Original instructions

User manual

HM3 Humimax™

Evaporative humidifier/cooler

TEN-HM3-B1506

Munters

Table of contents

1 Introduction

1.1 About this manual

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

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

This manual does not describe in full all the maintenance work required to guarantee the longevity and reliability of this type of equipment. Only the services of a qualified engineer who is a member of a confirmed maintenance company will ensure the safe and long lasting operation of the unit.

The contents of this manual can be changed without prior notice.

Send any comments regarding this manual to:

Munters Europe AB
Technical Documentation
P.O. Box 1150
SE- 164 26 KISTA Sweden
e-mail: t-doc@munters.se

1.2 Warranty

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

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

The warranty is limited to a free exchange of parts or components which have failed as a result of defects in materials or workmanship.

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

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

1.3 Inspection of delivery

- 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.
- Contact Munters immediately if the delivery is not complete or damaged in order to avoid installation delays.

- Remove all packaging material from the unit, and make sure that no damage has occurred during transportation.
- Any visible damage must be reported in writing to Munters within 3 days and prior to installation of the unit.
- Dispose of the packaging material according to local regulations.

1.4 Conformity with directives and standards

The humidifier is in conformity with the essential safety requirements of the Machinery Directive 2006/42/EC, and in conformity with the provisions of the Ecodesign Directive (ErP) 2009/125/EC, and of the EMC Directive 2004/108/EC.

1.5 Marking

Figure 1.1 Unit label example

The unit label is placed on the back, next to the main circuit breaker.

2 Safety

2.1 Warnings

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

WARNING!

Indicates a possible hazard that can result in severe personal injury or death.

CAUTION!

Indicates a possible hazard that can result in damage to the unit or other property, or cause environmental damage.

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

2.2 Intended use

The unit delivered by Munters must only be used for the treatment of air. This includes cooling and humidifying the 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.

2.3 Safe installation, operation and maintenance

Great effort has been placed on the design and manufacture of the unit, to comply with applicable safety aspects for this type of equipment.

The information in this manual includes suggestions for best working practice and 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.

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

WARNING!

Before doing any service or maintenance work on the unit make sure that all electrical equipment has been disconnected from the power supply, and secured against reconnection. The unit is connected to high voltage which can cause serious injury or death.

The humidifier includes a rotating fan. Keep hands away from fan blades at all times while unit is on. DO NOT service unit until the fan has completely stopped.

The unit must never be connected to a voltage or frequency other than that for which it was designed. Refer to the unit label. Line voltage that is too high can cause an electrical shock hazard and damage to the unit.

Use only approved lifting equipment to avoid accidents.

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

Water spillage can cause slipping accidents resulting in serious injury.

CAUTION!

Never climb on the unit or use it as scaffolding.

3 Product design

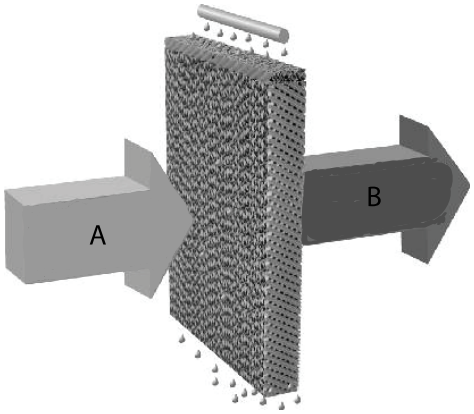
3.1 Product description

The Munters Humimax maintains a required humidity or temperature, depending on the selected operation mode and the technical possibilities.

The main components are a stainless steel casing, an evaporative humidification pad and a high performance fan for which the speed is regulated to achieve the selected setpoint.

Common applications are printing, electronics manufacturing, data center server rooms and preservation of artifacts.

3.2 Principle of operation



A. Warm and dry air
B. Cooled and humidified air

A circulation pump in the water tray feeds water to the top of the CELdek evaporative media. The water flows down the corrugated surface of the media.

As the warm and dry air passes through the pad it evaporates part of the water and produces cool, humidified air.

The rest of the water assists in washing the pad, and is drained back to the tray.

The energy that is needed for the evaporation is taken from the air itself. The air that leaves the humidifier is therefore humidified and cooled simultaneously without any external energy supply for the evaporation.

This is in essence the adiabatic cooling process. It is very efficient and the consumption of energy is very low.

3.3 Function

The unit can be started directly from the control panel, by a weekly schedule in the controller or by a remote switch.

It can as standard be connected to a Modbus TCP/IP or RS485 communication network, and optionally through BACnet.

The unit can be used as stand alone, or in a group of units working together with a common control input. See the HM3 Commissioning Guide for more information on connection possibilities.

The bottom of the unit forms a water tray. Water is supplied to the tray through a water filter, a solenoid valve and a level switch that controls the water level.

The tray is emptied and refilled with fresh water as needed (batch drain) to ensure a low level of minerals. The drain valve is opened electrically.

In the case of temperature control mode, there is a maximum humidity limitation setting to prevent over saturation of the air. If this value is reached, the fan speed will be regulated down without considering the temperature.

3.4 Options

If the air contains a high concentration of particles or organic dust, an optional air pre-filter can be installed on the back of the unit. The pre-filter is based on a mesh net with 350 micrometer filtration.

Problems with organic dust and minerals can be reduced by using an optional dosing system with bromide/chloride tablets, see *4.14, Chloride tablet dosing*.

The unit can optionally be equipped with a BACnet communication module, see *4.10, Connection of BACnet communication*.

4 Installation

4.1 Safety

WARNING!

The unit must never be connected to a voltage or frequency other than that for which it was designed. Refer to the unit label. Line voltage that is too high can cause an electrical shock hazard and damage to the unit.

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

CAUTION!

All electrical cabling must be secured in a safe way to avoid damages during normal operation or service, and not to interfere with removal of the evaporative pads.

Do not step on the unit or the piping.

A flexible hose must be used to connect to the water supply.

4.2 Moving the equipment

WARNING!

The humidifier is heavy. Be careful when lifting or moving the parts.

Use only approved lifting equipment to avoid injuries.

The humidifier is front-heavy. Take necessary precautions to prevent the unit from tipping over.

The humidifier must always be handled carefully.

Provided that the packaging material has not been removed, the humidifier can be lifted by a crane or forklift truck.

Dispose of the packaging material according to local regulations.

4.3 Storing the equipment

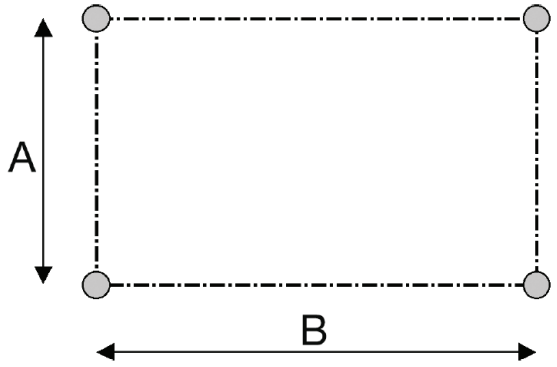
- Place the humidifier in an upright position on a horizontal surface.
- Re-use the packaging material to provide protection for the unit.
- Take necessary precautions to prevent the unit from tipping over.
- Protect the humidifier from physical damage.
- Store the humidifier under cover and protect it from dust, frost, rain and aggressive contaminants.
- Evaporative pads must be stored in a dry environment.

4.4 Install the consoles on the wall

1. The consoles are to be fixed in position on a concrete wall by four 12 mm concrete expansion-shell bolts according to *Table 4.1*.
2. For another type of wall or an alternative fixture method, the resulting fixture must have the same stability factor.

3. Non solid walls have to be reinforced to carry the weight of the unit. For weight information, see *8.1, Dimensions and weight.*
4. The safety of the installation must always be verified before operation.

