Condair OEM

Steam humidifier

INSTALLATION AND OPERATING INSTRUCTIONS

1118599 EN 1010

condair

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1 Introduction

1.1 To the very beginning

We thank you for having purchased a **steam humidifier Condair OEM**.

The steam humidifier Condair OEM incorporates the latest technical advances and meets all recognized safety standards. Nevertheless, improper use 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 steam humidifier Condair OEM, please **observe and comply with all information and safety instructions contained in the present installation and operating instructions**.

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 installation and operating instructions

Limitation

The subject of these installation and operating instructions are the steam humidifier **Condair OEM** in its different versions. The various accessories (humidistats, water filter, etc.) are only described insofar as this is necessary for proper operation of the equipment. Further information on accessories can be obtained in the respective instructions.

These installation and operating instructions are restricted to:

– the **planning** of a humidifying system that is to be equipped with a steam humidifier Condair OEM
– the **installation, commissioning, operation** and **servicing** of the steam humidifier Condair OEM

These installation and operating instructions are supplemented by various separate items of documentation (spare parts list, installation instructions for the electrical installation, etc.). Where necessary, appropriate cross-references are made to these publications in these installation and operating instructions.

Conventions

This symbol draws attention to **safety instructions and warnings** of potential danger which, if unheeded, could result in injury to persons and/or damage to property.

Safekeeping

Please safeguard the installation and operating instructions in a safe place, where it can be immediately accessed. If the equipment changes hands, the documentation should be passed on to the new operator. If the documentation gets mislaid, please contact your Condair supplier.

Language versions

These installation and operating instructions are available in various languages. Please contact your Condair supplier for information.

2 For your safety

Intended use

Steam humidifiers Condair OEM are intended exclusively for **direct or indirect room humidification within the specified operating conditions**. Any other type of application, without the written consent of your Condair supplier, is considered as not conforming with the intended purpose. The manufacturer/supplier cannot be made liable for any damages resulting from improper use. The user bears full responsibility.

Operation of the equipment in the intended manner requires **that all the information in these instructions is observed (in particular the safety instructions)**.

Please contact your local Condair distributor if the steam humidifier Condair OEM is to be used in a steam-bath.

General safety instructions

- The steam humidifier Condair OEM must only be installed, operated serviced and in all cases repaired **only by persons who are adequately qualified** to undertake such work and are well acquainted with the product. Ascertaining the qualifications is the customer‘s responsibility.
- **Caution, danger of electric shock! The Condair OEM is operated with mains voltage. Before commencing work** on the Condair OEM, the unit is to be **rendered inoperative** in accordance with section 6.4 and prevented from further inadvertent operation (isolate unit from the electrical power supply, isolate water supply).
- Observe all **local safety regulations**.
  - relating to the operation of mains-operated **electrical and electronic equipment**
  - and the **provision of water, steam and electrical installations**
- **Caution!** For the electrical installation it is mandatory to comply with the regulations stated in the “**DIN EN 60335-1**” and “**DIN EN 60335-2-98**” standards (concerning the safety of electrical devices). In particular, it must be made sure that there is **sufficient protection against inadvertent contact with life parts**.

  The Drain/Info key **must be connected** to enable manual draining of the steam cylinder and the display of error codes (see Electrical Installation Instructions for ECCM - Component “S2”).

- Poorly maintained humidification systems can endanger health. **The servicing intervals should therefore be adhered to without reservation and the servicing work carried out correctly**.
- If it is suspected that **safe operation is no longer possible**, then the Condair OEM should immediately **be shut down and secured against accidental power-up**. This can be the case under the following circumstances:
  - if the Condair OEM is damaged
  - if the Condair OEM is no longer operating correctly
  - if connections and/or piping are not sealed or cables are loose
- The Condair OEM must **only be operated under the specified operating conditions** (see section 9 “Technical data”).
- The Condair OEM is not IP protected. Make sure the units are installed in a drip-proof location and the electrical connections are protected against inadvertent touching.
- **Caution!** If the Condair OEM is installed in an area without a water drain, water sensors must be fitted in the area, such that in the event of leakage in the water system, the water feed is safely shut off.
- **Caution, danger of corrosion!** In order to avoid damage, **no corrosion-sensitive components** should be located in the area of the aerosol streams.
- No work/repair should be carried out on the Condair OEM other than that described in these instructions.
- Use exclusively **original accessories and spare parts** available from your Condair supplier.
- **No modifications must be undertaken** on the Condair OEM, the accessories and the options without the express written consent of the manufacturer.

3 Product Overview

3.1 The various models

Steam air humidifiers Condair OEM are available in a variety of models with different heating voltages and steam capacities ranging **from 1 kg/h up to 45 kg/h max.**.

The following table provides an overview of the various models and their capacity ranges.

Heating voltage Volt/System	Steam capacity kg/h	Model Condair OEM	Unit size		
			small	medium	large
230V/1N~/50..60 Hz	1 -2 kg/h	**OEM 140**	x		
	3 - 4 kg/h	**OEM 240**	x		
	5 - 8 kg/h	**OEM 342**	x		
400V/3~/50..60 Hz	2 - 4 kg/h	**OEM 263**	x		
	5 - 8 kg/h	**OEM 363**	x		
	9 - 15 kg/h	**OEM 464**		x	
	16 - 25 kg/h	**OEM 674**			x
	26 - 45 kg/h	**OEM 664**			x
230V/3~/50..60 Hz	2 - 4 kg/h	**OEM 243**	x		
	5 - 8 kg/h	**OEM 343**	x		
	9 - 15 kg/h	**OEM 444**		x	
	16 - 21 kg/h	**OEM 654**			x
	22 - 30 kg/h	**OEM 644**			x

The steam humidifiers Condair OEM are designed for operation with **raw water** (tap water) or **partially softened water** (softened water which has been diluted with tap water to approx. 1/3 of its original hardness). **Important: If you want to operate the Condair OEM with partially softened water, please contact your Condair distributor.**
The steam humidifiers Condair OEM are equipped, as standard, with an **exchangeable steam cylinder** and are configured for **On/Off control** via a **humidistat**. With the optional ECCM control unit the steam humidifier can also be operated with **continuous control**. The equipment can be supplied with various other options.

3.2 Delivery

The delivery includes:

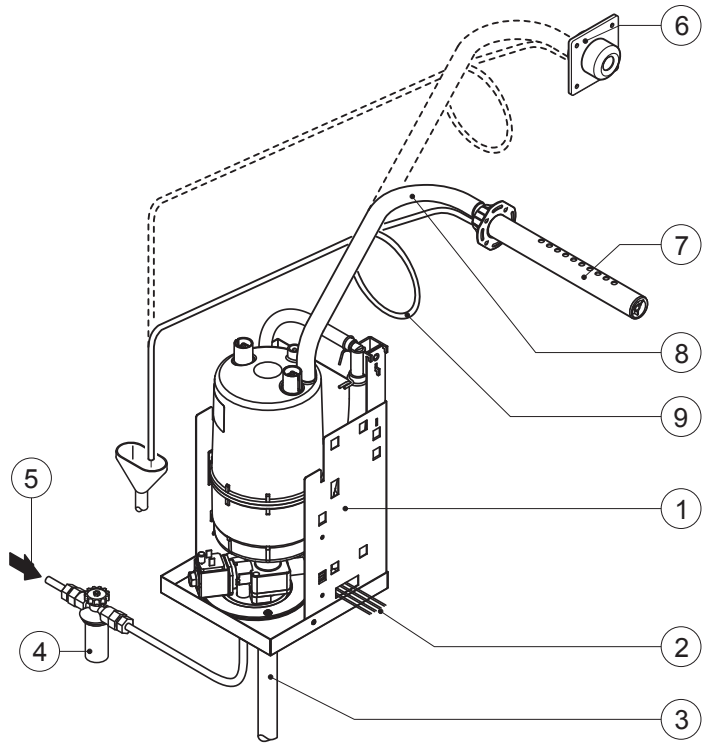
– Steam humidifier Condair OEM compl. (according to the model designation), equipped with the desired options.
  Note: Desired options (cleanable steam cylinder, control unit, unit housing made of stainless steel, etc.) must be specified separately when ordering. Detailed information on this subject is found in chapter 4.2.

– Water connection pipe with union nut G 3/4" and nipple 1/2"

– Accessories according to chapter 4.3
  Note: Accessories for steam distribution (steam distribution pipes, steam hoses, etc.) must be specified separately when ordering. Detailed information on this subject is found in chapter 4.3.

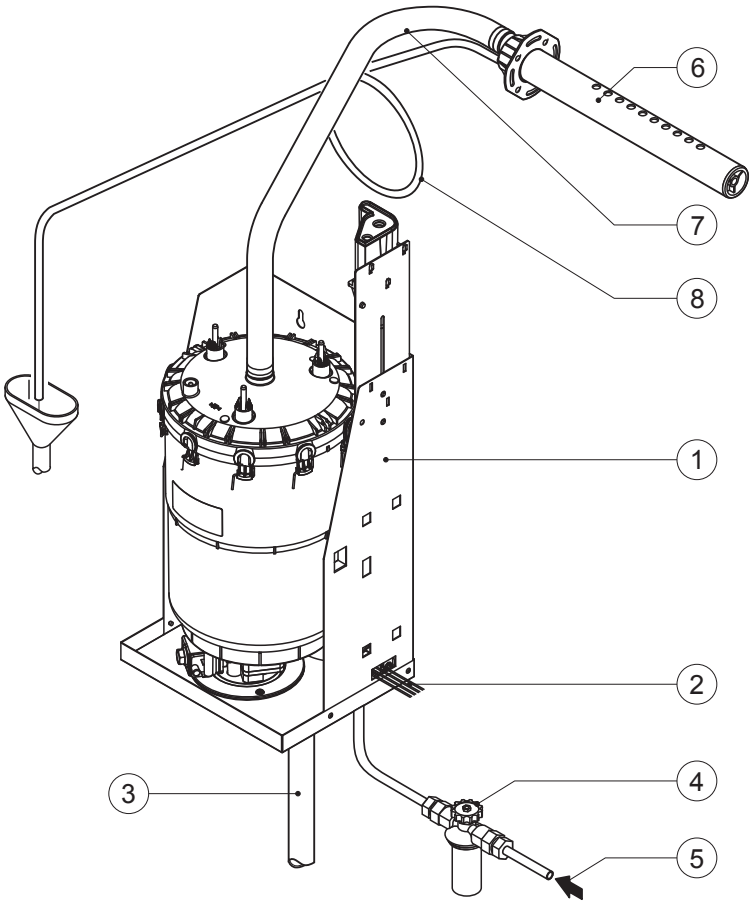
3.3 Humidification system overview

Models Condair OEM 1.., OEM 2... and OEM 3...



1 Steam humidifier
2 Electrical connection
3 Water drainage Ø22 mm (accessory “DS22”)
4 Filter valve (accessory “Z261”)
5 Water supply (building side)
6 Steam nozzle (accessory “W21”, for OEM 1.. and OEM 2.. only)
7 Steam distribution pipe (accessory “41-..”)
8 Steam hose (accessory “DS22”)
9 Condensate hose (accessory “KS10”)

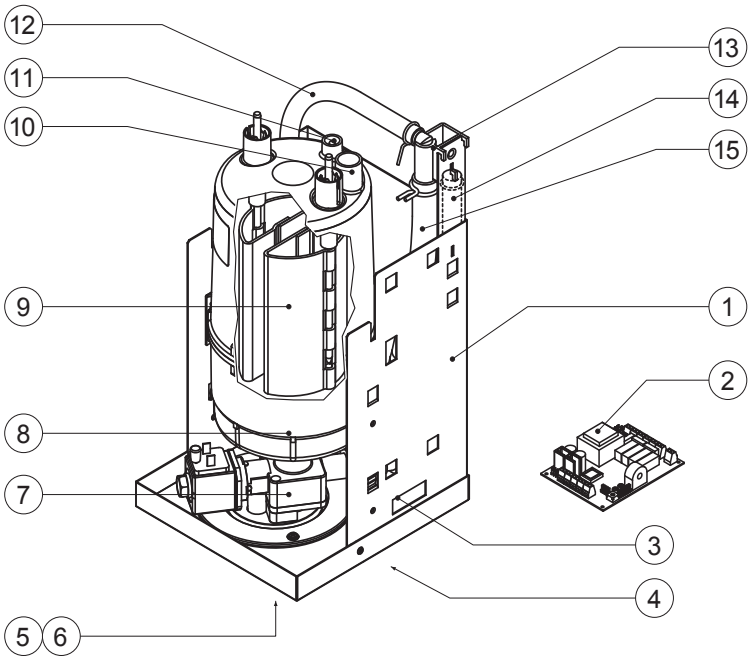
Models Condair OEM 4.., OEM 5... and OEM 6...



