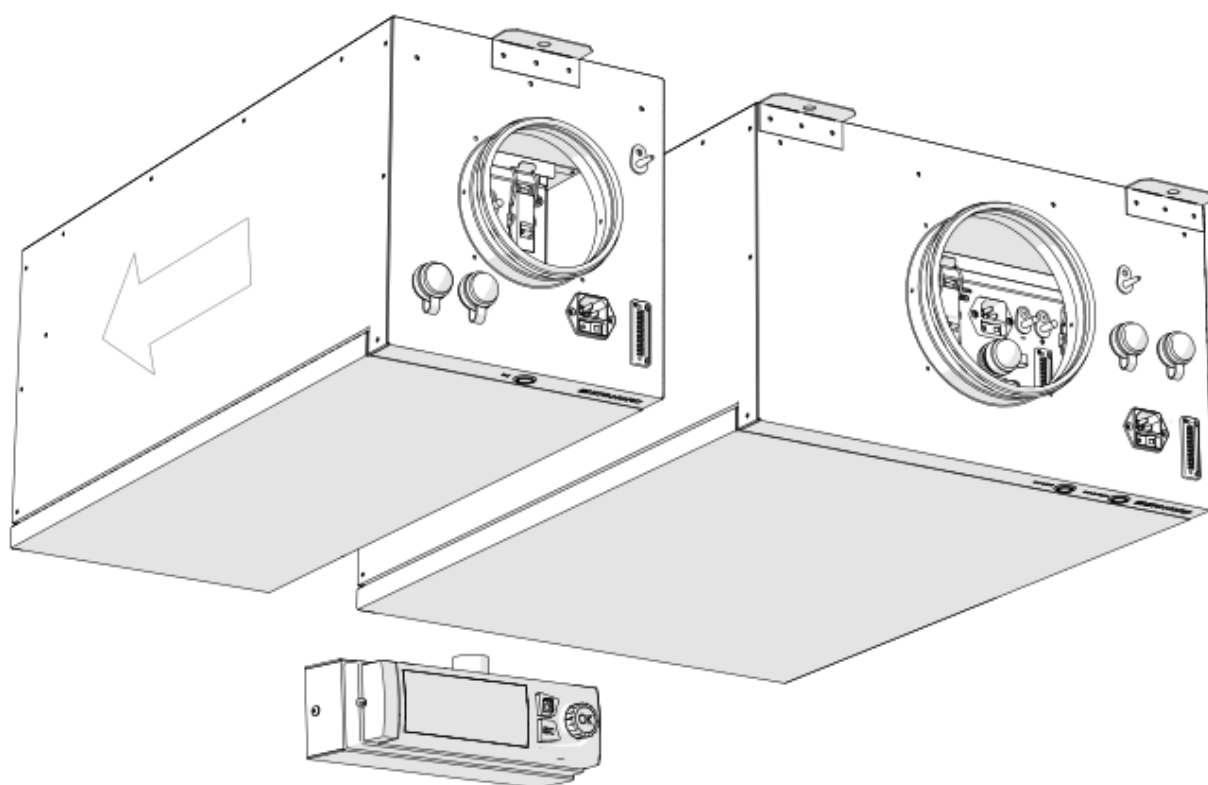




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EOZ 2.1 Ozone Generator Installation Guide

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General

This guide contains information for the safe installation of the ETS NORD EOZ 2.1 Ozone generator.

Read the guide carefully before installing this product.

All the installation activities described in the manual must be performed before the ETS NORD technician comes to the site to set up the system. ETS NORD AS reserves the right to issue an additional invoice if the prescribed works have not been performed.

After the installation, the EOZ 2.1 pre-commissioning checklist must be filled out and forwarded to ETS NORD when ordering the commissioning of the ozone cleaning system. The checklist can be found at the link www.etsnord.com/products/eoz-ozone-generator/.

ATTENTION!

- **EOZ 2.1 must be installed in a way it has easy access for service and maintenance, preferably above the ceiling. Removal of the ozone units from inside must be enabled.**
- **EOZ 2.1 chassis can be mounted in any position. It is very important to keep in mind that the direction of the airflow must correspond with the arrow on the EOZ 2.1 chassis.**
- **All duct installation materials between the outlet of the EOZ 2.1 unit and the main exhaust duct, including screws, rivets and saddle, must be acid resistant stainless steel (AISI 316).**
- **Fire dampers are used in accordance with local and country codes.**

Check the product shipment

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

Make sure that the product is in accordance with the order and that all parts specified in the delivery note are included. Incorrect delivery and transport damage must be immediately reported to both the cargo carrier and ETS NORD Service.

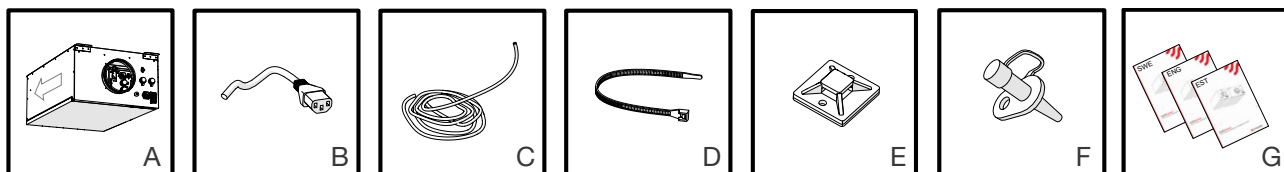
The time for filing a complaint or shipment discrepancy is 5 days after delivery. ETS NORD is not responsible for defects that have occurred after goods have been handed over to the buyer.

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 Service!

The EOZ 2.1 ozone generator packaging includes:

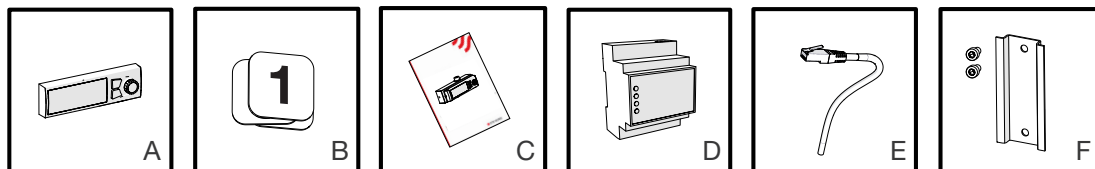
- A. EOZ 1 - 2.1 or EOZ 2 - 2.1 ozone generator
- B. Power cable IEC C13 with plug (1,5 m)
- C. Pressure measurement hose (3 m)
- D. Cable ties (10 pcs)
- E. Adhesive cable tie mount (10 pcs)
- F. Pressure measurement nozzle (1 pcs)
- G. User manual for personnel



The LCD control panel packaging include:

- A. LCD control panel with wall mount
- B. One sheet of ozone unit device address identification labels
- C. Installation guide
- D. M-Link remote access device*
- E. LAN cable for connection between M-Link and Master ozone generator (0,5m)*
- F. DIN rail + 2 x M5 bolts for mounting M-Linki*

* Is included in the package of LCD control panel with M-Link.



Safety

Failure to comply with the instructions for the use and safety of the ozone unit or improper use may cause bodily injury.

The ozone cleaning system is designed to treat air with ozone only as described in this guide.

Ozone reduces odors and breaks down grease, mold and bacteria. ETS NORD AS assumes no responsibility if the product is not used in accordance with the instructions contained in this guide.

Ozone is harmful to health. Prolonged exposure may cause subsequent damage:

- skin rash and burns;
- respiratory tract irritation and breathing problems.

Warnings!



Ozone danger!

Long-term exposure to ozone can cause health damage.



When removing grease filters, make sure that the ozone cleaning system is switched off!



Risk of falling!

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



Risk of electric shock!

Electrical connections to the system may only be made by a qualified and authorized electrician.



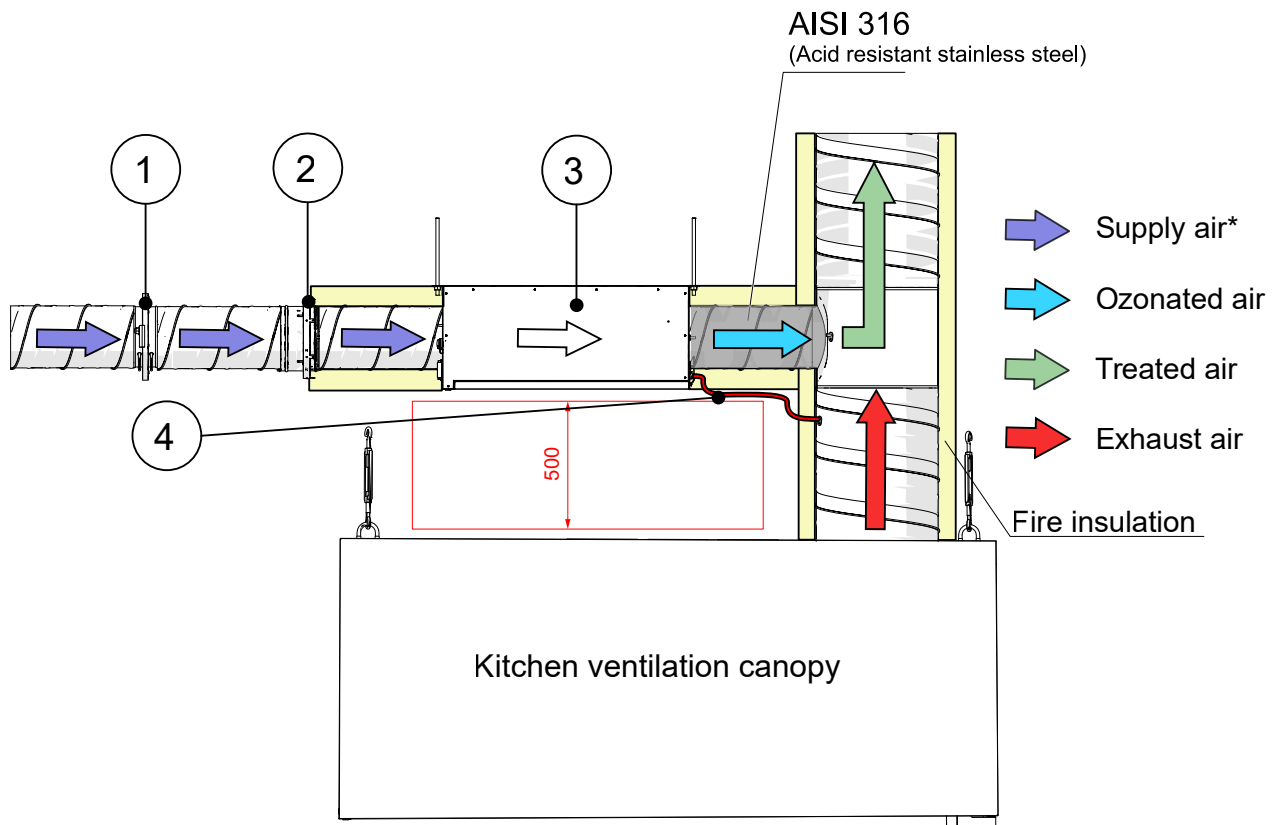
Before maintenance work, always switch off the system and disconnect the plug from the mains!

System overview

EOZ 1 - 2.1 consists of one OZ 4.0 Ozone unit and EOZ 2 - 2.1 consists of two OZ 4.0 Ozone units. EOZ 2.1 can be used together in one system with OZ 4.0 Ozone units which are located inside the canopies.

Ozone units generate ozone what is a very effective oxidant, and when mixed into the kitchen's exhaust air brakes down grease and odor particles to water vapor, carbon dioxide and dry minerals what are being removed through the exhaust system.

In one ozone cleaning system, behind one control panel there can be a maximum of 9 ozone units.



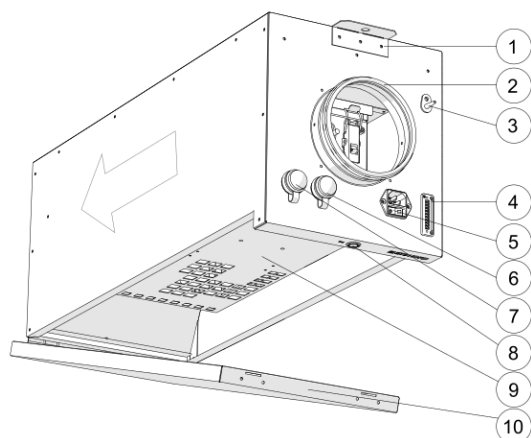
*Supply air must be clean air coming from the air handling unit.

