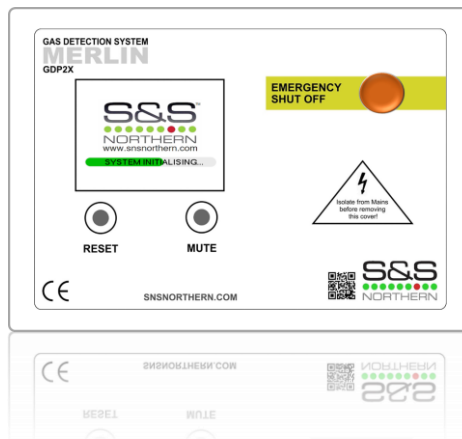




MERLIN GDP2-X

Gas Detection Panel



Installation & Operation Manual

Please read this manual carefully and retain for future use.

S&S Northern provide a range of detection panels which can be used in many applications such as factories, car parks, shopping centres and most commonly for this model - boiler houses.

The GDP2X can be used with up to eight Merlin gas detectors (sold separately) for monitoring and detecting gas including carbon monoxide, liquid petroleum gas and methane.

The information contained within this manual should be referenced for typical installation and operation only. For specific requirements that may deviate from the information in this guide – contact your supplier.

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IMPORTANT WARNING STATEMENTS

Please take the time to thoroughly read this user's guide which should be retained for future reference.

It is recommended that this device be commissioned upon installation and serviced at least annually.

Do not apply lighter gas or other aerosols to detectors – this will cause extreme damage to the gas sensing elements.

High concentrations of alcohol found in many products may damage, deteriorate or affect the gas sensing elements of the detectors – Avoid exposure near your devices.

This device is designed to detect the gas displayed on screen and in the designated zone area from any source of combustion or dangerous level. It is NOT designed to detect smoke, fire or other gases and should NOT be used as such.

This device provides early warning of the presence of gas, usually before a healthy adult would experience symptoms. This early warning is possible provided your alarm is located, installed and maintained as described in this guide.

Never ignore your device when in alarm. Actuation of your alarm indicates the presence of an error or significant issue that requires immediate attention.

This device requires a continual supply of electrical power – it will not work without power.

This device should not be used to substitute proper installation, use and/or maintenance of fuel burning appliances including appropriate ventilation and exhaust systems.

This device does not prevent dangerous gasses from occurring or accumulating.

This unit may not fully safeguard individuals with specific medical conditions. If in doubt, consult a doctor/physician.

Your product should reach you in perfect condition, if you suspect it is damaged, contact your supplier.

Manufacturer's Warranty

Warranty coverage:

The manufacturer warrants to the original consumer purchaser, that this product will be free of defects in material and workmanship for a period of three (3) years from date of purchase. The manufacturer's liability hereunder is limited to replacement of the product with repaired product at the discretion of the manufacturer. This warranty is void if the product has been damaged by accident, unreasonable use, neglect, tampering or other causes not arising from defects in material or workmanship. This warranty extends to the original consumer purchaser of the product only.

Warranty disclaimers:

Any implied warranties arising out of this sale, including but not limited to the implied warranties of description, merchantability and intended operational purpose, are limited in duration to the above warranty period. In no event shall the manufacturer be liable for loss of use of this product or for any indirect, special, incidental or consequential damages, or costs, or expenses incurred by the consumer or any other user of this product, whether due to a breach of contract, negligence, strict liability in tort or otherwise. The manufacturer shall have no liability for any personal injury, property damage or any special, incidental, contingent or consequential damage of any kind resulting from gas leakage, fire or explosion. This warranty does not affect your statutory rights.

Warranty Performance:

During the above warranty period, your product will be replaced with a comparable product if the defective product is returned together with proof of purchase date. The replacement product will be in warranty for the remainder of the original warranty period or for six months – whichever is the greatest.

Information on waste disposal for consumers of electrical & electronic equipment.



