

READ AND SAVE THESE INSTRUCTIONS

INSTALLATION MANUAL

Adiabatic air humidification/air cooling system
Nortec ME Direct Feed

Thank you for choosing Nortec

Installation date (MM/DD/YYYY):

Commissioning date (MM/DD/YYYY):

Location ref.:

Model:

Serial number:

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1 Introduction

1.1 General

We thank you for having purchased the **Nortec ME Direct Feed Evaporative Humidifier and Cooler** (Nortec ME Direct Feed for short).

To ensure a safe, proper, and economical operation of the Nortec ME Direct Feed, 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. Improper use of the Nortec ME Direct Feed may result in danger to the user or third parties and/or impairment of material assets.

If you have questions after reading this documentation, please contact your Nortec representative. They will be glad to assist you.

1.2 Notes on the installation manual

Limitation

The subject of this installation manual is the Nortec ME Direct Feed Evaporative Humidifier and Cooler. 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 Nortec ME Direct Feed and is meant for **well trained personnel being sufficiently qualified for their respective work.**

Please note, some illustrations in this manual may show options and accessories which may not be supplied as standard or available in your country. Please check availability and specification details with your Nortec representative.

The installation manual is supplemented by various separate items of documentation (such as the operation manual), 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 Nortec representative.

Language versions

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

2 For your safety

General

Every person working with the Nortec ME Direct Feed must have read and understood the installation manual and the operation manual of the Nortec ME Direct Feed 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 unit must be observed and kept in readable state.

Qualification of personnel

All 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 only be carried out by personnel with appropriate industry recognised qualifications or training.

It is assumed that all persons working with the Nortec ME Direct Feed are familiar and comply with the appropriate regulations on work safety and the prevention of accidents.

Intended use

The Nortec ME Direct Feed is intended exclusively for **air humidification and air cooling in AHU's or air ducts** within the specified operating conditions (see operation manual Nortec ME Direct Feed). 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 Nortec ME Direct Feed 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 Nortec ME Direct Feed



DANGER!
Risk of electric shock!

The optional Nortec ME Direct feed control units contain live mains voltage. 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 the covers have been relocated properly.



WARNING!

Some type of evaporative material is manufactured from glass fibre. Though this material is not classified as hazardous, it is recommended that Personal Protection Equipment such as gloves, protective clothing and eye protection are used during handling to protect the user from fibres or dust. If dust is generated during handling it is recommended that respiratory protection is worn.

Correct lifting and handling

Lifting or handling of components always carries an element of risk, and therefore must only be carried out by trained and qualified personnel. Ensure that any lifting operations have been fully planned and risk assessed. All equipment should be checked by a skilled and competent health & safety representative.

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

Preventing unsafe operation

All persons working with the Nortec ME Direct Feed 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/air cooling system Nortec ME Direct Feed without the express written consent of the manufacturer.

For the replacement of defective components use exclusively **original accessories and spare parts** available from your Nortec representative.

3 Important notes

3.1 Inspection of the delivery

After receiving:

- Inspect shipping boxes for damage.
Any damages to 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 Nortec representative within 48 hours after receipt of the goods. Nortec assumes no responsibility for any material shortages beyond this period.
- Unpack the parts/components and check for any damage.
It is particularly important that the tank, structural components, and fixings (such as studs) are inspected as damage to these items could affect the structural integrity of the system. If parts/components are damaged, notify the shipping company immediately.
- Check whether the components are suitable for installation on your site according to the product specification (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: 1 ... 40 °C
- Room humidity: 10 ... 75 %rh

Transportation

For optimum protection of the product, always transport the unit in its original packaging. The packaged Nortec ME unit is able to be transported by trained personnel, using an appropriate lifting/transporting device from the underside.



The evaporative module **must not** be transported with the optional droplet separators fitted.



It is the customer's responsibility to ensure that operators are trained in handling heavy goods and that the operators comply with the appropriate regulations on work safety and the prevention of accidents.

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 / Which model do you have

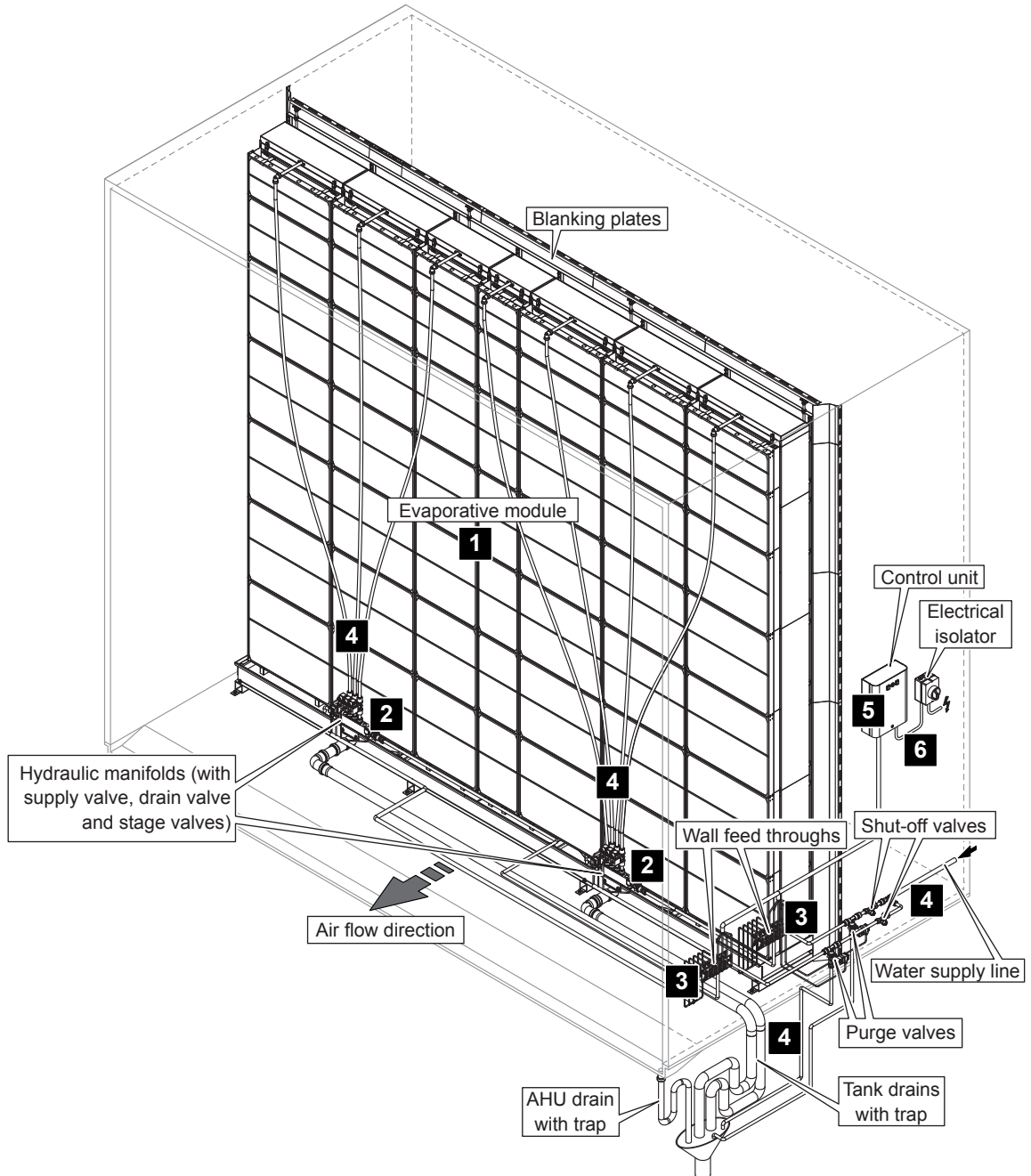
The product designation and the most important unit data are found on the rating plate fixed to the evaporative module and the control unit.

Information regarding the rating plate and the product key can be found in the operation manual of the Nortec ME Direct Feed.

4 Installation

4.1 Installation overviews

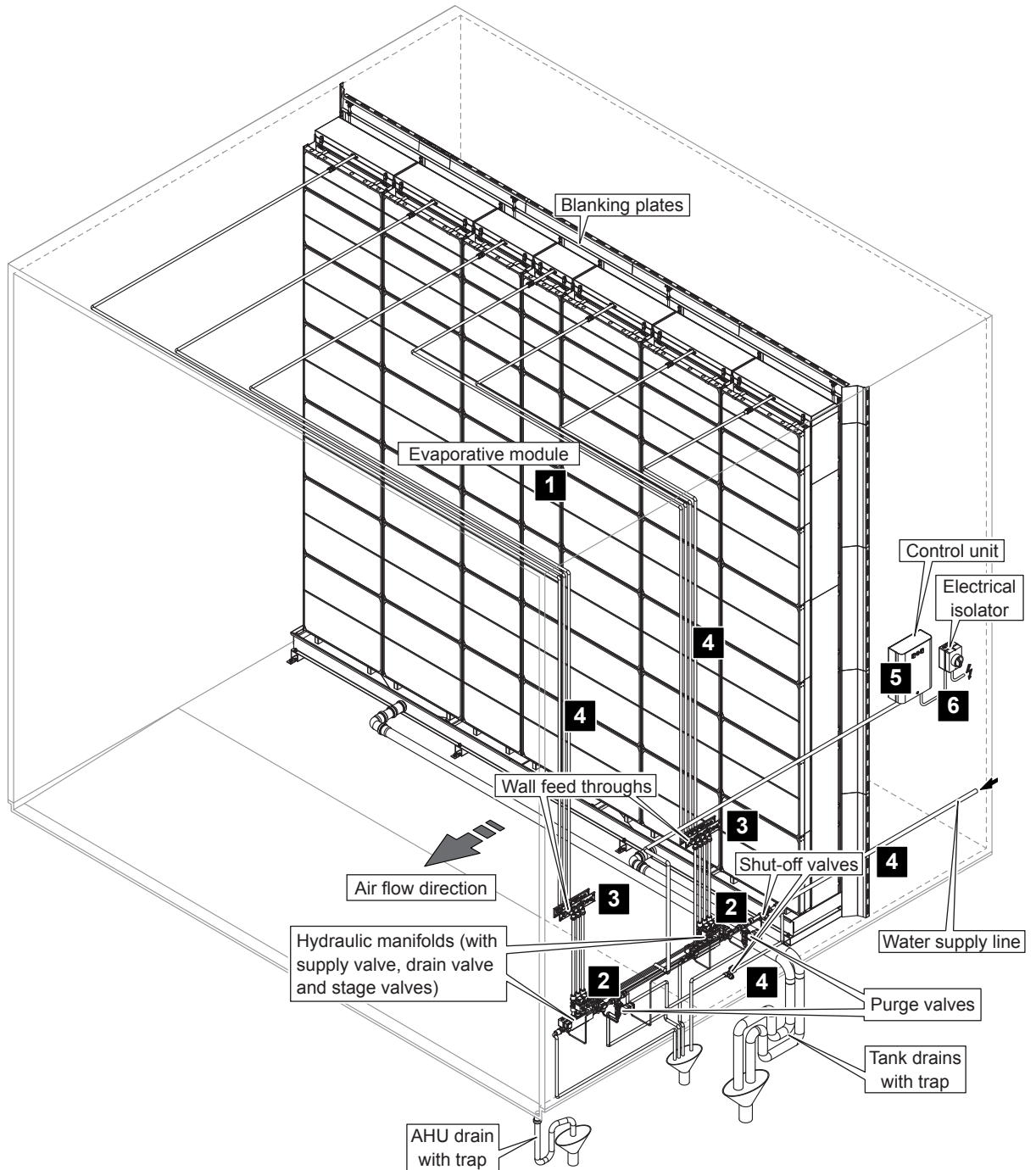
4.1.1 Typical installation Nortec ME Direct Feed (internal installation)



- 1 - Mounting the evaporative module --> see chapter [4.2 – Mounting the evaporative module](#)
- 2 - Mounting the hydraulic manifolds --> see chapter [4.3 – Mounting the hydraulic manifolds](#)
- 3 - Mounting the wall feed through --> see chapter [4.4 – Mounting the wall feed through plates](#)
- 4 - Water installation --> see chapter [4.5 – Water installation](#)
- 5 - Mounting the control unit --> see chapter [4.5.4 – Mounting the optional control unit](#)
- 6 - Electrical installation --> see chapter [4.6 – Electrical installation](#)

Fig. 1: Typical installation Nortec ME Direct Feed (internal installation)

4.1.2 Typical installation Nortec ME Direct Feed (external installation)



- 1 - Mounting the evaporative module --> see chapter [4.2 – Mounting the evaporative module](#)
- 2 - Mounting the hydraulic manifolds --> see chapter [4.3 – Mounting the hydraulic manifolds](#)
- 3 - Mounting the wall feed through --> see chapter [4.4 – Mounting the wall feed through plates](#)
- 4 - Water installation --> see chapter [4.5 – Water installation](#)
- 5 - Mounting the control unit --> see chapter [4.5.4 – Mounting the optional control unit](#)
- 6 - Electrical installation --> see chapter [4.6 – Electrical installation](#)

Fig. 2: Typical installation Nortec ME Direct Feed (external installation)

4.2 Mounting the evaporative module

4.2.1 Notes on positioning the evaporative module

The design and dimensioning of the AHU/air duct as well as the location of the evaporative module 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:

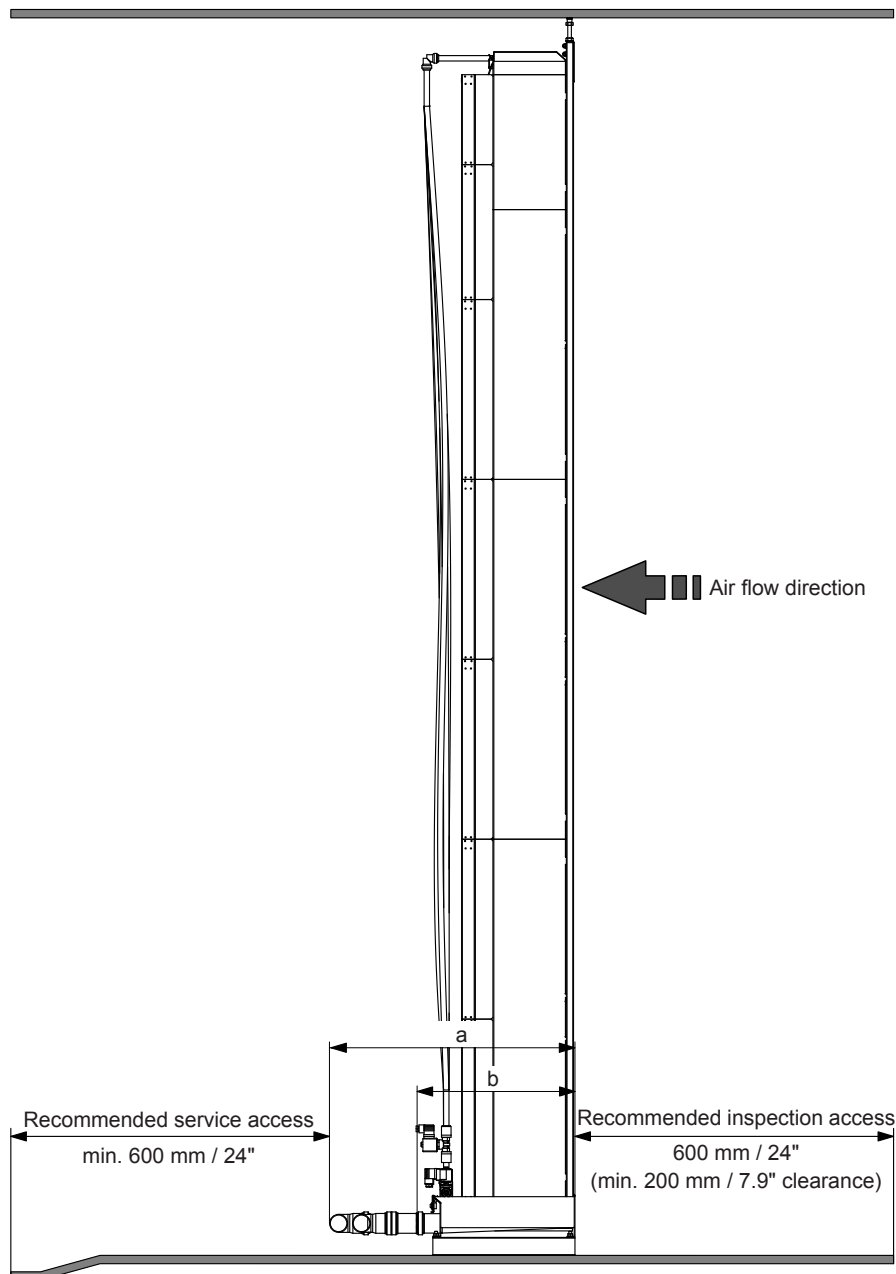
- The AHU/air duct floor must be designed with a loading capacity capable of supporting the evaporative module's weight.
- In the area where the evaporative module is installed the floor of the AHU/air duct must offer a plane support (lengthwise and crosswise).
- The evaporative module must be installed in a **waterproof** section of the AHU/air duct.
- Downstream, directly after the evaporative module a **drain pan with provision for running water to waste** must be installed. The drain must be connected via a drain trap to the waste water line of the building. The drain trap must be sufficiently high and must be filled with water prior to commissioning, so that the drain trap is not emptied by the air pressure in the duct. The drain pan and the drain trap must be accessible for cleaning and disinfection as part of the periodic maintenance of the system.
- For installation and maintenance sufficiently large access doors before and after the evaporative module must be available in the AHU/air duct.
- The supply air must be filtered. We recommend to install an **air filter with quality standard F7 (EU7)** or better before the evaporative module. If no air filter or an air filter with lower quality is installed an increased maintenance requirement will result.
- An **even air flow over the full cross section** of the evaporative module must be guaranteed. If necessary, rectifiers or perforated plates must be installed.
- The evaporative module must be positioned on upstands (supplied) to allow to install the drain pipe with a downslope through the side wall of the AHU/air duct.
- In case of low ambient temperature the AHU/air duct must be insulated to prevent the moist air from condensing inside the duct.
- If the AHU is equipped with a heater, make sure it is at least 600 mm (23.6") away from the evaporative module.
- If the evaporative module includes the optional droplet separator cassettes for high air velocities, then the droplet separator cassettes must be installed.
- Appropriate clearance must be available for the hydraulic manifold (and associated plumbing) when installing externally.
- For commissioning and maintenance we recommend a **minimum** of 600 mm (24") of free space after the evaporative module.



WARNING!

Consideration should be given to the amount of space required after the evaporative module for access equipment, particularly for taller systems as personnel will require access to the top of the evaporative module.

- For inspection we recommend 600 mm (24") of free space before the evaporative module. If inspection access is not required before the module, a minimum clearance of 200 mm (7.9") is acceptable provided any heater is at least 600 mm (24") away from the evaporative module.



Dimension "a" (Depth with elbow connector fitted):
 F-type fibre cassettes F75/F85/F95: 640 mm / 25.20"
 C-type fibre cassettes C85/C95: 770 mm / 30.31"
 Polyester cassettes P85/P95: 770 mm / 30.31"

Dimension "b" (Depth without elbow connector fitted):
 F-type fibre cassettes F75/F85/F95: 443 mm / 17.44"
 C-type fibre cassettes C85/C95: 573 mm / 22.56"
 Polyester cassettes P85/P95: 573 mm / 22.56"

Fig. 3: Positioning of the evaporative module



CAUTION!

The ME evaporative module contains a large reservoir of water when in operation. Install the ME unit where there is no risk of water damage, otherwise make provisions to contain any leakage.

4.2.2 Installation procedure evaporative module



A full risk assessment must be completed by suitably trained personnel prior to installing the ME unit. There may be increased risk when installing systems that necessitate working at height.

