FEC403EN Installation Manual

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Version This document applies to FEC403EN version 3.0

Certification CE

2012/19/EU (WEEE directive): Products marked with this symbol cannot be disposed of as unsorted municipal waste in the European Union. For proper recycling, return this product to your local supplier upon the purchase of equivalent new equipment, or dispose of it at designated collection points. For more information see: www.recyclethis.info.

2006/66/EC (battery directive): This product contains a battery that cannot be disposed of as unsorted municipal waste in the European Union. See the product documentation for specific battery information. The battery is marked with this symbol, which may include lettering to indicate cadmium (Cd), lead (Pb), or mercury (Hg). For proper recycling, return the battery to your supplier or to a designated collection point. For more information see: www.recyclethis.info.

Contact information For contact information, see www. utcfssecurityproducts.eu.

Content

Important information

Agency compliance

This product has been designed according to the following standards:

- EN54-2, EN54-4
- EN60950-1
- EN12094-1
- ANPI TN121
- EMC Immunity EN50130-4
- EMC Emissions EN61000-6-3, EN61000-3-2, EN61000-3-3

The EN12094-1 standard includes basic and optional requirements. The optional requirements this product meets are:

Table 1: EN12094-1 optional requirements

Clause	Description
4.17	Extinguishing agent release delay
4.18	Signal representing the flow of agent
4.19	Monitoring of the status of components
4.20	Emergency hold device (mode A or B)
4.23	Manual only mode
4.24	Triggering signals to equipment within the system
4.26	Triggering signals to equipment outside the system
4.27	Emergency abort device
4.30	Activation of alarm device with different signals

European regulations for construction products

This section includes both regulatory information and a summary on the declared performance according to the Construction Products Regulation 305/2011. For detailed information refer to the product Declaration of Performance (DoP).

Table 2:

Certification	CE
Certification body	1134
Manufacturer	UTC CCS Manufacturing Polska Sp. Z o.o. Ul. Kolejowa 24. 39-100 Ropczyce, Poland Authorized EU manufacturing representative: UTC Fire & Security B.V., Kelvinstraat 7,6003 DH Weert, The Netherlands

Year of first CE marking	09
Declaration of Performance number	360-3319-0199
EN 54	EN12094-1, EN54-2, EN54-4, Environmental Class A
Product identification	See model number on product identification label
Intended use	See DoP point 3
Essential characteristics	See DoP point 9

Product compatibility

This product is compatible with all UTC Fire & Security **Aritech** and **Kilsen** conventional fire detectors and manual call points, with the following exceptions:

- Aritech DI322I and DT313I detectors
- Kilsen KL731 and KL7313B detectors

Compatibility with third-party products cannot be guaranteed. Consult your local supplier for further information.

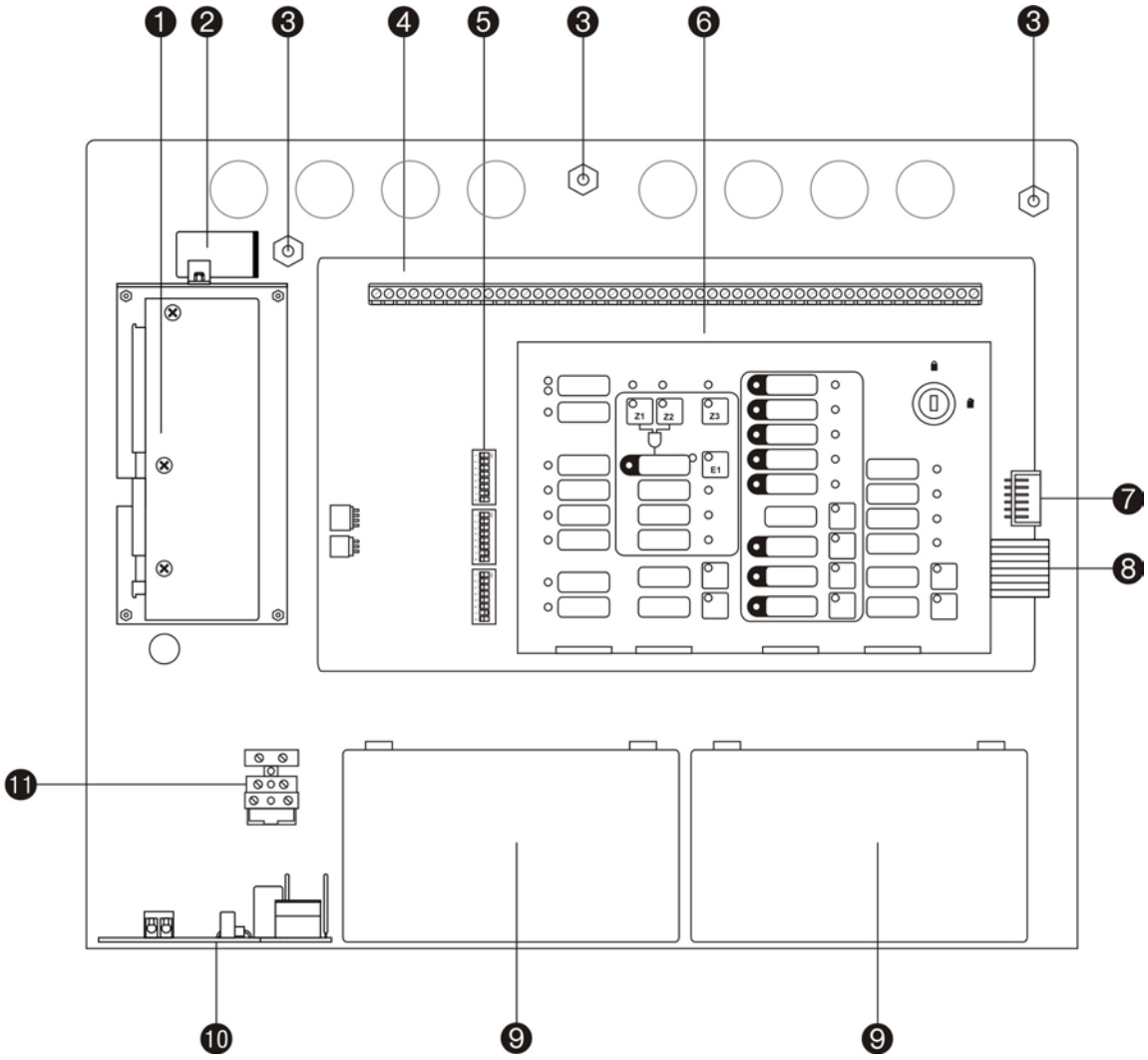
Limitation of liability

Installation in accordance with this manual, applicable codes, and the instructions of the authority having jurisdiction is mandatory. UTC Fire & Security shall not under any circumstances be liable for any incidental or consequential damages arising from loss of property or other damages or losses owing to the failure of UTC Fire & Security products beyond the cost of repair or replacement of any defective products. UTC Fire & Security reserves the right to make product improvements and change product specifications at any time.
While every precaution has been taken during the preparation of this manual to ensure the accuracy of its contents, UTC Fire & Security assumes no responsibility for errors or omissions.

Installation

Panel layout

Figure 1: FEC403EN layout

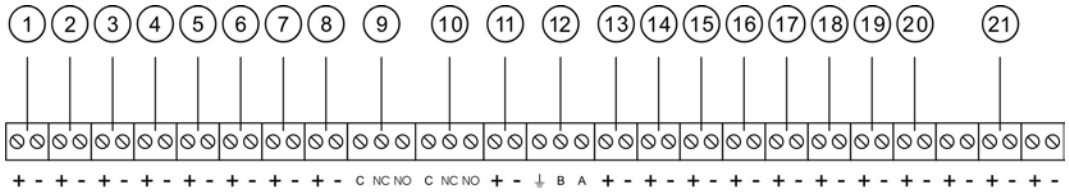


1. Power supply unit
2. Mains filter
3. Earth stud
4. Zone, fire detection and extinguishing system input/output connectors
5. Configuration DIP switches (top to bottom: SW1, SW2, SW3)
6. Control panel keypad
7. Master relay module connector
8. Keypad to PCB connector
9. Batteries
10. Power interface board
11. 230 VAC supply connector and fuse

Supervised inputs and outputs overview

The panel includes the following supervised inputs and outputs to connect to the fire detection and extinguishing systems.

Figure 2: Supervised inputs and outputs



1. Pyrotechnic output
2. Solenoid output
3. Fire brigade output
4. Illuminated gas released sign output
5. Illuminated evacuate sign output
6. Illuminated warning sign output
7. Sounder 2 output
8. Sounder 1 output
9. Potential free relay output (fault)
10. Potential free relay output (alarm)
11. 24V reset output.
12. RS485 communications (not used)
13. Door monitor input
14. Fault return input
15. Gas flow switch input
16. Pressure switch input
17. Manual mode input
18. Abort extinguishing manual call point input
19. Hold extinguishing manual call point input
20. Start extinguishing manual call point input
21. Z3, Z2, Z1 inputs

Supervised inputs and outputs by function

Table 3: Supervised inputs and outputs by function

Fire detection system inputs / outputs	Extinguishing system inputs / outputs
Fire brigade output	Pyrotechnic output
2 x Sounder outputs	Solenoid output
2 x Potential free relay outputs	3 x Illuminated sign outputs
24V reset output	Door monitor input
Fault return input	Gas flow switch input
3 x Zone inputs	Pressure switch input
	Manual mode input
	3 x extinguishing manual call point inputs

Panel input and output circuits are self-protected - no external fuses are required. Outputs will not work if the current limit is exceeded. See “Technical specifications” on page 34 for current limit specifications.

