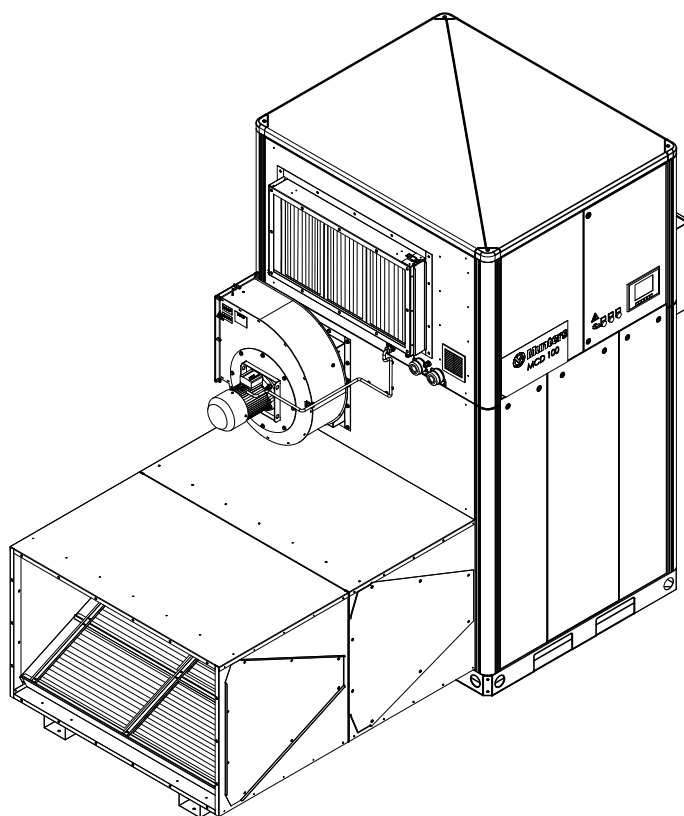


Users manual

MCD100G, MCD120G, MCD140G, MCD155G



Desiccant dehumidifier with gas heater for reactivation

Applies to all units manufactured
from week 22, 2013

190TEN-1081-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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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*.

Reactivation using a gas heater means that natural gas or propane/LPG (option) is the source of energy that is used to reactivate the dehumidifier's rotor. This technique is intended for use where natural gas or propane/LPG is available as an alternative to heating with electricity or steam.

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 Marking

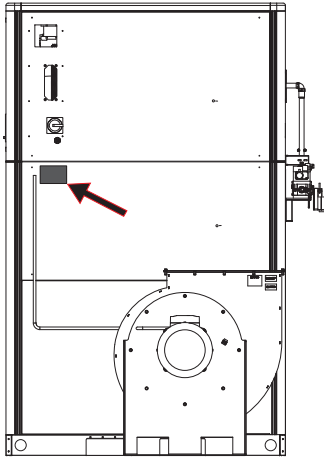


Figure 1.4 Position of identification plate



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

The label for the gas heater can be found next to the identification plate on the unit.



Figure 1.6 Example of label for natural gas

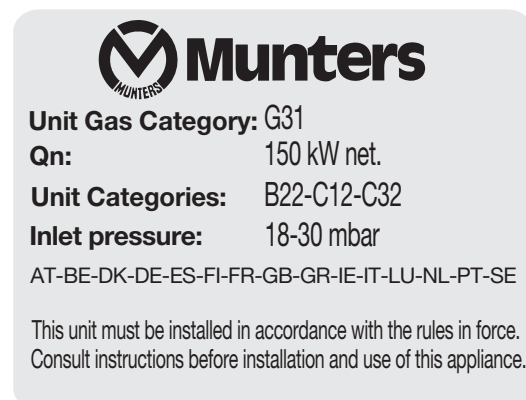


Figure 1.7 Example of label for propane (option)

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

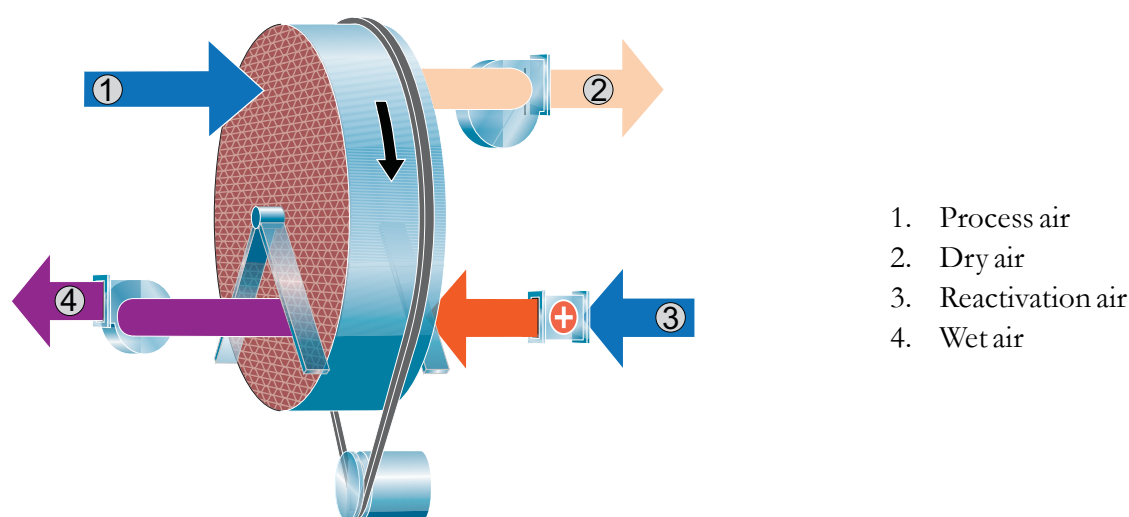


Figure 2.1 Rotor principle

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.

The gas burner system used for reactivation is based on a burner operating on natural gas or propane/LPG (option). The burner operates as a direct fired system to heat outdoor air to the required reactivation air temperature.

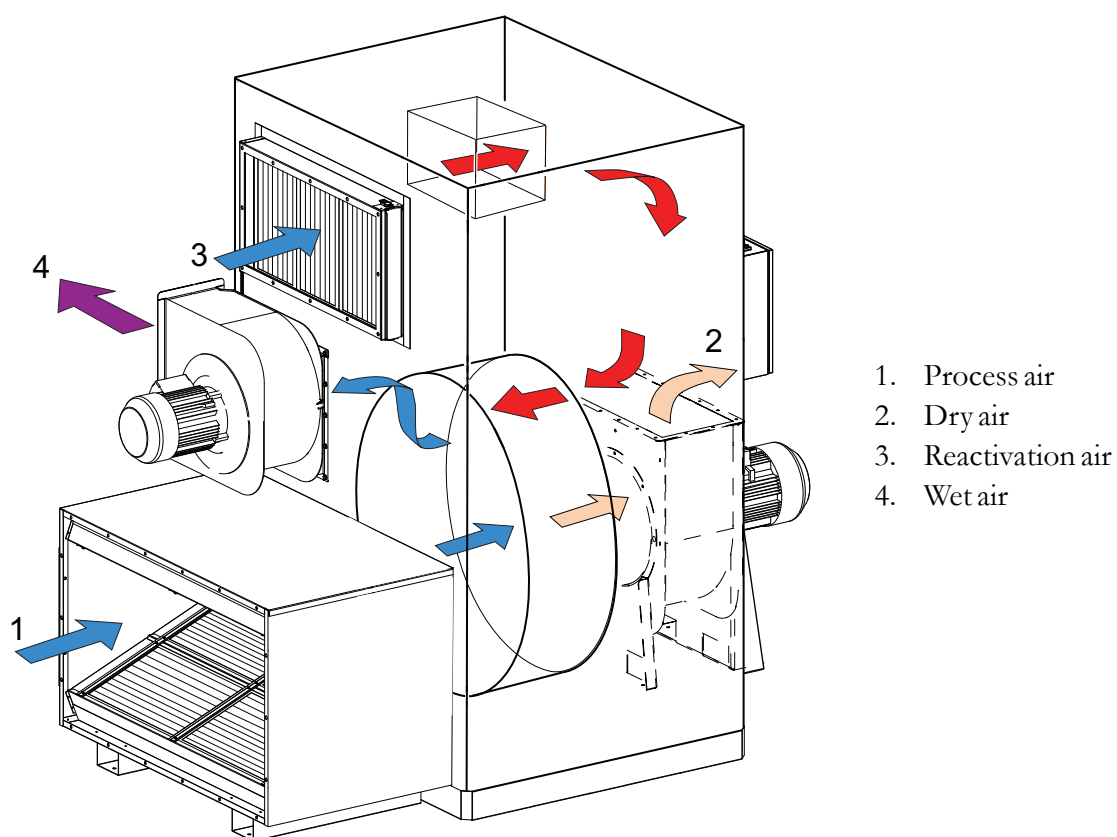


Figure 2.2 Airflow overview

2.3 System overview

2.3.1 Front view

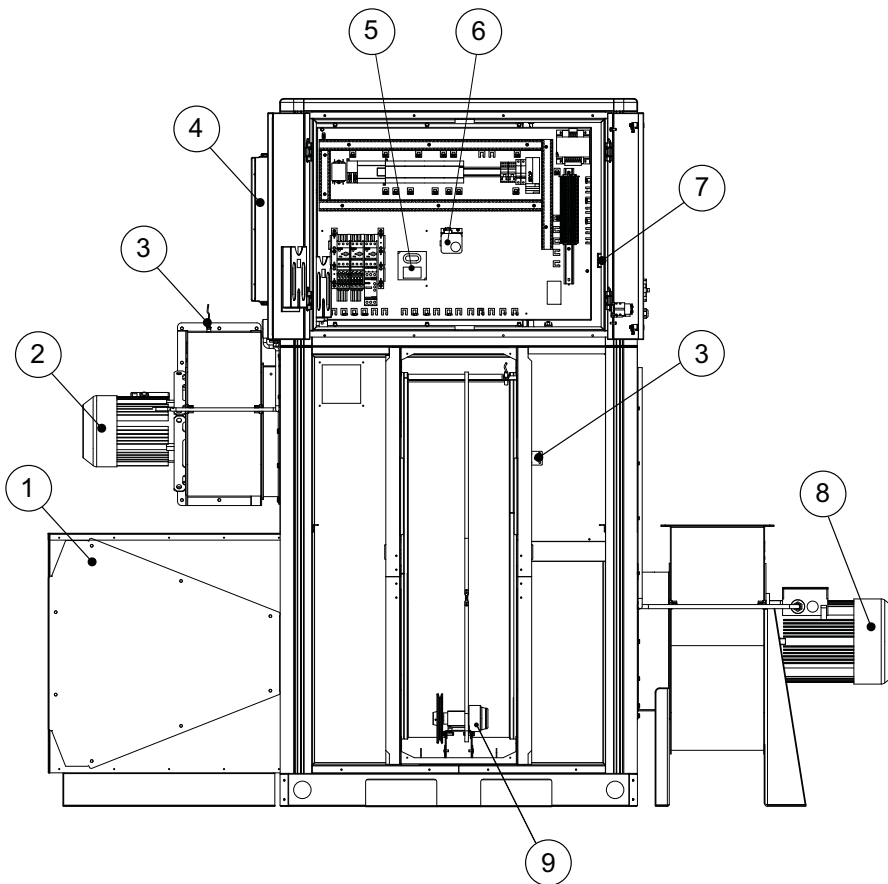


Figure 2.3 Front view, main components

- | | |
|---------------------------------|---|
| 1. Filter box, process air | 6. Pressure switch for reactivation air |
| 2. Reactivation fan motor | 7. High temperature cut-out switch (HTCO) |
| 3. Temperature sensor, PT1000 | 8. Process fan motor |
| 4. Filter box, reactivation air | 9. Drive motor for rotor |
| 5. Burner safety control unit | |

