



Features & Benefits

- Fully configurable LCD Display
- Direct thermistor temperature options available
- High stability & reliability
- Long term stability

Technical Overview

The GS-AQ1000 series of volatile organic compound (VOC) sensors are based on tried and tested SnO₂ sensor technology, the new design provides a highly cost-effective answer for monitoring VOCs for indoor air quality, typically for alarm purposes.

The sensor element responds to a broad range of contaminants, such as Ammonia (NH₃) and Hydrogen Sulphide (H₂S), generated from waste materials in office and home environments.

It also has high sensitivity to low concentrations of VOCs such as toluene emitted from wood finishing and construction products.

Please note that the sensor will need approximately 10 minutes warm-up time before the sensor becomes active.

Product Codes

GS-AQ1000 Space air quality and temperature sensor

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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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
-LCD	Integral LCD

Accessories

DECOR Decorators trim plate

GASKET Insulating gasket (pack of 10)

** Interface Restrictions

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

Note*:

When using the -T option, they are not compensated for internal 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:

Voltage	0-10Vdc, 0-5Vdc
Current	4-20mA (3-wire)

Optional Passive Outputs:

Thermistor	
Set point	0-10kΩ or 11-1kΩ linear
Momentary switch	VFC
Fan Speed	Resistive

Power Supply: 12-26Vac or 16-26Vdc @60mA

Ambient:

Temperature	0 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



Note:

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



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

Operation

The sensor has a heated element with a nominal resistance in clean air. This resistance decreases in the presence of detectable VOCs. This is a nominal resistance, is different for each sensor element and will change during the life of the sensor. To allow for this, on powering the sensor a period of time is required before the sensor achieves thermal equilibrium (about ten minutes). During this process the system determines the resistance for the sensor element fitted, with this value being used for air quality calculations. While in operation this reference value is constantly monitored and adjusted as necessary.

During the ten minute warm-up after power is applied, the sensor not be exposed to strong VOCs. During this period the output will register zero or GOOD air quality. During warm-up period the unit calibrates itself, it is important that the environment around it is clean uncontaminated air and free from odours, cigarette smoke and low occupancy. If exposed to VOCs during this time the calibration will be wrong, though it will correct itself after a couple of hours in clean air.

The purpose of the GS-AQ1000 is to control the amount of fresh air introduced by a ventilation plant and to reduce energy consumption. This is achieved by measuring the level of contaminant gases found in the controlled space and providing a signal to the BMS to reduce the volume of air supplied to the space, thereby saving on the energy consumed by heating or cooling fresh air during periods of little or no occupancy.

The principal feature of the GS-AQ1000 is that a mixed gas level is monitored and not any specific gas. The sensor, therefore, does not distinguish between contaminations from substances, such as tobacco smoke, cooking smells, or people, but provides the air correction necessary for comfort, as well as health with various gases present.

The GS-AQ1000 is a total contaminant sensor. It is sensitive to a large variety of gases and contaminants that are typically found in indoor environments and outputs a signal in relation to the concentration of those contaminants.

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. The base plate is suitable for EU & North America fixings.
4. 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.
5. Set jumper links according to output type required and replace the housing to the base plate and tighten the tamperproof screw (if required) through the lug at the bottom of the base plate.
6. 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).
7. Allow 10 minutes before checking functionality, and at least 30 minutes before carrying out pre-commissioning checks. This will allow the electronics time to stabilise.

Note:

- T 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.

Connections

Left Hand terminal Block:

24V	Supply + 24Vac or Vdc
GND	Supply 0V
OP1	Temperature output (see J11 settings)
OP2	Not used
GND	Common 0V
OP3	IAQ 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

Right Hand Terminal Block (if -T option is selected);

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

Voltage output Nominal voltage 24Vac/dc.

Current output Loop powered (no 0V connection) 24Vdc supply ONLY.
3-wire (0V connection) 24Vac/dc
Please see note in section 7 on previous page regarding connections.

If using the -LCD option, when in loop powered mode the back light will not be lit. The transmitter will require a 0V connection for the back light to work (3-wire).

Jumper Settings

Main board

J1, J2, J3

These set the outputs to either voltage or current, V for voltage, I for current

J10

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

J11

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

OP1 = active temperature output

T = direct thermistor

IAQ board

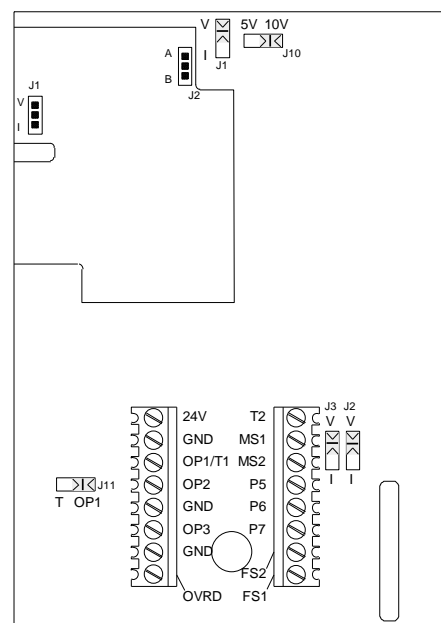
J1

This sets the output to either voltage or current:

V for voltage, I for current

J2

Default position "B" no not remove or change.



Options

Fan Speed (if fitted)

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

Set point(if fitted)

This is available in two standard values:

-	+
0k Ω	10k Ω
11k Ω	1k Ω

Using an external 1k Ω resistor (not supplied) on the terminals 0-10k Ω , 1-11k Ω can be achieved if required.

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

Momentary switch (if fitted)

Rated at 24Vac/dc @ 500mA max.

Note:

- T 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.