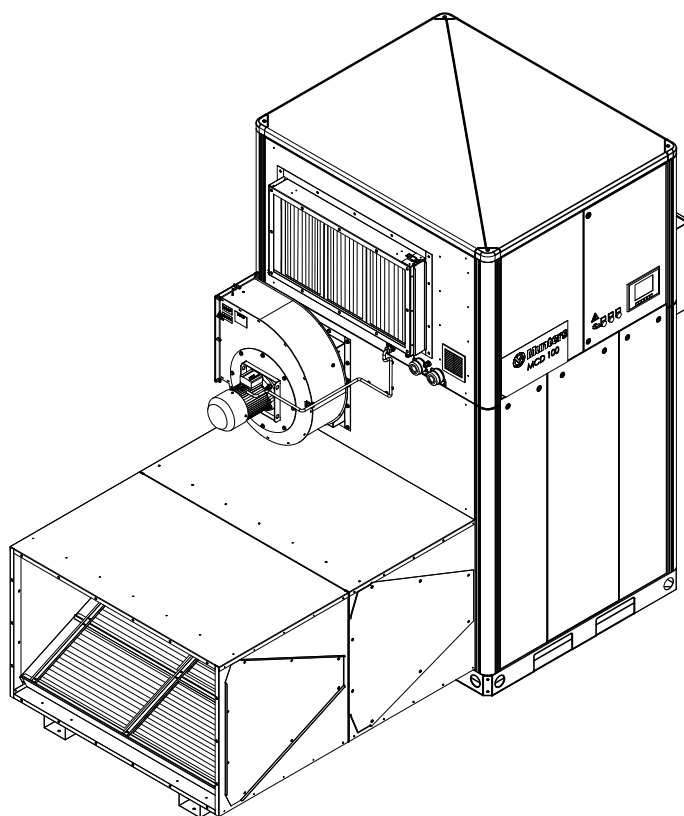


Users manual

MCD100S, MCD120S, MCD140S, MCD155S



Desiccant dehumidifier with steam heater for reactivation

Applies to all units manufactured
from week 22, 2013

190TEN-1067-J1408

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Important user information

Intended use

Munters dehumidifiers are intended to be used for the dehumidification of air. Any other use of the unit, or use which is contrary to the instructions given in this manual, can cause personal injury and damage to the unit and other property.

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.

Warranty

The warranty period is valid from the date the unit left our factory, unless otherwise stated in writing. The warranty is limited to a free exchange of parts or components which have failed as a result of defects in materials or workmanship.

All warranty claims must include proof that the fault has occurred within the warranty period and that the unit has been used in accordance with the specifications. All claims must specify the unit type and fabrication number. This information is stamped on the identification plate, see section *Marking*.

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.

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

Safety

Information about dangers are in this manual indicated by the common hazard symbol:



WARNING!

Indicates a possible danger that can lead to personal injury.



CAUTION!

Indicates a possible danger that can lead to damage to the unit or other property, or cause environmental damage.

NOTE! *Highlights supplementary information for optimal use of the unit.*

Conformity with Directives

The dehumidifier is in conformity with the essential safety requirements of the Machinery Directive 2006/42/EC, the Low Voltage Directive 2006/95/EC and the EMC Directive 2004/108/EC. The dehumidifier is manufactured by an ISO 9001:2008 accredited manufacturing organisation.

Copyright

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NOTE! *This manual contains information which is protected by copyright laws. It is not allowed to reproduce or transmit any part of this manual without written consent from Munters.*

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1 Introduction

1.1 General

Munters manufactures a wide range of efficient dehumidifiers designed for different uses and applications. Contact your nearest Munters office if you have any questions regarding the installation or the use of your dehumidifier.

For product data, see section *Technical specification*.

1.2 About this manual

This manual contains necessary information for how to install and use the dehumidifier in a safe and efficient way. Information and guidelines for the operation of the control system can be found in a supplementary document, also delivered with the dehumidifier.

NOTE! *Make sure to read all relevant parts of this manual before operating or performing any work on the dehumidifier. This manual should be stored in a permanent location close to the dehumidifier.*

1.3 Unintended use

The following restrictions on use apply:

- The dehumidifier is not intended for outdoor installation.
- The dehumidifier is not intended for use in classified areas where explosion safety compliant equipment is required.
- The dehumidifier must not be installed near any heat generating devices that can cause damage to the equipment.

1.4 Safety and cautions

Every measure has been taken in the design and manufacture of the dehumidifier to ensure that it meets the safety requirements of the directives and standards listed in the EC Declaration of Conformity.

The information in this manual shall in no way take precedence over individual responsibilities or local regulations.

During operation and other work with a machine it is always the responsibility of the individual to consider:

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

The types of dangers that are indicated in this manual are described in section *Important user information*.

**WARNING!**

- The unit must not be splashed with or immersed in water.
- Do not connect the unit to other mains voltage than specified on the identification plate.
- Do not insert fingers or any other objects into the air vents.
- All electrical installations must be carried out by a qualified electrician and in accordance with local regulations.
- The dehumidifier can restart automatically after a power cut. Always set and lock the main power switch in the OFF position before carrying out any service work.
- Use only approved lifting equipment to prevent personal injury and damage to the equipment.
- Always contact Munters for service or repair.

**WARNING!**

Never lift an assembled unit using lifting eye bolts attached to the top box. Lifting eye bolts must only be used for lifting the top box during installation of a split unit. Failure to observe this can cause personal injury and damage to the unit

The safety labels below are attached to the unit. Make sure that all personnel working with or near the unit are aware of the meaning of each label.



Figure 1.1 Risk of personal injury due to electric shock.



Figure 1.2 Risk of personal injury due to hot surfaces.



Figure 1.3 Lifting of unit not permitted.

Text on the safety label in Figure 1.3 :

WARNING

Only lifting of top box permitted.

Refer to the user manual before lifting.

1.5 Operation monitoring

The dehumidifier is controlled and monitored from the control panel on the front of the unit, see section 5.1, *Control panel*. The HMI (Human Machine Interface) is used to display values and parameters, and to input settings and commands to the control system. The HMI is described in the separate supplement.

1.6 Application limitations

The dehumidifier conforms to the emission limits of residential, commercial and light-industrial environments except for the emission limits for harmonics emission (EN 61000–3–12). As the equipment exceeds the limits for harmonics it may not be used in residential, commercial or light-industrial environment without taking proper steps regarding the power installation like supplying the equipment from a dedicated transformer connected to the high or medium voltage network.

The dehumidifier may only be used in industrial environments (class A) when the HMI is equipped with a touch panel. If the HMI is equipped with a text panel, the dehumidifier may be used in all environments since the text panel is approved according to class B.

1.7 Fault indications

Any faults are indicated by the red light on the control panel. The cause of the alarm is indicated on the display.

1.8 Steam supply

The quality of water determines the quality of steam produced. It is important that a good quality steam supply, at the correct temperature and pressure, is available for a reliable operation of the steam heater. Disregarding this can lead to degradation of the heater performance and eventually to failure.

The following impurities are common in the feed water:

- Dissolved solids – which can cause scale to form on equipment. The principal dissolved solids are carbonate and sulphates of calcium and magnesium.
- Suspended solids – these can cause sludge to form in the boiler. Suspended solids are usually solid mineral or organic particles carried in suspension in the water.
- Dissolved gases – these can cause corrosion in equipment. The dissolved gases are oxygen and carbon dioxide.
- Frothing substances that can cause contamination and corrosion of the equipment. The frothing substances creates a foam that usually contains soda in the form of carbonates, chlorides or sulphates.

Correct water treatment is required to remove the impurities in the feed water. If the impurities are not removed there could be an overflow of boiler water into the steam system.

1.9 Marking

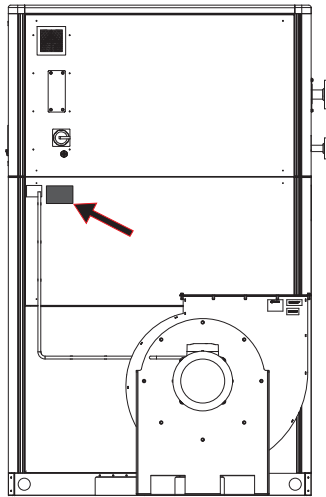


Figure 1.4 Position of identification plate

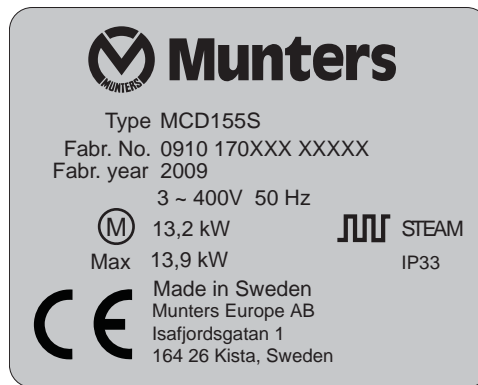


Figure 1.5 Identification plate, example

Explanation of "Fabr. no" on the identification plate:

09: Year of manufacture

10: Week of manufacture

170XXX: Article number

XXXXX: Serial number

2 Dehumidifier design

2.1 Product description

The desiccant dehumidifier has been designed to effectively dehumidify the air in environments requiring low air humidity.

All functional components are enclosed in a corrosion resistant Aluzink® casing (standard) or stainless steel casing (option) which makes installation and maintenance easy. The unit is constructed on a steel base frame which allows the use of a fork-lift truck during transportation and installation.

The electrical control system complies with standard EN 60204-1. The electrical components are mounted on bus bars. The dehumidifier is manufactured according to European standards and the established requirements for CE-marking.

2.2 Principle of operation

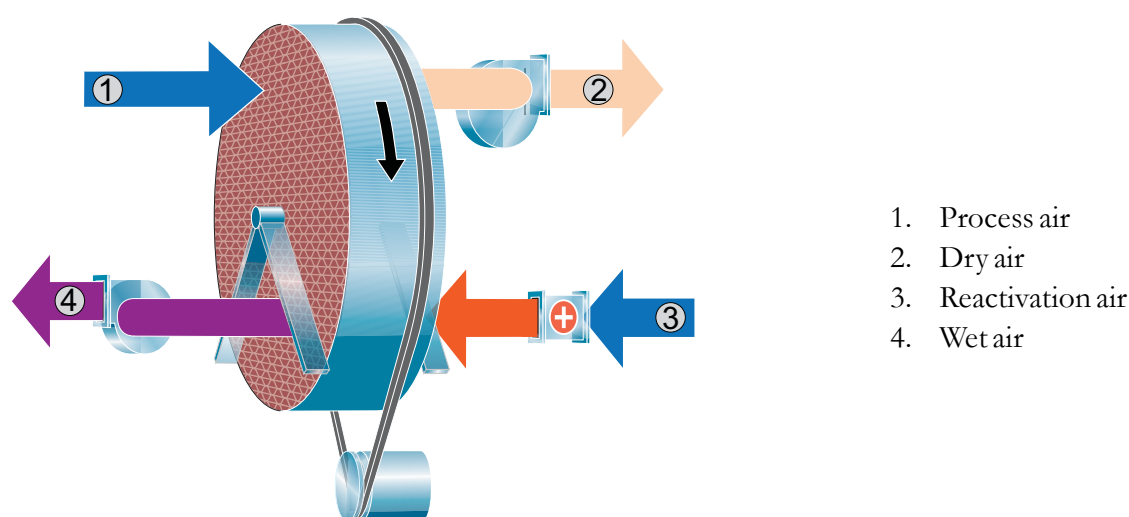


Figure 2.1 Rotor principle

The desiccant rotor is the adsorption dehumidifying component in the unit. The rotor structure is comprised of a large number of small air channels.

The desiccant rotor is made of a composite material that is highly effective in attracting and retaining water vapour. The rotor is divided in two zones. The airflow to be dehumidified, **process air**, passes through the largest zone of the rotor and then leaves the rotor as **dry air**. Since the rotor rotates slowly, the incoming air always meets a dry zone on the rotor, thus creating a continuous dehumidification process.

The airflow that is used to dry the rotor, **reactivation air**, is heated. The reactivation air passes through the rotor in the opposite direction to the process air and leaves the rotor as **wet air** (warm, moist air). This principle enables the dehumidifier to work effectively, even at freezing temperatures.

