Sontay®
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GS-CO2-AQ-S

Space Mounted CO_2 IAQ & Temp. Sensors

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Features and Benefits

- Slim design for room applications
- Easy installation with LED indication
- Built -in circuit diagnostics
- Optional set point, momentary button and LCD available

Technical Overview

Using a NDIR (non-dispersive infrared) sensor for measuring CO_2 concentrations and utilizing ABC (Automatic Baseline Correction) ensures accurate and maintenance free operation.

Options such as set point adjust & momentary switch are available.

A feature of this sensor is, when in 3-wire mode, it automatically detects the controller input type, 4-20mA or 0-10Vdc. This removes the requirement for output jumpers. It also provides on-board LED indication for power up status and set output mode. The terminal blocks are pluggable and allow tool free installation (ferrules required).

Product Codes

GS-CO2-AQ-S	Space CO_2 IAQ and Temperature Sensor 0-2000ppm

Suffixes (add to part code)

-T Direct resistive temp. output (change **T** to type below)*

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)

Nickel types:

F (NI1000a) **G** (NI1000a/TCR (LAN1))

Interface Options (add to part code)

-HR 0-5000ppm CO_2 range
-SP Resistive set point 0-10kΩ or 11-1kΩ
-MS Momentary switch
-TR Custom temperature range between -20 & +50°C
-LED 3-Colour LED indication for CO_2 levels
-LCD Integral LCD

-5V Output 0-5Vdc (instead of 0-10Vdc)

Accessories

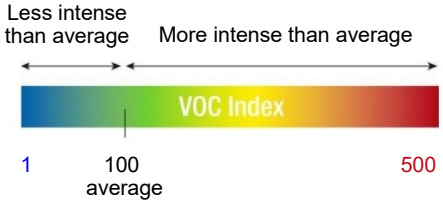
DECOR Decorators trim plate
GASKET Insulating gasket (pack of 10)

Notes:
* When using the -T option, the thermistor is not compensated for internal self heating.

Specification

Outputs:	0-10Vdc (0-5V for -5V version) or 4-20mA self-detecting
(optional -T)	PTC/NTC resistive sensing element
Power Supply:	24Vac/dc ±10%
Supply current:	
Average	30mA
Peak	390mA
Electrical connections:	Pluggable spring loaded terminal block min. 0.2mm^2, max. 1.5mm^2
Output ranges:	
CO_2	0-2000ppm (optional 0-5000ppm)
IAQ	0-460 TVOC Index
Temperature	0 to 40°C
RH	0 to 100% RH
Environmental:	
Temperature	-10 to 60°C
Humidity	0 to 95% non-condensing
Housing:	
Material	ABS (flame retardant)
Colour	Polished white finish
Dimensions	115 x 85 x 30mm
Protection	IP30
Country of origin	UK
Conformity	EMC, CE & UKCA Marked

Please note:
Sontay air quality sensors sold after the 19th of May 2025 now use the VOC index for TVOC levels. Previous products were 0 to 1,000ppb range. More information on page 3 of this data sheet.



WEEE Directive:

At the end of the products useful life please dispose as per the local regulations.
Do not dispose of with normal household waste.
Do not burn.

CE UKCA

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Sensor Characteristics

Carbon Dioxide

Measurement interval	2 seconds
Accuracy	±70ppm ±3% of reading
Pressure dependency	+1.6% reading per kPa deviation from normal pressure
Response rate	2 minutes by 90%

Temperature

Measurement range	0 to 40°C
Accuracy	(20 to 40°C) ±0.5°C
Long term stability	<0.02°C p.a.
Response time	5 to 30 seconds (t 63%)

Air Quality

Type	MEMS Siloxane, TVOC (Total Volatile Organic Compounds)
Accuracy	Typical ±15% of measured value
Measurement range	0 to 460 TVOC Index

Optional Passive Outputs

Type	Resistive PTC & NTC types
Accuracy:	
Thermistor	±0.2°C 0 to 70°C
Platinum types	±0.2°C @ 25°C
Nickle types	±0.4°C @ 25°C
Set point	Resistive 0-10kΩ or 11-1kΩ ±30% For 1-11kΩ use the 0-10kΩ and add an inline 1kΩ resistor on the controller input side
Momentary switch	VFC 24Vac/dc 50mA max.

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 and remove the front panel from the base.

3. 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.

4. Feed cable through the hole in the base plate of the housing, unplug the terminal block from the PCB and terminate the cores at the loose terminal block. Leave some slack inside the unit as required.

