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Installation Guidelines

Leakage Prevention System

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Version 1



Reinventing
Fire Suppression

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Reinforcing
Fire Suppression



1. Overview

This installation user guide provides information for the proper installation of the "LPS" "Leakage Prevention System" to the FirePro Condensed Aerosol Fire Suppression System.

2. Technical Summary

When protecting an enclosure, the open areas where the fire extinguishing agent will escape should be considered.

Apart from compensating the aerosol leakage with the addition of fire extinguishing agent, there are cases where it is necessary to use automated "LPS".

FirePro has developed a low cost automated "LPS" solution and is capable of delivering customized systems.

3. Technical Features

- Custom-made Systems.
- Easy Installation.
- Easy interconnection with the fire extinguishant control panel.

4. Technical Specifications

The "LPS" solution is applicable to the FirePro Condensed Aerosol Fire Suppression System, in cases where excessive openings exist and it is used as an additional measure for minimizing the openings, in order to enable successful implementation of total flooding application.

In order to implement the above solution, it is compulsory to perform Condensed Aerosol Leakage Compensation as indicated by the manufacturer in the "Technical Guideline Condensed Aerosol Fire Extinguishing System Solutions", section 5 "Aerosol Leakage Compensation".

CAUTION: The LPS shall never be used as a standalone method to control and/or extinguish a fire.

5. Installation Guidelines

Step 1: The "LPS" should be installed above the open area as shown in Figure 1.

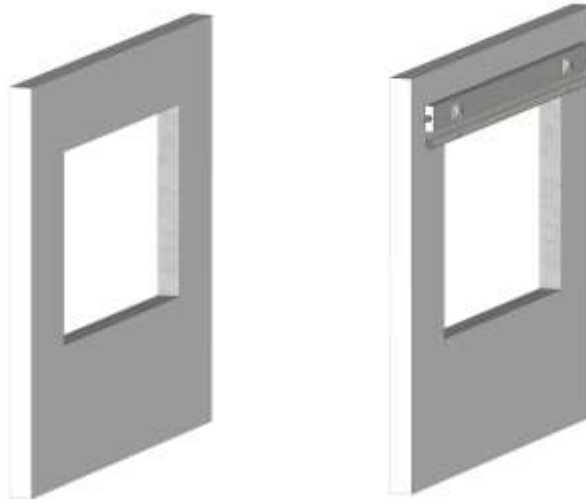


figure 1. "LPS" Installation location

Step 2: Identify the location of each component of the "LPS", for correct installation as shown in Figure 2.

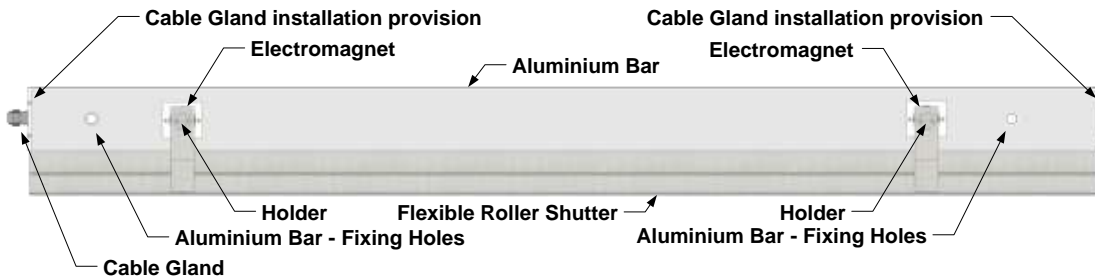


figure 2. "LPS" components.

Step 3: The "LPS" was developed with some predefined installation specifications, as shown in Figure 3. There is a minimum open clearance area at point A and B.

