



NORDcanopy

UV 1.2 Cleaning System Installation Guide

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1. General

This guide contains information for the safe installation of the ETS NORD UV 1.2 control units and UV cleaning system. UV-L 1.2 and UV-S 1.2 control units can be installed into one UV cleaning system.

UV 1.2 control units can be used with both UV-900 and UV-1200 lamps. Additionally, it is possible to use a LED notification panel with the UV 1.2 control units for visual monitoring of system statuses.

Read the guide carefully before installing or setting up the device!

All activities described in the installation guide must be carried out in accordance with UV Pre-commissioning checklist before an ETS NORD technician comes to the site to carry out system commissioning. ETS NORD reserves the right to issue an additional invoice if the confirmed tasks have not been completed.

2. Checking the product

Check that the packaged products do not have visible damage. Immediately notify the supplier and manufacturer of the products of damage or missing components.

Make sure that all components are received, matching both the order and delivery confirmation letters. Incorrect delivery and transport damage must be immediately reported to both the cargo carrier and ETS NORD Customer Service.

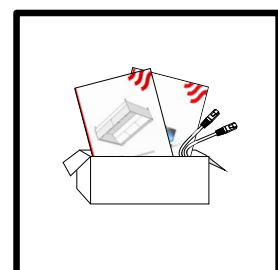
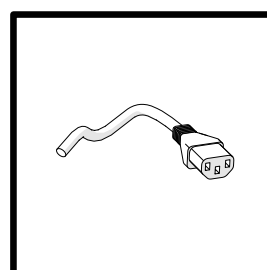
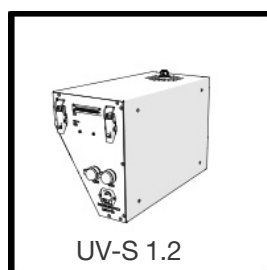
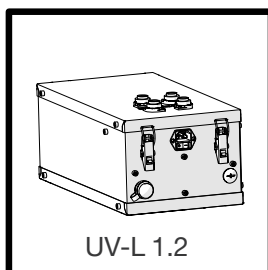
The time for filing a complaint or shipment discrepancy is 5 days after delivery. ETS NORD is not responsible for defects that have occurred after goods have been handed over to the buyer.

If goods purchased from ETS NORD have defects for which ETS NORD is responsible, ETS NORD will repair or replace the defective goods. If the goods cannot be repaired or replaced, ETS NORD will refund to the buyer all fees for such items resulting from the sales contract.

If you have any problems, please contact ETS NORD Customer Service!

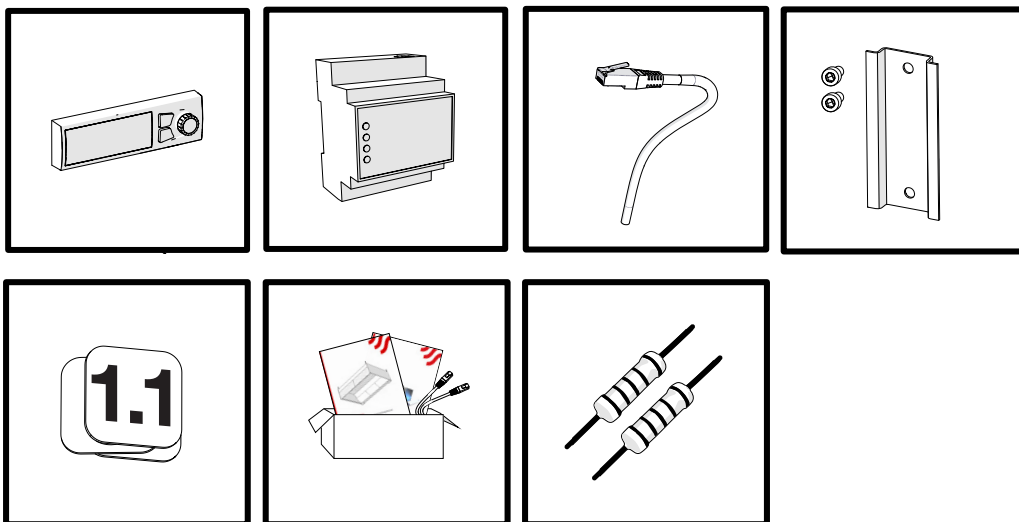
The UV 1.2 control unit package includes:

- Control unit (UV-L 1.2 or UV-S 1.2),
- Power cable IEC C13 with plug (3 m),
- User manuals (EST, ENG, FIN, SWE).



The LCD control panel and IoT device M-Link package includes:

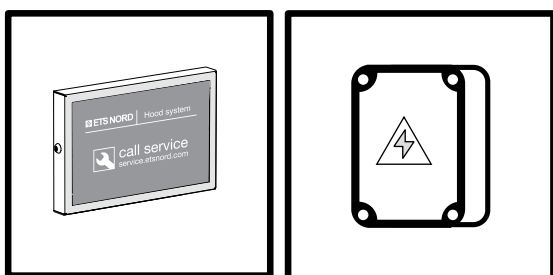
- LCD control panel with wall mount
- IoT device M-Link
- LAN cable for connection between M-Link and LCD control panel (0.5 m)
- DIN rail + 2 × M5 bolts for mounting M-Link
- Canopy section marking stickers
- Installation guide
- Termination resistors 120 ohm 0,5W (2 pcs).



A maximum of 6 different control units (UV-L 1.2 or UV-S 1.2) can be combined under one LCD control panel.

Optional extras:

- LED notification panel
- Relay box (for duplicating the status signals to LED notification panel and to building automation)



The integrated control unit packaging includes:

- Control unit
- Power cable IEC C13 with plug (3 m)
- User manual for personnel

3. Product safety

Failure to comply with the instructions for the use and safety of the UV (ultraviolet) device or improper use may cause bodily injury.

The UV cleaning system is designed to treat air with UV-C radiation and ozone only as described in this manual. UV reduces odours and breaks down grease, mould and bacteria. ETS NORD AS assumes no liability if the product is not used in accordance with the instructions contained in this guide.

The installation of the integrated control unit may only be carried out by persons trained and authorized by ETS NORD in accordance with international standards and regulations.

Only UV lamps and spare parts supplied by ETS NORD AS may be used in the system.

Ultraviolet radiation and ozone are harmful to health. Prolonged exposure can cause the following damage:

- Skin rashes and burns
- Eye irritation, retinal burn and loss of vision
- Respiratory irritation and breathing problems

Remove canopy grease filters only after the UV lamps have been powered off from the LCD control panel.

When installing the lamp, always wear goggles and protective gloves to protect against quartz fragments in case of UV lamp breakage.

WARNINGS!



This device emits ultraviolet radiation and ozone!

Prolonged exposure to ozone and ultraviolet radiation can cause bodily injury.



When removing grease filters, make sure that the lamps are not turned on!



Risk of falling!

Make sure installation and service personnel have stable work platforms when installing the device.



Use protective glasses and gloves during installation and maintenance!



Risk of electric shock!

Electrical connections to the system may only be made by an authorized electrician.



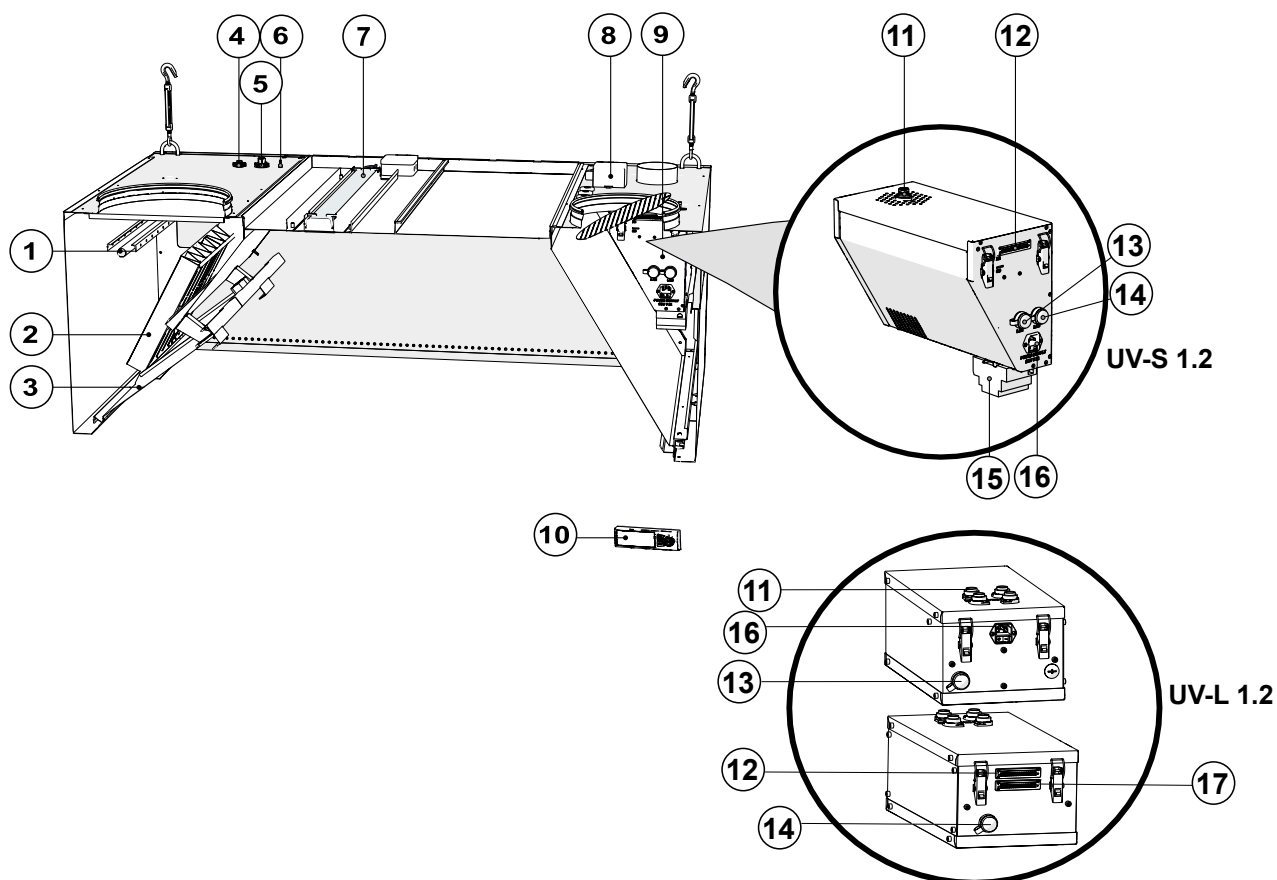
Always power off the system and disconnect (by the plug) from the mains before any maintenance work!



Only original spare parts and UV lamps purchased from ETS NORD may be used in the UV 1.2 control unit!

UV lamps can be ordered from the sales office.

4. System overview



UV Canopy components:

- 1 – UV-lamp
- 2 – HFK grease filter
- 3 – UV protection shield
- 4 – UV-lamp socket
- 5 – Safety switch socket
- 6 – Pressure measurement tip
- 7 – LED light
- 8 – Pressure sensor
- 9 – UV control unit
- 10 – LCD control panel

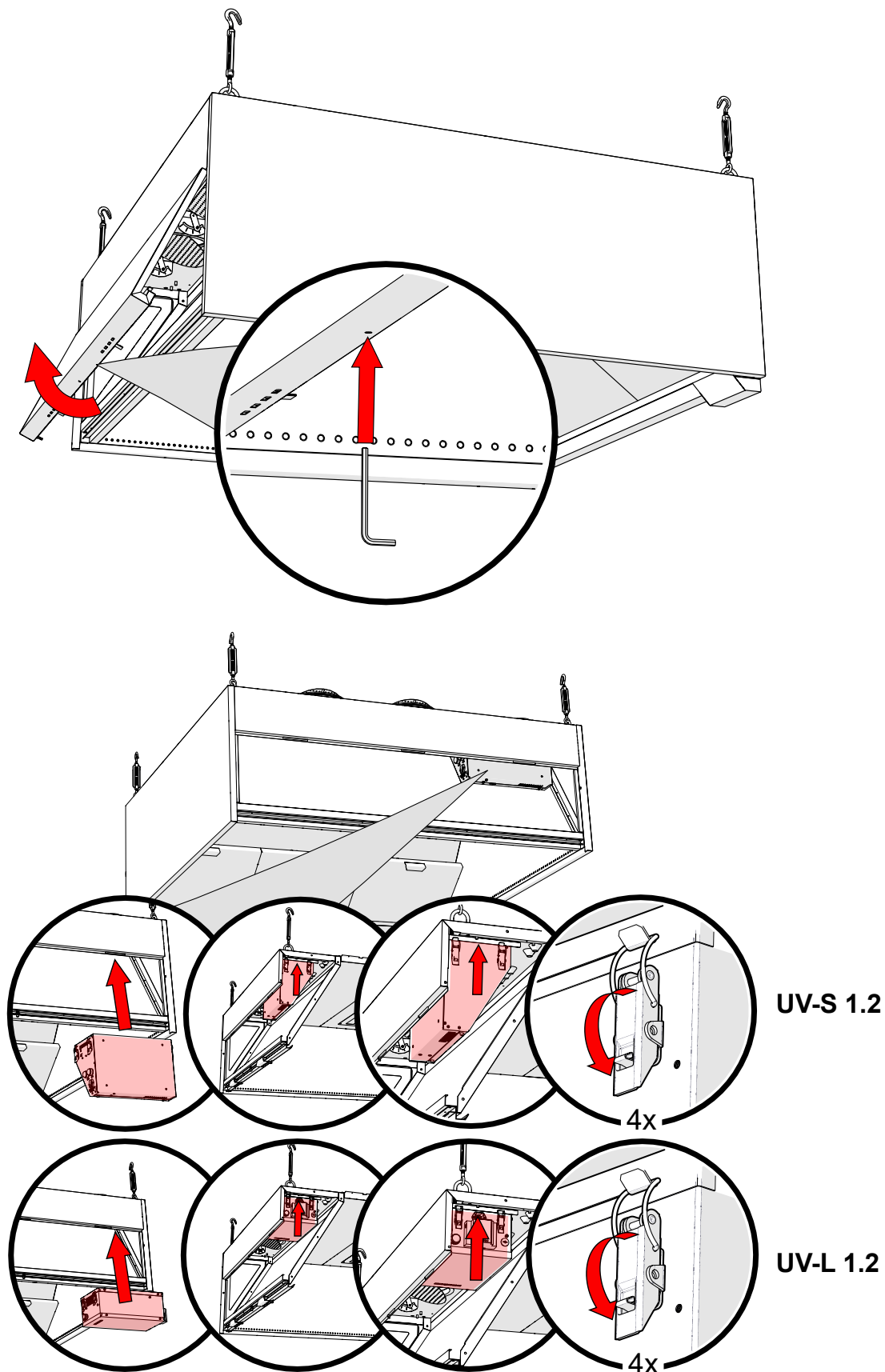
Control unit components:

- 11 – UV-lamp power supply socket
- 12 – Control unit X1 socket
- 13 – M-Link socket
- 14 – LCD socket
- 15 – M-Link (ETS NORD IoT device)
- 16 – Control unit power supply socket
- 17 – Control unit X2 socket

5. UV 1.2 control unit installation



Risk of falling! Make sure installation and service personnel have stable work platforms when installing the device.



