

**WELCOME TO THE FUTURE  
OF SMOKE CONTROL**



**SMART | SECURE | VERIFIED**

**O Range 7  
Smoke Control Panel**

**INSTALLATION GUIDE**

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**SUPPLYING THE  
TRADE SINCE 1988**



# O Range 7 Smoke Control Panel

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### Connections

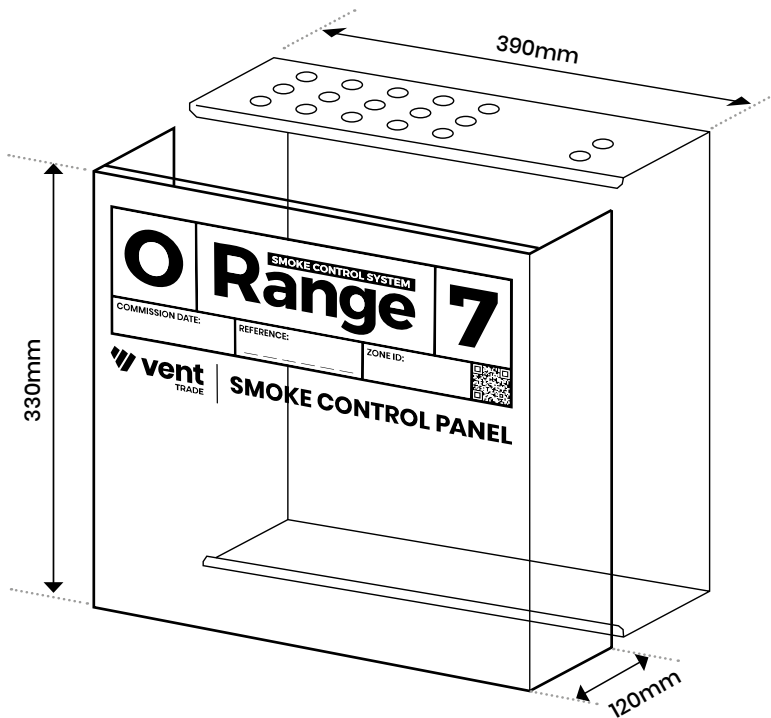
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### Technical & Diagnostic

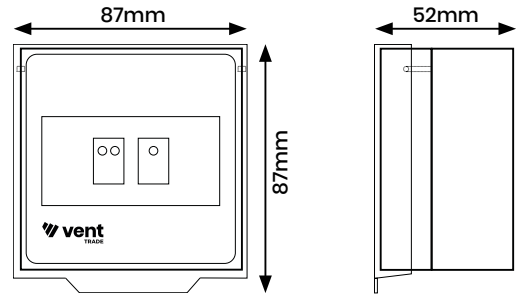
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# Introduction

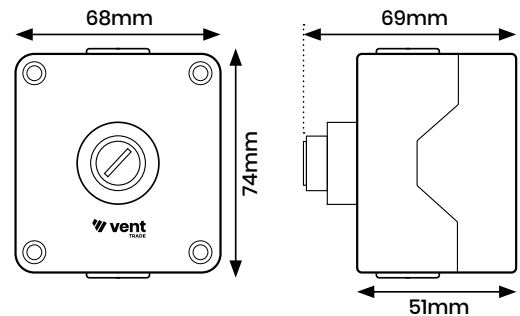
## O Range Control Panel Dimensions



## O Range Firefighter Switch



## Roof Access Key Switch



## O Range Products

- O Range 7F      7A Field Panel
- O Range 7E      7A Line End Panel
- O Range FS      Firefighter Switch

## O Range Ancillaries

- Ventec OSD      Optical Smoke Detector
- Ventec TTC      Tamperproof Thermostat
- Ventec TC        Thermostat
- Ventec DS        Retractive Day Switch
- Ventec RKS      Roof Access Key Switch
- Ventec MDR      Magnetic Door Release (MagLock)

## Compatible Products

- Ventec SCD      Smoke Control Damper
- Ventec ED        Environmental Damper
- Ventec Blade    Head of Shaft Louvred Vent
- Ventec Ostro    Head of Stairs 140° Hatch/Vent
- Ventec Elite     Outward Opening Window
- Ventec Centro   Central Pivoting Window
- Ventec Velo      Louvred Facade Window

## O Range Tools (Multi Zone installation ONLY)

- O Range Connect
- Commissioning Software

**IMPORTANT** A Laptop is required for Multi Zone installations.

## Panel Fixings



**IMPORTANT:** Use the provided drilling template.  
Check orientation (horizontal/vertical) before drilling.



### Masonry (Block/Brick)

- Use wall plug and screw as standard
- Hammer drill recommended (SDS+)
- Use M6 penny washers (25mm OD)



### Plasterboard Walls

- Use metal plasterboard fixings
- Use washers if required, depending on screw head



### Wood

- Use standard wood screws, minimum size 10
- Use M6 penny washers (25mm OD)

## Types Of Cable

### Cable Types – Must conform to BS 8519 (Cat3, Annex B)

- BS 8519 specifies separate test standards for power and control cables
- Cables providing power to the control panels should be considered power cables
- Cables to components should be considered control cables

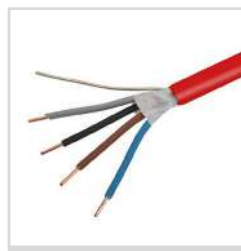
### POWER



2 Core + Earth  
fire-rated cable  
(230Vac)

For mains power supply

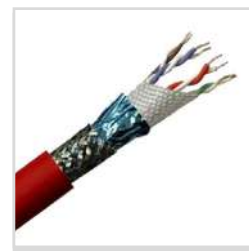
### CONTROL



Multi-Core + Earth  
fire-rated cable  
(24Vdc)

For panel-to-component signals

### NETWORK



Fire-rated Cat5/6 - Ethernet

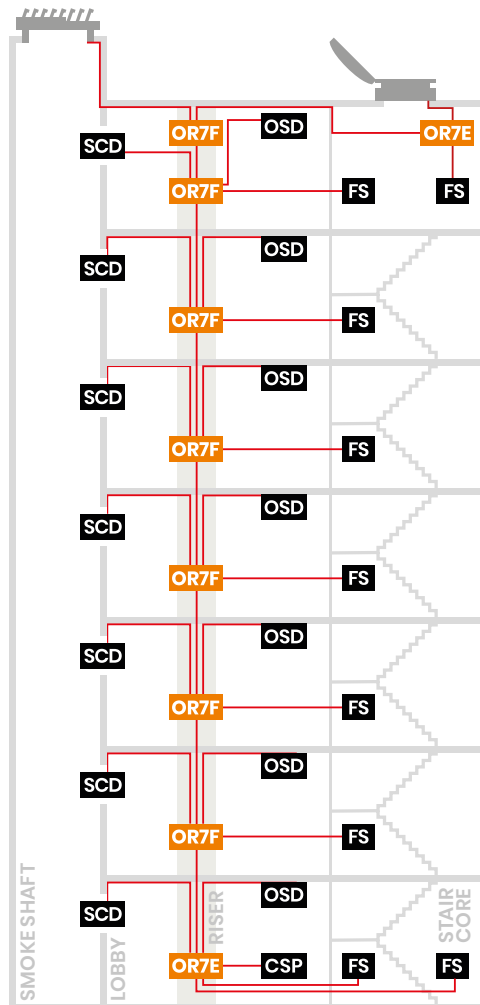
For BMS/comms

- Power = Any supply feeding into the panels
- Control = Any wiring or signal fed from the panels to components



**IMPORTANT:** All sizing and selection is the responsibility of the installing engineer. If in doubt about cable size or type, check the wiring schematic or speak to your system designer.

