

Multi Channel Gas Detection System

AGDS MC



MODERN PLANT

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Control & Automation
in Ireland

medemTM

Multi-channel Gas Detection System



The AGDS-MC, Gas detection system has been designed for use in boiler houses and plant rooms. Up to 16 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. The LCD will display appropriate information about alarm situations and detector status etc.

Design Features

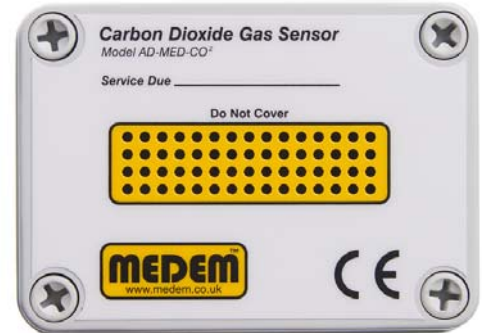


- **Gas detection** of Natural gas, Carbon monoxide and Butane/Propane L.P.G.
- **Compact** easy to install compact system with long detector life.
- **Remote signalling** can be connected to B.M.S and fire alarm systems.
- **User friendly**, digital design means clear system status indication at all times.
- **Emergency** shut off buttons and thermal links, all low voltage, can be connected.

The AGDS-MC gas detection panel has been designed to accept digital signals from up to sixteen gas detectors.

The AGDS-MC will accept gas detectors for natural gas, carbon monoxide and LPG. The detectors can be mixed on the AGDS-MC as each connected sensor is shown as a separate item on the panel LCD display. Up to four combustible or four carbon monoxide sensors can be connected to the main panel, though a total of 16 detectors can be connected when used with our transformer pack.

In the event of a gas being detected the panel LCD will show either pre alarm or high alarm and also which detectors have alarmed and which gas has been detected.



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-MC normally uses 240 volt normally closed valves but it is possible to run other types.

An emergency shut off button is incorporated on the AGDS-MC panel and remote emergency shut off buttons can be connected. 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-MC 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.

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.

Technical data sheet

The model AGD-MC consists of a mains powered panel capable of operating up to four combustible gas detectors and four Carbon Monoxide detectors.

Up to sixteen detectors (combustible or CO) can be connected to the AGDS-MC when used with the external transformer pack. See separate schematic for wiring the transformer pack, designed for when more than four combustibles are to be used.

The detectors are connected by low voltage 4 wire cable (typically telephone cable) daisy chained 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 183mm high x 212mm wide x 97mm deep.
This is also the power pack box size AD-PP.

The LED indications on the panel:

Power on	Green
Gas on	Red
Alert	Yellow

The LCD indications on the panel:

In the event of an alarm situation the LCD screen will display the condition that is causing the alarm and will generally offer a solution. The LCD display will indicate for the following, emergency shut off button activated, gas leak detected and which type of gas (with detector number).

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

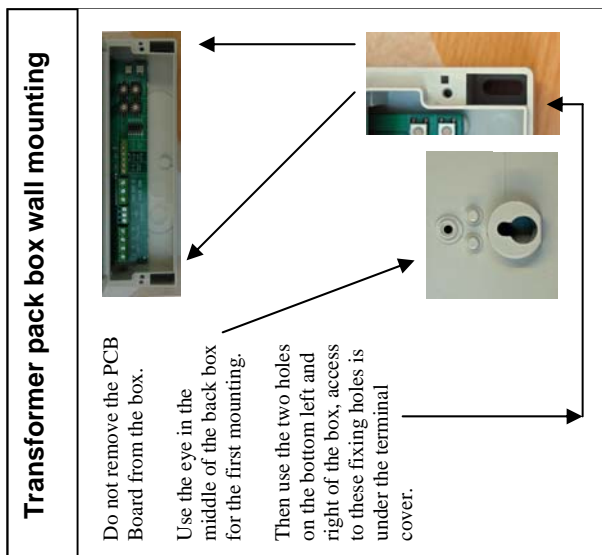
The combustible gas detectors are pre calibrated at works to detect gas at 5% of the low explosion level (pre alarm) and at 10% of the low explosion level (high alarm).