2.3.2 Rear view

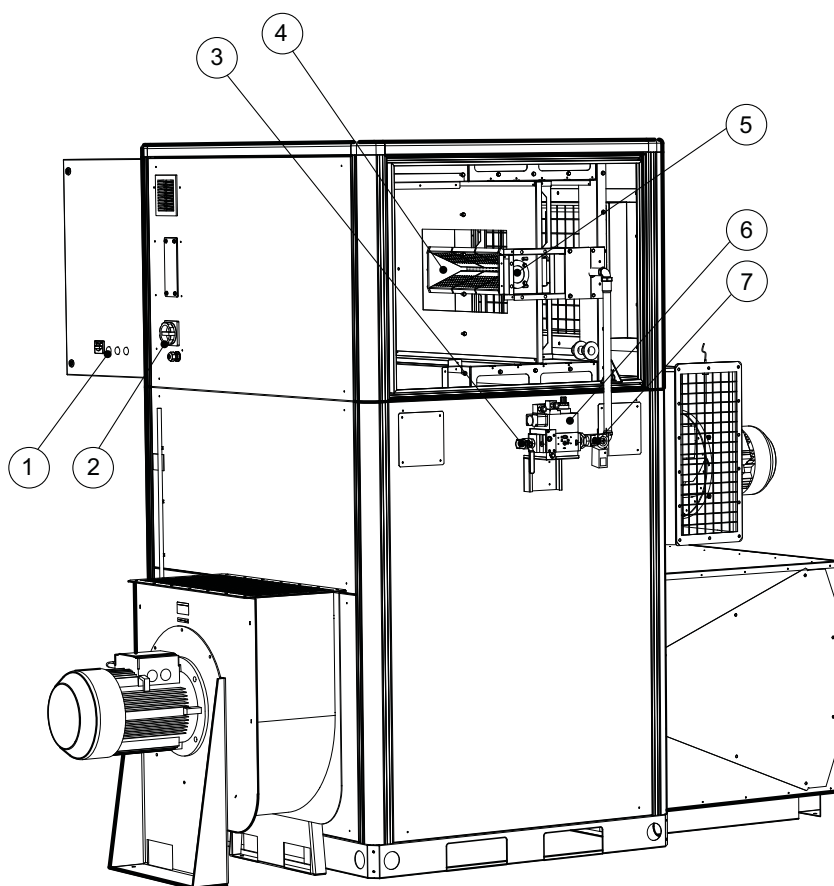


Figure 2.4 Rear view, main components

- | | |
|-----------------------|------------------------------------|
| 1. Control panel | 5. Inspection glass |
| 2. Main power switch | 6. GasMultiBloc control unit |
| 3. Gas shut-off valve | 7. Gas control valve with actuator |
| 4. Gas burner | |

2.4 Main components, exploded view

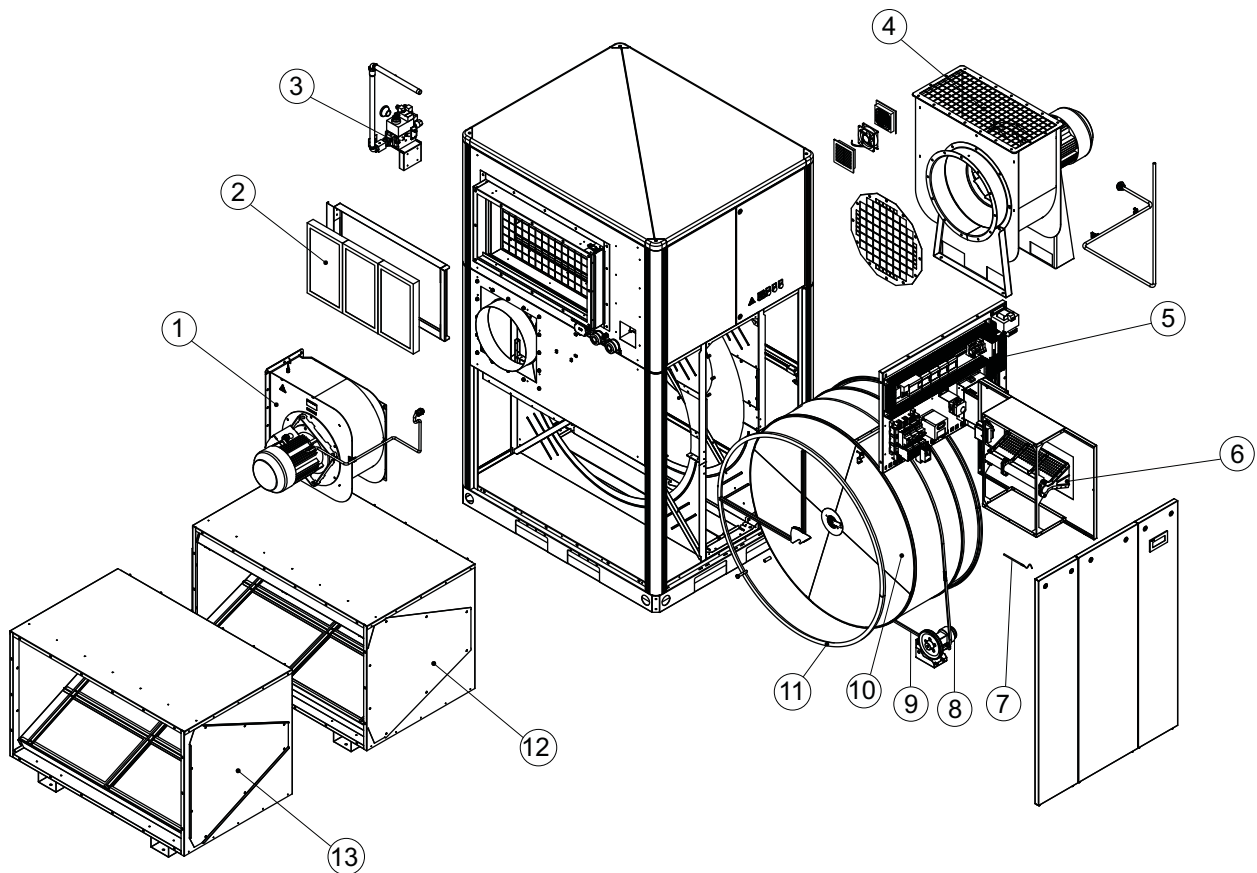


Figure 2.5 Main components

- | | |
|---|--------------------------------------|
| 1. Reactivation fan | 8. Rotor drive motor |
| 2. Filter, reactivation air | 9. Drive belt |
| 3. Gas train with GasMultiBloc control unit | 10. Rotor |
| 4. Process fan | 11. Rotor seal |
| 5. Electrical panel | 12. Filter box, process air |
| 6. Gas burner | 13. Filter box, process air (option) |
| 7. Temperature sensor | |

2.5 Gas burner unit

Direct fired gas burners are used on all MCD-series dehumidifiers. The burner operates on natural gas or propane (option) and uses the reactivation air to supply the oxygen necessary for combustion. A correct reactivation airflow is therefore essential to ensure that the burner operates efficiently.

For optimal performance, the reactivation air must contain minimum 20 % oxygen. Burner return air cannot be used. To maintain the efficiency of the unit, it is also important that the outlet for the wet air is correctly placed. This is to prevent the wet air contaminating the reactivation air.

The burner is mounted in the reactivation airflow. The gas is mixed with the reactivation air which penetrates into the space between the V-shaped mixing plates.

A spark ignitor and flame detection probe are mounted in the burner combustion chamber. The flame detection probe uses the ionisation principle to send a flame signal to the burner safety control unit.

The working principle with constant airflow and pressure drop across the burner ensures that the combustion gases and reactivation air mix well.

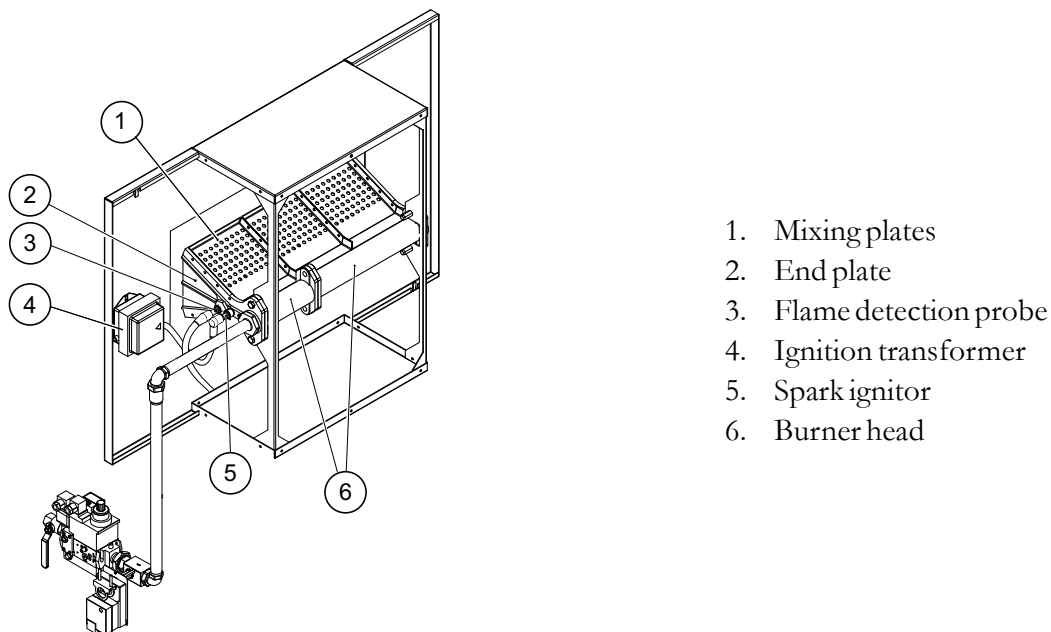


Figure 2.6 Gas burner assembly

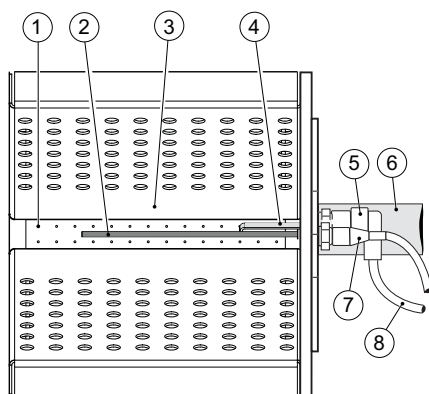


Figure 2.7 Side view of the burner

1. Burner head port
2. Flame detection probe
3. Mixing plates
4. Spark ignitor
5. Spark ignitor connection plug
6. Gas pipe
7. Flame detection connection plug
8. Silicone cable

2.6 GasMultiBloc® control unit

2.6.1 Principle of operation

A GasMultiBloc control unit in the gas train controls and monitors the gas pressure and flow. The GasMultiBloc contains an adjustable flow regulator which in conjunction with an external control valve enables automatic modulation of the burner capacity, see Figure 2.9.

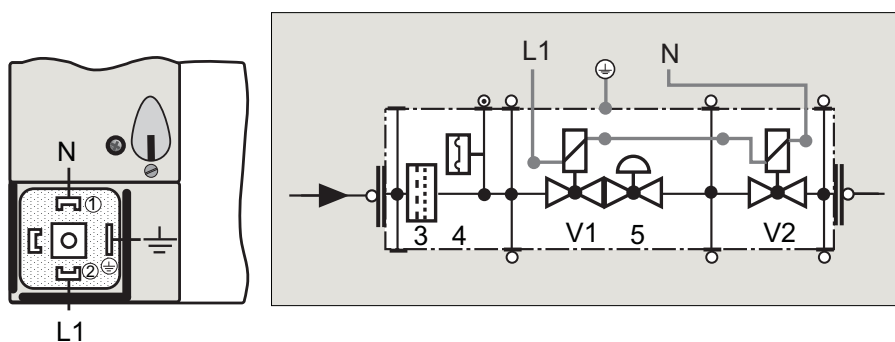


Figure 2.8 Diagram, GasMultiBloc

- | | |
|---------------------------|--|
| 3. Gas filter | V1. Solenoid valve |
| 4. Low pressure switch | V2. Solenoid valve (including adjustable flow regulator) |
| 5. Gas pressure regulator | L1. Phase |
| N. Neutral | |

The gas flows into the GasMultiBloc, passes through the gas filter (3) and the adjustable low pressure switch (4). Valves V1 and V2 are energised by the same control signal and open simultaneously. The pressure is set by the pressure regulator (5). The maximum allowed gasflow (max. burner capacity) is restricted by the adjustable flow regulator included in valve V2.

