

# TFA2-596 - TFA4-1192

## Addressable fire alarm systems



### Installation

Release:	3.2
FW release:	2.0.00
Models:	TFA2-596 - TFA4-1192
Programming SW release:	5.4
Update:	07/2019
Language:	English



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The manufacturer, Tecnoalarm S.r.l., declares that the present equipment complies with the Directives LVD 2014/35/EU and EMC 2014/30/EU as well as the regulation CPR 305/2011.

The full text of the EU Declaration of Conformity is available at the following internet address:  
[www.tecnofiredetection.com](http://www.tecnofiredetection.com).

In addition, the manufacturer declares that the listed products are certified according to the following standards:

Control panels EN 54-2:1997 + A1:2006

**TFA2-596** Certification number 0051-CPR-0389

**TFA4-1192** Certification number 0051-CPR-0388

Power supply EN 54-4: 1997 + A1:2002 + A2:2006

**TFPS-5** Certification number 0051-CPR-0492

The certificates are available at the following internet address: [www.tecnofiredetection.com](http://www.tecnofiredetection.com).

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# 1 - GENERAL REFERENCES

## Premise

Before proceeding with the installation, read this manual thoroughly. It contains important references and instructions concerning the correct installation, operation and servicing of the fire alarm system.

## Operational restrictions and purposes of a fire alarm system

It is fundamental to consider that a fire alarm system does not guarantee protection and immunity against material damages, of any kind and nature, caused or induced by fire. It is equally important that the fire alarm system must be installed and kept in a state of perfect functioning according to the instructions provided by the manufacturer.

The Tecnofire systems, designed for the detection, extinguishing, actuation, evacuation etc., are able to notify fire alarms promptly to the final user and/or the personnel in charge. The systems process the events automatically and, according to programming, transmit acoustic and/or telematic notifications apt to urge the evacuation of the premises, activate automatic control or extinguishing systems and eliminate all situations and events that may feed the fire, with the aim of guaranteeing the safety of the persons and safeguarding the property.

## Installation requirements

Although this manual contains all the necessary procedures for a correct installation of the equipment, the interpretation and correct application of its contents requires adequate training of the technical staff in charge of the installation. In particular, the installer must have the necessary technical skills and acquaint himself with the valid European standards regarding both the general requirements for fire alarm systems and the specific provisions for installation, electrical safety and maintenance. In addition, he must have a thorough knowledge of the products, acquired through specific training at Tecnofire (division of Tecnoalarm S.r.l.).

## Environmental requirements

The control panel and all the system components must be installed inside structures or buildings with climatic characteristics (temperature and non-condensing relative humidity) that comply with the standards applied during certification. Specific operating temperature and humidity values are indicated in the relevant technical data tables.

## Usage requirements

To avoid damage to the equipment or, even worse, dangerous malfunctions in detecting fire and actuating the devices and systems that operationally depend from the fire alarm system, it is mandatory to use only the components and devices indicated by Tecnofire. The interfacing with third-party systems must be made with Tecnofire input and output modules, verifying each time the full compatibility. If in doubt, always refer to the Tecnofire technical support service.

## Technical support

The technical support service of Tecnofire provides assistance in answering technical questions regarding the installation, functioning and operation of the Tecnofire products.

## Power supply

In the planning phase, to ensure the autonomy of service requested by the standards, it is important to size the primary (mains power) and secondary (battery) power supply correctly.

It must be considered that, in case of power failure, the system ensures functioning by means of batteries for a limited period of time, the length of which depends on the capacity and the state of efficiency of the batteries.

## Induced damage

Prior to working on any system component, in order not to cause damage while installing or servicing the equipment, always disconnect both the primary (mains power) and secondary (battery) power supply of the system. To avoid damage caused by electrostatic discharges, handle the electronic boards of the devices with care and avoid direct contact with the electronic components.

**Periodic maintenance**

To guarantee the efficiency of the fire alarm system, it is necessary to provide for an appropriate maintenance program. The frequency of maintenance depends on different aspects, however, it is recommended to have the system serviced at least once every 6 months. The maintenance operations should be carried out by specialized technical staff. It is assumed that those who designed and installed the system have the necessary information and knowledge to perform proper maintenance. The maintenance guidelines are prescribed by the European standards.

The most important controls include:

- Checking the operational state of the primary (mains power) and secondary (battery) power supply of the control panel and of the auxiliary power supplies
- Checking the operational state of the batteries and self-powered devices (sirens and telephone transmitters)
- Checking the functional efficiency of the detectors
- Checking the functional efficiency (cleanliness) of the smoke chamber of the optical detectors
- Checking the functional efficiency of the control panels and repeaters
- Verifying the efficiency of the acknowledgment, evacuation and system reset procedures
- Checking the functional efficiency of the manual call points
- Checking the functional efficiency of the optical-acoustic alarm devices
- Checking the functional efficiency of the alarm transmission equipment (ATE)
- Verifying the efficiency of the actuations through the input and output modules
- Verifying the correct coupling of the cables to the terminals
- Drafting of the final inspection report



## 2 - SYSTEM RESOURCES

The TFA2-596 control panel manages 2 and the TFA4-1192 manages 4 detection loops.  
 The number of available detection loops can be increased by connecting other control panels.  
 The maximum network configuration includes 16 control panels with 4 detection loops.

General specifications	TFA2-596	TFA4-1192	Max. network configuration (16 control panels)
Repeaters	16	16	Max. 256 (16 x 16)
Detection loop	2	4	Max. 64 (4 x 16)
Detectors per loop	199	199	
Total detectors	398 (199 x 2)	796 (199 x 4)	Max. 12736 (796 x 16)
Modules per loop	99	99	
Total modules	198 (99 x 2)	396 (99 x 4)	Max. 6336 (396 x 16)
Zones	300	300	Max. 4800 (300 x 16)
Virtual zones	100	100	Max. 1600 (100 x 16)
Access periods	32	32	Max. 512 (32 x 16)
Access levels	4	4	4
Codes	10	10	10
Formulas	200	400	400
Alarm plans	100	200	200

**N.B.** Although the control panel with 4 loops is able to manage a total of 1,192 detection devices (detectors + call points), the standard EN 54-2 chapter 13.6 provides that a failure may not affect more than 512 detectors and/or manual call points and their designated functions. Therefore, the maximum number of connectable detectors/call points to each control panel is 512, multiplied by 16 control panels equals 8,192.

The TFA2-596 and TFA4-1192 fire detection panels are designed and manufactured in accordance with the standards EN 54-2:1997 + A1:2006 (control panel) and EN 54-4:1997 + A1:2002 + A2:2006 (power supply).

It was designed under a quality system certified ISO 9001 that involves the application of a set of rules for the design and all subsequent activities necessary for the production. All the components of the equipment were selected for the intended purposes. Their specifications are guaranteed, if the environmental conditions outside the casing correspond to those specified for the class 3K5 of the standard EN 60721-3-3:1995.

The control panels should be installed in indoor areas, monitoring of temperature and humidity is not required.

The control panels consist of a metal casing with space for two 12V/7.2Ah batteries, a CPU board, which integrates the user interface consisting of a display and a keypad, a switching 24V/2.7Ah power supply (ALSW2827) and a terminal board.

<b>EN 54</b>	<b>Warning:</b> the TFA2-596 and TFA4-1192 control panels are certified with the following options with requirements from EN 54-2
<b>7.8</b>	Outputs to fire alarm devices
<b>7.11</b>	Output delays
<b>7.12</b>	Dependencies on more than one alarm signal (type B)
<b>8.3</b>	Failure signals from points
<b>9.5</b>	Disabling of addressable points
<b>10</b>	Test conditions

<b>EN 54</b>	<b>Warning:</b> the power supply of the TFA2-596 and TFA4-1192 control panels are certified to the requirements of EN 54-4
<b>5.1</b>	Power supply from the main power source
<b>5.2</b>	Power supply from the stand-by power source (battery)
<b>5.3</b>	Battery charging and check
<b>5.4</b>	Recognition and signaling of power supply failures



## 3 - SYSTEM SPECIFICATIONS

The scope of the TFA2-596 and TFA4-1192 control panels is to build small, medium-sized and large addressable systems for the automatic detection of fire. The systems can be composed of a network of maximum 16 control panels, permitting, in its maximum network configuration, the management of up to 19,072 devices. Remember that the limit imposed by the EN 54 is 512 detectors and/or manual call points for each control panel.

<b>User interface</b>
The front panel of the control panel hosts the user interface, consisting of 16 LED, a graphic color display and a keypad for management of the fire detection system. The user interface integrates also a voice synthesis function that uses a customizable vocabulary.
<b>Access levels</b>
The control panel manages 4 levels of access: level 1 (not protected by code), level 2 (user), level 3 (installation and maintenance personnel and level 4 (manufacturer).
<b>Monitored system mode</b>
The control panel provides for the monitored system mode, subject to the recognition of a level 2 code. The monitored system mode is indicated by the relevant LED on the control panel and the relevant icon on the repeater panel.
<b>System configuration</b>
The configuration of the system can be performed locally through the control panel or remotely using a personal computer and the programming software.
<b>Integrated Ethernet hub</b>
The control panel integrates an Ethernet interface which can communicate with the supervision centers on a local area network (LAN) and/or a wide area network (WAN or VPN). The Ethernet interface which meets the 803.2 standard can transmit in a full/half duplex mode with a transmission speed of 10 Mbit to 100 Mbit. The client/server communications are managed by 4 independent communication channels. To forward notifications, the Ethernet interface uses 8 independent channels.
<b>Communication protocols</b>
The 8 channels for the event notification use both standard and proprietary TCP/IP protocols with an 128 bit AES encryption. The channels can also manage encrypted transmissions using customized passphrases.
<b>Control panel network</b>
The network can be composed of a total of 16 addressable control panels connected through the RS485 serial bus. The network is arranged in a hierarchy, one master control panel has the complete control over up to 15 slave control panels. All information and signaling will be collected by the master. Network functioning is in compliance with the EN 54-13 standard.
<b>Detection loop</b>
The detection loop of the control panel can handle up to 199 detectors and 99 modules (maximum configuration in closed-loop mode).
<b>Detectors</b>
The control panel can directly manage the addressable detectors of the Tecnofire product line. Conventional detectors can be managed through addressable interfaces.
<b>Modules</b>
The control panel can manage different types of specialized modules: input modules, output modules, sirens, call points, optical-acoustic alarm devices, additional power supplies.
<b>Telephone communicator</b>
A total of 5 external PSTN telephone communicators with optional GSM-GPRS interface can be connected for transmitting voice, SMS, GPRS notifications of alarms and signaling.
<b>Repeater</b>
The repeater panel has the task of repeating alarm signaling and decentralizing system management. The repeater provides a 7 inches touch screen and a voice synthesis function.

<p><b>Synoptic repeater</b></p> <p>The synoptic repeater panel performs the same functions as the repeater and, in addition, it manages dynamically or on request up to 32 floor plans with up to 32 interactive icons each.</p>
<p><b>Additional power supply</b></p> <p>The system provides for the use of additional power supplies, which allow to increase the power supply and autonomy of the system. The power supplies can be freely distributed within the infrastructure of the loop. The Tecnofire power supplies are constantly supervised by the control panel and comply with the applicable standard EN 54-4-A2:2006.</p>
<p><b>Zones</b></p> <p>Each zone may control 1 to 32 detection and/or actuation devices, typically detectors and modules (maximum number of devices defined by EN 54). The control panel controls up to 150 zones, which can be specialized as fire zones or technical zones.</p>
<p><b>Virtual zones</b></p> <p>The control panel can manage up to 100 virtual zones. The virtual zone is an abstract set which includes detection and/or actuation devices, typically detectors and modules. The virtual zones do not cause any kind of alarm notification, but can be recalled as operands within formulas. The virtual zone may consist of devices, belonging to different loops and even to other virtual zones.</p>
<p><b>Formulas</b></p> <p>The formulas determine the rules of behavior affecting the operation of the devices, on the basis of the dynamic behavior of the system.</p>
<p><b>Alarm plans</b></p> <p>Each fire or technical zone can be associated with a specific alarm plan that, in the event of an alarm, is viewed by the control panel and the repeaters of the system. The alarm plan informs the operators about the behavior and the measures to be taken to deal with the alarm in the specific zone.</p>
<p><b>Programmable outputs</b></p> <p>In addition to the mandatory alarm, failure and reset outputs, the control panel features 2 programmable outputs. For each of them it is possible to program a function and the logic status (standard or reversed).</p>
<p><b>Access periods</b></p> <p>The control panel manages 8 access periods that can be recalled as operands within formulas governing the operation of the output modules, sirens and optical-acoustic alarm devices. The access periods invoked within a formula perform the operation requested by the associated operand. The access periods can also be used to enable the monitored system mode.</p>
<p><b>Customizable calendar</b></p> <p>The control panel is equipped with a customizable four-year calendar that manages all the operations controlled by the clock. It is possible to define weekdays, holiday eves, holidays and automatic Daylight Saving Time setting.</p>
<p><b>Personal computer interface</b></p> <p>The control panel has an USB interface dedicated to the connection of a personal computer with which it is possible to perform, depending on the access level, all programming operations and the system firmware update.</p>
<p><b>Serial printer interface</b></p> <p>The control panel provides a TTL port dedicated to connecting a PROG32 interface to which you can connect a serial printer.</p>
<p><b>Event buffer</b></p> <p>The control panel stores in its non-volatile buffer up to 8192 events in descending chronological order. The memory contents can be displayed via the control panel or sent to the printer through the TTL port. Events can be displayed and filtered by the software. For this, the events are downloaded and saved in a log file on the software.</p>
<p><b>Communication analysis</b></p> <p>The control panel constantly supervises all communications among the devices that make up the system and registers possible errors.</p>

## TFA2-596 • TFA4-1192 - Technical and functional specifications

Detectors Modules Zones	Total connectable detectors	796 (TFA4-1192) 398 (TFA2-596)	Expandability	Serial expansions (max. 16)	TFT-7	
	Total detectors per loop	199			TFT-7S	
	Total connectable modules	396 (TFA4-1192) 198 (TFA2-596)			Telephone communicator	
	Total modules per loop	99		Network configuration	1 master + 15 slaves	
	Total zones	300		Serial printer	✓	
	Virtual zones	100		Electrical specifications CPU	CPU board consumption	200mA @ 24V DC
	CPU outputs	Hard-programmed relays			2	Electrical outputs
Programmable relays		3	Power supply voltage (loop, serial bus, sirens)		20V...27.6V DC	
Programmable open-collectors		3	Modular power supply	Type	A - switching Fly-back	
Controlled siren output		1		Operating voltage	230V AC +10% -15% 50Hz	
Reset output		1		Power supply consumption	700mA AC	
System features	True color TFT display	480 x 272 pixel		Rated output current	5A @ 27.6V DC	
	Voice synthesis	Customizable vocabulary		Max. current available	5A	
	Detection loops	4 (TFA4-1192)		Peak-to-peak ripple voltage	≤150mV p-p	
		2 (TFA2-596)	Battery protection fuse	T 1.6A		
	RS485 serial buses	Master Bus (1 port) Slave Bus (1 port)	Battery	Capacity	2x 12Ah/12V	
Event buffer capacity	8192	Flame class		V-2 or superior		
Access management	Access levels	4		Cut-off voltage	<17.6V DC	
	Access codes	10		Recharge time	100% in 24h	
	Monitored system mode	✓	Physical specifications	Environmental class	3K5 (EN 60721-3-3:1995)	
Protocols	Loop	Fire-Speed		Operating temperature	-5°C...+40°C	
	RS485 serial bus	Fire-Bus		Relative humidity (without condensation)	10%...93%	
Ethernet hub	Type	Standard 803.2		Protection class	IP30	
	Connection channels	Local Server		Tecnoserver Call back	Casing	Aluminium - Steel
		Remote Server			Dimensions (L x H x D)	441 x 347 x 149mm
		Tecnoserver	Weight (without batteries)		6.2kg	
		Call back	Conformity		Fire alarm panel	EN 54-2:1997 + A1:2006
	Notification channels	8		Power supply	EN 54-4:1997 + A2:2006	
	IP addresses	16 (2 per channel)		Certification number	0051-CPR-0388 (TFA4-1192)	
	Transmittable events	15 categories			0051-CPR-0389 (TFA2-596)	
	Protocols	5 IP protocols		Year of CE marking	14	
	Encryption	AES 128 bit		Number of declaration of performance	002_TFA4-1192 (TFA4-1192)	
Transmission time	SIA IP DC-09 10s	003_TFA2-596 (TFA2-596)				
Call event queue	64 events	Notified body	IMQ			
Automation	Formulas	400 (TFA4-1192) 200 (TFA2-596)	Automation	Access periods	32	
		Alarm plans		200 (TFA4-1192) 100 (TFA2-596)	Calendar	Quadrennial (programmable)
	Test call with TCP/IP			✓		

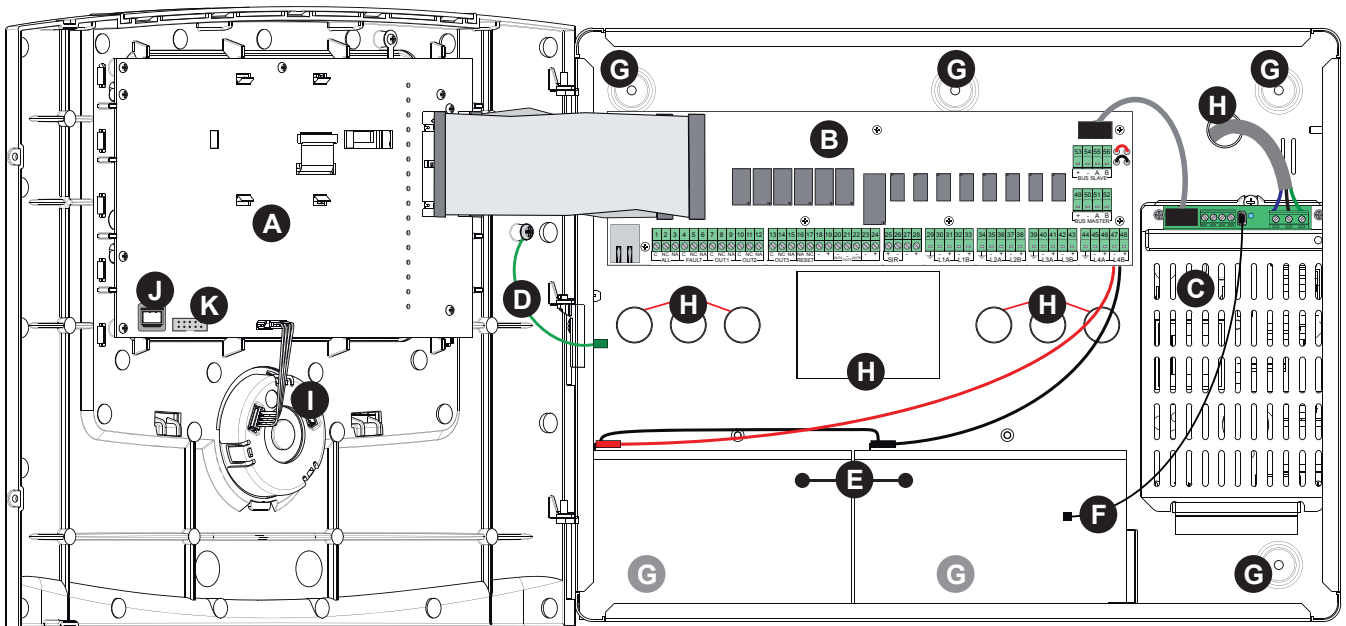


# 4 - WARNINGS FOR INSTALLATION

## 4-1 - Casing



<b>A</b>	Signaling LED	<b>C</b>	Function keys
<b>B</b>	Display	<b>D</b>	Numeric keys



<b>A</b>	CPU board	<b>E</b>	12V/12Ah batteries	<b>I</b>	Speaker
<b>B</b>	Terminal board	<b>F</b>	NTC probe for battery temperature monitoring	<b>J</b>	USB port
<b>C</b>	ALSW285PFC power supply	<b>G</b>	Mounting holes	<b>K</b>	TTL port
<b>D</b>	Ground connectors	<b>H</b>	Cable entry		

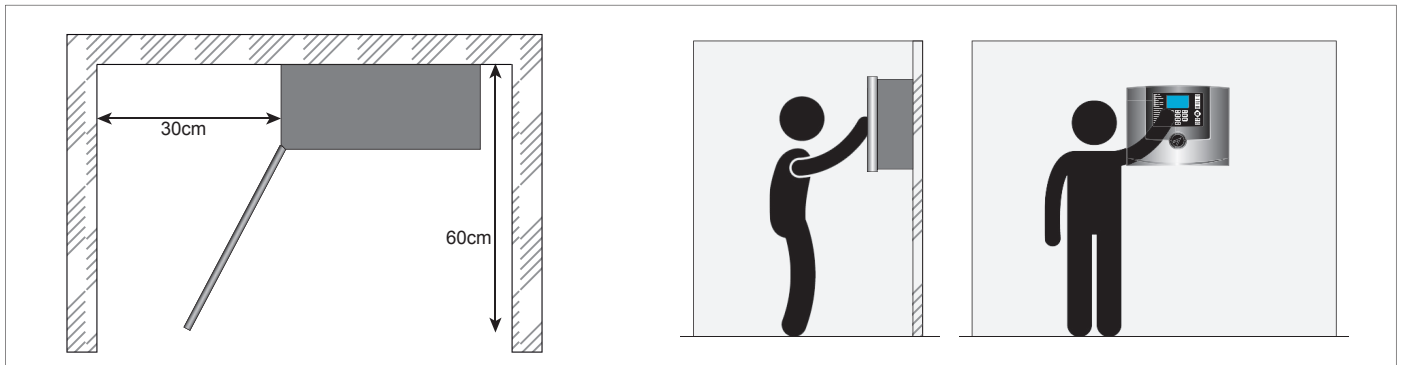
## 4-2 - Fixing of the casing

The casing of the control panel must be fixed in a position that guarantees adequate protection from accidental shocks and at a height that grants full access to the operator. Consider the space necessary for fully opening the casing door (approx. 60cm). Fix the casing horizontally on a solid surface using 4 dowels with 8mm diameter.

### General warnings

For the safety of the operators protect the control panel, as any electronic device, against splashes and avoid placing recipients containing liquids next to it. The control panel must be installed so as to ensure adequate ventilation. Do not cover the device with things that may hinder correct heat dissipation.

Install the control panel at an adequate distance from heat sources (e.g. radiators) and any device that may cause electromagnetic disturbances (e.g. radio antennas).



## 4-3 - Connection cables

The cables to be used for the connections are defined by standards and installation regulations. These are flame retardant, low smoke emission and halogen free cables.

The European standards specify the cables to be used for the construction of fire detection systems.

Among these standards we mention (non-exhaustive list):

EN 50200, EN 60228, EN 50363, EN 60332, EN 50267, IEC 60332, IEC 61034, IEC 6754.

The installer shall ascertain the current legislative requirements for his country.

