AGS

AMERICAN GAS SAFETY

Merlin 2000S

Gas Proving and Ventilation interlock system

Installation & Operation Manual

Please read this manual carefully and retain for future use.

This panel is designed for use when the kitchen appliances do not have flame failure devices fitted, therefore gas proving is a requirement.

The Merlin 2000S system acts as an interlock between the ventilation system and the gas solenoid valve. The system is compatible with both current monitors and air pressure differential switches in order to interlock with up to 4 fans.

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INSTALLATION

Planning

This panel is designed for use when the kitchen appliances do not have flame failure devices fitted, therefore gas proving is a requirement.
The Merlin 2000S system acts as an interlock between the ventilation system and the gas solenoid valve. The system is compatible with both current monitors and air pressure differential switches in order to interlock with up to 4 fans.

The fans can be monitored through air pressure switches or by means of an additional current monitor. To operate the Merlin 2000S the fans should be turned to the 'on' position, once the panel receives a signal to indicate the fans are operating the key on the panel can be turned to the 'on' position and this will open the gas solenoid valve. If the fans should fail, the 'fan fail' LED on the panel will illuminate and the gas solenoid will close.

The Merlin 2000S can work in conjunction with carbon dioxide, natural gas, carbon monoxide and LPG sensors.

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

Placing the panel at eye level allows for optimum monitoring of LED Indicators.

Fixing - Mounting

Unpack all the parts!

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.

> ⚠️
> Be careful when creating access for cables – Damage to boards will void any warranty.
> Carefully remove the circuit board before drilling cable entry holes.

A flush mount kit is available, comprising of a mounting bracket and decorative surround strip. Contact your supplier for more information.

Typical Installation Arrangement
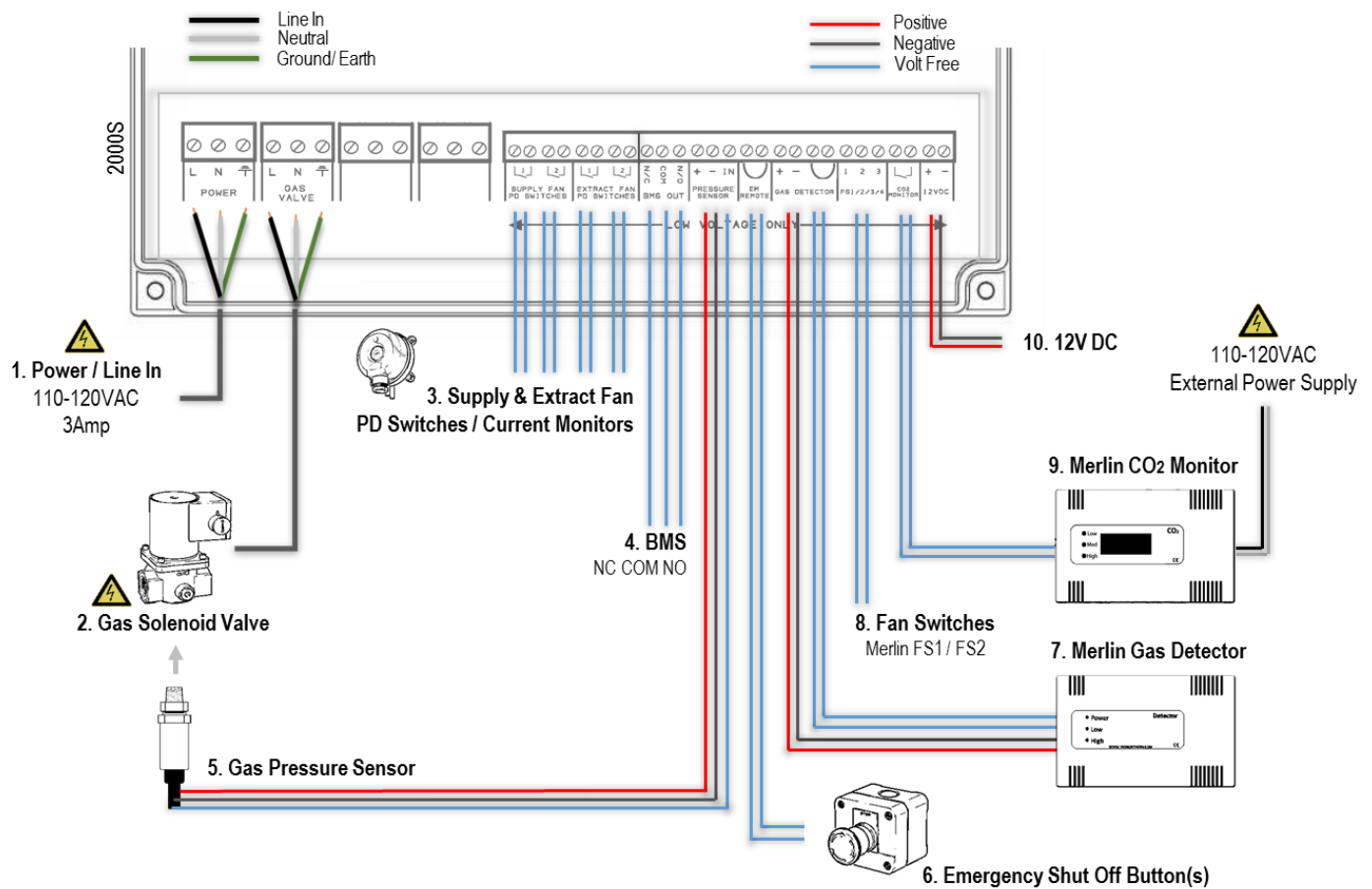
Terminal Connections

