SENTERA CONTROLS

Product catalogue

HVAC transmitters intelligent sensors & sensor controllers

- Temperature
- Relative humidity
- CO2
- Differential pressure
- Air quality
- Air flow volume
- Air flow velocity

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Outdoor, T, rH, TVOC

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Temperature, relative humidity, CO, LPG

Outdoor, T, rH, CO, LPG

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DSMFX-2R

Multifunctional duct transmitter

The DSMFX-2R series are multifunctional duct transmitters which measure temperature, relative humidity and CO_2 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 CO_2 ranges
- 3 selectable analogue / modulating outputs
- Bootloader for updating the firmware via Modbus RTU communication
- Modbus RTU (RS485)
- Innovative self-calibrating algorithm
- Replaceable CO_2 sensor element
- Long-term stability and accuracy

Technical specifications

3 analogue / modulating outputs	0—10 VDC mode: min. load 50 kΩ (R_L ≥ 50 kΩ)	
	0—20 mA mode: max. load 500 Ω (R_L ≤ 500 Ω)	
	PWM (open-collector type) mode: 1 kHz, min. load 50 kΩ (R_L ≥ 50 kΩ), 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	

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

Article codes

Article code	Supply	Maximum power consumption	Nominal power consumption	Imax
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)

Area of use

Monitoring duct temperature, relative humidity and CO_2 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 mm²		

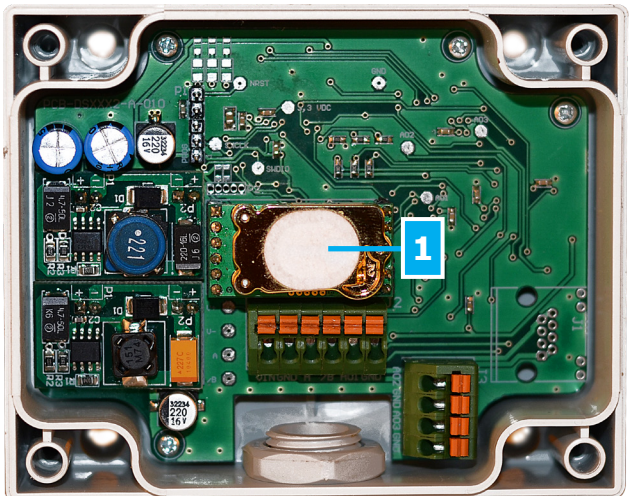
**Attention!* *The -F version of the product is not suited for 3-wire connection. It has separate grounds for power supply and analogue output. Connecting both grounds together might result in incorrect measurements. Minimum 4 wires are required to connect -F type sensors.*

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.

DCMFX-2R

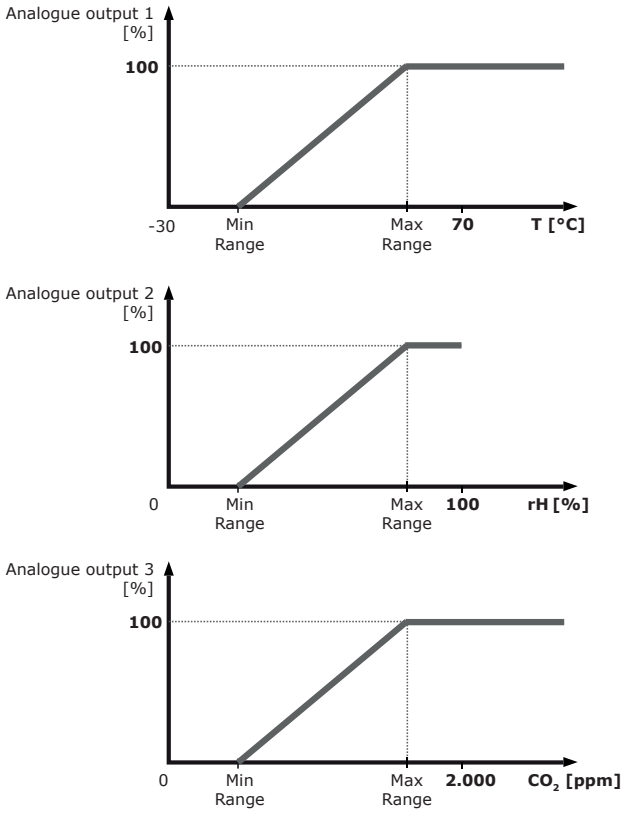
Intelligent multifunctional duct sensor

Settings

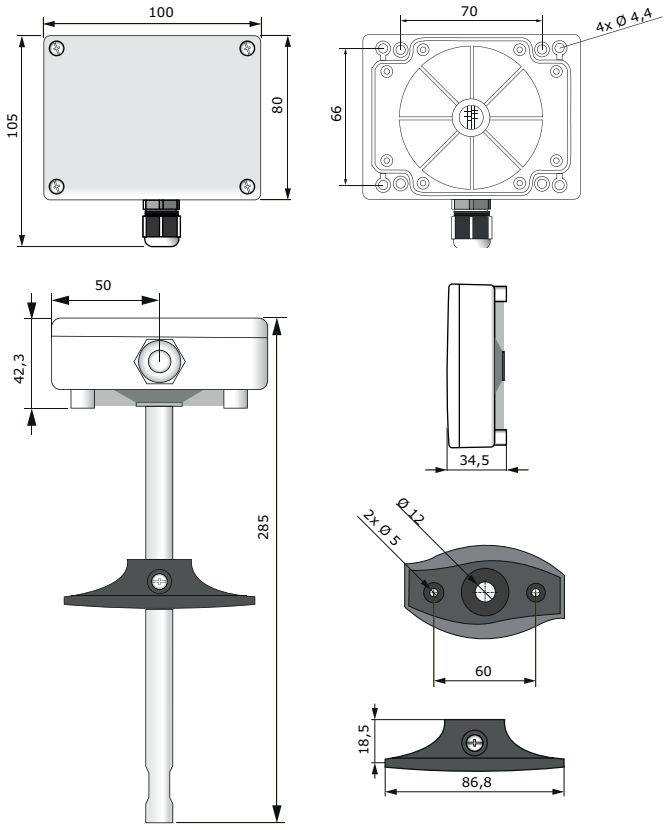


1 - CO_2 sensor element	Replaceable in case of faulty operation

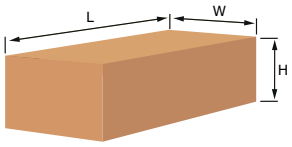
Operational diagram(s)



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

DSMFM-4

Duct-mounted CO_2 sensor

Description

The DSMFM-4 is a duct-mounted sensor manufactured to measure temperature, relative humidity, CO_2 levels and barometric pressure within buildings with HVAC ventilation systems. Based on the temperature and relative humidity measurements, the dew point is calculated, which is an essential factor in preventing condensation-related issues in the rooms.

- Key benefits:
  - Long term stability and accuracy - DSMFM-4 provides precise measurement of T, rH, CO_2 and barometric pressure, as long as the enclosure and the components of the device make it resistant to atmospheric conditions.
  - Real-time data to inform our customers: Connect the device to the SenteraWeb cloud platform, so you can receive real-time data for exceeded values or possible issues with the operation of the sensor.
  - Energy-efficient: The sensor is optimised to save energy and costs, while measuring the desired values.
  - Enhanced air quality control: The device helps our customers supply enough fresh air in the room and maintain the comfort.
  - Easy to be installed: The built-in pluggable terminal block ensures easy installation within minutes and tightly secures the wires, as well as prevents cable loosening.
  - Firmware update: Thanks to the bootloader functionality, the firmware of the unit can be updated, using the Modbus RTU communication.
  - Smooth integration with building management systems: The sensor can be easily connected to a building management system in order to constantly monitor the essential parameters for the indoor air quality.

The sensor is specifically designed for installation within air duct systems, making it ideal for monitoring HVAC systems in commercial, industrial and residential buildings. This 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

Internal storage conditions:
- Temperature: -10—60 °C
- Relative humidity: 10—90 % (non-condensing)

Replaceable CO_2 sensor element:
- Uses ABC algorithm for compensating the baseline drift and can be automatically recalibrated

Wide range of supply voltage:
- 24 VDC / PoM or 24 VAC ± 10%

Minimum recommended airflow velocity:
- 1 m/s

High quality of protection against ingress of fluids and dust:
- Enclosure - IP54
- Probe - IP20
- enclosure material: ABS plastic in grey

Over-voltage protection of the power supply up to 65 VDC

Intended Area of Use

- Demand controlled ventilation based on CO_2 concentration, temperature and relative humidity
- Air quality monitoring and control in buildings with the following ventilation systems:
  - Exhaust ventilation
  - Supply ventilation
  - Balanced ventilation
  - Energy recovery ventilation

Technical Specifications

Imax		40 mA
Accuracy	Temperature	± 0,4 °C
	Relative humidity	± 2,5 % rH
	CO_2 levels	±30 ppm + 3 %
	Barometric pressure	±0,5 hPa
Selectable ranges	Temperature	-30—70 °C
	Relative humidity	0—100 % rH
	CO_2	0—2.000 ppm
	Barometric pressure	300—1.250 hPa

Article Codes

Article code	Supply
DSMFM-4	24 VDC, PoM (acceptable voltage range: 18—34 VDC)/ 24 VAC ± 10%

Standards

- Electromagnetic compatibility directive 2014/30/EU:
  - EN 61326-1:2021 – Electrical equipment for measurement, control and laboratory use - EMC requirements - Part 1: General requirements
  - EN 61326-2-3:2021 – 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 61326-2-5:2021 – Electrical equipment for measurement, control and laboratory use - EMC requirements - Part 2-5: Particular requirements - Test configurations, operational conditions and performance criteria for field devices with field bus interfaces according to IEC 61784-1
- Low voltage directive 2014/35/EU:
  - EN 60529:2019 – Degrees of protection provided by enclosures (IP Code)
  - EC 60730-1:2022 – Automatic electrical controls - Part 1: General requirements
- 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
  - EN IEC 63000:2018 – Technical documentation for the assessment of electrical and electronic products with respect to the restriction of hazardous substances

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.

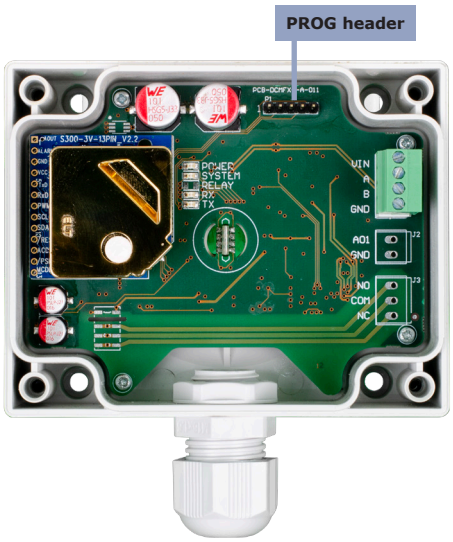
Wiring and Connections

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

DSMFM-4

Duct-mounted CO_2 sensor

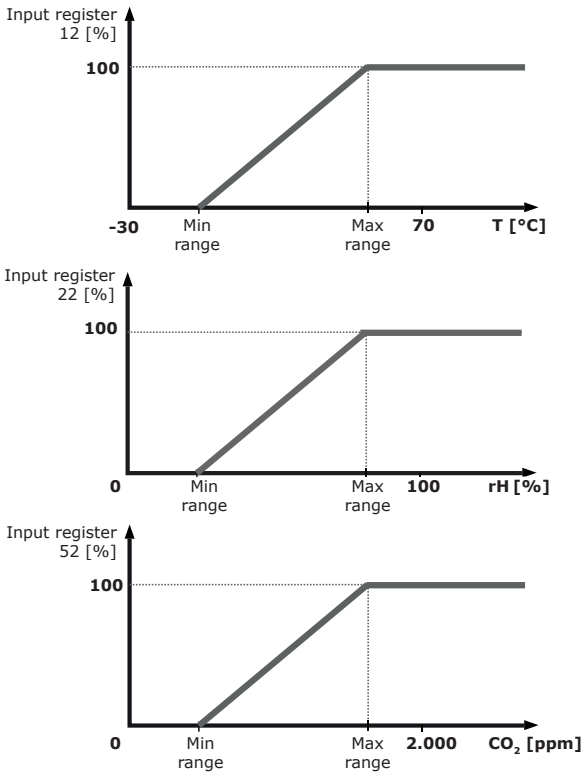
Settings



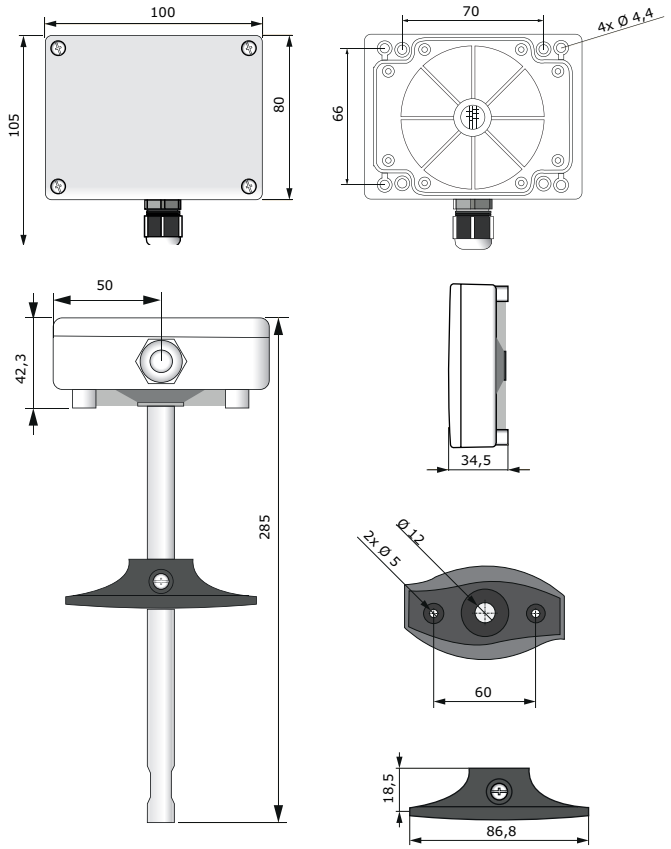
PROG header, P1	1 2 3 4 5	Put a jumper onto pins 1 and 2 and wait for at least 5 seconds to reset the Modbus communication parameters
	1 2 3 4 5	Put a jumper onto pins 3 and 4 and restart the power supply to enter bootloader mode

(- indicates the position of the jumper)

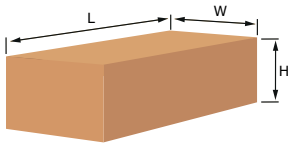
Operational Diagrams



Installation and Dimensions



Packaging



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

Global Trade Item Numbers 14 (GTIN 14)

Packaging	DSMFM-4
Unit	5401003018972
Carton	5401003504444
Palette	5401003701461

DCMFX-2R

Intelligent CO_2 duct sensor

The DCMFX-2R series are intelligent multifunctional duct sensors featuring adjustable temperature, relative humidity and CO_2 ranges. The used algorithm controls a single analogue / modulating output based on the measured T, rH and CO_2 values, which can be used to directly control an EC fan, an AC fan speed controller or an actuator powered damper. All parameters are accessible via Modbus RTU.

Key features

- Spring contact terminal blocks
- Selectable temperature, relative humidity and CO_2 ranges
- Fan speed control based on T, rH and CO_2
- Bootloader for updating the firmware via Modbus RTU communication
- Modbus RTU communication
- Replaceable CO_2 sensor element
- Long-term stability and accuracy

Technical specifications

Analogue / modulating output	0—10 VDC mode: $R_L \geq 50$ kΩ	
	0—20 mA mode: $R_L \leq 500$ Ω	
	PWM mode: 1 kHz, $R_L \geq 50$ kΩ, 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	± 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	Imax
DCMFF-2R	18—34 VDC	110 mA
DCMFG-2R	18—34 VDC / 15—24 VAC ±10 %	110 mA
		120 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.

Area of use

- Demand controlled ventilation based on temperature, relative humidity and CO_2
- Suitable for mounting in air 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/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

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 mm²		

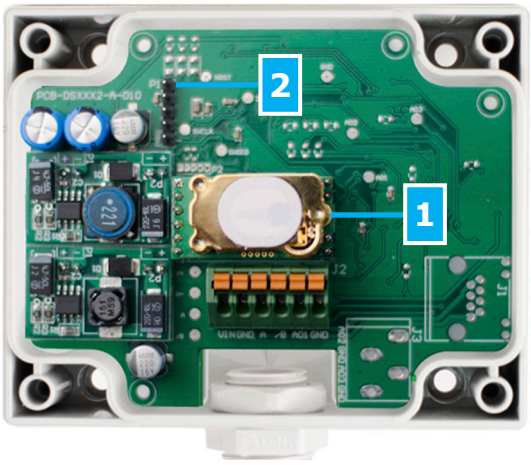
Attention! *The -F version of the product is not suited for 3-wire connection. It has separate grounds for power supply and analogue output. Connecting both grounds together might result in incorrect measurements. Minimum 4 wires are required to connect -F type sensors.*

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.

DCMFX-2R

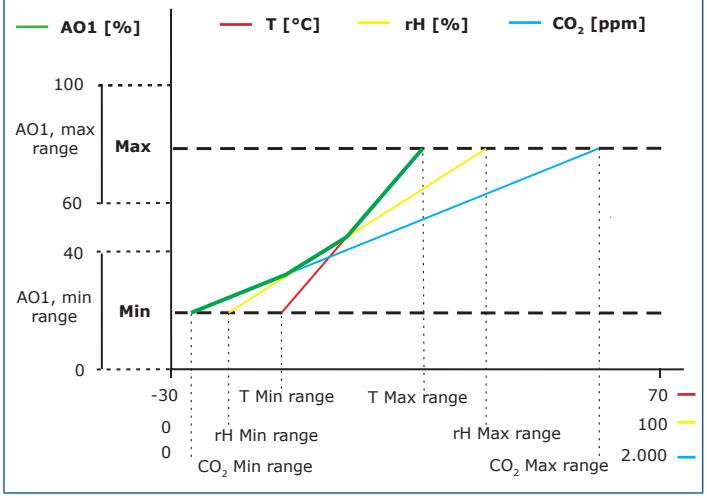
Intelligent CO_2 duct sensor

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)

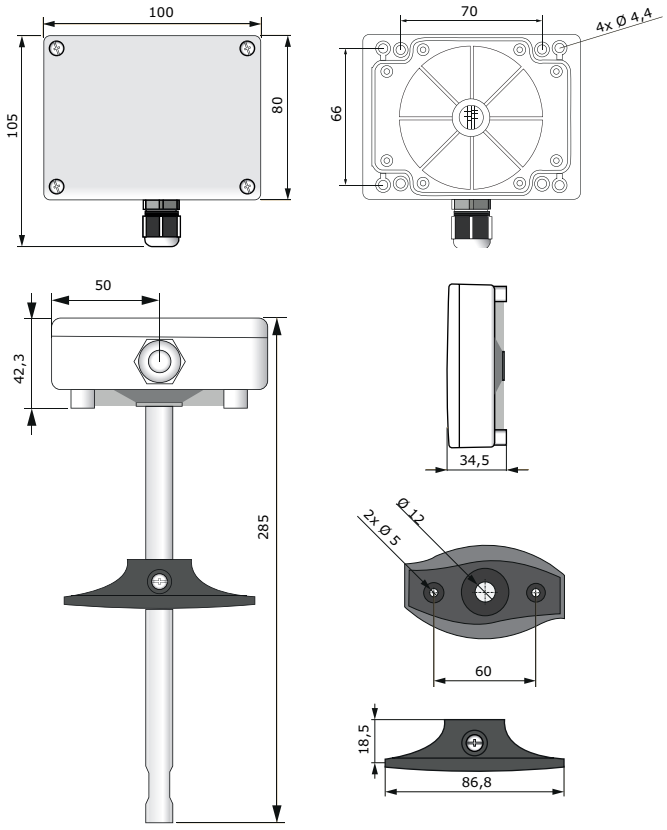


Note: *The output changes automatically depending on the highest of the T, rH or CO_2 values, i.e. the highest of the three output values controls the output. See the green line in the operational diagram above. One or multiple sensors can be deactivated. E.g. it is also possible to control the output based on the measured CO_2 values only.*

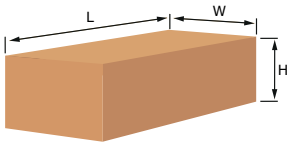
Global trade item numbers (GTIN)

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 CO_2 duct sensor

The DCMFM-2R is an intelligent duct sensor featuring adjustable temperature, relative humidity and CO_2 ranges. The used algorithm generates an output value based on the measured T, rH and CO_2 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 CO_2 ranges
- Bootloader for updating the firmware via Modbus RTU communication
- Modbus RTU communication
- Replaceable CO_2 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

Article codes

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

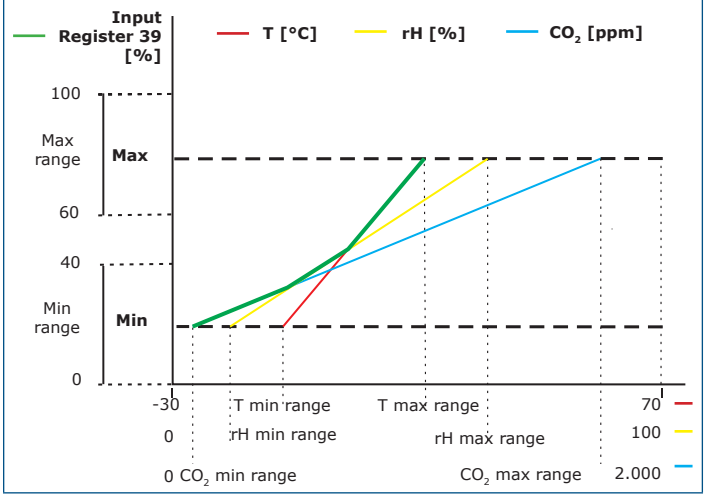
Area of use

- Demand controlled ventilation based on temperature, relative humidity and CO_2
- Suitable for mounting in air 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/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

Operational diagram(s)

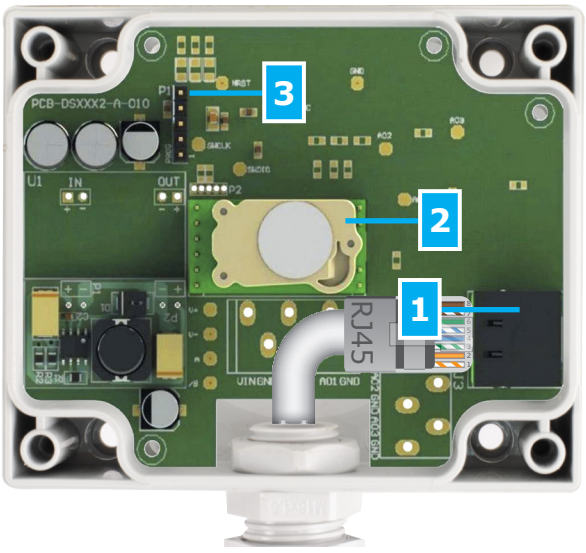


Note: *The output changes automatically depending on the highest of the T, rH or CO_2 values, i.e. the highest of the three output values controls the output signal. See the green line in the operational diagram above. One or multiple sensors can be deactivated. E.g. it is also possible to control the output based on the measured CO_2 value only.*

DCMFM-2R

Intelligent CO_2 duct sensor

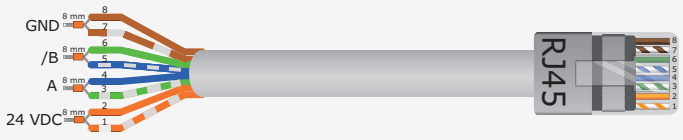
Settings



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	 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

Wiring and connections

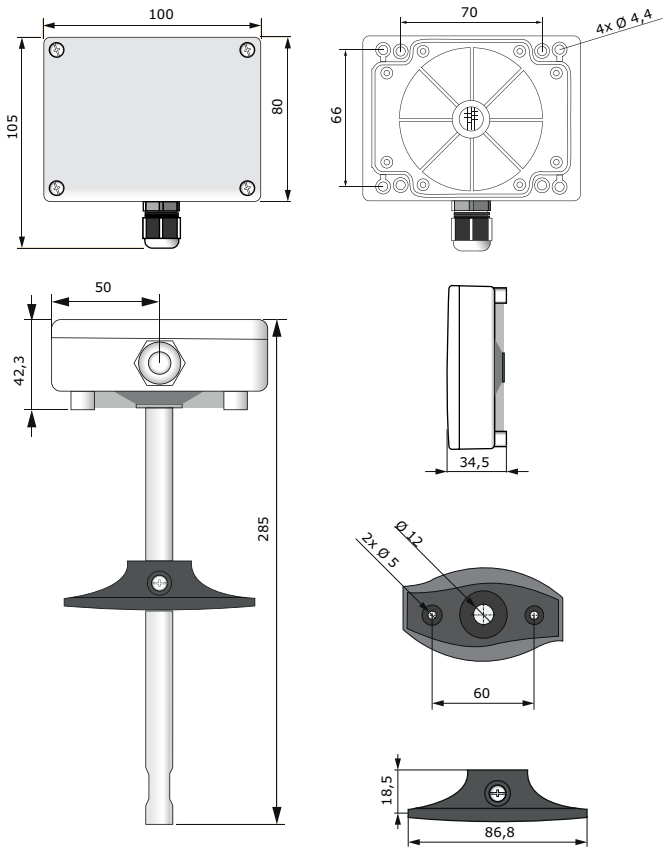
24 VDC	Supply voltage 24 VDC
GND	Ground
A	Modbus RTU communication, signal A
/B	Modbus RTU communication, signal /B



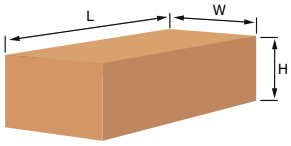
Global trade item numbers (GTIN)

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 CO_2 room transmitter

The RSMFX-3 series are multifunctional room transmitters which measure CO_2 concentration levels, temperature, relative humidity and ambient light. They have three analogue / modulating outputs for temperature, relative humidity and CO_2 and a wide range of low voltage power supply. Through Modbus RTU, all parameters are accessible.

Key features

- Selectable CO_2, 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 CO_2 levels in HVAC applications
- Suitable for residential and commercial buildings
- For indoor use only

Article codes

Article code	Supply voltage	Imax	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
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

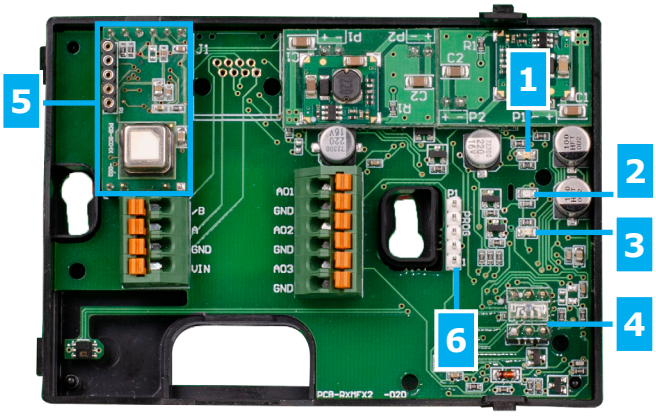
SenteraWeb

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.

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	1 2 3 4 5	Put a jumper on 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 on pins 3 and 4 and restart the supply to enter bootloader mode

Note: *By default, the LED indicators visualise the measured CO_2 level. When the sensor is in bootloader mode, the green and yellow LEDs flash alternately. During the firmware download, the red LED is flashing additionally.*

RSMFX-3

Multifunctional CO_2 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 mm²		

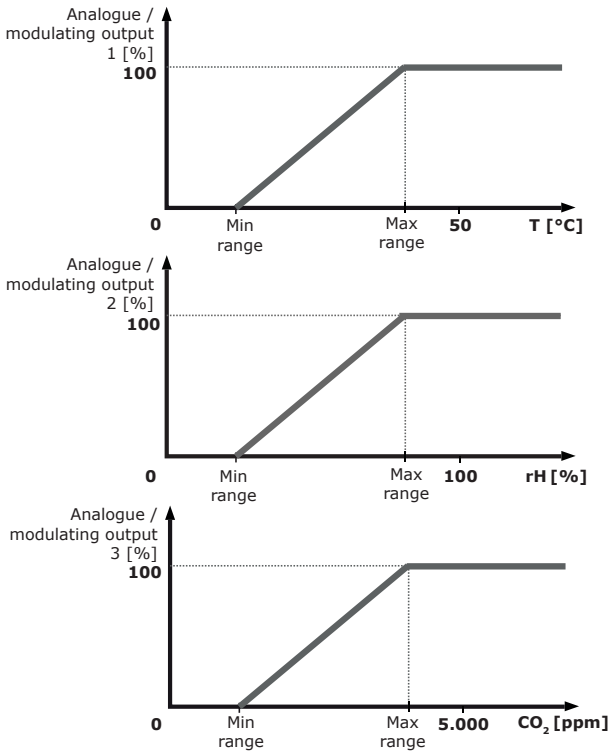
Attention! *The -G version is intended for 3-wire connection and features a 'common ground'. This means that the ground of the analogue output is internally connected with the ground of the power supply.*

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!

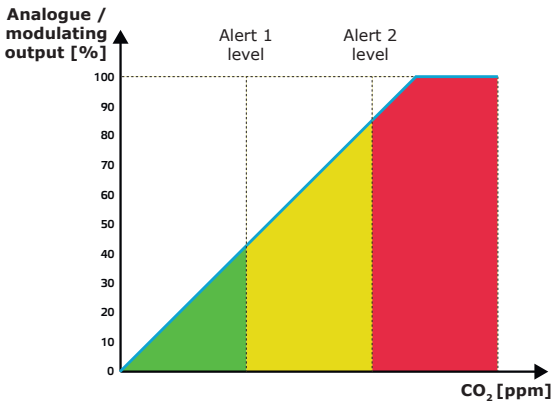
Standards

- 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

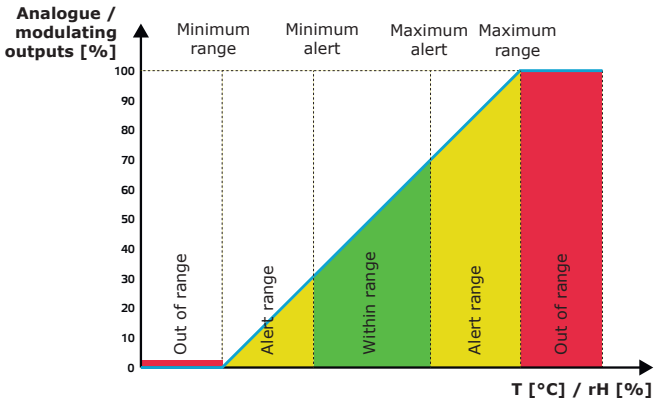
Operational diagrams



LED indication of CO_2 sensor (default setting)



LED indication of temperature and humidity sensor



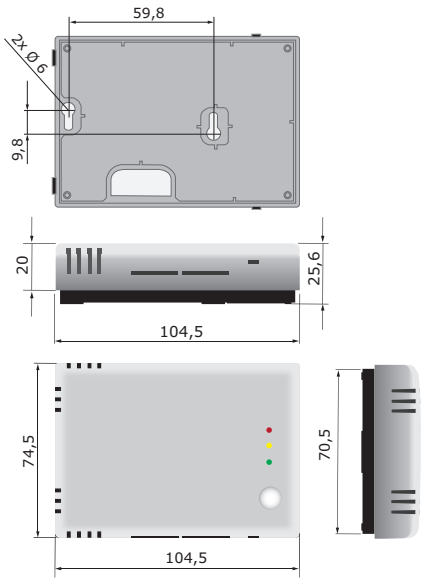
RSMFX-3

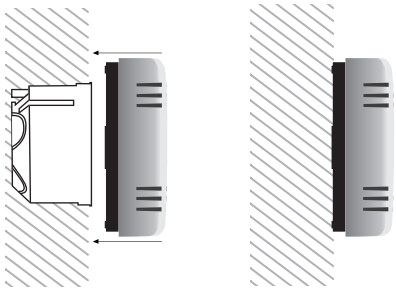
Multifunctional CO_2 room transmitter

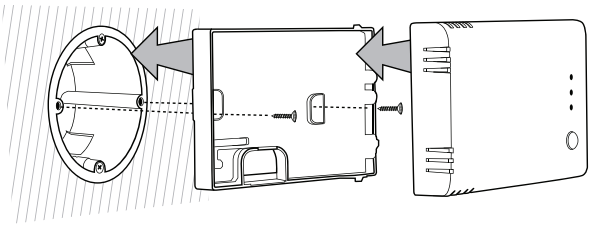
Global trade item numbers (GTIN)

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

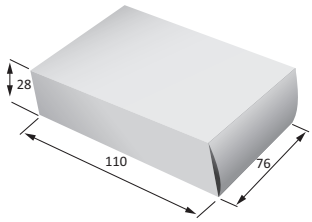
Fixing and dimensions







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

SENTERA CONTROLS

RSMFM-3

Multifunctional CO_2 room transmitter, PoM

The RSMFM-3 are multifunctional room transmitters which measure CO_2 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 CO_2, 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 CO_2 levels in HVAC applications
- Suitable for residential and commercial buildings
- For indoor use only

Article codes

Article code	Supply voltage	Imax	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 ºC (5—50 ºC)
		±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

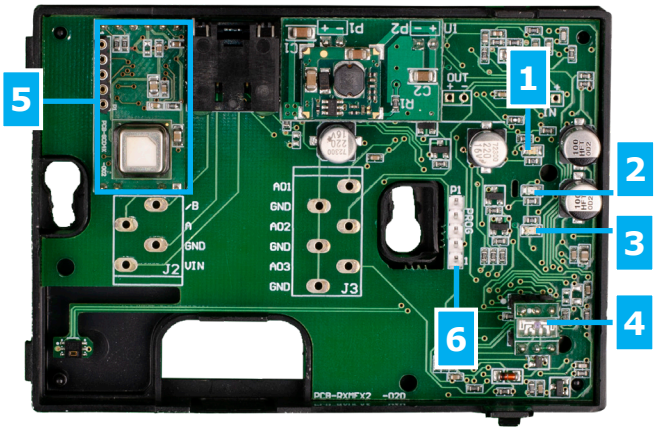
SenteraWeb

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.

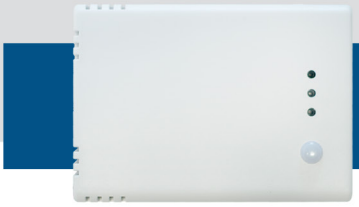
Settings and indications



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	1 2 3 4 5	Put a jumper on 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 on pins 3 and 4 and restart the supply to enter bootloader mode

Note: *By default, the LED indicators visualise the measured CO_2 level. When the sensor is in bootloader mode, the green and yellow LEDs flash alternately. During the firmware download, the red LED is flashing additionally.*

SENTERA CONTROLS



RSMFM-3

Multifunctional CO_2 room transmitter, PoM

Wiring and connections

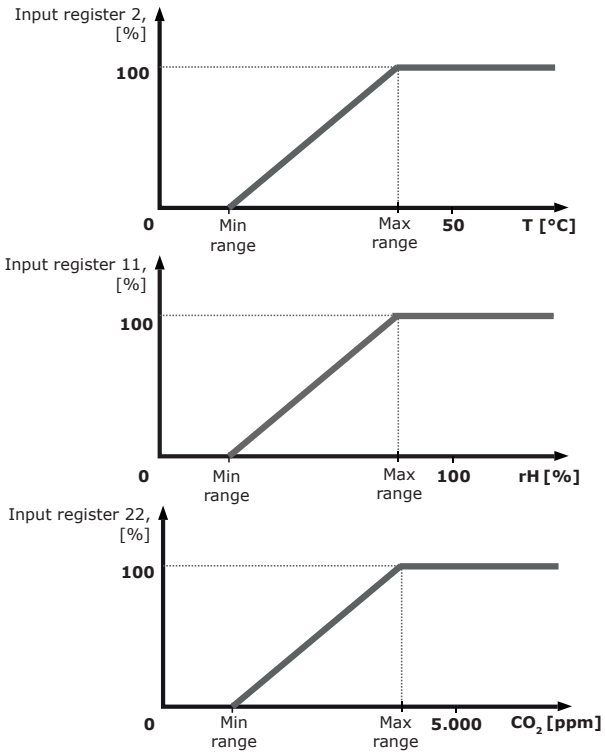
RJ45 socket (Power over Modbus)

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		

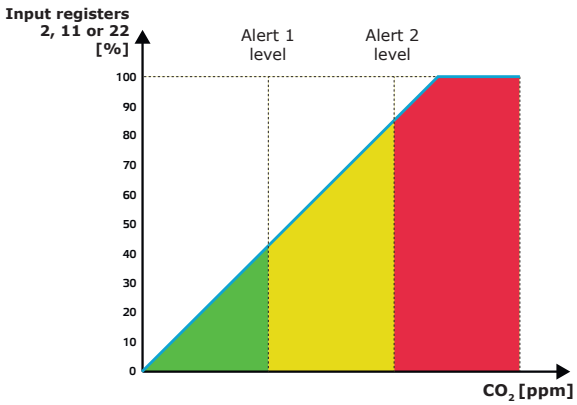
Standards

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

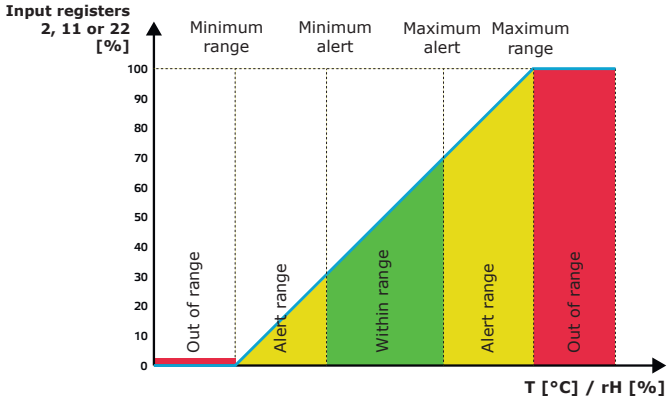
Operational diagrams



LED indication of CO_2 sensor (default setting)



LED indication of temperature and humidity sensor



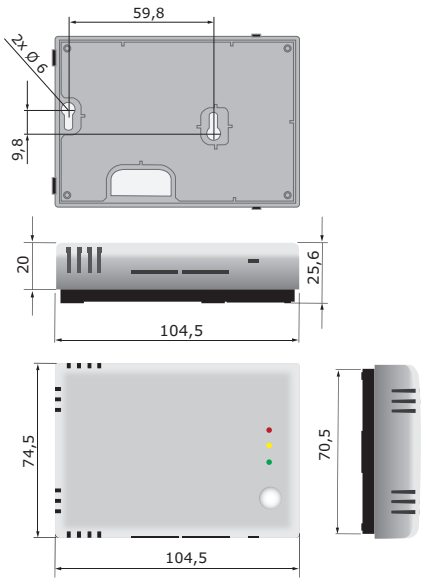
RSMFM-3

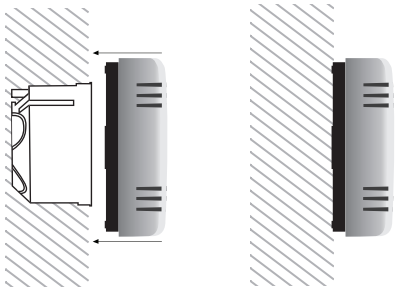
Multifunctional CO_2 room transmitter, PoM

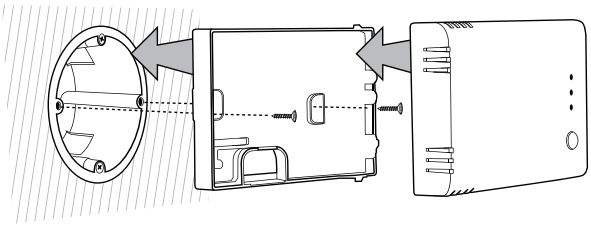
Global trade item numbers (GTIN)

Packaging	RSMFM-3
Unit	05401003018873
Carton	05401003302965
Box	05401003504390

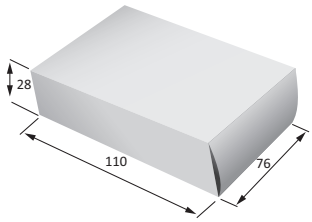
Fixing and dimensions



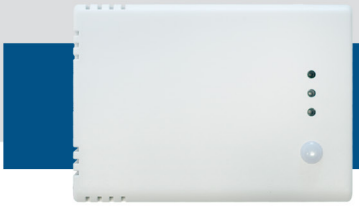




Packaging



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 CO_2 room transmitter

The RSMFH-3 series are multifunctional room transmitters which measure CO_2 concentration levels, temperature, relative humidity and ambient light. They have three analogue / modulating outputs for temperature, relative humidity and CO_2 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 CO_2 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 CO_2 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 ≥ 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
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

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.

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

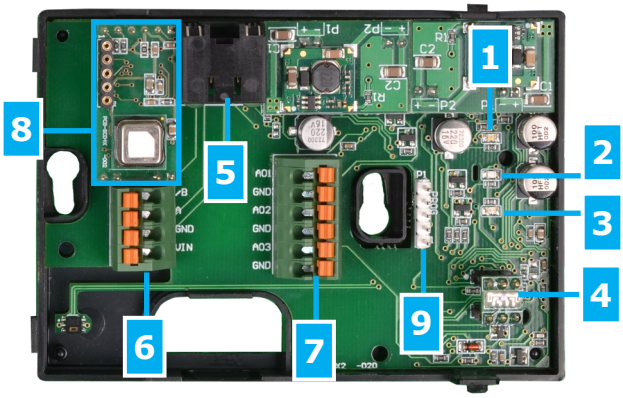
Attention! *The unit needs to be supplied via the RJ45 connector or via the connection terminals. Do not connect the device via the RJ45 connector and the terminal block simultaneously.*

SENTERA CONTROLS

RSMFH-3

Multifunctional CO_2 room transmitter

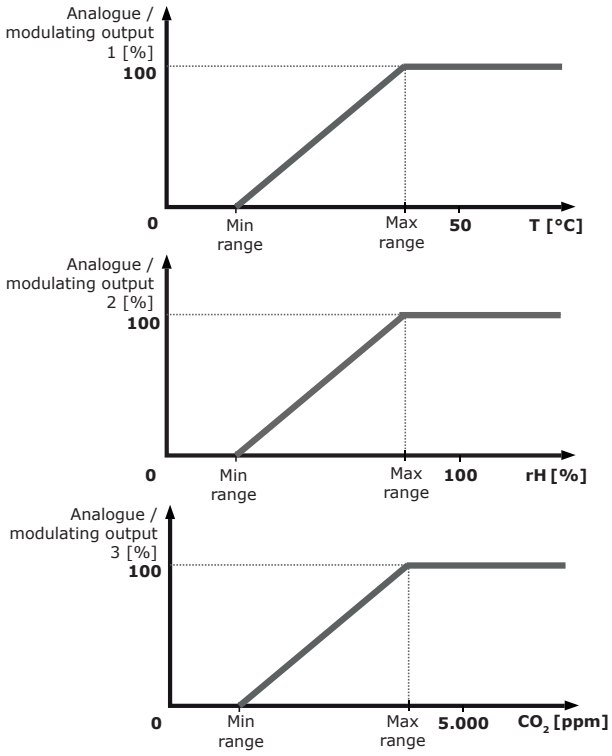
Settings and indications



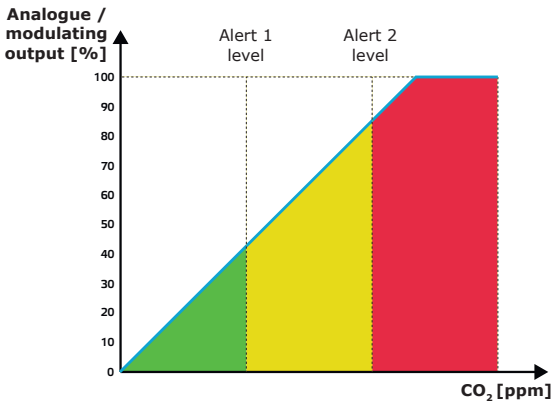
1 - Red LED	On	Measured temperature or relative humidity values are out of range or CO_2 is higher than or equal to Alert 2 level
	Blinking	Communication with one of the sensors fails
2 - Yellow LED	On	Measured temperature or relative humidity values are in the alert range or CO_2 is higher than or equal 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	1 2 3 4 5	Put a jumper on 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 on pins 3 and 4 and restart the supply to enter bootloader mode

Note: *By default, the LED indicators visualise the measured CO_2 level. When the sensor is in bootloader mode, the green and yellow LEDs flash alternately. During the firmware download, the red LED is flashing additionally.*

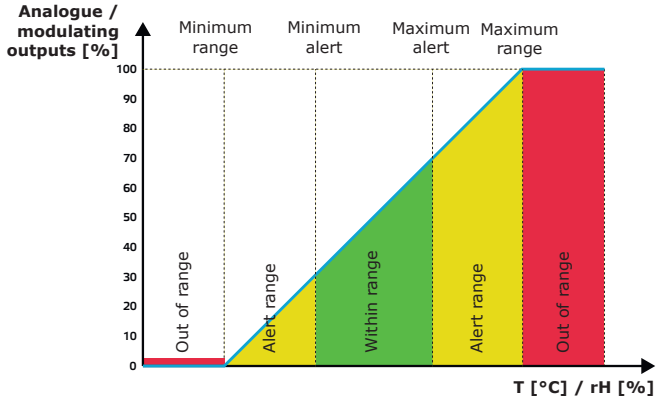
Operational diagrams



LED indication of CO_2 sensor (default setting)



LED indication of temperature and humidity sensor



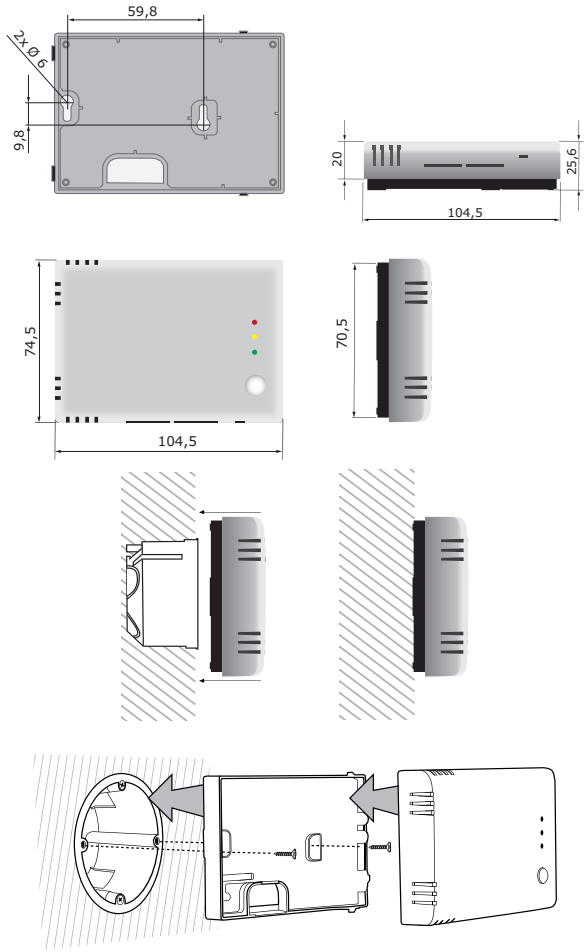
RSMFH-3

Multifunctional CO_2 room transmitter

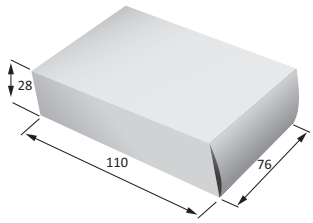
Standards

- 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

Fixing and dimensions



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

Global trade item numbers (GTIN)

Packaging	RSMFH-3
Unit	05401003018866
Carton	05401003302958
Box	05401003504383

RCMFX-3

Intelligent multifunctional CO_2 room sensor

The RCMFX-3 are intelligent multifunctional room sensors featuring adjustable CO_2, temperature and relative humidity ranges. The used algorithm controls a single analogue / modulating output based on the measured CO_2, 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 CO_2, temperature and relative humidity ranges
- Fan speed control based on temperature, humidity and CO_2 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 CO_2
- 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 ≥ 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
Accuracy		±0,5 ºC (5—50 ºC)
		±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

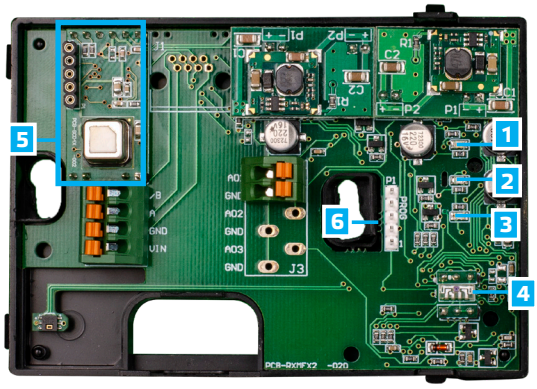
SenteraWeb

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.

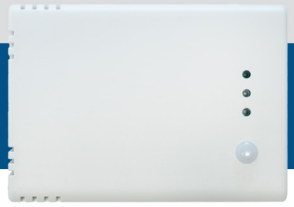
Indications



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	1 2 3 4 5	Put a jumper on 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 on pins 3 and 4 and restart the supply to enter bootloader mode

Note: *By default, the LED indicators visualise the measured CO_2 level. When the sensor is in bootloader mode, the green and yellow LEDs flash alternately. During the firmware download, the red LED is flashing additionally.*

SENTERA CONTROLS



RCMFX-3

Intelligent multifunctional CO_2 room sensor

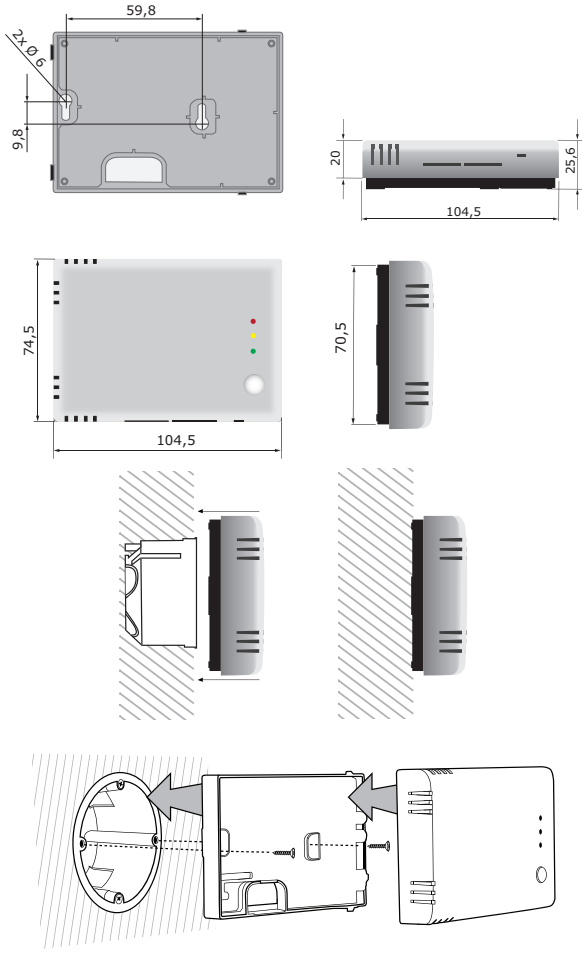
Wiring and connections

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 mm²		

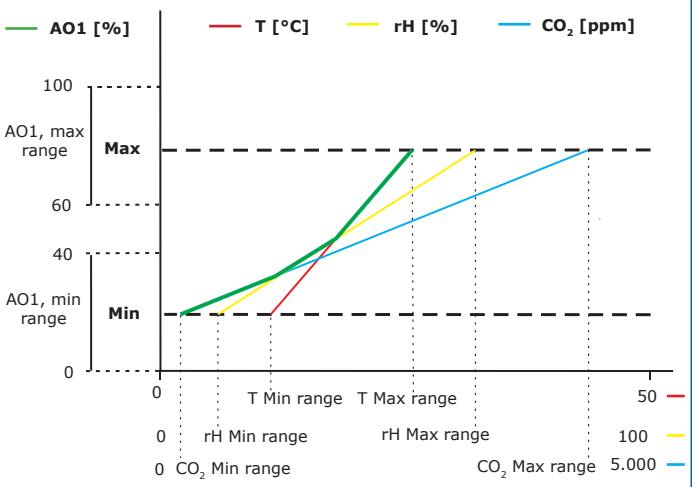
Attention! *The -F version of the product is not suited for 3-wire connection. It has separate grounds for power supply and analogue output. Connecting both grounds together might result in incorrect measurements. Minimum 4 wires are required to connect -F type sensors.*

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.

Fixing and dimensions

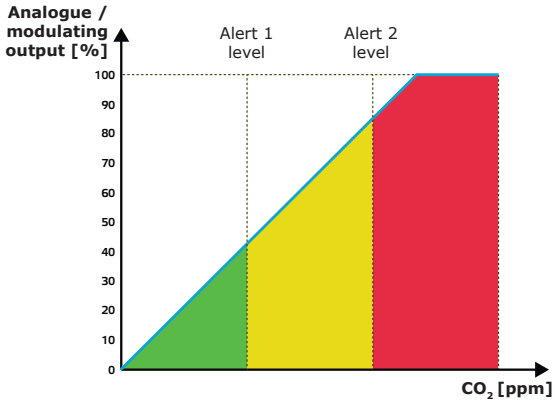


Operational diagrams

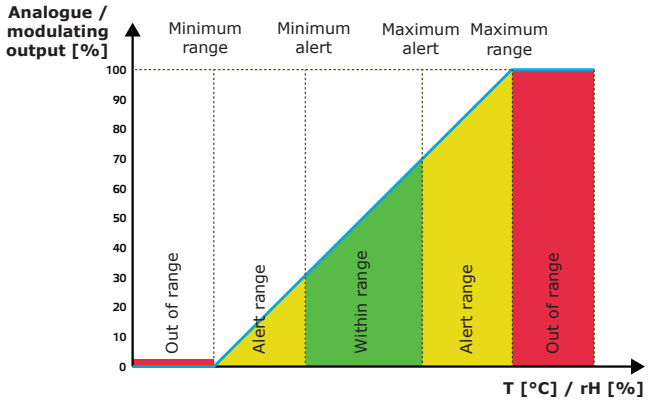


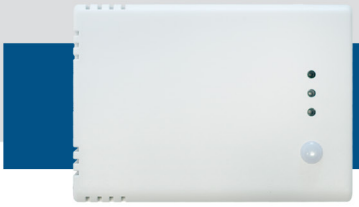
Note: *The output changes automatically depending on the highest of the T, rH or CO_2 values, i.e. the highest of the three output values controls the output. See the green line in the operational diagram above. One or multiple sensors can be deactivated. E.g. it is also possible to control the output based on the measured CO_2 value only.*

LED indication of CO_2 sensor (default setting)



LED indication of temperature and humidity sensors





RCMFX-3

Intelligent multifunctional CO_2 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
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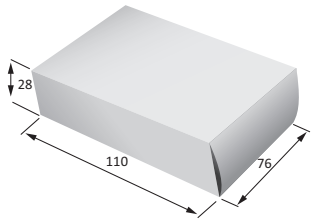
  - EN 61326-1:2013 Electrical equipment for measurement, control and laboratory use - EMC requirements - Part 1: General requirements
  - EN 61326-2-3:2013 Electrical equipment for measurement, control and laboratory use - EMC requirements - Part 2-3: Particular requirements Test configuration, operational 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 CO_2 room sensor, PoM

The RCMFM-3 are intelligent room sensors featuring adjustable CO_2, temperature, and relative humidity ranges. The used algorithm generates an output value based on the measured T, rH and CO_2 values, which can be used to directly control an EC fan, an AC fan speed controller or and actuator powered damper. They are Power over Modbus supplied and all parameters are accessible via Modbus RTU.