Installation instructions

Install the panel in a clean, dry place free from vibrations and with a temperature between 5º and 40º C. The relative humidity must not exceed 95%. There should be no condensation. The panel should be installed where the risk of fire is minimal and the place is protected by the fire detection system. Risk of mechanical damage must be avoided.

Cabling recommendations

Use PG11-type cable glands to ensure clean connections to the control panel. The use of pressure-sensitive flanges to fix the cables to the chassis of the control panel is recommended.

Recommended cable

The mains cable must have a minimum section of 1.5 mm² and must include an earth wire.

For inputs and outputs use single-pair screened and twisted cable with a cross-section of 1.5 mm². The maximum cable resistance per zone must not exceed 44Ω for a maximum cable length of 2 km.

Connecting the cable screen

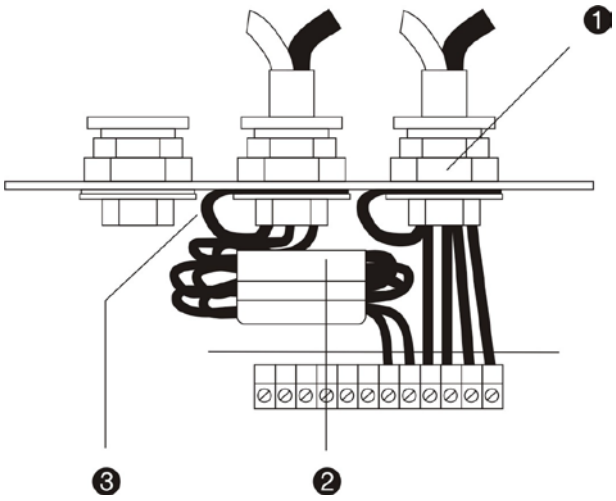
Connect the cable screen to the control panel chassis at the entry point of the cable gland and ensure that the installation is correctly earthed (see Figure 3).

Note: When a cable gland is not used devices should be earthed using the earth studs on the control panel chassis.

Radio frequency interference

Use ferrite where the system is exposed to intense electrical disturbance. The ferrite must be connected as close as possible to the main PCB connection block.

Figure 3: Using ferrite and screened cable



1. Cable gland
2. Cable screen connected to panel chassis
3. Ferrite

Connecting the 230 VAC supply

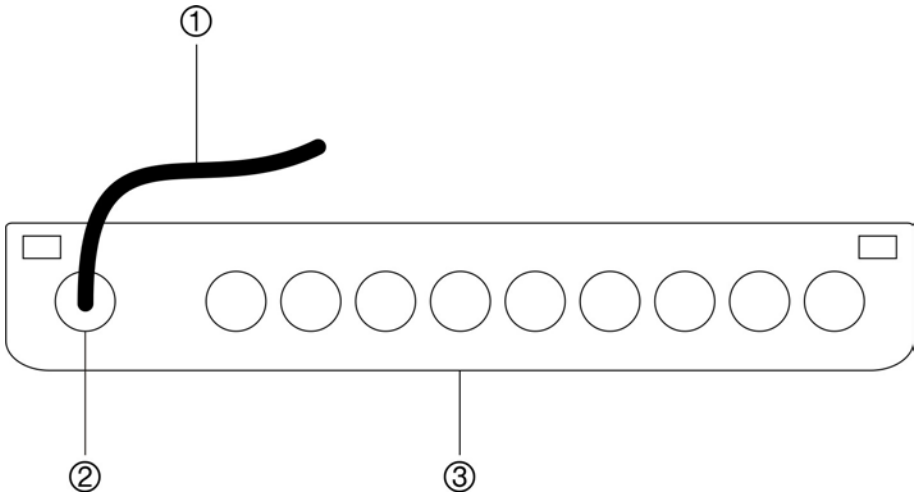
The panel must be powered from 230 VAC. Use the mains cable entry hole at the top left of the panel.

Note: The 230 VAC supply must be connected to the power supply via an external bipolar magneto-thermal switch.

The following guidelines must be followed to avoid damage to the system and / or personal injury:

1. Never make any connections while the power supply is on.
2. The mains supply must be connected before the batteries.

Figure 4: Top view of panel with mains cable entry hole



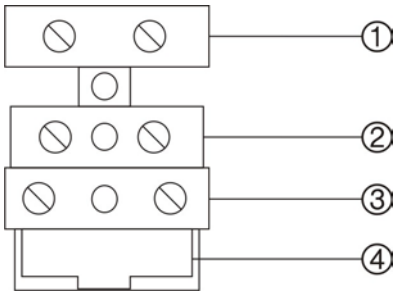
1. Mains cable
2. Mains cable entry hole
3. Front of the panel

To avoid potential short circuits and interference the mains cable must be seperated from the other cables inside the chassis (feed the mains cable to the mains connector to the left of the power supply). The cable should be fixed to the panel chassis using cable holders to prevent movement.

An adequate ground connection is required. For safety it is recommended that the ground cable be longer than the other cables so that it is the last cable to be disconnected if the cable is pulled.

Connect the 230 VAC power supply cables to the correct terminals on the mains connector (as shown in Figure 5).

Figure 5: 230 VAC power supply connections



1. Neutral
2. Earth
3. Live
4. 230 VAC fuse

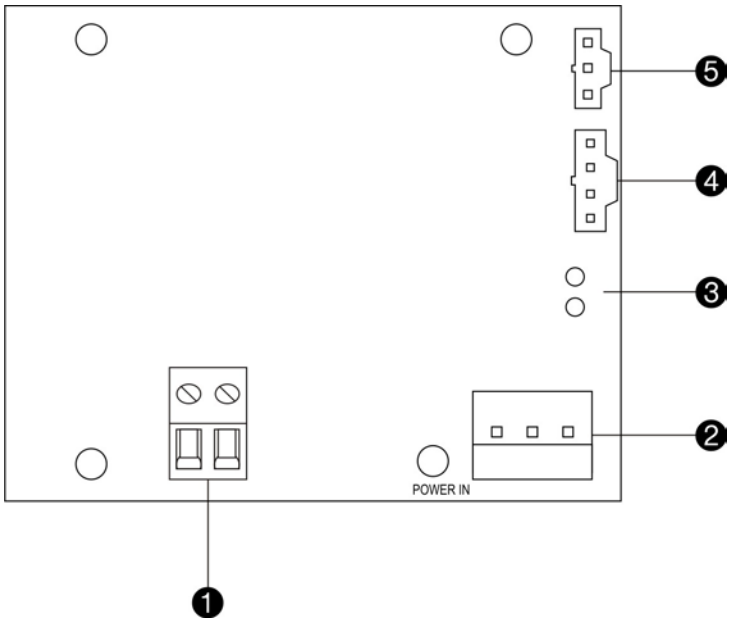
Caution: Do not use the mains fuse for connecting and disconnecting the panel from the mains power supply.

Connecting the power supply unit

Connect the power supply unit to the mains connector, power interface board (located at the base of the panel chassis) and to the panel PCB as shown in the following pages.

Caution: The power supply must be connected to the panel PCB before the panel is powered up.

Figure 6: Power interface board layout



1. Auxiliary output
2. Power supply input connector
3. Battery connections
4. Power and communications output (panel PCB)
5. Power supply output (panel PCB)

Figure 7: Connecting the power supply to the mains connector and power interface board

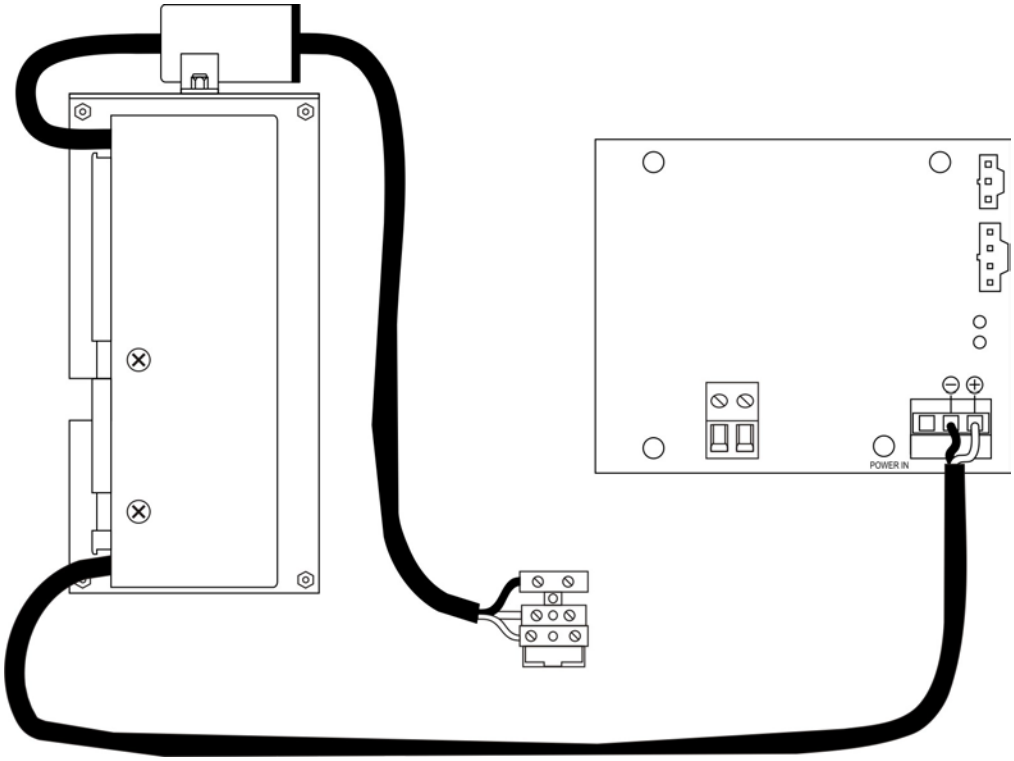
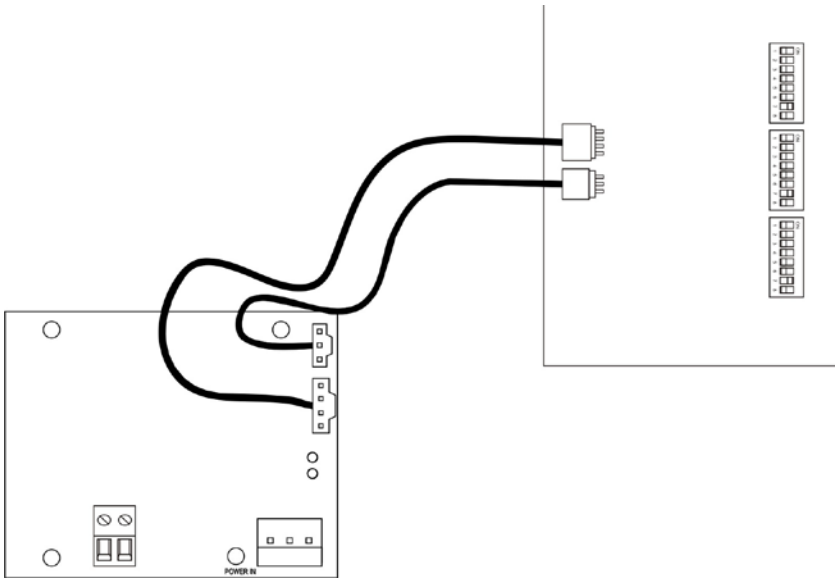


