

Operating manual

NA series



Air handling unit



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1 Introduction

1.1 Definition

The Air handling unit described in this manual is hereafter referred to as the “unit”.

1.2 About this manual

This instruction manual contains important safety information, a product description and maintenance instructions for the delivered air treatment unit. Please read all relevant parts of this manual before operating or performing any work on the unit. Observance of this information will help you to avoid danger, to minimise repair cost and downtime, and to increase the reliability and the service life of the air treatment unit.

This manual should be stored in a permanent location close to the unit.

This manual does not describe in full all the maintenance work required to guarantee the longevity and reliability of this type of equipment. Always contact Munters for service and repairs, to ensure safe and long lasting operation of the unit.

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1.3 Warnings

In this publication residual risks, hazardous activities or necessary precautions are indicated and preceded by the common hazard symbol.



WARNING!

is used in this publication to indicate a possible danger that could lead to personal injury or death. An instruction is normally given, followed by a short explanation, plus the possible effects if the instruction is not followed.



CAUTION!

is used in this publication to indicate a possible danger that could lead to damage to the machine or other equipment and/or cause environmental damage.

NOTE! *is used to accentuate supplementary information that is required for problem free and optimal use of the unit.*

1.4 Warranty

The warranty is based on the terms of sale and delivery of Munters. The warranty is not valid if repairs or modifications are carried out without the written agreement of Munters, or if the unit does not operate under the conditions agreed with Munters. Damages resulting from negligence, poor maintenance or failure to comply with the recommendations will not be covered by the warranty.

It is a condition of the warranty that the unit for the full warranty period is serviced and maintained by a qualified Munters engineer or Munters approved engineer. Access to specific and calibrated test equipment is necessary. The service and maintenance must be documented for the warranty to be valid.

Commissioning/Start-up inspection "S" by Munters is mandatory to validate the full warranty.

Always contact Munters for service or repair. Operating faults can occur if the unit is maintained insufficiently or incorrectly.

1.5 Inspection of delivery

Upon receipt, inspect the equipment before signing the delivery note. Specify any damage on the delivery note and send a registered letter of complaint to the last company responsible for transporting the equipment within three days. Inform Munters of this complaint.

The unit must be fully inspected within one week from arrival. If a hidden fault is discovered, send a registered letter of complaint to the haulier within the week following delivery, and notify Munters of this.

1.6 Technical data

The technical data for a specific unit can be found in the separate Data sheet issued for each unit.

2 Safety

2.1 Intended use

The unit delivered by Munters must only be used for the treatment of air. This includes filtering, heating, cooling, humidifying, dehumidifying and transporting air. Munters explicitly rules out any other use.

The unit is designed to meet the safety requirements, directives and standards listed in the EC Declaration of Conformity.

No modification of the unit is allowed without prior approval by Munters. Attachment or installation of additional devices is only allowed after written agreement by Munters.

The conditions of operation specified in the separate Data sheet must be observed absolutely. Any other use of the equipment can cause personal injury and/or machine damage.

2.2 Safe installation, operation and maintenance

The information in this manual include suggestions for best working practice and shall in no way take precedence over individual responsibilities or local regulations. Great effort is placed on the design and manufacture of the various sections of the unit, so it will comply with applicable safety aspects for this type of equipment. During operation and other work with a machine it is always each individual's responsibility to consider:

- The safety of all persons concerned.
- The safety of the unit and other property.
- The protection of the environment.

Always carry out risk assessments before doing any work on the unit.

2.2.1 Electrical hazard



Figure 2.1 Electrical hazard



Figure 2.2 Secure against reconnection



WARNING!

Installation, adjustments, maintenance and repairs must only be carried out by qualified personnel who are aware of the risks involved when working with equipment operating with high electrical voltage and high machine temperatures.



WARNING!

Do not open distribution boxes or other electrical connection boxes. The unit is connected to high voltage which can cause serious injury or death.



WARNING!

Before doing any service or maintenance work on the unit make sure that all electrical equipment is disconnected from the power supply, and secured against reconnection.



WARNING!

The unit must never be connected to a voltage or frequency other than that for which it was designed. Refer to the unit identification plate.



WARNING!

Any external electrical equipment, for example a portable lamp, must be connected to an earth fault breaker.



WARNING!

Commissioning and initial start-up of the unit must be carried out by authorized personnel only.