Key features

- Selectable CO_2, 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 CO_2
- 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

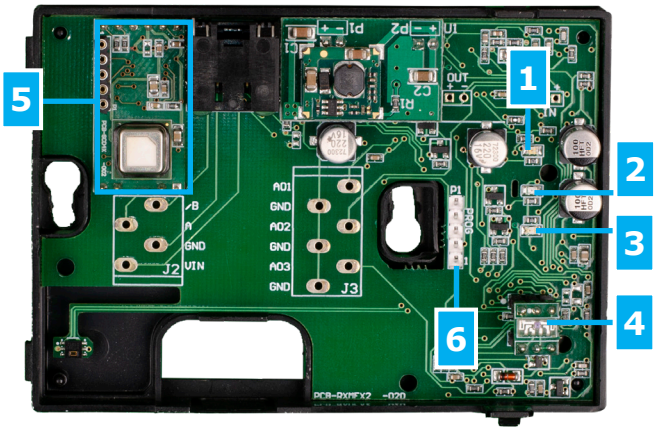
SenteraWeb

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.

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	1 2 3 4 5	Put a jumper on 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 on pins 3 and 4 and restart the supply to enter bootloader mode

Note: *By default, the LED indicators visualise the measured CO_2 level. When the sensor is in bootloader mode, the green and yellow LEDs flash alternately. During the firmware download, the red LED is flashing additionally.*

SENTERA CONTROLS

RCMFM-3

Intelligent multifunctional CO_2 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
- EMC Directive 2014/30/EU
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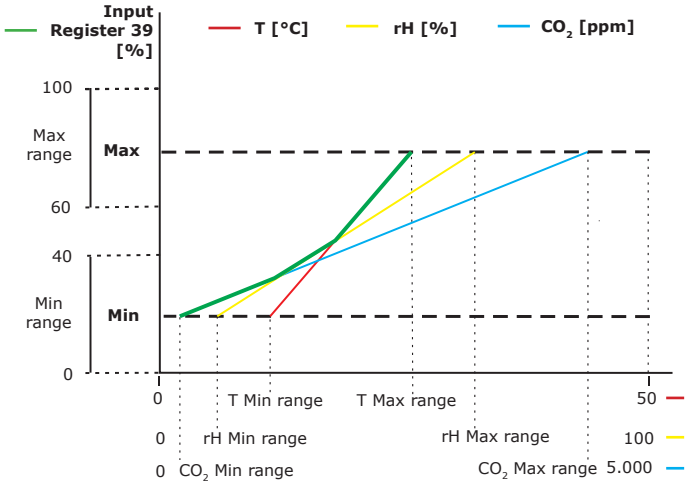
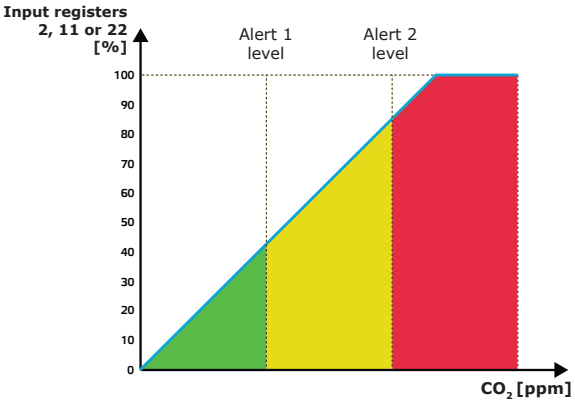
- WEEE 2012/19/EU
- RoHs Directive 2011/65/EU
  - EN IEC 63000:2018 Technical documentation for the assessment of electrical and electronic products with respect to the restriction of hazardous substances

Operational diagrams

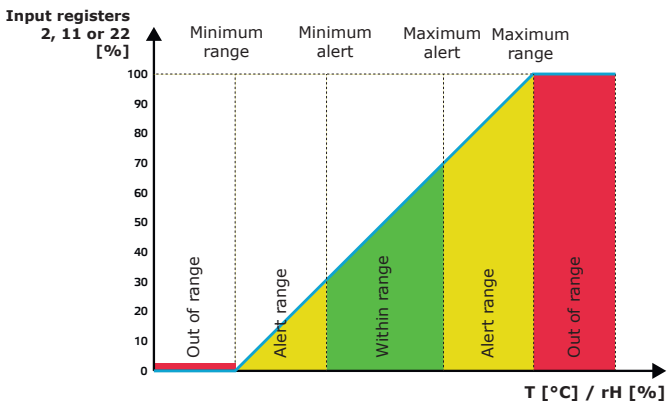


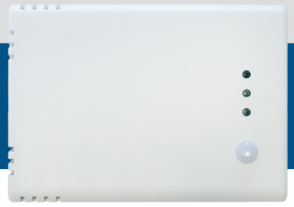
Note: *The output changes automatically depending on the highest of the T, rH or CO_2 values, i.e. the highest of the three output values controls the output signal. See the green line in the operational diagram above. One or multiple sensors can be deactivated. E.g. it is also possible to control the output based on the measured CO_2 value only.*

LED indication of CO_2 sensor (default setting)



LED indication of temperature and humidity sensor





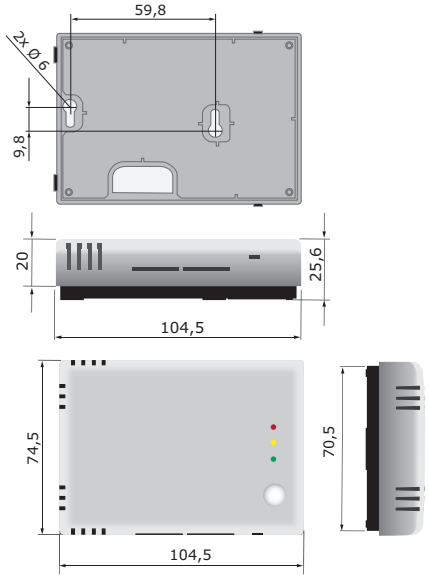
RCMFM-3

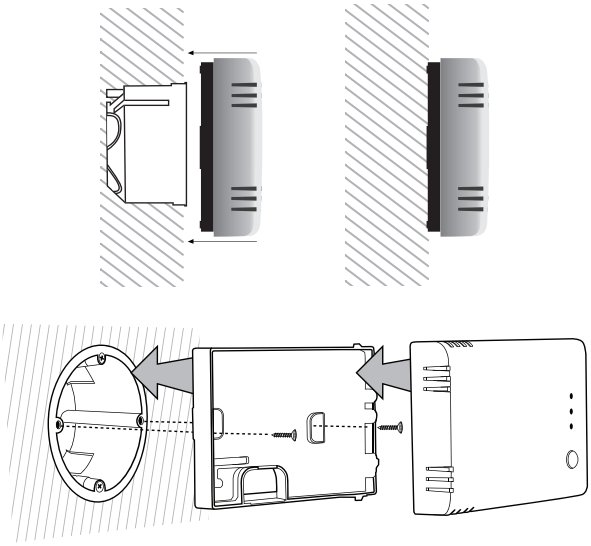
Intelligent multifunctional CO_2 room sensor, PoM

Global trade item numbers (GTIN)

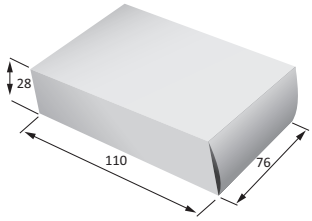
Packaging	RCMFM-3
Unit	05401003018910
Carton	05401003303009
Box	05401003504437

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 CO_2 room sensor

The RCMFH-3 are intelligent multifunctional room sensors featuring adjustable CO_2, temperature and relative humidity ranges. The used algorithm controls a single analogue / modulating output based on the measured CO_2, 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 CO_2, temperature and relative humidity ranges
- Fan speed control based on temperature, humidity and CO_2 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 CO_2
- 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 ≥ 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
Accuracy		±0,5 ºC (5—50 ºC)
		±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

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.

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

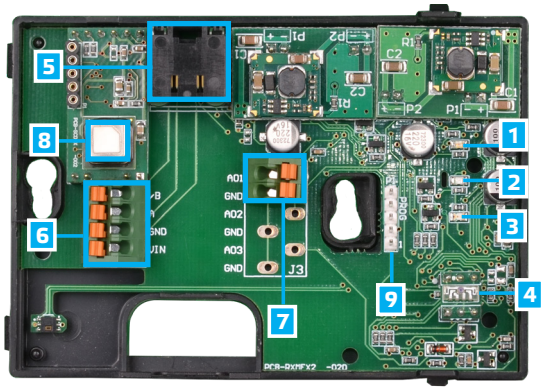
Attention! *The unit needs to be supplied via the RJ45 connector or via the connection terminals. Do not connect the device via the RJ45 connector and the terminal block simultaneously.*

SENTERA CONTROLS

RCMFH-3

Intelligent multifunctional CO_2 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	 1 2 3 4 5	Put a jumper on 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 on pins 3 and 4 and restart the supply to enter bootloader mode

Note: *By default, the LED indicators visualise the measured CO_2 level. When the sensor is in bootloader mode, the green and yellow LEDs flash alternately. During the firmware download, the red LED is flashing additionally.*

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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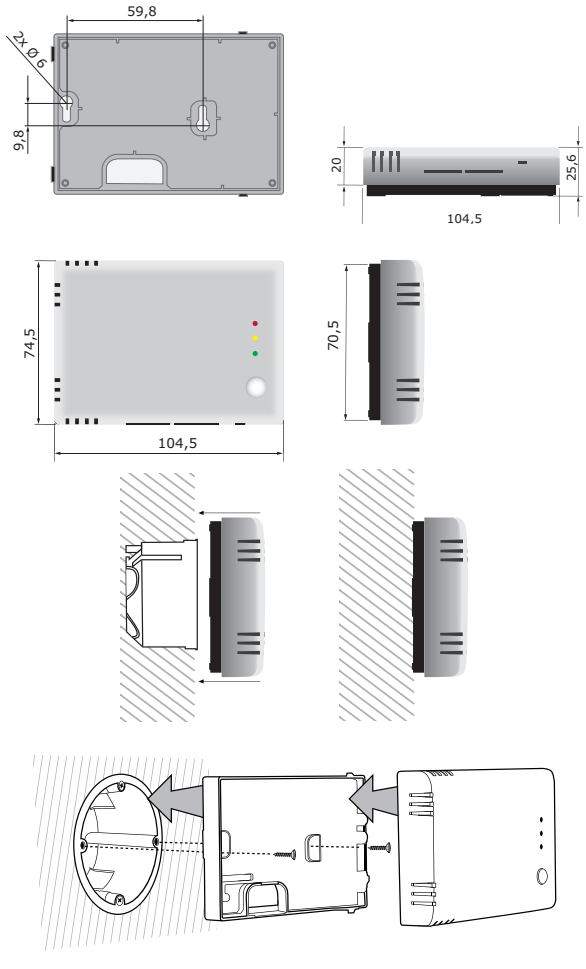
  - EN 61326-2-3:2013 Electrical equipment for measurement, control and laboratory use - EMC requirements - Part 2-3: Particular requirements Test configuration, operational conditions and performance criteria for transmitters with integrated or remote signal conditioning.
- WEEE 2012/19/EU
- RoHs Directive 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

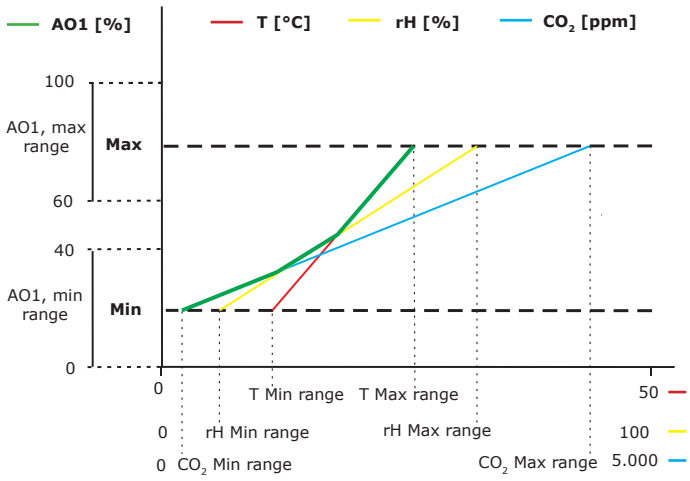
Fixing and dimensions



RCMFH-3

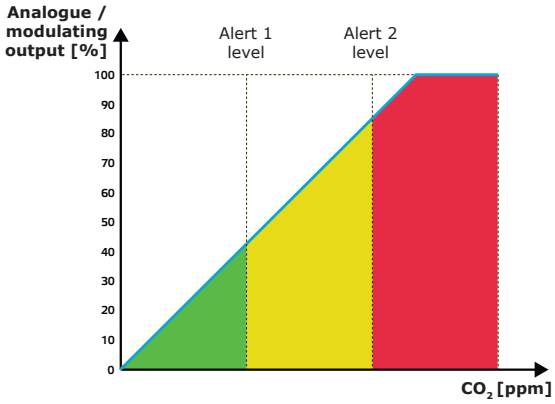
Intelligent multifunctional CO_2 room sensor

Operational diagrams

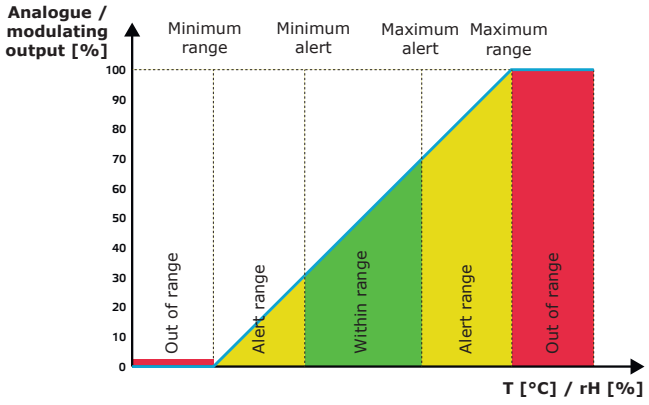


Note: *The output changes automatically depending on the highest of the T, rH or CO_2 values, i.e. the highest of the three output values controls the output. See the green line in the operational diagram above. One or multiple sensors can be deactivated. E.g. it is also possible to control the output based on the measured CO_2 value only.*

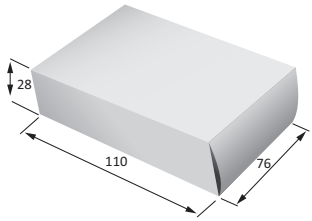
LED indication of CO_2 sensor (default setting)



LED indication of temperature and humidity sensors



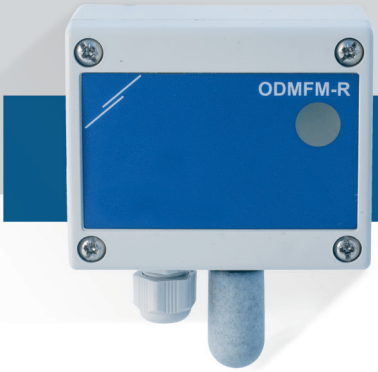
Packaging



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, CO_2 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 CO_2 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 CO_2 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)

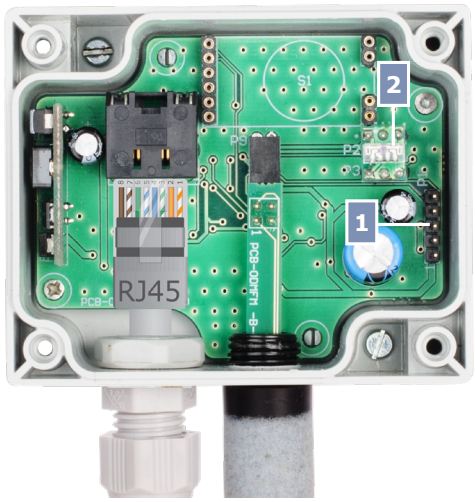
Article codes

	Supply	Connection
ODMFM-R	24 VDC, PoM	RJ45

Area of use

- Monitoring of temperature, relative humidity and CO_2 levels
- Suitable for both indoor and outdoor use (e.g. open-air spaces, multi-storey and subterranean car parks, residential and commercial buildings)

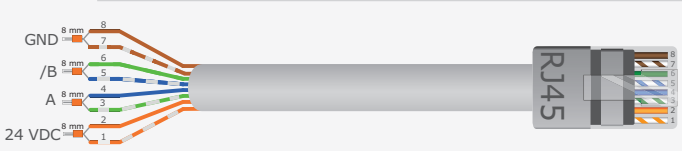
Settings



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

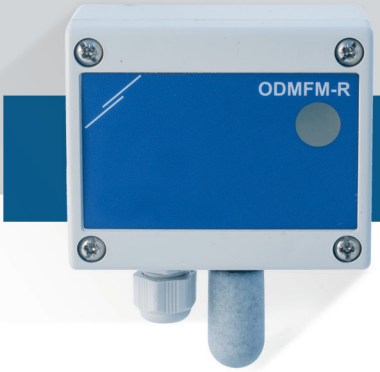
Wiring and connections

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)

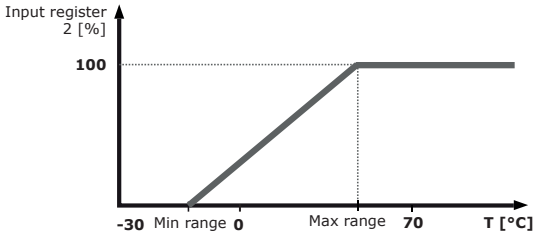
Packaging	ODMFM-R
Unit	05401003010679

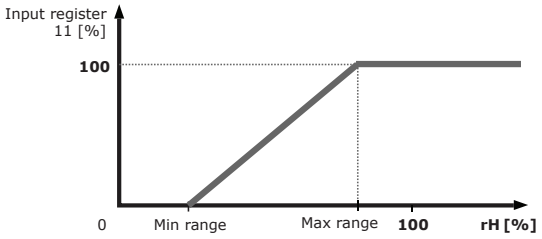


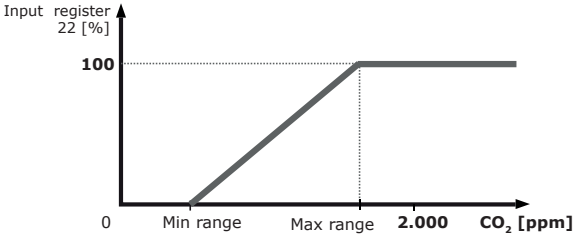
ODMFM-R

Multifunctional outdoor transmitter

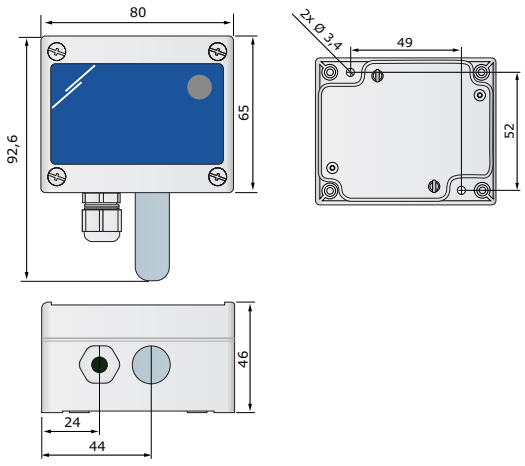
Operational diagram(s)







Fixing and dimensions



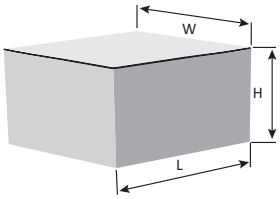
Modbus registers

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



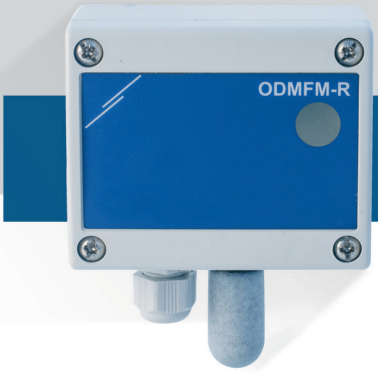
Article	Packaging	Length [mm]	Width [mm]	Height [mm]	Net weight	Gross weight
ODMFM-R	Unit (1 pc.)	110	90	50	0,125 kg	0,155 kg
	Box (80 pcs.)	590	380	280	10,00 kg	13,26 kg

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

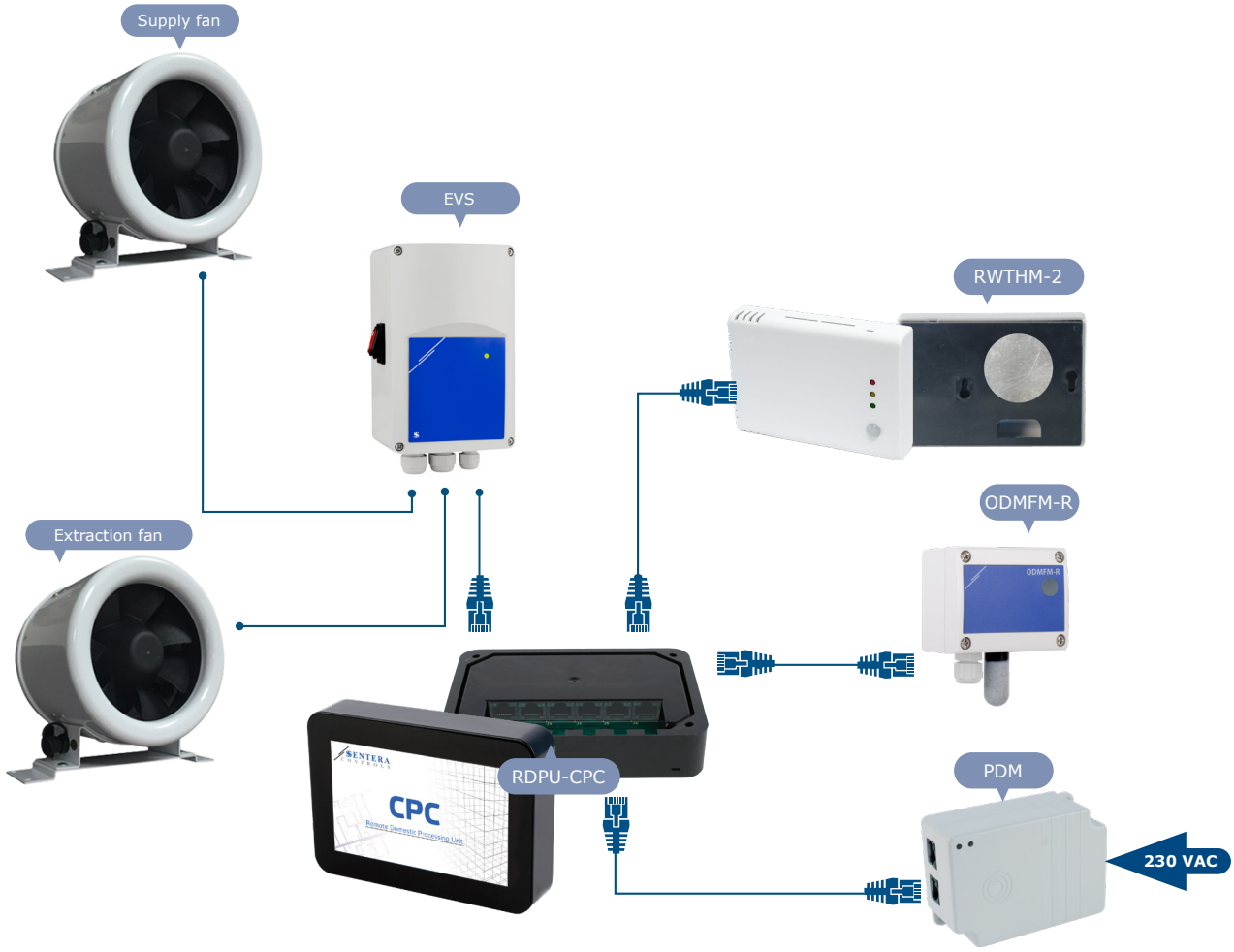
- RoHs Directive 2011/65/EC

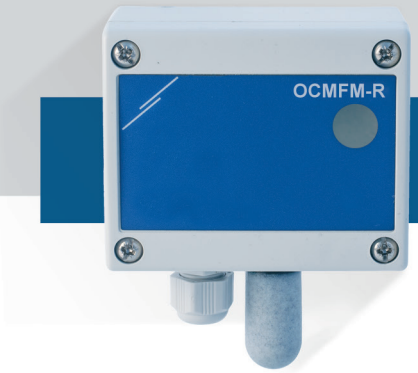


ODMFM-R

Multifunctional outdoor transmitter

Application example





OCMFM-R

Intelligent CO_2 sensor for harsh environments

The OCMFM-R are intelligent sensors featuring adjustable temperature, relative humidity and CO_2 ranges suitable for outdoor applications or tough environments. The used algorithm controls a single analogue / modulating output based on the measured temperature, humidity and CO_2 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 CO_2 ranges
- Fan speed control based on temperature, humidity and CO_2
- 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 CO_2 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

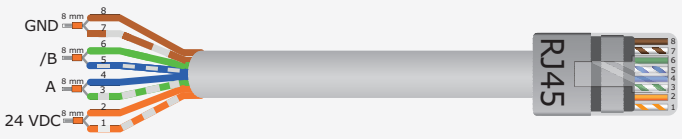
	Supply	Connection
OCMFM-R	24 VDC, PoM	RJ45

Area of use

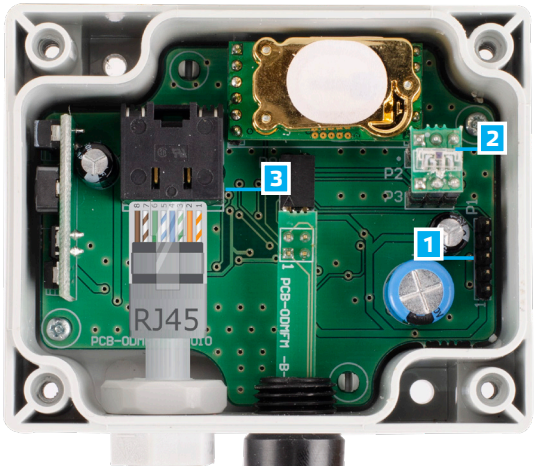
- Demand controlled ventilation based on temperature, relative humidity and CO_2
- Suitable for both indoor and outdoor use (e.g. open-air spaces, multi-storey and subterranean car parks, residential and commercial buildings)

Wiring and connections

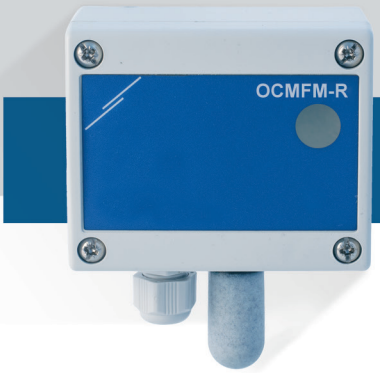
24 VDC	Supply voltage 24 VDC
GND	Ground
A	Modbus RTU communication, signal A
/B	Modbus RTU communication, signal /B



Settings



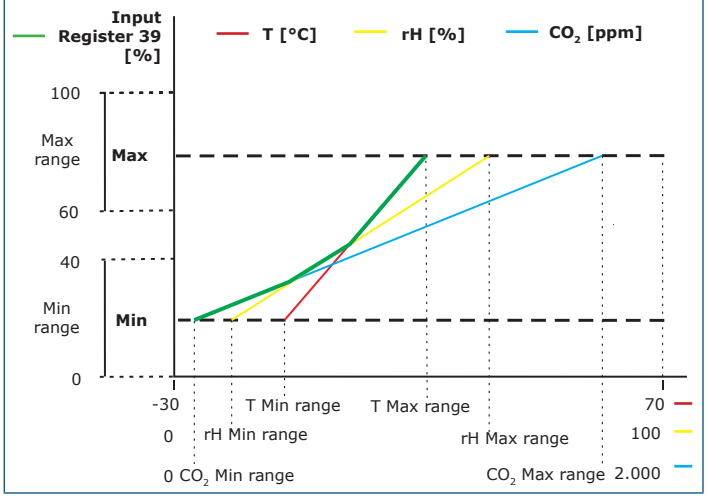
1 - PROG header, P1	1 2 3 4 5	Put a jumper onto pins 1 and 2 and wait for at least 5 seconds to reset the Modbus communication parameters
	1 2 3 4 5	Put a jumper onto pins 3 and 4 and restart the supply to enter bootloader mode
2 - Ambient light sensor		Low light intensity / Active / Standby
3 - RJ45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



OCMFM-R

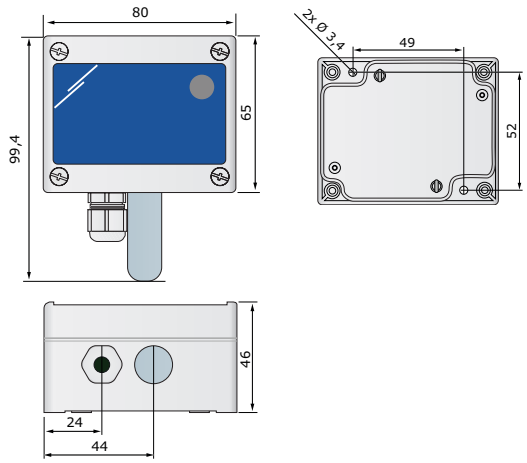
Intelligent CO_2 sensor for harsh environments

Operational diagram



Note: *The output changes automatically depending on the highest of the T, rH or CO_2 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 CO_2 values only.*

Fixing and dimensions



Modbus registers

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

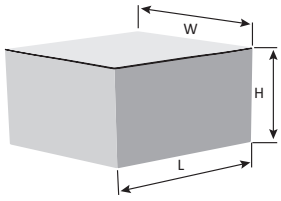
The parameters of the unit can be monitored / configured through the 3SModbus software platform. You can download it from the following link:
https://www.sentera.eu/en/3SMCenter

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: Genericstandards - 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, CO_2 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 CO_2 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 CO_2 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)

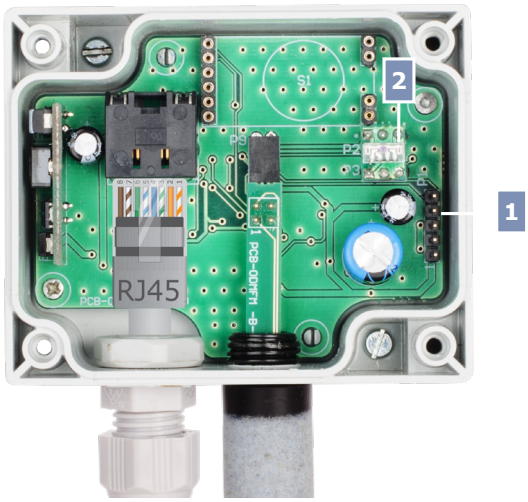
Article codes

	Supply	Connection
ODMHM-R	24 VDC, PoM	RJ45

Area of use

- Monitoring of temperature, relative humidity and CO_2 levels
- Suitable for harsh environments. Application field: greenhouses, livestock breeding farms, mushroom growing houses, etc.

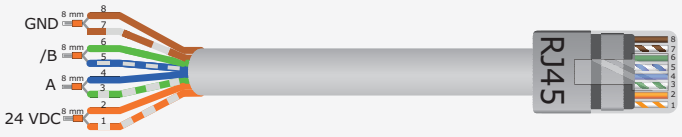
Settings



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

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)

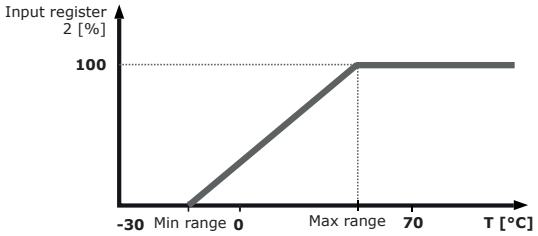
Packaging	ODMHM-R
Unit	05401003010686
Box	05401003502334

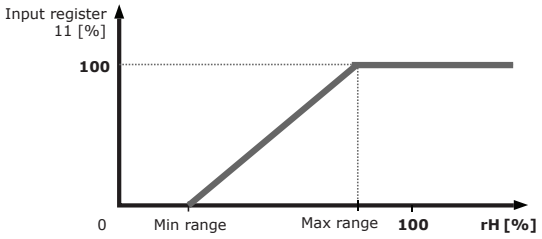
SENTERA CONTROLS

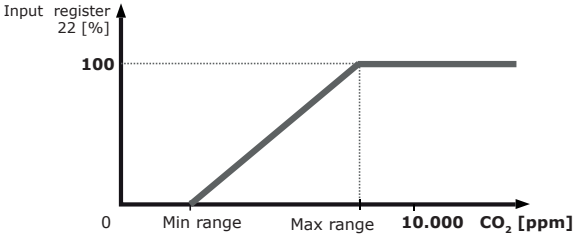
ODMHM-R

Multifunctional transmitter for agriculture

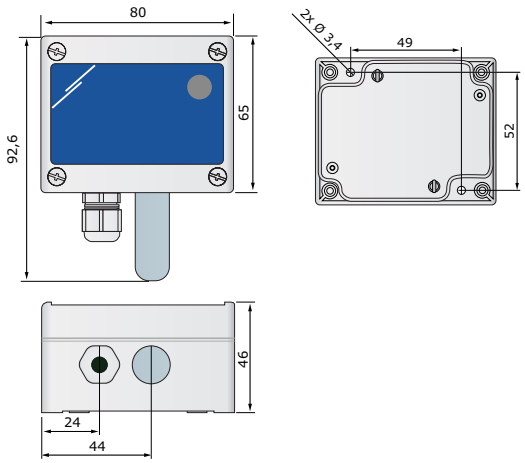
Operational diagram(s)







Fixing and dimensions



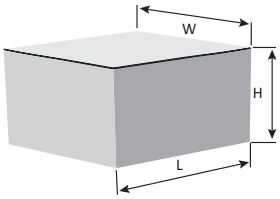
Modbus registers

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



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

CE

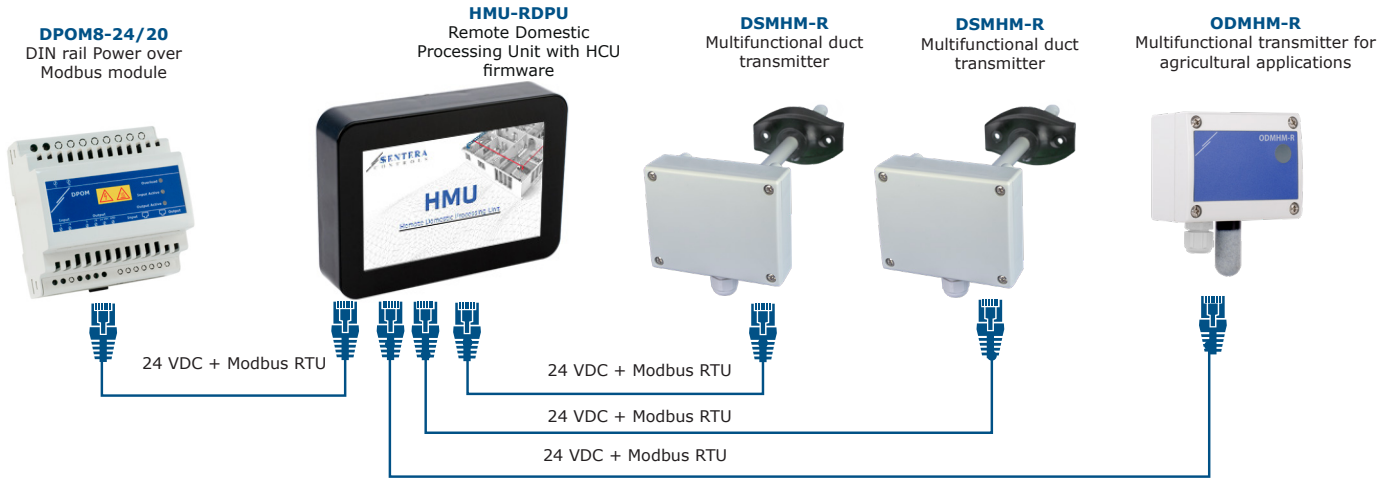
- EMC Directive 2014/30/EC:
  - EN 61000-6-1:2007 Electromagnetic compatibility (EMC) - Part 6-1: Generic standards - Immunity for residential, commercial and light-industrial environments
  - EN 61000-6-3:2007 Electromagnetic compatibility (EMC) - Part 6-3: Generic standards - Emission standard for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

SENTERA CONTROLS

ODMHM-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 CO_2 ranges. The used algorithm controls a single analogue/ modulating output based on the measured T, rH and CO_2 values, which can be used to directly control an EC fan, an AC fan speed controller or an actuator powered damper. All parameters are accessible via Modbus RTU.

Key features

- Universal input voltage: 85—264 VAC / 50—60 Hz
- Selectable temperature, relative humidity and CO_2 ranges
- Fan speed control based on temperature, relative humidity and CO_2
- Inset or surface mounting
- Bootloader for updating the firmware via Modbus RTU communication
- Ambient light sensor with adjustable 'active' and 'standby' level
- Replaceable CO_2 sensor element
- Modbus RTU communication
- 3 LEDs with adjustable light intensity for status indication
- Long-term stability and accuracy

Technical specifications

Analogue / modulating output	0—10 VDC mode: min. load 50 kΩ (R_L ≥ 50 kΩ)	
	0—20 mA mode: max. load 500 Ω (R_L ≤ 500 Ω)	
	PWM (open-collector type) mode: 1 kHz, min. load 50 kΩ (R_L ≥ 50 kΩ), PWM voltage level: 3,3 VDC or 12 VDC	
Typical field of use	Temperature range	0—50 °C
	Relative humidity range	0—95 % rH (non-condensing)
	CO_2 range	400—2.000 ppm
Accuracy	± 0,4 °C (range 0—50 °C)	
	± 3% rH (range 0—100 % rH)	
	± 30 ppm (range 400—2.000 ppm)	
Protection standard	IP30 (according to EN 60529)	

Area of use

- Demand controlled ventilation based on temperature, relative humidity and CO_2
- 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 mm²; 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	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

Note: *By default, the LED indicators visualise the measured CO_2 level. When the sensor is in bootloader mode, the green and yellow LEDs flash alternately. During the firmware download, the red LED is flashing additionally.*

FCMF8-R

Intelligent multifunctional sensor

Modbus registers

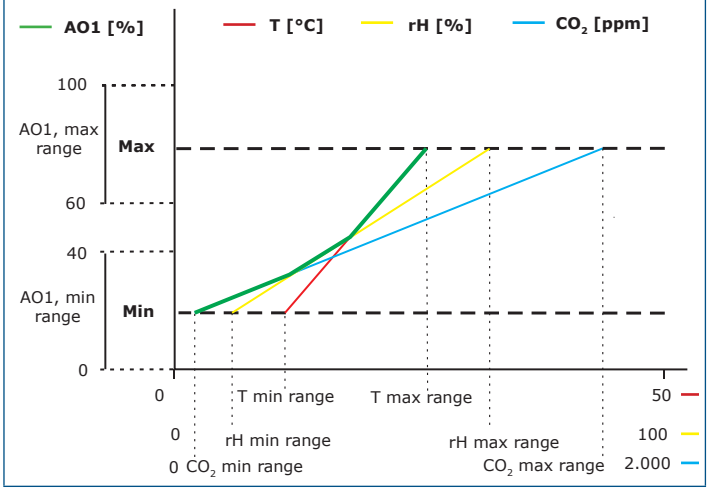
The Sensistant Modbus configurator allows you to easily monitor and/or configure Modbus parameters.

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

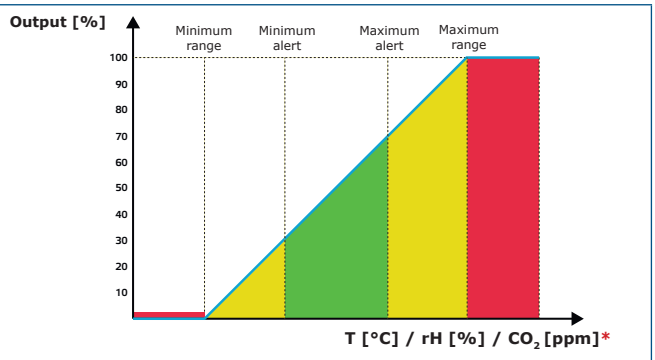
https://www.sentera.eu/en/3SMCenter

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 CO_2 values, i.e. the highest of the three values controls the output. See the green line in the operational diagram above. One or multiple sensors can be deactivated. E.g. it is also possible to control the output based on the measured CO_2 value only.*

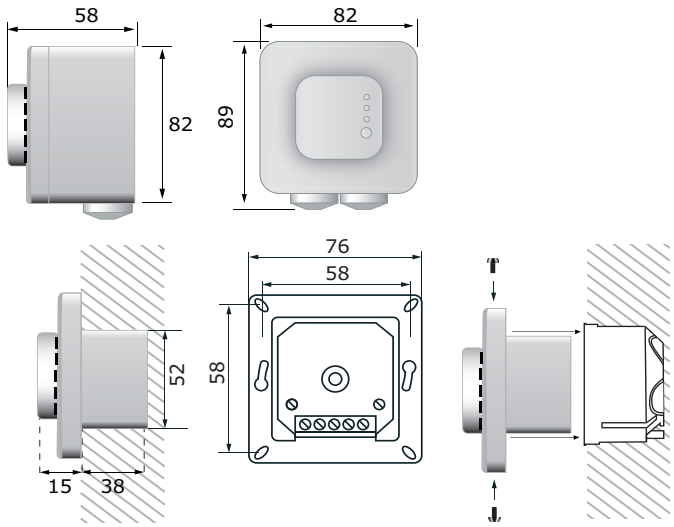


*** LED indications - T, rH or CO_2 (default)**

Global trade item numbers (GTIN)

Packaging	FCMF8-R
Unit	05401003006207
Carton	05401003300732
Box	05401003501146

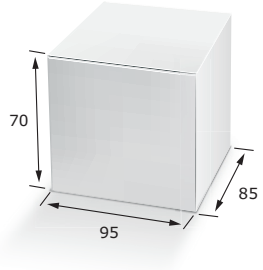
Fixing and dimensions



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

SENTERA CONTROLS

FCMFX-R

Intelligent CO_2 sensor

The FCMFX-R series are intelligent sensors featuring adjustable temperature, relative humidity and CO_2 ranges. The used algorithm controls a single analogue / modulating output based on the measured T, rH and CO_2 values, which can be used to directly control an EC fan, an AC fan speed controller or an actuator powered damper. All parameters are accessible via Modbus RTU.

Key features

- Spring contact terminal block
- Adjustable temperature, relative humidity and CO_2 ranges
- Fan speed control based on T, rH and CO_2
- Inset or surface mounting
- Bootloader for updating the firmware via Modbus RTU communication
- Ambient light sensor with adjustable 'active' and 'standby' level
- Replaceable CO_2 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: $R_L \geq 50$ kΩ	
	0—20 mA mode: $R_L \leq 500$ Ω	
	PWM mode: 1 kHz ,$R_L \geq 50$ kΩ, PWM voltage level: 3,3 VDC or 12 VDC	
Typical field of use	Temperature range	0—50 °C
	Relative humidity range	0—95 % rH (non-condensing)
	CO_2 range	400—2.000 ppm
Accuracy	± 0,4 °C (range 0—50 °C)	
	± 3% rH (range 0—100 %)	
	± 30 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 ±10%	180 mA
FCMFF-R	18—34 VDC	90 mA

Area of use

- Demand controlled ventilation based on temperature, relative humidity and CO_2
- 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 mm²; pitch 5 mm; shielded cable		

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

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

Indications

1 - Red LED	On	Measured temperature, relative humidity or CO_2 values are out of range
	Blinking	Communication with one of the sensors fails
2 - Yellow LED	On	Measured temperature, relative humidity or CO_2 values are in the alert range
	Blinking	Modbus communication has stopped and HR8 is activated (Modbus timeout > 0 seconds)
3 - Green LED	On	Measured temperature, relative humidity or CO_2 values are within range
4 - Ambient light sensor		Low light intensity / Active / Standby
5 - CO_2 sensor element		Replaceable in case of faulty operation
6 - PROG header, P1	1 2 3 4 5	Put a jumper onto pins 1 and 2 and wait for at least 5 seconds to reset the Modbus communication parameters
	1 2 3 4 5	Put a jumper onto pins 3 and 4 and restart the supply to enter bootloader mode

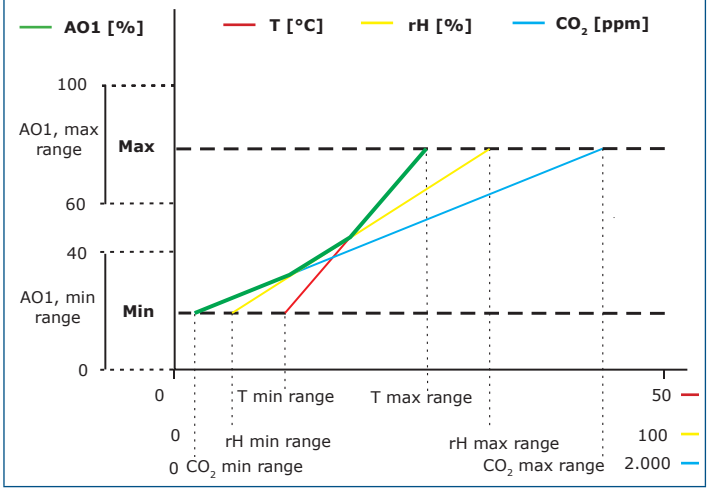
Note: *By default, the LED indicators visualise the measured CO_2 level. When the sensor is in bootloader mode, the green and yellow LEDs flash alternately. During the firmware download, the red LED is flashing additionally.*

SENTERA CONTROLS

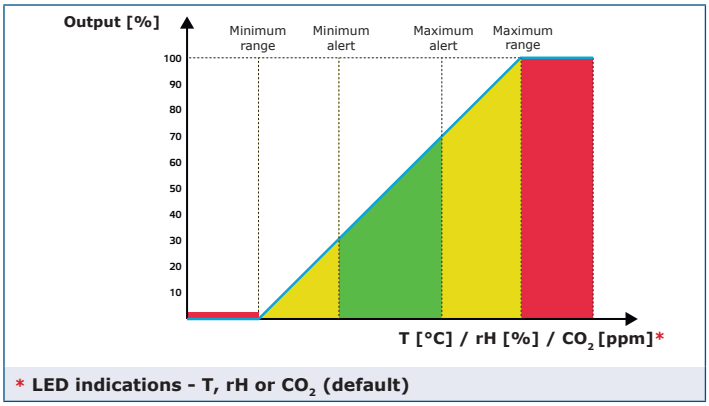
FCMFX-R

Intelligent CO_2 sensor

Operational diagram

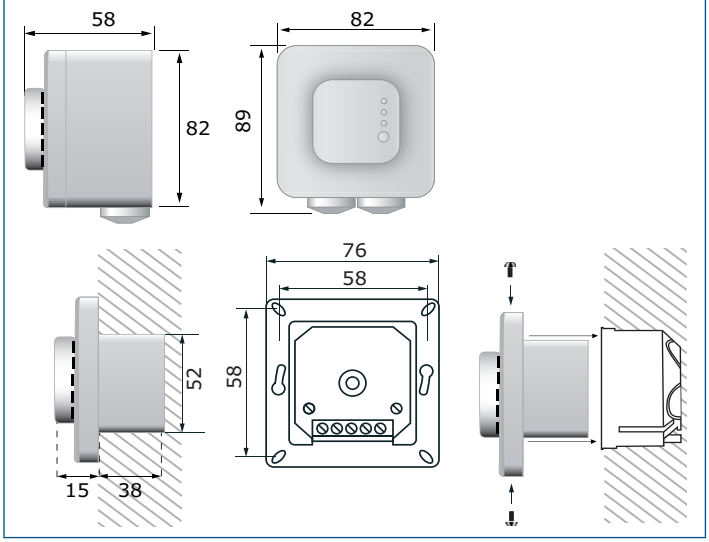


Note: *The output changes automatically depending on the highest of the T, rH or CO_2 values, i.e. the highest of the three output values controls the output. See the green line in the operational diagram above. One or multiple sensors can be deactivated. E.g. it is also possible to control the output based on the measured CO_2 value only.*



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

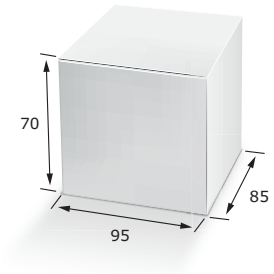
Fixing and dimensions



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

Article codes

	Supply	Connection
DSTHM-2	24 VDC, PoM	RJ45

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

Monitoring duct temperature and relative humidity in HVAC applications

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

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

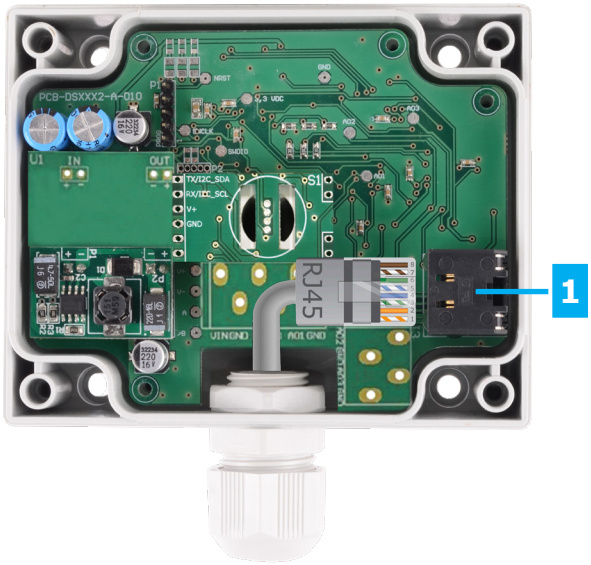
Global trade item numbers (GTIN)

Packaging	DSTHM-2
Unit	05401003001998
Box	05401003500774

DSTHM-2

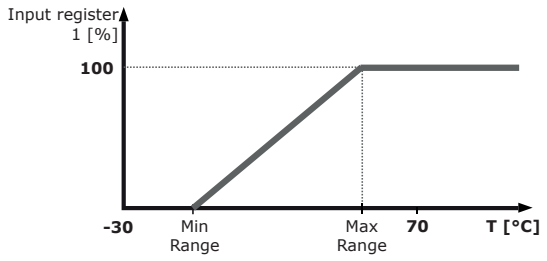
Temperature and humidity duct transmitter

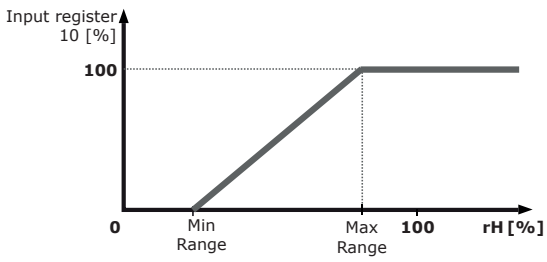
Settings



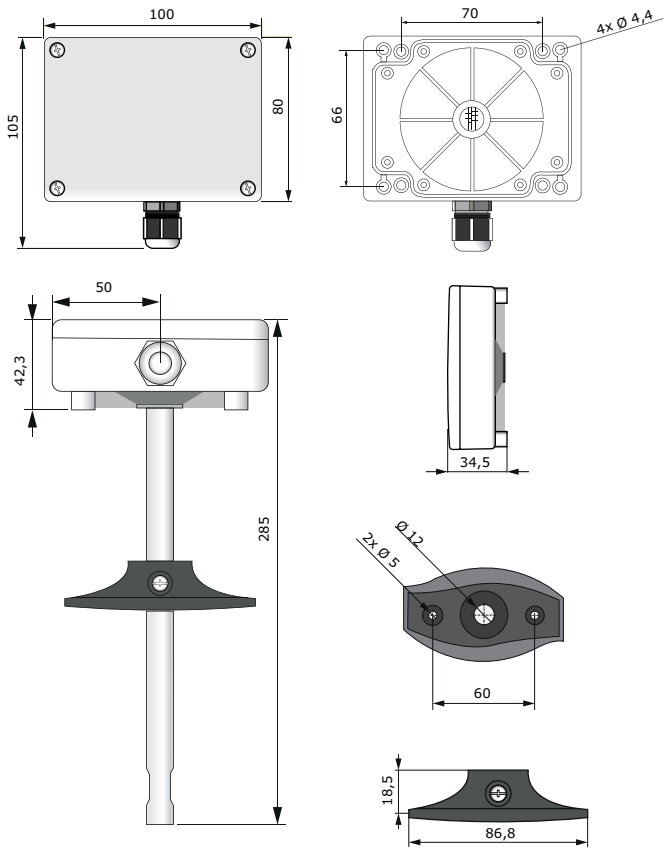
1 - RJ45 socket		Plug the communication and power cable into the socket

Operational diagram(s)

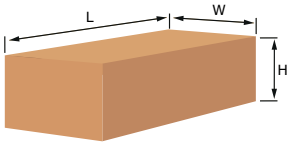




Fixing and dimensions



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 ≥ 50 kΩ)	
	0—20 mA mode: max. load 500 Ω (R_L ≤ 500 Ω)	
	PWM (open-collector type) mode: 1 kHz, min. load 50 kΩ (R_L ≥ 50 kΩ), 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	± 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

- 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	Imax
DSTHG-3	18—34 VDC	70 mA
	15—24 VAC ±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 mm²		

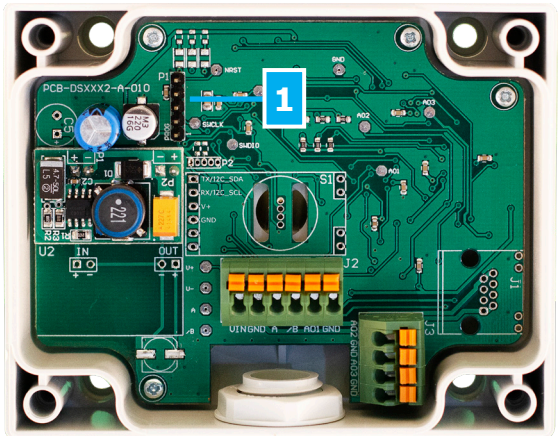
**Attention!* The -F version of the product is not suited for 3-wire connection. It has separate grounds for power supply and analogue output. Connecting both grounds together might result in incorrect measurements. Minimum 4 wires are required to connect -F type sensors.*

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.

