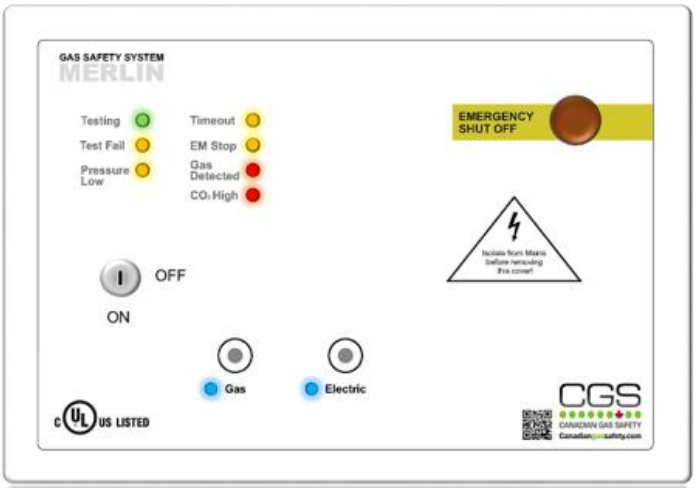
CANADIAN GAS SAFETY
Canadiangassafety.com

Merlin **1000S+**

Gas Proving Dual Utility Controller



INSTALLATION & OPERATION

Please read this manual carefully and retain for future use.

For specific requirements that may deviate from the information in this guide – contact your supplier.

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Important Warning Statements

⚠ Warning Symbol!
Where this symbol is used, the manual must be consulted to understand the nature of any potential hazards and how to avoid them.

⚠ **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

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.



At the end of their working life, electrochemical sensors should be disposed of in an environmentally safe manner. Alternatively, they can be securely packaged and returned to **CGS** clearly marked for disposal. Electrochemical sensors should not be incinerated as this may cause the cell to emit toxic fumes.

Installation

Typical Application & Location

⚠ **Installation must be carried out by a licenced, insured contractor!**
⚠ **Installation must be in accordance with recognised standards in the country concerned, for North America, NEC / CEC regulations should be followed!**
⚠ **Cables must be protected against mechanical damage!**

The Merlin 1000S+ gas pressure proving and electrical isolation system is designed specifically for use in educational establishments and laboratories.

This panel is to be used to carry out a gas-proving test on the pipe work to highlight if there is a gas appliance open or a gas leak in a laboratory. The Merlin 1000S+ is designed to give the teacher full control over the incoming gas supply and bench electrics with the lockable main key-switch and touch sensors.

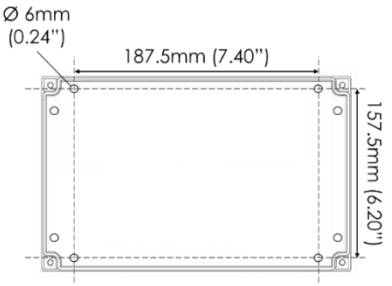
The Merlin 1000S+ can work in conjunction with carbon dioxide, natural gas, carbon monoxide and LPG sensors. The Merlin 1000S+ also has a built in “timeout” facility which will automatically shut off the gas solenoid valve at the end of a specific time, this period can be adjusted to 2, 4, 8 hours or can be overridden if required.

Mounting & Cabling

⚠ **If mounting direct to wall - ensure the wall surface is flat to prevent base distortion!**
⚠ **Ensure the rear base is installed in the correct orientation as shown!**
⚠ **Where cable glands/conduits are used for wire entry, use 20mm (3/4 inch) max separated by at least 20mm!**
⚠ **Any parts that form part of the connections/installation must have a minimum fire-retardant rating of UL94v-2!**
⚠ **Damage to PCBs when creating cable entry points or attempting to remove the circuit board may void any warranty!**
⚠ **Restrain the hazardous live wiring from accidental loosening to prevent wires from moving after installation and touching parts of opposite polarity or at low voltages!**
⚠ **Isolate the equipment from all hazardous live power sources before opening the cover!**