6. UV-lamp installation

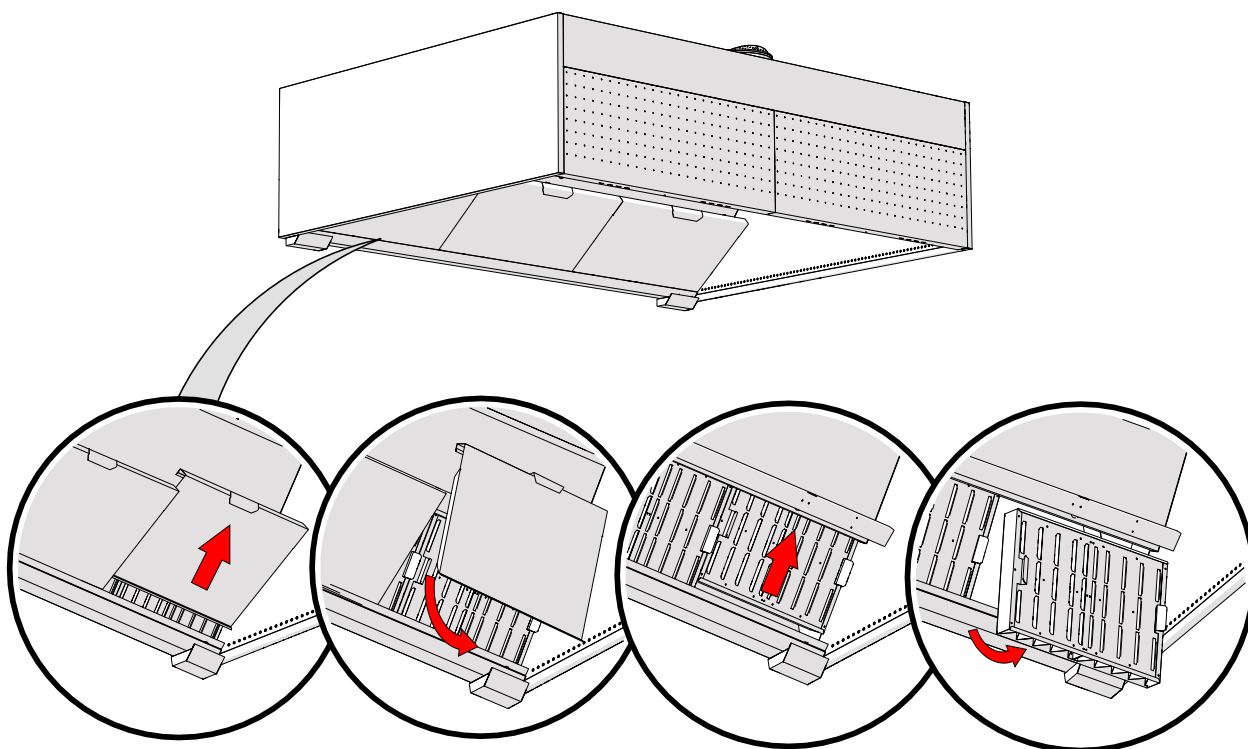


Use protective glasses and gloves during installation.

Both types of lamps (UV-900 or UV-1200) can be connected to the UV 1.2 control unit.

6.1 Removing UV protective shields and grease filters

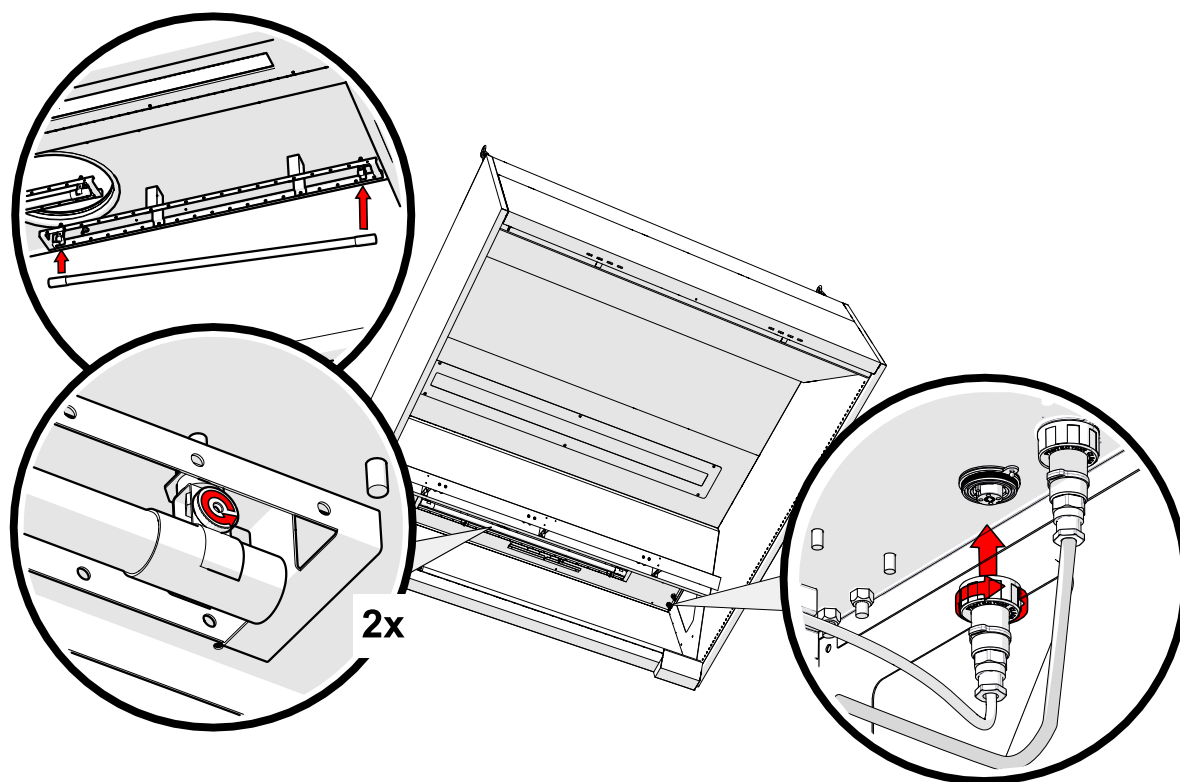
Under the protective shields are located canopy safety switches. When removing the protective shield make sure that the switch is not damaged.



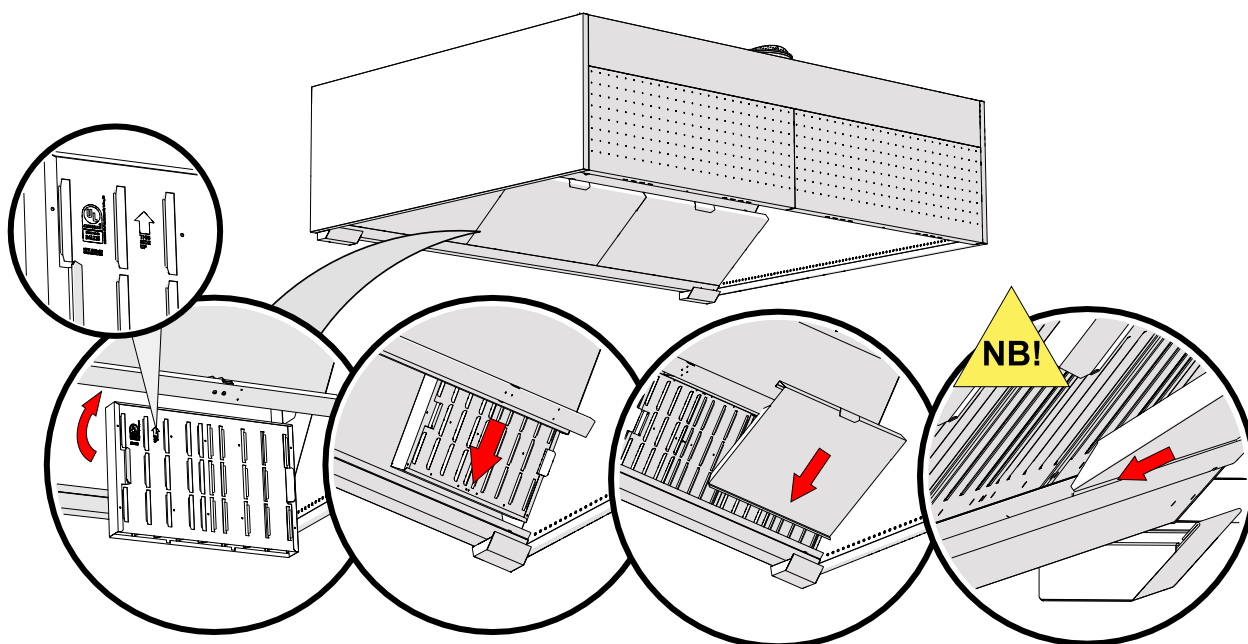
6.2 Mounting UV-lamp to exhaust chamber



Make sure that the lamp is properly installed and secured.
Attach the mounting clamp to the blue part of the lamp.



6.3 Restoring UV protective shields and grease filters



NB! When restoring the UV protective shields make sure that they are fixed properly, and that the safety switch is pressed down.

7. Electrical installation



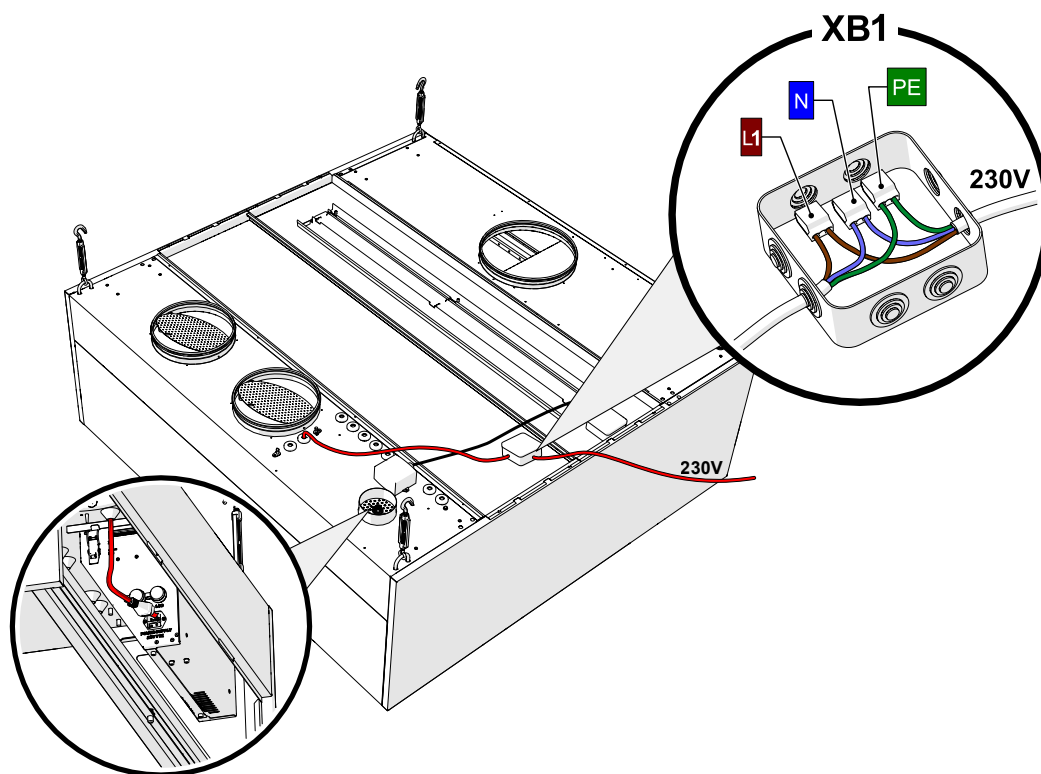
Electrical connections to the system may only be made by an authorized electrician.

All the cablings and electrical installations indicated in the following chapters must be compiled by an electrician of the site.

7.1 Control unit power supply

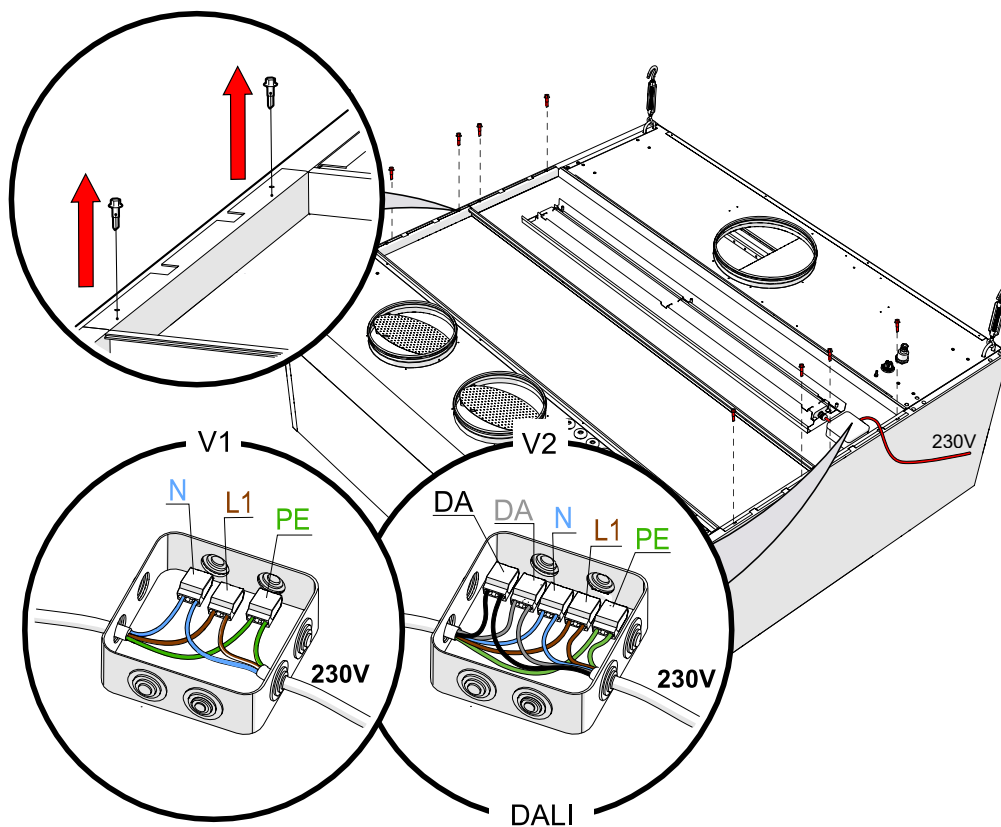
The table indicates the quantities of UV control units per corresponding circuit breaker.

Circuit breaker type	Cable	UV-L control unit max. quantity	UV-S control unit max. quantity	Possible combina- tions of control units
C6	3G 0,75 mm ² or 3G 1,5 mm ²	1	3	-
C10	3G 1,5 mm ²	1	6	1 UV-L + 3 UV-S
C13	3G 1,5 mm ² or 3G 2,5 mm ²	2	-	1 UV-L + 3 UV-S 2 UV-L + 1 UV-S
C16	3G 2,5 mm ²	3	-	1 UV-L + 5 UV-S 2 UV-L + 3 UV-S



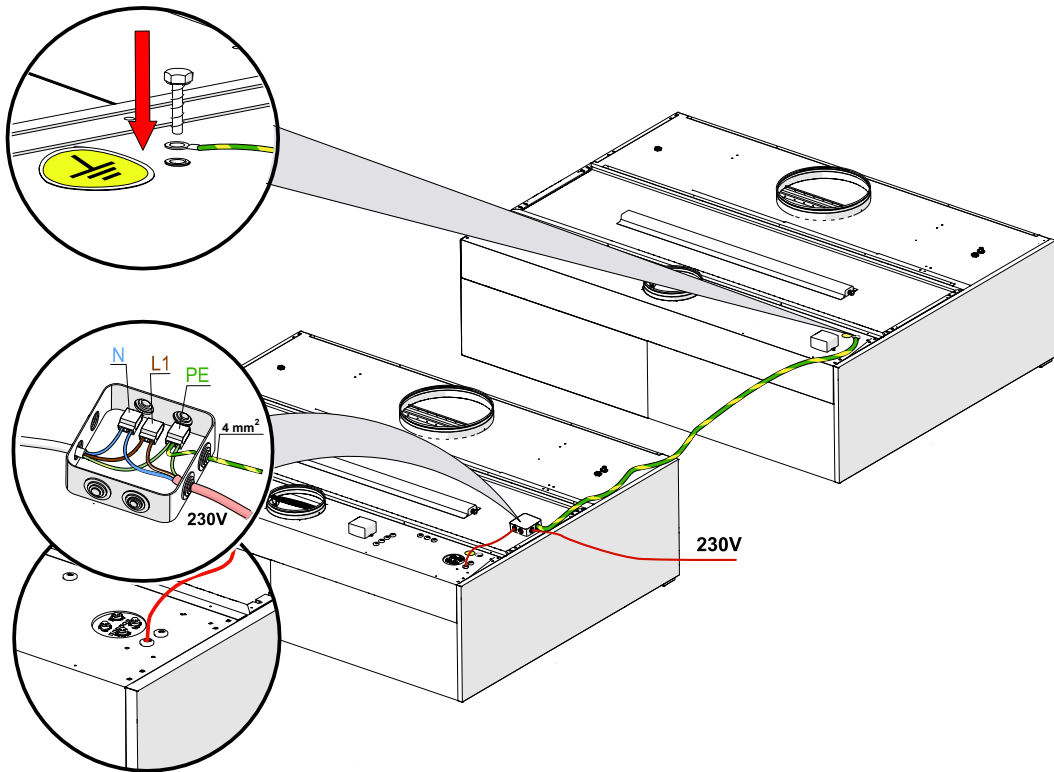
After connecting the power to the control unit, leave the power switch to “OFF” position.

