indigoswitch

Fan proving system

Manual

Model FPS1

Table of Contents

Application

Thank you for choosing the indigoswitch fan proving system. We developed this system after many years spent working with catering equipment installations, and it is this experience that led us to an understanding the problems with present-day pressure-switch based fan proving systems – and of how these problems could be solved.

Present day systems using a pressure switch to detect pressure differential between the extract duct and the kitchen have a problem, which is that air pressure switches are very sensitive to wind gusts, dirt ingress and turbulence.

As the gas supply is mission critical, a highly reliable system is required. The indigoswitch system achieves this by using a venturi to detect air flow, an off-delay relay will allow the gas to stay on for a short period when the airflow is too low.

The gas safety regulations require that the extractor system is proven to remove all combustion products when all gas appliances are being used. Liaison is required between the canopy installers, electrician and the gas installer. A commissioning certificate is included with the fan proving system it has section allowing the planning stages to be fully documented. The FPS 1 system is intended for extractor systems without variable speed control, where a variable speed control is used, the minimum setting required to switch on the gas must be equal or higher than the ventilation rate required to safely remove all products of combustion

Notes on System Limitations

Application limitations

The indigoswitch fan proving system is intended to switch an electric solenoid valve with a maximum rated input current of 5A in commercial catering installations in the UK as required by BS6173: 2009 and IEC EN 60335-2-99: 2003. The normal environmental conditions to ensure safe operation are a permanently fixed installation which is:

- Indoor
- Ambient temperature 5 °C to 40 °C
- Maximum relative humidity 80 % for temperatures up to 31 °C decreasing linearly to 50% at 40 °C
- Mains supply voltage 240VAC ± 10%
- Pollution degree level 2
- The controlbox is IP54 rated.

Fan Proving and Emergency Shutoff Procedure

In many gas installations, the gas solenoid valve supplying the catering equipment can also be used as an additional emergency shutoff valve. However, it is important to remember that this combined function is not always possible. For example, certain appliances do not rely on the mechanical extractor for safe operation, and their gas may be branched off the main supply before the solenoid. In this case, a suitably worded noticed must be placed in the kitchen, showing what actions to take in an emergency, and clearly identifying the location of the Emergency Control Valve and the procedure for isolating the gas supply.

Air pressure and air flow proving

Indigoswitch uses a simple venturi fitted inside the extractor duct. This will switch the air pressure differential switch over when there is a minimum of 4.5 meters per second air flow inside this duct. The advantage of this system is that it measures air flow as required by gas safety regulation 27(4). If a system is used by simply using an air pressure difference between the inside and outside of the extract duct the gas supply may be left on in fault conditions such as blocked grease filters. The whole point of linking the gas supply to the extract system is to increase safety. Therefore the key factor that influences system performance, which is airflow, should be measured.

Auxiliary Switching

Additional safety controls can be connected to the indigoswitch fan proving system, for example emergency stop knock off switches, CO detectors, links to fire alarm systems, or other switches.

Fan proving and gas proving

Indigoswitch fan proving system is not a gas proving system. Gas proving is necessary if there is any appliance beyond the solenoid valve that is not fully flame safety protected. A separate gas proving system can be installed, after the indigoswitch and in series with it.

Make up air proving

Make up air is normally provided by permanent openings from the kitchen to the outside. Because indigoswitch proves the airflow in the canopy, the gas can be allowed to come on without separately proving the make up air fan, after all what goes out of the kitchen must have come in.

If the make up air fan is not running, and all the doors and windows are closed, there may be insufficient make up air entering the kitchen to allow the extractor fan to maintain airflow to keep the air pressure switch beyond switch point.

In some circumstances, a make-up air fan is necessary to avoid excessive drafts through serving hatches or to avoid smoke being drawn into the kitchen from adjoining rooms. In such cases, a separate air pressure switch and venturi system may be installed to operate a warning system (such as a light or buzzer) to notify catering personnel of system failure. If there is no gas safety issue, then linking the make-up air fan to the gas solenoid is not advisable.

