Installation and maintenance manual

Ned Air air handling units

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Frisse lucht voor iedereen

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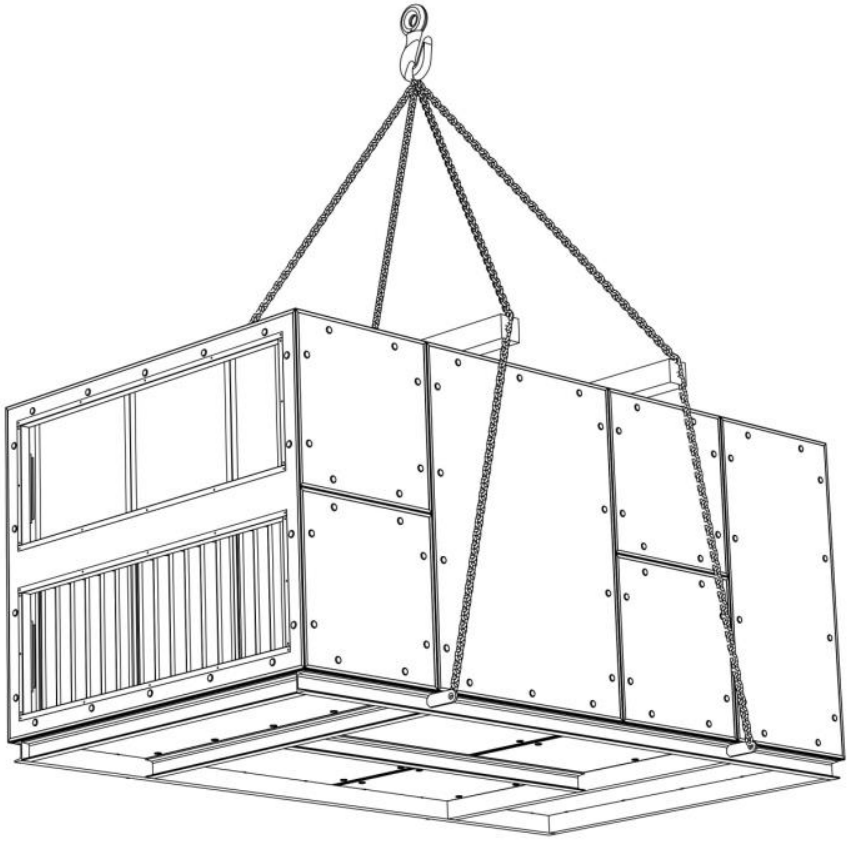
1 Delivery

The air handling units are supplied in transportable size. On arrival, the air handling unit must be checked for transport damage. In the event of damage, or even suspected damage, the consignee must note this on the consignment note and have it countersigned by the forwarding agent. The recipient of the air handling unit must also immediately report this to Ned Air.

2 Transport

The air handling units may only be transported in the position in which they are installed. The air handling unit must be supported at the bottom during transport. When using a forklift truck, make sure that the forks protrude completely under the unit, otherwise the plating will be pressed in (use support beams if necessary!).
When using the lifting eyes, the length of the transport cable must be at least as great as the distance between the lifting eyes. When lifting with cables, the cabinet must be protected against being pressed by the contracting lifting sling! Appropriate spacers (“equalizers”) must be used for this purpose.



1 Beware
2 Please read this manual thoroughly
3 Lifting point

3 Assembly

When setting up an air handling unit, consider the accessibility of inspection panels and doors and the necessary space for removing the heater, cooler, fans and other components.

The unit must be standing on an elevation.

The support for the cabinet must be present over the full circumference, for an even weight distribution.

NOTES:

- Do not step on a cabinet without taking protective measures for the panels.
- With humidifiers and coolers, a pressureless water discharge to the sewer and the height of the water seal must be considered.
- See also the water-side connections of the humidifiers and coolers.
- It is recommended to fit a thin rubber strip between the cabinet and support to compensate for minor irregularities in the support.

3.1 Duct connection

The air ducts can be connected directly to the air handling unit, provided that no tension is exerted on the air handling unit by the ducts. The air ducts can also be connected by means of flexible sleeves. These allow a greater freedom of measurement of the duct in relation to the cabinet and do not transfer any residual vibrations from the fan to the duct system. Bear in mind, however, that the flexible sleeves have practically negligible sound attenuation, so that noise emission is unavoidable.