For all the connections on the loop, it is recommended to use shielded multicore twisted-pair cables with flexible conductors.

For selecting the loop and 24V power supply cables to be used, refer to the below table that indicates, based on the extension of the loop, the minimum section that must be observed.

MINIMUM CABLE SECTION			
Loop extension	Minimum section required	Loop extension	Minimum section required
750 meters	0.75mm <sup>2</sup>	1500 meters	1.5mm <sup>2</sup>
1000 meters	1mm <sup>2</sup>	3000 meters	2.5mm <sup>2</sup>

For reasons of electrical safety, the shieldings of the cables must be connected in order not to stop their path and must be grounded inside the casing of the control panel.

The maximum length allowed for the laying of the detection loop is 3000 meters, as defined by the low voltage directive LVD 2006/95/EU.

The maximum length allowed for the RS485 bus (Master Bus) is 1000m. For greater distances use a fiber optic connection by connecting a TFSFC01 RS485-fiber optic converter.

The relays and the electrical outputs of the control panel and its expansion devices form a SELV voltages network (EN 60950-1). These outputs can only be connected to circuits that comply with SELV voltages.



## 4-4 - Compliance with EN 60950-1- Electrical Safety

### Ground connection

The ground connection must comply with the valid European standards.

**It is mandatory to connect the ground conductor between the casing and the door.**

### External circuit breaker

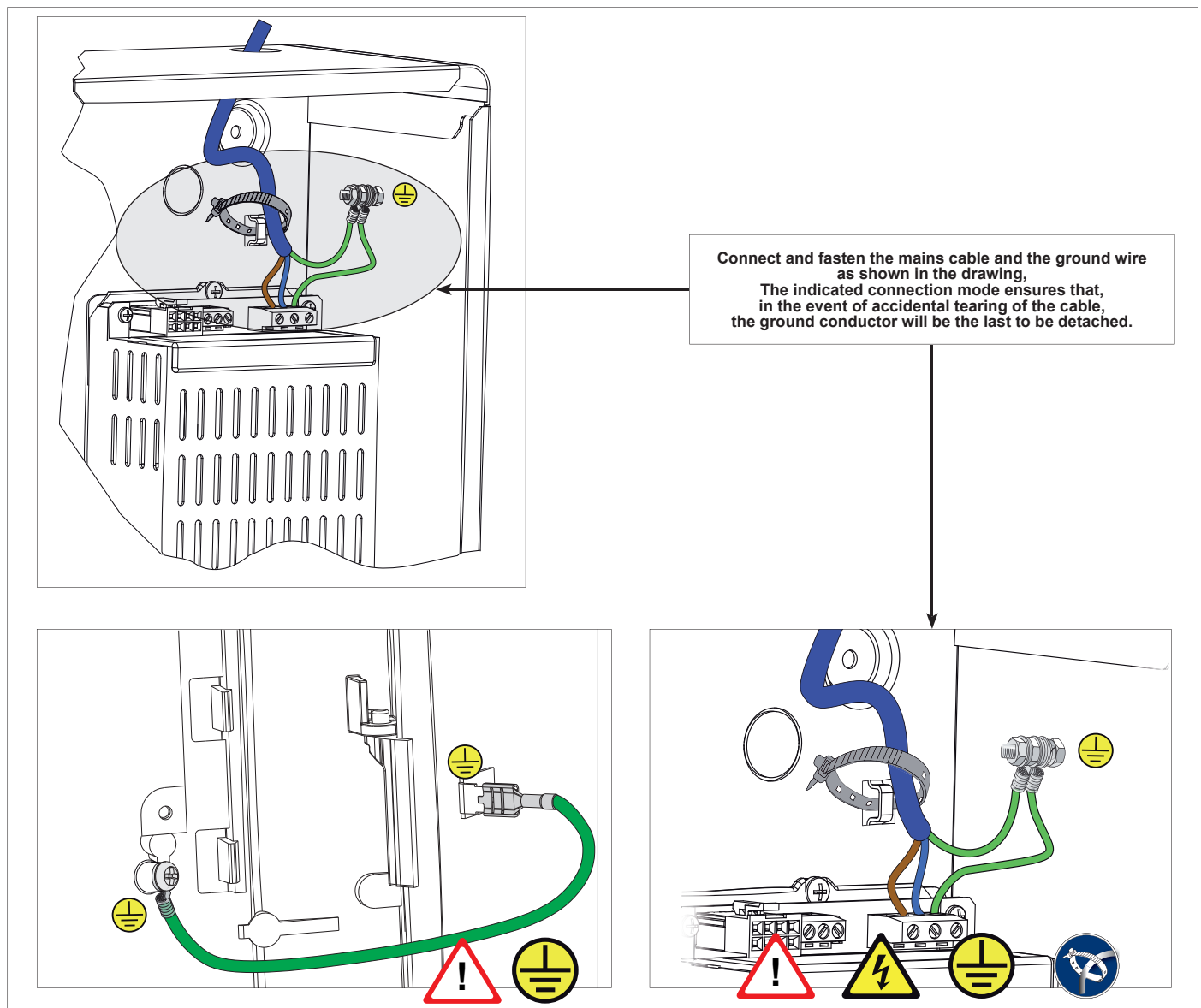
The power supply of the control panel is not equipped with a circuit breaker. To guarantee accordance of the installation with the valid European standards, it is necessary to connect an external circuit breaker or a bipolar mains switch (16A curve C, opening stroke min. 3mm) in an accessible part of the electric installation (230V AC).

The circuit breaker must be installed close to the control panel and must be clearly labeled.

### Mains connection (230V AC)

The mains cable is not included. To reduce the risk of electric shocks in normal operating conditions, observe the following precautions:

- Use a double insulated cable (with shielding) for the connection to mains power.
- The mains cable should have a diameter of minimum  $3 \times 1.5\text{mm}^2$  and, once it has been connected to the corresponding power input, it should be attached with a cable tie to the casing (see figure).
- To guarantee the electrical safety and correct functioning, always connect the ground conductor between the corresponding terminal and the threaded pin for ground connection and between the base and the door of the casing (see figure).



## 4-5 - Secondary power supply

### Battery information

The batteries must always be two. Never use batteries of different manufacturers and capacities. Capacities lower than 12Ah, besides reducing the autonomy, distort its resistance values causing possible improper failure signaling.

In accordance with the standards EN 54, it is mandatory to block the two batteries using the provided fixing bracket.

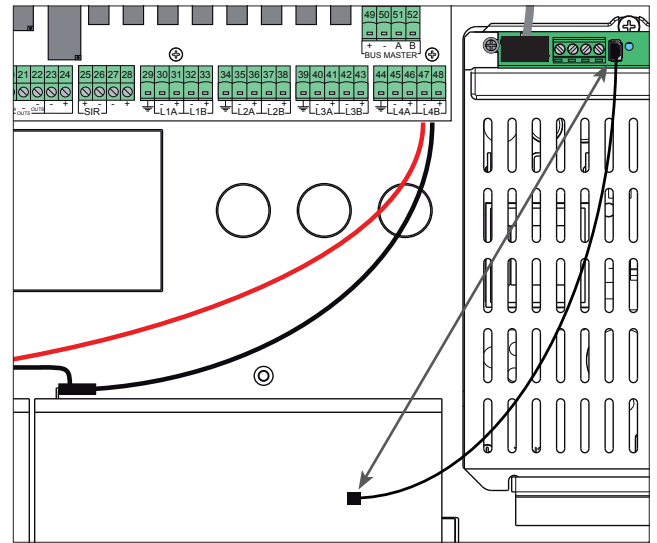
The bracket must be screwed on the casing.

### Self-regulation of the charging voltage

The power supply reads the temperature of the battery via the NTC (Negative Temperature Coefficient) probe and adjusts the charging voltage of the batteries according to the temperature measured. The NTC probe must be connected to the dedicated polarized connector, the sensing end of the probe should be attached to the battery casing using an electrical tape.

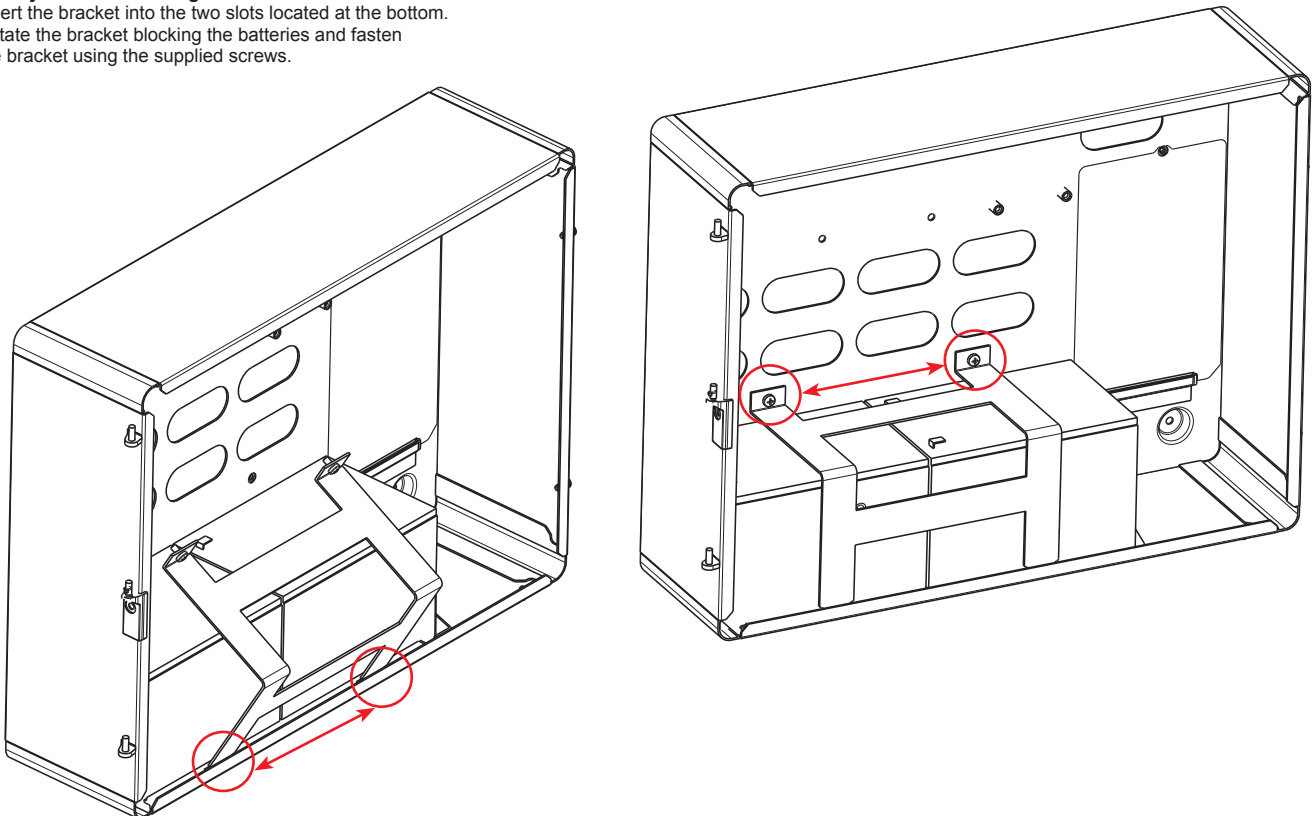
### Automatic disconnection

In the absence of the primary power supply voltage (230V AC mains), the batteries automatically assume the power supply of the system. When the battery voltage drops to a value <math><18V</math> for a duration of 15 minutes, the batteries automatically disconnect, to prevent their deep discharge and consequent functional degradation.



### Battery bracket fastening

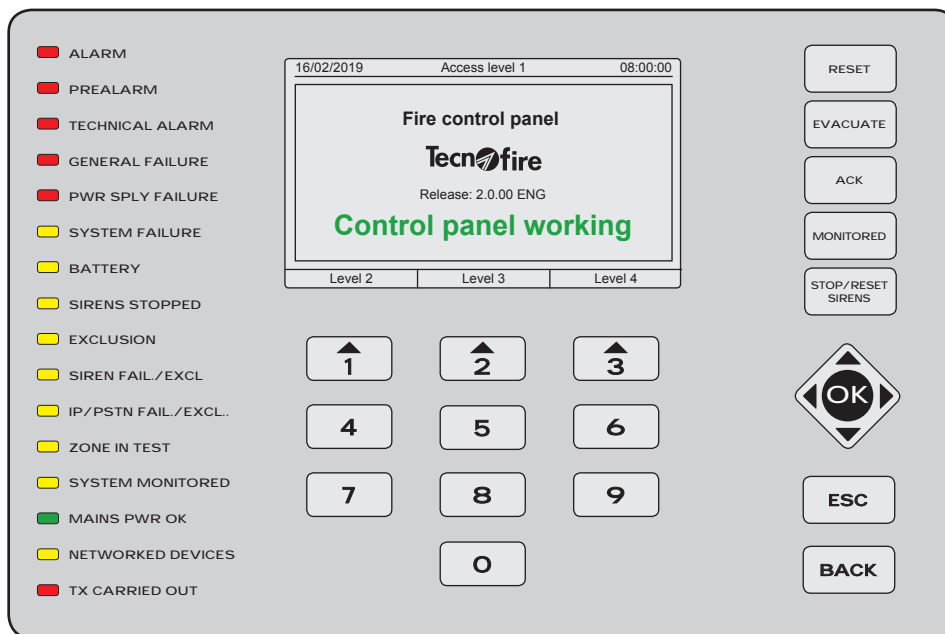
Insert the bracket into the two slots located at the bottom. Rotate the bracket blocking the batteries and fasten the bracket using the supplied screws.



# 5 - USER INTERFACE

## 5-1 - Control panel

The user interface of the control panel consists of a 480 x 272 pixels TFT color graphic display, 16 notification LED, 5 function keys, 7 navigation keys and 10 number keys, with which the user can manage the system. The user interface is completed by the speaker that, according to the functional states of the control panel, provides audible alarms or notifications by using the voice synthesis function.



## 5-2 - Access levels and codes

The control panel manages 10 access codes associated to 4 levels of access: level 1 (not protected by code), level 2 (user), level 3 (installation and maintenance personnel) and level 4 (manufacturer).

**Level 1**

In stand-by, the control panel provides access to the functions reserved to the level 1, without having to enter a code.

The access level 1 allows to perform the following operations:

- A** - Access the upper levels with the keys 1 or 2 or 3 and the relevant code (password)
- B** - Acknowledge the alarm pressing the **ACK** key
- C** - Display the acknowledged, the ongoing alarms and those stored in the event categories folders.

**Level 2**

To access level 2 press the key 1 and enter the relevant user code, then press the confirmation key.

At level 2, it is possible to perform all the operations of the level 1, plus the followings:

- A** - Reset the control panel pressing the **RESET** key.
- B** - Switch the operating state of the control panel (monitored/not monitored).
- C** - Manually activate an evacuation alarm.
- D** - Access the list of menus reserved to level 2.
- E** - Stop and reset the sirens.

**Level 3**

To access level 3 press the key 2 and enter the relevant installer code, then press the confirmation key.

Access to level 3 is reserved to staff authorized to edit important operating parameters.

At level 3 it is possible to perform all the operations of the levels 1 and 2 and to access the menus reserved to level 3 (system configuration menu)

**Level 4**

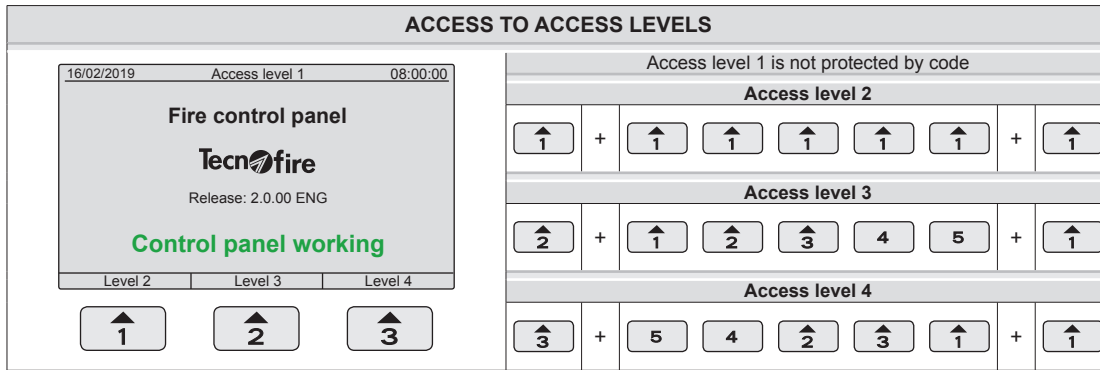
To access level 4 close the **JP6 KEY** jumper, press the key 3 and enter the manufacturer code, then press the confirmation key.

Access to level 4 is reserved to highly qualified personnel authorised by the manufacturer to carry out technical services of special importance.

At level 4 it is possible to perform all the operations of the previous levels and to access the menus reserved to level 4.

The following table shows how to enter the codes and access the different access levels:

Access level key + Code + Confirmation key.



### 5-3 - Function keys

The table describes the keys on the front panel of the control panel.

Key	Description	Operational sequence
	Reset (deletion) of all prealarm, fire alarm, technical prealarm, technical alarm and failure notifications and reset of the control panel to normal operating condition.	1 - Press <b>RESET</b> 2 - Enter level 2 code The LED and display notifications are cleared.
	Activation of the programmed procedure for the evacuation alarm, activation of the sirens and output modules programmed to be activated by the evacuation alarm procedure.	1 - Press <b>EVACUATE</b> 2 - Enter level 2 code 3 - Confirm the operation The ALARM LED turns on. The display shows <b>Evacuation</b> .
	Acknowledges the alarms issued for prealarm, fire alarm, technical prealarm, technical alarm and failure. Moreover, the local speakers of all the control panels and repeaters are muted. <b>N.B.</b> The button does not mute the sirens and does not stop the external activation devices (output modules, sirens etc.).	1 - Press <b>ACK</b> The code is not required. The ALARM LED remains lit. The display alarm notifications remain visible.
	Toggle of the <b>Monitored system mode</b> . <b>N.B.</b> This function only works if the option has been programmed.	1 - Press <b>MONITORED</b> 2 - Enter level 2 code The MONITORED SYSTEM LED turns on or off: LED on = monitored, LED off = not monitored
	Stop and reset of all sirens programmed for prealarm, fire alarm, technical prealarm, technical alarm and failure as well as all external actuating devices (output modules, sirens etc.) if the acknowledgment function has been programmed for each of them.	1 - Press <b>STOP/RESET SIRENS</b> 2 - Enter level 2 code The SIRENS STOPPED LED turns on.
	Navigation and confirmation keys. The arrow keys allow navigation of the menus. Depending on the context, you can change the displayed page and/or increase and decrease programming parameters. The <b>OK</b> key is to confirm the selection.	
		Move the cursor up - Increase the value
		Move the cursor down - Decrease the value
		Move the cursor left - Decrease the value
		Move the cursor right - Increase the value
	Confirm the selection	
	The <b>ESC</b> key allows to exit from the menu or displayed function.	
	The <b>BACK</b> key allows to move the cursor to the previous position and erase its contents	
	The number keys allow to enter the code and select the menus and devices in a direct way.	
	Number keys 1, 2 and 3 are accompanied by an arrows up symbol. Depending on the context, they are numeric keys or pointing keys. The arrows indicate the pointing boxes displayed directly above them: access to level 2, 3 and 4.	

### 5-4 - Signaling LED

The table describes the functions and procedures for reporting of the LED on the front panel of the control panel. As required by EN 54-2 provisions concerning light signals, the ON/OFF flashing frequency of the LED is:

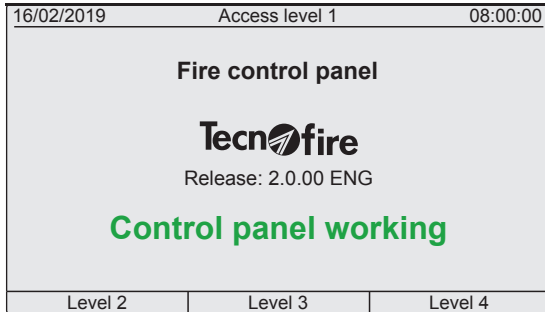
- 2.5s. ON / 2.5s OFF (slow flashing) for failure
- 0.5s ON / 0.5s OFF (fast flashing) for alarm

LED	Color	Description	Signaling	
ALARM	Red	Fire alarm	Off	No alarm
			Flashing	Fire alarm active (not acknowledged)
			On	Fire alarm active (acknowledged)
PREALARM	Red	Fire prealarm	Off	No prealarm
			Flashing	Fire prealarm active (not acknowledged)
			On	Fire prealarm active (acknowledged)
TECHNICAL ALARM	Red	Technical prealarm and alarm	Off	No alarm
			Flashing	Technical alarm active (not acknowledged)
			On	Technical alarm active (acknowledged)
GENERAL FAILURE	Yellow	Failure	Off	No failure
			Flashing	Failure active (not acknowledged)
			On	Failure active (acknowledged)
PWR SPLY FAILURE	Yellow	Failure of the power supply of the control panel (insufficient current to power the control panel and/or to charge the batteries)	Off	No failure
			Flashing	Power supply check active
			On	Power supply failure active
SYSTEM FAILURE	Yellow	System failure	Off	No failure
			Flashing	System failure active (not acknowledged)
			On	System failure active (acknowledged)
Battery	Yellow	Low battery	Off	Battery OK
			Flashing	Low battery
			On	Battery failure or missing battery
SIRENS STOPPED	Yellow	General siren stop	Off	Sirens not stopped
			On	Sirens stopped
exclusion	Yellow	Exclusion of system devices	Off	No device excluded
			On	At least one device excluded
Siren fail./EXCL.	Yellow	Failure or exclusion of the sirens	Off	No siren excluded
			Flashing	Siren failure active (not acknowledged)
			On	Siren failure acknowledged or siren excluded
IP/PSTN fail./EXCL.	Yellow	Failure or exclusion of the alarm transmission equipment	Off	No ATE excluded
			Flashing	ATE failure active (not acknowledged)
			On	ATE failure acknowledged or ATE excluded
zone in test	Yellow	Presence of zones under test	Off	No zone under test
			On	At least one zone under test
SYSTEM MONITORED	Yellow	Monitored system mode	Off	System not monitored
			On	System monitored
mains PWR OK	Green	Presence of mains power	Off	No mains power
			On	Mains power OK
NETWORKED DEVICES	Yellow	State of the connections between the devices connected on the RS485 bus	Off	RS485 communication OK
			Flashing	Communication error active (not acknowledged)
			On	Communication error active (acknowledged)
TX CARRIED OUT	Red	State of telephone notifications	Off	No telephone notification transmitted
			Flashing	Telephone notification transmission active
			On	Telephone notification transmitted successfully

**N.B.** The lighting of each specific failure LED is always accompanied by the lighting of the general failure LED. If the automatic acknowledgment of failures is disabled, the power supply failure and battery LED remains visible until the alarms are acknowledged. In cases where the control panel is reset or not working, lighting of the two general failure and system failure LED is accompanied by a beep.

