



GDA 4350

Carbon Dioxide Sensor

Operating Manual

Manual Revision: 1.1
Hardware Version: 11, 12
Software Version: 2.1.3



Thank you for purchasing this product from Gas Detection (Australia) Pty Ltd

This manual contains information about the method of installation, simple maintenance and troubleshooting of the GDA 4350 gas sensor. Please read it carefully and keep it nearby for further reference.

Note:

The calibration period for a sensor will depend on a number of factors such as the environment in which it is used, operating temperature, humidity, atmospheric pressure and environmental pollutants.

In all cases we recommend sensors are calibrated in line with target market legislation.

In order for these sensors to maintain operational efficiency and performance it is recommended that the sensors are checked for functionality on 6 monthly periodic cycle.

A sensor calibration should be carried out annually, by fully trained and authorised and approved technicians approved by GDA.

PROPRIETARY RIGHTS

No part of the hardware or documentation may be reproduced, transmitted, transcribed, stored in a retrieval system, or translated into any language or computer language, in any form or by any means, without prior written permission of GDA.

While great efforts have been made to ensure the accuracy and clarity of this document, GDA assumes no liability resulting from any omissions in this document, or from misuse of the information contained herein. The information in this document has been carefully checked and is believed to be entirely reliable with all of the necessary information included. GDA reserves the right to make changes to any products described herein to improve reliability, function, or design, and reserves the right to revise this document and make changes from time to time in content hereof with no obligation to notify any persons of revisions or changes. GDA does not assume any liability arising out of the application or any use of any product or circuit described herein; neither does it convey license under its patent rights or the rights of others.

Table of Contents

1. Overview	5
1.1. Introduction.....	5
1.2. Specifications.....	6
2. Sensor Placement	7
3. Wiring Instructions	8
4. Operation	9
5. Output Configuration	10
6. Calibration:.....	11
6.1. Fresh air Zero point Calibration:.....	11
7. Revision History	16

1. Overview

1.1. Introduction

The GDA 4350 is designed for use in safe area applications. It uses the latest laser semiconductor technology for detection of carbon dioxide. The sensor and electronics are one homogenous unit and must never be separated. It has an analog output which can be set to 4-20mA, 0-20mA, 0-10V or 0-5V.



Figure 1: Dimensions

1.2. Specifications

Model	GDA 4350
Detectable Gases	Carbon Dioxide (CO ₂)
Detectable Gas Ranges	0-2000ppm; 0-10000ppm; 0-5% vol; 0-20% vol; 0-100% vol
Detection Type	Diffusion
Sensor Technology	Non Dispersive Infra red (NDIR)
Linearity	Linear
Response Time	< 24 seconds at STP
Accuracy of Reading	± 2% FSD ±0.5% reading @STP
Warm Up Time	< 4 min
Zero Drift	<0.5% FSD for 90days @STP
Calibration Drift	<0.5% FSD for 90 days @STP
Calibration Requirement	Annually if sensor operated at STP
Operating Voltage	+24V _{DC}
Output Type	4-20mA (Standard), 0-20mA, 0-10V or 0-5V (User Specified)
Power Consumption	150mA peak @ 24V _{DC}
Connection	4 pin plug connector
Wiring	3 core wire with overall screen with current carrying capability to suit cable length of cable run, Screen must be connected to the Earth connection on the connector P1.
Output Specifications	4-20mA (Standard), 0-20mA, 0-10V or 0-5V (User Specified)
Operating Temperature	5°C to +45°C (LT version to -20°C to +45°C)
Operating Humidity	5% to 95% RH peak non condensing
Operating Pressure	950 to 1050 hPa
Cable Entry	User defined (Top or Left side pre cut)
Mounting Height	Approximately 300mm above the floor
Enclosure Material	ABS plastic
Dimensions	115 x 130 x 71 (W, H, D)
Weight	300g
IP Rating of Enclosure	IP50

Table 1: Specifications

2. Sensor Placement

The sensor is rated IP50 and therefore suitable for indoor use only. If it is going to be used in external environments seek specialist advice from GDA. The sensor should not be exposed to steam or saturated water vapour.

Carbon Dioxide is heavier than air and therefore will (if there is no air movement) fall to lower levels. The recommended minimum installation height above the floor is 300mm.

Mount the sensor as close as possible to where the leak of the gas being detecting may occur as the distance from a potential leak affects the time taken to detect it. The further from the potential leaks the more the gas will be diluted. Take into account drafts and air movements when mounting the sensor.