NOTE! *The unit must be positioned level within 2° in both directions.*



Unit	A (mm/inch)	B (mm/inch)
HM3 2000	360/14.2	600/23.6
HM3 5000	360/14.2	600/23.6
HM3 10000	360/14.2	1200/47.2

Table 4.1 Drilling template

4.5 Install the unit on the consoles

1. Make sure that the unit is not connected to the power supply.
2. Note the minimum distance from the wall in *Figure 4.1* , (mm/inch) to give sufficient air circulation and service space.

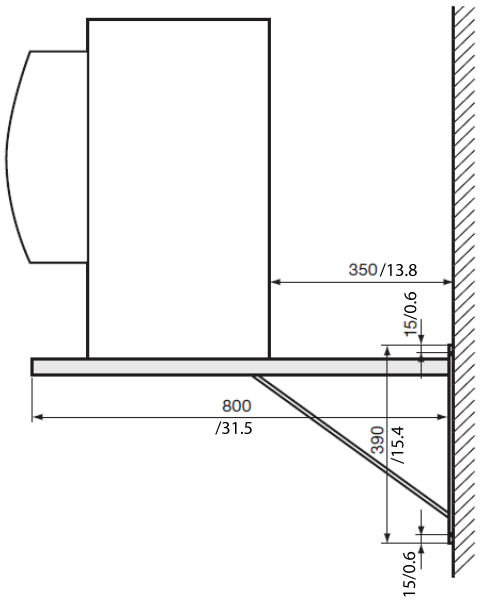
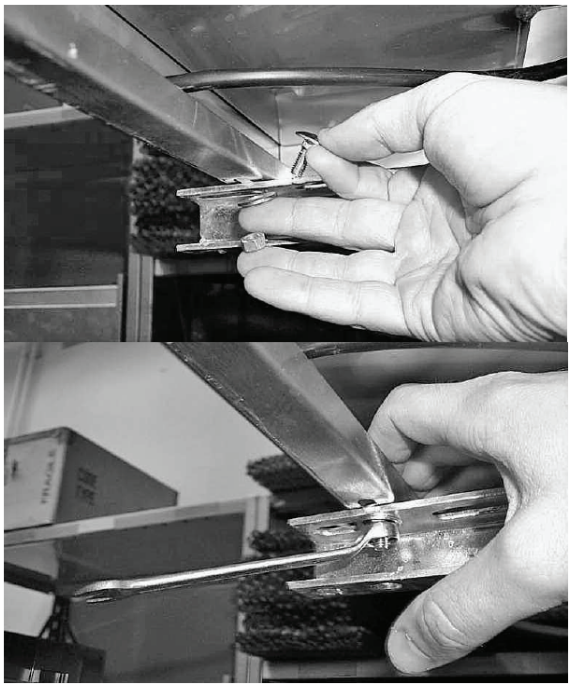


Figure 4.1 Position on the consoles

CAUTION!

Do not install the unit above any electrical or other moisture sensitive equipment.

3. Remove the bottom plate from the unit.
4. Attach the unit to the consoles with the included screws, nuts and washers.



5. Install the bottom plate.
6. Adjust the deflectors on the front of the unit to direct the airflow in the desired direction.

NOTE! *A too steep angle setting of the deflectors will reduce the airflow. The maximum recommended angle is 45°.*

4.6 Electrical connections

WARNING!

The unit must never be connected to a voltage or frequency other than that for which it was designed. Refer to the unit label. Line voltage that is too high can cause an electrical shock hazard and damage to the unit.

Make sure that the unit is connected to an electrical outlet that is correctly grounded.

A safety switch must be installed between the unit and the power supply in case of a fixed installation.

4.7 Remote On/Off switch connection

To use remote start when the humidifier is in Auto mode, an external switch can be connected to the controller.

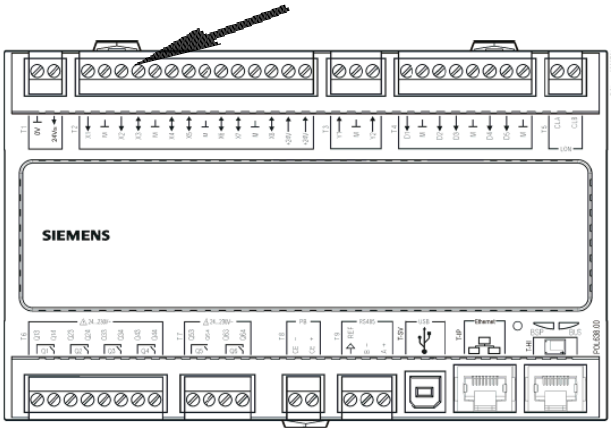


Figure 4.2 Connection of remote switch

Connect a normally open (NO) switch to terminals X3 and M, see *Figure 4.2* .

4.8 Humidity/temperature sensor connection

CAUTION!

Connection of the humidity sensor must be carried out by a person with adequate knowledge.

Follow the instructions below to assemble and connect the humidity sensor connection kit to the sensor.

Use a three wire signal cable.

Connect a jumper cable between +RH and +T.

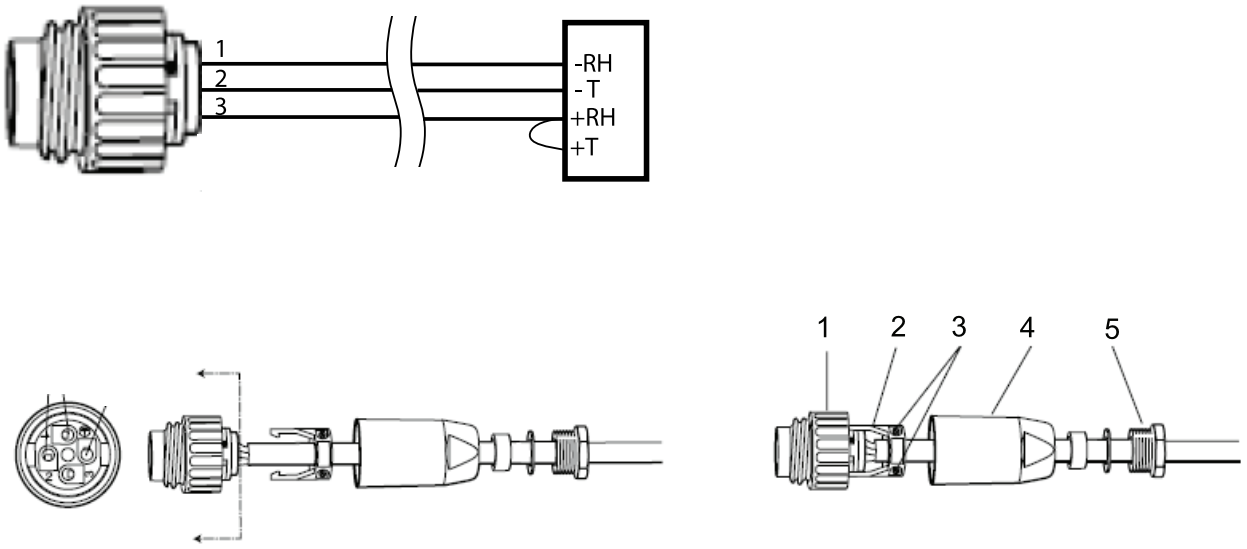


Figure 4.3 Connection of leads and humidity sensor connection kit assembly

1. Connect the wires between the connector and the sensor, Pin 1 = -RH, Pin 2 = -T, Pin 3 = +RH
2. Note the jumper cable between +RH and +T
3. Attach the terminal (2) to the connector (1)
4. Tighten the terminal screws (3)
5. Attach the cover (4) to the connector (1)
6. Attach the flange (5) to the cover (4)

Connect to the socket marked RH/T on the back of the humidifier.

If you have more than one humidifier in the same room, it is possible to use only one sensor. This is set up at commissioning.

The humidity sensor must be installed in a position that is a good representation of the general room humidity.

It is important that the humidity sensor is not placed near any heat sources or disturbing air currents, or in the direct airflow from the humidifier.

4.9 Connection of Modbus RS485 communication

See how to assemble the connector in *4.8, Humidity/ temperature sensor connection*.