- 1 – KRI Regulating damper
- 2 – Fire damper (used in accordance with local and country codes)
- 3 – EOZ 2.1 Ozone Generator
- 4 – Pressure tube

ATTENTION! Fire dampers are used in accordance with local and country codes.

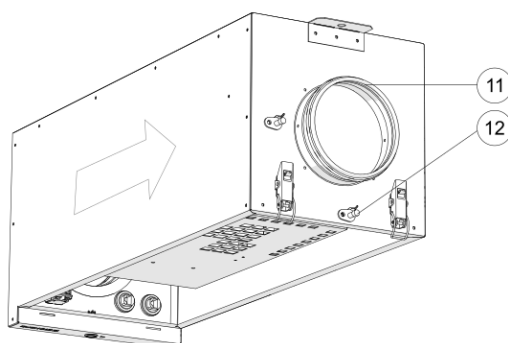
EOZ 1 - 2.1

EOZ 1 - 2.1 Supply air end



- 1 – Suspension brackets
- 2 – Supply air connection
- 3 – Ambient air pressure nozzle (+)
- 4 – X1 input connector
- 5 – Power supply socket
- 6 – M-Link socket

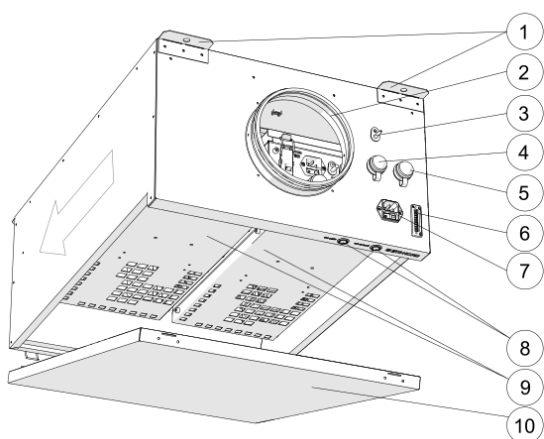
EOZ 1 - 2.1 Exhaust air end



- 7 – LCD control panel socket
- 8 – Status LED
- 9 – OZ 4.0 Ozone unit
- 10 – Service hatch
- 11 – Exhaust air connection
- 12 – Exhaust air pressure nozzle (-)

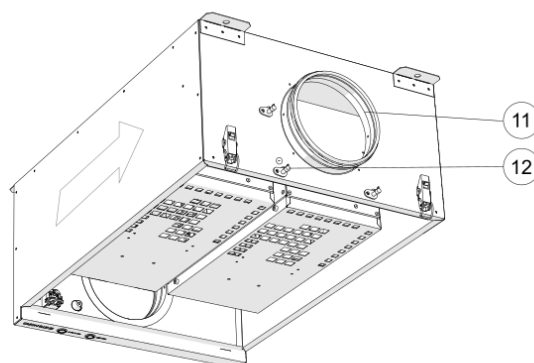
EOZ 2 - 2.1

EOZ 2 - 2.1 Supply air end



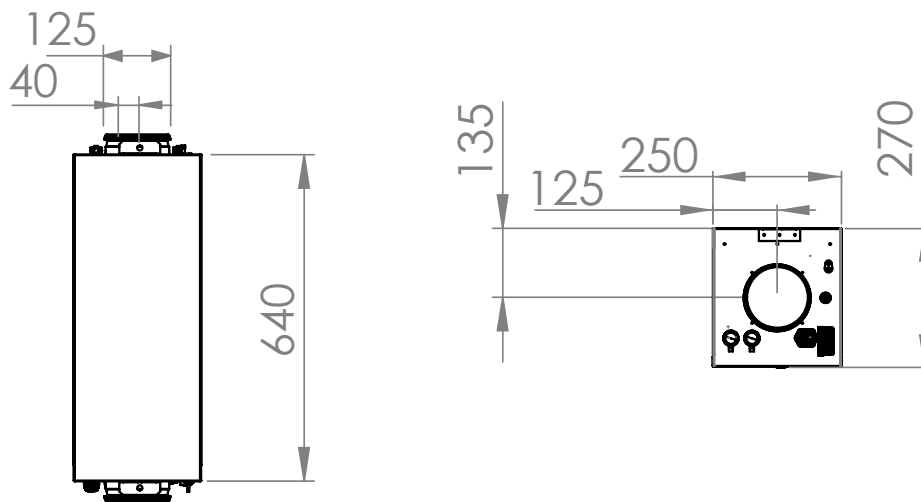
- 1 – Suspension brackets
- 2 – Supply air connection
- 3 – Ambient air pressure nozzle (+)
- 4 – M-Link socket
- 5 – LCD control panel socket
- 6 – X1 input connector

EOZ 2 - 2.1 Exhaust air end

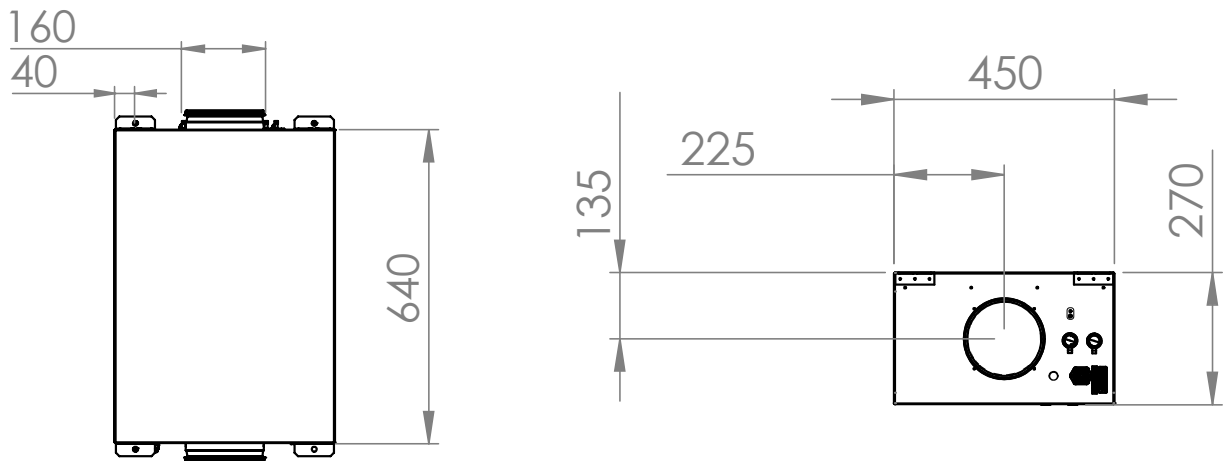


- 7 – Power supply socket
- 8 – Status LEDs
- 9 – OZ 4.0 Ozone units
- 10 – Service hatch
- 11 – Exhaust air connection
- 12 – Exhaust air pressure nozzle (-)

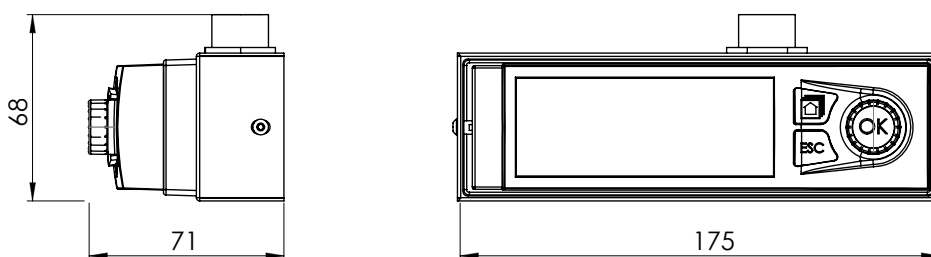
EOZ 1 - 2.1 Ozone generator dimensions



EOZ 2 - 2.1 Ozone generator dimensions



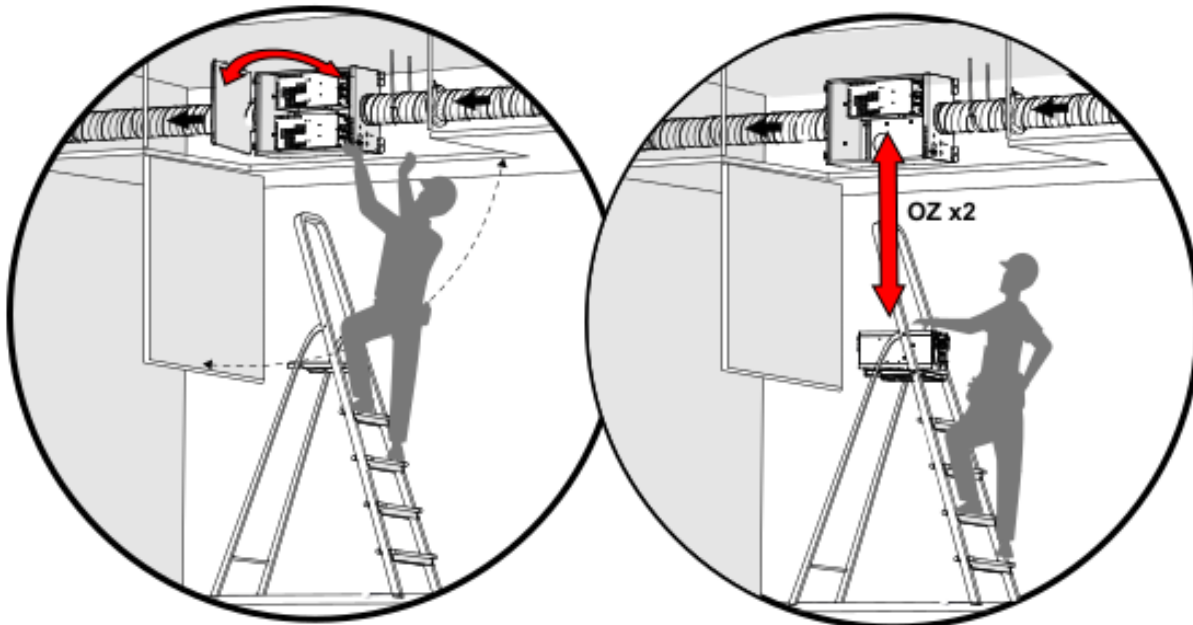
LCD control panel dimensions



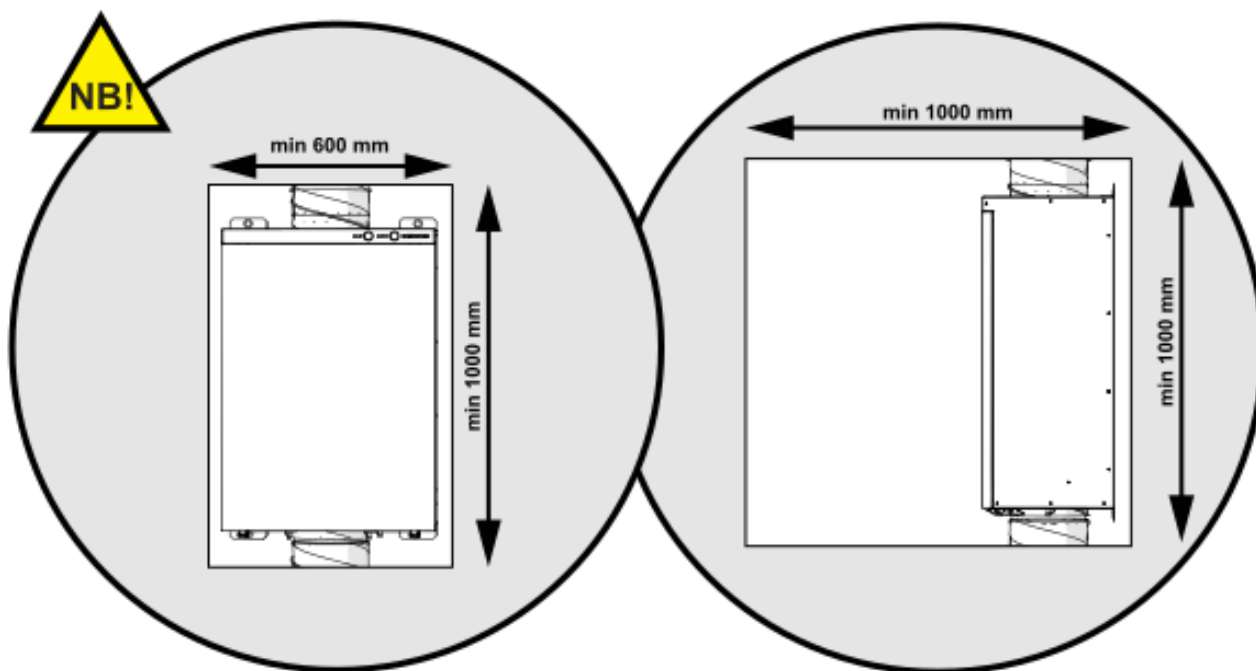
1. Installation location information

1.1 EOZ under the ceiling

EOZ can be hidden behind the suspended ceiling – NB! There must be a maintenance hatch to access the device.

