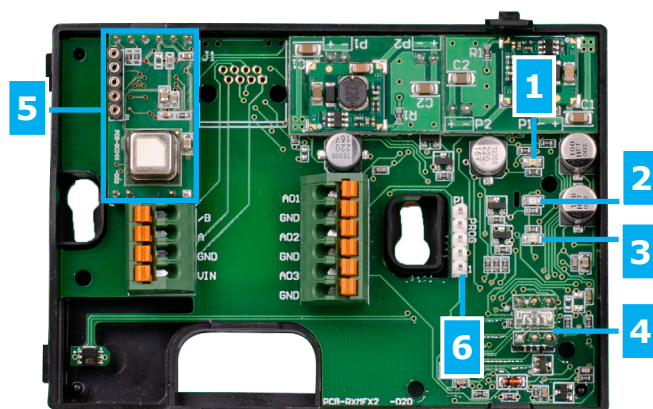
Via a Sentera Internet Gateway you can connect your installation to the SenteraWeb HVAC cloud and:

- Easily change the parameter settings of the connected devices remotely
- Define users and give them access to monitor the installation via a standard web browser
- Log data - create diagrams and export logged data
- Receive alerts or warnings when measured values exceed alert ranges or when errors occur
- Create different regimes for your ventilation system - e.g. day-night regime

Please refer to the Modbus Register Map of the product for more details regarding the Modbus registers.



Settings and indications



1 - Red LED	On	Measured temperature or relative humidity values are out of range or CO ₂ is higher than or equal to Alert 2 level
	Blinking	Communication with one of the sensors fails
2 - Yellow LED	On	Measured temperature or relative humidity values are in the alert range or CO ₂ is higher than or equal to Alert 1 level
	Blinking	Modbus communication has stopped and Holding register 8 is activated (Modbus timeout > 0 seconds)
3 - Green LED	On	Measured temperature or humidity levels are within range or CO ₂ level is lower than Alert 1 level
4 - Ambient light sensor		Low light intensity / Active / Standby
5 - CO ₂ sensor element		To measure CO ₂ concentration, self-calibrating
6 - PROG header, P1		Put a jumper on pins 1 and 2 and wait for at least 5 seconds to reset the Modbus communication parameters
		Put a jumper on pins 3 and 4 and restart the supply to enter bootloader mode

Note: By default, the LED indicators visualise the measured CO₂ 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.



RSMFX-3

Multifunctional CO₂ room transmitter

Wiring and connections

Article type	RSMFF-3	RSMFG-3	
VIN	24 VDC	24 VDC	24 VAC ±10%
GND	Ground	Common ground	AC ~
A	Modbus RTU (RS485) communication, signal A		
/B	Modbus RTU (RS485) communication, signal /B		
AO1	Analogue / modulating output 1 for temperature measurement (0—10 VDC / 0—20 mA / PWM)		
GND	Ground AO1	Common ground	
AO2	Analogue / modulating output 2 for relative humidity measurement (0—10 VDC / 0—20 mA / PWM)		
GND	Ground AO2	Common ground	
AO3	Analogue / modulating output 3 for CO ₂ measurement (0—10 VDC / 0—20 mA / PWM)		
GND	Ground AO3	Common ground	
Connections	Spring contact terminal blocks, cable cross section: 1,5 mm ²		

Attention! 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.

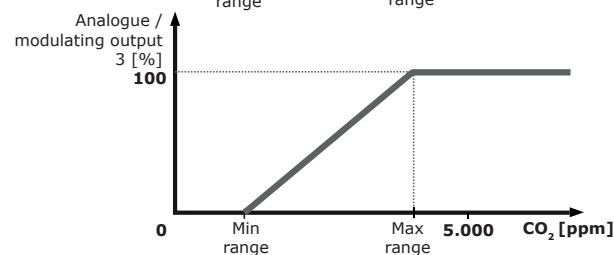
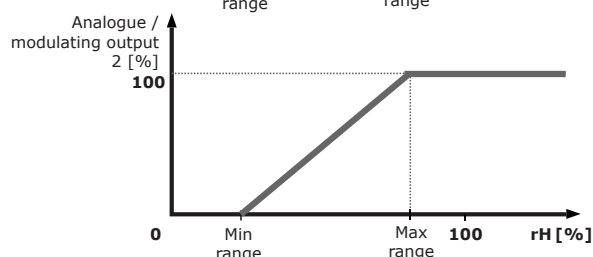
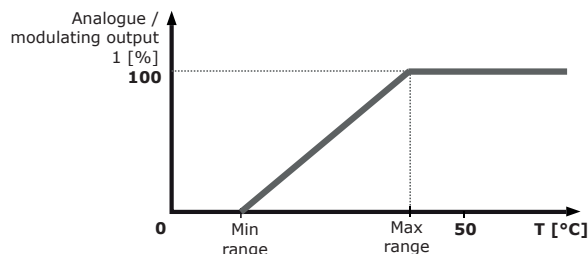
The -F version is suited for 4-wire connection. It features separate grounds for power supply and analogue output. Never connect the separated ground of the -F article to other devices powered by an AC voltage. Doing so might cause permanent damage to the device!

Standards

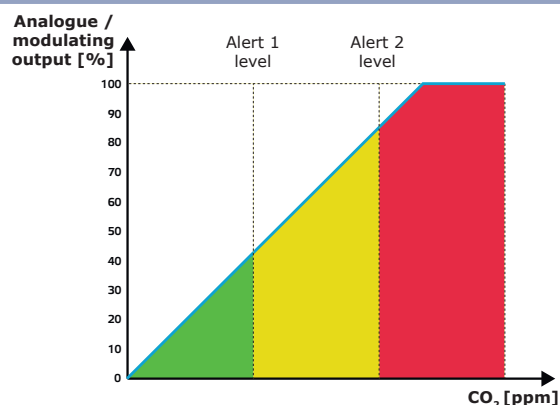


- Low Voltage Directive 2014/35/EU
 - EN 60529:1991 Degrees of protection provided by enclosures (IP Code) Amendment AC:1993 to EN 60529
 - EN 60730-1:2011 Automatic electrical controls for household and similar use - Part 1: General requirements
- EMC Directive 2014/30/EU
 - EN 60730-1:2011 Automatic electrical controls for household and similar use - Part 1: General requirements
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 - 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 transmitters with integrated or remote signal conditioning.
- WEEE 2012/19/EU
- RoHS Directive 2011/65/EU
 - EN IEC 63000:2018 Technical documentation for the assessment of electrical and electronic products with respect to the restriction of hazardous substances

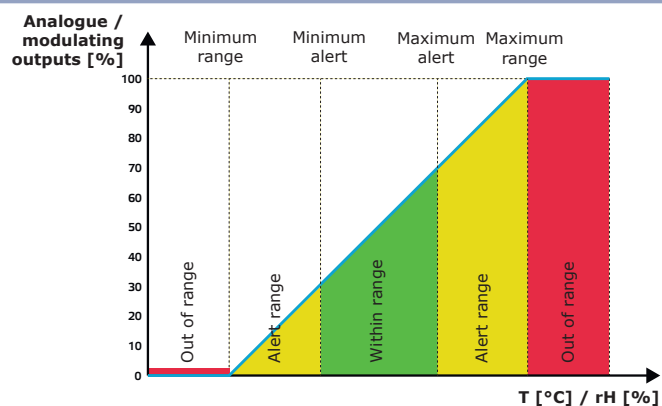
Operational diagrams

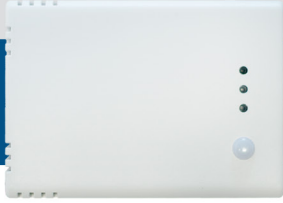


LED indication of CO₂ sensor (default setting)



LED indication of temperature and humidity sensor





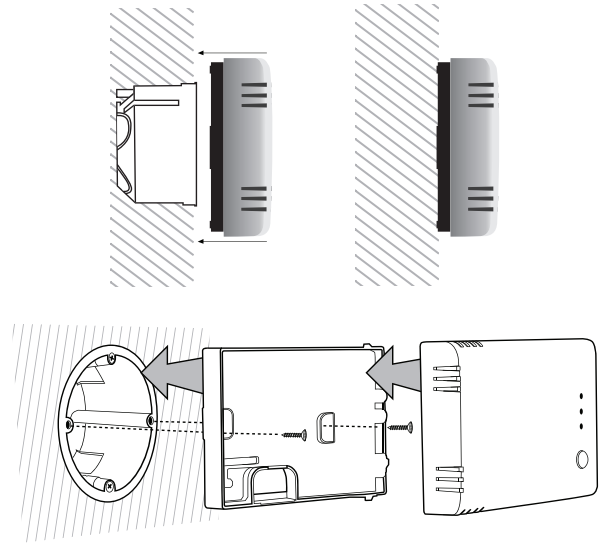
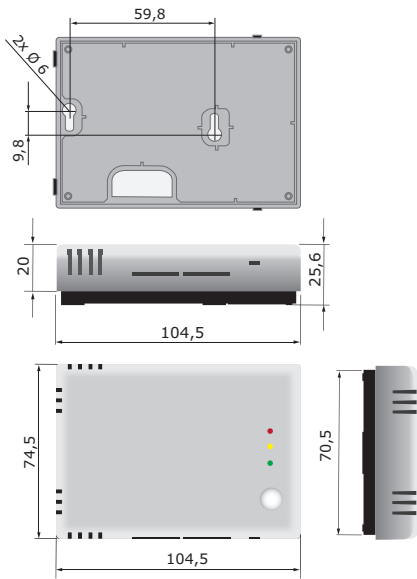
RSMFX-3

Multifunctional CO₂ room transmitter

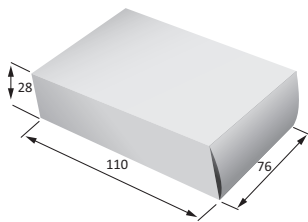
Global trade item numbers (GTIN)

Packaging	RSMFF-3	RSMFG-3
Unit	05401003018842	05401003018859
Carton	05401003302934	05401003302941
Box	05401003504369	05401003504376

Fixing and dimensions



Packaging



Article	Packaging	Length [mm]	Width [mm]	Height [mm]	Net weight	Gross weight
RSMFF-3 RSMFG-3	Unit (1 pc.)	110	76	28	0,095 kg	0,108 kg
	Carton (24 pcs.)	492	177	85	2,28 kg	2,742 kg
	Box (144 pcs.)	590	380	505	13,68 kg	17,442 kg

RSMFM-3

Multifunctional CO₂ room transmitter, PoM

The RSMFM-3 are multifunctional room transmitters which measure CO₂ concentration levels, temperature, relative humidity and ambient light. They are Power over Modbus supplied and all parameters are accessible via Modbus RTU.

Key features

- Selectable CO₂, temperature and relative humidity ranges
- Outputs available via Modbus RTU input registers
- A bootloader for firmware updates using Modbus RTU communication
- Ambient light sensor with adjustable 'active' and 'standby' level
- 3 LEDs with adjustable light intensity for status indication
- Long-term stability and accuracy

Area of use

- Monitoring indoor temperature, relative humidity and CO₂ levels in HVAC applications
- Suitable for residential and commercial buildings
- For indoor use only

Article codes

Article code	Supply voltage	I _{max}	Connection type
RSMFM-3	24 VDC, PoM	30 mA	RJ45 socket

Technical specifications

Supply voltage	24 VDC, Power over Modbus	
Typical range of use	Temperature	0—50 °C
	Relative humidity	0—95 % rH (non-condensing)
	CO ₂ range	400—2.000 ppm
Accuracy	±0,5 °C (5—50 °C)	
	±6 % rH (20—80 % rH)	
	400—2.000 ppm CO ₂	±(50 ppm + 3 % of the reading)
	2.001—5.000 ppm CO ₂	±(40 ppm + 5 % of the reading)
Protection standard	IP30 (according to EN 60529)	

How to configure



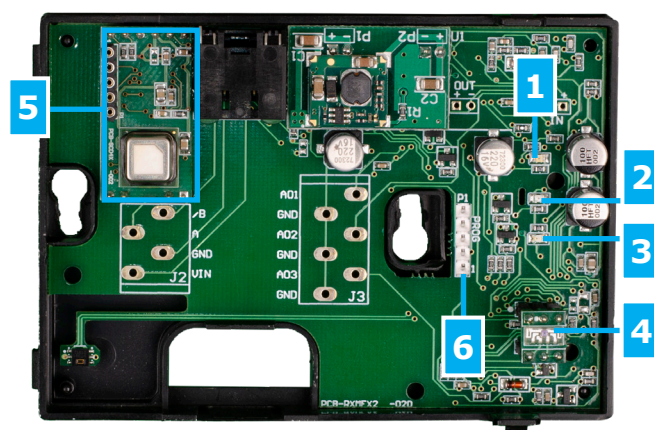
Via a Sentera Internet Gateway you can connect your installation to the SenteraWeb HVAC cloud and:

- Easily change the parameter settings of the connected devices remotely
- Define users and give them access to monitor the installation via a standard web browser
- Log data - create diagrams and export logged data
- Receive alerts or warnings when measured values exceed alert ranges or when errors occur
- Create different regimes for your ventilation system - e.g. day-night regime

Please refer to the Modbus Register Map of the product for more details regarding the Modbus registers.



Settings and indications



1 - Red LED	On	Measured temperature or relative humidity values are out of range or CO ₂ is higher than or equal to Alert 2 level
	Blinking	Communication with one of the sensors fails
2 - Yellow LED	On	Measured temperature or relative humidity values are in the alert range or CO ₂ is higher than or equal to Alert 1 level
3 - Green LED	On	Measured temperature or relative humidity values are within range or CO ₂ level is lower than Alert 1 level
4 - Ambient light sensor		Low light intensity / Active / Standby
5 - CO ₂ sensor element		To measure CO ₂ concentration, self-calibrating
6 - PROG header, P1		Put a jumper on pins 1 and 2 and wait for at least 5 seconds to reset the Modbus communication parameters
		Put a jumper on pins 3 and 4 and restart the supply to enter bootloader mode

Note: By default, the LED indicators visualise the measured CO₂ 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.

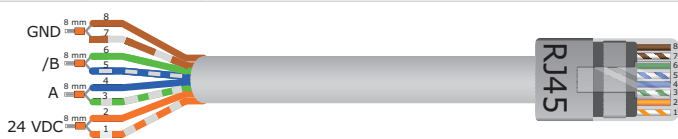
RSMFM-3

Multifunctional CO₂ room transmitter, PoM

Wiring and connections

RJ45 socket (Power over Modbus)

Pin 1	24 VDC	Supply voltage
Pin 2		
Pin 3	A	Modbus RTU communication, signal A
Pin 4		
Pin 5	/B	Modbus RTU communication, signal /B
Pin 6		
Pin 7	GND	Ground, supply voltage
Pin 8		

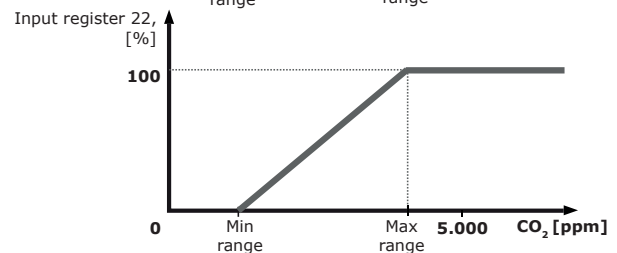
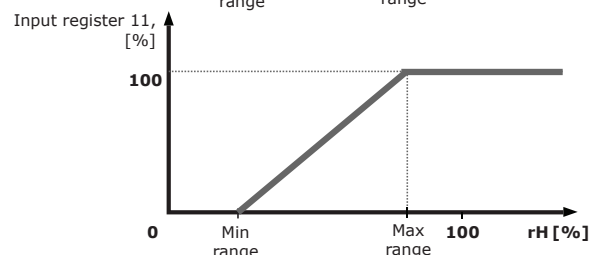
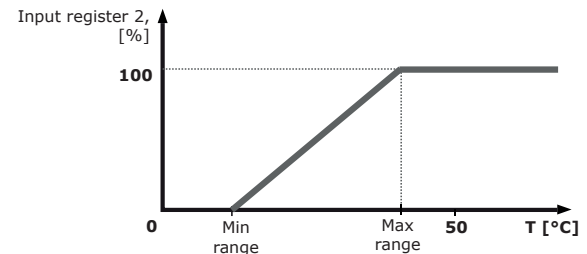


Standards



- Low Voltage Directive 2014/35/EU
 - EN 60529:1991 Degrees of protection provided by enclosures (IP Code) Amendment AC:1993 to EN 60529
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- WEEE 2012/19/EU
- RoHs Directive 2011/65/EU
 - EN IEC 63000:2018 Technical documentation for the assessment of electrical and electronic products with respect to the restriction of hazardous substances

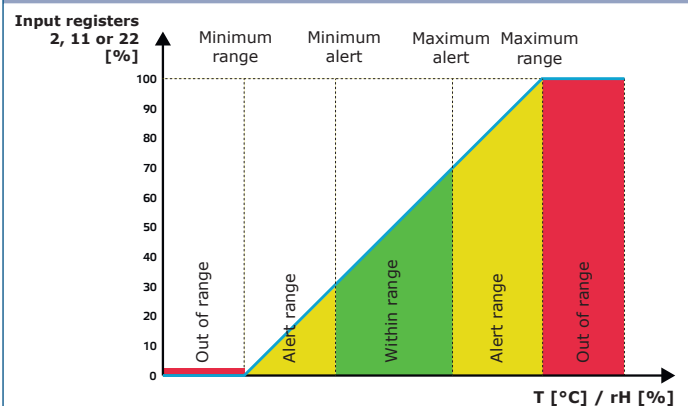
Operational diagrams

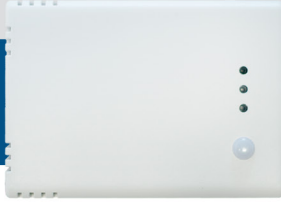


LED indication of CO₂ sensor (default setting)



LED indication of temperature and humidity sensor





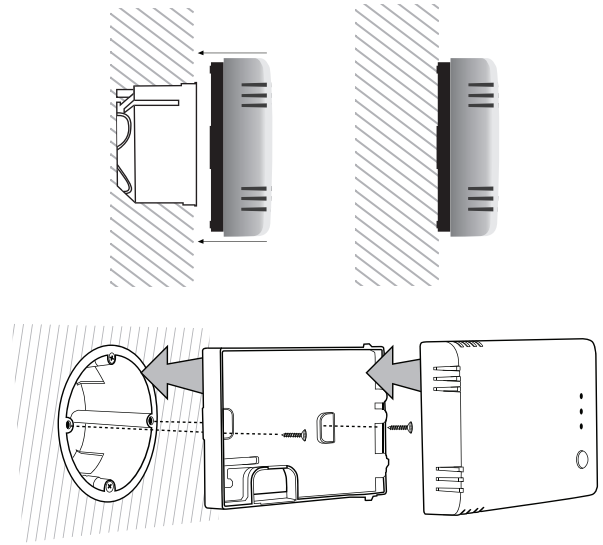
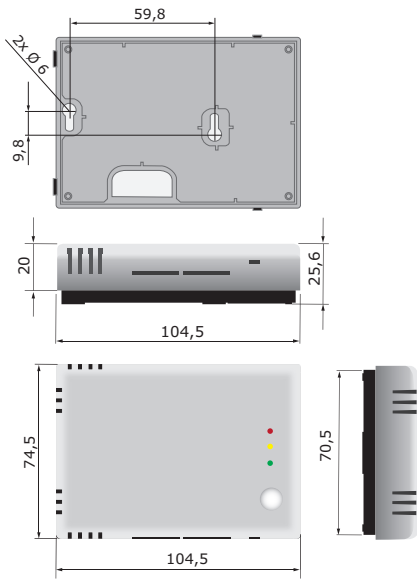
RSMFM-3

Multifunctional CO₂ room transmitter, PoM

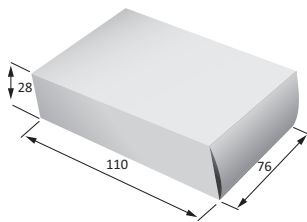
Global trade item numbers (GTIN)

Packaging	RSMFM-3
Unit	05401003018873
Carton	05401003302965
Box	05401003504390

Fixing and dimensions



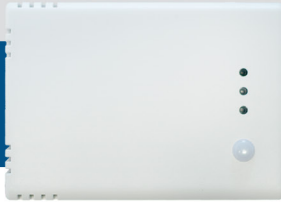
Packaging



Article	Packaging	Length [mm]	Width [mm]	Height [mm]	Net weight	Gross weight
RSMFM-3	Unit (1 pc.)	110	76	28	0,088 kg	0,101 kg
	Carton (24 pcs.)	492	177	85	2,112 kg	2,574 kg
	Box (144 pcs.)	590	380	505	12,672 kg	16,434 kg

RSMFH-3

Multifunctional CO₂ room transmitter



The RSMFH-3 series are multifunctional room transmitters which measure CO₂ concentration levels, temperature, relative humidity and ambient light. They have three analogue / modulating outputs for temperature, relative humidity and CO₂ and 24 VDC power supply. Through Modbus RTU, all parameters are accessible.

Key features

- Spring contact terminal block or RJ45 connection
- Selectable temperature, relative humidity and CO₂ ranges
- 3 selectable analogue / modulating outputs
- A bootloader for firmware updates using Modbus RTU communication
- Ambient light sensor with adjustable 'active' and 'standby' level
- Modbus RTU communication
- 3 LEDs with adjustable light intensity for status indication
- Long-term stability and accuracy

Area of use

- Monitoring indoor temperature, relative humidity and CO₂ levels in HVAC applications
- Suitable for residential and commercial buildings
- For indoor use only

Article codes

Article code	Supply	Imax	Connection type
RSMFH-3	24 VDC	60 mA	RJ45 or terminal block

Technical specifications

3 analogue / modulating outputs	0—10 VDC mode	min. load resistance 50 kΩ ($R_L \geq 50 \text{ k}\Omega$)
	0—20 mA mode	max. load resistance 500 Ω ($R_L \leq 500 \text{ }\Omega$)
	PWM (open-collector type) mode	1 kHz, min. load resistance 50 kΩ ($R_L \geq 50 \text{ k}\Omega$), PWM voltage level: 3,3 VDC or 12 VDC
Typical range of use	Temperature	0—50 °C
	Relative humidity	0—95 % rH (non-condensing)
	CO ₂ range	400—2.000 ppm
Accuracy		±0,5 °C (5—50 °C)
		±6 % rH (20—80 % rH)
	400—2.000 ppm CO ₂	±(50 ppm + 3 % of the reading)
Protection standard	2.001—5.000 ppm CO ₂	±(40 ppm + 5 % of the reading)
		IP30 (according to EN 60529)

How to configure



Via a Sentera Internet Gateway you can connect your installation to the SenteraWeb HVAC cloud and:

- Easily change the parameter settings of the connected devices remotely
- Define users and give them access to monitor the installation via a standard web browser
- Log data - create diagrams and export logged data
- Receive alerts or warnings when measured values exceed alert ranges or when errors occur
- Create different regimes for your ventilation system - e.g. day-night regime

Please refer to the Modbus Register Map of the product for more details regarding the Modbus registers.



Wiring diagram

RJ45 socket (Power over Modbus)

Pin 1	24 VDC	Supply voltage
Pin 2		
Pin 3	A	Modbus RTU communication, signal A
Pin 4		
Pin 5	/B	Modbus RTU communication, signal /B
Pin 6		
Pin 7	GND	Ground, supply voltage
Pin 8		



Terminal Block 1

VIN	Supply voltage 24 VDC
GND	Supply voltage, ground
A	Modbus RTU communication, signal A
/B	Modbus RTU communication, signal /B

Terminal Block 2

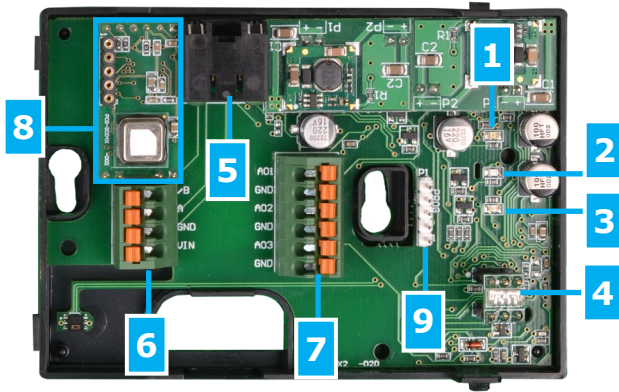
AO1	Analogue / modulating output 1 for temperature measurement (0—10 VDC / 0—20 mA / PWM)
GND	Ground AO1
AO2	Analogue / modulating output 2 for relative humidity measurement (0—10 VDC / 0—20 mA / PWM)
GND	Ground AO2
AO3	Analogue / modulating output 3 for CO ₂ measurement (0—10 VDC / 0—20 mA / PWM)
GND	Ground AO3

Attention! The unit needs to be supplied via the RJ45 connector or via the connection terminals. Do not connect the device via the RJ45 connector and the terminal block simultaneously.

RSMFH-3

Multifunctional CO₂ room transmitter

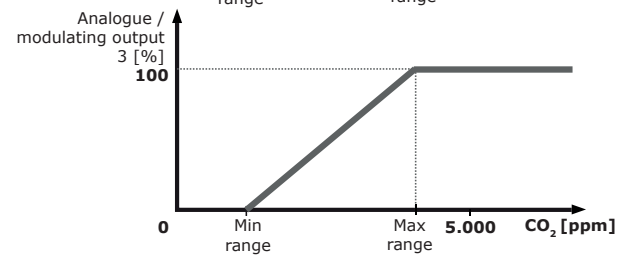
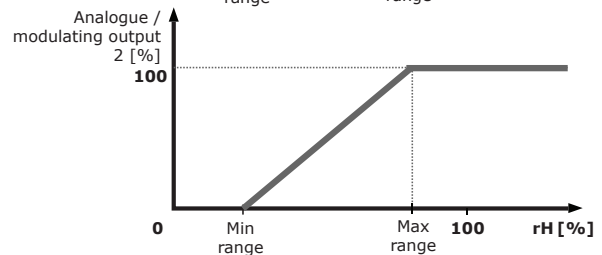
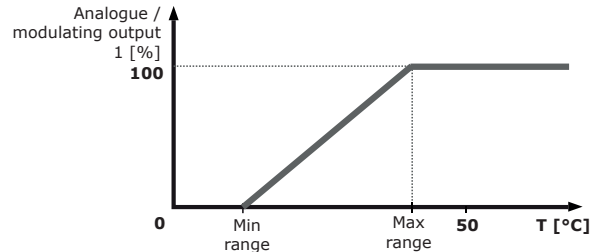
Settings and indications



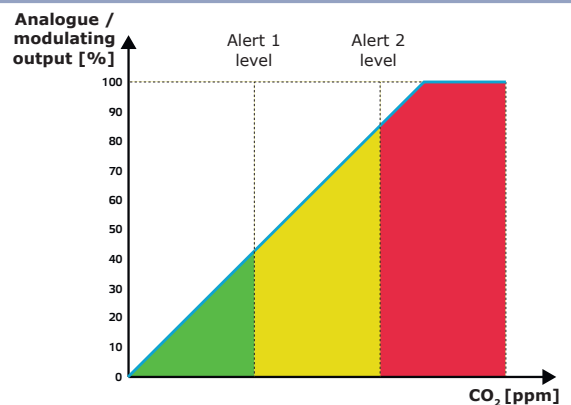
1 - Red LED	On	Measured temperature or relative humidity values are out of range or CO ₂ is higher than or equal to Alert 2 level
	Blinking	Communication with one of the sensors fails
2 - Yellow LED	On	Measured temperature or relative humidity values are in the alert range or CO ₂ is higher than or equal to Alert 1 level
	Blinking	Modbus communication has stopped and Holding register 8 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 - RJ45 socket		Modbus communication with connected Master devices and PoM voltage supply (24 VDC) Blinking LEDs indicate that packages are transmitted via Modbus RTU communication
6 - Terminal block input connection		24 VDC supply voltage and Modbus RTU signal
7 - Output connection		AO1 - temperature measurement
		AO2 - relative humidity measurement
		AO3 - CO ₂ measurement
8 - CO ₂ sensor element		To measure CO ₂ concentration, self-calibrating
9 - PROG header, P1		Put a jumper on pins 1 and 2 and wait for at least 5 seconds to reset the Modbus communication parameters
		Put a jumper on pins 3 and 4 and restart the supply to enter bootloader mode

Note: By default, the LED indicators visualise the measured CO₂ 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.

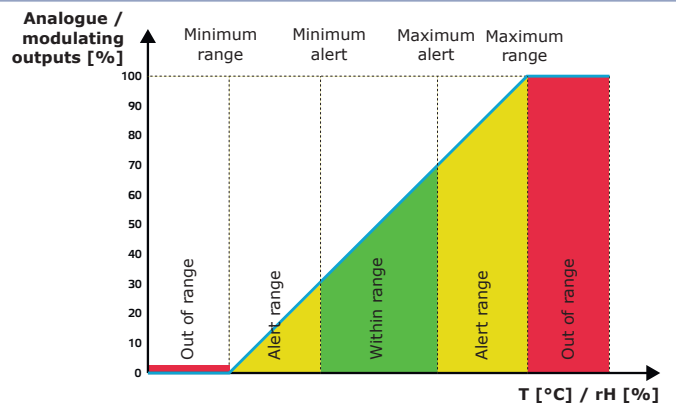
Operational diagrams

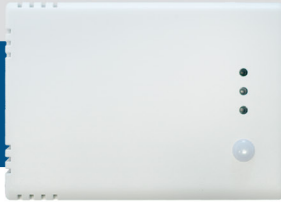


LED indication of CO₂ sensor (default setting)



LED indication of temperature and humidity sensor





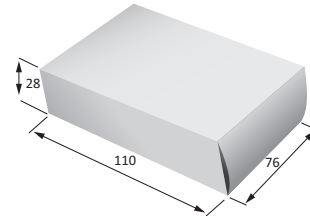
RSMFH-3

Multifunctional CO₂ room transmitter

Standards

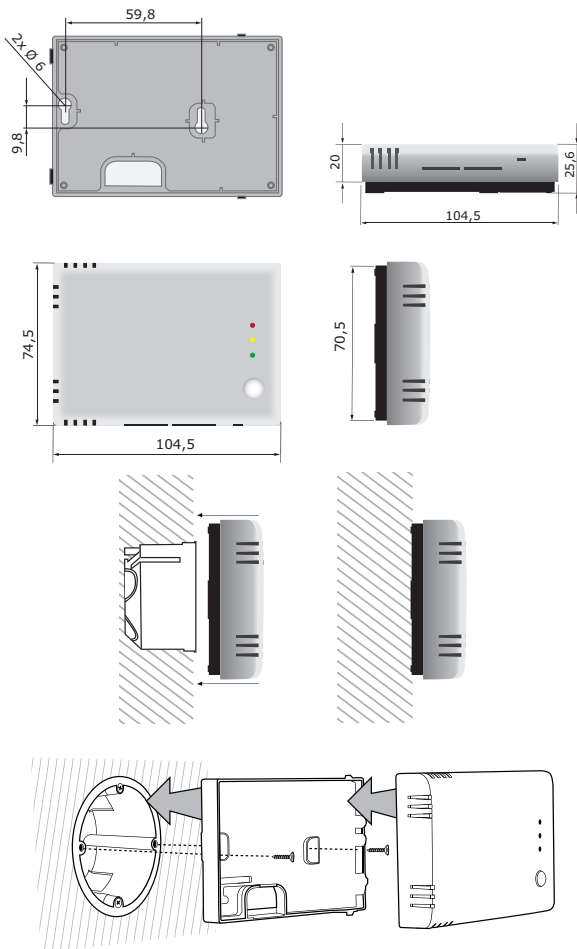
- Low Voltage Directive 2014/35/EU 
 - EN 60529:1991 Degrees of protection provided by enclosures (IP Code) Amendment AC:1993 to EN 60529
 - EN 60730-1:2011 Automatic electrical controls for household and similar use - Part 1: General requirements
- EMC Directive 2014/30/EU
 - EN 60730-1:2011 Automatic 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 transmitters with integrated or remote signal conditioning.
- WEEE 2012/19/EU
- RoHs Directive 2011/65/EU
 - EN IEC 63000:2018 Technical documentation for the assessment of electrical and electronic products with respect to the restriction of hazardous substances

Packaging



Article	Packaging	Length [mm]	Width [mm]	Height [mm]	Net weight	Gross weight
RSMFH-3	Unit (1 pc.)	110	76	28	0,097 kg	0,11 kg
	Carton (24 pcs.)	492	177	85	2,328 kg	2,79 kg
	Box (144 pcs.)	590	380	505	13,968 kg	17,73 kg

Fixing and dimensions



Global trade item numbers (GTIN)

Packaging	RSMFH-3
Unit	05401003018866
Carton	05401003302958
Box	05401003504383

RCMFX-3

Intelligent multifunctional CO₂ room sensor

The RCMFX-3 are intelligent multifunctional room sensors featuring adjustable CO₂, temperature and relative humidity ranges. The used algorithm controls a single analogue / modulating output based on the measured CO₂, T and rH 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 CO₂, temperature and relative humidity ranges
- Fan speed control based on temperature, humidity and CO₂ measurements
- Bootloader for updating the firmware via Modbus RTU communication
- Modbus RTU communication
- Day / night detection via ambient light sensor
- 3 LEDs for status indication with adjustable light intensity
- Long-term stability and accuracy

Area of use

- Demand controlled ventilation based on temperature, relative humidity and CO₂
- Suitable for residential and commercial buildings
- For indoor use only

Article codes

Article code	Supply	Imax
RCMFG-3	24 VDC	50 mA
	24 VAC ±10%	120 mA
RCMFF-3	24 VDC	50 mA

Technical specifications

Analogue / modulating output	0—10 VDC mode	min. load resistance 50 kΩ ($R_L \geq 50 \text{ k}\Omega$)
	0—20 mA mode	max. load resistance 500 Ω ($R_L \leq 500 \Omega$)
	PWM (open-collector type) mode	1 kHz, min. load resistance 50 kΩ ($R_L \geq 50 \text{ k}\Omega$), PWM voltage level: 3,3 VDC or 12 VDC
Typical range of use	Temperature	0—50 °C
	Relative humidity	0—95 % rH (non-condensing)
	CO ₂ range	400—2.000 ppm
Accuracy		±0,5 °C (5—50 °C)
		±6 % rH (20—80 % rH)
	400—2.000 ppm CO ₂	±(50 ppm + 3 % of the reading)
	2.001—5.000 ppm CO ₂	±(40 ppm + 5 % of the reading)
Protection standard	IP30 (according to EN 60529)	

How to configure



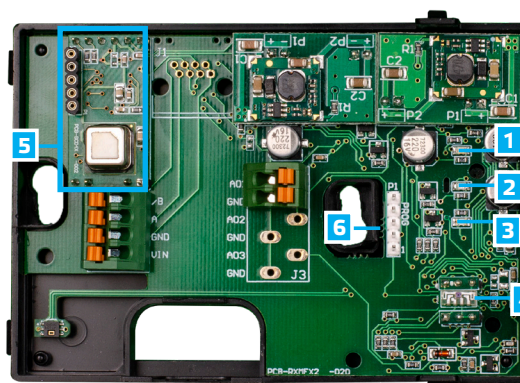
Via a Sentera Internet Gateway you can connect your installation to the SenteraWeb HVAC cloud and:

- Easily change the parameter settings of the connected devices remotely
- Define users and give them access to monitor the installation via a standard web browser
- Log data - create diagrams and export logged data
- Receive alerts or warnings when measured values exceed alert ranges or when errors occur
- Create different regimes for your ventilation system - e.g. day-night regime

Please refer to the Modbus Register Map of the product for more details regarding the Modbus registers.



Indications

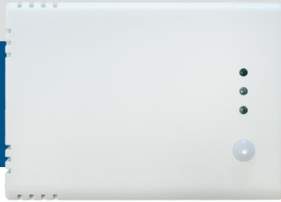


1 - Red LED	On	Measured temperature or relative humidity values are out of range or CO ₂ is higher than or equal to Alert 2 level
	Blinking	Communication with one of the sensors fails
2 - Yellow LED	On	Measured temperature or relative humidity values are in the alert range or CO ₂ is higher than or equal to Alert 1 level
	Blinking	Modbus communication has stopped and Holding register 8 is activated (Modbus timeout > 0 seconds)
3 - Green LED	On	Measured temperature or relative humidity values are within range or CO ₂ level is lower than Alert 1 level
4 - Ambient light sensor		Low light intensity / Active / Standby
5 - CO ₂ sensor element		To measure CO ₂ concentration, self-calibrating
6 - PROG header, P1		Put a jumper on pins 1 and 2 and wait for at least 5 seconds to reset the Modbus communication parameters
		Put a jumper on pins 3 and 4 and restart the supply to enter bootloader mode

Note: By default, the LED indicators visualise the measured CO₂ 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.

RCMFX-3

Intelligent multifunctional CO₂ room sensor



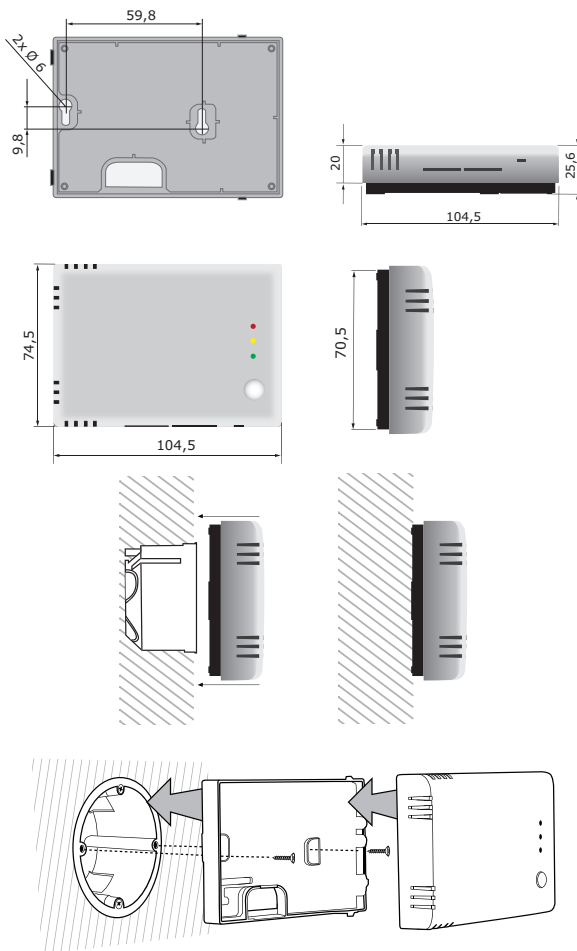
Wiring and connections

Article type	RCMFF-3	RCMFG-3	
VIN	24 VDC	24 VDC	24 VAC ±10%
GND	Ground	Common ground	AC ~
A	Modbus RTU (RS485) communication, signal A		
/B	Modbus RTU (RS485) communication, signal /B		
AO1	Analogue / modulating output 1 - temperature, rH or CO ₂ (0—10 VDC / 0—20 mA / PWM)		
GND	Ground AO1	Common ground	
Connections	Spring contact terminal blocks, cable cross section: 1,5 mm ²		

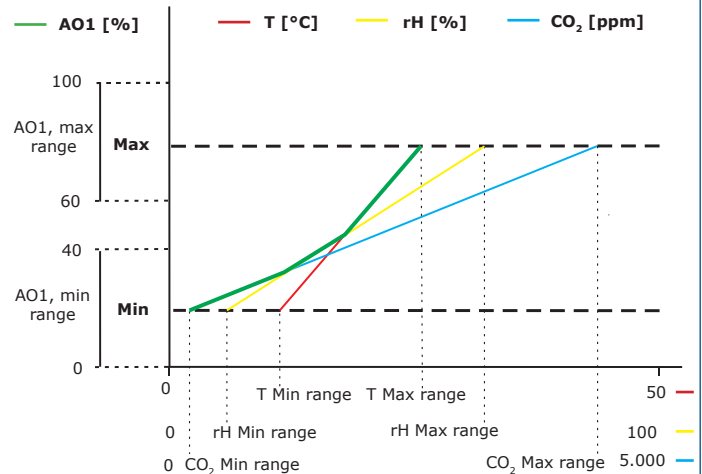
Attention! The -F version of the product is not suited for 3-wire connection. It has separate grounds for power supply and analogue output. Connecting both grounds together might result in incorrect measurements. Minimum 4 wires are required to connect -F type sensors.

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.

Fixing and dimensions

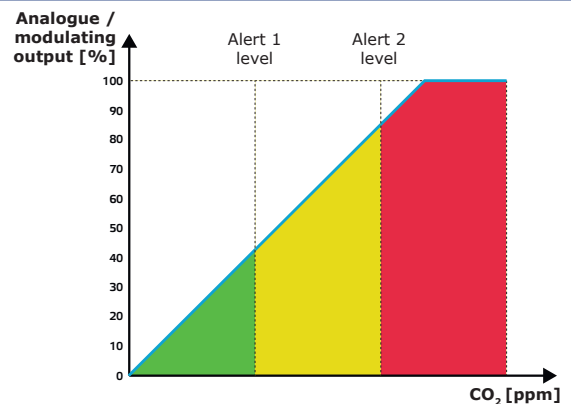


Operational diagrams

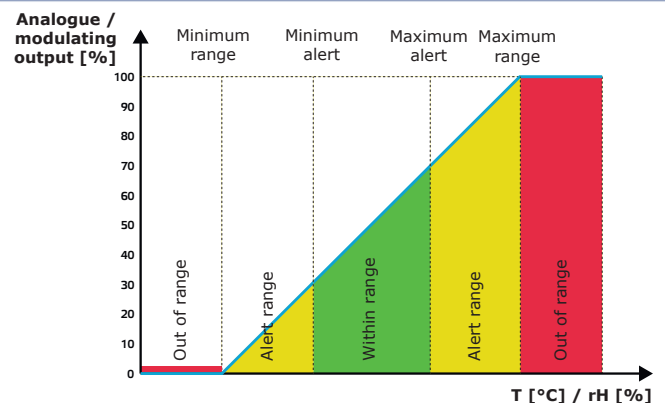


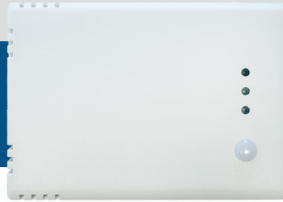
Note: The output changes automatically depending on the highest of the T, rH or CO₂ values, i.e. the highest of the three output values controls the output. See the green line in the operational diagram above. One or multiple sensors can be deactivated. E.g. it is also possible to control the output based on the measured CO₂ value only.

LED indication of CO₂ sensor (default setting)



LED indication of temperature and humidity sensors





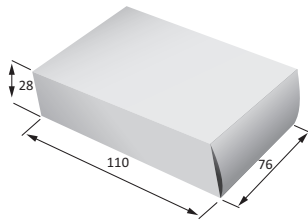
RCMFX-3

Intelligent multifunctional CO₂ room sensor

Standards

- 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 transmitters with integrated or remote signal conditioning.
- WEEE 2012/19/EU
- RoHS Directive 2011/65/EU:
 - EN IEC 63000:2018 Technical documentation for the assessment of electrical and electronic products with respect to the restriction of hazardous substances

Packaging



Article	Packaging	Length [mm]	Width [mm]	Height [mm]	Net weight	Gross weight
RCMFF-3 RCMFG-3	Unit (1 pc.)	110	76	28	0,092 kg	0,105 kg
	Carton (24 pcs.)	492	182	84	2,208 kg	2,67 kg
	Box (144 pcs.)	514	414	274	13,248 kg	17,01 kg

Global trade item numbers (GTIN)

Packaging	RCMFF-3	RCMFG-3
Unit	05401003018880	05401003018897
Carton	05401003302972	05401003302989
Box	05401003504406	05401003504413



RCMFM-3

Intelligent multifunctional CO₂ room sensor, PoM

The RCMFM-3 are intelligent room sensors featuring adjustable CO₂, temperature, and relative humidity ranges. The used algorithm generates an output value based on the measured T, rH and CO₂ values, which can be used to directly control an EC fan, an AC fan speed controller or and actuator powered damper. They are Power over Modbus supplied and all parameters are accessible via Modbus RTU.

Key features

- Selectable CO₂, temperature and relative humidity ranges
- Outputs available via Modbus RTU input registers
- A bootloader for firmware updates using Modbus RTU communication
- Ambient light sensor with adjustable 'active' and 'standby' level
- 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 CO₂
- Suitable for residential and commercial buildings
- For indoor use only

Article codes

Article code	Supply voltage	Imax	Connection type
RCMFM-3	24 VDC, PoM	30 mA	RJ45 socket

Technical specifications

Supply voltage	24 VDC, Power over Modbus	
Typical range of use	Temperature	0—50 °C
	Relative humidity	0—95 % rH (non-condensing)
	CO ₂ range	400—2.000 ppm
Accuracy	±0,5 °C (5—50 °C)	
	±6 % rH (20—80 % rH)	
	400—2.000 ppm CO ₂	±(50 ppm + 3 % of the reading)
	2.001—5.000 ppm CO ₂	±(40 ppm + 5 % of the reading)
Protection standard	IP30 (according to EN 60529)	

How to configure



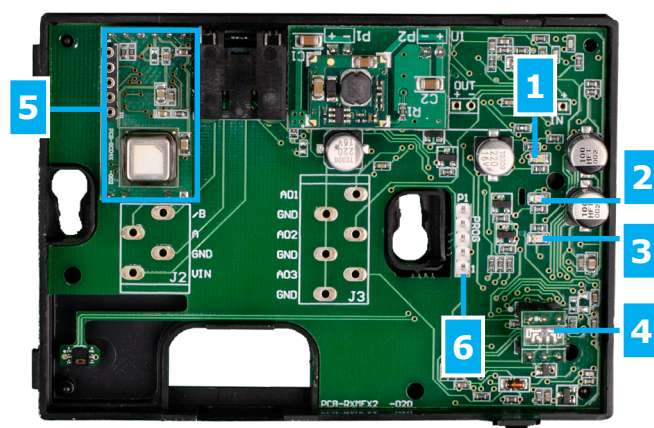
Via a Sentera Internet Gateway you can connect your installation to the SenteraWeb HVAC cloud and:

- Easily change the parameter settings of the connected devices remotely
- Define users and give them access to monitor the installation via a standard web browser
- Log data - create diagrams and export logged data
- Receive alerts or warnings when measured values exceed alert ranges or when errors occur
- Create different regimes for your ventilation system - e.g. day-night regime

Please refer to the Modbus Register Map of the product for more details regarding the Modbus registers.



Settings and indications



1 - Red LED	On	Measured temperature or relative humidity values are out of range or CO ₂ is higher than or equal to Alert 2 level
	Blinking	Communication with one of the sensors fails
2 - Yellow LED	On	Measured temperature or relative humidity values are in the alert range or CO ₂ is higher than or equal to Alert 1 level
3 - Green LED	On	Measured temperature or relative humidity value is within range or CO ₂ level is lower than Alert 1 level
4 - Ambient light sensor		Low light intensity / Active / Standby
5 - CO ₂ sensor element		To measure CO ₂ concentration, self-calibrating
6 - PROG header, P1		Put a jumper on pins 1 and 2 and wait for at least 5 seconds to reset the Modbus communication parameters
		Put a jumper on pins 3 and 4 and restart the supply to enter bootloader mode

Note: By default, the LED indicators visualise the measured CO₂ 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.

RCMFM-3

Intelligent multifunctional CO₂ room sensor, PoM

Wiring and connections

RJ45 socket (Power over Modbus)

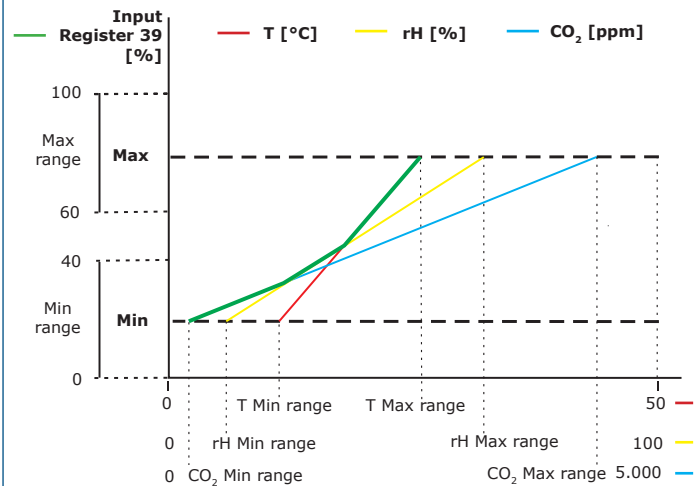
Pin 1	24 VDC		Supply voltage
Pin 2			
Pin 3	A		Modbus RTU communication, signal A
Pin 4			
Pin 5	/B		Modbus RTU communication, signal /B
Pin 6			
Pin 7	GND		Ground, supply voltage
Pin 8			



Standards

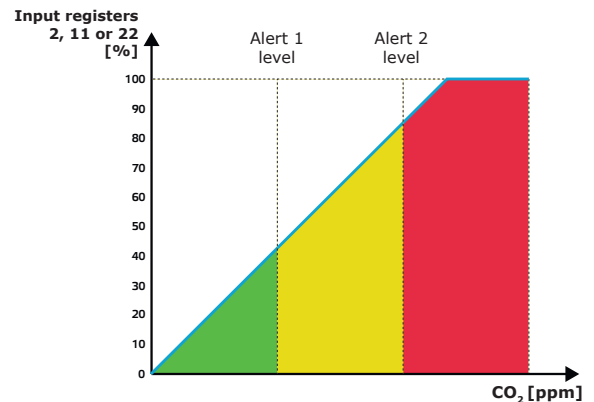
- Low Voltage Directive 2014/35/EU
 - EN 60529:1991 Degrees of protection provided by enclosures (IP Code) Amendment AC:1993 to EN 60529
 - EN 60730-1:2011 Automatic electrical controls for household and similar use - Part 1: General requirements
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 - 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
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 - 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 transmitters with integrated or remote signal conditioning
- WEEE 2012/19/EU
- RoHS Directive 2011/65/EU
 - EN IEC 63000:2018 Technical documentation for the assessment of electrical and electronic products with respect to the restriction of hazardous substances

Operational diagrams

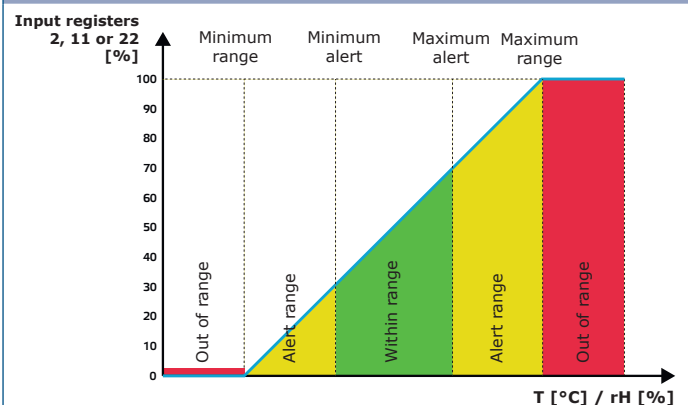


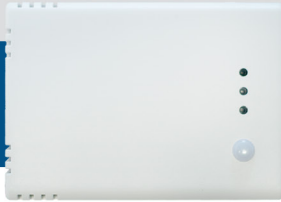
Note: The output changes automatically depending on the highest of the T, rH or CO₂ values, i.e. the highest of the three output values controls the output signal. See the green line in the operational diagram above. One or multiple sensors can be deactivated. E.g. it is also possible to control the output based on the measured CO₂ value only.

LED indication of CO₂ sensor (default setting)



LED indication of temperature and humidity sensor





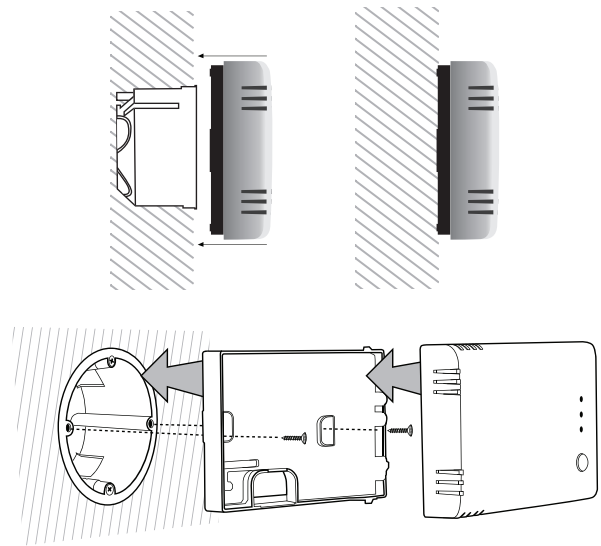
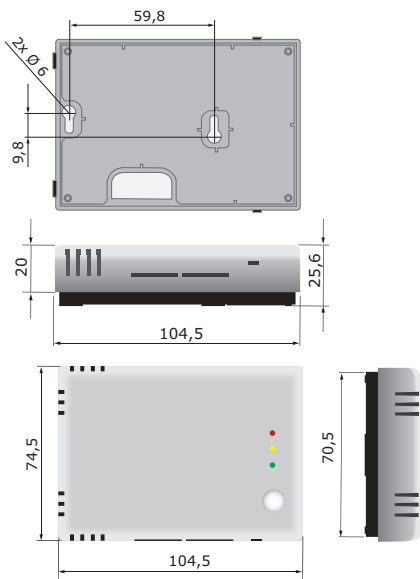
RCMFM-3

Intelligent multifunctional CO₂ room sensor, PoM

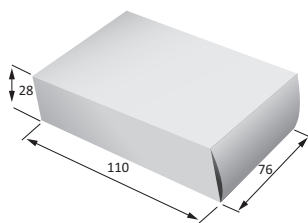
Global trade item numbers (GTIN)

Packaging	RCMFM-3
Unit	05401003018910
Carton	05401003303009
Box	05401003504437

Fixing and dimensions



Packaging



Article	Packaging	Length [mm]	Width [mm]	Height [mm]	Net weight	Gross weight
RCMFM-3	Unit (1 pc.)	110	76	28	0,087 kg	0,100 kg
	Carton (24 pcs.)	492	177	85	2,088 kg	2,55 kg
	Box (144 pcs.)	590	380	505	12,528 kg	16,29 kg

RCMFH-3

Intelligent multifunctional CO₂ room sensor



The RCMFH-3 are intelligent multifunctional room sensors featuring adjustable CO₂, temperature and relative humidity ranges. The used algorithm controls a single analogue / modulating output based on the measured CO₂, T and rH values, which can be used to directly control an EC fan, an AC fan speed controller or an actuator powered damper. They feature 24 VDC power supply and all parameters are accessible via Modbus RTU.

Key features

- Spring contact terminal block or RJ45 connection
- Selectable CO₂, temperature and relative humidity ranges
- Fan speed control based on temperature, humidity and CO₂ measurements
- Bootloader for updating the firmware via Modbus RTU communication
- Modbus RTU communication
- Day / night detection via ambient light sensor
- 3 LEDs for status indication with adjustable light intensity
- Long-term stability and accuracy

Area of use

- Demand controlled ventilation based on temperature, relative humidity and CO₂
- Suitable for residential and commercial buildings
- For indoor use only

Article codes

Article code	Supply voltage	Imax	Connection type
RCMFH-3	24 VDC	40 mA	RJ45 or terminal block

Technical specifications

Analogue / modulating output	0—10 VDC mode	min. load resistance 50 kΩ ($R_L \geq 50 \text{ k}\Omega$)
	0—20 mA mode	max. load resistance 500 Ω ($R_L \leq 500 \Omega$)
	PWM (open-collector type) mode	1 kHz, min. load resistance 50 kΩ ($R_L \geq 50 \text{ k}\Omega$), PWM voltage level: 3,3 VDC or 12 VDC
Typical range of use	Temperature	0—50 °C
	Relative humidity	0—95 % rH (non-condensing)
	CO ₂ range	400—2.000 ppm
Accuracy		±0,5 °C (5—50 °C)
		±6 % rH (20—80 % rH)
	400—2.000 ppm CO ₂	±(50 ppm + 3 % of the reading)
	2.001—5.000 ppm CO ₂	±(40 ppm + 5 % of the reading)
Protection standard	IP30 (according to EN 60529)	

How to configure



Via a Sentera Internet Gateway you can connect your installation to the SenteraWeb HVAC cloud and:

- Easily change the parameter settings of the connected devices remotely
- Define users and give them access to monitor the installation via a standard web browser
- Log data - create diagrams and export logged data
- Receive alerts or warnings when measured values exceed alert ranges or when errors occur
- Create different regimes for your ventilation system - e.g. day-night regime

Please refer to the Modbus Register Map of the product for more details regarding the Modbus registers.



Wiring diagram

RJ45 socket (Power over Modbus)

Pin 1	24 VDC	Supply voltage
Pin 2		
Pin 3	A	Modbus RTU communication, signal A
Pin 4		
Pin 5	/B	Modbus RTU communication, signal /B
Pin 6		
Pin 7	GND	Ground, supply voltage
Pin 8		



Terminal Block 1

VIN	Supply voltage 24 VDC
GND	Supply voltage, ground
A	Modbus RTU communication, signal A
/B	Modbus RTU communication, signal /B

Terminal Block 2

AO1	Analogue / modulating output (0—10 VDC / 0—20 mA / PWM)
GND	Ground AO1

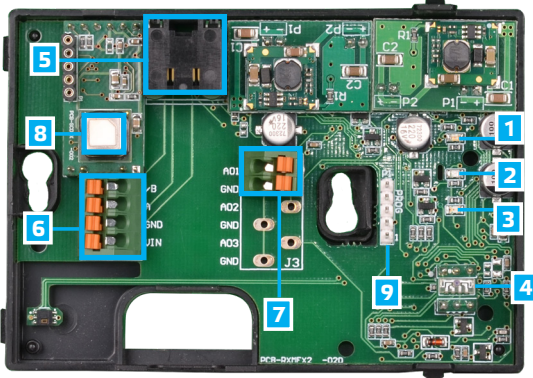
Attention! The unit needs to be supplied via the RJ45 connector or via the connection terminals. Do not connect the device via the RJ45 connector and the terminal block simultaneously.

RCMFH-3

Intelligent multifunctional CO₂ room sensor



Indications



1 - Red LED	On	Measured temperature or relative humidity values are out of range or CO ₂ is higher than or equal to Alert 2 level
	Blinking	Communication with one of the sensors fails
2 - Yellow LED	On	Measured temperature or relative humidity values are in the alert range or CO ₂ is higher than or equal to Alert 1 level
	Blinking	Modbus communication has stopped and Holding register 8 is activated (Modbus timeout > 0 seconds)
3 - Green LED	On	Measured temperature or relative humidity values are within range or CO ₂ level is lower than Alert 1 level
4 - Ambient light sensor		Low light intensity / Active / Standby
5 - RJ45 socket		Modbus communication with connected Master devices and PoM voltage supply (24 VDC)
		Blinking LEDs indicate that packages are transmitted via Modbus RTU communication
6 - Terminal block input connection		24 VDC supply voltage and Modbus RTU signal
7 - Output connection		AO1 - Temperature, relative humidity or CO ₂
8 - CO ₂ sensor element		To measure CO ₂ concentration, self-calibrating
9 - PROG header, P1		Put a jumper on pins 1 and 2 and wait for at least 5 seconds to reset the Modbus communication parameters
		Put a jumper on pins 3 and 4 and restart the supply to enter bootloader mode

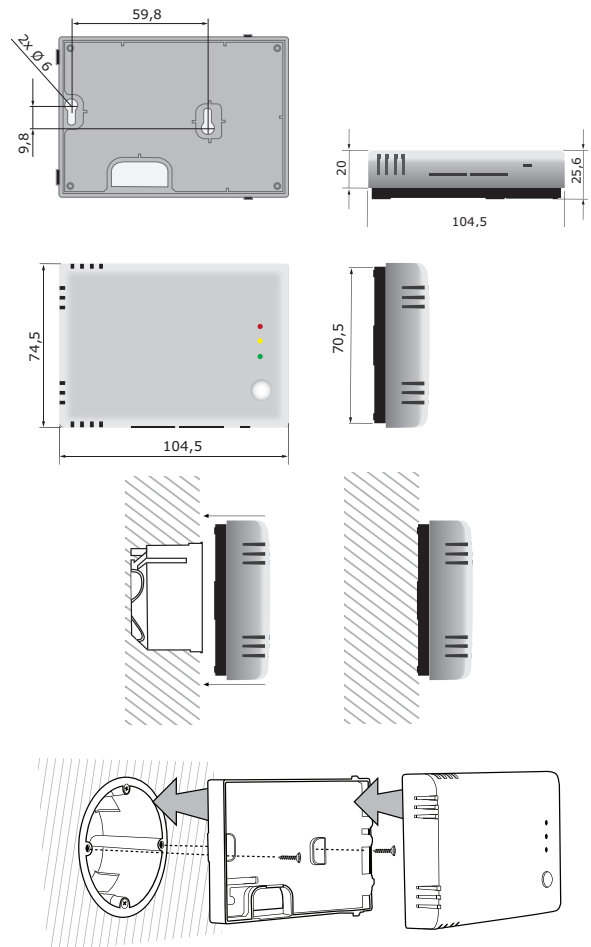
Note: By default, the LED indicators visualise the measured CO₂ level. When the sensor is in bootloader mode, the green and yellow LEDs flash alternately. During the firmware download, the red LED is flashing additionally.

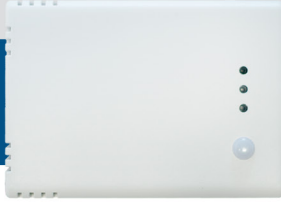
Standards



- 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
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- WEEE 2012/19/EU
- RoHS Directive 2011/65/EU
 - EN IEC 63000:2018 Technical documentation for the assessment of electrical and electronic products with respect to the restriction of hazardous substances

Fixing and dimensions

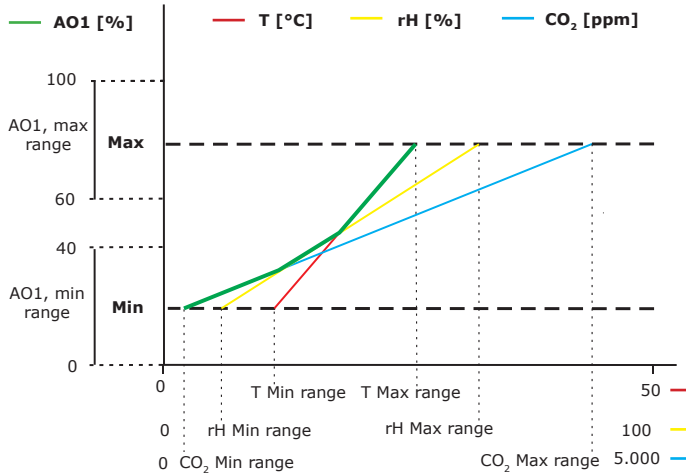




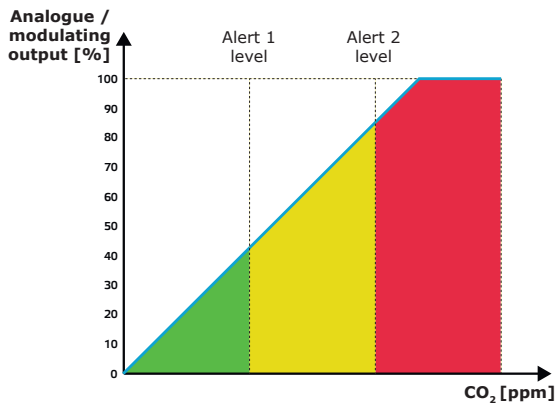
RCMFH-3

Intelligent multifunctional CO₂ room sensor

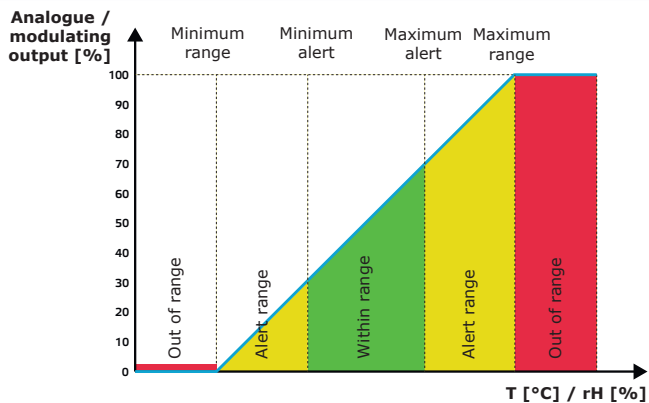
Operational diagrams



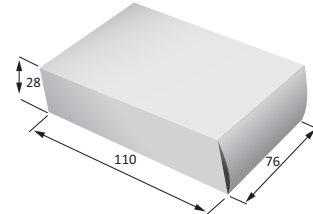
LED indication of CO₂ sensor (default setting)



LED indication of temperature and humidity sensors



Packaging



Article	Packaging	Length [mm]	Width [mm]	Height [mm]	Net weight	Gross weight
RCMFH-3	Unit (1 pc.)	110	76	28	0,094 kg	0,107 kg
	Carton (24 pcs.)	492	182	84	2,256 kg	2,718 kg
	Box (144 pcs.)	514	414	274	13,536 kg	17,298 kg

Global trade item numbers (GTIN)

Packaging	RCMFH-3
Unit	05401003018903
Carton	05401003302996
Box	05401003504420

ODMFM-R

Multifunctional outdoor transmitter

The ODMFM-R are multifunctional outdoor transmitters which measure temperature, relative humidity, CO₂ level and ambient light. Based on these measurements, the dew-point temperature can be calculated. They are Power over Modbus supplied and all parameters and the output are accessible via Modbus RTU.

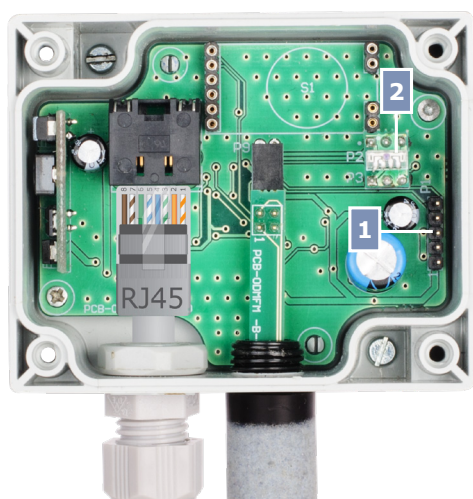
Key features

- Suitable for harsh environments
- Selectable temperature, relative humidity and CO₂ ranges
- Bootloader for updating the firmware via Modbus RTU communication
- Day / Night detection via ambient light sensor
- Ambient light sensor with adjustable 'active' and 'standby' level
- Modbus RTU (RS485)
- Removable CO₂ sensor element for easy calibration and verification
- Long-term stability and accuracy

Technical specifications

Supply voltage	24 VDC, Power over Modbus	
Maximum power consumption	1,2 W	
Nominal or average power consumption in normal operation	0,9 W	
Imax	50 mA	
Typical range of use	Temperature range	-30—70 °C
	Relative humidity range	0—100 % rH (non-condensing)
	CO ₂ range	0—2.000 ppm
Accuracy	±0,4 °C (-30—70 °C)	
	±3 % rH (0—100 % rH)	
Protection standard	IP65	
Ambient conditions	Temperature	-30—70 °C
	Rel. humidity	0—100 % rH (non-condensing)

Settings



1 - 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
2 - Ambient light sensor		Low light intensity / Active / Standby



Article codes

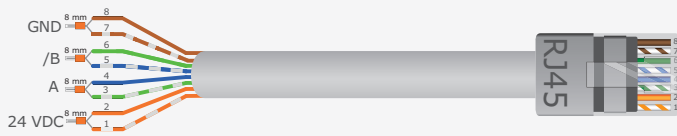
	Supply	Connection
ODMFM-R	24 VDC, PoM	RJ45

Area of use

- Monitoring of temperature, relative humidity and CO₂ levels
- Suitable for both indoor and outdoor use (e.g. open-air spaces, multi-storey and subterranean car parks, residential and commercial buildings)

Wiring and connections

24 VDC	Supply voltage 24 VDC
GND	Ground
A	Modbus RTU communication, signal A
/B	Modbus RTU communication, signal /B



Global trade item numbers (GTIN)

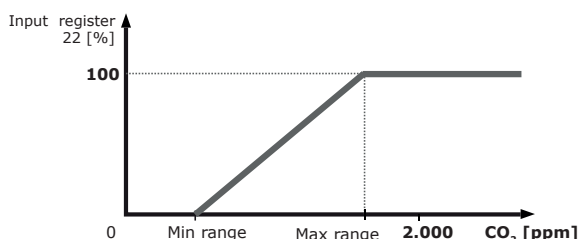
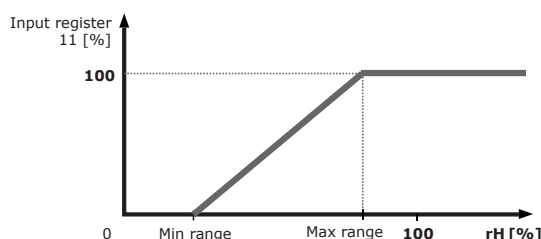
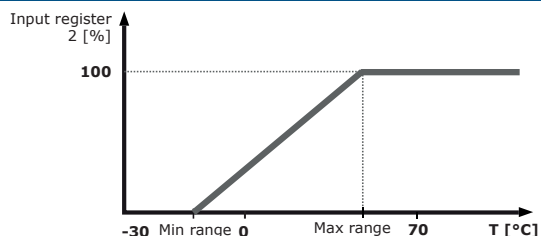
Packaging	ODMFM-R
Unit	05401003010679



ODMFM-R

Multifunctional outdoor transmitter

Operational diagram(s)



Modbus registers



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

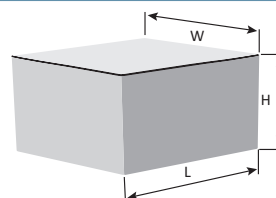


The parameters of the unit can be monitored / configured through the 3SModbus software platform. You can download it from the following link:

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

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

Packaging



Article	Packaging	Length [mm]	Width [mm]	Height [mm]	Net weight	Gross weight
ODMFM-R	Unit (1 pc.)	110	90	50	0,125 kg	0,155 kg
	Box (80 pcs.)	590	380	280	10,00 kg	13,26 kg

Standards

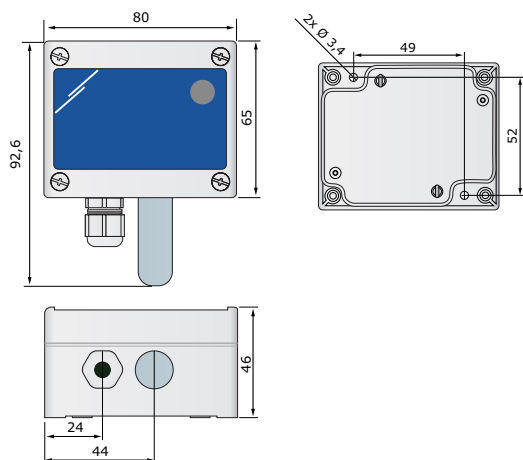
- Low Voltage Directive 2014/35/EC:
 - EN 60529:1991 Degrees of protection provided by enclosures (IP Code) Amendment AC:1993 to EN 60529



- EMC Directive 2014/30/EC:
 - 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

- RoHS Directive 2011/65/EC

Fixing and dimensions

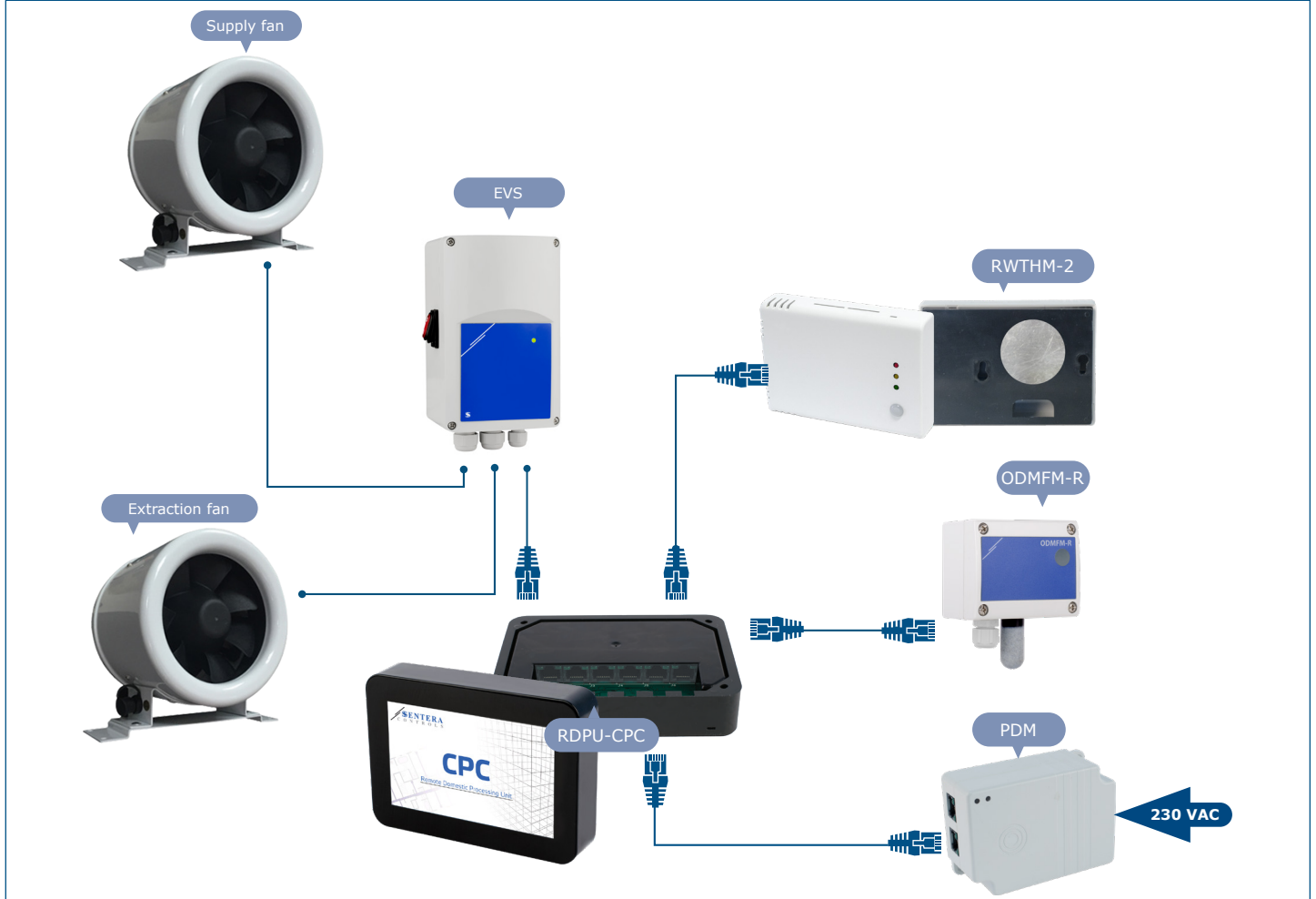


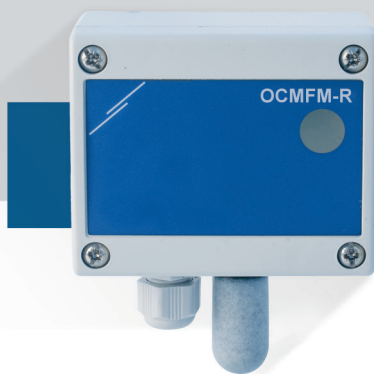
ODMFM-R

Multifunctional outdoor transmitter



Application example





OCMFM-R

Intelligent CO₂ sensor for harsh environments

The OCMFM-R are intelligent sensors featuring adjustable temperature, relative humidity and CO₂ ranges suitable for outdoor applications or tough environments. The used algorithm controls a single analogue / modulating output based on the measured temperature, humidity and CO₂ values, which can be used to directly control an EC fan, an AC fan speed controller or an actuator powered damper. They are Power over Modbus supplied and all parameters are accessible via Modbus RTU communication.



