

Esmi Sense FDP

Fire detection panel

Installation and commissioning
manual

Part 1

O1885GB8



Document number: O1885GB8

The installation and commissioning manual is split into two parts. Part 1 (O1885GBX) includes chapters 1-5.10.3. Part 2 (O1886GBX) includes chapters 5.10.4-8.

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1 How to read this manual

1.1 Warnings and notes

The following safety-related markings are used in this document.



WARNING

Warnings are used to indicate important information about hazards, risks, or prohibited actions.

Warnings indicate hazards which, if not prevented, can result in injuries or damage to your equipment. Different warning symbols are used for different situations.



NOTE: Notes are used to indicate important information and useful tips.

Safety symbols

The following safety symbols can show in notes or warnings. Symbols for hazard, prohibited action and mandatory action:

- warn of situations that can cause environmental damage and personal injury,
- indicate an action that must not be taken, or
- indicate an action that must be taken.

	General warning symbol		Limited or restricted access
	Electrical hazard		Read the manual or instructions

1.2 Conventions used in this document

This document uses the following type conventions:

- The **bold** type highlights menu options, important concepts and key terms.
- The *italic* type highlights note text and information that shows on the display.

1.3 Glossary

This document uses the following acronyms for the various different panels or parts in the fire detection panel:

Table 1: Glossary

FDP221	Fire detection panel model
FDP252	Fire detection panel model
FDP292	Fire detection panel model
ALCB/ALC2/SLC	Loop controller (circuit board) Note: In this document, "ALC2" refers to both ALC2 and ALCB.
PS2	Power supply
MCU	Master controller unit
UIC	User interface controller
CLC	Conventional line controller (circuit board)
IOC	Input/output controller (circuit board)
OCA	Output controller A (circuit board)
CODIS/CODINET	Modem adapter
DAPX/DAP2/Esmi DAP	Delay alarm panel
FMPX/FMP2/Esmi FMP	Fireman's panel
MCOX/MCOXOB/MCO	Logical control unit
MPO, MPOX, MPOX-OB	Protocol converter
REPX/REPXOB/REP	Protocol repeater

2 Safety instructions

2.1 General safety instructions



NOTICE

**Read and obey these safety instructions.
Keep these instructions for future reference.**

This document contains important instructions that must be followed during the installation and commissioning of the fire detection panel. Read these instructions before you start the installation and commissioning process. Keep this manual near the fire detection panel for future reference.



WARNING

**Before you connect cables, disconnect all power from the fire detection panel.
First disconnect the battery power, then the mains supply.**



WARNING

**Incorrectly connected batteries can cause a short circuit, which can cause an explosion, an electric shock, or a fire.
Make sure that you connect the batteries correctly. Carefully examine the polarity of the batteries before you connect the cables.**



WARNING

**If the battery is not replaced by the correct type of battery, there is a risk of explosion.
Dispose of used batteries according to the instructions.
Use batteries 12 Ah for FDP221 and battery cabinet 4x12 Ah (YUASA NP12-12 or CSB GP12120F2).
Use batteries 17 Ah for FDP252 and battery cabinet 4x17 Ah (YUASA NP17-12I or CSB GP12170B1).**



WARNING

**Do not connect 230 Vac devices to the clean contact outputs.
If you must connect a 230 Vac device to a clean contact output, use an intermediate relay. Install the intermediate relay in a protective casing outside the fire detection panel cabinet. Install a protective diode (for example 1N4005) with the intermediate relay.**



WARNING

When you test the monitored output line, the fire alarm devices activate.
Notify all people in the building before you test the fire alarm devices.



WARNING

Connecting the alarm routing equipment is the last step in the commissioning of the fire detection panel.
Do not connect the alarm routing equipment before you have completed all other commissioning procedures.



WARNING

The installation of fire detection systems can be controlled by laws or regulations.
Obey the laws and regulations in your area.



WARNING

Do not do electrical work unless you are a qualified electrician.
If you do not obey this safety instruction, there is a risk of injury, equipment malfunction, or even death.

2.2

Security annex

The Esmi Sense FDP Fire detection panel supports centralized configuration management and remote monitoring and operation using the EcoStruxure Fire Expert online solution. In order to enable the remote management capabilities, the panel needs to have access to an Internet connection and has to be registered in the EcoStruxure Fire Expert service during commissioning, as described in the EcoStruxure Fire Expert User manual.

The panel uses its Internet connection only for contacting the management services provided by EcoStruxure Fire Expert over secured connections. The panel will not contact any third-party systems or accept any incoming connections. The management interface uses only the external Ethernet interface and has been isolated from fire detection core features, which operate independently of any online features. Unavailability of the Internet connectivity or malicious traffic in the external network do not affect the core functionality of the panel.

Schneider Electric will provide fixes to vulnerabilities discovered in components used, but installation of fixes requires that changes are approved by owner. In order to ensure the security of the panel, the person responsible for managing the panel must acknowledge and deploy the fixes in a timely manner. If the responsibility of installing security patches has not been assigned, the manufacturer cannot assure the security of the connection and it is not safe to connect the panel to the Internet.

In order to ensure the security of the panel, the instructions in the security datasheet must be followed. See the security datasheet:

https://www.se-tech.net.fi/sites/default/files/media/content/d10168gbx_security_datasheet.pdf

**WARNING**

Certain hardware configurations have additional Ethernet ports for interpanel connectivity. These interfaces are reserved for this purpose only.

Do not connect these ports to any LAN set up for another purpose and never connect any unsupported devices to the FDP dedicated network. Although the panel's interfaces have been secured against malicious traffic, the load caused by unsupported devices could affect the core features.

3 Introduction to the FDP fire detection panel

3.1 Overview of the FDP fire detection panel

The FDP fire detection panel is the control unit to your fire detection system. If your fire detection system requires additional battery life, you can install an external battery cabinet. The fire detection product line also has a map cabinet that stores all your manuals and maps close at hand.

The FDP fire detection panel comes in three different models: FDP221, FDP252, and FDP292. FDP221 comes in the smaller cabinet frame. FDP252 and FDP292 come in the larger cabinet frame. Refer to *Figure 1: The components inside the FDP fire detection panel* for more information.

You can connect 2–8 addressable loops into your FDP fire detection panel, depending on the model and the installed circuit boards.

The fire detection panel controls the addressable loops with loop controllers. For FDP, you can install two different types of loop controllers: ALCB/ALC2 ("ALC2") and SLC.



NOTE: The loop controllers ALC2 and SLC are not compatible with each other. Select loop controllers that work with your addressable detectors and other devices. For more information, contact a Schneider Electric representative.

If your fire detection panel has an SLC loop controller, the maximum number of devices on the addressable loop is 159 (addressable detectors) + 159 (other devices).

If your fire detection panel has an ALC2 loop controller, the maximum number of devices on the addressable loop is 126.

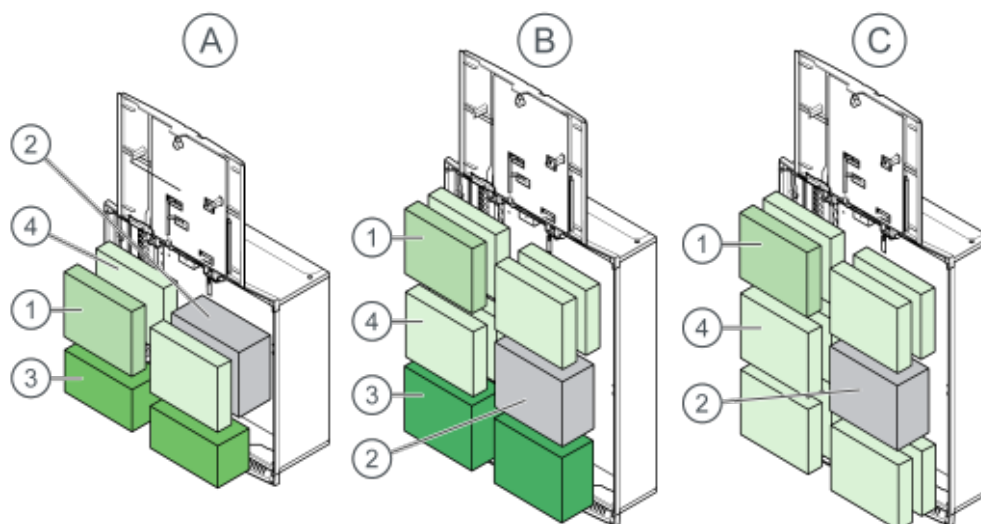


Figure 1: The components inside the FDP fire detection panel

A	FDP221	1	Master controller unit (MCU)
B	FDP252	2	Power supply (PS2)
C	FDP292	3	Batteries: 2 x 12 Ah for FDP221 (YUASA NP12-12 or CSB GP12120F2) and 2 x 17 Ah for FDP252 (YUASA NP17-12I or CSB GP12170B1)
		4	Optional circuit board slots



NOTE: In FDP221, you can install one optional circuit board on top of the power supply.

Table 2: The components of FDP221, FDP252 and FDP292

Circuit board or other component	FDP221	FDP252	FDP292
User interface controller (UIC)	1	1	1
Master controller unit (MCU)	1	1	1
Power supply (PS2)	1	1	1
Optional circuit board slots	2	5	9
Loop controller (ALC2 or SLC)	0...2	0...4	0...4
Conventional line controller (CLC)	0...2	0...4	0...4
Input/output controller (IOC)	0...2	0...4	0...4
Output controller A (OCA)	0...2	0...4	0...4
REPX-OB protocol repeater	0...1	0...1	0...1
MCOX-OB logic control unit	0...1	0...1	0...1
ZLPX-IC zone LED control unit	0...1	0...1	0...1

3.2

Operation principle of the FDP network system

You can configure the fire detection panels in the FDP network system as seeing or visible panels.

- A *seeing panel* monitors and controls all fire detection panels that have been configured as visible panels to that seeing panel.
- A *visible panel* gives information to the seeing panel that monitors and controls it.

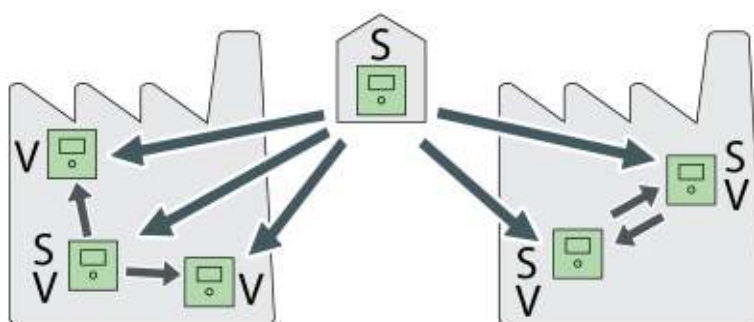


Figure 2: The relationship between seeing and visible panels

For example, in [Figure 2: The relationship between seeing and visible panels](#) there are two factory buildings and a separate control room. In the separate control room is the main seeing panel which receives data from all the other panels in the factory area. This panel does not send information to the other panels.