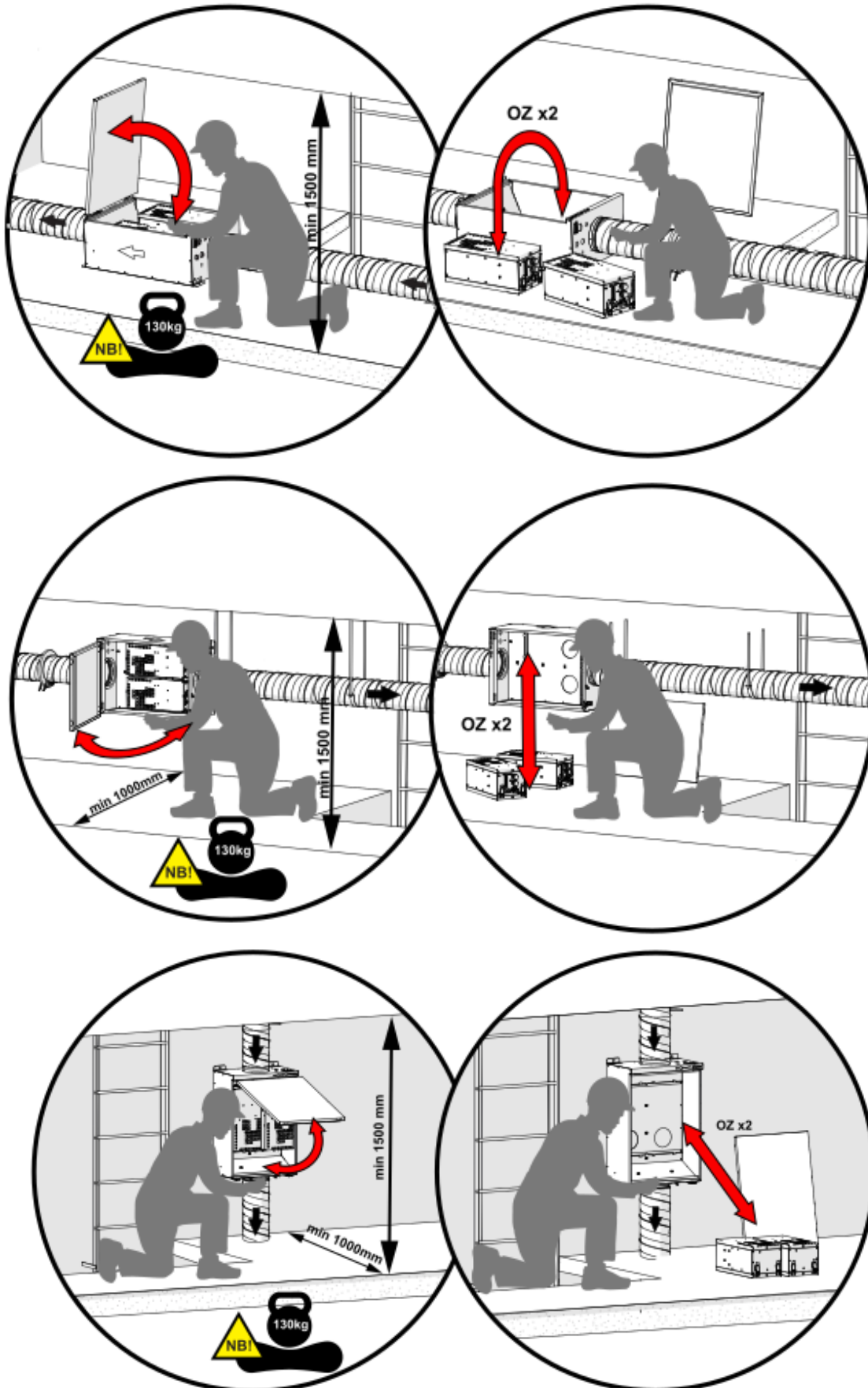


Service hatch minimal size requirements:

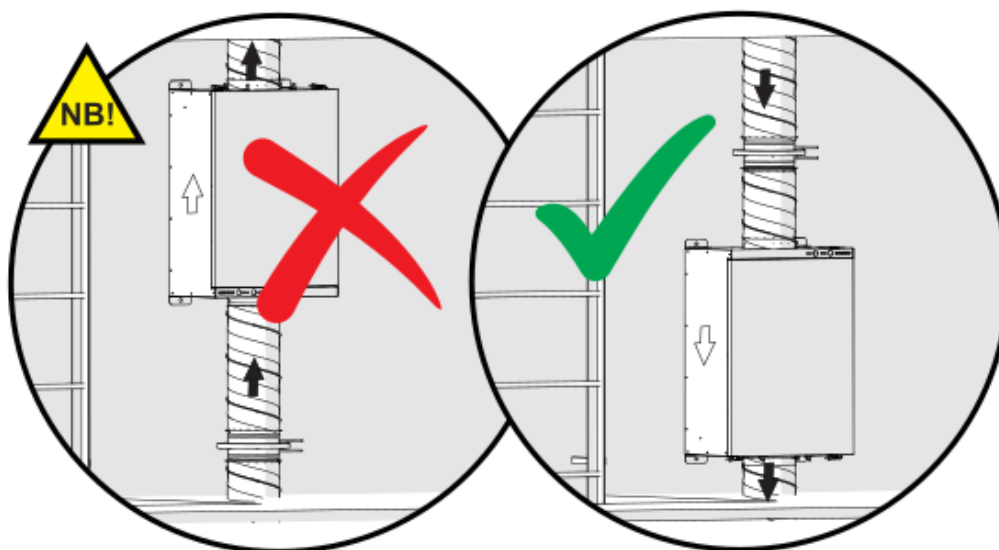


1.2 EOZ on suspended ceiling or mid-ceiling

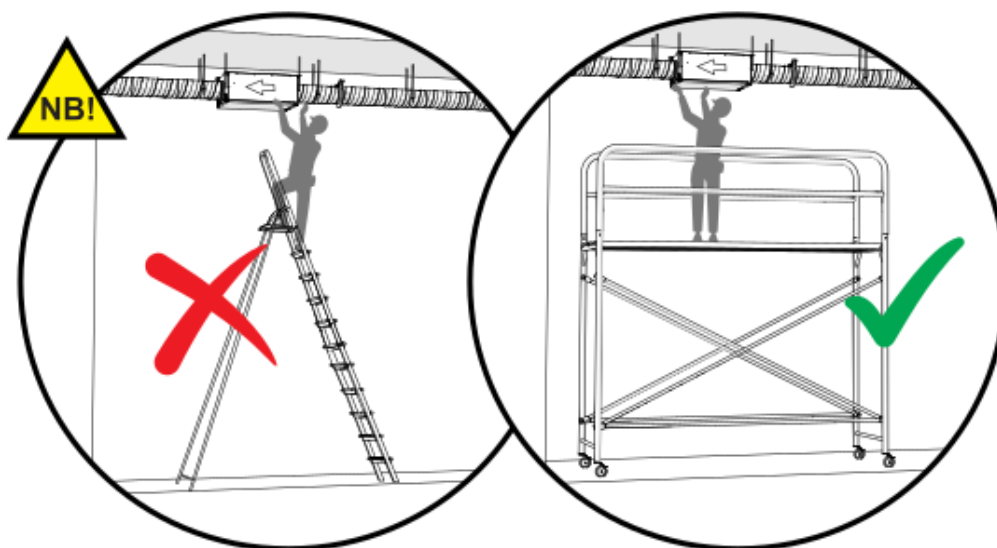
NB! The minimum weight to be considered is 130 kg.



When the EOZ is positioned vertically, it should be noted that the air flow must always be downwards, as ozone is heavier than air.



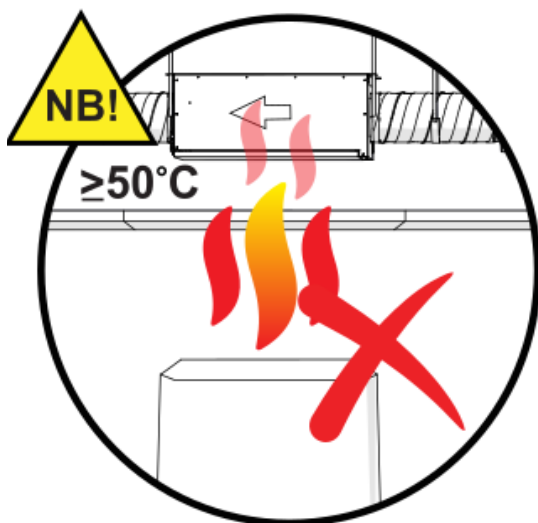
1.3 If the device is located at a height, scaffolding must be used for safety reasons.



1.4 The device must be serviced on a work surface or table.



1.5 NB! A heat-separating device must not be installed below the EOZ. EOZ does not start and does not work in an environment where the temperature is 50 °C and above.



2. Installing the EOZ

The EOZ 2.1 unit may be installed in any convenient location in the kitchen space, ideally with easy access to supply air and within 3m of the canopy connection to the exhaust duct.

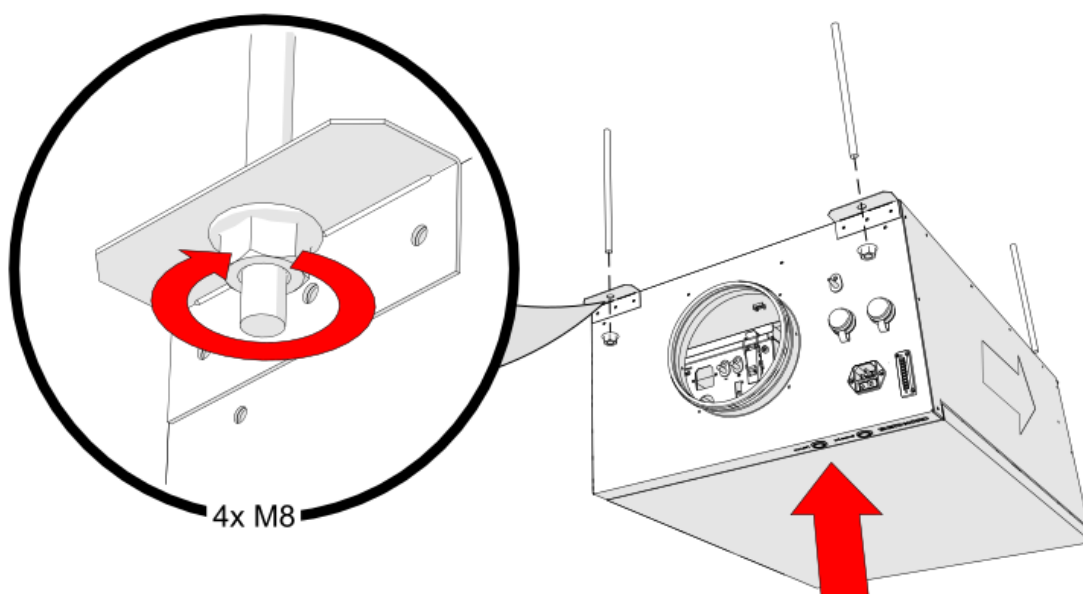
Keep in mind that all duct installation materials between the outlet of the EOZ 2.1 unit and the main exhaust duct, including screws, rivets, and the connecting flange, must be acid resistant stainless steel (AISI 316).

NOTE! Direction of the airflow must correspond with the arrow on the EOZ 2.1.

The following sections in the chapter describe installing EOZ 2 - 2.1 however EOZ 1 - 2.1 is similarly installed.

