

GS-CO2-1001

Space Mounted CO₂, Temperature & RH Sensors



Features:

- CO₂ Self-calibration algorithm
- Selectable 0-10Vdc, 0-5Vdc or 4-20mA output
- Direct thermistor options available
- LCD display, fan speed, set point & momentary switch options
- "Traffic Light" LED CO₂ indication option

Benefits:

- Aesthetically pleasing housing
- Long sensor life
- Energy saving by ventilating at the optimum CO₂ levels

Technical Overview

The GS-CO2-1001 range combines CO₂ and Temperature or CO₂, temperature & RH sensing in one housing.

Using a non-dispersive infrared sensor for measuring CO₂ concentrations and utilizing microprocessor based electronics, the unique self-calibration algorithm offers long-term stability and accuracy. They are also fitted with a temperature output or RH & temperature output. A directly connected passive resistive temperature output is also available, as an alternative to the standard active temperature output.

The sensor can be used to ensure adequate ventilation while maximizing energy savings by ventilating at the optimum level, making these ideal for all types of ventilation in commercial buildings, industrial plants, laboratories and public spaces, such as schools.

Specification:

Outputs	0-10Vdc, 0-5Vdc or 4-20mA
Power supply	24Vac/dc
Supply current	140mA max.
Output ranges:	
CO ₂	0 to 2000ppm
Temperature	0 to 40°C
Optional	
-HR	0 to 5000ppm
-RHT	0 to 100%
-T	PTC/NTC Element Any Sontay resistive type
Accuracy:	
CO ₂	±30ppm +5% of reading
Temperature	±0.5°C
RH	±3%RH (20 to 80%)
Stability:	
CO ₂	<2% of FS over sensor life
Temperature	±0.1°C
RH	±1%RH per year
Ambient:	
Temperature	0°C to 50°C
RH	0 to 95% RH, non-condensing
Housing:	
Material	ABS (flame retardant)
Colour	polished white finish
Dimensions	115 x 85 x 28mm
Protection	IP30
Country of origin	UK



The products referred to in this data sheet meet the requirements of EU Directive 2004/108/EC

Part Codes:

GS-CO2-1001

Space CO₂ & T transmitter 0-2000ppm

GS-CO2-RHT-1001

Space CO₂, RH & T transmitter 0-2000ppm

Suffixes (add to part code)

-T Direct resistive temperature output*
Thermistor types:

A (10K3A1)	B (10K4A1)	C (20K6A1)
H (SAT1)	K (STA1)	L (TAC1)
M (2.2K3A1)	N (3K3A1)	P (30K6A1)
Q (50K6A1)	S (SAT2)	T (SAT3)
W (SIE1)	Y (STA2)	Z (10K NTC)

Platinum types:

D (PT100a)	E (PT1000a)
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Nickel types:

F (NI1000a)	G (NI1000a/TCR (LAN1))
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-HR

0-5000ppm CO₂ range

-SP

2-Wire resistive set point 0-10KΩ or 11-1KΩ

-MS

Momentary switch

-FS3

Resistive 3-speed fan switch

-FS4

Resistive 4-speed fan switch

-FS5

Resistive 5-speed fan switch

-LCD

Integral LCD

-TR

Custom temperature output range scaling

-LED

3-colour LED indication for CO₂



Note*:

When using the **-T** option, they are not compensated for internal heating.

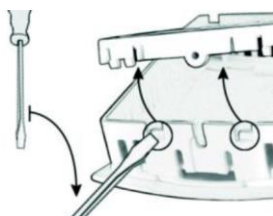
Current versions are NOT loop powered and will require a common 0V connection.

Installation:



Antistatic precautions must be observed when handling these sensors. The PCB contains circuitry that can be damaged by static discharge.

1. Select a location on a wall of the controlled space which will give a representative sample of the prevailing room condition. Avoid sitting the sensor in direct sunlight, on an outside wall or near heat sources. An idea mounting height is 1.5m from the floor.
2. Undo the tamperproof screw at the bottom of the housing.
3. To remove the front panel from the base, twist a screwdriver as below and pull gently the front panel from the base.