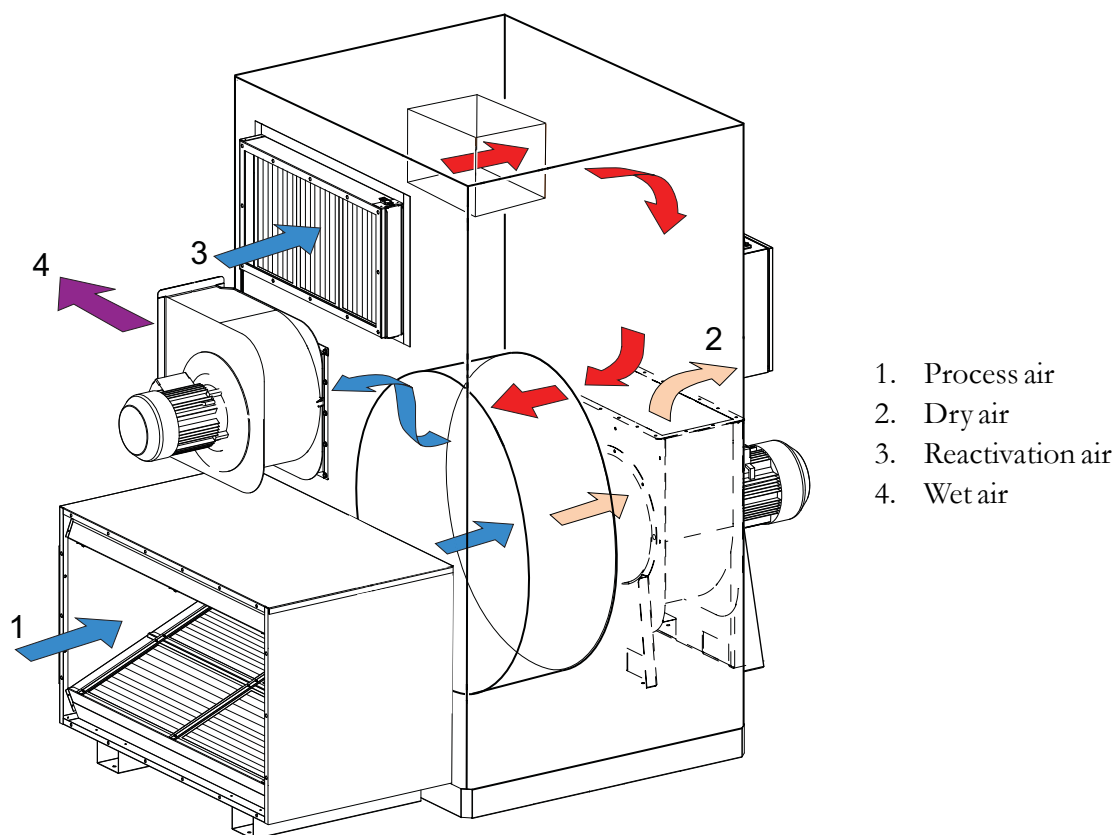


Figure 2.2 Airflow overview

2.3 Main components, exploded view

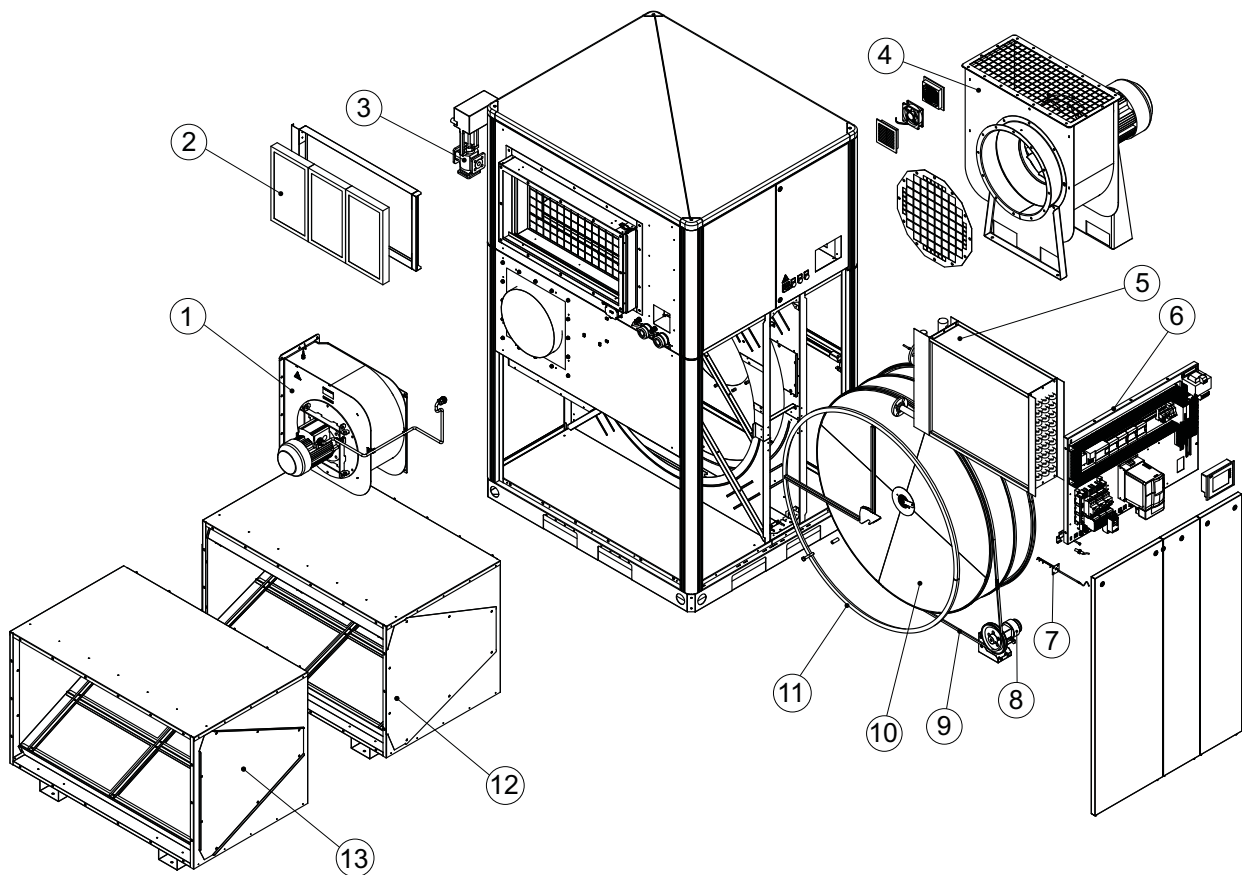


Figure 2.3 Main components

- | | |
|-----------------------------|--------------------------------------|
| 1. Reactivation fan | 8. Rotor drive motor |
| 2. Filter, reactivation air | 9. Drive belt |
| 3. Steam valve and actuator | 10. Rotor |
| 4. Process fan | 11. Rotor seal |
| 5. Steam coil | 12. Filter box, process air |
| 6. Electrical panel | 13. Filter box, process air (option) |
| 7. Temperature sensor | |

2.4 Configuration features

This chapter includes information about functions and components that can be added when ordering a MX² dehumidifier. At delivery, each unit is configured according to the configuration sheet supplied with the user manual.

2.4.1 Insulated process air inlet

All dehumidifier units supplied with pre-cooled process air have insulated process air inlet. The process air sector in front of the rotor has an internal lining of isolation to prevent condensation on the unit.

2.4.2 Process fan control

The process fan is equipped with a frequency converter for controlling the fan speed. The process fan control can be configured as fixed speed or variable speed according to below:

Fixed speed

The frequency converter for the process fan is pre-set at the factory and the process fan always runs with a constant speed that gives the rated process airflow.

Variable speed

The frequency converter for the process fan is controlled either by flow or pressure.

At flow control, a pressure sensor measures the pressure difference over the inlet cone on the process fan. At pressure control, a pressure sensor measures the air pressure in the dry air duct.

The actual value from the pressure sensor is calculated, together with the fan coefficient, by the PLC in the control system. The PLC compares the actual value with the set point value and changes the command signal to the frequency converter if there is a difference between the values.

2.4.3 Energy Recovery Purge

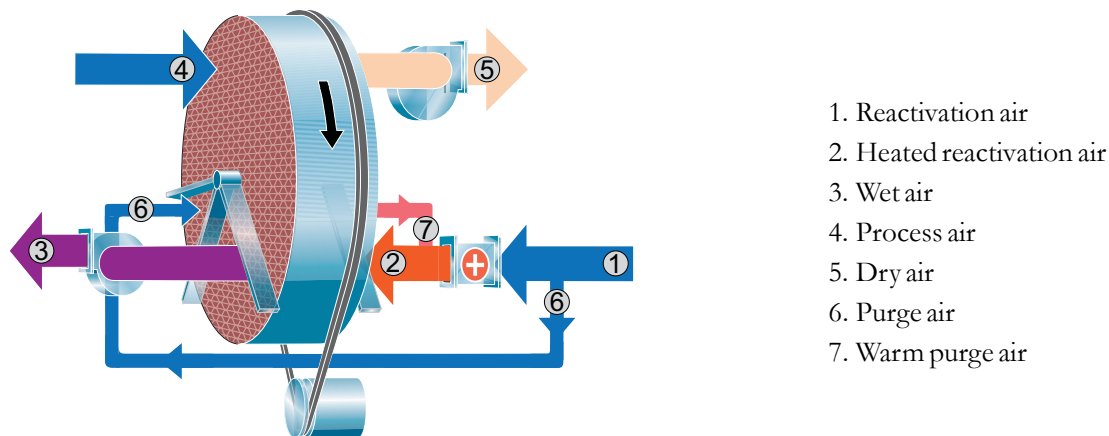


Figure 2.4 Principle for Energy Recovery Purge

Energy Recovery Purge (ERP) is an energy saving solution that recycles heat from the rotor, after the reactivation section in the rotational direction of the rotor. A minor part of the reactivation airflow is bypassed to the warm sector of the rotor, before the airflow enters the reactivation heater. The airflow is heated up by the rotor and then mixed with the reactivation airflow, after the reactivation heater. The recycled heat from the rotor increases the efficiency and reduces the energy consumption. Compared to a standard unit, ERP will give the same dehumidification capacity with reduced reactivation heater energy.

3 Installation

3.1 Safety



WARNING!

All electrical equipment connections must be carried out in accordance with local regulations and by qualified personnel. Risk of electrical shock.



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!

The mains power supply is permanently connected to the main power switch of the unit.



WARNING!

Never lift an assembled unit using lifting eye bolts attached to the top box. Lifting eye bolts must only be used for lifting the top box during installation of a split unit. Failure to observe this can cause personal injury and damage to the unit.



CAUTION!

Never climb on the unit or use it as scaffolding.

3.2 General

The dehumidifier is normally delivered on a single pallet. Due to height restrictions, the dehumidifier is sometimes delivered as a split unit, divided into four pallets with rotor box, top box, fans and filter box.

3.3 Inspection of delivery

1. Inspect the delivery and compare with the delivery note, order confirmation or other delivery documentation. Make sure that everything is included and nothing is damaged.
2. Contact Munters immediately if the delivery is not complete in order to avoid installation delays.
3. If the unit is to be put into storage prior to installation, see section *Storing the equipment*.
4. Remove all packaging material from the unit, and make sure that no damage has occurred during transportation.
5. Any visible damage must be reported in writing to Munters within 5 days and prior to installation of the unit.
6. Dispose of the packaging material according to local regulations.

NOTE! *If the dehumidifier is delivered as a split unit, especially check that the seals on the rotor box are not damaged.*

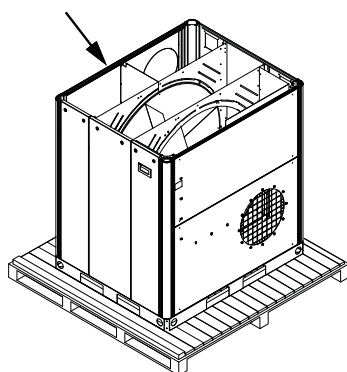


Figure 3.1 Rotor box seals

NOTE! *After delivery inspection, the consignment note should be signed to confirm approval of delivery.*

3.4 Moving the dehumidifier

The dehumidifier must be handled with care. All panel doors must be closed during transportation. Use a fork lift or pallet loader to move the dehumidifier. The forklift/pallet loader must be equipped with extended forks to ensure even weight distribution. See section 8.4, *Technical data* for weight data.



WARNING!

Move the dehumidifier carefully as there is a risk of the dehumidifier tipping over.

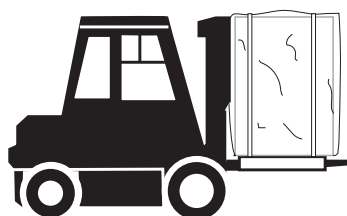


Figure 3.2 Correct length on forklift arms

**CAUTION!**

Never move the dehumidifier when the process fan and filter box have been installed. Failure to observe this will cause damage to the dehumidifier.

3.5 Storing the dehumidifier

The following is important if the dehumidifier is to be stored prior to installation:

- Place the dehumidifier in an upright position on a horizontal surface.
- Protect the dehumidifier from physical damage.
- Store the dehumidifier under cover and protect it from dust, frost, rain and aggressive contaminants.

See section 8.4, *Technical data* for correct storage temperature.

3.6 Site requirements

NOTE! *It is important that the intended installation site meets the requirements in order to achieve the best possible performance and trouble-free operation.*

NOTE! *It is important for both maintenance and service purposes that the minimum service space requirements are complied with.*

The dehumidifier is only intended for indoor installation. Avoid installing the dehumidifier in a damp environment where there is a risk of water entering the unit, or in a very dusty environment. Refer to Munters for advice if in doubt.

NOTE! *If there is a need for reduction of vibrations from the dehumidifier, contact Munters for instructions. Refer to standard EN1299+A1:2008.*

See section 8.3, *Dimensions and service space* for unit and service dimensions.

3.7 Split unit installation

**WARNING!**

To prevent personal injury or damage to the dehumidifier, always use approved lifting equipment.

**WARNING!**

Check that the lifting equipment is capable of supporting the top box before lifting.

See section 8.4, *Technical data* for weight data.

**CAUTION!**

A lifting frame with four slings must be used when lifting the top box. The lifting angle must not exceed 15°, see Figure 3.9.

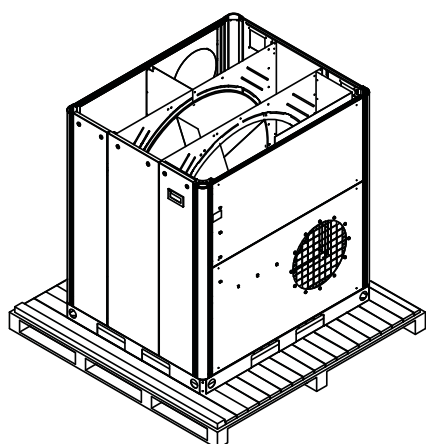


Figure 3.3 Rotor box

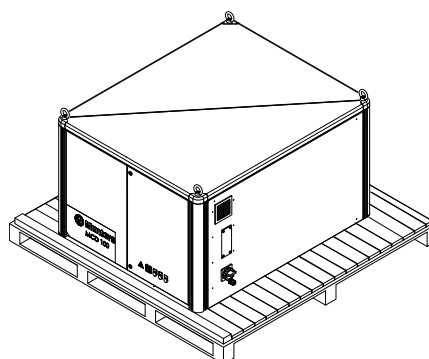


Figure 3.4 Top box

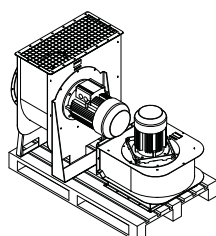


Figure 3.5 Fans

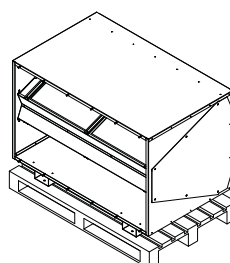


Figure 3.6 Filter box

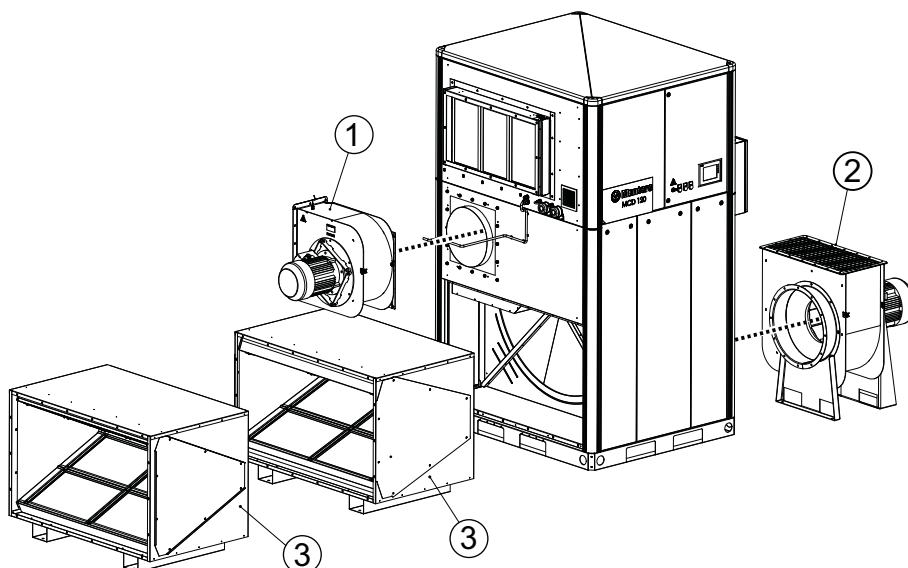


Figure 3.7

1. Reactivation fan
2. Process fan
3. Filter boxes

3.7.1 Assembly

1. Pull off the protection tape from the rotor box seals.
2. Make sure that the four lifting eye bolts for the top box are tightened.