Pin connection: Pin 1 = A+, Pin 2 = B-, Pin 3 = REF.

Connect to the socket marked RS485 on the back of the humidifier.

4.10 Connection of BACnet communication

The BACnet communication module is optional. A network cable must be connected to the module inside the Climatix control box.

For more information, see the HM3 Commissioning Guide.

4.11 Connection of Modbus TCP/IP communication

Connect a network cable to the socket marked TCP/IP on the back of the humidifier.

4.12 Connection of control system HMI

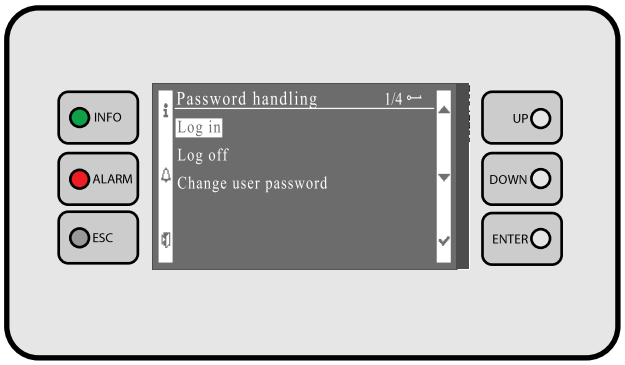


Figure 4.4 Climatix control system HMI

Connect the display plug to the socket marked HMI on the back of the humidifier.
Install the HMI-holder in a suitable position.
Position the HMI so that the status indication LED is visible.

4.13 Water supply and drain

Connect the supplied flexible hose to the unit, and to the mains water supply through the water filter and the shut-off valve. The valve is delivered together with the fitting for a 1/2" pipe.

The minimum water pressure is 1 bar, maximum pressure 8 bar.

The maximum flow through the solenoid valve is 3 liters per minute.

The pipes and connected equipment must be installed in such a way as to avoid high-pressure peaks in the water supply pipe.

The outlet water connection inner diameter is 24 mm, rubber sleeve.

The drain must extend and terminate with an indirect connection to the sanitary system by way of an open drain, funnel drain, or fixed air gap, all of which shall include a trap part in their installation.

Make sure that the drain has enough capacity for the overflow protection to work properly.

The tube must in no position be above the outlet connection on the humidifier.

CAUTION!

Make sure that there is no water leakage.

Figure 4.5 Overflow funnel

4.14 Chloride tablet dosing

A high concentration of dust in the air increases the risk for clogged pads and water tank. In fact the evaporative humidifier is also a very effective air filter. Problems with organic dust and minerals can be reduced by using an optional dosing system with bromide/chloride tablets.

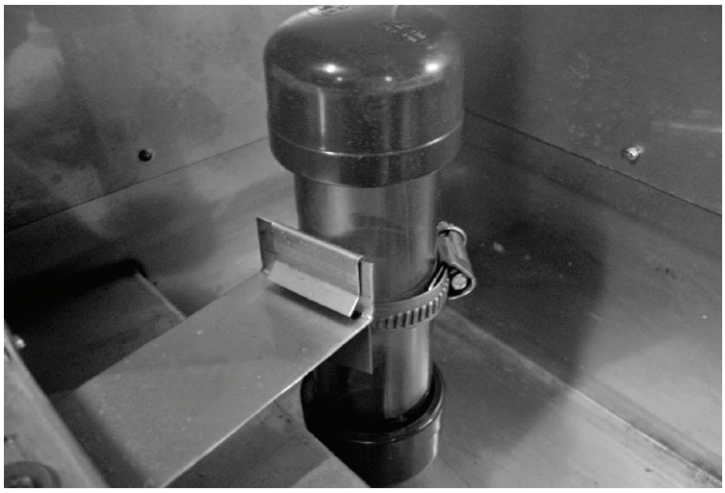


Figure 4.6 Chloride tablet dosing system

Install the bromide chloride tablet dosing system DT1:

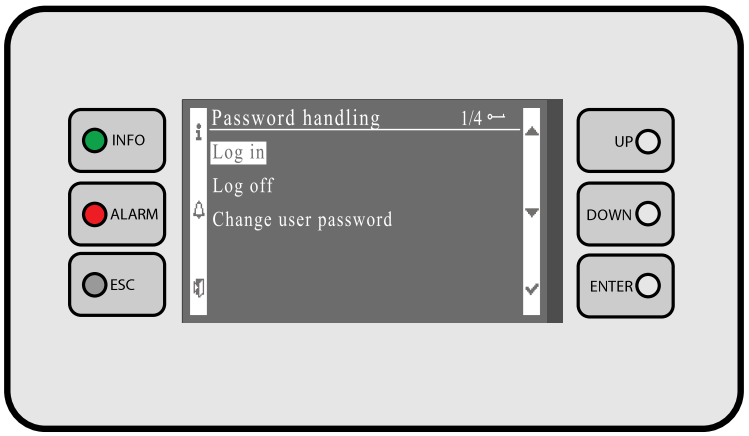
- Attach the bracket in the holes of the frame underneath the evaporative pad.
- Position the doser so that the bottom of the container is approximately 5 mm/0.2 inch above the bottom of the tray.
- If the doser is standing on the bottom of the tray, the water circulation will not be sufficient and the chloride concentration too low.
- When the doser is in the correct position, the tablets will be wetted in sequence and the chloride concentration will be correct.

NOTE! *For maintenance, make sure that the holes are not clogged and refill tablets as needed.*

5 Operation

5.1 HMI Operation

The Human Machine Interface (HMI) is used to display values and parameters, and to input settings and commands to the control system.



Key	Action	Function
UP	Press	Scroll up or increase an input value.
	Press and hold	Press and hold for more than 1.5 second enables the acceleration function to roll up or increase the value rapidly.
DOWN	Press	Scroll down or decrease an input value.
	Press and hold	Press and hold for more than 1.5 second enables the acceleration function to roll down or decrease the value rapidly.
ENTER	Press	Selection/confirmation.
	Press and hold	After logging in any user level, Press and hold key ENTER for 3 seconds to activate login/logoff window. If the user is not logged in, press and hold key ENTER for 3 seconds to display the password enter page.
INFO	Press	Go to Main Index. Toggle between Start page and Main index.
ALARM	Press	Go to Alarm page. Toggle between active alarms, alarm history and alarm functions.
ESC	Press	Cancel modification/exit to upper level of menu/back to previous page.
	Press and hold	Go to Settings.

Table 5.1 Overview of functions of HMI keys

5.2 HMI Light indications

LED	Indication	Function
INFO	Blinking green	StdBy, Start-up/Stop sequence, Override, Fanoverrun,
	Constant green	Run mode
	Constant orange	Alarm/Immediate stop
	Blinking green/orange	Wiring test mode
	Blinking red/orange	Configuration mode
ALARM	Blinking red	Indicates active and unacknowledged alarm exists.
	Constant red	Indicates active alarms exist but all alarms have been acknowledged.
	Off	No active alarm exists.