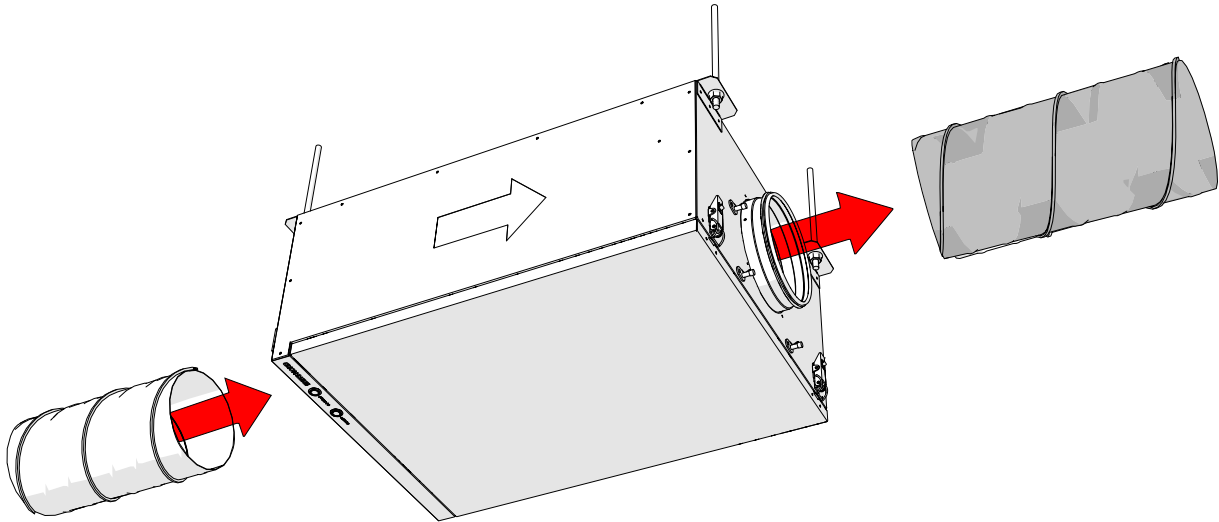
2.1 Mounting the EOZ 2.1 chassis

Begin by mounting four (4) M8 threaded rods to the ceiling. Suspend the EOZ 2.1 unit from the rods with M8 nuts and washers as shown. Adjust height as needed.

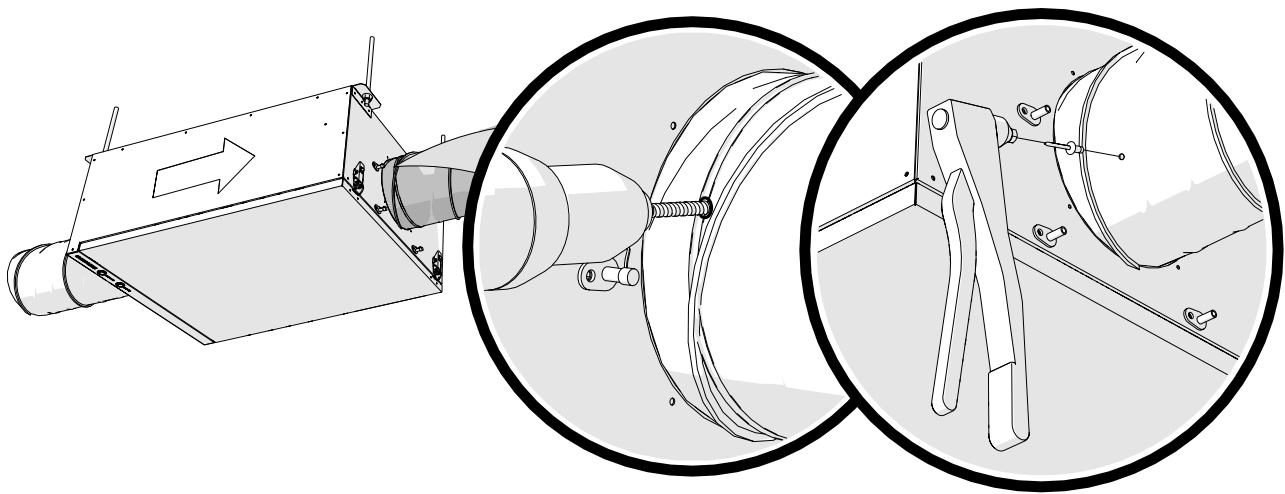


2.2 Connecting to the ventilation ducts

After the EOZ 2.1 unit has been securely attached to the ceiling, connect the supply air and exhaust air ducts.



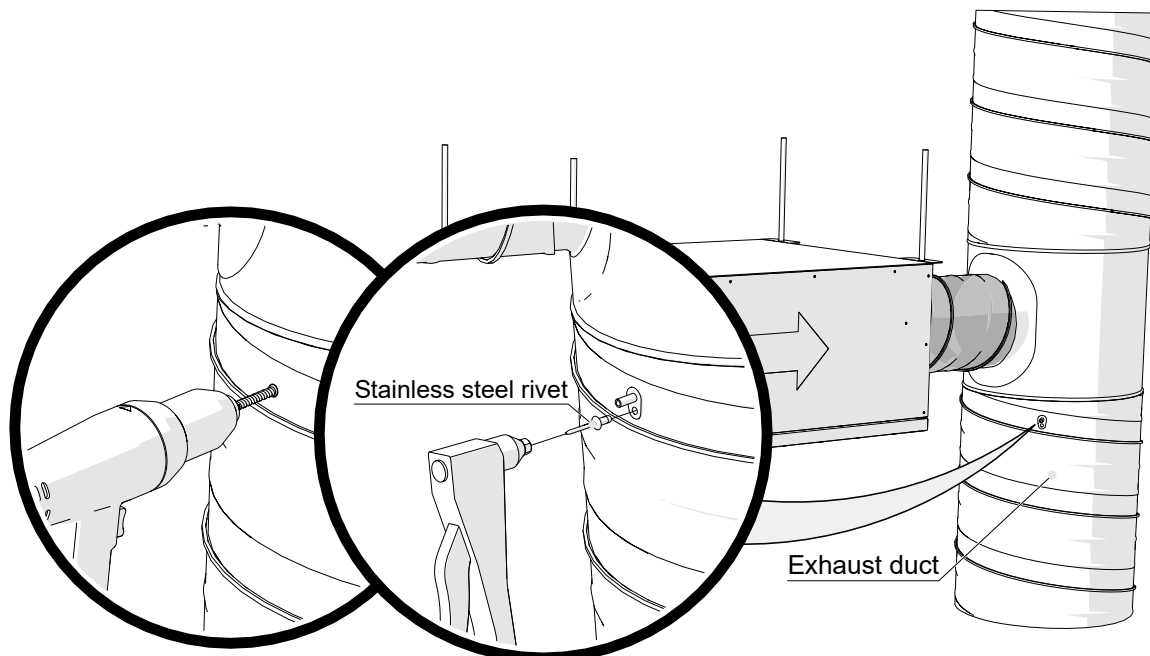
Secure the ducts with **stainless steel rivets** or **sheet metal screws** from both sides and ensure the connection is airtight



2.3 Connecting the pressure measurement hose to the exhaust duct

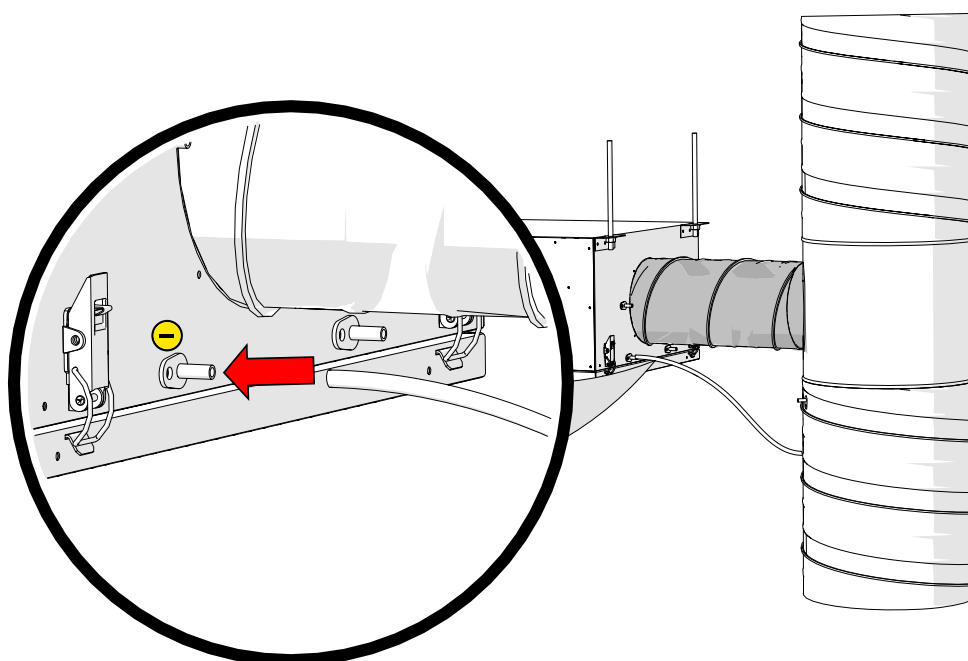
NOTE! This hose must be connected between the EOZ 2.1 unit and main exhaust duct for proper operation.

Drill a hole and mount the pressure measurement nozzle to the exhaust duct ahead of the EOZ 2.1 connection pipe as shown below.



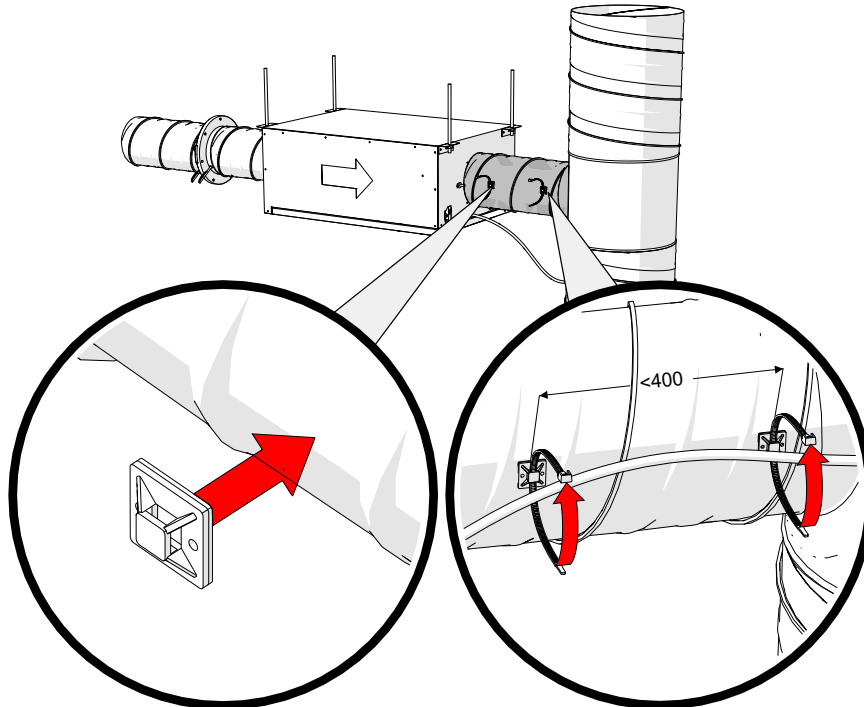
Connect the pressure hose from the EOZ 2.1 “-” (minus) nozzle to the newly installed nozzle on the exhaust duct.

NOTE! Be sure that the hose is connected to the proper nozzle on the EOZ 2.1 and that the caps of the nozzles has been removed.



Finally, secure the hose to the duct using adhesive cable tie mounts and cable ties that can found in the EOZ 2.1 packaging.

NOTE! Be careful not to tighten the cable ties to strongly to ensure that the airflow through the hose is not blocked.



