CO2S-W Wide Range
Ultra Low Power Carbon Dioxide Sensor

CO2S-W is an ultra low power (3.5mW[4]), high performance CO_2 sensor, ideally suited for battery operation and portable instruments. Based on patented IR LED and Detector technology and innovative optical designs, CO2S-W is the lowest power NDIR sensor available. Optional temperature and humidity sensing are available. CO2S-W is a third generation product from SST Sensing Ltd.

With measurement ranges of 0-5%, 0-20%, 0-60% and 0-100%, CO2S-W **Wide Range** sensors are suited for process control applications such as diving, industrial safety and automotive.

Unlike Electrochemical sensors the CO_2 sensors connect to customers systems using a TTL-Level RS232 protocol. This removes the need for A to D conversion.

- Ultra-low Power 3.5mW

- Measurement ranges from 0 to 100%

- 3.3V supply.

- Peak current only 33mA.

- Optional Temperature and Humidity Output

- All sensors come pre-calibrated and temperature compensated

| General Performance	
Warm-up Time	< 10s
Operating Conditions	0°C to 50°C (Standard) -25°C to 55°C (Extended range) 0 to 95% RH, non-condensing
Recommended Storage	-30°C to +70°C
CO2 Measurement	
Sensing Method	Non-dispersive infrared (NDIR) absorption Patented Gold-plated optics Patented Solid-state source and detector
Sample Method	Diffusion
Measurement Range	0-5%,0-20%,0-60%,0-100%
Accuracy	±70 ppm +/- 5% of reading[1]
Non Linearity	< 1% of FS
Pressure Dependence	0.13% of reading per mm Hg in normal atmospheric conditions.
Operating Pressure Range	950 mbar to 10 bar[2]
Response Time	4 secs to 2 mins (user Configurable)[3] Reading refreshed twice per second.[3]

Electrical/ Mechanical	
Power Input	3.2 to 5V. (3.3V recommended). Peak Current 33mA[4]. Average Current <1.5mA[4].
Power Consumption	3.5 mW[4]

Dimensions and Wiring Connections

2x5 0.1" header. Pin 1 is identified on the dimensional drawing**.**

Pin 1, Pin side
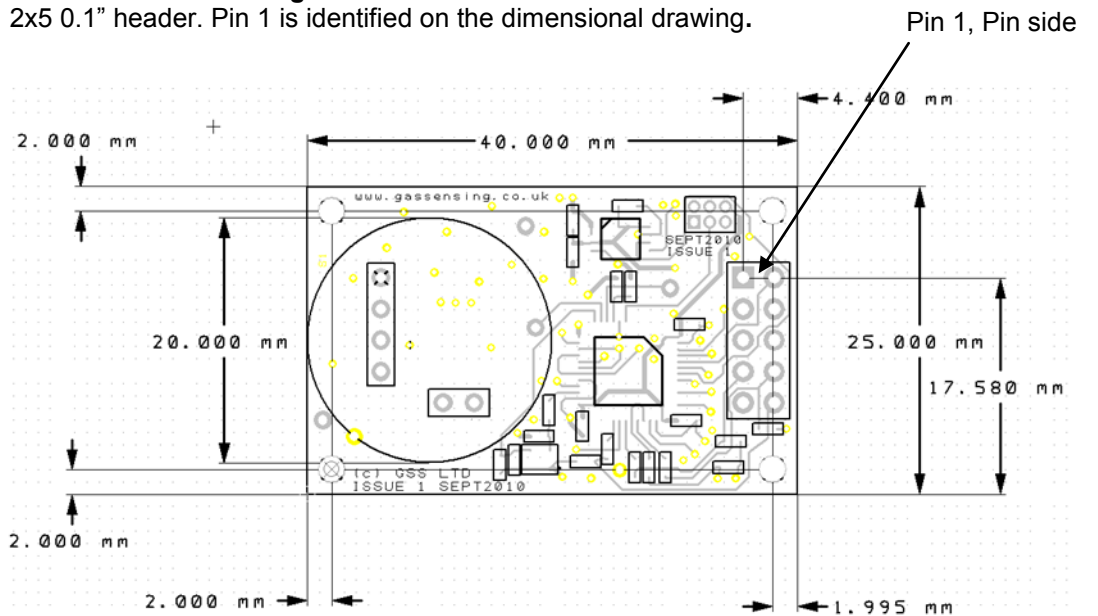
Do not compress plastic sensor housing !   See note 1 below.

19mm

Function	Pin #	Pin #	Function
0V	**1**	**2**	N/C
+3.3V	**3**	**4**	0V/GND
Sensor Rx (in)	**5**	**6**	0V/GND
Sensor Tx (out)	**7**	**8**	Zero N
Analogue O/P	**9**	**10**	Zero Air

Pin 2 should not be connected. Pins 4 and 6 do not require connection and are internally connected to GND.

The zeroing options are for hardware zeroing (both active low). These functions can also be implemented by sending a serial command (recommended).

Typical connections for digital interface are GND, 3.3V, Rx and Tx. Note that the Vh for the serial Tx line will be 3V regardless of the supply voltage.