1. POWER / LINE IN

110-120V AC Power should be supplied to the [POWER / LINE IN] terminal 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 (American Gas Safety Logo).

2. GAS SOLENOID VALVE OUTPUT

100-120V AC electrical power supplied 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.

Refer to your valve manual for more information and wiring!

3. SUPPLY & EXTRACT FAN PRESSURE DIFFERENTIAL SWITCHES / CURRENT MONITORS

These terminals are used to receive an input signal from external air pressure switches or external current monitors. These terminals have factory fitted links installed.

If only one fan is being used – leave factory fitted links in terminals NOT IN USE!

4. BMS OUTPUT

Connections are available on the board for Building Management Systems.

[NO Normally Open] [COM Common] [NC Normally Closed]
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 12V DC output and other external relays that affect other devices and controls such as purge fans and audible alarms etc.
See section; Switch Settings - for BMS options
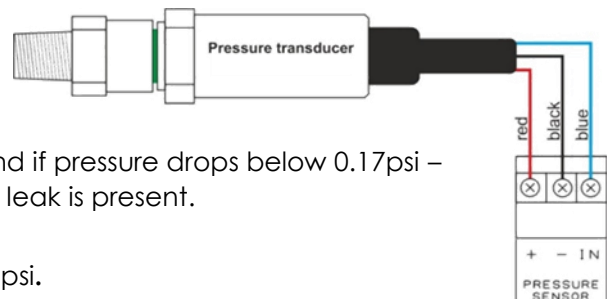
5. PRESSURE SENSOR

The pressure sensor is wired to the [PRESSURE SENSOR] connector and screwed into the downstream port of the gas solenoid valve.

Connect the pressure sensor as shown:

Red [+] Black [-] Blue [IN]

The sensor will monitor the gas supply pressure and if pressure drops below 0.17psi – the gas valve will close as this could mean a gas leak is present.

The pressure sensor operating pressure is: 0 – 1.45psi.

> ⚠️
> Screw the pressure sensor into the downstream port of your gas solenoid valve.

6. EM REMOTE

Connections for remote emergency shut-off or stop buttons is detailed on the circuit board as [EM REMOTE]. This is linked out as a factory setting.

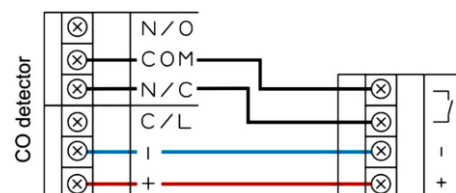Remote emergency shut-off buttons should be volt free and wired to the Merlin 2000S using a plenum security cable, white, 18/2 (18AWG 2 conductor), stranded, CMP or similar.

7. GAS DETECTOR

Connections can be made for a Merlin gas detector (LPG, NG, CO or Hydrogen).
If no detector is being used leave the factory fitted link in.
A wiring example is shown.

Refer to your gas detector manual for further information.

8. FAN SWITCHES

This terminal switches when the key is turned on and off.

This can be connected to a fan switch (supplied separately) which can provide power to fans when the control panel is switched on.

9. CO2 MONITOR

This terminal can be used to connect a Merlin CO_2 monitor to shut off the system in the event of a high concentration of CO_2.

If no CO2 monitor is connected, the panel will 'beep' upon power up and the CO2 LED will flash 3 times to indicate that this terminal has been disabled.

An external power supply is required.
Refer to your CO_2 monitor manual for further information.

10. 12V DC

This is a power output for external auxiliary devices when there is power at the panel and can be used to create a relay switch with the BMS relay output.

Max output: 50mA

Switch Settings

There are various DIP-switches on the front circuit board that can be adjusted to configure your system as per the following.

