

AOV Smoke Vent

Installation and Connection Instructions

24V System – Trained Specialist Installation Required



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AOV Smoke Vent

Installation and Connection Instructions

Quick Start Guide

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Abbreviations

- AOV Automatic Operating Vent (Smoke Vent)
- CCB Cable Change Box (contractor supply)
- ELM End of Line Module
- FAS Fire Alarm System
- JB Junction Box
- MCP Manual Call Point (aka Breakglass Unit) – optional, **recommended**.
- RE Resistor

Additional supporting documentation

For additional information please also refer to the following documents:

1. Ferralux SHEV Control Unit EMB 7300 – Installation and Operating Instructions
2. Simon Folding Arm² Operating Manual

Warnings:

1. **The actuators within the AOV smoke vent are 24V.** It is imperative that correct cable size is used to connect the control panel to the smoke vent to prevent a voltage drop in excess of 2V and avoid damaging the actuator motors.
2. **A 24V certified power pack must be used for testing.** The batteries are an emergency back up to normal operation.
3. Incorrect connection and operational testing of this system will damage sensitive components and invalidate any warranty.
4. Incorrect connection can result in damage that requires replacement of the control unit by the manufacturer. In the event of this please call 0117 963 7385 to arrange service engineer attendance.
5. The AOV unit, control unit panel and actuators are programmed at the factory prior to shipping. Further programming is not required.
6. Do not cycle the AOV smoke vent via multiple repeated pushes of the manual call point, this can damage the actuator motors. A delay before operation of 2-3 seconds is normal.
7. Use of alternative switches, manual call points, control panels and batteries is not recommended and only to be undertaken by a competent electrician with 24V system knowledge. **If in doubt ask!**
8. Connections to a fire alarm system or building management system **must be Normally Open and Voltage Free** else damage to the control panel will occur.

Prerequisite:

Confirm all the components have been delivered and are undamaged. AOV smoke vent plus items shown in **Picture 1** below.



Post installation testing procedure

To test the system via the manual call point. Note: The manual call point will override all other inputs. Check the MCP active light is on. **See Picture 2**

To OPEN the AOV smoke vent. Open the manual call point and press the centre button once. The AOV Smoke vent will open to its maximum open position and stop.

To CLOSE the AOV smoke vent. Open the manual call point and press the reset button to the right of the centre button. The AOV smoke vent will close to its fully shut position and stop.



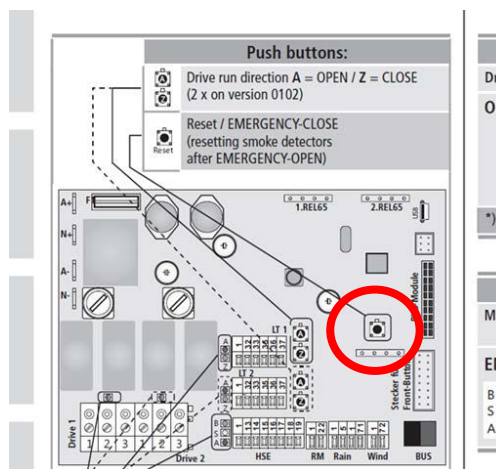
Picture 2 – Manual Call Point (aka Breakglass Unit)

To test the system via the open/close manual switch.

To OPEN the AOV smoke vent. Press and hold the open button, release the button when the AOV is opened to the desired level. Expect a delay in operation of 2-3 seconds.

To CLOSE the AOV smoke vent. Press the close button once only. The AOV smoke vent will close to its fully shut position and stop. Expect a delay in operation of 2-3 seconds.

If no MCP is fitted, the only means of closing the AOV and resetting the Control Panel following activation (from a smoke detector head or FAS), is via the reset push button located on the Control Panel Motherboard. See Picture 3