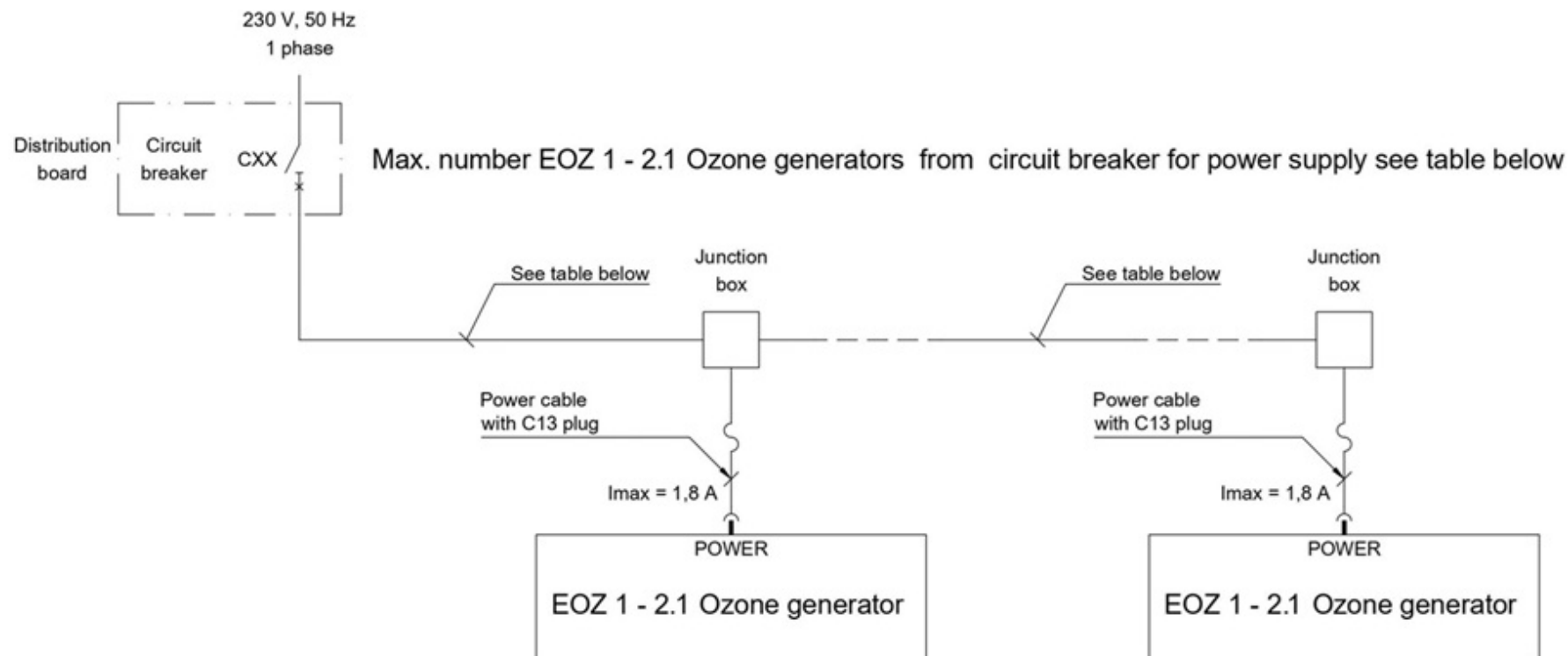
3. Electrical installation

NOTE! Electrical installation must be performed by an authorized electrician and follow local, regional and national standards and regulations.

The following sections in the chapter use EOZ 2 - 2.1 illustrations however same is applied with EOZ 1- 2.1. The EOZ 2.1 must be connected to the supply and exhaust ventilation system. When connecting the EOZ 2.1, the pressure hoses must be connected according to the installation drawings. The EOZ 2.1 is equipped with pressure sensors which are functional on the exhaust side of the ventilation system.

As an additional protection, the client can use the “**Work permission**” input to communicate with different master devices, see ["OZ 4.0 Ozone Cleaning System Automation Guide."](#)

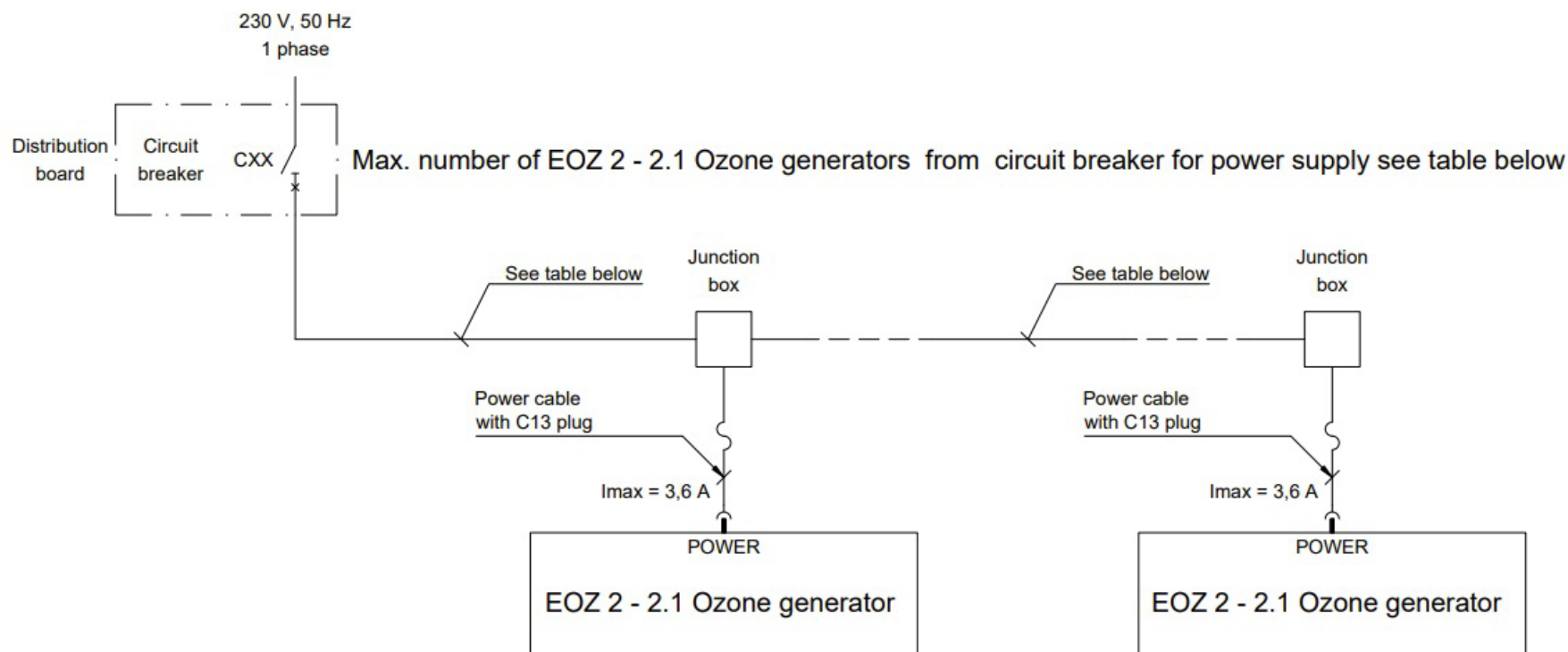
Connection diagram 1 - EOZ 1 - 2.1 unit(s) power supply possible connections



Maximum EOZ 1 - 2.1 units per one circuit breaker		
Number of EOZ 1 - 2.1 units	Type and nominal current of circuit breaker	Cable
1 or 2	C6 or C10	3G1,5 mm ²
4	C10	3G1,5 mm ²
6	C16	3G2,5 mm ²

Power cables with C13 plugs are supplied by ETS NORD.
Installation work must be done by the customer.

Connection diagram 2 - EOZ 2 - 2.1 unit(s) power supply possible connections



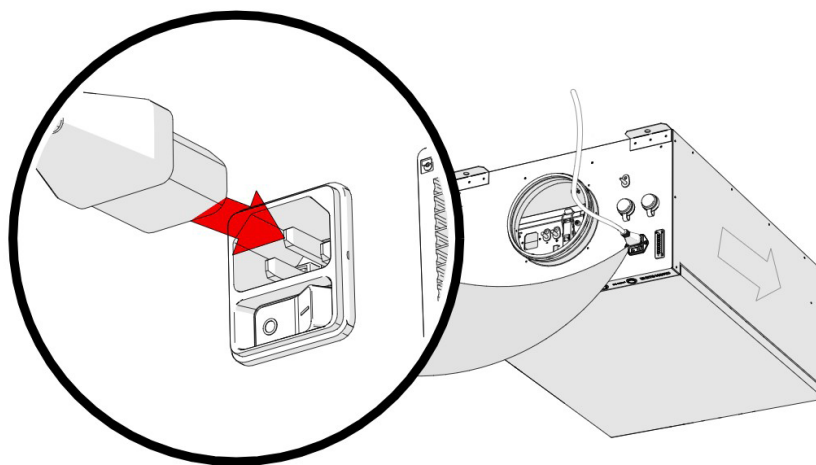
Maximum EOZ 2 - 2.1 generators per one circuit breaker		
Number of EOZ 2 - 2.1 generators	Type and nominal current of circuit breaker	Cable
1	C6 or C10	3G1,5 mm2
2	C10	3G1,5 mm2
3	C16	3G2,5 mm2

Power cables with C13 plugs are supplied by ETS NORD.

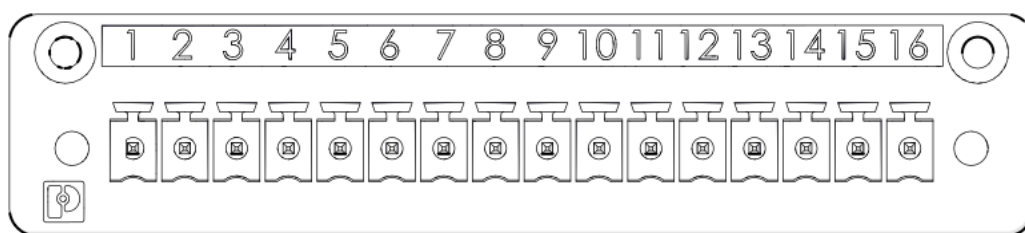
Installation work must be done by the customer.

3.1 EOZ power supply

EOZ 2.1 is supplied with a power cable that can be found inside the packaging. Connect it to the EOZ 2.1 as shown below.



3.2 EOZ connections to connector X1



Input corrector	I/O grouping	I/O name	Terminological name
1	Modbus RTU (for connection between EOZ 2.1 units)	A	Modbus data (A)-
2		B	Modbus data (B)+
3		GND	Modbus grounding
4	Modbus RTU for Building management system	A2	Master only Modbus data (A)-
5		B2	Master only Modbus data (B)+
6		GND	Master only Modbus grounding
7	Work permission	Work permission +	Fire alarm system or work permission
8		Work permission -	Fire alarm system or work permission
9	Status signals for building management system (BMS) and LED-notification panel	Operation status	Building automation
10		Critical error	Building automation
11		Service + fault status	Building automation
12		COM	Common 24V for building
13	24V+	24 V/DC	LED notification panel power supply
14	0V-	GND	LED notification panel power supply
15	Reserve input	0...10 V	
16		GND	

* NB! Maximum cable core cross-section is 1,5 mm² (solid conductors) for X1 connector.

3.3 EOZ Modbus data connection between the ozone generator units

If there is more than one EOZ unit, then they must be connected in parallel directly to the next unit.

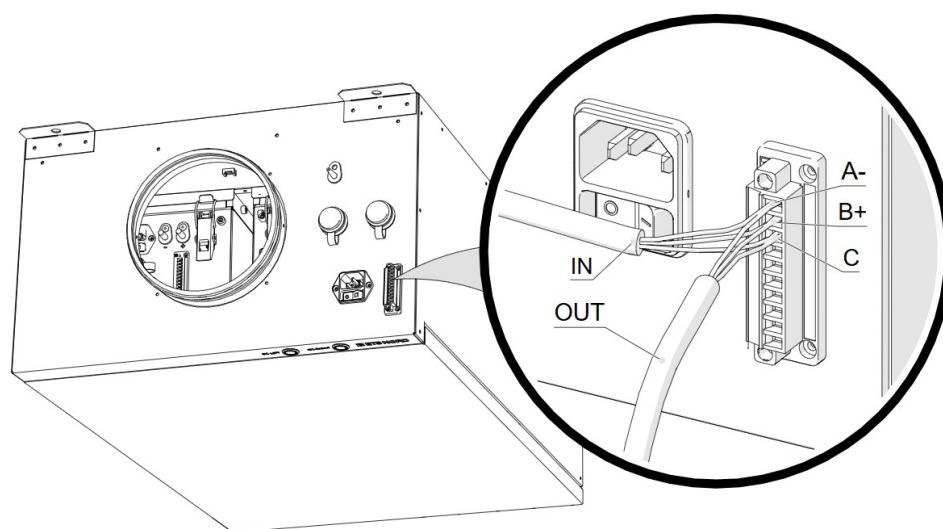
The first device from which the cable passes to the next device must be the Master device, i.e., the LCD control panel (and LED notification panel) must be connected to this (Master) unit in the future.

- Maximum of 9 EOZ 1 - 2.1 units can be in one system behind one LCD panel.
- Maximum of 4 EOZ 2 - 2.1 units can be in one system behind one LCD panel.