Key features

- Wiring via RJ45 connector
- Suitable for harsh environments
- Selectable temperature, relative humidity and CO₂ ranges
- Fan speed control based on temperature, humidity and CO₂
- Bootloader for updating the firmware via Modbus RTU communication
- Day / Night detection via ambient light sensor
- Ambient light sensor with adjustable 'active' and 'standby' level
- Modbus RTU communication
- Replaceable CO₂ sensor element
- Long-term stability and accuracy

Technical specifications

Supply voltage	24 VDC, Power over Modbus	
Maximum power consumption	1,2 W	
Nominal power consumption	0,9 W	
Imax	50 mA	
Typical range of use	Temperature range	-30—70 °C
	Relative humidity range	0—100 % rH (non-condensing)
	CO ₂ range	400—2.000 ppm
Accuracy	± 0,4 °C (range -30—70 °C)	
	± 3% rH (range 0—100 %)	
	± 30 ppm (range 400—2.000 ppm)	
Protection standard	IP65 (according to EN 60529)	

Article codes

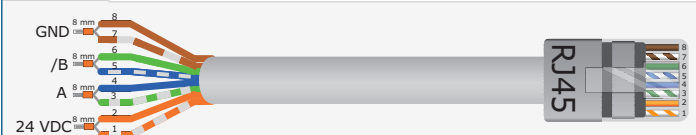
	Supply	Connection
OCMFM-R	24 VDC, PoM	RJ45

Area of use

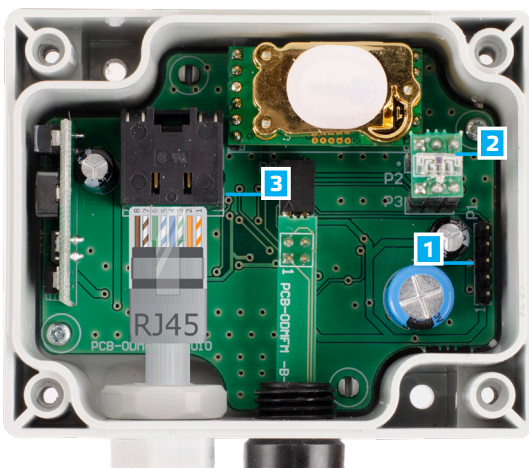
- Demand controlled ventilation based on temperature, relative humidity and CO₂
- Suitable for both indoor and outdoor use (e.g. open-air spaces, multi-storey and subterranean car parks, residential and commercial buildings)

Wiring and connections

24 VDC	Supply voltage 24 VDC
GND	Ground
A	Modbus RTU communication, signal A
/B	Modbus RTU communication, signal /B



Settings



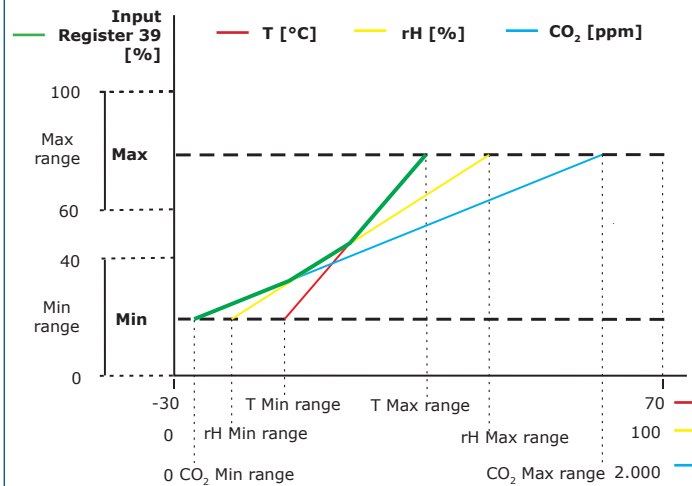
1 - PROG header, P1		Put a jumper onto pins 1 and 2 and wait for at least 5 seconds to reset the Modbus communication parameters
		Put a jumper onto pins 3 and 4 and restart the supply to enter bootloader mode
2 - Ambient light sensor		Low light intensity / Active / Standby
3 - RJ45 Socket		Plug the communication and power cable into the socket



OCMFM-R

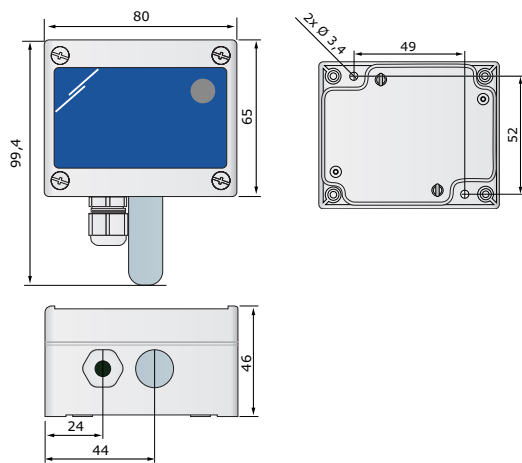
Intelligent CO₂ sensor for harsh environments

Operational diagram



Note: The output changes automatically depending on the highest of the T, rH or CO₂ values, i.e. the highest of 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 CO₂ values only.

Fixing and dimensions



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>

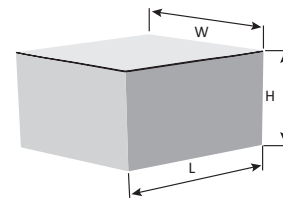
For more information about the Modbus registers, please refer to the product Modbus Register Map.

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
OCMFM-R	Unit (1 pc.)	110	90	50	0,125 kg	0,155 kg
	Box (80 pcs.)	590	380	280	10,00 kg	13,26 kg

Global trade item numbers (GTIN)

Packaging	OCMFM-R
Unit	05401003010631
Carton	05401003301562
Box	05401003502310

ODMHM-R

Multifunctional transmitter for agriculture

The ODMHM-R are multifunctional transmitters which measure temperature, relative humidity, CO₂ level and ambient light designed for applications in the agriculture industry. Based on these measurements, the dew-point temperature can be calculated. They are Power over Modbus supplied and all parameters and the output are accessible via Modbus RTU.

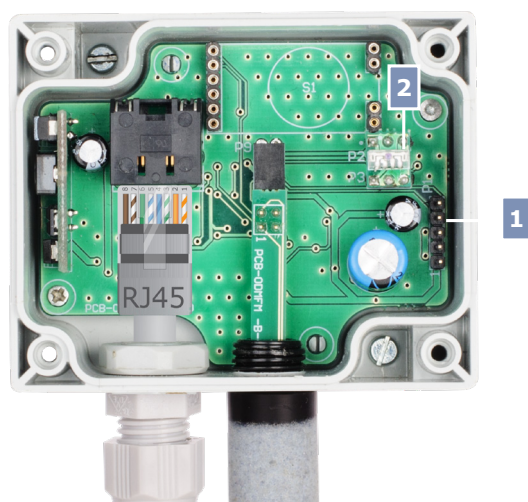
Key features

- Suitable for harsh environments thanks to the special ammonia resistant coating
- Selectable temperature, relative humidity and CO₂ ranges
- Bootloader for updating the firmware via Modbus RTU communication
- Day / Night detection via ambient light sensor
- Ambient light sensor with adjustable 'active' and 'standby' level
- Modbus RTU (RS485)
- Replaceable CO₂ sensor element
- Long-term stability and accuracy

Technical specifications

Supply voltage	24 VDC, Power over Modbus	
Maximum power consumption	1,2 W	
Nominal power consumption	0,9 W	
Imax	50 mA	
Selectable temperature range	-30—70 °C via Modbus RTU	
Selectable relative humidity range	0—100 % rH via Modbus RTU	
Selectable CO ₂ range	0—10.000 ppm via Modbus RTU	
Accuracy	±0,4 °C (-30—70 °C)	
	±3 % rH (0—100 % rH)	
	30 ppm CO ₂ ±3 % (0—10.000 ppm CO ₂)	
Protection standard	IP65	
Ambient conditions	Temperature	-30—70 °C
	Rel. humidity	0—100 % rH (non-condensing)

Settings



1 - 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
2 - Ambient light sensor		Low light intensity / Active / Standby



Article codes

	Supply	Connection
ODMHM-R	24 VDC, PoM	RJ45

Area of use

- Monitoring of temperature, relative humidity and CO₂ levels
- Suitable for harsh environments. Application field: greenhouses, livestock breeding farms, mushroom growing houses, etc.

Wiring and connections

24 VDC	Supply voltage 24 VDC
GND	Ground
A	Modbus RTU communication, signal A
/B	Modbus RTU communication, signal /B

Global trade item numbers (GTIN)

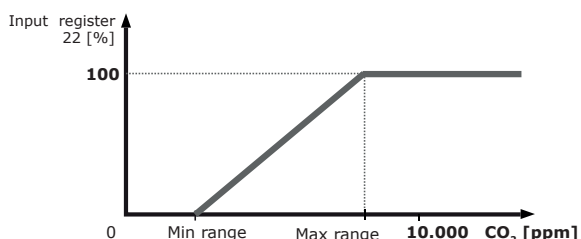
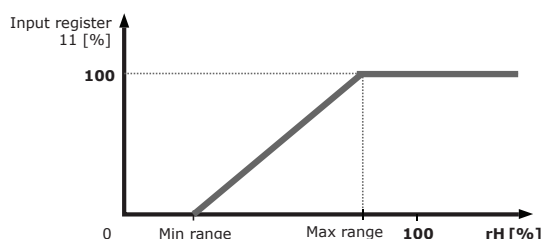
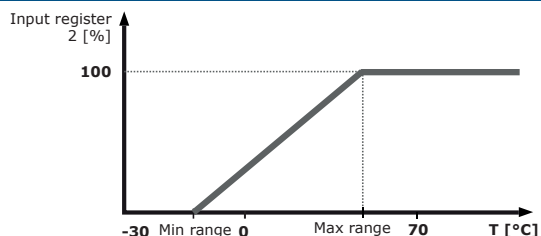
Packaging	ODMHM-R
Unit	05401003010686
Box	05401003502334

ODMHM-R

Multifunctional transmitter for agriculture



Operational diagram(s)



Modbus registers



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

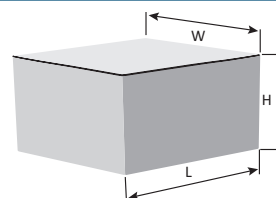


The parameters of the unit can be monitored / configured through the 3SModbus software platform. You can download it from the following link:

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

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

Packaging



Article	Packaging	Length [mm]	Width [mm]	Height [mm]	Net weight	Gross weight
ODMHM-R	Unit (1 pc.)	110	90	50	0,125 kg	0,155 kg
	Box (80 pcs.)	590	380	280	10,00 kg	13,26 kg

Standards

- Low Voltage Directive 2014/35/EC:
 - EN 60529:1991 Degrees of protection provided by enclosures (IP Code) Amendment AC:1993 to EN 60529



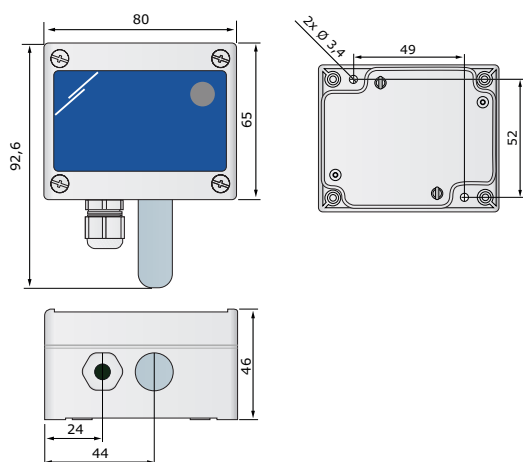
- EMC Directive 2014/30/EC:
 - EN 61000-6-1:2007 Electromagnetic compatibility (EMC) - Part 6-1: Generic standards - Immunity for residential, commercial and light-industrial environments
 - EN 61000-6-3:2007 Electromagnetic compatibility (EMC) - Part 6-3: Generic standards - Emission standard for residential, 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

- High protective conformal coating
 - MIL-I-46058C qualified
 - IPC-CC-830

- RoHS Directive (2011/65/EU) and EPA 33/50 compliant

Fixing and dimensions

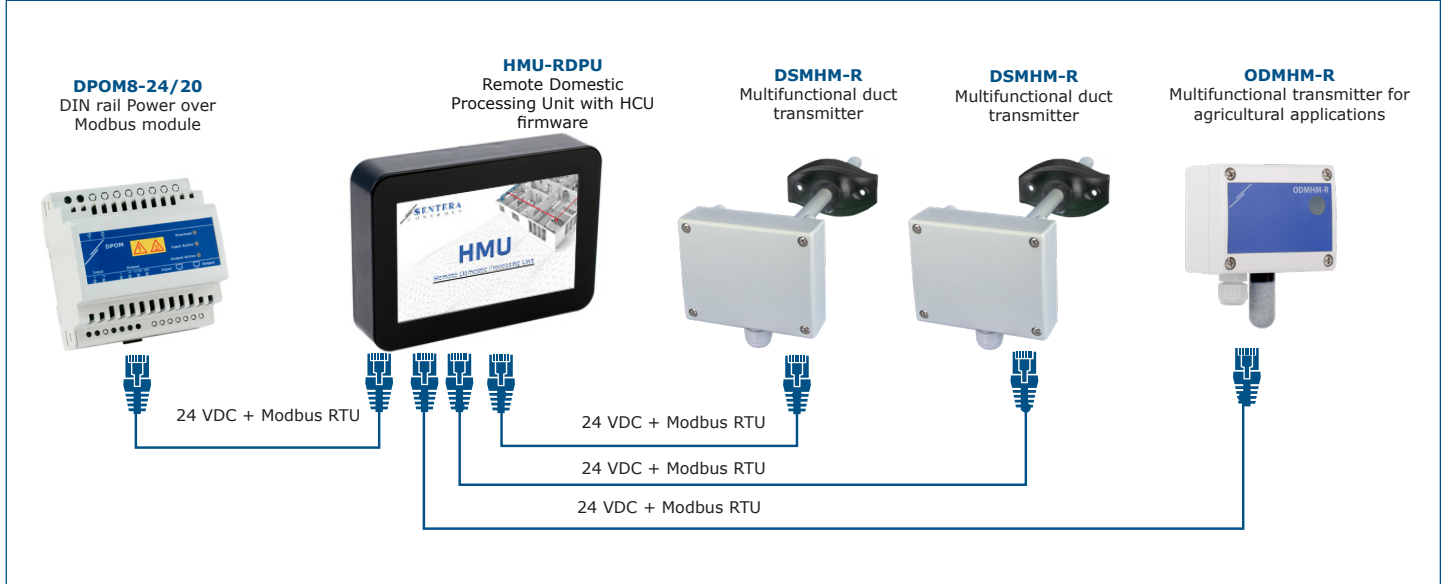


ODMHH-R

Multifunctional transmitter for agriculture



Application example





FCMF8-R

Intelligent multifunctional sensor

The FCMF8-R series are intelligent sensors featuring adjustable temperature, relative humidity and CO₂ ranges. The used algorithm controls a single analogue/modulating output based on the measured T, rH and CO₂ 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 CO₂ ranges
- Fan speed control based on temperature, relative humidity and CO₂
- Inset or surface mounting
- Bootloader for updating the firmware via Modbus RTU communication
- Ambient light sensor with adjustable 'active' and 'standby' level
- Replaceable CO₂ 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 ($R_L \geq 50 \text{ k}\Omega$)	
	0—20 mA mode: max. load 500 Ω ($R_L \leq 500 \text{ }\Omega$)	
	PWM (open-collector type) mode: 1 kHz, min. load 50 kΩ ($R_L \geq 50 \text{ k}\Omega$), 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 ₂ range	400—2.000 ppm
Accuracy	$\pm 0,4 \text{ }^\circ\text{C}$ (range 0—50 °C)	
	$\pm 3\% \text{ rH}$ (range 0—100 % rH)	
	$\pm 30 \text{ ppm}$ (range 400—2.000 ppm)	
Protection standard	IP30 (according to EN 60529)	

Area of use

- Demand controlled ventilation based on temperature, relative humidity and CO₂
- Suitable for residential and commercial buildings
- For indoor use only

Wiring and connections

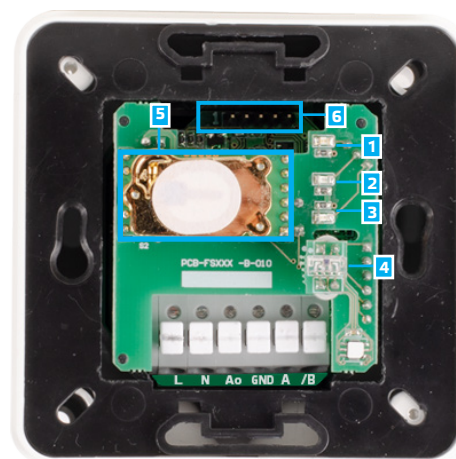
L	Power supply, line (85—264 VAC / 50—60 Hz)
N	Power supply, neutral
Ao	Analogue / modulating output - T, rH or CO ₂ (0—10 VDC / 0—20 mA / PWM)
GND	Ground Ao
A	Modbus RTU (RS485), signal A
/B	Modbus RTU (RS485), signal /B
Connections	Spring contact terminal block, cable cross section: 2,5 mm ² ; pitch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

Article codes

Article code	Supply	Imax
FCMF8-R	85—264 VAC / 50—60 Hz	45 mA



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		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 CO₂ 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 Sensistant Modbus configurator allows you to easily monitor and/or configure Modbus parameters.

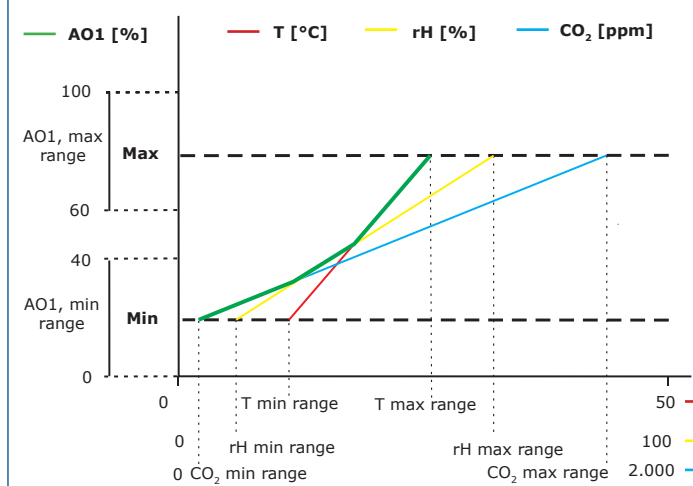
The parameters of the unit can be monitored / configured through the 3SModbus software platform. You can download it from the following link:

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

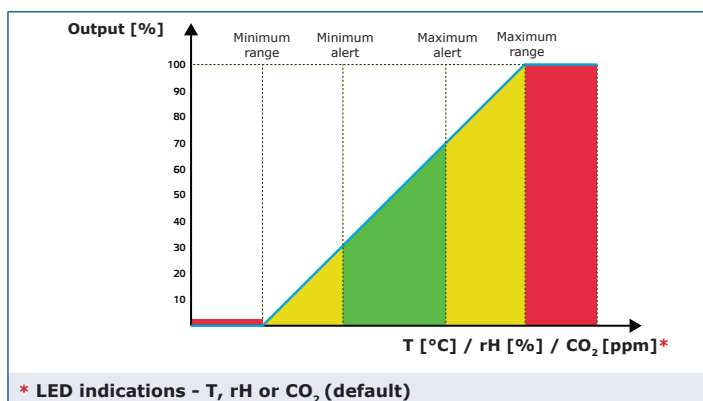


For more information about the Modbus registers, please refer to the product Modbus Register Map.

Operational diagram



Note: The output changes automatically depending on the highest of the T, rH or CO₂ 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 CO₂ value only.

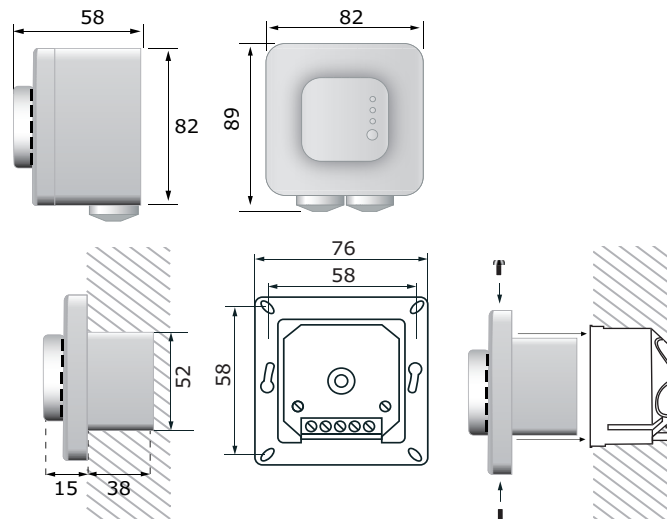


* LED indications - T, rH or CO₂ (default)

Global trade item numbers (GTIN)

Packaging	FCMF8-R
Unit	05401003006207
Carton	05401003300732
Box	05401003501146

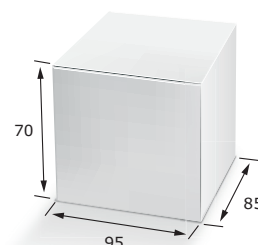
Fixing and dimensions



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
- 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

FCMFX-R

Intelligent CO₂ sensor



The FCMFX-R series are intelligent sensors featuring adjustable temperature, relative humidity and CO₂ ranges. The used algorithm controls a single analogue / modulating output based on the measured T, rH and CO₂ 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
- Adjustable temperature, relative humidity and CO₂ ranges
- Fan speed control based on T, rH and CO₂
- Inset or surface mounting
- Bootloader for updating the firmware via Modbus RTU communication
- Ambient light sensor with adjustable 'active' and 'standby' level
- Replaceable CO₂ 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: $R_L \leq 500 \Omega$	
	PWM mode: 1 kHz, $R_L \geq 50 \text{ k}\Omega$, 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 ₂ range	400—2.000 ppm
Accuracy	$\pm 0,4 \text{ }^\circ\text{C}$ (range 0—50 °C)	
	$\pm 3\%$ rH (range 0—100 %)	
	$\pm 30 \text{ ppm}$ (range 400—2.000 ppm)	
Protection standard	IP30 (according to EN 60529)	

Article codes

Article code	Supply	Imax
FCMFG-R	18—34 VDC	90 mA
	15—24 VAC $\pm 10\%$	180 mA
FCMFF-R	18—34 VDC	90 mA

Area of use

- Demand controlled ventilation based on temperature, relative humidity and CO₂
- Suitable for residential and commercial buildings
- For indoor use only

Wiring and connections

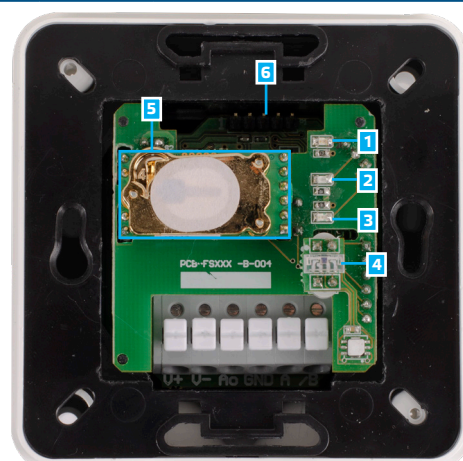
Article code	FCMFF-R	FCMFG-R	
V+	18—34 VDC	18—34 VDC	15—24 VAC ± 10 %
V-	Ground	Common ground	AC ~
A	Modbus RTU (RS485), signal A		
/B	Modbus RTU (RS485), signal /B		
Ao	Analogue / modulating output (0—10 VDC / 0—20 mA / PWM)		
GND	Ground	Common ground	
Connections	Spring contact terminal block, cable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



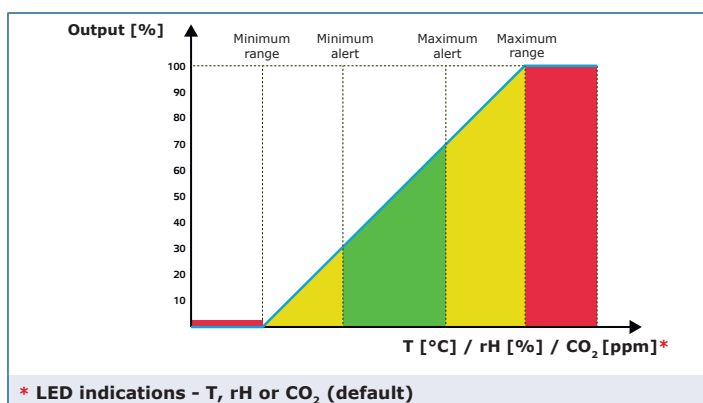
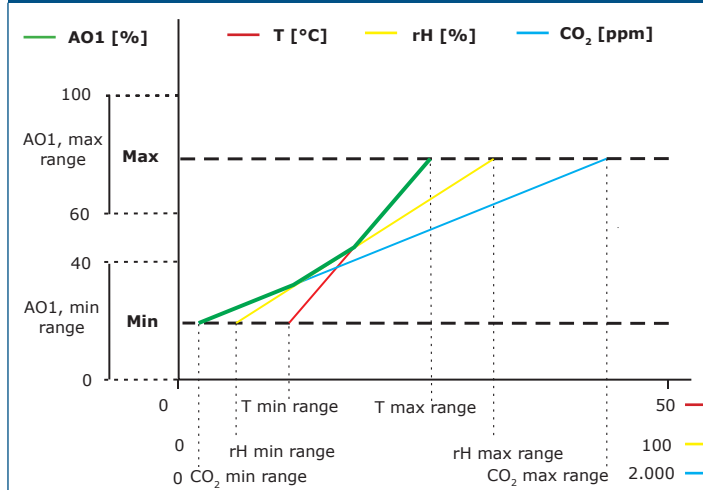
1 - Red LED	On	Measured temperature, relative humidity or CO ₂ values are out of range
	Blinking	Communication with one of the sensors fails
2 - Yellow LED	On	Measured temperature, relative humidity or CO ₂ values are in the alert range
	Blinking	Modbus communication has stopped and HR8 is activated (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		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 CO₂ 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.

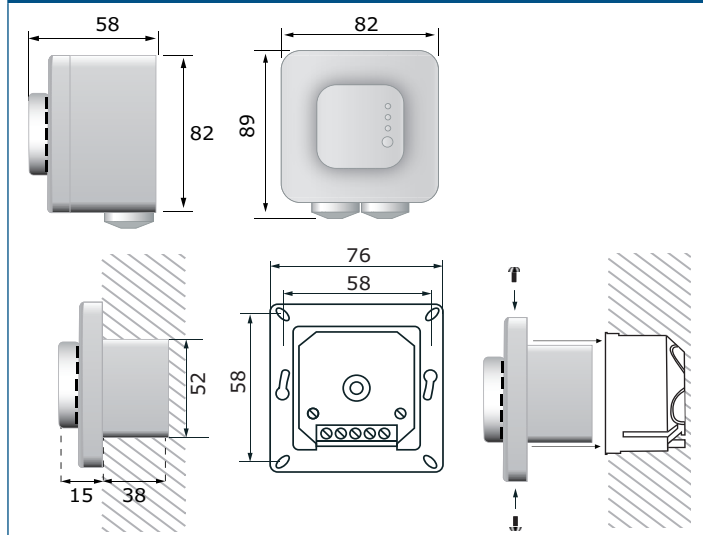
FCMFX-R Intelligent CO₂ sensor



Operational diagram



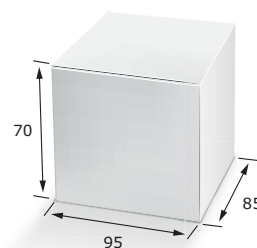
Fixing and dimensions



Standards

- 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
- RoHS Directive 2011/65/EU

Packaging



Article	Packaging	Length [mm]	Width [mm]	Height [mm]	Net weight	Gross weight
FCMFG-R FCMFF-R	Unit (1 pc.)	95	85	70	0,19 kg	0,19 kg
	Carton (10 pcs.)	492	182	84	1,94 kg	2,2 kg
	Box (60 pcs.)	590	380	280	11,6 kg	13,8 kg
	Pallet (1,680 pcs.)	1,200	800	2,100	327 kg	389 kg

Global trade item numbers (GTIN)

Packaging	FCMFF-R	FCMFG-R
Unit	05401003006214	05401003006221
Carton	05401003300749	05401003300756
Box	05401003501153	05401003501160

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.

DSTHM-2

Temperature and humidity duct transmitter

The DSTHM-2 series are combined duct transmitters which measure temperature and relative humidity. Based on the temperature and relative humidity measurements, the dew point is calculated. They are Power over Modbus supplied and all parameters are accessible via Modbus RTU.

Key features

- Selectable temperature and relative humidity ranges
- Bootloader for updating the firmware via Modbus RTU communication
- Modbus RTU (RS485)
- Long-term stability and accuracy

Technical specifications

Supply voltage	24 VDC, Power over Modbus	
Maximum power consumption	0,36 W	
Nominal power consumption	0,27 W	
Imax	15 mA	
Typical range of use	Temperature range	-30—70 °C
	Relative humidity range	0—100 % rH (non-condensing)
Accuracy	± 0,4 °C (range -30—70 °C)	
	± 3% rH (range 0—100 %)	
Min. airflow velocity	1 m /s	
Protection standard	Enclosure: IP54, Probe: IP20	

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.

Standards

- EMC Directive 2014/30/EC:
 - 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/EC
- RoHS Directive 2011/65/EC

Global trade item numbers (GTIN)

Packaging	DSTHM-2
Unit	05401003001998
Box	05401003500774



Article codes

	Supply	Connection
DSTHM-2	24 VDC, PoM	RJ45

Area of use

Monitoring duct temperature and relative humidity in HVAC applications

Wiring and connections

24 VDC	Supply voltage 24 VDC
GND	Ground
A	Modbus RTU communication, signal A
/B	Modbus RTU communication, signal /B

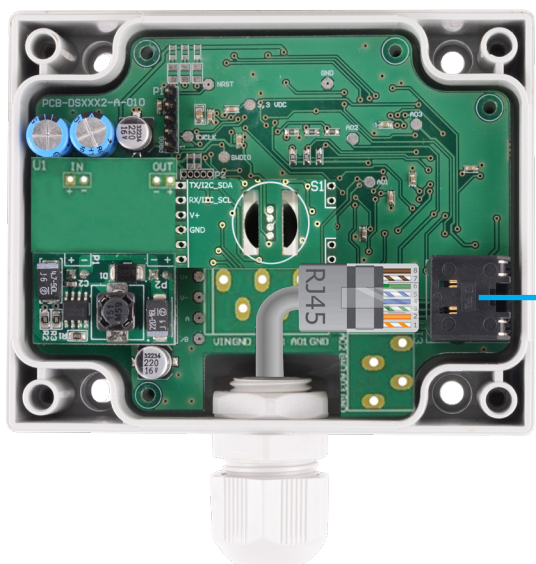


DSTHM-2

Temperature and humidity duct transmitter



Settings



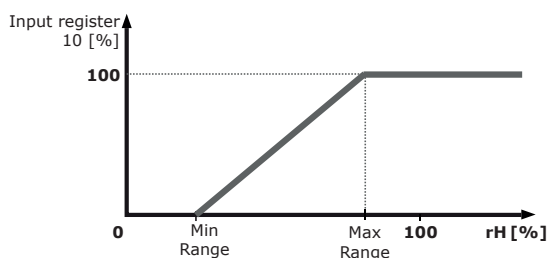
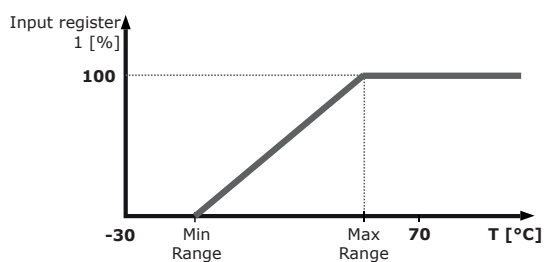
1

1 - RJ45 socket

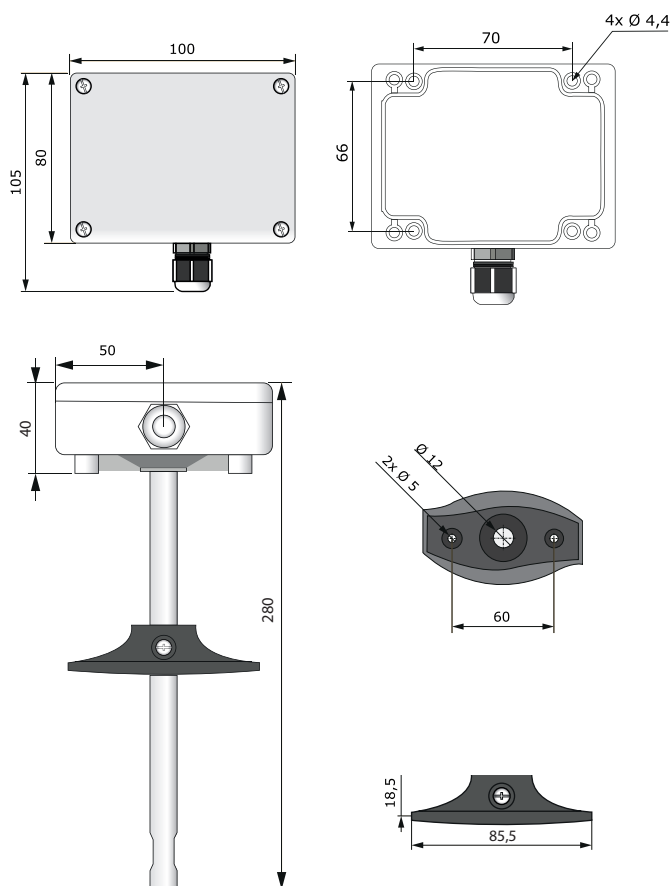


Plug the communication and power cable into the socket

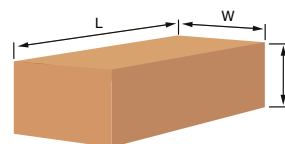
Operational diagram(s)



Fixing and dimensions



Packaging



Article	Packaging	Length [mm]	Width [mm]	Height [mm]	Net weight	Gross weight
DSTHM-2	Unit (1 pc.)	300	105	105	0,17 kg	0,30 kg
	Box (20 pcs.)	580	370	495	3,48 kg	7,14 kg

DSTHX-3

Temperature and humidity duct transmitter

The DSTHX-3 series are dual duct transmitters which measure temperature and relative humidity. They feature a wide range of low voltage power supply and three analogue / modulating outputs. All parameters are accessible via Modbus RTU.

Key features

- Selectable temperature and relative humidity ranges
- 3 selectable analogue / modulating outputs: temperature, relative humidity and temperature or relative humidity
- Bootloader for updating the firmware via Modbus RTU communication
- Modbus RTU (RS485)
- Long-term stability and accuracy

Technical specifications

Analogue / modulating output type	0—10 VDC mode: min. load 50 kΩ ($R_L \geq 50 \text{ k}\Omega$)	
	0—20 mA mode: max. load 500 Ω ($R_L \leq 500 \text{ }\Omega$)	
	PWM (open-collector type) mode: 1 kHz, min. load 50 kΩ ($R_L \geq 50 \text{ k}\Omega$), PWM voltage level: 3,3 VDC or 12 VDC	
Typical field of use	Temperature range	-30—70 °C
	Relative humidity range	0—100 % rH (non-condensing)
Accuracy	$\pm 0,4 \text{ }^\circ\text{C}$ (range -30—70 °C)	
	$\pm 3\%$ rH (range 0—100 %)	
Min. airflow velocity	1 m / s	
Protection standard	Enclosure: IP54, probe: IP20	

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.

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 Directive 2012/19/EC
- RoHS Directive 2011/65/EC



Article codes

Article code	Supply	I _{max}
DSTHG-3	18—34 VDC	70 mA
	15—24 VAC $\pm 10\%$	80 mA
DSTHF-3	18—34 VDC	80 mA

Area of use

Monitoring duct temperature and relative humidity in HVAC applications

Wiring and connections

Article type	DSTHF-3		DSTHG-3
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 1 for temperature measurement (0—10 VDC / 0—20 mA / PWM)		
GND	Ground AO1	Common ground*	
AO2	Analogue / modulating output 2 for relative humidity measurement (0—10 VDC / 0—20 mA / PWM)		
GND	Ground AO2	Common ground*	
AO3	Analogue / modulating output 3 for temperature or relative humidity measurement (0—10 VDC / 0—20 mA / PWM)		
GND	Ground AO3	Common ground*	
Connections	Spring contact terminal blocks, cable cross section: 1,5 mm ²		

***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.

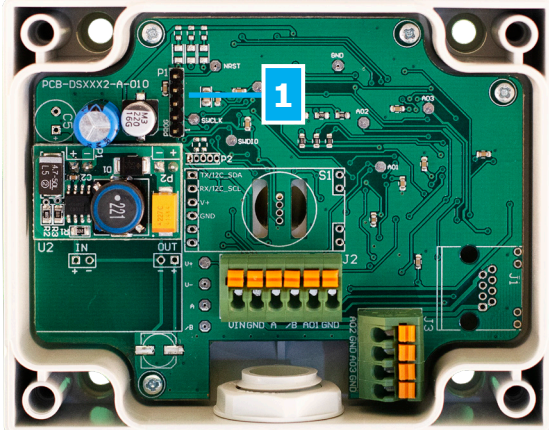
The -G version is intended for 3-wire connection and features a 'common ground'. This means that the ground of the analogue output is internally connected with the ground of the power supply. For this reason, -G and -F types cannot be used together on the same network. Never connect the common ground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

DSTHX-3

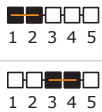
Temperature and humidity duct transmitter



Settings



1 - PROG header, P1

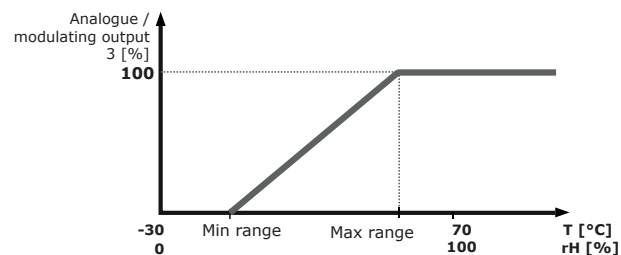
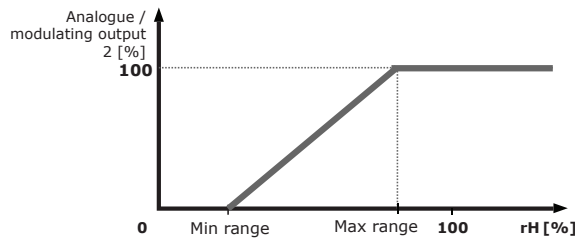
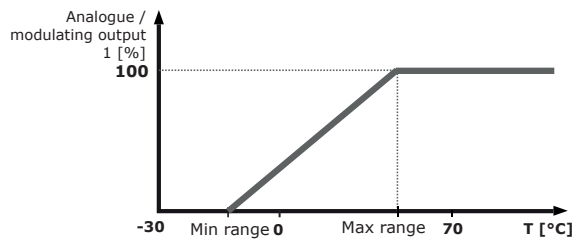


Put a jumper onto pins 1 and 2 and wait for at least 5 seconds to reset the Modbus communication parameters

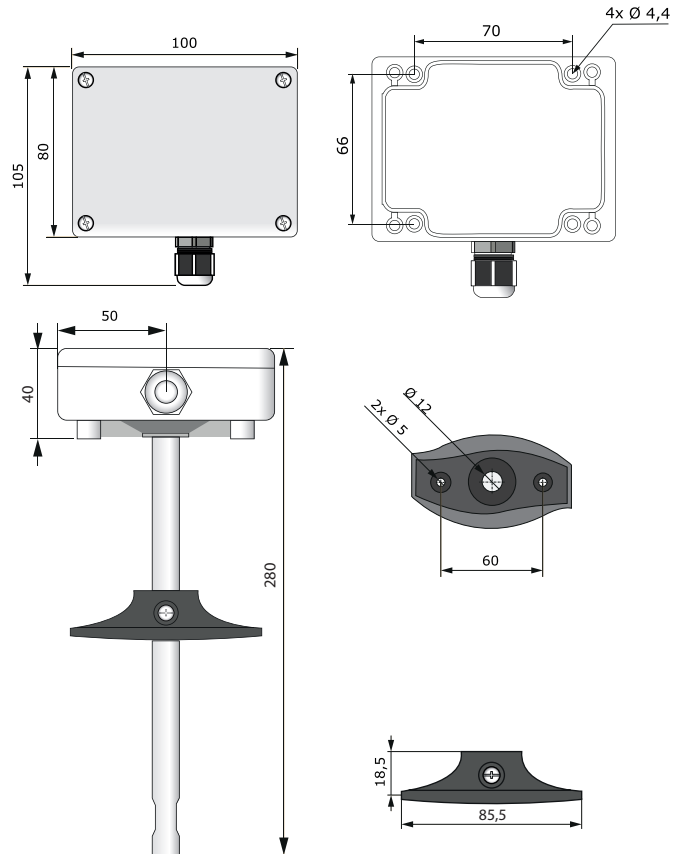
Put a jumper onto pins 3 and 4 and restart the supply to enter bootloader mode

() indicates the position of the jumper)

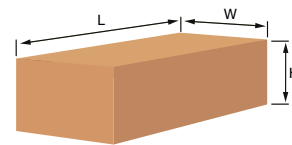
Operational diagram(s)



Fixing and dimensions



Packaging



Article	Packaging	Length [mm]	Width [mm]	Height [mm]	Net weight	Gross weight
DSTHF-3 DSTHG-3	Unit (1 pc.)	310	115	115	0,15 kg	0,26 kg
	Box (20 pcs.)	590	380	505	3,00 kg	6,39 kg

Global trade item numbers (GTIN)

Packaging	DSTHF-3	DSTHG-3
Unit	05401003017685	05401003017692
Box	05401003503461	05401003503478



DCTHM-2

Intelligent temperature and humidity duct sensor, PoM

The DCTHM-2 are intelligent sensors featuring adjustable temperature and relative humidity ranges. The used algorithm generates an output value based on the measured temperature and relative humidity levels, which can be used to directly control an EC fan, an AC fan speed controller or an actuator powered damper. They are Power over Modbus supplied and all parameters are accessible via Modbus RTU.

Key features

- 24 VDC power supply via RJ45 (PoM)
- Selectable temperature and relative humidity ranges
- Fan speed control based on T and rH
- Bootloader for updating the firmware via Modbus RTU communication
- Modbus RTU communication
- Long-term stability and accuracy

Technical specifications

Supply voltage	24 VDC, Power over Modbus	
Imax	15 mA	
Typical range of use	Temperature range	-30—70 °C
	Relative humidity range	0—100 % rH (non-condensing)
Accuracy	±0,4 °C (-30—70 °C)	
	±3 % rH (0—100 % rH)	
Min. airflow velocity	1 m /s	
Protection standard	Enclosure: IP54, probe: IP20	

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.

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
- RoHS Directive 2011/65/EC



Article codes

Article code	Supply	Imax	Connection
DCTHM-2	24 VDC, PoM	15 mA	RJ45

Area of use

- Demand controlled ventilation based on temperature and relative humidity
- Suitable for mounting in air ducts

Wiring and connections

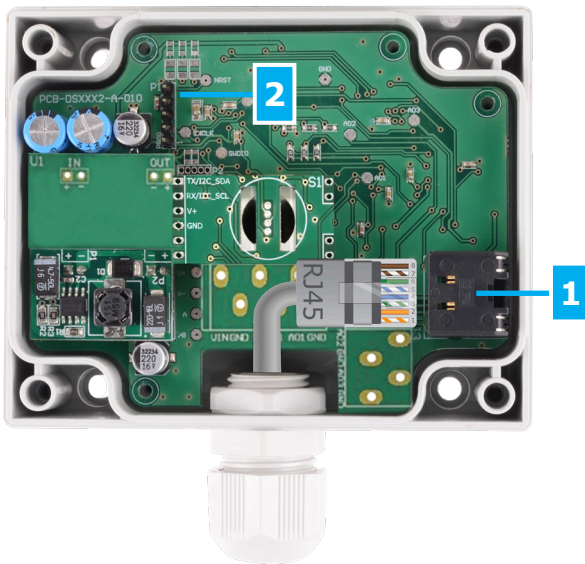
24 VDC	Supply voltage
GND	Ground
A	Modbus RTU communication, signal A
/B	Modbus RTU communication, signal /B



DCTHM-2

Intelligent temperature and humidity duct sensor, PoM

Settings



1 - RJ45 socket



Plug the communication and power cable into the socket

2 - PROG header, P1

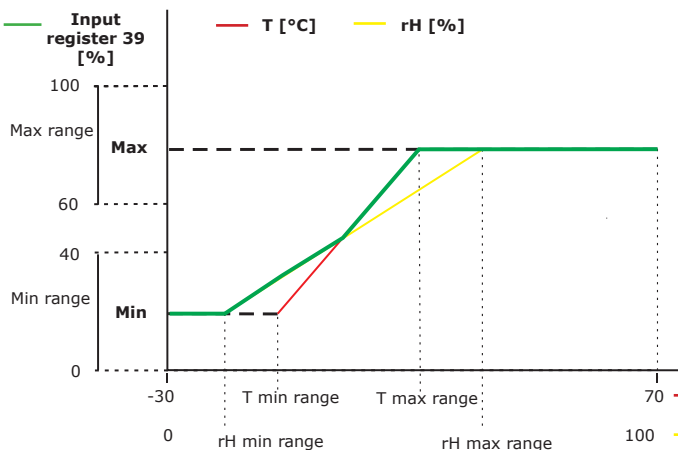


Put a jumper onto pins 1 and 2 and wait for at least 5 seconds to reset the Modbus communication parameters



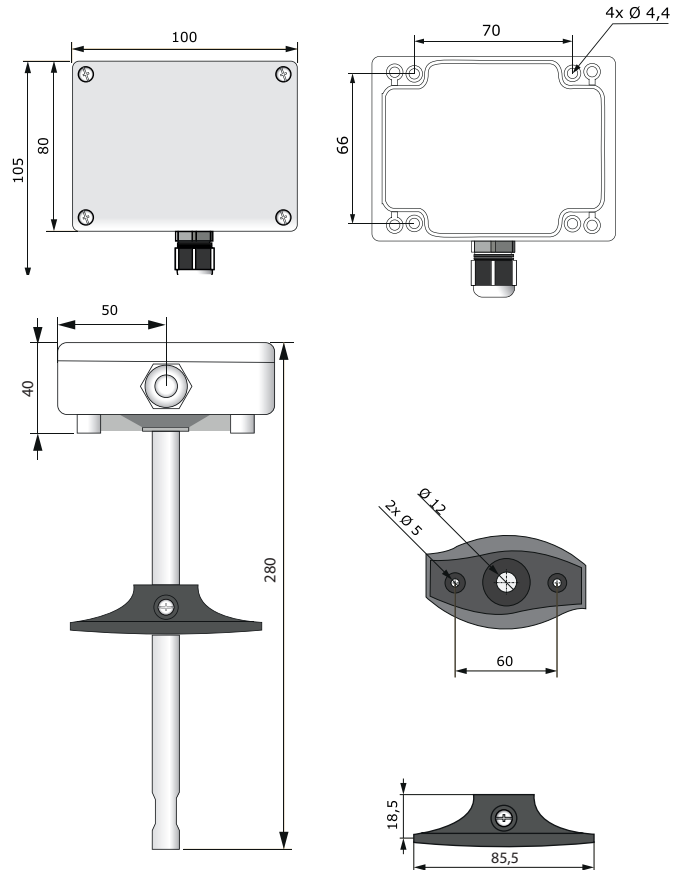
Put a jumper onto pins 3 and 4 and restart the supply to enter bootloader mode

Operational diagram

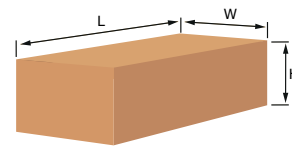


Note: The output changes automatically depending on the highest of the T and rH values, i.e. the highest of the two output values controls the output. See the green line in the operational diagram above. One or multiple sensors can be deactivated. E.g. it is also possible to control the output based on the measured temperature values only.

Fixing and dimensions



Packaging



Article	Packaging	Length [mm]	Width [mm]	Height [mm]	Net weight	Gross weight
DCTHM-2	Unit (1 pc.)	310	115	115	0,16 kg	0,28 kg
	Box (20 pcs.)	590	380	505	3,20 kg	6,41 kg

Global trade item numbers (GTIN)

Packaging	DCTHM-2
Unit	05401003017913
Box	05401003503645

DCTHX-2

Intelligent temperature and humidity duct sensor

The DCTHX-2 are intelligent sensors featuring adjustable temperature and relative humidity ranges. The used algorithm controls a single analogue / modulating output based on the measured temperature and relative humidity 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 blocks
- Selectable temperature and relative humidity ranges
- Fan speed control based on temperature and relative humidity
- Bootloader for updating the firmware via Modbus RTU communication
- Modbus RTU communication
- Long-term stability and accuracy

Technical specifications

Analogue / modulating output type	0—10 VDC mode: min. load 50 k Ω ($R_L \geq 50$ k Ω)	
	0—20 mA mode: max. load 500 Ω ($R_L \leq 500$ Ω)	
	PWM (open-collector type) mode: 1 kHz, min. load 50 k Ω ($R_L \geq 50$ k Ω), PWM voltage level: 3,3 VDC or 12 VDC	
Typical range of use	Temperature range	-30—70 °C
	Relative humidity range	0—100 % rH (non-condensing)
Accuracy	$\pm 0,4$ °C (-30—70 °C)	
	± 3 % rH (0—100 % rH)	
Min. airflow velocity	1 m / s	
Protection standard	Enclosure: IP54, probe: IP20	

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:
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Standards

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 - EN 60730-1:2011 Automatic electrical controls for household and similar use - Part 1: General requirements
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 - 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/EC
- RoHS Directive 2011/65/EC



Article codes

Article code	Supply	I _{max}
DCTHG-2	18—34 VDC	40 mA
	15—24 VAC $\pm 10\%$	45 mA
DCTHF-2	18—34 VDC	40 mA

Area of use

- Demand controlled ventilation based on temperature and relative humidity
- Suitable for mounting in air ducts

Wiring and connections

Article type	DCTHF-2		DCTHG-2	
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 AO		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.

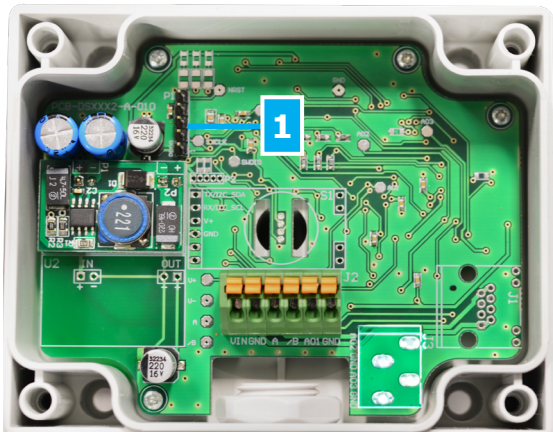
The -G version is intended for 3-wire connection and features a 'common ground'. This means that the ground of the analogue output is internally connected with the ground of the power supply. For this reason, -G and -F types cannot be used together on the same network. Never connect the common ground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

DCTHX-2

Intelligent temperature and humidity duct sensor



Settings



1 - PROG header, P1

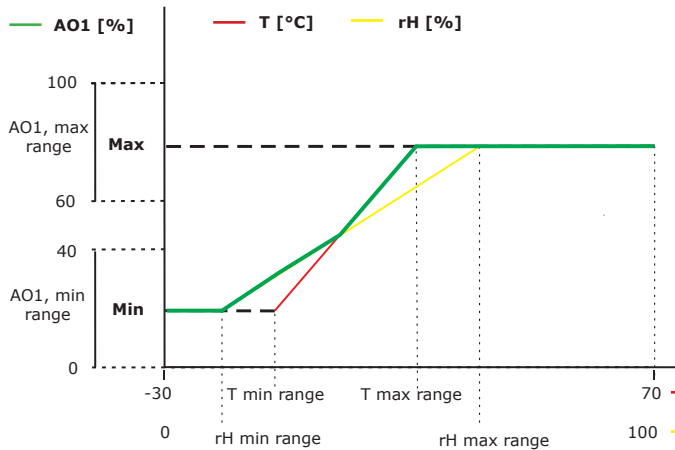


Put a jumper onto pins 1 and 2 and wait for at least 5 seconds to reset the Modbus communication parameters



Put a jumper onto pins 3 and 4 and restart the supply to enter bootloader mode

Operational diagram

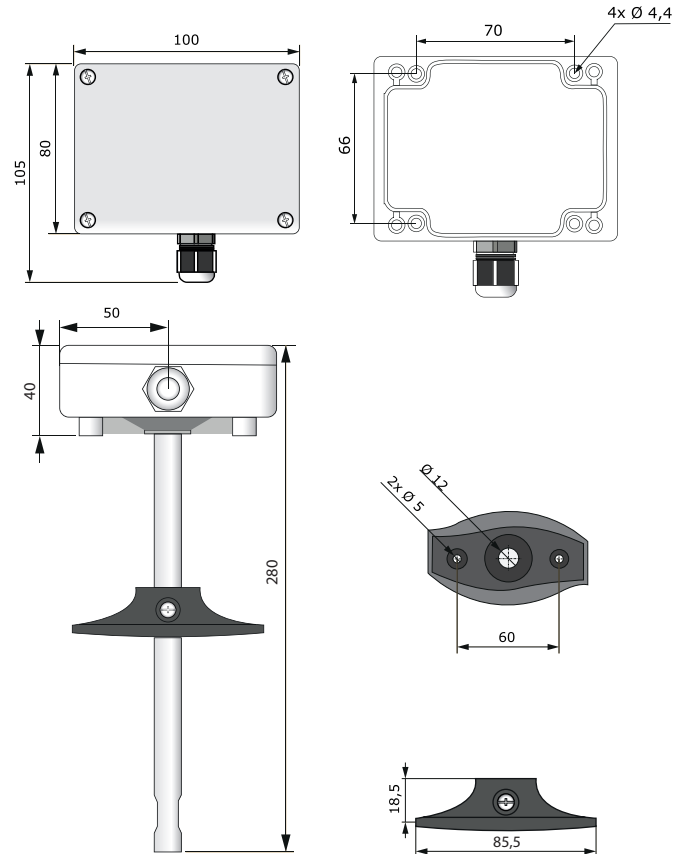


Note: The output changes automatically depending on the highest of the T and rH values, i.e. the highest of the two output values controls the output. See the green line in the operational diagram above. One or multiple sensors can be deactivated. E.g. it is also possible to control the output based on the measured relative humidity only.

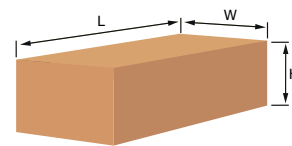
Global trade item numbers (GTIN)

Packaging	DCTHF-2	DCTHG-2
Unit	05401003017890	05401003017906
Box	05401003503621	05401003503638
Pallet	05401003700884	05401003700891

Fixing and dimensions



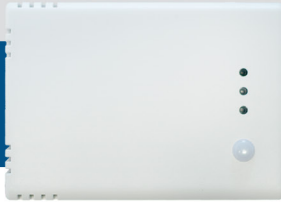
Packaging



Article	Packaging	Length [mm]	Width [mm]	Height [mm]	Net weight	Gross weight
DCTHF-2 DCTHG-2	Unit (1 pc.)	300	105	105	0,16 kg	0,25 kg
	Box (20 pcs.)	590	380	505	3,20 kg	5,16 kg
	Pallet (320 pcs.)	1,200	800	2,016	51 kg	82,5 kg

RSTHM-2

Temperature and humidity room transmitter



The RSTHM-2 series are combined room transmitters which measure temperature, relative humidity and ambient light. They are Power over Modbus supplied and all the parameters are accessible via Modbus RTU.

Key features

- Selectable temperature and relative humidity ranges
- 24 VDC Power over Modbus supply
- Bootloader for updating the firmware via Modbus RTU communication
- Ambient light sensor with adjustable 'active' and 'standby' level
- Modbus RTU (RS485)
- 3 LEDs with adjustable light intensity for status indication
- Long-term stability and accuracy

Technical specifications

Supply voltage	24 VDC, Power over Modbus	
Maximum power consumption	0,312 W	
Nominal or average power consumption in normal operation	0,234 W	
Imax	13 mA	
Selectable temperature range	0—50 °C via Modbus RTU	
Selectable relative humidity range	0—100 % rH via Modbus RTU	
Accuracy	±0,4 °C (0—50 °C)	
	±3 % rH (0—100 % rH)	
Protection standard	IP30 (according to EN 60529)	
Ambient conditions	Temperature	0—50 °C
	Rel. humidity	0—100 % rH (non-condensing)

Wiring and connections

RJ45 socket (Power over Modbus)

Pin 1	24 VDC	Supply voltage
Pin 2		
Pin 3	A	Modbus RTU communication, signal A
Pin 4		
Pin 5	/B	Modbus RTU communication, signal /B
Pin 6		
Pin 7	GND	Ground, supply voltage
Pin 8		



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.



Article codes

	Supply voltage	Connection type
RSTHM-2	Power over Modbus, 24 VDC	RJ45

Area of use

- Monitoring indoor temperature and relative humidity in HVAC applications
- Suitable for residential and commercial buildings
- For indoor use only

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

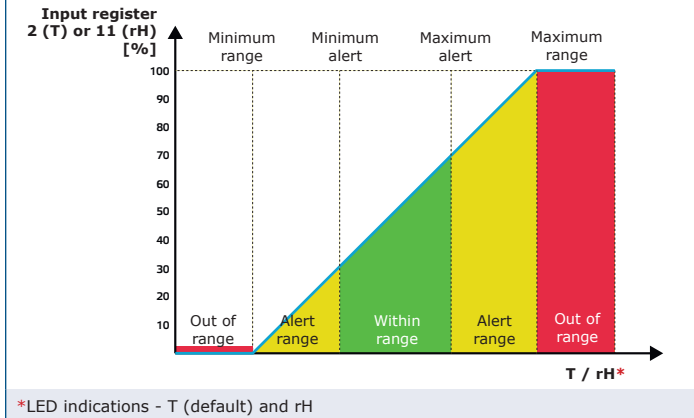


RSTHM-2

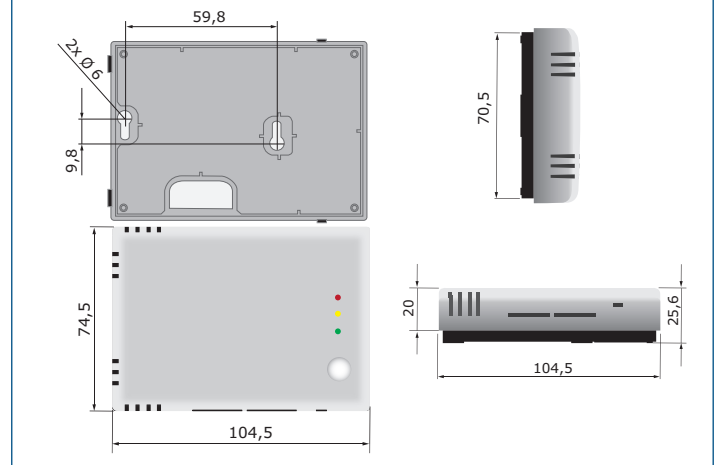
Temperature and humidity room transmitter



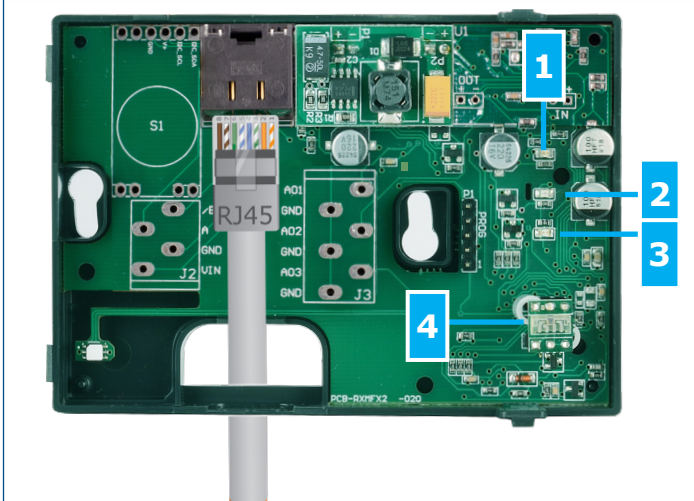
Operational diagram(s)



Fixing and dimensions

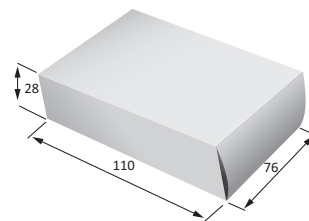


Settings and indications



1 - Red LED	Continuous	Measured temperature or relative humidity are out of range
	Blinking	Communication with one of the sensors fails
2 - Yellow LED	On	Measured temperature or relative humidity are in the alert range
3 - Green LED	On	Measured temperature or relative humidity are within range
4 - Ambient light sensor		Low light intensity / Active / Standby
5 - RJ45 socket		Modbus communication with connected Master devices and PoM-voltage supply (24 VDC)
		Blinking LEDs indicate that packages are transmitted via Modbus RTU communication
Bootloader mode		When bootloader mode is activated, the green and yellow LEDs flash alternately
		After starting the bootloader application, the red LED starts blinking

Packaging



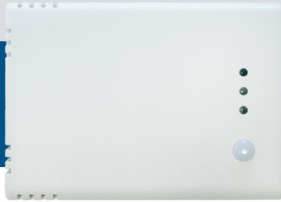
Article	Packaging	Length [mm]	Width [mm]	Height [mm]	Net weight	Gross weight
RSTHM-2	Unit (1 pc.)	110	76	28	0,082 kg	0,095 kg
	Carton (24 pcs.)	485	175	77	1,96 kg	2,43 kg
	Box (144 pcs.)	510	410	270	10,80 kg	14,554 kg

Global trade item numbers (GTIN)

Packaging	RSTHM-2
Unit	05401003011430
Carton	05401003301876
Box	05401003502693

RWTHM-2

Temperature and humidity room transmitter



Key features

- Selectable temperature and relative humidity ranges
- 24 VDC Power over Modbus supply
- Bootloader for updating the firmware via Modbus RTU communication
- Ambient light sensor with adjustable 'active' and 'standby' level
- Modbus RTU (RS485)
- 3 LEDs for status indication with adjustable light intensity
- Long-term stability and accuracy

Article codes

	Supply	Connection
RWTHM-2	24 VDC, Power over Modbus,	RJ45

Technical specifications

Supply voltage	24 VDC, Power over Modbus	
Maximum power consumption	1,2 W	
Nominal or average power consumption in normal operation	0,9 W	
Imax	50 mA	
Selectable temperature range	0—50 °C via Modbus RTU	
Selectable relative humidity range	0—100 % rH via Modbus RTU	
Accuracy	±0,4 °C (0—50 °C)	
	±3 % rH (0—100 % rH)	
Protection standard	IP30 (according to EN 60529)	
Ambient conditions	Temperature	0—50 °C
	Rel. humidity	0—100 % rH (non-condensing)

Wiring diagram

RJ45 socket (Power over Modbus)

Pin 1	24 VDC	Supply voltage
Pin 2		
Pin 3	A	Modbus RTU communication, signal A
Pin 4		
Pin 5	/B	Modbus RTU communication, signal /B
Pin 6		
Pin 7	GND	Ground, supply voltage
Pin 8		



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.

The RWTHM-2 series are combined indoor transmitters which measure indoor temperature, relative humidity and ambient light. Based on these measurements, the dew point can be calculated. They are equipped with a second temperature sensor located on an aluminium plate on the backside of the device enclosure in order to measure the temperature of the surface onto which it is mounted. The series are Power over Modbus supplied and all the parameters are accessible via Modbus RTU.



