

# DATA SHEET

## CO<sub>2</sub> Sensors

### Fast Response Range—SprintIR



DESIGN • MANUFACTURE • CUSTOMISE • CONFIGURE

#### FEATURES

- Low power / energy consumption—35mW
- Measures up to 100% CO<sub>2</sub> concentration
- High speed sensing; 20 measurements per second (20Hz)
- Solid-state; no moving parts, no heated filaments
- Digital (UART) output
- Optional (factory fit) flow through adapter available



#### Supply Voltage



#### Power Consumption



#### Operating Temp



#### Output Digital



#### Response Time



#### BENEFITS

- Very fast response (see graph page 2)
- Ideal for very low power and battery applications
- Suitable for wireless, portable, wearable and self-powered systems
- Fits neatly inside compact instruments

#### TECHNICAL SPECIFICATIONS

Supply voltage	3.2—5V <sub>DC</sub> (3.3V recommended)
Current	<15mA (average) 100mA (peak)
Power consumption <sup>a</sup>	35mW
Output type	3.3V TTL level UART
Temperature	
Operating:	0°C to +50°C (standard) -25°C to +55°C (extended)
Storage:	-30°C to +70°C
Humidity	0—95% Rh, non-condensing
Start-up time	< 30 seconds

#### CO<sub>2</sub> MEASUREMENT SPECIFICATIONS

Sensing method	Non-dispersive infrared (NDIR) absorption
Sample method	
Standard:	Diffusion
Optional:	Flow through (with adaptor)
Measurement range	0—5%, 0—20%, 0—100%
Accuracy <sup>b</sup>	±70ppm ±5% of reading (100% range ±300ppm ±5% of reading <sup>a</sup> )
Measurement noise	< 10% of reading (no digital filtering)
Pressure dependence <sup>c</sup>	0.15% of reading per mbar in normal atmospheric conditions
Operating pressure range <sup>d</sup>	500mbar—10bar 500mbar to 2 bar with flow through adaptor
Response time (a step to change in gas level) <sup>e</sup>	Flow rate dependant
Update rate	20Hz

**Need help? Ask the expert**  
**Tel: + 44 (0)1236 459 020**  
**and ask for “Technical”**

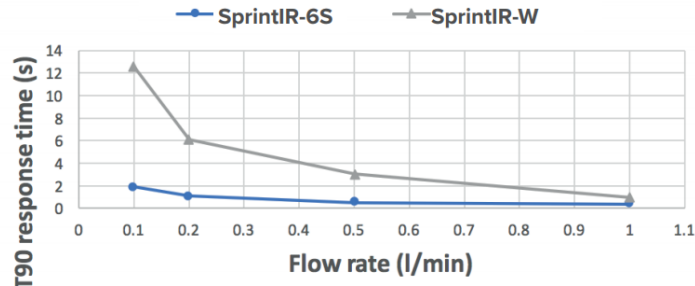


#### NOTES

- Power measurements for standard CO<sub>2</sub> sensor with 20 readings per second.
- All measurements are at NTP unless otherwise stated.
- Calibrated for 1013mbar. External pressure calibration required.
- SST can supply advanced pressure correction advice when operating outside normal atmospheric conditions.
- Response time to a step change in gas level is dependent on application/filter/flow rate/diffusion.

## RESPONSE TIME GRAPH

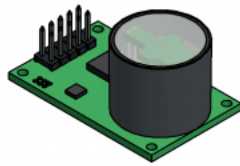
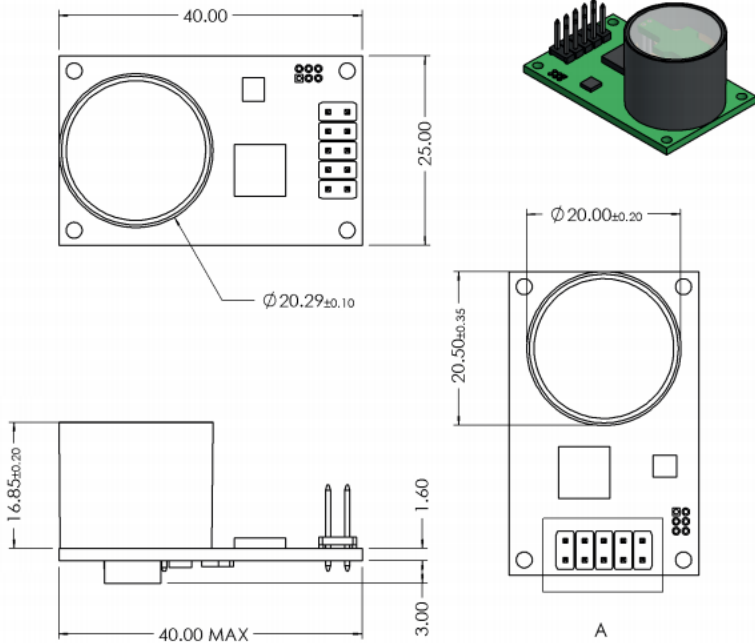
### T90 response time - SprintIR-6S V SprintIR-W



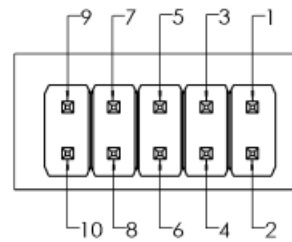
(T90 time measured from 0 to 10% CO<sub>2</sub> - digital filter switched off)

## OUTLINE DRAWINGS

2x5 0.1" header. All dimensions shown in mm.