Table 5.2 Overview of HMI LED-light indications

5.3 HMI Display

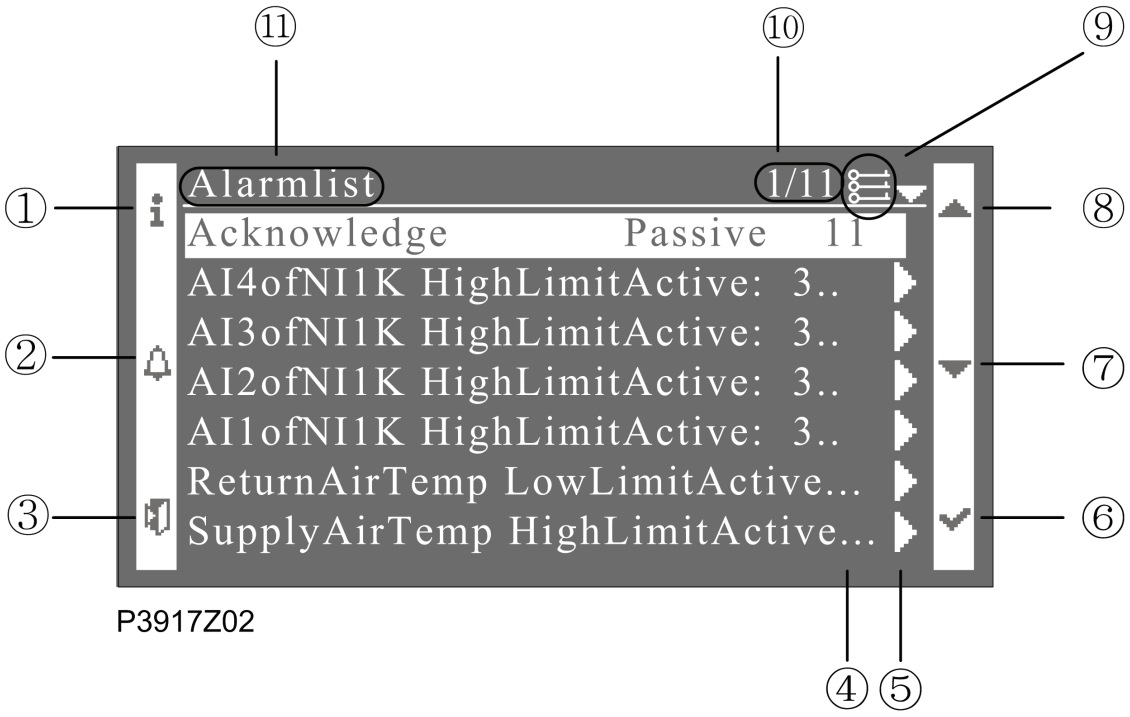


Figure 5.1 Display example, see Table 5.3

Position	Icon	Explanation
1		Key INFO
2		Key ALARM
3		Key ESC
4	•••	Indicates there are characters not shown in this line. If a string is longer than the length of the line, the "..." will be displayed at the end of the line. If this line is highlighted, it will scroll automatically character by character. In a line with more than 1 string, if the end part of a string is covered by the string of next position, "..." will be displayed at the end of the string. When this line is highlighted, the first string with covered text will scroll automatically character by character. The character scrolling function assures that a complete character shifts each time.
5	►	Indicates that a sub-menu exists.
6		Key ENTER
7	▼	The icon on the right margin is to indicate the key DOWN. The icon on the upper margin is to indicate there are other line(s) hidden below the current screen.
	—	On value changing page, the icon ▼ becomes "-" to indicate that the key is used for value decreasing.
8	▲	The icon on the right margin is to indicate the key UP. The icon on the upper margin is to indicate there are other line(s) hidden above the current screen.
	+	On value changing page, the icon ▲ becomes "+" to indicate that the key is used for value increasing.
9		No indication – Level 0, Viewing of all operational settings.
		Operator login, see *5.7.3, Password enter (Login)*
		System configuration, see *5.7.3, Password enter (Login)*
10	**1/11**	Indicates that the total number of lines in this page is 11, and line 1 is currently selected.
11	Title	Page title.

Table 5.3 Overview of display icons

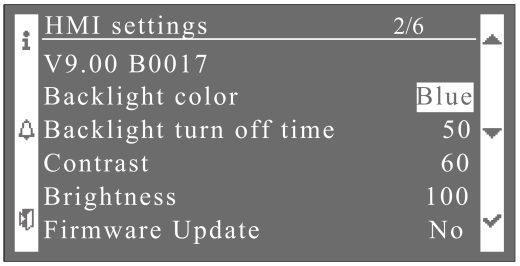
5.4 Settings

The following examples show how to change settings in the menus.

If there is an input value in a line, the whole line will be highlighted when the line is selected.

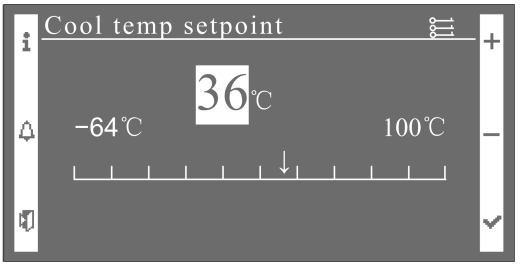
P3917Z04

Press ENTER, the input value will be highlighted allowing the user to change the value using the UP and DOWN keys. Press ENTER to confirm.



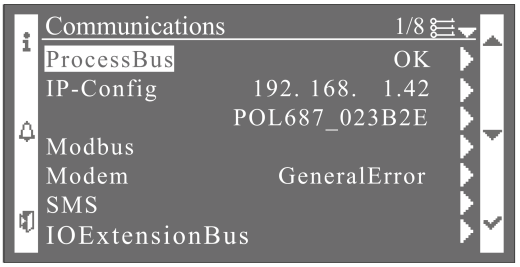
P3917Z05

A dedicated page is used to edit integer and float type values. On the value editing page, press the UP and DOWN keys to change the value.



P3917Z30

If there is no input value in a line, the first string will be highlighted when the line is selected.



P3917Z06

5.5 Pre-start checks

1. Make sure that the electrical connections and the water supply are correctly installed.
2. Make sure that the drain system including water trap is correctly installed.
3. Set the main circuit breaker to On.
4. At first start-up, set the desired humidity setpoint, fan max output and batch drain interval if other than the default values, see *5.7.5, Temperature and humidity*.

NOTE! *At start-up with a new evaporative pad, limit fan speed to 50-60% of maximum for the first week to avoid water carry over, and run the shutdown procedure once a day to improve wetting ability of the pad.*

5. Inspect the installation, along with all water connections, to ensure that no leakages are found.

5.6 Start the humidifier

1. Log in to the control system with password 1111. Select **Start page>Main index>Password enter**, see *5.7, Controller menus*.
2. Set the control system to the desired humidity (RH) setpoint, select **Main index>Humidity**.
3. Set a maximum fan speed, select **Main index>Humidity>Setpoints/settings**. Note that a low maximum fan speed will result in prolonged time before the desired humidity is reached when starting the humidifier. Factory setting is 60 % fan speed to run in the wetting ability of the new evaporative pad.
4. Set the batch drain according to the recommended interval for your water quality. In cases with a high level of organic dust in the air the batch drain interval time must be adjusted, see *Table 5.4*. The factory setting is 2.5 hours interval. Water treatment can be necessary in some cases, contact Munters for more information.

Water condition	Hardness (dH)	$CaCH_3$ (mg/l)	Recommended batch drain intervals (hours)
Very soft	0–2	0–36	4–5
Soft	2–5	36–90	3–4
Normal	5–10	90–179	2–3
Hard	10–21	179–376	1–2
Very hard	>21	>376	<1

Table 5.4 Recommended batch drain time

5. If the humidifier is run continuously, it is recommended to have the optional dry pad function set up at commissioning, see the HM3 Commissioning Guide. It can then be scheduled to run once per 24 hours in the menu **Humidity>Setpoints/settings** to increase the pad life.
6. Go to **Main index>Operating mode** to set the unit op. mode switch to On, Off or Auto. In Auto mode, the humidifier will run if there is a remote switch command for On, or a weekly schedule set to On. The humidifier will not run if both the switch and the schedule are set to Off.
7. A weekly schedule with On/Off times for all days of the week can be set in the menu **Main index>Operating mode**.

5.7 Controller menus

5.7.1 Start page

NOTE! *The contents of the menus can vary depending on the unit configuration.*

All settings and changes are done on the control system HMI.

Press the "INFO" button to go to the Main index.

Go back one page using the "ESC" button.

Restart the unit under menu item "Restart controller" to activate all parameter changes.

The arrow ▶ indicates going to the next menu level.