3.3 Operation principle of fire zones

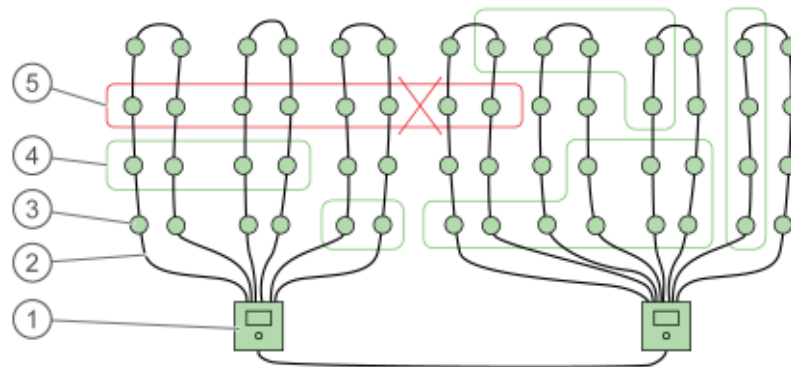


Figure 3: Operation principle of fire zones

1. The FDP fire detection panel. There can be more than one FDP in one building or a cluster of buildings.
2. An addressable loop. The maximum number of addressable loops connected to one FDP is 8.
3. An addressable device that is attached to a loop.
4. A detection zone is a combination of detectors that are usually in the same location for easier fire detection. For example, fire detectors in one floor of a building can make one detection zone.
5. The detection zones do not cover loops of different FDPs. You can only make detection zones from the detectors connected to one FDP.

3.4 Operation principle of control groups

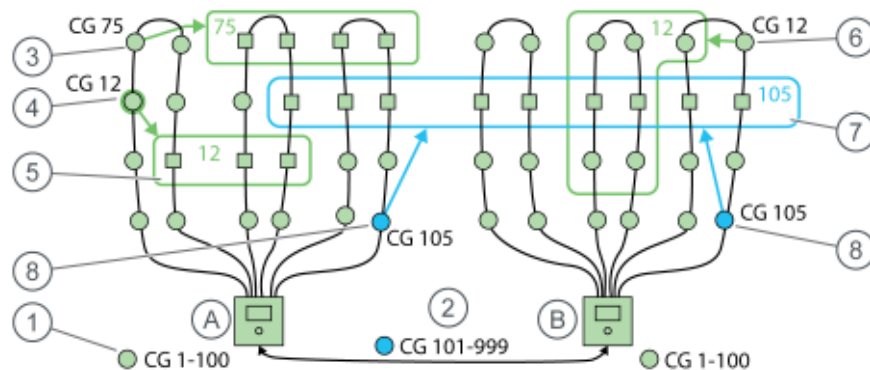


Figure 4: Operation principle of control groups

- | | | | |
|---|-----------------------------------|---|------------------------------------|
| 1 | Local control group values | 5 | Local control group |
| 2 | Global control group values | 6 | Detector at a local control group |
| 3 | Detector at a local control group | 7 | Global control group |
| 4 | Detector at a control group | 8 | Detector at a global control group |



NOTE: The numbers are control group numbers, not address numbers.

1. All panels have local control groups that are given panel-specific values 1-100.
2. Panels can have global control groups that are given values 101-999. These values are shared between all panels.
3. When a detector is given the local control group value 75, it can activate the local control group 75.
4. A detector at the local control group 12 has activated.
5. Because control group 12 is a local control group, the control group 12 activates only below panel A.
6. There is a control group 12 below panel B, but because the detector at the control group 12 activated below panel A, it does not activate below panel B.
7. A global control group can be connected to several FDP panels.
8. If one of the two detectors at the global control group 105 activates, the global control group 105 activates.

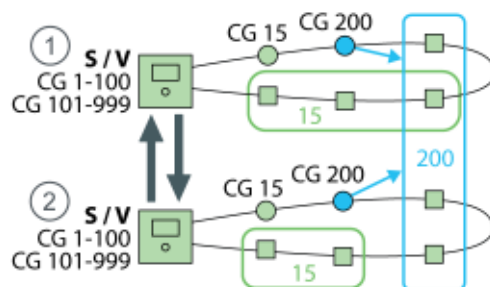


Figure 5: Two seeing and visible panels

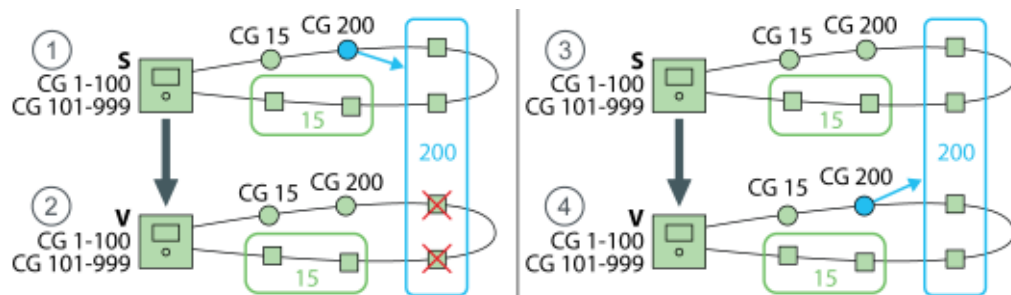


Figure 6: A seeing panel (1) and a visible panel (2)



NOTE: The numbers are control group numbers, not address numbers.

The difference between a seeing panel and a visible panel is shown in [Figure 5: Two seeing and visible panels](#) and [Figure 6: A seeing panel \(1\) and a visible panel \(2\)](#). In [Figure 5: Two seeing and visible panels](#) both fire detection panels are both seeing and visible. If a detector configured to a global control group activates below one of the two panels, the control group activates below both panels.

In [Figure 6: A seeing panel \(1\) and a visible panel \(2\)](#) panels 1 and 3 are seeing panels and 2 and 4 are visible panels. The visible panels do not receive data from the seeing panels. That is why when a detector configured to a global control group 200 below the seeing panel 1 activates, the control group members below the visible panel 2 do not activate. However, if detector 200 activates below the visible panel 4, the full global control

group 200 below panels 3 and 4 is activated, because the seeing panel 3 receives data from the visible panel 4.

3.5 Compatibility with EcoStruxure Fire Expert



EcoStruxure Fire Expert is an online application for the efficient management of Esmi Sense FDP fire detection systems. EcoStruxure Fire Expert lets you remotely monitor and manage multiple fire detection systems. The FDP fire detection system lets you commission and configure your fire detection system with EcoStruxure Fire Expert. Software installation is not necessary – access the application online at www.esmifire.com.

EcoStruxure Fire Expert supports computers, mobile phones and tablets with the latest version of Mozilla Firefox or Google Chrome.

For more information, go to www.esmi.com/fireexpert.

3.6 The fire detection panel user interface

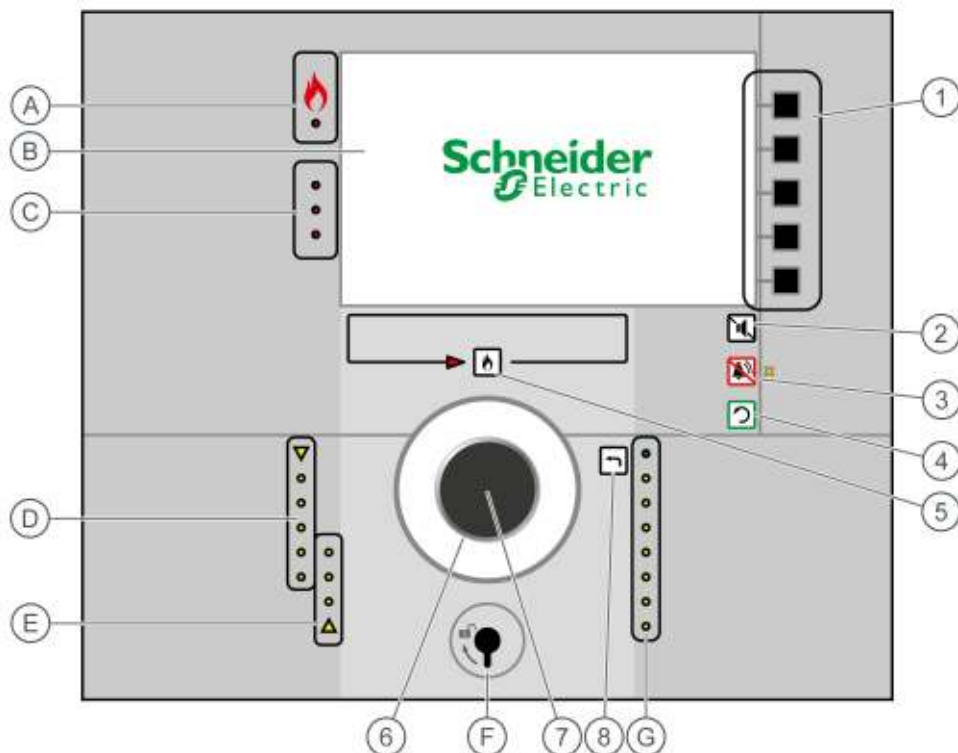


Figure 7: Fire detection panel user interface

FDP LEDs and other features	FDP buttons
A Fire/prealarm	1 Multi-function buttons Various functions that change when the view changes.
B Display	2 Buzzer silence Mutes the panel buzzer to off.
C Active outputs	3 Alarm Device silence/re-sound Set all alarm devices to off or on.
D Active faults	4 Reset Reset fire alarms, prealarms, faults, etc.
E Active disablements	5 More alarms Scroll alarms, faults, etc.
F Keyhole	6 Selection wheel Scroll alarms, faults, menu options, etc.
G Other status indications	7 Selection wheel button Select alarms, faults, menu options, etc.
	8 Escape Go to the previous view.

3.7 Access levels

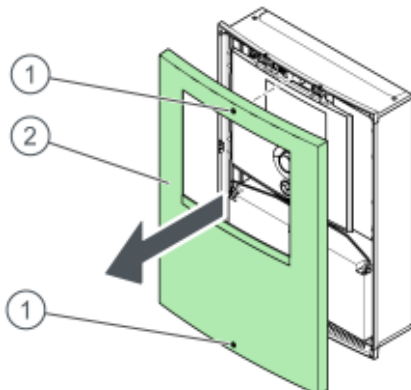
The fire detection panel has four access levels. High access levels enable more functions and require a password.

Table 3: The access levels of the fire detection panel

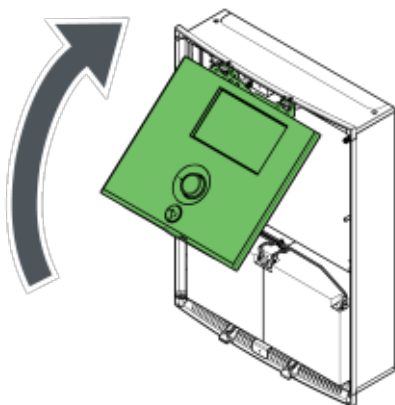
Access level	Main functions enabled on access level	How to enter level
1	- Silence the panel buzzer - Test the fire detection panel user interface - See all alarms / faults / maintenance indications	This is the basic user level without the key. Connect power to the fire detection panel to enter this level.
2	- Silence/re-sound alarm devices - Reset alarms / faults / maintenance indications - Other most common functions	Insert the key and turn clock- wise OR remove the cover of the fire detection panel.
3	Maintenance procedures	Go to the Login menu and enter the default password 5910.
4	- Reset the alarm counter - Update software - Update configuration	Go to the Login menu and enter the default password 6010.

3.8 How to access the circuit boards and assembly tray

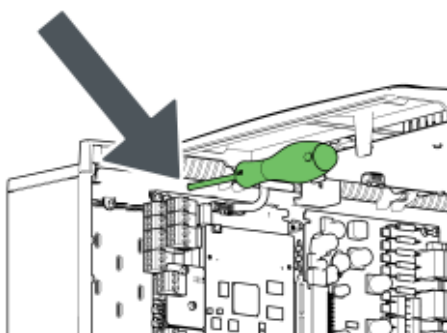
1. Loosen the two screws that hold the front panel in position.
2. Remove the front panel.