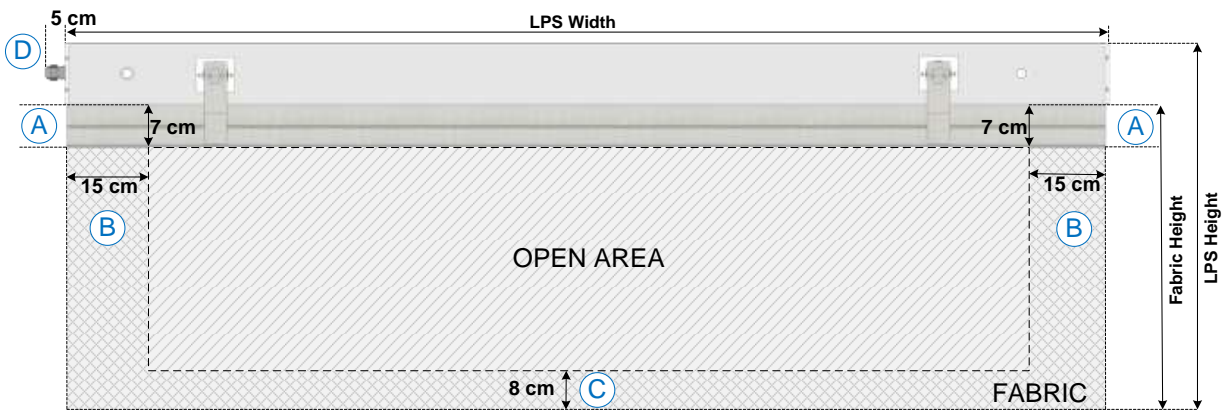


figure 3. Fixing the aluminium frame.



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Point A: The "LPS" must be 7 cm between the underside of the aluminium frame and the upper side of the open area.

Point B: The "LPS" must extend 15 cm away from the open area boundary on each side, in such a way that the "flexible roller shutter" overlaps the open area at a distance of 15cm away from both sides.

Point C: The "flexible roller shutter" extends 8 cm on the underside.

Point D: At least 5 cm extra width is required for installation purposes (i.e. gland and cable).

Step 4: Installing the "LPS"

Remove the plastic covers from the fixing holes located on the aluminium frame.

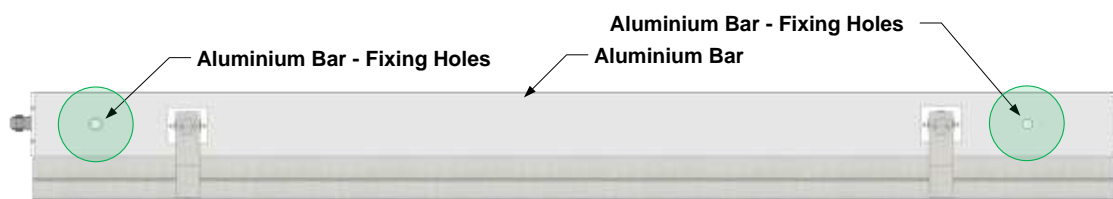


figure 4. remove the plastic covers

Install the "LPS", above the open area at the right distances, as indicated in the figure below.

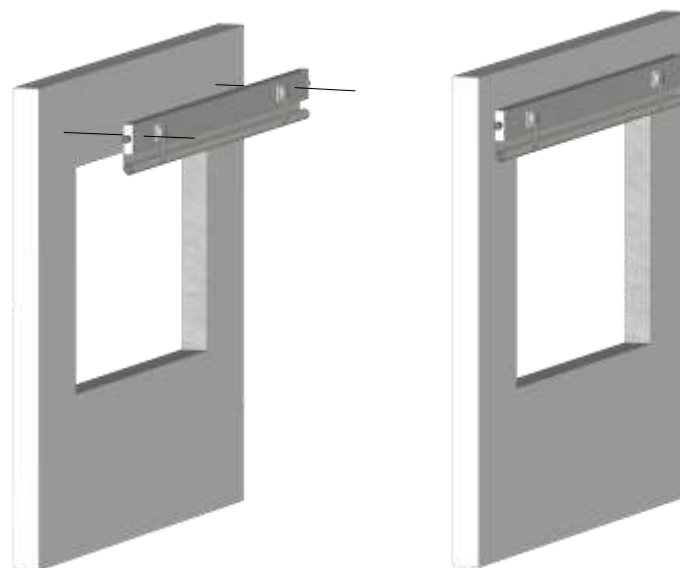


figure 5. "LPS" - Installation

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Step 5: Interconnecting the "LPS" to the Fire Suppression System.

