

INSTALLATION MANUAL

Adiabatic air humidification system
Condair DL

Thank you for choosing Condair

Installation date (MM/DD/YYYY):

Commissioning date (MM/DD/YYYY):

Site:

Model:

Serial number:

Manufacturer

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1 Introduction

1.1 To the very beginning

We thank you for having purchased the **adiabatic air humidification system Condair DL**.

The adiabatic air humidification system Condair DL incorporates the latest technical advances and meets all recognized safety standards. Nevertheless, improper use of the adiabatic air humidification system Condair DL may result in danger to the user or third parties and/or impairment of material assets.

To ensure a safe, proper, and economical operation of the adiabatic air humidification system Condair DL, please observe and comply with all information and safety instructions contained in the present documentation as well as in the separate documentations of the components installed in the humidification system.

If you have questions which are not or insufficiently answered in this documentation, please contact your Condair representative. They will be glad to assist you.

1.2 Notes on the installation manual

Limitation

The subject of this installation manual is the adiabatic air humidification system Condair DL in its different versions. The various options and accessories are only described insofar as is necessary for proper operation of the equipment. Further information on options and accessories can be obtained in the respective instructions.

This installation manual is restricted to the **installation** of the adiabatic air humidification system Condair DL and is meant for **well trained personnel being sufficiently qualified for their respective work**.

This installation manual is supplemented by various separate items of documentation (operation manual, spare parts list, etc.), which are included in the delivery as well. Where necessary, appropriate cross-references are made to these publications in the installation manual.

Symbols used in this manual



CAUTION!

The catchword “CAUTION” used in conjunction with the caution symbol in the circle designates notes in this installation manual that, if neglected, may cause **damage and/or malfunction of the unit or other material assets**.



WARNING!

The catchword “WARNING” used in conjunction with the general caution symbol designates safety and danger notes in this installation manual that, if neglected, may cause **injury to persons**.



DANGER!

The catchword “DANGER” used in conjunction with the general caution symbol designates safety and danger notes in this installation manual that, if neglected, may lead to **severe injury or even death of persons**.

Safekeeping

Please safeguard this installation manual in a safe place, where it can be immediately accessed. If the equipment changes hands, the documentation must be passed on to the new operator.

If the documentation gets mislaid, please contact your Condair representative.

Language versions

This installation manual is available in various languages. Please contact your Condair representative for information.

2 For your safety

General

Every person working with the adiabatic air humidification system Condair DL must have read and understood this installation manual and the operation manual of the Condair DL before carrying out any work. Knowing and understanding the contents of the installation manual and the operation manual is a basic requirement for protecting the personnel against any kind of danger, to prevent faulty operation, and to operate the unit safely and correctly.

All ideograms, signs and markings applied to the components of the adiabatic humidification system Condair DL must be observed and kept in readable state.

Qualification of personnel

All installation work described in this installation manual **may only be carried out by specialists who are well trained and adequately qualified and are authorized by the customer.**

For safety and warranty reasons any action beyond the scope of this manual must be carried out only by qualified personnel authorised by the manufacturer.

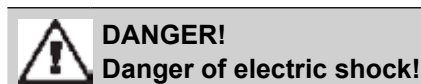
It is assumed that all persons working with the adiabatic air humidification system Condair DL are familiar and comply with the appropriate regulations on work safety and the prevention of accidents.

Intended use

The adiabatic air humidification system Condair DL is intended exclusively for **air humidification in AHU's or air ducts** within the specified operating conditions (see operation manual of the adiabatic air humidification system Condair DL). Any other type of application, without the written consent of the manufacturer, is considered as not conforming with the intended purpose and may lead to the adiabatic air humidification system Condair DL becoming dangerous.

Operation of the equipment in the intended manner requires **that all the information contained in this installation manual are observed (in particular the safety instructions).**

Danger that may arise from the adiabatic air humidification system Condair DL



The control unit of the adiabatic air humidification system Condair DL is mains powered. Live parts may be exposed when the control unit is open. Touching live parts may cause severe injury or danger to life.

Prevention: The control unit must be connected to the mains only after all mounting and installation work has been completed, all installations have been checked for correct workmanship and all components have been locked properly.

Preventing unsafe operation

All persons working with the adiabatic air humidification system Condair DL are obliged to report any alterations to the unit that may affect safety to the owner without delay and to **secure such systems against accidental power-up**.

Prohibited modifications to the unit

No modifications must be undertaken on the adiabatic air humidification system Condair DL without the express written consent of the manufacturer.

3 Important notes on installation

3.1 Delivery

After receiving:

- Inspect shipping boxes for damage.
Any damages of the shipping boxes must be reported to the shipping company.
- Check packing slip to ensure all parts has been delivered.
All material shortages are to be reported to your Condair supplier within 48 hours after receipt of the goods. Condair assumes no responsibility for any material shortages beyond this period.
- Unpack the parts/components and check for any damage.
If parts/components are damaged, notify the shipping company immediately.
- Check whether the components are suitable for installation on your site according to the model key stated on the type plate (refer to model key in the operation manual).

3.2 Storing/Transportation/Packaging

Storing

Until installation store the system components in its original packaging in a protected area meeting the following requirements:

- Room temperature: 5 ... 40 °C
- Room humidity: 10 ... 75 %rh

Transportation

For optimum protection always transport the unit in the original packaging and use an appropriate lifting/transporting device.



It is the customer's responsibility to ensure that operators are trained in handling heavy goods and to enforce the relevant lifting regulations.

Packaging

Keep the original packaging of the components for later use.

In case you wish to dispose of the packaging, observe the local regulations on waste disposal. Please recycle packaging where possible.

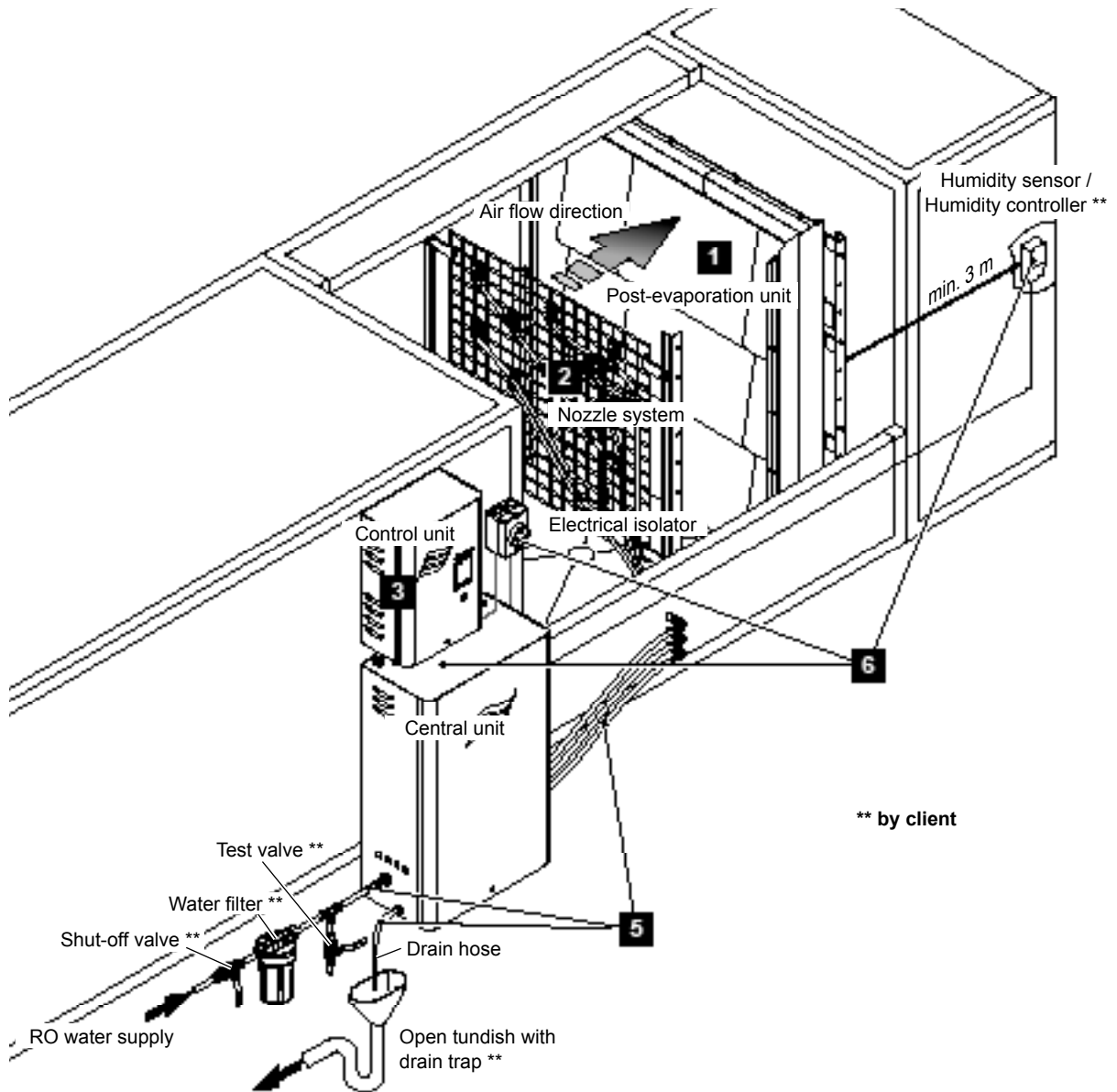
3.3 Product designation

The product designation and the most important unit data are found on the rating plate fixed on the right side of the control unit.

Notes regarding the rating plate and the product key can be found in the operation manual of the Condair DL.

4 Installation

4.1 Installation overview



- 1 - Mounting the post evaporation unit --> see chapter 4.2 – *Installation of the humidification unit*
- 2 - Mounting the nozzle system --> see chapter 4.4 – *Positioning and mounting the control unit*
- 3 - Mounting the control unit --> see chapter 4.4 – *Positioning and mounting the control unit*
- 4 - Mounting the central unit --> see chapter 4.3 – *Positioning and mounting the central unit*
- 5 - Water installation --> see chapter 4.5 – *Water installation*
- 6 - Electrical installation --> see chapter 4.6 – *Electrical installation*

Abb. 1: Installation overview Condair DL

4.2 Installation of the humidification unit

4.2.1 Positioning of the humidification unit

Usually, the design and dimensioning of the ventilation duct/AHU as well as the location of the humidification system Condair DL inside the duct are determined, recorded and set compulsory when planning the entire system. Prior to installation, however, make sure the following criteria have been taken into consideration:

- **For safety reasons the Condair DL must be installed only in rooms provided with a floor drain. If for some reason the Condair DL must be installed in a location without floor drain, it is mandatory to provide a water tub with drain below the central unit and the duct wall feed throughs and/or water sensors in the room/water tub to safely interrupt water supply in case of leakage.**
- In the area of the humidification unit the ventilation duct/AHU must be waterproof.
- **Caution, fully demineralised water is aggressive!** For this reason, all components located close to the humidification unit (duct/AHU, fastening material, drain pipe, etc.) must be made of **corrosion-proof steel** (minimum requirements according to DIN 1.4301) or **plastic**.
- For installation and maintenance of the humidification unit a **inspection window** and a sufficiently large **maintenance door** must be available in the duct/AHU.
Important: inspection windows must be constructed in such a manner that they can be covered, so that no light can fall into the duct section where the humidification unit is installed (reduction of the growth of microorganisms)
- **Important! An air filter must be installed at the air inlet of the humidification unit. The filter must meet the quality standards F7 (EU7) or better.**
- In case of low ambient temperature the duct must be insulated to prevent the moist air from condensing inside the duct.
- If the system is equipped with a heater, make sure it is at least 0.5 m away from the humidification unit.
- In order to avoid drops seeping over the ceramic elements, an **even air flow over the full cross section** of the post-evaporation unit must be guaranteed. If necessary, rectifiers or perforated plates must be installed on the building side before the humidifier.
If the air velocity in the duct before the post-evaporation unit (in relation to the humidification efficiency) exceeds 3.0 m/s, booster elements must be installed.

- For control and maintenance purposes we recommend to provide the duct/AHU with an additional inspection door after the post-evaporation unit.
- **The section of the duct holding the humidification unit must be equipped with a sloping tub having drains before and after the post-evaporation unit (pass-through tub), or with a drain before the separation as well as drains before and after the post-evaporation unit (separated tubs). Each drain must be connected separately to the waste water system via a siphon. For hygienic reasons connect the drain pipes with an open outlet to the waste water system of the building.**

Note: The effective height of the siphon drain depends on the duct pressure. Correct dimensioning of the siphon drain is the customer's responsibility.

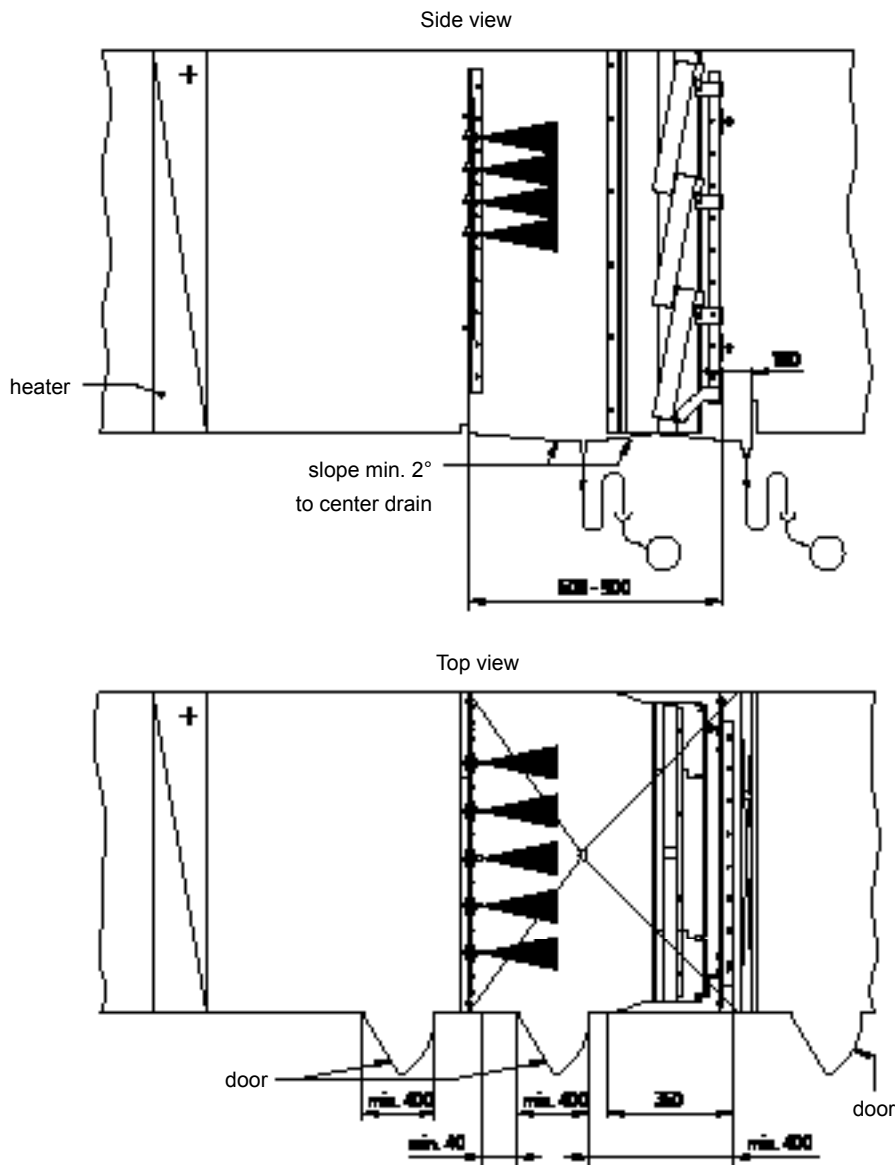


Abb. 2: Positioning of the humidification unit (dimensions in mm)

4.2.2 Mounting the post-evaporation unit

1. Marking the positions of the fastening elements inside the duct/AHU:

- Mark the position of the topmost fastening holes (or welding studs) for the fastening of the lateral supports of the post-evaporation unit "A", the nozzle system "C" and the fastening profiles for the lateral sealing plates "B" on both duct walls using the drilling template supplied.
- Mark the position of the outmost fastening holes (or welding studs) for the fastening of the leftmost and rightmost fastening profiles for the upper sealing plates "D" on duct ceiling using the drilling template supplied.

Note: For marking the fastening holes (or welding studs) "D" the drilling template must be bended 90° on the indicated position.