2.2.2 Physical hazard

**WARNING!**

Rotating hazard. The unit contains rotating fans and other moving parts.

To prevent personal injury, the unit must be run with all panel doors closed and all removable panels and protective grids properly in place. Never open the doors or panels before all fans and other moving parts have come to a complete stop, and the main power is switched off.

Fans and other moving parts can start automatically and without warning.

**WARNING!**

The unit sections are heavy. Use only approved lifting equipment adapted to the weight of the sections to avoid accidents.

**WARNING!**

Make sure that all pipe couplings are properly tightened before the medium supply for cooling or heating coils is turned on.

**WARNING!**

Cleaning agents, cooling media, oil and grease are substances that are dangerous to personal health and to the environment. They must not be allowed to drain away into the soil or the public sewer system. The disposal of such substances must be effected in accordance with local and national law and regulations.

2.2.3 Property hazard

**CAUTION!**

The unit is not intended for use in classified areas, nor for treating air polluted with solvents, dust or other aggressive, corrosive or abrasive particles.

**CAUTION!**

Failure to correctly adjust the air flows can cause malfunction of the unit.

Any damage to the unit resulting from incorrect adjustment of the air flows can invalidate the warranty of the unit.

The unit must not be run for more than a few minutes before setting up the correct air flows.

**CAUTION!**

Service and maintenance work should only be carried out by qualified and trained personnel. Operating faults can occur if the unit is maintained insufficiently or incorrectly.

**CAUTION!**

Never climb on the unit or use it as scaffolding.

2.3 Residual risks

In order to avoid the possible dangers in operating or maintaining the unit, necessary protections have been foreseen. However, there are still some residual risks that all personnel working with the unit must be aware of:

The handling of fluids in refrigerating, heating or cooling circuits can be dangerous. Please study the information relevant for each type of fluid to avoid dangers.

Hot or cold surfaces can cause injuries. Before intervening, wait until temperatures become normal or use protective clothing.

When working inside the unit, please pay attention to the possible ergonomic dangers from inadequate work positions or heavy lifts.

Unit sections can be high. Use secure scaffolding to access the upper level.

Unit panels can be heavy. Do not handle alone.

Sharp steel edges on boxes or coils can cause cuts. Use protective gloves, particularly during disassembly or assembly.

When working with or near fans, be aware that remaining air flow through the unit can cause spontaneous rotation of the fans and thereby causing personal injury.

Doors for overpressure compartments can be equipped with additional safety locks against accidental opening. Ensure that such locks are closed before starting the unit.

The fire and/or smoke detection is not a safety function in relation to the EN ISO 13849-1.

When working with filters or in a dusty area: To protect the user from dust, wear a suitable CE marked face mask selected and fitted in accordance with the applicable safety standards.

Use hearing protection according to applicable safety standards when working in a noisy environment to avoid hearing impairment.

Dampers open and close automatically. Keep hands clear of the dampers when they are moving.

2.4 Warning signs

The following warning signs can be present on the unit, to warn the users of residual risks which can cause serious injury or death. Please make sure that all personnel working with or near the unit are aware of the meaning of each sign.



Figure 2.3 Risk of electrical shock.



Figure 2.4 Hot surfaces.



Figure 2.5 Risk of injury in moving parts.



Figure 2.6 Unit starts automatically.



Figure 2.7 Risk of falling



Figure 2.8 System under high pressure

2.5 Emergency stop

The unit can in an emergency be stopped using the main power switch.



CAUTION!

Only use the main power switch to stop the unit in the case of an emergency. The normal shutdown sequence will not be followed. The fans stop and the heater can be very hot, which can result in damage to the heater and other components close to it.

3 System design and function

3.1 System design

The NA2000 series is an AHU (Air Handling Unit) system which can be configured with many different functions such as mixing, filtering, heating, cooling and humidifying of air. *Figure 3.1* is only one example.