Building Management System Integration

There is a DIP-switch located on the circuit board labelled [BMS SEL].

The panel can be integrated with a BMS to make or break a circuit when the gas is either on or off, (valve open or valve closed). This will tell the BMS whether or not power is being sent to the solenoid valve.

OFF	Signals the BMS when gas is on or gas is off. (Default)
ON	Signals the BMS on a fault, i.e. high gas levels detected, emergency shut-off activated, etc.

Fan Switch Integration

There is the facility to connect a Fan Switch.

A fan switch (Merlin FS1 or FS2 - sold separately) provides the facility to turn on fan(s) when the 2000S panel is switched on and removes power to fan(s) when the switched off.

There is a switch located on the circuit board labelled [EM SEL].

OFF	Instructs the system to shut down fan(s) and gas supply upon activation of emergency shut off button(s). (Default)
ON	Instructs the system to leave the fans on and shut off the gas supply only upon activation of emergency shut off button(s).

This option is not available if a Fan Switch is not installed.

Fire Panel Integration

The Merlin 2000S can be integrated with a fire alarm to close the gas supply automatically in the event of a fire. The volt free fire alarm signal can be wired in series with any remote emergency shut off buttons.

If there are no remote emergency shut off buttons being installed, wire this directly to the terminal marked [EM REMOTE].

Gas Fill Time and Prove Time

FILL TIME: *Amount of time the gas valve opens to fill the gas line on power up or reset.*
PROVE TIME: *Amount of time the system tests the gas line for leaks on power up or reset.*

There are two switches located on the circuit board labelled [FILL TIME] and [PROVE TIME].

	FILL TIME		PROVE TIME
OFF	5 Seconds (Default)	**OFF**	30 Seconds (Default)
ON	10 Seconds	**ON**	50 Seconds

Once the settings have been changed - remove power for 10 seconds.

CO_2 MODE

Under normal working conditions the Merlin 2000S monitors the ventilation and the concentration level of Carbon Dioxide (CO_2) in the air. In the event of ventilation failure or if the CO_2 level is at alarm level, the panel will shut off the gas supply.

The Merlin 2000S features a 'CO_2 Mode' - this allows the user to have the access to the gas supply in the event of a fan failure. The 'CO_2 Mode' button located on the front of the panel will only be available to use when 'Fan fault' LED illuminates Red. To enable the CO_2 Mode, this button has to be pressed for 5 seconds. The Fan Fault LED will go off and CO_2 Mode LED will come on.

In this mode, the Merlin 2000S will monitor only the CO_2 levels to ensure there is a safe working environment. This mode will allow the gas valve to open for 8 hours each time the system is energised, provided there are satisfactory levels of CO_2.
At the end of 8 hours, the gas valve will close and CO_2 Mode LED will be flashing.
To reinstate the system the panel has to be restarted.

 CO2 Mode will be permanently disabled if a CO2 monitoring device is not connected.

Specification

Model:	2000S
Visual Indication	LED
Mains Electrical Power Input	100-120VAC
Gas Solenoid Valve Output	100-120VAC
Current Consumption	12W max (50mA) @ 120VAC
Internal Fuse	3.15A
Pressure Sensor Operating Pressure	0 -1.45psi
Operating Temperature	32 – 104°F 0-95%RH Non-Condensing
Audible Alarm Buzzer dB	65 dB (300mm distance in quiet conditions)
Internet connection	N/A
Housing Material	Polylac PA-765
Flame Rating	UL 94
Approvals	CE, RoHS
O/All Dimensions (H x W x D) mm / inch	7.08 x 10 x 3.03"

OPERATION

First Power Up

On connecting mains power, an LED on the front of the panel (AGS Logo) will illuminate red.
1. Turn off all appliances
2. Turn the Fans On.
3. Turn the key switch to ON position. See LED indicators.

To turn the system off, turn the key switch to OFF position.

Emergency Shut Off Button

The emergency shut off button is located on the front of the panel.
There is also a facility for remote shut off buttons to be wired in series on the circuit board.

The emergency shut off button(s) will cut off the gas supply and electrics only when activated. To reinstate the system, the emergency shut off button(s) will need to be reset and the panel restarted.

LED Indicators

● **Gas On**

When the fans are running and the key switch is turned on, the Merlin 2000S will open the gas valve and the Gas-On LED will illuminate.
ON = Gas On / OFF = Gas Off

● **Testing**

This LED will illuminate for approximately 30 seconds when the panel is checking the integrity of the gas installation upon start up.
ON = proving the gas line, do NOT operate any appliances during the testing period.