The following risks should be considered (this list is not exhaustive, and there may be additional site specific risks that will need to be considered):

- Electrical work
- Manual handling
- Musculoskeletal disorders
- Working at height
- Falling objects & objects dropped from higher levels
- Risks arising from the use of Mobile Elevated Work Platforms
- Risk of contact with ceilings, overhead items or asbestos roofing while using access equipment
- Adverse weather conditions
- Unsuitable surface and ground
- Other equipment, machinery or supply pipework in the vicinity of the work area

Installation of the ME unit must only be carried out by trained personnel, and all installation equipment must be checked by a skilled and competent health & safety representative.

1. Mounting the tank upstands to the tank:

- Mounting the **tank upstands supplied by Nortec**: fix tank upstands to the tank as shown in the figure below using the nuts (M8, AF: 13 mm) and washers supplied.

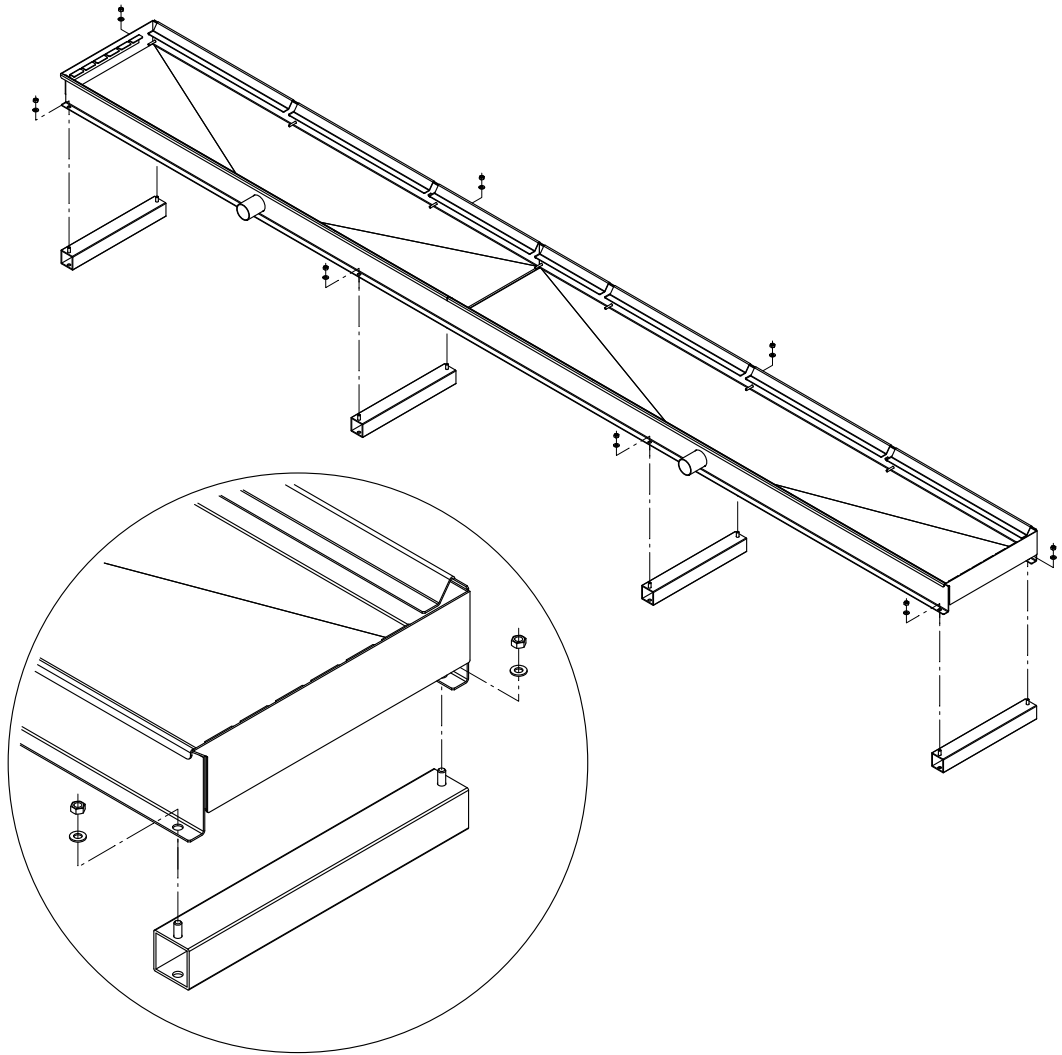


Fig. 4: Mounting the tank upstands to the tank

2. Mounting the tank:

- Insert the tank into the AHU/air duct.



WARNING!

Use an appropriate lifting device or handle the tank with the help of another person to position it inside the duct. It is the customer's responsibility to ensure that operators are trained in handling heavy goods and to enforce the relevant lifting regulations.

- Align the tank to the centre of the duct and perpendicular to the duct walls. When aligned fix tank upstands to the duct floor.



CAUTION!

The installer must take appropriate measures to ensure that the duct floor remains water proof once the tank upstands has been fixed to the duct floor.

- Check that the tank is lengthwise and crosswise exactly horizontal using a level.

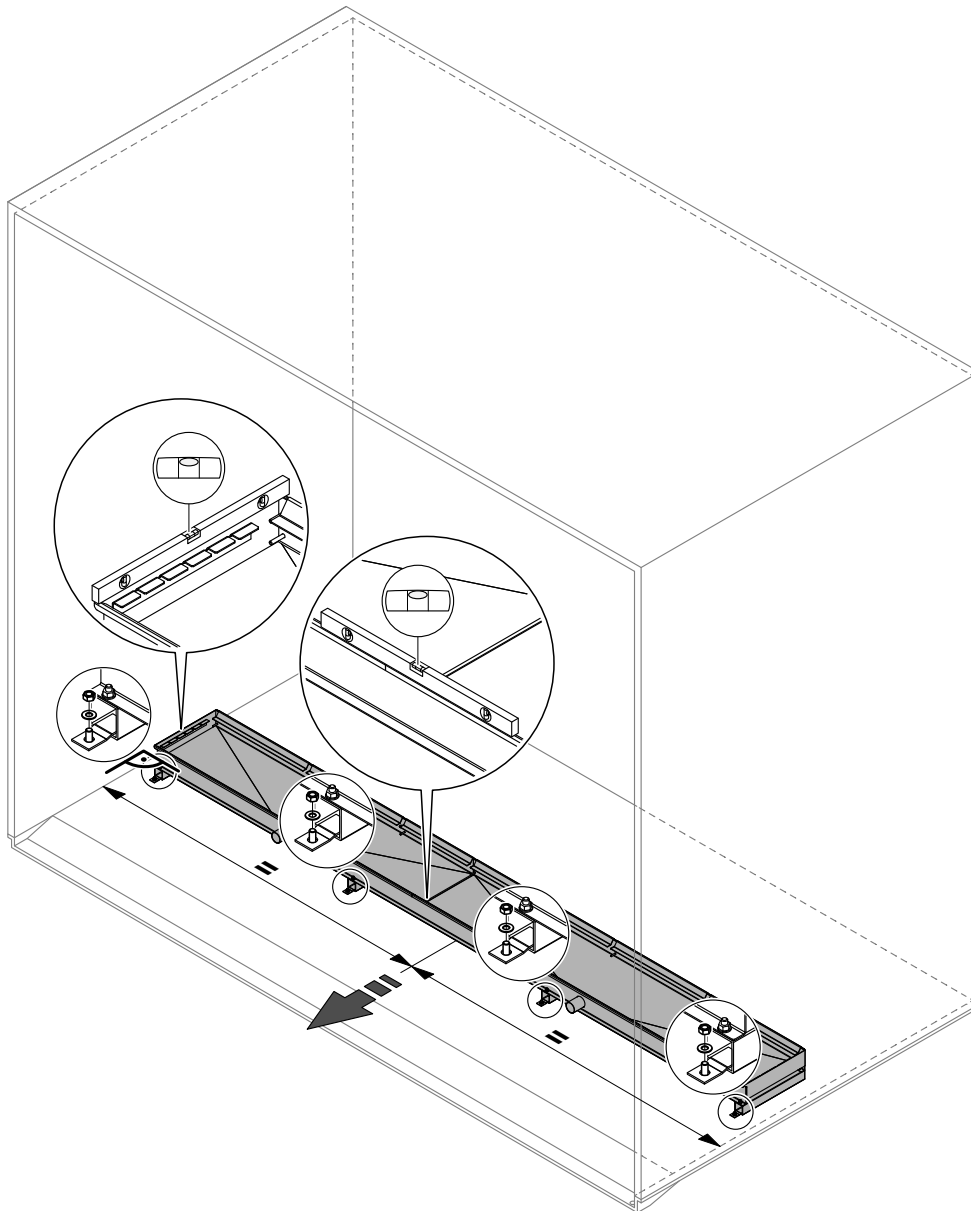


Fig. 5: Mounting the tank

3. Fix frame to the tank:

- Fix the vertical supports to the tank using the nyloc nuts (M6, AF: 10 mm) and M6 washers. Then, align the vertical supports exactly vertical using a level and tighten the nuts.
- Fix the cross member to the vertical supports using the nyloc nuts (M6, AF: 10 mm) and M6 washers. Then, tighten the nuts.

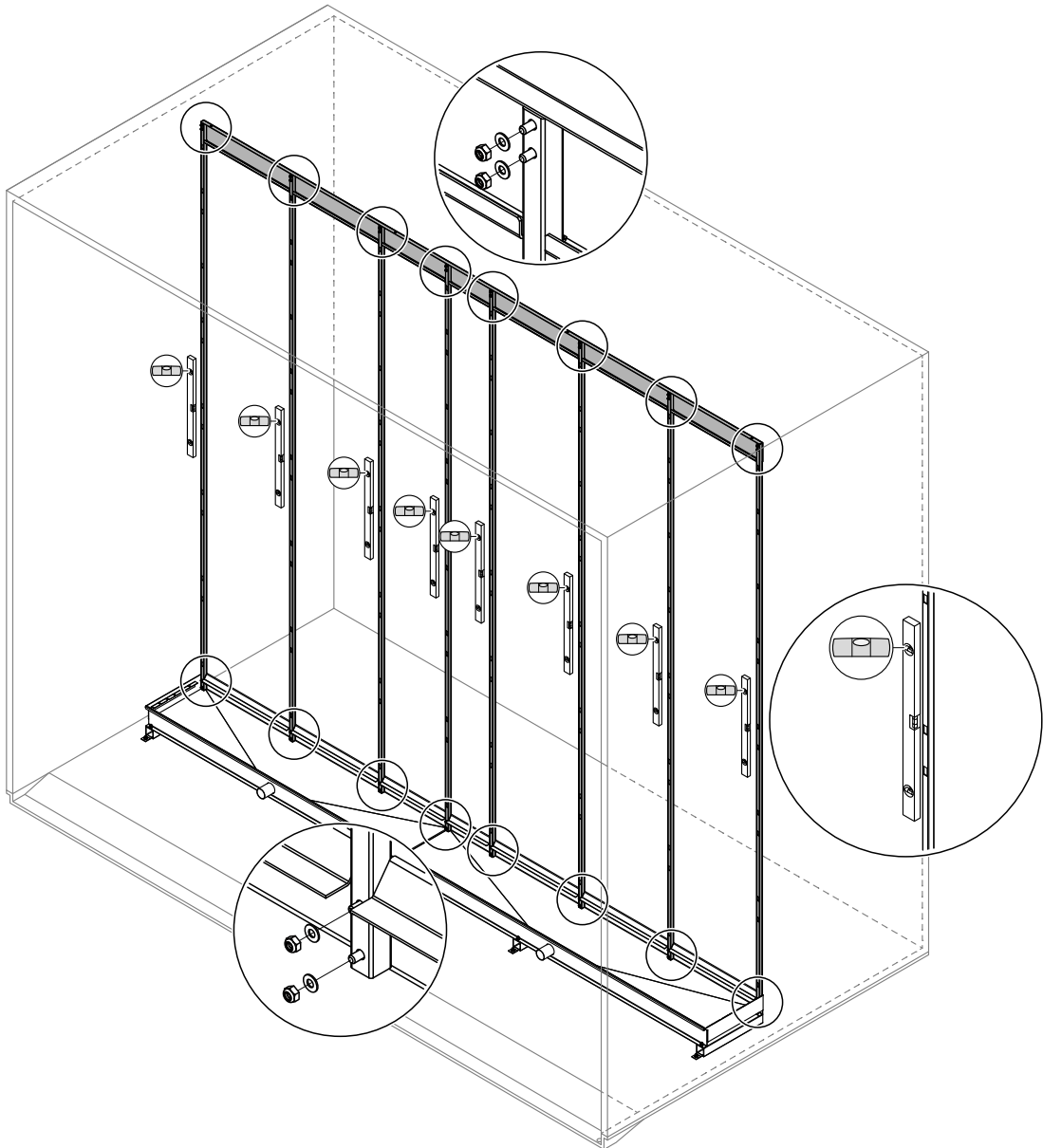


Fig. 6: Fix frame to tank

4. Fix cross member of frame to AHU/duct ceiling:

- Fix the cross member to the AHU/duct ceiling using appropriate fixings (supplied as part of the installation kit). Before tightening the screws (not supplied) align the vertical supports exactly vertical using a level.



WARNING!

If the cross member is not secured to the AHU/duct ceiling there is a risk that the evaporative module could fall over, potentially causing injury or damage.

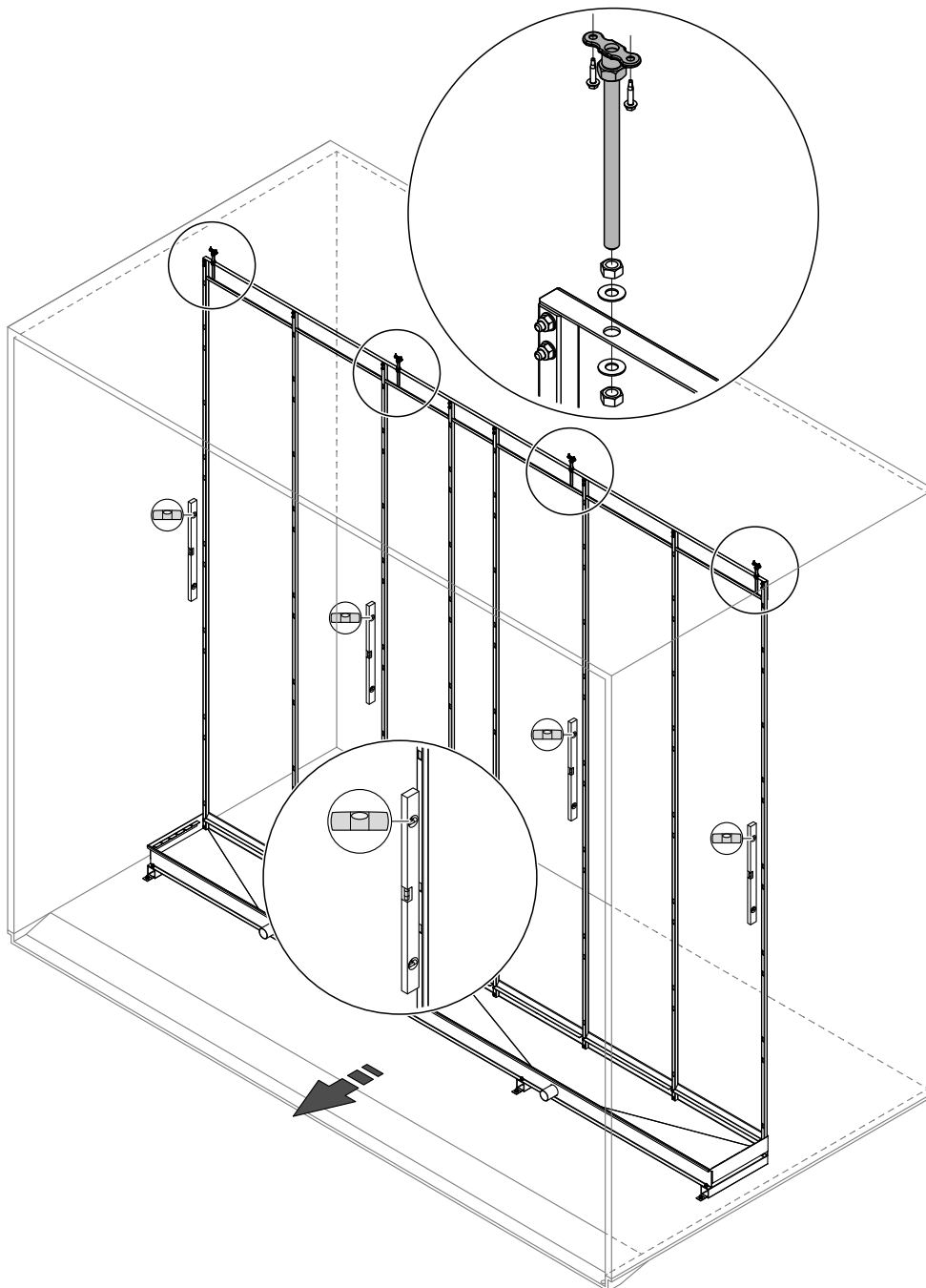


Fig. 7: Fix cross member to AHU/duct ceiling

5. Mount the blanking plates on the air inlet side (blanking plates available as option):

- Starting on each duct side at the bottom fix the side blanking plates to the duct wall using appropriate fixings. Before fixing make sure the side blanking plates are aligned exactly vertical and the free end of the blanking plates touches the side of the corresponding vertical support.
- Starting on one side fix the upper blanking plates to the duct ceiling using appropriate fixings. Before fixing make sure the upper blanking plates are aligned exactly perpendicular to the duct walls and the free ends of the blanking plates touch the cross member of the frame. Also ensure the ends of the blanking plates are touching the side blanking plates.
- Starting on one side fix the lower blanking plates to the duct floor using appropriate fixings. Before fixing make sure the lower blanking plates are aligned exactly perpendicular to the duct walls and the free ends of the blanking plates touch the tank wall. Also ensure the ends of the lower blanking plates are touching the side blanking plates.



CAUTION!

The installer must take appropriate measures to ensure that the duct floor remains water proof once the lower blanking plates have been fixed to the duct floor.