Fit using the four fixing holes in the corners of the box. When drilling avoid any vibration of the sensor unit. The laser diode sensing unit is very sensitive. **Do not expose the sensor to any mechanical shock.**

IT IS VERY IMPORTANT THAT THE GDA 4350 IS INSTALLED IN THE MOST UPRIGHT POSITION AGAINST A VERTICAL STRUCTURE.



Figure 2: Sensor Mounting orientations

For other mounting positions other than recommended please contact Gas Detection (Australia). The sensor will need to be recalibrated if an alternate mounting position is required. Do not mount the sensor with the opening facing up, as CO₂ gas can accumulate in the sensor and cause false readings.

3. Wiring Instructions

The sensor electrical connection is on the rear of the faceplate via a 4 pin polarised plug on the PCB.

The sensor is to be wired with a 3 core cable with an overall screen with current carrying capability to suit cable length of cable run. Screen must be connected to the Earth connection on the connector P1. The enclosure is plated with a layer of conductive chrome which is connected to the earth terminal on the PCB.

The 4-20mA O/P is to be connected to the 4-20mA input of the control board.

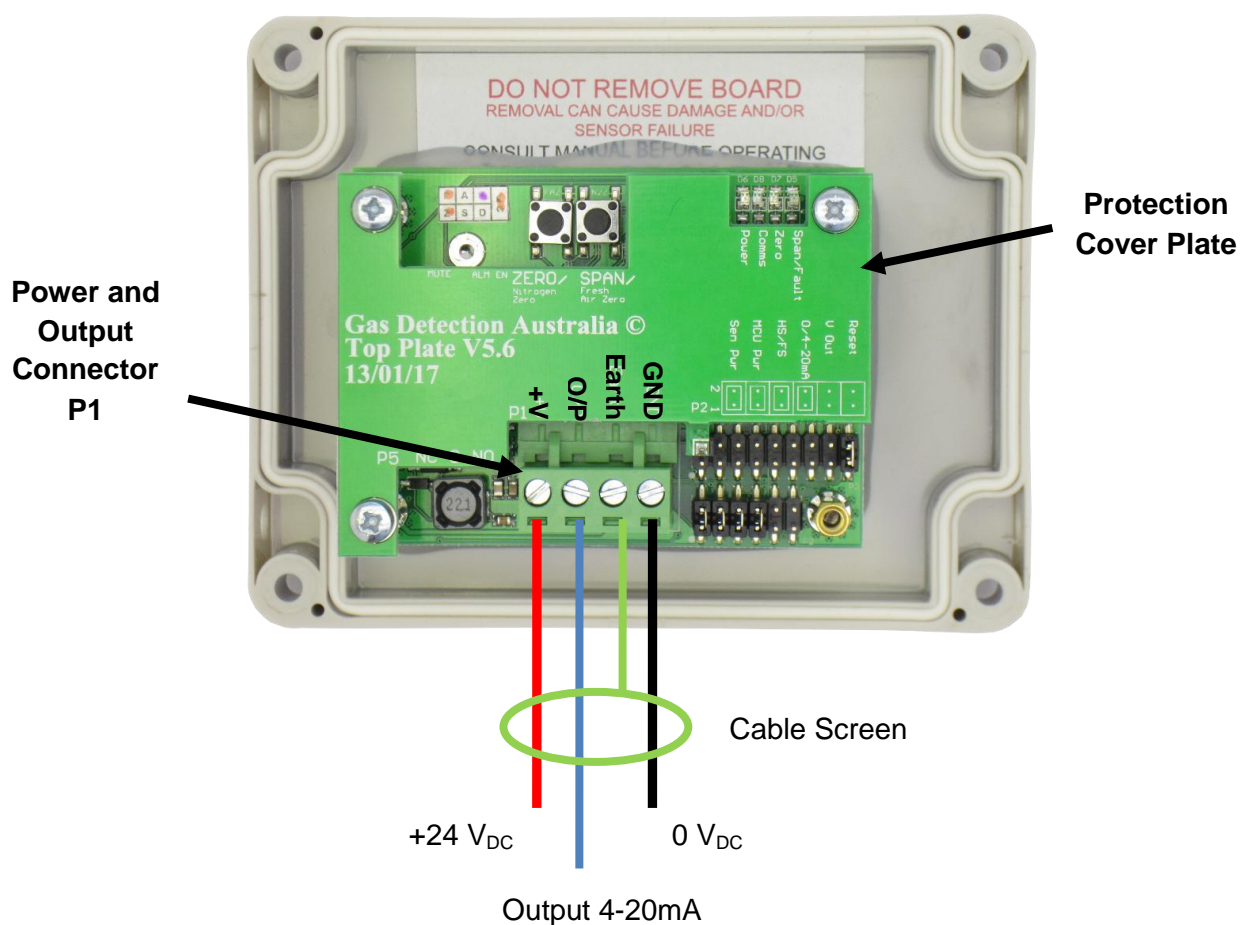