 The analog (voltage) output is available only when specified. Otherwise, N/C.

Note 1: The plastic sensor housing should not be compressed in the installation.   Compression is likely to alter the calibration of the sensor. If compression is unavoidable, at least ensure that the level of compression cannot change after installation and that the sensor is calibrated before being used.

Temperature & Humidity Measurement[5]

Optional Temperature and Humidity sensor (only available as digital output)

Sensing Method	Humidity: Capacitive Temperature: Bandgap
Measurement Range	-25 to +55 °C 0 to 95% RH
Resolution	0.08 °C 0.08% RH
Absolute Accuracy[5]	+/- 1 °C 0°C to 55°C. +/- 3% RH 20°C to 55°C. +/- 2 °C over the full temperature range. +/- 5% RH over the full temperature range.
Repeatability	+/- 0.1 °C +/- 0.1 % RH

Note 1: All measurements are at STP unless otherwise stated.
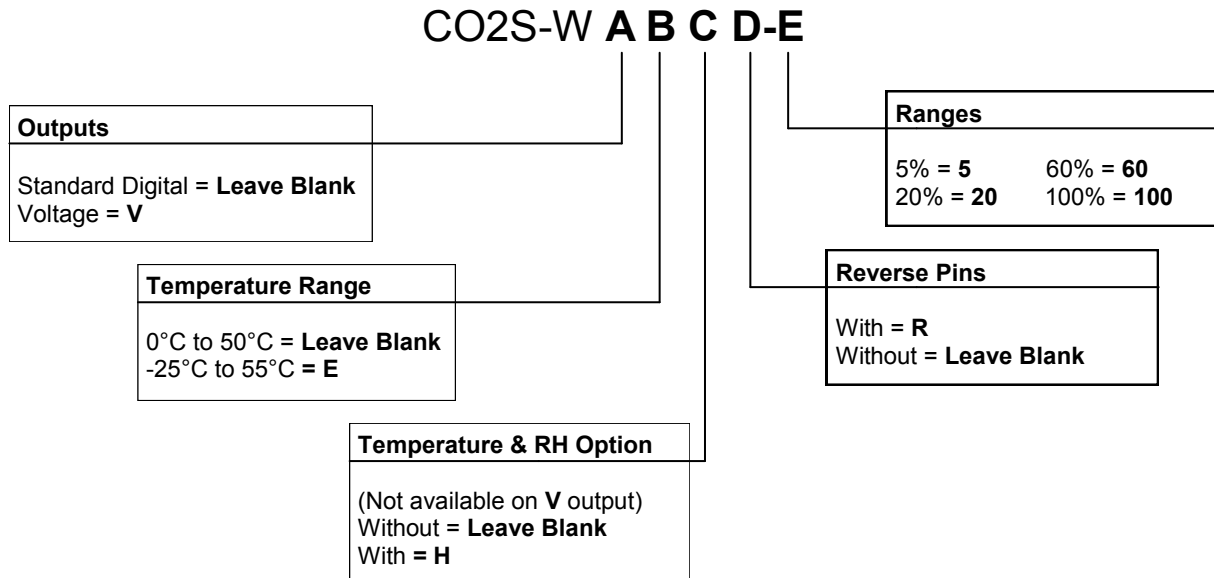**Note 2:** External Pressure calibration required.
Note 3: User Configurable Filter Response.
Note 4: Power measurements for standard CO_2 sensor with 2 readings per second. Temperature and humidity measurements increase the power consumption.
Note 5: Temperature and Humidity derived from Sensirion SHT21 chip. Please request data sheet for full details.

Ordering Guide

Replace **A,B,C,D** and **E** with the following values to create the part number you require.

CO2S-W **A B C D-E**

Outputs

Standard Digital = **Leave Blank**
Voltage = **V**

Temperature Range

0°C to 50°C = **Leave Blank**
-25°C to 55°C **= E**

Temperature & RH Option

(Not available on **V** output)
Without = **Leave Blank**
With **= H**

Ranges

5% = **5**   60% = **60**
20% = **20**   100% = **100**

Reverse Pins

With = **R**
Without = **Leave Blank**

Examples:

CO2S-WHR-60 = Standard digital output, 0°C to 50°C, with temperature & RH option, with reverse pins, without split, 60% range

CO2S-WV-20 = Voltage output, 0°C to 50°C, without temperature & RH option (as only available on digital output), without reverse pins, 20% range

WARNING	CAUTION
Personal Injury	Do not exceed maximum ratings.
DO NOT USE these products as safety or Emergency Stop devices or in any other application where failure of the product could result in personal injury.	**Please read this data sheet thoroughly to ensure the product is suitable for your application.**
Failure to comply with these instructions could result in death or serious injury.	**Failure to comply with these instructions may result in product damage.**

It is the customer's responsibility to ensure that this product is suitable for use in their application. For technical assistance or advice, please email us: technical@sstsensing.com

General Note: SST Sensing Ltd reserves the right to make changes in product specifications without notice or liability. All information is subject to SST's own data and is considered accurate at time of going to print.