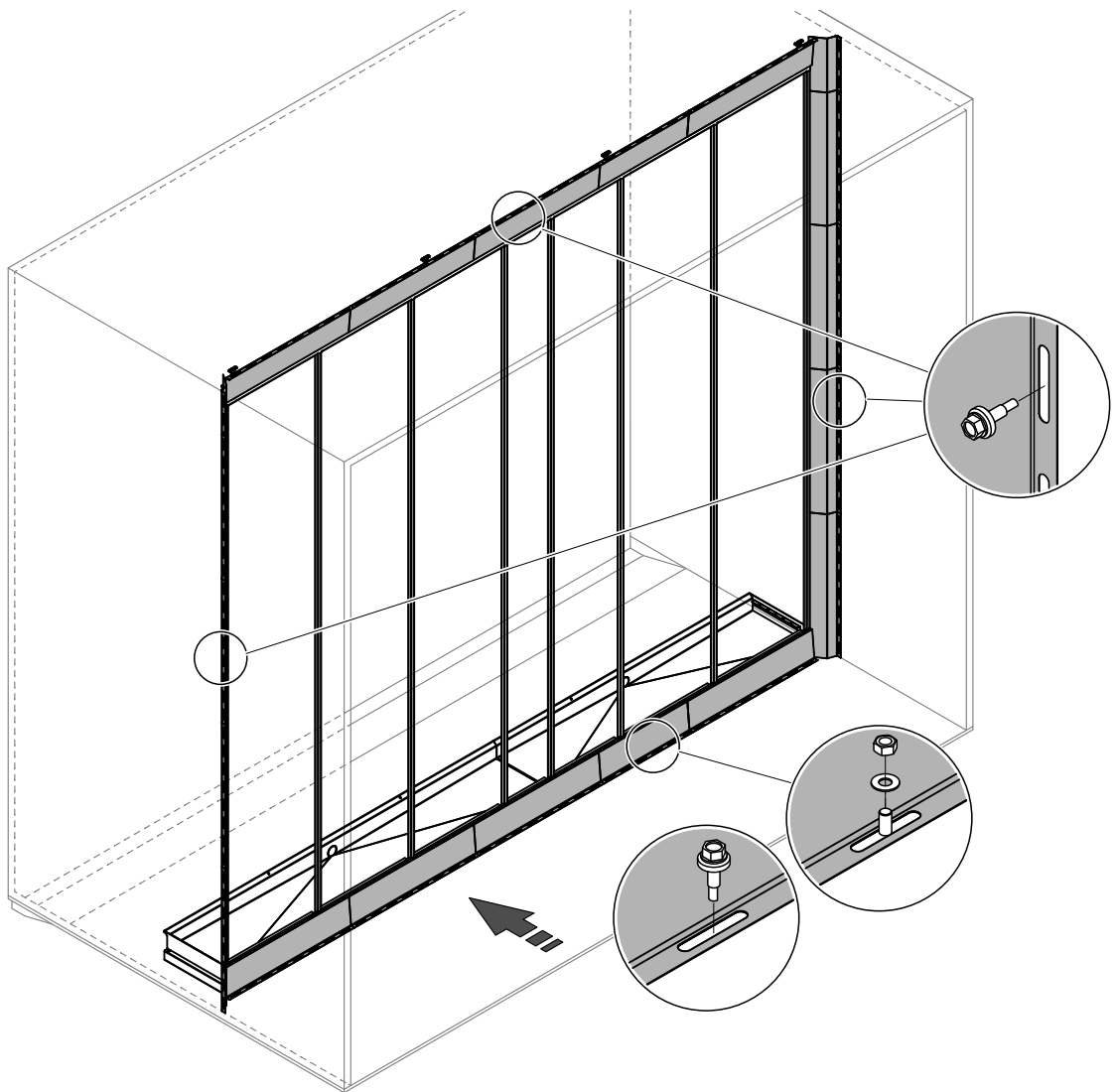


Fig. 8: Mounting the optional Nortec blanking plates on the air inlet side

6. Mounting the crossbar:

- Fix the supplied crossbar support(s) to the tank using the M6 cross-head bolt and the two stop nuts (M8, AF: 13 mm) according to the figure below.

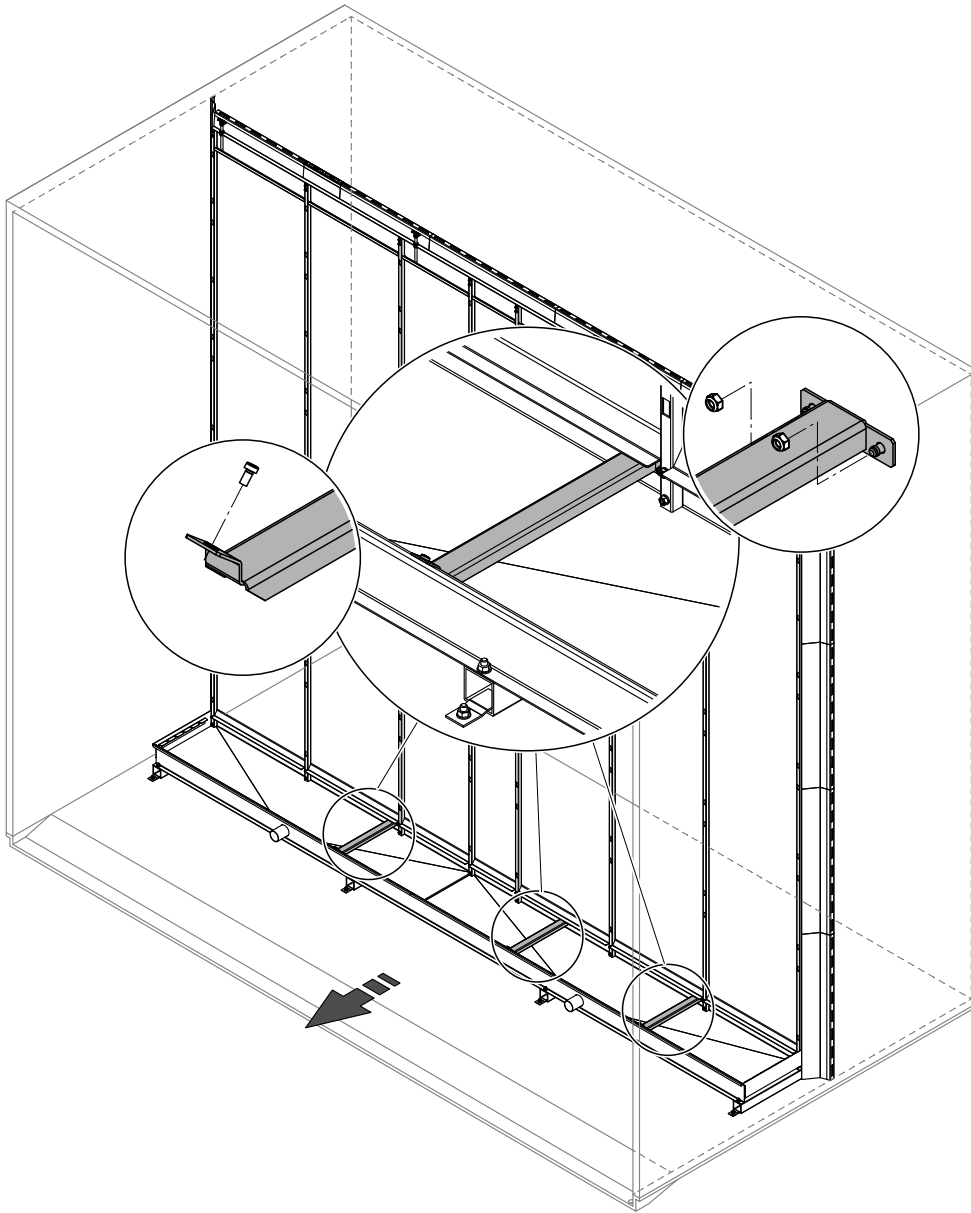


Fig. 9: Mounting the crossbar support(s)

- Put the cross bar on the corresponding cross bar bracket with a distance of "A" to the vertical support (see table below). The cross bar should be positioned so that the evaporative cassettes sit on the edge of the cross bar, and the slots in the side of the cross bar should face the air-off side of the evaporative module as shown below.

Type evaporative cassette (according to rating plate)	Dimension A (nominal)
F75	100 mm (4")
F85	150 mm (6")
F95	200 mm (8")
P85	200 mm (8")
P95	300 mm (12")
C85	200 mm (8")
C95	300 mm (12")

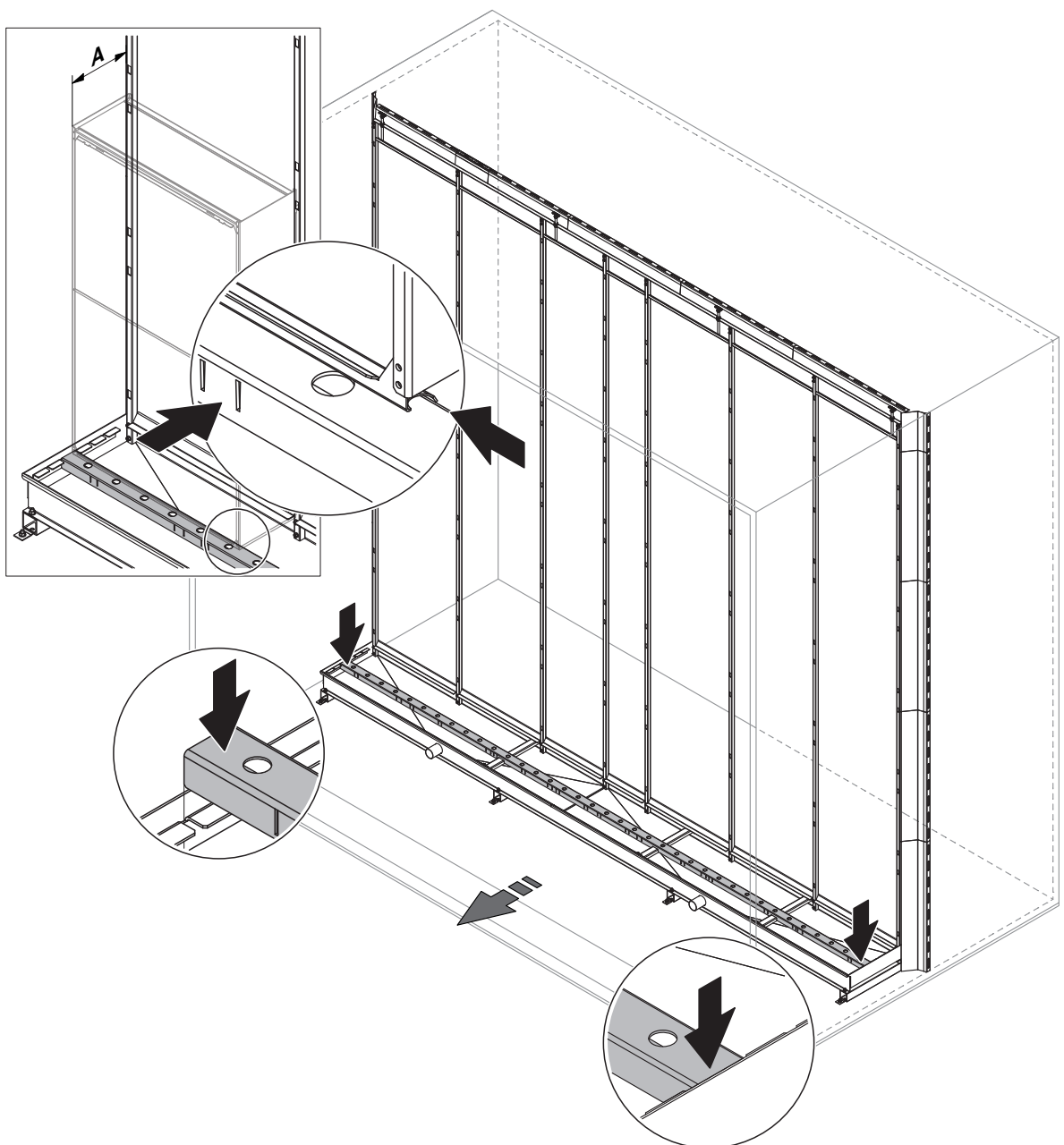


Fig. 10: Mounting the cross bar

7. Mount distribution head assembly to the topmost evaporative cassettes:

Note: The topmost evaporative cassettes will be the ones that are shortest (vertically).

- **This step must only be carried out on evaporative cassettes with glass fibre media:** mount the appropriate distribution cassettes onto the corresponding evaporative cassettes, by hooking the return on the underside of the distribution cassette under the top strut of the evaporative cassette.
- Mount the appropriate distribution heads onto the corresponding evaporative cassettes or distribution cassettes respectively, by hooking the return on the underside of the distribution head under the top strut of the cassette below. Then secure the distribution heads to the evaporative cassettes using the locking clamps on the distribution heads.

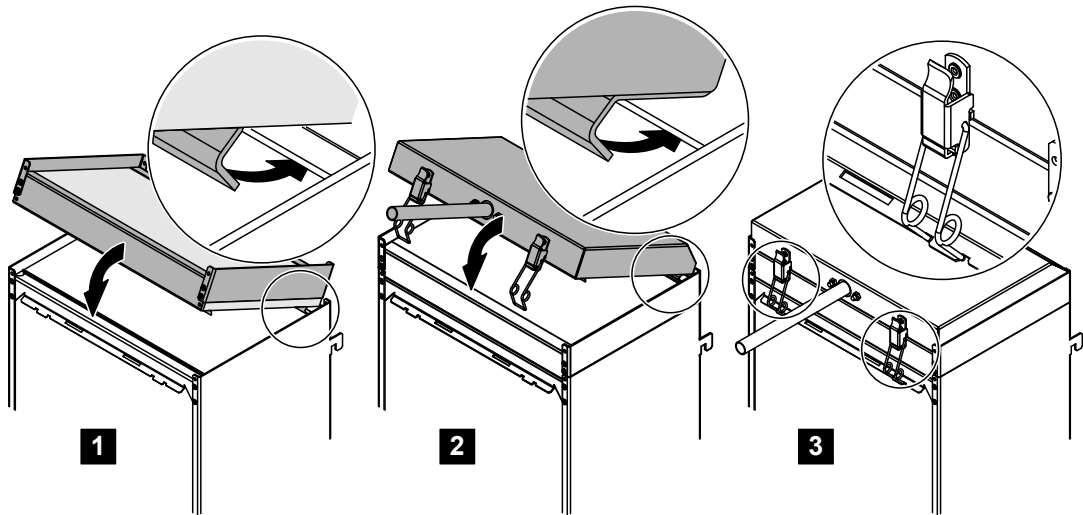


Fig. 11: Mounting the distribution head assembly onto glass fibre evaporative cassettes

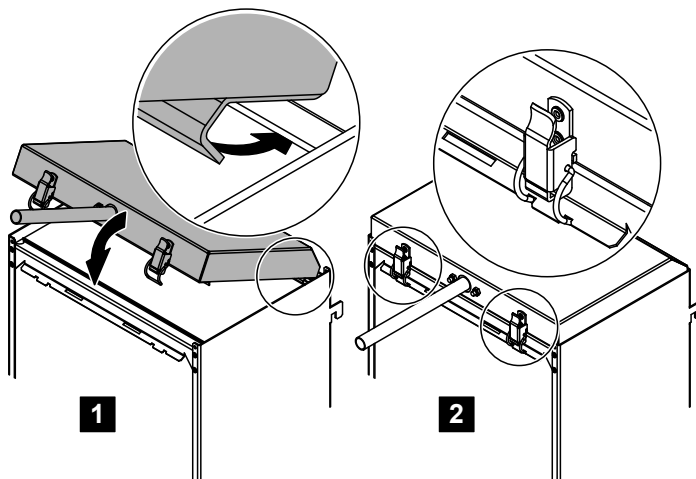


Fig. 12: Mounting the distribution head assembly onto polyester evaporative cassettes

8. Mount evaporative cassettes:

Note: to avoid damage to the evaporative cassettes during transit, we recommend that the evaporative cassettes are fitted on site.

- Before installing the evaporative cassettes sweep the interior of the tank.
- Starting with the tallest evaporative cassettes on the bottom and working up to the shortest evaporative cassette on the top, hook the cassettes into the vertical supports. Make sure the overlying cassettes slip properly into each other.

Note: The narrowest evaporative cassettes should be positioned near the center of the tank, and the widest evaporative cassettes should be positioned at the right and left ends of the tank (see [Fig. 14](#)).

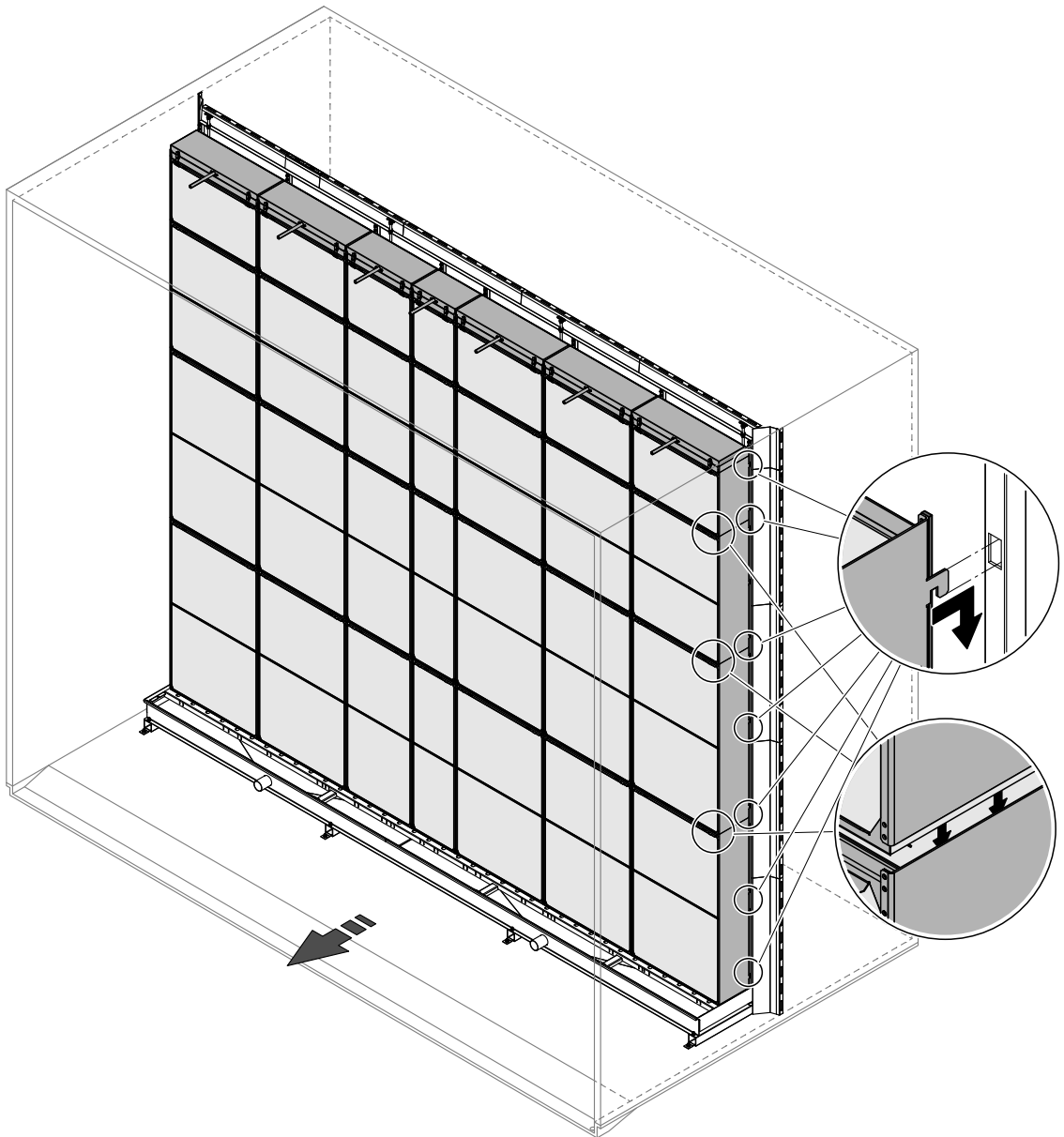


Fig. 13: Mount evaporative cassettes

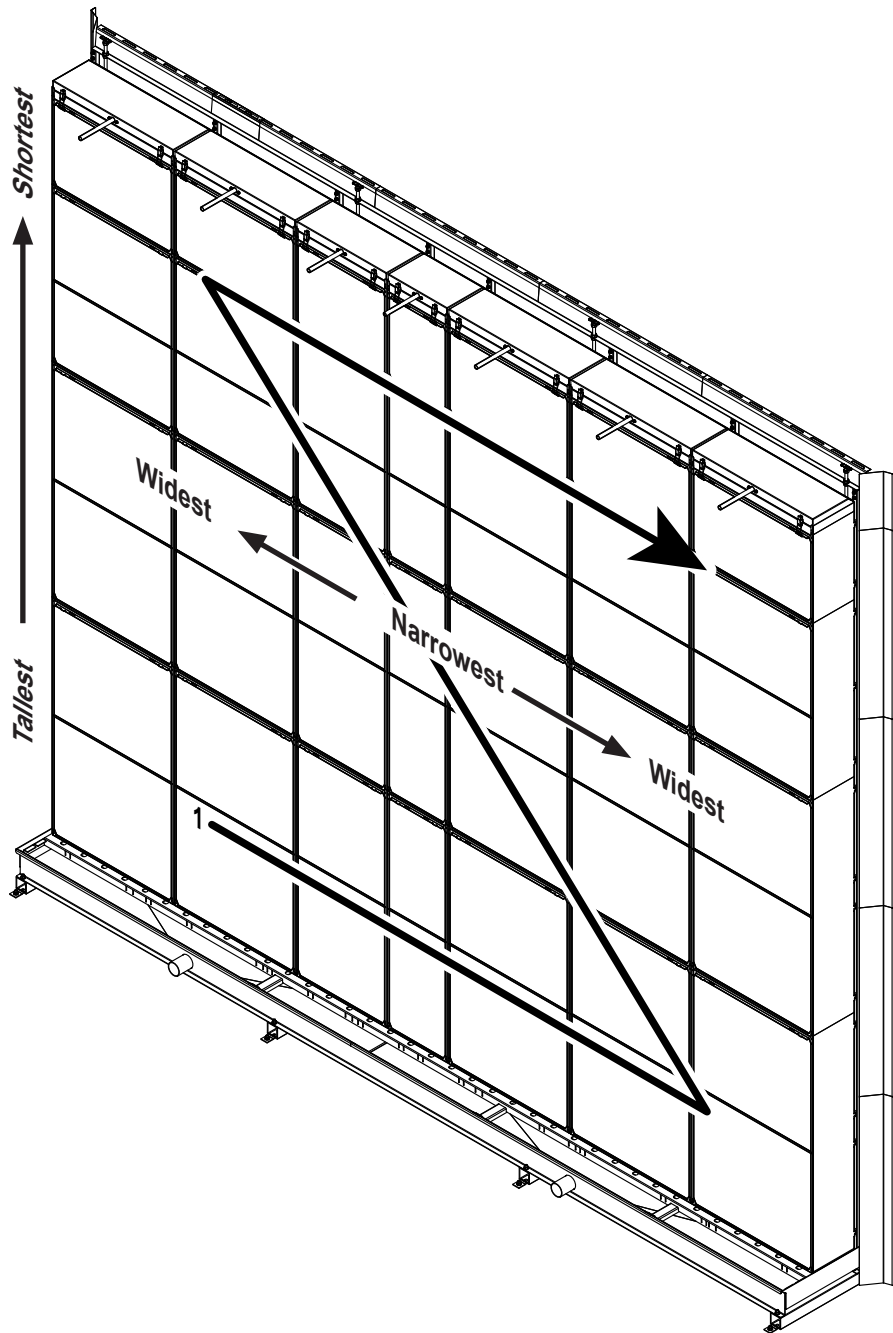


Fig. 14: Mounting order and positioning of the evaporative cassettes

9. Mount the droplet separator cassettes (this step must only be carried out, if your system is equipped with a droplet separator):

Note: to avoid damage to the droplet separator cassettes during transit, the droplet separator cassettes must be fitted on site.