1 Steam humidifier
2 Electrical connection
3 Water drainage Ø30 mm (accessory “DS60”)
4 Filter valve (accessory “Z261”)
5 Water supply (building side)
6 Steam distribution pipe (accessory “61-../81-..”)
7 Steam hose (accessory “DS60/DS80”)
8 Condensate hose (accessory “KS10”)

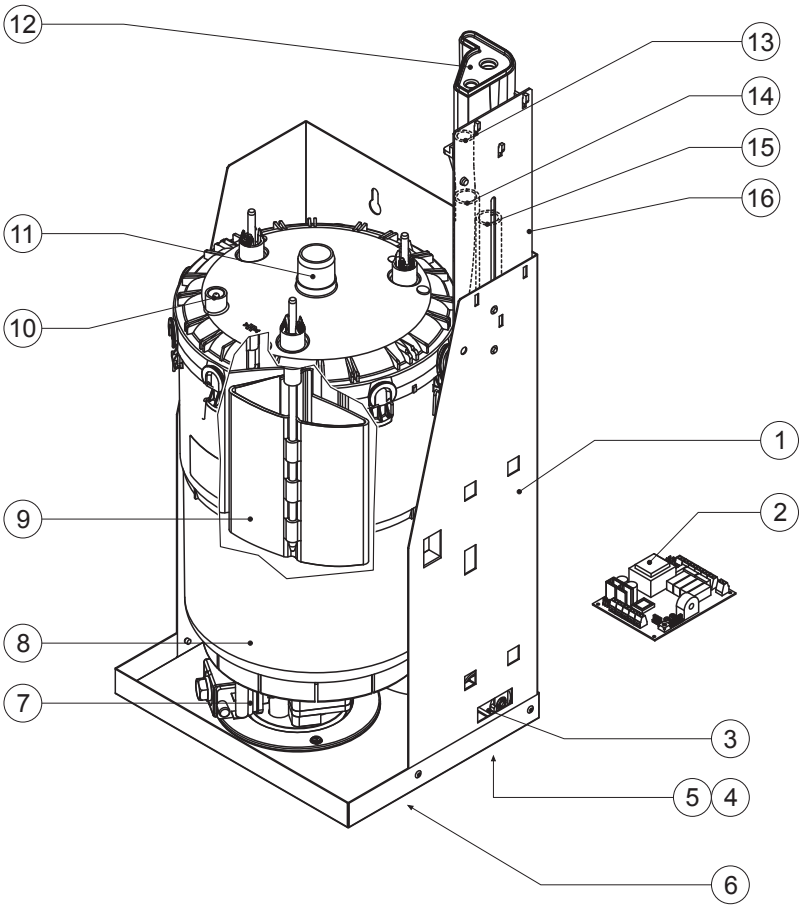
3.4 Steam humidifier construction

Models Condair OEM 1.., OEM 2... and OEM 3...



1 Housing (small)
2 Control unit ECCM (option)
3 Cable passage
4 Drain connection
5 Water supply connection
6 Inlet valve
7 Drain valve
8 Steam cylinder
9 heating electrodes
10 Steam outlet
11 Level sensor
12 Water supply hose
13 Water cup
14 Filling hose
15 Overflow hose

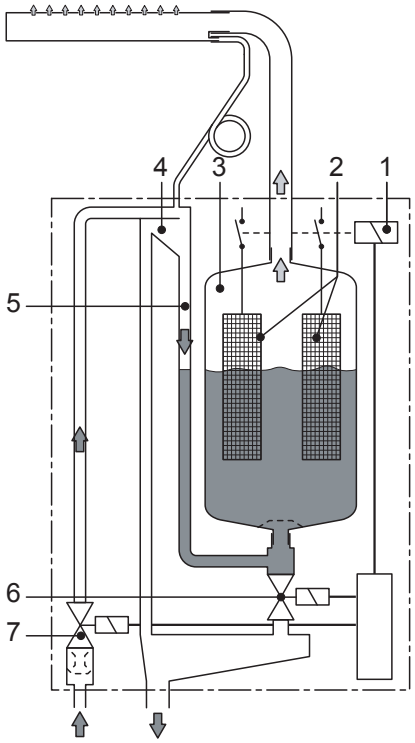
Models Condair OEM 4.., OEM 5... and OEM 6...



1 Housing (medium, large)
2 Control unit ECCM (option)
3 Cable passage
4 Water supply connection
5 Inlet valve
6 Drain connection
7 Drain valve
8 Steam cylinder
9 heating electrodes
10 Level sensor
11 Steam outlet
12 Water cup
13 Water supply hose
14 Overflow hose
15 Filling hose
16 Pressure compensation set

3.5 Functional description

The steam humidifier Condair OEM is a **pressureless steam generator** designed for **direct or indirect room humidification**. The steam humidifier Condair OEM utilizes electrode heating. It is intended for use with regular tap water or partially softened water.



Steam generation

Any time steam is requested, the electrodes (2) are supplied with voltage via main contactor (1). Simultaneously, the inlet valve (7) opens and water enters the steam cylinder (3) from the bottom via water cup (4) and supply line (5). As soon as the electrodes come in contact with the water, current begins to flow between the electrodes, eventually heating and evaporating the water. The more the electrode surface is exposed to water, the higher is the current consumption and thus the steam capacity.

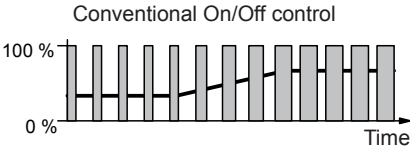
Upon reaching the requested steam capacity, the inlet valve closes. If the steam generation decreases below a certain percentage of the required capacity, due to lowering of the water level (e.g. because of the evaporation process or drainage), the inlet valve opens until the required capacity is available again.
If the required steam capacity is lower than the actual output, the inlet valve is closed until the desired capacity is achieved by lowering of the water level (evaporation process).

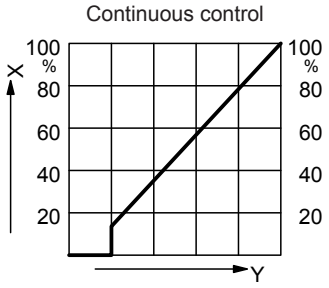
Level monitoring

A sensor provided in the steam cylinder cover detects when the water level gets too high. The moment the sensor comes in contact with water, the inlet valve closes.

Drainage

As a result of the evaporation process, the conductivity of the water increases due to an escalating mineral concentration. Eventually, an inadmissibly high current consumption would take place if this concentration process were permitted to continue. To prevent this concentration from reaching a value, unsuitably high for the operation, a certain amount of water is periodically drained from the cylinder and replaced by fresh water.
During the drainage process, the drain valve (6) is opened. Following a predetermined time of drainage, the drain valve is closed again.





X = steam capacity in %
Y = output signal of controller

Control

Units equipped with the optional **ECCM control unit** employ either On/Off control (via an external On/Off humidistat) or continuous control (via an external or the built-in humidity controller) for steam production. Below a minimum controllable steam output, continuous control will work in two-point operation (on/off control).

4 Basic planning

All the data necessary for the selection and layout of a Condair OEM humidifier system are provided in the following chapters. The following planning steps are required:

- Selecting the unit (see chapter 4.1)
- Selecting options (see chapter 4.2)
- Selecting accessories (see chapter 4.3)

4.1 Selecting the unit

The selection of the unit is reflected in the type description:

Condair OEM 363

Model version (steam cylinder) ——

4.1.1 Model version

Model version (steam cylinder)

Steam humidifiers Condair OEM are available with different steam cylinders for different heating voltages. The maximum obtainable steam capacity is dependent on the type of steam cylinder used and the heating voltage.

Heating voltage 230V/1N~/50..60Hz						
Model Condair OEM ...	**140**	**240**	**342**	——	——	——
Steam capacity kg/h	2	4	8	——	——	——
Heating voltage 400V/3~/50..60Hz						
Model Condair OEM ...	——	**263**	**363**	**464**	**674**	**664**
Steam capacity kg/h	——	4	8	15	25	45
Heating voltage 230V/3~/50..60Hz						
Model Condair OEM ...	——	**243**	**343**	**444**	**654**	**644**
Steam capacity kg/h	——	4	8	15	21	30

Condair OEM 363

Note: If you require a unit with a different heating voltage, please contact your Condair supplier.

Control voltage

Condair OEM steam humidifiers are available with a **control voltage of 220…240 VAC/50...60 Hz** or **24 VAC/50...60 Hz** (**Important**: specify desired control voltage when ordering).

Calculating the maximum required steam capacity

The maximum required steam capacity is calculated from the following formulas:

$$m_D = \frac{V \cdot \rho}{1000} \cdot (x2 - x1) \quad \text{or} \quad m_D = \frac{V}{1000 \cdot \varepsilon} \cdot (x2 - x1)$$

m_D: maximum steam demand in **kg/h**
V: volume of supply air portion per hour in **m^3/h** (for indirect room humidification) or volume space in case of simple air circulation per hour in **m^3/h** (for direct room humidification)
ρ: specific gravity of air in **kg/m^3**
ε: specific volume of air in **m^3/kg**
x_2: desired absolute room air humidity in **g/kg**
x_1: minimum absolute supply air humidity in **g/kg**

The values for **ρ**, **ε**, **x2** and **x1** can be gathered from the **h,x-diagram** or the **Carrier-Diagram** for moist air respectively.

For a rough estimate of the calculated steam capacity, the following table can be used. The values listed in the table are based on a desired room air temperature of 20 °C and a desired relative room air humidity of 45 %rh.
Note: To roughly estimate the calculated maximum steam capacity for larger supply air portions or room volumes, the values listed in the table can be projected accordingly.

Max. portion of supply air per hour in m^3/h or volume space in case of simple air circulation per hour in m^3/h			**Max. steam capacity in kg/h**
Temperature / rel. humidity of supply air			
-15 °C / 90%rh	-5°C / 80%rh	5°C / 60%rh	
500	650	800	**4**
1000	1250	1500	**8**
2000	2500	3000	**15**
4000	5000	6000	**30**
6000	7500	9000	**45**

Important notes:

– The required maximum steam capacity depends on the specific application and the installation. The calculated steam capacity based on the above formulas, the h,x diagram and the condition of the air to be humidified does not consider any steam loss (e.g. due to condensation in the steam hoses and the steam distributors), any heat loss of the unit as well as any absorption or release of humidity of materials located in the room being humidified.
In addition, the calculated steam capacity does not consider any losses caused by the draining rate depending on the water quality as well as any losses occur if the steam humidifier is operated on a mains circuit with a ground fault circuit interrupter.

The total amount of losses depends on the entire system and must be taken into consideration when calculating the required steam capacity. If you have any questions regarding the calculation of the steam capacity please contact your Condair supplier.

– For systems where the max. required steam capacity varies extensively (e.g. for test facilities or for systems with variable air volume flow, etc.), please contact your Condair supplier.

4.2 Options

4.2.1 Options overview

The following table presents an overview of all options which are available for the steam humidifier Condair OEM.

Model Condair OEM	**OEM 140**	**OEM 240** **OEM 243** **OEM 263**	**OEM 342** **OEM 343** **OEM 363**	**OEM 444** **OEM 464**	**OEM 654** **OEM 674** **OEM 644** **OEM 664**
Cleanable steam cylinder (see details in chapter 4.2.2)	**——**	**——**	**1 x D3..**	**1 x D4..**	**1 x D6..**
Control unit (see details in chapter 4.2.2)	**ECCM**	**ECCM**	**ECCM**	**ECCM**	**ECCM**
Plug and cable set (see details in chapter 4.2.2)	**A**	**D**	**D**	**CP**	**CP**
Pressure compensation set Kit for mounting the filling cup at an extended height when operating the steam humidifiers in systems with a duct air pressure of up to 1 kPa.				**X** [1)]	**X** [1)]
Unit housing of stainless steel	**x**	**x**	**x**	**x**	**x**

[1)] included in the standard delivery for these OEM units

4.2.2 Option details

Steam cylinder

The steam humidifier is available with **two different types** of steam cylinders:

– **Exchangeable steam cylinder type A... (standard version)**

– **Cleanable steam cylinder type D... (option)**

The following tables present an overview of the steam cylinders used in the different models.

Model Condair OEM	**OEM 140**	**OEM 240**	**OEM 243**	**OEM 263**	**OEM 342**	**OEM 343**	**OEM 363**
	For water conductivity from 125 to 1250 µS/cm						
Exchangeable steam cylinder	A 140	A 240	A 243	A 263	A 342	A 343	A 363
Cleanable steam cylinder	——	——	——	——	D 342	D 343	D 363

Model Condair OEM	**OEM 444**	**OEM 464**	**OEM 654**	**OEM 674**	**OEM 644**	**OEM 664**
	For water conductivity from 125 to 1250 µS/cm					
Exchangeable steam cylinder	A 444	A 464	A 654	A 674	A 644	A 664
Cleanable steam cylinder	D 444	D 464	D 654	D 674	D 644	D 664

If you have questions regarding the steam cylinders please contact your Condair representative.