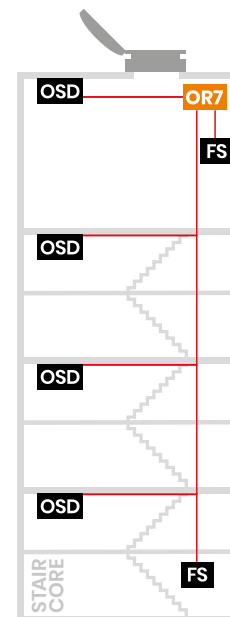
## O Range System: Shaft and Stairwell Layouts (indicative only)



**MULTI ZONE**  
SMOKE SHAFT & STAIRWELL SYSTEM

### SYSTEM KEY:

- OR7F** O RANGE FIELD PANEL
- OR7E** O RANGE LINE END PANEL
- SCD** SMOKE CONTROL DAMPER
- FS** FIREFIGHTER SWITCH
- OSD** OPTICAL SMOKE DETECTOR
- CSP** CONTROL STATUS PANEL



**SINGLE ZONE**  
STAIRWELL SYSTEM  
(Out of the Box)

OR7E or OR7F panels can be used in a single stairway system

**IMPORTANT:** If in doubt about cable size or type, check the wiring schematic or speak to the system designer.

## Control Panel Earth Cable

- The O Range has an earthing point that connects the back plate to the removable front
- To avoid damaging the cable, attach the front panel to the lower screw holes of the rear casing, as shown in **Fig. 1**
- Alternatively, you can attach as in **Fig. 2**



Fig.1

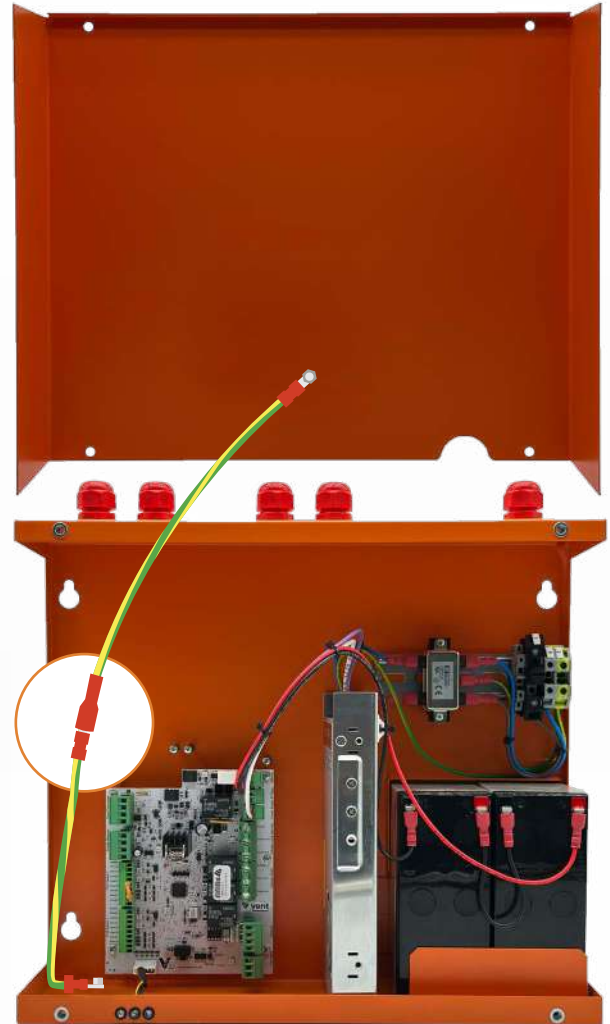
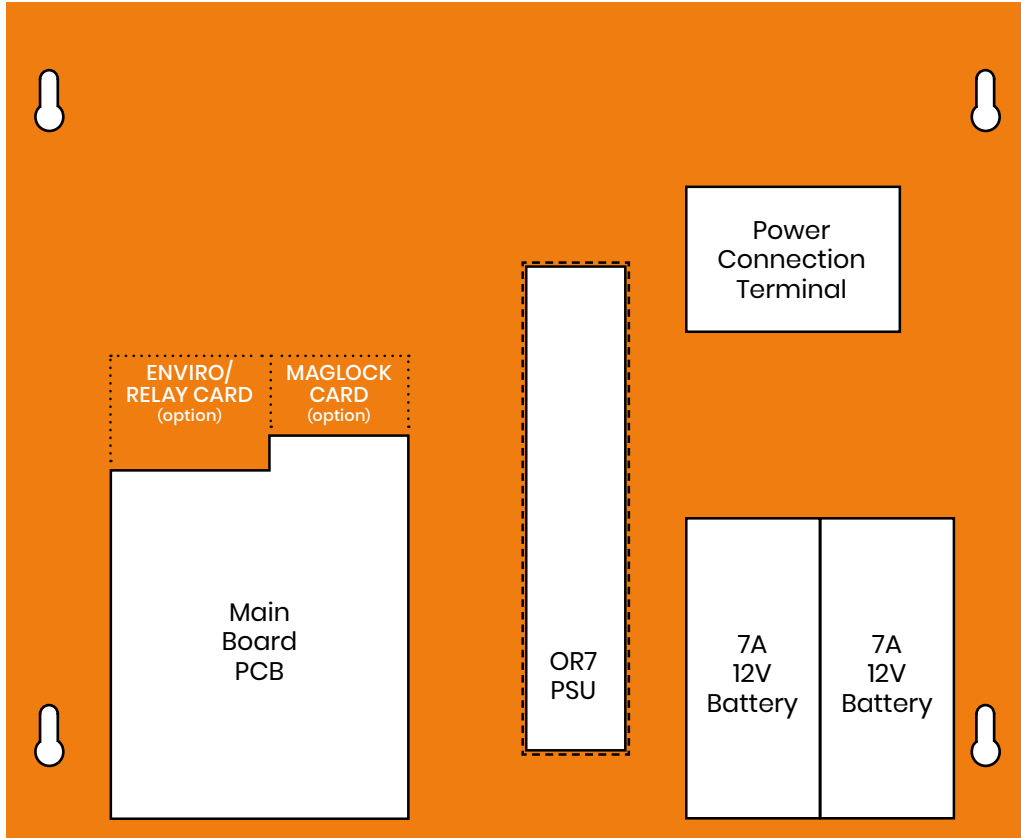


Fig. 2



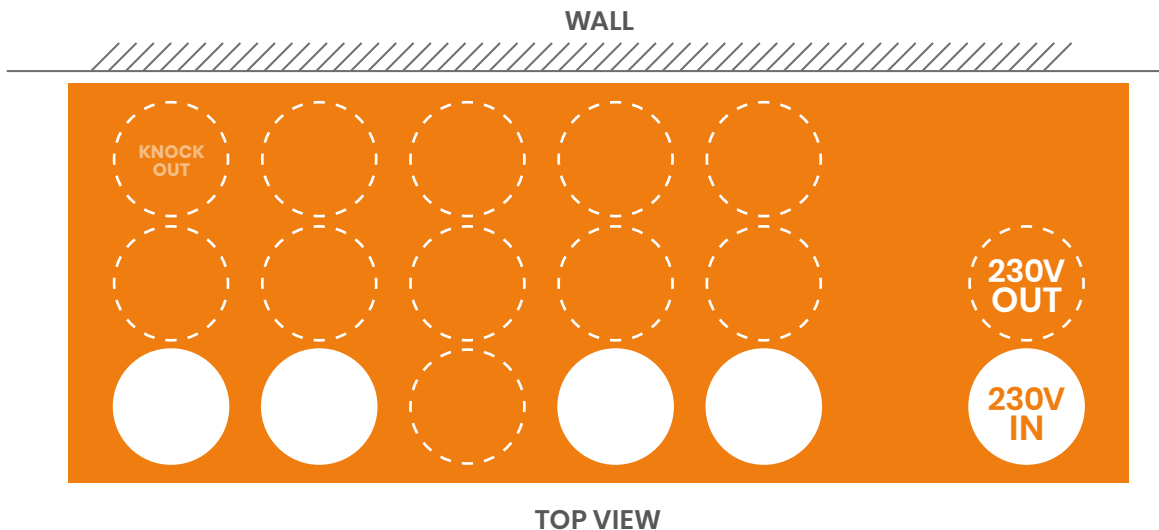
**CAUTION:** All metallic parts of the panel must be earth protected to avoid electrical shock.