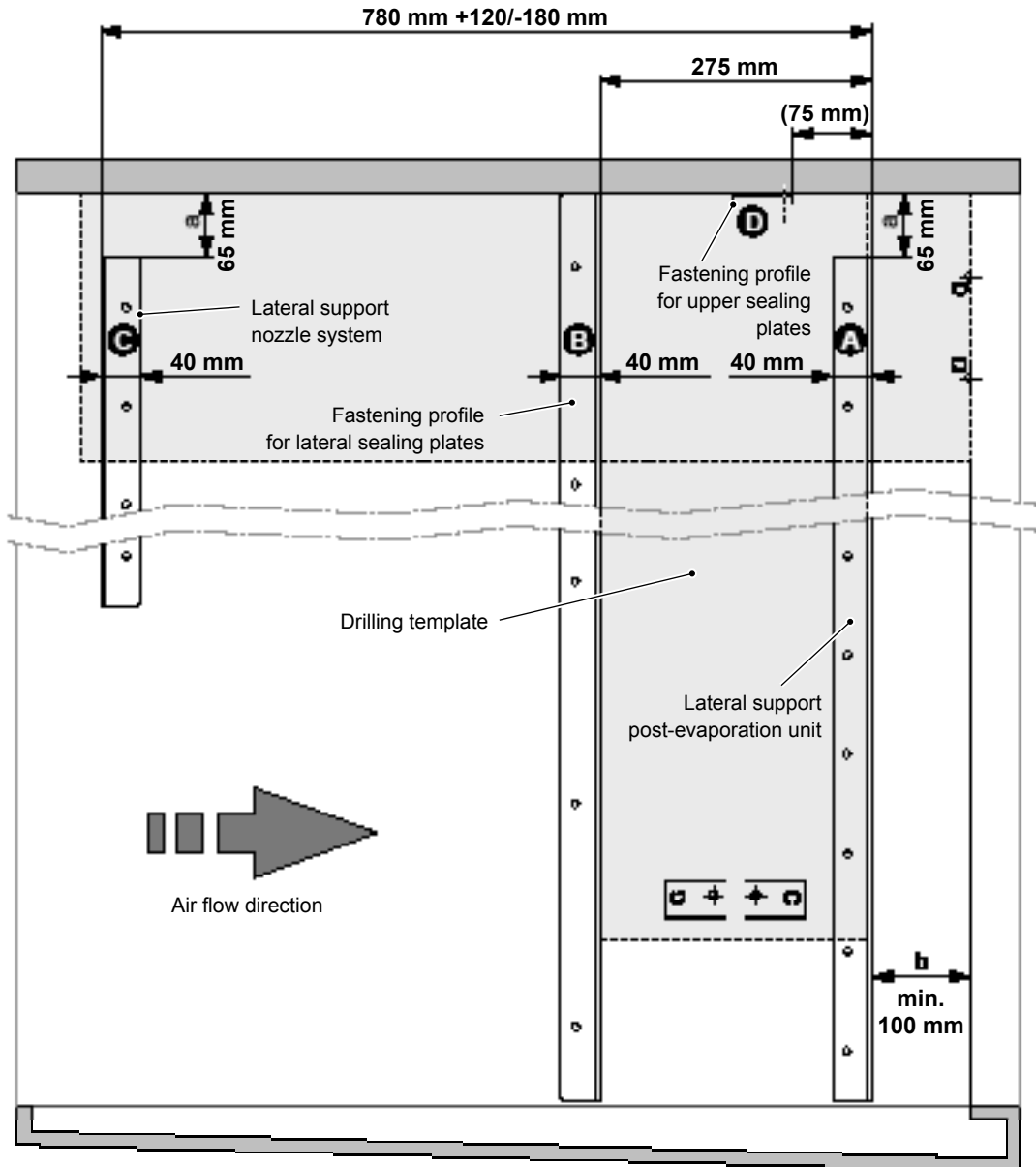


Abb. 3: Positioning of the fastening elements (side view)

2. Mount the lateral supports of the post-evaporation unit to the duct walls:

- Align the lateral supports with the "TOP" labeled mounting bracket on top with an identical distance to the duct ceiling (**target measure "a": 65 mm, admissible range: 0...90 mm**) and with a distance "b" of 100 mm to the intersection of the AHU, then fix them via the topmost fastening hole to the duct wall using a self-tapping screw 6.3 x 25 mm (do not tighten the screw yet).

Important: to be able to mount the optional booster the distance of 100 mm to the intersection of the AHU must be maintained.

- Align both supports at right angles to the duct ceiling and check the distance to the duct ceiling once more (the distance must be identical for both supports). Then, fix both supports approx. every 30 cm with a self-tapping screw 6.3 x 25 mm to the duct walls.

Note: evenly allocate the self-tapping screws over the entire length of the supports.

- This step must be carried out only on ducts with a height >2100 mm where the supports consist of several profiles: fix the additional supports flush and in line with the upper support approx. every 30 cm with a self-tapping screw 6.3 x 25 mm to the duct walls.

Note: evenly allocate the self-tapping screws over the entire length of the supports.

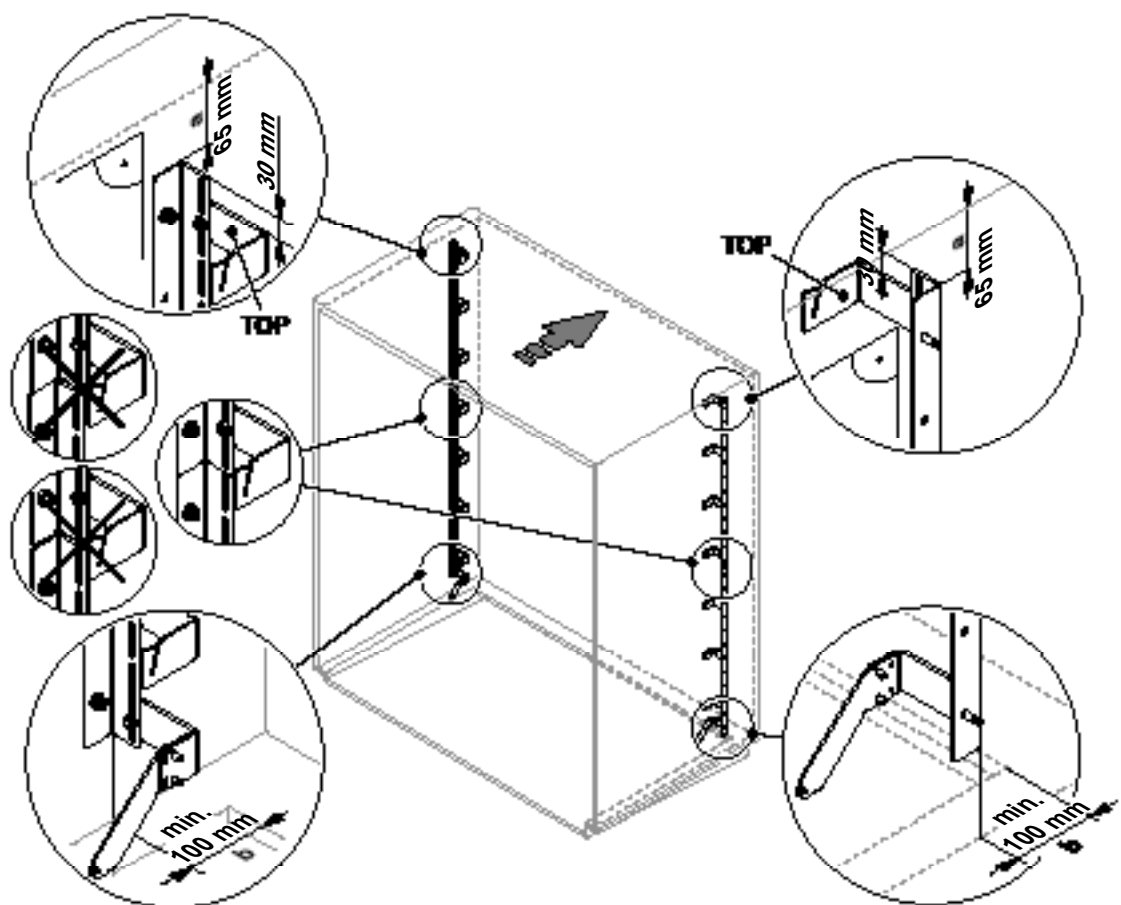


Abb. 4: Mount the lateral supports

3. Mounting the fastening profiles for the upper sealing plates:

- If not done already in step 1, mark the position of the outmost fastening holes for the fastening of the leftmost and rightmost fastening profiles for the upper sealing plates “D” on the duct ceiling using the bended drilling template.
- Fix both fastening profiles to the duct ceiling via the marked hole using a self-tapping screw 6.3 x 25 mm. Then, align both fastening profiles to each other using a cord. When aligned, fix the two fastening profiles to the duct ceiling using self-tapping screws 6.3 x 25 mm.
- Fix the remaining fastening profiles evenly allocated over the duct with and flush to the first mounted fastening profiles to the duct ceiling using a self-tapping screw 6.3 x 25 mm.

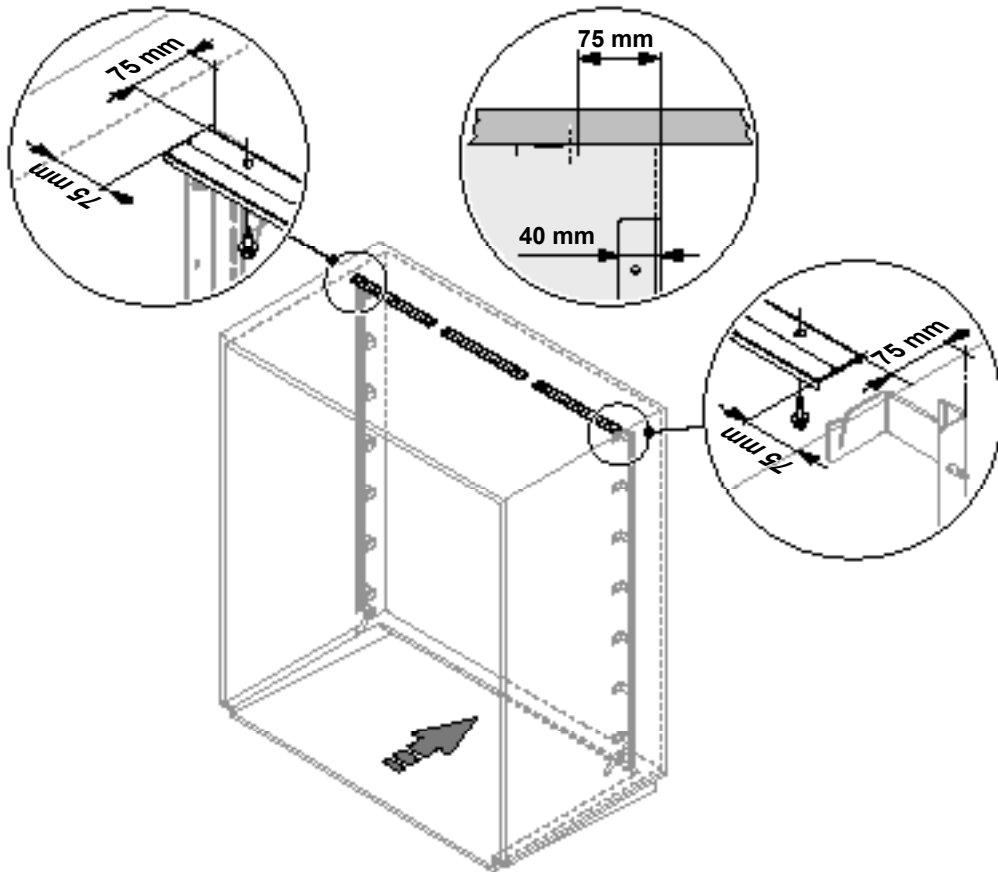


Abb. 5: Mounting the fastening profiles for the upper sealing plates

4. Mounting the fastening profiles for the lateral sealing plates:

- If not done already with the drilling template in step 1, mark the position of the lateral fastening profiles for the lateral sealing plates on both sides of the duct. Distance between fastening profiles and post-evaporation supports **275 mm**.
- Fix fastening profiles with a distance of 275 mm to the post-evaporation supports and right-angled to the duct ceiling to the duct wall using self-tapping screws 6.3 x 25 mm. Do not tighten the screws yet.

Note: Make sure the lateral fastening profiles are evenly allocated over the duct height and in line one below the other and that the lowest profiles are flush with the bottom of the duct and the topmost profiles are flush with the duct ceiling.

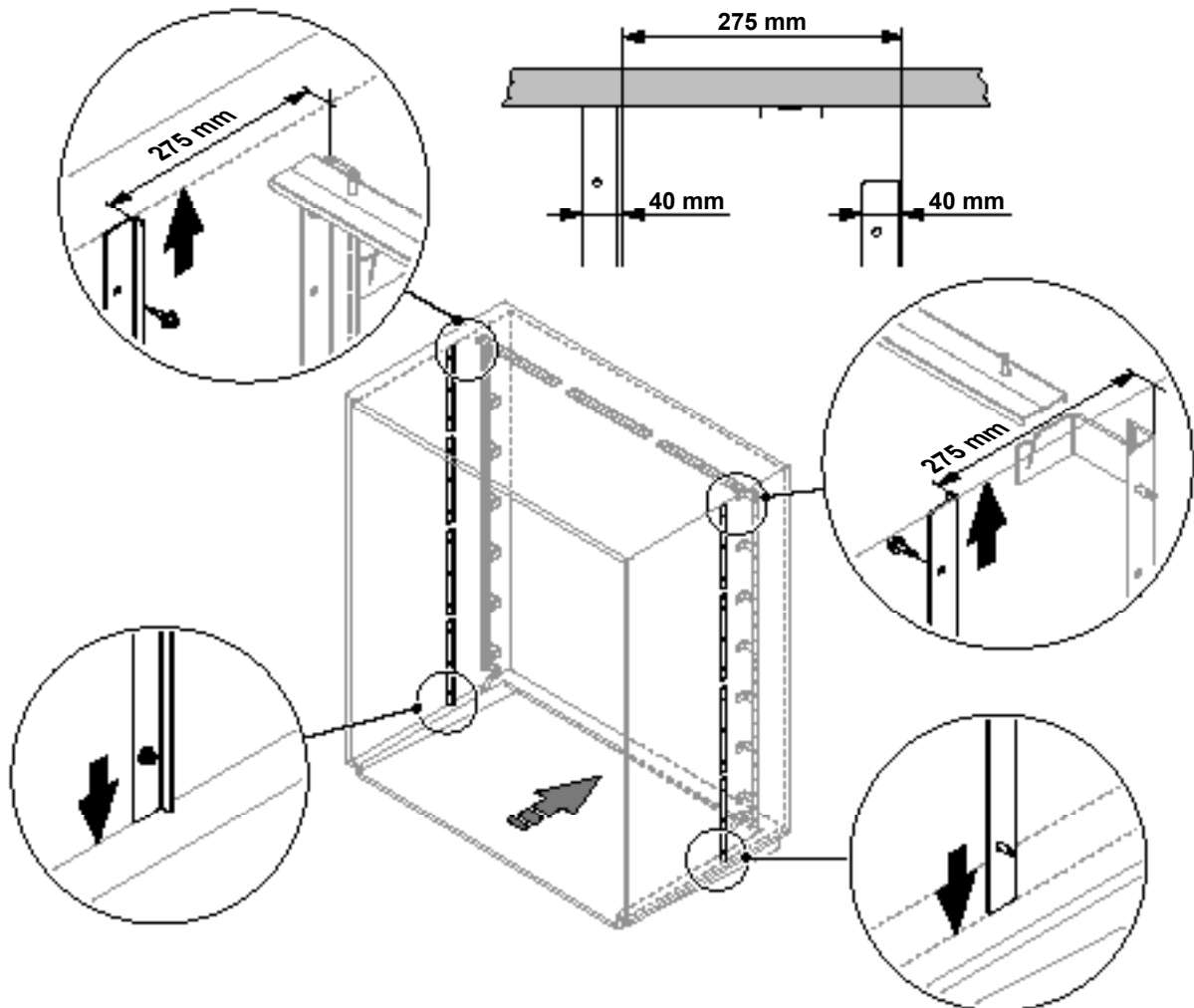


Abb. 6: Mounting the fastening profiles for the lateral sealing plates

5. Mount the cross members:

Note: This step must be carried out only on air ducts /AHU's with a width >1650 mm.

- For air ducts/AHU's with a width >2000 mm the cross members are supplied in sections and must be bolted together on site. Proceed as follows: Undo the screw connections on the cross members overlapping. Arrange cross member sections and fix them together using the screws M6 x 16 mm and nuts removed right before. Exactly align cross member sections and fasten the screw connections. Then, fix the reinforcement plates at the overlapping to the cross members as shown below using four screws M6 x 16 and nuts, align plates and fasten the screw connections.
- Slightly loosen the four screw connections, with which the mounting plates are attached on both sides to the cross members, so the mounting plates can be moved.
- From behind (view in air flow direction) hang up the cross members at the appropriate vertical position to the lateral supports of the post-evaporation unit, then push the cross members downwards until they come to a stop. Now, fasten all screw connections of the mounting plates.