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

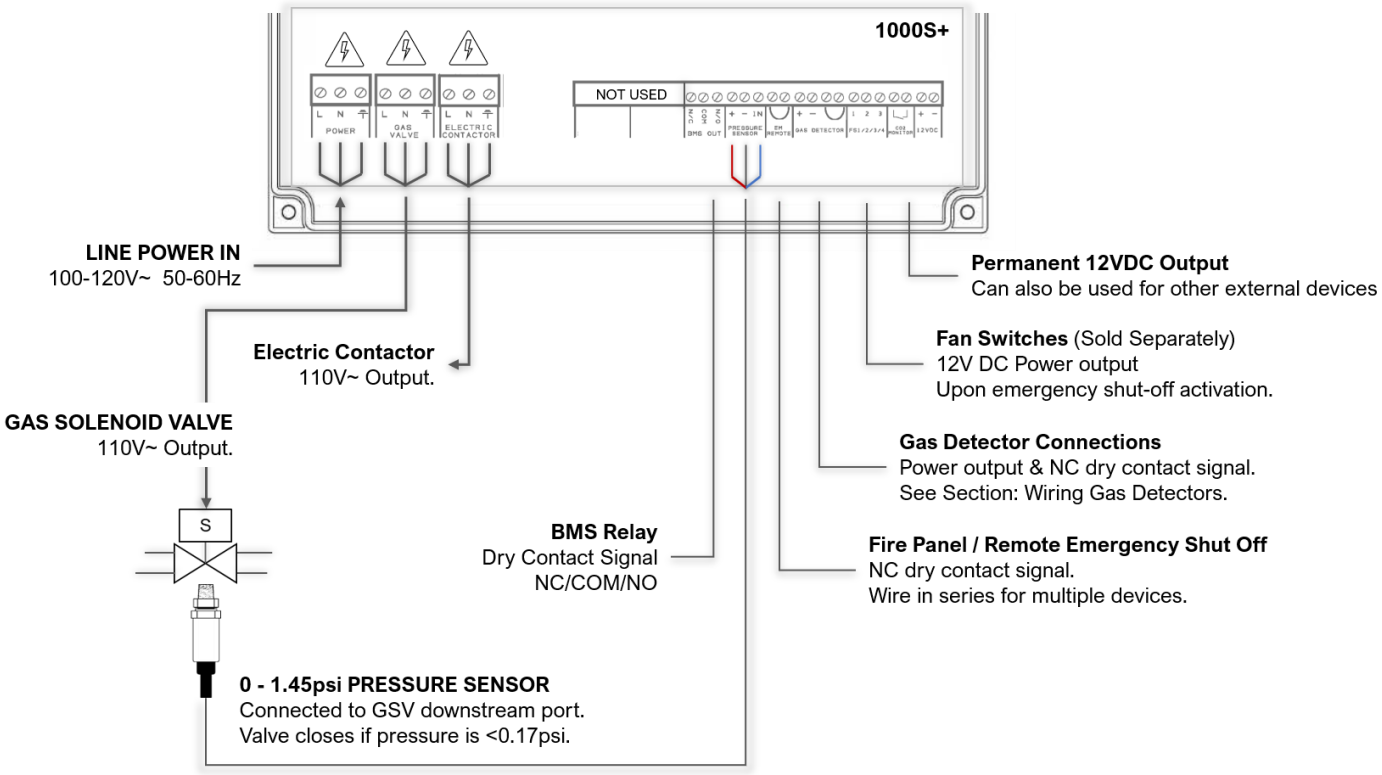
Designed for surface mounting, it must be installed by a licensed, insured contractor.



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. Remove the keys and spare parts - keep safe.
3. 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. Drill out as necessary ensuring all swarf is removed from the box and holes have smooth edges.
4. After executing the mounting and the connections –replace the front cover and insert the security caps over the four bolts.

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

Circuit Board Connections Overview



POWER / LINE IN

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

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.

ELECTRIC CONTACTOR OUTPUT

110-120V AC electrical power supplied from the [ELECTRIC CONTACTOR] connector using a 3 core cable can be connected to a contactor

BMS OUT

Connections are available on the board for Building Management Systems.

[NO Normally Open] [COM Common] [NC Normally Closed] These are dry 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

PRESSURE SENSOR

The pressure sensor is screwed into the downstream port of the gas solenoid valve.

Connect the pressure sensor as shown: Wiring: 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 operating pressure is: 0 – 1.45psi**.**

EM REMOTE / FIRE PANEL

Connections for remote emergency shut-off buttons or integrated with a fire alarm to close the gas supply automatically in the event of a fire. This is linked out as a factory setting.

