Manual 010001

FALCON EX

EXTINGUISHING ALARM CONTROL PANEL

Made in Portugal - EU

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INSTALLATION & COMMISSION MANUAL

Table of Contents

1. Overview

Introduction

This document covers the installation and commissioning of a FALCON EX control panel. It is intended for use by a competent and qualified installation technician.

The FALCON EX system must be tailored to the specific requirements of the building and the systems it is intended to protect. The complete system must be designed in compliance with all relevant regulations and standards. Installation must be carried out in accordance with the approved system design. This manual not only specifies the components and clarifies the wiring during installation, but also provides guidance for commissioning and maintenance. It addresses the installation and commissioning of a complete system.

The FALCON EX extinguishing control panel is designed to initiate extinguishing either automatically or manually. These modes can be selected using a key located in the bottom right corner of the panel, or via a remote input, if configured accordingly. The automatic extinguishing mode features an autonomous mechanism comprising two independent zones (Z1 and Z2), which allows extinguishing to be triggered when both zones are activated. In manual mode, extinguishing is initiated through direct action and does not depend on the activation of these two zones. In addition to the various inputs that enable manual activation, there are options to cancel the process if interruption is required, as well as to monitor the status of extinguishing components and respond appropriately.

Symbology

Electrostatic discharge sensitive device

Device with mains earth connection

Risk of electrocution

All PCBs contain devices that are sensitive to electrostatic discharge. Ensure that appropriate precautions are taken against electrostatic discharge (ESD) when removing or installing printed circuit boards.

Key Features

- Extinguishing mode: Automatic or manual, selectable via key switch or remote input;
- Programmable and independent end-of-line options (resistive/capacitive);
- 2 zones dedicated to the automatic extinguishing process and 1 auxiliary fire detection zone;
- 5 extinguishing controls: Manual discharge, Discharge abort, Flow sensor, Valve sensor, and Low pressure;
- 2 configurable, non-monitored inputs for triggering pre-programmed actions;
- 4 monitored outputs: Fire alarm sounder, Extinguishing sounder, Extinguishing indicator, and Extinguishing solenoid valve;
- 4 non-monitored outputs: 1 fire relay, 2 customisable auxiliary relays, and 1 fault relay;
- 2 limited power outputs (max. 300 mA), one of which is firmware-configurable;
- Backlit graphical LCD display, supporting alphanumeric characters;
- Event log with capacity for up to 10,000 entries, allowing detailed analysis;
- Programming via integrated keypad or PC software.

Primary Power Supply

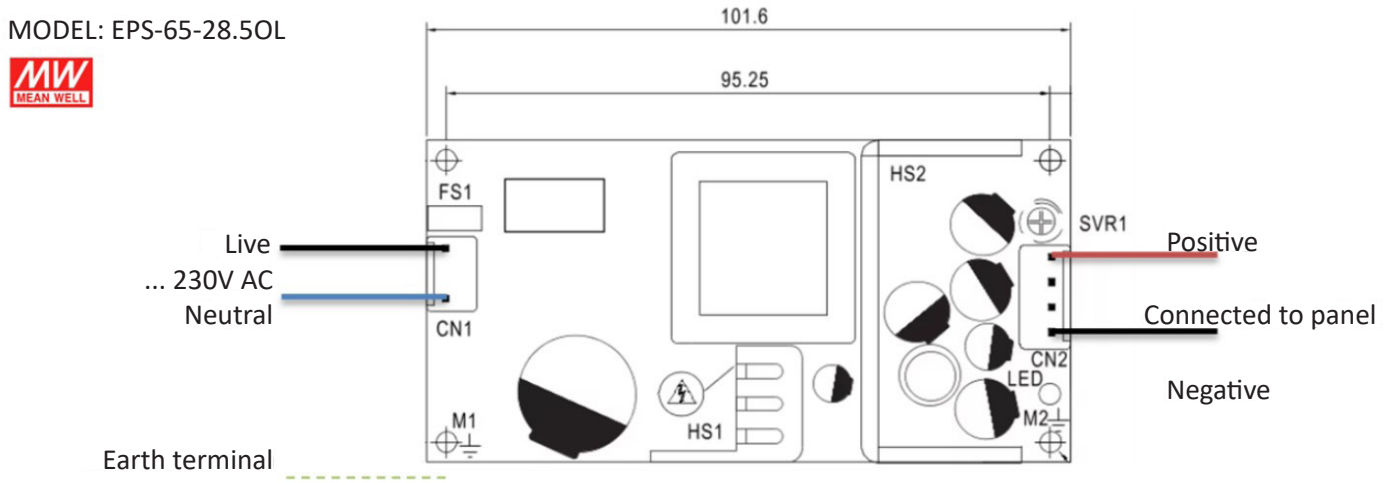


Figure 1: External power supply model EPS-65-28.5 OL

Power Supply - Meanwell Model: EPS-65-28.5OL	
Mains Supply Voltage	90~264 VAC 50/60 Hz - DC input operation possible by connecting AC/N(+), AC/L(-)
Internal Power Supply	Min. 20 V DC - Max. 30 V DC (28.5 V DC nominal) Max. Ripple 1 V peak-peak
Max Output Current	2.4 A @ 230 VAC
System Mains Supply Monitoring	Yes
System Battery Charger Failure Monitoring	Yes
Internal Battery Capacity	2 x 12 V DC 12 Ah - Sealed lead acid batteries
Mains Fuse	4 A - Surge protected (slow blow) 20mm HRC

2. Power Supply Standards

RoHS Directive: 2011/65/EU

Low Voltage Directive: 2014/35/EU – EN 60950-1:2006 + A11 + A1 + A12 + A2

EMC Directive (Electromagnetic Compatibility): 2014/30/EU
EMC – Emissions
Conforms BS EN/EN 55032 (CISPR 32), Classe B, BS EN/EN 61000-3-2 e 61000-3-3, EAC TP TC 020

EMC – Immunity
Conforms BS EN/EN 61000-4-2, -4-3, -4-4, -4-5, -4-6, -4-8 e -4-11, BS EN/EN 55035, EAC TP TC 020

3. Battery Requirements

Connection Details

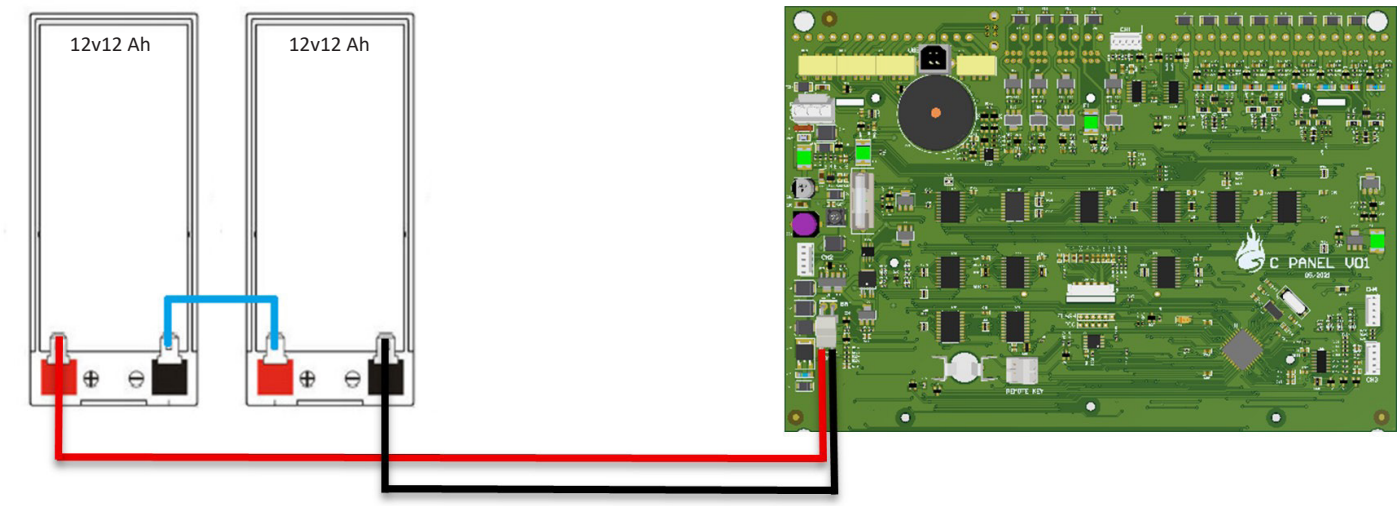


Figure 2: Battery connections to the panel

The maximum load capacity in terms of electric charge for a given battery group is easily calculated using the following formula:

(The resting current in mA of the control panel with everything connected x Necessary standby time in hours divided by 1000) +

(Alarm current in Amperes (sounders load) x Alarm time in hours) + 20%

Use a battery capacity value higher than the one calculated, according to the available battery models on the market.

System standby currents:

Panel	Standby Current (mA)	Alarm Current (mA)
FALCON	60	104

(Standby current (mA) of the control panel + all equipment connected x Maintenance time in hours divided by 1000) + (Alarm current (A) with active sounders x Alarm time in hours) + 20%

Example: A given installation with a load of 58 mA from detectors, 1.1 A from sirens, and a 24-hour autonomy requirement.

60 mA (Panel) + 58 mA (Detectors load) = 118 mA

x

24h (Standby time in hours divided by 1000) = 0.024 h

= 2.832 Ah

+

104 mA (Panel) + 58 mA (Detectors load) + 1.1 A (Sounders) = 162 mA + 1.1 A = 1.262 A

x

0.5 (Alarm time in hours) = 0.5 h

= 0.631 Ah

= 2.832 Ah + 0.631 Ah + 20% = 4.16 Ah

The available market battery capacity value is 7 Ah

WARNING:

The total current load of all siren circuit zones and auxiliary power output connections must not exceed the panel's maximum power capacity.

Refer to the technical specifications tables for details.