The connection between the box, the sleeve and the ducts must be made airtight.
The flexible sleeves have a working length of approx. 100 mm and are equipped with a 35 mm flange, provided with pre-drilled holes with a diameter of 7 mm and a pitch of 350 mm c.c. To avoid unnecessary pressure loss, the duct bend after the fan discharge nozzle should preferably run in the direction of fan rotation.

It is also possible to order duct adapters from Ned Air. More information can be requested from the sales department.

On the unit you will find the following stickers at the duct connections:

Outside air intake (**O**ut **D**oor **A**ir)

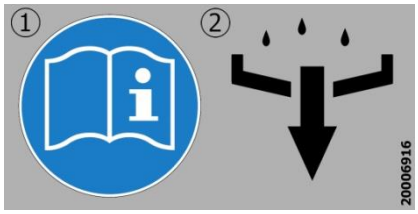
Vent outside (**E**x**H**aust **A**ir)

Return air from building (**E**x**T**ract **A**ir)

Supply air to building (**SUP**ply Air)

3.2 Condensate drain connection

The condensate discharge from the air handling units must be connected to the sewer via a bal siphon. A ball siphon has been developed by Ned Air for this purpose. For more information, please contact our sales department.



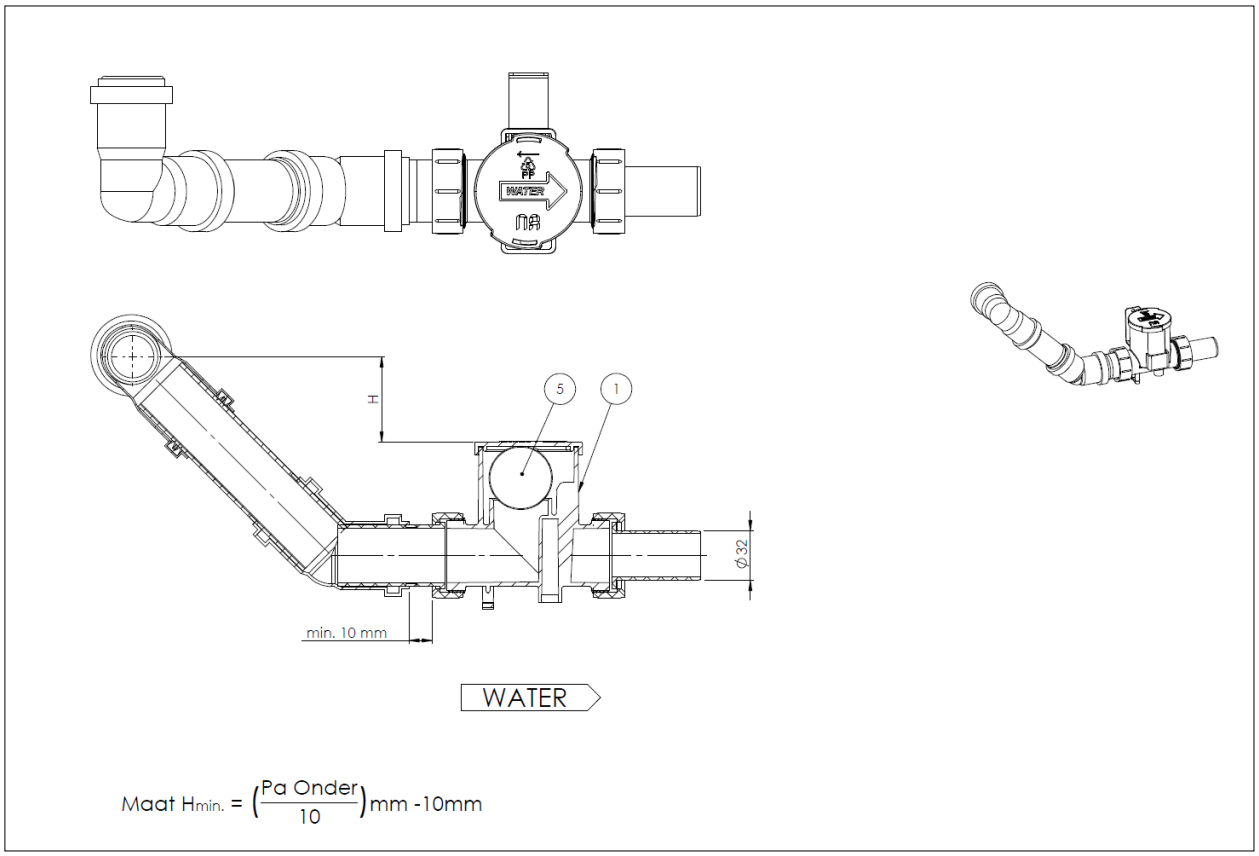
1 Please read this manual thoroughly
2 Condensate drain