Figure 8: Connecting the power interface board to the panel PCB

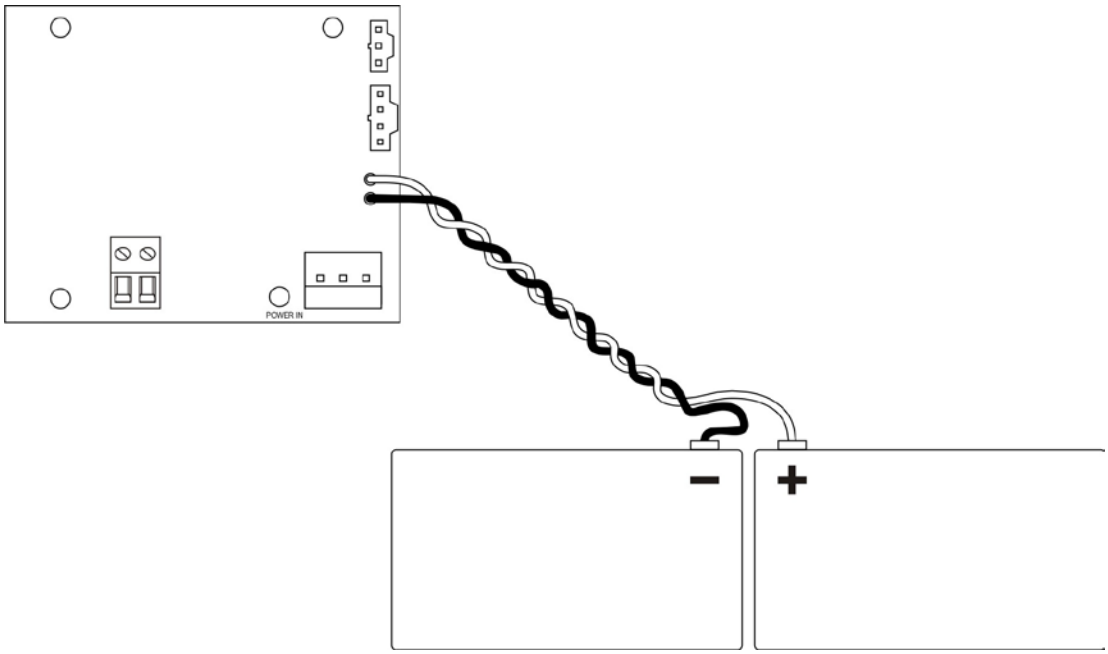


Connecting the batteries

The panel requires 2 x12 V / 7.2 Ah batteries. These batteries must be connected in series using the provided bridge connector. Make sure the mains connections have been completed before connecting the batteries.

Connect the positive contact of one of the batteries to the negative contact of the other and connect to the power supply as shown in Figure 9.

Figure 9: Connecting the batteries to the power interface board

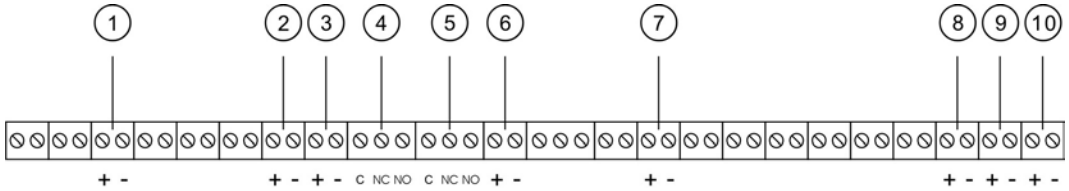


Connecting fire detection system devices

For detectors, manual call points and other devices refer to product installation manual for detailed wiring guidelines and installation information.

Fire detection system supervised inputs / outputs

Figure 10: Fire detection system supervised inputs / outputs



1. Fire brigade output
2. Sounder 2 output
3. Sounder 1 output
4. Potential free relay output (fault)
5. Potential free relay output (alarm)
6. 24V reset output
7. Fault return input
8. Z3 input
9. Z2 input
10. Z1 input

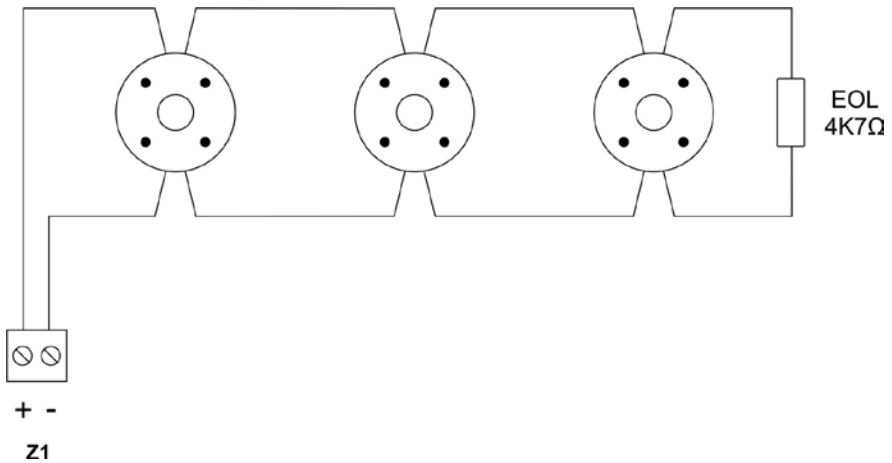
End-of-line resistance for fire detection inputs and outputs

The end-of-line resistance for fire detection outputs is 15KΩ. The end-of-line resistance for fire detection inputs is 4K7Ω.

End-of-line resistance for zone lines

All zone lines require a 4K7Ω end-of-line resistor installed as shown in Figure 11. The end-of-line resistor must not be placed at the output terminal of the zone. If a zone is not used the end-of-line resistor must be installed on the panel connection block for the unused zone. No T-offs are allowed on any zone cable.

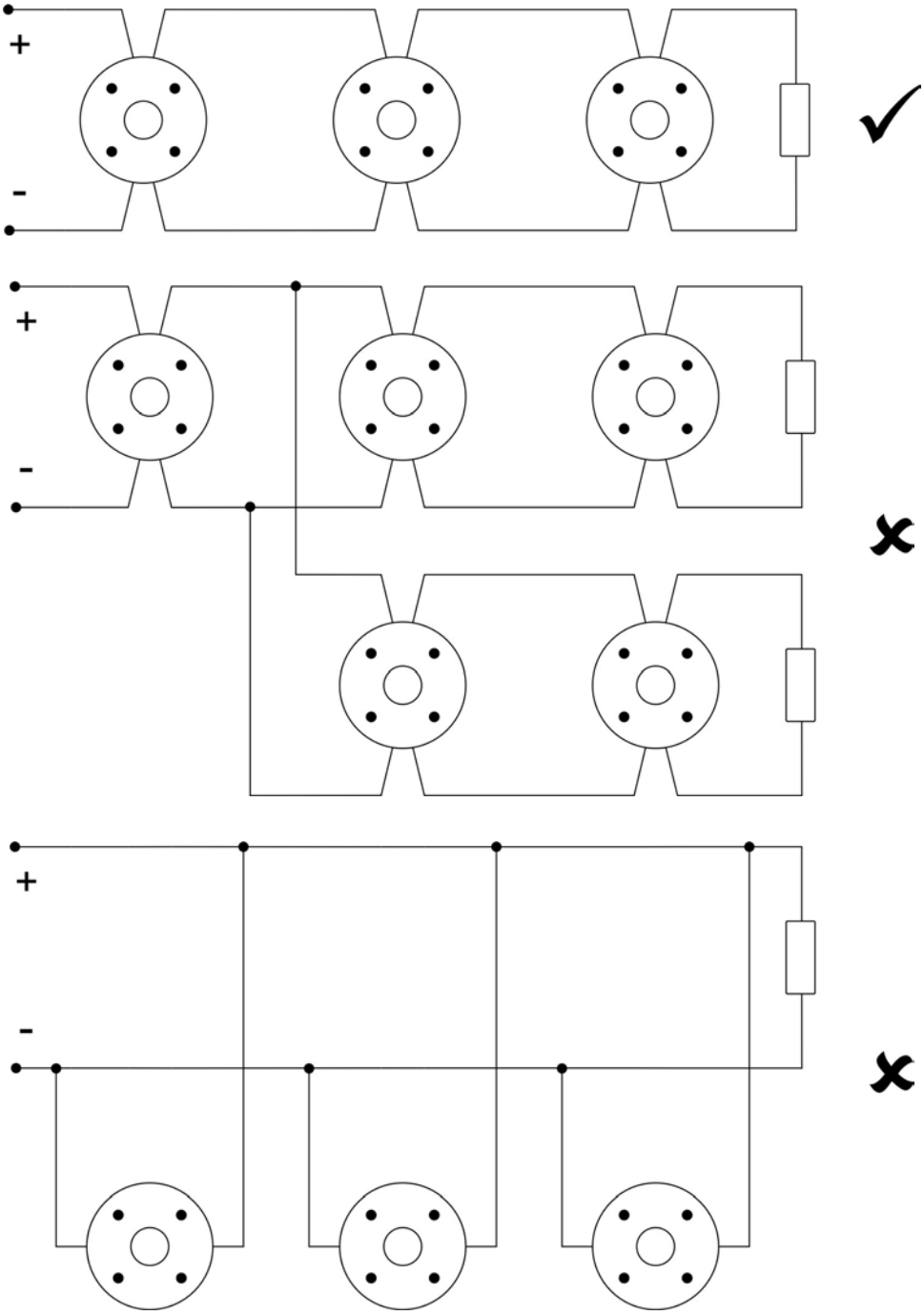
Figure 11: End-of line resistance for zone lines