Installation Overview

Action to be taken at the planning stage

- Check suitability of application
- Decide the position and orientation of the controlbox
- Decide position and arrange accessibility of venturi(s)
- Decide position of Air Pressure Switch
- Decide number, position and orientation of gas solenoid(s) (note: gas solenoid is not included)
- Advise electrician about wiring diagram, controlbox power supply and installation instructions
- Keep documentary evidence of all planning decisions.

The indigoswitch system as delivered includes the following components:

- indigoswitch controller box
- this manual
- venturi
- air pressure switch
- PVC air tubing (2 metres)
- commissioning certificate.

Optional extras include:

- Knock off station
- Norprene heat resistant air tube suitable for fitting inside canopy

Competency

A competent electrician must undertake all electrical work, according to the IEE wiring regulations (BS7671).

A Gas Safe Registered installer, qualified for catering installations to BS6173, must commission the system.

Control Box Positioning and power supply

Consider the following points when positioning the indigoswitch control box:

- If the indigoswitch is to be used as an emergency control valve, then the box must be in a readily accessible position, preferably near the exit of the kitchen.

- The control box must be placed where the red button is shielded from accidental pressing, eg above shoulder height
- The ambient temperature of the control box should not exceed 60°C.
- The power supply has to be linked to auxiliary supply on the fan controller that is energised when the fan is switched on.

Air Pressure Switch Positioning

The air pressure switch is sensitive to vibration and may require frequent access. Because of this, the ideal position is fixed vertically on a wall adjacent to the extract duct. The air tubes should run down, away from the air pressure switch to avoid the ingress of moisture or grease.

Venturi Positioning and Orientation

The venturi should be fitted inside the extract duct in a position where it can be easily accessed for cleaning. Ideally, it should be placed between the terminal of the canopy and the first access door of the extract duct. If the placement means that there are access doors between the venturi and the canopy, a suitable worded notice must be affixed to these access doors, advising that they must be kept closed whenever gas appliances are in use. It is possible to site the venturi downstream of the fan, provided that there is no false air entering the duct between the kitchen and the fan as you need to measure the airflow taken from the kitchen.

The venturi is sensitive to turbulence, which is reduced over straight runs and increased at bends. For this reason, it is best to fit the venturi immediately in front of the extractor fan impeller or in a straight length of the extract duct away from any bends. Also, to avoid water ingress, the venturi should ideally be fitted in a horizontal duct section.

If the canopy has an internal fan that discharges directly to the outside, the venturi can be fitted in front of the impeller at the point of maximum airflow. A bracket and heat resistant air tube are available as optional extras.