7.2 Canopy lighting electrical connections and removal of ceiling panel transport screws



7.3 Grounding the canopies

All canopies where there is no UV control unit inside but there are UV lamps must be grounded with the grounding of the control unit's power supply.

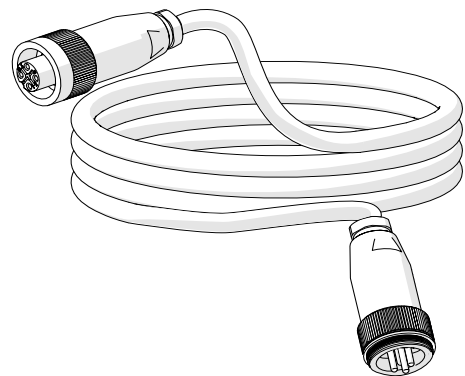


7.4 Connecting the UV lamps with the control unit

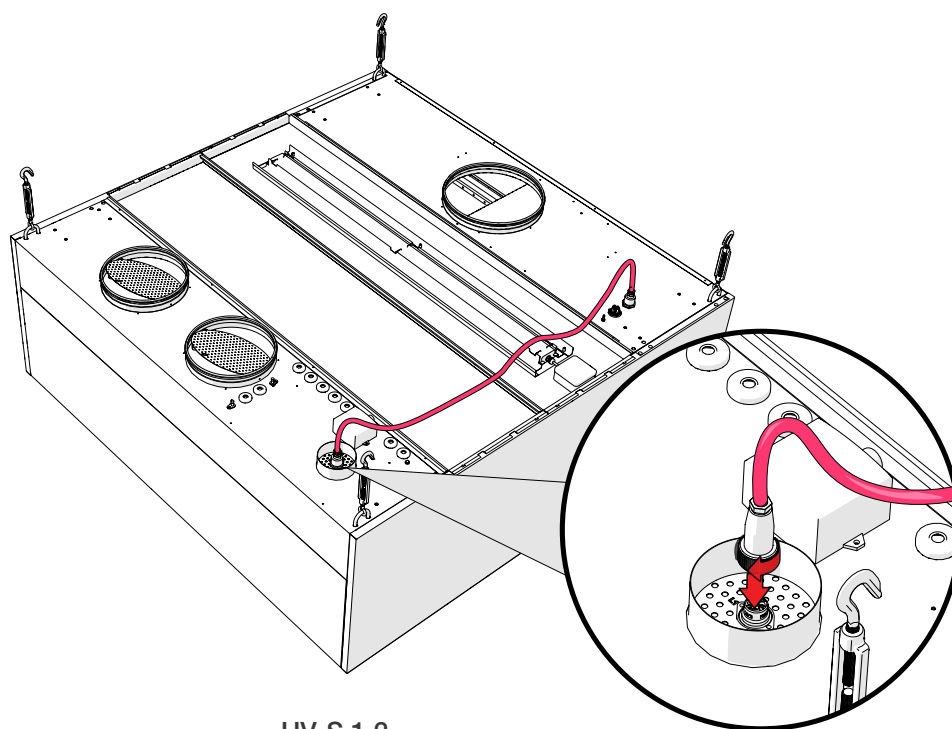
All sections of the UV canopy are always equipped with a 5-meter UV lamp cable, which can be connected directly from the UV lamp connector to the UV control unit (plug-in). UV canopies or sections where there is no control unit are equipped with a 10-meter UV lamp cable.

If any canopy or section is more than 10 meters away from the control unit, an additional cable must be ordered from ETS NORD to extend the existing UV lamp cable. The maximum cable length between the UV lamp and the control unit can be 25 meters.

UV lamp extension cables from ETS NORD are 3, 5 and 15 meters.

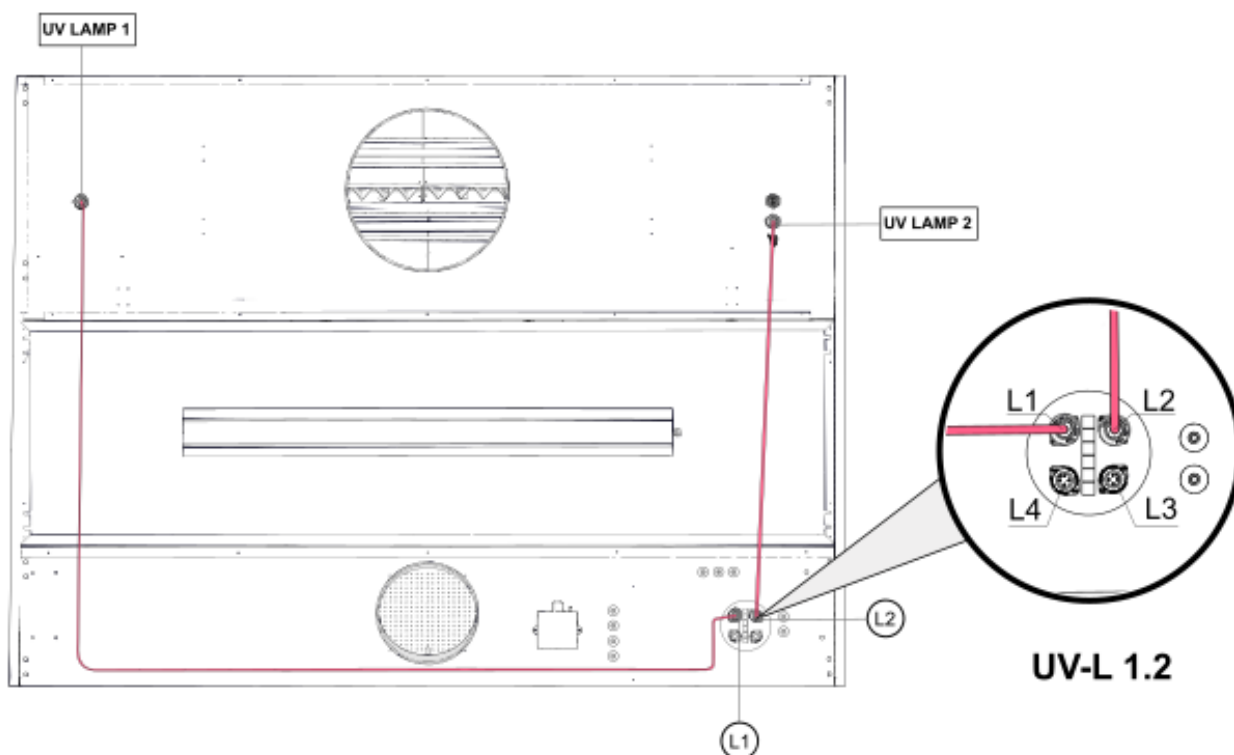


Both types of lamps (UV-900 or UV-1200) can be connected to the UV 1.2 control unit.



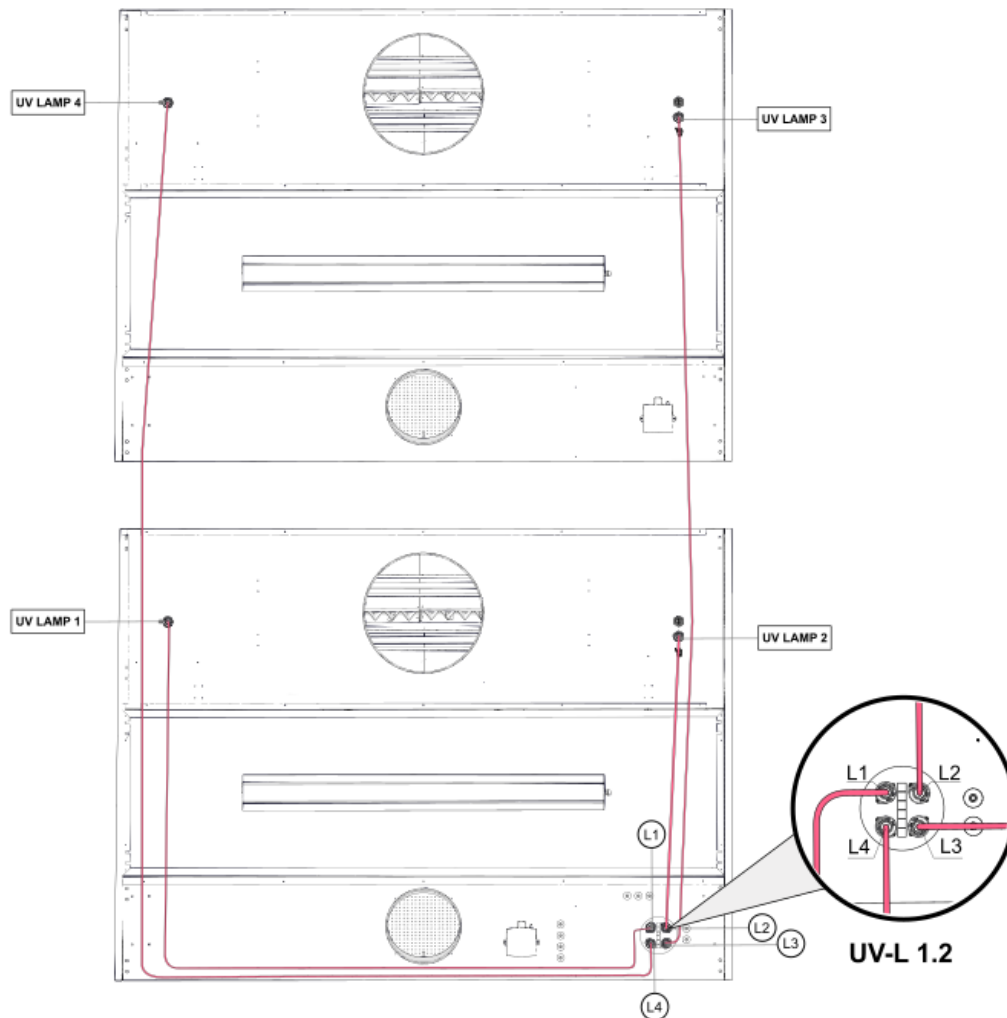
UV-S 1.2

Connect the canopy UV-lamps to the UV-L 1.2 control unit in numerical sequence. In other words, in the case of one section with a control unit and two UV-lamps, connect them to sockets L1 and L2.



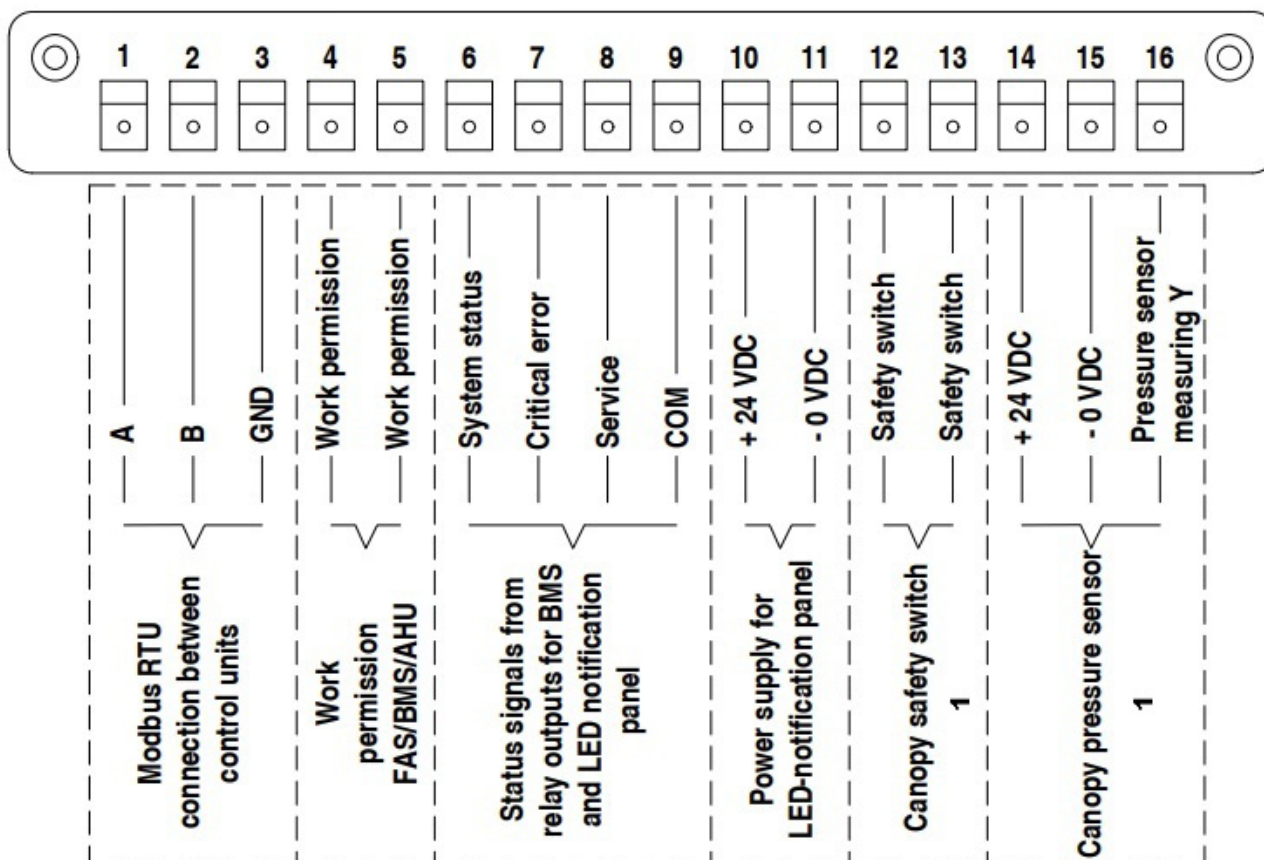
UV-L 1.2

If there is more than one section or UV canopy behind one control unit, connect the UV-lamps to the following connector numbers.



