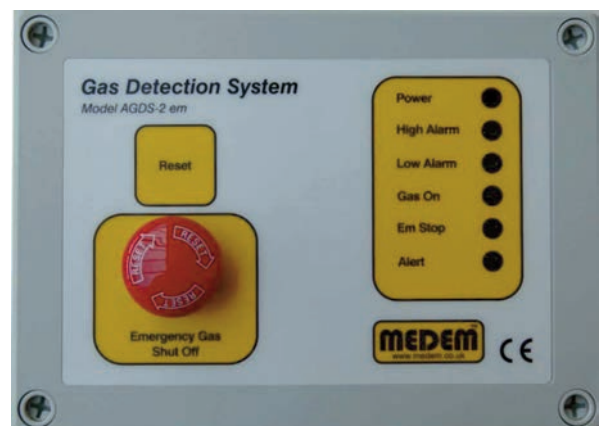# Single or Two Channel Gas Detection System

AGDS 2em
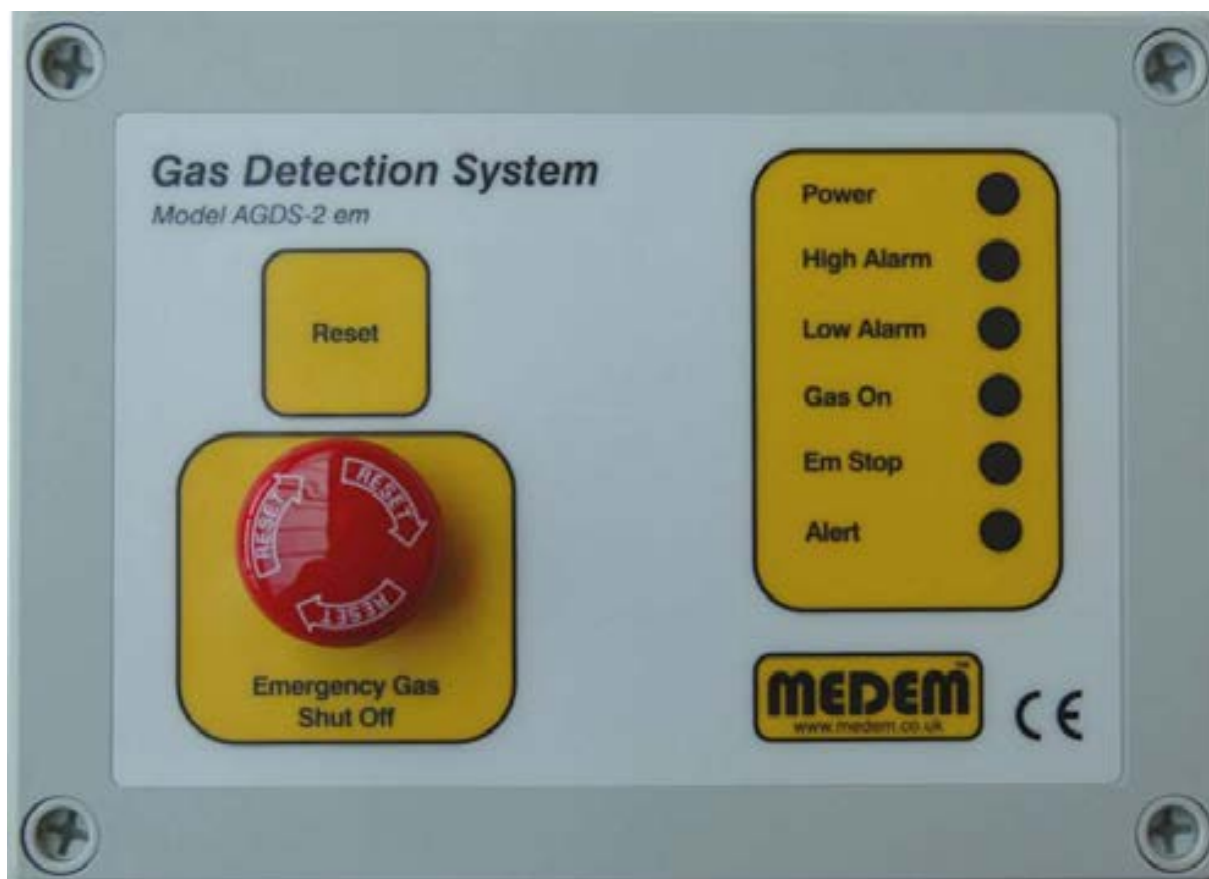

MODERN PLANT

The Home of
Control & Automation
in Ireland

medem™

Single or Two channel Gas Detection System

The AGDS-2em, Gas detection system has been designed for use in boiler houses and plant rooms. Up to 2 low voltage sensors for the detection of natural gas, LPG or carbon monoxide can be connected to the panel. In the event of a high alarm from one of the sensors the system will isolate the gas supply by closing a connected electric control valve. Emergency stop buttons can be fitted and a fire alarm can close the gas valve when connected to the panel.