4. External Box

Deep Box

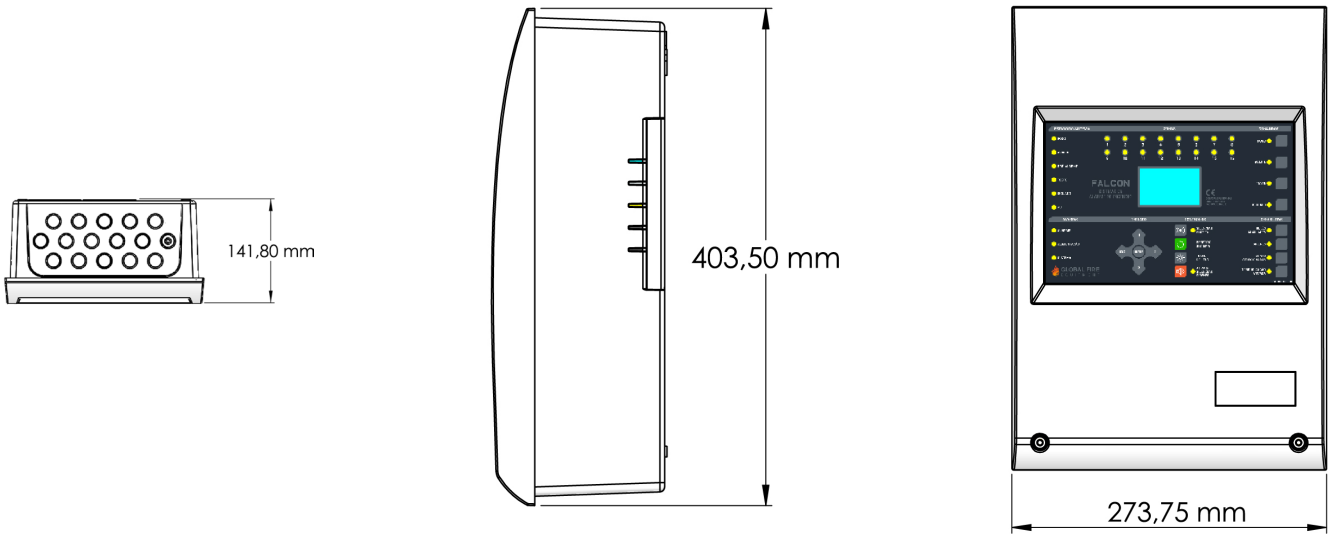


Figure 3: Exterior box - DEEP BOX

5. Internal Components

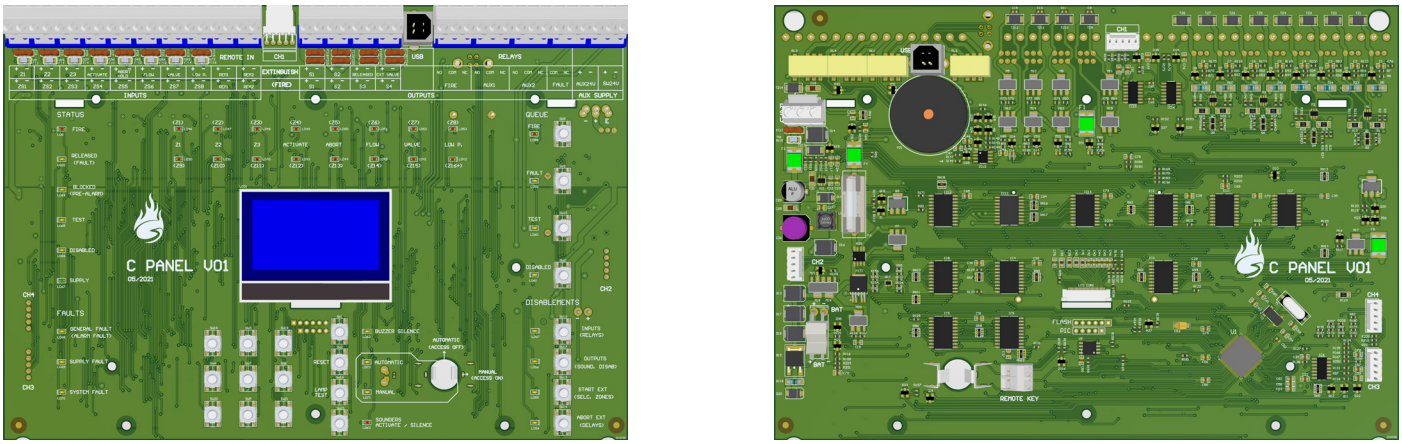


Figure 4: cPanel motherboard

Deep Box Internal View

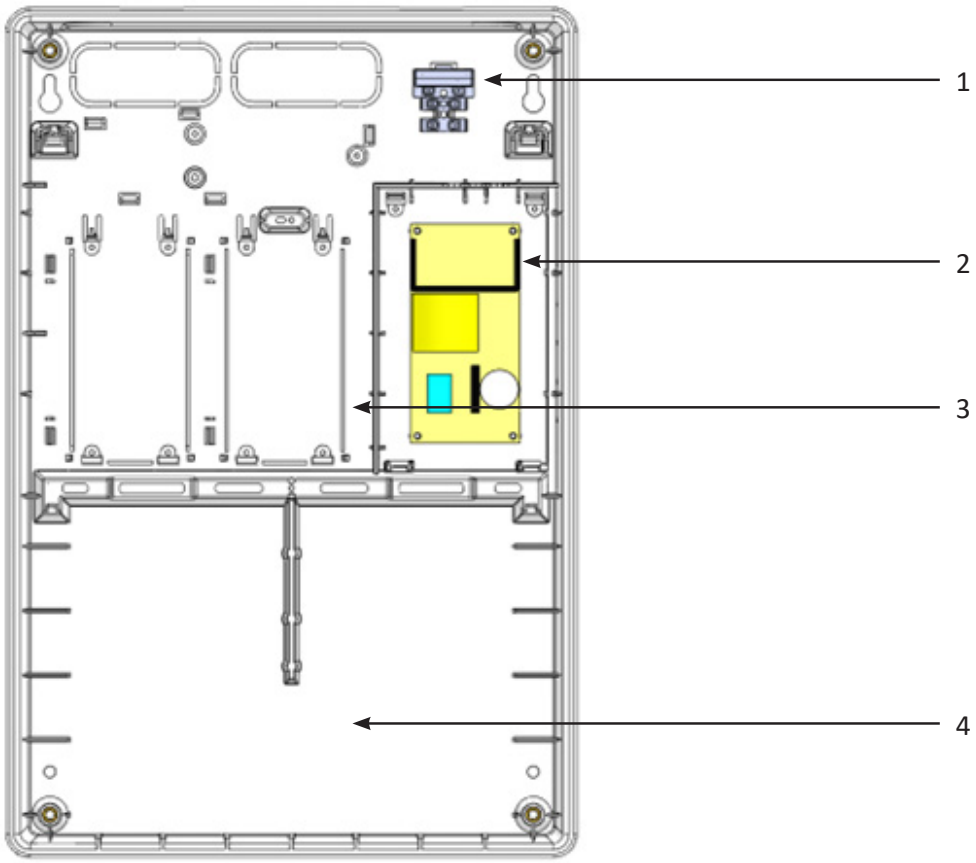


Figure 5: Internal view

1 - Main power supply terminal
2 - Power supply EPS-65-28.5OL
3 - Space for future modules
4 - Battery compartment space

6. Terms, Definitions and Abbreviations

Conventional Sounder: An acoustic signalling device connected to the conventional sounder output of the panel. It differs electrically from an analogue sounder powered by the detection loop, as it is polarised and activated via a DC power supply.

Detector: Any type of fire detector connected to the loop or detection zone.

Device: A detector, sounder, interface module, or manual call point connected to the detection loop.

Evacuation: A system status in which all sounders are activated simultaneously. Pressing the ACTIVATE SIRENS button for 3 seconds initiates the evacuation condition.

Fibre Optic Connection: A form of data communication that uses light signals transmitted through fibre optic cables instead of electrical signals through copper cables. This method supports longer transmission distances and reduces susceptibility to electromagnetic interference.

Flash Memory: Non-volatile memory used to store the panel's programming and user settings. It is highly robust and retains data without requiring power.

NVRAM: Memory that retains stored information even when the system is powered off. A dedicated circuit supports this memory.

PCB: A board used to mechanically support and electrically connect electronic components.

System: A set of interconnected devices forming the fire detection and alarm network.

Zone: A group of devices, such as detectors, connected to the system and treated as a single unit for monitoring and control.

EOL (End of Line): A component placed on the last device in a zone to complete the circuit.

Access Levels: Defined states of the Control and Indicating Equipment (CIE), as specified in the EN 54-2 standard.

Conditions: The status of the control panel or extinguishing system, as indicated by the Control and Indicating Equipment (CIE).

- **Activation:** The condition in which the control sequence has been initiated.
- **Pre-Activation:** The condition in which one of the two required input signals has been detected.
- **Fault:** The condition in which a fault has been identified by the system.
- **Disablement:** The condition in which a specific function has been intentionally disabled.
- **Release:** The condition in which the flow of the extinguishing agent has been initiated.
- **Quiescent:** The normal operating condition in which the panel is powered and no fault or fire condition is present.

Pre-Discharge Countdown: A timed countdown period that begins with the discharge warning and ends with the actual release of the extinguishing agent.

Release Duration: The time period, with a countdown, during which the extinguishing agent is actively flowing from the tank.

Flooding Time: The time required for the extinguishing agent to reach the necessary concentration within the protected area.

7. Recommendations

Due to the flexibility and advanced functionality of this panel, configuring it to meet specific requirements can be challenging. If there is any uncertainty, it is recommended to contact technical support or the authorised distributor. Additional training may also be necessary.

If the system does not appear to be functioning as expected, take the time to carefully review the relevant sections of this manual. The ultimate goal is to ensure correct configuration and to establish appropriate cause-and-effect logic to effectively protect both equipment and personnel.

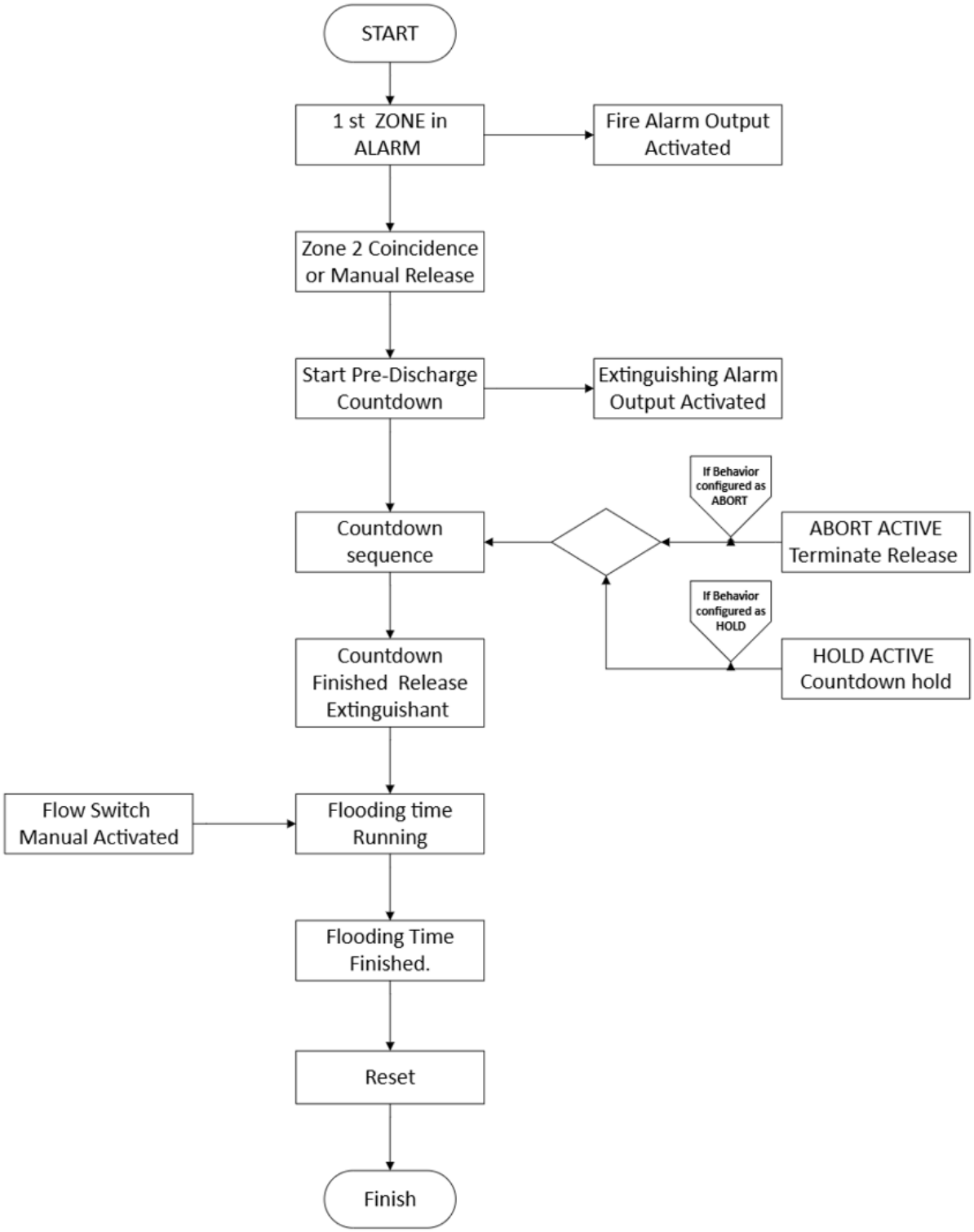
The panel's basic functions are readily accessible and become operational once power is supplied. However, certain advanced settings must be configured via the front panel buttons by navigating through the menu system. Some functions and devices may also be disabled within these menus.

The most effective way to become familiar with the panel's full programming capabilities is through hands-on experience, guided closely by the instructions provided in this manual.