2.6.2 Overview

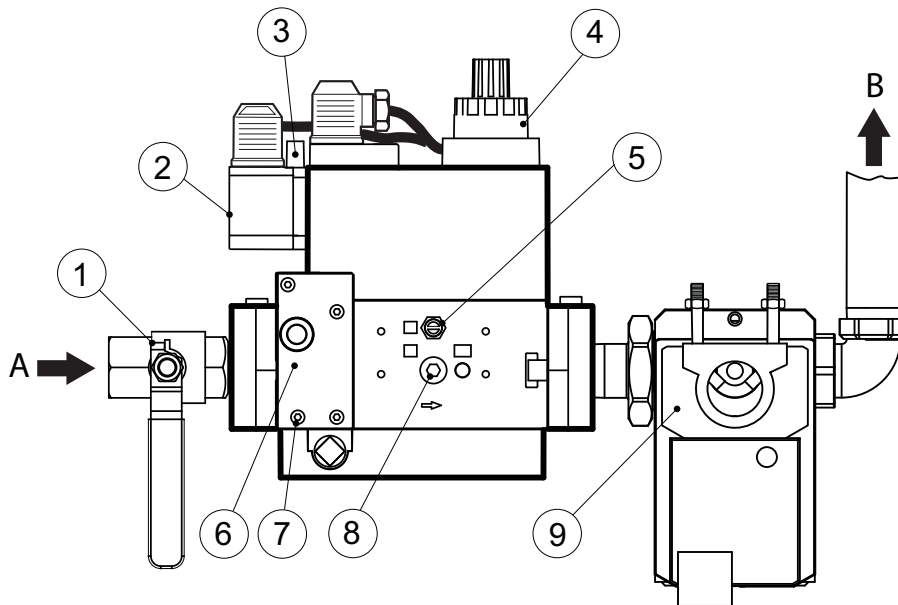


Figure 2.9 Overview, GasMultiBloc

A. Flow from gas supply

B. Flow to gas burner

- | | |
|---|--|
| 1. Gas shut-off valve | 6. Cover plate for gas filter |
| 2. Low pressure switch | 7. Screw for cover plate |
| 3. Pressure test point for gas supply (P_e) | 8. Pressure test point (before valve V1) |
| 4. Maximum flow adjustment knob | 9. Gas control valve with actuator |
| 5. Pressure test point (after valve V1) | |

2.6.3 Low pressure switch

The low pressure switch is connected to the inlet pipe on the GasMultiBloc control unit. If the gas pressure is too low, the electrical supply to the control unit is disrupted. The dehumidifier is then switched off automatically, and an alarm for low gas pressure is shown on the control panel display. The low pressure switch has a range of 5 to 150 mbar. Standard setting is 15 mbar.

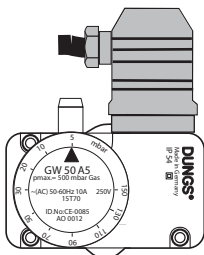
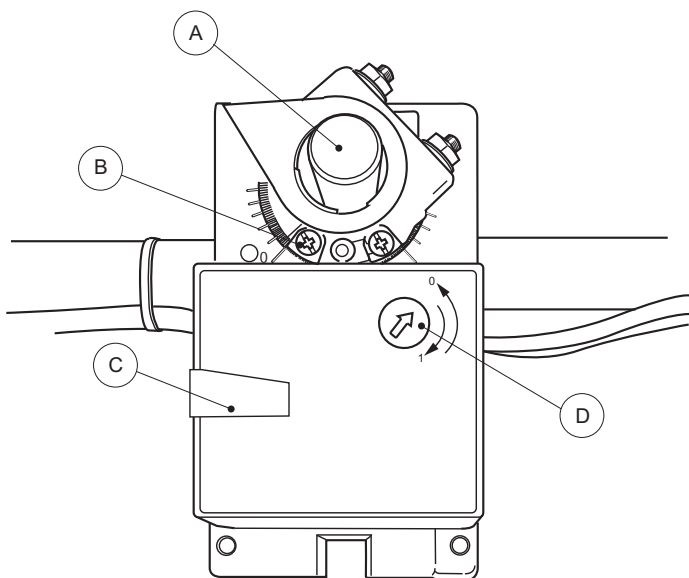


Figure 2.10 Low pressure switch

2.7 Gas control valve unit

In this modulating gas reactivation heater system, there is a control valve fitted in the gas line between the GasMultiBloc and the gas burner. This makes it possible to vary the gas flow and burner capacity during operation. The control valve is connected to an electric actuator that is controlled by the program unit using a 0 – 10V DC signal.



A. Rotating valve extension

B. Minimum capacity screw

C. Override button

D. Inverse control action switch

2.8 Burner safety control unit

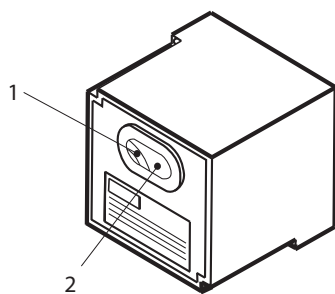
The burner safety control unit is located in the electrical panel, see *Figure 2.3*.

The control unit ensures safe ignition, start-up and shut-down during both normal operation and if a fault occurs.

It is equipped with a self-checking flame monitoring circuit that controls the combustion process. The flame monitoring circuit applies the necessary safety measures if the flame signal occurs too soon or not at all, and if any type of fault in the flame detector, detector cables or flame signal amplifier occurs.

Faults that are detected during the start-up procedure or normal operation result in shutdown. Operation is then prevented until the fault is remedied and the burner safety control unit is reset using the mode switch.

See the wiring diagram for more information on the control unit connections.



1. Programme indicator
2. Warning lamp for shutdown/lockout switch

Figure 2.11 Burner safety control unit

2.8.1 Operation – start-up sequence

When power is applied to the relay and the start contact is closed, the burner control unit runs to 'start' position. When the burner control unit receives a starting signal from the PLC, an automatic check is carried out between the burner control unit and the pressure switch for the reactivation airflow. This is to ensure that the pressure switch contact is open. If the contact is open, the reactivation air fan can start.

- **If the pressure switch contact is closed (in the 'no air' position), the control unit does not start.** Shortly after the reactivation air fan starts, the burner control unit checks that the pressure switch contact has closed (combustion air supply available).

- **If the contact has not closed, the control unit aborts the burner start up .**

When the flow switch contact is closed, the purge time starts. For about 30 seconds, all remaining gasses are purged from the combustion chamber. After the purge time has been terminated, the ignition is started. A few seconds later the gas supply valves (V1 and V2) are supplied with power. In case a flame has been established and detected by the flame probe, the relay continues to operate until it has reached its run position. If no flame is present or not detected, the relay generates a burner lock out, closing (V1 and V2) immediately. The program indicator stops in the position where the problem occurred as help for fault tracing.

2.8.2 Programme indicator

The programme indicator shows the status of the burner. Since the programme indicator remains in the position where shutdown occurs, it gives valuable information that facilitates fault tracing. The different situations causing shutdown are indicated by the following symbols:

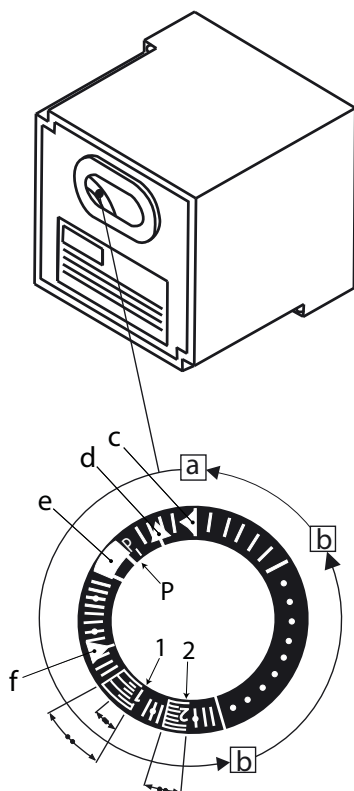


Figure 2.12 Programme indicator

Symbol	Description
a – b	Start-up sequence
.....	Duration of safety time
c	Start position
d	No start when the contacts for the reactivation airflow pressure switch are closed (no air position)
e	Lockout (fault in the flame supervision circuit)
f	Abortion of start-up sequence (not in use in this application)
1	Lockout (no flame)
2	Lockout (no flame), high flame (not in use in this application)
P	Lockout (no reactivation air)

2.8.3 Flame detection

A flame detection probe is used to verify that a flame is present. The detection probe consists of a metal electrode which is positioned in the flame.

The burner's control unit senses the existence, or not, and condition of the flame during start-up and normal operation. A flame fault always causes burner shutdown and lockout.

2.8.4 Shutdown/Lockout

When shutdown/lockout occurs, its cause must be remedied before the burner can be restarted using the mode switch. To restart the burner, the mode switch must first be set to 0 and then to start.

Shutdown/Lockout can be due to the following:

- Low pressure switch on the GasMultiBloc is defective or incorrectly set
- The pressure switch for reactivation air is defective or incorrectly set
- Gas valves fail to open
- No ignition
- Defect in the reactivation air fan
- Flame fault (either at start-up or during normal operation)

See *Table 7.1* for possible faults and the remedies that are required to reset the control unit.

2.9 High temperature cut-out

The unit is equipped with a high temperature cut-out (HTCO), which prevents the unit from being overheated and damaged if the reactivation air is too hot. The HTCO switches off the heater if the temperature exceeds the HTCO setting.

The thermostat housing is located beside the electrical panel, see *Figure 2.3*. A resetting button is located on the back of the thermostat housing.

The HTCO bulb is located in the reactivation air duct. When the HTCO trips, the message "Heater high temperature" is shown on the control panel display.

2.10 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.

2.10.1 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.

2.10.2 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.

2.10.3 Energy Recovery Purge

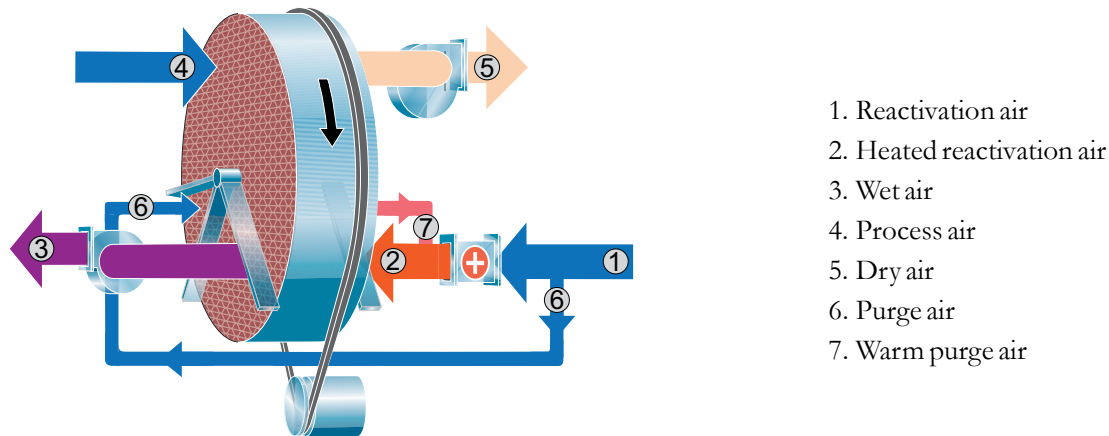


Figure 2.13 Principle for Energy Recovery Purge

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!