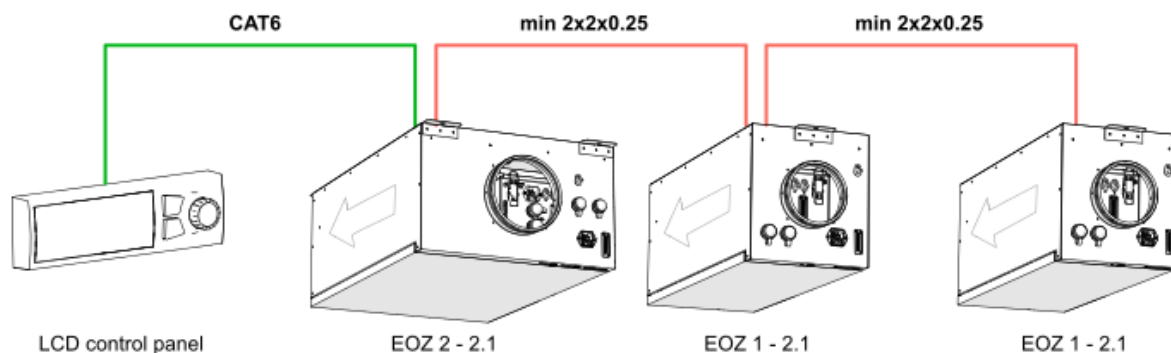
NB! One ozone cleaning system can contain both EOZ 2.1 and OZ 4.0 units at the same time!

Use a 2x2x0,25 mm² twisted pair cable for Modbus connection between devices.

Input corrector	Input connector (number on the connector plug)	I/O name	Terminological name
X1	1	A	Modbus data A
	2	B	Modbus data B
	3	GND	Modbus grounding



The following picture illustrates Modbus connection between EOZ 2.1 units and the LCD control panel with ethernet cable.



It is possible to combine different OZ 4.0 devices (OZ 4.0 Ozone unit, EOZ 1 - 2.1 or EOZ 2 - 2.1) with each other using Modbus.

- EOZ 1 - 2.1 consists of 1 OZ 4.0 ozone unit
- EOZ 2 - 2.1 consists of 2 OZ 4.0 ozone units

Keep in mind when connecting the units, that behind 1 LCD control panel the maximum number of OZ 4.0 devices is 9 (1 Master & 8 Slaves).

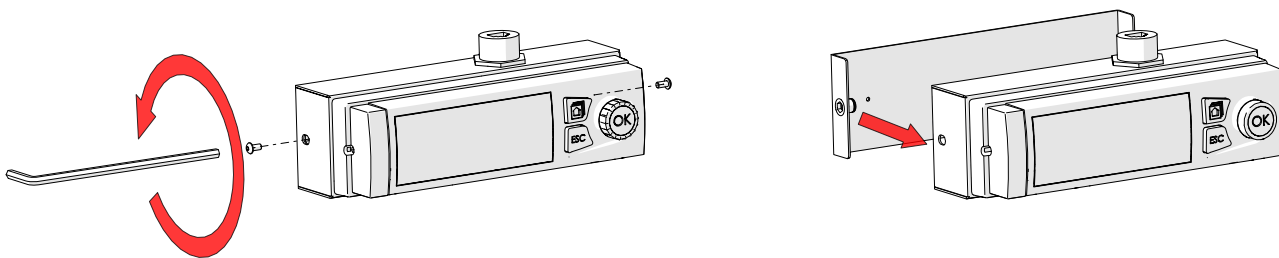
4. LCD control panel installation

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.

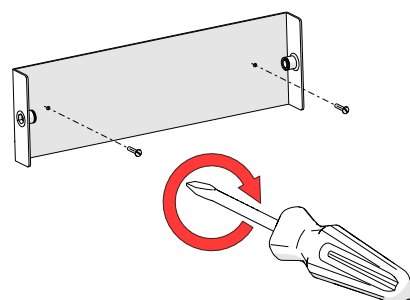
4.1 Attaching the mounting frame and connecting the LAN cable

LCD control panel is delivered in separate packages.

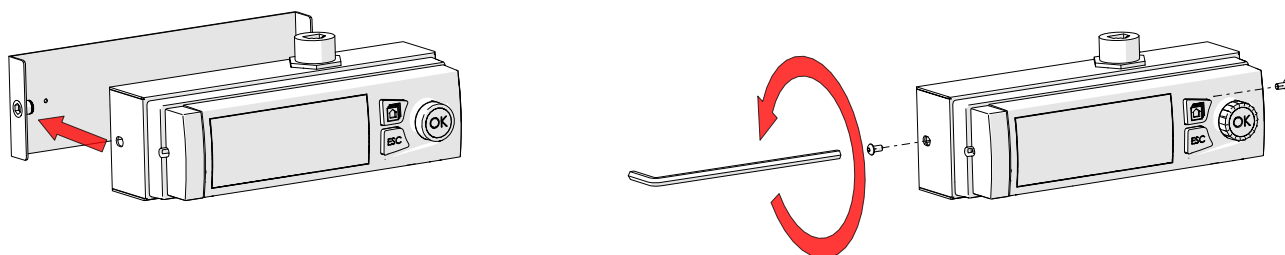
First remove the rear bezel of the control panel by removing the two bolts on each side.



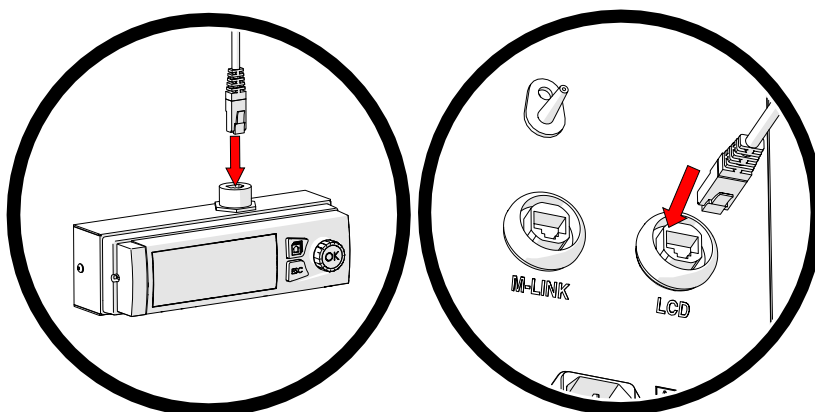
Attach the mounting frame to the wall or the side of the canopy so that the user always has free access to it. Avoid installing the control panel in a greasy area.



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



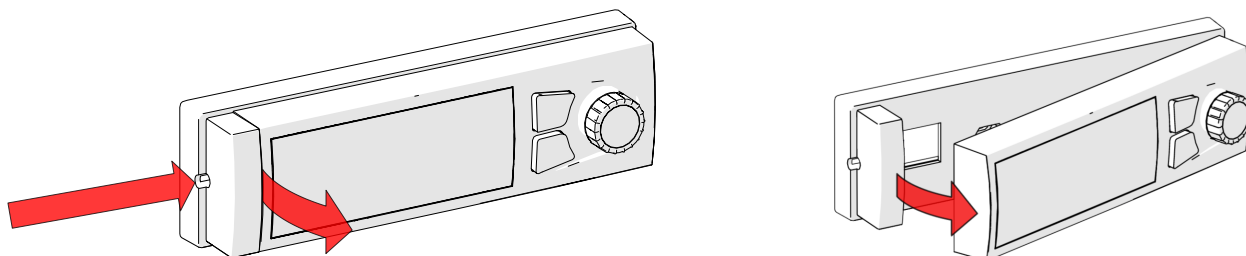
Connect the LAN cable from the LCD control panel to the Master ozone unit or Master EOZ 2.1 socket marked „LCD“.



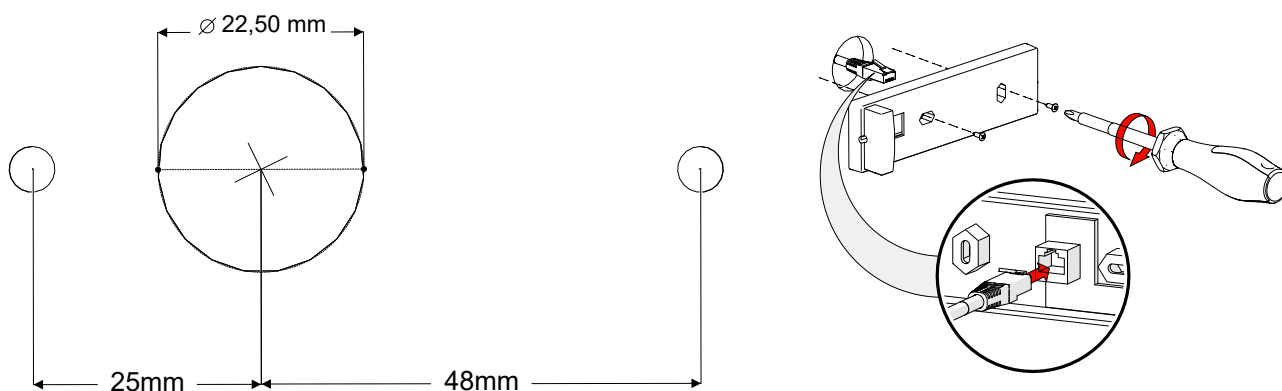
4.2 Fixing the control panel to the wall without a metal case

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.

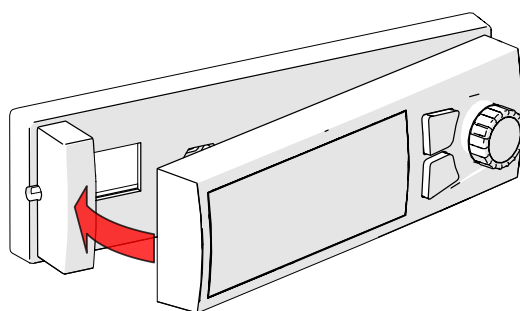
Remove the control panel from the mounting frame.



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 EOZ 2.1 „LCD“ socket.

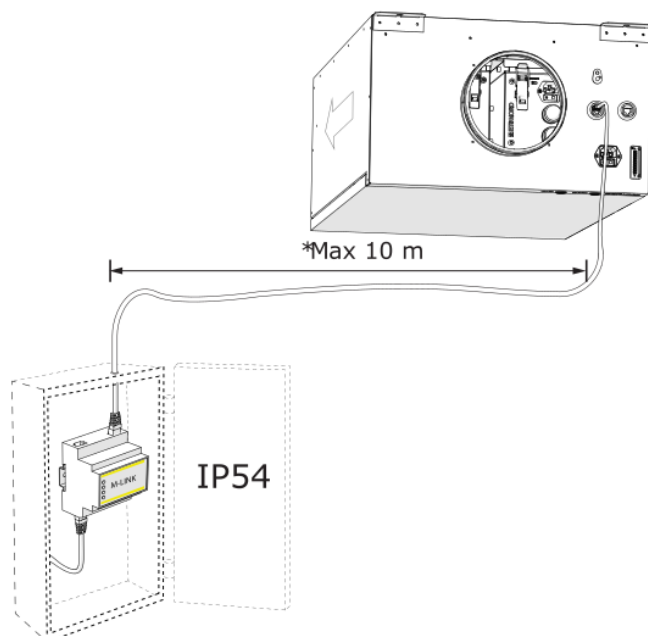


5. Connecting the IoT device M-Link

The M-Link remote access device is an accessory and is supplied if the user wants to use the Modbus TCP/IP protocol or the remote management and maintenance service provided by ETS NORD.

