GASGUARD

CH_4 CATALYTIC DETECTOR UNIT

User Manual

Version: 8, August 2021

User Manual Part #: 161297

Designed and manufactured in Australia by Ampcontrol Pty Ltd

WARNING!

The **warning** symbol highlights a potential risk of **injury or death**.

Please share these warnings with other operators.

CAUTION!

The **caution** symbol highlights a potential risk of **damage to equipment**.

Please share these cautions with other operators.

NOTE

The **note** symbol highlights **key information**.

Please share these notes with other operators.

ENVIRO

The **enviro** (environmental) symbol highlights areas which may have an impact on the surrounding **fauna and/or flora**.

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Before You Begin

Thank you for purchasing from the Ampcontrol GasGuard range.

WARNING!

In the interests of **safety and correct equipment operation**, please take the time to read and understand the content in this manual.

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DEFINITIONS

Term	Definition
Detector	Complete apparatus purchased by end user comprised of a sensor head and amplifier PCB in a stainless steel enclosure that detects gas and converts to a 4-20mA signal as well as displays a reading on the LCD screen
Sensor head	The assembly attached to the bottom of the detector which houses the sensor cell
Amplifier PCB	The PCB inside the detector that amplifies the sensor cell signal into a usable 4-20mA loop
CH_4	Methane
NATA	National Association of Testing Authorities, Australia

1 SAFETY AND OTHER WARNINGS

For safety reasons, the GasGuard detectors must be installed, operated and serviced only by competent personnel. Please read and understand this instruction manual completely before installing, operating or servicing this equipment. Failure to install or operate these instruments in accordance with the instructions contained in this manual may create hazardous operating conditions.

1.1 Safe Use of Equipment

The equipment supplied has been designed and manufactured to ensure safe operation. The equipment must only be used within the design parameters.
The instructions within this manual must be observed as an aid towards achieving the safest possible installation.

Persons responsible for installation, maintenance, or operation, must observe the following instructions:

1.1.1 Changes to Equipment

Changes in the design and modifications to the equipment are not permitted. Unauthorised changes made to the hardware or operating firmware will void the manufacturer's warranty, and may compromise the integrity of the system into which it is installed and other connected equipment.

1.1.2 Equipment Knowledge

Experience with, or understanding of, this equipment is essential for the safe installation and removal of the equipment. Therefore, please read and understand this manual prior to use. Competency based training courses are recommended and are available on request.

1.1.3 Manual Handling

Precautions have been taken to ensure all equipment is safe to handle and free from sharp edges. However, care should always be taken when handling enclosures and gloves should be worn.

1.1.4 Installation

Correct operation and safety depend on the GasGuard detector and associated equipment being installed correctly. Mechanical and/or electrical installation and maintenance of plant and equipment must only be carried out by appropriately qualified personnel and must be tested thoroughly prior to operation.

1.1.5 Operation

As safety depends on the GasGuard detector functioning correctly it is highly recommended that all safety functions of the product be periodically tested to ensure correct operation.

2 RECEIVING AND STORAGE

2.1 Receiving

All possible precautions are taken to protect the equipment against damage or losses during shipment; however, before accepting delivery, check all items against the packing list or bill of loading. If there is evidence of physical damage, notify Ampcontrol immediately.

Notify Ampcontrol immediately in the case of any discrepancies to the packing list. Keep a record of any claims and correspondence. Photographs are recommended.

Where practicable do not remove protective covers prior to installation unless there are indications of damage. Boxes opened for inspection and inventory should be carefully repacked to ensure protection of the contents or else the parts should be packaged and stored in a safe place. Examine all packing boxes, wrappings and covers for items attached to them, retain and store any approval documentation for your safety file as applicable prior to wrapping being discarded.

2.2 Inspection

Equipment that is found to be damaged or has been modified away from its published specifications must not be used. Please contact Ampcontrol if the equipment is suspected to be different than that ordered or if it does not match the published specifications.

2.3 Storage after Delivery

When the equipment is not to be installed immediately, proper storage is important to ensure protection of equipment and validity of warranty.

All equipment should be stored indoors between 3-20˚C, preferably on shelves and protected from moisture and sunlight.

2.4 Unpacking of Equipment

The method of packing used will depend on the size and quantity of the equipment. The following cautions should be interpreted as appropriate.

CAUTION!

Take care when unpacking crates as the **contents may have shifted during transport**.

ENVIRO

The disposal of packaging materials, replaced parts, or components must comply with environmental restrictions without polluting the soil, air or water.

Ensure that any timber and cardboard used as **packaging is disposed of in a safe and environmentally responsible manner**.

Where possible, dispose of all waste products i.e. oils, metals, plastic and rubber products by using an approved recycling service centre.

3 PRODUCT OVERVIEW

Ampcontrol's GasGuard Methane Sensor / Transmitters are supplied complete with an amplifier and a Liquid Crystal Display.
The Transmitter/Sensor assembly is an IEC Ex ia Group I certified assembly. The Certification is based on the unit being sealed to IP66 in a stainless steel enclosure and the appropriate checks being made on the Intrinsically Safe Parameters of the overall system the transmitter is connected into.
The Transmitter and Sensor can be mounted as an integral device but there is also an option to mount the sensor separately up to 10m from the transmitter. In the remote configuration the sensor is factory fitted with a type 2S cable which is potted directly into the sensor assembly.
The sensor is designed to provide a standardised output applicable for the gas range. This signal is not for direct connection to other devices and so the amplifier PCB in the transmitter housing is used to condition the signal, provide calibration functions and produce a 4-20mA signal.
The transmitter and amplifier assembly is configured in the factory for a specific gas range.