The following must be considered when installing the ball siphon:

- Consider the required minimum height to place the ball siphon. The effective height must be greater than the maximum over- or under pressure (1mm water column ≈ 10 Pa). See the formula on the next page for this. Also pay attention to the required slope of the drainpipes.
-
- The ball siphon must always be placed horizontally with the lid at the top.
-
- Make sure that the ball siphon is equipped with the correct lid. In the case of an overpressure siphon, it must be fitted with the blue lid. In the case of a negative pressure siphon, it must be fitted with the gray lid.
-
- Each condensate drain must be equipped with its own siphon. Never connect several condensate drains to a shared siphon.
-
- Never connect the ball siphon directly to the sewer system. The siphon must be connected to the sewage system without pressure. With an outdoor installation (roof version), the condensation water can be discharged onto the roof via the ball siphon.
-
- During commissioning or longer periods of non-use, the ball siphon must be filled with water to ensure proper operation. Check annually whether the ball siphon is dirty and fill it with water if necessary.
-
- When it is cold, condensation forms in the heat recovery unit. It is important that the bal siphon is protected against freezing.

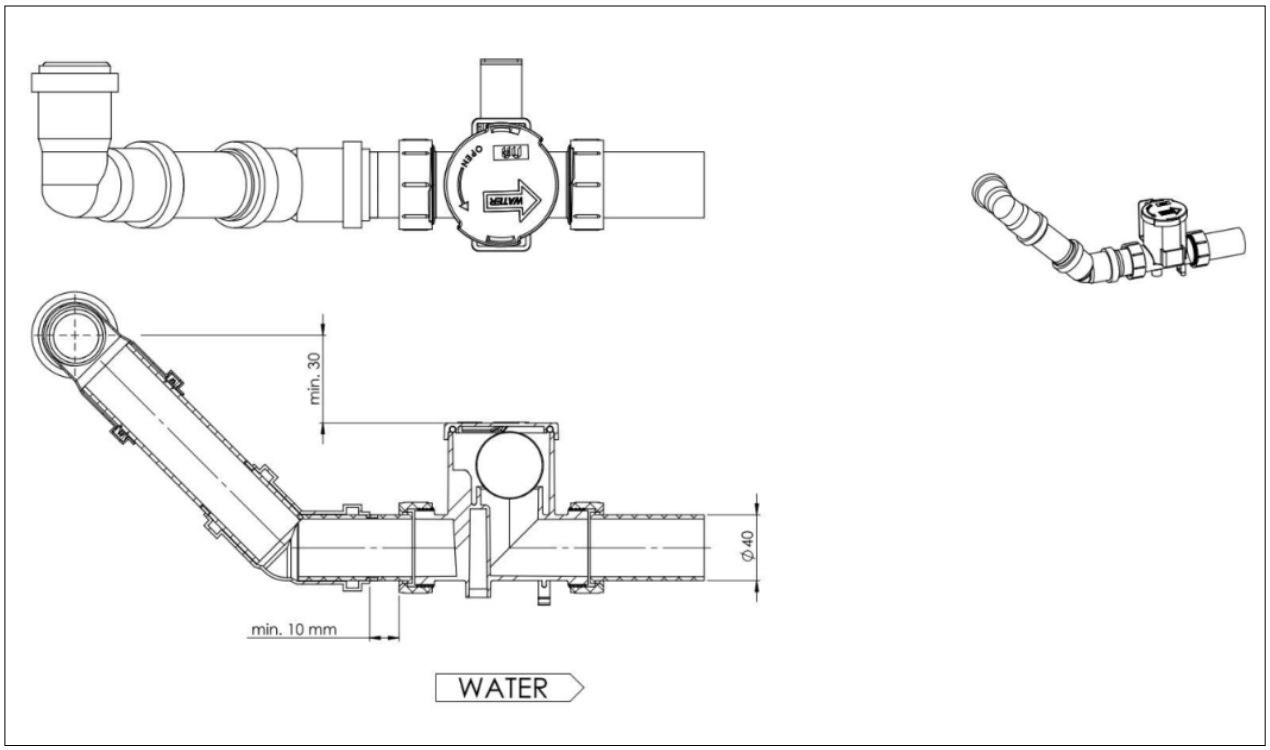
A heated siphon is available for outdoor installation to prevent freezing. The ball siphon heating is equipped with its own thermostat, so that the heating element only comes into operation at very low temperatures.