3. To access the circuit boards and assembly tray, turn the display out of the way.



4. To keep the display up, put a screwdriver in the support hole.

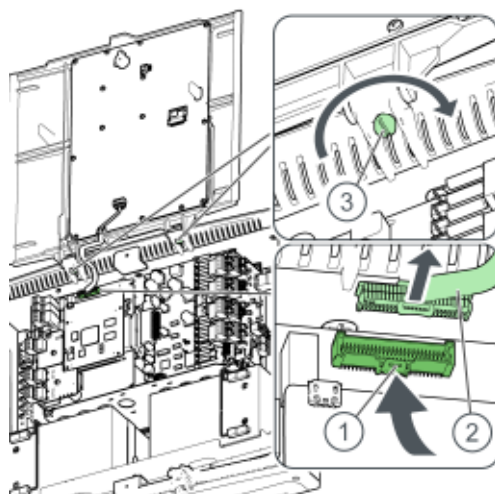


If you must remove the display, refer to [Section 3.9 How to remove the display](#).

3.9 How to remove the display

1. Push the lock mechanism.
2. Carefully remove the connector.

3. To release the hinges, turn the two plastic locking screws 90 degrees until the grooves at the end of the screws are horizontal.



3.10 Location of cable through-holes

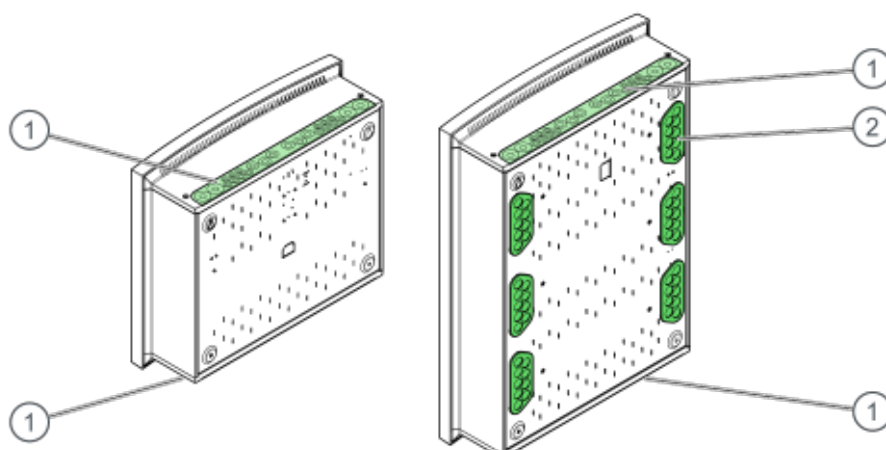


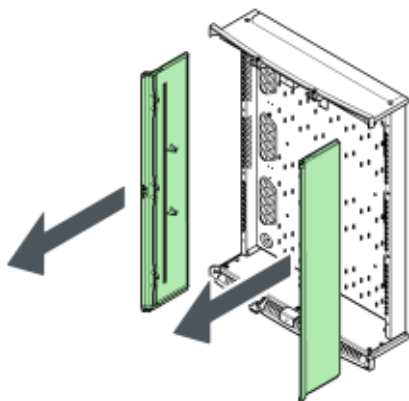
Figure 8: The location of cable through-holes in the small and large FDP frame

- | | |
|--|---|
| <p>1 Cable through-holes on the top and at the bottom</p> | <p>2 Optional cable through-holes on the back plate (only available for FDP252 and FDP292)</p> |
|--|---|

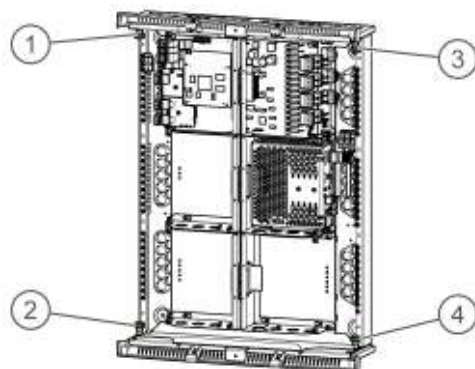
To make cable installation easier, you can remove the sides of the frame, remove the assembly tray, or turn the assembly tray out of the way with the turning mechanism.

1. Remove the front cover and turn the display out of the way. Refer to [Section 3.8 How to access the circuit boards and assembly tray](#) for more information.

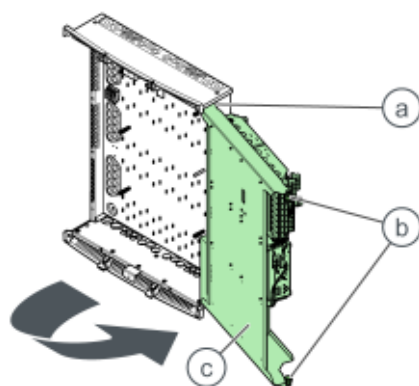
2. Pull out the sides of the frame.



3. Find the four screws in the corners of the frame.



4. To turn the assembly tray out of the way:
 - a. Loosen slightly the two screws on one side of the frame.
 - b. Loosen the two screws on the other side.
 - c. Turn the assembly tray to the side.

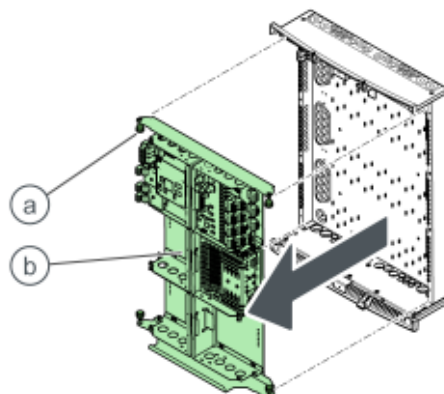


NOTE: The assembly tray turns in models FDP252 and FDP292.



NOTE: The assembly tray turns in both directions depending on how you loosen the screws.

5. To remove the assembly tray:
 - a. Loosen all four screws.
 - b. Remove the assembly tray.



3.11 Battery cabinets for FDP

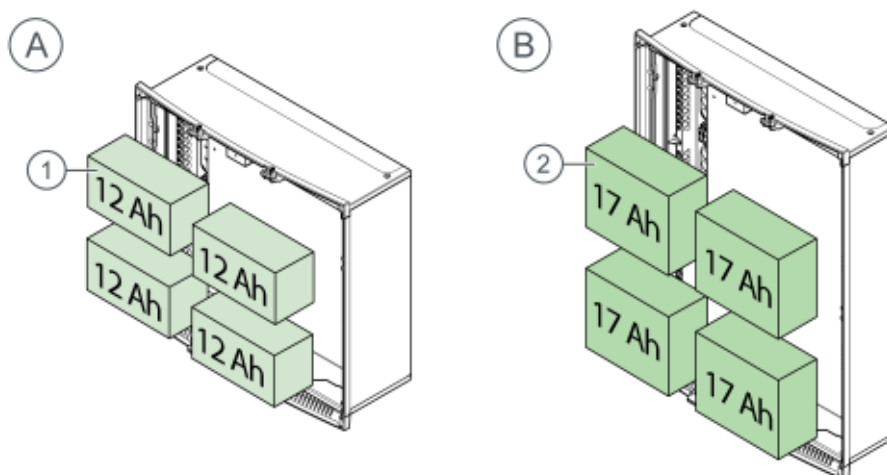


Figure 9: The battery cabinets for FDP

A	Battery cabinet 4x12 Ah	B	Battery cabinet 4x17 Ah
1	12 Ah batteries (YUASA NP12-12 or CSB GP12120F2)	2	17 Ah batteries (YUASA NP17-12I or CSB GP12170B1)

You can connect a maximum of two battery cabinets to FDP.

3.12 Map cabinets for FDP

You can store the maps of the buildings with the fire detection panel system in the map cabinets.

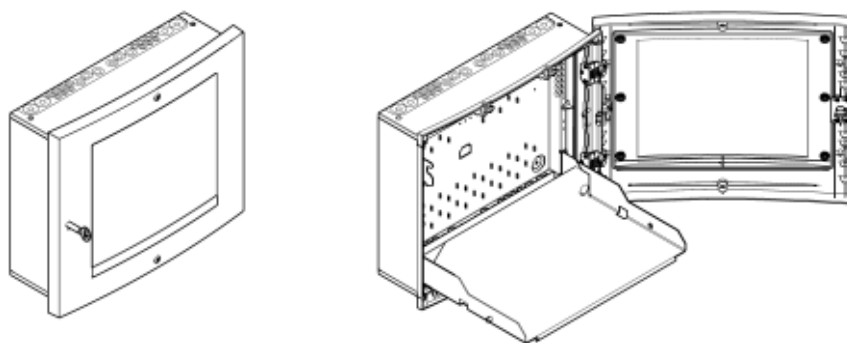


Figure 10: Map cabinet A4 for FDP 221

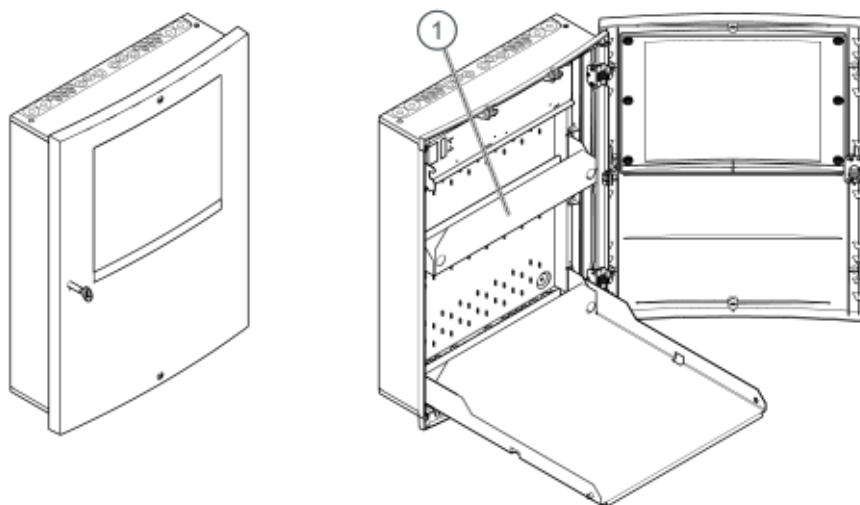


Figure 11: Map cabinet A3 for FDP 252 and 292



NOTE: The cabinet shelf (1) in the larger cabinet is an optional component that can be ordered separately.

