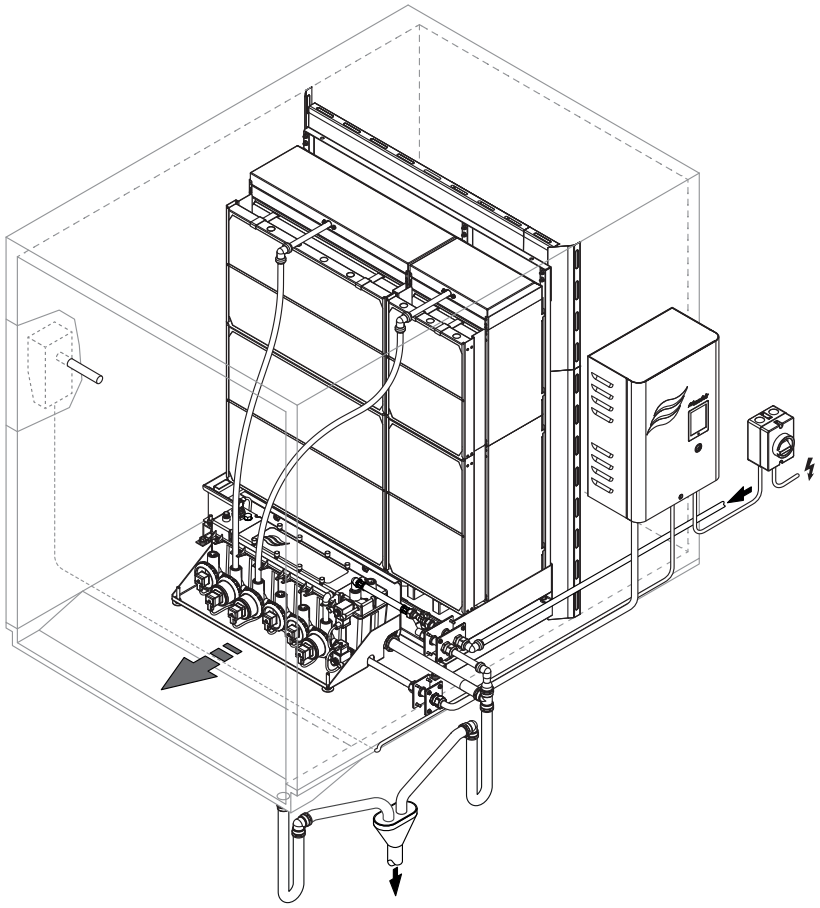
Preliminary editon 3 EN 1406

ME SERIES



# OPERATION MANUAL

Adiabatic air humidification/air cooling system
Condair **ME**

Humidification and Evaporative Cooling

condair

# Thank you for choosing Condair

| |
|---|
| Installation date (MM/DD/YYYY): |
| Commissioning date (MM/DD/YYYY): |
| Location ref.: |
| Model: |
| Serial number: |

**Manufacturer**

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# Contents

# 1 Introduction

## 1.1 To the very beginning

We thank you for having purchased the **adiabatic air humidification/air cooling system Condair ME**.

The adiabatic air humidification/air cooling system Condair ME incorporates the latest technical advances and meets all recognized safety standards. Nevertheless, improper use of the adiabatic air humidification/air cooling system Condair ME may result in danger to the user or third parties and/or impairment of material assets.

To ensure a safe, proper, and economical operation of the adiabatic air humidification/air cooling system Condair ME, please observe and comply with all information and safety instructions contained in the present documentation as well as in the separate documentations of the components installed in the humidification system.

If you have questions, which are not or insufficiently answered in this documentation, please contact your Condair supplier. They will be glad to assist you.

## 1.2 Notes on the operation manual

**Limitation**

**The subject of this operation manual is the adiabatic air humidification/air cooling system Condair ME in its different versions**. The various options and accessories are only described insofar as this is necessary for proper operation of the equipment. Further information on options and accessories can be obtained in the respective instructions.

This operation manual is restricted to the **operation**, the **maintenance** and **troubleshooting** of the adiabatic air humidification/air cooling system Condair ME and is meant for **well trained personnel being sufficiently qualified for their respective work**.

The operation manual is supplemented by various separate items of documentation (installation manual, spare parts list, etc.), which are included in the delivery as well. Where necessary, appropriate cross-references are made to these publications in the operation manual.

### Symbols used in this manual

**CAUTION!**

The catchword “CAUTION” used in conjunction with the general caution symbol designates notes in this installation and operating instructions that, if neglected, may cause **damage and/or malfunction of the unit or other material assets**.

**WARNING!**

The catchword “WARNING” used in conjunction with the general caution symbol designates safety and danger notes in this installation and operating instructions that, if neglected, may cause to **injury to persons**.

**DANGER!**

The catchword “DANGER” used in conjunction with the general caution symbol designates safety and danger notes in this installation and operating instructions that, if neglected, may lead to **severe injury or even death of persons**.

### Safekeeping

Please safeguard this operation manual in a safe place, where it can be immediately accessed. If the equipment changes hands, the operation manual must be passed on to the new operator.

If the operation manual gets mislaid, please contact your Condair supplier.

### Language versions

This operation manual is available in various languages. Please contact your Condair supplier for information.

# 2 For your safety

### General

Every person working with the adiabatic air humidification/air cooling system Condair ME must have read and understood the operation manual of the Condair ME before carrying out any work.
Knowing and understanding the contents of the operation manual is a basic requirement for protecting the personnel against any kind of danger, to prevent faulty operation, and to operate the unit safely and correctly.

All ideograms, signs and markings applied to the components of the adiabatic air humidification/air cooling system Condair ME must be observed and kept in readable state.

### Qualification of personnel

All work described in this operation manual **may only be carried out by specialist who are well trained and adequately qualified and are authorized by the customer**.
For safety and warranty reasons any action beyond the scope of this manual must be carried out only by qualified personnel authorised by the manufacturer.

It is assumed that all persons working with the adiabatic air humidification/air cooling system Condair ME are familiar and comply with the appropriate regulations on work safety and the prevention of accidents.

The adiabatic air humidification/air cooling system Condair ME may not be used by persons (including children) with reduced physical, sensory or mental abilities or persons with lacking experience and/or knowledge, unless they are supervised by a person responsible for their safety or they received instructions on how to operate the system.
Children must be supervised to make sure that they do not play with the adiabatic air humidification/air cooling system Condair ME.

### Intended use

The adiabatic air humidification/air cooling system Condair ME is intended exclusively for **air humidification and air cooling in AHU's or air ducts** within the specified operating conditions. Any other type of application, without the written consent of the manufacturer, is considered as not conforming with the intended purpose and may lead to the adiabatic air humidification/air cooling system Condair ME becoming dangerous.
Operation of the equipment in the intended manner requires **that all the information contained in this operation manual are observed (in particular the safety instructions)**.

**Danger that may arise from the adiabatic air humidification/air cooling system Condair ME**

**DANGER!**
**Risk of electric shock!**

**The Condair ME control units (and the optional submerged UV system) contain live mains voltage. One may get in touch with live parts when the control unit (or the terminal box of the optional submerged UV system) is open. Touching live parts may cause severe injury or danger to life.**

**Prevention:** Before carrying out any work on the adiabatic air humidification/air cooling system Condair ME switch of the control unit, disconnect it from the mains via the mains disconnecter switch and secure mains disconnecter switch in Off position against inadvertent power-up.

**DANGER!**
**Health risk because of inadequate hygiene!**

Inadequately operated and/or poorly maintained evaporative humidification/cooling systems may endanger health. When inadequately operated and/or poorly maintained micro-organisms (including the bacterium which causes Legionnaire's disease) may grow in the evaporative module, the water tank and the water system of the adiabatic air humidification/air cooling system Condair ME and may affect the air in the AHU/air duct.
Prevention: the adiabatic air humidification/air cooling system Condair ME must strictly be operated and maintained in accordance with this manual.

**WARNING!**

Some type of evaporative material is manufactured from glass fibre. Though this material is not classified as hazardous, it is recommended that Personal Protection Equipment such as gloves, protective clothing and eye protection are used during handling to protect the user from fibres or dust. If dust is generated during handling it is recommended that respiratory protection is worn.

**Behaviour in case of danger**

If it is suspected that **safe operation is no longer possible**, then the adiabatic air humidification/air cooling system Condair ME should immediately **be shut down and secured against accidental power-up according to chapter** *4.6 – Taking the system out of operation*. This can be the case under the following circumstances:

– if the adiabatic air humidification/air cooling system Condair ME is damaged
– if the adiabatic air humidification/air cooling system Condair ME is contaminated
– if the electrical installations are damaged
– if the adiabatic air humidification/air cooling system Condair ME is no longer operating correctly
– if connections and/or piping are not sealed

All persons working with the adiabatic air humidification/air cooling system Condair ME must report any alterations to the system that may affect safety to the owner without delay.

**Prohibited modifications to the unit**

**No modifications must be undertaken** on the adiabatic air humidification/air cooling system Condair ME without the express written consent of the manufacturer.

For the replacement of defective components use exclusively **original accessories and spare parts** available from your Condair supplier.

# 3 Product Overview

## 3.1 Models overview

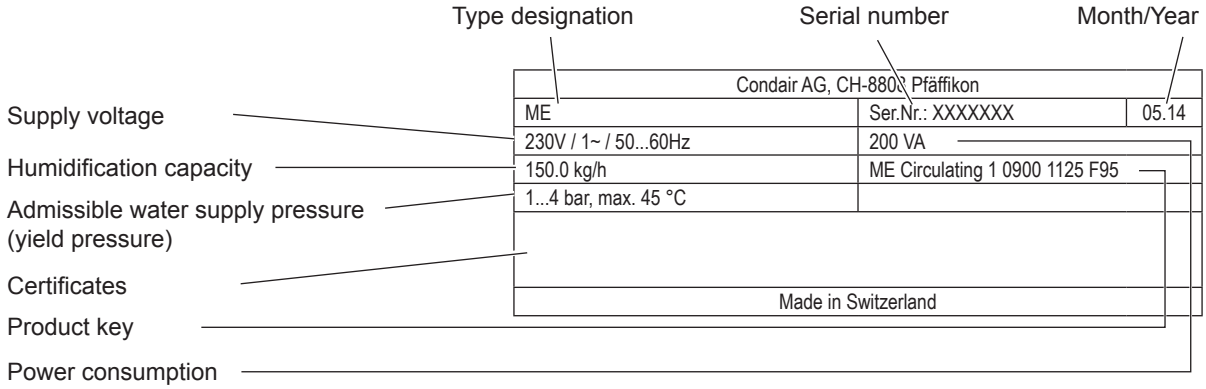
The adiabatic air humidification/air cooling system Condair ME is available in two different system versions and three basic models:

| | System versions | |
|---|---|---|
| | Circulating System | Direct Feed System |
| Model designation | Condair ME Circulating Full Control | |
| | Condair ME Circulating | Condair ME Direct Feed |

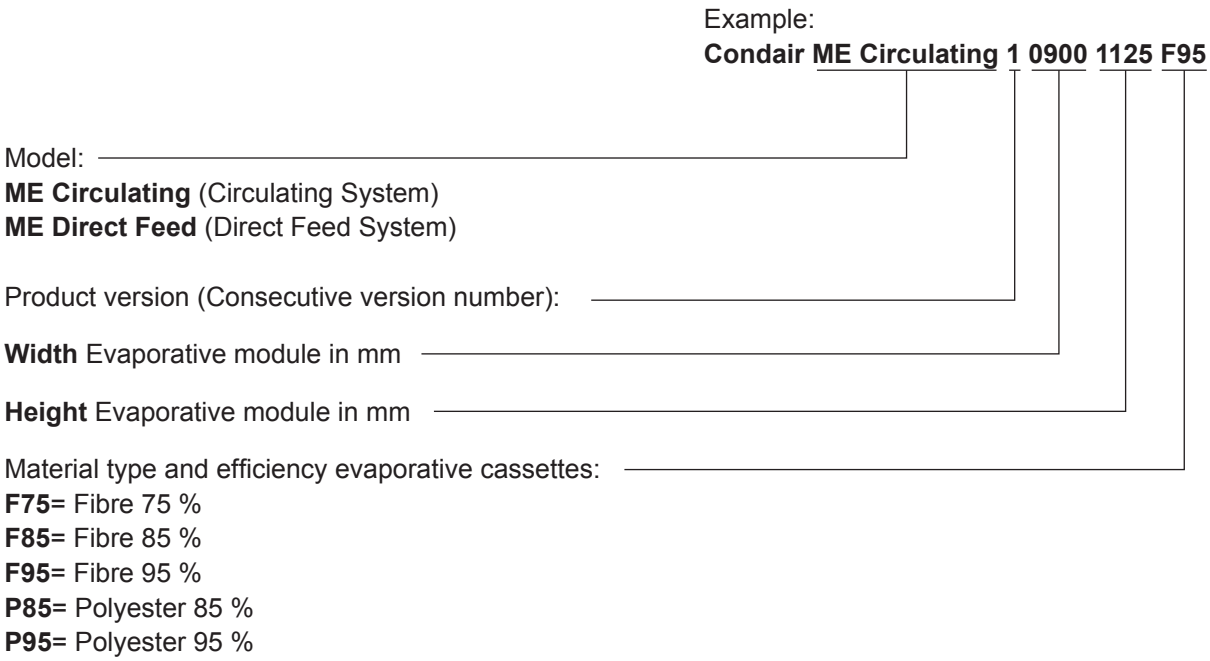
All models can be equipped with two different types of evaporative cassettes with different efficiencies and various options. The hydraulic modules of all models can be mounted inside the duct directly to the tank or outside the duct to the duct wall.

## 3.2 Product designation / Which model do you have

The product designation and the most important unit data are found on the rating plate fixed to the evaporative module and the control unit:

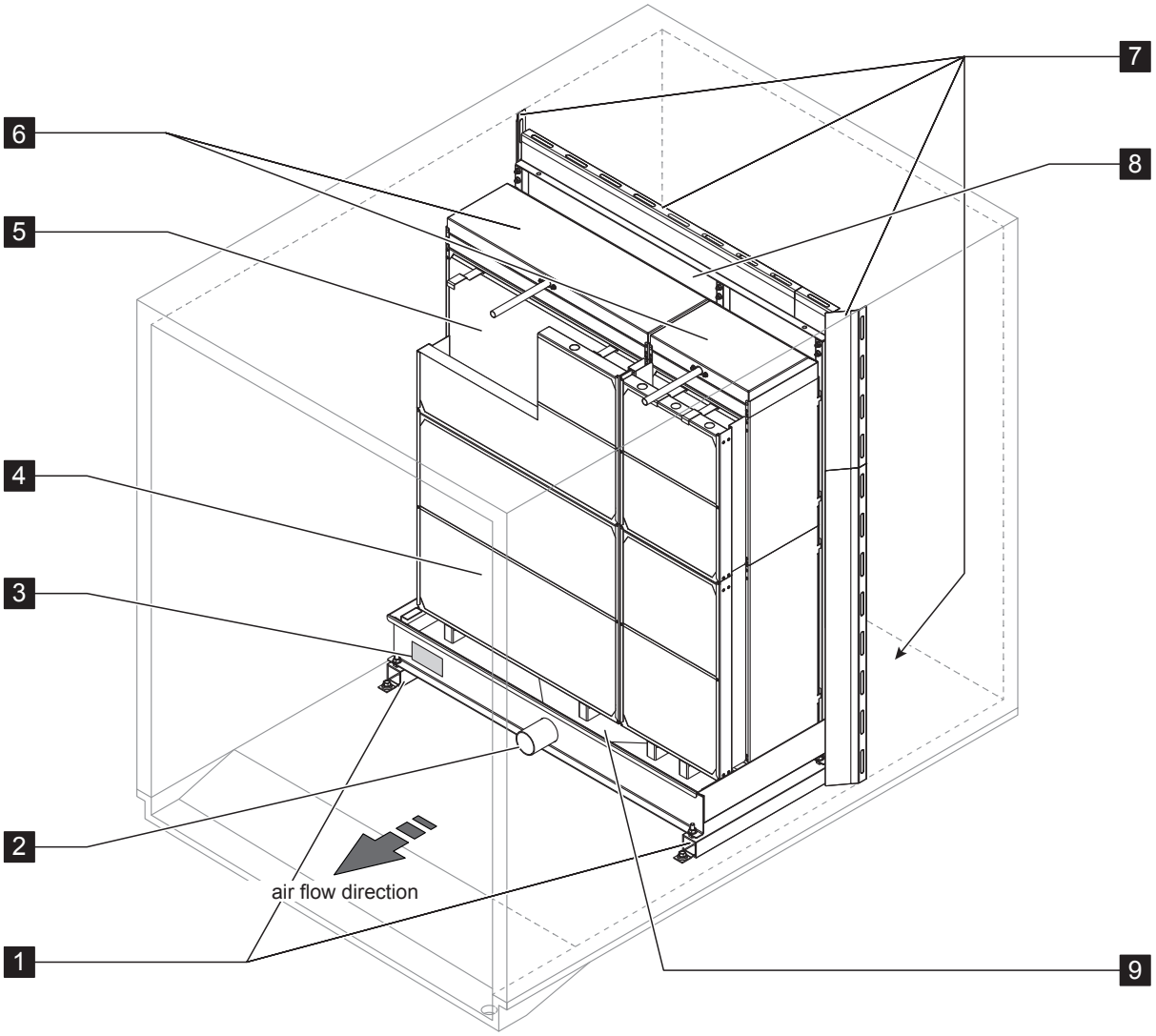


**Product key**


Example:
**Condair ME Circulating 1 0900 1125 F95**
Model:
**ME Circulating** (Circulating System)
**ME Direct Feed** (Direct Feed System)
Product version (Consecutive version number):
**Width** Evaporative module in mm
**Height** Evaporative module in mm
Material type and efficiency evaporative cassettes:
**F75=** Fibre 75 %
**F85=** Fibre 85 %
**F95=** Fibre 95 %
**P85=** Polyester 85 %
**P95=** Polyester 95 %