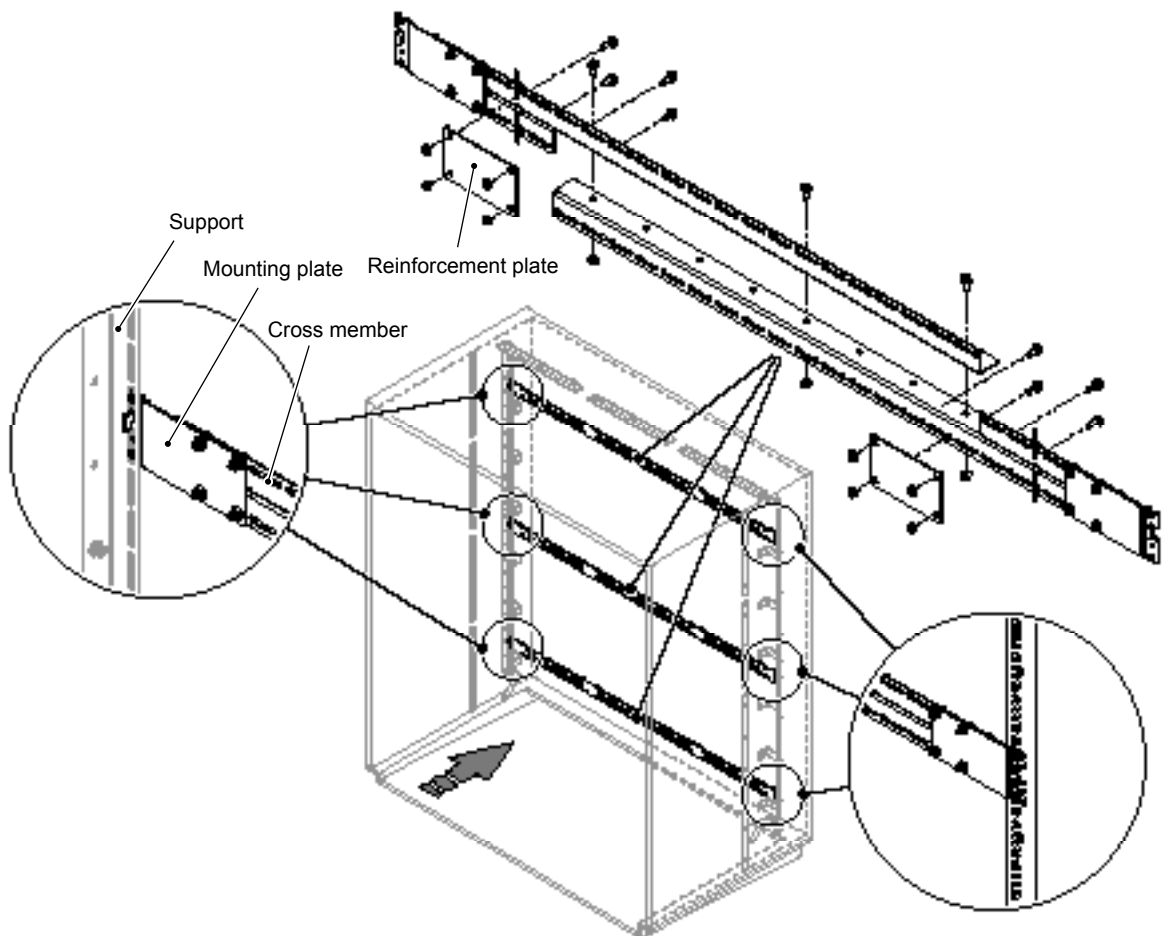


Abb. 7: Mount the cross members

6. Mount the vertical support(s):

Note: This step must be carried out only on air ducts /AHU's with a width >1650 mm.

- For air ducts/AHU's with a height >2000 mm the vertical supports are supplied in sections and must be bolted together on site. Proceed as follows: Undo the screw connections on the vertical supports overlapping. Arrange vertical support sections and fix them together using the screws M6 x 16 mm and nuts removed right before. Exactly align vertical support sections and fasten the screw connections.
- Fix angle bracket(s) (for fixing the vertical support to the duct ceiling) to the vertical support(s) using two screws M6 x 16 mm and nuts. If necessary, remove the corresponding screw connection on the vertical support(s) first.

Important: Fix angle bracket in such a manner that the distance between the leg of the angle bracket and the upper edge of the vertical support has the same distance as the upper edge of the two lateral supports have to the duct ceiling (see step 1).

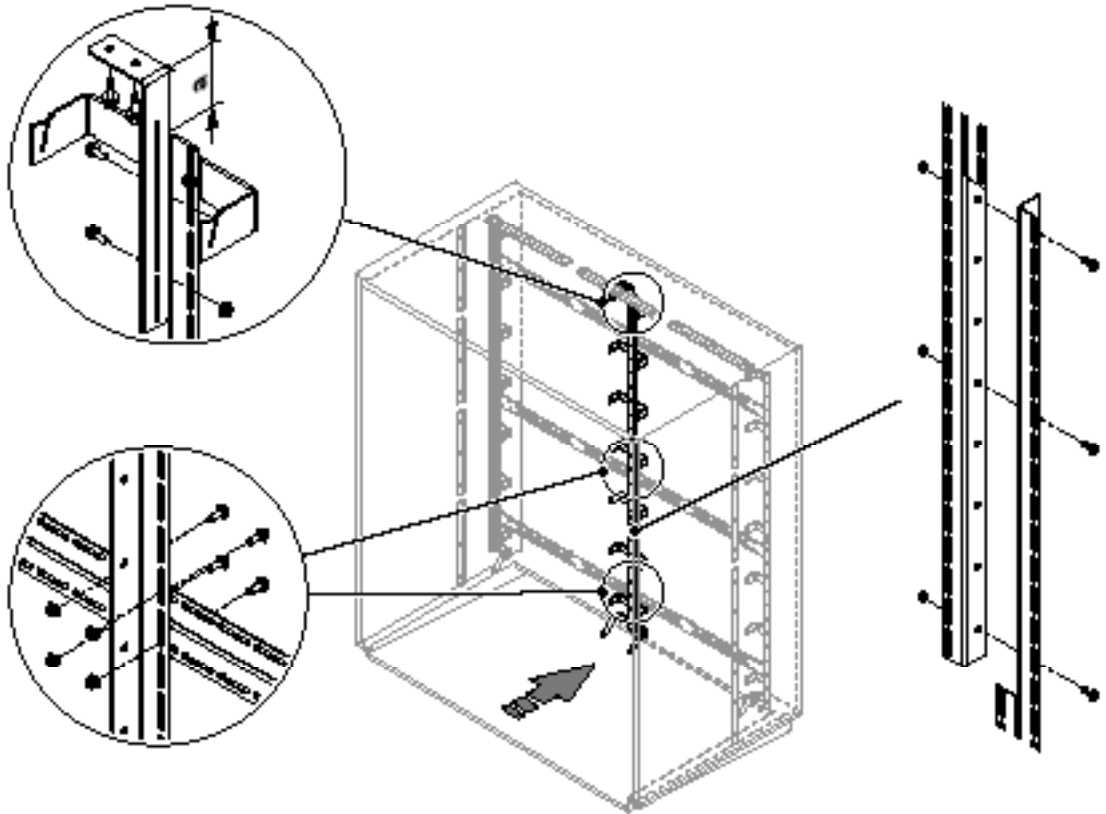


Abb. 8: Mounting the vertical support

- Mark horizontal position(s) of the vertical support(s) on the cross members (one vertical support is always in the middle of the duct, several vertical supports must be evenly allocated over the duct width). From the front (view in air flow direction) attach the vertical support(s) with the angle bracket on top to the cross members, then shift upwards until it comes to a stop and fix the vertical support(s) four screws M6 x 16 mm and nuts to the cross members. Slightly fasten the screw connections only.
- Check distance between upper edge of the vertical support(s) and the duct ceiling as well as the vertical alignment of the vertical support(s) by measuring the distance between the vertical support(s) and the duct walls on top and on the bottom.
Important: The distance between the upper edge of the vertical support(s) to the duct ceiling must be identical to the distance between the upper edge of the two lateral supports of the post-evaporation unit to the duct ceiling. If necessary, align vertical support(s) horizontally and vertically.
- Fix angle bracket of the vertical support(s) with two self-tapping screws 6.3 x 25 mm to the duct ceiling (see detail top left in fig. 8).
- Check dimensions again and realign if necessary. Then, tighten all screw connections.

7. Mounting the lateral sealing plates:

- Start on the bottom shift the lateral sealing plates with the slightly bent surface behind the fastening profiles. Make sure the sealing plates on top of each other covers and overlaps the subjacent sealing plate. Slightly tighten the self-tapping screws of the appropriate fastening profile after the sealing plates have been positioned to ensure that the sealing plates do not slip downwards but can still be moved.
- Evenly allocate the overlapping of the sealing plates over the duct height. Shift the topmost sealing plate flush to the duct ceiling and the lowest sealing plate flush to the duct floor, then tighten all self-tapping screws on the fastening profiles.

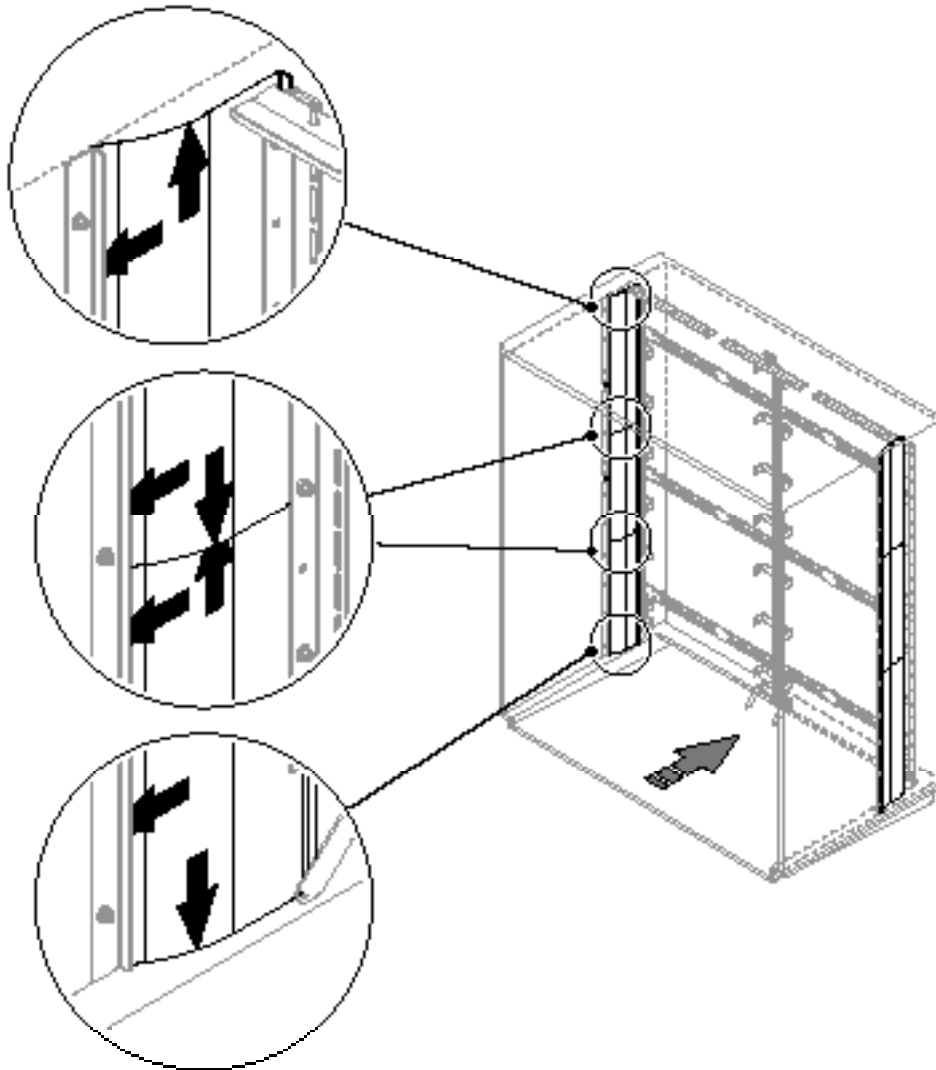


Abb. 9: Mounting the lateral sealing plates

8. Inserting ceramic support profiles:

- Insert the ceramic support profiles into the lowest row of holders. Make sure the support profiles are inserted such that the pins on each side of the support profile are outside of the holder.

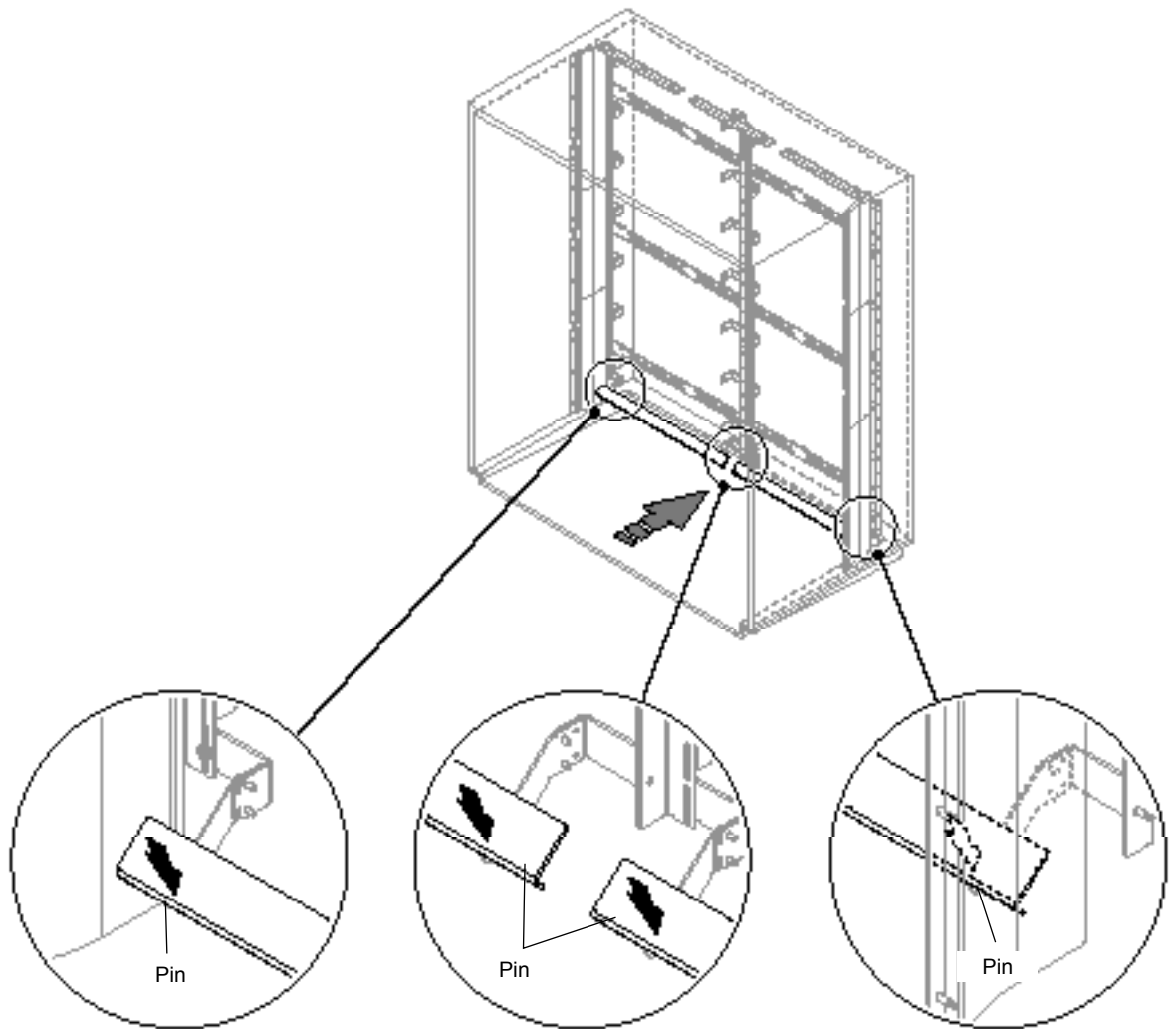


Abb. 10: Inserting ceramic support profiles

9. Mounting the tub rubber sealing:

- Fix tub rubber sealing with the clips to the ceramic support profiles as shown below (longer part of the clip is on the side of the rubber sealing). Cut rubber sealing on both sides of the duct to the appropriate length. Make sure rubber sealing is flush with the edge of the tub and the lateral sealing plates on both duct sides.

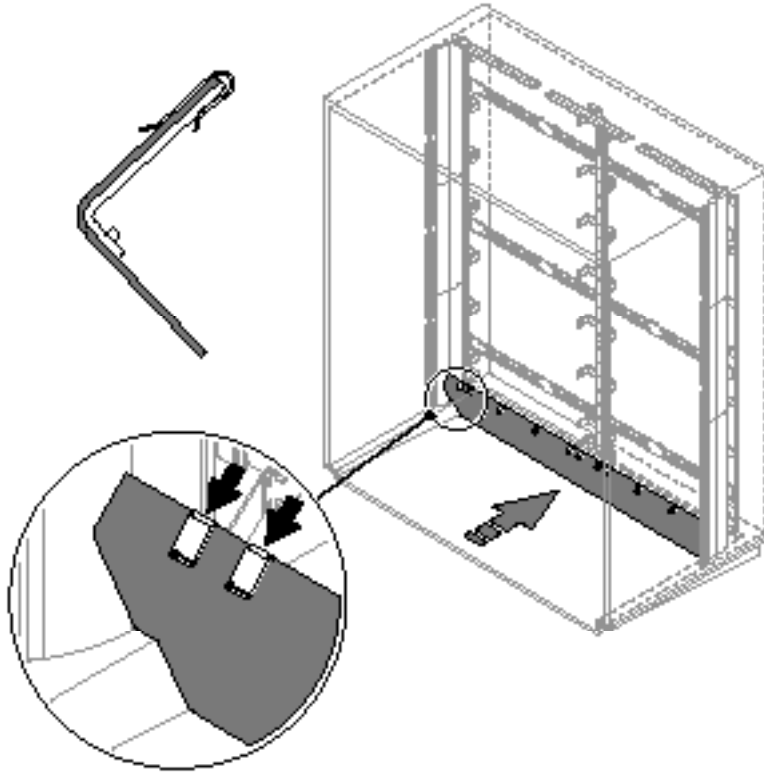


Abb. 11: Mounting the tub rubber sealing

10. Inserting ceramic carrier profiles:

- Insert the ceramic carrier profiles into holders. Make sure the carrier profiles are inserted such that the pins on each side of the carrier profile are outside of the holder.

