HAES

AOV®

Automatically Opening Vent Control Panel

Installation, Commissioning & Operating Manual

Approved Document UI-AOV-01 Issue 7.0

CE

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Model Number

3 Amp, Automatically Opening Vent control panel, AOV-3 (standard spec) & AOV-3H (high spec)

5 Amp, Automatically Opening Vent control panel, AOV-5 (standard spec) & AOV-5H (high spec)

10 Amp, Automatically Opening Vent control panel, AOV-10 (standard spec) & AOV-10H (high spec)

In accordance with the following directives:
2006/95/EC - The Low Voltage Directive
2004/108/EC - The Electromagnetic Compatibility Directive

Is in conformity with the applicable requirements of the following documents:

BSEN 50130-4 +A1, 2014. Product family standard immunity requirements for components of fire, intruder and social alarm systems.

BSEN 61000-6-3, 2011. Electromagnetic Compatibility (EMC) General Standards. Emission standard for residential, commercial & light industrial environments.

BSEN 62368-1, 2014. Audio/video information and communication technology equipment safety requirements.

IMPORTANT NOTE

PLEASE READ THIS MANUAL BEFORE HANDLING THE EQUIPMENT AND OBSERVE ALL ADVICE GIVEN IN IT

THIS PARTICULARLY APPLIES TO THE PRECAUTIONS NECESSARY TO AVOID E.S.D

ATTENTION

IMPORTANT SAFETY NOTES

The panel is safe to operate provided it has been installed in compliance with the manufacturer's instructions and used in accordance with this manual.

Hazardous voltages are present inside the panel—DO NOT open it unless you are qualified and authorised to do so. There is no need to open the panel's enclosure except to carry out commissioning, maintenance and remedial work. This work must only be carried out by competent service personnel who are fully conversant with the contents of the panel's installation manual and have the necessary skills for maintaining this equipment.

Disclaimer

No responsibility can be accepted by the manufacturer or distributors of this control panel for any misinterpretation of an instruction or guidance note or for the compliance of the system as a whole. The manufacturer's policy is one of continuous improvement and we reserve the right to make changes to product specifications at our discretion and without prior notice. E & O E.

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PRODUCT OVERVIEW

AOV is a range of single area Automatic Opening Vent control panels. The panels are available with three different output capabilities, 3 Amp, 5 Amp & 10 Amp for controlling small, medium or larger loads.

The panels are supplied in two different enclosure sizes with the 3 Amp version in a smaller cabinet with space for 3.2Ah batteries and the 5 & 10 Amp versions in a larger cabinet with space for 12Ah batteries.

Standard & high spec versions are available with the high spec version including additional control inputs and outputs. See product codes and features table.

All variations are supplied in a sheet steel enclosure suitable for wall mounting with a hinged, lockable front access door. The panels can be semi recessed using a suitable recessing bezel. Cable entry is via 20mm knockouts located at the top and rear of the cabinet.

Different key types are used for the door lock and the ‘activate controls’ key switch. It is also possible to enable the controls via a 4 digit code entry, if preferred. An eight button keypad is used to control the system and allow access to the function options. The three main buttons, ‘OPEN VENT’ (red), ‘CLOSE VENT’ (blue) & ‘RESET’ (green) being much larger and colour coded to assist the end users.

The panels are designed to control 24vdc motorised vents which use a polarity reversal to control direction. A 1 Amp output is also provided for the control of magnetic vents or other purposes.

Product codes and features

Product	Power	Enclosure Size	Batt Capacity	Inputs	Outputs
AOV-3	3 Amp	308W x 260H x 80D	3.2Ah	A, S, E, F	M, ACT(x1), CA, CF
AOV-3H	3 Amp	308W x 260H x 80D	3.2Ah	A, S, R, P, E, F, B	M, ACT(x2), CA, CF, BMS
AOV-5	5 Amp	460W x 310H x 110D	12Ah	A, S, E, F	M, ACT(x1), CA, CF
AOV-5H	5 Amp	460W x 310H x 110D	12Ah	A, S, R, P, E, F, B	M, ACT(x2), CA, CF, BMS
AOV-10	10 Amp	460W x 310H x 110D	12Ah	A, S, E, F	M, ACT(x1), CA, CF
AOV-10H	10 Amp	460W x 310H x 110D	12Ah	A, S, R, P, E, F, B	M, ACT(x2), CA, CF, BMS

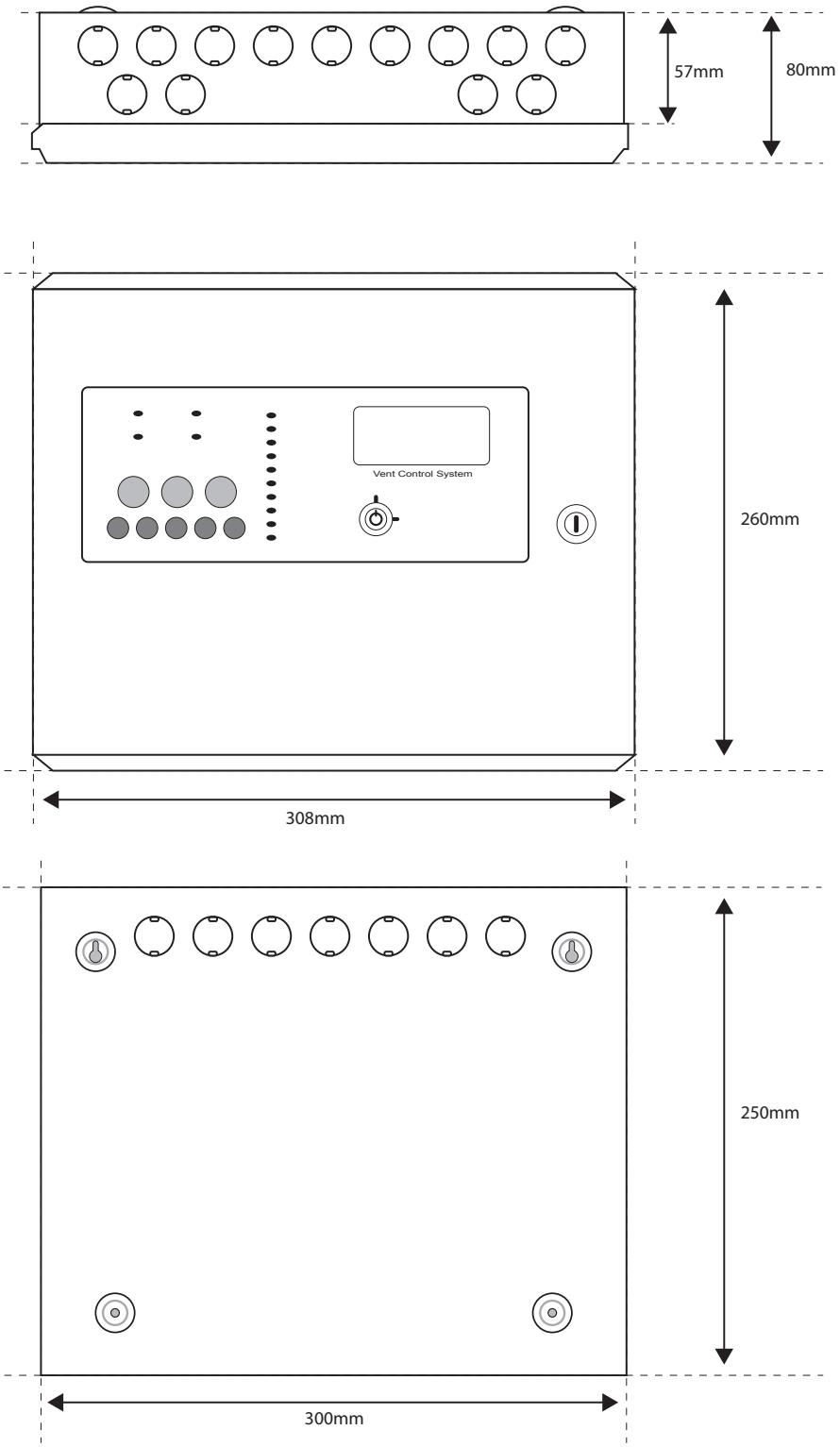
Input & output key

Inputs		Outputs	
A	Alarm input circuit	M	Magnetic vent
S	Smoke detection circuit	ACT	Actuator
R	Rain sensor	CA	Common alarm contacts
P	PIR sensor	CF	Common fault contacts
E	External control switch	BMS	BMS 0-10v status
F	Firemans override		
B	BMS 0-10v control		

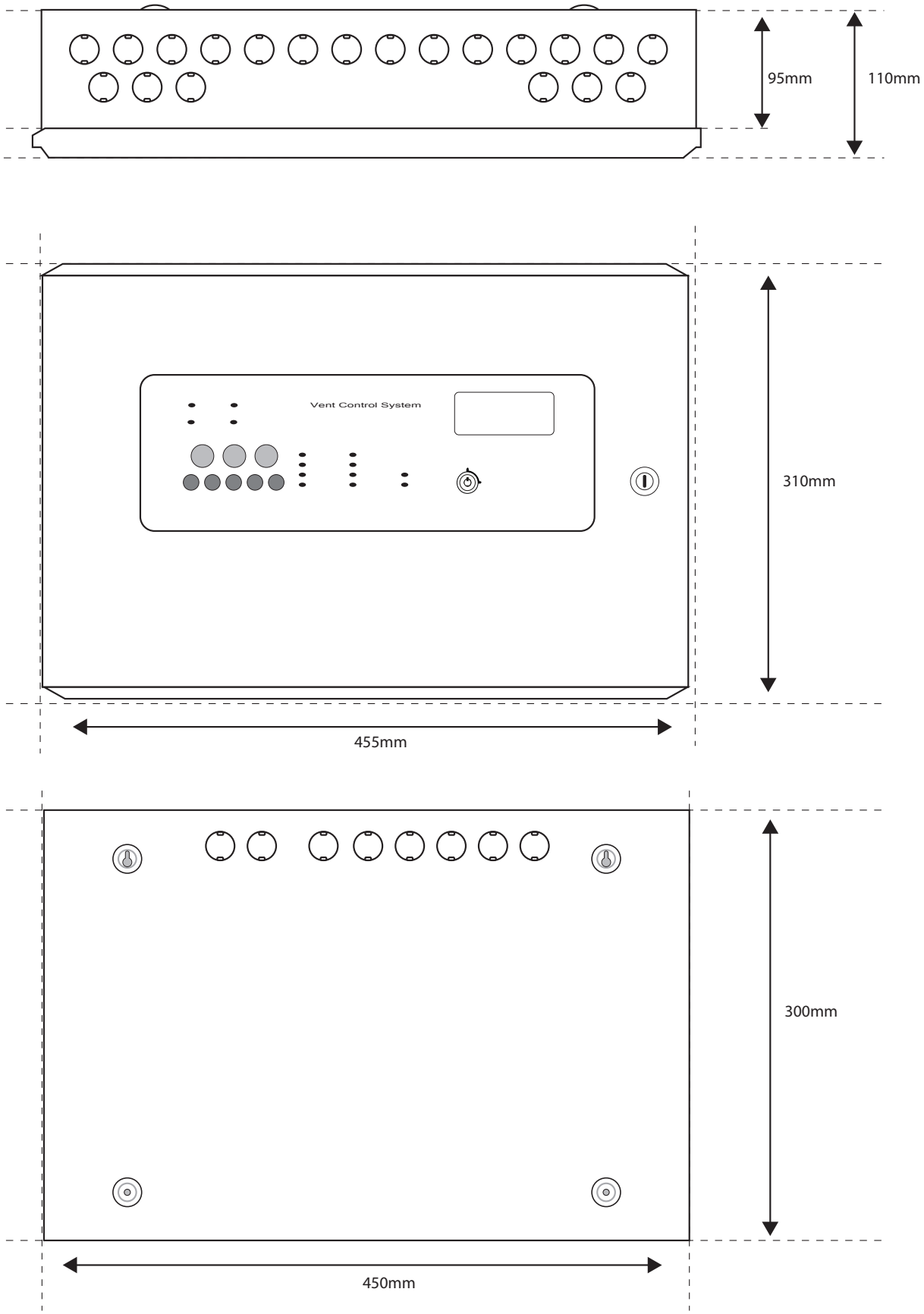
Quiesecent and alarm current details for standby battery calculations