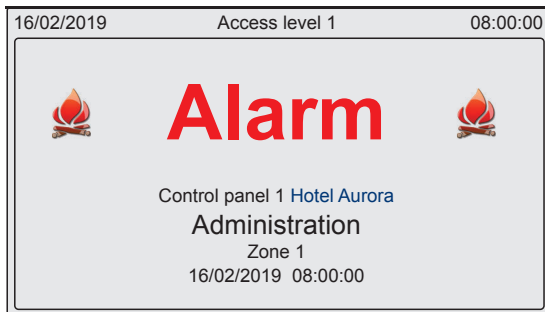
## 5-5 - Viewing of operating states

The display changes the display mode according to the operating state of the control panel, stand-by, active event and active acknowledged event.



### Stand-by state

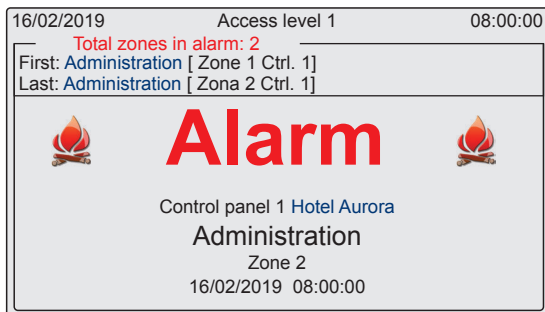
The display shows the date and time, the access level, the description given to the control panel, the firmware release, the operating mode and the pointing boxes of the access levels.



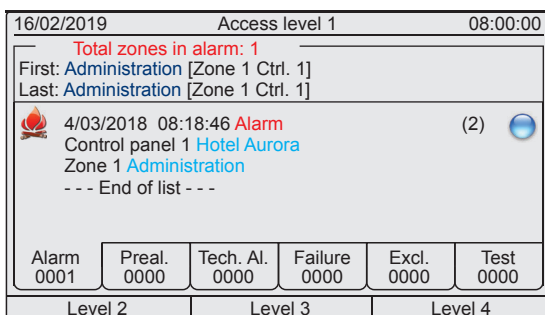
### Active event

When the control panel collects an alarm notification, it enables the speaker and displays the category of the alarm: fire alarm, fire prealarm, technical prealarm, technical alarm or failure.

In addition to the blinking icons and the writing indicating the event, the display provides all necessary information to identify the source of the alarm: control panel name and number, name and number of the affected zone/device, description of the possible cause and date and time of the event.



If the control panel collects other alarm events before acknowledgment, the display automatically changes the view, highlighting the category and the source of the last alarm and listing the previous alarms at the top.



### Active acknowledged event

The acknowledgment of an event causes the muting of the speaker and the automatic display of the contents of the storage folder of the acknowledged event.

At the bottom, the display shows 6 folders in which the events are stored according to their category. Each folder provides a counter that displays the total number of events stored in it.

The folders are automatically displayed when at least one event is stored in them and they remain visible until the next reset of the control panel. The reset clears the folders and resets the counters.

EVENT STORAGE FOLDERS					
Name	Icon	Description	Name	Icon	Description
Alarm 0000		The folder logs and counts all fire alarms divided by zone	Failure 0000		The folder logs and counts all zone and system failures
Preal. 0000		The folder logs and counts all fire prealarms divided by zone	Excl. 0000		The folder logs all excluded items (i.e. put out of service)
Tech.Al. 0000		The folder logs and counts all technical alarms and prealarms divided by zone	Test 0000		The folder logs all alarms recorded by the devices under test

**N.B.** The folders can contain up to a maximum of 4096 events. The folders are cleared and the counters are reset each time the control panel is reset. The events remain stored in the event buffer of the control panel.

16/02/2019 Access level 1 08:00:00

Total zones in alarm: 1

First: Administration [Zone 1 Ctrl. 1]  
Last: Administration [Zone 1 Ctrl. 1]

08/03/2018 08:00:00 Alarm (2)

Control panel 1 Hotel Aurora  
Zone 1 Administration  
--- End of list ---

Alarm 0001	Preal. 0000	Tech. Al. 0000	Failure 0000	Excl. 0000	Test 0000
------------	-------------	----------------	--------------	------------	-----------

Level 2      Level 3      Level 4

### Consultation of the event storage folders

To view and browse the contents of the folders, use the navigation keys.

		Select the next folder
		Select the previous folder
		Scroll the event list down
		Scroll the event list up
		Expand the display of the event pointed by the cursor
		Exit the expanded view

16/02/2019 Access level 1 08:00:00

Total zones in alarm: 1

First: Administration [Zone 1 Ctrl. 1]  
Last: Administration [Zone 1 Ctrl. 1]

08/03/2018 08:00:00 Allarme (2 di 2)

Control panel 1 Hotel Aurora  
Zone 1 Administration

08/03/2018 08:00:00 Detector alarm  
Detector 10 Line 1 Marco's office  
optical alarm

Alarm 0001	Preal. 0000	Tech. Al. 0000	Failure 0000	Excl. 0000	Test 0000
------------	-------------	----------------	--------------	------------	-----------

Level 2      Level 3      Level 4

Each event in the list is identified by the event type icon, date, time, alarm type and source.

The last event of the list is indicated by the words **End of list**.

**N.B.** Since the control panel controls the zones, the failures and the alarms of the individual detectors and modules are not added up in the count, but they are considered integral to the individual zones. Accordingly, for the events related to a zone, to the left of the cursor a number is displayed, indicating how many detectors and/or modules of the zone are affected by the event.

Selecting the event with the cursor and pressing the **OK** key the view of the zone is expanded showing the detail of the devices.

16/02/2019 Access level 1 08:00:00

Total zones in alarm: 1

**Fire alarm plan**

Evacuate the marketing dept., 1st floor, following the escape route, south side.  
Reach assembly point 2.

Alarm 0001	Preal. 0000	Tech. Al. 0000	Failure 0000	Excl. 0000	Test 0000
------------	-------------	----------------	--------------	------------	-----------

Level 2      Level 3      Level 4

With the pointer over an event, pressing the acknowledgment key, the speaker issues the description of the event.

In the case of an alarm and if the zone has an associated alarm plan, by pressing again the acknowledgment key, a pop-up window appears that displays the text of the alarm plan. The alarm plan remains visible for 10 seconds. To exit the alarm plan display, press the **ESC** key.

16/02/2019 Access level 1 08:00:00

**Fire control panel**

**Tecnofire**

Release: 2.0.00 ENG

**No alarm active**

Alarm 0000	Preal. 0001	Tech. Al. 0000	Failure 0000	Excl. 0000	Test 0000
------------	-------------	----------------	--------------	------------	-----------

Level 2      Level 3      Level 4

If you select a folder whose counter shows a number other than 0000, as in the example the folder **Preal.**, the relative events are displayed.



## 5-6 - Notification of operating states

The operating states of the control panel are notified optically and acoustically and according to the level of priority (see below table).

Priority level	Operating state	Priority level	Operating state
1	Fire alarm	4	Technical prealarm
2	Fire prealarm	5	Failure
3	Technical alarm	6	Stand-by

### STAND-BY STATE - NO ALARM ACTIVE

Normal operating state, no failure active, all detectors in stand-by.

<div style="border: 1px solid black; padding: 5px;"> <p>16/02/2019      Access level 1      08:00:00</p> <p style="text-align: center;"><b>Fire control panel</b></p> <p style="text-align: center;"><b>Tecnofire</b></p> <p style="text-align: center;">Release: 2.0.00 ENG</p> <p style="text-align: center; color: green; font-weight: bold; font-size: 1.2em;">Control panel working</p> <p style="text-align: center;">Level 2      Level 3      Level 4</p> </div>	<b>Signaling</b>	<p>The display shows the normal operating state</p> <p><b>MAINS PWR OK</b> LED on</p> <p><b>MONITORED</b> LED on or off depending on the selected state</p> <p><b>TX CARRIED OUT</b> LED off</p> <p>All the other LED are off</p> <p>No siren is active</p> <p>No output is active</p>
--	------------------	--

### FIRE PREALARM STATE

A double-knock zone in alarm or, with active monitored system mode, a single-knock zone in alarm, or a detector in prealarm state.

<div style="border: 1px solid black; padding: 5px;"> <p>16/02/2019      Access level 1      08:00:00</p> <div style="display: flex; justify-content: space-between; align-items: center;"> <span style="font-size: 2em; color: red; font-weight: bold; text-align: center;">Prealarm</span> </div> <p style="text-align: center;">Control panel 1 Zone 1 16/02/2019 08:20:20</p> </div>	<b>Signaling before acknowledgment</b>	<p>The speaker issues the audible prealarm signal</p> <p>The <b>PREALARM</b> LED flashes</p> <p>The output programmed for prealarm is triggered</p> <p>The display shows the prealarm state</p>
	<b>Signaling after the first acknowledgment</b>	<p>The speaker is muted</p> <p>The <b>PREALARM</b> LED turns on steadily</p> <p>The display shows the list of active prealarms</p>
	<b>Signaling after the second acknowledgment</b>	<p>The speaker issues the list of zones in prealarm state</p>

### FIRE ALARM STATE

A single-knock zone in alarm, or multiple detectors of a double-knock zone in alarm or, with active monitored system mode, end of double-knock zone prealarm timeout.

<div style="border: 1px solid black; padding: 5px;"> <p>16/02/2019      Access level 1      08:00:00</p> <div style="display: flex; justify-content: space-between; align-items: center;"> <span style="font-size: 2em; color: red; font-weight: bold; text-align: center;">Alarm</span> </div> <p style="text-align: center;">Control panel 1 Hotel Aurora Administration Zone 1 16/02/2019 08:00:00</p> </div>	<b>Signaling before acknowledgment</b>	<p>The speaker issues the audible alarm signal</p> <p>The <b>ALARM</b> LED flashes</p> <p>The alarm relay is activated</p> <p>The display shows the alarm state</p>
	<b>Signaling after the first acknowledgment</b>	<p>The speaker is muted</p> <p>The <b>ALARM</b> LED turns on steadily</p> <p>The display shows the list of active alarms</p>
	<b>Signaling after the second acknowledgment</b>	<p>The speaker issues the list of zones in alarm state</p> <p>In case of a zone alarm, the display shows the associated alarm plan</p>



TECHNICAL PREALARM STATE		
A technical double-knock zone in alarm or a detector in prealarm state.		
<div style="border: 1px solid black; padding: 5px;"> <div style="display: flex; justify-content: space-between; font-size: small;"> <span>16/02/2019</span> <span>Access level 1</span> <span>08:00:00</span> </div> <div style="text-align: center; margin: 10px 0;"> <h2 style="margin: 0;">Technical prealarm</h2> <p style="margin: 5px 0;">Control panel 1 Hotel Aurora Administration Zone 1 16/02/2019 08:00:00</p> </div> </div>	Signaling before acknowledgment	The speaker issues the audible prealarm signal
		The <b>TECHNICAL ALARM</b> LED flashes
		The output programmed for technical prealarm is triggered
	Signaling after the first acknowledgment	The display shows the technical prealarm state
		The speaker is muted
		The <b>TECHNICAL ALARM</b> LED turns on steadily
	Signaling after the second acknowledgment	The display shows the list of active technical alarms
		The speaker issues the list of technical zones in prealarm state

TECHNICAL ALARM STATE		
A technical single-knock zone in alarm, or multiple detectors of a technical double-knock zone in alarm.		
<div style="border: 1px solid black; padding: 5px;"> <div style="display: flex; justify-content: space-between; font-size: small;"> <span>16/02/2019</span> <span>Access level 1</span> <span>08:00:00</span> </div> <div style="text-align: center; margin: 10px 0;"> <h2 style="margin: 0;">Technical alarm</h2> <p style="margin: 5px 0;">Control panel 1 Hotel Aurora Administration Zone 1 16/02/2019 08:00:00</p> </div> </div>	Signaling before acknowledgment	The speaker issues the audible alarm signal
		The <b>TECHNICAL ALARM</b> LED flashes
		The output programmed for technical alarm is triggered
	Signaling after the first acknowledgment	The display shows the technical alarm state
		The speaker is muted
		The <b>TECHNICAL ALARM</b> LED turns on steadily
	Signaling after the second acknowledgment	The display shows the list of active technical alarms
		In case of a zone alarm, the display shows the associated alarm plan.

FAILURE STATE		
Zone failure or system failure.		
<div style="border: 1px solid black; padding: 5px;"> <div style="display: flex; justify-content: space-between; font-size: small;"> <span>16/02/2019</span> <span>Access level 1</span> <span>08:00:00</span> </div> <div style="text-align: center; margin: 10px 0;"> <h2 style="margin: 0; color: yellow;">Failure</h2> <p style="margin: 5px 0;">Control panel 1 Hotel Aurora Console 1 Communication missing 16/02/2019 08:00:00</p> </div> </div>	Signaling before acknowledgment	The speaker issues the audible failure signal
		The <b>GENERAL FAILURE</b> LED flashes
		The failure relay is activated
	Signaling after the first acknowledgment	The display shows the failure state
		The speaker is muted
		The <b>GENERAL FAILURE</b> LED turns on steadily
	Signaling after the second acknowledgment	The display shows the list of active failures
		The speaker issues the list of failures

**N.B.** Since the control panel controls the zones, the failures and the alarms of the individual detectors and modules are not added up in the count, but they are considered integral to the individual zones. Accordingly, for the events related to a zone, to the left of the cursor a number is displayed, indicating how many detectors and/or modules of the zone are affected by the event. Selecting the event with the cursor and pressing the **OK** key the view of the zone is expanded showing the detail of the devices.

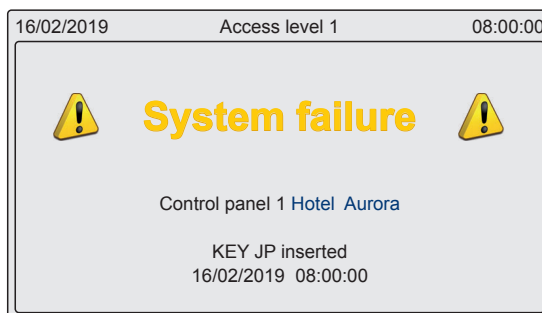
5-7 - Icons

The below table illustrates the icons that the control panel uses to optically support the notification of its operating states, alarms, failures etc.

ICONS			
	<b>No mains power</b> This icon signals power failure.		<b>Battery charger failure</b> This icon signals that the power supply is not able to charge the battery.
	<b>General failure</b> This icon signals that the indicated device is in failure state.		<b>Low battery</b> This icon signals that battery voltage is low.
	<b>Active technical prealarm</b> This icon signals that the indicated device is in technical prealarm state.		<b>Battery failure</b> This icon signals that the battery is damaged and cannot be recharged.
	<b>Active technical alarm</b> This icon signals that the indicated device is in technical alarm state.		<b>Zone under test</b> This icon signals that the indicated device is under test.
	<b>Active fire prealarm</b> This icon signals that the indicated device is in prealarm state.		<b>Loop communication failure</b> This icon signals that the communication between the control panel and the devices connected on the loop has broken down.
	<b>Active fire alarm</b> This icon signals that the indicated device is in alarm state.		<b>Detectors maintenance request</b> This icon signals that the indicated optical detector needs maintenance (smoke chamber cleaning).
	<b>Alarm by tested device</b> This icon signals that the tested device is in alarm state.		<b>Reset delays</b> This icon signals that the delays have been reset.
	<b>Control panel repeater exclusion</b> The icon signals that the signaling outputs of the control panel are excluded.		<b>Notification carried out</b> This icon signals that the indicated notification has been transmitted.
	<b>Device exclusion</b> This icon signals that the indicated device is excluded.		<b>Monitored system mode</b> This icon signals that the monitored system mode has been activated.
	<b>System failure</b> This icon signals the presence of a system failure.		<b>Network communication failure</b> The icon signals that the network connection between the system devices connected on the serial bus has been broken down.
	<b>System event</b> This icon signals the presence of an event related to the system.		<b>Earth leakage</b> This icon signals that a cable or device of the system has recorded earth leakage current.

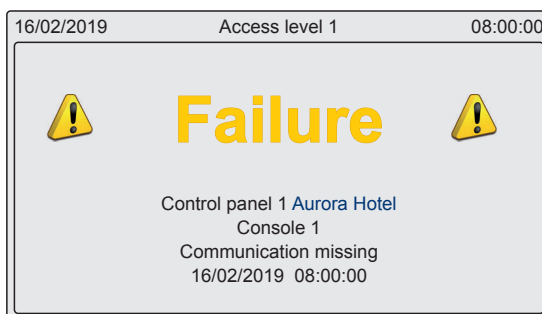
# 6 - FAILURE NOTIFICATIONS

The control panel manages two types of failures: system failures and general failures. System failures are a special category of failures that refer to the standard EN 54-2. General failures group all the other types of failures.



SYSTEM FAILURES		
Failure event	Description	Automatic acknowledgment
Reset by watchdog	The control panel has detected a reset signal that has been generated by the watchdog circuit.	No
KEY jumper inserted with an access level lower than level 4	The KEY jumper has been inserted while the control panel was not at access level 4.	Yes
Failure of control panel buffer	The RAM and FLASH memories of the control panel are automatically checked every 30 minutes. The detection of any malfunction during the test triggers the failure notification.	No

**N.B.** With the **Automatic system failure acknowledgment** option enabled, the notification is stopped when the failure state ends. With the **Automatic system failure acknowledgment** option disabled, the notification cannot be automatically stopped but continues even when the failure state is over. In this case, to stop the notification, it is necessary to reset the control panel.



GENERAL FAILURES			
Failure event	Automatic acknowledgment	Failure event	Automatic acknowledgment
Communication missing among control panels or repeaters	Yes	Open loop	No
Low battery	Yes	Short-circuited loop	No
Battery failure	Yes	Overvoltage	Yes
Power failure	Yes	Siren termination resistor missing	Yes
Inconsistent programming	No	Ethernet interface failure	No
Earth leakage	Yes	Ethernet connection missing	Yes
Power supply failure	Yes	Communication missing (channel)	Yes
Open RS485 loop	Yes	No answer (channel)	Yes

**N.B.** With the **Automatic system failure acknowledgment** option enabled, the notification is stopped when the failure state ends. With the **Automatic system failure acknowledgment** option disabled, the notification cannot be automatically stopped but continues even when the failure state is over. In this case, to stop the notification, it is necessary to reset the control panel.



# 7 - POWER SUPPLY

## 1 - Composition

The power supply section of the control panel complies with the requirements of the standard EN 54-4. It consists of a primary power supply (PS - power supply) and a secondary power supply (SD - storage device).

The primary power supply consists of a modular switching power supply, capable of providing 5A/28V direct current.

The secondary power supply consists of two 12V/12Ah batteries connected in series with each other. It is imperative that the batteries are always two. Never use batteries of different manufacturers, capacities and/or production lots.

Capacity lower than 12Ah, besides reducing the autonomy, distort the resistance values causing possible improper failure signaling.

## 2 - Mains power LED

In the normal operating state (no active failure), only the green **MAINS POWER** LED is on.

## 3 - Protection against battery reverse polarity

The power supply section is protected against reverse battery polarity by fuse (F 5A, 250V 5x20mm).

## 4 - Automatic system failure acknowledgment

With the option enabled, the return to normal operating conditions automatically acknowledges all the notifications and removes the failure notification from the event queue.

With the option disabled, the return to normal operating conditions does not automatically acknowledge all notifications.

It is necessary to reset the control panel.

## 5 - Switch on with battery power only

Control panel switch on with battery power only is normally inhibited. To enable it, insert the JP1 jumper on the CPU board.

**Warning:** when mains power is available, it is mandatory to remove the JP1 jumper. If the jumper remains inserted, there is a risk that:

- The automatic battery test provides incorrect results
- The automatic disconnection of the battery in case of deep discharge no longer works
- Power supply is overloaded

TECHNICAL AND FUNCTIONAL SPECIFICATIONS		
Power supply (PS)	Type	5A/28.8V DC switching
	Operating voltage	230V AC +10% -15% 50Hz
	Maximum consumption	700mA
	Maximum current available	I max. (a) 4A
	Maximum current available without battery charger	I max. (b) 4A
Batteries (SD)	Capacity	2x 12V/12Ah
	Battery test	Automatic (every 30 minutes)
	Charging time	80% 24h - 100% 48h (2x 12Ah batteries)
	Cut-off voltage	<18V
Available current for loads	Battery charger	Max. 1A
	Self-consumption	200mA
	Loops	Max. 500mA (each)
	Master Bus	Max. 500mA
	Slave Bus	Max. 500mA
	Wired outputs	Max. 800mA
Failure notifications	Primary power supply failure	See table 1
	Secondary power supply failure	See table 2
	Battery high impedance	See table 3
	Battery charger failure	See table 4
	Overvoltage	See table 5
	Low battery	See table 6
	Discharged battery	See table 7

## 7-1 - Failure notifications of the power supply section

**TABLE 1 - PRIMARY POWER SUPPLY FAILURE**

The test is performed every second. The failure is notified when for the preset time the mains power is missing.

<b>Test frequency</b>	1 second
<b>Delay of failure notification</b>	Programmable from 0 to 30 minutes
<b>Signaling on occurrence of failure</b>	The <b>MAINS PWR OK</b> LED turns off
	The <b>PWR SPLY FAILURE</b> LED flashes
<b>Signaling on notification of failure</b>	The control panel display shows <b>MAINS FAILURE</b>
	The failure notification is stored in the failure folder and the relative counter is incremented
	The <b>PWR SPLY FAILURE</b> LED turns on steadily
	The <b>GENERAL FAILURE</b> LED starts flashing
	The failure relay is activated
<b>Reset of failure notifications</b>	The failure notifications are reset after detecting for the preset time, that the mains power voltage has been restored.
<b>N.B.</b> The MAINS PWR OK LED follows the state of mains power immediately without any delay.	

**TABLE 2 - SECONDARY POWER SUPPLY FAILURE**

The test is performed only in the presence of mains power, with an interval of 10 seconds, on each battery. The failure is notified if the test detects for 5 minutes a battery voltage without load below 10V.

<b>Test frequency</b>	10 seconds
<b>Delay of failure notification</b>	5 minutes
<b>Signaling on occurrence of failure</b>	The <b>BATTERY</b> LED flashes
<b>Signaling on notification of failure</b>	The control panel display shows <b>BATTERY FAILURE</b>
	The failure notification is stored in the failure folder and the relative counter is incremented
	The <b>BATTERY</b> LED turns on steadily
	The <b>GENERAL FAILURE</b> LED starts flashing
	The failure relay is activated
<b>Reset of failure notifications</b>	The failure notifications are reset after detecting, for 30 seconds, a battery voltage without load above 10V

**TABLE 3 - BATTERY HIGH IMPEDANCE**

The test is performed only in the presence of mains power, with an interval of 30 minutes, on each battery. The failure is notified if the test detects an impedance above the failure threshold (1,5Ω which cannot be changed).

