



Ventam 86 Automatic Interlock and Gas Proving System Installation & Commissioning Instructions

1 General

Current Electrical and Gas Regulations must be adhered to at all times and Interlock & Gas Proving systems must be installed and/or maintained by competent and approved persons. Attention is drawn in particular to Regulations relating to isolation and de-isolation of Gas and Electrical Systems. All these instructions should be read before installation.

The Ventam 86 interlock system benefits :

- Provides interlocking to prevent the gas supply from being turned on until the fan(s) are on and Gas Proving in the same compact unit.
- Automatically regulates the extract and intake air fan speed in proportion to actual real-time gas consumption.
- Relieves staff of the responsibility to adjust the fan speed in proportion to increased/decreased gas consumption.
- Reduces heat loss due to excessive air extract and intake which in turn will reduce the climate change levy costs. This heat loss is not limited to the kitchen area - heat from the dining area is also extracted unnecessarily and in many cases heat from adjoining corridor is also extracted.
- Lower fan speeds results in reduced fan motor running costs and therefore reduced climate change levy costs.
- Reduced number of staff complaints that the kitchen is too cold to work in due to excessive and unnecessary ventilation.
- Reduced fan noise and increased life of mechanical fan components.
- System is on-site programmable for actual site gas consumption.

Ventam operation

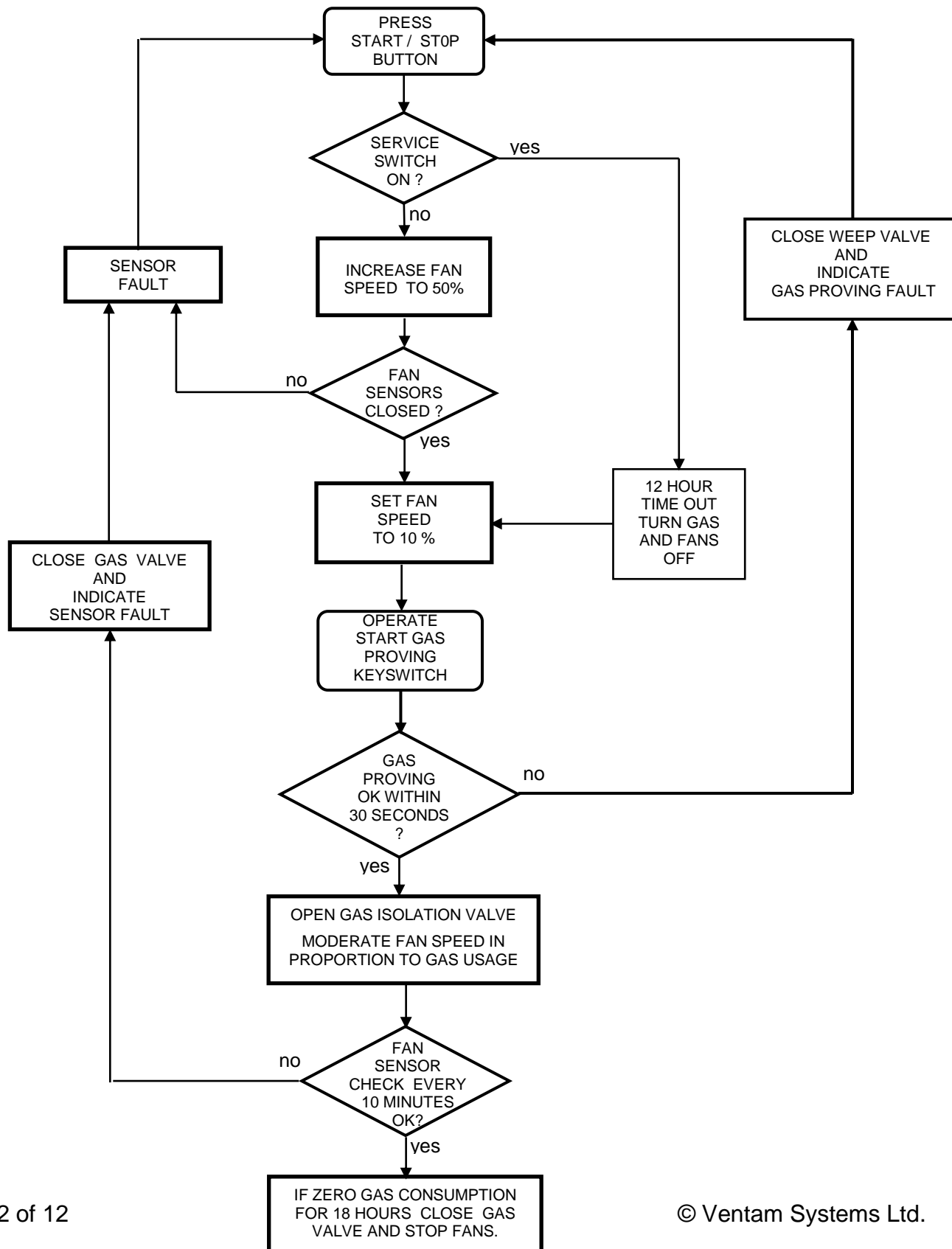
Refer to flow diagram below.