## 3.3 Construction of the system components

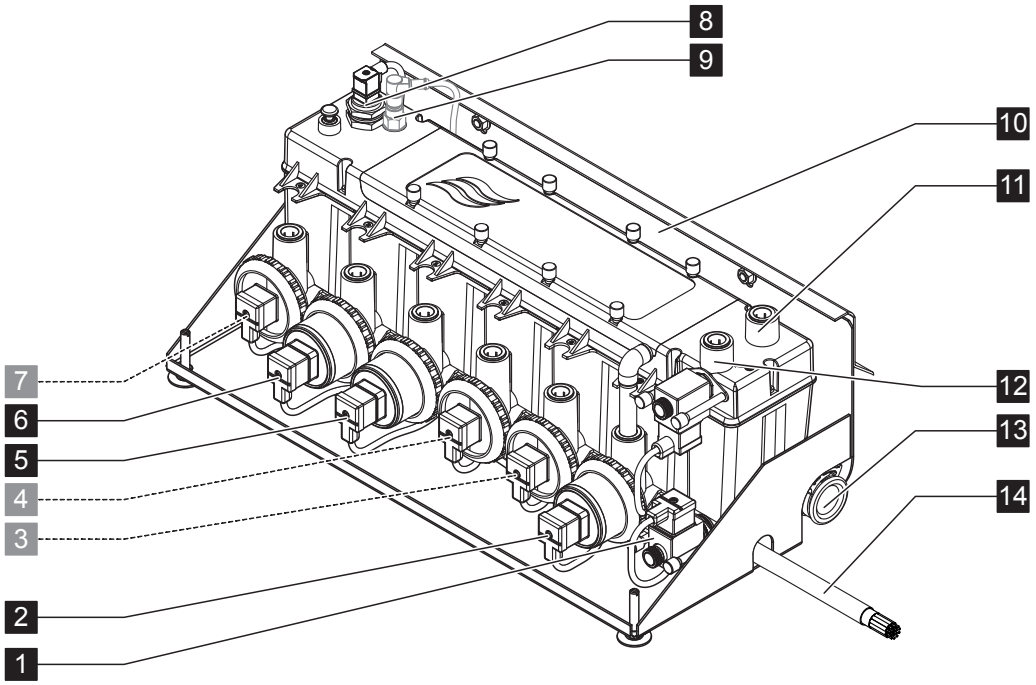
### 3.3.1 Construction of the evaporative module




1 Standups (Option)
2 Tank connector ø54 mm (2.1")
3 Rating plate
4 Droplet separator (mandatory for air velocities above the evaporative cassettes >4.5 m/s)
5 Evaporative cassettes (F75, F85, F95, P85 or P95)
6 Distribution heads
7 Blanking Plates (Option)
8 Mounting frame evaporative cassettes
9 Water Tank

*Fig. 1: Construction of the evaporative module*

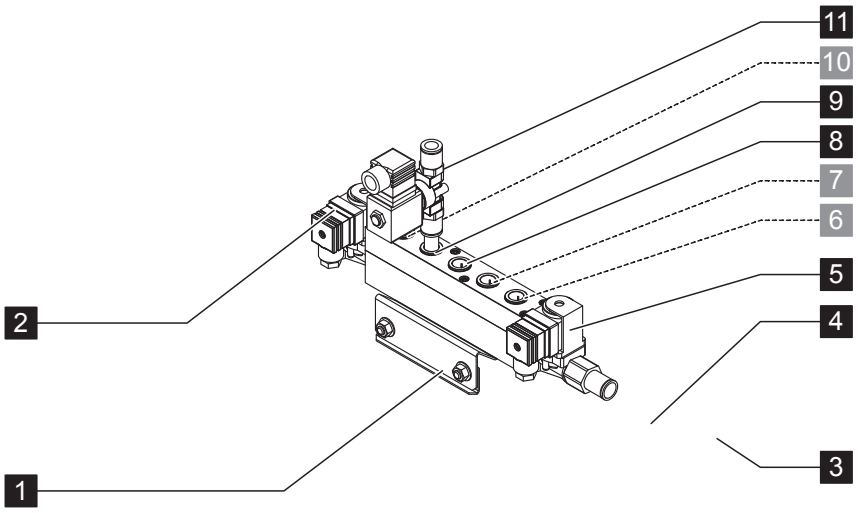
### 3.3.2 Construction of the hydraulic module for circulating systems




1 Drain valve
2 Drain pump
3 Stage pump 5 with push-fit connector ø15 mm (0.6")
4 Stage pump 3 with push-fit connector ø15 mm (0.6")
5 Stage pump 1 with push-fit connector ø15 mm (0.6")
6 Stage pump 2 with push fit connector ø15 mm (0.6")
7 Stage pump 4 with push fit connector ø15 mm (0.6")
8 Level sensor
9 Conductivity sensor (option)
10 Fixing bracket
11 Push-fit connector ø15 mm (0.6") pressure equalisation (only needed when mounted outside of AHU)
12 Water supply push-fit connector ø15 mm (0.6")
13 Drain connector ø28 mm (1.1")
14 Interconnecting cable hydraulic module

*Fig. 2: Construction hydraulic module circulating systems (figure shows layout for 2-stage control)*

### 3.3.3 Construction of the hydraulic module for direct feed systems




1 Fixing bracket
2 Drain valve
3 Water supply connector ? mm (?")
4 Purge valve
5 Supply valve
6 Connector stage 5
7 Connector stage 3
8 Connector stage 1
9 Connector stage 2
10 Connector stage 4
11 Stage valve 2 (Option)

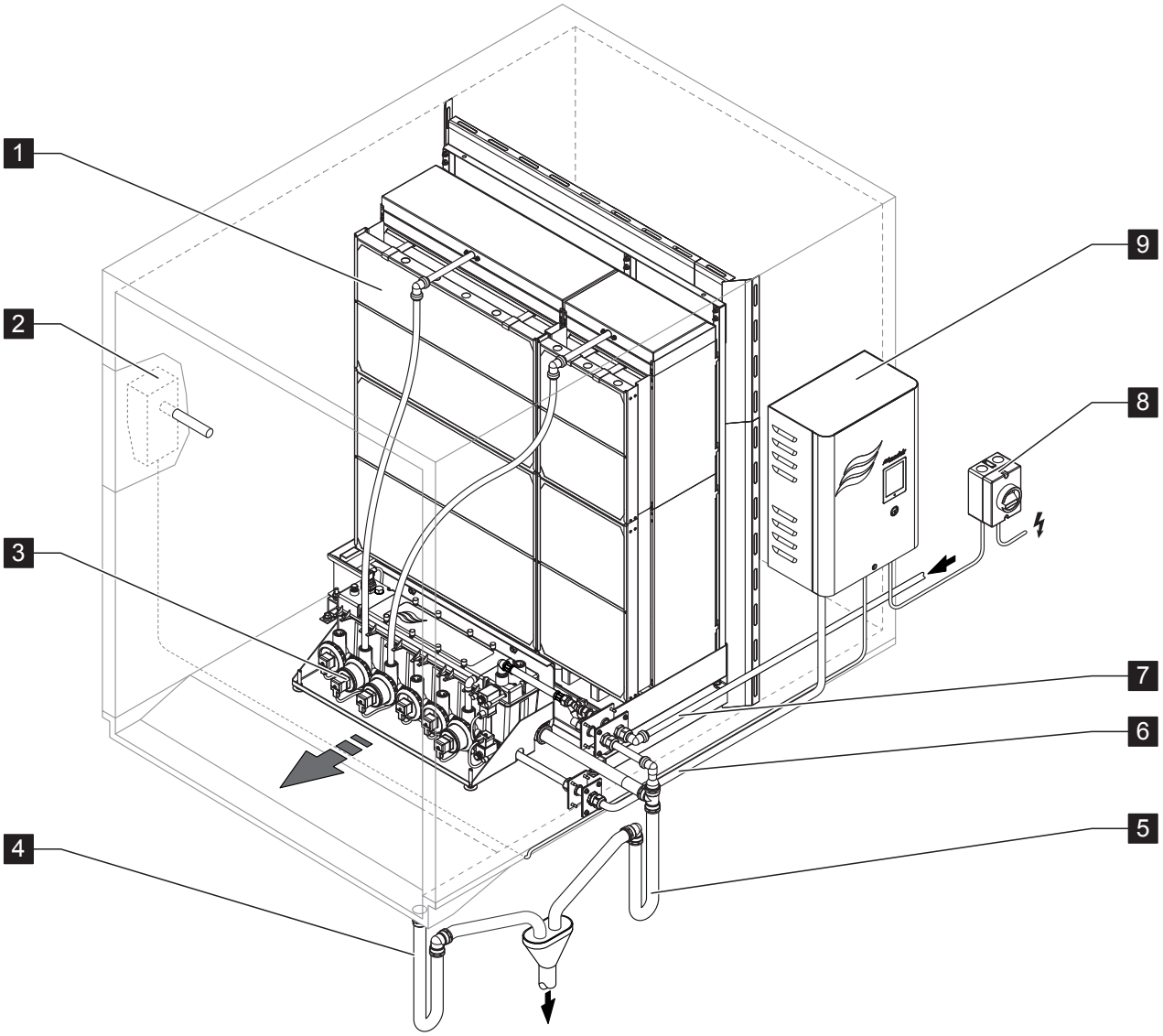
*Fig. 3: Hydraulic module direct feed systems (figure shows layout for 2-stage control - option)*

CAD of hydraulic module with purge valve not available till now

## 3.4 System overviews

### 3.4.1 Condair ME Circulating System

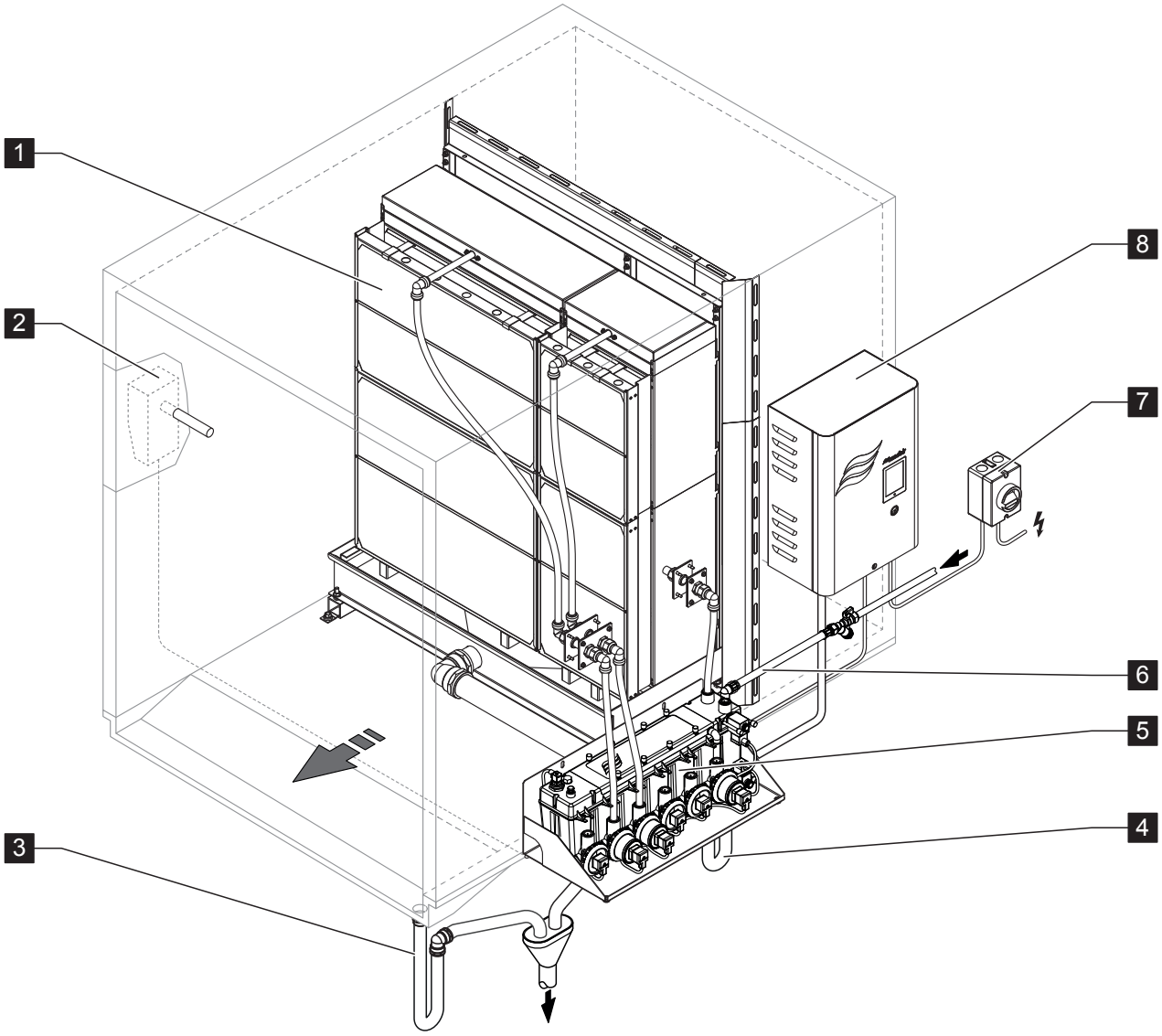
**System overview Condair ME Circulating System (internally mounted)**




1 Evaporative module
2 Humidity/Temperature controller/sensor
3 Hydraulic module
4 Duct drain with trap
5 Tank drain with trap
6 Vent drain pipe
7 Water supply
8 Mains disconnecter switch
9 Control unit ME

*Fig. 4: System overview Condair ME Circulating System (internally mounted)*

**System overview Condair ME Circulating System (externally mounted)**




1 Evaporative module
2 Humidity/Temperature controller/sensor
3 Duct drain with trap
4 Tank drain with trap
5 Hydraulic module
6 Water supply
7 Mains disconnecter switch
8 Control unit Condair ME

*Fig. 5: System overview Condair ME Circulating System (externally mounted)*

## Functional description

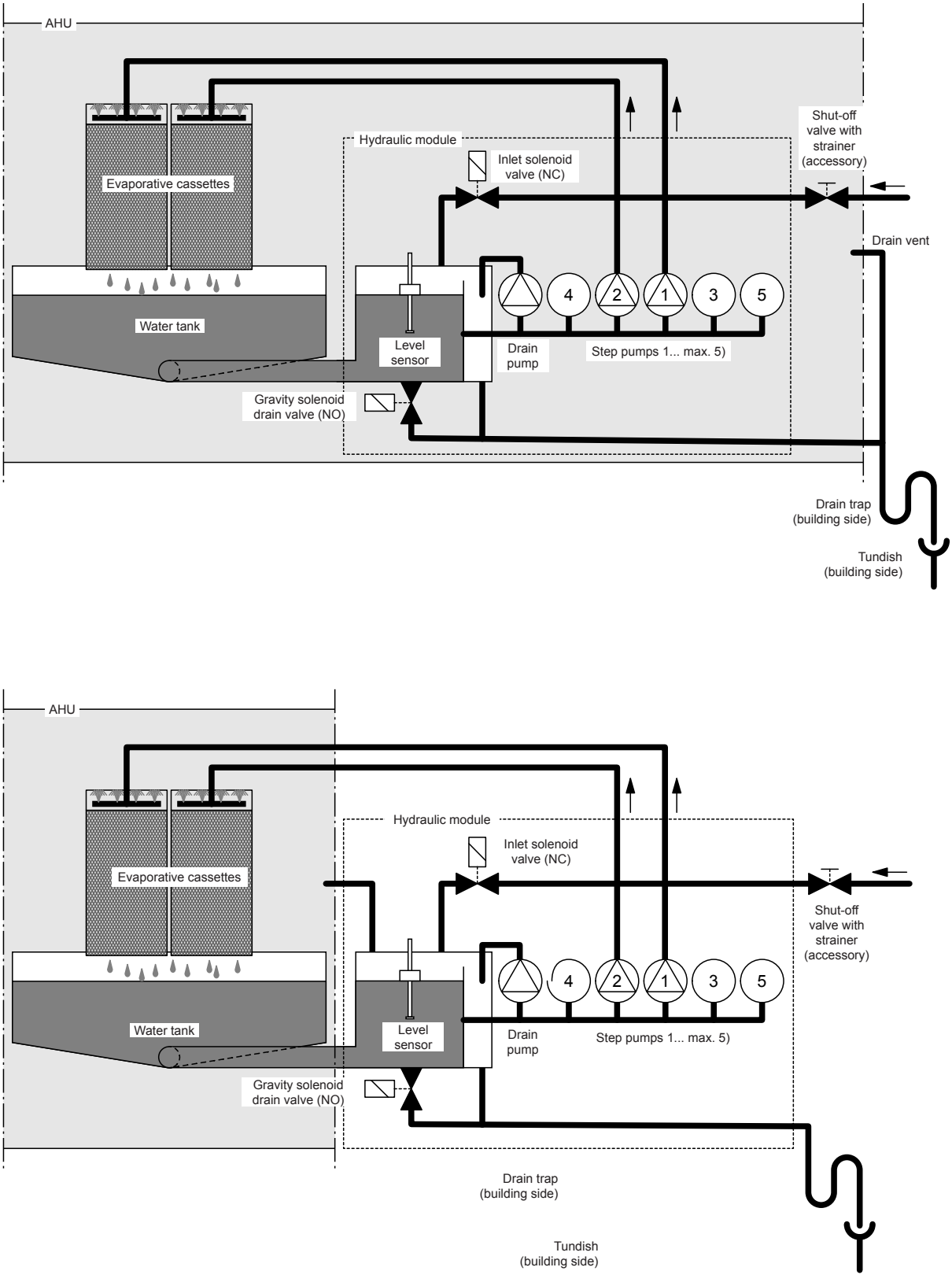



*Fig. 6: Pricipal diagram Condair ME Circulating System (internally and externally mounted)*

The water tank is filled up to a preset upper level via the level-controlled inlet solenoid valve (NC). When the water level in the water tank drops below a certain limit, the level-controlled inlet solenoid valve opens until the upper limit is reached again.

The “Condair ME Circulating System” provides multistep control by means of the Condair ME control unit and the step pumps (1 to 5 step pumps depending on the humidifier capacity or the number of banks of evaporative cassettes). The Condair ME control unit processes analog sensor/control signals and uses them to control the step pumps. This allows multistep control (1 to 5 steps depending on the system capacity) which improves control accuracy.