3.13

Flush mounting frames for FDP

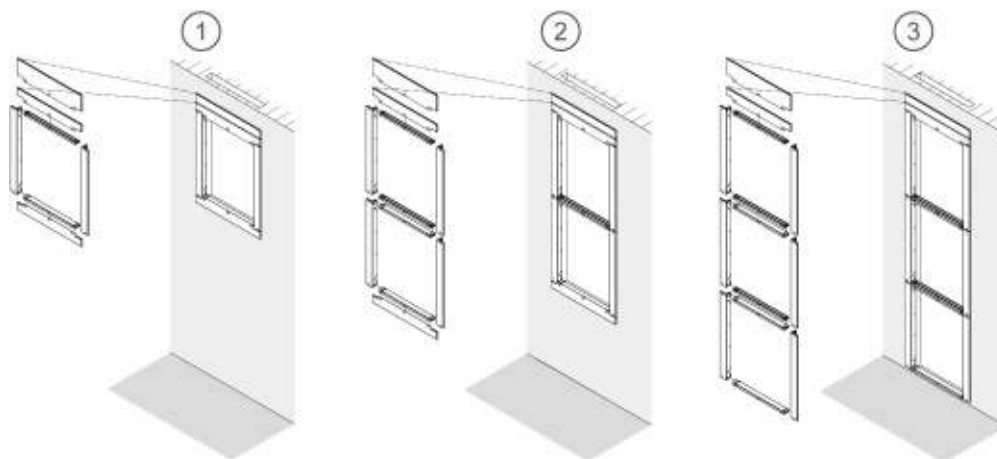


Figure 12: Flush mounting frame installation with 1, 2 or 3 frames

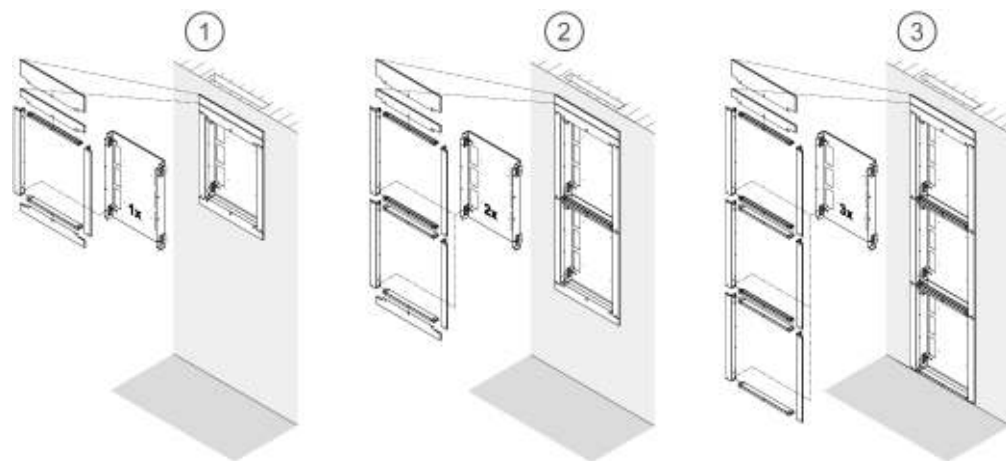


Figure 13: Flush mounting frame set installation with 1, 2 or 3 frames

Table 4: Flush mounting frame and frame set codes

FRAME MODEL/SET	CODE
FLUSH MOUNTING FRAME FDP252/292	FFS00703963
FLUSH MOUNTING FRAME SET FDP252/292	FFS00703961
FLUSH MOUNTING FRAME FDP221	FFS00703962
FLUSH MOUNTING FRAME SET FDP221	FFS00703960

4 How to install the fire detection panel onto a wall

You can install the fire detection panel directly onto a strong wall or in a mounting frame. With a mounting frame, the fire detection panel can be embedded into a wall.

The mounting surface must be flat and sufficiently strong to hold the weight of the fire detection panel and the optional battery cabinet and map cabinet.

Table 5: Weights of the FDP fire detection panel and accessory cabinets

	Without batteries [kg]	With batteries [kg]
FDP221 fire detection panel (FFS00703910)	6.6	14.6
FDP252 fire detection panel (FFS00703920)	10.6	23
FDP292 fire detection panel (FFS00703930)	11.1	-
Battery cabinet 4x12 Ah (FFS00704620)	4.8	12.8
Battery cabinet 4x17 Ah (FFS0074630)	7.2	19.6
Map cabinet A4 (FFS00704640)	5.5	-
Map cabinet A3 (FFS00704650)	7.6	-
Shelf for Map cabinet FDP A3 (FFS00704652)	0.7	-

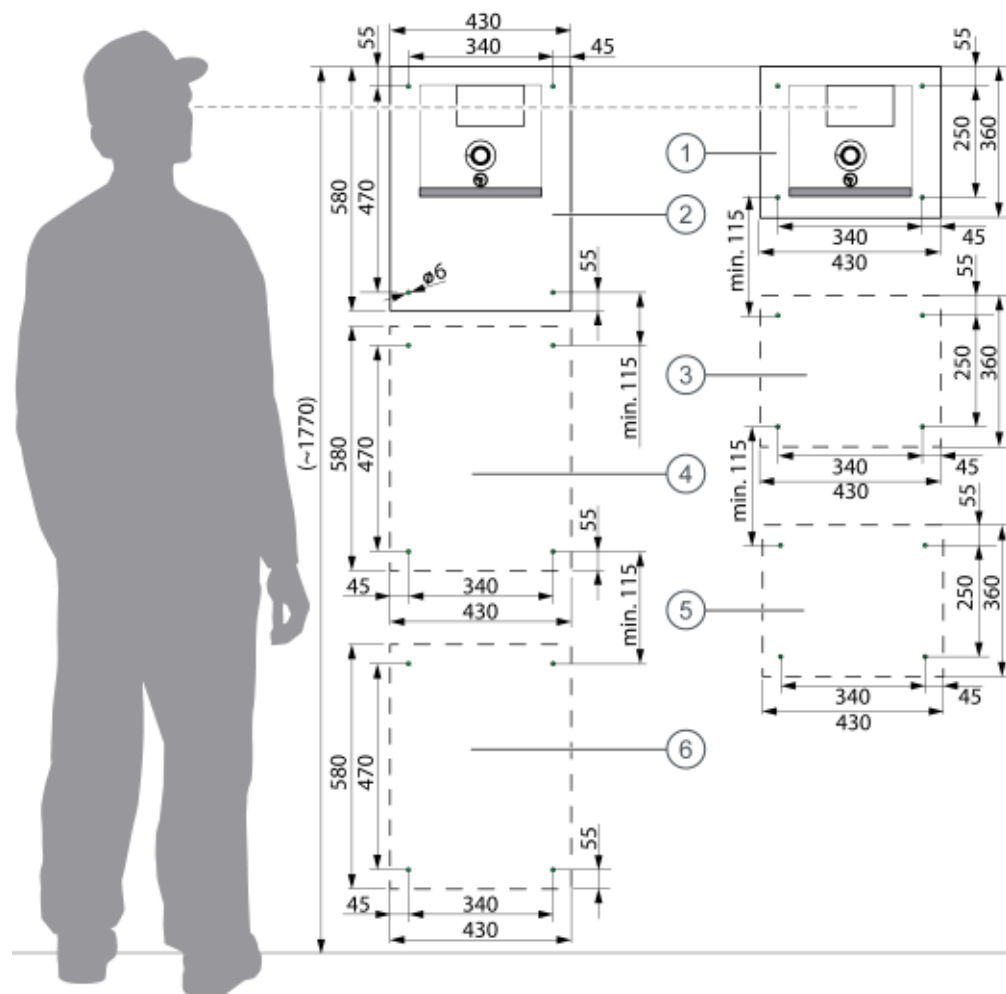


Figure 14: Suggested installation positions [mm]

- | | |
|---|---|
| 1 FDP221 | 4 Map cabinet A3 or battery cabinet 4x17 Ah |
| 2 FDP292 or FDP252 | 5 Battery cabinet 4x12 Ah |
| 3 Map cabinet A4 or battery cabinet 4x12 Ah | 6 Battery cabinet 4x17 Ah |

5 How to commission the fire detection panel

5.1 Introduction to the commissioning of the fire detection panel



WARNING

Before you connect cables, disconnect all power from the fire detection panel. First disconnect battery power, then the mains supply.



NOTE: Before you start to commission the fire detection panel, make sure that it is correctly installed. Refer to [Chapter 4 How to install the fire detection panel onto a wall](#) for more information.

Make sure that you have these devices and documents close at hand:

- FDP fire detection panel installation and commissioning manual
- FDP fire detection panel user manual
- A multimeter
- All site-specific plans and installation documents
- A PC and a USB memory stick (optional, for configuration)
- Configuration data (optional, for configuration)

These are the main steps of the commissioning process:

1. Make sure that the circuit boards are correctly assembled.
2. Connect the mains supply to the mains terminal.
3. Make sure that the fire detection panel operates correctly.
4. Install and connect the batteries.
5. Examine all cables for possible earth leaks.
6. Connect and commission the addressable loop.
7. Connect the conventional lines.
8. Connect the monitored output lines.
9. Connect the clean contact output lines.
10. Connect the 24 V power supply outputs.
11. Connect the clean contact inputs.
12. Connect your system with other FDP fire detection panels.
13. Connect INFO devices.
14. Configure the fire detection panel (if required according to your installation plan or site specific features).
15. Connect the alarm routing equipment.
16. Connect the extinguisher equipment.

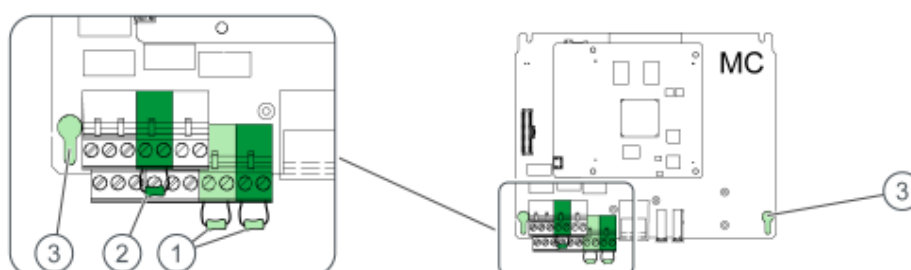
5.2 How to make sure that the circuit boards are correctly assembled

Before you connect the cables to the fire detection panel, make sure that:

- the circuit boards are accurately assembled, and
- the circuit boards have not damaged during transportation
- address jumpers are correctly set.

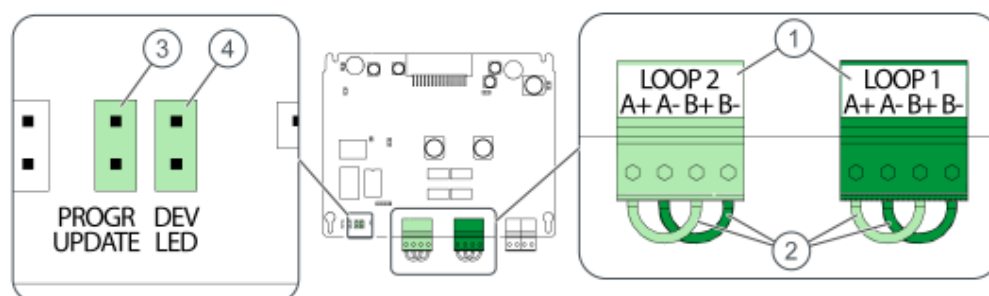
5.2.1 How to examine the MCU unit assembly

1. Make sure that there is a 4k7 resistor in both of the clean contact input terminals.
2. Make sure that there is a 4k7 resistor in the monitored output line terminal.
3. Make sure that the two locking screws at the outer corners of the MCU unit are tightened because the ground leak monitoring is done through the locking screws.