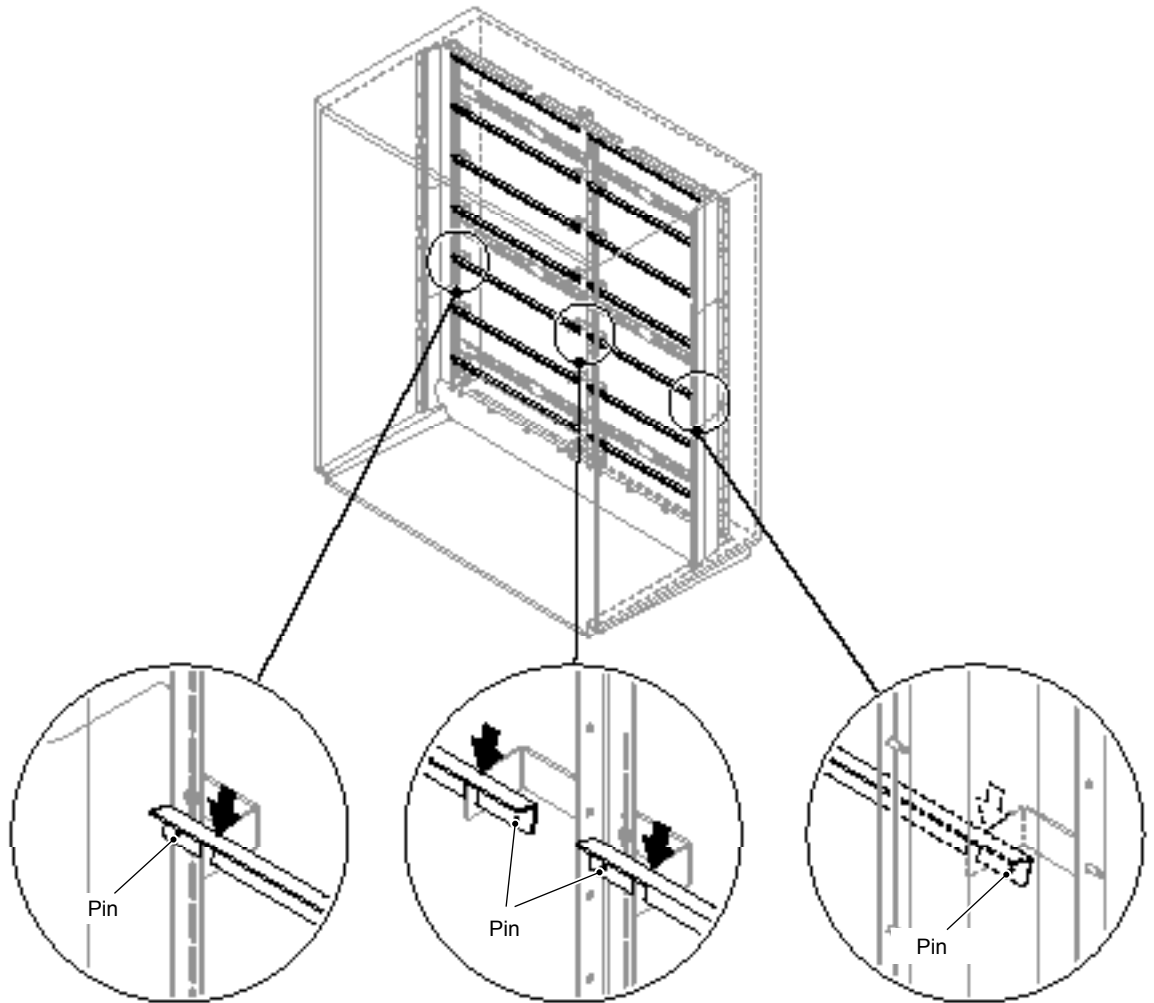


Abb. 12: Inserting ceramic carrier profiles

11. Mount the ceramic plates:

- Start from the bottom left (view in air flow direction) carefully hang the ceramic plates of the bottom row onto the carrier profiles, then align the row to the middle of the duct.

Important: Make sure, the very right and very left ceramic plates have the same distance to the duct wall and that all plates properly rest against each other.

Important: On sites with ceramic plates with a height of 300 mm, make sure these plates are mounted always in the bottom row.

- Start from the left (view in air flow direction) carefully hang the ceramic plates of the remaining rows onto the carrier profiles and carefully align them to the subjacent ceramic plates row.

Important: Make sure the ceramic plates rows are aligned exactly below each other and that all plates properly rest against each other.

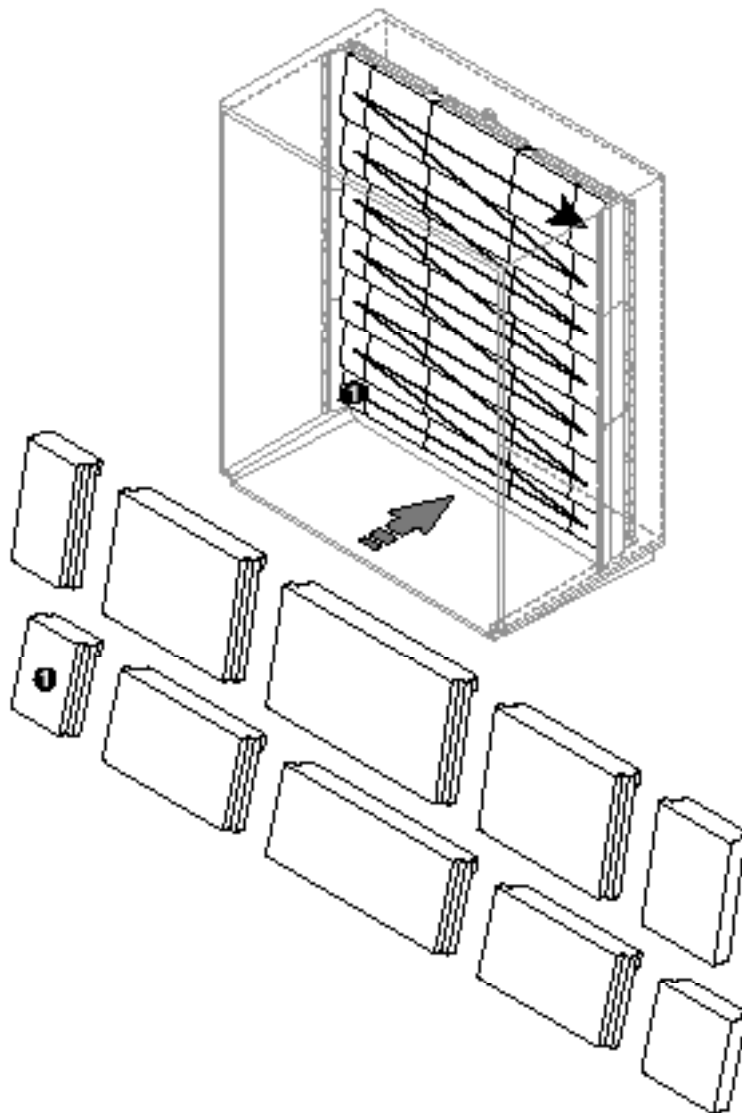


Abb. 13: Mount the ceramic plates

12. Mount the upper sealing plates:

- Starting on one side push the upper sealing plates underneath the fastening profiles until they touch the ceramic plates of the topmost row.
- Carefully shift the very right and the very left sealing plate against the lateral sealing plates without pushing them away.

Important: Make sure the overlapping of the sealing plates are evenly allocated.

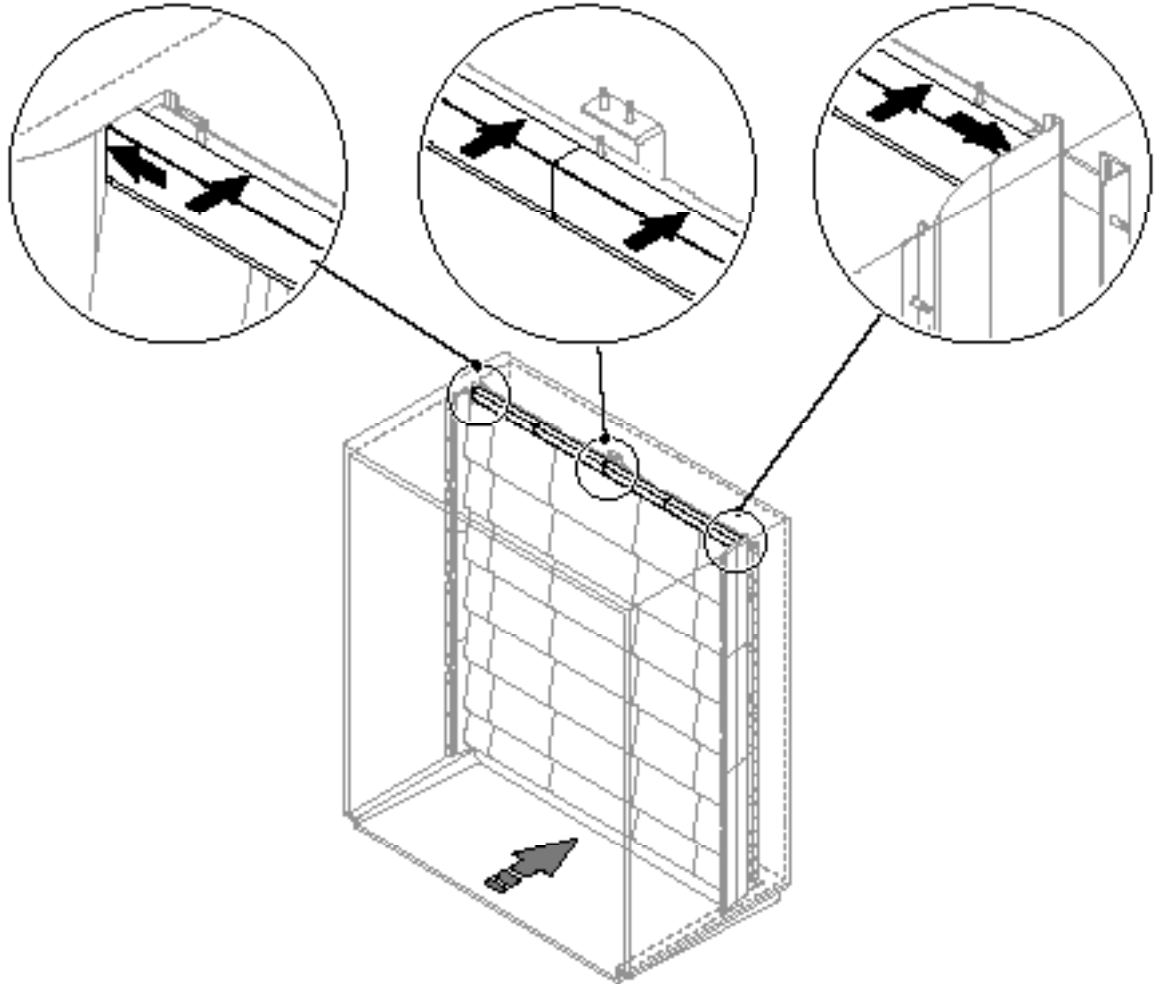


Abb. 14: Mount the upper sealing plates

4.2.3 Mounting the nozzle system

1. Mount the lateral supports of the nozzle system to the duct walls:

- Align the lateral supports with the “TOP” labeled mounting bracket on top with an identical distance to the duct ceiling (**target measure ”a”**: **65 mm**, **admissible range: 0...90 mm**) and with a **distance “d” of 780 mm +120/-180 mm** to the supports of the post-evaporation unit, then fix them via the topmost fastening hole to the duct wall using self-tapping screws 6.3 x 25 mm (do not tighten the screw yet).
- **Align both supports at right angles to the duct ceiling** and check the distance to the duct ceiling once more (the distance must be identical for both supports). Then, fix both supports approx. every 30 cm with self-tapping screws 6.3 x 25 mm to the duct walls.
Note: evenly allocate the self-tapping screws over the entire length of the supports.

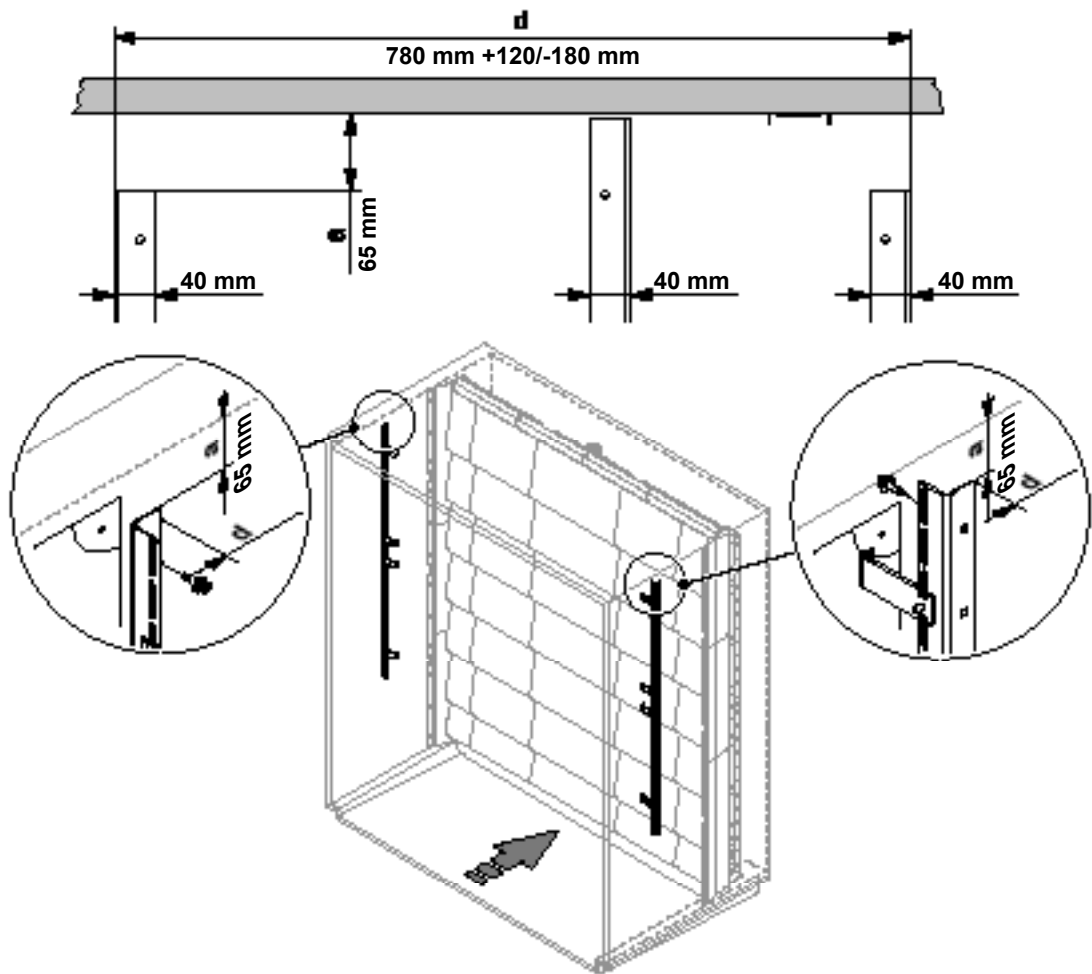


Abb. 15: Mount the lateral supports of the nozzle system

2. Mount the cross members:

Note: this step must be carried out only on systems with two nozzle grids in the width.

- For air ducts/AHU's with a width >2000 mm the cross members are supplied in sections and must be bolted together on site. Proceed as follows: Undo the screw connections on the cross members overlapping. Arrange cross member sections and fix them together using the screws M6 x 16 mm and nuts removed right before. Exactly align cross member sections and fasten the screw connections. Then, fix the reinforcement plates at the overlapping to the cross members as shown below using four screws M6 x 16 mm and nuts, align plates and fasten the screw connections.
- Slightly loosen the four screw connections, with which the mounting plates are attached on both sides to the cross members, so the mounting plates can be moved.
- From the front (view in air flow direction) hang up the cross members at the appropriate vertical position to the lateral supports of the nozzle system, then push the cross members downwards until they come to a stop. Now, fasten all screw connections of the mounting plates.