This device must be connected to the Master ozone unit or EOZ 2.1 Ozone generator. **Master is the one with the LCD control panel connection.**

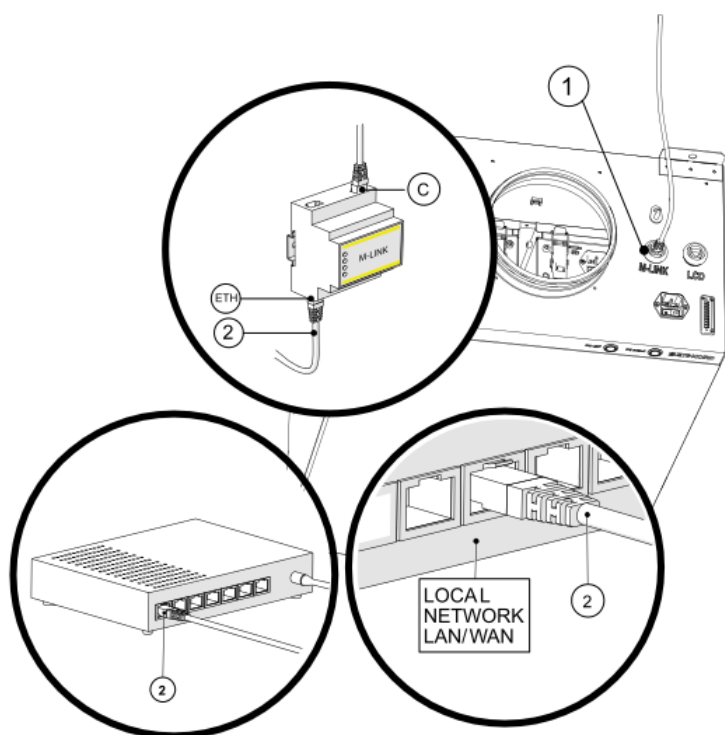
Mount the M-Link device into an electrical panel and install it onto a wall with a maximum distance from the EOZ 2.1 Ozone generator of 10 m.



- A – LAN cable connection between the device and the ozone unit
- 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 C port of the M-Link, connect the LAN cable included in the package to the “M-LINK” connector of the ozone unit.



- 1 – M-Link socket on the ozone 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 ozone 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 M-Link remote access 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 that have occurred and the necessary maintenance or repair of the ozone unit is carried out.

6. 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 accessory and is supplied if the user wants to have a quick and simplified manner of understanding the EOZ 2.1 Ozone generator status.

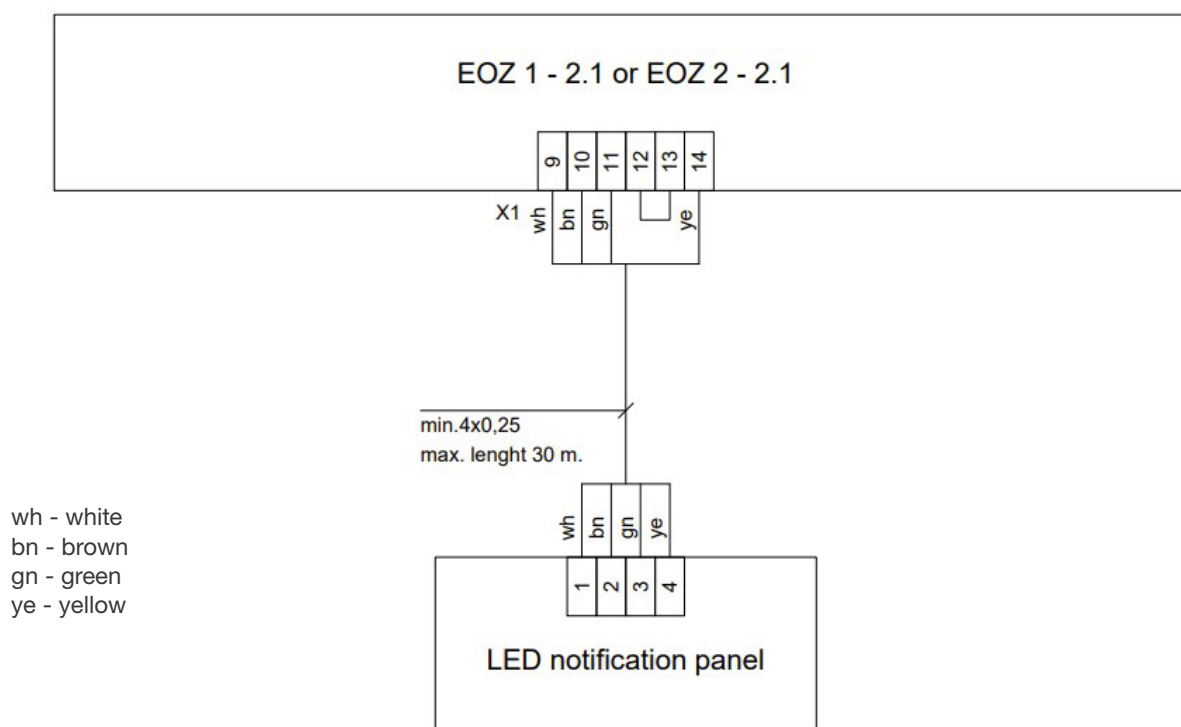
The LED notification panel must be connected to the Master ozone unit or EOZ 2.1 Ozone generator. **Master is the one with the LCD control panel connection.**

You will need a separate cable (min 4x0.25mm² used for LED notification panel and EOZ 2.1 Ozone generator connection) and in-wall junction box (screw distance 60 mm, min depth 30 mm). These items are not included in the LED notification panel package.

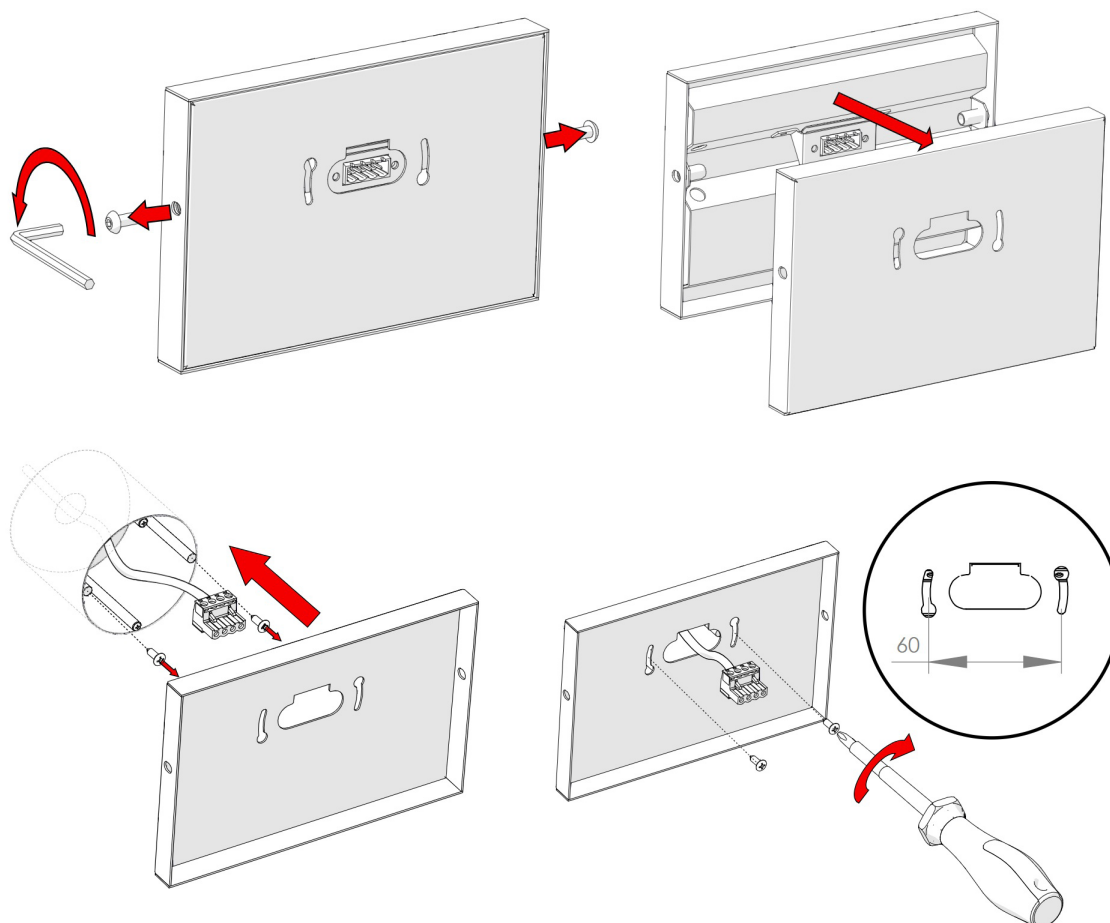
EOZ ozone generator and LED-notification panel connection:

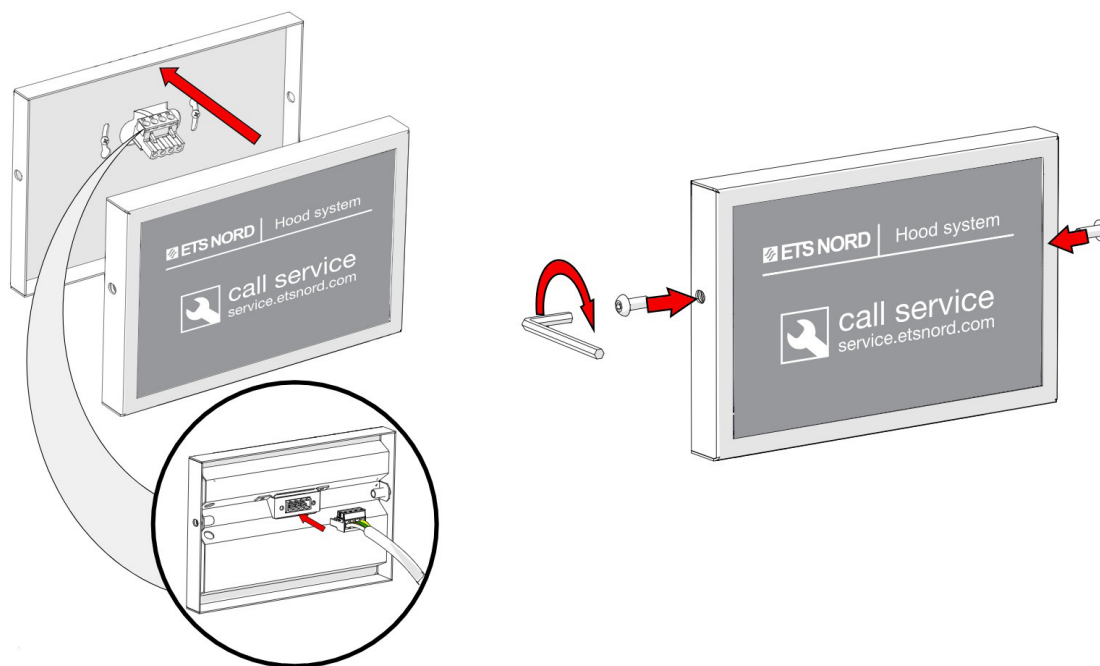
LED-notification panel connector	Input connector X1	I/O name	Cable core colours
1	9	Operation status	White
2	10	Critical error	Brown
3	11	Service + fault status	Green
	12	COM	Bridged together with a wire
	13	24 V/DC	
4	14	GND	Yellow

Connection diagram:



Wall mounting:





7. Building management system (BMS)

The ETS NORD Ozone Cleaning System can be connected to building automation via I/O status signals, Modbus RTU or TCP/IP. In addition, it is possible to grant work permission to the system through a potentially free NO/NC contact from the building automation center, ventilation unit or fire alarm system (FAS).

7.1 BMS through Modbus RTU

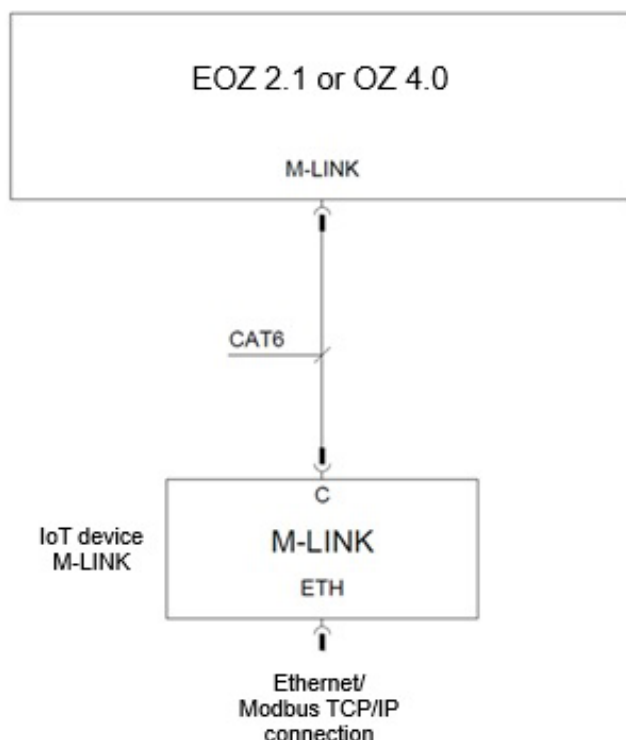
When connecting the Ozone Cleaning System to building automation via Modbus RTU a connection must be made to the Master unit X1 connector.