When this product has reached the end of its life it must be treated as Waste Electrical & Electronics Equipment (WEEE). Any WEEE marked products must not be mixed with general household waste, but kept separate for the treatment, recovery and recycling of the materials used. Please contact your supplier or local authority for details of recycling schemes in your area.

INSTALLATION

Planning

The Merlin GDP2X is a multi-zone gas detection panel which can be used in many applications such as factories, car parks, shopping centres and most commonly - boiler houses.

It can be used with up to eight Merlin gas detectors (model X) for monitoring and detecting gas including carbon monoxide, liquid petroleum gas and methane.

The GDP2X system can be integrated with, but not limited to, a BMS (building management system) a fire panel, external alarms and remote emergency shut-off buttons.



Please refer to your detector manual for important information regarding coverage, location and positioning including areas and conditions to avoid!

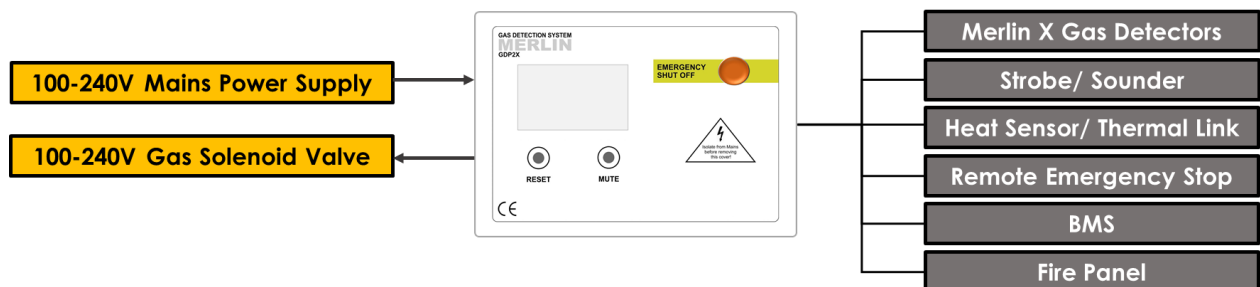
Locations for detectors will vary based on the intended application and target gas, they should be located near identified sources of a potential gas leaks/ pockets where hazardous gas could quickly accumulate and areas of identified consequential risk.

The composition of the target gas and its density relative to air are used as the basis for any recommended height of sensors.

Generally, the installation height of a sensor for a heavy gas (such as propane) would be close to the lowest point in the area, and for a light gas (such as methane) would be close to the highest point in the area. Any recommended heights may vary based on air flow and temperature conditions in addition to the proposed application and location – this is particularly apparent with oxygen depletion sensors, and the target gas that they are used for.

Quick Installation Arrangement

The control panel should be located outside of the hazardous area that it is monitoring. Easy accessibility is required both for status observation and alarm purposes.



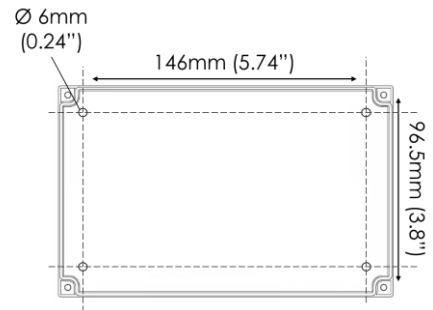
Where connections may exceed 100 metres from one control panel – Contact your supplier!

