CO2 EMS MONITORING SYSTEM

APPLICATIONS

- Schools
- Offices
- Homes
- Public Buildings
- Light Industrial
- Hotels

SENSOR OPTIONS

- Carbon Dioxide
- Oxygen
- Temperature
- Relative Humidity
- Atmospheric Pressure

OUTPUT OPTIONS

- Up to 3 analogue – voltage and/or current
- RS232 or RS485 (Modbus RTU)
- Up to 3 relays
- LEDs
- Buzzer

CERTIFIED STANDARDS

- EN50270:2006
- RoHS Compliant

DESCRIPTION

The EMS Environmental Monitoring System is a low cost, high sensitivity CO2 and indoor air quality monitor. It incorporates the advanced C1 infrared Carbon Dioxide sensor and is designed for monitoring indoor air quality in hotels, schools, offices, homes and public buildings.

The affordable wall-mounted system measures the concentration of Carbon Dioxide in the air with a simple traffic light and buzzer alarm or the choice of analogue, digital or relay outputs for larger installation requirements including integration into building management systems.

The system is completely configurable at time of ordering, allowing you to customise to meet your specific application needs. There are additional options to measure Oxygen concentration, temperature, atmospheric pressure and relative humidity. Also choose from numerous output types and communications interfaces, alongside a choice of precalibrated alarm levels. This makes the unit particularly ideal for indoor environmental monitoring for Heating, Ventilation and Air Conditioning (HVAC) and Indoor Air Quality (IAQ) control.

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CO2 EMS MONITORING SYSTEM

CUSTOMISED TO MEET YOUR NEEDS

The EMS Environmental Monitoring System can be configured to meet your needs – from simple CO2 monitoring to a system for integration into Building Management applications, with additional air quality functions.

Stand Alone CO2 Monitor

The monitor is small, light and easily mountable for a wall. There is a simple mains plug if required. The product continuously monitors air quality and alerts the occupant when a change in CO2 level occurs to the room, which is above the recommended limits.

Here you may wish to choose the basic CO2 version with traffic light style LEDs (green, amber, red) and the audible alarm for warning. If the alarm is heard, the occupant should manually increase the ventilation by opening doors, windows or turning on ventilation, where applicable. Once the CO2 levels have reduced to within the permissible limits, the alarm will stop and the LED will go back to green.

Direct Control

The monitor measures air quality continuously and can be used to directly and automatically control ventilation, heating or air conditioning in order to maintain a preset range of room conditions. Here you may choose a monitor with relay or analogue outputs. Select from a monitor with LEDs or with a plain cover, depending on your requirements.

Integration into Building Management System

Each monitor can be utilised to send air quality information to a central processing system that controls ventilation, heating and/or air conditioning for the entire building or complex. Multiple units can be individually configured and used through the system design. Choose monitors with full features, including measurement of Carbon Dioxide, Oxygen, temperature and humidity levels, complimented by analogue or digital outputs.

EURO-GAS MANAGEMENT SERVICES LTD, CHURSTON HOUSE, BASCOMBE ROAD, CHURSTON FERRERS, DEVON, TQ5 0JJ, UK
☎: +44 (0)1803 844414 Fax: +44 (0)1803 844224
sales@euro-gasman.com www.euro-gasman.com

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FEATURES

- Customisable CO_2 measuring ranges, with additional options of Oxygen, temperature, humidity and pressure measurement.

- Combinations of output available on request: current; voltage; RS232; RS485 (both Modbus RTU); and relays with configurable switching levels.

- Traffic light LED indicators can be set to illuminate at your chosen CO_2 levels.

- Low power 24Vdc supply voltage.

- Compact design.

- Maintenance free with long-term stability.

- Low unit cost.
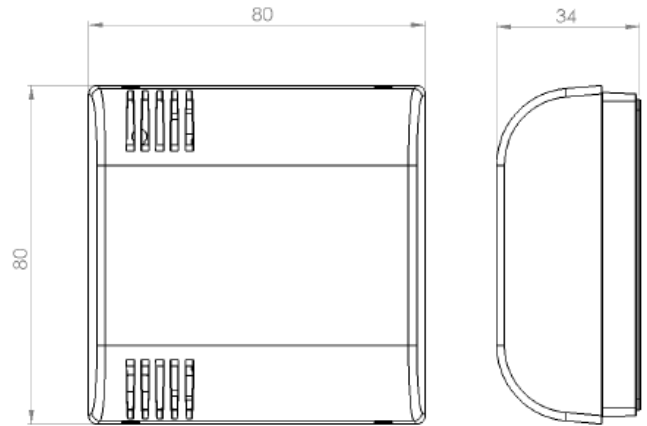
Dimensions in mm

SENSOR OPTIONS AND PARAMETERS

Sensor	Symbol	Range	Units	Description
Carbon dioxide	CO_2	0 – 5000 0 – 10000	ppm	Accuracy: ±70ppm, ±5% of reading (whichever is greater) Resolution: 1ppm
Oxygen	O_2	0 – 25	%	Accuracy: ±1% volume O2 (after calibration in fresh air) Resolution: 0.01% volume O2
Temperature	T	0 – 50	°C	Accuracy: ±2°C Resolution: 0.1°C
Relative humidity	Rh	0 – 95	%Rh	Non-condensing Accuracy: ±3% Resolution: 0.1%
Atmospheric pressure	P	750 – 1150	mbar	Accuracy: ±5mbar Resolution: 1mbar

