



Features and Benefits

- Latest electro-chemical sensor technology with a lifetime up to 10 years
- Easy installation with LED indication, test button and auto-output mode detection (3-wire)
- Supports 2-wire loop powering or 3-wire installation
- Pluggable terminal blocks and tool free installation
- Optional set point, fan speed & momentary switch

Technical Overview

Using latest electro-chemical sensor technology with high repeatability and sensitivity to Carbon Monoxide gases in the ambient air, this sensor ensures accurate and maintenance free operation in residential and commercial environments. The sensor modules have a catalytic ability to ensure years of operation with no chance of sensor life degradation as known from other electro-chemical sensors.

IMPORTANT The sensor is not designed, manufactured or intended for use or re-sale as control or monitoring equipment in environments requiring life safety performance, in which the failure of the sensor could lead directly to death, personal injury, or severe physical or environmental damage. Sontay and its suppliers specifically disclaim any express or implied warranty of fitness for life safety.

Product Codes

GS-CO-S Space CO & Temperature transmitter 0-500ppm

Suffixes (add to part code)

-T Direct resistive temperature output (replace **T** with option 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)**

-SP Resistive set point 0-10kΩ or 11-1kΩ
-FS3 Resistive 3-speed fan switch
-FS4 Resistive 4-speed fan switch
-FS5 Resistive 5-speed fan switch
-MS Momentary switch

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

Accessories

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

** Interface Restrictions

SP only SP-MS only
 MS only SP-FS only

Note*:

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

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.

Specification

Outputs:

0-10Vdc (0-5V for -5V version) or 4-20mA 3-wire

4-20mA 2-wire, loop powering via DIP switch

(optional -T) PTC/NTC resistive sensing element

Power Supply: 24Vac/dc ±10% (3-wire)

24Vdc ±10% (2-wire)

Supply current Max. 30mA (3-wire)

Electrical connections Pluggable spring loaded terminal Block, min. 0.2mm², max. 1.5mm²

Output ranges:

CO 0 to 500ppm

Temperature 0 to 40°C

Environmental:

Temperature -10 to 60°C

Humidity 5 to 95% non-condensing

Housing:

Material ABS (flame retardant)

Colour RAL 9003 polished white finish

Dimensions 115 x 85 x 30mm

Protection IP30

Country of origin UK



The products referred to in this data sheet meet the requirements of EU Directive 2014/30/EU

Sensor Characteristics

Carbon Monoxide

Type	Electrochemical sensor
Accuracy	Typical $\pm 7\%$ fsd.
Measurement range	0-500ppm
Baseline offset	$< \pm 10$ ppm equivalent
Response time	max. 60 seconds (t90)

Temperature

Measurement range	0 to 40°C
Accuracy (20 to 40°C)	$\pm 0.5^\circ\text{C}$
Long term stability	$< 0.02^\circ\text{C}$ p.a.
Response time	5 to 30 seconds (t 63%)

Optional Passive Outputs

Type	Resistive PTC & NTC types
Accuracy:	
Thermistor	$\pm 0.2^\circ\text{C}$ 0 to 70°C
Platinum types	$\pm 0.2^\circ\text{C}$ @ 25°C
Nickle types	$\pm 0.4^\circ\text{C}$ @ 25°C
Set point	Resistive 0-10k Ω or 11-1k Ω $\pm 30\%$ For 1-11k Ω use the 0-10k Ω and add An inline 1k Ω resistor on the BMS input side
Fan speed	Resistive, see page 4
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.

Note: Sontays range of CO sensors are not to be used in domestic applications

- 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.
- Undo the tamperproof screw at the bottom of the housing and remove the front panel from the base.
- 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.
- 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.
- Set the switch on the PCB either to the 3-wire or 2-wire position.

IMPORTANT! Do not alter the switch position while sensor is powered up. Do not select 2-wire if a 0v connection (3-wire) is made. Permanent damage to the sensor or BMS controller may result.