Connecting detectors

The output of a zone line can support a maximum of 20 detectors (or 32 manual call points). When detectors are installed in out-of-sight areas a visible remote indicator must be used to signal that the detector is in alarm condition.

Figure 12: Correct and incorrect detector connection



Connecting manual call points

The output of a zone line can support a maximum of 32 manual call points (or 20 detectors). Manual call points must have a resistance of 100Ω / 2W in series with the normally open (NO) contact to avoid short-circuit and to allow the panel to identify the origin of the alarm activation (manual call point, detector).

Connecting sounders

Each output allows for a sounder circuit with a maximum current of 250 mA per circuit. The sounder output is activated and supplies 24 VDC when a zone alarm is activated. Use polarity sensitive sounders or install a diode to prevent sounders from being activated in standby condition.

Note: If a motorized alarm bell is used, a diode may need to be installed in parallel to the sounder to avoid an inverted current effect. See Figure 15.

Figure 13: Sounder connection

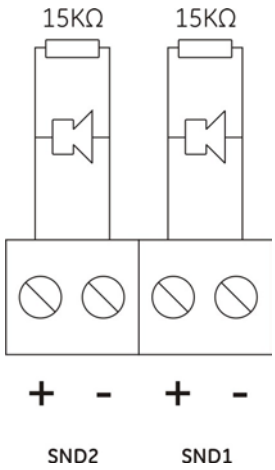


Figure 14: Typical sounder installation

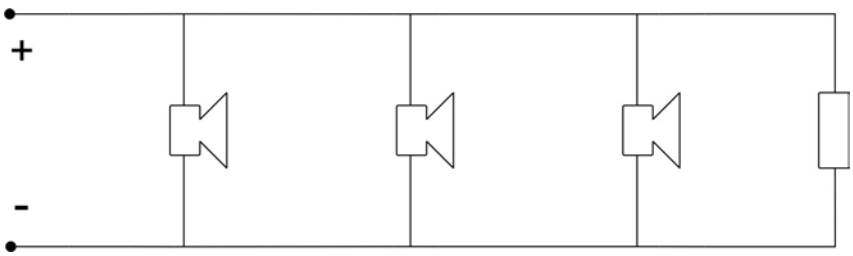
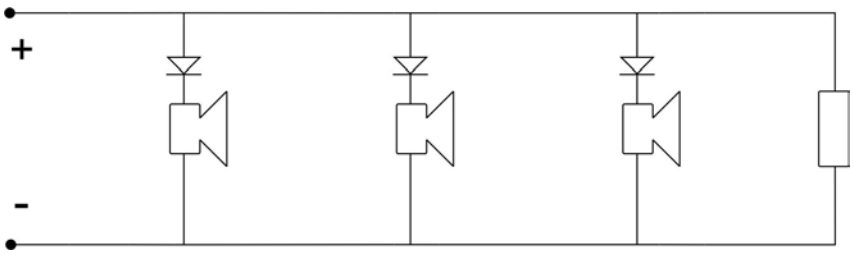


Figure 15: Sounder installation with diode in parallel

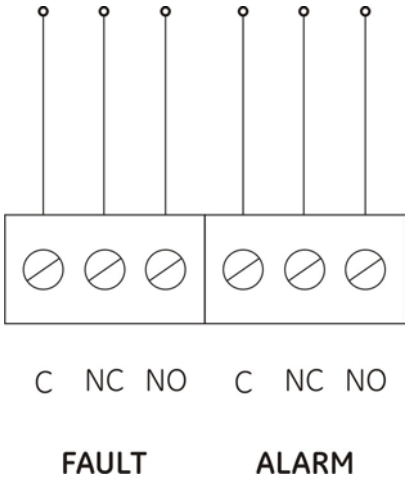


Connecting the potential free relay outputs

These potential free relay outputs (C, NC, NO) can be activated in an alarm or fault situation. The fault output is usually energized. The maximum current for each circuit is 1 A.

Caution: 230 VAC devices must be connected to the panel via a 24 VAC (or 24 VDC) relay.

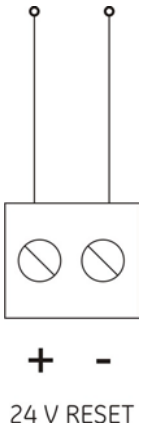
Figure 16: Potential free relay output connection



Connecting the resettable 24 VDC output

This output allows for a 24 VDC resettable circuit when in standby with a maximum consumption of 100 mA. When a reset is performed, the supply from panel is disconnected for 3 seconds.

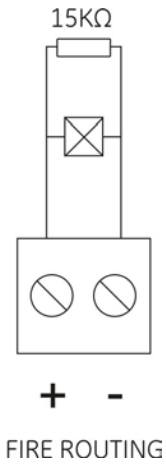
Figure 17: Resettable 24 VDC output connection



Connecting the fire routing output

For installations requiring fire routing when an alarm is triggered. The maximum current for the circuit is 250 mA. An end-of-line resistance of 15KΩ is required.

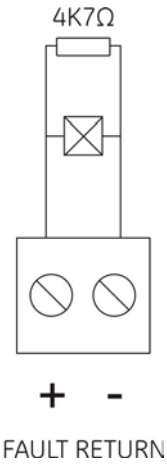
Figure 18: Fire routing output connection



Connecting the fault return input

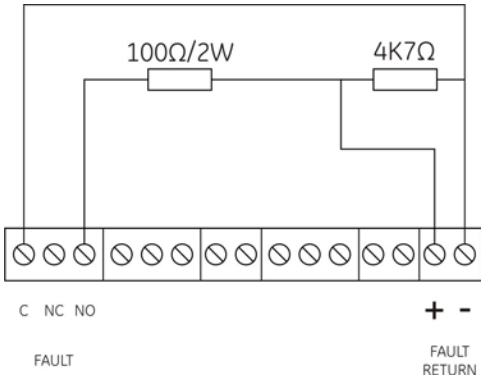
The fault return input must have a resistance of 100Ω / 2W in series with the normally open (NO) contact to be activated. An end-of-line resistance of 4K7Ω is required.

Figure 19: Fault return input connection



If no fault routing device is connected to the fault return input, the following connection must be made between the fault return input and fault relay.

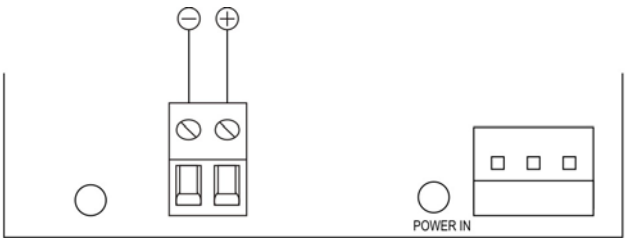
Figure 20: Fault return input connection with no fault routing device



Connecting auxiliary 24 VDC devices

Auxiliary devices requiring 24 VDC may be connected to the system via the AUX1 auxiliary output located in the power supply interface board. The maximum current is 1.3 A.

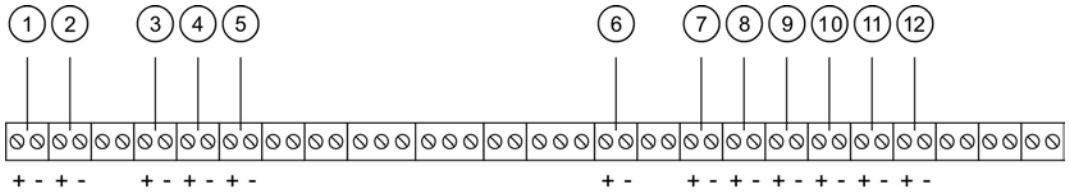
Figure 21: Auxiliary 24 VDC output



Connecting extinguishing system devices

Extinguishing system supervised inputs / outputs

Figure 22: Extinguishing system supervised inputs / outputs



1. Pyrotechnic output
2. Solenoid output
3. Illuminated gas released sign output
4. Illuminated evacuate sign output
5. Illuminated warning sign output
6. Door monitor input
7. Gas flow switch input
8. Pressure switch input
9. Manual mode input
10. Abort extinguishing manual call point input
11. Hold extinguishing manual call point input
12. Start extinguishing manual call point input

End-of-line resistance for extinguishing inputs and outputs

- The pyrotechnic and solenoid outputs are connected to the extinguishing EOL module (see Figure 23 and Figure 24).
- The end-of-line resistance for the remaining extinguishing outputs is 15KΩ.
- The end-of-line resistance for all extinguishing inputs is 4K7Ω

Extinguishing area overview

The FEC403EN panel has a single extinguishing area that is controlled by zones 1 and 2. The extinguishing area performs a double check of the alarm status, as both zones must be in alarm status at the same time before the extinguishing agent is released (preventing the possibility of accidental discharge). The additional zone may be used to connect any kind of detection devices that the customer wishes to add to the installation (these devices will not have any influence on the activation of the extinguishing process).

