

# CDM8S Compact Carbon Dioxide Sensor Module

## Features:

- \* Pre-calibrated and ready to use
- \* Miniature size
- \* Low cost
- \* Low power consumption
- \* Maintenance-free
- \* Good long term stability

## Applications:

- \* Fresh air ventilators
- \* Air conditioners
- \* Commercial and automotive air cleaners
- \* Automatic fans and window openers
- \* Combustion controls
- \* Intrusion alarms
- \* Container monitoring

The **CDM8S CO2 Module** is the world's smallest NDIR CO2 sensor, featuring excellent performance characteristics, including high accuracy and low power consumption. The CDM8S Module offers an excellent low cost solution for the CO2 sensing needs of users.

The CDM8S Module is designed for high volume production with full traceability in all manufacturing process and key components by using the unique sensor serial number. Every sensor is individually calibrated and is provided with a UART digital interface. The sensor is maintenance-free and has an estimated lifetime of more than 15 years.

The CDM8S Module is designed for simple integration into the users' products. It can be used in a wide range of applications such as ventilation controls for the improvement of energy savings and to assure a good indoor climate. Other fields in which the sensor can be used are personal safety, measurement for increasing process yields, and measurements for increasing the economic value of bio-related processes.



### FIGARO ENGINEERING INC.

1-5-11 Senba-nishi  
 Mino, Osaka 562 JAPAN  
 Phone: (81)-72-728-2561  
 Fax: (81)-72-728-0467  
[www.figaro.co.jp](http://www.figaro.co.jp)  
 email: [figaro@figaro.co.jp](mailto:figaro@figaro.co.jp)

## Specifications

Item	Specification
Target gas	CO <sub>2</sub>
Operating principle	Non-dispersive infrared (NDIR)
Measurement range	0.04 ~ 2% volume CO <sub>2</sub> ( <b>Note 1</b> ) Up to 3.2% volume CO <sub>2</sub> extended range ( <b>Note 2</b> )
Accuracy	±0.02% volume CO <sub>2</sub> ±3% of reading ( <b>Notes 3 and 4</b> )
Response time	2 minutes to 90% for diffusion sampling method
Operating temperature	0° ~ 50°C (sensor will function down to -20°C, but values valid only for 0°~50°C)
Operating humidity	0 ~ 85%RH non-condensing ( <b>Note 5</b> )
Storage temperature	-40° ~ +70° C
Dimensions	S8-SM: 32.7 x 19.7 x 9.9 S8-CON: 33.3 x 19.7 x 9.9
Weight	< 8 grams
Power supply	5V ±5% unprotected against surges and reverse connection
Power consumption	300mA peak, 30mA average, configurable
Sensor life	15 years in a normal commercial environment
Serial communication	UART, Modbus protocol Direction control pin for direct connection to RS485 transceiver integrated circuit
PWM output (1kHz)	0~100% for 0~20,000 ppm; 3.3V push-pull CMOS output, unprotected
Alarm OC	8500/6500ppm, normally conducting max 100mA Transistor open at CO <sub>2</sub> High, OR Power Low, OR at Sensor Failure

Table 1 - CDM8S specifications

Note 1: Sensor is designed to measure in the range 0 to 32,000ppm with the accuracy specified above. Exposure to concentrations below 400 ppm may result in incorrect operation of the ABC algorithm and should be avoided for models with ABC activated.

Note 2: Sensor provides readings via UART in the extended range, but accuracy is degraded compared to the above specification.

Note 3: In normal IAQ applications. Accuracy is defined after minimum 3 weeks of continuous operation. However, some industrial applications do require maintenance. Please, contact Figaro for further information.

Note 4: Accuracy is specified over the operating temperature range. Specification is referenced to certified calibration mixtures. Uncertainty of calibration gas mixtures (±2% currently) should be added to the specified accuracy for absolute measurements.

Note 5: Specification provides operating conditions 100% tested in production. Normally sensors shall operate at 0~95%RH and 0~50°C temperature.

Parameter	Minimum	Maximum	u/m
Ambient temperature under bias	-40	85	°C
Voltage on G+ pin with respect to G0 pin	-0.3	5.5	V
Maximum output current from active output pin	-25	+25	mA
Maximum current on output	-5	+5	µA

Table 2 - CDM8S absolute maximum ratings