Area of use

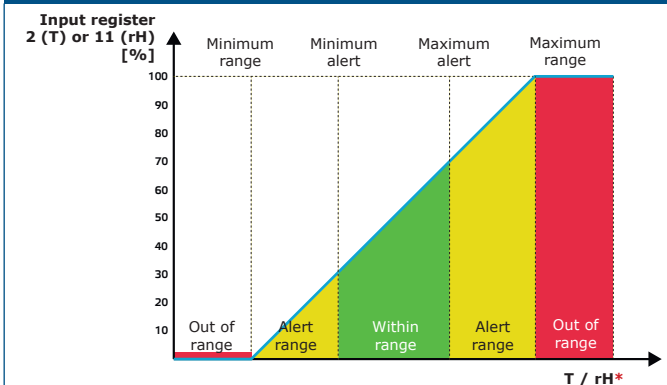
- Monitoring indoor temperature and relative humidity in HVAC applications
- Suitable for residential and commercial buildings
- For indoor use only

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

Operational diagram(s)



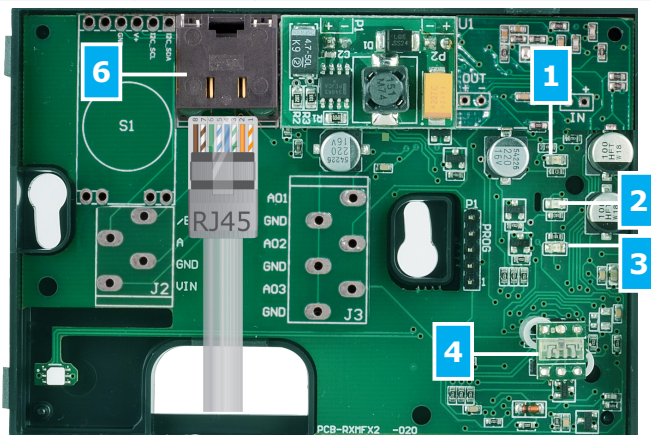
*LED indications - T (default) and rH

RWTHM-2

Temperature and humidity room transmitter

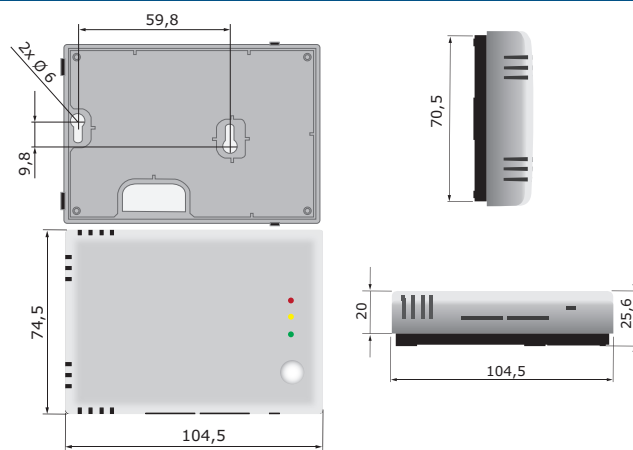


Indications

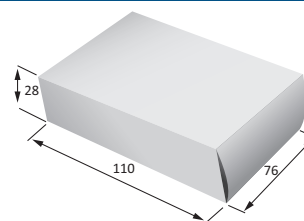


1 - Red LED	Continuous	Measured temperature or relative humidity are out of range
	Blinking	Communication with one of the sensors fails
2 - Yellow LED	On	Measured temperature or relative humidity are in the alert range
3 - Green LED	On	Measured temperature or relative humidity are within range
4 - Ambient light sensor		Low light intensity / Active / Standby
5 - 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
Bootloader mode		When bootloader mode is activated, the green and yellow LEDs flash alternately
		After starting the bootloader application, the red LED starts blinking
6 - RJ45 socket		Modbus communication with connected Master devices and PoM-voltage supply (24 VDC)
		Blinking LEDs indicate that packages are transmitted via Modbus RTU communication

Fixing and dimensions



Packaging



Article	Packaging	Length [mm]	Width [mm]	Height [mm]	Net weight	Gross weight
RWTHM-2	Unit (1 pc.)	110	76	28	0,08 kg	0,102 kg
	Carton (24 pcs.)	492	182	84	1,92 kg	2,588 kg
	Box (144 pcs.)	510	410	270	11,52 kg	16,76 kg

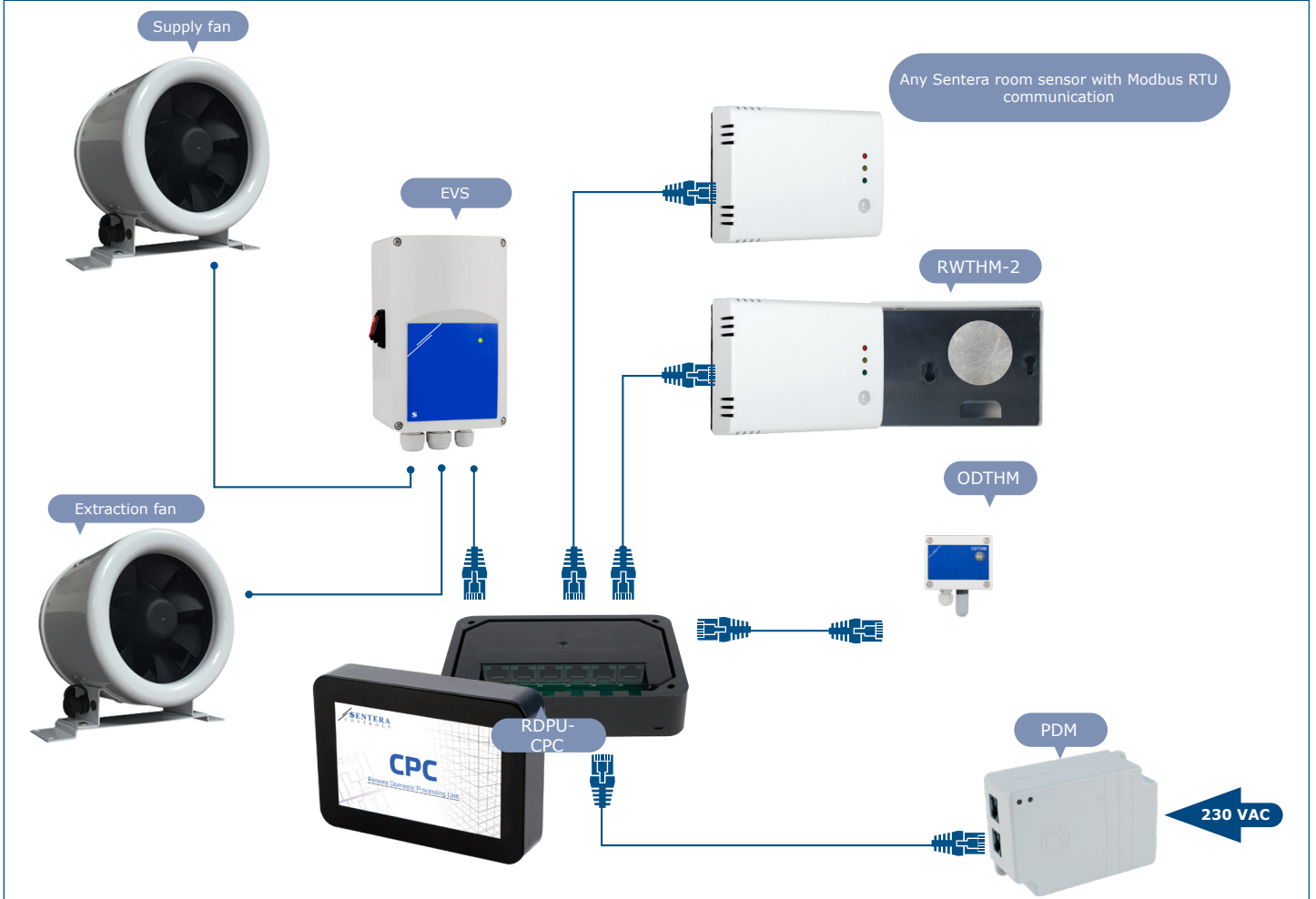
Global trade item numbers (GTIN)

Packaging	RWTHM-2
Unit	05401003011584

RWTHM-2

Temperature and humidity room transmitter

Application example





RSTHX-3

Temperature and humidity room transmitter

The RSTHX-3 series are room sensors which measure temperature, relative humidity and ambient light. They feature a wide range of low voltage power supply and three analogue / modulating outputs. All parameters are accessible via Modbus RTU.

Key features

- Selectable temperature and relative humidity ranges
- 3 selectable analogue / modulating outputs - temperature, relative humidity and selectable temperature or relative humidity
- Ambient light sensor with adjustable 'active' and 'standby' level
- Modbus RTU (RS485)
- 3 LEDs with adjustable light intensity for status indication
- Long-term stability and accuracy

Technical specifications

Analogue / modulating outputs	0—10 VDC mode: $R_L \geq 50 \text{ k}\Omega$	
	0—20 mA mode: $R_L \leq 500 \Omega$	
	PWM (open-collector type) mode: 1 kHz, $R_L \geq 50 \text{ k}\Omega$, PWM voltage level: 3,3 VDC or 12 VDC	
Typical range of use	Temperature range	0—50 °C
	Relative humidity range	0—95 % rH (non-condensing)
Accuracy	$\pm 0,4 \text{ °C}$ (range 0—50 °C)	
	$\pm 3\% \text{ rH}$ (range 0—100 %)	
Protection standard	IP30 (according to EN 60529)	

Article codes

Article code	Supply	Imax
RSTHF-3	18—34 VDC	75 mA
RSTHG-3	18—34 VDC / 15—24 VAC $\pm 10\%$	75 mA / 85 mA

Wiring and connections

Article type	RSTHF-3		RSTHG-3	
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 1 for temperature measurement (0—10 VDC / 0—20 mA / PWM)			
GND	Ground AO		Common ground*	
AO2	Analogue / modulating output 2 for relative humidity measurement (0—10 VDC / 0—20 mA / PWM)			
GND	Ground AO		Common ground*	
AO3	Analogue / modulating output 3 for temperature or relative humidity measurement (0—10 VDC / 0—20 mA / PWM)			
GND	Ground AO		Common ground*	
Connections	Spring contact terminal blocks, cable cross section: 1,5 mm²			

***Attention!** 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.

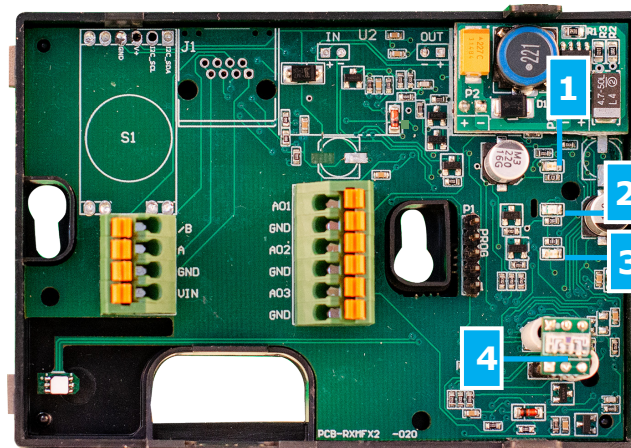
The -F version is suited for 4-wire connection. It features separate grounds for power supply and analogue output. Never connect the separated ground of the -F article to other devices powered by an AC voltage. Doing so might cause permanent damage to the device!



Area of use

- Monitoring indoor temperature and relative humidity in HVAC applications
- Suitable for residential and commercial buildings
- For indoor use only

Indications



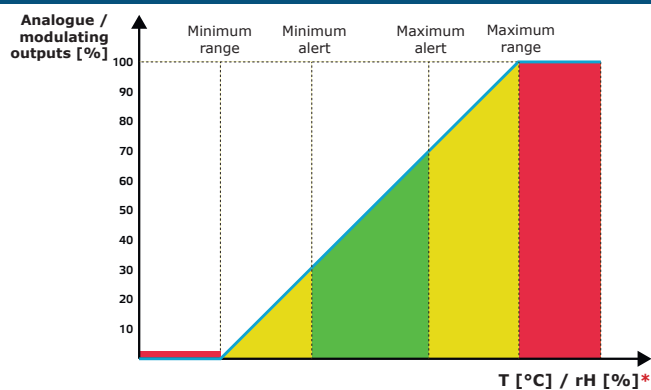
1 - Red LED	Continuous	Measured temperature or relative humidity are out of range
	Blinking	Communication with one of the sensors fails
2 - Yellow LED	On	Measured temperature or relative humidity are in the alert range
3 - Green LED	On	Measured temperature or relative humidity are within range
4 - Ambient light sensor		Low light intensity / Active / Standby

RSTHX-3

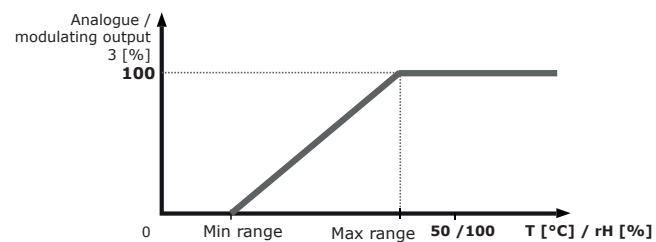
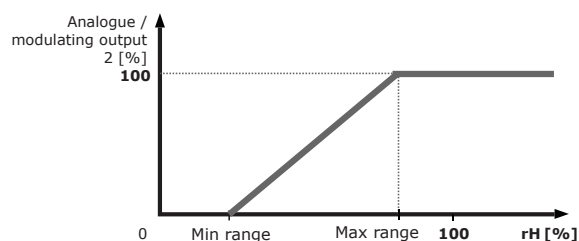
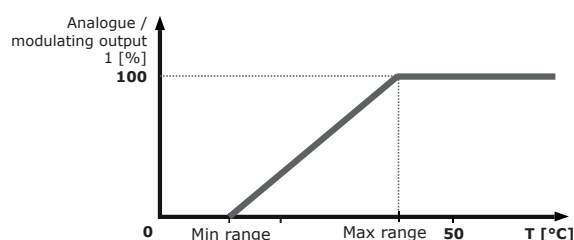
Temperature and humidity room transmitter



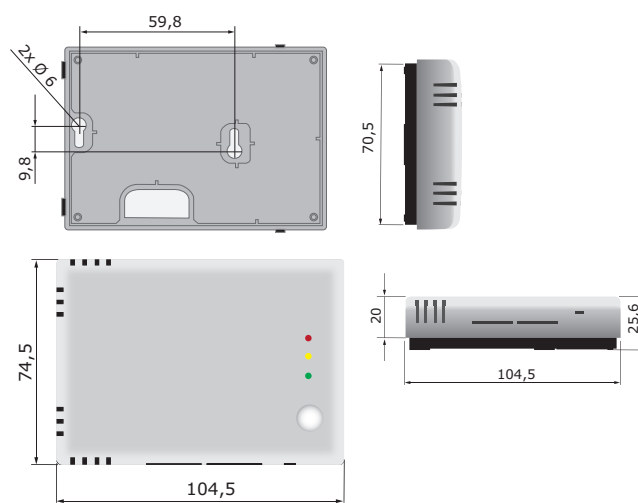
Operational diagram(s)



* LED indications - T (default) / rH



Fixing and dimensions



How to configure



Via a Sentera Internet Gateway you can connect your installation to the SenteraWeb HVAC cloud and:

- Easily change the parameter settings of the connected devices remotely
- Define users and give them access to monitor the installation via a standard web browser
- Log data - create diagrams and export logged data
- Receive alerts or warnings when measured values exceed alert ranges or when errors occur
- Create different regimes for your ventilation system - e.g. day-night regime

Please refer to the Modbus Register Map of the product for more details regarding the Modbus registers.

Standards

- Low Voltage Directive 2014/35/EC
 - EN 60529:1991 Degrees of protection provided by enclosures (IP Code) Amendment AC:1993 to EN 60529



- 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

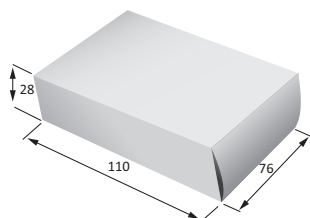
- RoHS Directive 2011/65/EC



RSTHX-3

Temperature and humidity room transmitter

Packaging



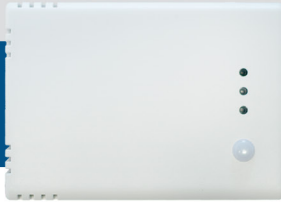
Article	Packaging	Length [mm]	Width [mm]	Height [mm]	Net weight	Gross weight
RSTHF-3 RSTHG-3	Unit (1 pc.)	110	76	28	0,086 kg	0,099 kg
	Carton (24 pcs.)	492	182	84	2,064 kg	2,526 kg
	Box (144 pcs.)	510	410	270	12,384 kg	16,146 kg

Global trade item numbers (GTIN)

Packaging	RSTHF-3	RSTHG-3
Unit	05401003017708	05401003017715
Carton	05401003302378	05401003302385
Box	05401003503485	05401003503492

RSTHH-3

Temperature and humidity room transmitter



The RSTHH-3 series are room sensors which measure temperature, relative humidity and ambient light. They feature 24 VDC power supply (Power over Modbus) and 3 analogue / modulating outputs. All parameters are accessible via Modbus RTU.

Key features

- Spring contact terminal block or RJ45 connections
- Selectable temperature and relative humidity ranges
- 3 selectable analogue / modulating outputs - temperature, relative humidity and selectable temperature or relative humidity
- Ambient light sensor with adjustable 'active' and 'standby' level
- Modbus RTU (RS485)
- 3 LEDs with adjustable light intensity for status indication
- Long-term stability and accuracy

Technical specifications

Analogue / modulating outputs	0—10 VDC mode: $R_L \geq 50 \text{ k}\Omega$	
	0—20 mA mode: $R_L \leq 500 \Omega$	
	PWM (open-collector type) mode: 1 kHz, $R_L \geq 50 \text{ k}\Omega$, PWM voltage level: 3,3 VDC or 12 VDC	
Typical range of use	Temperature range	0—50 °C
	Relative humidity range	0—95 % rH (non-condensing)
Accuracy	$\pm 0,4 \text{ }^\circ\text{C}$ (range 0—50 °C)	
	$\pm 3\%$ rH (range 0—100 %)	
Protection standard	IP30 (according to EN 60529)	

Wiring diagram

RJ45 sockets (Power over Modbus)

Pin 1	24 VDC	Supply voltage
Pin 2		
Pin 3	A	Modbus RTU communication, signal A
Pin 4		
Pin 5	/B	Modbus RTU communication, signal /B
Pin 6		
Pin 7	GND	Ground, supply voltage
Pin 8		



Input terminal block

VIN	Supply voltage 24 VDC
GND	Supply voltage, ground
A	Modbus RTU communication, signal A
/B	Modbus RTU communication, signal /B

Output terminal block

AO1	Analogue / modulating output 1 for temperature measurement (0—10 VDC / 0—20 mA / PWM)
GND	Ground AO1
AO2	Analogue / modulating output 2 for relative humidity measurement (0—10 VDC / 0—20 mA / PWM)
GND	Ground AO2
AO3	Analogue / modulating output 3 for temperature or relative humidity measurement (0—10 VDC / 0—20 mA / PWM)
GND	Ground AO3

Attention! The unit needs to be supplied via the RJ45 connector or via the Input Terminal Block. Do not use them simultaneously!



Article codes

Article code	Supply	Connection type	Imax
RSTHH-3	24 VDC, PoM	RJ45 or terminal block	75 mA

Area of use

- Monitoring indoor temperature and relative humidity in HVAC applications
- Suitable for residential and commercial buildings
- For indoor use only

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

Modbus registers



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

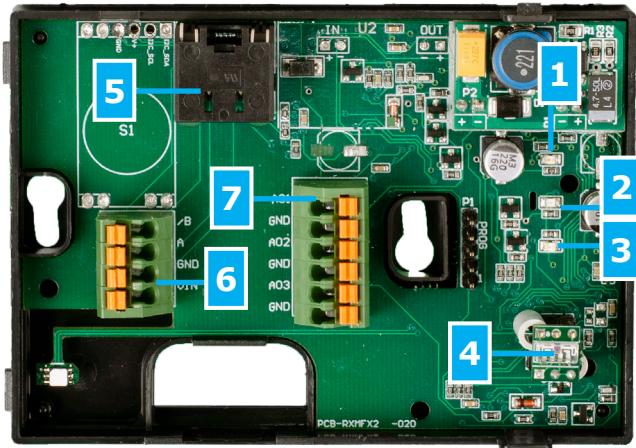
The parameters of the unit can be monitored / configured through the 3SMODBUS software platform. You can download it from the following link:
<https://www.sentera.eu/en/3SMCenter>

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

RSTHH-3

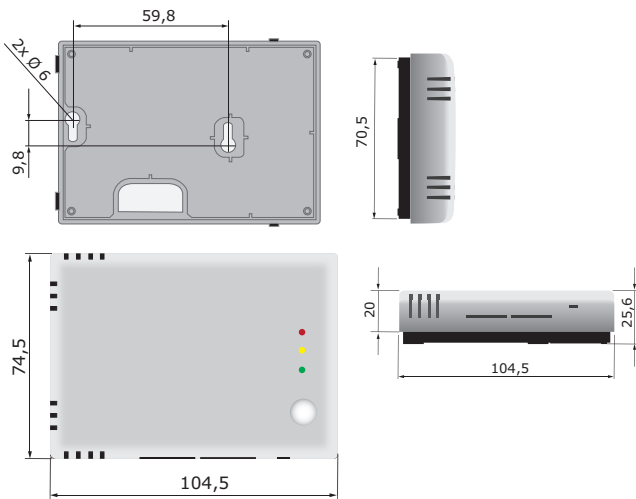
Temperature and humidity room transmitter

Connections and indications

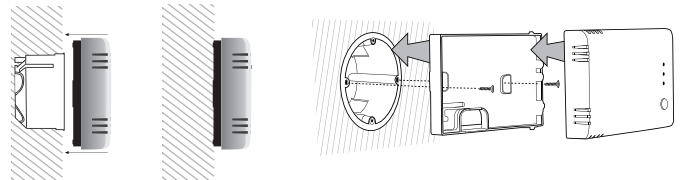


1 - Red LED	Continuous	Measured temperature or relative humidity are out of range
	Blinking	Communication with one of the sensors fails
2 - Yellow LED	On	Measured temperature or relative humidity are in the alert range
3 - Green LED	On	Measured temperature or relative humidity are within range
4 - Ambient light sensor		Low light intensity / Active / Standby
5 - RJ45 socket		Modbus communication with connected Master devices and PoM-voltage supply (24 VDC)
		Blinking LEDs indicate that packages are transmitted via Modbus RTU communication
6 - Input terminal block		Modbus communication with connected Master devices and PoM-voltage supply (24 VDC)
7 - Output terminal block		Analogue / modulating outputs

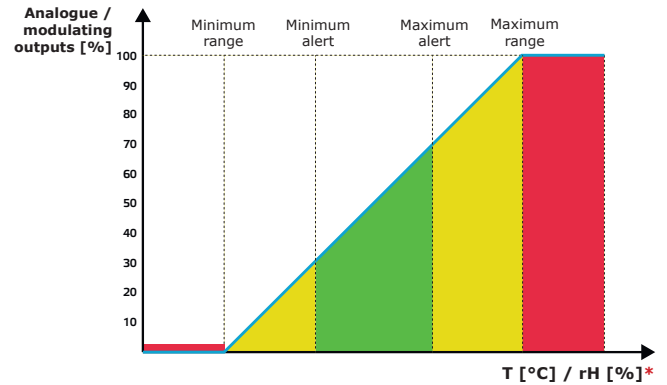
Fixing and dimensions



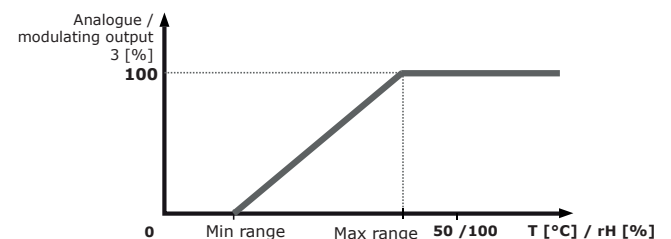
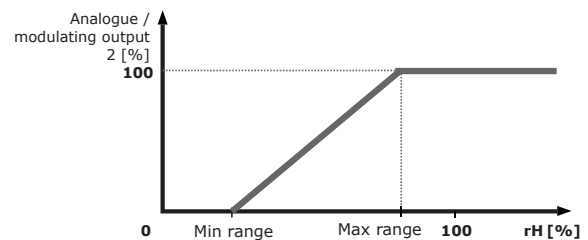
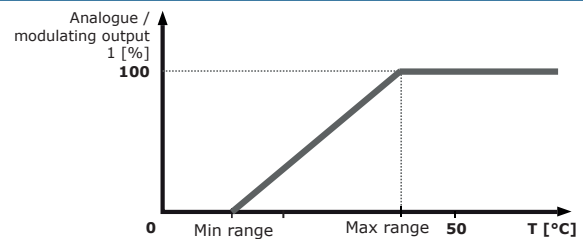
Fixing and dimensions

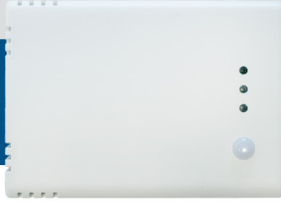


Operational diagram(s)



* LED indications - T (default) / rH





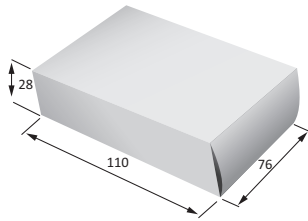
RSTHH-3

Temperature and humidity room transmitter

Global trade item numbers (GTIN)

Packaging	RSTHH-3
Unit	05401003017722
Carton	05401003302392
Box	05401003503508

Packaging



Article	Packaging	Length [mm]	Width [mm]	Height [mm]	Net weight	Gross weight
RSTHH-3	Unit (1 pc.)	110	76	28	0,08 kg	0,092 kg
	Carton (24 pcs.)	492	182	84	1,92 kg	2,34 kg
	Box (144 pcs.)	510	410	270	11,52 kg	14,065 kg



RCTHX-2

Intelligent temperature and humidity room sensor

The RCTHX-2 are intelligent room sensors featuring adjustable temperature and relative humidity ranges. The used algorithm controls a single analogue / modulating output based on the measured temperature and humidity 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 terminals
- Selectable temperature and relative humidity ranges
- Fan speed control based on temperature and relative humidity
- Bootloader for updating the firmware via Modbus RTU communication
- Ambient light sensor with adjustable 'active' and 'standby' level
- 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: $R_L \geq 50 \text{ k}\Omega$	
	0—20 mA mode: $R_L \leq 500 \Omega$	
	PWM (open-collector type) mode: 1 kHz, $R_L \geq 50 \text{ k}\Omega$, PWM voltage level: 3,3 VDC or 12 VDC	
Typical range of use	Temperature range	0—50 °C
	Relative humidity range	0—95 % rH (non-condensing)
Accuracy	$\pm 0,4 \text{ }^\circ\text{C}$ (range 0—50 °C)	
	$\pm 3\% \text{ rH}$ (range 0—100 %)	
Protection standard	IP30 (according to EN 60529)	

Article codes

Article code	Supply	Imax
RCTHF-2	18—34 VDC	40 mA
RCTHG-2	18—34 VDC / 15—24 VAC $\pm 10\%$	40 mA/ 45 mA

Area of use

- Demand controlled ventilation based on measured temperature and relative humidity
- Suitable for residential and commercial buildings
- For indoor use only

Wiring and connections

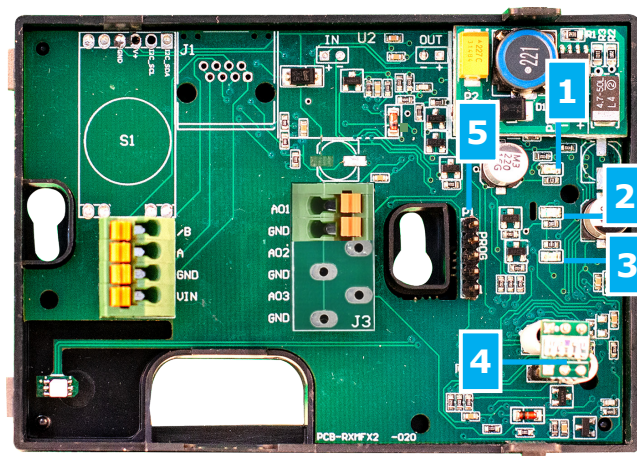
Article type	RCTHF-2	RCTHG-2	
VIN	18—34 VDC	18—34 VDC	15—24 VAC ±10%
GND	Ground	Common ground	AC ~
A	Modbus RTU (RS485), signal A		
/B	Modbus RTU (RS485), signal /B		
AO1	Analogue / modulating output 1 (0—10 VDC / 0—20 mA / PWM)		
GND	Ground AO1	Common ground	
Connections	Spring contact terminal blocks, cable cross section: 1,5 mm²		

Attention! The -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.

The -F version is suited for 4-wire connection. It features separate grounds for power supply and analogue output. Never connect the separated ground of the -F article to other devices powered by an AC voltage. Doing so might cause permanent damage to the device!



Indications



1 - Red LED	On	Measured temperature or relative humidity values are out of range
	Blinking	Communication with one of the sensors fails
2 - Yellow LED	On	Measured temperature or relative humidity 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 or relative humidity values are within range
4 - Ambient light sensor		Low light intensity / Active / Standby
5 - 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

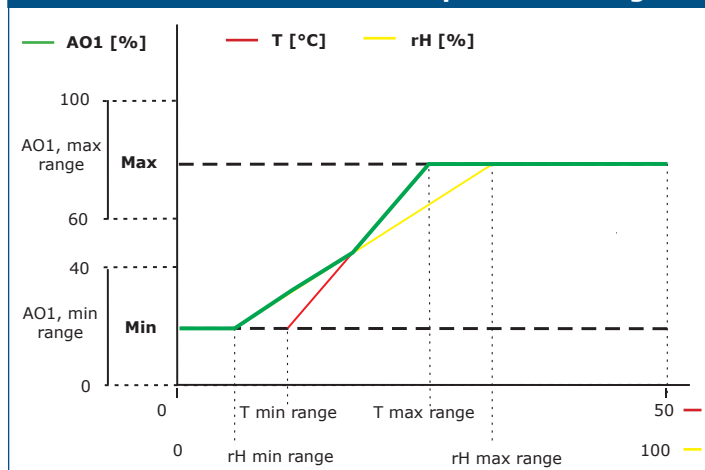
Note: By default, the LED indicators visualise the measured temperature level. When the sensor is in bootloader mode, the green and yellow LEDs flash alternately. During the firmware download, the red LED is flashing additionally.



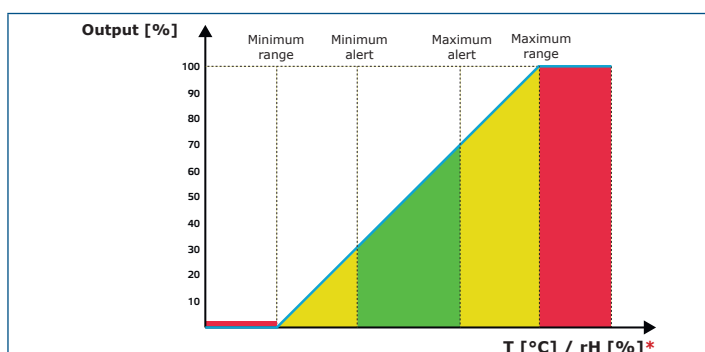
RCTHX-2

Intelligent temperature and humidity room sensor

Operational diagram

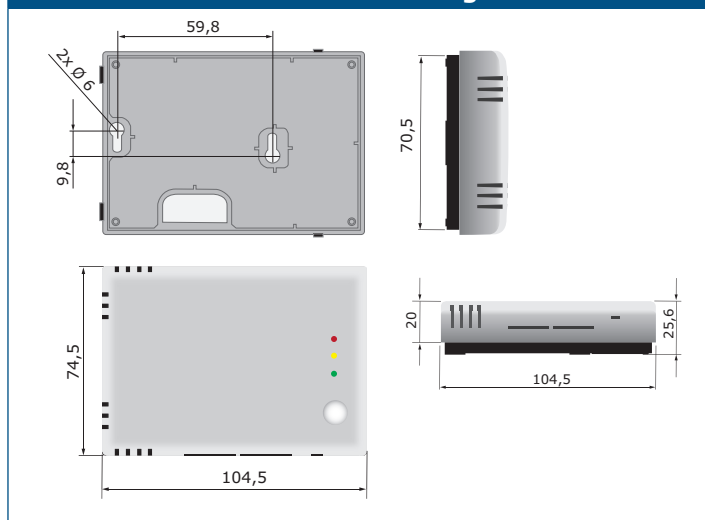


Note: The output changes automatically depending on the highest of the T and rH values, i.e. the highest of the two output values controls the output. See the green line in the operational diagram above. One or multiple sensors can be deactivated. E.g. it is also possible to control the output based on the measured temperature only.



* LED indications - T (default) or rH

Fixing and dimensions



How to configure



Via a Sentera Internet Gateway you can connect your installation to the SenteraWeb HVAC cloud and:

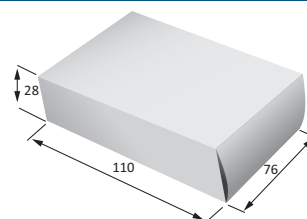
- Easily change the parameter settings of the connected devices remotely
- Define users and give them access to monitor the installation via a standard web browser
- Log data - create diagrams and export logged data
- Receive alerts or warnings when measured values exceed alert ranges or when errors occur
- Create different regimes for your ventilation system - e.g. day-night regime

Please refer to the Modbus Register Map of the product for more details regarding the Modbus registers.

Standards

- 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

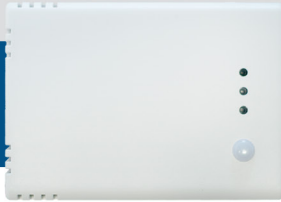
Packaging



Article	Packaging	Length [mm]	Width [mm]	Height [mm]	Net weight	Gross weight
RCTHF-2 RCTHG-2	Unit (1 pc.)	110	76	28	0,075 kg	0,083 kg
	Carton (24 pcs.)	492	182	84	1,8 kg	2,22 kg
	Box (144 pcs.)	510	410	270	10,08 kg	13,35 kg

Global trade item numbers (GTIN)

Packaging	RCTHF-2	RCTHG-2
Unit	05401003017920	05401003017937
Carton	05401003302514	05401003302521
Box	05401003503652	05401003503669



RCTHM-2

Intelligent temperature and humidity room sensor

The RCTHM-2 are intelligent room sensors featuring adjustable temperature and relative humidity ranges. The used algorithm generates an output value based on the measured temperature and humidity values, which can be used to directly control an EC fan, an AC fan speed controller or an actuator powered damper. They are Power over Modbus supplied and all parameters are accessible via Modbus RTU communication.

Key features

- 24 VDC power supply via RJ45 (PoM)
- Selectable temperature and relative humidity ranges
- Fan speed control based on temperature and humidity
- Bootloader for updating the firmware via Modbus RTU communication
- Ambient light sensor with adjustable 'active' and 'standby' level
- Modbus RTU communication
- 3 LEDs with adjustable light intensity for status indication
- Long-term stability and accuracy

Technical specifications

Supply voltage	24 VDC, Power over Modbus	
Typical field of use	Temperature range	0–50 °C
	Relative humidity range	0–95 % rH (non-condensing)
Accuracy		± 0,4 °C (range 0–50 °C)
		± 3% rH (range 0–100 %)
Protection standard	IP30 (according to EN 60529)	

Article codes

Article code	Supply	Connection type	Imax
RCTHM-2	24 VDC	RJ45	30 mA

Area of use

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

Wiring and connections

Supply voltage	24 VDC, PoM
GND	Ground
A	Modbus RTU communication, signal A
/B	Modbus RTU communication, signal /B

Modbus registers



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

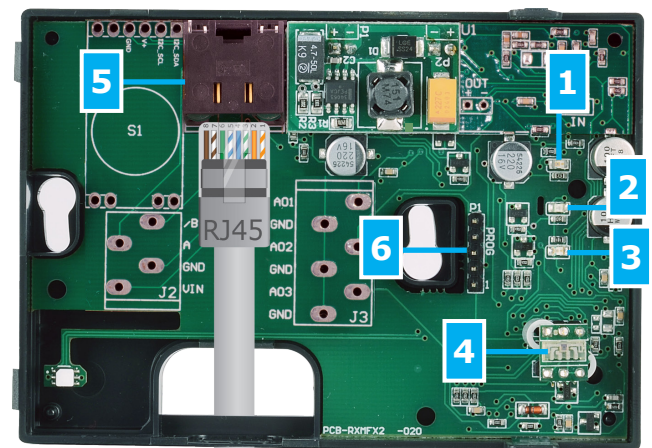
The parameters of the unit can be monitored / configured through the 3SModbus software platform. You can download it from the following link:

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

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

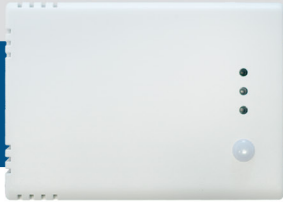


Indications



1 - Red LED	On	Measured temperature or relative humidity values are out of range
	Blinking	Communication with one of the sensors fails
2 - Yellow LED	On	Measured temperature or relative humidity values are in the alert range
3 - Green LED	On	Measured temperature or relative humidity values are within range
4 - Ambient light sensor		Low light intensity / Active / Standby
5 - RJ45 socket		Modbus communication with connected Master devices and PoM-voltage supply (24 VDC)
		Blinking LEDs indicate that packages are transmitted via Modbus RTU communication
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 power supply to enter bootloader mode

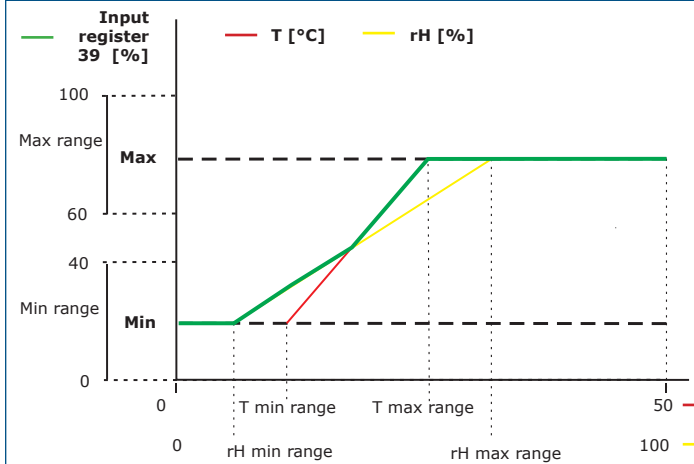
Note: By default, the LED indicators visualise the measured temperature level. When the sensor is in bootloader mode, the green and yellow LEDs flash alternately. During the firmware download, the red LED is flashing additionally.



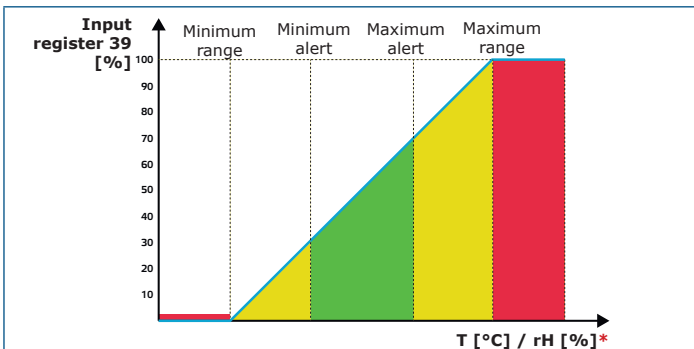
RCTHM-2

Intelligent temperature and humidity room sensor

Operational diagram

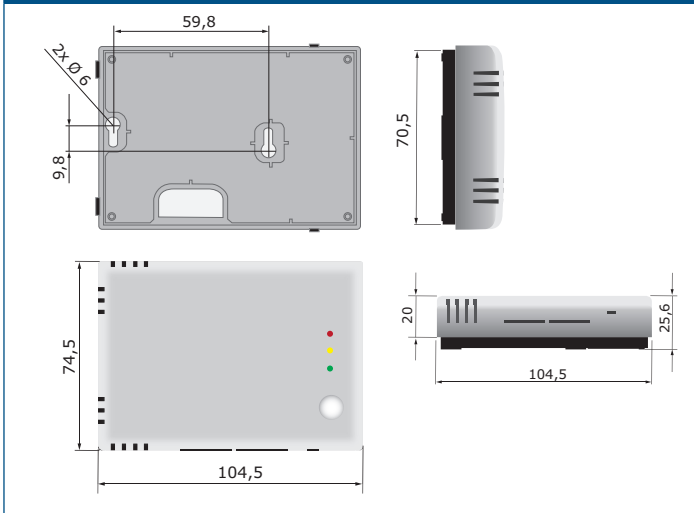


Note: The output changes automatically depending on the highest of the T and rH values, i.e. the higher of the two output values controls the output. See the green line in the operational diagram above. One or multiple sensors can be deactivated. E.g. it is also possible to control the output based on the measured temperature values only.



* LED indications - T (default) or rH

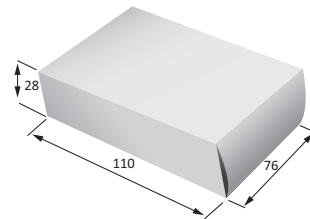
Fixing and dimensions



Standards

- 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
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 - 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
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 - 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

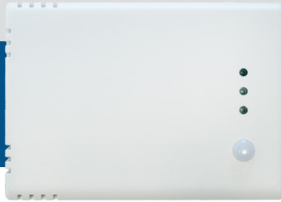
Packaging



Article	Packaging	Length [mm]	Width [mm]	Height [mm]	Net weight	Gross weight
RCTHM-2	Unit (1 pc.)	110	76	28	0,075 kg	0,083 kg
	Carton (24 pcs.)	46	182	84	1,8 kg	2,22 kg
	Box (60 pcs.)	590	410	270	10,08 kg	13,35 kg

Global trade item numbers (GTIN)

Packaging	RCTHM-2
Unit	05401003017951
Carton	05401003302545
Box	05401003503683



RCTHH-2

Intelligent temperature and humidity room sensor

The RCTHH-2 are intelligent room sensors featuring adjustable temperature and relative humidity ranges. The used algorithm controls a single analogue / modulating output based on the measured temperature and humidity values, which can be used to directly control an EC fan, an AC fan speed controller or an actuator powered damper. They feature 24 VDC power supply and an ambient light sensor. All parameters are accessible via Modbus RTU.

Key features

- Spring contact terminal block or RJ45 connection
- Selectable temperature and relative humidity ranges
- Fan speed control based on temperature and humidity
- Bootloader for updating the firmware via Modbus RTU communication
- Ambient light sensor with adjustable 'active' and 'standby' level
- Modbus RTU communication
- Three 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: $R_L \leq 500 \Omega$	
	PWM (open-collector type) mode: 1 kHz, $R_L \geq 50 \text{ k}\Omega$, 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)
Accuracy	$\pm 0,4 \text{ }^\circ\text{C}$ (range 0—50 °C)	
	$\pm 3\% \text{ rH}$ (range 0—100 %)	
Protection standard	IP30 (according to EN 60529)	

Article codes

Article code	Supply voltage	Connection type	I _{max}
RCTHH-2	24 VDC	RJ45 or terminal block	40 mA

Wiring diagram

RJ45 socket (Power over Modbus)

Pin 1	24 VDC	Supply voltage
Pin 2		
Pin 3	A	Modbus RTU communication, signal A
Pin 4		
Pin 5	/B	Modbus RTU communication, signal /B
Pin 6		
Pin 7	GND	Ground, supply voltage
Pin 8		



Terminal Block 1

VIN	Supply voltage 24 VDC
GND	Supply voltage, ground
A	Modbus RTU communication, signal A
/B	Modbus RTU communication, signal /B

Terminal Block 2

AO1	Analogue / modulating output for temperature or relative humidity (0—10 VDC / 0—20 mA / PWM)
GND	Ground AO1

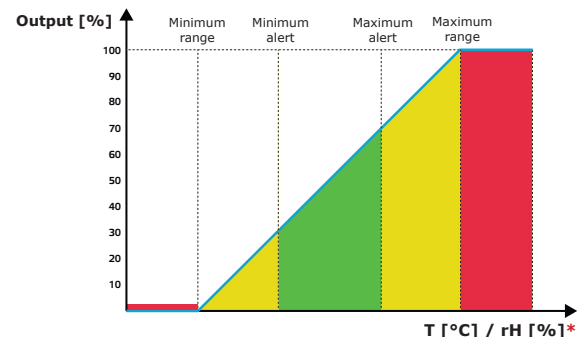
Attention! The unit needs to be supplied via the RJ45 connector or via the connection terminals. Do not connect the device via the RJ45 connector and the terminal block simultaneously!



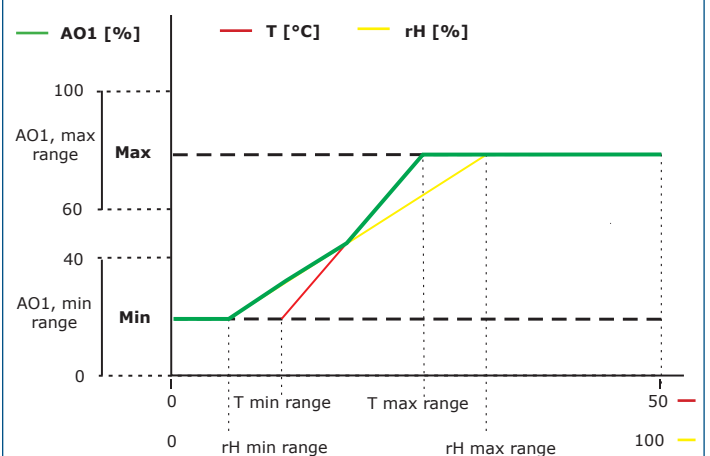
Area of use

- Demand controlled ventilation based on measured temperature and relative humidity
- Suitable for residential and commercial buildings
- For indoor use only

Operational diagram(s)



*LED indications - T (default) or rH



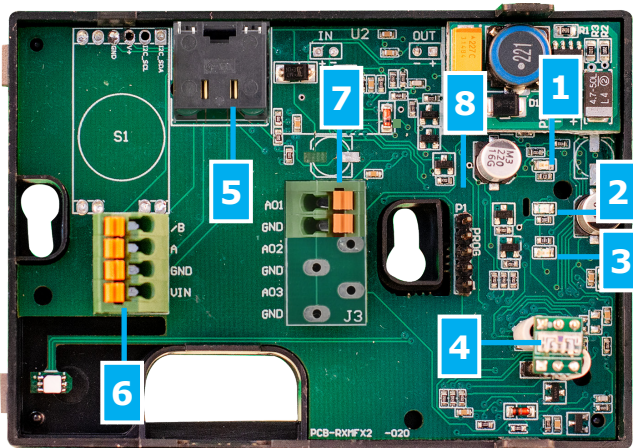
Note: The output changes automatically depending on the highest of the T or rH values, i.e. the highest of the two output values controls the output. See the green line in the operational diagram above. One or multiple sensors can be deactivated. E.g. it is also possible to control the output based on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

RCTHH-2

Intelligent temperature and humidity room sensor



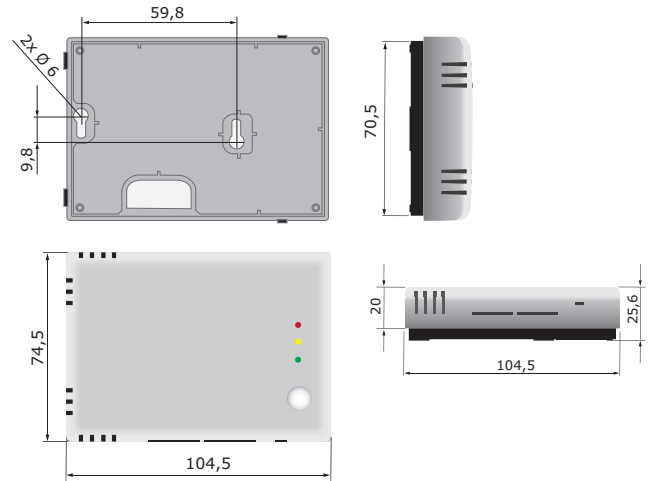
Settings and indications



1 - Red LED	On	Measured temperature or relative humidity values are out of range
	Blinking	Communication with one of the sensors fails
2 - Yellow LED	On	Measured temperature or relative humidity 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 or relative humidity values are within range
4 - Ambient light sensor		Low light intensity / Active / Standby
5 - RJ45 socket		Modbus communication with connected Master devices and PoM voltage supply (24 VDC)
		Blinking LEDs indicate that packages are transmitted via Modbus RTU communication
6 - Terminal block input connection		24 VDC supply voltage and Modbus RTU signal
7 - Output connection		AO1 - Temperature and relative humidity
8 - 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 power supply to enter bootloader mode

Note: By default, the LED indicators visualise the measured temperature 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.

Fixing and dimensions



Modbus registers



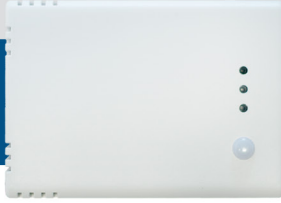
The Sensistant Modbus configurator allows you to easily monitor and/or configure Modbus parameters.

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.

Standards

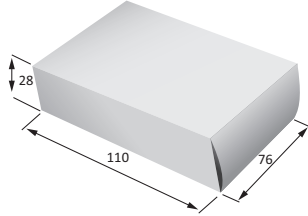
- Low Voltage Directive 2014/35/EC 
 - EN 60529:1991 Degrees of protection provided by enclosures (IP Code) Amendment AC:1993 to EN 60529
 - EN 60730-1:2011 Automatic electrical controls for household and similar use - Part 1: General requirements
- EMC directive 2014/30/EC:
 - EN 60730-1:2011 Automatic 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 Directive 2012/19/EC
- RoHS Directive 2011/65/EC



RCTHH-2

Intelligent temperature and humidity room sensor

Packaging



Article	Packaging	Length [mm]	Width [mm]	Height [mm]	Net weight	Gross weight
RCTHH-2	Unit (1 pc.)	110	76	28	0,080 kg	0,115 kg
	Carton (24 pcs.)	492	182	84	1,92 kg	2,76 kg
	Box (144 pcs.)	514	414	274	11,52 kg	16,56 kg

Global trade item numbers (GTIN)

Packaging	RCTHH-2
Unit	05401003017944
Carton	05401003302538
Box	05401003503676



ODTHM

Temperature and humidity outdoor transmitter

The ODTHM are multifunctional outdoor transmitters which measure outdoor temperature, relative humidity and ambient light. Based on these measurements, the dew-point temperature can be calculated. They are Power over Modbus supplied and all parameters are accessible via Modbus RTU.

Key features

- Selectable temperature and relative humidity ranges
- Bootloader for updating the firmware via Modbus RTU communication
- Day / Night detection via ambient light sensor
- Adjustable 'active' and 'standby' level depending on the ambient light intensity
- Modbus RTU (RS485)
- Long-term stability and accuracy

Technical specifications

Supply voltage	24 VDC, Power over Modbus	
Maximum power consumption	0,6 W	
Nominal or average power consumption in normal operation	0,45 W	
Imax	25 mA	
Selectable temperature range	-30—70 °C via Modbus RTU	
Selectable relative humidity range	0—100 % rH via Modbus RTU	
Accuracy	±0,4 °C (-30—70 °C)	
	±3 % rH (0—100 % rH)	
Enclosure	Protection class	IP65 (according to EN 60529)
	Material	POLYFLAM® RABS 90000 UV5, colour: grey RAL 7035
Ambient conditions	Temperature	-30—70 °C
	Rel. humidity	0—100 % rH (non-condensing)



Area of use

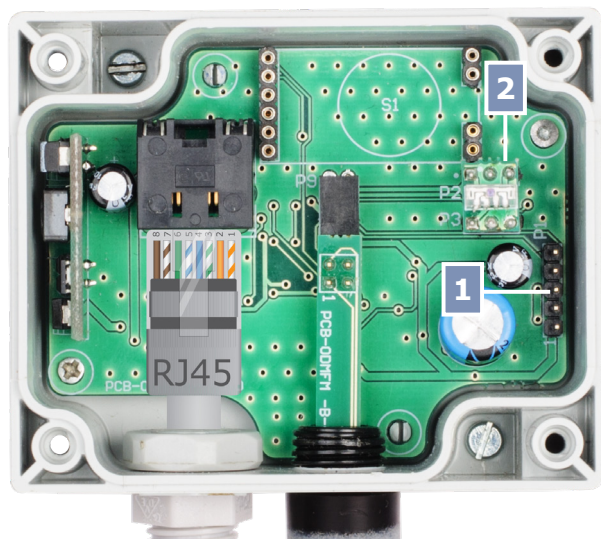
- Monitoring temperature and relative humidity in HVAC applications
- Suitable for both indoor and outdoor use

Wiring and connections



24 VDC	Supply voltage 24 VDC
GND	Ground
A	Modbus RTU communication, signal A
/B	Modbus RTU communication, signal /B

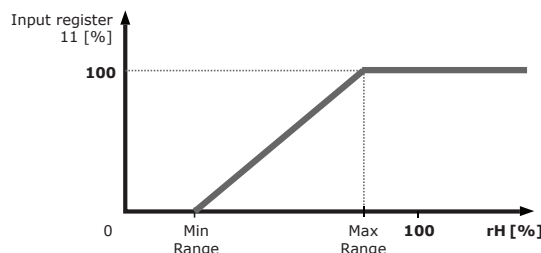
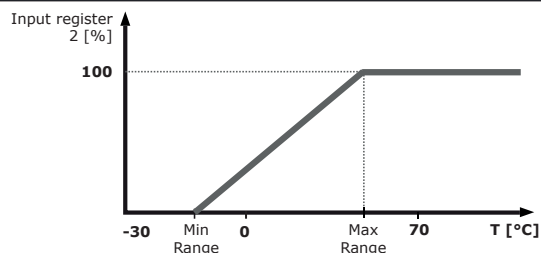
Settings



1 - 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
2 - Ambient light sensor		Low light intensity / Active / Standby

indicates the position of the jumper)

Operational diagrams

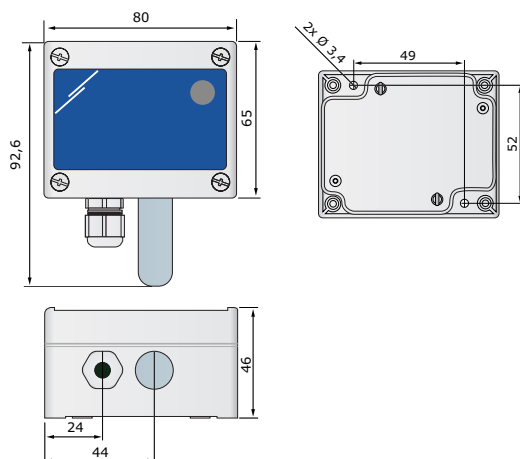




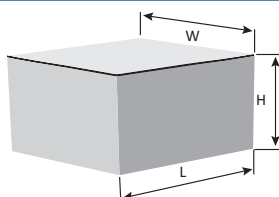
ODTHM

Temperature and humidity outdoor transmitter

Dimensions



Packaging



Article	Packaging	Length [mm]	Width [mm]	Height [mm]	Net weight	Gross weight
ODTHM	Unit (1 pc.)	110	90	50	0,12 kg	0,15 kg
	Box (80 pcs.)	590	380	280	9,60 kg	12,86 kg

Standards

- Low Voltage Directive 2014/35/EC
 - EN 60529:1991 Degrees of protection provided by enclosures: (IP Code) Amendment AC:1993 to EN 60529
- EMC directive 2014/30/EC:
 - 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/EC
- RoHS Directive 2011/65/EC



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.

Global trade item numbers (GTIN)

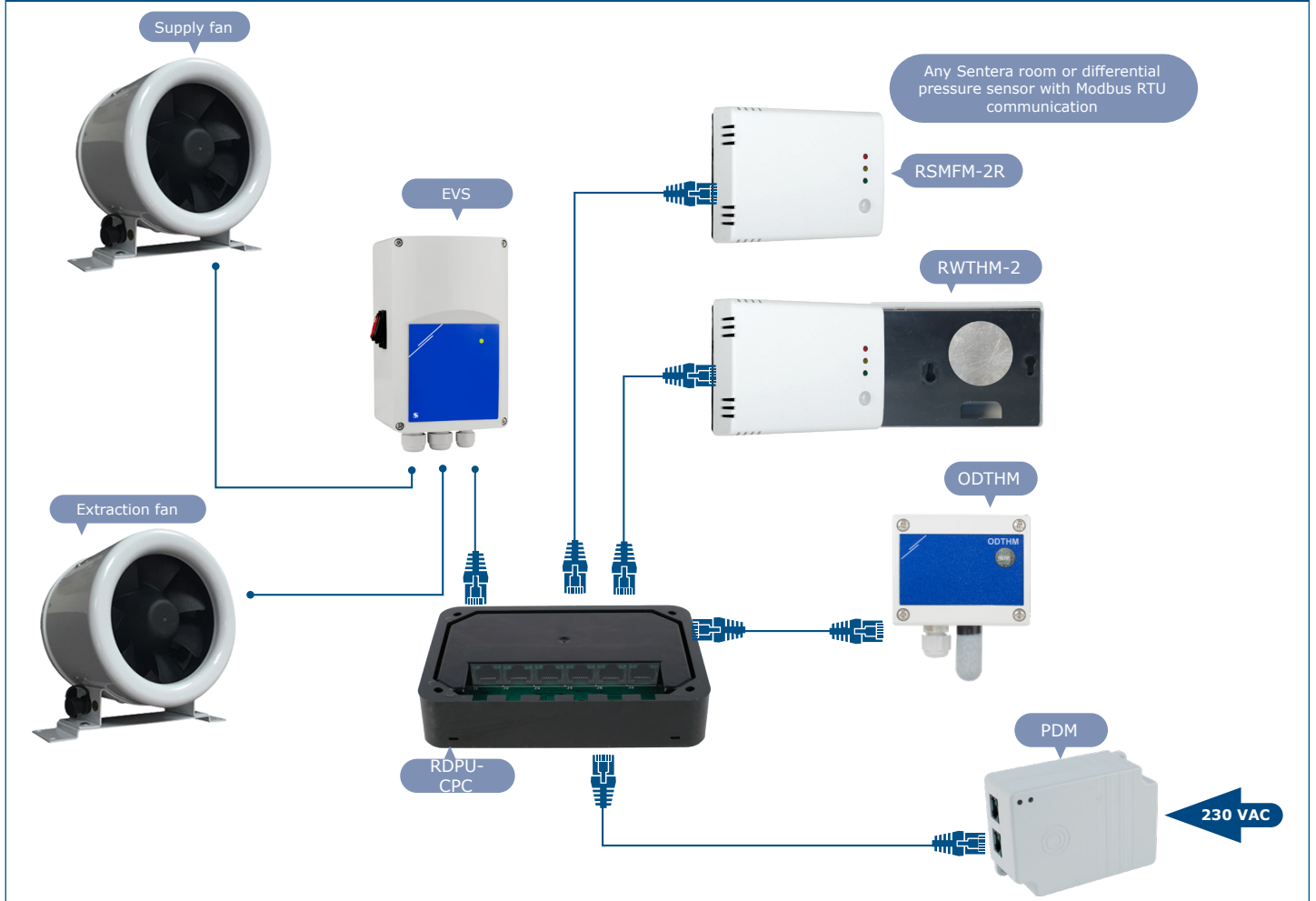
Packaging	ODTHM
Unit	05401003010693



ODTHM

Temperature and humidity outdoor transmitter

Application example



OCTHM-R

Intelligent temperature and humidity sensor



The OCTHM-R are intelligent sensors featuring adjustable temperature and relative humidity ranges suitable for outdoor applications or tough environments. Their algorithm generates an output value based on the measured temperature and humidity values, which can be used to directly control an EC fan, an AC fan speed controller or an actuator powered damper. They are Power over Modbus supplied and all parameters are accessible via Modbus RTU communication.

Key features

- Wiring via RJ45 connector
- Suitable for harsh environments
- Selectable temperature and relative humidity ranges
- Fan speed control based on temperature and humidity
- Bootloader for updating the firmware via Modbus RTU communication
- Ambient light sensor with adjustable 'active' and 'standby' level
- Modbus RTU communication
- Long-term stability and accuracy

Article codes

Article code	Supply	Imax	Connection
OCTHM-R	24 VDC, PoM	25 mA	RJ45

Technical specifications

Supply voltage	24 VDC, Power over Modbus	
Typical range of use	Temperature range	-30—70 °C
	Relative humidity range	0—100 % rH (non-condensing)
Accuracy	±0,4 °C (-30—70 °C)	
	±3 % rH (0—100 % rH)	
Protection standard	IP65 (according to EN 60529)	

Area of use

- Demand controlled ventilation based on temperature and relative humidity levels
- Suitable for both indoor and outdoor use (e.g. open-air spaces, multi-storey and subterranean car parks, residential and commercial buildings)

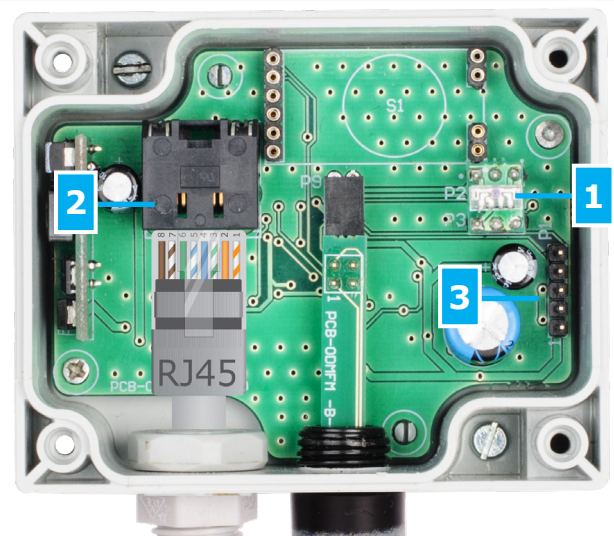
Wiring and connections

RJ45 socket (Power over Modbus)

Pin 1	24 VDC	Supply voltage
Pin 2		
Pin 3	A	Modbus RTU communication, signal A
Pin 4		
Pin 5	/B	Modbus RTU communication, signal /B
Pin 6		
Pin 7	GND	Ground, supply voltage
Pin 8		



Settings



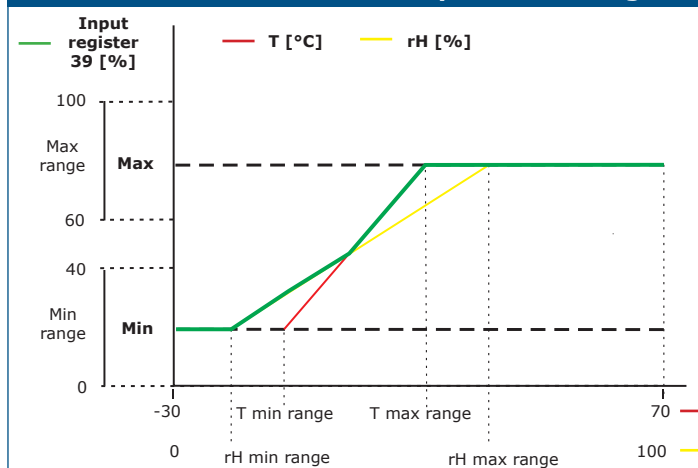
1 - Ambient light sensor		Low light intensity / Active / Standby
2 - RJ45 Socket		Plug the communication and power cable into the socket
3 - PROG header, P1		Put a jumper onto pins 1 and 2 and wait for at least 10 seconds to reset the Modbus communication parameters
		Put a jumper onto pins 3 and 4 and restart the power supply to enter bootloader mode

OCTHM-R

Intelligent temperature and humidity sensor

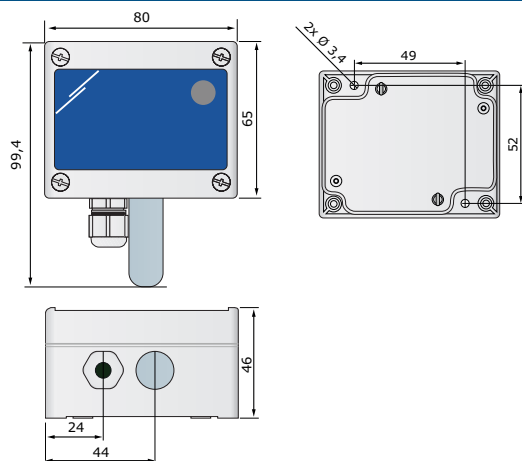


Operational diagram



Note: The output changes automatically depending on the highest of the T and rH values, i.e. the highest of the two 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 relative humidity values only.

Fixing and dimensions



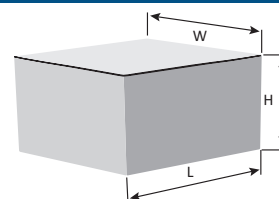
Global trade item numbers (GTIN)

Packaging	OCTHM-R
Unit	05401003018255
Box	05401003503980
Pallet	05401003701003

Standards

- Low Voltage Directive 2014/35/EU
 - EN 60529:1991 Degrees of protection provided by enclosures: (IP Code) Amendment AC:1993 to EN 60529
- EMC directive 2014/30/EU:
 - 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
- WEEE Directive 2012/19/EU
- RoHS Directive 2011/65/EU

Packaging



Article	Packaging	Length [mm]	Width [mm]	Height [mm]	Net weight	Gross weight
OCTHM-R	Unit (1 pc.)	105	80	55	0,115 kg	0,160 kg
	Box (80 pcs.)	590	380	280	9,20 kg	13,65 kg
	Pallet (2,240 pcs.)	1,200	800	2,100	257,6 kg	397,2 kg

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.



FCTH8

Intelligent temperature and humidity sensor

The FCTH8 are intelligent sensors featuring adjustable temperature and relative humidity ranges. The used algorithm controls a single analogue / modulating output based on the measured T and rH 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 and relative humidity ranges
- Fan speed control based on temperature and relative humidity
- Inset or surface mounting
- Bootloader for updating the firmware via Modbus RTU communication
- Ambient light sensor with adjustable 'active' and 'standby' level
- 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 k Ω ($R_L \geq 50$ k Ω)	
	0—20 mA mode: max. load 500 Ω ($R_L \leq 500$ Ω)	
	PWM (open-collector type) mode: 1 kHz, min. load 50 k Ω ($R_L \geq 50$ k Ω), 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)
Accuracy	$\pm 0,4$ °C (range 0—50 °C)	
	$\pm 3\%$ rH (range 0—100 % rH)	
Protection standard	IP30 (according to EN 60529)	

Article codes

Article code	Supply	Imax
FCTH8	85—264 VAC / 50—60 Hz	20 mA

Area of use

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

Wiring and connections

L	Power supply, line (85—264 VAC / 50—60 Hz)
N	Power supply, neutral
Ao	Analogue / modulating output (0—10 VDC / 0—20 mA / PWM)
GND	Ground AO
A	Modbus RTU (RS485), signal A
/B	Modbus RTU (RS485), signal /B
Connections	Spring contact terminal block, cable cross section: 2,5 mm ² ; pitch 5 mm; shielded cable

Modbus registers



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

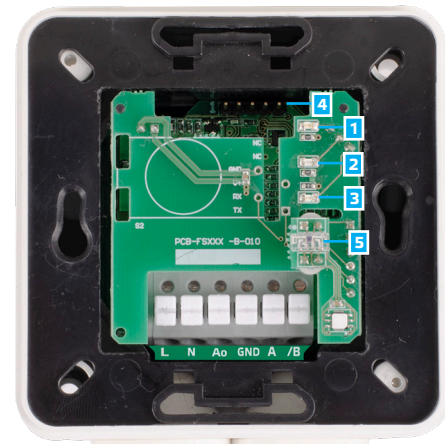
The parameters of the unit can be monitored / configured through the 3SModbus software platform. You can download it from the following link:

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

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



Indications



1 - Red LED	On	Measured temperature or relative humidity values are out of range
	Blinking	Communication with one of the sensors fails
2 - Yellow LED	On	Measured temperature or relative humidity 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 or relative humidity values are within range
4 - 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
5 - Ambient light sensor		Low light intensity / Active / Standby

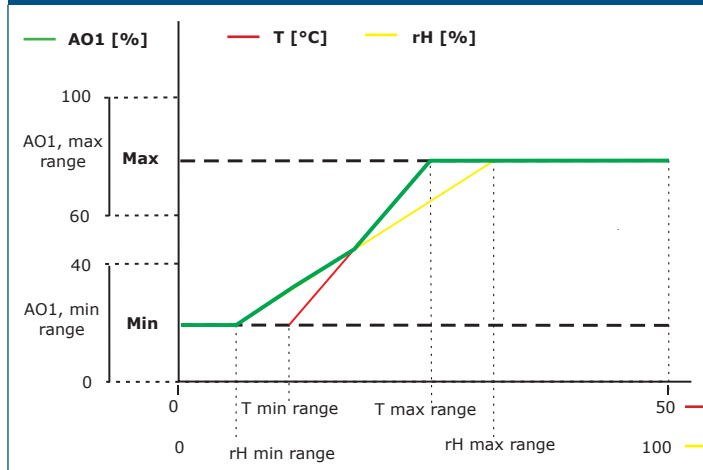
Note: By default, the LED indicators refer to the measured temperature level. When the sensor is in bootloader mode, the green and yellow LEDs flash alternately. During the firmware download, the red LED is flashing additionally.



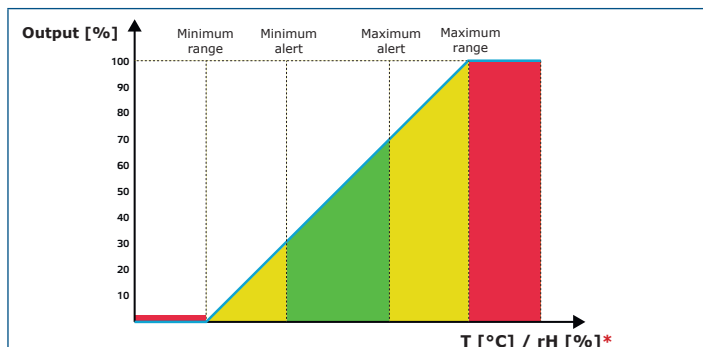
FCTH8

Intelligent temperature and humidity sensor

Operational diagram

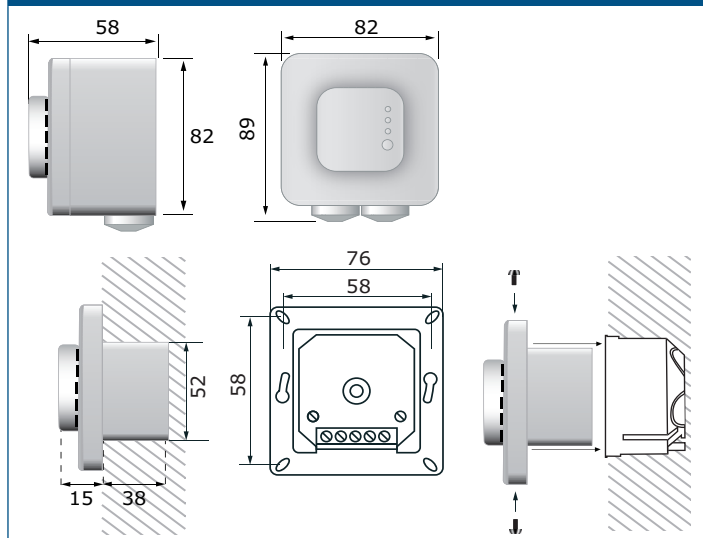


Note: The output changes automatically depending on the highest of the T or rH values, i.e. the highest of the two output values controls the output. See the green line in the operational diagram above. One or multiple sensors can be deactivated. E.g. it is also possible to control the output based on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



* LED indications - T (default) or rH

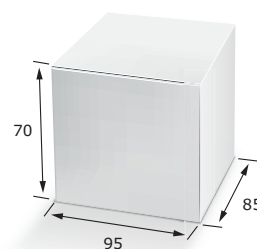
Fixing and dimensions



Standards

- 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

Packaging



Article	Packaging	Length [mm]	Width [mm]	Height [mm]	Net weight	Gross weight
FCTH8	Unit (1 pc.)	95	85	70	0,20 kg	0,21 kg
	Carton (10 pcs.)	492	182	84	2,07 kg	2,31 kg
	Box (60 pcs.)	590	380	280	12,47 kg	14,48 kg
	Pallet (1,680 pcs.)	1,200	800	2,100	349,23 kg	421,84 kg

Global trade item numbers (GTIN)

Packaging	FCTH8
Unit	05401003006238
Carton	05401003300763
Box	05401003501177
Pallet	05401003701058



FCTHX

Intelligent temperature and humidity sensor

The FCTHX are intelligent sensors featuring adjustable temperature and relative humidity ranges. The used algorithm controls a single analogue / modulating output based on the measured T and rH 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 and relative humidity ranges
- Fan speed control based on temperature and relative humidity
- Inset or surface mounting
- Bootloader for updating the firmware via Modbus RTU communication
- Ambient light sensor with adjustable 'active' and 'standby' level
- 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: $R_L \geq 50 \text{ k}\Omega$	
	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	
Typical field of use	Temperature range	0—50 °C
	Relative humidity range	0—95 % rH (non-condensing)
Accuracy	$\pm 0,4 \text{ }^\circ\text{C}$ (range 0—50 °C)	
	$\pm 3\%$ rH (range 0—100 %)	
Protection standard	IP30 (according to EN 60529)	

Article codes

Article code	Supply	Imax
FCTHG	18—34 VDC	35 mA
	15—24 VAC $\pm 10\%$	95 mA
FCTHF	18—34 VDC	38 mA

Area of use

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

Wiring and connections

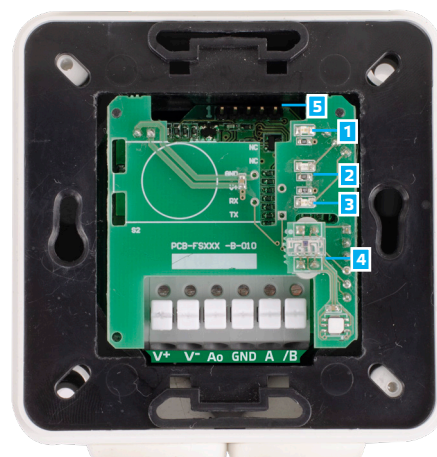
Article code	FCTHF		FCTHG	
V+	18—34 VDC		18—34 VDC	15—24 VAC ± 10 %
V-	Ground	Common ground		AC ~
A	Modbus RTU (RS485), signal A			
/B	Modbus RTU (RS485), signal /B			
Ao	Analogue / modulating output (0—10 VDC / 0—20 mA / PWM)			
GND	Ground	Common ground		
Connections	Spring contact terminal block, cable cross section: 2,5 mm ² ; 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	On	Measured temperature or relative humidity values are out of range
	Blinking	Communication with one of the sensors fails
2 - Yellow LED	On	Measured temperature or relative humidity 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 or relative humidity values are within range
4 - Ambient light sensor		Low light intensity / Active / Standby
5 - 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

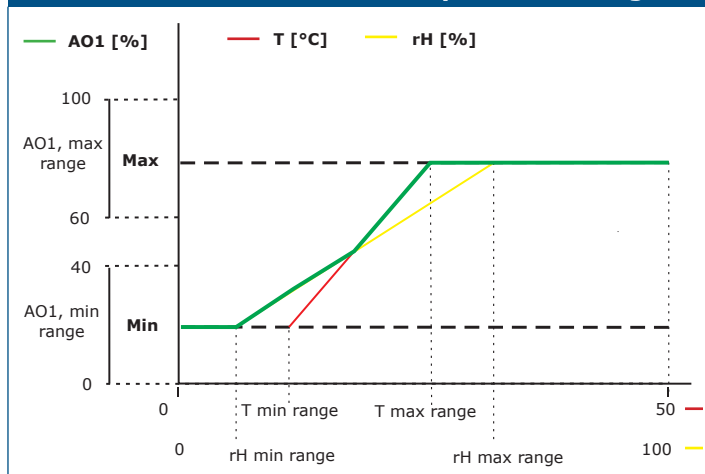
Note: By default, the LED indicators visualise the measured temperature level. When the sensor is in bootloader mode, the green and yellow LEDs flash alternately. During the firmware download, the red LED is flashing additionally.