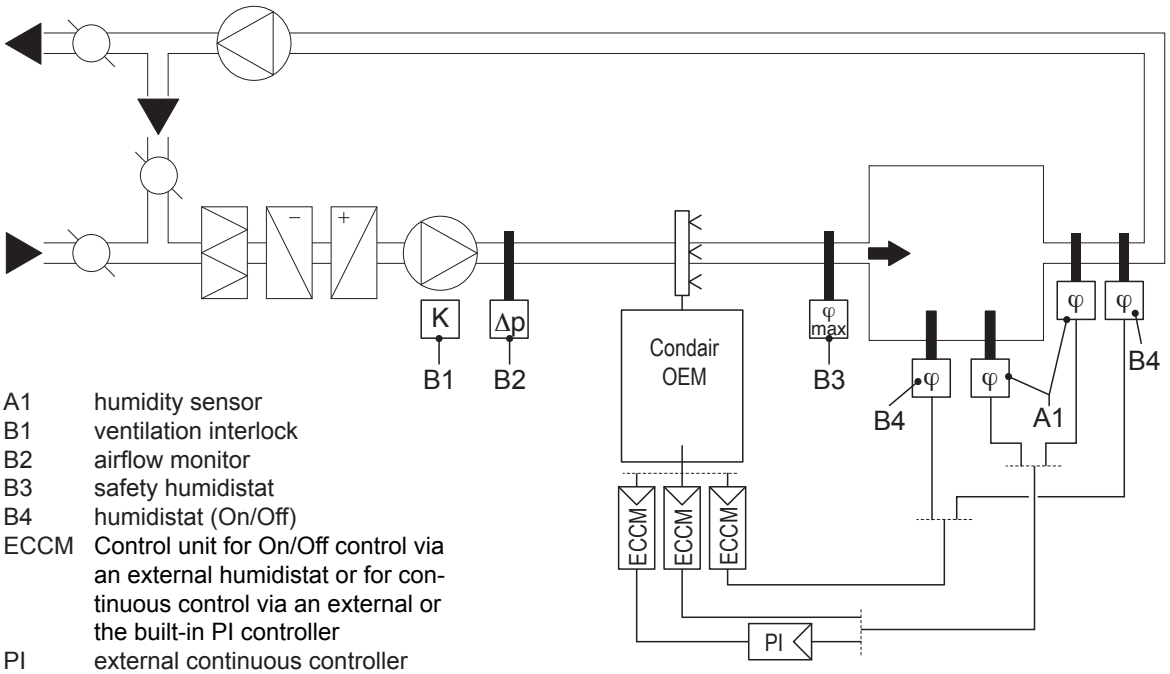
Control unit ECCM

Unit for On/Off control via an external humidistat or for continuous control via an external or the built-in PI controller (proportional range Xp: 18 %, integral action time Tn: 540 s) with operating indicators (LEDs) for "Error", "Warning/Maintenance" and "Steam production" and the option of connecting external LEDs for remote indication of operational states.

Admissible input signals:

Control with **external controller** **Control signals**	Control with **internal PI controller** **Humidity sensor signals**
0 ... 10 VDC	0 ... 10 VDC (e.g. EGH110)
2 ... 10 VDC	2 ... 10 VDC
0 ... 20 mA	0 ... 20 mA
4 ... 20 mA	4 ... 20 mA
Potentiometer 1 ... 10 kΩ (e.g. HPH 1000)	
Humidistat (On/Off)	

The following illustration shows the control system applicable for the Condair OEM. The system is suited for **direct room humidification** and **air conditioning systems with mainly recirculated air**. The humidity sensor or humidistat respectively is preferably located in the exhaust air duct.



A1 humidity sensor
B1 ventilation interlock
B2 airflow monitor
B3 safety humidistat
B4 humidistat (On/Off)
ECCM Control unit for On/Off control via an external humidistat or for continuous control via an external or the built-in PI controller
PI external continuous controller (e.g. PI-controller)

Please contact your Condair supplier, if your application meets the following conditions:

– Air conditioning systems with a high number of air exchanges
– Systems with variable air volume flow
– Test facilities with extreme control accuracy requirements
– Rooms with a high variation in max. steam capacity
– Systems with temperature fluctuations
– Cold rooms and systems with dehumidification

4.3 Accessories

4.3.1 Accessories overview

The following table presents an overview of all accessories which are available for the steam humidifier Condair OEM.

Model Condair OEM		**1..**	**2..**	**3..**	**4..**	**6..**
Steam nozzle (see details in chapter 4.3.2)		**W21**	**W21**	**–**	**–**	**–**
	number	1	1	1	–	–
Steam distribution pipe (see details in chapter 4.3.2)		**41-..**	**41-..**	**41-..**	**61-..**	**81-..**
	number	1	1	1	1	1
Steam hose / meter		**DS22**	**DS22**	**DS22**	**DS60**	**DS80**
	number	1	1	1	1	1
Condensate hose / meter		**1xKS10**				
Filter valve		**Z261** (1 pc. per system)				
Humidistat		all commercial models (1 pc. per system)				
Duct air humidity sensor		**EGH110** (1 pc. per system)				
Humidity control potentiometer, duct		**HPH1000** (1 pc. per system)				

The following table provides an overview of the recommended heating contactors available as an option.

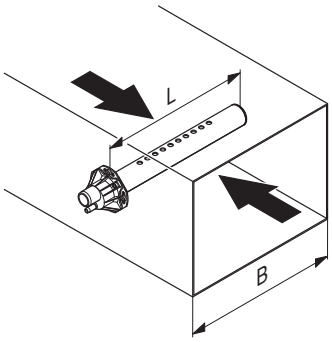
Heating voltage 230 V/1N~/50...60 Hz						
Model Condair OEM ...	**140**	**240**	**342**	–	–	–
Steam capacity	2	4	8	–	–	–
Heating contactor 230 V, 50...60 Hz	**K3-10**	**K3-10**	**K3-24**	–	–	–
number	1	1	1	–	–	–
Heating voltage 400 V/3~/50...60 Hz						
Model Condair OEM ...	–	**263**	**363**	**464**	**674**	**664**
Steam capacity	–	4	8	15	25	45
Heating contactor 230 V, 50...60 Hz	–	**K3-10**	**K3-10**	**K3-10**	**K3-24**	**K3-32**
number	–	1	1	1	1	1
Heating voltage 230 V/3~/50...60 Hz						
Model Condair OEM ...	–	**243**	**343**	**444**	**654**	**644**
Steam capacity	–	4	8	15	21	30
Heating contactor 230 V, 50...60 Hz	–	**K3-10**	**K3-10**	**K3-24**	**K3-40**	**K3-40**
number	–	1	1	1	1	1

Note: Heating contactors operating at 24 V/50..60 Hz control voltage are available on request.

4.3.2 Accessory details

Steam distribution pipe 41-../61-../81-.. for indirect room humidification

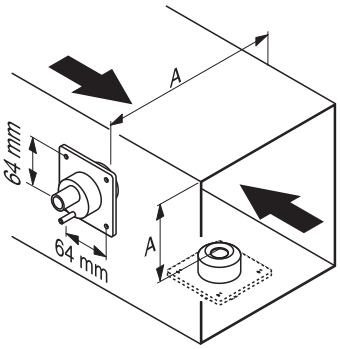
The steam distribution pipes 41-../61-../81-.. are selected on the basis of the **duct width** (for horizontal installation) or the **duct height** (for vertical installation) and the capacity of the steam humidifier.
Important! Always select the longest possible steam distribution pipe (optimum humidification distance).



Steam distribution pipe [1] for Condair OEM			Steam distribution pipe	Duct width (B)
Type 41-..	**Type 61-..**	**Type 81-..**	**Length in mm (L) [2]**	**in mm**
41-200			200	210…400
41-350	**61-350**	**81-350 [3]**	350	400…600
41-500	**61-500**	**81-500 [3]**	500	550…750
41-650	**61-650**	**81-650**	650	700…900
41-800	**61-800**	**81-800**	800	900…1100
41-1000	**61-1000**	**81-1000**	1000	1100…1300
41-1200	**61-1200**	**81-1200**	1200	1300…1600
	61-1500	**81-1500**	1500	1600…2000
	61-1800	**81-1800**	1800	2000…2400
	61-2000	**81-2000**	2000	2200…2600
		81-2300	2300	2500…2900
		81-2500	2500	2700…3100

[1] Material: CrNi steel
[2] special length on request
[3] up to max. 30 kg/h steam capacity

Steam nozzle (for models OEM 1.. and OEM 2.. only)



The **steam nozzle "W21"** can be mounted in the ventilation duct horizontally or vertically. Keep a **minimum distance clearance (A) of 200 mm** between nozzle opening and the opposite duct wall.

4.4 Additional planning instructions

In addition to the selection of the steam humidifier, the accessories and the options, other points should be considered during planning. Please note the information in the following chapters:

– Unit fitting (see chapter 5.2)
– Steam installation (see chapter 5.3)
– Water installation (see chapter 5.4)
– Electric installation (see chapter 5.5)

If you have other questions relating to planning that are not adequately covered by these installation and operating instructions, please contact your Condair representative. He will be happy to provide further assistance.

5 Mounting and installation works

5.1 Safety instructions for mounting and installation works

- All mounting and installation work must be performed **only by adequately qualified personnel**. Ascertaining the qualifications is the customer‘s responsibility.
- **All local regulations** relating to the execution of the respective installation work (Water, steam and electrical installation) must be noted and complied with.
- All the information contained in these installation and operating instructions relating to equipment assembly and to water, steam and electrical installation **must be unconditionally observed and complied with**.
- **Caution - Danger from electric shock! The connection of the steam humidifier to the mains electrical supply must not be made until all installation work has been completed.**
- Electronic components are very susceptible to electrostatic discharges. For the protection of these components, measures must be taken during all installation work to prevent damage caused by electrostatic discharge (ESD–protection).

5.2 Unit fitting

5.2.1 Humidifier location

The installation site of the steam humidifier depends largely on the location of the steam distribution pipe or the steam nozzle (see chapter 5.3.1), respectively. To ensure proper functioning of the steam humidifier and to obtain an optimal efficiency, the following points must be considered and observed when choosing the location for the steam humidifier:

- Install the steam humidifier so that the **length of the steam hose is kept as short as possible (max. 4 m)** and that the **minimum bend radius (R= 300 mm)** and **up-slope (20 %)** or **down-slope (5 %)** of the steam hose is observed (see chapter 5.3.3).
- The steam humidifiers Condair OEM are designed for wall-mounting. Make sure that the construction (wall, pillar, floor-mounted console, etc.) to which the humidifiers are to be mounted, offers a sufficiently high load-bearing capacity (take notice of the weight information found later in this chapter), and is suitable for the installation.

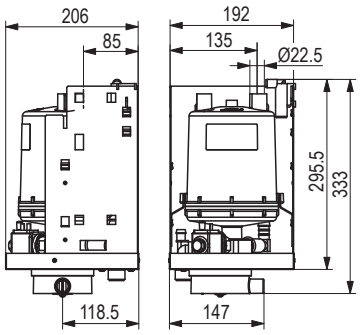
  Warning! Do not mount the steam humidifier directly to the ventilation duct (insufficient stability).
- The Condair OEM is retaining heat during operation (max. surface temperature of the metal housing approx. 60 - 80 °C). Make sure, therefore, that the construction (wall, pillar, etc.) to which the units are to be mounted, does not consist of heat-sensitive material.

  Warning! Make sure there is sufficient aeration at the site of location so that the admissible ambient temperature of 50 °C (40 °C for the control unit) is not exceeded.
- Install the steam humidifier in such a manner that it is freely accessible with sufficient space available for maintenance purposes.

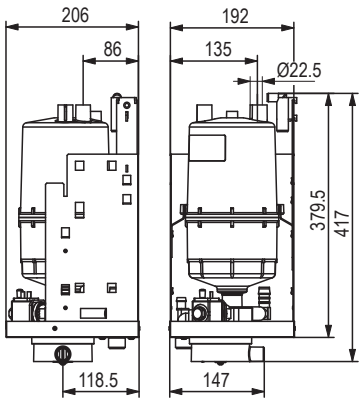
Dimensions (in mm) **and Weights**

OEM 140



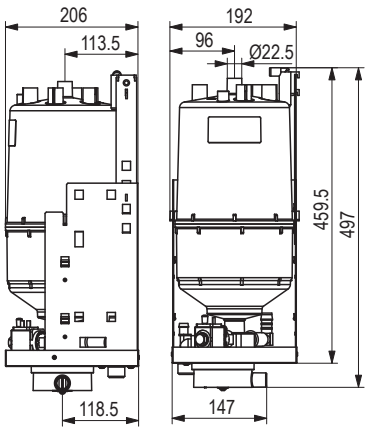
Netweight: **3 kg**
Grossweight: **8 kg**

OEM 2..