Key Features

- Economical Fixed Gas Sensor / Transmitter
- Rugged Construction
- Reliable
- Certified Intrinsically Safe – Ex ia
- LCD Display
- Non-Intrusive Closed Case Calibration

This document covers the catalytic range of GasGuard detectors. The GasGuard range of detectors consists of electrochemical, catalytic and infrared sensor types and each provides a linear 4-20mA DC current output. The full range consists of:

Electrochemical:

- Oxygen (O_2)
- Carbon Monoxide (CO)
- Hydrogen Sulphide (H_2S)
- Nitric Oxide (NO)
- Nitrogen Dioxide (NO_2)

Catalytic

- Methane (CH_4)

Infrared:

- Carbon Dioxide (CO_2)

The sensor unit part numbers are unique and are identified in accordance with the following scheme:
Model Number 65-6550XXX series is for electrochemical detector units.
Model Number 65-6551XXX series is for catalytic detector units.
Model Number 65-6552XXX series is for Infrared sensor units.

Where XXX represents the chemical symbols for the gas detected by the unit. For example, 65-6550CH4 is the Model number for an electrochemical unit designed to detect Methane (CH_4).

3.1 Methane Gas Sensor

The Methane Gas Sensor, which operates on the catalytic combustible gas detection principle, is a small platinum element coated in a catalyst. Electrical current is passed through the platinum wire and the potential of the catalytic element is monitored by a simple Wheatstone bridge arrangement. Combustible gases, once in contact with the heated catalytic surface of the measuring element, react and cause the surface temperature of the element to rise. Any increase in temperature affects the resistance of the platinum wire, causing a small shift in potential across the Wheatstone bridge proportional to the concentration of the combustible gas.

3.1.1 Sensor Cell Cross Sensitivity

The cross sensitivity of the methane sensor cells to commonly occurring gases are listed below in Table 1.
Methane (CH_4) gas sensors positively detect the presence of all flammable gases. They are unable to distinguish the difference between gases so the sensor will display a reading if any flammable gas is present.

CAUTION!

Exposure to Hydrogen Sulphide gas (H_2S) may affect the performance of the Methane sensor (i.e. it may reduce its sensitivity). If the sensor is exposed to H_2S gas then it should be **recalibrated**.

3.1.1.1 Cross-sensitivity Data

Table 1: Methane cross-sensitivity

Methane Cross-Sensitivity		
Gas	**Concentration**	**Reading (% v/v)**
Acetic Acid	4.0%	1.45
Acetone	2.6%	2.5
Ammonia	15%	6.25
Benzene	1.2%	2.0
n-Butane	1.8%	2.5
Carbon Monoxide	12.5%	4.0
Chlorobenzene	1.3%	1.7
Ethanol	3.3ppm	2.95
n-Hexane	1.2%	2.0
Hydrogen	4.0%	4.0
Methane	5.0%	5.0
Methanol	6.7%	4.25
Methyl ethyl kentone	1.9%	2.0
n-Pentane	1.4%	2.0
Propane	2.1%	2.5
Toluene	1.2%	2.0

3.1.2 Humidity

Sensors can operate in a condensing atmosphere. In such an environment, a thin film of water can form across the membrane, effectively sealing it and stopping the passage of gas into the sensor. On evaporation of this water the sensor usually resumes normal operation.

3.1.3 Poisoning of Sensors (Contamination)

High levels of or long exposure to certain compounds may poison the catalytically active detector filament thereby reducing or destroying its sensitivity.
Among these compounds are halides, sulphur compounds, leaded petrol, silanes, silicates and other products with silicon. Products such as aerosol sprays, polishes, waxes and lubricants with silicones and non-catalysed silicone rubbers such as “silastic”, phosphate esters, and hydraulic fluids – will all damage catalytic sensors.

3.2 Amplifier PCB

The purpose of the Amplifier PCB is to convert the low-level electrical output of the sensor into a signal capable of driving various types of external indicator equipment such as the Ampcontrol GasGuard 4 Channel Controller.
The Amplifier PCB requires a 12VDC operating voltage and transmits a signal of 4-20mA. At the lower end of the range, the 4mA signal level indicates a zero gas concentration. At the upper end of the range, the 20mA signal indicates that the sensor has detected a full span gas concentration. ZERO and SPAN adjustment reed switches located on the PCB are used for calibration of the instrument.
The CH4 detector latches when the reading is over 5.50% gas concentration. This will result in the output current latching at 21.6mA. To recover, the detector must have a power cycle, and restart with a reading less than 5.50%.

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3.3 Stainless Steel Enclosure

The standard stainless steel housing, (shown in Figure 1.1, Page 1), incorporates the methane sensor and amplifier PCB. The housing is robust and is corrosion resistant. It is suitable for almost all applications and provides for easy installation and maintenance. When properly used it gives many years of efficient operation.

3.4 Sensor Wiring Assembly

Sensor and Transmitter assemblies are matched together and cannot be replaced or interchanged by unauthorised personnel. Connection of any other type of sensor head will render the unit non-operational.

3.4.1 Anti-Vibration Clip

An Anti-Vibration clip Pt/No. 121647 is fitted to the sensor and power connectors on the rear of the Amplifier PCB.