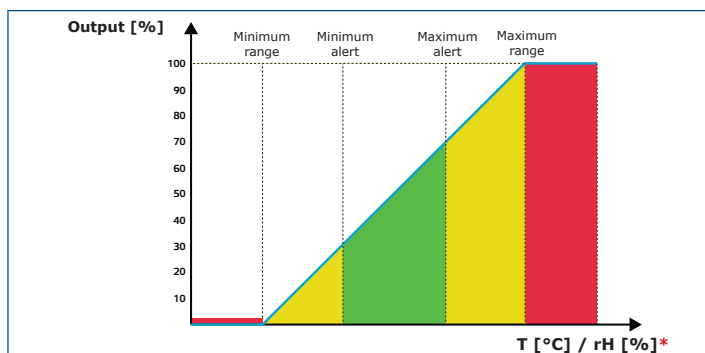
FCTHX

Intelligent temperature and humidity sensor

Operational diagram

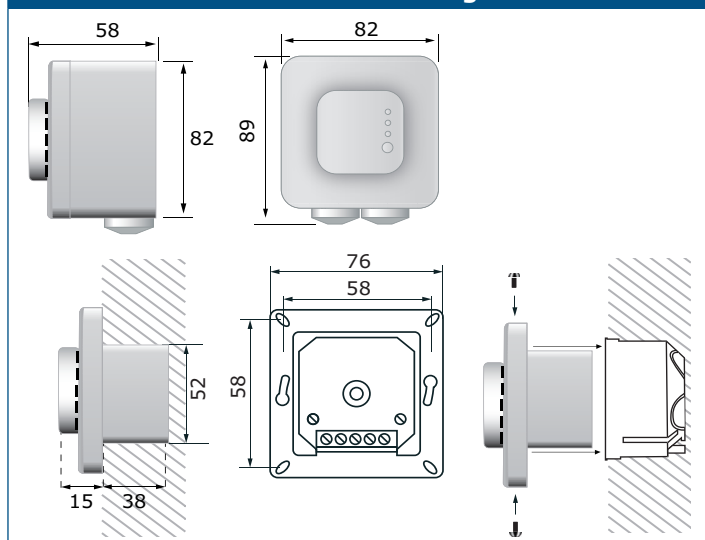


Note: The output changes automatically depending on the highest of the T or rH values, i.e. the highest of two output values controls the output. See the green line in the operational diagram above. One or multiple sensors can be deactivated. E.g. it is possible to control the output based on the measured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



* LED indications - T (default) or rH

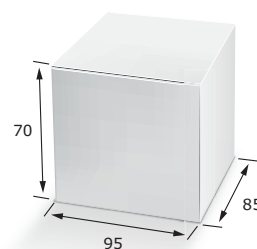
Fixing and dimensions



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
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 - 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
FCTHG FCTHF	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	FCTHF	FCTHG
Unit	05401003006245	05401003006252
Carton	05401003300770	05401003300787
Box	05401003501184	05401003501191

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.

FLTSN-N

Temperature probe

The FLTSN-N passive temperature probes feature an outstanding stability of the temperature characteristics due to the platinum sensor element used. The sensor element is resin encapsulated in a stainless steel tube. These temperature sensors have a negative temperature coefficient of resistance: when the temperature rises, the resistance decreases.

Key features

- Resin encapsulated sensor element in a stainless steel tube
- Alloy lead wires for reduced thermal conductivity
- Negative temperature coefficient
- Long-term stability
- Rapid time response: <1 second in liquids

Technical specifications

Nominal resistance at 25° C	3 kΩ	
Dissipation Constant in still air at 25° C	0,75 mW/°C	
Temperature coefficient of resistance at 25° C	4,39 %/°C	
Resistance tolerance from 0°C to +70°C	±0,1 °C	
Flying leads	Length	1 m, can be extended*
	Cross section	0,5 mm ²
Ambient conditions	Temperature	-20—60 °C
	Rel. humidity	< 95 % rH (non-condensing)

* Use screened extension wires

Area of use

- Temperature sensing, control and compensation in HVAC applications

Standards

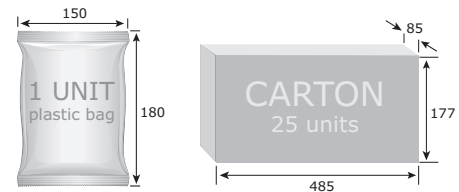
- WEEE Directive 2012/19/EC
- RoHs Directive 2011/65/EC



Dimensions

	A	B	C
	8 mm	53 mm	100 cm

Packaging



Article	Packaging	Length [mm]	Width [mm]	Height [mm]	Net weight	Gross weight
FLTSN-N-3K3A1-010	Bag (1 pc.)	150	≈20	180	0,032 kg	0,033 kg
	Carton (25 pcs.)	485	177	85	0,8 kg	0,97 kg
	Box (150 pcs.)	590	280	280	4,8 kg	6,65 kg

Nominal resistance values

T °C	Ω	T °C	Ω	T °C	Ω	T °C	Ω	T °C	Ω	T °C	Ω	T °C	Ω	T °C	Ω	T °C	Ω	T °C	Ω
-40	100619	-23	34676	-6	13383	11	5692	28	2633	45	1310	62	695	79	389	96	229	113	141
-39	94180	-22	32690	-5	12694	12	5428	29	2522	46	1260	63	670	80	377	97	222	114	137
-38	88194	-21	30830	-4	12 045	13	5177	30	2417	47	1212	64	647	81	365	98	216	115	133
-37	82625	-20	29087	-3	11433	14	4940	31	2316	48	1166	65	625	82	353	99	210	116	130
-36	77442	-19	27453	-2	10855	15	4714	32	2220	49	1122	66	603	83	342	100	204	117	126
-35	72616	-18	25921	-1	10310	16	4500	33	2129	50	1080	67	583	84	332	101	198	118	123
-34	68121	-17	24483	0	9795	17	4297	34	2042	51	1040	68	563	85	321	102	192	119	120
-33	63932	-16	23134	1	9309	18	4105	35	1959	52	1002	69	544	86	311	103	187	120	117
-32	60026	-15	21867	2	8850	19	3922	36	1880	53	965	70	525	87	302	104	181	121	114
-31	56382	-14	20676	3	8416	20	3748	37	1804	54	929	71	508	88	292	105	176	122	111
-30	52982	-13	19558	4	8006	21	3583	38	1732	55	895	72	491	89	283	106	171	123	108
-29	49808	-12	18507	5	7619	22	3426	39	1663	56	863	73	475	90	275	107	167	124	105
-28	46843	-11	17518	6	7252	23	3277	40	1597	57	832	74	459	91	267	108	162	125	102
-27	44073	-10	16588	7	6905	24	3135	41	1535	58	802	75	444	92	259	109	157		
-26	41484	-9	15713	8	6577	25	3000	42	1475	59	774	76	430	93	251	110	153		
-25	39062	-8	14890	9	6266	26	2872	43	1417	60	746	77	416	94	243	111	149		
-24	36796	-7	14114	10	5971	27	2749	44	1362	61	720	78	402	95	236	112	145		

FLTSN-N

Temperature probe

Global trade item numbers (GTIN)	
Packaging	FLTSN-N-3K3A1-010
Unit	05401003007037
Carton	05401003300831
Box	05401003501245

TUTSN-P

Temperature probe

The TUTSN passive temperature probes feature an outstanding stability of the temperature characteristics in ducts due to the platinum sensor element used. The sensor element is built-in in a plastic tube housing. These temperature probes have a positive temperature coefficient of resistance: when the temperature rises, the resistance rises. They are easy to install and are compatible with most common temperature control systems.

Key features

- Positive temperature coefficient
- Long-term stability
- Wide measurement range
- Easy installation
- Article versions for different duct diameters

Technical specifications

Temperature measurement range	-50—80 °C	
Measurement current (DC)	0,1—0,3 mA (PT500) 0,1—0,4 mA (PT1000)	
Tolerance class	F0.3	
Flying leads	Length	1,0 m
	Cross section	0,5 mm ²
	Tensile forces	< 5 N
Self-heating	≤ 0,5 K/mW in air flow 1 m/s	
Protection standard	IP30 (according to EN 60529)	
Installation temperature	> -5 °C	
Ambient conditions	Temperature	-50—80 °C
	Rel. humidity	< 95 % rH (non-condensing)



Article codes

	Temperature sensor	Duct diameter	Plastic tube length
TUTSN-P500-150	PT500	< 300 mm	150 mm
TUTSN-P500-250	PT500	> 300 mm	250 mm
TUTSN-P1K0-150	PT1000	< 300 mm	150 mm
TUTSN-P1K0-250	PT1000	> 300 mm	250 mm

Area of use

- HVAC applications for temperature measurements
- Non-corrosive, dry environment only

Standards

- IEC 60751 /DIN EN 60751
- RoHS Directive 2011/65/EU



Functional performance

Temperature / resistance relationships

- For the temperature range: -55—0 °C
 $R_T = R_0 \times (1 + A \times T + B \times T^2 + C \times (T - 100 \text{ °C}) \times T^3)$
- For the temperature range: 0—80 °C
 $R_T = R_0 \times (1 + A \times T + B \times T^2)$

Where

R_T : Resistance as a function of temperature
 R_0 : Nominal resistance value at 0 °C
 T : Temperature in °C

- Coefficients according to EN 60751

$$A = 3,9083 \times 10^{-3} \text{ °C}^{-1}$$

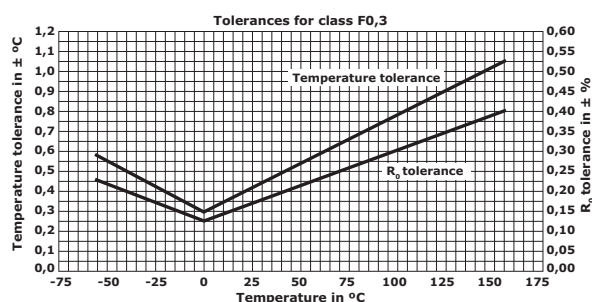
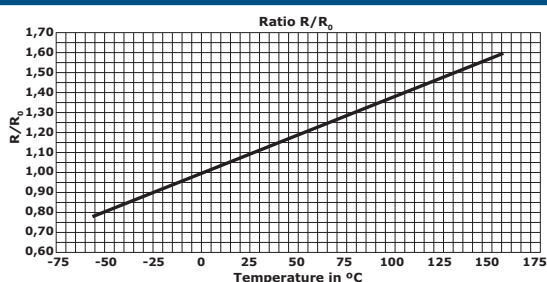
$$B = -5,775 \times 10^{-7} \text{ °C}^{-2}$$

$$C = -4,183 \times 10^{-12} \text{ °C}^{-4}$$

Sensor tolerance values equation (according to EN 60751)

- Class F0.3
 $\Delta T_{F0.3} = \pm(0,30 + 0,005 \times |T|)$

Resistance and tolerance values

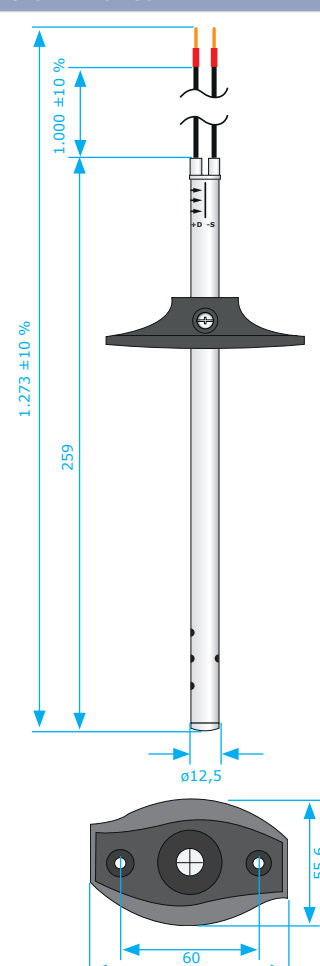
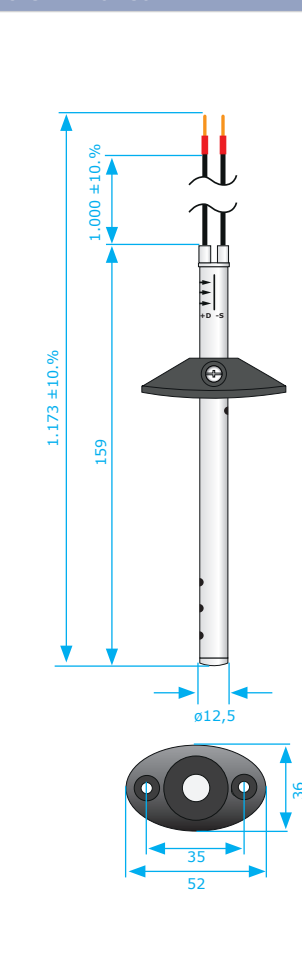


TUTSN-P

Temperature probe

Nominal resistance values				
Temp. °C	R/R0 ratio			Class F0.3
		R0 500 Ω	R0 1.000 Ω	T _{tol.} °C
-55	0,78379	391,59	783,19	±0,58
-50	0,80306	391,59	803,06	±0,55
-45	0,82290	401,53	822,90	±0,53
-40	0,84271	411,45	842,71	±0,50
-35	0,86248	421,35	862,48	±0,48
-30	0,88222	431,24	882,22	±0,45
-25	0,90192	441,11	901,92	±0,43
-20	0,92160	450,96	921,60	±0,40
-15	0,94124	470,62	941,24	±0,38
-10	0,96086	480,43	960,86	±0,35
-5	0,98044	490,22	980,44	±0,33
0	1,00000	500,00	1000,00	±0,30
5	1,01953	509,76	1019,53	±0,33
10	1,03903	519,51	1039,03	±0,35
15	1,05849	529,25	1058,49	±0,38
20	1,07794	538,97	1077,94	±0,40
25	1,09735	548,67	1097,35	±0,43
30	1,11673	558,36	1116,73	±0,45
35	1,13608	568,04	1136,08	±0,48
40	1,15541	577,70	1155,41	±0,50
45	1,17470	587,35	1174,70	±0,53
50	1,19397	596,99	1193,97	±0,55
55	1,21321	606,60	1213,21	±0,58
60	1,23242	616,21	1232,42	±0,60
65	1,25160	625,80	1251,60	±0,63
70	1,27075	635,38	1270,75	±0,65
75	1,28987	644,94	1289,87	±0,70
80	1,30897	654,48	1308,97	±0,73

Global trade item numbers (GTIN)		
Packaging	Unit	Box
TUTSN-P1K0-150	05401003017081	05401003503157
TUTSN-P1K0-250	05401003017098	05401003503164
TUTSN-P500-150	05401003017104	05401003503171
TUTSN-P500-250	05401003017111	05401003503188

Dimensions	
TUTSN-PXX0-250	TUTSN-PXX0-150
	

</

FLTSN-P

Temperature probe

The FLTSN-P passive temperature probes feature an outstanding stability of the temperature characteristics due to the platinum sensor element used. The sensor element is resin encapsulated in a stainless steel tube. These temperature sensors have a positive temperature coefficient of resistance: when the temperature rises, the resistance rises.

Key features

- Resin encapsulated sensor element in a stainless steel tube
- Positive temperature coefficient
- Long-term stability

Technical specifications

Long-term stability	< ±0,04 %		
Insulation resistance	> 10 MΩ		
Flying leads	Length	FLTSN-P100-010 FLTSN-P500-010 FLTSN-P1K0-010	1 m, can be extended*
		FLTSN-P500-040 FLTSN-P1K0-040	4 m, can be extended*
	Cross section	0,5 mm ²	
Ambient conditions	Temperature	-20—60 °C	
	Rel. humidity	< 95 % rH (non-condensing)	

* Use screened extension wires

Article codes

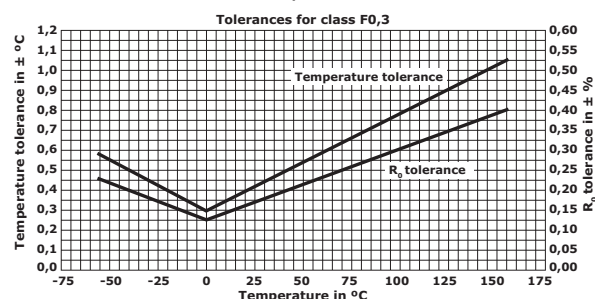
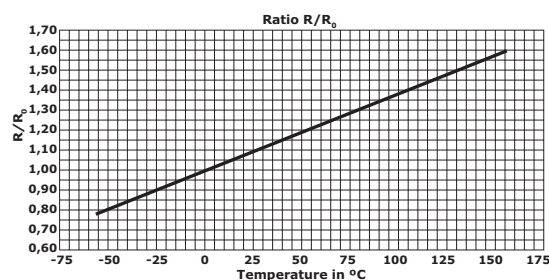
	FLTSN-P100-010	FLTSN-P500-010 FLTSN-P500-040	FLTSN-P1K0-010 FLTSN-P1K0-040
Measurement current (DC)	0,1—1,0 mA	0,1—0,40 mA	0,1—0,25 mA
Self-heating	≤ 0,8 K/mW	≤ 0,8 K/mW	≤ 0,7 K/mW
Thermal response time flowing water	t _{0,5} ≤ 0,2 s t _{0,9} ≤ 0,3 s	t _{0,5} ≤ 0,2 s t _{0,9} ≤ 0,3 s	t _{0,5} ≤ 0,3 s t _{0,9} ≤ 0,4 s
	t _{0,5} ≤ 1,5 s t _{0,9} ≤ 8,0 s	t _{0,5} ≤ 1,5 s t _{0,9} ≤ 8,0 s	t _{0,5} ≤ 0,3 s t _{0,9} ≤ 0,4 s

Area of use

- Temperature measurement in HVAC applications



Resistance and tolerance values



Temp. °C	R/R ₀ ratio	Nominal resistance values			Class F0.3
		R ₀ 100 Ω	R ₀ 500 Ω	R ₀ 1000 Ω	T _{tol.} °C
-20	0,92160	92,16	460,80	921,60	±0,40
-15	0,94124	94,12	470,62	941,24	±0,38
-10	0,96086	96,09	480,43	960,86	±0,35
-5	0,98044	98,04	490,22	980,44	±0,33
0	1,00000	100,0	500,00	1000,00	±0,30
5	1,01953	101,95	509,76	1019,53	±0,33
10	1,03903	103,90	519,51	1039,03	±0,35
15	1,05849	105,85	529,25	1058,49	±0,38
20	1,07794	107,79	538,97	1077,94	±0,40
25	1,09735	109,73	548,67	1097,35	±0,43
30	1,11673	111,67	558,36	1116,73	±0,45
35	1,13608	113,61	568,04	1136,08	±0,48
40	1,15541	115,54	577,70	1155,41	±0,50
45	1,17470	117,47	587,35	1174,70	±0,53
50	1,19397	119,40	596,99	1193,97	±0,55
55	1,21321	121,32	606,60	1213,21	±0,58
60	1,23242	123,24	616,21	1232,42	±0,60

FLTSN-P

Temperature probe

Standards

- Low Voltage Directive 2006/95/EC
- EMC Directive 2004/108/EC: EN 61326
- WEEE Directive 2012/19/EC
- RoHS Directive 2011/65/EC

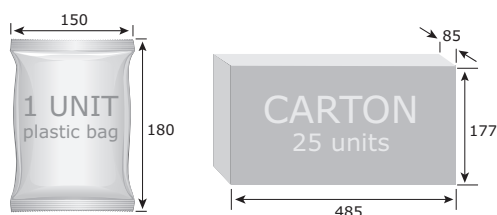


Dimensions



Article code	A	B	C
FLTSN-PXX0-010	8 mm	53 mm	100 cm
FLTSN-PXX0-040	8 mm	53 mm	400 cm

Packaging



Article	Packaging	Length [mm]	Width [mm]	Height [mm]	Net weight	Gross weight
FLTSN-P100-010	Bag (1 pc.)	150	≈20	180	0,04 kg	0,04 kg
	Carton (25 pcs.)	485	177	85	1,00 kg	1,15 kg
FLTSN-P500-010	Bag (1 pc.)	150	≈20	180	0, 04 kg	0,04 kg
	Carton (25 pcs.)	485	177	85	1,00 kg	1,15 kg
FLTSN-P1K0-010	Bag (1 pc.)	150	≈20	180	0, 04 kg	0,04 kg
	Carton (25 pcs.)	485	177	85	1,00 kg	1,15 kg
FLTSN-P500-040	Bag (1 pc.)	150	≈20	180	0,06 kg	0,06 kg
	Carton (10 pcs.)	485	177	85	0,6 kg	0,75 kg
FLTSN-P1K0-040	Bag (1 pc.)	150	≈20	180	0,06 kg	0,06 kg
	Carton (10 pcs.)	485	177	85	0,6 kg	0,75 kg

Global trade item numbers (GTIN)

Packaging	Unit	Carton	Box
FLTSN-P100-010	05401003007044	05401003300848	05401003501252
FLTSN-P1K0-010	05401003007051	05401003300855	05401003501269
FLTSN-P1K0-040	05401003007068	05401003300862	05401003501276
FLTSN-P500-010	05401003007075	05401003300879	05401003501283
FLTSN-P500-040	05401003007105	05401003300909	05401003501313

FLTSN-PXXXP100

Passive temperature probe

Description

FLTSN-PXXXP100 are passive temperature probes (Resistance Temperature Detectors), which function by measuring the change in electrical resistance of a material as its temperature changes. They have a positive linear temperature coefficient of resistance: when the measured temperature rises, the resistance rises as well.

The passive temperature probes FLTSN-PXXXP100 provide the following benefits:

- **Stability:** Reliable temperature measurements due to the platinum sensor element used.
- **Robustness:** The sensing element is coated with waterproof acrylic coating and enclosed in ABS (Acrylonitrile Butadiene Styrene) plastic tube.
- **User-Friendliness:** Simpler connection with two cores — Line and Neutral.

With their simplicity and practicality, the passive temperature probes FLTSN-PXXXP100 can be implemented effortlessly in various HVAC applications.

Key Features

- **Sensing element:**
 - Coated in acrylic and enclosed in a plastic tube
- **Positive linear temperature coefficient:**
 - Enhanced readability of temperature changes
 - Relatively constant change of resistance per degree
 - No calibration required
 - Suitable for various applications
- **Tinned connections:**
 - Improved solderability
 - Prevention of fraying of stranded wires
 - Reduced corrosion
- **Cable sheath:**
 - Colour: white
- **Plastic tube:**
 - Colour: black
 - Material: ABS (Acrylonitrile Butadiene Styrene) plastic
- **Sensing element characteristics:**
 - Standardised characteristics according to IEC 60751
 - Short reaction times down to $t_{0.9} \leq 5$ s (flowing air, 3.0 m/s)
 - Outstanding stability of temperature characteristic

Technical Specifications

Temperature coefficient (0 – 100°C) [ppm/K]	3850
Long-term stability [%]	$< \pm 0,04$
Flying leads length [m]	1
Flying leads cross section [mm ²]	0.5
Operating temperature [°C]	-20 – 60
Operating relative humidity [% rH]	< 95
Ingress protection	IP65

Area of Use

- Temperature measurement in HVAC applications
- Indoor and outdoor applications

Standards

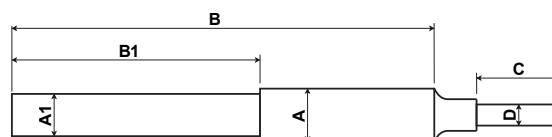
- Low Voltage Directive 2014/35/EU
- Electromagnetic Compatibility (EMC) Directive 2014/30/EU
- WEEE Directive 2012/19/EU
- Commission Delegated Directive (EU) 2015/863 (RoHS 3) of 31 March 2015 amending Annex II to Directive 2011/65/EU of the European Parliament and of the Council as regards the list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



Article Codes

Article code	Measurement current [mA]
FLTSN-P500P100	0.1–0.4
FLTSN-P1K0P100	0.1–0.25

Fixing and Dimensions

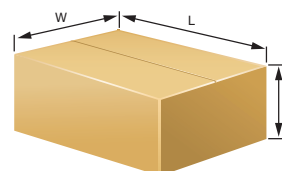


Article code	A1	A	B1	B	C	D
FLTSN-PXXXP100	8 mm	9 mm	53 ± 2 mm	89 mm	1000 mm	4 mm

Global Trade Item Numbers 14 (GTIN 14)

Article	Unit	Carton	Box
FLTSN-P500P100	5401003019016	5401003303023	5401003504468
FLTSN-P1K0P100	5401003019023	5401003303030	5401003504475

Packaging



Article	Packaging	Length [mm]	Width [mm]	Height [mm]	Net weight [kg]	Gross weight [kg]
FLTSN-P500P100	Unit (1 pc.)	-	-	-	0,04	0,04
	Carton (24 pcs.)	492	182	84	0,96	1,96
	Box (144 pcs.)	590	380	280	5,76	12,68
FLTSN-P1K0P100	Unit (1 pc.)	-	-	-	0,04	0,04
	Carton (24 pcs.)	492	182	84	0,86	1,11
	Box (144 pcs.)	590	380	280	5,18	7,58

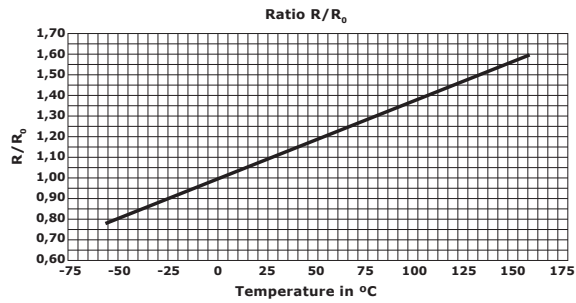
FLTSN-PXXXP100

Passive temperature probe



Operational Diagrams

Resistance values



This diagram helps you to calculate the electrical resistance of your temperature probe at different temperatures. To calculate it, multiply the resistance or the temperature probe at 0 °C by the factor mentioned on the left side of the diagram. For example, at 0 °C, a PT500 has a resistance of 500 Ohm. At 25 °C, the factor is 1,1. So at 25 °C, the PT500 probe will have a resistance of 550 Ohm.

IMRT

Industrial mechanical thermostat

The IMRT industrial room thermostats are ideal for applications in demanding (humid) environments. They are single-pole mechanical thermostats suitable for switching fans, electrical heating systems or other Sentera controllers in industrial and agricultural climatology (warehouses, greenhouses, stables etc.). These units have a gas-filled bulb and an optimised external spiral which guarantee an accurate and reliable temperature detection.

Key features

- Optimal temperature range
- Gas-filled bulb sensor type
- Stainless bulb
- Long-term stability and accuracy

Technical specifications

Temperature range	0—40 °C (alternative ranges on request)	
Setpoint setting	by scale etched knob	
Hysteresis	±4 °C	
Temperature gradient	1 °K/15 min	
Tolerance	±2 °C	
Protection standard	IP54 (according to EN 60529)	
Contact rating	Resistive	250 VAC / 16 A 400 VAC / 10 A
	Inductive	250 VAC / 5 A 400 VAC / 1 A
Operating temperature	Bulb	maximum 44 °C
	Environment	80 °C
Operating humidity	< 95 % rH (non-condensing)	

Area of use

- Temperature control in demanding (humid) environment
- Industrial premises (warehouses, workshops etc.)
- Agricultural climatology (greenhouses, stables etc.)

Wiring and connections

1	Normally closed contact
2	Normally open contact
C	Common contact

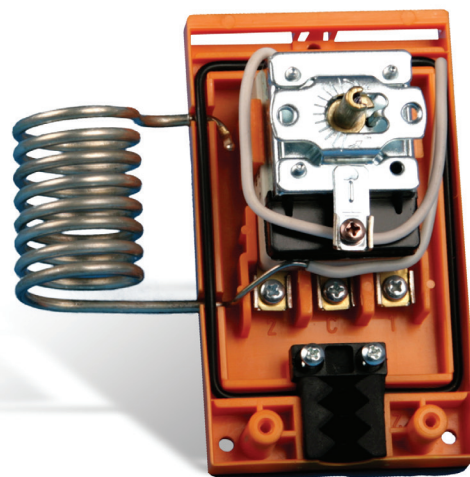
Standards

- RoHS Directive 2011/65/EU

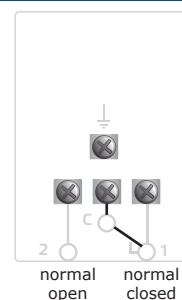


Global trade item numbers (GTIN)

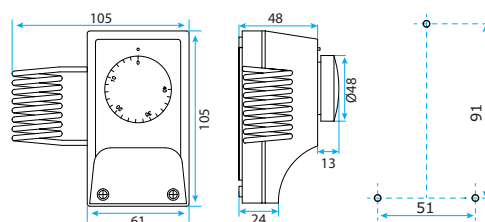
Packaging	IMRT
Unit	05401003008010
Carton	05401003301241
Box	05401003501764



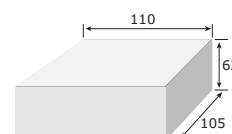
Wiring diagram



Fixing and dimensions



Packaging



Article	Packaging	Length [mm]	Width [mm]	Height [mm]	Net weight	Gross weight
IMRT	Unit (1 pc.)	105	62	110	0,22 kg	0,25 kg

ROTSN-P

Room temperature sensor



The ROTSN passive temperature probes feature outstanding stability of the temperature characteristics thanks to the platinum sensor element used. They have a positive temperature coefficient of resistance: when the temperature rises, the resistance rises. The sensor element is soldered on a printed circuit board and is mounted in a plastic housing. It is designed to be connected with shielded cable, grounded on the other side of the line.

Key features

- Low profile housing with covered screws
- Positive temperature coefficient
- Connection for shielded cables
- Long-term stability

Technical specifications

Long-term stability	< ±0,04 %	
Insulation resistance	> 10 MΩ	
Cable cross section	1,5 mm ²	
Protection standard	IP30	
Ambient conditions	Temperature	-20—60 °C
	Rel. humidity	< 95 % rH (non-condensing)

Article codes

	ROTSN-P100	ROTSN-P500	ROTSN-P1K0
Resistance at 0 °C	100 Ω	500 Ω	1,000 Ω
Measurement current (DC)	0,1—1,0 mA	0,1—0,40 mA	0,1—0,25 mA
Self-heating	≤ 0,8 K/mW	≤ 0,8 K/mW	≤ 0,7 K/mW
Thermal response time flowing water	t _{0,5} ≤ 0,2 s	t _{0,5} ≤ 0,2 s	t _{0,5} ≤ 0,3 s
	t _{0,9} ≤ 0,3 s	t _{0,9} ≤ 0,3 s	t _{0,9} ≤ 0,4 s
Thermal response time flowing air	t _{0,5} ≤ 1,5 s	t _{0,5} ≤ 1,5 s	t _{0,5} ≤ 0,3 s
	t _{0,9} ≤ 8,0 s	t _{0,9} ≤ 8,0 s	t _{0,9} ≤ 0,4 s

Area of use

- HVAC applications for temperature measurements

Wiring and connections

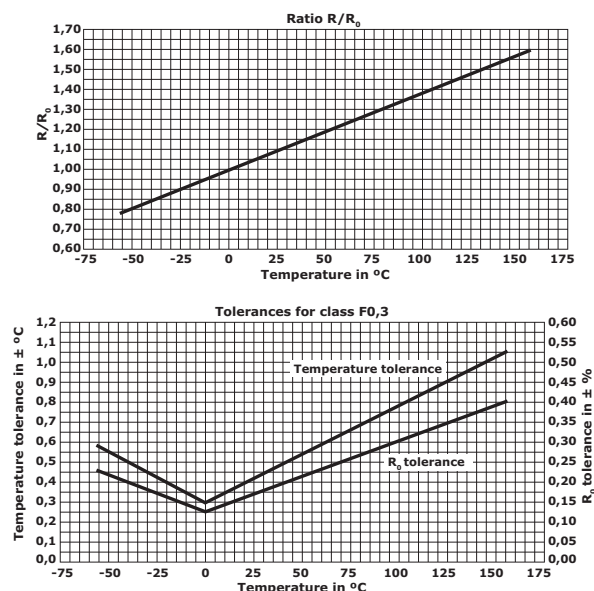
T1	Temperature sensor pin 1
T2	Temperature sensor pin 2
SH	Cable shield connection
Connections	Cable cross section: 1,5 mm ²

Standards

- Low Voltage Directive 2006/95/EC
- DIN / IEC 60751
- WEEE Directive 2012/19/EU
- RoHS Directive 2011/65/EU



Resistance and tolerance values



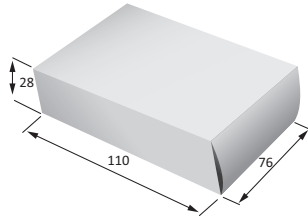
Temp. °C	R/R ₀ ratio	Nominal resistance values			Class F0,3
		R ₀ 100 Ω	R ₀ 500 Ω	R ₀ 1000 Ω	T _{tol} °C
-20	0,92160	92,16	460,80	921,60	±0,40
-15	0,94124	94,12	470,62	941,24	±0,38
-10	0,96086	96,09	480,43	960,86	±0,35
-5	0,98044	98,04	490,22	980,44	±0,33
0	1,00000	100,0	500,00	1000,00	±0,30
5	1,01953	101,95	509,76	1019,53	±0,33
10	1,03903	103,90	519,51	1039,03	±0,35
15	1,05849	105,85	529,25	1058,49	±0,38
20	1,07794	107,79	538,97	1077,94	±0,40
25	1,09735	109,73	548,67	1097,35	±0,43
30	1,11673	111,67	558,36	1116,73	±0,45
35	1,13608	113,61	568,04	1136,08	±0,48
40	1,15541	115,54	577,70	1155,41	±0,50
45	1,17470	117,47	587,35	1174,70	±0,53
50	1,19397	119,40	596,99	1193,97	±0,55
55	1,21321	121,32	606,60	1213,21	±0,58
60	1,23242	123,24	616,21	1232,42	±0,60

ROTSN-P

Room temperature sensor

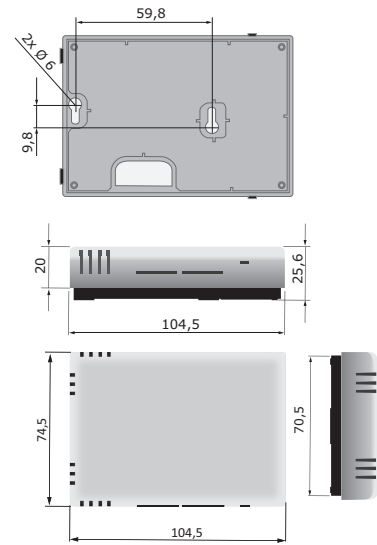


Packaging



Article	Packaging	Length [mm]	Width [mm]	Height [mm]	Net weight	Gross weight
ROTSN-P100	Unit (1 pc.)	110	76	28	0,054 kg	0,072 kg
	Carton (24 pcs.)	492	182	84	1,30 kg	1,86 kg
	Box (144 pcs.)	514	414	274	7,78 kg	12,13 kg
ROTSN-P500	Unit (1 pc.)	110	76	28	0,054 kg	0,072 kg
	Carton (24 pcs.)	492	182	84	1,30 kg	1,86 kg
	Box (144 pcs.)	514	414	274	7,78 kg	12,13 kg
ROTSN-P1K0	Unit (1 pc.)	110	76	28	0,054 kg	0,072 kg
	Carton (24 pcs.)	492	182	84	1,30 kg	1,86 kg
	Box (144 pcs.)	514	414	274	7,78 kg	12,13 kg

Fixing and dimensions



Global trade item numbers (GTIN)

Article	Unit	Carton	Box
ROTSN-P100	05401003011249	05401003301722	05401003502549
ROTSN-P500	05401003011263	05401003301746	05401003502563
ROTSN-P1K0	05401003011256	05401003301739	05401003502556

DUTSN

Duct temperature sensor

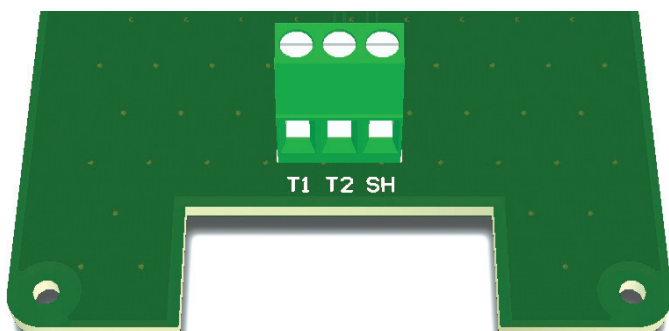
The DUTSN series are passive duct temperature sensors which are based on the advanced thin film technology of the platinum sensitive element. They provide temperature measurements with high stability and accuracy. An integrated shield connection makes these sensors suitable for applications where grounded shielded cables are required.

Key features

- Outstanding stability of temperature characteristic
- Short reaction time
- Connection for shielded cables
- Long-term stability and accuracy

Technical specifications

Long term stability	< ±0,04 %	
Insulation resistance	> 10 MΩ	
Measurement current (DC)	0,1 mA—1,0 mA (PT100) 0,1 mA—0,40 mA (PT500) 0,1 mA—0,25 mA (PT1000)	
Self-heating	< 0,8 K / mW	
Protection standard	Enclosure: IP54, Probe: IP20	
Ambient conditions	Temperature	-30—70 °C
	Rel. humidity	< 95 % rH(non-condensing)



Wiring and connections

T1	Temperature sensor connection
T2	Temperature sensor connection
SH	Shield connection for shielded cables
Connections	Cable cross section: max. 1,5 mm ² Cable gland clamping range: 5—10 mm

Functional performance

Temperature resistance relationships of the platinum sensors	
• For the temperature range: -30 °C - 0 °C	$R_T = R_0 \times (1 + A \times T + B \times T^2 + C \times (T - 100 \text{ °C}) \times T^3)$
• For the temperature range: 0 °C - 70 °C	$R_T = R_0 \times (1 + A \times T + B \times T^2)$
• Where	R_T : Resistance as a function of temperature R_0 : Nominal resistance value at 0 °C T : Temperature in °C
• Coefficients according to EN 60751	$A = 3,9083 \times 10^{-3} \text{ °C}^{-1}$ $B = -5,775 \times 10^{-7} \text{ °C}^{-2}$ $C = -4,183 \times 10^{-12} \text{ °C}^{-4}$
Sensor tolerance values equation (according to EN 60751)	
• Class F0.3	$\Delta T_{F0.3} = \pm(0,30 + 0,005 \times T)$



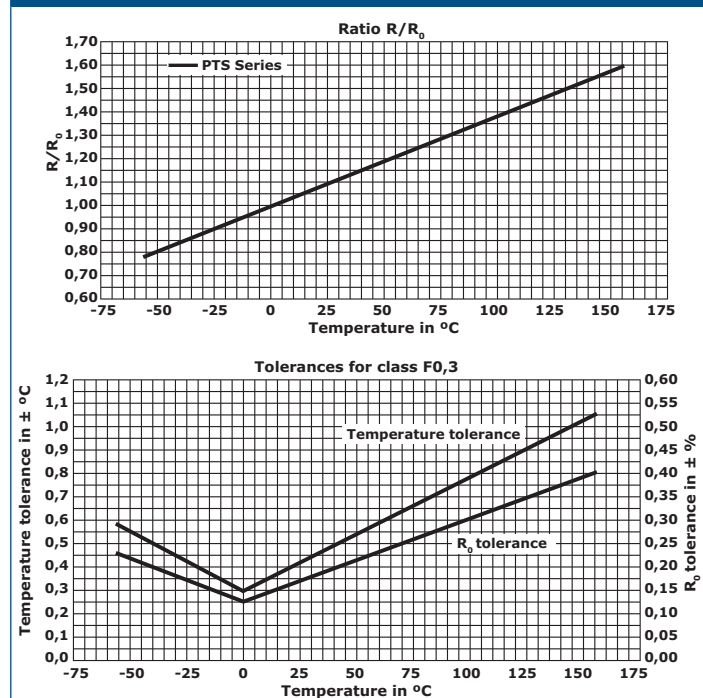
Article codes

	Temperature sensor element
DUTSN-P100	PT100
DUTSN-P500	PT500
DUTSN-P1K0	PT1000

Area of use

- Temperature control in duct HVAC applications where shielded cables are required

Operational diagram(s)



DUTSN

Duct temperature sensor



Nominal resistance values

Temperature, [°C]	R0, 100 Ω	R0, 500 Ω	R0, 1000 Ω
-30	88,22	441,11	882,22
-25	90,19	450,96	901,92
-20	92,16	460,80	921,60
-15	94,12	470,62	941,24
-10	96,09	480,43	960,86
-5	98,04	490,22	980,44
0	100,00	500,00	1.000,00
5	101,95	509,76	1.019,53
10	103,90	519,51	1.039,03
15	105,85	529,25	1.058,49
20	107,79	538,97	1.077,94
25	109,73	548,67	1.097,35
30	111,67	558,36	1.116,73
35	113,61	568,04	1.136,08
40	115,54	577,70	1.155,41
45	117,47	587,35	1.174,70
50	119,40	596,99	1.193,97
55	121,32	606,60	1.213,21
60	123,24	616,21	1.232,42
65	125,16	625,80	1.251,60
70	127,08	635,38	1.270,75

Standards

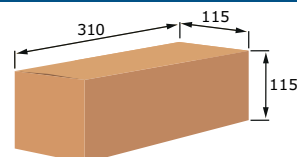
- Low Voltage Directive 2006/95/EC
- DIN / IEC 60751
- RoHS Directive 2011/65/EU



Global trade item numbers (GTIN)

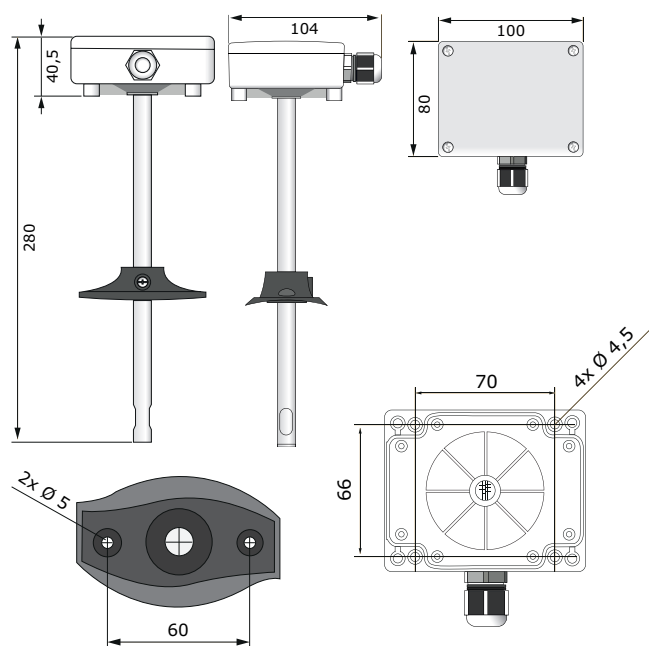
Article	Unit	Box
DUTSN-P100	05401003002124	05401003500903
DUTSN-P500	05401003002148	05401003500927
DUTSN-P1K0	05401003002131	05401003500910

Packaging



Article	Packaging	Length [mm]	Width [mm]	Height [mm]	Net weight	Gross weight
DUTSN-P100	Unit (1 pc.)	310	115	115	0,16 kg	0,28 kg
	Box (20 pcs.)	590	380	505	3,20 kg	6,85 kg
DUTSN-P500	Unit (1 pc.)	310	115	115	0,16 kg	0,28 kg
	Box (20 pcs.)	590	380	505	3,20 kg	6,85 kg
DUTSN-P1K0	Unit (1 pc.)	310	115	115	0,16 kg	0,28 kg
	Box (20 pcs.)	590	380	505	3,20 kg	6,85 kg

Fixing and dimensions



DTS-M

Digital temperature sensor for ducts

The DTS-M series are digital temperature sensors powered over Modbus with 24 VDC via an RJ45 connector. They are intended for duct channels and are compatible with various control systems based on temperature. The sensor element is placed in a stainless steel tube, which simplifies the cleaning of the duct system. There are two product versions featuring different tube length - 85 and 165 mm.

Key features

- Wide temperature range: -30—70 °C
- Modbus RTU communication
- Easy wiring via an RJ45 socket
- Low-maintenance and easy-to-clean design

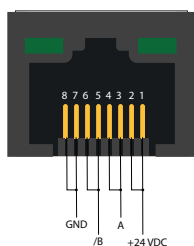
Technical specifications

Supply voltage	24 VDC, Power over Modbus	
Power consumption	Maximum: 0,192 W	
	Nominal: 0,18 W	
	Imax: 8 mA	
Sensor range	-30—70 °C	
Accuracy	±1 °C	
Protection standard	IP65	
Ambient conditions	Temperature	-30—70 °C
	Rel. humidity	5—95 % rH (non-condensing)

Wiring and connections

RJ45 socket		
Pin 1	Supply voltage	
Pin 2	Supply voltage	
Pin 3	Modbus RTU communication, signal A	
Pin 4	Modbus RTU communication, signal A	
Pin 5	Modbus RTU communication, signal /B	
Pin 6	Modbus RTU communication, signal /B	
Pin 7	Ground, supply voltage	
Pin 8	Ground, supply voltage	

RJ45 socket



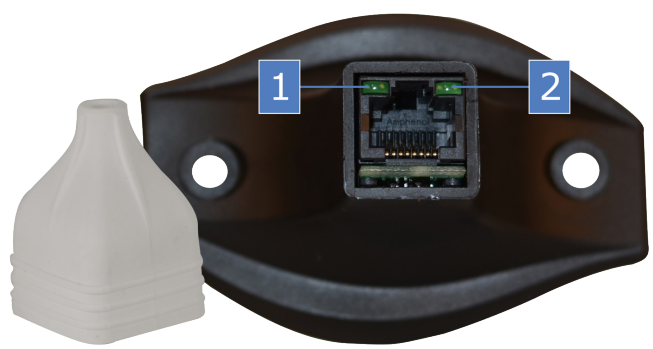
Article codes

Article code	Supply	Probe length
DTS-M-080	24 VDC, PoM	85 mm
DTS-M-160		165 mm

Area of use

- Measuring temperature in duct channels

Indications

		
1 - Green LED on the left	On	During normal operation, the left LED lights up to indicate that the unit is supplied with 24 VDC
2 - Green LED on the right	On	Indicates active Modbus communication
RJ45 socket		To plug in the communication and power cable

DTS-M

Digital temperature sensor for ducts

Standards

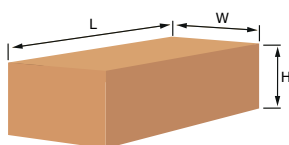
- Low Voltage Directive 2014/35/EC 
 - EN 60529:1991 Degrees of protection provided by enclosures (IP Code) Amendment AC:1993 to EN 60529
 - EN 60730-1:2011 Automatic electrical controls for household and similar use - Part 1: General requirements

- EMC Directive 2014/30/EC
 - EN 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
 - EN 61326-2-5:2013 Electrical equipment for measurement, control and laboratory use - EMC requirements - Part 2-5: Particular requirements - Test configurations, operational conditions and performance criteria for devices with field bus interfaces according to IEC 61784-1

• WEEE Directive 2012/19/EU

• RoHS Directive 2011/65/EU

Packaging

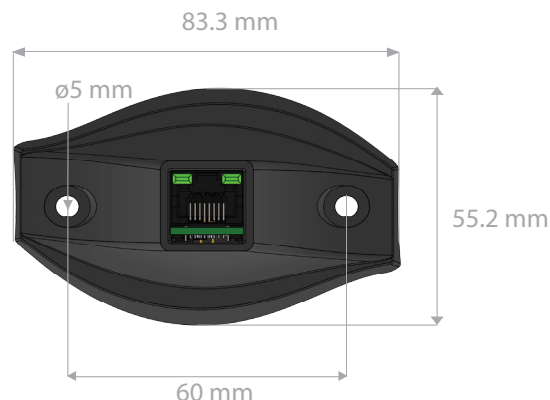


Article	Packaging	Length [mm]	Width [mm]	Height [mm]	Net weight	Gross weight
DTS-M-080 DTS-L-080	Unit (1 pc.)	82	55	175	0.058 kg	0.062 kg
	Carton (10 pcs.)	492	182	84	0.58 kg	0.77 kg
	Box (60 pcs.)	590	380	280	3.48 kg	5.54 kg
DTS-M-160 DTS-L-160	Unit (1 pc.)	82	55	225	0.070 kg	0.076 kg
	Carton (10 pcs.)	492	182	84	0.705 kg	0.915 kg
	Box (40 pcs.)	590	380	280	4.23 kg	6.41 kg

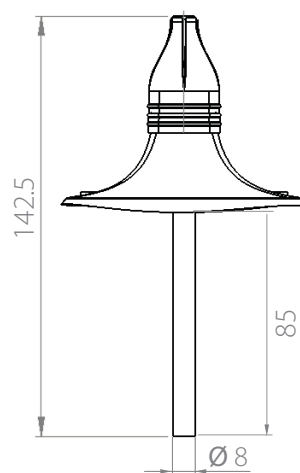
Global trade item numbers (GTIN)

Article	Unit	Carton	Box
DTS-M-080	5401003701034	05401003002100	5401003500880
DTS-L-080	5401003002087	5401003701010	5401003500866
DTS-M-160	5401003002117	5401003701041	5401003500897
DTS-L-160	5401003002094	5401003701027	5401003500873

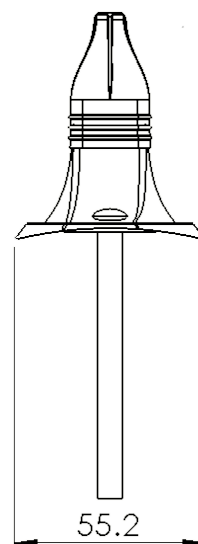
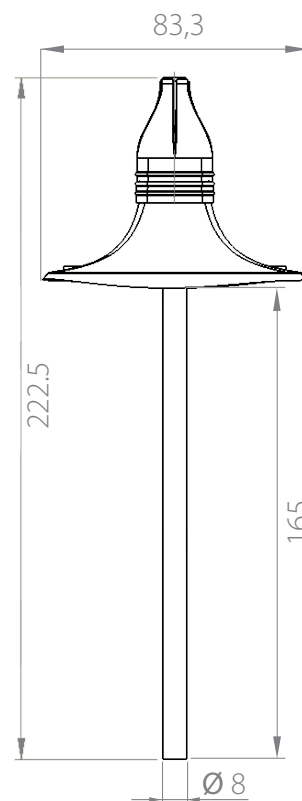
Fixing and dimensions



DTS-M-080



DTS-M-160





DTP-M

Digital temperature pipe sensor

The DTP-M series are digital temperature water pipe sensors powered over Modbus with 24 VDC via an RJ45 connector. They are intended for mounting onto metal pipes and are compatible with various temperature control systems. Thanks to the copper contact plate, we can ensure faster response time and a more accurate temperature measurement of the media within the pipe.

Key features

- Wide temperature range: 0—85 °C
- Modbus RTU communication
- Easy wiring via an RJ45 socket
- Quick and easy mounting via a cable tie
- Copper plate for enhanced thermal conductivity
- Heat resistant cable tie 300 x 4,8 mm included
- Thermal pad for a more accurate temperature measurement included (19 x 14 x 1,5 mm)

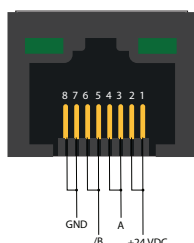
Technical specifications

Supply voltage	24 VDC, Power over Modbus	
Power consumption	Maximum: 0,192 W	
	Nominal: 0,18 W	
	Imax: 8 mA	
Sensor range	0—85 °C	
Accuracy	±1 °C	
Protection standard	IP65	
Ambient conditions	Temperature	-30—85 °C
	Rel. humidity	5—95 % rH (non-condensing)

Wiring and connections

RJ45 sockets (Power over Modbus)

Pin 1	24 VDC	Supply voltage
Pin 2		
Pin 3	A	Modbus RTU communication, signal A
Pin 4		
Pin 5	/B	Modbus RTU communication, signal /B
Pin 6		
Pin 7	GND	Ground, supply voltage
Pin 8		



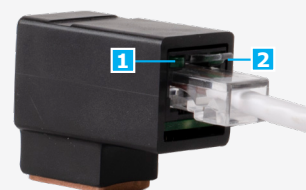
Article codes

Article code	Supply
DTP-M	24 VDC, PoM

Area of use

- Measuring temperature in metal water pipes

Indications RJ45



RJ45 socket		Plug the communication and power cable into the socket
1 - Green LED on the left	On	In normal operation, the left LED on is activated, indicating the presence of 24 VDC power supply
2 - Green LED on the right	On	Indicates active Modbus communication



DTP-M

Digital temperature pipe sensor

Standards

- EMC directive 2014/30/EU: 
- 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
- EN 61326-2-5:2013 Electrical equipment for measurement, control and laboratory use - EMC requirements - Part 2-5: Particular requirements - Test configurations, operational conditions and performance criteria for devices with field bus interfaces according to IEC 61784-1

- RoHS Directive 2011/65/EU

Packaging

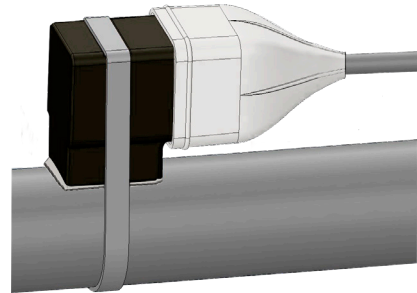


Article	Packaging	Length [mm]	Width [mm]	Height [mm]	Net weight	Gross weight
DTP-M	Unit (1 pc.)	100	-	120	0,024 kg	0,03 kg

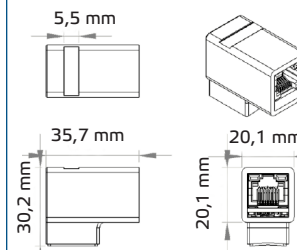
Global trade item numbers (GTIN)

Packaging	DTP-M
Unit	05401003002070
Carton	05401003300640
Box	05401003500859

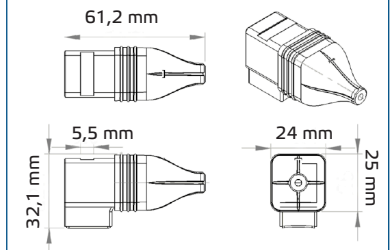
Fixing and dimensions



Without protective cover



With protective cover

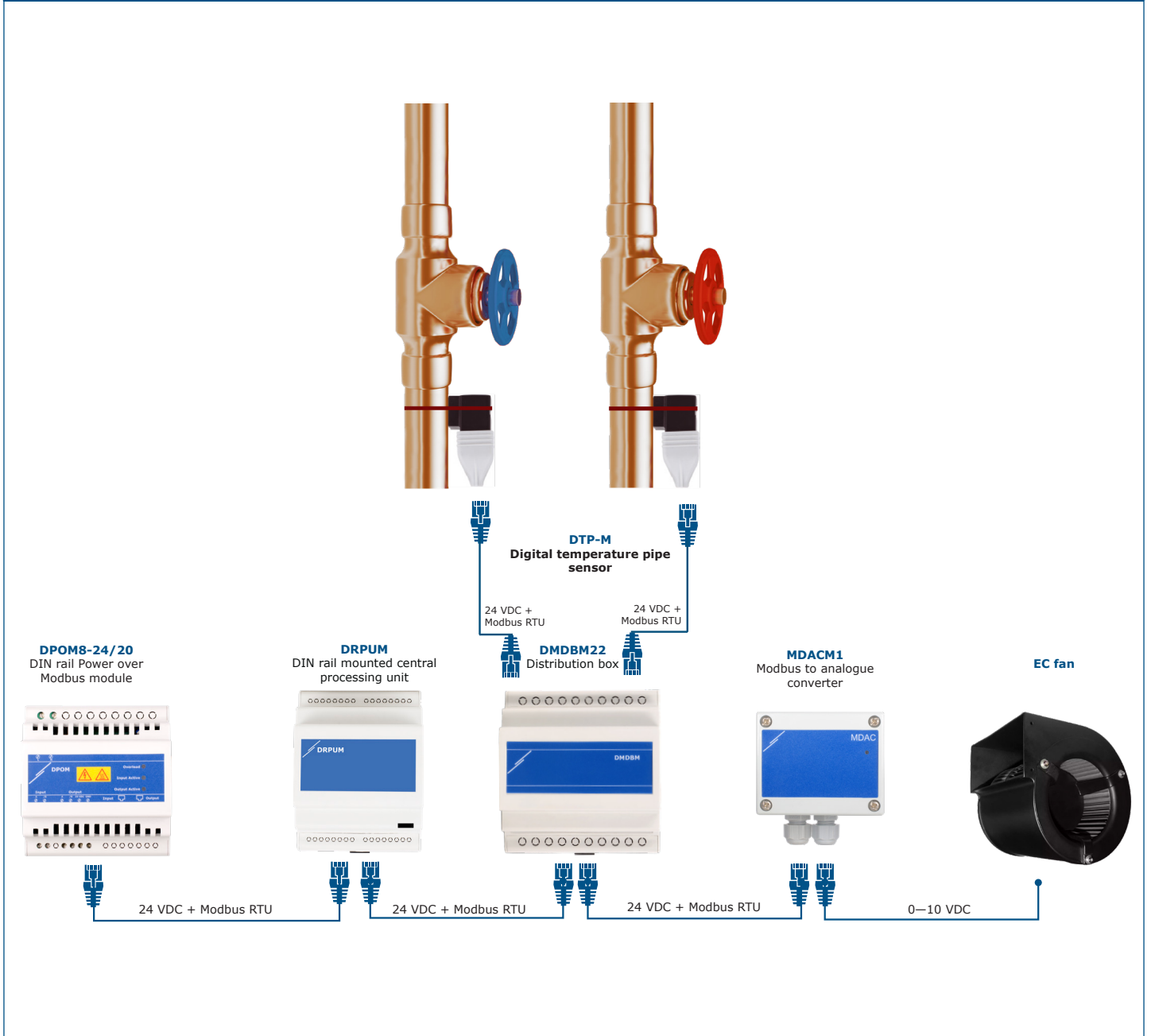


DTP-M

Digital temperature pipe sensor



Application example



HPD

Dual differential pressure transmitter



The HPD series are compact high resolution double differential pressure transmitters, which are equipped with two fully digital pressure transducers designed for a wide range of applications. Air velocity readout is available by connecting an external Pitot tube connection set. All parameters are accessible via Modbus RTU (3SModbus software or Sensistant). They also feature integrated K-factor and 2 analogue / modulating outputs (0–10 VDC / 0–20 mA / 0–100 % PWM).

Key features

- 2 analogue / modulating outputs - one for each sensor module
- 2 built-in digital high resolution differential pressure sensors
- Air velocity detection (by using an external PSET-PTX-200 Pitot tube connection set)
- Variety of operating ranges
- Selectable response time: 0,1–10 s
- Implemented K-factor
- Differential pressure, air volume⁽¹⁾ or air velocity⁽²⁾ readout via Modbus RTU
- Modbus registers reset function (to factory pre-set values)
- Selectable internal voltage source for PWM output: 3,3 / 12 VDC
- Modbus RTU communication
- Sensor calibration procedure
- Selectable minimum and maximum span
- Selectable analogue / modulating output type
- Aluminium pressure connection nozzles



Article codes

Codes	Power supply	Maximum power consumption	Nominal power consumption	Imax	Operating range
HPD-F-1K0	18–34 VDC	1,44 W	1,2 W	80 mA	0–1.000 Pa
HPD-F-2K0					0–2.000 Pa
HPD-F-4K0					0–4.000 Pa
HPD-F-10K					0–10.000 Pa
HPD-G-1K0	18–34 VDC /	1,17 W	1 W	65 mA	0–1.000 Pa
HPD-G-2K0					0–2.000 Pa
HPD-G-4K0	15–24 VAC ±10 %	2,88 W	2,4 W	160 mA	0–4.000 Pa
HPD-G-10K					0–10.000 Pa

Area of use

- Differential pressure, air velocity⁽¹⁾ or volume flow ⁽²⁾ measurement in HVAC applications
- Differential pressure / volume flow monitoring in clean rooms
- Clean air and non-aggressive, non-combustible gases

Technical specifications

2 selectable analogue / modulating outputs	0–10 VDC	$R_L \geq 50 \text{ k}\Omega$
	0–20 mA	$R_L \leq 500 \text{ }\Omega$
	0–100 % PWM	PWM Frequency: 1 kHz, $R_L \geq 50 \text{ k}\Omega$
Minimum differential pressure range span	50 Pa	
Minimum volume flow range span	10 m ³ /h	
Minimum air velocity range span	1 m/s	
Operating modes	Differential pressure	
	Air volume	
	Air velocity	
Accuracy	±2 % of the operating range	
Protection standard	IP65 (according to EN 60529)	
Enclosure	ASA, grey (RAL9002)	
Ambient conditions	Temperature	–5–65 °C
	Rel. humidity	< 95 % rH (non-condensing)

⁽¹⁾ Only when K-factor of fan / drive is known. If K-factor is unknown, volume flow can be calculated via multiplying the duct cross-sectional area (A) by the air velocity (V) using the formula: $Q = A \cdot V$

⁽²⁾ By using an external PSET-PTX-200 Pitot tube connection set

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:

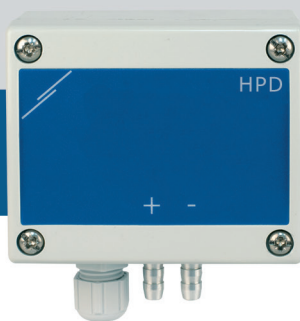
<https://www.sentera.eu/en/3SMCenter>

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

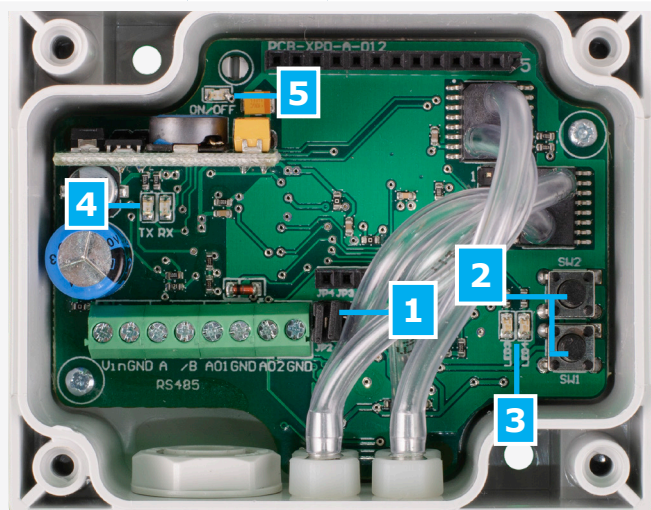
Standards

- EMC Directive 2014/30/EC:
 - 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/EC
- RoHS Directive 2011/65/EC





Settings and indications

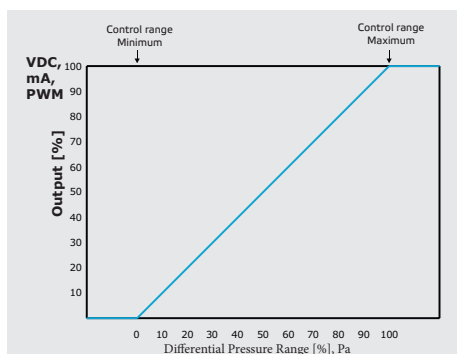


1 - Internal pull-up resistor jumpers (JP1 for sensor 1, JP2 for sensor 2)		The relevant PWM output is connected to an internal +3,3 VDC or +12 VDC source**
2 - Sensor calibration and Modbus register reset tact switches (SW1, SW2)		The relevant PWM output has to be connected to external voltage source via external pull-up resistor
3 - Sensor calibration and Modbus registers reset indication	Blinking blue (as defined)	Modbus register factory reset or sensor calibration
4 - Modbus communication indication	Blinking green	Transmitting / receiving
5 - Operating LED indication	Solid on	Normal operation

* indicates closed position of the jumper.

** The voltage source depends on the value in holding register 54 and 74.

Operational diagram(s)



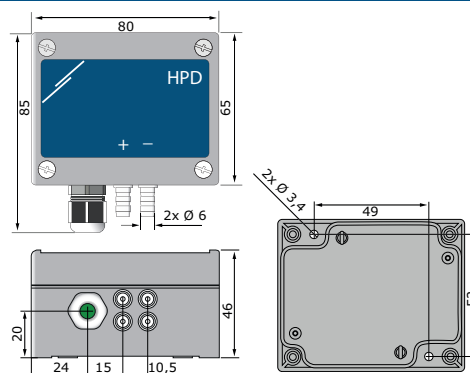
Wiring and connections

Article type	HPD-F	HPD-G	
Vin	18—34 VDC	18—34 VDC	13—26 VAC
GND	Ground	Common ground*	AC ~*
A	Modbus RTU (RS485), signal A		
/B	Modbus RTU (RS485), signal /B		
AO1	Analogue / modulating output 1 (0—10 VDC / 0—20 mA / PWM)		
GND	Ground AO1	Common ground*	
AO2	Analogue / modulating output 2 (0—10 VDC / 0—20 mA / PWM)		
GND	Ground AO2	Common ground*	
Connections	Cable cross section	1,5 mm²	
	Cable gland clamping range	3—6 mm	
	Connecting tube diameter	6 mm	

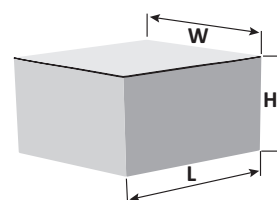
***Attention!** The -F version of the product is not suited for 3-wire connection. It has separate grounds for power supply and analogue output. Connecting both grounds together might result in incorrect measurements. Minimum 4 wires are required to connect -F type sensors.

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.

Fixing and dimensions



Packaging



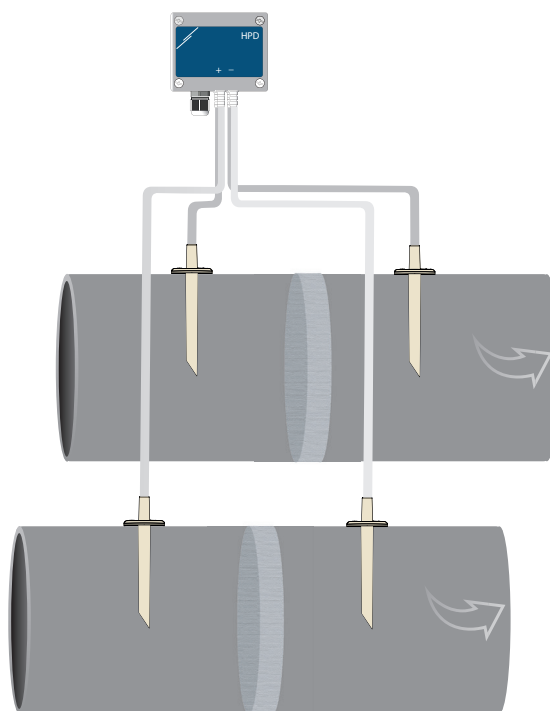
Article	Packaging	Length [mm]	Width [mm]	Height [mm]	Net weight	Gross weight
HPD	Unit (1 pc.)	95	85	70	0,14 kg	0,20 kg
	Carton (10 pcs.)	495	185	87	1,40 kg	2,08 kg
	Box (60 pcs.)	590	380	280	8,4 kg	13,03 kg



HPD

Dual differential pressure transmitter

Application example: Measuring differential pressure [Pa] or air flow volume [m³/h] using PSET-PVC



Global trade item numbers (GTIN)

Packaging	HPD-F-1K0	HPD-F-2K0	HPD-F-4K0	HPD-F-10K
Unit	05401003007488	05401003007495	05401003007501	05401003007471
Carton	05401003300923	05401003300930	05401003300947	05401003300916
Box	05401003501443	05401003501450	05401003501467	05401003501436
Packaging	HPD-G-1K0	HPD-G-2K0	HPD-G-4K0	HPD-G-10K
Unit	05401003007525	05401003007532	05401003007549	05401003007518
Carton	05401003300961	05401003300978	05401003300985	05401003300954
Box	05401003501481	05401003501498	05401003501504	05401003501474

HPS -2

Differential pressure transmitter



The HPS -2 series are differential pressure transmitters, which are equipped with a fully digital pressure transducer designed for a wide range of applications. Air velocity readout is available by connecting an external Pitot tube connection set. All parameters are accessible via Modbus RTU (3SModbus software or Sensistant). They also feature integrated K-factor and an analogue / modulating output (0–10 VDC / 0–20 mA / 0–100 % PWM).

