AFA 1000/E/DUAL

ECON VENTURI VALVE & DUAL OUTPUT
AIRFLOW SENSOR + SASH POSITION

Operating and Instruction Manual

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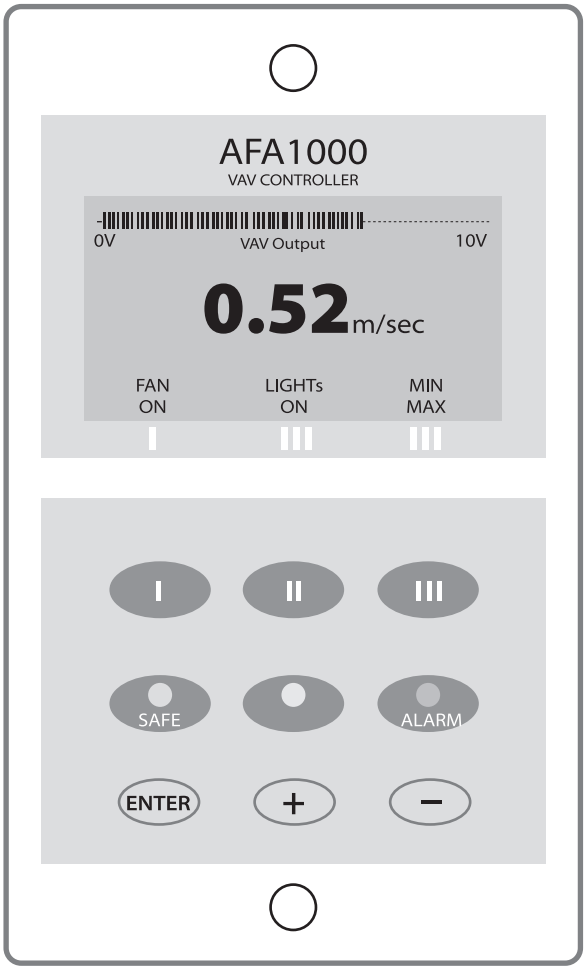


AFA 1000/E /DUAL

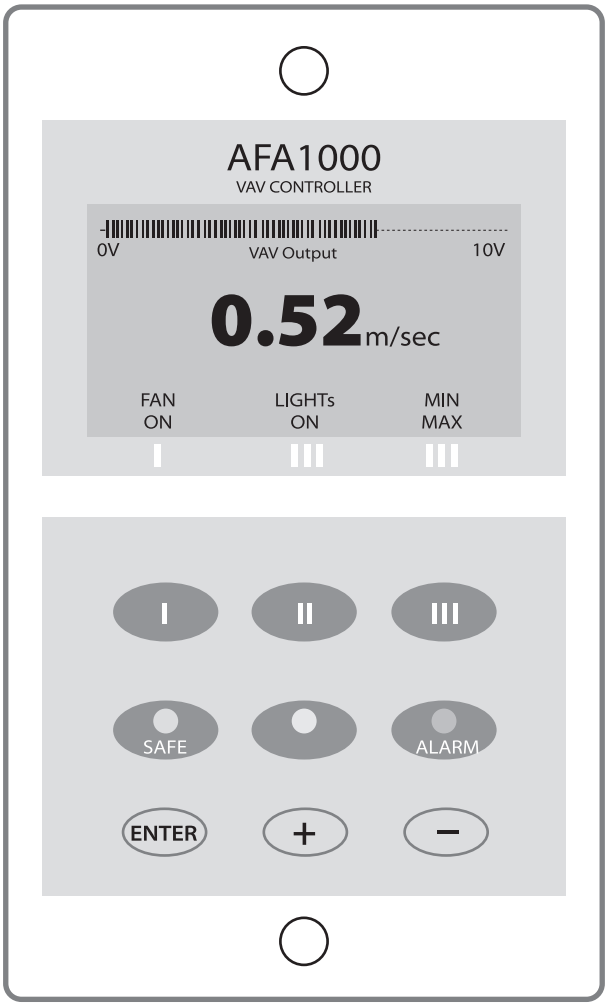
ECON VENTURI VALVE & DUAL OUTPUT AIRFLOW SENSOR + SASH POSITION

Model AFA1000 / E/ Dual Output with Sash Position - Mk3

- Digital display
- 3 Relay inputs
- 3 Relay outputs
- 3 Pushbuttons
- Com port
- Dual VAV Control output
- Sash Position Sensor
- Airflow Sensor
- Econ Venturi Terminal

Used for alarm indication , monitoring and dual VAV control on Fume Cupboards with Venturi valve or room pressure controls.

OPERATOR DISPLAY PANEL



VAV Output Bar Graph or Alarm Time Line

Velocity display m/sec or fpm

Control Pushbutton functions

Control Pushbuttons

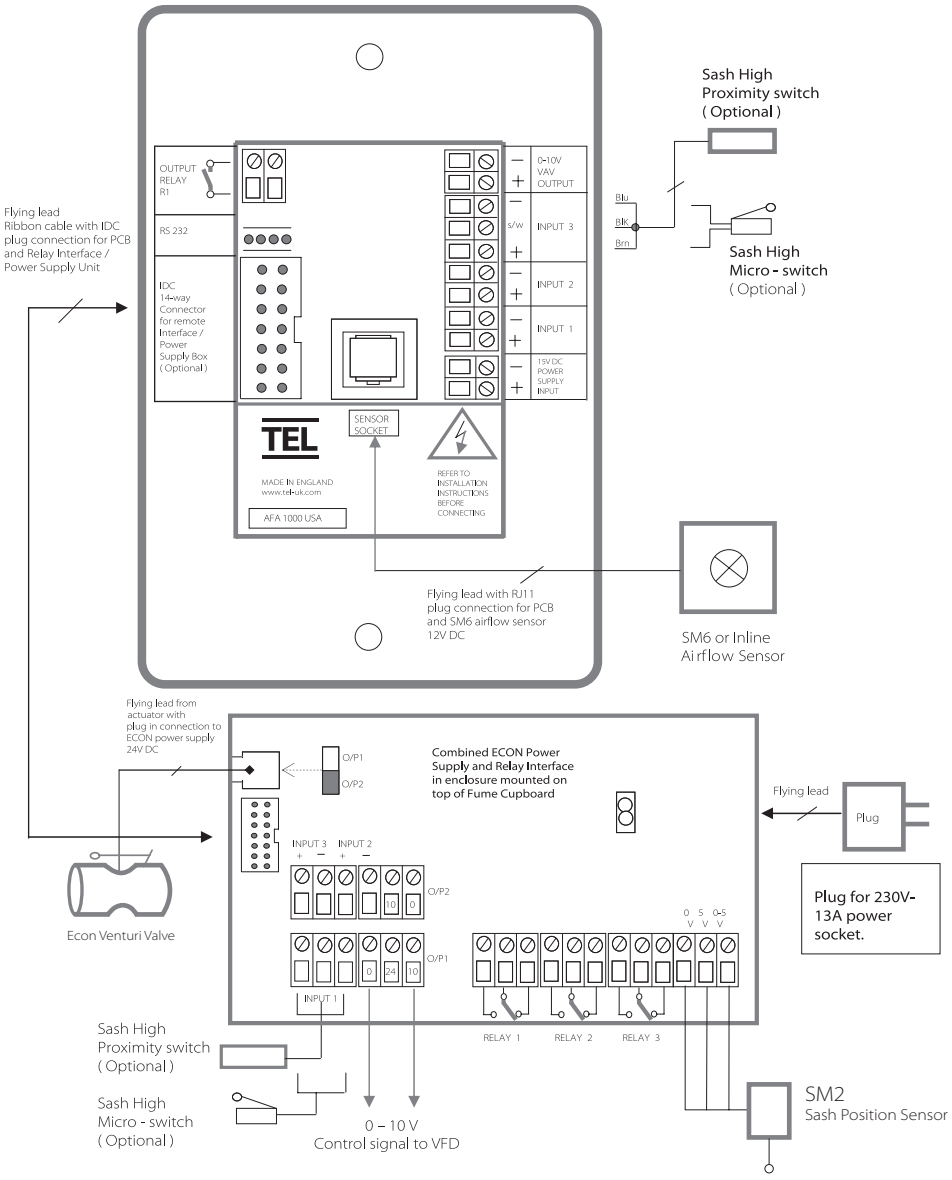
LED indicators

Function and up/down buttons for Menu Configuration and Calibration
ENTER – also used as Mute button for audible alarm

Note:
Access to the Calibration and Configuration menus is password protected and is factory set. To access and or change the password contact the supplier for the Engineer's Password and enter the Passwords in the Main Menu or alternatively use a Laptop connected to the Com port and the Upload/Download software provided.

Connection details:

Exhaust Venturi Valve and AFA1000/E/Dual Airflow Sensor/Sash Position



Note:

The Remote Interface Box / Power supply is supplied with this model. This is supplied complete with a 2m long ribbon cable with IDC plugs. The box is designed to allow termination of external cables rated at 230V and includes the following connection points :

2 – VAV output 0V , 24V and 0 – 10V to control the ECON venturi valve (Terminal and plug-in connection)

3 – Input connections – Input 1 , Input 2 , Input 3

3 – Relay outputs – Output relays R1 , R2 , R3

CONTENTS

General Description 1.0

All systems comprise of the following components :

1 – SM6 Airflow Sensor
1 – AFA1000 / E/DUAL VAV Controller / Alarm Unit
1 – ECON Interface/Power Supply Unit
1 – SM2 Sash Position Sensor
1 – ECON Venturi Valve(s)

If the Sash High Alarm System option is included there will also be a sash micro switch or proximity switch.

Operator Features

The controller / alarm has the following operator features :

Digital Display

The digital display is a back-lit, full graphic unit with a visual display of approx 56 x 27 mm.
The display operates through the software allowing the generation of figures, wording and icons.

The display shows the Fume Cupboard face velocity in m/sec or fpm when enabled or the alternative with no velocity reading but showing AIR FAIL / AIR SAFE as continuous display.
All of the above are configurable via the alarm key pad.

An ' event time line ' segmented into 20 x 3 minute segments will scroll across the display (when enabled) .This takes the form of a graphical ' blip' that will progress from the right hand side to the left hand side – representing events that have occurred during the past hour. On the standard alarm this will be limited to airflow alarms but other alarms are available.

Using the diagnostics software and an associated computer via the com port on the alarm the event data can be transferred to a data logger.
The alternative to the event time line is a dynamic ' bar graph ' representing the VAV 0-10V Control Output.

The display shows a Horn icon (with line through it) when the audible alarm is in the Muted condition.

Sash High
Will be displayed when the Sash alarm is enabled and the sash is raised above the max safe working opening.
This display will alternate on/off with the velocity reading.

Emergency
Will be displayed when the Emergency input is activated (when enabled).
This display will alternate on/off with the velocity reading.

Air Fail
Will be displayed if the airflow is less than the Low air alarm point.
This display will alternate on/off with the velocity reading.

High Air
Will be displayed if the airflow is more than the High air alarm point.
This display will alternate on/off with the velocity reading.

Set-back
Will be displayed if the night set-back function is activated (when enabled).
This display will alternate on/off with the velocity reading.

Disabled

Will be displayed if the alarm disable function is activated (when enabled).
This display will alternate on/off with the velocity reading.

Pushbutton 1

This button can be configured to act as a Fan stop / start button for the Fume Cupboard extract fan or as Night Set-back Override.

Pushbutton 2

This button can be configured to act as a Lights ON / OFF or UV Lights On/OFF for the Fume Cupboard or Pump stop / start button for a Fume Cupboard scrubber pump(Can be interlocked with Pushbutton 1).

Pushbutton 3

This button can be configured to act as a VAV Purge ON/OFF button or VAV Min / Normal or VAV Min / Normal / Max.

Fan ON / OFF
Will be displayed if the Fan button is operated (when enabled).

Lights ON / OFF
Will be displayed if the Lights button is operated (when enabled).

UV Lights ON / OFF
Will be displayed if the UV Lights button is operated (when enabled).

Pump ON / OFF
Will be displayed if the Pump button is operated (when enabled).

Purge ON / OFF
Will be displayed if the Purge button is operated (when enabled).

MIN
Will be displayed if the MIN function is activated (when enabled).

RUN
Will be displayed if the Normal function is activated (when enabled).

MAX
Will be displayed if the MAX function is activated (when enabled).

LED Indicators

The alarm unit has three LED indicators :
Red – Alarm
Amber – Caution
Green – Safe

Audible Alarm Sounder

The alarm has an audible alarm sounder with local or remote
Mute facility.

Enter

The controller / alarm has an Enter button – this is multi-functional as follows :
Press Enter momentarily when alarm is sounding will mute the alarm.
Press Enter for 5 secs will gain access to Calibration and Configuration menus (both menus password protected).

+ / -

The alarm has + / - buttons that can be used to scroll through the calibration and configuration menu or to select options or values.