Figure 3.1: Anti-vibration clip

4 PRODUCT OPERATION

The user interface for the Sensor / Transmitter is shown in Figure 4.1, with the numbered items being explained in Table 2.

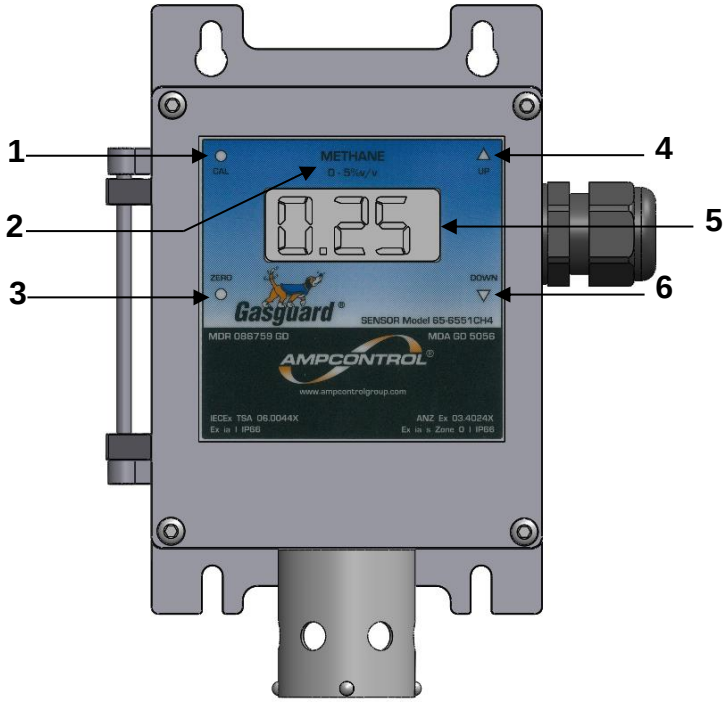

Figure 4.1: Sensor / Transmitter User Interface

Table 2: Sensor / Transmitter User Interface Descriptors

Item	Name	Function
1	CAL	Button operated using the magnetic calibration tool
2	Sensor Type	Label displaying Sensor Type
3	ZERO	Button operated using the magnetic calibration tool
4	UP	Button operated using the magnetic calibration tool
5	Screen	Used to display the detected gas level or display codes
6	DOWN	Button operated using the magnetic calibration tool

Table 3: GasGuard Display Codes

Display	Description
-777	There is no sensor plugged into the amplifier
-999	Amplifier needs reconfiguration
Er	Error has occurred
CAL	Calibration mode initiated (display blinks when in calibration mode)
SAU	Calibration settings have been saved
PU	Power Up

5 INSTALLATION

5.1 General Warnings

These instructions have been designed to assist users of the GasGuard detector with installation.

Before a GasGuard detector can be installed, there are a number of things that need to be considered and understood to prevent incorrect or unsafe operation of the detector or the system into which it is installed.

Along with relevant competence, and an understanding of the target application, the following points should be considered:

5.1.1 Ensure that the information provided in this user manual is fully understood.

It is extremely important that the limitations and functionality of the GasGuard detector is understood to prevent incorrect installation and use from creating a potentially dangerous risk. If in doubt as to the nature of the limitations or their implication, consult a competent authority such as a supervisor or Ampcontrol technical representative.

5.1.2 Ensure that the application into which the GasGuard detector is being installed has been properly defined, designed and approved.

Any system intended to mitigate the risk of injury needs to be properly designed and implemented. Such a system must be the result of structured risk analysis with the outcomes used to define the system requirements. These requirements, in turn, will guide the choice of instrumentation, logic solvers and actuators needed to implement the system. Understanding the needs of the system will ensure proper selection of equipment.

5.1.3 Ensure that the GasGuard detector will properly perform the required functions within the system design.

It is important to understand how a GasGuard detector is intended to interact with other equipment within a system. For safe and reliable use, it is crucial that neither the detector logical operation nor its signalling be compromised by incompatibilities with connected equipment.

5.1.4 Modifications of any form to the GasGuard detector are prohibited.

The GasGuard detector as supplied has been designed and manufactured to comply with the requirements of protection standards. If modifications of any form are made to the detector, the equipment may no longer be fit for use. If any modifications or damage to the detector is evident, do not use the equipment and contact Ampcontrol for advice.

5.2 Mandatory Installation Practices

The following information must be adhered to when installing any GasGuard detector. Failure to adhere to this information may give rise to unsafe operation.

Using the detector in a manner that exceeds its electrical, functional or physical specifications, or in a way that is contrary to its operating restrictions, may create risks to personnel and/or equipment resulting in injury or death.

- The GasGuard detector must be powered within the specified voltage range.
- The installation of the GasGuard detector must be carried out by suitably trained and qualified personnel.
- Identification labels fixed to the GasGuard detector must not be damaged, removed or covered before, during or after installation.
- The installation is to be in accordance with the relevant installation Standards/Codes of Practice.
- Modifications must not be made to any part of the GasGuard detector. As supplied, the unit is built to, and complies with the relevant standards. Modifications to its construction will render the unit non-compliant.
- Complete and accurate records of the installation must be kept as part of the site installation.