The dehumidifier must only be installed in a well ventilated area in accordance with the Gas Directive regulations.



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.*

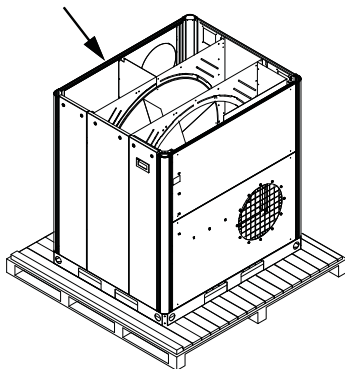


Figure 3.1 Rotor box seals

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.

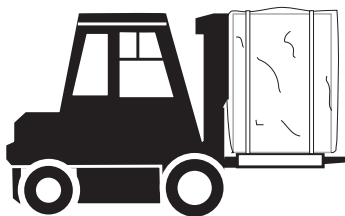


Figure 3.2 Correct length on forklift arms

**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.

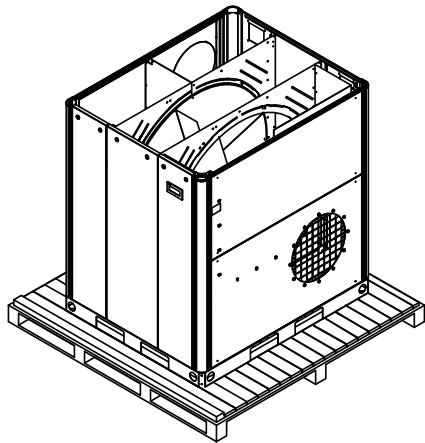


Figure 3.3 Rotor box

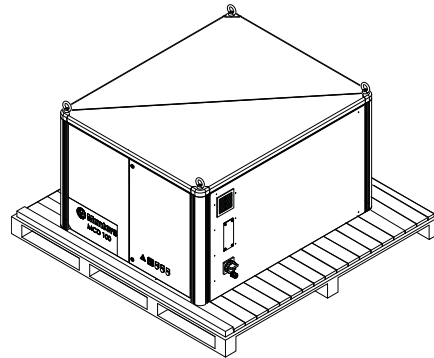


Figure 3.4 Top box

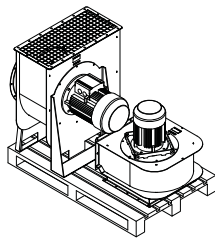


Figure 3.5 Fans

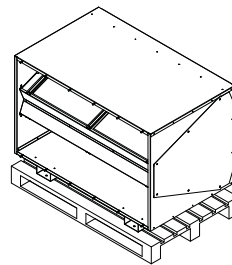


Figure 3.6 Filter box

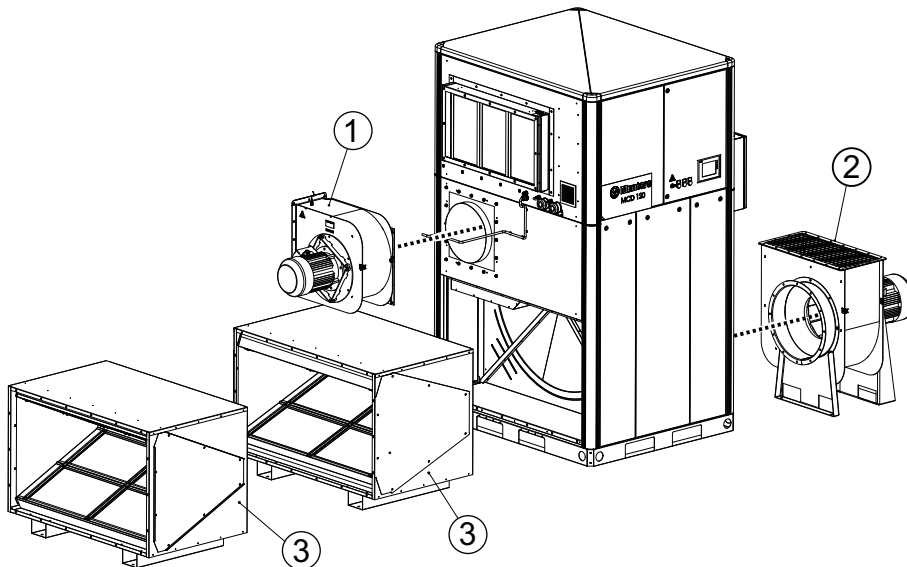


Figure 3.7

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.

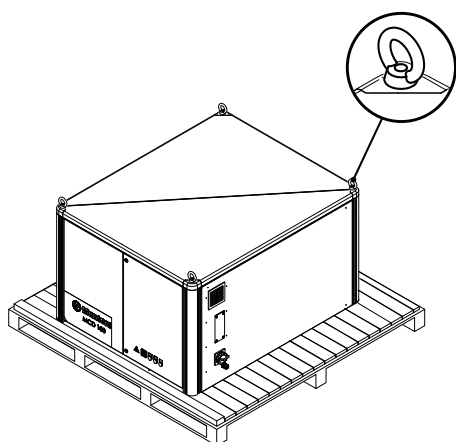


Figure 3.8 Lifting eye bolts for top box

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.

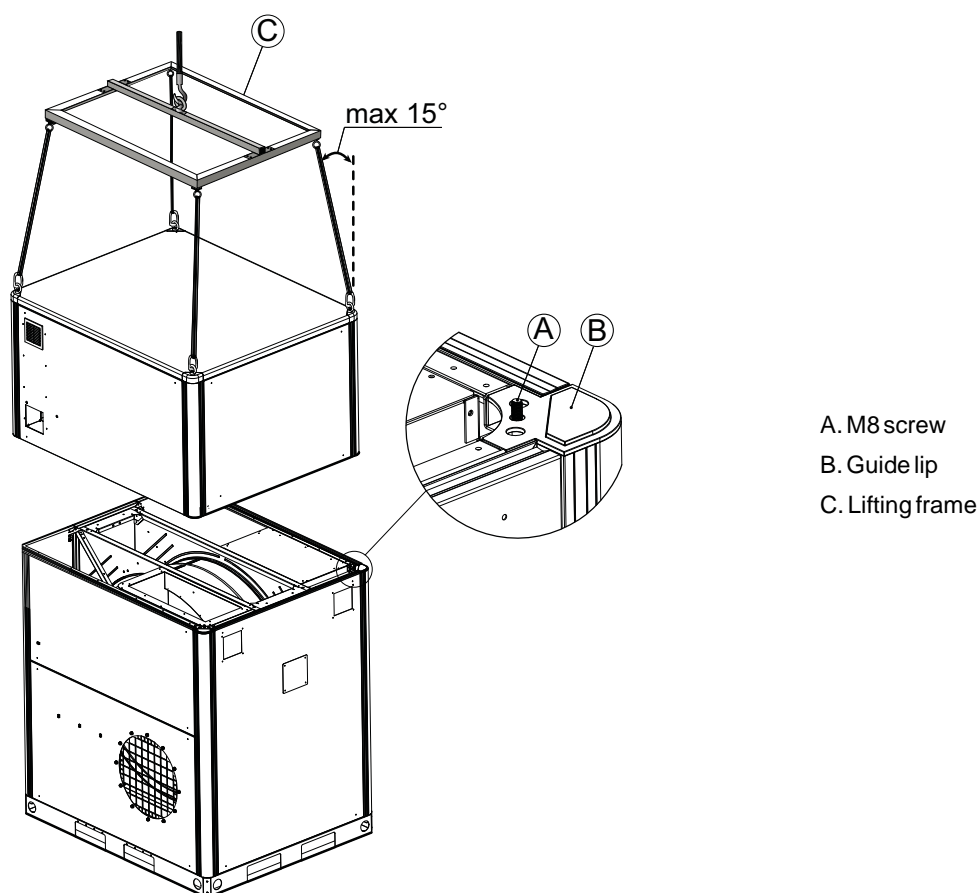


Figure 3.9 Lifting the top box



Figure 3.10 A: M8 screw seen from underneath.

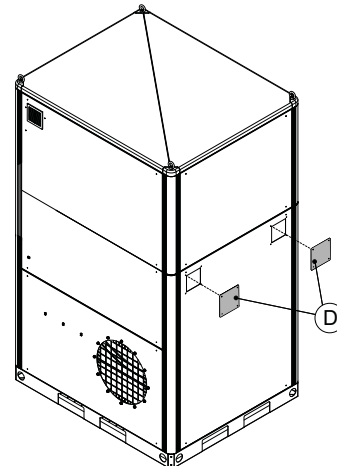


Figure 3.11 D: Cover plates

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

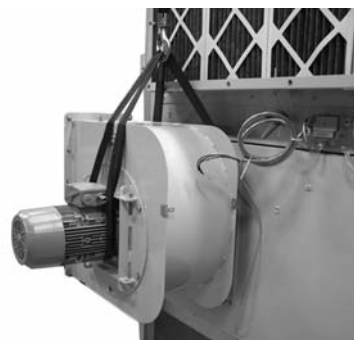


Figure 3.13 Reactivation fan lifted into position

3.7.2 Electrical connections

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

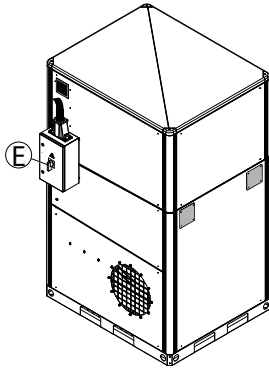


Figure 3.14 Power supply infeed box (E)

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

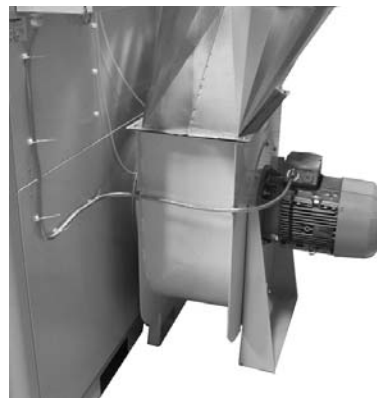


Figure 3.16 Process fan

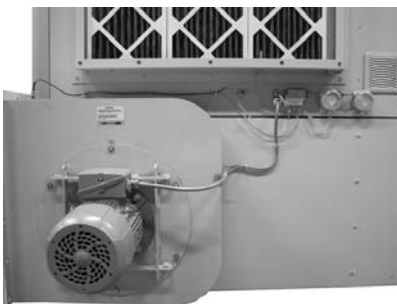


Figure 3.17 Reactivation fan

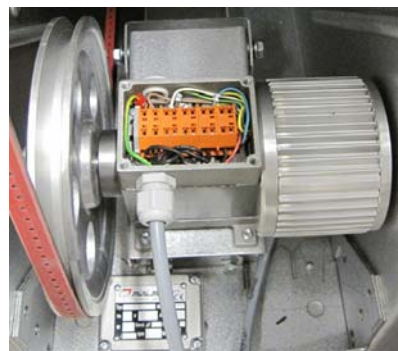


Figure 3.18 Rotor drive motor

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

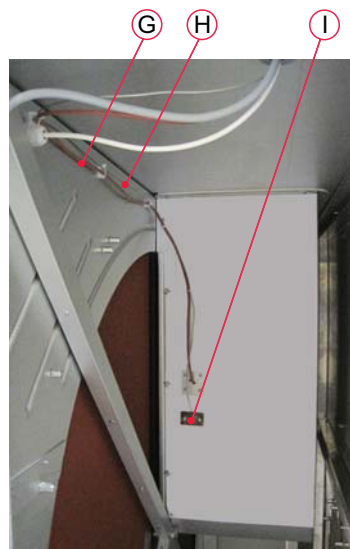


Figure 3.20 PT1000 cable (G), HTCO cable (H), pipe (I)



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 Duct installation

3.8.1 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 3.25*.
- 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 4.3, *Airflow adjustment*.
- If the dehumidifier is equipped with a frequency converter for the process air, see section 4.3, *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*.

