

TECHNICAL DATA SHEET



**CARBON DIOXIDE
INFRARED SENSOR
CERTIFIED VERSION
TYPE MSH-P-CO2**



**Patent Numbers : GB 2 401 432 & GB 2 403 291
US Patent Application No. 10/929, 350
Other World Patents Pending**

ATEX Certificate No. SIRA 04ATEX1357U, I M2 EExd I and II 2 G EEx d IIC
IECEX Certificate No. SIR 05.0053U, Ex d I and/or Ex d IIC
UL recognised Class 1, Groups A, B, C and D, T4 with 60°C ambient

FEATURES

- ★ Contains all the necessary optics, electronics and firmware to provide a linearized, temperature-compensated output.
- ★ Choice of output format – direct pellistor replacement, industry standard 0.4 to 2 volts dc or digital.
- ★ Provides the option to convert existing compatible pellistor-based instruments to infrared Carbon Dioxide.
- ★ Sensors can be factory configured to customer specification.
- ★ All sensor types are user configurable using configuration equipment available from Dynament.
- ★ Fast track route for original equipment manufacturers to introduce the latest infrared technology – without any specialist knowledge.
- ★ Internal Flash memory allowing sensor firmware updates via configuration equipment.



Dynament Limited

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DESCRIPTION

Dynamant infrared sensors operate by using the NDIR principle to monitor the presence of target gas. The sensor contains a long life tungsten filament infrared light source, an optical cavity into which gas diffuses, a dual temperature compensated pyroelectric infrared detector, an integral semiconductor temperature sensor and electronics to process the signals from the pyroelectric detector .

Two versions are available:-

3 Pin Version - Pellistor Replacement Infrared

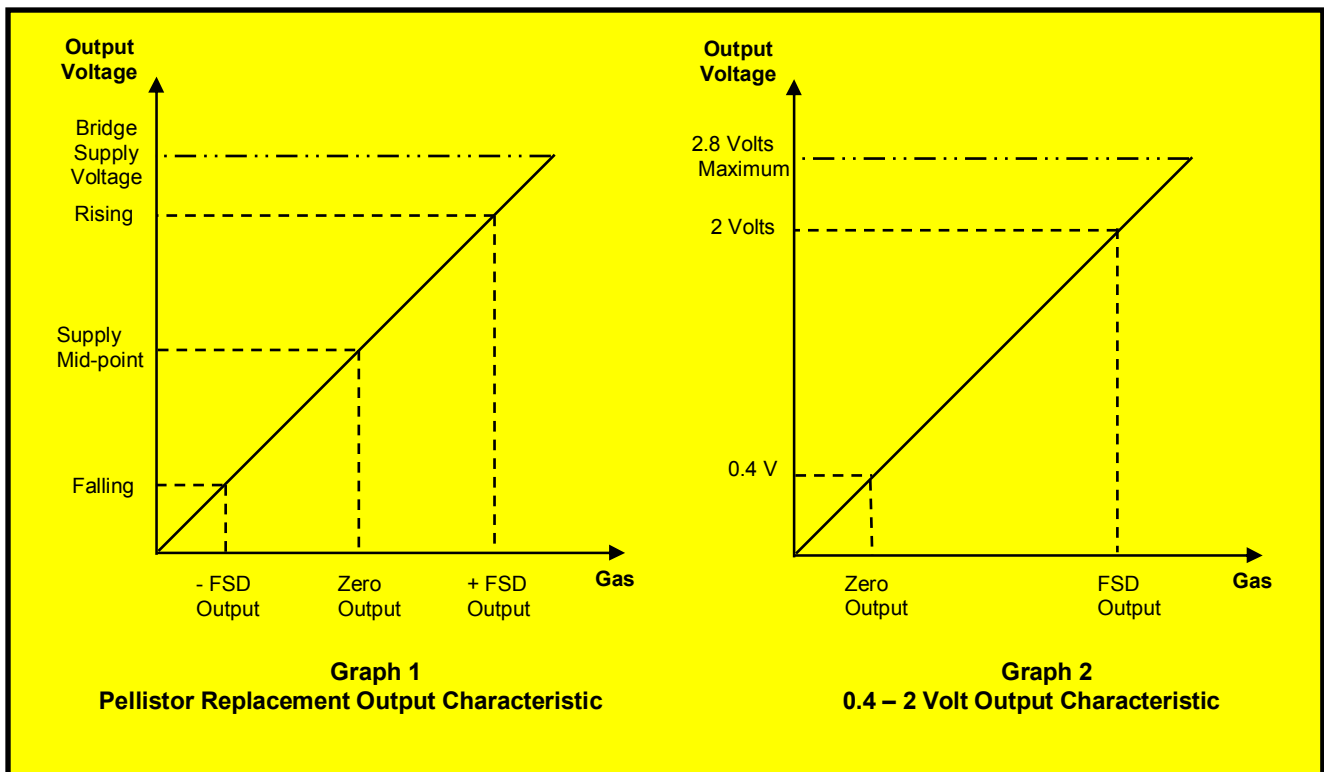
These sensors provide a pellistor style linearized, temperature-compensated output as shown in Graph 1. They can either be supplied pre-set to customer specification or may be configured by the user by means of a configuration unit available from Dynamant Ltd. The output signal can be set to rise or fall with increase in the gas level.

5 Pin Version - Multi-Purpose Range

This version of the sensor provides maximum user flexibility by providing the following output options:-

- ★ Industry Standard 0.4 to 2 volt linearized, temperature-compensated output as shown in Graph 2, or alternative voltages for zero and FSD outputs.
- ★ Digital output for direct communications with instrument electronics.
- ★ Rising or falling output with increasing gas level.