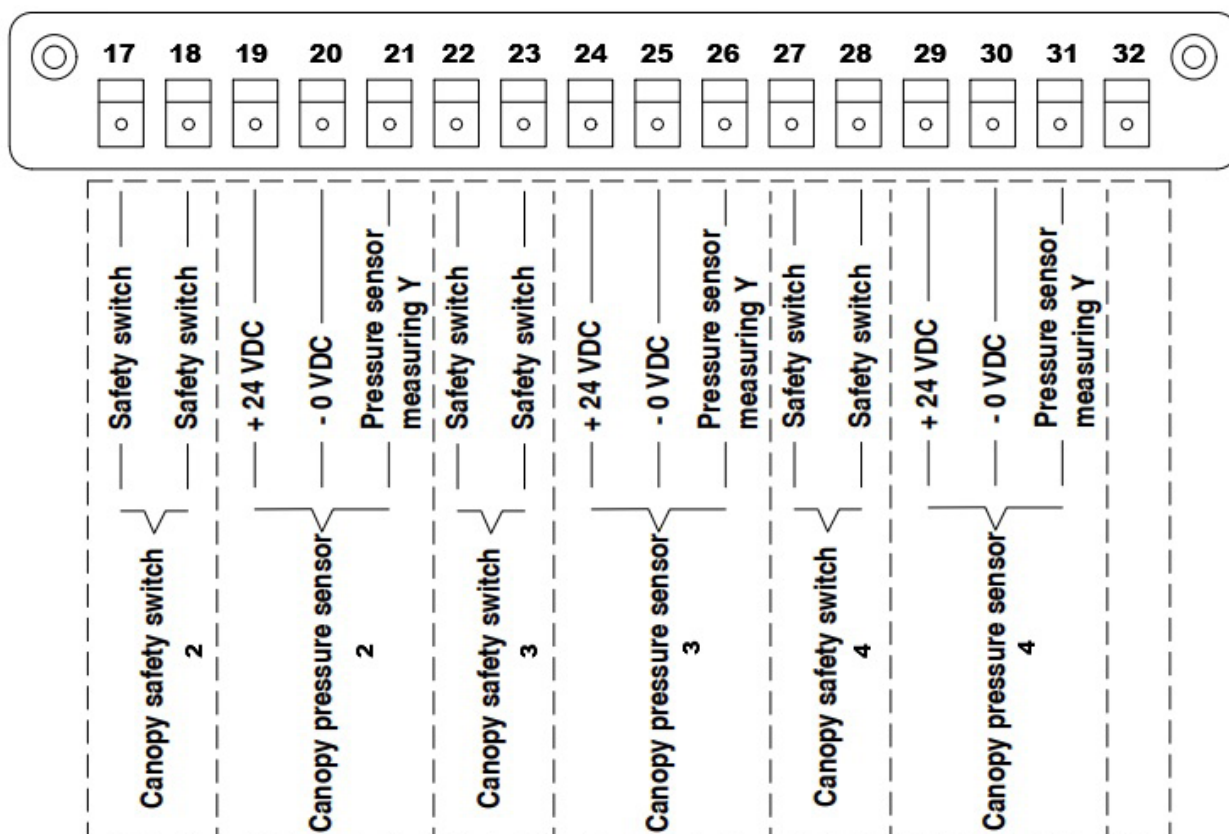
The part of the cable that is left over must be rolled up and left on top of the canopy ceiling.

7.5 External control unit connections to X1 socket



X1 socket	I/O grouping	I/O name
1	Modbus RTU for connection between control units	A
2		B
3		GND
4	Work permission FAS/BMS/AHU	Work permission +
5		Work permission -
6	Status signals for building automation and LED notification panel from relay outputs	Operation status
7		Critical error
8		Service + fault status
9		COM (24 VDC relays)
10	LED notification panel power supply	+24 VDC
11		-0 VDC (GND)
12	Canopy safety switch 1	Safety switch +
13		Safety switch -
14	Canopy pressure sensor 1	+24 VDC
15		-0 VDC (GND)
16		Pressure sensor measuring Y

7.6 External control control unit connections to X2 socket

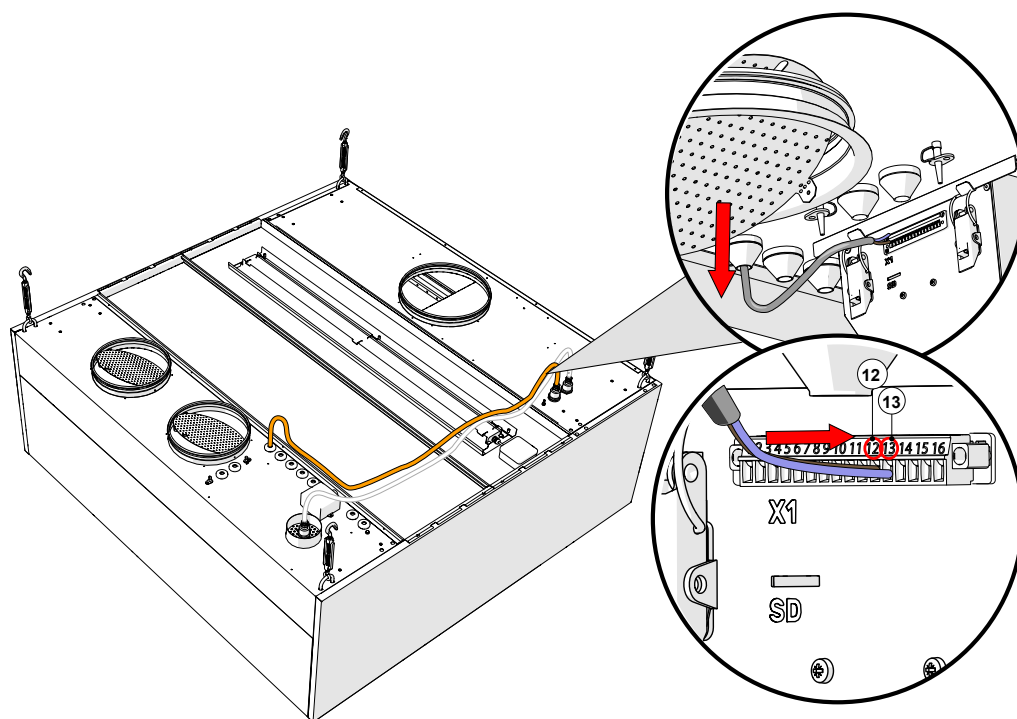


X2 socket	I/O grouping	I/O name
17	Canopy safety switch 2	Safety switch +
18		Safety switch -
19	Canopy pressure sensor 2	+24 VDC
20		-0 VDC (GND)
21		Pressure sensor measuring Y
22	Canopy safety switch 3	Safety switch +
23		Safety switch -
24	Canopy pressure sensor 3	+24 VDC
25		-0 VDC (GND)
26		Pressure sensor measuring Y
27	Canopy safety switch 4	Safety switch +
28		Safety switch -
29	Canopy pressure sensor 4	+24 VDC
30		-0 VDC (GND)
31		Pressure sensor measuring Y
32	-	-

7.7 Connecting the safety switches of canopy sections

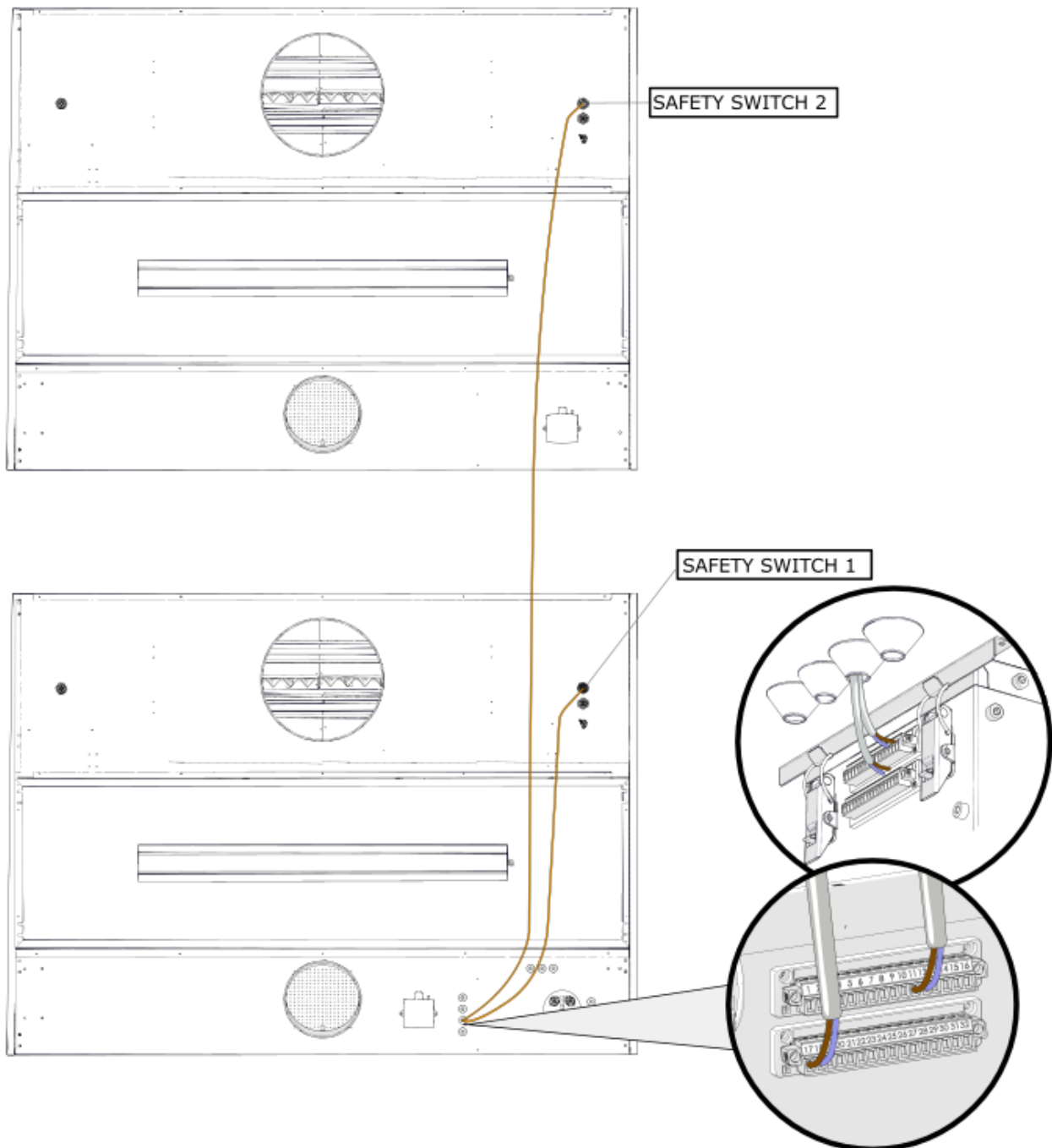
The safety switch cable (2x0,5mm²) for the UV protection shields is on top of the ceiling of each section (10 meters) and 5 meters on the section with a control unit. In total, safety switches of up to four sections can be connected to one UV-L control unit. The safety switch cable needs to be connected to the UV control unit X1 connector as follows:

X1 socket	I/O grouping	I/O names	Cable core colours
12	Canopy safety switch 1	Canopy safety switch 1	Brown
13		Canopy safety switch 1	Blue



The safety switch cable needs to be connected to the UV control unit X2 connector as follows:

X2 socket	I/O grouping	I/O names	Cable core colours
17	Canopy safety switch 2	Canopy safety switch 2	Brown
18		Canopy safety switch 2	Blue
22	Canopy safety switch 3	Canopy safety switch 3	Brown
23		Canopy safety switch 3	Blue
27	Canopy safety switch 4	Canopy safety switch 4	Brown
28		Canopy safety switch 4	Blue



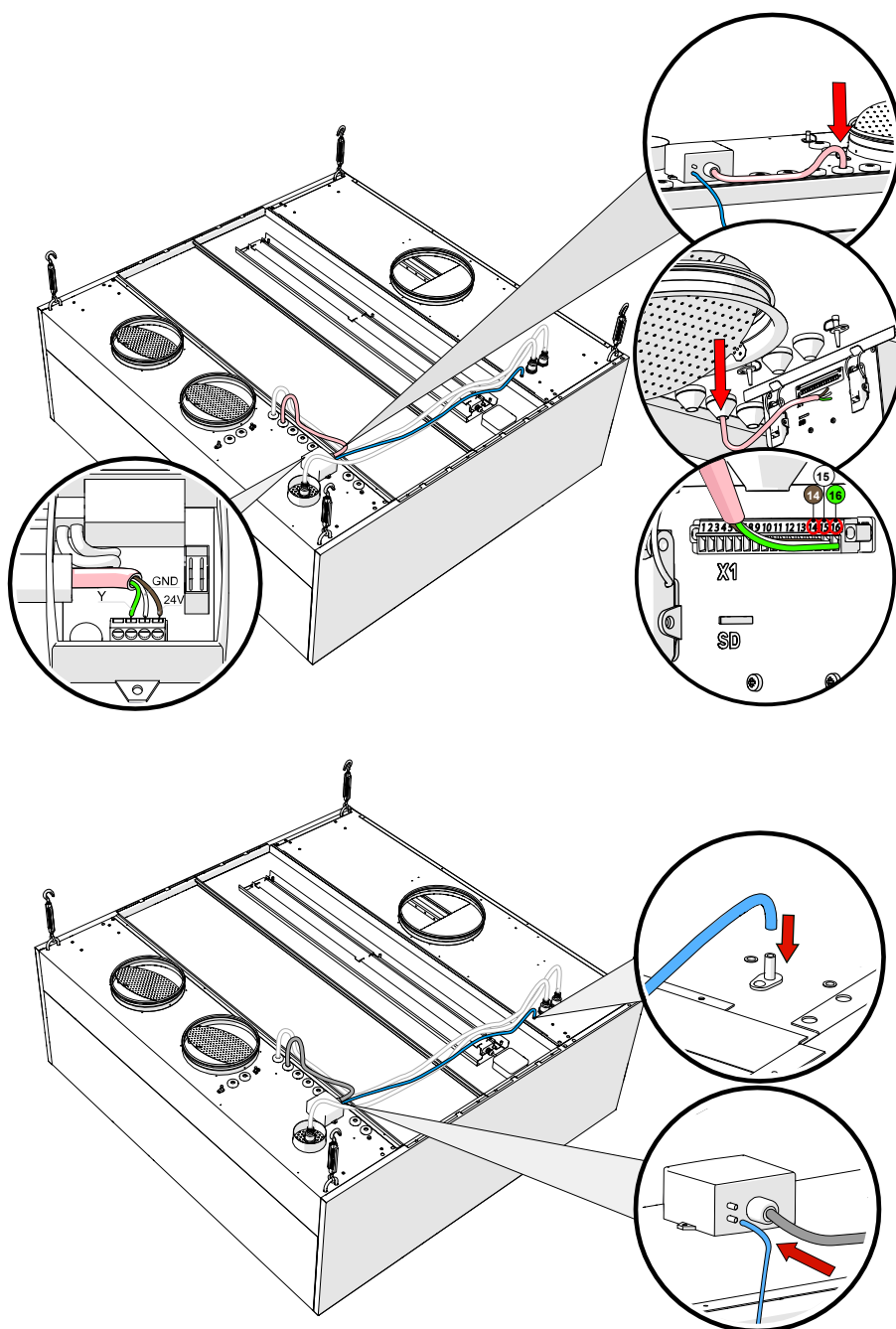
7.8 Connecting the pressure sensors of canopy sections

The UV canopy section pressure sensor cable is connected to the pressure sensors on the ceiling of each section and needs to be connected to the UV control unit. A total of up to four section pressure sensors can be connected to one UV-L control unit. Connect the pressure sensor cable to the X1 connector on the UV control unit as follows:

X1 socket	I/O grouping	I/O name	Cable core colours
14	Canopy pressure sensor 1	+24 VDC	Brown
15		-0 VDC	White
16		Pressure sensor 1 measuring Y	Green