## O Range Control Panel Layout

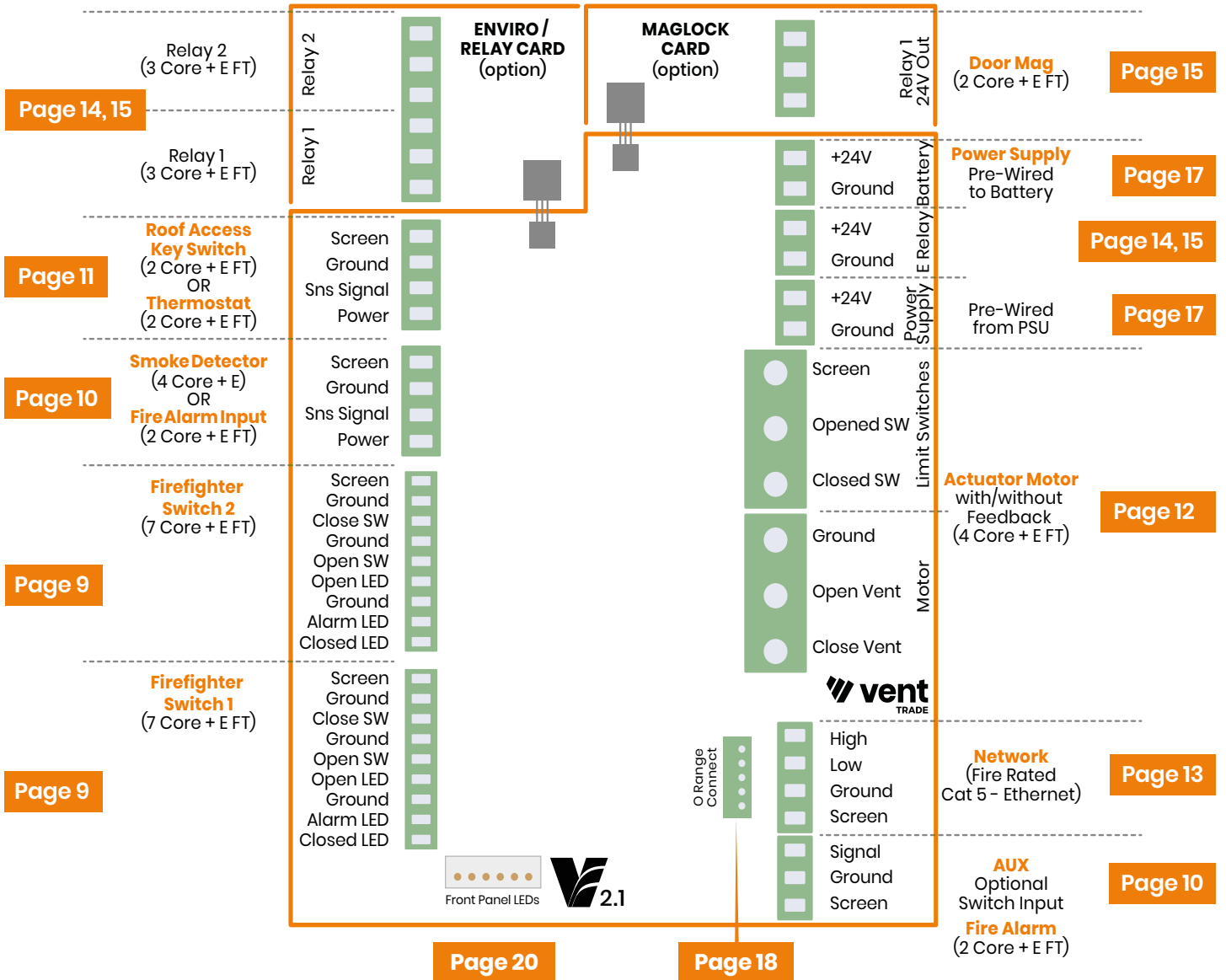


## O Range Control Panel Cable Entry

- As viewed from above



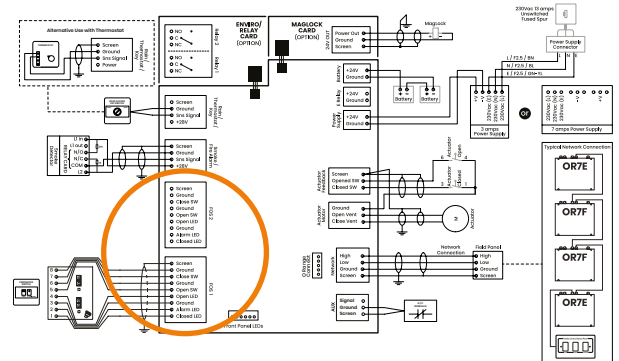
# O Range Main Board Layout



# CONNECTIONS

## O Range FS: Firefighter Switch (OFS)

- Use fire-rated 7 Core + Earth or CAT5/6 network cable
- Switch format: Open/Close/Reset
- Use Connector FOS 2 for a second OFS



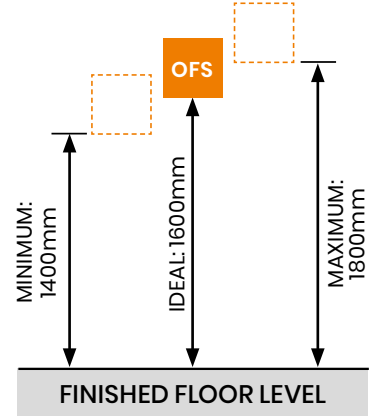
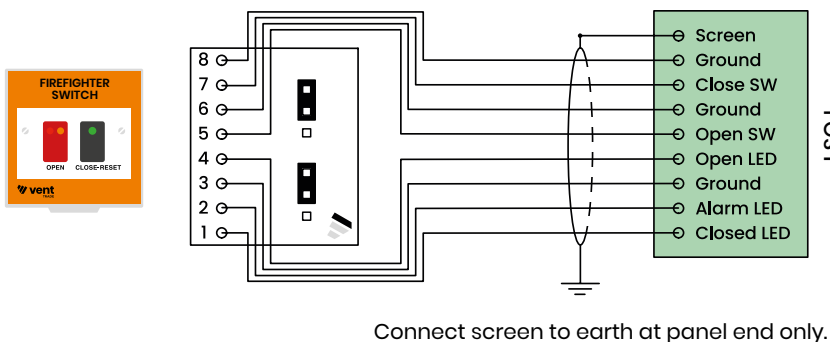
CXSM-ORA-FFSW-0002

O Range FS: Firefighter Switch

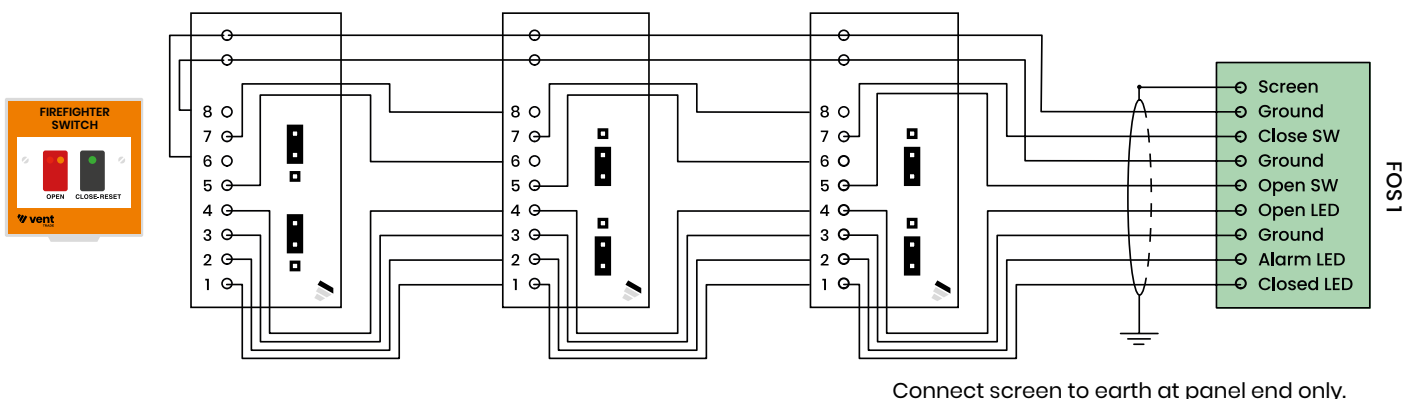
**IMPORTANT:** The OFS is only available for open/closing of AOV and Dampers when the system has been activated. When the system is in Standby Mode the OFS is to be considered 'tamperproof'.

**IMPORTANT:** In order to comply with prEN12101-9, you should follow the terminated wiring schedules. This will need to be configured in the commissioning software.

### SINGLE OFS

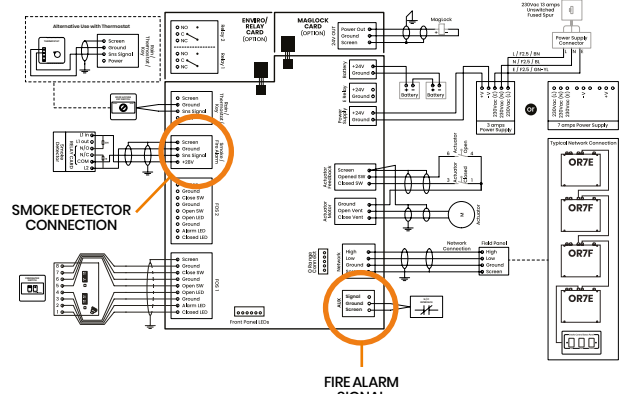
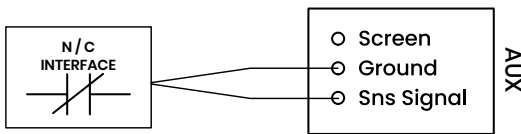


### MULTIPLE OFS ON SAME LOOP



## Fire Alarm Signal

- Requires 2 Core + Earth fire-rated power cable
- Connect to the following terminals:
  - Screen
  - Ground
  - SNS Signal
  - +28V
- Source must be a volt-free relay output (N/C or N/O) from the fire alarm interface



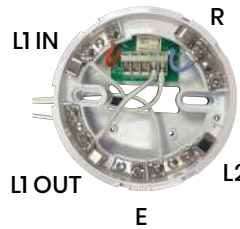
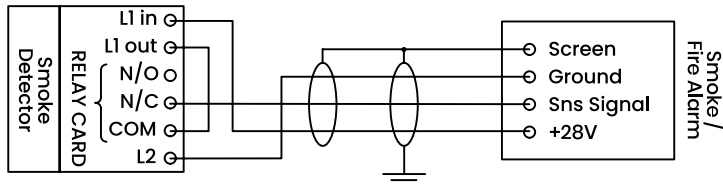
## Optical Smoke Detector Signal