DSTHX-3

Temperature and humidity duct transmitter

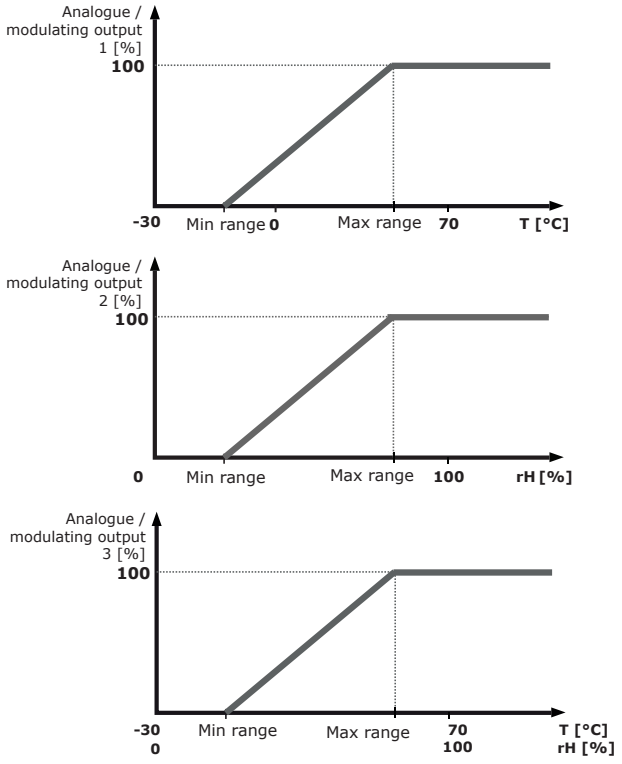
Settings



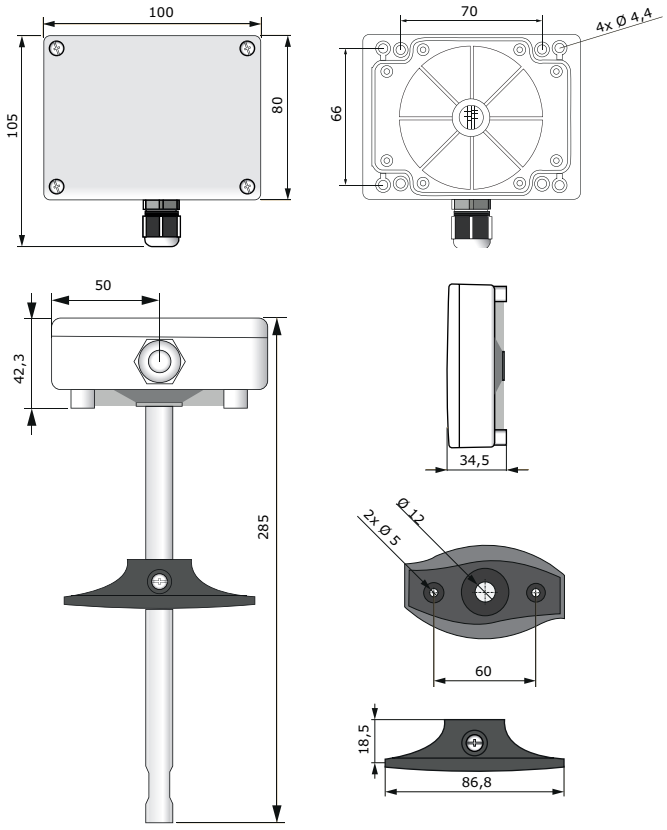
1 - PROG header, P1	1 2 3 4 5	Put a jumper onto pins 1 and 2 and wait for at least 5 seconds to reset the Modbus communication parameters
	1 2 3 4 5	Put a jumper onto pins 3 and 4 and restart the supply to enter bootloader mode

(■■ indicates the position of the jumper)

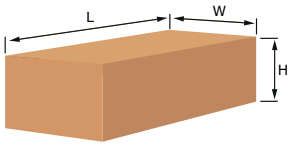
Operational diagram(s)



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 ºC (-30—70 ºC)
		±3 % rH (0—100 % rH)
Min. airflow velocity		1 m /s
Protection standard		Enclosure: IP54, probe: IP20

Article codes

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

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

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

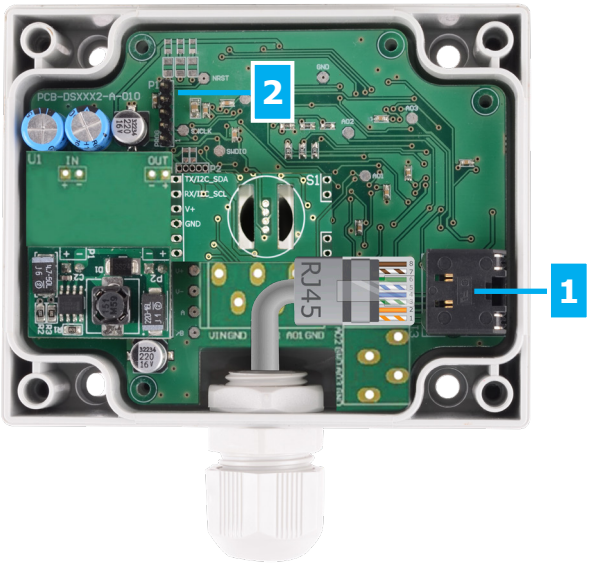
Wiring and connections

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

DCTHM-2

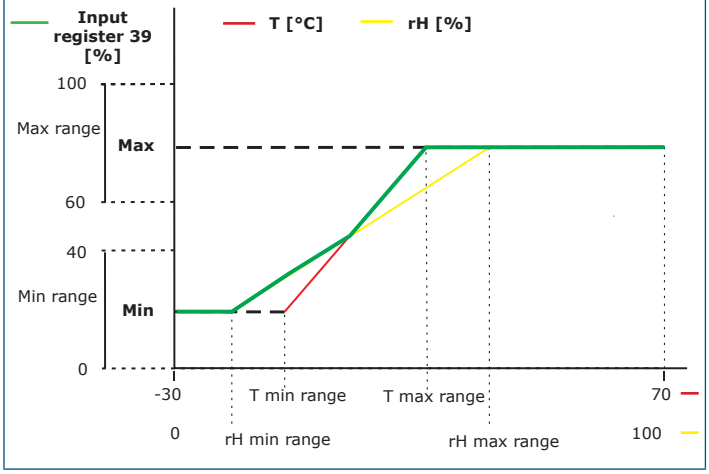
Intelligent temperature and humidity duct sensor, PoM

Settings



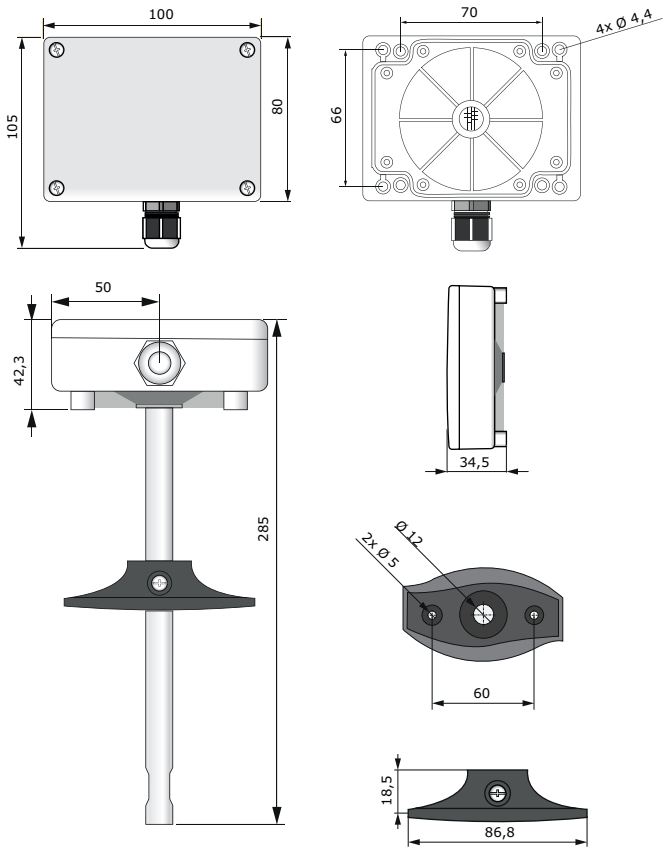
1 - RJ45 socket		Plug the communication and power cable into the socket
2 - PROG header, P1	 1 2 3 4 5	Put a jumper onto pins 1 and 2 and wait for at least 5 seconds to reset the Modbus communication parameters
	 1 2 3 4 5	Put a jumper onto pins 3 and 4 and restart the supply to enter bootloader mode

Operational diagram

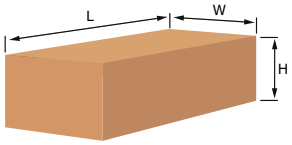


Note: *The output changes automatically depending on the highest of the T and rH values, i.e. the highest of the two output values controls the output. See the green line in the operational diagram above. One or multiple sensors can be deactivated. E.g. it is also possible to control the output based 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 kΩ (R_L ≥ 50 kΩ)	
	0—20 mA mode: max. load 500 Ω (R_L ≤ 500 Ω)	
	PWM (open-collector type) mode: 1 kHz, min. load 50 kΩ (R_L ≥ 50 kΩ), 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	±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
- WEEE Directive 2012/19/EC
- RoHs Directive 2011/65/EC

Article codes

Article code	Supply	Imax
DCTHG-2	18—34 VDC	40 mA
	15—24 VAC ±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		

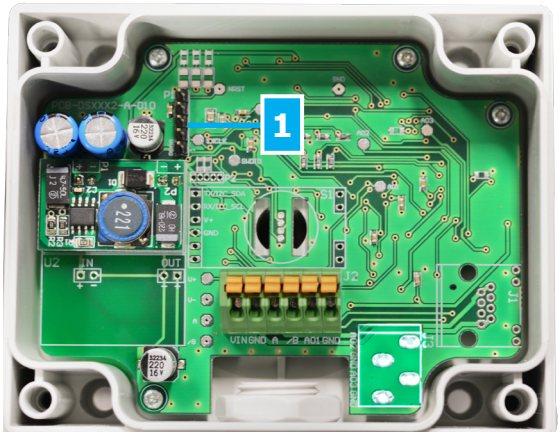
Attention! *The -F version of the product is not suited for 3-wire connection. It has separate grounds for power supply and analogue output. Connecting both grounds together might result in incorrect measurements. Minimum 4 wires are required to connect -F type sensors.*

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

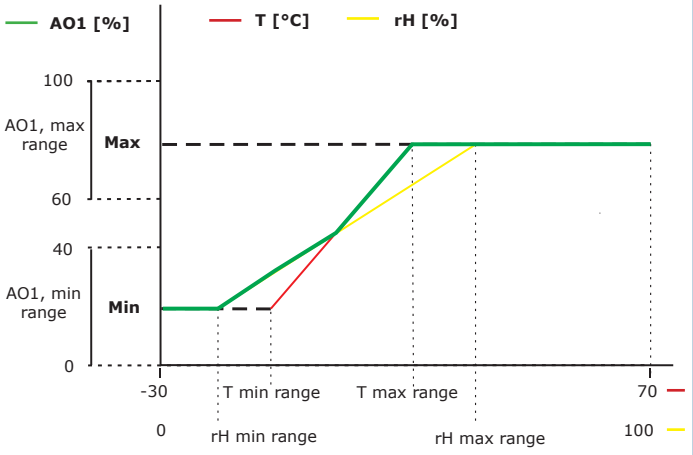
Intelligent temperature and humidity duct sensor

Settings



1 - PROG header, P1	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

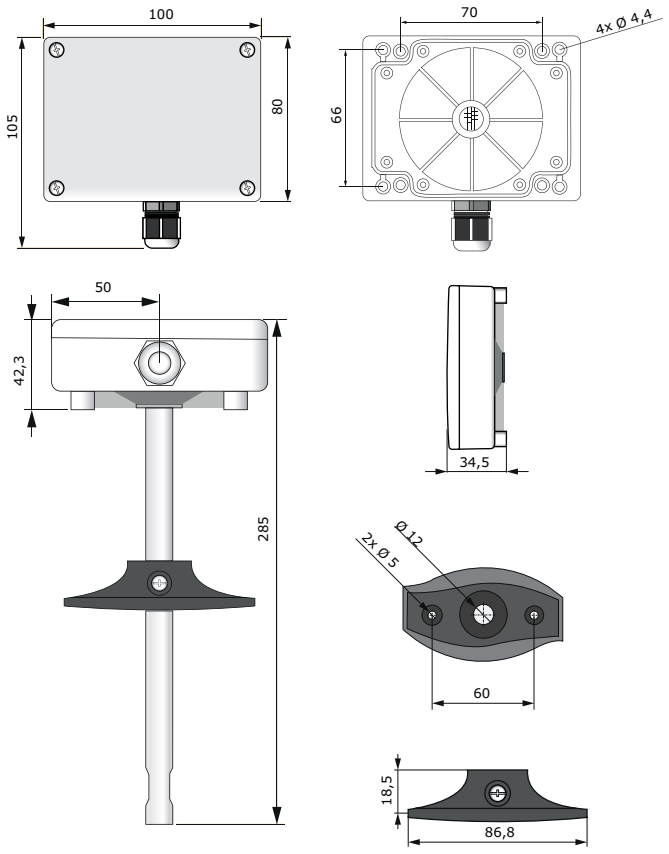


Note: *The output changes automatically depending on the highest of the T and rH values, i.e. the highest of the two output values controls the output. See the green line in the operational diagram above. One or multiple sensors can be deactivated. E.g. it is also possible to control the output based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

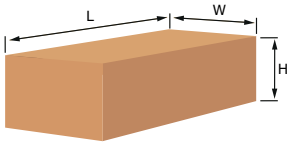
Global trade item numbers (GTIN)

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)

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

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/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

Modbus registers

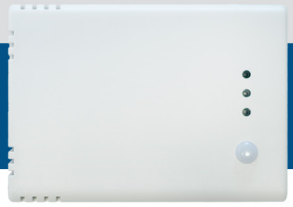
The Sensistant Modbus configurator allows you to easily monitor and/or configure Modbus parameters.

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

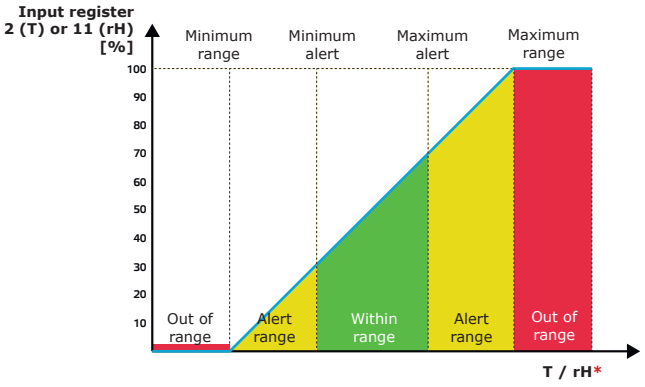
For more information about the Modbus registers, please refer to the product Modbus Register Map.

RSTHM-2

Temperature and humidity room transmitter

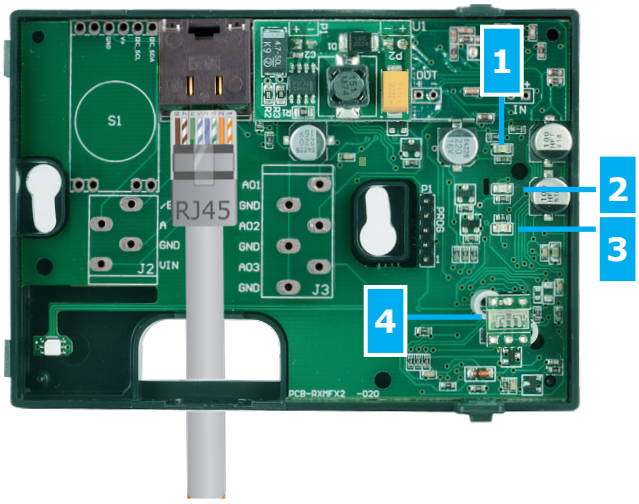


Operational diagram(s)



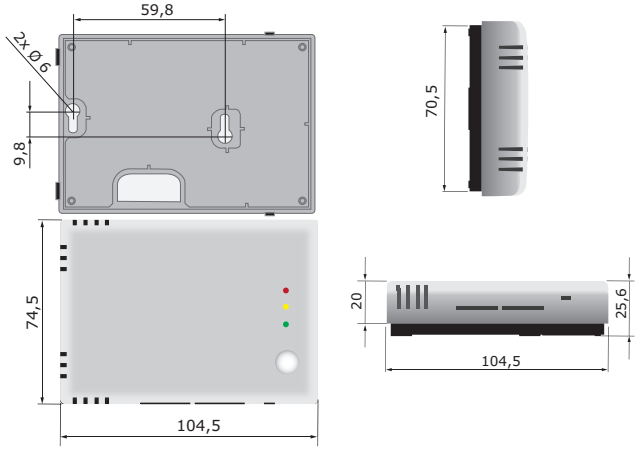
*LED indications - T (default) and rH

Settings and indications

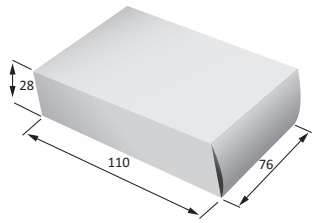


1 - Red LED	Continuous	Measured temperature or relative humidity are out of range
	Blinking	Communication with one of the sensors fails
2 - Yellow LED	On	Measured temperature or relative humidity are in the alert range
3 - Green LED	On	Measured temperature or relative humidity are within range
4 - Ambient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

Fixing and dimensions



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

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.

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.

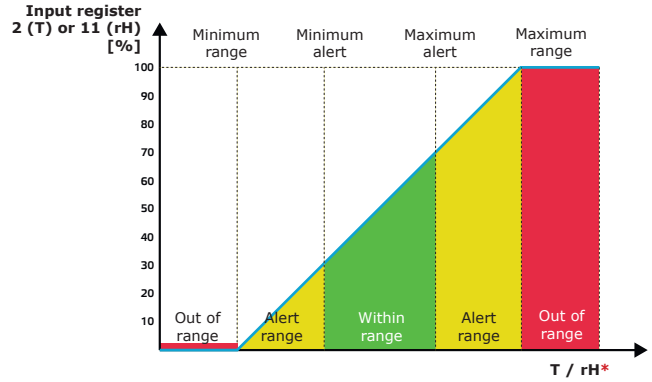
Area of use

- 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)

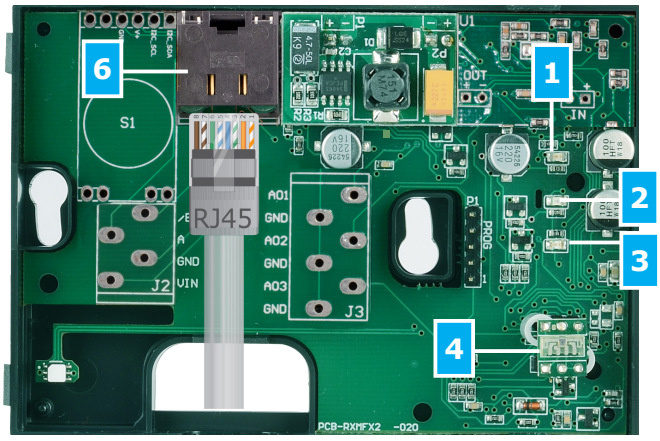


*LED indications - T (default) and rH

RWTHM-2

Temperature and humidity room transmitter

Indications

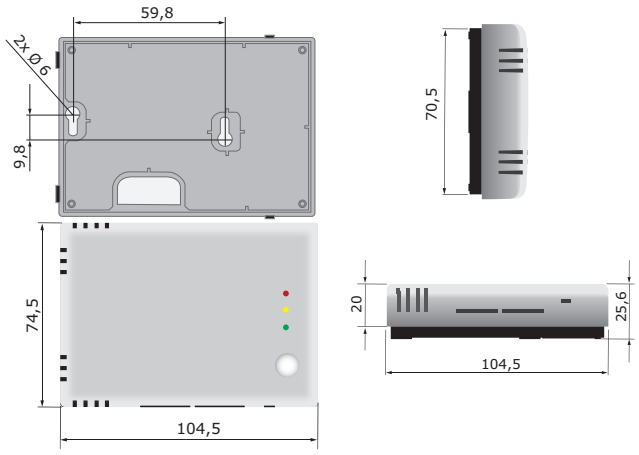


1 - Red LED	Continuous	Measured temperature or relative humidity are out of range
	Blinking	Communication with one of the sensors fails
2 - Yellow LED	On	Measured temperature or relative humidity are in the alert range
3 - Green LED	On	Measured temperature or relative humidity are within range
4 - Ambient light sensor		Low light intensity / Active / Standby
5 - PROG header, P1	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
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

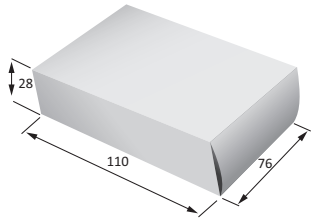
Global trade item numbers (GTIN)

Packaging	RWTHM-2
Unit	05401003011584

Fixing and dimensions



Packaging

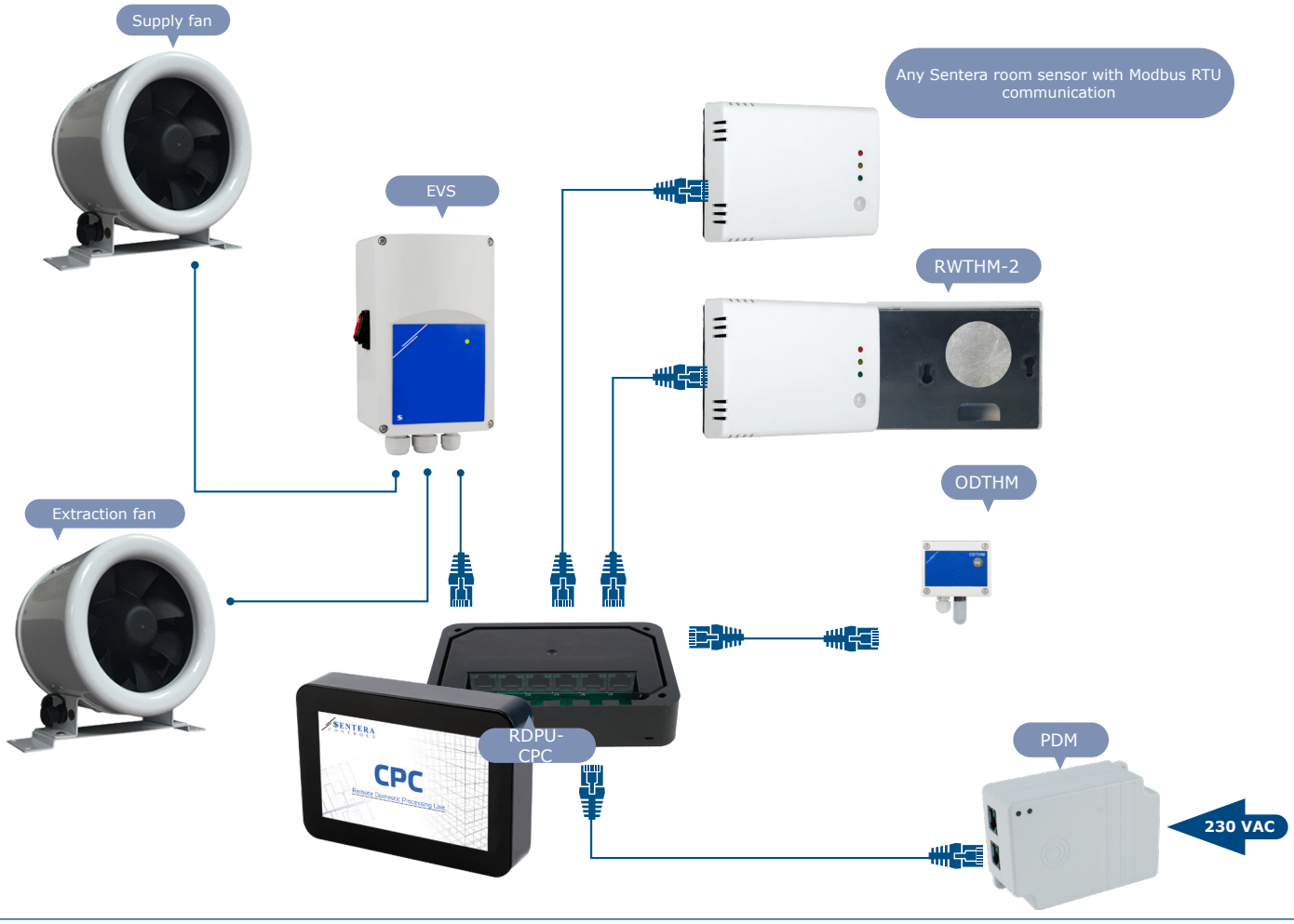


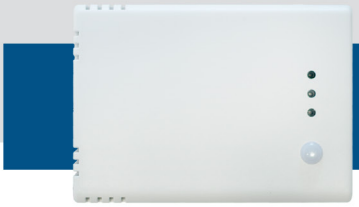
Article	Packaging	Length [mm]	Width [mm]	Height [mm]	Net weight	Gross weight
RWTHM-2	Unit (1 pc.)	110	76	28	0,08 kg	0,102 kg
	Carton (24 pcs.)	492	182	84	1,92 kg	2,588 kg
	Box (144 pcs.)	510	410	270	11,52 kg	16,76 kg

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: $R_L \geq 50$ kΩ
		0—20 mA mode: $R_L \leq 500$ Ω
		PWM (open-collector type) mode: 1 kHz, $R_L \geq 50$ kΩ, 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		± 0,4 °C (range 0—50 °C)
		± 3% rH (range 0—100 %)
Protection standard		IP30 (according to EN 60529)

Area of use

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

Article codes

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

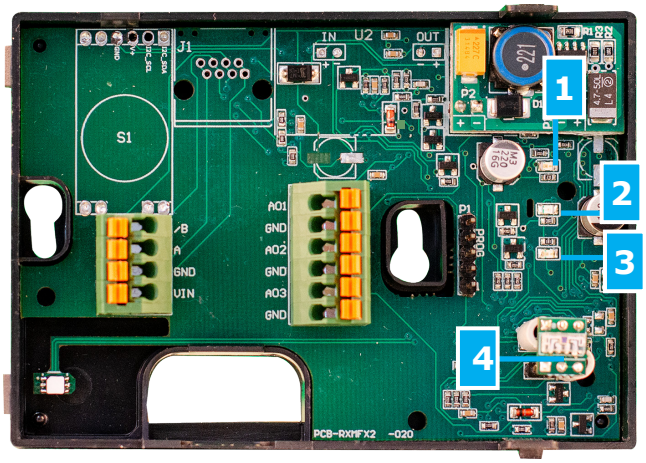
Wiring and connections

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.*

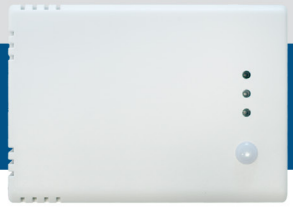
The -F version is suited for 4-wire connection. It features separate grounds for power supply and analogue output. Never connect the separated ground of the -F article to other devices powered by an AC voltage. Doing so might cause permanent damage to the device!

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

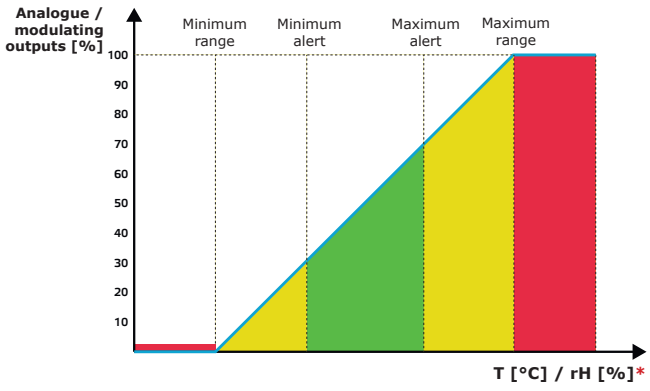
SENTERA CONTROLS



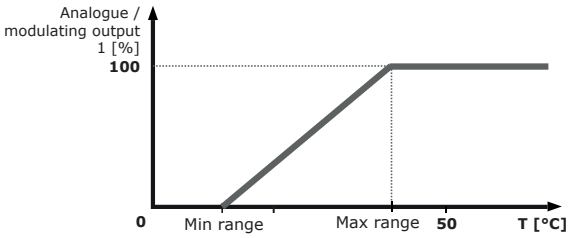
RSTHX-3

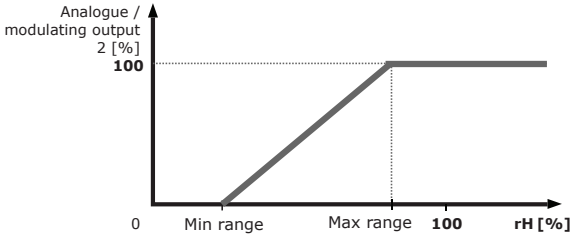
Temperature and humidity room transmitter

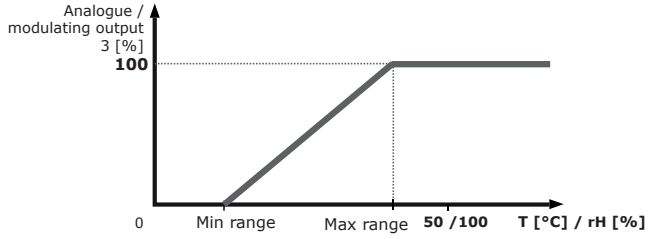
Operational diagram(s)



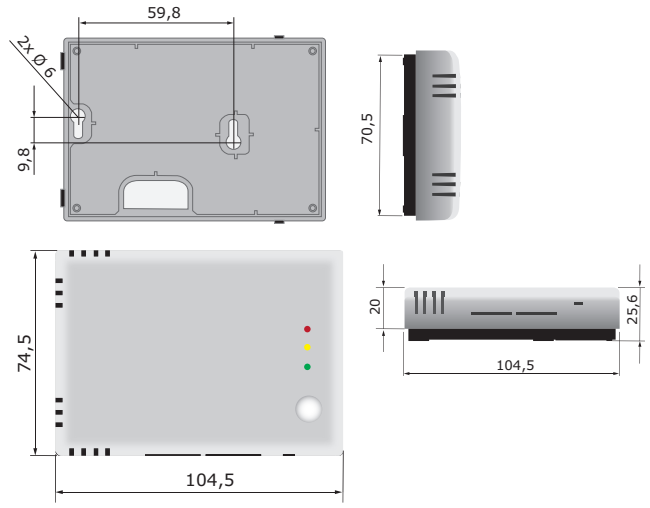
* LED indications - T (default) / rH







Fixing and dimensions



How to configure

SenteraWeb

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

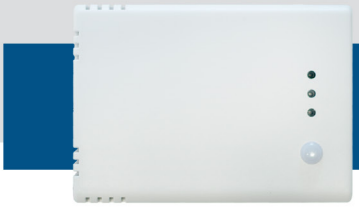
- Easily change the parameter settings of the connected devices remotely
- Define users and give them access to monitor the installation via a standard web browser
- Log data - create diagrams and export logged data
- Receive alerts or warnings when measured values exceed alert ranges or when errors 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.

Standards

CE

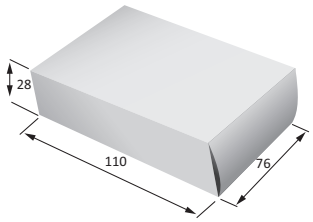
- Low Voltage Directive 2014/35/EC
  - EN 60529:1991 Degrees of protection provided by enclosures (IP Code) Amendment AC:1993 to EN 60529
- EMC directive 2014/30/EU:
  - EN 60730-1:2011 Automatic electrical controls for household and similar use - Part 1: General requirements
  - EN 61000-6-1:2007 Electromagnetic 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: $R_L \geq 50$ kΩ	
	0—20 mA mode: $R_L \leq 500$ Ω	
	PWM (open-collector type) mode: 1 kHz, $R_L \geq 50$ kΩ, 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	± 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
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

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!*

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

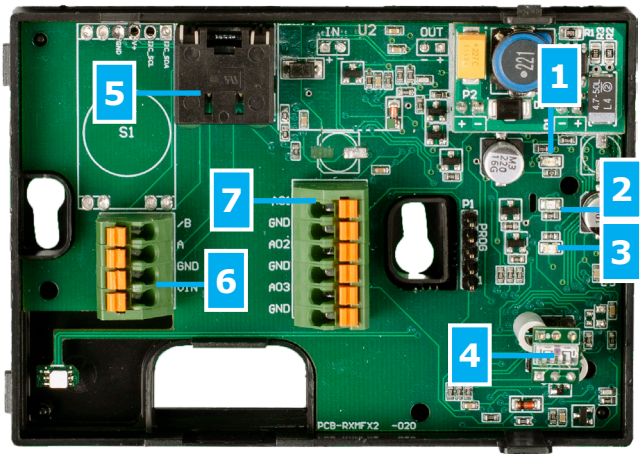
For more information about the Modbus registers, please refer to the product Modbus Register Map.

SENTERA CONTROLS

RSTHH-3

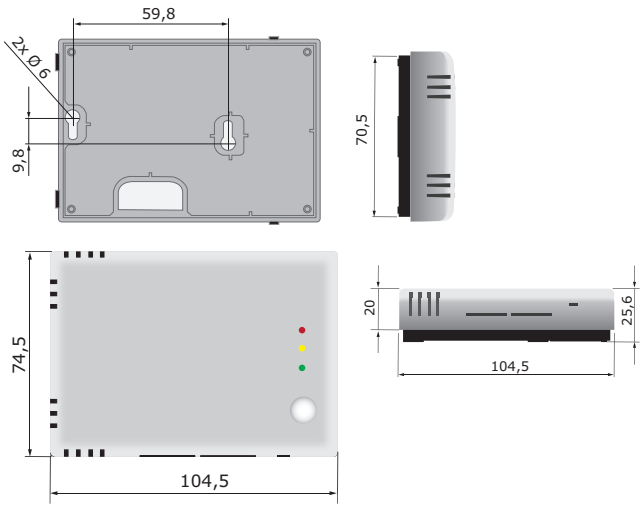
Temperature and humidity room transmitter

Connections and indications

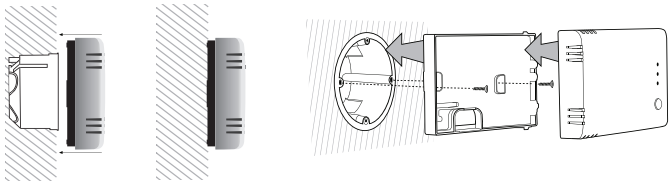


1 - Red LED	Continuous	Measured temperature or relative humidity are out of range
	Blinking	Communication with one of the sensors fails
2 - Yellow LED	On	Measured temperature or relative humidity are in the alert range
3 - Green LED	On	Measured temperature or relative humidity are within range
4 - Ambient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

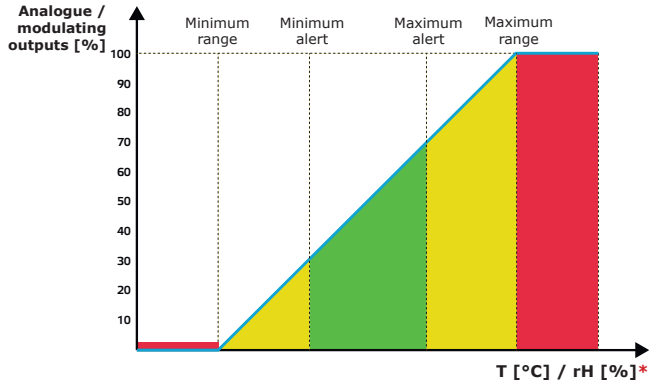
Fixing and dimensions



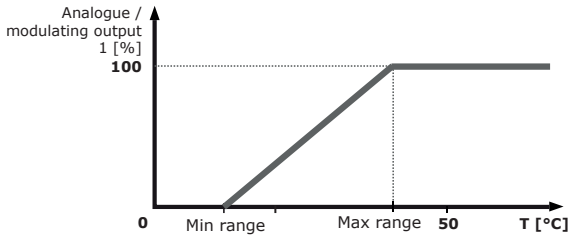
Fixing and dimensions

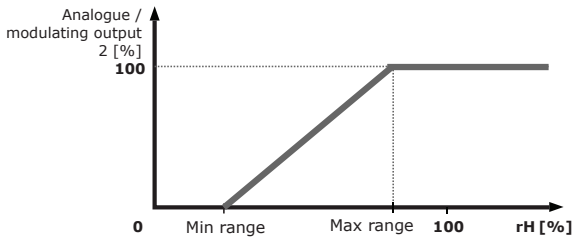


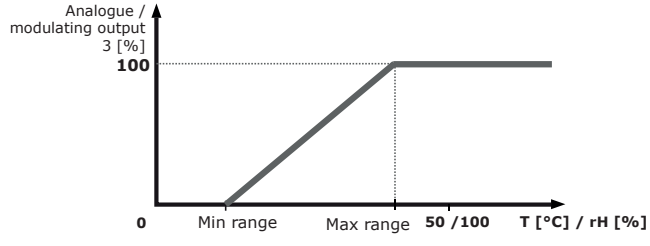
Operational diagram(s)



* LED indications - T (default) / rH







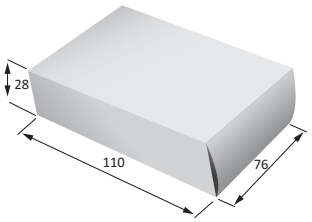
RSTHH-3

Temperature and humidity room transmitter

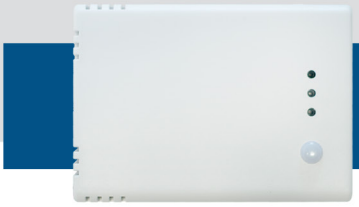
Global trade item numbers (GTIN)

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: $R_L \geq 50$ kΩ	
	0—20 mA mode: $R_L \leq 500$ Ω	
	PWM (open-collector type) mode: 1 kHz, $R_L \geq 50$ kΩ, 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	± 0,4 °C (range 0—50 °C)	
	± 3% 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 ±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

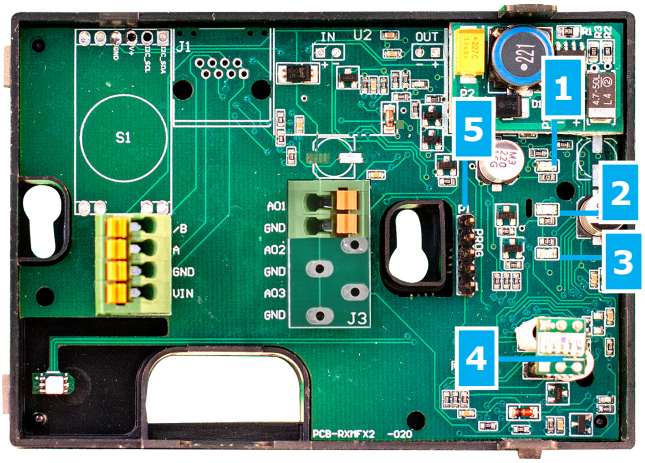
Wiring and connections

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



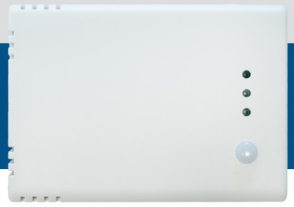
1 - Red LED	On	Measured temperature or relative humidity values are out of range
	Blinking	Communication with one of the sensors fails
2 - Yellow LED	On	Measured temperature or relative humidity values are in the alert range
	Blinking	Modbus communication has stopped and HR8 is activated (Modbus timeout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

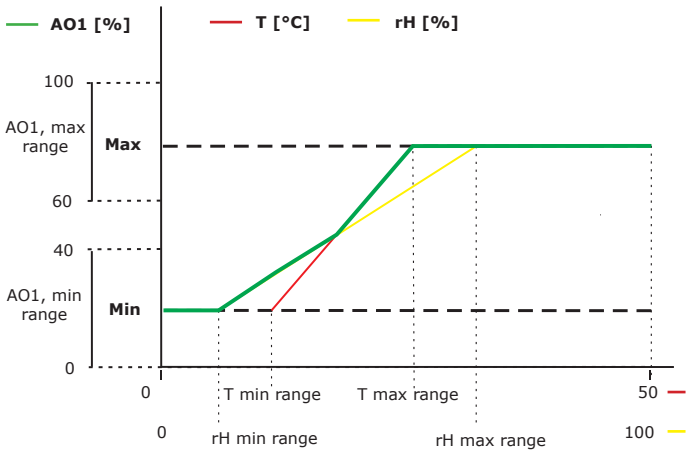
SENTERA CONTROLS

RCTHX-2

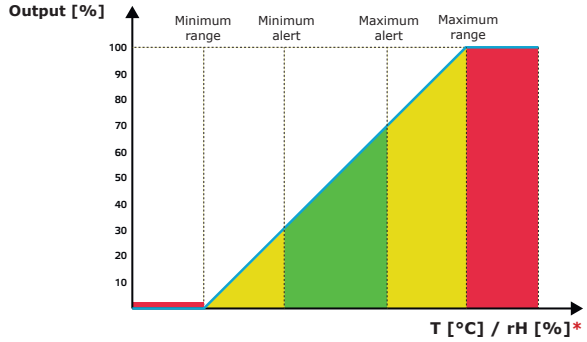
Intelligent temperature and humidity room sensor



Operational diagram

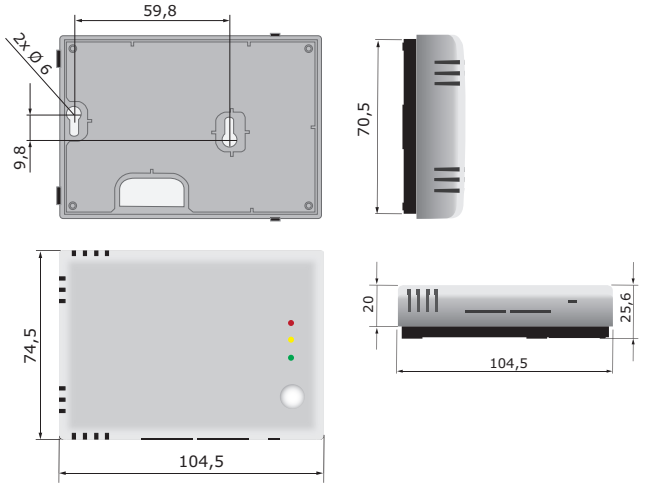


Note: *The output changes automatically depending on the highest of the T and rH values, i.e. the highest of the two output values controls the output. See the green line in the operational diagram above. One or multiple sensors can be deactivated. E.g. it is also possible to control the output based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

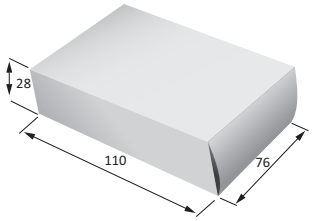
- Easily change the parameter settings of the connected devices remotely
- Define users and give them access to monitor the installation via a standard web browser
- Log data - create diagrams and export logged data
- Receive alerts or warnings when measured values exceed alert ranges or when errors 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

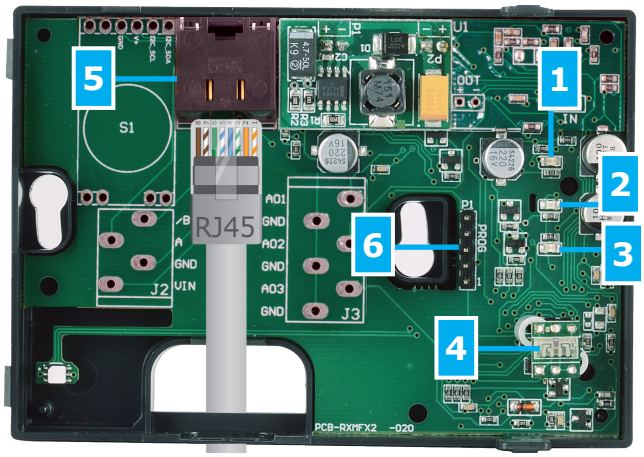
Modbus registers

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/3SMCenter

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

Indications



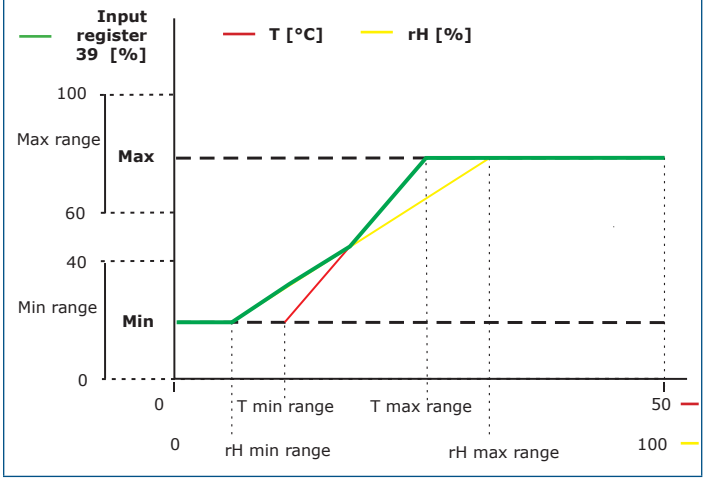
1 - Red LED	On	Measured temperature or relative humidity values are out of range
	Blinking	Communication with one of the sensors fails
2 - Yellow LED	On	Measured temperature or relative humidity values are in the alert range
3 - Green LED	On	Measured temperature or relative humidity values are within 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	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.*

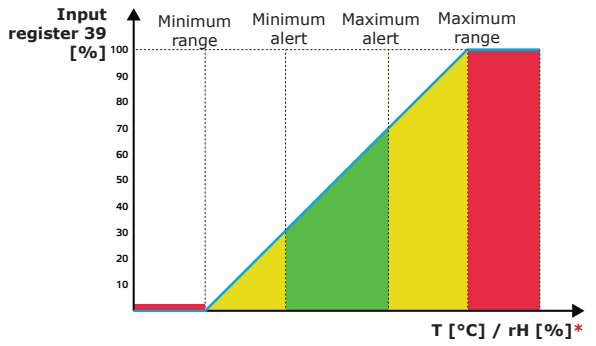
RCTHM-2

Intelligent temperature and humidity room sensor

Operational diagram

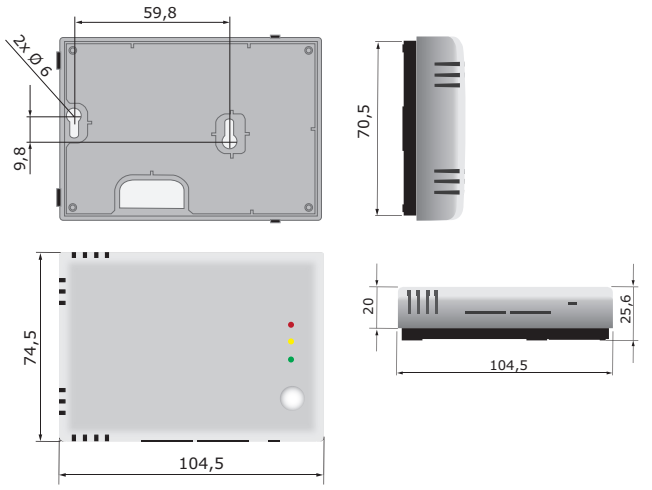


Note: *The output changes automatically depending on the highest of the T and rH values, i.e. the higher of the two output values controls the output. See the green line in the operational diagram above. One or multiple sensors can be deactivated. E.g. it is also possible to control the output based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



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

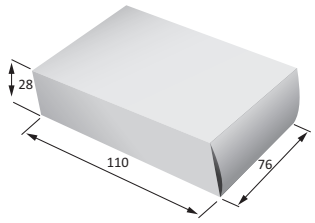
Fixing and dimensions



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
  - 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
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 ≥ 50 kΩ	
	0—20 mA mode: R_L ≤ 500 Ω	
	PWM (open-collector type) mode: 1 kHz, R_L ≥ 50 kΩ, PWM voltage level: 3,3 VDC or 12 VDC	
Typical field of use	Temperature range	0—50 °C
	Relative humidity range	0—95 % rH (non-condensing)
Accuracy	± 0,4 °C (range 0—50 °C)	
	± 3% rH (range 0—100 %)	
Protection standard	IP30 (according to EN 60529)	

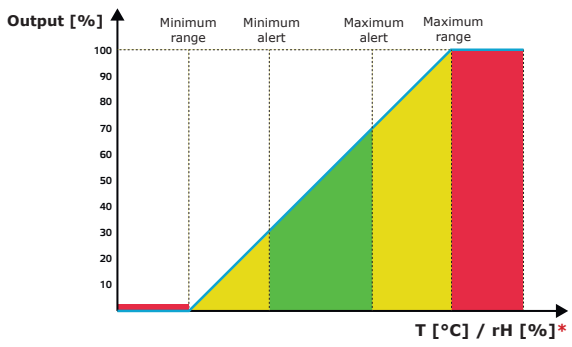
Area of use

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

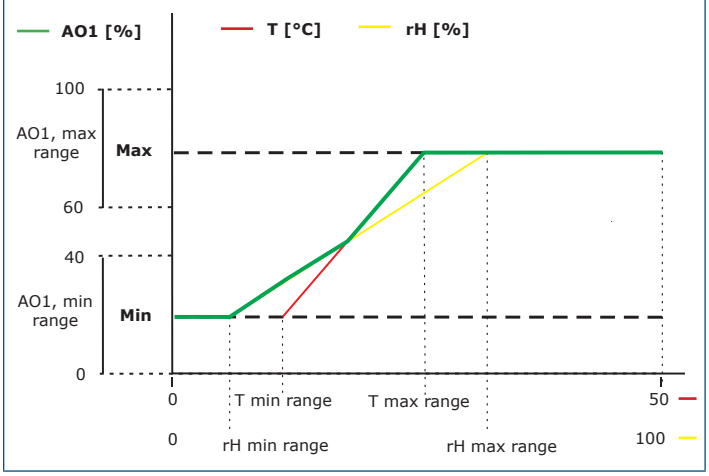
Article codes

Article code	Supply voltage	Connection type	Imax
RCTHH-2	24 VDC	RJ45 or terminal block	40 mA

Operational diagram(s)



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



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

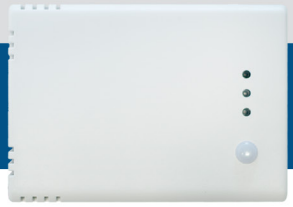
Attention! *The unit needs to be supplied via the RJ45 connector or via the connection terminals. Do not connect the device via the RJ45 connector and the terminal block simultaneously!*

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.*

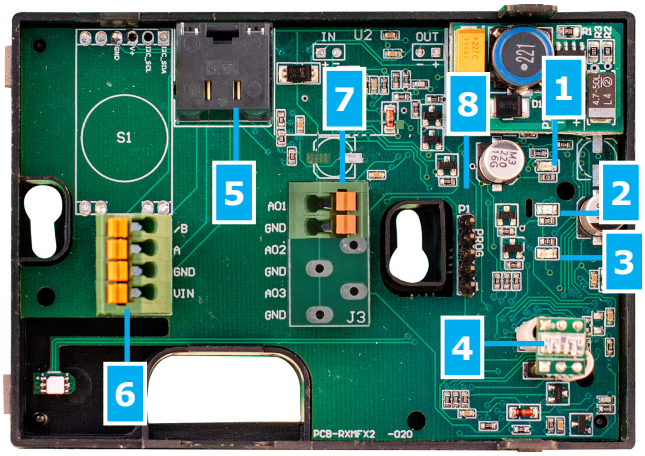
SENTERA CONTROLS

RCTHH-2

Intelligent temperature and humidity room sensor



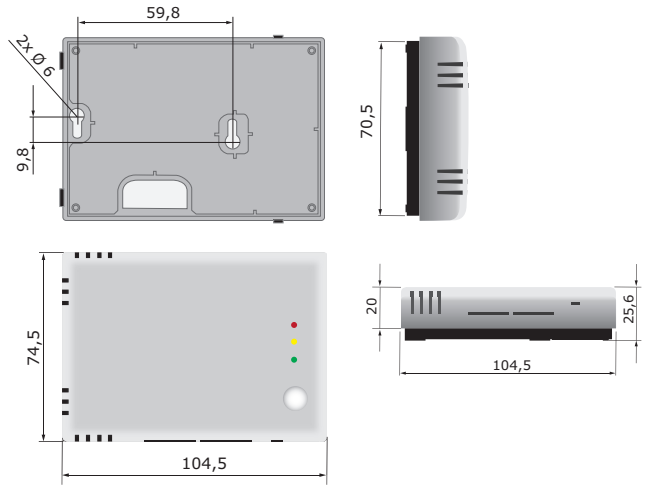
Settings and indications



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	 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.*

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.

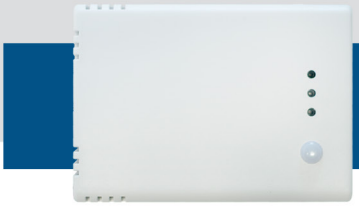
Standards

- 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

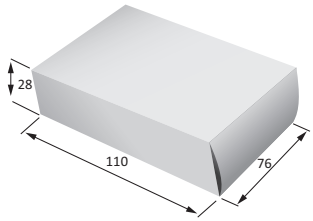
- WEEE Directive 2012/19/EC
- RoHs Directive 2011/65/EC



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)

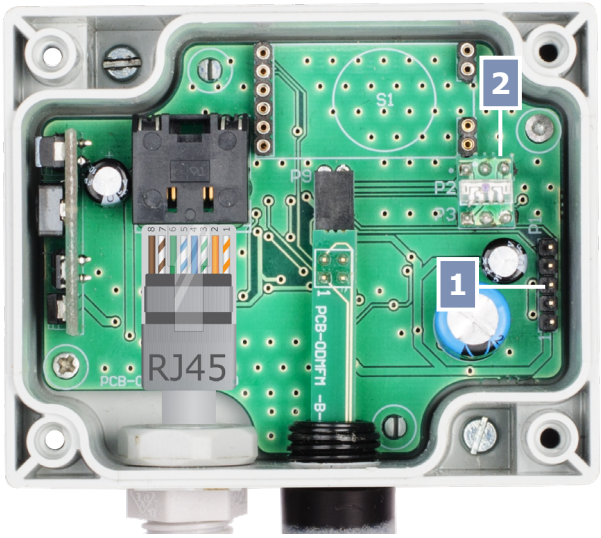
Area of use

- 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

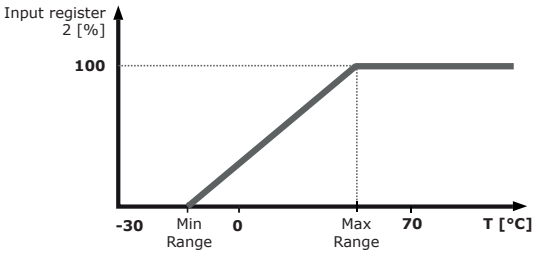
Settings

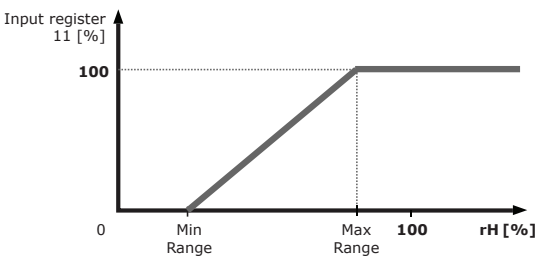


1 - PROG header, P1	1 2 3 4 5	Put a jumper onto pins 1 and 2 and wait for at least 5 seconds to reset the Modbus communication parameters
	1 2 3 4 5	Put a jumper onto pins 3 and 4 and restart the supply to enter bootloader mode
2 - Ambient light sensor		Low light intensity / Active / Standby

(■■ indicates the position of the jumper)

Operational diagrams

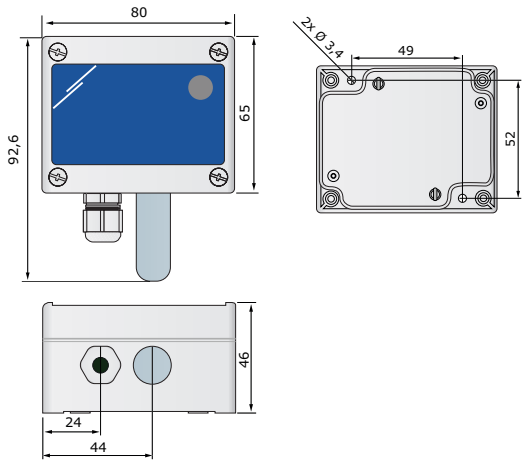




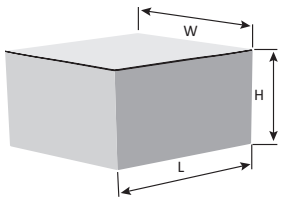
ODTHM

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.