Design Features

Gas Detection System
Model AGDS-2 em

Reset

Emergency Gas Shut Off

Power
High Alarm
Low Alarm
Gas On
Em Stop
Alert

- **Gas detection** of Natural gas, Carbon monoxide and Butane/Propane L.P.G.

- **Compact** easy to install compact system with long detector life.

- **Remote signalling** can be connected to B.M.S and fire alarm systems.

- **User friendly**, digital design means clear system status indication at all times.

- **Emergency** shut off buttons and thermal links, all low voltage, can be connected.

medem AGDS-2em

The AGDS-2em gas detection panel has been designed as a compact and versatile system able to accept digital signals from one or two addressable Medem gas detectors.

The AGDS-2em will accept Medem gas detectors for natural gas, carbon monoxide and LPG. In the event of the target gas being detected the panel will show either a pre alarm or high alarm condition.

In the pre alarm condition the AGDS-2em will indicate by flashing the LED marked "low alarm" and, if enabled, the internal sounder. The system will not isolate the gas supply in the pre alarm condition.

On high alarm the panel isolates the gas supply by closing the control valve. At the same time a BMS and a beacon or sounder can be activated.

The AGDS-2em normally connects to 240 volt normally closed valves.

An emergency shut off button or buttons can be connected to the AGDS-2em panel. Remote emergency shut off button connections are wired low voltage, normally closed, open on alarm.

Thermal links can be connected to the system, connections are again low voltage. The AGDS-2em can also take a signal from a fire panel to close the control valve in the event of a fire alarm situation.
A fire test isolation panel is available from Medem to allow a fire test to be carried out without isolating the gas supply.
A mute button has been incorporated into the panel lid as well as a reset button in order that a connected valve can be reopened after a high alarm situation has been resolved.

All Medem systems are designed built and supported by Medem UK. The sensors have a design life of five years when used in clean air environments such as a boiler house. Continuous exposure to combustible gas will shorten the life of combustible gas detectors.

medem AGDS-2em

Technical data sheet

The model AGDS-2em consists of a mains powered panel capable of operating up to two combustible gas and or Carbon Monoxide detectors.

The detectors are connected by low voltage 4 wire cable (typically telephone cable) back to the control panel.
The sensor units may be mounted up to 100mtrs from the control unit.
The complete system is designed to comply with the latest CE directives including the low voltage directive.
This is housed in an IP65 rated ABS enclosure measuring 180mm high x 129mm wide x 70mm deep.

The LED indications on the panel :

Power on	Green
High alarm	Red
Low alarm	Yellow
Gas on	Red
Em stop	Yellow
Alert	Yellow

The high alarm and low alarm LED will, when the system is in alarm, flash either once or twice per second to indicate
which sensor has responded to the target gas.

Audible indications:

An internal buzzer is provided to give the following sounds:
Alarm, beep every 1 second.
There is an option to disable the alarm buzzer on the panel circuit board by removing a jumper plug.
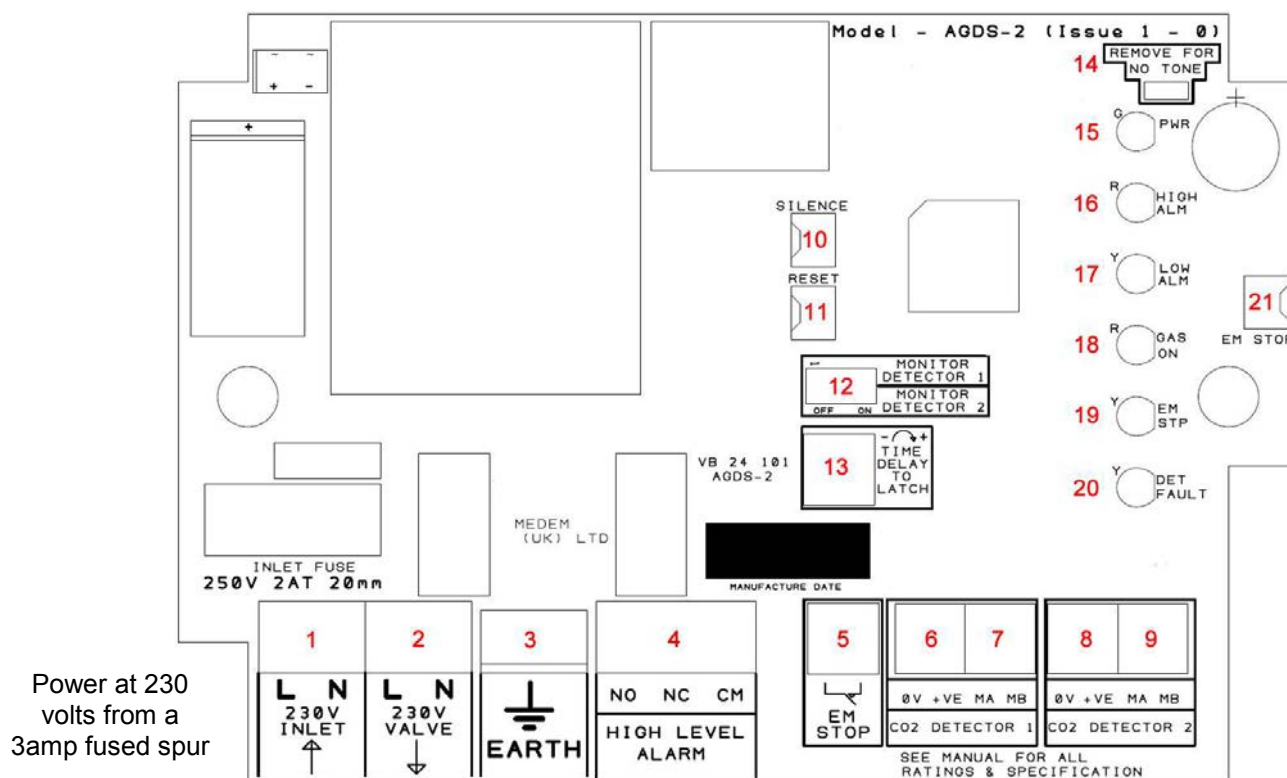
Relay outputs:

Main valve relay rated at 5 amps to provide a switched live to the main solenoid valve.
230 volt rated potential free changeover alarm relay to activate a remote sounder and or beacon or signal a BMS system.

Gas detection settings

The combustible gas detectors are pre calibrated at works to detect gas at 5% of the low explosion level (pre alarm) and at 10% of the low explosion level (high alarm).
The CO detectors are calibrated at 80ppm for pre alarm and 100ppm for full alarm

medem AGDS-2em

Made by Medem

Power at 230 volts from a 3amp fused spur

Connections to panel: marked on board

1. Live & Neutral 230 volts supply from 3amp switched fuse spur
2. 230 volts out to gas solenoid valve (5amp relay)
3. Earth connection terminals
4. High Alarm BMS relay (potential free contact, mains rated, max load 5amp)
5. Remote emergency stop buttons SELV, multiple buttons connect in series (requires a N/C circuit)
6. Detector Channel One - Power connections for detectors, Methane, LPG, CO.
7. Detector Channel One - Comms connections for detectors, Methane, LPG, CO.
8. Detector Channel Two - Power connections for detectors, Methane, LPG, CO.
9. Detector Channel Two - Comms connections for detectors, Methane, LPG, CO.
10. Front Panel button connection - Mute
11. Front Panel button connection - Reset
12. Enable Detectors Channels - enable a channel when it has a detector connected.
13. High alarm time delay function - Controls the length of time between a High alarm and the closing of the gas valve
14. Jumper link to disable audible alarm sounder
15. Power Led - will illuminate when mains power is applied to the system
16. High Alarm LED - will illuminate when a detector enters high alarm (10% LEL for combustible 100ppm for CO)
17. Low Alarm LED - will illuminate when a detector enters low alarm (5% LEL for combustible 80ppm for CO)
18. Gas On LED - will illuminate to indicate when the gas valve is open - press and hold the reset button to open valve
19. EM Stop LED - will illuminate when any connected remote emergency stop buttons have been pressed
20. Alert LED - will illuminate if comm's to a detector are lost. *(Check detector address and channel enable switch settings)*
21. Front Panel button connection - Emergency Stop - not available on this model, (AGDS-2em only)

AGDS-2em Operating and Maintenance

Operation

With mains power available the green 'Power' LED should be illuminated. When power is first applied to the system (or after a power cut) press and hold the reset button (2's) to open the gas valve. The red 'Gas On' LED will be illuminated when the gas valve is open.

Normal operating procedure for gas (when power is first applied)

- Press and hold the 'Reset' button for 2's.
- The gas valve will open and the 'Gas On' LED will light.

Gas can be isolated at any time by pressing the emergency stop button.

Maintenance and testing

To test all features the system.

When power is first applied to the system; press the 'Reset' button on the AGDS-2em:
The 'Gas On' LED will light and the gas valve open, gas should now be available for use.

With the gas available for use, apply a small amount of the target gas to each detector:
The detector LED will turn from 'Green' (powered) to 'Red' (alarm). The AGDS-2em will indicate a low level alarm at 5% LEL for combustible gases, 80ppm for CO, and a high level alarm at 10% LEL for combustible gases, 100ppm for CO.