<b>Test frequency</b>	30 minutes
<b>Delay of failure notification</b>	2 hours
<b>Signaling on occurrence of failure</b>	The <b>BATTERY</b> LED starts flashing
<b>Signaling on notification of failure</b>	The control panel display shows <b>BATTERY FAILURE</b>
	The failure notification is stored in the failure folder and the relative counter is incremented
	The <b>BATTERY</b> LED turns on steadily
	The <b>GENERAL FAILURE</b> LED starts flashing
	The failure relay is activated
<b>Reset of failure notifications</b>	The failure notifications are reset after detecting, for 30 seconds, that the impedance of the battery has returned to a value below the failure threshold.

TABLE 4 - BATTERY CHARGER FAILURE	
The test is performed every second. The failure is notified when the test detects for more than 5 minutes the presence of mains power, but not the battery charging current.	
<b>Test frequency</b>	1 second
<b>Delay of failure notification</b>	5 minutes
<b>Signaling on occurrence of failure</b>	The <b>PWR SPLY FAILURE</b> LED starts flashing
<b>Signaling on notification of failure</b>	The control panel display shows <b>POWER SUPPLY FAILURE</b>
	The failure notification is stored in the failure folder and the relative counter is incremented
	The <b>PWR SPLY FAILURE</b> LED turns on steadily
	The <b>GENERAL FAILURE</b> LED starts flashing
	The failure relay is activated
<b>Reset of failure notifications</b>	The failure notifications are reset after detecting the battery charging current for 5 minutes.

TABLE 5 - OVERVOLTAGE	
The test is performed every second, the failure is notified when the test detects, for more than 60 seconds, that the power supply voltage required by the external devices exceeds 30V.	
<b>Test frequency</b>	1 second
<b>Delay of failure notification</b>	60 seconds
<b>Signaling on occurrence of failure</b>	The <b>PWR SPLY FAILURE</b> LED starts flashing
<b>Signaling on notification of failure</b>	The control panel display shows <b>OVERVOLTAGE FAILURE</b>
	The failure notification is stored in the failure folder and the relative counter is incremented
	The <b>PWR SPLY FAILURE</b> LED turns on steadily
	The <b>GENERAL FAILURE</b> LED starts flashing
	The failure relay is activated
<b>Reset of failure notifications</b>	The failure notifications are reset after detecting, for 60 seconds, that the power supply voltage required by the external devices has returned to the rated value of 30V.

TABLE 6 - LOW BATTERY	
The test is performed only in case of power failure, with an interval of 1 second. The failure is notified when the test detects for more than 15 minutes a battery voltage below 21.6V.	
<b>Test frequency</b>	1 second
<b>Delay of failure notification</b>	15 minutes
<b>Signaling on occurrence of failure</b>	The <b>BATTERY</b> LED starts flashing
<b>Signaling on notification of failure</b>	The control panel display shows <b>LOW BATTERY</b>
	The failure notification is stored in the failure folder and the relative counter is incremented
	The <b>BATTERY</b> LED turns on steadily
	The <b>GENERAL FAILURE</b> LED starts flashing
	The failure relay is activated
<b>Reset of failure notifications</b>	Failure notifications are reset after detecting, for at least 30 seconds, a battery voltage above 22.8V.

TABLE 7 - DISCHARGED BATTERY	
The test is performed only in case of power failure. If the test detects for 15 minutes a battery voltage below 18V, the power supply section disconnects the batteries and shuts down.	
<b>Signaling 10 seconds before power supply shut down</b>	The control panel display shows <b>BATTERY FAILURE</b>
	The failure notification is stored in the failure folder and the relative counter is incremented
	The <b>BATTERY</b> LED turns on steadily
	The <b>GENERAL FAILURE</b> LED starts flashing
	The failure relay is activated





# 8 - DETECTION ZONES

## 8-1 - Zones

The 199 detectors and 99 modules that can be connected to the control panel's detection loop must be assigned to the zones of the control panel. The devices not assigned to any zone, will be automatically assigned to the default zone.

ZONE CONFIGURATION RULES	
1	It can include only detectors
2	It can include only modules
3	It can include both detectors and modules
4	It cannot share its devices with other zones
5	It must include minimum 1 device
6	It can include a total of 32 devices (limitation valid only for fire zones)

**Zone types**

The zones of the control panel can be either fire or technical zones. Both zones type can be set as double-knock or single-knock zone.

**Default zone**

All devices, detectors and modules of the control panel, that have not been assigned to any fire or technical zone, are automatically assigned to the default zone. The default zone allows these devices to perform their function anyway.

**N.B.** The default zone can be bypassed.

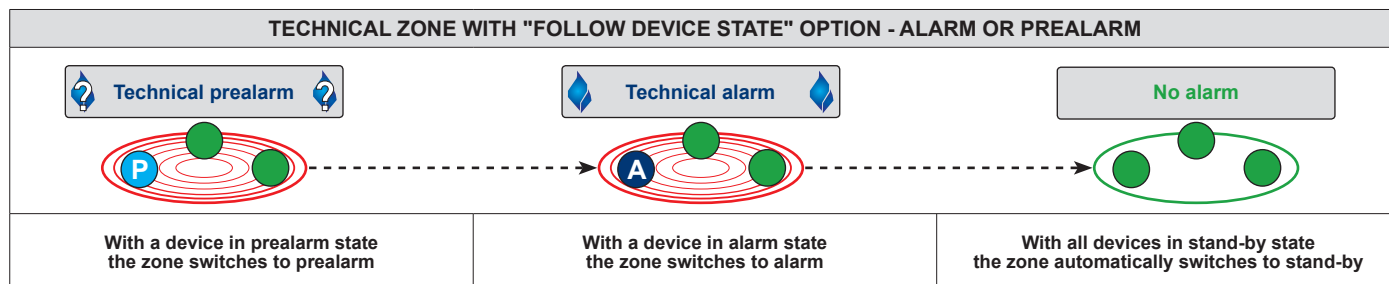
DEFAULT ZONE FEATURES	
1	It is a non-programmable single-knock fire zone
2	It includes all the programmed devices not assigned to the zones
3	Its composition is not directly editable

**Fire zone**

The fire zone consists of one or more devices, typically fire detectors and actuating devices. The alarm of the zone triggers the alarm procedure programmed for the zone and the evacuation siren.

**Technical zone**

The technical zone consists of one or more devices, typically flood, gas detectors etc. and actuating devices. The monitoring of these phenomena is not covered by the standard EN 54-2, but the presence and management of such detectors does not affect the control panel mandatory functions. The alarm of the zone triggers the alarm procedure programmed for the zone and the output programmed as Technical alarm. If the Follow device state option has been enabled for the technical zone, the technical prealarm and alarm notifications are automatically acknowledged as soon as the devices that triggered the alarm return to stand-by state.

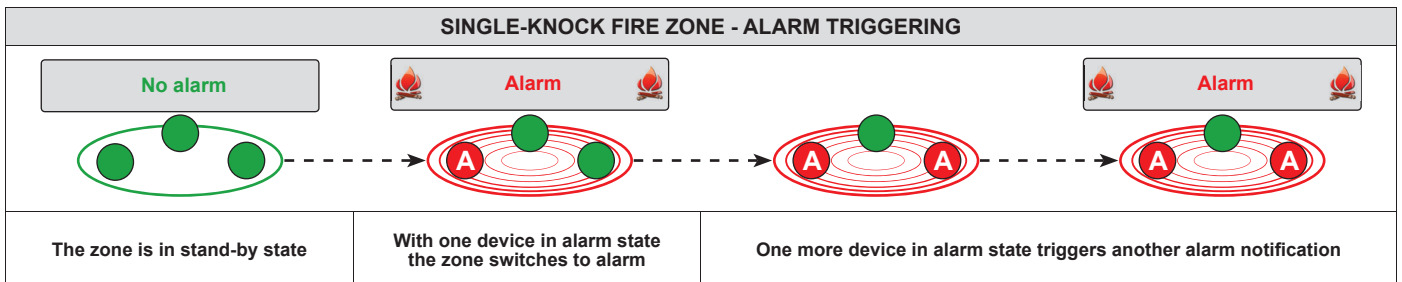
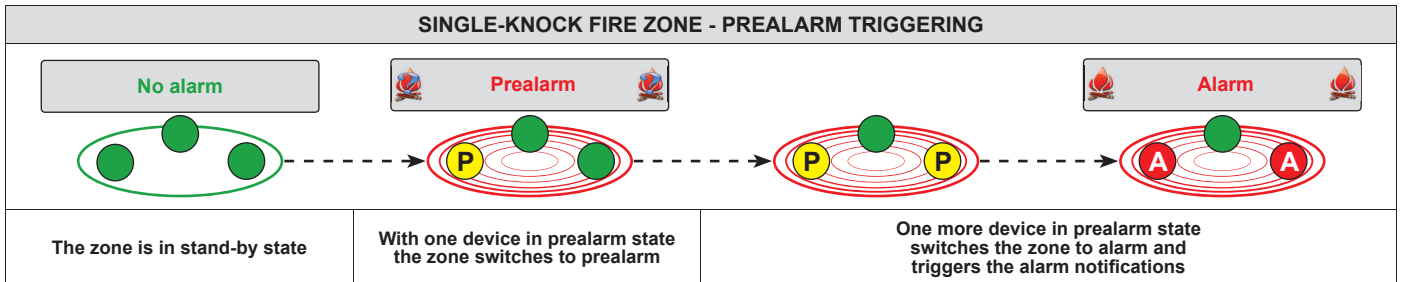


Legend	
<span style="color: green;">●</span>	Detector (stand-by)
<span style="color: blue; border: 1px solid blue; border-radius: 50%; padding: 2px;">P</span>	Detector (technical prealarm)
<span style="color: yellow; border: 1px solid yellow; border-radius: 50%; padding: 2px;">P</span>	Detector (fire prealarm)
<span style="color: blue; border: 1px solid blue; border-radius: 50%; padding: 2px;">A</span>	Detector technical (technical alarm)
<span style="color: red; border: 1px solid red; border-radius: 50%; padding: 2px;">A</span>	Detector fire (fire alarm)
<span style="color: green;">○</span>	Zone (stand-by)
<span style="color: red;">⊗</span>	Zone (alarm or prealarm)

## 8-2 - Fire zones

### Single-knock fire zone

The alarm of a single device (single-knock) is sufficient to generate the alarm of the zone and initiate the alarm procedure programmed for the zone and the evacuation siren. If a device generates a prealarm, the zone will switch to prealarm state.



### Double-knock fire zone

The prealarm or alarm of a single device generates a prealarm in the zone, the intervention of a second device causes an alarm in the zone. However, if the first device is a manual call point, the double-knock zone immediately issues an alarm.

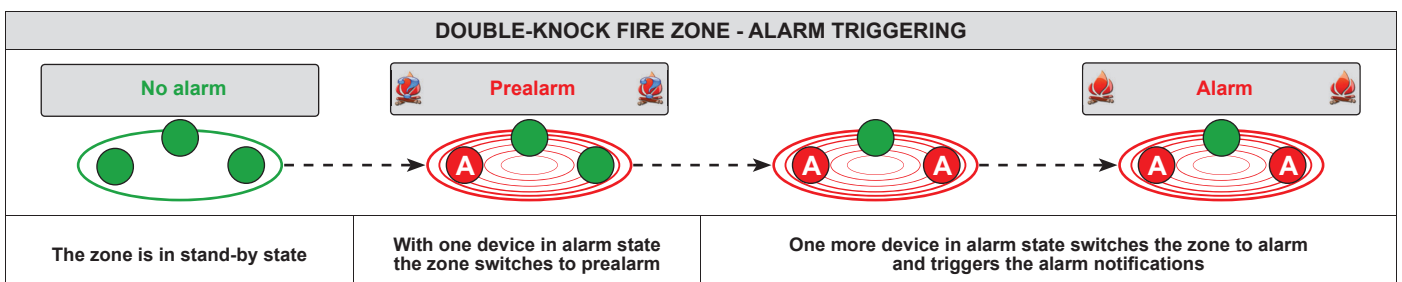
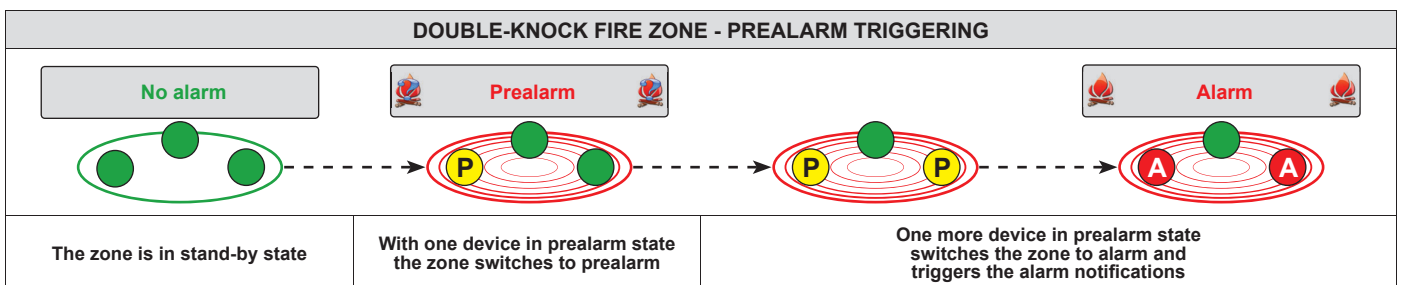
#### Double-knock zone prealarm timeout

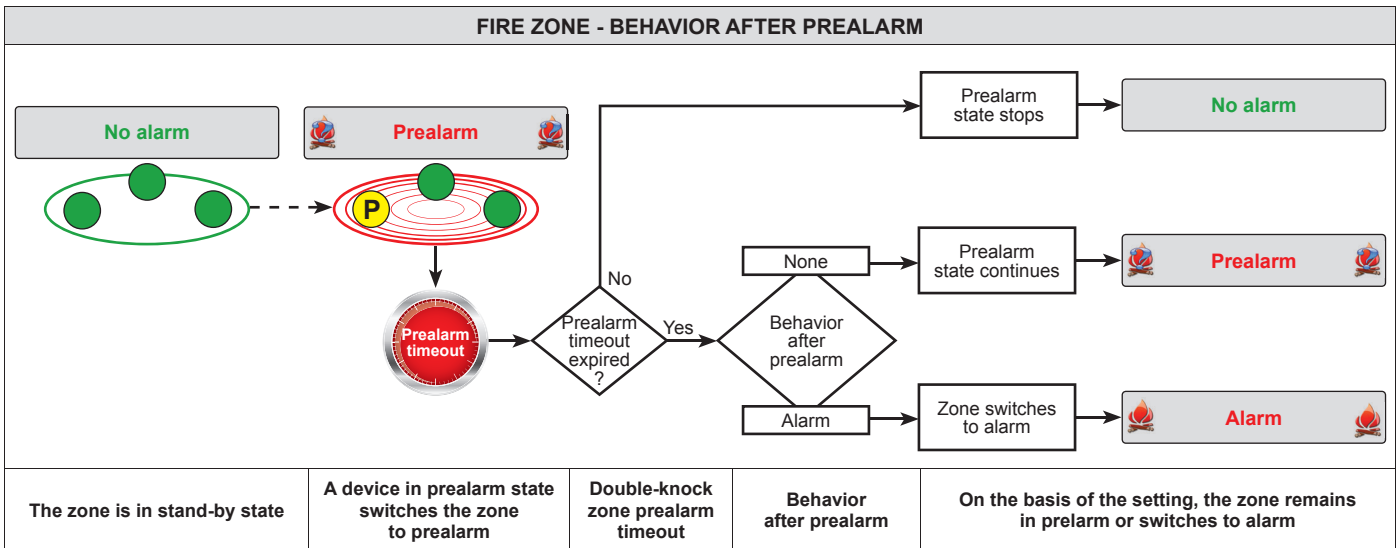
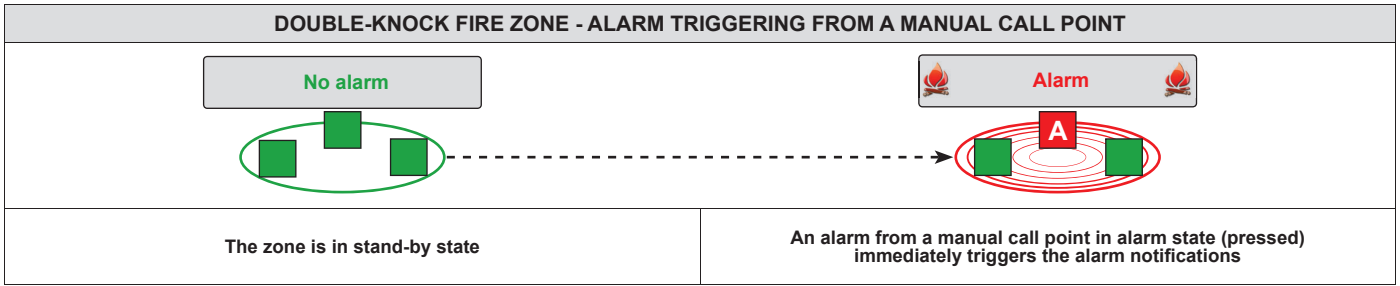
It is possible to set the maximum prealarm time for the double-knock zones.

If a zone in prealarm state at the end of the set timeout has switched to stand-by state, the prealarm is automatically cleared.

If, however, the prealarm condition persists, the zone remains in prealarm state until the detector switches to stand-by or another detector of the zone switches to alarm. The timeout can be set by steps of 5 minutes from 0 (infinite) to 60 minutes.

**N.B.** The **Behavior after prealarm** setting can have an effect on the alarm release.



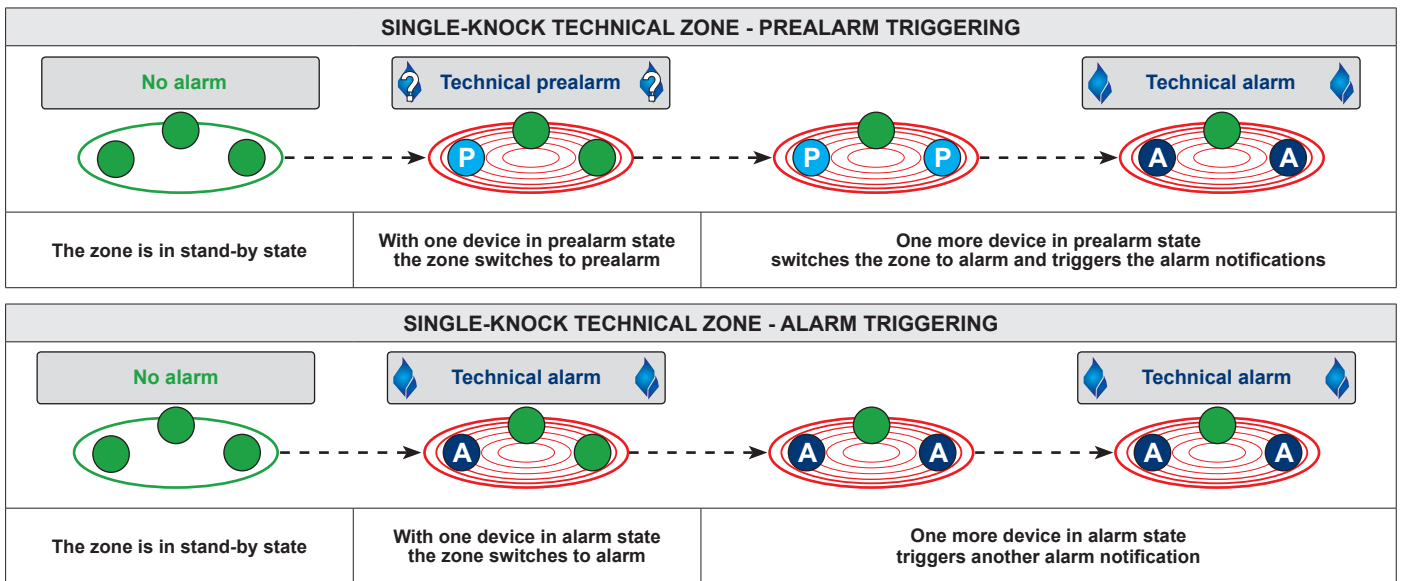


### 8-3 - Technical zones

The prealarm and alarm outputs of the technical zone must be programmed, specializing the programmable outputs for these functions.

#### Single-knock technical zone

The alarm of a single device (single-knock) is enough to generate a technical alarm of the zone and trigger the output specifically programmed for technical alarm. If a device generates a prealarm, the zone will switch to prealarm state.



#### Double-knock technical zone

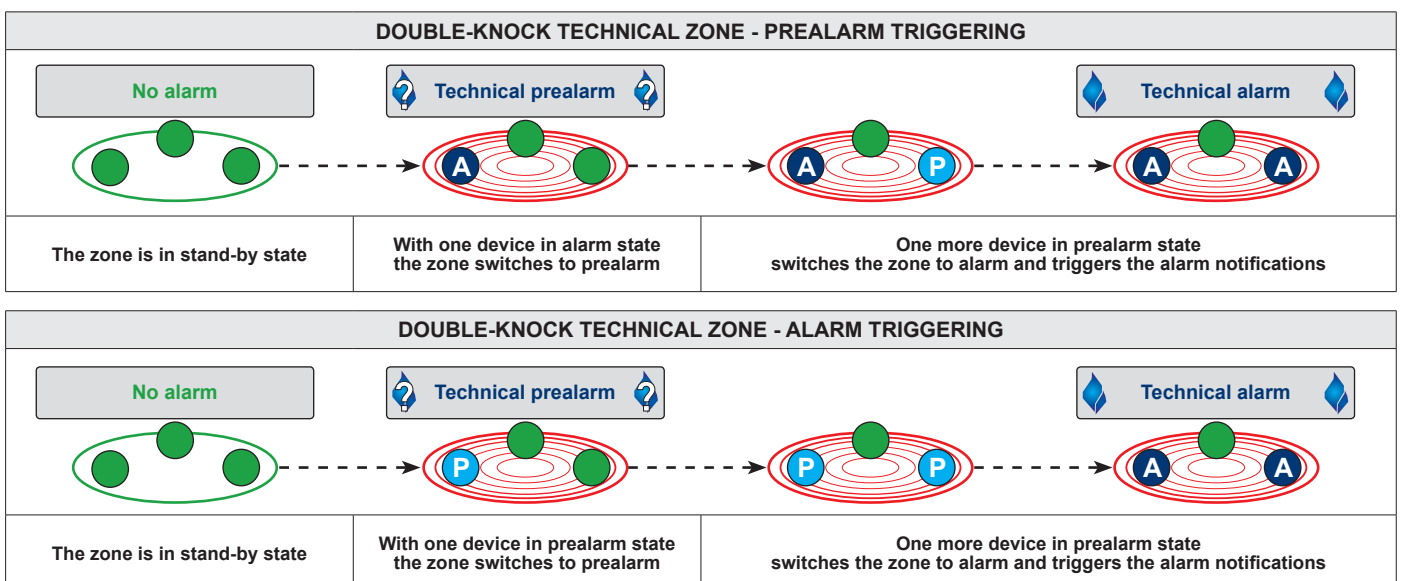
The prealarm or alarm of a single device generates a technical prealarm in the zone, the intervention of a second device causes a technical alarm in the zone.

