

CDM30K Carbon Dioxide Sensor Module

Features:

- * Pre-calibrated and ready to use
- * Compact size
- * Low cost
- * Maintenance-free
- * MODBUS serial communications-enabled
- * RoHS compliant

Applications:

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

The **CDM30K Carbon Dioxide Sensor Module** is a low cost, maintenance-free infrared transmitter module which is intended to be built into host devices that require CO₂ monitoring data.

The CDM30K is targeted for high volume production. For a moderate start-up cost, Figaro can provide tailor-made products in order to meet a user's unique requests.

The patented state-of-the-art, EQC-coated, infrared (NDIR) wave-guide technology of CDM30K is comprised of a unique folded-path optical sensor. This feature provides an unbeatable path length, ensuring excellent accuracy and long-term stability.

The CDM30K is an accurate, yet low cost gas sensing solution for OEMs who wish to integrate CO₂ gas sensing into their product without investing in their own gas sensor development. This compact-sized and low-power module is intended to be an add-on component to compliment other microprocessor-based controls and equipment.

The CDM30K may be software customized in different ways in order to optimize the total system with respect to the OEM application.

The CDM30K is offered for installation in OEM IAQ sensor housings, OEM air handling units, OEM alarm sensor housings, among other applications. The only restriction on usage of this product is the creativity and inventiveness of the user.

This version is RoHS compliant with improved speed of response and a reduced spatial build-in height.



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Specifications

Category	Item	Specification	
General Performance	Storage Temperature	-30 ~ +70°C	
	Sensor Life Expectency	> 15 years	
	Maintenance Interval	no maintenance required (note 1)	
	Self Diagnostics	complete function check of sensor module	
	Warm-up Time	≤ 1 minute (@full spec ≤ 15 min.)	
	Conformance with Standards	Emissions: EN61000-6-3:2007	
		Immunity: EN61000-6-1:2007	
		RoHS directive 2002/95/EG	
	Operating Temperature	0 ~ 50°C	
	Operating Humidity	0 ~ 95%RH (non-condensing)	
Operating Environment	Residential, commercial, industrial spaces HVAC systems (notes 2,4)		
Electrical / Mechanical	Power Input	4.5-14V DC, stabilized to within ±5% (external protection circuit required) (note 3)	
	Current Consumption	40mA average < 150mA peak current (avg during IR lamp ON, 110 msec) < 300mA peak power (during IR lamp start-up, first 35msec.)	
	Electrical Connections (note 4)	terminals not mounted (G+, G0, OUT1, OUT2, ErStat, TxD, RxD)	
	Dimensions	5.1cm length x 5.7cm width x 1.3cm height	
CO ₂ Measurement (note 4)	Sensing Method	non-dispersive infrared (NDIR) waveguide technology with ABC (automatic background calculation) algorithm	
	Sampling Method	diffusion (optional: tube in/out)	
	Response Time (T _{90%})	20 sec. diffusion time	
	Measurement Range	0 ~ 5,000ppm (expandable to 0 ~ 10,000ppm) (see note 7)	
	Repeatability	±20ppm ±1% of measured value	
	Accuracy (note 1)	±30ppm ±5% of measured value	
	Pressure Dependency	+1.6% reading per kPa deviation from normal pressure of 100kPa	
	On-board Calibration Support	Din1 switch input to trigger Background Calibration @ 400ppm CO ₂ Din2 switch input to trigger Zero Calibration @ 0ppm CO ₂	
Linear Signal Output (notes 4,5,6,7)	D/A Conversion Accuracy		±2% of reading ±20mV
	OUT1	D/A Resolution	10mV
		Linear Conversion Range	0~4V DC = 0~2000ppm (note 7)
		Electrical Characteristics	R _{out} < 100Ω, R _{load} > 5kΩ
	OUT2	D/A Resolution	5mV
		Linear Conversion Range	1~5V DC = 0~2000ppm (note 7)
Electrical Characteristics		R _{out} < 100Ω, R _{load} > 5kΩ	
Digital Outputs (notes 4,7)	Electrical Characteristics	High Output	2.3V min. to DVDD=3.3V (1mA source)
		Low Output	0.75V max. (4mA sink) - protection 56R in series
	Function		High level at CO ₂ High
	OUT3 CO ₂ High Alarm/Reset Level		800/700 ppm
	OUT4 CO ₂ High Alarm/Reset Level		1000/900 ppm
UART Serial Com Port (note 4)	Protocol		MODBUS open protocol
	Hardware Interface		CMOS UART with Rx/D (R/T to support RS485 standard drivers on request)
	Baud Rate		9600 (max. TBD)

Note 1: In normal IAQ applications, accuracy is defined after a minimum 3 weeks of continuous operation. However, some industrial applications do require maintenance. Please contact Figaro for further information.

Note 2: SO₂ enriched environments are excluded.

Note 3: Notice that absolute maximum rating is 14V, so the sensor can be used with 12V±10% supply

Note 4: Different options exist and can be customized depending on the application. Please contact Figaro for further information.

Note 5: During power up, OUT1 and OUT2 are defined to be low. Exact value depends on many factors including temperature.

Note 6: For the buffered outputs OUT1 and OUT2 the maximum output voltage range equals power voltage input minus 0.5V

Note 7: Standard range of OUT1 and OUT2 is 0~2,000ppm

Standard range of UART serial communication is 0~5,000ppm

Range can be custom configured by Figaro - please inquire. Note: accuracy over 5,000ppm not defined.