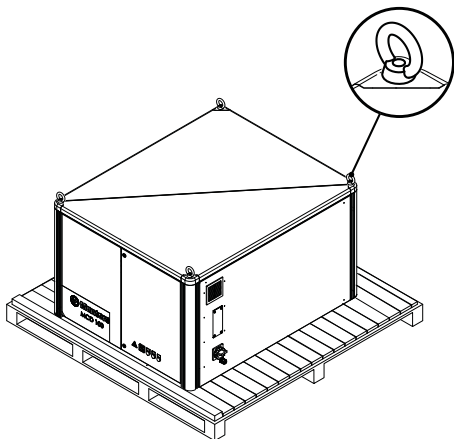


Figure 3.8 Lifting eye bolts for top box

3. Lift the top box onto the rotor box and make sure that the guide lips and M8 screws align in each corner, see *Figure 3.9*.

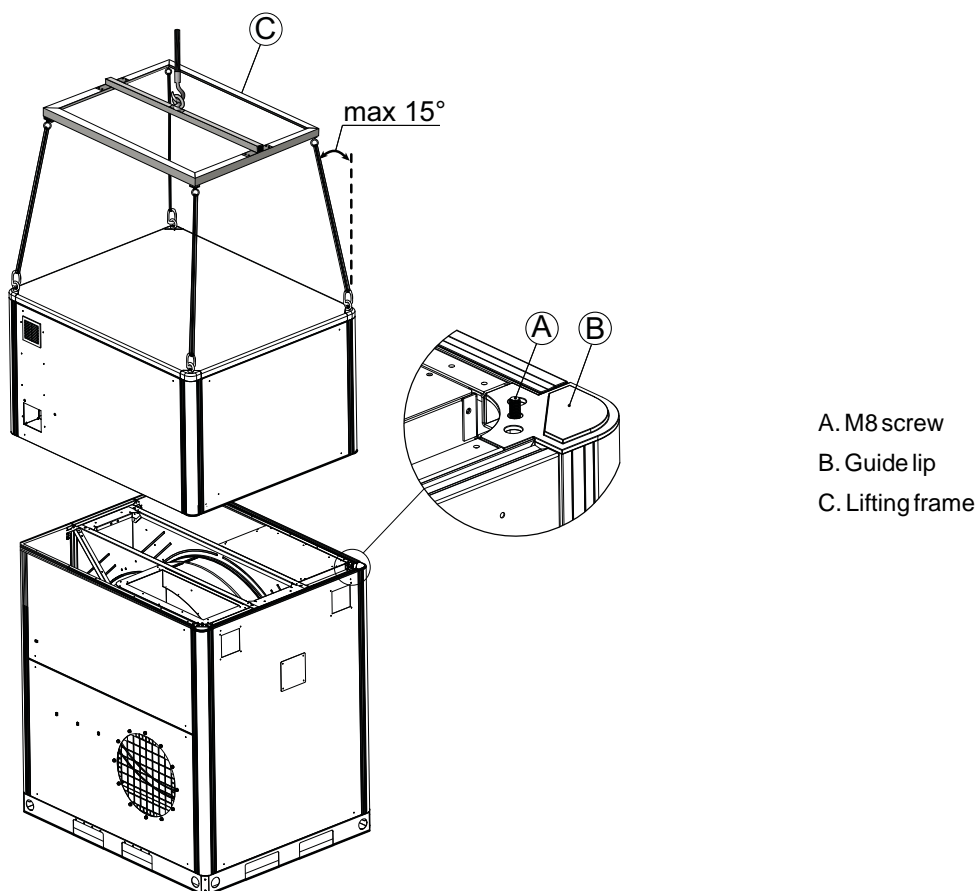


Figure 3.9 Lifting the top box

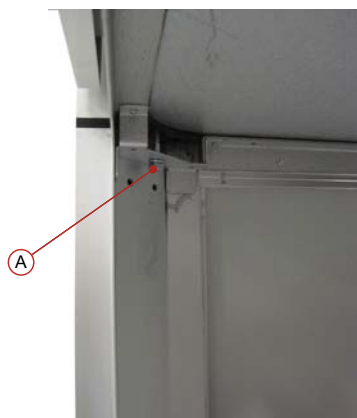


Figure 3.10 A: M8 screw seen from underneath.

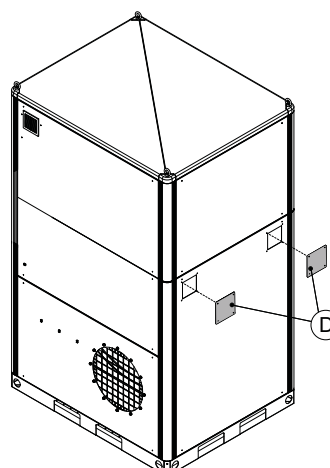


Figure 3.11 D: Cover plates

4. Tighten the four M8 screws (A) to compress the seals.
5. Fasten the two cover plates (D) with pop rivets (4 x 10 mm).
6. Unscrew the lifting eye bolts from the top box to prevent lifting of the assembled unit.
7. Move the unit to its final position on the site using a fork lift or pallet loader, before installing the fans and filter box(es).
8. Install the process fan and process filter box(es) to the rotor box.

NOTE! Standard delivery includes one process filter box.

9. Attach a sling to the reactivation fan according to Figure 3.12 and lift the fan into position on the rotor box.
10. Tighten the screws holding the fan before removing the sling.



Figure 3.12 Lifting the reactivation fan

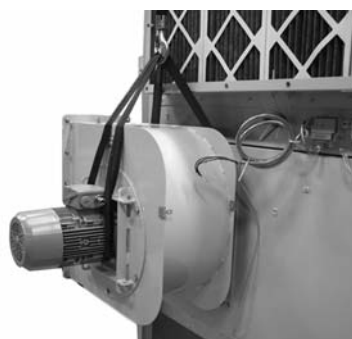


Figure 3.13 Reactivation fan lifted into position

3.7.2 Electrical connections

1. Install the infeed box and the cable for power supply.

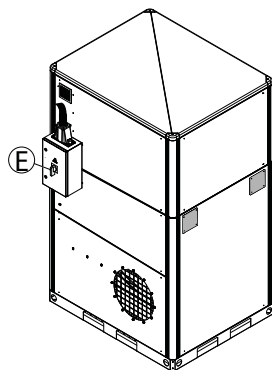


Figure 3.14 Power supply infeed box (E)

2. Connect the cables for the reactivation fan and process fan, see *Figure 3.15*, *Figure 3.16* and *Figure 3.17*.



Figure 3.15 Fan motor wiring

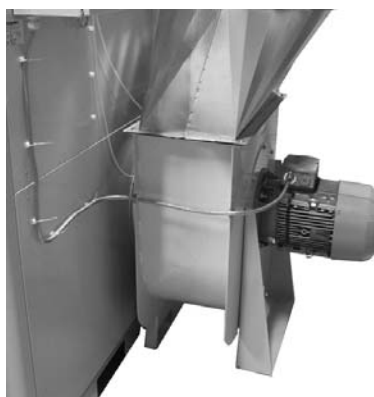


Figure 3.16 Process fan

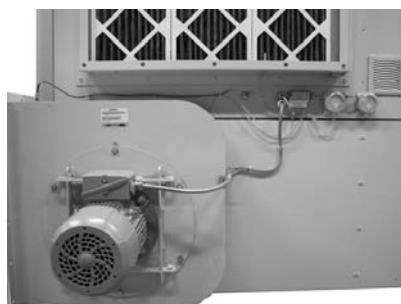


Figure 3.17 Reactivation fan

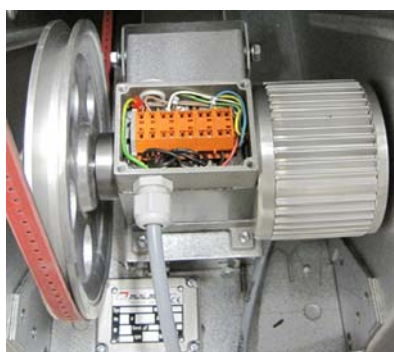


Figure 3.18 Rotor drive motor

3. Connect the cables for the rotor drive motor according to *Table 3.1* and *Figure 3.18*.

| Terminal block (drive motor) | Drive motor cable |
|------------------------------|-------------------|
| Brown cable | 5 |
| Brown cable | 4 |
| 6 (yellow) | 3 |
| 4 (blue) | 2 |
| 2 (green) | 1 |

Table 3.1 Connections for rotor drive motor

- Connect the HTCO and PT1000, see *Figure 3.19*, *Figure 3.20* and *Figure 3.21*.
Run the cables through the rubber grommet (F). Insert the HTCO cable as far as possible into the pipe (I).
- Apply silicone sealant around the cable at the pipe end.



Figure 3.19 F: Grommet for HTCO/PT1000

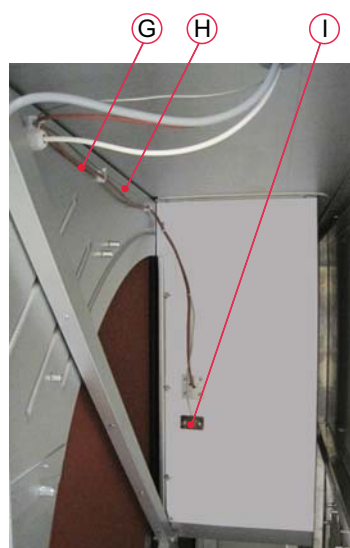


Figure 3.20 PT1000 cable (G), HTCO cable (H), pipe (I)



Figure 3.21 PT1000 connection at reactivation fan

6. Connect the DPT (Differential Pressure Transmitter) for the reactivation fan. The bottom side of the DPT is marked with plus (+) and minus (-) at the two connections.
 - Connect the tube from the fan duct (before impeller) to plus (+).
 - Connect the tube from the fan cone (impeller) to minus (-).
7. Connect the DPT for the process fan.
 - Connect the tube from the fan duct (before impeller) to plus (+).
 - Connect the tube from the fan cone (impeller) to minus (-).

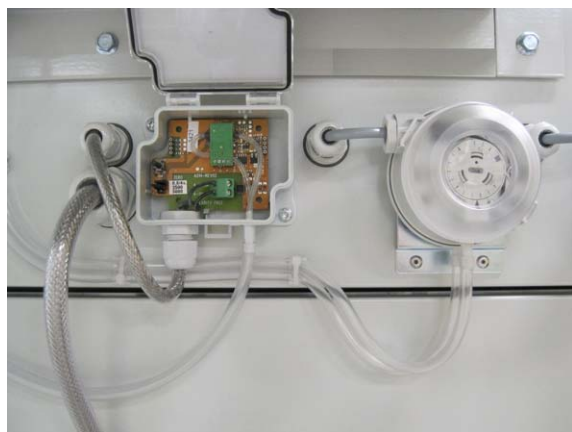


Figure 3.22 Connection for DPT (Reactivation fan)



Figure 3.23 Connection for DPT (Process fan)

3.8 Scope of delivery – steam reactivation system

The following steam components are included with the delivery:

| Component | MCD100 | MCD120 | MCD140 | MCD155 |
|---|---------------|---------------|---------------|---------------|
| Steam valve (Sauter) | VUG 015 F304 | VUG 020 F304 | VUG 020 F304 | VUG 015 F304 |
| Actuator (Sauter) | AVM 234S F132 | AVM 234S F132 | AVM 234S F132 | AVM 234S F132 |
| Steam battery with flange and companion flange PN16, DN25 (1") and DN40 (1½"). | | | | |
| The steam valve is delivered without companion flange PN16, DN15 (½") or DN20 (¾"). | | | | |

A data sheet for the valve and actuator are delivered with the components. Contact Munters for additional information.

3.9 Steam regulation

For dehumidifiers with steam reactivation heater, the dehumidification capacity/reactivation heater effect can be regulated according to the two different principles described below. The regulating principle is set from the factory.

1. **Steam pressure regulation:** The steam pressure in the steam heater is regulated by a modulating reducing valve on the steam inlet. As this regulating principle result in a narrow regulating range for the reactivation temperature, it is not suitable if the dehumidifier will run for long periods with low dehumidification need.
2. **Variable reactivation flow:** Steam pressure and condensation temperature remains constant all the time. The steam control valve is operated with an ON/OFF-function. Dehumidification capacity and reactivation power is controlled by varying reactivation flow, this by means of variable-speed control on the reactivation fan. The reactivation flow can be down-regulated from rated flow to a small flow limited by the fan motor's minimum speed, or the air distribution in the reactivation sector.

When the steam control valve closes, the steam flow to the heater is shut-off. This can be selected when there is no need for dehumidification, or when the dehumidifier is turned off.

In order to limit the reactivation temperature when the reactivation airflow is low, the steam supply pressure must not exceed 4–5 bar(g).

Default setting from the factory is variable reactivation flow.

3.10 Steam heater – recommendations for installation

The following components must be installed as part of the steam supply system to ensure problem-free operation:

- Separator for removing contaminants and fluid from incoming steam. The separator removes fluids that can negatively affect the heat transmission surface or cause erosion damage.
- A steam control valve for opening and closing the steam flow through the heater. When regulating with steam pressure, the valve is used for adjusting the condensation temperature in the heater. For all types of control valves, it is important that they open slowly in order to reduce the risk of hydraulic shock, thermal strains and erosion that can damage the heat exchanger. The delivered steam control valve is equal percentage in order to obtain a slow opening action. The actuator has an opening time of 120 seconds. Respect these values when replacing the valve by an other type.
- When the steam control valve has a modulating function, note that the pressure drop across the valve affects the steam pressure to the steam heater, and therefore the temperature that can be achieved. Observe this if selecting another control valve than the one delivered.
- A vacuum breaker shall be installed on the steam inlet to make it possible to drain condensate upon shut-down and when operating with low power consumption.
- The steam trap must be a float type, preferably with built-in thermal de-aerator. A thermostatic trap must not be used.
- A non-return valve must be installed in the condensate return line to prevent condensate from returning to the heater and to protect against any hammering in the condensate system. This applies if the condensate return line has condensate from more than one steam trap as there could be differing pressures and temperatures and/or to protect against return flow when condensate is "lifted" to the condensate tank.

- Both the inlet and outlet lines must have expansion bends to compensate for thermal expansion. All pipework must be independently supported close to the dehumidifier to prevent strain on the steam heater.
- If the air temperature drops below +7 °C, a risk of freezing is presumed and a thermostat must then be installed directly downstream of the heater in the airflow direction. The thermostat must be a two-stage type with a long, temperature sensing capillary tube. The capillary tube is active along its entire length, and mounted so it covers the sectional area efficiently. The thermostat reacts to the lowest temperature present along the capillary tube length, that is where the gas in the thermostat system condensates. At the air temperature +7 °C, the reactivation effect should increase and a warning-type of alarm be triggered. If the temperature drops further to +3 °C, the thermostat should switch off the dehumidification system so that the reactivation airflow ceases and an alarm is triggered.