External Connections

The alarm unit will have the following connection points :

Input 1
Volt free relay input configurable for normally closed or normally open relays.
This input can be configured as :
Alarm disable Night set-back Emergency Sash High High / Low

Input 2
Volt free relay input configurable for normally closed or normally open relays.
This input can be configured as :
Alarm disable Night set-back Emergency Sash High High / Low

Input 3
Volt free relay input configurable for normally closed or normally open relays.
This input can be configured as :
Alarm disable Night set-back Emergency Sash High High / Low

Output R1
Volt free relay output configurable as normally closed or normally open relays.

VAV Output 1
0-10V (2-10V) control output – configurable direct or indirect action.

VAV Output 2
0-10V (2-10V) control output – derived from VAV Output 1.

Output 2 (With interface box)
Volt free relay output configurable as normally closed or normally open relays.

Output 3 (With interface box)
Volt free relay output configurable as normally closed or normally open relays.

Com Port
To enable connection to Laptop or PC for full diagnostics , logging or setting up and for communications to building computer system (BMS) Output is RS485 Modbus RTU.

Power Supply
Low voltage DC power supply.

Airflow Sensor
Connection socket for the face velocity airflow sensor.

Sash Position Sensor
Connection for the Sash Position sensor.

Venturi Valve
Connection socket for the venturi air flow control terminal.

VAV Control / Alarm Configuration and Calibration

1.1

The controller / alarm can be configured via a Laptop or PC using a variety of 'set up ' programs each designed for a particular application with a combination of inputs , outputs and push buttons.

This configuration can be changed via the alarm key pad using the menu system if required or re-configured by re-connection of the laptop or PC.
This allows the Fume Cupboard manufacturer to stock standard units and configure the controller / alarms to suit the application.

The configuration of the various functions and the calibration of the controller / alarm display is menu driven. Access to the menu will be via password (4 digit number) and will be two level. The first level will be for calibration of the unit and the second level will be for 'engineers' to set up the configuration of the alarm.

> **! Note** :
> If you enter the Calibration or Configure Menu by accident :
> press the + & - buttons at the same time to escape back to the Main Menu.

The menus and sub – menus are in ' plain language ' and incorporate brief instructions where appropriate.

See Menu Block Diagram :
AFA1000/E/DUAL-Sash Pos-Blockdiag-msec-FEB08-V3.12MPC.doc

Start Up

1.2

When unit is powered up the following sequence of events occur :

1. The 12V DC power is applied to the airflow sensor and a delay on timer is initiated.

2. The alarm then performs a self test on the display and all indicators etc (approx 5 sec).

3. At the end of the delay the unit performs one of two options :

a

If the alarm calibration has been previously complete – the unit goes to normal operating mode (Run).

b

If the unit has not been calibrated the unit displays:
" Unit requires Set up – press Enter to access Set up menu ".
The set up menu allows calibration or configuration via the password protection.

During the set - up all alarms and output relays are inhibited.

Events/Actions

1.3

Safe airflow
- Meter reading above warning level (eg > 0.45 m/sec).
- Green LED on.

Warning airflow
- Meter reads between warning level and air fail level (eg > 0.4 m/sec and < 0.45 m/sec).
- Amber LED on.

Low airflow
- Meter reads below alarm level for longer than the warning to low air delay time.
- AIR FAIL toggles on / off with display.
- Red LED on (Flashing).
- Audible alarm sounds – can be muted via Enter pushbutton.
- Low air relay operates (if configured).

Reset : When airflow rises 0.02 above Low air level for longer than the low air to warning air delay time the Low air alarm resets automatically.

High airflow

If configured :
- High Air toggles on / off with display.
- Audible alarm sounds – can be muted via Enter pushbutton.

Audible alarm mute
- When the audible alarm is muted via the Enter button – an Icon (horn with forward slash) is shown on the display.

Sash high
- When the input configured as Sash High is activated.
- Amber LED on.
- Sash High – toggles on / off with velocity display.
- Audible alarm sounds.
- Audible can be muted via Enter pushbutton – this silences the alarm and initiates a repeat timer (if configured). After the delay time the alarm re-sounds (and can be re-muted). During this time the Amber LED flashes on / off.
- Sash High relay operates (if configured).

Reset : When Sash lowered to safe position and input de-activated.

High / Low

- When input configured as High / Low is activated.
- Display Icon shows High or Low.
- High / Low relay operates (if configured).

This function is designed for two speed fan operation or Binary State Venturi Valve operation switched via a micro switch or proximity switch activated at a given position on the sash.

Night set-back

- When input configured as Night set-back is activated.
- Night Set-back Icon displayed on meter.
- Unit is driven to the VAV MIN operating position.
- Audible alarm muted.
- Mute Icon shown on display.

Emergency

- When input configured as Emergency is activated.
- Red LED on (Flashing) – (if configured).
- Emergency toggles on /off with display – (if configured).
- Audible alarm sounds – can be muted via Enter pushbutton.
- Emergency alarm relay operates (if configured).
- Unit is driven to the VAV MAX operating position.

> **! Note**:
> The external Emergency input can be a remote relay contact or a local Emergency.
> Stop stay-put pushbutton.

Alarm disable

- When input configured as Alarm disable is activated.
- Alarm Disabled displayed.
- Red LED on (Flashing).
- Audible alarm muted.
- Mute Icon shown on display.

Pushbutton 1 – Fan Stop / Start

- Fan start relay operates.
- Display shows Fan On/Off.
- Run up timer for 2nd relay – Amber LED flashes on / off (if configured).
- Run down timer for fan start relay – Amber LED flashes on / off (if configured).
- Interlock with Pushbutton 2 (if configured).

or

Pushbutton 1 – Override On / Off

- Relay operates (if configured).
- Red LED flashes on/off.
- Audible alarm muted.
- Meter displays Override On/Off.
- Disables Night setback operation in Override On condition.

> **Note**:
> In the On condition the unit ignores any Night Set-back input signals and remains in this condition until Off is selected.

Pushbutton 2 – Pump On / Off , Lights On / Off , UV Lights On / Off

- Relay operates.
- Pump , Lights , UV Lights Icon shown on display (if configured).
- Interlock with Pushbutton 1 (if configured).

Pushbutton 3 – Purge On/Off

- Relay operates – (if configured).
- Red LED on (Flashing) – (if configured).
- Emergency toggles on /off with display – (if configured).
- Audible alarm sounds – can be muted via Enter pushbutton.
- VAV output goes to Max.
- Re-sets to VAV to normal Run condition after time delay.

or

Pushbutton 3 – Min / Normal

VAV output switches between Min and Run conditions.

or

Pushbutton 3 – Min / Normal / Max

VAV output switches between Min , Run and Max conditions.

> **Note**:
> When MIN is selected via pushbutton 3 the unit goes to a pre-set fixed low extract condition and displays 'Standby'.

Quick Start Installation 2.0

Follow the instructions below for installing and commissioning the unit:

1. Fit the AFA1000/E/DUAL unit to the Fume Cupboard using the cut-out details provided with the unit – see page 23.

2. Fit the airflow sensor to the Fume Cupboard using the cut out and installation details provided – see page 24 to 25.

3. Connect the 'telephone style' airflow sensor plug-in cable to the sensor and the back of the AFA1000/E unit – see typical connection diagram on page 40 to 42.

4. For Venturi Valve control plug in the flying lead with the 'telephone style' connector to the ECON power supply unit and the other end of the cable to the connection socket on the back of the AFA1000/E/DUAL unit – connect Output 2 to the actuator or Inverter – see typical connection diagrams on page 43 to 44.

5. For Inverter control – see typical connection diagram on page 25 to 26.

6. Plug in the Mains AC power plug on the flying lead to the ECON power supply unit – see typical connection diagram on page 40 to 42.

7. Power up the unit and wait at least 30 secs while the sensor temperature stabilises.

8. If the unit has not been calibrated the unit will display 'Requires setup' – press ENTER to continue and in the 'Main Menu' use the +/- buttons on the alarm facia to select 'SETUP' and then press the ENTER button.

9. In the Setup Menu select 'CONFIGURE' and press the ENTER button.

10. At this stage you will be requested to enter the PASSWORD. Use the +/- buttons to select the individual digits in turn and then press ENTER. If the password is correct the unit will go to the 'Configure Menu'. If the password is not correct you will be requested to try again – on the third wrong password entry the calibration menu will lock out for 10 mins.

11. In the 'Configure Menu' select 'BLEED VENTURI ' and go to 'Manual / Automatic'. Select 'Manual' then adjust the output to the required percentage.

> **! Note** :
>
> When using Output 2 for controlling the supply air set the percentage to 50%.

When completed select 'Done' to return to the Main menu.

12. In the 'Configure Menu' select 'ECON configure ' and go to 'Manual / Automatic'. Select 'Manual' then open the Sash to the normal max safe working opening and use the +/- buttons to adjust the face velocity to the design value eg 0.5m/sec. When completed select 'Done' to return to the Main menu.

13. In the 'Main menu' select 'Setup' and go to 'Calibration' and select Airflow sensor.

14. At this stage you will be requested to enter the PASSWORD. Use the +/- buttons to select the individual digits in turn and then press ENTER. If the password is correct the unit will go to the calibration mode. If the password is not correct you will be requested to try again – on the third wrong password entry the calibration menu will lock out for 10 mins.

15. When in the calibration mode follow the instructions on the display screen to carry out the calibration of the unit.
See Calibration Notes below for hints on successful calibration.
When the calibration is complete the unit will return to the Main Menu.

16. In the 'Main menu' select 'Setup' then go to 'Configure' (using the password) followed by 'ECON configure' followed by 'Manual / Auto'. Select 'Automatic' followed by 'Done' to return to the 'Main menu'. Select 'Run' and the unit will operate in automatic control mode.

17. If using the Sash Position sensor this requires calibration. In the 'Main menu' select 'Setup' then go to 'Calibration' – When in the calibration mode follow the instructions on the display screen to carry out the calibration of the unit.
See Calibration Notes below for hints on successful calibration.
When the calibration is complete the unit will return to the Main Menu.

18. If Output 2 is used for controlling the supply air :

a. Open the sash to the normal operating height.

b. Press ENTER for 5 seconds or until the 'Main Menu' appears and use the +/- buttons on the alarm facia to select 'SETUP' and then press the ENTER button.
c. In the Setup Menu select 'CONFIGURE' and press the ENTER button.
d. In the 'Configure Menu' select 'BLEED VENTURI' and go to 'Manual / Automatic'. Select 'Automatic'.
e. In the 'BLEED VENTURI' Menu select BLEED OFFSET and adjust the offset percentage so that the correct maximum supply volume is achieved. Select 'Done' to return to the Configure menu then select 'Done' followed by 'RUN'.

> **! Note**:
>
> This can be done by either measuring the differential room pressure between the room and the corridor or by measuring the air velocity through the supply air grilles.

f. Close the sash to the minimum position.
g. Press ENTER for 5 seconds or until the 'Main Menu' appears and use the +/- buttons on the alarm facia to select 'SETUP' and then press the ENTER button.
h. In the 'BLEED VENTURI' Menu select HIGH VALUE and adjust the high value percentage so that the correct minimum supply volume is achieved. Select 'Done' to return to the Configure menu then select 'Done' followed by 'RUN'.

> **! Note**:
>
> This can be done by either measuring the differential room pressure between the room and the corridor or by measuring the air velocity through the supply air grilles.

i. Open the sash to the normal operating height and double check that the maximum supply volume is correct and then close the sash and double check that the minimum supply volume is correct.

19. If Output 2 is used for controlling a Bleed venturi valve or Extract VFD

a. Open the sash to the normal operating height.
b. Look at the VAV output Bar Graph at the top of the screen and note the approximate percentage output.
c. Press ENTER for 5 seconds or until the 'Main Menu' appears and use the +/- buttons on the alarm facia to select 'SETUP' and then press the ENTER button.
d. In the 'Configure Menu' select 'BLEED VENTURI ' and go to 'Manual / Automatic'. Select 'Automatic'.
e. In the 'BLEED VENTURI' Menu select BLEED OFFSET and adjust the offset percentage so that the output is equal to the VAV output percentage noted in step b. Select 'Done' to return to the

Configure menu then select 'Done' followed by 'RUN'.

f. At this point the Bleed venturi valve should be closed when the sash is open to the normal operating height and the controller is at its set point. If the Bleed venturi valve is partially open adjust the 'BLEED OFFSET' percentage in step e until the Bleed venturi valve is closed.

> **! Note**:
>
> If there is too much air on the Hood and the Econ venturi valve is closed more than 70% then open the Bleed venturi valve using the 'BLEED OFFSET' until the Econ venturi valve output is 70% or less.

g. Close the sash to the 100mm.

h. Press ENTER for 5 seconds or until the 'Main Menu' appears and use the +/- buttons on the alarm facia to select 'SETUP' and then press the ENTER button.

i. In the 'BLEED VENTURI' Menu select 'HIGH VALUE' and adjust the high value percentage so that the Fume Cupboard face velocity is equal to the minimum volume – typically 150 fpm or higher. Select 'Done' to return to the Configure menu then select 'Done' followed by 'RUN'.

j. Open the sash to the normal operating height and double check that the Bleed venturi valve closes then close the sash and double check that the Bleed venturi valve opens.