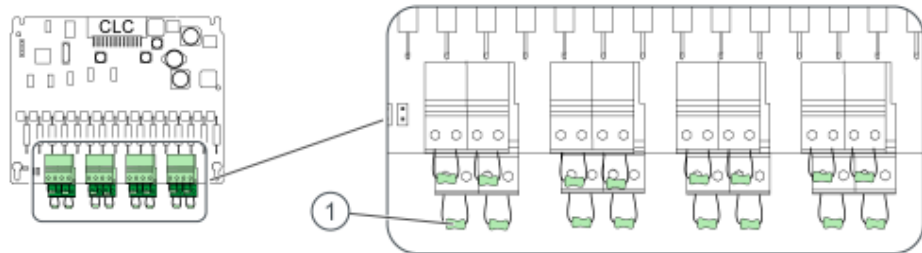
5.2.2 How to examine the ALC2 or SLC circuit board assembly

1. Look for the addressable loop terminals on the ALC2/SLC circuit board.
There are two addressable loops on each ALC2/SLC circuit board.
2. Make sure that there is a wire between the positive terminals (A+ and B+) and the negative terminals (A- and B-).
3. Make sure that the **PROGR UPDATE** jumper is **not connected**.
4. Make sure that the **DEV LED** jumper is
 - a. connected (for flashing detector LEDs), or
 - b. not connected (for non-flashing LEDs).



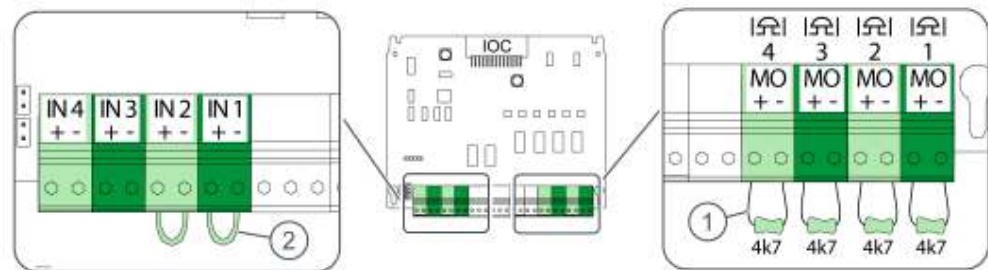
5.2.3 How to examine the CLC circuit board assembly

1. Make sure that there is a 4k7 resistor in all of the 16 conventional line terminals.



5.2.4 How to examine the IOC circuit board assembly

1. Make sure that the four monitored output terminals all have a 4k7 resistor.
2. Make sure that two of the four clean contact input terminals are connected with a loop wire.



5.2.5 How to set addresses for the circuit boards

The circuit boards ALC2, SLC, CLC, IOC and OCA have address jumpers. ALC2, SLC and CLC make one group, and IOC and OCA make another group. The groups are numbered separately from 1-4 each. Set an address for each circuit board in your fire detection panel (for example, SLC-1, SLC-2, CLC-3, CLC-4 or IOC-1, OCA-2) with these address jumpers. The MCU unit identifies all circuit boards by their address jumper settings.

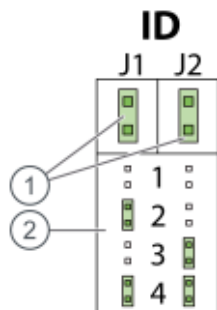


Figure 15: Options for address jumper settings in ALC2, SLC, CLC and OCA

1. Address jumpers J1 and J2
2. How to set addresses 1-4

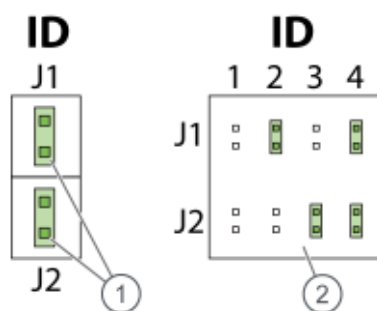


Figure 16: Options for address jumper settings in IOC

1. Address jumpers J1 and J2
2. How to set addresses 1-4

5.3 How to connect the mains supply to the mains terminal



WARNING

Do not connect the mains supply to the mains terminal unless you are a qualified electrician.

Failure to obey this safety instruction can cause injury, equipment malfunction, or even death.



NOTE: The cable size for the mains supply is 3 x 1.5 mm². Use a separate 10 A fuse for the mains supply (230 Vac).

Refer to [Figure 17: How to connect the mains supply to the mains terminal](#) for instructions on how to connect the mains supply to the mains terminal.

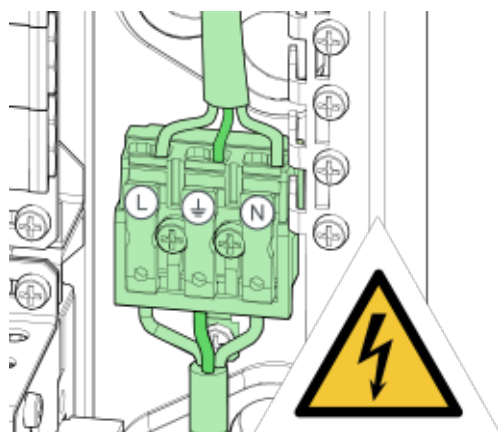


Figure 17: How to connect the mains supply to the mains terminal



NOTE: When all addressable detectors and devices and all fire detection panel outputs are connected, the maximum 24 V current consumption of the fire detection panel is 1.0 A during standby operation (no active fire alarms or faults) and 4.8 A during a fire alarm. The minimum standby time for the fire detection system can be controlled by laws or regulations. The required standby time can limit the maximum load for the outputs.

5.4 How to make sure that the fire detection panel operates correctly

Before you connect the batteries or cables to the fire detection panel, do a test run to make sure that the fire detection panel operates correctly and was not damaged during transportation. The fire detection panel starts for the first time when you connect the mains supply to the PS2 mains terminal.

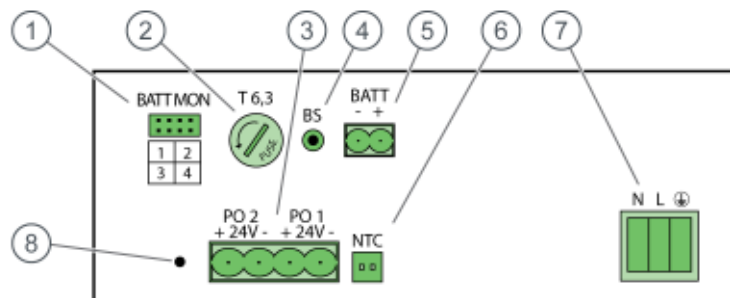


Figure 18: The power supply PS2

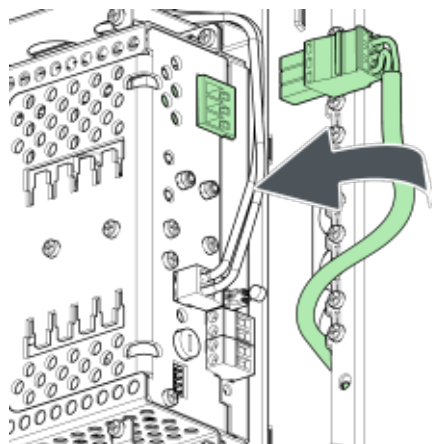
- | | | | |
|---|---|---|----------------------------------|
| 1 | Terminals for the battery monitoring devices (optional) | 5 | Terminal for battery cable |
| 2 | Battery fuse, T 6.3 A | 6 | Battery temperature sensor |
| 3 | Power supply outputs PO1 and PO2 (24 V) | 7 | PS2 mains terminal |
| 4 | Battery start button | 8 | Factory assembly adjustment only |



NOTE: If you must start your FDP for the first time with only battery power, first connect the batteries and then push the **Battery start** button. For the location of the **Battery start** button, refer to Figure 18: The power supply PS2.

Procedure:

1. Connect the mains connector to the power supply (PS2) to turn the fire detection panel on.



2. Wait approximately 60 seconds while the display remains black. Then the *Panel starting up message* shows on the display, followed by the message, *Please wait while FDP is starting*.

Do not try to operate the fire detection panel when it is starting up.

After a short period, the fire detection panel shows a battery fault, because the batteries are not installed.

3. The panel buzzer gives a continuous alarm and the Fault LED flashes.
4. To silence the panel buzzer, push the **Buzzer** button.
The fire detection panel indicates another fault for missing configuration data.
5. To reset the fault for missing configuration data, push the **Reset** button until the buzzer goes silent (approximately 5 seconds).

After this, the mains supply is connected, the fire detection panel operates correctly, and you can continue to install and connect the batteries.



NOTE: If the test run does not go as described in this section, contact a Schneider Electric representative.

5.5 How to install and connect the batteries

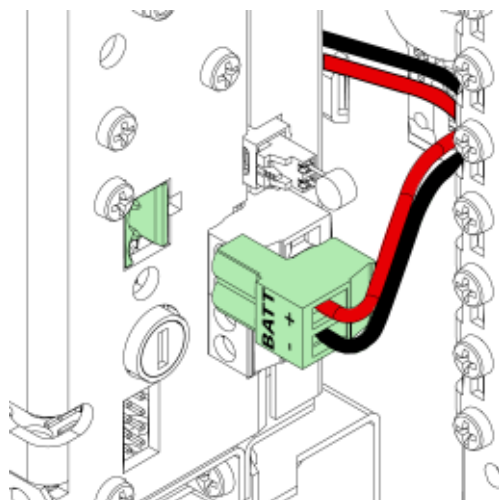


WARNING

Incorrectly connected batteries can cause a short circuit, which can cause an explosion, an electric shock or a fire.

Make sure that you connect the batteries correctly. Carefully examine the polarity of the batteries before you connect the cables.

1. Make sure that the battery connector is disconnected from the battery terminal on the PS2 power supply.
2. If you are installing a battery cabinet with a battery monitoring device, refer to [Section 5.5.1 Battery monitoring device for battery cabinets](#) for more information.



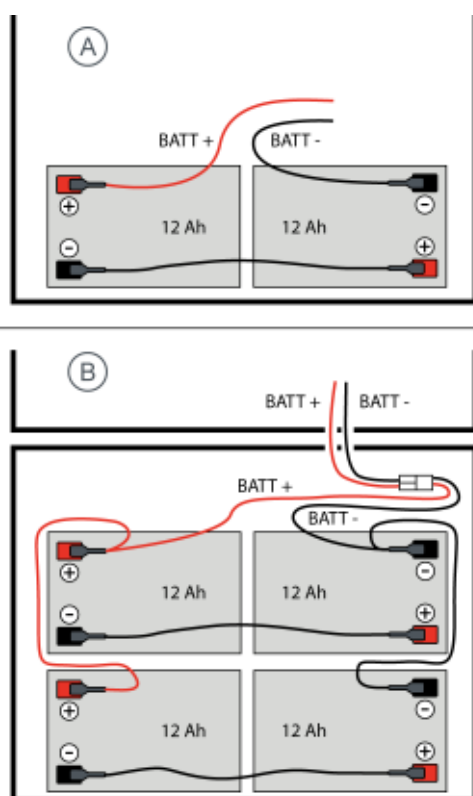
3. *For FDP221:* Install the 12 Ah batteries sideways. Connect the battery cables to the poles of the batteries.

Connect the batteries inside the fire detection panel in series (A).

If you have a separate battery cabinet in your fire detection system, install all batteries in the battery cabinet. Connect the two main batteries in series. Connect possible extra battery pairs in series and connect the pairs in parallel with the main batteries (B).



NOTE: When you have a separate battery cabinet, the maximum length of the connecting cable is 1.5 m. The minimum thickness of the connecting cable is 1.5 mm².