Model	Standby Current	Alarm Current
AOV-3	65mA	106mA
AOV-3H	75mA	116mA
AOV-5	65mA	106mA
AOV-5H	75mA	116mA
AOV-10	65mA	106mA
AOV-10H	75mA	116mA

AOV-3 CABINET



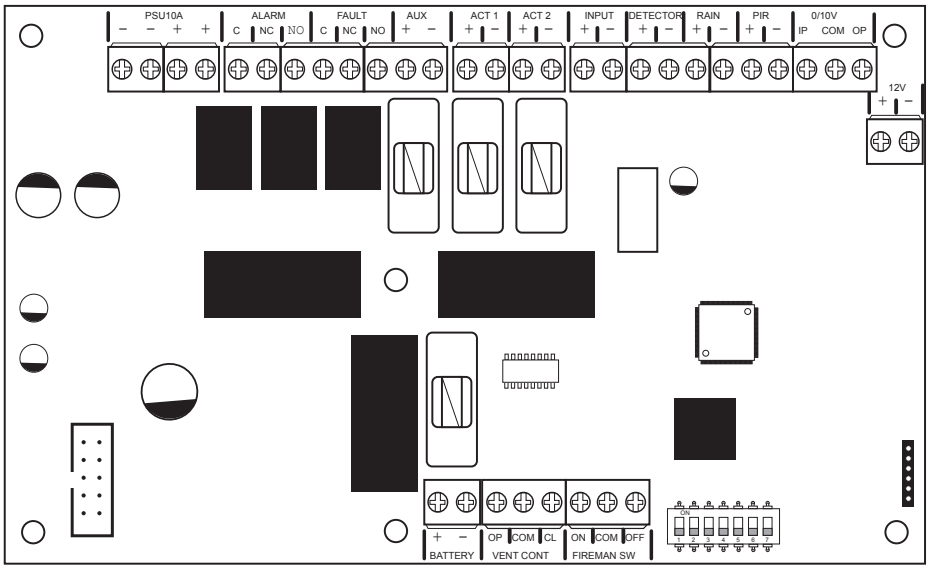
AOV-5/10 CABINET



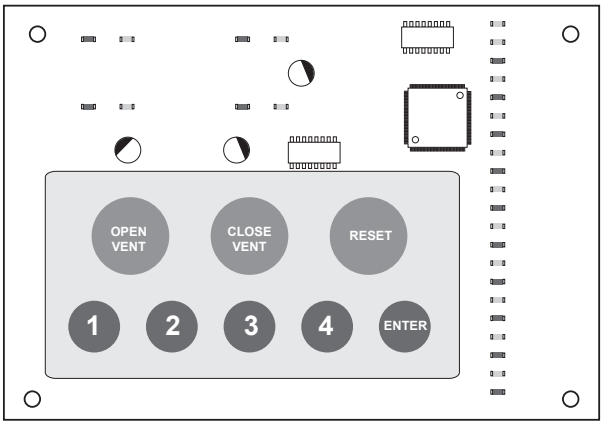
CIRCUIT BOARDS

AOV panels comprise of two circuit boards, a master PCB and a display & controls PCB

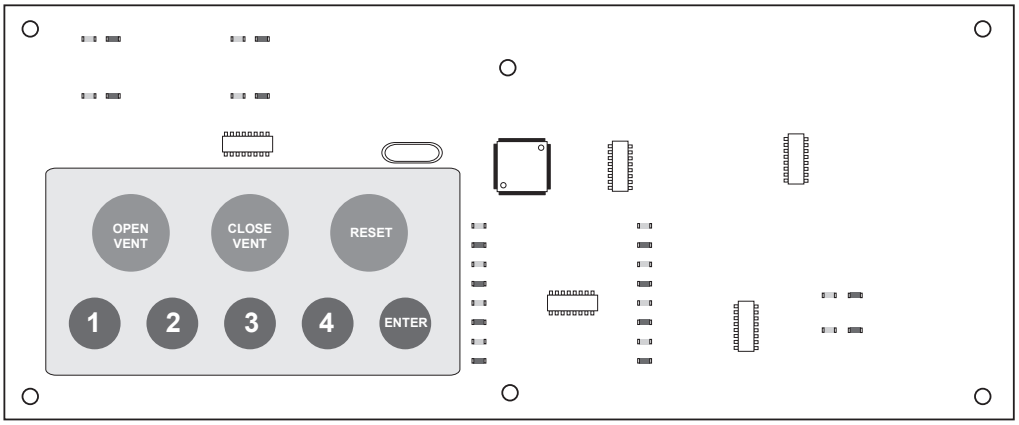
TPCA016V(H) Master PCB



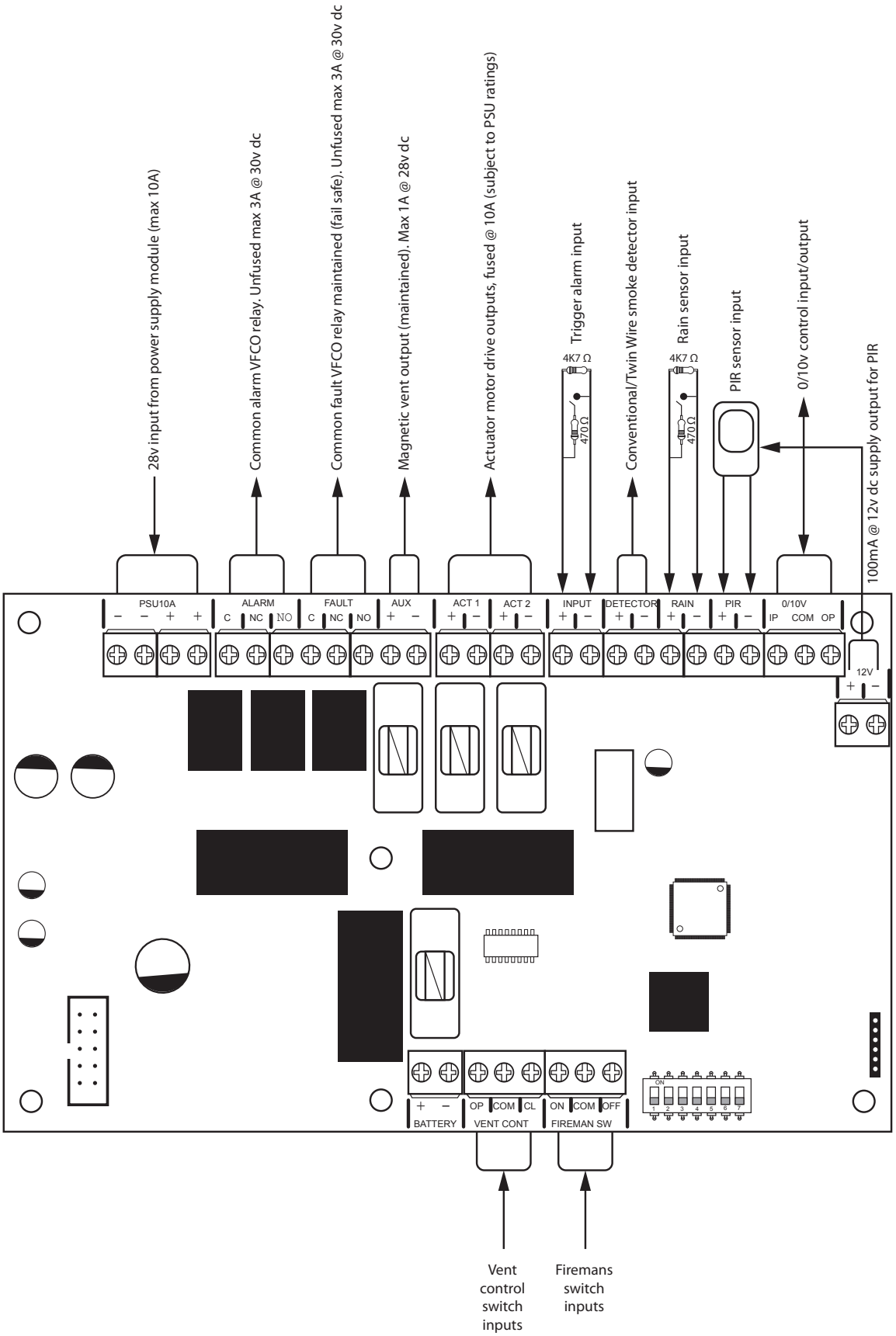
TPCA02-AOV - LED Display & Controls PCB for AOV-3 control panels



TPCA03-AOV - LED Display & Controls PCB for AOV-5/10 control panels



MAIN PCB TERMINALS (drawing shows high spec version with all available inputs and outputs fitted)



TECHNICAL SPECIFICATION

Electrical Specification Inputs & Outputs - TPCA016-V		
Cabling	Fire resistant screened cable, minimum size 1mm². Max cable length 1Km (20 Ohm). FireBurn, FP200 or equivalent (max capacitance 1uF, max inductance 1 millihenry).	Suitable cable glands must be used.
Terminal capacity	0.5mm² to 2.5mm² solid or stranded wire.	
PSU Input, 10A - - + +	28vdc supply input. Diode protected for reversal and independent short circuit. Max current 10 amps.	Max input current 10 amps. Input voltage 22vdc to 32vdc.
Common Alarm Relay	Alarm relay contact. Clean C/O. Max 3A @ 30vdc.	Unfused.
Common Fault Relay	Maintained fault relay contact. Clean C/O. Max 3A @ 30vdc.	Unfused.
Aux + -	Maintained magnetic vent output, 28v dc. Max 1 amp.	Fused 1 amp, 20mm glass quick blow fuse.
ACT1 + -	Dual polarity reversal actuator drive outputs, 28v dc. Max 8 amps.	Fused 10 amp, 20mm glass quick blow fuse.
Input + -	Alarm activating input, 470R alarm. 4K7 Ohm 5% 0.25W EOL resistor.	Monitoring current limit 14mA, unfused.
Detector + -	Fire alarm zone circuit. Conventionally wired detection circuit or Twin Wire combined detection / sounder circuit. 4K7 Ohm 5% 0.25W EOL resistor.	Monitoring current limit 50mA, fused @ 500mA. Typical max load 22 alarm devices @ 18mA each.
12v + -	12v dc supply output for PIR power.	12v dc, fused @ 100mA resettable fuse.

