

Description

DSCDG3-4 is a duct sensor that measures carbon dioxide (CO₂), temperature (T) and relative humidity (rH). The CO₂ level is measured via NDIR (non-dispersive infrared) technology, which has long-term precision and stability.

This device has an ABC self-calibrating algorithm, which compensates for the gradual drifting of the NDIR CO₂ sensor. This algorithm is designed for applications where CO₂ concentrations drop to outside ambient conditions (± 400 ppm) for at least 15 minutes once every 7-day period, which is typically seen during unoccupied periods. The lowest reading during a 7-day period is considered fresh outside air (i.e. the baseline). The ABC algorithm is enabled by default and can be disabled via Holding Register 58 through Modbus communication.



Key Features

- Measurements are transmitted via 3 analogue outputs or via Modbus RTU communication
- Easy firmware updates via Modbus RTU communication
- Robust enclosure made of Acrylonitrile Butadiene Styrene (ABS) plastic
- Remote access to device data through Modbus RTU communication
- Over-voltage protection of the power supply up to 65 VDC
- Reliable temperature and relative humidity measurements as sensing elements require no calibration

Article Code

Article code	Supply voltage
DSCDG3-4	24 VDC / 24 VAC $\pm 10\%$

Area of Use

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

Standards

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

Warnings and Attention Points

- This product is intended for indoor use only.
- Avoid mounting the device in locations affected by direct sunlight.
- Turn off the power supply before all servicing and maintenance.
- Applying overvoltage to any of the intelligent sensor parts will cause improper operation or failure to the internal circuit.
- Do not short-circuit the terminals or the input and output wiring.
- During operation, the unit must be closed.
- If the unit does not work according to the instructions, the wiring connections, supply voltage and settings need to be checked.

Technical Specifications

Imax	80 mA
Minimum recommended air flow velocity	1 m/s
Accuracy of measurements	
CO ₂ level	$\pm(30 \text{ ppm} + 3\%)$
Temperature	$\pm 0,4 \text{ }^\circ\text{C}$
Relative humidity	$\pm 2,5 \text{ rH}$
Measurement ranges	
CO ₂ level	0-2.000 ppm
Temperature	-30-70 $^\circ\text{C}$
Relative humidity	0-100 % rH
Analogue output	
0-10 VDC	(load resistance $\geq 1 \text{ k}\Omega$)
2-10 VDC	(load resistance $\geq 1 \text{ k}\Omega$)
0-5 VDC	(load resistance $\geq 1 \text{ k}\Omega$)
0-20 mA	(load resistance $\leq 500 \Omega$)
4-20 mA	(load resistance $\leq 500 \Omega$)
PWM Push-Pull	(frequency = 1kHz, load resistance $\geq 1 \text{ k}\Omega$, output voltage level = 12 VDC)
PWM Open Collector	(frequency = 1kHz, pull-up resistance $\geq 1 \text{ k}\Omega$, pull-up voltage level $\leq 12 \text{ VDC}$)
Operating conditions	
Temperature	-10-50 $^\circ\text{C}$
Relative humidity	10-90 % (non-condensing)
Storage conditions	
Temperature	-10-60 $^\circ\text{C}$
Relative humidity	5-80 % rH
Protection standard	
Enclosure	IP54
Probe	IP20
Enclosure type	
Material	Acrylonitrile Butadiene Styrene (ABS) plastic
Colour	Grey (RAL 7035)