Mounting

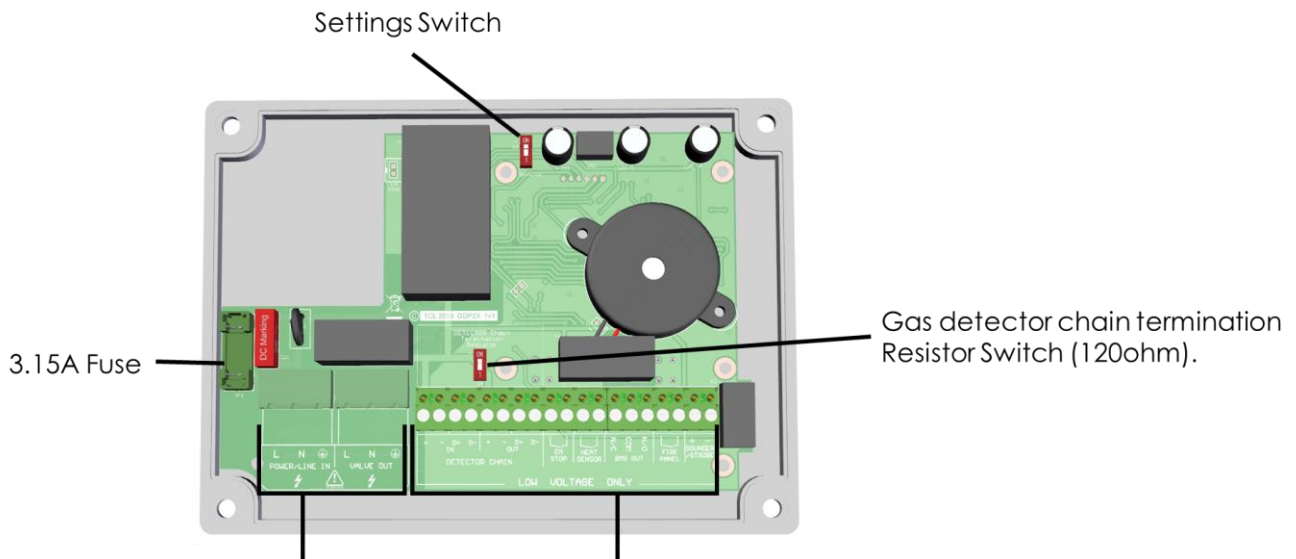
Unpack all the parts!


Designed for surface mounting, it must be installed by a licensed, insured contractor.

1. Carefully remove the front cover from the unit by unscrewing the four bolts located at each corner. To do this – use the socket wrench provided.
2. Mark the four screw holes located on the back of the enclosure to the wall. Ensure the wall surface is flat to prevent base distortion.
3. After executing the mounting and the connections – replace the front cover and insert the security caps over the four bolts.



Board Overview - Main



100-240VAC

 - Power / Line In
 - Gas Valve output

Low Voltage Connections
 - Gas Detector(s)
 - Emergency Stop
 - Heat Sensor
 - BMS Relay
 - Fire Panel
 - Sounder/ Strobe



Be careful when creating access for cables – Damage to boards will void any warranty!

Any damage attempting to remove the circuit board parts may void any warranty!

Wiring of different circuits shall be separated by means of routing, clamping or barrier!

All Class 2 wiring is to be installed within flexible tubing to maintain segregation between circuits!

For MODBUS communications, a shielded and twisted pair cable is used!

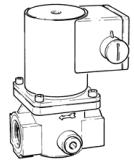
Board Connections Overview

POWER / LINE IN

100-240Vac mains power should be supplied to the [POWER/LINE IN] connector using a 3 core cable and fused at 3A. On connecting the mains supply to the panel the power LED indicator will light up – this is located on the front cover.

VALVE OUT

100-240Vac electrical power output from the [VALVE OUT] connector using a 3 core cable can be connected to a gas solenoid valve which can shut the gas supply on alarm status. A pressure sensor should be connected to the downstream port.



Refer to your valve manual for more information and wiring!

DETECTOR CHAIN

12-24Vdc power and modbus RTU communication data is wired to gas detectors. Up to 16 detectors can be connected, chained in parallel up to approx. 100 yards from the panel depending on chain configuration, wire type for power and condition.

For more information do to section: **Gas Detector Set-Up.**

EM STOP

Connections for remote emergency shut-off or stop buttons detailed on the board as [EM STOP].