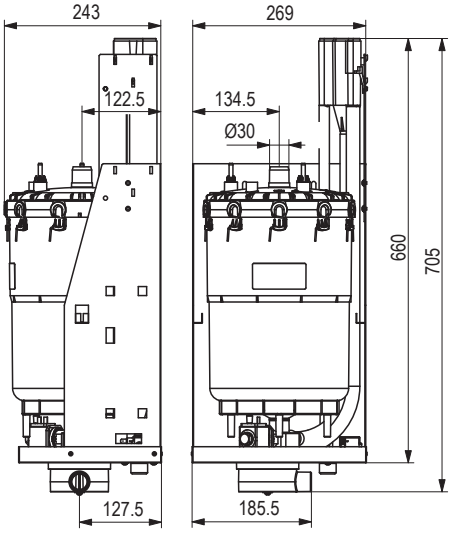
Netweight: **3 kg**
Grossweight: **8 kg**

OEM 3..



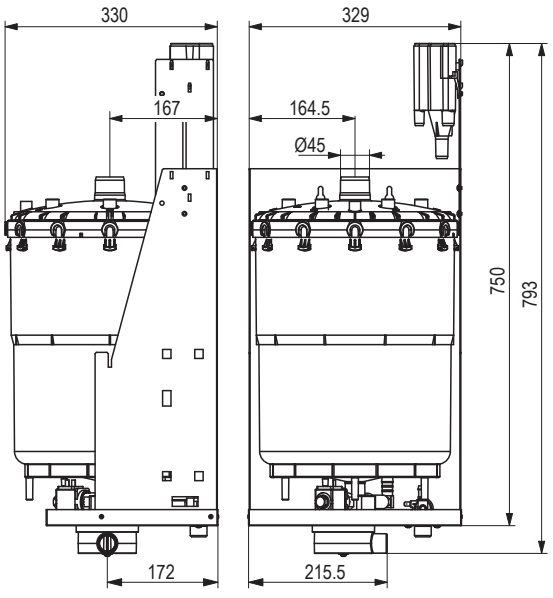
Netweight: **4 kg**
Grossweight: **20 kg**

OEM 4..



Netweight: **6 kg**
Grossweight: **26 kg**

OEM 6..

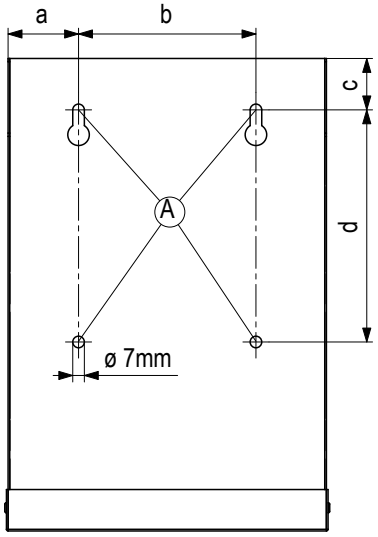


Netweight: **9 kg**
Grossweight: **49 kg**

5.2.2 Mounting the humidifier

Use a level to align the unit horizontally and vertically, then fix it to the support (wall, console, etc.) respecting the 4 points of fixation “A”.

Caution! Correct fastening is the customer’s responsibility.



	Condair		
	OEM 1.. OEM 2.. OEM 3..	**OEM 4..**	**OEM 6..**
a	42.5 mm	81.0 mm	111.0 mm
b	107.0 mm	107.0 mm	107.0 mm
c	31.0 mm	31.0 mm	31.0 mm
d	140.0 mm	140.0 mm	140.0 mm

5.2.3 Inspecting the installed unit

Use the following check list to ascertain that the installation was performed correctly:

☐ Is the unit in the correct place?
(see chapter 5.2.1)

☐ Is the unit correctly aligned vertically and horizontally?

☐ Is steam humidifier properly secured?
(stability of the carrying structure)

☐ Is there sufficient aeration so that the admissible ambient temperature of 50 °C (40 °C for the control unit) is not exceeded?

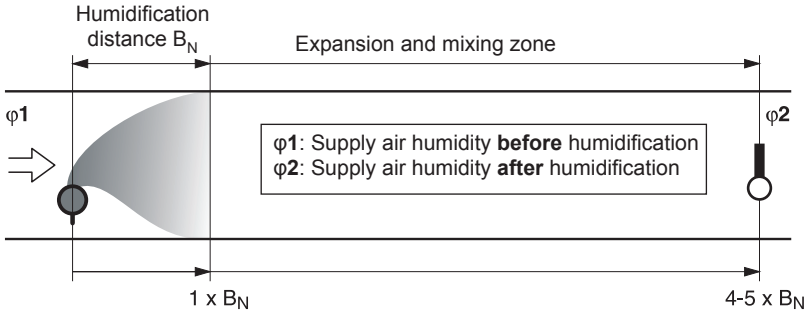
5.3 Steam installation

5.3.1 Positioning and mounting of the steam distribution pipes

The location for the steam distribution pipes should be determined at the time of dimensioning the air conditioning system. Please note the following instructions to ensure proper humidification of the duct air.

Calculating the humidification distance

The water vapour, emitting from the steam distribution pipes, requires a certain distance to be absorbed by the ambient air so that it is no longer visible as steam. This distance is referred to as **humidification distance "B_N"** and serves as a basis for the determination of the minimum distances from the upstream components in the system.



The calculation of the humidification distance "B_N" is dependent on several factors. For a rough estimation of the humidification distance "B_N", the following table is useful. Recommended **standard values** listed in this table are based on a supply-air temperature range of 15°C to 30 °C. The values given **apply to steam distribution pipes 41-../61-.. and 81-..**.

Input humidity φ1 in %rh	**Length of humidification distance B_N in m Output humidity φ2 in %rh**					
	40	**50**	**60**	**70**	**80**	**90**
5	**0,9**	**1,1**	**1,4**	**1,8**	**2,3**	**3,5**
10	**0,8**	**1,0**	**1,3**	**1,7**	**2,2**	**3,4**
20	**0,7**	**0,9**	**1,2**	**1,5**	**2,1**	**3,2**
30	**0,5**	**0,8**	**1,0**	**1,4**	**1,9**	**2,9**
40	**–**	**0,5**	**0,8**	**1,2**	**1,7**	**2,7**
50	**–**	**–**	**0,5**	**1,0**	**1,5**	**2,4**
60	**–**	**–**	**–**	**0,7**	**1,2**	**2,1**
70	**–**	**–**	**–**	**–**	**0,8**	**1,7**

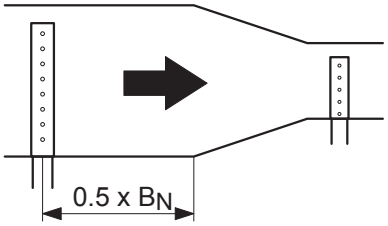
φ1 in %rh: Relative supply air humidity prior to humidification at the lowest supply air temperature
φ2 in %rh: Relative supply air humidity after the steam distribution pipe at maximum capacity

Example	
given:	φ1= 30 %rh, φ2= 70 %rh
humidification distance B_N:	**1,4 m**

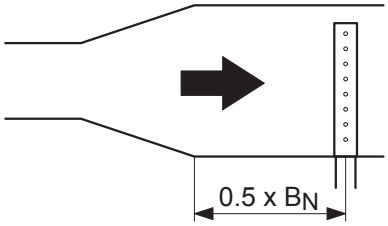
Minimum distances to be observed

To prevent the water vapour, that is emitting from the steam distribution pipe, from condensing on downstream system components, a minimum distance to the steam distribution pipe must be observed (depends on the humidification distance "B_N").

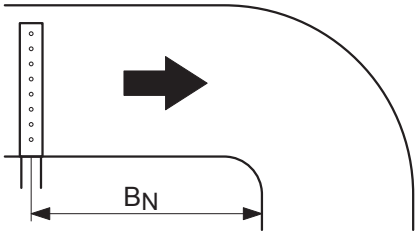
before/after constriction



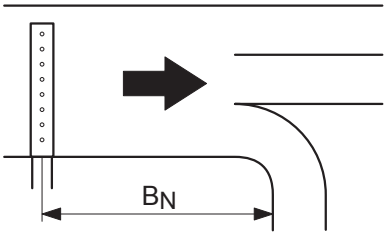
after expansion



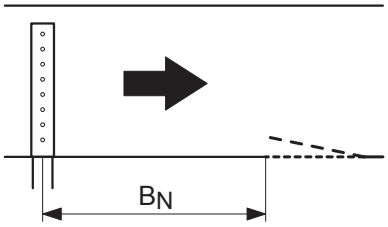
before bend



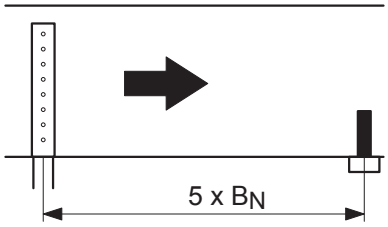
before branch



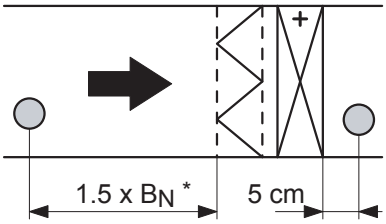
before diffuser



before control sensor

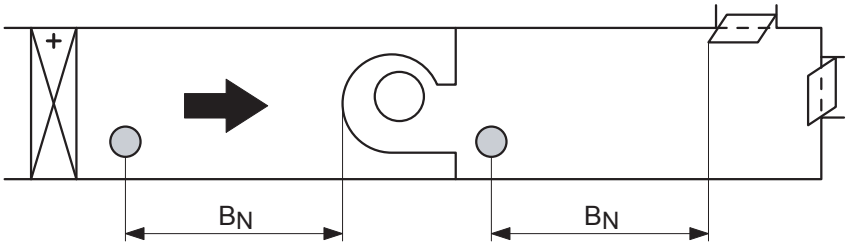


before/after filter/register



2,5 x B_N before aerosol filter

before/after fan, zone exit



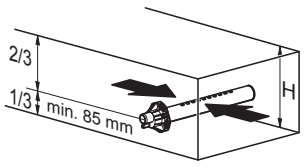
Installation notes and dimensions

The steam distribution pipes are designed for either **horizontal** installation (on the duct wall) or, with accessories, for **vertical** installation (in the duct floor). The **outlet orifices should always point upwards and at right angles to the airflow**.

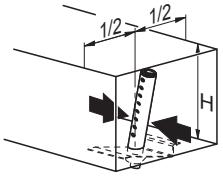
If possible, the steam distribution pipes should be installed on the **pressure side** of the duct (**max. duct pressure 1000 Pa**, Condair OEM 4.. and OEM 6.. with pressure compensation set only). If the steam distribution pipes are installed on the suction side of the duct, the **maximum vacuum must not exceed 500 Pa**.

Select a location for the installation, tailored to suit your duct (see the following illustrations) and position the steam distribution pipes in the duct so that a uniform distribution of steam is achieved.

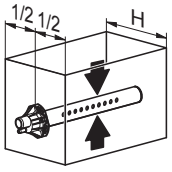
In positioning the steam distribution pipes, the following dimensions should be observed.



min H= 250 mm



H 400 mm



min H= 200 mm

Guidelines for dimensioning the ventilation ducts

– To facilitate the installation of the steam distribution pipes and for control purposes, a sufficiently sized control opening should be planned.
– Within the range of the humidification distance, the ventilation duct should be waterproofed.
– Air ducts passing through cold rooms should be insulated to prevent the humidified air from condensing along the duct wall.
– Poor airflow conditions within the air duct (e.g. caused by obstacles, tight bends, etc.) can lead to condensation of the humidified air.
– Steam distribution pipes must not be mounted to round ducts.

If you have questions relating to the dimensioning of ventilation ducts in combination with steam humidifiers Condair OEM, contact your Condair supplier.