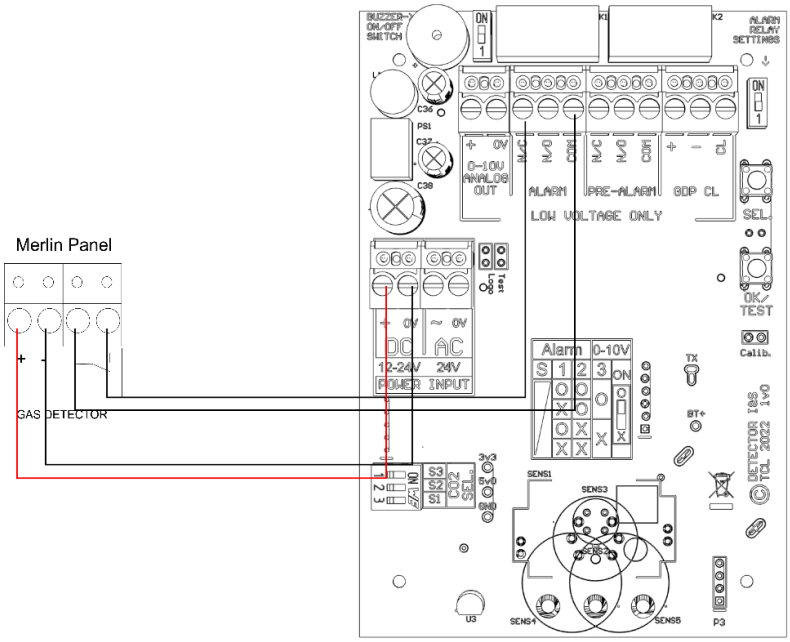
Remote emergency shut-off buttons should be dry contact and wired to the using a plenum security cable, white, 18/2 (18AWG 2 conductor), stranded, CMP or similar.

WIRING GAS DETECTORS

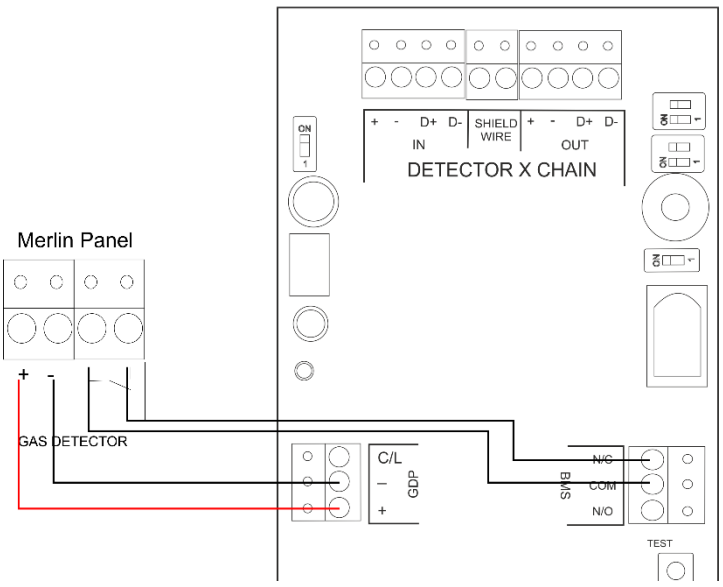
⚠ **Refer to your gas detector manual for further information!**