HEAT SENSOR

The terminal for heat sensors/ thermal links is detailed as [HEAT SENSOR].

BMS OUTPUT

Connections are available on the board for Building Management Systems.

These are volt free connections.

This is a relay that changes state in alarm or when the gas is on/off and can be used in conjunction with the 24V DC output and other external relays that affect other devices and controls such as purge fans and audible alarms etc.

FIRE PANEL

The terminal for fire alarms is detailed on the circuit board as [FIRE PANEL].

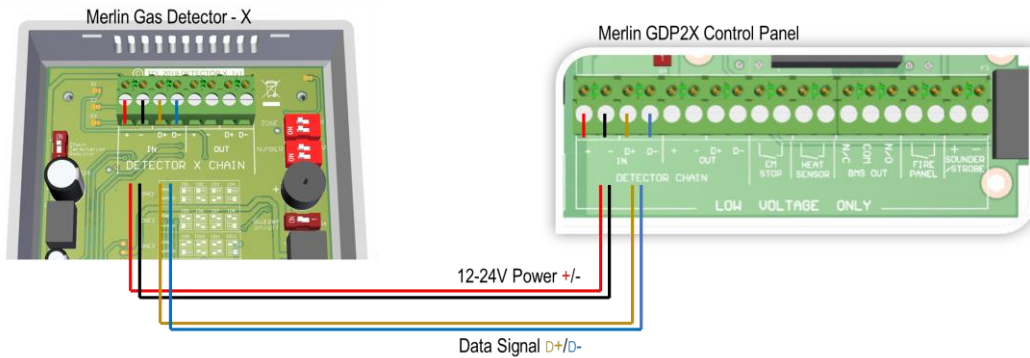
SOUNDER-STROBE

There are connections for an external sounder alarm/ strobe lighting to activate on alarm.

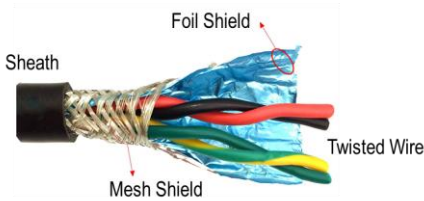
Refer to your sounder/ strobe manual for wiring.

Gas Detector Setup

12-24Vdc power and modbus RTU communication data is wired to gas detectors. Up to 8 detectors can be connected, chained in parallel up to approx. 100 metres from the panel depending on chain configuration, wire type for power and condition.



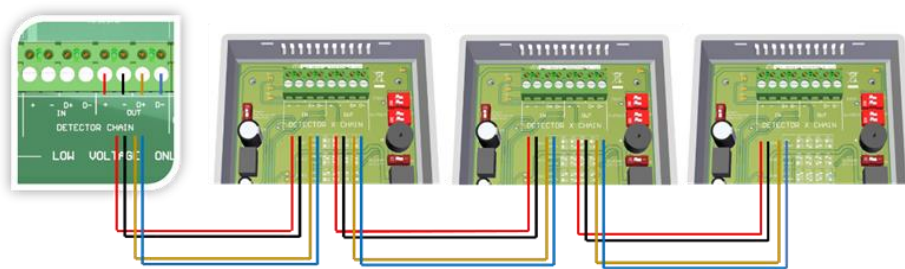
For MODBUS DATA communication, a shielded and twisted 2 or 4 core cable is used. Any cable with similar characteristics can be used to connect all the devices together.



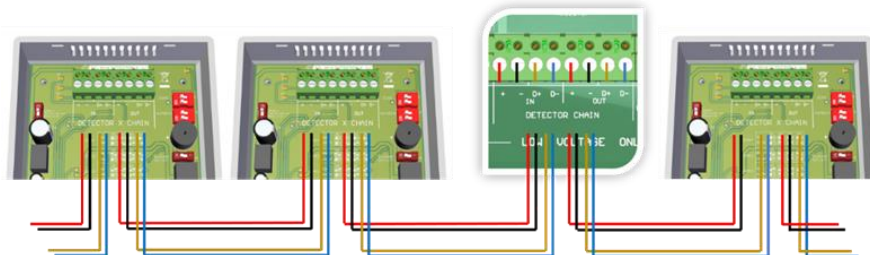
The shielding can be of 2 types: braided [mesh of thin conducting wires] or foil (consisting of a thin sheet of metal covering the twisted wires). If you are encountering noise or irregular problems with a modbus link, the problem is likely related to grounding, incorrect shielding or wiring mains power next to Modbus wiring.