NOTE:

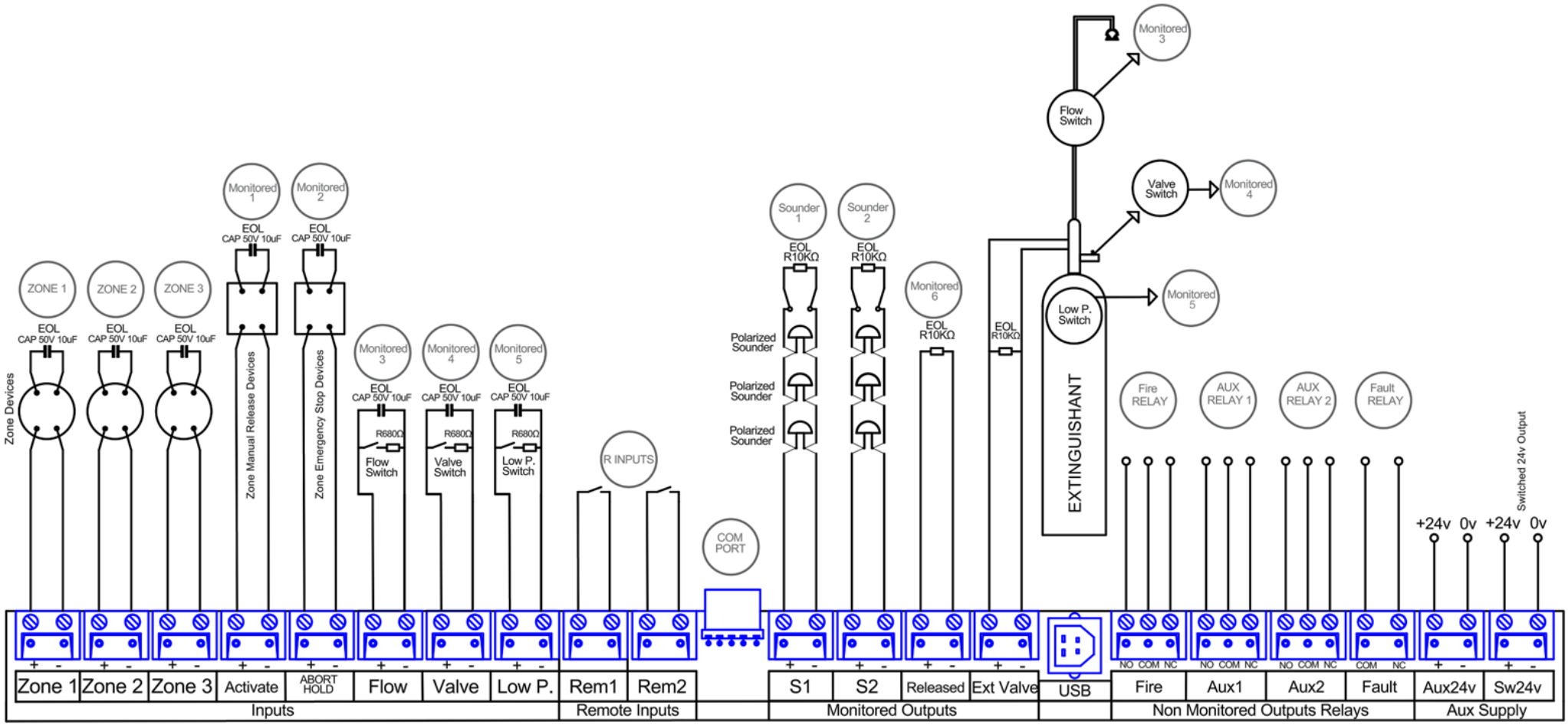
If a fire occurs while the panel is in programming mode, it will automatically exit programming mode. However, if a fault is detected during programming, the fault will be reported, but the panel will remain in programming mode. In this case, it is necessary to manually exit programming mode in order to view the fault details on the LCD display.

8. Extinguishing Operation Flowchart



Flowchart 1: Extinguishing Operation Flowchart

9. Extinguisher Control Panel Wiring Diagram



Flowchart 2: Extinguisher Control Panel Wiring Diagram

10. Panel Inputs and Outputs Description

		FUNCTIONALITY		ACTIVATION	EOL
Inputs	**Z1 and Z2 monitored zones**	In auto mode, the system behaves as coincidence zones In manual mode, it functions as standard conventional fire zones		With zone device	**CAP 50V 10µF**
	Z3	Standard convention fire zone			
	ACTIVATE	Manual activation zone for extinguishing system		Yellow push button (EN 12094)	
	ABORT/ HOLD	This is an emergency stop or extinction pause zone, configurable via menu 6-5		Blue push button (EN 12094)	
	FLOW	This is a flow switch monitoring zone for the extinguishing agent		680Ω Resistor	
	VALVE	Valve monitoring is used to ensure that the valve is operating correctly, whether it is open or closed as expected			
	LOW P	Ensure that the system is pressurised and ready for operation; trigger an alert if the pressure drops			
Remote Inputs	**REM 1 & 2**	By default, REM1 is assigned to the panel reset function, while REM2 is assigned to the evacuation function	External switch	N/A	
Monitored Outputs	**S1**	Monitored sounder S1 - Standard Fire		Sounders	**10K RES**
	S2	Monitored sounder S2 - Extinguish			
	RELEASED	It remains continuously active once the extinguishing solenoid has been triggered. It serves as a status indicator, confirming that the extinguishing process has been initiated and that the solenoid valve is energised			
	EXT VALVE	This output is responsible for energising the extinguishing solenoid for a specific duration, as defined by the system's timing parameters. It ensures that the extinguishing agent is released only within the programmed discharge window			
Non Monitored Outputs	**FIRE RELAY, FAULT RELAY AND AUX 1 & 2**	Unmonitored Output (Relays)		N/A	**N/A**
Aux Supply	**24V AUXILIARY SUPPLY**	Auxiliary Power Output for Supplying External Devices AUX 24 – normal power output SW 24 – delayed power output (20-second delay at startup)			**N/A**
	CHx	3 channels: x2 Master & Slave x1 Data Loop ou Odyssey (future developments)			**N/A**

11. General

Introduction

This section of the manual outlines the physical installation of the system, with a primary focus on the required components and their interconnections.

IMPORTANT:

At this stage, the system must remain unpowered—neither the mains supply nor the batteries should be connected. All panels must remain switched off.

System start-up procedures will be covered in the following section of this manual.

Panel

The control panel must be installed in a location that allows unrestricted access to internal components and protects it from excessive temperature, humidity, vibration, and mechanical shock. A visual inspection should be carried out to identify any foreign objects or non-compliant conditions within the enclosure.

Any residual metal fragments may damage the printed circuit boards (PCBs) if present when the panel is powered on. Therefore, it is strongly recommended to remove all PCBs from the enclosure during installation. Before doing so, ensure you memorise or record the exact positions of each PCB to facilitate correct reassembly.

Recommended Cables

Monitored inputs, remote inputs and monitored outputs

The following fire-resistant cables are approved for use in monitored inputs, remote inputs, and monitored output circuits:

AEI type Firetec Multicore Ref. F1C1 (1 mm²) to F1C2.5 (1.5 mm²) in 2-core
AEI type Firetec Armored Ref. F2C1 (1.5 mm²) to F2C2.5 (1.5 mm²) in 2-core
AEI type Mineral Insulated Cable (all types up to 1.5 mm²)
BICC types Mineral Insulated twin twisted conductor cables, Ref. CCM2T1RG and CCM2T1.5 RG
BICC types Mineral Insulated Pyrotenax (all types up to 1.5 mm²)
CALFLEX type Calflam CWZ 2 core type up to 1.5 mm²
PIRELLI type FP200 Gold 2 core type from 1 mm² to 1.5 mm²
FIRETUF (OHLS) FTZ up to 1.5 mm². Manufactured by Draka

All cables must be shielded.
Minimum conductor cross-section for detection zones: 0.8 mm²
Maximum conductor cross-section for detection zones: 1.5 mm²

NOTE:

When using shielded cables, the shield should be connected to the functional earth (FE) bus at only one end. The other end, at the final device in the line, should remain unconnected.

Figure 7: Earth busbar

- There must be only one device zone per shielded cable.
- Conventional detection zones and conventional sounders must not operate on the same shielded cable.
- Each end of an independent mesh must be connected to the central unit's single earth bus.

12. Commissioning

Commissioning involves verifying that all connections have been made correctly and that all hardware is functioning properly. This requires the system to be installed in accordance with the previous section of this manual.

The control panel is supplied in Installation Mode. In this mode, the green SYSTEM ON LED will flash on and off. The console automatically detects and stores the expansion modules present in the system.

By default, the system is ready to operate and detect both extinguishing and fire events as soon as power is applied. It is therefore fully functional without requiring any additional configuration. Any further actions will tailor the system to the specific requirements of the installation.

Once all connections and hardware have been checked, the system can be commissioned quickly: simply place the system in Installation Mode for 90 seconds, then switch it to Active Mode.

ENTER – Confirms the entry of any data or selection.
▲ (1) – Increases the selected value or number. Also used for entering codes.
▼ (3) – Decreases the selected value or number. Also used for entering codes.
► (2) – Moves the screen cursor when required.
ESC – Exit key. Used to leave a particular function.

► ▲ ▼ Use the arrow keys to enter codes. Once complete, press **ENTER** to confirm.

NOTE:
It is not possible to enter text for labels using the front display keypad. To update label text, the FALCON CONNECTOR must be used.

Panel Controls and Indications

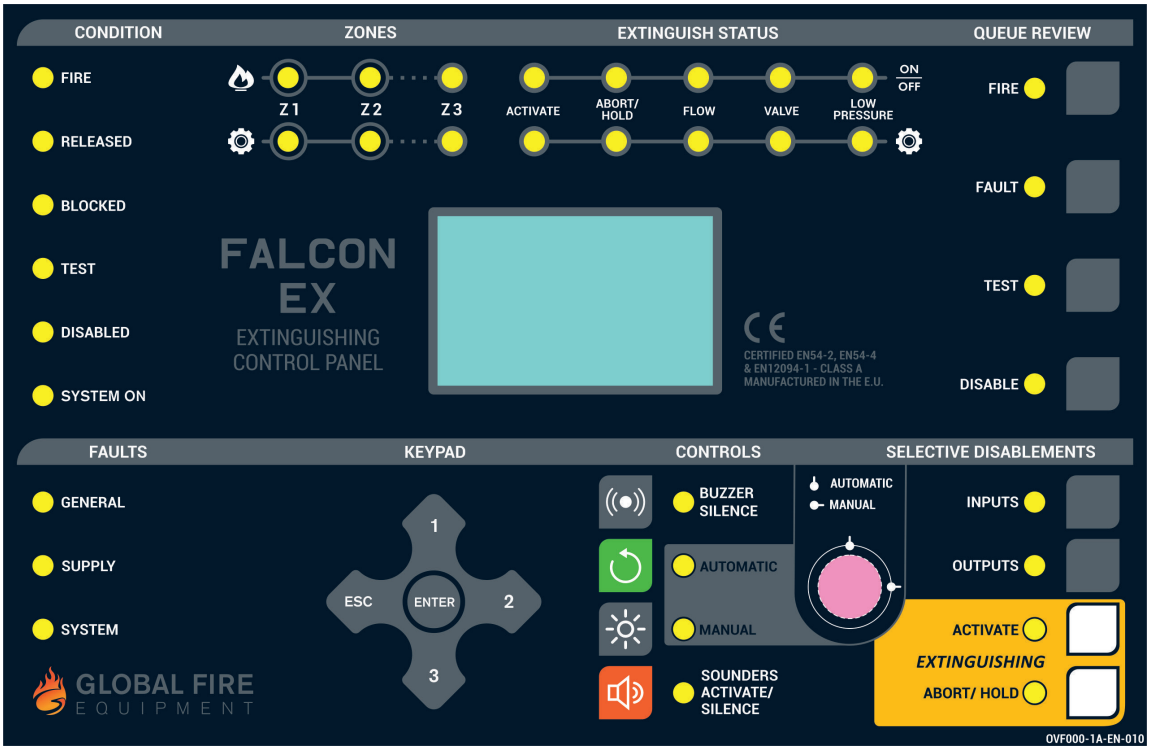


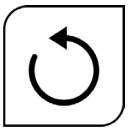
Figure 8: Control and indication display

Silent Buzzer

The occurrence of any FIRE or FAULT condition will activate the internal buzzer. Pressing this button will silence the buzzer until a new FIRE or FAULT condition is triggered by the system.

System Reset

Pressing this button will perform a system reset, clearing all active alarms and faults—unless a priority condition exists, such as an active siren. In such cases, a pop-up message will appear indicating the cause.



A standard reset is sufficient in most situations. However, a full reset can be carried out by disconnecting the main power supply—removing both the primary AC and secondary DC power sources.

NOTE:

If an alarm has been detected, it is necessary to silence the alarms using the SILENCE BUZZER button before the SYSTEM RESET button will function.

LED Test

Pressing this button activates all panel LEDs and turns on the LCD backlight. The LED test functions only while the button is held down and is used to verify that all indicator LEDs are operating correctly.