20. See Operation Notes below for operational settings

Calibration Notes 2.1

1. When using a standard Fume Cupboard with Vertical Sliding sashes open the sash to the normal max safe working height to manually set the initial design face velocity in the 'Manual mode' and use this same position for the Low Air sample.

2. For the Higher Air sample close the sash to approx 50% of the opening used for the Lower Air sample while still in the 'Manual mode'. If the Higher air sample value is too close to the Lower Air sample the alarm will detect this and ask you to repeat with a higher value. To do this close the sash a little more and repeat the sample. Avoid closing the sash below 100mm.

3. The face velocity readings on the open sash may vary at different points on the measuring grid by up to 0.1m/sec. This is quite acceptable in terms of the Fume Cupboard performance so long as no individual point is below the designated Low Air alarm point .The figure entered for the calibration point can be taken as the average value of all the measuring grid readings or could be taken as the individual lowest point on the grid. For most Fume Cupboards this low point is on the bottom row in the centre and is a convenient position to measure and for future reference when checking the alarm during annual maintenance.

4. Take time when measuring the face velocities for the calibration procedure to allow for the velocities across the open sash to stabilise. If the velocities are changing or are turbulent during the sampling period the alarm will detect this and ask you to repeat the sample.

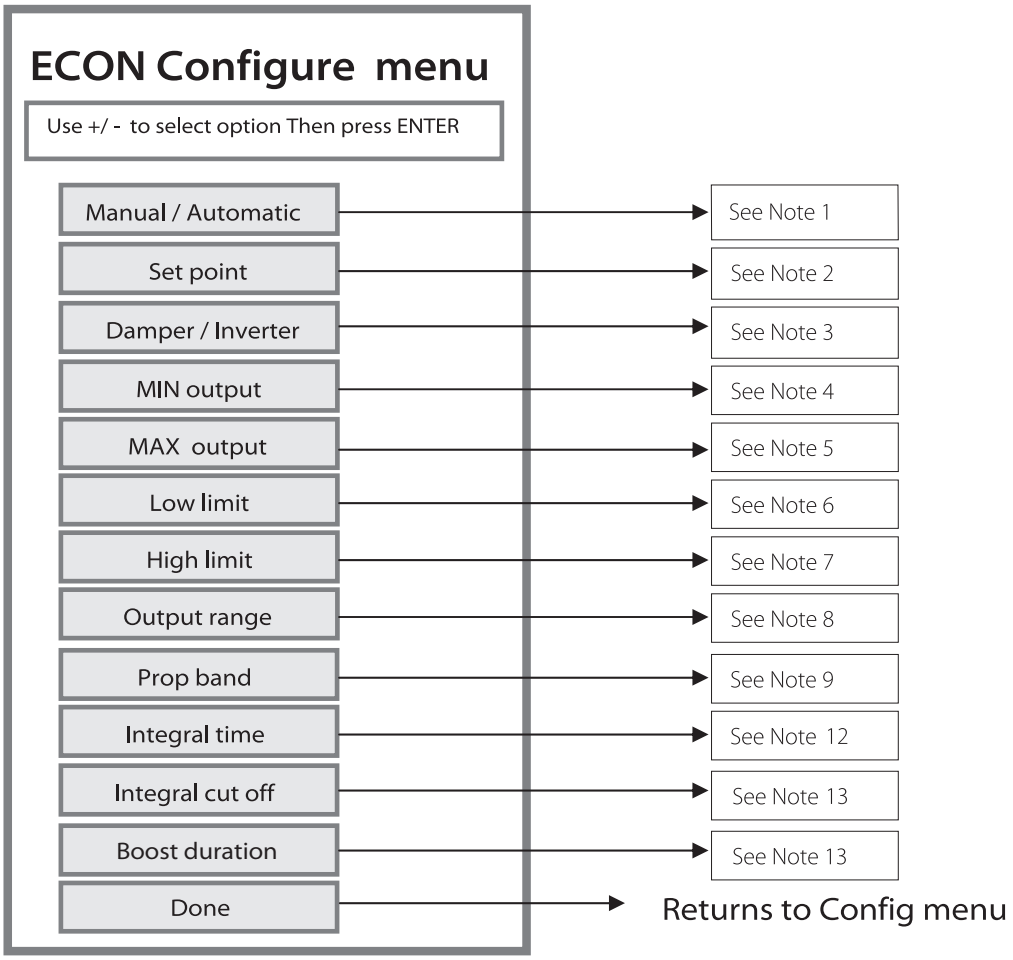
5. When using a Fume Cupboard with Horizontal Sliding sashes open the sashes to the normal max safe working opening for the Manual setting and the Low Air sample.

6. When calibrating or re-calibrating the alarm it is important to ensure that the 'Vent kit' is connected to the SM6 sensor on the Fume Cupboard. If the vent kit is not connected the sensor will not 'see' a change in the airflow during the calibration procedure and will display 'Check Sensor'. This only applies during the calibration mode. If in normal running after successful calibration the vent kit becomes disconnected the air flow across the sensor will fall and the alarm will go into the AIR FAIL condition and the ECON damper will drive fully open – ie Fail safe.

A. Econ Operation Notes 2.2a

There are various operational setting that need to be set to give good control of the fume cupboard face velocity. These setting are adjustable in the 'ECON configure menu'.

To get to the Econ Config Menu — go to Setup / Configure / Econ Config



! Note 1- Manual / Automatic

This allows the control output voltage to be set to Manual control or Automatic control. In Manual control the output is shown as 0 – 100% and can be adjusted using the +/- buttons. When the desired value is set–press Enter and the value will remain fixed at this point.
In Automatic control the output will continuously adjust automatically to make the displayed face velocity equal to the SET POINT (see below). Automatic is used for VAV control.

! Note 2 – Set Point

This is used to enter the desired set point face velocity for the VAV control.

! Note 3 – Damper / Inverter

This is used to select either Venturi Valve control for the VAV or for Inverter speed control of the exhaust blower.
Venturi 0 – 10v (Direct action for normally open venturi valve)
Inverter 10 – 0v (Reverse action)

! Note 4 – MIN output

This is used when Pushbutton III is set to Min / Run / Max.
Min output sets the venturi valve (or Inverter) to a min exhaust volume when the fume cupboard is not is use and the MIN function is selected Output range 0 – 100%.

! Note 5 – MAX output

This is used when Pushbutton III is set to Min / Run / Max.
Max output sets the venturi valve (or Inverter) to a max exhaust volume in an emergency when the MAX function is selected. Output range 0 – 100%.

! Note 6 – Low Limit

This is used to set up the minimum exhaust rate from the Fume Cupboard in automatic VAV operation. As the Sash is lowered the venturi valve will progressively close(or exhaust blower slow down), to reduce the exhaust volume and maintain the set point face velocity.
The Low Limit sets a minimum position to prevent the volume reducing too far.

As the Sash is lowered the displayed face velocity will be at the set point value until the venturi valve reaches the Low Limit. As the sash is closed further the venturi valve will not move and the displayed face velocity will increase. The increased velocity should represent a volume through the Fume Cupboard in the sash closed position equal to approx 15 – 20% of the design volume with the sash at the max safe working opening.

! Note 7 – High Limit

This is used to set up the maximum exhaust rate from the Fume Cupboard in automatic VAV operation. As the Sash is raised the venturi valve will progressively open(or exhaust blower speed up), to increase the exhaust volume and maintain the set point face velocity.
The High Limit sets a maximum position to prevent the volume increasing too far. In most installations the High Limit is set to 100%.

! Note 8 – Output Range

This is used to select the correct range for venturi valve control for the VAV or for Inverter speed control of the exhaust blower.
Venturi 0 – 10V Inverter 0 – 10V

! Note 9 – Prop Band

The Prop Band (Proportional band) is the main control parameter for the automatic VAV control. It is in effect the 'sensitivity' of the control system. If this is set too low a very small change in the measured face velocity will result in a large change in the output and the venturi valve will become unstable. If this is set too high it will require a large change in the measured face velocity to give a small change in the output and the venturi valve will react very slowly.
The ideal setting for this value is to select a value that is as small as possible but that gives stable control of the venturi valve or Inverter without 'hunting'.
A practical explanation of how to set this value on a Fume Cupboard is given below in Note 12 – 'Control Setup Guide'.

! Note 10 – Integral Time

The Integral Time is the second most important control parameters for the automatic VAV control. It is in effect the 'correction action' of the control system. Using proportional control only will result in an error between the actual measured face velocity and the set point face velocity. The Integral action looks at this error and adjusts the control output in a series of small

steps to bring the measured value to the same as the set point value. The time taken to correct the measured value depends on how many times the controller makes the small adjustments over a period of time. The Integral action is shown on the menu as 'Reps per minute' (repetitions per minute). The higher this figure the faster the actual correction time.
If this is set too low it will take a long time for the measured value to reach the set point. If it is set too high the measured value will correct very quickly but may 'overshoot' in each direction and cause 'hunting'.
The ideal setting for this value is to select a value as high as possible that gives stable control of the venturi valve or Inverter without 'hunting'.
A practical explanation of how to set this value on a fume cupboard is given below in Note 12 – 'Control Setup Guide'.

! Note 11 – Integral Cut Off

The Integral Cut Off is a special parameter unique to our controller to give a rapid change in the control output when the sash is raised from the closed or partially closed position.
This function looks at the 'rate of change' of the measured face velocity and if this reaches the set point will boost the opening of the venturi valve or boost the speeding up of the Inverter driven exhaust blower .

! Note :
If using an Inverter the 'ramp up time' setting on the Inverter needs to be set to 1 sec.

This parameter should not require any on-site setting and is factory set to 0.2 m/sec.

! Note 12 – Control Setup Guide

To achieve good VAV control the prop band and integral time parameters will need to be adjusted.
When the CALIBRATION has been completed this control setup guide should help find the best values for each particular installation.

a. Initially set the Integral Time to 0 reps per minute. This will give proportional control only.

b. Set the Prop Band to 25%.

c. Set the Econ to Automatic and select RUN.

d. At the design sash height e.g. 18" the face velocity will be close to the set point e.g. 100 fpm.

e. When the sash is lowered to 4" the face velocity will increase. Adjust the Prop Band value in steps up or down until the face velocity at 4" is approx. 150fpm and check that the face velocity is stable (not oscillating).
The Prop Band value should be approx. 15 to 35%.
If the Prop Band is set to a low value e.g. 10% the sensitivity will be high and the output may oscillate when the sash is lowered.
If the Prop Band is set to a high value e.g. 50% the sensitivity will be low and the face velocity at 4" will be too high.
At this stage the measured face velocity will probably not be at the set point with the sash at 18" .The function of this first step is to get stable control at 18" and at 4" (no 'hunting').

f. Once the correct Prop Band is determined we can set up the Integral Time to correct the measured face velocity to the set point Initially set the Integral Time to 5 reps per minute.
Now when the sash is lowered the Integral will reduce the face velocity back to the set point over a specified time.

g. If the 'correction time' is too slow increase the Integral Time reps per minute in steps of 5 until the face velocity controls back to the set point over an acceptable time.
If the Integral Time is set too low the face velocity will take too long to control back to the set point when the face velocity changes.
If the Integral Time is set too high the Integral may over-compensate and create overshoot and give unstable control.
The Integral time should be set approx. 10 – 30 reps per minute.

! Note 13 – Boost Duration

This applies when the Sash Position Sensor is being used. When the sash is opened the venturi valve will drive instantly to the position determined during the sash sensor position calibration and remain at this position for a length of time determined by the Boost Duration parameter (typically 3 seconds) and then return to normal airflow sensor operation.

! Note 14 – Troubleshooting

The stability of the control system and measured face velocity can be effected by three main items:

a. Turbulent airflow across the face of the Fume Cupboard and airflow sensor.

b. The Calibration of the airflow sensor.

c. The 'sensitivity' of the control loop (Prop Band & Integral Time settings).

It is important to establish the cause of the problem before attempting to adjust any parameters.

To do this put the control system into 'Manual' operation. and use a calibrated anemometer to measure and check the stability of the face velocity. In this condition the control venturi valve will be at a fixed position so any instability seen will be due to the extract system or to turbulent air across the Fume Cupboard. This can be checked and corrected mechanically.

If the measured face velocity with the anemometer is stable but the displayed face velocity on the controller is reading a different value or is not stable this could be due to the calibration procedure carried out earlier or due to turbulent air across the airflow sensor. Correct any turbulence at the airflow sensor and then re-calibrate the controller taking time to ensure that the airflow sensor has stabilised at each sampling value.