- 1 Press the Start button.
- 2 The system checks if the service switch is activated.
- 3 The Ventam 86 checks the fan sensor operation - If the fan sensors do not close, a "Sensor Fault" is indicated on the panel and the system will not function unless the service key is operated.
- 4 Operate the Gas Proving key-switch.
- 5 The gas isolation valve will now open after a short delay, and the fans are driven in proportion to actual gas consumption.
- 6 While the valve is open:
 - The system checks every 10 minutes that the sensors are closed – if the sensors are not closed the fans are increased in speed until they do close. If the sensors still do not close, a "Sensor Fault" is indicated on the panel and the system turns off.
 - The system will increase and decrease the fan(s) speed in proportion to gas consumption.
 - If an emergency stop button is pressed the gas isolation valve will close and "Emergency Stop" is indicated on the panel.
 - If the gas pressure falls below the gas proving switch setting, the system will turn the gas off and "Gas Proving Fault" is indicated on the panel
- 7 If there is no measured gas consumption for 18 hours, the system will close the valve and reduce fan speeds to zero and the system turns off.
- 8 If a fault occurs, the system turns off, but the fault is still displayed on the panel until the Start button is pressed.



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VENTAM 86 SYSTEM FLOW CHART





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2 Installation details

The Ventam 86 interlock system is comprised of the following components;

- ❖ Ventam 86 Control Panel.
- ❖ Fan Air Flow Sensor Unit(s).
- ❖ In line gas meter.
- ❖ Gas Proving Valve.
- ❖ 0-10VDC remote control fan speed controllers (supplied by others to suit site fans).
- The fan sensor unit is mounted adjacent to and above the fan.
- The gas isolation valve is installed in the **kitchen equipment** gas supply pipe work.
- The in-line system gas meter is installed in the **kitchen equipment** gas supply pipe work.
- The sensor unit is connected to the panel by a two-core cable (12VDC).
- The sensor unit is connected to the fan duct-work by flexible tubing (supplied).
- The fan sensor detects the airflow and sends a signal to the Control Panel. Only when the “Fan(s) On” signal is received by the control panel can the gas isolation valve open.
- The gas isolation valve is connected to the Ventam 86 Control Panel via three 3-core cables (Switched Live, Neutral and Earth).
- The system gas meter is connected to the Ventam 86 by 4 core 0.75mm² cable.

The Ventam 86 System has interface terminals that can be used for fan sensing, to close the gas valve, to interface with fire alarm or BMS systems etc. Site-specific integration to suit the application is the responsibility of the installer (please call for advice).

The Ventam 86 interlock system is supplied fitted with links in various terminals. Do not remove these links until pre-commissioning is completed.

Refer to supplied schematic wiring diagrams in conjunction with these instructions.

3 Ventam 86 Interlock Panel Location

Install the Ventam 86 Interlock Panel adjacent to the emergency exit and at an elevation suitable for the users to reach and view the panel controls.

The panel must not be located where access to it may be obstructed – e.g. by placing it behind an opening door or where it may be obstructed by mobile trolleys, hanging clothing or similar. It should not be located where the shut-off button could be operated accidentally. Mount the panel on a flat level surface.

The panel must not be located adjacent to or above sources of heat, vapour or steam, e.g. beside or above a cooking range or cooking or washing appliances.