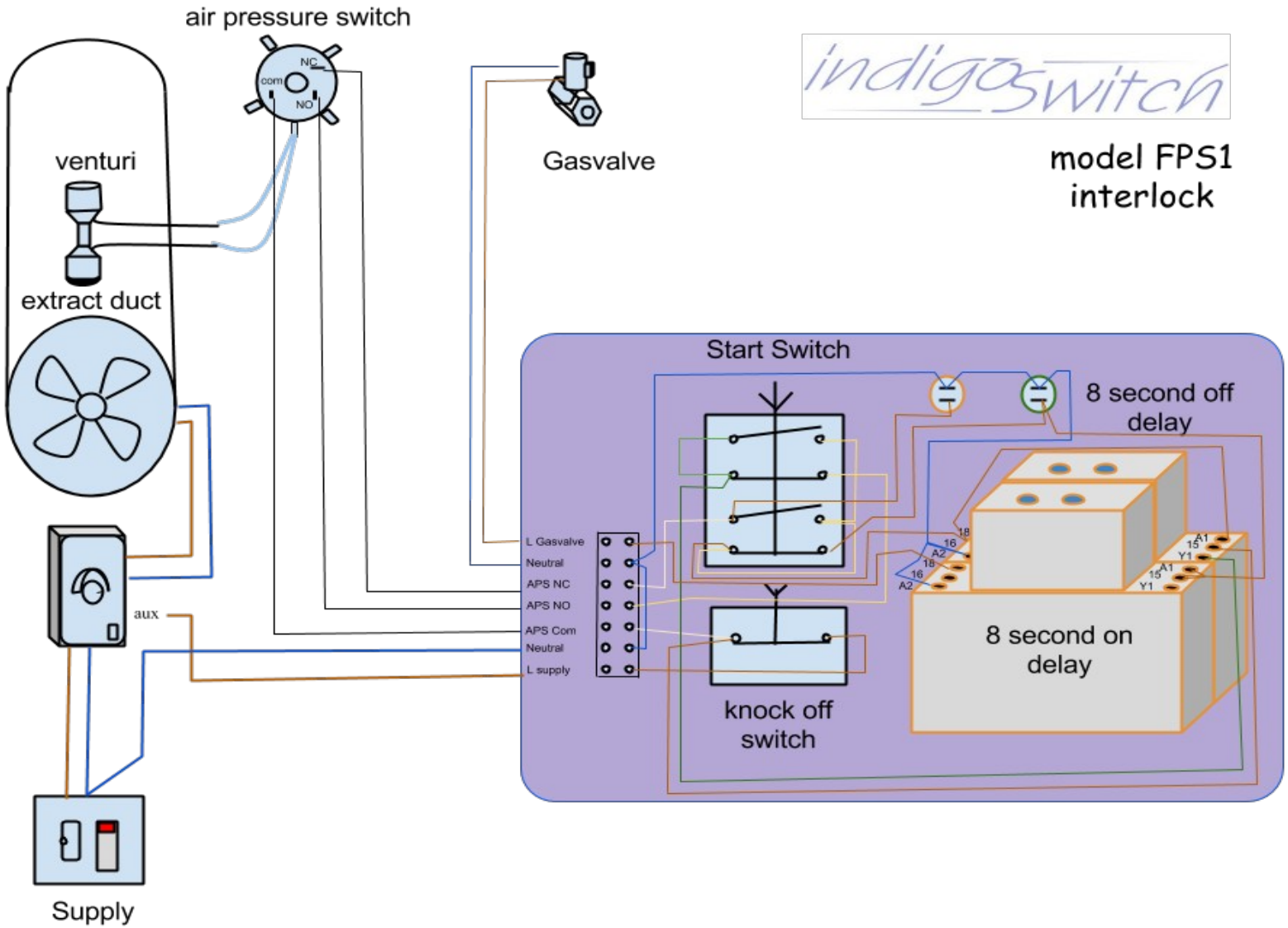
Fix the venturi to the extract with the glands, preferably with the air tubes rising between venturi and air pressure switch to avoid ingress of dirt.

Note: for applications where there are more than one fans serving the same canopy, multiple venturis and air pressure switches must be fitted.

Electrical Installation

The installation should be carried out according to IEE wiring regulations BS7671. To increase system reliability, two gas solenoid valves may be used in parallel with a selector switch, ensure that the user is aware of how to switch between these valves and what to do in case one of them fails. Should the current required exceed 3A, then an extra contactor must be fitted.

To to maintain IP rating ensure that all connections are suitably rated. The components and the enclosure are rated to IP54.


air pressure switch
NC
com
NO
venturi
extract duct
Gasvalve
indigoswitch
model FPS1
interlock
Start Switch
8 second off
delay
L Gasvalve
Neutral
APS NC
APS NO
APS Com
Neutral
L supply
aux
8 second on
delay
knock off
switch
Supply

Commissioning Instructions

In the event of problems, please see the Troubleshooting section on page 8.