3.8.2 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.

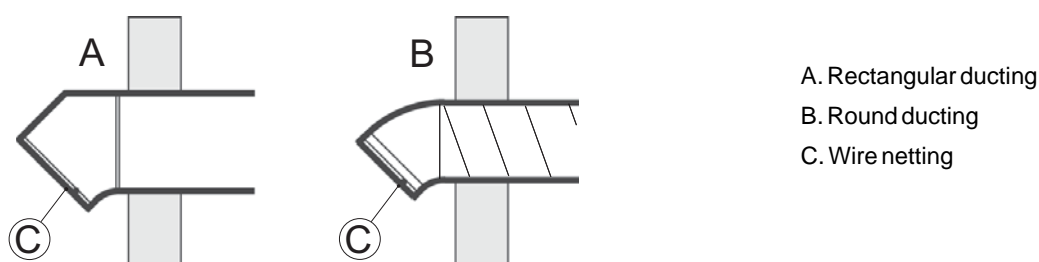


Figure 3.24 Outdoor air inlet design

3.8.3 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.

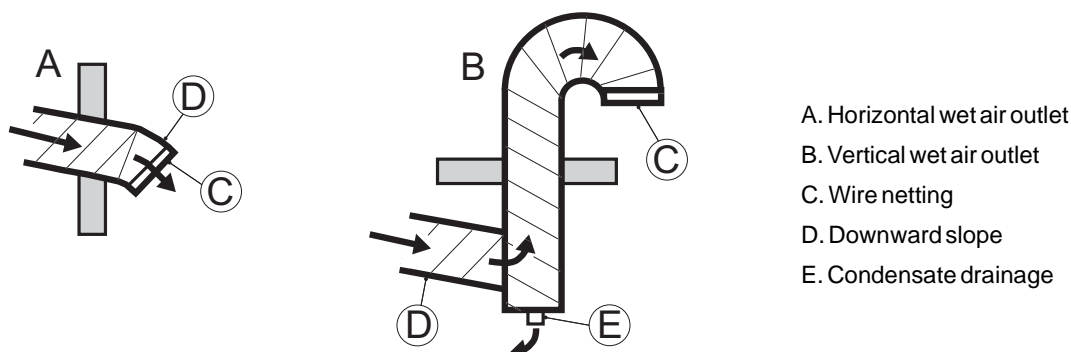


Figure 3.25 Wet air outlet design

3.8.4 Duct connection dimensions for inlets

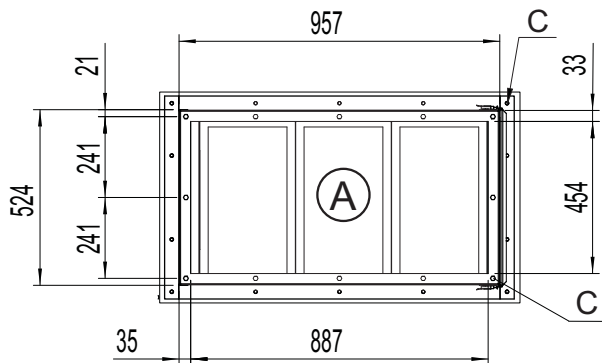
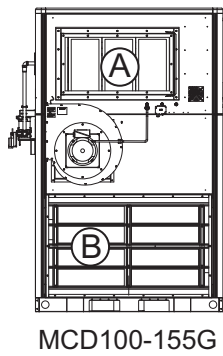


Figure 3.26 Reactivation air inlet

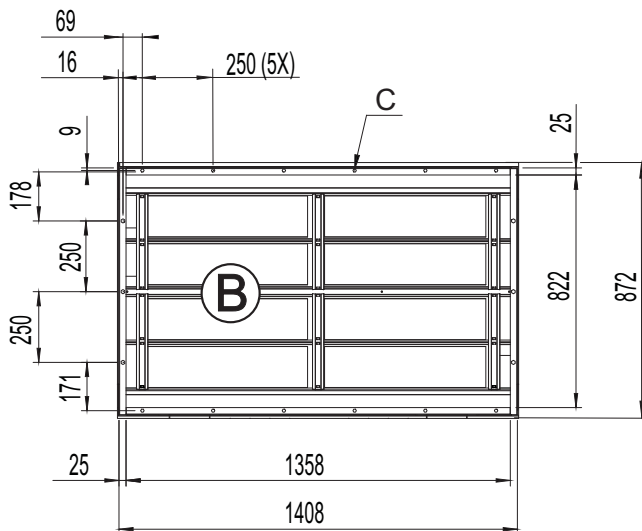


Figure 3.27 Process air inlet
(for installation with filter box)

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

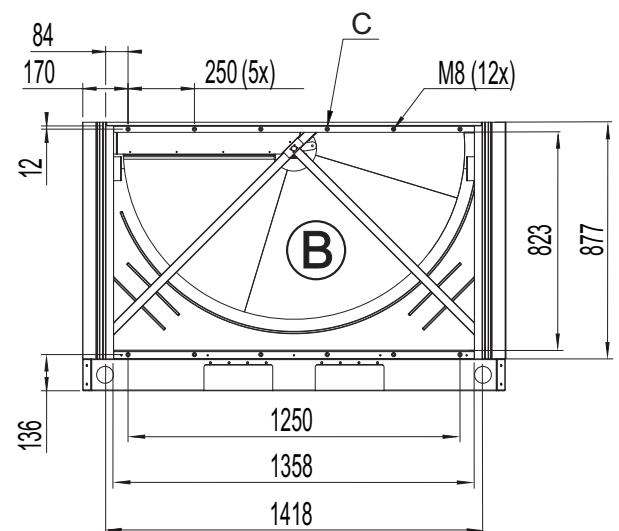


Figure 3.28 Process air inlet
(for installation without filter box)

NOTE! Fan protection grid removed to clarify dimensions in Figure 3.28.

3.8.5 Duct connection dimensions for fans

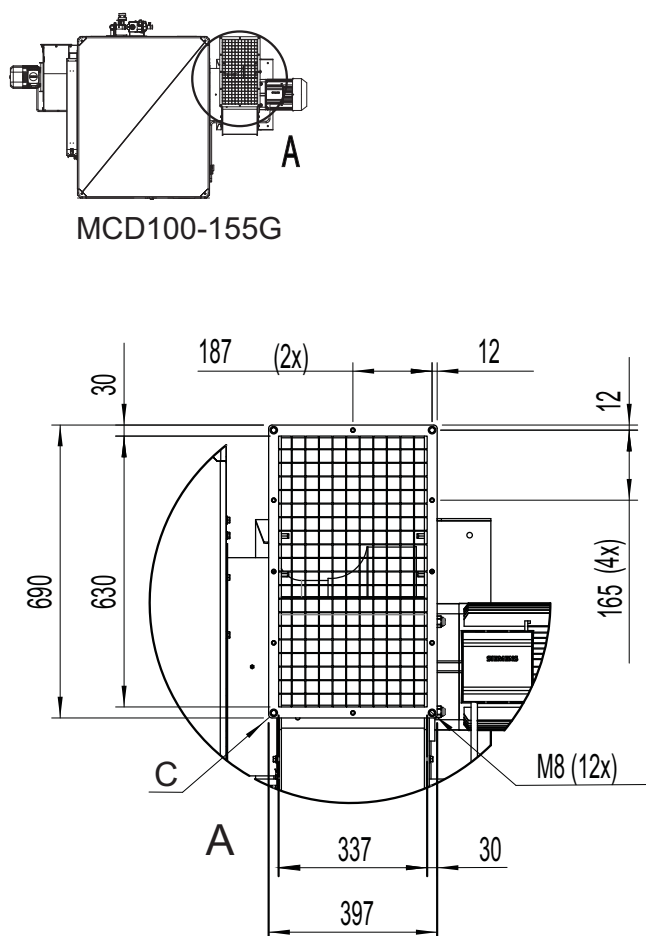


Figure 3.29 Process air outlet (dry air outlet)

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

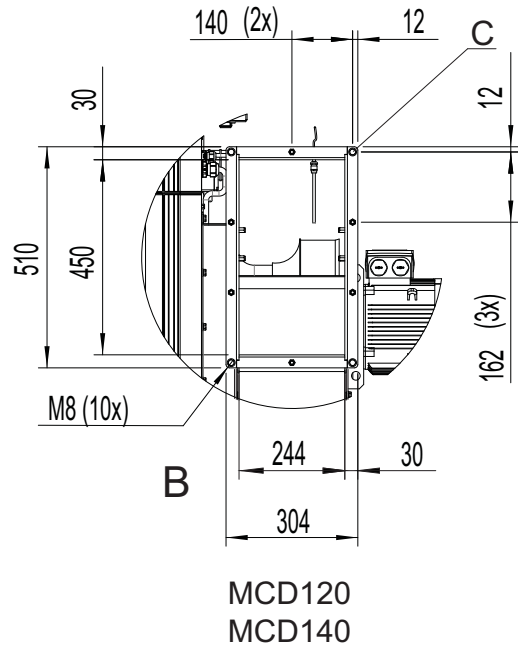
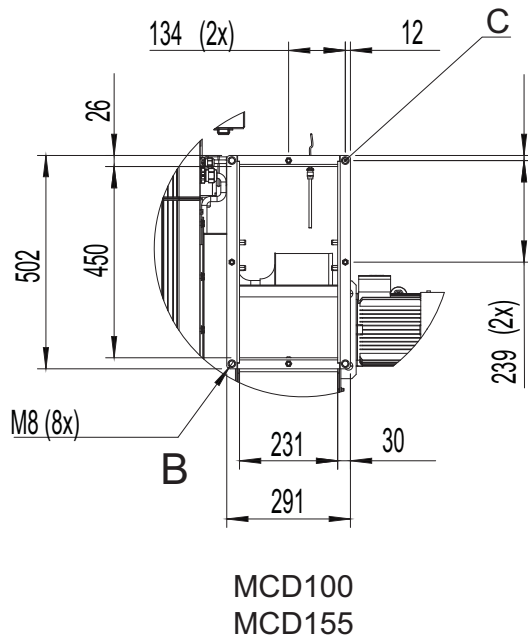
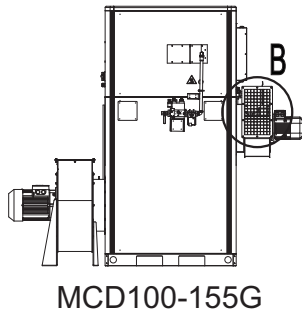


Figure 3.30 Reactivation air outlet (wet air outlet)

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

3.9 Gas and air supply



WARNING!

All connections of gas to the unit must be carried out in accordance with local regulations and by qualified personnel.



WARNING!

The reactivation air must not be contaminated with combustible substances in the state of gas, steam, fog or dust that mixed with air will create hazardous situations.



WARNING!

The wet air outlet is also the exhaust for the combustion gases. It is therefore essential that the duct installation is carried out in accordance with local regulations.

- The gas supply pipes have to be supported adequately to minimise the load and stress due to weight and movements of the gas supply.
- The gas supply inlet pressure for the burner must be correct, see section 8.4, *Technical data*.
- The reactivation air for the burner must be fresh air (no return air) that contains a minimum of 20 % oxygen.
- Only fuel gas with a sulphur content of maximum 30 ppm (silica gel rotor) must be used. The correct type of fuel gas is specified on the label next to the main identification plate, see section 1.8, *Marking*.