5. Set the switch on the PCB to the 3-wire position ONLY (default).

6. Plug the terminal block on the pins header on the PCB. Check polarity and orientation. Replace the housing to the base plate and tighten the tamperproof screw (if required) through the lug at the bottom of the base plate.

7. Connect all sensor outputs to the controller inputs or to the device, the sensor output(s) are connected to.

8. Before powering the sensor, ensure that the supply voltage is within the specified tolerances.

9. Allow 4 minutes before checking functionality, and at least 30 minutes before carrying out pre-commissioning checks. This will allow the auto detection to complete and electronics time to stabilise. The electronics require at least 24h continues operation in clean air before any accuracy tests can be performed.

   In normal building management applications, accuracy is defined after a minimum of 3 ABC periods (72h) of continuous operation. Automatic Background Logic (ABC) is designed to be used in HVAC applications where CO_2 concentrations will drop to outside ambient condition (400ppm) in a 7-day period.

Electrical Connections:

24V	Supply 24Vac/dc
0V	Supply 0V (Common 0V)
OP1	CO_2 output
OP2	IAQ
OP3	Temperature output
0V	Common 0V (if fitted)
TH1	Direct Thermistor output (-T only)
TH2	Direct Thermistor output (-T only)
FS1	Not used
FS2	Not used
P5	Set point
P6	Set point, wiper
P7	Set point
MS1	Momentary switch
MS2	Momentary switch
OVR	LCD override only

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Selecting output mode and LED indication:

IMPORTANT! Do not alter the switch position while sensor is powered up, do not select 2-wire (only fitted on RHT version). Permanent damage to the sensor or BMS controller may result.

3-wire connection:

Ensure there is no power to the sensor before changing the switch. Set the switch in the left hand position. The sensor automatically sets the outputs to 0-10V or 4-20mA based on the resistive load on the outputs. All outputs MUST be connected to the same type of load:

- If ALL the loads are >2k2Ω, all the outputs will be set to 0-10Vdc and the green 0-10V LED will light.
- If ALL the loads are >50Ω and <550Ω, all the outputs will be set to 4-20mA and the orange 4-20mA LED will light.
- If ANY of the loads are <50Ω or >550 and < 2k2Ω, all the outputs will be switched off and the red ERROR LED will light.

Output 1 is checked first, and if it has determined what this output is set to it will assume that all other enabled outputs are connected to similar loads. The LEDs will switch off after 15 minutes.

Self-Test Button:

The self-test button helps the installer to validate the wiring for each output and helps to commission the system.
When self-test button is pushed it cycles all outputs as follows: 0%, 50%, 100%, normal operation. After 30 seconds in any mode the system resets to normal operation.

When self-test button is held for more than 3 seconds, it sets all outputs to 50%, when released the outputs return to normal operation.

LED CO_2 Level Indication

The LED is configured to turn from green to amber when the CO_2 level rises above 1000ppm. The colour changes to red when the CO_2 level exceeds 1500ppm. These levels are customizable, but alternative values MUST be stated when ordering, as they cannot be changed on site.

Recommended TVOC Monitoring Levels

The GS-AQ-D incorporates a highly sensitive VOC sensor for air pollution measurement. Gases that can be detected by the VOC sensor include: Volatile Organic Compounds (VOCs) from paints (such as formaldehyde), lacquers, paint strippers, cleaning supplies, furnishings, office equipment, glues, adhesives and alcohol.

The table below illustrates the IAQ Index parameter with a description of the air quality, its impact and suggested action for that level / banding.

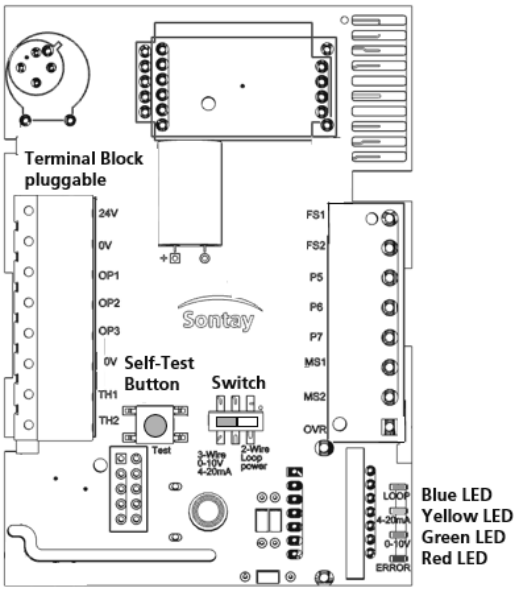
IAQ Index	Air Quality	Impact (long-term exposure)	Suggested action
0 – 50	Excellent	Pure air; best for wellbeing	No measures needed
51 – 100	Good	No irritation or impact on wellbeing	No measures needed
101 – 150	Lightly polluted	Reduction of wellbeing possible	Ventilation suggested
151 – 200	Moderately polluted	More significant irritation possible	Increase ventilation with clean air
201 – 250[1]	Heavily polluted	Exposition might lead to effects like headache depending on type of VOC	Optimise ventilation
251 – 350	Severely polluted	More severe health issue possible if harmful VOC present	Contamination should be identified if level is reached even without the presence of people; maximise ventilation and reduce attendance
> 351	Extremely polluted	Headaches, additional neurotoxic effects possible	Contamination needs to be identified; avoid presence in room and maximise ventilation