Additional Inputs & Outputs on High Spec Version - TPCA016-VH		
ACT2 + -	Dual polarity reversal actuator drive outputs, 28v dc. Max 8 amps.	Fused 10 amp, 20mm glass quick blow fuse.
Rain + -	Rain sensor signal input. 470R alarm. 4K7 Ohm 5% 0.25W EOL resistor.	Monitoring current limit 14mA, unfused.
PIR + -	PIR input N/C contacts. Alarm = 8K, 4K7 Ohm 5% 0.25W EOL resistor.	Monitoring current limit 14mA, unfused.
0/10v Input	Positional voltage input, 10% steps of motor time.	Max 10v dc, 75K Ω impedance.
Com	Common 0v output.	Reference ground.
0/10v Output	Positional voltage output, 10% steps.	680R impedance, max 10v dc 2mA. Max 20K Ω load.

General Specification	
Enclosure	Steel IP30. Epoxy powder coated Interpon Radon, silver grey
Temperature range	-5 deg C to +40 deg C max RH 95%
Number of conventional/Twin Wire detection circuits	1
Conventional/Twin Wire detector compatibility	Apollo: S65, Orbis. / Hochiki CDX. / Nittan EV

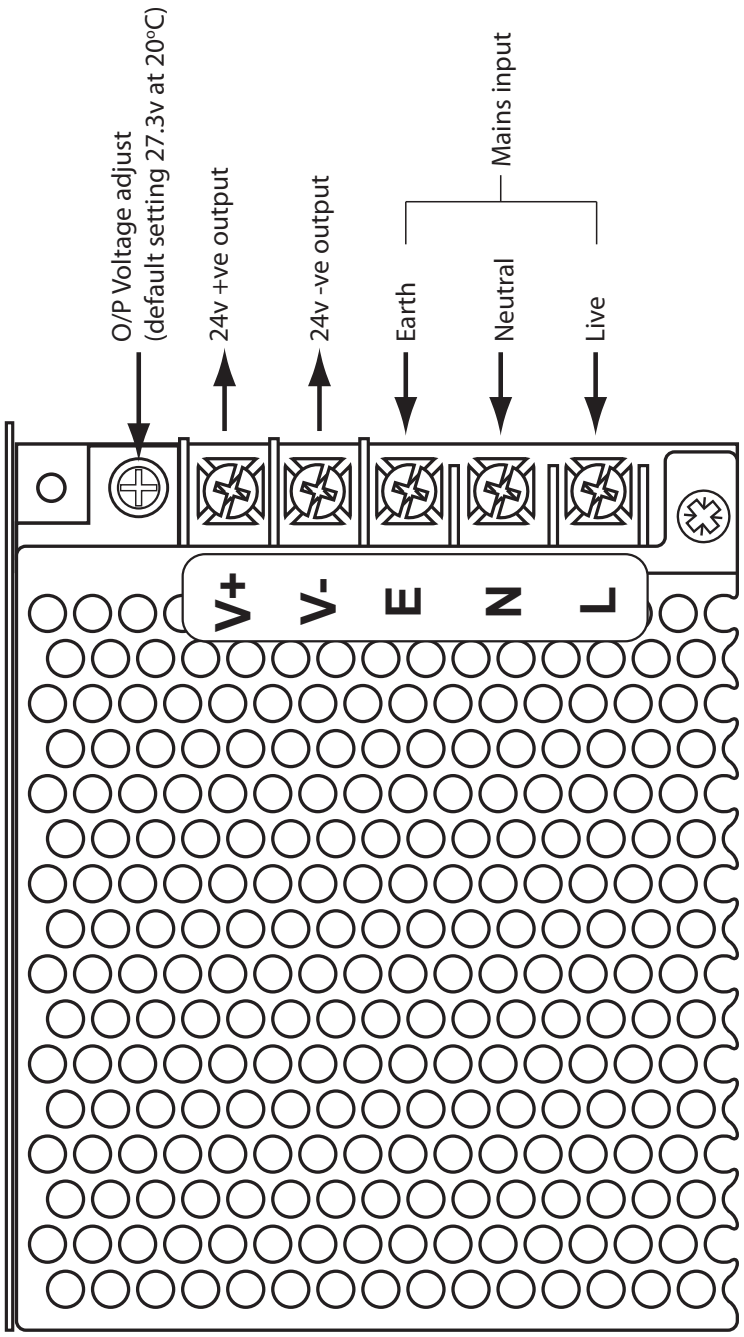
POWER SUPPLY MODULES

Power Supply Specifications - PSM3-24 (AOV-3)		
Mains supply	230vac +10% -15%	50Hz 1.2A
Mains supply fuse	4 Amp (F4A 250V)	Not accessible
Power supply rating	3 Amp incl battery charge	Max shared load 3A
Power supply output voltage	22-27.6 vdc	Set for batt charge O/P 27.3v
Maximum ripple	120mV p-p.	
Min/max battery size and type	1.2Ah/3.2Ah x 2 12volt VRLA Yuasa NP range	
Battery charging voltage	27.3 nom dc	
Battery charging output current	630mA Current limited 10 Ohms	
Max current drawn from batteries	10 Amps. Battery fuse 10A HBC 20mm	

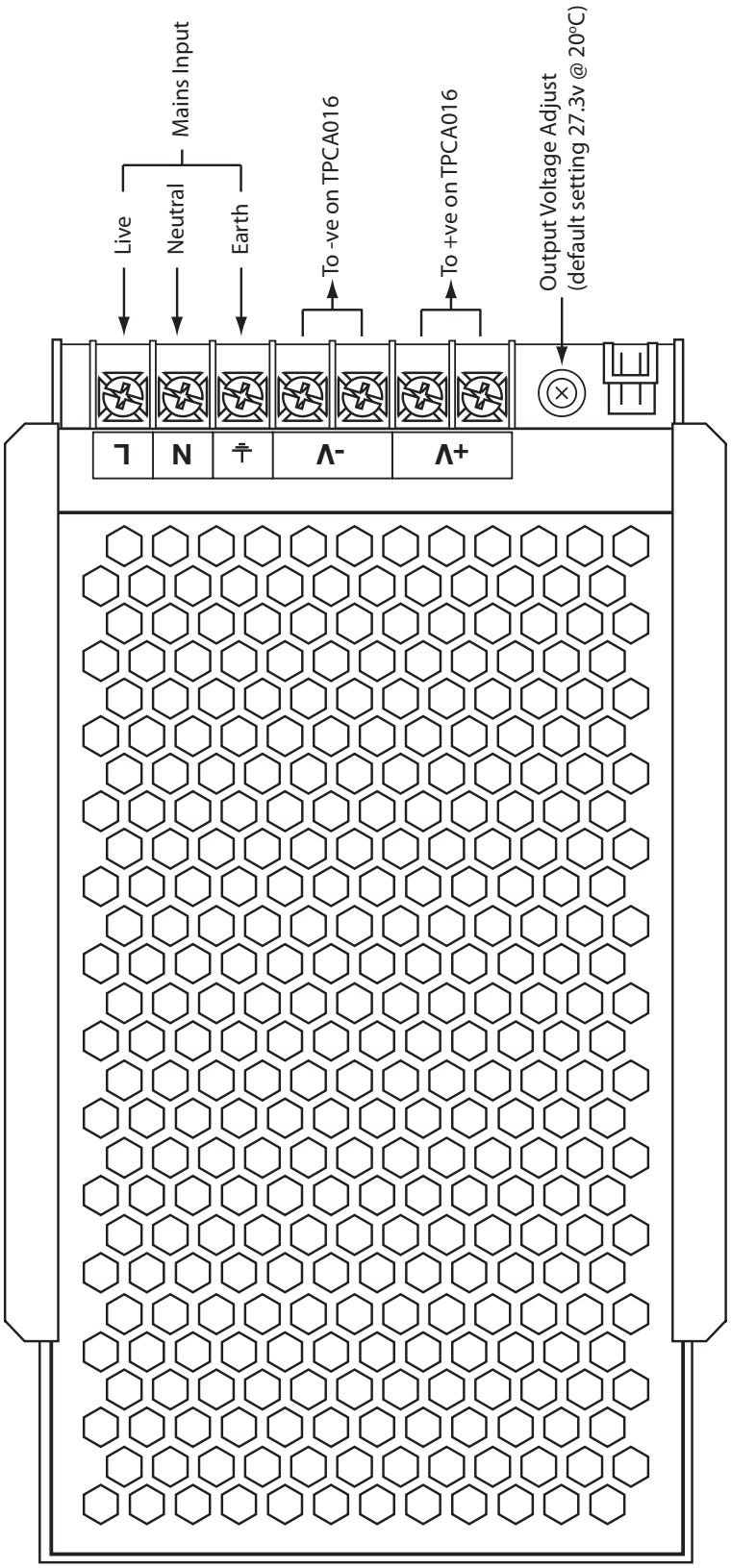
Power Supply Specifications - PSM5-27 (AOV-5)		
Mains supply	230vac +10% -15%	50Hz 0.8A
Mains supply fuse	3.15 Amp (F3.15A 250V)	Not accessible
Power supply rating	5 Amp incl battery charge	Max shared load 5A
Power supply output voltage	25.7-29.7 vdc	Set for batt charge O/P 27.3v
Maximum ripple	150mV p-p.	
Min/max battery size and type	3.2Ah/12Ahr x 2 12volt VRLA Yuasa NP range	
Battery charging voltage	27.3 nom dc	
Battery charging output current	630mA Current limited 10 Ohms	
Max current drawn from batteries	10 Amps. Battery fuse 10A HBC 20mm	

Power Supply Specifications - PSM10-27 (AOV-10)		
Mains supply	230vac +10% -15%	50Hz 1.5A
Mains supply fuse	6.3 Amp (F6.3A 250V)	Not accessible
Power supply rating	10 Amp incl battery charge	Max shared load 10A
Power supply output voltage	26-31.5 vdc	Set for batt charge O/P 27.3v
Maximum ripple	200mV p-p.	
Min/max battery size and type	3.2Ah/12Ahr x 2 12volt VRLA Yuasa NP range	
Battery charging voltage	27.3 nom dc	
Battery charging output current	630mA Current limited 10 Ohms	
Max current drawn from batteries	10 Amps. Battery fuse 10A HBC 20mm	

AOV-3 - 3 AMP POWER SUPPLY MODULE



AOV-5/10 - 5 & 10 AMP POWER SUPPLY MODULE



CIRCUIT DESCRIPTION/FUNCTIONS

PSU 10A - - + +

28v dc input from power supply module. Maximum input current, 10 Amps.

ALARM C NC NO

Common alarm changeover relay contacts. Activate when an alarm condition (470R) exists on the input or detector circuit.