Maintain the gas at the detector until the high alarm state latches and the gas valve closes:
There is a optional delay adjustment within the AGDS-2em (see installation instructions) with which you can control the amount of time between a high level alarm and the gas valve closing (default set to 1 second)

There should be a manual operational test on any installed Emergency stop buttons, which when operated will isolate the gas supply and remain isolated until a manual reset is completed.

Detector Alert LED
An incorrectly 'addressed detector' or 'detector channel' enabled when not in use will cause a "sensor Alert state"; which indicates that a detector is not being recognised on the current setting's - this can also be as a result of a connection issue with the wiring.

A yearly test and inspection of the solenoid valve and let by test should be carried out by a qualified technician i.e. Gas safe registered engineer.

The detectors are designed to have very low drift so recalibration on site is not required but should be replaced every 5 years in a clean environment but consideration should be given to replacement after 3 years if contamination is a possibility. A functionality test should be carried out every 6-12 months.

If at any time there is an alert or the sounder sounds follow these instructions, further information can be found both in the installation instructions and by contacting Medem (UK) Ltd.

Please read this sheet as it contains important information

Before commencing installation please familiarise yourself to the equipment by reading the comprehensive installation instructions. If in doubt then please call 0161 233 0600. Out of hours please call 07894 684080 or 07843 355163.

It is a statutory requirement that this safety system is installed and commissioned to the satisfaction of the manufacturer.

A commissioning certificate must be issued to the end user along with instructions for the operation of the equipment.

As the Manufacturer Medem UK should commission this safety system whereupon a commissioning report will be forwarded to the installing agent who should provide a copy to the end user.

At the point of our commissioning an individual serial number will be attached to the system along with a 24 help line number. Photos and all relevant information for the installation will then be stored on the Medem site database to be accessed in the event of a call on the 24 hour help line. The warranty period for the main panel only will then be extended to Ten years.

Two channel Gas Detection system

System description
The AGDS-2em is a gas detection system designed to monitor the atmosphere for target gases. The system comprises of a mains powered panel capable of operating two sensors, either combustible or Carbon Monoxide gas or a mixture of both. The sensors are pre-calibrated by Medem (UK) Ltd such that they only require to be connected to the panel and functionally tested.
In the event of a high alarm from one of the sensors the system will isolate the gas supply by closing a connected electric control valve. Emergency stop buttons and Thermal Links can be fitted and a fire alarm can close the gas valve when connected to the panel.

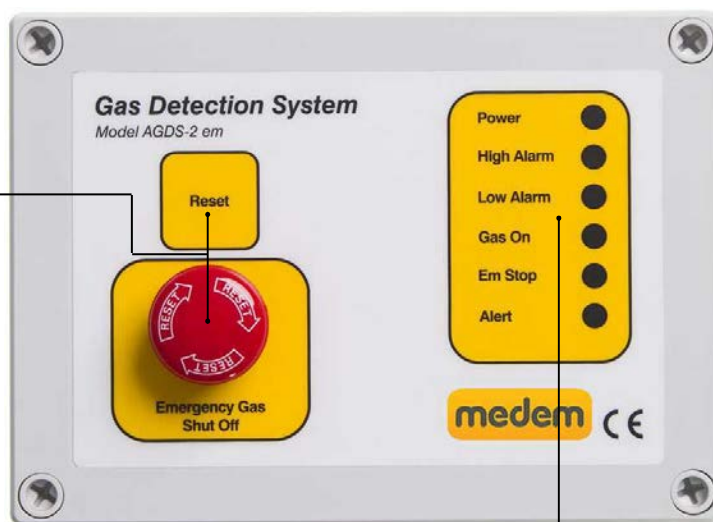**Control Panel** the front of the panel has the following controls and indications:

Panel Buttons:
Emergency Stop button
Reset button
Press and hold reset button (2's) when power is first applied to enable gas.

LED indications:
Power On	- green
High Alarm	- flashing red (every 1/2 second)
High Alarm & Gas isolated	- permanent red
Low Alarm	- flashing red (every second)
Gas On	- red
EM STOP	- yellow
Alert	- yellow

Gas Detection System
Model AGDS-2 em

Reset

Emergency Gas Shut Off

Power
High Alarm
Low Alarm
Gas On
Em Stop
Alert

medem CE

Low Voltage Gas Detectors

The maximum cable(4 core) length between a sensor and the control panel should not exceed 100 metres, If the distance between the main panel and the detectors is greater than 20meters 1mm cable should be used on the +VE, 0v terminals..