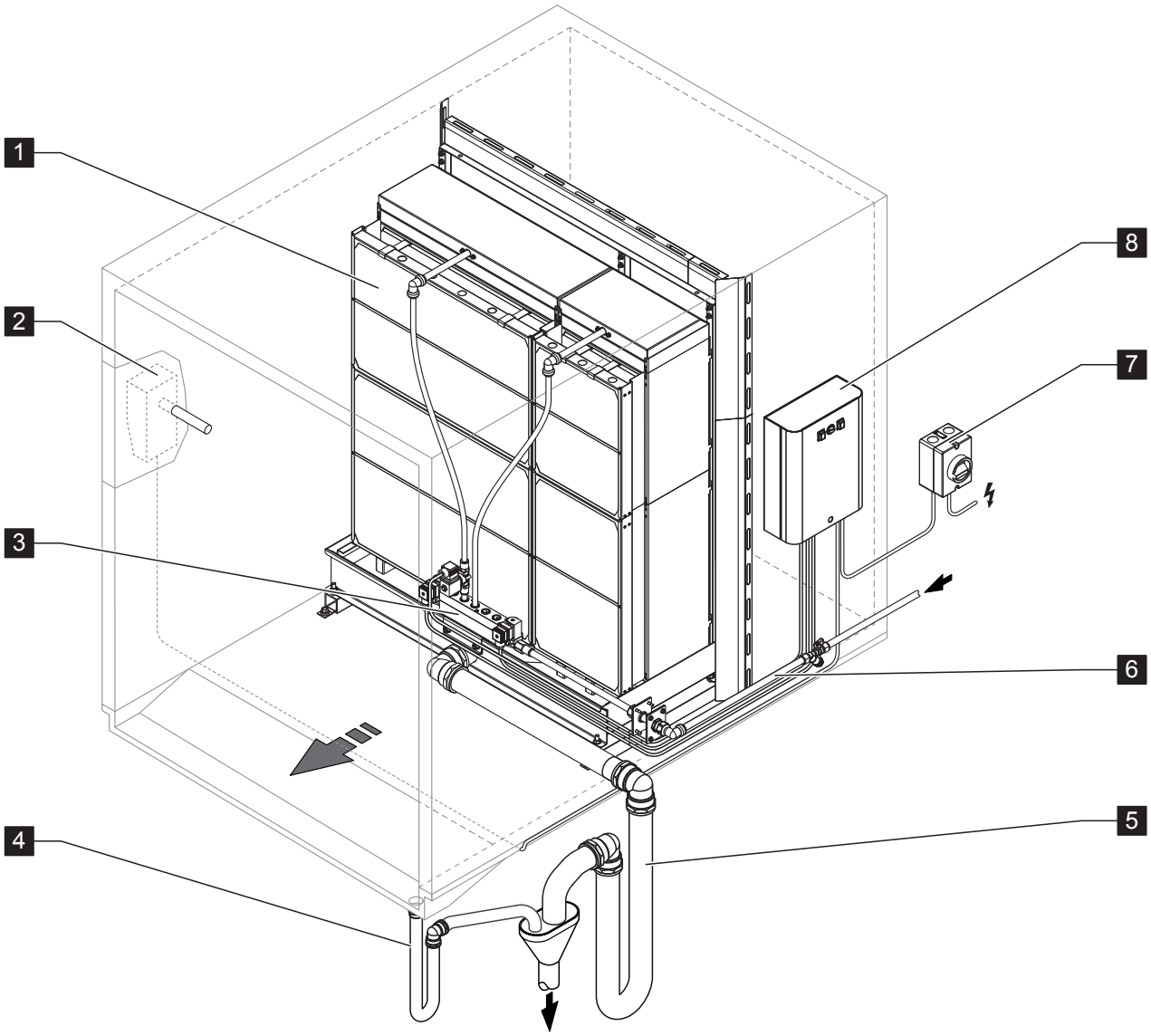
In case of a humidification/cooling request one, two, three, four or all five step pumps start (depending on the demand signal) and the water flows to the distribution header above the evaporative cassettes.

The distribution pipes inside the distribution header evenly supply the water to the entire surface of the evaporative cassettes where it flows down and humidifies the air flowing through the evaporative cassettes. The excess water not used for humidification flows to the water tank.

To prevent accumulation of mineral residues and the formation of germs in the water tank, the tank is completely drained periodically (interval or time controlled). Additionally further hygiene functions can be activated: Operation-dependent draining of the water tank (fill cycle, conductivity, temperature or time controlled).

### 3.4.2 Condair ME Direct Feed System

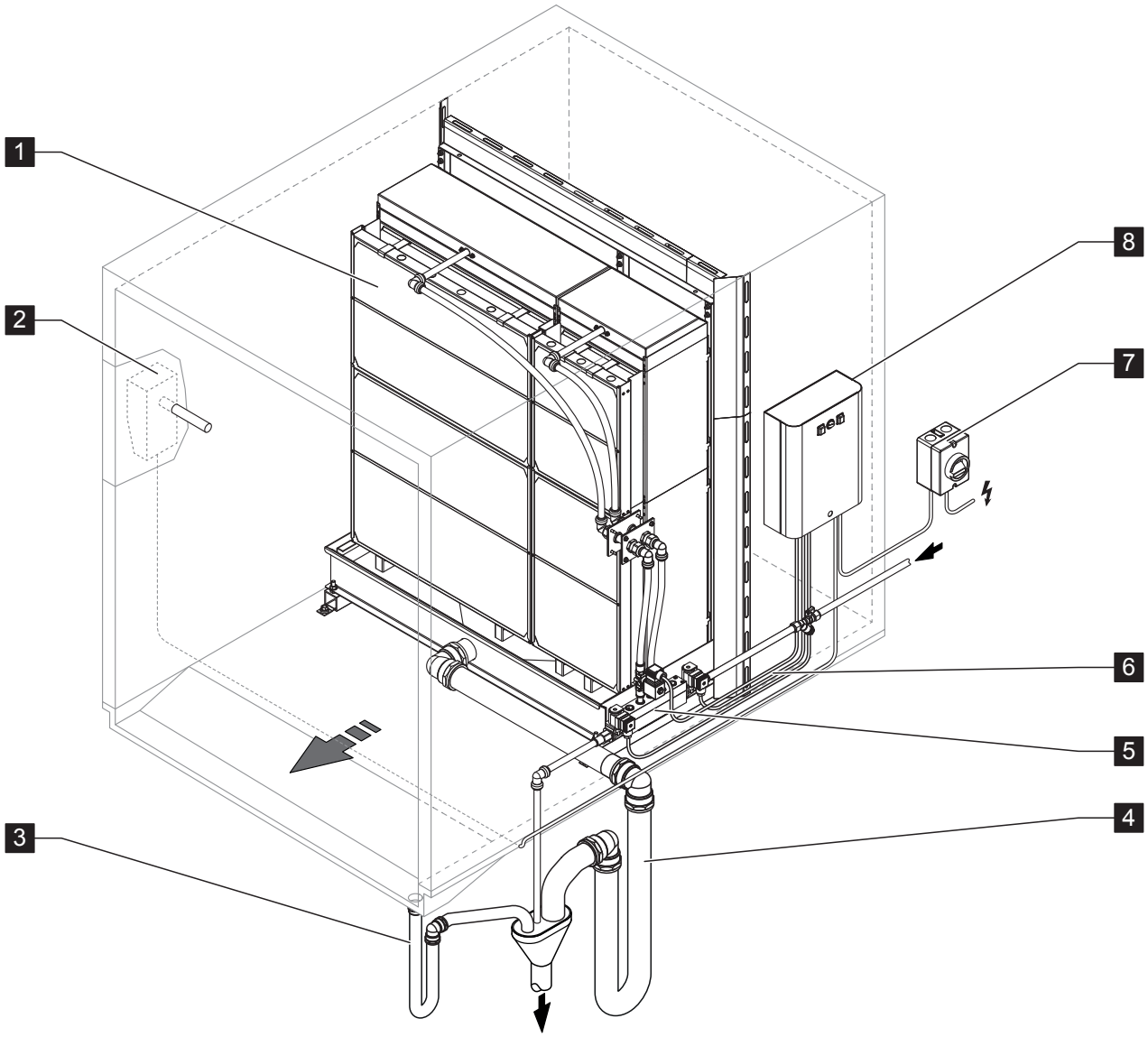
**System overview Condair ME Direct Feed System (internally mounted)**




1 Evaporative module
2 Humidity/Temperature controller/On/Off humidistat
3 Hydraulic module
4 Duct drain with trap
5 Tank drain with trap
6 Water supply
7 Mains disconnecter switch
8 Control unit RC (Option)

*Fig. 7: System overview Condair ME Direct Feed System (internally mounted)*

**System overview Condair ME Direct Feed System (externally mounted)**




1 Evaporative module
2 Humidity/Temperature controller/sensor
3 Duct drain with trap
4 Tank drain with trap
5 Hydraulic module
6 Water supply
7 Mains disconnecter switch
8 Control unit Condair RC (Option)

*Fig. 8: System overview Condair ME Direct Feed System (externally mounted)*

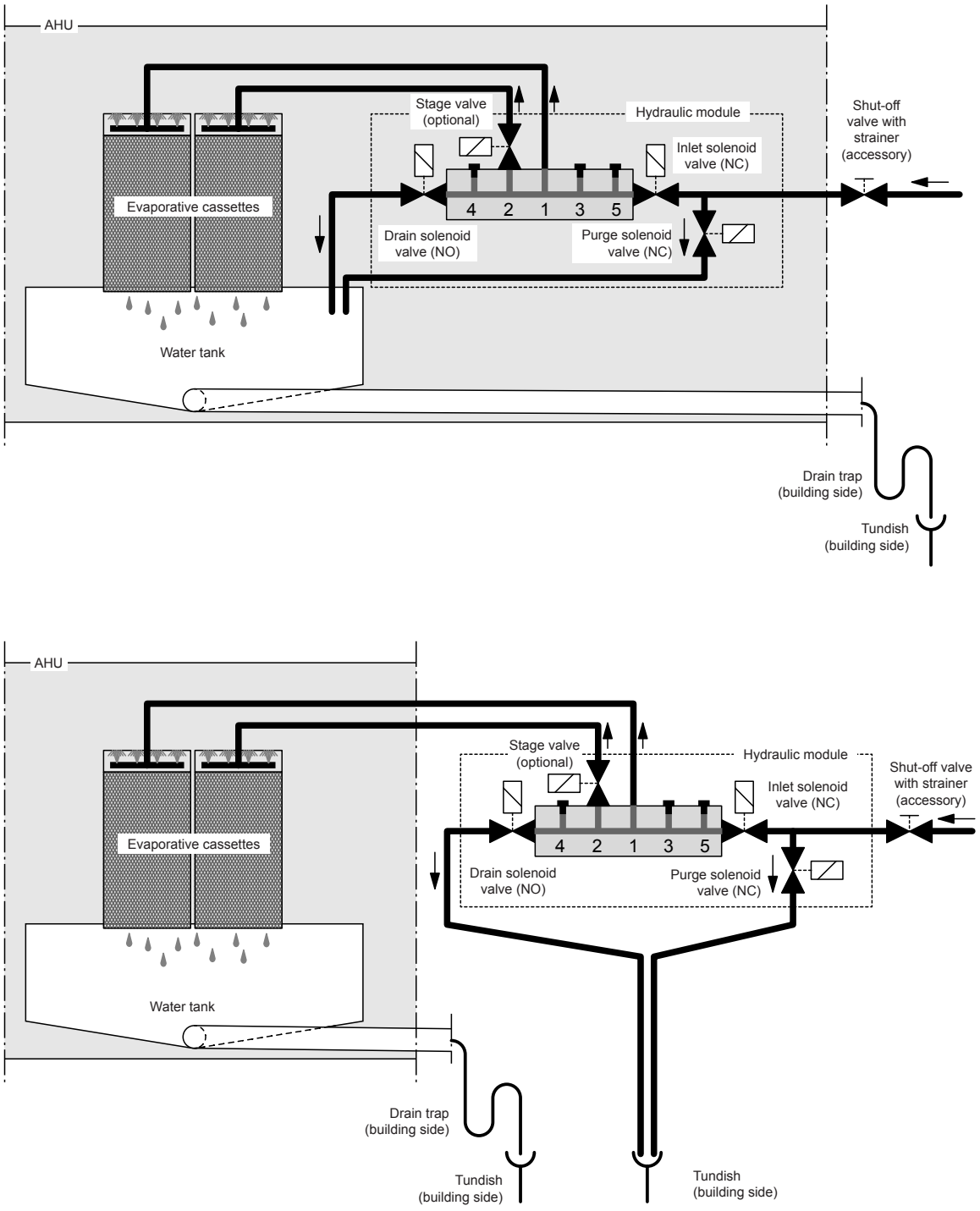



*Fig. 9: Pricipal diagram Condair ME Circulating System (internally and externally mounted)*

**Functional description**

The “Condair ME Circulating System” provides On/Off control as standard. Equipped with the optional step valves and the optional control unit Condair RC multistep control (1 to 5 steps depending on the system capacity) can be established.

In case of a humidification/cooling request with **standard On/Off control** the drain solenoid valve (NO) closes and the inlet solenoid valve (NC) opens and the water flows to the distribution header above the evaporative cassettes.

In case of a humidification/cooling request with **optional step control** the drain solenoid valve (NO) closes and the inlet solenoid valve (NC) opens. Depending on the demand signal additionally stage valve two, three, four and five open to supply water to the distribution header of the corrsponding evaporative cassettes bank.

The distribution pipes inside the distribution header evenly supply the water to the entire surface of the evaporative cassettes where it flows down and humidifies the air flowing through the evaporative cassettes. The excess water not used for humidification flows to the water tank and then directly to the drain.

If the there is no request for more than 23 hours the water supply line is flushed via the pruge valve to prevent water stagnation in the water supply line which can lead to the grow of micro-organisms in the water supply line.

# 4 Operation

## 4.1 Important notes on operation

**Qualification of personnel**

The adiabatic air humidification/air cooling system Condair ME must be commissioned and operated only by personnel familiar with the system and adequately qualified for the respective tasks. It is the owner's responsibility to verify proper qualification of the operating personnel.

**General notes**

The instructions and details regarding commissioning and operation must be followed and upheld. Only carry out the maintenance work described in this documentation.

The first-time commissioning of the adiabatic air humidification/air cooling system Condair ME requires appropriately trained technical personnel. It is mandatory that your Condair distributor commissions your system.

Please pay attention to local regulations regarding working at heights and electrical work. Part of this commissioning process is a disinfection of water tank and evaporative cassettes. Please read this document in full before commencing any work..

**Safety and Hygiene**

**DANGER!**

**The adiabatic air humidification/air cooling system Condair ME must be operated in accordance with this manual. Failure to do so could result in contamination that might cause Legionnaires" disease, which can be fatal**

**WARNING!**

**The Condair ME Circulating system equipped with a Condair ME control unit should not be electrically isolated for periods exceeding 24 hours as automatic drain and purge cycles will be disabled.**

## 4.2 First-time commissioning

The first-time commissioning of the adiabatic air humidification/air cooling system Condair ME requires appropriately trained technical personnel. We strongly recommend that your Condair distributor commissions your system.

**Inspections**

Prior to first-time commissioning the complete system must be inspected for correct execution of the installations. Procedd as follows:

1. Switch off AHU.
2. **Evaporative Module Installation**: Check that the Evaporative Module has been installed level in all planes with secure blanking plates to prevent air bypass. Check that there is sufficient access for cassette removal during maintenance. Ensure assembly is securely fixed, and that there is no visible damage. Check that the Module is installed in a waterproof section.
3. **Control unit Installation**: Check that the control unit is mounted in a convenient dry location
4. **Supply water Installation**: Ensure the water system in the building has been subject to a Risk Assessment. The Condair ME **must be connected to a clean, potable mains water supply**. It is the responsibility of the user to ensure that the water system complies with local regulations and bylaws, particularly those for the control of Legionella microbes (such as the HSE ACoP L8, The control of Legionella microbes in water systems). The use of mains water fed tanks and reservoirs is only permitted as part of a managed water treatment system. Check that the Evaporative Module has a feed water supply in excess of 2 bar (29 psi) connected to the supplied approved filling hose. Ensure that any hygiene options have been correctly installed. Check all joints and fittings for leaks.
5. **Drain installation**: Check that the drain line is made according to the corresponding instructions given in the installation manual. Ensure the drain line is connected to the main building drain and that drain pipe-work is trapped to a suitable level for the applicable working duct pressure. Check all joints and fittings. Ensure that the drain connection includes an air gap.
6. **Distribution Pipework**: Check all water distribution pipework between the hydraulic module and the distribution headers are securely fitted.
7. **Electrical Wiring**: Check all electrical connections with reference to the corresdponding wiring diagram in this manual. Check that a 230V / 5A (or 110V / 10A power supply in the US) is connected to the control unit. Check that this power supply is isolated within 1 m (39") of the control unit.
   Note: For systems equipped with a custom control unit please refer to the corresponding manual.
8. **Optional Controls**: Check that appropriate controls connections have been made to the Management System. Refer to the controls wiring section of the manual.
9. **Water Tank**: Check that the water tank of the evaporative module is free of any dirt and debris, and is clean.
10. **Flush Water Supply**: Disconnect water supply pipe from connector on the hydraulic module. Fix hose to free end of supply pipe and lead hose to a drain. Carefully flush supply pipe for approx. 5 mintes without creating splashing or aerosols. The reattach water supply pipe to connector on hydraulic module.
11. **Perform pressure test**: Turn on water supply and check for leaks.

12. **Health and Safety**: Take a water sample to ensure that supply water meets the requirements specified in the water quality guide. The sample should be tested using a dip slide to indicate the total number of coliforming units per ml (cfu/ml). Generally, levels of 1x103 cfu/ml may be considered acceptable for this type of humidifier provided the species of microbes and/or fungi involved are themselves not considered to be harmful. If you are unsure of the quality of your water please consult your Condair distributor for advice.
13. Start AHU.
14. **Validate Temperature and Air Flow**: Measure the air volumes and the air conditions, check this against the design data.

After the system has been inspected and found correct the further commisioning steps depend on the model:

– Fist-time commissioning steps **Condair ME Ciculating Systems**
    1. Switch on mains disconnecter switch.
    2. Switch on control unit switch.
    3. Enter the activation code (see chapter *5.5.2 – Service functions*).
    4. Perform a matrix wash over cycle (see chapter *5.5.2 – Service functions*).
    5. Configuring the Condair ME control unit according to the situation on site (se chapter *5.4 – Configuration*).
    6. Carrying out test runs.
    7. Fill out commissioning protocol.

– Fist-time commissioning steps **Condair ME Direct feed systems**
    1. Switch on mains disconnecter switch.
    2. Switch on control unit switch (if applicable).

The system is now ready for normal operation.