4. Using the base as a template mark the hole centres and fix to the wall with suitable screws. Alternatively the base plate can be mounted on to a conduit box or standard recessed back box. The base plate is suitable for EU & North America fixings.
5. Feed cable through the hole in the base plate of the housing and terminate the cores at the terminal block as required. Leaving some slack inside the unit.
6. Set yellow dip-switches according to output type required (see page 5 for dip-switch details).
7. Replace the housing to the base plate and fit the tamperproof screw (if required) through the lug at the bottom of the base plate.
8. Before powering the sensor, ensure that the supply voltage is within the specified tolerances.
Note: When using the sensor with a 4-20mA output, it is important to make all electrical connections before applying the supply voltage. If the sensor is not connected sequence, then you may see a higher reading than expected (can be as much as 55mA).
9. Allow 10 minutes before carrying out pre-commissioning checks. This will allow the electronics time to stabilise and full commissioning should not be carried out for at least 48 hours. This will enable the ABC Logic self-calibration procedure to complete.

ABC Logic Self-Calibration:

When first powering the transmitter, it needs to be powered continuously for at least 2 days. This will allow the CO₂ sensors ABC Logic self-calibration system to operate correctly.

Connections:

Left Hand terminal Block:

24V	Supply + 24Vac or Vdc (see note below)
GND	Supply 0V
OP1	Temperature output (see J11 settings)
OP2	Optional RH output
GND	Common 0V
OP3	CO ₂ Output
GND	Common 0V
OVRD	0-10Vdc input to indicate occupancy or override. Note that this can only be used if voltage output is used, as it needs a common 0V, and if the LCD option is fitted.

Right Hand Terminal Block (if option's are selected);

T2	Direct thermistor output only (other half of OP1 if J11 is set to T)
MS1	Momentary switch VFC output
MS2	Momentary switch output
P5*	Set point
P6*	Set point wiper
P7*	Set point
FS2	Fan speed switch output, resistive
FS1	Fan speed switch output, resistive

Notes:

Voltage output Nominal voltage 24Vac/dc.

Current output Nominal voltage 24Vac/dc 3-wire

Set point* 2-wire 11-1k Ω output is required use terminals P6 and P7
 2-wire 0-10k Ω output is required, use terminals P5 and P6

Direct thermistor output (if fitted) is between terminals OP1 and T2, polarity is independent. When using the **-T** option, they are not compensated for internal heating.

Options:

Set point, this is available in two standard values;

-	+	(legend markings on housing fascia)
0k Ω	10k Ω	
11k Ω	1k Ω	

Using an external 1k Ω resistor (not supplied) on the 0-10k terminals 1-11k Ω can be achieved if required.
Potentiometer tolerances are $\pm 30\%$

Fan speed, the position of the selector switch will cause the resistance between the terminals to alter as shown below.

Switch position	Output
0	Open circuit
1	22.7k Ω
2	26k Ω
3	29.3k Ω
Auto	32.6k Ω

Momentary switch, rated at 24Vac/dc @ 500mA max.

Dipswitch/Jumper Settings & PCB Layout:

Main board

J10

If the outputs are set to voltage (by putting jumpers J1, J2 and J3 in the "V" position), the output can be set to either 0-10Vdc or 0-5Vdc;

J1, J2, J3

These set the output to either voltage of current:
V for voltage, I for current

J11

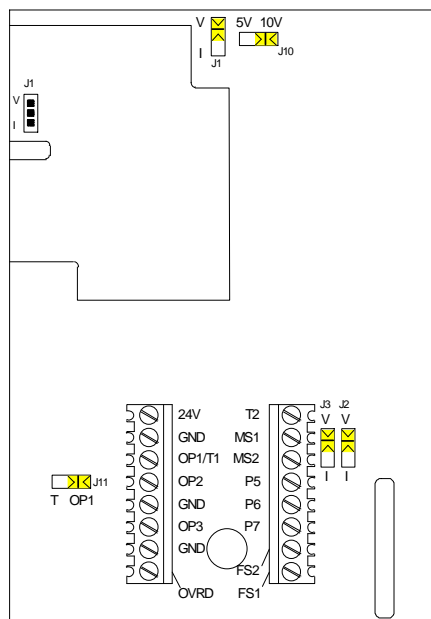
Selects either active temperature output (current or voltage) or direct thermistor.

OP1 = Active temperature output
T = Direct thermistor

CO₂ board

J1

This sets the output to either voltage of current:
V for voltage, I for current



Note: When using current output mode the **GS-CO2-1001** is NOT loop powered and will require a common 0V connection.

LED CO₂ Level Indication:

The LED is configured to turn from green to amber when the CO₂ level rises above 1000ppm. The colour changes to red when the CO₂ level exceeds 1500ppm. These levels are customizable, but alternative values **MUST** be stated when ordering, as they cannot be changed on site.

Whilst every effort has been made to ensure the accuracy of this specification, Sontay cannot accept responsibility for damage, injury, loss or expense from errors or omissions. In the interest of technical improvement, this specification may be altered without notice.

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