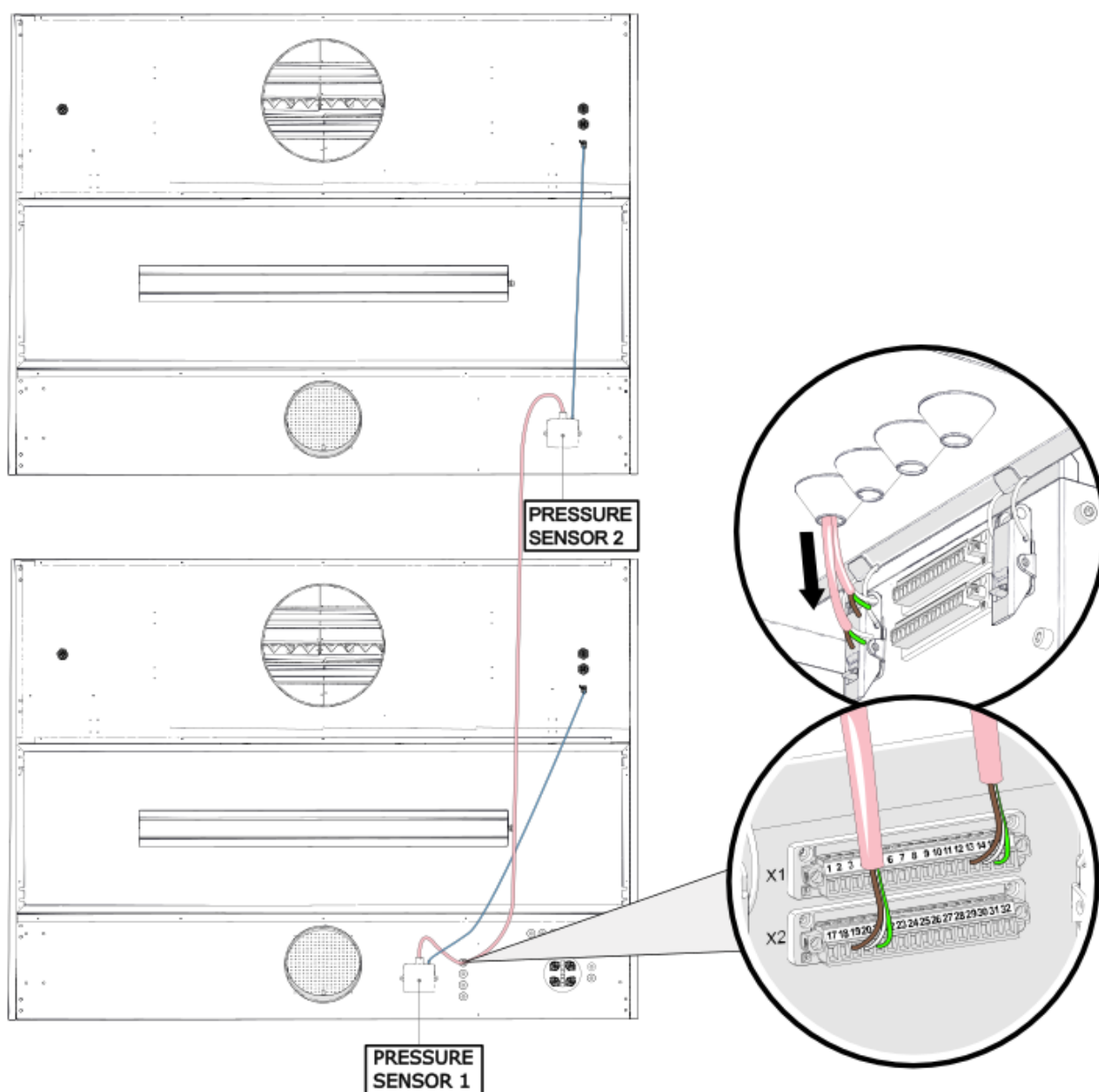
The pressure sensor cable and hose are already in place on the ceiling of the UV canopy's air inlet chamber and ready for connection.

If the pressure sensor hose has become disconnected from the measuring point during transport or installation, it must be reconnected.



Connect the pressure sensor cable to the X2 connector on the UV control unit as follows:

X2 socket	I/O grouping	I/O name	Cable core colours
19	Canopy pressure sensor 2	+24 VDC	Brown
20		-0 VDC	White
21		Pressure sensor 2 measuring Y	Green
24	Canopy pressure sensor 3	+24 VDC	Brown
25		-0 VDC	White
26		Pressure sensor 3 measuring Y	Green
29	Canopy pressure sensor 4	+24 VDC	Brown
30		-0 VDC	White
31		Pressure sensor 4 measuring Y	Green



7.9 Modbus data communication connection for control units

If there is more than one UV control unit in the kitchen then they must be connected in parallel with the next UV control unit.

The first control unit from which the cable continues to the next device must be the Master control unit, i.e. both the LCD control panel and the IoT device M-Link must be connected to this device in the future.

Use a 2×2×0,25 mm² twisted pair cable for Modbus connection between devices. A specific type of cable characterized by the following characteristics:

1. Number and size of twisted pairs:

- 2x2 – Means that the cable contains two pairs of wires, for a total of four wires.
- 0,25 mm² – Each wire has a cross-sectional area of 0.25 mm², which refers to the dimensions of the wires and usually refers to the diameter of the wires and their ability to carry electrical current.

2. Twisting

- Twisted pair cable consists of wires twisted in pairs, where each pair is tightly twisted to avoid electromagnetic interference and suitable signal integrity.

3. Connecting

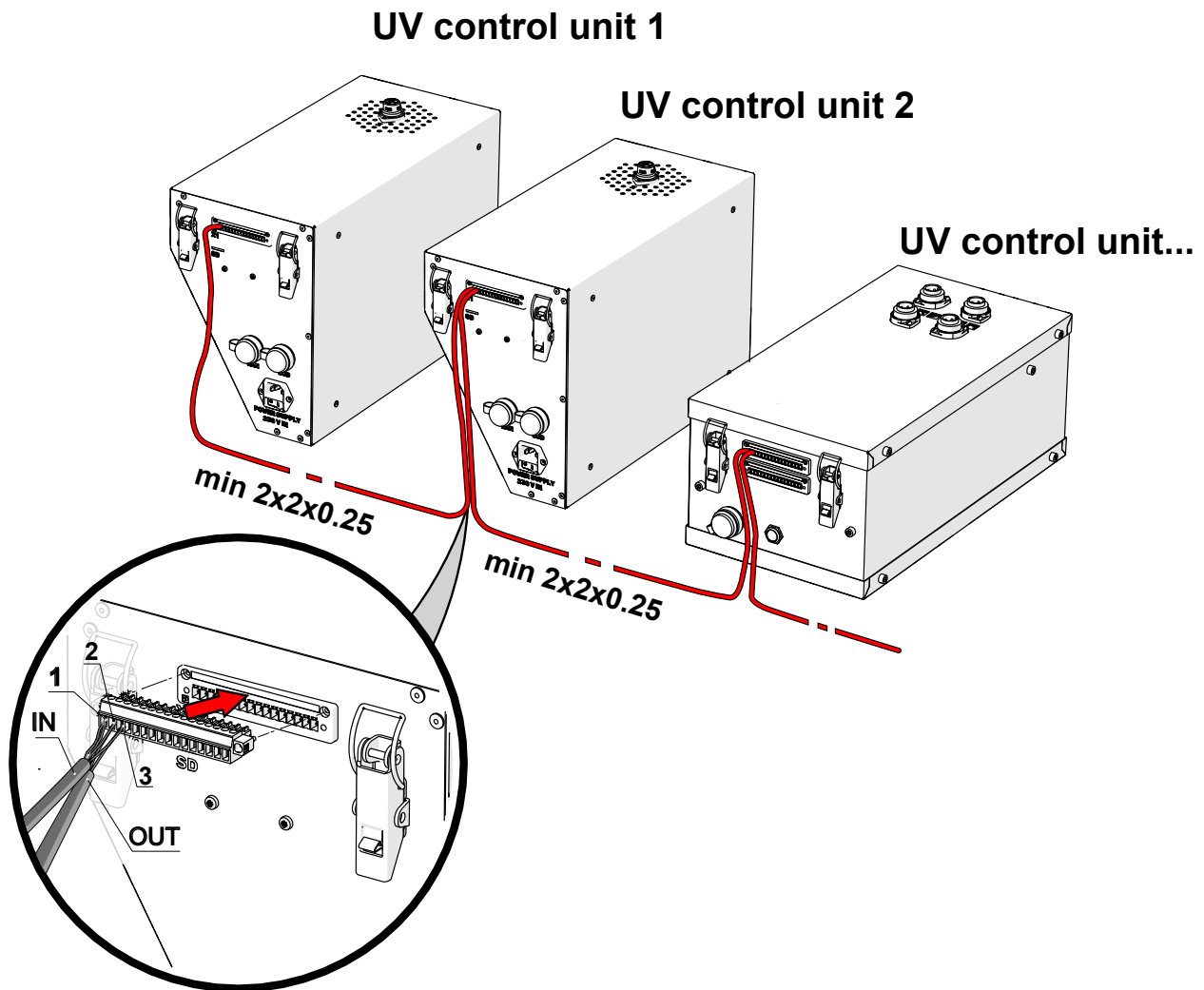
- First twisted pair - connect to X1 slot input connector numbers 1(A) and 2 (B).
- Second twisted pair - connect X1 slot to input connector number 3 (GND).

4. Recommended cable options:

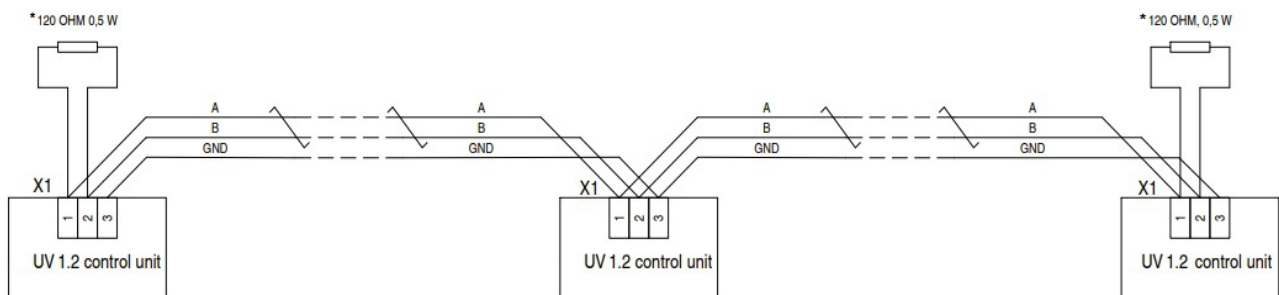
- CAT5E; CAT6; NOMAK 2×2×0,5+0,5; JAMAK 2×(2+1)×0,5).
- In the case of a cable with more twisted pairs, isolate the free twisted pairs - no application can be found (e.g. CAT5E). When choosing a cable, strictly use a fiber cable!

X1 socket connections:

X1 socket	I/o grouping	I/O name
1	Modbus RTU for connection between control units	A
2		B
3		GND



Termination resistors must be added to the beginning and end of the Modbus network to get a stronger signal. Resistors can be found from the package of LCD control panel and M-Link. Size of the termination resistors is 120 ohms 0,5 W.

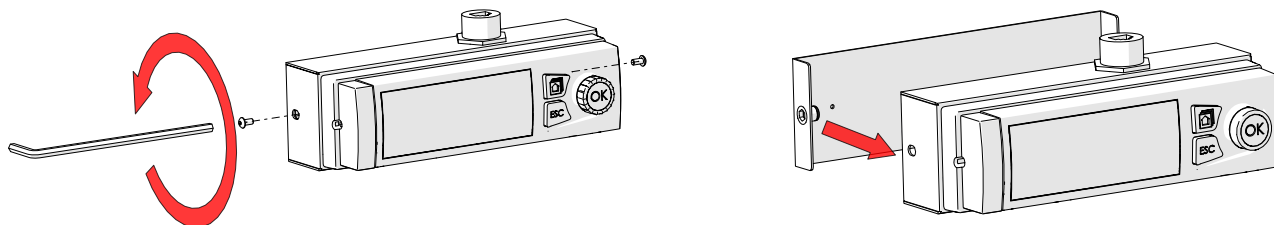


*Termination resistors must be added to the both ends of the network.

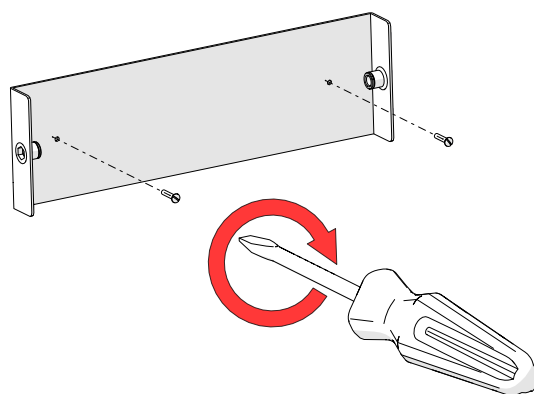
8. LCD control panel installation

NB! To install the control panel, choose a location in the kitchen or its immediate vicinity that is visible and easily accessible only to the staff. Avoid placing the control panel above kitchen appliances.

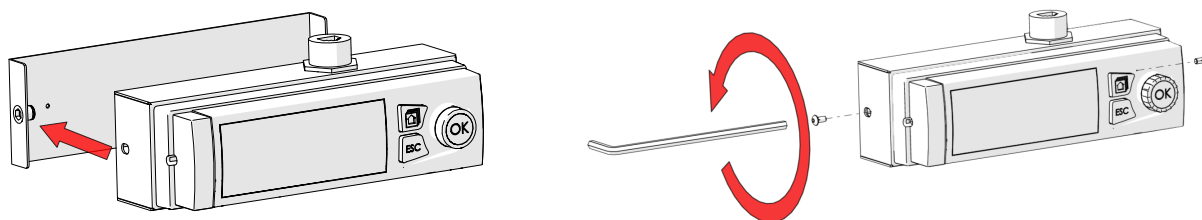
8.1 Attaching the mounting frame and connecting the LAN cable



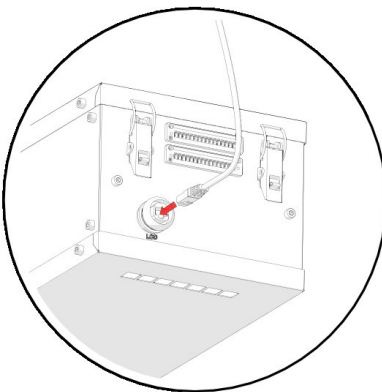
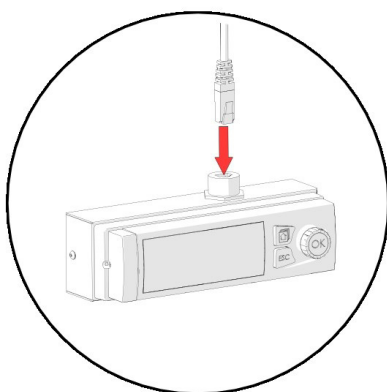
Attach the mounting frame to the wall or the side of the canopy so that the user always has free access to it. Avoid installing the control panel in a greasy area.



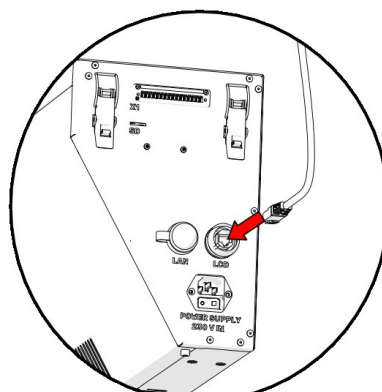
Reattach the control panel to the mounting frame and fix it with bolts on both sides.



Connect the LCD control panel to Master UV control unit using LAN cable.