Combustible detectors are pre calibrated at 5% LEL (Pre alarm) and 10% LEL for the High alarm.
Carbon Monoxide detectors are pre calibrated at 80ppm (pre alarm) and 100ppm for high alarm.
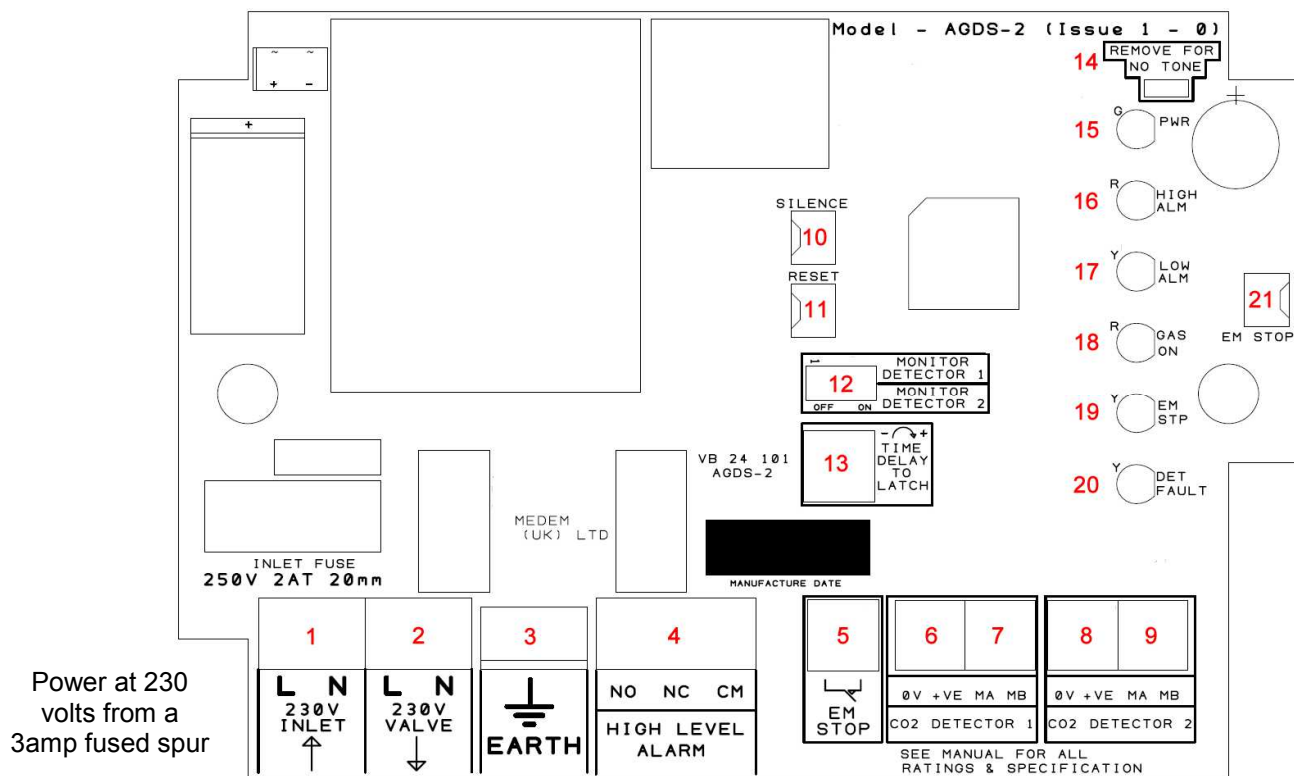
Connect a detector to either the "detector 1 terminals"(6&7) or "detector 2 terminals"(8&9), each detector has a rotary address selector switch (0-F) set to address 1 or 2 depending on which terminal has been used. Once connected and addressed you are required to enable the channel using the "channel enable switch"(12).

Each sensor unit has an LED which shows green when power is applied.
Note: There is a warm up period after initial power up of approximately 90 seconds. During this time the green LED will flash once per second and the output signal will be inhibited. This is to prevent spurious alarms. After the warm up period and on application of gas, the red LED will light when a high gas alarm level is reached.