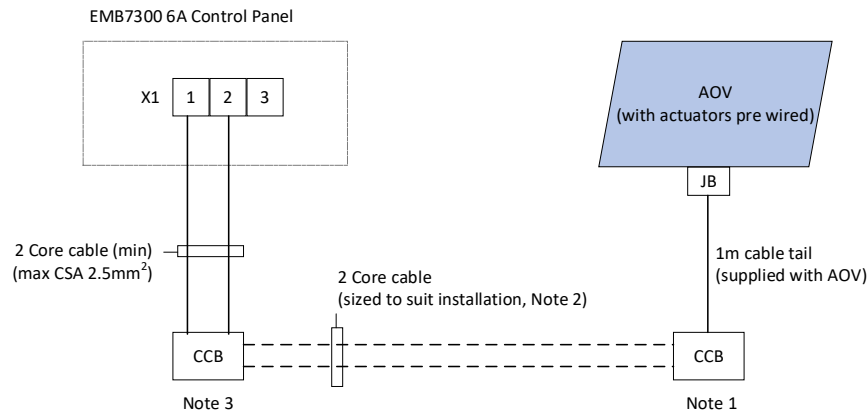


Picture 3 – Control Panel Reset Switch Location

Pre installation inspection - Connecting the Actuator Drive Motors

Check cabling between CCBs has been installed correctly and is of adequate size for a 24V system. See Diagram 1 below and Table 1 volt drop.

Actuator Drive Motor Cabling



Notes:

1. Contractor to supply and fit a Cable Changing Box (CCB) to terminate the actuator cable tail supplied with the AOV.
2. Cable between control panel and AOV actuator **MUST** be sized to minimise voltage drop.
3. If the required cable CSA is greater than 2.5mm², an additional CCB is to be supplied and fitted adjacent to the control panel.

Diagram 1 – AOV Actuator Connections

Cabling between the EBM7300 6A Control Panel and the Actuator Motors must be sized sufficiently to minimise voltage drop (VD). **The maximum permissible VD (at the Actuators) is to be no greater than 2Volts.**

If the required CSA for the cabling to the Actuator is greater than can be terminated in the Control Panel (max CSA 2.5mm²), the contractor will require to supply and fit a suitable Cable Changing Box (CCB) adjacent to the Control Panel.

A suitable CCB will also be required at the Actuator end in order to terminate the 1-3m Cable Tail supplied with the Vent Actuator/Motor Unit. Note - Volt drop within the AOV internal cabling and tail could be as high as 1V.

TABLE 1 provides details of typical voltage drops for a 6Amp max rated load, based on cable length and conductor Cross Sectional Area (CSA) using the formula: **mV/A/m**.

24V Cable sizing**TABLE 1 - Typical cable sizes / lengths required for use with the EMB7300 6A Control Panel**

Cable CSA (mm ²)	1.5	2.5	4	6	10	16
<i>mV/A/m</i>	31	19	12	7.9	4.7	2.9
Cable Length (m)						
0 – 10	1.86V	1.14V	0.72V	0.47V	0.28V	0.17V
11 – 20	X	X	1.44V	0.95V	0.56V	0.35V
21– 30	X	X	X	1.42V	0.85V	0.52V
31 – 40	X	X	X	1.89V	1.13V	0.70V
41 – 50	X	X	X	X	1.41V	0.87V
51 – 60	X	X	X	X	1.69V	1.04V
61 – 100	X	X	X	X	X	1.74V

Maximum Permissible VD = 2V Cable length/CSA marked “X” should not be used.

Example : 6A (max) Actuators connected to EMB7300 6A Control Panel using 4mm² cable with a maximum cable length of 30 metres:

$$\text{mV/A/m} = 12 * 6 * 30 / 1000 = \mathbf{2.16V} \quad (\text{VD too large – use 6mm}^2 \text{ cable})$$

For 6mm² Cable:

$$\text{mV/A/m} = 7.9 * 6 * 30 / 1000 = \mathbf{1.42V} \quad (\text{Acceptable VD} = < 2V)$$

Typical mV drop ratings for copper cable are shown in TABLE 2.

TABLE 2 – Typical Voltage Drop (per Ampere per metre) for copper cables

Conductor CSA (mm ²)	0.75	1.0	1.5	2.5	4.0	6.0	10	16
mV / A / m	62	46	31	19	12	7.9	4.7	2.9

Connecting the AOV smoke vent control panel

Ensure all connections are made to correct terminals, See Diagram 2 and 3

EMB7300 6A Control Panel
(General connecting)