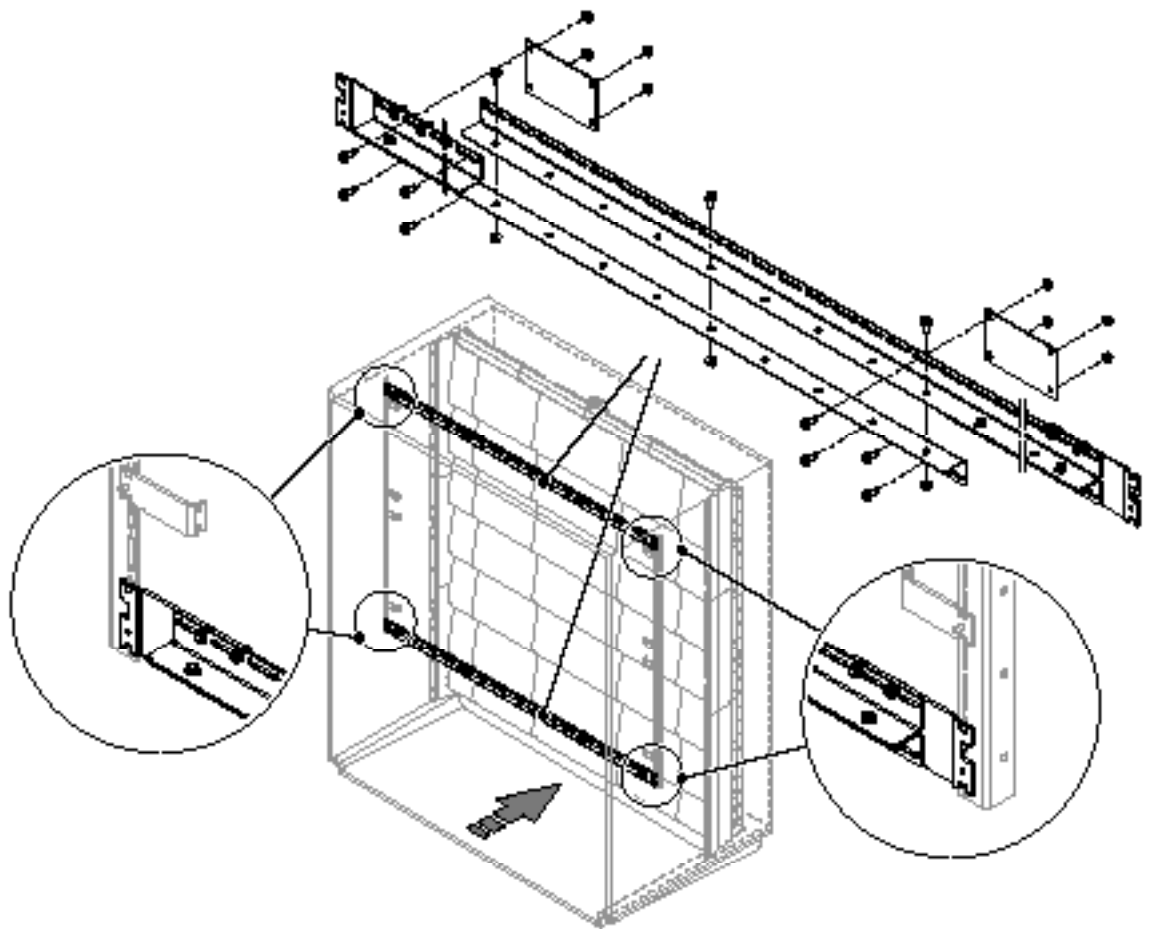


Abb. 16: Mount the cross members

3. Mount vertical support(s):

Note: This step must be carried out only on air ducts /AHU's with a width >2000 mm.

- Mark horizontal position(s) of the vertical support(s) on the cross members. From the back (view in air flow direction) attach the vertical support(s) with the same distance to the duct ceiling as the lateral supports of the nozzle system have, then fix the vertical support(s) four screws M6 x 16 mm and nuts to the cross members. Slightly fasten the screw connections only.
- Check distance between upper edge of the vertical support(s) and the duct ceiling as well as the vertical alignment of the vertical support(s) by measuring the distance between the vertical support(s) and the duct walls on top and on the bottom.
Important: The distance between the upper edge of the vertical support(s) to the duct ceiling must be identical to the distance between the upper edge of the two lateral supports of the nozzle system to the duct ceiling. If necessary, align vertical support(s) horizontally and vertically.
- Fasten all screw connections.

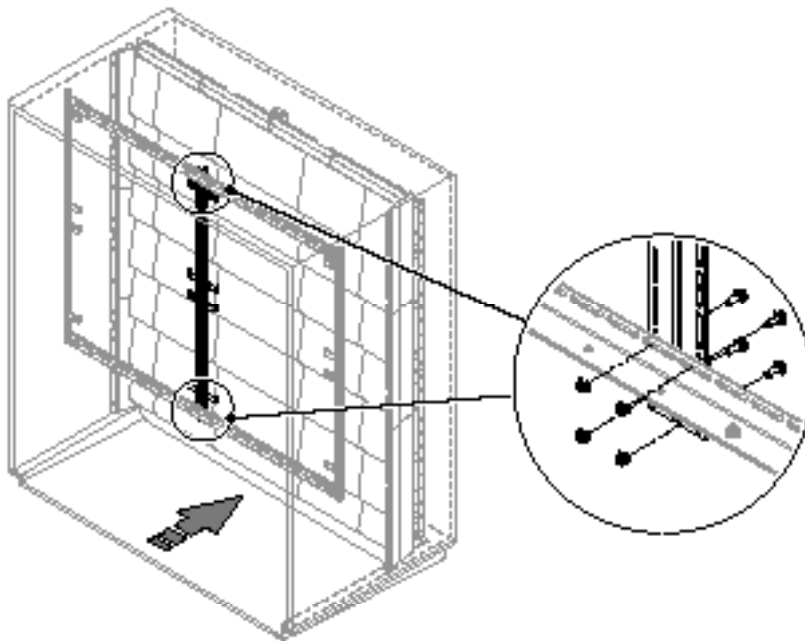


Abb. 17: Mount the vertical support

4. Hang up nozzle grid(s):

- Hang up nozzle grid into the holders, then push nozzle grid downwards until its comes to a stop. Repeat step for additional nozzle grid(s) if necessary.

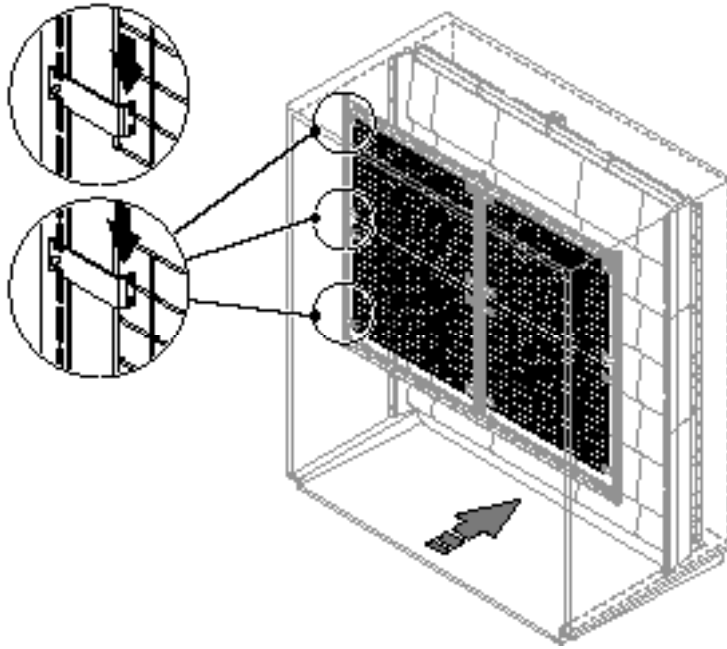


Abb. 18: Hang up nozzle grid

5. Mount housing feed throughs:

- Drill holes $\varnothing 19$ mm for the housing feed throughs at the desired position (distance between axes min. 55 mm) into the duct wall, then deburr the holes.
Important: It is mandatory that the holes of the housing lead-throughs are below the lowest hose connector on the nozzle grid(s).
- Fix housing feed throughs with gasket on the inside to the duct wall using two self-tapping screws 6.3 x 25 mm.
- Screw in and fasten by hand hose connectors on both sides into the housing feed throughs.

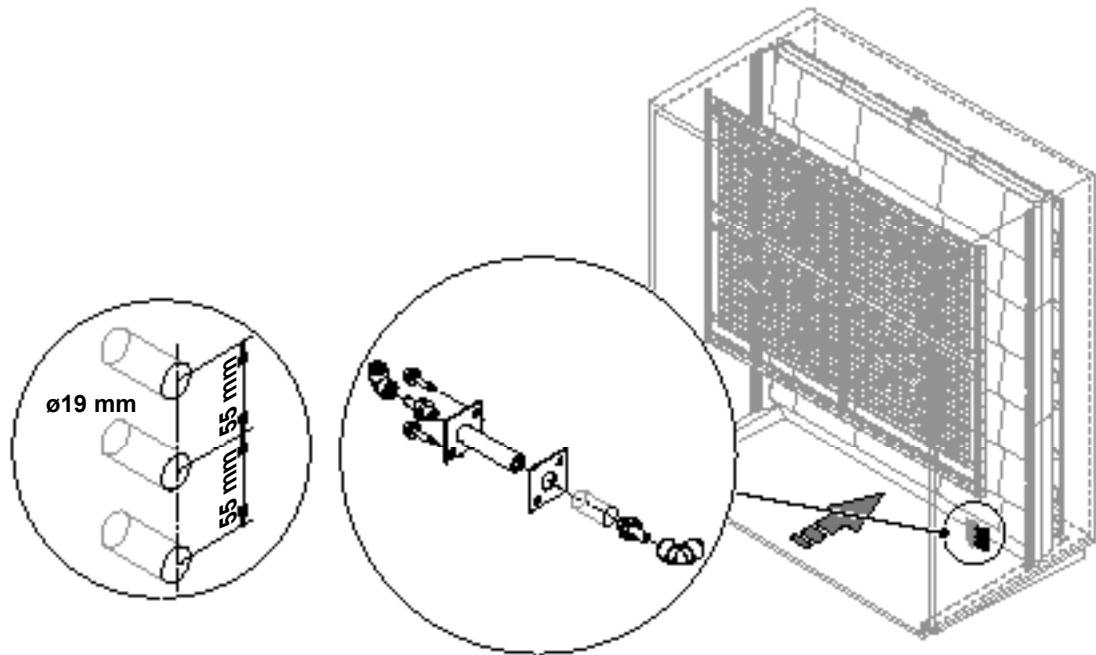


Abb. 19: Mount housing feed throughs

6. Connect spray circuits to the housing feed throughs:

- Interconnect the spray circuits of the different nozzle grids (if more than on grid is present). Interconnect spray circuits with same colour only.
- Connect spray circuits to the appropriate housing feed throughs.

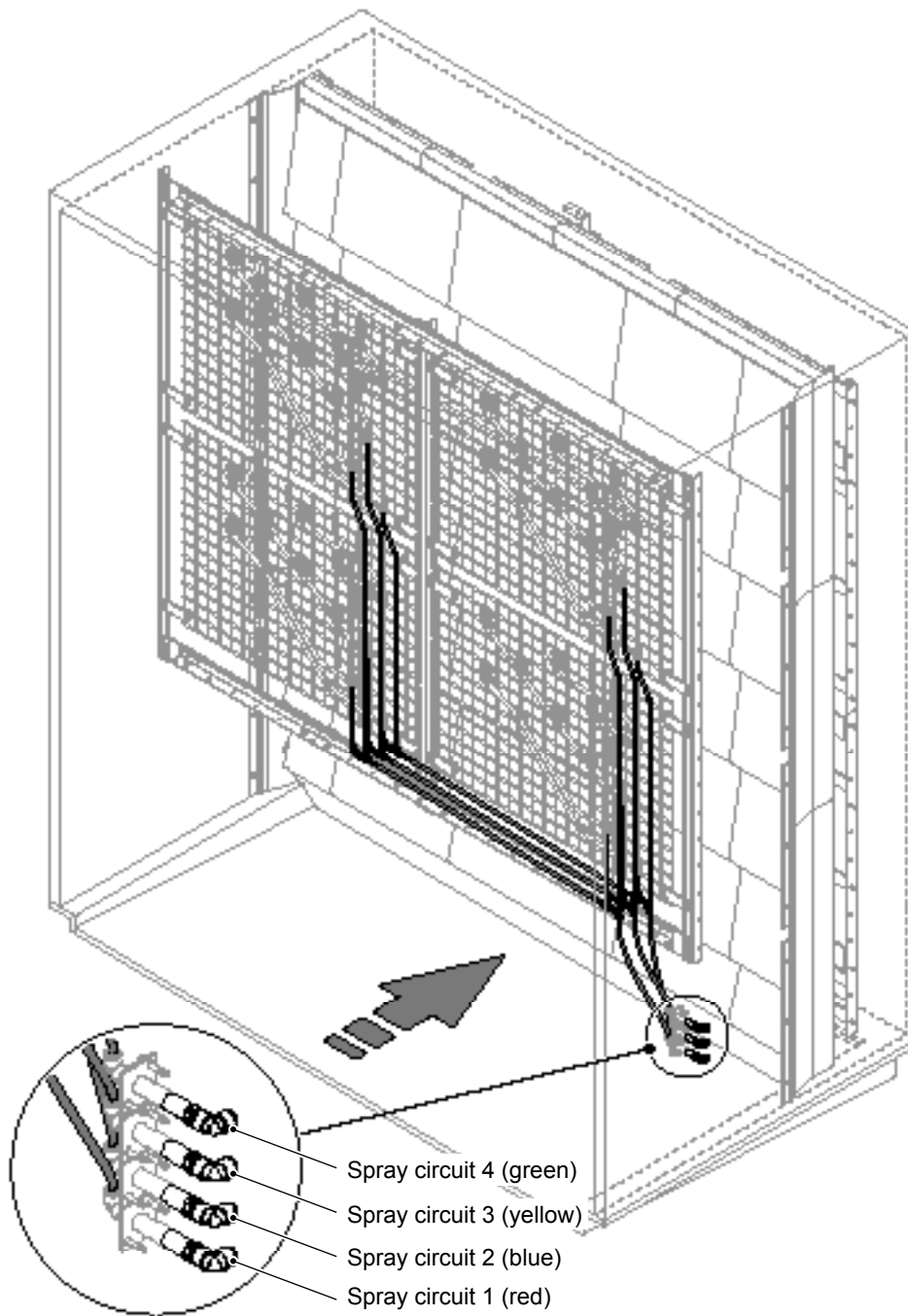


Abb. 20: Connect spray circuits to the housing feed throughs

4.3 Positioning and mounting the central unit

Positioning the central unit

- The central unit is designed for wall-mounting in interior spaces. Make sure that the construction (duct wall, pillar, etc.) to which the central unit is to be mounted, offers a **sufficiently high load-bearing capacity**, and is suitable for the installation.



CAUTION!

Do not mount the central unit to vibrating components, not in exposed areas or places with excessive dust load.

- The central unit may only be installed in rooms with a floor drain. If for some reason the central unit must be installed in a location without floor drain, it is mandatory to provide a leakage monitoring device to safely interrupt the water supply in case of leakage. Additionally make sure that sensitive materials are kept clear of the central unit to prevent damage in case of water leakage.
- Locate the central unit in such a manner that:
 - the length of the spray circuit lines between central unit and housing feed throughs of the duct are as short as possible (**max. 10 m**).
 - the spray circuit lines can be installed with a constant downslope (min. 2%) from the housing feed throughs on the duct/AHU to the connections of the central unit.
 - the central unit is **freely accessible** with sufficient space available for maintenance purposes (**minimum distances** showed in the following illustration **must be adhered to**).
 - the control unit can be mounted in direct proximity to the central unit (**max. length of the electrical connecting cables** between control unit and central unit **0.75 m**)
- The central unit is protected according to **IP22**. Make sure the central unit are installed in a drip-proof location and the admissible ambient conditions are complied with.
- When fixing the central unit use **only the fixing materials supplied with the unit**. If fixing with the materials supplied is not possible in your particular case, select a method of fixing that is of similar stability.