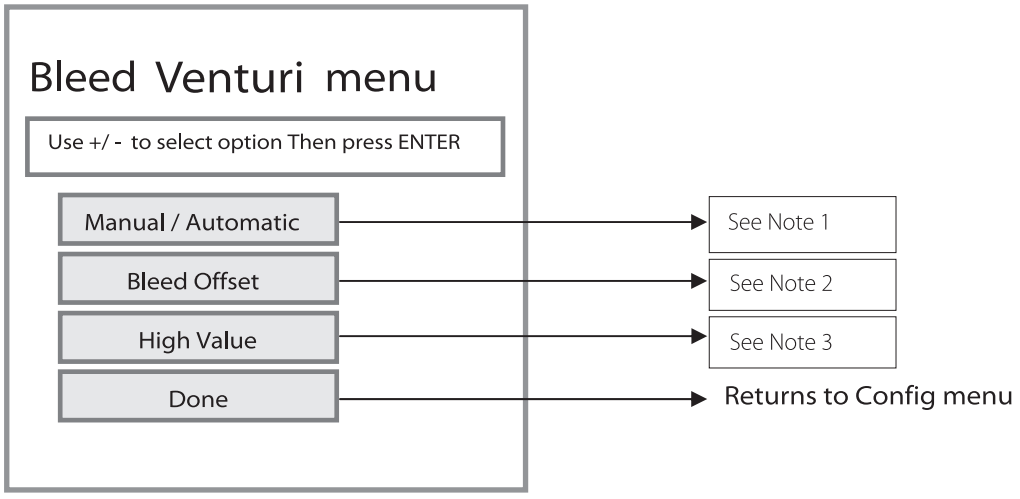
If the above is OK the problem is probably due to the Prop Band and / or the Integral Time settings. In this case switch back to Automatic control and repeat the procedure in Note 12 above.

B. Output 2 Operation Notes

2.2b

There are various operational setting that need to be set to give good control of Output 2
These setting are adjustable in the 'BLEED VENTURI' configure menu.

To get to the Bleed Venturi Menu – go to Setup / Configure / Bleed Damper



! Note 1 – Manual / Automatic

This allows output 2 voltage to be set to Manual control or Automatic control.
In Manual control the output is shown as 0 – 100% and can be adjusted using the +/- buttons.

When the desired value is set –press Enter and the value will remain fixed at this point.
In Automatic control the output will continuously adjust automatically in conjunction with Output 1.

! Note 2 – Bleed Offset

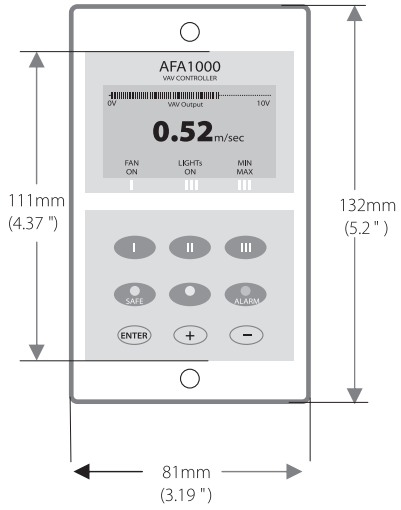
This is used to offset the Output 2 voltage to zero against the Output 1 voltage. For example – when Output 1 is at 50% (5V) adjusting the Bleed Offset to 50% will set output 2 to 0V.
If the High Value is 100% Output 2 will then be proportional to output 1(OP1 =6V / OP2 = 2V, OP1 = 7V / OP2 = 4V etc).

! Note 3 – High Value

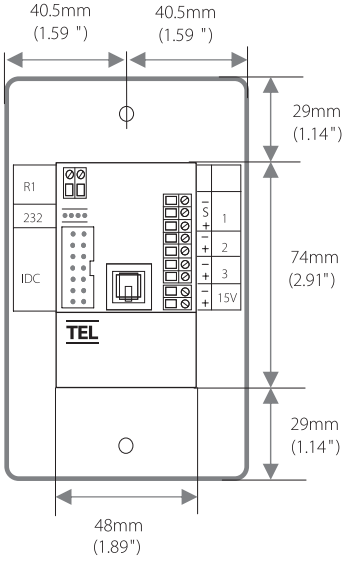
This is used to offset Output 2 high limit against the Output 1 voltage. For example – when Output 1 is 10v output 2 will be 10v, adjusting the high value to 90% will offset Output 2 so that Output 1 = 9V / Output 2 = 10v. Adjusting the high limit to 50% will offset Output 2 so that OP1 =5V / OP2 =10V etc.

Dimensions 3.0

Alarm Panel Dimensions



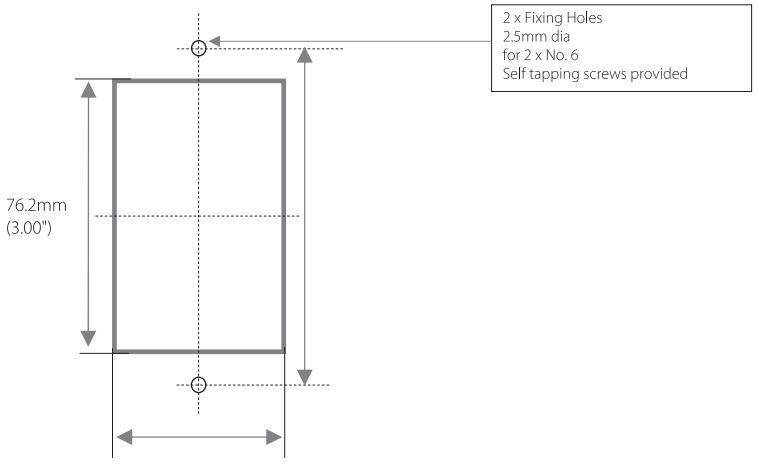
Front View



Rear View

Side View

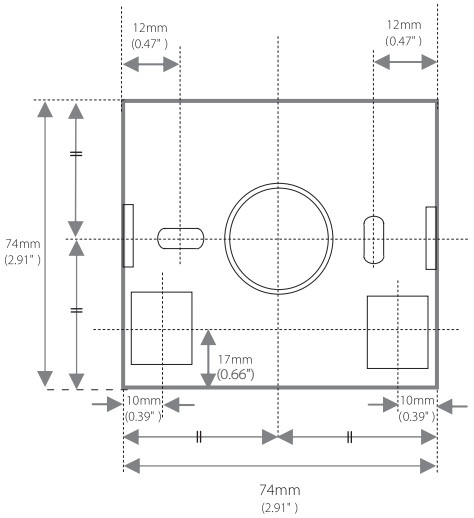
Panel Cutout Dimensions 3.00" x 2.00"



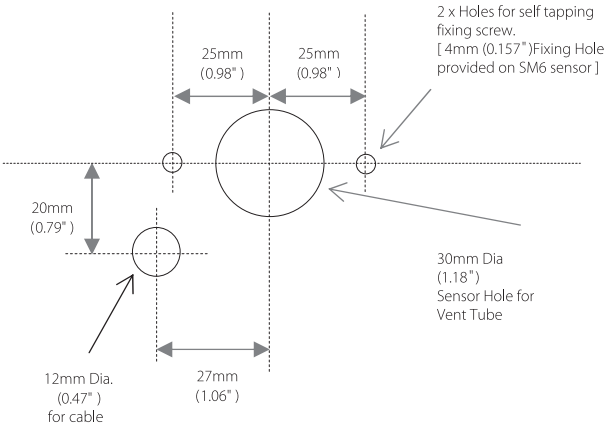
NOT TO SCALE

Airflow Sensor

3.1



SM6 Sensor Dimensions
(Rear view)

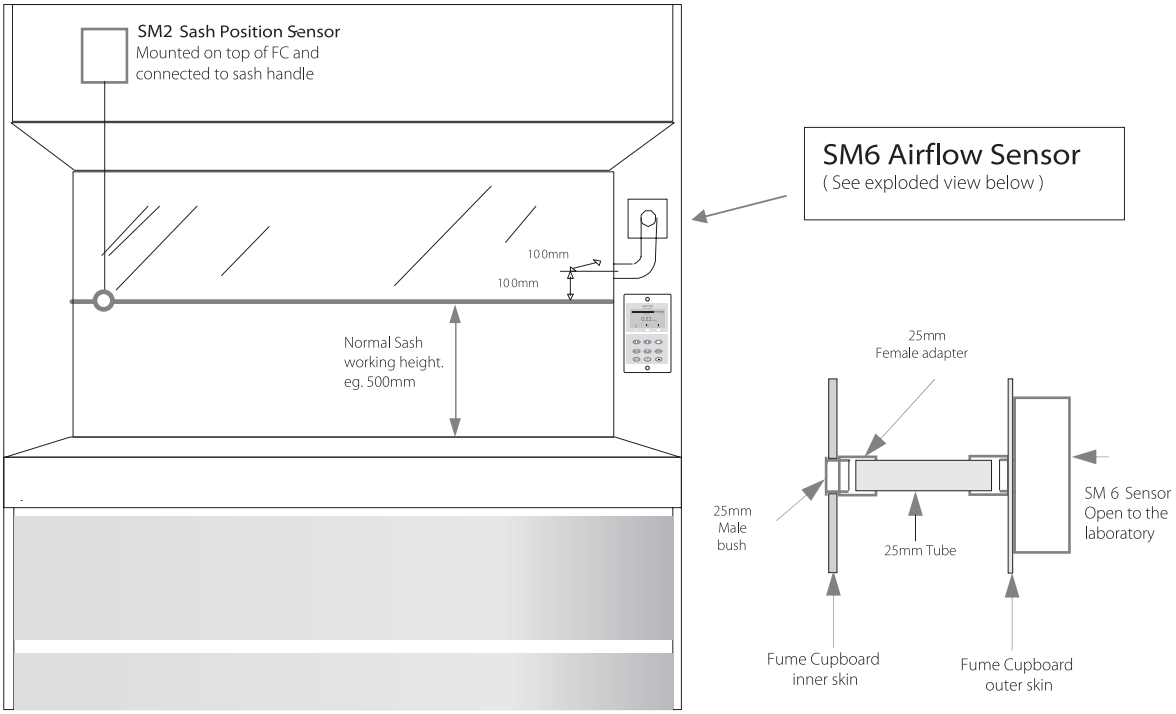


SM6 Sensor Panel Cutout Dimensions
(Front view)

NOT TO SCALE

SM6 Airflow Sensor Installation

3.2



It is very important to position the SM6 airflow sensor in the correct position to give long term stable reading of the face velocity. Please read the INSTALLATION NOTES below and if in doubt contact us for further advice.

! Installation Notes :

! 1. The SM6 sensor must be positioned where it can 'see' the airflow into the fume cupboard in the laboratory.The back connection spigot of the sensor is designed to accept a 25mm OD tube which should be connected to the inner chamber of the Fume Cupboard (This tube and fittings is known as the " vent kit ").
The ideal position for the end of the 25mm tube for most Fume Cupboards is 100mm back from the sash glass and 100mm higher than the normal sash opening height through the inner side wall.

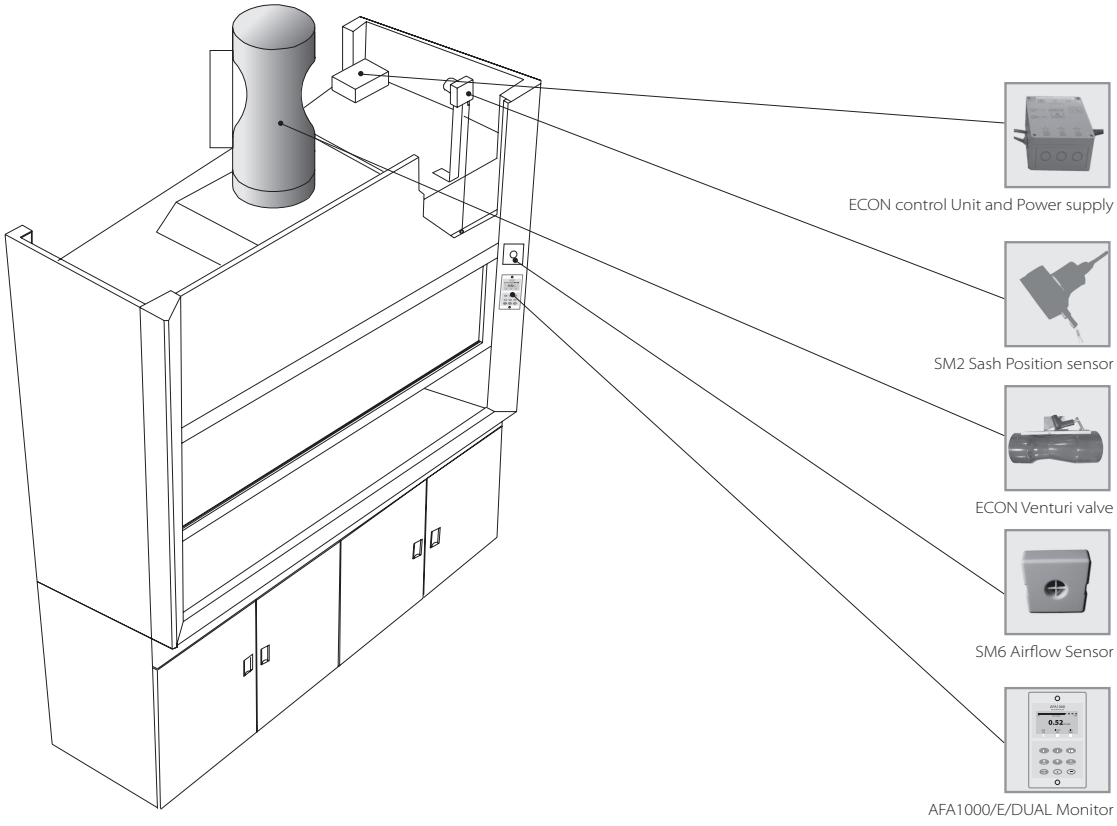
! 2. If possible mount the sensor on the front of the Fume Cupboard and use a short length of tube. Tube lengths of more than 1metre or smaller diameter will restrict the airflow through the sensor. This will lead to too much sensitivity being required to calibrate the unit which can lead to some instability of the reading or incorrect readings at low velocities.