Key Features

- Built-in digital high resolution differential pressure sensor
- Air velocity detection (by using an external PSET-PTX-200 Pitot tube connection set)
- Selectable response time: 0,1–10 s
- Implemented K-factor
- Differential pressure, volume flow⁽¹⁾ or air velocity⁽²⁾ readout via Modbus RTU
- Modbus registers reset function (to factory pre-set values)
- Selectable internal voltage source for PWM output: 3,3 / 12 VDC
- Four LEDs with for status indication
- Modbus RTU communication
- Sensor calibration procedure
- Selectable minimum and maximum operating ranges
- Selectable analogue / digital output
- Aluminium pressure connection nozzles



Article Codes

Codes	Power supply	Maximum power consumption	Nominal power consumption	Imax	Operating range
HPS-F-1K0 -2	18–34 VDC	1,3 W	1,26 W	70 mA	0–1.000 Pa
HPS-F-2K0 -2					0–2.000 Pa
HPS-F-4K0 -2					0–4.000 Pa
HPS-F-10K -2					0–10.000 Pa
HPS-G-1K0 -2	18–34 VDC /	1,3 W	1,26 W	70 mA	0–1.000 Pa
HPS-G-2K0 -2					0–2.000 Pa
HPS-G-4K0 -2	15–24 VAC ±10 %	1 W	0,9 W	71 mA	0–4.000 Pa
HPS-G-10K -2					0–10.000 Pa

Technical Specifications

Selectable analogue / modulating output	0–10 VDC mode	min. load 50 kΩ ($R_L \geq 50 \text{ k}\Omega$)
	0–20 mA mode	max. load 500 Ω ($R_L \leq 500 \text{ }\Omega$)
	PWM mode	PWM Frequency: 1 kHz, min. load 50 kΩ ($R_L \geq 50 \text{ k}\Omega$)
Minimum differential pressure range span	50 Pa	
Minimum volume flow range span	10 m³/h	
Minimum air velocity range span	1 m/s	
Operating modes	Differential pressure	
	Volume flow ⁽¹⁾	
	Air velocity ⁽²⁾	
Accuracy	±2 % of the operating range	
Protection standard	IP65 (according to EN 60529)	
Ambient conditions	Temperature	–5–65 °C
	Rel. humidity	< 95 % rH (non-condensing)

Area of Use

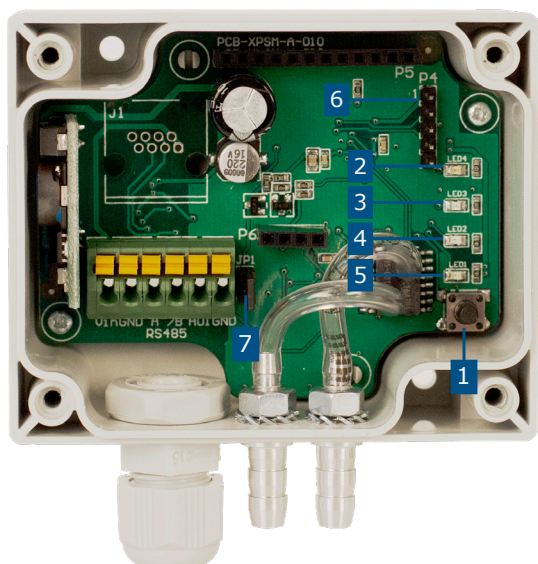
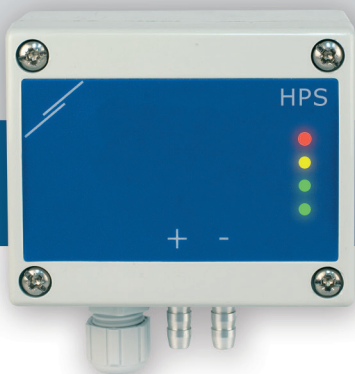
- Differential pressure, air velocity⁽²⁾ or volume flow ⁽¹⁾ measurement in HVAC applications
- Overpressurizing applications: clean rooms to avoid particle contamination or staircases for fire safety
- Underpressurizing applications: restaurant kitchens and biohazard laboratories
- Volume flow application: ensuring the minimum legal ventilation rate (m³/h) for buildings

⁽¹⁾ Only when K-factor of fan / drive is known. If K-factor is unknown, volume flow can be calculated via multiplying the duct cross-sectional area (A) by the air flow velocity (V) using the formula: $Q = A \cdot V$

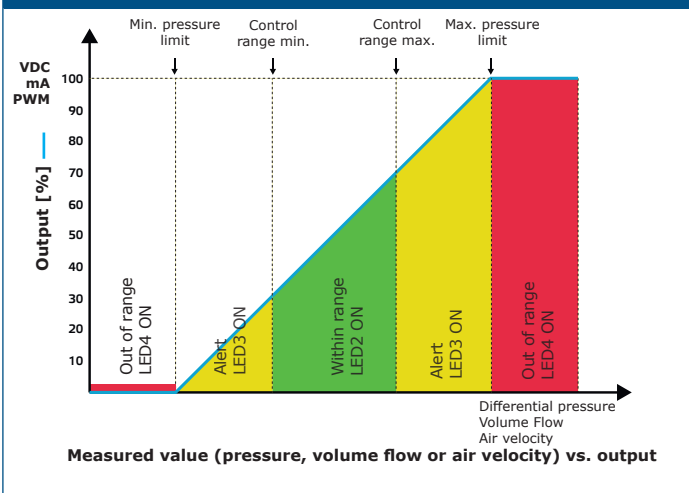
⁽²⁾ By using an external PSET-PTX-200 Pitot tube connection set

HPS -2

Differential pressure transmitter



Operational Diagrams



Settings

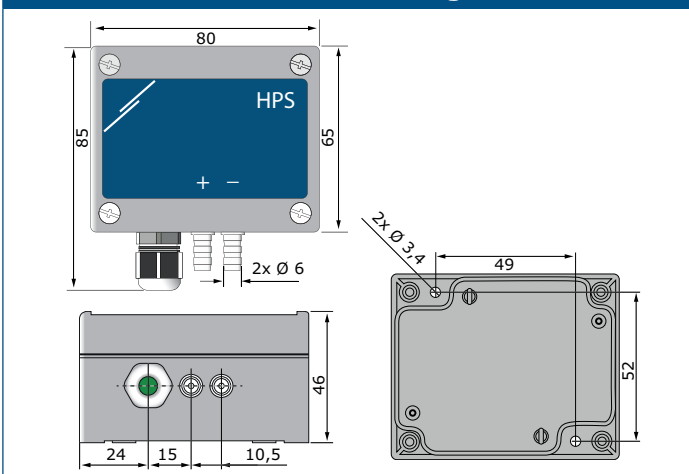
1 - Sensor calibration and Modbus register reset tact switch (SW1)		Push to start the Modbus RTU register factory reset or the sensor calibration
2 - Red LED4	Continuous	Measured differential pressure, air volume or air velocity is out of range
	Blinking	Sensor element failure
3 - Yellow LED3	On	Measured differential pressure, air volume or air velocity is in the alert range
4 - Green LED2	On	Measured differential pressure, air volume or air velocity is within range
5 - Green LED1	On	Power OK; active Modbus RTU communication
6 - Modbus holding registers reset jumper (P4)*		Put a jumper onto pins 1 and 2 for at least 20 s to reset holding registers 1-3
7 - Internal pull-up resistor jumper JP1		PWM output is connected to internal +3,3 VDC or +12 VDC source***
		PWM has to be connected to external voltage source via external pull-up resistor

* The reset jumper is not included in the set

** indicates closed position of the jumper.

***The voltage source depends on the value in holding register 54.

Fixing and Dimensions



Wiring and Connections

Article type	HPS-F	HPS-G
Vin	18-34 VDC	18-34 VDC
GND	Ground	Common ground*
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	Cable cross section	1,5 mm ²
	Cable gland clamping range	3-6 mm
	Connecting tube diameter	6 mm

***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.

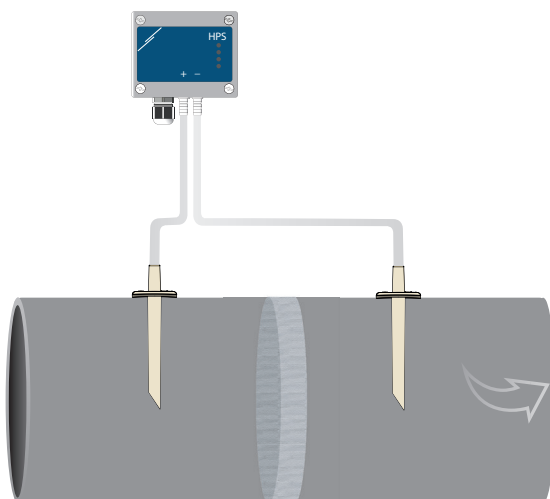
HPS -2

Differential pressure transmitter



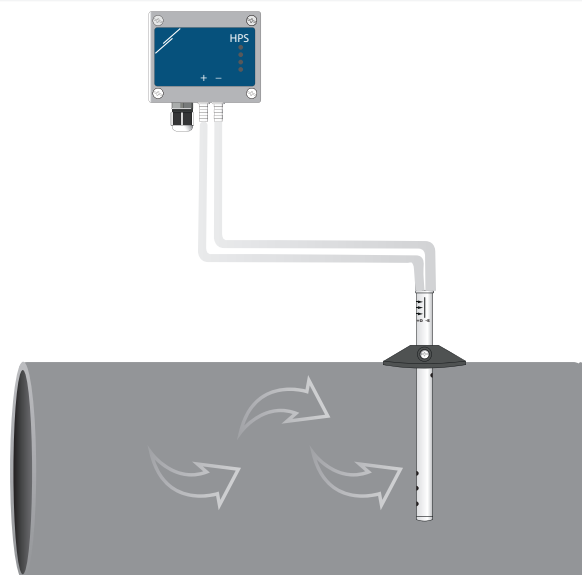
Application Example 1

Measuring differential pressure [Pa] or air flow volume [m³/h] using PSET-PVC



Application Example 2

Measuring supplied air volume [m³/h] or airflow velocity [m/s] using PSET-PT



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:

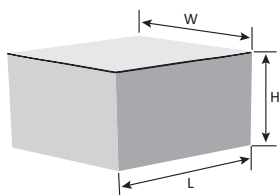
<https://www.sentera.eu/en/3SMCenter>

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

Global Trade Item Numbers 14 (GTIN 14)

Article	Unit	Carton	Box
HPS-F-1K0 -2	5401003007761	5401003301005	5401003501528
HPS-F-2K0 -2	5401003007778	5401003301012	5401003501535
HPS-F-4K0 -2	5401003007785	5401003301029	5401003501542
HPS-F-10K -2	5401003007754	-	-
HPS-G-1K0 -2	5401003007815	5401003301050	5401003501573
HPS-G-2K0 -2	5401003007822	5401003301067	5401003501580
HPS-G-4K0 -2	5401003007839	5401003301074	5401003501597
HPS-G-10K -2	5401003007808	5401003301043	5401003501566

Packaging



Article	Packaging	Length [mm]	Width [mm]	Height [mm]	Net weight	Gross weight
HPS -2	Unit (1 pc.)	85	95	70	0,13 kg	0,15 kg
	Carton (10 pcs.)	485	175	77	1,28 kg	1,63 kg
	Box (60 pcs.)	580	370	270	7,69 kg	10,78 kg

HPSPX-2

Differential pressure PI controller



The HPSP -2 series are high resolution differential pressure controllers. The integrated PI control with anti-windup function offers the possibility to directly control EC motors / fans. They are equipped with a fully digital state-of-the-art pressure transducer designed for a wide range of applications. Zero point calibration and Modbus registers reset can be executed via a tact switch. They also feature integrated K-factor and an analogue / modulating output (0—10 VDC / 0—20 mA / 0—100 % PWM). All parameters are accessible via Modbus RTU (3SModbus software or Sensistant).



Key features

- Built-in digital high resolution differential pressure sensor
- Air velocity detection (by using an external PSET-PTX-200 Pitot tube connection set)
- Variety of operating ranges
- Selectable response time: 0,1—10 s
- Implemented K-factor
- Differential pressure, air volume⁽¹⁾ or air velocity⁽²⁾ readout via Modbus RTU
- Modbus registers reset function (to factory pre-set values)
- Selectable internal voltage source for PWM output: 3,3 / 12 VDC
- Four LED indicators for the status of the transmitter and the controlled values
- Modbus RTU communication
- Sensor calibration procedure
- Selectable minimum and maximum span
- Selectable analogue / modulating output
- Aluminium pressure connection nozzles

Article codes

Codes	Power supply	Maximum power consumption	Nominal power consumption	Imax	Operating range
HPSPF-1K0 -2	18—34 VDC	1,8 W	1,35 W	100 mA	0—1.000 Pa
HPSPF-2K0 -2					0—2.000 Pa
HPSPF-4K0 -2					0—4.000 Pa
HPSPF-10K -2					0—10.000 Pa
HPSPG-1K0 -2	18—34 VDC	1,71 W	1,28 W	95 mA	0—1.000 Pa
HPSPG-2K0 -2					0—2.000 Pa
HPSPG-4K0 -2					0—4.000 Pa
HPSPG-10K -2	15—24 VAC ±10 %	3,3 W	2,475 W	220 mA	0—10.000 Pa

Technical specifications

Selectable analogue / modulating output	0—10 VDC	$R_L \geq 50 \text{ k}\Omega$
	0—20 mA	$R_L \leq 500 \Omega$
	0—100 % PWM	PWM Frequency: 1 kHz, $R_L \geq 50 \text{ k}\Omega$
Operating modes	Differential pressure	
	Air volume	
	Air velocity	
Accuracy	±2 % of the operating range	
Protection standard	IP65 (according to EN 60529)	
Enclosure	ASA, grey (RAL9002)	
Ambient conditions	Temperature	−5—65 °C
	Rel. humidity	< 95 % rH (non-condensing)

Wiring and connections

Article type	HPSPF	HPSPG
Vin	18—34 VDC	18—34 VDC
GND	Ground	Common ground*
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	Cable cross section	
	1,5 mm ²	

***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.

Area of use

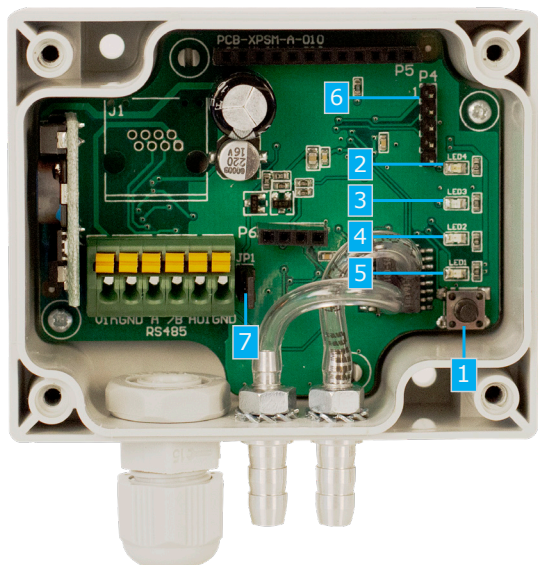
- Differential pressure, air velocity⁽¹⁾ or volume flow⁽²⁾ measurement in HVAC applications
- Overpressurizing applications: clean rooms to avoid particle contamination or staircases for fire safety
- Underpressurizing applications: restaurant kitchens and biohazard laboratories
- Volume flow application: ensuring the minimum legal ventilation rate (m³/h) for buildings

⁽¹⁾ Only when K-factor of fan is known. If K-factor is unknown, air volume flow can be calculated via multiplying the duct cross-sectional area (A) by the air flow velocity (V) using the formula: $Q = A \cdot V$

⁽²⁾ By using an external PSET-PTX-200 Pitot tube connection set

HPSPX-2

Differential pressure PI controller



Settings

1 - Sensor calibration and Modbus register reset tact switch (SW1)		Push to start the Modbus RTU register factory reset or the sensor calibration
2 - Red LED4	Blinking	Sensor element failure
3 - Yellow LED3	On	The differential pressure, air volume or air velocity has exceeded the minimum or maximum span threshold
4 - Green LED2	On	The actual differential pressure, air volume or air velocity is stabilized between the minimum span and maximum span
5 - Green LED1	On	Power OK; active Modbus RTU communication
6 - Modbus holding registers reset jumper (P4)*		Put a jumper onto pins 1 and 2 for at least 20 s to reset holding registers 1—3
7 - Internal pull-up resistor jumper JP1		Connection to internal voltage source

* The reset jumper is not included in the set
 ** indicates closed position of the jumper.

Modbus registers



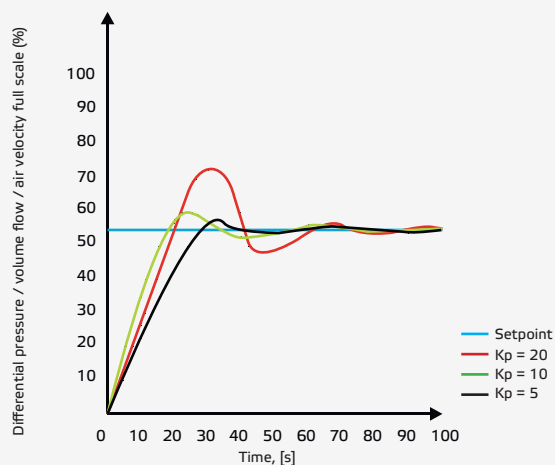
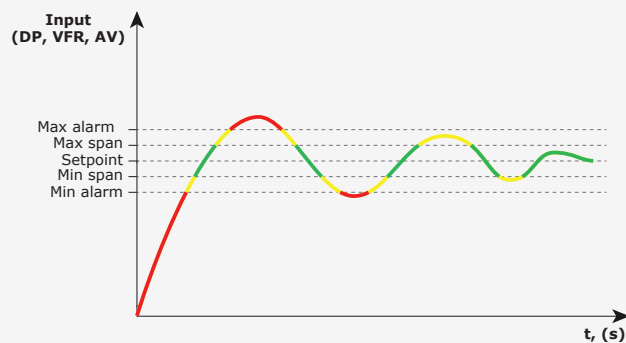
The Sensistant Modbus configurator allows you to easily monitor and/or configure Modbus parameters.

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>

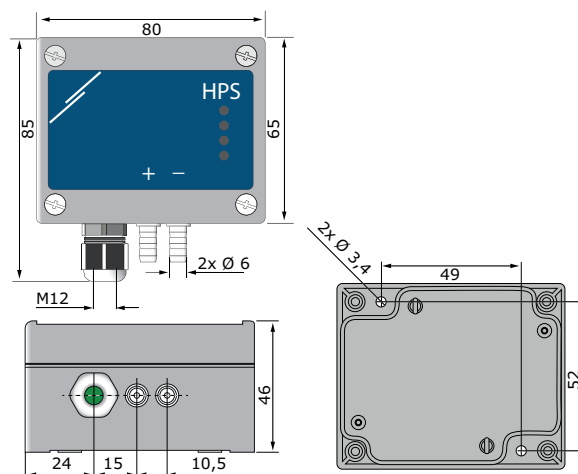


For more information about the Modbus registers, please refer to the product Modbus Register Map.

Operational diagrams



Fixing and dimensions

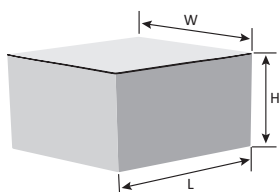


HPSPX-2

Differential pressure PI controller



Packaging



Article	Packaging	Length [mm]	Width [mm]	Height [mm]	Net weight	Gross weight
HPSP -2	Unit (1 pc.)	95	85	70	0,12 kg	0,13 kg
	Carton (10 pcs.)	495	185	87	1,20 kg	1,30 kg
	Box (60 pcs.)	590	380	280	7,2 kg	7,8 kg

Standards

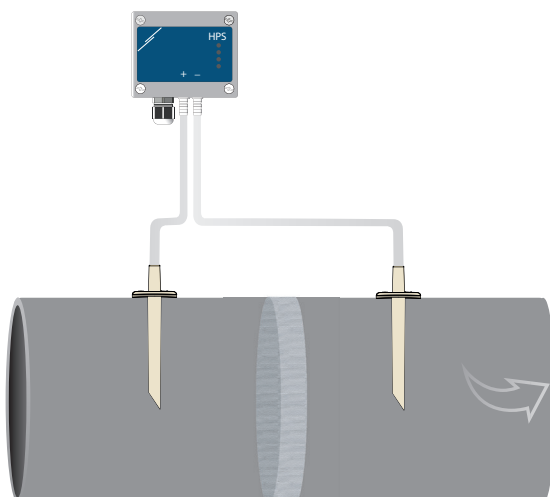


- EMC directive 2014/30/EU:
 - EN 61326-1:2013 Electrical equipment for measurement, control and laboratory use - EMC requirements - Part 1: General requirements
 - EN 61326-2-3:2013 Electrical equipment for measurement, control and laboratory use - EMC requirements - Part 2-3: Particular requirements - Test configuration, operational conditions and performance criteria for transducers with integrated or remote signal conditioning

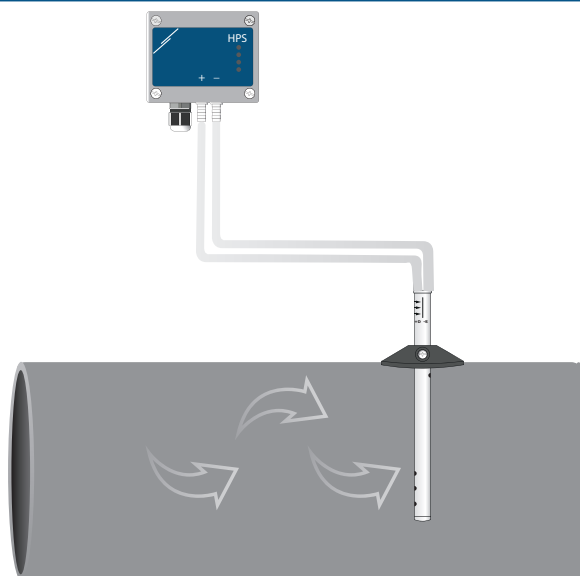
- WEEE Directive 2012/19/EC

- RoHS Directive 2011/65/EC

Application 1: Measuring differential pressure [Pa] or air flow volume [m³/h] using PSET-PVC



Application 2: Measuring supplied air volume [m³/h] or airflow velocity [m/s] using PSET-PT



HPSPX-2

Differential pressure PI controller



Global trade item numbers (GTIN)

Article	Unit	Carton	Box
HPSPF-1K0 -2	05401003007907	05401003301142	05401003501665
HPSPF-2K0 -2	05401003007914	05401003301159	05401003501672
HPSPF-4K0 -2	05401003007921	05401003301166	05401003501689
HPSPF-10K -2	05401003007891	05401003301135	05401003501658
HPSPG-1K0 -2	05401003007952	05401003301197	05401003501719
HPSPG-2K0 -2	05401003007969	05401003301203	05401003501726
HPSPG-4K0 -2	05401003007976	05401003301210	05401003501733
HPSPG-10K -2	05401003007945	05401003301180	05401003501702



HPS-X--LP

Differential pressure transmitter

The HPS-X--LP series are differential pressure transmitters (-125—125 Pa), which are equipped with a fully digital pressure transducer designed for a wide range of applications. Air velocity readout is available by connecting an external Pitot tube connection set. All parameters are accessible via Modbus RTU (3SModbus software or Sensistant). They also feature integrated K-factor and an analogue / modulating output (0—10 VDC / 0—20 mA / 0—100 % PWM).

Key features

- Built-in digital high resolution differential pressure sensor
- Air velocity detection (by using an external PSET-PTX-200 Pitot tube connection set)
- Variety of operating ranges
- Selectable response time: 0,1—10 s
- Implemented K-factor
- Differential pressure, air volume⁽¹⁾ or air velocity⁽²⁾ readout via Modbus RTU
- Modbus registers reset function (to factory pre-set values)
- Selectable internal voltage source for PWM output: 3,3 / 12 VDC
- Four LED indicators for the status of the transmitter and the controlled values
- Modbus RTU communication
- Sensor calibration procedure
- Selectable minimum and maximum span
- Selectable analogue / modulating output
- Aluminium pressure connection nozzles



Article codes

Codes	Power supply	Maximum power consumption	Nominal power consumption	Imax	Operating range
HPS-F--LP	18—34 VDC	1,3W	1,26 W	71 mA	-125—125 Pa
HPS-G--LP	18—34 VDC	1,3 W	1,26 W	70 mA	
	15—24 VAC ±10 %	1 W	1 W		

Technical specifications

Selectable analogue / modulating output	0—10 VDC	$R_L \geq 50 \text{ k}\Omega$
	0—20 mA	$R_L \leq 500 \Omega$
	0—100 % PWM	PWM Frequency: 1 kHz, $R_L \geq 50 \text{ k}\Omega$
Minimum differential pressure range span	10 Pa	
Minimum volume flow range span	10 m³/h	
Minimum air velocity range span	1 m/s	
Operating modes	Differential pressure	
	Air volume	
	Air velocity	
Accuracy	±2 % of the operating range	
Protection standard	IP65 (according to EN 60529)	
Enclosure	ASA, grey (RAL9002)	
Ambient conditions	Temperature	-5—65 °C
	Rel. humidity	< 95 % rH (non-condensing)

Area of use

- Differential pressure, air velocity⁽¹⁾ or volume flow ⁽²⁾ measurement in HVAC applications
- Overpressurising applications: clean rooms to avoid particle contamination or staircases for fire safety
- Underpressurising applications: restaurant kitchens and biohazard laboratories
- Volume flow application: ensuring the minimum legal ventilation rate (m³/h) for buildings

Wiring and connections

Article type	HPS-F--LP	HPS-G--LP	
Vin	18—34 VDC	18—34 VDC	13—26 VAC
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	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.

⁽¹⁾ Only when K-factor of fan / drive is known. If K-factor is unknown, volume flow can be calculated via multiplying the duct cross-sectional area (A) by the air velocity (V) using the formula: $Q = A \cdot V$

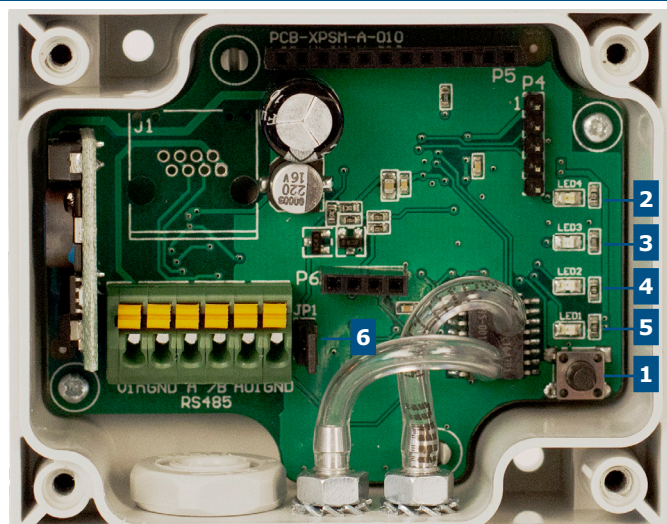
⁽²⁾ By using an external PSET-PTX-200 Pitot tube connection set

HPS-X--LP

Differential pressure transmitter



Settings

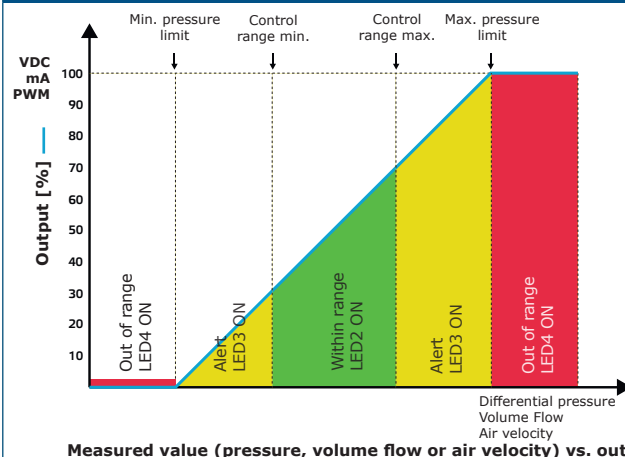


1 - Sensor calibration and Modbus register reset tact switch (SW1)		Push to start the Modbus RTU register factory reset or the sensor calibration
2 - Red LED4	Continuous	Measured differential pressure, air volume or air velocity is out of range
	Blinking	Sensor element failure
3 - Yellow LED3	On	Measured differential pressure, air volume or air velocity is in the alert range
4 - Green LED2	On	Measured differential pressure, air volume or air velocity is within range
5 - Green LED1	On	Power OK; active Modbus RTU communication
6 - Internal pull-up resistor jumper JP1		PWM output is connected to internal +3,3 VDC or +12 VDC source**
		PWM has to be connected to external voltage source via external pull-up resistor

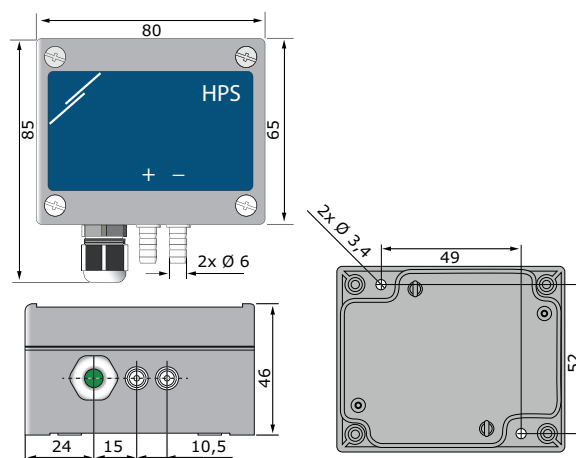
* indicates closed position of the jumper.

** The voltage source depends on the value in holding register 54.

Operational diagram



Fixing and dimensions

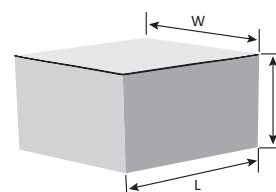


Standards

- EMC Directive 2014/30/EC:
 - 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/EC
- RoHS Directive 2011/65/EC



Packaging



Article code	Packaging	Length [mm]	Width [mm]	Height [mm]	Net weight	Gross weight
HPS-F--LP HPS-G--LP	Unit (1 pc.)	95	85	70	0,12 kg	0,13 kg
	Carton (10 pcs.)	495	185	87	1,20 kg	1,30 kg
	Box (60 pcs.)	590	380	280	7,2 kg	7,8 kg

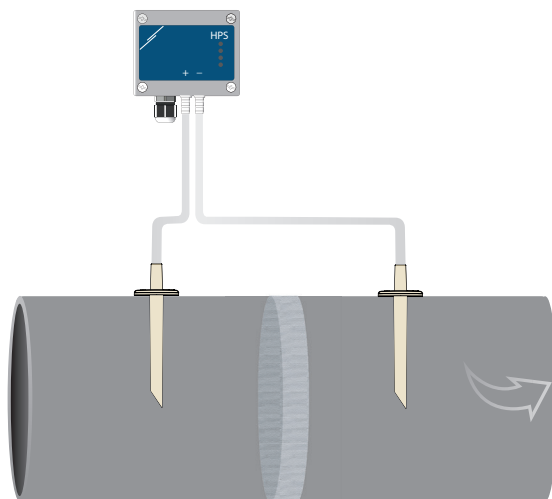
HPS-X--LP

Differential pressure transmitter



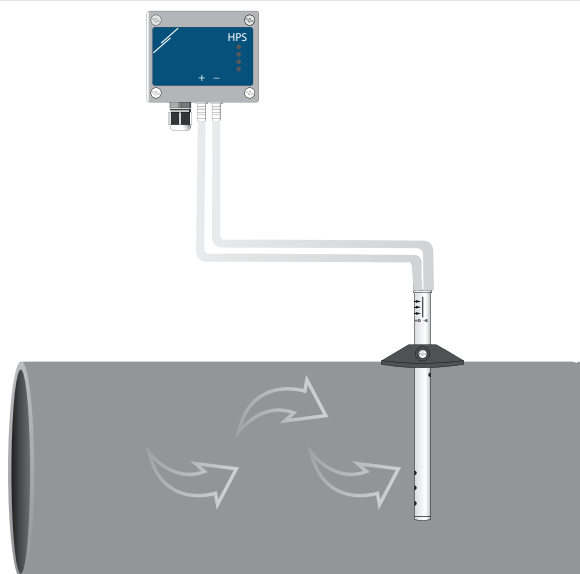
Application Example 1

Measuring differential pressure [Pa] or air flow volume [m³/h] using PSET-PVC



Application Example 2

Measuring supplied air volume [m³/h] or airflow velocity [m/s] using PSET-PT



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.

Global trade item numbers 14 (GTIN 14)

Packaging	HPS-F--LP	HPS-G--LP
Unit	5401003007747	5401003007792
Carton	5401003300992	5401003301036
Box	5401003501511	5401003501559



HPSPX-LP

Differential pressure PI controller

The HPSPX-LP series are high resolution differential pressure controllers (-125—125 Pa). The integrated PI control with anti-windup function offers the possibility to directly control EC motors / fans. They are equipped with a fully digital state-of-the-art pressure transducer designed for a wide range of applications. Zero point calibration and Modbus registers reset can be executed via a tact switch. They also feature integrated K-factor and an analogue / modulating output (0—10 VDC / 0—20 mA / 0—100 % PWM). All parameters are accessible via Modbus RTU (3SModbus software or Sensistant).

Key features

- Built-in digital high resolution differential pressure sensor
- Air velocity detection (by using an external PSET-PTX-200 Pitot tube connection set)
- Variety of operating ranges
- Selectable response time: 0,1—10 s
- Implemented K-factor
- Differential pressure, air volume flow⁽¹⁾ or air velocity⁽²⁾ readout via Modbus RTU
- Modbus registers reset function (to factory pre-set values)
- Selectable internal voltage source for PWM output: 3,3 / 12 VDC
- Four LED indicators for the status of the transmitter and the controlled values
- Modbus RTU communication
- Sensor calibration procedure
- Selectable minimum and maximum span
- Selectable analogue / modulating output
- Aluminium pressure connection nozzles



Article codes

Codes	Power supply	Maximum power consumption	Nominal power consumption	Imax	Operating range
HPSPF-LP	18—34 VDC	1,3W	1,26 W	71 mA	-125—125 Pa
HPSPG-LP	18—34 VDC	1,3 W	1,26 W	70 mA	
	15—24 VAC ±10 %	1 W	1 W		

Technical specifications

Selectable analogue / modulating output	0—10 VDC	$R_L \geq 50 \text{ k}\Omega$
	0—20 mA	$R_L \leq 500 \Omega$
	0—100 % PWM	PWM Frequency: 1 kHz, $R_L \geq 50 \text{ k}\Omega$
Operating modes	Differential pressure	
	Air volume	
	Air velocity	
Accuracy	±2 % of the operating range	
Protection standard	IP65 (according to EN 60529)	
Enclosure	ASA, grey (RAL9002)	
Ambient conditions	Temperature	-5—65 °C
	Rel. humidity	< 95 % rH (non-condensing)

Area of use

- Differential pressure, air volume flow⁽¹⁾ or air velocity⁽²⁾ measurement in HVAC applications
- Overpressurizing applications: clean rooms to avoid particle contamination or staircases for fire safety
- Underpressurizing applications: restaurant kitchens and biohazard laboratories
- Volume flow application: ensuring the minimum legal ventilation rate (m³/h) for buildings

Wiring and connections

Article type	HPSPF-LP	HPSPG-LP	
Vin	18—34 VDC	18—34 VDC	13—26 VAC
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	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.

⁽¹⁾ Only when K-factor of fan / drive is known. If K-factor is unknown, volume flow can be calculated via multiplying the duct cross-sectional area (A) by the air velocity (V) using the formula: $Q = A * V$

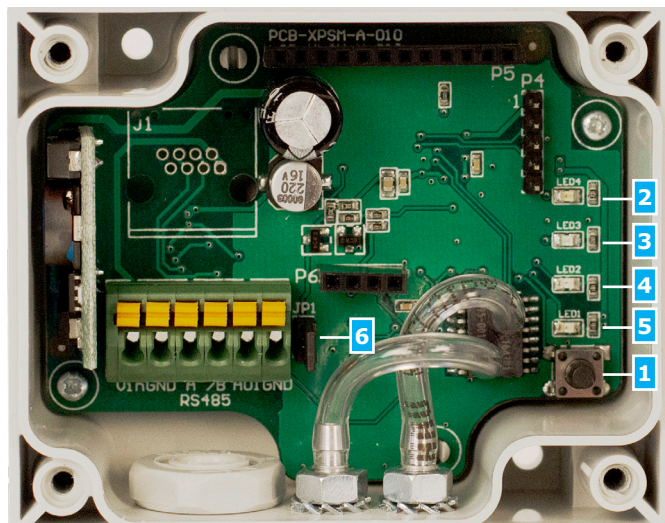
⁽²⁾ Only when duct cross section is known by using an external PSET-PTX-200 Pitot tube connection set

HPSPX-LP

Differential pressure PI controller



Settings



1 - Sensor calibration and Modbus register reset tact switch (SW1)		Push to start Modbus RTU register factory reset or sensor calibration
2 - Red LED4	Continuous	The differential pressure, air volume or air velocity has exceeded the minimum or maximum alarm threshold
	Blinking	Sensor element failure
3 - Yellow LED3	On	The differential pressure, air volume or air velocity has exceeded the minimum or maximum span threshold
4 - Green LED2	On	The actual differential pressure, air volume or air velocity is stabilized between the minimum span and maximum span
5 - Green LED1	On	Power OK; active Modbus RTU communication
6 - Internal pull-up resistor jumper JP1	*	PWM output is connected to internal +3,3 VDC or +12 VDC source**
		PWM has to be connected to external voltage source via external pull-up resistor

* indicates closed position of the jumper.

** The voltage source depends on the value in holding register 54.

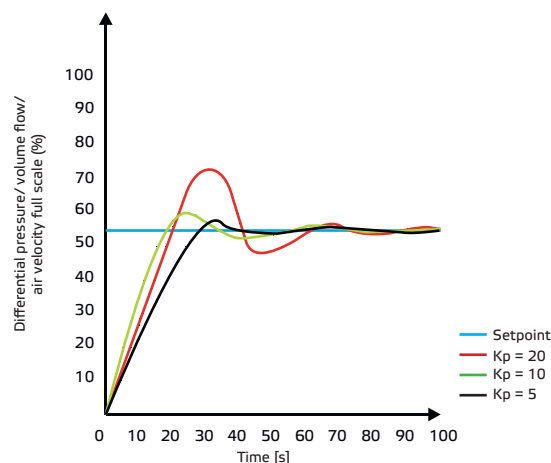
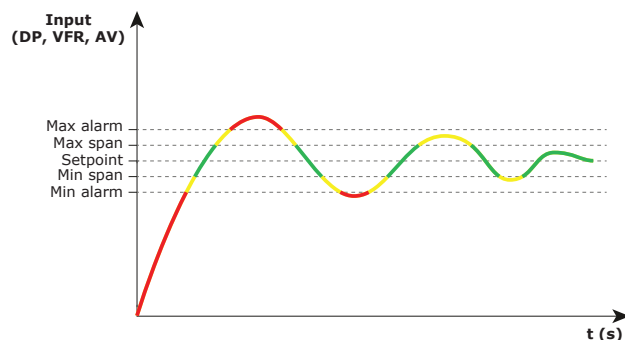
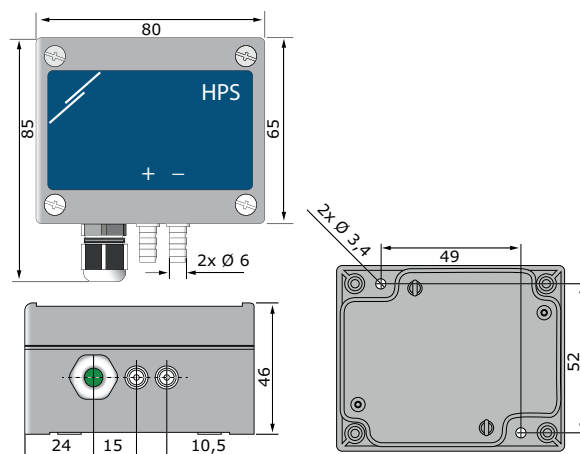
Standards

- EMC Directive 2014/30/EC:
 - 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/EC
- RoHS Directive 2011/65/EC

Fixing and dimensions

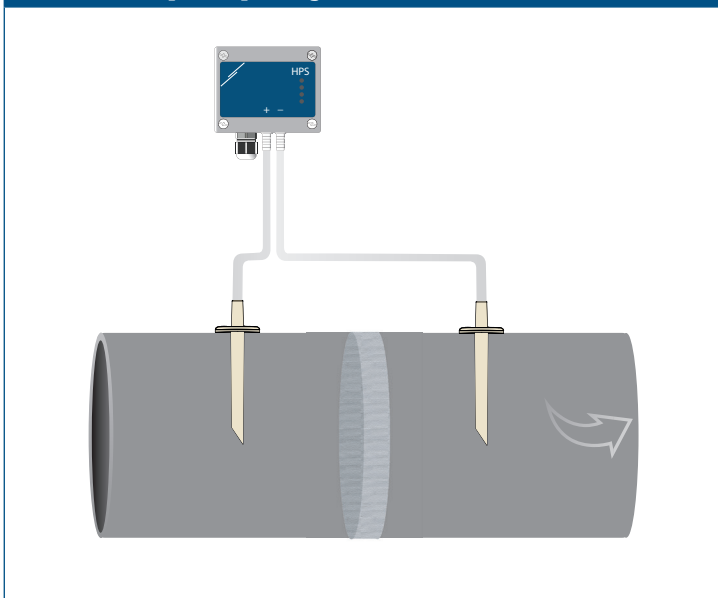


HPSPX-LP

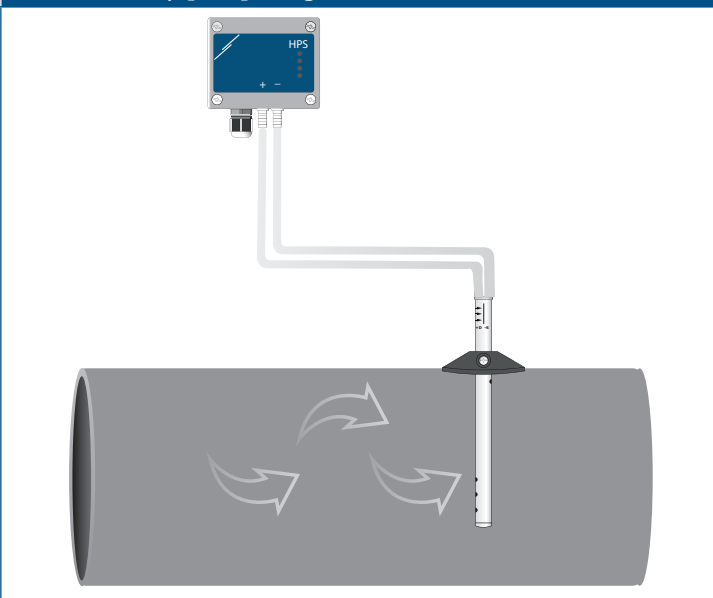
Differential pressure PI controller



Application 1: Measuring differential pressure [Pa] or air flow volume [m³/h] using PSET-PVC



Application 2: Measuring supplied air volume [m³/h] or airflow velocity [m/s] using PSET-PT



Modbus registers



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

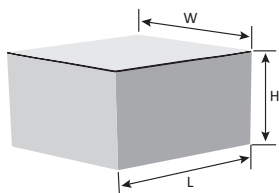


The parameters of the unit can be monitored / configured through the 3SModbus software platform. You can download it from the following link:

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

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

Packaging



Article code	Packaging	Length [mm]	Width [mm]	Height [mm]	Net weight	Gross weight
HPSPF-LP HPSPG-LP	Unit (1 pc.)	95	85	70	0,12 kg	0,13 kg
	Carton (10 pcs.)	495	185	87	1,20 kg	1,30 kg
	Box (60 pcs.)	590	380	280	7,2 kg	7,8 kg

Global trade item numbers (GTIN)

Packaging	HPSPF-LP	HPSPG-LP
Unit	05401003007938	05401003007983
Carton	05401003301173	05401003301227
Box	05401003501696	05401003501740

HPSAX-2

Differential pressure PI controller for damper actuators



Key features

- The differential pressure setpoint can be adjusted via Modbus RTU
- Built-in digital high resolution differential pressure sensor
- Air velocity control (by using an external PSET-PTX-200 Pitot tube connection set)
- Variety of operating ranges
- Selectable response time: 0,1—10 s
- Implemented K-factor
- Differential pressure, air volume⁽¹⁾ or air velocity⁽²⁾ control
- Modbus registers reset function (to factory pre-set values)
- Selectable internal voltage source for PWM output: 3,3 / 12 VDC
- Four LED indicators for the status of the controller and the controlled values
- Modbus RTU communication
- Sensor calibration procedure
- Selectable minimum and maximum span
- Selectable analogue / modulating output
- Aluminium pressure connection nozzles

Article codes

Codes	Power supply	Imax	Operating range
HPSAF-1K0 -2	18—34 VDC	75 mA	0—1.000 Pa
HPSAF-2K0 -2			0—2.000 Pa
HPSAG-1K0 -2	15—24 VAC / 18—34 VDC	120 mA / 50 mA	0—1.000 Pa
HPSAG-2K0 -2			0—2.000 Pa

Technical specifications

Selectable analogue / modulating output	0—10 VDC	$R_L \geq 50 \text{ k}\Omega$
	0—20 mA	$R_L \leq 500 \Omega$
	0—100 % PWM	PWM Frequency: 1 kHz, $R_L \geq 50 \text{ k}\Omega$
Minimum differential pressure range span	50 Pa	
Minimum volume flow range span	10 m ³ /h	
Minimum air velocity range span	1 m/s	
Operating modes	Differential pressure	
	Air volume	
	Air velocity	
Accuracy	±2 % of the operating range	
Protection standard	IP65 (according to EN 60529)	
Enclosure	ASA, grey (RAL9002)	
Ambient conditions	Temperature	-5—65 °C
	Rel. humidity	< 95 % rH (non-condensing)

The HPSA -2 series are high resolution differential pressure controllers. The integrated PI control with anti-windup function offers the possibility to directly control damper actuators. They are equipped with a fully digital state-of-the-art pressure transducer designed for a wide range of applications. Zero point calibration and Modbus registers reset can be executed via a tact switch. They also feature integrated K-factor and an analogue / modulating output (0—10 VDC / 0—20 mA / 0—100 % PWM). All parameters are accessible via Modbus RTU (3SModbus software or Sensistant).



Wiring and connections

Article type	HPSAF	HPSAG	
Vin	18—34 VDC	18—34 VDC	13—26 VAC
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	Cable cross section		1,5 mm ²

***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.

Area of use

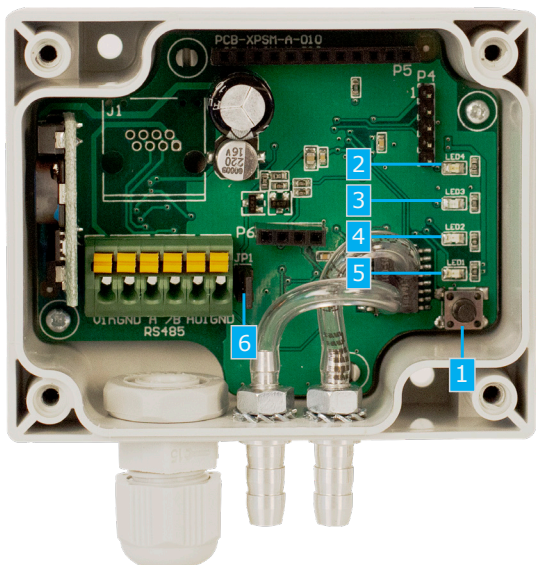
- Differential pressure, air velocity⁽¹⁾ or volume flow ⁽²⁾ measurement in HVAC applications
- Overpressurizing applications: clean rooms to avoid particle contamination or staircases for fire safety
- Underpressurizing applications: restaurant kitchens and biohazard laboratories
- Volume flow application: ensuring the minimum legal ventilation rate (m³/h) for buildings

⁽¹⁾ Only when K-factor of fan / drive is known. If K-factor is unknown, volume flow can be calculated via multiplying the duct cross-sectional area (A) by the air velocity (V) using the formula: $Q = A * V$.

⁽²⁾ By using an external PSET-PTX-200 Pitot tube connection set

HPSAX-2

Differential pressure PI controller for damper actuators



Settings

1 - Sensor calibration and Modbus register reset tact switch		Push to start the Modbus RTU register factory reset or the sensor calibration
2 - Red LED4	On	Measured value out of range
3 - Yellow LED3	On	Measured differential pressure, air volume or air velocity (depending on the selected setpoint) is in out of the setpoint span
4 - Green LED2	On	Measured differential pressure, air volume or air velocity (depending on the selected setpoint) is within the setpoint span
5 - Green LED1	On	Power OK; active Modbus RTU communication
6 - Internal pull-up resistor jumper JP1	*	Connection to internal voltage source

* indicates closed position of the jumper.

Modbus registers

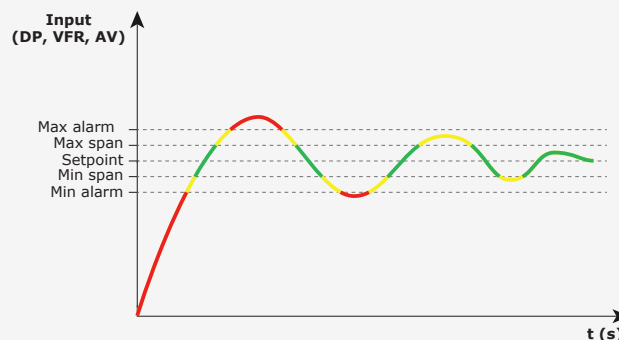


The Sensistant Modbus configurator allows you to easily monitor and/or configure Modbus parameters.

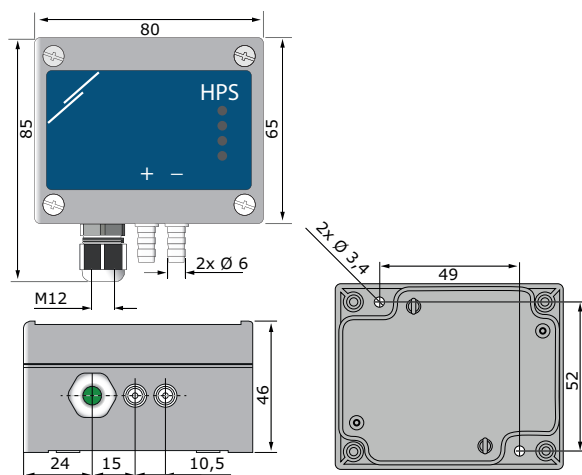
The parameters of the unit can be monitored / configured through the 3SModbus software platform. You can download it from the following link:
<https://www.sentera.eu/en/3SModbus>

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

Operational diagram



Fixing and dimensions



Standards



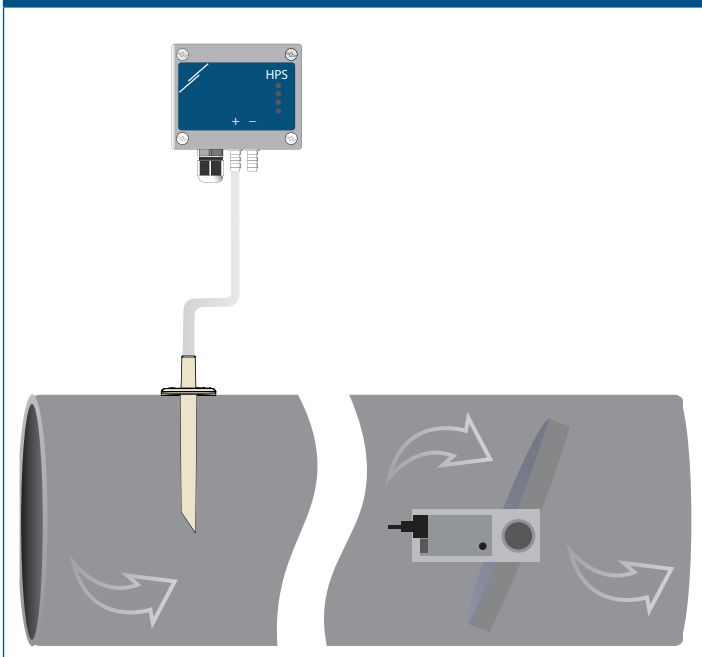
- Low Voltage Directive 2014/35/EC
 - EN 60529:1991 Degrees of protection provided by enclosures (IP Code) Amendment AC:1993 to EN 60529
 - EN 60730-1:2011 Automatic electrical controls for household and similar use - Part 1: General requirements
- EMC Directive 2014/30/EC
 - EN 60730-1:2011 Automatic 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
- RoHS Directive 2011/65/EC

HPSAX-2

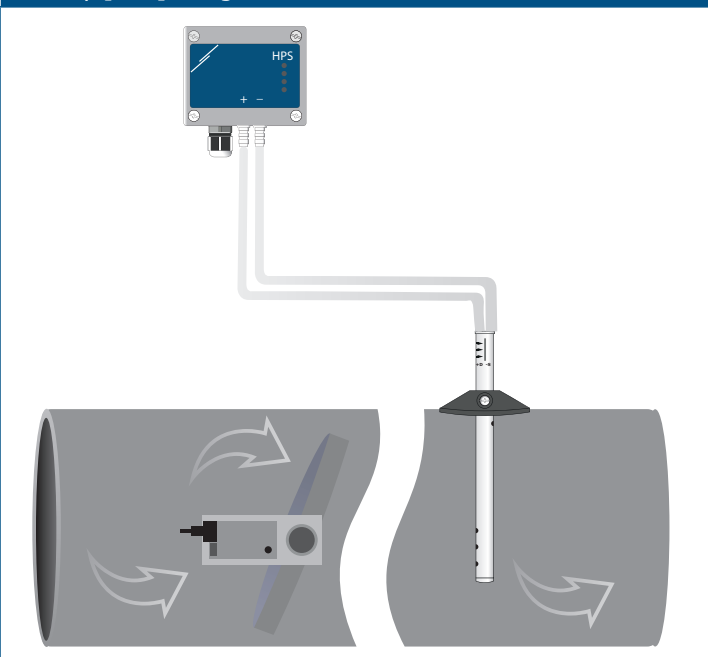
Differential pressure PI controller for damper actuators



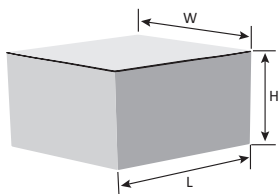
Application 1: Controlling air volume flow [m³/h] using PSET-PVC



Application 2: Controlling air volume flow [m³/h] or airflow velocity [m/s] using PSET-PT



Packaging



Article	Packaging	Length [mm]	Width [mm]	Height [mm]	Net weight	Gross weight
HPSA -2	Unit (1 pc.)	95	85	70	0,12 kg	0,13 kg
	Carton (10 pcs.)	495	185	87	1,20 kg	1,30 kg
	Box (60 pcs.)	590	380	280	7,2 kg	7,8 kg

Global trade item numbers (GTIN)

Packaging	HPSAF-1K0 -2	HPSAF-2K0 -2	HPSAG-1K0 -2	HPSAG-2K0 -2
Unit	05401003017616	05401003017623	05401003017630	05401003017647
Carton	05401003302323	05401003302330	05401003302347	05401003302354
Box	05401003503423	05401003503430	05401003503447	05401003503454

Dual high resolution differential pressure sensor with display



The DPD series are compact high resolution double differential pressure transmitters, which are equipped with two fully digital pressure transducers designed for a wide range of applications. Air velocity readout is available by connecting an external Pitot tube connection set. All parameters are accessible via Modbus RTU (3SModbus software or Sensistant). They also feature integrated K-factor and 2 analogue / modulating outputs (0—10 VDC / 0—20 mA / 0—100 % PWM).

Key features

- 2 analogue / modulating outputs - one for each sensor module
- Built-in digital high resolution differential pressure sensor
- Air velocity detection (by using an external PSET-PTX-200 Pitot tube connection set)
- Variety of operating ranges
- Selectable response time: 0,1—10 s
- Implemented K-factor
- Differential pressure, air volume⁽¹⁾ or air velocity⁽²⁾ readout via Modbus RTU
- Modbus registers reset function (to factory pre-set values)
- Selectable internal voltage source for PWM output: 3,3 / 12 VDC
- Modbus RTU communication
- Sensor calibration procedure
- Selectable minimum and maximum span
- Selectable analogue / modulating output type
- Aluminium pressure connection nozzles
- 4-digit 7-segment LED display for indicating differential pressure or air volume flow



Article codes

Codes	Power supply	Maximum power consumption	Nominal power consumption	Imax	Operating range
DPD-F-1K0	18—34 VDC	1,85 W	1,35 W	100 mA	0—1.000 Pa
DPD-F-2K0					0—2.000 Pa
DPD-F-4K0					0—4.000 Pa
DPD-F-10K					0—10.000 Pa
DPD-G-1K0	18—34 VDC /	1,85 W	1,35 W	105 mA	0—1.000 Pa
DPD-G-2K0					0—2.000 Pa
DPD-G-4K0	15—24 VAC ±10 %	3,4 W	2,5 W	230 mA	0—4.000 Pa
DPD-G-10K					0—10.000 Pa

Area of use

- Differential pressure, air velocity⁽¹⁾ or volume flow ⁽²⁾ measurement in HVAC applications
- Differential pressure / volume flow monitoring in clean rooms
- Clean air and non-aggressive, non-combustible gases

Technical specifications

2 selectable analogue / modulating outputs	0—10 VDC	$R_L \geq 50 \text{ k}\Omega$
	0—20 mA	$R_L \leq 500 \Omega$
	0—100 % PWM	PWM Frequency: 1 kHz, $R_L \geq 50 \text{ k}\Omega$
Minimum differential pressure range span	50 Pa	
Minimum volume flow range span	10 m³/h	
Minimum air velocity range span	1 m/s	
Operating modes	Differential pressure	
	Air volume	
	Air velocity	
Accuracy	±2 % of the operating range	
Protection standard	IP65 (according to EN 60529)	
Enclosure	ASA, grey (RAL9002)	
Ambient conditions	Temperature	-5—65 °C
	Rel. humidity	< 95 % rH (non-condensing)

⁽¹⁾ Only when K-factor of fan / drive is known. If K-factor is unknown, volume flow can be calculated via multiplying the duct cross-sectional area (A) by the air velocity (V) using the formula: $Q = A \cdot V$.

⁽²⁾ By using an external PSET-PTX-200 Pitot tube connection set

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.

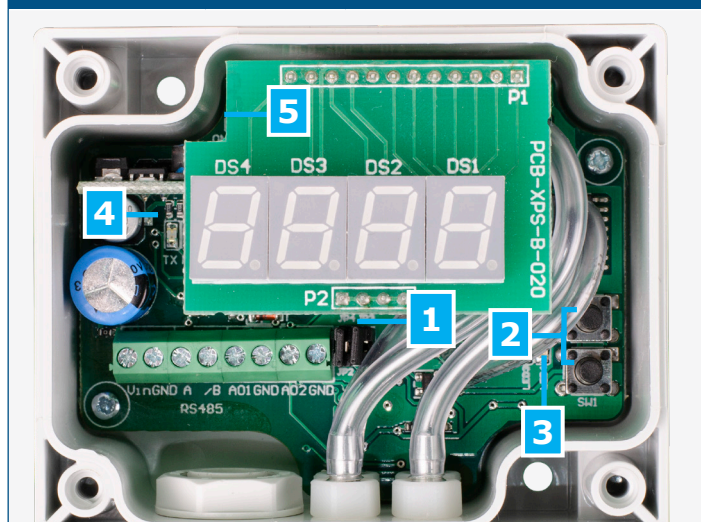
Standards

- EMC Directive 2014/30/EC:
 - 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/EC
- RoHS Directive 2011/65/EC





Settings and indications

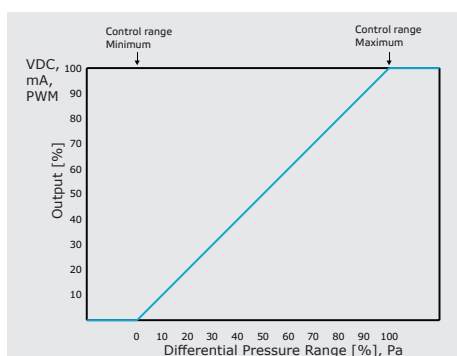


1 - Internal pull-up resistor jumpers (JP1 - for sensor 1, JP2 for sensor 2)		The relevant PWM output is connected to an internal +3,3 VDC or +12 VDC source**
2 - Sensor calibration and Modbus register reset tact switches (SW1, SW2)		The relevant PWM output has to be connected to external voltage source via external pull-up resistor
3 - Sensor calibration and Modbus registers reset indication	Blinking blue (as defined)	Modbus register factory reset or sensor calibration
4 - Modbus communication indication	Blinking green	Transmitting / receiving
5 - Operating LED indication	Solid on	Normal operation

* indicates closed position of the jumper.

** The voltage source depends on the value in holding register 54 and 74.

Operational diagram(s)



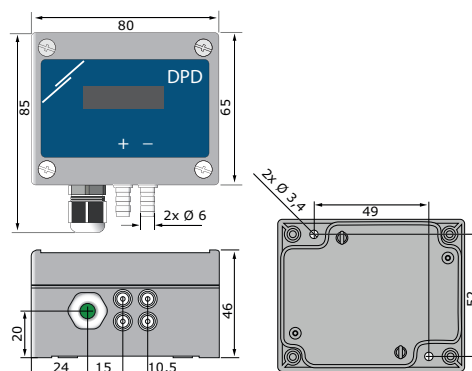
Wiring and connections

Article type	DPD-F	DPD-G	
Vin	18—34 VDC	18—34 VDC	13—26 VAC
GND	Ground	Common ground*	AC ~*
A	Modbus RTU (RS485), signal A		
/B	Modbus RTU (RS485), signal /B		
AO1	Analogue / modulating output 1 (0—10 VDC / 0—20 mA / PWM)		
GND	Ground AO1	Common ground*	
AO2	Analogue / modulating output 2 (0—10 VDC / 0—20 mA / PWM)		
GND	Ground AO2	Common ground*	
Connections	Cable cross section	1,5 mm²	
	Cable gland clamping range	3—6 mm	
	Connecting tube diameter	6 mm	

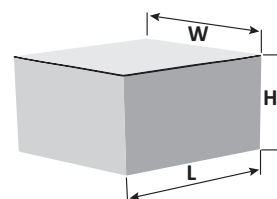
***Attention!** The -F version of the product is not suited for 3-wire connection. It has separate grounds for power supply and analogue output. Connecting both grounds together might result in incorrect measurements. Minimum 4 wires are required to connect -F type sensors.

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.

Fixing and dimensions



Packaging



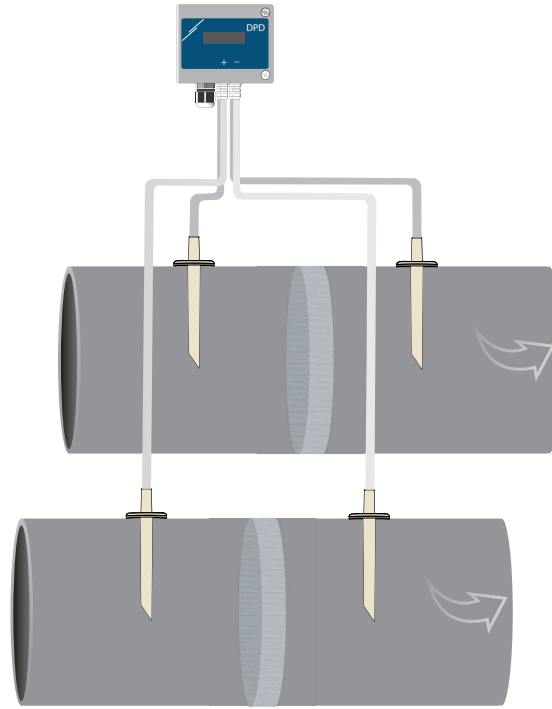
Article	Packaging	Length [mm]	Width [mm]	Height [mm]	Net weight	Gross weight
DPD	Unit (1 pc.)	95	85	70	0,15 kg	0,21 kg
	Carton (10 pcs.)	495	185	87	1,50 kg	2,23 kg
	Box (60 pcs.)	590	380	280	9 kg	13,95 kg



DPD

Dual high resolution differential pressure sensor with display

Application example: Measuring differential pressure [Pa] or air flow volume [m³/h] using PSET-PVC



Global Trade Item Number (GTIN)				
Packaging	DPD-F-1K0	DPD-F-2K0	DPD-F-4K0	DPD-F-10K
Unit	05401003001349	05401003001356	05401003001363	05401003001332
Carton	05401003300282	05401003300299	05401003300305	05401003300275
Box	05401003500286	05401003500293	05401003500309	05401003500279
Packaging	DPD-G-1K0	DPD-G-2K0	DPD-G-4K0	DPD-G-10K
Unit	05401003001387	05401003001394	05401003001400	05401003001370
Carton	05401003300329	05401003300336	05401003300343	05401003300312
Box	05401003500323	05401003500330	05401003500347	05401003500316



DPS-2

Differential pressure transmitter

The DPS -2 series are differential pressure transmitters, which are equipped with a fully digital pressure transducer designed for a wide range of applications. Air flow velocity readout is available by connecting an external Pitot tube connection set. All parameters are accessible via Modbus RTU (3SModbus software or Sensistant). They also feature integrated K-factor and an analogue / modulating output (0–10 VDC / 0–20 mA / 0–100 % PWM).

Key features

- 4-digit 7-segment LED display for indicating differential pressure or volume flow
- Built-in digital high resolution differential pressure sensor
- Air velocity detection (by using an external PSET-PTX-200 Pitot tube connection set)
- Variety of operating ranges
- Selectable response time: 0,1–10 s
- Implemented K-factor
- Differential pressure, volume flow⁽¹⁾ or air velocity⁽²⁾ readout via Modbus RTU
- Modbus registers reset function (to factory pre-set values)
- Selectable internal voltage source for PWM output: 3,3 / 12 VDC
- Four LEDs for transmitter status indication
- Modbus RTU communication
- Sensor calibration procedure
- Selectable minimum and maximum operating ranges
- Selectable analogue / modulating output
- Aluminium pressure connection nozzles

Technical specifications

Selectable analogue / modulating output	0–10 VDC mode	min. load 50 kΩ ($R_L \geq 50 \text{ k}\Omega$)
	0–20 mA	max. load 500 Ω ($R_L \leq 500 \text{ }\Omega$)
	PWM	PWM Frequency: 1 kHz, min. load 50 kΩ ($R_L \geq 50 \text{ k}\Omega$)
Minimum differential pressure range span	50 Pa	
Minimum volume flow range span	10 m³/h	
Minimum air velocity range span	1 m/s	
Operating modes	Differential pressure	
	Volume flow ⁽¹⁾	
	Air velocity ⁽²⁾	
Accuracy	±2 % of the operating range	
Protection standard	IP65 (according to EN 60529)	
Ambient conditions	Temperature	–5–65 °C
	Rel. humidity	< 95 % rH (non-condensing)



Area of use

- Differential pressure, air velocity⁽²⁾ or volume flow ⁽¹⁾ measurement in HVAC applications
- Overpressurizing applications: clean rooms to avoid particle contamination or staircases for fire safety
- Underpressurizing applications: restaurant kitchens and biohazard laboratories
- Volume flow application: ensuring the minimum legal ventilation rate (m³/h) for buildings

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.

Article codes

Codes	Power supply	Maximum power consumption	Nominal power consumption	Imax	Operating range
DPS-F-1K0 -2	18–34 VDC	1,8 W	1,35 W	100 mA	0–1.000 Pa
DPS-F-2K0 -2					0–2.000 Pa
DPS-F-4K0 -2					0–4.000 Pa
DPS-F-10K -2					0–10.000 Pa
DPS-G-1K0 -2	18–34 VDC /	1,71 W	1,28 W	95 mA	0–1.000 Pa
DPS-G-2K0 -2					0–2.000 Pa
DPS-G-4K0 -2	15–24 VAC ±10 %	3,3 W	2,5 W	220 mA	0–4.000 Pa
DPS-G-10K -2					0–10.000 Pa

⁽¹⁾ Only when K-factor of fan / drive is known. If K-factor is unknown, volume flow can be calculated via multiplying the duct cross-sectional area (A) by the air velocity (V) using the formula: $Q = A \cdot V$.

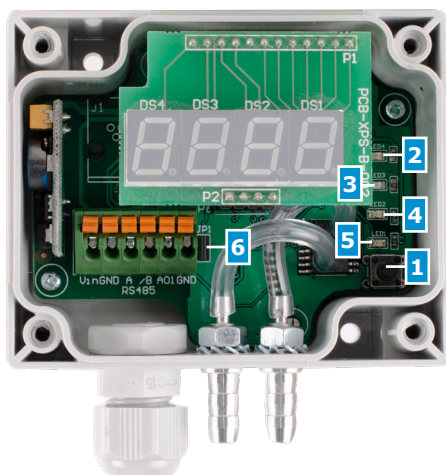
⁽²⁾ By using an external PSET-PTX-200 Pitot tube connection set

DPS-2

Differential pressure transmitter



Settings

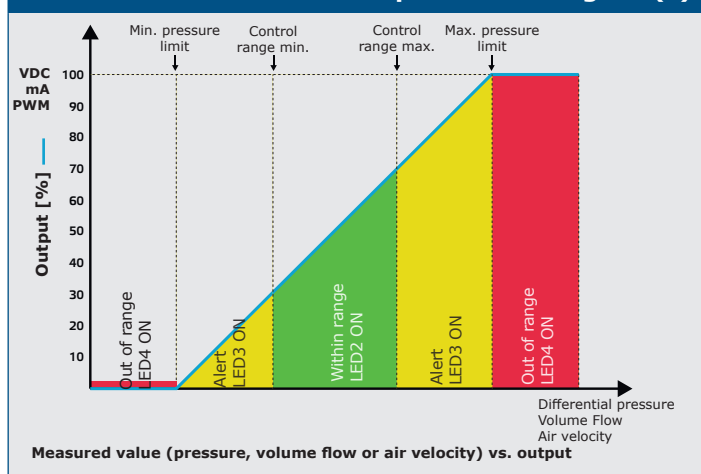


1 - Sensor calibration and Modbus register reset tact switch (SW1)		Push to start the Modbus RTU register factory reset or the sensor calibration
2 - Red LED4	Continuous	Measured differential pressure, volume flow or air velocity is out of range
	Blinking	Sensor element failure
3 - Yellow LED3	On	Measured differential pressure, volume flow or air velocity is in the alert range
4 - Green LED2	On	Measured differential pressure, volume flow or air velocity is within range
5 - Green LED1	On	Power OK; active Modbus RTU communication
6 - Internal pull-up resistor jumper JP1	*	PWM output is connected to internal +3,3 VDC or +12 VDC source**
		PWM has to be connected to external voltage source via external pull-up resistor

* indicates closed position of the jumper.

** The voltage source depends on the value in holding register 54.

Operational diagram(s)



Standards



- EMC Directive 2014/30/EC:
 - 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/EC
- RoHS Directive 2011/65/EC

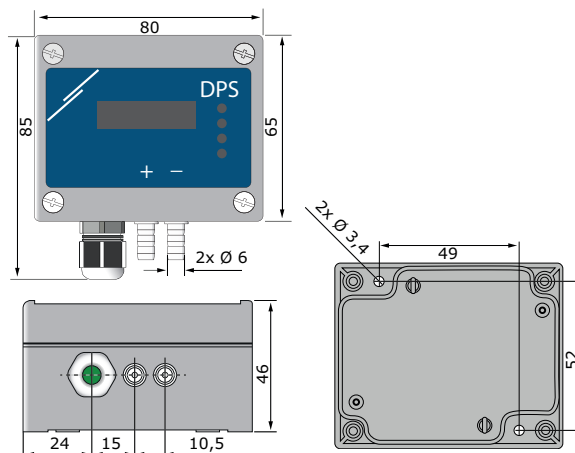
Wiring and connections

Article type	DPS-F	DPS-G	
Vin	18–34 VDC	18–34 VDC	13–26 VAC
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	Cable cross section	1,5 mm ²	
	Cable gland clamping range	3–6 mm	
	Connecting tube diameter	6 mm	

***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.

Fixing and dimensions

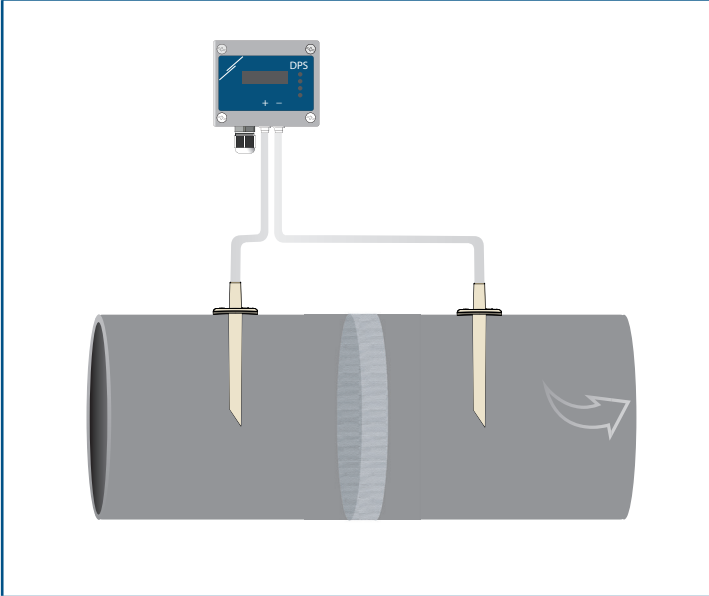




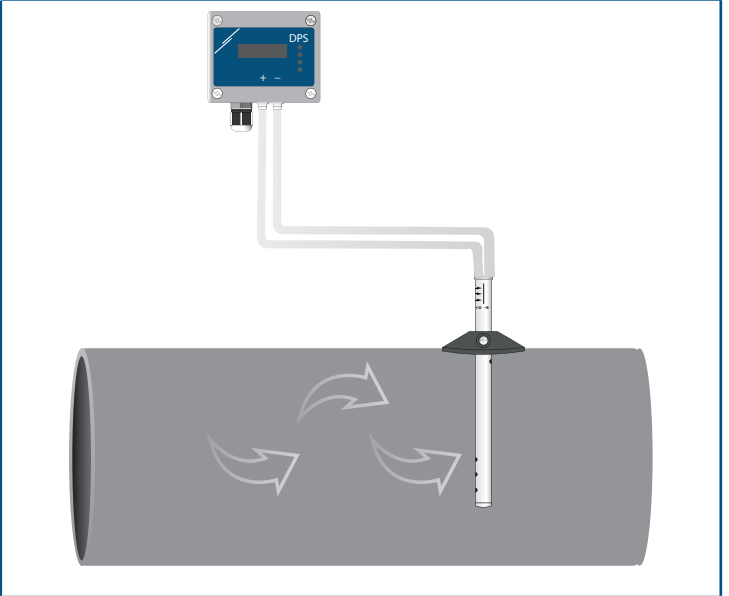
DPS -2

Differential pressure transmitter

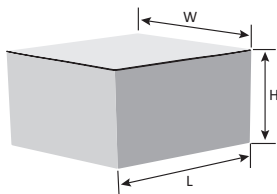
Application 1: Measuring differential pressure [Pa] or volume flow [m³/h] using PSET-PVC



Application 2: Measuring volume flow [m³/h] or air velocity [m/s] using PSET-PT



Packaging



Article	Packaging	Length [mm]	Width [mm]	Height [mm]	Net weight	Gross weight
DPS -2	Unit (1 pc.)	85	95	70	0,14 kg	0,16 kg
	Carton (10 pcs.)	485	175	77	1,43 kg	1,78 kg
	Box (60 pcs.)	580	370	270	8,58 kg	11,67 kg

Global trade item numbers (GTIN)

Article	Unit	Carton	Box
DPS-F-1K0 -2	05401003001523	05401003300374	05401003500378
DPS-F-2K0 -2	05401003001530	05401003300381	05401003500385
DPS-F-4K0 -2	05401003001547	05401003300398	05401003500392
DPS-F-10K -2	05401003001516	05401003300367	-
DPS-G-1K0 -2	05401003001578	05401003300428	05401003500422
DPS-G-2K0 -2	05401003001585	05401003300435	05401003500439
DPS-G-4K0 -2	05401003001592	05401003300442	05401003500446
DPS-G-10K -2	05401003001561	05401003300411	05401003500415



DPS-M-2

Differential pressure transmitter with display, PoM

The DPS-M -2 series are differential pressure transmitters, which are equipped with a fully digital pressure transducer designed for a wide range of applications. Air velocity readout is available by connecting an external Pitot tube connection set. They are Power over Modbus supplied and parameters are accessible via Modbus RTU (3SModbus software or Sensistant).