For building automation via Modbus, you can find the [“OZ 4.0 Ozone Cleaning System Automation Guide”](#) on the ETS NORD website under the Ozone Cleaning System.

X1 Input connector number	I/O name	Terminological name
4	A2	Master only Modbus data (A)-
5	B2	Master only Modbus data (B)+
6	GND	Master only Modbus data GND

7.2 BMS through Modbus TCP/IP

When connecting the ozone cleaning system to building automation via Modbus TCP/IP a connection must be made to the Master units IoT device M-Link ETH (ethernet) port.



For building automation via Modbus, you can find the [“OZ 4.0 Ozone Cleaning System Automation Guide”](#) on the ETS NORD website under the Ozone Cleaning System.

7.3 Working permission

In the case of the ozone cleaning system, it is possible to integrate it with an automatic fire system (AFS) or to give the system a work permit by building automation. The connection must be made to the Master unit through a potentially free NO or NC contact.

X1 Input connector number	I/O name	Terminological name
7	Work permission +	Work permission /AFS
8	Work permission -	Work permission /AFS

7.4 I/O signals

The ozone cleaning system can be integrated with building automation, where the device sends status signals to the building automation.

If there is more than one device in the system and they are connected to each other via Modbus, the building automation I/O signals must be connected only to the Master device.

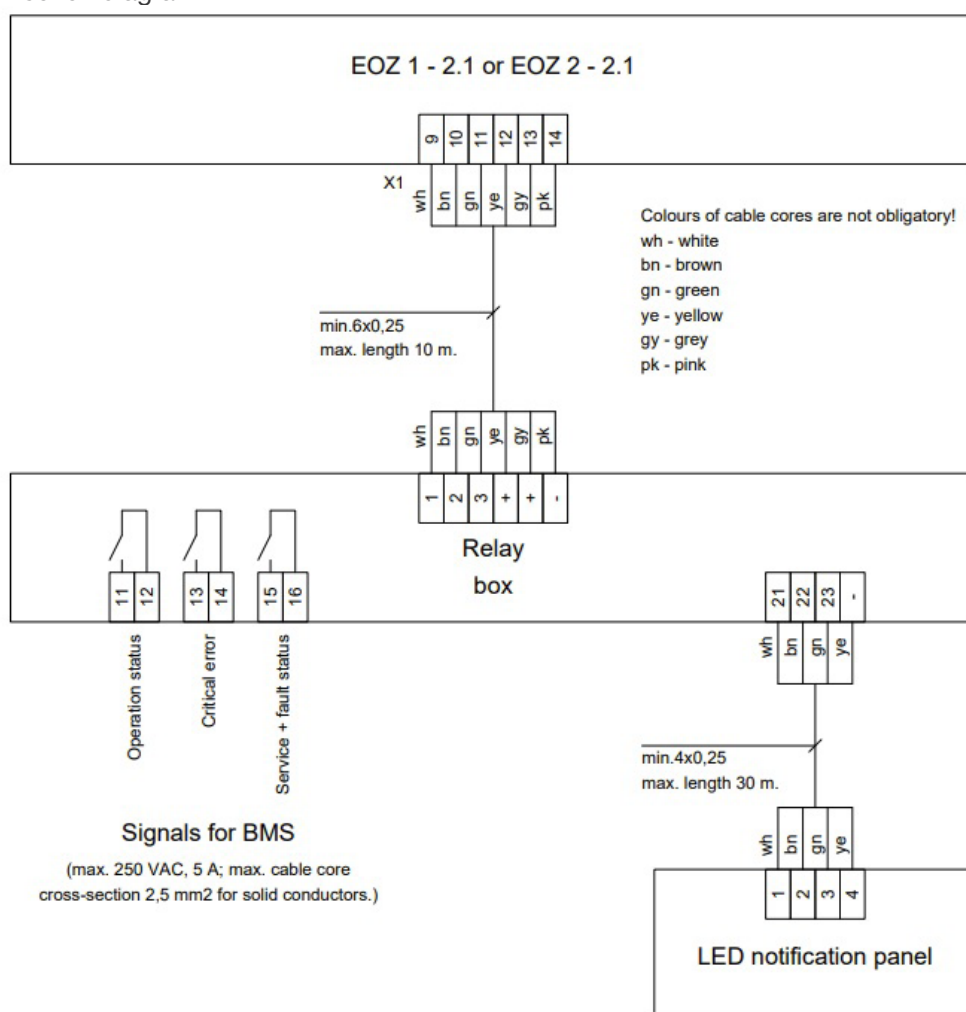
X1 Input connector number	I/O name	Terminological name
9	Operation status	Building automation
10	Critical error	Building automation
11	Service + fault status	Building automation
12	COM	Building automation 24V

Status table:

I/O name	Value is 0	Value is 1
Operation status	Status – Off (unit/system is not working)	Status – On (unit/system is working)
Critical error	Status – Normal (unit/system has no hardware faults)	Status – Alarm (unit/system has a hardware fault)
Service + fault status	Status – Normal (unit/system has no faults and does not need maintenance)	Status – Alarm (unit/system has faults and needs maintenance)

If an LED notification panel is also connected to the Master device, both the building automation and the LED notification panel must be connected through a relay box, which is an optional accessory.

Relay box connection diagram:



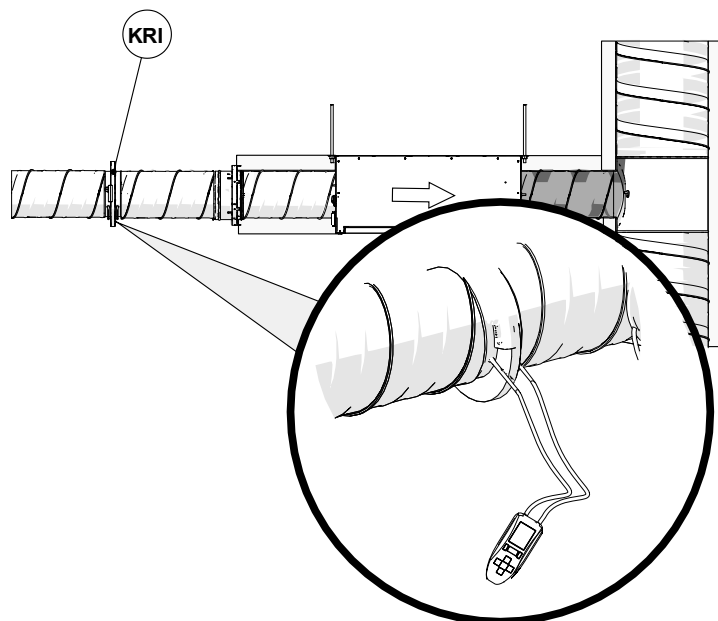
These connections are only used for the Master EOZ ozone generator or single EOZ ozone generator. Single EOZ ozone generator is the only ozone generator in the Ozone Cleaning system without Slave EOZ ozone generators.

All the cables are supplied, installed and connected to the devices at the installation site by the customer. Max. cable core cross-section is 1,5 mm² (solid conductors) for X1 connector.

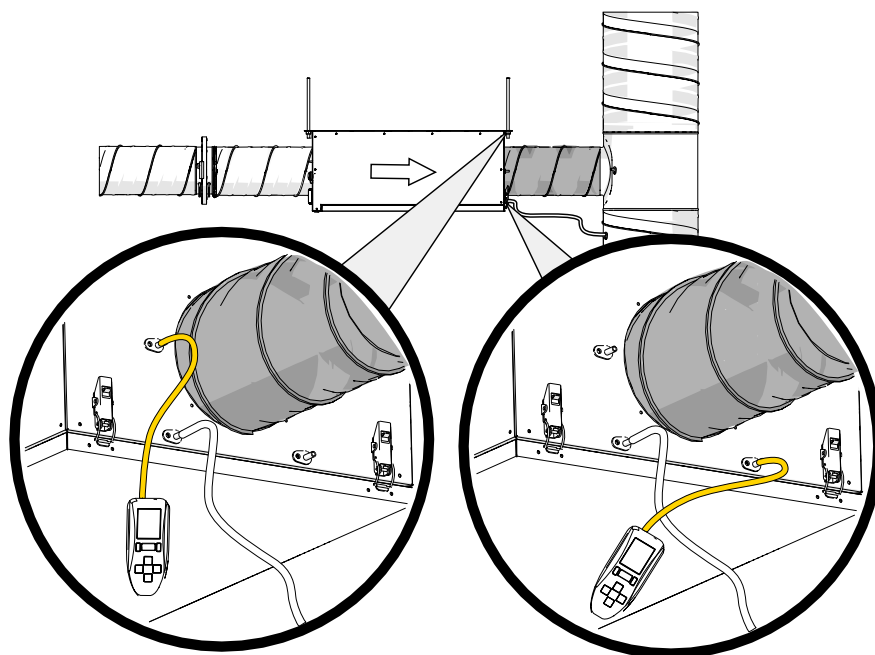
Once the necessary connections have been made, it is recommended to store the relay box on top of the canopy. If this is not possible, the relay box should be mounted on the wall.

8. Measure and adjust airflow

1. Measure the airflow at the KRI damper installed before the EOZ 2.1 to find operational airflow of the unit. For more information refer to KRI regulating damper installation guide.



2. Measure the air pressure difference of the EOZ 2.1 unit from both nozzles as seen in the picture (both measurements need to be approximately the same).



Confirm that the system airflow and pressures fall within the following specifications:

Model	Operational airflow (l/s)	Pressure difference (Pa)	Pressure drop (Pa)
EOZ 1 – 2.1	30	-20	71
EOZ 2 – 2.1	60	-25	41

Facts about ozone

- Ozone is a colorless gas, the sharp smell of which can be detected by a person at a concentration of 0.02 ppm (0,4 mg/m³).
- The smell of ozone is similar to the smell of chlorine used in swimming pools.
- The use of ozone is subject to the applicable protection legislation. For example, in Sweden, the Swedish Work Environment Authority provides the following hygienic limits for ozone:
 - 0,05 ... 0,2 ppm (during working time, 8 hours)
 - (Directive 2000/39/EC) 0.3 ppm (15 minutes)
- Acute exposure to ozone may result in the following damage:
 - skin irritation and burning sensation
 - severe irritation and burns in eyes and vision loss
 - pulmonary irritation in the respiratory tract and respiratory problems
- If the presence of ozone is detected indoors, the Ozone Module must be switched off immediately and the area must be ventilated.

Limited warranty of device

Warranty conditions:

- General warranty conditions can be found on producers homepage.
- The new device is covered by a 2-year warranty against defects and manufacturing defects, if:
 - the initial commissioning of the device has been performed by an authorized partner of ETS NORD AS;
 - the equipment is serviced every 12 months after commissioning;
 - specified components (eg ozone generating equipment) have been replaced as required.
- The warranty for a new device covers the repair or replacement of a defective part.
- The warranty for replacement parts for manufacturing defects is valid for ninety (90) days from the installation of the replacement part.
- The warranty is valid from the date of commissioning and product registration.

Service and maintenance

Maintenance and configuration of Ozone Modules may only be carried out by ETS NORD trained personnel or its authorized contractors. Technical assistance or annual maintenance can be requested from the website: www.etsnord.com/service.

- An Ozone Module generates ozone. If an Ozone Module is used by people who have not read these instructions, there is a risk of damage, such as lung irritation or electrical shock. Always follow the rules and recommendations for the particular work environment issued by national authorities.
- This manual describes how to install a typical Ozone Module. Installation may differ according to local regulations related to building materials, ventilation systems or building/room design. Always contact the manufacturer before installation if something seems unclear.



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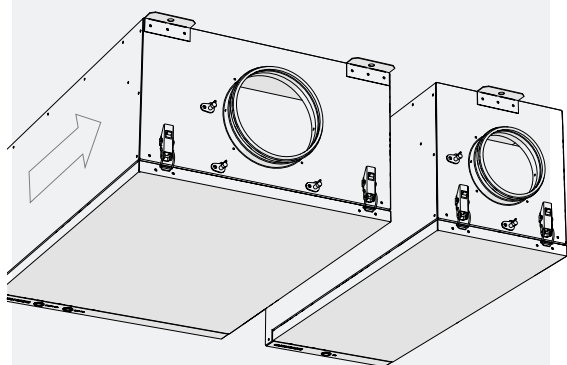
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*Let's move the air **together!***