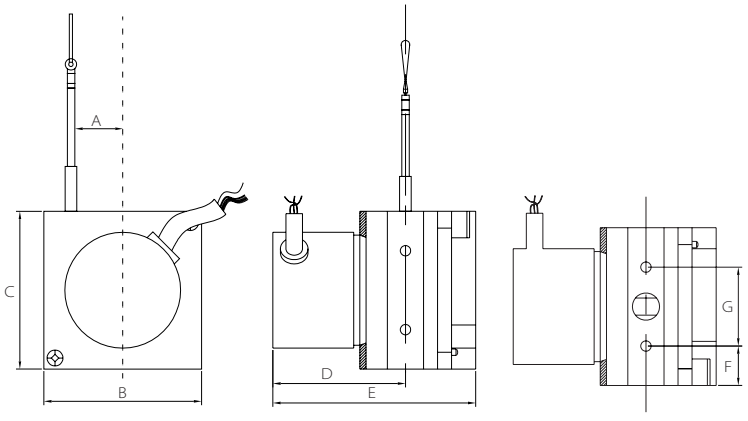
! 3. For Fume Cupboards with a single skin side wall or a double skin with a small gap between them it may not be possible to achieve the ideal sensing position using a flexible tube.
With a single skin side wall it is possible to fix the sensor on the outside of the Fume Cupboard and connect directly to the inner chamber in the ideal position. This method can only be used for up to two Fume Cupboards when they are positioned side by side (using the two outer walls).
An alternative method is to mount the sensor on the front of the Fume Cupboard and connect using a short flexible tube to a rigid wall tube attached to the inner side wall. The open end of this rigid wall tube should be positioned in the 'ideal position', ie. 100mm back from the sash and 100mm higher than the normal sash opening.
Fume cupboards with a high internal height can present a difficulty because the tube length to reach the ideal position may be longer than 1 metre. In this case it is better to use a tube no longer than 1 metre which may result in a sensing position higher than the ideal.
When fitting a sensor to a 'narrow wall' Fume Cupboard for the first time it may be necessary to try various combinations of rigid and flexible tube to find the best combination and position.

! 4. The sensor should not be mounted in a position were it is subject to draughts from the laboratory air input or ventilation system.

SM2 Sash Position Sensor and Installation

3.3





Stroke Range	1250mm	2500mm
A	16.2	40.6
B	50.8	94.0
C	50.8	93.0
D	42.7	44.2
E	65.3	74.2
F	12.7	22.9
G	25.4	50.8

Venturi Type Valve

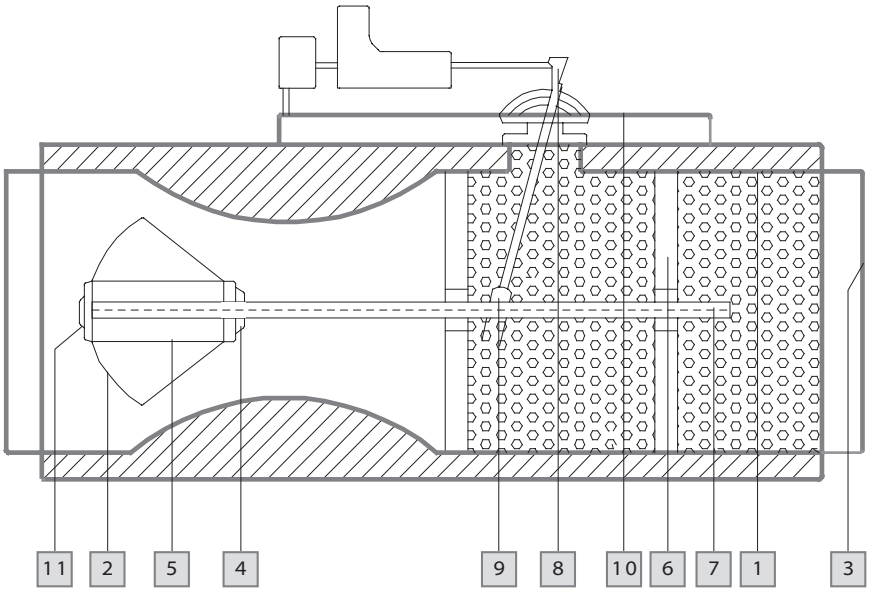
4.0

TEL ECON venturi type valve is pressure independent airflow terminal unit to control airflow accurately. Venturi type of valve is widely used in critical operation area to control fume cupboard face velocity and room pressure. The variable volume valve can maintain preset volume over a range of 150 to 750 Pa by internal spring cone structure to sense the pressure change across the valve.

ECON venturi valve is available in aluminum body with stainless steel components. When corrosion resistance required, special coating will be applied. ECON series have several standard sizes from 6 " to 16" in diameter for single valve body. When more flow required than can be furnished through a single 16" valve, multiple valves can be paralleled to meet required additional flow. The venturi valve will control air flow for both supply and exhaust ducts based on air volume preset by fast actuator. This valve in its normal operating mode is pressure independent so that flow can always maintain constant volume.

Valve Structure

4.1



Item	Description	Material
1	Valve body	Aluminum
2	Adjusting cone	Aluminum
3	Linkage	SS440
4	Spring cap	Aluminum
5	Cylinder	Aluminum
6	Draft frame	SUS304
7	Draft	SUS304
8	Lever	SUS304
9	Cone guide	SUS304
10	Actuator base	SUS304
11	Cylinder cap	Aluminum

Design Features

4.2

ECON venturi valve incorporates a built – in sound attenuator. It is uniquely constructed of perforated aluminum with one-inch high quality fiberglass lined with special coating to resist erosion. The outside is covered with a 26 gauge galvanized steel jacket. The discharge and radiated noise levels are substantially reduced. The unit is completely thermally insulated.
If required volume through valve is over single valve, multiple venturi valves can be paralleled to provide additional flow. The static pressure range is 150Pa to 750Pa. The material of valve body and cone are aluminum. The shaft is stainless and the bearing is Teflon or Heresite coated.

! Note:
Special coating available if required.

ECON venturi valve can be controlled either by pneumatic or electric control system. No main air piping or consumption is required.

Standard Design Features:

- Fully pressure independent on range of 150 to 750 Pa
- No main air consumption of pneumatic actuator
- Factory set on range of whole designed volume
- Fully insulated with 26g Galv. Cover
- High accuracy of 5% on designed volume range
- Less than 1 second response time
- 16 points pre-calibrated in factory for VV valve
- Compact design for easy installation

Optional Design Features:

- Hot water & electric booster coils
- Dual duct systems
- Multiple valve assemblies
- Special coating provided for acid resistance
- Pressure switch optional for fume cupboard alarm

Volume Range 4.3

4.3a Single Valve CV/BV/VV NORMAL / SHUT-OFF TYPE

Operating Static Pressure	Middle Pressure		High Pressure	
	150-750 Pa		300-1250 Pa	
SIZE (Diameter)	NORMAL TYPE(CMH)	SHUT-OFF TYPE(CMH)	NORMAL TYPE(CMH)	SHUT-OFF TYPE(CMH)
06"(150mm)	50-450	0-425	85-770	0-680
08"(200mm)	155-770	0-680	190-1300	0-1100
10"(250mm)	200-1700	0-1250	260-2400	0-2100
12"(300mm)	300-2400	0-1800	510-3400	0-2600
16"(400mm)	550-4000	0-3000	800-5400	0-4000

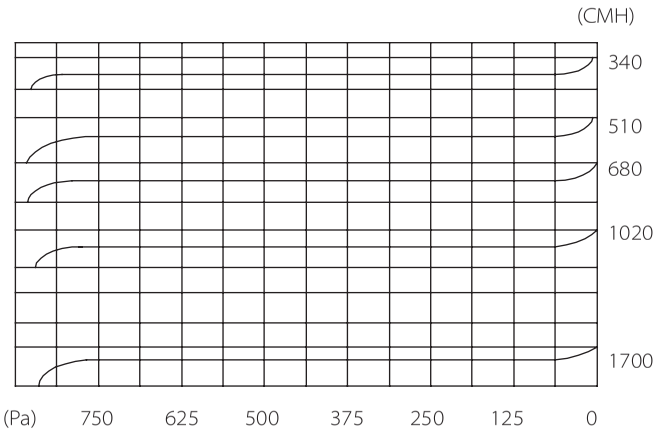
4.3b Multiple Valve CV/BV/VV NORMAL TYPE

SIZE of single valve	No. of valves	Middle Pressure 150-750Pa (CMH)	High Pressure 300-1250Pa (CMH)
12"(300mm)	1	300-2400	510-3400
	2	600-4800	1020-6800
	3	900-7200	1530-10200
	4	1200-9600	2040-13600
16"(400mm)	1	550-4000	
	2	1100-8000	
	3	1650-12000	
	4	2200-16000	

4.3c Multiple Valve CV/BV/VV SHUT-OFF TYPE

SIZE of single valve	No. of valves	Middle Pressure 150-750Pa (CMH)	High Pressure 300-1250Pa (CMH)
12"(300mm)	1	0-1800	0-2600
	2	0-3600	0-5200
	3	0-5400	0-7800
	4	0-7200	0-10400
16"(400mm)	1	0-3000	
	2	0-6000	
	3	0-9000	
	4	0-12000	

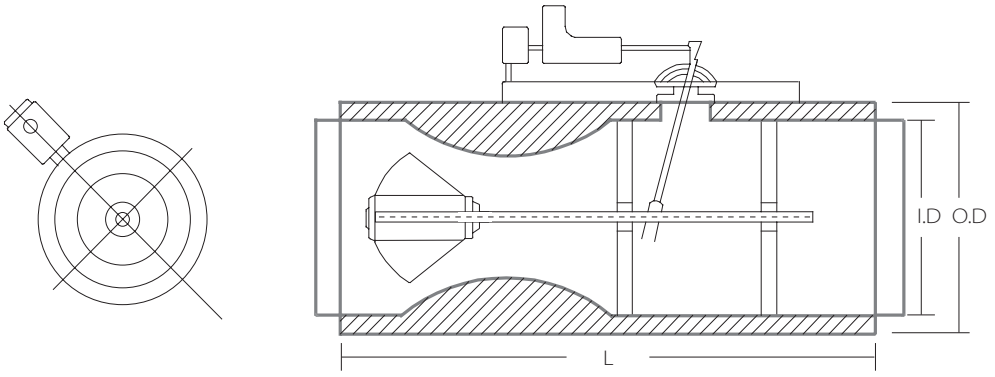
4.3d Pressure Independence Curve



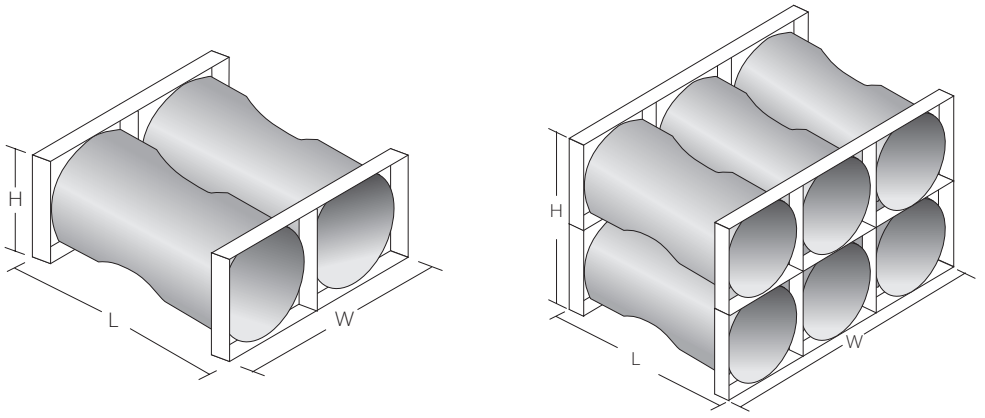
Dimensions

4.4

4.4a Single Valve CV/BV/VV NORMAL TYPE / SHUT-OFF TYPE



4.4b Multiple Valve CV/BV/VV NORMAL TYPE / SHUT-OFF TYPE



SIZE (Diameter)	DIMENSIONS (mm)		
	I.D	O.D	L
06" (150mm)	150	200	560
08" (200mm)	200	250	630
10" (250mm)	250	300	680
12" (300mm)	300	350	680
16" (400mm)	400	450	920