In addition to the above, installation of the following components is recommended to facilitate operation and maintenance:

- De-aerator to ventilate any oxygen or other gases in the steam supply.
- Shut-off valves.
- A manometer to indicate the steam pressure at the heater.
- A thermometer, capable of withstanding the line pressure, to indicate the full scale of the steam supply.
- Filters to restrict unwanted impurities.
- An extra shut-off valve downstream of the condensate trap. This to facilitate installation of a manometer, which would quickly indicate any counter pressure in the condensate system in the event of any malfunctions during operation.

NOTE! *If a manometer is installed in the steam line, the full scale reading must be 1,5 times the line pressure where it is installed.*

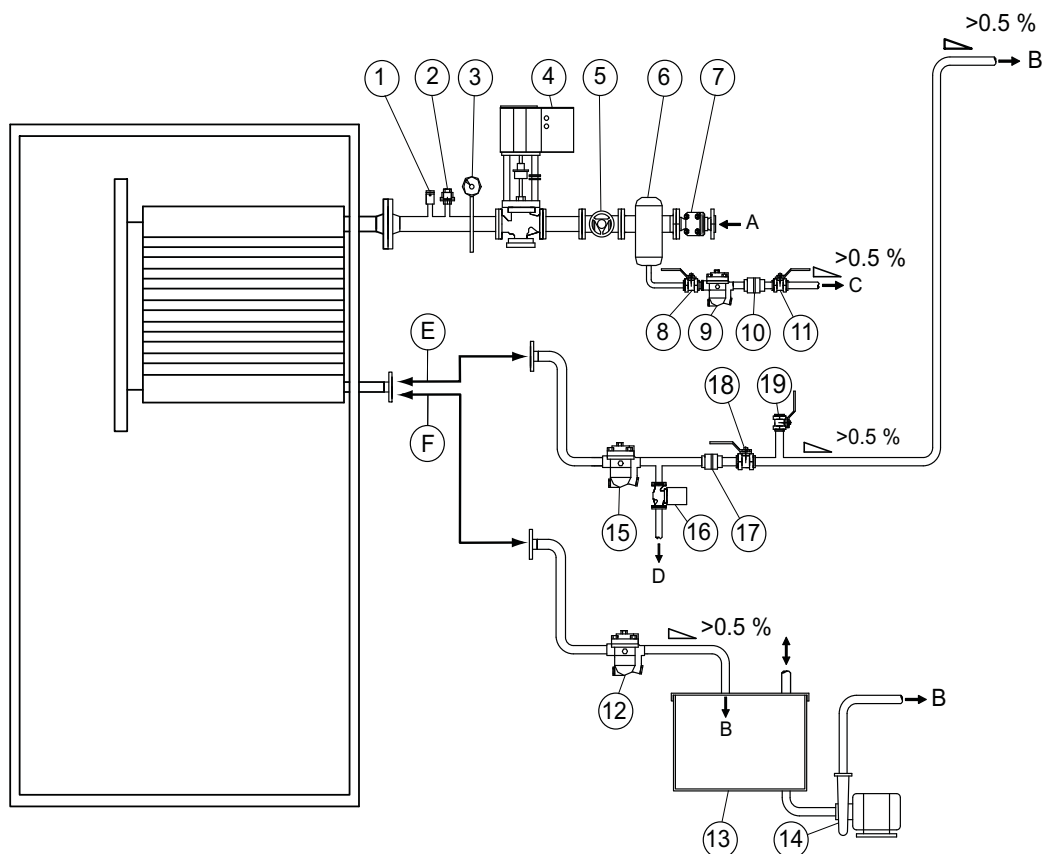


Figure 3.24 Installation of steam heater.

A. Steam supply

B. Condensate return, dehumidifier

C. Condensate return, drainage

D. Condensate drainage

E. Closed condensate return

F. Open condensate return

1. Thermal de-aerator

2. **Vacuum valve**

3. Manometer

4. **Modulating steam valve**

5. Mushroom valve

6. **Separator**

7. Steam filter

8. Ball valve

9. **Steam trap (float)**

10. **Non-return valve**

11. Ball valve

12. **Steam trap (float)**

13. Condensate tank

14. Pump

15. **Steam trap (float)**

16. **Electromechanical valve**

17. **Non-return valve**

18. Ball valve (shut-off valve)

19. Ball valve (for connecting manometer)

NOTE! Components marked in bold must always be installed.

NOTE! *All pipework must be supported to ensure minimal strain on the connections.*

NOTE! *It is vital that the control valve does not open too quickly, including during "On/Off" control as this might damage the steam heater and other components.*



WARNING!

When the steam control valve opens, no condensate must remain in the steam heater. During downtime, the pressure in the heater must not prevent draining of the heater.

NOTE! *It is extremely important that the condensate return line does not have too high counter pressure, and that it is installed at a downward slope from the steam heater outlet all the way to the open condensate tank. This to make drain of condensate easier.*

If this is not possible due to external conditions, the risk of stalling must be minimised by installing a condensate pump or a component with the same function.

3.11 Duct installation

3.11.1 General recommendations

The connections for process and reactivation air are designed in accordance with the recommendations in ISO 13351. The rectangular duct connections contain tapped inserts for M8 screws.

NOTE! *The dehumidifier has been designed to operate at specific process airflows (corresponding to the fan sizes installed) and must not be directly connected to air-conditioning systems.*

When installing ductwork between the dehumidifier and the inlet and outlet connections, the following recommendations should be observed:

- The length of ductwork should be kept as short as possible to minimise static air pressure losses.
- To maintain performance, all rigid process or reactivation air ductwork joints must be air and vapour tight.
- The process air ductwork must be insulated to prevent condensation developing on the outside of the duct, whenever the temperature of the air within the duct falls below the dewpoint temperature of the ambient air through which the ductwork is routed.
- The ducts must always be insulated when there is a risk of freezing.
- The wet air leaving the dehumidifier will, because of high moisture content, condense on the inside duct walls. By insulating the ducts, the amount of condensate is reduced.
- Horizontal wet air ducts must be installed with a slight decline (away from the dehumidifier) to drain away possible condensation. Suitable condensation drains should be installed at low points in the wet air outlet duct, see *Figure 3.26*.
- Ensure that access for operation and servicing is not restricted when designing and installing ducting. For more information, see section 8.3, *Dimensions and service space*.
- To reduce noise and/or vibration being transmitted along rigid ducts, good quality, airtight flexible connections can be fitted.
- Ducts mounted directly onto the dehumidifier should be adequately supported to minimise the load and stress due to the weight and movement of the ducting.
- Dampers for adjusting the airflows must be installed in the dry air outlet and reactivation air inlet ducts. Correct airflows are essential for maintaining the operating efficiency of the unit. For airflow adjustment details, see section 4.2, *Airflow adjustment*.
- If the dehumidifier is equipped with a frequency converter for the process air, see section 4.2, *Airflow adjustment*, the process air pressure and flow are adjusted using the process air fan's frequency converter. In this case, there is no need for a damper in the dry air duct.
- The total pressure drop in the process and reactivation ductwork must not exceed the available pressure of the fans fitted to the dehumidifier. For details of minimum available static pressure, see section 8.4, *Technical data*.

3.11.2 Duct for outdoor air inlet

When bringing ambient air from outdoors into the dehumidifier, the inlet duct opening must be located sufficiently high above ground level to prevent dust and debris from entering.

The ducting must be designed to prevent rain and snow from being drawn into the dehumidifier. The air inlet must be located away from possible contaminants such as engine exhaust gases, steam and harmful vapours.

To prevent the wet (outlet) air from humidifying the reactivation (inlet) air, the air inlet for reactivation must be located at least 2 m from the wet air outlet.

Attach a wire net with a mesh width of approximately 10 mm in the outer end of the duct to prevent animals from entering the dehumidifier ducting.

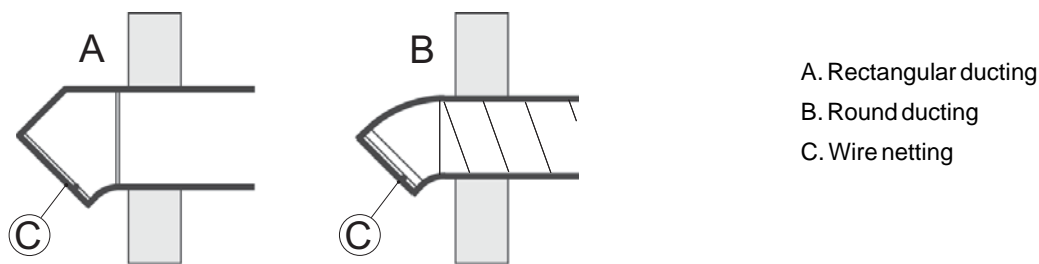


Figure 3.25 Outdoor air inlet design

3.11.3 Duct for wet air outlet

The material for the wet air duct must withstand corrosion and temperatures of up to 100 °C. The wet air ducting must always be insulated if there is a risk of condensation. The wet air leaving the dehumidifier will easily cause condensation on the inside of the duct walls due to the high moisture content.

Horizontal ducts must be installed sloping downwards (away from the dehumidifier) to drain away possible condensation. The duct slope must be at least 2 cm/m. In addition, drainage holes (5 mm) should be made at low points in the duct to prevent water accumulation.

Attach a wire net with a mesh width of approximately 10 mm in the outer end of the duct to prevent animals from entering the dehumidifier ducting.

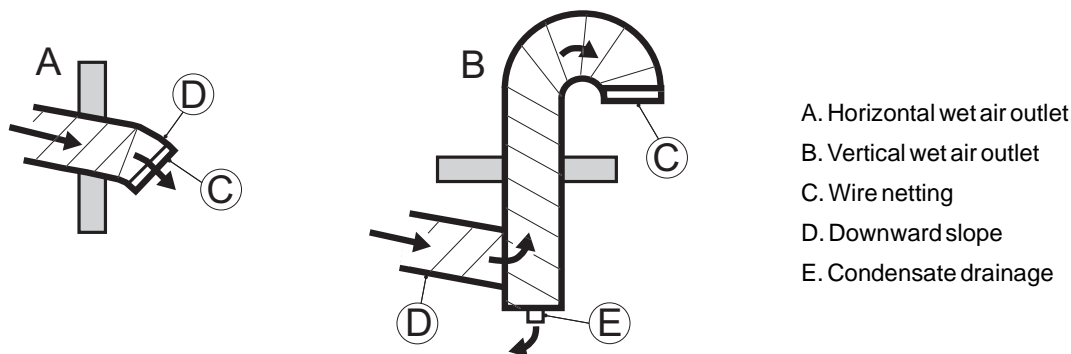


Figure 3.26 Wet air outlet design

3.11.4 Duct connection dimensions for inlets

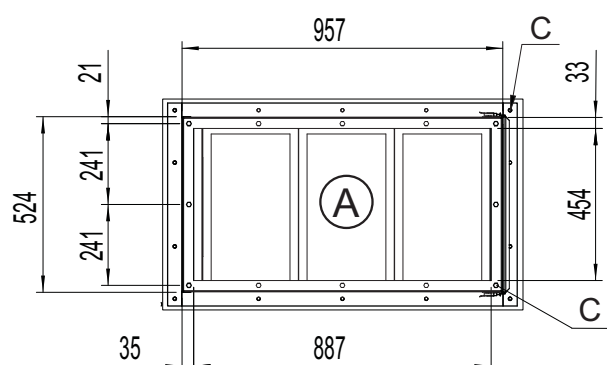
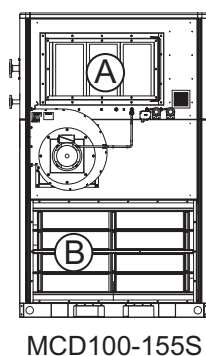


Figure 3.27 Reactivation air inlet

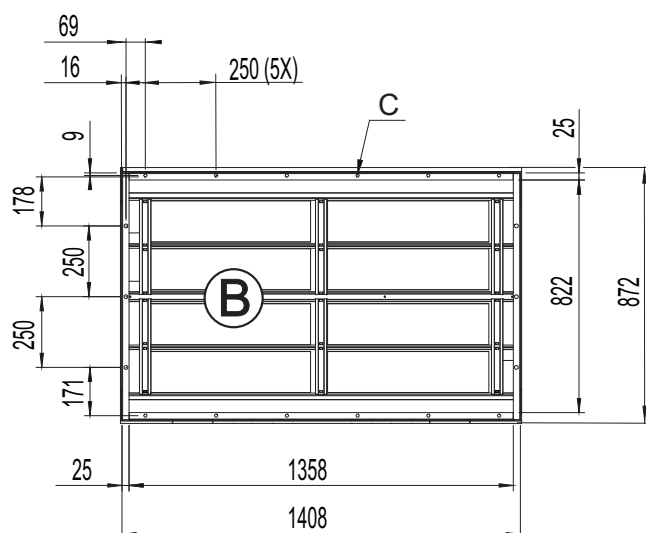


Figure 3.28 Process air inlet
(for installation with filter box)

C: Use hexagon head bolts (M8 x 25).

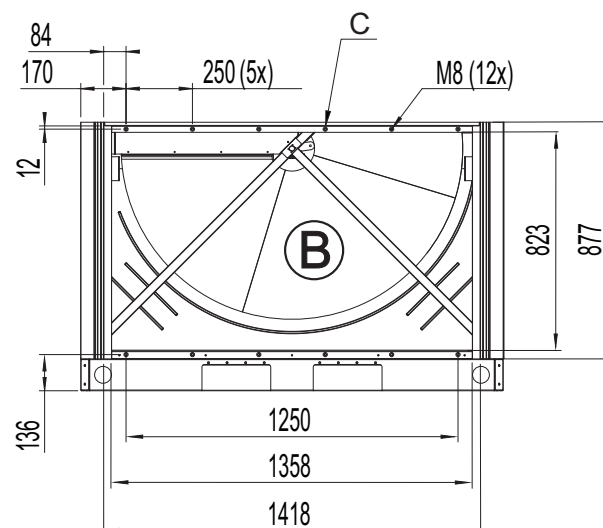


Figure 3.29 Process air inlet
(for installation without filter box)

NOTE! Fan protection grid removed to clarify dimensions in Figure 3.29.