The panel location must allow 600mm clearance to the front and 150mm clearance on all sides for access and maintenance.

4 Additional Emergency Stop Buttons

Where there is more than one emergency exit, a normally closed emergency stop button should be located at each exit and wired in series to “emergency stop remote” terminals.

5 Panel power Supply

The panel must be supplied by a 240Vac five Amp single-phase earthed supply, via an unswitched fused spur with neon mains indicator or similar.



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6 Gas Isolation Valve

The 240vac Gas Isolation Valve must only be powered from the Ventam 86 Interlock Panel, as per supplied wiring diagrams and in accordance with the manufacturers instructions provided with the valve and in accordance with Electrical and Gas Regulations.

7 Fan Sensor Location

The sensor must be mounted vertically. Sensor tube connections must be made at the top or side of the duct, not at the bottom.

The sensor should be located immediately above the fan. Where this is not possible, the sensor must be mounted as high as possible to allow the sensor tubing to slope down from the sensor unit to the duct-work connector. Sensor tubing must slope down continuously from the sensor to the duct-work to allow condensate to naturally drain from the tubing to prevent blockages occurring.

Twists, loops and kinks are not permitted in the sensor tubing. Allow 600mm clearance to the front and 150mm below for access and maintenance.

DO NOT mount the sensor on the duct-work or transmitted vibrations will cause unreliability.

DO NOT mount the sensor where it will be subjected to higher than ambient temperatures.

8 Fan Sensor Installation

- The sensor is of the differential pressure type. This has a negative pressure connection that is connected to ductwork on the inlet side of the fan and a positive pressure connection that can be connected to the outlet side of the fan.
- A negative pressure is generated by the fan on its suction side.
- Fit the negative pressure ductwork connector **as close as possible** to the fan on the inlet side of the fan.
- Drill a 7mm hole in the ductwork and insert the duct connector - the duct connectors are held in place with self-tapper screws.
- Flexible tubing connects the ductwork connector to the push-fit connectors on the bottom of the sensor.
- While the fan is running at full speed, rotate the duct connector whilst measuring the pressure in the ductwork. Usually, the arrow on the duct connector should oppose the airflow direction. Fix the duct connector in the position that provides the greatest pressure. Best results are obtained by using a digital pressure meter to measure the pressure at the duct connector (pressure meter range +/- 0 to 3 millibar).
- Connect the “-” connection on the sensor to the fan INLET ductwork.
- DO NOT connect the “+” connection on the sensor to the fan outlet ductwork unless the extract fan outlet ductwork is in excess of 10m long. If the “+” connection is used, connect it not less than one metre from the fan. In smaller systems, great care must be taken if the “+” pressure connection IS used or unpredictable results can be obtained!!!!
- If the “+” pressure connection IS NOT used, leave the “+” connection open to atmosphere.
- Sensor tubing must be protected and secured to prevent damage.
- Sensor tubing must be replaced at 24-month intervals. Blocked or dirty filters will adversely affect airflow and system operation.
- When the ductwork is cleaned, the sensor tubing must be disconnected first and then re-connected or replaced to prevent blockages affecting system operation.



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9 Installation sequence

- Isolate and make safe all gas and electrical services including the fan power supply and make known to others that works are commencing.
- Install the interlock panel, the gas isolation valve and the fan Sensors.
- Install electrical supply to the Control Panel via un-switched fused spur.
- Install 1.5 mm² two-core cable between the fan Sensors and the Control Panel.
- Install three off 1.5 mm² three-core cables to the Isolation Valve from the Control Panel.
- Install 0.75 mm² four-core cable between the system gas meter and the Control Panel.
- Install 1.5 mm² two core cable from any additional emergency stops to the Control Panel.

Extract Sensor cable

Fan Sensor 1 – GND and SW terminals of the control panel to terminals 2 and 3 at the sensor.

Supply Air Sensor cable (ONLY Where supply air is also interlocked)

Fan Sensor 2 – GND and SW terminals of the control panel to terminals 2 and 3 at the sensor.

- IF ONLY ONE FAN IS USED, link Fan Sensor 2 GND and SW terminals.

Gas Isolation Valve cables

Main Valve panel terminals L, N & E to Live, Neutral and Earth at the main gas isolation valve.

Weep Valve panel terminals L, N & E to Live, Neutral and Earth at the weep bypass valve.