- Starting with the tallest droplet separator cassettes on the bottom, and working towards the shortest cassettes at the top, rivet the banks of the droplet separator cassettes together using a rivet gun with \varnothing 3.2 mm (0.13") stainless blind rivets. Make sure the overlying cassettes slip properly into the subjacent cassettes.

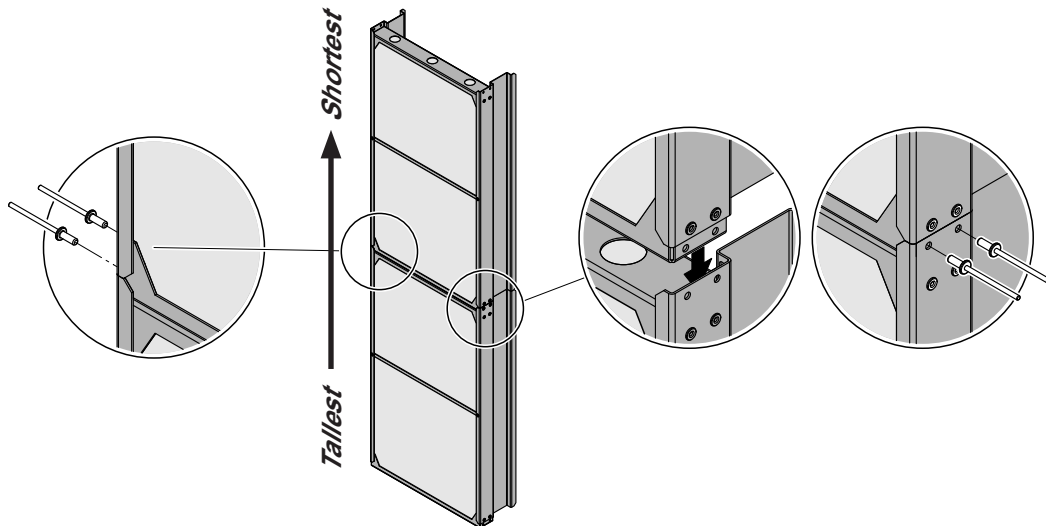


Fig. 15: Riveting the banks of the droplet separator cassettes together

- Hook the lower separator brackets into the cross bar.
- Then, starting on one side mount one separator bank after the other, align it and secure it with the upper separator brackets. Make sure separator metalwork aligns with evaporator cassette metalwork.

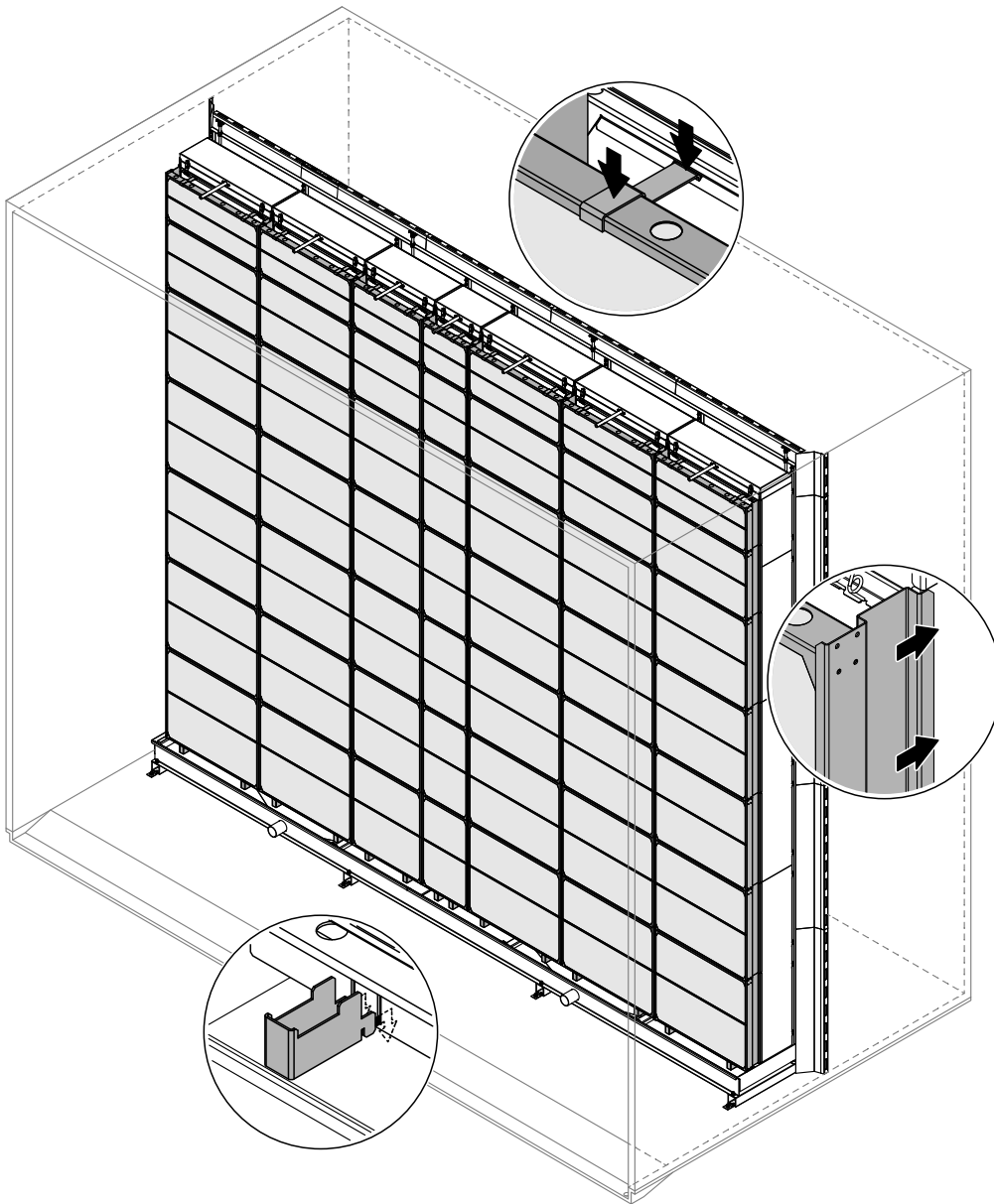


Fig. 16: Mount the droplet separator banks

4.3 Mounting the hydraulic manifolds

The mounting procedure of the hydraulic manifolds depend on whether or not the hydraulic manifolds are mounted internal or external to the duct.

If changing between an internal and external hydraulic installation unscrew the four bolts in the underside of the hydraulic manifolds and rotate the mounting brackets 180 degrees before reattaching the brackets using the four bolts. This ensures that the stages on the hydraulic manifolds will align with the stages on the evaporative module.

The inlet valve and drain valve can be swapped to suit the supply / drain layout on site if required, but ensure the valves are inspected for leaks when the system is commissioned.

4.3.1 Mounting the hydraulic manifolds (internal installation)

1. Fix the hydraulic manifolds via the prefixed support to tank using the bracket, hexagon socket screws (M8, Allen key: 6 mm) and washers supplied.
2. Align the hydraulic manifolds to the center of the tank spigots, then tighten the screws.

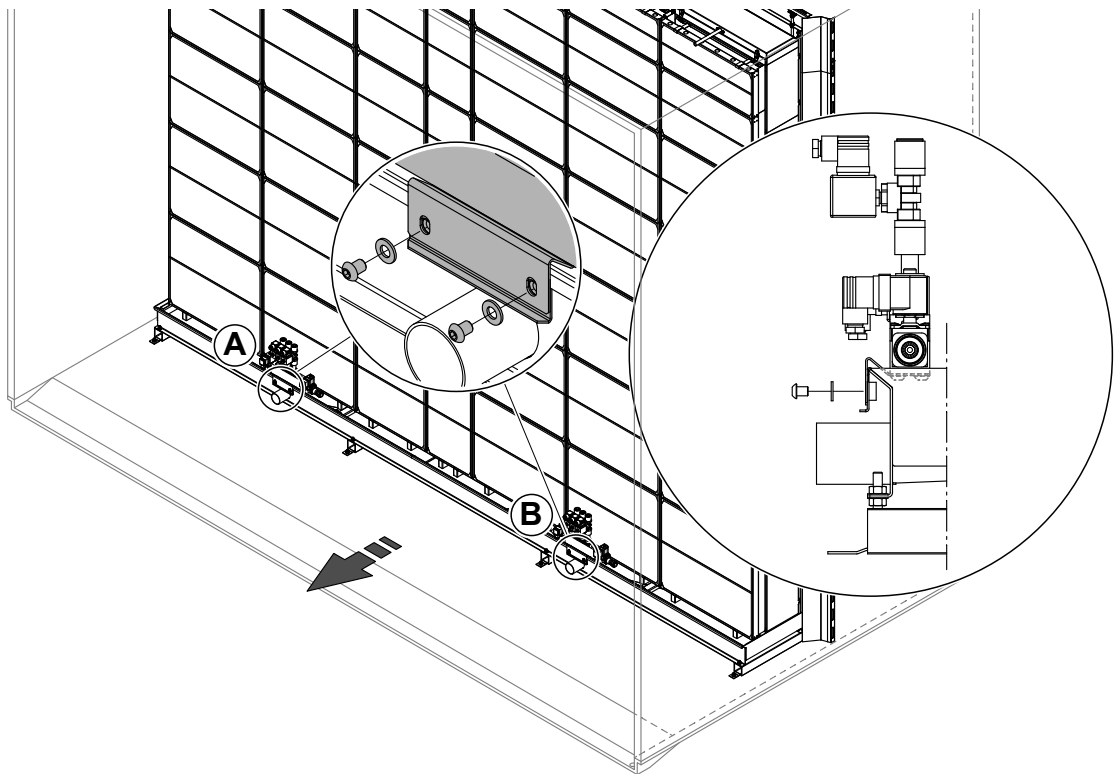


Fig. 17: Mounting the hydraulic manifolds (internal installation)

4.3.2 Mounting the hydraulic manifolds (external installation)

Clearances to be observed

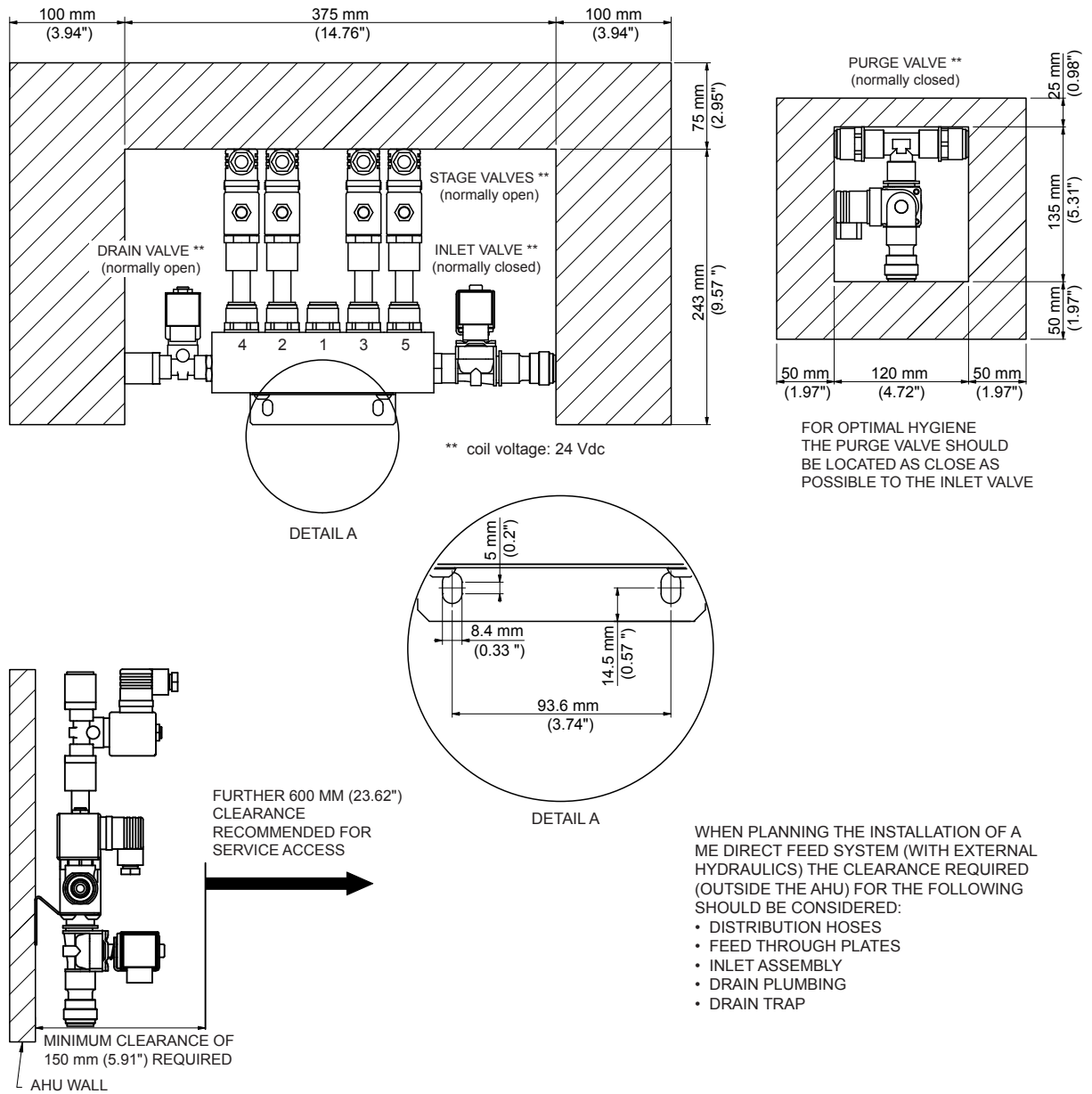


Fig. 18: Clearances to be observed when mounting the hydraulic manifolds externally

Note: Nortec ME Direct Feed systems that are greater than 3000 mm wide will require two of the above hydraulic manifolds. Please ensure adequate space is available for both hydraulic manifolds.

Mounting procedure

1. Mark a horizontal line at the desired position on the AHU/duct wall.
2. Position and align the Hydraulic manifold at the desired position. Then, fix the Hydraulic manifold to the duct wall using appropriate fixings.

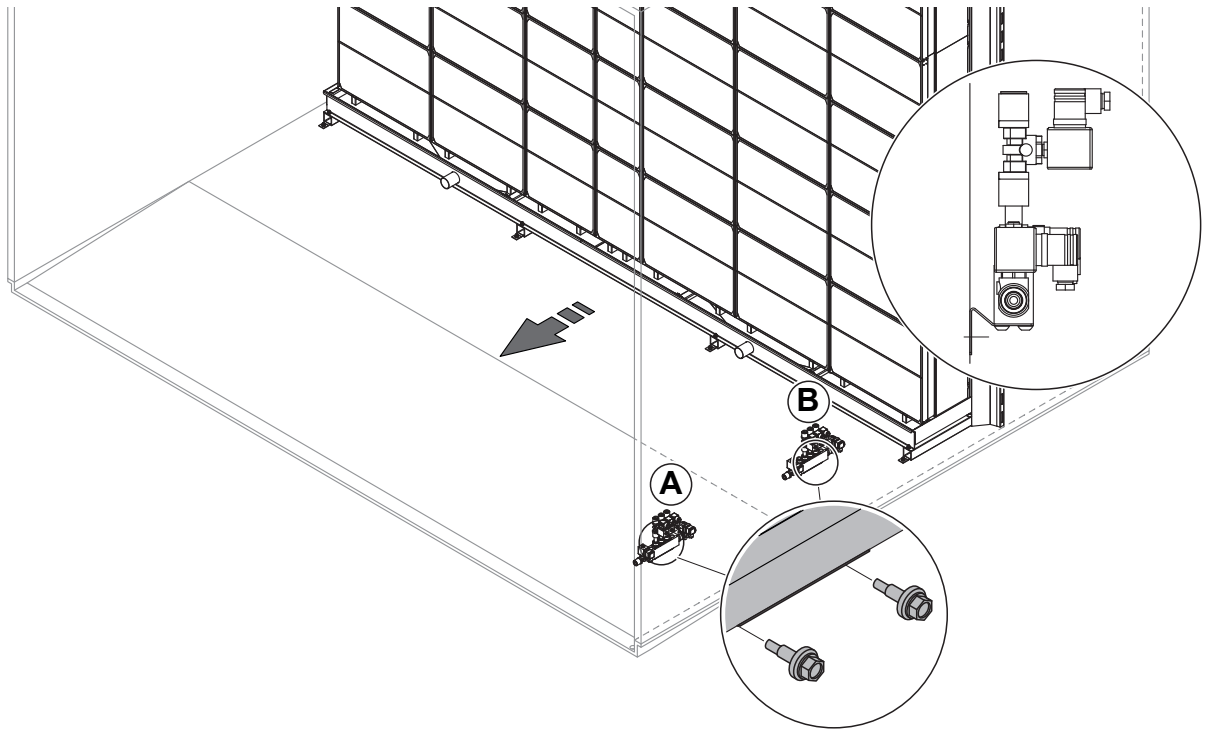
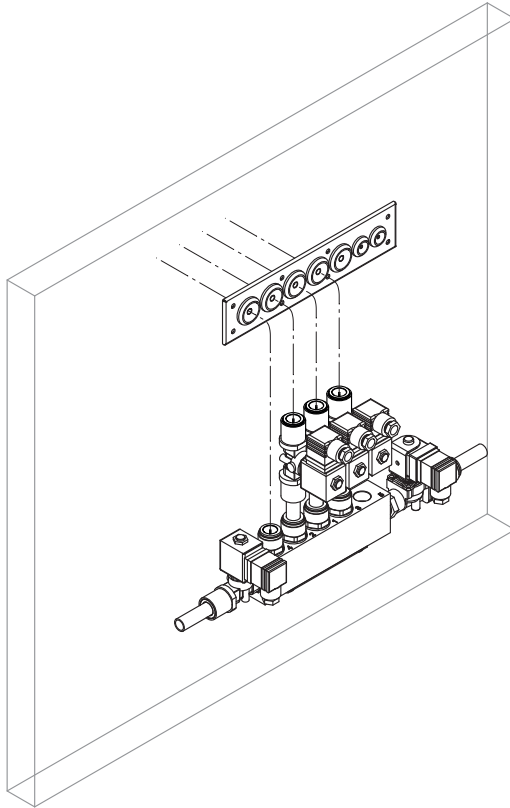


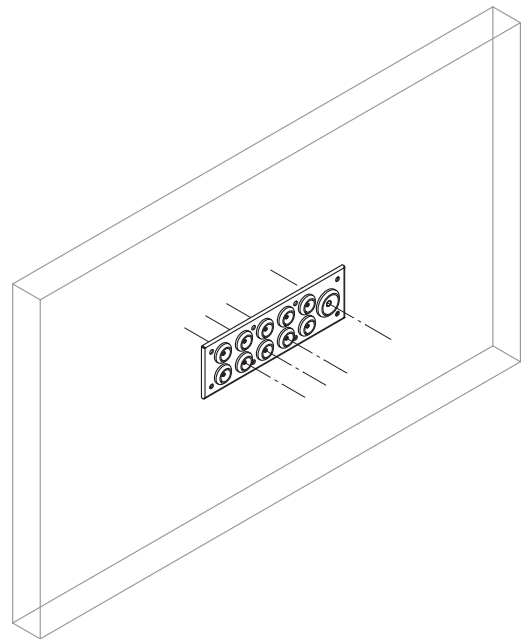
Fig. 19: Mounting the Hydraulic manifold of ME Direct Feed (external installation)

4.4 Mounting the wall feed through plates

1. Push out or pierce the centre of grommets that will have pipes or cable passing through them. Large grommets are for pipe work, and small grommets are for cables.
Note: on feed through plates for use with externally installed hydraulics the large grommets are spaced to match the stage pipe spacing on the hydraulic manifold.
2. Using the feed through plate as a guide, mark where the pipes and cables will feed through the AHU wall.