3.11.5 Duct connection dimensions for fans

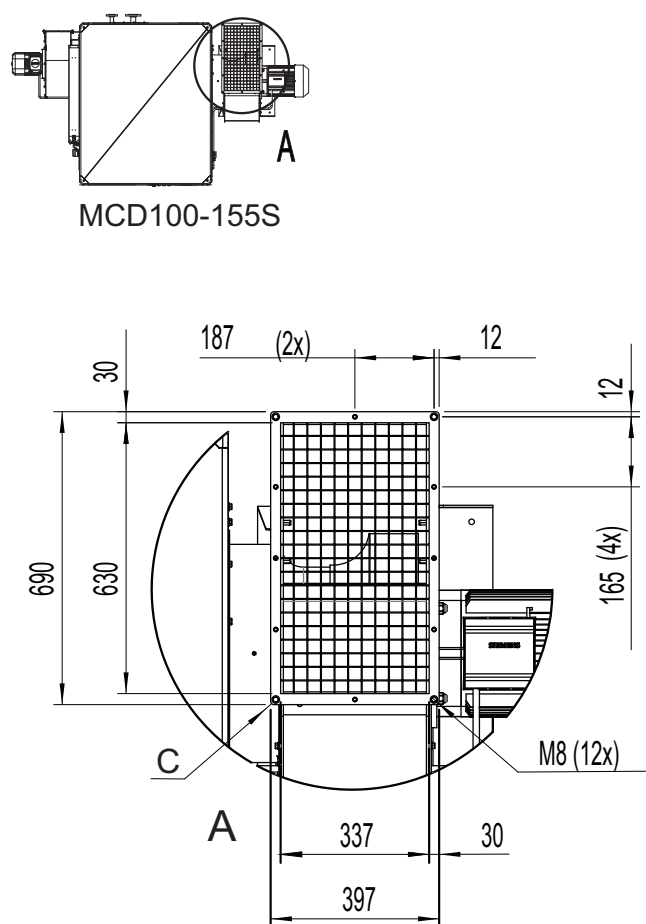
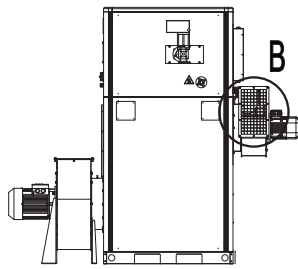
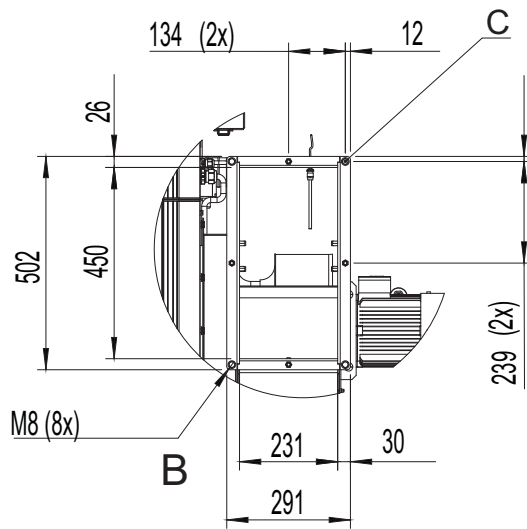


Figure 3.30 Process air outlet (dry air outlet)

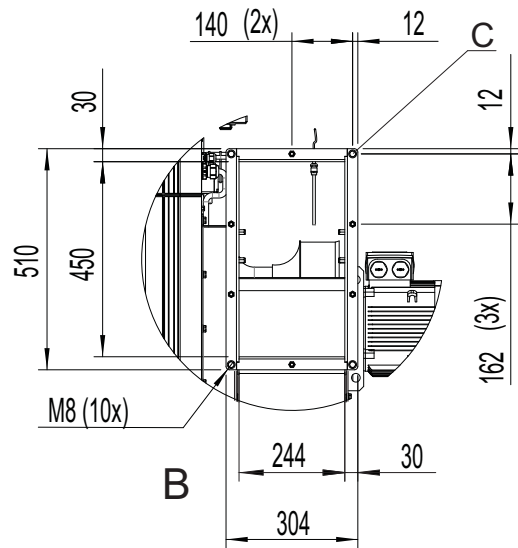
C: Use hexagon head bolts (M8 x 25).



MCD100-155S



MCD100
MCD155



MCD120
MCD140

Figure 3.31 Reactivation air outlet (wet air outlet)

C: Use hexagon head bolts (M8 x 25).

3.12 Steam connections

1. Ensure the shut-off valves are closed.
2. Connect the reactivation heater to the steam supply.
3. Open the steam supply valves.
4. Read the manometer and make sure that the steam supply pressure is correct.
5. Check that there are no leaks from the coil or the pipe connections.
6. Read the steam temperature on the thermometer and make sure that the temperature is correct according to the line pressure.
7. Open the control valve manually, very slowly, to test the condensation evacuation system.

3.13 Electrical connections

The dehumidifier is designed for operation with a three-phase four wire system. All dehumidifiers are delivered complete with all internal wiring installed and configured in accordance with the voltage and frequency specified on the identification plate.

The mains power supply is connected directly to the main power switch in the unit. The supply cable and main fuses must be dimensioned to suit the unit being installed. For connection details, refer to the identification plate and wiring diagram, or to section 8.4, *Technical data*.

NOTE! *The supply voltage must not differ from specified operating voltage by more than +/- 10%.*

3.14 External humidity transmitter

The dehumidifier is delivered with one of the humidity transmitters described below. The transmitter has an output signal of 4–20 mA for temperature and humidity respectively.

- Humidity transmitter for relative humidity in wall mounted version (standard):
The measurement range for humidity is 0–100 % RH as standard. The measurement range for temperature is -5...+55 °C as standard.
- Humidity transmitter for relative humidity in duct mounted version (standard):
The measurement range for humidity is 0–100 % RH as standard. The measurement range for temperature is -20...+80 °C as standard.
- Humidity transmitter for dewpoint (optional):
Measurement range -80...+20 °C.

The humidity transmitter is mounted externally and connected according to the wiring diagram provided with the unit. The humidity transmitter controls the dehumidifier when the mode switch is in **AUTO** position, i.e. automatic operation, and also indicates the current humidity.

To ensure correct operation, the humidity transmitter should be connected with NOVOFLEX NCY (shielded 4G, 0,75 mm²) electric cable, or equal.

When placed on a wall, the humidity transmitter should be mounted 1–1,5 m above the floor. It should be positioned so that it is not directly exposed to dry air from the unit, or moist air flowing in through doors that are opened and closed. It should not be placed close to a heat source or be exposed to direct sunlight.

For more information, see the wiring diagram delivered with the unit and the assembly instruction delivered with the humidity transmitter.

4 Commissioning



WARNING!

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



WARNING!

The mains power supply is permanently connected to the main power switch of the unit. Risk of electric shock.

4.1 Pre-start checks

1. Make sure that the main power switch on the control panel is in the **0** position.
2. Make sure that the air intake filters are undamaged and correctly installed and that all areas inside the different unit sections are clean.
3. Examine all ducts and duct connections and make sure that all connections have been correctly installed, and that there are no signs of damage to the system. Make sure that all ducts are free from unwanted material blocking the air passage.
4. Make sure that the humidity transmitter is correctly positioned in the duct, and correctly connected to the dehumidifier, see section 3.14, *External humidity transmitter*.
5. Open the cover for the electrical panel and make sure that no circuit breakers or automatic fuses have tripped. For more information, refer to the wiring diagram provided with the unit.
6. Make sure that the incoming power supply voltage is correct and that the cables are correctly connected.
7. Set the main power switch to position **1**.
8. Start the unit by setting the mode switch to position **MAN**.
9. Make sure that the rotor rotates in the direction indicated by the arrows. If the direction of rotation is wrong, interchange the connections for the incoming wires in the main power switch.
10. Switch off the unit and continue with the procedure in section 4.2, *Airflow adjustment*.

4.2 Airflow adjustment

4.2.1 General

To obtain optimal performance, the process and reactivation airflows must be correctly adjusted in accordance with the rated airflows, see 8.4, *Technical data*. The airflows can be set in the control system display without using dampers.

For more information about the control system, parameters and settings, see the control system supplement.

Contact Munters for help with installation and settings. For contact addresses, see section 10, *Contact Munters*.

NOTE! *The application software settings for the frequency converter are set at the factory. The frequency control range is limited to correspond to an acceptable fan speed.*



WARNING!

Rotating hazard – to prevent access to the fan impellers the dehumidifier must only be run with the wet and dry air ducts connected.



CAUTION!

Failure to correctly adjust the airflows can cause malfunction of the unit.

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

The airflows must never be set above the rated airflows. If higher airflows are requested, consult Munters for verification.

4.2.2 Setting the rated airflows

Process fan control with fixed speed

1. Calculate the corresponding differential pressures for the actual process and reactivation airflows. Use the formula and the fan coefficients in section 4.2.3, *Base configuration settings*.
2. Start the dehumidifier and run at full effect.
3. Connect a manometer to the pressure nipple on the process fan. Measure and record the differential pressure.
4. Compare the measured differential pressure with the calculated value.
5. Adjust the set point for the process airflow in the control system so the measured differential pressure value corresponds to the calculated value.
6. Connect the manometer to the pressure nipple on the reactivation fan. Repeat the procedure in step 3–5 to set the actual reactivation airflow.

NOTE! The actual airflow is dependant on the temperature at the fan outlet.

Process fan control with variable speed

1. Start the dehumidifier and run at full effect.
2. Set the required process airflow in the control system.
3. Measure the actual process airflow external to the dehumidifier using external, calibrated test equipment.
4. If necessary, adjust the set point for the process airflow in the control system.
5. Set the required reactivation airflow in the control system. Repeat the procedure in step 3–4 to set the actual reactivation airflow.

4.2.3 Base configuration settings

| | | Fan coefficient | Airflow (m ³ /h) | Differential pressure (Pa) | Fan speed, (rpm) |
|----------------|------------------|-----------------|-----------------------------|----------------------------|------------------|
| MCD-100 | Process fan | 690 | 10000 | 210 | 1900 |
| | Reactivation fan | 150 | 3060 | 416 | 2940 |
| MCD-120 | Process fan | 690 | 12000 | 302 | 2150 |
| | Reactivation fan | 220 | 3960 | 324 | 2710 |
| MCD-140 | Process fan | 690 | 14000 | 412 | 2450 |
| | Reactivation fan | 220 | 4500 | 418 | 2920 |
| MCD-155 | Process fan | 690 | 15300 | 492 | 2450 |
| | Reactivation fan | 150 | 3060 | 416 | 2840 |

Table 4.1 Base configuration settings for rated airflows at air density 1,2 kg/m³

$$\Delta p = \left(\frac{q}{k} \right)^2$$

Δp = Differential pressure (Pa)

q = Airflow (m³/h at actual temperature)

k = Fan coefficient

Figure 4.1 Formula for calculation of differential pressure

4.3 Set-up and test of steam heater

1. Make sure that the shut-off valves are closed.
2. Connect the reactivation heater to the steam supply.
3. Open the steam supply valves.
4. Check that correct steam supply pressure is indicated on the manometer.
5. Check that there are no leaks from the coil or the pipe connections.
6. Check that the thermometer is indicating a temperature relevant to the line pressure.
7. Open the control valve manually, very slowly, to test the condensation evacuation system.

5 Operation

5.1 Control panel

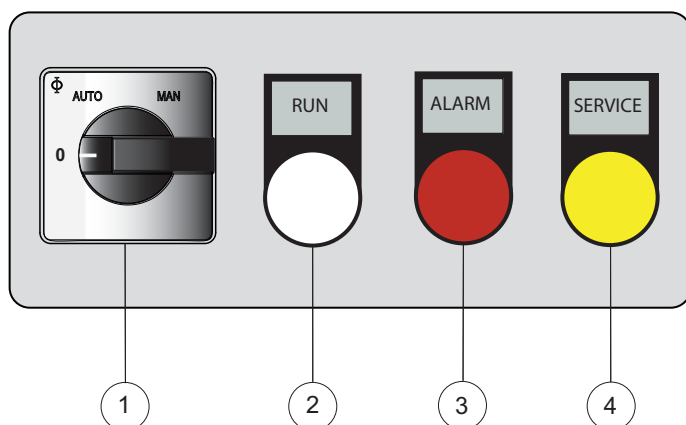


Figure 5.1 Control panel

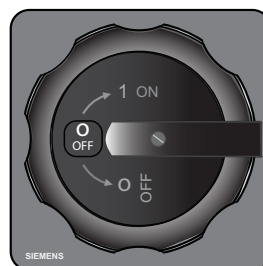


Figure 5.2 Main power switch

| Item | Switch/Indicator | Function |
|------|--|---|
| | Main power switch (see <i>Figure 5.2</i>) | When the main power switch is in position 0 , the unit is not powered beyond the switch. When the main power switch is in position 1 , the dehumidifier can be started. |
| | Control and regulation system (HMI) | See the supplement for information on HMI operation. |
| 1 | Mode switch | When the mode switch is in position MAN , the dehumidifier runs continuously (full capacity). There is a brief delay before the unit starts. When the mode switch is in position AUTO , the dehumidifier is regulated by an internal adjustable humidity level set-point, or via an external input signal. |
| 2 | White lamp (RUN) | Lights when one of the fans is running. |
| 3 | Red lamp (ALARM) | Illuminates with a steady glow when an alarm has been triggered. Check which alarm has been triggered. |
| 4 | Yellow lamp (SERVICE) | Lights when a filter change is required, or when the dehumidifier has reached the number of operating hours or the date at which maintenance should be carried out. |

Table 5.1 Control panel functions

5.2 General

The mode switch on the control panel has two operating positions:

- **AUTO** (Automatic position): The dehumidifier's fans, rotor and reactivation heater are activated only when the humidity *exceeds* the desired value (the set-point). If continual process air operation is selected in the control system display, the process air fan continues to run even after the unit has stopped dehumidifying.
- **MAN** (Max effect position): The dehumidifier's fans, rotor and reactivation heater operate continuously at full capacity.

Remote start/stop

If remote start/stop is connected, the mode switch must be set to position AUTO in order to run the dehumidifier.

External control

If the dehumidifier is regulated via an external signal, the fans and drive motor start when the "remote start" switch is closed, regardless of the present humidity. In order to operate the dehumidifier, the external signal must be > 1 V. The reactivation heater is regulated via the input signal.

On delivery the dehumidifier is set to restart automatically after a power cut.

5.3 Quick stop

Under normal working conditions, the mode switch is used to stop and start the unit (see). In case of an emergency, use the main power switch on the dehumidifier. An externally placed immediate stop button is available as option.

5.4 Operating the unit

5.4.1 Initial start-up, Manual mode (MAN)

1. Set the main power switch to position **1** and check that the display lights up.
2. Set the mode switch to **MAN** position. Check that:
 - The white lamp which indicates that the dehumidifier is in operational mode lights. A few seconds delay is normal.
 - The fans have started.
 - The airflows for the process and reactivation air are correct, see section 8.4, *Technical data*.
3. Run the unit for about 10 minutes to allow the operating conditions to stabilise. Check that:
 - The steam valve is fully opened and the temperature is increasing.
 - The reactivation heater temperature is correct.
4. Set the mode switch on the control panel to position **0**. In order to dissipate any residual heat, the reactivation air fan will continue to run after the unit has been switched off. The fan will run until the temperature has fallen below preset temperature, or according to preset time. The default temperature value is 50 °C and the time value is 30 s.

5.4.2 Initial start-up, Automatic mode (AUTO) – regulating to set-point

In order to operate the unit in automatic mode to a desired set-point, a humidity transmitter must be connected. If the system is equipped with "remote start", this switch must be closed.

If remote start is not used, ensure that the jumper between terminal blocks 9 and 10 in row XT1 is fitted.