FAULT C NC NO

Common fault signal changeover relay contacts. Normally energised (failsafe) contacts, change over when any fault is active on the panel or in the event of total power loss.

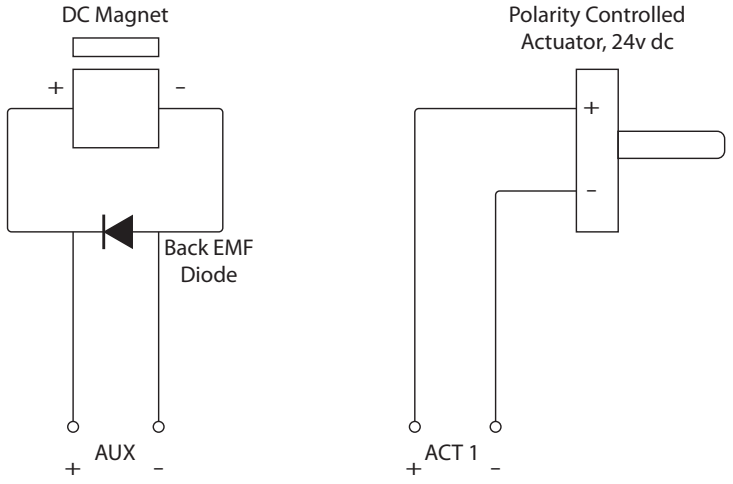
AUX + -

A maintained magnetic vent 28v output. Switches off to release magnet in the alarm condition. The output can be inverted using DIL switch 2 on the main PCB. The 0/10v BMS input does not affect the operation of this output.

ACT1 + - / ACT2 + -

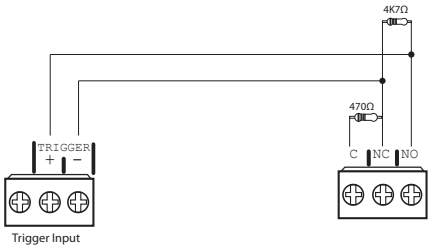
Fused motor drive outputs, not normally powered. Operated for a configurable time period of 10 to 120 seconds. The default setting is 30 seconds, this should be set to the time period required to open/close the vent fully. Polarity is reversed for vent closure. Both outputs, when fitted, always operate fully.

On commissioning the vent should be set to the fully closed position prior to connection. The actuator outputs may be changed to a continuous, maintained operation using DIL switch 3, 'ACT POWER'.



INPUT + - (NON LATCHING)

Alarm signal input from a remote contact. Monitored for open and short circuit faults, 4K7 end of line monitoring resistor. Alarm signal requires a 470 Ω impedance. Can be programmed to accept a short circuit as alarm input and latching mode (see programming details).



DETECTOR + -

Conventional/Twin Wire fire alarm zone circuit. Monitored via a 4K7 end of line resistor. Up to 20 detectors may be used on this circuit, these may use schottky diode bases for detector removal monitoring, assuring that if a detector is removed, other devices on the cable are still functional.

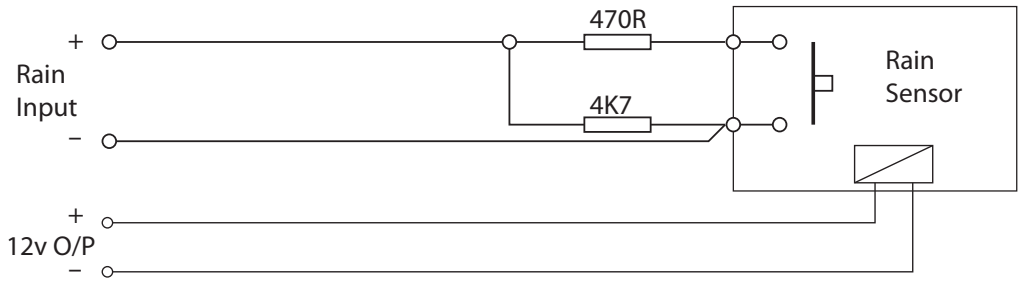
The circuit can be used in 'Twin Wire' mode by selection of DIL switch 4 on the main PCB. This allows use of 24v alarm sounders in reverse polarity on this circuit. Note: In this mode the detectors require special 'Sav-Wire' bases.

An alarm on the detector circuit will activate the vent outputs in the same way as the activation input.

Some programming options are available for this circuit, please refer to the programming and set up section.

RAIN + - (only available on the high spec versions)

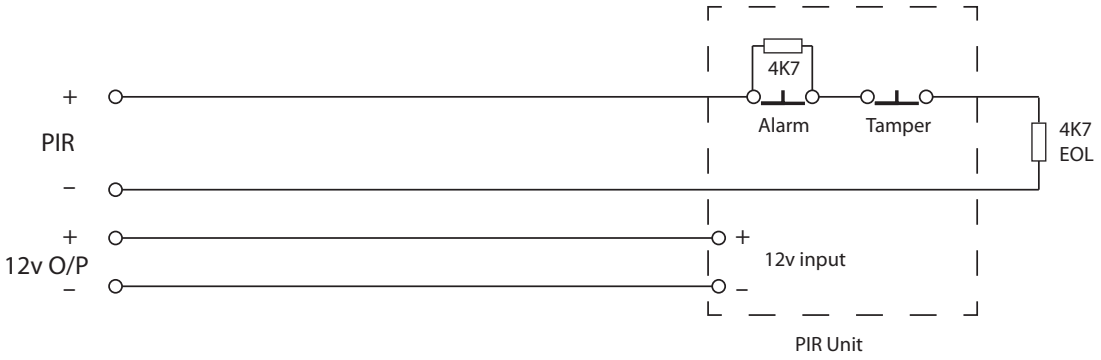
Signal input from rain sensors. Typically a rain sensor will have a closing contact alarm signal and may require a 12v supply which can be taken from the 12v output in the panel. The input requires a 470 Ω impedance to trigger. The rain signal will close a manually opened vent but will not override an alarm signal status.



PIR + - (only available on the high spec versions)

The PIR input is available to monitor a typical security type PIR with N/C alarm and tamper contacts. When operated the PIR alarm prevents the vent from closing, to guard against entrapment injury.

The PIR should be mounted in accordance with the manufacturers instructions to detect presence in the vicinity of the entrapment risk.



0/10V (only available on the high spec versions)

Designed for interfacing with control systems using 0/10 volt proportional control signals.

IP	Accepts 0/10 volt (dc) signal in 1 volt steps per 10%. Vent position is determined by running time, which by default is 30 seconds, i.e. 10% = 3 seconds running time, 50% = 15 seconds etc.
COM	This is 0 volts common reference for 0/10V input & output
OP	This output represents the position of the vent according to the time run. Provides feed back of the 0/10V input status and vent positional information.

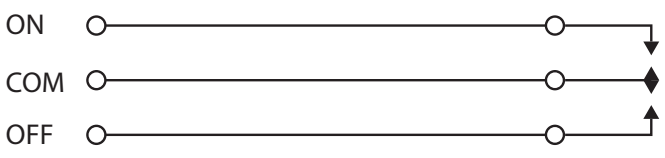
12V + -

12 volts dc supply for PIR or general purpose use. Max continuous rated load 100mA.

FIRMANS SW

Input for 3 way firemans control switch.

ON	Activates the vent output (fully open vent)
COM	Common 0v reference
OFF	Disables vent operation (regardless of status)
AUTO	(neither input grounded) Vent follows panel automatic control

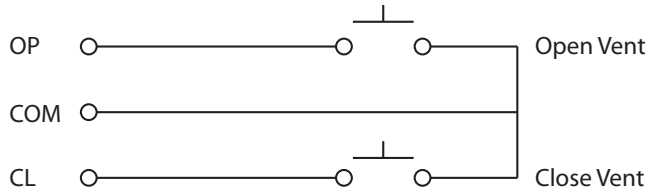


Firemans
3 way switch

VENT CONT

Vent control inputs for manual operation of vents via seperate 3 way control switch.

OP	Open vent
COM	Common 0v reference for switching inputs
CL	Close vent



BATTERY + -

Connections for 24v VRLA batteries

CABLE TYPES & LIMITATIONS

To comply with EMC (Electro Magnetic Compatibility) regulations and to reduce the risk of electrical interference in the system wiring, we recommend the use of screened cables throughout the installation. Acceptable, commonly available, screened cables, which can be used on both the sounder and detector circuits include, NoBurn™ FP200™, Firetuff™, Firecel™, MICC (Pyro™) or any other cable complying with BS 6387 categories C, W, Z.. Refer to BS 5839 pt1 clause 26 for detailed information on cables wiring and interconnections.

CABLING

Suitable cables should be brought into the cabinet using the knockouts provided via a suitable cable gland recommended for use with that cable. The screen or drain wire of circuits should be bonded to earth at one location only, and should be continuous throughout the circuit. Drain wires should be terminated in the cabinet using the earthing terminal provided.

CABLE LENGTHS

The maximum recommended cable length for a zone or sounder circuit is 1Km. This, however, is highly dependant on the number and type of devices connected.

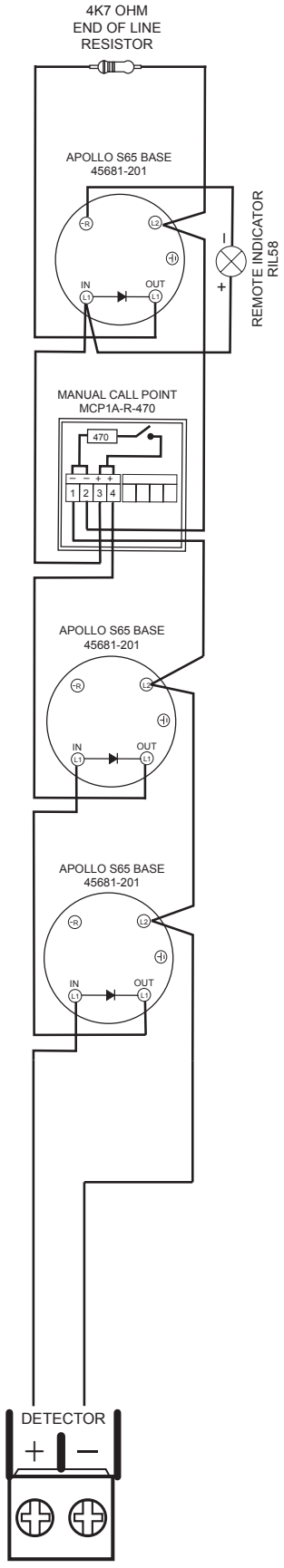
If in doubt, cable load and resistance calculations should be undetaken to ensure devices are working within specified limits.

MAINS PROVISION

The mains supply to the control panel should be hard wired, using suitable three core cable (no less than 1.0 mm^2 and no more than 2.5mm^2) or a suitable three conductor system that meets the appropriate national wiring regulations. The panel should be fed from an isolating switched fused spur, supplied directly from the Main Distribution Board, fused at 3A. This should be secure from unauthorised operation.