On the aluminium frame of the "LPS" there are two installation provisions where the cable gland is mounted. The one is located on the left-hand side and the other is located on the right-hand side of the aluminium frame. The cable gland is used to fix the fire resistant cable where is powering the electromagnets. During installation, it will be decided which installation provision is appropriate for use, see Figure 6.



figure 6. Cable access

The "fire resistant cable" inside the aluminium frame of the "LPS" connects the two electromagnets but also has enough cable at both ends, so that access to either side of the aluminium frame is feasible for the interface. Both cable ends are terminated with terminal blocks.



figure 7. cable route

The "LPS" must be interconnected with the extinguishant control panel of the "Fire Suppression System", so that the "flexible roller shutter" must drop and seal the open area before the releasing of the extinguishing agent (Condensed Aerosol).

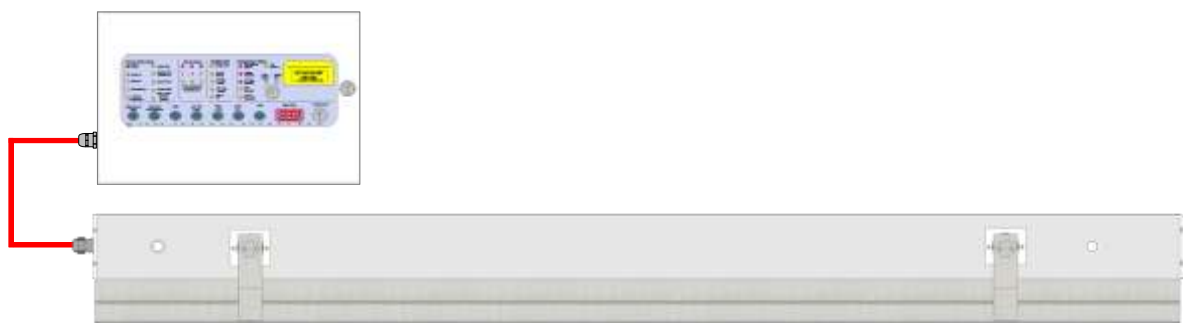


figure 8. Interconnecting the "LPS"

In order for the "flexible roller shutter" to be in the hold position, the electromagnets must be operated continuously. This can be achieved by providing a continuous supply voltage to the electromagnets. Only when the extinguishant control panel decides that it is time to initiate the drop of the "flexible roller shutter", then the extinguishant control panel must disconnect the power supply to the electromagnets.

The disconnection of the power supply to the "LPS" should take place at "stage 2" of the fire suppression system. The "stage 2" implies that both input detection zones of the extinguishant control panel are in alarm (double knock feature), confirming the presence of the fire.

The extinguishant control panels have dedicated dry contact relays which activated (pre-programmed) to a specific event of the control panel. Therefore at "stage 2" of the fire suppression system this specific dry contact relay should be activated.

The interconnection of the "LPS" to the Sigma XT extinguishant control panel is illustrated below.