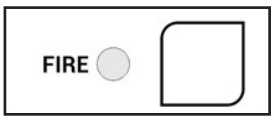
Activate or Silent Sirens

This button either activates or silences all sirens. If held for 3 seconds, it triggers evacuation mode, activating all sirens connected to the S1 output. The adjacent LED remains illuminated while any siren is active.

Event Log History

FIRE- General User Access

No code entry is required to access this function.

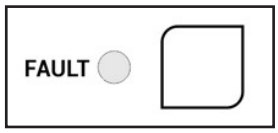


If more than one FIRE event is detected, the LED adjacent to this button will flash alternately. Pressing the button will display all detected fire events sequentially. Once all fire inputs have been acknowledged, the LED will remain steadily lit. Any new events will be added to the end of the input list, and the LED will resume alternating.

After each activation of this button, the information is displayed for 20 seconds, after which the system returns to showing the first entry in the list.

FAULT – General Access Key

If more than one FAULT event is detected, the LED adjacent to this button will flash alternately. By pressing the button, all detected fault events will be displayed sequentially.

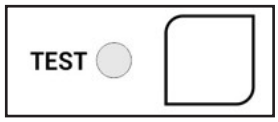


Once all fault inputs have been acknowledged, the LED will remain steadily lit. Any subsequent events will be added to the end of the input list, and the LED will resume alternating.

After each activation of this button, the information is displayed for 20 seconds, after which the system returns to showing the first entry in the list.

TEST – General Access Key

No code entry is required to access this function.



If the LED adjacent to this key is illuminated, it indicates that test mode has been selected in the corresponding programming menus. Pressing the key will display which sirens and zones have been selected for test mode.

Pressing the key again will allow you to view the next zone in test mode, if available. The information is displayed for 15 seconds before automatically returning to the main menu.

NOTE:

SYSTEM RESET function will clear all active test modes configured in the system.

DISABLE

If the LED is illuminated, it indicates that at least one disablement is currently active in the system. By pressing the button, the system will display the list of active disablements.

If there are more disablements than can be shown at once, pressing the button again will display the next set of disablements, and so on.

The information is shown for 5 seconds before returning to the default display.

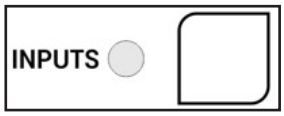
Possible disablements include:

- Detectors
- Extinguishing inputs
- Conventional sirens
- Extinguishing outputs
- Auxiliary relays
- Custom timers

Inputs

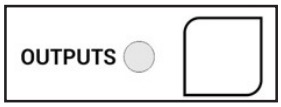
Through the programming menus, zones can be configured with selective disablement enabled. When this button is activated, any zones with selective disablement will not trigger a fire alarm condition.

If no zones have selective disablement enabled, pressing this button will have no effect. Pressing the button again restores normal sensor operation.



Selective Disablement of Individual Outputs

Through the programming menus, individual outputs—such as monitored outputs (conventional sounders and extinguishing outputs), unmonitored outputs (relays), and custom timers—can have selective disablement enabled.



When this button is activated, outputs with selective disablement enabled are not triggered and do not perform any potential fault checks. If no outputs have selective disablement enabled, pressing this button has no effect. Pressing the button again restores normal operation.

Manual Mode vs. Automatic + Manual Mode Selection

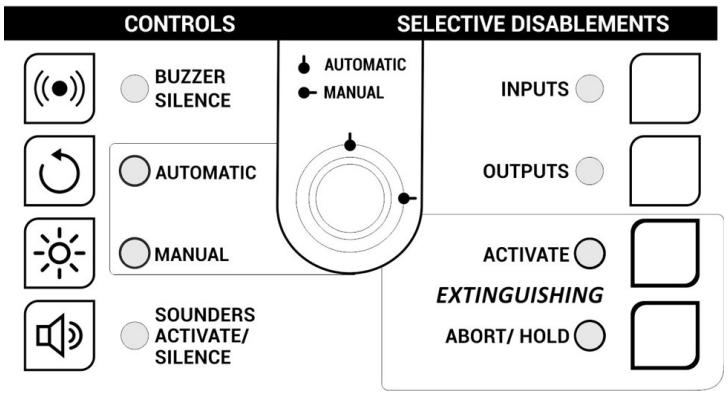


Figure 25: Interface push buttons are used for activation and programming, along with a selector switch for Automatic/Manual mode.

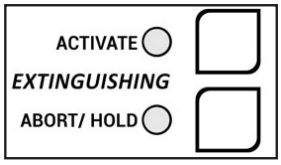
The extinguishing mode is selected using a key switch, allowing the choice between two options: “Manual Only” or “Auto + Manual”.

Automatic Mode: All extinguishing functions are available.
Manual Mode: All functions are available except for automatic detection in Zone 1 and Zone 2.

Extinguishing

Activate

Pressing this button for an extended period triggers a manual extinguishing procedure. This action is equivalent to pressing the manual release button, which activates the discharge of the extinguishing agent in emergencies where automatic detection has not yet been triggered.



Abort/Hold

The Abort and Hold functions are critical safety features that provide authorised personnel with manual control over the release sequence.

Abort

Purpose: Cancels or interrupts the extinguishing sequence before discharge (Pre-Discharge).
How it works: When the Abort button is pressed and held, it prevents the system from releasing the suppression agent, even if the countdown has already begun.

Hold

Purpose: Delays the extinguishing sequence without cancelling it.
How it works: Pressing the Hold button pauses the countdown timer, allowing more time for evacuation or verification.

Access Level 1 - Any User

This level of access does not require an access code and is therefore the most basic level. The functions available on the control panel are very limited and include only the following:

1 - LED test button
2 - Event history review button (Fire, Fault, Test and Disabled)

Access Level 2 - General User

Unless otherwise specified, operating a given switch requires a valid User or Programming Access Code. Access at this level is granted by entering a code using the panel keypad. The user code is factory-set as ▲ ▲ ▲ ▲ ▲.
After entering each digit in sequence, press OK to confirm the entry.

Upon entering a valid User Access Code, the authorised user gains access to operate all switches on the front display panel. General User Access also permits zones to be enabled or disabled. This code can be changed.

Access Level 3 - Authorised Installer

Access Level 3 – Press ENTER, then enter the installer access code ▲ ▲ ▲ ▲ ▲ , and press ENTER again to confirm the entry.

Primary Supply Connection

The panel must be properly earthed. The earth wire should be connected to the terminal designated for the green and yellow conductor **(PE – Protective Earth)**.

The line (phase) conductor of the power supply must be connected to the fused input terminal of the power supply unit, where the black or brown conductor **(L – Line)** is connected.

The neutral conductor must be connected to the terminal designated for the blue conductor **(N – Neutral)**.

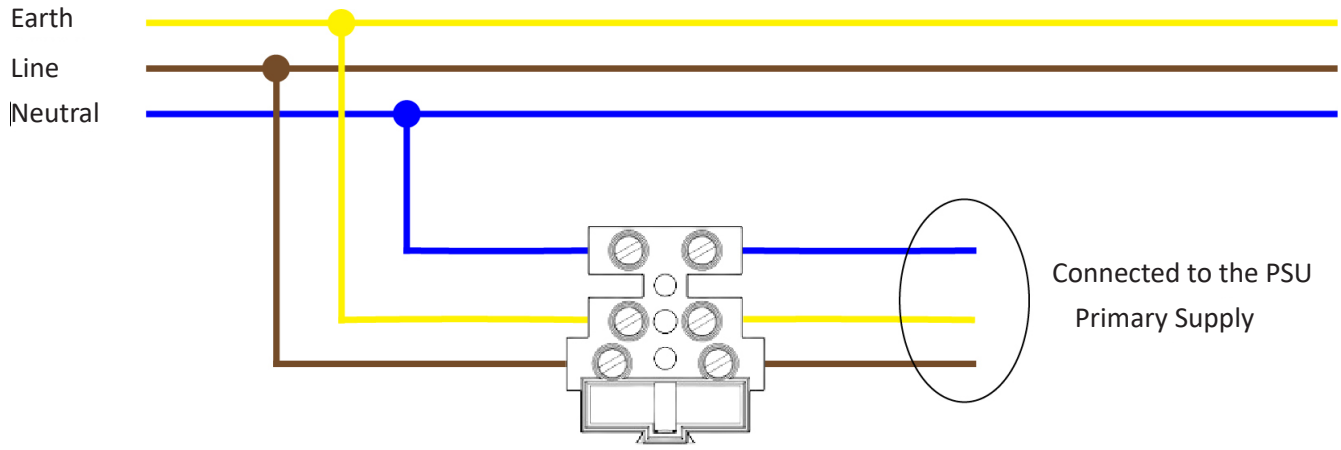


Figure 6: Primary supply connections

Monitored Inputs

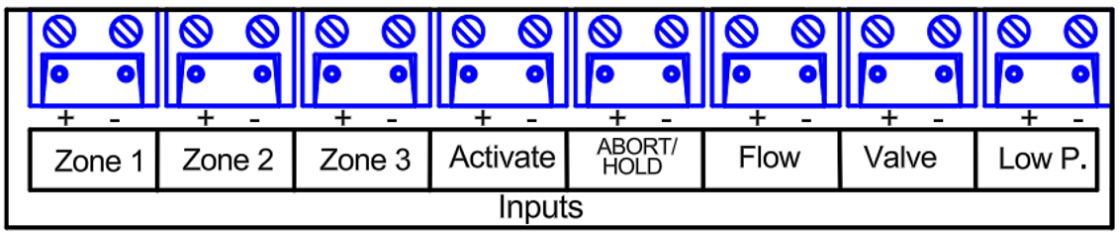


Figure 9: Monitored input ports

Zones Z1 and Z2 Connections

Zones Z1 and Z2 have two distinct operating behaviours, depending on the system mode:

Automatic Mode:
In this mode, Zones **Z1 and Z2 function as coincident extinguishing zones**. An **extinguishing process is triggered only when both zones go into alarm**. These zones must be installed in the extinguishing area in an interlaced configuration to ensure effective coverage.

Manual Mode:
In manual mode, Zones **Z1 and Z2 operate as conventional fire detection zones**.

Each zone can support up to 32 detectors.

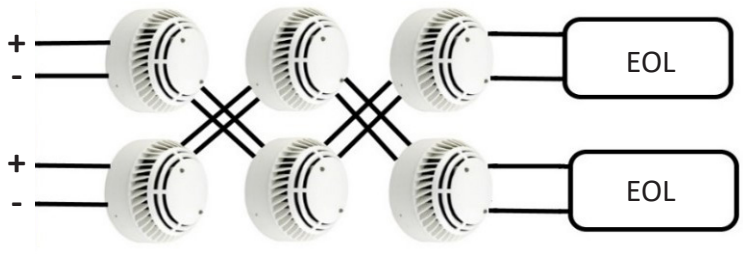


Figure 10: Z1 and Z2 with interlaced connection and capacitive end-of-line CAP 50V 10µF

Zone Z3 Connections

A conventional fire zone that is isolated from the extinguishing process, allowing for the connection of up to 32 detectors.

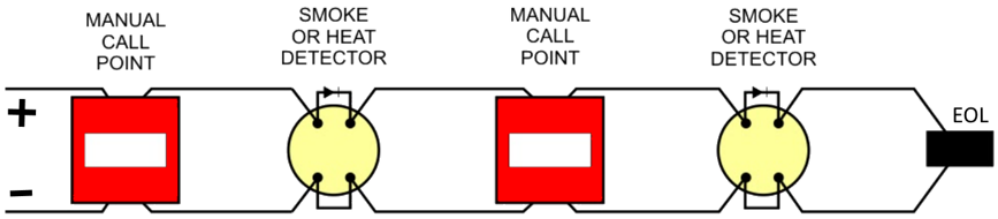


Figure 11: Conventional fire zone with capacitive end-of-line CAP 50V 10µF

Activate Connections

Monitors the status of emergency push buttons and, upon activation, triggers the extinguishing process in either Automatic or Manual mode.

Supports up to 32 push buttons.

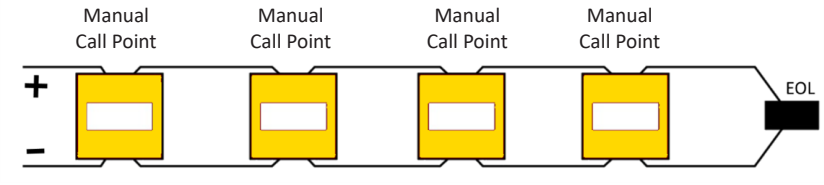


Figure 12: Zone dedicated to manual extinguishing activation. Monitored with a captive end-of-line Cp 50v 10 MF

Zone Abort/Hold Connections

Monitors the status of emergency push buttons and, in the event of activation, interrupts the extinguishing process. The system must be reset to return to normal operation.