Application negative pressure siphon



Maat $H_{min.} = \left(\frac{\text{Pa Onder}}{10}\right)$ mm -10mm

Application overpressure siphon



3.3 Electrical connection

The Ned Air air handling unit can be supplied in several configurations. The specific construction of your air handling unit can be found in the electrical diagrams supplied with the air handling unit. The electrical connection values of the air handling unit are stated on the front page.

Before installing an electrical connection to the supplying group(s), the connection values must be checked. The connection values must be at least equal to the prescribed values. So do not use too small cables or protections.

When the air handling unit is delivered, both the main switch and the electrical protection devices are switched off. During commissioning, the safety devices must be activated by authorized personnel before operating the main switch. This must be done according to the applicable procedures on site by the person responsible for the installation/work, in accordance with locally applicable rules. This prevents working in the vicinity of rotating parts (fans) that are located in the vicinity of the electrical connection box.

It is not permitted to make electrical changes to the air handling unit without prior written instructions and/or approval from Ned Air. All liability of Ned Air resulting from changes made without instructions and/or approval is disclaimed.

Caution!

- It is not allowed to test the insulation resistance of the air handling unit with the safety devices switched on. The internal electronics used are not suitable for performing this measurement.
- Ned Air personnel are not authorized to switch on customer power supplies. During commissioning on site, authorized personnel must always be present to switch on the power supply at the main switch.

3.4 Commissioning

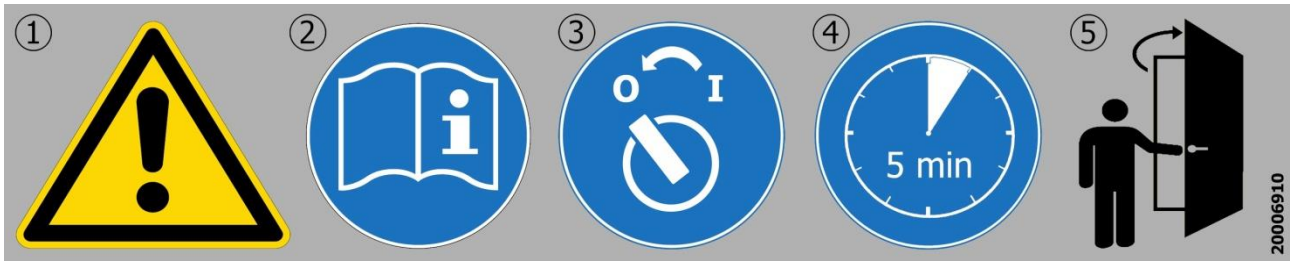
Check whether:

- • (based on the dimensional drawing) all components have been mounted in the correct order and have been properly connected (see the relevant instructions for the components),
- • all air handling unit units are set up level,
- • close all inspection panels and doors properly,
- • all transport protections have been removed,
- • all connections are airtight,
- • the ducts are connected airtight and stress-free,
- • the air handling unit is damaged (repair damage immediately),
- • the control facilities are properly connected,
- • all control-technical safety devices are properly adjusted.

3.5 Maintenance

General:

1. 1 Watch out.
2. 2 Read this manual carefully.
3. 3 Turn off the ventilation.
4. 4 Switch off the main switch when work needs to be carried out in the air handling unit, if necessary lock the main switch with a lock.
5. 5 Wait 5 minutes.
6. 6 Now open the door by first unscrewing the door lock with a tool.