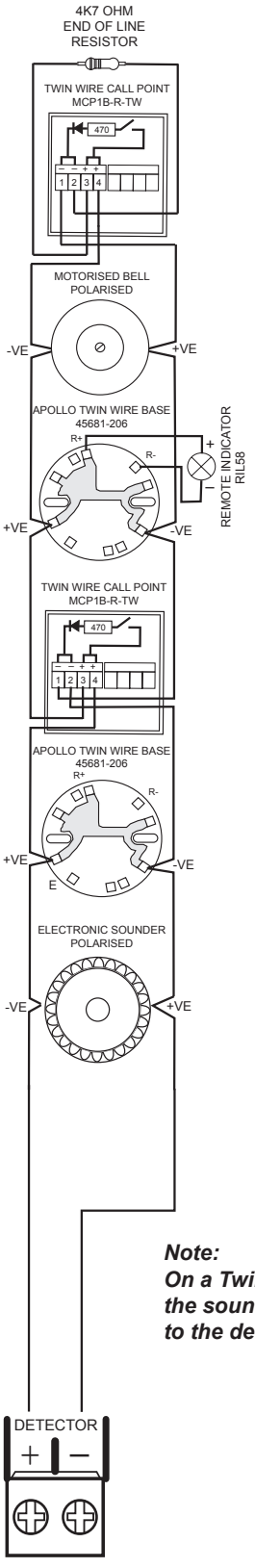
As an alternative to a switched fused spur, an appropriately fused double pole isolating device may be used providing it meets the appropriate national wiring regulations.

DETECTOR CIRCUIT CONVENTIONAL SYSTEM SCHEMATIC

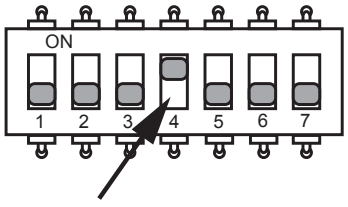


DETECTOR CIRCUIT TWIN WIRE SYSTEM SCHEMATIC

Typical Twin Wire Circuit Wiring



Note:
Detector circuit configuration is set to 'Conventional' by default. 'Twin Wire' mode must be set using DIL switch 4 on main PCB.



Note:
On a Twin Wire circuit the sounders are connected in reverse polarity to the detectors and call points

SAFETY

Suppliers of articles for use at work are required under section 6 of the Health and Safety at Work Act 1974 to ensure as reasonably as is practical that the article will be safe and without risk to health when properly used. An article is not regarded as properly used if it is used “without regard to any relevant information or advice” relating to its use made available by the supplier.

This product should be installed, commissioned and maintained by, or under the supervision of, competent persons according to good engineering practice and,

(i) BS 7671 (IEE wiring regulations for electrical installations)
(ii) Codes of Practice
(iii) Statutory requirements
(iv) Any instructions specifically advised by the manufacturer

According to the provisions of the Act you are therefore requested to take such steps as are necessary to ensure that any appropriate information about this product is made available by you to anyone concerned with its use.

This equipment is designed to be operated from 230V AC 50/60 Hz mains supplies and is of Class I construction. As such it must be connected to a protective earthing conductor in the fixed wiring of the installation. Failure to ensure that all conductive accessible parts of this equipment are adequately bonded to the protective earth will render the equipment unsafe.

This equipment must only be installed and maintained by a suitably skilled and technically competent person.

THIS IS A PIECE OF CLASS 1 EQUIPMENT AND MUST BE EARTHED

Installation of the panel should only be carried out by qualified personnel. The electronic components within the panel can be damaged by static charge. Suitable precautions must be taken when handling circuit boards. Never insert or remove boards or components, or connect cables, with the mains power on or batteries connected.

Equipment Guarantee

This equipment is not guaranteed unless the complete system is installed and commissioned in accordance with the laid down national standards by an approved and competent person or organisation.

CE This product has been manufactured in conformance with the requirements of all applicable EU Council Directives

ESD PRECAUTION

Electronic components are vulnerable to damage by Electrostatic Discharges (ESD). An ESD wrist strap, suitably grounded, should be worn at all times when handling pcbs. These wrist straps are designed to prevent the build up of static charges, not only within a persons body, but on many other materials.
ESD damage is not always evident immediately, faults can manifest themselves at anytime in the future.
All pcbs should be stored in static shielded bags (silvered) for safe keeping, when not mounted in the control panel.

GENERAL

Care should be taken with regards to avoiding the close proximity of high voltage cables or areas likely to induce electrical interference. Earth links should be maintained on all system cables and grounded in the control panel. The detection and sounder circuit cabling is classed as extra low voltage and must be segregated away from mains voltage.

- Any coils or solenoids used in the system must be suppressed, to avoid damage to the control equipment.

MOUNTING THE CABINET

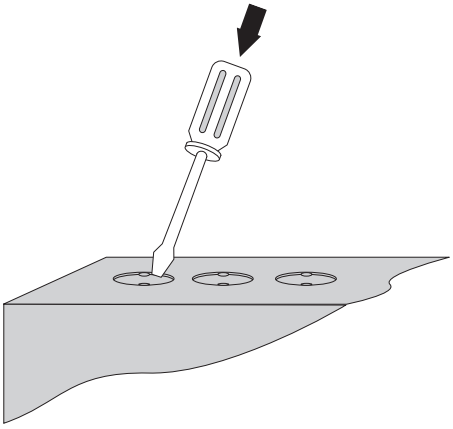
The site chosen for the location of the panel should be clean, dry and not subject to shock or vibration. Damp, salt air or environments where water ingress or extremes of temperature may affect the panel must be avoided. The temperature should be in the range -5° to +40°C, and the relative humidity should not exceed 95%.

Before mounting the cabinet remove the main PCB.

Remove the power supply module connecting wires from the main PCB, taking care to note where to re-connect them. The main PCB can then be carefully pulled off it's mounting clips.

Secure the cabinet to the wall using the four indented holes in the back box. Ensure the box is mounted level and in a convenient location where it may be easily operated and serviced.

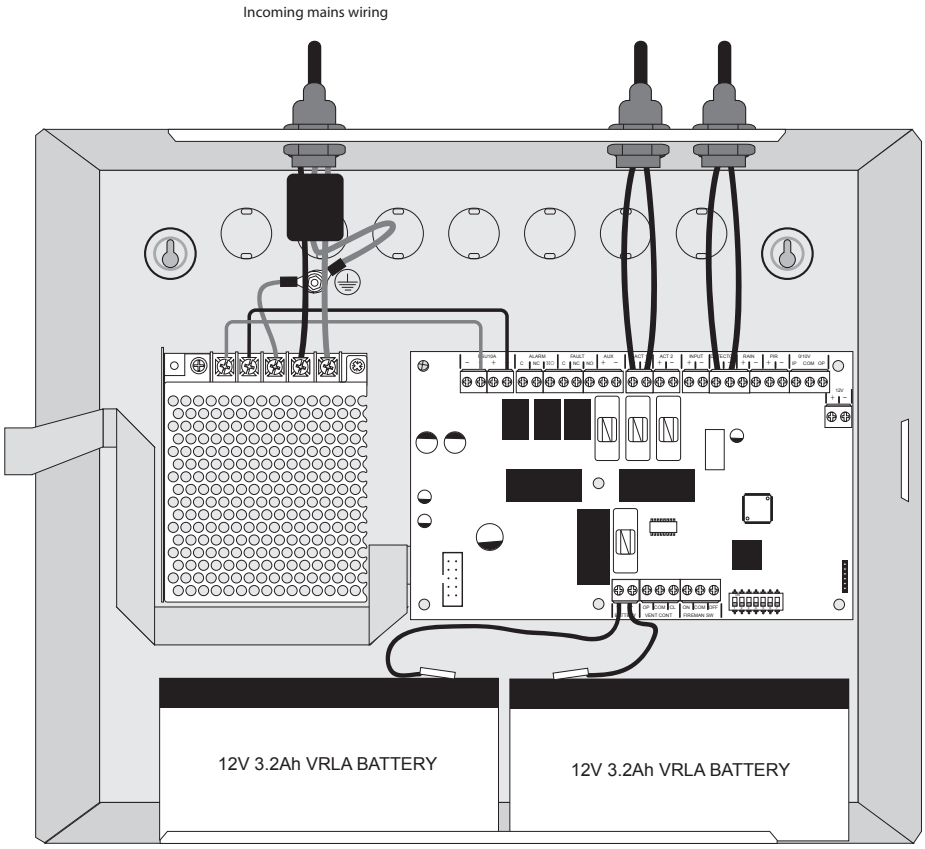
External cables should be glanded via preformed knockouts at the top and rear of the cabinet. Remove any knockouts and ensure the cabinet is clear of swarf etc prior to refitting the PCB. Always ensure that if a knockout is removed, the hole is filled with a good quality cable gland. Any unused knockouts must be securely blanked off.



Knockouts should be removed with a sharp tap at the rim of the knockout using a flat 6mm broad bladed screwdriver.

Use of excessive force will damage the enclosure around the knockout.

Typical panel layout



Drawing shows typical internal layout of the AOV-3 panel cabinet with two 3.2Ah, 12v batteries fitted

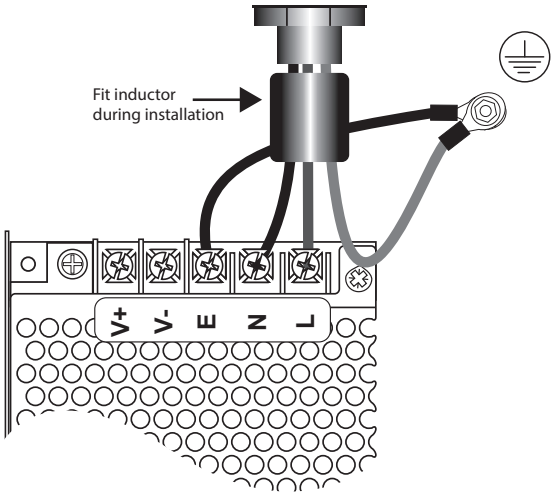
MAINS CONNECTIONS

Do not connect the mains supply to the panel until you are fully conversant with the layout and features of the equipment.

A rating plate is attached to the power supply module describing the nature of the supply permitted.

The incoming mains supply should be brought into the panel via one of the knockouts provided.

A suitable cable gland must be used to secure the outer sheath of the cable used. The earth must first be connected to the primary earth stud (peg) marked with a ⏚ symbol, using a suitable ring crimp.



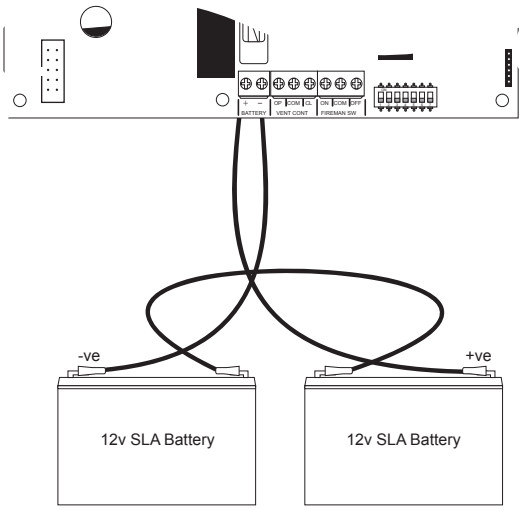
Sufficient earth lead should be left to allow Live and Neutral connections to be accidentally pulled from the terminal block while leaving the earth connection intact.