3.10 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%.*

3.11 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. Set the main power switch on the control panel to position **0**.
2. Make sure that the gas supply shut-off valve is closed.
3. 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.
4. Examine the gas train and make sure that all pipes, components and wiring are correctly installed and secured.
5. Make sure that the low pressure switch on the GasMultiBloc is set at 18 mbar.
6. Examine the air intake filters and make sure they are undamaged and correctly installed, and that all areas inside the different unit sections are clean.
7. Examine all ducts and duct connections and make sure that all connections have been correctly installed, and that there are no signs of damage. Make sure that all ducts are free from unwanted material blocking the air passage.
8. Make sure that the incoming power supply voltage is correct and that the cables are correctly connected.
9. Make sure that the humidity transmitter is correctly positioned in the duct, and correctly connected to the dehumidifier, see section 3.11, *External humidity transmitter*.

4.2 Adjustment of gas burner



WARNING!

The burner and surrounding metal work can become very hot. Be careful to avoid burns.

1. Unscrew the cover for the burner inspection glass.
2. Make sure that the gas supply to the dehumidifier is switched on.
3. Open the gas supply valve.
4. Purge the gas supply by opening the screw at the pressure test point outlet on the low pressure switch until only gas flows out. See *Figure 4.1*.

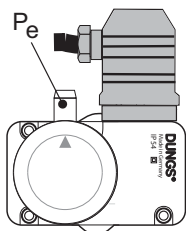


Figure 4.1 Pressure test point outlet (P_e)

5. Measure the gas supply pressure by connecting a pressure gauge to the pressure test outlet (P_e). The pressure should be between 20 - 30 mbar.

NOTE! If the gas supply pressure exceeds 30 mbar, a pressure reduction valve must be fitted in the gas supply inlet pipe.

6. Close the pressure test point outlet (P_c).
7. Unscrew the hood covering the dial and make sure that the low pressure switch is set at 18 mbar. If necessary, set the pressure using the dial, see *Figure 4.2* and *Figure 4.3*.

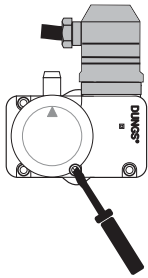


Figure 4.2 Unscrewing the hood

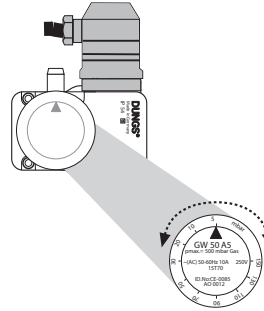
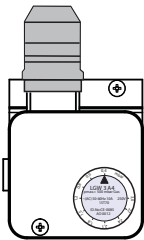


Figure 4.3 Pressure setting

8. Make sure that there is no leakage in the gas train up to the burner.
9. Set the differential pressure on the pressure switch for the reactivation airflow at 50 Pa. This prevents the burner automation from disconnecting when the airflow is adjusted.



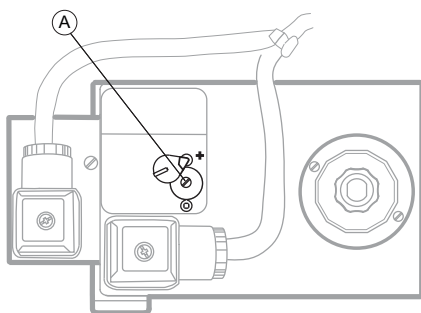


Figure 4.5 A: Adjustment screw for controlled gas supply pressure.

14. Switch off the unit and continue with the procedure in section 4.3, *Airflow adjustment*.

4.3 Airflow adjustment

4.3.1 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.

4.3.2 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 4.3.3, *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.

4.3.3 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 4.6 Formula for calculation of differential pressure

4.4 Setting the gas burner effect

4.4.1 Setting maximum effect

NOTE! The procedure in section 4.3, Airflow adjustment must be done before setting the gas burner effect.

1. Start the unit by setting the mode switch to **MAN**.
2. Wait until the control valve is completely opened, i.e. the actuating rod indicator is in position E as shown in Figure 4.7.

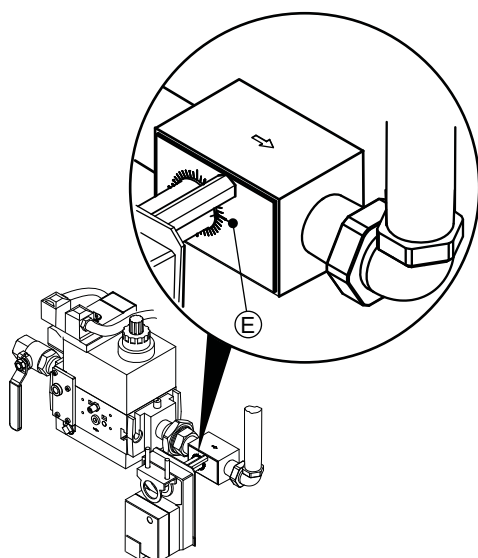
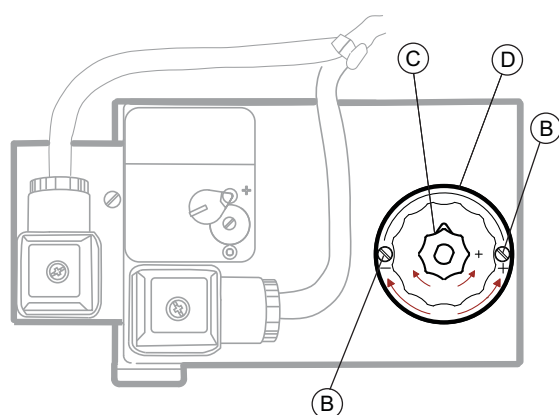


Figure 4.7 Control valve in fully open position (E)

3. Make sure that 100% heater effect is shown on the control system display.
4. Read the reactivation temperature on the control system display. If the temperature is above 125 °C, reduce the gas supply using the knob on the GasMultiBloc, see Figure 4.8 .
 - 4a. First loosen the locking screws (B).
 - 4b. Reduce the maximum flow with the outer knob (D) until the display shows approximately 120 °C.

NOTE! Adjust in small stages to allow the temperature to stabilise.



- B. Locking screws
- C. Knob for hydraulic damping adjustment
- D. Knob for adjusting gas supply

Figure 4.8 Burner effect adjustment

5. Examine the flame through the inspection glass. The flame should be evenly spaced over the full length of the burner, and have a blue colour.
6. If the unit is running normally, wait 5–10 minutes to let the normal operational temperature to be reached before continuing with the next step.
7. Measure and record the temperature in the reactivation air inlet.
8. Select the reactivation heater status view.
9. Calculate the temperature increase across the burner (the temperature of the reactivation air minus the measured temperature in step 7 above). The temperature should increase by 95 °C.
If the temperature increase is too low, increase the heater effect via the knob on the GasMultiBloc, as in *Figure 4.8*.
10. Tighten the lock screws.
11. Install the hood on the low pressure switch.
12. Reset the pressure switch for the reactivation airflow to 1,2 mbar.

NOTE! The hydraulic damping is set to maximum at the factory. Further adjustment is not necessary.

4.4.2 Setting minimum effect

1. Start the unit by setting the mode switch to **AUTO**.
2. Adjust the set point value for dehumidification to the lowest possible value.
3. Adjust the minimum capacity screw so the control valve is half-closed.

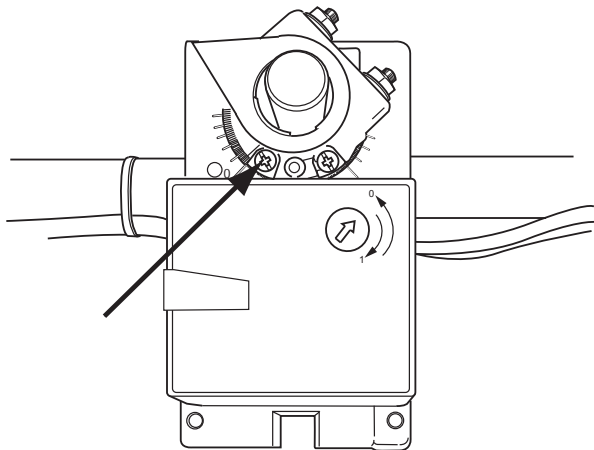


Figure 4.9 Minimum capacity screw

4. Wait until the valve actuator is stabilised in closed position. This can take up to five minutes.
5. Examine the flame through the inspection glass and slowly adjust the minimum capacity screw for the lowest flame possible (without the unit going into lockout).
6. Read the reactivation temperature. The temperature should be between 30–40 °C.
7. Adjust the set point value for dehumidification to the highest possible value. Make sure that the control valve opens completely.
8. Lock the minimum capacity screw after finishing adjustment.

5 Operation

5.1 Control panel

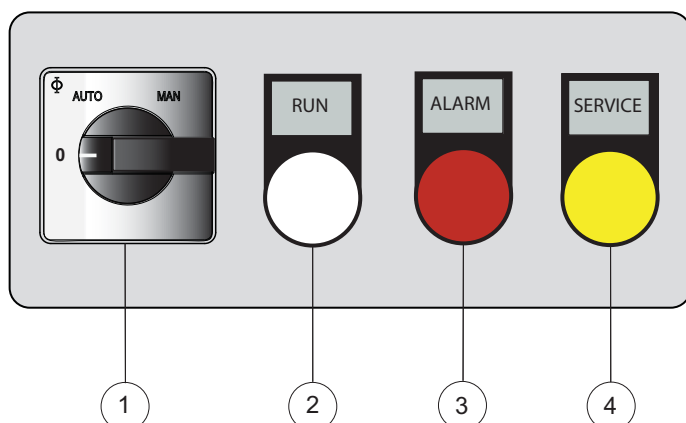


Figure 5.1 Control panel

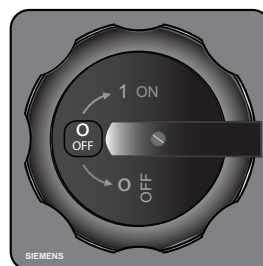


Figure 5.2 Main power switch

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.

The mode switch is also used for resetting gas alarm. Returning to position 0 will reset the burner alarm.

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 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, the 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 applies 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 rises.
4. 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.
5. Set the required expected value for humidity and restart the unit if necessary.

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 schedule for gas heater unit

Inspection and maintenance procedures are described in the following table.



WARNING!

Adjustment, maintenance and repairs must only 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!

Leaking gas can cause fire or explosion. Always do a leak test when the gas heater unit has been disassembled and reassembled. Use leak spray or equivalent.

Component	Inspection	
	6 – 12 months	24 months
Reactivation air	Measure the airflow and adjust the setting if required.	Measure the airflow and adjust the setting if required. .
Electrical components and wiring	Examine the control components and wiring for damage and signs of over-heating.	Examine the control components and wiring for damage and signs of over-heating. Make sure that all electrical connections are tight and free from damage.
Gas burner	Examine the flame and make sure it is even and has the correct height and colour.	Examine the flame and make sure it is even and has the correct height and colour. Any scale or foreign material in the bottom of the burner compartment must be removed. Any accumulation of scale or foreign material on either side of the mixing plates must be removed using a wire brush. Check that none of the holes in the mixing plates or any of the burner head ports are blocked. The burner head ports must not be enlarged or performance will be affected.
Gas filter	Examine the gas filter on the GasMultiBloc for blockage. Clean or replace the filter as required.	Examine the gas filter on the GasMultiBloc for blockage. Clean or replace the filter as required.
Spark ignitor	Clean the spark ignitor. Make sure that the silicone cable and spark ignitor connection plug are not damaged. Make sure that the insulation around the spark gap is not cracked or broken. Replace the spark ignitor as required.	Clean the spark ignitor. Make sure that the silicone cable and spark ignitor connection plug are not damaged. Make sure that the insulation around the spark gap is not cracked or broken. Replace the spark ignitor as required.
Flame detection probe	Clean the flame detection probe. Make sure that the probe is correctly placed and without damage. Make sure that the silicone cable and flame detection connection plug are not damaged.	Clean the flame detection probe. Make sure that the probe is correctly placed and without damage. Make sure that the silicone cable and flame detection connection plug are not damaged.
System set-up		Check the burner capacity setting in accordance with the user's manual.