Proving Switch panel terminals Com & N/O & E to Com, N/O & Earth at the pressure switch.

Additional Emergency Stop Buttons

Connect additional e-stops in series to “Emerg Stop Remote” terminals in panel.

Mains power supply

Connect the mains power supply to panel terminals “Mains In” L, N & E.

Gas meter

Connect the gas meter pulse output to the panel terminals marked “Gas Meter” terminal 1, 2.

10.0 Commissioning

Re-set the emergency stop on the control panel (and any remote stop buttons) by turning the button in the direction of the arrows on the button. Ensure it is safe to start fan(s).

Check that all connections are secure - use the correct tool and do not over-tighten terminals.

Ensure that a link is fitted in the “Emergency Stop Remote” panel terminals, unless additional e-stops are wired to these terminals.

10.1 Check that

- **All** gas appliances served by the system are isolated.
- the gas supply is turned on at the mains,
- that all the E-Stops are re-set
- remove the Service key.
- Turn on the power supply to the panel and all fans.
- Panel should indicate “Fan(s) Off” and “Gas Off”.
- Press the Start button.
 - Fan speed will increase to close the sensor contacts.
 - After a short delay, the panel will indicate “Fan(s) On”.



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10.2

- Turn the Start Gas Proving button clockwise and release it.
 - Gas Proving will now commence – this may take up to thirty seconds or so.
 - **If** gas proving is successful, the main gas valve will open and the panel will indicate “Gas ON”.
 - Purge and light the gas.

10.3 Press the Stop button

- Gas valve will now close
- “Panel will indicate “Gas OFF”.

10.4

- Press the Start button.
 - Fan speeds will increase to close the sensor contacts.
 - After a short delay, the panel will indicate “Fan(s) On”.
 - Panel will indicate “Gas Off”
 - Turn the Start Gas Proving button clockwise and release it.
 - Gas Proving will now commence – this may take up to thirty seconds or so.
 - **If** gas proving is successful, the main gas valve will open and the panel will indicate “Gas ON”.
 - Light the gas.
 - Press the Emergency Stop button on the panel.
 - Gas valve will now close
 - “Panel will indicate “Gas OFF” and “Emergency Stop”.
 - Repeat Step 10.4 for all remote stop buttons fitted.

10.5 Calibration of system

The system stores a number in its memory which represents maximum gas consumption. When the system is factory tested, a figure is stored in memory to enable full bench testing. When the system is installed on site, it is essential that the system is calibrated for on site gas consumption or the system will not respond correctly to gas consumption variations.

To calibrate the system,

- First complete all commissioning steps as listed above.
- Turn the system on and turn the gas on.
- Light all gas appliances isolated by the system isolation valve, including ovens.
- Turn all appliance gas taps to maximum -(open oven doors to ensure that they are not restricted by the oven thermostat).
- Turn the gas reset keyswitch clockwise and hold it turned for five seconds until the panel buzzer is heard to buzz once - The panel is now counting the gas meter pulses it is reading.
- After thirty seconds ;
 - the panel will buzz once to indicate a successful calibration.
 - The panel will buzz three times to indicate a failed calibration.
- If the panel buzzes three times, it is because zero or insufficient gas meter pulses have been read by the system. If this occurs, check meter connections and the pulse output rates for the gas consumption being measured. Minimum pulses within thirty seconds is 15, the maximum that the panel will count in thirty seconds is 255.



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11.0 Service Key-Switch

The Service key can be used for maintenance, gas commissioning and system fault-finding.

- Press the Stop button on the panel.
 - The panel will indicate “Fans OFF” and “Gas OFF”
- Operate the Service key by turning the key clockwise.
 - The panel will indicate “Service ON”
 - After a short delay, the panel will indicate “Fan(s) On” and “Gas Off”.
- Press the Start button.
 - Fan speeds will increase to close the sensor contacts.
 - After a short delay, the panel will indicate “Fan(s) On” and “Gas Off”.
 - Turn the Start Gas Proving button clockwise and release it.
 - Gas Proving will now commence.
 - The main gas valve will open and the panel will indicate “Gas ON”.
 - Light the gas.
 - Turn off the Service Key-switch
 - Gas valve will now close and the Panel will indicate “ Gas OFF”.
- Remove the Service key from the panel and give the key to the responsible person for safe keeping and instruct the responsible person in the correct use of the service facility.