## 4.3 Display and operating elements

### Condair ME control unit

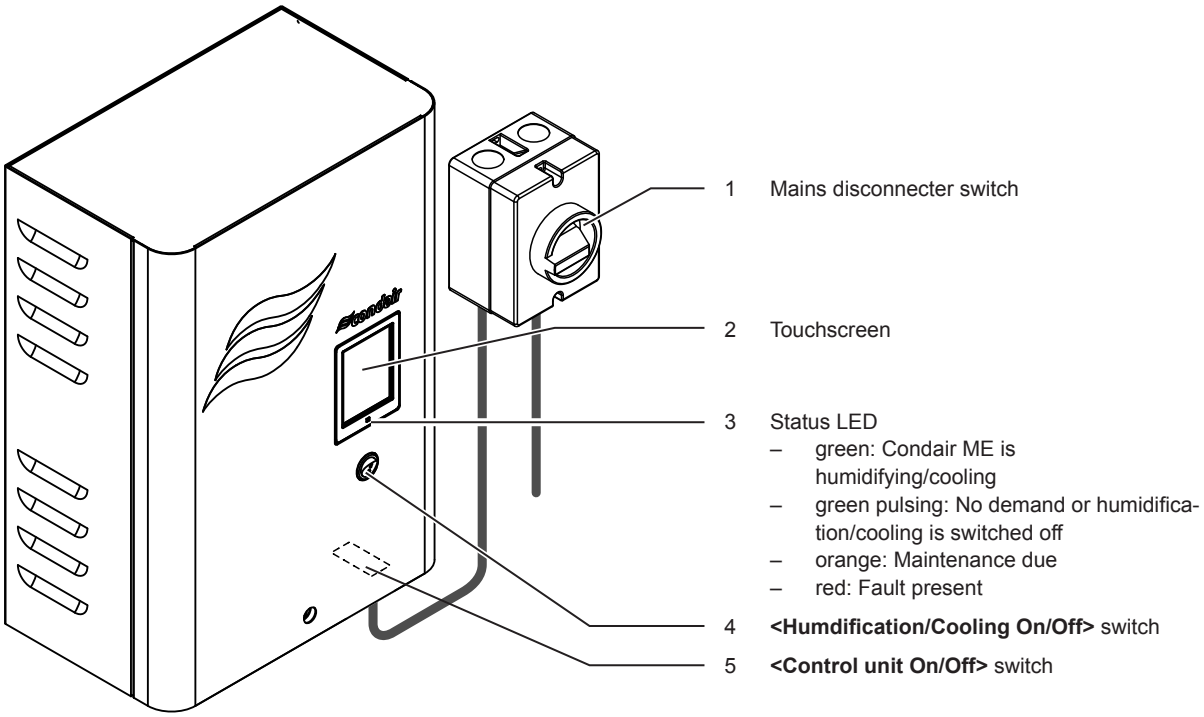



*Fig. 10: Display and operating elements Condair ME control unit*

### Condair RC control unit (option for direct feed systems)

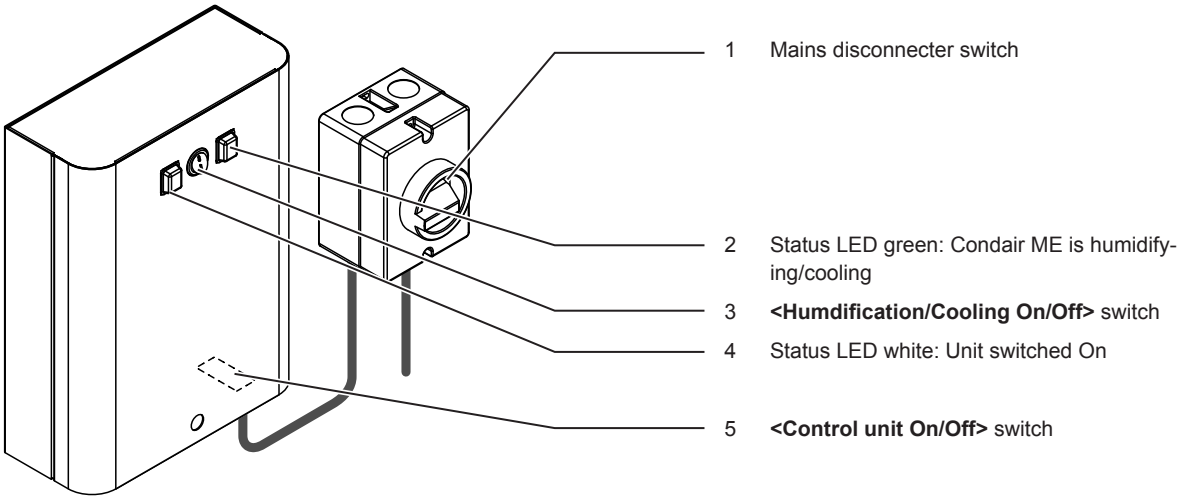



*Fig. 11: Display and operating elements Condair RS control unit (Option)*

## 4.4 Commissioning for daily operation

It is assumed that first-time commissioning has been carried out properly by the service technician of your Condair supplier.

The following description outlines the commissioning procedure for daily operation for systems equipped with a Condair ME or Condair RC control unit. For commissioning of systems equipped with a control unit of another brand please refer to the operating instructions of the corresponding control unit.

Proceed as follows to prepare the adiabatic air humidification/air cooling system Condair ME for operation:

1. Switch off AHU.
2. Examine the adiabatic air humidification/air cooling system Condair ME for possible damage.

   **DANGER!**

   Damaged systems or systems with damaged components or installation may present danger to human life or cause severe damage to material assets.
   **Damaged systems and/or systems with damaged or faulty installation must not be operated.**
3. If adiabatic air humidification/air cooling system Condair ME has been disconnected from the mains for more than 48 hours:
   - Close shut-off valve in the water supply line.
   - Disconnect water supply line from the connector on the hydraulic module.
   - Connect hose to the water supply line and lead the open end into open tundish outside the AHU.
   - Open shut-off valve in the water supply line and flush water supply line for at least 5 minutes. Then, close shut-off valve again, remove hose and reconnect supply line to the connector on the hydraulic module.
4. Make sure the front panel of the control unit is mounted and fixed with the retaining screw.
5. Open shut-off valve in the water supply line.
6. Switch on AHU.
7. Switch on the mains disconnecter switch in the mains supply to the control unit.
8. Switch on the control unit (systems equipped with a Condair ME or Condair RC control unit only).
9. If the circulating system equipped with a Condair ME control unit has been disconnected from the mains for more than 48 hours the control unit prompts a commissioning warning. If the water supply line has been flushed according to step 3, reset the commissioning warning according to chapter *5.5.2 – Service functions*.

The adiabatic air humidification/air cooling system Condair ME is now ready for operation. The touch screen of the Condair ME control unit shows the **standard operating display**.
Note: Further information on the operation of the Condair ME control software can be found in chapter *5 – Operating the Condair ME control software*.

## 4.5 Notes on operation

### 4.5.1 Remote operating and fault indication (Option)

If your control unit is equipped with the optional operating and fault indication PCB the different operating status can be indicated via the remote relays. For further information please refer to the corresponding manual on this option.

### 4.5.2 Inspections during operation

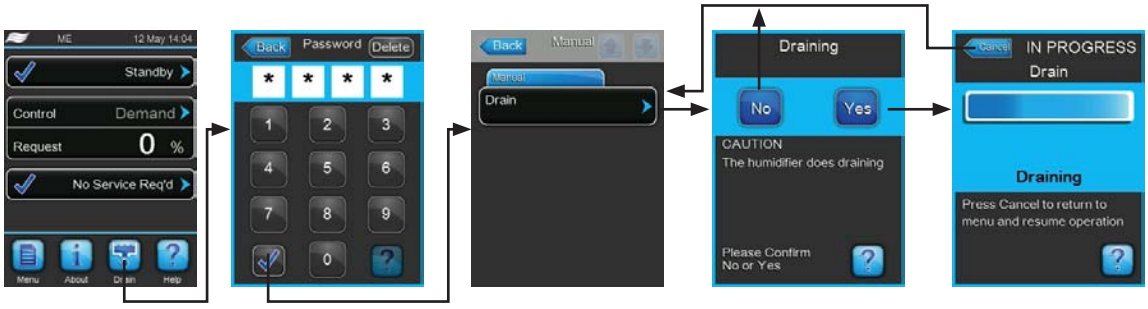
During operation the adiabatic air humidification/air cooling system Condair ME has to be inspected weekly. On this occasion check the following:

- the tank as well as the supply and drain water systems for any leakage.
- the evaporative module and the hydraulic module and the other system components for correct fixing and any damage.
- the electric installation for any damage.
- Systems equipped with Condair ME control unit: check system information in info menu and whether or not a warning or error message is present.

If the inspection reveals any irregularities (e.g. leakage, error indication) or any damaged components take the adiabatic air humidification/air cooling system Condair ME out of operation as described in chapter *4.6 – Taking the system out of operation*. Then, have the malfunction be eliminated or the damaged component be replaced by a well trained specialist or a service technician from your Condair supplier.

### 4.5.3 Manual flushing of the water system

If a manual flushing of the water system is required proceed as follows:




1. Press on the **<Drain>** button in the standard operating display .
2. Enter the user password and confirm it.
3. Press on the **<Drain>** button. The drain dialogue appears.
4. Press on the **<Yes>** button to start the flushing of the water system.

   Note: by pressing the **<Cancel>** button in the flushing progress window the flushing cycle is stopped and the unit returns to the manual drain menu.

## 4.6 Taking the system out of operation

In order to take the adiabatic air humidification/air cooling system Condair ME out of operation (e.g. to perform maintenance works, to eliminate a malfunction, etc.) perform the following steps:

1. On Condair ME Circulating System equipped with a Condair ME control unit: if the system has to be switched off because of a malfunction, please note the Warning and Fault code(s) of the actual error message(s) shown in the fault history.
2. Close the shut-off valve in the water supply line.
3. On Condair ME Circulating System: Empty the water tank with the manual drain function.
4. Close the shut-off valve in the water supply line to the hydraulic module.
5. Switch off the control unit (systems equipped with a Condair ME or Condair RC control unit only).
6. Disconnect control unit from the mains (switch off the mains disconnecter switch in the mains supply to the control unit and secure switch in “off” position against accidentally being switched on, or clearly mark the switch.
7. If work has to be carried out on the evaporative module or the hydraulic module mounted inside the duct, switch off the AHU and secure the system against accidentally being switched on.

Note: if the adiabatic air humidification/air cooling system Condair ME is not be used for a longer period of time the Condair ME Direct Feed systems should be taken out of operation as described above. However, the Condair ME Circulating systems should stay operable to keep the hygiene functions (e.g. periodical flushing of supply pipe) active. Therefore switch on power supply to control unit again after maintenance has been carried out or malfunctions have been eliminated.

# 5 Operating the Condair ME control software

## 5.1 Standard operating display

After switching on the control unit and the automatic system test the control unit is in normal operating mode and the standard operating display is shown.
Note: the appearance of the standard operating display depends on the current operating status and the configuration of the humidity/temperature regulation of the system and can deviate from the display shown below.

The standard operating display s structured as follows:

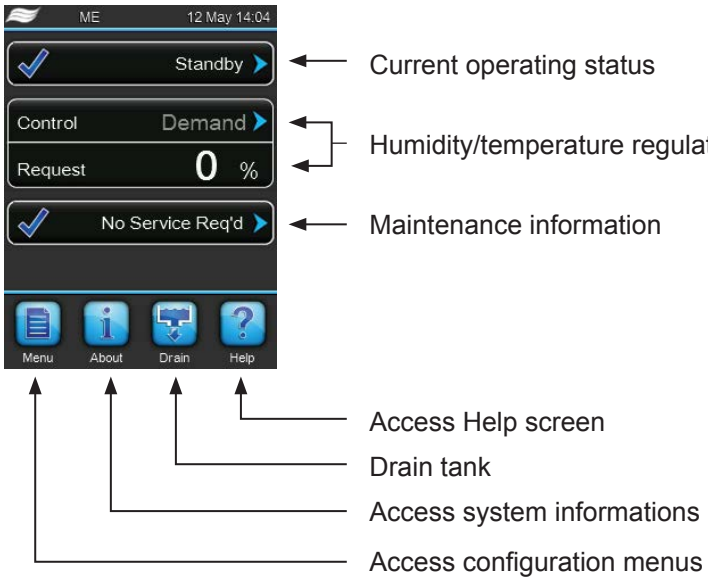
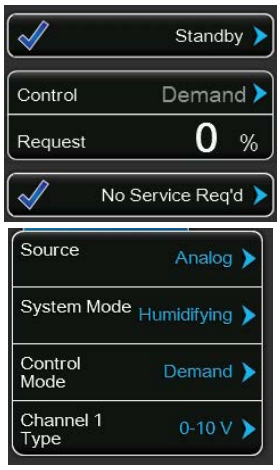



*Fig. 12: Standard operating display*

## 5.2 Navigating/Operating the Condair ME control software

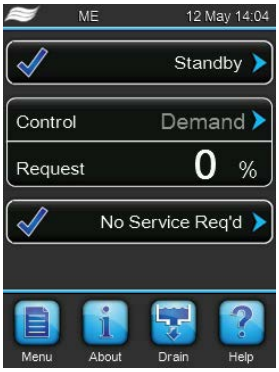
| Navigation element | Action |
|---|---|
|  | Accessing main menu |
|  | Accessing system informations |
|  | Performing manual Drain |
|  | Accessing Help screen |
|  | If you press on a field with a blue arrow symbol a new screen with additional informations or settings appears. |
|  | This symbol on the left side of the operating status and service status fields indicates, that the system is working ok. |
|  | This symbol on the left side of the operating status and service status fields indicates, that a Warning is present. Press on the operating status field to get further information on the Warning. |
|  | This symbol on the left side of the operating status and service status fields indicates, that a Fault is present (additionally the LED lights red). Press on the operating status field to get further information on the fault. |
|  | Jumps back to previous screen (Cancel and back) |
|  | Scroll up/down |
|  | Increase/decrease value |
|  | Delete shown value |
|  | Confirm set value or selected option |

## 5.3 Information functions

### 5.3.1 Accessing support informations


In the standard operating display press the **<Help>** button.
The screen with the support information appears.

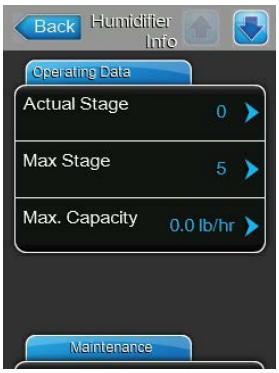
### 5.3.2 Accessing system informations




In the standard operating display press the **<About>** button.

The system information screen appears. Use the arrow buttons to scroll up and down within the system information screen.

#### Operating data




- **Actual Stage**: Actual number of currently operating stages of the system.
- **Max Stage**: Number of maximum stages set to operate.
- **Max. Capacity**: Maximum evaporating capacity in kg/h or lb/hr.

### Maintenance


– **Hours of Operation**: Operating hours since initial comissioning of the system.
– **Next System Service**: Remaining time until next maintenance of the system must be performed.

### Evaporator Conditions

The content of the “Evaporator Conditions” information section depends on the set dilution mode.


Dilution mode set to “**Fill cycle**”:

– **Dillution fill cycle**: Actual set fill cycles for periodical tank draining depending on the fill cycles.
– **Drain Interval**: Actual set tank drain interval time.


Dilution mode set to “**Dilution µS Limit**”:

– **Conductivity**: Actual conductivity of the water in the tank in µS/cm.
– **Water Temperature**: Actual temperature of the water in the tank in °C or °F.
– **Dillution µS Limit**: Actual set conductivity limit value if exceeded a dilution cycle is triggered.
– **Drain Interval**: Actual set tank drain interval time.


Dilution mode set to “**Dilution H2O Temp**”:

– **Dilution H2O Temp**: Actual set temperature limit value if exceeded a dilution cycle is triggered.
– **Dilution H2O Temp**: Actual temperature of the water in the tank in °C or °F.
– **Drain Interval**: Actual set tank drain interval time.


Dilution mode set to “**Dilution Interval**”:

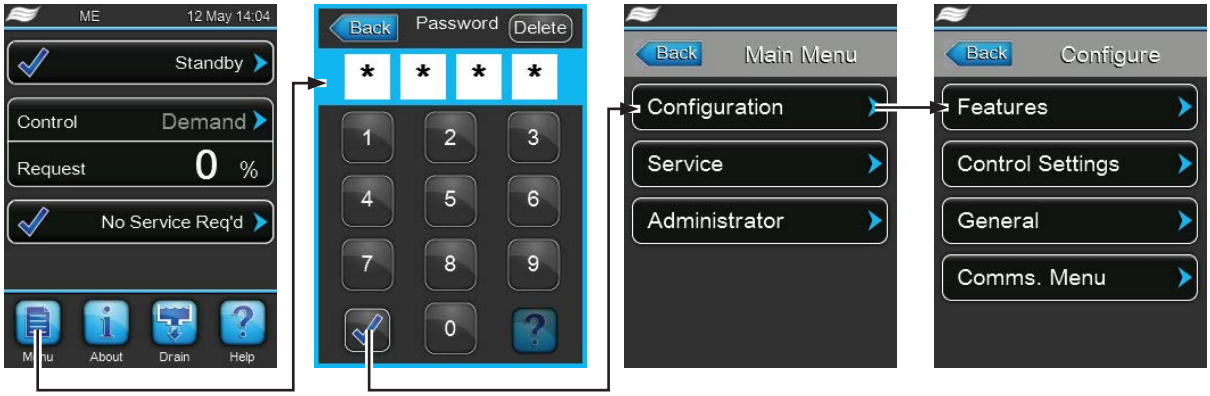
– **Dillution fill cycle**: Actual set fill cycles for periodical tank draining depending on the fill cycles.
– **Drain Interval**: Actual set tank drain interval time.

### General


- **Humidifier Model**: Designation of the humidifier model.
- **Software Version**: Actual version of the control software.
- **Driver A.DB.A Version**: Actual software version of the driver board.
- **Ext. A.DB.A 1 Version**: Actual software version of the conductivity monitoring board.
- **Serial number**: Serial number of the adiabatic air humidification/air cooling system Condair ME.

## 5.4 Configuration

### 5.4.1 Accessing the “Configuration” submenu




### 5.4.2 Configuring dilution and drain cycle functions (“Features” submenu)

In the “Features” submenu you set the parameters for the dilution and drain cycle functions.

**Dilution**

The process of evaporative humidification/cooling leads to a build up of dissolved solids in the water tank. To control the degree of dissolved solids in the tank, the Condair ME will trigger a dilution cycle according to the set fill cycles, interval time, water temperature or conductivity limit. During the Dilution Cycle the Condair ME will open the gravity drain solenoid valve and the inlet solenoid valve for a preset duration to drain dissolved solids away and replenish the tank with fresh water. The Dilution Cycle does not interrupt normal system operation.


– **Mode**: select the desired dilution cycle control mode.