Start page	
Op Mode Switch	Set the unit in manual On/Off or Auto for remote start[1]
Act Op Status	Unit status (Off, Run, Manual run, Stop Alarm/Emergency)
Act. OpMode	Actual operation mode
Temperature Sensor	Current temperature sensor reading
Temperature Setpoint	Change **setpoint value** for the unit in cooler mode
Humidity Sensor	Current humidity sensor reading
Humidity Setpoint/max value	Change **setpoint value** for the unit in humidifier mode. Set max value in cooler mode.
Fan outp signal	Current fan % speed output
Main index ▶	Go to Main index menu, *5.7.2, Main index*.

5.7.2 Main index

Main index		
Operating mode	▶	Display and set system status, *5.7.4, Operating mode*
Temperature	▶	Display/set operational values in cooler mode, *5.7.5, Temperature and humidity*
Humidity	▶	Display/set operational values, *5.7.5, Temperature and humidity*
Global functions	▶	Alarm handling and global settings, *5.7.6, Global functions*
Setup	▶	Go to setup menu, *5.7.7, Setup*
Password enter	▶	See *5.7.3, Password enter (Login)*

5.7.3 Password enter (Login)

User settings:	1111
Configuration:	9999

5.7.4 Operating mode

To display system operational status, go to **Main index>Operating mode**.

Operating mode	Menu items depend on unit configuration
Act Op Status	Unit status (Off, Run, Manual run, Stop Alarm/Emergency)
Act Op Mode	Actual operation mode
Op Mode Switch	Set the unit in manual On/Off or Auto for time schedule or remote start.
Schedule ▶	Set start/stop schedule Monday-Sunday, see *5.7.8, Setting On/Off weekly schedule.*
Stage1 pump cmd	On/Off
Fan outp signal	0–100 %
Humidity Sensor	0..100 %RH
BMS Signal	0..100 %
Temperature Sensor	-5..55 C
BMS StandBy	Run/Off
Emergency stop	On/Off
Pump alarm	Normal/Alarm
Fire alarm	Normal/Alarm
Flow Indicator	No flow/Flow
Supply Valve	Open/Closed
Level switch	Full/Empty
Drain Valve	Open/Closed
Leakage detector	Normal/Alarm
Leakage Valve	Open/Closed
Run Indicator	On/Off
Dehumidifier command	On/Off (Start command for a connected dehumidifier)

5.7.5 Temperature and humidity

Temperature	
Temperature Sensor	Actual temperature value from the sensor.
Temperature Setpoint	Change **setpoint value** for the unit in cooler mode.
Cooler	Current output from cooling regulator
Setpoints/settings ▶	Go to menu for humidity and temperature setpoints and settings.

Humidity	
Humidity Sensor	Current humidity value from the sensor.
BMS Signal	Current signal from BMS system.
Humidity Setpoint/max value	Change **setpoint value** for the unit in humidifier mode. Set max value in cooler mode.
Humidifier	Current output from humidity regulator
Setpoints/settings ▶	Go to menu for humidity and temperature setpoints and settings.

►Setpoints/settings		Menu items depend on unit configuration.
Loop Controllers*	►	Settings for Loop Controllers
Drain Timer		Shutdown delay after no need for humidification. Factory setting 24 hours
Run dry protect.*		Time for pump run dry protection. Factory setting 5 minutes
Supply valve off delay*		Delay for valve off after level full. Factory setting 10 s
Batchdrain time*		Time for batchdrain valve open. Factory setting 10/20 s**
Batchdrain interval		Time between drains. Factory setting 2.5 h.
Force fan startup*		Fan running time after startup before regulation starts. Factory setting 2 minutes
Force fan signal		Fan output during startup. Factory setting 30 %
Nbr.pump pulses*		Set number of pad wetting runs before fan start. Factory setting 3
Pump puls, On*		Pump run time for each pulse. Factory setting 15 s
Pump puls, Off*		Delay time between pump pulses. Factory setting 10 s
Pump off delay		Delay time for pump off after exceeded humidity setpoint. Factory setting 30 minutes
New startup proc. delay		Delay for new pad wetting after no need for humidification. Factory setting 120 minutes, 30 minutes in continuous fan mode
Fan Min Output		Min output in continuous fan mode. Factory setting 20 %
Fan Max Output		Max output. Factory setting 60 %
Dry pad schedule	►	Set schedule for dry pad function.
Stop, dry pad		Time for drying pad after pump shut off. Factory setting 30 minutes
Drypad fan signal		Fan output during pad drying time. Factory setting 80 %
Sup.valve time alarm	►	Alarm if valve open time exceeds limit. Factory setting delay 600 s
Empty tray alarm	►	Alarm if tray empty time exceeds limit. Factory setting delay 600 s
Dehumidifier command start		Activates output if humidity value exceeds setpoint plus setting.
Dehumidifier command stop		Deactivates output if humidity value falls below setpoint minus setting.

*Only for setup, login with password 9999
**Depending on unit size

5.7.6 Global functions

For alarm handling, go to **Main index>Global functions**.

Global functions	
Alarm handling ▶	Read and acknowledge alarms
Manual mode*	Indicates if some function is manually forced
Man.mode, Alm*	Manual mode alarm On/Off
Set I/O to Auto*	Forces all functions to Auto
Run Indicator*	On/Off
*Only for setup, login with password 9999	

5.7.7 Setup

Scroll down to "Setup" to change date, time, service interval and to configure parameters.
If the unit is to be set up for MODBUS communication, see the MODBUS integration guide.

Setup	
Date and time	
Service ▶	Service maintenance interval, set as needed
Settings I/O ▶	Settings for the Inputs/Outputs
Communication ▶	Communication settings for the controller
System overview ▶	Controller version and language info
Overview I/O config/rawvalues ▶	All I/O overview
Configuration	Configuration status Done/Not done

NOTE! *See the HM3 Commissioning Guide for more information.*

To start configuration login with password 9999.
Scroll down to "**Configuration**".
Scroll down and change "**Config**" to "**Done/Man**".

►Configuration	
Config	Download or Done/Man
Unit size	10000/5000/2000
System Type	Humidifier/cooler
Global functions ►	Go to menu
Options ►	Go to menu
ConfigOptions	Factory setting, do not change.
Restart controller	Restarts the controller and sets the current parameters to active

►►Global functions	
General:	
Unit system ►	Metric or Imperial
ExtdIO-955–1, 945–4 ►	No/POL945/POL955, Type of extension module
Functions:	
Fan Mode	On demand/Continuous
Schedule Drypad	Active/Passive
Sensor type	Humidity&Temperature/Humidity/BMS control
Sensor Value Output	None/Humidity/Remote/Temperature
Alarm Output	No/1BO (Summary alarm output from the controller)
Pump Alarm	Yes/No
DO5 Function	None/Run indicator/Dehumidifier command*
Restart controller	Restarts the controller and sets the current parameters to active
Next ►	Go to the options settings (Also available from the "**Configuration**" page)
*Depending on system type	

►►Options	
Flow Indicator	Yes/No
BMS StandBy	Yes/No
Leakage detector	Yes/No
Leakage Valve	Yes/No
Fire alarm	Yes/No
Emergency stop	Yes/No
Aux Alarm Input	No/1 Alarm/2 Alarm
Restart controller	Restarts the controller and sets the current parameters to active

NOTE! *When configuration is finished, always scroll to **Restart the controller** and press Enter to confirm. Select **Execute** and press again. Check that the status on the Setup page has changed to **Done**. If not, the controller will not work and there is still something to set up, or a restart is necessary.*

5.7.8 Setting On/Off weekly schedule

Go to menu **Main index>Operating mode>Schedule**.