A detector incorrectly addressed or a channel enabled when not in use will cause a "sensor Alert state" (yellow LED 20); which indicates that a detector is not being recognised on the current setting's - this can also be as a result of a connection issue with the wiring.
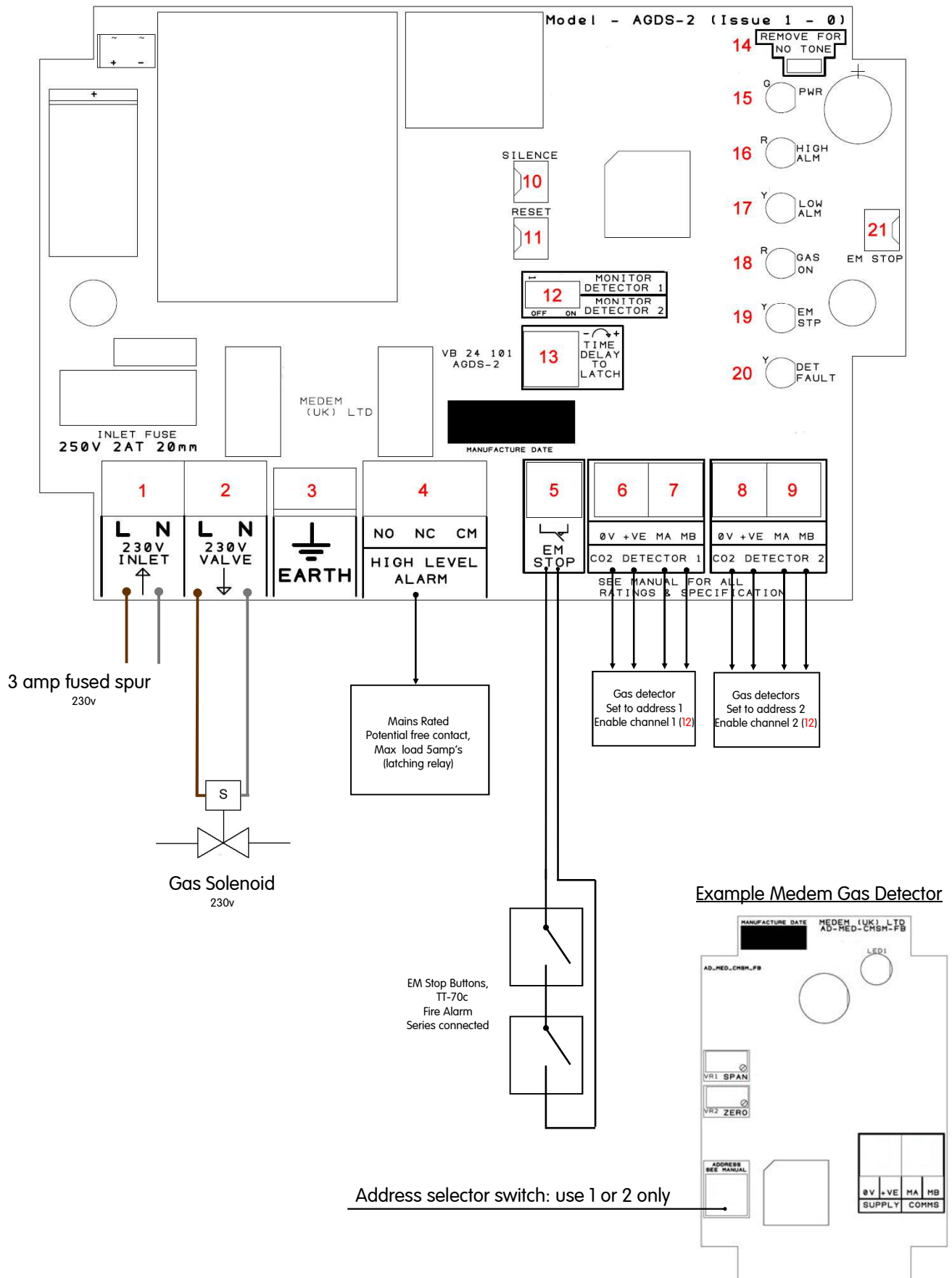
When first powered or after a loss of power press and hold the reset button for 2 seconds to start the system and open the gas valve.

Power at 230 volts from a 3amp fused spur

Connections to panel: marked on board

1. Live & Neutral 230 volts supply from 3amp switched fuse spur
2. 230 volts out to gas solenoid valve (5amp relay)
3. Earth connection terminals
4. High Alarm BMS relay (potential free contact, mains rated, max load 5amp)
5. Remote emergency stop buttons SELV, multiple buttons connect in series (requires a N/C circuit)
6. Detector Channel One - Power connections for detectors, Methane, LPG, CO.
7. Detector Channel One - Comms connections for detectors, Methane, LPG, CO.
8. Detector Channel Two - Power connections for detectors, Methane, LPG, CO.
9. Detector Channel Two - Comms connections for detectors, Methane, LPG, CO.
10. Front Panel button connection - Mute
11. Front Panel button connection - Reset
12. Enable Detectors Channels - enable a channel when it has a detector connected.
13. High alarm time delay function - Controls the length of time between a High alarm and the closing of the gas valve
14. Jumper link to disable audible alarm sounder
15. Power Led - will illuminate when mains power is applied to the system
16. High Alarm LED - will illuminate when a detector enters high alarm (10% LEL for combustible 100ppm for CO)
17. Low Alarm LED - will illuminate when a detector enters low alarm (5% LEL for combustible 80ppm for CO)
18. Gas On LED - will illuminate to indicate when the gas valve is open - press and hold the reset button to open valve
19. EM Stop LED - will illuminate when any connected remote emergency stop buttons have been pressed
20. Alert LED - will illuminate if comm's to a detector are lost. *(Check detector address and channel enable switch settings)*
21. Front Panel EM stop button connection.