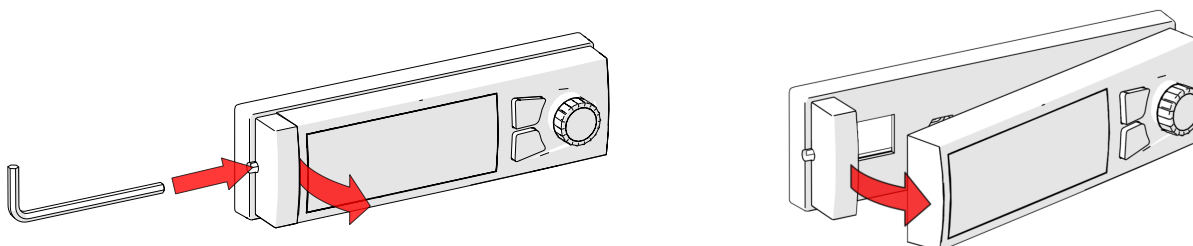
UV-L 1.2



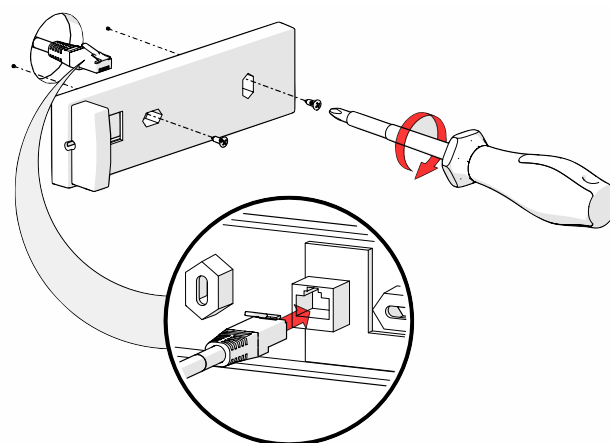
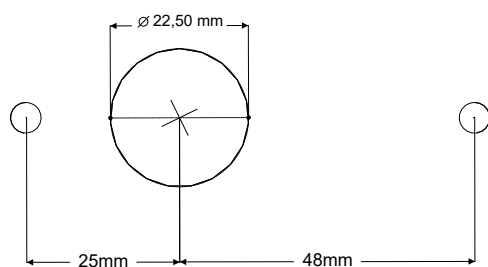
UV-S 1.2

8.2 Fixing the control panel to the wall without a metal case

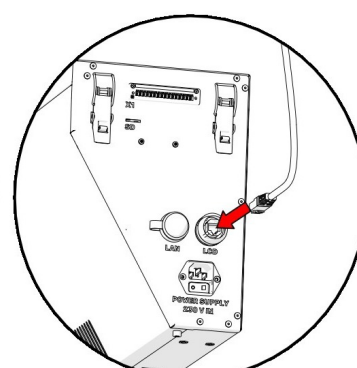
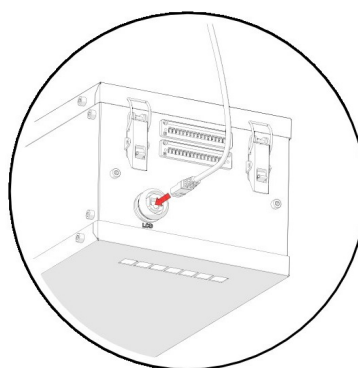
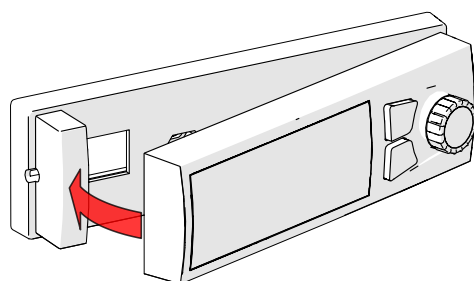
If you want to install the control panel on the wall so that its LAN cable comes from the back and remains inside the wall, the metal housing of the control panel must be dismantled and the plastic mounting frame attached to the wall.



Attach the mounting frame to the wall so that the LAN cable can come through the wall from the back. The drawing shows the mounting holes in the mounting frame.



Place the screen back on the mounting frame and connect the LAN cable to the control unit "LCD" socket.



9. Connecting the IoT device M-Link

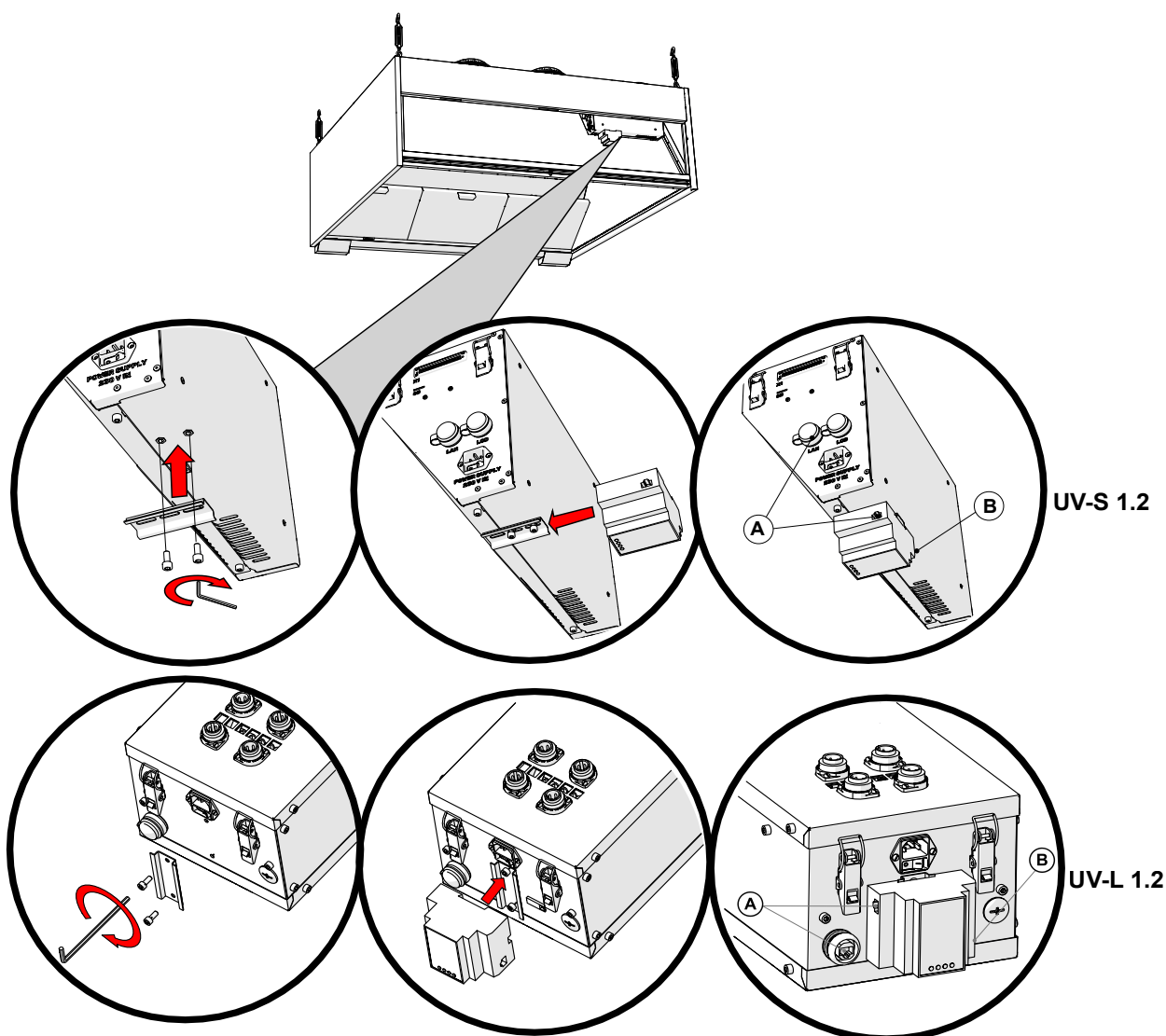
IoT device M-Link must be connected to the Master UV control unit, which also is connected to the LCD control panel.

To install the M-Link, attach the DIN rail to the control unit in a predetermined place and attach the device to the DIN rail.

A – LAN cable connection between the device and the control unit

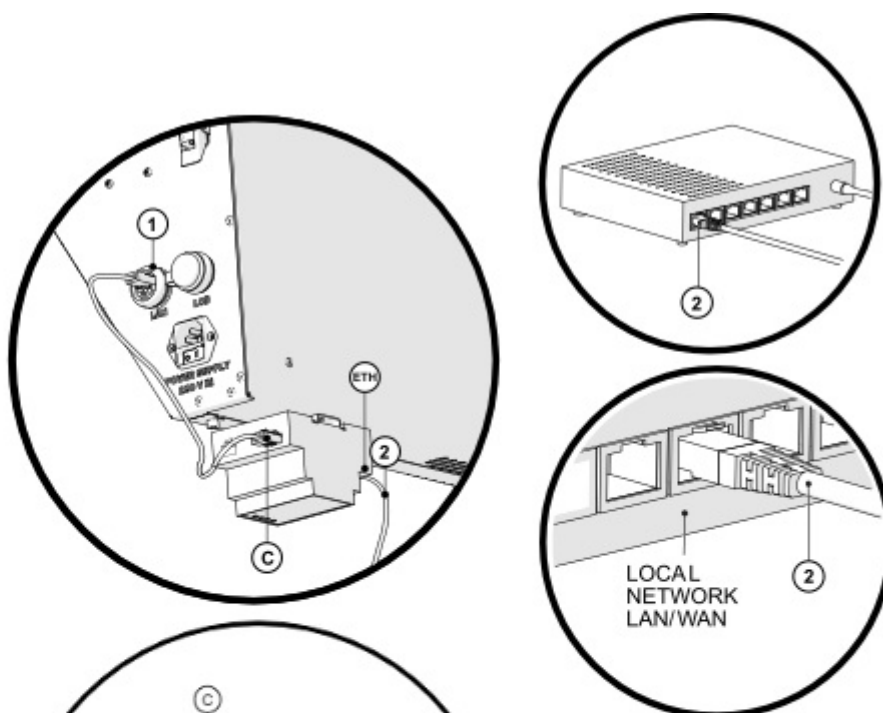
NB! Connect cable to M-Link port on control unit only if there is internet access.

B – Ethernet port, for network connection

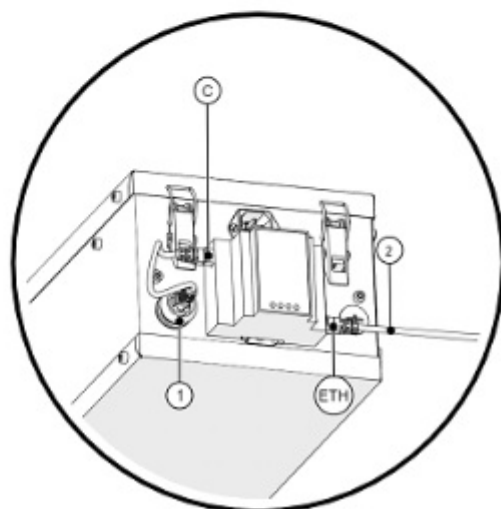


Connect the LAN cable from the router or directly from the local network to the M-Link ethernet port. From the upper C port of the M-Link, connect the LAN cable included in the package to the “M-LINK” connector of the UV control unit.

UV-S 1.2



UV-L 1.2



1 – M-LINK socket on UV control unit.

2 – Internet connection between local network or router and M-Link.

ETH – Ethernet port of M-Link for network connection.

C – The connection port between the M-Link and the control unit.

A local network is required, and it must be possible to connect the M-Link to it. If the customer does not want to connect the remote access device to their local network, there is also the option of using a 4G router. The router can be purchased through the ETS NORD sales department, and additional costs are incurred.

When using a router, an electrical connection must be provided by an electrician via an additional plug so that the router can be connected to the mains.

Without the IoT device, it is not possible for ETS NORD to provide the customer with a maintenance service, during which the customer is informed of the malfunctions and the UV lamp is replaced in time.

10. LED notification panel installation

**NB! To install the LED panel, choose a location in the kitchen that is highly visible to the staff.
Avoid placing the LED panel above kitchen appliances.**

The LED notification panel is an optional accessory and is supplied if the user wants to quickly and easily understand the status of the UV cleaning system.

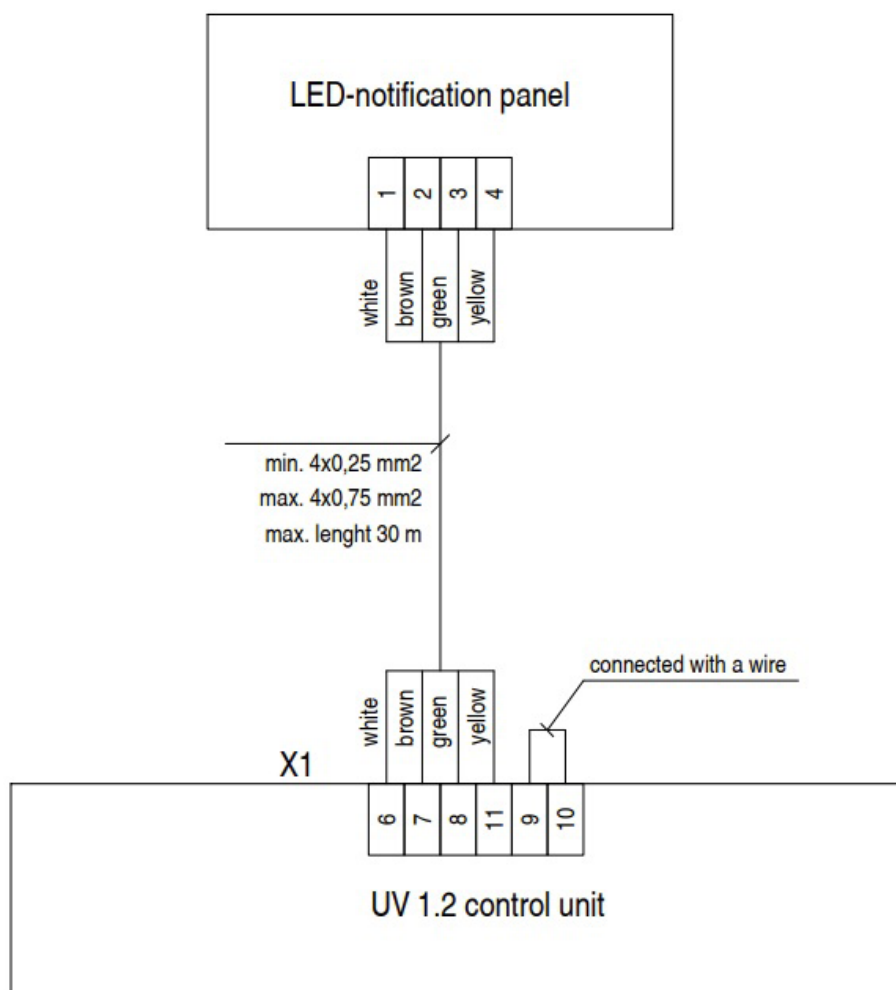
One LED notification panel is used per UV cleaning system, and it must be connected to the Master UV 1.2 control unit (the one with the LCD control panel connection).

The device can be installed in the kitchen either on the wall or on the canopy if the walls of the canopy allow it. For wall mounting you will need to use a 68 mm junction box. For the connection between the LED notification panel and the control unit, it is necessary to use a cable min. 4x0.25 mm².