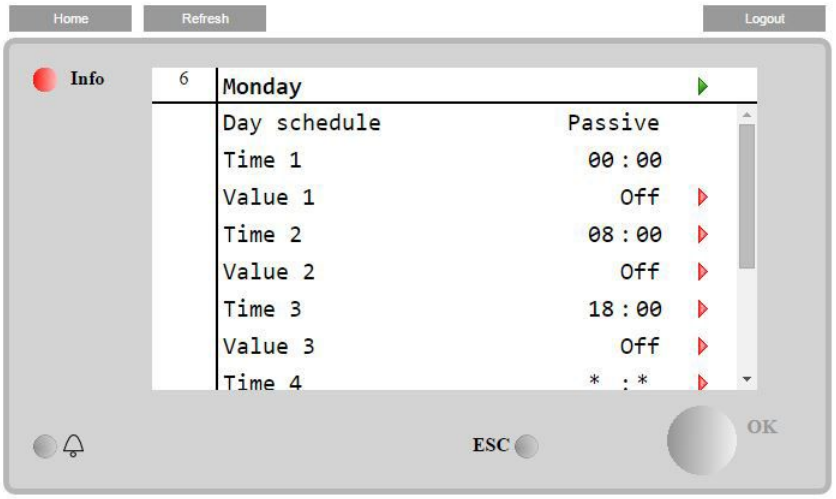


Figure 5.2 Setting of schedule

Day schedule is "Active" for the current day in the controller, and "Passive" for the other days.

To set the schedule, always start at time **00.00 (midnight)** for each day.

NOTE! *Never change Time 1, 00:00 for each day of the week.*

- Set operation state On or Off for the time after 00.00 (Value 1) for Monday.
- Set time for the first change of state (Time 2), and the new state On or Off.
- Set next time and new state, and continue until all the operation state changes for all 24 hours of the first day are specified.
- Continue in the same way with the next day.
- Use the copy function to set the same time intervals for other days.

Examples:

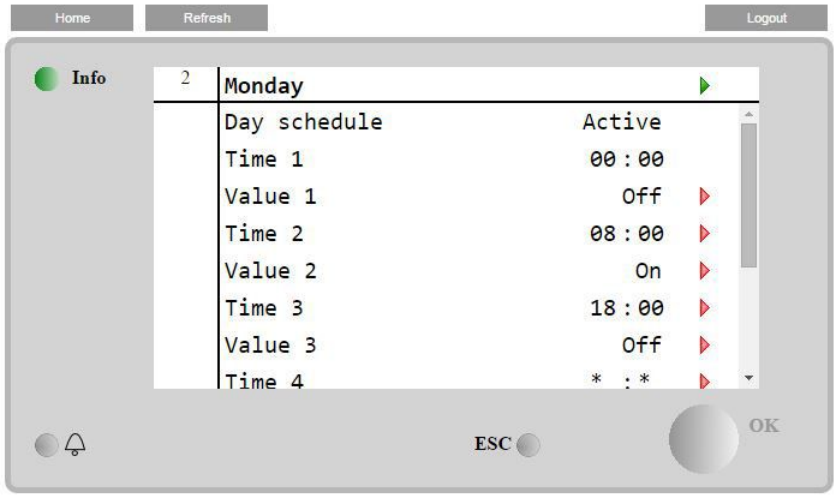


Figure 5.3 Daytime operation between 8:00 and 18:00

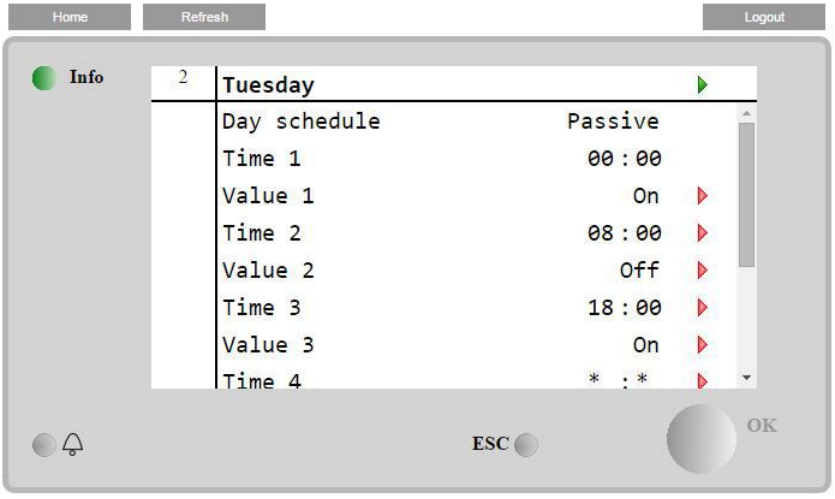


Figure 5.4 Night operation between 18:00 and 8:00.

5.7.9 Restore saved parameters

To restore parameters saved in the controller from the factory, or from the on site commissioning, go to **Setup>System overview>Save/restore>Par. Service load**. Select **Execute** and press Enter.

6 Service and maintenance

6.1 Safety

WARNING!

Before doing any service or maintenance work on the unit make sure that the main power switch has been set to Off, and that the power plug is pulled out from the socket. The unit is connected to high voltage which can cause serious injury or death.

WARNING!

Water spillage can cause slipping accidents resulting in serious injury.

CAUTION!

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

6.2 General

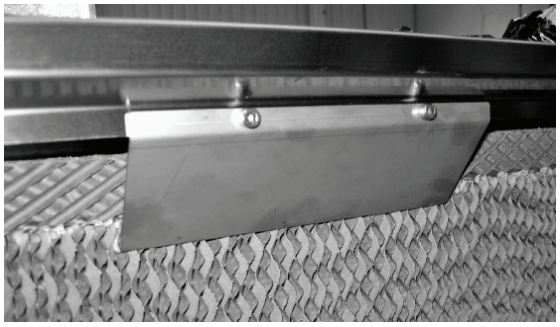
Service is recommended after every six months of operation depending on water and air quality in the premises. The service interval can vary between installations.

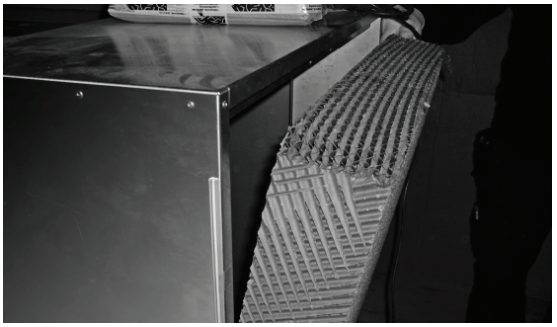
There is an adjustable service alarm function in the control system.

The recommendation is to replace the evaporative pad once a year, ideally before a new humidification season.

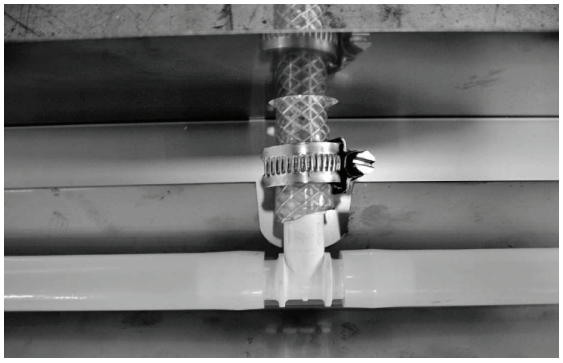
6.3 Maintenance procedure

1. Shut down the humidifier by setting the **Op Mode Switch** on the Start page to **Off**.
2. Wait until the shutdown procedure is complete, the fan has stopped rotating and the display reading for Act Op mode is Off.
3. Turn off the humidifier using the mains power switch and pull the plug from the socket.
4. Remove the pad holder at the top and carefully pull the top part of the evaporative pad out.





5. Disconnect the distribution pipe by unscrewing the hose clamp that is connected to the middle of the distribution pipe.



6. Clean the distribution holes using a small screwdriver or other sharp object.
7. Remove both end caps and flush the distribution pipe with water.
8. Assemble using the reverse procedure.
9. Clean all surfaces on the inside of the humidifier with a damp cloth and remove all waste deposits from the tray.

10. Clean the level switch and make sure that the lever is moving freely.

11. Clean under the pump where the water is pumped in with a bottle brush or similar, and make sure that the water inlet is clean.
12. If an optional air pre-filter is attached, clean it with a vacuum cleaner or with water.
13. Install the evaporative pad with the glued on distribution pad on top.