If a fault is detected in this zone, the system will prevent the extinguishing process from starting until the fault has been cleared and the system has been reset.

Abort
Cancels or interrupts the extinguishing sequence before discharge (pre-discharge).
When the Abort button is pressed and held, it prevents the system from releasing the suppression agent, even if the countdown has already begun.

Hold
Pressing the Hold button pauses the countdown timer, giving more time for evacuation or verification.
There are 2 types of configurations for this function:

When pressed, holds the extinguishing sequence and **resets** the pre-discharge counter when released.
When pressed, holds the extinguishing sequence and **resumes** the pre-discharge counter from where it was paused when released.

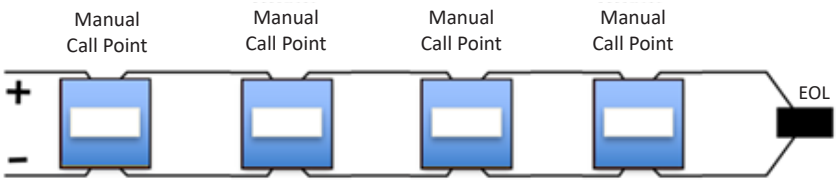


Figure 13: Zone dedicated to manual extinguishing activation of cancellation or interruption of the pre-extinguishing or extinguishing process. Monitored with a capacitive end-of-line Cp 50v 10 MF

Flow Sensor Monitoring Connections

Monitors the sensor that detects the activity of the extinguishing agent following activation. When triggered, the sensor should produce a current draw of approximately 21 mA through a 680Ω resistor.

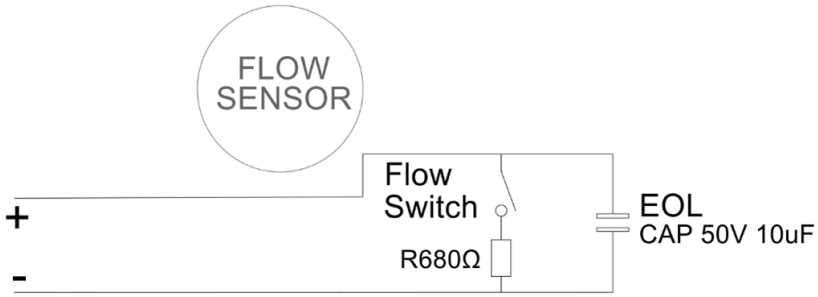


Figure 14: FLOW Sensor Circuit

Valve Sensor Connections

Monitors the sensors that detect the correct positioning or engagement of the extinguishing valve, triggering the 'BLOCKED' condition as a safety measure if maintenance is required, and to ensure that the respective valve is correctly installed at the end of the maintenance process. When activated, the sensor should produce a current draw of approximately 20 mA through a 680Ω resistor.

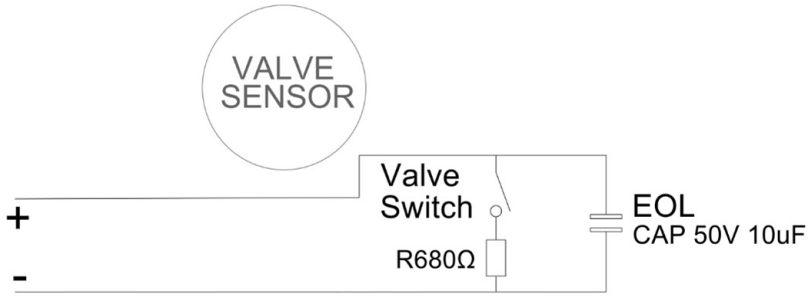


Figure 15: VALVE Sensor Circuit

Switch open - VALVE LOCKED
Switch closed - VALVE UNLOCKED

Low Pressure Monitoring Connections

Monitors the pressure sensors of the extinguishing cylinder. The sensor can be used to measure the weight of the cylinder, indicating whether it is empty. When triggered, the sensor should produce a current draw of approximately 20 mA through a 680Ω resistor.

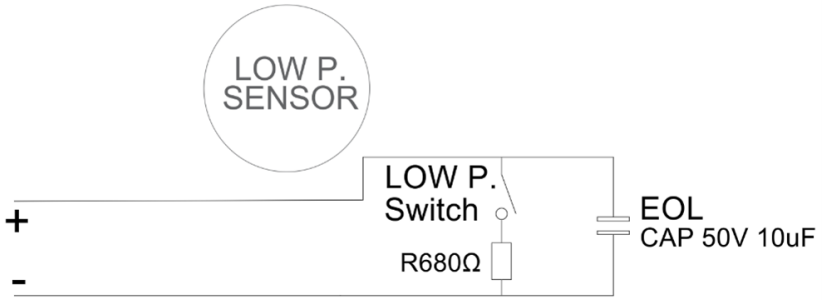


Figure 16: LOW PRESSURE Sensor Circuit

Remote Inputs Connections

The 'Remote Inputs' trigger a pre-programmed action in menu 2-2 whenever the input terminals are activated. These inputs can be configured to function as RESTART, EVAC./SILENCE, SELECTED INPUT, SELECTED OUTPUT, SELECTED I/O, START EXTINGUISH, ABORT EXTINGUISH, or CLASS CHANGE.

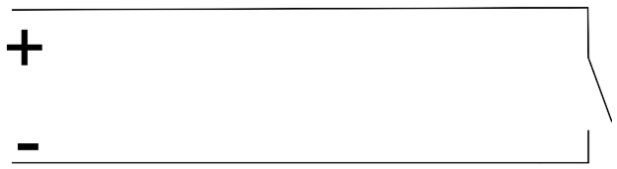


Figure 17: Remote Input Circuit

Monitored Outputs

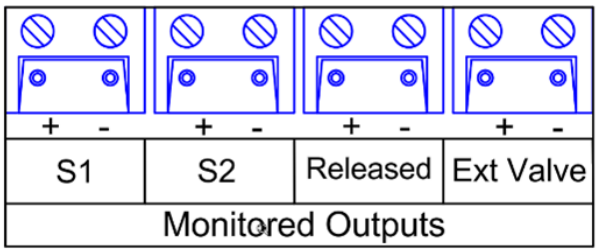


Figure 18: Monitored Outputs

Conventional Sounder - S1 Connections

The Fire Sounder Outputs activate the conventional sounders continuously whenever a new fire or evacuation event is detected. Each output is individually protected against short circuits. Monitoring is carried out using the reverse polarity method with a 10 kΩ resistive end-of-line.

Connected devices—such as sounders, beacons, bells, or pyrotechnic activators—must be polarised. Non-polarised devices will trigger a fault on the control panel circuit. To prevent this, a polarisation diode can be added in series with the device when using bipolar components.

Pressing the “Activate/Silence Sounders” button for 3 seconds initiates evacuation mode and activates this output.

Conventional Sounder - S2 Connections

The Extinguishing Sounder Output activates conventional sounders in a pulsed manner during the pre-extinguishing period, and continuously when the extinguishing solenoid is activated. The output includes individual short-circuit protection. Monitoring is performed using reverse polarity and a 10 kΩ resistive end-of-line.

Connected devices—such as sounders, beacons, bells, or pyrotechnic activators—must be polarised. Non-polarised devices will trigger a fault in the control panel circuit. To mitigate this issue, a polarisation diode should be added in series when using bipolar devices.

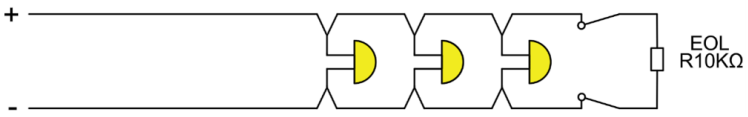


Figure 19: Polariser Sounder circuit

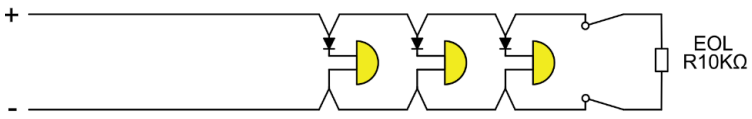


Figure 20: Non-Polariser Sounders circuit

For non-polarised devices place the diode as the figure above Diode reference- 1N400x

Released Monitoring Connections

Output that permanently signals the activation of the extinguishing solenoid or the detection of extinguishing agent flow. The output includes individual short-circuit protection. The nominal output voltage is 28.5 VDC, and the maximum permitted output current is 250 mA. Monitoring is carried out using reverse polarity and a 10 kΩ resistive end-of-line.

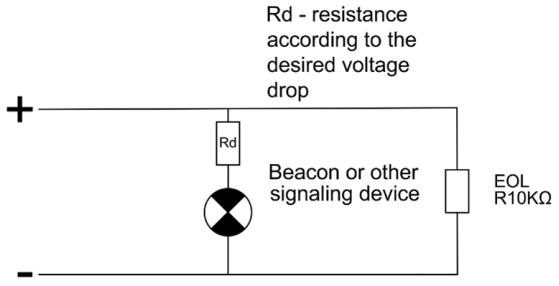


Figure 21: Released circuit implementation for a single signaling device

External Valve Monitoring Connections

Output that activates the extinguishing solenoid for a predefined duration. The output includes individual short-circuit protection. The output voltage is 28.5 VDC, with a maximum output current of 850 mA. For short periods (10–30 seconds), the maximum output current is 950 mA. Monitoring is carried out using reverse polarity and a 10 kΩ resistive end-of-line.

WARNING:

All these outputs are monitored using a 10 kΩ end-of-line resistor, and the group of outputs is limited to a peak current of 1.1 A. A protection diode must be used when connecting inductive loads.

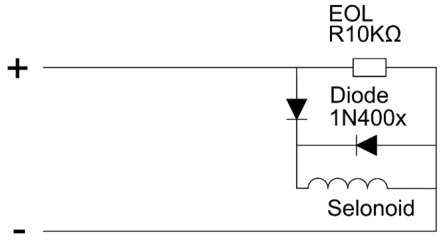


Figure 22: External valve output. Solenoid circuit implementation

Non-Monitored Outputs

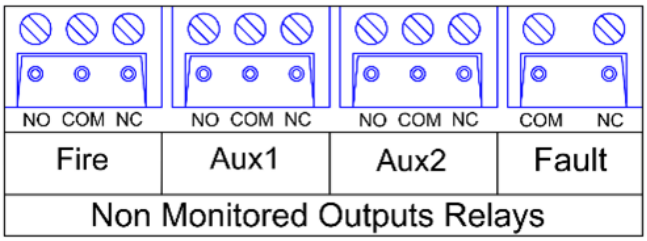


Figure 23: Non-monitored Outputs, Fire, AUX1, AUX2 and FAULT relays

Four relay outputs are provided.
The maximum rated contact current for each relay contact set is:

- 1 A at 50 V DC (resistive load), or
- 0.5 A at 125 V AC (resistive load).

Fire Relay

Activated whenever a new alarm condition occurs.

Aux 1 & Aux 2 Relays

These two relays can be programmed to operate with the following options: ZONAL RELAY, FIRE RELAY, FAULT RELAY, EXTRACTOR RELAY, SIGNAL RELEASED, SIGNAL MANUAL ON, SIGNAL HOLD, SIGNAL ABORT, SIGNAL **LOCKED**, or AC RELAY. They can be configured with Fail-Safe functionality.

Fault Relays

Activated when a new fault condition occurs.

WARNING:
Relay outputs are not monitored. Ensure that all cables connected to these outputs are power-limited.

Auxiliary Supply

These outputs provide an unmonitored auxiliary 24 V power supply.

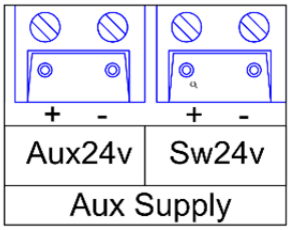


Figure 24: Switched and permanent auxiliary power output

Aux 24V Output

Provides continuous output power at the system's nominal voltage. The output voltage is 28 V when powered by the main supply. If the main supply is interrupted, the voltage ranges between 21 V and 26 V, depending on the nominal voltage of the battery.