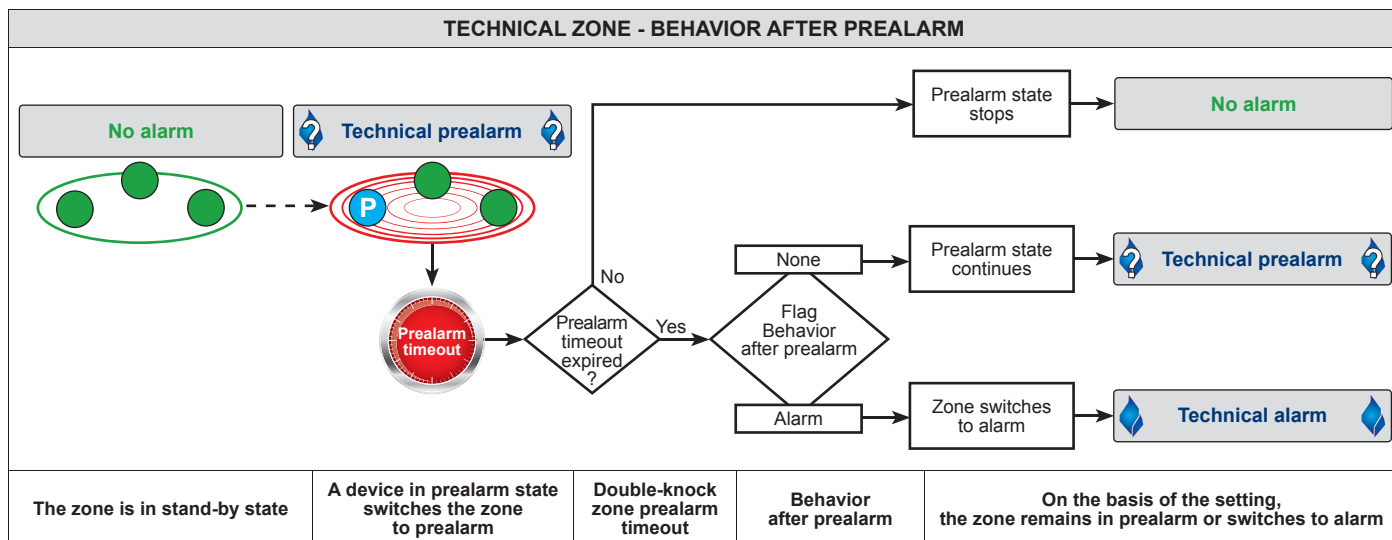
#### Double-knock zone prealarm timeout

It is possible to set the maximum prealarm time for the double-knock zones. If a zone in prealarm state at the end of the set timeout has switched to stand-by state, the prealarm is automatically cleared. If, however, the prealarm condition persists, the zone remains in prealarm state until the detector switches to stand-by or another detector of the zone switches to alarm.

The timeout can be set by steps of 5 minutes from 0 (infinite) to 60 minutes.

**N.B.** The **Behavior after prealarm** setting can have an effect on the alarm release.





### 8-4 - Monitored system mode

**Warning:** the monitored system mode may only be used if the control panel is under the direct control of authorized personnel. It is only available if its use was enabled during setup.

The activation and deactivation of the monitored system mode requires a level 2 code. Its activation is indicated by the relevant LED on the control panel which turns on. At the same time, the repeater panel displays the icon that indicates the monitored system mode.

With the operation mode active, the alarms generated by the devices are reported by the control panel as prealarm.

However, if the alarm is generated by a manual call point, an alarm is reported immediately.

The monitored system mode has no effect on the operation of the technical zones.

#### Access period

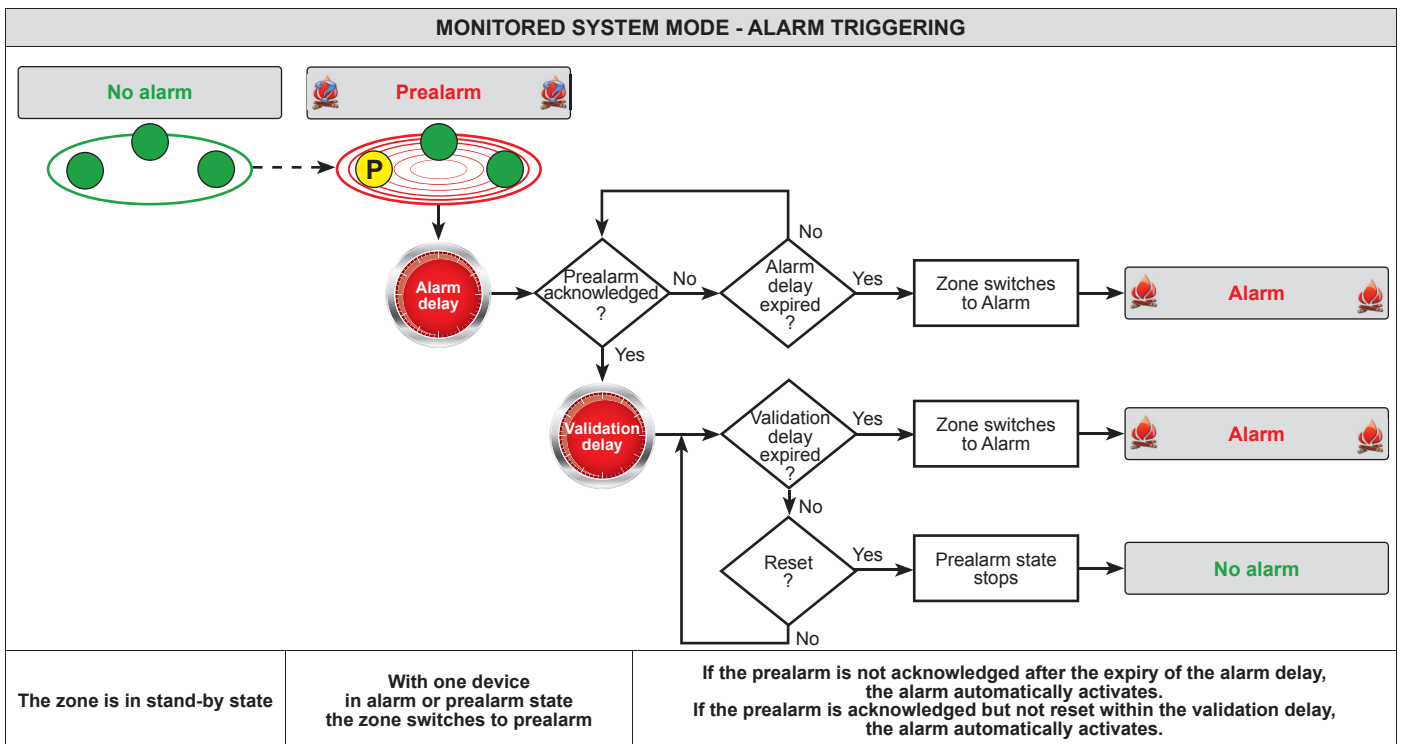
The activation of the monitored system mode can be subjected to an access period. In this case, the operator can activate the operating mode only during the set access period. At the end of the access period, the operating mode is automatically deactivated.

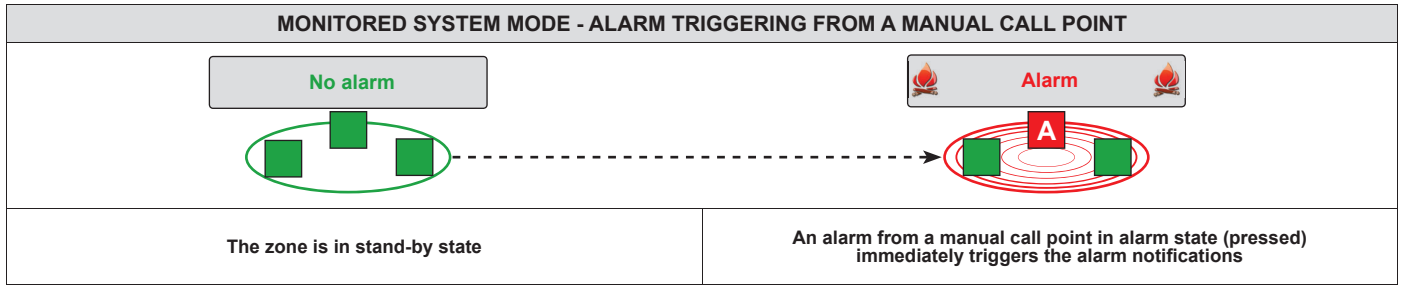
#### Operating logic

On generation of the prealarm, the control panel activates the alarm delay. If the prealarm is not acknowledged by the operator within the alarm delay, the prealarm is automatically converted into an alarm. If the prealarm is acknowledged by the operator, the validation delay activates. If a reset is performed within this delay, the prealarm state stops, whereas if no reset is performed, the prealarm is converted into an alarm.

If the prealarm turns out to be a false alarm, the operator can perform the reset from the control panel or from any device that manages the reset function.

If the alarm proves to be real, the staff can wait for the expiry of the validation delay or can generate the alarm either by activating the evacuation (using a level 2 code) or via a manual call point.





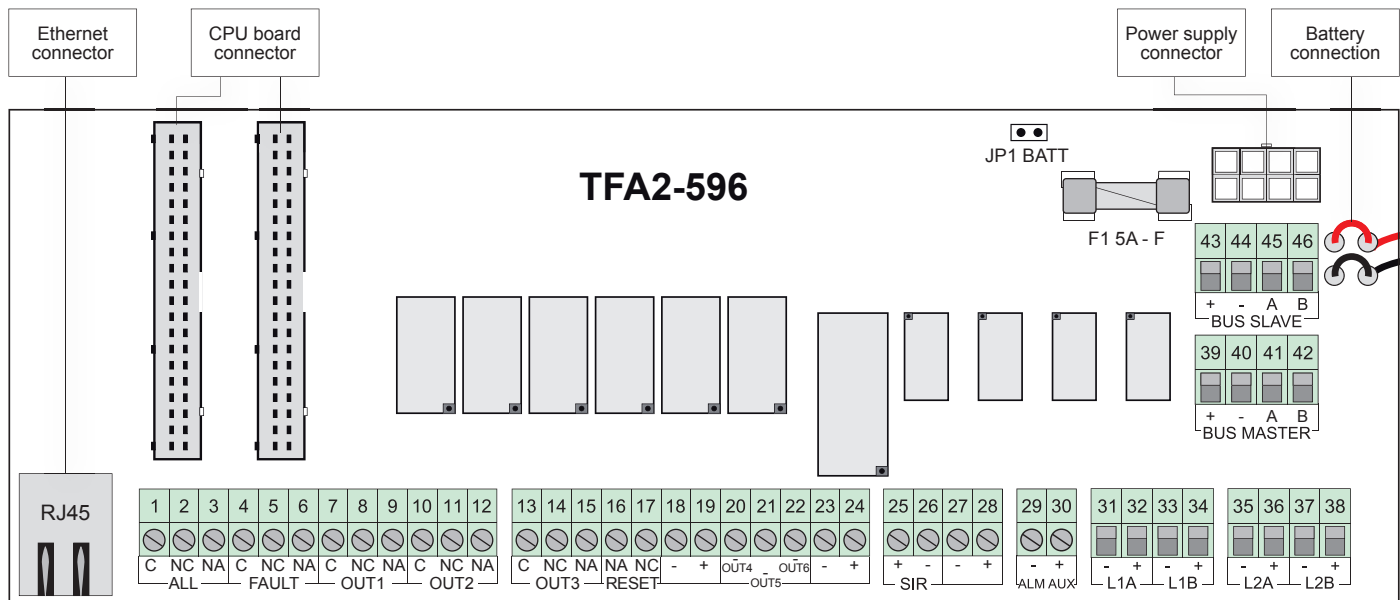




# 9 - ELECTRONIC BOARDS

The control panel electronics are divided into two parts, the CPU board and the terminal board.

## 9-1 - TFA2-596 terminals



**Warning:** the outputs OUT1 (terminals 7, 8, 9), OUT2 (terminals 10, 11, 12), OUT3 (terminals 13, 14, 15), OUT4 (terminal 20), OUT5 (terminal 21), OUT6 (terminal 22), alarm relay output ALL (terminals 1, 2, 3) and the relay output RESET (terminals 16, 17) are not supervised (type C, E, J according to EN 54-1 nomenclature). Therefore, in accordance with EN 54-2, they may not be used to control fire alarm devices or transmission devices for fire or failure alarm.  
The failure relay output FAULT (terminals 4, 5, 6) is not supervised (type J according to EN 54-1 nomenclature) and therefore, in accordance with EN 54-2, may not be used to control transmission devices for failure alarm.

### PROTECTION AGAINST DEEP DISCHARGE

<b>JP1 BATT</b>		Automatic battery disconnection for Vbat <18V DC
		Protection against deep discharge disabled

	<b>Fuse F1</b>
Protection against battery reverse polarity (type 5A - F 5x20)	

## 9-2 - Terminals

		Outputs	Notes	Max. current
	1	Common contact	Alarm relay output with free contact	1A 30V DC
	2	Normally closed contact		
	3	Normally open contact		
	4	Common contact	Failure relay output with free contact	1A 30V DC
	5	Normally closed contact		
	6	Normally open contact		
	7	Common contact	OUT1 relay with free contact (programmable)	1A 30V DC
	8	Normally closed contact		
	9	Normally open contact		
	10	Common contact	OUT2 relay with free contact (programmable)	1A 30V DC
	11	Normally closed contact		
	12	Normally open contact		

		Outputs	Notes	Max. current
	13	Common contact	OUT3 relay with free contact (programmable)	1A 30V DC
	14	Normally closed contact		
	15	Normally open contact		
	16	Normally de-energized contact	+24V DC reset relay output voltage	1A 30V DC
	17	Normally energized contact (+24V DC)	Power supply output for external loads	1.5A 24V DC
	18	Negative power supply voltage		
	19	Positive power supply voltage		
	20	Signaling output 4	Programmable open collector outputs (negative voltage or high impedance)	150mA
	21	Signaling output 5		
	22	Signaling output 6		
	23	Negative power supply voltage	Power supply output for external loads	1.5A 24V DC
	24	Positive power supply voltage		

		Siren output	Notes	Max. current
	25	Positive power supply voltage for siren	Controlled siren output (reversed polarity in alarm)	750mA 24V DC
	26	Negative power supply voltage for siren		
	27	Negative power supply voltage	Power supply output for external loads	1.5A 24V DC
	28	Positive power supply voltage		

		Auxiliary power supply	Notes
	29	Negative input for power supply	24V DC input for connection of TFPS-5 power supply
	30	Positive input for power supply	

		Loop	Notes	Max. current
	31	Negative power supply voltage for line 1A	Outward loop	500mA 24V DC
	32	Positive power supply voltage for line 1A		
	33	Negative power supply voltage for line 1B	Return loop	
	34	Positive power supply voltage for line 1B		

**N.B.** The maximum current available for external loads is shared between terminals 19, 24 and 28.

The state indicated for the terminals 5 and 6 is in the condition of unpowered control panel.

With the control panel powered, the state of the terminals is reversed: terminal 5 is in NO state and terminal 6 is in NC state.

The additional power supply connected to terminals 29 and 30 must not be regarded as a resource to increase the availability of current of the control panel.

The power supply should be considered for the current that its batteries make available to increase the autonomy of the system in case of power failure.

	Loop		Notes	Max. current
	35	Negative power supply voltage for line 2A	Outward loop	500mA 24V DC
	36	Positive power supply voltage for line 2A		
	37	Negative power supply voltage for line 2B	Return loop	
38	Positive power supply voltage for line 2B			

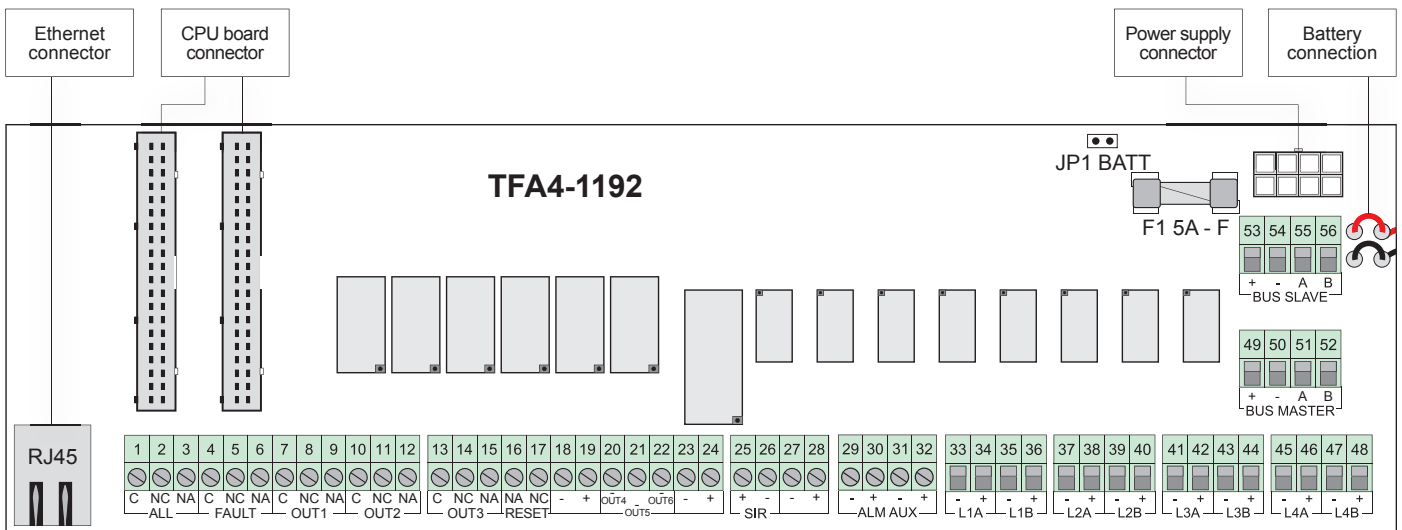
	Master Bus		Notes	Max. current
	39	Positive power supply voltage for serial bus	Power supply output for expansion devices	500mA 24V DC
	40	Negative power supply voltage for serial bus		
	41	Channel A serial bus	Master Bus communication channels (connection of expansion devices)	
42	Channel B serial bus			

	Slave Bus		Notes	Max. current
	43	Positive power supply voltage for serial bus	Power supply output for expansion devices	500mA 24V DC
	44	Negative power supply voltage for serial bus		
	45	Channel A serial bus	Slave Bus communication channels (connection of expansion devices)	
46	Channel B serial bus			

	Ethernet connector RJ45			
	1	White/green	5	White/blue
	2	Green	6	Orange
	3	White/orange	7	White/brown
	4	Blue	8	Brown

PROGRAMMABLE OUTPUTS			
Function	Acknowledgeable	Function	Acknowledgeable
Fire alarm	Yes	Status: Power failure	No
Fire prealarm	Yes	Status: Power supply failure/battery charger failure	No
Technical alarm	Yes	Status: Earth leakage	No
Delayed alarm	No	Status: SIR output failure	No
General failure	No	Exclusion of at least one device (including outputs)	No
Alarm from device under test	No	Exclusion of control panel outputs	No
System failure	No	At least one zone under test	No
Evacuation	No	Control panel under maintenance	No
Low battery	No	Status: Communication with device	No
Battery failure	No	Status: Control panel network connected and working	No
Power failure	No	Ethernet connection present	No
Power supply failure/battery charger failure	No	System OK	No
Earth leakage failure	No	Open RS485 loop	No
SIR output failure	No	Monitored control panel	No
KEY jumper inserted	No	Prog. enabled	No
Status: battery	No	Control panel reset	No
Status: battery failure	No	Technical prealarm	Yes

9-3 - TFA4-1192 terminals



**EN 54**

**Warning:** the outputs OUT1 (terminals 7, 8, 9), OUT2 (terminals 10, 11, 12), OUT3 (terminals 13, 14, 15), OUT4 (terminal 20), OUT5 (terminal 21), OUT6 (terminal 22), alarm relay output ALL (terminals 1, 2, 3) and the relay output RESET (terminals 16, 17) are not supervised (type C, E, J according to EN 54-1 nomenclature). Therefore, in accordance with EN 54-2, they may not be used to control fire alarm devices or transmission devices for fire or failure alarm. The failure relay output FAULT (terminals 4, 5, 6) is not supervised (type J according to EN 54-1 nomenclature) and therefore, in accordance with EN 54-2, may not be used to control transmission devices for failure alarm.

PROTECTION AGAINST DEEP DISCHARGE		
JP1 BATT		Automatic battery release due to low battery voltage for Vbat <18V DC
		The battery automatic release function is disabled

	<b>Fuse F1</b>
Battery polarity reversal safety fuse (type 5A - F 5x20)	

### 9-4 - Terminals

		Outputs	Notes	Max. current
	1	Common contact	Alarm relay output with free contact	1A 30V DC
	2	Normally closed contact		
	3	Normally open contact		
	4	Common contact	Failure relay output with free contact	1A 30V DC
	5	Normally closed contact		
	6	Normally open contact		
	7	Common contact	OUT1 relay with free contact (programmable)	1A 30V DC
	8	Normally closed contact		
	9	Normally open contact		
	10	Common contact	OUT2 relay with free contact (programmable)	1A 30V DC
	11	Normally closed contact		
	12	Normally open contact		

		Outputs	Notes	Max. current
	13	Common contact	OUT3 relay with free contact (programmable)	1A 30V DC
	14	Normally closed contact		
	15	Normally open contact		
	16	Normally de-energized contact	+24V DC reset relay output voltage	1A 30V DC
	17	Normally energized contact (+24V DC)		
	18	Negative power supply voltage	Power supply output for external loads	1.5A 24V DC
	19	Positive power supply voltage		
	20	Signaling output 4	Programmable open collector outputs (negative voltage or high impedance)	150mA
	21	Signaling output 5		
	22	Signaling output 6		
	23	Negative power supply voltage	Power supply output for external loads	1.5A 24V DC
24	Positive power supply voltage			

		Siren output	Notes	Max. current
	25	Positive power supply voltage for siren	Controlled siren output (reversed polarity in alarm)	750mA 24V DC
	26	Negative power supply voltage for siren		
	27	Negative power supply voltage	Power supply output for external loads	1.5A 24V DC
	28	Positive power supply voltage		

		Auxiliary power supply	Notes
	29	Negative input for power supply	24V DC input for connection of TFPS-5 power supply
	30	Positive input for power supply	
	31	Negative input for power supply	
	32	Positive input for power supply	

		Loop	Notes	Max. current
	33	Negative power supply voltage for line 1A	Outward loop	500mA 24V DC
	34	Positive power supply voltage for line 1A		
	35	Negative power supply voltage for line 1B	Return loop	
	36	Positive power supply voltage for line 1B		

**N.B.** The maximum current available for external loads is shared between terminals 19, 24 and 28.

The state indicated for the terminals 5 and 6 is in the condition of unpowered control panel.