1. Check Operation

- turn power on
- press green button only when amber light is on, without the amber light the gas cannot come on.
- The amber and green light will be on and the gas will be on in ten seconds.
- However, there is only an eight second window when both the amber and green lights can be on together.
- The amber light is on when the pressure switch detects no airflow, it will go off when airflow is detected
- It is imperative that the button is pressed within the eight second window before the fan reaches the speed that turns the amber light off.
- So only press the green button when the air flow switch will switch over within the next eight seconds
- When the green light is on, the gas will come on after 8 seconds
- Whilst the start button is pressed, the green light is off the gas will go off and come on eight seconds after releasing the green button

.

2. Check Air Pressure Switch Operation

- Disconnect the tubes from the air pressure switch. The gas should go off after approximately 8 seconds

The basic wiring is now correct.

3. commissioning of the air pressure switch

make sure that all products of combustion are captured by the extraction system. Where a speed control is used check that the minimum speed that allows the gas to be on is effective in capturing all products of combustion. By increasing the set pressure on the air pressure switch or by increasing the minimum speed setting. Where grease filters are used in the canopy of a mesh type that can get blocked, ensure that the gas goes off when the blockage in the airflow is stopping the extractor removing all the POC

4. **handover to customer**

Demonstrate system operation and explain simple troubleshooting as written on the operation sticker, which should be affixed near the control box in a readily visible position. Point out all remote auxiliary switching systems (if fitted) and write their details down in the user trouble shooting section.

Finally, hand over the completed commissioning certificate.

Cleaning and maintenance

Routine cleaning and safety checks

The control box and air pressure switch can be cleaned with a damp cloth and mild detergent. Routinely check the control box and components for damage and proper working order. Damaged components should be replaced by competent personnel. Do not open the control box unless you are competent. Routine operational checks: check that the airtubes and the venturi inside the ventilation duct are clean. This is an essential safety mechanism: ensure it is working correctly and take remedial action if it does not.

Troubleshooting

User Troubleshooting

If the amber light does not come on when the fan is off, check that the power is on and the tubes to the air pressure switch are clean, the venturi inside the duct must be clean and the air pressure switch should return to the off position when the fan does not run. Blow or suck on a tube connected to the pressure switch, you should hear it click and the amber light should be on. Once the amber light is on, the green button should be pressed and the fan should be switched on. The green light should be on once the green button is pressed, if it does not come on, the timer relay could be faulty. There is only an eight second window for both the amber light and the green light to be on at the same time, the amber light should go off when the fan has reached it normal operating speed. If the amber light stays on, check that the airflow in the duct is normal, ensure filters are clean and that the

- Switch off fan and back on again after the fan has stopped, ensure fan is working ok.
- Ensure remote switches and other linked in systems are calling for gas. The remote systems fitted are:

- Ensure that the tubes connecting the venturi to the air pressure switch are connected properly. Ensure that the venturi is clean and fitted in the correct position.

If this doesn't cure the problem, then a qualified technician must carry out electrical faultfinding.

Warning! Working on live electrical systems is dangerous and must only be carried out by competent technicians. Do NOT open the control box without isolating the supply.

.

.

Spare Parts List

Off delay timer

on delay timer

On off switch parts:

Contact block NO

Contact block NC

green start actuator

red knock off actuator

Indicator light green or amber

air pressure switch

venturi

Manufacturer & Warranty

Indigoswitch™
Penyllyn
Brynberian
Crymych
SA41 3TL
0845 2263701

web site: www.indigoswitch.co.uk
email: info@indigoswitch.co.uk

For queries and technical advice do not hesitate to contact us.
Due to our policy of continual improvement we reserve the right change components or appearance.

The Indigoswitch Fan proving system is covered by a twelve-month (from the date of purchase) return-to-base warranty against faulty components and workmanship, provided the installation instructions have been complied with. If a copy of the commissioning certificate has been returned to us the warranty will start on day of commissioning

CE

BS EN 60730:1