- 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.

IMPORTANT! Make sure the Terminal Block is fitted the correct position and direction. The cable entry faces the centre of the sensor.

- Connect all sensor outputs to the controller inputs or to the device, the sensor output(s) are connected to.
- Before powering the sensor, ensure that the supply voltage is within the specified tolerances

Electrical Connections

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

Terminal Blocks

For easier installation, the terminal block can be detached from the PCB.

When used with ferrules it doesn't require any tools to release the spring loaded terminal block. When used with stranded cable, push in the orange latch to compress the spring load. Feed in the wire and release the spring to secure the wire connection.

IMPORTANT! Make sure the Terminal Block is fitted the correct position and direction. The cable entry faces the centre of the sensor.

Selecting Output Mode & LED Indication

IMPORTANT! Do not alter the switch position while sensor is powered up. Do not select 2-wire if a 0V connection (3-wire) is made. 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 $>2k\Omega$, all the outputs will be set to 0-10Vdc and the green 0-10V LED will light.

If ALL the loads are $>50\Omega$ and $<550\Omega$, all the outputs will be set to 4-20mA and the orange 4-20mA LED will light.

If ANY of the loads are $<50\Omega$ or >550 and $<2k\Omega$, 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.

2-wire connection:

Ensure there is no power to the sensor before changing the switch and do not connect 0V. Set the switch in the right hand position. All outputs **MUST** be connected. The blue LOOP LED will light.

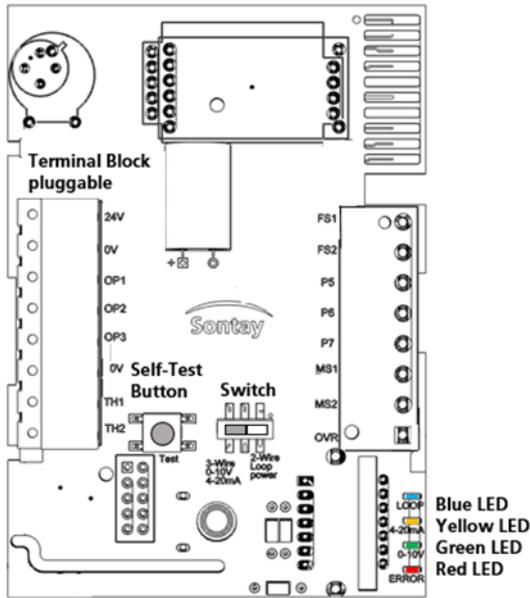
Self-Test Button

The self-test button helps the installer to validate the wiring for each output and helps to commission the system.

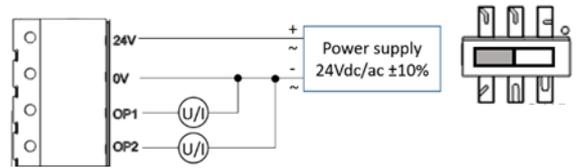
When self-test button is pushed it cycles all outputs as follows: 0%, 50%, 100%, normal operation. After 30 seconds in any mode the system resets to normal operation.

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.

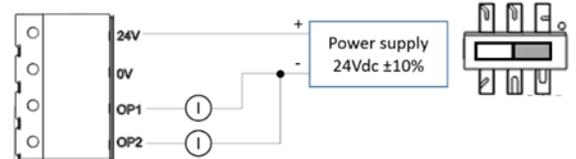
PCB Layout & Connections



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



2-wire, 4-20mA



-T Direct Thermistor only



Fan Speed (-FSx)

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

0	Open circuit
1	22.7kΩ
2	26kΩ
3	29.3kΩ
Auto	32.6kΩ

Momentary Switch (-MS)

max. 500mA @24Vac/dc

Set Point (-SP):

	-	+
P5/P6	0kΩ	10kΩ
P7/P6	11kΩ	1kΩ

For 1-11kΩ use the 0-10kΩ and add an inline 1kΩ resistor on the controller input side