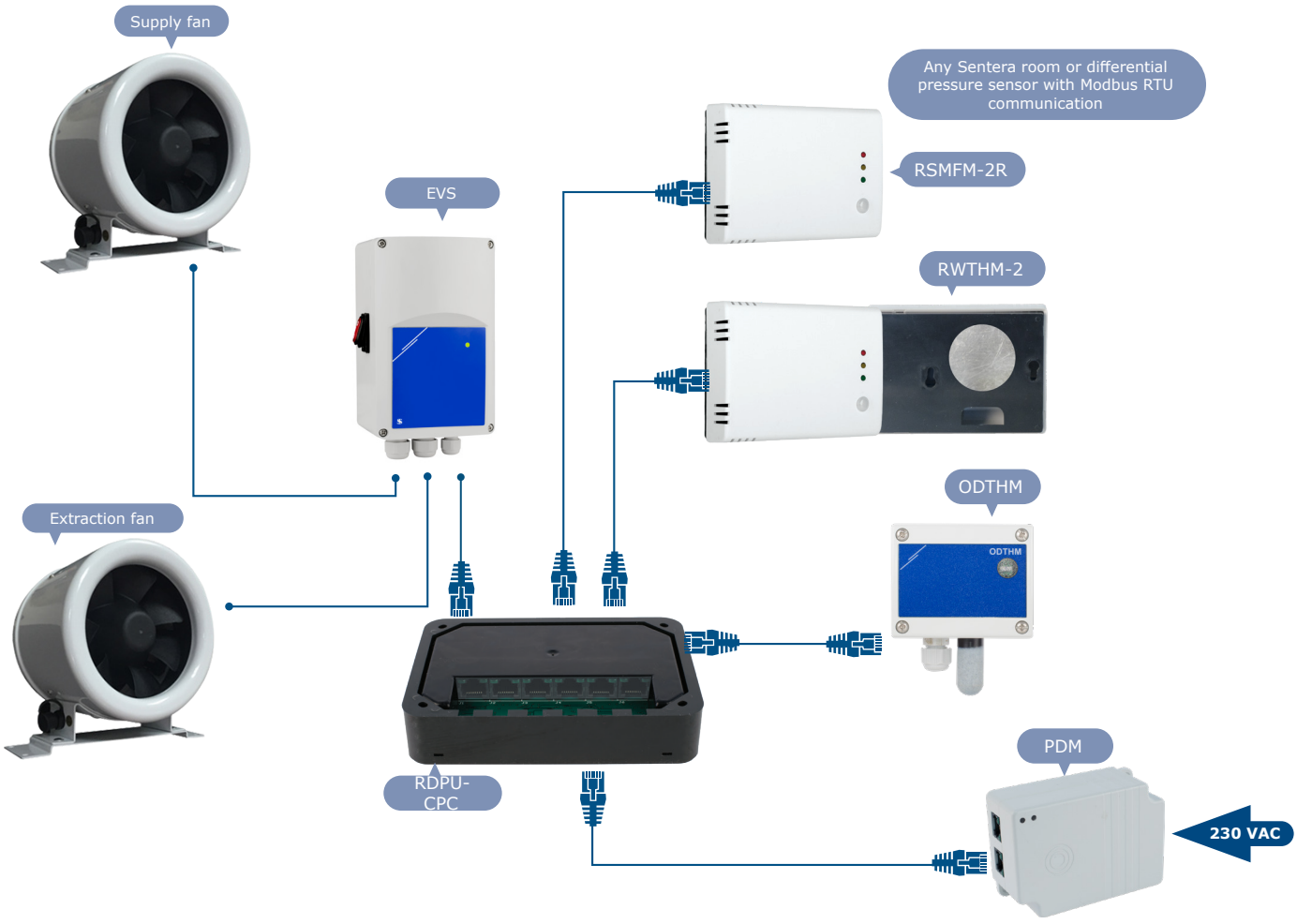
Global trade item numbers (GTIN)

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

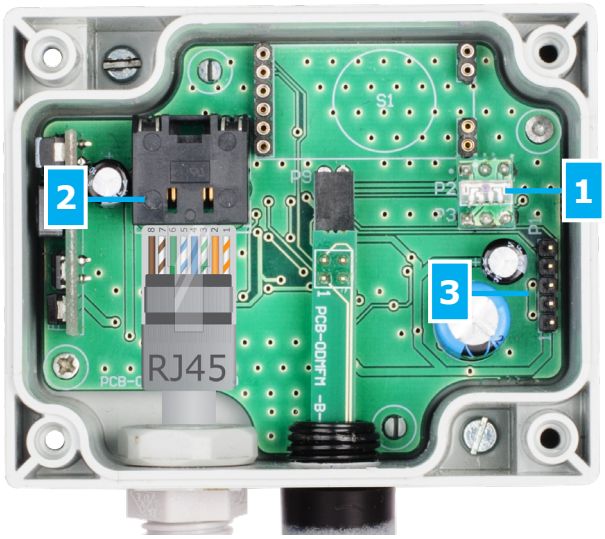
- Demand controlled ventilation based on temperature and relative humidity levels
- Suitable for both indoor and outdoor use (e.g. open-air spaces, multi-storey and subterranean car parks, residential and commercial buildings)

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

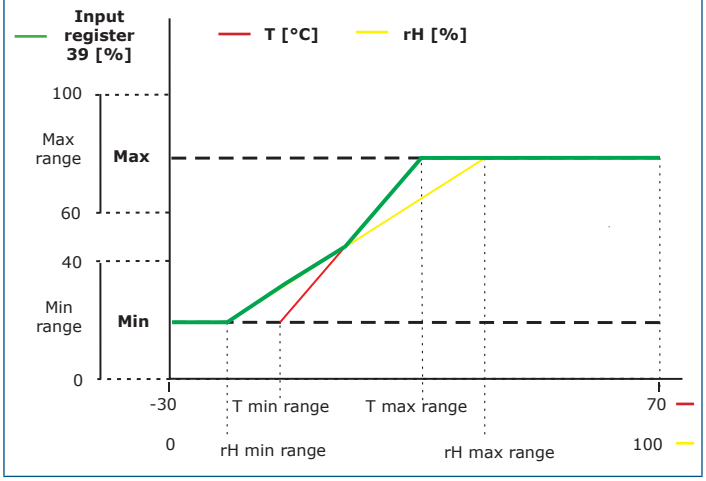


1 - Ambient light sensor		Low light intensity / Active / Standby
2 - RJ45 Socket		Plug the communication and power cable into the socket
3 - PROG header, P1	1 2 3 4 5	Put a jumper onto pins 1 and 2 and wait for at least 10 seconds to reset the Modbus communication parameters
	1 2 3 4 5	Put a jumper onto pins 3 and 4 and restart the power supply to enter bootloader mode

OCTHM-R

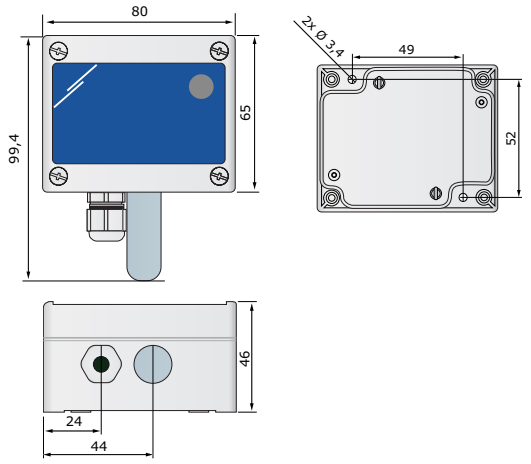
Intelligent temperature and humidity sensor

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



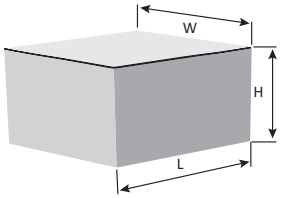
Global trade item numbers (GTIN)

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 kΩ (R_L ≥ 50 kΩ)	
	0—20 mA mode: max. load 500 Ω (R_L ≤ 500 Ω)	
	PWM (open-collector type) mode: 1 kHz, min. load 50 kΩ (R_L ≥ 50 kΩ), PWM voltage level: 3,3 VDC or 12 VDC	
Typical field of use	Temperature range	0—50 °C
	Relative humidity range	0—95 % rH (non-condensing)
Accuracy	± 0,4 °C (range 0—50 °C)	
	± 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 mm²; pitch 5 mm; shielded cable

Modbus registers

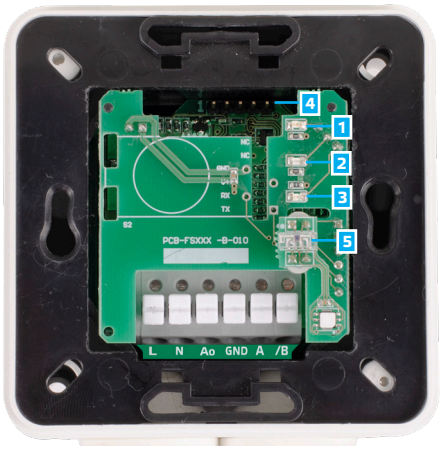
The Sensistant Modbus configurator allows you to easily monitor and/or configure Modbus parameters.

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



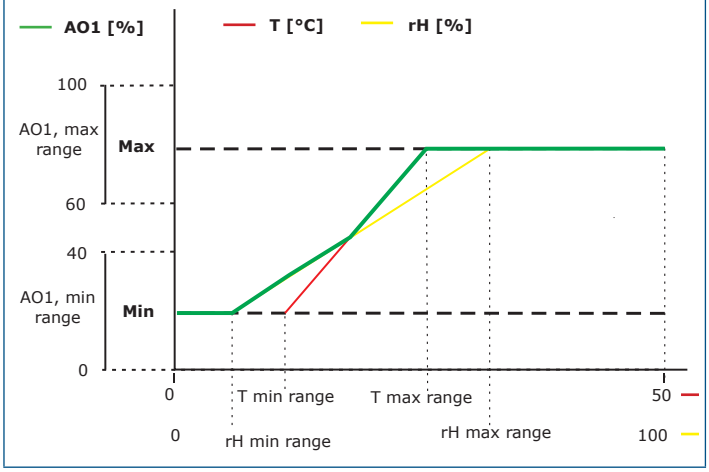
1 - Red LED	On	Measured temperature or relative humidity values are out of range
	Blinking	Communication with one of the sensors fails
2 - Yellow LED	On	Measured temperature or relative humidity values are in the alert range
	Blinking	Modbus communication has stopped and HR8 is activated (Modbus timeout > 0 seconds)
3 - Green LED	On	Measured temperature or relative humidity values are within range
4 - PROG header, P1	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
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.*

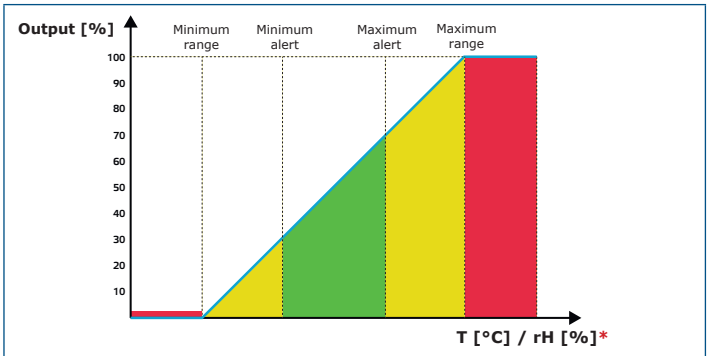
FCTH8

Intelligent temperature and humidity sensor

Operational diagram

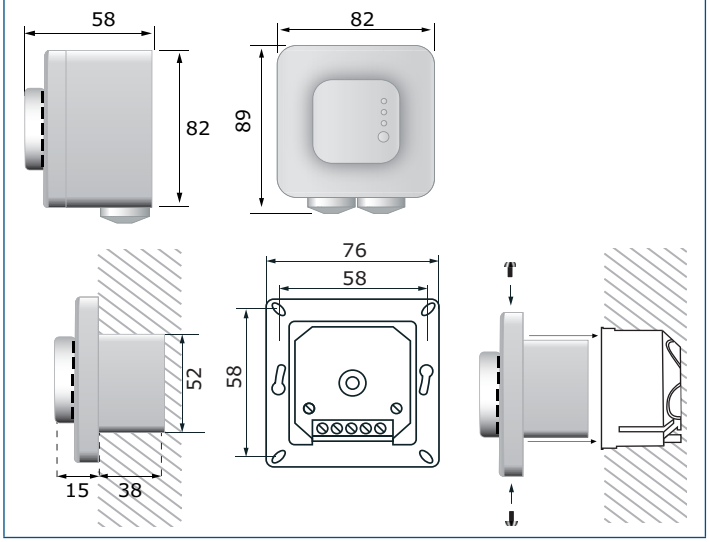


Note: *The output changes automatically depending on the highest of the T or rH values, i.e. the highest of the two output values controls the output. See the green line in the operational diagram above. One or multiple sensors can be deactivated. E.g. it is also possible to control the output based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



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

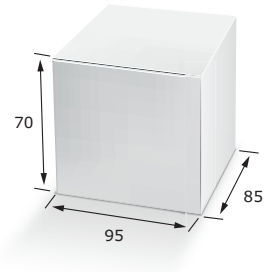
Fixing and dimensions



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: $R_L \geq 50$ kΩ	
	0—20 mA mode: $R_L \leq 500$ Ω	
	PWM (open-collector type) mode: 1 kHz, $R_L \geq 50$ kΩ, PWM voltage level: 3,3 VDC or 12 VDC	
Typical field of use	Temperature range	0—50 °C
	Relative humidity range	0—95 % rH (non-condensing)
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	Imax
FCTHG	18—34 VDC	35 mA
	15—24 VAC ±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

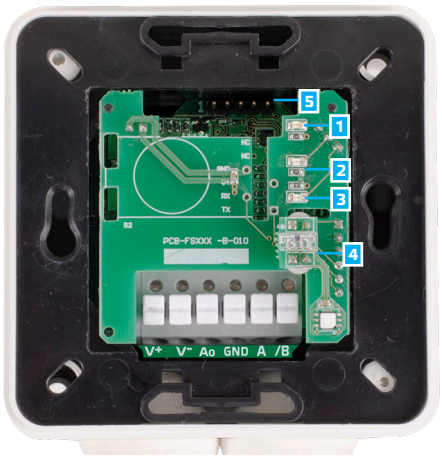
Wiring and connections

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 mm²; pitch 5 mm; shielded cable		

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

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

Indications



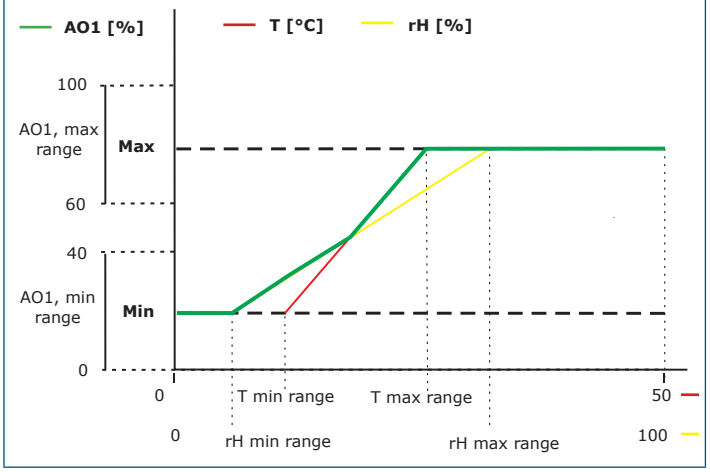
1 - Red LED	On	Measured temperature or relative humidity values are out of range
	Blinking	Communication with one of the sensors fails
2 - Yellow LED	On	Measured temperature or relative humidity values are in the alert range
	Blinking	Modbus communication has stopped and HR8 is activated (Modbus timeout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

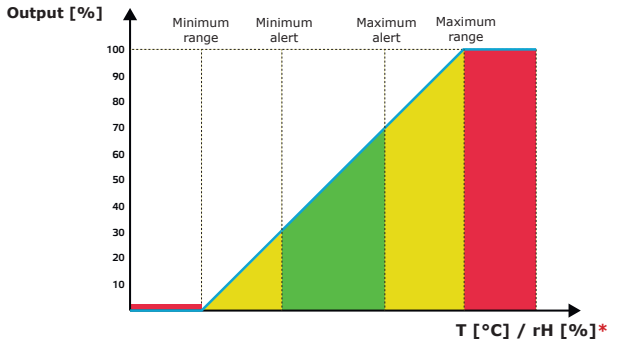
FCTHX

Intelligent temperature and humidity sensor

Operational diagram

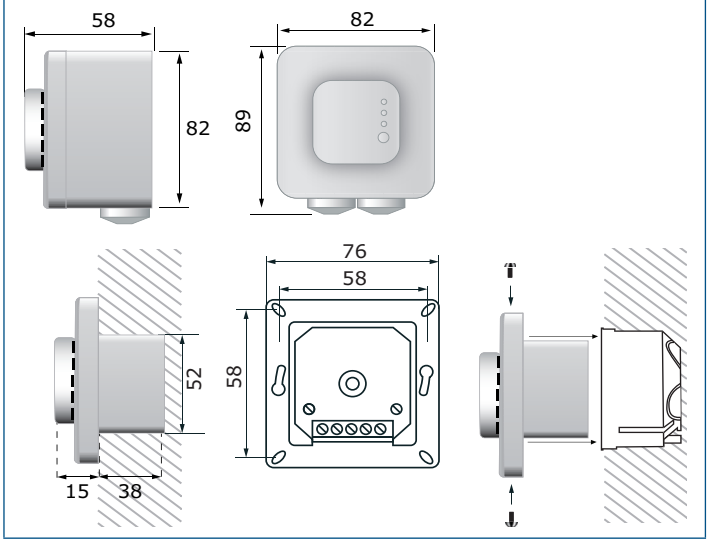


Note: *The output changes automatically depending on the highest of the T or rH values, i.e. the highest of two output values controls the output. See the green line in the operational diagram above. One or multiple sensors can be deactivated. E.g. it is possible to control the output based on the measured 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
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- EMC directive 2014/30/EC:
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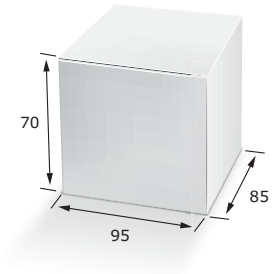
  - EN 61000-6-3:2007 Electromagnetic compatibility (EMC) - Part 6-3: Generic standards - Emission standard for residential, commercial and light-industrial environments Amendments A1:2011 and AC:2012 to EN 61000-6-3
  - EN 61326-1:2013 Electrical equipment for measurement, control and laboratory use - 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

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

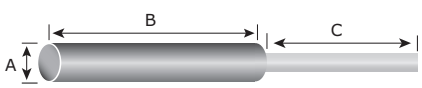
- Resin encapsulated sensor element in a stainless steel tube
- Alloy lead wires for reduced thermal conductivity
- Negative temperature coefficient
- Long-term stability
- Rapid time response: <1 second in liquids

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 mm²
Ambient conditions	Temperature	-20—60 °C
	Rel. humidity	< 95 % rH (non-condensing)

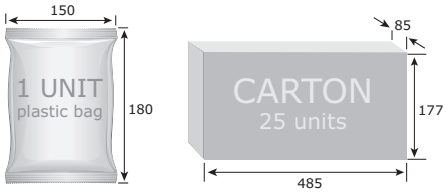
** Use screened extension wires*

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

Area of use

- Temperature sensing, control and compensation in HVAC applications

Standards

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

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		

SENTERA CONTROLS

FLTSN-N

Temperature probe

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

SENTERA CONTROLS

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.

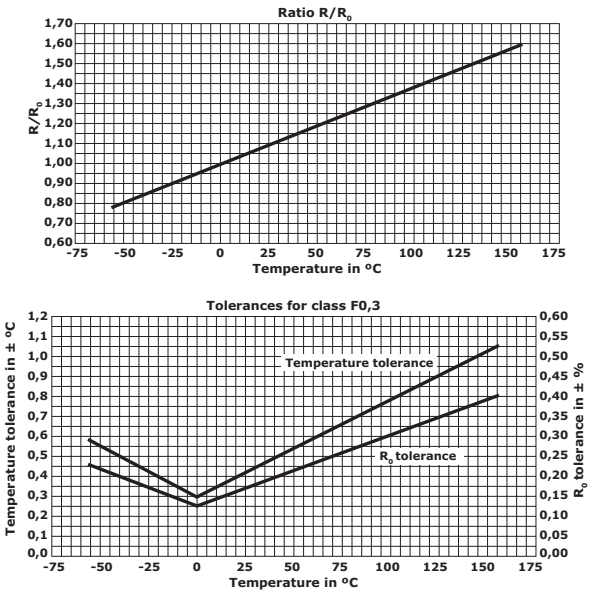
Key features

- 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 mm²
	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)

Resistance and tolerance values



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 CE
- RoHs Directive 2011/65/EU

Functional performance

Temperature / resistance relationships	
• For the temperature range: -55—0 °C	$R_T = R_0 \times (1 + A \times T + B \times T^2 + C \times (T - 100\,°C) \times T^3)$
• 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	$A = 3{,}9083 \times 10^{-3}\ °C^{-1}$ $B = -5{,}775 \times 10^{-7}\ °C^{-2}$ $C = -4{,}183 \times 10^{-12}\ °C^{-4}$
Sensor tolerance values equation (according to EN 60751)	
• Class F0.3	$\Delta T_{F0.3} = \pm(0{,}30 + 0{,}005 \times \lvert T \rvert)$

SENTERA CONTROLS

TUTSN-P
Temperature probe

Nominal resistance values

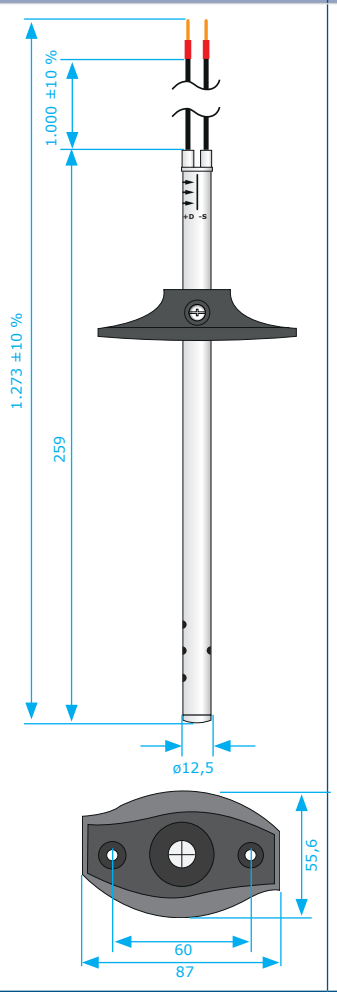
Temp. °C	R/R0 ratio			Class F0.3
		R0 500 Ω	R0 1.000 Ω	$T_{tol.}$ °C
-55	0,78379	391,59	783,19	±0,58
-50	0,80306	391,59	803,06	±0,55
-45	0,82290	401,53	822,90	±0,53
-40	0,84271	411,45	842,71	±0,50
-35	0,86248	421,35	862,48	±0,48
-30	0,88222	431,24	882,22	±0,45
-25	0,90192	441,11	901,92	±0,43
-20	0,92160	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)

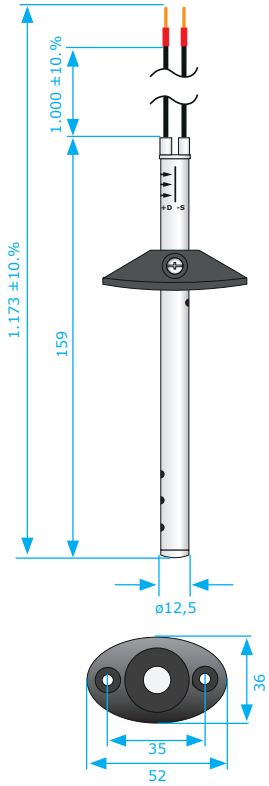
Packaging	Unit	Box
TUTSN-P1K0-150	05401003017081	05401003503157
TUTSN-P1K0-250	05401003017098	05401003503164
TUTSN-P500-150	05401003017104	05401003503171
TUTSN-P500-250	05401003017111	05401003503188

Dimensions

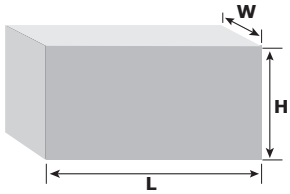
TUTSN-PXX0-250



TUTSN-PXX0-150



Packaging



Article	Packaging	Length [mm]	Width [mm]	Height [mm]	Net weight	Gross weight
TUTSN-PXX0-150	Bag (1 pc.)	170	53	36	0,067 kg	0,071 kg
	Carton (15 pc.)	495	185	87	1,005 kg	1,215 kg
	Box (180 pcs.)	580	370	500	6,03 kg	8,28 kg
TUTSN-PXX0-250	Bag (1 pc.)	170	53	36	0,05 kg	0,052 kg
	Carton (10 pc.)	495	185	87	0,5 kg	0,67 kg
	Box (120 pcs.)	590	380	505	3,00 kg	5,01 kg

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	Lenght	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 mm²	
Ambient conditions	Temperature	-20—60 °C	
	Rel. humidity	< 95 % rH (non-condensing)	

** Use screened extension wires*

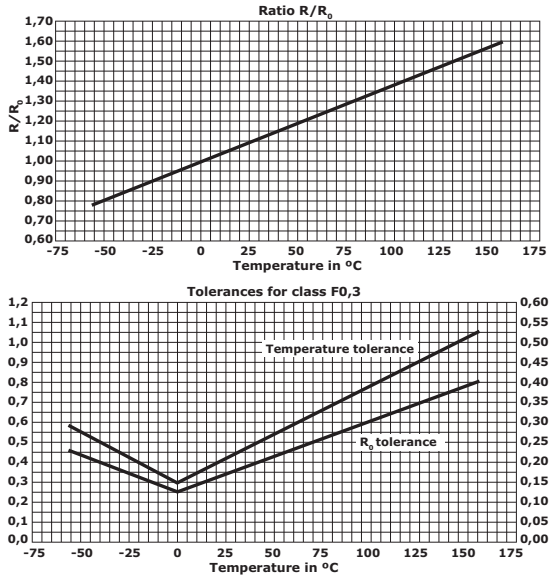
Article codes

	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	t0,5 ≤ 0,2 s t0,9 ≤ 0,3 s	t0,5 ≤ 0,2 s t0,9 ≤ 0,3 s	t0,5 ≤ 0,3 s t0,9 ≤ 0,4 s
Thermal response time flowing air	t0,5 ≤ 1,5 s t0,9 ≤ 8,0 s	t0,5 ≤ 1,5 s t0,9 ≤ 8,0 s	t0,5 ≤ 0,3 s t0,9 ≤ 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

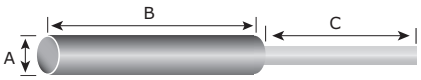
SENTERA CONTROLS

FLTSN-P
Temperature probe

Standards

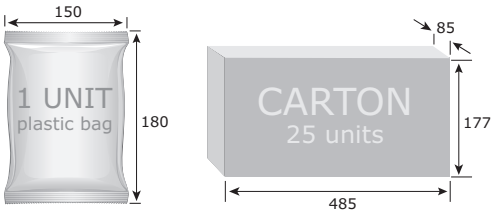
- Low Voltage Directive 2006/95/EC CE
- EMC Directive 2004/108/EC: EN 61326
- WEEE Directive 2012/19/EC
- RoHs Directive 2011/65/EC

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)

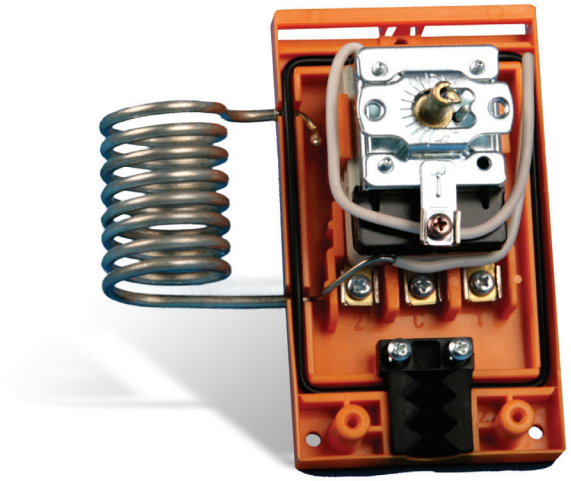
Packaging	Unit	Carton	Box
FLTSN-P100-010	05401003007044	05401003300848	05401003501252
FLTSN-P1K0-010	05401003007051	05401003300855	05401003501269
FLTSN-P1K0-040	05401003007068	05401003300862	05401003501276
FLTSN-P500-010	05401003007075	05401003300879	05401003501283
FLTSN-P500-040	05401003007105	05401003300909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

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

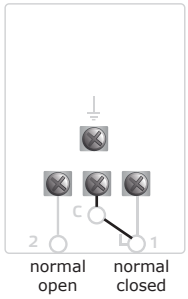
- Optimal temperature range
- Gas-filled bulb sensor type
- Stainless bulb
- Long-term stability and accuracy



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)

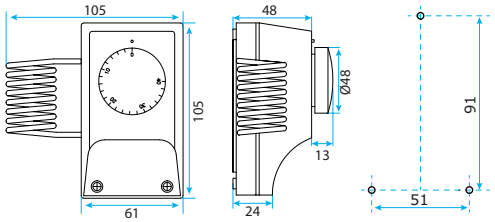
Wiring diagram



Area of use

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

Fixing and dimensions



Wiring and connections

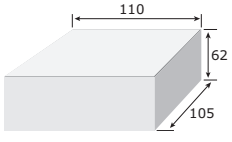
1	Normally closed contact
2	Normally open contact
C	Common contact

Standards

- RoHs Directive 2011/65/EU

CE

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

Global trade item numbers (GTIN)

Packaging	IMRT
Unit	05401003008010
Carton	05401003301241
Box	05401003501764

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 mm²
Protection standard		IP30
Ambient conditions	Temperature	-20—60 °C
	Rel. humidity	< 95 % rH (non-condensing)

Article codes

	ROTSN-P100	ROTSN-P500	ROTSP1K0
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	t0,5 ≤ 0,2 s t0,9 ≤ 0,3 s	t0,5 ≤ 0,2 s t0,9 ≤ 0,3 s	t0,5 ≤ 0,3 s t0,9 ≤ 0,4 s
Thermal response time flowing air	t0,5 ≤ 1,5 s t0,9 ≤ 8,0 s	t0,5 ≤ 1.5 s t0,9 ≤ 8.0 s	t0,5 ≤ 0,3 s t0,9 ≤ 0,4 s

Area of use

- HVAC applications for temperature measurements

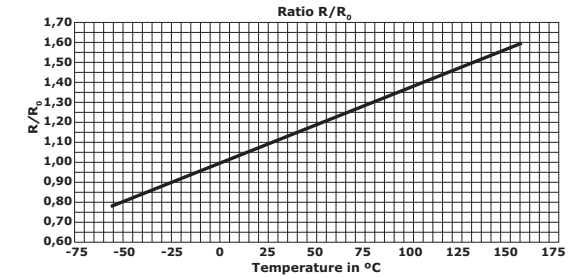
Wiring and connections

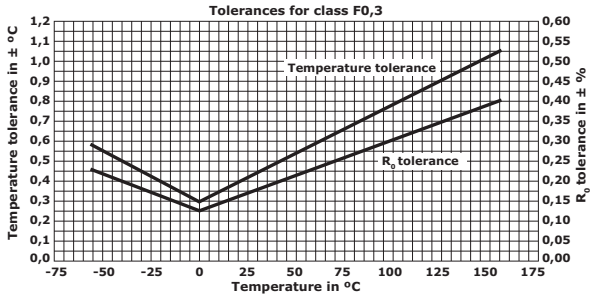
T1	Temperature sensor pin 1
T2	Temperature sensor pin 2
SH	Cable shield connection
Connections	Cable cross section: 1,5 mm²

Standards

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

Resistance and tolerance values



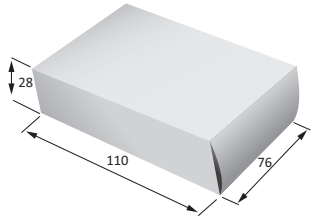


Temp. °C	R/R0 ratio	Nominal resistance values			Class F0.3
		R_0 100 Ω	R_0 500 Ω	R_0 1000 Ω	T_{tol} °C
-20	0,92160	92,16	460,80	921,60	±0,40
-15	0,94124	94,12	470,62	941,24	±0,38
-10	0,96086	96,09	480,43	960,86	±0,35
-5	0,98044	98,04	490,22	980,44	±0,33
0	1,00000	100,0	500,00	1000,00	±0,30
5	1,01953	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

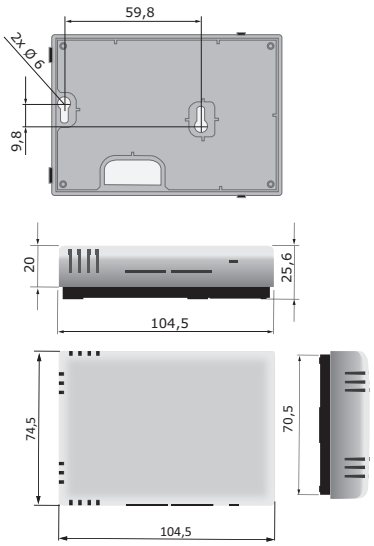
Room temperature sensor

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

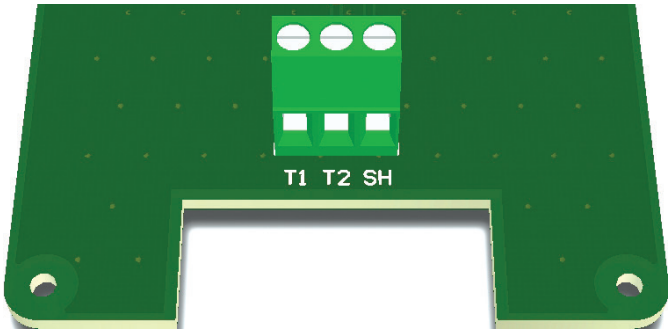
The DUTSN series are passive duct temperature sensors which are based on the advanced thin film technology of the platinum sensitive element. They provide temperature measurements with high stability and accuracy. An integrated shield connection makes these sensors suitable for applications where grounded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



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

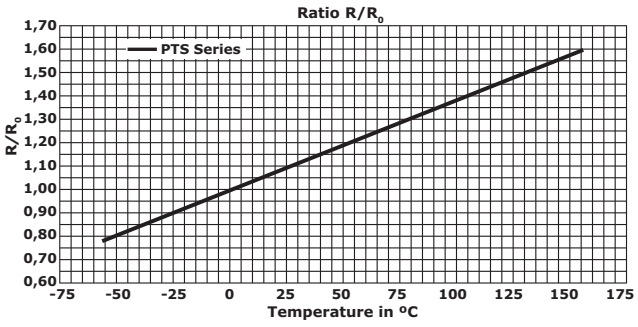
Wiring and connections

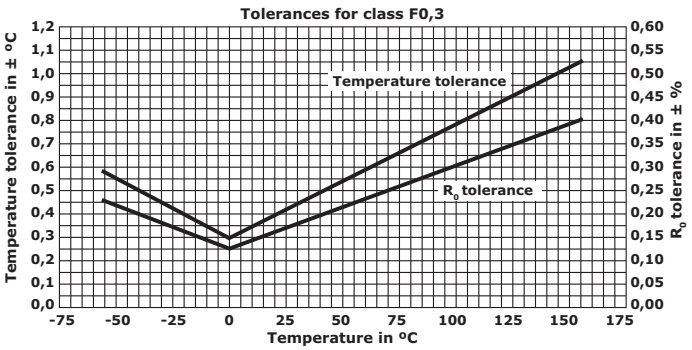
T1	Temperature sensor connection
T2	Temperature sensor connection
SH	Shield connection for shielded cables
Connections	Cable cross section: max. 1,5 mm² Cable gland clamping range: 5—10 mm

Functional performance

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

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

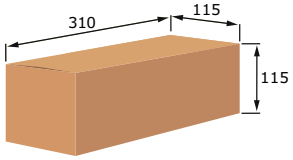
Standards

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

Global trade item numbers (GTIN)

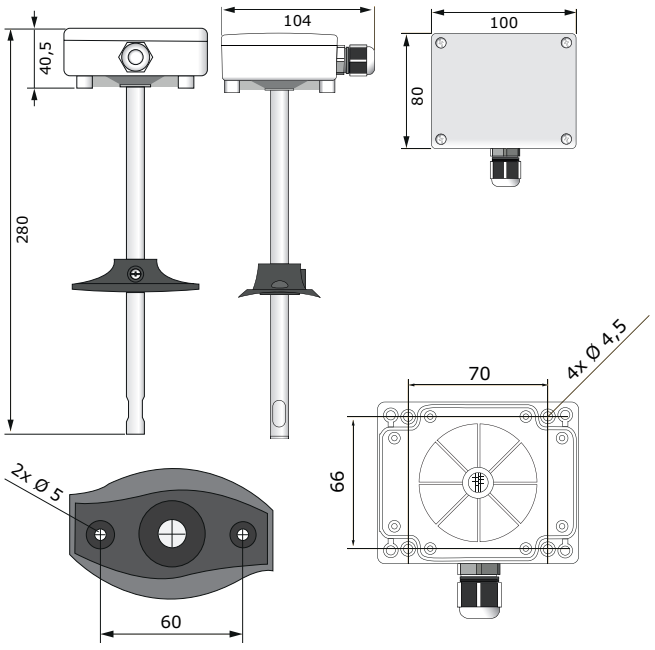
Article	Unit	Box
DUTSN-P100	05401003002124	05401003500903
DUTSN-P500	05401003002148	05401003500927
DUTSN-P1K0	05401003002131	05401003500910

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)

Article codes

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

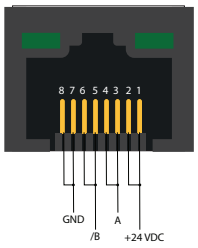
Area of use

- Measuring temperature in duct channels

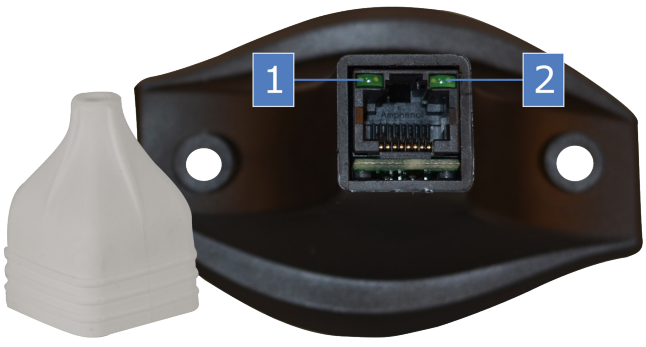
Wiring and connections

	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



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

SENTERA CONTROLS

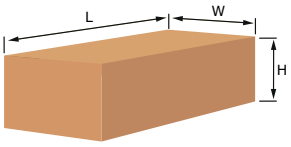
DTS-M

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

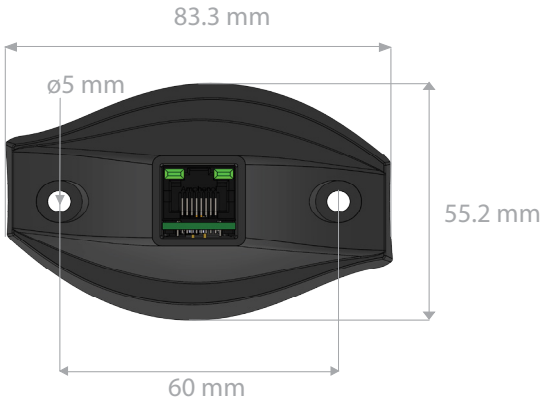


Article	Packaging	Length [mm]	Width [mm]	Height [mm]	Net weight	Gross weight
DTS-M-080 DTS-L-080	Unit (1 pc.)	82	55	175	0.058 kg	0.062 kg
	Carton (10 pcs.)	492	182	84	0.58 kg	0.77 kg
	Box (60 pcs.)	590	380	280	3.48 kg	5.54 kg
DTS-M-160 DTS-L-160	Unit (1 pc.)	82	55	225	0.070 kg	0.076 kg
	Carton (10 pcs.)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

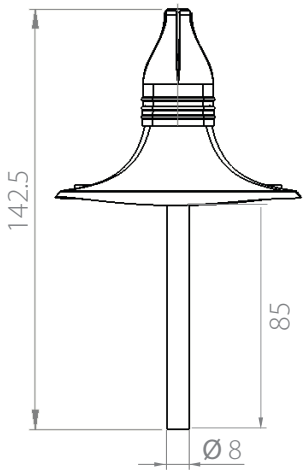
Global trade item numbers (GTIN)

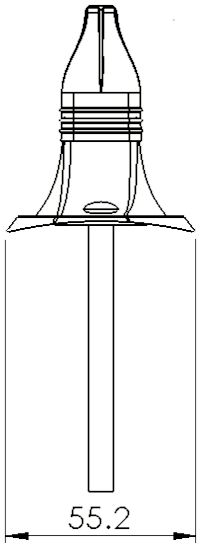
Article	Unit	Carton	Box
DTS-M-080	5401003701034	05401003002100	5401003500880
DTS-L-080	5401003002087	5401003701010	5401003500866
DTS-M-160	5401003002117	5401003701041	5401003500897
DTS-L-160	5401003002094	5401003701027	5401003500873

Fixing and dimensions

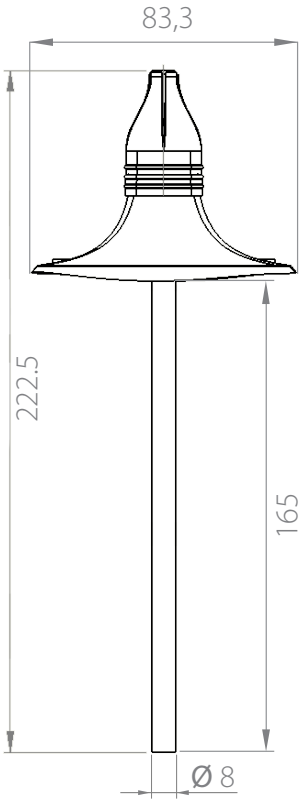


DTS-M-080





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)

Article codes

Article code	Supply
DTP-M	24 VDC, PoM

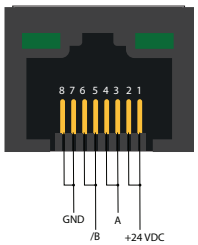
Area of use

- Measuring temperature in metal water pipes

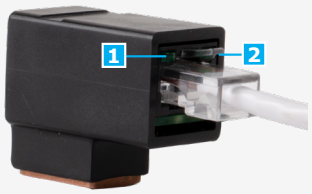
Wiring and connections

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		



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:

CE

- 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

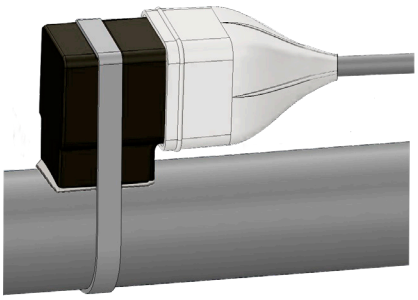
Packaging

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

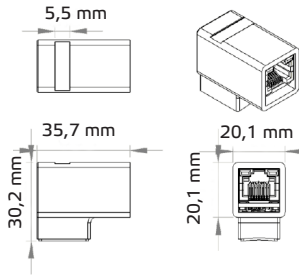
Global trade item numbers (GTIN)

Packaging	DTP-M
Unit	05401003002070
Carton	05401003300640
Box	05401003500859

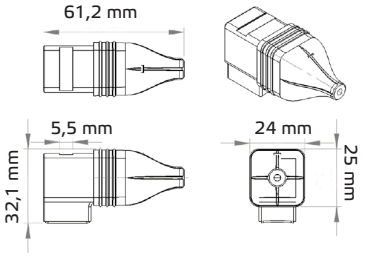
Fixing and dimensions



Without protective cover



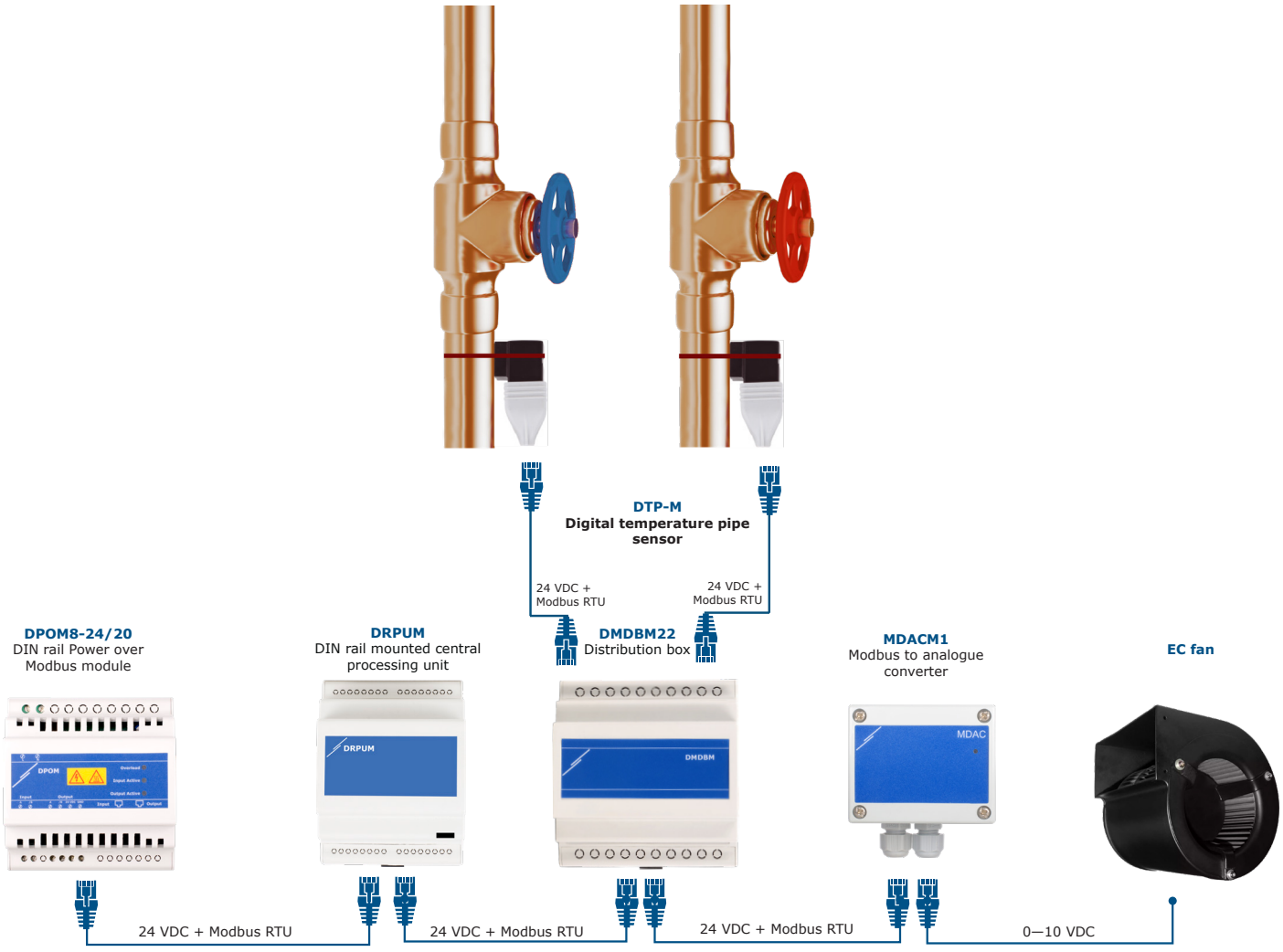
With protective cover



DTP-M

Digital temperature pipe sensor

Application example



SPSA

Pressure controller for actuator powered damper

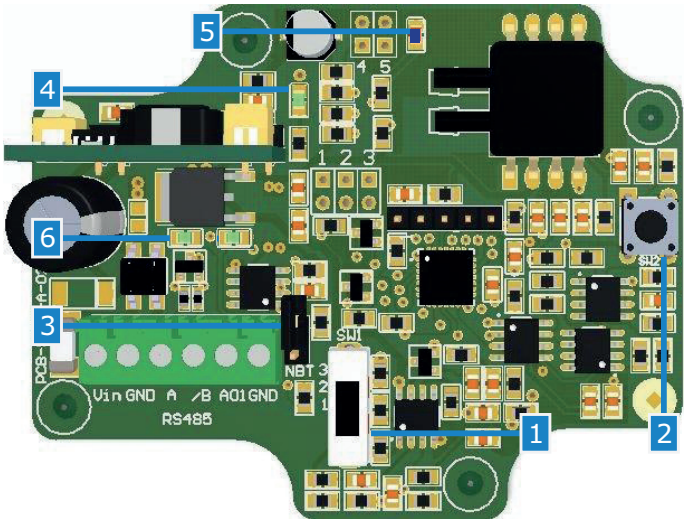
The SPSA differential pressure controllers directly control actuator powered dampers. They are equipped with Modbus RTU communication and have an analogue / digital output. The SPSA controllers feature integrated PI control and setpoint adjustment. They are temperature compensated and provide a high degree of reliability and accuracy.

Key features

- Long-term stability and accuracy
- 1 analogue or 1 PWM (open collector) output
- Modbus RTU (RS485) communication
- Integrated PI control and setpoint adjustment
- Automatic range selection according to the selected setpoint
- Modbus register reset function (factory preset values)
- Sensor calibration procedure
- Aluminium pressure connection nozzles

Technical specifications

Outputs		1 analogue output (0—10 VDC / 0—20 mA) / 1 digital output PWM (open collector)
Consumption	No load	18—34 VDC supply: 20—10 mA 15—24 VAC supply: 15—10 mA
Operating pressure range		0—2.000 Pa
Operating mode		Differential pressure
Accuracy (analogue voltage output)		±3 %
Long-term stability		±1 % per year
Protection standard		IP65 (according to EN 60529)
Ambient conditions	Temperature	10—60 °C
	Rel. humidity	< 95 % rH (non-condensing)



Article codes

	Supply	Connections
SPSAG-2K0	13—26 VAC 18—34 VDC	3-wire
SPSAF-2K0	18—34 VDC	4-wire

Area of use

- Pressure control in premises
- Clean air and non-aggressive, non-combustible gases

Wiring and connections

Vin	Positive DC voltage / AC ~
GND	Ground / AC ~
A	Modbus RTU (RS485) signal A
/B	Modbus RTU (RS485) signal /B
AO1	Analogue / PWM (open collector) output
GND	Ground
Connections	Cable cross section: max. 0,75 mm² Cable gland clamping range: 3—6 mm

Caution: *If a G-type article is using the same AC power supply source (transformer) as F-type article, a SHORT CIRCUIT may result when the power supply and analogue signal terminals are connected to the same common ground! In this case always connect different article types to separate AC transformers or use the same article version.*

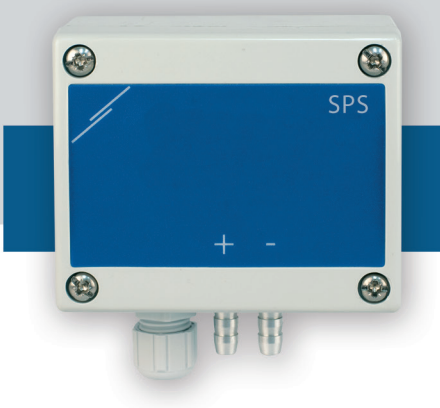
If an AC power supply is used with any of the units in a Modbus network, the GND terminal should NOT BE CONNECTED to other units on the network or via the CNVT-USB-RS485 converter. This may cause permanent damage to the communication semiconductors and/or the computer!

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

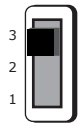
For more information about the Modbus registers, please refer to the Modbus register map of the product.



SPSA

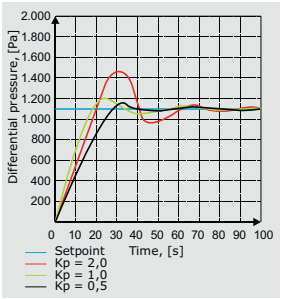
Pressure controller for actuator powered damper

Settings

1 - Analogue output mode selection switch (SW1)		1: 0—10 VDC 2: 0—20 mA 3: PWM (open collector)
2 - Tact switch (SW2) for sensor calibration and Modbus register reset		Push to start sensor calibration (LED5 blinking twice) Push to start Modbus register reset (LED5 blinking twice, then 3 times)
3 - Network bus resistor jumper (NBT)		SPSA is the first or last unit
4 - Power indication	Cont. green	ON
5 - Blue LED5	Continuously blinking	Normal operation
	Blinking twice (by pushing SW2)	Start sensor calibration
	Blinking twice, then 3 times (by pushing SW2)	Start Modbus register reset
6 - Modbus communication indication	Blinking green	Transmitting / receiving

(indicates closed position of the jumper.)

Operational diagram(s)



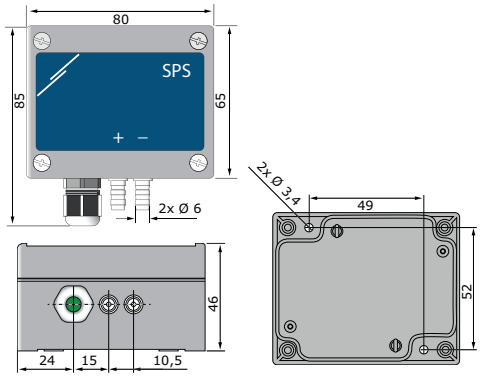
Standards

- Low Voltage Directive 2014/35/EC
- EMC Directive 2014/30/EC
- RoHs Directive 2011/65/EC

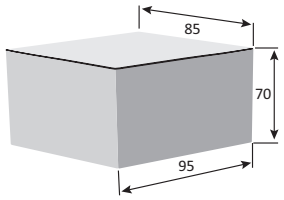
Global trade item numbers (GTIN)

Packaging	SPSAG-2K0	SPSAF-2K0
Unit	05401003014820	05401003014813
Carton	05401003302156	05401003302149
Box	05401003503089	05401003503072

Fixing and dimensions



Packaging



Article	Packaging	Length [mm]	Width [mm]	Height [mm]	Net weight	Gross weight
SPSA	Unit (1 pc.)	85	95	70	0,13 kg	0,15 kg
	Carton (10 pcs.)	485	175	77	1,29 kg	1,64 kg
	Box (60 pcs.)	580	370	270	7,74 kg	10,83 kg

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 / 15—24 VAC ±10 %	1,17 W	1 W	65 mA	0—1.000 Pa
HPD-G-2K0					0—2.000 Pa
HPD-G-4K0		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 ≥ 50 kΩ
	0—20 mA	R_L ≤ 500 Ω
	0—100 % PWM	PWM Frequency: 1 kHz, R_L ≥ 50 kΩ
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 * 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.