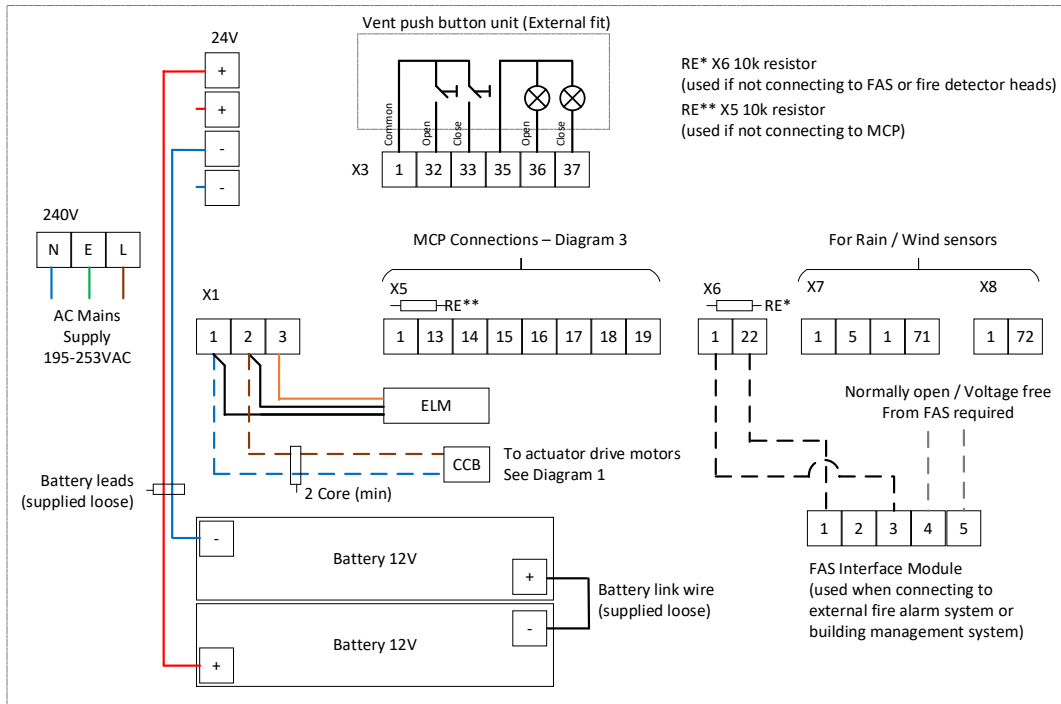


Diagram 2 – General Connections

Manual Call Point (MCP) Connections
(orange break glass unit)

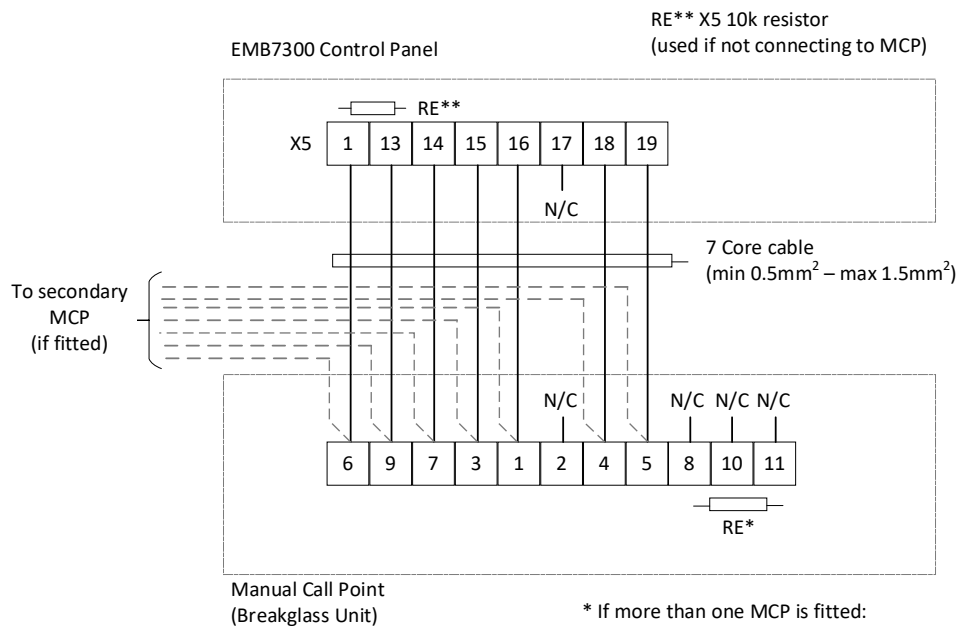


Diagram 3 – Manual Call Point Connections

Wiring / Connections Notes for EMB 7300 SHEV Control Panel used for Ventilation only.