Installing the steam distribution pipes/steam nozzle

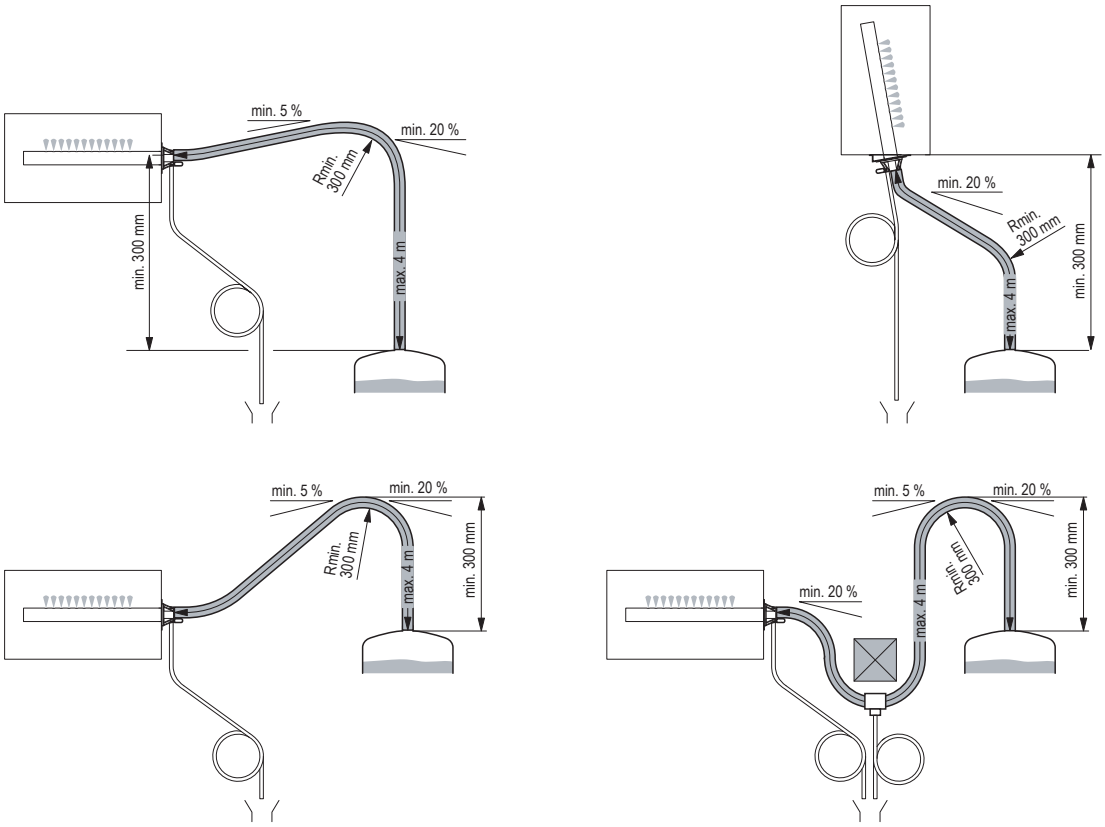
Detailed information on the installation of steam distribution pipes and the steam nozzle can be found in the separate “Mounting Instructions” for this products.

5.3.3 Installing the steam hose

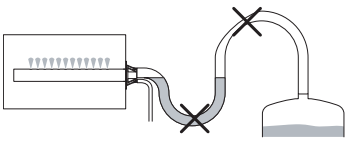
Important! Use original Condair steam hose exclusively. Other types of steam hoses can cause undesired operational malfunctions.

Instructions for the hose layout

Initially, the steam hose must always be led with an **upslope of at least 20 % over a minimum height of 300 mm** above the top edge of the humidifier and then lead the hose with a **minimum upslope of 20%** and/or a **minimum downslope of 5%** to the steam distribution pipe.



– Steam hoses must be prevented from sagging (condensate pockets); if necessary, support with pipe clamps, trough or wall brackets, or install a condensate drain in the steam hose.
  If sagging of the steam hose can not be prevented, a condensate drain at the lowest point of the steam hose must be installed (see illustration above).
– The steam hose should be kept as short as possible (**max. 4 m**) while observing the **minimum bend radius of 300 mm**. **Important!** Allowance must be made for a **pressure loss of 10 mm water column (approx. 100 Pa)** per meter steam hose.
– Reductions in the cross section such as kinks should be avoided throughout the entire length of the hose. The installation of a stop cock in the steam hose is not permissible.



– **Important!** When deciding on the length and layout of the hose, it should be noted that the steam hose may become somewhat shorter with progressive ageing.

Securing the hose

The steam hose must be secured to the steam distribution pipe and steam cylinder by means of **hose clamps**.

Caution! Do not overtighten the hose clamp on the steam connector of the steam cylinder.

Steam line with fixed piping

For steam lines with fixed piping, the same instructions apply to the laying of the piping as already described. The following additional notes should be observed:

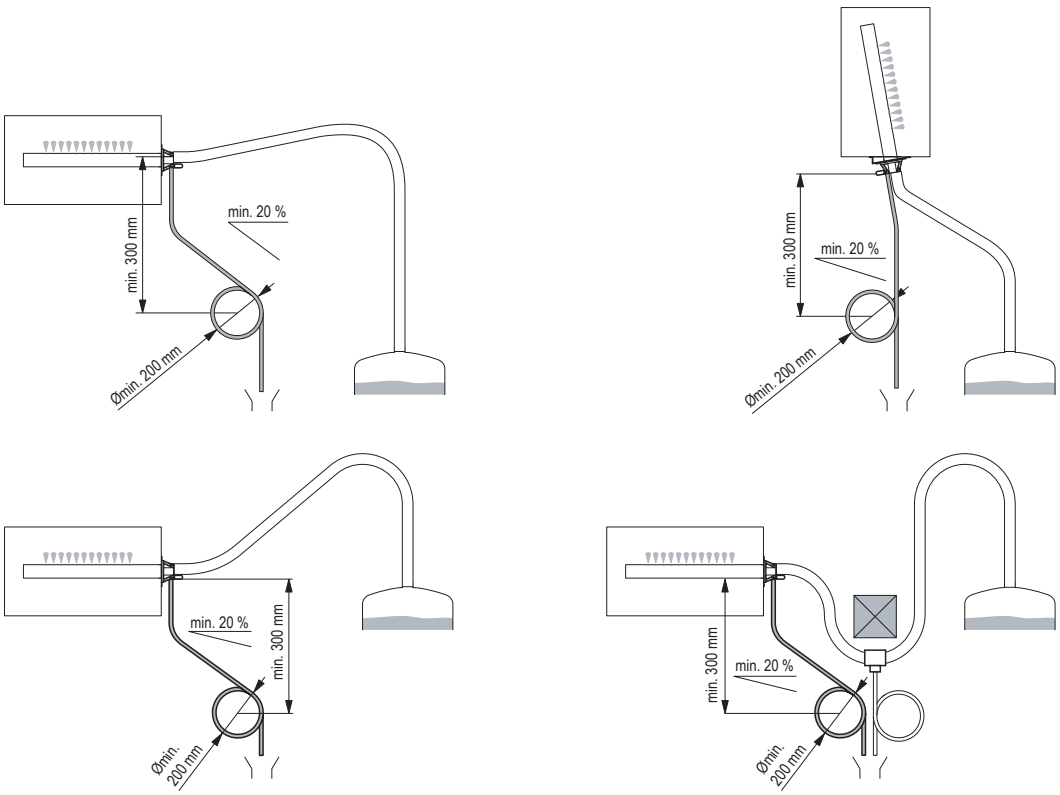
- The **minimum internal diameter of 22 mm, 30 mm or 45 mm** respectively should be applied over the whole length of the piping.
- Use exclusively Cu pipe (operation with untreated water) or stainless steel (min. DIN 1.4301).
- To minimize the condensate formation (=loss), the steam pipes must be insulated.
- The **minimum bend radius** for solid pipes is **4-5 x internal diameter**.
- Connection of the steam pipes to the steam distribution pipe and steam humidifier is effected by means of short lengths of steam hose secured with hose clamps. Connection to the steam humidifier is secured via a G 2” coupling.
- **Important!** Allowance must be made for a **pressure loss of 10 mm water column (approx. 100 Pa)** per meter length or per 90° bend.

5.3.4 Installing the condensate hose

Important! Use original Condair condensate hose exclusively. Other types of hoses can cause operational malfunctions.

Instructions for the hose layout

Condensate hose is led down with a **minimum slope of 20 %**, in the form of a **siphon (min. hose bend radius Ø200 mm)**, directly into a discharge funnel.



Important! Before putting the unit into operation, the siphon of the condensate hose must be filled with water.

5.3.5 Inspecting the steam installation

Use the following check list to ascertain that the steam installation was performed correctly:

– Steam distribution pipe
  - ☐ Steam distribution pipe correctly positioned and secured (screws tightened)?
  - ☐ Are the outlet orifices at right angles to the air flow direction?
– Steam hose
  - ☐ Maximum length of 4 m?
  - ☐ Minimum bend radius of 300 mm (4-5 x internal diameter with fixed piping)?
  - ☐ Have the instructions for hose positioning been followed?
  - ☐ Steam hose: no sagging (condensate pocket)?
  - ☐ Rigid steam lines: properly insulated? Correct installation material used? Minimum internal diameter maintained?
  - ☐ Steam hose securely attached with clamps?
  - ☐ Heat expansion during operation and shortening of the hose with ageing taken into consideration?
– Condensate hose
  - ☐ Downslope of at least 20 %?
  - ☐ Siphon existing and filled with water?
  - ☐ Condensate hose correctly fixed?

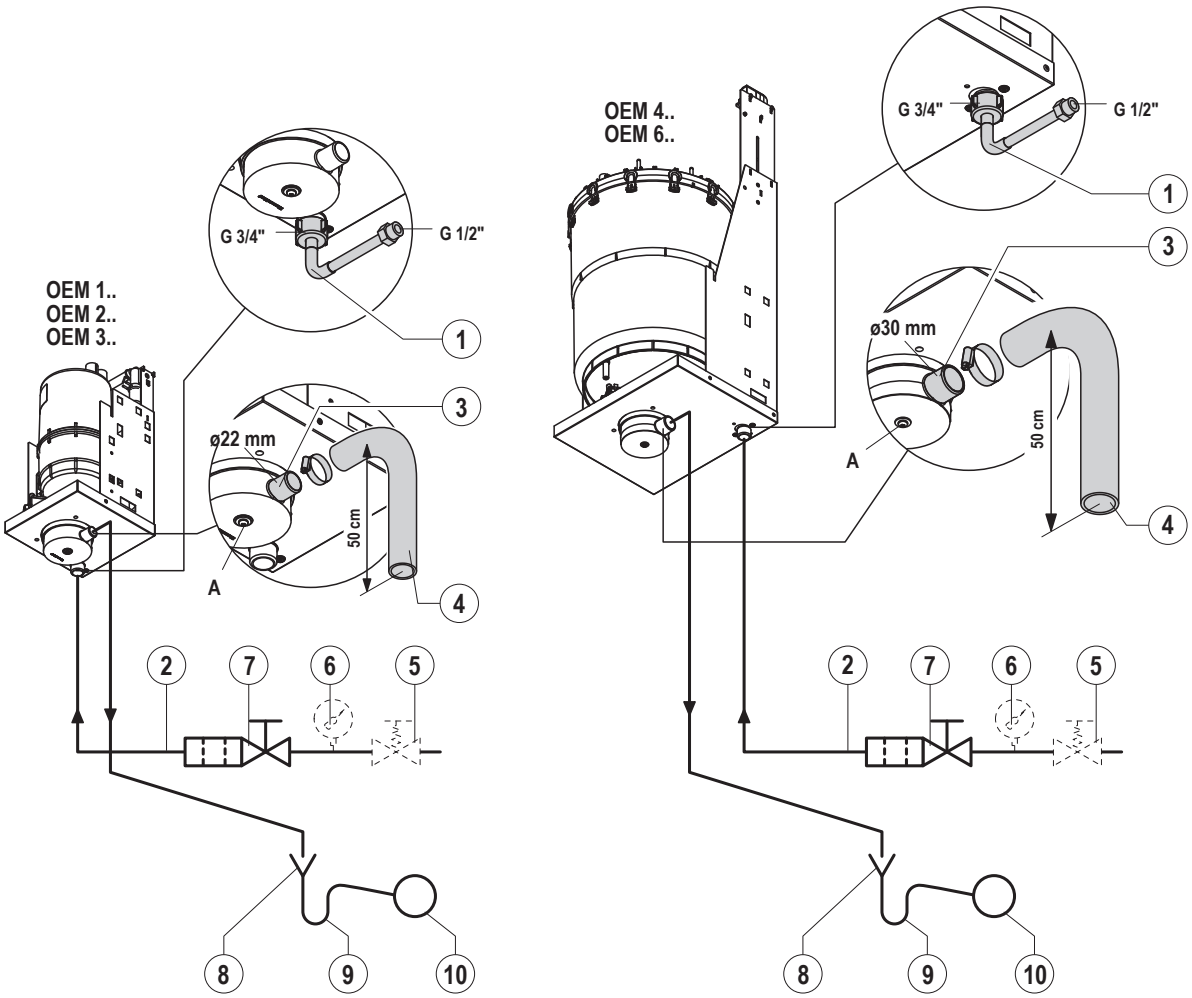
5.4 Water installation

All work concerning the water installation must be performed only by **adequately qualified personnel** (e.g. plumbers). Ascertaining the qualifications is the customer‘s responsibility.

Please observe **all local regulations** concerning the installation of appliances to the mains and waste water systems.

Warning - danger of electric shock! For all installation work, the steam humidifier **must be disconnected from the mains supply** (inasmuch as installed) and **secured against unintentional re-connection**.

5.4.1 Performing the water installation



1 Water connection pipe with union nut G 3/4" (on unit side) and nipple G 1/2" (on installation side)
2 Water supply pipe (min. inner Ø: 8 mm)
3 Water drain connection Ø22 mm (OEM 1.. to OEM 3..) or Ø30 mm (OEM 4.. and OEM 6..)
4 Drain pipe min. inner Ø 22 mm (OEM 1.. to OEM 3..) or min. inner Ø 30 mm (OEM 4.. and OEM 6..), min. 50 cm directed vertically downwards
5 Pressure reducing valve (compulsory for water pressures >10 bar, building side)
6 Manometer (installation recommended, building side)
7 Filter valve (accessory “Z261”)
8 Funnel (building side)
9 Siphon (min. inner Ø: 30 mm, building side)
10 Drain line, building side (min. inner Ø: >30 mm)

Water supply

The water feed pipe is to be connected via the **filter valve** (accessory “Z261”), to the connection on the unit (see detailed illustration). The installation of the filter valve should be made as close as possible to the steam humidifier.
Note: Instead of the filter valve, a **shut-off valve** (essential) and a **water filter 5 µm** (not essential, but advantageous) can be used.