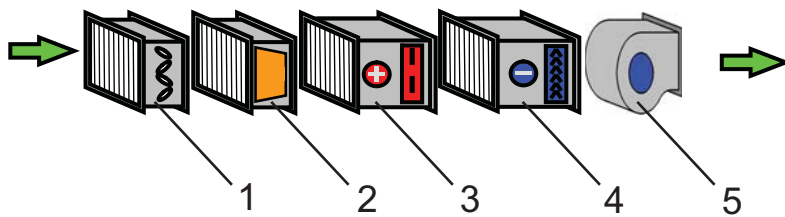


Figure 3.1 Example AHU configuration

1. Damper
 2. Filter
 3. Heater
 4. Cooler
 5. Supply fan
- Inlet dampers to enable isolation of the unit from the air flow. The dampers are installed on the outside of the unit.
 - Filters for various air quality specifications. Filters can be equipped with pressure drop sensors to enable "blocked filter" alarm (option).
 - Heating coil: The coil can be electric or use hot water or steam as heating medium. The coil must then be connected to an external heating medium supply.
 - Cooling coil: The coil uses chilled water, possibly mixed with glycol. The coil must be connected to an external medium supply.
 - Supply fan for transporting the air.
 - Humidification by evaporation or steam injection.

4 Main components description

NOTE! Some components are optional, and individual system specifications may differ.
All component pictures are examples, and may not correspond to individual units.

4.1 Water coils

4.1.1 Cooling coils

Cooling can be supplied by optional cold water coils installed in the pre- and or post-treatment sections. The coil uses chilled water, possibly mixed with glycol, as cooling medium. The coil must be connected to an external medium supply.



CAUTION!

Hot and cold water supply lines must only be designed and executed by qualified personnel taking into account the respective relevant local regulations.

When there is a risk of frost, the water coils must be frost protected. See section 4.1.3, Frost protection.

4.1.2 Heating coils

Heating can be supplied by optional hot water coils installed in the pre- and or post-treatment section. The coil uses hot water or steam as heating medium. The coil must be connected to an external heating medium supply.



CAUTION!

Hot and cold water supply lines must only be designed and executed by qualified personnel taking into account the respective relevant local regulations.

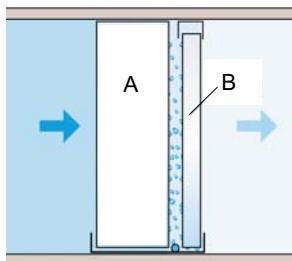
When there is a risk of frost, the water coils must be frost protected. See section 4.1.3, Frost protection.

4.1.3 Frost protection

If the water in a coil freezes this could cause serious damage. A frozen coil must almost always be replaced. The guarantee is no longer valid even if the cracks are not visible.

If there is a risk of frost, the cooling medium must be enriched with glycol or an anti-freeze heater complete with anti-freeze thermostat must be installed.

4.1.4 Droplet separator



*Figure 4.1 Cooling coil **A** and droplet separator **B***

A cooling section can be equipped with a droplet separator to remove droplet carry-over from the cooling coil.

The droplet separator is built from a patented three-plane-fluted pad that is set at an angle to the flow of air. The separator absorbs the water droplets and transports them down through the material to the drainage section.

4.1.5 Cleaning



WARNING!

Coil fins have sharp edges. Always wear protective gloves when working with coils.

1. The coils should be checked at least once a year, and cleaned if required.
2. Some of the dust which passes through the filters comes to rest on the coil cells. This layer of dust affects the air flow and reduces the rate of exchange leading to decreased unit efficiency.
3. The coils should therefore be kept clean. Cleaning can be done by using a vacuum cleaner, low pressure compressed air or low pressure water and a soft brush. Do not forget to clean the unit internally after the coil cleaning. Never use HP cleaners, this will damage the coil fins.
4. Furthermore, in the case of cooling coils, clean the drip tray and siphon for the condensation water once per year. Note that siphons need to be refilled with water after the winter season.

4.1.6 Stopping water flow to the coils

Precautions to take in case of frost risk:

- where it is envisaged to stop or considerably reduce the flow of hot water, all the fresh air intakes must be closed and the ventilation stopped.
- the reference point of the antifreeze thermostat must not be set too low.
- if for whatever reason a building is not heated in winter, the coils as well as the piping must be emptied.

Hot water coils

Make sure that the temperature of the hot water is not too low, and that the circulation of the water is maintained. Ensure that:

- the valves are open.
- the piping is purged from remaining gases.
- the hot water circulation pump operates even at night.

Cooling coils

Cooling coils must be purged if the passing air temperature is lower than the freezing point of the coolant.

Where the coils are supplied with water which does not contain glycol, and no preheater coil is installed, it is therefore necessary to empty the coils as soon as the passing air temperature reaches 0 °C.

4.2 Evaporative coolers/humidifiers



Evaporative coolers/humidifiers are used as needed to achieve the process air quality specification.