Table 6.3 Maintenance schedule for gas 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.

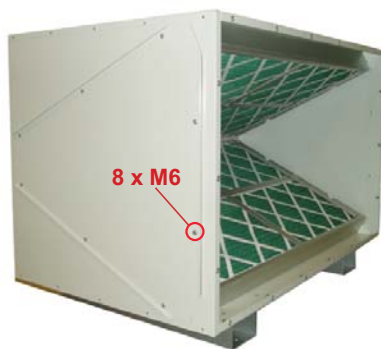


Figure 6.5

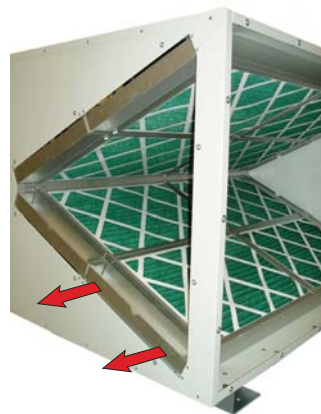


Figure 6.6

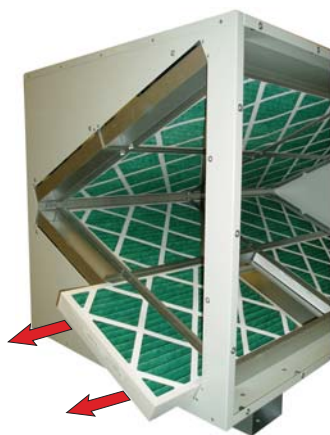


Figure 6.7

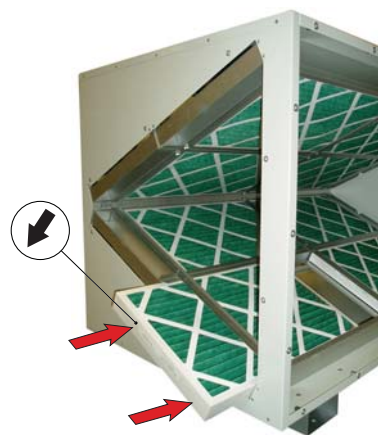


Figure 6.8

7 Fault tracing, gas heater unit

7.1 Fault tracing list

The fault tracing list below provides help in identifying faults related to the gas heater unit. The list complements the fault tracing instructions found in the supplement. For faults during start-up, the indicators on the burner control unit provide the best means of fault isolation. For more information, refer to section 2.8.2, *Programme indicator*.

Before contacting Munters service, go through the list below and rectify the fault if possible.



WARNING!

Adjustment, maintenance and repairs must only 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.

Fault symptom	Possible cause	Corrective action
The burner will not start.	The synchronous motor in the burner control unit does not start.	Check that the power supply is switched on (terminals 1 and 2). Check that there is a demand for the burner to start (need for dehumidification). Burner start can be identified by a closed contact between terminals 4 and 5.
	The synchronous motor in the burner control unit runs, and the indicator rotates – but the burner does not start.	Check that the reactivation air pressure switch is in the “no air” position (open circuit between the burner control unit pins 12 and 14).
	The burner control unit indicator has stopped.	Check the programme indicator to establish the reason for the failure.
		Check that the pressure switch contact for the reactivation airflow is closed (no airflow).
		Check that the reactivation air fan is running and that the airflow has been correctly adjusted. Check that there are no blockages or obstructions in the reactivation air ducting.
		Check that the spark ignitor is performing correctly. Check that the spark ignitor insulator is not cracked and that the cable from the ignition transformer to the spark ignitor is not shorting to ground.
		Check that the flame detector probe is correctly placed in the flame and that the flame signal (>12 µA) is shown at the burner control unit pin 24.
		Check that the flame detector probe insulation is not cracked.

Fault symptom	Possible cause	Corrective action
The burner will not start.	The burner control unit indicator has stopped.	Check the programme indicator to establish the reason for the failure.
		Check that when both solenoid valves (V1, V2) in the GasMultiBloc are open, the change in the flame characteristics does not cause the flame to "lift-off" the burner head and hence temporarily allow the flame detection probe to lose contact with the flame.
		Check for interruption in the gas supply.
		Check for failure of combustion air supply.
		Check for incorrectly positioned flame detection probe.
		Check for failure of flame detection probe insulation and silicone cable connection.
Performance faults	The burner flame is too high.	The gas volume and/or gas pressure is set too high. Adjust the burner maximum capacity according to the user's manual.
	The burner flame is yellow at the flame end.	The reactivation airflow is too low or it contains too little oxygen. The oxygen content must be greater than 20%. Recirculated air from the wet air outlet must not be allowed to contaminate the reactivation air inlet.
	The burner flame is uneven (longer at one end of the burner).	Poor combustion airflow pattern. Check the reactivation air ducts for blockage. Check that none of the holes in the mixing plates or any of the burner head ports are blocked.
	The burner is operating, but the unit is not controlling the humidity.	The burner settings are incorrect. Check the burner system settings in accordance with the user's manual.
		The burner capacity is incorrect. Check the burner capacity and temperature increase across the burner according to the user manual.

Table 7.1 Fault tracing list for gas heater unit

7.2 Measuring flame signal and differential gas pressure

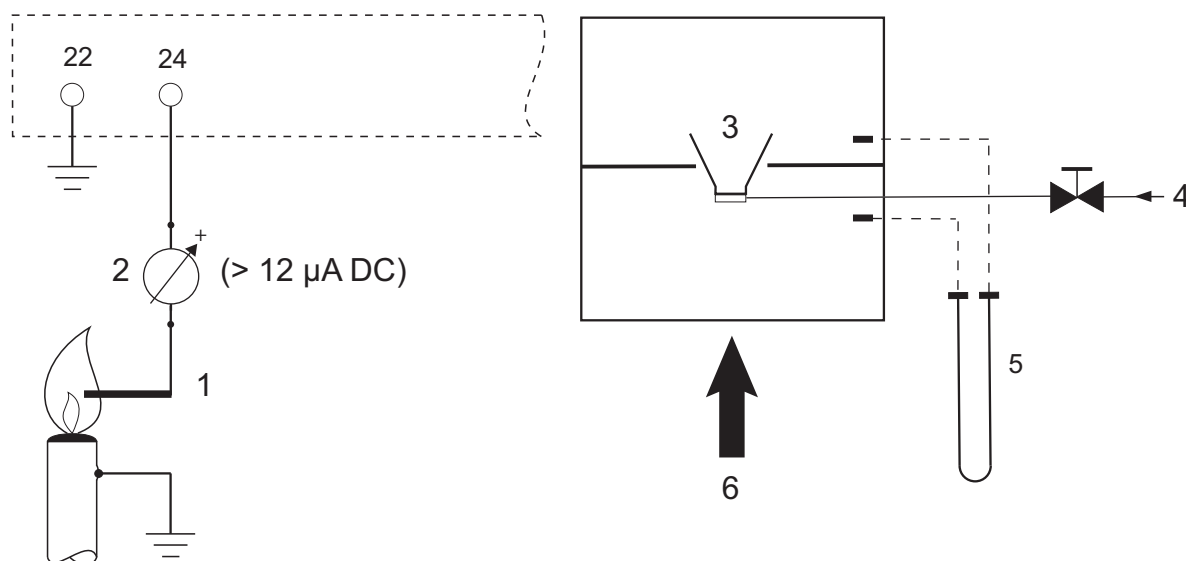


Figure 7.1 Measuring flame signal and differential gas pressure.

- | | |
|--------------------------|--|
| 1. Flame detection probe | 4. GasMultiBloc control unit |
| 2. DC meter (0–100 µA)* | 5. Differential pressure indicator or U-pipe |
| 3. Combustion chamber | 6. Airflow through burner |

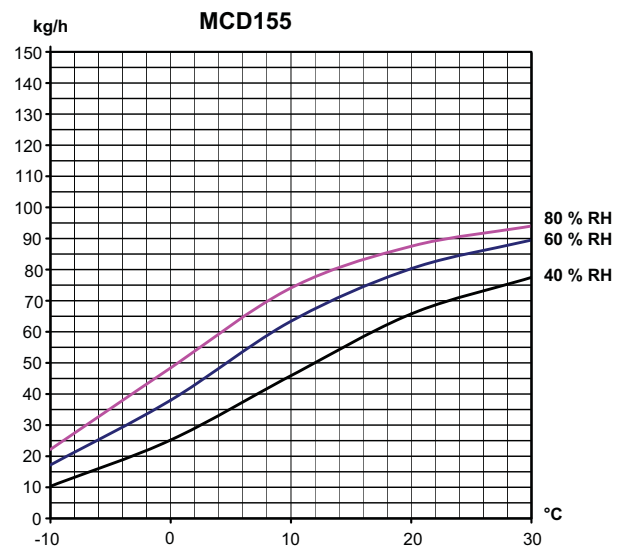
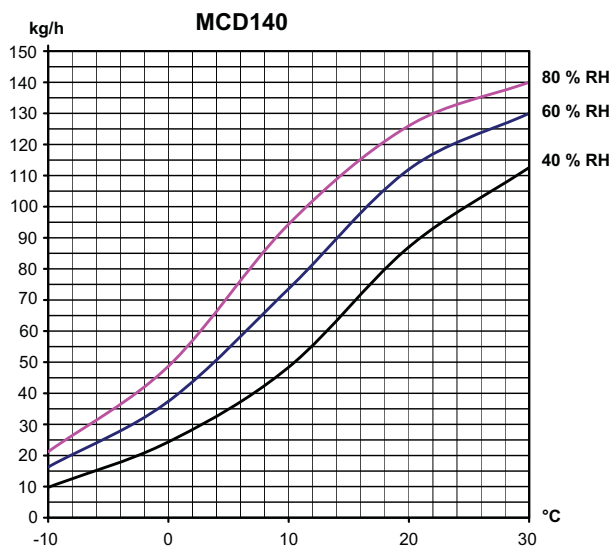
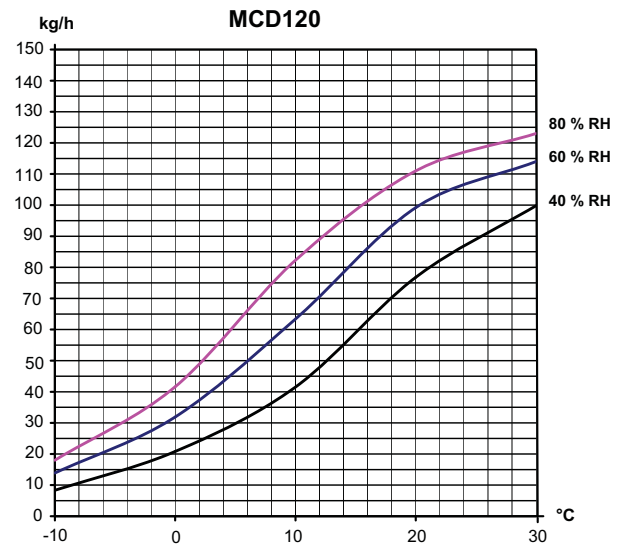
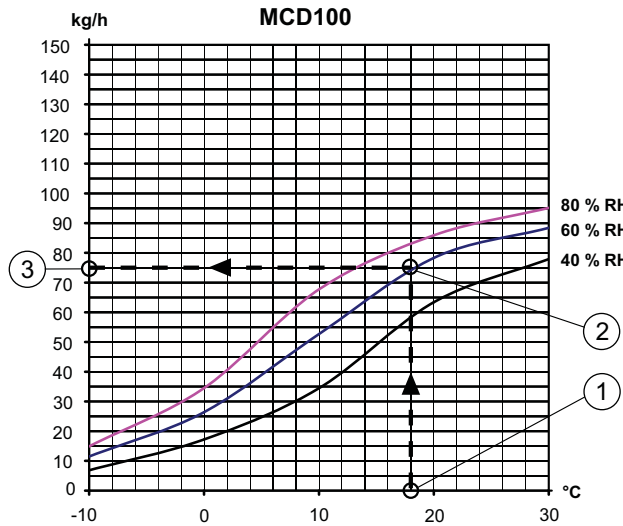
* The flame signal must be higher than 12 µA.