*Fig. 20: Mark feed through holes
(external installation)*



*Fig. 21: Mark feed through holes
(internal installation)*

- Drill holes through the AHU wall for the pipes and cables. Holes should be as small as possible for the pipe or cable passing through them, and no larger than $\varnothing 12$ mm ($\varnothing 0.47$ "") for the (small) cable grommets, and $\varnothing 20$ mm ($\varnothing 0.79$ "") for the (large) pipe work grommets.

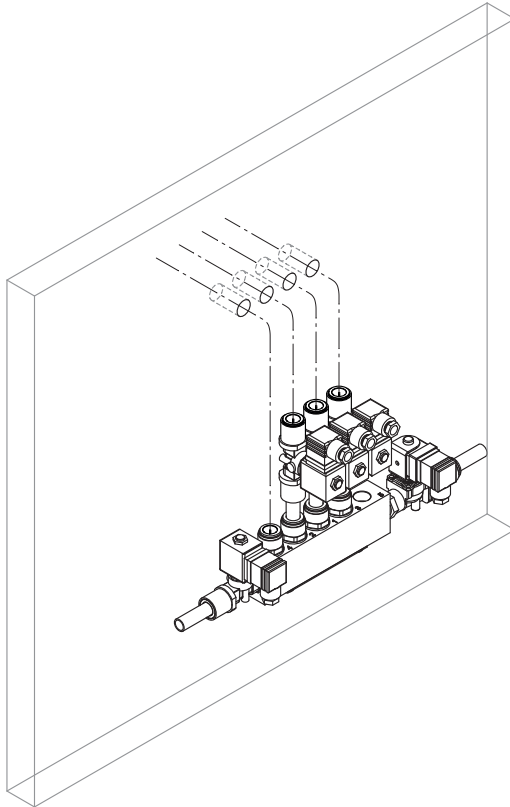


Fig. 22: Drill feed through holes
(external installation)

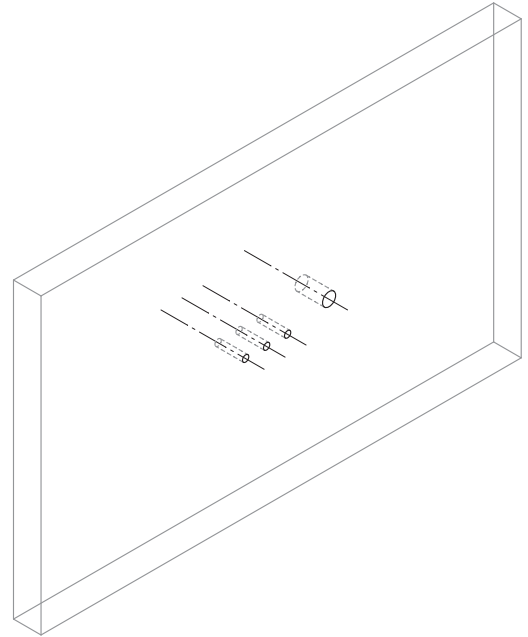


Fig. 23: Drill feed through holes
(internal installation)

- Feed the pipe work (see notes in chapter 4.5 – [Water installation](#)) and cables through the outer feed through plate, then through the AHU wall and finally through the feed through plate on the inner side of the AHU wall.

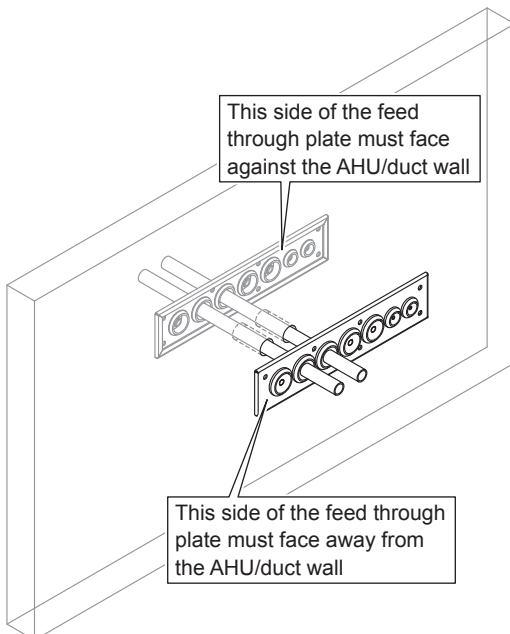


Fig. 24: Mounting the feed through plate
(external installation)

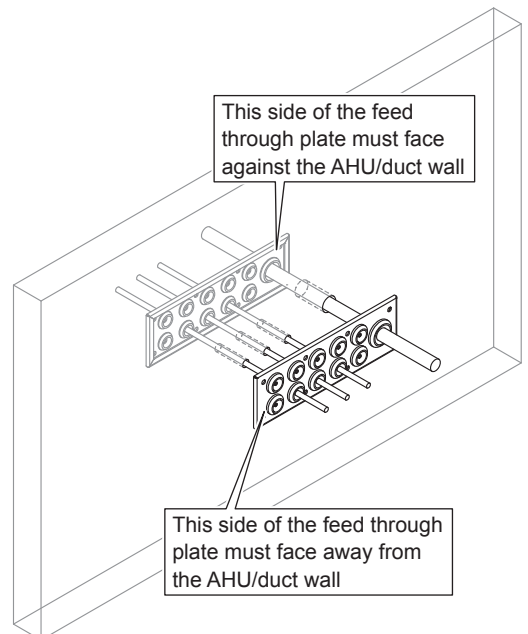


Fig. 25: Mounting the feed through plate
(internal installation)

5. Screw the feed through plates to the AHU wall using appropriate fixings.

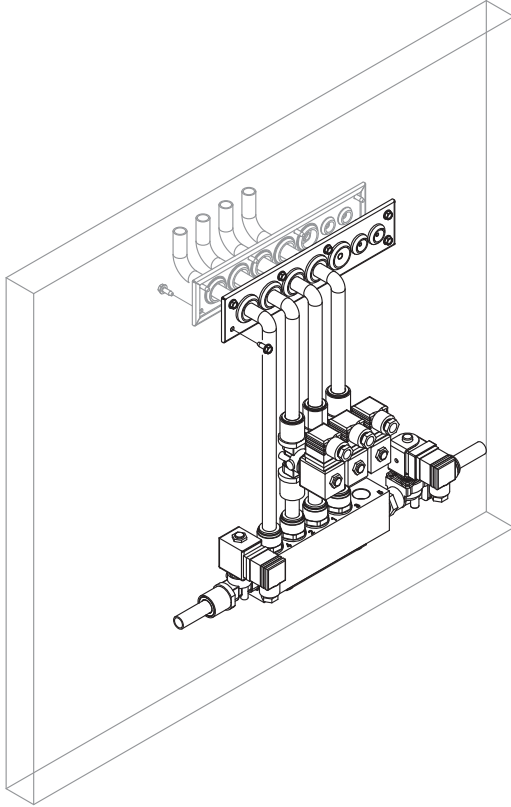


Fig. 26: Fixing the feed through plate to the duct wall (external installation)

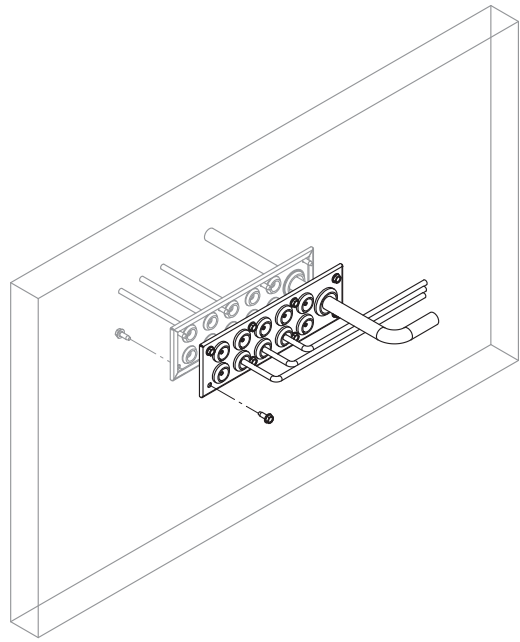


Fig. 27: Fixing the feed through plate to the duct wall (internal installation)

4.5 Water installation

4.5.1 Notes on water installation

The layout of the water piping (supply, drain and distribution piping) depends on the system version. Refer to the corresponding chapter for detailed information and observe the following installation notes.

For guidance on installing the supplied duct wall feed through refer to chapter [4.4 – Mounting the wall feed through plates](#).

– Notes on water supply

- The water supply is to be carried out according to the figures found in chapter [4.5.2 – Water installation \(internal installation\)](#) and chapter [4.5.3 – Water installation \(external installation\)](#) and the applicable local regulations for water installations. The indicated connection specifications must be observed. The installation material must be supplied by the customer.
- The installation of **shut-off valve(s)** in the supply line is mandatory and should be made as close as possible to the hydraulic manifold(s).
- The water supply pressure should be between 2-5 bar (29-72.5 psi), a pressure regulator should be installed to control the pressure if there is a risk of the pressure exceeding this range.
- The installation material must be rated for the supply pressure and certified for use in drinking water supply systems.
- The water supply (internal mounting) should be fed through the provided wall feed through.
Important: after installation the water supply pipe has to be sealed around the feed through using silicone-free sealant, if not using a Nortec supplied feed through.
- The water supply pipe for an ME Direct Feed with two hydraulic manifolds should be at least $\varnothing 22$ mm ($\varnothing 0.875$ "), before splitting in to two separate $\varnothing 15$ mm or $\varnothing 16$ mm ($\varnothing 0.625$ ") pipes (as applicable) for the individual hydraulic manifolds. Do not supply more than one hydraulic manifold from a pipe that is less than $\varnothing 22$ mm ($\varnothing 0.875$ ") or the ME Direct Feed may not achieve the required performance.
- **Important! To prevent new systems being contaminated with low quality water the entire water supply line must be flushed and tested until the supply water and the bacteria counts, are in line with the water quality specifications, before connecting it to the hydraulic manifold.** For water quality requirements refer to chapter [5.1 – Inlet water quality requirements](#).
- Purge valves should be installed in the water supply line to allow periodic flushing of the water supply line to the drain in order to prevent bacteria build up in the supply line. For optimal hygiene these purge valves should be located as close as possible to the hydraulic manifolds.



CAUTION!

After cutting rigid pipes any **sharp edges must be deburred**, as sharp edges may damage the couplings and seals or cause injury.

– **Notes on water drain**

- The water drains are to be carried out according to the figures found in chapter [4.5.2 – Water installation \(internal installation\)](#) and chapter [4.5.3 – Water installation \(external installation\)](#) and the applicable local regulations for water installations. The indicated connection specifications must be observed. The installation material must be supplied by the customer.
- Make sure the drain lines are installed with a constant down-slope down to the funnel.
- The drain pipes must not touch the funnel, allow air gap of min 20 mm (0.8").
- Make sure the drain pipes, the drain traps and the funnel are correctly fixed and easily accessible for inspections and cleaning purposes.
- Access holes for the drain pipes through the duct/AHU must be provided by the customer.
Important: after installation the drain pipes have to be sealed around the feed through using silicone-free sealant.
- The minimum inside diameter of the drain pipes must be maintained throughout the entire length!

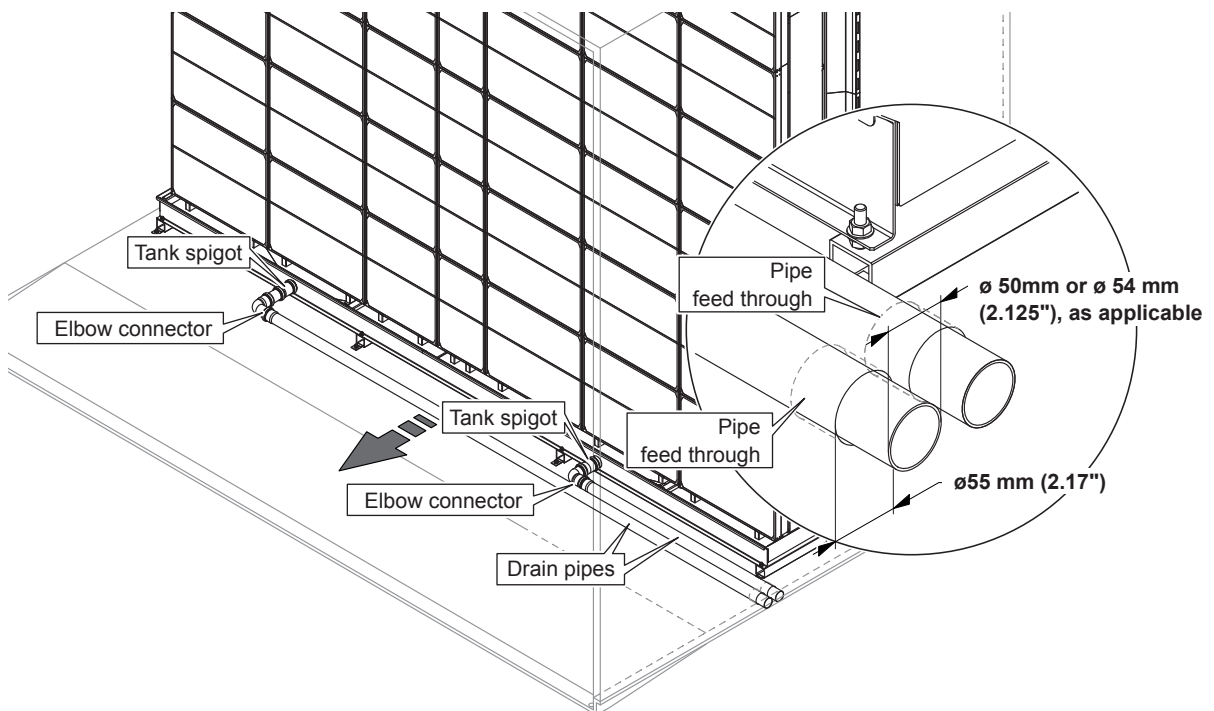


Fig. 28: Drain connections

– **Notes on distribution piping**

- The distribution piping is to be carried out according to the figures found in chapter [4.5.2 – Water installation \(internal installation\)](#) and chapter [4.5.3 – Water installation \(external installation\)](#) and the applicable local regulations for water installations. The indicated connection specifications and connection layout must be observed.
- The distribution piping is made of $\varnothing 15$ mm or $\varnothing 16$ mm (0.625") flexible plastic hoses (supplied with internally installed systems) or stainless steel pipe/rigid plastic pipes (supplied as part of an optional external installation kit).
- Make sure the distribution hoses have a constant downslope (no sagging) to the hydraulic manifold and are not kinked over the entire length.
- All connections are made with appropriate fittings.
- On systems where the hydraulic manifold is mounted outside the duct, the distribution pipes must be fed through the supplied wall feed through and must be supported if necessary.

General notes on installation of the supplied hoses (internal installation)

- Use the supplied $\varnothing 15$ mm or $\varnothing 16$ mm (0.625") flexible plastic hoses only. For hygienic reasons do not use other hoses (except products supplied by your Nortec distributor).
- When cutting hoses use an **appropriate cutting tool** providing **straight, kink-free** cuts.



CAUTION!

After cutting the hoses any **sharp edges must be deburred** otherwise the couplings may be damaged.

- The hoses must be free of kinks and other damage (longitudinal scratches or misshaped ends, in particular).
- When cutting hoses **ensure at least 25 mm (1")** is added to the required length, to ensure the hoses can be fastened correctly (down to the stop) in the push-fit couplings.
- Make sure the hoses are not kinked and pay attention to the **minimum bend radius of 100 mm (4")**.
- Do not lead hoses past hot system components (**max. ambient temperature is 60 °C/140 °F**).
- 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 be correctly secured against accidentally pulling out.