Switched 24V Output

Power output at the system's nominal voltage, controlled by a pre-programmed action. The output voltage is 28 V when powered by the main supply. If the main supply is interrupted, the voltage ranges between 21 V and 26 V, depending on the nominal voltage of the batteries. The combined AUX outputs are limited to a maximum of 1 A.

NOTE:

The total current available for the two auxiliary ports (AUX 24 and SWITCHED 24V) is limited to 1 A, which is shared between both outputs depending on the connected load.

WARNING:

The total current load of all detection zones, sounder circuits, and auxiliary power outputs must not exceed the control panel's maximum power capacity. Please refer to the technical specification tables for detailed limits.

Logging In and Accessing Functions

To access all panel functions, you must log in using one of the two available access levels.

- The panel must be powered on and fully initialised — it should not display the message 'INITIALISING'.
- Press ENTER on the keypad.
- You will then be prompted to enter your Installer Access Code.
- There is no limit to the number of attempts, but if code entry is not started within 10 seconds, the panel will return to the default screen.

Programming functions are organised through a menu system.

Use the ▲ and ▼ keys to navigate through functions or submenus.

- Press ENTER to select a function.
- Press ESC to move up one menu level.

Main Menus

1. Historical Log Review
2. Remote Input
3. Zones
4. Sounders
5. Relay Outputs
6. Extinguishing
7. Monitor Counts and Zone Tests
8. General

Most functions operate consistently using the standard keys. The item being modified is typically highlighted by a blinking cursor.

Control Panel Batteries

It is recommended that the batteries be installed at the end of the system commissioning process. Otherwise, it may be difficult to quickly disconnect power if a problem occurs.

The batteries are connected to the main board of the FALCON EX. This connection not only supplies power to the control panel in the event of a primary power failure but also provides a charging output to keep the batteries fully charged.

Before connecting the batteries, check the voltage across the battery connection terminals. The value should be 27.5V ± 0.5V.

NOTE:
Risk of electric arc and fire. Never short-circuit the battery terminals. Always connect the blue wire between the batteries last.

Extinguishing System Functionality Description

Pre-discharge Warning Time

The Pre-discharge Warning Time is the initial phase of the extinguishing sequence, serving as a warning period before the actual release of the extinguishing agent. This phase is designed to ensure the safety of personnel and equipment by providing a brief delay, allowing time for evacuation or intervention if necessary.

This warning phase is initiated under any of the following conditions:

Dual-Zone Alarm (Z1 and Z2): When both **Zone 1 and Zone 2** simultaneously enter an alarm condition.
Manual Activation via Panel: When the **ACTIVATE** button is pressed directly on the control panel interface.
Remote Activation via Push Button: When a **manual call point** connected to the ACTIVATE port is triggered.

Once triggered, the system enters the **Pre-discharge Warning Time** phase, initiating the extinguishing process. Key features of this phase include:

- A countdown period (10 to 60 seconds).
- Simultaneous **audible and visual alerts**, such as buzzers and display indicators.
- A clear display message, such as **“Pre-discharge”**.

Depending on system configuration, the process can still be aborted or delayed by authorised personnel during this window.

NOTE:
At this point, the process can still be **aborted or delayed** by authorised personnel.

Activate (External Valve Activation)

The ACTIVATE phase represents the moment when the extinguishing agent is effectively discharged. It **begins immediately after the Pre-discharge Warning Time ends**, provided the process has not been reset or aborted during the countdown.

Once activated, the system performs the following actions:

Immediately activates the External Valve Output to **release the extinguishing agent** (e.g., gas or other suppression media).
Starts the Extinguishing Time countdown (maximum duration: 1200 seconds).
Activates visual indicators (e.g., "**Valve Output Activated**" messages on the display).
Maintains **audible alarms** to signal that suppression is in progress.
Triggers **output relays and connected devices** to support the discharge process.

System Operation

Ensure that all connectors are firmly seated and that all connections are securely tightened, with no loose wires.

If an expansion board has been added to the panel:

- Confirm that it is correctly installed.
- Ensure it is powered by the auxiliary supply.
- Verify that the flat Molex cable is connected to CH3.

Check for any missing end-of-line (EOL) devices in the monitored I/O circuits.

Power on the panel and verify that it is in Installation Mode (the SYSTEM ON LED should be flashing). If it is not:

1. Enter Programming Mode (Menu 8-4-1).
2. Select Installation Mode.
3. Press SYSTEM RESET.

Check Panel Operation

To verify LED functionality and identify equipped zones:

Press and hold the LED TEST button on the panel. All LEDs should illuminate, and the LCD backlight should turn on.

Identify the zones that are equipped

1. Enter programming mode by entering the installer access code.
2. If site-specific data has not been pre-programmed, select: Function 8-3-1: Clear client flash memory.
3. Select Function 8-3-2: Clear non-volatile RAM (NVRAM).
4. The system will automatically detect connected devices and report any faults.
5. Re-enter programming mode and access Menu 7 – Zone Monitoring and Testing.

6. Select Function 7-1: Zone Status. Use ▲ and ▼ to scroll through devices. Confirm that all zones are present and no faults are reported. If a fault is present, check for short/open circuits or a missing End-of-Line (EOL) device.
7. Select Function 7-2: Monitored Output Status. Use ▲ and ▼ to select the device. Confirm that all outputs are present and fault-free. Investigate any faults as above.
8. Select Function 7-3: Relay Status. Use ▲ and ▼ to select the device. Confirm that all outputs are present. Energised relays will be indicated as “On”.
9. Select Function 7-6: Expansion Modules. Use ▲ and ▼ to select the device. Confirm that all expansion modules are present.
10. Once all faults have been cleared and the system has remained in Installation Mode for 90 seconds, it can be switched to Active Mode.

Zone Monitoring Check

- Inspect each zone output for any signs of short circuit or open circuit conditions.
- To perform an open circuit test, disconnect either the + or – OUT terminal of Zone 1, 2, or 3. A fault condition should be detected and displayed within a few seconds.
- Reconnect all wiring and press SYSTEM RESET to clear any fault indications.
- Ensure that a capacitive End-of-Line (EOL) device is correctly installed on the last device in each zone to maintain proper supervision and circuit integrity.

Conventional Sounders Check

- When the building is unoccupied, press and hold the ACTIVATE SOUNDERS / SILENCE ALARMS button for more than 3 seconds.
- All sirens will activate and will continue to sound until the button is pressed again.
- If the building is occupied, it is strongly recommended to use the built-in siren test feature in programming mode:
  - Enter programming mode.
  - Navigate to Menu 7-4: Test Sounders.
- This function activates all sounders for 2 seconds, followed by a 9-second silence cycle.
- Ensure that an End-of-Line (EOL) resistor is correctly installed on the final device in each zone to maintain proper supervision and circuit integrity.

Activate and Abort/Hold Check

- Like the zone ports, these ports are monitored using a capacitive end-of-line device.
- Inspect each zone output for any signs of short or open circuit conditions.
- To perform an open circuit test, disconnect either the + or – OUT terminal of Zone 1, 2, or 3. A fault condition should be detected and displayed within a few seconds.
- Reconnect all wiring and press SYSTEM RESET to clear any fault indications.
- Ensure that a capacitive End-of-Line (EOL) device is correctly installed on the final device in each zone to maintain proper supervision and circuit integrity.

WARNING:

If the outputs of the conventional sounders experience a short circuit while the sounders are active, the electronic overload protection will be triggered. The system will report a sounder fault and simultaneously activate the FAULT ALARM LED. Once the short circuit has been cleared, resetting the system will remove the fault condition.

Flow, Valve and Low Pressure Check

- Like the zone ports, these ports are monitored using a capacitive end-of-line (EOL) device.
  - A 680-ohm resistor is included in these circuits to trigger a fault condition on the panel.
  - First, check for any faults with the installed EOL device. Then complete the circuit as shown in Figure 14, 15 and 16.
- Begin by inspecting each port for any signs of short or open circuit conditions.
- To perform an open circuit test, disconnect either the + or – connection on each port. A fault message will appear on the display.
- To perform a short circuit test, connect a jumper wire across each port, linking the + and – terminals. In either test, after a few seconds, a fault message will appear on the LCD screen of the control panel and any repeater panels, indicating that the port is shorted. The FAULT and FAULT ALARM indicator LEDs will illuminate.
- Restore the original wiring and press SYSTEM RESET to clear all fault indications.

Detector Test by Zone

- Enter programming mode and select Function 7-5: Test Zones, which allows you to choose the zones to be included in the test.
- Select the zone to be placed in test mode.
- Choose the siren output mode and the sound duration.
- Exit programming mode, but do not press SYSTEM RESET, as this will clear all test modes.
- In test mode, whenever a detector is activated, its LED will illuminate and the event will be reported on the control panel for 15 seconds. If enabled, the sirens will also sound for the preconfigured duration.
- Press TEST ZONE REVIEW to display the zones currently in test mode and the source type of the last alarm (detector or manual call point).

NFC KEY Configuration

The control panel supports the use of NFC Fire Key modules to unlock the system. Up to 10 NFC keys can be stored, each configured with the same access level.

Configuration is carried out as follows:

- Connect CN1 to the FALCON communication port. Do not power the panel at this stage, as doing so may cause damage.
- Check the communication channel settings via Menu 8-5: Channel Config to ensure it is set to the Master-Slave protocol.
- Access Menu 8-9-1: Access Config, select the tag number to configure, and assign the desired access level (options: User, Installer, or Master).
- Select Get Tag ID — LED 1 will turn green. The user then has 60 seconds to present the NFC key tag to the reader.
- Once the tag is detected, the screen will display Tag Read and the green LED will turn off. Select Save, then press Enter.

Repeat the above steps for up to 10 cards/tags.

NOTE:

If the same card/tag is programmed twice with different access levels, the highest level will be applied. For example, if both “User” and “Installer” levels are stored on the same tag, the panel will always use the higher level, in this case “Installer”.

Completion of Installation and Operation

At this stage, the user can configure the more advanced features of the system. The basic minimum typically involves assigning text labels to the Zones. Once this is completed, do not forget to carry out the following steps:

- Connect the batteries to the panel as described in the Installation section of this manual.
- Test the battery monitoring function by temporarily disconnecting the blue wire between the batteries. After a few seconds, a fault should be registered on the panel. Once the blue wires are reconnected, pressing SYSTEM RESET should clear the fault report.
- Test the primary power supply monitoring and ensure the battery system is functioning correctly. Disconnect the AC power supply to each power unit on the panel. After a few seconds, the panel should report a fault.
- Reconnect the AC power supplies and press SYSTEM RESET. Confirm that the system is in Active Mode — the SYSTEM ON LED should remain steadily lit.

Programming Function by Software FALCON CONNECTOR

To configure devices, zone text messages, and other advanced features, it is essential to use the FALCON CONNECTOR PC-based software.

The FALCON CONNECTOR software can be downloaded from the official GFE website. Once downloaded and installed on your computer, follow these steps:

- Connect the panel's USB cable to the computer running FALCON CONNECTOR.
- On the panel, select Menu 8-4-2, then press the right-hand key.
- On the keypad, download the panel firmware, then customise the configuration data as required.
- Upload the updated content back to the panel.

13. Functions

Menus and Submenus

1 Review Historic Log

Accessible to all levels

All the functions associated with reviewing events and settings.

1-1 Display Historic Log

Accessible to all levels

The dashboard records all events in an internal event log, capable of storing up to 10,000 entries. When the log reaches full capacity, the newest entry is added, and the oldest entry is automatically deleted.

Help is displayed automatically upon entering the function, as it is not possible to view a log entry and help text simultaneously. To navigate through the log and select a specific entry, use the ▲ and ▼ keys.

1-3 Read/Clear Automatic Start-Up Count

Accessible at levels 2 and 3

The autostart counter can be read and reset via Remote Input 2.

2 Config IO's

Accessible only at level 3

This function allows you to define the behaviour of the available remote inputs. Each input can be configured to perform specific actions such as pre-selected restarts, evacuations, or deactivations.