- The start manual call point will activate the extinguishing process.
- The **hold manual call point** will delay the release of the extinguishing agent for as long as the call point is depressed (see the “Hold extinguishing manual call point” section for further details).
- The abort manual call point input cancels any extinguishing process (automatic or manual) that has been started through via detection zone alarm status or start extinguishing manual call point.

For configuration details of extinguishing area components see the “System configuration” section.

A pre-alarm (zone 1 or zone 2 in alarm) is indicated as follows:

- The general Fire LEDs are activated.
- The general fire relay is activated.
- The corresponding zone Fire LED is activated (for example – first alarm in zone 1, confirmed alarm in zone 2: zone 1 LED flashing, zone 2 LED steady).
- The Activated LED is activated (flashing).
- The internal buzzer is activated (constant).
- The stage 1 sounder and associated LED are activated.
- The illuminated **warning** sign is activated.
- The auxiliary output relays are activated (if enabled).
- The call fire brigade / call fire brigade delay is activated (if set) *

* If configured to stage 1 alarm.

An alarm (zone 1 and zone 2 in alarm or a manual call point activated) is indicated as follows:

- The general Fire LEDs are activated.
- The corresponding zone Fire LEDs are activated.
- The Activated LED is activated (constant).
- The internal buzzer is activated (constant).
- The stage 2 sounder and associated LED are activated.
- The illuminated **evacuate** sign is activated.
- The extinguishing agent release delay is activated (if configured).
- The door monitor timer is cancelled (if configured).
- The call fire brigade / call fire brigade delay is activated (if set).
- The Reset button is blocked and associated LED is activated.

An alarm in zone 3 is indicated as follows:

- The general Fire LEDs are activated.
- The zone 3 Fire LED is activated.
- The internal buzzer is activated (constant).
- The stage 1 sounder and associated LED are activated.
- The illuminated **warning** sign is activated. *
- Activate the two stage 1 alarm relays (if auxiliary outputs are enabled). *
- The call fire brigade / call fire brigade delay is activated (if set). *
- The general fire alarm relay is activated.
- The zone 3 fire alarm relay is activated.

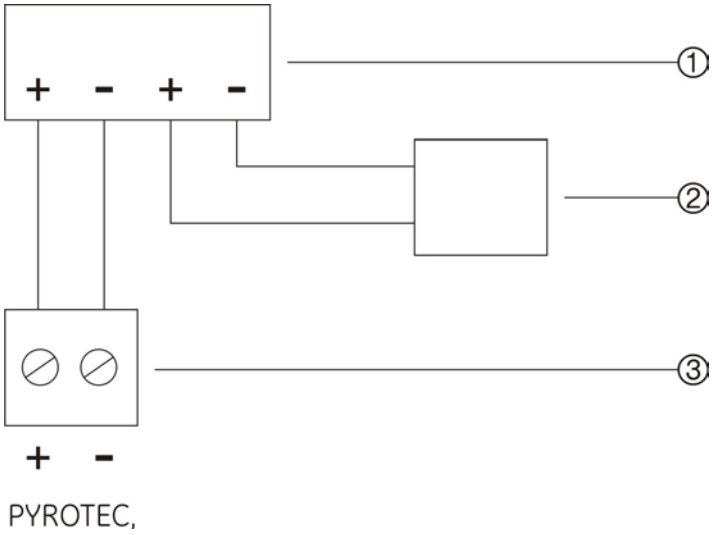
* Subject to configuration.

Connecting the pyrotechnic output

The pyrotechnic output must be conected to the extinguishing agent bottle via the extinguishing end-of-line module. Activation of the pyrotechnic output generates a charge of >1A during 10 ms.

WARNING: The system allows for connection of the pyrotechnic output or the solenoid output. Do not attempt to connect both. Ensure that the panel and DIP switch are configured for use with the pyrotechnic output (see the “Pyrotechnic / Solenoid select” section for further details).

Figure 23: Pyrotechnic output connection



1. Extinguishing EOL module
2. Pyrotechnic device
3. Pyrotechnic connector (panel)

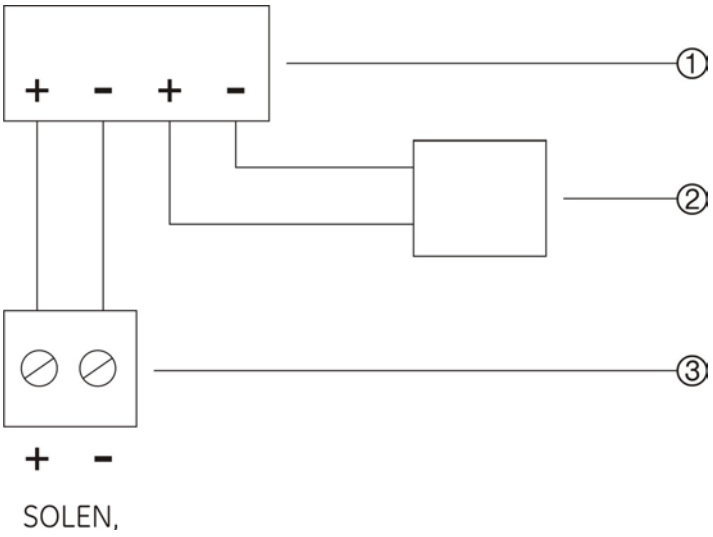
The resistance for the pyrotechnic installation must not exceed 12Ω (including the cable resistance and pyrotechnic device).

Connecting the solenoid output

The solenoid output must be connected to the extinguishing agent bottle via the extinguishing end-of-line module. The maximum current is 0.5 A.

WARNING: The system allows for connection of the pyrotechnic output or the solenoid output. Do not attempt to connect both. Ensure that the panel and DIP switch are configured for use with the solenoid see the “Pyrotechnic / Solenoid select” section for further details).

Figure 24: Solenoid output connection

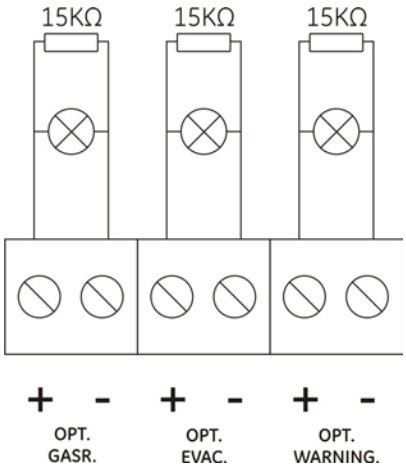


1. Extinguishing EOL module
2. Solenoid
3. Solenoid connector (panel)

Connecting the illuminated signs

Three illuminated signs may be connected to the system (Warning, Evacuate, and Gas released). The maximum peak current for the circuit is 900 mA. An end-of-line resistance of 15KΩ is required.

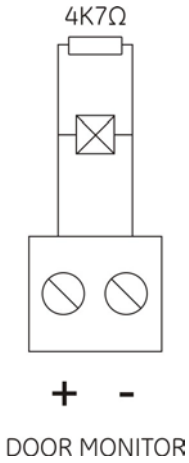
Figure 25: Illuminated sign connection (warning, evacuate, gas released)



Connecting the door monitor input

The door monitor checks the status of the fire doors (it does not control the opening or closing of doors). The input must have a resistance of 100Ω / 2W in series with the normally open (NO) contact to be activated. An end-of-line resistance of 4K7Ω is required.

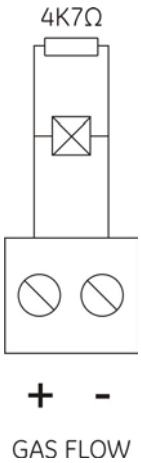
Figure 26: Door monitor connection



Connecting the gas flow switch input

The gas flow switch input monitors the gas in the extinguishing agent bottles (to see if it has been released). The input must have a resistance of 100Ω / 2W in series with the normally open (NO) contact to be activated. An end-of-line resistance of 4K7Ω is required.

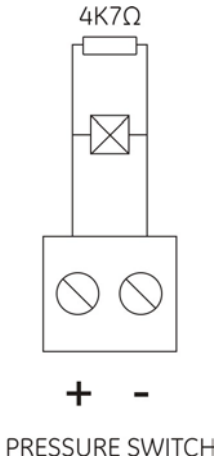
Figure 27: Gas flow switch input



Connecting the pressure switch input

The pressure switch input monitors the pressure of the gas in the extinguishing agent bottles. The input must have a resistance of 100Ω / 2W in series with the normally open (NO) contact to be activated. An end-of-line resistance of 4K7Ω is required.

Figure 28: Pressure switch connection

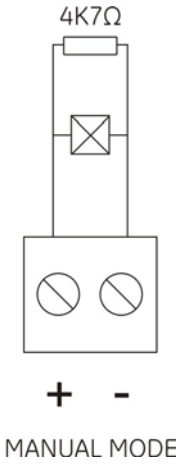


When the pressure switch input is activated the pressure switch relay of the relay master module (if installed). will also be activated. See the “Relay master module” section for further details.