4.5.2 Water installation (internal installation)

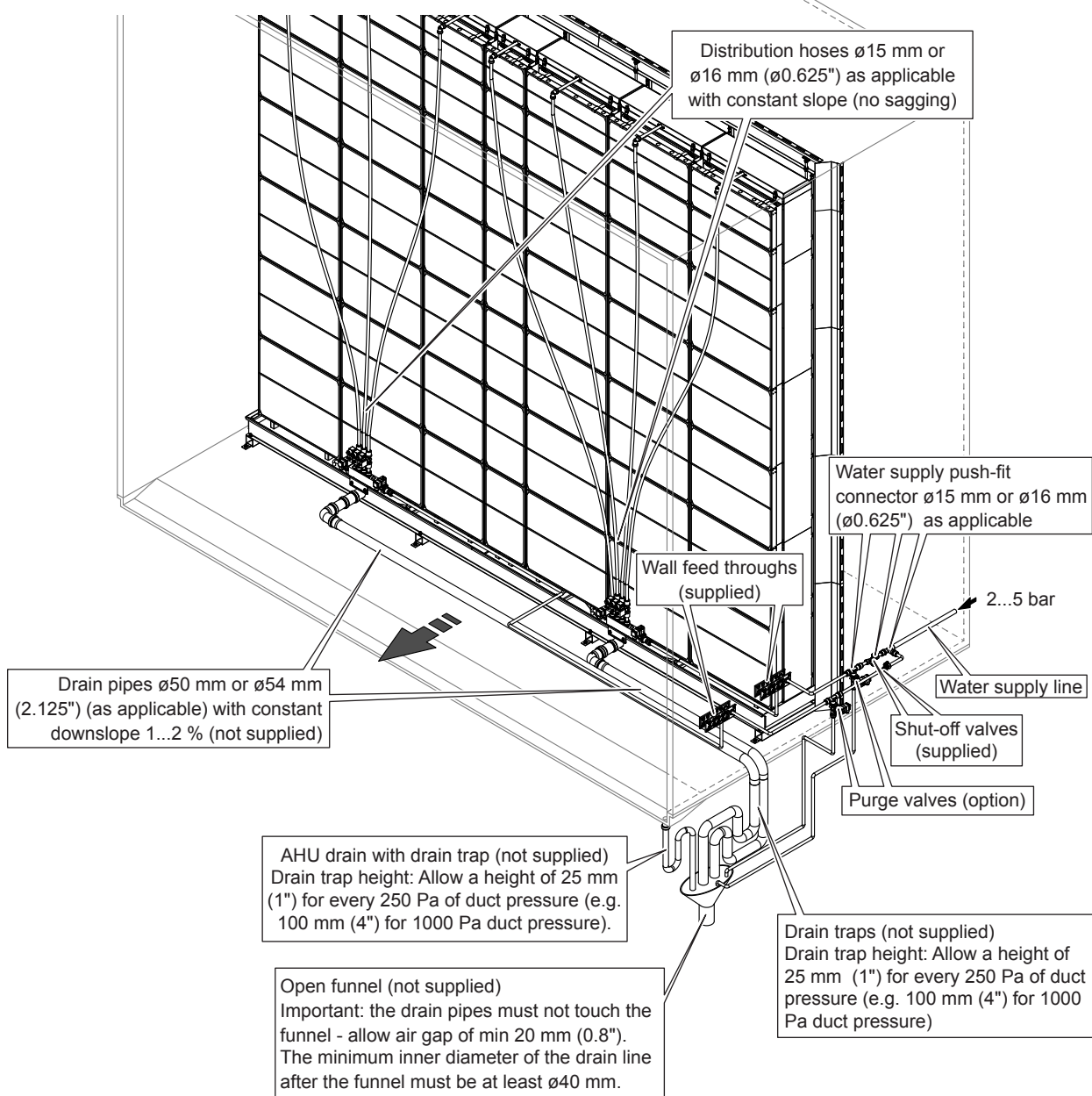
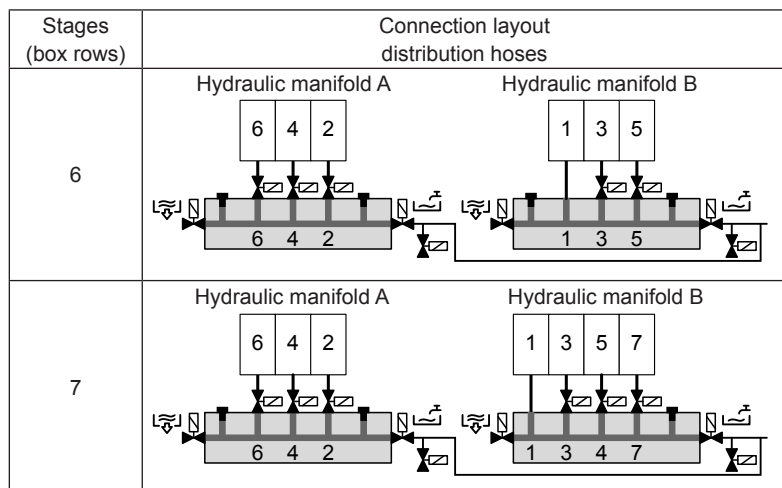


Fig. 29: Water installation (internal installation)

4.5.3 Water installation (external installation)

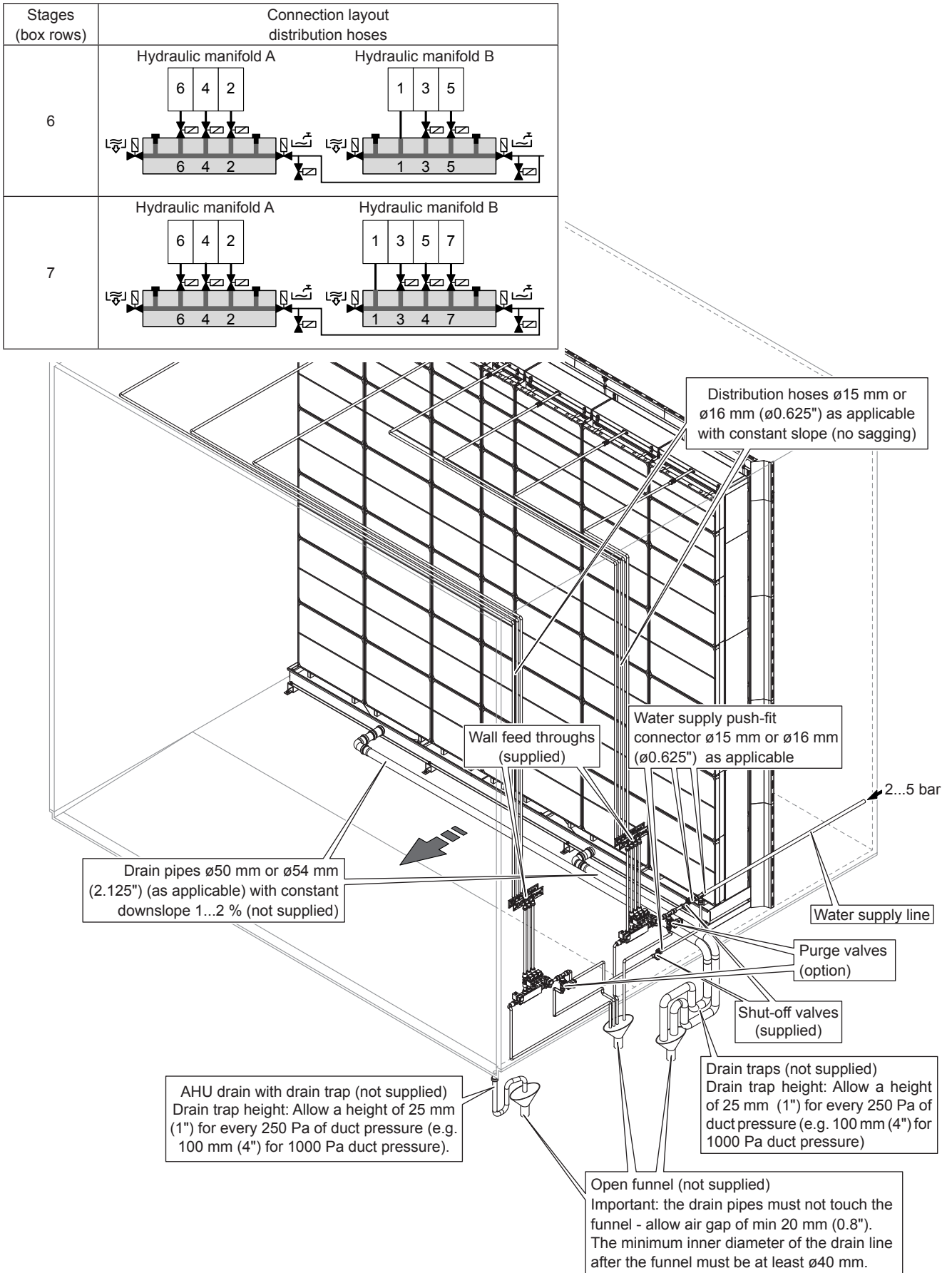


Fig. 30: Water installation (external installation)

4.5.4 Mounting the optional control unit

4.5.5 Notes on positioning the control unit

Please observe the following notes when positioning the optional Nortec ME Direct Feed control unit:

- The control unit can be mounted directly outside to the AHU/air duct or to a wall or stand (not supplied).
- The control unit should ideally be positioned as close to the evaporative module as possible for ease of servicing and maintenance.
- The control unit is protected according to **IP21**. Make sure the control unit is installed in a drip-proof location and the admissible ambient conditions are complied with (see technical data in the operation manual to the Nortec ME Direct Feed).
- The power supply to the control unit must be equipped with an electrical isolator (not supplied) fitted within 1 m (39") for purposes of maintenance and emergencies. When positioning the control unit make sure the electrical isolator can be mounted within that range.

4.5.6 Recommended access requirements of the control unit

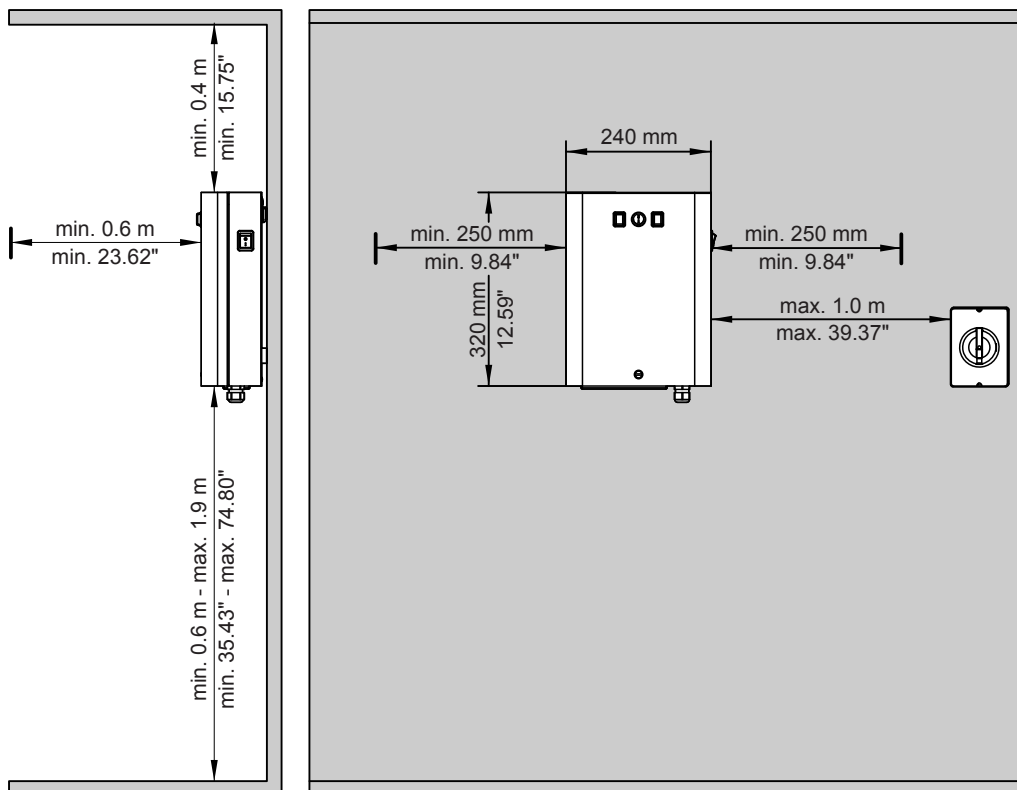


Fig. 31: Recommended access requirements of the control unit

4.5.7 Mounting the optional control unit

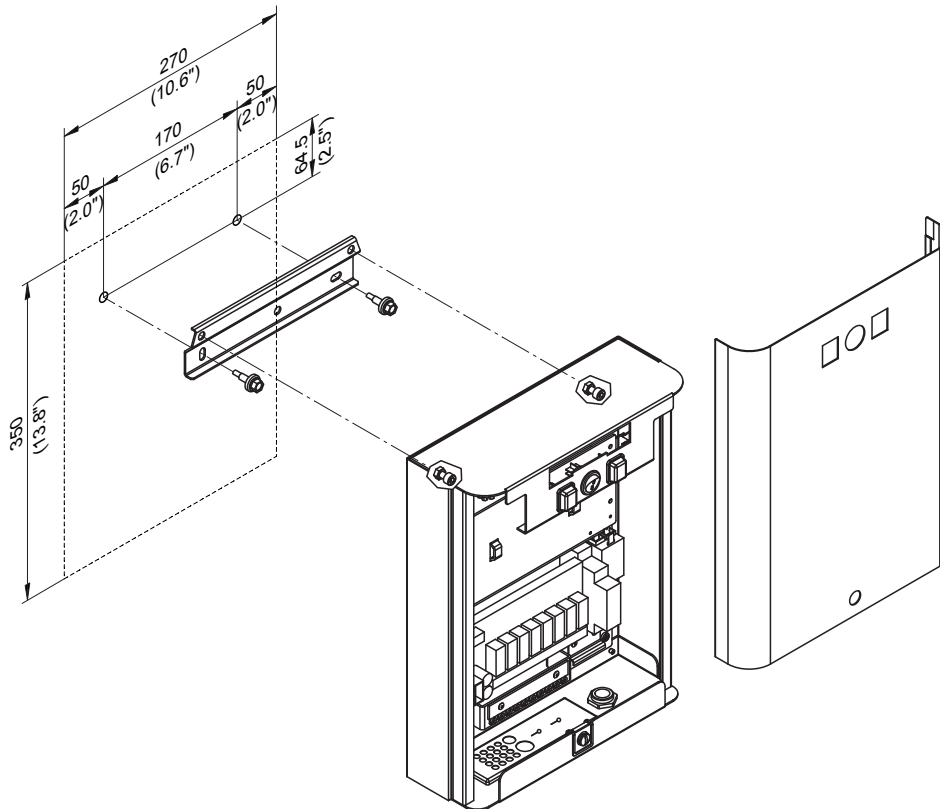


Fig. 32: Mounting the optional control unit

Mounting procedure:

1. Mark the attachment points for the wall support at the desired position with the help of a level.
2. Fix the wall support to the wall using appropriate fixings. Before tightening the fixings adjust the wall support horizontally using a 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 support and secure using the two M6 bolts in the top corners of the control unit.
5. Reattach the front panel and secure it with the screw.

4.6 Electrical installation

4.6.1 Notes on electrical installation



DANGER!
Risk of electric shock!

The control unit contains live mains voltage. 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 isolated from the mains before commencing any installation work.



WARNING!

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 or technicians 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 corresponding wiring diagrams (see chapters [4.6.2.1 – Wiring diagram Nortec ME Direct Feed with optional stage control unit \(6 stage control\)](#) and [4.6.2.2 – Wiring diagram Nortec ME Direct Feed with optional stage control unit \(7 stage control\)](#)), the notes on electric installation as well as the applicable local regulations. All information given in the wiring diagrams must be followed and observed.
- All cables must be led into the control unit via the cable feed throughs on the bottom side of the control units. The mains cable must be led into the control unit via the cable opening equipped with the cable gland.

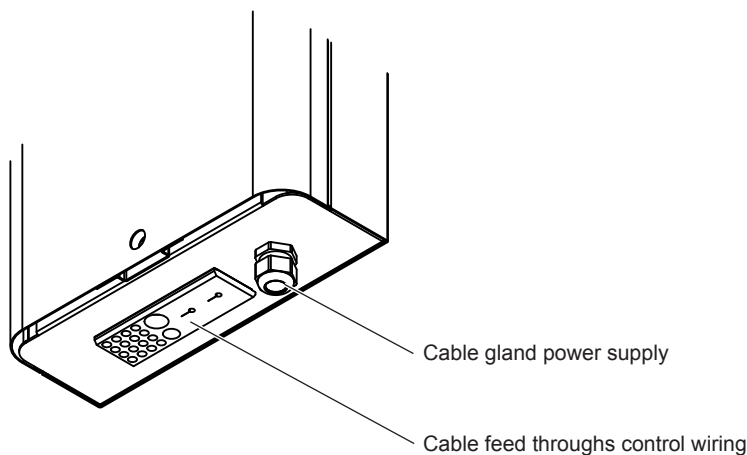
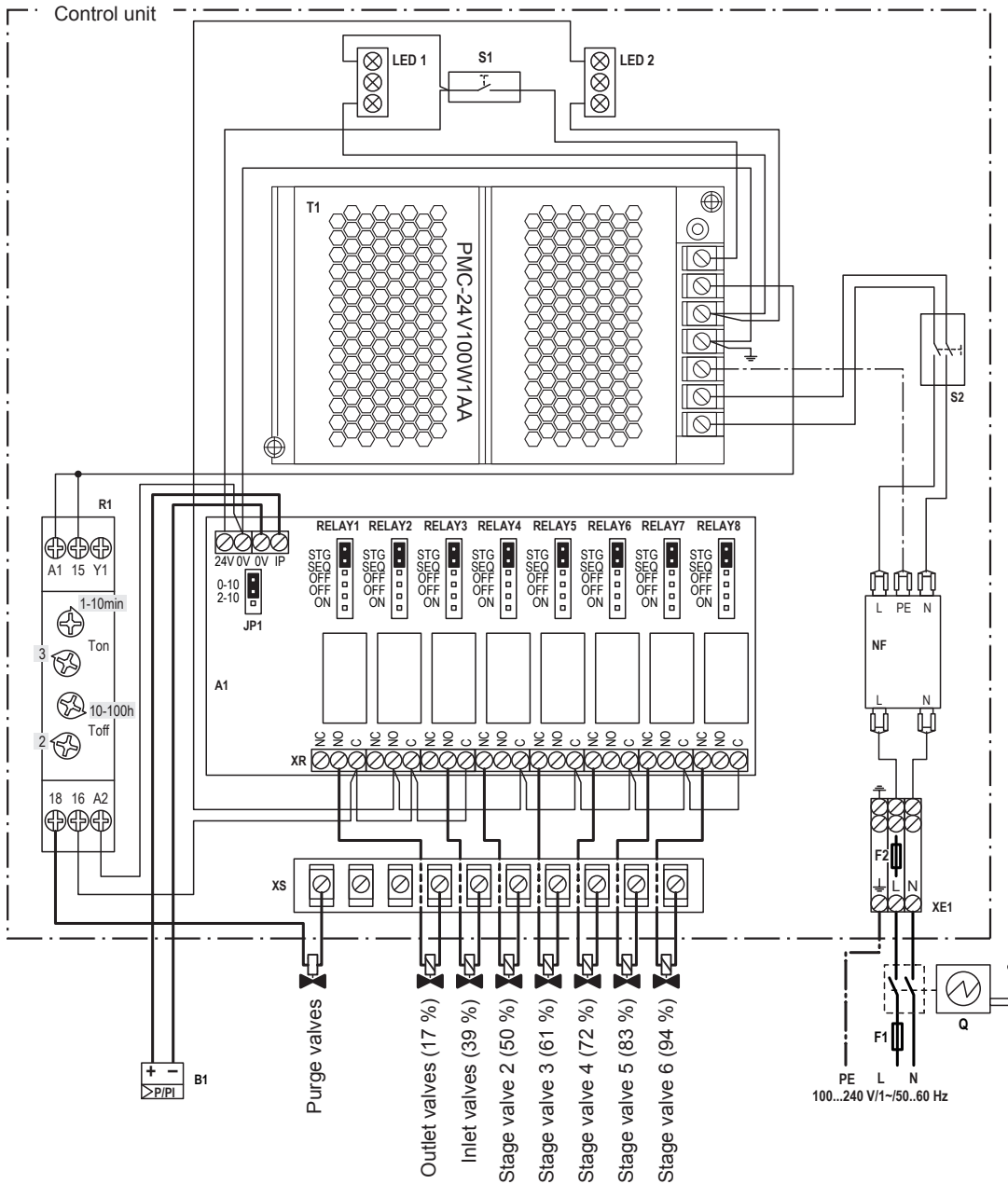


Fig. 33: Cable feed throughs control unit

- All cables from the hydraulic manifolds mounted inside the AHU/air duct must be led via the supplied feed through or cable gland(s) out of the duct.
- Ensure cables are secured in such a way that the insulation is not damaged by sharp edges and so that they do not create a trip hazard.
- Observe and maintain maximum cable length and required cross section per wire.
- The mains supply voltage must match the respective voltage stated on the rating plate.