- OSD must be installed on a relay base to function properly
- Use 4 Core + Earth fire-rated control cable
- Polarity matters – clearly mark the INs and OUTs
- Get the direction wrong = Detectors won't trigger the panel



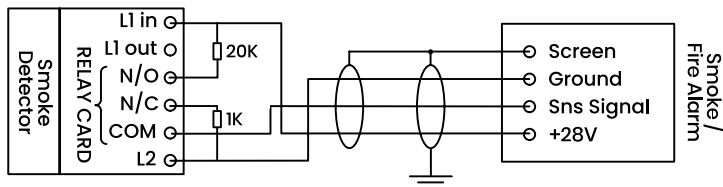
**CXSM-ORA-SDET-0001**

Optical Smoke Detector – Head and Relay Base



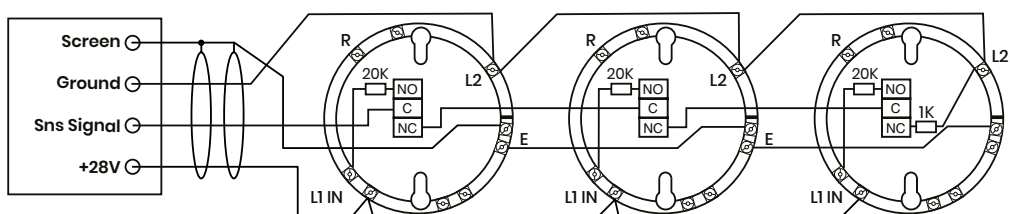
Close Up of Relay Card

### Terminated Wiring Diagram



**IMPORTANT:** In order to comply with prEN12101-9, you should follow the terminated wiring schedules. This will need to be configured in the commissioning software.

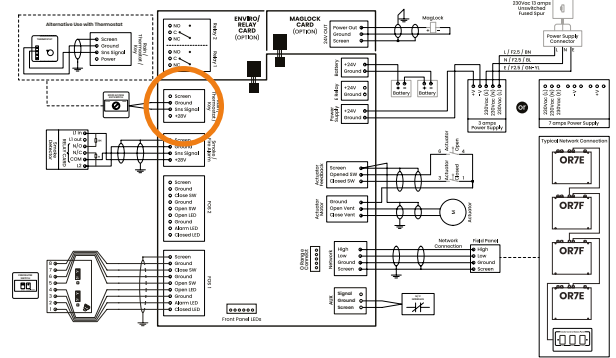
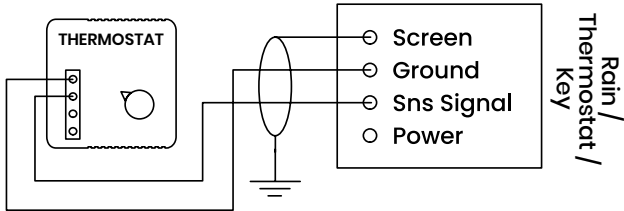
### Multiple Smoke Detector Connection



**NOTE:** Max. 4 chained OSDs.

## Thermostat

- Requires 2 Core + Earth fire-rated control cable



**NOTE:** Environmental Mode is only available when powered by mains.

## Roof Access Key Switch

**NOTE:** If a Thermostat is also fitted, the Roof Access Key Switch can connect to the AUX port (see Fig. 1).

- Use 2 Core + Earth fire-rated control cable
- Connect to the SNS Signal and Ground terminals on the panel
- The switch isn't polarity sensitive – either core can go to either terminal
- To terminate the CPC (Earth Core) – place into green/yellow sleeve and terminate into a terminal block e.g. WAGO
- Connect the cable to either the Rain/Thermostatic/Key terminal or the AUX port on the main board connectors

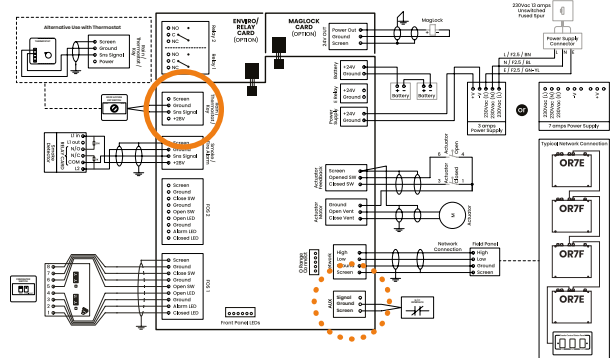
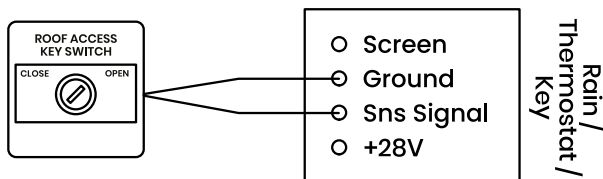


Fig. 3

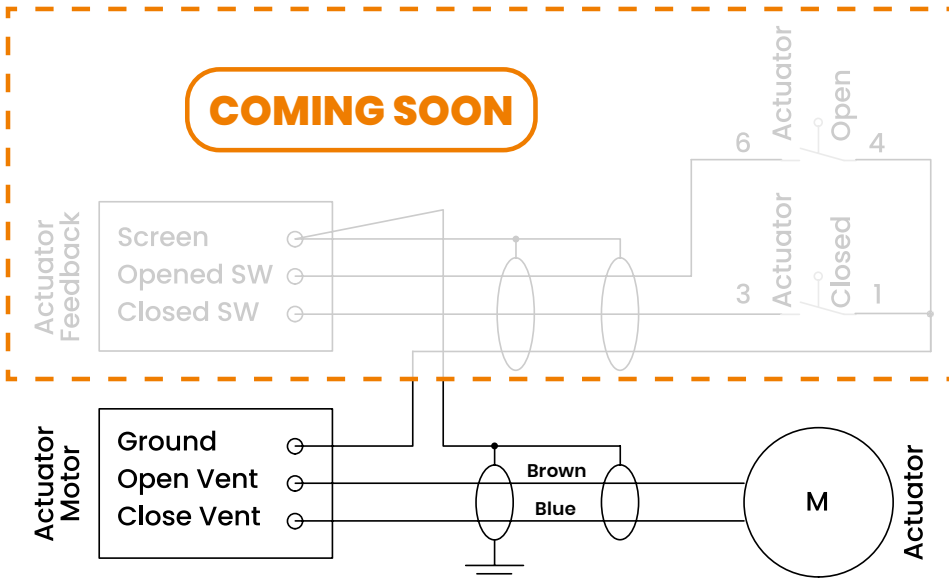
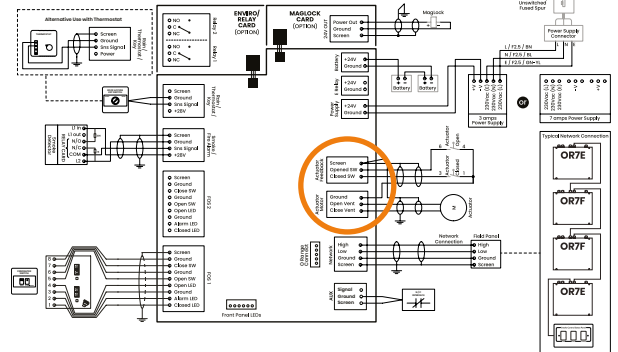


## Actuator Connection

- For reverse polarity Actuators: Use a 2 Core + Earth fire-rated power cable
- For Actuator feedback: Use a 4 Core + Earth fire-rated control cable

### NOTE: Ventec FTA 600 – Door Opener

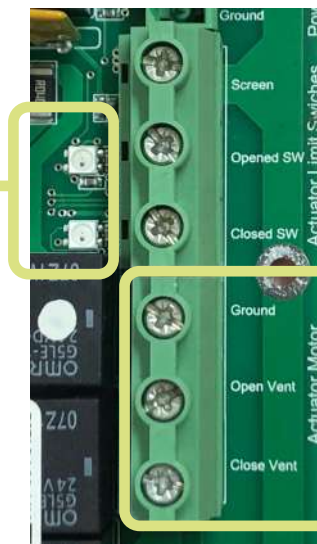
- Connect the Actuator to the O Range Main Board using 2 Cores only: **BROWN** and **BLUE**
- **DO NOT** connect **WHITE** or **GREY** cores



**NOTE:** End limit switches must be configured in the commissioning software.

## Actuator Status

ACTUATOR MOTION	LED STATUS (alternating)
OPENING	GREEN
CLOSING	CYAN



TERMINAL	VOLTAGE	
	OPEN	CLOSE
Ground	0Vdc	0Vdc
Open Vent	24Vdc	0Vdc
Close Vent	0Vdc	24Vdc