medem AGDS-2em

Earth Connections not shown

Model - AGDS-2 (Issue 1 - 0)

14 REMOVE FOR NO TONE

15 G PWR

16 R HIGH ALM

17 Y LOW ALM

18 R GAS ON

19 Y EM STP

20 Y DET FAULT

21 EM STOP

SILENCE
10

RESET
11

12 MONITOR DETECTOR 1 / MONITOR DETECTOR 2
OFF   ON

VB 24 101 AGDS-2

13 - ↻ + TIME DELAY TO LATCH

MEDEM (UK) LTD

MANUFACTURE DATE

INLET FUSE
250V 2AT 20mm

1	2	3	4	5	6	7	8	9
L N 230V INLET	L N 230V VALVE	⏚ EARTH	NO NC CM HIGH LEVEL ALARM	EM STOP	0V +VE MA MB CO2 DETECTOR 1		0V +VE MA MB CO2 DETECTOR 2	

SEE MANUAL FOR ALL RATINGS & SPECIFICATION

3 amp fused spur
230v

Gas Solenoid
230v

S

Mains Rated Potential free contact, Max load 5amp's (latching relay)

Gas detector
Set to address 1
Enable channel 1 (12)

Gas detectors
Set to address 2
Enable channel 2 (12)

EM Stop Buttons,
TT-70c
Fire Alarm
Series connected

Example Medem Gas Detector

MANUFACTURE DATE   MEDEM (UK) LTD
AD-MED-CMSM-FB

LED1

AD_MED_CMSM_FB

VR1 SPAN

VR2 ZERO

ADDRESS SEE MANUAL

0V +VE MA MB
SUPPLY   COMMS

Address selector switch: use 1 or 2 only

Detector Location

Detector location will vary dependant on the individual characteristics of the target gas that is being monitored for. The descriptions below describe the position for each detector after considering these characteristics.

Natural Gas
Natural gas detectors should be mounted at high level on a wall approximately 150mm from the ceiling height and avoiding corners and potential dead air areas.

Natural gas detectors should not be mounted below the height of the top of a doorway for example. This is because as the gas is slightly lighter than air it will rise filling the room from the ceiling down and will spill through the top of a door opening into the next room. If the detectors are mounted below this height then it will take longer the gas to reach the detector.

LPG
LPG gas is heavier than air so detectors need to be mounted at low level 100mm from the floor, consideration should be given to any potential mopping or wet floor height.

Carbon Monoxide
Carbon Monoxide is similarly weighted to air so detectors should be mounted between 1 to 2 meters from the floor.

Detector Testing

Any installed gas detector can be tested by allowing a small amount of the target gas onto the detector head until a change of state is registered on the control panel.

If the level of gas applied is of the set low alarm level, the LED on the detector will change from a solid green to a flashing red. An LED indicating a low level alarm detection combined with an audible alarm on the panel will begin.

If the level of gas drops below the set low alarm level the detector LED will return to a solid green and the panels audible alarm and LED will clear.

Should an emergency shut-off valve be connected to the panel this will remain open during a low alarm level detection.

If the level of gas applied is of the high alarm level or above, the LED on the detector will change from a solid green to a solid red. An LED indicating a high level alarm detected combined with an audible alarm on the panel will begin.

Should an emergency shut-off valve be connected to the panel this will automatically close.

Once the level of gas drops below the high alarm level the audible alarm will continue and the high alarm LED will remain.

The valve cannot be reinstated until the gases have been cleared and the control panel reset.