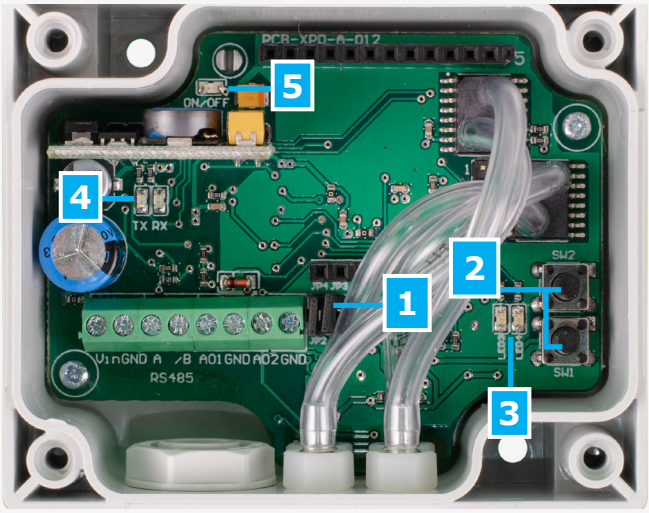
Standards

- 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

HPD

Dual differential pressure transmitter

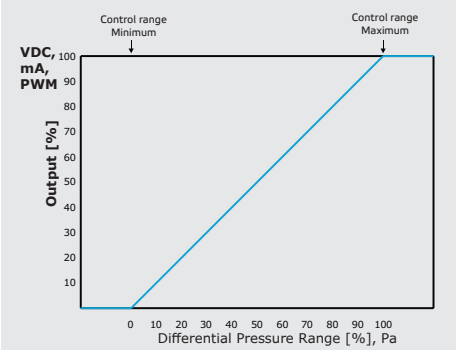
Settings and indications



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**
	□□	The relevant PWM output has to be connected to external voltage source via external pull-up resistor
2 - Sensor calibration and Modbus register reset tact switches (SW1, SW2)		Push tact switch SW1 to start sensor 1 calibration / Modbus registers reset Push tact switch SW2 to start sensor 2 calibration / Modbus registers reset
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)

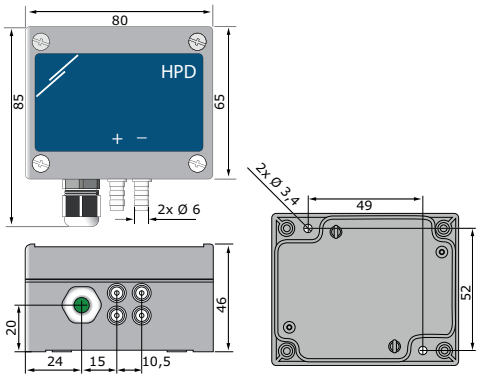


Wiring and connections

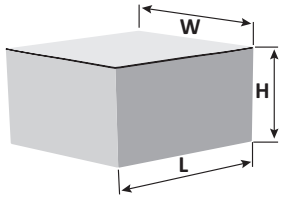
Article type	HPD-F	HPD-G	
Vin	18—34 VDC	18—34 VDC	13—26 VAC
GND	Ground	Common ground*	AC ~*
A	Modbus RTU (RS485), signal A		
/B	Modbus RTU (RS485), signal /B		
AO1	Analogue / modulating output 1 (0—10 VDC / 0—20 mA / PWM)		
GND	Ground AO1	Common ground*	
AO2	Analogue / modulating output 2 (0—10 VDC / 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

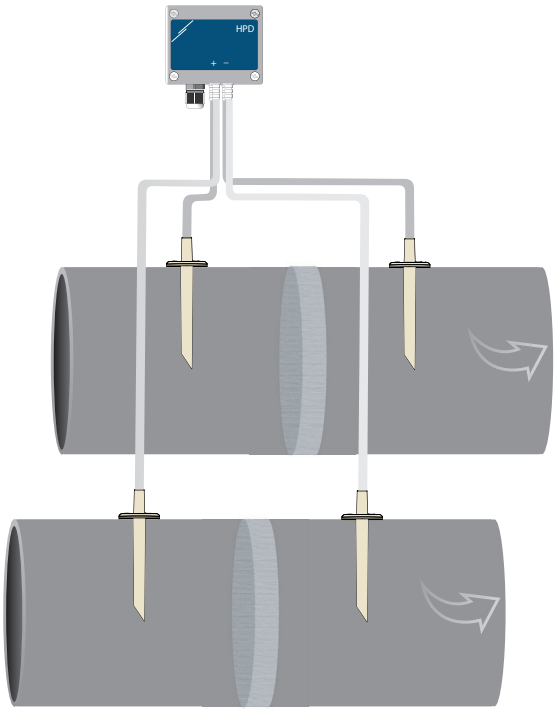


Article	Packaging	Length [mm]	Width [mm]	Height [mm]	Net weight	Gross weight
HPD	Unit (1 pc.)	95	85	70	0,14 kg	0,20 kg
	Carton (10 pcs.)	495	185	87	1,40 kg	2,08 kg
	Box (60 pcs.)	590	380	280	8,4 kg	13,03 kg

HPD

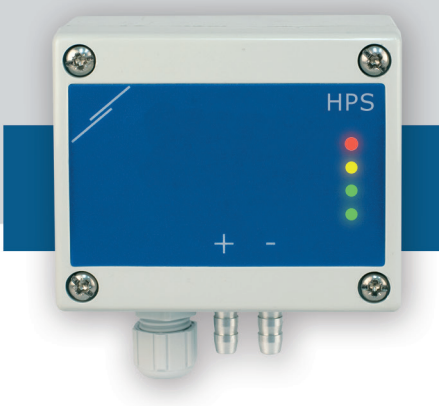
Dual differential pressure transmitter

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 / 15—24 VAC ±10 %	1,3 W	1,26 W	70 mA	0—1.000 Pa
HPS-G-2K0 -2					0—2.000 Pa
HPS-G-4K0 -2		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 ≥ 50 kΩ)
	0—20 mA mode	max. load 500 Ω (R_L ≤ 500 Ω)
	PWM mode	PWM Frequency: 1 kHz, min. load 50 kΩ (R_L ≥ 50 kΩ)
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

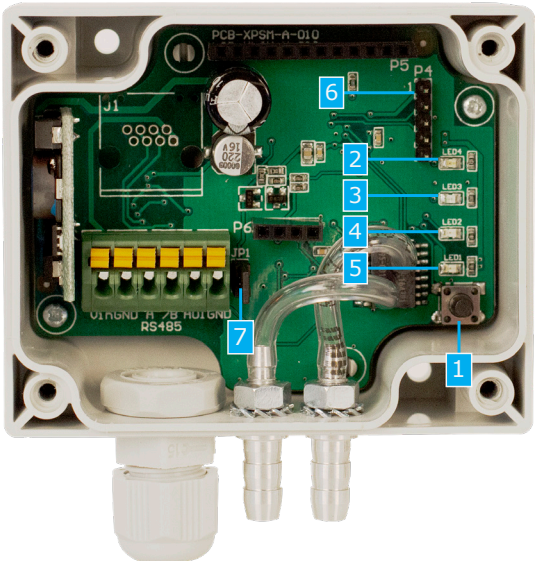
*(1) Only when K-factor of fan / drive is known. If K-factor is unknown, volume flow can be calculated via multiplying the duct cross-sectional area (A) by the air flow velocity (V) using the formula: Q = A * V*

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

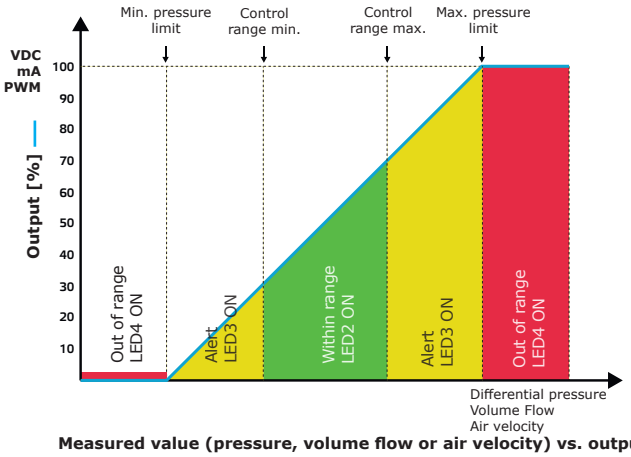
SENTERA CONTROLS

HPS -2

Differential pressure transmitter



Operational diagrams



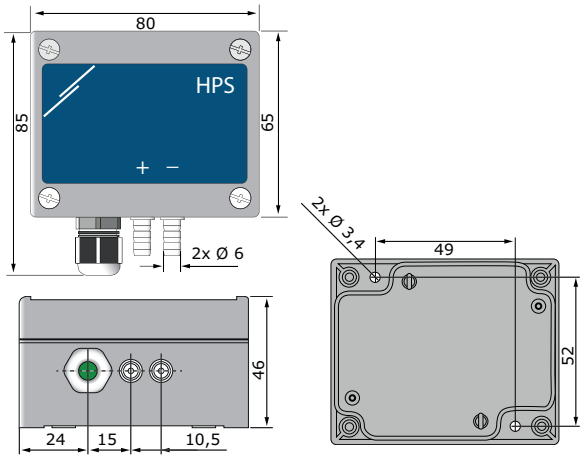
Measured value (pressure, volume flow or air velocity) vs. output

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)*	 1 2 3 4 5	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	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
	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.*

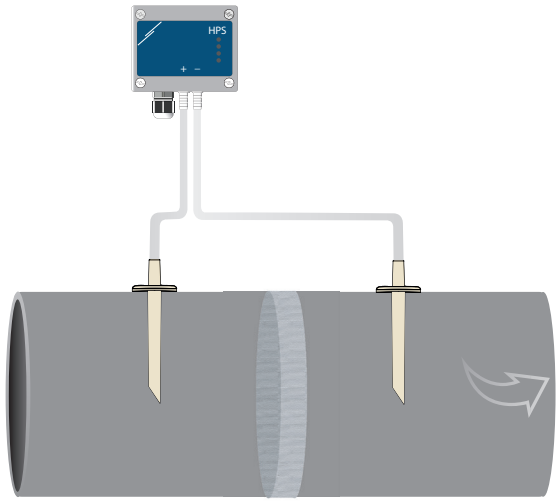
The -G version is intended for 3-wire connection and features a 'common ground'. This means that the ground of the analogue output is internally connected with the ground of the power supply. For this reason, -G and -F types cannot be used together on the same network. Never connect the common ground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

SENTERA CONTROLS

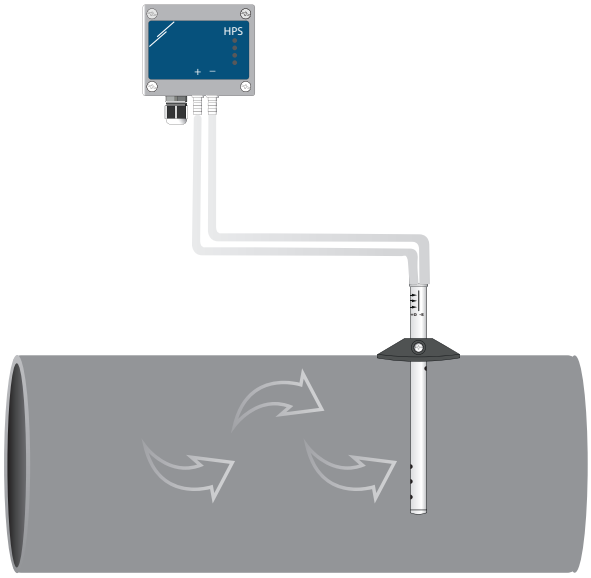
HPS -2

Differential pressure transmitter

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



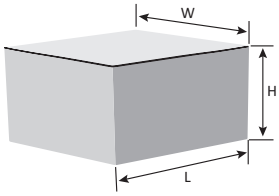
Modbus registers

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	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

Global trade item numbers (GTIN)

Article	Unit	Carton	Box
HPS-F-1K0 -2	05401003007761	05401003301005	05401003501528
HPS-F-2K0 -2	05401003007778	05401003301012	05401003501535
HPS-F-4K0 -2	05401003007785	05401003301029	05401003501542
HPS-F-10K -2	05401003007754	-	-
HPS-G-1K0 -2	05401003007815	05401003301050	05401003501573
HPS-G-2K0 -2	05401003007822	05401003301067	05401003501580
HPS-G-4K0 -2	05401003007839	05401003301074	05401003501597
HPS-G-10K -2	05401003007808	05401003301043	05401003501566

HPS-M -2

Differential pressure transmitter, PoM

The HPS-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
- Selectable minimum and maximum operating rangesz
- 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 or Modbus RTU
- Aluminium pressure connection nozzles

Article codes

	Operating ranges	Imax	Connections
HPS-M-1K0-2	0—1.000 Pa	40 mA	RJ45 connector on the PCB
HPS-M-2K0-2	0—2.000 Pa		
HPS-M-4K0-2	0—4.000 Pa		
HPS-M-10K-2	0—10.000 Pa		

Technical specifications

Power supply		24 VDC (Power over Modbus)
Output		Modbus RTU (RS485)
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)

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 (m^3/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

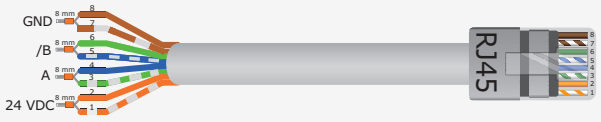
The Sensistant Modbus configurator allows you to easily monitor and/or configure Modbus parameters.

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.

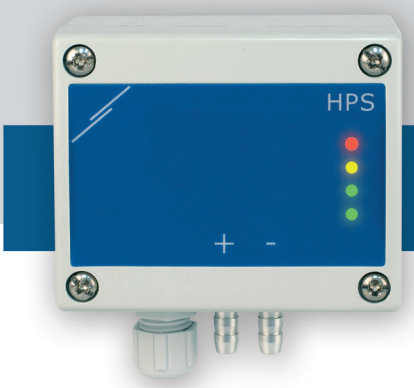
Wiring and connections

24 VDC	Supply voltage 24 VDC
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, 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*

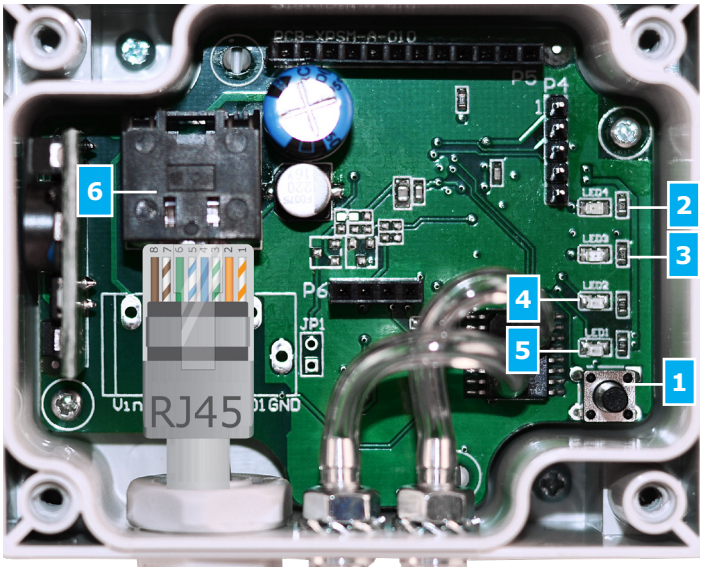
[2] By using an external PSET-PTX-200 Pitot tube connection set



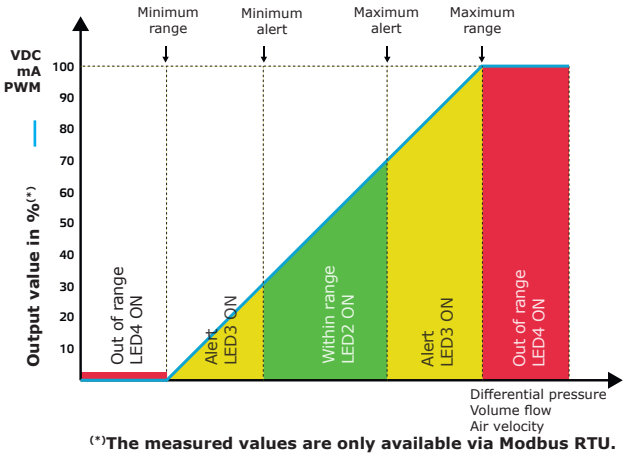
SENTERA CONTROLS

HPS-M -2

Differential pressure transmitter, PoM



Operational diagrams

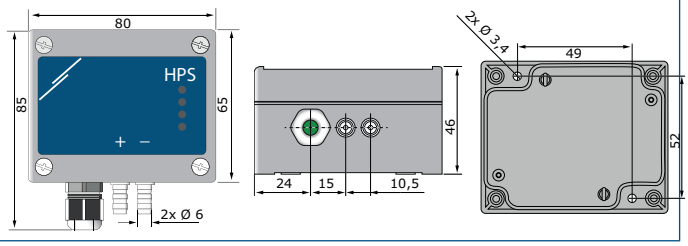


(*)**The measured values are only available via Modbus RTU.**

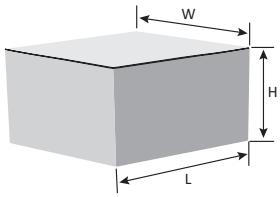
Settings

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



Packaging



Article	Packaging	Length [mm]	Width [mm]	Height [mm]	Net weight	Gross weight
HPS-M-XXX-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

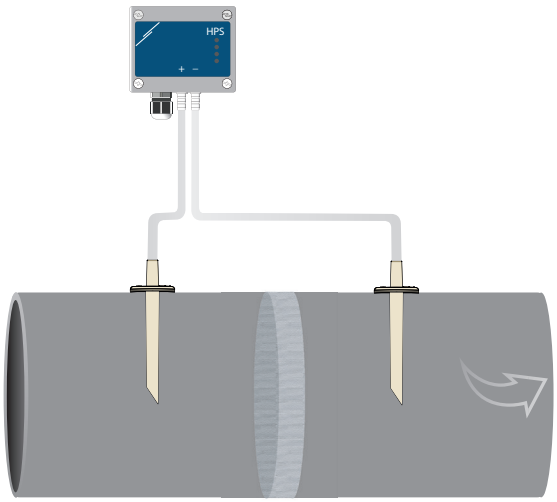
Global trade item numbers (GTIN)

Packaging	HPS-M-1K0 -2	HPS-M-2K0 -2	HPS-M-4K0 -2	HPS-M-10K -2
Unit	05401003007860	05401003007877	05401003007884	05401003007853
Carton	05401003301104	05401003301111	05401003301128	05401003301098
Box	05401003501627	05401003501634	05401003501641	05401003501610

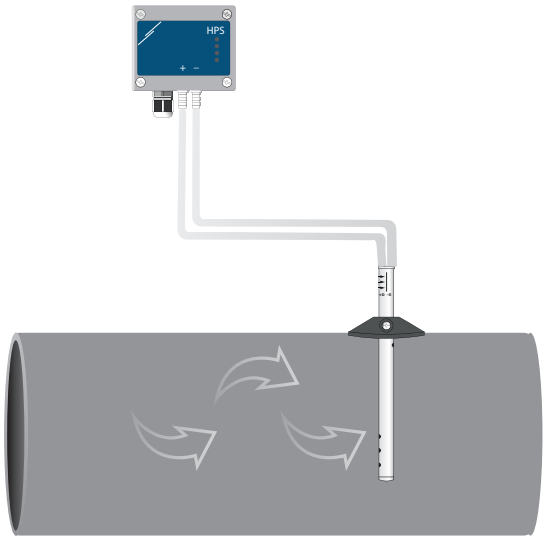
HPS-M -2

Differential pressure transmitter, PoM

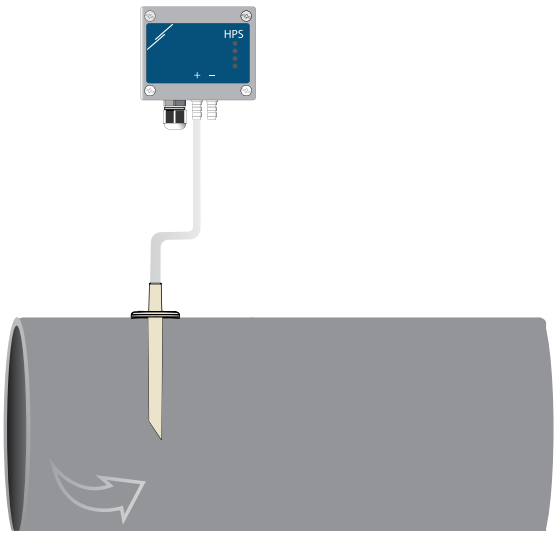
Application 1: Measuring differential pressure [Pa] using PSET-PVC



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



Application 3: Measuring differential pressure [Pa] or volume flow [m³/h] using PSET-PVC



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	15—24 VAC ±10 %	3,3 W	2,475 W	220 mA	0—4.000 Pa
HPSPG-10K -2					0—10.000 Pa

Technical specifications

Selectable analogue / modulating output	0—10 VDC	R_L ≥ 50 kΩ
	0—20 mA	R_L ≤ 500 Ω
	0—100 % PWM	PWM Frequency: 1 kHz, R_L ≥ 50 kΩ
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	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.

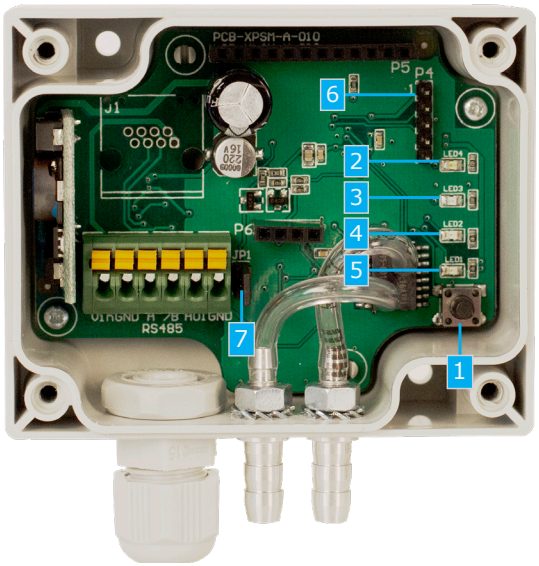
Area of use

- 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 * 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
	On	The differential pressure, air volume or air velocity has exceeded the minimum or maximum alarm threshold
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.*

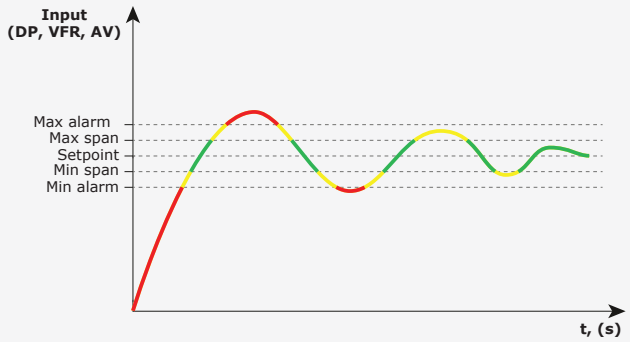
Modbus registers

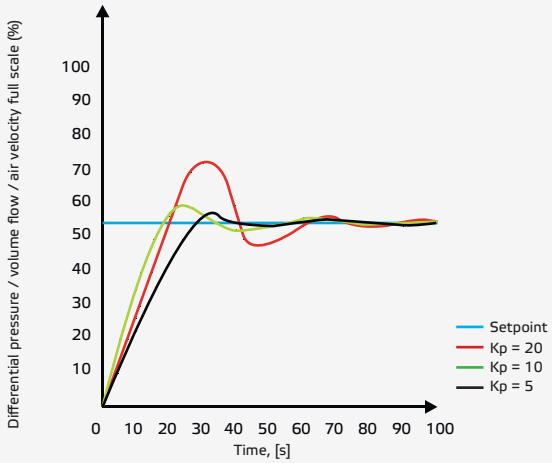
The Sensistant Modbus configurator allows you to easily monitor and/or configure Modbus parameters.

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

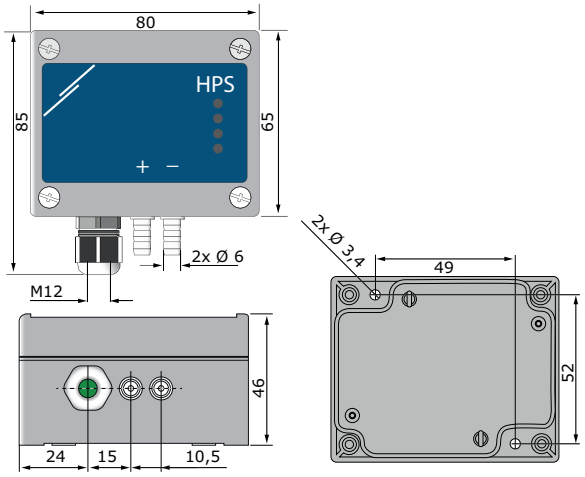
For more information about the Modbus registers, please refer to the product Modbus Register Map.

Operational diagrams





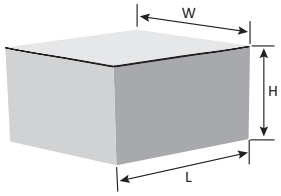
Fixing and dimensions



HPSPX-2

Differential pressure PI controller

Packaging



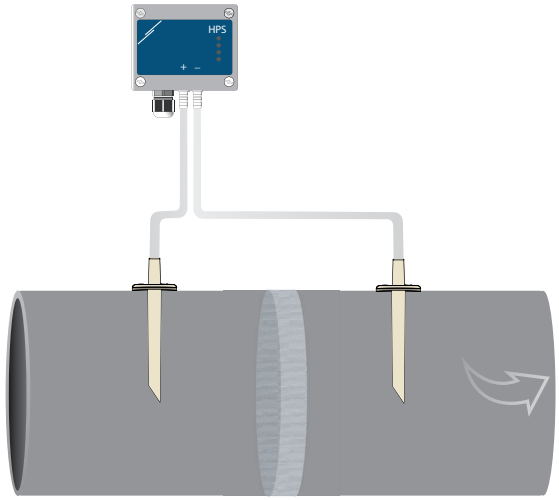
Article	Packaging	Length [mm]	Width [mm]	Height [mm]	Net weight	Gross weight
HPSP -2	Unit (1 pc.)	95	85	70	0,12 kg	0,13 kg
	Carton (10 pcs.)	495	185	87	1,20 kg	1,30 kg
	Box (60 pcs.)	590	380	280	7,2 kg	7,8 kg

Standards

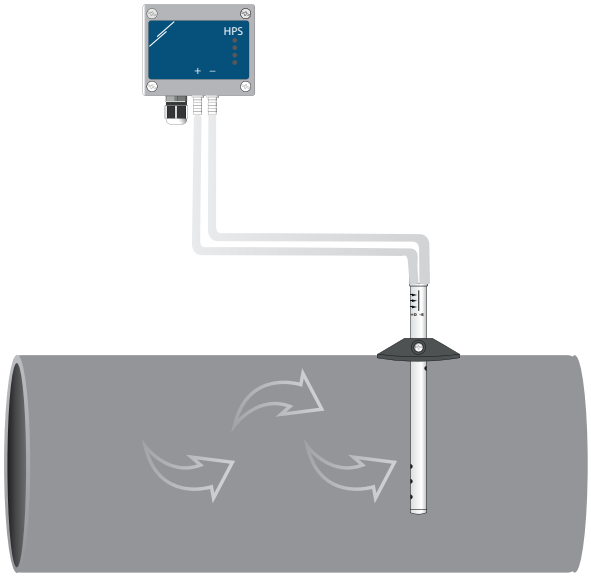
CE

- 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



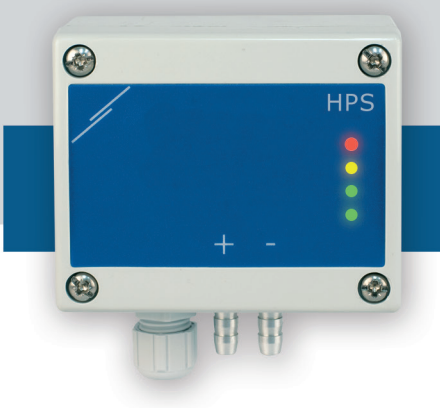
Application 2: Measuring supplied air volume [m³/h] or airflow velocity [m/s] using PSET-PT



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 ≥ 50 kΩ
	0—20 mA	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
		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

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.

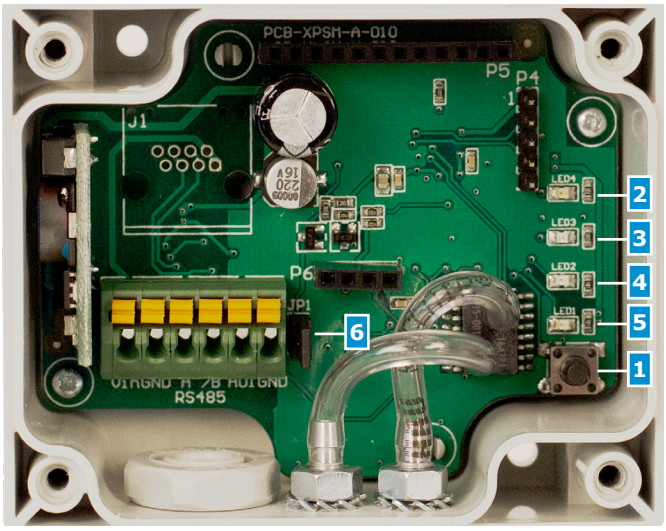
[1] *Only when K-factor of fan / drive is known. If K-factor is unknown, volume flow can be calculated via multiplying the duct cross-sectional area (A) by the air velocity (V) using the formula: Q = A * V*
[2] *By using an external PSET-PTX-200 Pitot tube connection set*

SENTERA CONTROLS

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

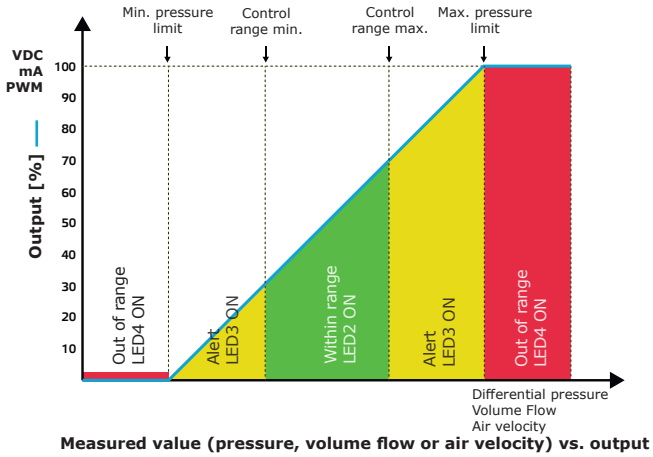
* ▬▬ *indicates closed position of the jumper.*
** *The voltage source depends on the value in holding register 54.*

Standards

CE

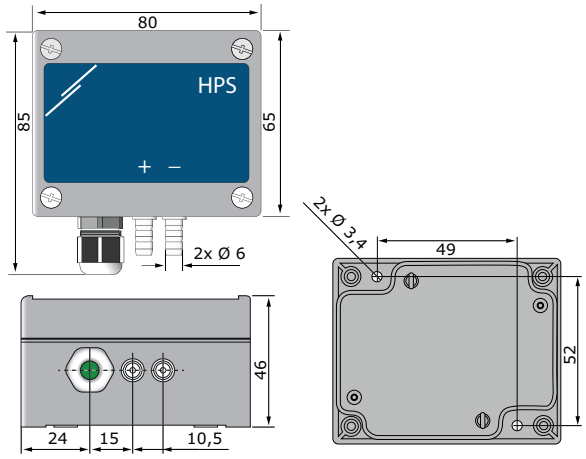
- EMC Directive 2014/30/EC:
  - EN 61326-1:2013 Electrical equipment for measurement, control and laboratory use - EMC requirements - Part 1: General requirements
  - EN 61326-2-3:2013 Electrical equipment for measurement, control and laboratory use - EMC requirements - Part 2-3: Particular requirements. 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

Operational diagram(s)

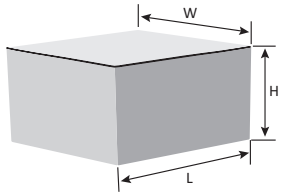


Measured value (pressure, volume flow or air velocity) vs. output

Fixing and dimensions



Packaging



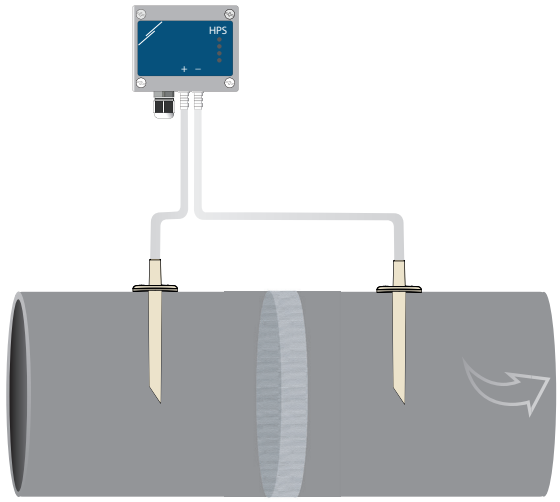
Article code	Packaging	Length [mm]	Width [mm]	Height [mm]	Net weight	Gross weight
HPS-F--LP HPS-G--LP	Unit (1 pc.)	95	85	70	0,12 kg	0,13 kg
	Carton (10 pcs.)	495	185	87	1,20 kg	1,30 kg
	Box (60 pcs.)	590	380	280	7,2 kg	7,8 kg

SENTERA CONTROLS

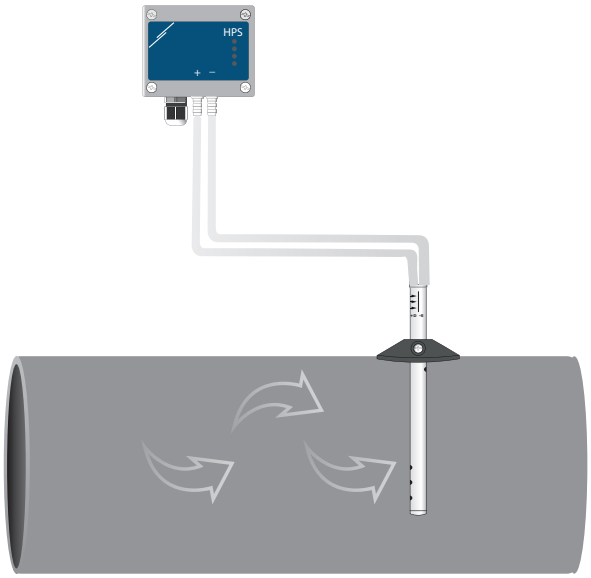
HPS-X--LP

Differential pressure transmitter

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

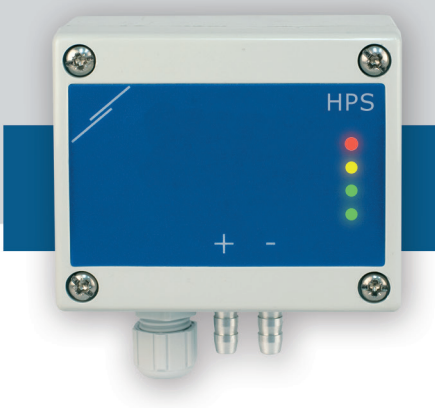
The Sensistant Modbus configurator allows you to easily monitor and/or configure Modbus parameters.

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.

Global trade item numbers (GTIN)

Packaging	HPS-F--LP	HPS-G--LP
Unit	05401003007747	05401003007792
Carton	05401003300992	05401003301036
Box	05401003501511	05401003501559



HPS-M--LP

Differential pressure transmitter, PoM

The HPS-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
- 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 measured 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	Imax	Operating range
HPS-M--LP	24 VDC, Power over Modbus	RJ45 connector on the PCB	1 W	0,75 W	40 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 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(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

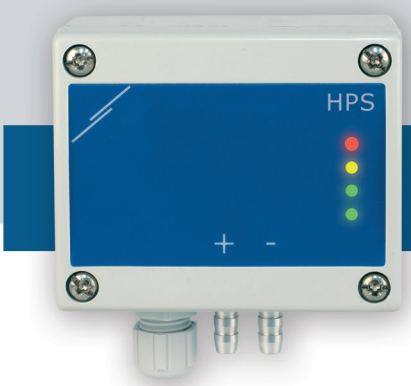
The Sensistant Modbus configurator allows you to easily monitor and/or configure Modbus parameters.

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 * V.*

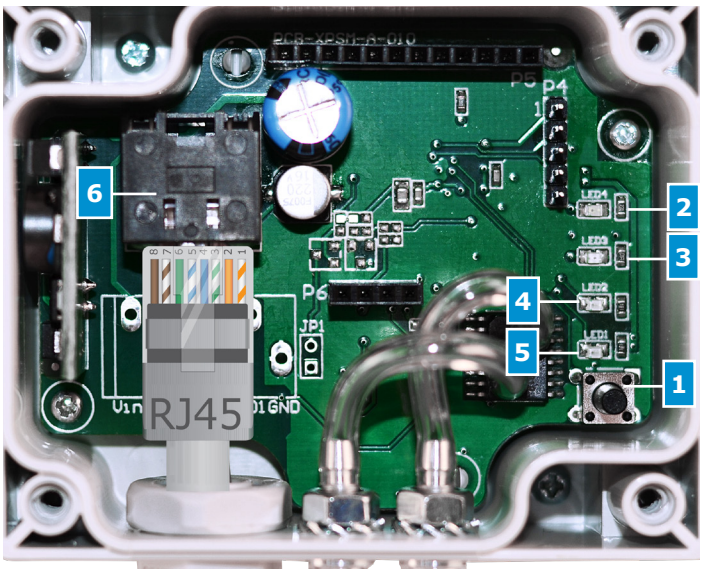
(2) By using an external PSET-PTX-200 Pitot tube connection set



SENTERA CONTROLS

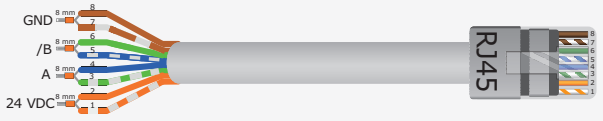
HPS-M--LP

Differential pressure transmitter, PoM

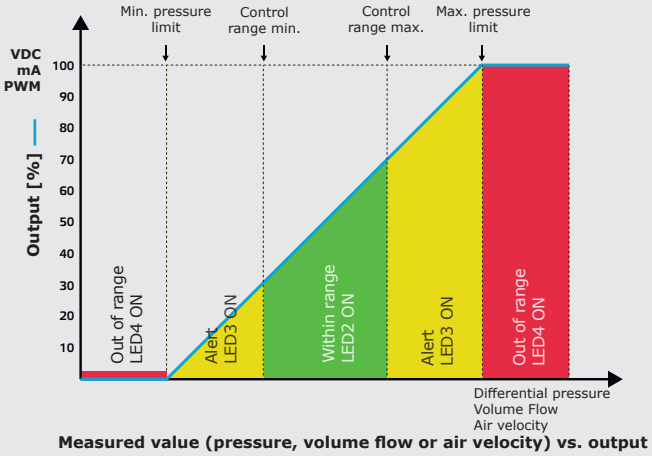


Wiring and connections

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



Operational diagram(s)

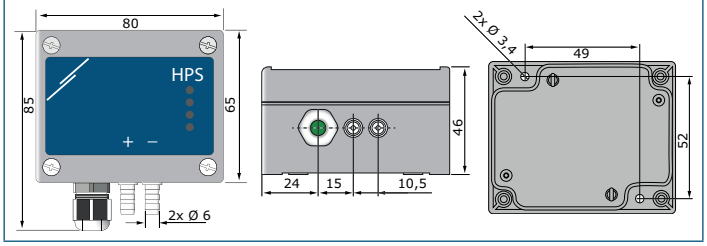


Measured value (pressure, volume flow or air velocity) vs. output

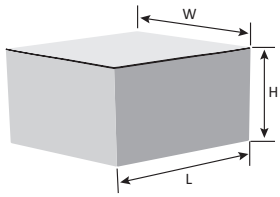
Settings

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



Packaging



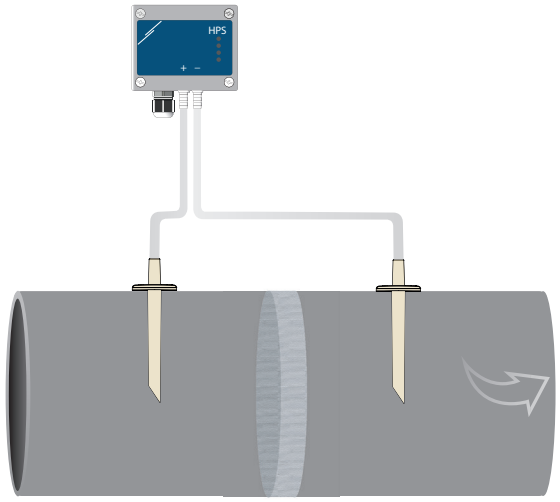
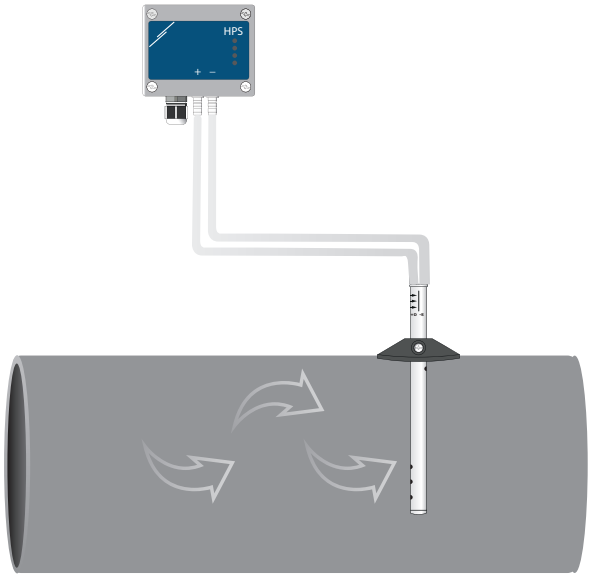
Article	Packaging	Length [mm]	Width [mm]	Height [mm]	Net weight	Gross weight
HPS-M--LP	Unit (1 pc.)	95	85	70	0,12 kg	0,13 kg
	Carton (10 pcs.)	495	185	87	1,20 kg	1,30 kg
	Box (60 pcs.)	590	380	280	7,2 kg	7,8 kg

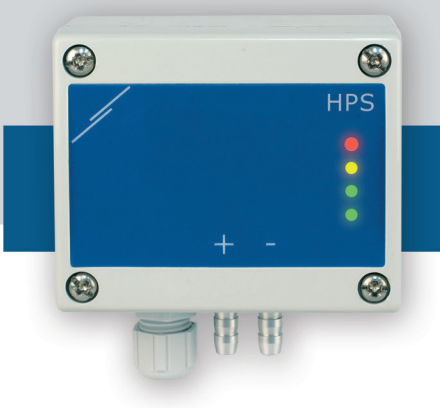
Global trade item numbers (GTIN)

Article	Unit	Carton	Box
HPS-M--LP	05401003007846	05401003301081	05401003501603

HPS-M--LP

Differential pressure transmitter, PoM

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-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 15—24 VAC ±10 %	1,3 W	1,26 W	70 mA	
		1 W	1 W		

Technical specifications

Selectable analogue / modulating output	0—10 VDC	R_L ≥ 50 kΩ
	0—20 mA	R_L ≤ 500 Ω
	0—100 % PWM	PWM Frequency: 1 kHz, R_L ≥ 50 kΩ
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.

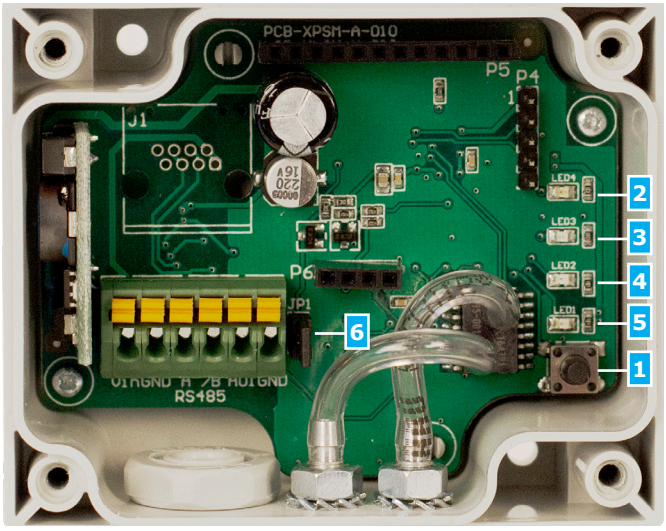
*[1] Only when K-factor of fan / drive is known. If K-factor is unknown, volume flow can be calculated via multiplying the duct cross-sectional area (A) by the air velocity (V) using the formula: Q = A * V*
[2] Only when duct cross section is known by using an external PSET-PTX-200 Pitot tube connection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

SENTERA CONTROLS

HPSPX-LP

Differential pressure PI controller

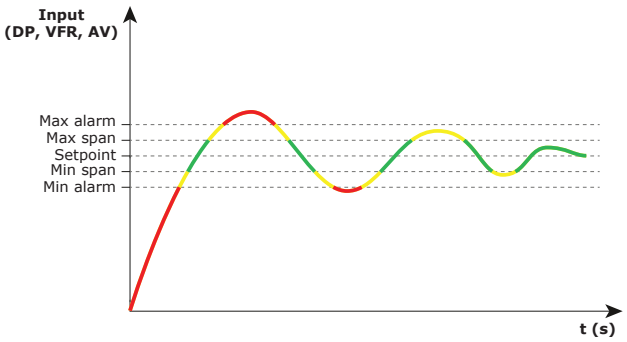
Settings

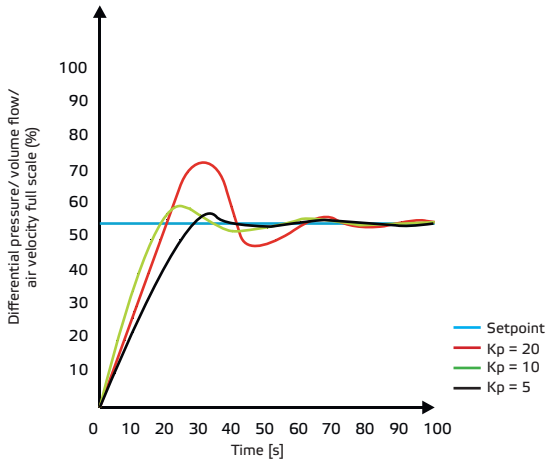


1 - Sensor calibration and Modbus register reset tact switch (SW1)		Push to start Modbus RTU register factory reset or sensor calibration
2 - Red LED4	Continuous	The differential pressure, air volume or air velocity has exceeded the minimum or maximum alarm threshold
	Blinking	Sensor element failure
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.*

Operational diagrams

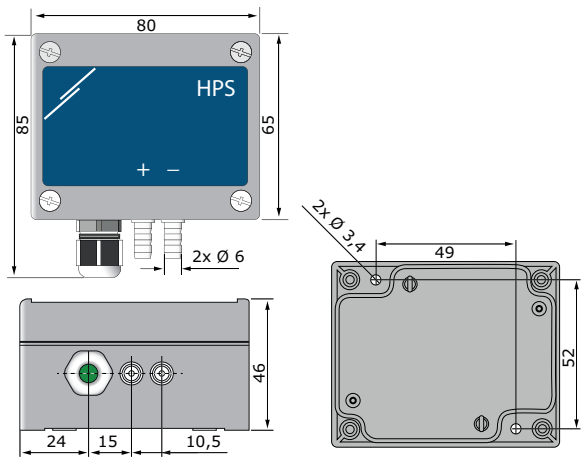




Standards

- 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

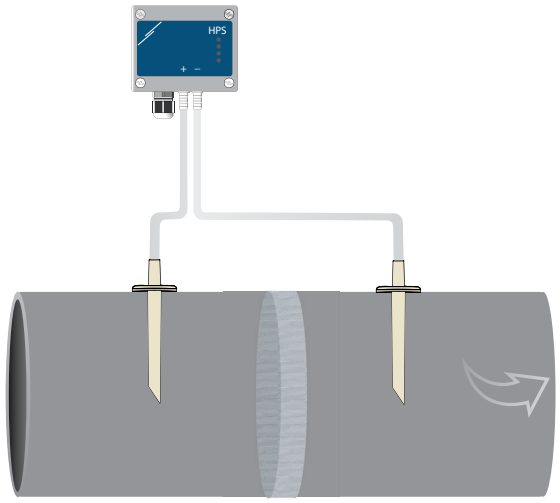
Fixing and dimensions



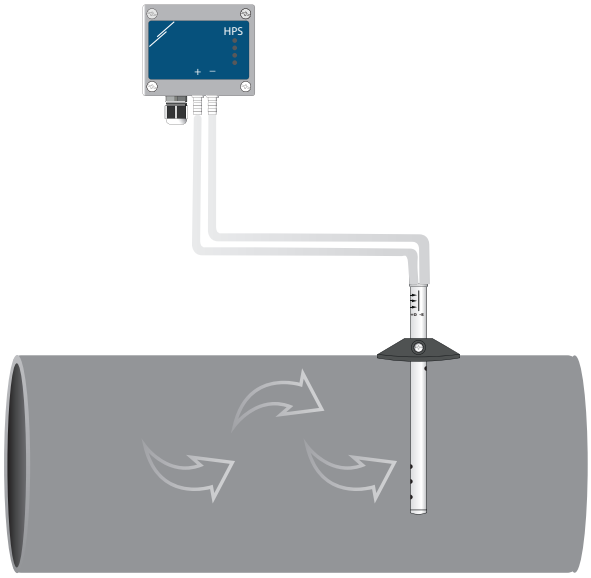
HPSPX-LP

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



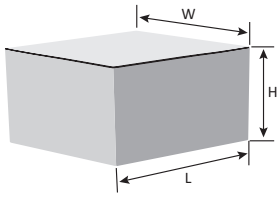
Modbus registers

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

HPSPM-LP

Differential pressure PI controller

The HPSPM-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

- 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, volume flow 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, 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
- Zero-point calibration via tact switch
- Selectable minimum and maximum span
- Aluminium pressure connection nozzles

Article codes

Codes	Power supply	Connection	Maximum power consumption	Nominal power consumption	Imax	Operating range
HPSPM-LP	24 VDC, Power over Modbus	RJ45 connector on the PCB	0,96 W	0,72 W	40 mA	-125—125 Pa

Technical specifications

Power supply		24 VDC (Power over Modbus)
Output		Modbus RTU (RS485)
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)

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

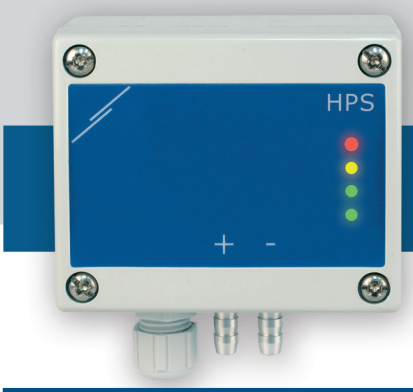
Area of use

- 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

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, 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

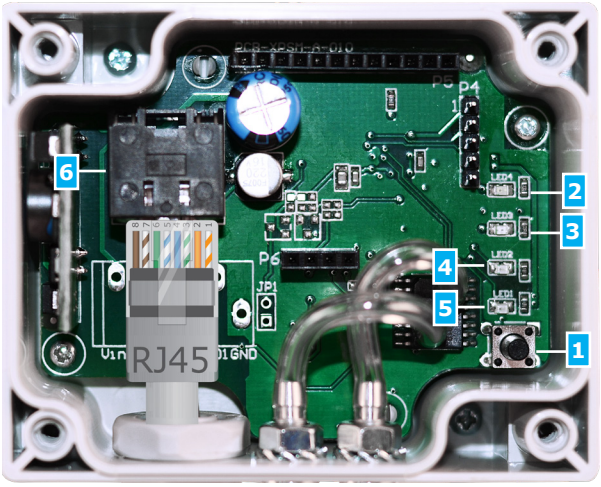


SENTERA CONTROLS

HPSPM-LP

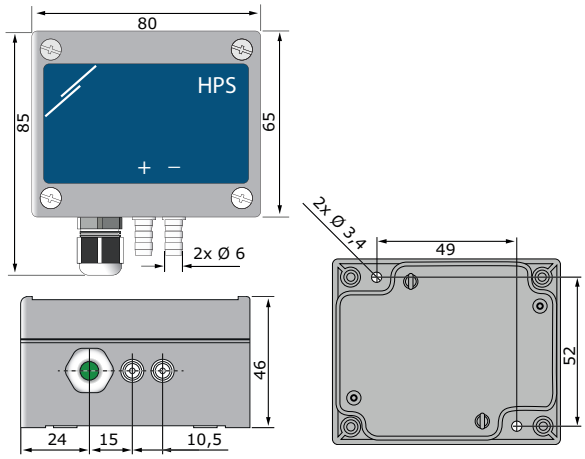
Differential pressure PI controller

Settings

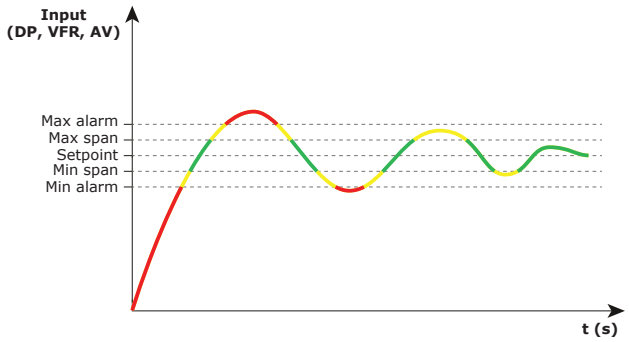


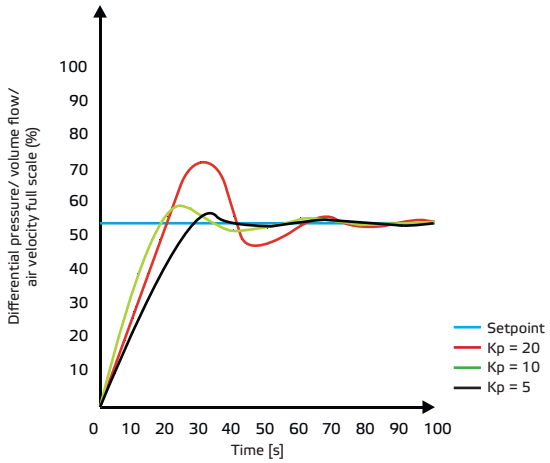
1 - Sensor calibration and Modbus register reset tact switch (SW1)		Push to start the Modbus RTU register factory reset or the sensor calibration
2 - Red LED4	Continuous	The differential pressure, air volume or air velocity has exceeded the minimum or maximum alarm threshold
	Blinking	Sensor element 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 - 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



Operational diagrams





Modbus registers

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

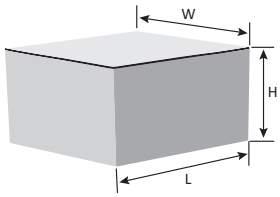
The parameters of the unit can be monitored / configured through the 3SModbus software platform. You can download it from the following link:
https://www.sentera.eu/en/3SMCenter

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

HPSPM-LP

Differential pressure PI controller

Packaging

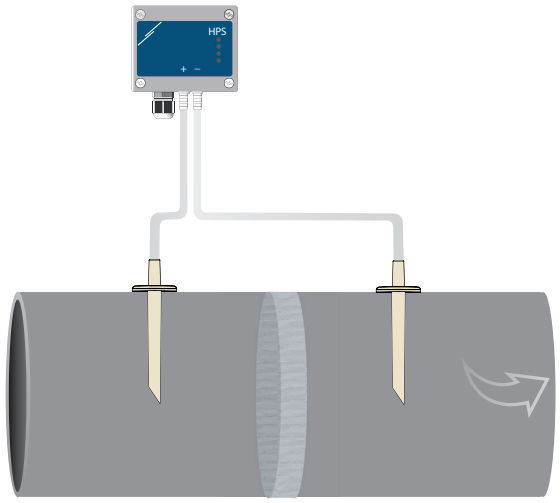


Article code	Packaging	Length [mm]	Width [mm]	Height [mm]	Net weight	Gross weight
HPSPM-LP	Unit (1 pc.)	95	85	70	0,12 kg	0,13 kg
	Carton (10 pcs.)	495	185	87	1,20 kg	1,30 kg
	Box (60 pcs.)	590	380	280	7,2 kg	7,8 kg

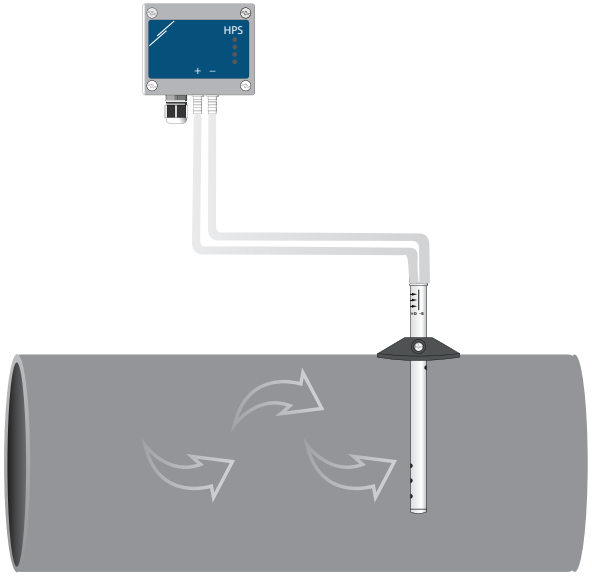
Global trade item numbers (GTIN)

Packaging	HPSPM-LP
Unit	05401003007990
Carton	05401003301234
Box	05401003501757

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



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



HPSAX-2

Differential pressure PI controller for damper actuators

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).