Fit 10k Resistor (supplied loose) between Terminal X5-1 and X5-13 (if no external MCP is fitted).

Fit 10k Resistor (supplied loose) between Terminal X6-1 and X6-22 (if no FAS Module or Fire Detectors are fitted).

Drive End of Line Module – ELM (supplied loose) is to be connected to Terminals X1-1, 2 and 3 as shown. (Orange wire on X1-3).

The ELM can be fitted at the motor end but a 3 core cable should be installed between the SHEV Control Panel and the Vent Actuator Motors.

Cabling to the Vent Actuator Drive Motors **MUST** be sized to minimise Voltage Drop (VD).

When a Manual Call Point – MCP (also known as Breakglass Unit) is fitted, the 10k Resistor between Terminal X5-1 and X5-13 is to be removed. If no MCP is fitted, the only means of resetting the Control Panel is via the reset push located on the Control Panel Motherboard.

An external Vent Push Button Unit can be supplied / fitted and wired (to Terminal Block X3) as detailed in **Diagram 2**. If no PB unit is fitted, manual Vent control can only be initiated via the push switches located on the Control Panel Motherboard.

External Rain and/or Wind sensors (if required) can be connected via Terminal Blocks X7 and X8.

Wiring / Connection Notes for EMB 7300 SHEV Control Panel used for Smoke Clearance.

When using the SHEV Control Panel in Fire / Smoke Clearance Mode, the FAS Module (Supplied Loose) is to be attached internally to the RHS of the SHEV Control Panel enclosure; and the 10K Resistor between Terminal X6-1 and X6-22 removed. The FSA Module is to be wired / connected to Terminals X6-1 & 22 as detailed:

X6-1 -----<--- FAS-3

X6-22 -----<--- FAS-1

IMPORTANT: Connections from an external Fire Control System to the FAS Module **MUST** be from a Normal Open (N/O) and Volt Free Contact.

FAS-4 -----<---

Feed from external Fire Control System N/O Contact

FAS-5 -----<---

Connecting power supply 240V

The panel will display a green ON led when initially powered. If the indicator light is amber and flashing, there is a fault with the system. The number of flashes and duration help identify faults. For fault codes, refer to page 22-23 of Ferralux SHEV Control Unit EMB 7300 – Installation and Operating Instructions.

Wind Speed and Rain Sensor Connections

The EMB 7300 SHEV Control Panel has three Wind Speed Setting, Low / Medium / High. The Panel as delivered is set to LOW.

Wind and/or Rain sensors are connected on Terminals Blocks X7 and X8. Refer to Ferralux SHEV Control Unit EMB 7300 – Installation and Operating Instructions for connection options.

Post Installation, Pre Operation inspection prior to testing

Ensure all system monitoring lights are green and not showing any faults.

Ensure AOV smoke vent is not obstructed prior to testing. See Diagram 4.

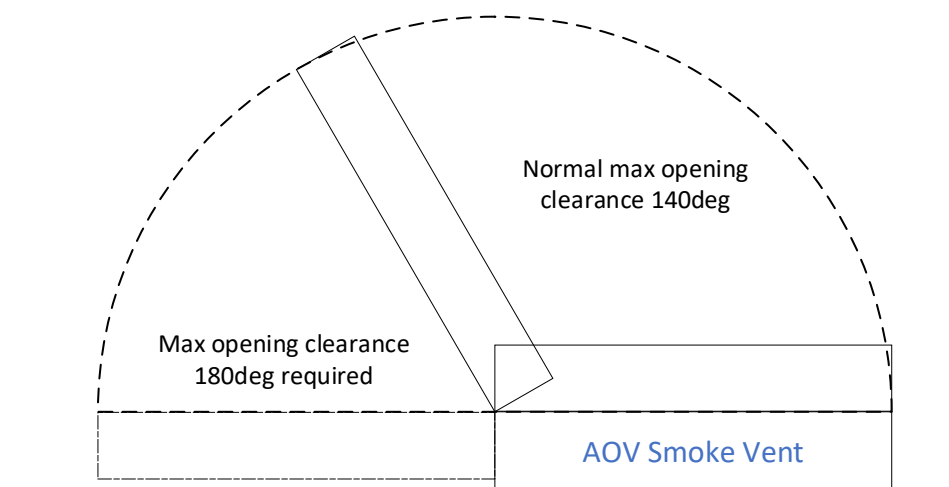


Diagram 4