SIZE of single valve	No. of valves	DIMENSIONS (mm)		
		W	H	L
12"(300mm)	1	350	350	680
	2	740	370	840
	3	1110	370	840
	4	740	740	840
16"(400mm)	1	450	450	920
	2	940	470	1080
	3	1410	470	1080
	4	940	940	1080

Air-Regenerated Noise 4.5

Discharge Noise, Single Valve, Normal Type

SIZE (Diameter)	100 Pa								250 Pa								500 Pa								750 Pa							
	VOLUME	OCTAVE BAND							OCTAVE BAND								OCTAVE BAND								OCTAVE BAND							
	(CMH)	2	3	4	5	6	7	NC	2	3	4	5	6	7	NC	2	3	4	5	6	7	NC	2	3	4	5	6	7	NC		
6″	170	58	38	36	29	25	27	<20	55	45	43	37	32	34	<20	59	52	51	44	39	41	<20	63	59	51	46	48		23			
	255	53	40	38	32	28	27	<20	56	47	45	40	35	36	<20	62	55	53	46	42	43	<20	64	61	61	53	49	50	24			
	340	55	42	40	35	31	31	<20	57	49	40	35	31	31	<20	65	58	55	48	45	45	<20	65	63	63	55	52	52	27			
	425	56	44	42	38	34	33	<20	58	51	42	38	34	33	<20	68	61	57	40	48	47	20	70	65	65	57	55	54	29			
8″	510	58	43	42	38	34	33	<20	63	51	42	38	34	33	<20	68	59	57	52	48	47	20	72	66	65	58	55	54	29			
	595	59	45	44	37	32	28	<20	64	53	44	37	32	28	<20	69	61	59	53	51	49	23	73	68	67	60	58	56	31			
	680	60	47	46	39	35	30	<20	65	55	46	39	35	30	<20	70	63	62	55	54	51	25	74	70	69	58	59	59	30			
	765	61	46	48	41	38	32	<20	66	57	48	41	38	32	20	71	65	64	57	57	53	29	76	72	71	64	64	60	35			
10″	765	61	51	47	39	35	41	<20	67	59	47	39	35	41	20	72	63	61	51	51	52	26	76	70	69	58	59	59	30			
	1105	63	52	49	41	38	43	<20	70	59	56	58	47	49	21	75	65	63	54	54	54	27	79	72	71	61	62	61	31			
	1445	65	53	51	44	41	45	<20	73	64	58	64	50	51	22	78	67	65	57	57	56	28	82	74	73	64	65	63	32			
	1700	66	55	53	47	44	47	<20	76	63	60	64	53	53	24	81	79	67	60	60	58	30	85	76	75	67	68	65	35			
12″	1350	60	51	48	43	39	36	<20	69	58	55	53	50	48	<20	73	65	62	59	59	57	24	75	69	65	64	62	63	28			
	1700	64	55	51	46	42	39	<20	71	60	59	56	51	50	20	76	69	65	62	62	60	25	79	73	69	67	65	67	29			
	2040	68	59	54	49	45	42	<20	73	62	63	59	52	52	21	79	73	68	65	65	63	28	83	77	73	70	78	71	31			
	2380	70	62	57	52	57	45	<20	75	64	67	62	53	54	22	82	76	71	68	69	66	30	87	81	77	73	71	75	34			

Note:

Variable volume valve (VV) type (10% up to 100%)

Radiated Noise, Single Valve, Normal Type

SIZE (Diameter)	100 Pa								250 Pa							500 Pa							750 Pa						
	VOLUME(CMH)	OCTAVE BAND							OCTAVE BAND							OCTAVE BAND							OCTAVE BAND						
		2	3	4	5	6	7	NC	2	3	4	5	6	7	NC	2	3	4	5	6	7	NC	2	3	4	5	6	7	NC
6″	170	43	27	22	21	17	16	<20	46	46	27	22	23	21	<20	50	51	32	28	29	29	<20	53	54	35	33	32	33	<20
	255	45	29	25	24	20	19	<20	48	48	30	25	26	24	<20	53	53	35	31	31	31	<20	56	56	38	36	35	35	<20
	340	47	31	28	27	23	22	<20	50	51	33	28	29	26	<20	56	45	38	34	33	33	<20	59	58	41	39	38	37	<20
	425	49	34	31	30	28	25	<20	54	54	37	32	33	29	<20	60	48	42	38	37	36	<20	63	60	45	43	42	41	<20
8″	510	52	36	31	27	20	17	<20	58	41	37	32	33	29	<20	62	47	43	39	37	35	<20	65	60	46	43	41	39	<20
	595	56	39	34	30	23	20	<20	62	44	40	35	34	32	<20	65	51	46	42	40	39	<20	69	53	49	46	45	43	<20
	680	60	42	37	33	26	23	<20	65	48	43	38	38	36	<20	68	48	43	40	34	31	<20	70	57	52	49	49	46	<20
	765	64	45	40	36	29	26	<20	68	51	45	41	41	39	<20	71	58	53	48	47	46	<20	74	61	55	52	53	48	<20
10″	765	51	40	35	31	25	25	<20	64	51	45	41	41	39	<20	69	48	43	40	34	31	<20	71	52	46	43	38	38	<20
	1105	55	43	38	34	28	28	<20	67	44	41	37	33	28	<20	72	52	46	43	37	35	<20	74	55	49	46	42	41	<20
	1445	59	46	41	37	31	31	<20	70	48	44	40	39	31	<20	75	56	49	46	41	39	<20	77	58	51	49	46	44	<20
	1700	63	49	44	40	43	34	<20	74	51	47	43	42	34	<20	78	59	51	48	44	43	<20	80	61	55	52	50	47	<20
12″	1350	58	44	43	35	29	25	<20	64	47	45	42	38	38	<20	69	53	50	47	42	43	<20	72	57	55	51	46	43	<20
	1700	61	48	47	39	33	29	<20	68	51	49	46	42	42	<20	74	57	54	50	46	47	20	76	61	58	53	51	47	<20
	2040	64	52	51	43	37	33	<20	72	55	53	50	47	46	<20	78	62	58	55	40	51	20	81	65	63	57	55	51	22
	2380	67	56	55	47	41	37	<20	74	56	55	52	49	48	<20	81	64	60	57	53	54	22	84	68	65	59	57	53	25

Note:

Sound Data Based on ETL Report on 479355

The performance tests were conducted in accordance with ARI 880-83, "Industry Standards for Air Terminals"

1.Discharge noise NC based on:

- 5ft(6" and 8" valve) and 10ft (10" and 12" valve)
- Inlet and outlet size equal to valve diameter
- Number of outlets: 340 up to 680 CMH per diffuser

2.Radiated noise NC based on:

- 10dB room absorption
- Ceiling sound transmission class 37-41

3.For 2 Valves in Parallel ADD 3dB

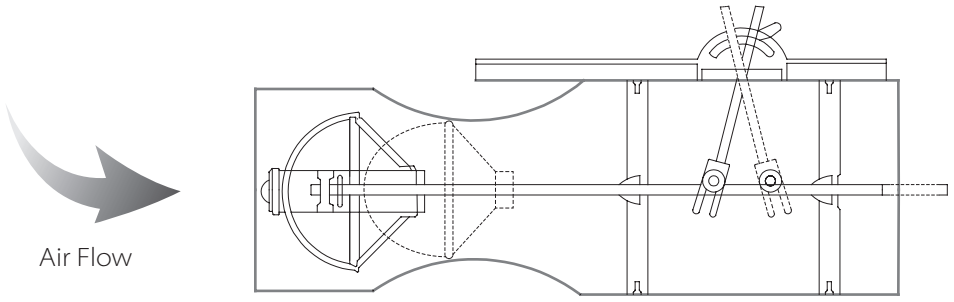
Discharge Noise, Single Valve, Shut-Off Type

SIZE (Diameter)	100 Pa								250 Pa							500 Pa							750 Pa						
	VOLUME (CMH)	OCTAVE BAND							OCTAVE BAND							OCTAVE BAND							OCTAVE BAND						
		2	3	4	5	6	7	NC	2	3	4	5	6	7	NC	2	3	4	5	6	7	NC	2	3	4	5	6	7	NC
6″	170	51	41	36	31	25	25	<20	55	45	43	37	32	34	<20	63	54	51	45	43	43	<20	66	56	53	49	50	47	23
	255	52	42	38	33	27	27	<20	56	47	45	40	35	36	<20	65	56	53	47	45	44	<20	68	58	55	55	53	48	24
	340	53	43	40	35	29	29	<20	57	49	40	35	31	31	<20	67	58	55	49	46	45	<20	70	60	57	53	55	52	27
	425	54	44	42	37	31	31	<20	58	51	42	38	34	33	<20	69	60	57	51	49	46	20	73	63	60	56	58	54	29
8″	425	55	43	41	36	31	30	<20	63	51	42	38	34	33	<20	65	59	54	50	48	46	20	67	63	51	55	52	50	29
	510	57	45	43	38	33	32	<20	64	53	44	37	32	28	<20	68	62	57	53	50	48	23	69	66	60	58	55	53	31
	595	59	47	46	40	36	36	<20	65	55	46	39	35	30	<20	71	65	60	56	52	50	25	71	70	63	61	58	57	30
	680	61	49	49	42	39	38	<20	66	57	48	41	38	32	20	73	68	63	59	54	52	29	73	72	66	64	60	60	35
10″	680	59	48	44	39	35	33	<20	67	59	47	39	35	41	20	69	60	61	55	52	48	26	72	63	65	59	56	53	30
	850	60	49	46	41	37	36	<20	70	59	56	58	47	49	21	72	63	63	57	54	51	27	75	66	67	61	58	55	31
	1020	61	50	48	43	39	39	<20	73	61	56	61	50	51	22	75	66	65	59	56	54	28	78	68	69	67	64	60	32
	1190	62	51	50	45	41	41	<20	76	63	60	64	53	53	24	78	69	67	61	58	57	30	81	71	71	66	63	60	35
12″	1105	59	51	48	44	39	40	<20	69	58	55	53	50	48	<20	73	68	64	61	59	56	24	76	71	68	67	64	60	28
	1275	62	54	51	47	43	45	<20	71	60	59	56	51	50	20	76	71	67	64	61	58	25	80	73	70	68	65	62	29
	1445	64	58	54	50	47	50	<20	73	62	63	59	52	52	21	79	74	70	67	63	60	28	84	75	72	69	66	64	31
	1700	66	61	56	53	50	54	<20	75	64	67	62	53	54	22	82	77	73	70	64	60	30	87	76	73	70	66	66	34

Applications

4.6

4.6a Constant Volume (CV) Series



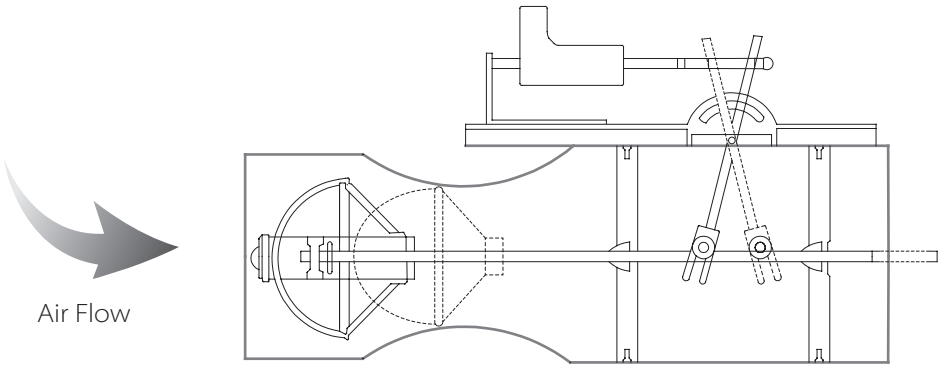
Pressure independent type
Constant Volume (CV)

Regardless of the change of static pressure across the valve, it accurately maintains preset volume through the valve according to the location of shaft which can be adjusted manually. The volume through is pre-calibrated in factory of the preset value. The cone structure moves by sensing the changing static pressure and if the pressure between valve ends increases, the cone will move towards the cylinder housing to increase the resistance and if the pressure decreases, the cone will move towards the opposite side to reduce the resistance and maintain the preset volume. Operator can adjust the lever to any position by reading the scale panel if the volume is required to change.

! Note:

For highly accuracy required area, on site calibration is recommended.