The CO detectors are calibrated at 80ppm for pre alarm and 100ppm for full alarm

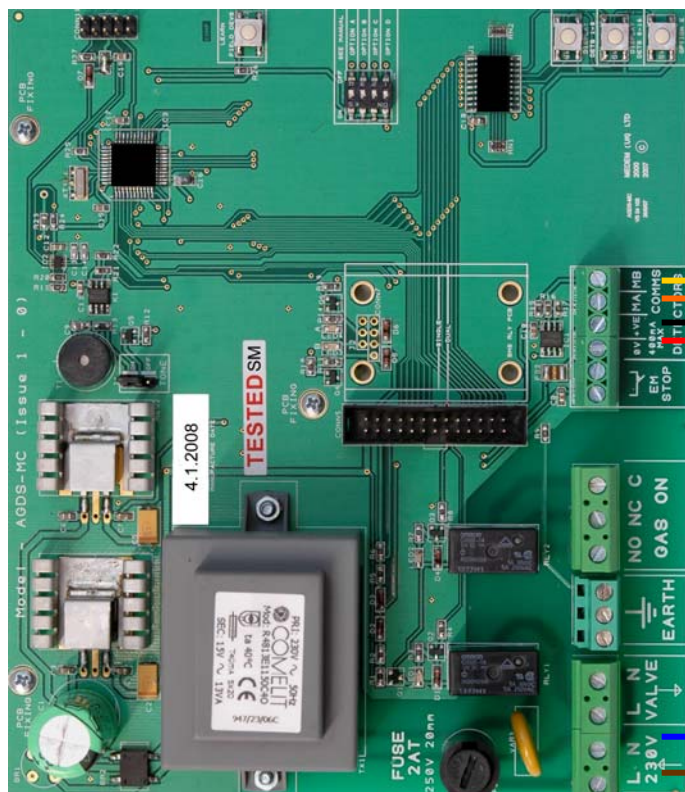


1. Live & Neutral 230 volts supply from 3amp switched fuse spur
2. 230 volts out to gas solenoid valve (5amp relay)
3. Earth connection terminals
4. Gas On BMS relay (potential free contact, mains rated, max load 5amp)
5. Remote emergency stop buttons SELV, multiple buttons connect in series (requires a N/C circuit, open for alarm)
6. Power connections for detectors, Methane, LPG, CO.
7. Comms connections for detectors, Methane, LPG, CO.
8. Unused Option button.
9. Display detectors addressed 9 to 16.
10. Display detectors addressed 1 to 8.
11. Option Switches
12. Learn Detectors - Press after connecting & addressing Medem gas sensors.
13. Enable/Disable Internal toner
14. Optional Dual BMS relay (SELV) - Factory fit only, must be requested at point of order

Option Switches (No 11)		Relay A	Relay B
Opt A - Off		Factory set	Factory set
Opt A - On		Factory set	Factory set
Opt B - Off		Low gas alert	High gas alert
Opt B - On		low & High gas alert	Emergency Stop



AD-Med-Sensors



Mains Supply Fuse at 3 Amps

Minimum 2 Sensors, Maximum 4 to be connected to main panel

Additional sensors can be connected 'daisy chain'

BOARD & WIRING FOR THE AGDS-MC Gas Detection Panel

AGDS-MC Operating and Maintenance

Operation

With the system switch in the off position; the green power LED should be lit and the LCD displaying the message "Multi Gas Detection System" all other LED's should be off.

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

- Turn system switch to the on position.
- The gas valve will open, the LCD will display the message "Gas On" and 'Gas On' LED will light.

Maintenance and testing

To test all features the system.

With the system switch off; the green power LED should be lit; turn the system switch to on:

The LCD will display 'Gas On', the 'Gas On' LED will light and the gas valve open, gas should now be available for use.

Verify all gas detectors are being correctly identified by the AGDS-MC;

Remove the AGDS-MC's terminal cover and locate the "Display Detectors" buttons (see installation instructions).

Press and hold the button to display on the LCD screen all "learnt" detectors, ensure all detectors "type" and "ID" are being correctly identified.

With the gas available for use, apply a small amount of the target gas to each detector:

The AGDS-MC 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.
The detector LED will turn from 'Green' (powered) to 'Red' (alarm).

With the AGDS-MC in an alarm state;

The LCD will display the message Low Alarm or High Alarm.

The alert LED will light, the tone will sound and the Gas On LED will go out.

The Gas valve will close

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.

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 panel and sender unit will then be extended to Ten years.