  Factory setting: **Fill Cycle**

  Options: **Fill Cycle** (fill cycle controlled dilution cycle)
  **µS Limit** (conductivity controlled dilution cycle)
  **H2O Temp** (temperature controlled dilution cycle)
  **Interval** (time controlled dilution cycle)

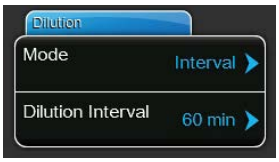
Depending on the selected dilution cycle control mode additionally the “Dilution Fill Cycle”, ”Dilution µS Limit”, “Dilution H2O Temp” or “Dilution Interval” must be set.


– **Dilution Fill Cycle**: set the desired fill cycles after which a dilution cycle is triggered. The number of fill cycles to be set depends on the water quality.

  Factory setting: **10**

  Setting range: **1...200** (fill cycles)






– **Dilution µS Limit**: set the desired conductivity limit in µS/cm. A dilution cycle is triggered as soon as the conductivity of the water in the tank exceeds the set conductivity limit.

  Factory setting: **600 µS**

  Setting range: **10...5000 µS**

– **Dilution H2O Temp**: set the desired water temperature in °C or °F. A dilution cycle is triggered as soon as the water temperature in the tank exceeds the set temperature.

  Factory setting: **10 °C**

  Setting range: **0...50 °C (32... 122 °F)**

– **Dilution Interval**: set the desired interval time in minutes. A dilution cycle is triggered as soon as the interval time has elapsed.

  Factory setting: **10 minutes**

  Setting range: **1...2160 minutes**

### Drain

The drain cycle function is designed to drain the water tank periodically to prevent conditions which favour the growth of bacterieas in the tank (e.g. legionella). The drain cycle can be initiated at a fixed time of day or after a interval time has elapsed. If a drain cycle is triggered the stage pumps will be stopped and the tank is completely drained via the drain pump (the drain pump is stopped when a preset level is reached) and the gravity drain solenoid valve. If a demand is present the gravity drain solenoid valve is closed and the tank is refilled otherwise the tank remains empty until the next demand.


– **Mode**: select the desired drain cycle control mode.

  Factory setting: **Interval**

  Options: **Interval** (interval time controlled drain cycle)
  **Time** (time of day controlled drain cycle)

  Depending on the selected drain cycle control mode additionally the “Drain Interval” or ”Drain Time” must be set.


– **Drain Interval**: set the desired interval time in hours. A drain cycle is triggered as soon as the interval time has elapsed.

  Factory setting: **12 hours**

  Setting range: **1...24 hours**


– **Drain Time**: set the desired time of day time (according to set time format) at which a drain cycle is triggered.

  Factory setting: **12:00 am**

  Setting range: **according to set time format**

### 5.4.3 Control Settings (“Control Settings” submenu)

In the “Control Settings” submenu you determine the control settings for the adiabatic air humidification/air cooling system Condair ME. The control settings available depend on the selected signal source and the control mode.

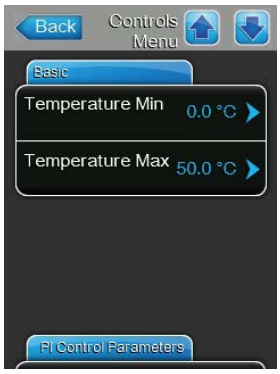
**Basic**


– **Source**: with this setting you determine whether the control signal comes from an analogue source (signal of a humidity sensor or demand signal from an external humidity controller) or via Modbus.
  Factory setting: **Analog**
  Options: **Analog** or **Modbus**

– **System Mode**: with this setting you determine whether the adiabatic air humidification/air cooling system Condair ME is configured as an air humidifier (“Humidifying”) or as an air cooler (“Cooling”).
  Factory setting: **Humidifying**
  Options: **Humidifying** (configured as air humidifier)
  **Cooling** (configured as air cooler)

– **Control Mode**: with this setting you determine the type of controller used with the adiabatic air humidification/air cooling system Condair ME.
  Factory setting: **Demand**
  Options: **On/Off** (external On/Off humidistat)
  **Demand** (external continuous controller)
  **RH P** (internal P controller)
  **RH PI** (internal PI controller)

– **Channel 1 Type / Channel 2 Type**: with this setting you determine the control signal type for channel 1 (if System Mode is set to humidifying) or channel 2 (if System Mode is set to cooling).
  Note: this setting appears only if signal source is set to “Analog” and control mode is set to “Demand”, “RH P” or “RH PI”.
  Factory setting: **0-10 V**
  Options: **0-5V, 1-5V**, **0-10V**, **2-10V**, **0-20V**, **0-16V**, **3.2-16V**, **0-20mA**, **4-20mA**




– **Temperature Min**: with this setting you determine the minimum temperature of the measuring range of the temperature sensor used.
  Note: this setting appears only if System Mode is set to “Cooling” and control mode is set to “RH P” or “RH PI”.
  Factory setting: **0.0 °C (32 °F)**
  Setting range: **–50.0 ... +100 °C (–58 ... 212 °F)**

– **Temperature Max**: with this setting you determine the maximum temperature of the measuring range of the temperature sensor used.
  Note: This setting appears only if signal source is set to “Analog” and control mode is set to “Demand”, “RH P” or “RH PI”.
  Factory setting: **0.0 °C (32 °F)**
  Setting range: **–50.0 ... +100 °C (–58 ... 212 °F)**

### PI Control Parameter


– **Setpoint**: with this setting you set the humidity setpoint in %rh (if System Mode is set to “Humidifying”) or the temperature setpoint in °C or °F (if System Mode is set to “Cooling”).
**Note**: this setting appears only if the Control Mode is set to “RH P” or “RH PI”.

  Factory setting: **50 %**
  Options: **0 ... 95 %**

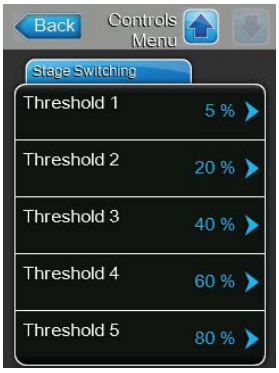
– **Band Channel 1 / Band Channel 2**: with this setting you set the proportional range of channel 1 in %rh (if System Mode is set to humidifying) or of channel 2 in °C or °F (if System Mode is set to cooling).
**Note**: this setting appears only if the Control Mode is set to “RH P” or “RH PI”.

  Factory setting: **18 %rh** or **10 °C (50 °F)**
  Options: **6 ... 65 %rh** or **1.0 ... 50.0 °C (33.8 ... 122 °F)**

– **ITime Channel 1 / ITime Channel 1**: with this setting you set the integral time of channel 1 (if System Mode is set to humidifying) or channel 2 (if System Mode is set to cooling) in minutes.
**Note**: this setting appears only if the Control Mode is set to “RH PI”.

  Factory setting: **8 minutes**
  Options: **1 ... 60 minutes**

### Stage switching




– **Threshold 1**: With this setting you determine the set point at which the pump of stage 1 will switch on or off in % of the demand signal.

  Factory setting: **5 %**
  Options: **0 ... 99 %**

– **Threshold 2**: With this setting you determine the set point at which the pump of stage 2 will switch on or off in % of the demand signal.

  Factory setting: **20 %**
  Options: **0 ... 99 %**

– **Threshold 3**: With this setting you determine the set point at which the pump of stage 3 will switch on or off in % of the demand signal.

  Factory setting: **40 %**
  Options: **0 ... 99 %**

– **Threshold 4**: With this setting you determine the set point at which the pump of stage 4 will switch on or off in % of the demand signal.

  Factory setting: **60 %**
  Options: **0 ... 99 %**

– **Threshold 5**: With this setting you determine the set point at which the pump of stage 5 will switch on or off in % of the demand signal.

  Factory setting: **80 %**
  Options: **0 ... 99 %**

### 5.4.4 Basic settings (“General” submenu)

In the “General” submenu you determine the basic settings for operating the Condair ME control unit.

#### Basic


– **Datum**: With this setting you determine the current date in the set format (”MM/DD/YYYY” or “DD/MM/YYYY”).
  Factory setting: **00/00/0000**
– **Time**: With this setting you set the current hour of the day in the set time format (”12H” or “24H”).
  Factory setting: **12:00**
– **Language**: With this setting you determine the dialogue language.
  Factory setting: **depending on the country**
  Options: **different dialogue languages**
– **Units**: With this setting you determine the desired unit system.
  Factory setting: **depending on the country**
  Options: **Metric or Imperial**


– **Contrast**: With this setting you determine the desired value for the display contrast.
  Factory setting: **8**
  Options: **1 (weak contrast) ... 31 (strong contrast)**
– **Brightness**: With this setting you determine the desired value for the display brightness.
  Factory setting: **52**
  Options: **1 (dark) ... 100 (white)**

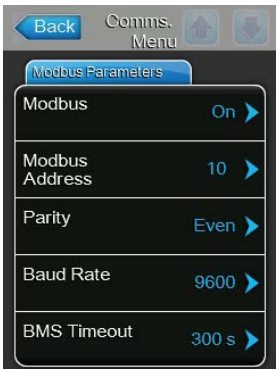
#### Time/Date


– **Date Format**: With this setting you determine the desired date format.
  Factory setting: **DD/MM/YYYY**
  Options: **DD/MM/YYYY** or **MM/DD/YYYY**
– **Clock Format**: With this setting you determine the desired time format.
  Factory setting: **12H**
  Options: **24H** (24 hours, display 13:35) or
  **12H** (12 hours, display: 01:35 PM)

### 5.4.5 Modbus settings (“Modbus” submenu)

In the “Modbus” submenu you can determine the parameters for the communication via a Modbus network.

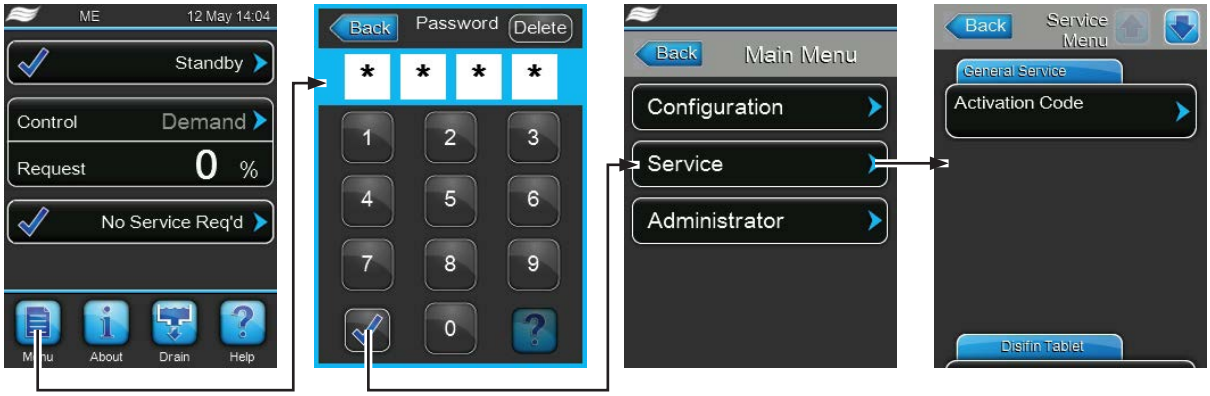
**Time/Date**




– **Modbus**: With this setting you can activate (“On”) or deactivate (“Off”) communication via a Modbus network.
  Factory setting: **Off**
  Options: **Off** or **On**
– **Modbus Address**: With this setting you determine the Modbus address for the adiabatic air humidification/air cooling system Condair ME for the communication via a Modbus network.
  Factory setting: **1**
  Setting range: **1...247**
– **Parity**: With this setting you set the parity bit for the data transfer.
  Factory setting: **None**
  Options: **None, Even or Odd**
– **Baudrate**: With this setting you set the Baudrate for the data transfer.
  Factory setting: **9600**
  Options: **9600, 19200, 39400, 115200**
– **BMS-Timeout**: With this setting you set the timeout time for the data transfer.
  Factory setting: **5 Seconds**
  Options: **0 ... 300 Seconds**

## 5.5 Service

### 5.5.1 Accessing the “Service” submenu

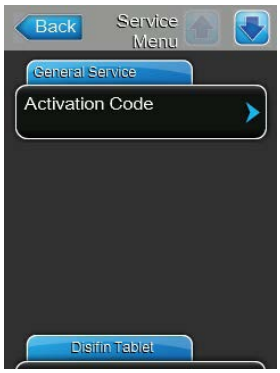



### 5.5.2 Service functions

In the “Service” submenu you can enter the activation code, accessing and resetting the fault and maintenance history and performing different input and output diagnostic functions.

**General Service**

As long as the system is locked only the “Activation Code” function is shown in the “General Service” section.




– **Activation Code**: via the activation code function you can unlock the adiabatic air humidification/air cooling system Condair ME if it is locked ex factory. Once the activation code has been entered and confirmed the menu item is not shown anymore.
Note: Contact your Condair supplier to get the activation code. Once the activation code has been entered the “Activation Code” function is not shown anymore.


- **Commissioning Reset**: with this function you can access the fault history list where the last 40 fault events are stored. After pressing on the “Fault History” button the fault history list appears.
- **Matrix Wash Over**: with this function you can wash over the evaporative cassette matrix. After pressing on the “Matrix Wash Over” button the wash over cycle is automatically started.
  Note: Use this function to wash over newly installed evaporative cassettes to remove any dust and glue left after the manufacture of evaporative cassette material.
- **UV Bulb Reset**: with this function you can reset the UV Bulb replacement message after having replaced the UV bulb.
  Note: Resetting the UV Bulb replacement message without having replaced the UV Bulb may lead to contamination of the system.
- **PureFlo Ag+ Reset**: with this function you can reset the PureFlo Ag+ replacement message after having replaced the PureFlo Ag+ cartridge.
  Note: Resetting the PureFlo Ag+ replacement message without having replaced the PureFlo Ag+ cartridge may lead to contamination of the system.
- **System Service Reset**: with this function you can reset the System Service message after having performed a system service.
  Note: Resetting the System Service replacement message without having performed a system service may lead to contamination of the system.

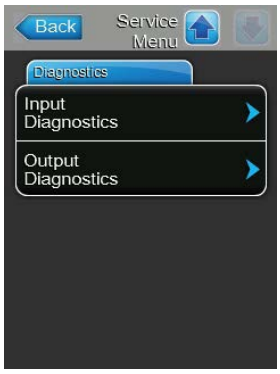
### Disifin Tablet


- **Disifin Tablet**: When DISIFIN tablet(s) are added to the tank for disinfection, the conductivity in the tank will increase. This would cause a fault on systems equipped with the optional conductivity monitoring.
  With the function “Disifin Tablet” you can override the conductivity monitoring for 1 hour once you have added DISIFIN tablet(s).

### Fault/Service History


- **Fault History**: with this function you can access the fault history list where the last 40 fault events are stored. After pressing on the “Fault History” button the fault history list appears.
- **Service History**: with this function you can access the service history list where the last 40 service events are stored. After pressing on the “Service History” button the service history list appears.
- **Reset Fault History**: with this function you can reset the fault history list. After pressing on the “Reset Fault History” button a confirmation window appears where the resetting of the fault hystory list must be confirmed.
- **Reset Service History**: with this function you can reset the service history list. After pressing on the “Reset Service History” button a confirmation window appears where the resetting of the service hystory list must be confirmed.
- **Export History**: with the function “Export Hystory” you can export the fault and service history list to a USB memory stick via the USB port on the control board.
  Note: If this function is selected without having connected a USB memory stick to the USB port a corresponding Error message is displayed.

### Diagnostics




- **Input Diagnostics**: with this function you can access the “Input Diagnostics” submenu where you can view different current input values the control system is using. Detailed information can be found in chapter *5.5.2.1 – Input Diagnostics*.
- **Output Diagnostics**: with this function you can access the “Output Diagnostics” submenu where you can activate or deactivate different system functions for diagnostic reason. Detailed information can be found in chapter *5.5.2.2 – Output Diagnostic Functions*.

  Important: By accessing the“Output Diagnostics” submenu the system is automatically switched to standby operation.

### 5.5.2.1 Input Diagnostics

The following input values can be viewed after accessing the “Input Diagnostics” submenu.

#### Control


- **Humidity control**: Actual demand signal in %
- **Temperature control**: not available
- **Safety Chain**: Actual status of the safety chain (Open= Safety chain open, Closed= Safety chain closed)
- **Enable**: Actual status of the external enable function (Off= external enable function deactivated, On= external enable function activated)

#### Evaporator Conditions


The Evaporator Conditions section shows information regarding options such as:

- Actual conductivity of the water in the tank in µS/cm
- Actual temperature of the water in the tank in °C or °F
- Actual air temperature of the incoming air in °C or °F

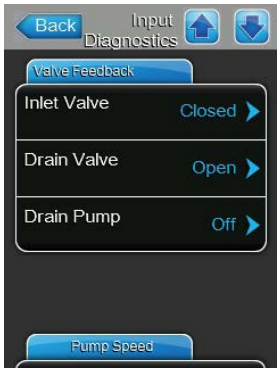
#### Level Floats


- **Level**: Actual level of the level sensor (level information must be supplied)

### Hygiene & Safety

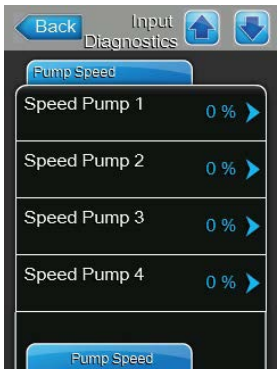

- **24V External Supply**: Actual voltage of the external 24 V supply
- **10V External Supply**: Actual voltage of the external 10 V supply
- **5V Peripheral Supply**: Actual voltage of the external 24 V supply

### Valve Feedback

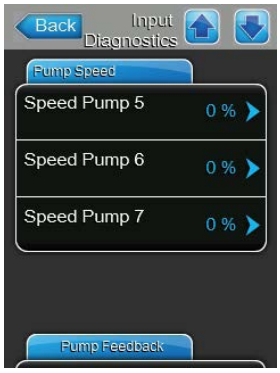



- **Inlet Valve**: Actual status of inlet solenoid drain valve (open or closed)
- **Drain Valve**: Actual status of gravity solenoid drain valve (open or closed)
- **Drain Pump**: Actual status of drain pump (on or off)

### Pump Speed

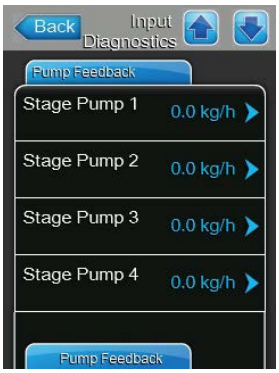



- **Speed Pump 1**: Actual speed of stage pump 1 in % of the maximum speed
- **Speed Pump 2**: Actual speed of stage pump 2 in % of the maximum speed
- **Speed Pump 3**: Actual speed of stage pump 3 in % of the maximum speed
- **Speed Pump 4**: Actual speed of stage pump 4 in % of the maximum speed

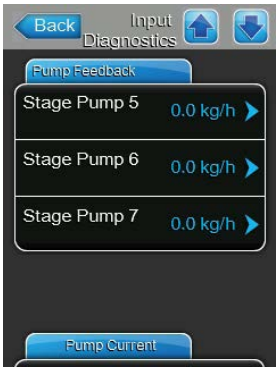



- **Speed Pump 5**: Actual speed of stage pump 5 in % of the maximum speed
- **Speed Pump 6**: Actual speed of stage pump 6 in % of the maximum speed
- **Speed Pump 7**: Actual speed of stage pump 7 in % of the maximum speed

### Pump Feedback




- **Speed Pump 1**: Actual flow rate of stage pump 1 in kg/h or lb/hr
- **Speed Pump 2**: Actual flow rate of stage pump 2 in kg/h or lb/hr
- **Speed Pump 3**: Actual flow rate of stage pump 3 in kg/h or lb/hr
- **Speed Pump 4**: Actual flow rate of stage pump 4 in kg/h or lb/hr




- **Speed Pump 5**: Actual flow rate of stage pump 5 in kg/h or lb/hr
- **Speed Pump 6**: Actual flow rate of stage pump 6 in kg/h or lb/hr
- **Speed Pump 7**: Actual flow rate of stage pump 7 in kg/h or lb/hr

### 5.5.2.2 Output Diagnostic Functions

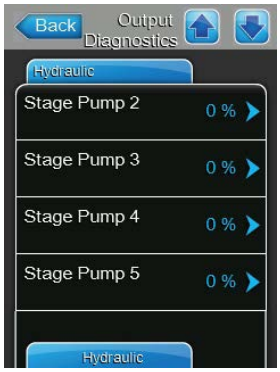
The following diagnostic functions are available after accessing the “Output Diagnostics” submenu.

