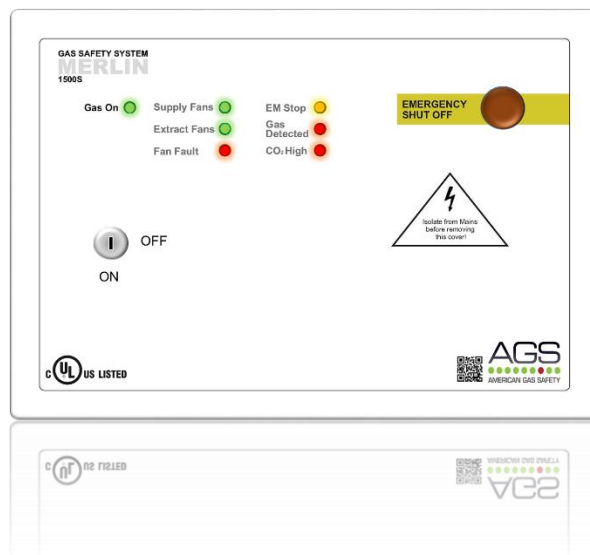# AGS

AMERICAN GAS SAFETY

Merlin 1500S

Gas and Ventilation interlock system

📖 **Installation & Operation Manual**

Please read this manual carefully and retain for future use.

The Merlin 1500S ventilation interlock system is designed for kitchens where all appliances have built in flame failure devices and there is no need for gas pressure proving. The Merlin 1500S acts as an interlock between the ventilation system and the gas solenoid valve. It ensures the gas solenoid cannot be opened unless the ventilation system is proven to be working and working at such a speed that is effective to exhaust the fumes from the appliances.

⚠️

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.

Contents

⚠ IMPORTANT WARNING STATEMENTS

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

⚠ 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.

⚠ Non-continuous (intermittent) operation will not affect performance.

⚠ Actuation of alarms indicates the presence of a danger.

⚠ 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 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.

⚠ *Alternatively, all AGS products can be securely packaged and returned clearly marked for disposal.*

Installation

Planning

The Merlin 1500S acts as an interlock between the ventilation system and the gas solenoid valve. It ensures the gas solenoid cannot be opened unless the ventilation system is proven to be working and working at such a speed that is effective to exhaust the fumes from the appliances.

The fans can be monitored through air pressure switches or by means of an additional current monitor. To operate the Merlin 1500S 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 1500S 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.

Mounting

Place the panel 48-60 inches above finished floor level.

Unpack all the parts!
Designed for surface mounting, it must be installed by a licensed, insured contractor.

Ø 6mm (0.24")
187.5mm (7.40")
157.5mm (6.20")

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.
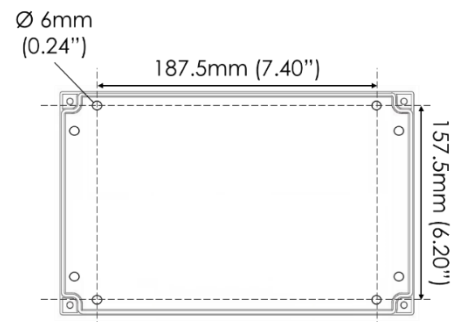
⚠ Take care when making connections to high voltage connectors!
⚠ Any damage attempting to remove the circuit board may void any warranty!
⚠ All Class 2 wiring is to be installed within flexible tubing to maintain segregation between circuits!
⚠ Wiring of different circuits shall be separated by means of routing, clamping or barrier!