They can have either a direct water supply, or a recirculated system.

The heart of the FA6 cooler/humidifier is a cassette made from inorganic evaporative media – GLASdek®. Water is supplied to the top of the evaporative media via a distribution header. The water flows down the corrugated surface of the media. As the warm and dry air passes through the media it evaporates a proportion of the water and thus produces cool, humidified air. The rest of the water assists in washing the media, and is drained back to the tank. In the case of a recirculated system, there must be a bleed-off and an automatic drainage in order to avoid contamination of the water.

The energy that is needed for the evaporation is taken from the air itself. The air that leaves the humidifier is therefore humidified and cooled simultaneously without any external energy supply for the evaporation. This is in essence the adiabatic cooling process. It is very efficient and the consumption of energy is very low.

Periodic maintenance of the coolers is recommended once a year, following the operating season.



Figure 4.2 Open the safety catch on the distribution header by turning a quarter turn

1. Clean the distribution header.
2. Clean the pump filter.
3. Clean the reservoir.
4. Check the function of the level switch.
5. Check the function of the bleed-off valve.

6. Check that the humidifier cassette is evenly wetted and that no calcium streaks can be found on the inlet side.
7. Check that the hoses and couplings do not leak.
8. Check the discharge pipe and water trap. Clean if necessary.

NOTE! *For more information on servicing of evaporative coolers/humidifiers, see the separate Munters FA6 manual.*

4.3 Fans

4.3.1 Fan types

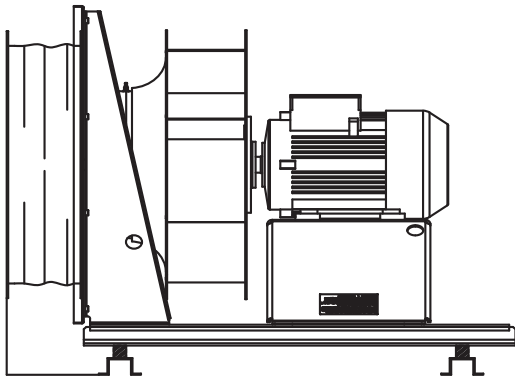


Figure 4.3 Plug fan

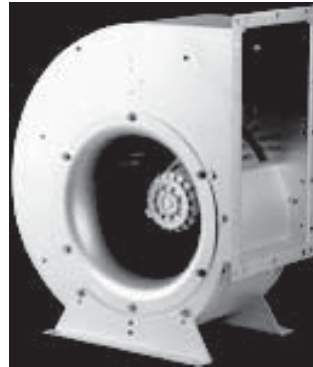


Figure 4.4 Scroll fan

The unit can be equipped with plug fans or scroll fans. The fans are driven by electric motors that can be controlled by frequency converters, which enable adjustment of the air pressure and air flow from the operator panel.

4.3.2 Maintenance

1. Before starting up the unit, ensure that there are no loose objects inside the unit.
2. Clean the inside of the unit using a vacuum cleaner.
3. If the fan impellers come into contact with contaminated air or dust, it is imperative that they are cleaned regularly to avoid vibrations caused by unbalance.
4. Do not use any aggressive cleaning agents, clean fan housing with warm water if required.
5. Never use a high pressure cleaner or water spray for cleaning.

4.3.3 Tension of the belts

It is important to maintain the correct belt tension to avoid premature deterioration of the bearings and wear and tear of the belts. There are two methods of checking the tension.

1. The elongation of the length of the belt can be measured when it is stretched. This elongation will be between 0.6% (for small units in regular operation) and 1% (for large units operating with irregular motor torques).
2. By using an appropriate measuring instrument, see *Figure 4.5*.

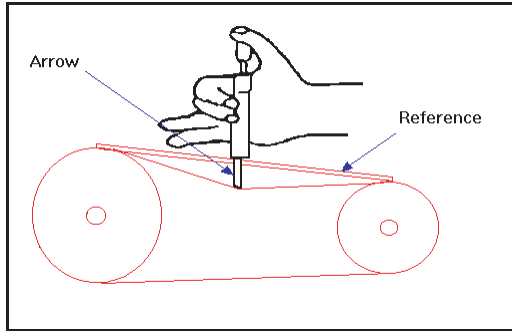


Figure 4.5 Tension of the belts

4.3.4 Maintenance of the belts

Clean the belts and pulleys with a dry cloth. Oil, lubricant and dust must be removed from the belts. The use of a belt lubricant is not recommended.