Connect detectors in a parallel (daisy chain) method for bus data signal. Any other way may cause issues or damage to the overall system.

****Single chain example.**



****Split chain example**



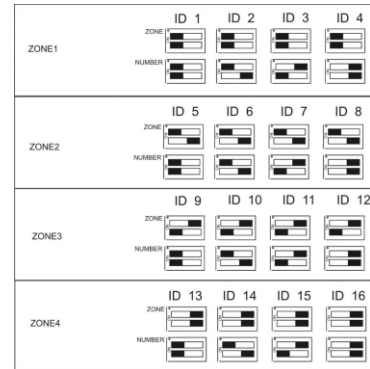
****Where connections may exceed 100 metres from one control panel – Contact your supplier! For more information refer to your detector manual!**

Gas Detector ID Switches

When wiring multiple detectors in a chain it is important to identify each and every detector installed for the control panel to receive and display accurate data corresponding with the correct detector type.

The ID configuration diagram is printed onto detector boards for quick reference. All detectors are factory set to ID1.

ID Switches must be configured for each and every detector connected to receive and display accurate data!



We recommend a plan, map and/or marking the detector enclosures detailing ID and location!

120ohm Termination Resistance

Signal communication issues may occur where the bus length is too long, high baud rates are used or signal reflections are occurring. To avoid this, terminating at each end of a chain may help the quality of the data signal by turning on the 120ohm terminal resistor switch of the last device in the chain.



In some cases, it is also required to turn on the resistor of the first device also, e.g. If a split chain is used, terminate the last detector in each chain. If a single chain is used, terminate the first (panel) and last (detector) device.

Settings Switch

On the front fascia circuit board you'll find a SETTINGS dip-switch – when switched to ON, the screen will display the settings menu – you can now configure your GDP2X.

To view, change and save settings, you must provide mains power to [POWER/LINE IN].

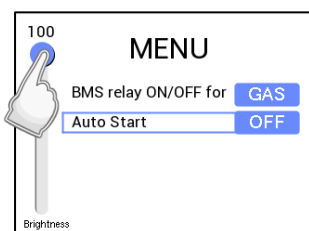
When changes have been made – turn the SETTINGS switch OFF and the system will automatically restart.

Settings Menu

The GDP2X has a touch screen which allows the engineer/ user to configure the system.

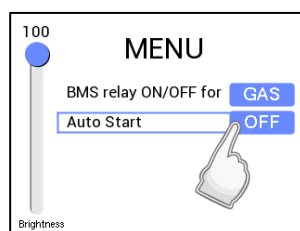
Adjust the screen brightness.

Press or slide the cursor up and down.



Change/Select option

Press the blue option box or press and hold.



When changes have been made – turn the SETTINGS switch OFF and the system will restart.

Settings Options Explained

FUNCTION	OPTIONS	Explanation
BMS relay ON/OFF for-	- Gas - Error	Gas changes relay state with gas valve status only. Error changes relay state upon all alarm messages.
Auto Start-	- ON - OFF	In the event of a power loss - the GDP2X will restart automatically when power is restored, or not.

Factory Set Condition

BMS relay ON/OFF for-	- Gas	Auto Start-	- OFF
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Trouble Shooting

Fault.	Possible Cause/Correction.
Detector not responding.	<ul style="list-style-type: none"> o Incorrect wiring or screening of Data cables. o ID switches not properly configured. o Termination switches not set up correctly.
Service message	o Detector requires service – contact supplier.
End of Life message	o Detector requires replacement – contact supplier.

