



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

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-D Duct 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))

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

-TR Custom temperature range between -20 and +50°C

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:

Housing: -30 to 60°C

5 to 95% non-condensing

Media: -10 to +50°C

Housing:

Material PC/GF (Halogen free, flame retardant & UV stabilized)

Dimensions 125 x 105 x 85mm

Probe:

Material Probe PVC - End cap Delrin

Dimensions 210 x 20mm dia.

Protection IP65

Country of origin UK

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.



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%)

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 in the duct where dust & contaminants are at a minimum (i.e. after filters etc.) and which will give a representative sample of the prevailing air condition.
- Fix the housing to the duct with appropriate screws, or by using the optional duct mounting flange.
- Release the snap-fit lid by gently squeezing the locking tab and feed the cable through the waterproof gland and terminate the cores at the terminal block. Leaving some slack inside the unit, tighten the cable gland onto the cable to ensure water tightness.
- If the sensor is to be mounted outside, it is recommended that the unit be mounted with the cable entry at the bottom. If the cable is fed from above then into the cable gland at the bottom, it is recommended that a rain loop be placed in the cable before entry into the sensor.
- Set the switch on the PCB either to the 3-wire or 2-wire position. Snap shut the lid after the connections have been made. If IP65 protection is required, secure the lid with two screws provided.

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.

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.

IMPORTANT! It is important to make all electrical output connections before applying the supply voltage. If the sensor is not connected in this sequence, damage may be caused to the input circuitry of the controller or device the sensor output(s) are connected to.

- Allow 3 minutes before checking functionality, and at least 30 minutes before carrying out pre-commissioning checks. This will allow the electronics time to stabilise. The CO electronics require at least 24h continuous operation in clean air before any accuracy tests can be performed.

Electrical Connections

24V	Supply 24Vac/dc
0V	Supply 0V (Common 0V)
OP1	Carbon monoxide output
OP2	Temperature output
OP3	Not used (if fitted)
0V	Common 0V (if fitted)
TH1	Direct Thermistor output (-T only)
TH2	Direct Thermistor output (-T only)

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.

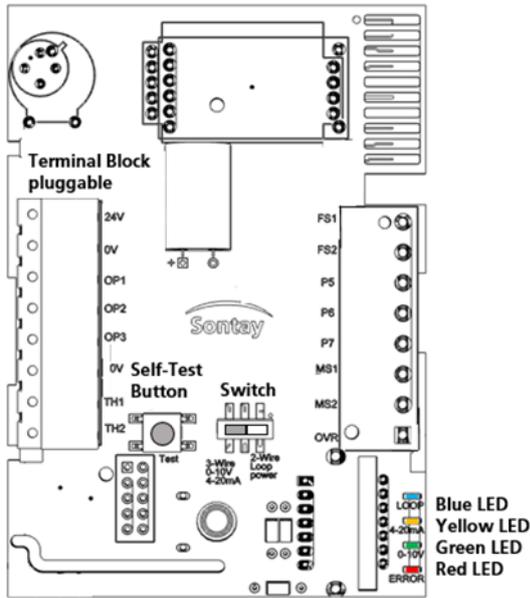
Self-Test Button

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

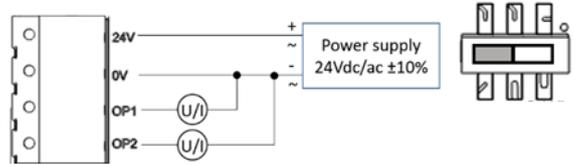
When self-test button is pushed it cycles all outputs as follows: 0%, 50%, 100%, normal operation. After 30 seconds in any mode the system resets to normal operation.

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.

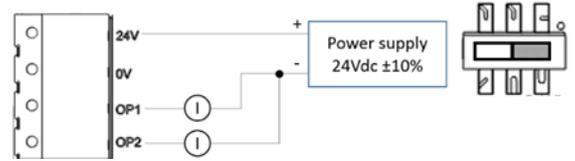
PCB Layout & Connections



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



2-wire, 4-20mA



-T Direct Thermistor only



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.