When the belt requires changing, the entire set must be replaced. Never force the belts into the pulleys, but adjust the motor to allow assembly.

4.3.5 Alignment of the pulleys

This can be checked using a straight ruler. The two edges of the pulley must lie within the alignment of the ruler, see Figure 4.6 .

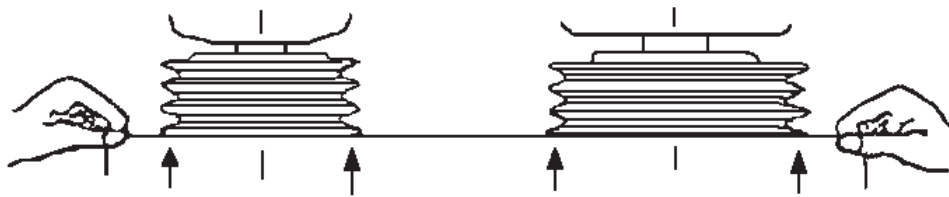


Figure 4.6 Checking the alignment

NOTE! Switching the unit on and off too many times in a day causes premature wear of the pulleys and belts.

4.4 Filters

4.4.1 Filter types



Figure 4.7 Bag filter



Figure 4.8 Panel filters

4.4.2 Filter maintenance



WARNING!

There is a fire hazard, or risk of unit malfunction, if filters are maintained insufficiently or incorrectly.



WARNING!

When replacing the filters or working in a dusty area: To protect the user from dust, wear a suitable CE marked face mask selected and fitted in accordance with the applicable safety standards.

The filters require regular replacement. The frequency depends on the amount of dust in the air and the operating conditions. A filter guard will indicate when replacement is required (option).

Blocked filters can reduce the air flow in the unit. Replacing the filters is therefore of prime importance for the correct operation of the installation. Incorrect air flow will reduce the capacity and the energy efficiency of the unit. Replace the filters when:

- Final pressure drop is reached.
- There is a filter alarm.
- The filter is damaged and air is passing without filtration.
- Paper frame filters have become wet.

4.4.3 Panel filters

- Check the degree of dirt accumulation by measuring the differential pressure or by inspecting the filters visually.
- Replace as required.
- Before replacing the filter, check that the frames are sealed and if necessary replace the seals.
- Clean the filter section, check that there is no dirt beyond the filter.

4.4.4 Bag filters

- Check the degree of dirt accumulation by measuring the differential pressure or by inspecting the filters visually. Bag filters cannot be cleaned and are not reusable.
- Fit a new bag filter and check its tightness. Bags must be vertically mounted.

4.5 Dampers



Figure 4.9 Inlet damper

Dampers are used to open and close the inlet and the outlet of the unit, as well as optionally for controlling bypass and recirculation.



WARNING!

Keep hands clear of the dampers when they are moving. Risk of personal injury.

Openings with dampers should always be covered by ducts.

Any unducted air dampers should be fitted with a protective grille (not included in Munters delivery) to prevent injury from the damper blade movement.

Damper maintenance

Clean and check the operation of the dampers, the gearing and bearings.

The blades can be cleaned with water or compressed air.

Check the position in respect of the indications “OPEN” and “CLOSED”.

If the dampers do not move freely, lubricate the gearing and bearings with silicone oil.

4.6 Flexible connections



Figure 4.10 Flexible duct connection

Flexible duct connections are used in order to avoid any transmission of structure borne noise and vibrations.

The length in operation is normally 120 mm (fully extended 200 mm).

The flexible connections are relatively fragile and cuts must be avoided.

The flexible connections are fixed during transport.



WARNING!

As the pressure inside can be high, the flexible connections must not be dismounted during operation.



CAUTION!

The flexible connections can never be used as duct support.

5 Commissioning



CAUTION!

Commissioning and initial start-up of the unit should be carried out by Munters personnel only.

5.1 Checks before starting up

- Check that the fan motor transportation blocks are removed.
- It is always possible that during transport certain elements work loose due to vibrations. We advise you to check thoroughly that all screws and nuts, and in particular rotating parts such as turbines, pulleys, bearings, etc., are tight.
- Turn the fan by hand to make sure that it can rotate freely. Check that no foreign bodies have found their way into the fan.
- Check that the bearings in the motor and fan are properly lubricated.
- Check that there are no foreign bodies in the unit (or in the ducts) and that the air intakes and outlets are not blocked.
- Check manually that the dampers are correctly positioned and are able to operate correctly.
- Check the tension and alignment of the belts and readjust if necessary.
- Check all electrical connections.
- Check the direction of rotation of the fans and compressors. Correct direction can be checked on a fan wheel with an arrow, or by monitoring the change in high and low pressure when a compressor starts.