5.3 Installation Guidelines

5.3.1 Mounting Location

To ensure continued reliable operation of the sensor system, the following should be considered when mounting the unit:

- Select a suitable central location for mounting with good access. The location should be as clean and dry as practicable and at a temperature as close to 20°C as practicable.
- Mount the sensor unit in a position that reduces the risk of mechanical damage.
- Mounting should be to a vertical surface, pointing downwards, allowing for easy wiring access and subsequent servicing.
- It is essential that the sensor be positioned to take into account the expected flow of the gas to be measured.
- Allow sufficient space under the sensor for fitting of calibration cups or accessories.
- Ensure to account for the relative density to air of the gas that is being detected.

5.3.2 Relative Density of Gas Type

The relative density or buoyancy a gas or vapour with respect to air determines its propensity to rise or fall when released into the atmosphere.
Gases or vapours with buoyancy less than air will tend to rise from the source of release.
Conversely, gases or vapours heavier than air will tend to fall and accumulate in concentrations over long periods of time. Normal air movements in and around such gas concentrations will have the inevitable effect of producing zones of highly toxic mixtures.
This knowledge of the characteristics of the gas assists when determining the location of the gas sensor. See Table 4 for gas density values.
For this reason the methane sensor should be installed as high as practical.
The services of a Risk Assessment Engineer or specialist should be used if additional assistance is required in selecting the position of, or the number of sensors required for the application.

Table 4: Gas Density Relative to Air

Gas	Density
Hydrogen	Lighter than Air
Ammonia	
Methane	
Carbon Monoxide	
Carbon Dioxide	Heavier than Air
Nitric Oxide	
Oxygen	
Hydrogen Sulphide	
Chlorine	

5.4 Mechanical Installation Information

5.4.1 Enclosure Dimensions

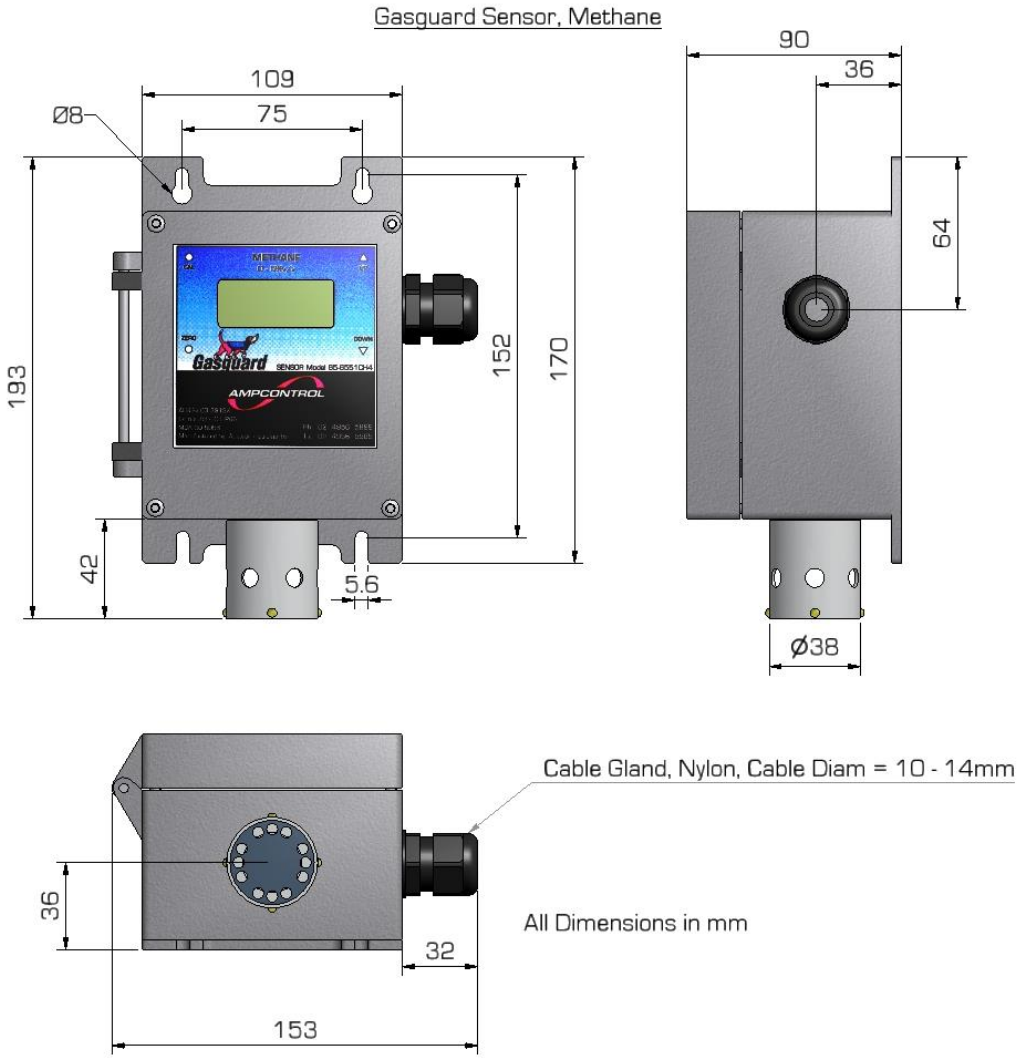

Figure 5.1: Catalytic detector dimensions

5.4.2 Mounting Arrangements

The GasGuard detector is a panel mounted unit. See Figure 5.1 for hole centre locations.

5.4.3 Terminal Layout

The connection terminals for GasGuard detectors are located within the enclosure. In order connect the incoming cable to the unit the cable must feed through the side mounted cable gland.