Figure 3: Sensor Wiring Diagram

4. Operation

When power is applied the sensor goes through a power up procedure as detailed below. Please note that the **current o/p is not valid for approximately 2-4 minutes from the power being applied.**

During the 2-4 minute power up the current output of the GDA 4350 may reach the full scale of the set output. Ensure that this does not affect external equipment.

LED	LED STATE	FUNTION
	ON	Power is present
	OFF	Power is not present
	GREEN ON, BLUE FLASHING, YELLOW ON	The sensor is in its warm up period (approx 2~4 mins) during this period the sensor o/p is 0.45mA
	GREEN ON, BLUE FLASHING	Normal operation the sensor has stabilised and the 4-20ma reflects the amount of gas present
	GREEN & RED ON	This indicates a fault associated with the sensor. The o/p current is reduced to 1.2ma

Table 2: LED Status

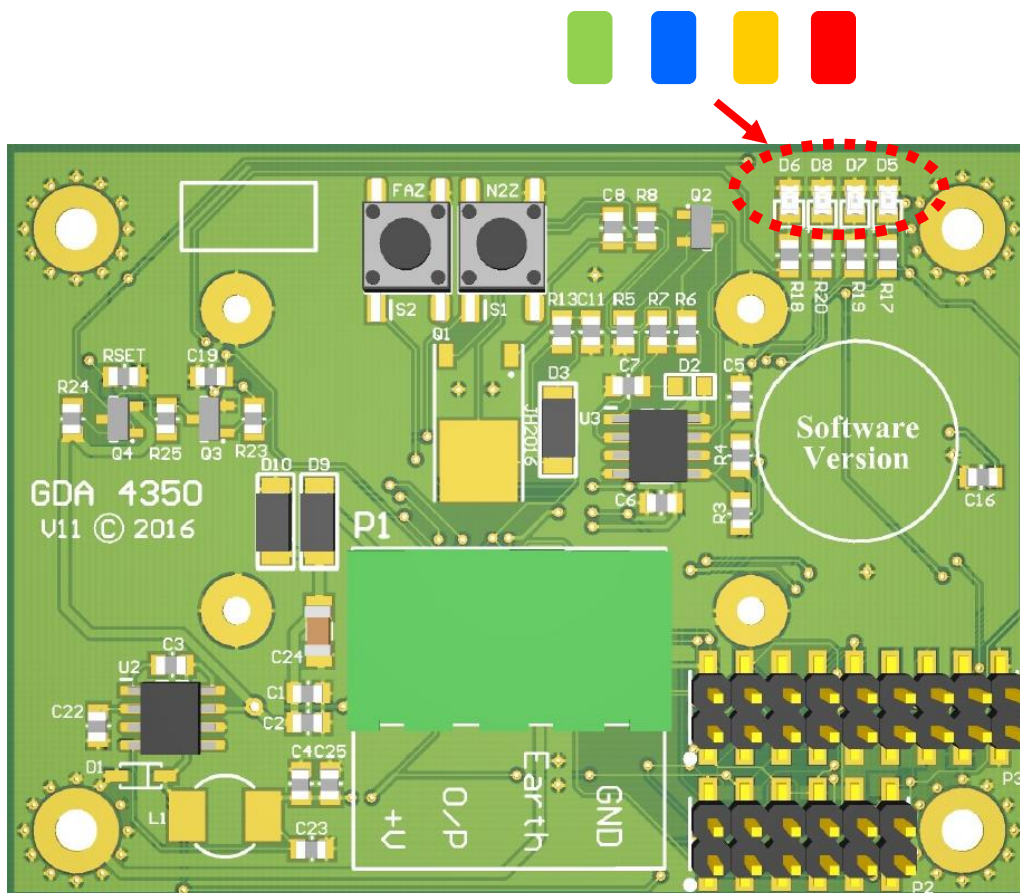


Figure 4: Status LED Location

5. Output Configuration

Current or Voltage 0-20mA, 4-20mA, 0-5V, 0-10V Configuration

This output will generate a current or voltage output reflecting the full scale of the sensor. This output is factory set and calibrated to the user's specified requirements at point of purchase.