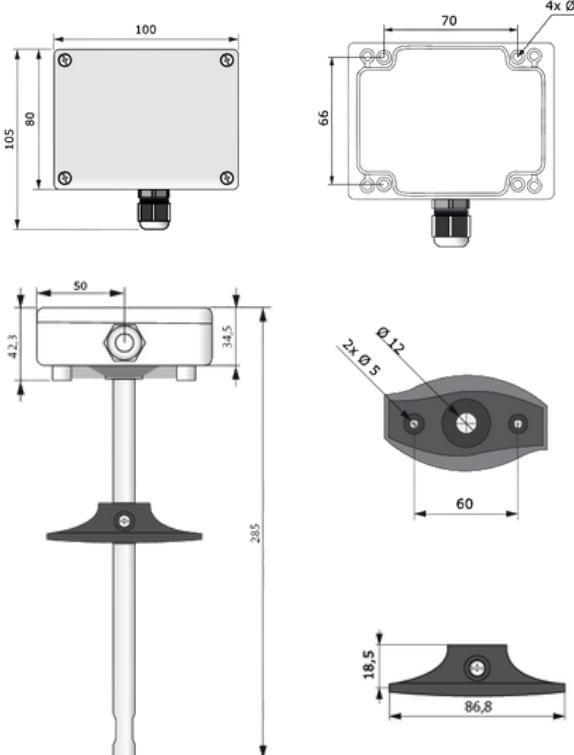
Wiring and Connections



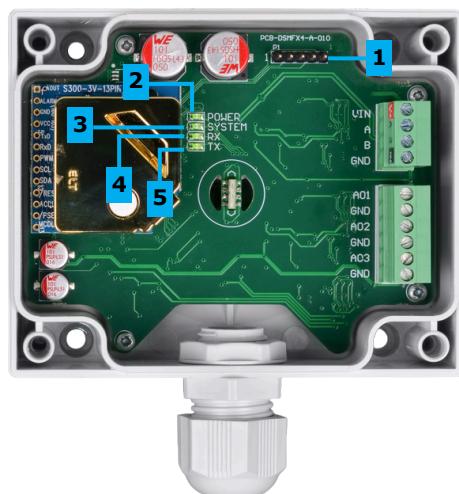
Supply voltage and Modbus communication

VIN	24 VDC / 24 VAC ± 10%
A	Modbus RTU (RS485), signal A
B	Modbus RTU (RS485), signal /B
GND	Common ground
Analogue outputs	
A01	Analogue output 1
GND	Analogue output 1, common ground
A02	Analogue output 2
GND	Analogue output 2, common ground
A03	Analogue output 3
GND	Analogue output 3, common ground
Cable characteristics	Cat5 or EIB cable, cross section ≥ 0,5 mm ²

Fixing and Dimensions



Settings and Indications



1 - PROG header, P1



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

On-board LED indication

2 - Power ON indication



The internal power supply (3,3 VDC) of the device is OK.

3 - System indications



The device is powered and the system is OK.



The device is powered, but there is a system error. Blinking frequency: 1 time per second / 1 Hz



The device is powered and is in bootloader mode. Blinking frequency: 2 times per second / 2 Hz

4 - RX indication



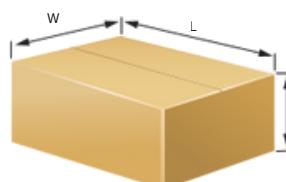
A Modbus request from a master (client) is received.

5 - TX indication



A Modbus response from the device is transmitted.

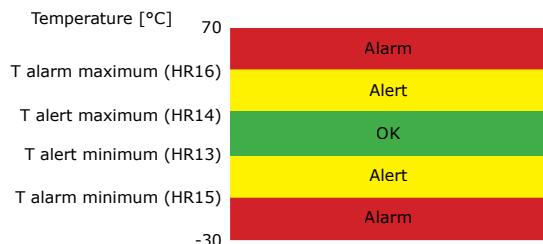
Packaging



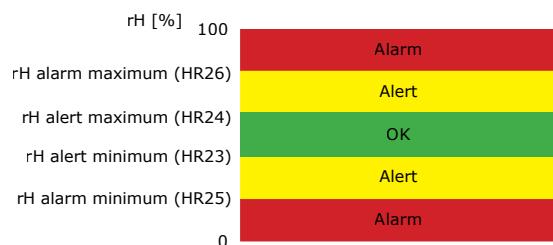
Article code	Packaging	Length [mm]	Width [mm]	Height [mm]	Net weight [kg]	Gross weight [kg]
DSCDG3-4	Unit (1 pc.)	310	115	115	0,13	0,26
	Box (24 pcs.)	590	380	505	3,07	7,25
	Pallet (384 pcs.)	1.200	800	2.170	49,15	135,35



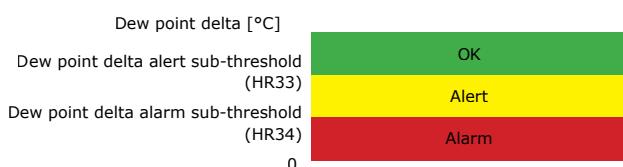
Temperature Diagram



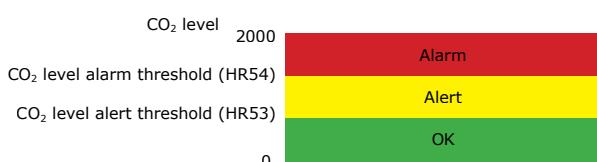
Relative Humidity Diagram



Dew Point Diagram



CO₂ Level Diagram



Global Trade Item Numbers 14 (GTIN 14)

Article code	Unit	Box	Pallet
DSCDG3-4	5401003019061	5401003504512	5401003701508