5.5 Electrical Installation Information

5.5.1 Cable Resistance Considerations

The voltage available to the amplifier must be a minimum of 10VDC. The maximum resistance in the 4-20mA signal to ground at 12V DC supply is 150 Ohms. See Table 5 for typical cable resistance values.

Table 5: Nominal Resistance Values for Typical Wire Sizes

Conductor Area (mm^2)	Resistance (Typical) Loop Per 500m
0.5	39Ω
1.0	21.2Ω
1.5	13.6Ω
2.5	8Ω
4.0	4.95Ω

5.5.2 Earthing Procedures

Consideration should be given to the earthing of the transmitters and cable screens of the incoming customer cables.
Normal practice would be to isolate the cable screens at the Transmitter and connect the screens to earth adjacent to the Control units or power supply to the system.
Remote sensor cable screens should be earthed at the transmitter.

5.5.3 Catalytic Sensor Unit Wiring Diagram

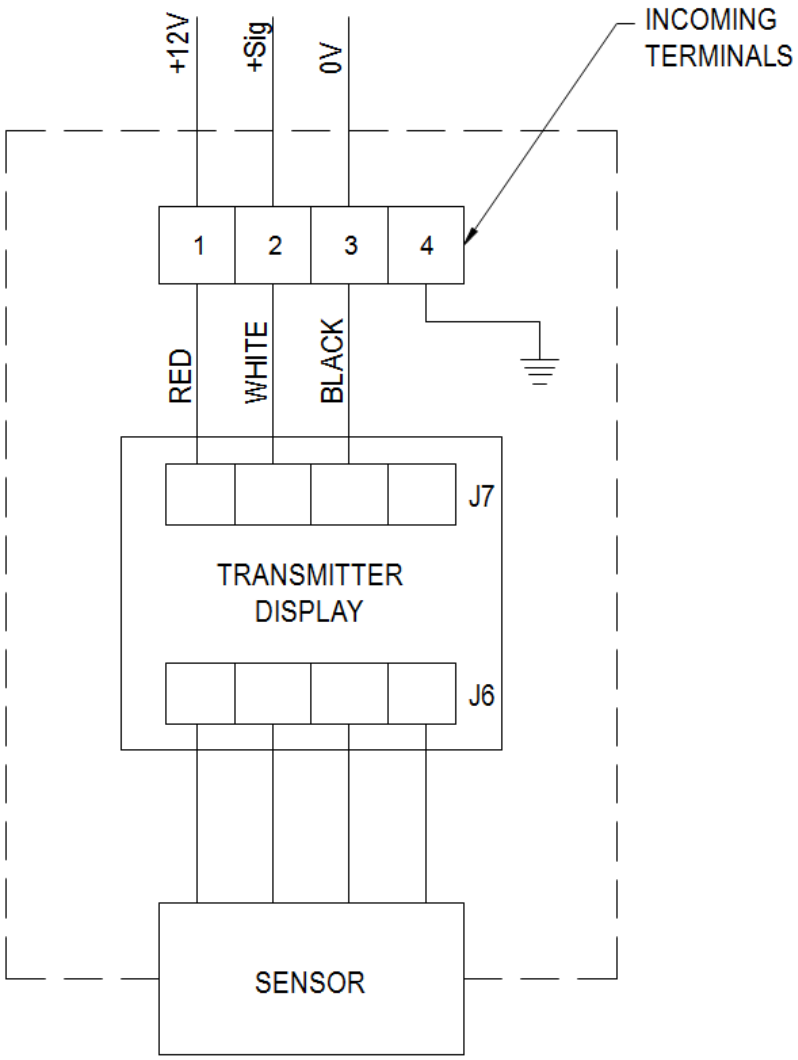

Figure 5.2: Catalytic sensor unit wiring diagram

5.5.4 Remote Catalytic Sensor Unit Wiring Diagram

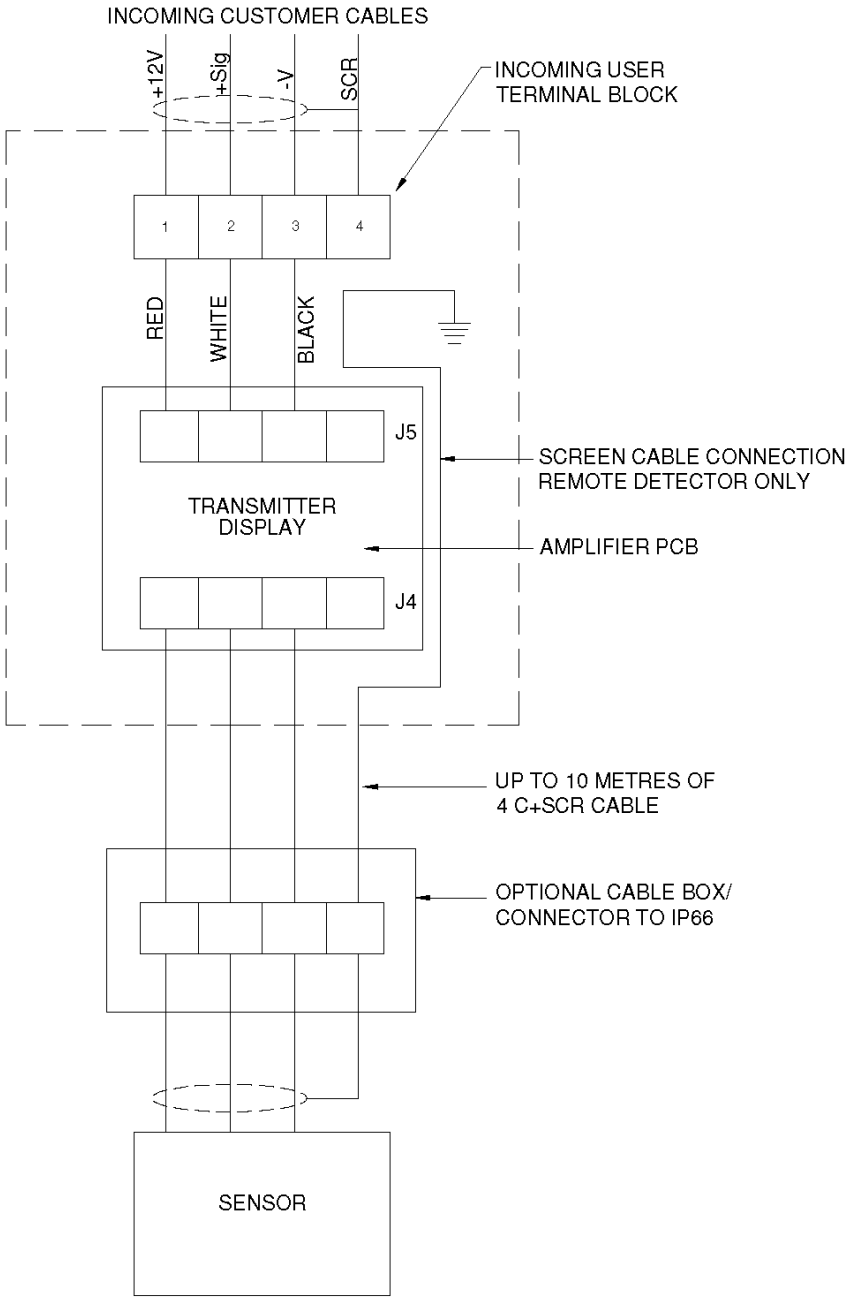

Figure 5.3: Remote catalytic sensor unit wiring diagram

6 COMMISSIONING AND CALIBRATION

Commissioning is the performance of initial checks, adjustments and calibration prior to placing the system in operation for the first time. Calibration, however, is not limited to performance of commissioning. Calibration is also performed throughout the life of the system on a periodic basis and after major repairs to the system.

During commissioning and subsequent re-calibration, it is vital to ensure that procedures are followed to prevent any abnormal sensor signal from initiating any fault, warning or alarm status indicator or equipment control function, on auxiliary equipment connected to the transmitter. Consult the relevant control unit manual for details of how to do this.