12.0 Air flow sensor adjustments

It May be necessary to adjust the position of the sensor pick point on the ductwork if the sensor does not close when the fan is on. Please call Ventam Systems for advice on this.

13.0 Speed Controllers

Speed controllers must be of the 0-10VDC remote control type for use with this system.

The speed controller must be matched to the fan or the ventilation system will not be responsive or proportional to gas consumption. Advice on speed controller type should be sought from the fan supplier or fan manufacturer.

As many as three extract fans and three inlet fans may be connected to the Ventam 86.

14.0 Direct inputs

Direct inputs are provided to enable the use of temperature and humidity sensors to be used in conjunction with the system.

For example, a temperature sensor would be positioned in the kitchen to monitor the ambient temperature and provide additional cooling only when necessary.

If the ambient temperature were to increase beyond a set point, the 0-10V DC output of the sensor would be greater than the output of the control panel to the speed controller for the current gas consumption. The control panel would then increase the fan speed of channel A or B until the ambient temperature reduced. If, in the mean time the gas consumption increased beyond the output of the temperature sensor, then the fan would be increased in line with the gas consumption.

Any type of sensor with a 0-10 VDC output can be utilised. It would be powered from the 12DC Aux Output terminals in the panel.



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14.1 System demonstration

Instruct site staff in system operation.

- Instruct staff to clean the canopy filters regularly to ensure safe and reliable operation.
- **Confirm that the *user* knows how many fans are interlocked.**
- **Ask the *user* to switch on power to the fans.**
- **Ask the *user* to ensure that the panel power supply is switched on.**
- **Ask the *user* to start the system.**
- **Ask the *user* to operate the Gas Start Proving keyswitch.**
- **Ask the *user* to light the gas.**
- **Ask the *user* to stop the system with the stop button.**

- **Ensure that the *user* understands that the appliances MUST be isolated before the system will turn on the gas.**
 - **Demonstrate this to the *user* so that the *user* recognises this problem when it occurs .**

- **Ensure that the *user* knows when to use the Emergency Stop button.**
- **Ensure that the *user* knows that the system will not operate if an Emergency Stop button has been operated.**
- **Ensure that the *user* knows that the Emergency Stop button must only be used in an emergency.**
- **Ensure that the *user* knows how many Emergency Stop buttons are on the system.**

- **Ensure that the *user* understands the system operation and why it is a British Standard and a CORGI safety requirement that it is used.**