4.6b Binary State (BV) / Variable Volume (VV) Series



Pressure independent type
Binary State (BV) / Variable Volume (VV)

Regardless of the change of static pressure across the valve, it accurately maintains preset volume through the valve according to the location of shaft which can be adjusted automatically by fast actuator either pneumatic or electronic. The BV type of venturi, only two position can be applied by analog signal or simple on-off signal. In factory only these 2 points are pre-calibrated.

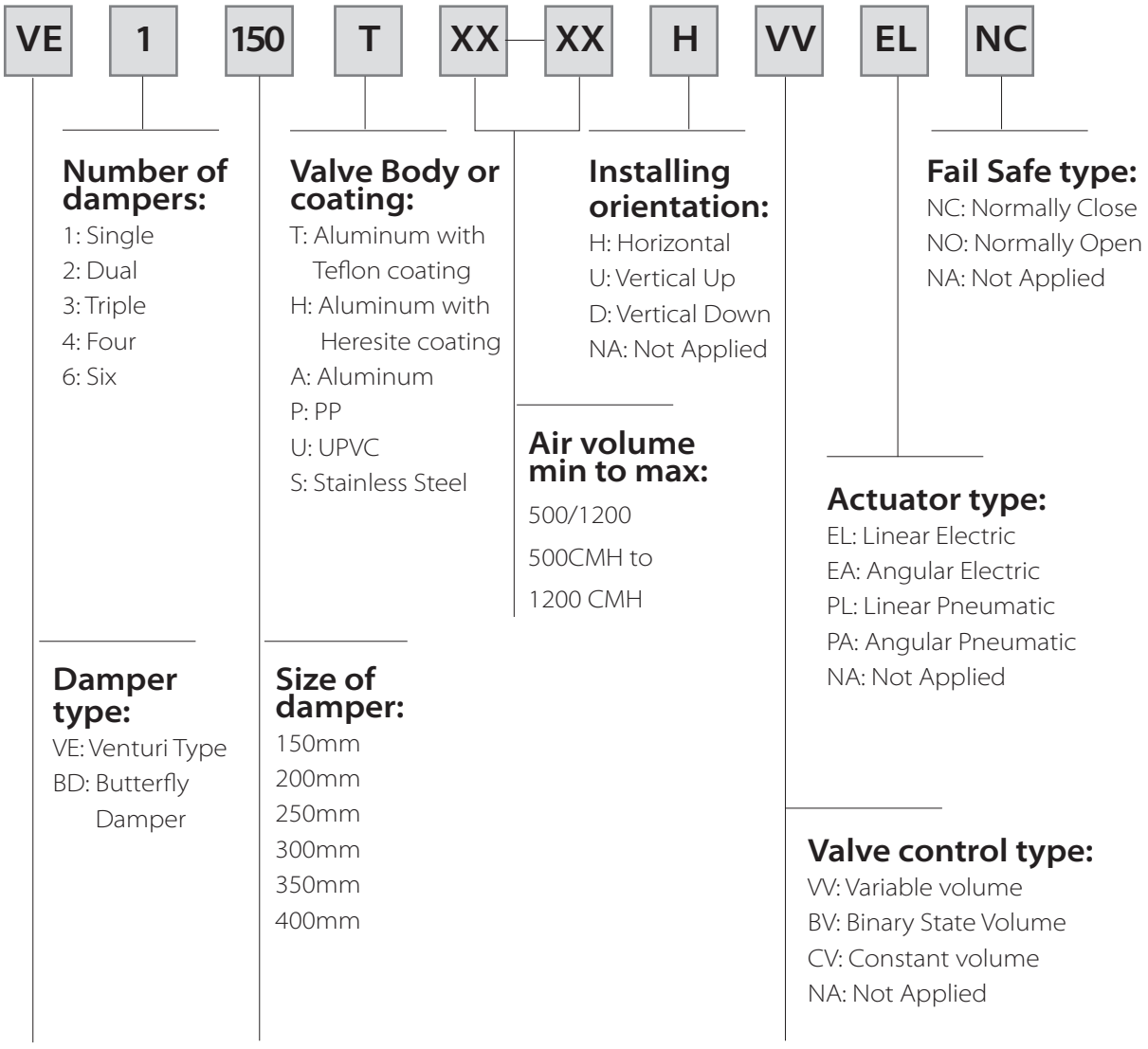
> **! Note**:
>
> Changing of the preset air volume is not suggested unless accurate on-site calibration can be ensured.

The variable volume type of venturi, 16 points will be factory pre-calibrated which will ensure accuracy for all the specified range.

The cone structure moves by sensing the changing static pressure when shaft position is fixed and if the pressure between both valve ends increases, the cone will move towards the cylinder housing to increase the resistance and if the pressure decreases, the cone will move towards the opposite side to reduce the resistance and maintain the preset volume.

Order Instructions

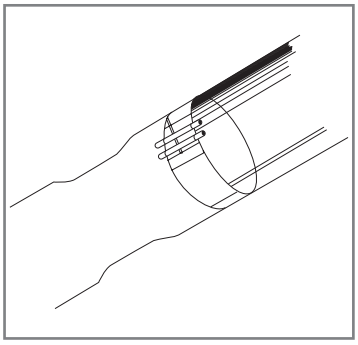
4.7



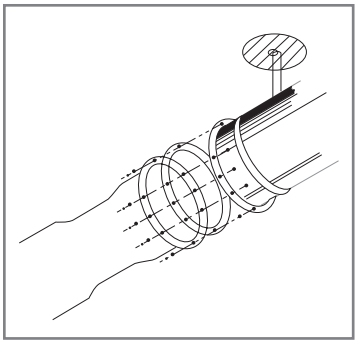
Installation

4.8

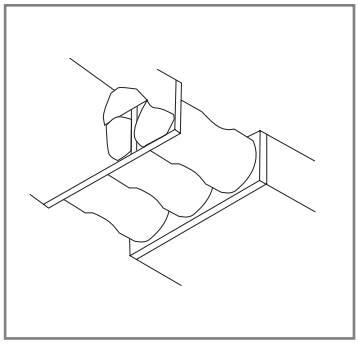
Procedures for installing ECON series venturi valves:



Single Valve Draw-band



Single Valve Circular Flange



Multiple Valve Slip-type Flange

1. Read all instructions before installing valves.

2. Check the tag number on valve label to ensure valve matches as scheduled.

3. Verify correct airflow direction and orientation of the valve as scheduled.

> **! Note**:
> Valves mounted out of horizontal or vertical (as planned and factory calibrated) will affect performance and control accuracy.

4. Allow a minimum of 14 inches of free unobstructed around the valve for maintenance and installation. Generally the valve may be installed in a 360° rotation. However, single horizontal hood valves should be installed so that the pivot arm located between 8 and 4 o'clock (not within 4 to 8 o'clock).

5. Allow 6 inches of unobstructed space in the duct on valve's inlet side for the shaft to reach the maximum flow position.

6. Use duct sealant on all valve/duct connection(or flange gaskets for circular flanges).

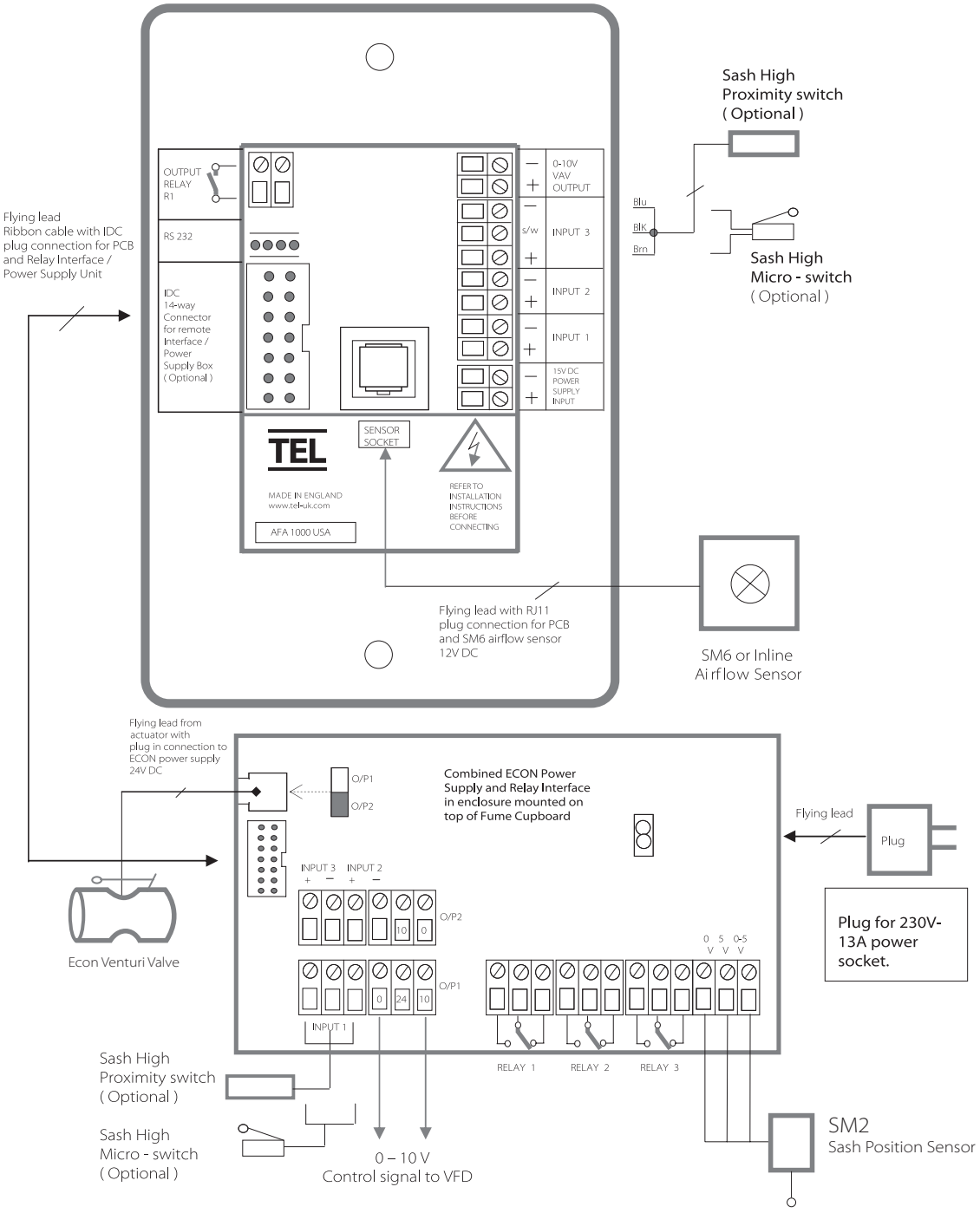
7. Install a hanger stock to support the ductwork within 12 inches of the valve connection. Install valve into duct after hanger stock is in position.

8. Follow appropriate installation diagram and abiding to relevant codes.

> **! Note**:
> Screws, fasteners, duct sealant, hanger stocks, companion flanges, and gaskets are not provided with venturi valve.