## ELECTRICAL CONNECTIONS



DETAIL A  
SCALE 3 : 1

Designation	Pin	Pin	Designation
GND	1	2	N/C
+3.3V	3	4	GND
Sensor Rx (In)	5	6	GND
Sensor Tx (Out)	7	8	Nitrogen Zero
N/C	9	10	Fresh Air Zero

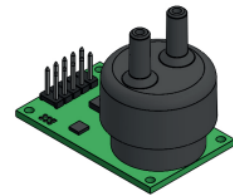
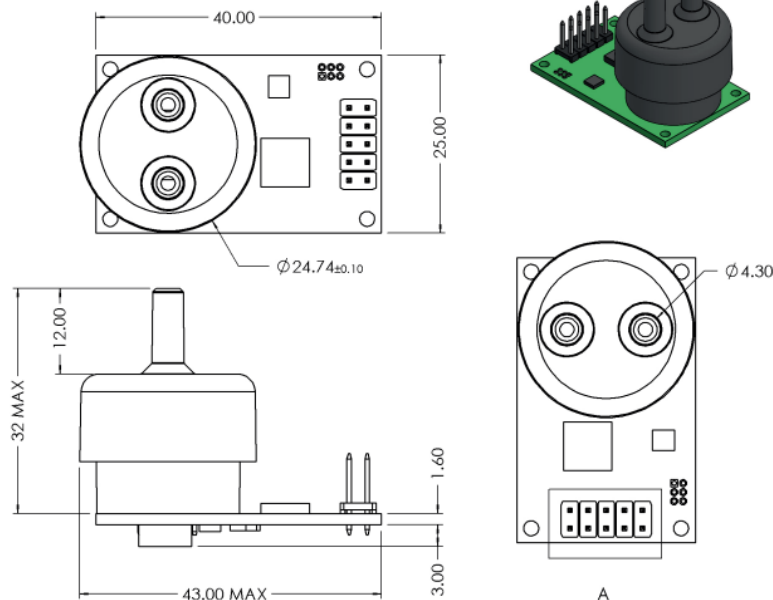
PIN 1 is identified on the dimensional drawing.

Pin 2 should not be connected.

Pins 4 and 6 do not require connection and are internally connected to GND.

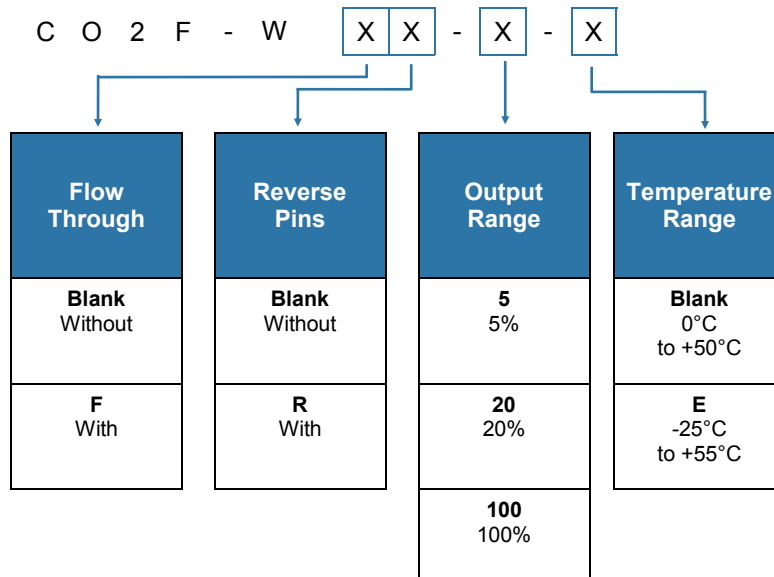
The zeroing options are for hardware zeroing (both active low). These functions can also be implemented by sending a serial command (recommended).

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



# ORDER INFORMATION

Generate your specific part number using the convention shown below. Use only the numbers that correspond to the sensor option you require — omit those you do not.



### EXAMPLES:

- CO2F-WF-5 = Flow through adaptor, 0°C to 50°C, without reverse pins, 5% range.
- CO2F-WR-20-E = No flow through adaptor, with reverse pins, 20% range, -25°C to 55°C.

### CAUTION

Do not exceed maximum ratings and ensure sensor(s) are operated in accordance with their requirements.  
Carefully follow all wiring instructions. Incorrect wiring can cause permanent damage to the device.  
Do NOT use chemical cleaning agents.

**Failure to comply with these instructions may result in product damage.**

### INFORMATION

As customer applications are outside of SST Sensing Ltd.'s control, the information provided is given without legal responsibility. Customers should test under their own conditions to ensure that the equipment is suitable for their intended application.

**For technical assistance or advice, please email:**  
[technical@sstsensing.com](mailto:technical@sstsensing.com)

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