The digital output is a UART format comprising 8 data bits, 1 stop bit and no parity. Refer to specification for available baud rates.



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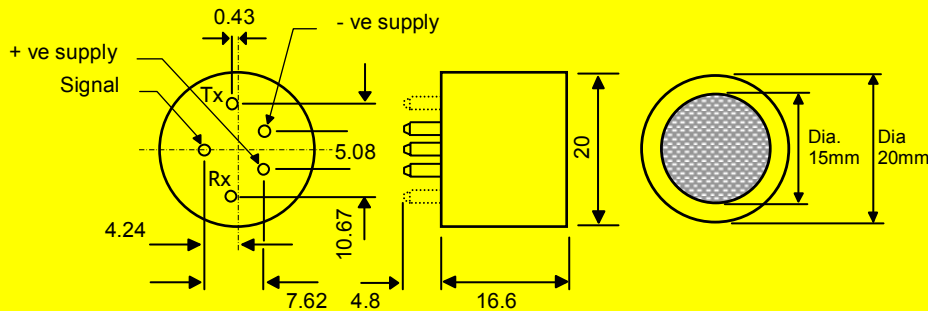
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SPECIFICATION

Operating Voltage Range:	3.0 – 5.0 V d.c.
Operating Current:	Constant current operation, current range 75 – 85mA
Programmable Output Voltage Ranges:	Voltage Output Types – 0v to 2.8 volts d.c. Bridge Output Types – 0v to Bridge Supply Voltage
Measuring ranges:	0 - 5%, 0-4%, 0-3%, 0-2%, 0-1% volume CO ₂
Resolution:	1% of measuring range
Warm up time:	To final zero ± 100ppm : 1 minute @20°C (68°F) ambient
Response Time T₉₀:	<30s @20°C (68°F) ambient
Zero Repeatability:	± 500ppm @20°C (68°F) ambient
Span Repeatability:	± 500ppm @20°C (68°F) ambient
Long term zero drift:	± 500ppm / month @20°C (68°F) ambient
Operating temperature range:	-20°C to +50°C (-4°F to 122°F)
Temperature performance:	± 10% FSD or ± 10% of reading from -20°C to +50°C (-4°F to 122°F)
Storage temperature range:	-20°C to +50°C (-4°F to 122°F)
Humidity range:	0 to 95% RH non-condensing.
Digital signal format:	8 data bits, 1 stop bit, no parity
Standard baud rates:	38,400, 19,200, 9600
User configurable parameters:	Zero output voltage FSD output voltage Positive or negative going output Sensor 'zero' function Sensor 'span' function
MTBF:	> 5 years
Weight :	15 grams

MECHANICAL DETAIL

NOTES



Pins viewed from underside Diameter of pins = 1.5mm
Tx & Rx communication connections are available as either pads or pins

1. DIMENSIONS WITHOUT TOLERANCES ARE NOMINAL.
2. RECOMMENDED PCB SOCKET WEARNES CAMBION LTD CODE: 450-3326-01-06-00.
3. WEIGHT: 15g
4. USE ANTI-STATIC PRECAUTIONS WHEN HANDLING
5. DO NOT CUT PINS
6. DO NOT SOLDER DIRECTLY TO PINS

NOTE – The above pin configuration is shown for the POSITIVE version of the sensor. The NEGATIVE version has the +ve and -ve supply pin positions exchanged. See ordering details.

Dynamant reserve the right to alter technical specifications without prior notice



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Ordering Details

In order to completely specify the type of sensor that is required, the customer needs to provide the following information:-

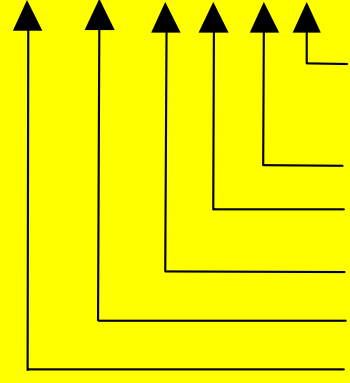
- An Order Code (see below) that specifies the sensors' basic physical and electrical characteristics.
- The sensor configuration requirements.

Available sensor options:

F = Replaceable, self adhesive microporous PTFE filter

EXAMPLE OF ORDER CODES

MSH – P / CO2 / 3 / B / P / F



Option

FILTER : BLANK = OMITTED
 F = FITTED

SUPPLY POLARITY : P = Positive
 N = Negative

OUTPUT TYPE : B = Bridge
 V = Voltage

NUMBER OF PINS : 3 or 5

GAS TYPE : CO2 = Carbon Dioxide

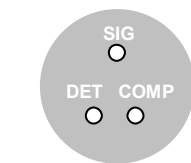
PREMIER SENSOR

CONFIGURATION OPTIONS

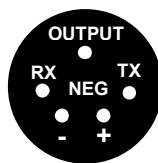
(To be stated on customer order in addition to the Order Code)

1. Output voltage for zero.
2. Output voltage for span.
3. Rising or falling output voltage with increasing gas level.
4. Sensitivity
5. Communication speed – 38,400 baud (default), specify alternative rate if required.

Conversion of Pellistor-Based Instruments to Measure Carbon Dioxide - Explanation of Positive & Negative Polarity

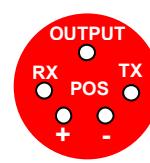


Typical Pellistor Pinout



Premier Negative Polarity Option

Use where the DET pin of the existing pellistor is connected to the Negative of the pellistor bridge supply.



Premier Positive Polarity Option

Use where DET pin of the existing pellistor is connected to the Positive of the pellistor bridge supply.

Note – the RX and TX connections are pads on the 3 pin versions of the sensor.



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