Mounting the central unit

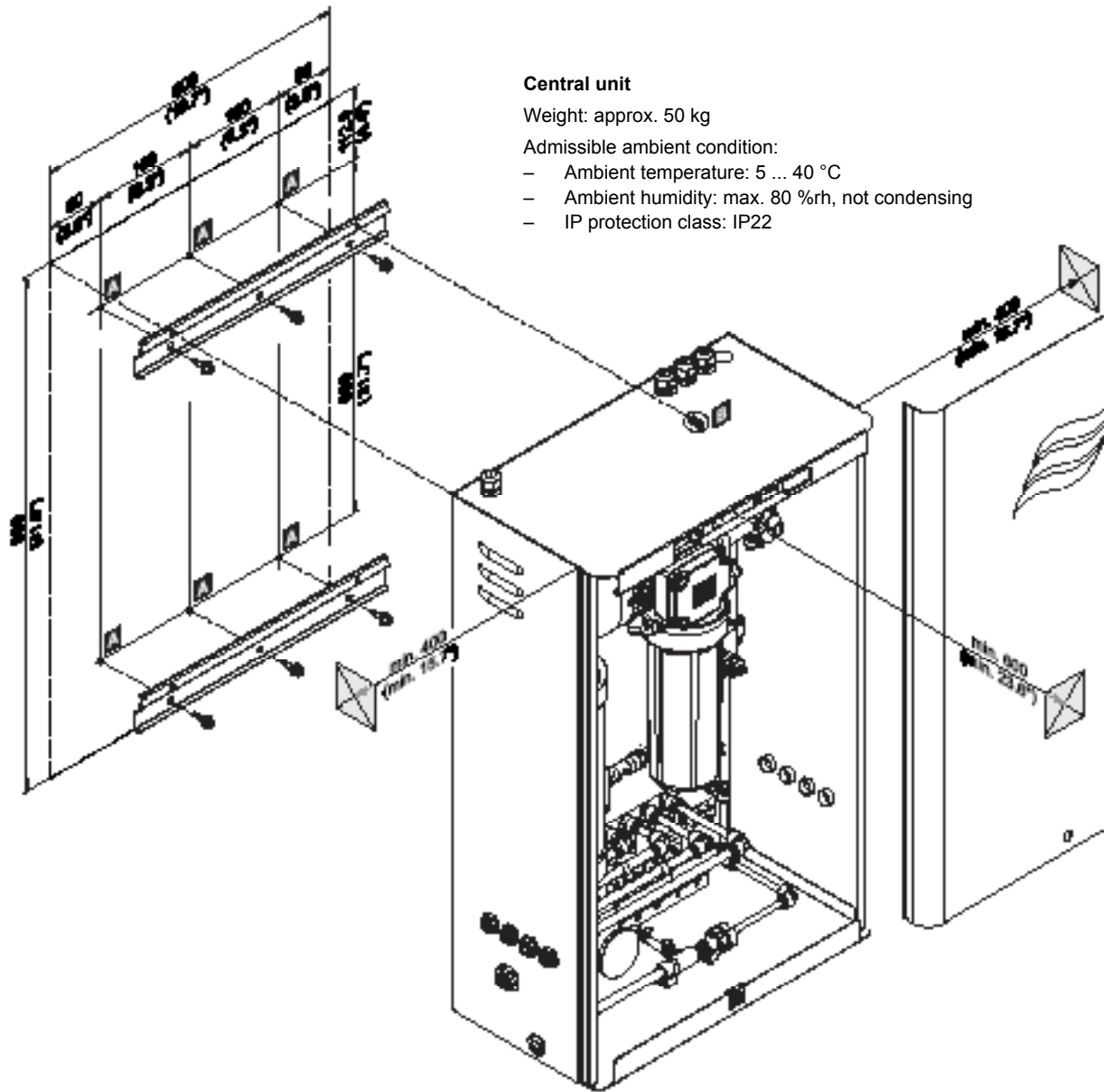


Abb. 21: Mounting the central unit - dimensions in mm (Inch)

Procedure

1. Mark the attachment points "A" for the two wall supports at the desired position with the help of a spirit level.
2. Fix the wall supports with the self-tapping screws 6.3 x 25 mm supplied to the wall. Before tightening the screws adjust wall supports horizontally using a spirit level.
3. Unlock the screw of the front panel of the control unit, then remove the front panel.
4. Hang up the central unit onto the wall supports. Then, fix the unit to the upper wall support using the screw "B" already inserted in the central unit on the upper right side.
5. Reattach the front panel and secure it with the screw.

4.4 Positioning and mounting the control unit

Positioning the control unit

- The control unit is designed for wall-mounting in interior spaces. Make sure that the construction (duct wall, pillar, etc.) to which the control unit is to be mounted, offers a **sufficiently high load-bearing capacity**, and is suitable for the installation.



CAUTION!

Do **not** mount the control unit to vibrating components, not in exposed areas or places with excessive dust load.

- Locate the control unit in such a manner that:
 - the control unit is **freely accessible** with sufficient space available for maintenance purposes (**minimum distances** showed in the following illustration **must be adhered to**).
 - the distance to the central unit is as short as possible (**max. length of the electrical connecting cables** between control unit and central unit **0.75 m**).
 - the electrical isolator (included in the delivery) can be mounted in direct proximity of the control unit (max. distance 1 m) and in a convenient height between 0.6 m and 1.9 m (recommended: 1.7 m).
- The control unit is protected according to **IP22**. Make sure the control unit are installed in a drip-proof location and the admissible ambient conditions are complied with.
- When fixing the control unit use **only the fixing materials supplied with the unit**. If fixing with the materials supplied is not possible in your particular case, select a method of fixing that is of similar stability.

Mounting the control unit

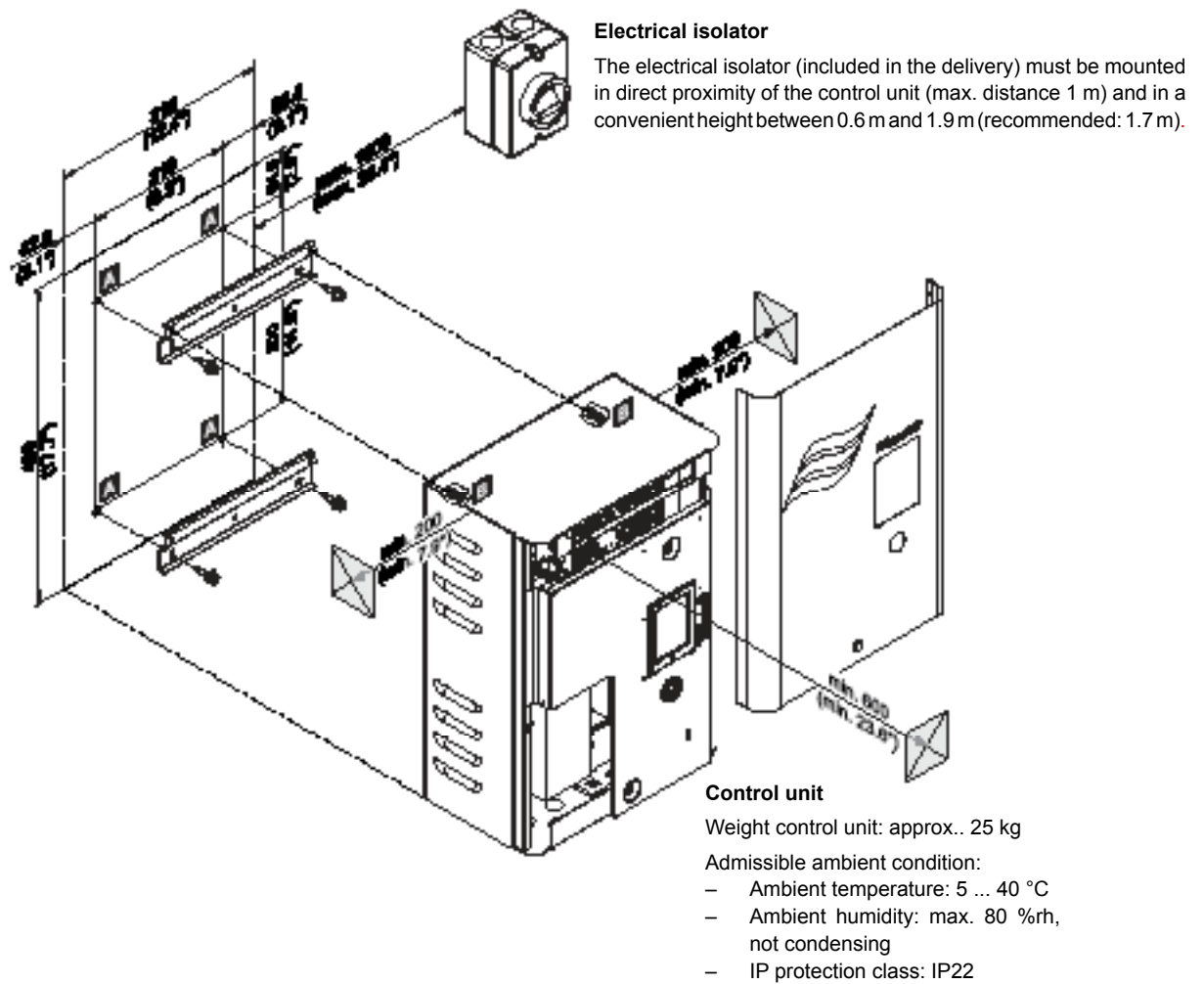


Abb. 22: Mounting the control unit - dimensions in mm (Inch)

Procedure

1. Mark the attachment points "A" for the two wall supports at the desired position with the help of a spirit level.
2. Fix the wall supports with the self-tapping screws 6.3 x 25 mm supplied to the wall. Before tightening the screws adjust wall supports horizontally using a spirit level.
3. Unlock the screw of the front panel of the control unit, then remove the front panel.
4. Hang up the control unit onto the wall supports. Then, fix the unit to the upper wall support using the screws "B" already inserted in the control unit.
5. Reattach the front panel and secure it with the screw.

4.5 Water installation

4.5.1 Overview water installation

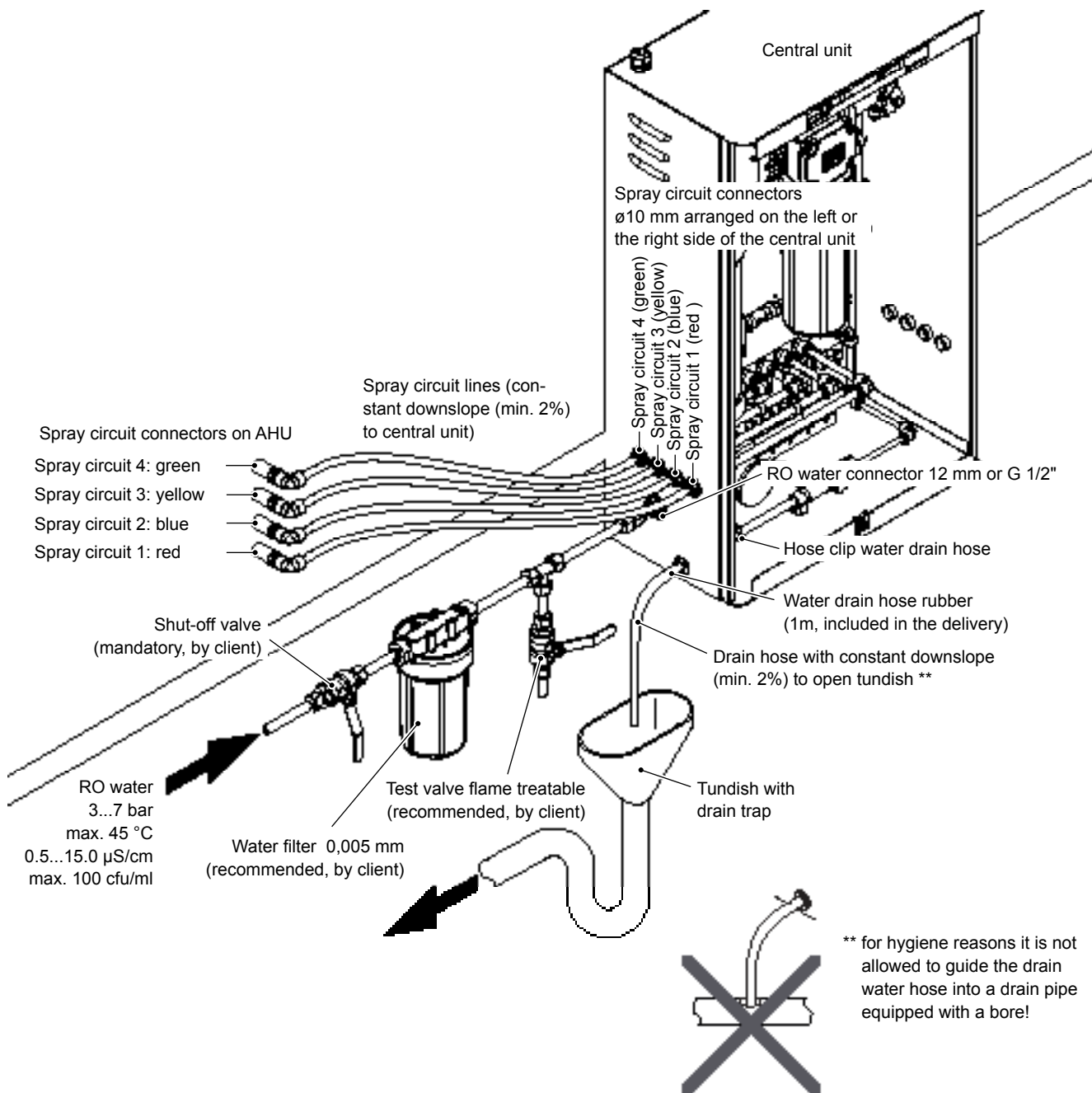


Abb. 23: Overview water installation

4.5.2 Notes on water installation

General notes on installation of the hoses

- Use the supplied black plastic hoses $\varnothing 10/8$ mm and $\varnothing 12/10$ mm only. For hygienic reasons do not use other hoses (except products supplied by your Condair distributor).



CAUTION!

Fully demineralised water is aggressive. For this reason, the entire water system must contain **fully demineralised water resistant material only** (do not use copper pipes).

- When cutting hoses use an **appropriate cutting tool** providing **straight, kink-free** cuts.



CAUTION!

After cutting the tubes the **sharp cutting edge must be deburred** otherwise the couplings may be damaged.

- The hoses must be free of kinks and other damage (longitudinal scratches, in particular).
- When cutting hoses always **add at least 5 mm** to the required length. This way the hoses can be fastened correctly (down to the stop) to the quick-action couplings of the nipples.
- Make sure the hoses are not kinked and pay attention to the **minimum bend radius of 100 mm**.
- Do not lead hoses past hot system components (**max. ambient temperature is 40 °C**).
- To prevent damage we strongly recommend leading the hoses inside a duct (or a similar means of protection) between the central unit and the housing feed throughs of the duct/AHU.
- It is mandatory that the hoses between the connections on the nozzle grid and the housing feed throughs on the duct/AHU, and between the housing feed throughs and the corresponding connectors on the central unit are installed with a constant downslope.
- After installation verify correct fastening of all hoses. Correctly mounted hoses can not be removed without pressing the locking ring.



CAUTION!

In order to avoid damage caused by leaking water during operation, all hoses must correctly be secured against accidentally pulling out.

RO water supply

- The installation of a **shut-off valve** is **mandatory**. The shut-off valve is to be installed as close to central unit as possible. The installation of a water filter with a mesh width of min. 0.005 mm and a test valve is recommended.

Before joining the fully demineralised water supply conduit to the water supply connector on the central unit, **flush the conduit thoroughly for at least 10 minutes**.

If the water pressure is >7 bar, install a pressure reducing valve (set to 7 bar) in the supply conduit.

- If the conduit length between the water conditioning unit and the central unit of the Condair DL exceeds 20 m, the supply conduit must be equipped with a suitable pressure damper (overflow valve, surge tank, etc.). Furthermore, the supply conduit must be properly fastened according to the regulations
- The RO water must meet the following requirements:
 - **Fully demineralised water from a reverse osmosis system**
 - **Conductance of the supply water: 0.5 ... 15.0 µS/cm**
 - **Working pressure at maximum humidification capacity: min. 3 bar**
 - **Maximum admissible inlet temperature: 45 °C**
 - **No additives** (such as **chlorine, disinfecting agents, ozone**, etc.), except such approved by Condair.
 - **Max. germ count at the water inlet on the Condair DL: 100 cfu/ml**

Water drain line

The drain hose (rubber hose 1m, included in the delivery) is fed into the central unit via the corresponding feed through and connected to the water jet pump using the hose clamp supplied.

The drain hose is fed from the central unit with a constant downslope (min 2%) down into an open tundish connected via a siphon to waste water line of the building. Prevent the drain hose from slipping out of the tundish by fastening it **with appropriate means right above the tundish** (without reducing the diameter of the hose).

Important: for hygiene reasons it is not allowed to guide the drain water hose into a drain pipe equipped with a bore!

4.6 Electrical installation

4.6.1 Notes on electrical installation



DANGER!
Danger of electric shock

The control unit of the adiabatic air humidification system Condair DL is mains powered. Live parts may be exposed when the control unit is open. Touching live parts may cause severe injury or danger to life.

Prevention: The control unit must be connected to the mains only after all mounting and installation work has been completed, all installations have been checked for correct workmanship and all components have been locked properly.



CAUTION!

The electronic components inside the control unit are very sensitive to electrostatic discharge. Before carrying out installations work inside the control unit, appropriate measures must be taken to protect the electronic components against damage caused by electrostatic discharge (ESD protection).