8 Technical specification

8.1 Capacity diagrams

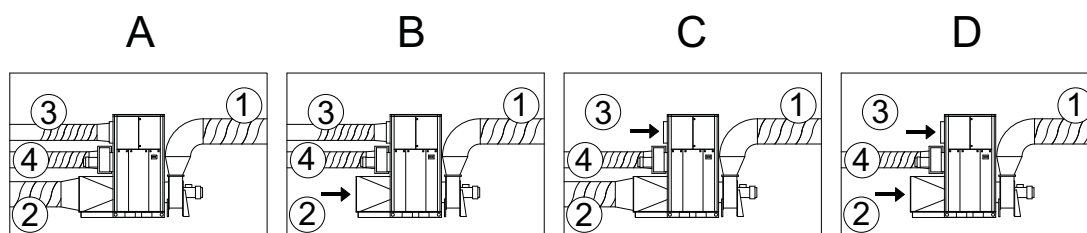
Approximate capacity in kg/h. Contact your nearest Munters' office for further information.

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)

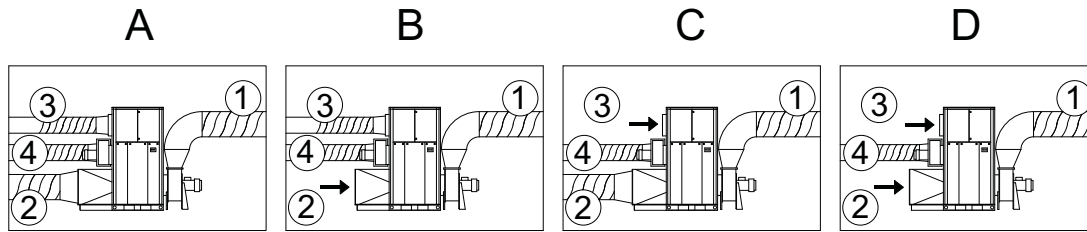
Kok = Correction for calculating Lw (Lw = Lwt + Kok)

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)

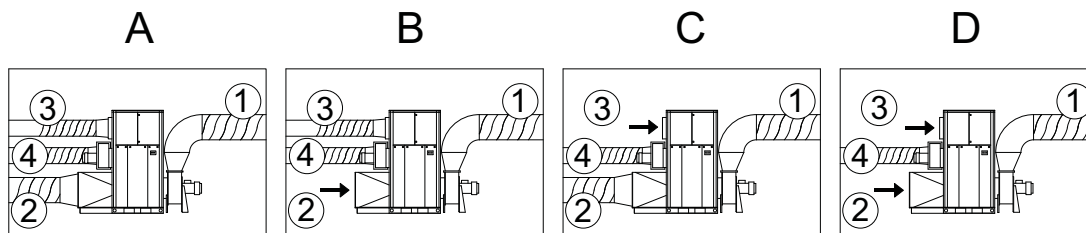
Kok = Correction for calculating Lw (Lw = Lwt + Kok)

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)

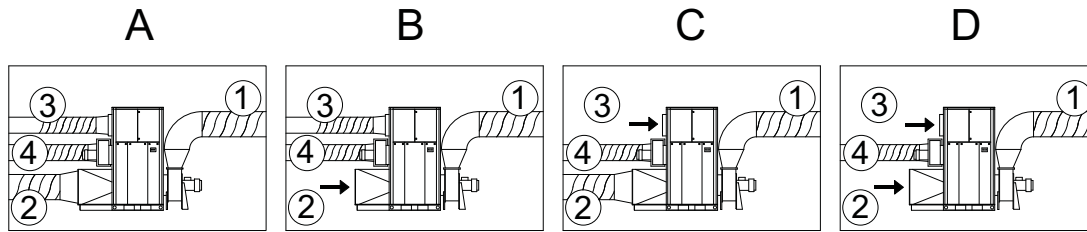
Kok = Correction for calculating Lw (Lw = Lwt + Kok)

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

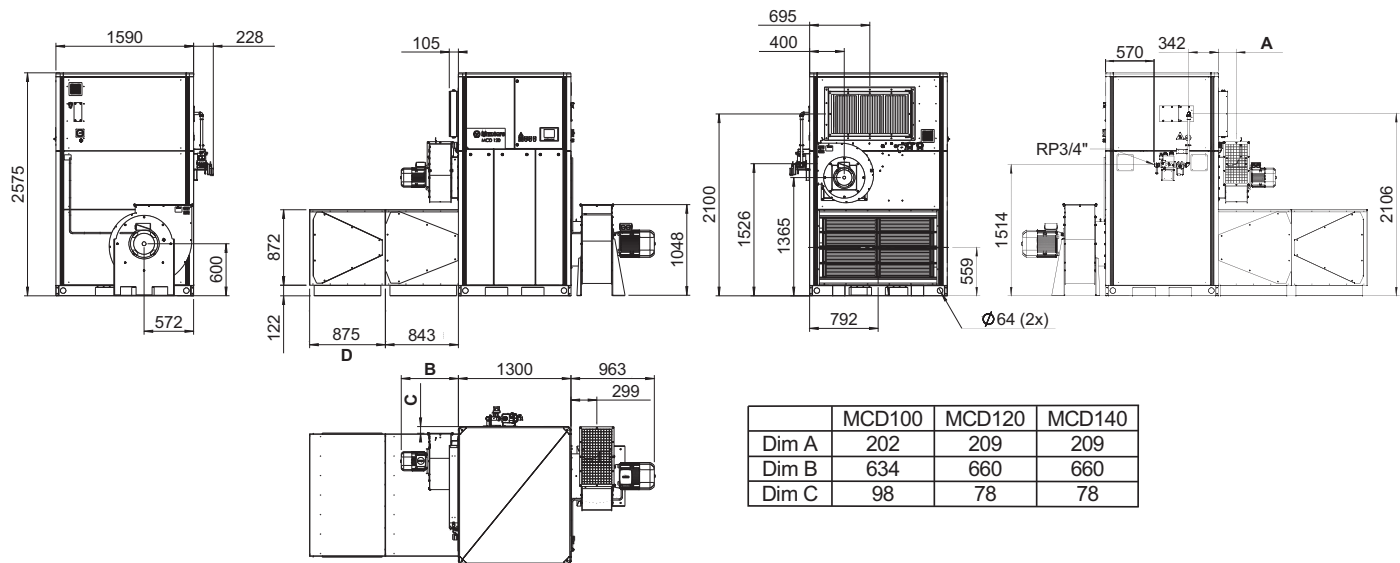


Figure 8.1 Dimensions, MCD100–140G

D. Option

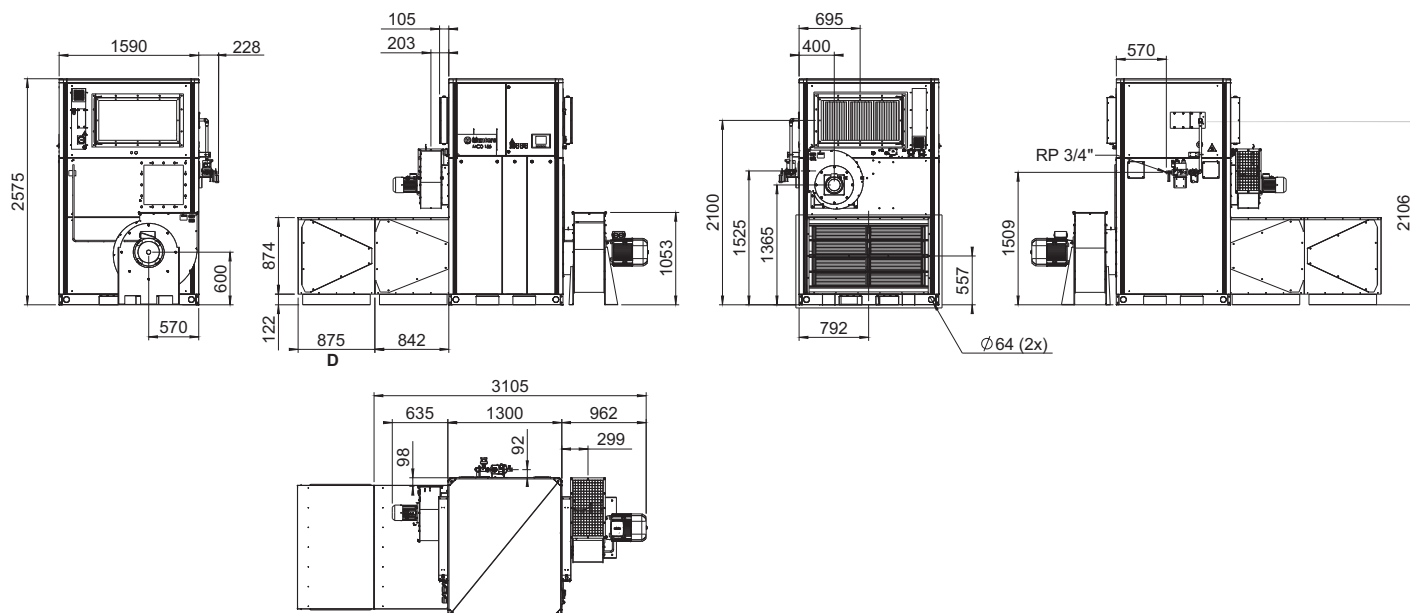
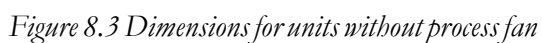
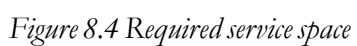


Figure 8.2 Dimensions, MCD155G

D. Option



8.3.3 Service space



8.4 Technical data

	MCD100G	MCD120G	MCD140G	MCD155G
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
Gas consumption (m ³ /h)	10,04	12,99	14,77	10,04
Gas consumption with ERP (m ³ /h)	8,86	11,81	12,99	8,86
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)	872	872	872	802
Weight rotor box (kg)	552	552	492	407
Weight, top box (kg)	320	320	380	395
Weight, reactivation fan (kg)	60	81	81	60
Weight, process fan (kg)	200	200	200	200
Weight, filter box (kg)	92	92	92	92

	MCD100G	MCD120G	MCD140G	MCD155G
Weight, total (kg)	1132	1153	1153	1062
Weight, total, without process fan (kg)	932	953	953	862
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
Contactor 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)			
Gas burner	MCD100G	MCD120G	MCD140G	MCD155G
Gas consumption (m³/h)	10,04	12,99	14,77	10,04
Gas consumption with ERP (m³/h)	8,86	11,81	12,99	8,86
Gas burner control system, voltage requirement	1~50/60 Hz, 220/240 V			
Control valve, rated voltage	1~50/60 Hz, 24 V AC			
Control valve, control voltage	0–10 V DC			
Flame current signal (normal operation)	12–50 µA			
Flame current signal (flame failure)	<12 µA			
Gas specifications				
Natural gas pressure (mbar)	18–30 (G20 / G25)			
1 Nm³/h natural gas = 10,158 kW				
Maximum sulphur content, HPS rotor (ppm)	30			
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 gas 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

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