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

Typical Installation Arrangement
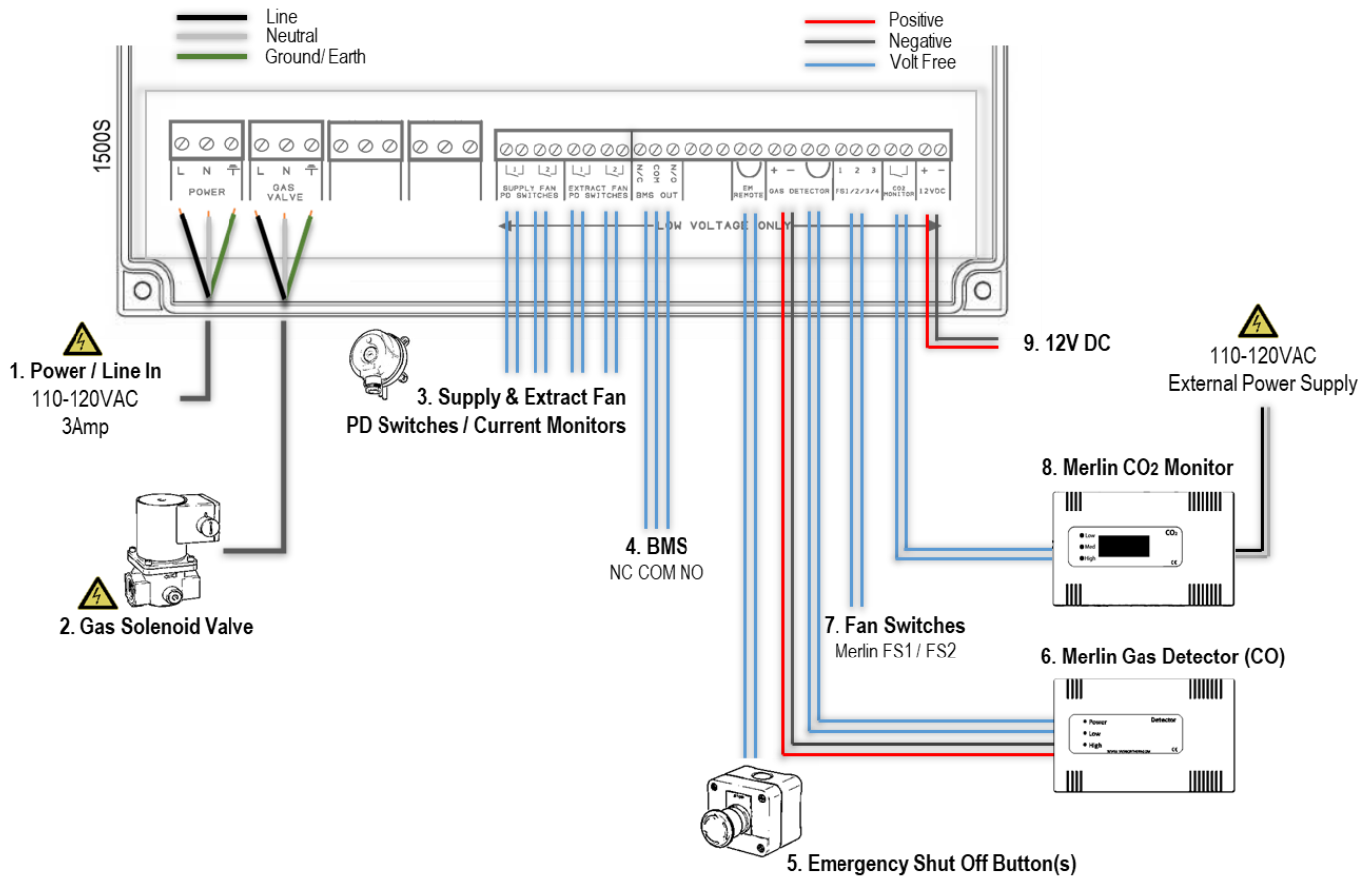
Terminal Connections

1. POWER / LINE IN

110-120V AC Power should be supplied to the [POWER / LINE IN] terminal and fused at 3A.

2. GAS SOLENOID VALVE OUTPUT

110-120V 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.

⚠ Pressure sensors should be screwed to the downstream port of the valve.

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.   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 1500S using a plenum security cable, white, 18/2 (18AWG 2 conductor), stranded, CMP or similar.
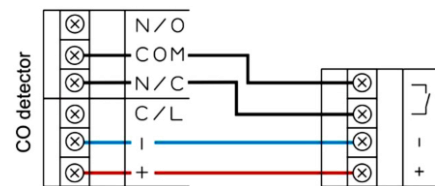
6.   GAS DETECTOR

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.

7.   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.

8.   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.

9.   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

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 high gas levels detected.

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 1500S 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 1500S 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].

CO_2 Mode

Under normal working conditions the Merlin 1500S 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 1500S 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 1500S 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.

General Specification

Model:	1500S
Visual Indication	LED
Mains Electrical Power Input	110-120VAC
Gas Solenoid Valve Output	110-120VAC
Current Consumption	12W max (50mA) @ 120VAC
Internal Fuse	3.15A
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
UL Approval Reference	E464760
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 any fans connected to the system on.
2. Turn the key switch to ON.

Turn the key switch to the off position to turn the panel off.

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 1500S will open the gas valve and the Gas-On LED will illuminate.

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

- **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.
ON = the gas supply has been shut off due to a ventilation fault.

⚠   IF A FAULT IS FOUND YOU WILL NEED TO CONTACT YOUR SERVICE/MAINTENANCE COMPANY.
⚠   YOU SHOULD NOT ATTEMPT TO CARRY OUT A REPAIR UNLESS YOU ARE QUALIFIED TO DO SO.

● **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.

Maintenance

Cleaning

To keep your control panel in good working order - follow these basic principles;

- Remove any dust/debris from the outer enclosure regularly using a slightly damp cloth.
- Never spray air fresheners, hair spray, paint or other aerosols near gas detecting devices.
- Never paint the device.
- 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.

Bump Test (Gas Response Check)

What is a Gas Response Check?

Response checks are often referred to as a 'BUMP TEST'. Bump tests are important to make sure a gas detection device is able to detect a release of gas as early as possible.

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 that exceeds the highest alarm point. If the detector goes into alarm and all system outputs/relays activate, then it is working safely.

If the system fails to operate as intended in an alarm state, the gas detector must not be used until a full inspection and service has been conducted.

Why is it important?

A detector may visually appear in good working 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 should I Bump Test a detector?

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 and TWA dependant i.e. CO will take a more than a minute to alarm in presence of >300ppm CO) and is often completed alongside a scheduled fire alarm test, however the frequency should be determined following a risk assessment by the end user. Remember, bump testing does not remove the need to have gas detectors inspected, calibrated and serviced periodically by a trained personnel.

What equipment do I need to perform a Bump Test?

Contact your AGS representative for details of suitable bump testing kits and gases.

Kits usually consist of a certified gas cylinder; flow control regulator, tube pipe and applicator cone.

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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