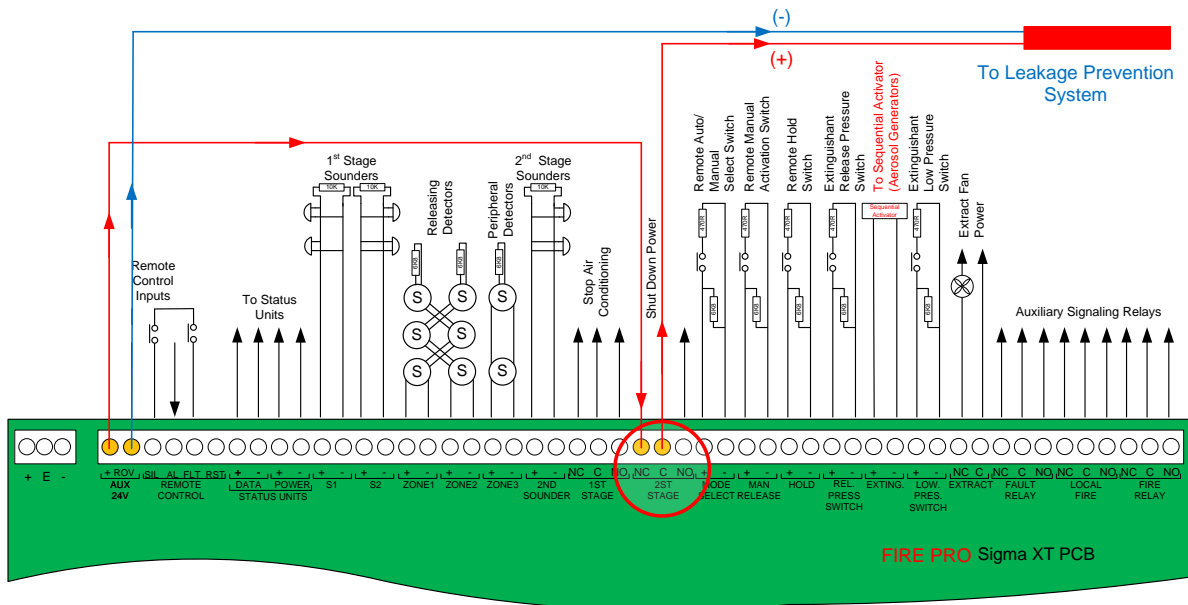


figure 9. Extinguishant Control Panel interconnection

When connecting multiple "LPS" systems to a single control panel, the total power consumption of the electromagnets should be considered. If the auxiliary output power of the control panel is unable to power the multiple "LPS" systems, an external power supply must be used. The power requirements for each electromagnet are referred in section "9. Electrical Specifications" of this installation guide.

6. System Commissioning

Once the "LPS" installation has been completed and is interconnected to the extinguishant control panel, it is necessary to check if the fire suppression system is operating as intended.

Step 1: Isolate the Aerosol Generators connected to the Fire Suppression System by activating the Isolation Switch (physical disconnection of the cable).

Step 2: Power the system. Ensure that the electromagnets are operating.

Step 3: Wrap the "flexible roller shutter" and secure it with the "holders".

Step 4: Initiate fire alarm conditions by triggering an input zone on the extinguishant control panel. Once the extinguishant control panel detects the alarm, the system is in "stage 1" alarm.

Step 5: Initiate fire alarm conditions by triggering the second input zone on the extinguishant control panel. Once the extinguishant control panel detects the alarm, the system is in "stage

2" alarm. Therefore the "flexible roller shutter" should drop from its initial position and cover the open area.

Step 6: After the successful operation, reset the panel to its original state, wrap the "flexible roller shutter" and secure it to its initial position.

Step 7: If no problem is detected on the system, reset the Isolation Switch.

7. System Components

The following components are provided with the customized systems "LPS".

| "Leakage Prevention System" – Components | | | |
|--|----------------------|---------------------|--|
| # | Description | Model | Technical Specifications |
| 1 | Electromagnet | CC-DRW-L | Magnetic 200N Retainer |
| 2 | Aluminium Frame | 100 x 30 x 2 mm | Aluminium |
| 3 | Silica Cloth | RS-600 | Weave: Sartin 8HS Weight: 600±30 g Width:1 m Thickness: 0.7±0.05 mm Warp yarns: 18±1 per cm Weft yarns: 13±1 per cm Max temperature: 1200 C for 10s Operation temp: Up to 800 C |
| 4 | Fire-Resistant cable | SAR0211HFESL-F3(IE) | 2 X 1 mm |
| 5 | Gland | M20 | Nickel-plated |
| 6 | Terminal Block | OK431/02 NYLP | 2 way, 6A |
| 7 | Rubber Plugs | Size 20 and 30 | PO plastic or rubber |