With the control panel powered, the state of the terminals is reversed: terminal 5 is in NO state and terminal 6 is in NC state.

The additional power supply connected to terminals 29, 30 and 31, 32 must not be regarded as a resource to increase the availability of current of the control panel.

The power supply should be considered for the current that its batteries make available to increase the autonomy of the system in case of power failure.

	Loop		Notes	Max. current
	37	Negative power supply voltage for line 2A	Outward loop	500mA 24V DC
	38	Positive power supply voltage for line 2A		
	39	Negative power supply voltage for line 2B	Return loop	
40	Positive power supply voltage for line 2B			

	Loop		Notes	Max. current
	41	Negative power supply voltage for line 3A	Outward loop	500mA 24V DC
	42	Positive power supply voltage for line 3A		
	43	Negative power supply voltage for line 3B	Return loop	
44	Positive power supply voltage for line 3B			

	Loop		Notes	Max. current
	45	Negative power supply voltage for line 4A	Outward loop	500mA 24V DC
	46	Positive power supply voltage for line 4A		
	47	Negative power supply voltage for line 4B	Return loop	
48	Positive power supply voltage for line 4B			

	Master Bus		Notes	Max. current
	49	Positive power supply voltage for serial bus	Power supply output for expansion devices	500mA 24V DC
	50	Negative power supply voltage for serial bus		
	51	Channel A serial bus	Master Bus communication channels (connection of expansion devices)	
52	Channel B serial bus			

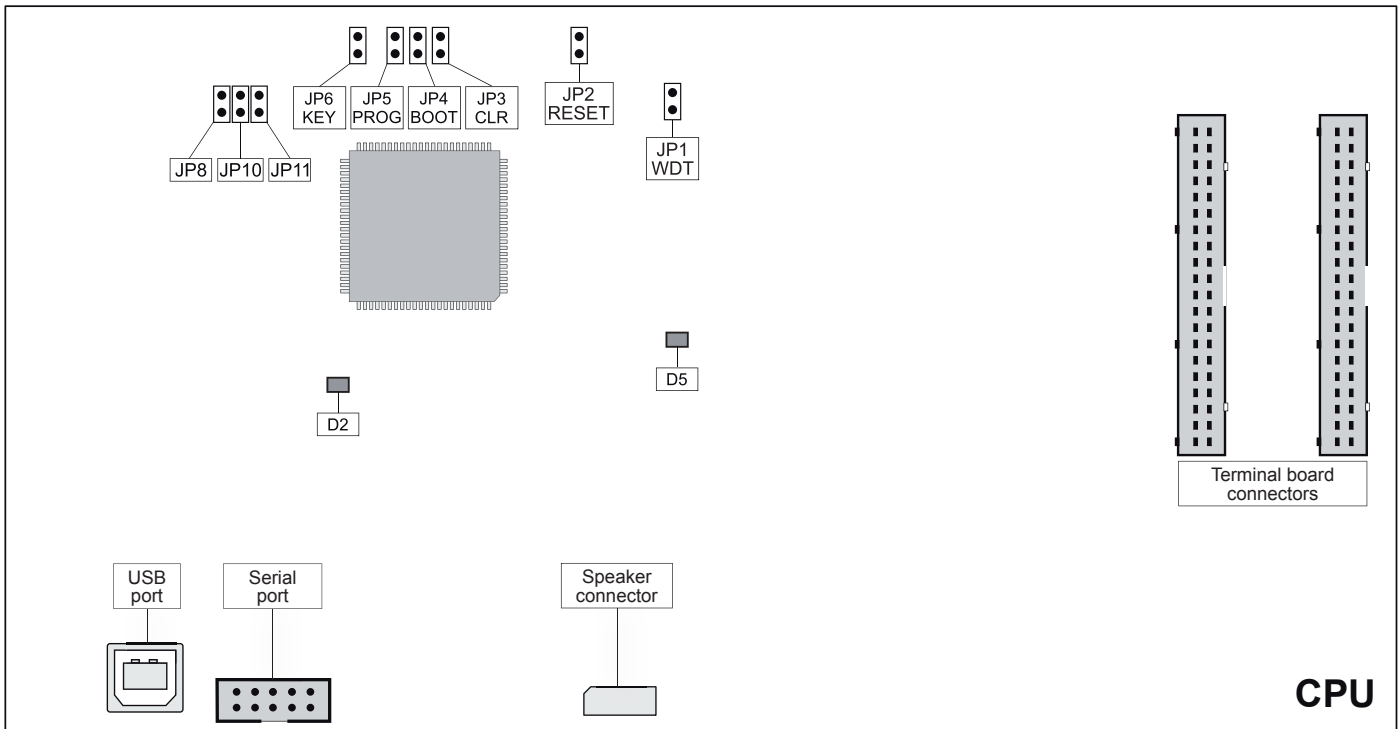
	Slave Bus		Notes	Max. current
	53	Positive power supply voltage for serial bus	Power supply output for expansion devices	500mA 24V DC
	54	Negative power supply voltage for serial bus		
	55	Channel A serial bus	Slave Bus communication channels (connection of expansion devices)	
56	Channel B serial bus			

	Ethernet connector RJ45			
	1	White/green	5	White/blue
2	Green	6	Orange	
3	White/orange	7	White/brown	
4	Blue	8	Brown	

PROGRAMMABLE OUTPUTS			
Function	Acknowledgeable	Function	Acknowledgeable
Fire alarm	Yes	Status: Power failure	No
Fire prealarm	Yes	Status: Power supply failure/battery charger failure	No
Technical alarm	Yes	Status: Earth leakage	No
Delayed alarm	No	Status: SIR output failure	No
General failure	No	Exclusion of at least one device (including outputs)	No
Alarm from device under test	No	Exclusion of control panel outputs	No
System failure	No	At least one zone under test	No
Evacuation	No	Control panel under maintenance	No
Low battery	No	Status: Communication with device	No
Battery failure	No	Status: Control panel network connected and working	No
Power failure	No	Ethernet connection present	No
Power supply failure/battery charger failure	No	System OK	No
Earth leakage failure	No	Open RS485 loop	No
SIR output failure	No	Monitored control panel	No
KEY jumper inserted	No	Prog. enabled	No
Status: battery	No	Control panel reset	No
Status: battery failure	No	Technical prealarm	Yes

## 9-5 - CPU board

The CPU board is equipped with all the key jumpers which permit high-level management of the control panel, such as firmware upgrade, reset of system configuration, access to the 4th (manufacturer) access level etc. The CPU board also hosts the USB and TTL ports for connecting a PC and a serial printer to the control panel.



### Key jumpers

Special high-level procedures, such as firmware upgrade, reset of system configuration etc., require the use of specific jumpers available on the CPU board of the control panel:

**JP1 WDT** - The jumper disables the WATCHDOG circuit of the control panel. In normal operating conditions, the jumper must always be open. In some procedures, such as firmware upgrade via serial port, the jumper must temporarily be closed.

**JP2 RESET** - The jumper is used to reset and restart the microprocessor. In normal operating conditions, the jumper must always be open. In some procedures, such as firmware upgrade, the jumper must temporarily be closed.

**JP3 CLR** - The jumper is used to clear programming and restore the default settings. In normal operating conditions, the jumper must always be open. During the reset of system configuration, the jumper must be temporarily closed.

**JP4 BOOT** - The jumper is used along with the CLR jumper to perform the firmware upgrade via USB port. In normal operating conditions, the jumper must always be open.

**JP5 PROG** - The jumper is used to perform the firmware upgrade of the control panel. In normal operating conditions, the jumper must always be open. During firmware upgrade via serial port, the jumper must temporarily be closed.

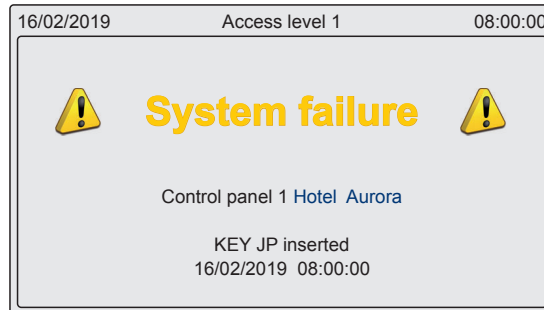
**JP6 KEY** - The jumper enables the access to the level 4 menu. In normal operating conditions, the jumper must always be open.

SPECIAL PROCEDURES		
<b>JP1 - WDT</b>	Leave open during normal operating conditions (jumpers reserved for firmware upgrade and reset of system configuration)	Supervised position
<b>JP2 - RESET</b>		
<b>JP3 - CLR</b>		
<b>JP4 - BOOT</b>		
<b>JP5 - PROG</b>		
<b>JP6 - KEY</b>		

**Supervision of jumpers**

The control panel oversees the open or closed state of the jumpers to prevent that they are forgotten in the wrong position after use, causing potential undesirable behaviors or malfunctioning of the control panel. The control panel notifies the condition of anomaly, through a screen that indicates **System failure** and **KEY jumper inserted**. The signaling remains visible until the relevant key jumper is correctly positioned.

**N.B.** If the Automatic system failure acknowledgment function is not enabled, it is also necessary to perform a manual acknowledgment to cancel the **System failure** notification.



**JP8 - JP10 - JP11 - END-OF-SERIAL BUS** - The bus termination jumpers provide the balancing resistors for the slave bus of the control panel. Depending on the connection mode the three jumpers must be either all open or all closed (see connection schemes).

END-OF-SERIAL BUS	
JP8 JP10 JP11	Insert on the last device of the serial bus

LED	Signaling
D2 Green	Flashing = Run indication (proper running of control panel firmware)
D5 Red	On = USB cable connected

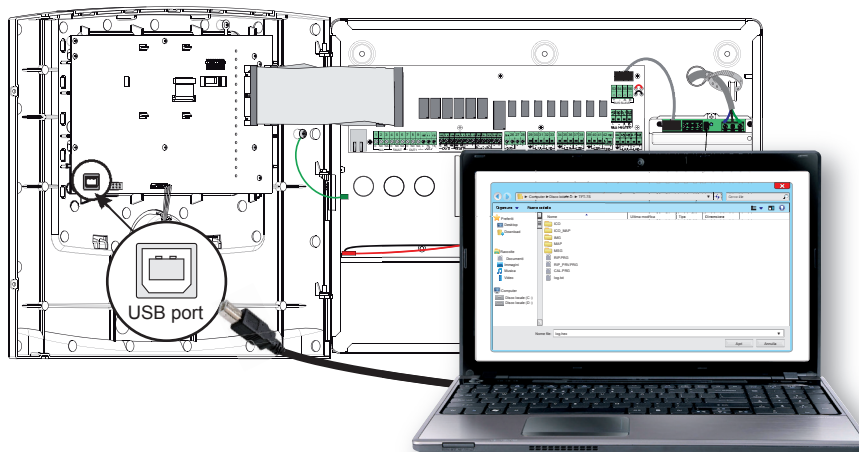
**USB port**

The USB port allows to connect the control panel directly to a PC, for programming of the control panel and upgrade of its firmware. This connection supports only the standard Tecnofire protocol from the Tecnoalarm and TECNOMONITOR software. The USB interface can also be enabled by an access level 3 or 4 code, to allow access to the data Flash memory of the control panel as a disk drive and customize the vocabulary using the Tecnoalarm software.

**SERIAL port**

The TTL port allows to connect a PC via the PROG32 or PROG USB interface, for programming of the control panel and upgrade of its firmware. This port has longer transfer times compared to the USB port. The TTL port also allows to connect a serial printer.

Port	Function
USB	PC connection for programming and firmware upgrade
SERIAL	Serial printer or programming interface connection





## 9-6 - Power supply

The control panels are equipped with a Fly-back type switching power supply model ALSW285PFC providing a maximum output current of 5A @ 24V DC (default calibration 28.8V DC @ 25°C). The power supply is equipped with an integrated PFC circuit (Power Factor Correction) which interrupts current supply when there is no power demand. Therefore the power supply only starts working with a load superior to 50mA. The connection to the control panel is made via a polarized connector. The wiring transfers to the control panel the power supply as well as diagnostic.

**N.B.** The voltage value measured at the battery charger output is subject to variations, due to the temperature of the battery. The battery temperature is measured by a probe mounted on the battery surface.

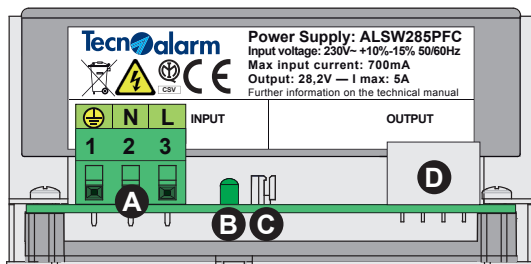
### Input protection

The 230V AC mains input is protected against overvoltage by varistors and by a non replaceable fuse integrated in the electronics (F1:T1.6A - T). Fuse blowing is necessarily attributed to a failure, or an exceptionally violent electromagnetic discharge that would inevitably require repair.

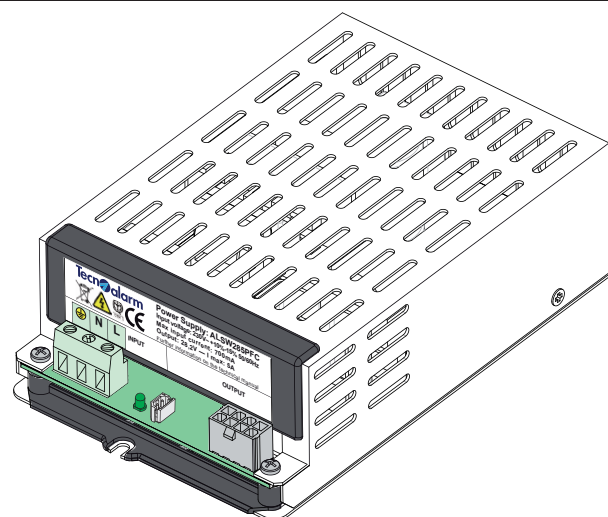
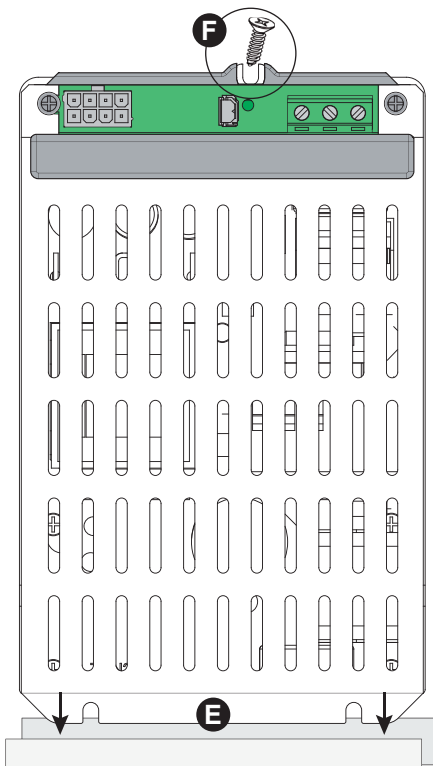
Current	Blow time
1.5A	Approx. 1 hour
2A	Approx. 2 minutes
4A	150ms to 3 seconds

### Output protection

The output section of the power supply is automatically protected against short circuits and overloads. If one of these conditions occurs, the device deactivates and then reactivates automatically when the cause of the cut-off is removed or normal operating conditions are restored.



		Terminals	
A		1	Ground connector
		2	Neutral conductor 230V AC
		3	Phase conductor 230V AC
B		<b>LED</b>	
		Green	On = normal operating conditions
C		Battery check probe connection	
D		Pre-wired polarized control panel connector	
E	Mounting holes for fixing to control panel casing		
F			





# 10 - CONNECTION

This chapter explains how to connect the detection loop, the sirens and the Master Bus.

**N.B.** All detectors and modules connectable on the loop are equipped with a dual loop isolator (inbound and outbound), in compliance with the standard EN 54-2 which provides for an isolator at least every 32 devices.

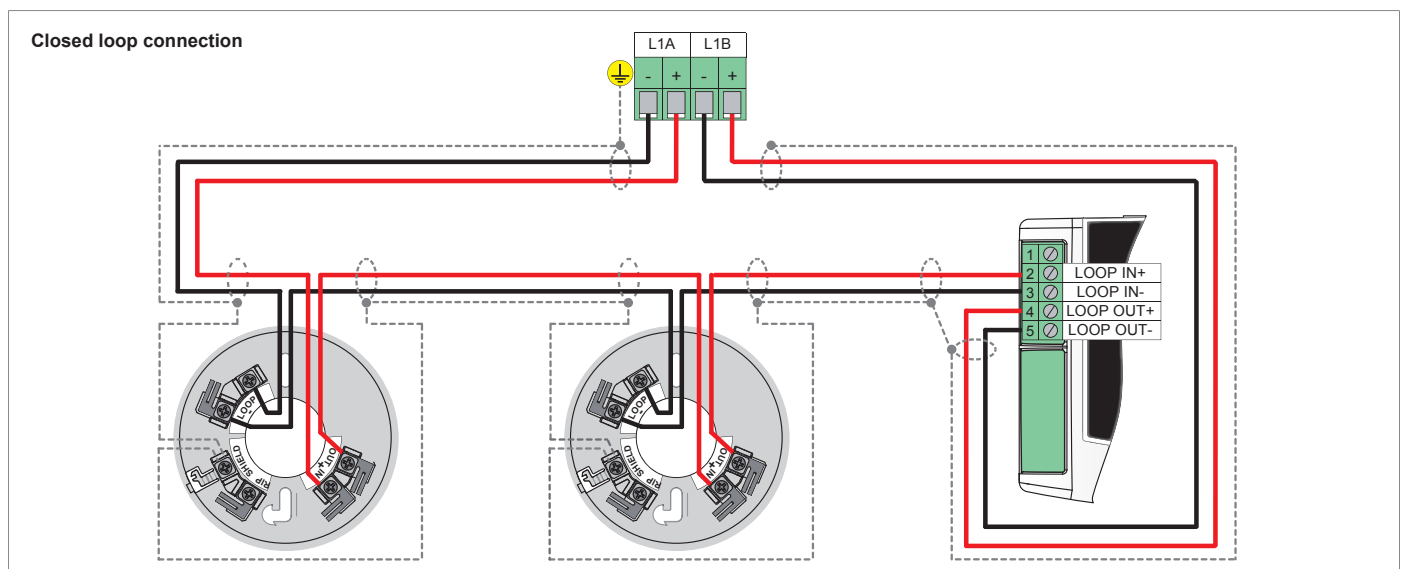
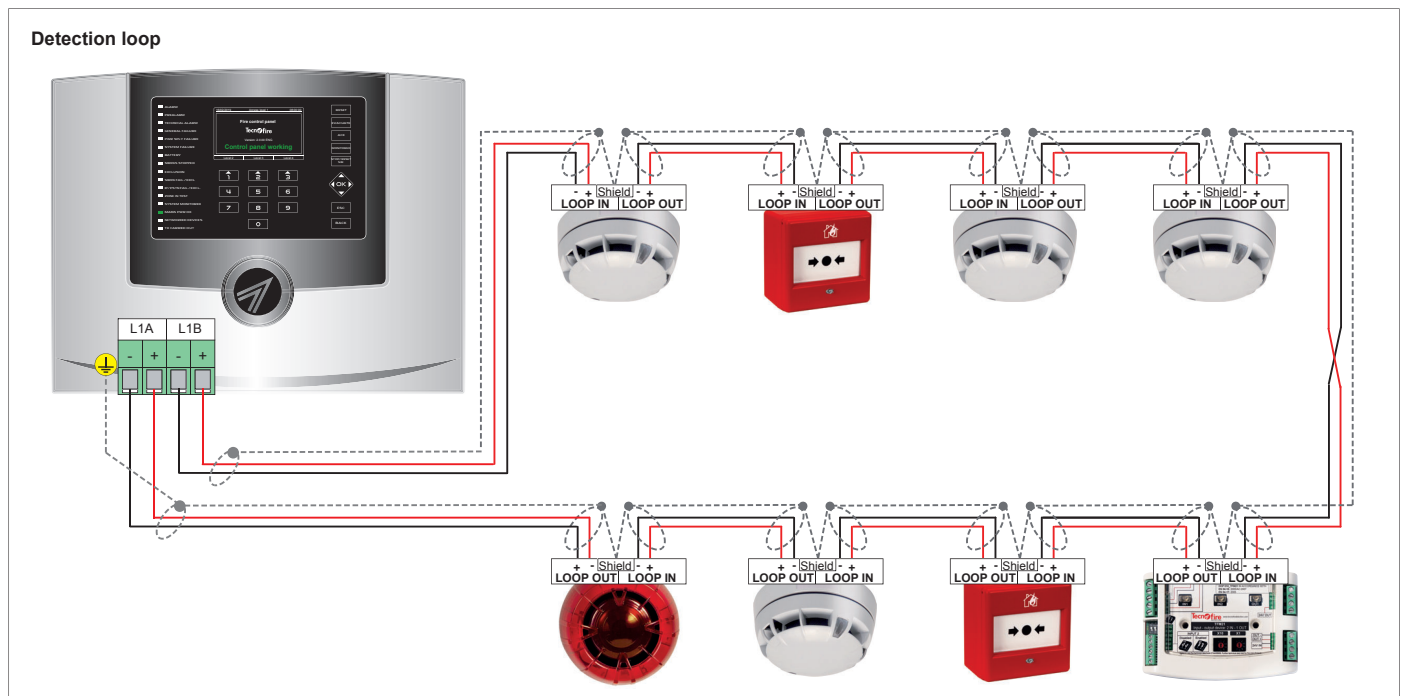
## 10-1 - Detection loop connection

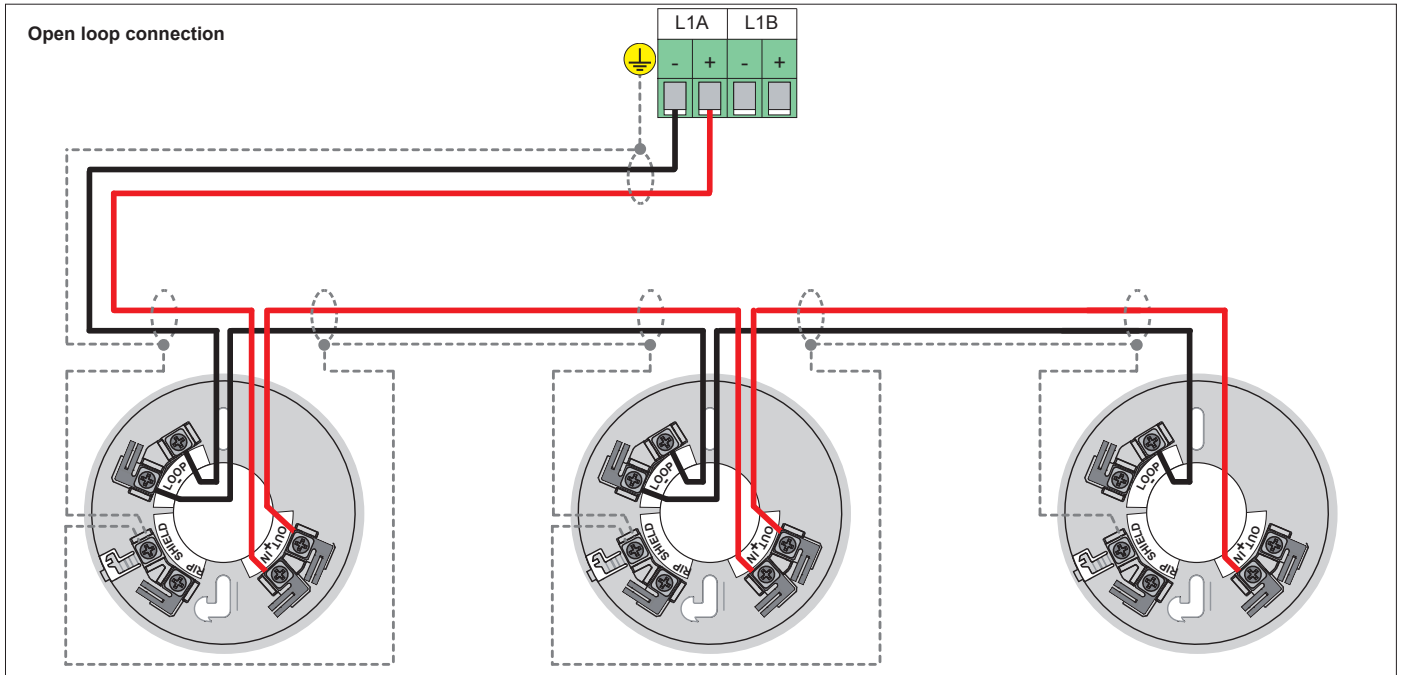
On the detection loop of the control panel it is possible to connect up to 199 detectors and up to 99 modules. The detection loop can be connected in open or closed loop mode. In open loop mode, pursuant to the standard EN 54, it is possible to connect a total of 32 devices (detectors or modules) on each branch of the detection loop.