CAUTION!

Rotation direction is checked in the factory meaning that if one motor is rotating in the wrong direction, all motors are actually rotating in the wrong direction. Phases must then be inverted on the main terminal block. It is still important to check all motors.

- The cooling coil sections are supplied with drains. Check that they are correctly connected to allow efficient drainage.
- Fit the air filters. Ensure that the filters are firmly attached to the frame.

NOTE! *Before putting the unit into operation, the bag filters must be protected to avoid the excessive accumulation of dirt caused by the first use (dust and construction residue in the unit).*

- Adjust the differential pressure switches.

5.2 Inspection of evaporative coolers

1. Remove any loose material in the bottom of the water tank.
2. Close the bottom valve and fill the tank with water.
3. Check that the connections are tight.
4. Check the function of each solenoid valve.

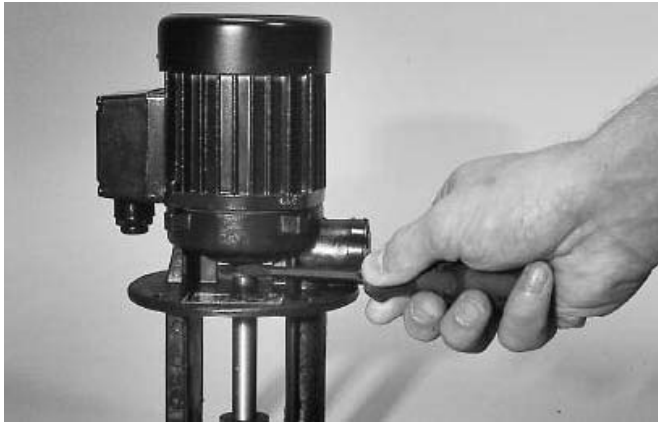


Figure 5.1 Checking the direction of rotation

The items below concern recirculated systems:

5. Start the pump and check the direction of rotation by touching the rubber ring with a screwdriver. Viewed from above, the motor should rotate clockwise. If it rotates in the wrong direction, switch two of the phases.
6. Adjust the bleed-off valve to correspond to the calcium level in the water.

NOTE! *The level of the water in circulating water coolers is very important. If the level is consistently too low, cooling performance can be drastically impaired.*

5.3 Starting up

After carrying out all the checks listed above, the unit can be put into operation and the following points checked:

- a) Measure the tension of the network and the intensity absorbed by each motor and compare them to the figures on the motor identification plate.

NOTE! *The power of the motors in our units is calculated with a predetermined safety coefficient. Compare the theoretical intensity with the intensity absorbed by the motor of the unit while it is operating.*

- b) The system's external static pressure must comply with the order specifications. Non-conformance will lead to variations in the air flow.

The flow rate varies according to the rotation speed of the fan, the pressure according to the square of the rotation speed and the absorbed power according to the cube of this speed. If the system pressure is lower than the values estimated, the flow rate will increase together with the absorbed power, which creates a risk of overloading the motor. This is especially important for forward curved fans. For backward curved fans the absorbed power curve follows almost exactly the rotation speed curve.

NOTE! *Compliance with all these points is a condition of the guarantee.*

6 Service and maintenance

6.1 Safety



Figure 6.1 Electrical hazard



Figure 6.2 Secure against reconnection

Electrical hazard



WARNING!

Installation, adjustments, maintenance and repairs must only be carried out by qualified personnel who are aware of the risks involved when working with equipment operating with high electrical voltage and high machine temperatures.



WARNING!

Do not open distribution boxes or other electrical connection boxes. The unit is connected to high voltage which can cause serious injury or death.



WARNING!

Before doing any service or maintenance work on the unit make sure that all electrical equipment is disconnected from the power supply, and secured against reconnection.



WARNING!

Any external electrical equipment, for example a portable lamp, must be connected to an earth fault breaker.

Physical hazard**WARNING!**

Remove hand wheels from water and steam supply valves, or otherwise lock off reopening on a component that is isolated to prevent inadvertent reopening. Alternatively, place a notice on the valve indicating that it is closed for a reason.