The following steps apply irrespective of whether the unit is controlled by set-points entered via the unit's display or by external means.

1. Set the main power switch to position **1**; electrical connection is confirmed by the display lighting up.
2. Adjust the humidity set-point to the lowest possible value, internally or externally.
3. Set the mode switch to **AUTO** position. Check that:
 - The white lamp which indicates that the unit is in operational mode lights. A few seconds delay is normal.
 - The fans have started.
 - The heater is switched on.
 - Reactivation temperature increases.
4. a) Frequency controlled reactivation fan: Slowly increase the humidity set-point and check that the reactivation airflow decreases to minimum flow when the set-point coincides with the actual humidity.
b) Analogue controlled steam valve: Slowly increase the humidity set-point and check that the reactivation air temperature decreases to minimum temperature when the set-point coincides with the actual humidity.
5. Set the mode switch to position **0**. In order to dissipate any residual heat, the reactivation air fan will continue to run after the unit has been switched off. The fan will run until the temperature has fallen below preset temperature, or according to preset time. The default temperature value is 50 °C and the time value is 30 s.

6 Service and maintenance

6.1 Safety



WARNING!

Adjustment, maintenance and repairs must be carried out by qualified personnel who are fully aware of the hazards of operating and maintaining equipment containing high voltages, temperatures and flammable gases.



WARNING!

The mains power supply is permanently connected to the main power switch of the unit.



WARNING!

The dehumidifier can restart automatically after a power cut. Always switch off and lock the main power switch before carrying out any service work.

6.2 Regular service and maintenance

Munters dehumidifiers are designed to run reliably in continuous operation for long periods. Regular service and maintenance is required to ensure that the dehumidifier is operating as efficient and economical as possible.

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 dehumidifier works intensively.

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

The dehumidifier's control system is equipped with a service indicator. During installation and commissioning, an estimate should be made of a suitable number of operating hours until the next service, or the date for the next service. This value is programmed by Munters personnel at initial start-up of the unit.

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 indicator lamp

The yellow service indicator lamp indicates one of the following:

- Filter replacement required
- Humidity level too high
- Service requirements

6.6 Service and maintenance schedule (0–24000 hours)

| 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 controls | | X | X | X | X | X | X | X |
| Preventive inspection including safety check | | X | | X | | X | | X |
| Capacity check, rotor inspection | | X | | X | | X | | X |
| 1) Replacement of high-temperature protection | | | | | | | | X |
| Inspection of heater coils | | | | | | | | X |
| Replacement of drive belt and belt fastener | | | | | | | | X |
| Replacement of rotor drive motor | | | | | | | | |
| 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 |
| Inspecting rotors, replacing rotor gaskets if necessary | | | | | | | | |
| 1) Not required on units with steam heater. | | | | | | | | |

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

6.7 Service and maintenance schedule (28000–48000 hours)

| 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 controls | | X | X | X | X | X | X |
| Preventive inspection including safety check | | | X | | X | | X |
| Capacity check, rotor inspection | | | X | | X | | X |
| ¹⁾ Replacement of high-temperature protection | | | | | | | X |
| Inspection of heater coils | | | | | | | X |
| Replacement of drive belt and belt fastener | | | | | | | X |
| Replacement of rotor drive motor | | | | | | | 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 |
| Inspecting rotors, replacing rotor gaskets if necessary | | | | | | | X |
| ¹⁾ Not required on units with steam heater. | | | | | | | |

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

6.9 Maintenance of steam heater unit

Before attempting to carry out any inspection or maintenance in the heater compartment, the reactivation heater must first be allowed to cool down.

The following checks must be carried out before the dehumidifier is re-started:

1. Visually check all ductwork and duct insulation for correct connection and for general signs of damage and leaks.
2. Check the steam connections to ensure that all pipes are correctly installed and secured.

| Service interval | Service work |
|------------------|--|
| Weekly | Read the manometer and make sure that the steam pressure is correct. |
| | Examine all steam connections for leaks. |
| Monthly | Examine the heater compartment for signs of corrosion and scale build-up. All signs of corrosion must be treated immediately. Any scale deposits or dirt accumulated on the bottom of the heater compartment should be removed. |
| | Examine the electrical connections for the modulating valve and make sure the connections are secure. |
| Six-monthly | Examine the modulating valve. Refer to manufacturer's technical documentation. |
| | Examine all finned surfaces for corrosion. Repair if necessary. |
| Annually | Drain the heater. Examine the water for minute magnetic deposits. |

Table 6.3 Maintenance schedule for steam heater unit

6.10 Air filter replacement

6.10.1 Preparation

1. Set the mode switch to position **0**.
2. Wait 60 seconds for the heater to cool down.
3. Set the main power switch to position **0** and lock the switch.

6.10.2 Reactivation air filter

1. Open the two latches and lift off the end panel from the filter box, see *Figure 6.1* and *Figure 6.2*.
2. Pull out the filter from the filter box, see *Figure 6.3*.
3. Clean the filter box using a vacuum cleaner.
4. Push the new filter fully into the filter box. Make sure that the arrow on the filter points in the same direction as the air stream, see *Figure 6.4*.
5. Install the end panel and close the latches.



Figure 6.1



Figure 6.2



Figure 6.3



Figure 6.4

6.10.3 Process air filter

1. Unscrew the screws holding one of the covers (see *Figure 6.5*). Carefully remove the cover from the filter box without damaging the gasket.
2. Pull the channel spacers straight out from the filter box to release the filters, see *Figure 6.6*.
3. Pull out the filters from the filter box, see *Figure 6.7*.
4. Clean the filter box using a vacuum cleaner.
5. Push the new filters into the filter box. Make sure that the arrow on the filter points in the same direction as the air stream, see *Figure 6.8*.
6. Install the channel spacers.
7. Replace the gasket for the cover if damaged.
8. Install the cover and tighten the screws.

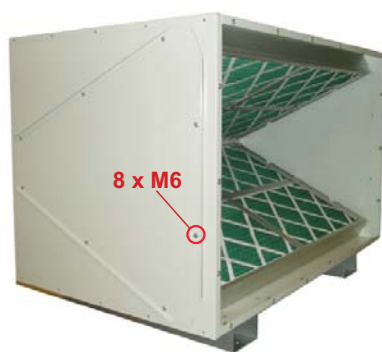


Figure 6.5



Figure 6.6

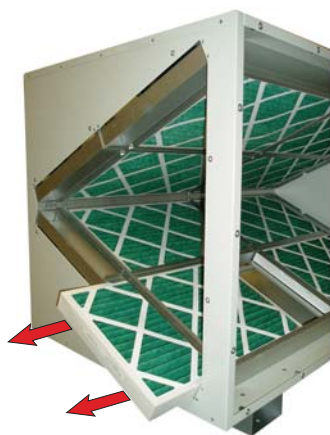


Figure 6.7

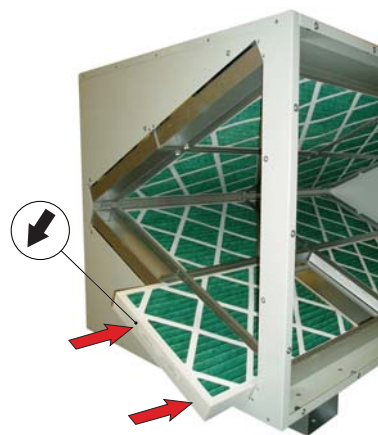


Figure 6.8

7 Fault tracing, steam heater unit

The fault tracing list below provides help in identifying faults related to the steam heater unit. The list complements the fault tracing instructions found in the supplement. Before contacting Munters service, go through the list below and rectify the fault if possible.



WARNING!

Adjustment, maintenance and repairs should only be carried out by qualified personnel who are aware of the hazards of operating and maintaining equipment operating with high voltages, temperatures and pressures.

| Fault symptom | Possible cause | Corrective action |
|---|---|---|
| General | | |
| Low or no reactivation heat. | Incorrect steam pressure. | Check that pressure indicated on manometer is within the working limits (<10 barg overpressure). |
| | Blocked steam trap. | Check the function of the steam trap and replace it if necessary. |
| | Incorrect steam temperature. | Check that the temperature indicated on the thermometer corresponds to the line pressure. |
| | Closed shut-off valve. | Check that the shut-off valves are open. |
| | The modulating steam valve remains closed. | Check that the modulating valve is operating correctly. |
| | Blocked steam pipes. | Check the steam pipe work for blockage. |
| | Leaking steam pipes. | Check the steam pipe works for leaks. |
| Loss of performance | | |
| The unit is operating, but is not controlling air humidity. | Steam reactivation heater malfunction. | Check the steam pressure and temperature in the heater. |
| | | Check that the steam pipe work is not blocked or leaking. |
| | The modulating steam valve does not open fully. | Check the controller for regulation of the modulating valve and the signal to the modulating valve. |
| | Clogged filter or clogged steam trap. | Clean the filter and steam trap. |
| Performance variations | | |
| The unit is operating, but air humidity varies. | The steam pressure varies. | Stabilise the steam pressure. |
| | Other cause | Contact Munters service. |

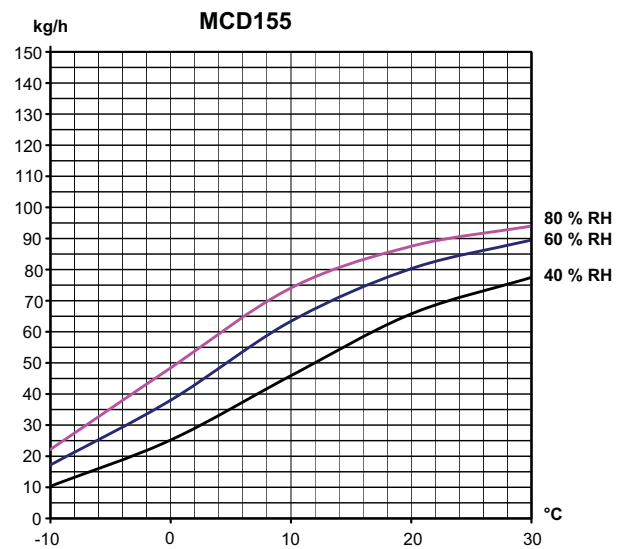
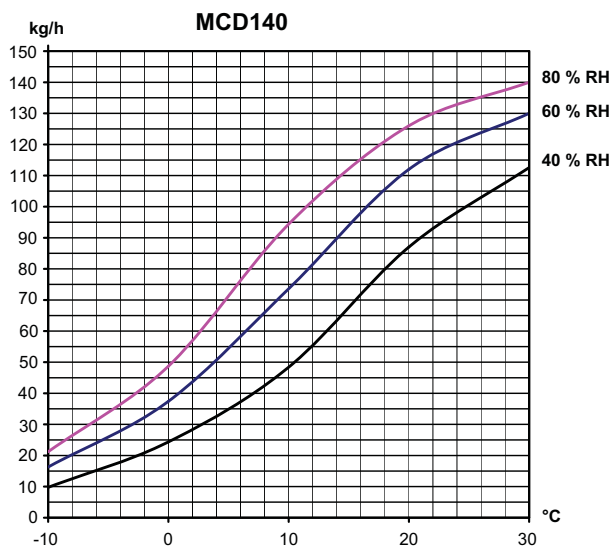
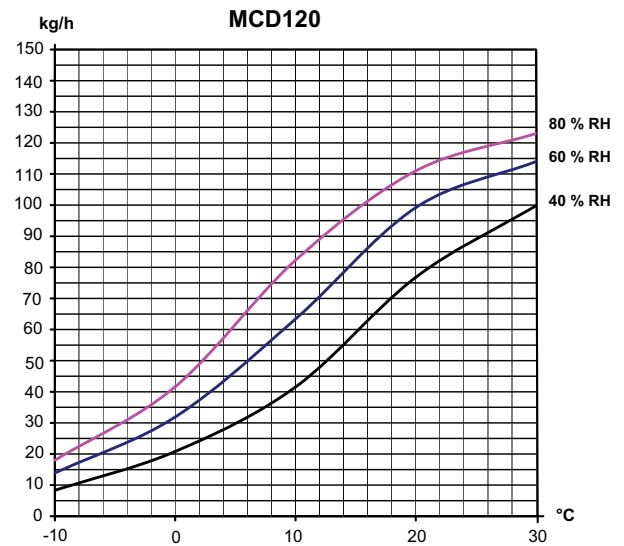
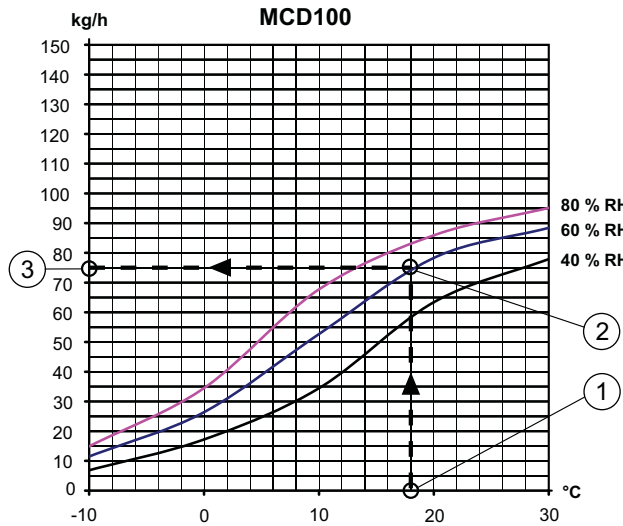
Table 7.1 Fault tracing list for steam heater unit

8 Technical specification

8.1 Capacity diagrams

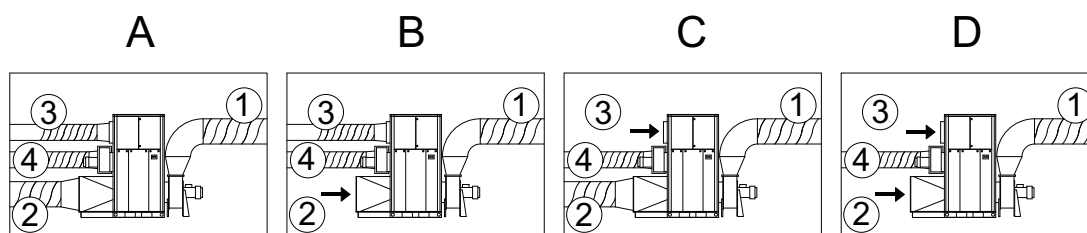
Approximate capacity in kg/h. Contact your nearest Munters' office for further information.

NOTE! The figures in the diagrams are based on a rated airflow (1/1).