For loop connection, we recommend to use a shielded 2-poles twisted-pair cable with flexible conductors, whose minimum section required is 0.5mm<sup>2</sup>.

For reasons of electrical safety, the shieldings of the cables must be connected in order not to stop their path and must be grounded inside the casing of the control panel.

The maximum length allowed for the laying of the detection loop is 3000 meters, as defined by the low voltage directive LVD 2006/95/EU.



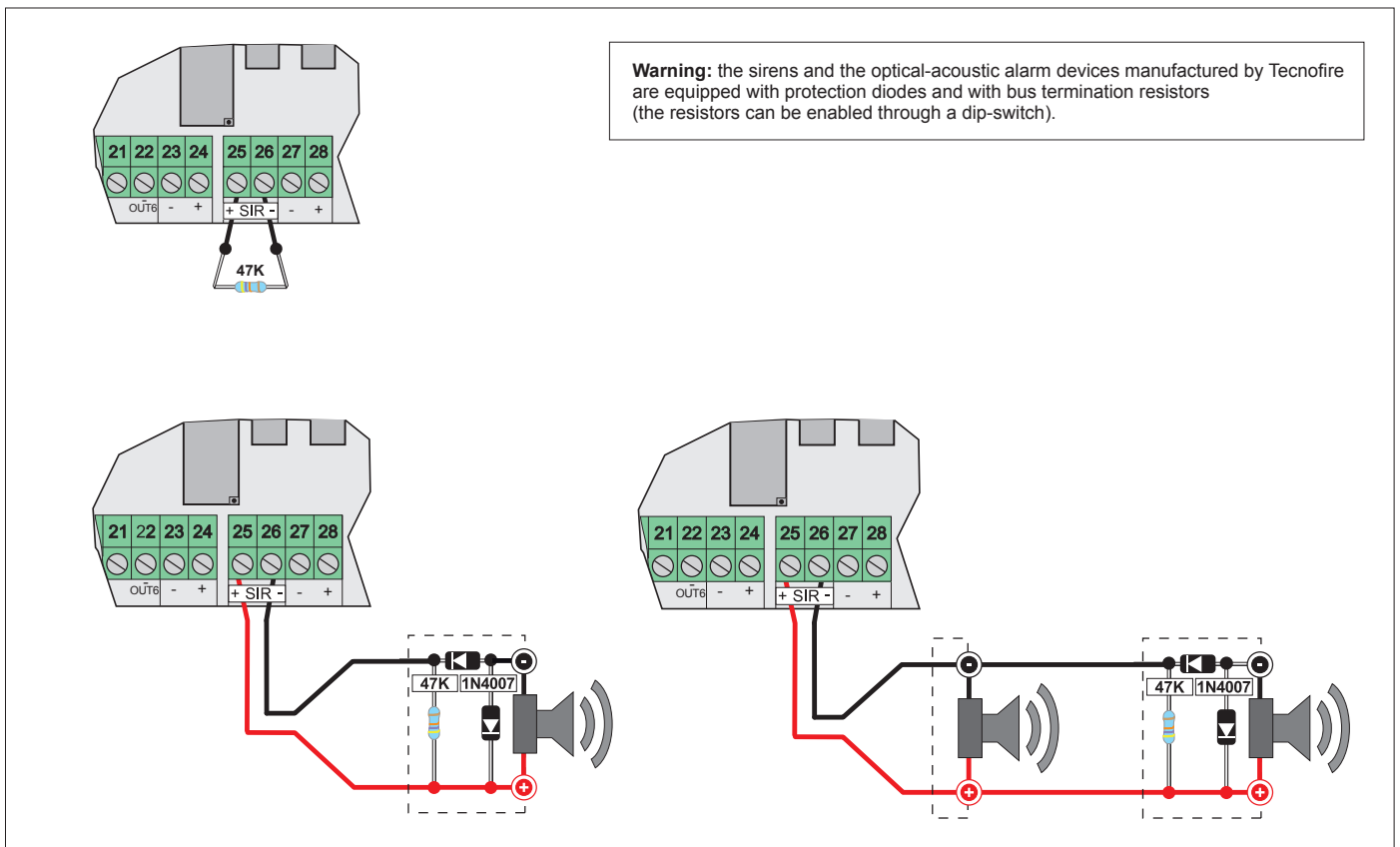


### 10-2 - Siren connection

The sirens are connected via a controlled output (terminals 25 SIR+ and 26 SIR-).  
The line must be terminated with a 47K resistance:

- If no siren is connected, a 47K bus termination resistor must be connected between terminals 25 and 26.
- If one siren is connected, a 47K resistor must be connected in parallel next to the siren.
- If multiple sirens are connected, a 47K resistor must be connected in parallel next to the last siren.

**N.B.** The polarity of the terminals refers to the alarm state, in stand-by the polarity is reversed.

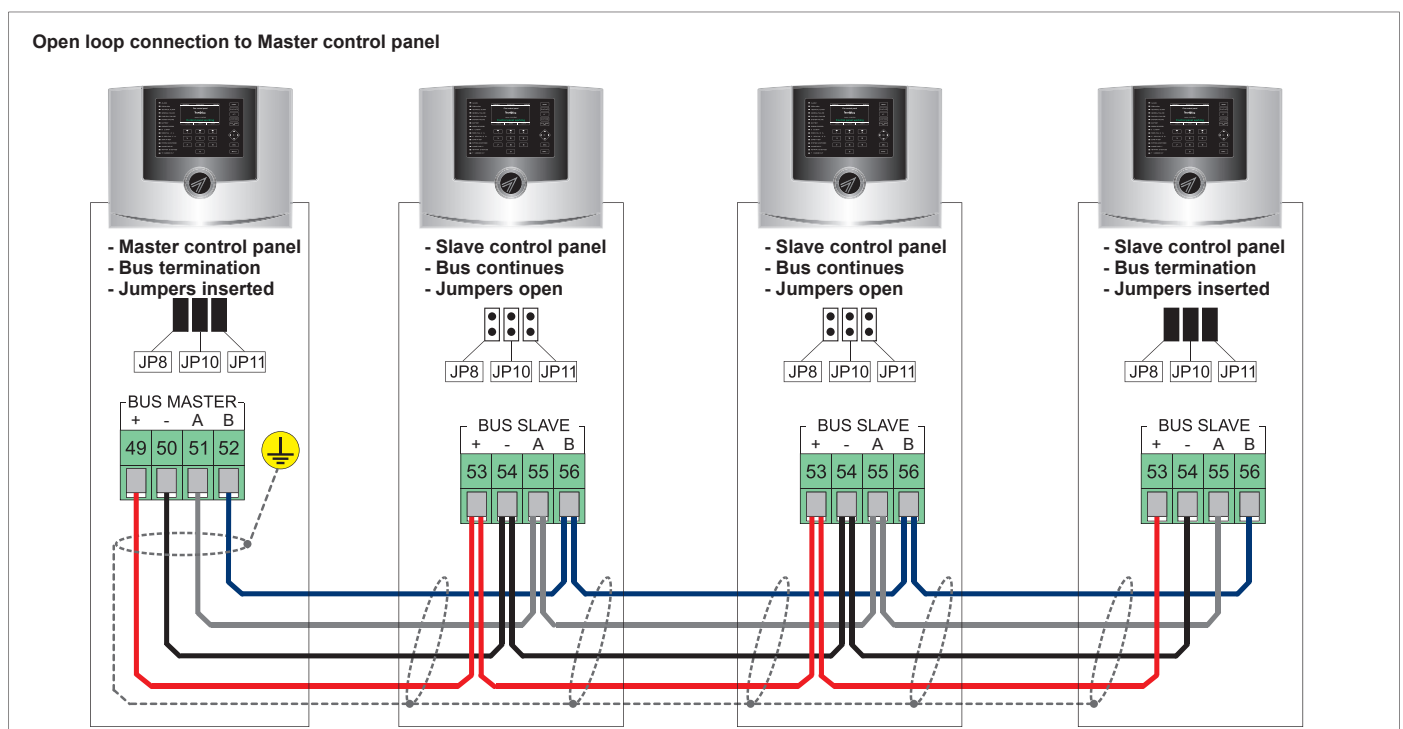
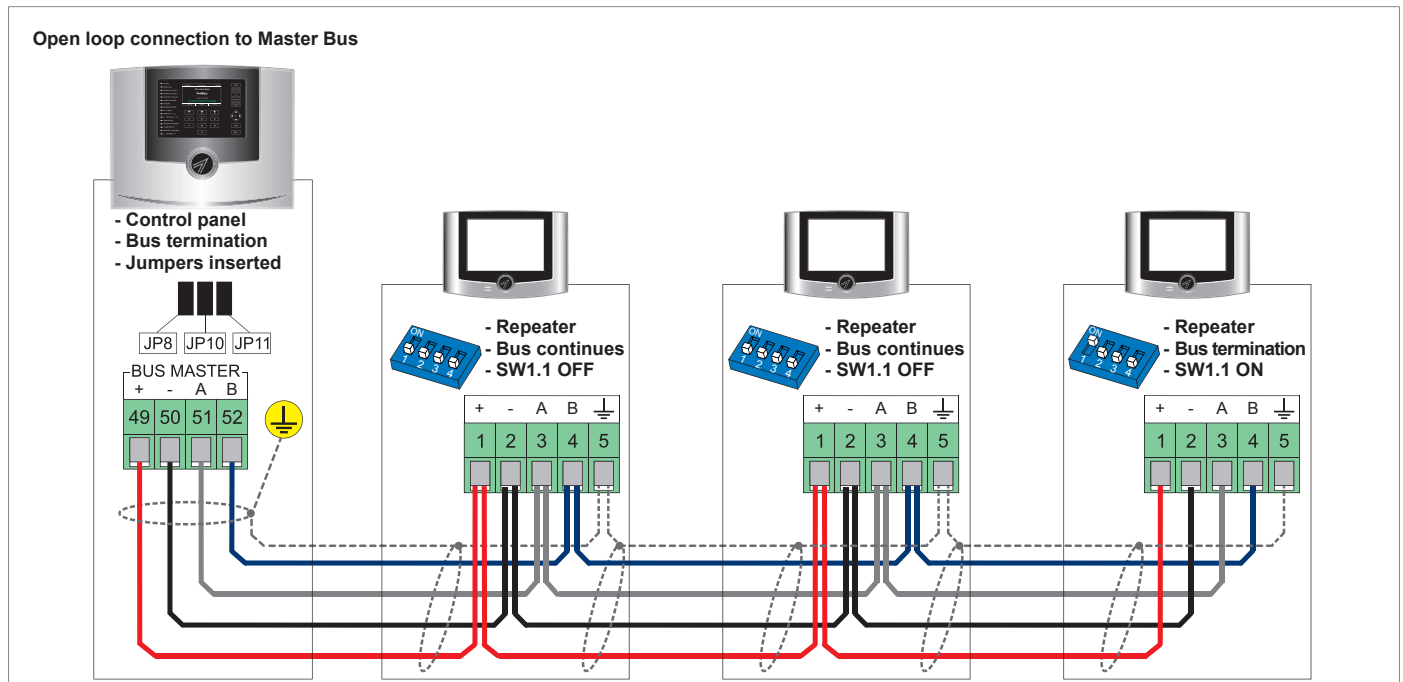


### 10-3 - RS485 bus connection

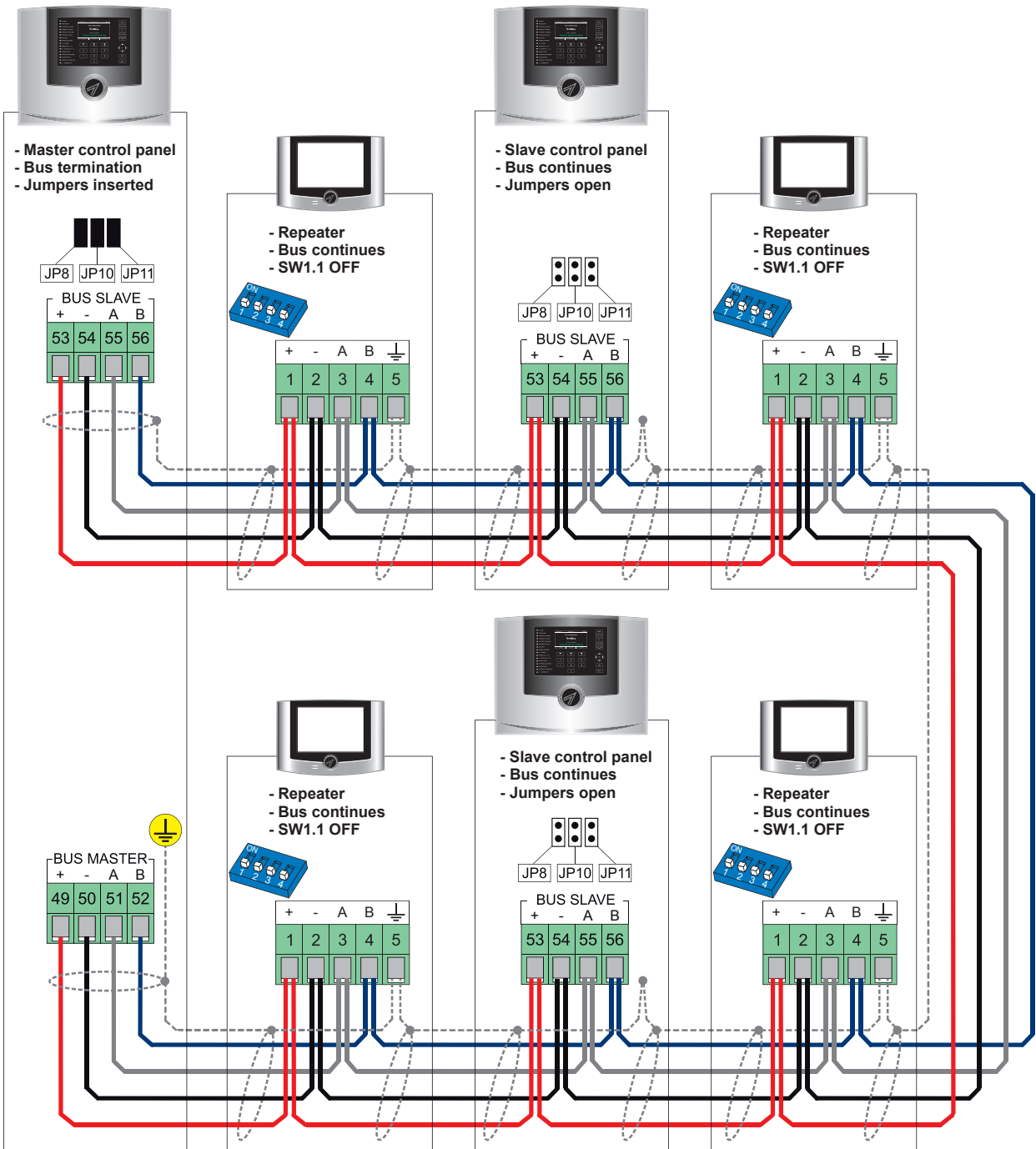
The control panel provides two RS485 ports used to connect a total of 16 expansion devices. The same serial ports can be used to connect other control panels creating a network of maximum 16 control panels. The master and slave bus can be connected in open or closed loop mode. In this latter case, the loop wired to the Master Bus port is closed on the Slave Bus port. The RS485 bus must be balanced with resistors inserted on the first and on the last device of the bus.

For Master Bus connection, it is recommended to use shielded multicore twisted-pair cables with flexible conductors. The minimum section of the conductors must be in proportion to the extension of the bus and to the consumption of the connected devices. For reasons of electrical safety, the shieldings of the cables must be connected in order not to stop their path and must be grounded inside the casing of the control panel.

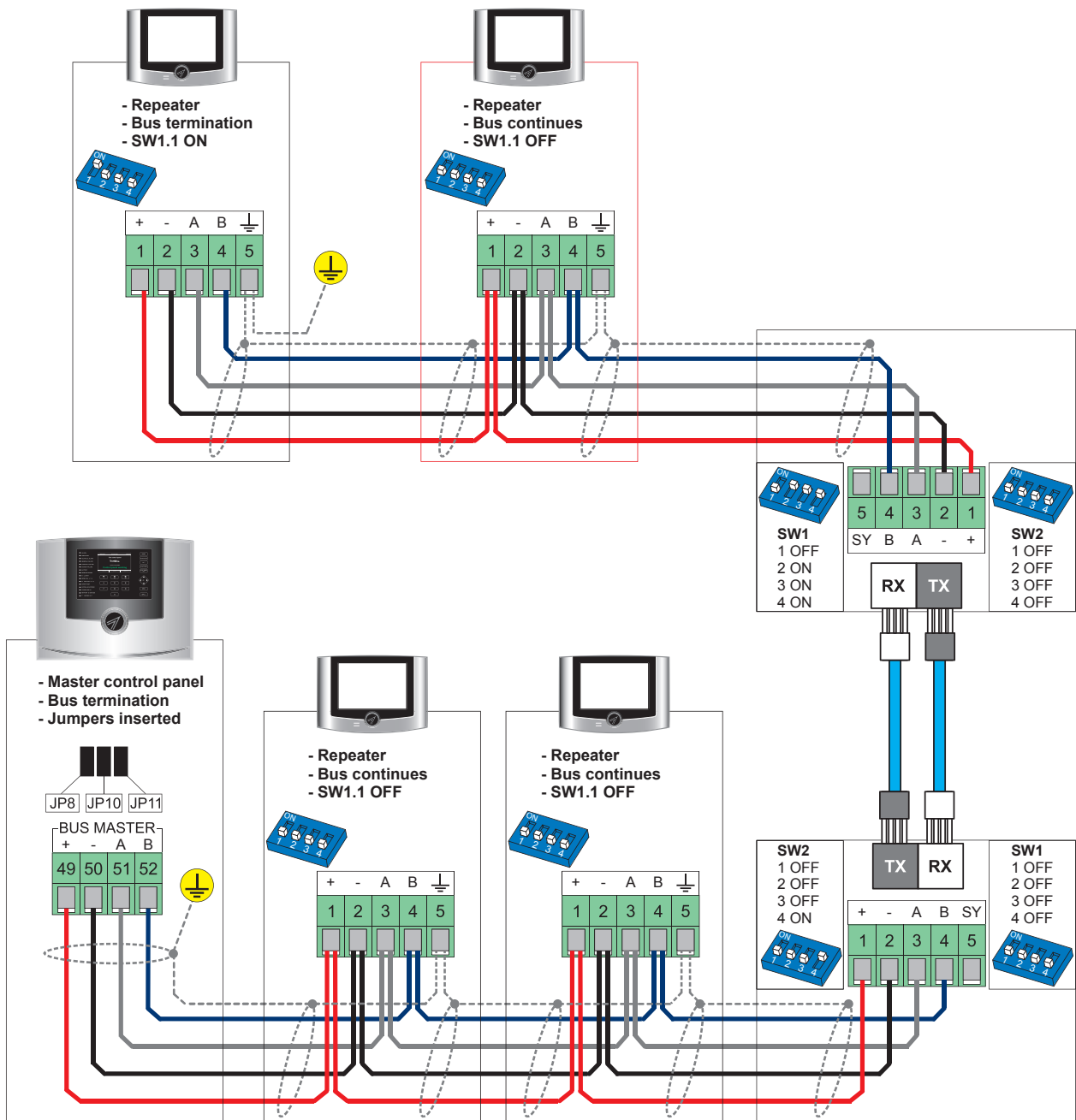
The maximum length allowed for the RS485 bus (Master Bus) is 1000m. For greater distances use a fiber optic connection by connecting a TFSFC01 RS485-fiber optic converter.



Closed loop connection to Master control panel



Connection of repeaters in open loop to Master control panel with fiber optic converter.



## 10-4 - Potentiation of the secondary power supply

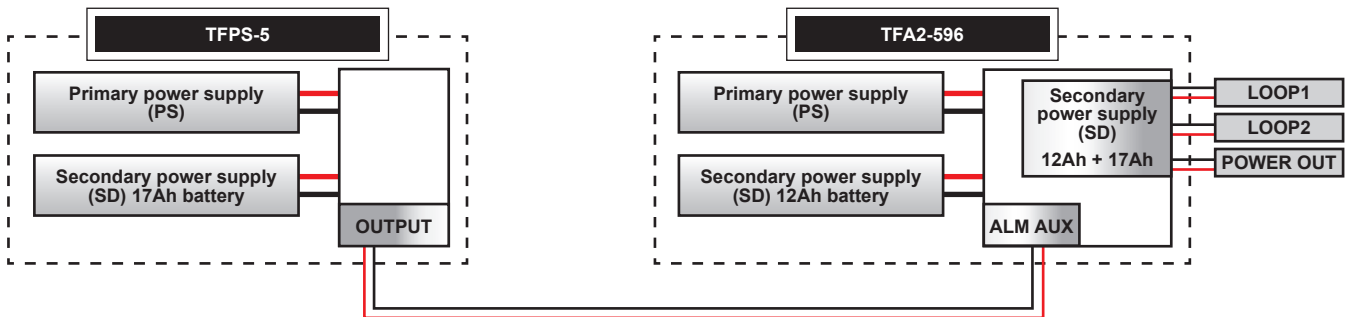
### Normative references

The European standards indicate the conditions and parameters necessary to dimension the secondary power supply on the basis of the current requirements.