Table 1. "LPS" accessories

8. Installation Specifications

This "LPS" is designed for indoor use only and should be installed on a flat surface, to ensure:

- Free and unrestricted deployment of the system upon activation.
- Sufficient sealing to prevent the aerosol from escaping the protected enclosure.

The appropriate number of "fixing holes" would be manufactured on the system, however, it's up to the installer to use appropriate mounting components (screws, wall anchoring components etc.).



9. Table of standard LPS Systems and protected openings

| "Leakage Prevention System" | | | |
|-----------------------------|------------|----------------------------|------------|
| LPS Dimensions | | Opening Maximum Dimensions | |
| Width (m) | Height (m) | Width (m) | Height (m) |
| 0.90 | 0.84 | 0.60 | 0.59 |
| 0.90 | 1.50 | 0.60 | 1.25 |
| 0.90 | 3.00 | 0.60 | 2.75 |
| 0.90 | 5.00 | 0.60 | 4.75 |
| 1.80 | 0.84 | 1.50 | 0.59 |
| 1.80 | 1.50 | 1.50 | 1.25 |
| 1.80 | 3.00 | 1.50 | 2.75 |
| 1.80 | 5.00 | 1.50 | 4.75 |
| 2.45 | 0.84 | 2.15 | 0.59 |
| 2.45 | 1.50 | 2.15 | 1.25 |
| 2.45 | 3.00 | 2.15 | 2.75 |
| 2.45 | 5.00 | 2.15 | 4.75 |

Table 2. "LPS" available systems

Note: LPS Maximum dimensions: Max. Width: 2.45 m, Max. Height: 5.00 m

10. Information to be provided when a quotation is required

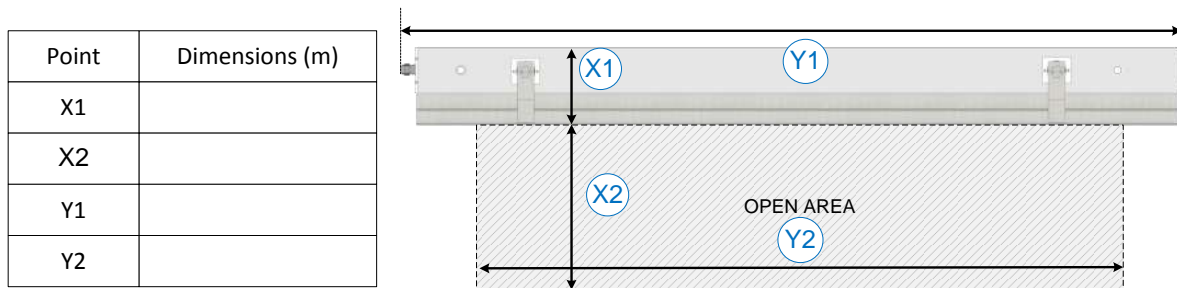


figure 10. Dimensions-information to be provided

11. Electrical Specifications

This "LPS" is designed for indoor use only.