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 ≥ 50 kΩ
	0—20 mA	R_L ≤ 500 Ω
	0—100 % PWM	PWM Frequency: 1 kHz, R_L ≥ 50 kΩ
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)

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 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.

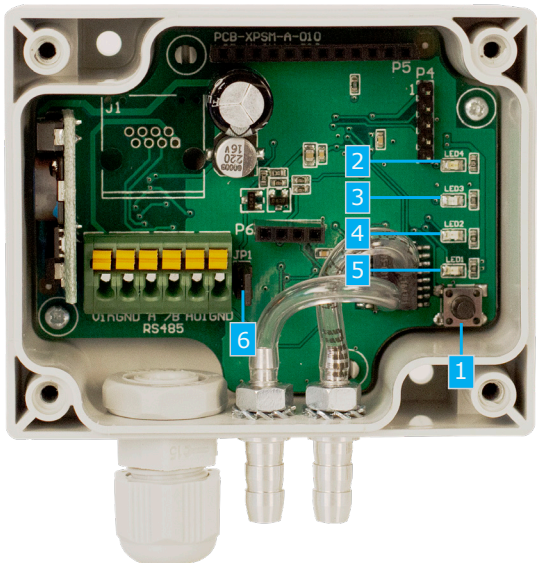
Area of use

- 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

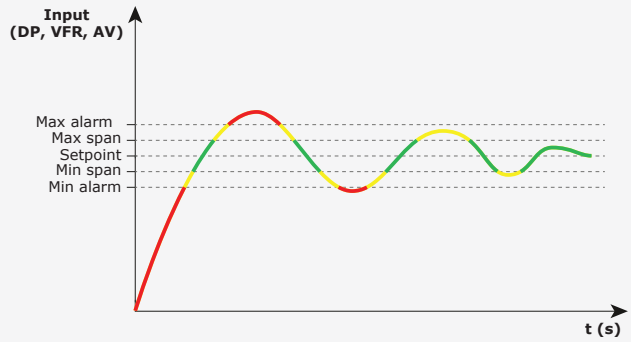
*(1) Only when K-factor of fan / drive is known. If K-factor is unknown, volume flow can be calculated via multiplying the duct cross-sectional area (A) by the air velocity (V) using the formula: Q = A * V.*
(2) By using an external PSET-PTX-200 Pitot tube connection set

HPSAX-2

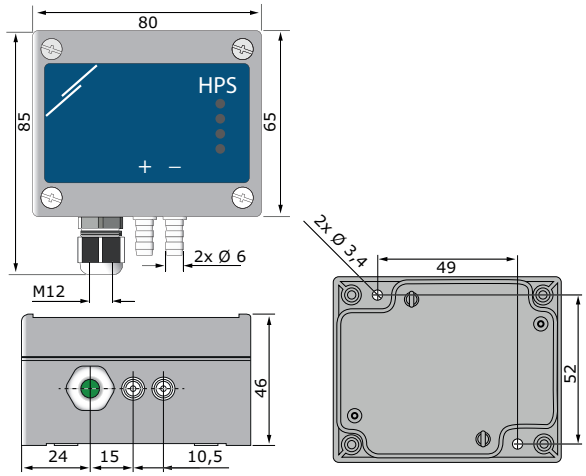
Differential pressure PI controller for damper actuators



Operational diagram



Fixing and dimensions



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/3SMCenter

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

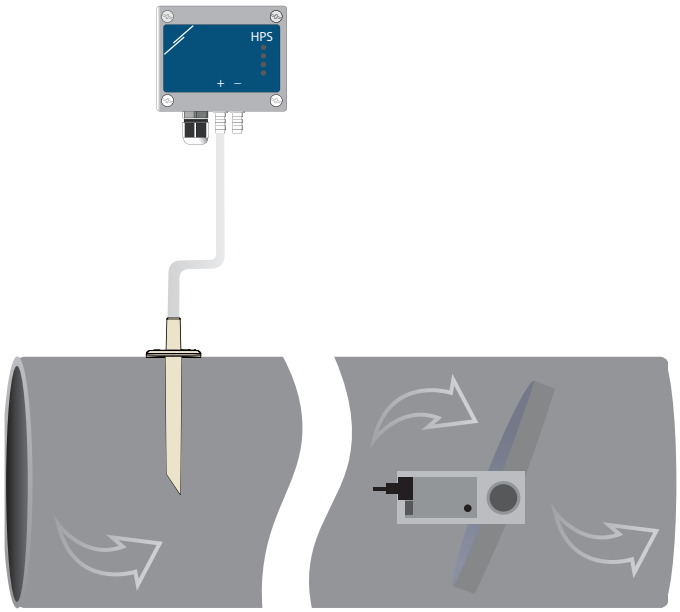
Standards

- 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
- RoHs Directive 2011/65/EC

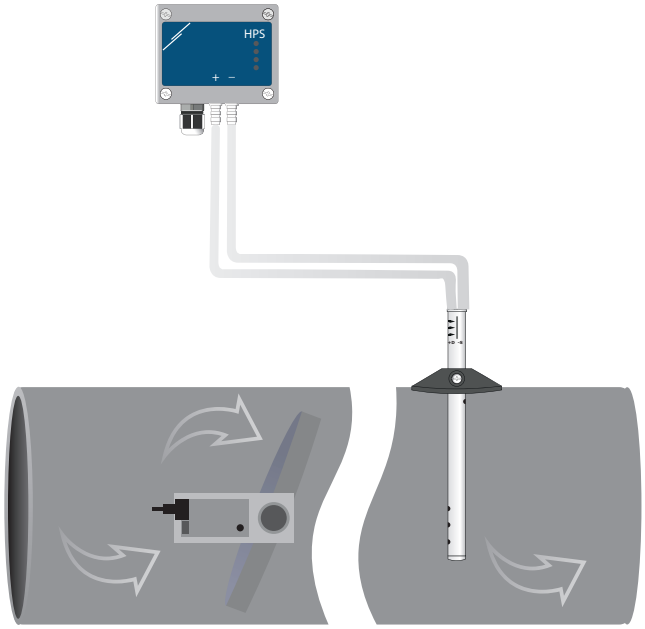
HPSAX-2

Differential pressure PI controller for damper actuators

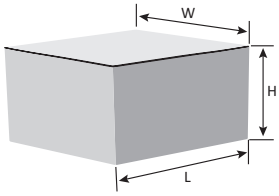
Application 1: Controlling air volume flow [m³/h] using PSET-PVC



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

DPD

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 ≥ 50 kΩ
	0—20 mA	R_L ≤ 500 Ω
	0—100 % PWM	PWM Frequency: 1 kHz, R_L ≥ 50 kΩ
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 * 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.

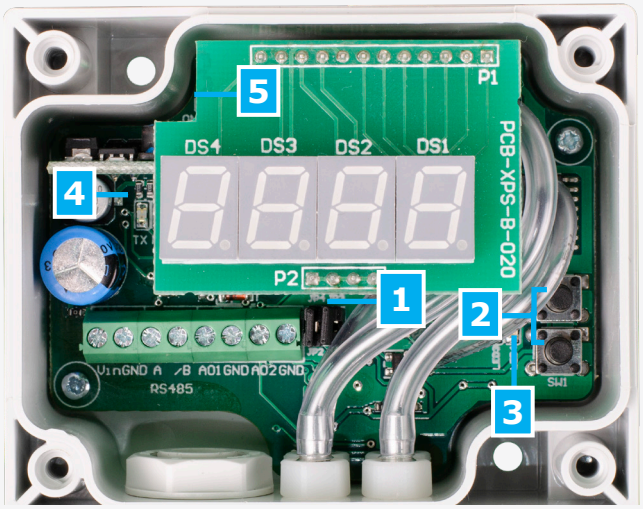
Standards

- 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

DPD

Dual high resolution differential pressure sensor with display

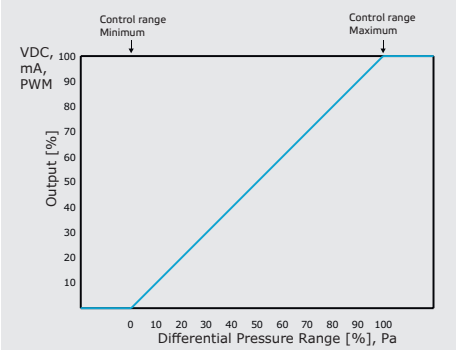
Settings and indications



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**
	□□	The relevant PWM output has to be connected to external voltage source via external pull-up resistor
2 - Sensor calibration and Modbus register reset tact switches (SW1, SW2)		Push tact switch SW1 to start sensor 1 calibration / Modbus registers reset Push tact switch SW2 to start sensor 2 calibration / Modbus registers reset
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)

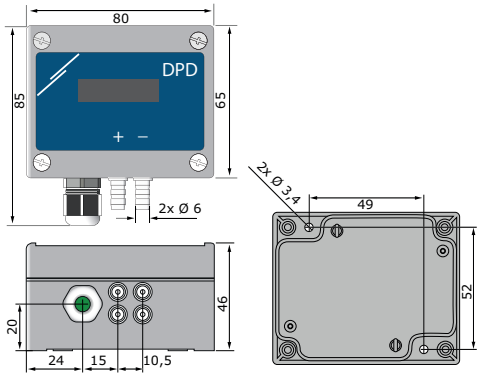


Wiring and connections

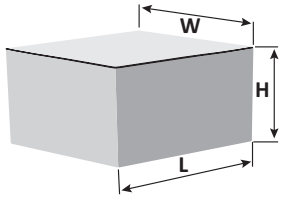
Article type	DPD-F	DPD-G	
Vin	18—34 VDC	18—34 VDC	13—26 VAC
GND	Ground	Common ground*	AC ~*
A	Modbus RTU (RS485), signal A		
/B	Modbus RTU (RS485), signal /B		
AO1	Analogue / modulating output 1 (0—10 VDC / 0—20 mA / PWM)		
GND	Ground AO1	Common ground*	
AO2	Analogue / modulating output 2 (0—10 VDC / 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

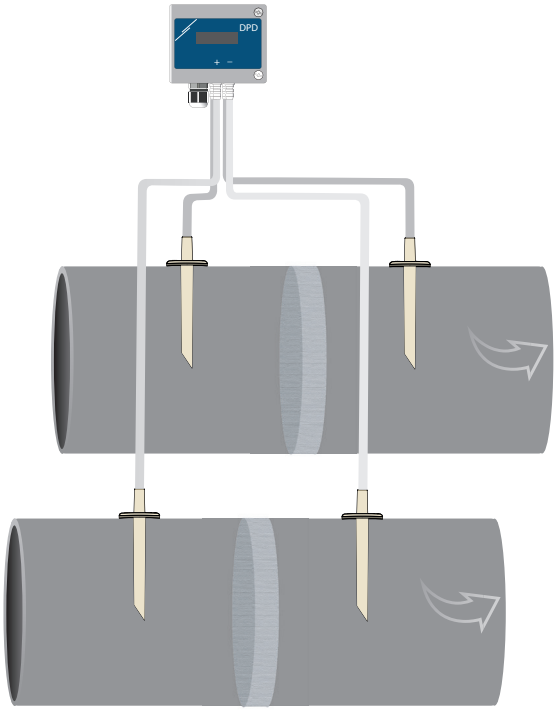


Article	Packaging	Length [mm]	Width [mm]	Height [mm]	Net weight	Gross weight
DPD	Unit (1 pc.)	95	85	70	0,15 kg	0,21 kg
	Carton (10 pcs.)	495	185	87	1,50 kg	2,23 kg
	Box (60 pcs.)	590	380	280	9 kg	13,95 kg

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

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 (m^3/h) for buildings

Technical specifications

Selectable analogue / modulating output	0—10 VDC mode	min. load 50 kΩ (R_L ≥ 50 kΩ)
	0—20 mA	max. load 500 Ω (R_L ≤ 500 Ω)
	PWM	PWM Frequency: 1 kHz, min. load 50 kΩ (R_L ≥ 50 kΩ)
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)

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 / 15—24 VAC ±10 %	1,71 W	1,28 W	95 mA	0—1.000 Pa
DPS-G-2K0 -2					0—2.000 Pa
DPS-G-4K0 -2		3,3 W	2,5 W	220 mA	0—4.000 Pa
DPS-G-10K -2					0—10.000 Pa

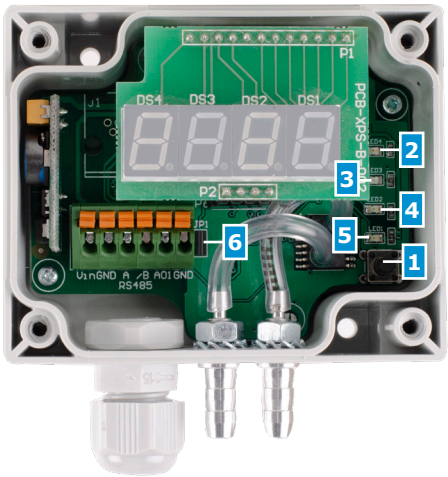
*(1) Only when K-factor of fan / drive is known. If K-factor is unknown, volume flow can be calculated via multiplying the duct cross-sectional area (A) by the air velocity (V) using the formula: Q = A * V.*
(2) By using an external PSET-PTX-200 Pitot tube connection set

SENTERA CONTROLS

DPS -2

Differential pressure transmitter

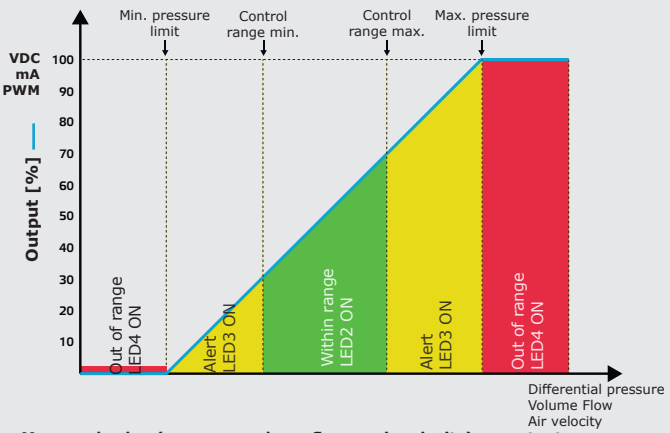
Settings



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)



Measured value (pressure, volume flow or air velocity) vs. output

Standards

- EMC Directive 2014/30/EC:
  - EN 61326-1:2013 Electrical equ ipment 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

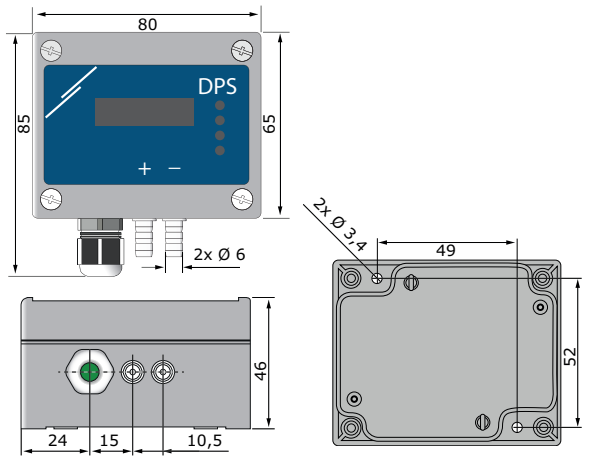
Wiring and connections

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 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

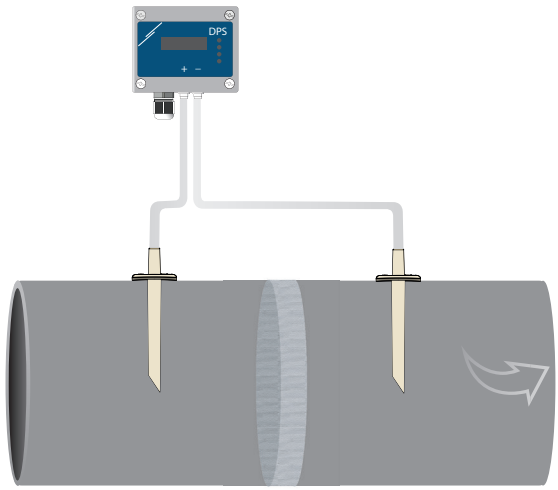


SENTERA CONTROLS

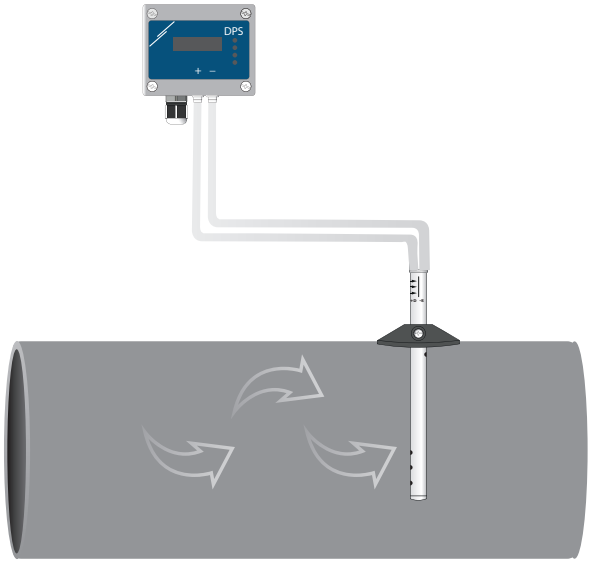
DPS -2

Differential pressure transmitter

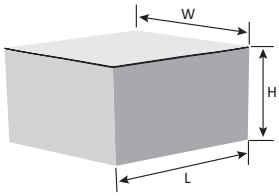
Application 1: Measuring differential pressure [Pa] or volume flow [m³/h] using PSET-PVC



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 (m^3/h) for buildings

Standards

CE

- 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

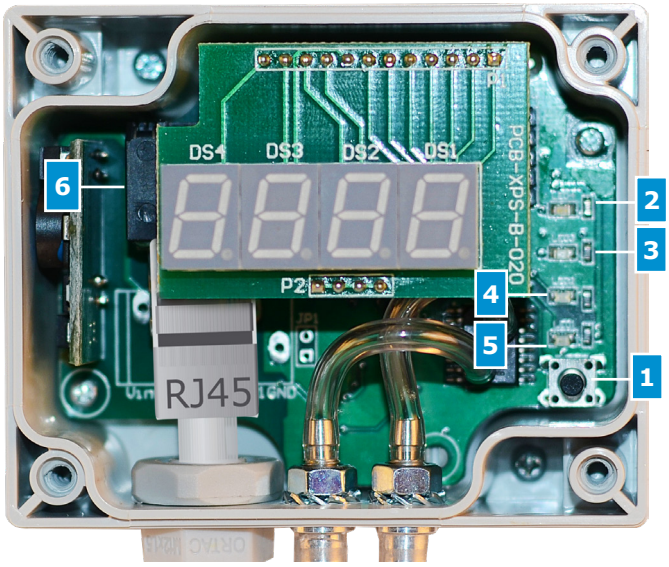
For more information about the Modbus registers, please refer to the product Modbus Register Map.

*(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 -2

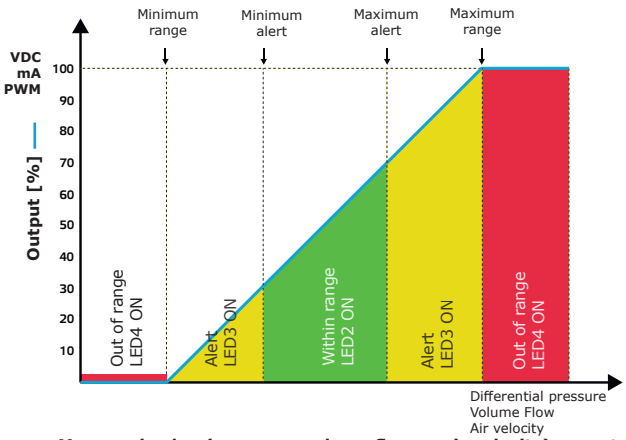
Differential pressure transmitter with display, PoM



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)

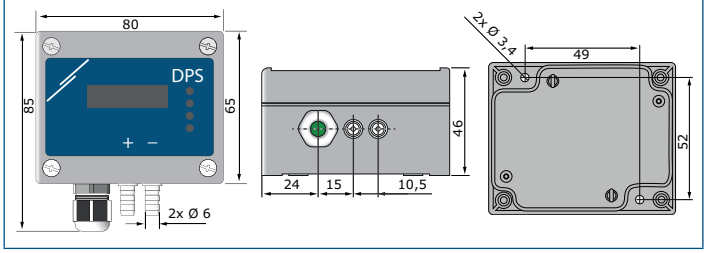


Measured value (pressure, volume flow or air velocity) vs. output

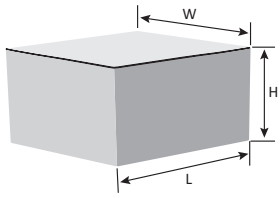
Settings

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



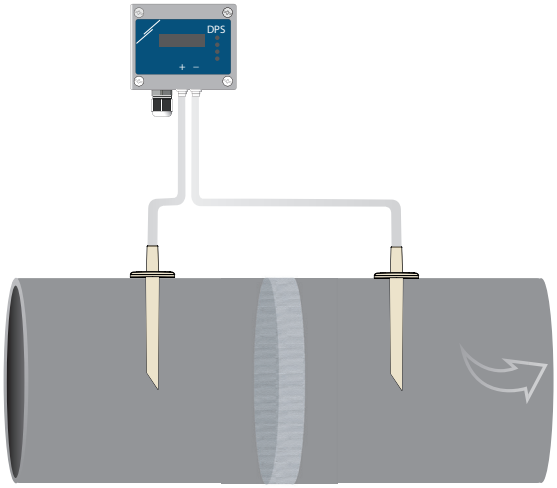
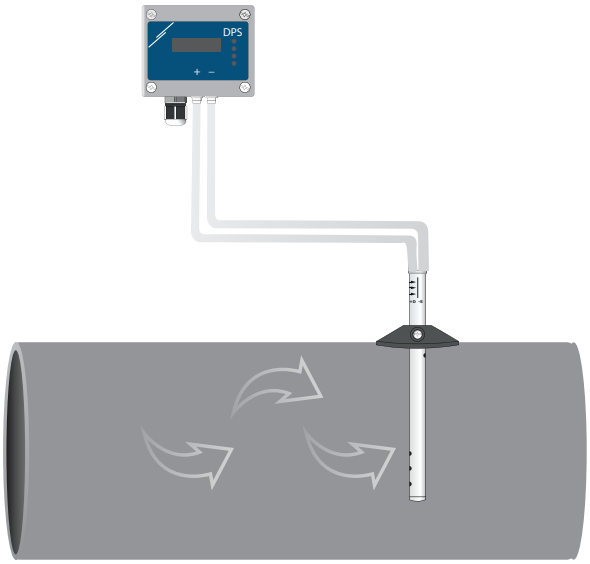
Packaging



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					0—10.000 Pa
DPSPG-1K0-2	18—34 VDC	1,71 W	1,28 W	95 mA	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 ≥ 50 kΩ
	0—20 mA	R_L ≤ 500 Ω
	0—100 % PWM	PWM Frequency: 1 kHz, R_L ≥ 50 kΩ
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 * 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	

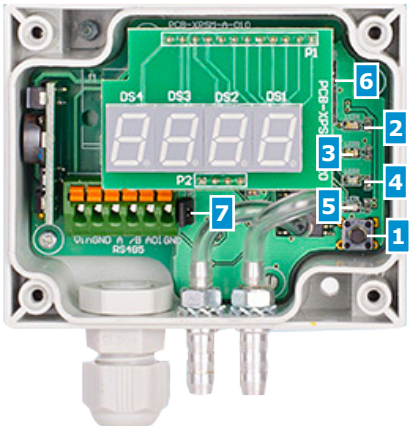
***Attention!** The -F version of the product is not suited for 3-wire connection. It has separate grounds for power supply and analogue output. Connecting both grounds together might result in incorrect measurements. Minimum 4 wires are required to connect -F type sensors.*
The -G version is intended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

SENTERA CONTROLS

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)*	 1 2 3 4 5	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.*

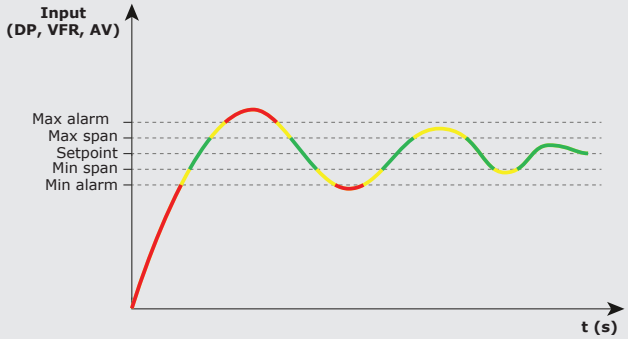
Modbus registers

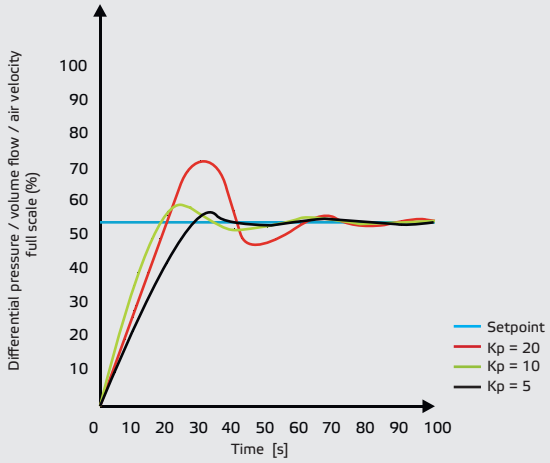
The Sensistant Modbus configurator allows you to easily monitor and/or configure Modbus parameters.

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

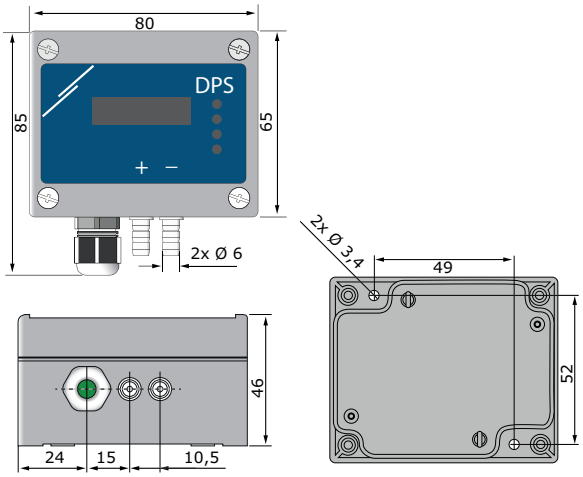
For more information about the Modbus registers, please refer to the product Modbus Register Map.

Operational diagrams





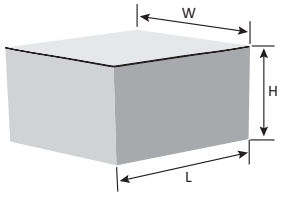
Fixing and dimensions



DPSP -2

Differential pressure PI controller

Packaging



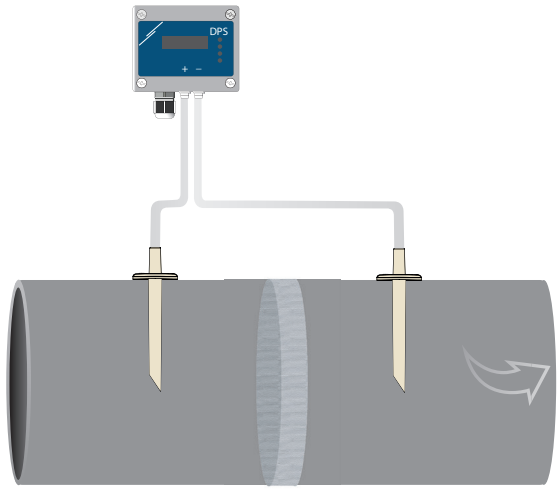
Article	Packaging	Length [mm]	Width [mm]	Height [mm]	Net weight	Gross weight
DPSP -2	Unit (1 pc.)	95	85	70	0,132 kg	0,142 kg
	Carton (10 pcs.)	495	185	87	1,32 kg	1,55 kg
	Box (60 pcs.)	590	380	280	7,92 kg	9,93 kg

Standards

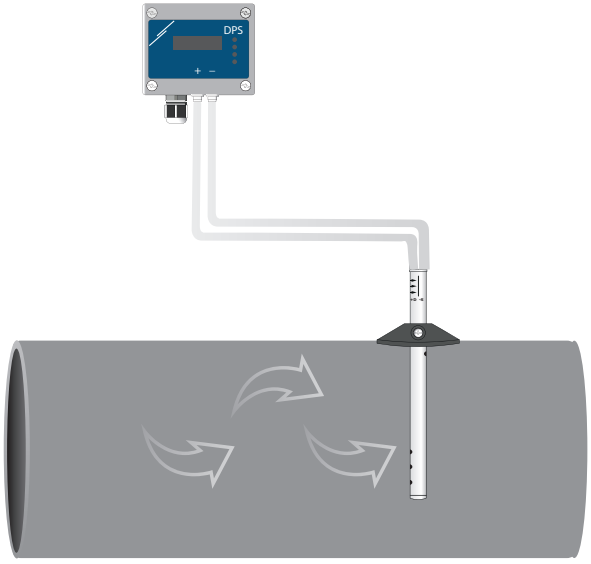
CE

- 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.*

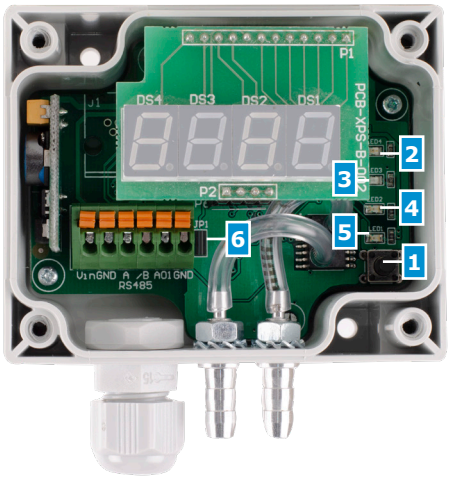
The -G version is intended for 3-wire connection and features a 'common ground'. This means that the ground of the analogue output is internally connected with the ground of the power supply. For this reason, -G and -F types cannot be used together on the same network. Never connect the common ground 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

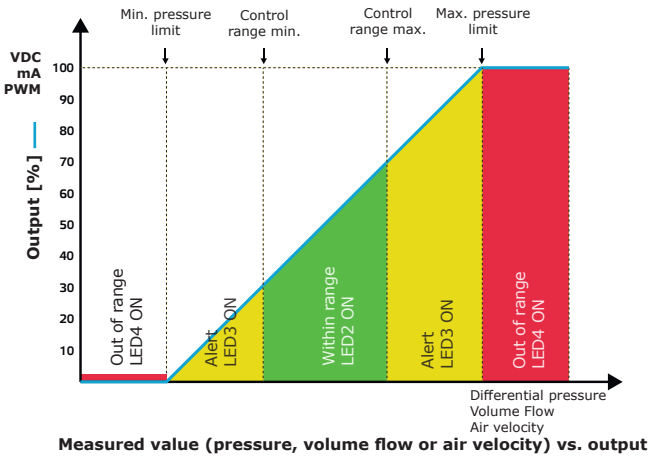
Settings



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

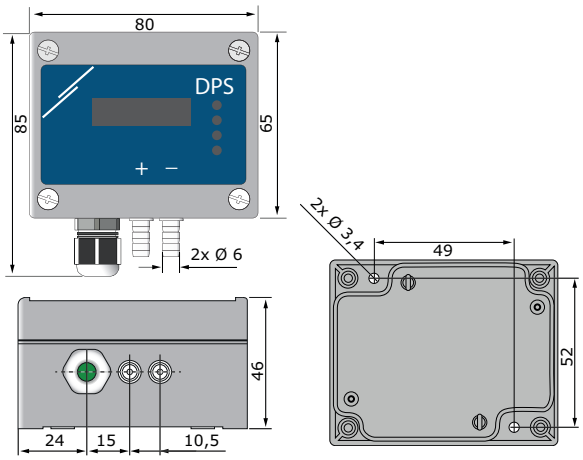
* ■■ *indicates closed position of the jumper.*
*** The voltage source depends on the value in holding register 54.*

Operational diagram(s)



Measured value (pressure, volume flow or air velocity) vs. output

Fixing and dimensions



Modbus registers

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

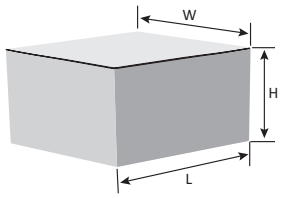
The parameters of the unit can be monitored / configured through the 3SModbus software platform. You can download it from the following link:
https://www.sentera.eu/en/3SMCenter

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

Global trade item numbers (GTIN)

Packaging	DPS-F--LP	DPS-G--LP
Unit	05401003001509	05401003001554
Carton	05401003300350	05401003300404
Box	05401003500361	05401003500408

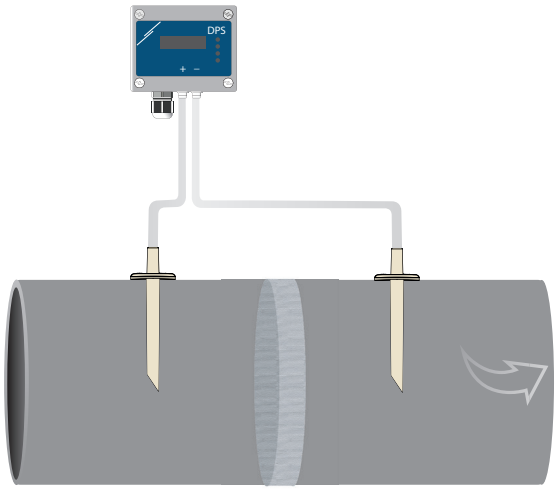
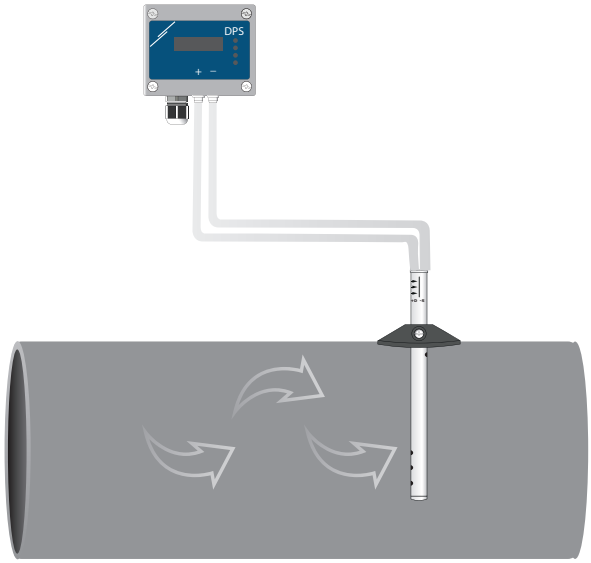
Packaging



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	Imax	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 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, 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

CE

- 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

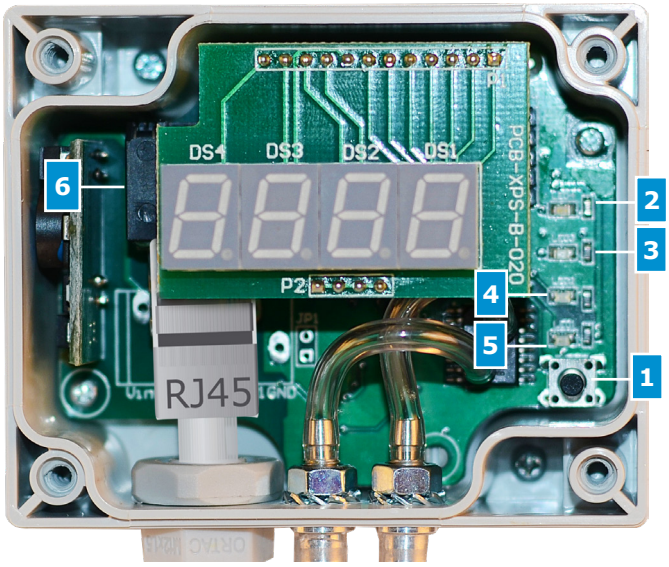
For more information about the Modbus registers, please refer to the product Modbus Register Map.

*[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

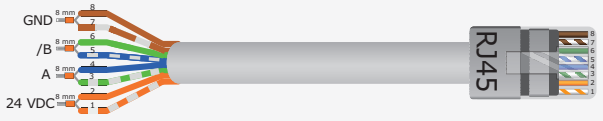
DPS-M--LP

Differential pressure transmitter with display, PoM



Wiring and connections

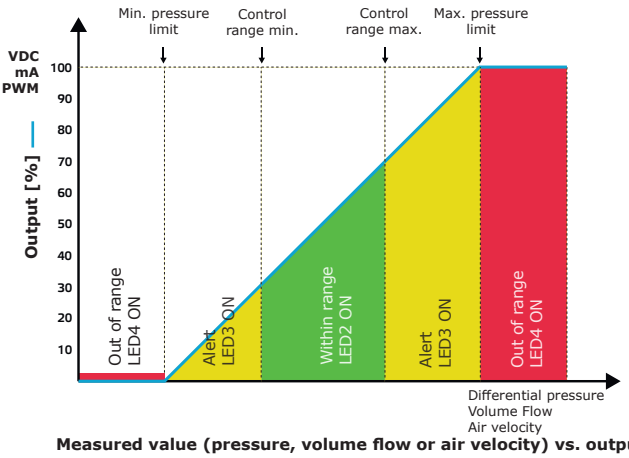
24 VDC	Supply voltage 24 VDC
GND	Ground
A	Modbus RTU communication, signal A
/B	Modbus RTU communication, signal /B



Settings

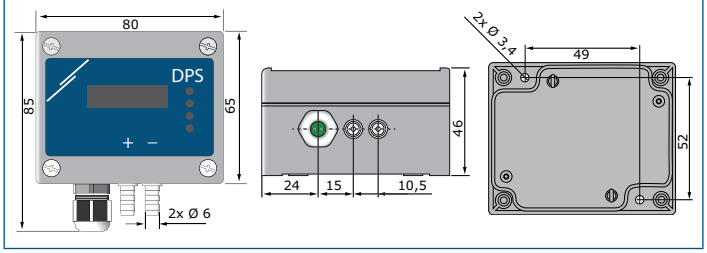
1 - Sensor calibration and Modbus register reset tact switch (SW1)		Push to start the Modbus RTU register factory reset or sensor calibration
2 - Red LED4	Continuous	Measured differential pressure, volume flow or air velocity is out of range
	Blinking	Sensor element failure
3 - Yellow LED3	On	Measured 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

Operational diagram(s)

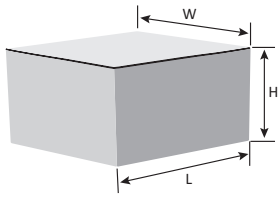


Measured value (pressure, volume flow or air velocity) vs. output

Fixing and dimensions



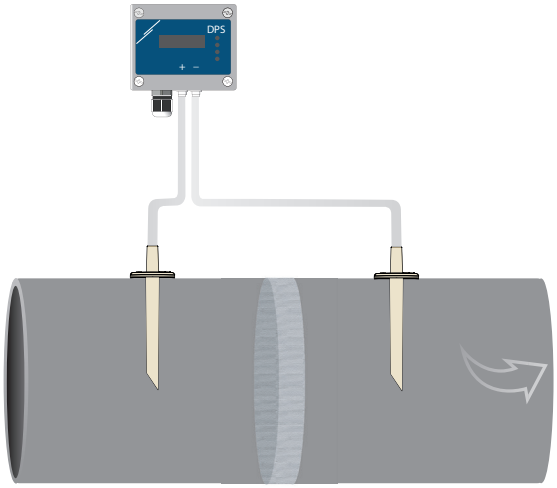
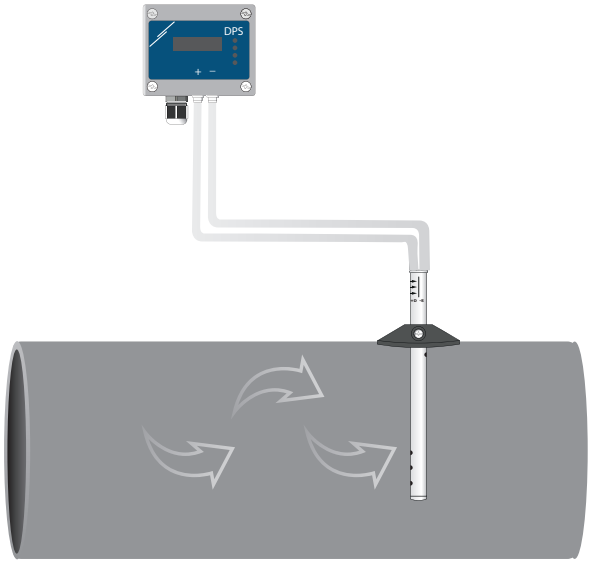
Packaging



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 ≥ 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		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)

Standards

CE

- 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, 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.*

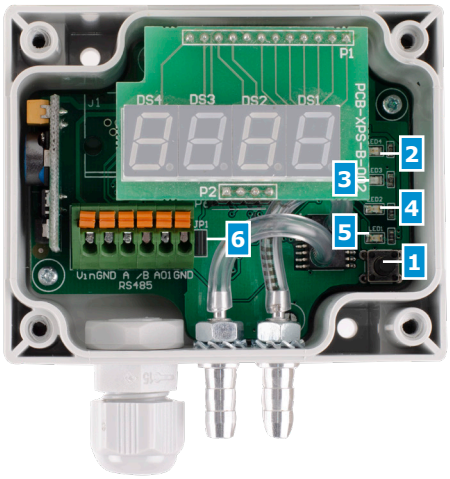
The -G version is intended for 3-wire connection and features a 'common ground'. This means that the ground of the analogue output is internally connected with the ground of the power supply. For this reason, -G and -F types cannot be used together on the same network. Never connect the common ground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

(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.*

DPSPX-LP

Differential pressure PI controller with display

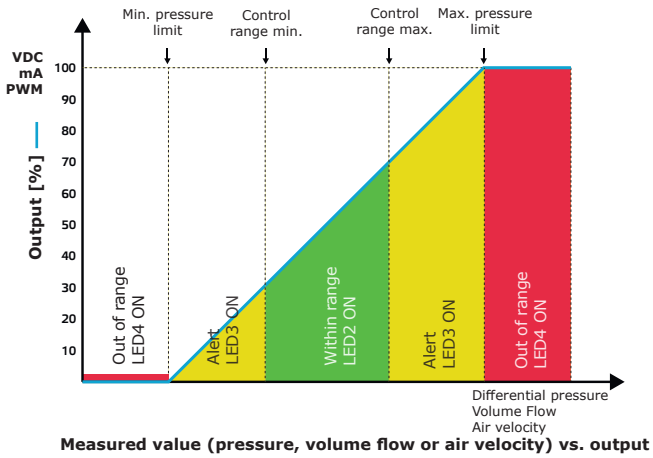
Settings



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

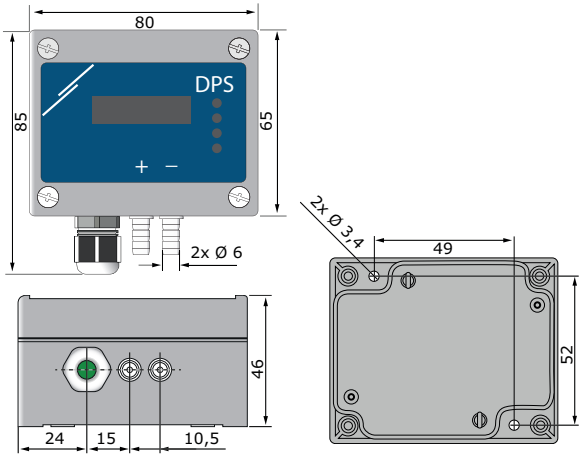
* ▬▬ *indicates closed position of the jumper.*
*** The voltage source depends on the value in holding register 54.*

Operational diagram(s)



Measured value (pressure, volume flow or air velocity) vs. output

Fixing and dimensions



Modbus registers

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

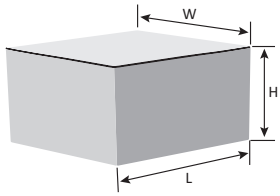
The parameters of the unit can be monitored / configured through the 3SModbus software platform. You can download it from the following link:
https://www.sentera.eu/en/3SMCenter

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

Global trade item numbers (GTIN)

Packaging	DPSPF-LP	DPSPG-LP
Unit	05401003001684	05401003001738
Carton	05401003300534	05401003300589
Box	05401003500538	05401003500583

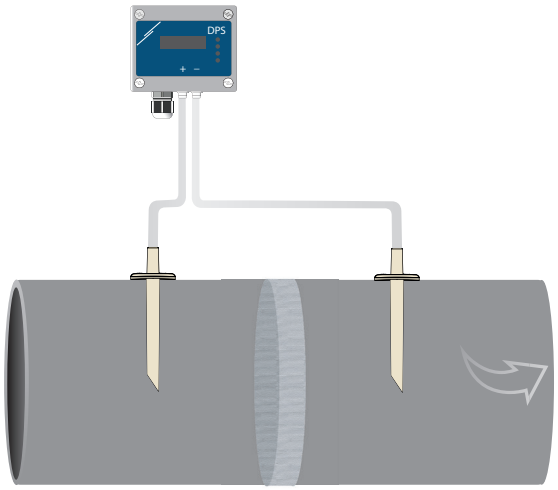
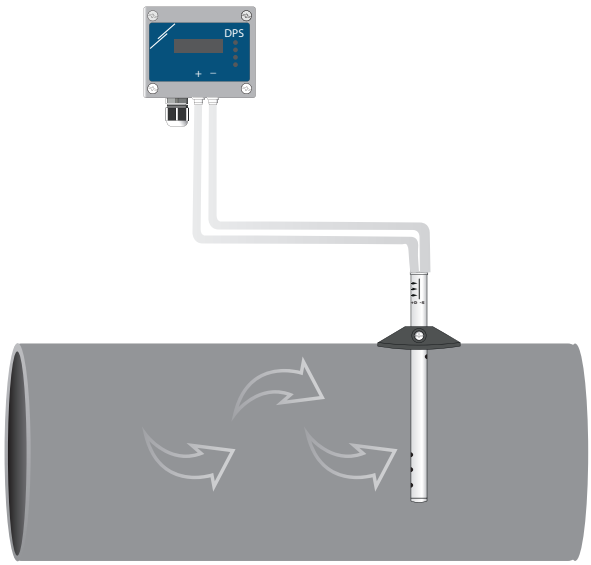
Packaging



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

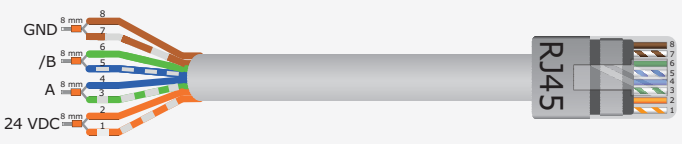
Maximum power consumption		1,44 W
Nominal power consumption		1,08 W
Imax		60 mA
Output		Modbus RTU (RS485)
Selectable minimum output value		10—50 % (default: 20 %)
Selectable maximum output value		50—100 % (default: 100 %)
Operating modes		Differential pressure Volume flow(1) Air velocity(2)
Accuracy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

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



Global trade item numbers (GTIN)

Packaging	DPSPM-LP
Unit	05401003001745
Carton	05401003300596
Box	05401003500590

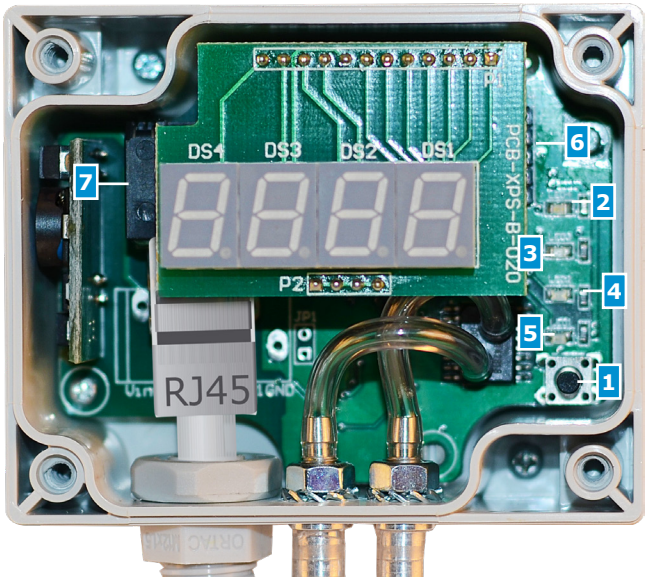
*(1) Only when K-factor of fan / drive is known. If K-factor is unknown, air volume flow can be calculated via multiplying the duct cross-sectional area (A) by the air flow velocity (V) using the formula: Q = A * V*
(2) By using an external PSET-PTX-200 Pitot tube connection set

SENTERA CONTROLS

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)*	 1 2 3 4 5	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.*

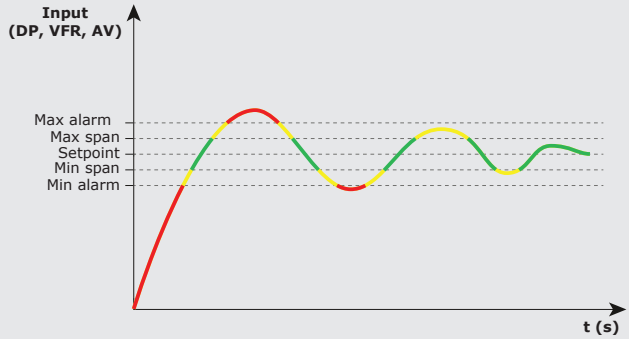
Modbus registers

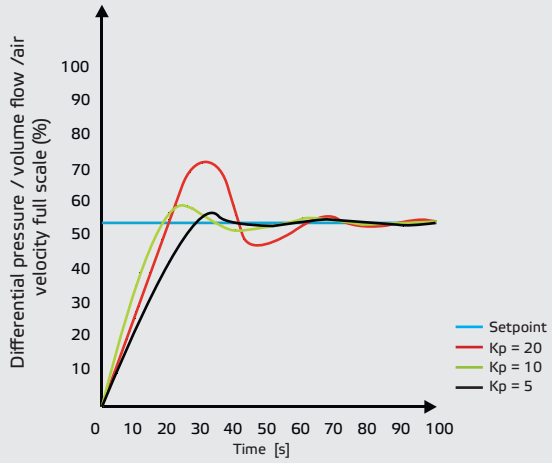
The Sensistant Modbus configurator allows you to easily monitor and/or configure Modbus parameters.

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

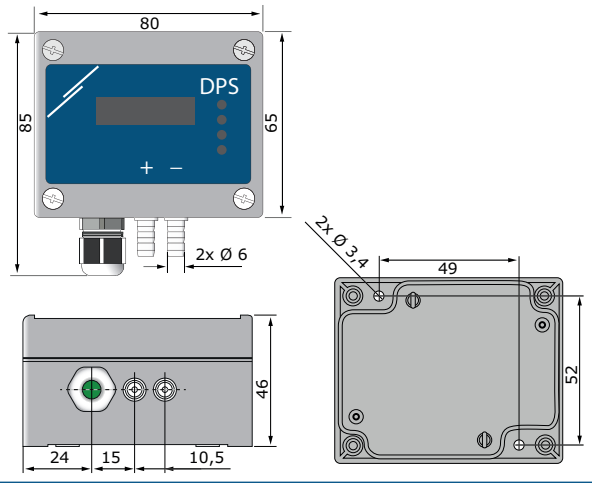
For more information about the Modbus registers, please refer to the product Modbus Register Map.