To EM Stop connections in

Single Switch

TB1   TB2   TB3

Use terminals TB2 A and TB2 C

To EM Stop connections in
the panel

Multiple Switches

Wire in series

TB1   TB2   TB3   TB1   TB2   TB3

Use terminals TB2 A and TB2 C   Use terminals TB2 A and TB2 C
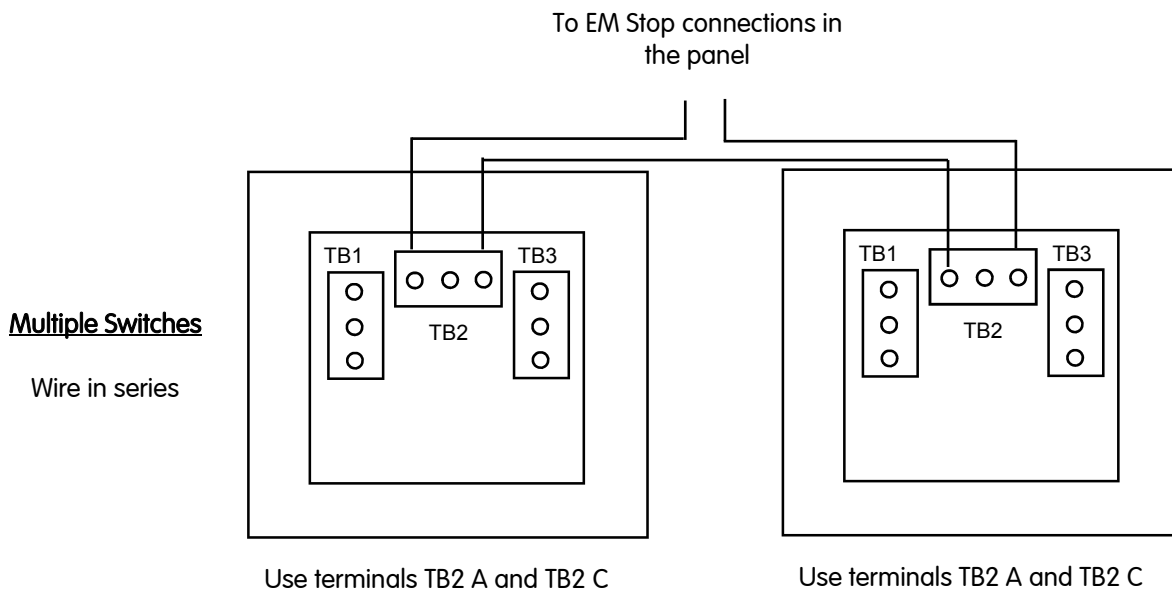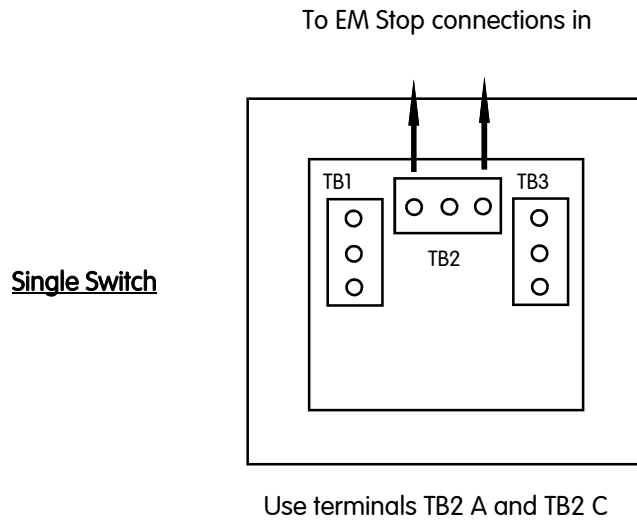
Remote stop buttons can be connected to the panel terminal marked as "EM STOP" (number 6). The remote buttons must be wired as above in order to provide a "closed contact" for the control panel.

medem AGDS-2em Checklist

It is essential that the installation of the AGDS-2em is carried out in the order given below to ensure the correct operation of the system.

This guide, when completed, should be posted to Medem UK in order that the warranty period can be activated.

Site Name	**Return one copy of this sheet to the address below:** Modern Plant Limited, Otter House, Naas Road, Clondalkin, Dublin 22 Tel: 00353 1 461 4300 E: sales @ modernplant.ie, W: www.modernplant.ie
Installing Company	
Engineers Name	
Date Completed	

With the panel fitted to the wall the following steps should be followed.

1, Connect the Control valve twin & earth to the marked terminals.

2, Connect BMS, beacons, sounders etc to the relay outputs.

3, Connect any additional EM stop buttons and thermal links in series to the terminals marked "EM STOP".

5, Each detector has a rotary address switch and each switch should be set to address's "1" or "2", then connected to the appropriate gas detector terminal marked "detector 1" or "detector 2" on the panel.

6, Enable the detector channels (1 or 2) as being used by with switch (12)

6, Connect the 3 amp fused spur 240 volt supply to marked terminals.

7, Once power is connected to the panel the detectors will flash the green LED's for 90 seconds after which the LED's will be on continuously.

8, At this point press the reset switch and the panel be activated.

Tick as each step is completed

1: All wiring checked tight and connected as per the installation instructions.

2: Each detector has an individual number Number 1 or 2

3: Each detector has been recognised by the panel using the selector switch.

4: On applying a little gas to the detectors the LED turns red and the panel alarms and closes the gas valve.

5: All detectors have a solid green LED Illuminated when not in alarm.

6: On activating each emergency stop button the panel alarms and closes the control valve.

Detector type	Methane	CO	LPG
Number fitted			

Please do not hesitate to call for advice on the following number:
00353 1 461 4300 office hours