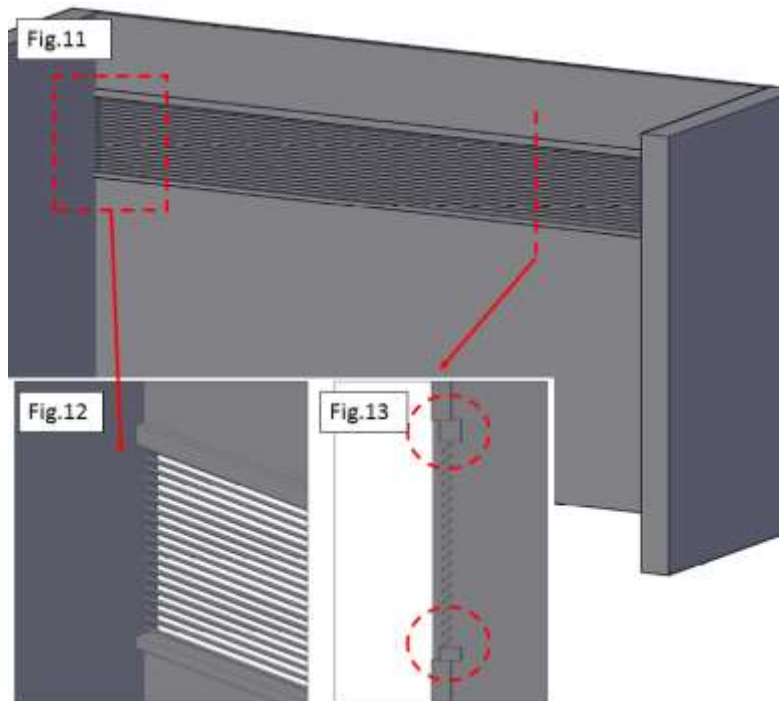
| | | | |
|-------------------|--|---------------------|---|
| Power consumption | 1.2 W (Watt) | Class of protection | IP 40 |
| Operating voltage | 24 V DC (Volts) | Ambient temperature | 0 – 50°C |
| Operating current | 50 mA (Milliamps) per Electromagnet | | |
| Cable gland | 20mm / M20 / PG11, cable range | Terminal Block | 1.5mm ² / AWG 14, conductor range |

Table 3. "LPS" electrical components

12. Case Study – Multiple LPS installation

Opening

- Opening Dimensions
Width = 5.00m
Height = 0.50 m
- No Side Margins available (see Figure 12)
- Not a flat surface due to the obstructions. (see Figure 13)

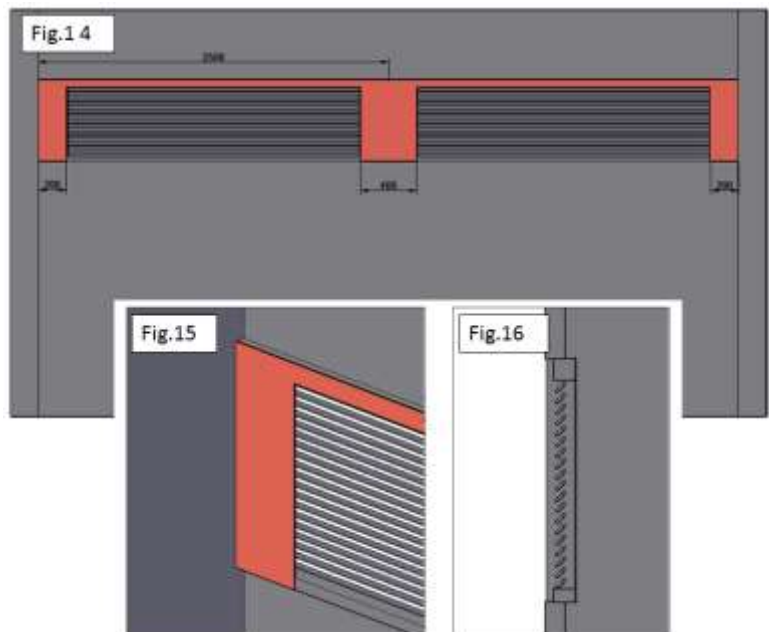


Appropriate modifications are required:

Metal plate supports should be added to the opening in order to accommodate the installation of multiple systems.

(see Figures 14 to 16)

- The added metal plates create:
 1. An obstruction-free flat surface essential for the unrestricted deployment of the system.
 2. The required side margins as per the LPS installation guidelines.

