

Ventilation Sensor – VS18

Carbon dioxide sensor / transmitter

PRODUCT DESCRIPTION

VS18 is a state-of-the-art non-dispersive infrared (NDIR) carbon dioxide (CO2) sensor cum transmitter. The direct insertion design and miniature size makes it easy to install in the ventilation duct.

The VS18 measures the CO2 concentration in the ambient air up to 2,000 ppm and provides measurement in a 0-10 V or 4-20mA output signal.

With CO2 demand controlled ventilations, VS18 helps to save money by decreasing the energy consumption while maintaining a healthier indoor climate!



**VS18-K (Duct mount)
CO2 sensor/transmitter**

FEATURES

Using patented state-of-the-art non-dispersive infrared (NDIR) wave-guide technology and offers reliable measurements

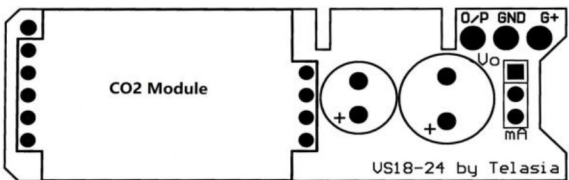
- measurement range: 0 - 2 000 ppm CO2
- analogue outputs:
OUT: 0 - 10 V (= 0 - 2 000 ppm CO2)
or 4 – 20mA (= 0 - 2 000 ppm CO2)
- maintenance-free in most HVAC ventilation applications
- high tolerance to extreme humidity environment conditions
- comply to EMC directive 89/336/EEC
- non-frill design, direct DDC connection
- optional ranges 0-0.5%, 0-2% or 0-5%
- Two different mounting options:
1) IP65 duct housing (model : VS08-K)
2) IP65 wall mount (model: VS08-W)
installation note: direction of sensor facing downwards)

APPLICATIONS

VS18 is a cost-effective sensor/transmitter for building climate control and other processes where measurement of carbon dioxide concentration is required.

By controlling the ventilation based on actual demand, it helps to reduce energy consumption while maintaining an acceptable and healthy indoor climate!

With high tolerance to extreme humidity environment, the VS18 is ideal for applications in greenhouses, mushroom farming and AHUs in high RH regions.



Power supply has to be connected to G+ and G0. G0 is considered as system ground. If analogue output is connected to a controller, the same ground reference has to be used for the VS18 unit and for the control system

WIRE CONNECTIONS

1	G+	Red	24 V AC/DC (+)
2	G0	Black	System ground (-)
3	Out	Brown/Blue	Signal output, 0-10V (by default) or 4-20mA (jumper select)

General Performance

Compliance with	EMC directive 89/336/EEC
Operating Temperature Range	0 - 50 °C
Storage Temperature Range	-40 to +70 °C
Operating Humidity Range	0 to 100% RH (sensor in powered-up condition)
Operating Environment	residential, commercial and industrial spaces ¹
Warm-up Time	≤ 1 min. (@ full specs ≤ 15 minutes)
Sensor Life Expectancy	> 15 years
Duct air velocity	Direct insertion sensor, no minimum air speed requirement
Maintenance Interval	no maintenance required ² (with ABC algorithm)

Electrical

Power Input	24 VAC/VDC ±20%, 50 Hz or 60Hz (half-wave rectifier input)
Power Consumption	< 1 Watt average
Connection wires	3 x 22AWG cables for power input (G+, G0) & voltage/current output (Out)

CO₂ Measurement

Sensing method	Non-dispersive infrared (NDIR) wave-guide technology with Automatic Background Calibration (ABC) and passive gas diffusion (no moving parts)
Response Time (T _{1/e})	< 10 sec. @ 30 cc/min. flow rate
	< 3 min. diffusion time
Repeatability	± 30 ppm ± 1 % of reading
Accuracy ^{1,2}	± 40 ppm ± 3 % of reading (@ 25 °C)
Annual Zero Drift ^{1,2}	< ± 10 ppm (with ABC function)
Pressure Dependence	+ 1.6 % reading per hPa
Installation support	background level calibration adjustment jumper trigger (bCAL).

Outputs

Voltage signal terminal CO₂ ³	
Voltage or current output	Jumper selection (default 0 – 10V)
Vo linear conversion range	0 -10 VDC for 0 - 2 000 ppmvol.
Io linear conversion range	4 – 20mA for 0 - 2 000 ppmvol.
D/A resolution	10 bits, 10 mV or 0.016mA
D/A conversion accuracy	± 2 % of reading ± 50 mV
Electrical characteristics	Voltage output - R _{OUT} < 100 Ohm, R _{LOAD} > 5 kOhm
	Current output – R _{LOAD} < 500 Ohm

Measuring range option

- 0.5%	0 ~ 5,000ppm CO2
- 2%	0 ~ 2 vol. % CO2
- 5%	0 ~ 5 vol. % CO2

Mounting options

DUCT HOUSING (standard)

Dim.: 94mm x 30mm diameter
Duct probe length: 51 mm
Protection class: IP65

WALL HOUSING (option)

Dim.: 94mm x 30mm diameter
Protection class: IP65 (installation dependent)



VS18-K



VS18-W

Note 1: The SO₂ enriched environments are excluded.
Note 2: In normal IAQ applications (@ NTP). Accuracy is defined after minimum 3 weeks of continuous operation.
The tolerance of the span calibration gas (2 % unless otherwise requested) and test gas adds to the total uncertainty.
Note 3: The specifications are valid for the output load connected to ground G0. Other outputs and measurement ranges are available per request.