#### Control

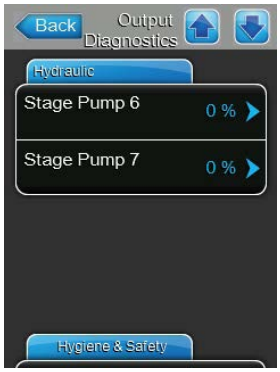

- **Control Select**: With this function you switch the humidity or demand control signal between voltage and current signal.
- **Temp. Select**: With this function you switch the temperature or demand control signal between voltage and current signal.

#### Hydraulic


- **Inlet Valve**: with this function you can open and close the inlet solenoid valve.
- **Drain Valve**: with this function you can open and close the gravity drain solenoid valve.
- **Drain Pump**: with this function you can start and stop the drain pump.
- **Stage Pump 1**: with this function you set the speed of stage pump 1 in % of the maximum revolution speed.




- **Stage Pump 2**: with this function you set the speed of stage pump 2 in % of the maximum revolution speed.
- **Stage Pump 3**: with this function you set the speed of stage pump 3 in % of the maximum revolution speed.
- **Stage Pump 4**: with this function you set the speed of stage pump 4 in % of the maximum revolution speed.
- **Stage Pump 5**: with this function you set the speed of stage pump 5 in % of the maximum revolution speed.



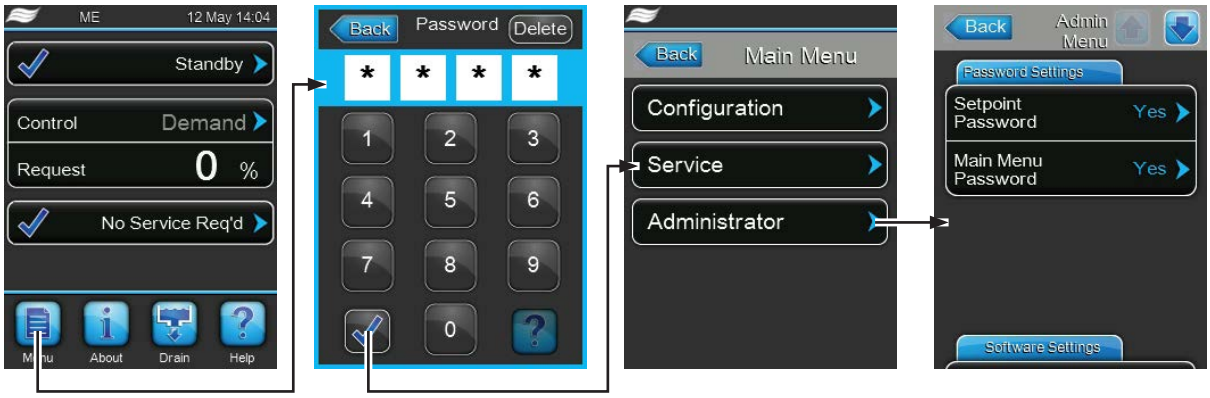

- **Stage Pump 6**: with this function you set the speed of stage pump 6 in % of the maximum revolution speed.
- **Stage Pump 7**: with this function you set the speed of stage pump 7 in % of the maximum revolution speed.

### Hygiene & Safety


– **UV Lamp**: With this function you can switch on and off the optional UV Lamp.
– **Dosing Pump**: With this function you can switch on and off the optional Dosing Pump.

## 5.6 Administration settings

### 5.6.1 Accessing “Administrator” submenu




Passwort: 8808

### 5.6.2 Administration settings (“Administrator” submenu)

In the “Administrator” submenu you can:

– activate or deactivate password protection for main menu and setpoint adjustment access.

– perform software updates via a USB memory medium connected to the USB port

– reset user settings to factory defaults.

#### Password Settings


– **Setpoint Password**: with the function “Setpoint Password” you can protect the setpoint input screen with the user password “8808” against unauthorised access (“Yes”) or not (“no”).

– **Main Menu Password**: with the function “Main Menu Password” you can protect the access to the main menu with the user password “8808” against unauthorised access (“Yes”) or not (“no”).

### Software Settings


- **Software-Update**: with the function “Software Update” you can update the control software of the integrated controller.
- **Ext.A.DB.A Update**: with the function “Ext.A.DB.A Update” you can update the driver board software.
- **Ext.A.DB.A.1 Update**: with the function “Ext.A.DB.A.1 Update” you can update the control board software.
- **Restore Factory Defaults**: with the function “Restore Factory Defaults” you can reset all user settings to factory defaults.

# 6 Maintenance

## 6.1 Important notes on maintenance

**Qualification of personnel**

All maintenance work must be carried out only by **well qualified and trained personnel authorised by the owner**. It is the owner's responsibility to verify proper qualification of the personnel.

**General notes**

The instructions and details for maintenance work must be followed and upheld. Only carry out the maintenance work described in this documentation.

The adiabatic air humidification/air cooling system Condair ME must be maintained in the prescribed intervals, the cleaning work must be carried out correctly and the evaporating boxes and the droplet separator boxes must be replaced after their prescribed lifetime has elapsed.

Only use original spare parts from your Condair supplier to replace defective parts or parts which have elapsed their lifetime.

**Safety and Hygiene**

Some maintenance work requires removal of the unit cover. Please note the following:

**DANGER!**
**Danger of electric hazard!**

**Before carrying out any maintenance work take the adiabatic air humidification/air cooling system Condair ME out of operation as described in chapter** *4.6 – Taking the system out of operation* **and secure the system against inadvertent power-up.** In addition take AHU out of operation as described in the operations instructions of the AHU and secure the AHU against inadvertent power-up.

**CAUTION!**

The electronic components inside the control units are very sensitive to electrostatic discharge. Prevention: Before carrying out any maintenance work to the electrical or electronic equipment of the control unit, appropriate measures must be taken to protect the respective components against damage caused by electrostatic discharge (ESD protection).

**DANGER!**
**Health risk by inadequate maintenance!**

**The adiabatic air humidification/air cooling system Condair ME must be maintained in accordance with this manual. Failure to do so could result in contamination that might cause Legionnaires" disease which can be fatal.**

## 6.2 Maintenance Intervals

In order to maintain operational safety and hygienic demands the adiabatic air humidification/air cooling system Condair ME must be maintained in regular intervals. The time interval for the maintenance is to be adapted to the operating conditions. The hygiene status depends mainly on the quality of the humidifier water but also on the adherence to the exchange intervals of the upstream air filter, the air velocity and the micro-biological and chemical composition of the supply air. Therefore the maintenance intervals must be determined for each system separately.

The maintenance interval is to be determined at commissioning. The default is **200 hours operation**. Depending on the encountered hygiene status when performing a maintenance the interval time must be decreased or increased.
**In any case the adiabatic air humidification/air cooling system Condair ME is to be maintained however at least twice annually.**

On Condair ME Circulating Systems with Condair ME control unit the system maintenance interval can be programmed on the control unit. As soon as the maintenance time has elapsed, a maintenance message is displayed to draw your attention to the pending maintenance. To determine the maintenance interval time the above described procedure can be used.

With systems without maintenance counter it is the customer's reasonability to observe the determined system maintenance intervals.

## 6.3 Maintenance guide

All humidifiers will form part or your hot and cold water system and as such require you to undertake certain duties with regards to “The control of Legionella microbes in water systems” (L8). Your water sampling / testing and disinfection regime must be based on details in the O&M manual and from results of a site specific risk assessment.

If any further assistance is required or you are interested in a planned maintenance quote, please contact your Condair distributor.

After the maintenance interval time has elapsed the following maintenance work has to be carried out:

| **Component** | **Work to be carried out** |
|---|---|
| Distribution heads | Dismantle and check distribution heads. Check the holes in the water distribution pipes for mineral deposit. If necessary, dismantle the water distribution pipes and remove the mineral deposit.<br>Clean distribution heads and water distribution pipes with a combined detergent and disinfectant. |
| Droplet separator boxes (Option) | Dismantle and check droplet separator boxes. Clean droplet separator boxes with a combined detergent and disinfectant.<br>If the droplet separator boxes are damaged, have them replaced. |

| | |
|---|---|
| Evaporative cassettes | Dismantle and check the evaporative cassettes. Clean evaporative cassettes with a combined detergent and disinfectant.<br>If the medium of the evaporative cassettes is heavily soiled or if the evaporative cassettes are damaged, the evaporative cassettes have to be replaced.<br>Note: If the evaporative cassettes indicate strong dust deposit, the air filter of the AHU is to be controlled (recommended filter quality: F7/EU7 or better). |
| Water tank | Check water tank for soiling (dust, slime, mineral deposit, etc.) and take a sample for a microbiological analysis.<br>Clean whole water tank (inside and outside) with a combined detergent and disinfectant.<br>Note: the result of the microbiological analysis indicates, whether the maintenance interval time must be decreased (microbiological contamination encountered) or can be increased (no microbiological contamination encountered). |
| Frame structure | Check screw connections of the frame structure, tight loose screw connections.<br>Clean frame structure with a combined detergent and disinfectant. |
| Blanking plates | Check fastening of the blanking plates, tight any loose fastenings.<br>Clean blanking plates with a combined detergent and disinfectant.<br>If necessary dismantle blanking plates for cleaning. |
| Duct section downstream of the evaporative module | Check the duct section downstream of the humidifier for collection of residual water. If residual water is present: Check air velocity above the Evaporative cassettes (without droplet separator max. 3.5 m/s, with droplet separator max. 4.5 m/s, respectively). Mount droplet separator if necessary.<br>Clean duct with a combined detergent and disinfectant. |
| Hydraulic module | Check connections and components for leaks and correct fastening. Seal/replace leaky components, replace defective components, fasten loose components.<br>Carefully clean the components of the hydraulic unit with a combined detergent and disinfectant. |
| Water distribution hoses | Dismantle and check water distribution hoses for cracks. Replace defective hoses.<br>Carefully clean the hoses with a combined detergent and disinfectant. |

| | |
|---|---|
| Water supply piping | Take a water sample from the supply water for a microbiological analysis.<br>Note: if microbiological contamination is encountered the entire water supply system of the building must be checked.<br>Check water supply piping for cracks and correct fastening, replace defective or leaky pipes.<br>Remove water supply piping and carefully clean the pipes, valves, etc. with a combined detergent and disinfectant.<br>Dismantle water filter (if present), clean it, then reinstall it. |
| Drain line and drain trap | Check and clean with a combined detergent and disinfectant, if necessary. |
| Submerged UV<br>(Option) | Dismantle the UV lamp. Carefully clean glass tube and UV lamp. Replace UV lamp when UV Service message appears. |
| Electric installation | Check all cables and components for correct fastening, correct function and defects. Let have defective components be replaced and loose components be fastened by a qualified specialist. |

## 6.4 Dismantling and installation of components for maintenance

### 6.4.1 Dismantling and installation of the evaporative module

1. Disconnect distribution hoses from the connectors on the distribution heads, the wall feed-throughs (if applicable) and the hydraulic module.
2. Remove droplet separator boxes (row by row):
   - Remove upper separator brackets.
   - Remove banks of separator boxes.
   - Remove lower separator brackets.
3. Remove evaporative cassettes (row by row):
   - Push box upwards and remove to the front
4. Remove distribution head assemblies from topmost evaporative cassettes:
   - Remove plastic rivets fixing the distribution head assembly to the evaporator box.
   - Carefully lift off the distribution head assembly.
5. Remove optional UV lamp (if applicable).
6. Remove the cross bar (remember position).

Clean dismantled components, water tank, frame structure, blanking plates and air duct as described in chapter *6.3 – Maintenance guide* If all components have been cleaned and dried, assemble the evaporative module in the reverse dismantling order. Replace any defective components with new ones.

## 6.5 Routine Water Sampling and Testing

**Hygiene**

Your attention is drawn to the local Health & Safety Executive's technical guidance on the control of Legionellosis in water systems. If inadequately maintained, water systems, of which any humidifier is a part, can support the growth of micro-organisms, including the bacterium that causes Legionnaires" disease. Condair Ltd. has considered all aspects of this equipment to reduce as far as possible the risk of Legionnaires" disease and other similar conditions, but it is important that users are aware of their responsibilities under the ACoP in reducing the risk of Legionellosis.

To prevent the growth of Legionella, users are required to:

1. Carry out a risk assessment of the water system using a competent person, and implement an appropriate monitoring and control regime.
2. Avoid water temperatures which favour the growth of Legionella.
3. Avoid water stagnation.
4. Clean and disinfect the system in accordance with the Health & Safety Executives technical guidance and instructions in this manual.
5. The Condair ME system MUST be connected to a clean, potable mains water supply and it is recommended that the supply pipework is chlorinated. It is the responsibility of the user to ensure that the water system complies with local regulations and bylaws, particularly those for the control of Legionella microbes (such as the HSE ACoP L8, The control of Legionella microbes in water systems). The use of mains water fed tanks and reservoirs is only permitted as part of a managed water treatment system.

On commissioning and at regular intervals thereafter, test for possible water contamination using Dipslides. Take samples from the water supply to the evaporative cassettes and from the tank. Check for biofilm.

The Dipslides should be incubated for 2 days at 30°C (86°F).

1. If the microbial count from the tank exceeds $10^3$ cfu/ml, the system should be turned off, any biofilm scrubbed clean and then disinfected using a 50 ppm chlorine solution for one hour before being put back into use.
2. If the microbial count in the water supply to the evaporative module exceeds $10^3$ cfu/ml, this suggests contamination of the water system within the building. The system should be turned off and you should seek specialist advice on cleaning your water supply.
3. If the water temperature anywhere in the system regularly exceeds 20°C, (68°F) increase the frequency of water sampling. The frequency may be reduced if successive tests show a consistent level below $10^3$ cfu/ml.

**Health and Safety Requirements**

Every 6 months, users are required by the Health & Safety Executive, Approved Code of Practice (ACoP) L8 to take samples for Legionella analysis. Samples should be taken from the same places as described above, and the analysis carried out by a accredited laboratory which is part of the Legionnella AQS Scheme. In the event that the Legionnella content exceeds $10^2$ cfu/l, the humidifier should be switched off and specialist advice sought regarding its disinfection.

1. If biofilm (a slimy or gel-like deposit when wet, which might be dry and crisp in a dry system) is found during any inspection of the humidifier or water system, the humidifier MUST be switched off and not put back into operation until the system has been taken apart, scrubbed and thoroughly cleaned with a suitable biocide with biofilm penetrating qualities such as 50ppm chlorine dioxide solution. This work should only be carried out by fully trained specialist organisations or individuals.
2. The **control unit of Condair ME Circulating System must be left powered on to allow automatic flushing and cleaning cycles to occur**. If the control unit of Condair ME Circulating System is powered off for prolonged periods, water stagnation might occur and contamination result, so the system, including any storage tanks or vessels should be drained and left dry. Before putting the system back into service, the water pipework supplying the Condair ME should be purged carefully, avoiding the creation of aerosols by splashing, and a water sample should be taken to ensure cleanliness. In the event that the humidifier pipework contains any residual water or has remained damp, and the temperature exceeded 20°C (68°F), the Condair ME should be chlorinated using 50 ppm chlorine solution for 1 hour.

Contact Condair distributor for advice on water sampling and analysis, disinfection of systems, service and maintenance.

## 6.6 Cleaning and Disinfection

**Before commencing cleaning and disinfection:**

For brand new clean systems we recommend the use of DISIFIN XL disinfection tablets at 500ppm prophylactic dose. 1 tablet per 2m width of tank should be placed in the tank, allowed to dissolve and circulated around the system. DISIFIN is 100% biodegradable, non-toxic and environmentally friendly and may be left to dissolve and naturally flush away from the Condair ME after commissioning. For systems which have been previously used or where the water quality or air quality is poor, it is recommended to dismantle and scrub the system clean, to carry out a disinfection with a minimum of 50ppm chlorine circulated for 1 hour. Please refer to the cleaning and disinfection and method statement section to ensure that the relevant chemicals, equipment and Personal Protective Equipment are available to carry out disinfection.

1. **Risk assess the situation.** This should include but is not limited to observance of COSHH, L8 and the use of PPE, working from heights and ensuring a full understanding of the Condair ME System.
2. Coordinate with relevant responsible persons.
3. Check records (i.e sample results of microbiological control) for system history.
4. If possible, disinfection should be carried out when the building is unoccupied, with air flow off.

Evaporative humidifiers must be regularly cleaned and maintained, to prevent contamination especially in industrial environments.