Connecting the manual mode input

The manual mode input may be used in installations requiring a key-operated manual mode call point to switch the control panel to manual mode. The input must have a resistance of 100Ω / 2W in series with the normally open (NO) contact to be activated. An end-of-line resistance of 4K7Ω is required.

Figure 29: Manual mode connection

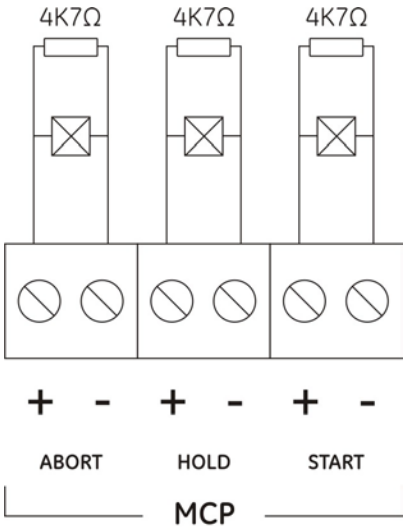


Connecting the extinguishing system manual call points

The extinguishing system supports three types of manual call point: to start extinguishing, to hold extinguishing and to abort extinguishing. The extinguishing circuit can support a maximum of 32 manual call points. The hold and abort manual call points must comply with EN12094-3.

The inputs must have a resistance of 100Ω / 2W in series with the normally open (NO) contact to be activated. An end-of-line resistance of 4K7Ω is required.

Figure 30: Connecting the extinguishing system manual call points

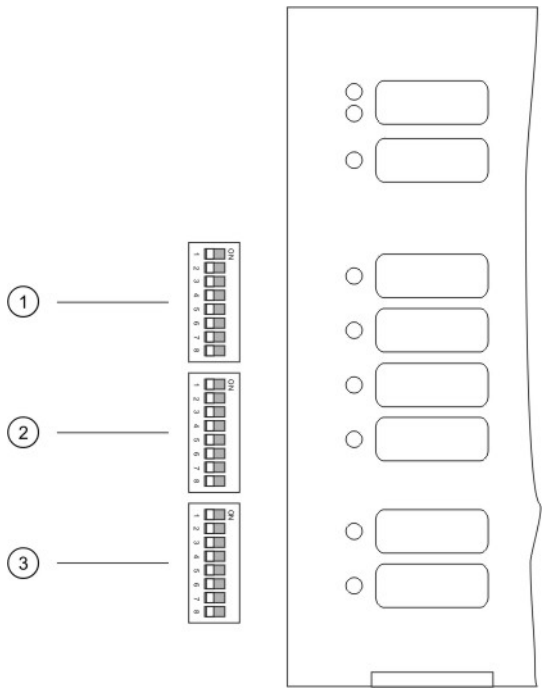


When the abort or hold extinguishing manual call point inputs are activated the related relays on the relay master module will also be activated (if installed).

System configuration and start-up

DIP switches and functions

Figure 31: Configuration DIP switches and functions



1. DIP switch 1 (SW1)
2. DIP switch 2 (SW2)
3. DIP switch 3 (SW3)

Table 4: Configurable functions for each DIP switch

DIP switch 1 (SW1)	DIP switch 2 (SW2)	DIP switch 3 (SW3)
Extinguishing delay	Release state gas flow check	Hold mode
Fire Routing delay	Fire Routing to release	Pyrotechnic/solenoid select
	Door monitor	First alarm relay
	Reset delay	Fire Routing to Z3
		Fire Routing to first/second alarm
		Warning light to Z3 alarm
		Maintenance (Clean Me)
		Active end-of-line

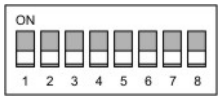
System configuration

Extinguishing agent release delay

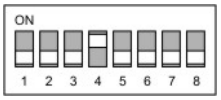
Use bits 1 to 4 of DIP switch 1 to configure a delay in the release of the extinguishing agent. The minimum delay is 5 seconds and the maximum delay is 60 seconds.

Figure 32: Extinguishing agent release delay configuration

No delay



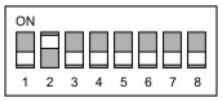
5 second delay



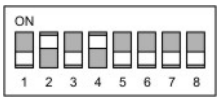
10 second delay

15 second delay

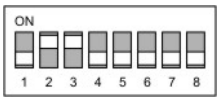
20 second delay



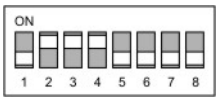
25 second delay



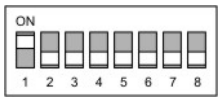
30 second delay



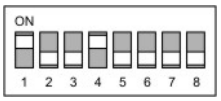
35 second delay



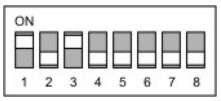
40 second delay



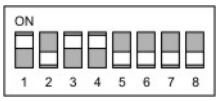
45 second delay



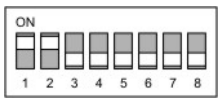
50 second delay



55 second delay



60 second delay

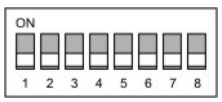


Fire brigade delay

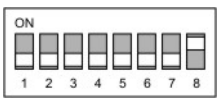
Use bits 5 to 8 of DIP switch 1 to configure a fire brigade delay. The minimum delay is 1 minute and the maximum delay is 10 minutes.

Figure 33: Fire brigade delay configuration

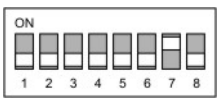
No delay



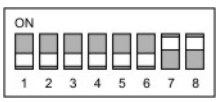
1 minute delay



2 minute delay



3 minute delay

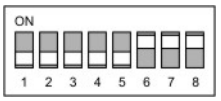


4 minute delay

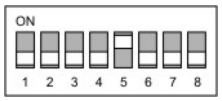
5 minute delay

6 minute delay

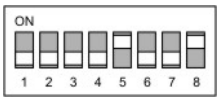
7 minute delay



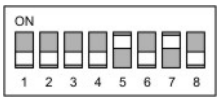
8 minute delay



9 minute delay



10 minute delay



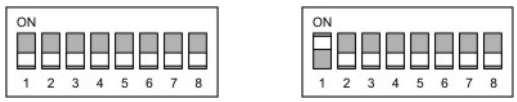
Release state gas flow check

Use bit 1 of DIP switch 2 to configure if confirmation of gas flow is required for the release state. This configuration ensures that the gas is released normally from the extinguishing agent bottle before a released state is confirmed).

- **Mode 1:** the released state is confirmed when the solenoid or pyrotechnic is activated (there is no gas flow check).
- **Mode 2:** the released state is confirmed only when the gas flow switch is activated (the gas flow check option is on).

Figure 34: Release state gas flow check configuration

Mode 1 Mode 2



Fire brigade to release

Use bit 2 of DIP switch 2 to configure fire brigade functionality in release state.

- **Mode 1:** No functionality.
- **Mode 2:** If the fire brigade has not already been called it will be called on release state.

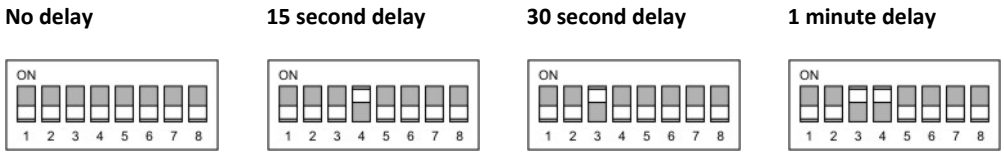
Figure 35: Fire brigade to release configuration

Mode 1 Mode 2

Door monitor

Use bits 3 and 4 of DIP switch 2 to configure the door monitor.

Figure 36: Door monitor configuration



In standby the door monitor active LED will be activated after the configured delay if a door is open.

In alarm mode (zone 1 and zone 2) or when a manual call point has been activated (or zone 1, zone 2, zone 3) any configured delay will be cancelled and the door monitor fault LED will be activated and the internal buzzer will sound. See Table 5 for further details of foor monitor fault indication.