⚠ **If no detector is being used leave the factory fitted link in!**

Connecting a Gas Detector i / i-S



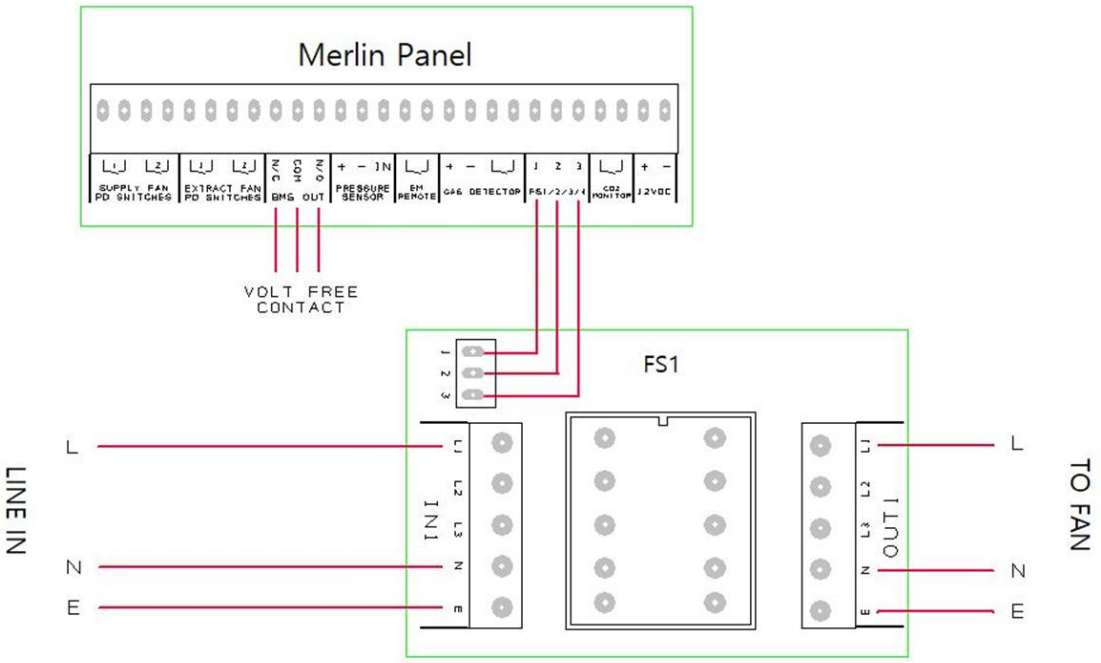
Connecting a Gas Detector TFT



FAN SWITCHES (FS 1 / 2 / 3)

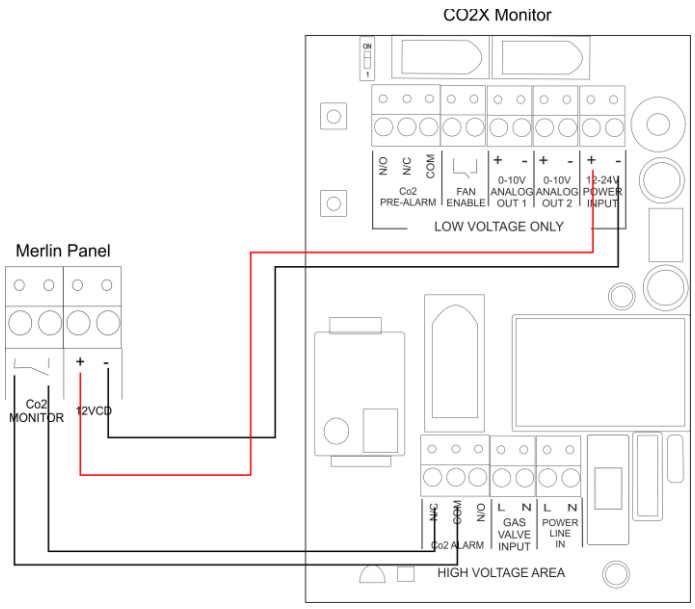
These terminals can be connected to a fan switch (supplied separately) which provide power to fans when the emergency shut-off button is pressed.

Example of an **CGS FS1** given.



CO2X & 12VDC

Primarily this is used to power the **CGS** CO2X but can be used as 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. If no CO2 monitor or other device 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.



Switch Settings – Auto Reset

OFF	When power is restored after the power cut/ loss, the panel has to be restarted manually. (Default)
ON	This will instruct the system to restart automatically when power is restored after power cut/loss.



Switch Settings – BMS Integration

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 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.



Switch Settings – Fan Switch Integration

[EM SEL].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 1000S+ panel is switched on and removes power to fan(s) when the switched off.

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.

Switch Settings – Gas Fill & Prove Time

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

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.*

Fill Time		**Prove Time**	
OFF	5 Seconds (Default)	**OFF**	30 Seconds (Default)
ON	10 Seconds	**ON**	50 Seconds



Switch Settings – Automatic Shut Down Timer

The system has an auto-shut down feature after a selected time.
There are two switches located on the circuit board labelled [TIME1] & [TIME2].
These can be configured to select the required timeout/ shut-down period.