4.6.2 Wiring diagram Nortec ME Direct Feed

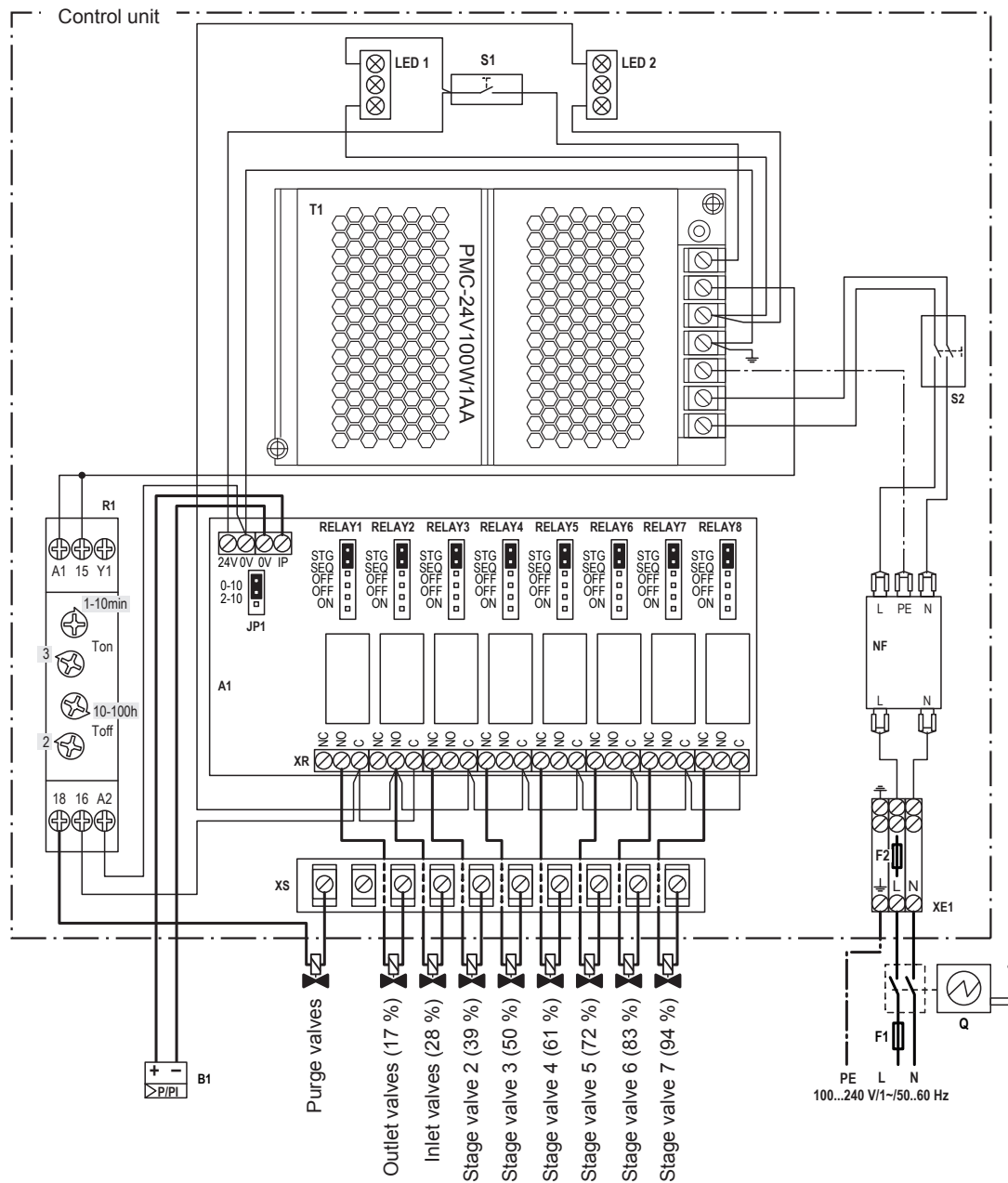
4.6.2.1 Wiring diagram Nortec ME Direct Feed with optional stage control unit (6 stage control)



A1	IO board	Q	Electrical isolator
B1	Demand signal 0...10V or 2...10V	R1	Timer purge valve
F1	External fuse mains supply (10 A, slow acting)	S1	Humidification On/Off switch
F2	Internal fuse mains supply (6.3 A, fast acting)	S2	On/Off switch control unit
JP1	Jumper control signal (Jumper fitted on 0..10V)	T1	24V power supply
LED 1	LED white (control unit switched ON)	XE1	Terminal mains supply voltage
LED 2	LED green (humidification ON)	XR	Terminals 24V valves
NF	Mains filter	XS	Ground terminals valves

Fig. 34: Wiring diagram Nortec ME Direct Feed with optional stage control unit (6 stage control)

4.6.2.2 Wiring diagram Nortec ME Direct Feed with optional stage control unit (7 stage control)



- | | | | |
|--------------|---|------------|-------------------------------|
| A1 | IO board | Q | Electrical isolator |
| B1 | Demand signal 0...10V or 2...10V | R1 | Timer purge valve |
| F1 | External fuse mains supply (10 A, slow acting) | S1 | Humidification On/Off switch |
| F2 | Internal fuse mains supply (6.3 A, fast acting) | S2 | On/Off switch control unit |
| JP1 | Jumper control signal (Jumper fitted on 0..10V) | T1 | 24V power supply |
| LED 1 | LED white (control unit switched ON) | XE1 | Terminal mains supply voltage |
| LED 2 | LED green (humidification ON) | XR | Terminals 24V valves |
| NF | Mains filter | XS | Ground terminals valves |

Fig. 35: Wiring diagram Nortec ME Direct Feed with optional stage control unit (7 stage control)

4.6.2.3 Installation work Nortec ME Direct Feed with stage control

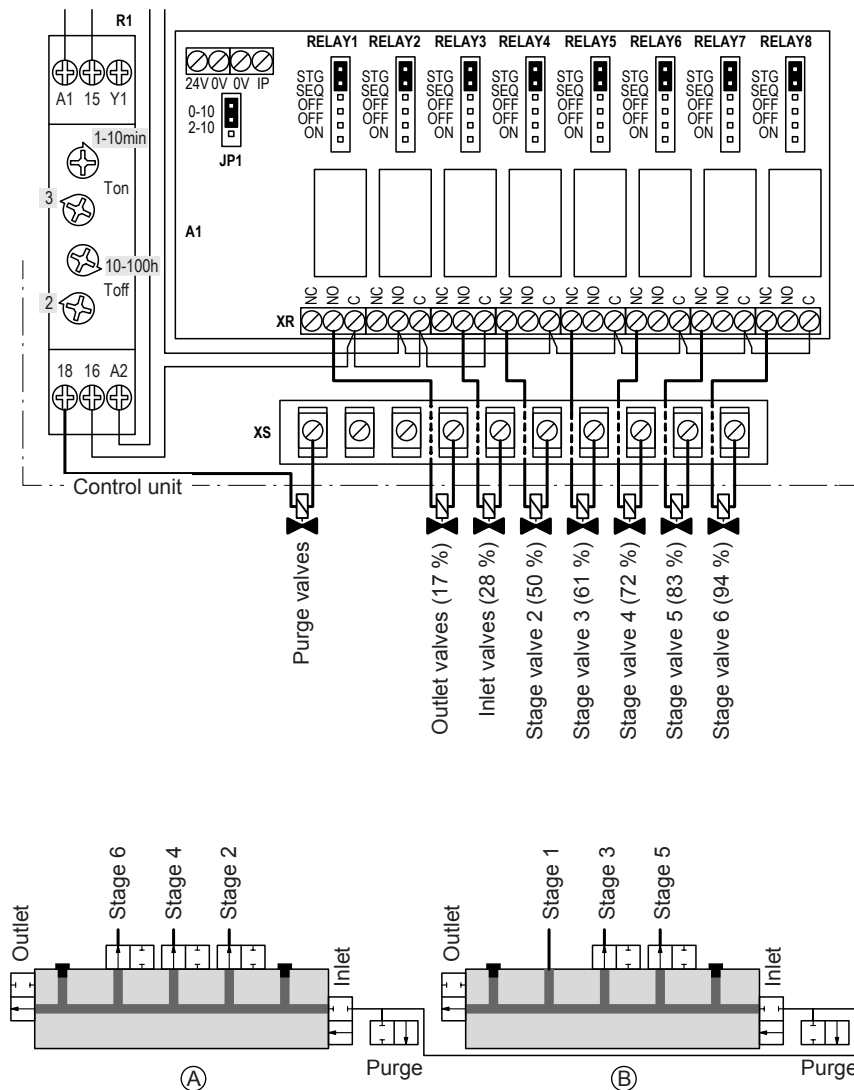
Note: for the connection of the available options please refer to the addendum manual of the corresponding option. The safety monitoring of the operation of the humidification/cooling system via a safety chain (max. humidity monitor, air flow monitor, etc.) is the responsibility of the client.

Connecting the valves of the Hydraulic manifold

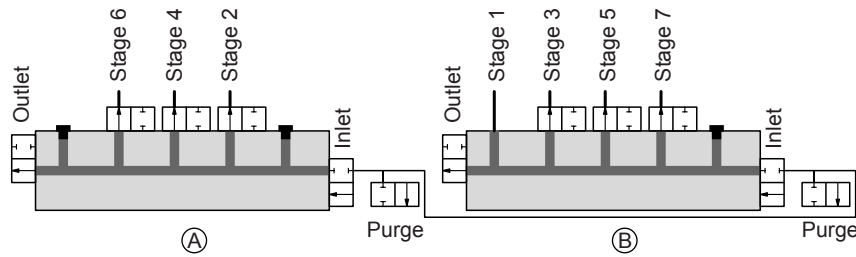
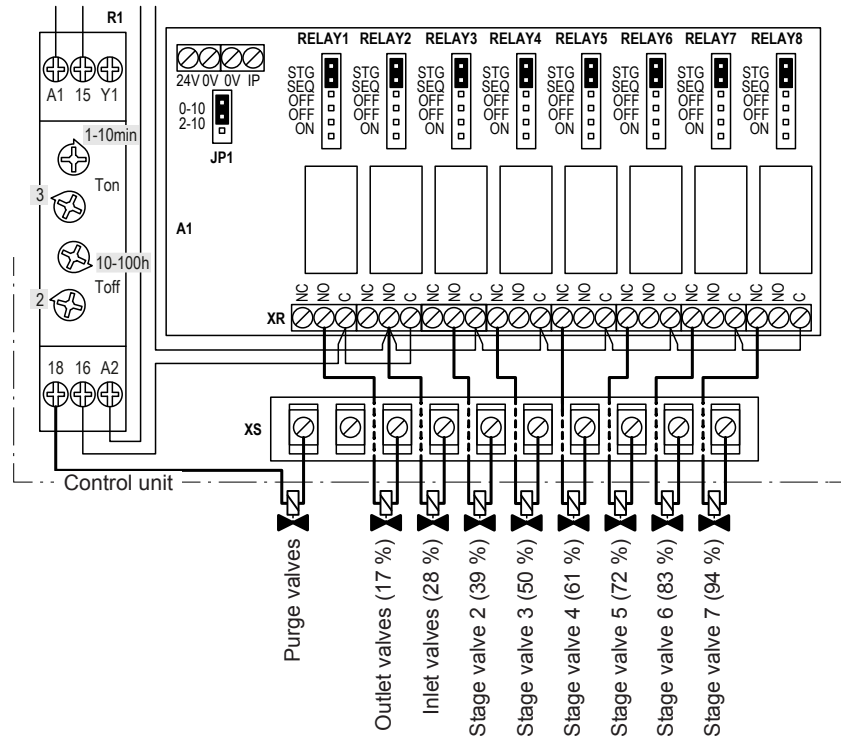
Note: Relay 1 to 8 on the IO board are switched dependent on the percentage of the demand signal. For this reason the valves must be connected to the control unit according to the corresponding stage control diagram and the relays on the IO board must be configured accordingly via the corresponding jumpers.

The connecting cables must be fed through the rectangular cable feed through into the control unit.

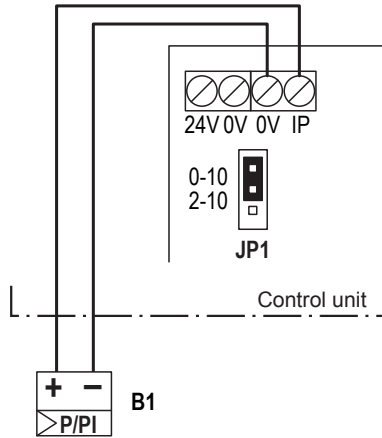
– Wiring and Jumper settings 6 stage control with purge valve



– Wiring and Jumper settings 7 stage control with purge valve



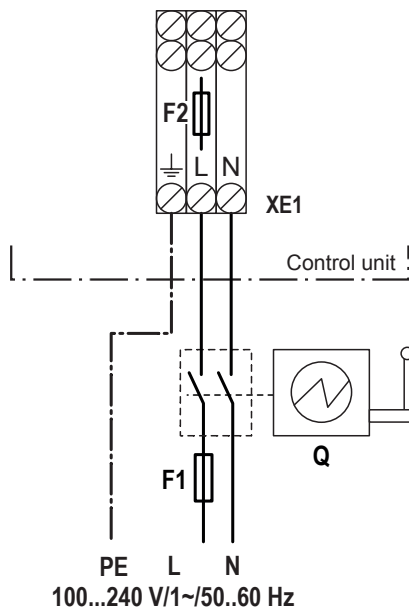
Control Signal



Connect an **external controller** to the corresponding terminals (0V= "-", IP= "+") on the IO board. The connecting cable must be fed through the rectangular cable feed through into the control unit.

Admissible control signals are 0-10VDC or 2-10VDC selectable via the Jumper JP1 on the IO board.

Power supply



CAUTION! Before connecting the mains voltage supply, make sure the voltage indicated on the rating plate meets the local line voltage. Otherwise, do not connect the control unit.

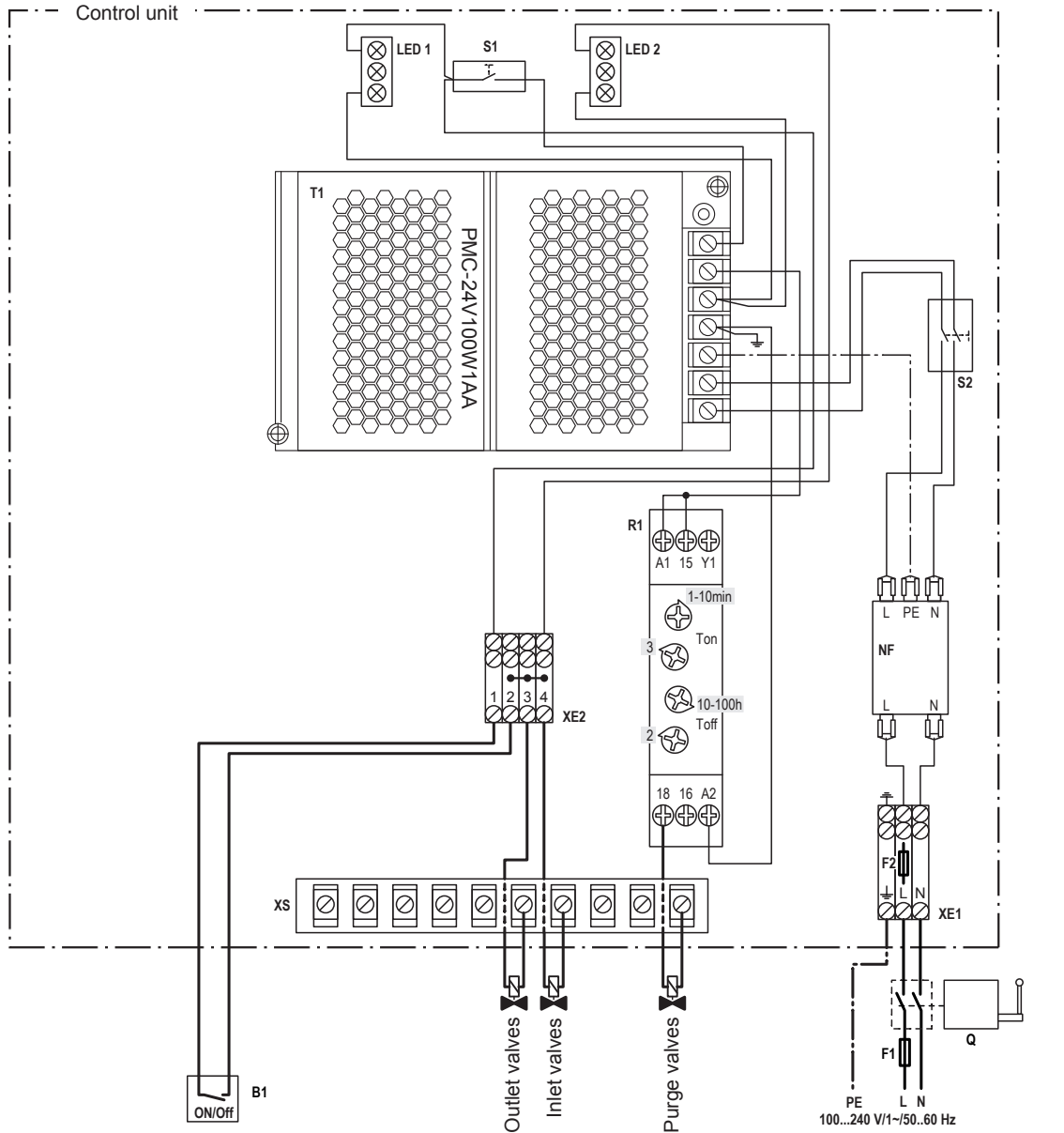
Connect **power supply** 100...240 V/1~/50...60 Hz in accordance with the wiring diagram, to the **terminal block "XE1"** in the control unit. The mains supply cable must be led into the control unit via the cable gland on right side on the bottom of the control unit.

The installation of the **fuse F1** (10A, slow acting), the **electrical isolator "Q"** (all pole disconnecting device with a minimum contact clearance of 3 mm/0.12") 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 1.0 m/39.37") and must be easily accessible in a height between 0.6 m/23.62" and 1.9 m/74.8" (recommended: 1.7 m/66.93").

The cross-section of the mains cable must comply with the applicable local regulations (min. 1.5 mm²/0.0023 sq.in.).

4.6.2.4 Wiring diagram Nortec ME Direct Feed with optional On/Off control unit



A1	I/O board	R1	Timer purge valves
B1	On/Off controller	S1	Humidification On/Off switch
F1	External fuse mains supply (10 A, slow acting)	S2	On/Off switch control unit
F2	Internal fuse mains supply (6.3 A, fast acting)	T1	24V power supply
LED 1	LED white (control unit switched ON)	XE1	Terminal mains supply voltage
LED 2	LED green (humidification ON)	XE2	Terminal valves and On/Off controller
NF	Mains filter	XR	Terminals 24V valves
Q	Electrical isolator	XS	Ground terminals valves

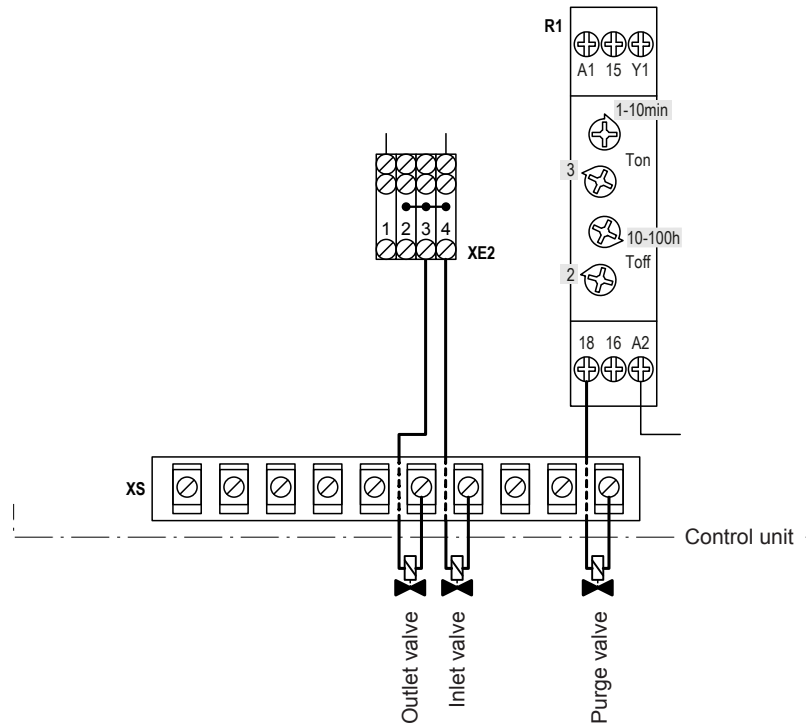
Fig. 36: Wiring diagram Nortec ME Direct Feed with optional On/off control unit

4.6.2.5 Installation work Nortec ME Direct Feed with On/Off control

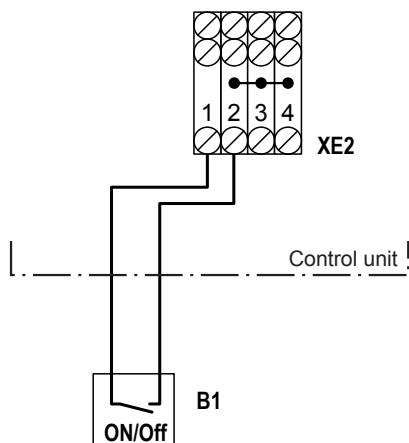
Note: for the connection of the available options please refer to the addendum manual of the corresponding option. The safety monitoring of the operation of the humidification/cooling system via a safety chain (max. humidity monitor, air flow monitor, etc.) is the responsibility of the client.