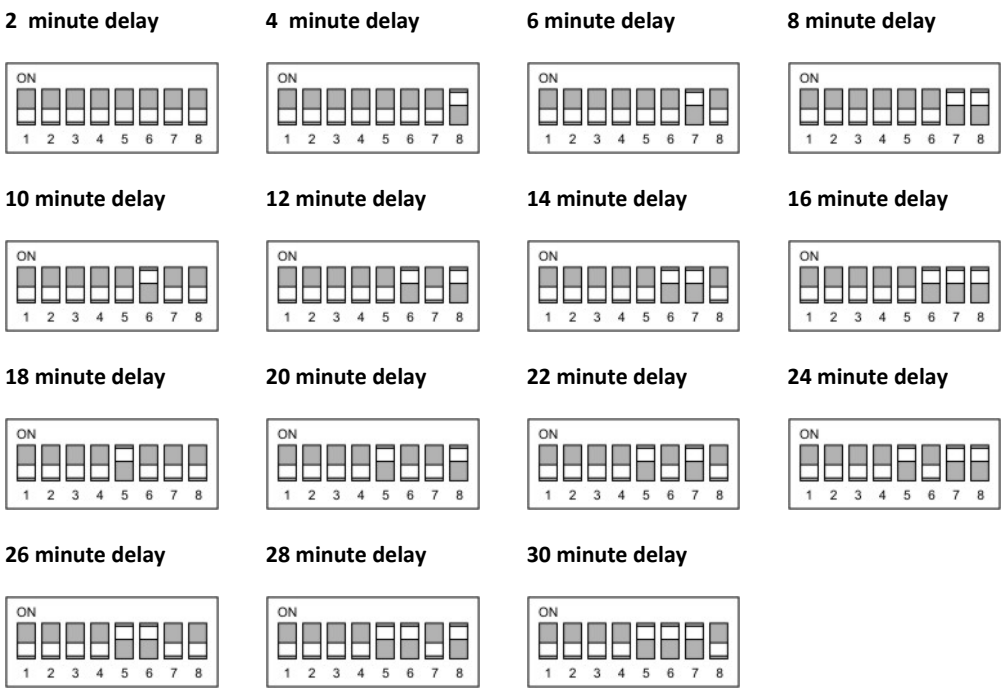
Table 5: Door monitor fault indication

System status	System mode	Fault indication
Standby	Automatic	Fault if the door is open after the delay
Standby	Manual	Fault if the door is closed after the delay
Detector alarm	Automatic	Fault is door is open (delay cancelled)
Detector alarm	Manual	Fault is door is closed (no delay)
Detector confirmed alarm	Automatic	Fault if door is open (delay cancelled)
Detector confirmed alarm	Manual	Fault if door is closed (no delay)
Start MCP activated	Automatic	Fault if door is open (delay cancelled)
Start MCP activated	Manual	Fault if door is open (no delay)
During extinguishing delay	n/a	Fault if the door is open (no delay)
Hold MCP activated during extinguishing delay	n/a	Fault if the door is open (no delay)
Extinguishing delay expires (hold / abort MCP not activated)	n/a	Fault if the door is open (no delay). Switch actuator if door is closed (no delay)
Abort MCP activated during extinguishing delay	n/a	Revert to fault status for automatic or manual mode
Actuators disabled (intentionally or due to a fault in hold / abort MCP line)	n/a	Revert to fault status for automatic or manual mode

Reset delay

Use bits 5 to 8 of DIP switch 2 to configure the reset delay. The minimum delay is 2 minutes and the maximum delay is 30 minutes.

Figure 37: Reset delay configuration

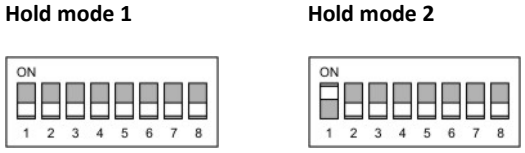


Hold extinguishing manual call point

Use bit 1 of DIP switch 3 to configure the Hold extinguishing manual call point.

- **Hold mode 1:** activation of the solenoid / pyrotechnic is blocked (the extinguishing process is stopped). Sounders and configured delays are unchanged (the configured delay will continue to run).
- **Hold mode 2:** activation of the solenoid / pyrotechnic is blocked and sounders emit a unique sound pattern while the hold MCP is pressed. When the hold MCP is released the released delay will be triggered and the sounder pattern will return to normal.

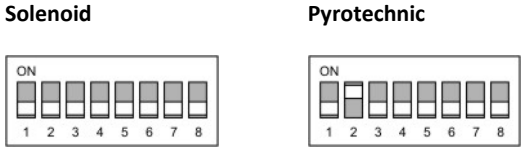
Figure 38: Hold configuration



Pyrotechnic / Solenoid select

Use bit 2 of DIP switch 3 to define use of a pyrotechnic or solenoid in the extinguishing system.

Figure 39: Solenoid / Pyrotechnic selection

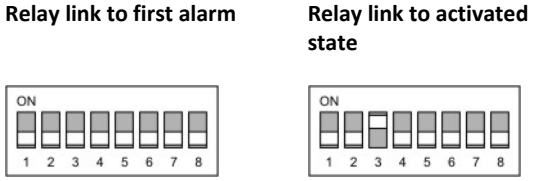


First alarm relay

Use bit 3 of DIP switch 3 to configure the first alarm relay to activate via the relay master module.

- **Mode 1 (off):** relay link to first alarm.
- **Mode 2 (on):** relay link to activated state.

Figure 40: First alarm relay configuration



Activation is linked to the Auxiliary Disable function. When the panel Auxiliary Disable LED is on the then the relay is disabled and will not be activated in the event of an alarm.

Note: This relay is intended for fire protection commands (for example - to switch off air conditioning systems or other devices external to the fire system).

Fire brigade link to zone 3 alarm

Use bit 4 of DIP switch 3 to configure the fire brigade link to a zone 3 alarm.

Figure 41: Fire brigade link to zone 3 alarm configuration

Fire brigade link to first alarm or second alarm

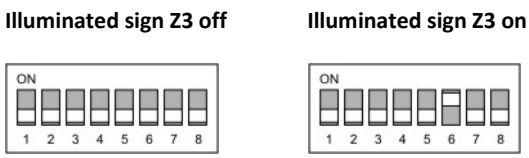
Use bit 5 of DIP switch 3 to configure the fire brigade link to a first alarm or second alarm.

Figure 42: Fire brigade link to first alarm or second alarm configuration

Illuminated warning sign link to zone 3 alarm

Use bit 6 of DIP switch 3 to configure the illuminated warning sign link to a zone 3 alarm.

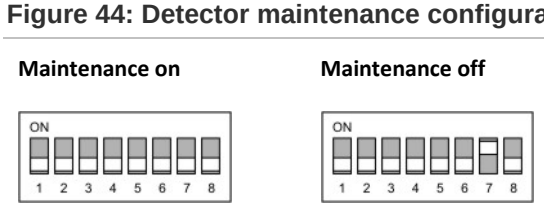
Figure 43: Illuminated warning sign link to zone 3 configuration



Detector maintenance

Use bit 7 of DIP switch 3 to configure the detector maintenance (clean me) feature. This feature may be used only on detectors with Clean Me® technology.

Figure 44: Detector maintenance configuration



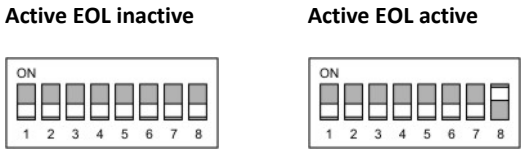
Active end-of-line module

An active end-of-line allows the panel to detect a fault caused by the removal of a detector from the installation. This fault is indicated as an open circuit fault but the rest of detectors in the installation keep working.

Caution: This operating mode is not compatible with the usual operating mode of a conventional zone with "passive" end-of-line detection.

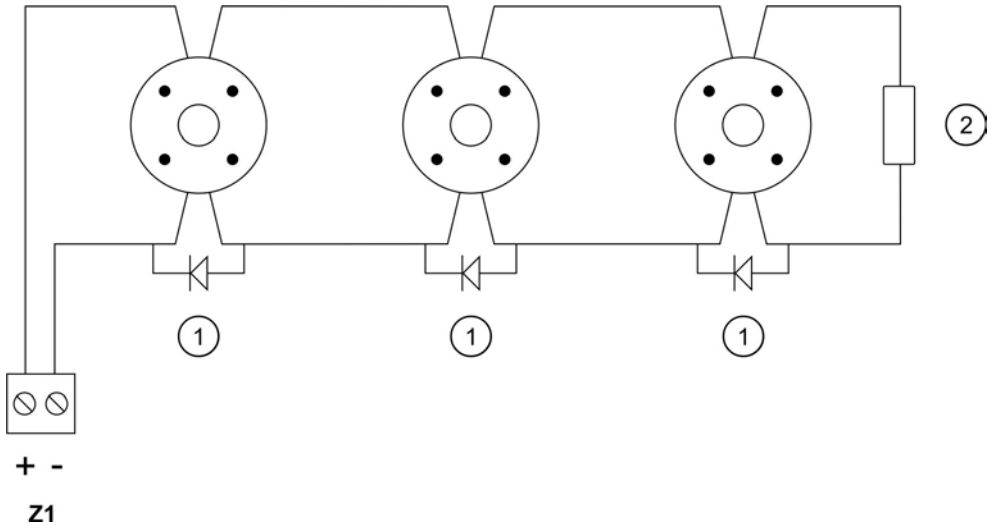
Use bit 8 of DIP switch 3 to configure the active end-of-line module.

Figure 45: Active EOL module configuration



Besides configuring the DIP switch a schottky diode must be added to each of the detector bases in the zone. This diode must be connected to the negative contact, whilst an active end-of-line is installed after the last detector of the zone line (see Figure 46).

Figure 46: Detector zone scheme with an active end-of-line



1. Diode (1N4007 or similar)
2. Active end-of-line module

Relay master module

The RB404 relay master module (sold separately) has 4 relays rated at 24 VDC / 3 A. The unit allows for a voltage-free relay for each detection zone or for programming the activation of different relays depending on the status of one or more zones. The panel accepts commands from addresses 54 and 55 on the master module. Up to two master modules may be installed.

Table 6: Commands accepted from the master module.

Address	Command	Relay
54	First alarm	1
	Zone 1 and Zone 2 in alarm OR Start MCP activated	2
	Manual mode	3
	Released	4
55	Pressure switch	1
	Hold MCP	2
	Abort MCP	3
	Zone 3 alarm	4

Caution: 230 VAC devices must be connected to the panel via a 24 VAC (or 24 VDC) relay. 230 VAC devices must not be connected directly.

For further details on the RB404 installation and functionality refer to the RB404 installation and configuration manual.

System start-up

The following refers to the first system start-up after installation. An additional start-up sequence also exists, and is used when an operational panel detects an internal fault. For details see the panel user manual.

System check

Before connecting the panel to the main power supply check the following points.