All surfaces requiring disinfection or cleaning must be in contact with the appropriate concentration of disinfection solution for at least one hour. The method statement for disinfection may need to be adapted depending on the layout of the humidifier pipe-work, for example, where system pipe-work splits into “H or U” shape, ensure that disinfection solution reaches all pipe-work end-of-lines. Additional procedures will be required for supply water system pipe-work or water treatment systems prior to the humidifier.

Condair Ltd. recommends that routine disinfection should take place in the following situations:

- At initial commissioning (for brand new systems use DISIFIN XL disinfection tablets).
- Where routine monitoring and control regime or risk assessment shows it to be necessary, Condair Ltd. recommends the use of DISIFIN XL month or as necessary. 1 tablet per 2m width of tank should be placed in the tank and allowed to dissolve.
- At six monthly intervals.
- If the system or part of it has been shutdown and/or substantially altered creating a risk of contamination.
- During or following an outbreak or suspected outbreak of Legionellosis.

This recommendation is in accordance with the HSE’s Approved Code of Practice (ACoP) L8.

**Recommended Disinfection Equipment**
Disinfection solution in accordance with manufacturers guidelines.
Disinfection neutraliser (only if necessary).
Disinfection solution test kit (to measure strength).
Bucket of fresh water.
Braided hose (for flushing at end of line).
Measuring container / syringe.
Clean cloths.
Mixing vessel.
Risk assessment / test record sheets.
Standard tools

## 6.7 Cleaning and Disinfection Method Statement

**Step 1 - Refer to the Risk Assessment**

- Refer to the Manufacturers instructions and safety advice.
- Ensure the area is well ventilated.
- Ensure the ME system is OFF and isolated from external controls.
- Dismantle unit and scrub tank fully. Remove matrix.

**Step 2 - Mix Disinfection Solution**

- Mix disinfection solution following the manufacturers instructions. L8 recommends 50ppm Chlorine solution circulated for 1 hour. NB: For larger or particularly unclean systems this process may need to be repeated.
- Calculate the total water volume of the system using wet and dry weight values (refer to dimension tables at the end of this manual).
- **Note:** Depending on the Risk Assessment, it may be necessary to clean the sump tray prior to disinfection.
- Solution loses strength over time and the process may need to be repeated.

**Step 3 - Run the unit**

- *Note the various control settings in case it is necessary to override them.
- Switch the panel switch to the drain (lower) position to drain water in sump tray.
- Switch the unit to the on (upper) position and allow the tank to refill.
- Place the unit into a RUN condition (*control settings may need to be overridden, refer to the programming section of this manual).

**Step 4 - Add disinfection solution**

- Add the solution to the water sump tray and allow to mix.
- Measure the strength of the disinfection solution and check it is the correct strength in accordance with manufacturers guidelines.
- Note the strengths of the disinfection solution at 15 minute intervals and record on a Record of Cleaning & Disinfection sheet for further reference.
- Adjust solution strength as required.

**Step 5 - Circulate disinfection solution**

- Check all surfaces are wetted for a minimum of 1 hour at 50ppm.

**Step 6 - Neutralise the disinfection solution**

- Mix neutralising agent as manufacturers instructions.
- Allow the neutralising agent to disperse over the matrix and circulate in the sump tray.
- Measure the strength until the disinfection solution is weak (less than 5ppm)

**Step 7 - Drain the unit into foul drain**

- Turn Off any fill cycle.
- Drain unit until empty into appropriate drain (depending on Risk Assessment) and rinse the tank if necessary.
- *Where required, reset to original setting and put unit back into operation. Test for correct operation as per commissioning section of the manufacturers manual.
- Check for and complete maintenance requirements as per manufacturers instructions.
- Always leave work area clean, dry and tidy.

**Step 8 - Recommission the ME system**

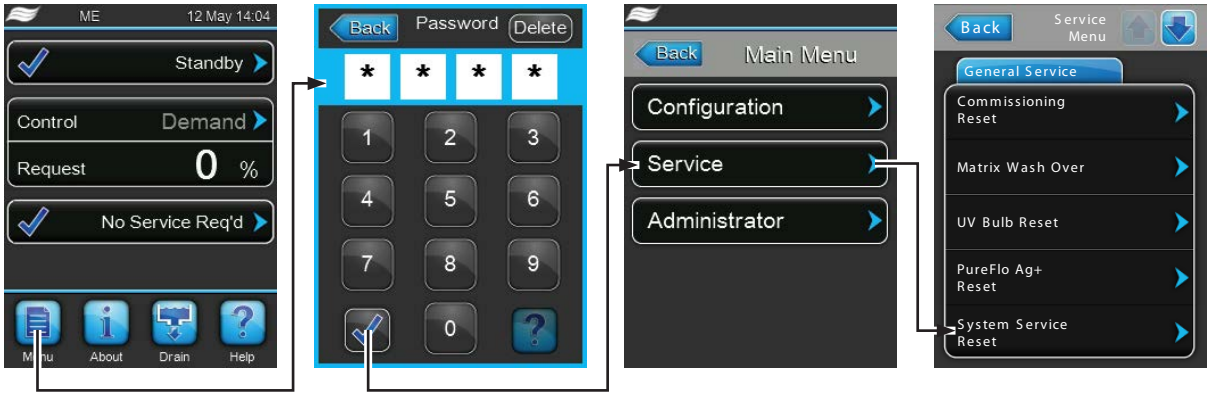
- Refer to the commissioning section of this manual.

If in doubt always contact your Condair distributor.

## 6.8 Resetting the maintenance indication on Condair ME Circulating system

After completing maintenance work, the **maintenance indication** must be reset on the control unit. Proceed as follows to reset the maintenance counter:

1. Select in the “Service” submenu the function “System Service Reset”
2. The reset dialogue appears in the display:




- Press the **<Yes>** button to reset the **maintenance counter** or the **maintenance indication**, respectively if the maintenance work has been completed. The **maintenance counter** and the **maintenance indication are reset and the control unit** is restarted.
- Press the **<No>** button if the maintenance work has not been completed and you want abort the reset procedure. The control unit returns to the “Service” submenu.

## 6.9 Performing software updates (Condair ME Circulating System only)

To perform a software update of the control unit of Condair ME Circulating System or one of its electronic boards, proceed as follows:

1. Switch off the voltage supply to the control unit and secure switch in the off position to prevent it from inadvertent power up.
2. Unlock the front door of the control unit and remove it.
3. Carefully lift-off the control board assembly from the housing frame, swivel it 90° to the right, then fix it to the unit frame again.
4. Connect USB memory stick (max. length 75 mm/3") holding the update software to the USB port of the control board.
5. Carefully lift-off the control board assembly from the housing frame, swivel it 90° to the left, then fix it to the unit frame again.
6. Close the front door of the control unit and lock it with the screw.
7. Switch on power supply to the control unit.
8. Select in the “Service” submenu the desired software update function (e.g. “Control Software Update”).
9. The update dialogue appears in the display:
   - Press the **<Yes>** button to start the update.
   - Press the **<No>** button to abort the update procedure.
10. During update a progress bar is shown in the display. If the update has completed a corresponding message is shown.
11. Repeat steps 1 to 6 to remove USB memory stick.

# 7 Fault elimination

**Important!** Most operational malfunctions are not caused by faulty equipment but rather by improper installation or disregarding of planning guidelines. Therefore, a complete fault diagnosis always involves a thorough examination of the entire system. Often, the installations have not been properly executed, or the fault lies with the humidity control system.

## 7.1 Malfunctions without indication

| Malfunction | Cause | Remedy |
|---|---|---|
| **Residual water in the section of the duct behind (downstream) the evaporative module.** | Air velocity above the evaporative cassettes is too high. Systems without droplet separator max 3.5 m/s, systems with a droplet separator max. 4.5 m/s. | Install droplet separator or reduce air velocity in the duct. |
| | Water tank, water piping or hydraulic module is leaking. | Check/seal water tank, water piping and hydraulic module. |
| **Humidity/Cooling demand present however the Condair ME does not humidify.** | Shut-off valve in the water supply line closed. | Open shut-off valve. |
| **Maximum humidification/cooling capacity is not reached.** | System incorrectly dimensioned (insufficient capacity). | Contact your Condair supplier. |
| | Insufficient water supply capacity. | Check water supply, increase water pressure. |
| | Models with Condair ME control unit: Output limitation active. | Deactivate output limitation. |
| **Optional step valves do not open (direct feed systems).** | No demand. | Check control signal. |
| | Safety chain open (safety humidistat, ventilation interlock, etc. have triggered). | Check safety chain. |

## 7.2 Fault indication on Condair ME control unit

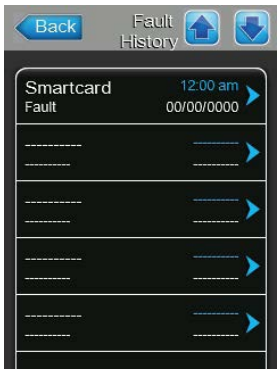
Malfunctions during operation detected by the control software are indicated by a corresponding **Warning** message (operation still possible) or **Fault** message (operation not longer possible) in the operating status field in the standard display of the control unit:

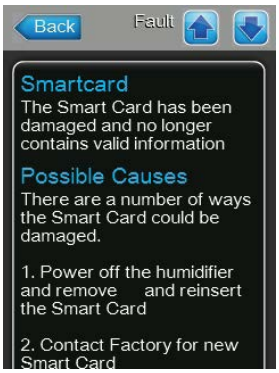
### Warning


Temporary problems (e.g. water supply interrupted for a short time) or malfunctions which cannot cause damage to the system are indicated with a warning message. If the cause of the malfunction disappears of its own accord within a certain period of time, the alarm message will automatically switch off otherwise an fault message is triggered.
Note: If warning indication has been switched off in the configuration menu, malfunctions with warning character will not be indicated by the optional remote operating and fault indication.

### Fault


Malfunctions where further operation is not possible any longer or malfunctions which can damage the system are indicated with a fault message, additionally the red LED below the touch panel light up. If such a malfunction occurs the system will be switched off automatically.




By pressing on the operating status field in the standard operating display the error list shown with all active warning and fault messages. By pressing on the corresponding Warning or Fault entry additional information regarding the malfunction are displayed.

## 7.3 Malfunction list

**Important!** Most operational malfunctions are not caused by faulty equipment but rather by improper installation or disregarding of planning guidelines. Therefore, a complete fault diagnosis always involves a thorough examination of the entire system. Often, the installation of the evaporative module has not been properly executed, or the fault lies with the humidity/temperature control system.

| Code | | Message | Information | |
|---|---|---|---|---|
| Warning | Fault | | Possible causes | Remedy |
| — | E18 | Air Temp Snsr | Condair ME stopped operation as the incoming temperature signal of the optional anti freeze protection has failed. | |
| | | | Sensor wiring broken or sensor defective | Check wiring, replace sensor if necessary |
| | | | Sensor not connected | Correctly connect sensor to driver board |
| — | E19 | Freeze Prot | The ME stopped operating as the temperature of incoming air fell below the preset limit of the optional anti freeze protection. | |
| | | | Temperature to low for safe operation of the Condair ME | No remedy |
| | | | Temperature limit set wrong | Adjust temperature limit to correct value |
| W20 | E20 | Safety Chain | The Condair ME stopped operating as an external device opened the safety chain. E.g. ventilation Interlock, safety humidistat, etc..<br>Note: If – at any time – the safety chain is closed again, the system will continue with normal operation. | |
| Note: depending on the configuration either Warning or Fault is indicated | | | Ventilation interlock open. | If applicable, check/turn on ventilation system. |
| | | | Air flow monitor triggered. | Check ventilator/filter of the ventilation system. |
| | | | Safety humidistat triggered. | Wait. If applicable, check safety humidistat |
| W21 | — | High Water | Water overflow detected. Current operation status not affected.<br>Note: If – at any time – the normal operating water level is reached, the system will continue with normal operation. | |
| | | | Inlet solenoid valve blocked in open position or defective. | Check/replace inlet solenoid valve. |
| | | | Gravity drain solenoid valve blocked in closed position. | Check/replace gravity drain solenoid valve. |
| | | | Drain piping/drain trap clogged. | Check/Clean drain piping and drain trap. |
| | | | Backpressure in drain trap. | Check drain trap venting to duct. |
| W22 | E22 | Water Inlet | Tank (re)fill timeout. The Condair ME stopped operation as the tank could not be (re)filled within a preset time. The Condair ME periodically tries to fill the tank.<br>Note: If – at any time – the required water level is reached, the system will continue with normal operation. | |
| | | | Water supply blocked: shut-off valve closed/cloggedwater pressure too low. | Check water supply (filter, pipes, etc.), Check/open shut-off valve, Check water pressure. |
| | | | Water pressure too low. | Check water supply system. |
| | | | Water treatment unit (fully demineralised water) is regenerating. | Wait. |
| | | | Inlet solenoid valve blocked or defective. | Check/replace Inlet solenoid valve. |
| | | | Gravity drain solenoid valve open, blocked in open position or not electrically connected (currentless open). | Check, electrically connect or replace gravity drain solenoid valve. |
| | | | Leakage in the water drain system. | Check/seal water drain system. |

| Code | | Message | Information | |
|---|---|---|---|---|
| Warning | Fault | | Possible causes | Remedy |
| ___ | E23 | Pump Error | Control was not able to activate one or more pumps. Current operation status not affected.<br>Note: If – at any time – the required water level is reached, the system will continue with normal operation. | |
| | | | Pump power supply not wired through current measurement option. | Correctly connect pump wiring. |
| | | | Electrical pump connection broken. | Electrically connect or replace respective pump. |
| | | | Pump defective. | Replace defective pump. |
| W28 | E28 | ME Service | System service interval exceeded. Current operation not affected. The Condair ME stops operation and triggers a fault after 30 days. | |
| | | | Sytem service is due. | Perform system service and reset system service maintenance counter. |
| W29 | E29 | UV Service | UV service interval exceeded. Current operation not affected. A fault is triggered after 30 days. The Condair ME stops operation if configured so. | |
| | | | Lifetime of UV bulb (Option) expired. | Replace UV bulb and reset UV service counter. |
| | E30 | No UV lamp | The Condair ME indicates fault as no UV Lamp has been detected. Condair ME automatically stopped operation. | |
| | | | UV bulb defective | Replace UV bulb and reset UV service counter. |
| | | | UV bulb not wired or wiring broken. | Check wiring/Reconnect UV bulb. |
| ___ | E31 | UV lamp OC | Current consumption of UV lamp too high, operation stopped if “Shut Down” mode is “On”. | |
| | | | UV bulb broken. | Replace UV bulb and reset UV service counter. |
| | | | Short circuit on UV option. | Check wiring. |
| ___ | E32 | Demand Snsr | Demand signal failed, Condair ME automatically stopped operation. | |
| | | | Sensor not connected. | Correctly connect sensor. |
| | | | Incorrect sensor configuration. | Correctly configure sensor. |
| | | | Sensor defective. | Replace Sensor. |
| ___ | E44 | Water Temp | Water supply temperature is too high, Condair ME changed to “Fill Cycle” mode dilution. | |
| | | | Standing Water in inlet system. | Check water supply system. |
| | | | Insufficient thermal insulation of inlet pipework. | Insulate supply water pipe. |
| ___ | E45 | Water Condu | Water supply conductivity is too high, Condair ME changed to “Fill Cycle” mode dilution. | |
| | | | Water treatment defective/needs service. | Check/service water treatment system. |
| | | | Condcutivity limit set too low. | Check/adjust condcutivity limit. |
| | | | Conductivity sensor configured incorrectly. | Correctly configure conductivity sensor. |
| | | | Conductivity sensor defective. | Replace conductivity sensor. |
| ___ | E46 | Water Outlet | Tank drain timeout. The Condair ME stopped operation as the tank could not be drained within a preset time. | |
| | | | Drain pump blocked/defective. | Check/replace drain pump. |
| | | | Drain piping or drain trap clogged. | Check/clean drain piping and drain trap. |
| | | | Level sensor stucked or short circuited. | Check/replace level sensor. |
| | | | Backpressure in drain pipe. | Check drain pipe venting. |

| Code | | Message | Information | |
|---|---|---|---|---|
| Warning | Fault | | Possible causes | Remedy |
| — | E47 | Level Sensor | Water level sensor signal failed. The Condair ME stopped operation. | |
| | | | Level sensor not connected. | Correctly connect level sensor. |
| | | | Level sensor defective. | Replace level sensor. |
| — | E48 | Water Temp Snsr | Water temperature sensor signal failed, Condair ME changed to “Fill Cycle” mode dilution. | |
| | | | Water temperature not connected. | Correctly connect water temperature sensor. |
| | | | Incorrect water temperature sensor configuration. | Correctly configure water temperature sensor. |
| | | | Water temperature sensor defective. | Replace water temperature sensor. |
| W49 | — | Matrix Wash Over | After installation of new evaporative cassettes a wash over procedure needs to be carried out. The wash over is mandatory for evaporative cassettes with glass fibre as evaporator media. | |
| | | | Condair ME is commissioned first time. | Evaporative cassettes matrix must be washed over with the Matrix wash over function in service submenu. |
| — | E50 | Out of Commissioning | The water held in the supply pipework needs to be fully drained. Any contact with the Condair ME has to be avoided. | |
| | | | Condair ME not energised for more than 48h. | Disconnect water supply pipe and flush supply pipe. Reconnect water supply pipe and manually flush the entire water system. |
| — | E51 | Dosing Level | Level of Liquid too low. Current operation status not affected. | |
| | | | Liquid used up during normal operation. | Refill liquid. |
| | | | Incorrect floater connection. | Check/correctly connect floater. |
| | | | Floater defective. | Replace floater sensor. |
| — | E54 | Standing WTR | Standing water outside the tank detected. The Condair ME stopped operating as a leak of the tank or pipework has been detected. | |
| | | | Water leakage on evaporative module or water piping inside the duct. | Check system and seal any leaky components. |
| — | E55 | Ag+ Service | PureFlo Ag+ silver ion cartridge replacement interval exceeded, current operation status not affected. | |
| | | | Lifespan of PureFlo Ag+ silver ion cartridge exceeded. | Replace PureFlo Ag+ silver ion cartridge. |
| | | | PureFlo Ag+ silver ion cartridge replacement interval counter not reset after replacement of cartridge. | Reset PureFlo Ag+ silver ion cartridge replacement interval counter. |
| — | E57 | Activation | Activation code not yet entered. Normal operation not possible. | |
| | | | Activation code not yet entered. | Enter activation code. |
| — | E70 | Water Condu Snsr | Water conductivity sensor signal failed, Condair ME changed to “Fill Cycle” mode dilution. | |
| | | | Water conductivity sensor not connected. | Correctly connect water conductivity sensor. |
| | | | Incorrect water conductivity sensor configuration. | Correctly configure water conductivity sensor |
| | | | Water conductivity sensor defective. | Replace water conductivity sensor. |

| Code | | Message | Information | |
|---|---|---|---|---|
| Warning | Fault | | Possible causes | Remedy |
| — | E74 | Keep Alive | Demand signal failed, Condair ME automatically stopped operation. | |
| | | | Driver board not connected. | Correctly connect driver board. |
| | | | Wrong driver board connected. | Connefct correct driver board. |
| | | | Driver board defective. | Replace driver board. |
| — | E82 | Driver Missing | Communication with driver board failed, Condair ME automatically stopped operation. | |
| | | | ?. | ?. |
| — | E83 | Slave Address | Slave address changed during operation | |
| | | | ?. | ?. |
| — | E84 | Driver faulty | Unspecific driver board fault. | |
| | | | ?. | ?. |
| — | E85 | Driver ID Wrong | Driver board ID doesn't match | |
| | | | ?. | ?. |
| — | E86 | Driver Incom-patible | Version of driver board dosn't match | |
| | | | Fuses on driver board defective. | Check fuses on driver board and replace. |
| | | | Short circuit in control panel. | Check control panel. |
| | | | Switched power supply unit defective. | Check/replace switched power supply unit. |
| — | E87 | Local 24V Supply | Local 24V supply out of valid range | |
| | | | Fuses on driver board defective. | Check fuses on driver board and replace. |
| | | | Short circuit in control panel. | Check control panel. |
| | | | Switched power supply unit defective. | Check/replace switched power supply unit. |
| — | E88 | Local 5V Supply | Local 5V supply out of valid range | |
| | | | Fuses on driver board defective. | Check fuses on driver board and replace. |
| | | | Short circuit in control panel. | Check control panel. |
| | | | Switched power supply unit defective. | Check/replace switched power supply unit. |
| — | E89 | Local Ref Supply | Local reference supply out of valid range | |
| | | | Driver Board defective. | Replace driver board. |
| — | E96 | Peri. 5V Supply | Peripheral 5V supply out of valid range | |
| | | | Fuses on driver board defective. | Check fuses on driver board and replace. |
| | | | Short circuit in control panel. | Check control panel. |
| | | | Switched power supply unit defective. | Check/replace switched power supply unit. |

## 7.4 Notes on fault elimination

**DANGER!**
**Danger of electric hazard!**

For the elimination of faults **set the adiabatic air humidification/air cooling system Condair ME out of operation** as described in chapter *4.6 – Taking the system out of operation*, **separate the control unit from the mains** and .