Remote Inputs	Available Option
01	NONE RESTART EVAC./SILENCE SELECTED INPUT SELECTED OUTPUT SELECTED I/O START EXTINGUISHING ABORT EXTINGUISH CLASS CHANGE
02	

NONE: Not applicable.
RESTART: If the contact is closed for 2 seconds, the control panel will restart.
EVAC. / SILENCE: When the contact is closed, the control panel activates the evacuation process.
SELECTED INPUT: When the contact is closed, the selected inputs configured to be disabled will be disabled.
SELECTED OUTPUT: When the contact is closed, the selected outputs configured to be disabled will be disabled.
SELECTED I/O: When the contact is closed, the selected inputs and outputs configured to be disabled will be disabled.
START EXTINGUISH: If the contact is closed for 5 seconds, the control panel will initiate the extinguishing sequence.
ABORT EXTINGUISH: If the contact is closed for 1.5 seconds, the control panel will initiate a request to cancel the extinguishing process.
CLASS CHANGE: When the contact is closed, it toggles the control panel's status between silent mode and siren activation.

2-4 Non Monitored Outputs

Accessible only at level 3

This function allows you to define the behaviour of the available unmonitored outputs. These outputs can be configured to operate as general fire relays, general fault relays, or zone-specific relays.

Please note: The fire relay and fault relay cannot be reconfigured. They are fixed in function and will always behave in a predefined manner.

Output	Option		Security Setup
Fire Relay	Only Fire Configuration		N/A
Relay Aux 1	NONE	SIGNAL MANUAL ON	Yes
Relay Aux 2	ZONAL RELAY	SIGNAL HOLD	
	FIRE RELAY	SIGNAL ABORT	
	FAULT RELAY	SIGNAL LOCKED	
	EXTRATOR RELAY	AC RELAY	
	SIGNAL RELEASED	SIGNAL DOOR	
Fault Relay	Only Fault Relay		N/A

NONE: Deactivates the relay.
ZONAL RELAY: The relay can be associated with a zone to activate (menu 5-3).
FIRE RELAY: Activates during a fire alarm.
FAULT RELAY: Activates when a fault is detected.
EXTRACTOR RELAY: Activates at the end of an extinguishing cycle.
SIGNAL RELEASED: Activates when the extinguishing agent is flowing.
SIGNAL MANUAL ON: Activates when the panel key is turned to manual extinguishing mode.
SIGNAL HOLD: Activates when a hold button is triggered during extinguishing.
SIGNAL ABORT: Activates when an abort pushbutton is triggered during extinguishing.
SIGNAL BLOCKED: Activates when the valve is unlocked.
AC RELAY: Activates when there is a primary power failure.
SIGNAL DOOR: Reserved for future development.

3 ZONES

3-1 Disable Zones

Accessible at levels 2 and 3

This function allows zones to be permanently or selectively disabled or enabled. The selected configuration only takes effect when the Zone Disable input button is pressed.

A zone can be set to one of the following states:
UNAFFECTED – These zones are not affected when the Zone Disable key is used.
SELECTED DISABLED – Zones configured in this mode will be disabled when the SELECTED ZONES key is active.
DISABLED – These zones are permanently disabled. All associated devices will cease to function.

To configure a specific zone:
Use the ▲ and ▼ keys to select the desired zone.
Press ENTER.
Use the ▲ and ▼ keys again to choose between Unaffected, Selected Disabled, or Disabled (permanent disable).

4 SOUNDERS

4-1 Disable Sounders

Accessible at levels 2 and 3

This function allows sounders to be permanently or selectively disabled or enabled. The selected configuration only takes effect when the Sounder Disable button is pressed.

A sounder can be set to one of the following states:
UNAFFECTED – Pressing the Sounder Disable key does not affect sounders configured in this mode.
SELECTED DISABLED – Sounders configured in this mode will be disabled when the SOUNDERS DISABLE key is active.
DISABLED – Sounders configured in this mode are permanently disabled. All associated devices will cease to operate.

To configure a specific sounder:
Use the ▲ and ▼ keys to select the desired sounder.
Press ENTER.
Use the ▲ and ▼ keys again to choose the desired option.

4-4 New Alarm Silenced Sounders

Accessible only at level 3

This setting allows you to configure how the sounders behave after they have been silenced.

Two options are available:
REMAIN SILENCED – In the event of a new alarm after silencing, the sounders will remain silent.
RESOUND ALL SOUNDERS – In the event of a new alarm, all previously silenced sounders will be reactivated.

5 RELAYS

5-1 Disable Relays

Accessible at levels 2 and 3

This function allows relays to be permanently or selectively disabled or enabled. The selected configuration only takes effect when the Relay Disable button is pressed.

A relay can be set to one of the following states:
UNAFFECTED – Pressing the Relay Disable key does not affect relays configured in this mode.
SELECTED DISABLED – Relays configured in this mode will be disabled when the AUXILIARY RELAYS key is active.
DISABLED – Relays configured in this mode are permanently disabled.

To configure a specific relay:
Use the ▲ and ▼ keys to select the desired relay.
Press ENTER.
Use the ▲ and ▼ keys again to choose the desired option.

6 EXTINGUISHING

6-1 Pre-Extinguishing Timer

Accessible only at level 3

This setting allows you to configure a delay period before the extinguishing procedure begins.

Default pre-extinguishing time: 10 seconds
Maximum configurable delay: 60 seconds
This delay provides a buffer period for verification or evacuation before the extinguishing sequence is activated.

6-2 EXTINGUISHANT Release Duration

Accessible only at level 3

This setting allows you to configure the EXTINGUISHANT release duration timer.

The release duration can be set from 1 second to 1200 seconds (20 minutes), depending on the requirements of the extinguishing system.

6-3 Pre-Select Outputs for Disablement

Accessible only at level 3

This function allows extinguishing outputs to be selectively enabled or disabled. The selected configuration only takes effect when the Output Disable button is pressed.

An output can be set to one of the following modes:
UNAFFECTED – Pressing the disable key does not affect outputs configured in this mode.
SELECTED DISABLED – Outputs configured in this mode will be disabled when the OUTPUTS key is active.

To configure a specific output:
Use the ▲ and ▼ keys to select the desired output.
Press ENTER.
Use the ▲ and ▼ keys again to choose the desired option.

6-4 Reset Mode

Accessible only at level 3

This setting allows you to configure the reset behaviour of the system following an extinguishing event. Three modes are available:

IMMEDIATE – The system can be reset without completing the extinguishing process.
- If the panel is in pre-extinguishing mode, an Abort must be performed before resetting.
- If the panel is in extinguishing mode, the sounders must be silenced before the reset can be carried out.

TIMED – Reset is only possible after a predefined delay period has elapsed following the extinguishing process.
FLOW END – Reset is only possible once the flow sensor detects that the discharge of the extinguishing agent has stopped.

6-5 Config Hold/Abort

Accessible only at level 3

This setting allows configuration of the Hold button behaviour, if available. There are two main modes:

HOLD – When activated, this mode pauses the pre-extinguishing timer. It can operate in one of two sub-modes:

RESTART – When the Hold button is released, the pre-extinguishing timer restarts from the beginning.
RESUME – When the Hold button is released, the pre-extinguishing timer continues from where it was paused.
ABORT – When activated, this mode immediately interrupts the extinguishing process.

6-6 Flooding Time

Accessible only at level 3

Future development.

7 MONITOR ZONES COUNTS AND TESTS

7-1 Zone Status

Accessible at levels 2 and 3

Use this function to verify that all zones are present.

In Installation Mode, all information is active — meaning the zone count and the status of each zone are automatically updated in real time.

To navigate to a specific zone, use the ▲ and ▼ keys.

7-2 Monitored Outputs Status

Accessible at levels 2 and 3

Use this function to verify that all monitored outputs are present.

In Installation Mode, all information is active — meaning the count and status of monitored outputs are automatically updated in real time.

To navigate to a specific output, use the ▲ and ▼ keys.

7-3 Relay Status

Accessible at levels 2 and 3

Use this function to verify that all unmonitored outputs are present.

Please note that in Installation Mode, all information is active — meaning the count and status of unmonitored outputs are updated automatically.

To navigate to a specific output, use the ▲ and ▼ keys.

7-4 Test Sounders

Accessible at levels 2 and 3

Use this function to test the audibility of the sirens in a more comfortable manner than by pressing AUDIBLE ALARMS.

The panel's standard sirens will sound for 1 second, followed by 9 seconds of silence.

7-5 Test Zones

Accessible at levels 2 and 3

Select the zones you wish to place in Test Mode. Exit Programming Mode, but DO NOT press SYSTEM RESET, as this will clear all test modes.

While in Test Mode:

- When a detector is activated, its LED will illuminate.
- The event will be displayed on the screen (and any repeaters) for 15 seconds.
- If enabled, the sirens will also sound for 1 second.

Pressing TEST QUEUE REVIEW will display the zones currently in Test Mode.

7-6 Expansion Modules

Future development.

8 GENERAL

8-1 Time/Date & Timers

8-1-1 Set Date & Time

Accessible only at level 3

Allows you to set the system's date and time. The date and time are displayed on the control panel when there is no fault or fire condition.

It is important to set the correct date and time, as they are used in the event log.

There is only one clock in the system. If the date or time is changed on the panel or on a repeater, the change will apply to all panels and repeaters in the system.

8-3 MEMORY - Beware engineers only

8-3-1 Clear Customer Flash Memory

Accessible only at level 3

This function deletes all data related to panel settings and configurations.

DO NOT delete this data if you have been provided with pre-programmed installation data.

If the Customer Flash Memory is erased, you will lose information such as:

- Zone text will be deleted
- All zone settings will be deleted
- Company name will be deleted
- All timer settings will be deleted
- The language will reset to English
- All pre-selected I/O deactivations will be erased

NOTE:
The installer access code will not be deleted.

8-3-2 Clear Non-Volatile RAM

Accessible only at level 3

Clearing the NVRAM deletes all installation settings, and the system is automatically placed into Installation Mode.

On the panel, this will result in:

- All permanently disabled zones being reactivated
- All permanently disabled sirens being reactivated
- All permanently disabled relays being reactivated
- The event history being erased
- The automatic reset count being cleared
- All checksums being erased and recalculated

8-3-3 Calculate Customer Flash Checksum

Accessible only at level 3

Calculates and stores the checksum of all data in the customer's Flash memory. When settings are modified using the programming functions, the checksum is recalculated as required.

Customer data downloads also trigger an automatic checksum update. The stored checksum is regularly compared (approximately every 2 minutes) to detect any memory corruption.

8-3-4 Calculate Programme Flash Checksum

Accessible only at level 3

Unlikely to be required under normal circumstances, this function calculates and stores a checksum for the program Flash memory.

When software updates are downloaded, the panel detects the change and automatically calculates and stores a new checksum. The stored checksum is regularly compared (approximately every minute) with a newly calculated checksum to detect any memory corruption.

8-4 OTHER FEATURES

8-4-1 Active/Installation Mode

Accessible at levels 2 and 3

An essential feature. The system should always be left in ACTIVE mode unless it is being installed or undergoing setup and testing.

When the system is set to Installation Mode, the green SYSTEM ON LED on the front panel of the Panel and Repeaters will flash. After the system has been in Installation Mode for 90 seconds, it can be placed into Active Mode.

Note: There is no definitive end to Installation Mode, as the system continuously scans and learns. However, if the system is switched to Active Mode before Installation Mode has had sufficient time to identify all system components, it will quickly report errors related to the presence of unexpected devices.

8-4-2 Upload/Download Link to PC

Accessible only at level 3

Use this function to download or upload the FALCON settings via USB, using the connector provided on the main board of the control panel. Please refer to the FALCON CONNECTOR software manual for further guidance.

8-4-3 Battery Status

Accessible only at level 3

This function allows you to check the battery status value.

8-4-4 Display Contrast Adjustment

Accessible at levels 2 and 3

Use the UP and DOWN arrow keys to adjust the contrast of the LCD display.

8-4-6 Select Language

Accessible at levels 2 and 3

This function allows you to set the system language. Please proceed carefully, as you will need to return to this function to change the language again if needed. All system text will be updated to reflect the selected language. The change will take effect once you press ENTER.

8-4-7 Set User Access Code

Accessible only at level 3

This function allows the installer to change the Customer Access Code. Use the ►, ▲ and ▼ keys to modify the code sequence.

8-4-8 Set Installer Access Code

Accessible only at level 3

This function allows you to change the Installer Code without needing to know the Factory Code. Use the ►, ▲ and ▼ keys to modify the code sequence.

The display will show:

- ENTER PRESENCE CODE and PRESS OK
- ENTER NEW CODE and PRESS OK

8-5 CHANNEL CONFIGURATION

Accessible at levels 2 and 3

This function allows the assignment of available protocols to physical channels and the selection of higher transmission rates.