## Network Connection

- Use fire-rated CAT5/6 cable (4 twisted pairs) or 3 Core + Earth fire-rated cable
- Max. cable length: 800m total
- Use same cores and terminals at each end

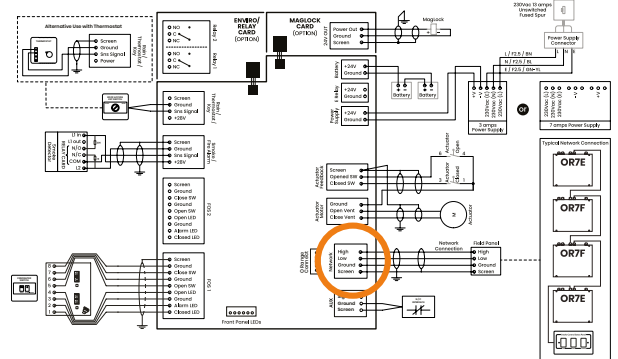
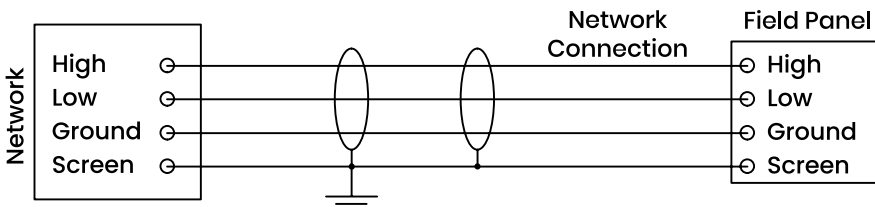
## Stripping the Cable

**IMPORTANT: DO NOT** cut off the shield when stripping back the fire-rated cable (keep the braid and foil)

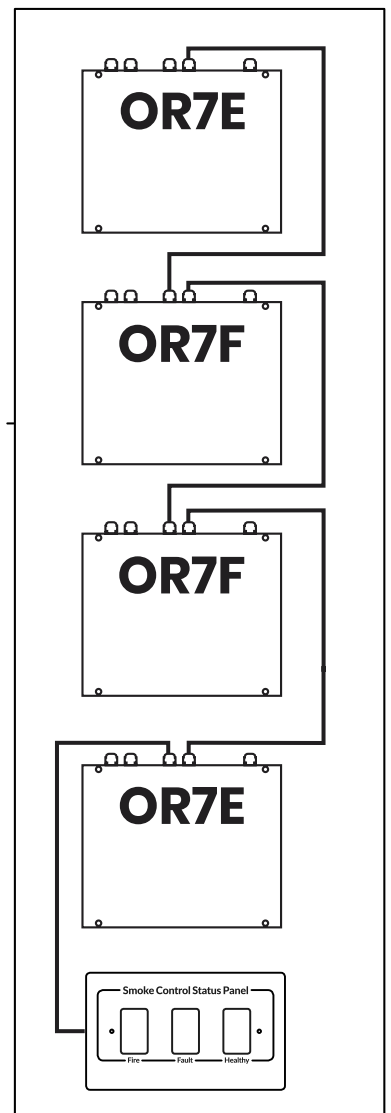
- Shield must be sleeved green/yellow
- Strip PVC insulation cleanly to expose copper – no nicks, and strip to double over neatly before termination to earth

## Earthing the Screen

- Screen must be earthed at one end only
- **DO NOT** earth both ends

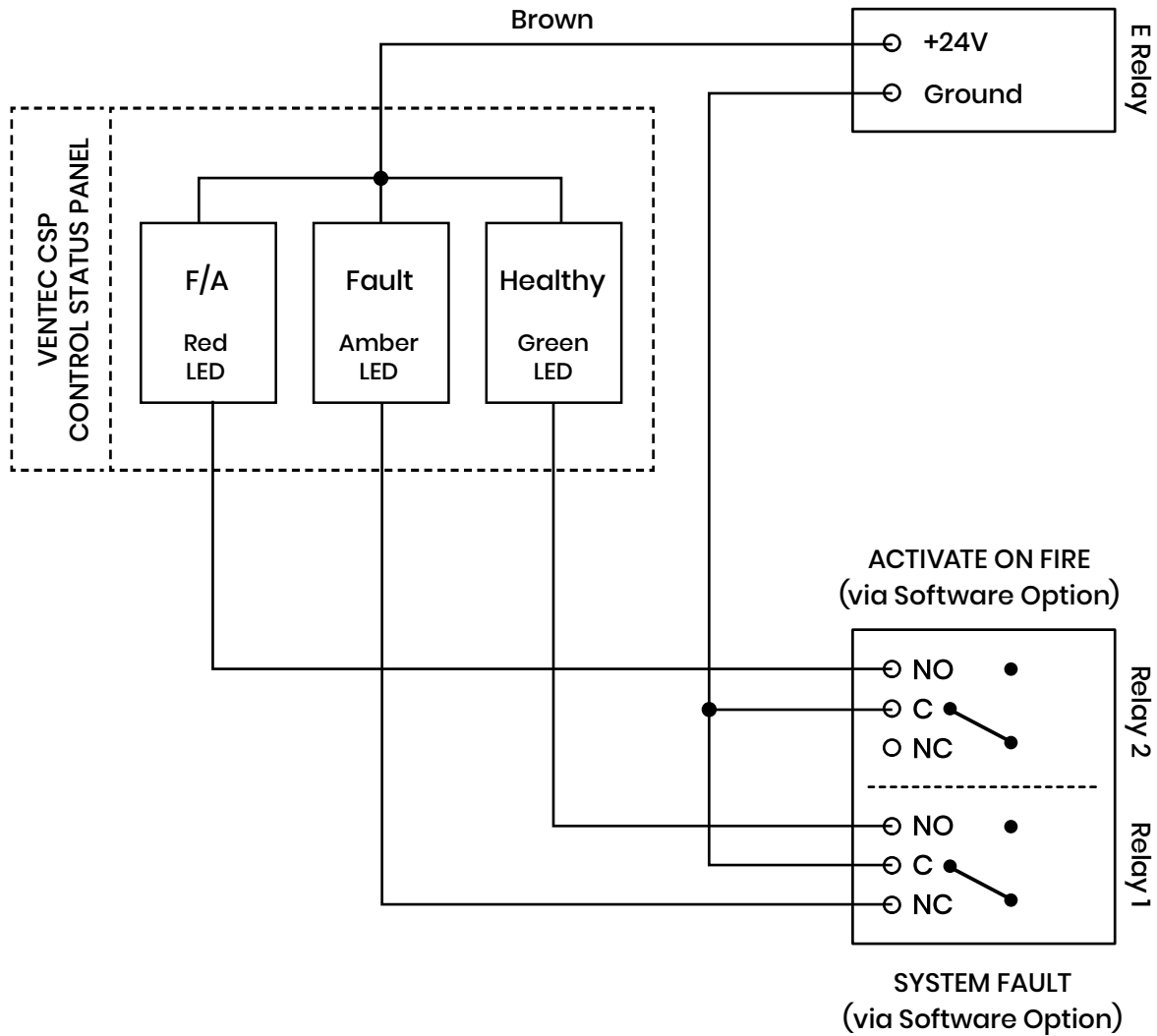
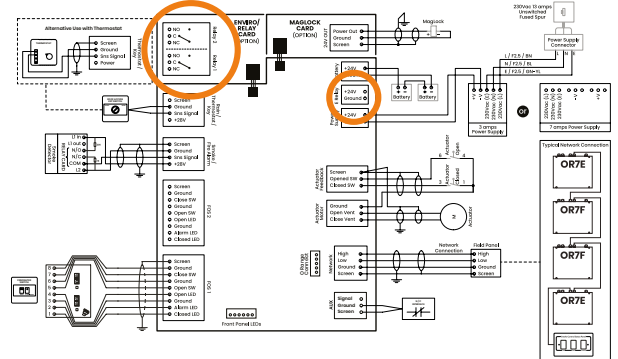


Typical Network Connection



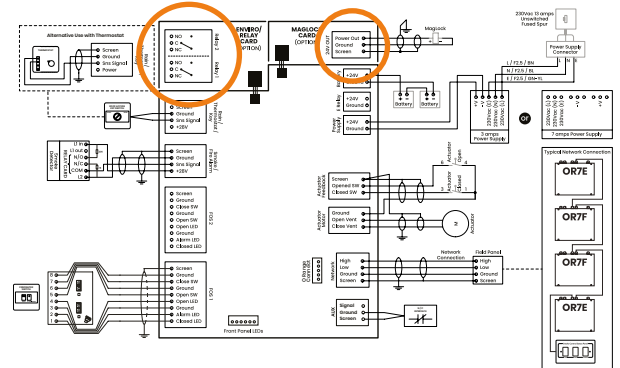
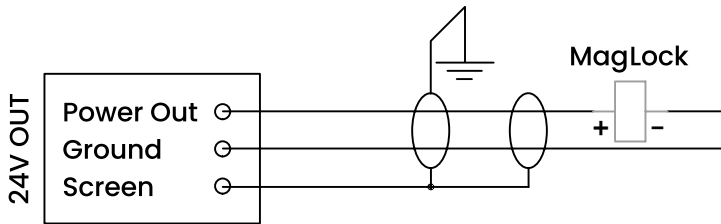
## Control Status Panel Connection