- **Leave the user guide with the user.**

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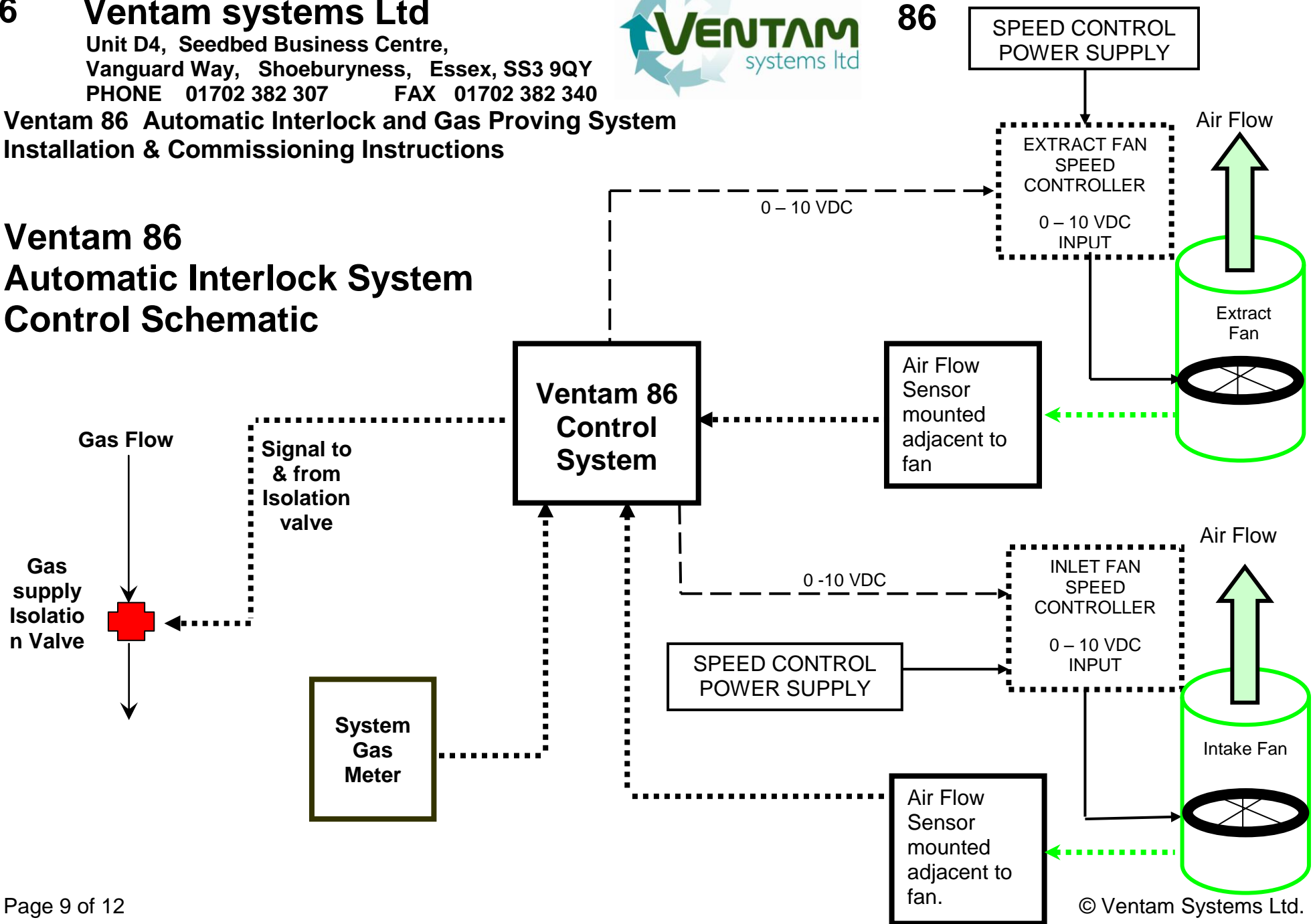
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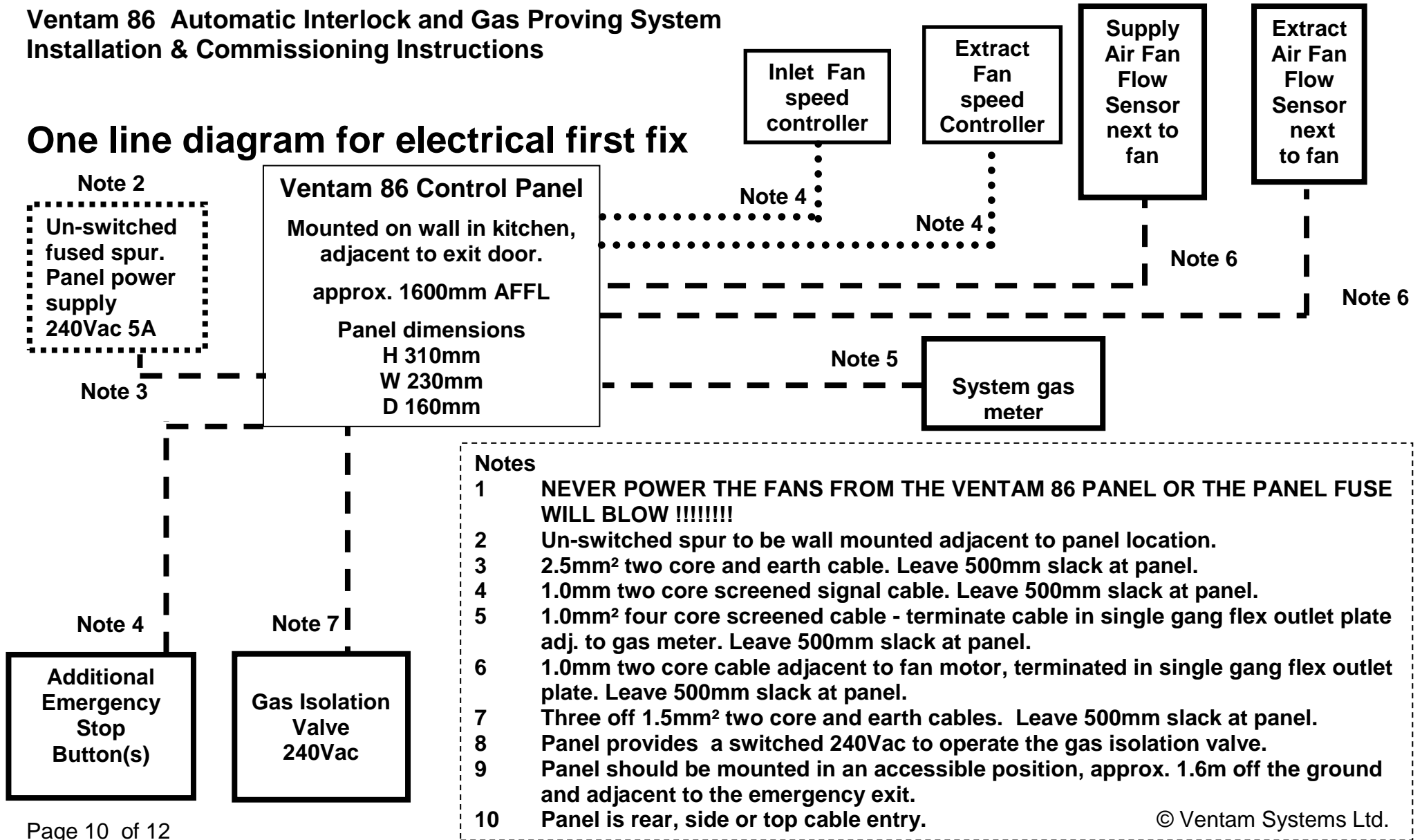
Ventam 86 Automatic Interlock System Control Schematic