NOTE! *At start-up with a new evaporative pad, limit fan speed to 50-60% of maximum for the first week to avoid water carry over, and run the shutdown procedure once a day to improve wetting ability of the pad.*

14. Start the humidifier and check its function as described in section *5.5, Pre-start checks*.
15. Reset the service alarm.

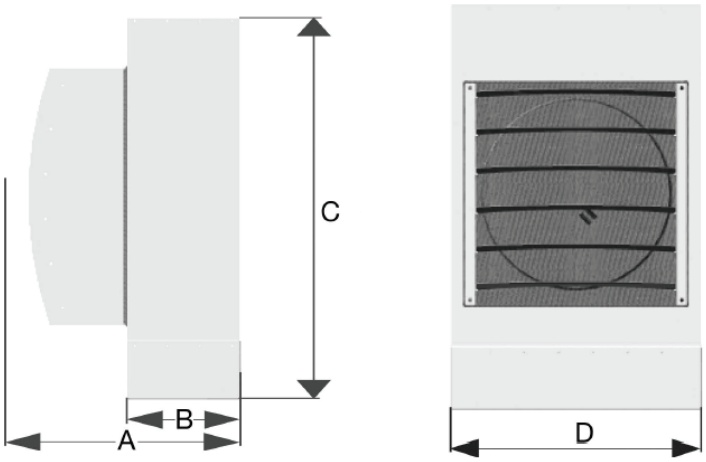
7 Fault tracing

Symptom	Corrective action
Service alarm in display	Service the humidifier according to the instructions. Order a new evaporative pad when necessary.
Low humidity level	Make sure that the humidifier is operating and that the evaporative pad is wet over its entire surface.
Red Alarm lamp is flashing	Alarm text in display. Rectify if possible, or contact Munters. The alarm is reset in the HMI under **Main index>Global functions>Alarm handling**.
No power supply to the humidifier	Do a check of the power connection.
Water continuously leaks from the humidifier	The water level is too high. Switch off the humidifier, verify that the power supply has been turned off and remove the evaporative pad. Do a check of the level switch function.
The evaporative pad is not properly wetted	Make sure that the water supply to the pad is working, and that pump inlet, hose or distribution header are not blocked. Make sure the pad is not clogged with scaling or dirt. It is recommended to replace the pad at least once a year.
The fan does not work or works very slowly	Make sure that the required humidity and/or temperature setting is set higher than the current ambient value. Increase the fan setting.
Splashing	Make sure that the evaporative pad is wet over its entire surface. See also section *6.3, Maintenance procedure.*

Table 7.1 Fault tracing list

8 Technical specification

8.1 Dimensions and weight



HM3 size	2000	5000	10000
A (mm/inch)	550/21.7	650/25.6	750/29.5
B (mm/inch)	350/13.8	350/13.8	350/13.8
C (mm/inch)	775/30.5	1275/50.2	1275/50.2
D (mm/inch)	730/28.7	730/28.7	1330/52.4
Weight dry (kg/lbs)	37/82	57/126	86/190
Weight wet (kg/lbs)	45/100	66/146	107/236

8.2 Water consumption

The total water consumption is the sum of the supply of water for evaporation and for rinsing away impurities and waste deposits:

$W_{total}=W_{usage}+W_{drainage}$

The formula for calculating the water usage for evaporation is $W_{usage}=1.2*q(\Delta X)/1000$, where q is the airflow in m^3/h and ΔX is the added humidity in g/kg.

The water used when draining the tank is $W_{drainage}$=Number of drainages per hour*water tank size*0.33.

Example:

For a size 2000 unit where we want to add 2.8 g/kg and constantly run on full speed.

$W_{usage}=1.2*2000*2.8/1000=6.7$ litres/hour

8.3 Technical data

HM3 size	2000	5000	10000
Airflow, maximum (m^3/h)	2000	5000	10000
Airflow, maximum (cfm)	1175	2940	5885
Water tank size (litres/gallons)	7/1.8	7/1.8	13/3.4
Electrical data			
Rated power* (W) at 230 V 50 Hz	220	420	770/900
Rated current* (A) at 230 V 50 Hz	1.8	2.7	4.8/3.7
Rated power* (W) at 120 V 60 Hz	240	440	
Rated current* (A) at 120 V 60 Hz	3.9	5.1	
*At maximum output			
Environmental conditions			
IEC protection class (unit)	44	44	44
IEC protection class (control unit)	30	30	30
Operating temperature** (°C)	0...+40	0...+40	0...+40
Operating temperature** (°F)	+32...+104	+32...+104	+32...+104
Maximum installation altitude, above sea level (m)	2000	2000	2000
Transport and storage temperature (°C)	-20...+70	-20...+70	-20...+70
Transport and storage temperature (°F)	-4...+158	-4...+158	-4...+158
**At t_{wet}>0 °C / 32 °F			
Noise data			
L_{wA} dB full/half speed	66/51	67/52	78/63
L_A[1] 3 m dB(A)	50/35	51/36	60/45
L_A[2] room dB(A)	48/33	49/34	57/42
[1]At a distance of 3 m from the fan and with an average absorption coefficient μ=0.10 (less damped room) and room absorption area 1500 m^2 for HM3 2000, 2500 m^2 for HM3 5000, and 5000 m^2 for HM3 10000.			
[2]Within reverberation field of room, according to note 1.			

9 Dimensioning

To calculate the level of humidity required in a room, the following parameters need to be taken into account:

Ventilation airflow + leakage infiltration into the building	q_1 (m^3/h)
Required room humidity	X_2 (g/kg)
Incoming air humidity	X_1 (g/kg)
Added humidity from humidifier	ΔX (g/kg)
Loss of humidity in room during process	(g/h)
Added humidity from other sources in room	(g/h)
Required humidifier air flow	q (m^3/h)

Ventilation airflow q_1

It is necessary to know the incoming ventilation airflow q1 in m3/h. If instead the air replacement number (n) for the room is known, the airflow can be calculated by multiplying the volume of the room with (n), thus q1=n(WxLxH). In q1, the infiltration flow may need to be added, which is related to for example frequent opening of doors.

Required room humidity X_2

The required room humidity X_2 (g/kg dry air) is another way of stating the air humidity than the more common relative air humidity (% RH). In order to calculate the air humidity (g/kg dry air), a Mollier (Psychrometric) diagram or a digital converter can be used.

Incoming air humidity X_1

The incoming air humidity X_1 (g/kg dry air) is, if recirculated air and other humidification is not used, set as the driest condition outside during winter.

Added humidity from humidifier ΔX

The added humidity from the humidifier ΔX (g/kg dry air) varies for different air conditions. Enter the room temperature and the required relative air humidity into *Figure 9.1* and read the added humidity.

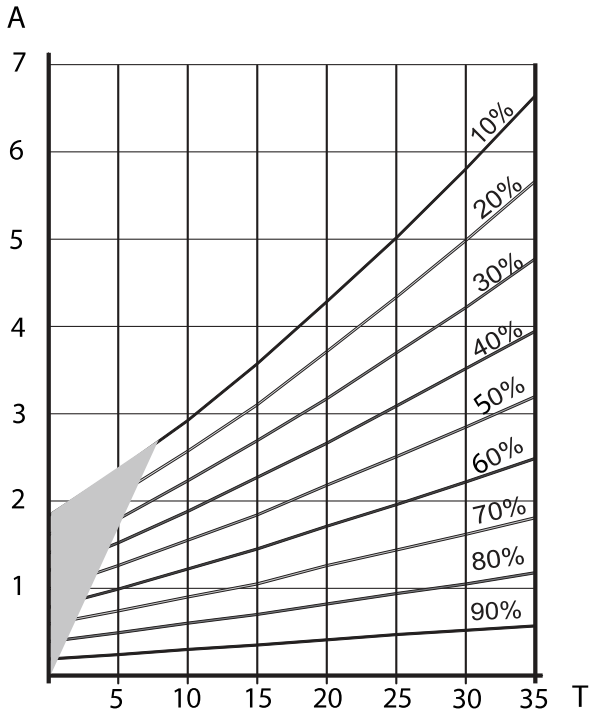


Figure 9.1 Capacity diagram

A=Added humidity ΔX (g/kg)
T=Room temperature °C
10 to 90% is the relative humidity in the room
Gray area indicates freezing condition

Example calculation of required humidifier airflow

For premises with a total air replacement rate of twice an hour and the room volume (WxLxH)=20x40x4=3200 m^3.