Do not forget to relock the door with tools when the work is finished.

The air handling unit:

- Regularly, at least once a year, clean the air handling unit inside and out, e.g., by vacuuming with a soft brush on the vacuum cleaner. Wipe the uncoated sendzimir parts on the inside and outside with a lightly oiled cloth.
- If the ID-label is no longer easy to read, request a new one from Ned Air
- Check whether the duct connections on the cabinet (the flexible sleeves) are OK.
- Repair or otherwise replace damaged cuffs.
- Check the door locks for proper operation and adjust properly if necessary.
- Treat any corrosion symptoms immediately and efficiently and find and remedy the cause.

4 Fan motor

4.1 Commissioning

4.1.1 Direct driven fan

- Check that there are no foreign objects in the fan section space and remove them.

4.1.2 Belt driven fan (option)

- Check that there are no foreign objects in the fan section space and remove them.
- Check the mounting of the motor and pulleys, alignment of the V-belts and the V-belt tension.
- The belt must be able to be turned a quarter turn.
- Check the direction of rotation of the fan (see fan arrow).

4.1.3 General

- Check the supply voltage
- Check that the fan is positioned correctly and can rotate freely
- Check whether the fan and the motor rotate smoothly in balance

4.2 Maintenance

- Check the V-belt tension after 36 hours of operation and retighten if necessary.

NOTE:

- An overloaded motor can cause the fan to operate with no or insufficient pressure.
- Therefore, check the duct connections and whether the filters are in place.
- If the air handling units are not in operation for a longer period of time and are set up in a cold environment and, moreover, relatively warm and moist building air can enter the air handling units on the extract air side, condensation can occur in the motors, controls, switchgear and servo motors.
- Check the V-belt for tension and wear once a month.
- Immediately replace a V-belt showing signs of wear.
- Check the noiseless running of the fan and motor.
- The bearings used do not need to be lubricated if no special instructions apply and no grease nipples are present.
- If the bearings produce an impermissible noise, they must be replaced.
- Replacement instructions are supplied with new bearings.
- Clean the fan and motor once a year.
- Also check that all fasteners are still tight and that the vibration dampers are not damaged.

Note:
Always have a spare set of V-belts.
In the case of several V-belts on a drive, always replace the complete set of V-belts, in connection with the stretch of the new belts.

5 Connect dampers

Servo motor
The assembly and electrical connection of the servo motor are carried out by Ned Air, in accordance with the supplier's instructions.

5.1 Commissioning

- Check the correct operation of the dampers with the position of the actuator.

5.2 Maintenance

- Clean the dampers and actuators once a year.
- Check the operation and adjustment as well.

6 Filters

The air handling unit is supplied with filters.

Default filter class:
- Supply air: ISO ePM_1 > 50%
- Extract air: ISO ePM_{10} > 50%

6.1 Commissioning

- Check whether the correct filters have been installed.
- Check whether the air direction of the filters is correct.
- Check whether the filter bags are mounted vertically.
- Adjust any differential pressure switches or differential pressure sensors.

Note: The air inlet and outlet side of the filter must never be blinded. If the pressure drop across the filter becomes too great, the filter's mounting frame will collapse.

6.2 Maintenance

Filters should be checked at least twice a year.
The frequency with which the filters must be checked, cleaned and/or replaced strongly depends on the contamination of the air to be filtered, the operating time and the type of filter.
Due to moisture in the filters (e.g., in foggy weather), reaction with the trapped dust can cause a very aggressive atmosphere in the air handling unit.

Checks and measures against corrosion must be taken early.

Note: There is a risk of viral and bacteriological contamination when changing the filter. The use of suitable gloves (liquid-tight), face mask (minimum FFP2) and safety goggles is mandatory.

NOTE:
- A new filter serves its purpose better than a cleaned filter.
- A good control of the filter is obtained by mounting a differential pressure gauge that gives a correct indication of the degree of contamination.
- ***Always have a set of spare filters available!***

If you would like to order filters, please call: +31 38 337 0844.