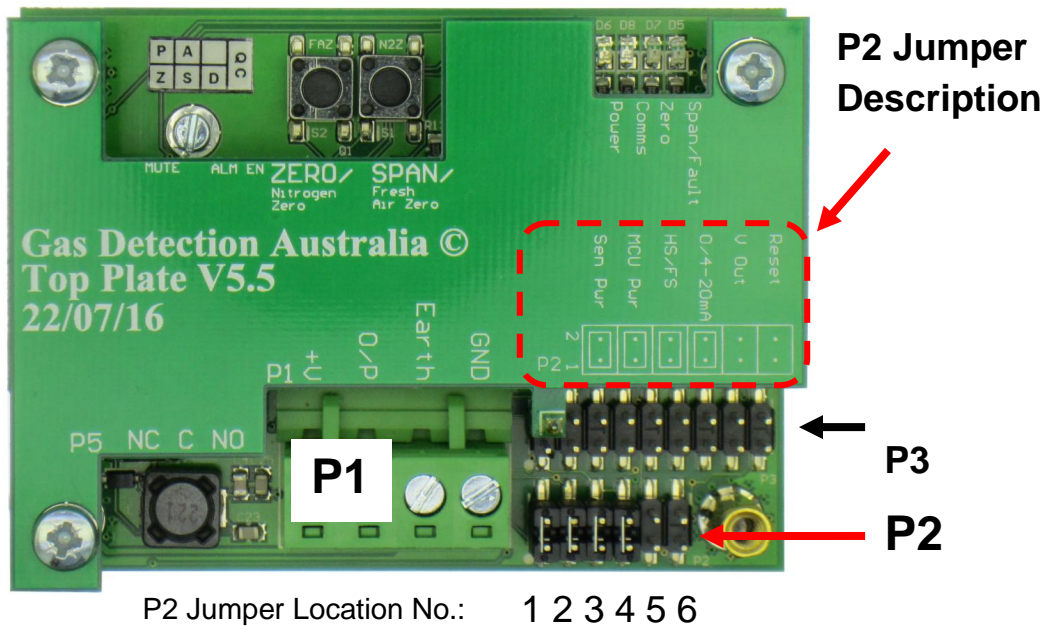
If an output type was not specified by the user at time of purchase the default setup is set and calibrated to 4-20mA. This is user adjustable out in field but will not be as accurate to what it was originally calibrated to from factory.

The 4-20ma will drive into a maximum of 680Ω load impedance (line and input impedance) at 24V.

Be cautious when handling the GDA 4350 as there are delicate components that can easily be damaged by static discharge. Always observe anti static precautions.

To change the output:

1. Isolate the GDA 4350 by removing the incoming power source connector (P1) from the rear of the board
2. Adjust jumper pins to the desired output configuration (see Table below)
3. Ensure output is configured for the changed output option
4. Revert to normal operation



Output Type	P2 Jumper Configuration (IN or OUT)					
P2 Jumper Location	1 Sen Pwr	2 MCU Pwr	3 HS/FS	4 0/4- 20mA	5 V Out	6 Reset
4 - 20 mA (Default as pictured)	IN	IN	IN	IN	OUT	OUT
0 - 20 mA	IN	IN	IN	OUT	OUT	OUT
0 - 5 V	IN	IN	OUT	OUT	IN	OUT
0 - 10 V	IN	IN	IN	OUT	IN	OUT

Table 3: Output Jumper location

6. Calibration:

Sensors are issued tested & pre-calibrated under controlled lab conditions. Changes to humidity, temperature, and other environmental factors affect the sensor accuracy and may need a re-set of the fresh air zero point when introduced to new environments.

The GDA 4350 is an auto calibrating device and under most cases will auto calibrate to new environment over time.

Functional testing may be carried out with a suitable test gas to ensure that the 4-20mA o/p corresponds with the gas level. This should be undertaken when the unit is fully assembled and using a flow rate of ~0.5L/min of the target gas. Test gas and equipment are available from Gas Detection Australia.

6.1. Fresh air Zero point Calibration:

A manual fresh air zeroing (span) of the sensor can be performed when the sensor has been powered for a minimum of one hour. The fresh air zero can be performed when the sensor is in a known fresh air. The sensor must be in the fresh air conditions for a minimum of five minutes or until the output has reached a stable point.