Warning - danger of damage! Union nut at the humidifier connection must be **hand-tightened only**.

The following connection specifications must be observed:

– Connection: **union nut G 3/4"** (on unit side) and **nipple G 1/2"** (on installation side)

– Min. inner Ø of supply line: **8 mm**

– Admissible mains pressure **1.0 to 10.0 bar** (hammer-free system)
For mains pressures >10 bar, connection must be made via pressure reducing valve (adjusted to 2.0 bar). For mains pressures <1.0 bar please contact your Condair supplier.

– Supply rate: **1l/min per 15 kg/h steam output**

– Admissible supply temperature: **1…40 °C**

– The connection material must be **pressure-proof** and **certified for use in the drinking water supply**.

– **Important!** Before connecting the water line**, the line should be well flushed out**.

– **Water quality**: For the water supply, use exclusively **fresh tap water** (raw water), **partially softened water** (softened water which is mixed with drinking water to approx. 1/3 of its original hardness). **Unmixed softened water must not be used.**
If you want to operate the Condair OEM with partially softened water or if you need more ample information on water quality please contact your Condair supplier.

  The water must not be mixed with any additional disinfectant: it would be distributed in the surrounding air during the evaporation process and lead to irritation of the mucous membrane or allergies.

Water drain

The water drainage is effected without pressure. Thus, in order to avoid any damming of the water, the drain pipe must be led **straight down into a drainage funnel, through a piece of hose** (accessory “DS22” or “DS60”) **of min. 50 cm**. Subsequently, the drain pipe is connected via **siphon** to the waste water system of the building. The minimum internal diameter of 22 mm (models OEM 1.. to OEM 3..) or 30 mm (models OEM 4.. and OEM 6..) must be maintained for the entire length. Make certain that the drain pipe is correctly fixed and easily accessible for inspections and cleaning purposes.
Note: The water drain connection may be turned to the desired direction by undoing screw “A” (see overview), turning the connection and fastening the screw again.

The following connection specifications must be observed:

– Drainage capacity: **approx. 2,5l/min per 15 kg/h steam capacity**

– Drainage temperature: **60…100 °C**

  Warning! Use only **temperature-resistant** installation materials!

– Connection on unit (hose connection): **Ø22 mm (models OEM 1.. to OEM 3..)**
Ø30 mm (models OEM 4.. and OEM 6..)

  Warning! Hose must be secured to the unit connection with a hose clamp.

– Min. inner Ø of drain line: **Ø22 mm (models OEM 1.. to OEM 3..)**
Ø30 mm (models OEM 4.. and OEM 6..)

– Min. downslope after siphon: **10 %**

5.4.2 Inspecting the water installation

Use the following check list to ascertain that the installation has been performed correctly:

– Water supply
  - ☐ Has filter valve (accessory “Z261”) or shut-off valve and filter 5 µm respectively been installed in supply line?
  - ☐ Have admissible water pressure (1.0 – 10 bar) and temperature (1 – 40 °C) been observed?
  - ☐ Does supply capacity match the humidifier(s)?
  - ☐ Are all pipes properly secured (threaded connections tightened)?
  - ☐ Is the feed pipe properly sealed?

– Water drain
  - ☐ Has minimum inside diameter of drain pipes been maintained at least 22 mm (models OEM 1.. to OEM 3..) or 30 mm (models OEM 4.. and OEM 6..) throughout the entire length?
  - ☐ Has drain pipe been installed with a downslope of at least 10 %?
  - ☐ Has the heat resistance of the material used been verified to be at least 100°C?
  - ☐ Are hoses and lines properly secured (hose clamps and threaded connections tightened)?

5.5 Electric installation

A separate electrical installation manual is available for the control unit ECCM, giving all necessary details (connection data, diagrams, etc.) for the correct installation of the electrics. The **directions in the electrical installation instructions must be followed**. Please also note the following instructions:

– All work concerning the electric installation must be performed only by **adequately qualified personnel (electrician or workman with equivalent training)**. Ascertaining the qualifications is the customer‘s responsibility.

– **Caution electrical hazard!** The unit incorporating the Condair OEM (e.g. air conditioning cabinet) must be protected in a way that no live components and wires can be touched when the Condair OEM is in operation.

– **Warning - danger of electric shock!** The steam humidifier may be connected to electric mains only after all installation work has been completed.

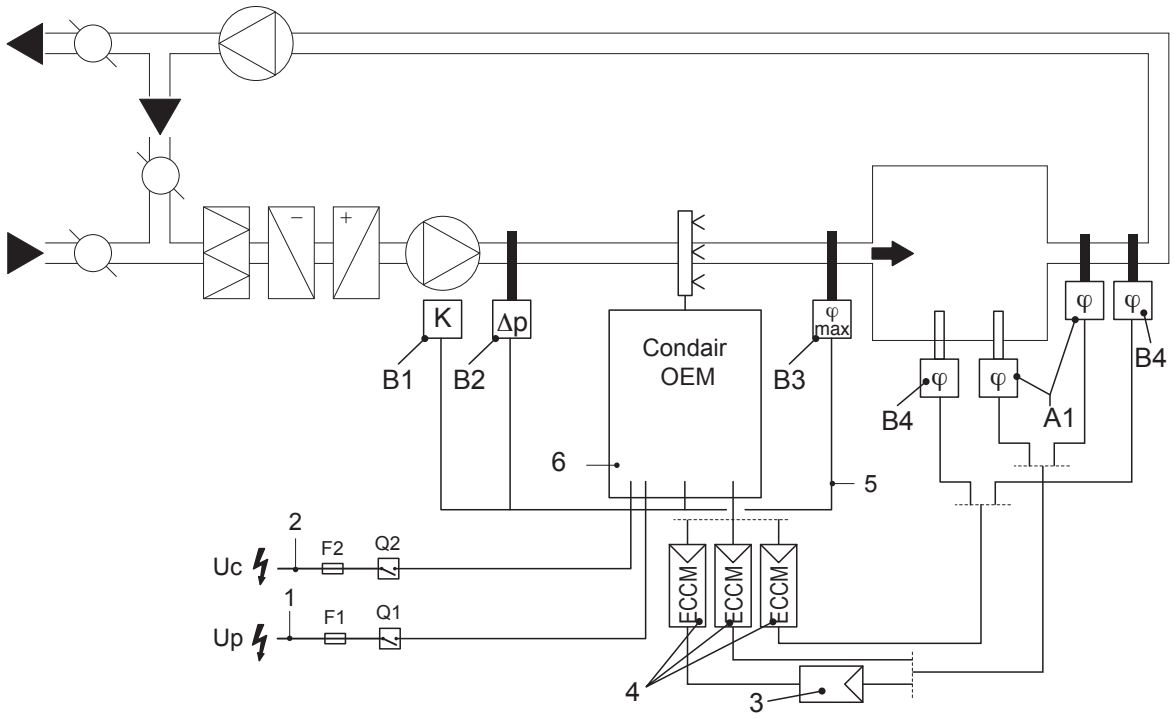
– Please observe **all local regulations** concerning the electric installation.

– **Warning!** The electronic components of the control unit are very susceptible to electrostatic discharges. For the protection of these components, measures must be taken during all installation work to prevent damage caused by electrostatic discharge (ESD–protection).

– **Caution!** For the electrical installation all regulations according to “**DIN EN 60335-1**” and “**DIN EN 60335-2-98**” standards regarding the safety of electrical devices must be strictly adhered to. In particular, it must be made sure that there is **sufficient protection against inadvertent contact with life parts**.

– For trouble-free operation we recommend using the **optional heating contactors** (see table in chapter 4.3.1).

5.5.1 Electric installation overview



1	Supply heating voltage Up
2	Supply control voltage Uc
3	External continuous controller
4	Control unit ECCM (On/Off control or continuous control)
5	External safety circuit
6	Steam humidifier
A1	Humidity sensor (room/exhaust)
B1	Ventilation interlock
B2	Airflow monitor
B3	Safety humidistat
B4	Humidistat
Q1/Q2	External service switch or plug-type connectors
F1/F2	External power supply fuses

5.5.2 Inspecting the electrical installation

Inspect for correct installation in accordance with the following checklist:

☐ Do the details on the rating plates for heating and control voltage match the relevant network voltage?

☐ Are the voltage supplies (heating and control voltage) correctly fused?

☐ Is the service switch “Q” installed in the supply line for to the heating and control voltage?

☐ Are all components correctly connected according to the connection diagram?

☐ Are all regulations according to “**DIN EN 60335-1**” and “**DIN EN 60335-2-98**” standards regarding the safety of electrical devices (in particular, protection against inadvertent contact with life parts) complied with?

☐ Is the Drain/Info key connected to the ECCM control unit correctly (see “Electrical Installation Condair ECCM”)?

☐ Are all connecting cables fastened?

☐ Are the units configured correctly (see “Electric-Installation Condair ECCM”)?

6 Operation

6.1 Operational safety instructions

– Initial commissioning: Before the steam humidifier is put into operation for the first time, all **installations** and the **unit configuration** must be **inspected** by the responsible persons to see that everything is **correct** (see also checklist for the individual installations). Any defects must be expertly dealt with before commissioning.

– The Condair OEM steam humidifier may only be started and operated by persons who are familiar with the unit and who have adequate qualifications for this work. Checking this qualification is the customer's concern.

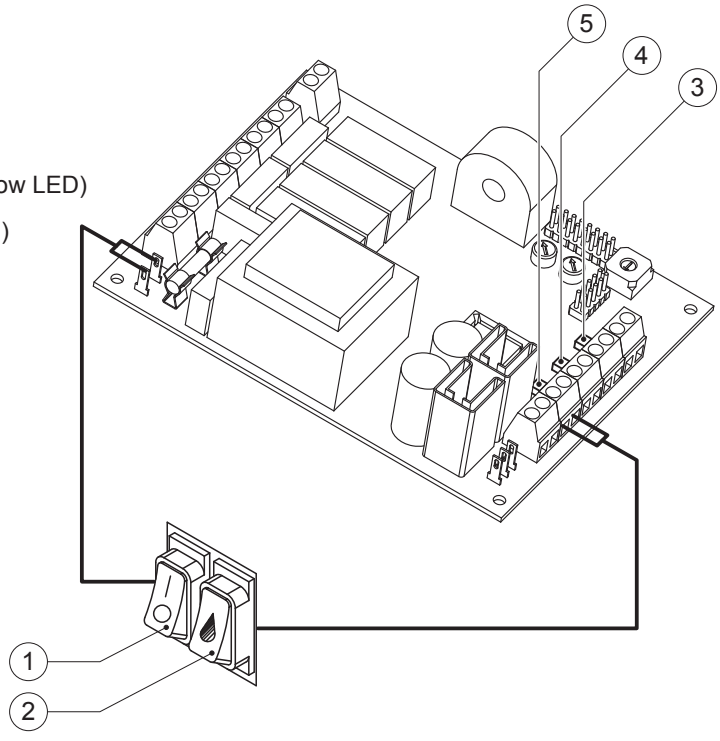
– **Warning - danger of electric shock!** Before actuating the service switches of the power supply lines (heating and control voltage) to the Condair OEM make sure the unit incorporating the Condair OEM (e.g. air conditioning cabinet) is duly closed and no live parts can be touched.

6.2 Display and operating elements

The figure below shows the display and operating elements of the ECCM control unit (available as an option). The ECCM control unit allows the connection of a drain key and an On/Off switch. Please consult the instructions supplied with the control unit.

ECCM control unit

1 On/Off switch
2 Drain/info key
3 Error display (red LED)
4 Warning and information display (yellow LED)
5 Steam production display (green LED)



6.3 Commissioning

In order to start up the steam humidifier, take the following steps:

- Check steam humidifier and installations for damage.
  Warning! Damaged units or units with damaged installations must **not be put into operation**.
- Open the shut-off valve to the water feed.
- Switch on the **service switch for network supplies** (heating and control voltage).
- **Switch on** the steam humidifier via the **On/Off-switch**.

  The following applies only to units equipped with ECCM control: After switching on the control unit ECCM carries out a system test, during which all the LEDs on the control unit light up in sequence. After the system test the unit is **ready for operation**.

  If, after the system test:
  – **the yellow LED blinks permanently**, the drain/info key has been pressed.
  – **the yellow LED lights permanently**, steam cylinder maintenance is due (see chapter 7) or the maintenance indication has not been reset (see chapter 7.5).
  – **the yellow LED and the red LED light permanently**, the steam cylinder maintenance (see chapter 7) has not been executed or the maintenance indication has not been reset (see chapter 7.5).
  – **the red LED light permanently**, a fatal malfunction has occurred (see chapter 8).