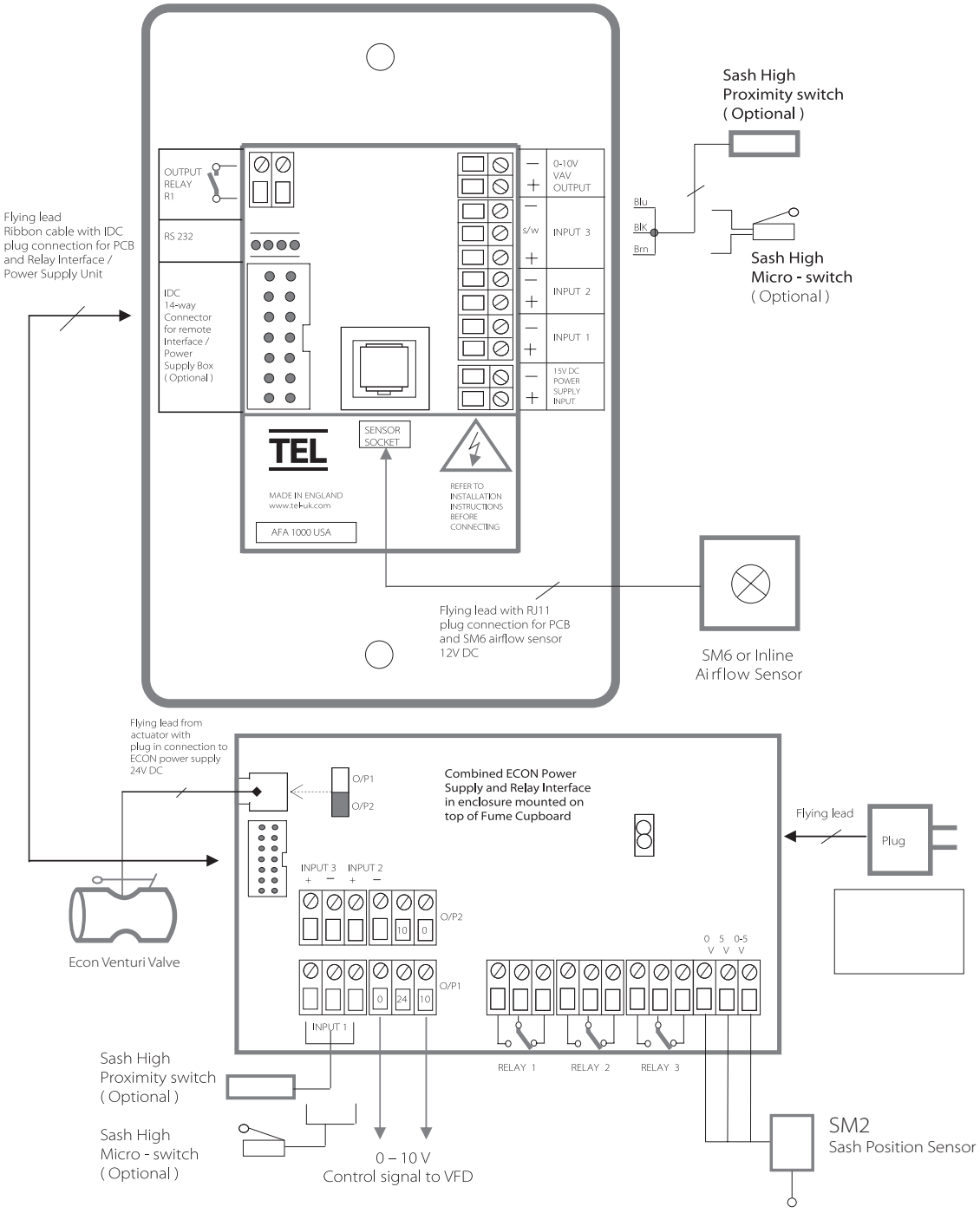
Typical Wiring Diagram 5.0

Exhaust Venturi Valve and PSU / Relay Interface Unit



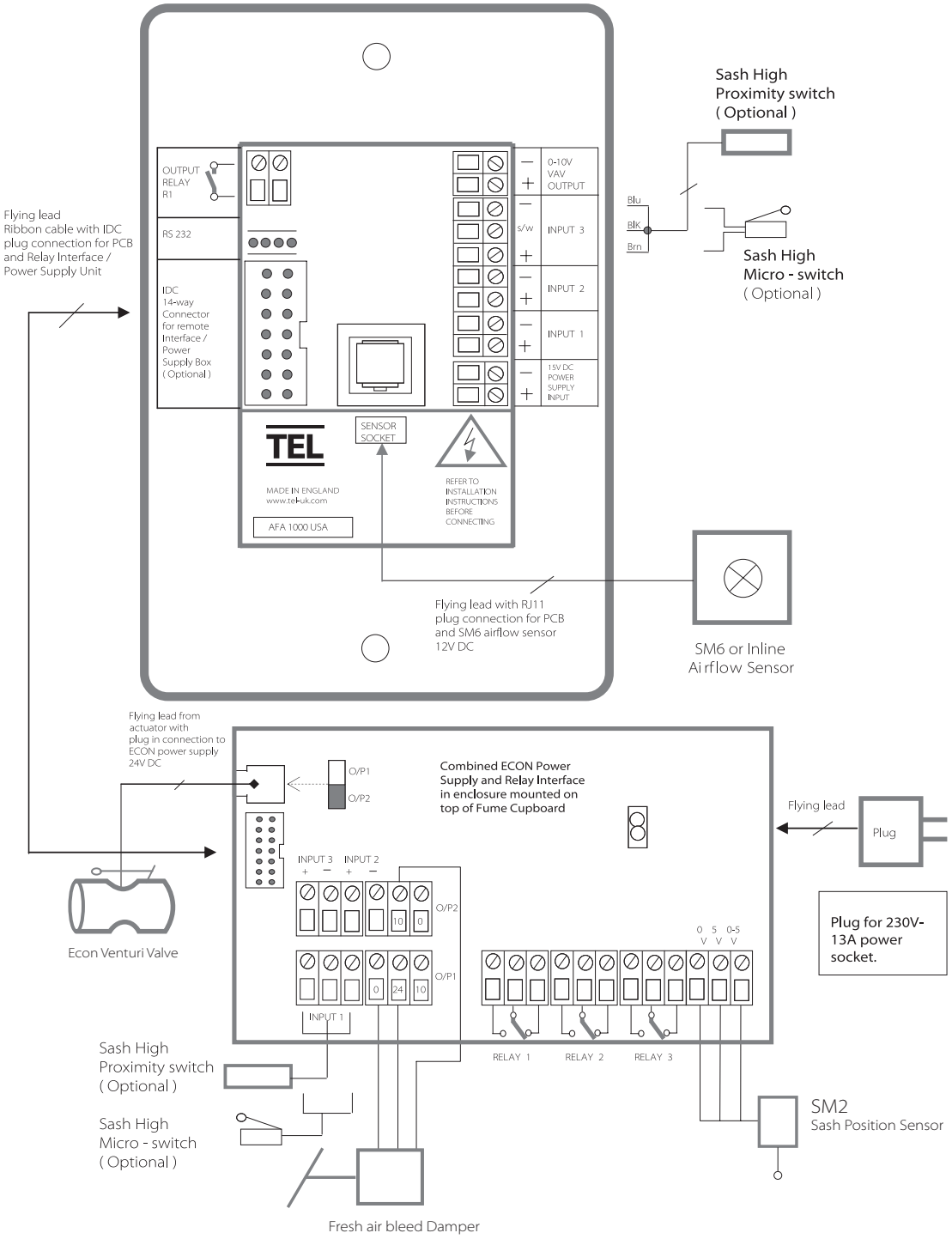
Typical Wiring Diagram 5.1

Venturi Control + Exhaust Fan VFD and PSU / Relay Interface Unit



Typical Wiring Diagram 5.2

Venturi Control+ Fresh Air Bleed Damper and
PSU / Relay Interface Unit



A. Venturi Valve Actuator connections using cable kit

Blue and Yellow wires with Blue crimp to terminal 1 on the actuator

Green and Red wires with Blue crimp to terminal 2 on the actuator

Black and White wires with White crimp to terminal 3 on the actuator

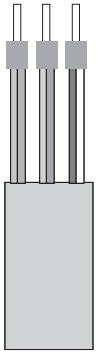
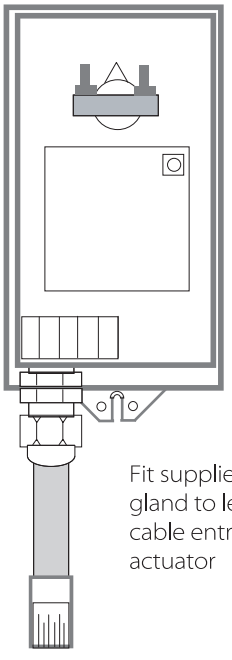


Fig .1

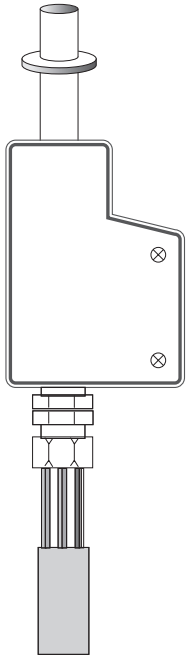
Angular Actuator



Fit supplied cable gland to left hand cable entry on the actuator

RJ11 Connection to Econ Power Supply

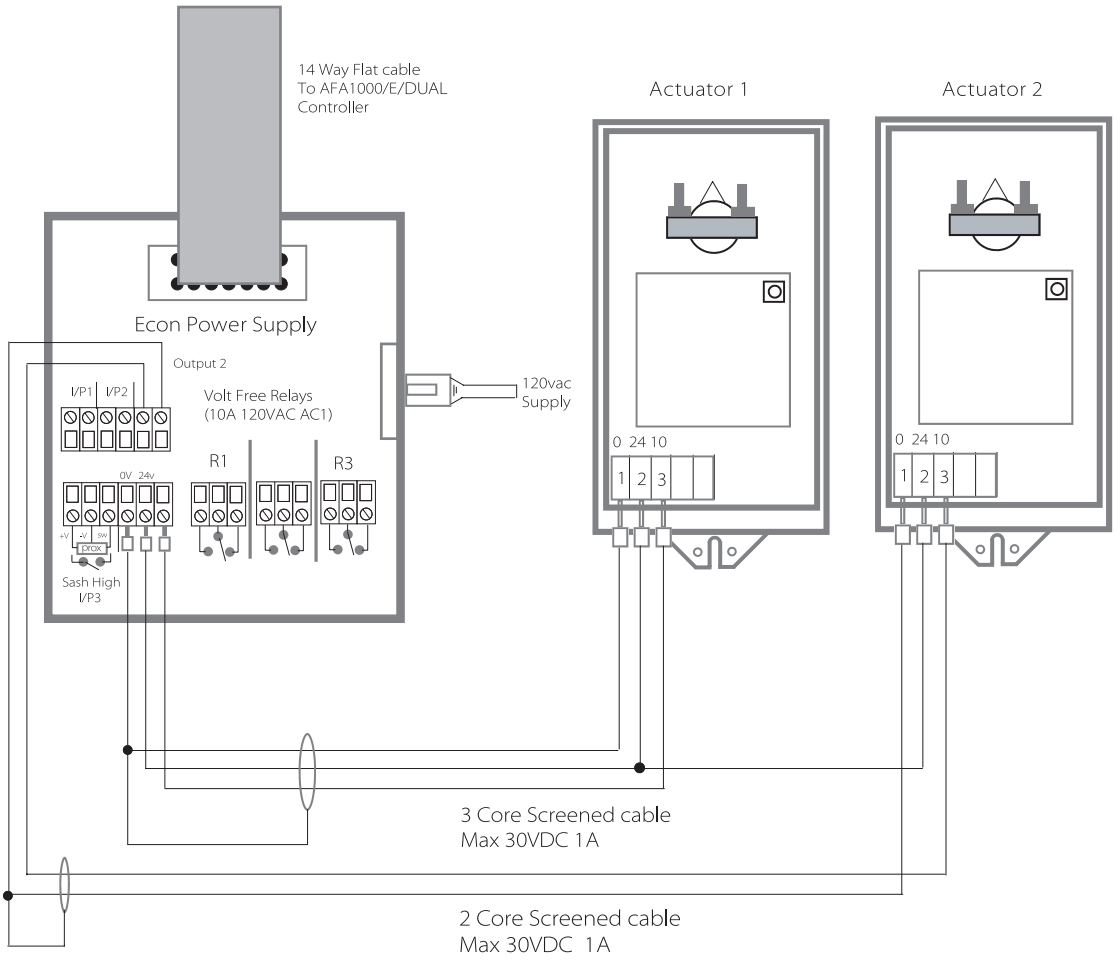
Linear Actuator



Connect supplied flying lead using the supplied cable gland as per Fig.1

B. Venturi Valve Actuator hard wired connections

5.3b



Limitation of Warranty and Liability

6.0

Seller warrants that this product, under normal use and service as described in the operator's manual shall be free from defects in workmanship and material for a period of twelve (12) months, or the length of time specified in the operator's manual, from the date of shipment to the customer. This limited warranty is subject to the following exclusion :

a. Batteries and certain other components when indicated in specifications are warranted for a period of 90 days from the date of shipment to the customer.

b. With respect to any repair services rendered, Seller warrants that the parts repaired or replaced will be free from defects in workmanship and material, under normal use, for a period of 90 days from the date of shipment to the customer.

c. Seller does not provide any warranty on finished goods manufactured by others. Only the original manufacturer's warranty applies.

d. Unless specifically authorised in a separate writing by Seller, Seller makes no warranty with respect to, and shall have no liability in connection with, any goods which are incorporated into other products or equipment by the Buyer. All goods returned under warranty shall be at the Buyer's risk of loss, Seller's factory prepaid, and will be returned at Seller's risk of loss, Buyer's factory prepaid.

The foregoing is in lieu of all other warranties and is subject to the conditions and limitations stated herein. No other express or implied warranty of fitness for particular purpose or merchantability is made. The exclusive remedy of the user or purchaser, and the limit of liability of seller for any and all losses, injuries, or damages in connection with this product (including claims based on contract negligence, strict liability, other tort, or otherwise) shall be the return of the product to the factory or designated location and the refund of the purchase price, or, at the option of the seller, the repair or replacement of the product. in no event shall seller be liable for any special, incidental or consequential damages.seller shall not be responsible for installation, dismantling, reassembly or reinstallation costs or charges. No action, regardless of form, may be brought against the seller more than one year after the cause of action has accrued.

The purchaser and all users are deemed to have accepted the terms of this limitation of warranty and liability, which contains the complete and exclusive limited warranty of Seller. This limitation of warranty and liability may not be amended or modified nor may any of its terms be waived except by a writing signed by an authorised representative of the Seller.

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For further Information on our range of airflow alarms and controls please contact us at:
TEL: INT +44 1706 633438