Multi Channel Gas Detection system

System description

The AGDS-MC is a gas detection system designed to monitor the atmosphere for target gases. The system comprises of a mains powered panel capable of operating up to four detectors (or 16 in conjunction of the AD-PP transformer pack), either Combustible, Carbon Monoxide, Carbon Dioxide and Oxygen or a mixture of any. The detectors 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 detectors 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:

Emergency Stop Button
On/Off Switch

LED indications:

Power On - green
Gas On - red
Alert - yellow

LCD display: Displaying system status and diagnostics



Low Voltage Gas Detectors

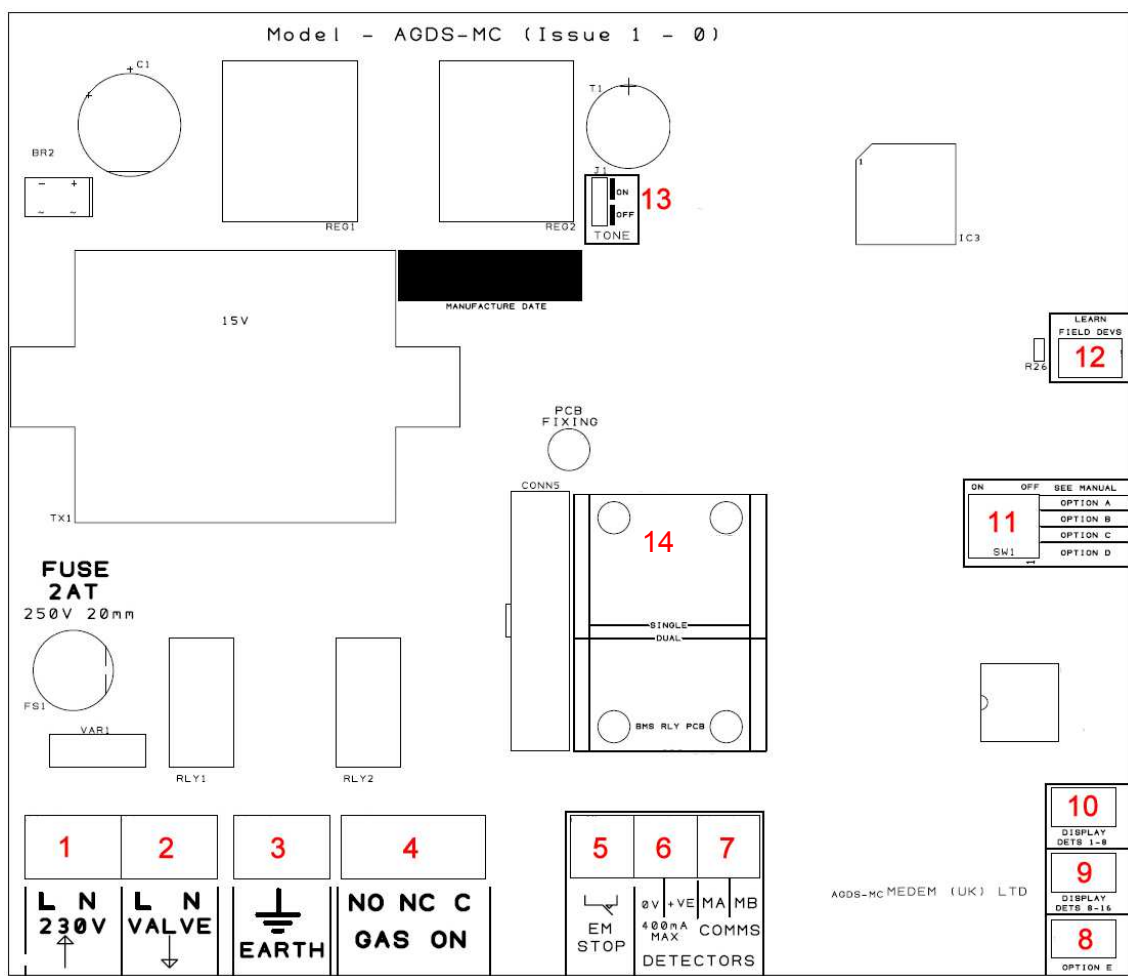
The maximum cable(4 core) length between a sensor and the control panel should not exceed 100 metres, If the distance between the main panel and the detectors is greater than 20meters 1mm cable should be used on the 12v, 0v terminals..

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.

Each detector has a rotary address selector switch (0-F) each detector must be set to a unique address. Once connected and addressed you are required to press the "learn Det's" button (12). Once pressed the corresponding detector LED's on the main panel will light green.

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.