To perform a manual fresh air zero (span) point calibration:

1. Remove the GDA 4350 from the wall to access the back of the sensor unit;
2. Add a jumper to pins 1 and 3 of **P3** see picture below, This enters Manual Calibration Mode (see table for LED sequence);
3. Press and hold the **SPAN/ Fresh Air Zero** calibration button **S1** for 1 to 2 seconds (see table for LED sequence):
 - If the Fresh Air Zero was successful (see table for LED sequence)
 - If the Fresh Air Zero was **NOT** successful (see table for LED sequence). Repeat step 3 after ensuring that the sensor is in fresh air and stable.

Note: Do not press the ZERO button as it will perform a Nitrogen zero.

4. When successfully zeroed remove the Manual Calibration jumper from header **P3** and return to normal operation.

Mode	LED Light Sequence	
Manual CAL Mode		Solid while jumper in Manual CAL position
Performing Zero		Alternate blinking at once per second for ~ 4 sec
Zero Successful		Fast blink for ~ 2 sec
Zero Failed		Solid for > 2 sec

Table 4: Calibration LED sequence

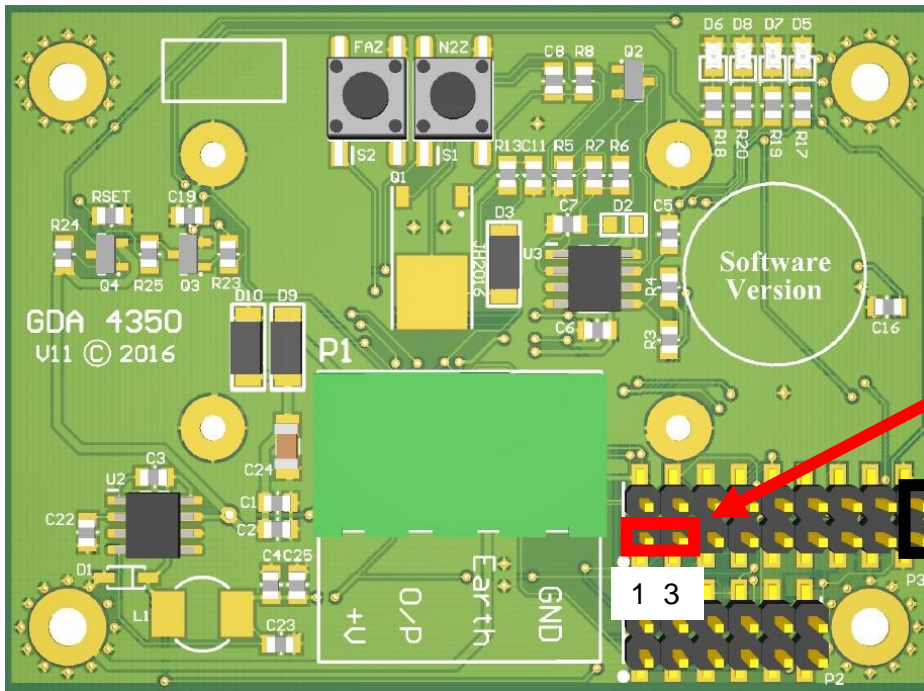


Figure 5: Manual Calibration Mode jumper position

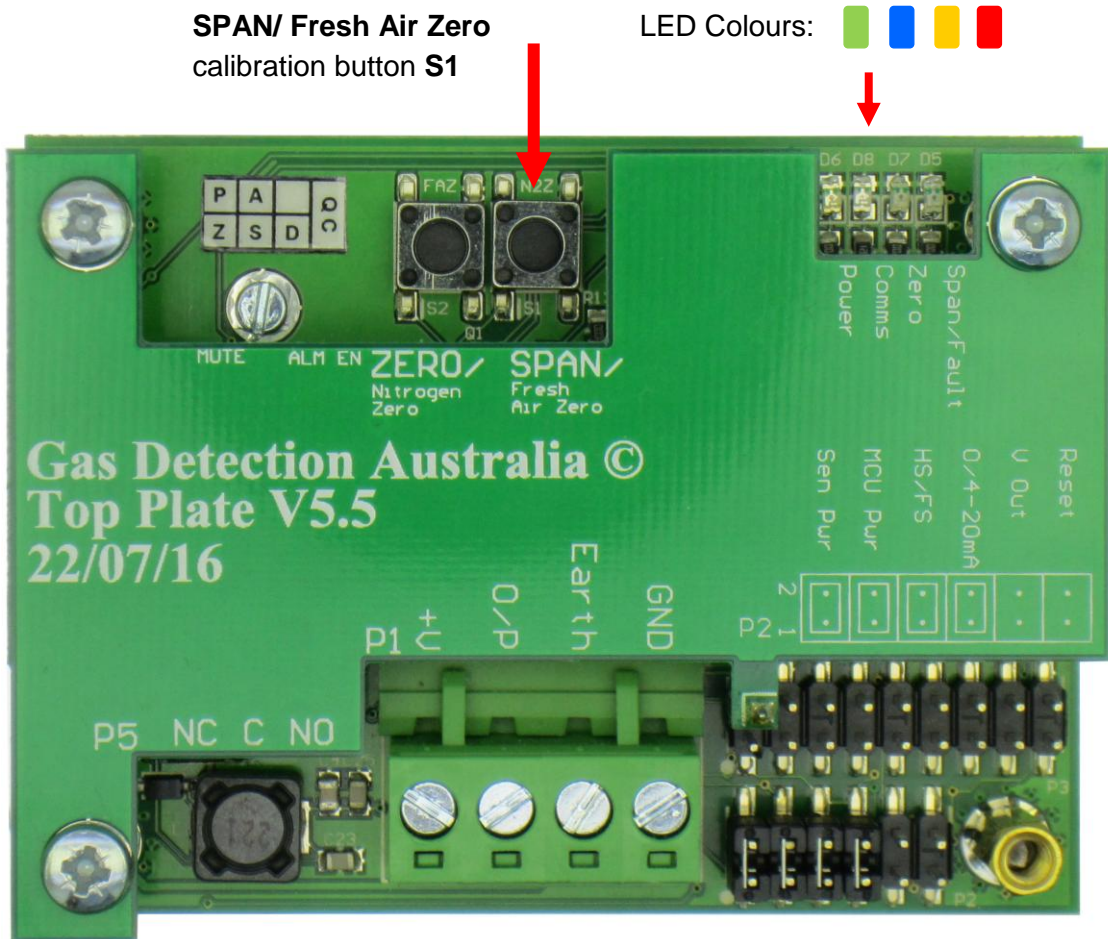


Figure 6: Fresh Air Zero button location

Contact OneTemp for more information if calibration of sensor is required

Label interpretation:

1. Product: Name of detectable gas and its chemical formula
2. Part Number: Product part number of detector, sensor head, controller, ...
3. Serial Number: Serial number of detector, sensor head, controller, ...
4. Range: Range of sensor and units (ppm, %vol, %LEL)
5. Date of Manufacture: Date of Manufacture/ Date of Calibration

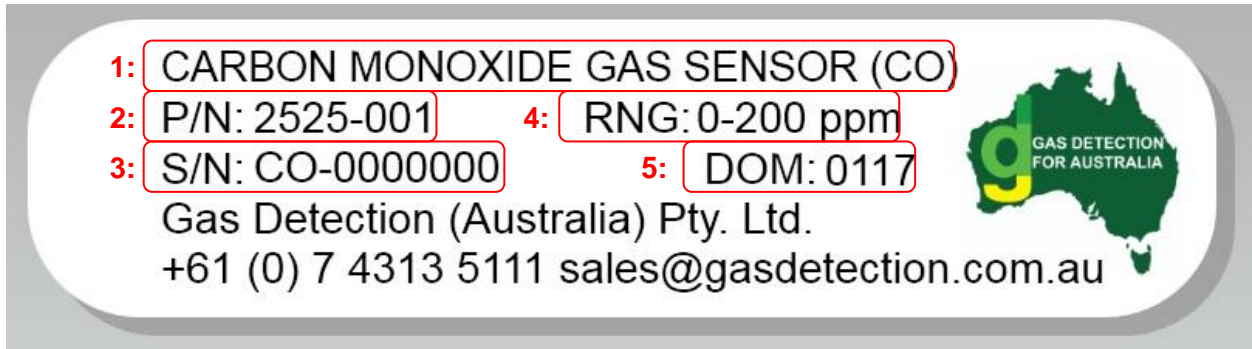


Figure 7: Label interpretation

7. Revision History

Version	Contents	Date
1	Initial revision of the Manual HW: V11-12	27 Apr, 2018
1.1	Manual CAL table 4 updated	1 May, 2018

Table 5: Revision History

This product and operating manual are subject to change without prior notice for the improvement of product performance and ease of use.



OneTemp^o pty ltd
measure | control | record
1300 768 887
www.onetemp.com.au