- Master-Slave: Protocol used for expansion modules. The baud rate must be specified.
- Data Loop: Protocol used for repeaters and BMS (Building Management System) applications.
- ODYSSEY: Protocol used for BMS applications.

8-6 ETHERNET INTERFACE SETTINGS

Future developments.

8-6-1 Configure IP Address & Netmask

Future developments.

8-6-2 Configure Gateway & External Server

Future developments.

8-6-3 Configure DNS Address

Future developments.

8-6-4 Configure Interface Operation Mode

Future developments.

Allows the panel to configure the operating mode of the interfaces.

8-6-5 Configure Interfaces Dataloop Role

Future developments.

8-6-6 Configure Interfaces Access Ports

Future developments.

8-8 ETHERNET INTERFACE OPTIONS

8-8-1 Apply Changes to Ethernet Interface

Future developments.

8-9 ACCESS CONFIGURATION

8-9-1 Apply Changes to Ethernet Interface

Accessible at levels 2 and 3.

This function allows you to configure NFC keys to unlock the control panel, provided an NFC Fire Keys module is connected. Within the configuration settings, you can select the type of access to assign to each key.

14. Fault Diagnosis

There may be faults in the system that either the user or the installer should be able to diagnose.

Main Power Supply Fuse Failure (AC Power Supply)

This fault may occur when the AC power supply is absent. To resolve the issue, follow the steps below:

1. Check the AC Supply

Use a multimeter to verify the presence of a 230V AC supply.

- Measure between terminals L and N.
- The reading should be 230 volts ±15 volts.

2. Inspect the Fuse

Ensure the fuse is correctly rated at 4 Amperes and properly connected.
Use a multimeter to check the fuse for continuity.

3. Verify Terminal Connections

Confirm that all terminals are making good contact and are securely fastened.

4. Measure the Power Supply Output

Set the multimeter to DC voltage.
Connect it to the red and black wires of the power supply.
The output should read between 28.3 and 29 volts (target: 28.5V ±0.3V).

Battery Charger Failure (Batteries)

Power Down
Turn off the control panel and remove the batteries.

Simulate Battery Load
Connect a 10 kΩ, ¼ watt resistor across the positive and negative battery wires.

Power On & Measure Voltage
Power on the panel and measure the voltage on the motherboard, specifically at the battery charger circuit terminals.
Expected range: 27.5 VDC to 28.5 VDC

Adjust PSU if Needed
If the voltage is below this range, adjust the potentiometer on the Power Supply Unit (PSU) accordingly.

Replace Motherboard if Voltage Is Too Low
If the voltage is below 21 VDC, replace the motherboard. After replacement, recheck the voltage.
If the fault persists, it indicates a motherboard failure.

Auxiliary Power Supply Failure
This fault may occur if the electronic fuse for the auxiliary power supply, located at the back of the motherboard, is blown.
It can be easily identified using a digital multimeter when the 28.5 VDC voltage is not present.

Potential causes for this fault include:
Excessive current drawn by third-party circuits
A short circuit at the auxiliary power supply terminals

General Fault

When a fault occurs in a zone, the fault LED on the siren circuit will illuminate amber. To troubleshoot the issue, follow these steps:

1. Check that the EOL capacitor (10 µF, 50 VDC) is present in the zone circuit.
2. Verify the presence of the EOL resistor (10 kΩ, ¼ watt) in the siren circuit.
3. Check whether the wiring is short-circuited, causing an imbalance in resistance.
4. Ensure that power is being supplied to both the zone and siren circuits.
5. Inspect the zone or siren wiring for short circuits or EOL components that may be shorted, possibly located inside the panel.
6. Check whether the Master/Slave modules are missing or faulty.

Earth Fault

When an earth connection is mixed with the AC or DC power supply, a fault may occur. It is important to be patient, as this type of fault typically becomes apparent after 5 to 7 minutes. To diagnose the issue, follow these steps:

1. Disconnect all cables from the panel and power it using batteries only.
2. Wait approximately 5 minutes and observe whether the earth leakage fault persists.
3. If the fault remains, investigate whether the motherboard is short-circuited to earth.
4. Measure the voltage between the earth terminal block and the motherboard's earth terminal.
   - It should range between 6V and 8V DC.
   - If not, the motherboard should be inspected by GFE.
5. If the test in step 4 gives satisfactory results, reconnect the main power supply (230 VAC) and repeat the test from step 4.
   - If the voltage is outside the expected range, the issue lies with the main power supply.
6. Gradually reconnect the cable sets (zones, siren circuit, communications, etc.) to the panel one by one, repeating step 3 each time until the source of the fault is identified.
7. If the fault does not occur, check whether the TZ9 component is short-circuited using a multimeter.

System Failure

In the event of a system failure, the issue may be caused by a microprocessor startup failure or a faulty or damaged component on the motherboard. To resolve the issue, follow these steps:

1. Restart the panel and observe its behaviour.
2. Check the motherboard for any signs of burning or physical damage.
3. If necessary, consider replacing the motherboard to confirm whether it is indeed faulty or damaged.

Communication Failure

Communication failures may occur, particularly with expansion modules during system operation. In such cases, a communication fault will be displayed on the screen. To resolve the issue, follow these steps:

1. Ensure that all communication cables are properly connected.
2. Restart the panel and check whether the fault clears.

Zone Fault

Zone faults may occur due to short circuits or open circuits within the zone. This happens when continuous zone monitoring fails to detect the EOL in the zone:

1. Ensure that the EOL is connected in the zone.
2. Check that there are no interruptions in the wiring.
3. Restart the panel and observe whether the fault clears.

15. Technical Specifications

Please note that these specifications apply to the FALCON EX, which is equipped with a 2.4 Amp power supply operating at a nominal 28.5V DC.

FALCON EX	
MAINS SUPPLY VOLTAGE	90~264 VAC 50/60 Hz – DC input operation possible by connecting AC/N(+), AC/L(-)
INTERNAL POWER SUPPLY	28.5V DC @ 2.4A 65W
MAIN FUSE	4A - Surge protected (slow blow) 20mm HRC
MAX OUTPUT CURRENT	2.4A @ 230V AC
INTERNAL BATTERY CAPACITY - MAXIMUM	2 x 12 V x 12 Ah - sealed lead acid batteries
MAINS SUPPLY/BATERY CHARGER FAILURE MONITORING	Yes
BATTERIES MONITORING	Yes
EARTH FAULT MONITORING	Yes
PRIMARY FIRE ZONE DETECTION	3x Monitored Fire Zones detection with programmable coincidence zone capability
MAX COMBINE DETECTORS & CALL POINTS PER CIRCUIT	32 devices
MAX CABLE LENGTH PER CIRCUIT	500m
ZONE QUIESCENT CURRENT (WITHOUT DEVICES)	50 mA
ZONE MONITORING TO OPEN, SHORTS CIRCUITS, FAULS	Yes
ZONE END OF LINE RESISTOR VALUE	Active EOL – 10uF/50 Bipolar Capacitor
NUMBER OF MONITORIZED INPUTS	5 (Manual Released, Flow Switch, Low Pressure, Valve, Abort or Hold)
MONITORIZED INPUTS EOL	680 Ω resistors
NUMBER OF CONVENTIONAL SOUNDER CIRCUITS	2 (1x Dedicated to the fire alarm and 1x dedicated to extinguishing alarm)
LINE MONITORING TO OPEN, SHORTS CIRCUITS, FAULS	Yes
SOUNDERS OUTPUT RATING	21V DC to 30V DC 250mA per circuit
SOUNDERS END OF LINE RESISTOR VALUE	10 kΩ
REMOTE INPUTS	2x Non monitored ports (Programmable inputs - Reset; Evac/Silence; Selected I/O)
NUMBER OF AUXILIARY OUTPUTS	1 x 24V DC + 1 x 24V DC SWITCHED, both divided by 900mA total available.
EXTINGUISHANT RELEASE OUTPUT	28Vdc, rated 800mA max - max peak current 950mA, for 10 seconds
EXTINGUISHANT RELEASE TIME DELAY	Adjustable 10-60 seconds
KEYSWITCHES	Manual & Automatic
FIRE RELAY AUXILIARY OUTPUT	1x Nominal voltage @ 30V DC resistive load / 0.5 @ 120V AC resistive load/ 0.25A @ 240V AC non-configurable resistive load
FAULT RELAY AUXILIARY OUTPUT	1x Nominal voltage 2A @ 30V DC resistive load / 0.5 @ 120V AC resistive load / 0.25A @ 240V AC non-configurable resistive load
AUXILIARY OUTPUTS 1 and 2	2x Nominal voltage 2A @ 30V DC resistive load / 0.5 @ 120V AC resistive load / 0.25A @ 240V AC configurable resistive load
GRAPHICAL LCD	Yes
COMMUNICATION CHANNELS	3 Channels
COMMUNICATION USB PORT	USB Type B
EVENT LOG	10,000 events
OPERATING TEMPERATURE	-5°C to +40°C
HUMIDITY	Max. 95% RH
DIMENSIONS	Deep box: 273 (L) x 404 (H) x 142 (W) mm
WEIGHT	2 kg without batteries
IP RATING	IP30 (Indoor use only) - Type A
COLOUR	White (RAL 9003)

16. EN54 Specifications

The FALCON EX conventional extinguishing control panel complies with the requirements of the following standards:

- EN 54-2:1997 + AC:1999 + A1:2006
- EN 54-4:1997 + AC:1999 + A1:2002 + A2:2006
- EN 12094-1:2004

CE Marking Specifications

CE 25	CE 25
GLOBAL FIRE EQUIPMENT S.A. Sítio da Barracha Parque Industrial Municipal Caixa Postal 610-A, 8150-017, São Brás de Alportel, Portugal xxx-CPR-xxxx	GLOBAL FIRE EQUIPMENT S.A. Sítio da Barracha Parque Industrial Municipal Caixa Postal 610-A, 8150-017, São Brás de Alportel, Portugal xxx-CPR-xxxx
FALCON EX Control and Indicating Equipment for Fire Detection and Fire Alarm Systems in Buildings **EN54-2: 1997 + AC: 1999 + A1:2006** Environmental Class: A Protection Rating: IP30	**FALCON EX** Power Supply Equipment for Fire Detection and Fire Alarm Systems in Buildings **EN54-4: 1997 + AC: 1999 + A1: 2002 + A2: 2006**
Options Available: 7.8 - Outputs for Fire Alarm Devices 7.11 - Output Timing 8.4 - Total Loss of Mains Power 10 - Test Conditions	
Other Technical Data: DOP CPR xxx - FALCON	

Standard	Title
EN54-2:1997 + EN54-2:1997/A1:2006 + EN54-2:1997/AC:1999	Fire Detection and Fire Alarm Systems – Part 2: Control and Indicating Equipment
EN54-4:1997 + EN 54-4:1997/AC:1999 + EN 54-4:1997/A1:2002 + EN 54-4:1997/A2:2006	Fire detection and fire alarm systems – Part 4: Power supply equipment
EN50130-4:1995 + EN 50130-4:1995/A1:1998 + EN 50130-4:1995/A2:2003	Alarm systems – Electromagnetic compatibility. Product family standard: Immunity requirements for components of fire, intruder, hold-up, CCTV, access control, and social alarm systems

EN12094-1 Specifications

CE
25

GLOBAL FIRE EQUIPMENT S.A.
Sítio da Barracha Parque Industrial Municipal
Caixa Postal 610-A, 8150-017, São Brás de Alportel, Portugal

1328-CPR-xxxx

FALCON EX
EN 12094-1:2004

Automatic Electrical Control and Delay Device
- Environmental Classification: Class A
- Protection Rating: IP30
- Flooding Zone: Zone 3

Functions:
Activate; Cancel/Hold; Flow; Valve; Low Pressure; Valve Released; Extinguish

Activation Condition Response Time: < 3 seconds
Output Activation Response Time: < 1 second

Options Available:
4.17 - Extinguishing Signal Timer
4.18 - Signal Representing Extinguishing Agent Flow
4.19 - Monitoring of Component Status
4.20 - Emergency Hold Device
4.21 - Flooding Time Control
4.23 - Manual Mode Only
4.27 - Emergency Cancel Device
4.30 - Activation of Alarm Devices with Different Signals

Other Technical Data:
DOP CPR xxx - FALCON EX

17. Limitations

To ensure maximum protection, the **system must be regularly tested and inspected by personnel qualified in fire alarm system installation**. All inspection and testing should be carried out in accordance with the relevant local standards.