**WARNING!**

Rotating hazard. The unit contains rotating fans and other moving parts.

To prevent personal injury, the unit must be run with all panel doors closed and all removable panels and protective grids properly in place. Never open the doors or panels before all fans and other moving parts have come to a complete stop, and the main power is switched off.

Fans and other moving parts can start automatically and without warning.

**WARNING!**

Cleaning agents, cooling media, oil and grease are substances that are dangerous to personal health and to the environment. They must not be allowed to drain away into the soil or the public sewer system. The disposal of such substances must be effected in accordance with local and national law and regulations.

NOTE! *A portable lamp is required when carrying out service work inside the unit.*

Property hazard**CAUTION!**

Service and maintenance work should only be carried out by qualified and trained personnel. Operating faults can occur if the unit is maintained insufficiently or incorrectly.

**CAUTION!**

Protect the bottom panels if work must be carried out inside the unit.

6.2 General

Most air treatment units require the same type of maintenance. The following paragraphs explain the necessary basic rules.

Service and maintenance interval lengths are primarily determined by operating conditions and the environment in which the unit is installed. For example, if the process air contains a lot of dust, preventative maintenance should be carried out at shorter intervals. The same also applies if the unit works intensively.

The service levels for a standard service and maintenance programme are described in section 6.3, *Service options*.

The control system is equipped with a service indicator. It is programmed at commissioning to give a service alarm after an estimated number of operating hours, or on the preset date for the next service.

6.3 Service options

In addition to commissioning of the unit there are four service options (A - D) as standard.

S. Commissioning/start-up.

A. Inspection and if necessary change of filter. General function check.

B. In addition to A, safety check and capacity, temperature and humidity regulation measurements.

C. In addition to B, preventive replacement of some components after 3 years of operation.

D. In addition to C, preventive replacement of some components after 6 years of operation.

NOTE! *Always contact Munters for service or repair. Operating faults can occur if the unit is maintained insufficiently or incorrectly.*

NOTE! *Commissioning/Start-up inspection "S" by Munters is mandatory to validate the full warranty.*

Munters service engineers have special equipment and rapid spare parts access to handle service on all Munters products. All test equipment used by our personnel to ensure proper system balancing is certified for accuracy.

Munters Service can offer a service plan adapted to suit the conditions of a specific installation. See contact addresses on the back page of this manual.

6.4 Extended warranty

Munters offers an extended warranty to the standard terms when the Customer signs a service contract with Munters. Details are available on request.

6.5 Service and maintenance schedule

Service work	Service level	Start	A	B	A	B	A	C
	Operating time in hours	0	4000	8000	12000	16000	20000	24000
	Calendar time in months	0	6	12	18	24	30	36
Filter inspection, replace filter if necessary, function check		X	X	X	X	X	X	X
Preventive inspection including safety check		X		X		X		X
Inspection and leakage check of system boxes and doors, adjust hinges if necessary		X						X
Inspection of heating/cooling coils								X
Inspection of fans (impellers, motors, bearings)								
Examining electrical- and control systems, function check		X		X		X		X
Calibration of moisture control equipment, sensors and valves		X		X		X		X
Calibration of temperature control equipment and sensors		X		X		X		X

Table 6.1 Service and maintenance schedule (0 - 24000 hours)

NOTE! Service work should be performed at indicated operating hours or calendar time, whichever is reached first.

Service work	Service level	A	B	A	B	A	D
	Operating time in hours	28000	32000	36000	40000	44000	48000
	Calendar time in months	42	48	54	60	66	72
Filter inspection, replace filter if necessary, function check		X	X	X	X	X	X
Preventive inspection including safety check			X		X		X
Inspection and leakage check of system boxes and doors, adjust hinges if necessary							X
Inspection of heating/cooling coils							X
Inspection of fans (impellers, motors, bearings)							X
Examining electrical- and control systems, function check			X		X		X
Calibration of moisture control equipment, sensors and valves			X		X		X
Calibration of temperature control equipment and sensors			X		X		X

Table 6.2 Service and maintenance schedule (28000 - 48000 hours)

NOTE! Maintenance schedule restarts again after maintenance type D.

7 Supplements

Additional information is available in supplements as applicable:

- Product specification data sheet
- Control system
- DX refrigeration
- Installation
- Steam heating
- Humidification

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