Sontay®

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GS-CO-S
Space Mounted CO & Temperature Sensor

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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.

A valuable feature of this sensor is it automatically detects the controller input type, Vdc or mA, when set to 3-wire mode.

IMPORTANT! The sensor is not designed, manufactured or intended to 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

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.

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

CE

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 ±7% fsd.
Measurement range	0-500ppm
Baseline offset	<±10ppm equivalent
Response time	max. 60 seconds (t90

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%)

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 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 suitable for use in swimming pool & spa applications. Sensors used in these types of applications are not covered under Sontays warranty terms. Chemicals used in swimming pool & spas can contaminate the humidity element, which results in a reduced service life.

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. The base plate is suitable for EU & North America fixings.

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 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.

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.

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

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

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)

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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 >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.

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.
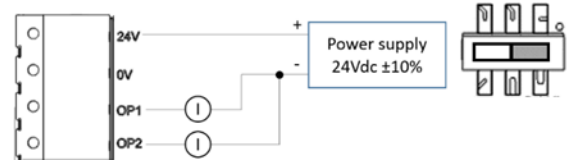
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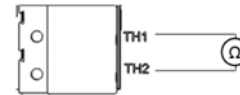
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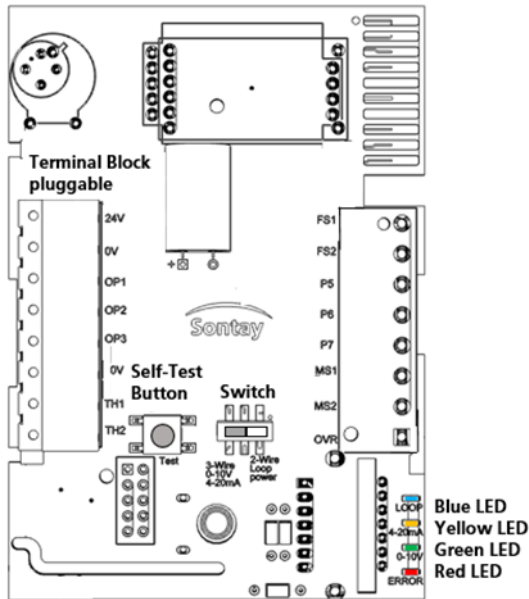
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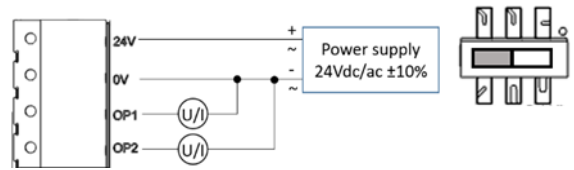
2-wire, 4-20mA

-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

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