- Requires 4 Core + Earth fire-rated control cable



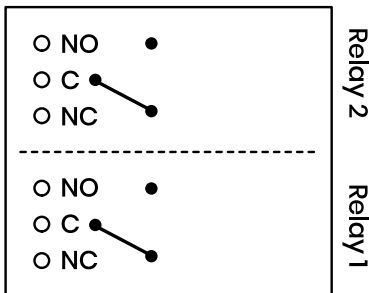
## MagLock Card Connection

- 1x Volt Free Contact
- Requires 2 Core + Earth fire-rated cable



## Enviro / Relay Card Connection (labelled Relay 1&2)

- 2x Volt Free Contact



## Available Functions

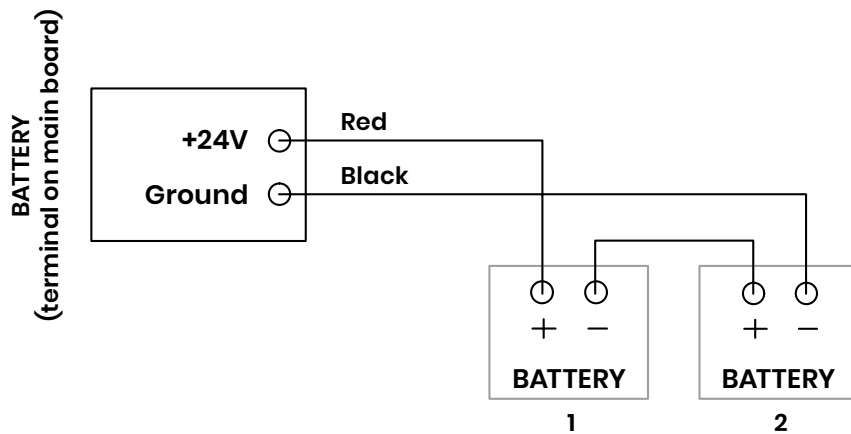
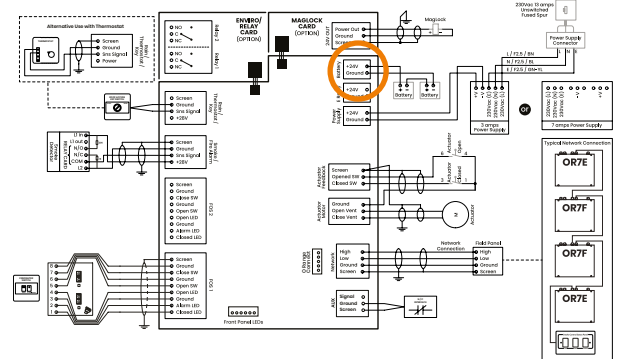
- Magnetic Lock\*
- Activate on Fire\*
- Local Fault\*
- System Fault\*
- Environmental Actuator (driven return)\*
- Environmental Actuator (auto-return)
- Damper Actuator (driven return)
- Damper Actuator (auto-return)
- Damper / Enviro (driven return)
- Damper / Enviro (auto-return)
- Enabled
- Disabled

\* Commonly used function

Configurable via the O Range Connect Tool, please see the software manual.

## Battery Connection: 24V Backup Supply

- The panel comes with battery cables pre-installed:
  - Red = +24V
  - Black = Ground (0V)
- Connect two 12V, 7.0Ah YUASA sealed lead-acid batteries in series using the supplied jumper wire
- Positive of Battery 2 - Negative of Battery 1
- Then:
  - Red cable from PCB - Positive of Battery 1
  - Black cable from PCB - Negative of Battery 2



**CAUTION:** Batteries can supply high current – even small ones.

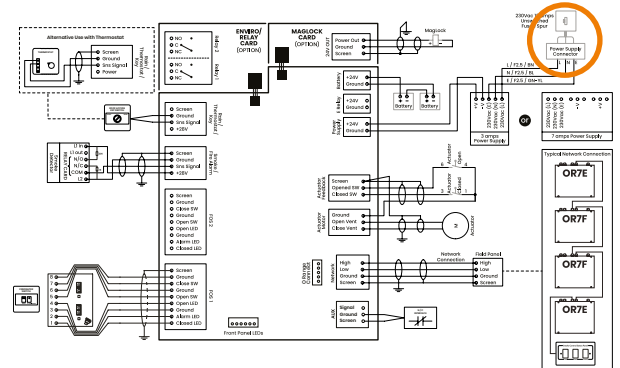
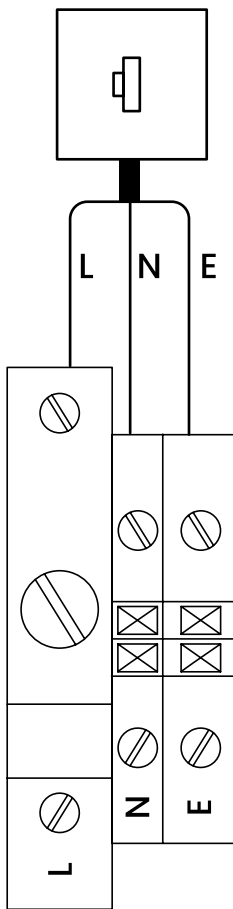
Incorrect connections can cause fire or serious injury.

- Always check polarity before connecting
- Use insulated tools when working with batteries

## External Supply to 230V Power Connection

- Requires 2 Core + Earth fire-rated power cable

230Vac 13A  
Unswitched  
Fused Spur

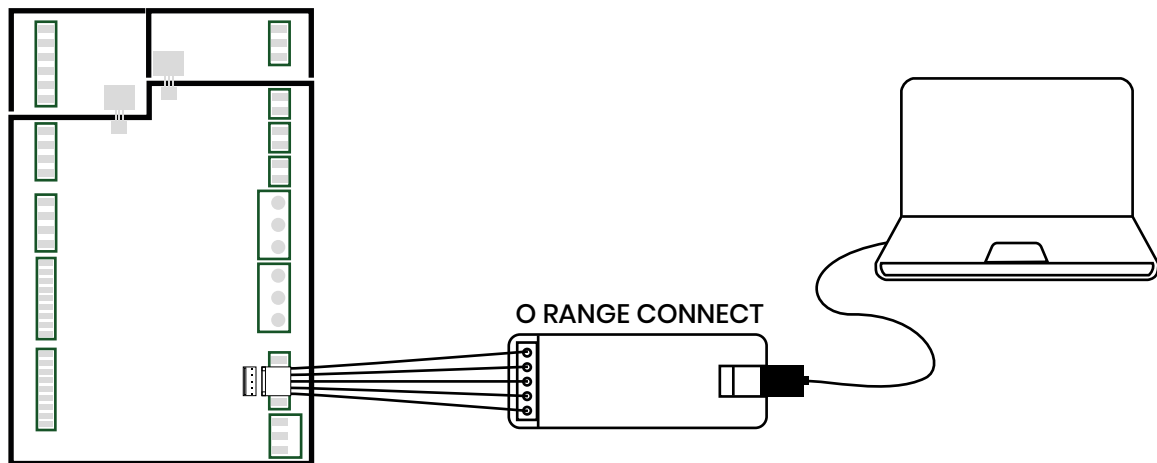
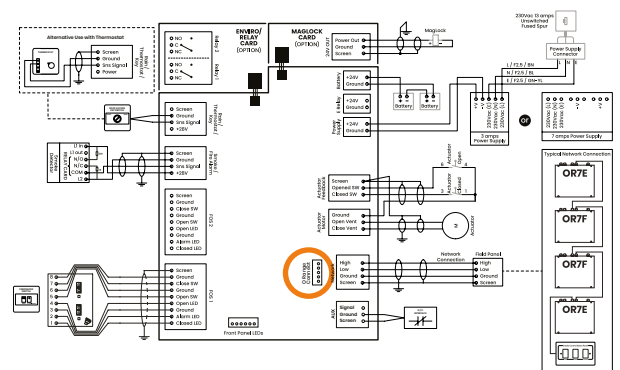