Key features

- Built-in digital high resolution differential pressure sensor
- RJ45 connector on the PCB
- Air velocity can be measured via Modbus RTU (by using an external PSET-PTX-200 Pitot tube connection set)
- Variety of operating ranges
- Selectable response time: 0,1—10 s
- Implemented K-factor
- Differential pressure, volume flow⁽¹⁾ or air velocity⁽²⁾ readout via Modbus RTU
- 4-digit 7-segment LED display for indicating differential pressure or volume flow
- Selectable minimum and maximum operating ranges
- Modbus registers reset function (to factory pre-set values)
- Four LED indicators for the status of the transmitter and the controlled values
- Modbus RTU communication
- Sensor calibration procedure via tact switch
- Aluminium pressure connection nozzles



Article codes

Codes	Power supply	Maximum power consumption	Nominal power consumption	Imax	Operating range
DPS-M-1K0-2	24 VDC	1,44 W	1,08 W	60 mA	0—1.000 Pa
DPS-M-2K0-2					0—2.000 Pa
DPS-M-4K0-2					0—4.000 Pa
DPS-M-10K-2					0—10.000 Pa

Technical specifications

Power supply	24 VDC (Power over Modbus)	
Output	Modbus RTU (RS485)	
Operating modes	Differential pressure	
	Air volume	
	Air velocity	
Accuracy	±2 % of the operating range	
Protection standard	IP65 (according to EN 60529)	
Enclosure	ASA, grey (RAL9002)	
Ambient conditions	Temperature	-5—65 °C
	Rel. humidity	< 95 % rH (non-condensing)

Area of use

- Differential pressure, air velocity⁽¹⁾ or volume flow ⁽²⁾ measurement in HVAC applications
- Overpressurizing applications: clean rooms to avoid particle contamination or staircases for fire safety
- Underpressurizing applications: restaurant kitchens and biohazard laboratories
- Volume flow application: ensuring the minimum legal ventilation rate (m³/h) for buildings

Standards



- EMC Directive 2014/30/EC:
 - 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/EC
- RoHS Directive 2011/65/EC

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>

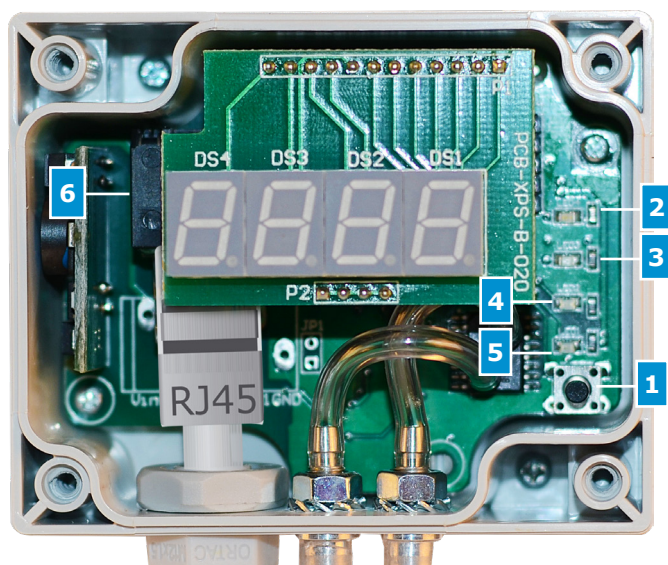
For more information about the Modbus registers, please refer to the product Modbus Register Map.

⁽¹⁾ Only when K-factor of fan / drive is known. If K-factor is unknown, volume flow can be calculated via multiplying the duct cross-sectional area (A) by air velocity (V) using the formula: $Q = A \cdot V$.

⁽²⁾ By using an external PSET-PTX-200 Pitot tube connection set

DPS-M-2

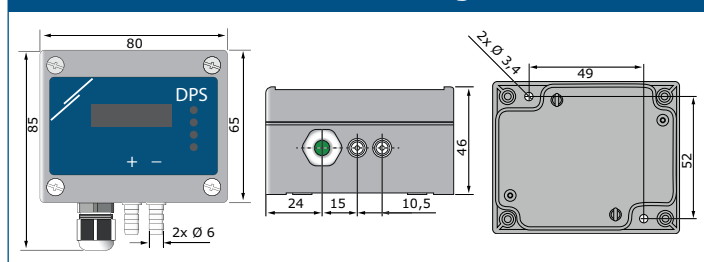
Differential pressure transmitter with display, PoM



Settings

1 - Sensor calibration and Modbus register reset tact switch (SW1)		Push to start the Modbus RTU register factory reset or sensor calibration
2 - Red LED4	Continuous	Measured differential pressure, volume flow or air velocity is out of range
	Blinking	Sensor element failure
3 - Yellow LED3	On	Measured differential pressure, volume flow or air velocity is in the alert range
4 - Green LED2	On	Measured differential pressure, volume flow or air velocity is within range
5 - Green LED1	On	Power OK; active Modbus RTU communication
6 - RJ45 Socket		Modbus RTU communication and 24 VDC power supply: Blinking green LED on the left indicates that data is transmitted; Blinking green LED on the right indicates that data is received

Fixing and dimensions

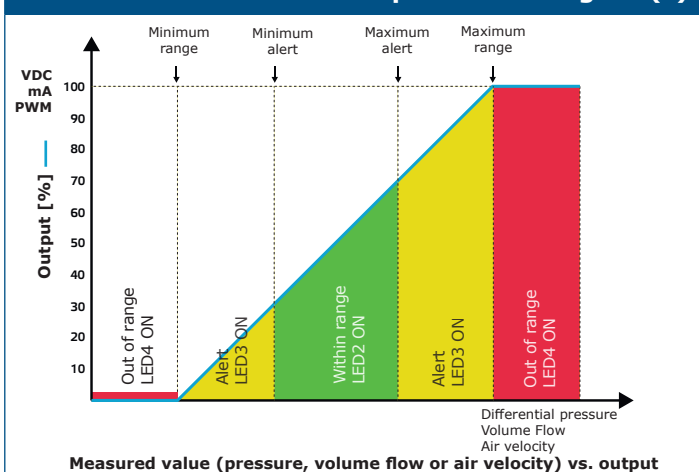


Wiring and connections

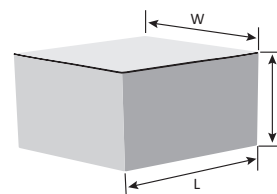
24 VDC	Supply voltage 24 VDC
GND	Ground
A	Modbus RTU communication, signal A
/B	Modbus RTU communication, signal /B



Operational diagram(s)



Packaging



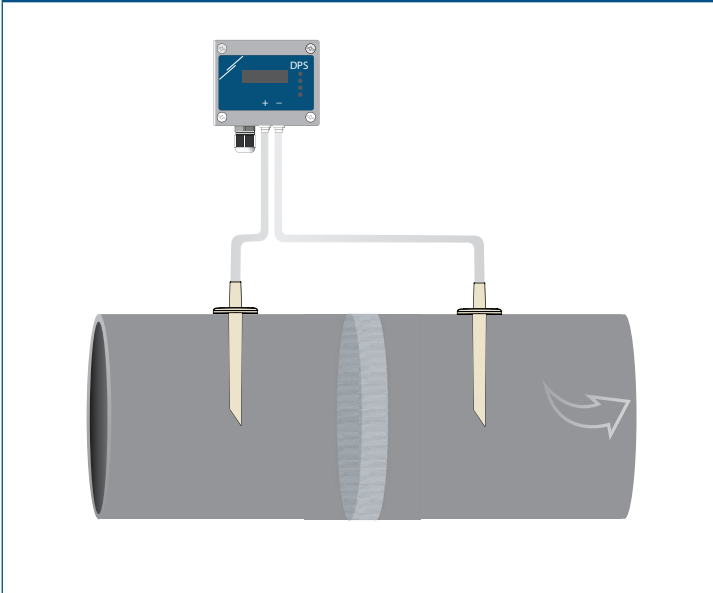
Article	Packaging	Length [mm]	Width [mm]	Height [mm]	Net weight	Gross weight
DPS-M-XXX-2	Unit (1 pc.)	95	85	70	0,13 kg	0,14 kg
	Carton (10 pcs.)	495	185	87	1,30 kg	1,40 kg
	Box (60 pcs.)	590	380	280	7,80 kg	8,40 kg



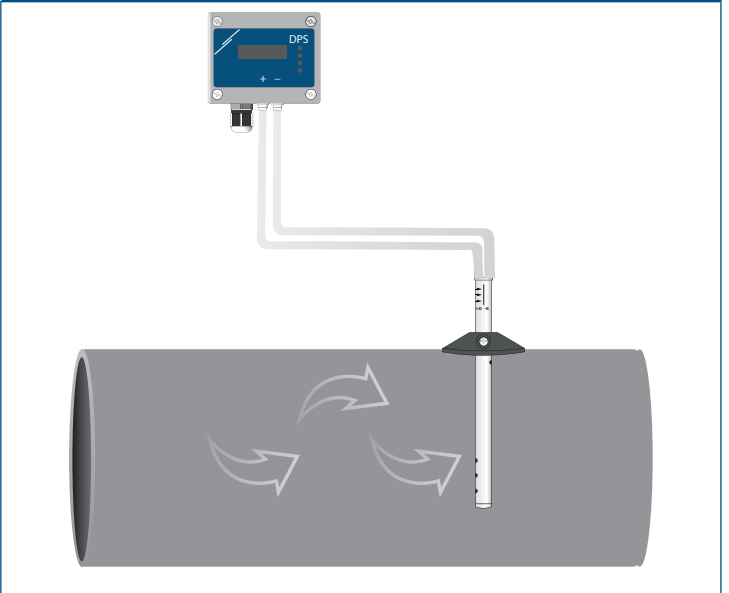
DPS-M-2

Differential pressure transmitter with display, PoM

Application 1: Measuring differential pressure [Pa] or volume flow [m³/h] using PSET-PVC connection set



Application 2: Measuring supplied volume flow [m³/h] or air velocity [m/s] using PSET-PT Pitot tube connection set





DPSP-2

Differential pressure PI controller

The DPSP -2 series are high resolution differential pressure controllers with analogue / modulating output. The integrated PI control with anti-windup function offers the possibility to directly control EC motors / fans. They are equipped with a fully digital state-of-the-art pressure transducer designed for a wide range of applications. Zero point calibration and Modbus registers reset can be executed via a tactile switch. All parameters are accessible via Modbus RTU (3SModbus software or Sensistant).

Key features

- 4-digit 7-segment LED display for indicating differential pressure, air volume flow and air velocity
- Built-in digital high resolution differential pressure sensor
- PI control with anti wind-up function and auto-tune function
- Active setpoint selection between differential pressure, air flow volume or air velocity
- Air velocity control (by using an external PSET-PTX-200 Pitot tube connection set)
- Minimum and maximum output value selection
- Integrated K-factor
- Selectable response time: 0,1–10 s
- Differential pressure, air volume⁽¹⁾ or air velocity⁽²⁾ readout via Modbus RTU
- Modbus registers reset function (to factory pre-set values)
- Selectable internal voltage source for PWM output: 3,3 / 12 VDC
- Four LEDs with light guides for controller status indication
- Modbus RTU communication
- Zero-point calibration via tact switch
- Selectable minimum and maximum setpoint span
- Selectable analogue / modulating output
- Aluminium pressure connection nozzles



Article codes

Codes	Power supply	Maximum power consumption	Nominal power consumption	Imax	Operating range
DPSPF-1K0-2	18–34 VDC	1,8 W	1,35 W	100 mA	0–1.000 Pa
DPSPF-2K0-2					0–2.000 Pa
DPSPF-4K0-2					0–4.000 Pa
DPSPF-10K-2	18–34 VDC	1,71 W	1,28 W	95 mA	0–10.000 Pa
DPSPG-1K0-2					0–1.000 Pa
DPSPG-2K0-2					0–2.000 Pa
DPSPG-4K0-2	15–24 VAC ±10 %	3,3 W	2,475 W	220 mA	0–4.000 Pa
DPSPG-10K-2					0–10.000 Pa

Technical specifications

Selectable analogue / modulating output	0–10 VDC	$R_L \geq 50 \text{ k}\Omega$
	0–20 mA	$R_L \leq 500 \text{ }\Omega$
	0–100 % PWM	PWM Frequency: 1 kHz, $R_L \geq 50 \text{ k}\Omega$
Minimum differential pressure range span	50 Pa	
Minimum volume flow range span	10 m³/h	
Minimum air velocity range span	1 m/s	
Operating modes	Differential pressure	
	Air volume	
	Air velocity	
Accuracy	±2 % of the operating range	
Protection standard	IP65 (according to EN 60529)	
Enclosure	ASA, grey (RAL9002)	
Ambient conditions	Temperature	–5–65 °C
	Rel. humidity	< 95 % rH (non-condensing)

⁽¹⁾ Only when K-factor of fan / drive is known. If K-factor is unknown, air volume flow can be calculated via multiplying the duct cross-sectional area (A) by the air flow velocity (V) using the formula: $Q = A \cdot V$

⁽²⁾ By using an external PSET-PTX-200 Pitot tube connection set

Area of use

- Differential pressure, air velocity⁽¹⁾ or volume flow ⁽²⁾ measurement in HVAC applications
- Overpressurizing applications: clean rooms to avoid particle contamination or staircases for fire safety
- Underpressurizing applications: restaurant kitchens and biohazard laboratories
- Volume flow application: ensuring the minimum legal ventilation rate (m³/h) for buildings

Wiring and connections

Article type	DPSPF -2	DPSPG -2	
Vin	18–34 VDC	18–34 VDC	13–26 VAC
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	Cable cross section		1,5 mm²

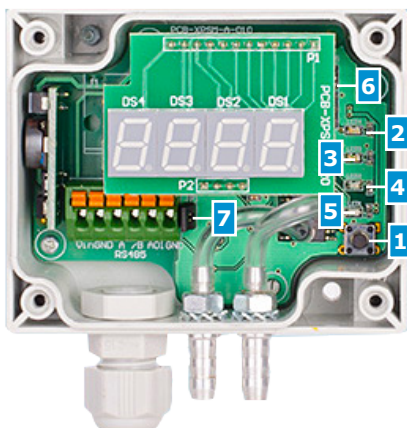
***Attention!** The -F version of the product is not suited for 3-wire connection. It has separate grounds for power supply and analogue output. Connecting both grounds together might result in incorrect measurements. Minimum 4 wires are required to connect -F type sensors. The -G version is intended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



DPSP-2

Differential pressure PI controller

Settings



1 - Sensor calibration and Modbus register reset tact switch (SW1)		Push to start the Modbus RTU register factory reset or the sensor calibration
2 - Red LED4	On	Measured value (pressure, volume or air velocity depending on operating mode selected) is in the alarm range
	Blinking	Sensor element failure or no feedback
3 - Yellow LED3	On	Measured differential pressure, air volume or air velocity (depending on the selected setpoint) is out of the setpoint span
4 - Green LED2	On	Measured differential pressure, air volume or air velocity (depending on the selected setpoint) is within the setpoint span
5 - Green LED1	On	Power OK; active Modbus RTU communication
6 - Modbus holding registers reset jumper (P4)*		Put a jumper onto pins 1 and 2 for at least 20 s to reset holding registers 1—3
7 - Internal pull-up resistor jumper JP1		Connection to internal voltage source

* The reset jumper is not included in the set
** indicates closed position of the jumper.

Modbus registers

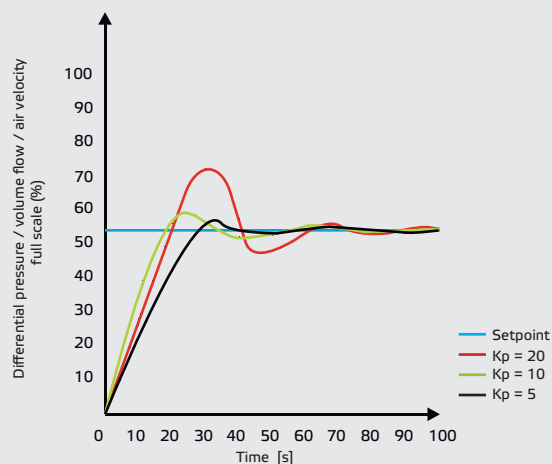
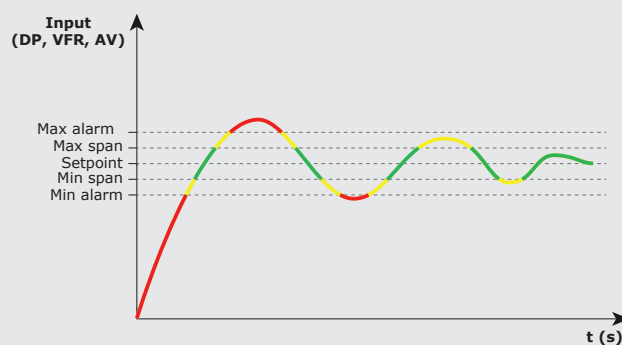


The Sensistant Modbus configurator allows you to easily monitor and/or configure Modbus parameters.

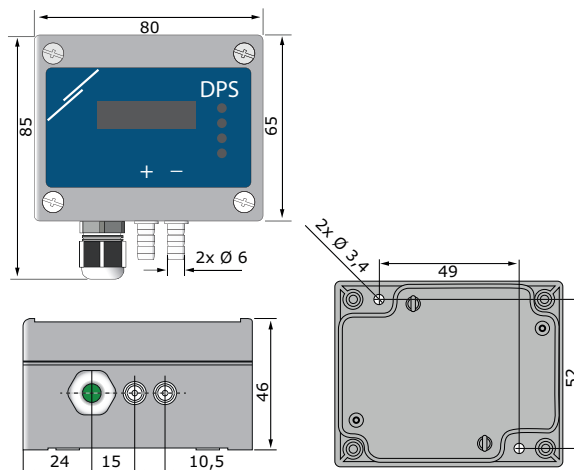
The parameters of the unit can be monitored / configured through the 3SModbus software platform. You can download it from the following link:
<https://www.sentera.eu/en/3SMCenter>

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

Operational diagrams



Fixing and dimensions

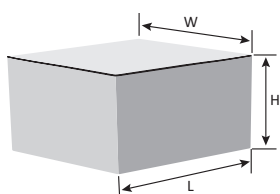




DPSP -2

Differential pressure PI controller

Packaging



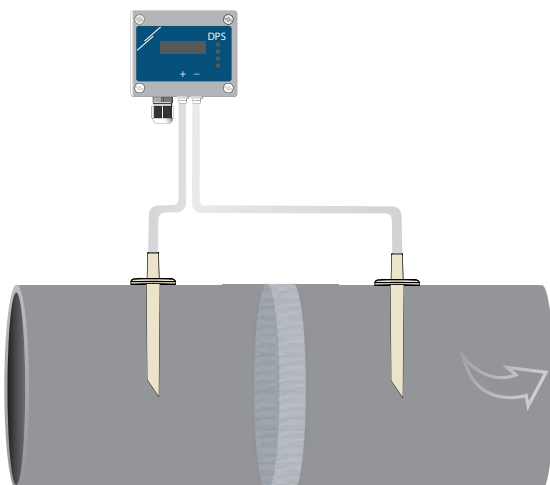
Article	Packaging	Length [mm]	Width [mm]	Height [mm]	Net weight	Gross weight
DPSP -2	Unit (1 pc.)	95	85	70	0,132 kg	0,142 kg
	Carton (10 pcs.)	495	185	87	1,32 kg	1,55 kg
	Box (60 pcs.)	590	380	280	7,92 kg	9,93 kg

Standards

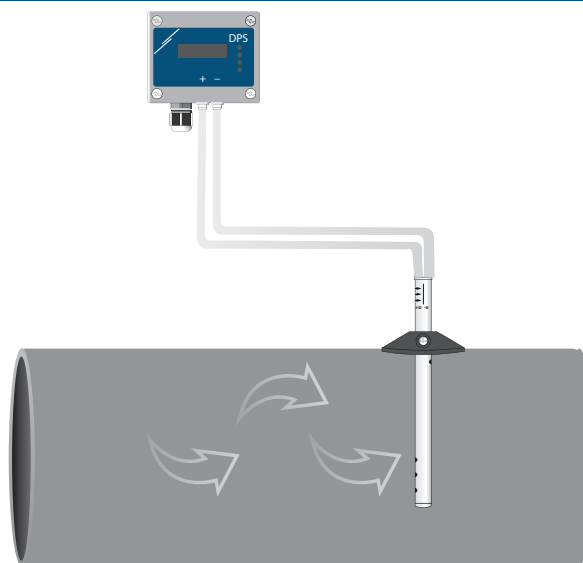


- EMC directive 2014/30/EU:
 - EN 61326-1:2013 Electrical equipment for measurement, control and laboratory use - EMC requirements - Part 1: General requirements
 - EN 61326-2-3:2013 Electrical equipment for measurement, control and laboratory use - EMC requirements - Part 2-3: Particular requirements - Test configuration, operational conditions and performance criteria for transducers with integrated or remote signal conditioning
- WEEE Directive 2012/19/EC
- RoHS Directive 2011/65/EC

Application 1: Measuring differential pressure [Pa] or volume flow [m³/h] using PSET-PVC connection set



Application 2: Measuring supplied volume flow [m³/h] or air velocity [m/s] using PSET-PT Pitot tube connection set





DPS-X--LP

Differential pressure transmitter with display

The DPS-X--LP series are differential pressure transmitters (-125—125 Pa), which are equipped with a fully digital pressure transducer designed for a wide range of applications. Air flow velocity readout is available by connecting an external Pitot tube connection set. All parameters are accessible via Modbus RTU (3SModbus software or Sensistant). They also feature integrated K-factor and an analogue / modulating output (0—10 VDC / 0—20 mA / 0—100 % PWM).

Key features

- 4-digit 7-segment LED display for indicating differential pressure or air volume flow
- Built-in digital high resolution differential pressure sensor
- Air velocity detection (by using an external PSET-PTX-200 Pitot tube connection set)
- Variety of operating ranges
- Selectable response time: 0,1—10 s
- Implemented K-factor
- Differential pressure, air volume⁽¹⁾ or air velocity⁽²⁾ readout via Modbus RTU
- Modbus registers reset function (to factory pre-set values)
- Selectable internal voltage source for PWM output: 3,3 / 12 VDC
- Four LEDs for transmitter status indication
- Modbus RTU communication
- Sensor calibration procedure
- Selectable minimum and maximum operating ranges
- Selectable analogue / modulating output
- Aluminium pressure connection nozzles



Article codes

Codes	Power supply	Maximum power consumption	Nominal power consumption	Imax	Operating range
DPS-F--LP	18—34 VDC	1,8 W	1,35 W	100 mA	-125—125 Pa
DPS-G--LP	18—34 VDC	1,71 W	1,28 W	95 mA	
	15—24 VAC ±10 %	3,3 W	2,475 W	220 mA	

Technical specifications

Selectable analogue / modulating output	0—10 VDC	min. load 50 kΩ (R _L ≥ 50 kΩ)
	0—20 mA	max. load 500 Ω (R _L ≤ 500 Ω)
	0—100 % PWM	PWM Frequency: 1 kHz, R _L ≥ 50 kΩ
Minimum differential pressure range span	10 Pa	
Minimum volume flow range span	10 m³/h	
Minimum air velocity range span	1 m/s	
Operating modes	Differential pressure	
	Air volume ⁽¹⁾	
	Air velocity ⁽²⁾	
Accuracy	±2 % of the operating range	
Protection standard	IP65 (according to EN 60529)	
Enclosure	ASA, grey (RAL9002)	
Ambient conditions	Temperature	-5—65 °C
	Rel. humidity	< 95 % rH (non-condensing)

Standards

- EMC Directive 2014/30/EC:
 - 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/EC
- RoHS Directive 2011/65/EC



Area of use

- Building and controlled ventilation
- Differential pressure, Air flow volume ⁽¹⁾ or air flow velocity ⁽²⁾ measurement in HVAC applications
- Differential pressure / air flow monitoring in clean rooms
- Clean air and non-aggressive, non-combustible gases

Wiring and connections

Article type	DPS-F--LP	DPS-G--LP	
Vin	18—34 VDC	18—34 VDC	13—26 VAC
	Ground	Common ground*	AC ~*
GND	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	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.

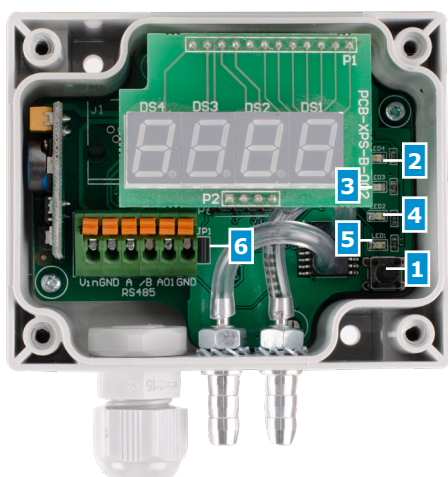
⁽¹⁾ Only when K-factor of fan / drive is known. If K-factor is unknown, air volume flow can be calculated via multiplying the duct cross-sectional area (A) by the air flow velocity (V) using the formula: Q = A * V
⁽²⁾ By using an external PSET-PTX-200 Pitot tube connection set.



DPS-X--LP

Differential pressure transmitter with display

Settings

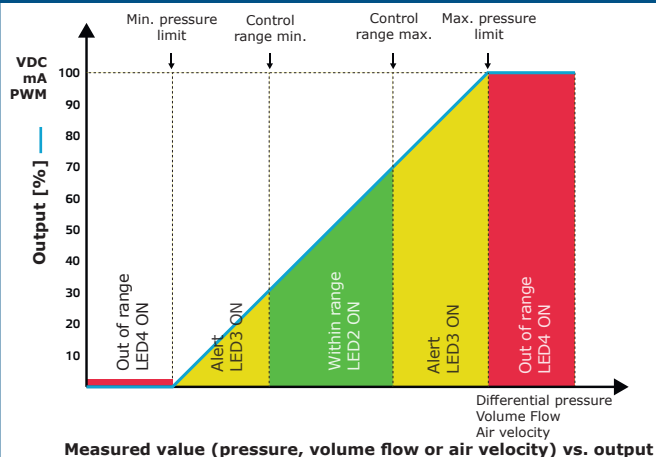


1 - Sensor calibration and Modbus register reset tact switch (SW1)		Push to start the Modbus RTU register factory reset or the sensor calibration
2 - Red LED4	Continuous	Measured differential pressure, air volume or air velocity is out of range
	Blinking	Sensor element failure
3 - Yellow LED3	On	Measured differential pressure, air volume or air velocity is in the alert range
4 - Green LED2	On	Measured differential pressure, air volume or air velocity is within range
5 - Green LED1	On	Power OK; active Modbus RTU communication
6 - Internal pull-up resistor jumper JP1	*	PWM output is connected to internal +3,3 VDC or +12 VDC source**
		PWM has to be connected to external voltage source via external pull-up resistor

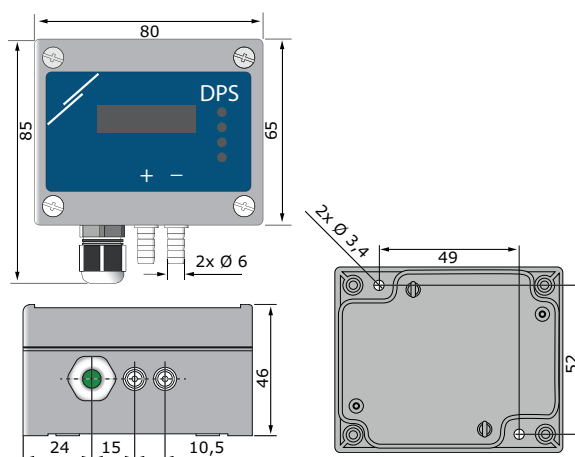
* indicates closed position of the jumper.

** The voltage source depends on the value in holding register 54.

Operational diagram(s)



Fixing and dimensions



Modbus registers



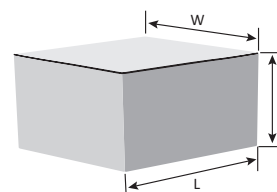
The SensiStart Modbus configurator allows you to easily monitor and/or configure Modbus parameters.

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.

Packaging



Global trade item numbers (GTIN)		
Packaging	DPS-F--LP	DPS-G--LP
Unit	05401003001509	05401003001554
Carton	05401003300350	05401003300404
Box	05401003500361	05401003500408

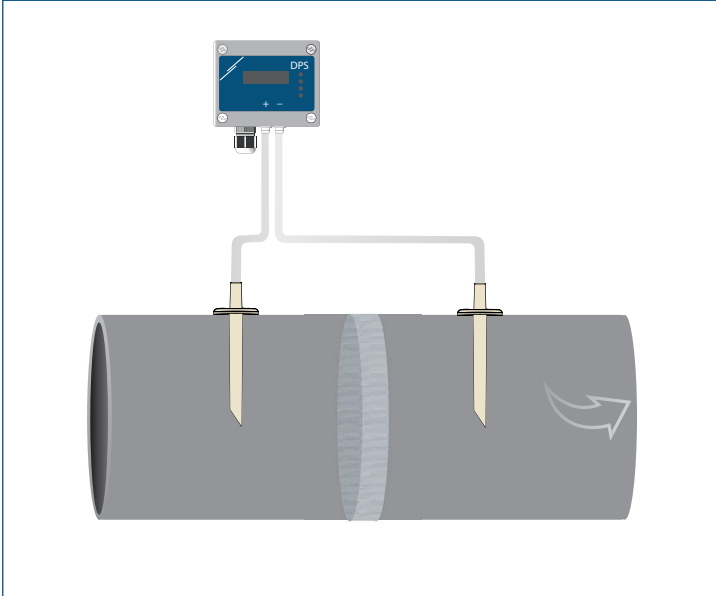
Article	Packaging	Length [mm]	Width [mm]	Height [mm]	Net weight	Gross weight
DPS-F--LP DPS-G--LP	Unit (1 pc.)	95	85	70	0,13 kg	0,14 kg
	Carton (10 pcs.)	495	185	87	1,30 kg	1,40 kg
	Box (60 pcs.)	585	375	280	7,80 kg	8,40 kg



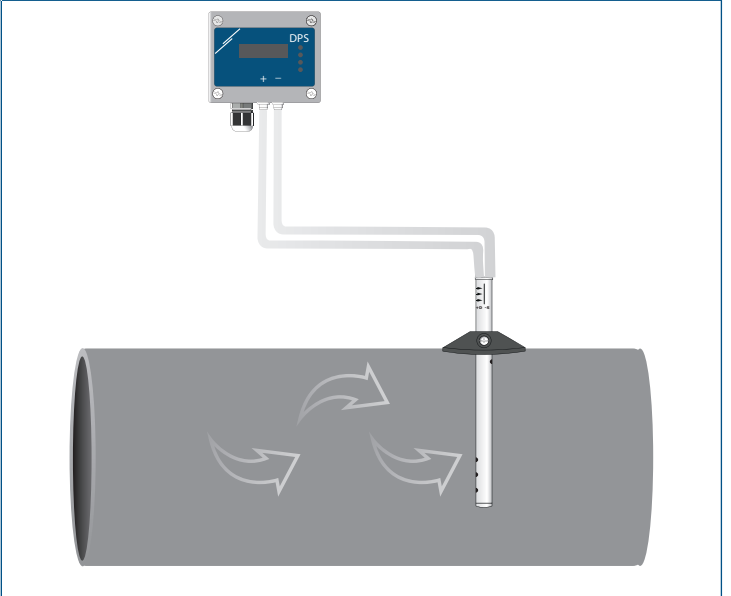
DPS-X--LP

Differential pressure transmitter with display

Application 1: Measuring differential pressure [Pa] or air flow volume [m³/h] using PSET-PVC



Application 2: Measuring supplied air volume [m³/h] or airflow velocity [m/s] using PSET-PT





DPS-M--LP

Differential pressure transmitter with display, PoM

The DPS-M--LP series are differential pressure transmitters (-125—125 Pa), which are equipped with a fully digital pressure transducer designed for a wide range of applications. Air velocity readout is available by connecting an external Pitot tube connection set. They are Power over Modbus supplied and parameters are accessible via Modbus RTU (3SModbus software or Sensistant).

Key features

- Built-in digital high resolution differential pressure sensor
- RJ45 connector on the PCB
- Air velocity can be measured via Modbus RTU (by using an external PSET-PTX-200 Pitot tube connection set)
- Variety of operating ranges
- Selectable response time: 0,1—10 s
- Implemented K-factor
- Differential pressure, volume flow⁽¹⁾ or air velocity⁽²⁾ readout via Modbus RTU
- 4-digit 7-segment LED display for indicating differential pressure or volume flow
- Selectable minimum and maximum operating ranges
- Modbus registers reset function (to factory pre-set values)
- Four LED indicators for the status of the transmitter and the controlled values
- Modbus RTU communication
- Sensor calibration procedure via tact switch
- Aluminium pressure connection nozzles



Article codes

Codes	Power supply	Connection	Maximum power consumption	Nominal power consumption	I _{max}	Operating range
DPS-M--LP	24 VDC, Power over Modbus	RJ45 connector on the PCB	1,8 W	1,35 W	100 mA	-125—125 Pa

Technical specifications

Power supply	24 VDC (Power over Modbus)	
Output	Modbus RTU (RS485)	
Minimum differential pressure range span	50 Pa	
Minimum volume flow range span	10 m ³ /h	
Minimum air velocity range span	1 m/s	
Operating modes	Differential pressure	
	Volume flow ⁽¹⁾	
	Air velocity ⁽²⁾	
Accuracy	± 2 % of the operating range	
Protection standard	IP65 (according to EN 60529)	
Ambient conditions	Temperature	-5—65 °C
	Rel. humidity	< 95 % rH (non-condensing)

Area of use

- Differential pressure, volume flow⁽¹⁾ or air velocity⁽²⁾ measurement in HVAC applications
- Differential pressure / volume flow monitoring in clean rooms
- Clean air and non-aggressive, non-combustible gases

Standards



- EMC Directive 2014/30/EC:
 - 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/EC
- RoHS Directive 2011/65/EC

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>

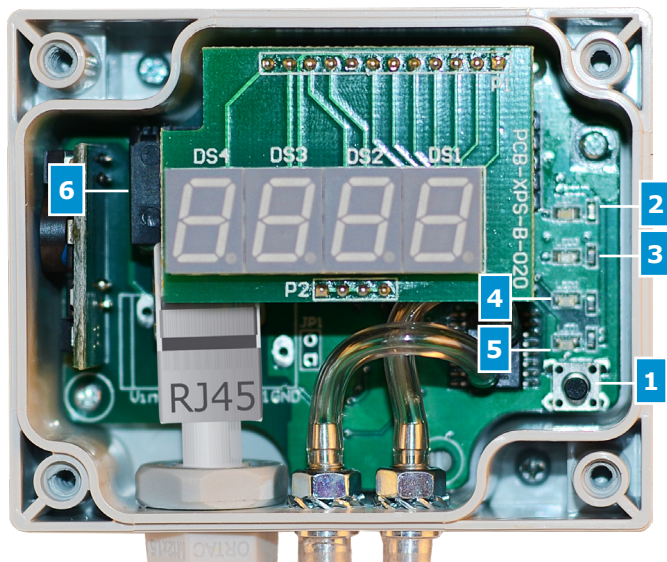
For more information about the Modbus registers, please refer to the product Modbus Register Map.

⁽¹⁾ Only when K-factor of fan / drive is known. If K-factor is unknown, volume flow can be calculated via multiplying the duct cross-sectional area (A) by air velocity (V) using the formula: Q = A * V.

⁽²⁾ By using an external PSET-PTX-200 Pitot tube connection set

DPS-M--LP

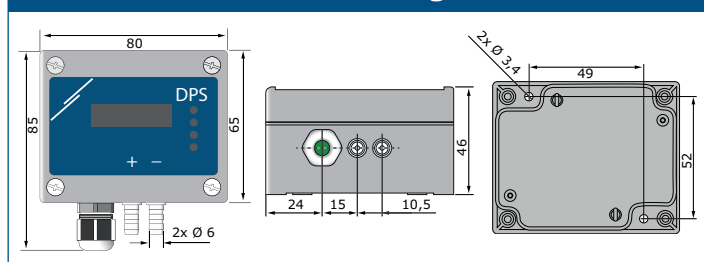
Differential pressure transmitter with display, PoM



Settings

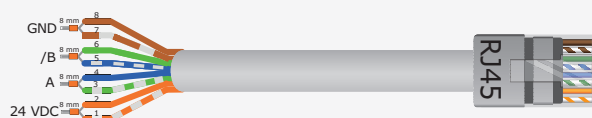
1 - Sensor calibration and Modbus register reset tact switch (SW1)		Push to start the Modbus RTU register factory reset or sensor calibration
2 - Red LED4	Continuous	Measured differential pressure, volume flow or air velocity is out of range
	Blinking	Sensor element failure
3 - Yellow LED3	On	Measured differential pressure, volume flow or air velocity is in the alert range
4 - Green LED2	On	Measured differential pressure, volume flow or air velocity is within range
5 - Green LED1	On	Power OK; active Modbus RTU communication
6 - RJ45 Socket		Modbus RTU communication and 24 VDC power supply: Blinking green LED on the left indicates that data is transmitted; Blinking green LED on the right indicates that data is received

Fixing and dimensions

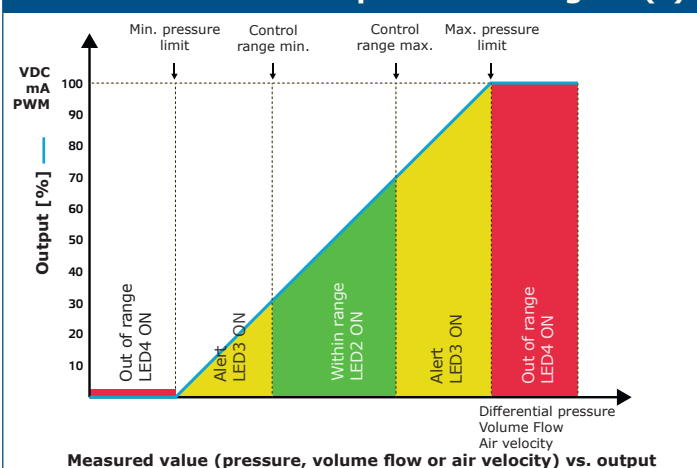


Wiring and connections

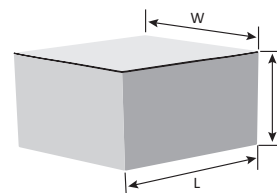
24 VDC	Supply voltage 24 VDC
GND	Ground
A	Modbus RTU communication, signal A
/B	Modbus RTU communication, signal /B



Operational diagram(s)



Packaging



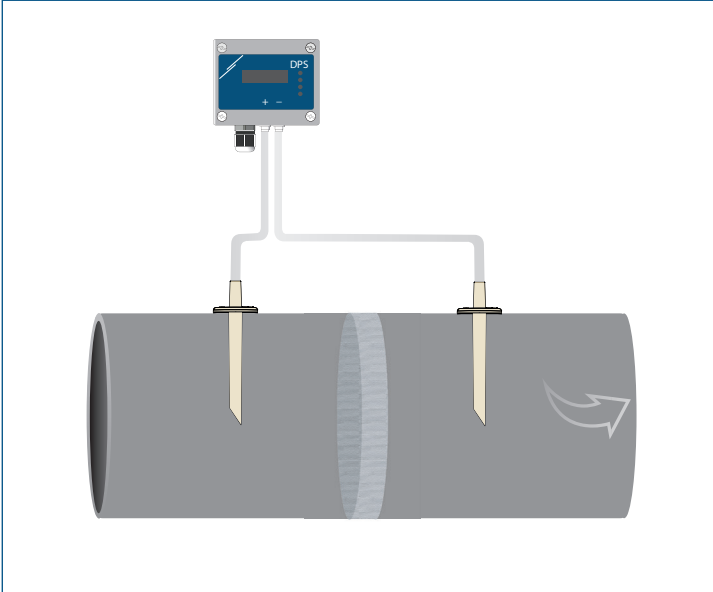
Article	Packaging	Length [mm]	Width [mm]	Height [mm]	Net weight	Gross weight
DPS-M--LP	Unit (1 pc.)	95	85	70	0,13 kg	0,14 kg
	Carton (10 pcs.)	495	185	87	1,30 kg	1,40 kg
	Box (60 pcs.)	590	380	280	7,80 kg	8,40 kg



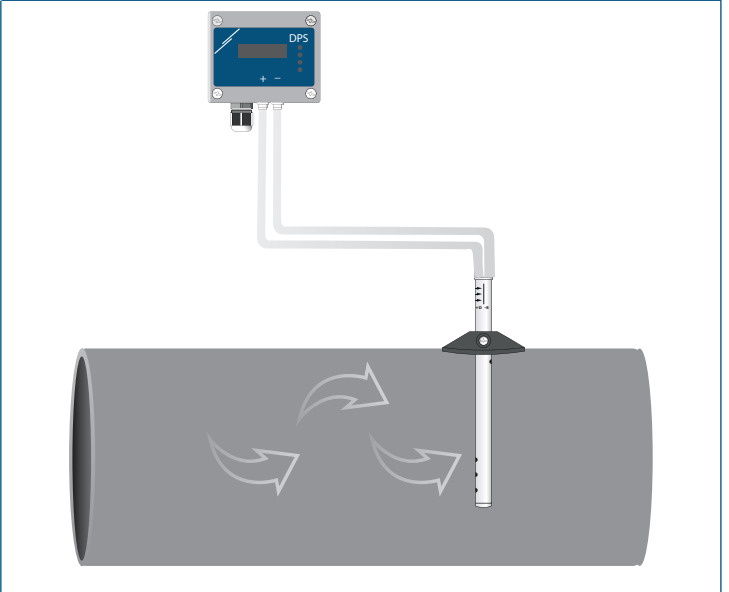
DPS-M--LP

Differential pressure transmitter with display, PoM

Application 1: Measuring differential pressure [Pa] or volume flow [m³/h] using PSET-PVC connection set



Application 2: Measuring supplied volume flow [m³/h] or air velocity [m/s] using PSET-PT Pitot tube connection set





DPSPX-LP

Differential pressure PI controller with display

The DPSPX-LP series are high resolution differential pressure controllers (-125—125 Pa). The integrated PI control with anti-windup function offers the possibility to directly control EC motors / fans. They are equipped with a fully digital state-of-the-art pressure transducer designed for a wide range of applications. Zero point calibration and Modbus registers reset can be executed via a tactile switch. They also feature integrated K-factor and an analogue / modulating output (0—10 VDC / 0—20 mA / 0—100 % PWM). All parameters are accessible via Modbus RTU (3SModbus software or Sensistant).

Key features

- 4-digit 7-segment LED display for indicating differential pressure or volume flow
- Built-in digital high resolution differential pressure sensor
- Air velocity detection (by using an external PSET-PTX-200 Pitot tube connection set)
- Variety of operating ranges
- Selectable response time: 0,1—10 s
- Implemented K-factor
- Differential pressure, volume flow⁽¹⁾ or air velocity⁽²⁾ readout via Modbus RTU
- Modbus registers reset function (to factory pre-set values)
- Selectable internal voltage source for PWM output: 3,3 / 12 VDC
- Four LED indicators for the status of the controller and the controlled values
- Modbus RTU communication
- Sensor calibration procedure
- Selectable minimum and maximum span
- Selectable analogue / modulating output
- Aluminium pressure connection nozzles



Article codes

Codes	Power supply	Maximum power consumption	Nominal power consumption	Imax	Operating range
DPSPF-LP	18—34 VDC	1,8 W	1,35 W	100 mA	-125—125 Pa
DPSPG-LP	18—34 VDC	1,71 W	1,28 W	95 mA	
	15—24 VAC ±10 %	3,3 W	2,475 W	220 mA	

Technical specifications

Selectable analogue / modulating output	0—10 VDC	min. load 50 kΩ ($R_L \geq 50 \text{ k}\Omega$)
	0—20 mA	max. load 500 Ω ($R_L \leq 500 \Omega$)
	0—100 % PWM	PWM Frequency: 1 kHz, $R_L \geq 50 \text{ k}\Omega$
Minimum differential pressure range span	50 Pa	
Minimum volume flow range span	10 m³/h	
Minimum air velocity range span	1 m/s	
Operating modes	Differential pressure	
	Volume flow ⁽¹⁾	
	Air velocity ⁽²⁾	
Accuracy	±2 % of the operating range	
Protection standard	IP65 (according to EN 60529)	
Enclosure	ASA, grey (RAL9002)	
Ambient conditions	Temperature	-5—65 °C
	Rel. humidity	< 95 % rH (non-condensing)

Area of use

- Building and controlled ventilation
- Differential pressure, volume flow⁽¹⁾ or air velocity⁽²⁾ measurement in HVAC applications
- Differential pressure / volume flow monitoring in clean rooms
- Clean air and non-aggressive, non-combustible gases

Wiring and connections

Article type	DPSPF-LP	DPSPG-LP	
Vin	18—34 VDC	18—34 VDC	13—26 VAC
	Ground	Common ground*	AC ~*
GND	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	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.

Standards

- EMC Directive 2014/30/EC:
 - 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/EC
- RoHS Directive 2011/65/EC



⁽¹⁾ Only when K-factor of fan / drive is known. If K-factor is unknown, volume flow can be calculated via multiplying the duct cross-sectional area (A) by the air velocity (V) using the formula: $Q = A \cdot V$

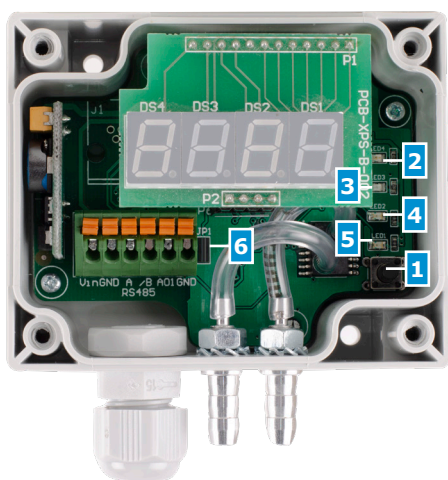
⁽²⁾ By using an external PSET-PTX-200 Pitot tube connection set.



DPSPX-LP

Differential pressure PI controller with display

Settings

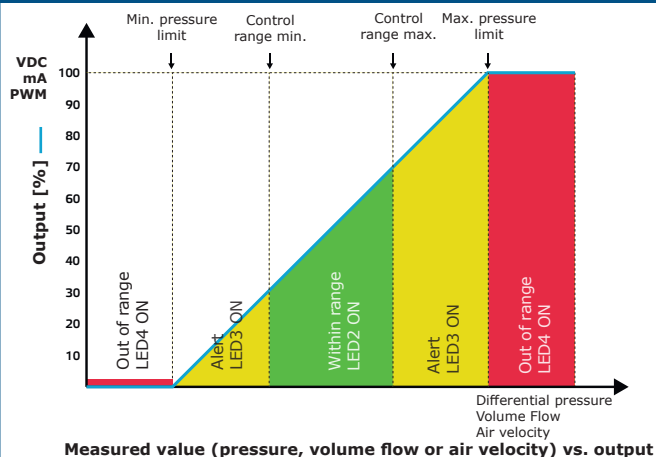


1 - Sensor calibration and Modbus register reset tact switch (SW1)		Push to start Modbus RTU register factory reset or sensor calibration
2 - Red LED4	Continuous	Measured differential pressure, air volume or air velocity is out of range
	Blinking	Sensor element failure
3 - Yellow LED3	On	Measured differential pressure, air volume or air velocity is in the alert range
4 - Green LED2	On	Measured differential pressure, air volume or air velocity is within range
5 - Green LED1	On	Power OK; active Modbus RTU communication
6 - Internal pull-up resistor jumper JP1	*	PWM output is connected to internal +3,3 VDC or +12 VDC source**
		PWM has to be connected to external voltage source via external pull-up resistor

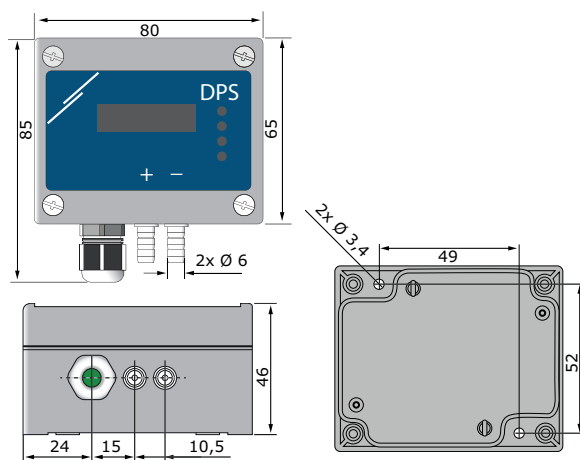
* indicates closed position of the jumper.

** The voltage source depends on the value in holding register 54.

Operational diagram(s)



Fixing and dimensions



Modbus registers



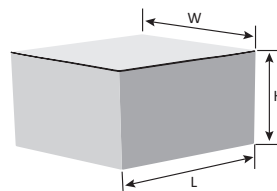
The Sensistant Modbus configurator allows you to easily monitor and/or configure Modbus parameters.



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.

Packaging



Global trade item numbers (GTIN)		
Packaging	DPSPF-LP	DPSPG-LP
Unit	05401003001684	05401003001738
Carton	05401003300534	05401003300589
Box	05401003500538	05401003500583

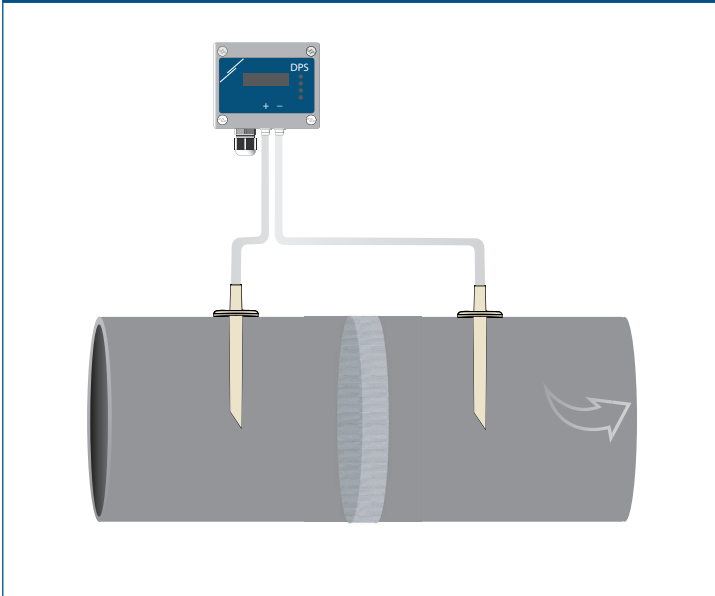
Article	Packaging	Length [mm]	Width [mm]	Height [mm]	Net weight	Gross weight
DPSPF-LP DPSPG-LP	Unit (1 pc.)	95	85	70	0,13 kg	0,14 kg
	Carton (10 pcs.)	495	185	87	1,30 kg	1,40 kg
	Box (60 pcs.)	585	375	280	7,80 kg	8,40 kg



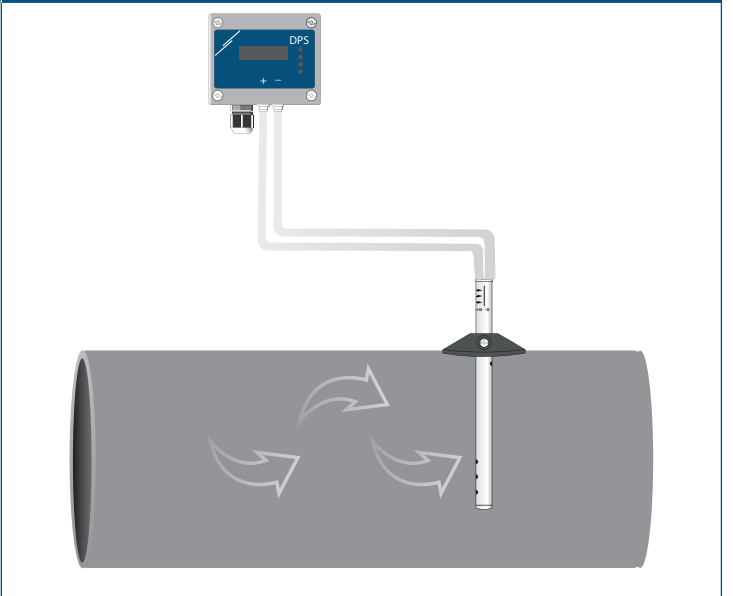
DPSPX-LP

Differential pressure PI controller with display

Application 1: Measuring differential pressure [Pa] or volume flow [m³/h] using PSET-PVC connection set



Application 2: Measuring supplied volume flow [m³/h] or air velocity [m/s] using PSET-PT Pitot tube connection set





DPSPM-LP

Differential pressure PI controller

The DPSPM-LP are high resolution differential pressure controllers (-125—125 Pa). The integrated PI control with anti-windup function offers the possibility to directly control EC motors / fans. They are equipped with a fully digital state-of-the-art pressure transducer designed for a wide range of applications. Zero point calibration and Modbus registers reset can be executed via a tactile switch. All parameters are accessible via Modbus RTU (3SModbus software or Sensistant).

Key features

- 4-digit 7-segment LED display for indicating differential pressure, air volume flow and air velocity
- Built-in digital high resolution differential pressure sensor
- PI control with anti wind-up function and auto-tune function
- Active setpoint selection between differential pressure, air flow volume or air velocity
- Air flow velocity control (by using an external PSET-PTX-200 Pitot tube connection set)
- Minimum and maximum output value selection
- Integrated K-factor
- Selectable response time: 0,1—10 s
- Differential pressure, volume flow⁽¹⁾ or air velocity⁽²⁾ readout via Modbus RTU
- Modbus registers reset function (to factory pre-set values)
- Selectable internal voltage source for PWM output: 3,3 / 12 VDC
- Four LEDs with light guides for controller status indication
- Modbus RTU communication
- Zero-point calibration via tact switch
- Selectable minimum and maximum setpoint span
- Aluminium pressure connection nozzles



Area of use

- Building and controlled ventilation
- Differential pressure, volume flow⁽¹⁾ or air velocity⁽²⁾ measurement and control in HVAC applications
- Differential pressure / air flow monitoring and control in clean rooms
- Clean air and non-aggressive, non-combustible gases

Technical specifications

Maximum power consumption	1,44 W	
Nominal power consumption	1,08 W	
Imax	60 mA	
Output	Modbus RTU (RS485)	
Selectable minimum output value	10—50 % (default: 20 %)	
Selectable maximum output value	50—100 % (default: 100 %)	
Operating modes	Differential pressure Volume flow ⁽¹⁾ Air velocity ⁽²⁾	
Accuracy	± 2 % of the operating range	
Protection standard	IP65 (according to EN 60529)	
Ambient conditions	Temperature	-5—65 °C
	Rel. humidity	< 95 % rH (non-condensing)

Global trade item numbers (GTIN)

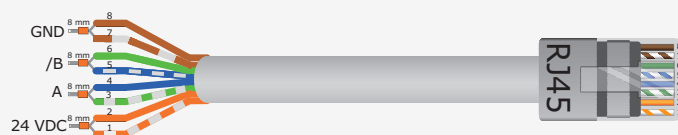
Packaging	DPSPM-LP
Unit	05401003001745
Carton	05401003300596
Box	05401003500590

Article codes

Code	Operating range	Power supply	Connections
DPSPM-LP	-125—125 Pa	24 VDC	RJ45 connector on the PCB

Wiring and connections

24 VDC	Supply voltage 24 VDC (max. 40 mA)
GND	Ground
A	Modbus RTU communication, signal A
/B	Modbus RTU communication, signal /B



⁽¹⁾ Only when K-factor of fan / drive is known. If K-factor is unknown, air volume flow can be calculated via multiplying the duct cross-sectional area (A) by the air flow velocity (V) using the formula: $Q = A \cdot V$

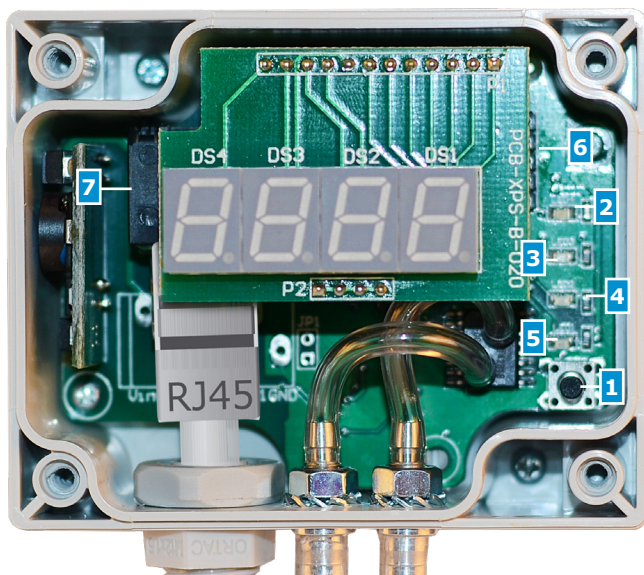
⁽²⁾ By using an external PSET-PTX-200 Pitot tube connection set

DPSPM-LP

Differential pressure PI controller



Settings and indications



1 - Sensor calibration and Modbus register reset tactile switch (SW1)		Push to start the Modbus RTU register factory reset or the sensor calibration
2 - Red LED4	On	Measured value (pressure, volume or air velocity depending on operating mode selected) is out of the alarm range
	Blinking	Sensor element failure or no feedback
3 - Yellow LED3	On	Measured differential pressure, volume flow or air velocity (depending on the selected setpoint) is in out of the setpoint span
4 - Green LED2	On	Measured differential pressure, volume flow or air velocity (depending on the selected setpoint) is within the setpoint span
5 - Green LED1	On	Power OK; active Modbus RTU communication
6 - Modbus holding registers reset jumper (P4)*		Put a jumper onto pins 1 and 2 for at least 20 s to reset holding registers 1-3
7 - RJ45 Socket		Plug the communication and power cable into the socket

* The reset jumper is not included in the set
** indicates closed position of the jumper.

Modbus registers



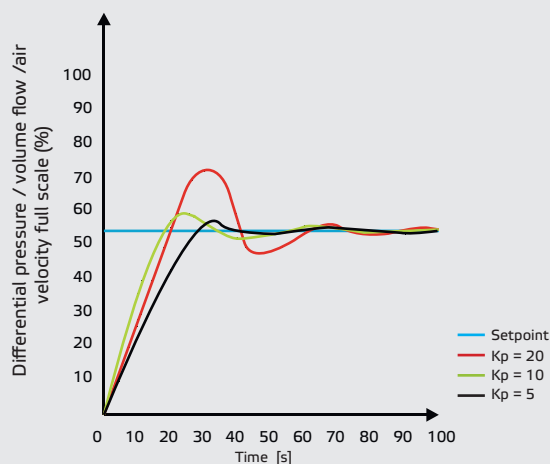
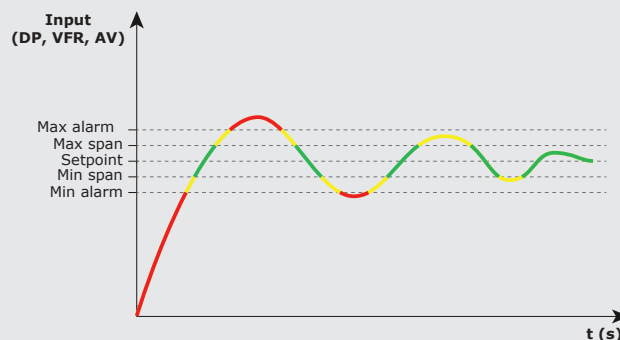
The SensiStart Modbus configurator allows you to easily monitor and/or configure Modbus parameters.

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

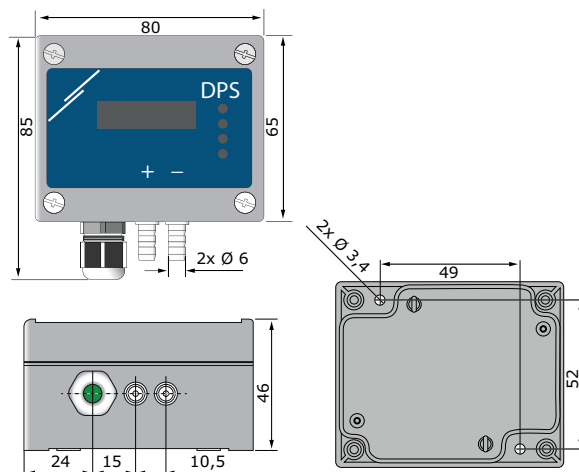
<https://www.sentera.eu/en/3SMCenter>

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

Operational diagrams



Fixing and dimensions

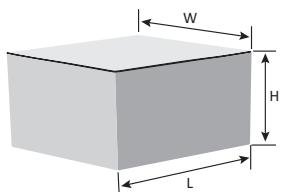




DPSPM-LP

Differential pressure PI controller

Packaging



Article	Packaging	Length [mm]	Width [mm]	Height [mm]	Net weight	Gross weight
DPSPM-LP	Unit (1 pc.)	95	85	70	0,132 kg	0,142 kg
	Carton (10 pcs.)	495	185	87	1,32 kg	1,55 kg
	Box (60 pcs.)	590	380	280	7,92 kg	9,93 kg

Standards

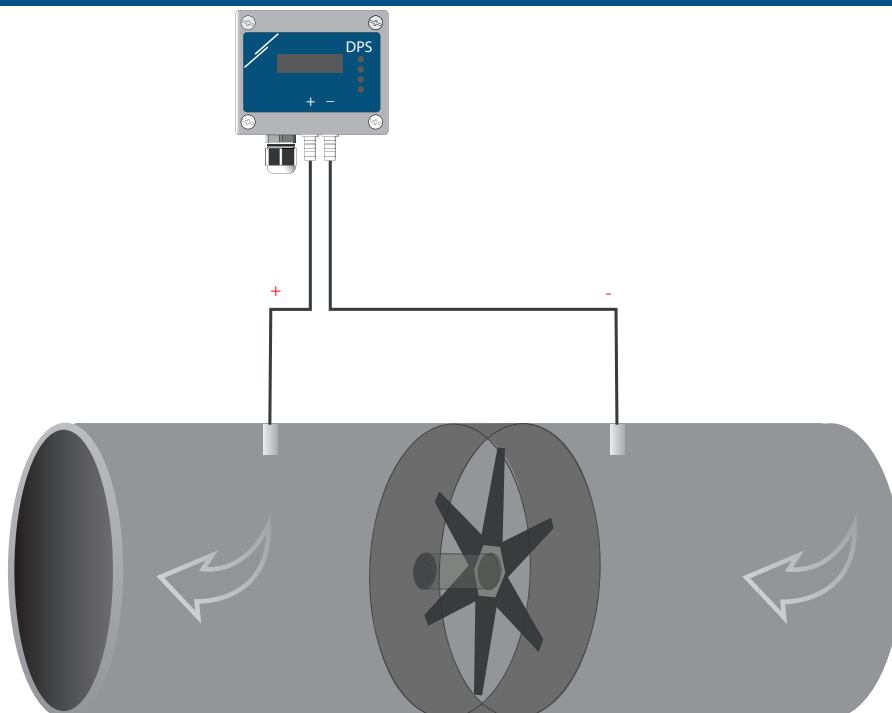


- EMC directive 2014/30/EU:
 - EN 61326-1:2013 Electrical equipment for measurement, control and laboratory use - EMC requirements - Part 1: General requirements
 - EN 61326-2-3:2013 Electrical equipment for measurement, control and laboratory use - EMC requirements - Part 2-3: Particular requirements
 - Test configuration, operational conditions and performance criteria for transducers with integrated or remote signal conditioning

- WEEE Directive 2012/19/EC

- RoHS Directive 2011/65/EC

Application example





DPSAX-2

Differential pressure PI controller for damper actuators

The DPSA -2 series are high resolution differential pressure controllers with display. The integrated PI control with anti-windup function offers the possibility to directly control damper actuators. They are equipped with a fully digital state-of-the-art pressure transducer designed for a wide range of applications. Zero point calibration and Modbus registers reset can be executed via a tact switch. They also feature integrated K-factor and an analogue / modulating output (0—10 VDC / 0—20 mA / 0—100 % PWM). All parameters are accessible via Modbus RTU (3SModbus software or Sensistant).

Key features

- 4-digit 7-segment LED display for indicating differential pressure, volume flow and air velocity
- The differential pressure setpoint can be adjusted via Modbus RTU
- Built-in digital high resolution differential pressure sensor
- Air velocity control (by using an external PSET-PTX-200 Pitot tube connection set)
- Variety of operating ranges
- Selectable response time: 0,1—10 s
- Implemented K-factor
- Differential pressure, volume flow⁽¹⁾ or air velocity⁽²⁾ control
- Modbus registers reset function (to factory pre-set values)
- Selectable internal voltage source for PWM output: 3,3 / 12 VDC
- Four LED indicators for the status of the controller and the controlled values
- Modbus RTU communication
- Sensor calibration procedure
- Selectable minimum and maximum span
- Selectable analogue / modulating output
- Aluminium pressure connection nozzles

Article codes

Codes	Power supply	I _{max}	Operating range
DPSAF-1K0 -2	18—34 VDC	100 mA	0—1.000 Pa
DPSAF-2K0 -2			0—2.000 Pa
DPSAG-1K0 -2	15—24 VAC /	160 mA / 80 mA	0—1.000 Pa
DPSAG-2K0 -2	18—34 VDC		0—2.000 Pa

Technical specifications

Selectable analogue / modulating output	0—10 VDC	$R_L \geq 50 \text{ k}\Omega$
	0—20 mA	$R_L \leq 500 \Omega$
	0—100 % PWM	PWM Frequency: 1 kHz, $R_L \geq 50 \text{ k}\Omega$
Minimum differential pressure range span	50 Pa	
Minimum volume flow range span	10 m ³ /h	
Minimum air velocity range span	1 m/s	
Operating modes	Differential pressure	
	Volume flow	
	Air velocity	
Accuracy	±2 % of the operating range	
Protection standard	IP65 (according to EN 60529)	
Enclosure	ASA, grey (RAL9002)	
Ambient conditions	Temperature	-5—65 °C
	Rel. humidity	< 95 % rH (non-condensing)



Wiring and connections

Article type	DPSAF	DPSAG	
Vin	18—34 VDC	18—34 VDC	13—26 VAC
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	Cable cross section		1,5 mm ²

***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.

Area of use

- Differential pressure, volume flow⁽¹⁾ or air velocity⁽²⁾ measurement in HVAC applications
- Overpressurizing applications: clean rooms to avoid particle contamination or staircases for fire safety
- Underpressurizing applications: restaurant kitchens and biohazard laboratories
- Volume flow application: ensuring the minimum legal ventilation rate (m³/h) for buildings

⁽¹⁾ Only when K-factor of fan / drive is known. If K-factor is unknown, volume flow can be calculated via multiplying the duct cross-sectional area (A) by the air velocity (V) using the formula: $Q = A \cdot V$.

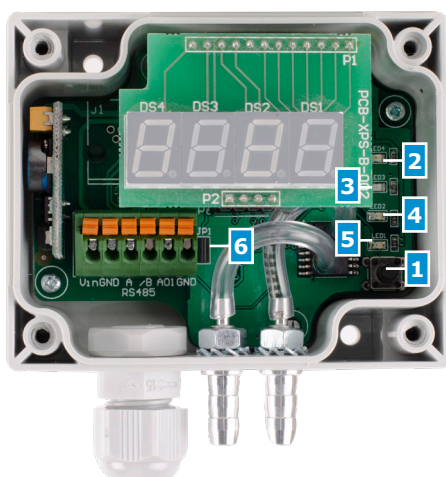
⁽²⁾ By using an external PSET-PTX-200 Pitot tube connection set



DPSAX-2

Differential pressure PI controller for damper actuators

Settings



1 - Sensor calibration and Modbus register reset tact switch (SW1)		Push to start Modbus RTU register factory reset or sensor calibration
2 - Red LED4	Continuous	Measured differential pressure, volume flow or air velocity is out of range
	Blinking	Sensor element failure
3 - Yellow LED3	On	Measured differential pressure, volume flow or air velocity is in the alert range
4 - Green LED2	On	Measured differential pressure, volume flow or air velocity is within range
5 - Green LED1	On	Power OK; active Modbus RTU communication
6 - Internal pull-up resistor jumper JP1	*	PWM output is connected to internal +3,3 VDC or +12 VDC source**
		PWM has to be connected to external voltage source via external pull-up resistor

* indicates closed position of the jumper.

** The voltage source depends on the value in holding register 54.

Modbus registers



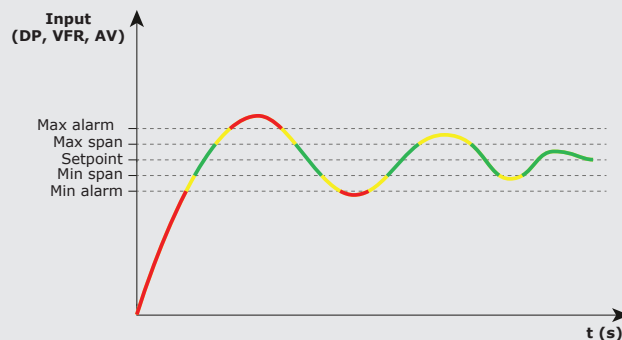
The Sensistart Modbus configurator allows you to easily monitor and/or configure Modbus parameters.