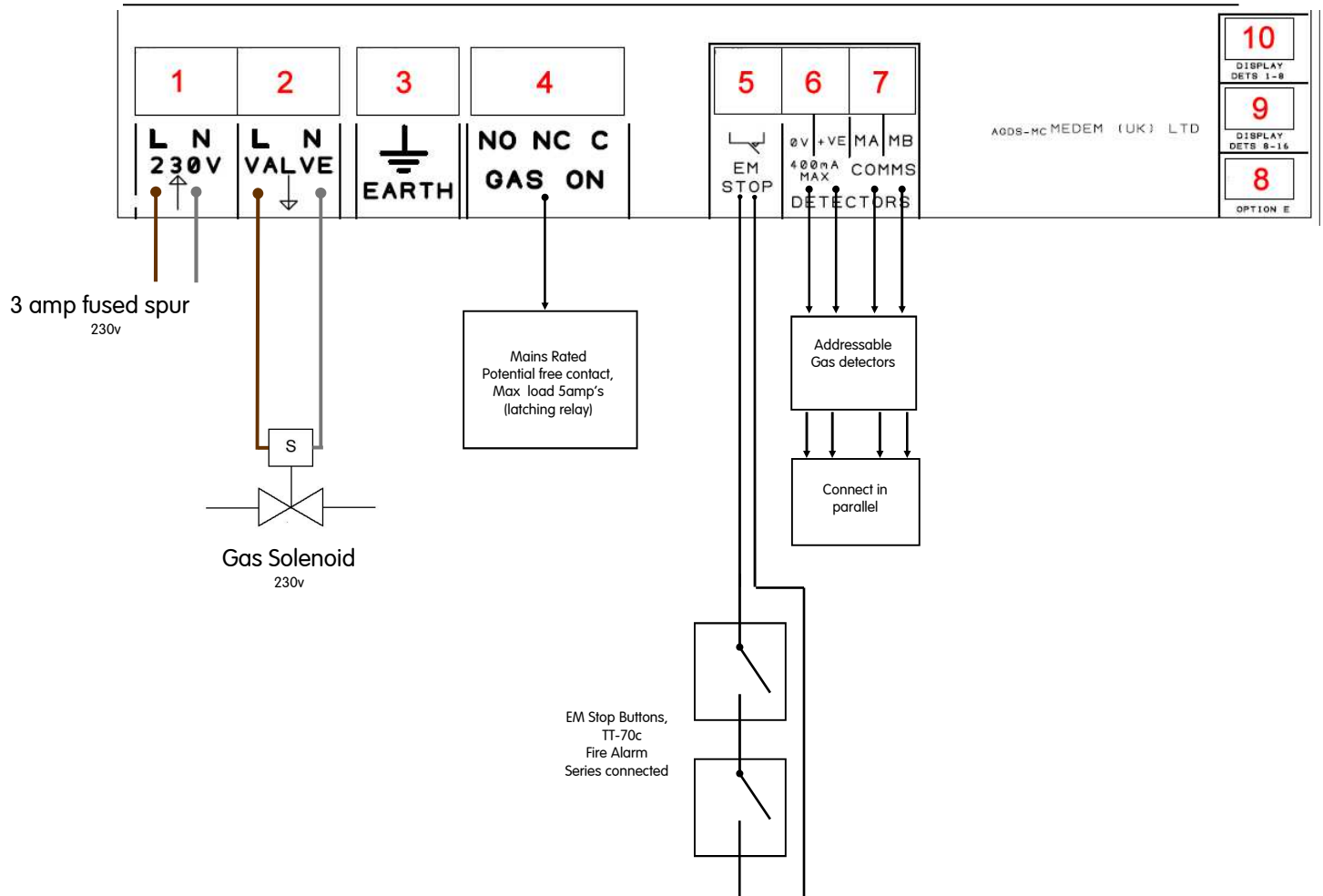


Connections to panel: marked on board

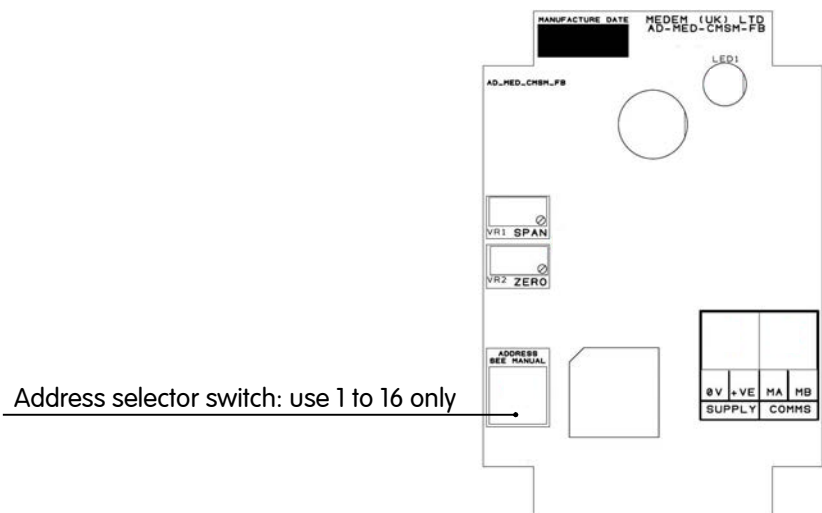
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4. Gas On BMS relay (potential free contact, mains rated, max load 5amp)
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14. Optional Dual BMS relay (SELV) - Factory fit only, must be requested at point of order

Option Switches (No 11)		Relay A	Relay B
Opt A - Off		Factory set	Factory set
Opt A - On		Factory set	Factory set
Opt B - Off		Low gas alert	low & High gas alert
Opt B - On		low & High gas alert	Emergency Stop

Earth Connections not shown



Example Medem Gas Detector



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.

Carbon Dioxide

Classroom Carbon Dioxide detectors under guidance from IGEM/UP11/Edition2 should be mounted at a seated head height. However following onsite experience this mounting height can make detectors susceptible to false readings due to direct breath contact. We would suggest following the guidance for mounting as per a commercial kitchen to reduce the potential for false alarm readings.