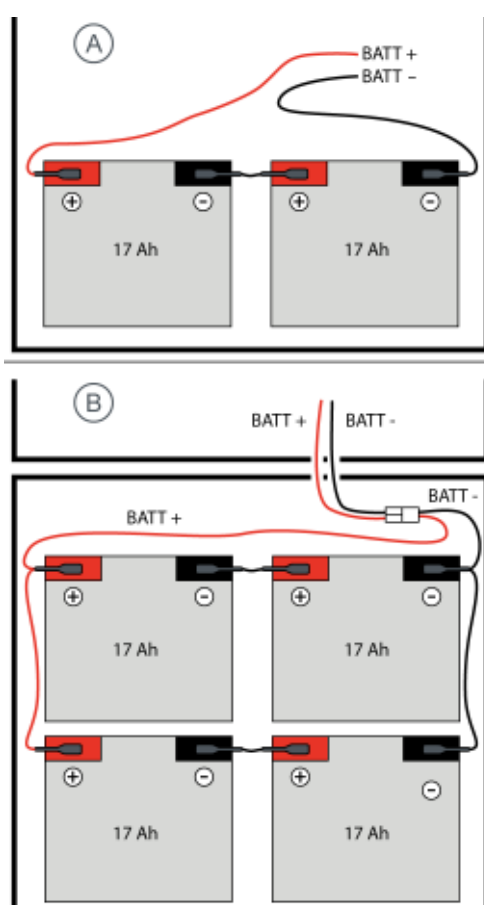
4. *For FDP252 and FDP292:* Install the 17 Ah batteries. Connect the battery cables to the poles of the batteries.

Connect the batteries inside the fire detection panel in series (A).

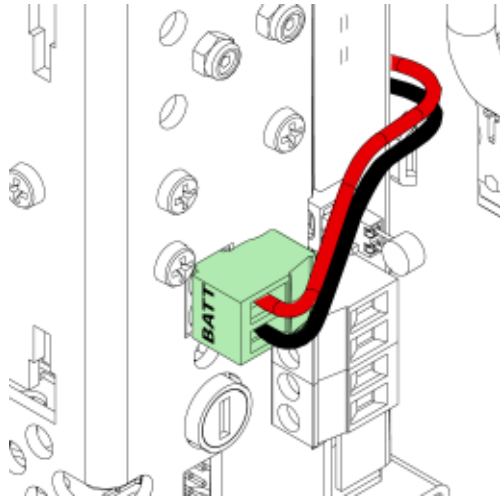
If you have a separate battery cabinet in your fire detection system, install all batteries in the battery cabinet. Connect the two main batteries in series. Connect possible extra battery pairs in series and connect the pairs in parallel with the main batteries (B).



NOTE: When you have a separate battery cabinet, the maximum length of the connecting cable is 1.5 m. The minimum thickness of the connecting cable is 1.5 mm².



5. Connect the battery connector to the battery terminal on the PS2 power supply.



The fire detection panel still indicates a battery fault.

6. To reset the battery fault, push the **Reset** button until the buzzer goes silent (approximately 5 seconds).
After this, the batteries are connected.

5.5.1 Battery monitoring device for battery cabinets

If you connect a battery cabinet to your FDP, you can install an optional battery monitoring device (FFS00702548). With the battery monitoring device, the FDP gives a fault warning if batteries are disconnected or removed. One battery monitoring device monitors two pairs of batteries.

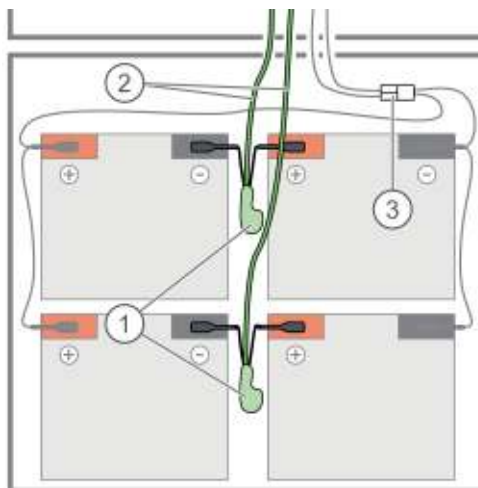


Figure 19: FDP battery monitoring device

- 1 Optional battery monitoring device
- 2 Connection to the PS2 power supply
- 3 Battery cable terminal block with a fuse

Attach the connection to the PS2 power supply to the **BATT MON** connector according to [Figure 20: The location of the battery monitor connector](#).

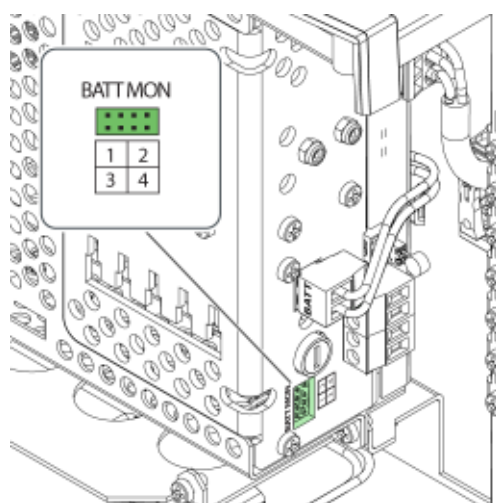


Figure 20: The location of the battery monitor connector



NOTE: To activate the external battery monitor, you must configure it first.

5.5.2

Remote temperature sensor for the battery cabinet

If you connect a battery cabinet to your FDP, you can install an optional remote temperature sensor (FFS00702553). With the remote temperature sensor, the FDP adjusts the battery voltage using the battery cabinet temperature.

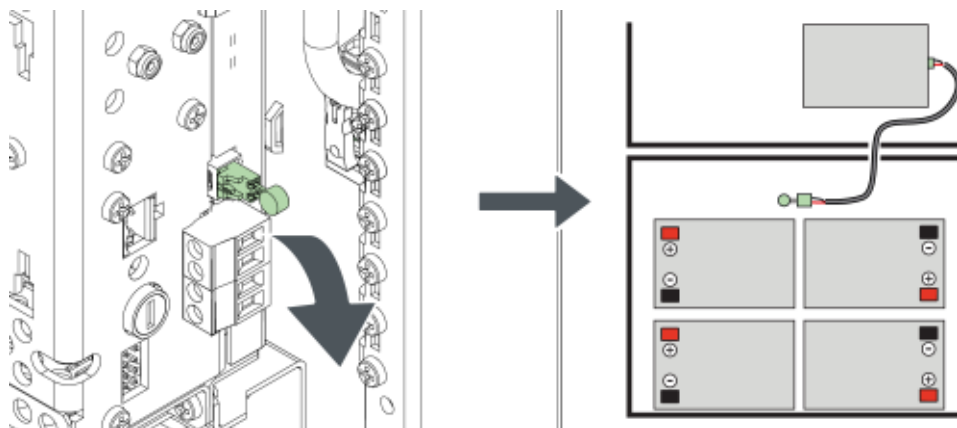


Figure 21: Remote temperature sensor for the battery cabinet



NOTE: There is a temperature reading on the power supply monitoring view. It shows the internal temperature of the PS2 power supply, not the battery temperature. The battery temperature is only used to compensate the charger voltage if the temperature changes.

5.6 Cabling specifics

Table 6: Cabling specification for the fire detection panel

Cable connection	Conductors x area	Max length	Comments
Addressable loop (SLC)	2 x 0.5 mm ² + shield 2 x 1.0 mm ² + shield	810 m (60 Ω) 1,600 m (60 Ω)	The maximum cable resistance of the addressable loop is 60 Ω. The maximum capacitance is 180 nF between the conductor and shield. 360 nF between conductors. The maximum voltage drop is 6 V.
Addressable loop (ALC2)	2 x 0.5 mm ² + shield 2 x 1.0 mm ² + shield	810 m (60 Ω) 1,600 m (60 Ω)	The maximum cable resistance of the addressable loop is 60 Ω. The maximum capacitance is 180 nF between the conductor and shield. 360 nF between conductors. The maximum voltage drop is 9 V.
Conventional line (CLC)	2 x 0.5 mm ² + shield 2 x 1.0 mm ² + shield	1,200 m (100 Ω) 2,400 m (100 Ω)	The maximum cable resistance of the conventional line with an Exi barrier is 50 Ω (100 Ω without an Exi barrier). The maximum capacitance of the cable is 0.5 µF.
Sub-detection circuits of conventional zone modules (SLC)	Sub-detection circuits of conventional zone modules	1,200 m (100 Ω)	Conventional zone modules EM210E-CZ, EM210E-CZR, M512ME and conventional detectors or conventional manual call points.
Sub-detection circuits of conventional zone modules (ALC2)	Sub-detection circuits of conventional zone modules	600 m (50 Ω)	Conventional zone module EMI-310-CZ/EMI410-CZ and conventional detectors or conventional manual call points.
24 Vdc power to conventional zone modules	2 x 0.5 mm ² + shield 2 x 1.0 mm ² + shield	600 m (50 Ω) 1,200 m (50 Ω)	Cable resistance max. 50 Ω.
Conventional Exi area sub-loop unit (1)	2 x 0.5 mm ² + shield 2 x 1.0 mm ² + shield	600 m (50 Ω) 1,200 m (50 Ω)	The total resistance from the fire detection panel through the address module to the Exi barrier is max. 50 Ω. If the power supply is brought to several units through the same cable, the length of this part must be multiplied with the number of units when comparing it to the maximum length.
Conventional Exi area sub-loop unit (2)	2 x 0.5 mm ² + shield	150 m	The loop resistance from the Exi barrier to the most distant conventional detector is max. 12 Ω. The loop capacitance is max. 390 nF.
Serial communication (INFO devices)	3 x 0.5 mm ² + shield	1,000 m	A plug-in with 1 RS485 port. Refer to Section 5.17.1 How to install an INFO device plug-in for more information.
Serial communication (FDP network)	Cable 1: 4 x 0.5 mm ² + shield Cable 2: 4 x 0.5 mm ² + shield	1,000 m	A plug-in with 2 RS485 ports. Refer to Section 5.16.1 How to install an Ethernet/RS485 plug-in for more information. Connect the isolated GND terminals in RS485 with a signal wire, not with the shield.
Ethernet plug-in for FDP network	Cable: cat5 or better	100 m	A plug-in with 2 Ethernet ports. Refer to Section 5.16.1 How to install an

Cable connection	Conductors x area	Max length	Comments
			Ethernet/RS485 plug-in for more information.
Clean contact inputs	2 x 0.5 mm ²	2,000 m	-
Clean contact outputs	2 x 0.5 mm ² / 2 x 1.0 mm ²	Calculated separately	The equipment that receives the contact signal can have restrictions on cable properties. Load controlled by the relay output can limit the allowed resistance and length for each cross-section. The relay contact rating is 30 Vdc / 1 A.
Monitored output lines (fire bells, sounders, fault buzzer line)	2 x 0.5 mm ² / 2 x 1.0 mm ² / 2 x 2.5 mm ²	Calculated separately	Select the cable according to the maximum allowed voltage drop.
Addressable monitor modules (SLC: monitor line)	2 x 0.5 mm ² + shield	600 m (50 Ω)	Monitor modules M500ME, M503ME, M501ME, EM210E, EM220E, EM221E.
Addressable control modules (SLC: power supply, alarm line)	2 x 0.5 mm ² / 2 x 1.0 mm ² / 2 x 2.5 mm ²	Calculated separately	Control modules M500CHE, EM201E, EM221E, M201 and M201E240. The number and distances of the relay control modules give the conductor area and length of the power supply cable.
Addressable monitor modules (ALC2: monitor line)	2 x 0.5 mm ² + shield	600 m (50 Ω)	Monitor modules EMI-310, EMI-310+, EMI-311, EMI-311/240, EMI-333, -EMI-410, EMI-410+, EMI-411. Mini monitor modules 55000-833 APO, 55000-832 APO, 55000-765 APO
Addressable control modules (ALC2: power supply, alarm line)	2 x 0.5 mm ² / 2 x 1.0 mm ² / 2 x 2.5 mm ²	Calculated separately	Control modules EMI-301, EMI-311, EMI-311/240, EMI-301S, EMI-333, EMI-401, EMI-401S, EMI-411.
Mains supply to mains terminal	3 x 1.5 mm ²	-	Mains connection: 230 ±10 % Vac, 50–60 Hz maximum power 165 W separate fuse 10 A

5.7 How to examine the signal cables for possible earth leaks



NOTE: Do not use an isolation resistance meter to measure resistance. Use a multimeter.