The Loose Ferrite Inductor must be fitted as shown on the mains input to the power supply module for the panel to comply with EMC regulations. This applies to models; AOV-5, AOV-5H, AOV-10 & AOV-10H.

CONNECTING THE BATTERIES

Batteries of even very small capacity are capable of delivering very high currents which can cause fire or injury, therefore battery connections should be done with caution.

The panel is supplied with battery leads already connected to the battery terminals on the main PCB. These leads are coloured red for +ve and black for -ve.



2 x 12v batteries should be connected in series using the white jumper lead provided. See diagram.

To optimise the service life of the batteries, the battery charger output voltage varies with temperature.

N.B.
In the event of mains failure, the battery charger circuit will protect the batteries from full discharge by disconnecting them when they reach below 19v. When the mains supply is restored the batteries will be automatically reconnected.

NOTE:
If the mains is connected before the batteries, the panel will show a Power Supply fault for up to 1 minute until the monitoring cylce has finished polling. This is normal. If the fault doesn't clear after 1 minute, check connections.

BATTERY CHARGING VOLTAGE CHECKS

The battery charging voltage is factory calibrated to 27.3vdc +/- 0.2v @ 20°C. This should not normally require adjustment. Where battery problems are experienced, the following information should be considered.

a) If a battery is disconnected from the charger, no voltage will appear on the output leads or terminals, due to intelligent battery controls.

b) Check the power supply voltage at the 28v & 0v supply output terminals. With the batteries disconnected the voltage should be 28.0vdc +/- 0.2v @ between 11°C - 40°C.

c) To test the batteries, turn off the mains and see if the system will run on the batteries. Check the battery voltage, should be 26.8v for a good battery or 22v for a flat battery.

d) The power supply voltage can be adjusted using the potentiometer on the power supply module, checking at the 28v & 0v output terminals with a calibrated volt meter. Batteries should be disconnected and the Access Level 3 DIL switch (DIL switch 6 on the main PCB) should be set to 'ON'. Carefully adjust the voltage to 27.3vdc +/- 0.2v. When completed, switch off Access Level 3 DIL switch (DIL switch 6 on the main PCB) and re-connect the batteries.

e) When the panel is re-charging a low battery, it should be possible to see the voltage across the batteries increase gradually. If this is not occurring, the batteries or the panel may be faulty.

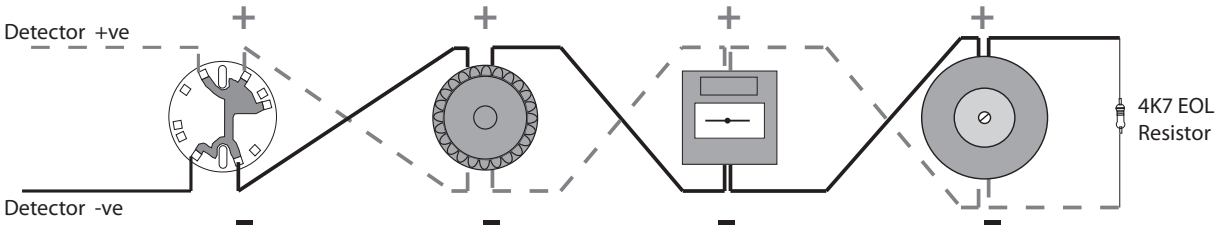
TWIN WIRE MODE

What is Twin Wire?

Twin Wire is often referred to as sav wire. The technology enables sounders and beacons to be connected to the same circuit as the detectors and call points.

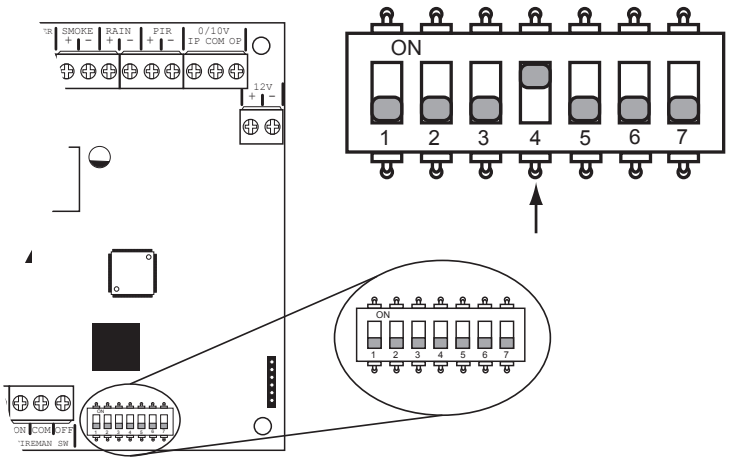
How does it work?

In Twin Wire configuration the detector circuit reverses polarity in alarm condition to power the sounders and beacons. For this reason the sounders and beacons need to be wired in opposite polarity to the detectors and call points, i.e. detector circuit positive wire connects to detector base and call point positive terminals but sounder and beacon negative terminals.



Twin Wire circuits require special ‘sav-wire’ detector bases and polarised call points but standard sounders. Most modern, non addressable, low current, polarised sounders, bells and beacons are compatible, Cooper Fulleon, Besson, Klaxon etc.

To set the DETECTOR output to Twin Wire mode, move switch 4 on the 7 way DIL switch located on the main PCB to the ‘ON’ position (up).



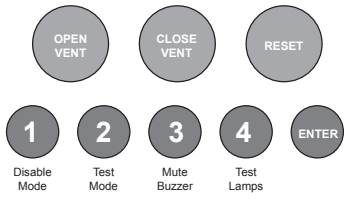
DIL SWITCH OPTIONS

The 7 way DIL switch located the main circuit board provides the following optional settings:

Switch 1	ALARM RELAY	If set to 'ON' the Alarm Relay will operate when the 'Open Vent' button is pressed. Note: The Alarm Relay will always operate for the Alarm Input and Detector Circuit alarm.
Switch 2	AUX INVERT	If set to 'OFF' (down) the magnetic vent output (AUX) is normally powered 'on' (maintained). The voltage clears during an alarm condition or 'Vent Open' status and is re-instated following a reset or in 'Vent Closed' status. If set to 'ON' (up) the magnetic vent ouput (AUX) is not normally powered (non maintained). 28v appears during an alarm condition or 'Vent Open' status. Voltage clears following a reset or 'Vent Closed' status. Could be used for controlling indicators, sounders or other ancilliary equipment active in the alarm condition. This function is not suitable for use in BMS mode (DIL Sw7 ON), and will produce a General Fault indication on the display.
Switch 3	ACT POWER	If set to 'OFF' (down) the actuator outputs function normally, i.e. powered only during timed open/closing polarity reversal. If set to 'ON' (up) the actuator outputs are maintained (normal polarity). No reversal operation and no timed function. Output clears during alarm or 'Vent Open' conditions. Provides a higher current magnetic vent output.
Switch 4	TWIN WIRE	Sets DETECTOR circuit to Twin Wire operation. See previous page.
Switch 5		Not used.
Switch 6	PROG MODE	Sets panel into Level 3 Programming Mode, see below.
Switch 7	BMS	Enable BMS mode (0/10v).

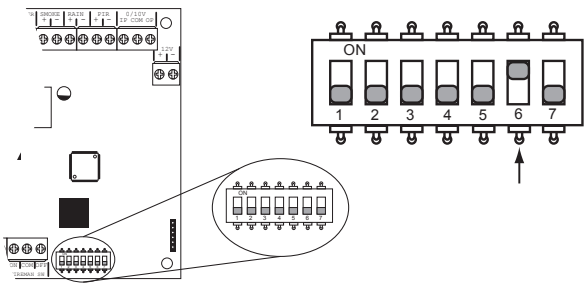
LEVEL 3 ENGINEERING OPTIONS

A series of programmable engineering options are available. These programming modes are initiated by entering a four digit code using buttons 1 - 4 on the keypad followed by the ENTER button.



To access Level 3 options, first set switch 6 on the 7 way DIL switch located on the main PCB to the 'ON' position (up). Then activate the controls by turning the key switch or by entering the four digit code (see Activate Controls in the OPERATING section).

The 'Access Level' indicator will pulse rapidly to signify that Level 3 access is active.



When finished programming, press and hold button 1 for 3 seconds to exit programming mode.

Return switch 6 to the 'OFF' position (down).

(1) (1) (2) (1) **Clear All Disablements**

(1) (1) (1) (3) **Reset All Disablements, Test Modes and Parameters Back to Factory Settings.**

Enter the required code as above and press the ENTER button.

Then press the ENTER button again and hold for 3 seconds. Any disablements will now be cleared (1121) or all disablements, test mode settings and engineering option parameters will revert back to factory settings (1113).

The panel will bleep to acknowledge the reset.

(2) (1) (2) (3) **Miscellaneous Program Options.**

There are four miscellaneous options using code 2-1-2-3. The options are represented by the 'Vent Open', 'Vent Closed', 'Input' & 'Detector' LEDs. The four options are:

1. Set keypad entry code (Vent Open LED)
2. Set motor run time (Vent Closed LED)
3. Disable battery monitoring (Input LED)
4. Disable muted tone beeps (Detector LED)

Enter the above code and press the ENTER button. The Vent Open LED will be on steady. Use buttons 1 & 3 to move forwards or backwards through the options as per above. With the desired LED lit, press the ENTER button to access edit mode for the chosen option. The LED will now pulse to indicate EDIT mode.

OPTION 1 (Vent Open LED) Change / Remove Keypad Access Code

The keypad can be used to activate the panel controls instead of using the key switch. The default code is 1-2-3-4, however, this can be changed. It is also possible to disable the use of a code entry to enable controls, forcing the use of the key switch only.

With the Vent Open LED pulsing. The General Fault (1), General Disablement (2), Test Mode (3) & Rain Status (4) LEDs will start to rapidly pulse in sequence to show the currently set code. If the ENTER button is pressd the sequence will be repeated once after which time the panel will automatically drop out of the set keypad entry mode.

Whilst the current code sequence is being repeated start to enter the new code. Enter the new code slowly and deliberately, one number at a time. The corresponding General Fault, General Disablement, Test Mode & Rain Status LEDs will rapidly pulse to confirm each entry.

Note: 'Enable Controls' codes must always start with a 1 or 2.

When finished entering the new four digit code, press the ENTER button. The panel will then confirm the new code with rapidly pulsing LEDs in sequence, after which time the panel will automatically drop out of the set keypad entry mode.

Changing the keypad code to 1 - 1 - 1 - 1 will disable the use of a keypad to enable controls.

OPTION 2 (Vent Closed LED) Set Motor Run Time

Set the Actuator motor run time for opening and closing motorised vents. The time is set in either 10 or 20 second steps.

The time is represented by the General Fault, General Disablement, Test Mode & Rain status LEDs using a 4 bit binary code.

The step size is represented by the PIR Status LED, OFF = 10 seconds, ON = 20 seconds.