Commercial kitchen Carbon Dioxide detectors should be installed so they monitor the general level of CO₂ within the cooking area. They should be mounted above standing head height and between 1m and 3m from the cooking line. Care should be taken so they are not located close to the edge of a canopy or in direct flow of the supply or extract ventilation.

For additional information or guidance on site specific requirements please don't hesitate to contact us.

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. The Alert LED and a message 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 the Alert LED and LCD message will clear.

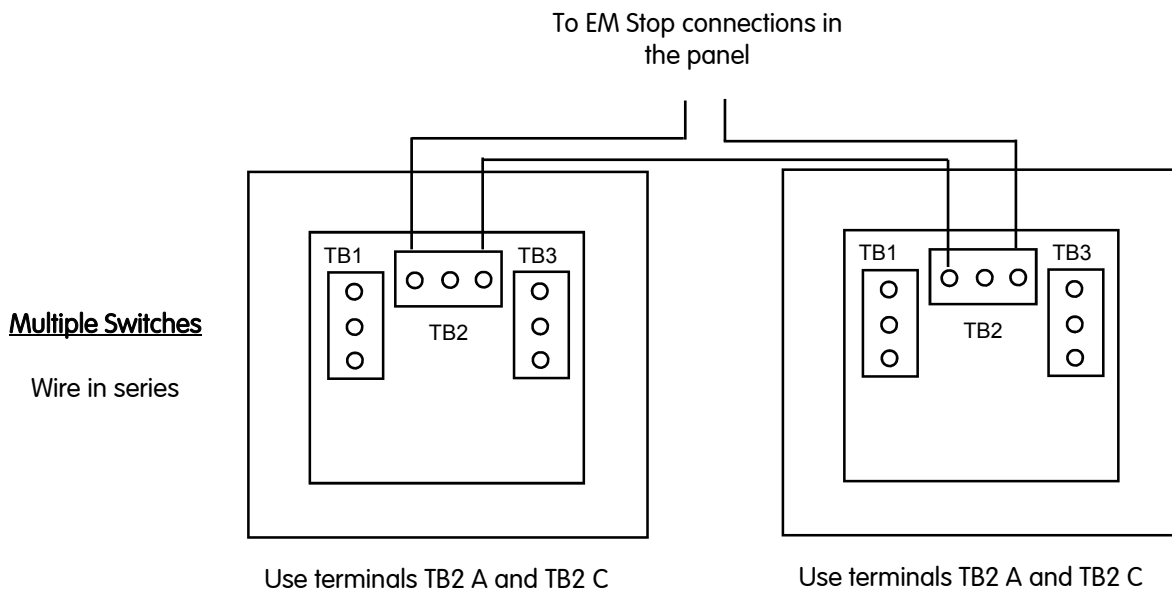
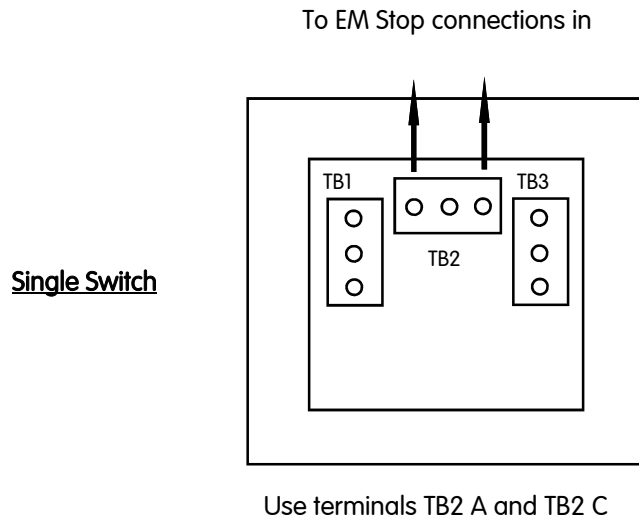
Should an emergency shut-off valve be connected to the panel this will remain open during a low alarm level detection.