This makes the ventilation airflow q_1=2x3200=6400 m^3/h.

For a required humidity level 40 %RH at 22 °C, the absolute moisture content can be obtained from a diagram or a digital converter. In this case it is 6.7 g/kg. The corresponding incoming air moisture content for the driest day is read as 1.8 g/kg.

The added moisture from the humidifier is found from *Figure 9.1* by entering the required humidity level and room temperature. In this case it is 2.8 g/kg.

The required humidifier airflow q is calculated using the following formula:
$q=q_1(X_2-X_1)/\Delta X$
$q=6400(6.7–1.8)/2.8=11200\ m^3/h$

This flow is divided by the humidifier's flow capacity, i.e. the number of humidifiers required to achieve the flow rate. To achieve a humidifier flow of 11200 m3/h, several humidifiers are required. There are two options:

- 1xHM3 10000 (humidifier airflow 10000 m^3/h) together with 1xHM3 2000 (humidifier airflow 2000 m^3/h). Results in a cheaper solution and only two units need to be installed.
- 2xHM3 5000 (humidifier airflow 5000 m^3/h) together with 1xHM3 2000 (humidifier airflow 2000 m^3/h). Distributes the moisture better and is a slightly quieter option.

Cooling effect

The evaporative principle also results in the humidifier having a cooling effect. The temperature reduction in the air flow is calculated by the formula:

$^{\triangle}t=2.5(^{\triangle}X)$

In the example, $^{\triangle}t=2.5*2.8=7\ °C$

The maximum cooling power is calculated by the formula:

$P_{cool}=2.5*^{\triangle}X*q*1.2/3600$

In the example, $P_{cool}=2.5*2.8*11200*1.2/3600=26\ kW$

10 Simplified dimensioning

This is a simplified method of estimating the required capacity.

Contact your Munters representative for more information and help with the dimensioning.

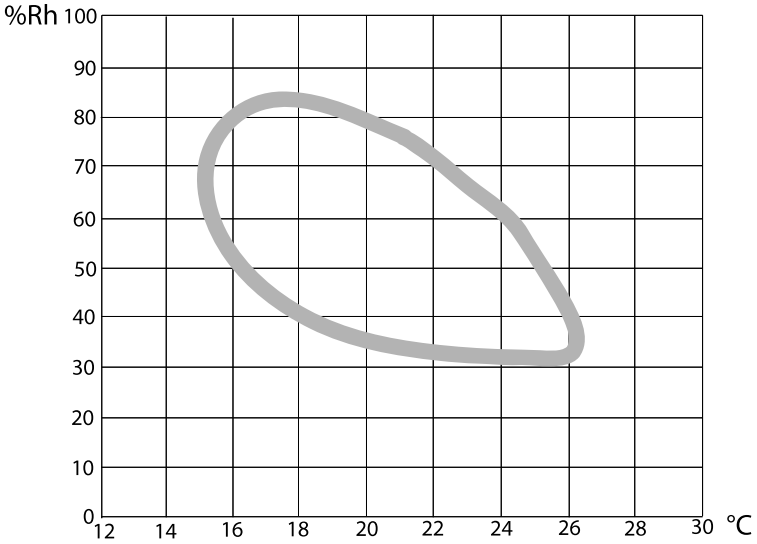


Figure 10.1 Comfort zone for humans working

Example 1

- Outdoor temperature: 0 °C
- Outdoor humidity: 40 %RH
- Air changes: 2 per hour
- Desired temperature: 22 °C
- Desired humidity: 50 %RH

Maximum permitted room volume for each model:

- HM3 2000 up to 290 m^3
- HM3 5000 up to 720 m^3
- HM3 10000 up to 1440 m^3

Multiple units should be used if needed.

Example 2

- Outdoor temperature: 0 °C
- Outdoor humidity: 40 %RH
- Air changes: 2 per hour
- Desired temperature: 15 °C
- Desired humidity: 75 %RH

Maximum permitted room volume for each model:

- HM3 2000 up to 125 m^3
- HM3 5000 up to 315 m^3
- HM3 10000 up to 625 m^3

Multiple units should be used if needed.

Example 3

- Outdoor temperature: –20 °C
- Outdoor humidity: 40 %RH
- Air changes: 2 per hour
- Desired temperature: 22 °C
- Desired humidity: 50 %RH

Maximum permitted room volume for each model:

- HM3 2000 up to 270 m^3
- HM3 5000 up to 675 m^3
- HM3 10000 up to 1350 m^3

Multiple units should be used if needed.

Example 4

- Outdoor temperature: –20 °C
- Outdoor humidity: 40 %RH
- Air changes: 2 per hour
- Desired temperature: 15 °C
- Desired humidity: 75 %RH

Maximum permitted room volume for each model:

- HM3 2000 up to 115 m^3
- HM3 5000 up to 290 m^3
- HM3 10000 up to 580 m^3

Multiple units should be used if needed.

11 Scrapping

Evaporative pads and complete units must be scrapped in accordance with applicable legal requirements and regulations. Contact your local authorities.

12 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: +3215285611 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: +4544953355 info@munters.dk www.munters.dk
FINLAND	Munters Finland Oy Kuivaajamyynti	Hakamäenkuja 3 FI-01510 VANTAA	Tel: +358 207 768 230 laitemyynti@munters.fi www.munters.fi
FRANCE	Munters France SAS Air Treatment	106, Boulevard Héloise 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-18027Chiusavecchia IM	Tel: +39 0183 521377 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. Oddzial w Polsce Air Treatment	ul. Swietojanska 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 Epresarial. Edificio Londres. C/Playa de Liencres 2. 28230 Las Matas. Madrid	Tel: +34 91 640 09 02 marketing@munters.es www.munters.es
SWEDEN	Munters Europe AB Air Treatment	P.O. Box 1150 SE-164 26 Kista	Tel: +46 8 626 63 00 avfuktning@munters.se www.munters.se
SWITZERLAND	Munters GmbH Air Treatment Zweigniederlassung Rümlang	Glattalstr. 501 CH-8153 Rümlang	Tel: +41 52 343 88 86 info.dh@munters.ch www.munters.ch
UNITED KINGDOM	Munters Ltd Air Treatment	Pathfinder Place 10 Ramsay Court Hinchingbrooke Business Park Huntingdon PE29 6FY Cambs	Tel: +44 1480 432 243 info@munters.co.uk www.munters.co.uk

AUSTRALIA	Tel:+61 288431588 dh.info@munters.com.au	**MEXICO**	Tel:+52 722 270 40 29 munters@munters.com.mx
BRAZIL	Tel: +55 11 5054 0150 www.munters.com.br	**SINGAPORE**	Tel:+65 6744 6828 singapore@muntersasia.com
CANADA	Tel: +1-800-843-5360 dhinfo@munters.com	**SOUTH AFRICA**	Tel:+27 11 997 2000 info@munters.co.za
CHINA	Tel: +86 10 804 18000 marketing@munters.cn	**TURKEY**	Tel:+90 216 548 14 44 info@muntersform.com
INDIA	Tel:+91 20 668 18 900 info@munters.in	**UAE (Dubai)**	Tel:+971 4 881 3026 middle.east@munters.com
JAPAN	Tel:+81 3 5970 0021 mkk@munters.jp	**USA**	Tel: +1-800-843-5360 dhinfo@munters.com
KOREA	Tel:+82 2 761 8701 munters@munters.kr		

www.munters.com