7 Connecting the water cooler

The water cooler must be connected in reverse flow. This means that if the air inlet in the cooler is on the right, the water supply must be opposite, i.e., on the left. Whether this supply connection is at the top or bottom is not important. Failure to follow this connection instruction will lead to a loss of capacity. With all water connections, proper ventilation and drainage options must be included in the piping system immediately outside the cabinet.

The cooler is placed in a condensation water collection tray that is equipped with 1 drain stub.
Place an overpressure ball siphon on the drain stub (for operation, see chapter 3.2 Condensate drain connection).

7.1 Frost protection

To prevent the cooler from freezing, it must be equipped with proper frost protection. This can be done by a frost thermostat or by using a glycol mixture. Watch out for injuries and other hazards with a glycol mixture. Use personal protective equipment (PPE).

REMARK
When tightening connections on the cooler, the connection stub must be held back with good tools, in such a way that no bending or twisting forces occur on the connection, otherwise this can lead to serious damage (leaking cooler).
Make sure that the connection lines do not run in front of the inspection panels and thus make inspection and maintenance more difficult.

Close the pipe penetrations through the cabinet wall airtight.

Water out

Water in

7.2 Commissioning

- Check whether water connections have been made correctly (in counterflow) and whether venting and draining are present.
- Fill the pipe network to the cooler and bleed it with the pump stopped.
- Check connections for leaks.

REMARK
- Simulate operation.

7.3 Maintenance

- Regularly check for corrosion and any leakage.
- Blow the fins of the cooler once a year on the air side with compressed air against the air direction.
- Clean the surface with a vacuum cleaner fitted with a soft brush.
  If necessary, unscrew the eliminator from the cooler.
- Check the fins of the eliminator behind the cooler.
- Clean the siphon and check it for proper operation.
- Check the condensate collection tray for dirt deposits and clean if necessary.
- For a cooler filled with glycol, it must be checked whether the correct weight percentage of glycol is present in the mixture.

8 Connecting the DX cooler

The DX cooler is placed in a condensation water collection tray that is equipped with 1 drain stub. Place an overpressure ball siphon on the drain stub (for operation, see chapter 3.2 Condensate drain connection).

8.1 Commissioning

- Check whether the pipes are connected correctly.
- Vacuum and flush the piping system.
- Leave the pipe under vacuum for 24 hours and check whether the vacuum is maintained.
- Locate the leak if not.
- Charge the system with refrigerant and adjust the evaporation temperature and expansion valve superheat while the plant is running.
- Check any anti-freeze protection for correct installation and connection and simulate operation.
- Set the frost protection to approx. 5 °C (41 °F) below the air outlet temperature.

8.2 Maintenance

- Regularly check for corrosion and any leakage, especially before the cooling season.
- Blow the fins of the cooler once a year on the air side with compressed air against the air direction.
  Note: DX coolers may never be cleaned with steam!
- Clean the surface with a vacuum cleaner fitted with a soft brush.
  If necessary, unscrew the eliminator from the cooler.
- Check the fins of the eliminator behind the cooler.
- Clean the siphon and check it for proper operation.
- Check the condensate collection tray for dirt deposits and clean if necessary.

9 Connecting the hot water heater

The hot water heater must be connected in reverse flow. This means that if the air inlet into the heater is on the right, the water supply must be opposite, i.e., on the left. Whether this supply connection is at the top or bottom is not important. Failure to follow this connection instruction will lead to a loss of capacity. With all water connections, proper ventilation and drainage options must be included in the piping system immediately outside the cabinet.

9.1 Frost protection

9.1.1 Preheater

The preheater of the air handling unit must be protected against frost by using glycol. The proportion of glycol in the water must be chosen in such a way that the heater does not freeze in severe frost.

9.1.2 Reheater

To prevent the reheater from freezing, it must be equipped with a frost thermostat. The frost thermostat must ensure by means of a control that the reheater does not freeze.

REMARK
When tightening connections on the heater, the connection stub must be held back with good tools, in such a way that no bending or twisting forces occur on the connection, otherwise this can lead to serious damage (leaking heater).
Make sure that the connection lines do not run in front of the inspection panels and thus make inspection and maintenance more difficult.

Close the pipe penetrations through the cabinet wall airtight.

Water out

Water in

9.2 Commissioning

- Check whether water connections have been made correctly (in counterflow) and whether venting and draining are present.
- Fill the pipe network to the heater and bleed it with the pump stopped.
- Check connections for leaks.