- The fire panel has been properly installed.
- There is no short or open circuit in any of the zone lines.
- All end-of-line resistors are installed.
- If manual call points have been installed, they have a resistor of 100 Ohm 2W in series with their contacts.
- All required optional configurations are all properly connected.
- Sounder lines are properly connected with its polarity and with corresponding end-of-line resistors.
- The correct configuration of any special operating mode that has been programmed. If no special mode is desired position all DIP switches to the OFF position.
- Check that the mains power is 230 VAC using a tester. Place the mains fuse accordingly. Check that the batteries have a voltage higher than 24 VDC.

System power-up

Once all connections and the installation have been verified, the fire panel can be powered up. The mains supply must be connected before the batteries.

At this time only the green service LED should be on. All other LED indicators should be off. If any other LED indicators are on check your installation thoroughly before continuing.

System test

Caution: Disconnect the extinguishing output before performing a functionality test.

Zone test

For a zone test, the fault simulations must be carried out by causing short-circuits and opening the zone lines (to check the short and open circuit faults respectively).

- The alarm simulation in the zone may be carried out by placing a resistor of 100 Ohm 2 W in parallel to the zone, or by activating a manual call point or detector.
- Verify that when a fault is caused, the fault relay is activated.

- Verify that when an alarm is raised the alarm relay and the alarm sounders are activated immediately. After the programmed delay, the fire brigade output should also be activated (if configured).

Inputs test

The alarm simulation in the inputs may be carried out by placing a resistor of 100 Ohm 2 W in parallel to the input. Verify that when a fault is caused, the fault relay is activated.

Detector test

Once the fire panel has been checked, it is advisable to perform a check on the functionality of the detectors connected in the installation.

The installer should activate all the detectors into alarm and ensure the system performs all the operations and indications that were expected.

Troubleshooting, maintenance and support

This section provides information to help you diagnose and solve various problems that may arise while configuring or using your UTC Fire & Security product.

Caution: This product must be installed and maintained by qualified personnel adhering to all applicable standards and local authority laws.

Troubleshooting

Solutions to common problems can be found in the following table:

Table 7: Troubleshooting common problems

Problem	Cause	Action to be taken
The service LED indicator is not on.	The panel has no power.	Check power supply (230 VAC). Check connection between power supply unit and power interface board. Check connection between power interface board and main board. Check power supply fuse. Check battery.
The general fault and power supply failure LED indicator is on and the buzzer is sounding intermittently.	The panel has no power supply from the mains and is working with batteries. There is a battery failure. The voltage from the power supply is not correct (24V or 5V).	Check power supply (230 VAC). Check power supply fuse. Check battery connection. Check the battery voltage is correct (19.7 V –28.8 V).
The general disabled and zone disabled LED indicators are on and the buzzer is sounding intermittently.	The indicated zone is disabled.	To enable the zone, turn the key to the ON position and press the key of the disabled zone.
The panel does not respond to the keypad.	The keypad is disabled.	To enable the keypad, turn the key to the ON position.
The general fault and out of service LED indicators are on and the buzzer is sounding intermittently.	The panel has no power supply from the mains and the battery is below 22 V (minimum working voltage).	Disconnect the battery and the power supply until the mains voltage or charged batteries can be supplied. Check the cable connection between the power supply and the PCB.

Problem	Cause	Action to be taken
The general fault, input/output and zone failure LED indicators are on (flashing) and the buzzer is sounding intermittently.	The indicated zone / device has a fault.	Check the end-of-line resistance of the zone. Check that there are no short or open circuits in the lines. Check that there are no inverted polarity detector connections. Check that there are no manual call points activated without a series resistance.
An output generates a fault when activated.	The current limit for the output has been exceeded.	Reset the panel to cancel the current protection and correct the current consumption for the output so as not to exceed the current limit.
The solenoid or pyrotechnic output does not work.	Incorrect configuration of DIP switches / system.	Check configuration of DIP switches 2 and 3. Check voltage from the outputs.

Maintenance

The following maintenance procedures should be performed.

System maintenance

To guarantee correct functioning of the system and compliance with EN54 standards, the following checks are recommended:

- **Daily Verification:** Check that the system is in ready status. If the above is not so, take the appropriate measures. (e.g. verification of incidents, alerts to maintenance, etc.).
- **Weekly Verification:** Check at least one detector or call point to confirm the functioning of the panel (make sure you do not always check the same one).
- **Quarterly Verification:** Carry out a quarterly verification by personnel who are experts in fire systems. This check must test one device per zone, supervising the activation of the corresponding outputs, verification of batteries and their load voltage.
- **Annual Verification:** All system devices must be checked annually. Visually inspect all electrical connections to make sure that they are securely fastened, that they have not been damaged and that they are appropriately protected.

Battery maintenance

The batteries must be replaced periodically as recommended by the manufacturer. The useful life of the battery is approximately 4 years. Do not connect batteries with voltage below 19.7V.

Cleaning

Keep the outside and inside of the panel clean. Carry out periodic cleaning using a damp cloth for the outside. Do not use products containing solvents to clean the unit. Do not clean the inside with liquid products.

Contacting technical support

For assistance installing, operating, maintaining, and troubleshooting this product, please contact your local supplier. Be ready at the equipment before calling for technical support.

Technical specifications

Mechanical	
Cabinet measurements (KM301)	420 x 335 x 110 mm
Weight	6.2 Kg
Cable input holes	10 x 20 mm at top / 8 at rear of chassis
Environmental	
Working temperature	-5°C to +40°C
Storage temperature	-10°C to +70°C
Relative humidity (noncondensing)	10% to 95%
Environmental class	Class A
Type class conditions	3K5 of IEC 60721
IP rating	IP 30
Zone output	
Maximum number of detectors per zone	20
Maximum number of rmanual call points per zone	32
Zone output voltage (nominal)	24 VDC
Zone output voltage (maximum)	28.8 VDC
Zone output voltage (minimum)	16 VDC
Maximum current	94 mA
Maximum length of zone line	2 km
Maximum resistance of zone line	44 Ω
Maximum capacitance of zone line	500 nF
Current in standby	7 mA
Current in alarm	50 mA
Sounder output	
Number of outputs in main board	2
Supervised	For open and short circuit
Maximum current	250 mA
Maximum voltage in standby	5 VDC to 9 VDC
Voltage in alarm	22 VDC to 28.8 VDC (nominal of 24 VDC)
Alarm relay	
Potential free relays	1 relay (C / NC / NO)
Maximum commutation power	1 A, 30 VDC
Fault relay output	
Potential free relays	1 relay (C / NC / NO)
Maximum commutation power	1 A, 30 VDC
Working condition	Normally energized (fail to safe)

Fire routing output	
Supervised	For open and short circuit
Maximum current	250 mA
Maximum voltage in standby	5 VDC to 9 VDC
Maximum voltage activated	22 VDC to 28.8 VDC (nominal of 24 VDC)
Auxiliary 24 VDC output	
Output voltage	18 V to 28.8 VDC (nominal of 24 VDC)
Maximum current	1.3 A
Resettable 24 VDC output	
Supervised	For short circuit
Maximum current	100 mA
Maximum voltage activated	18 VDC to 28.8 VDC (nominal of 24 VDC)
Reset time	3 seconds
Pyrotechnic output	
Supervised	For open and short circuit
Current	1 A at 10ms
Maximum voltage in stanby	5 VDC to 9 VDC
Maximum voltage activated	22 VDC to 28.8 VDC (nominal of 24 VDC)
Solenoid output	
Supervised	For open and short circuit
Current	500 mA
Maximum voltage in stanby	5 VDC to 9 VDC
Maximum voltage activated	21 VDC to 28.8 VDC (nominal of 24 VDC)
Optical warning sign output	
Supervised	For open and short circuit
Current	900 mA
Mean current	450 mA
Maximum voltage in stanby	5 VDC to 9 VDC
Maximum voltage activated	22 VDC to 28.8 VDC (nominal of 24 VDC)
Power supply	
Operating voltage	230 VAC
Voltage tolerance	+10% / -15%
Rated input current	1.5 A
Operating frequency	47 - 63 Hz
(I min.)	130 mA
Max. output current (I max. a)	900 mA
Max. output current (I max. b)	2.3 A
Mains fuse	T 2A H 250V

Battery	
Batteries	2 x 12V / 7.2 Ah (sealed lead type)
Batteries final voltage	19.7 V
Fully charged battery voltage	27.3 V @ 20ºC – 36 mV/ºC
Max. internal resistance of battery circuitry (Ri max.).	0.5 Ω
Battery charger	
Output voltage	27.3 V nominal at 20ºC
Temperature compensation	-36 mV/ºC
Cabling	
Inputs / Outputs	Single pair screened and twisted cable (2 x 1.5 mm²)
Mains	3 wire cable (3 x 1.5 mm²)
End-of-line resistor	
Zone lines	4K7Ω
Activate extinguishing input (MCP)	4K7Ω
Stop extinguishing input (MCP)	4K7Ω
Hold extinguishing input (MCP)	4K7Ω
Manual mode input (MCP)	4K7Ω
Fault return input	4K7Ω
Door monitor input	4K7Ω
Pressure monitor input	4K7Ω
Gas flow switch input	4K7Ω
Sounder outputs	15KΩ
Fire routing output	15KΩ
Optical sign outputs	15KΩ
Solenoid output	Extinguishing end-of-line module
Pyrotechnic output	Extinguishing end-of-line module

Glossary

Term	Definition
I min.	Minimum output current that corresponds to the condition of minimum internal power dissipation and minimum output loading.
I max. a	Maximum output current that can be supplied continuously by power supply unit.
I max. b	Maximum output current higher than I max. a, which can be supplied while battery charging is not required by power supply unit.
Ri max.	Maximum internal resistance of the battery and its associated circuitry.