An earth leak in the signal cables means that:

- the outer plastic sleeve of the cable is damaged
- the cable shield is in connection with the construction of the building at an addressable device
- there may be water on detector bases, modules or cables.

To find possible earth leaks, measure the resistance of the addressable loop cables and other signal cables before you connect them.

5.7.1 Steps to examine the signal cables for possible earth leaks

1. Make sure that all power is disconnected from the fire detection panel.
2. Remove the outer plastic sleeve of the cable.
3. If the wires are shielded with a conductive layer, such as a metal foil shield, remove it until the outer plastic sleeve.

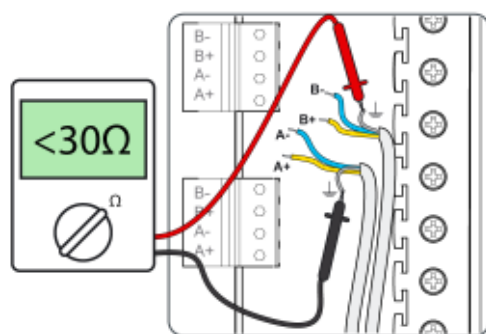


NOTE: Do not let pieces of the metal foil shield fall onto the component board. Identify the wires to make sure that you recognize them.

4. Remove the outer plastic sleeves of the wire ends.
5. If the cable is shielded, do steps 6–11. If the cable is not shielded, do steps 10–11.
6. Measure the resistance between the shield cables. The resistance must be lower than 30 Ω .



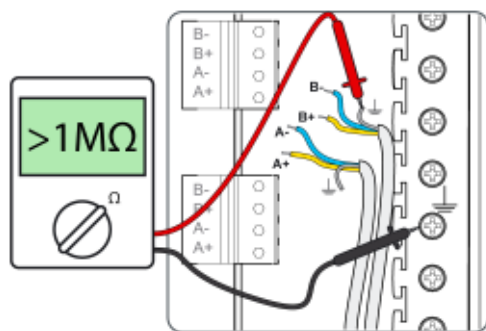
NOTE: If the resistance is significantly greater than 30 Ω , there is a wiring mistake in the cable or it is broken.



7. Measure the resistance between the cable shield and cabinet ground. If you are measuring the addressable loop, make sure that you measure both ends of the shield.



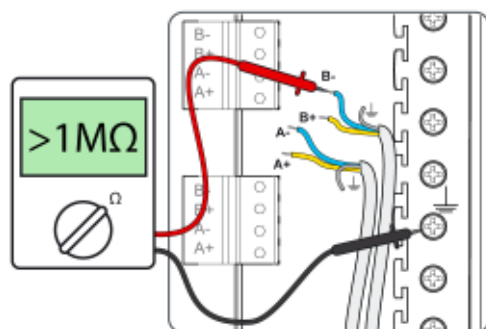
NOTE: The resistance between the shield and the cabinet ground must be more than 1 M Ω . If the resistance is smaller, the cable shield has an earth leak. Repair the possible earth leak.



8. Measure the resistance between the cable shield and each signal wire.

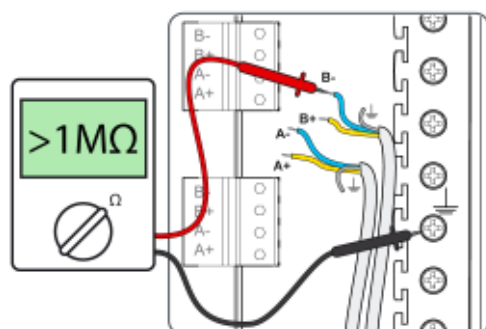


NOTE: The resistance between the cable shield and each signal wire must be more than 1 MΩ. If the resistance is smaller, the wire has an earth leak.



9. Find and repair the possible earth leak.
10. Measure the resistance between each signal wire and the cabinet ground. If you are measuring the addressable loop, make sure that you do this step again on the other end.

The resistance between each signal wire and the cabinet ground must be more than 1 MΩ. If the resistance is smaller, the wire has an earth leak.



11. Find and repair the possible earth leak.

5.8 How to connect the addressable loop

Before you connect the addressable loop to the fire detection panel, make sure that the wires of the addressable loop are in good condition and not in short circuit with the surroundings or with each other.

5.8.1 Steps to do functional verification on the addressable loop wires

Use a multimeter to examine the wires of the addressable loop.



NOTE: If the devices on your addressable loop have short-circuit isolators, the multimeter indicates an incorrect resistance level.

The multimeter shows the resistance only until the first short-circuit isolator.

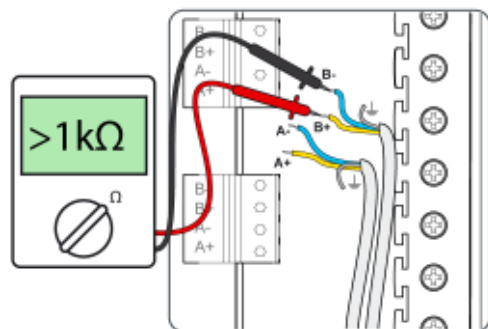
If your fire detection panel has an **ALC2 loop controller**, the short-circuit isolators are on the negative wire. The negative wire shows incorrect results for resistance.

If your fire detection panel has an **SLC loop controller**, the short-circuit isolators are on the positive wire. The positive wire shows incorrect results for resistance.

Procedure:

1. Measure the resistance between the + and - wires of the addressable loop cable.
Make sure that you connect the positive probe of the multimeter with the positive wire.

The resistance must be more than 1 k Ω . If the resistance is smaller, the cause is an incorrectly connected loop device, or a short-circuit isolator.

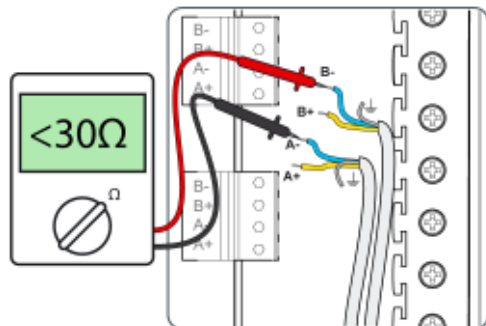


2. Find and repair possible faults.
3. Measure the resistance between both ends of the negative wire of the addressable loop cable.



NOTE: To get correct results, only measure the negative wire (if your device has an SLC loop controller) or the positive wire (if your device has an ALC2 loop controller).

The resistance must be less than 30 Ω .



4. Do step 3 again for the positive wire.

5. Compare the resistance of the + and - wires.

The maximum difference between the resistances of the + and - wire is 5 Ω .

The maximum allowed resistance of the + and - wires put together depends on the load of the addressable loop. The load of the address loop must be calculated separately.



NOTE: The maximum loop resistance is the sum of the resistance for the + and - wires (< 30 Ω per wire). Therefore, the possible range of the maximum loop resistance is 5–60 Ω .

6. Find and repair possible faults.

5.8.2

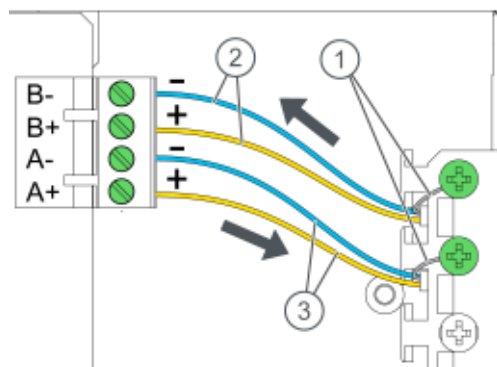
Steps to connect the addressable loop to the ALC2/SLC circuit board

1. If the addressable loop cable is shielded, connect the cable shields to the nearest grounding screw on the back plate.



NOTE: Make sure that you connect the cable shields tightly. The visible part of the shield should be as short as possible.

2. Connect the input wires (- and +) to the B- and B+ terminals.
3. Connect the output wires (- and +) to the A- and A+ terminals.



5.9

How to commission the addressable loop

The fire detection panel has a commissioning mode, in which the usual fire detection panel functions are not available.

When you start the commissioning mode, the fire detection panel scans the addressable loops continuously in order to identify all connected devices. (In normal mode, the loop scanning is done only once at loop start up.)



NOTE: By default, the fire detection panel only scans the A wire of the addressable loop. If there is a short circuit on the addressable loop, the scan cannot be completed. The scan runs only up to the short circuit isolator closest to the short circuit. After you repair the short circuit, the scan continues automatically.

5.9.1 How to activate the commissioning mode

1. Push the selection wheel button to open the main menu.
2. Go to access level 4. For instructions, refer to [Section 3.7 Access levels](#).
3. Go to **Menu > Tests > Commissioning mode**.
4. Push the selection wheel button to activate the commissioning mode.

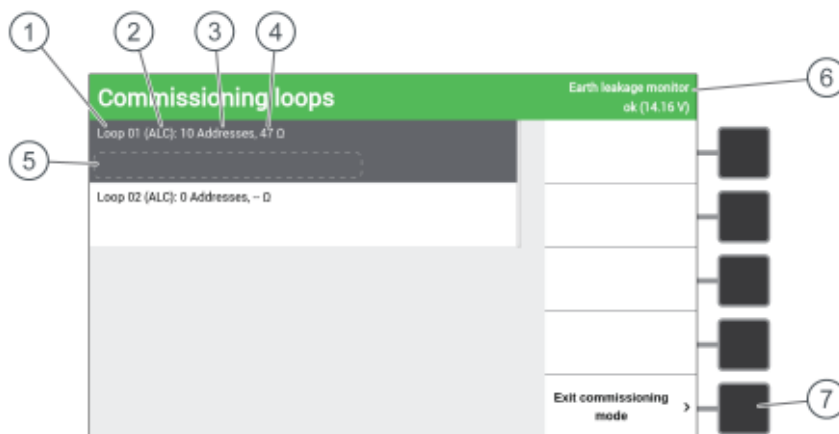
Stopping normal mode... shows on the display.

Starting commissioning mode... shows on the display.

Scanning loops... shows on the display.

5. Wait until the *Commissioning loops* view shows on the display.

The *Commissioning loops* view shows the loops, the loop type, the number of addresses in each loop, and the loop resistance (Ω). Information on possible faults, for example a break or a short circuit in the addressable loop, shows under the loop information. The earth leakage value (V) shows at the top of the display (monitored continuously).