The instruments supplied are NATA calibrated prior to delivery. However, before putting the system into operation, it is recommended to check the calibration. This is especially important if the instruments are commissioned sometime after delivery.

6.1 Preliminary Checks

Perform the following preliminary checks:

1. Verify that all connections are correct and installation complete as detailed in Section 0.
2. Check that voltage available to the amplifier is 12VDC.
3. Apply power to the system.

6.2 System Calibration

Before the start of calibration, the system should be left in a powered-up operational (no fault) state for one hour to allow the gas sensors to stabilise. However, if such a delay is not practical, observe the display indications with the sensor in a gas free atmosphere, until there is no appreciable display movement for a period of time. The system should then be sufficiently stable to allow calibration.

Calibration of the methane sensor can only be achieved by using methane gas. The methane calibration gas should ideally be about 50% of full scale of the relevant monitor. However, sometimes, due to practical restraints and safety reasons, the gas may be 20% or less of full scale. While calibration at such a low level is not ideal, the resulting inaccuracies are usually within the safety tolerances for the system.

Calibration gas should be applied to the sensor at a rate of approximately 0.5 to 1.0 litres per minute. It is not advisable to leave the gas flow on the sensor any longer than is needed for the output to stabilise and the calibration adjustment to be made.

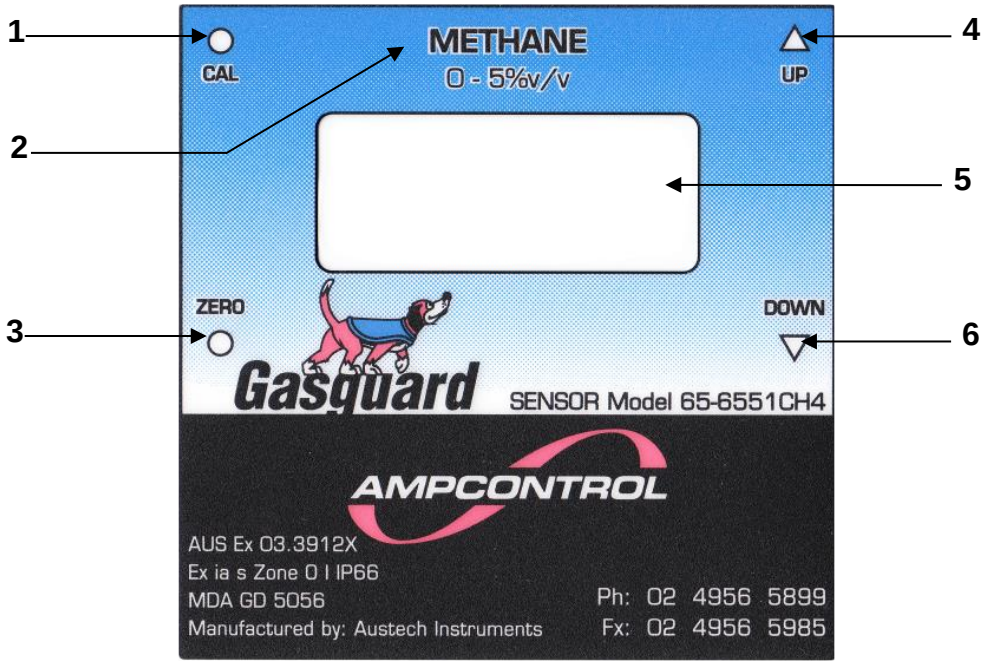

Figure 6.1: GasGuard detector control panel

6.3 Zero Calibration

Perform Zero Calibration as follows:

1. Ensure that the sensor is in a fresh air environment, and apply zero air via the Calibration Cup.
2. Place the magnetic tip of the calibration pen over the CAL symbol (1) for 5 seconds. The display will flash every 1-2 seconds while in calibration mode.
3. Now that the CAL mode is accessed place the magnetic tip over the ZERO symbol (3) for 2-3 seconds.
4. The display should have changed to a zero reading. To save the zero setting place the magnetic tip over the CAL symbol (1) for 5 seconds.
5. The sensor display (5) will show SAU to confirm that it has saved the zero setting. The display will cease to flash.

6.4 Span Calibration

Perform Span Calibration as follows:

1. Apply CH_4 calibration gas to the sensor at the rate of 0.5 to 1 litres per minute. Use a calibration gas of suitable concentration between 40-100% of the range of the unit.
2. To adjust the display so that it reads the correct value for the gas applied enter Calibration Mode by placing the magnetic tip of the Calibration pen over the CAL symbol (1) for 5 seconds. The display will flash every 1-2 seconds.
3. Place the magnetic tip of the pen over the UP symbol (4) to increase the display reading and over the DOWN symbol (6) to decrease the display reading.
4. Place the magnetic tip over the CAL symbol (1) for 5 seconds once the display reads the correct value for the gas applied. The display will cease to flash.
5. Shut off the calibration gas. If the Zero calibration is to be checked, wait for the sensor to stabilise before proceeding.

6.5 t90 Test Procedure

The response time of portable, fixed, transportable and machine mounted detectors is a critical parameter in ensuring their intended safety function of real time monitoring of gas concentrations. The response test measures the time taken for the detector to reach 90% of the target gas concentration. The response test may trigger alarms and set points. Operational procedures should be in place prior to undertaking a response test.
The following procedure minimises the delays and errors associated with inconsistent application of gas while measuring the response time. This procedure applies a repeatable step change in gas concentration, to reduce the effects of flow rate and delays associated with purging the calibration mask and tubing.

If the detector response is slowing in successive observations, then the detector performance is degrading, and further inspections or maintenance is required before the detector degradation is in exceedance of the allowable error bounds.

Response Time Test Procedure

The response times of portable, fixed, transportable and machine mounted detectors shall be tested in accordance with this instruction for in-situ testing of response times.

- A span gas shall be presented to the detector using item # 173981 MASK CALIBRATION VERSION2 FOR GASGUARD METHANE HEAD.
- The elapsed time between presentation of the span gas and the detector indicating 90% of the span gas concentration (t(90)) shall be recorded.
- Zero/Span flow regulators must be 1l/min.

NOTE

- The span gas concentration used for each successive test should be the same so that trends in detector performance can be readily observed.
- For testing of oxygen detectors, a span gas consisting of nitrogen can be used in lieu of the target gas (oxygen), with the response time calculated as the time taken for the display to fall to 10% of the original value (i.e. t(10)).
- Response time shall be based on the end user's risk assessment of AS/NZS 2290.3:2018.

In-situ t90 Test Procedure

In order to perform a t90 response time test, the following procedure must be followed:

1. Select appropriate span gas concentration, recommended range to be 40% to 50% LEL i.e. 2.0% to 2.5% v/v CH4 balance of synthetic air.

Table 6: Detector Zero and Span Gas

Detector Type	Zero Gas	Span Gas
GG Detector NDIR CO2 5%	Synthetic Air or 100% Nitrogen	2.0% CO2 mixed with Synthetic Air or Nitrogen
GG Detector NDIR CO2 2%	Synthetic Air or 100% Nitrogen	1% CO2 with Synthetic Air or 100% Nitrogen
GG Detector CAT CH4 5%	Synthetic Air	2% CH4 balance with Synthetic Air
GG Detector EC CO 100ppm	Synthetic Air	50ppm CO balance with Synthetic Air
GG Detector EC CO 50ppm	Synthetic Air	25ppm CO balance with Synthetic Air
GG Detector EC O2 25%	100% Nitrogen	<18% Oxygen balance with synthetic air
GG Detector EC H2S 100ppm	Synthetic Air	50ppm H2S balance with Synthetic Air
GG Detector EC H2S 50ppm	Synthetic Air	25ppm H2S balance with Synthetic Air

2. Challenge test the detector to ensure its reading is within allowable tolerances at a rate of 1l/min, (adjust zero and span as necessary).
3. Calculate 90% of the span gas being used.
4. Remove the calibration mask from the sensor and allow the reading to return to zero or background levels of gas concentrations.
5. Purge calibration line and calibration mask.
6. Apply calibration mask, place the mask on the sensor. Start timing with a stopwatch or similar when a display value change is observed on the Gasguard display.
7. Stop timing when the concentration reading reaches the value calculated in Step 3.
8. Record the t90 value.