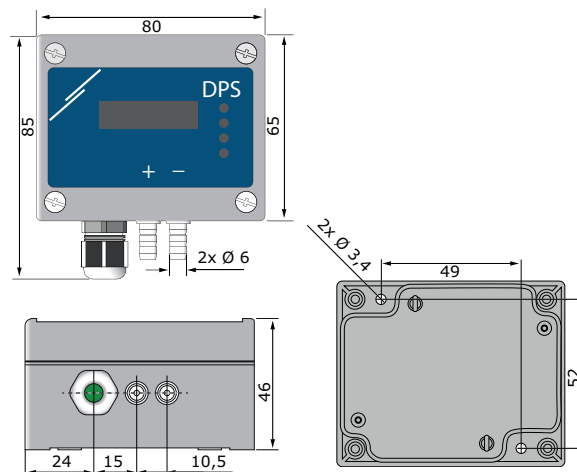
The parameters of the unit can be monitored / configured through the 3SMODBUS software platform. You can download it from the following link:
<https://www.sentera.eu/en/3SMCenter>

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

Operational diagram



Fixing and dimensions



Standards



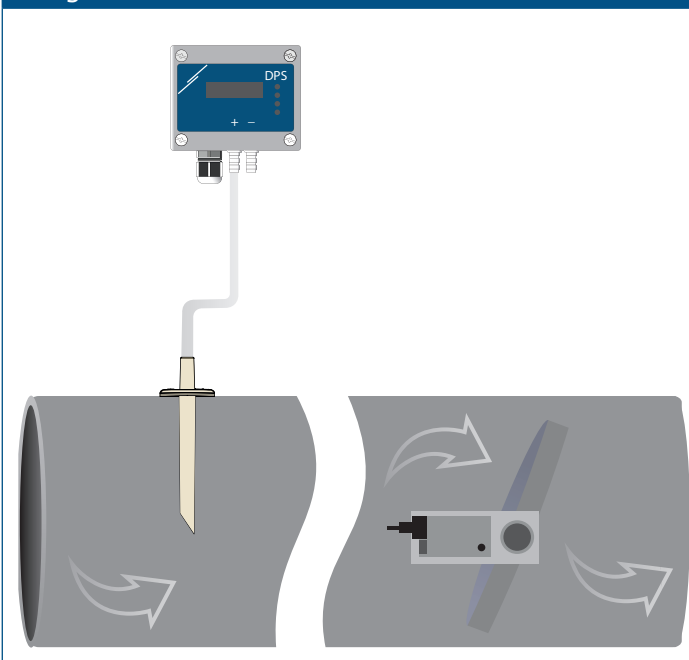
- Low Voltage Directive 2014/35/EC
 - EN 60529:1991 Degrees of protection provided by enclosures (IP Code) Amendment AC:1993 to EN 60529
 - EN 60730-1:2011 Automatic electrical controls for household and similar use - Part 1: General requirements
- EMC Directive 2014/30/EC
 - EN 60730-1:2011 Automatic 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
- WEEE Directive 2012/19/EC
- RoHS Directive 2011/65/EC



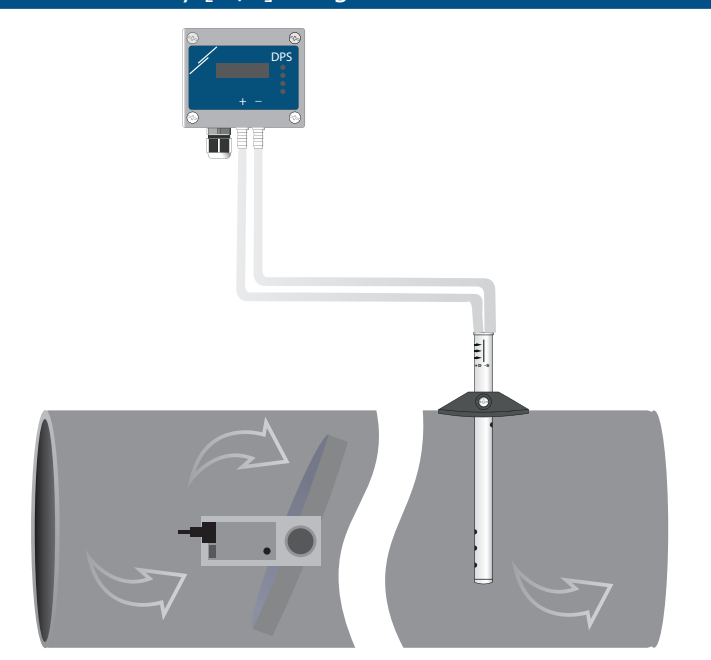
DPSAX-2

Differential pressure PI controller for damper actuators

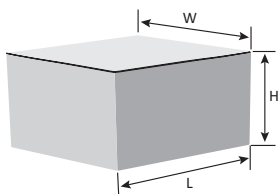
Application 1: Controlling volume flow [m^3/h] using PSET-PVC



Application 2: Controlling volume flow [m^3/h] or airflow velocity [m/s] using PSET-PT



Packaging



Article	Packaging	Length [mm]	Width [mm]	Height [mm]	Net weight	Gross weight
DPSA -2	Unit (1 pc.)	95	85	70	0,132 kg	0,142 kg
	Carton (10 pcs.)	495	185	87	1,32 kg	1,55 kg
	Box (60 pcs.)	590	380	280	7,92 kg	9,93 kg

Global trade item numbers (GTIN)

Packaging	DPSAF-1K0 -2	DPSAF-2K0 -2	DPSAG-1K0 -2	DPSAG-2K0 -2
Unit	05401003017579	05401003017586	05401003017593	05401003017609
Carton	05401003302286	05401003302293	05401003302309	05401003302316
Box	05401003503386	05401003503393	05401003503409	05401003503416



PSW

Differential pressure switch

The PSW series consists of highly sensitive, adjustable differential pressure switches suitable for monitoring overpressure, vacuum and differential pressure of air or other non-combustible, non-aggressive gases. The switching pressure setpoint can be adjusted by means of a scaled calibrated knob; the switching ΔP - by a screwdriver and a pressure gauge.

Key Features

- High sensitivity and accuracy
- Product versions for a variety of pressure ranges
- Adjustable switching point (DP)
- Long-term mechanical life

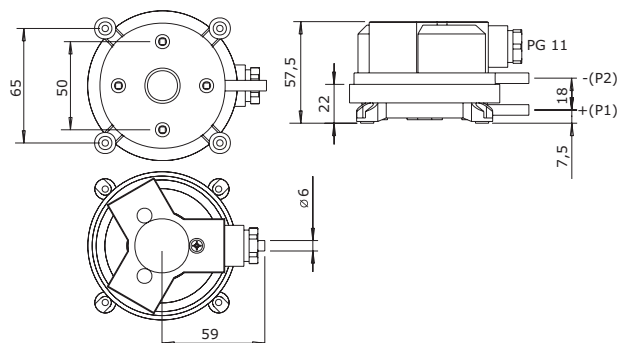
Technical Specifications

Max. operating pressure	10 kPa for all pressure ranges	
Mechanical life cycles	10.000.000 operations	
Contacts rating	max. 1,5 A (0,4) / 250 VAC (VDE 0630)	
Specifications according to EN 1854	Deviation	≤ ±15 %, min. ±10 Pa
	Drift	≤ ±15 %
Diaphragm	Silicone, free of gas emissions	
Protection standard	IP54 with cover (according to EN 60529)	
	IP00 without cover (according to EN 60529)	
Ambient conditions	Temperature	-20—85 °C
	Rel. humidity	< 95 % rH (non-condensing)
	Storage temperature	-40—85°C

Article Codes

	PSW--200	PSW--500
Range, Pa	20—200	50—500
Range, mBar	0,2—2,0	0,5—5,0
ΔP , Pa (mBar)	10 (0,1)	20 (0,2)

Dimensions



Area of Use

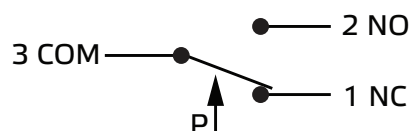
- Air filter and fan monitoring
- Overheating protection for fan heaters
- Controlling air and fire-protection dampers
- Monitoring airflows
- Monitoring flows in ventilation ducts
- Frost protection for heat exchanger
- Medium: air or other non-combustible, non-aggressive gases only

Standards

- Low Voltage Directive (LVD) 2014/35/EU
- WEEE Directive 2012/19/EU - Waste of electrical and electronic equipment
- 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
- Gas Appliance Directive 2016/426/EU



Wiring and Connections



1	Normally closed contact
2	Normally open contact
3	Common contact



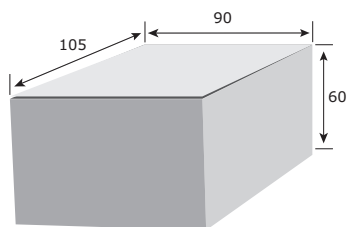
PSW

Differential pressure switch

Global Trade Item Numbers 14 (GTIN 14)

Article	Unit	Box	Pallet
PSW--200	5401003010815	5401003502402	-
PSW--200-PVC	5401003010822	5401003502419	5401003700297
PSW--500	5401003010839	5401003502426	-
PSW--500-PVC	5401003010846	5401003502433	5401003700303

Packaging



Article	Packaging	Length [mm]	Width [mm]	Height [mm]	Net weight [kg]	Gross weight [kg]
PSW	Unit (1 pc.)	90	105	60	0,1	0,7
	Box (72 pcs.)	580	370	270	10,1	12,3

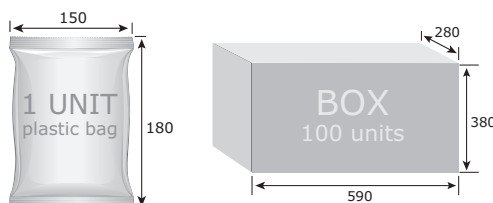


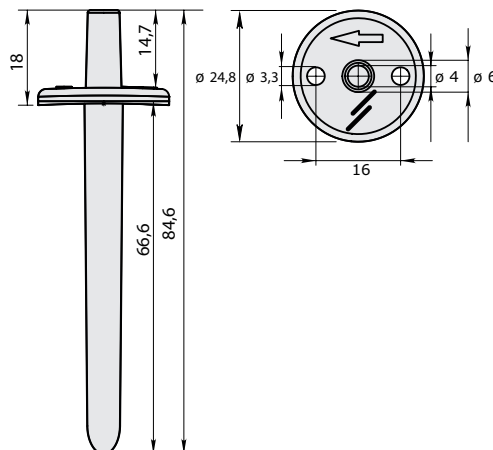
PSET-PVC

PVC differential pressure connection set

Contents			
Element	Pcs.	Material	Details
Connector end	2	ABS, grey	Length: 84,6 mm Connecting end diameter: Ø 6 mm
Screw	4	Metal, zinc plated	Type: round pan head, self-tapping 2,9 x 9,5 mm
Flexible tubing	1	PVC, transparent	Diameter: Ø 5 x 7 mm Length: 200 cm

Technical specifications	
Working pressure	max. 10.000 Pa
Operating temperature	max. 60 °C

Packaging						
						
Article	Packaging	Length [mm]	Width [mm]	Height [mm]	Net weight	Gross weight
PSET- PVC-200	Unit (1 pc.)	180	150	-	0,64 kg	0,68 kg
	Box (100 pcs.)	590	380	280	6,4 kg	7,72 kg

Fixing and dimensions	
	



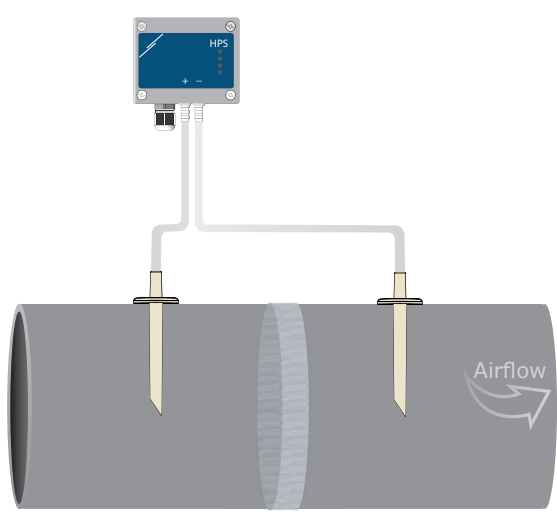
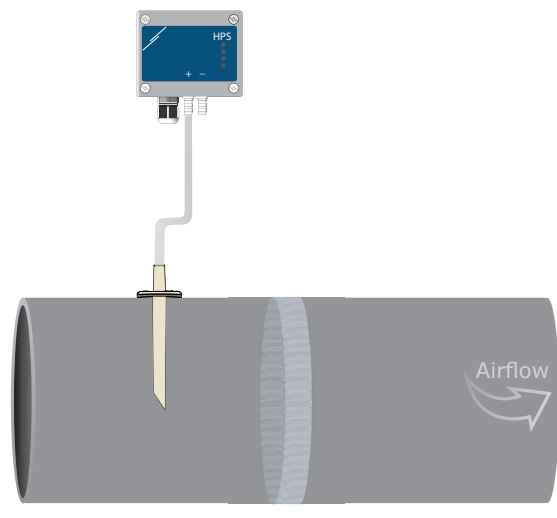
Article codes	
Code	Tubing length
PSET-PVC-200	200 cm

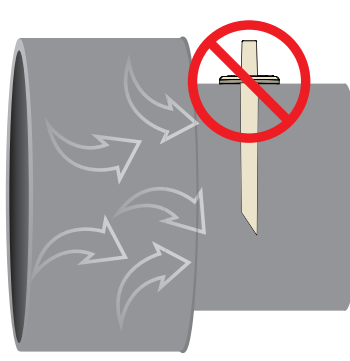
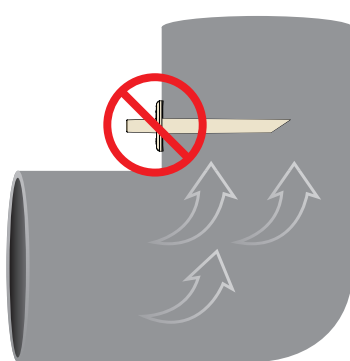
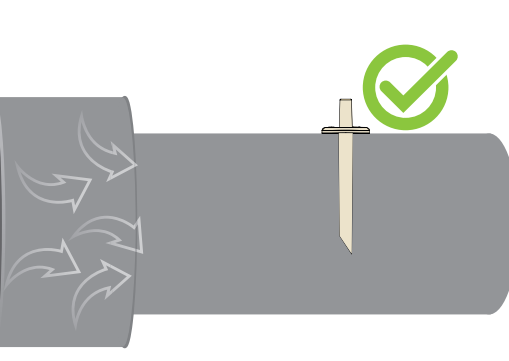
Standards	
- DIN EN ISO 7046-1, 2 - WEEE Directive 2012/19/EU	



PSET-PVC

PVC differential pressure connection set

Application 1: Detection of clogged filter	Application 2: Detection of supplied air volume [m³/h]
	

Mounting position		
		

Installation requirements: Correct positioning of the PSET-PVC connection ends is critical for reliable and accurate parameter readings in ducts, therefore they should be placed far enough from any source of air turbulence. The minimum distance at which the connection ends should be placed from the source of turbulence is in function of the duct diameter. Also install the connection ends far enough from bends, junctions or section changes in the duct to ensure accurate readings.

Global trade item numbers (GTIN)	
Packaging	PSET-PVC-200
Unit	05401003010792
Box	05401003502389

PSET-QF

Quick fit differential pressure connection set



Contents

Element	Pcs.	Material	Details
Orifice	2	Aluminium	Length: 46,4 mm Connecting end diameter: Ø 4 mm
Flexible tubing	1	PVC, transparent	Diameter: Ø 5 x 7 mm Length: 200 cm
Washer	2	Zinc plated	Type: plain Diameter: M5, 15 mm

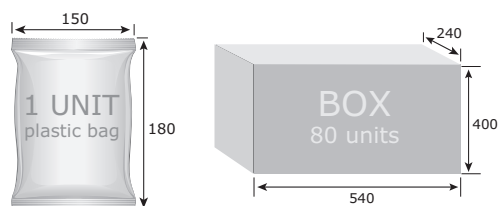
Technical specifications

Working pressure	max. 10.000 Pa
Operating temperature	max. 60 °C

Standards

- WEEE Directive 2012/19/EU

Packaging



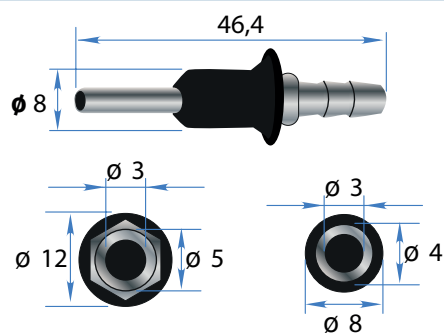
Article	Packaging	Length [mm]	Width [mm]	Height [mm]	Net weight	Gross weight
PSET-QF-200	Unit (1 pc.)	18	15	0,5	0,60 kg	0,60 kg
	Box (80 pcs.)	550	410	250	4,80 kg	5,63 kg



Article codes

	Tubing length
PSET-QF-200	200 cm

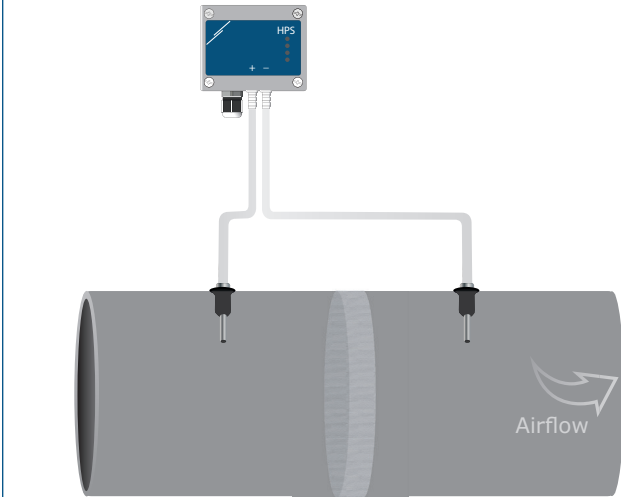
Fixing and dimensions



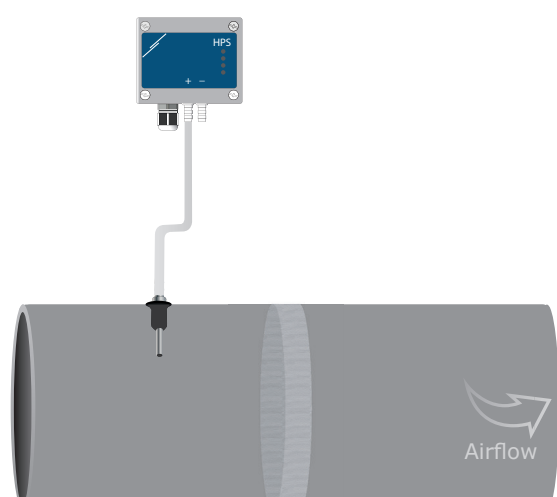
PSET-QF

Quick fit differential pressure connection set

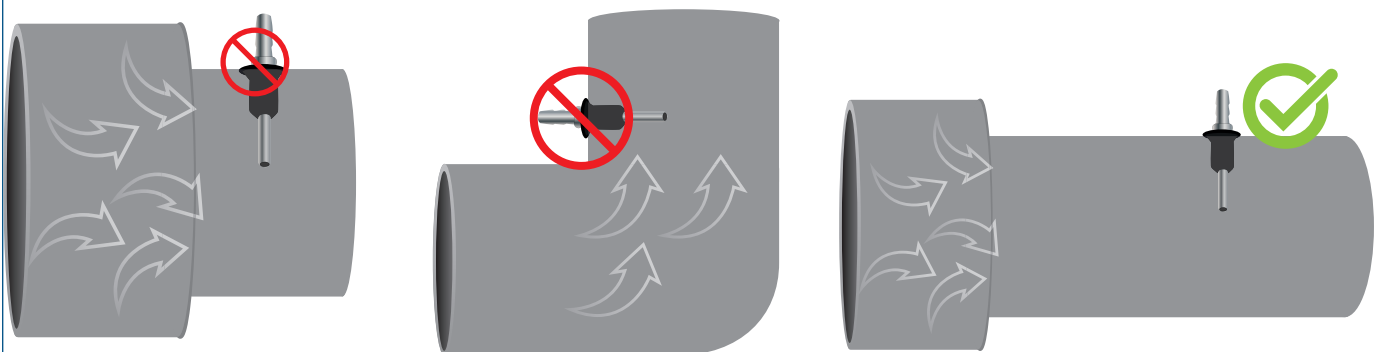
Application 1: Detection of clogged filter



Application 2: Detection of supplied air volume [m³/h]



Mounting position



Installation requirements: Correct positioning of the PSET-QF connection ends is critical for reliable and accurate parameter readings in ducts, therefore they should be placed far enough from any sources of air turbulence. The minimum distance the connection ends should be placed from the source of turbulence is a function of the duct diameter. Also, install the connection ends far enough from bends, junctions or section changes in the duct to ensure accurate readings.

Global trade item numbers (GTIN)

Packaging	PSET-QF-200
Unit	05401003010808
Box	05401003502396

PSET-PT

Pitot tube connection set

PSET-PT is a Pitot Tube set made of flame retardant ABS grade PBDE-free plastic with increased thermal stability. It is designed for measuring air flow velocity in HVAC applications in combination with Sentera's DPS-2 and HPS-2 differential pressure transmitters. It can also be used to measure air flow volume in combination with a differential pressure sensor if the duct cross section is known. The product is available in two sizes - 150 mm and 250 mm, each with different size tube fixators.

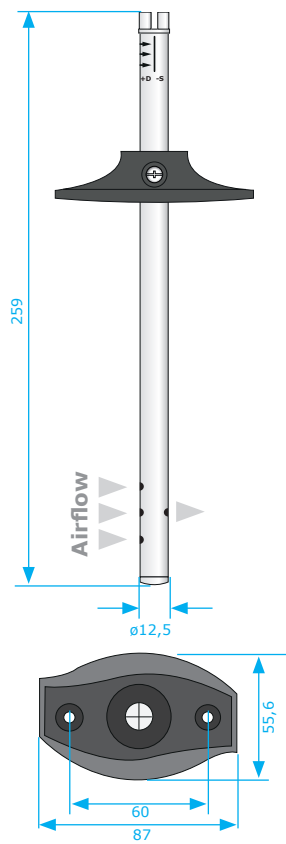
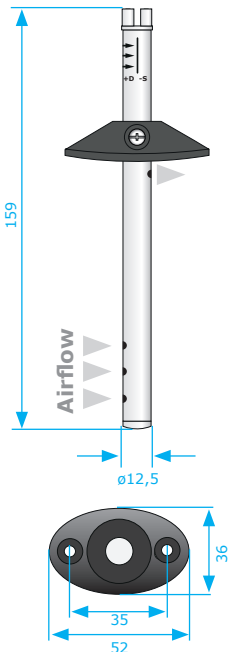
The set includes:

Component	Pieces	Material	Details
Pitot tube	1	POLYFLAM® RABS 90000 UV5, grey	PSET-PTS: 150 mm PSET-PTL: 250 mm
Flexible flange	1	PE LUPOLEN 1800S, black RAL 9004	PSET-PTS: 36 x 52 mm PSET-PTL: 55,6 x 87 mm
Screw for fixing tube into the flexible flange	1	Plastic, DIN 84, white	Length: 10 mm, slotted cheese head
Flexible tubing	1	PVC, transparent	Diameter: inside Ø = 5 mm; outside Ø = 7 mm Length: 200 cm
Screws	2	Metal, zinc plated	4, 2 x 9, 5 cross recessed pan head

Note: PSET-PTS-200 can be applied for duct diameters of 100–300 mm.
PSET-PTL-200 can be applied for duct diameters of 150–500 mm.



Fixing and dimensions

PSET-PTL	PSET-PTS
	

Article codes

	Flexible tubing length	Pitot tube length
PSET-PTS-200	200 cm	150 mm
PSET-PTL-200		250 mm

Standards

- WEEE Directive 2012/19/EC

Technical specifications

Impact strength	at 23° C	80 kJ/m ²
	at -30° C	45 kJ/m ²
Temperature of deflection under load (HDT)	80 ° C	
Operating temperature	max. 96 ° C	

Packaging

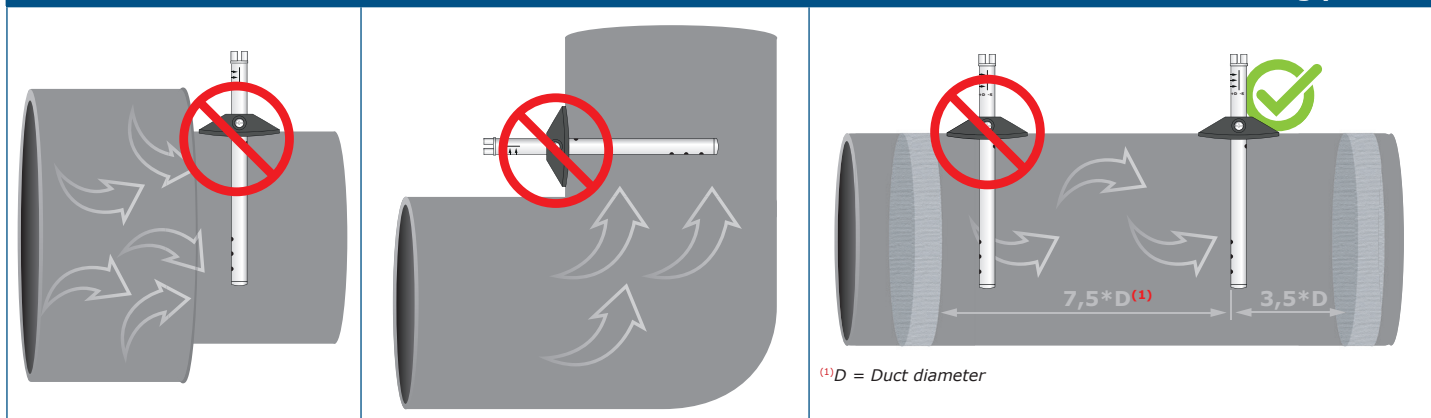


Article	Packaging	Length [mm]	Width [mm]	Net weight	Gross weight
PSET-PTL-200	Unit (1 pc.)	230	170	0,126 kg	0,127 kg
PSET-PTS-200	Unit (1 pc.)	230	170	0,113 kg	0,114 kg

PSET-PT

Pitot tube connection set

Mounting position



Installation requirements: The PSET-PTx-200 must not be installed in a turbulent air zone. Ensure sufficiently long settling zones upstream and downstream of the tapping point. A settling zone consists of a straight section of pipe or duct, with no obstructions. Avoid installation nearby filters, cooling coils, fans, etc. PSET will achieve the optimal result when the measurement is taken at least 7,5 duct diameters downstream and at least 3 duct diameters upstream from any turns or flow obstructions.

Note: When using a rectangular duct or pipe, you can use the following conversion table to calculate the circular equivalent diameter.

Circular equivalent diameter - de (mm)

	Duct side - b															
	(mm)	100	150	200	250	300	400	500	600	800	1000	1200	1400	1600	1800	2000
Duct side - a	100	109	133	152	168	183	207	227								
	150	133	164	189	210	229	261	287	310							
	200	152	189	219	244	266	305	337	365							
	250	168	210	246	273	299	343	381	414	470						
	300	183	229	266	299	328	378	420	457	520	574					
	400	207	260	305	343	378	437	488	531	609	674	731				
	500	227	287	337	381	420	488	547	598	687	762	827	886			
	600		310	365	414	457	531	598	656	755	840	914	980	1041		
	800			414	470	520	609	687	755	875	976	1066	1146	1219	1286	
	1000				517	574	674	762	840	976	1093	1196	1289	1373	1451	1523
	1200					620	731	827	914	1066	1196	1312	1416	1511	1598	1680
	1400						781	886	980	1146	1289	1416	1530	1635	1732	1822
	1600							939	1041	1219	1373	1511	1635	1749	1854	1952
	1800								1096	1286	1451	1598	1732	1854	1968	2073
	2000										1523	1680	1822	1952	2073	2186

The equivalent diameter of a rectangular tube or duct can be calculated as (Huebscher):
 $de = 1,30 (a b)^{0,625} / (a + b)^{0,25}$

de	equivalent diameter (mm, inches)
a	length of major or minor side (mm, inches)
b	length of minor or major side (mm, inches)

Global trade item numbers (GTIN)

Packaging	PSET-PTS-200	PSET-PTL-200
Unit	05401003010785	05401003010778
Carton	05401003301609	05401003301593
Box	05401003502372	05401003502365



AWP

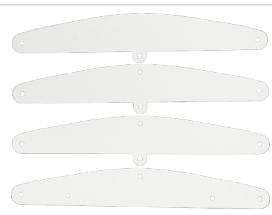
All-weather protective hood for outdoor sensors

AWP is an all-weather protective hood for outdoor sensors that protects them against variable weather factors and direct sunlight. It aims to increase the service life of HVAC outdoor sensors and increase the reliability of their measurements.

Key features

- Protects outdoor HVAC sensors against variable weather factors and direct sunlight
- Increases the service life of HVAC outdoor sensors
- Increases the reliability of HVAC outdoor sensor measurements
- Halogen free, no substances that can damage the ozone layer
- Inert waste, non toxic and 100 % recyclable

Contents in the box

Element	Pcs.	Material	Images
SNAP-Rivet	7	Polyamide, light grey	
Sheet	4	Polypropylene, white	
Sheet (back)	1	Polypropylene, white	



Article codes

AWP-10-13-13

Compatible with Sentera outdoor sensors and differential pressure sensors.

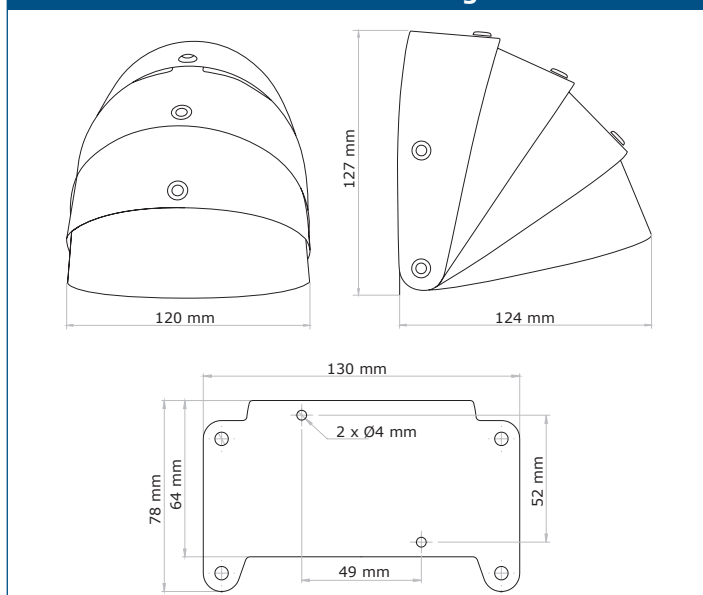
Standards

- Coneg norm (USA) & Directive 94/62/EC
- RoHS Directive 2002/95/EC (European Parliament and the Council of 27 January 2003)

Material

Material	Polypropylene sheet
Characteristics	At low temperatures, the material becomes brittle. At higher temperatures, the material loses stiffness.

Fixing and dimensions





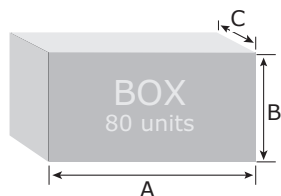
AWP

All-weather protective hood for outdoor sensors

Application



Packaging



Article	Packaging	A [mm]	B [mm]	C [mm]	Net weight	Gross weight
AWP-10-13-13	Unit (1 pc.)	305 mm	82 mm	12 mm	0,43 kg	0,6 kg
	Box (80 pcs.)	430 mm	300 mm	190 mm	4,8 kg	5,3 kg

Global trade item numbers (GTIN)

Packaging	AWP-10-13-13
Unit	05401003018620
Box	05401003504246

DTS-MB

Wall mounting bracket for DTS temperature sensors



DTS-MB is a mounting bracket designed for the DTS-L and DTS-M temperature sensors. It is used to attach the sensor to a flat surface, making it easy to use in a room.

Key features

- Material: Non-alloy steel
- Used to attach DTS-L and DTS-M sensors to a flat surface

Contents in the box

Element	Pcs.	Images
Mounting bracket	1	
Wall plug	3	
Screw for bracket wall mounting	3	
RVS bolt, nut and washer	2	
Cable gland and cable gland nut	1	

Material

Material	Non-alloy steel DC01
Thickness	1.2 mm

Standards

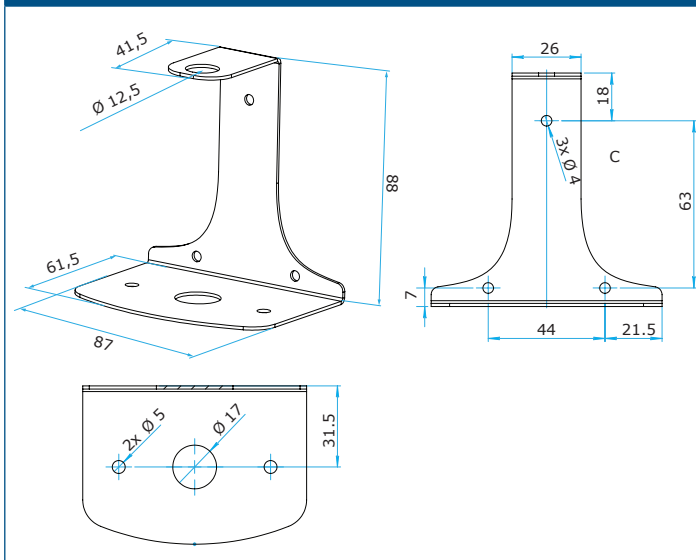
- DIN EN 10130 – Cold rolled low carbon steel flat products



Article codes

DTS-MB-BK	Compatible with Sentera temperature sensors DTS-M and DTS-L
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Fixing and dimensions





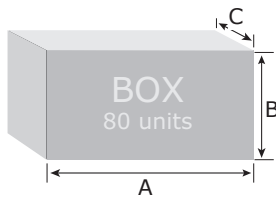
DTS-MB

Wall mounting bracket for DTS temperature sensors

Application



Packaging



Article	Packaging	A [mm]	B [mm]	C [mm]	Net weight	Gross weight
DTS-MB-BK	Unit (1 pc.)	106	88	96	0.102 kg	0.144 kg
	Box (60 pc.)	545	245	245	8.64 kg	9.8 kg

Global trade item numbers (GTIN)

Packaging	DTS-MB-BK
Unit	05401003018644
Box	05401003504253

TSVCT

Duct air quality sensor



Description

TSVCT is a compact digital air quality (VOC) sensor, which also measures temperature and relative humidity.

Air quality is measured based on a VOC index, which is a smart and adaptive indicator that reflects trends in indoor air pollution from volatile organic compounds (VOCs), similar to how the human nose perceives odours. The index continuously adapts to its environment and helps detect air quality deterioration or recovery over time.

Thanks to Modbus RTU communication, all parameters and settings of TSVCT can be adjusted remotely through SenteraWeb if the device is connected to a [Sentera internet gateway](#).

The sensor is specifically designed for integration into air duct systems, making it ideal for HVAC systems in commercial and industrial applications.

Key Features

- **Modbus RTU communication:** The sensor has no analogue outputs — all measured values are transmitted via Modbus RTU.
- **Easy Connection:** TSVCT is equipped with a pluggable screw terminal block that can be unplugged from the device and plugged back when the wires have been connected.
- **Compact enclosure:** Due to its miniature design, the sensor does not require significant mounting space, allowing easy integration into HVAC systems.
- **VOC Index:** The sensor uses an adaptive VOC index for accurate indoor air quality monitoring.
- **Protective coating:** The PCB of the device is covered with a special coating protecting it from moisture, dust, chemicals and temperature extremes.

Area of Use

- Demand controlled ventilation based on temperature, relative humidity and air quality.
- Air quality monitoring in air ducts.

Standards

- Low Voltage Directive 2014/35/EU
- Electromagnetic Compatibility (EMC) Directive 2014/30/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
- WEEE Directive 2012/19/EU



Warnings and Attention Points

- Do not use this product as safety or emergency stop devices or in any other application where failure of the product could result in personal injury.
- This product is not suitable for environments with continuously elevated levels of volatile organic compounds (VOCs), such as areas with persistent exposure to paint fumes, solvents, or industrial emissions.
- Do not use this product in outdoor or harsh industrial environments, where exposure to dust, moisture, or extreme conditions may impair performance or damage the sensor.
- After long exposure to high VOCs, the sensor's baseline shifts upward. When clean air returns, the VOC index decreases slowly, as the algorithm interprets it as an improvement from a higher baseline, not an immediate return to normal.
- Avoid the device mounting in locations affected by direct sunlight.
- Turn off a power supply before all servicing and maintenance.
- Applying overvoltage to the sensor parts will cause improper operation or failure to the internal circuit.
- If the unit does not work according to the instructions, the wiring connections, supply voltage and settings need to be checked.



Article code

Article code	Supply
TSVCT	24 VDC

Technical Specifications

Supply voltage	24 VDC
Maximum input current	20 mA
Output type	No analogue outputs Measurements transmitted via Modbus RTU
Safe operating conditions*	
Temperature	-10—50 °C
Relative humidity	0—90 % rH, non-condensing
VOC index pre-heating time	5 minutes
Selectable alert / alarm levels via Modbus registers	
Temperature	-30—70 °C
Relative humidity	0—100 % rH
VOC index threshold	1—500
Accuracy of measurements	
Temperature	±0,4 °C
Relative humidity	±2,5 % rH
Minimum recommended airflow velocity	1 m/s
Storage conditions	
Temperature	-20—60°C
Relative humidity	5—80 % rH
Enclosure	
Material	ABS (Acrylonitrile Butadiene Styrene)
Colour	Black
Protection class	IP20 (EN 60529)

* **Attention:** Adhere to the safe operating conditions to avoid causing permanent damage to the device.

Global Trade Item Numbers 14 (GTIN 14)

Packaging	TSVCT
Unit (1 pc.)	5401003019009
Carton (10 pcs.)	5401003303016
Box (60 pcs.)	5401003504451

TSVCT

Duct air quality sensor

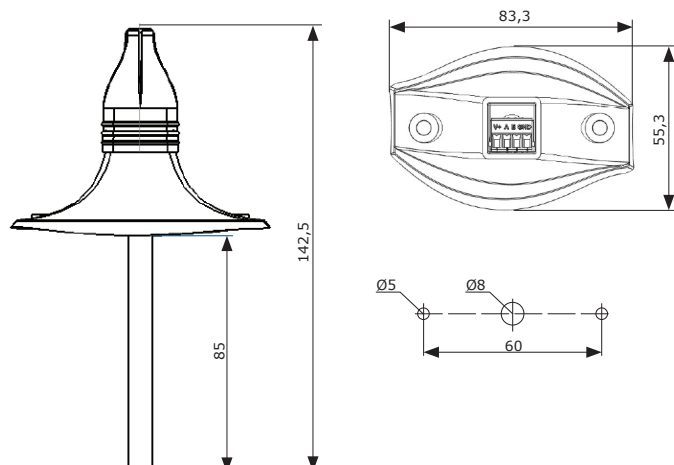


Wiring and Connections

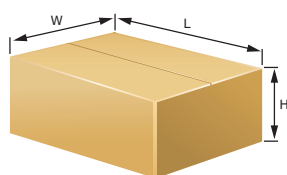


V+	24 VDC
A	Modbus RTU (RS485), signal A
B	Modbus RTU (RS485), signal /B
GND	Common ground
Connection type	Pluggable screw terminal block
Cable characteristics	Cat5 or EIB cable

Fixing and Dimensions

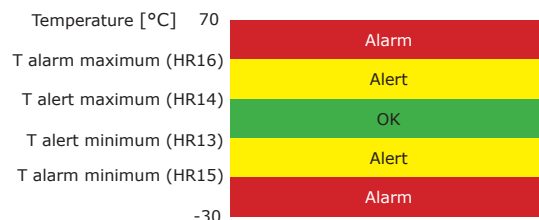


Packaging

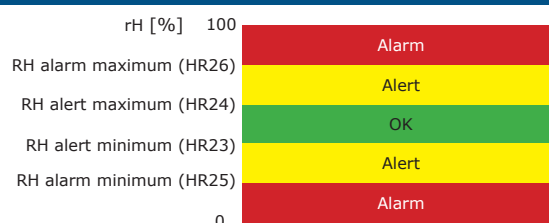


Article	Packaging	Length [mm]	Width [mm]	Height [mm]	Net weight [kg]	Gross weight [kg]
TSVCT	Unit (1 pc.)	18	15	60	0,05	0,05
	Carton (10 pcs.)	492	182	84	0,50	0,69
	Box (60 pcs.)	590	380	280	3	5,06

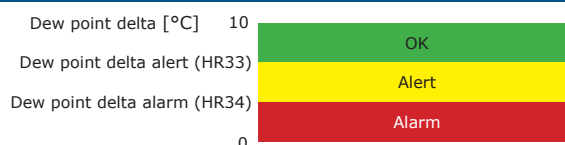
Temperature Diagram



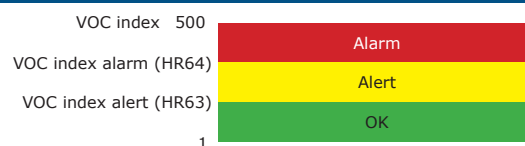
Relative Humidity Diagram



Dew Point Diagram



VOC Index Diagram



Note: HR — Holding register

All above-mentioned parameters are holding registers and can be accessed through Modbus RTU communication via SenteraWeb.

Connect Devices to SenteraWeb



Via a Sentera Internet Gateway you can connect your installation to the SenteraWeb HVAC cloud and:

- Easily change the parameter settings of the connected devices remotely.
- Define users and give them access to monitor the installation via a standard web browser.
- Log data - create diagrams and export logged data.
- Receive alerts or warnings when measured values exceed alert ranges or when errors occur.
- Create different regimes for your ventilation system - e.g. day-night regime.

Please refer to the Modbus Register Map of the product for more details regarding the Modbus registers.





RSVCX-R Air quality room transmitter

RSVCX-R are multifunctional room transmitters which measure temperature, relative humidity and a broad range of total volatile organic compounds (TVOCs). The TVOC concentration is an accurate indicator for indoor air quality and the occupancy of a room. Based on the temperature and relative humidity measurements, the dew-point temperature is calculated. RSVCX-R feature 3 analogue / modulating outputs - one for temperature, one for relative humidity and one for TVOC. All the parameters and measurements are accessible via Modbus RTU.

Key features

- Selectable temperature, relative humidity and TVOC ranges
- Silicon based sensor elements for TVOC measurements
- Bootloader for updating the firmware via Modbus RTU communication
- Day / Night detection via ambient light sensor
- Ambient light sensor with adjustable 'active' and 'standby' level
- Modbus RTU (RS485)
- 3 LEDs with adjustable light intensity for status indication
- Long-term stability and accuracy

Area of use

- Measurement of indoor temperature, relative humidity and TVOC
- Monitoring of indoor air quality
- Suitable for residential and commercial buildings
- For indoor use only

Technical specifications

Analogue / modulating outputs	0—10 VDC mode: RL ≥ 50 kΩ	
	0—20 mA mode: RL ≤ 500 Ω	
	PWM (open-collector type) mode: 1 kHz, RL ≥ 50 kΩ, 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	± 0,4 °C (range 0—50 °C)	
	± 3% rH (range 0—95 %)	
	±15 % TVOC (range 0—60.000 ppb)	
Protection standard	IP30 (according to EN 60529)	

Wiring and connections

Article type	RSVCF-R	RSVCG-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 1 for temperature measurement (0—10 VDC / 0—20 mA / PWM)		
GND	Ground AO1	Common ground*	
AO2	Analogue / modulating output 2 for relative humidity measurement (0—10 VDC / 0—20 mA / PWM)		
GND	Ground AO2	Common ground*	
AO3	Analogue / modulating output 3 for TVOC measurement (0—10 VDC / 0—20 mA / PWM)		
GND	Ground AO3	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!



Article codes

Article code	Supply	I _{max}
RSVCG-R	18—34 VDC	115 mA
	15—24 VAC ±10%	115 mA
RSVCF-R	18—34 VDC	115 mA

Indications

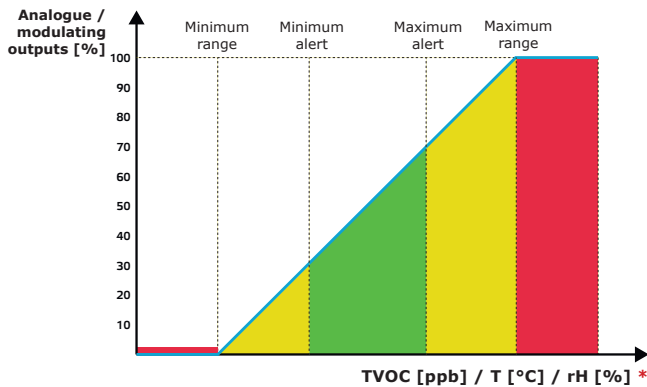
1 - Red LED	Continuous	Measured temperature, relative humidity or TVOC are out of range
	Blinking	Communication with one of the sensors fails
2 - Yellow LED	On	Measured temperature, relative humidity or TVOC are in the alert range
3 - Green LED	On	Measured temperature, relative humidity or TVOC are within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

RSVCX-R

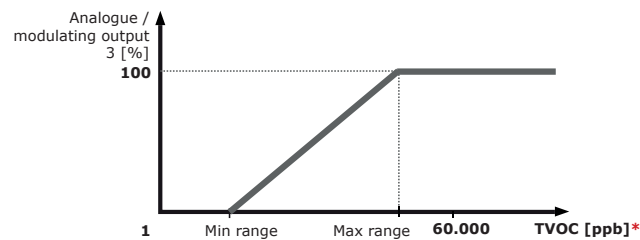
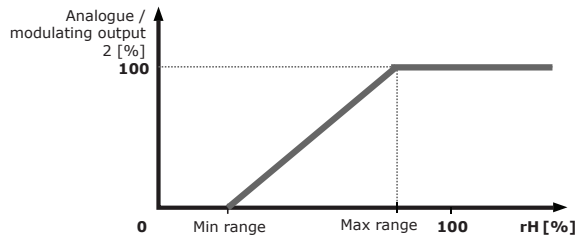
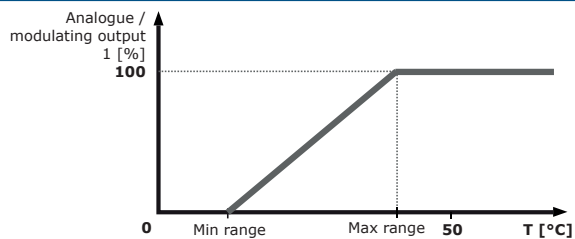
Air quality room transmitter



Operational diagram

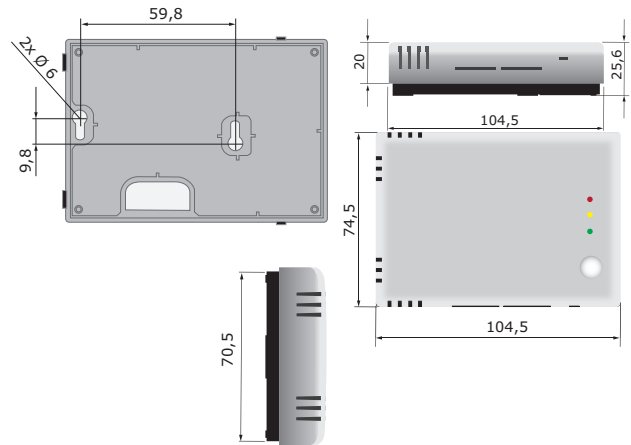


* LED indications - T (default) or rH



*TVOC measurement will return 0 ppb during warm-up time.

Fixing and dimensions



Modbus registers



The Sensistart 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.

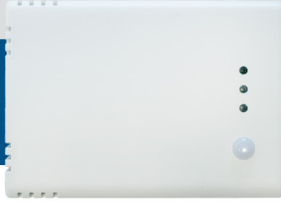
Standards

- 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

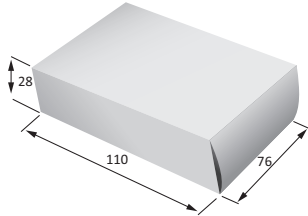
- WEEE 2012/19/EC
- RoHS Directive 2011/65/EC



RSVCX-R

Air quality room transmitter

Packaging



Article	Packaging	Length [mm]	Width [mm]	Height [mm]	Net weight	Gross weight
RSVCF-R RSVCG-R	Unit (1 pc.)	110	76	28	0,089 kg	0,111 kg
	Carton (24 pcs.)	492	182	84	2,14 kg	2,804 kg
	Box (144 pcs.)	510	410	270	12,81 kg	18,066 kg

Global trade item numbers (GTIN)

Packaging	RSVCF-R	RSVCG-R
Unit	05401003011447	05401003011454
Carton	05401003301883	05401003301890
Box	05401003502709	05401003502716



RSVCM-R

Air quality room transmitter

RSVCM-R are multifunctional room transmitters which measure temperature, relative humidity and a broad range of total volatile organic compounds (TVOCs). The TVOC concentration is an accurate indicator for indoor air quality. Based on the temperature and relative humidity measurements, the dew-point temperature is calculated. All the parameters and measurements are accessible via Modbus RTU.

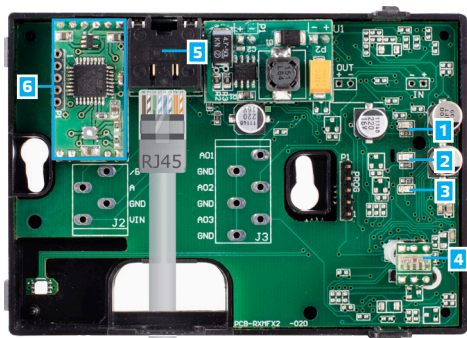
Key features

- Selectable temperature, relative humidity and TVOC ranges
- Silicon based sensor elements for TVOC measurements
- Bootloader for updating the firmware via Modbus RTU communication
- Day / Night detection via ambient light sensor
- Ambient light sensor with adjustable 'active' and 'standby' level
- Modbus RTU (RS485)
- Replaceable TVOC sensor module
- 3 LEDs with adjustable light intensity for status indication
- Long-term stability and accuracy

Technical specifications

Warm-up time	15 minutes	
Typical range of use	Temperature range	0—50 °C
	Relative humidity range	0—95 % rH (non-condensing)
	TVOC range	0—60.000 ppb
Accuracy	± 0,4 °C (range 0—50 °C)	
	± 3% rH (range 0—95 %)	
	±15 % TVOC (range 0—60.000 ppb)	
Protection standard	IP30 (according to EN 60529)	

Indications



1 - Red LED	Continuous	Measured temperature, relative humidity or TVOC are out of range
	Blinking	Communication with one of the sensor elements fails
2 - Yellow LED	On	Measured temperature, relative humidity or TVOC are in the alert range
	On	Measured temperature, relative humidity or TVOC are within range
3 - Green LED	Blinking	Sensor warming up
4 - Ambient light sensor		Low light intensity / Active / Standby
5 - RJ45 socket		Modbus communication with connected Master devices and PoM-voltage supply (24 VDC)
		Blinking LEDs indicate that packages are transmitted via Modbus RTU communication
6 - TVOC sensor element		Replaceable in case of faulty operation



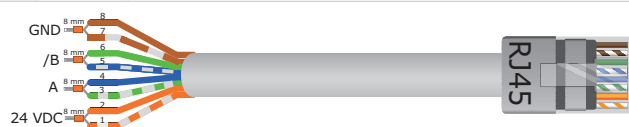
Article codes

Article code	Supply	Imax	Connection
RSVCM-R	24 VDC, PoM	115 mA	RJ45

Wiring and connections

RJ45 socket (Power over Modbus)

Pin 1	24 VDC	Supply voltage
Pin 2		
Pin 3	A	Modbus RTU communication, signal A
Pin 4		
Pin 5	/B	Modbus RTU communication, signal /B
Pin 6		
Pin 7	GND	Ground, supply voltage
Pin 8		



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.

Area of use

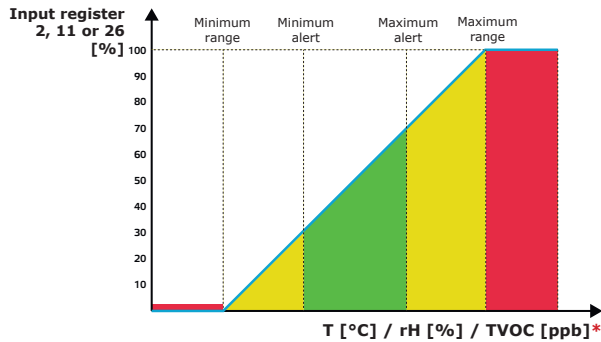
- Measurement of indoor temperature, relative humidity and TVOC
- Monitoring of indoor air quality
- Suitable for residential and commercial buildings
- For indoor use only



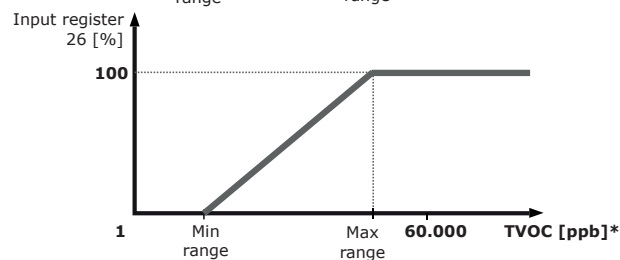
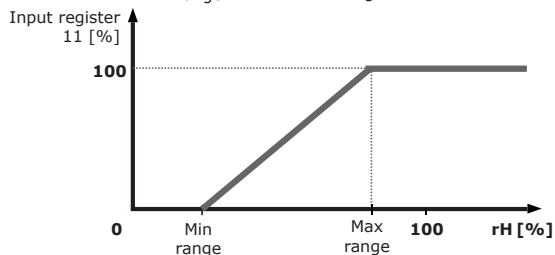
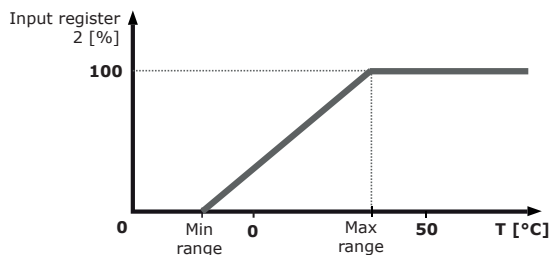
RSVCM-R

Air quality room transmitter

Operational diagram(s)



* LED indications - T, rH or TVOC (default)

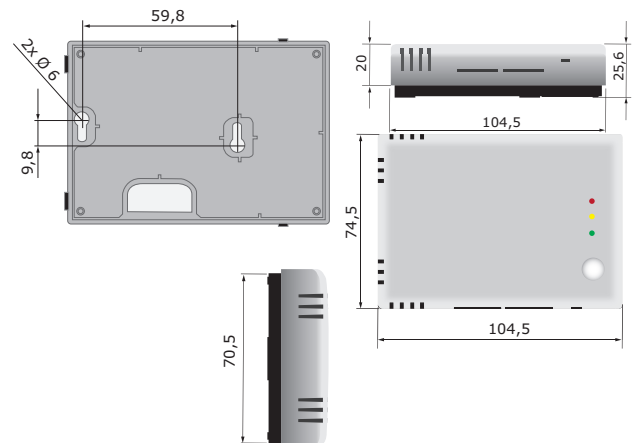


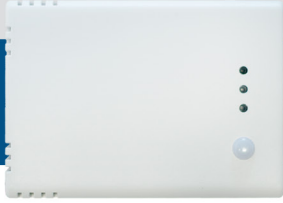
*TVOC measurements will return 0 ppb during warm-up time.

Standards

- Low Voltage Directive 2014/35/EC
 - EN 60529:1991 Degrees of protection provided by enclosures (IP Code) Amendment AC:1993 to EN 60529
- 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

Fixing and dimensions

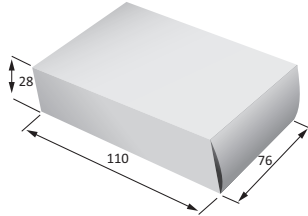




RSVCM-R

Air quality room transmitter

Packaging



Article	Packaging	Length [mm]	Width [mm]	Height [mm]	Net weight	Gross weight
RSVCM-R	Unit (1 pc.)	110	76	28	0,089	0,111 kg
	Carton (24 pcs.)	492	182	84	2,14 kg	2,284 kg
	Box (144 pcs.)	510	410	270	12,81 kg	18,066 kg

Global trade item numbers (GTIN)

Packaging	RSVCM-R
Unit	05401003011478
Carton	05401003301913
Box	05401003502730

RSVCH-R

Air quality room transmitter



RSVCH-R are multifunctional room transmitters which measure temperature, relative humidity and a broad range of total volatile organic compounds (TVOCs). The TVOC concentration is an accurate indicator for indoor air quality. Based on the temperature and relative humidity measurements, the dew-point temperature is calculated. They feature 24 VDC power supply and 3 analogue / modulating outputs - one for temperature, one for relative humidity and one for TVOC. All the parameters and measurements are accessible via Modbus RTU.



Key features

- Spring contact terminal block or RJ45 connections
- Selectable temperature, relative humidity and TVOC ranges
- Silicon based sensor elements for TVOC measurements
- Bootloader for updating the firmware via Modbus RTU communication
- Day / Night detection via ambient light sensor
- Ambient light sensor with adjustable 'active' and 'standby' level
- Modbus RTU (RS485)
- Replaceable TVOC sensor module
- 3 LEDs with adjustable light intensity for status indication
- Long-term stability and accuracy

Area of use

- Measurement of indoor temperature, relative humidity and TVOC
- Monitoring of indoor air quality
- Suitable for residential and commercial buildings
- For indoor use only

Technical specifications

Analogue / modulating outputs	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	$\pm 0,4 \text{ }^\circ\text{C}$ (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 voltage	I _{max}	Connection type
RSVCH-R	24 VDC	115 mA	RJ45 or terminal block

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.

Wiring diagram

RJ45 sockets (Power over Modbus)

Pin 1	24 VDC	Supply voltage
Pin 2		
Pin 3	A	Modbus RTU communication, signal A
Pin 4		
Pin 5	/B	Modbus RTU communication, signal /B
Pin 6		
Pin 7	GND	Ground, supply voltage
Pin 8		



Terminal Block 1

VIN	Supply voltage 24 VDC
GND	Supply voltage, ground
A	Modbus RTU communication, signal A
/B	Modbus RTU communication, signal /B

Terminal Block 2

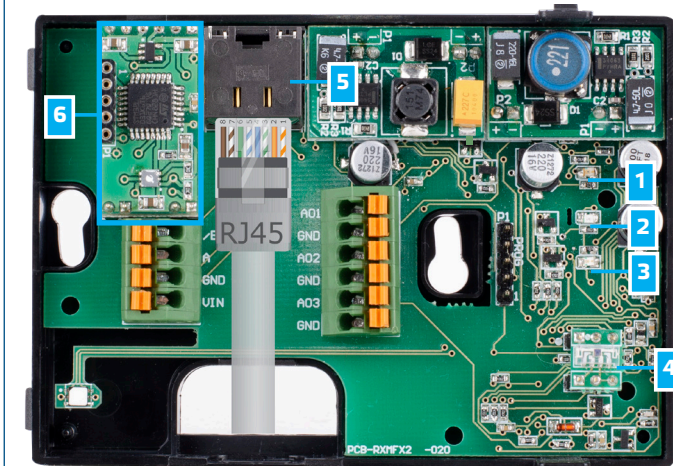
AO1	Analogue / modulating output 1 for temperature measurement (0—10 VDC / 0—20 mA / PWM)
GND	Ground AO1
AO2	Analogue / modulating output 2 for relative humidity measurement (0—10 VDC / 0—20 mA / PWM)
GND	Ground AO2
AO3	Analogue / modulating output 3 for TVOC measurement (0—10 VDC / 0—20 mA / PWM)
GND	Ground AO3

⁽¹⁾ **Attention!** The unit needs to be supplied via the RJ45 connector or via the connection terminals. Do not connect the device via the RJ45 connector and the terminal block simultaneously!

RSVCH-R

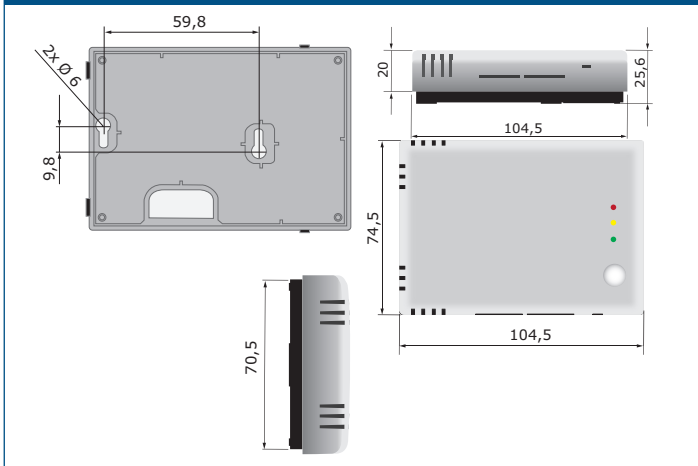
Air quality room transmitter

Settings and indications

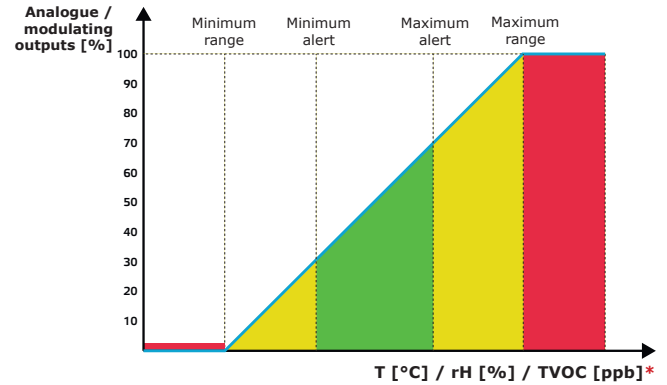


1 - Red LED	Continuous	Measured temperature, relative humidity or TVOC are out of range
	Blinking	Communication with one of the sensors fails
2 - Yellow LED	On	Measured temperature, relative humidity or TVOC are in the alert range
	On	Measured temperature, relative humidity or TVOC are within range
3 - Green LED	Blinking	Sensor warming up
4 - Ambient light sensor		Low light intensity / Active / Standby
5 - RJ45 socket		Modbus communication with connected Master devices and PoM voltage supply (24 VDC)
		Blinking LEDs indicate that packages are transmitted via Modbus RTU communication
6 - TVOC sensor element		Replaceable in case of faulty operation

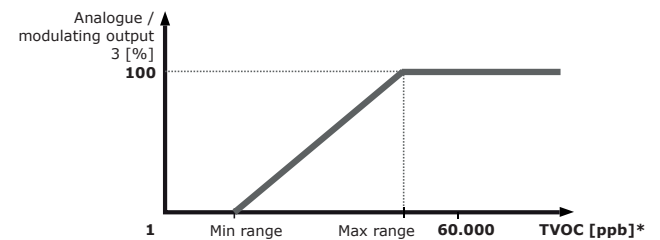
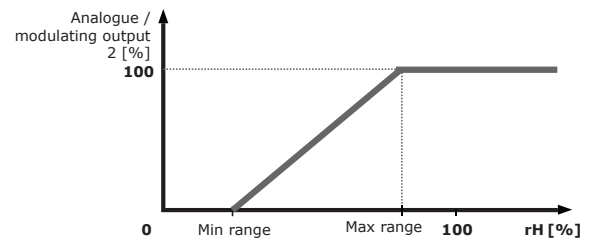
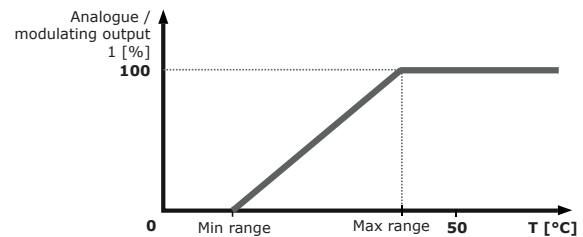
Fixing and dimensions



Operational diagram(s)



* LED indications - TVOC (default), T or rH



*TVOC measurements will return 0 ppb during warm-up time.



RSVCH-R

Air quality room transmitter

Standards

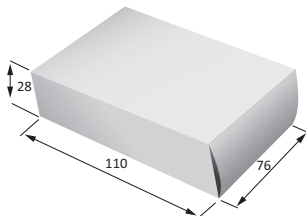


- Low Voltage Directive 2014/35/EC
 - EN 60529:1991 Degrees of protection provided by enclosures (IP Code) Amendment AC:1993 to EN 60529
 - EN 60730-1:2011 Automatic electrical controls for household and similar use - Part 1: General requirements
- EMC directive 2014/30/EU:
 - EN 60730-1:2011 Automatic electrical controls for household and similar use - Part 1: General requirements
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 - 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

Global trade item numbers (GTIN)

Packaging	RSVCH-R
Unit	05401003011461
Carton	05401003301906
Box	05401003502723

Packaging



Article	Packaging	Length [mm]	Width [mm]	Height [mm]	Net weight	Gross weight
RSVCH-R	Unit (1 pc.)	110	76	28	0,089 kg	0,111 kg
	Carton (24 pcs.)	492	182	84	2,14 kg	2,804 kg
	Box (144 pcs.)	510	410	270	12,81 kg	18,066 kg



RCVCX-R

Intelligent air quality room sensor

The RCVCX-R are intelligent room sensors for measuring temperature, relative humidity and TVOC ranges. The used algorithm controls a single analogue / modulating output based on the measured temperature, humidity and TVOC 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

- Selectable temperature, relative humidity and TVOC ranges
- Spring contact terminal block
- Fan speed control based on T, rH and TVOC measurements
- Silicon based sensor elements for TVOC measurements
- Bootloader for updating the firmware via Modbus RTU communication
- Day / Night detection via ambient light sensor
- Ambient light sensor with adjustable 'active' and 'standby' level
- Modbus RTU communication
- Replaceable TVOC 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 TVOC
- Suitable for residential and commercial buildings
- For indoor use only

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 range 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—100 %)	
	$\pm 15\%$ TVOC (range 0—60.000 ppb)	
Protection standard	IP30 (according to EN 60529)	

Wiring and connections

Article type	RCVCF-R	RCVCG-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 - T, rH or TVOC (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!



Article codes

Article code	Supply	I _{max}
RCVCG-R	18—34 VDC	45 mA
	15—24 VAC $\pm 10\%$	50 mA
RCVCF-R	18—34 VDC	45 mA

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.

Standards

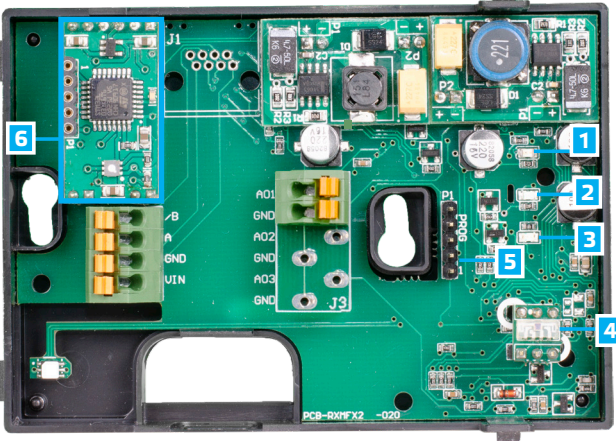


- Low Voltage Directive 2014/35/EU
 - EN 60529:1991 Degrees of protection provided by enclosures (IP Code) Amendment AC:1993 to EN 60529
 - EN 60730-1:2011 Automatic electrical controls for household and similar use - Part 1: General requirements
- EMC directive 2014/30/EU:
 - EN 60730-1:2011 Automatic 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

RCVCX-R

Intelligent air quality room sensor

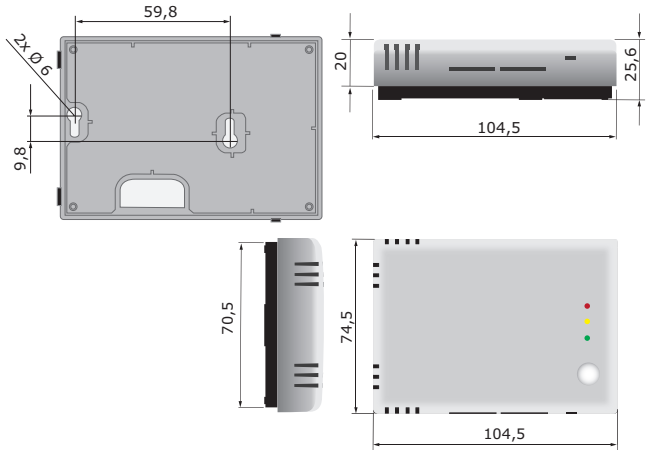
Indications



1 - Red LED	On	Measured temperature, relative humidity or TVOC values are out of range
	Blinking	Communication with one of the sensors fails
2 - Yellow LED	On	Measured temperature, relative humidity or TVOC 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 TVOC values are within range
	Blinking	TVOC sensor is warming up
4 - Ambient light sensor		Low light intensity / Active / Standby
5 - 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 power supply to enter bootloader mode
6 - TVOC sensor element		Replaceable in case of faulty operation

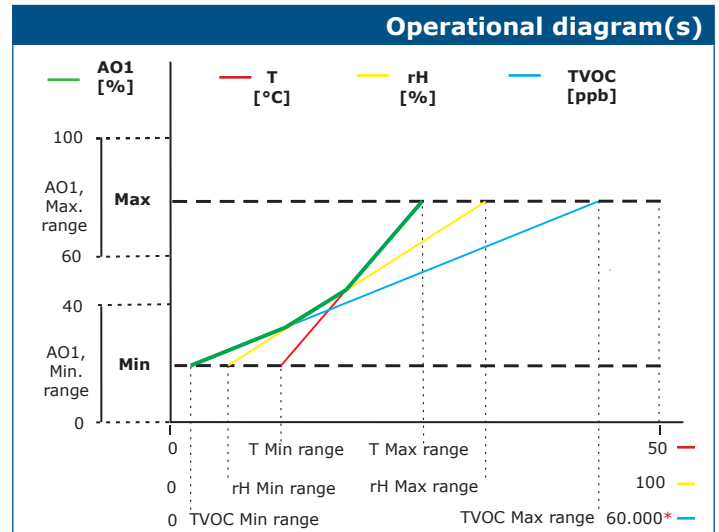
Note: By default, the LED indicators visualise the measured TVOC level. When the sensor is in bootloader mode, the green and yellow LEDs flash alternately. During the firmware download, the red LED is flashing additionally.