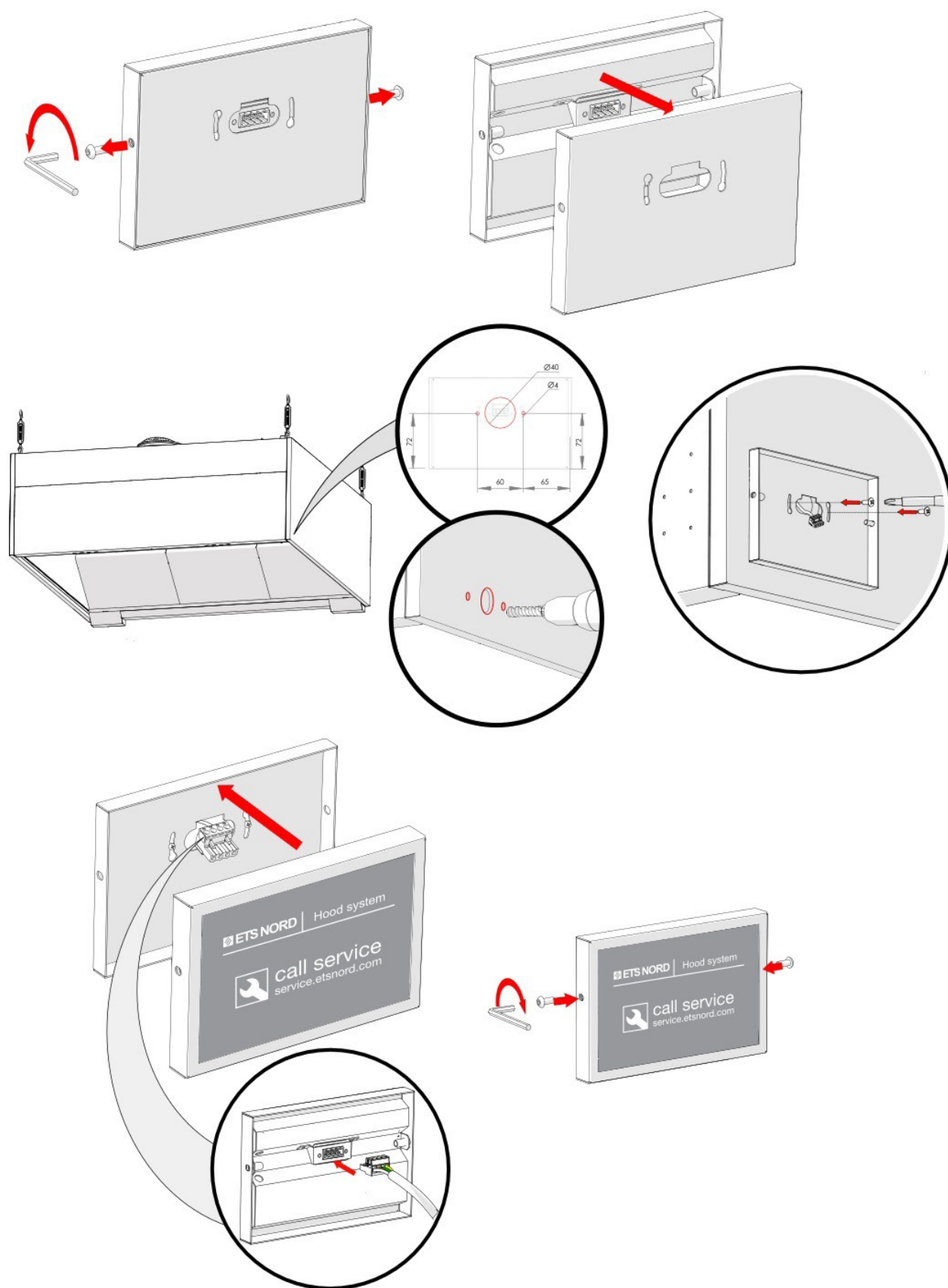
Connection between the UV 1.2 control panel and the LED notification panel:

LED notification panel connector	UV 1.2 control unit X1 connector	I/O name	
1	6	Operation status	
2	7	Critical error	
3	8	Service + fault status	
	9	COM	Bridged together with a wire
	10	+24 VDC	
4	11	-0 VDC	

Connection diagram:



LED notification panel installation:



11. Marking the canopies' sections with stickers

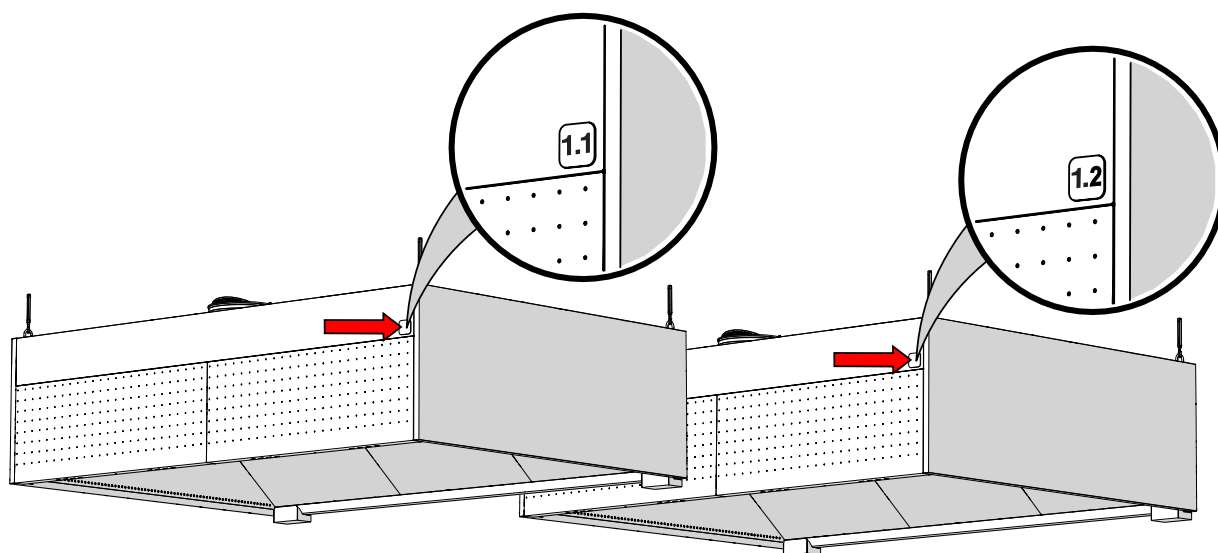
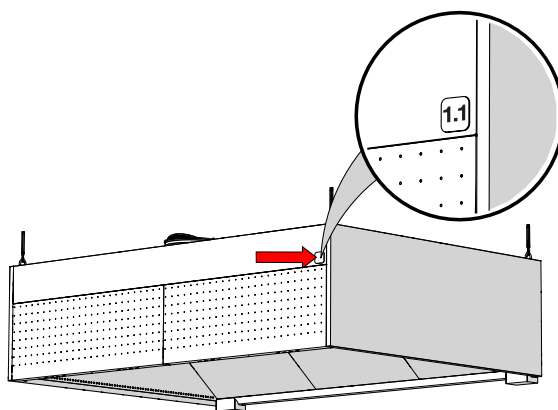
The canopy marking stickers are delivered in the package of the LCD control panel and M-Link. Stickers should be installed on the sections of the canopies where the UV lamps are located.

The stickers are numerically: 1.1-1.4 ... 6.1-6.4.

The first number on the sticker displays the unit's Modbus address, where on the Master units only the sticker 1.X is used and on Slave units the rest of the numbers 2.X ... 6.X.

The second number on the sticker displays the section in the canopy where the UV-lamps are located.

With UV-S control unit only the sticker X.1 is used despite whether it is a Master or Slave unit.



An example of using the stickers: There are four UV lamps under the Master control panel, and they are divided between two sections. There are two UV-lamps in each section. In this case, use sticker 1.1 on the first section and sticker 1.2 on the second section. If there are other UV control units (Slave units) in the same system, use stickers according to control units Modbus addresses and sections.

12. Building management system (BMS)

The ETS NORD UV cleaning system can be connected to building automation via I/O status signals, Modbus TCP/IP or by giving the system a work permission from the building management system (BMS), ventilation unit (AHU) or fire alarm system (FAS) through potential free NO/NC contact.

To use building automation via Modbus, you can find the “UV Cleaning System Guide for Automatics” under UV cleaning system on the ETS NORD website.

12.1 Overview of each BMS connection benefits

Factors	Modbus RTU	Modbus TCP/IP	I/O signals
Cable type	Twisted pair Designed for Serial Communication (CAT5E or CAT6 can be used for short or medium distances)	CAT5E or CAT6 cables Designed for communication over Ethernet with TCP/IP protocols	Control multicore cable
Maximum speed	Max 115 Kbps Often sufficient for smallscale industry usages where master-slave devices are nearby	100 Mbps; Suitable for applications requiring large data handling, faster data transmission, and real-time performance	Not applied
Length	Depends on speed: for a maximum 9600 Baud Rate and AWG26 (or wider) gauge, the maximum length is 1000m	Up to 100 meters	Depends on PLC input characteristics
Topology	Bus (directly - daisy chaining) or by short derivation cables. (Supports upto 32 slaves without repeaters and 247 with repeaters)	Star, Tree, Daisy Chain, etc. (up to 247 servers)	Peer-to-peer
Master-Slave communication	Single Master	Multiple Clients	Not applied
Security	Can be hacked after gaining physical access	Can be hacked remotely by hackers	Signals can be forced by physical connections between core of cable

12.2 Compatibility with building automation through I/O status signals

I/O status signals indicate the system’s operational status, system critical errors and maintenance need. To integrate building automation via I/O status signals, the connection must be made to the X1 connector of the Master UV 1.2 control unit.

If the system also uses a LED notification panel, then both the I/O status signals and the LED notification panel must be connected through a relay box which is an optional extra accessory.

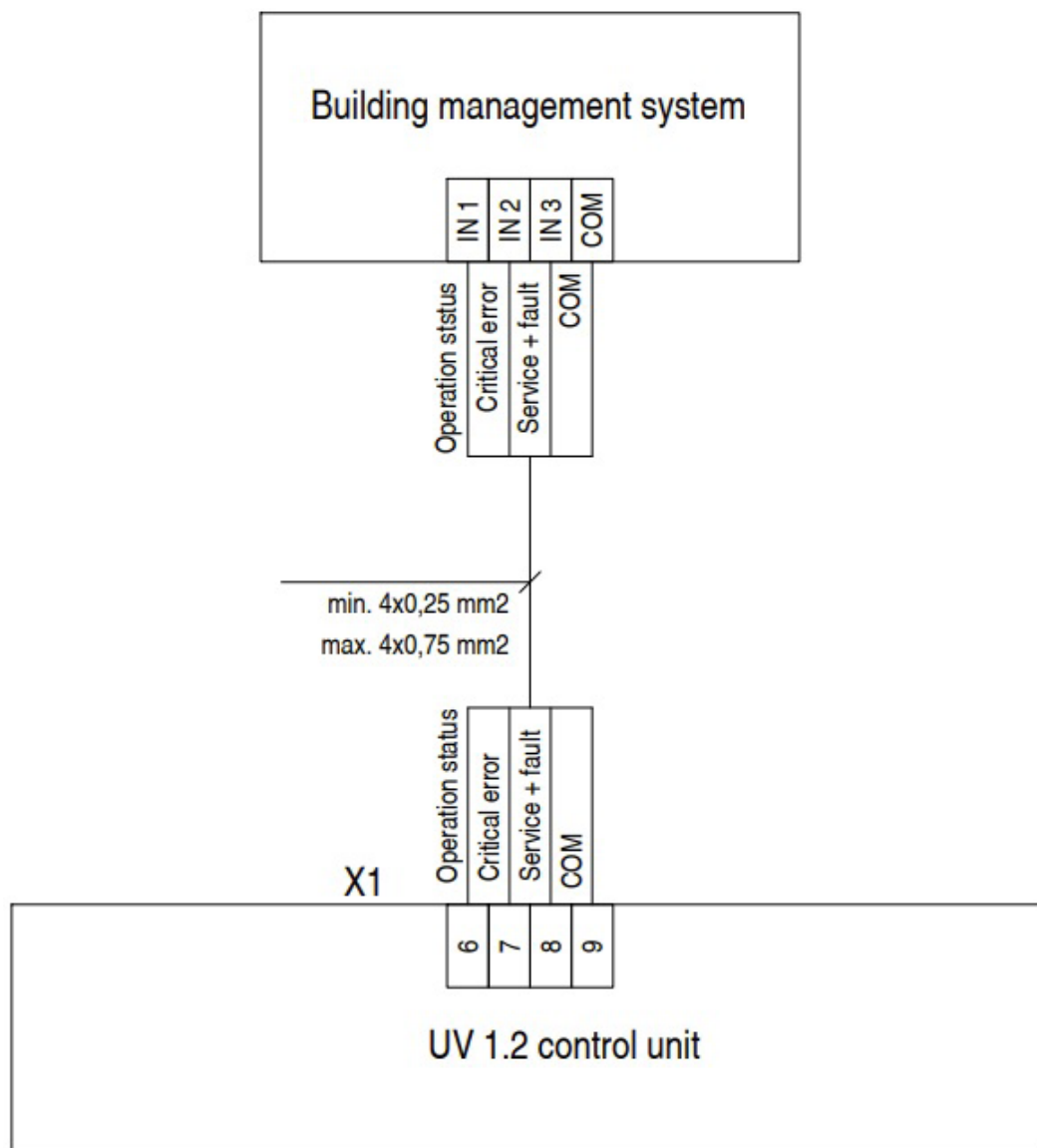
Status table:

I/O name	Value 0	Value 1
Operation status	Status – Off (UV-lamps are off)	Status – On (UV-lamps are on)
Critical error	Status – Normal (UV-system does not have errors)	Status – Alarm (UV-system has active errors)
Service + fault status	Status – Normal (UV-system does not have maintenance need or faults)	Status – Alarm (UV-system requires maintenance or has faults)

Connecting status signals via X1 connector:

X1 connector	I/O grouping	I/O name
6	Status signals for building automation	Operation status
7		Critical error
8		Service + fault status
9		COM (24 VDC relays)

Connection diagram:

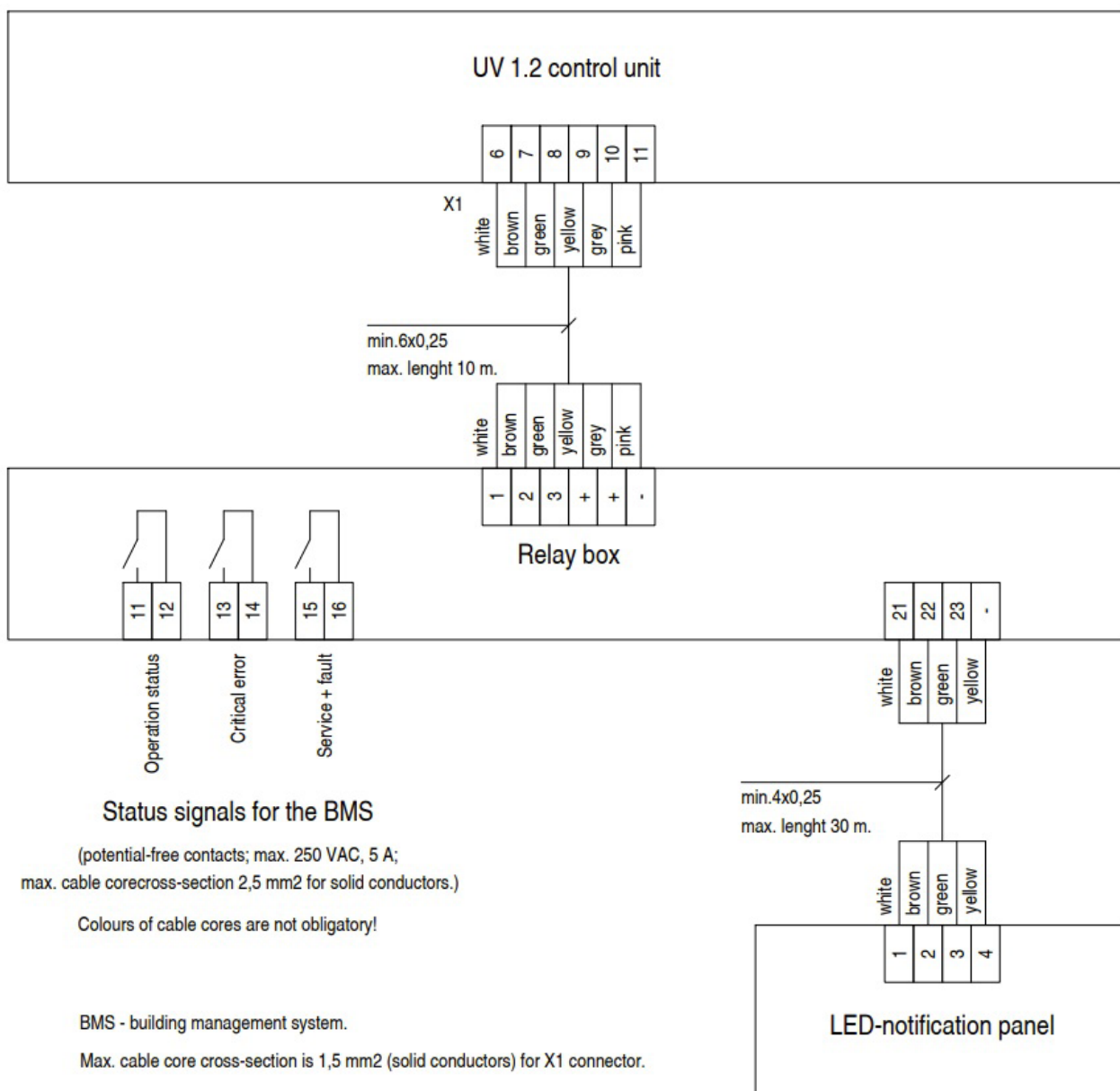


If, in addition to the building automation I/O status signals the LED notification panel is used, then both must be connected through a relay box.