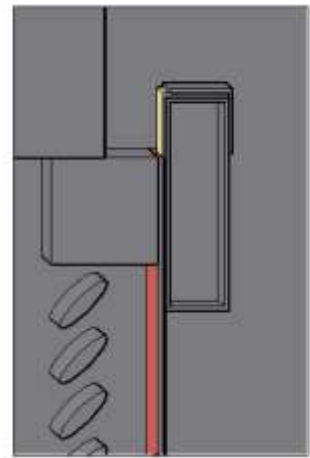
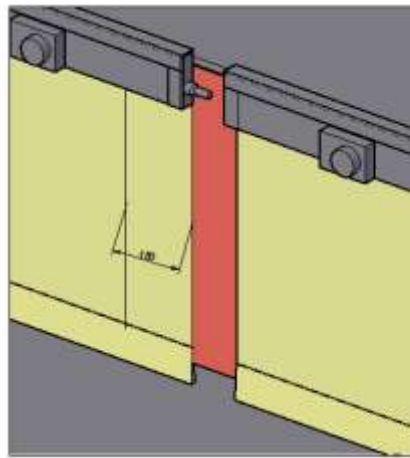
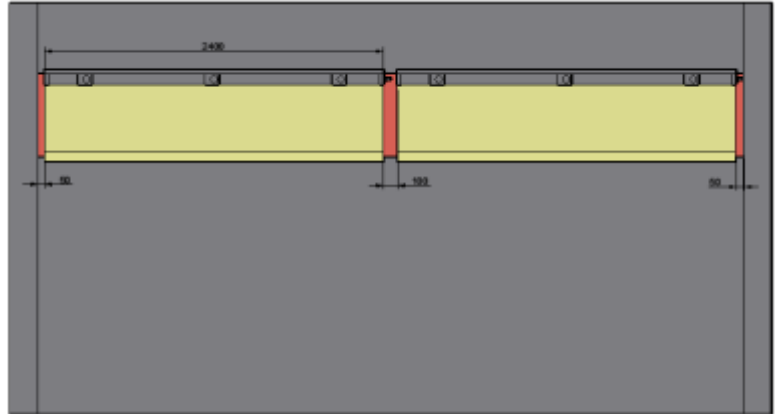


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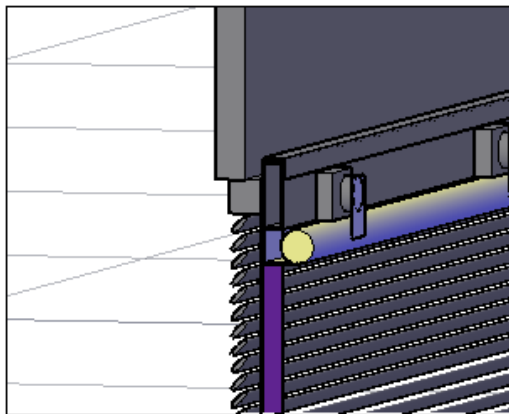
Install 2 LPS units

LPS Width = 2400 mm

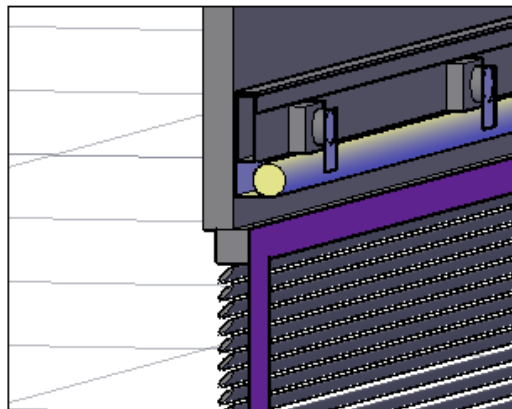
Min. LPS Height = 750 mm



Correct Installation



False Installation



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Cable sizes are indicative since they can vary depending on actual cable lengths and respective voltage drop calculations, which do not fall within the scope of FirePro Systems.

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