Operational diagrams





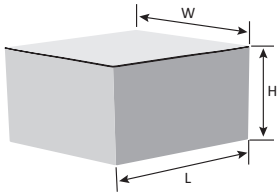
Fixing and dimensions



DPSPM-LP

Differential pressure PI controller

Packaging



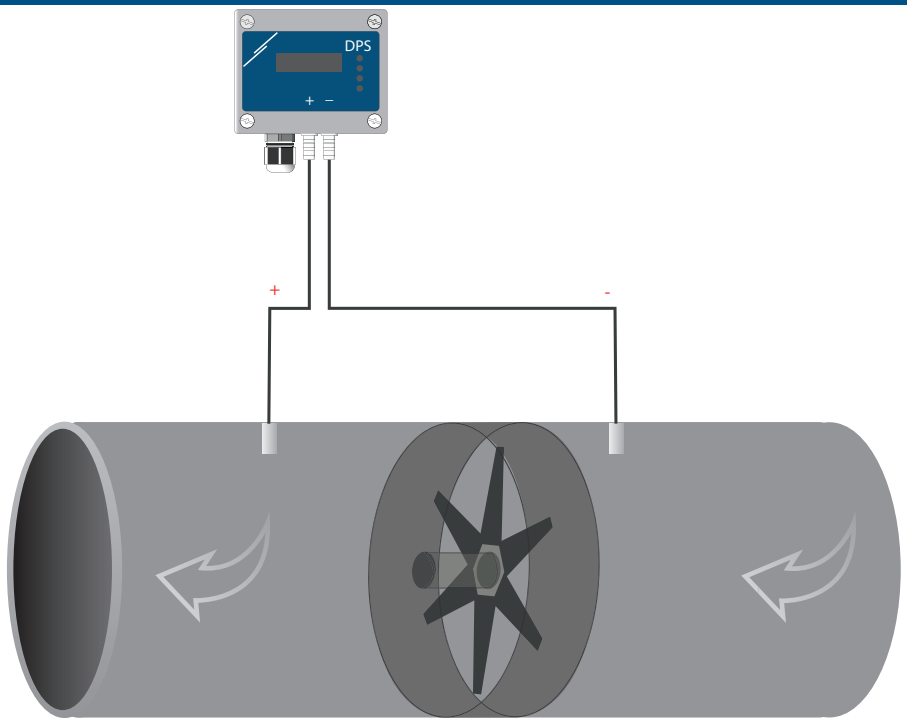
Article	Packaging	Length [mm]	Width [mm]	Height [mm]	Net weight	Gross weight
DPSPM-LP	Unit (1 pc.)	95	85	70	0,132 kg	0,142 kg
	Carton (10 pcs.)	495	185	87	1,32 kg	1,55 kg
	Box (60 pcs.)	590	380	280	7,92 kg	9,93 kg

Standards

CE

- 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	Imax	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 / 18—34 VDC	160 mA / 80 mA	0—1.000 Pa
DPSAG-2K0 -2			0—2.000 Pa

Technical specifications

Selectable analogue / modulating output	0—10 VDC	R_L ≥ 50 kΩ
	0—20 mA	R_L ≤ 500 Ω
	0—100 % PWM	PWM Frequency: 1 kHz, R_L ≥ 50 kΩ
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
		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 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.

Area of use

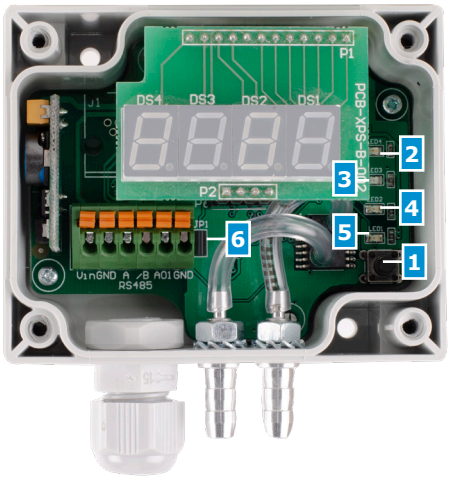
- Differential pressure, volume flow(1) or air velocity(2) measurement in HVAC applications
- Overpressurizing applications: clean rooms to avoid particle contamination or staircases for fire safety
- Underpressurizing applications: restaurant kitchens and biohazard laboratories
- Volume flow application: 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 * 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.*

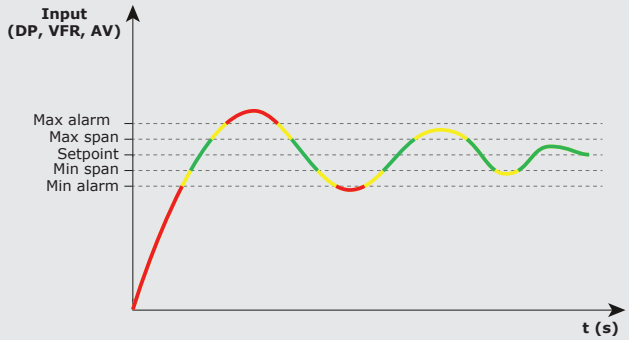
Modbus registers

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

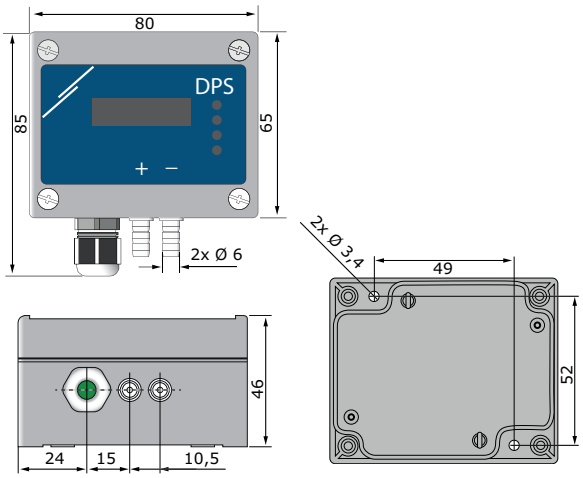
The parameters of the unit can be monitored / configured through the 3SModbus software platform. You can download it from the following link:
https://www.sentera.eu/en/3SMCenter

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

Operational diagram



Fixing and dimensions



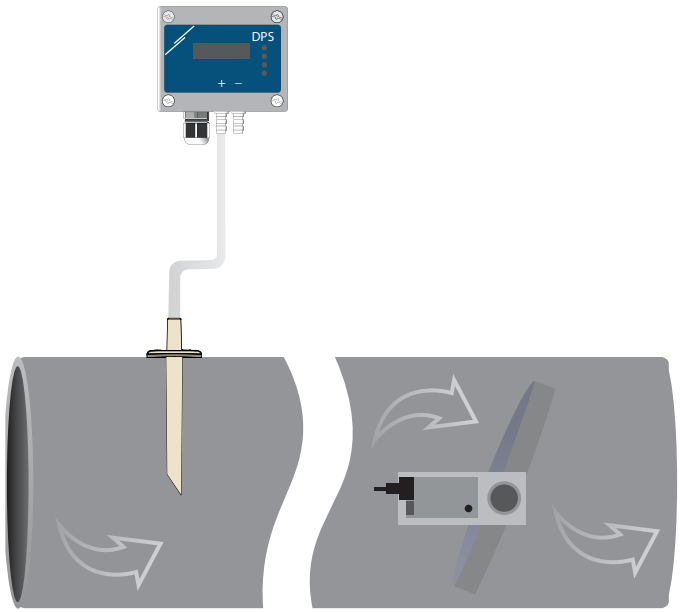
Standards

- 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

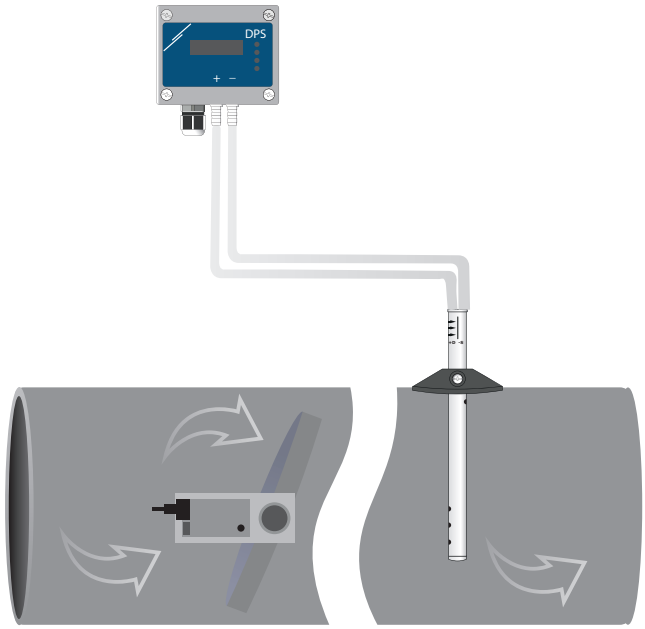
DPSAX-2

Differential pressure PI controller for damper actuators

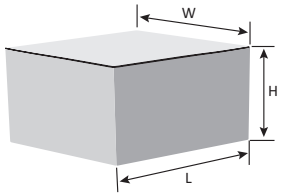
Application 1: Controlling volume flow [m³/h] using PSET-PVC



Application 2: Controlling 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
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)

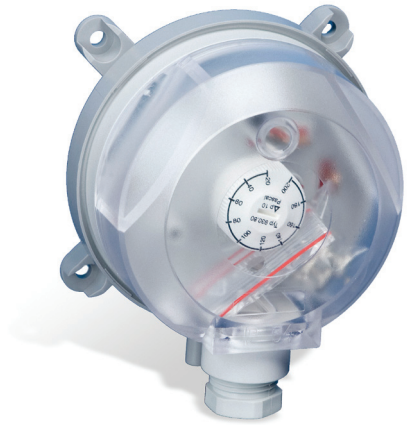
Packaging	DPSAF-1K0 -2	DPSAF-2K0 -2	DPSAG-1K0 -2	DPSAG-2K0 -2
Unit	05401003017579	05401003017586	05401003017593	05401003017609
Carton	05401003302286	05401003302293	05401003302309	05401003302316
Box	05401003503386	05401003503393	05401003503409	05401003503416

PSW
Differential pressure switch

The PSW series are 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

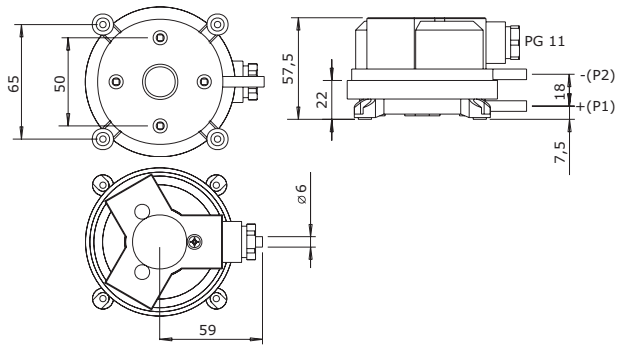
Max. operating pressure		2,500 Pa for all pressure ranges
Mechanical life cycles		10.000.000 operations
Contacts rating		max. 1,0 A (0,4) / 250 VAC (VDE 0630, EN 1854)
Diaphragm		Silicone
Protection standard		IP54 (according to EN 60529)
Ambient conditions	Temperature	-20—85 °C
	Rel. humidity	< 95 % rH (non-condensing)

**Use screened extension wires*

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



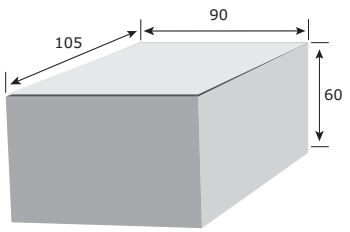
Area of use

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

Standards

- Low Voltage Directive 2006/95/EC CE
- RoHs Directive 2011/65/EU

Packaging



Article	Packaging	Length [mm]	Width [mm]	Height [mm]	Net weight	Gross weight
PSW	Unit (1 pc.)	90	105	60	0,14 kg	0,16 kg
	Box (72 pcs.)	580	370	270	10,08 kg	12,3 kg

PSET-PVC

PVC differential pressure connection set

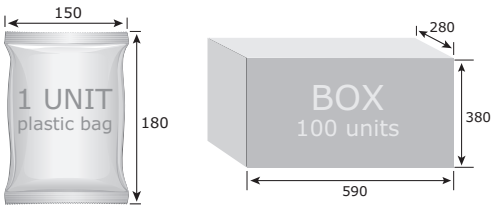
Contents

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

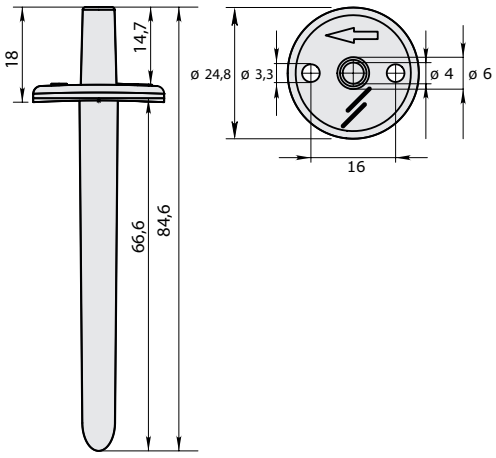
Working pressure	max. 10.000 Pa
Operating temperature	max. 60 °C

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

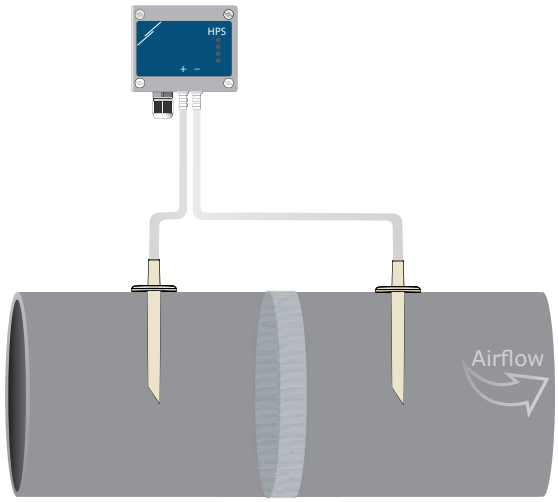
Standards

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

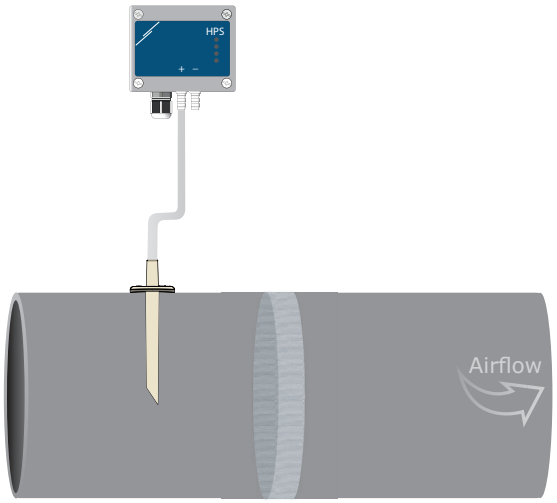
PSET-PVC

PVC differential pressure connection set

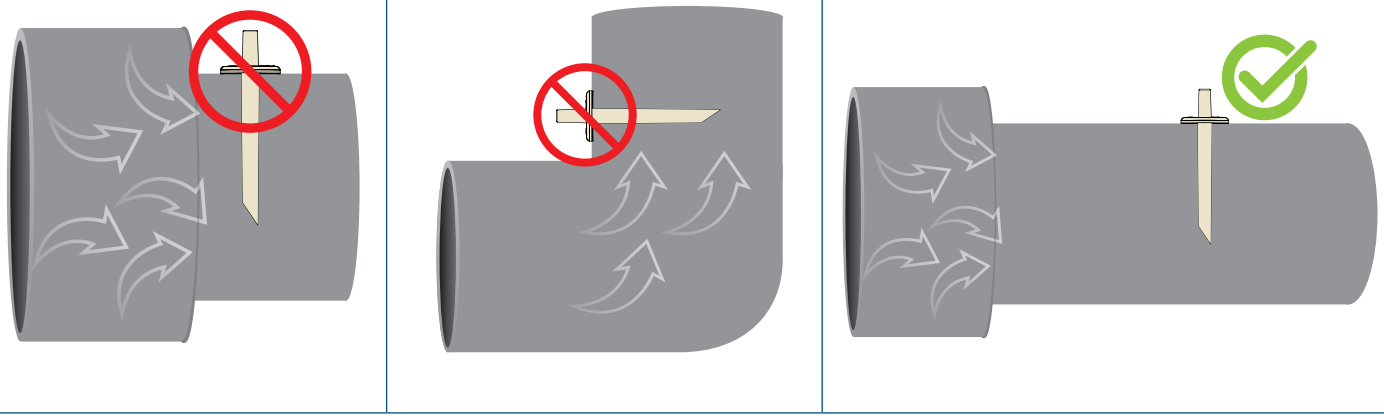
Application 1: Detection of clogged filter



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

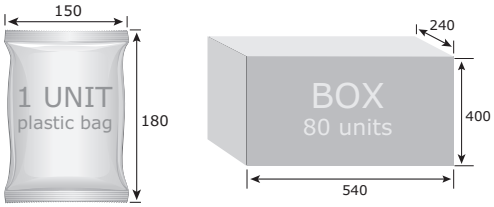
Technical specifications

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

Standards

- WEEE Directive 2012/19/EU

Packaging

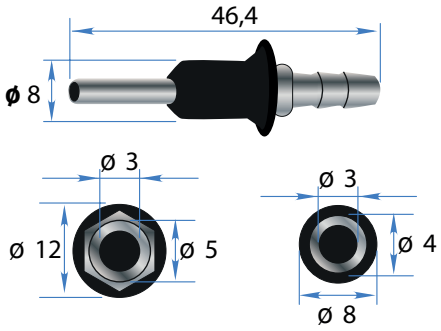


Article	Packaging	Length [mm]	Width [mm]	Height [mm]	Net weight	Gross weight
PSET-QF-200	Unit (1 pc.)	18	15	0,5	0,60 kg	0,60 kg
	Box (80 pcs.)	550	410	250	4,80 kg	5,63 kg

Article codes

	Tubing length
PSET-QF-200	200 cm

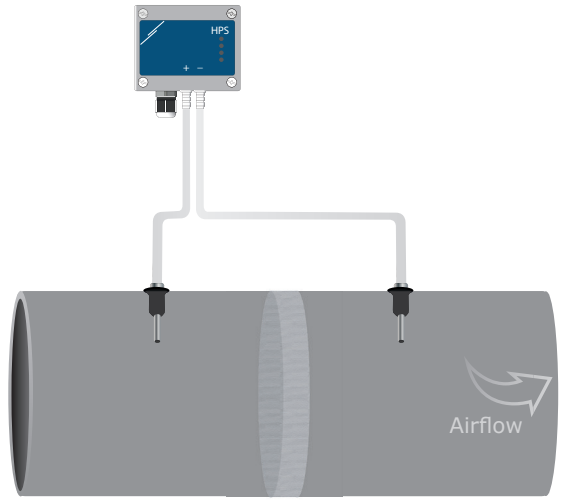
Fixing and dimensions



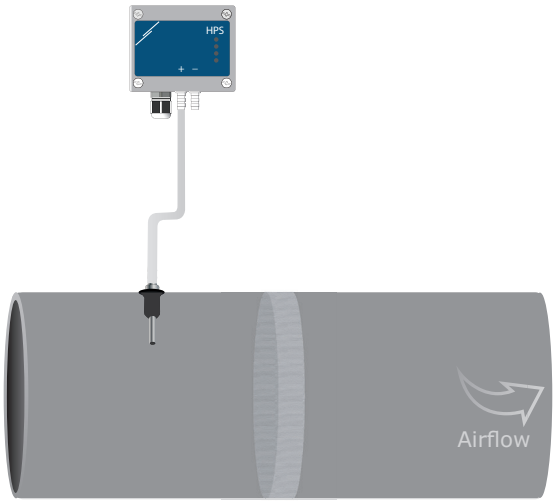
PSET-QF

Quick fit differential pressure connection set

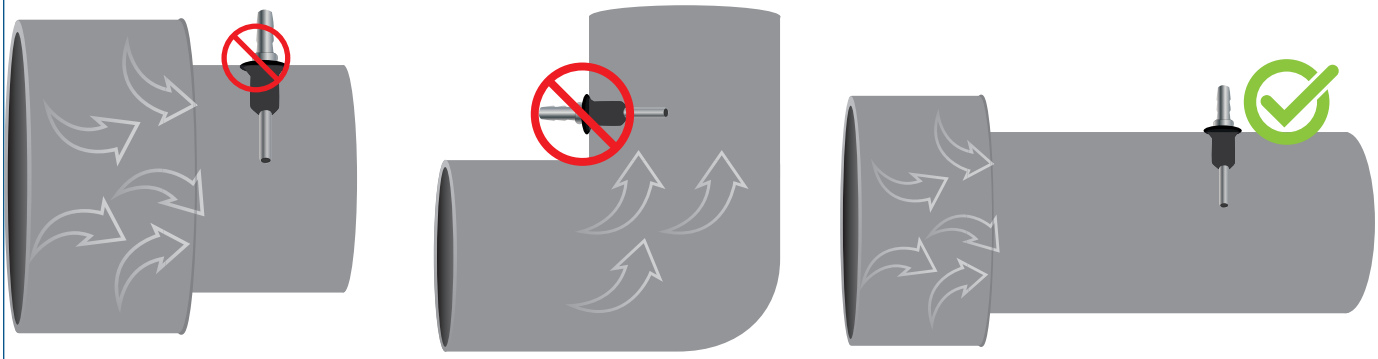
Application 1: Detection of clogged filter



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.

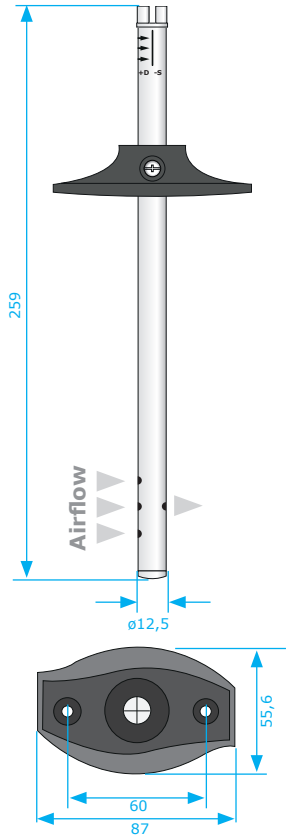
The set includes:

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

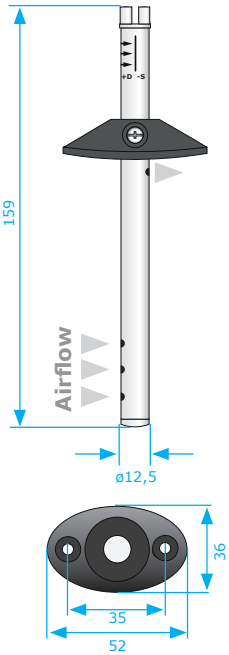
Note: *PSET-PTS-200 can be applied for duct diameters of 100—300 mm.*
PSET-PTL-200 can be applied for duct diameters of 150—500 mm.

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

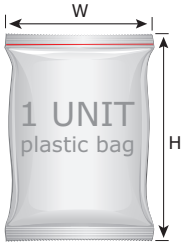
Standards

- WEEE Directive 2012/19/EC

Technical specifications

Impact strength	at 23° C	80 kJ/m²
	at -30° C	45 kJ/m²
Temperature of deflection under load (HDT)		80 ° C
Operating temperature		max. 96 °C

Packaging



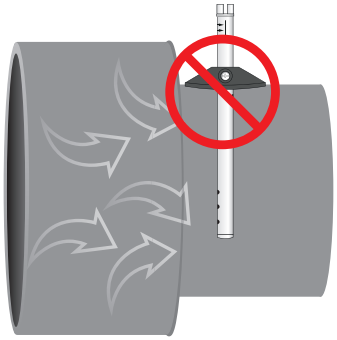
Article	Packaging	Length [mm]	Width [mm]	Net weight	Gross weight
PSET-PTL-200	Unit (1 pc.)	230	170	0,126 kg	0,127 kg
PSET-PTS-200	Unit (1 pc.)	230	170	0,113 kg	0,114 kg

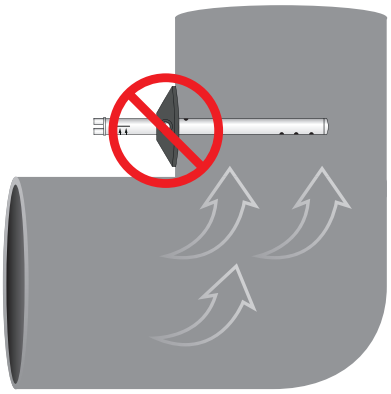
SENTERA CONTROLS

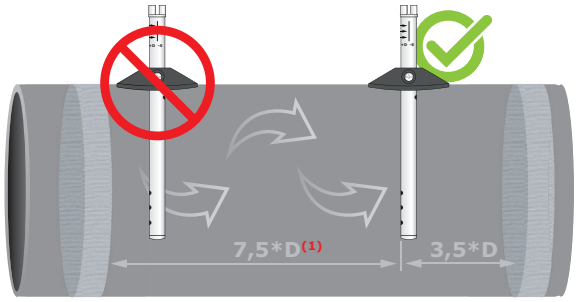
PSET-PT

Pitot tube connection set

Mounting position







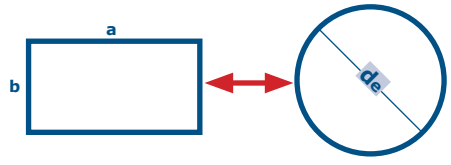
(1)D = Duct diameter

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 - a \ Duct side - b	100	150	200	250	300	400	500	600	800	1000	1200	1400	1600	1800	2000
(mm)															
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

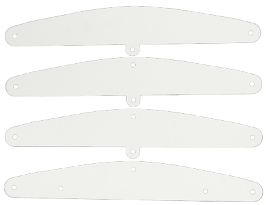
All-weather protective hood for outdoor sensors

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.

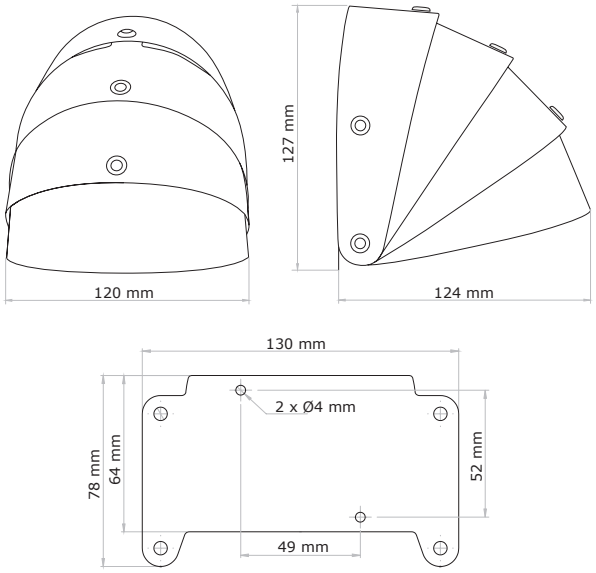
Material

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

Standards

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

Fixing and dimensions

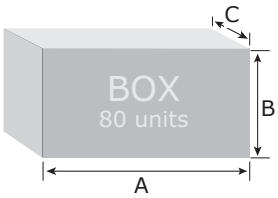


AWP

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

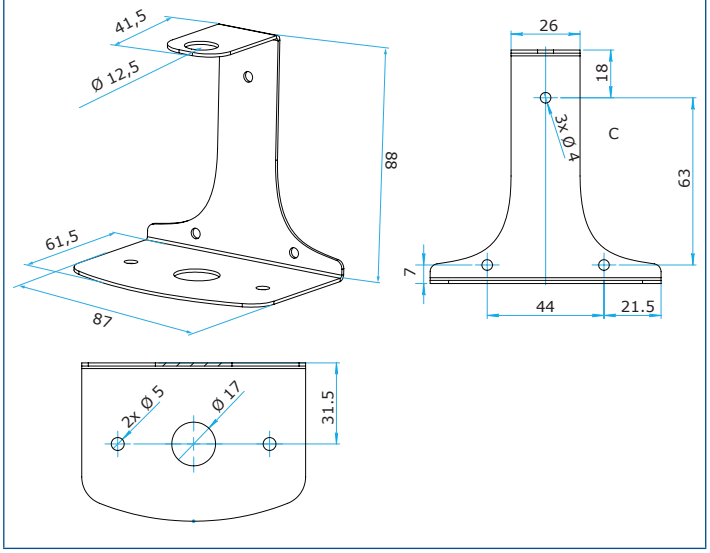
Standards

- 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

Fixing and dimensions

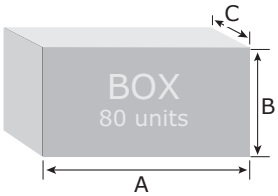


DTS-MB

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

TSVCM

Temperature, relative humidity and air quality (VOC) duct sensor

Description

TSVCM is a compact digital temperature, relative humidity and air quality (VOC) duct sensor suitable for a variety of HVAC applications. Equipped with Modbus RTU communication, TSVCM allows easy adjustment of parameters and settings remotely through SenteraWeb.

TSVCM provides the following benefits:

- Easy Connection: TSVCM is equipped with a pluggable terminal block that can be unplugged from the device and plugged back when the wires have been connected.
- Power over Modbus (PoM) Compatibility: PoM allows both power supply and data to be transmitted via a single UTP or EIB cable, which makes TSVCM easy to implement in a variety of HVAC systems.
- Accurate TVOC Detection: The algorithms of TSVCM precisely measure the level of total volatile organic compounds (TVOCs).
- Intelligent Baseline Adaptation: Featuring automated baseline correction, the device intelligently learns its environment to consistently and accurately identify elevated TVOC levels in any condition.
- Long-Term Performance: Equipped with a proprietary metal oxide (MOx) sensor, this product delivers reliable and effective responsiveness to changing TVOC levels throughout its operational lifespan.
- Human-Like Sensitivity: The algorithm mimics the human nose, offering rapid detection of subtle changes in air quality with high sensitivity while effectively filtering out very gradual variations.
- Fast Initial Response: The integrated sensor reacts instantly to the presence of all TVOCs, ensuring immediate detection of air quality changes.
- Smart Long-Term Adaptation: While the sensor reacts quickly, the algorithm employs a 24-hour time constant for full decay, allowing it to adapt to stable air quality conditions over time.
- Automatic Baseline Calibration: In consistently clean air environments over a 24-hour period, the algorithm intelligently converges to an IAQ index of 100, indicating optimal air quality.

Key Features

- Modbus RTU communication allowing:
  - Monitoring and setting of parameters
  - Data reading
  - Firmware upload
- Free selectable ranges and alert levels via Modbus registers:
  - Temperature: -30 - 70 °C
  - Relative humidity: 0 – 100 %
  - VOC index: 0 – 500 AQI
- Pluggable terminal block providing easy connection:
  - Supply: 24 VDC, GND
  - Modbus communication: A, /B
- Provides precise and rapid environmental readings for temperature and relative humidity.
- Offers quick and reliable volatile organic compound detection for air quality assessment.
- Delivers long-lasting and consistent measurements of total volatile organic compounds for indoor air quality monitoring.

Area of Use

- Demand controlled ventilation based on temperature, relative humidity and air quality.
- Air quality monitoring and control in buildings with any of the following duct ventilation system:
  - Exhaust ventilation
  - Supply ventilation
  - Balanced ventilation
  - Energy recovery ventilation

Article Code

Article code	Supply voltage	Imax	Connection type
TSVCM	24 VDC	20 mA	Pluggable terminal block

Technical Specifications

Supply voltage	24 VDC / Power-over-Modbus (acceptable voltage range: 18 – 28 VDC)	
Maximum input current	20 mA	
Default Modbus setting	Address 1, 19.200 bps baud rate, even parity, one stop bit	
Operating conditions	Temperature	-10 – 50 °C
	Relative humidity	10 – 90 % rH, non-condensing
Pre-heating time	VOC index	5 minutes
	IAQ Rating and TVOC	3 minutes
Minimum recommended airflow velocity	1 m/s	
Storage conditions	Temperature	-20°C – 60°C
	Relative humidity	5 – 80% rH
Enclosure	Material	Black ABS (Acrylonitrile Butadiene Styrene)
	Protection class	IP20 (EN 60529)

Wiring and Connections

Connection	Pins	Ratings	Cable characteristics
Pluggable terminal block	V+, A, /B, GND	24 VDC, RS-485	Cat5 or EIB cable

Global Trade Item Numbers 14 (GTIN 14)

Article	Unit	Carton	Box
TSVCM	5401003019009	5401003303016	5401003504451

TSVCM

Temperature, relative humidity and air quality (VOC) duct sensor

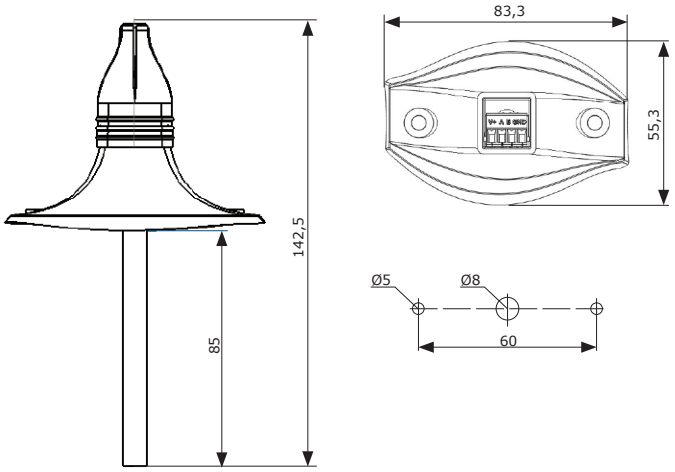
Standards

- Low Voltage Directive 2014/35/EU
  - EN 60529:1991/A2:2013/AC:2019-02 Degrees of protection provided by enclosures (IP Code)

- Electromagnetic Compatibility (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

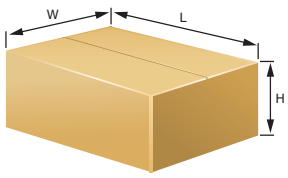
- Commission Delegated Directive (EU) 2015/863 (RoHS 3) of 31 March 2015 amending Annex II to Directive 2011/65/EU of the European Parliament and of the Council as regards the list of restricted substances
  - EN IEC 63000:2018 Technical documentation for the assessment of electrical and electronic products with respect to the restriction of hazardous substances

Fixing and Dimensions



Article code	Length [mm]	Width [mm]	Height [mm]
TSVCM	142,2	55,3	83,3

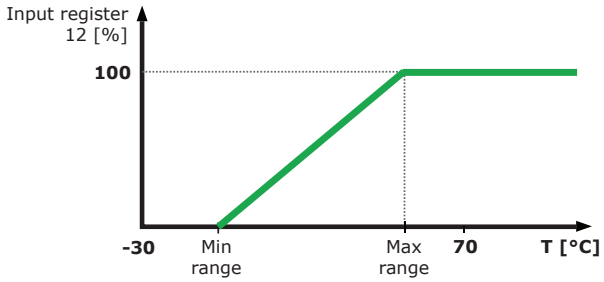
Packaging



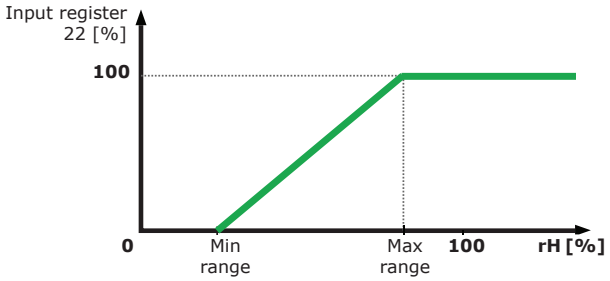
Article	Packaging	Length [mm]	Width [mm]	Height [mm]	Net weight [kg]	Gross weight [kg]
TSVCM	Unit	18	15	60	0,050	0,054
	Carton	492	182	84	0,50	0,69
	Box	590	380	280	3	5,06

Operational Diagrams

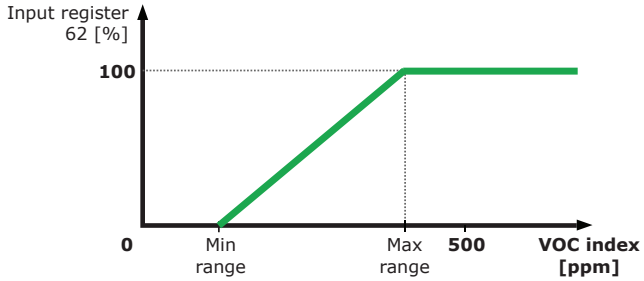
Temperature



Relative humidity



VOC Index (IAQ)



If there is no active sensor or all sensors are broken, the output value will be 0.

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)	

Article codes

Article code	Supply	Imax
RSVCG-R	18—34 VDC	115 mA
	15—24 VAC ±10%	115 mA
RSVCF-R	18—34 VDC	115 mA

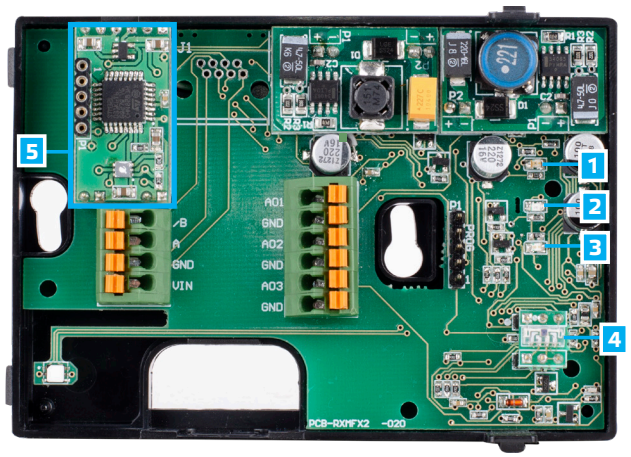
Wiring and connections

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!

Indications

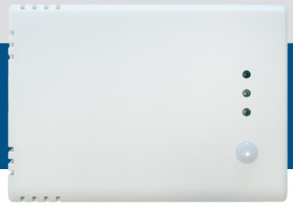


1 - Red LED	Continuous	Measured temperature, relative humidity or TVOC are out of range
	Blinking	Communication with one of the sensors fails
2 - Yellow LED	On	Measured temperature, relative humidity or TVOC are in the alert range
3 - Green LED	On	Measured temperature, relative humidity or TVOC are within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

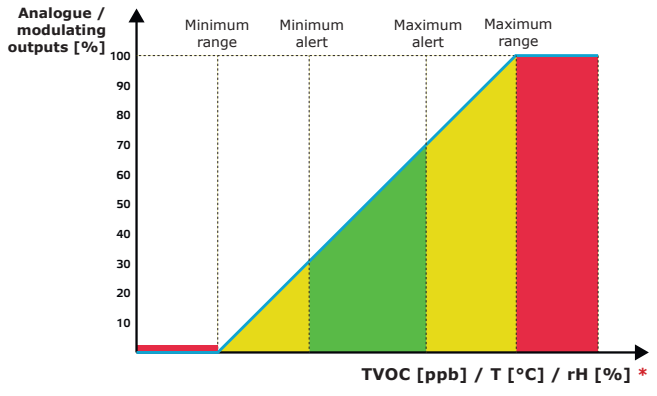
SENTERA CONTROLS

RSVCX-R

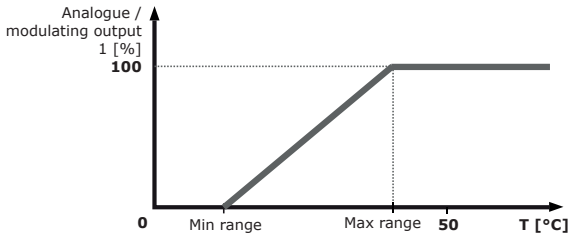
Air quality room transmitter

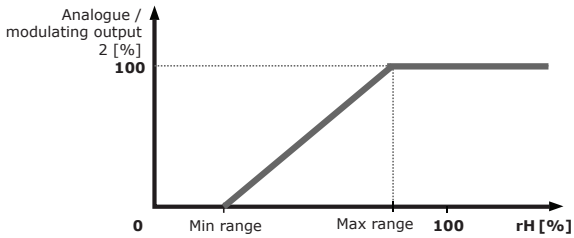


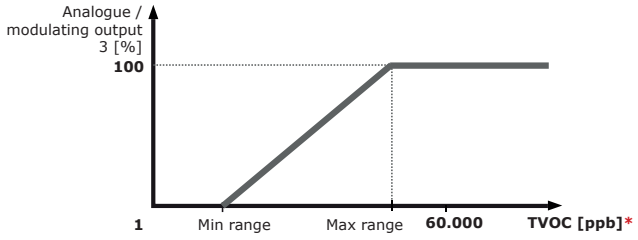
Operational diagram



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

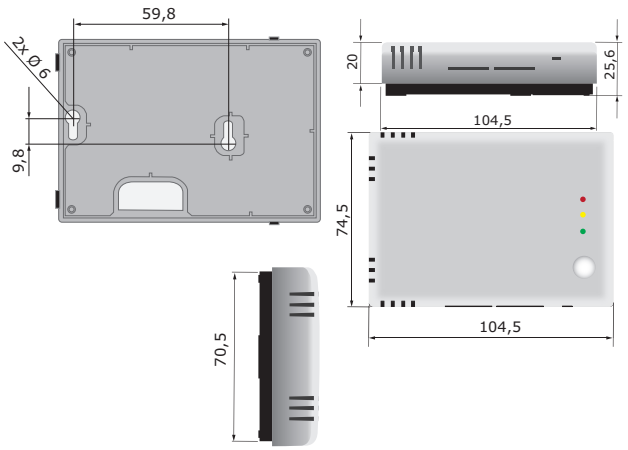






**TVOC measurement will return 0 ppb during warm-up time.*

Fixing and dimensions



Modbus registers

The 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.

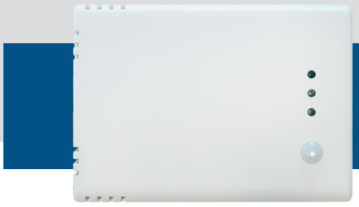
Standards

- 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

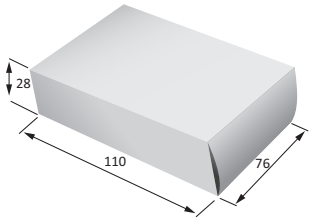
- WEEE 2012/19/EC

- RoHs Directive 2011/65/EC



RSVCX-R
Air quality room transmitter

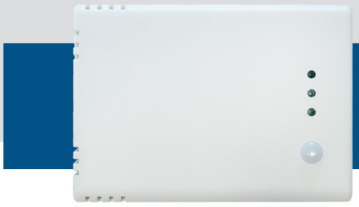
Packaging



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)

Article codes

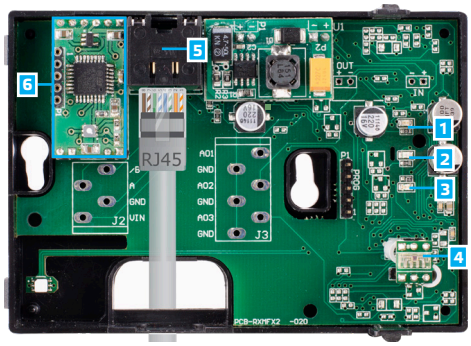
Article code	Supply	Imax	Connection
RSVCM-R	24 VDC, PoM	115 mA	RJ45

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		

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
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 - 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

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.

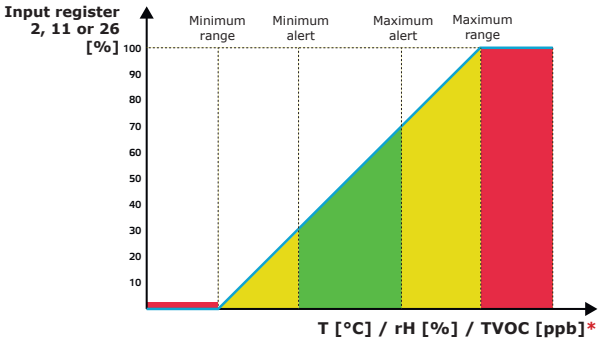
Area of use

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

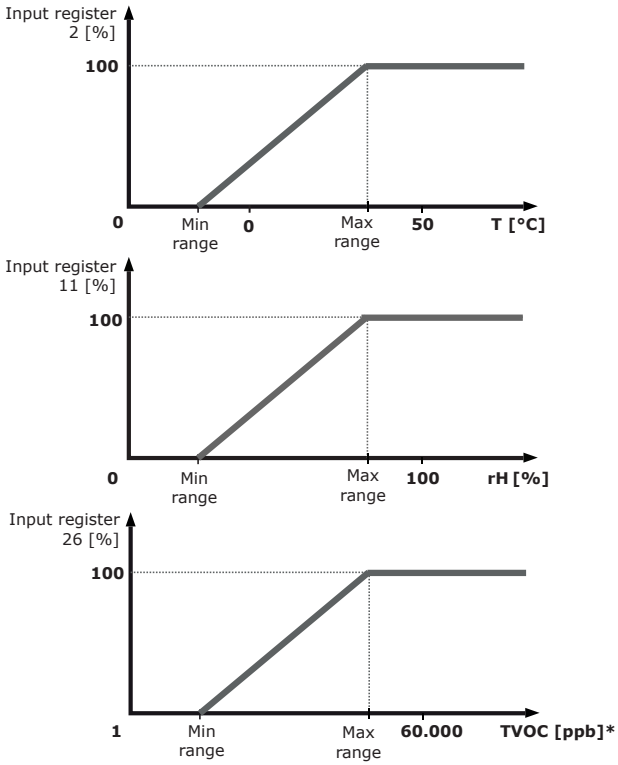
RSVCM-R

Air quality room transmitter

Operational diagram(s)



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

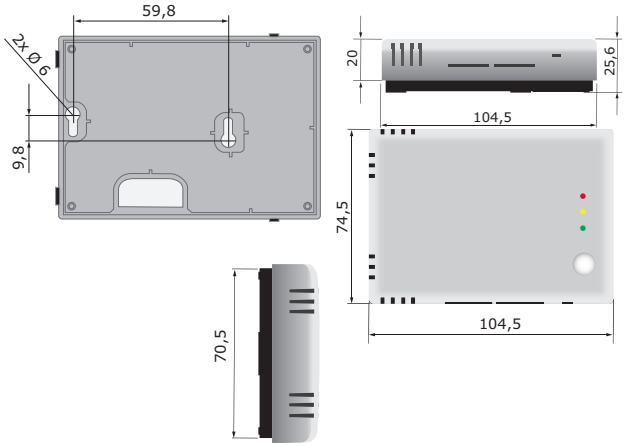


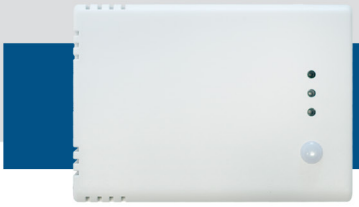
**TVOC measurements will return 0 ppb during warm-up time.*

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

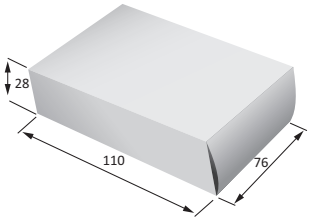




RSVCM-R

Air quality room transmitter

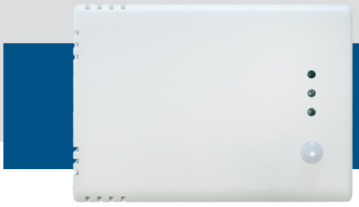
Packaging



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

Article codes

Article code	Supply voltage	Imax	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

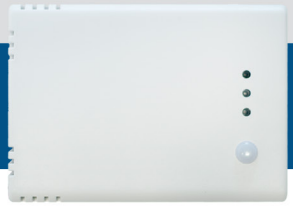
AO1	Analogue / modulating output 1 for temperature measurement (0—10 VDC / 0—20 mA / PWM)
GND	Ground AO1
AO2	Analogue / modulating output 2 for relative humidity measurement (0—10 VDC / 0—20 mA / PWM)
GND	Ground AO2
AO3	Analogue / modulating output 3 for TVOC measurement (0—10 VDC / 0—20 mA / PWM)
GND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

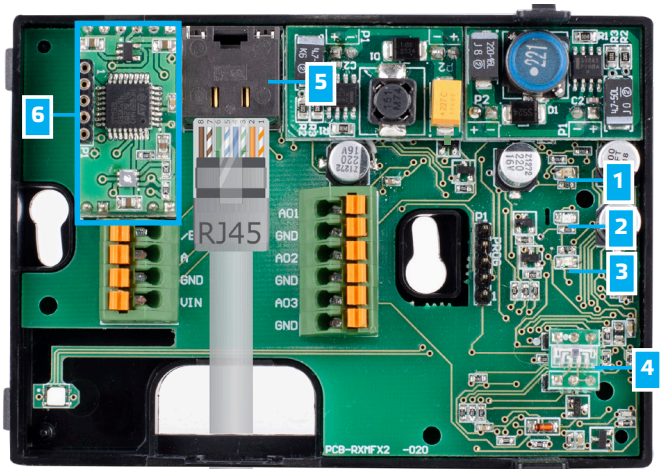
SENTERA CONTROLS

RSVCH-R

Air quality room transmitter

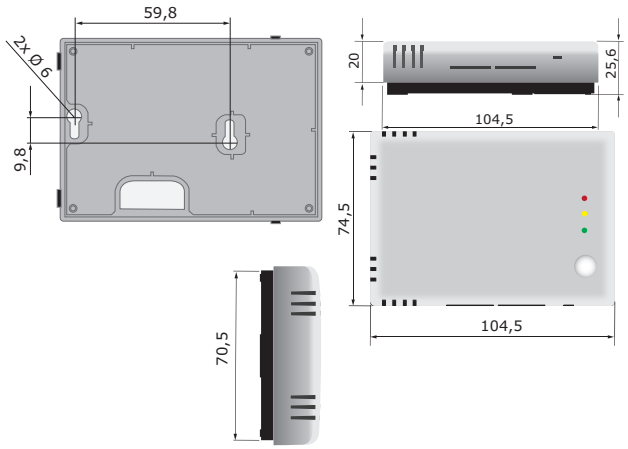


Settings and indications

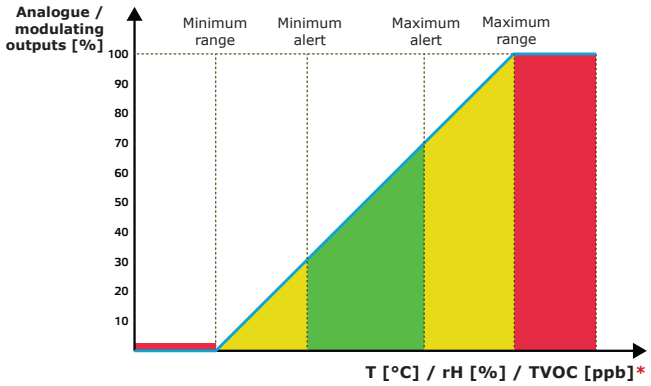


1 - Red LED	Continuous	Measured temperature, relative humidity or TVOC are out of range
	Blinking	Communication with one of the sensors fails
2 - Yellow LED	On	Measured temperature, relative humidity or TVOC are in the alert range
3 - Green LED	On	Measured temperature, relative humidity or TVOC are within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

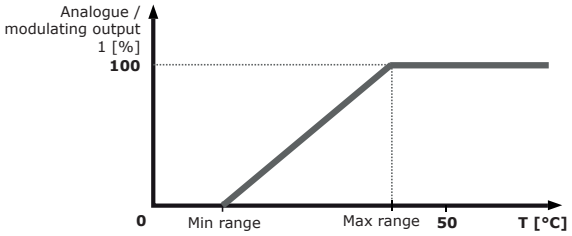
Fixing and dimensions

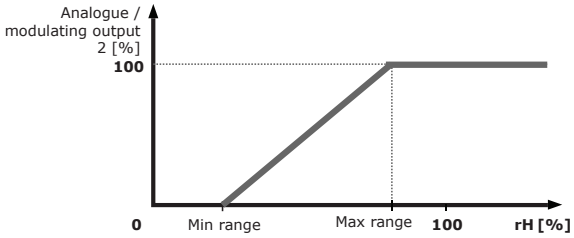


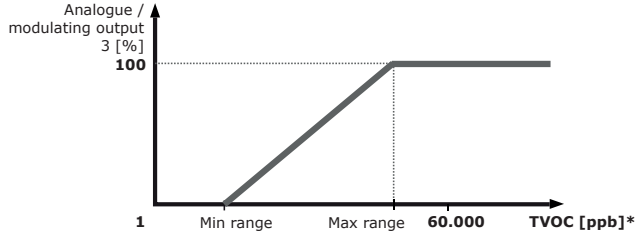
Operational diagram(s)



* 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

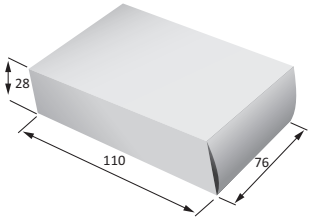
- EMC directive 2014/30/EU:
  - EN 60730-1:2011 Automatic electrical controls for household and similar use - Part 1: General requirements
  - EN 61000-6-1:2007 Electromagnetic compatibility (EMC) - Part 6-1: Generic standards - Immunity for residential, commercial and light-industrial environments
  - 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

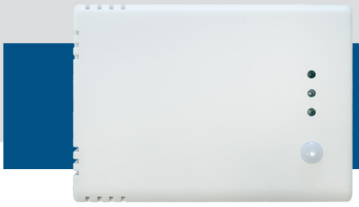
Global trade item numbers (GTIN)

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 ≥ 50 kΩ	
	0—20 mA mode: R_L ≤ 500 Ω	
	PWM (open-collector type) mode: 1 kHz, R_L ≥ 50 kΩ, 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	± 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)	

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	Imax
RCVCG-R	18—34 VDC	45 mA
	15—24 VAC ±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
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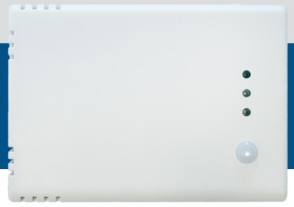
  - EN 61000-6-3:2007 Electromagnetic compatibility (EMC) - Part 6-3: Generic standards - Emission standard for residential, commercial and light-industrial environments. Amendments A1:2011 and AC:2012 to EN 61000-6-3
  - EN 61326-1:2013 Electrical equipment for measurement, control and laboratory use - 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/EU
- RoHs Directive 2011/65/EU

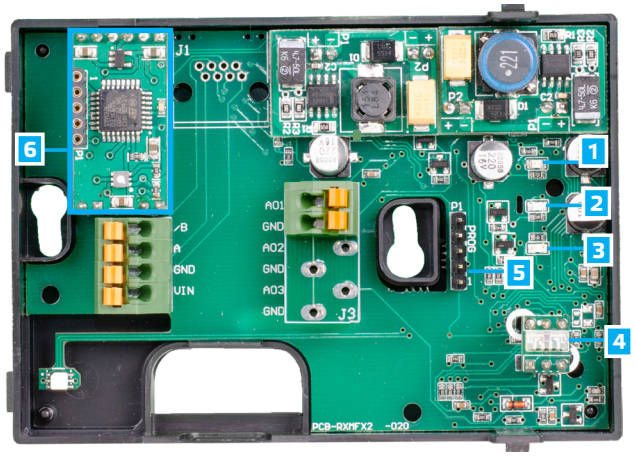
SENTERA CONTROLS



RCVCX-R

Intelligent air quality room sensor

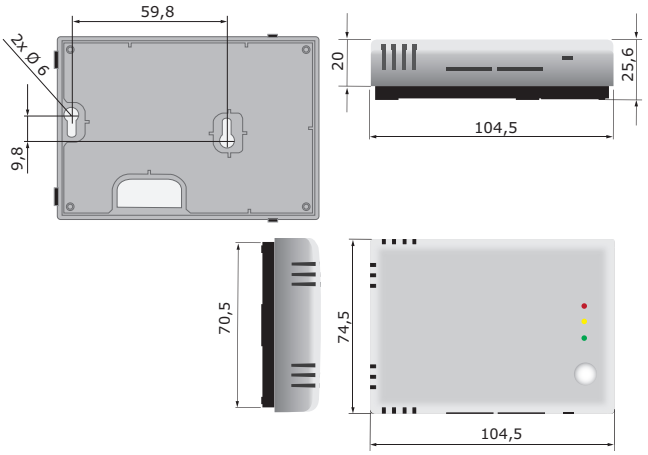
Indications



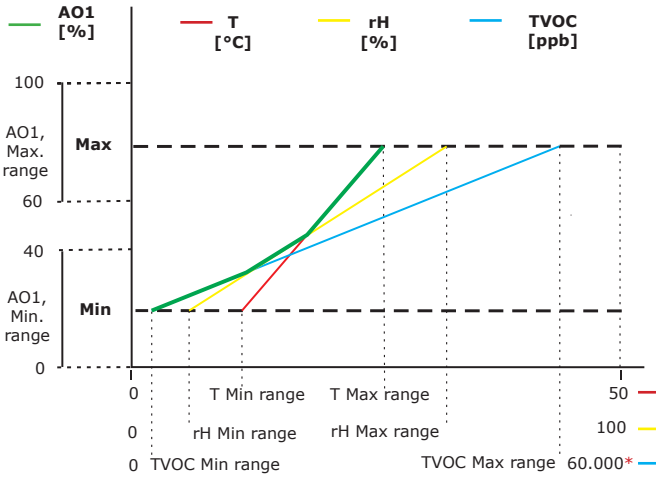
1 - Red LED	On	Measured temperature, relative humidity or TVOC values are out of range
	Blinking	Communication with one of the sensors fails
2 - Yellow LED	On	Measured temperature, relative humidity or TVOC values are in the alert range
	Blinking	Modbus communication has stopped and HR8 is activated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