The secondary power supply shall be dimensioned to ensure, in the event of main power failure, the autonomous operation of the system. The autonomy must be equal to the sum of the times required for notifying, servicing and system recovery and in any case must not be less than 24h. Moreover, the alarms should be transmitted with devices certified to EN 54-21 to one or more recipients. On expiry of the minimum autonomy, the secondary power supply shall ensure in any case the operation of the system for at least another 30 minutes starting from the issue of the first alarm.

### Additional power supply source

In the case where the consumption of the system exceeds the available current of the battery, it becomes necessary to connect an additional power supply. For this purpose, the control panel is equipped with dedicated terminals for the connection of one or more power supplies TFPS-5, compliant to EN 54-4. The operation of the TFPS-5 connected on the loop is supervised by the system and therefore it is sufficient to connect the output of the power supply directly to the ALM AUX input of the control panel.

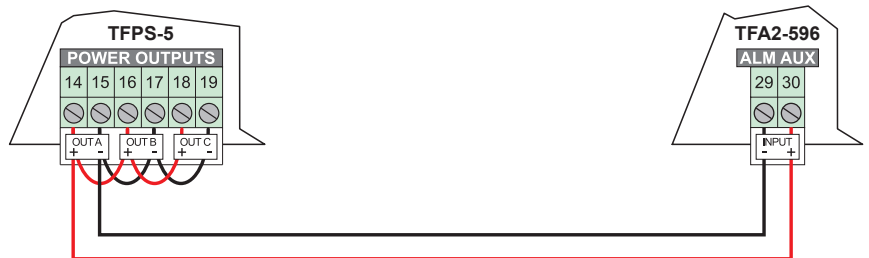


## 10-5 - TFA2-596 additional power supply connection

### Connection of one additional power supply

The outputs OUT A, OUT B and OUT C of the TFPS-5 power supply must be connected in parallel and must then be connected to the terminals 29 and 30 of the control panel.

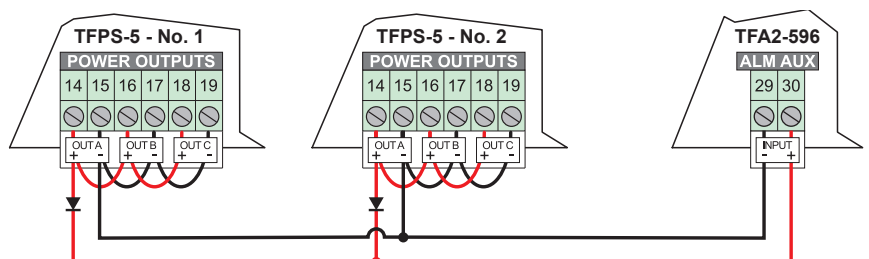
TOTAL CURRENT PROVIDED	
TFA2-596	12Ah
TFPS-5	17Ah
<b>Total</b>	<b>29Ah</b>



### Connection of two or more additional power supplies

The outputs of each TFPS-5 power supply must be connected in parallel. The negative voltages of the power supplies must be connected in common, the positive voltages must be uncoupled with a Schottky diode SB1240 (12A-40V) and downstream must be connected in common. The resulting pair of wires must be connected to the terminals 29 and 30 of the control panel.

TOTAL CURRENT PROVIDED	
TFA2-596	12Ah
TFPS-5 - No. 1	17Ah
TFPS-5 - No. 2	17Ah
<b>Total</b>	<b>46Ah</b>



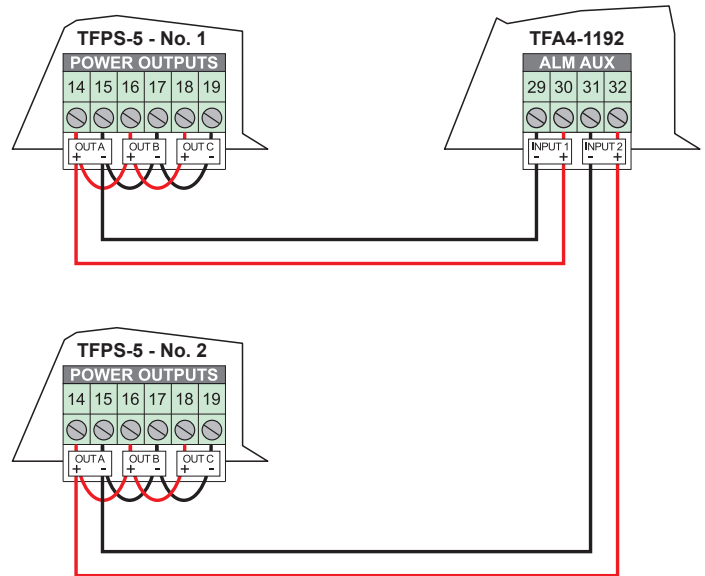


## 10-6 - TFA4-1192 additional power supply connection

### Connection of one or two additional power supplies

The outputs OUT A, OUT B and OUT C of each TFPS-5 power supply must be connected in parallel and must then be connected one to the terminals 29 and 30 and the other to the terminals 31 and 32 of the control panel.

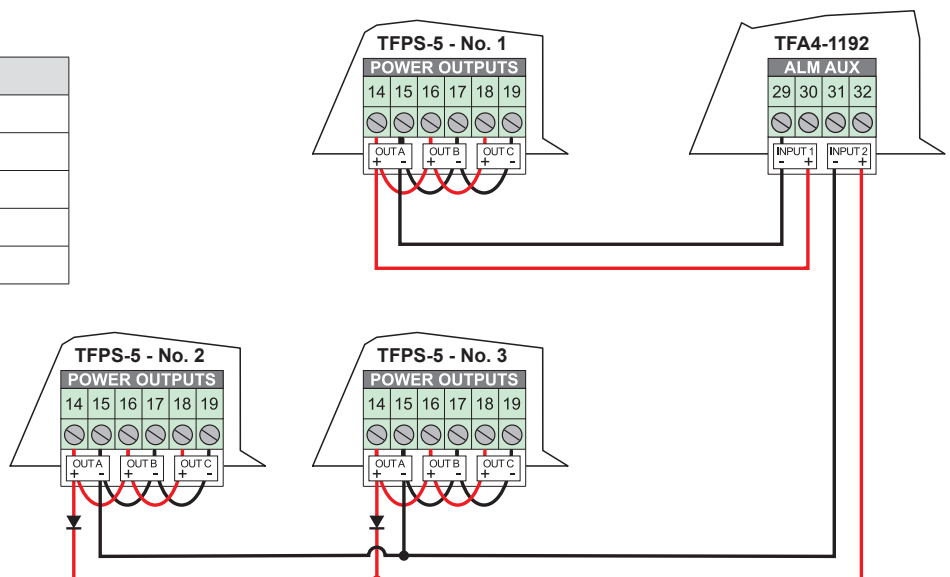
TOTAL CURRENT PROVIDED	
TFA4-1192	12Ah
TFPS-5 - No. 1	17Ah
TFPS-5 - No. 2	17Ah
<b>Total</b>	<b>46Ah</b>



### Connection of two or more additional power supplies

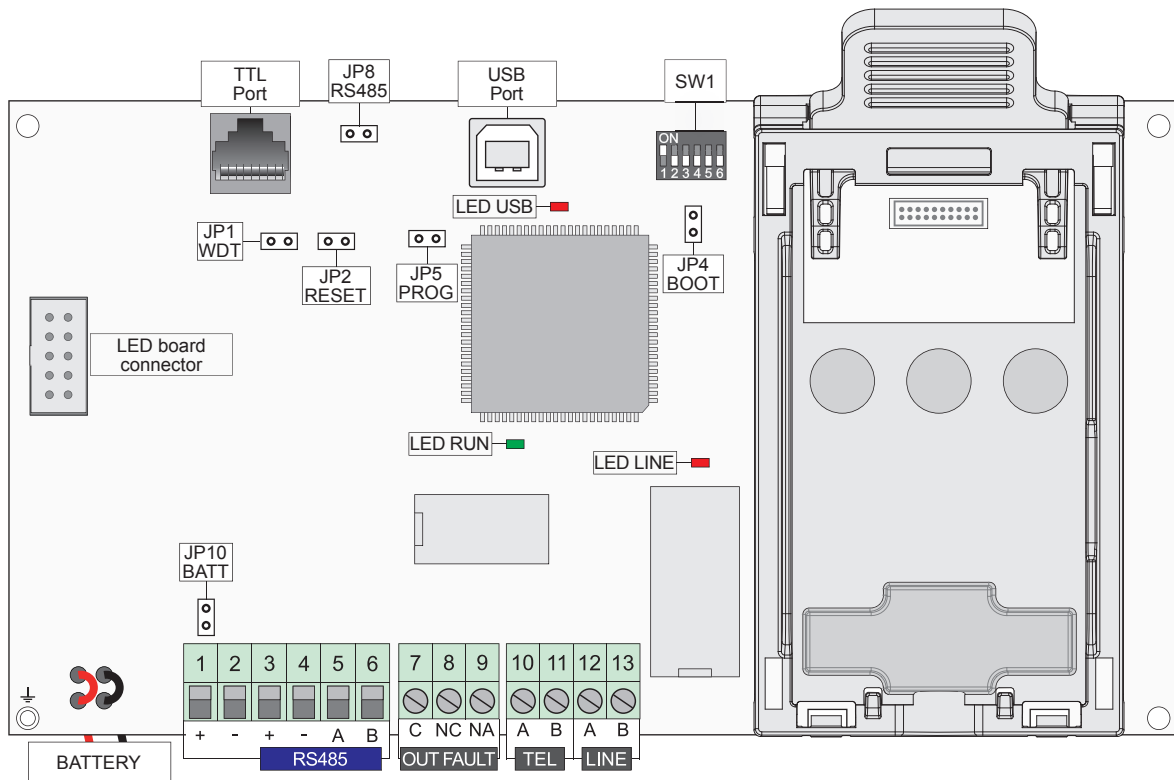
The outputs of each TFPS-5 power supply must be connected in parallel. The positive and negative voltages of the first power supply must be connected to the terminals 29 and 30 of the control panel. The negative voltages of the other power supplies must be connected in common, their positive voltages must be uncoupled with a Schottky diode SB1240 (12A-40V) and downstream must be connected in common. The resulting pair of wires must be connected to the terminals 31 and 32 of the control panel.

TOTAL CURRENT PROVIDED	
TFA4-1192	12Ah
TFPS-5 - No. 1	17Ah
TFPS-5 - No. 2	17Ah
TFPS-5 - No. 3	17Ah
<b>Total</b>	<b>63Ah</b>



## 10-7 - Telephone communicator

The electronics of the TFCOM telephone communicator are divided into two parts, the CPU board and the LED board.



RS485 serial bus		Notes
1	Positive power supply voltage	24V DC power supply input
2	Negative power supply voltage	
3	Positive power supply voltage	24V DC power supply output
4	Negative power supply voltage	
5	Channel A serial bus	Serial bus communication channels
6	Channel B serial bus	

Failure output		Notes
7	Common contact	Failure relay output with free contact PTC protected (I max. 0.75A)
8	Normally closed contact	
9	Normally open contact	
<b>N.B.</b> The state indicated for the terminals 8 and 9 is in the condition of unpowered telephone communicator. With the telephone communicator powered, the state of the terminals is reversed: terminal 8 is in NO state and terminal 9 is in NC state		

Telephone line		Notes
10	<b>A (TEL)</b> Telephone line output A	PSTN telephone line (DC)
11	<b>B (TEL)</b> Telephone line output B	
12	<b>A (LINE)</b> Telephone line input A	
13	<b>B (LINE)</b> Telephone line input B	

EN 54

**Warning:** the failure output OUT FAULT (terminals 7, 8, 9) is not supervised (type J according to EN 54-1 nomenclature) and therefore, in accordance with EN 54-2, should not be used to control transmission devices for failure alarm.  
In accordance with EN 54-21, the serial bus power supply consists of two pairs of power supply terminals (terminals 1, 2, 3, 4).



LED		Signaling
LED RUN	Green	Flashing = normal operating conditions
LED LINE	Red	On = PSTN telephone line busy
LED USB	Red	On = USB cable connected

END-OF-SERIAL BUS	
	Insert on the last device of the serial bus

PROTECTION AGAINST DEEP DISCHARGE		
		Automatic battery disconnection for Vbat <8.9V DC
		Protection against deep discharge disabled

**Key jumpers**

Special high-level procedures, such as firmware upgrade, reset of the configuration etc., require the use of specific jumpers available on the CPU board of the telephone communicator:

**JP1 WDT** - The jumper disables the WATCHDOG circuit of the telephone communicator.  
 In normal operating conditions, the jumper must always be open.  
 In some procedures, such as firmware upgrade via serial port, the jumper must temporarily be closed.

**JP2 RESET** - The jumper is used to reset and restart the microprocessor.  
 In normal operating conditions, the jumper must always be open.  
 In some procedures, such as firmware upgrade, the jumper must temporarily be closed.

**JP4 BOOT** - The jumper is used to perform the firmware upgrade via USB port.  
 In normal operating conditions, the jumper must always be open.

**JP5 PROG** - The jumper is used to perform the firmware upgrade of the telephone communicator.  
 In normal operating conditions, the jumper must always be open.  
 During firmware upgrade via serial port, the jumper must temporarily be closed.

**Supervision of jumpers**

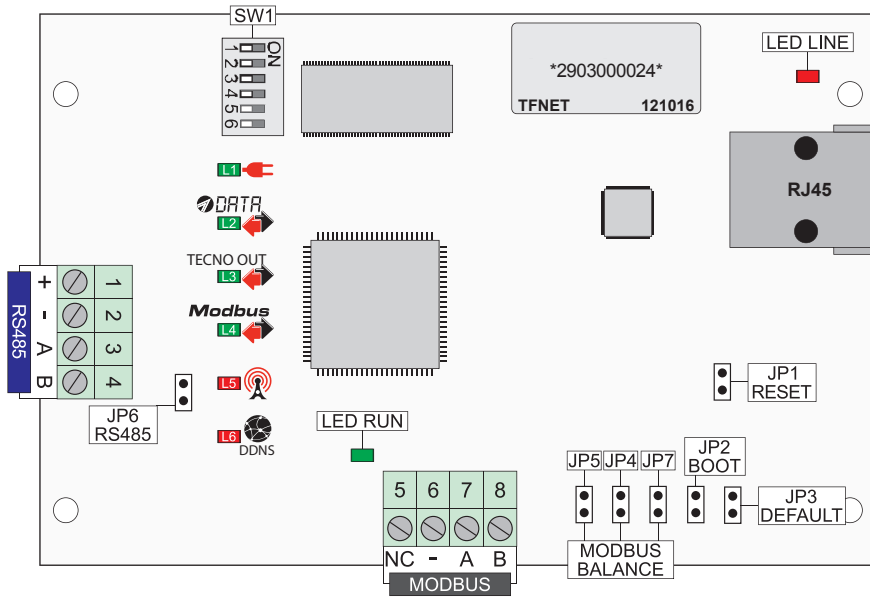
The telephone communicator oversees the open or closed state of the jumpers to prevent that they are forgotten in the wrong position after use, causing potential undesirable behaviors or malfunctioning of the telephone communicator.  
 The telephone communicator notifies the condition of anomaly to the control panel.

SPECIAL PROCEDURES		
<b>JP1 - WDT</b> <b>JP2 - RESET</b> <b>JP4 - BOOT</b> <b>JP5 - PROG</b>	Leave open during normal operating conditions (jumpers reserved for firmware upgrade and reset the configuration)	Supervised position

SW1	Address													
	Address	SW1.1	SW1.2	SW1.3	SW1.4	SW1.5	SW1.6	Address	SW1.1	SW1.2	SW1.3	SW1.4	SW1.5	SW1.6
	0	OFF	OFF	OFF	OFF	OFF	OFF	9	ON	OFF	OFF	ON	OFF	OFF
	1	ON	OFF	OFF	OFF	OFF	OFF	10	OFF	ON	OFF	ON	OFF	OFF
	2	OFF	ON	OFF	OFF	OFF	OFF	11	ON	ON	OFF	ON	OFF	OFF
	3	ON	ON	OFF	OFF	OFF	OFF	12	OFF	OFF	ON	ON	OFF	OFF
	4	OFF	OFF	ON	OFF	OFF	OFF	13	ON	OFF	ON	ON	OFF	OFF
	5	ON	OFF	ON	OFF	OFF	OFF	14	OFF	ON	ON	ON	OFF	OFF
	6	OFF	ON	ON	OFF	OFF	OFF	15	ON	ON	ON	ON	OFF	OFF
	7	ON	ON	ON	OFF	OFF	OFF	16	OFF	OFF	OFF	OFF	ON	OFF
	8	OFF	OFF	OFF	ON	OFF	OFF							

N.B. The address 0 disables the telephone communicator. Accepted addresses range from 1 to 16. All the other addresses are reserved.

### 10-8 - External Ethernet interface



RS485				MODBUS			
1	2	3	4	5	6	7	8
+	-	A	B	NC	-	A	B
RS485				MODBUS			
1	+	Positive power supply voltage for serial bus		5	NC	Not connected (terminal not used)	
2	-	Negative power supply voltage for serial bus		6	-	Negative reference voltage	
3	A	Channel A serial bus		7	A	Channel A Modbus	
4	B	Channel B serial bus		8	B	Channel B Modbus	

Ethernet connector RJ45				LED		Signaling	
1	White/green	5	White/blue	LED RUN	Green	Flashing = normal operating conditions	
2	Green	6	Orange	LED LINE	Red	On = Ethernet line busy	
3	White/orange	7	White/brown				
4	Blue	8	Brown				

SPECIAL PROCEDURES		
JP1 - RESET		
JP2 - BOOT	Leave open during normal operating conditions (jumpers reserved for firmware upgrade and reset the configuration)	Supervised position
JP3 - DEFAULT		

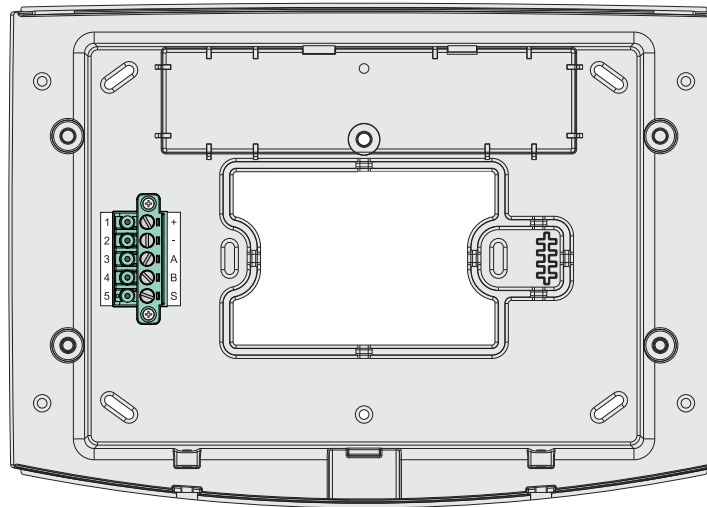
MODBUS TERMINATION		
JP4 - JP5 - JP7 MODBUS BALANCE		Modbus not terminated (unbalanced)
		Modbus terminated (balanced)

END-OF-SERIAL BUS	
JP6 RS485	Insert on the last device of the serial bus

SW1	Address													
	Address	SW1.1	SW1.2	SW1.3	SW1.4	SW1.5	SW1.6	Address	SW1.1	SW1.2	SW1.3	SW1.4	SW1.5	SW1.6
	0	OFF	OFF	OFF	OFF	OFF	OFF	9	ON	OFF	OFF	ON	OFF	OFF
	1	ON	OFF	OFF	OFF	OFF	OFF	10	OFF	ON	OFF	ON	OFF	OFF
	2	OFF	ON	OFF	OFF	OFF	OFF	11	ON	ON	OFF	ON	OFF	OFF
	3	ON	ON	OFF	OFF	OFF	OFF	12	OFF	OFF	ON	ON	OFF	OFF
	4	OFF	OFF	ON	OFF	OFF	OFF	13	ON	OFF	ON	ON	OFF	OFF
	5	ON	OFF	ON	OFF	OFF	OFF	14	OFF	ON	ON	ON	OFF	OFF
	6	OFF	ON	ON	OFF	OFF	OFF	15	ON	ON	ON	ON	OFF	OFF
	7	ON	ON	ON	OFF	OFF	OFF	16	OFF	OFF	OFF	OFF	ON	OFF
	8	OFF	OFF	OFF	ON	OFF	OFF							

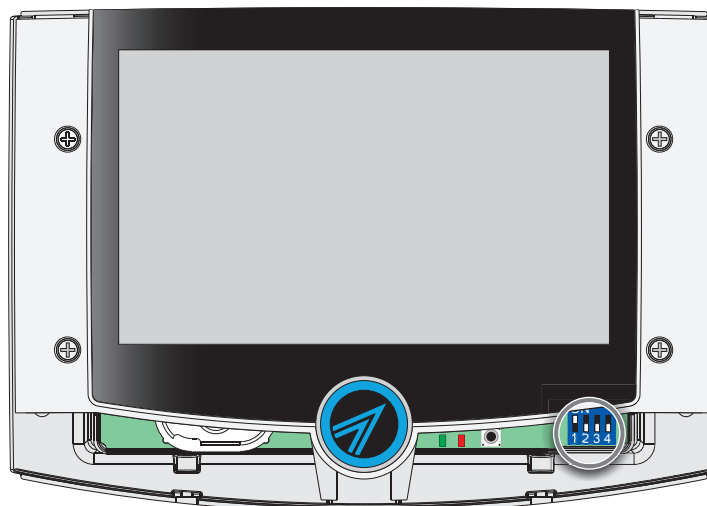
N.B. The address 0 disables the external Ethernet interface. Accepted addresses range from 1 to 16. All other addresses are reserved.

### 10-9 - Repeaters



Terminals		Description		Signal
	1	+	Positive power supply voltage for serial bus	+24V DC
	2	-	Negative power supply voltage for serial bus	-
	3	A	Channel A serial bus	Serial
	4	B	Channel B serial bus	Serial
	5	S	Cable shield connection	-

SW1	1	Bus termination
	ON	Bus terminated (only if last device)
	OFF	Bus not terminated (only if not last device)
	2	Unused (reserved)
	3	BOOT function
	ON	Programming mode (BOOT function enabled)
	OFF	Normal operating mode
	4	CLR function
	ON	Programming mode (CLR function enabled)
OFF	Normal operating mode	



NOTES

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