  In this case press the drain/info key (at least 3 seconds) until operating status display is activated (see below) and consult the information given in chapter 8 “Fault elimination”.

After switching on the unit is **ready for operation**. As soon as the humidity controller or the humidistat requires humidity, power is switched on for heating. The inlet valve opens (slight delay) and the steam cylinder fills with water. As soon as the submerged electrodes heat the water up the green LED lights up (only on units equipped with ECCM control) and after a few minutes (approx. 5–10 minutes, depending on the conductivity of the water) steam is produced.
Note: If the water has low conductivity, it is possible in the first few hours of operation that the maximum steam output is not achieved. This is normal. As soon as the water reaches adequate conductivity through the vaporization process, the steam humidifier will work at maximum output.

Operating status display (only on units equipped with ECCM control)

By pressing the drain/info key for at least 3 seconds, the steam humidifier’s current operating status can be displayed by the LEDs on the control unit.
Note: The status indication is automatically reset after 5 minutes, or manually by pressing the drain/info key again.

– The **green LED current steam output in % of maximum output by blinking at regular intervals**:

Green LED blinking...	1x	2x	3x	4x	5x	6x	7x	8x	9x	10x
Steam output in %	10	20	30	40	50	60	70	80	90	100

– The **yellow LED blinking at regular intervals** shows that there is a **malfunction** which the **control unit ECCM is trying to remedy**. The blinking frequency of the LED indicates the type of problem. In-depth details are found in chapter 8.

– The **red LED blinking at regular intervals** shows that there is a malfunction which the control unit ECCM cannot **remedy**. The blinking frequency of the LED indicates the type of problem. In-depth details are found in chapter 8.

Remote operation and fault indication via external LEDs (with ECCM control only)

Assuming external LEDs are connected to the respective terminals of the ECCM control unit the following states of operation can be displayed remotely:

Operation status	**Output activated on ECCM control unit**	**Display on ECCM control unit**
“Error”, Humidification off	H1 “Error”	red LED lights up
Steam cylinder maintenance due	H2 “Maintenance”	yellow LED lights up
Steam production	H3 “Steam production”	green LED lights up

6.4 Switching off

In order to switch off the steam humidifier, e.g. for maintenance work, take the following steps:

- Close shut-off valve to the water feed.
- **Press drain/info key briefly**. The heating voltage is cut off and the steam cylinder empties. The **yellow LED blinks** (only on units equipped with ECCM control).
- Wait until the steam cylinder is empty (approx. 5-10 minutes). Then **switch off the unit via the On/Off switch** and **secure switch in “off” position against accidentally being switched on**.
- **Disconnect steam humidifier from electricity supply**: **Switch off all service switches to network supplies** (heating and control voltage) and **secure switch in “off” position against accidentally being switched on.**

7 Maintenance

– **All maintenance work should only be carried out by trained and qualified personnel**, who are familiar with the related dangers. Checking the qualification is the customer's concern.
– The instructions and details for maintenance work must be followed and upheld.
– Only the maintenance work described in this documentation may be carried out.
– Only use original Condair spare parts to replace the steam cylinder or faulty parts.
– **Before starting maintenance work the Condair OEM must be switched off as described in chapter 6.4 and secured against accidental switching on.**

7.1 Instructions for Maintenance

To maintain operational safety the Condair OEM steam humidifier must be maintained at regular intervals. This is differentiated between the **first maintenance after approx. 500 operating hours "I"**, **steam cylinder maintenance after the yellow LED lights up "II"** (only on units equipped with ECCM control) and **annual maintenance "III"**.

Below you will find a summary of the work to be carried out for each of the three maintenance stages.

Components	**Interval**			**Work to be done**
	I	**II**	**III**	
Cleanable steam cylinder Type D..	X	X	X	Clean steam cylinder and electrodes and check for damage, replace if necessary. Note: The steam cylinder must be replaced after a maximum operating time of 5,000 hrs. (see also chapter 7.2).
Electrode plug	X	X	X	Check to see firmly positioned (remove cover and tighten fixing screw with hexagonal head socket wrench). **Warning!** This work should only be carried out by an electrician.
Replacement steam cylinder Type A..		X		Remove and replace.
Drain valve			X	Remove, disassemble and clean, replace if necessary.
Drain duct from unit			X	Inspect, clean if necessary.
Drain pipe inclus. siphon			X	Inspect, clean if necessary (decalcify and rinse out).
Steam installation	X		X	Inspect steam and condensate hoses for cracks and to see that they are correctly attached, replace faulty hoses.
Water installation	X		X	Inspect water hoses in the unit for cracks and to see that they are correctly attached, replace faulty hoses Check supply pipe is tight, make tight if necessary. Clean water filter, if available.
Electrical installation	X		X	Check all cables in the unit are firmly positioned and examine status of insulation.

7.2 Replacement/cleaning of steam cylinders

Life time

The life time of the steam cylinders and electrodes depends on various factors (water quality, conductivity, average steam output).

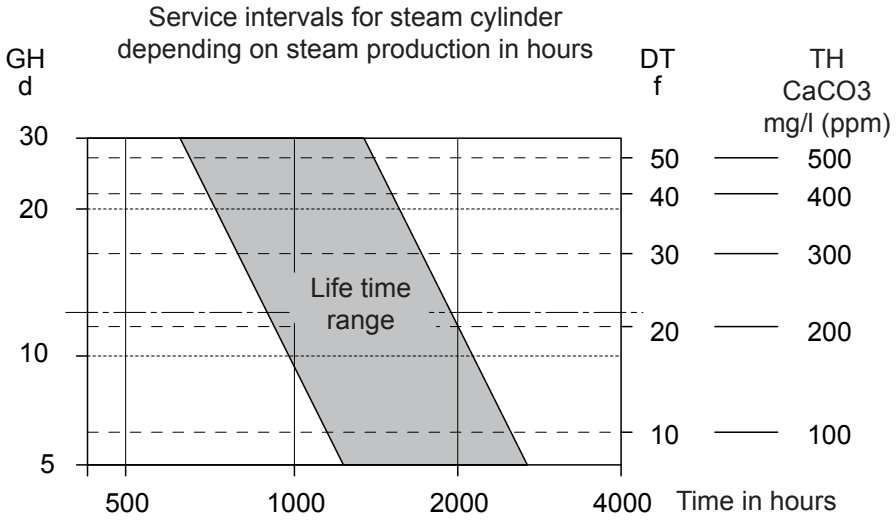
The following apply in general: When the yellow LED (only on units equipped with ECCM control) lights up:

– Replacement steam cylinder **Type A**... **should be replaced**.

– Cleanable steam cylinder **Type D... should be cleaned**, or replaced if the maximum life time (5,000 hrs) has already been reached.

Note: Only the cleanable steam cylinder Type D... can be cleaned. The replacement steam cylinder Type A... must always be replaced on expiry of the tool life.

The following diagram gives you guide values for the tool life of the replacement steam cylinder and the cleaning intervals for the cleanable steam cylinder.



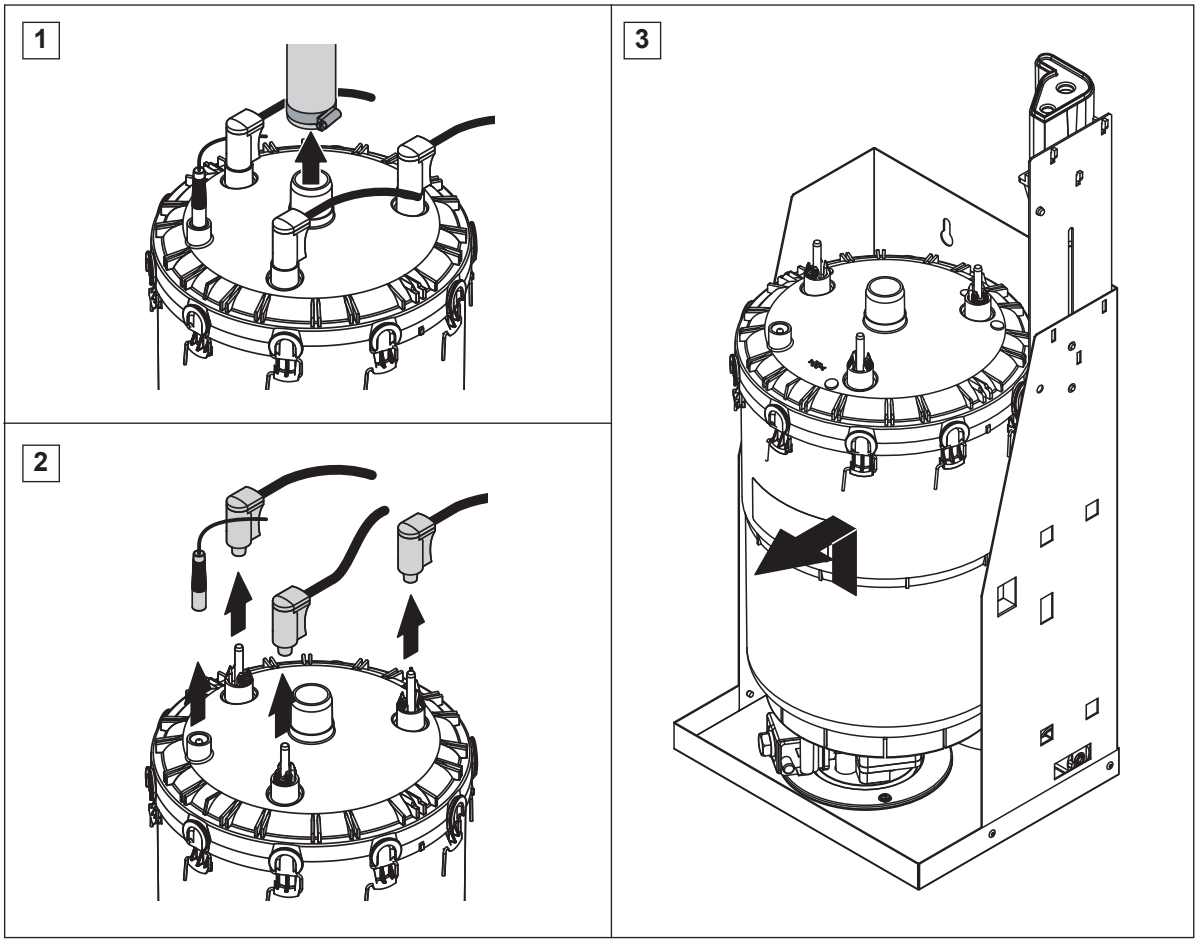
GH: Gesamthärte
DT: Dureté totale
TH: Total hardness

7.3 Removing and installing parts

Warning! Before starting to remove parts, the steam humidifier must be **switched off** as described in chapter 6.4 **and secured against accidental switching on.**

Warning - danger of burning! If steam was produced until shortly before switching off, the **steam cylinder will be hot**. Therefore you should wear well-insulated gloves or wait until the steam cylinder is cool to remove parts.

Removal and installation of the steam cylinders



1. Release hose clamp on the steam hose using screwdriver and detach hose upwards from the steam connection.
2. Detach plug on electrode cable and on the sensor cable.
3. Carefully push steam cylinder upwards from the holding devices on the side or the rear respectively and take out from front.

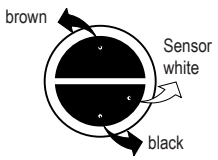
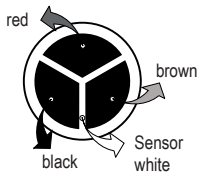
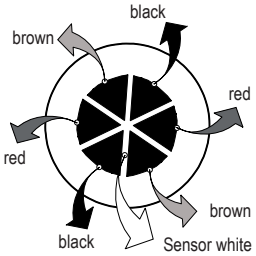
Warning! Put steam cylinder down carefully.

Installation of the steam cylinder follows the reverse sequence. **Please note the following instructions**:

– Before installation of the steam cylinder in the unit check the O-ring in the drain valve for damage and replace if necessary.