- All work concerning the electrical installation must be performed only by **skilled and qualified technical personnel (e.g. electrician with appropriate training) authorised by the owner**. It is the owner's responsibility to verify proper qualification of the personnel.
- The electrical installation must be carried out according to the wiring diagrams chapter 4.6.2 – *Wiring diagram Condair DL*, the notes on electrical installation as well as the applicable local regulations. All information given in the wiring diagram must be followed and observed.
- All cables must be lead into the control unit, the central unit and the electrical isolator via appropriate cable feed throughs.
- Make sure the cables are adequately fixed, do not scrub on any components or become a stumbling trap.
- Observe and maintain maximum cable length and required cross section per wire according to local regulations.
- The mains supply voltage must match the respective voltage stated on the type plate.

4.6.2 Wiring diagram Condair DL

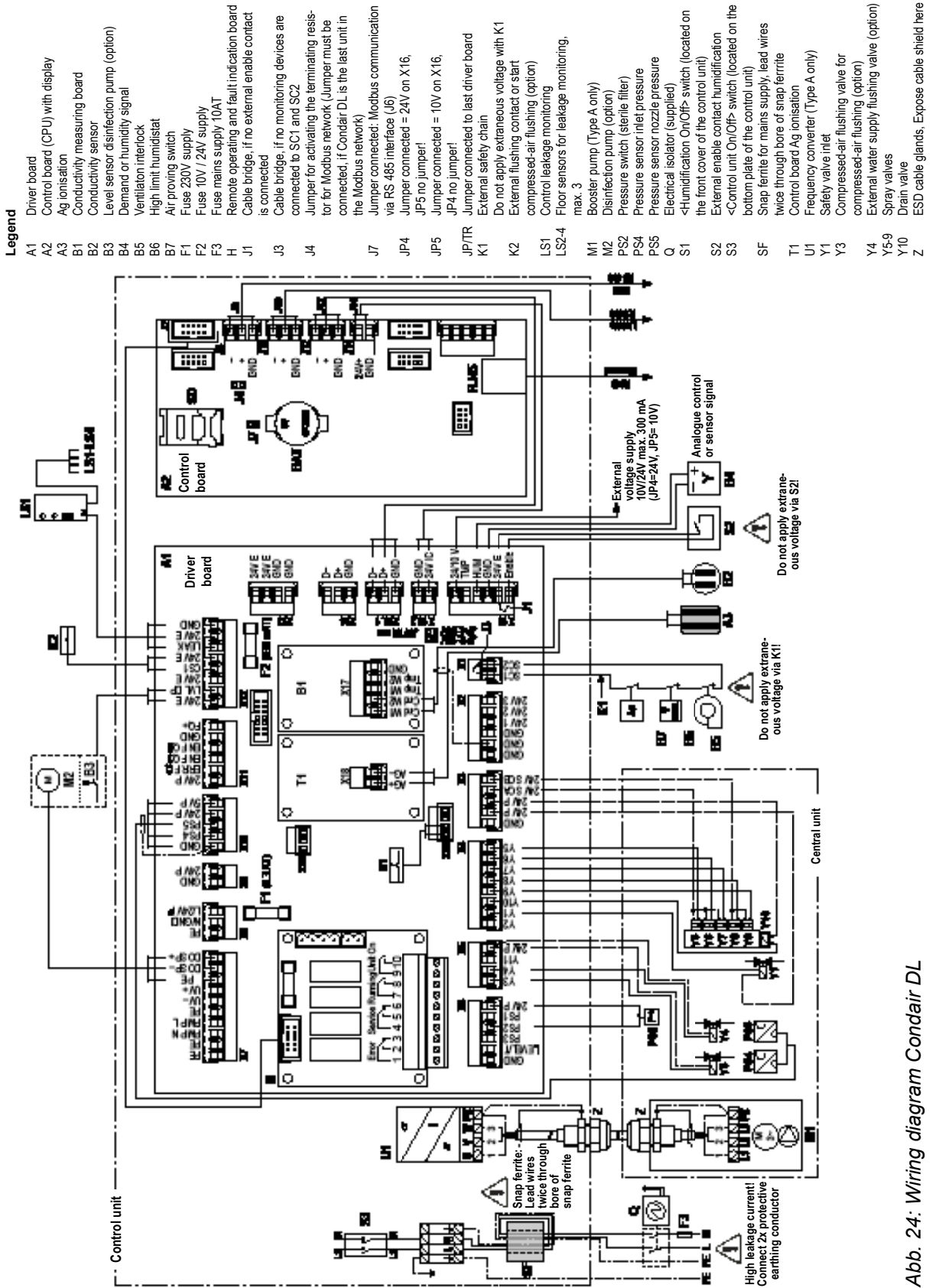


Abb. 24: Wiring diagram Condair DL

4.6.3 Electrical connections between central unit and control unit

4.6.3.1 Wiring diagram central unit - control unit

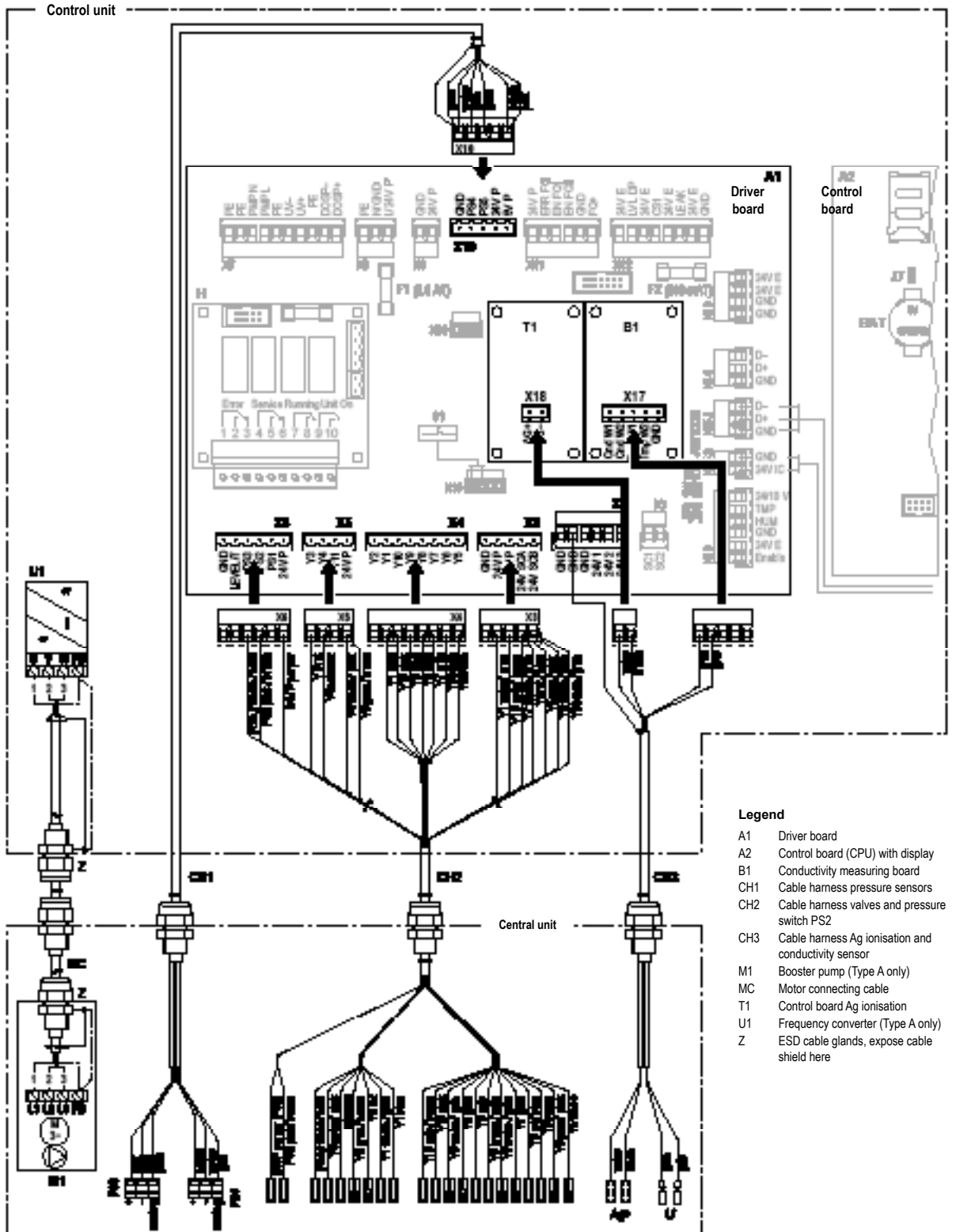
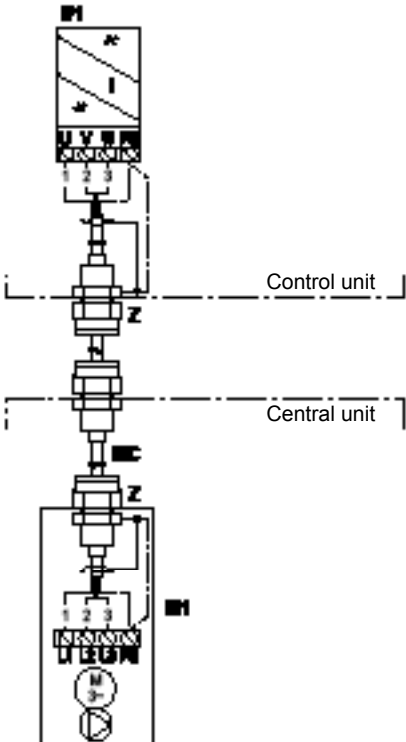
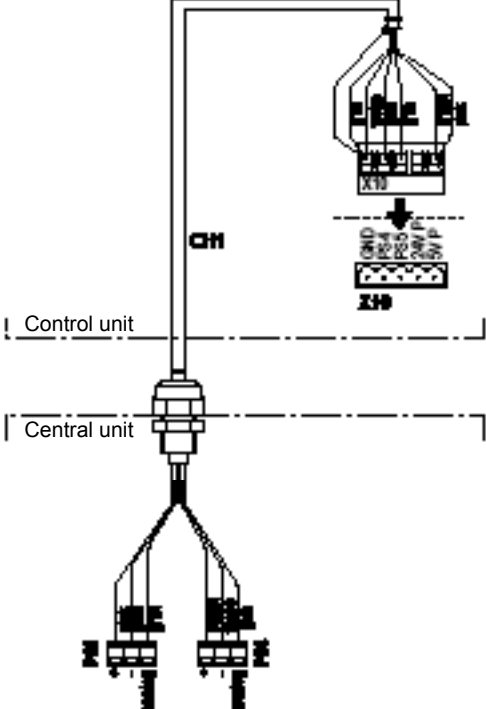
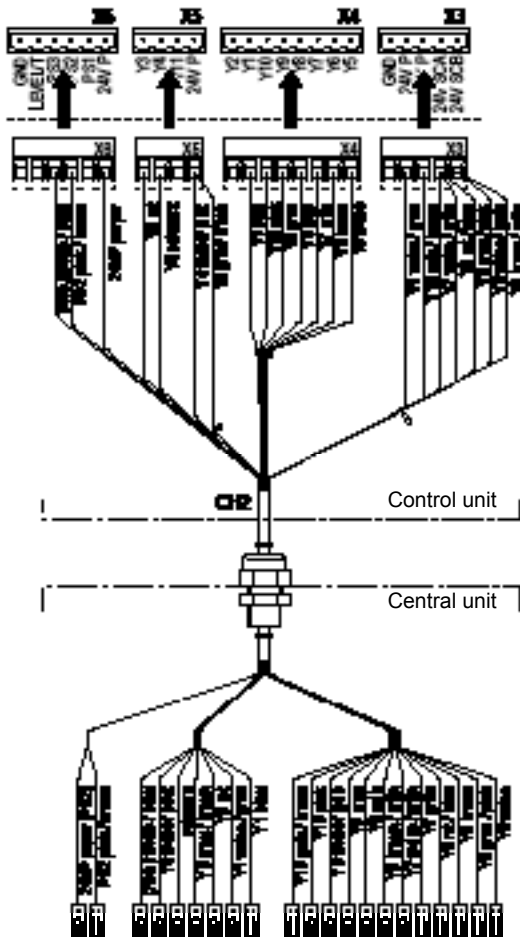


Abb. 25: Wiring diagram central unit - control unit

4.6.3.2 Installation work central unit - control unit

Connecting the motor cable (MC) to the frequency converter (type A only)	
	<p>Ex factory the motor cable is connected to the frequency converter inside control unit. On site the motor cable must be fed via the cable gland (top left) into the central unit, and there be connected to the booster pump motor according to the wiring diagram. At the section where the motor cable passes through the metallic EMV cable gland (Z), the cable shield must be exposed to achieve electrical connection of the cable shield with the EMV cable gland.</p> <p>Note: the remaining cable between control and central unit must be pulled down into the central unit and there be inserted in a loop into the corresponding cable duct.</p>
Connecting the cable harness “Pressure sensors” (CH1)	
	<p>Ex factory the cable harness “Pressure sensors” (CH1) is connected inside central unit to the corresponding pressure sensors. On site the terminal connector of the cable harness must be connected to the appropriate terminal (X10) on the driver board inside the control unit. The cable harness is to be led through the rectangular cable feed through into the control unit</p> <p>Note: lead cable harness inside the control unit in the cable ducts to the corresponding terminal on the driver board. The remaining cable of the cable harness between control and central unit must be pulled down into the central unit and there be inserted in a loop into the corresponding cable duct.</p>

Connecting the cable harness “valves” (CH2)

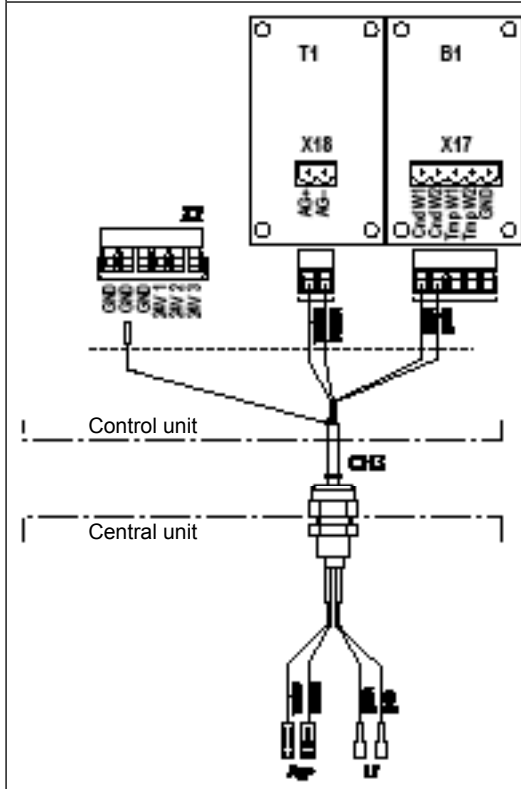


Ex factory the cable harness “valves” (CH2) is connected inside central unit to the corresponding valves. On site the terminal connectors of the cable harness must be connected to the appropriate terminals (X3 to X6) on the driver board inside the control unit.

The cable harness is to be led through the rectangular cable feed through into the control unit

Note: lead cable harness inside the control unit in the cable ducts to the corresponding terminals on the driver board. The remaining cable of the cable harness between control and central unit must be pulled down into the central unit and there be inserted in a loop into the corresponding cable duct.

Connecting the cable harness "Ag-Ionisation" and "Conductivity measuring" (CH3)



Ex factory the cable harness "Ag-Ionisation" and "Conductivity measuring" (CH3) is connected inside central unit to the silver ionisation cartridge and to the conductivity sensor. On site the terminal connectors of the cable harness must be connected to the appropriate terminals on the Ag-Ion board (X18) and on the conductivity board (X17) inside the control unit.

The shielding of the cable harness must be connected to the terminal "GND".

The cable harness is to be led through the rectangular cable feed through into the control unit.

Note: lead cable harness inside the control unit in the cable ducts to the corresponding terminals of the two boards. The remaining cable of the cable harness between control and central unit must be pulled down into the central unit and there be inserted in a loop into the corresponding cable duct.