8.2 Noise data

8.2.1 MCD100E



Setup A: All ducts connected

Setup B: Process inlet not connected to duct

Setup C: Reactivation inlet not connected to duct

Setup D: Reactivation and process inlet not connected to duct

1. Ductwork for dry air

2. Ductwork for process air

3. Ductwork for reactivation air

4. Ductwork for wet air

Noise to room

| Setup | Lp(A) 100 m ² | Correction Kok dB at ISO-band centre frequency, Hz | | | | | | | | |
|-------|--------------------------|--|----|-----|-----|-----|------|------|------|-----|
| | | Lwt (dB) | 63 | 125 | 250 | 500 | 1000 | 2000 | 4000 | |
| A | 77 | 99 | -8 | -3 | -6 | -16 | -14 | -18 | -17 | -17 |
| B | 78 | 99 | -8 | -4 | -6 | -11 | -14 | -20 | -18 | -16 |
| C | 77 | 99 | -7 | -3 | -7 | -17 | -14 | -19 | -18 | -17 |
| D | 78 | 100 | -8 | -4 | -6 | -11 | -15 | -18 | -18 | -16 |

Table 8.1 Noise to room

Lp(A) 100 m² = Rated pressure sound level at 100 m² room absorption (A-weighted).

Lwt = Total sound power level (db) (rel. 10 –12 W)

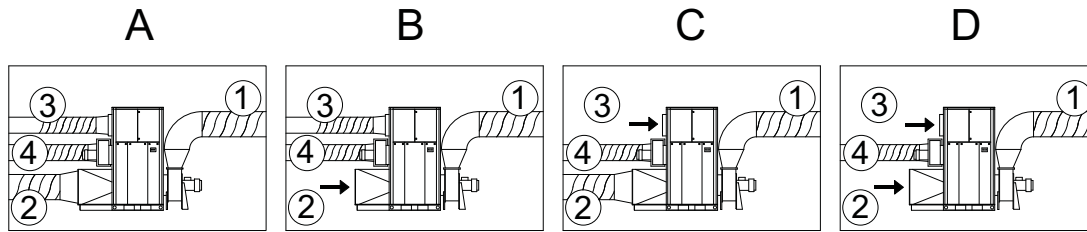
Kok = Correction for calculating Lw (Lw = Lwt + Kok)

Noise in ducts

| Ductwork | Correction Kok dB at ISO-band centre frequency, Hz | | | | | | | | |
|---------------------|--|-----|-----|-----|-----|------|------|------|-----|
| | Lwt (dB) | 63 | 125 | 250 | 500 | 1000 | 2000 | 4000 | |
| 1. Dry air | 110 | -7 | -7 | -3 | -16 | -19 | -25 | -32 | -38 |
| 2. Process air | 92 | -2 | -7 | -9 | -21 | -28 | -34 | -44 | -52 |
| 3. Reactivation air | 84 | -1 | -9 | -9 | -22 | -25 | -28 | -34 | -44 |
| 4. Wet air | 100 | -13 | -9 | -2 | -11 | -18 | -22 | -28 | -31 |

Table 8.2 Noise in ducts

8.2.2 MCD120E



Setup A: All ducts connected

Setup B: Process inlet not connected to duct

Setup C: Reactivation inlet not connected to duct

Setup D: Reactivation and process inlet not connected to duct

1. Ductwork for dry air

2. Ductwork for process air

3. Ductwork for reactivation air

4. Ductwork for wet air

Noise to room

| Setup | Lp(A) 100 m ² | Correction Kok dB at ISO-band centre frequency, Hz | | | | | | | | |
|-------|--------------------------|--|----|-----|-----|-----|------|------|------|-----|
| | | Lwt (dB) | 63 | 125 | 250 | 500 | 1000 | 2000 | 4000 | |
| A | 79 | 101 | -7 | -3 | -7 | -12 | -13 | -17 | -18 | -18 |
| B | 81 | 102 | -8 | -4 | -7 | -7 | -14 | -19 | -19 | -18 |
| C | 79 | 101 | -7 | -3 | -8 | -13 | -13 | -18 | -19 | -18 |
| D | 81 | 102 | -7 | -4 | -8 | -8 | -14 | -17 | -20 | -18 |

Table 8.3 Noise to room

Lp(A) 100 m² = Rated pressure sound level at 100 m² room absorption (A-weighted).

Lwt = Total sound power level (dB) (rel. 10–12 W)

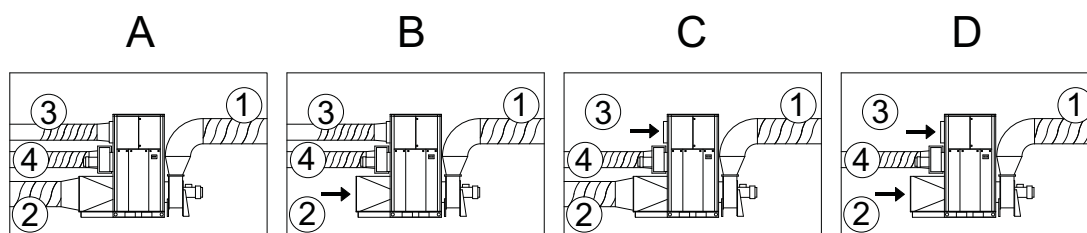
Kok = Correction for calculating Lw (Lw = Lwt + Kok)

Noise in ducts

| Ductwork | Correction Kok dB at ISO-band centre frequency, Hz | | | | | | | | |
|---------------------|--|----|-----|-----|-----|------|------|------|-----|
| | Lwt (dB) | 63 | 125 | 250 | 500 | 1000 | 2000 | 4000 | |
| 1. Dry air | 112 | -7 | -6 | -3 | -9 | -18 | -24 | -30 | -37 |
| 2. Process air | 95 | -2 | -7 | -12 | -21 | -27 | -33 | -40 | -50 |
| 3. Reactivation air | 91 | -1 | -8 | -22 | -24 | -30 | -34 | -39 | -52 |
| 4. Wet air | 103 | -6 | -4 | -8 | -29 | -14 | -17 | -24 | -29 |

Table 8.4 Noise in ducts

8.2.3 MCD140E



Setup A: All ducts connected

Setup B: Process inlet not connected to duct

Setup C: Reactivation inlet not connected to duct

Setup D: Reactivation and process inlet not connected to duct

1. Ductwork for dry air

2. Ductwork for process air

3. Ductwork for reactivation air

4. Ductwork for wet air

Noise to room

| Setup | Lp(A) 100 m ² | Correction Kok dB at ISO-band centre frequency, Hz | | | | | | | | |
|-------|--------------------------|--|----|-----|-----|-----|------|------|------|-----|
| | | Lwt (dB) | 63 | 125 | 250 | 500 | 1000 | 2000 | 4000 | |
| A | 81 | 103 | -6 | -3 | -12 | -14 | -12 | -16 | -17 | -20 |
| B | 83 | 103 | -7 | -3 | -11 | -8 | -12 | -17 | -18 | -20 |
| C | 81 | 103 | -6 | -2 | -13 | -15 | -12 | -17 | -18 | -21 |
| D | 83 | 104 | -6 | -3 | -12 | -9 | -13 | -15 | -18 | -20 |

Table 8.5 Noise to room

Lp(A) 100 m² = Rated pressure sound level at 100 m² room absorption (A-weighted).

Lwt = Total sound power level (dB) (rel. 10–12 W)

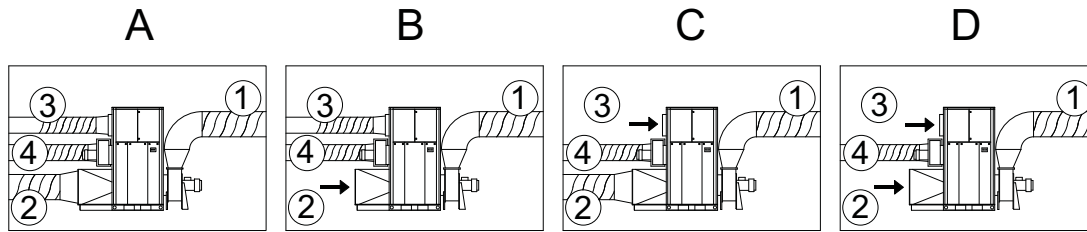
Kok = Correction for calculating Lw (Lw = Lwt + Kok)

Noise in ducts

| Ductwork | Correction Kok dB at ISO-band centre frequency, Hz | | | | | | | | |
|---------------------|--|----|-----|-----|-----|------|------|------|-----|
| | Lwt (dB) | 63 | 125 | 250 | 500 | 1000 | 2000 | 4000 | |
| 1. Dry air | 114 | -5 | -4 | -8 | -10 | -14 | -20 | -26 | -33 |
| 2. Process air | 96 | -2 | -5 | -12 | -18 | -24 | -30 | -39 | -47 |
| 3. Reactivation air | 93 | -1 | -8 | -23 | -22 | -29 | -33 | -38 | -51 |
| 4. Wet air | 106 | -8 | -4 | -8 | -6 | -14 | -17 | -23 | -30 |

Table 8.6 Noise in ducts

8.2.4 MCD155E



Setup A: All ducts connected

Setup B: Process inlet not connected to duct

Setup C: Reactivation inlet not connected to duct

Setup D: Reactivation and process inlet not connected to duct

1. Ductwork for dry air

2. Ductwork for process air

3. Ductwork for reactivation air

4. Ductwork for wet air

Noise to room

| Setup | Lp(A) 100 m ² | Correction Kok dB at ISO-band centre frequency, Hz | | | | | | | | |
|-------|--------------------------|--|----|-----|-----|-----|------|------|------|-----|
| | | Lwt (dB) | 63 | 125 | 250 | 500 | 1000 | 2000 | 4000 | |
| A | 81 | 103 | -6 | -3 | -12 | -14 | -12 | -16 | -17 | -20 |
| B | 83 | 103 | -7 | -3 | -11 | -8 | -12 | -17 | -18 | -20 |
| C | 81 | 103 | -6 | -2 | -13 | -15 | -12 | -17 | -18 | -21 |
| D | 83 | 104 | -6 | -3 | -12 | -9 | -13 | -15 | -18 | -20 |

Table 8.7 Noise to room

Lp(A) 100 m² = Rated pressure sound level at 100 m² room absorption (A-weighted).

Lwt = Total sound power level (dB) (rel. 10–12 W)

Kok = Correction for calculating Lw (Lw = Lwt + Kok)

Noise in ducts

| Ductwork | Correction Kok dB at ISO-band centre frequency, Hz | | | | | | | | |
|---------------------|--|-----|-----|-----|-----|------|------|------|-----|
| | Lwt (dB) | 63 | 125 | 250 | 500 | 1000 | 2000 | 4000 | |
| 1. Dry air | 114 | -5 | -4 | -8 | -10 | -14 | -20 | -26 | -33 |
| 2. Process air | 96 | -2 | -5 | -12 | -18 | -24 | -30 | -39 | -47 |
| 3. Reactivation air | 84 | -1 | -9 | -9 | -22 | -25 | -28 | -34 | -44 |
| 4. Wet air | 100 | -13 | -9 | -2 | -11 | -18 | -22 | -28 | -31 |