TIME 1	TIME 2	Timeout Period
OFF	**OFF**	**2 Hours (Default)**
ON	**OFF**	**4 Hours**
OFF	**ON**	**8 Hours**
ON	**ON**	**Disabled**



⚠ Upon timeout the gas supply will be turned off unless other utilities are configured.

Switch Settings – Select Utility Output

There is a switch located on the circuit board labelled [ELECTR].
They are factory set to 'Off'.

Upon installation, it can be switched 'On'.
This will instruct the system to turn off Electric output when performing auto-shut down/timeout.



Operation

Initial Power Up

On connecting mains power, an LED on the front of the panel (CGS Logo) will illuminate red.

1. Turn the key switch to on position.
2. Gas & Electric LEDs will flash for 10 seconds.
3. Press relevant service button to turn required utility on.

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

All services can be turned on or off within 10 seconds only of the key switch being turned on.
After 10 seconds, all utility buttons will be disabled. The user must turn the key off and back on to adjust any services.

LED Indicators

- **Gas**

When the key switch is turned on, the system will check the installation for gas leaks.
If gas proving is successful, the LED will illuminate.
ON = Gas On
OFF = Gas Off

- **Electric**

When Electric service is turned on, the Electric LED will illuminate.
ON = Electric On
FLASHING = Electric Off, Electric button enabled
OFF = Electric Off, Electric button disabled.

- **Testing**

This LED will illuminate GREEN 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.**

- **Test Fail**

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

- **Pressure Low**

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

- **Timeout**

Under normal working conditions this LED is off. This LED will illuminate AMBER when auto-shut down has occurred. **OFF = OK / ON = Auto-shut down activated**

- **EM Stop**

If an emergency shut off button (either remote or on the panel) is pressed, the LED will illuminate AMBER and the gas will be turned off and the fans switch (if a fan switch is connected). The EM Stop button must be reset before restarting the system. The emergency shut off button(s) will cut off the gas supply, electrics, and fans (if connected) when activated. **OFF = OK / ON = Emergency Shut-Off button activated.**

- **Gas Detected**

Under normal working conditions this LED is off. If the external Merlin detector connected detects gas this will show RED, 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 CO2 in the air is at alarm level (relevant detector required), the LED will show RED, and the gas valve will close. **OFF = OK / ON = the concentration of CO2 is at alarm level.**

Maintenance

Cleaning

⚠ **Concentrations of alcohol found in many products may damage, deteriorate, or affect the gas sensing elements such as wine; deodorants; stain removers and thinners. Other gases and substances to avoid are corrosives (i.e., chlorine & hydrogen chloride); alkali metals; basic or acidic compounds; silicones; tetraethyl lead; halogens and halogenated compounds!**

Keep your panel in good working order - follow these basic principles.

- Remove any dust/debris from the outer enclosure regularly using a slightly damp cloth.
- Never use detergents or solvents to clean your device.
- Never spray air fresheners, hair spray, paint or other aerosols near the device.
- Never paint the device. Paint will seal vents and interfere with the device.

Specification

General	
Model:	1000S+
Size: (H x W x D)	7.08 x 10.03 x 3” (180 x 255 x 77 mm)
Housing Material:	ABS Polylac - PA765. UL 94 V-1
Mounting:	Indoor use - Wall Mounting
User Interface	
Visual Indicators:	LED
Audible Alarm:	>70dB @ 3.28ft (1m). Quiet conditions.
Language:	English
Power Supply	
Power Rating:	6W max.
Voltage Rating:	100-120V~ 50-60Hz
Internal Fuse:	T3.15A L250V
Equipment	
Overvoltage Category:	II
Pollution Degree:	2
Equipment Class:	2
Environmental	
Ingress Protection:	Not Formally Evaluated
Operating:	-10 ~ 50°C / 14 ~ 122°F 30 ~ 80% RH (non-condensing)
Storage:	-25 ~ 50°C / -13~122F° up to 95% RH (non-condensing)
Altitude Rating:	2000m
Approvals	
Electromagnetic Compatibility and Electrical Safety	IEC 61010-1:2010 + AMD1:2016; EN 61010-1:2010 +A1:2019; UL61010-1/2012/R:2019-07; CAN CSA C22.2 No. 61010-1-12/A1:2018-11 EMC EN 61326-1:2013
UL Approval Reference	E464760

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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