REMARK
- If present (option), check frost protection thermostat for correct installation and connection.
- Simulate operation.
- Set frost protection thermostat to 2 °C (35,6 °F).

9.3 Maintenance

- Check regularly for corrosion and any leakage, especially before the heating season.
- Blow the fins of the heater once a year on the air side with compressed air against the air direction.
- Clean the surface with a vacuum cleaner fitted with a soft brush.
- Check the function of the frost protection before the heating season.

10 Connecting the electric heater

The electric heater is mounted inside the air handling unit. The heater control is wired to the terminal block. The power supply may still have to be connected to the heater.
The connection diagram is located in the connection box.

For air handling units installed outdoors, the electrical supply cables must be fed through the unit wall via well-closing cable glands (make sure that this does not make inspection more difficult). The connection must comply with the locally applicable regulations.

10.1 Commissioning

Note: When the electric heater is switched on, the supply fan must always run to prevent overheating. After turning off the electric heater, the fan must run for at least 5 minutes to cool the coils.

- Check that the heater is properly connected.
- Check the operation of the overheating thermostat.
  This should be set at approx. 20 °C (68 °F) above the air outlet temperature.

10.2 Maintenance

- Check the overheating thermostat for correct operation at least once a year.

11 Rotary heat exchanger

The rotary heat exchanger is built into the air handling unit by Ned Air. If necessary, connect the supplied controller in accordance with the supplied installation instructions.

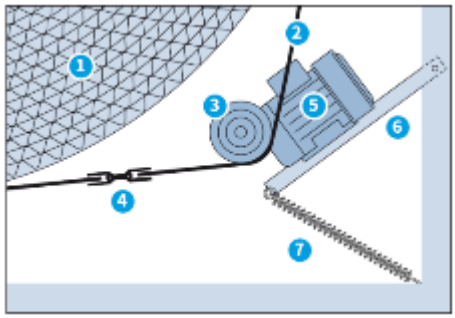
11.1 Commissioning

- Check whether the rotary heat exchanger can rotate freely.
- Check that the seals are against the wheel with the fans running.
- Check that the seal is not pressing too hard on the rotor by turning the rotor by hand.
- Avoid direct grinding of the seal, as this will damage the rotor.
- Check the direction of rotation of the rotor. See direction of rotation arrow on housing near motor.

11.2 Maintenance

The rotary heat exchanger is constructed from a wrapped aluminum foil. Because the rotary heat exchanger works in counterflow principle, in most cases the rotary heat exchanger will clean itself. If self-cleaning is not sufficient, the rotary heat exchanger can be cleaned with compressed air or, in the case of stubborn contamination, with a high-pressure sprayer.

Attention:
Air or water jet should be directed straight at the rotary heat exchanger so as not to deform the aluminum.



1 Rotor
2 V-belt
3 Pulley for V-belt
4 Coupling for V-belt
5 Motor
6 Motor seesaw
7 Spring

11.2.1 V-belt

Check the tension of the V-belt especially during the first 400 operating hours.
If the tension on the V-belt is too low, it can be shortened.

11.2.2 Motor

Under normal operating conditions, the motor requires no maintenance.

11.3 Controller

Information about the controller can be found in the separate manual. This is supplied with the air handling unit.

12 Mufflers

The muffler must be checked for damage to the top layer.

It is recommended to periodically check the baffles of the mufflers for possible damage and loosening of the fibers in order to prevent deposits of dirt further down the installation.

13 Lighting

Optionally, the air handling unit can be equipped with lighting, for example to check whether the fans are running without having to open the inspection hatch or door.

- Check the connection voltage.
- Check the operation of the switch. The switch must be connected according to local regulations.

14 Notes

Ned Air is a leading manufacturer of air handling systems, heat recovery units and roof fans.
Based on our passion for technology, we create a sustainable air technology solution for every situation. For more than 30 years, our products have been successfully used in housing, utilities, industry, the food and health sector, shipping, offshore, horticulture, defense and education, among others.

Ned Air bv
Postbus 79
8260 AB Kampen
Constructieweg 49
8263 BC Kampen

+31 38 33 70 844

info@nedair.nl
nedair.nl