Fixing and dimensions



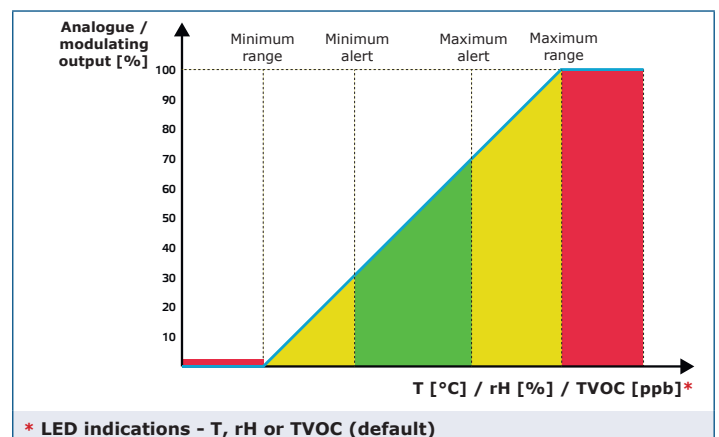
Top view dimensions: 59,8 mm (width), 104,5 mm (length), 9,8 mm (mounting hole offset), 20 mm (mounting hole diameter), 25,6 mm (mounting hole diameter).

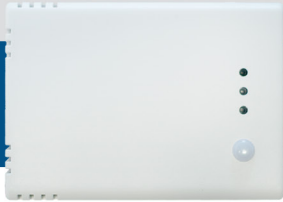
Side view dimensions: 70,5 mm (height), 74,5 mm (height), 104,5 mm (length).



*TVOC measurements will return 0 ppb during warm-up time.

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). One or multiple sensors can be deactivated. E.g. it is also possible to control the output based on the measured TVOC values only.

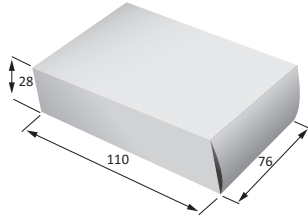




RCVCX-R

Intelligent air quality room sensor

Packaging



Article	Packaging	Length [mm]	Width [mm]	Height [mm]	Net weight	Gross weight
RCVCF-R RCVCG-R	Unit (1 pc.)	110	76	28	0,089 kg	0,111 kg
	Carton (24 pcs.)	492	182	84	2,14 kg	2,804 kg
	Box (144 pcs.)	510	410	270	12,81 kg	18,066 kg

Global trade item numbers (GTIN)

Packaging	RCVCF-R	RCVCG-R
Unit	05401003018118	05401003018132
Carton	05401003302675	05401003302682
Box	05401003503850	05401003503867

RCVCM-R

Intelligent TVOC room sensor

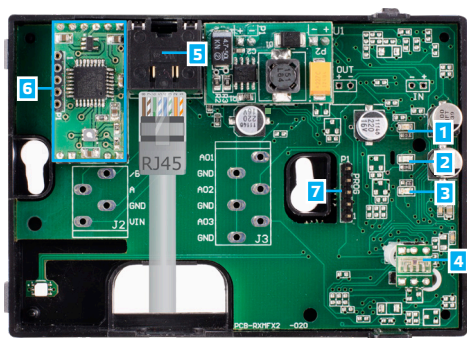
The RCVCM-R are intelligent room sensors featuring adjustable temperature, relative humidity and TVOC ranges. The used algorithm generates an output value based on the measured T, rH and TVOC values, which can be used to directly control an EC fan, an AC fan speed controller or an actuator powered damper. They are Power over Modbus supplied and all parameters are accessible via Modbus RTU.

Key features

- 24 VDC power supply via RJ45 (PoM)
- Selectable temperature, relative humidity and TVOC ranges
- Fan speed control based on T, rH and TVOC measurement
- Silicon based sensor elements for TVOC measurement
- Bootloader for updating the firmware via Modbus RTU communication
- Day / Night detection via ambient light sensor
- Ambient light sensor with adjustable 'active' and 'standby' level
- Modbus RTU communication
- Replaceable TVOC sensor module
- 3 LEDs with adjustable light intensity for status indication
- Long-term stability and accuracy



Indications



1 - Red LED	On	Measured temperature, relative humidity or TVOC values are out of range
	Blinking	Communication with one of the sensors fails
2 - Yellow LED	On	Measured temperature, relative humidity or TVOC values are in the alert range
	Blinking	TVOC sensor is warming up
3 - Green LED	On	Measured temperature, relative humidity or TVOC values are within range
	Blinking	TVOC sensor is warming up
4 - Ambient light sensor		Low light intensity / Active / Standby
5 - RJ45 socket		Modbus communication with connected Master devices and PoM-voltage supply (24 VDC)
		Blinking LEDs indicate that packages are transmitted via Modbus RTU communication
6 - TVOC sensor element		Replaceable in case of faulty operation
7 - 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 power supply to enter bootloader mode

Note: By default, the LED indicators visualise the measured TVOC 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.

Wiring and connections

RJ45 socket (Power over Modbus)

Pin 1	24 VDC	Supply voltage
Pin 2		
Pin 3	A	Modbus RTU communication, signal A
Pin 4		
Pin 5	/B	Modbus RTU communication, signal /B
Pin 6		
Pin 7	GND	Ground, supply voltage
Pin 8		



Area of use

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

Article codes

Article code	Supply	I _{max}	Connection
RCVCM-R	24 VDC, PoM	30 mA	RJ45

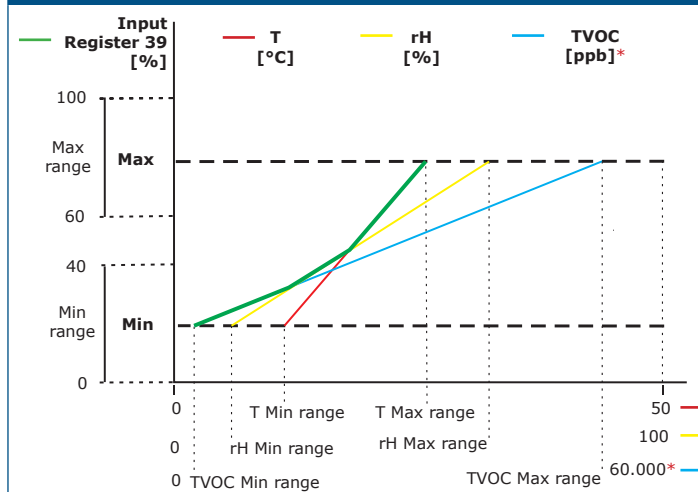
Technical specifications

Supply	24 VDC, Power over Modbus		
Warm-up time	15 minutes		
Typical range of use	Temperature range	0–50 °C	
	Relative humidity range	0–95 % rH (non-condensing)	
	TVOC range	0–60.000 ppb	
Accuracy	± 0,4 °C (range 0–50 °C)		
	± 3% rH (range 0–100 %)		
	±15 % TVOC (range 0–60.000 ppb)		
Protection standard	IP30 (according to EN 60529)		

RCVCM-R Intelligent TVOC room sensor

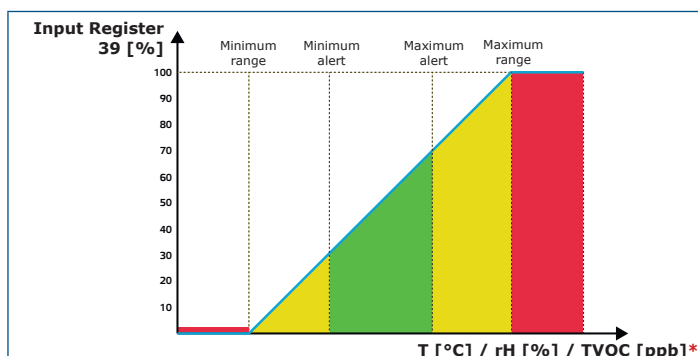


Operational diagram(s)



*TVOC measurements will return 0 ppb during warm-up time.

Note: The output changes automatically depending on the highest of the T, rH or TVOC 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 possible to control the output based on the measured TVOC value only.



*LED indications - T, rH or TVOC (default)

Standards



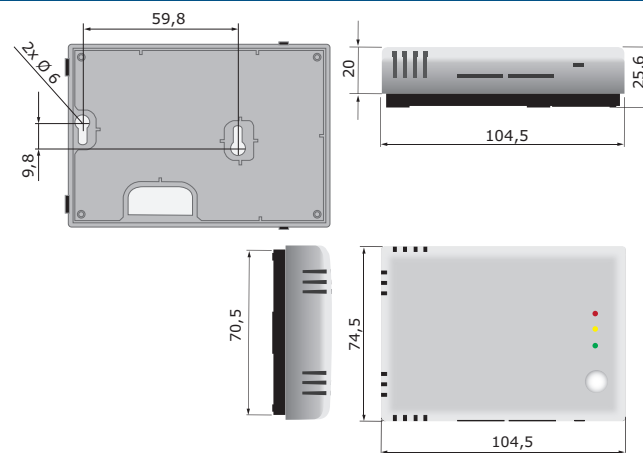
- Low Voltage Directive 2014/35/EU
- EN 60529:1991 Degrees of protection provided by enclosures (IP Code) Amendment AC:1993 to EN 60529
- EN 60730-1:2011 - Automatic electrical controls for household and similar use - Part 1: General requirements

- 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

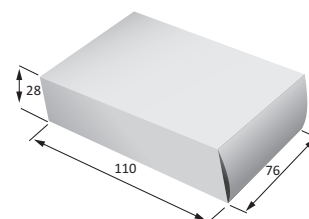
- WEEE 2012/19/EU

- RoHS Directive 2011/65/EU

Fixing and dimensions



Packaging



Article	Packaging	Length [mm]	Width [mm]	Height [mm]	Net weight	Gross weight
RCVCM-R	Unit (1 pc.)	110	76	28	0,089	0,111 kg
	Carton (24 pcs.)	492	182	84	2,14 kg	2,284 kg
	Box (144 pcs.)	510	410	270	12,81 kg	18,066 kg

Global trade item numbers (GTIN)

Packaging	RCVCM-R
Unit	05401003018156
Carton	05401003302705
Box	05401003503881

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.



RCVCH-R

Intelligent TVOC room sensor

The RCVCH-R are intelligent room sensors for measuring temperature, relative humidity and TVOC ranges. The used algorithm controls a single analogue / modulating output based on the measured temperature, humidity and TVOC values, which can be used to directly control an EC fan, an AC fan speed controller or an actuator powered damper. They feature 24 VDC power supply and an ambient light sensor. All parameters are accessible via Modbus RTU.

Key features

- Spring contact terminal block or RJ45 connection
- Selectable temperature, relative humidity and TVOC ranges
- Silicon based sensor elements for TVOC measurements
- Fan speed control based on temperature, humidity and TVOC
- Bootloader for updating the firmware via Modbus RTU communication
- Day / Night detection via ambient light sensor
- Ambient light sensor with adjustable 'active' and 'standby' level
- Modbus RTU communication
- Replaceable TVOC sensor module
- 3 LEDs with adjustable light intensity for status indication
- Long-term stability and accuracy

Area of use

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

Technical specifications

Analogue / modulating output	0—10 VDC mode: $R_L \geq 50 \text{ k}\Omega$	
	0—20 mA mode: $R_L \leq 500 \Omega$	
	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	$\pm 0,4 \text{ }^\circ\text{C}$ (0—50 °C)	
	$\pm 3\%$ rH (range 0—100 %)	
	$\pm 15\%$ TVOC (range 0—60.000 ppb)	
Protection standard	IP30 (according to EN 60529)	

Article codes

Article code	Supply voltage	I _{max}	Connection type
RCVCH-R	24 VDC	45 mA	RJ45 or terminal block

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.



Wiring diagram

RJ45 sockets (Power over Modbus)

Pin 1	24 VDC	Supply voltage
Pin 2		
Pin 3	A	Modbus RTU communication, signal A
Pin 4		
Pin 5	/B	Modbus RTU communication, signal /B
Pin 6		
Pin 7	GND	Ground, supply voltage
Pin 8		



Terminal Block 1

VIN	Supply voltage 24 VDC
GND	Supply voltage, ground
A	Modbus RTU communication, signal A
/B	Modbus RTU communication, signal /B

Terminal Block 2

AO1	Analogue / modulating output - temperature, humidity or TVOC measurement (0—10 VDC / 0—20 mA / PWM)
GND	Ground AO1

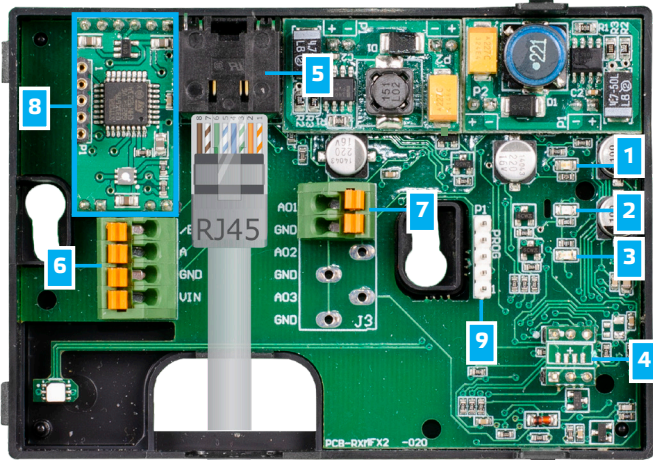
Attention! The unit needs to be supplied via the RJ45 connector or via the connection terminals. Do not connect the device via the RJ45 connector and the terminal block simultaneously!

RCVCH-R

Intelligent TVOC room sensor

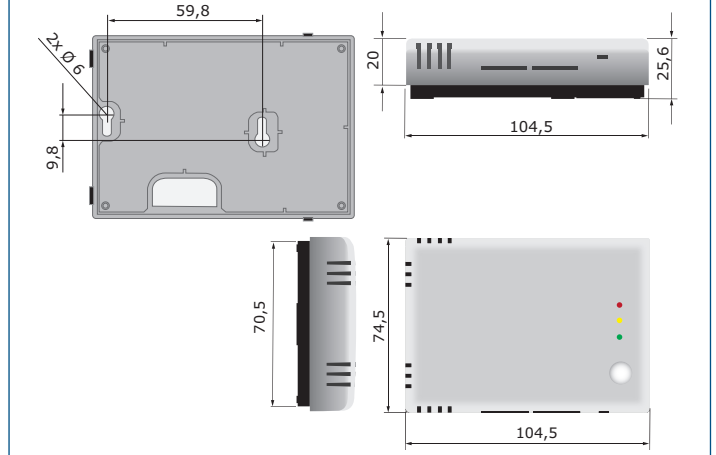


Settings and indications

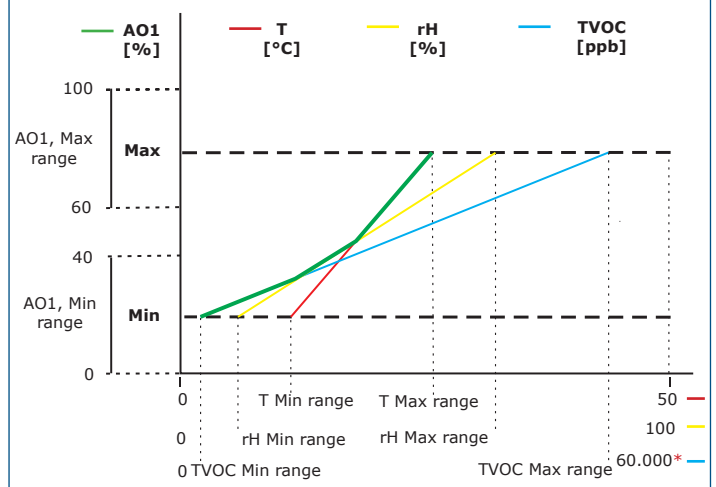
		
1 - Red LED	On	Measured temperature, relative humidity or TVOC values are out of range
	Blinking	Communication with one of the sensors fails
2 - Yellow LED	On	Measured temperature, relative humidity or TVOC values are in the alert range
	Blinking	Modbus communication has stopped and HR8 is activated (Modbus timeout > 0 seconds)
3 - Green LED	On	Measured temperature, relative humidity or TVOC values are within range
	Blinking	TVOC sensor is warming up
4 - Ambient light sensor		Low light intensity / Active / Standby
5 - RJ45 socket		Modbus communication with connected Master devices and PoM voltage supply (24 VDC)
		Blinking LEDs indicate that packages are transmitted via Modbus RTU communication
6 - Terminal block input connection		24 VDC supply voltage and Modbus RTU signal
7 - Output connection		AO1 - Temperature, relative humidity or TVOC
8 - TVOC sensor element		Replaceable in case of faulty operation
9 - 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 power supply to enter bootloader mode

Note: By default, the LED indicators visualise the measured TVOC 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.

Fixing and dimensions

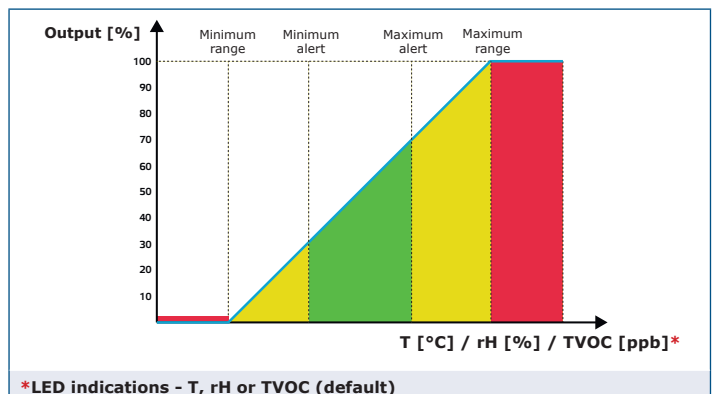


Operational diagram(s)



*TVOC measurements will return 0 ppb during warm-up time.

Note: The output changes automatically depending on the higher of the T, rH or TVOC 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 possible to control the output based on the measured TVOC value only.



*LED indications - T, rH or TVOC (default)



RCVCH-R

Intelligent TVOC room sensor

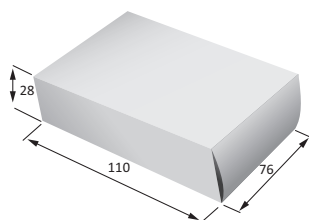
Standards

- 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

Global trade item numbers (GTIN)

Packaging	RCVCH-R
Unit	05401003018149
Carton	05401003302699
Box	05401003503874

Packaging



Article	Packaging	Length [mm]	Width [mm]	Height [mm]	Net weight	Gross weight
RCVCH-R	Unit (1 pc.)	110	76	28	0,089 kg	0,111 kg
	Carton (24 pcs.)	492	182	84	2,14 kg	2,804 kg
	Box (144 pcs.)	510	410	270	12,81 kg	18,066 kg

ODVCM-R

Multifunctional transmitter for harsh environments



ODVCM-R are multifunctional transmitters for harsh environments which measure temperature, relative humidity, TVOC as well as ambient light. The TVOC concentration is an accurate indicator for indoor air quality. Based on the temperature and relative humidity measurements, the dew point can be calculated. They are Power over Modbus supplied and all parameters are accessible via Modbus RTU.

Key features

- Power over Modbus supply via RJ45 socket
- Suitable for harsh environments
- Selectable temperature, relative humidity and TVOC
- Silicon based sensor elements for TVOC measurement
- Bootloader for updating the firmware via Modbus RTU communication
- Day / Night detection via ambient light sensor
- Ambient light sensor with adjustable 'active' and 'standby' level
- Modbus RTU communication
- Long-term stability and accuracy
- Replaceable TVOC sensor module

Area of use

- Measurement of temperature, relative humidity and air quality
- Detection of ambient light
- Suitable for both indoor and outdoor use (e.g. open-air spaces, multi-storey and subterranean car parks, residential and commercial buildings)

Article codes

Article code	Supply	Imax	Connection
ODVCM-R	24 VDC, PoM	15 mA	RJ45

Technical specifications

Supply voltage	24 VDC, Power over Modbus	
Warm-up time	15 minutes	
Typical range of use	Temperature range	-30—70 °C
	Relative humidity range	0—100 % rH (non-condensing)
	TVOC range	0—60.000 ppb
Accuracy	±0,4 °C (-30—70 °C)	
	±3 % rH (0—100 % rH)	
	±15 % TVOC (0—60.000 ppb)	
Protection standard	IP65 (according to EN 60529)	

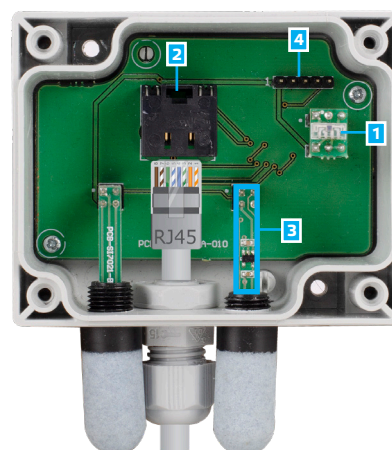
Wiring and connections

RJ45 socket (Power over Modbus)

Pin 1	24 VDC	Supply voltage
Pin 2		
Pin 3	A	Modbus RTU communication, signal A
Pin 4		
Pin 5	/B	Modbus RTU communication, signal /B
Pin 6		
Pin 7	GND	Ground, supply voltage
Pin 8		



Indications



1 - Ambient light sensor		Low light intensity / Active / Standby
2 - RJ45 socket		Plug the communication and power cable into the socket
3 - TVOC sensor element		Replaceable in case of faulty operation
4 - 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

ODVCM-R

Multifunctional transmitter for harsh environments



Modbus registers



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

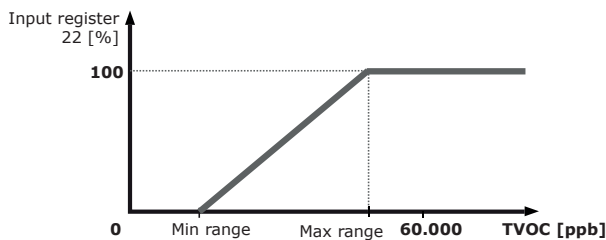
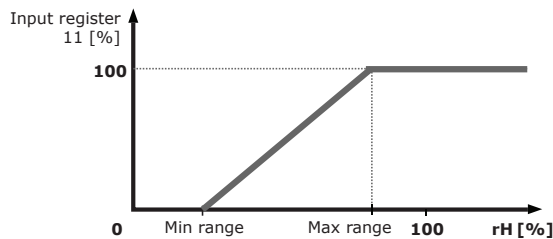
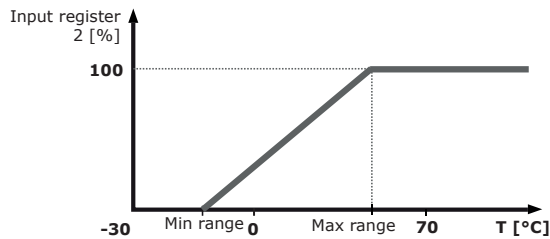
The parameters of the unit can be monitored / configured through the 3SModbus software platform. You can download it from the following link:

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



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

Operational diagram(s)



Standards

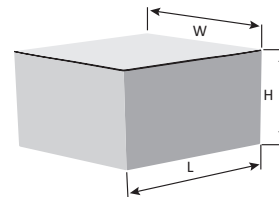


- Low Voltage Directive 2014/35/EC
 - EN 60529:1991 Degrees of protection provided by enclosures (IP Code) Amendment AC:1993 to EN 60529
 - EN 61010-1:2010 Safety requirements for electrical equipment for measurement, control, and laboratory use - Part 1: General requirements
- EMC directive 2014/30/EU:
 - EN 61000-6-1:2007 Electromagnetic compatibility (EMC) - Part 6-1: Generic standards - Immunity for residential, commercial and light-industrial environments
 - EN 61000-6-2:2005 Electromagnetic compatibility (EMC) - Part 6-2: Generic standards - Immunity for industrial environments. Amendment AC:2015 to EN 61000-6-2
 - 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

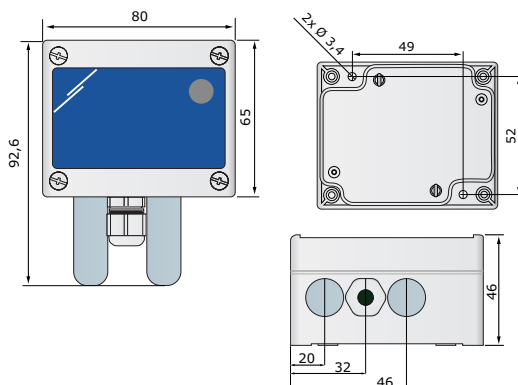


Article	Packaging	Length [mm]	Width [mm]	Height [mm]	Net weight	Gross weight
ODVCM-R	Unit (1 pc.)	80	45	100	0,15 kg	0,18 kg
	Carton (10 pcs.)	—	—	—	1,5 kg	1,96 kg
	Box (60 pcs.)	590	380	280	9 kg	11,76 kg

Global trade item numbers (GTIN)

Packaging	ODVCM-R
Unit	05401003010709
Carton	05401003301586
Box	05401003502341

Fixing and dimensions





OCVCM-R

Intelligent TVOC sensor for harsh environments

The OCVCM-R are intelligent sensors featuring adjustable temperature, relative humidity and TVOC ranges suitable for outdoor applications or tough environments. Based on the temperature and relative humidity measurements, the dew point temperature is calculated. The used algorithm generates an output value based on the measured temperature, humidity and TVOC values, which can be used to directly control an EC fan, an AC fan speed controller or an actuator powered damper. They are Power over Modbus supplied and all parameters are accessible via Modbus RTU communication.

Key features

- Wiring via RJ45 connector
- Suitable for harsh environments
- Selectable temperature, relative humidity and TVOC ranges
- Fan speed control based on temperature, humidity and TVOC
- Silicon based sensor elements for TVOC measurement
- Bootloader for updating the firmware via Modbus RTU communication
- Day / Night detection via ambient light sensor
- Ambient light sensor with adjustable 'active' and 'standby' level
- Modbus RTU communication
- Long-term stability and accuracy
- Replaceable TVOC sensor module

Area of use

- Demand controlled ventilation based on temperature, relative humidity and TVOC
- Suitable for both indoor and outdoor use (e.g. open-air spaces, multi-storey and subterranean car parks, residential and commercial buildings)

Article codes

Article code	Supply	Imax	Connection
OCVCM-R	24 VDC, PoM	15 mA	RJ45

Technical specifications

Supply voltage	24 VDC, Power over Modbus	
Warm-up time	15 minutes	
Typical range of use	Temperature range	-30—70 °C
	Relative humidity range	0—100 % rH (non-condensing)
	TVOC range	0—60.000 ppb
Accuracy	±0,4 °C (-30—70 °C)	
	±3 % rH (0—100 % rH)	
	±15 % TVOC (range 0—60.000 ppb)	
Protection standard	IP65 (according to EN 60529)	

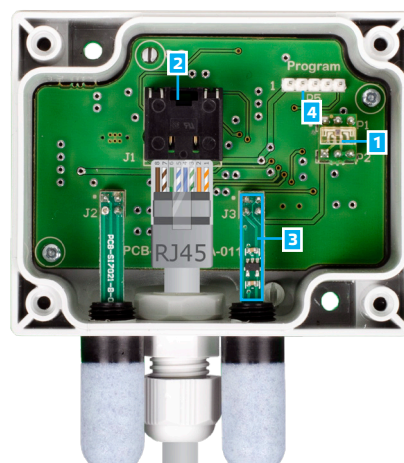
Wiring and connections

RJ45 socket (Power over Modbus)

Pin 1	24 VDC	Supply voltage
Pin 2		
Pin 3	A	Modbus RTU communication, signal A
Pin 4		
Pin 5	/B	Modbus RTU communication, signal /B
Pin 6		
Pin 7	GND	Ground, supply voltage
Pin 8		



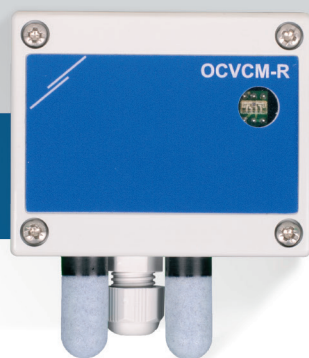
Indications



1 - Ambient light sensor		Low light intensity / Active / Standby
2 - RJ45 socket		Plug the communication and power cable into the socket
3 - TVOC sensor element		Replaceable in case of faulty operation
4 - PROG header		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 power supply to enter bootloader mode

OCVCM-R

Intelligent TVOC sensor for harsh environments



Modbus registers



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

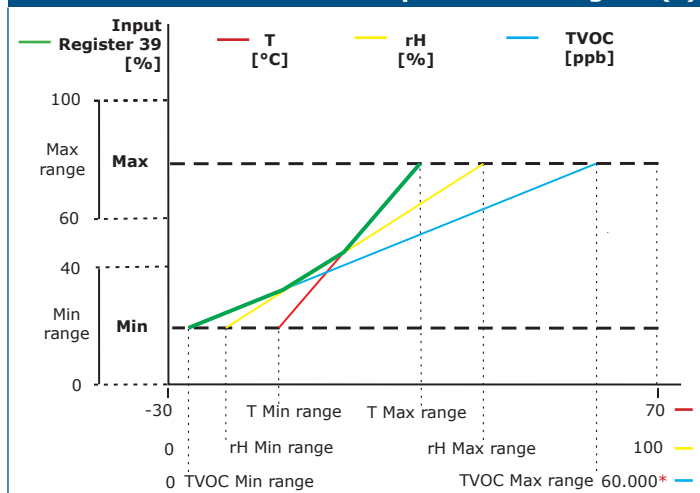
The parameters of the unit can be monitored / configured through the 3SModbus software platform. You can download it from the following link:

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



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

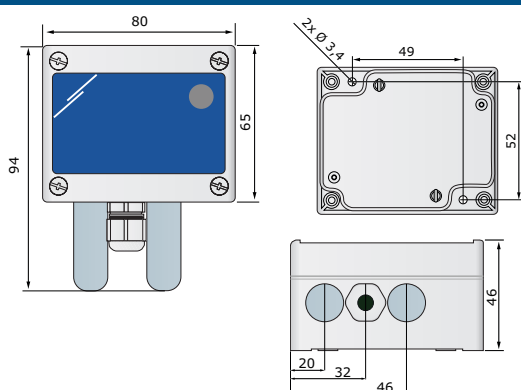
Operational diagram(s)



*TVOC measurements will return 0 ppb during warm-up time.

Note: The output changes automatically depending on the highest of the T, rH or TVOC 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 TVOC values only.

Fixing and dimensions



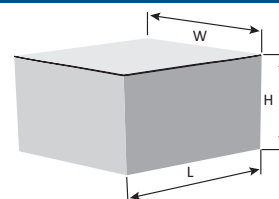
Standards

- Low Voltage Directive 2014/35/EU
 - EN 60529:1991 Degrees of protection provided by enclosures (IP Code) Amendment AC:1993 to EN 60529
 - EN 61010-1:2010 Safety requirements for electrical equipment for measurement, control, and laboratory use - Part 1: General requirements
- EMC directive 2014/30/EU
 - EN 61000-6-1:2007 Electromagnetic compatibility (EMC) - Part 6-1: Generic standards - Immunity for residential, commercial and light-industrial environments
 - EN 61000-6-2:2005 Electromagnetic compatibility (EMC) - Part 6-2: Generic standards - Immunity for industrial environments Amendment AC:2015 to EN 61000-6-2
 - 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

Packaging



Article	Packaging	Length [mm]	Width [mm]	Height [mm]	Net weight	Gross weight
OCVCM-R	Unit (1 pc.)	105	80	55	0,150 kg	0,190 kg
	Box (80 pcs.)	590	380	280	12,00 kg	15,2 kg
	Pallet (2,240 pcs.)	1,200	800	2,100	336 kg	425,6 kg

Global trade item numbers (GTIN)

Packaging	OCVCM-R
Unit	05401003018163
Box	05401003503898
Pallet	05401003700983



FCVC8-R

Intelligent air quality sensor

The FCVC8-R series are intelligent sensors featuring adjustable temperature, relative humidity and TVOC ranges. 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, 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 TVOC ranges
- Fan speed control based on T, rH and TVOC
- Inset or surface mounting
- Bootloader for updating the firmware via Modbus RTU communication
- Ambient light sensor with adjustable 'active' and 'standby' level
- Replaceable TVOC 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: $R_L \geq 50 \text{ k}\Omega$	
	0—20 mA mode: $R_L \leq 500 \Omega$	
	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—100 %)	
	$\pm 15\%$ TVOC (range 0—60.000 ppb)	
Protection standard	IP30 (according to EN 60529)	

Article codes

Article code	Supply	Imax
FCVC8-R	85—264 VAC / 50—60 Hz	30 mA

Area of use

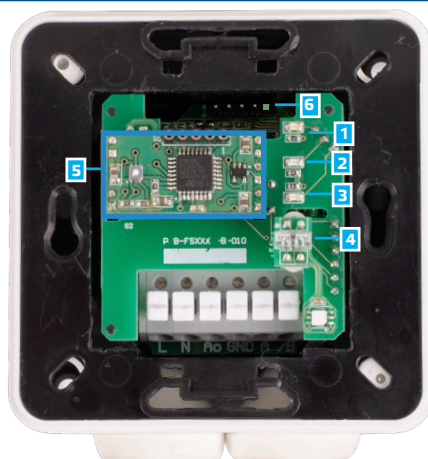
- Demand controlled ventilation based on temperature, relative humidity and TVOC
- Suitable for residential and commercial buildings
- For indoor use only

Wiring and connections

L	Power supply, line (85—264 VAC / 50—60 Hz)
N	Power supply, neutral
Ao	Analogue / modulating output (0—10 VDC / 0—20 mA / PWM)
GND	Ground AO1
A	Modbus RTU (RS485), signal A
/B	Modbus RTU (RS485), signal /B
Connections	Spring contact terminal block, cable cross section: 2,5 mm ² ; pitch 5 mm; shielded cable



Indications



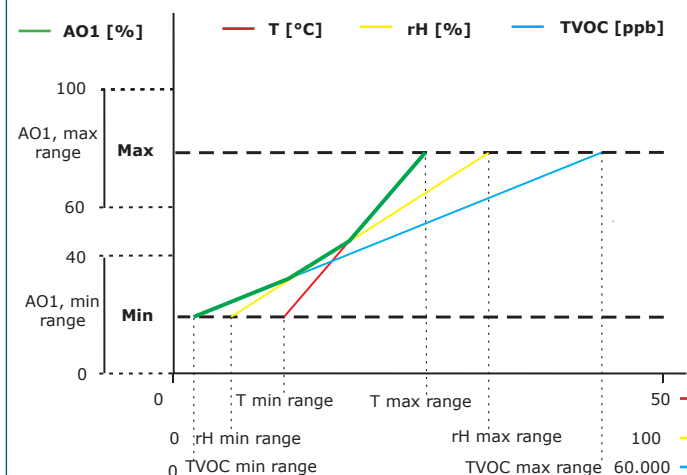
1 - Red LED	On	Measured temperature, relative humidity or TVOC values are out of range
	Blinking	Communication with one of the sensors fails
2 - Yellow LED	On	Measured temperature, relative humidity or TVOC values are in the alert range
	Blinking	Modbus communication has stopped and HR8 is activated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

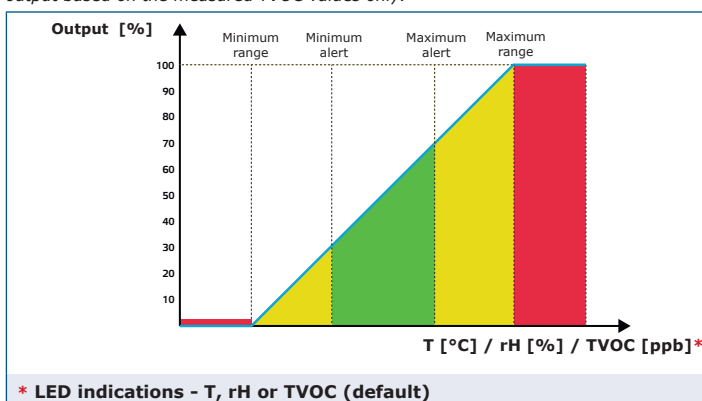
FCVC8-R Intelligent air quality sensor



Operational diagram



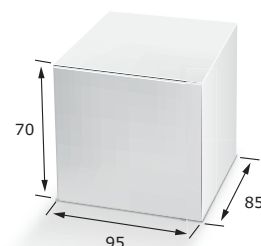
Note: TVOC measurements will return 0 ppb during warm-up time. The output changes automatically depending on the highest of the T, rH or TVOC values, i.e. the highest of three output values controls the output. See the green line in the operational diagram above. One or multiple sensors can be deactivated. E.g. it is also possible to control the output based on the measured TVOC values only.



Standards

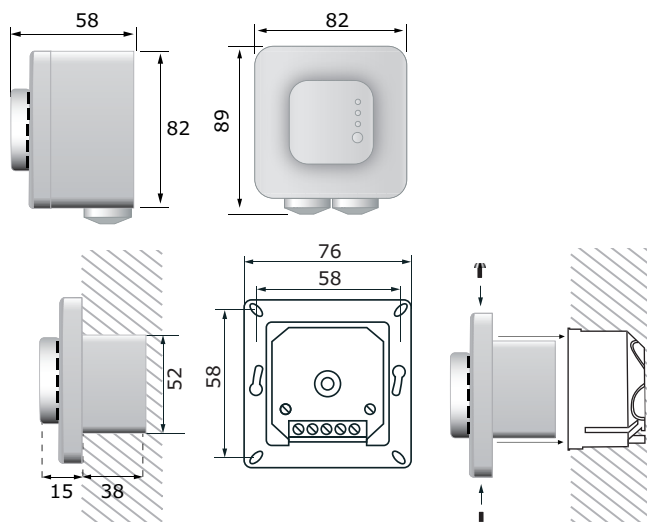
- Low Voltage Directive 2014/35/EU
 - EN 60730-1:2011 Automatic electrical controls for household and similar use - Part 1: General requirements
 - EN 60529:1991 Degrees of protection provided by enclosures (IP Code) Amendment AC:1993 to EN 60529
- EMC directive 2014/30/EU:
 - EN 60730-1:2011 Automatic 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

Packaging



Article	Packaging	Length [mm]	Width [mm]	Height [mm]	Net weight	Gross weight
FCVC8-R	Unit (1 pc.)	89	82	58	0,20 kg	0,21 kg
	Carton (10 pcs.)	492	182	84	2 kg	2,3 kg
	Box (60 pcs.)	590	380	280	12 kg	13,9 kg

Fixing and dimensions



Global trade item numbers (GTIN)

Packaging	FCVC8-R
Unit	05401003006269
Carton	05401003300794
Box	05401003501207

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.



FCVCX-R

Intelligent air quality sensor

The FCVCX-R series are intelligent sensors featuring adjustable temperature, relative humidity and TVOC ranges. The TVOC concentration is an accurate indicator for indoor air quality. 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, 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 TVOC ranges
- Fan speed control based on T, rH and TVOC
- Inset or surface mounting
- Bootloader for updating the firmware via Modbus RTU communication
- Ambient light sensor with adjustable 'active' and 'standby' level
- Replaceable TVOC 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: $R_L \geq 50 \text{ k}\Omega$	
	0—20 mA mode: $R_L \leq 500 \Omega$	
	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—100 %)	
	$\pm 15 \%$ 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
- Suitable for residential and commercial buildings
- For indoor use only

Wiring and connections

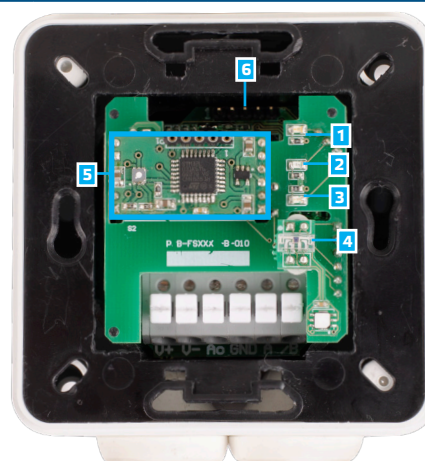
Article code	FCVCF-R		FCVCG-R	
V+	18—34 VDC		18—34 VDC	15—24 VAC ± 10 %
V-	Ground		Common ground	AC ~
A	Modbus RTU (RS485), signal A			
/B	Modbus RTU (RS485), signal /B			
Ao	Analogue / modulating output (0—10 VDC / 0—20 mA / PWM)			
GND	Ground AO1		Common ground	
Connections	Spring contact terminal block, cable cross section: 2,5 mm ² ; 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



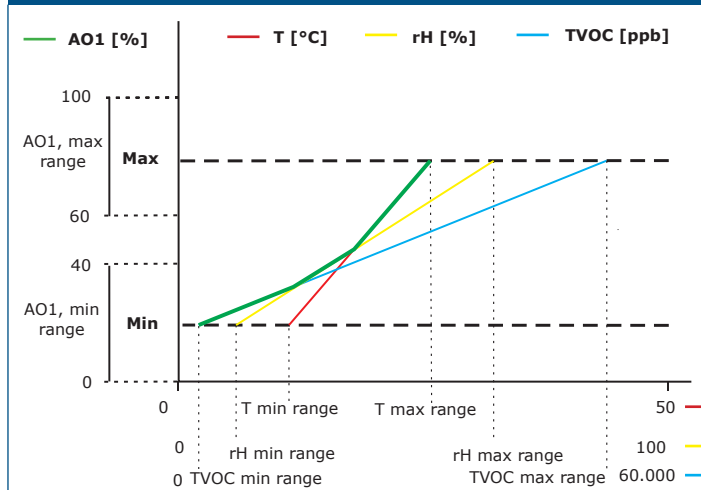
1 - Red LED	On	Measured temperature, relative humidity or TVOC values are out of range
	Blinking	Communication with one of the sensors fails
2 - Yellow LED	On	Measured temperature, relative humidity or TVOC values are in the alert range
	Blinking	Modbus communication has stopped and HR8 is activated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

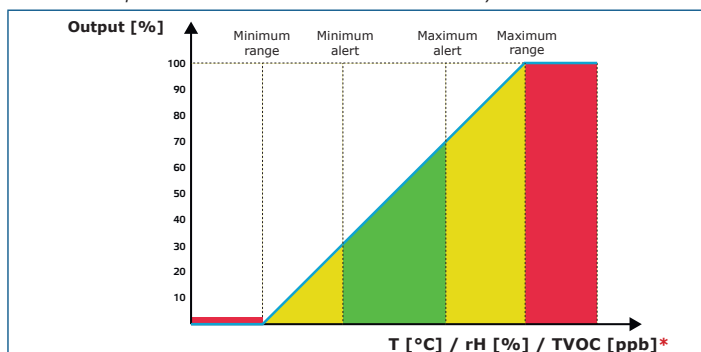
FCVCX-R Intelligent air quality sensor



Operational diagram

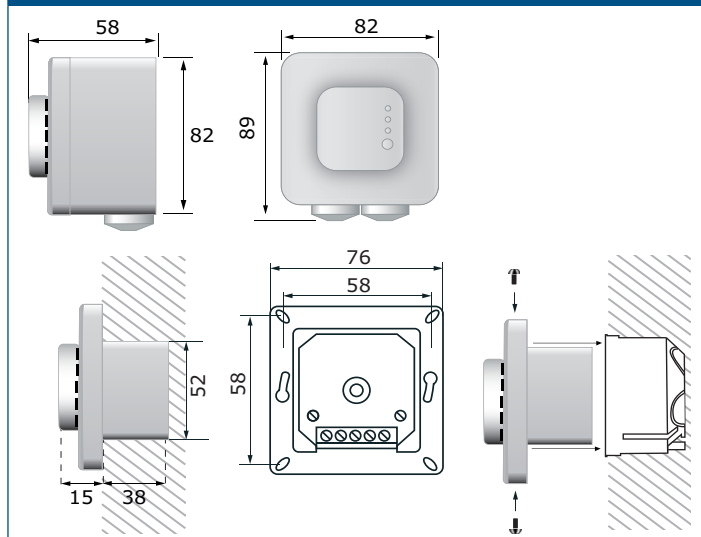


Note: TVOC measurements will return 0 ppb during warm-up time. The output changes automatically depending on the highest of the T, rH or TVOC values, i.e. the highest of the three output values controls the output. See the green line in the operational diagram above. One or multiple sensors can be deactivated. E.g. it is also possible to control the output based on the measured TVOC values only.



*LED indications - T, rH or TVOC (default)

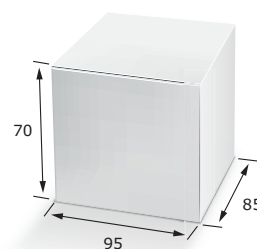
Fixing and dimensions



Standards

- 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

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 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.

SWCSM-075

Soil moisture sensor

SWCSM-075 is a soil water content sensor equipped with a digital temperature sensor. It is supplied with 24 VDC Power over Modbus. The measured values and all other parameters are accessible via Modbus RTU.

Key features

- 24 VDC supply voltage, Power over Modbus (PoM)
- Fast response to changes in water content for optimal irrigation
- Wide temperature measurement range
- 7,5 m long cable (can be extended)
- Easy installation
- Factory calibrated
- Measurements accessible via Modbus RTU

Technical specifications

Supply voltage	24 VDC Power over Modbus	
Imax	10 mA	
Sensing area	103,35 x 18,75 mm	
Protection standard	IP67	
Ambient conditions	Temperature	-30—70 °C
	Relative humidity	0—100 % rH

Area of use

- Environmental and irrigation monitoring and control
- Measuring the moisture content of a medium
- Smart farming

Standards

- EMC directive 2014/30/EU:
 - EN 55022:2010: Information technology equipment – Radio disturbance characteristics - Limits and methods of measurement Amendment AC:2011 to EN55022
 - EN 61326-1:2013 Electrical equipment for measurement, control and laboratory use – EMC requirements - Part 1: General requirements
- WEEE 2012/19/EC
- RoHs Directive 2011/65/EC:
 - EN IEC 63000:2018 Technical documentation for the assessment of electrical and electronic products with respect to the restriction of hazardous substances



Packaging



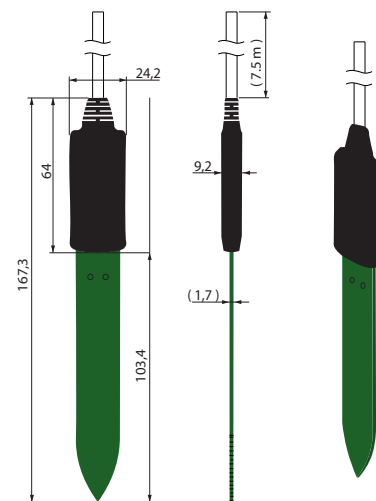
Article	Packaging	Length [mm]	Width [mm]	Height [mm]	Net weight	Gross weight
SWCSM-075	Unit (1 pc.)	167,3	24,2	9,2	0,25 kg	0,30 kg

Global trade item numbers (GTIN)

Packaging	SWCSM-075
Unit	05401003017784



Dimensions



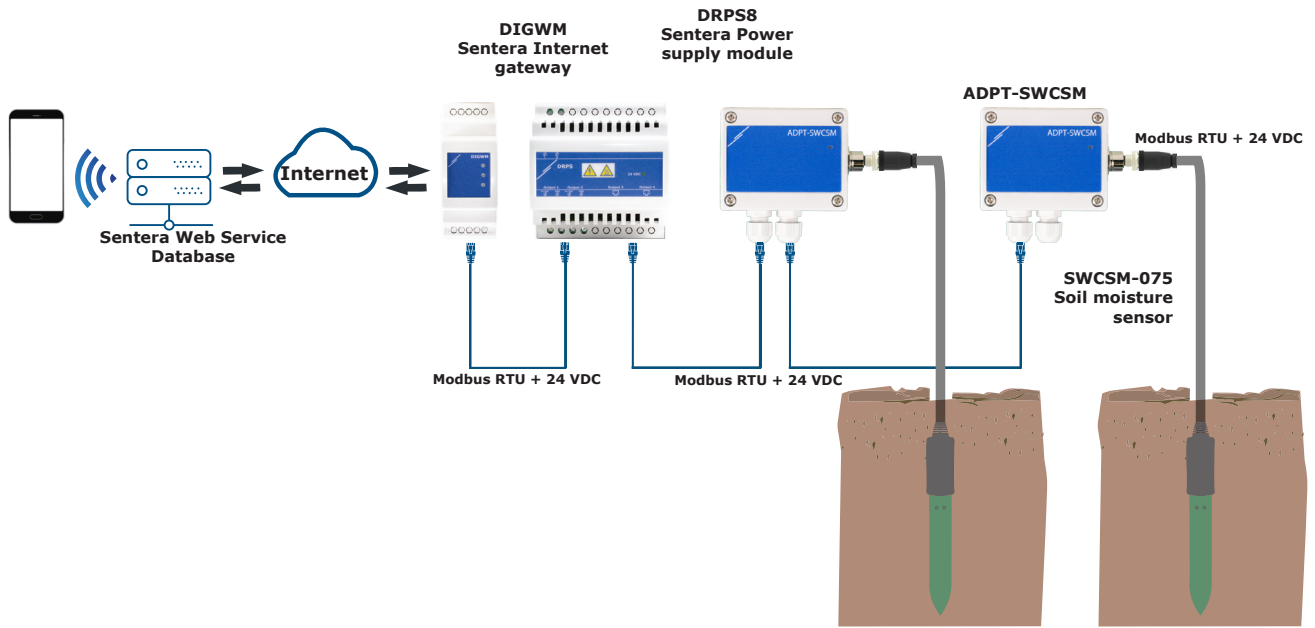
Length:	Width:	Height:
167,3 mm	24,2 mm	9,2 mm



SWCSM-075

Soil moisture sensor

Application example



ADPT-SWCSM

Adapter box

ADPT-SWCSM is an adapter box for connecting SWCSM-075 soil water content sensor to a Sentera Modbus network.

Key features

- 24 VDC supply voltage, Power over Modbus (PoM)
- Socket for the Sentera soil moisture sensor type SWCSM-075 with M12 connector
- 2 RJ45 sockets for connecting to a Sentera network
- Power ON - Green LED indication
- Easy installation

Technical specifications

Input	2 sockets for RJ45 connector - Sentera PoM connection		
Output	Socket for 4 pole M12 connector - SWCSM-075 sensor		
Protection standard	Connector	IP67	
	Enclosure	IP65	
Ambient conditions	Temperature	-30—70 °C	
	Relative humidity	0—100 % rH	

Area of use

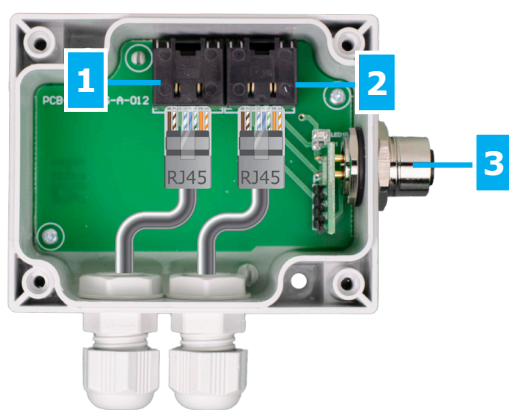
- Monitoring and control of environment and irrigation
- Measuring the moisture content of a medium
- Smart farming
- Agricultural applications to prevent overwatering

Standards

- WEEE 2012/19/EC
- RoHs Directive 2011/65/EC:
- EN IEC 63000:2018 Technical documentation for the assessment of electrical and electronic products with respect to the restriction of hazardous substances



Indications



1 - RJ45 socket



Modbus RTU communication and 24 VDC power supply can be connected via the RJ45 sockets

2 - RJ45 socket



3 - Socket for SWCSM-075

Plug in the Sentera soil moisture sensor cable

Attention! Connect the 24 VDC power supply to only one of the RJ45 sockets! Connecting two power supplies might result in short circuit!



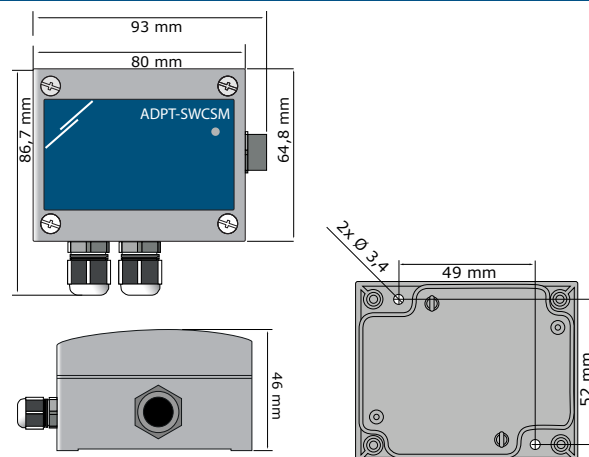
Wiring diagram

RJ45 socket (Power over Modbus)

Pin 1	24 VDC	Supply voltage
Pin 2		
Pin 3	A	Modbus RTU communication, signal A
Pin 4		
Pin 5	/B	Modbus RTU communication, signal /B
Pin 6		
Pin 7	GND	Ground, supply voltage
Pin 8		



Fixing and dimensions





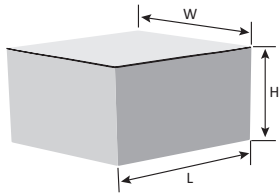
ADPT-SWCSM

Adapter box

Global trade item numbers (GTIN)

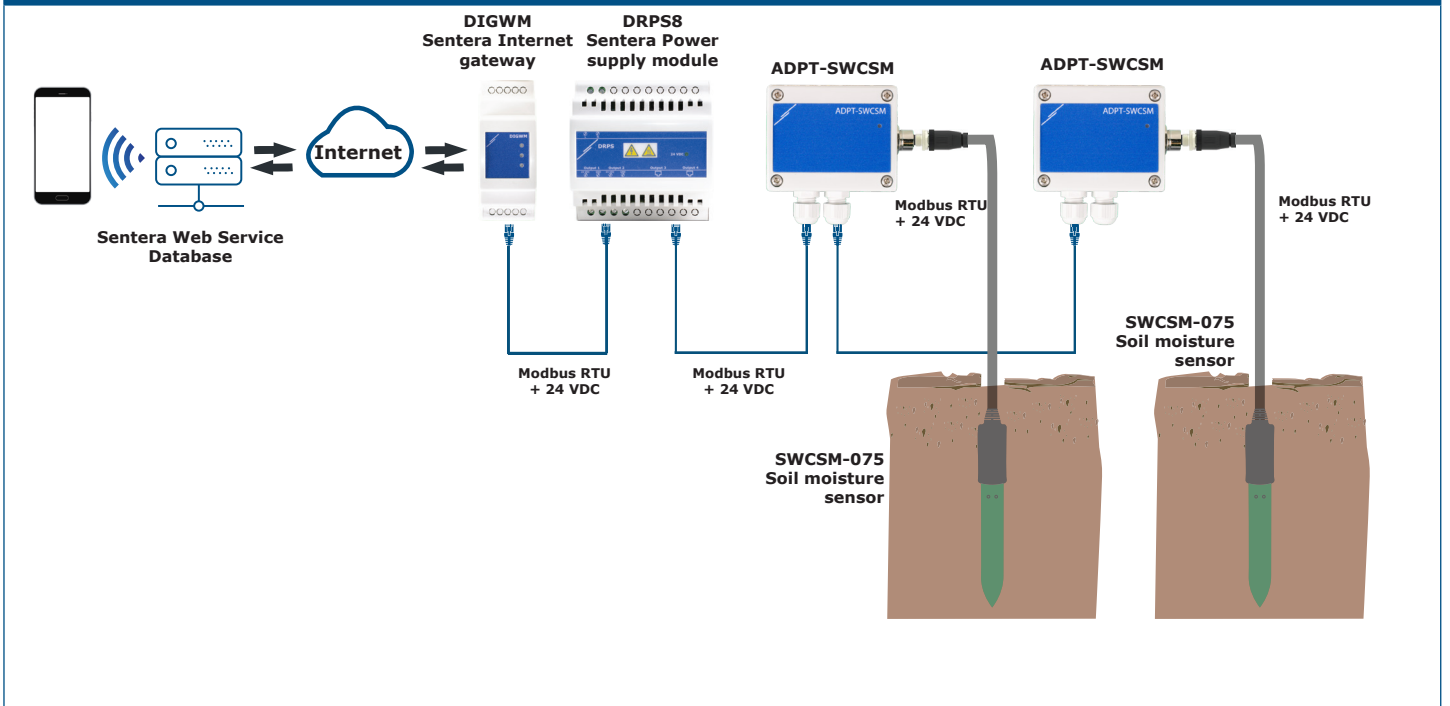
Packaging	ADPT-SWCSM
Unit	05401003017777

Packaging



Article	Packaging	Length [mm]	Width [mm]	Height [mm]	Net weight	Gross weight
ADPT-SWCSM	Unit (1 pc.)	95	85	70	0,12 kg	0,16 kg

Application example



FIMX8

Air filter monitor



FIMX8 are filter monitors for online observation of air filters in HVAC systems. Their purpose is to provide information on filter status and notify on the level of clogging. They are available with either one or two integrated differential pressure sensors to measure the pressure drop on both sides of the filter. The pressure difference shows how clogged the filter is. The internet connection is based on the integrated Sentera Internet Gateway (SIG-M-2 or SIGWM). Via SenteraWeb measurements can be monitored and Modbus registers can be reset.

Key features

- 1 or 2 differential pressure channels with built-in digital high resolution differential pressure sensor
- Data transmission to and from the Internet via standard Ethernet or Wi-Fi
- Firmware updates via internet (SenteraWeb) or Wi-Fi
- LED indications
- Implemented MQTT protocol
- Configurable filter warning and filter alarm pressure
- Clogged filter notifications are sent by SenteraWeb via SMS or email

Area of use

Online monitoring of air filters in HVAC systems using SenteraWeb

Technical specifications

Power supply	85-264 VAC / 50-60 Hz	
Maximum current consumption	25 mA	
Ambient conditions	Temperature	-5—60°C
	Relative humidity	5—95 % rH, non-condensing
Protection standard	IP30	

Standards

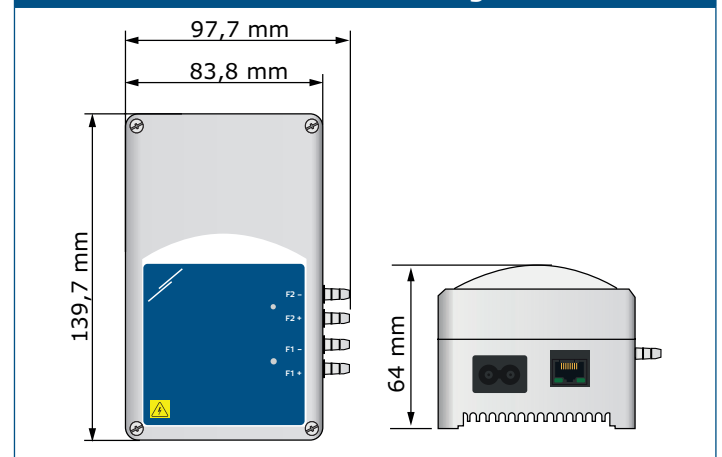


- EMC directive 2014/30/EU:
 - EN 61000-6-2:2005 Electromagnetic compatibility (EMC) - Part 6-2: Generic standards - Immunity for industrial environments Amendment AC:2005 to EN 61000-6-2
 - EN 61000-6-3:2007 Electromagnetic compatibility (EMC) - Part 6-3: Generic standards - Emission standard for residential, 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 55011:2009 Industrial, scientific and medical equipment - Radio-frequency disturbance characteristics - Limits and methods of measurement Amendment A1:2010 to EN 55011
 - EN 55024:2010 Information technology equipment - Immunity characteristics - Limits and methods of measurement
- LVD directive 2014/35/EU:
 - EN 60529:1991 Degrees of protection provided by enclosures (IP Code) Amendment AC:1993 to EN 60529
 - EN 62311:2008 Assessment of electronic and electrical equipment related to human exposure restrictions for electromagnetic fields (0 Hz - 300 GHz)
 - EN 60950-1:2006 Information technology equipment - Safety - Part 1: General requirements Amendments AC:2011, A11:2009, A12:2011, A1:2010 and A2:2013 to EN 60950-1
- Radio equipment directive 2014/53/EU:
 - EN 300 328 V2.1.1 Wideband transmission systems; Data transmission equipment operating in the 2,4 GHz ISM band and using wide band modulation techniques; Harmonised Standard covering the essential requirements of article 3.2 of Directive 2014/53/EU
- ETSI EN 301 489-1 V2.1.1 (2017-02) Electromagnetic Compatibility (EMC) standard for radio equipment and services; Part 1: Common technical requirements; Harmonised Standard covering the essential requirements of article 3.1(b) of Directive 2014/53/EU and the essential requirements of article 6 of Directive 2014/30/EU
- ETSI EN 301 489-17 V3.1.1 (2017-02) Electromagnetic Compatibility (EMC) standard for radio equipment and services; Part 17: Specific conditions for Broadband Data Transmission Systems; Harmonised Standard covering the essential requirements of article 3.1(b) of Directive 2014/53/EU
- RoHS Directive 2011/65/EU
 - EN IEC 63000:2018 Technical documentation for the assessment of electrical and electronic products with respect to the restriction of hazardous substances

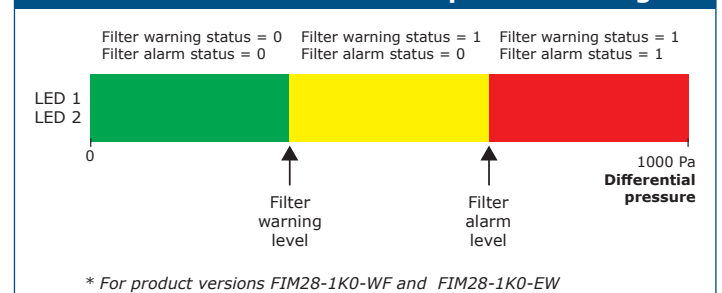
Article codes

Article code	Monitoring of	Wi-Fi	Ethernet LAN connection
FIM18-1K0-WF	1 filter	yes	no
FIM28-1K0-WF	2 filters	yes	no
FIM18-1K0-EW	1 filter	yes	yes
FIM28-1K0-EW	2 filters	yes	yes

Fixing and dimensions

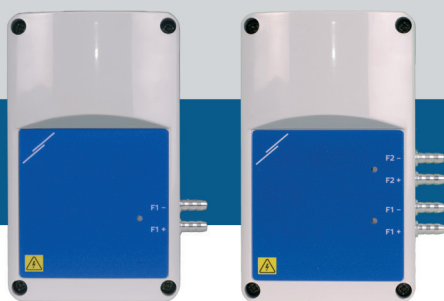


Operational diagram



FIMX8

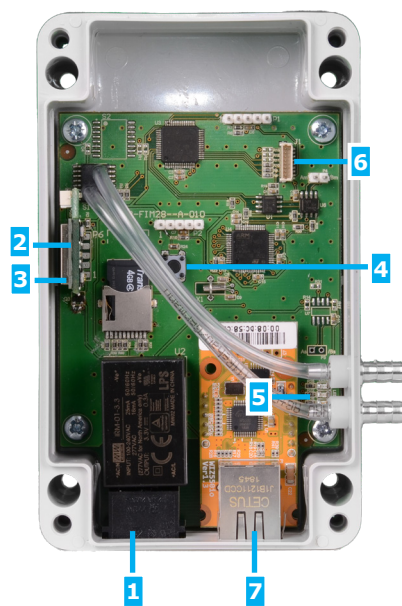
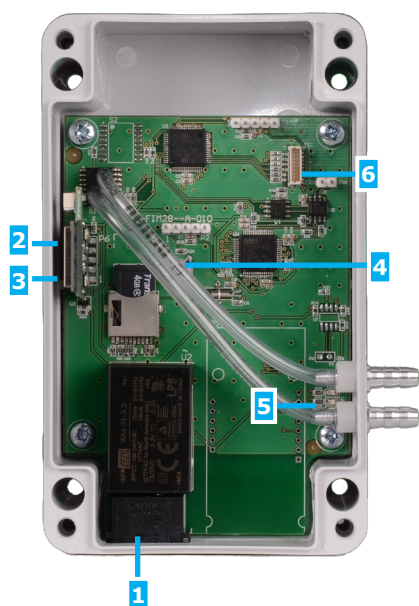
Air filter monitor



Settings and indications

FIM18-1K0-WF

FIM18-1K0-EW



1 - Power supply	85—264 VAC / 50—60 Hz		
2 - Wi-Fi module	Both the EW and WF product versions feature Wi-Fi connection. The EW version also features LAN connection		
3 - Reset tact switch for Wi-Fi (for both EW and WF versions)		In case of connection problems or to stop Wi-Fi connection: press RST and hold it until the blue LED on the Wi-Fi module lights up. When the LED goes out, Wi-Fi connection is broken. If necessary, you can reconnect to any network via the SenteraWeb configuration page: http://192.168.1.123	
4 - Internet connection reset button		FIM18-1K0-EW FIM28-1K0-EW	Reset button for Ethernet LAN module only
		FIM18-1K0-WF FIM28-1K0-WF	Reset button for Wi-Fi module
5 - LED indication	For communication status		
6 - LED connection	For LEDs on cover (indicating pressure level)		
7 - RJ45 socket	Ethernet connection (EW only)		

LED Indications on PCB

LED Indications on cover

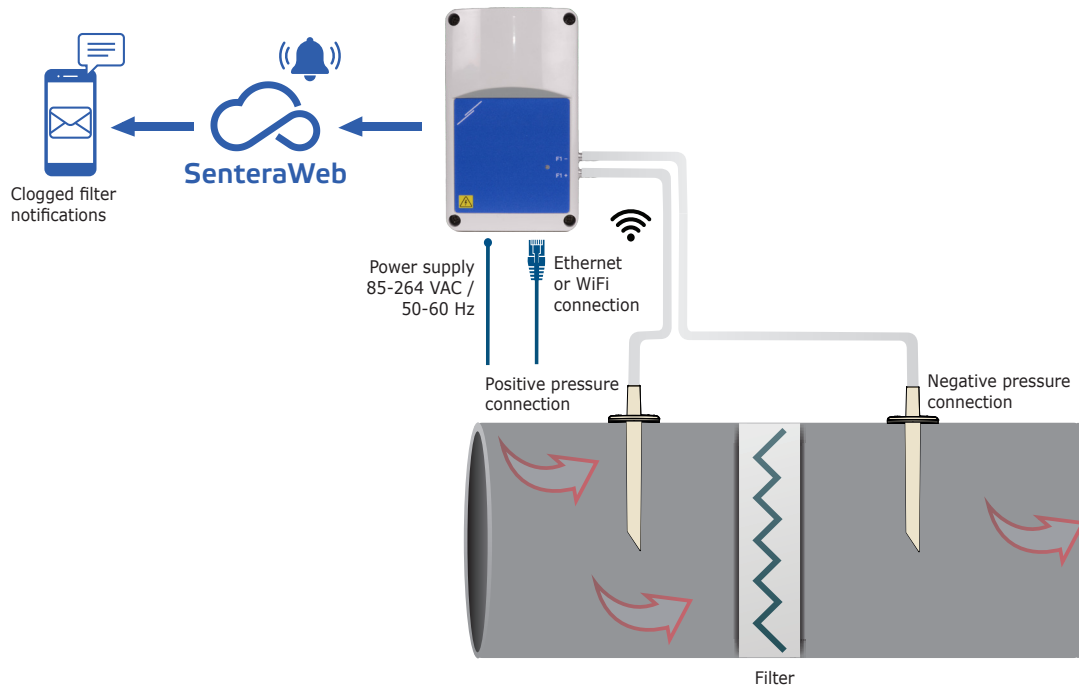
Green LED1	Solid on for power OK and successful connection to the MQTT Broker of Sentera – ready to be used in installations, currently active internet connection (the gateway successfully communicates with the Sentera Webserver).	Green	Pressure level is lower than specified filter warning level.
Green LED2	Short blink when Web Server is sending data to gateway. Slow blink when in bootloader mode.	Yellow	Pressure level is higher than specified filter warning level but lower than filter alarm level.
		Red	Pressure level is higher than filter alarm level.
Red LED3	Solid on indicates system error (connection to SenteraWeb has been lost).	Pink	No communication with pressure sensor.
		Bootloader mode	LED F1 is alternately blinking blue and green. It blinks red during programming.

FIMX8

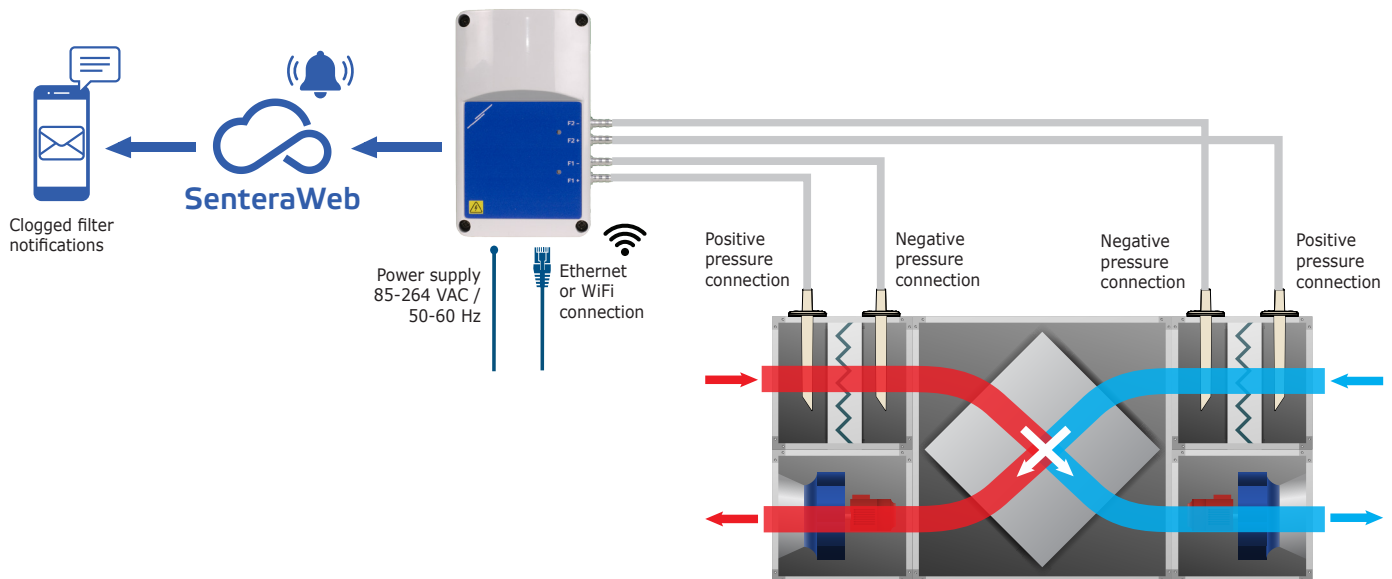
Air filter monitor

Application example

FIM18-1K0-XX

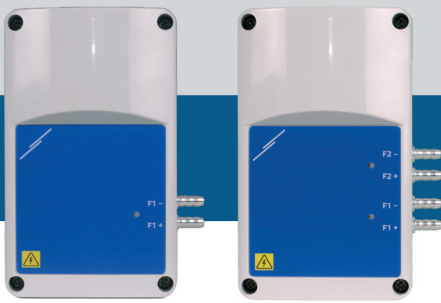


FIM28-1K0-XX

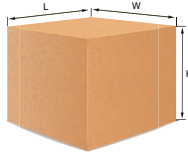


FIMX8

Air filter monitor



Packaging



Article	Packaging	Length [mm]	Width [mm]	Height [mm]	Net weight	Gross weight
FIM18-1K0-WF	Unit (1 pc.)	170	95	90	0,34 kg	0,42 kg
FIM28-1K0-WF	Unit (1 pc.)	170	95	90	0,345 kg	0,425 kg
FIM18-1K0-EW	Unit (1 pc.)	170	95	90	0,35 kg	0,43 kg
FIM28-1K0-EW	Unit (1 pc.)	170	95	90	0,355 kg	0,435 kg

Global trade item numbers (GTIN)

Packaging	Unit (1)	Box (24)	Pallet (672)
FIM18-1K0-WF	05401003018750	05401003504307	05401003701386
FIM28-1K0-WF	05401003018774	05401003504321	05401003701409
FIM18-1K0-EW	05401003018743	05401003504291	05401003701379
FIM28-1K0-EW	05401003018767	05401003504314	05401003701393

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UAB Sentera Baltica

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