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MAXIMUM RATINGS

Parameter	Maximum ratings	Description
Supply voltage	24Vdc ± 20%	Optional mains adaptor available
Current consumption	250mA max	All possible sensor and output options fitted

OUTPUT OPTIONS AND PARAMETERS

Output	Number	Options	Description
Analogue (current or voltage)	3	4 – 20mA 0 – 5Vdc 0 – 10Vdc 1 – 5Vdc	For current output, maximum load = 500Ω. For voltage output, minimum load = 10kΩ. Output range is directly proportional to the relevant sensor's measuring range
Digital communications	1	RS232 RS485	Modbus RTU protocol For RS485, up to 32 devices on the same bus
Relay	3	375VA 250Vac max	All three relays switch a common input Individual configurable switch points (with or without hysteresis). Standard hysteresis = 0.1% of reading. User-defined NO/NC settings
LEDs	1	Traffic light warning sequence	Red, amber and green LEDs Configurable activation threshold Continuous and/or intermittent operation
Buzzer	1	70dB @ 4kHz	Configurable alarm threshold Continuous and/or intermittent operation

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OUTPUT OPTIONS

As standard, the EMS monitor comes with traffic light LED indicators and a buzzer. Additional outputs are also available as follows (with or without traffic light system and alarm):

- Analogue: Up to three analogue outputs (current or voltage) are configurable to suit your interface requirements, for example: 4-20mA, 1-5Vdc, 0-5Vdc or 0-10Vdc. Analogue outputs can be linked to any of the on-board sensors.

- Digital communications: RS232 or RS485, both operating an industry standard Modbus RTU protocol. In the case of the RS485 version, address selection (manually via PCB mounted DIP switches, and/or through the communications interface) allows more than one device (up to 32) on the same bus. Digital communications are recommended for Customers who require access to all available sensor information and diagnostics, or who want to link to building management systems.

- Relay: Up to three relays are available to switch a common input. All available with configurable switch points, with or without hysteresis.

Please ask us if you require assistance or have a requirement that is not listed.

CO2 EMS Monitoring System is available with traffic light and alarm option (above) or with analogue/digital/relay output options with plain cover.
Part no. 2112BC2300

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sales@euro-gasman.com www.euro-gasman.com

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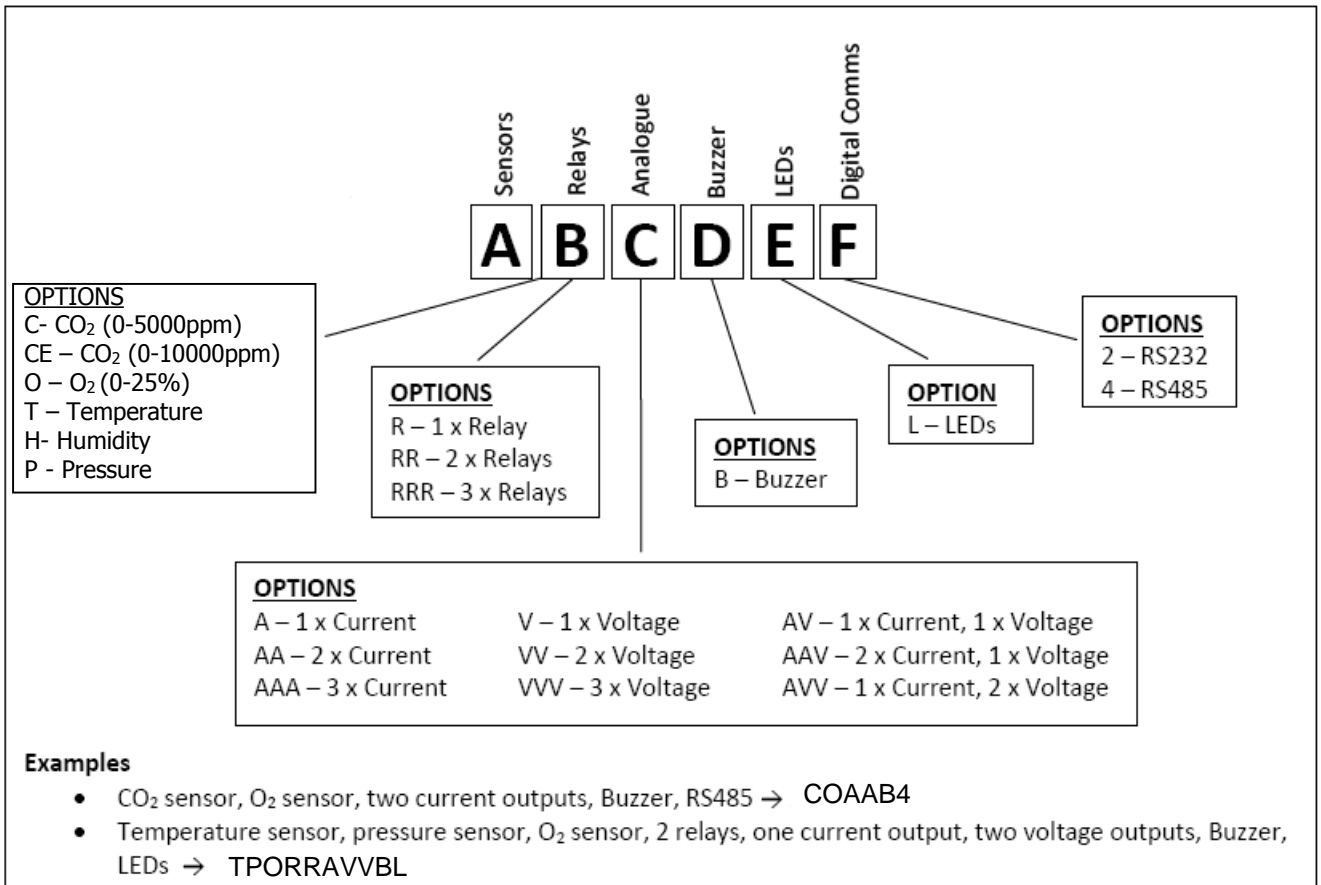
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ORDERING GUIDE