- | | | | |
|---|---------------------------------|---|----------------------------------|
| 1 | Loop | 5 | Information on possible faults |
| 2 | Loop type | 6 | Earth leakage value (V) |
| 3 | Number of addresses in the loop | 7 | Exit commissioning mode soft key |
| 4 | Loop resistance (Ω) | | |

6. Push the **Exit commissioning mode** soft key to exit the commissioning mode.
- Resuming normal operations...* shows on the display.
7. Wait until the main menu shows on the display.

5.9.2 How to view the addressable detectors and devices

1. Turn the selection wheel to go to the loop in the *Commissioning loops* view.
2. Push the selection wheel button to open the loop information.
- The found addresses show on the display.
3. Turn the selection wheel to scroll the rows of addresses.
- The found addresses have a number. Missing addresses are empty.

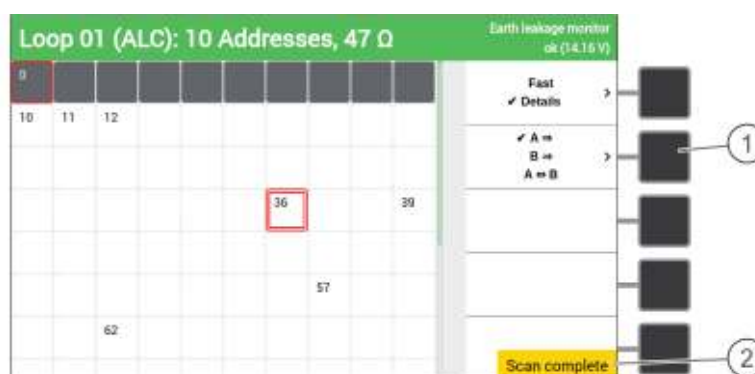
4. Push the escape button next to the selection wheel to return to the previous view.

5.9.3 How to control the direction of the scan (A/B/A+B)

By default, the addressable loop scan runs from the output (A).

To change the direction of the scan:

1. Go to the loop in the *Commissioning loops* view.
2. Push the selection wheel button to open the loop information.
The found addresses show on the display.
3. Push the **A** $\Rightarrow$, **B** $\Rightarrow$, **A** $\Leftrightarrow$ **B** soft key (1) to select the direction of the scan. The selection mark shows which direction is active.



The system scans the selected direction until it finds a break or a short circuit in the loop.

The **Scan complete** text (2) shows that the system has scanned the whole loop and starts a new round.

4. Select **A** $\Leftrightarrow$ **B** to scan the loop from both directions.
5. Push the escape button next to the selection wheel to return to the previous view.

5.9.4 How to identify incorrect addresses on the addressable loop

Each addressable detector and device on the addressable loop has a unique address. The fire detection panel identifies all detectors and devices by their addresses. During commissioning, it is important to make sure that there are no incorrect addresses on the addressable loop.

Incorrect addresses include:

- double addresses (when two devices have the same address),
- zero addresses (when a device has no address), and
- missing addresses.

By default, the FDP fire detection panel shows the fast results of the scan:

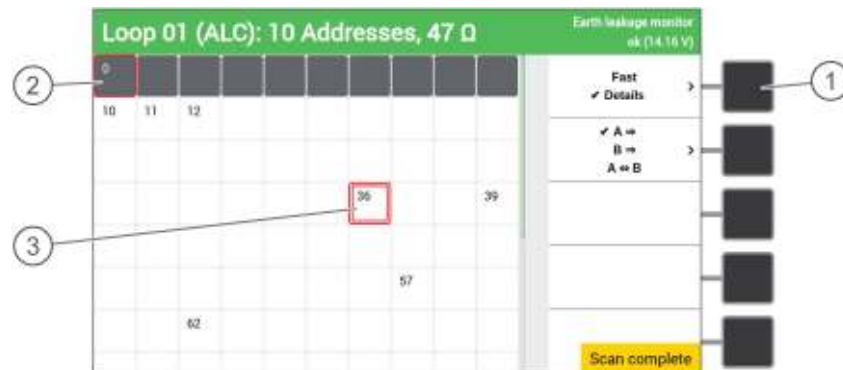
- If the address exists and is correctly configured, the address number shows.
- If the addressable device is missing, the address number is missing.
- If the address has not been set (zero address):
 - the number zero (0) shows with a red circle around it.
 - the number zero (200) shows with a red circle around it (only SLC).
 - the number zero (127) shows with a red circle around it (only ALC2)

- If there are double addresses (two or more detectors or devices with the same address), the address number shows with two red circles around it.

To view the double addresses, go to the **Details** view.

Procedure:

1. Push the **Details** soft key (1).
 - zero addresses have one red circle around them (2)
 - double addresses have two red circles around them (3)



5.9.5 How to view a single address

1. Turn the selection wheel to go to the loop in the *Commissioning loops* view.
2. Push the selection wheel button to open the loop information.
The found addresses show on the display.
3. Turn the selection wheel to scroll the rows of addresses.
4. To scroll the addresses on a certain row:
 - a. Go to the row.
 - b. Push the selection wheel button.
 - c. Turn the selection wheel to scroll the addresses.
5. To view a single address:
 - a. Turn the selection wheel to go to the address.
 - b. Push the selection wheel button.

The following information shows for the address:

- Type, for example: Optical detector (Discovery)
- Value, for example: 25

See [Figure 22: Commissioning mode details of a single address](#).



NOTE: If you are viewing the details of an address, the system scans only the selected address. When you exit the address details, the scan continues.

6. Turn the selection wheel to view the details of the next address.

7. Push the **Activate output and led** soft key to activate the output and LED in the selected address.
The LED is turned off automatically when you exit the address view.
8. Push the escape button next to the selection wheel to return to the previous view.

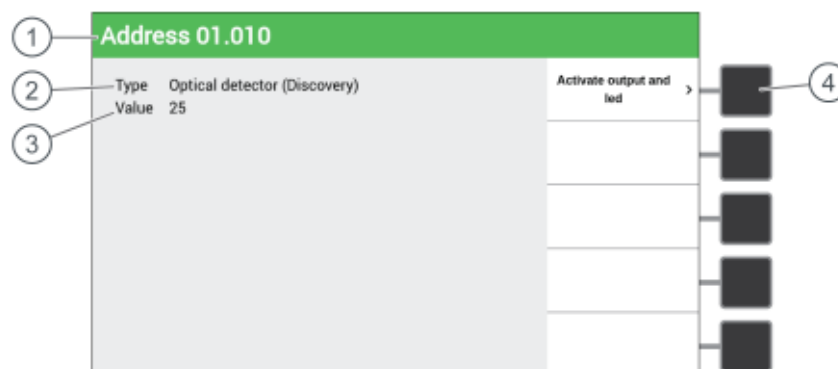


Figure 22: Commissioning mode details of a single address

- | | | | |
|---|---------|---|----------------------------------|
| 1 | Address | 3 | Value |
| 2 | Type | 4 | Activate output and led soft key |

5.10 How to make sure that the addressable loop is correctly connected

The addressable loop operates correctly, if the fire detection panel does not indicate alarms, a fault or maintenance indication after normal start-up. Set the fire detection panel to on to make sure that the addressable loop operates correctly.

1. Connect power to the fire detection panel.
First connect the mains connector, then the battery connector. To prevent a battery fault warning, connect the battery connector in 30 seconds or less from the start-up.
2. Wait until the *Panel starting up* text goes out of the display.



NOTE: If the fire detection panel gives a fire alarm, a prealarm, or a fault or maintenance indication, refer to the instructions in the **FDP Fire detection panel user manual**.

To make sure that all addressable devices on the loop are detected properly:

1. Push the selection wheel button to open the menu.
2. Go to **Addresses > loops / address points**.
3. Push the selection wheel button to see all of the address points on the addressable loop.

If the fire detection panel gives a fire alarm or a prealarm, the cause can be one of these:

- someone pushed a manual call point
- a manual call point window is broken or missing
- a monitored input device is active
- there is smoke, water vapour or dust in a smoke detector
- a heat detector detects heat

If the fire detection panel gives a fault or maintenance indication, the cause can be one of these:

- a break or a short circuit in the addressable loop
- an earth leak in the addressable loop
- an address fault in the addressable loop

For more information, refer to [Sections 5.10.1 How to find a short circuit in the addressable loop](#), [5.10.2 How to find a break in an addressable loop](#), and [5.10.4 Address faults and maintenance warnings](#).

5.10.1 How to find a short circuit in the addressable loop

The possible cause for a short circuit in the addressable loop is:

- an addressable detector or device that is connected incorrectly, or
- the addressable loop wires are in short circuit with each other.



NOTE: If there are short-circuit isolators on the addressable loop, the short circuit is isolated between the two short-circuit isolators nearest to the short circuit. If the fire detection panel is already configured, all addresses between the affected short-circuit isolators give out fault warnings.

How to find a short circuit:

1. Push the selection wheel button to open the menu.
2. Go to **Addresses > loops / address points**.
3. Push the selection wheel button to see all of the address points on the addressable loop.
4. To find the addressable detector or device that has a short circuit, compare the addresses with your installation plan.

5.10.2 How to find a break in an addressable loop

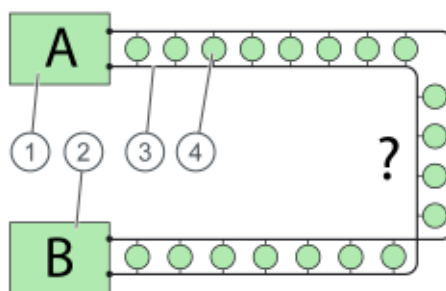


Figure 23: How to find a break in an addressable loop

1	Loop A (A+ and A-)	3	Loop wire
2	Loop B (B+ and B-)	4	Detector

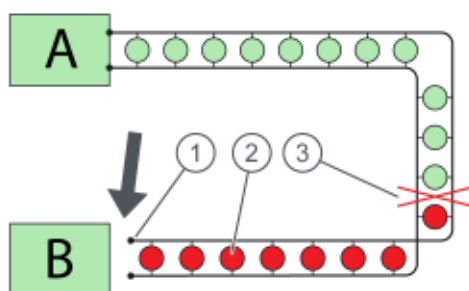


Figure 24: A break in an addressable loop

- | | | | |
|---|-----------------------|---|-------|
| 1 | Disconnected lines | 3 | Break |
| 2 | Disconnected detector | | |

Procedure:

1. Disconnect the return end of the addressable loop wires (B+ and B-).
2. Wait approximately 100 seconds for the fire detection panel to scan the change in the addressable loop.
3. See which addresses give the address fault 52.
These addresses are on the area between the break and the B- end.
4. To find the break, compare the addresses with your installation plan.
The addressable loop has a break on the first addressable device that the fire detection panel does not show.

5.10.3

How to find an earth leak in the addressable loop

1. Disconnect the return end (B+ and B-) of the addressable loop.
2. To find the earth leak on the addressable loop, examine it in smaller sections. Break the addressable loop in two parts from the middle.



NOTE: Any type of cable that is connected to the panel can cause an earth leak fault.

3. Push the **Reset** button to return the earth leak fault.
If the fire detection panel:
 - shows an earth fault, the earth leak is on the still connected part of the addressable loop
 - does not show an earth fault, the earth leak is on the disconnected part of the addressable loop.
4. To find out the accurate location of the earth leak, divide the defective part of the addressable loop in smaller sections. Test the smaller sections as you did in steps 2 and 3.
5. When you find the earth leak, repair the fault and connect all wires again.