Connecting the valves of the Hydraulic manifold

Note: The drain, supply and purge valve are to be connected to the corresponding terminals in accordance with the wiring diagram.

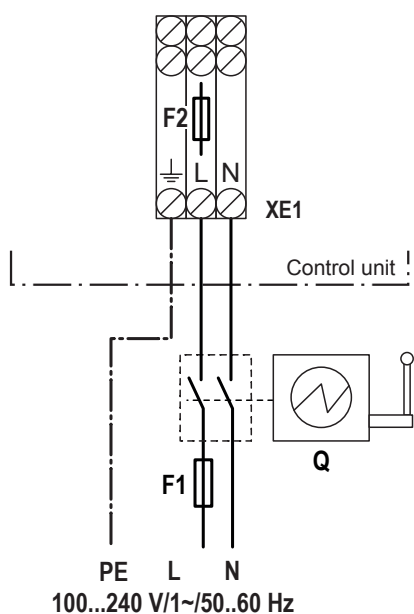


Control Signal



Connect an **external On/Off controller** to the corresponding terminals 1 and 2 on terminal block "XE2" in the control unit. The connecting cable must be fed through the rectangular cable feed through into the control unit.

Power supply



CAUTION! Before connecting the mains voltage supply, make sure the voltage indicated on the rating plate meets the local line voltage. Otherwise, do not connect the control unit.

Connect **power supply** 100...240 V/1~/50...60 Hz in accordance with the wiring diagram, to the **terminal block "XE1"** in the control unit. The mains supply cable must be led into the control unit via the cable gland on right side on the bottom of the control unit.

The installation of the **fuse F1** (10A, slow acting), the **electrical isolator "Q"** (all pole disconnecting device with a minimum contact clearance of 3 mm/0.12") 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 1.0 m/39.37") and must be easily accessible in a height between 0.6 m/23.62" and 1.9 m/74.8" (recommended: 1.7 m/66.93").

The cross-section of the mains cable must comply with the applicable local regulations (min. 1.5 mm²/0.0023 sq.in.).

5 Appendix

5.1 Inlet water quality requirements

Nortec Plc recommends that the Nortec ME must be connected to a **clean, wholesome (drinking water quality) mains water supply**. For areas of hard water and to minimise scale build up the water supply may be treated by a reverse osmosis system (RO).

Reverse Osmosis

For Nortec ME systems supplied with RO water it is recommended that the system is operated within the following parameters. The use of RO water fed tanks and reservoirs is only permitted as part of a managed and hygiene monitored water system and should form part of the water system risk assessment.

System	Conductivity
Nortec ME Direct Feed	> 5 $\mu\text{S cm}^{-1}$ at 20 °C (68 °F)

Other Water Supplies

There is a growing demand to utilise sustainable water sources to help overcome scarcity challenges and recycle water. It is possible to use high-quality, treated effluent for non-wholesome applications. The following gives guidance on reclaimed water quality that may be acceptable for use within the Nortec ME. "Effluent treated water", must be treated by an appropriate water treatment method and risk assessed to ensure it is safe and suitable for use in the Nortec ME unit. It is the responsibility of the user to ensure that the water supply system is part of a managed, hygiene monitored water system, risk assessed and complies with the local regulations and bylaws.

Below are example water conditions that would allow a Nortec ME to operate within specification.

Parameter	Content in supply water	Concern
Temperature	< 20 °C (68 °F)	Warm water favours growth of bacteria
Aluminium	-	No specific concerns
Ammonium	< 0.50 mg/l	Odour passed to air
Calcium	< 300 mg/l	Scale formation
Chloride	< 300 mg/l	Corrosion of stainless steel
Colour	None	Not directly a concern
Copper	< 1 mg/l	Deposits and corrosion stimulation
Conductivity	< 650 $\mu\text{S cm}^{-1}$ at 20°C (68 °F)	Total hardness and scale formation.
pH	6.5 to 9.5	Acid or Alkali damage to equipment.
Iron	< 0.5 mg/l	Deposit formation on oxidation and a critical support role in Legionella growth.
Manganese	< 0.1 mg/l	Deposit formation
Nitrate	-	No specific concerns
Nitrite	-	No specific concerns
Odour	Acceptable to users	Smell passed to air
Sulphate	< 250 mg/l	No specific comments
Sodium	-	No specific concerns
Total organic carbon	-	No specific concerns
Turbidity	< 5 NTU	No specific concerns
Colony count 22°C	< 1000 cfu/ml	Indicator of contaminated water supply

Parameter	Content in supply water	Concern
Coliform bacteria	< 10 cfu/100 ml	Indicator of poor water quality
Legionella bacteria	< 50 cfu/1000 ml	Risk of Legionella
Pseudomonas species	< 10 cfu/100 ml	Indicator of slime forming potential



DANGER!

Failure to ensure the quality of the supply water may endanger the health of individuals exposed to the ME system, the air from the AHU/air duct, or the water from the ME system. Poor supply water quality may also encourage the growth of micro-organisms (including the bacterium which causes Legionnaire's disease).

Controlled Substances



DANGER!

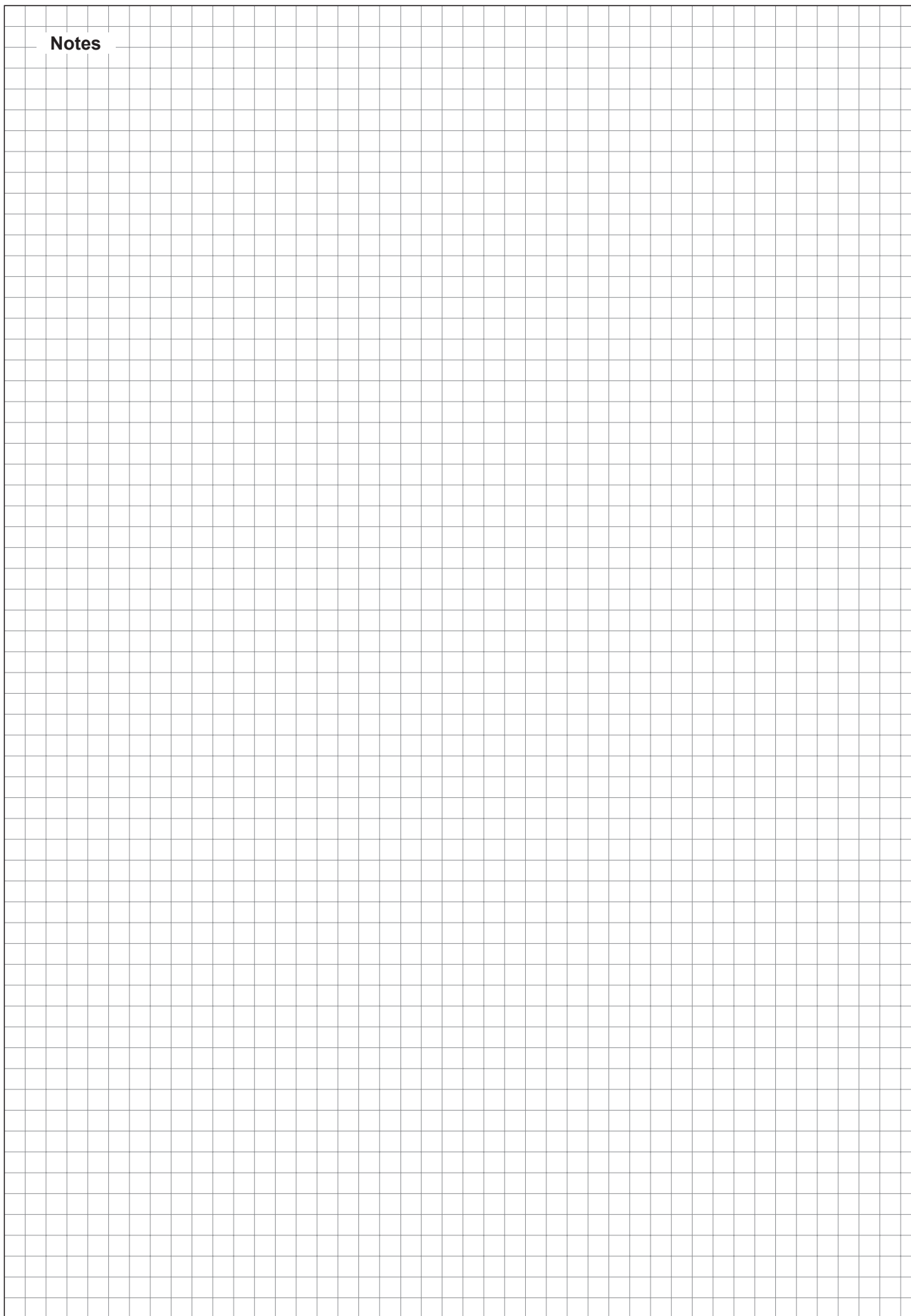
Many of the following controlled substances could present a risk to health; for example vinyl chloride is highly toxic, flammable and carcinogenic and could be evaporated off the evaporative matrix from contaminated water and passed to the airflow. Therefore it is important to note that any supply water coming from complex waste water which may contain the following contaminants should be carefully risk assessed by a water treatment specialist.

Controlled substances
Clostridium perfringens (including spores)
Acrylamide
Antimony
Arsenic
Benzene
Benzo(a)pyrene
Boron
Bromate
Cadium
Chromium
Cyanide
1,2-dichloroethane
Epichlorohydrin
Fluoride
Lead
Mercury
Nickel
Pesticides
Polycyclic aromatic hydrocarbons
Selenium
Tetrachloroethene and Trichloroethene
Trihalomethanes
Vinyl chloride

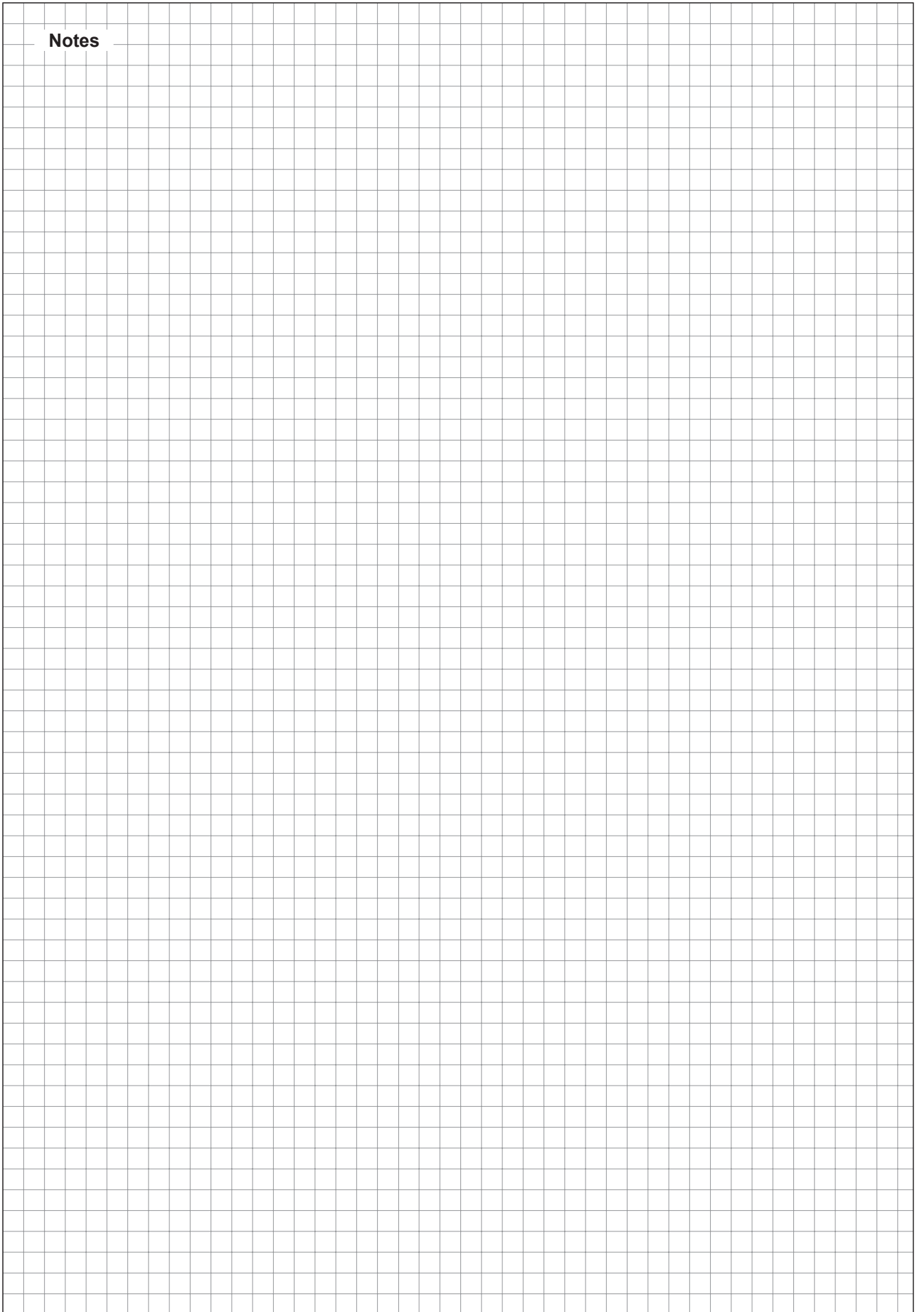
Water Monitoring

The Nortec ME water system must be monitored for hygiene as part of the customers water safety control scheme.

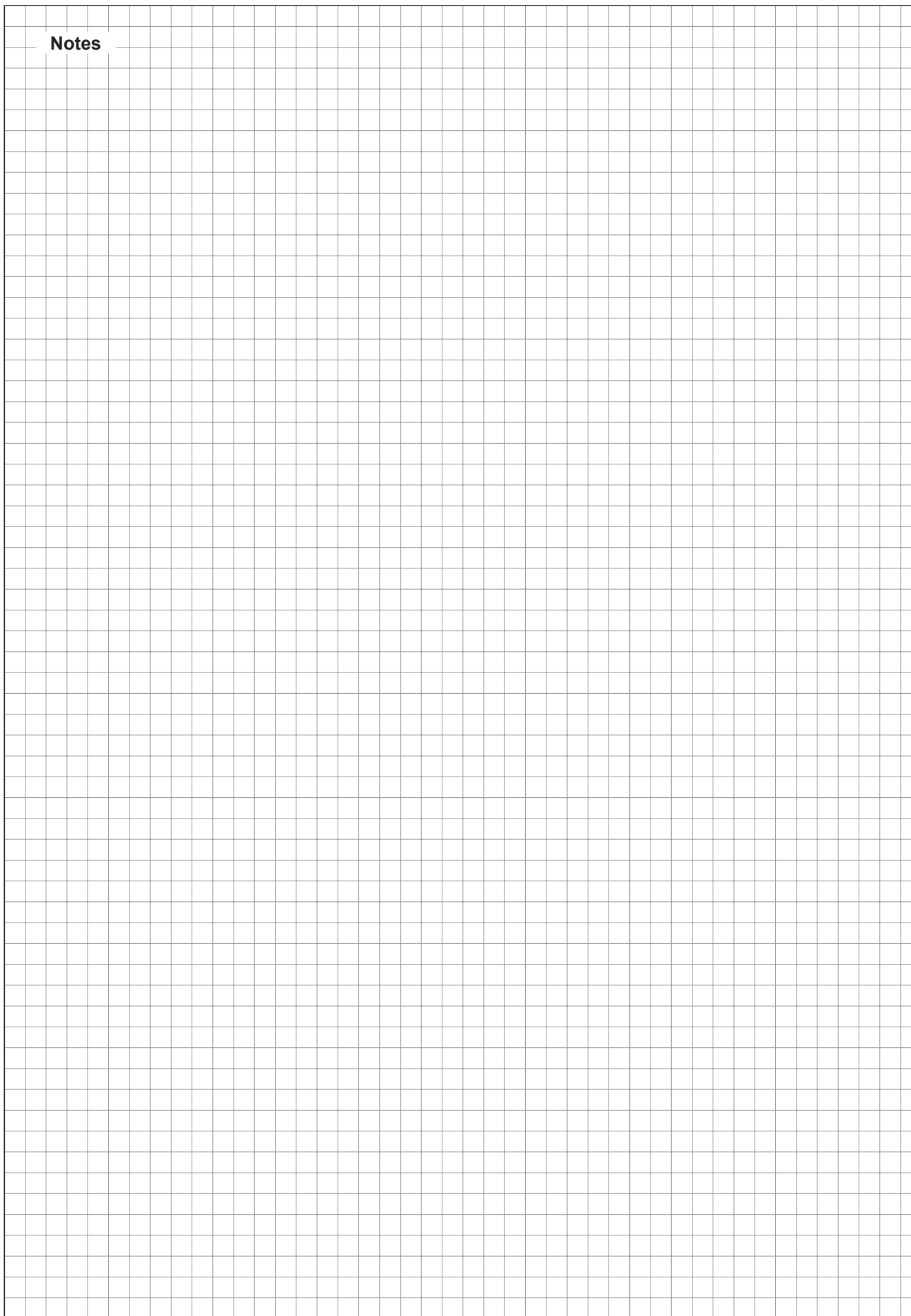
Notes



Notes



Notes



Warranty

Nortec Humidity Inc. and/or Nortec Humidity Ltd. (hereinafter collectively referred to as THE COMPANY), warrant for a period of two years after installation or 30 months from manufacturer's ship date, whichever date is earlier, that THE COMPANY's manufactured and assembled products, not otherwise expressly warranted, are free from defects in material and workmanship. No warranty is made against corrosion, deterioration, or suitability of substituted materials used as a result of compliance with government regulations.

THE COMPANY's obligations and liabilities under this warranty are limited to furnishing replacement parts to the customer, F.O.B. THE COMPANY's factory, providing the defective part(s) is returned freight prepaid by the customer. Parts used for repairs are warranted for the balance of the term of the warranty on the original humidifier or 90 days, whichever is longer.

The warranties set forth herein are in lieu of all other warranties expressed or implied by law. No liability whatsoever shall be attached to THE COMPANY until said products have been paid for in full and then said liability shall be limited to the original purchase price for the product. Any further warranty must be in writing, signed by an officer of THE COMPANY.

THE COMPANY's limited warranty on accessories, not of the companies manufacture, such as controls, humidistats, pumps, etc. is limited to the warranty of the original equipment manufacturer from date of original shipment of humidifier.

THE COMPANY makes no warranty and assumes no liability unless the equipment is installed in strict accordance with a copy of the catalog and installation manual in effect at the date of purchase and by a contractor approved by THE COMPANY to install such equipment.

THE COMPANY makes no warranty and assumes no liability whatsoever for consequential damage or damage resulting directly from misapplication, incorrect sizing or lack of proper maintenance of the equipment.

THE COMPANY makes no warranty and assumes no liability whatsoever for damage resulting from freezing of the humidifier, supply lines, drain lines, or steam distribution systems.

THE COMPANY retains the right to change the design, specification and performance criteria of its products without notice or obligation.

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