4.6.4 External electrical connections

4.6.4.1 Wiring diagram external electrical connections

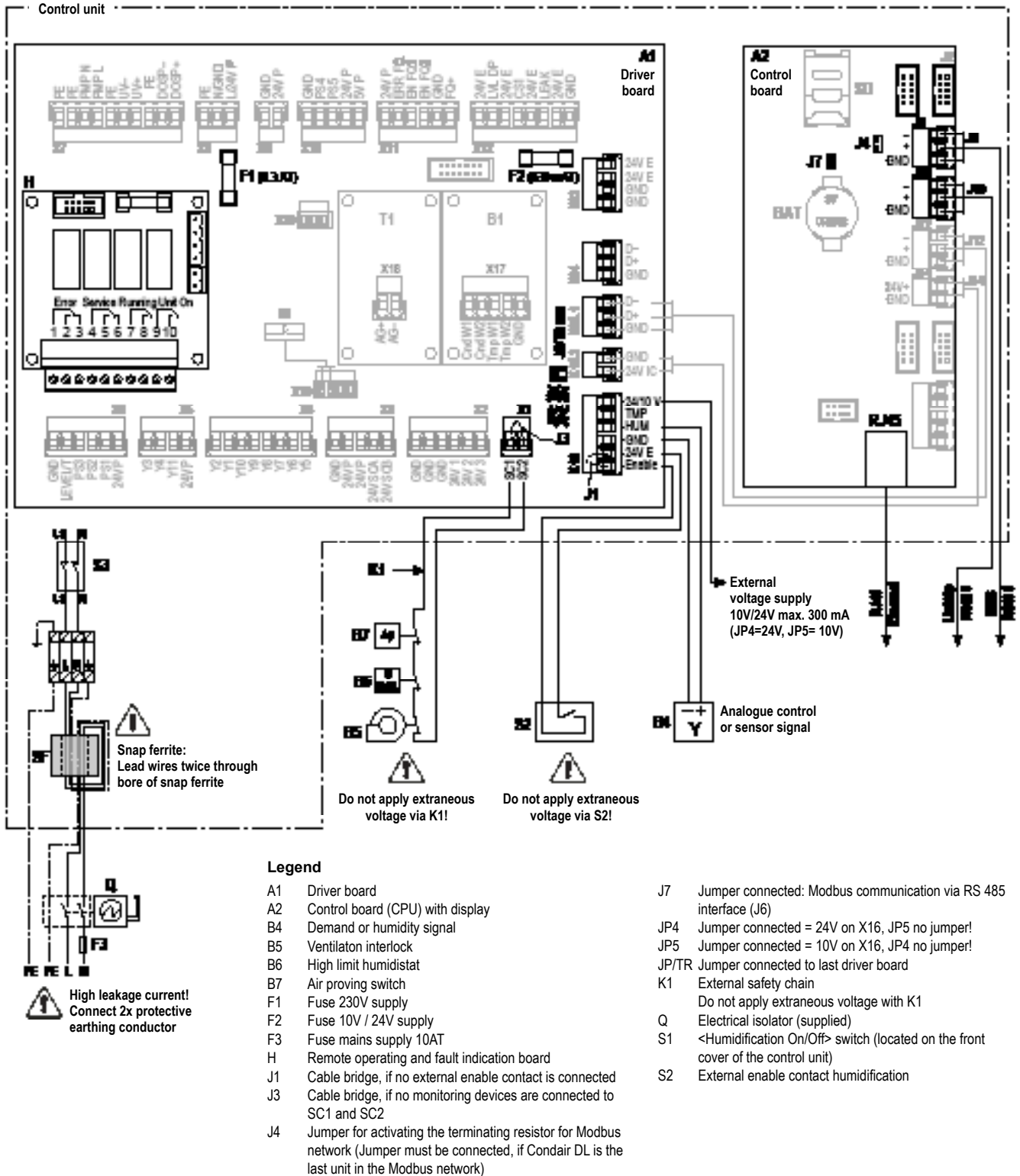
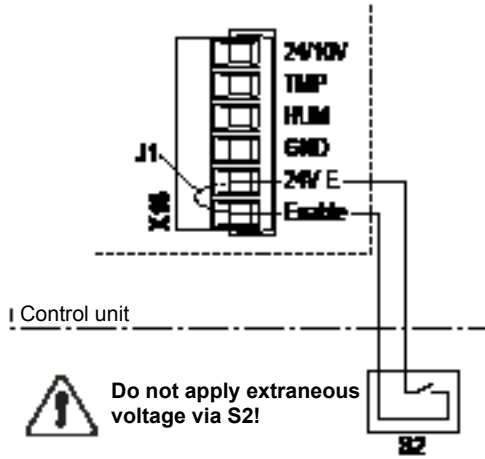


Abb. 26: Wiring diagram external electrical connections

4.6.4.2 Installation work external connections

Connecting the external safety chain	
<p>Control unit</p> <p>Do not apply extraneous voltage via K1!</p>	<p>The potential-free contacts of external monitoring devices (e.g. ventilation interlock, safety high limit humidistat, airflow monitor, etc.) are connected in series (safety chain “K1”) to the terminals “SC1” and “SC2” of the terminal block “X1” on the driver board in accordance with the wiring diagram.</p> <p>The connecting cable must either be led through the rectangular cable feed through or a free cable gland into the control unit.</p> <p>Note: If, for whatever reason, no external monitoring devices are connected, a cable bridge “J1” must be installed on the contacts “SC1” and “SC2” of the terminal block “X1”.</p> <p>CAUTION! Do not apply any extraneous voltage to contacts “SC1” and “SC2” via the contacts of the external monitoring devices.</p>
Anschluss Anforderungs- oder Feuchtesignal	
<p>Control unit</p>	<p>The signal cable of an external controller or of a humidity sensor (if the internal P/PI controller is used) are to be connected according to the wiring diagram to the terminals “HUM” and “GND” of the terminal block “X16”.</p> <p>The admissible signal values can be found in the technical data table in the operation manual. The connecting cable must either be led through the rectangular cable feed through or a free cable gland into the control unit.</p> <p>Note: if the external controller or the humidity sensor shall be supplied with 10 V or 24 V from the driver board (terminal “24/10V”), the corresponding jumper (“JP5: 10V” or “JP4: 24V”) must be set and the other one must be removed.</p> <p>The shielding of the control signal cable must be connected to terminal “GND”.</p> <p>Caution! If the shielding of the control signal is already connected to a potential or a grounded conductor, do not connect it to terminal “GND”</p>

Connecting the external enable switch

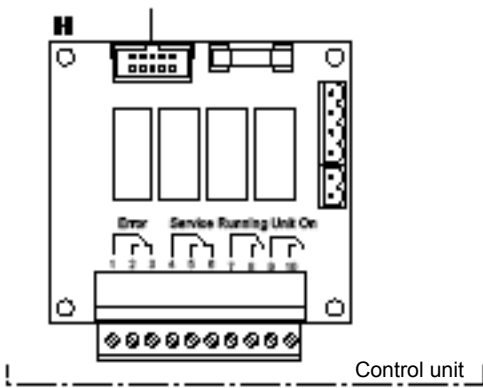


The potential-free contact of external enable contact is connected to the terminals “24V” and “Enable” of the terminal block “X16” on the driver board in accordance with the wiring diagram.

The connecting cable must either be led through the rectangular cable feed through or a free cable gland into the control unit.

CAUTION! Do not apply any extraneous voltage to terminals via the external enable switch.

Connecting the remote operating and fault indication



The remote operating and fault indication board contains four potential-free relay contacts for the connection of the following operating and fault indications:

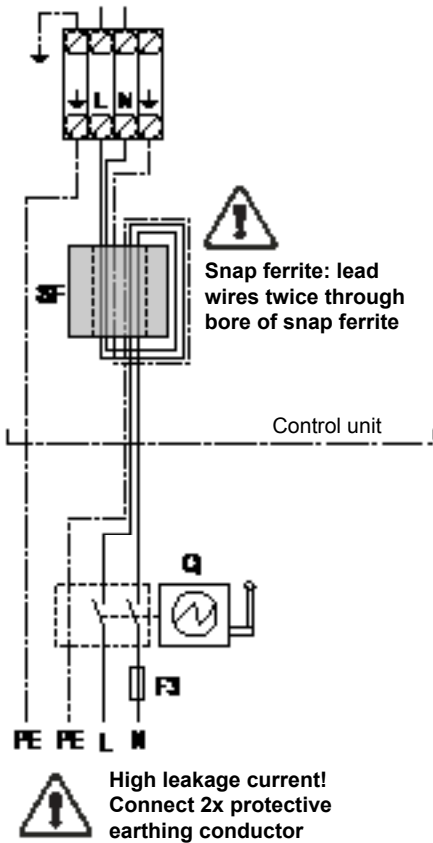
- “Error”:
This relay is activated if an error is present.
- “Service”:
This relay is activated when the set service interval has expired.
- “Running”:
This relay closes as soon as the Condair DL humidifies.
- “Unit on”:
This relay closes as soon as the voltage supply to the control unit of the Condair DL is switched on.

The connecting cable must either be led through the rectangular cable feed through or a free cable gland into the control unit.

The **maximum contact loading** is **250V/8A**.

Appropriate suppressor modules are to be used for the switching of relays and miniature contactors.

Connecting the mains voltage supply



The **mains voltage supply** (L1, N and 2xPE) is to be connected to terminals XE1 in accordance with the wiring diagram. The phase "L1", the neutral conductor "N" and one of the protective earth wires "PE" are to be led twice through the bore of the snap ferrite "SF" supplied.

The installation of the **fuse F3**, the **electrical isolator "Q"** (all pole disconnecting device with a minimum contact clearance of 3 mm) and a fault current protection switch with 30 mA trigger current (by client) in the mains supply line are mandatory.

The electrical isolator must be mounted in direct proximity of the control unit (max. distance 1 m) and must be easily accessible in a height between 0.6 m and 1.9 m (recommended: 1.7 m).

CAUTION! Make sure the voltage indicated on the rating plate meets the local line voltage. Otherwise, do not connect the control unit.

DANGER! When using a frequency converter there must be **TWO protective earth conductors for optimum safety. The second protective earth wire must be connected directly to the nearest potential equalization.** The wire cross section of both earth conductors must comply with the local regulations. If the present installation does not allow for two protective earth conductors, the wire cross section of the single earth conductor must be at least 10 mm².

Note: If the control unit is connected to a mains supply incorporating a fault current protection switch make sure the fault current protection switch is suitable for operation with frequency converters and their filters. If problems should arise when operating the system in conjunction with a fault current protection switch, please contact your Condair representative.

4.6.5 Connecting options

For the electrical connection of options (e.g. leakage monitoring) please refer to the separate manual of corresponding option.

5 Appendix

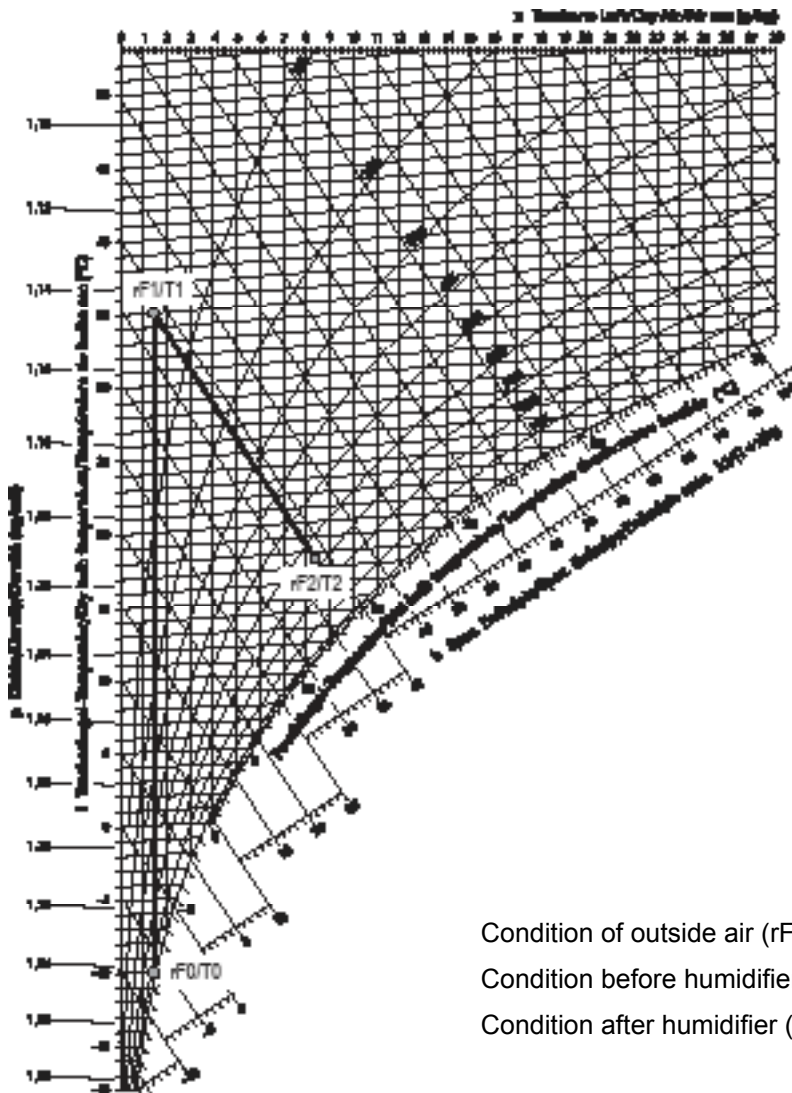
5.1 Enthalpy control for Condair DL

For accurate and energy saving air conditioning an enthalpy control is recommended. In simple terms, enthalpy is the amount of energy of the air in kJ/kg. With an enthalpy control the air temperature and the air humidity are used to control the preheater in a way, that the Condair DL can be exactly and continuously regulated along the adiabatic line to the respective outlet conditions (rF2 and T2). With an enthalpy control a reheater is not needed.

Important! A dew point control which uses the dew point as regulation parameter in conjunction with a preheater and an air humidifier and where the desired air temperature is achieved with a reheater is not suitable.

If another control system than the enthalpy control should be used please contact your Condair representative.

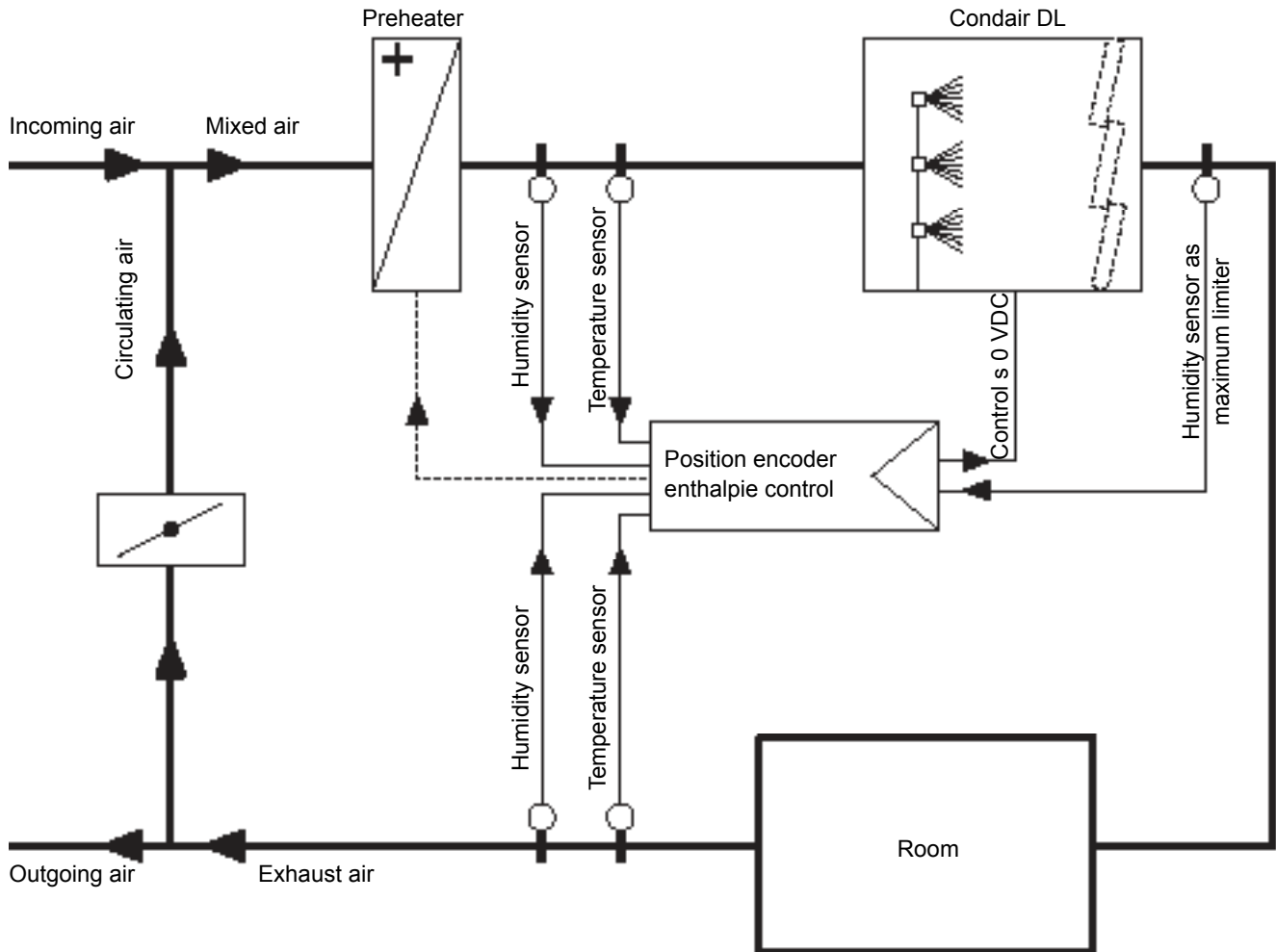
Example of an enthalpy control for Condair DL



Condition of outside air (rF0/T0): -10 °C / 90 %rh
Condition before humidifier (rF1/T1): 35 °C / 4 %rh
Condition after humidifier (rF2/T2): 17.5 °C / 65 %rh

Basic diagram of an enthalpy control

Remark: If the temperature is changed at the preheater, the humidification of the air which can be reached by the humidifier must be adapted to the new temperature before the humidification unit. When adapting, make sure the calculated **efficiency factor of the humidifier system “ η ”** is not exceeded according the following formula.



$$\eta = \frac{(x_2 - x_1) \cdot 100}{x_S - x_1} \%$$

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