● **Test Fail**

Under normal working conditions this LED is off.
When the panel detects a gas leak on start- up, the LED will illuminate and the gas valve will remain closed.
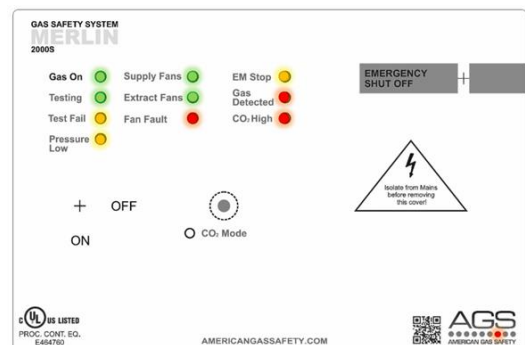OFF = OK / ON = gas proving test failed

● **Pressure Low**

Under normal working conditions the LED is off.
The LED will illuminate when the incoming gas pressure drops below 0.17psi for 10 seconds and the gas valve will close.
OFF = OK / ON = gas supply pressure low.

- **Supply Fans**

Under normal working the LED will illuminate.

If a supply fan fault is detected, the LED will flash.

ON = OK / *FLASHING = One of the supply fans is not running.

- **Extract Fans**

Under normal working the LED will illuminate.

If an extract fan fault is detected, the LED will flash.

ON = OK / *FLASHING = One of the extract fans is not running

*IF SUPPLY AND/OR EXTRACT FANS LED FLASHES FOR MORE THAN 20 SECONDS, THE GAS WILL SHUT OFF.

- **Fan Fault**

Under normal working conditions this LED is off.

If a fan fault is present for more than 20 seconds, the LED will illuminate RED.

OFF = OK / ON = the gas supply has been shut off due to a ventilation fault.

- **EM Stop**

If an emergency shut off button (either remote or on the panel) is pressed, the LED will illuminate and the gas is shut off. The button(s) must be re-set before restarting the system.

OFF = OK / ON = Emergency Shut Off button pressed

- **Gas Detected**

Under normal working conditions this LED is off.

If an external Merlin detector connected detects high levels of gas this LED will illuminate and the Gas valve will turn off.

OFF = OK / ON = Gas detected.

- **CO_2 High**

Under normal working conditions this LED is off.

If the concentration of Carbon Dioxide (CO_2) in the air is at alarm level (CO2 Monitors sold separately), the LED will show illuminate and the Gas valve will turn off.

OFF = OK / ON = the concentration of CO_2 is at alarm level.

CO_2 Mode

The 'CO_2 Mode' button located on the front of the panel will only be available to use when 'Fan fault' LED illuminates. To enable CO2 Mode, this button has to be pressed for 5 seconds. The Fan Fault LED will go off and CO2 Mode LED will come on. In this mode, the Merlin 2000S will monitor only the CO_2 levels to ensure there is a safe working environment and allow the gas valve to open for 8 hours each time CO2 Mode is activated provided CO_2 levels are safe.

At the end of 8 hours, the gas valve will close and CO2 Mode LED will be flashing.

To reinstate the system the panel has to be restarted.

 CO2 Mode will be permanently disabled if a CO2 monitoring device is not connected.

Servicing & General Maintenance

> ⚠️
>
> It is recommended that any detectors connected to the system 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 devices – this may permenantly or temporarily damage any gas sensing elements.
- ✗ NEVER spray lighter gas, paint or other aerosols near detectors or monitors.
- ✗ NEVER paint the device. Paint will seal vents and may interfere with the device.

> ⚠️
>
> Avoid exposure of high concentrations of alcohol found in many products, this can damage, deteriorate or affect gas detectors. For more information refer to your detector manual.

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 sensor 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. Dust, humidity, temperature fluctuations, cleaning products, contaminants or sensor drift (ageing) can cause a decline in sensitivity and eventual failure. Regular 'bump tests' are important to make sure the detector is able to detect a release of gas as early as possible.

How often?

A 'bump test' takes seconds and is often completed alongside a scheduled fire alarm test. We recommend this is done at least weekly to reduce the risk of a detector not performing, however the frequency should be determined from a risk assessment by the end user.

Please remember, 'bump testing' does not remove the need to have gas detectors inspected, calibrated and serviced periodically by a trained engineer.

For more help and advice on bump testing, calibration and service – contact us.

⚠ 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.

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.

Never ignore your devices when in alarm. Actuation of your alarm indicates the presence of an error or 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.

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

Manufacturer's Warranty

3 Year 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 manufacture. 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.

Notes

Notes

Installation Details

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

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

CONTACT US:

AGS Head Office
Tel: (727) 608-4375
Fax: (727) 538-4237
info@americangassafety.com

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