7 SERVICE, MAINTENANCE & DISPOSAL

7.1 Equipment Service

A number of external system based checks should be completed on a regular basis. These 'routine inspections' must be carried out by suitably trained people with knowledge of the GasGuard range and the systems into which it is fitted. Routine inspections may take the form of either visual-only checks, or visual and 'hands-on' checks.

7.1.1 Visual Only Inspections

A basic visual inspection focuses on looking at the installation for signs of physical damage, water or dust ingress and the condition of cables and labels. This type of inspection may involve opening cabinets to gain access to the units and other equipment. This level of inspection may also include cleaning display windows that have become obscured by dirt.

Observations would typically be:

- Check that equipment enclosures, cable trays, conduits, etc. are in good order with no physical damage.
- Check that sealed wall boxes are free from water and dust ingress internally. Door seals are in good condition.
- Check that connected cables are free from cuts, abrasions and obvious signs of damage. Cable restraints are in good order and correctly fitted.
- Check that labels on equipment, wall boxes and cables are present and in good condition (especially certification labels).
- Check that no modifications have been carried out to installed equipment.

7.1.2 Hands-On (Detailed) Inspections

A more detailed inspection would include all of the elements of a visual inspection, plus some checks that cover the integrity of connections, fixtures and fittings.

In addition to basic visual observations, more detailed integrity checks would involve:

- Verify that equipment housings, wall boxes and other mechanical fixtures are secured in place. This includes terminal box lids, tightness of cable glands, integrity of wall-box mountings, security of equipment fixing to walls/DIN rails etc.
- Verify all electrical connections are secure with no loose screw terminals or DIN rail terminals not fitted to rails etc.

7.2 Equipment Maintenance

WARNING!

The GasGuard range of detectors has no user-serviceable parts.

All repairs must be carried out by Ampcontrol only.

If a fault develops, return the unit to Ampcontrol for repair. It is essential that **no attempt be made to repair any product in the GasGuard range** as any attempt to dismantle or repair the unit can **seriously compromise the safety of the unit and voids product warranty**.

7.2.1 Periodic Maintenance

Periodic maintenance consists mainly of scheduled checks to ensure the instrument remains in adjustment and gives the required response to sampled gas. For recommended maintenance tasks and schedules, refer to AS/NZS 2290.3.

7.2.1 Corrective Maintenance

During maintenance it is vital to ensure that suitable procedures are followed to prevent any abnormal sensor signal from unintentionally operating any fault, warning or alarm status indicator, or equipment control function. Consult the relevant control unit manual for details as to how to do this.
There are no user serviceable parts. If a fault develops, the detector must be returned to an accredited repair facility.

Table 7: Corrective Maintenance Checks

Fault	Checks
No 4-20mA Output	a) Check that voltage applied to the Amplifier PCB is 12VDC and that the polarity is correct. b) Check for loose plug and terminal connections.
Sensor cannot be Spanned or Zeroed	a) Check that voltage and polarity applied to the amplifier is correct. b) Check for loose plug and terminal connections.
Erratic Output	a) Check that voltage and polarity applied to the Amplifier PCB is correct. Also, check that there are no severe voltage swings, indicating an intermittent fault in the field wiring or control unit. b) Check for loose plug and terminal connections.

7.3 Disposal

ENVIRO

The electronic equipment discussed in this manual **must not be treated as general waste**. By ensuring that this product is disposed of correctly you will be helping to prevent potentially negative consequences for the environment which could otherwise be caused by incorrect waste handling of this product.

8 SPECIFICATIONS

Electrical	
Supply Voltage	10 – 16.5 VDC
Analogue Output	4-20mA DC
Maximum Current	100mA
Mechanical and Environment	
Housing Material	Cast Stainless Steel
Temperature Range	-20 ˚C to +40˚C
Ingress Protection	Housing: IP66 Gas Inlet Port: IP66
Weight	3.8kg (approximately)
Dimensions	See Figure 5.1: Catalytic detector dimensions
Cable Gland Entry Size	8 to 13mm O.D.
Sensor	
Calibrated Range	0-5%
Absolute Maximum Gas	6%
Accuracy	<± 5% FSD
Zero Drift	<0.5% per month
Sensitivity Drift	<1% per month
Resolution	0.01% Methane
Repeatability	<± 1 % of Reading
Sensing element life	>2 Years In Clean Air
Humidity (RH non-condensing)	0 – 95%
Storage temperature	-30 to +70 ˚C
Certifications	
ANZEx	ANZEx 03.4024X – Ex ia s Zone 0 I IP66
IECEx	IECEx TSA 06.0044X – Ex ia I IP66
DPI	MDR 086759 GD (Design Registration)

9 EQUIPMENT LIST

Part Number	*Description*
Methane CH_4	
106198	CH4 Detector 0-5% 4-20mA
142977	CH4 Detector 0-5% 4-20mA 1.1m sensor tail
166352	CH4 Detector 0-5% 4-20mA 1.5m sensor tail
115217	CH4 Detector 0-5% 4-20mA 5m sensor tail
101768	CH4 Detector 0-5% 4-20mA 10m sensor tail
Accessories	
173981	Calibration cup for catalytic sensors
140225	Calibration magnetic tool
105703	Allen key

NOTE

Customised gas panels and systems are also available as well as sample draw panels. These can be designed specifically to your gas sensing needs.

For more information call customer service on 1300 267 373