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One line diagram for electrical first fix



- Notes**
- 1 NEVER POWER THE FANS FROM THE VENTAM 86 PANEL OR THE PANEL FUSE WILL BLOW !!!!!!!
 - 2 Un-switched spur to be wall mounted adjacent to panel location.
 - 3 2.5mm² two core and earth cable. Leave 500mm slack at panel.
 - 4 1.0mm two core screened signal cable. Leave 500mm slack at panel.
 - 5 1.0mm² four core screened cable - terminate cable in single gang flex outlet plate adj. to gas meter. Leave 500mm slack at panel.
 - 6 1.0mm two core cable adjacent to fan motor, terminated in single gang flex outlet plate. Leave 500mm slack at panel.
 - 7 Three off 1.5mm² two core and earth cables. Leave 500mm slack at panel.
 - 8 Panel provides a switched 240Vac to operate the gas isolation valve.
 - 9 Panel should be mounted in an accessible position, approx. 1.6m off the ground and adjacent to the emergency exit.
 - 10 Panel is rear, side or top cable entry.

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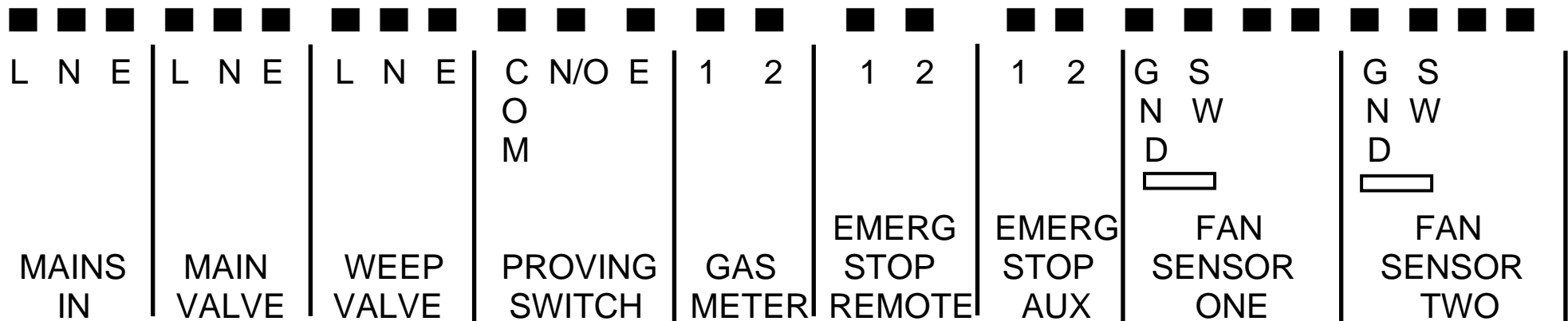
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Ventam 86 Automatic Interlock Panel wiring detail No. 1