The standard and most popular options for the EMS monitor are available as follows:

1. CO2 Monitor, with traffic light LEDs and buzzer

2. CO2 Monitor, with traffic light LEDs and Modbus RTU interface

3. CO2 Monitor, with Rh, Temperature, LEDs and Modbus RTU interface

4. CO2 Monitor, with traffic light LEDs and 3 Relays

A range of combinations and output options are also available in addition to the above selection. Please advise us of your requirements and we will be pleased to offer you a comprehensive solution.

PART NUMBERING SYSTEM

Generate your specific part number using the system below:

```
        Sensors  Relays  Analogue  Buzzer  LEDs  Digital Comms

         A       B       C        D       E     F
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OPTIONS (Sensors)
C- CO_2 (0-5000ppm)
CE – CO_2 (0-10000ppm)
O – O_2 (0-25%)
T – Temperature
H- Humidity
P - Pressure

OPTIONS (Relays)
R – 1 x Relay
RR – 2 x Relays
RRR – 3 x Relays

OPTIONS (Analogue)
A – 1 x Current   V – 1 x Voltage   AV – 1 x Current, 1 x Voltage
AA – 2 x Current   VV – 2 x Voltage   AAV – 2 x Current, 1 x Voltage
AAA – 3 x Current   VVV – 3 x Voltage   AVV – 1 x Current, 2 x Voltage

OPTIONS (Buzzer)
B – Buzzer

OPTION (LEDs)
L – LEDs

OPTIONS (Digital Comms)
2 – RS232
4 – RS485

Examples

- CO_2 sensor, O_2 sensor, two current outputs, Buzzer, RS485 → COAAB4
- Temperature sensor, pressure sensor, O_2 sensor, 2 relays, one current output, two voltage outputs, Buzzer, LEDs → TPORRAVVBL

CO2 EMS MONITORING SYSTEM

EXAMPLES OF STANDARD PRODUCTS

Standard settings with alarm (schools/offices/light industrial)

CO_2 Concentration	LEDs			Buzzer
	Green	Amber	Red	
$CO_2 < 1500ppm$	**ON**	Off	Off	Off
$1500 < CO_2 < 2500ppm$	Off	**ON**	Off	**Sounds every 5 minutes**
$2500 < CO_2 < 3000ppm$	Off	Off	**ON**	**Sounds every 1 minute**
$CO_2 > 3000ppm$	Off	Off	**FLASHING**	**Sounds every 2 seconds**

Standard settings without alarm (schools/offices/light industrial/hotels)

CO_2 Concentration	LEDs		
	Green	Amber	Red
$CO_2 < 1500ppm$	**ON**	Off	Off
$1500 < CO_2 < 2500ppm$	Off	**ON**	Off
$2500 < CO_2 < 3000ppm$	Off	Off	**ON**
$CO_2 > 3000ppm$	Off	Off	**FLASHING**

CO2 EMS MONITORING SYSTEM

With 3 x Relays and LEDs (Building management systems)

CO_2 Concentration	Relays			LEDs		
	R1	R2	R3	Green	Amber	Red
CO_2 < 1500ppm	Open	Open	Open	**ON**	Off	Off
1500 < CO_2 < 2500ppm	**Closed**	Open	Open	Off	**ON**	Off
2500 < CO_2 < 3000ppm	Open	**Closed**	Open	Off	Off	**ON**
CO_2 > 3000ppm	Open	Open	**Closed**	Off	Off	**Flashing**

CAUTION

- Do not exceed maximum ratings.

- Carefully follow all wiring instructions, as 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.