Using 10 second steps General Fault = 10 seconds, General Disablement = 20 = seconds, Test Mode = 40 seconds, Rain status = 80 seconds. Using 20 second steps these times will all be doubled.

i.e to set 60 seconds, General Disablement & Test Mode LEDs should be ON (20 + 40 = 60), alternatively General Fault & General Disablement & PIR should be ON (10 + 20 doubled to 20 + 40 = 60).

With the Vent Closed LED pulsing, the General Fault, General Disablement, Test Mode & Rain Status LEDs will show the currently set time (factory default = 30 seconds). Use buttons 1 & 3 to increase or decrease the time by 10 seconds at a time if PIR status LED is OFF, or 20 seconds at a time if PIR Status LED is ON. Use button 4 to set PIR status LED On or OFF. Maximum run time of 300 seconds can be set.

Press the ENTER button to set the time and return to the main menu.

OPTION 3 (Input LED) Disable Battery Monitoring

Use this option to disable the battery monitoring (i.e batteries not installed).

With the Input LED pulsing the current status is represented by the Power Supply Fault LED.

LED OFF = Normal, batteries are monitored, LED ON = Battery monitoring disabled.

Use button 2 to change the status. Press the ENTER button to save the setting and return to the main menu.

OPTION 4 (Detector LED) Disable Muted Tone Beeps

Use this option to inhibit the intermittant beep that still occurs when a fault or fire tone has been muted using the Mute Buzzer button.

With the Detector LED pulsing the current status is represented by the PIR Status LED.

LED OFF = Normal, panel beeps intermittently when the panel buzzer has been muted, LED ON = Muted beeps disabled.

Use button 2 to change the status. Press the ENTER button to save the setting and return to the main menu.

When finished all the miscellaneous options programming, enter the next programming code or disable the controls and return DIL switch 6 to ‘OFF’.

(3) (1) (2) (1) Input Circuit Function Settings

There are 3 functional settings available for each of the input circuits (Input, Detector, Rain & PIR). These are as follows:

Alarm latching
Normally a circuit latches an alarm input signal. This setting allows the panel to clear automatically when the signal is removed. This is useful for interfacing purposes.

Short circuit as alarm
For non fault monitored systems. This allows a short circuit to activate an alarm rather than a fault condition.

Detector removal monitoring (Detector circuit only)
The detector removal monitoring can be turned off. For use with detectors which are not compatible with this function.

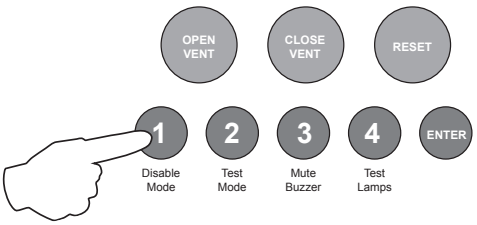
Enter the above code and press the ENTER button.

The Input LED will light. This indicates setting the above attributes for the activate Input circuit.

The General Alarm, General Fault & General Disablement LEDs will show the current attribute settings for that circuit (see table over page).

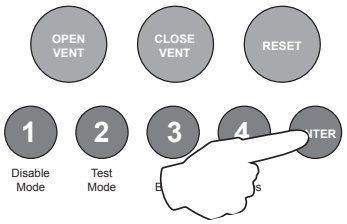
Use button 1 to move to the circuit that requires editing.

Input (Input LED), Detector (Detector LED), Rain (Rain Status LED), PIR (PIR Status LED).



With the required LED lit, press the ENTER button to enter ‘editing mode’.

The General Alarm LED will now pulse to indicate the editing of attribute 1 (alarm latching) for the selected circuit (see table over page).



Use button 1 to scroll to the attribute that requires editing, inidicated by a pulsing LED as per table below.

3121 Input Circuit Function Settings

(*) = Default State

CIRCUIT TO BE EDITED

Attributes	Input Circuit		Detector Circuit		Rain Circuit		PIR Circuit	
LED Status	*Fast Pulse*	*Slow Pulse*	*Fast Pulse*	*Slow Pulse*	*Fast Pulse*	*Slow Pulse*	*Fast Pulse*	*Slow Pulse*
CIRCUIT LATCH (Gen Alarm LED)	Latching	* Non Latching	* Latching	Non Latching	* Latching	Non Latching	Latching	* Non Latching
SHORT CIRCUIT (Gen Fault LED)	Short cct = alarm	* Short cct = fault	Short cct = alarm	* Short cct = fault	Short cct = alarm	* Short cct = fault	Short cct = alarm	* Short cct = fault
DETECTOR REMOVAL (Gen Disable LED)			Detector Removal On	Detector Removal Off				

- LED status when NOT in Edit Mode
  - Fast Pulse Status indicated by ‘STEADY’ LED
  - Slow Pulse Status indicated by LED ‘OFF’

Use button 2 to switch the attribute ON or OFF

Then use button 1 to move to the next attribute if required.

Press the ENTER button to return back to the circuit selection, indicated by a steady circuit LED.

(4) (1) (4) (1) Thermostat Controlled Ventilation Mode

This option allows for thermostat control of vent opening by using a thermostat to switch in a 4K7 resistance between the VENT CONT OP and COM terminals. This will allow the vent to open a set distance – either 10%, 20% or 50% of full opening – when the pre-set temperature on the thermostat is reached.

Enter the above code and press ENTER button.

The Vent Open Red LED will be rapidly pulsing. Press ENTER button to set the required amount of Vent opening as indicated by the Input and Detector Yellow Fault LED’s on the display as shown.

Both Input and Detector LED’s OFF = Default setting. This function is not selected i.e normal operation of the VENT CONT switch.

Input LED ON = 10% of full opening.

Detector LED ON = 20% of full opening.

Both Input and Detector LED’s ON = 50% of full opening.

Successive pressing of ENTER button will cycle through the above settings until the returning to the original state (both Input and Detector LED’s OFF = normal operation).

When the required Vent opening setting is indicted press button 1 and hold for appox. 3 second to return to Main Display.

(2) (1) (2) (4) Type ‘A’ dependency mode (false alarm management)

Dependency ‘A’ (confirmation alarm) can be used to reduce the possibility of false alarms.

Dependency ‘A’ will apply the following sequence:

1. The first detector alarm is inhibited.
2. The panel resets and re-checks the inhibited detector circuit within 15-30 seconds.
3. If an alarm is detected then the panel activates a full fire condition.
4. If no alarm is detected, the panel stays in an alert condition for 5 minutes. Any new alarm from the detector circuit within this time activates a full fire condition.
5. After 5 minutes or if RESET, the panel reverts to step 1.

Note: 220Ω ‘Evacuate’ call points should be used to provide an instant un-delayed alarm. A 470Ω call point will be included in the dependency delay sequence.

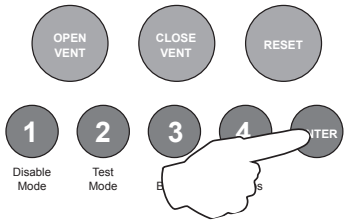
By default this is set to ‘off’

To set Detector circuit to Type ‘A’ dependency mode, enter the above code and press the ENTER button. The Vent Open LED will pulse rapidly to indicate the detector circuit is under selection.

The Input LED indicates the status as per below, press the ENTER button to change the status. Pressing the ENTER button again will toggle the status, indicated by the Input LED as below.

Vent Open LED Rapid Pulse *= Detector circuit is under selection.*

Input LED Off *= Detector circuit is set to standard alarm mode.*
Input LED On *= Detector circuit has been set to confirmation alarm mode.*

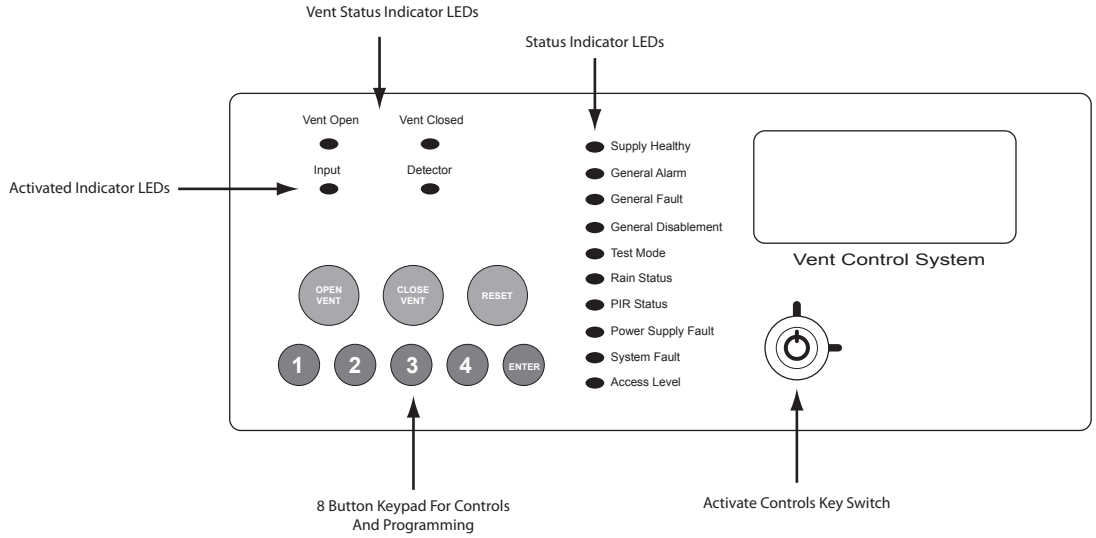


When finished programming Dependency Mode, press and hold button 1 for 3 seconds to exit programming mode.

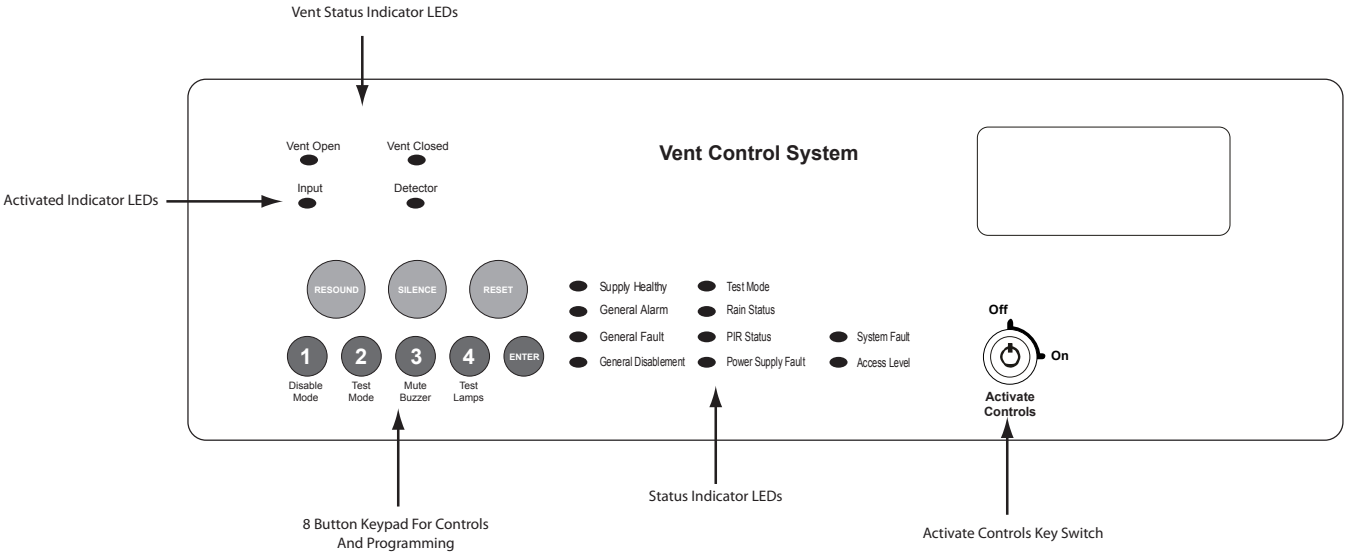
Return switch 6 to the ‘OFF’ position (down).