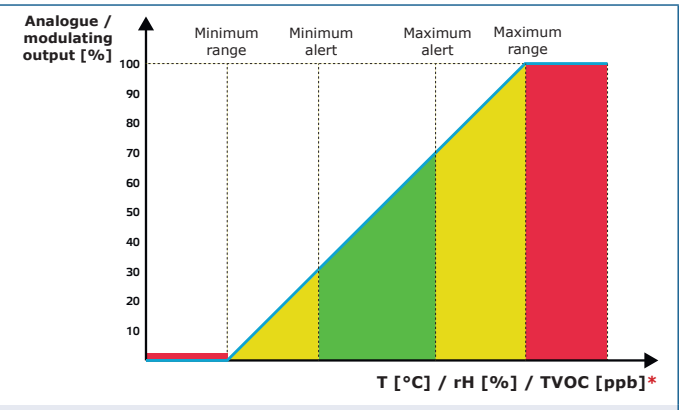


Operational diagram(s)



**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.*

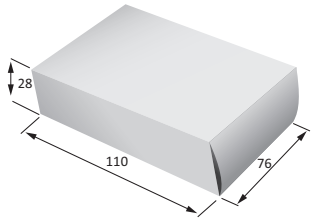


*** LED indications - T, rH or TVOC (default)**

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

SENTERA CONTROLS

RCVCM-R

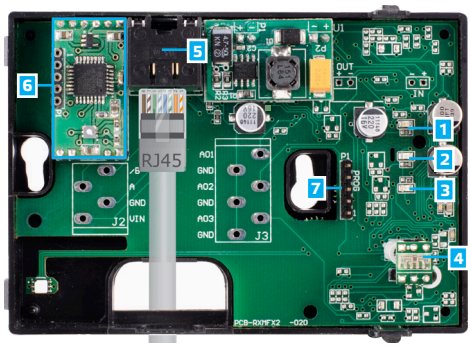
Intelligent TVOC room sensor

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

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	Imax	Connection
RCVCM-R	24 VDC, PoM	30 mA	RJ45

Technical specifications

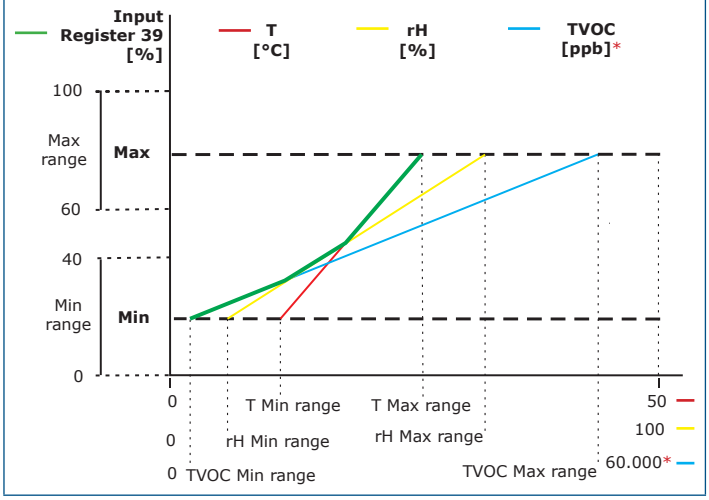
Supply		24 VDC, Power over Modbus
Warm-up time		15 minutes
Typical range of use	Temperature range	0—50 °C
	Relative humidity range	0—95 % rH (non-condensing)
	TVOC range	0—60.000 ppb
Accuracy		± 0,4 °C (range 0—50 °C)
		± 3% rH (range 0—100 %)
		±15 % TVOC (range 0—60.000 ppb)
Protection standard		IP30 (according to EN 60529)

SENTERA CONTROLS

RCVCM-R

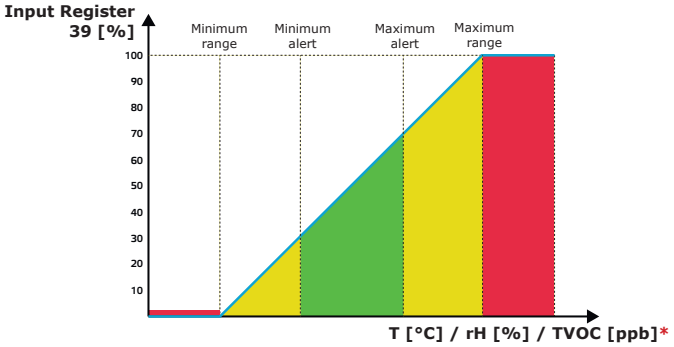
Intelligent TVOC room sensor

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.*

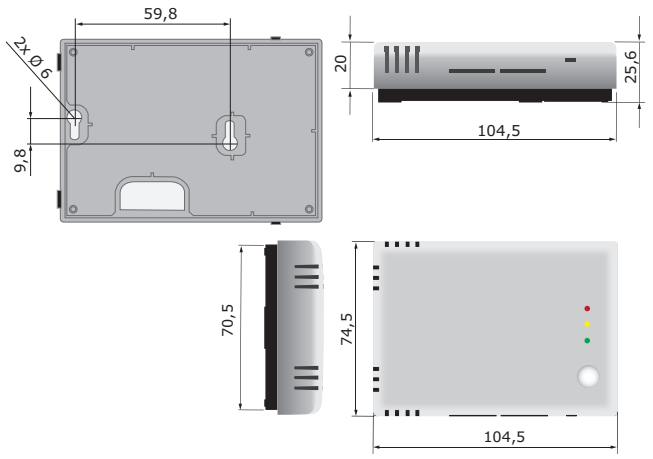


***LED indications - T, rH or TVOC (default)**

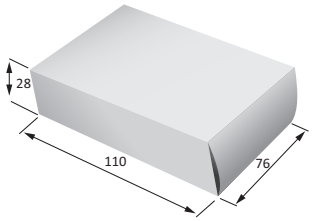
Standards

- 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

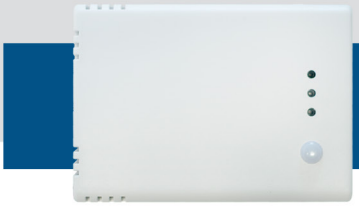
Modbus registers

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 ≥ 50 kΩ	
	0—20 mA mode: R_L ≤ 500 Ω	
	PWM (open-collector type) mode: 1 kHz, R_L ≥ 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 ºC (0—50 ºC)	
	± 3% rH (range 0—100 %)	
	±15 % TVOC (range 0—60.000 ppb)	
Protection standard	IP30 (according to EN 60529)	

Article codes

Article code	Supply voltage	Imax	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

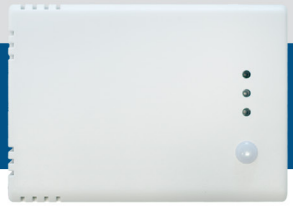
Terminal Block 2

AO1	Analogue / modulating output - temperature, humidity or TVOC measurement (0—10 VDC / 0—20 mA / PWM)
GND	Ground AO1

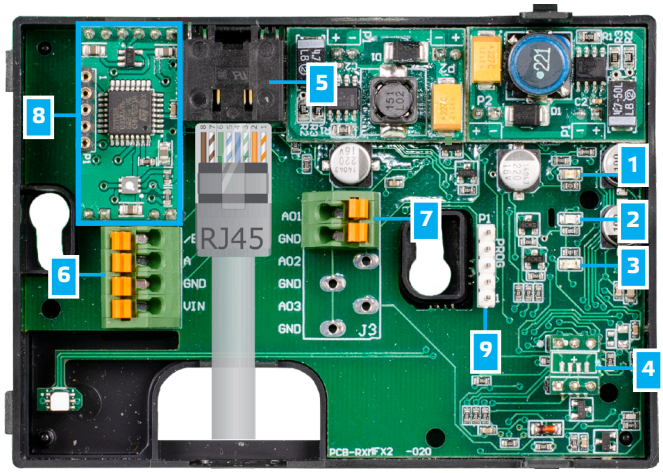
Attention! *The unit needs to be supplied via the RJ45 connector or via the connection terminals. Do not connect the device via the RJ45 connector and the terminal block simultaneously!*

RCVCH-R

Intelligent TVOC room sensor



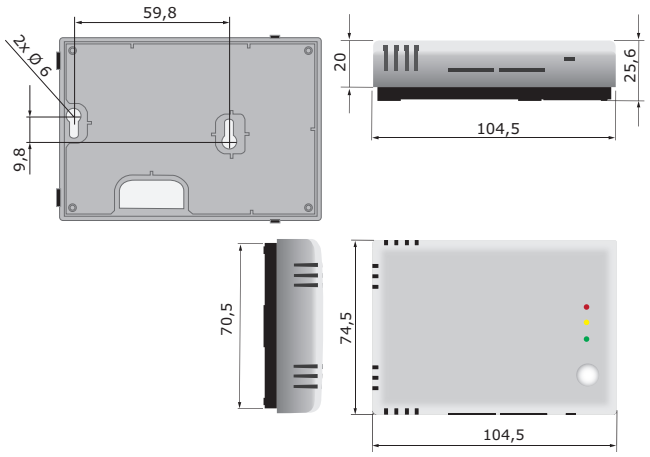
Settings and indications



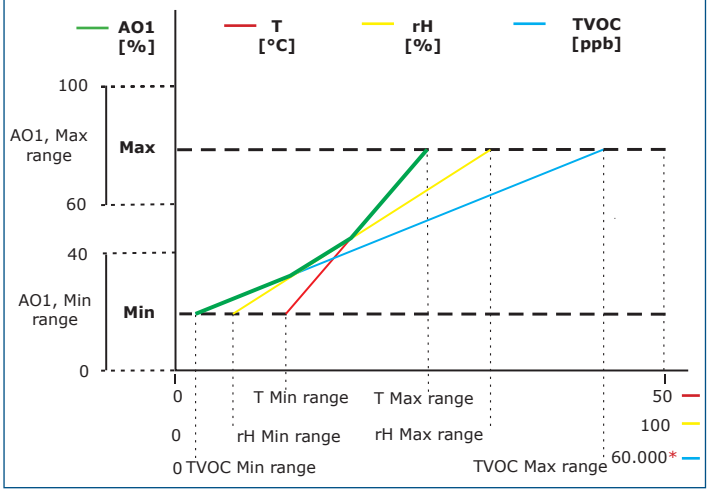
1 - Red LED	On	Measured temperature, relative humidity or TVOC values are out of range
	Blinking	Communication with one of the sensors fails
2 - Yellow LED	On	Measured temperature, relative humidity or TVOC values are in the alert range
	Blinking	Modbus communication has stopped and HR8 is activated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

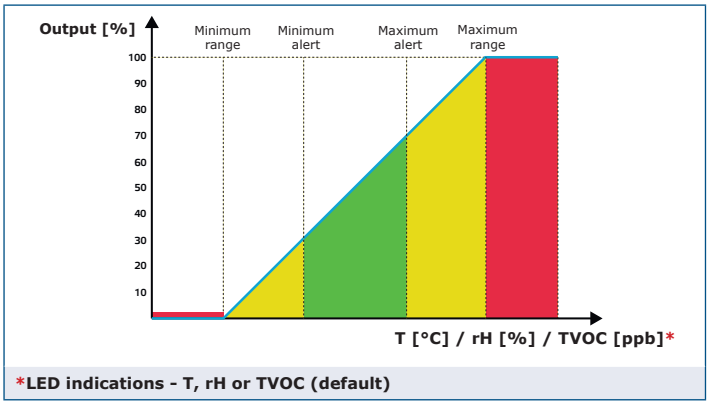


Operational diagram(s)



**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

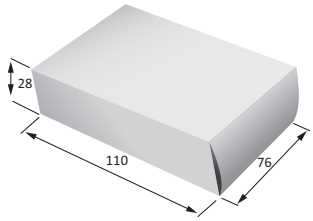
- EMC directive 2014/30/EU:
  - EN 60730-1:2011 Automatic electrical controls for household and similar use - Part 1: General requirements
  - EN 61000-6-1:2007 Electromagnetic compatibility (EMC) - Part 6-1: Generic standards - Immunity for residential, commercial and light-industrial environments
  - 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

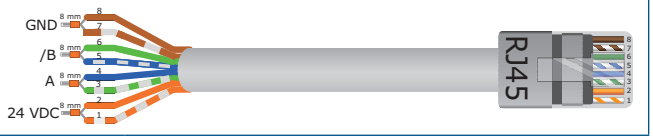
Technical specifications

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)

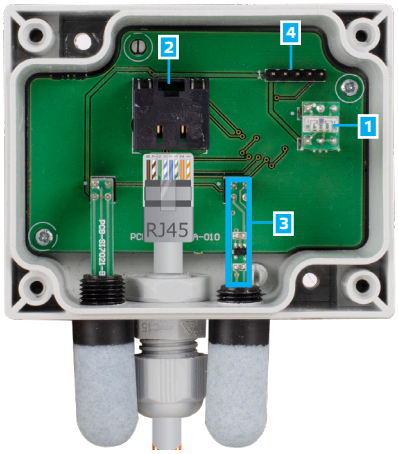
Wiring and connections

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	 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

ODVCM-R

Multifunctional transmitter for harsh environments

Modbus registers

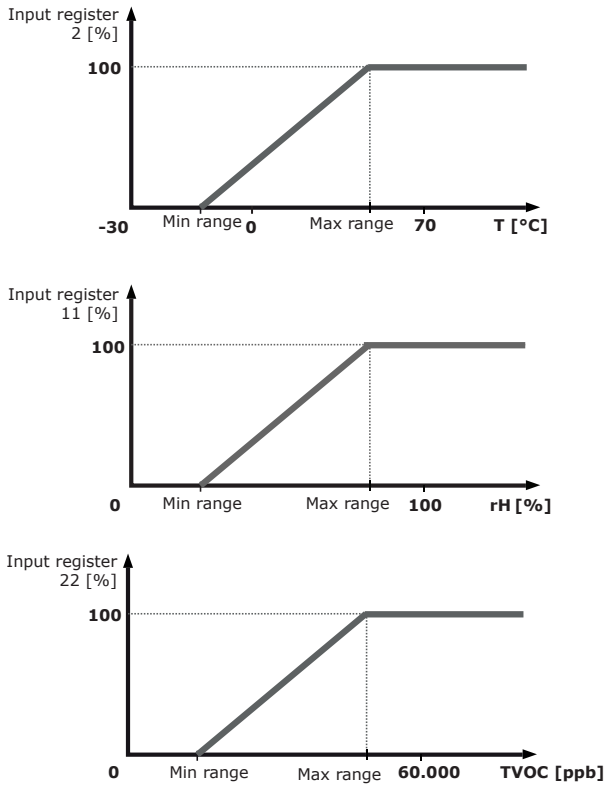
The Sensistant Modbus configurator allows you to easily monitor and/or configure Modbus parameters.

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

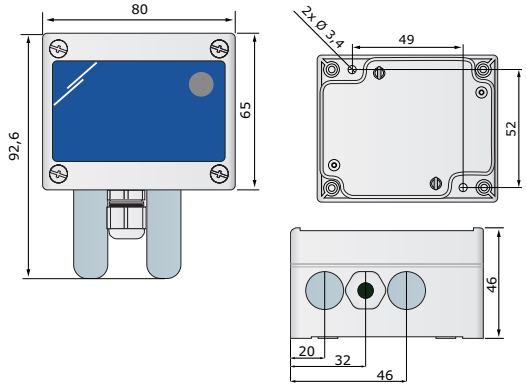
https://www.sentera.eu/en/3SMCenter

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

Operational diagram(s)



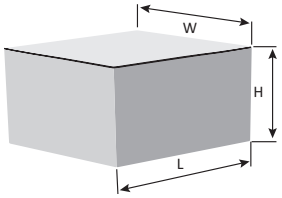
Fixing and dimensions



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 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

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

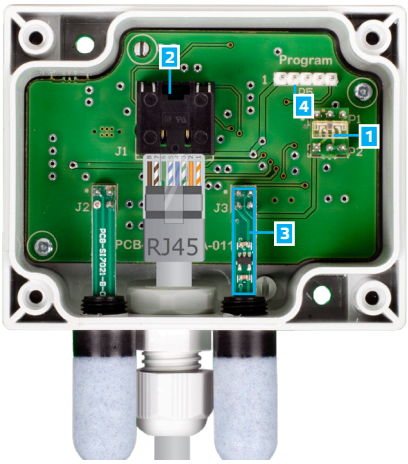
Supply voltage		24 VDC, Power over Modbus
Warm-up time		15 minutes
Typical range of use	Temperature range	-30—70 °C
	Relative humidity range	0—100 % rH (non-condensing)
	TVOC range	0—60.000 ppb
Accuracy		±0,4 ºC (-30—70 ºC)
		±3 % rH (0—100 % rH)
		±15 % TVOC (range 0—60.000 ppb)
Protection standard		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	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

OCVCM-R

Intelligent TVOC sensor for harsh environments

Modbus registers

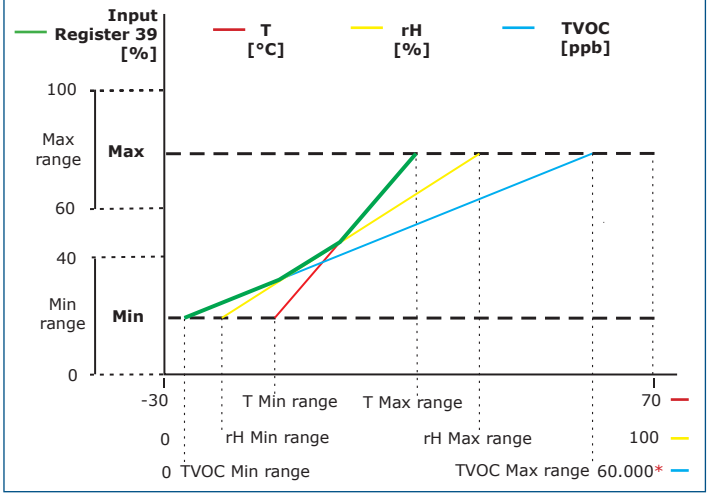
The Sensistant Modbus configurator allows you to easily monitor and/or configure Modbus parameters.

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.

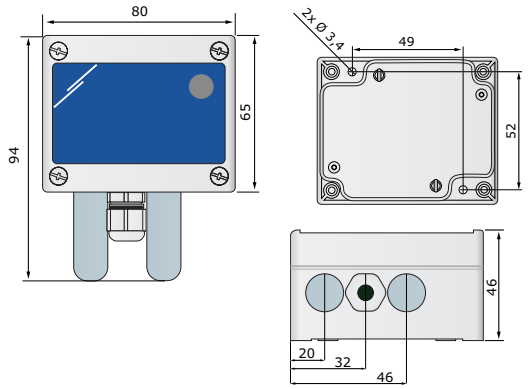
Operational diagram(s)



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.*

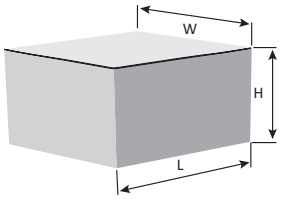
Fixing and dimensions



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 ≥ 50 kΩ	
	0—20 mA mode: R_L ≤ 500 Ω	
	PWM (open-collector type) mode: 1 kHz, R_L ≥ 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—100 %)	
	±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

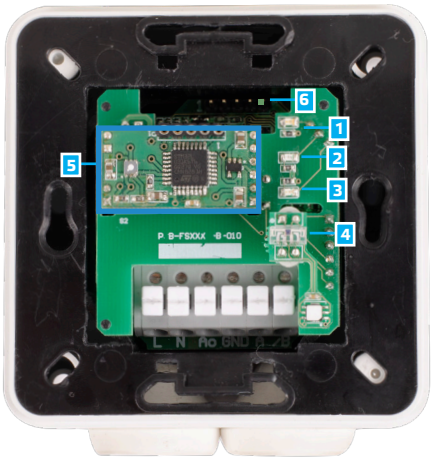
Area of use

- 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 mm²; pitch 5 mm; shielded cable

Indications



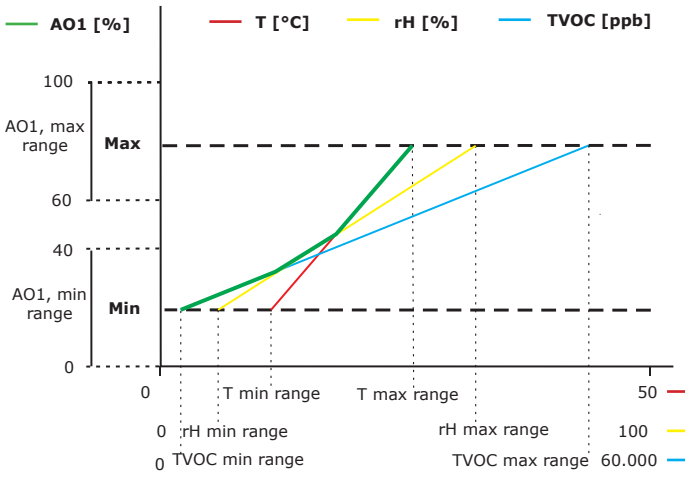
1 - Red LED	On	Measured temperature, relative humidity or TVOC values are out of range
	Blinking	Communication with one of the sensors fails
2 - Yellow LED	On	Measured temperature, relative humidity or TVOC values are in the alert range
	Blinking	Modbus communication has stopped and HR8 is activated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

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.*

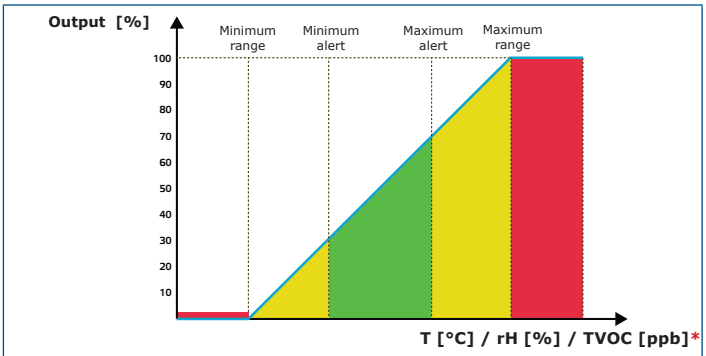
FCVC8-R

Intelligent air quality sensor

Operational diagram

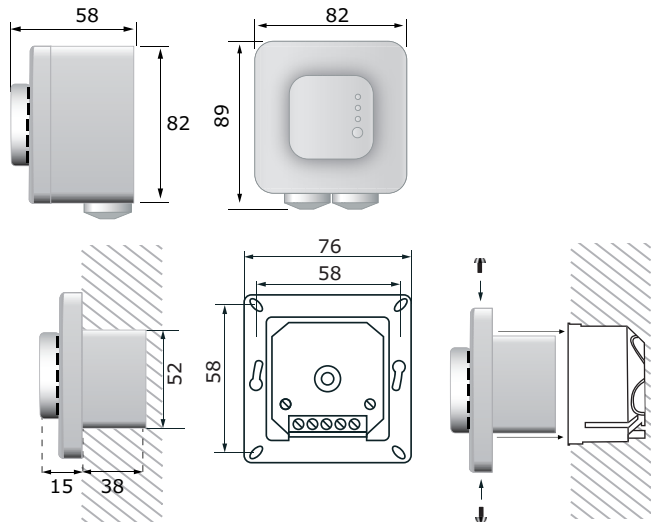


Note: *TVOC measurements will return 0 ppb during warm-up time. The output changes automatically depending on the highest of the T, rH or TVOC values, i.e. the highest of three output values controls the output. See the green line in the operational diagram above. One or multiple sensors can be deactivated. E.g. it is also possible to control the output based on the measured TVOC values only.*



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

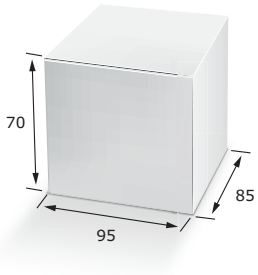
Fixing and dimensions



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

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: $R_L \geq 50$ kΩ	
	0—20 mA mode: $R_L \leq 500$ Ω	
	PWM (open-collector type) mode: 1 kHz, $R_L \geq 50$ 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—100 %)	
	±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 ±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

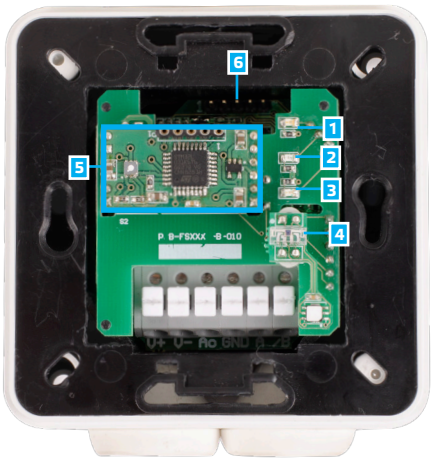
Wiring and connections

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 mm²; pitch 5 mm; shielded cable		

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

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

Indications



1 - Red LED	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	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

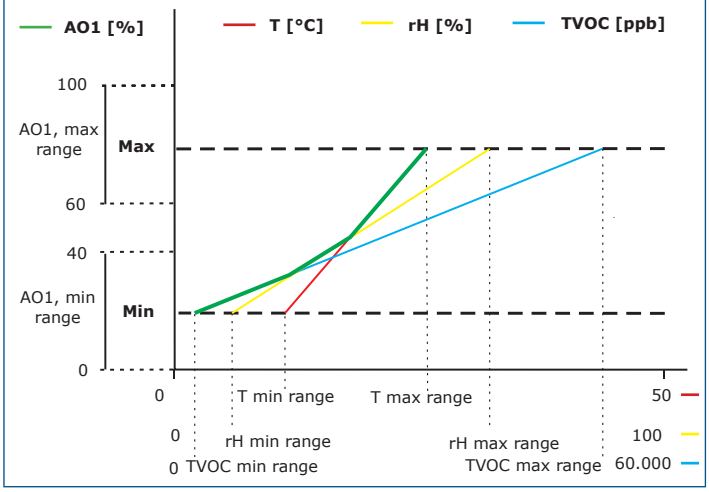
Note: *By default, the LED indicators visualise the measured TVOC level. When the sensor is in bootloader mode, the green and yellow LEDs flash alternately. During the firmware download, the red LED is flashing additionally.*

SENTERA CONTROLS

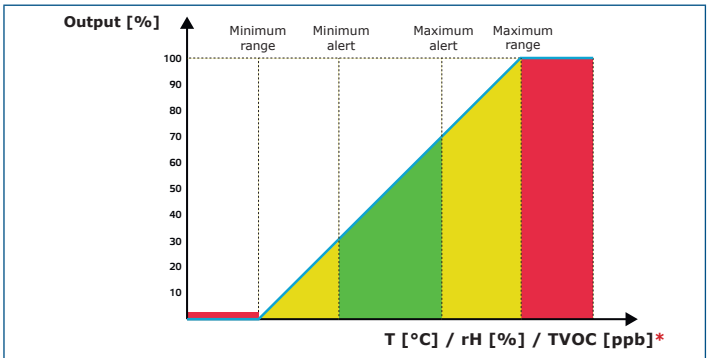
FCVCX-R

Intelligent air quality sensor

Operational diagram

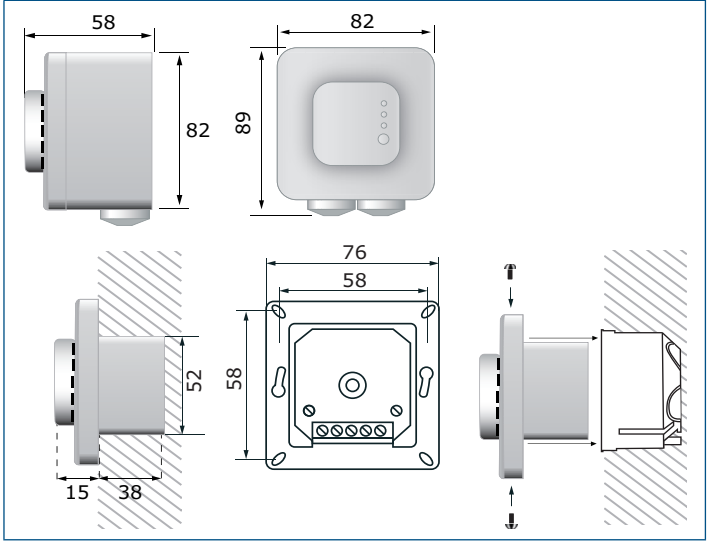


Note: *TVOC measurements will return 0 ppb during warm-up time. The output changes automatically depending on the highest of the T, rH or TVOC values, i.e. the highest of the three output values controls the output. See the green line in the operational diagram above. One or multiple sensors can be deactivated. E.g. it is also possible to control the output based on the measured TVOC values only.*



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

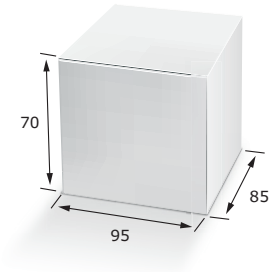
Fixing and dimensions



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.

SPRKM-R

Car park gas sensor

The SPRKM-R are multifunctional parking garages gas sensors which measure temperature, relative humidity, CO and LPG (propane C_3H_8). levels. They are Power over Modbus supplied and all parameters and the output value are accessible via Modbus RTU.

Key features

- Suitable for harsh environments
- Selectable temperature, relative humidity, CO and LPG ranges
- Selectable temperature, relative humidity, CO and LPG alert levels
- Bootloader for updating the firmware via Modbus RTU communication
- Day / Night detection via ambient light sensor with adjustable 'active' and 'standby' level
- RGB LED with adjustable brightness via Modbus register
- Modbus RTU (RS485)
- Replaceable CO and LPG sensor element
- Long-term stability and accuracy

Technical specifications

Supply voltage		24 VDC, Power over Modbus
Imax		52 mA
CO / LPG sensor element warm-up time		15 minutes
Typical range of use	Temperature	-10—50 °C
	Relative humidity	0—95 % rH (non-condensing)
	CO	0—1.000 ppm
	LPG	300—10.000 ppm
Accuracy	Temperature	± 0,4 °C (range -10—50 °C)
	Relative humidity	± 3% rH (range 0—95%)
	CO	± 5% (range 0 -1000 ppm)
Protection standard		IP54 (EN 60529)

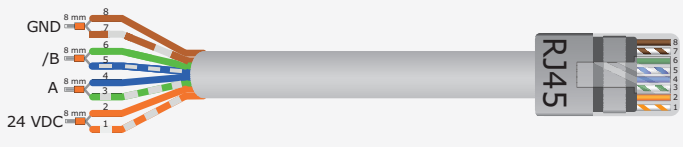
Article codes

	Supply	Connection
SPRKM-R	24 VDC, PoM	RJ45

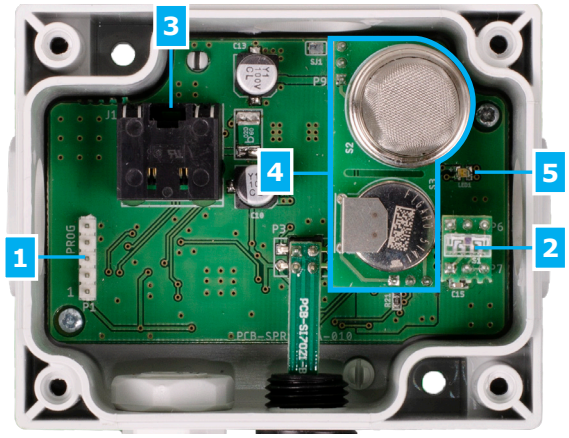
Area of use

- Monitoring gas concentration in underground parking garages and loading docks
- Ventilation control based on temperature, relative humidity and vehicle exhaust fumes - CO and LPG
- Suitable for both indoor and outdoor use (e.g. open-air spaces, multi-storey and subterranean car parks, residential and commercial buildings)

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



Settings

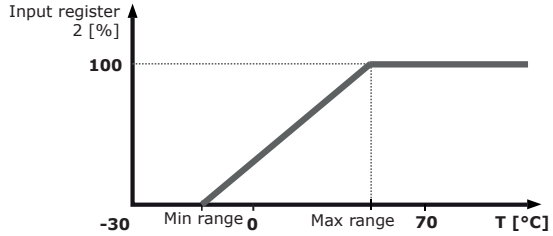


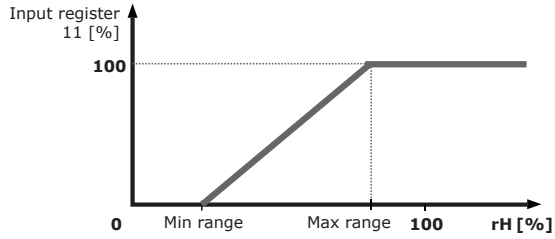
1 - PROG header, P1	1 2 3 4 5	Put a jumper onto pins 1 and 2 and wait for at least 5 seconds to reset the Modbus communication parameters
	1 2 3 4 5	Put a jumper onto pins 3 and 4 and restart the supply to enter bootloader mode
2 - Ambient light sensor		Low light intensity / Active / Standby
3 - RJ45 Socket		Plug the communication and power cable into the socket
4 - CO / LPG sensor element		Replaceable in case of faulty operation
5 - RGB LED indicator		Indicates device status and alerts

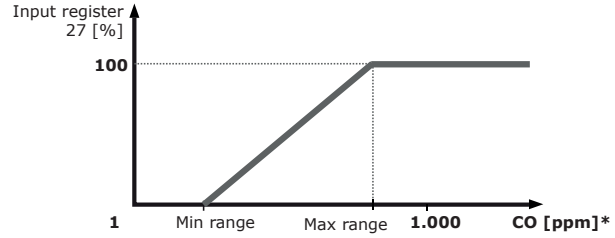
SPRKM-R

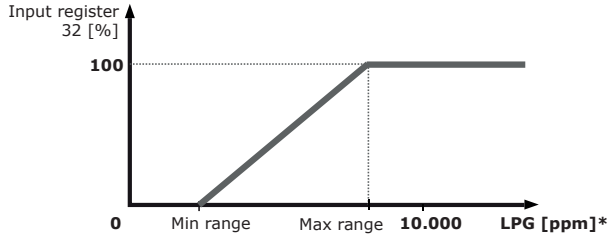
Car park gas sensor

Operational diagrams

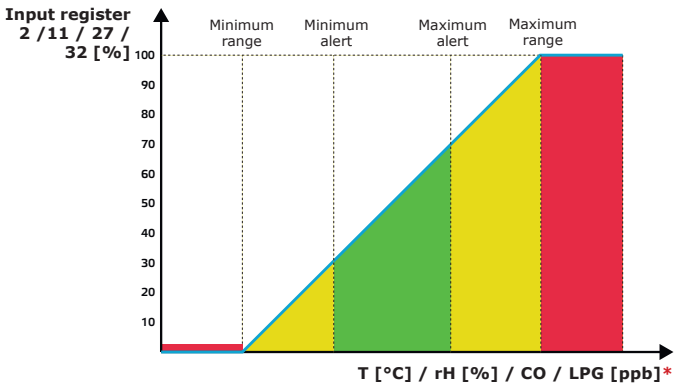






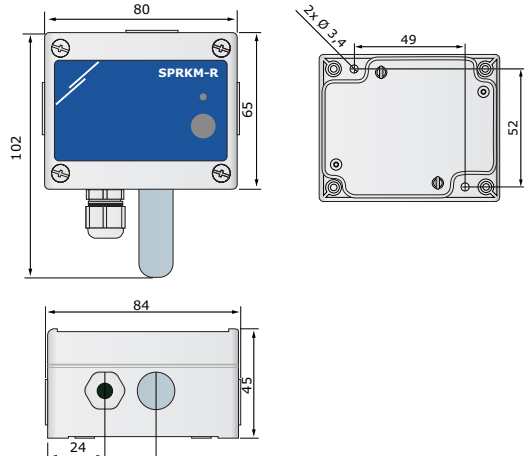


CO / LPG measurements will return 0 ppm during warm-up time.



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

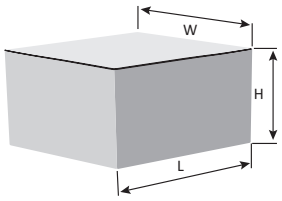
Fixing and dimensions



Standards

- Low Voltage Directive 2014/35/EC:
  - EN 61010-1:2010 Safety requirements for electrical equipment for measurement, control, and laboratory use - Part 1: General requirements
  - EN 60529:1991 Degrees of protection provided by enclosures (IP Code) Amendment AC:1993 to EN 60529
- EMC Directive 201-4/30/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
- RoHs Directive 2011/65/EC

Packaging



Article	Packaging	Length [mm]	Width [mm]	Height [mm]	Net weight	Gross weight
SPRKM-R	Unit (1 pc.)	120	95	55	0,125 kg	0,160 kg
	Box (80 pcs.)	590	380	280	10,00 kg	13,26 kg

Global trade item numbers (GTIN)

Packaging	SPRKM-R
Unit	05401003018088
Box	05401003503812

SENTERA CONTROLS

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

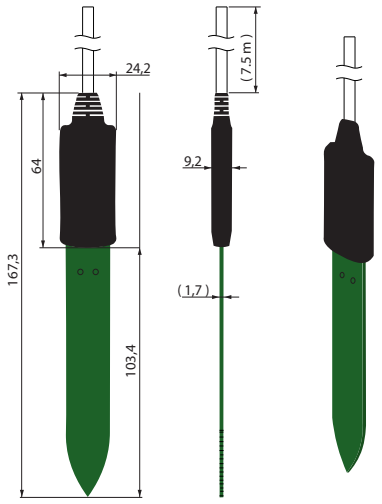
- Environmental and irrigation monitoring and control
- Measuring the moisture content of a medium
- Smart farming

Standards

CE

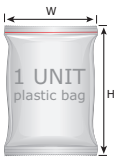
- EMC directive 2014/30/EU:
  - EN 55022:2010: Information technology equipment – Radio disturbance characteristics - Limits and methods of measurement Amendment AC:2011 to EN55022
  - EN 61326-1:2013 Electrical equipment for measurement, control and laboratory use – EMC requirements - Part 1: General 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

Dimensions



Length:	Width:	Height:
167,3 mm	24,2 mm	9,2 mm

Packaging



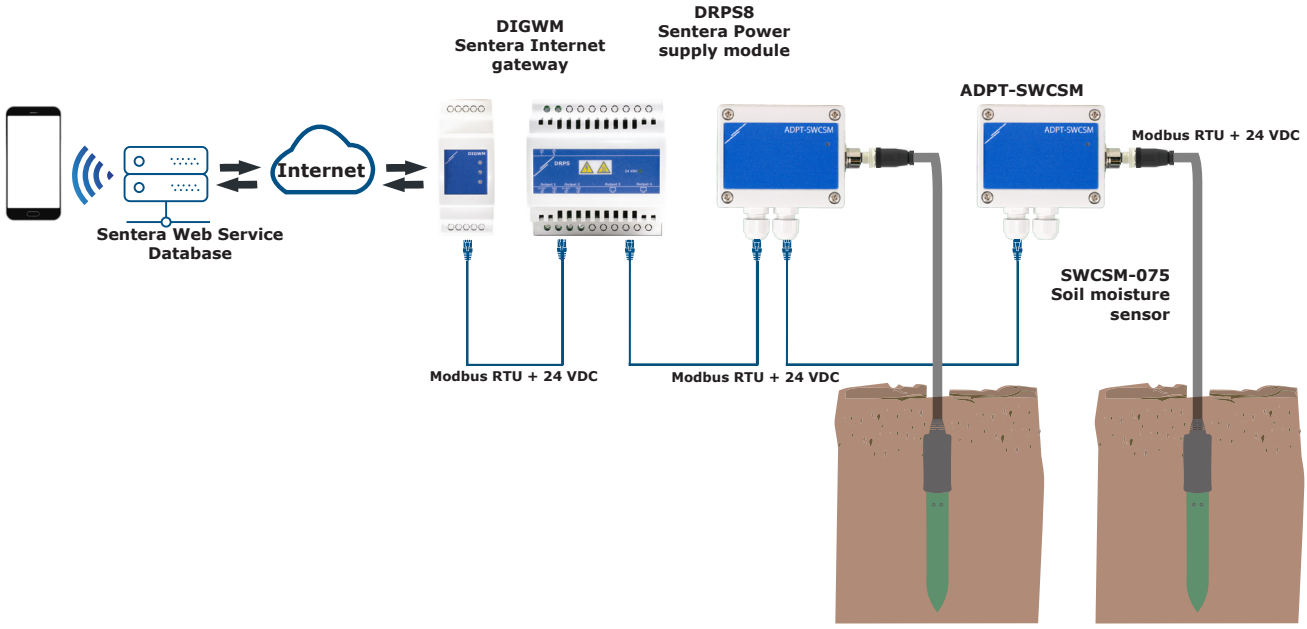
Article	Packaging	Length [mm]	Width [mm]	Height [mm]	Net weight	Gross weight
SWCSM-075	Unit (1 pc.)	167,3	24,2	9,2	0,25 kg	0,30 kg

Global trade item numbers (GTIN)

Packaging	SWCSM-075
Unit	05401003017784

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

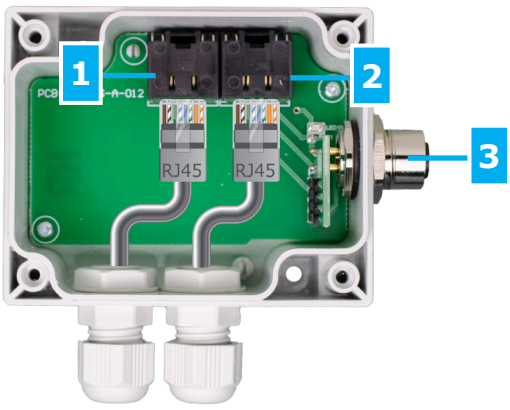
Area of use

- 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

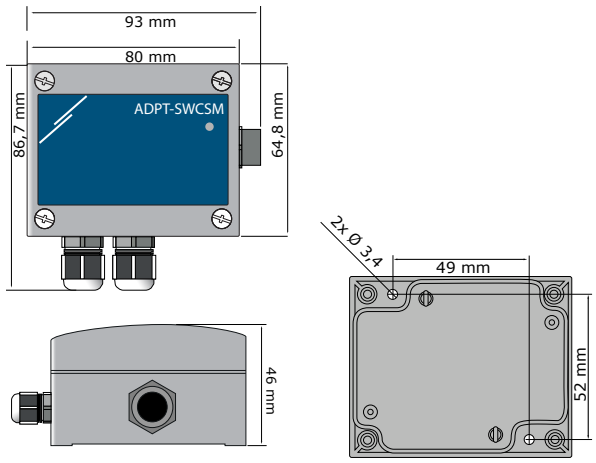
Attention! *Connect the 24 VDC power supply to only one of the RJ45 sockets! Connecting two power supplies might result in short circuit!*

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

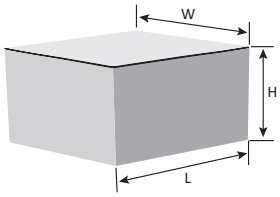


ADPT-SWCSM
Adapter box

Global trade item numbers (GTIN)

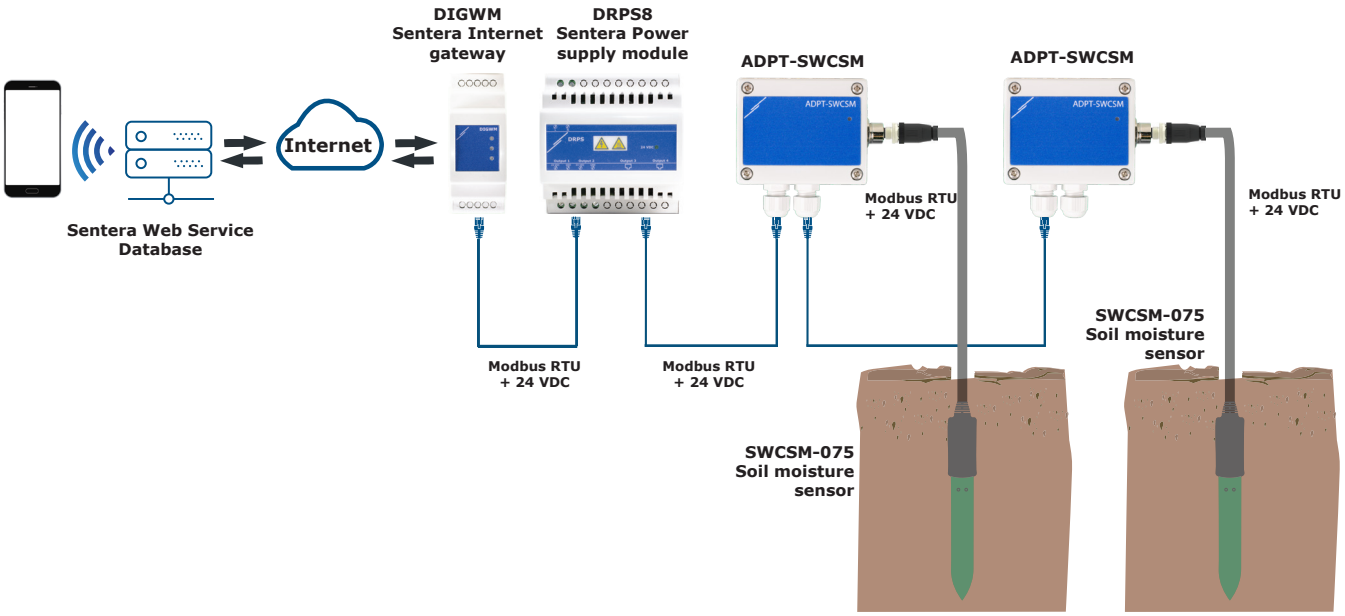
Packaging	ADPT-SWCSM
Unit	05401003017777

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

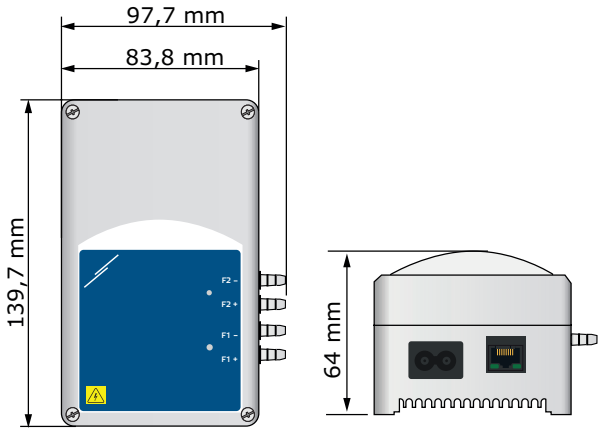
Standards

- 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

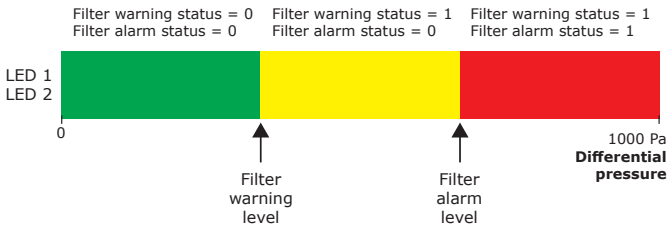
Article codes

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

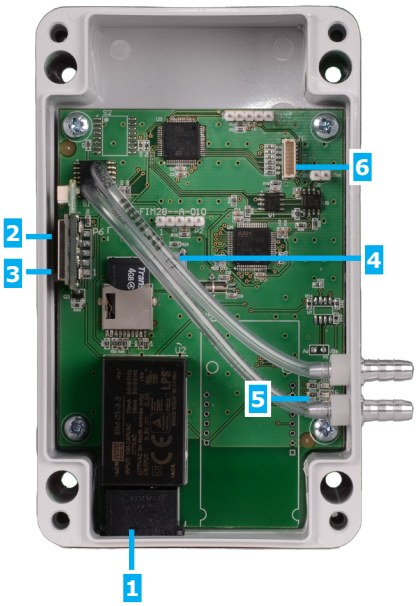


** For product versions FIM28-1K0-WF and FIM28-1K0-EW*

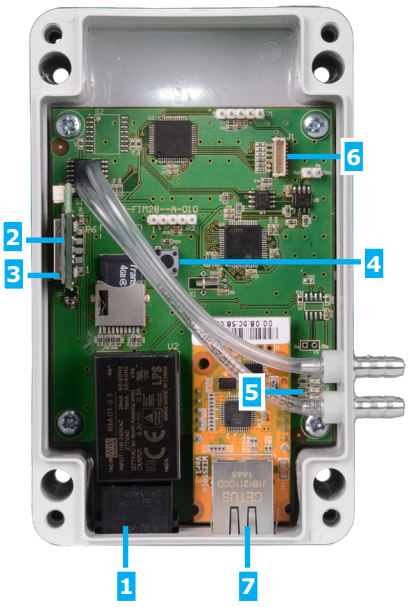
FIMX8
Air filter monitor

Settings and indications

FIM18-1K0-WF



FIM18-1K0-EW



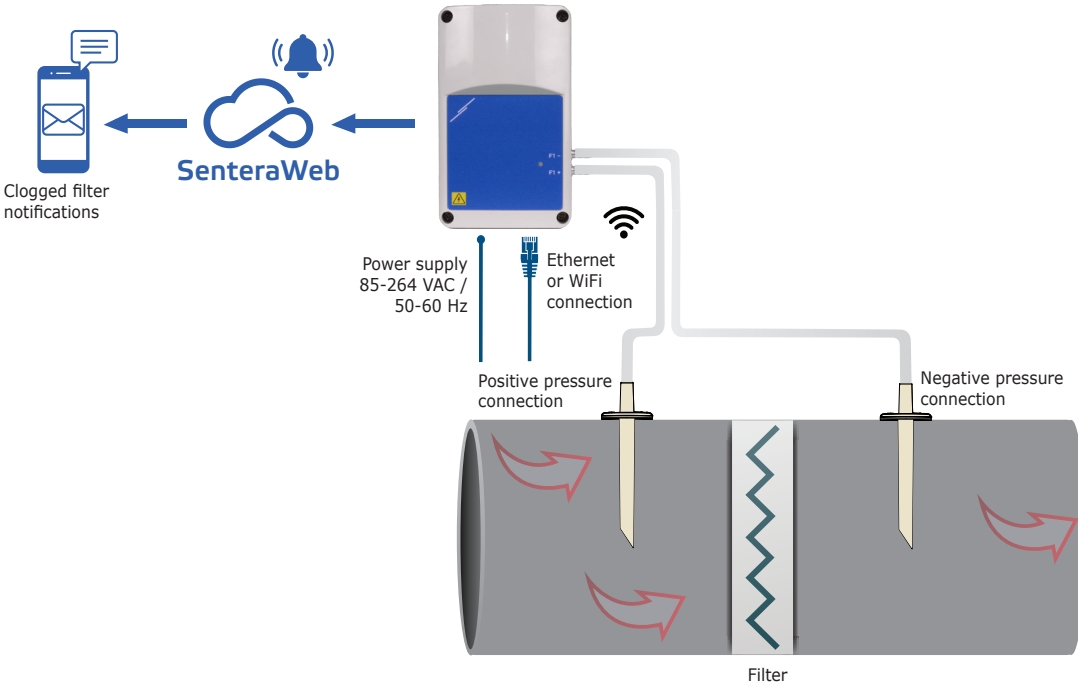
1 - Power supply			85—264 VAC / 50—60 Hz
2 - Wi-Fi module			Both the EW and WF product versions feature Wi-Fi connection. The EW version also features LAN connection
3 - Reset tact switch for Wi-Fi (for both EW and WF versions)			In case of connection problems or to stop Wi-Fi connection: press RST and 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.

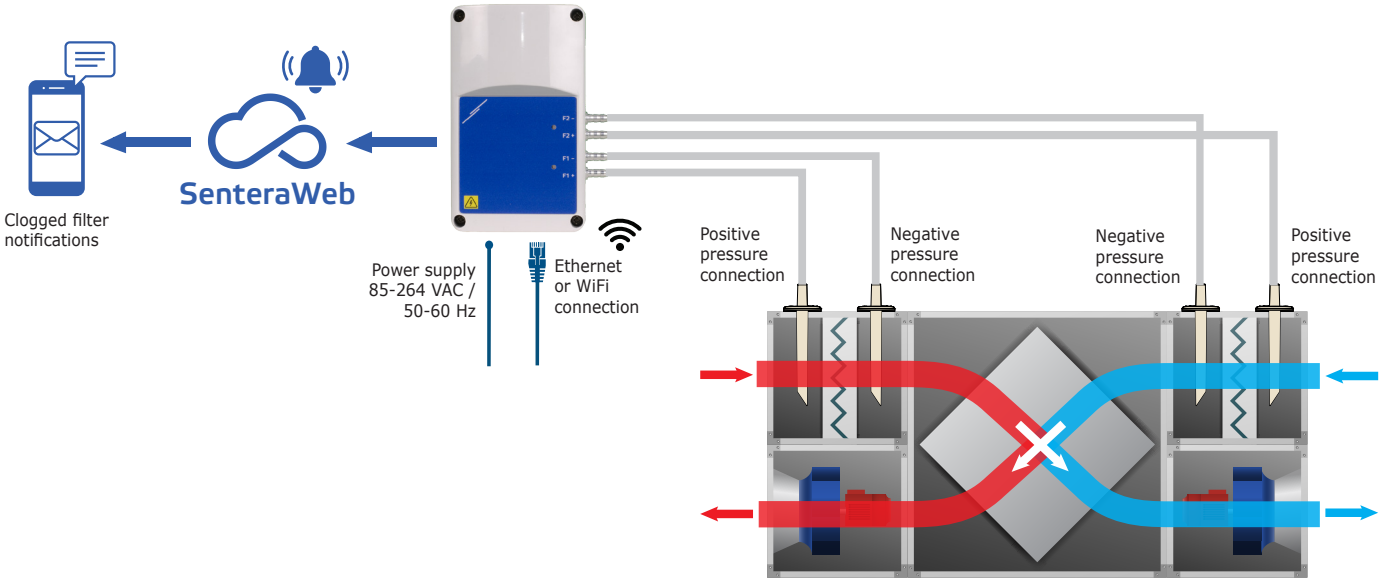
FIMX8
Air filter monitor

Application example

FIM18-1K0-XX

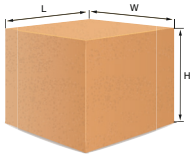


FIM28-1K0-XX



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

Despite our numerous checks and best efforts, mistakes might appear in this document. Please accept our apologies in advance.
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