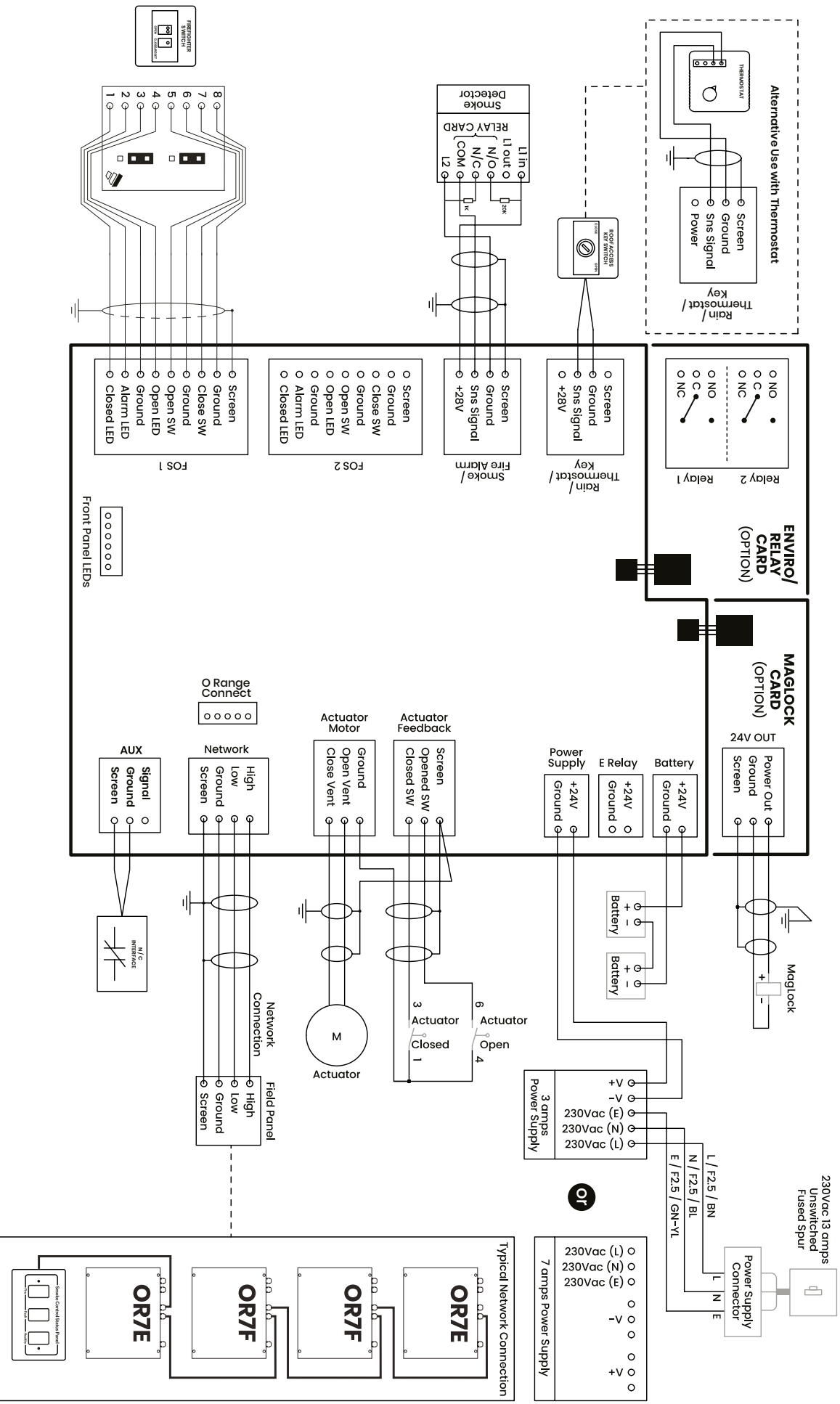
**CAUTION:** Before installation, confirm that the fuse rating is suitable for the maximum current load of the O Range control panel.

Incorrect fuse rating may cause equipment damage or fire.

## Connecting the O Range Connect

- Connect the USB of the O Range Connect to the laptop
- Connect the zone board connector to the PCB
- Open the commissioning software
- Ensure O Range Connect is connected
- If further instruction needed, see the [Software Manual](#).





# TECHNICAL & DIAGNOSTICS



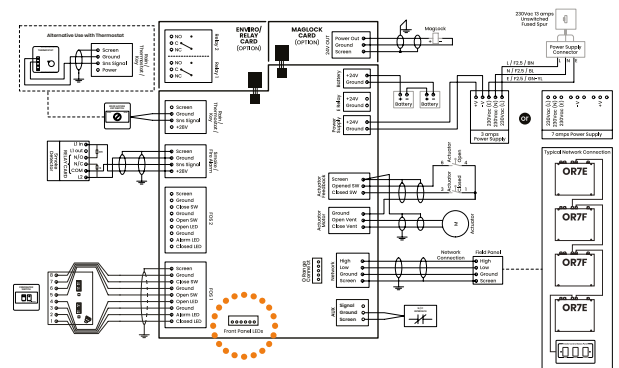
**O Range Downloads**  
Data sheets, guides and Engineer resources.



**Technical Support Chat**  
24/7 O Range advice. New content weekly.

## Front Panel Status LEDs

- Visual indication of live status



FRONT OF PANEL LEDs ARE PRE-CONNECTED TO MAIN BOARD

## Front Panel Status LED Key:

● LED ON (SOLID)    ✨ LED FLASHING    ○ LED OFF

RED	AMBER	GREEN	LED STATUS	SYSTEM STATUS / FUNCTION
●	○	○	RED SOLID	System activated / actuator open
○	●	○	AMBER SOLID	Local fault
○	○	●	GREEN SOLID	Mains power indication
○	○	✨	GREEN FLASHING	Battery power indication

## Main Board Status LED Guide

### LED 1 and 2 (End Stops)

- ALTERNATING CYAN:** Damper closing
- ALTERNATING GREEN:** Damper opening
- CYAN:** Endstop reads "closed"
- GREEN:** Endstop reads "open"
- PURPLE:** No signal from endstop (high/low mode)
- YELLOW:** Open circuit on endstop (low or high input mode)

### LED 3 (Isolated Input)

- GREEN:** Active input
- YELLOW:** Fire or smoke present (assuming in appropriate mode)
- CYAN:** Inactive input
- RED:** Input out of range

### LED 4 to 7 (Firefighter Switch Inputs)

- GREEN:** Active input (or switch pressed)
- YELLOW:** Fire or smoke present (assuming in appropriate mode)
- CYAN:** Inactive input (or switch not pressed)
- RED:** Input out of range

### LED 8 and 9 (Sensor Inputs)

- GREEN:** Active input (or switch pressed)
- YELLOW:** Fire or smoke present (assuming in appropriate mode)
- CYAN:** Inactive input (or switch not pressed)
- PURPLE:** Sensor is resetting
- RED:** Input out of range

### LED 10 (Monitor MagLock Output)

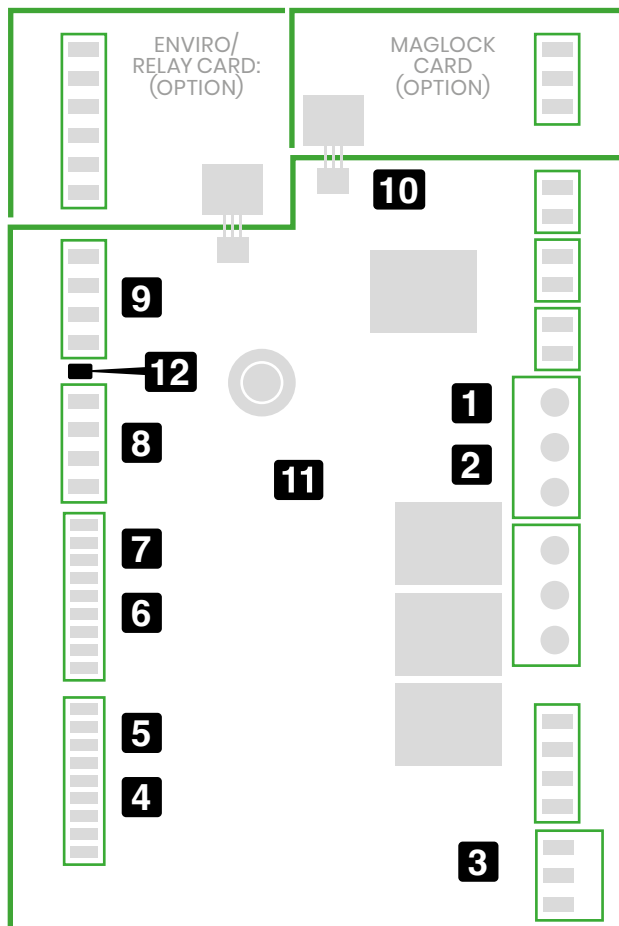
- GREEN:** Maglock is held
- CYAN:** Maglock is released
- RED:** Maglock is faulty (output shorted or option board missing)

### LED 11 (General Status LED)

- GREEN:** No faults
- CYAN:** No faults but powered from battery
- RED:** Fault (may not show on LED 1-10)
- PURPLE:** Fault (may not show on LED 1-10) and powered from battery

### LED 12 (Sensor Power LED)

There is power provided to the sensor



**IMPORTANT:** If all LEDs are off, the function is disabled

## O Range Troubleshooting



### Technical Support Chat

24/7 O Range advice.  
New content daily.