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. The Alert LED and an LCD message 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 Alert LED and LCD message will remain.

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



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.



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

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

Site Name
Installing Company
Engineers Name
Date Completed

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

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".
- 4, Each detector has a blue rotary switch and each switch should be set to a different number or letter starting with "0". Then connect the gas detectors to terminals marked "detectors" on the panel. Detectors can be wired "Daisy chain".
- 5, Connect the 3 amp fused spur 240 volt supply to marked terminals.
- 6, Once power is connected to the panel the detectors will flash the green LEDs for 90 seconds after which the LEDs will be on continuously.
- 7, Press the "learn field button" this is on the main circuit board on the right hand side, just over half way up the board. Pressing this once allows the panel to learn how many and which type of detectors are fitted.
- 8, Press and keep pressed the "display detectors" button whilst checking on the LCD display that all the detectors have been recognised by the panel. A recognised detector will appear as "CO" or "CM" in the second section of each row. Count the number of "seen" Detectors on screen and ensure total is the same as the number of detectors installed. NM in the third column means that number is not monitored. If more then 8 detectors are fitted then press the second button labelled display detectors. Note that a detector set at 0 appears as 1 on the LCD and a detector set as 1 appears as 2 on the LCD etc.
- 9, At this point turn the on/off switch to the on position and provided there are no leaks the panel will allow gas and the gas on LED will light. Should there be low level gas detected the panel will Alarm and the alert LED will flash. If there is a high level of gas detected the valve will close and the panel will sound and the alert LED will flash.
- 10, A functionality test of the Methane detectors can be carried out by applying a small amount of lighter gas. The detector LED will turn red and the panel will alarm and close the valve.

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 or letter from adjusting the blue rotary switch **before** the "learn" button was pressed.
- 3: Each detector has been recognised by the panel.
- 4: On applying a little lighter gas to the Methane 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



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GROHE



Modern Plant Ltd are an official stocking distribution centre for Emerson Rosemount industrial flow, level, pressure, analytical and temperature instrumentation products.

EMERSON
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STIEBEL ELTRON
Comfort through technology



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STUART TURNER
ENGINEERED TO EXCEL



Modern Plant Ltd are official stocking distributors for the full range of SMC products and have a wide range of parts available from our trade counter.

SMC



Modern Plant Ltd is the sole Irish distributor for the complete Medem gas safety product range. Both companies work closely to ensure the products remain best in class.

medem



We stock a comprehensive range of Haws AG emergency equipment. We also supply special models to the highest level of quality as well as attractive, stylish drinking fountains and water coolers.

Haws
Switzerland



We are the official Irish distributor for all Metso Automation valve and control products, including NELES branded flanged ball valves, rotary plug valves, segment valves, high performance off-set butterfly valves, valve actuators and much more.

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Bonfiglioli
power, control and green solutions



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AMG specialise in quarter turn rack and pinion pneumatic actuators with many available from stock held locally in Modern Plant.



MODERN PLANT For more information call 00353 1 461 4300

Modern Plant Limited, Otter House, Naas Road, Clondalkin, D 22

E: sales @ modernplant.ie, W: www.modernplant.ie