Connection between the UV-S 1.2 control unit and relay box

UV 1.2 control unit X1 connector	Relay box terminal	I/O name
6	1	Operation status
7	2	Critical error
8	3	Service + fault status
9	+	COM
10	+	+24 VDC
11	-	-0 VDC

Connection diagram:



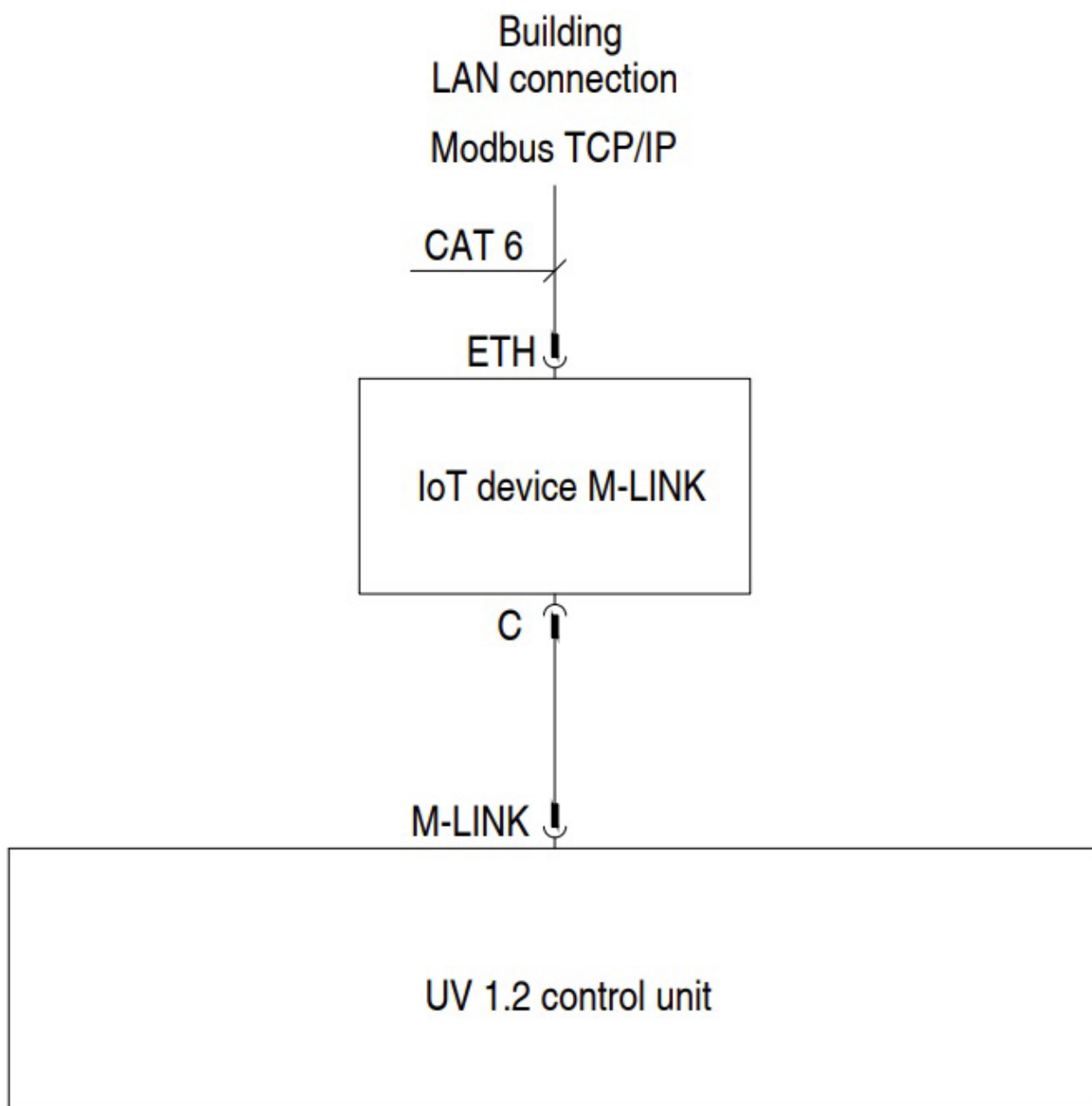
Note. Remove the bridge on connector X1 between terminals 9 and 10 for connection of cable between control unit and relay box.

12.3 Compatibility with building automation through Modbus TCP/IP

To integrate building automation via Modbus TCP/IP, the connection must be made to the Master control unit M-Link Ethernet port.

To use building automation via Modbus, you can find the [“UV Cleaning System Guide for Automatics”](#) under UV cleaning system on the ETS NORD website.

Connection diagram:

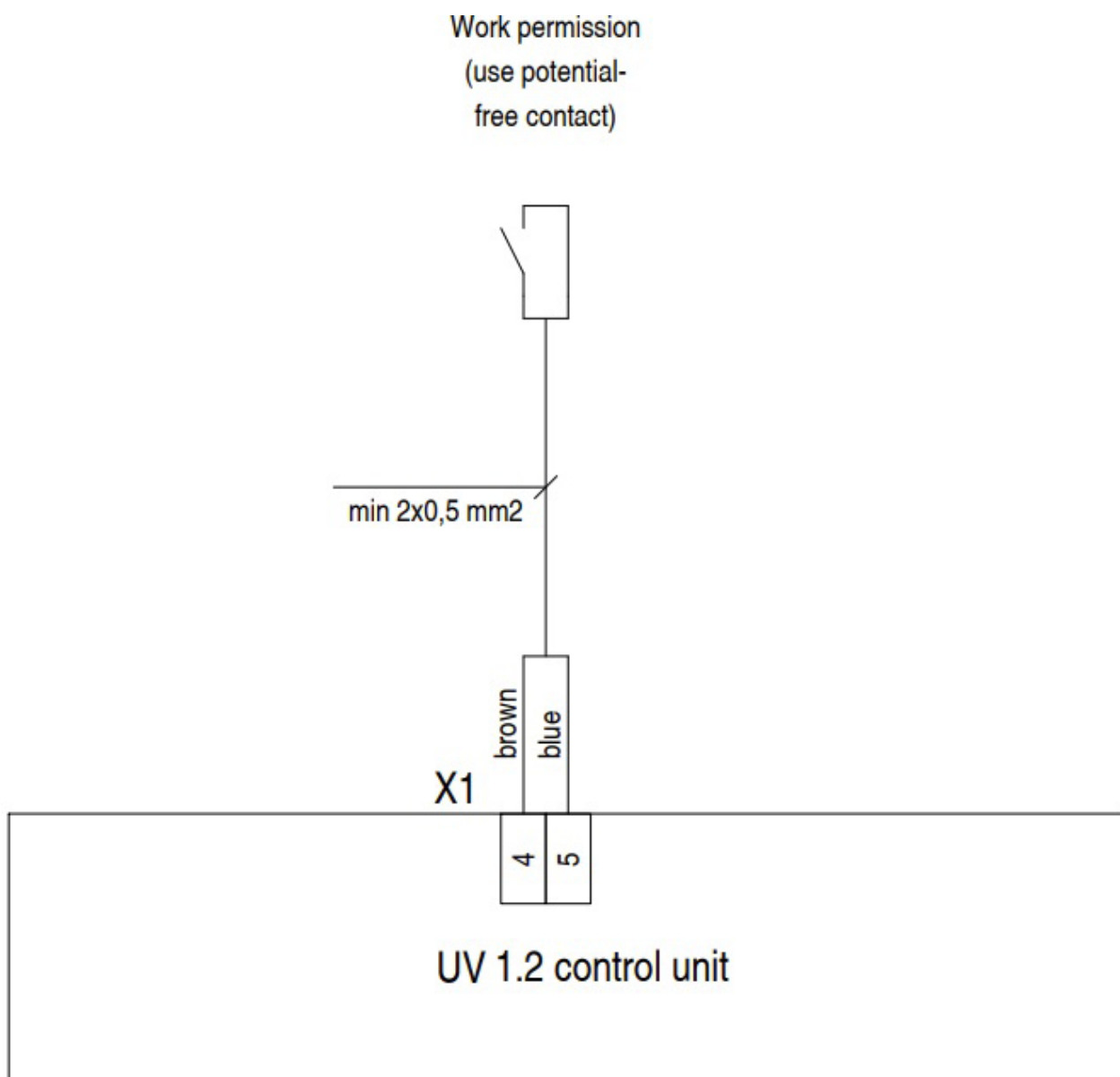


12.4 Work permission compatibility

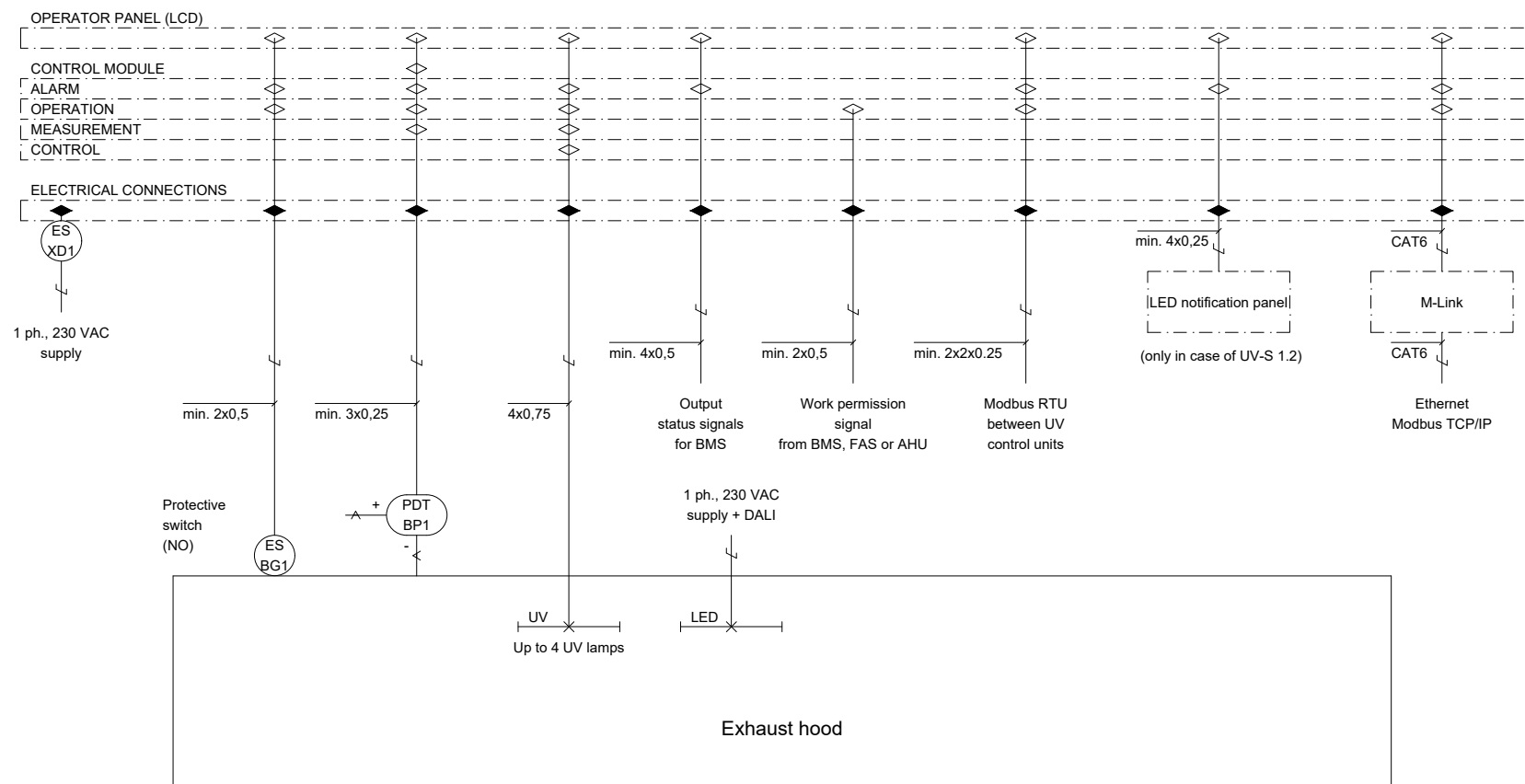
It is possible to give a work permission to the UV cleaning system through NO or NC potential free contact. The work permission signal can either come from FAS, building automation centre or a ventilation unit.

X1 connector connections:

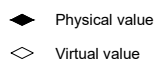
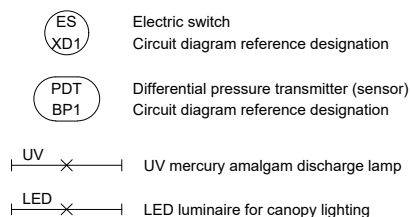
X1 connector	I/O grouping	I/O name
4	Work permission FAS/BMS/AHU	Work permission +
5		Work permission -



13. UV cleaning system functional diagram



Used symbol's explanation



BMS - building management system
FAS - fire alarm system
AHU - air handling unit

14. Facts about UV and ozone

UV radiation is radiation invisible to the eye, consisting of several sub-rays divided by wavelength. The most dangerous of these are VUV and UVC, which are blocked by the Earth's ozone layer. Only UVB and UVA can escape the ozone layer, the dangerous effects of which are manifested by prolonged exposure.

In the case of UV radiation, according to EN 16282-8:2017, the maximum effective radiation intensity is 0.5 mW/m² measured at 10 cm from the separator. In Estonia, the limit of effective radiation intensity in the working environment is 30 J/m² for 8 hours of exposure or 1 mW/m² in Annex 1 of VV Regulation No. 47.

Prolonged exposure to UV radiation can cause the following injuries:

- On the skin: irritation and burning sensation;
- In the eyes: severe irritation, burns and decreased vision.

Ozone is a colourless gas whose sharp smell can be recognized by a person at a concentration of 0.02 ppm (0,4 mg/m³). Ozone smells similarly to chlorine used in swimming pools. When using ozone, the current legislation must be observed. In Estonia, the following hygienic limits for ozone have been provided:

- 0,05...0,2 ppm (during working hours, 8 hours)
- 0,3 ppm (15 minutes).

Acute exposure to ozone can cause the following injuries:

- On the skin: irritation and burning sensation;
- In the eyes: severe irritation, burns and decreased vision;
- Lungs: irritation in the respiratory organs and breathing problems.

If ozone is detected indoors, precautions should be taken.

15. Warranty information

The warranty of the UV cleaning system is subject to the following conditions:

- A two-year warranty is granted for the new product against possible defects or manufacturing defects, provided that:
 - The introduction of the UV cleaning system has been carried out by ETS NORD.
 - The annual maintenance of the device has been completed on time.
 - Components that have exceeded the operating hours or switching cycle (e.g. UV-lamps) have been replaced on time.
- The warranty of the new UV cleaning system covers the replacement and repair of the defective part.
- Replacement parts have a 90-day defect and manufacturing defect warranty from the date of original installation.
- The warranty takes effect from the date of commissioning.

16. Service and maintenance

Maintenance and commissioning of the ozone purification system may only be performed by ETS NORD's trained personnel or its authorized contractors.

You can get more information about the service and maintenance of the ozone cleaning system from ETS NORD's service.



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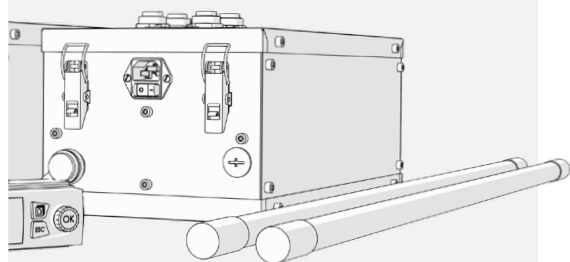
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