Table 8.8 Noise in ducts

8.3 Dimensions and service space

8.3.1 Dimensions, MCD100–140S

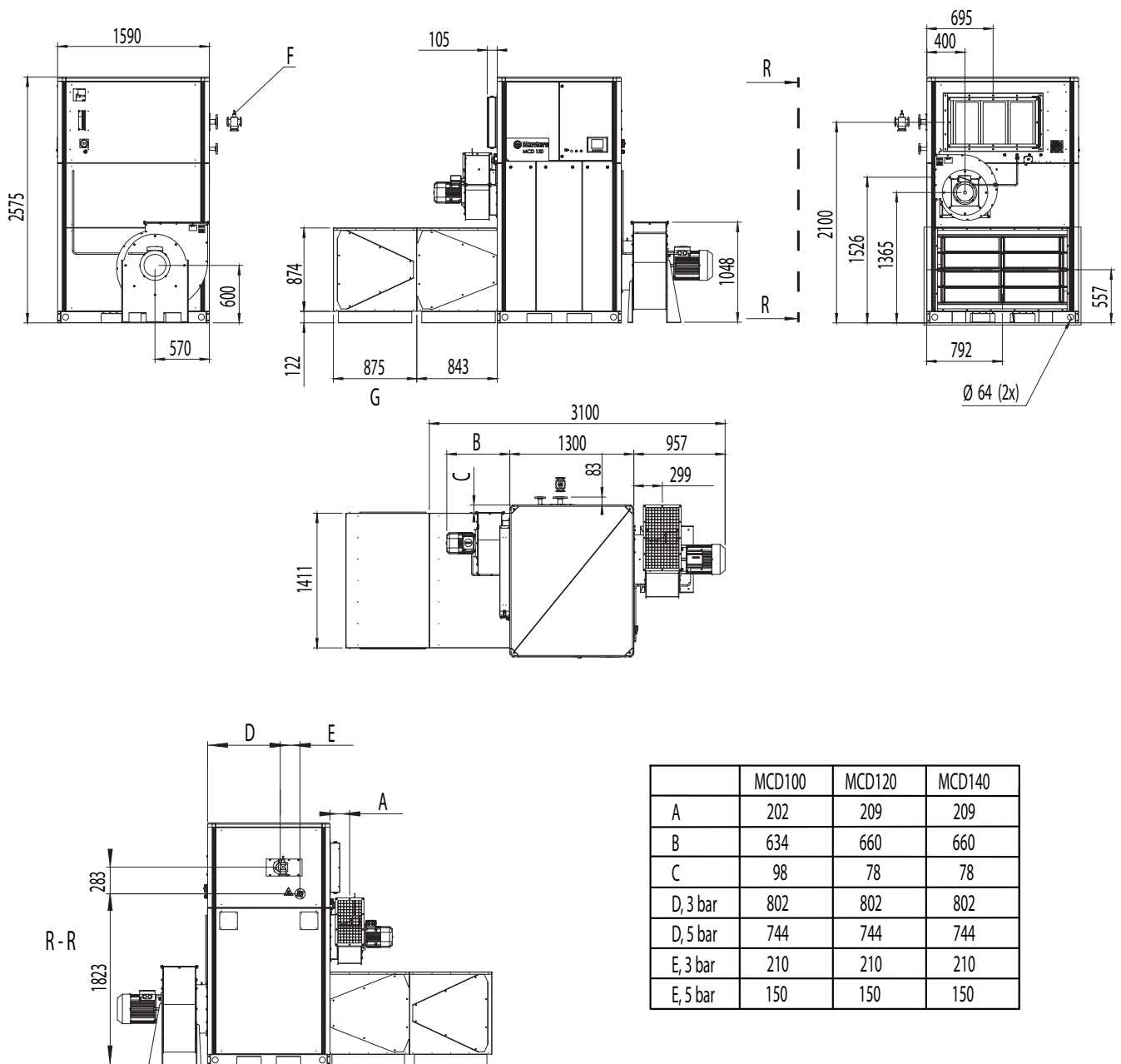


Figure 8.1 Dimensions, MCD100–140S

F. Item supplied loose

G. Option

8.3.2 Dimensions, MCD155S

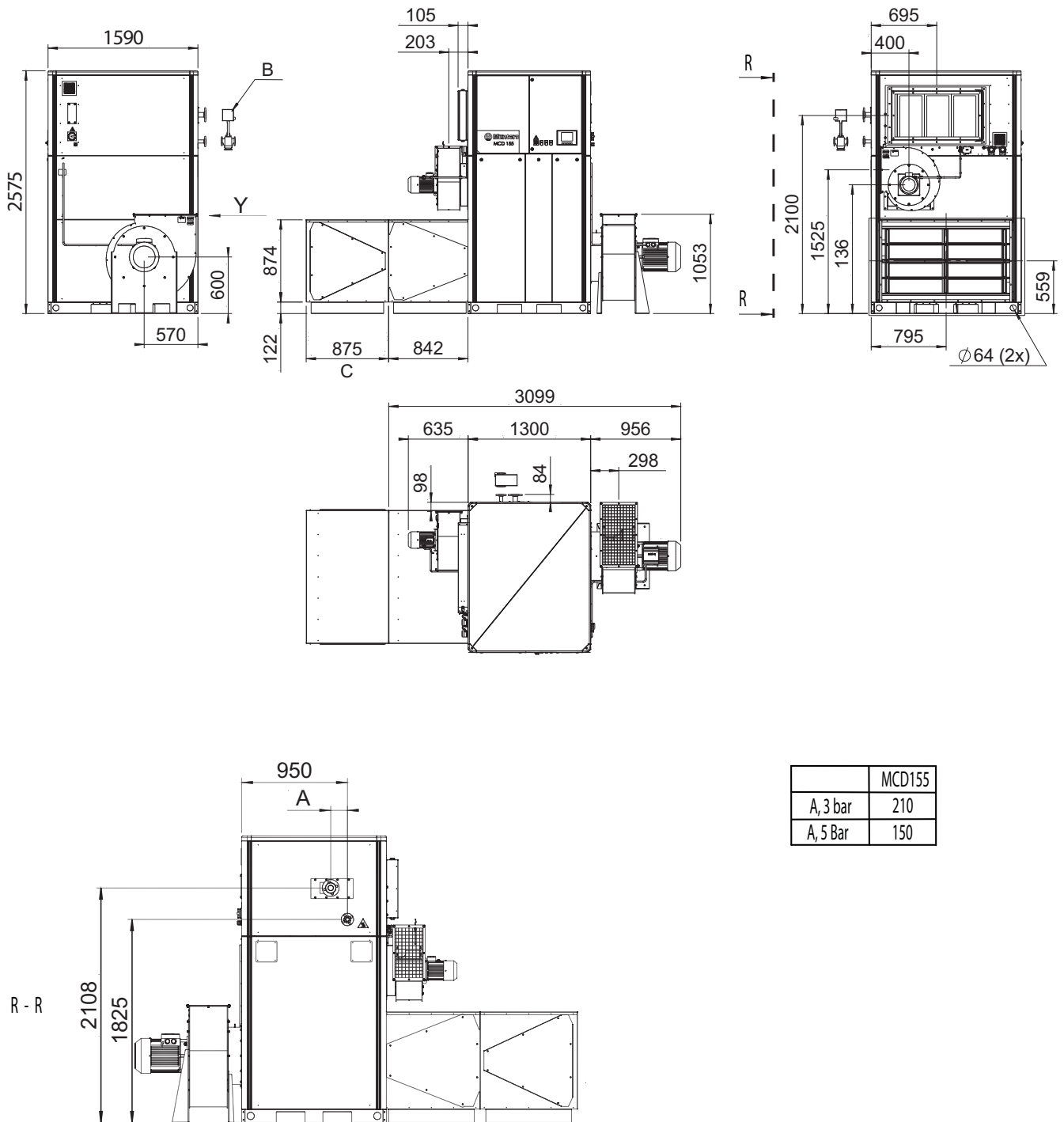


Figure 8.2 Dimensions, MCD155S

B. Item supplied loose

C. Option

8.3.3 Dimensions for units without process fan

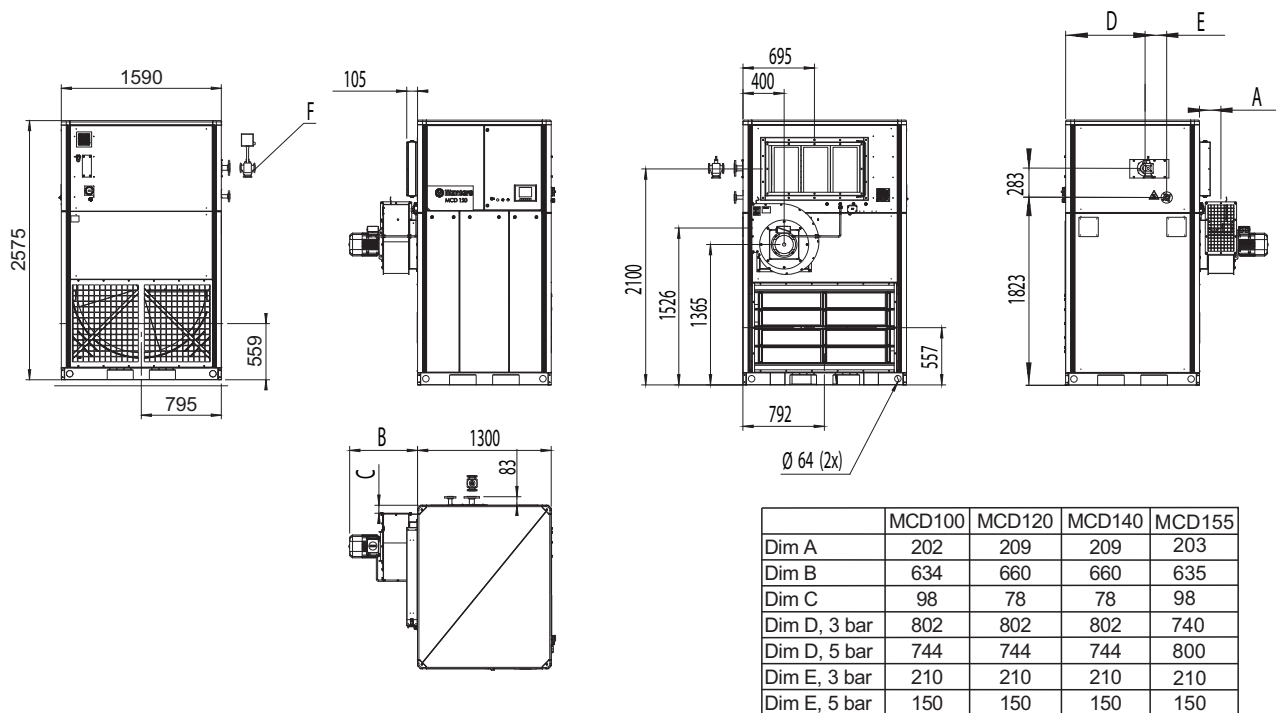


Figure 8.3 Dimensions for units without process fan

F. Item supplied loose

8.3.4 Service space

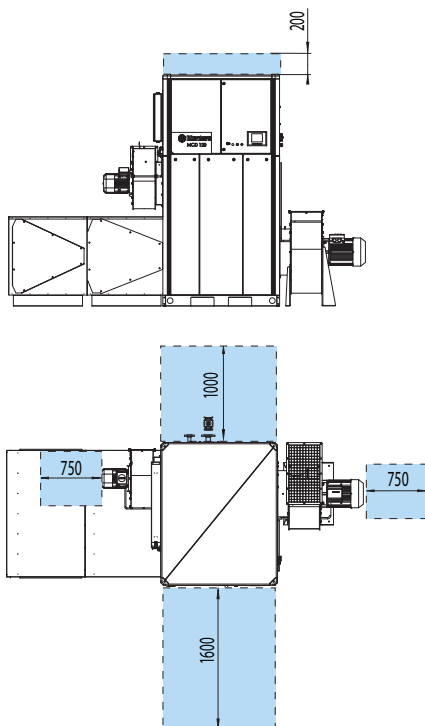


Figure 8.4 Required service space

8.4 Technical data

| | MCD100S | MCD120S | MCD140S | MCD155S |
|---|---------|---------|---------|---------|
| Process air | | | | |
| Figures quoted are rated, based on a fan inlet temperature of 20 °C and an air density of 1,2 kg/m ³ . | | | | |
| Rated airflow (m ³ /s) | 2,78 | 3,33 | 3,89 | 4,25 |
| Rated airflow (m ³ /h) | 10000 | 12000 | 14000 | 15300 |
| Minimum available static pressure (Pa) | 300 | 300 | 300 | 300 |
| Fan motor power (kW) | 11 | 11 | 11 | 11 |
| Reactivation air | | | | |
| Rated airflow (m ³ /s) | 0,850 | 1,100 | 1,250 | 0,850 |
| Rated airflow (m ³ /h) | 3060 | 3960 | 4500 | 3060 |
| Minimum available static pressure (Pa) | 300 | 300 | 300 | 300 |
| Fan motor power (kW) | 2,2 | 4,0 | 4,0 | 2,2 |
| Reactivation heater | | | | |
| Temperature increase across heater (°C) | 100 | 100 | 100 | 100 |
| Reactivation heater power (kW) | 102 | 132 | 150 | 102 |
| Total required power (50 Hz) | | | | |
| With process and reactivation fan (kW) | 13,9 | 15,7 | 15,7 | 13,9 |
| Without process fan (kW) | 2,9 | 4,7 | 4,7 | 2,9 |
| Rated current with process and reactivation fan | | | | |
| 380 V, 3~50 Hz (A) | 27 | 31 | 33 | 28 |
| 400 V, 3~50 Hz (A) | 26 | 29 | 31 | 27 |
| 415 V, 3~50 Hz (A) | 25 | 28 | 30 | 26 |
| Weight | | | | |
| Weight, rotor box and top box (kg) | 780 | 780 | 780 | 710 |
| Weight rotor box (kg) | 460 | 460 | 460 | 372 |
| Weight, top box (kg) | 320 | 320 | 320 | 338 |
| Weight, reactivation fan (kg) | 90 | 90 | 90 | 90 |
| Weight, process fan (kg) | 180 | 180 | 180 | 180 |
| Weight, filter box (kg) | 92 | 92 | 92 | 92 |
| Weight, total (kg) | 1132 | 1153 | 1153 | 1062 |
| Weight, total, without process fan (kg) | 932 | 953 | 953 | 862 |

| | MCD100S | MCD120S | MCD140S | MCD155S |
|--|--|---------|---------|---------|
| Miscellaneous data | | | | |
| Drive motor power, 50/60 Hz (W) | 10/12 | 10/12 | 10/12 | 10/12 |
| Filter class (standard) | G4 | G4 | G4 | G4 |
| IEC protection class, unit | IP33 | IP33 | IP33 | IP33 |
| IEC protection class, electrical panel | IP54 | IP54 | IP54 | IP54 |
| Fan motor, winding insulation class | Class F | Class F | Class F | Class F |
| Drive motor, winding insulation class | Class F | Class F | Class F | Class F |
| Contactors coil voltage (V AC) | 230 | 230 | 230 | 230 |
| Moisture removal at 20 °C, RH 60 % (kg/24 hr) | 1910 | 2380 | 2660 | 1900 |
| Maximum noise level unducted (dBA) | 78 | 81 | 83 | 83 |
| Corrosion class, outside casing | C4 (painted, AluZink 150, ISO 12944) | | | |
| Corrosion class, inside casing | C3 (unpainted, AluZink 150, ISO 12944) | | | |
| Steam data | | | | |
| Steam consumption, 3 bar (g/s) | 47,8 | 61,9 | 70,3 | 47,8 |
| Steam consumption, 5 bar (g/s) | 48,9 | 63,3 | 71,9 | 48,9 |
| Steam consumption with ERP, 3 bar (g/s) | 42,2 | 56,2 | 61,9 | 42,2 |
| Steam consumption with ERP, 5 bar (g/s) | 43,1 | 57,5 | 63,3 | 43,1 |
| Maximum steam working pressure (barg) | 7 | 7 | 7 | 7 |
| Environmental conditions | | | | |
| Operating temperature (°C) | -20... +40 | | | |
| Maximum installation altitude, above sea level (m) | 2000 | | | |
| Transport and storage temperature (°C) | -20... +70 | | | |

Table 8.9 Technical specification, units with steam heater

9 Scrapping

The unit must be scrapped in accordance with applicable legal requirements and regulations. Contact your local authorities.

The rotor material is not combustible, and should be deposited like glass fibre materials.

If the rotor has been exposed to chemicals that are dangerous to the environment the risk must be assessed. The chemicals can accumulate in the rotor material. Take the necessary precautions to comply with applicable legal requirements and regulations.



WARNING!

If the rotor is to be cut in pieces, wear a suitable CE marked face mask selected and fitted in accordance with the applicable safety standards to protect from the dust.

10 Contact Munters

| | | | |
|-----------------------|---|---|--|
| AUSTRIA | Munters GmbH Air Treatment Zweigniederlassung Wien | Eduard-Kittenberger-Gasse 56, Obj. 6 A-1235 Wien | Tel: +43 1 616 4298-92 51 luftentfeuchtung@munters.at www.munters.at |
| BELGIUM | Munters Belgium nv Air Treatment | Blarenberglaan 21c B-2800 Mechelen | Tel: +32 15 285 611 service@muntersbelgium.be www.muntersbelgium.be |
| CZECH REPUBLIC | Munters CZ, organizacni slozka Air Treatment | Slevacská 2368/68 CZ-615 00 BRNO | Tel: +420 775 569 657 info@munters-odvlhcovani.cz www.munters-odvlhcovani.cz |
| DENMARK | Munters A/S Air Treatment | Ryttermarken 4 DK-3520 Farum | Tel: +45 44 953 355 info@munters.dk www.munters.dk |
| FINLAND | Munters Finland Oy Kuivaajamyynä | Hakamäenkuja 3 FI-01510 VANTAA | Tel: +358 207 768 230 laitemyynti@munters.fi www.munters.fi |
| FRANCE | Munters France SAS Air Treatment | 106, Boulevard Héloïse F-95815 Argenteuil Cedex | Tel: +33 1 34 11 57 57 dh@munters.fr www.munters.fr |
| GERMANY | Munters GmbH Air Treatment-Zentrale | Hans-Duncker-Str. 8 D-21035 Hamburg | Tel: +49 (0) 40 879 690 - 0 mgd@munters.de www.munters.de |
| ITALY | Munters Italy S.p.A Air Treatment | Strada Piani 2 I-18027 Chiavari IM | Tel: +39 0183 521 377 marketing@munters.it www.munters.it |
| NETHERLANDS | Munters Vochtbeheersing | Energieweg 69 NL-2404 HE Alphen a/d Rijn | Tel: +31 172 43 32 31 vochtbeheersing@munters.nl www.munters.nl |
| POLAND | Munters Sp. z o.o. Oddział w Polsce Air Treatment | ul. Świetojńska 55/11 81-391 Gdynia | Tel.: +48 58 305 35 17 dh@munters.pl www.munters.com.pl |
| SPAIN | Munters Spain SA Air Treatment | Europa Empresarial. Edificio Londres. C/Playa de Liencres 2. 28230 Las Matas. Madrid | Tel: +34 91 640 09 02 marketing@munters.es www.munters.es |
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