Specification

Product:	Gas Detection Panel
Model:	GDP2X
Display	2.8" Touch Screen TFT
Power Input Voltage	100-240V AC
Gas Valve Output Voltage	100-240V AC
Current Consumption	20W max (full load)
BMS Output	3A
Internal Fuse	3.15A
Operating Temperature	0 – 50°C 30-85%RH Non-Condensing
Wire ratings:	18AWG min
Audible Alarm Buzzer dB	65 dB (300mm distance in quiet conditions)
Housing Material	Polylac PA-765
Flame Rating	UL 94
Approvals	CE, RoHS
O/All Dimensions (H x W x D) mm	140 x 190 x 62

OPERATION

First Power Up

On connecting mains power, the GDP2X panel will 'warm up' for approximately 60 seconds – during this time the screen will display an 'initialisation' message.

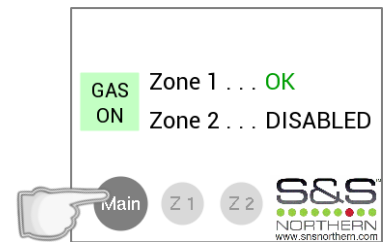


The panel will search for detectors wired to the system.

Main Screen

When the GDP2X has completed initialising – the Main screen will appear.

The Main screen gives an overview of the status of each zone being monitored by gas detectors (detectors sold separately) and if the gas supply is on or off.



ZONE STATUS EXPLANATION

- OK**
 - Gas levels are safe.
 - No error conditions.
- ALERT**
 - Detector(s) are in Pre-Alarm status.
 - Detector(s) require service.
 - Detector gas sensor(s) end of life.
- ALARM**
 - Dangerous gas levels detected. (Gas is shut off).
 - Detector gas sensor fault or detector(s) disconnected. (Gas is shut off).
- DISABLED**
 - No detector signals are received from the zone.
 - X --** ○ Detector signal lost, not installed or not configured correctly.

Zone Screens

Switch between zone screens by touching the relevant zone screen, i.e. Z1 or Z2. Each zone can display up to 4 detectors as follows:

- a. ID:** The detector identification number
- b. Serial Number:** The unique serial number for that detector.
- c. Gas:** The target gas that the detector is monitoring.
- d. Status:** The status of gas levels, errors and messages.
- e. Value:** The concentration value of gas being monitored.

	a	b	c	d	e
ID	Serial Number	Gas	Status	Value	
1	123456789103	CO	GOOD	20 ppm	
2	123456789103	CO	GOOD	20 ppm	
3	123456789103	CO	GOOD	20 ppm	
4	123456789103	LPG	GOOD	5.4 LEL%	

Alarm Messages

The GDP2X will display messages when in alarm – the messages are prompted from external devices that have been connected i.e. heat sensor or remote emergency stop. When the GDP2X goes in to alarm, the user can silence the audible buzzer by pressing MUTE.

During the alarm, the gas will be shut off and no gas detection details will be available. After the cause of alarm has been rectified – press the RESET button on the GDP2X panel.



The cause of alarm will have to be investigated and rectified before resetting the GDP2X!

Alarm Message List

EMERGENCY SHUT OFF



An emergency shut-off button has been activated. Pressing MUTE on the GDP2X will silence the audible alarm buzzer.

Investigate and rectify the issue before RESETTING the panel.

FIRE PANEL ALARM



The fire alarm panel has reached alarm status. Pressing MUTE on the GDP2X will silence the audible alarm buzzer.

Investigate and rectify the issue before RESETTING the panel.

HEAT SENSOR ALARM



Heat sensor/ thermal link has reached alarm status. Pressing MUTE on the GDP2X will silence the audible alarm buzzer.

Investigate and rectify the issue before RESETTING the panel.