- 1 CONNECT PANEL MAINS SUPPLY TO TERMINALS MARKED "MAINS IN" L,N,E.
- 2 CONNECT MAIN VALVE TO TERMINALS MARKED "MAIN VALVE" L,N,E.
- 3 CONNECT WEEP VALVE TO TERMINALS MARKED "WEEP VALVE" L,N,E.
- 4 CONNECT GAS PROVING SWITCH TO TERMINALS MARKED "PROVING SWITCH" COM, N/O AND E.
- 5 CONNECT GAS METER TO TERMINALS MARKED "GAS METER" 1 AND 2.
- 6 CONNECT ADDITIONAL EMERGENCY STOP BUTTONS IN SERIES TO TERMINALS "EMERG STOP REMOTE" 1 AND 2.
- 7 CONNECT EXTRACT SENSOR TO TERMINALS MARKED "FAN SENSOR ONE" GND AND SW.
- 8 CONNECT INLET AIR SENSOR TO TERMINALS MARKED "FAN SENSOR TWO" GND AND SW.
- 9 FOR REMOTE INDICATION OF EMERGENCY STOP BUTTON OPERATION CONNECT TO "EMERG STOP AUX" 1 AND 2.

For more information go to www.barbourproductsearch.info



**Ventam 86 Automatic Interlock and Gas Proving System
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Ventam 86 wiring detail No. 2

THESE TERMINALS MUST ONLY BE USED TO POWER AUXILLARY SYSTEM DEVICES.	12v DC AUX output	12	V
		0	V
<p>THESE TERMINALS PROVIDE 0-10V DC OUTPUTS FOR EXTRACT FAN CONTROLLERS.</p> <p>EXTRACT CONTROLLER A IS CONNECTED TO 0-10V OUTPUT A + AND A —.</p> <p>EXTRACT CONTROLLER B IS CONNECTED TO 0-10V OUTPUT B + AND B —.</p> <p>EXTRACT CONTROLLER C IS CONNECTED TO 0-10V OUTPUT C + AND C —.</p>	CHANNEL A FAN CONTROLLERS	A	+
		A	-
		B	+
		B	-
		C	+
		C	-
<p>THESE TERMINALS PROVIDE 0-10V DC OUTPUTS FOR INTAKE AIR FAN CONTROLLERS.</p> <p>INTAKE AIR CONTROLLER A IS CONNECTED TO 0-10V OUTPUT A + AND A —.</p> <p>INTAKE AIR CONTROLLER B IS CONNECTED TO 0-10V OUTPUT B + AND B —.</p> <p>INTAKE AIR CONTROLLER C IS CONNECTED TO 0-10V OUTPUT C + AND C —.</p>	CHANNEL B FAN CONTROLLERS	A	+
		A	-
		B	+
		B	-
		C	+
		C	-
<p>THESE TERMINALS ACCEPT 0-10V DC INPUTS FOR DIRECT CONTROL OF EXTRACT AIR FAN CONTROLLERS.</p> <p>DIRECT INPUT ONE IS CONNECTED TO A1+ AND A1 —.</p> <p>DIRECT INPUT TWO IS CONNECTED TO A2+ AND A2 —.</p>	CHANNEL A DIRECT INPUT	A 1	+
		A 1	-
		A 2	+
		A 2	-
<p>THESE TERMINALS ACCEPT 0-10V DC INPUTS FOR DIRECT CONTROL OF INTAKE AIR FAN CONTROLLERS.</p> <p>DIRECT INPUT ONE IS CONNECTED TO B1+ AND B1 —.</p> <p>DIRECT INPUT TWO IS CONNECTED TO B2+ AND B2 —.</p>	CHANNEL B DIRECT INPUT	B 1	+
		B 1	-
		B 2	+
		B 2	-

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