PANEL CONTROLS & INDICATIONS

AOV-3 Panel Display



AOV-5/10 Panel Display



Activate Controls

In normal standby mode the keypad controls are inactive to protect from unauthorised operation. Controls can be activated by using the 'Activate Controls' key switch or by entering a four digit code using the keypad.

The use of a code entry to activate the controls is enabled by default but can be disabled in the engineering functions.

To activate the controls using the key switch; turn the key clockwise to the 'On' position. The 'Access Level' indicator LED will light and all buttons on the keypad will now be operational. To deactivate the controls, turn the key back to the 'Off' position and the 'Access Level' indicator LED will extinguish.

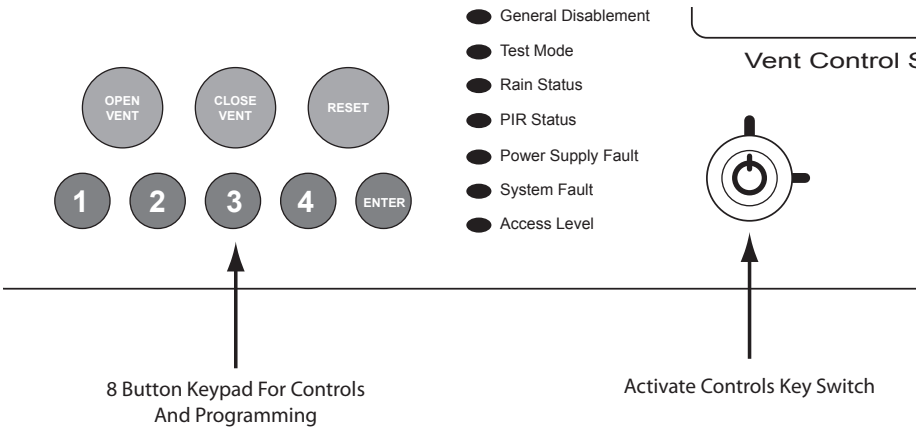
If the key switch is in the 'On' position the keypad will remain active.

NOTE : It is not possible to remove the key in the 'On' position.

To activate the controls using the keypad; enter the four digit code using buttons 1 - 4. The factory default code is 1-2-3-4 but can be changed in the engineering functions. After entering the four digit code press the 'ENTER' button. The 'Access Level' indicator LED will light and all buttons on the keypad will now be operational.

After activation by code entry, controls will automatically deactivate again after 2 minutes and the panel will return to standby mode.

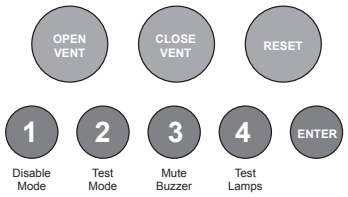
The test lamps and mute buzzer functions are operational without the need to activate controls.



Status LED Indicators

	LED On	LED Pulsing
Vent Open	Vent in open position	Vent opening
Vent Closed	Vent in closed position	Vent closing
Vent Open/Closed + PIR	N/A	Vent closing stopped while PIR active. This requires the RESET button to be pressed to make the vent move again
Input	N/A	Input faulty or disabled
Detector	Detector circuit open circuit	Detector circuit faulty, disabled or detector removed
Supply Healthy	Power on	N/A
General Alarm	N/A	Input or Detector input alarm is active
General Fault	N/A	Indicates one or more faults are present
General Disablement	Indicates circuits are disabled	Disablement selection mode is active
Test Mode	Panel test mode is active	N/A
Rain Status	Rain input is active	Rain input is faulty or disabled
PIR Status	PIR input is active	PIR input is faulty or disabled
Power Supply Fault	N/A	Mains failure or battery fault
System Fault	Panel not functional	Panel has recovered from a system fault
Access Level	Indicates controls are activated (access level 2)	Indicates panel is in engineering mode (access level 3)

Keypad



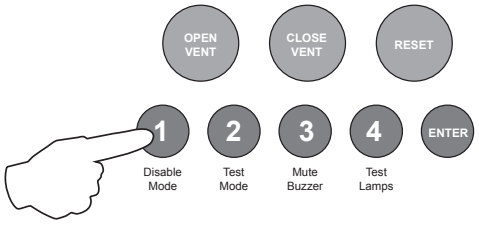
OPEN VENT (red):	Use to activate the vent outputs to the open position.
CLOSE VENT (blue):	Use to activate the vent outputs to the closed position.
RESET (green):	Resets the panel back to standby mode.
1: (Disable Mode)	With controls active, use to disable circuits or vent outputs (see DISABLE MODE section). Also has the numeric value 1 for code entry.
2: (Test Mode)	With controls active, use to put circuits into test mode (see TEST MODE section). Also has the numeric value 2 for code entry.
3: (Mute Buzzer)	Mutes the panels internal alarm and fault buzzer. (The buzzer will still blip every 5-6 seconds during an alarm or fault condition unless disabled in the programming functions). This function is operational without the need to activate controls. Also has the numeric value 3 for code entry.
4: (Test Lamps & Buzzer)	Use this button to illuminate all LEDs and sound the internal buzzer to check that they are working correctly. This function is operational without the need to activate controls. Also has the numeric value 4 for code entry.
ENTER:	This button is used to confirm code entries.

Some buttons and indicators have other functions within the engineering facilities. These functions are described in the relevant sections.

DISABLE MODE

Disable Mode is used to disable or isolate individual circuits.

To initialise Disable Mode, firstly activate the controls by turning the key switch or by entering the four digit code. Then press and hold the Disable Mode button (1) for 3 seconds.

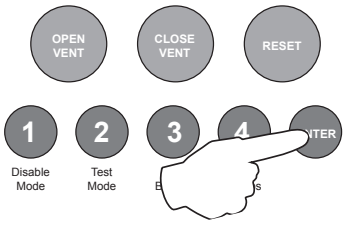


After 3 seconds the panel will bleep and the General Disablement LED and Input LED will pulse slowly, indicating that the Input circuit is in disable selection mode.

Pressing the Disable Mode button again will move disable selection mode to the Detector circuit and the Detector LED will be pulsing instead. Subsequent presses will move the selection to PIR & Rain.

After the Rain circuit, pressing the button once more will move the selection back to the Input circuit again.

When the desired circuit or output to be disabled is indicated by a slow pulsing LED, use the ENTER button to select it. Once selected the indicator LED will change to a rapid pulse. Pressing ENTER again will toggle the circuit between disabled and enabled. Then use the Disable Mode button again to move to the next circuit. Any or all circuits can be disabled simultaneously.



When all disablements have been set, press and hold the Disable Mode button for 3 seconds again. This will exit the disable selection mode and the panel will return to standby. All disabled circuits and the General Disablement will now be indicated by a steady LED.

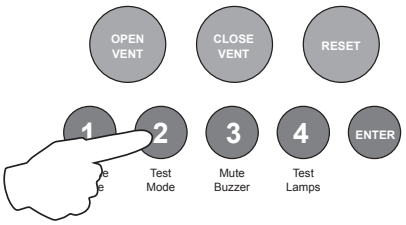
To enable the circuits again, repeat the above process using the Disable Mode button to select the circuit and the ENTER button to remove the disablement.

Tip:
With the controls active, pressing the Disable Mode button briefly will reveal which circuits are disabled (as opposed to in test mode). This is useful if using Disable Mode and Test Mode at the same time.

TEST MODE

Test Mode is used when testing the vent control system. In test mode the devices in all circuits in test, detectors and call points etc, can be activated and the panel will automatically reset, enabling the system to be tested by one person. It is possible to test head removal monitoring rain sensors & PIR.

To initialise Test Mode, firstly activate the controls by turning the key switch or by entering the four digit code. Then press and hold the Test Mode button (2) for 3 seconds.



After 3 seconds the panel will bleep and the Test Mode LED will illuminate

Pressing and holding the Test Mode button again for 3 seconds will cancel the Test Mode.

FUNCTIONALITY DURING A SYSTEM FAULT

A system fault is indicated when a processor controlling a function in the panel has a watchdog time out or processor failure. In the event of a system fault the particular board affected may not be functional. The following indications may be observed.

Display Board
System Fault LED only continous and continous buzzer sound. Display board is halted and no other indication or control is possible. Fault relay and fault output are activated. If a fire occurs alarm sounders and outputs will still function.

Main Board
System Fault LED continous and General Fault LED pulsing and continous buzzer sound. Main board is halted. Fault relay is activated. No alarms may be activated on the system.

System Fault recovery
System Fault LED pulsing and General Fault LED pulsing along with a pulsed buzzer (fault tone) a system fault has occurred and the affected board has recovered. The indication will remain until the panel is reset.

USER INSTRUCTIONS

If an alarm condition is present a responsible person should:-

1. Check the control panel to see what has caused the system to go into alarm. This will be indicated by a pulsing LED on the front of the control panel.
2. Go to the area which has caused the alarm to check if a fire exists.
3. Only when it is safe to do so should the alarms be silenced. Activate the controls by turning the key switch or by entering the four digit code (see Activate Controls in the OPERATING section) and press the Mute Buzzer button (3) to silence the panel buzzer and any external sounders.
4. In the event of a false alarm look for the device that has caused the alarm. A detector will have a red LED lit, or check to see if a call point glass is broken (if so replace the glass or call an engineer).
5. If required the vent can be closed by pressing the (blue) Close Vent button (fig 1). (regardless of alarm condition, this should only be done if no smoke is present.
6. When fully satisfied that there is no alarm conditions present, return to the control panel and Activate Controls, then press the (green) Reset button, see (fig 2). The panel should return to normal with the green SUPPLY HEALTHY LED and the amber ACCESS LEVEL LED illuminated on the display. Turning off Activate Controls, only the SUPPLY HEALTHY LED should be lit.

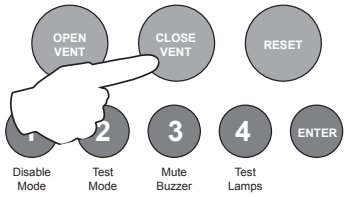


fig 1

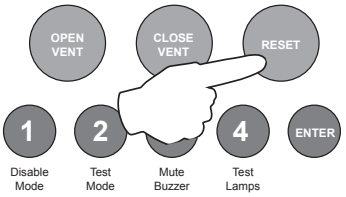


fig 2

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