DETECTOR ALARM

Detector Alarm ID: 3		MUTE		
ZONE 1				
ID	Serial Number	Gas	Status	Value
1	123456789103	CO	GOOD	20 ppm
2	123456789103	CO	GOOD	20 ppm
3	123456789103	CO	ALARM	48 ppm
4	123456789103	LPG	Pre-Alarm	5.4 LEL%

If dangerous gas levels are detected, your GDP2X will show the detector ID in alarm in the top left hand corner.

Pressing MUTE on the GDP2X will silence the audible alarm buzzer.

Investigate and rectify the issue before RESETTING the panel.

Servicing & General Maintenance

On the gas detector - a service message will intermittently flash every 30 seconds after one year of operation. The detector will still operate as intended but contact your supplier immediately.

When Merlin gas detector(s) display the service message – the GDP2X panel will show [SERVICE] on the status screen.

Detector Alarm ID: 9					MUTE
ZONE 3					
ID	Serial Number	Gas	Status	Value	
9	123456789103	CO	SERVICE	82 ppm	
10	123456789103	H	GOOD	0.4 LEL%	
11	123456789103	CO	Pre-Alarm	47 ppm	
12				--X--	

The GDP2X will still operate as intended and if any dangerous gas levels are detected, your GDP2X will show the detector ID in alarm in the top left hand corner.

It is recommended that detectors are inspected and serviced at least annually from the date of installation for optimum performance and protection.

- ✓ DO carefully remove any accumulated dust from the outer enclosure once a month.
- ✗ NEVER use detergents or solvents to clean your detectors – this may permanently or temporarily damage the gas sensing elements.
- ✗ NEVER spray lighter gas, paint or other aerosols near detectors.
- ✗ NEVER paint the device. Paint will seal vents and may interfere with the device.

Bump Testing

What is Bump Testing?

Bump testing is a term used for checking a gas detector is functioning correctly by exposing it to the target gas. A known concentration of the target gas is applied to the device to trigger an alarm condition and ascertain the detector is working safely.

Why is it Important?

A detector may visually appear in good order, but its sensitivity can be inhibited by external factors such as, dust; humidity; temperature fluctuations; cleaning products; contaminants or sensor drift (ageing). All can cause a decline in sensitivity and eventual failure.

The aim of the bump test is to make sure a gas detector is working at its optimum by briefly exposing the unit to a known concentration of the target gas. The reading (if displayed) is compared to the actual content of gas present, as stated on the test gas cylinder and if the detector goes into alarm within an acceptable range of the actual concentration, usually within 10%, then it is working safely.

If the bump test results are not within the acceptable range, the gas detector must not be used until a full calibration has been conducted.

Bump testing has a number of benefits for the end user:

- Peace of mind that the system does actually detect the gas in question.
- Allows the site to practice safe operations in a similar manner to the fire system.
- Early indication of any issues.

How Often?

Regular bump tests are important to make sure the detector is able to detect a release of gas as early as possible. A bump test usually takes seconds (gas type dependant) and is often completed alongside a scheduled fire alarm test, however the frequency should be determined following a risk assessment by the end user.

Current standards recommend that for new installations - it may be prudent to carry out a bump test frequently (perhaps weekly), following a successful initial period and as confidence grows in the installation concerned, the frequency could be reduced.

Remember, bump testing does not remove the need to have gas detectors inspected, calibrated and serviced periodically by a trained engineer. You should not attempt this yourself and should employ the services of a specialist company.

For more information on this, contact us.

NOTES

Remember to individually ID each connected detector by configuring the ID switches on the detector circuit boards and making a plan, map and/or note of the location of all connected detectors for tracing and locality purposes!

Where connections may exceed 100 metres from one control panel – Contact your supplier!

Service Record

Date	Device ID	Gas	Pass	Sign

Installation Details

Please pass this manual to the system owner or system user.

Date of Installation:	
Installation Location:	
Organisation:	
Stamp/ Signature of the installer:	

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