Indoor air quality (IAQ) classification and colour coding [1]

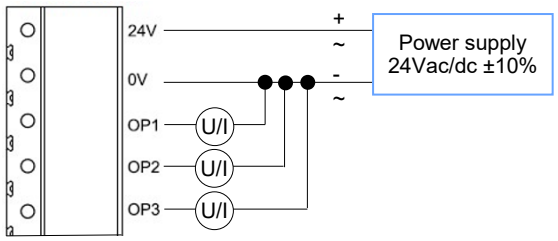
[1] According to the guidelines issued by the German Federal Environmental Agency, exceeding 25 mg/m3 of total VOC leads to headaches and further neurotoxic impact on health.

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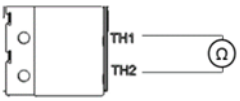
PCB Layout:



3-wire, 0-10Vdc or 4-20mA



-T Direct Thermistor only

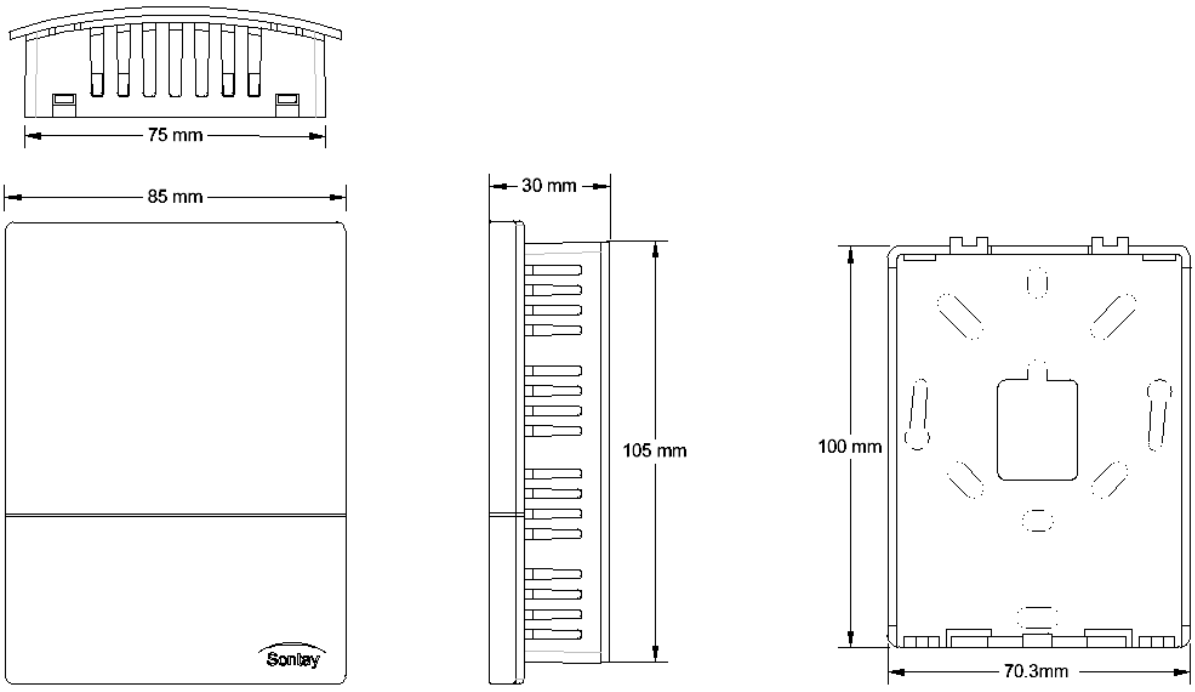


Momentary Switch (-MS) max. 500mA @24Vac/dc

Set Point (-SP): For 1-11kΩ use the 0-10kΩ and add an inline 1kΩ resistor on the controller input side.

	-	+
P5/P6	0kΩ	10kΩ
P7/P6	11kΩ	1kΩ

Dimensions



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

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