The elimination of faults must be carried out by qualified and well trained professionals only.
Malfunctions relating to the electrical installation (e.g. replacement of the backup battery, replacement of fuses) must be repaired by authorized personnel or by your Condair representative's service technician only.

Repair work and the replacement of faulty components must be carried out by your Condair representative's service technician only!

## 7.5 Resetting the fault status on Condair ME Circulating System

To reset the error indication:

1. Disconnect the control unit of the Condair ME Circulating System from the mains.
2. Wait approx. 5 seconds, then reconnect the control unit to the mains.

Note: If the fault has not been eliminated, the fault indication reappears after a short while.

## 7.6 Saving fault and service histories to a USB memory stick

The fault and service histories of the Condair ME Circulating System can be saved to a USB memory stick for journaling an further analysis.

To save the fault and service histories to a USB memory stick, proceed as follows:

1. Disconnect power supply to control unit by switching off mains disconnecter switch in the mains supply line. Secure mains disconnecter switch against inadvertent power-up.
2. Unlock retaining screw of front cover of control unit, then remove front cover.
3. Carefully lift-off the control board assembly from the housing frame, swivel it 90° to the right, then fix it to the housing frame again.
4. Connect USB memory stick (max. lenth 75 mm/3") to USB port on the control board.
5. Relocate front cover on control unit and lock it with the retaining screw.
6. Switch on power supply to control unit.
7. Select "Export History" function in the "Service" submenu. The data are saved as excel spreadsheet on the USB memory stick.
8. When the data have been saved repeat steps 1 to 5 to remove USB memory stick.

## 7.7 Replacing the backup battery on the control board of Condair ME Circulating System

1. **Set the adiabatic air humidification/air cooling system Condair ME out of operation out of operation as described in chapter** *4.6 – Taking the system out of operation*, **disconnect the control unit from the mains and secure the control unit against inadvertent power-up**.
2. Undo the screw of the front cover of the control unit, then remove the front cover.

**CAUTION!**

The **electronic components** inside the humidifier are **very sensitive to electrostatic discharge.** Before carrying out the next step, appropriate **measures must be taken to protect the electronic components against damage caused by electrostatic discharge (ESD protection).**

3. Carefully lift-off the control board assembly from the housing frame, swivel it 90° to the right, then fix it to the housing frame again.
4. Undo the fastening screws of the control board, then carefully pull-off the control board from the control unit assembly.
5. Replace the backup battery (CR2032, Lithium 3V).
6. Reassemble the unit in reverse order.
7. If necessary set date and time.

**WARNING!**
**Environmental hazard!**

The old battery must be returned to an authorised collecting point for correct disposal/ recycling in accordance with local regulations. In no case the old battery must be disposed of in the domestic waste or into the environment.

# 8 Taking out of service/Disposal

## 8.1 Taking out of service

If the adiabatic air humidification/air cooling system Condair ME must be replaced or if the humidification system is not needed any more, proceed as follows:

1. Take the adiabatic air humidification/air cooling system Condair ME out of operation as described in chapter *4.6 – Taking the system out of operation*.
2. Have the system components unmounted by a qualified service technician.

## 8.2 Disposal/Recycling

Components not used any more must not be disposed of in the domestic waste. Please dispose of the the individual components in accordance with local regulations at the authorised collecting point.

If you have any questions, please contact the responsible authority or your local Condair representative.

Thank you for your contribution to environmental protection.

# 9 Product specifications

## 9.1 Technical data

| | Condair ME models | | |
|---|---|---|---|
| | Direct Feed | Circulating | Circulating Full System |
| Control | —— | —— | Control ME |
| Control supply voltage | —— | —— | 110...230 VAC/50...60 Hz |
| Circulation pump supply voltage | —— | 24 VAC/50...60 Hz | |
| Power consumption | —— | ? VA | ? ... ? VA [1) 2)] |
| Control signals | —— | —— | 0...5 VDC<br>1...5 VDC<br>0..10 VDC<br>2...10 VDC<br>0...16 VDC<br>3.2...16 VDC<br>0..20 mA<br>4..20 mA<br>On/Off |
| Control accuracy | Control accuracy depends on air conditions, control distance, water quality and probably on the number of On/Off cycles | | |
| Max. admissible air speed above evaporative cassettes | 3.5 m/s (4.5 m/s with 100 mm droplet separator) | | |
| Water supply | Push fit connector ø15mm | | |
| Water drain (outside diameter) | ø 54 mm | ø 54 mm (Tank) / ø 54 mm (Hydraulic module) | |
| Admissible water supply pressure | 2...8 bar | 2...8 bar | 2...8 bar |
| Admissible water temperature | 5...45 °C | | |
| Water quality | Tap water, softened or fully demineralised water with a max. of 100 cfu/ml | | |
| Pressure drop | typically 70 Pa at 2.5 m/s, 90 %rh | | |
| Admissible ambient temperature (Control unit) | —— | —— | 1...40 °C |
| Admissible ambient humidity (Control unit) | —— | —— | max. 75 %rh |
| Degree of protection of Control unit | —— | —— | IP21 |
| Degree of protection of pump, valves. etc. | —— | IP54/IP65 | IP54/IP65 |
| Conformity | CE marking | | |
| Fire classification of evaporation medium | DIN EN 53438 Class F1 | | |

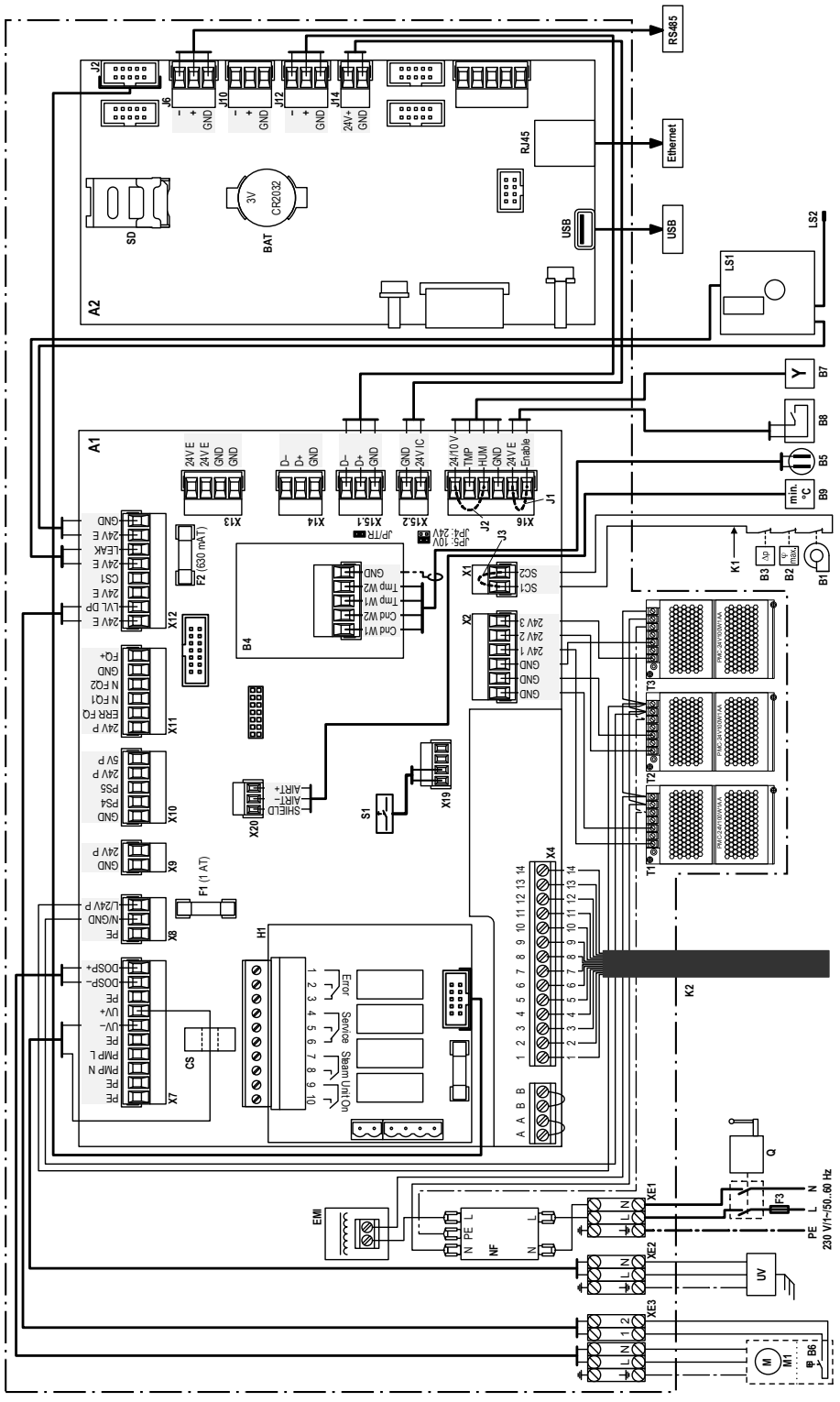
| Accessories | | | |
|---|---|---|---|
| – Water connection unit | • | • | • |
| – Duct humidistat HBC | • | • | • |
| – Room humidistat HSC | • | • | • |
| – Duct humidity sensor (continuous) EGH 110 | | | • |
| – Room humidity sensor (continuous) EGH 130 | | | • |
| – Remote indication PCB On/Error/Maintenance/Humidification | | | • |
| – Blanking plates | • | • | • |

| Options | | | |
|---|---|---|---|
| – Submerged UV | | | • |
| – Conductivity monitoring | | | • |

S= Standard equipment
•= Accessory/option available
1) Power consumption depending on the number of vertical evaporative cassettes banks
2) If the optional “Submerged UV” is used the power consumption increases by 60 VA

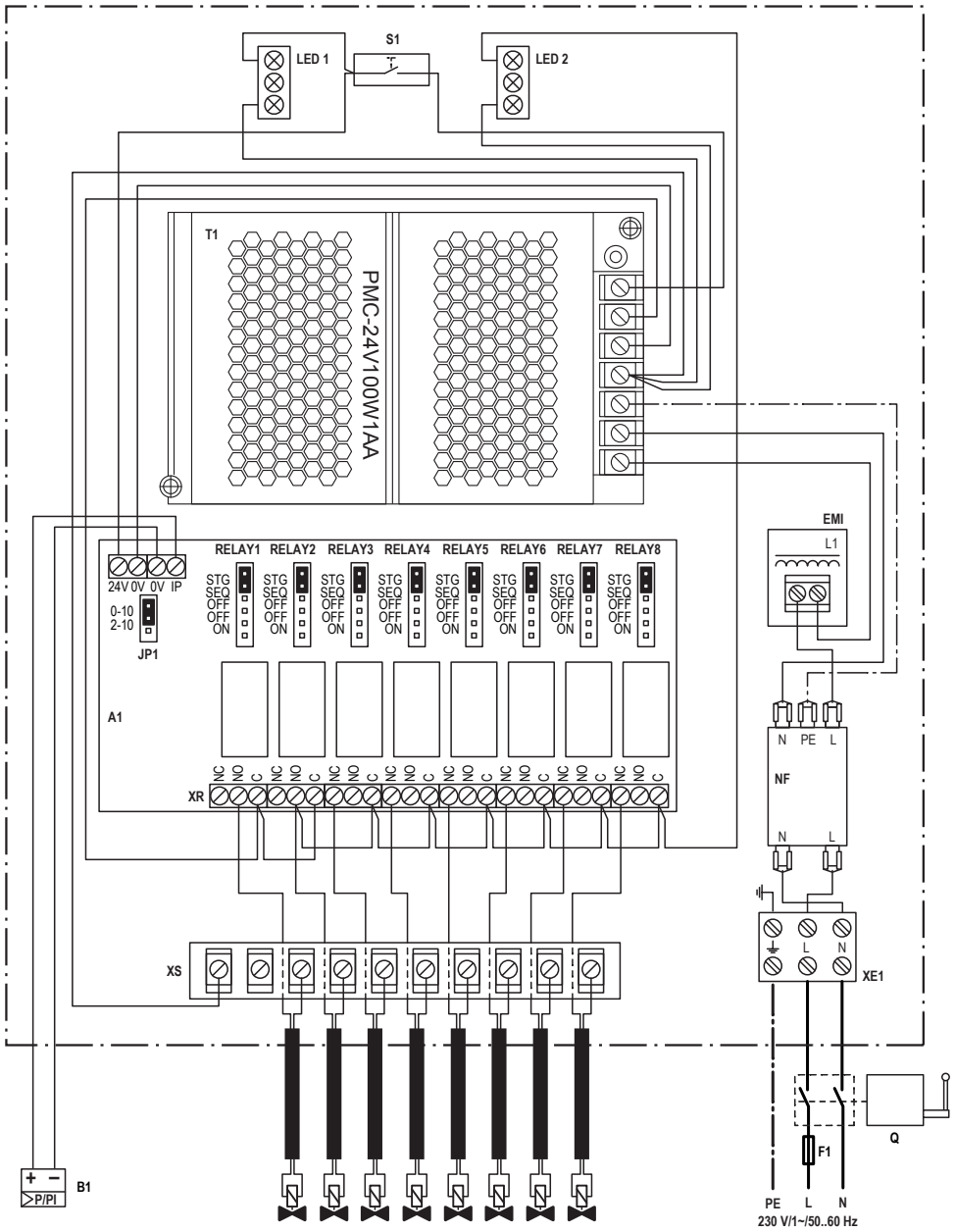
# 10 Appendix

## 10.1 Wiring diagram Condair ME Circulating System



| | | | | | | | |
|---|---|---|---|---|---|---|---|
| A1 | Driver board | CS | Current sensor (UV lamp) | J3 | Cable bridge if no safety chain is connected | M1 | Dosing pump (option) |
| A2 | Control board | BAT | Backup battery (CR2032, 3V) | JP4 | Jumper fitted= 24 V on X16 (JP5 removed) | NF | Mains filter |
| B1 | Ventilation interlock | EMI | EMI choke board | JP5 | Jumper fitted= = 10 V on X16 (JP4 removed) | Q | External mains disconnecter switch |
| B2 | Max. humidity monitor | F1 | Fuse 230V supply (1 AT) | JP/TR | Jumper fitted on the last driver board | S1 | On/Off switch control unit |
| B3 | Air flow monitor | F2 | Fuse 10/24 VDC supply(630 mAT) | K1 | External safety chain | SD | Memory card |
| B4 | Temperature and conductivity measuring | F3 | Fuse mains supply (6.3 AF) | K2 | Cable harness from hydraulic module | T1..T3 | 24V power supply |
| B5 | Sensor temperature and conductivity measuring | H1 | Remote operating and fault indication board (option) | LS1 | Leakage monitoring board (option) | UV | UV lamp (option) |
| B6 | Level sensor dosing pump (option) | J1 | Cable bridge if no external On/Off switch is connected | LS2 | Sensor leakage monitoring (option) | XE1 | Terminal mains supply voltage |
| B7 | Demand or humidity/temperature signal | J2 | Cable bridge demand signal (for commissioning only) | | | XE2 | Terminal UV lamp |
| B8 | External On/Off switch (external enable) | | | | | XE3 | Terminal Disinfection pump |
| B9 | Air temperature monitoring duct (option) | | | | | X4 | Terminal cable harness hydraulic module |

## 10.2 Wiring diagram Condair ME Direct Feed System




| | | | |
|---|---|---|---|
| A1 | I/O board | NF | Mains filter |
| B1 | Demand signal 0...10V | Q | External service switch |
| EMI | EMI choke | S1 | On/Off switch control unit |
| F1 | Fuse mains supply (10 AF) | T1 | 24V power supply |
| JP1 | Jumper control signal (Jumper fitted on 0..10V) | XE1 | Terminal mains supply voltage |
| LED 1 | LED white (control unit switched ON) | XS | Terminals 24 V |
| LED 2 | LED green (humidification/colling ON) | XR | Terminals Relays 1...8 |

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