### 1. System Reset and Smoke Mode Issues

Actuator stays open after smoke event and seems locked in smoke mode	Ensure smoke signal has cleared. Hold both O Range Firefighter Switch (OFS) Open and Close/Reset buttons for 10 seconds.
Actuator re-activates immediately after reset	Smoke signal may still be active. Check smoke detector or fire alarm status.
Smoke detector remains in alarm state after test	Allow time for reset or clean detector. Hold both O Range Firefighter Switch (OFS) Open and Close/Reset buttons for 10 seconds.
Reset via O Range Firefighter Switch not working	Verify OFS wiring. Check LEDs next to FOS Input. See Status LED Guide.
How can I quickly reset the system?	In commissioning software, open Live Data and press System Reset to restart all panels.

### 2. O Range Firefighter Switch Issues

OFS has no effect after smoke event	Check switch wiring and function. See Status LED guide.
OFS "Open" button has no effect	The OFS only operates when fire condition detected.
Red light on switch	Solid: Fire event on this zone. Flashing: Fire event on remote zone.
Amber light on switch	Solid: Fault on this zone. Flashing: Fault on remote Zone.

### 3. Actuator and Motor Issues

Actuator opens briefly then stops	Check for voltage drop, cable size, connections, and PSU capacity. Check current limit setting.
Actuator does not move but voltage is present	Confirm actuator not jammed. Check for internal fault or seized mechanism.
Motors open during close cycle	Reverse actuator polarity.
Motor opens when cold and closes when hot	Check thermostat wiring and configuration.

CONTINUED...

## O Range Troubleshooting

### 4. Detector, Zone, and Fire Signal Issues

Fire activation repeats or won't clear	Smoke or heat signal still active. Check detector heads and alarm relay contact.
Purple light in centre of PCB	Local system fault. Panel powered from battery. Mains power unavailable.
How to see which panel is in fire mode	In commissioning software, open Live Data tab to view fire activations.

### 5. Power and Supply Issues

Control panel restarts during operation	Check mains stability, battery condition, and 24Vdc load.
No 24Vdc output but mains present	Check 3A fuse and green PSU LED.
No battery charge despite 230Vac supply	Check charger and battery connections. Review error codes in software.
What order to power up	Connect batteries first, then mains. If reversed, wait up to 5 minutes for faults to clear.

### 6. Relay, Output, and Network Issues

Maglock / Relay Card output not working	Ensure Aux. Relay Card is enabled. Verify wiring and configuration in software.
No continuity on relay card	Check blade fuses.
Bootloader / updater cannot find panels	Check cabling and termination. If not resolved, call for support.
One panel fault blocks others	Yes, a network fault interrupts communication and Head of Stairs/Shaft.
Relay card wiring	Use 2 or 3 Core + Earth cables to labelled terminals MagLock Card and/or Enviro/Relay Card (both optional).

### 7. Environmental and Mode Questions

Why system uses manual reset	Manual reset requires human confirmation for safety.
Do AOVs close when it rains	Yes, if a rain sensor is fitted and the system is in environmental mode with mains power. When rain is detected, AOVs close automatically. When running on battery, all environmental functions, including the rain sensor, are disabled.
Does environmental mode work on battery	No, disabled on backup power.
How to open window if too hot	Via thermostat in non-fire mode only.

CONTINUED...

## O Range Troubleshooting

### 8. General Information and FAQs

<b>What is a relay card</b>	Interface for controlling external devices such as fans or actuators.
<b>Where to terminate CPC</b>	Oversleeve green/yellow and terminate at Earth point.
<b>Blind/black grommets</b>	Placeholder for optional cable entries. Remove only for extra wiring.
<b>Unused stuffing glands</b>	Replace with blind grommets.
<b>Incoming supply cable</b>	Fire-rated 2 Core + Earth, sized per load.
<b>Protective device</b>	Non-RCD-protected 13A Unswitched Fused Spur.
<b>Fire alarm contact type</b>	Normally closed relay contact.
<b>Battery specification</b>	2x 12V 7Ah in series for 24V (72 h standby).
<b>Connecting to the panel</b>	Wiring diagrams in installation manual at <a href="http://vent-trade.co.uk">vent-trade.co.uk</a> .
<b>Commissioning process</b>	Use PC commissioning tool – download from <a href="http://vent-trade.co.uk">vent-trade.co.uk</a> .
<b>Type of gland</b>	20mm fire-rated gland.
<b>Cover screws</b>	M5 × 10mm machine screws.
<b>Certifications</b>	BS EN 12101-10, UKCA, CE approved.

## System Reset

In order for an O Range system to return to standby mode, the system must be reset. This is done using any O Range FS Firefighter Switch connected as part of the O Range system.

### STEP 1

If it has been activated, ensure the fire alarm has been reset.

**IMPORTANT:** Only when both of the above steps have been performed, will the O Range system be fully returned to Standby Mode.

### STEP 2

Using any O Range Firefighter Switch within the O Range system, press the Close-Reset button AND the Open button simultaneously for a period in excess of ten seconds.

This will close ALL dampers and vents within the system, and return all components to their default standby status.



## System Status Diagnosis (via O Range FS Status LEDs)

A visual indication of the O Range Smoke Control System status is available via the Status LEDs on the O Range FS Firefighter Switch/Switches.

**Firefighter Switch Status LED Key:** ● LED ON (SOLID)    ✨ LED FLASHING    ○ LED OFF

RED	AMBER	GREEN	LED STATUS	SYSTEM STATUS
○	○	✨	Short GREEN Flash once every <b>20</b> seconds	System Healthy - O Range FS Disabled
○	○	✨	Short GREEN Flash once every <b>5</b> seconds	System Healthy - O Range FS Enabled
○	✨	○	Short AMBER Flash once every <b>1</b> second	System Fault - Remote Zone
○	●	○	Solid AMBER	System Fault - Local Zone
✨	○	○	Short RED Flash once every <b>1</b> second	Fire Mode Activation in Remote Zone
●	○	○	Solid RED	Fire Mode Activation in Local Zone (Vent/Damper Open)
●	○	●	Solid RED & GREEN	Local Vent/Damper Overridden Closed (O Range FS Available)
●	○	✨	Solid RED, plus Short GREEN Flash once every <b>1</b> second	Local Vent/Damper Overridden Closed (O Range FS Unavailable)
✨	○	●	Short RED Flash once every <b>1</b> second and Solid GREEN	Fire Mode Activation in Remote Zone (O Range FS Available)
✨	○	○	Short RED Flash once every <b>0.5</b> second	Fire Mode Activation in Remote Zone (Damper Open via Override)

## O Range Technical Data

	O Range 7 Control Panel
Control Panel Voltage In	230Vac
Control Panel Voltage Out	24Vdc nominal
Battery	2x 12Vdc 7Ah
Battery Re-charging Time – 0% to 100%	24 hours max.
Battery Standby / Emergency Use	72 hours
Operating Temperature	-5°C to +40°C
Visual Diagnostics	On Board LEDs
Smoke Ventilation Zones	1
IP Rating	IP30
Enclosure Colour	Orange (RAL 2008)

INPUTS	
Smoke Detectors / Fire Alarm	✓
Orange Firefighter Switch Supported	2 max.
Orange Firefighter Switch Input No. Of Cable Cores	7 Core + Earth
Environmental Switch (manual)	1
Thermostat/Wind/Rain Sensor	✓
Carbon Dioxide (CO <sub>2</sub> ) Sensor	✓

OUTPUTS	
Motor Output Current	1x 7A
Enviro Assist Damper	Upgrade Option
Maglock Support – Auxiliary Output	Upgrade Option
Visual Display	via Orange Firefighter Switch
Fault VFC (Volt Free Contact) 2x	Upgrade Option
Lift To Ground	Upgrade Option

Vent Trade advises that the design, supply, and installation of all electrical wiring be carried out in accordance with current standards.

## Electrical Ratings

	O Range 7 Control Panel	Notes
AC Mains Supply	230Vac 50Hz	Standby
AC Current Draw (Standby)	0.15A	
AC Current Draw (Charging)	0.275A	
AC Max. Current Draw	2.2A	
Battery Capacity	7Ah	
PSU Output Voltage	27.8Vdc	Test on install
Motor Output Current	7A	
Sensor Output Current Budget	0.05A Average Continuous (0.5A max. pulse)	Combined budget: Sensor 1, Sensor 2, FOS1, FOS2. When operating from battery
Relay Board Current	1A Each Relay	
Mag Lock Current	0.5A	Disabled when using secondary supply
Ext. Relay Output Current	1A	Disabled when using secondary supply
Max. Interruption Time	500 milliseconds	Switching from Primary to Secondary Supply

## Fuse Ratings

AC Mains Input	3A Fast – 5x20 BS1362
Option Relay 1 / Option Relay 2	1A Fast – Automotive Blade
Option Maglock	1A PTC Resettable
Actuator	Programmable Digital Auto Reset
Sensors / FOS	1A PTC Resettable
Ext. Relay Output	1A PTC Resettable

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