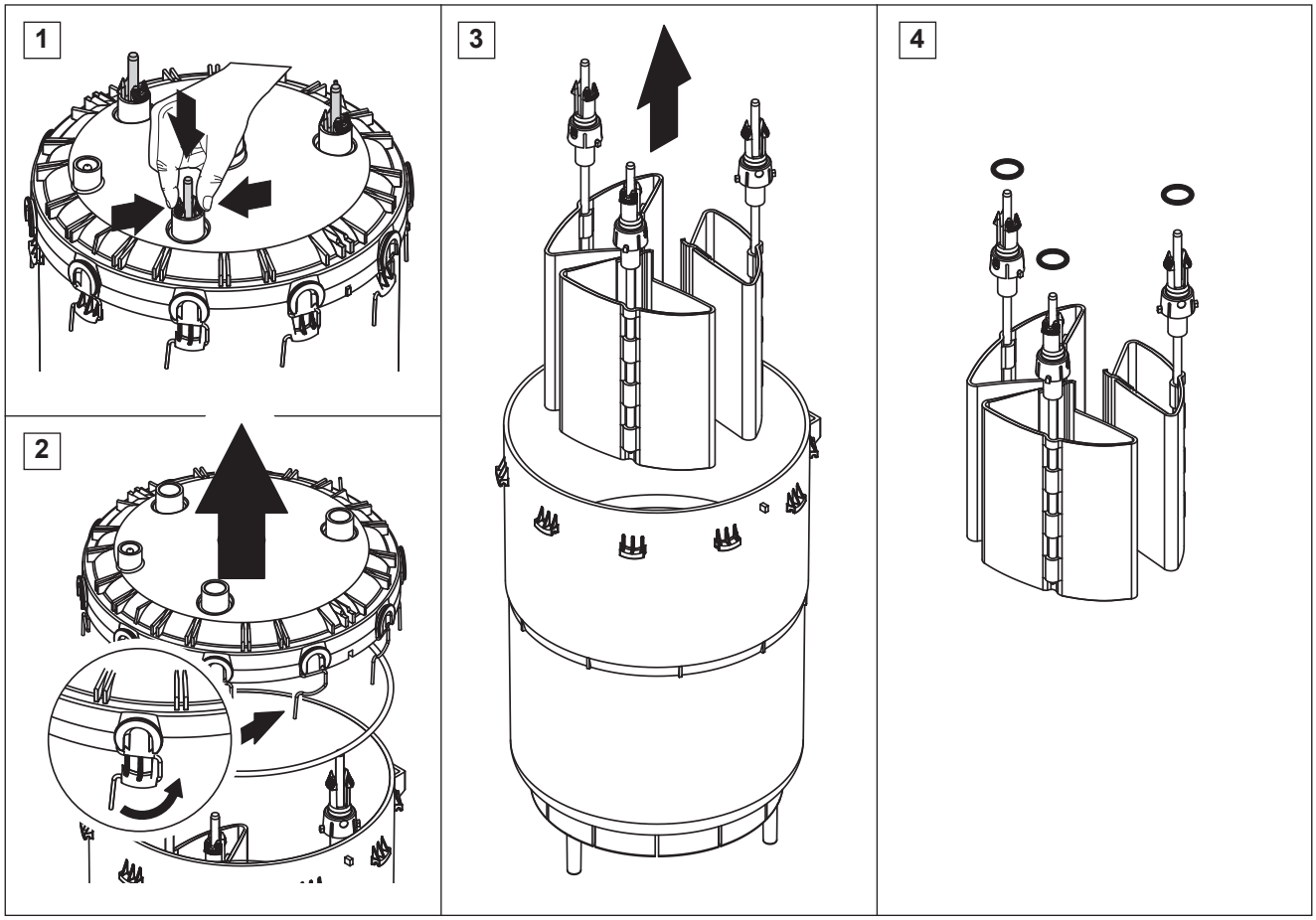
– Place steam cylinder in the holding devices on both sides of the unit or the rear respectively. Carefully push steam cylinder downwards into the drain valve until it stops.

– Mount the plugs of the electrode and sensor cables according to the following table to the respective electrode or sensor connections.

	Steam cylinder type		
	A140 A240 A/D342	**A/D343 A/D363 A/D444 A/D464**	**A/D654 A/D644 A/D664 A/D674**
Cable configuration			

– Fasten steam hose on steam connector of the cylinder with hose clamps. A leaky steam hose can cause damp damage in the interior of the unit.
Caution–Danger of damage! Do not overtighten the hose clamp on the steam connector of the steam humidifier.

Disassembly and assembly of the cleanable steam cylinder type D...



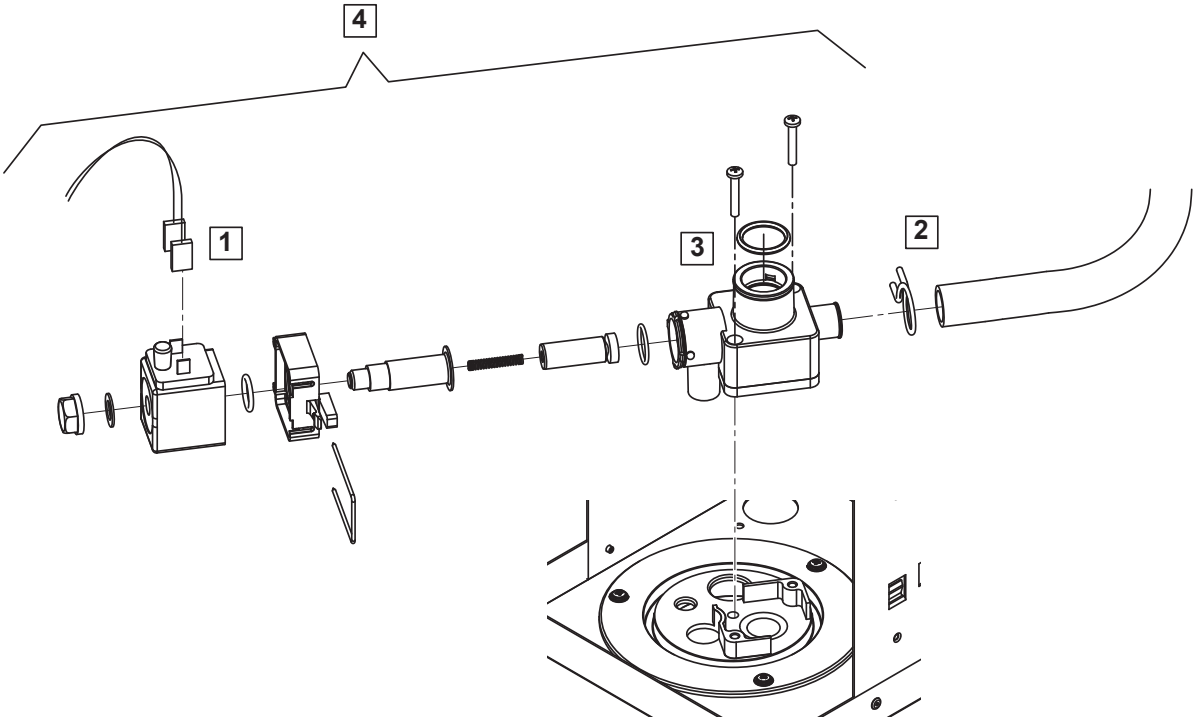
1. Fasten electrode snap fastenings and push electrodes approx. 2 cm downwards into the steam cylinder.
2. Release clamp clips of the cylinder cover and raise cover.
3. Remove carefully electrodes by lifting upwards.
4. Remove O-rings from the electrodes.
   Note: Intact O-rings can be reused.

The **assembly** of the cleanable steam cylinder follows the reverse sequence. **Please note the following instructions**:

– Before assembling of the steam cylinder check all O-rings for damage and replace if necessary.
– Place O-rings on the electrodes. Insert electrodes in steam cylinder cover. Snap fastening must engage.
– Mount cylinder cover in the correct position (align the two cams on the steam cylinder body with the corresponding grooves in the cylinder cover, do not forget the O-ring) and fast cover with clamp clips.

Removal and installation of drain valves

The steam cylinder has to be removed first, as already described, before removing the drain valve.

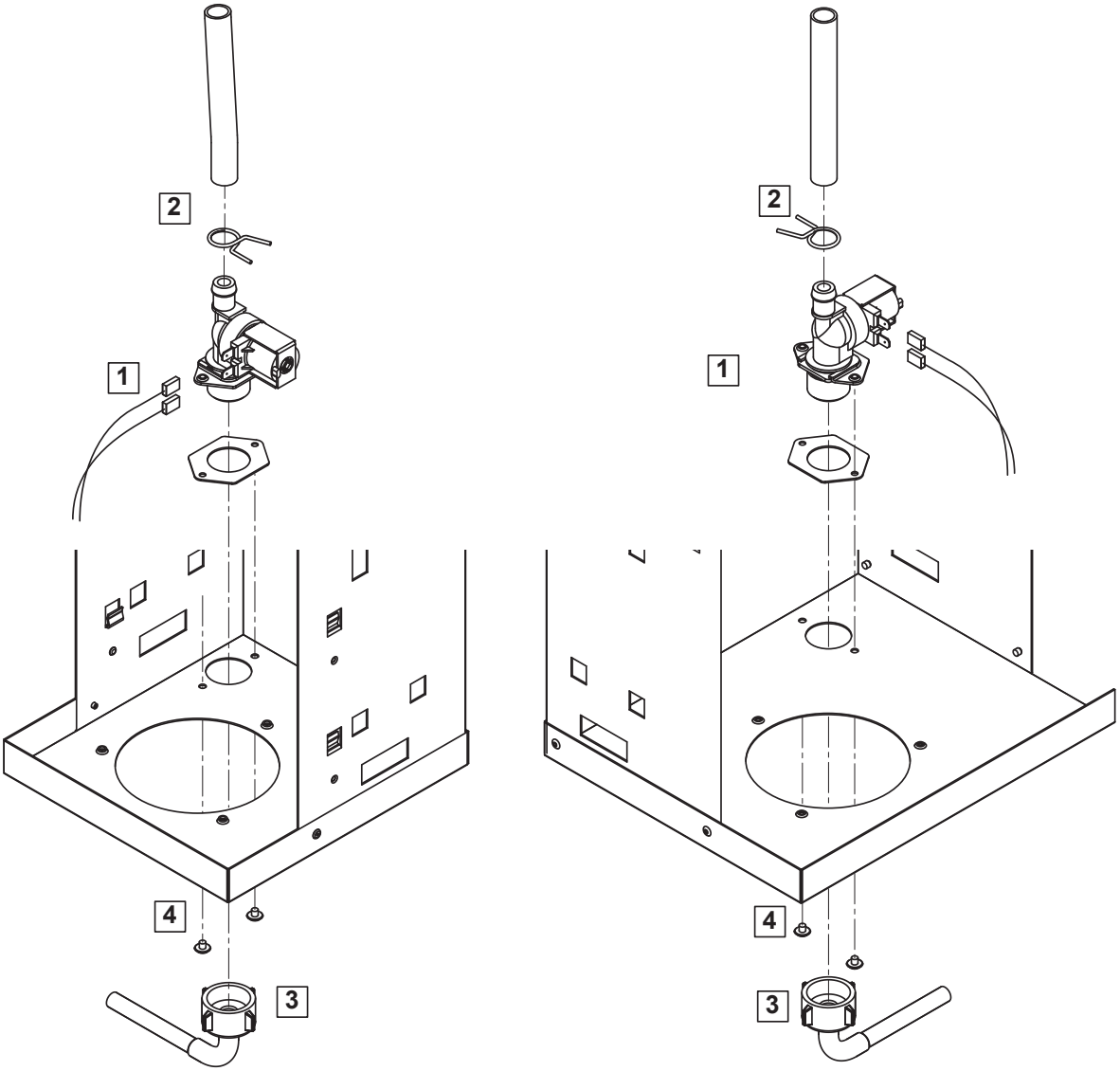


1. Detach electric cable.
2. Release hose clamp and detach filling hose.
3. Release two fixing screws using Philips screwdriver and remove drain valve.
4. Disassemble drain valve.

Installation of the drain valve follows the reverse sequence.

Removal and installation of the inlet valve

The steam cylinder must not be removed, before removing the inlet valve.



1. Detach electric cable.
2. Release hose clamp and detach hose.
3. Release union nut of water supply pipe and remove.
4. Release two fixing screws using Philips screwdriver and remove inlet valve.

Installation of the inlet valve follows the reverse sequence.

7.4 Instructions for cleaning

Cleaning the steam cylinder Type D...

Details on cleaning the cleanable steam cylinders Type D... can be found in the separate documentation to this unit component.

- Knock off any limescale as much as possible.
  Note: If the parts are heavily calcified, place them in an 8% formic acid solution, until the limescale disintegrates.
- Then wash parts with a hand-wash temperature soap solution and rinse well.

Cleaning the interior of the unit

Wipe components in the interior of the unit with a damp cloth without cleaning agent. Heavily calcified parts, e.g. the drain duct, the drain valve and the inlet valve may be cleaned with **normal cleaning and decalcifying agents**.

⚠ **Warning!** Take care that the electrical connections and the electronic components remain dry.

Notes on the cleaning agent

The instructions for use of the cleaning agent must be observed and followed. In particular: details on personal safety, environmental safety and all restrictions on use.

⚠ The use of disinfectants is only permitted if they do not leave any toxic residues. The parts must be thoroughly rinsed with water after cleaning.

Warning! Do not use any solvents, aromatized or halogenized hydrocarbons or other aggressive substances.

Always maintain **local environmental regulations.**

7.5 Resetting maintenance indication (units with ECCM control only)

After completing maintenance work, the maintenance indication can be reset as follows:

- Press drain key with the unit switched off and hold down.
- Switch on steam humidifier using On/Off switch.
- Hold drain key down until the system test is completed (approx. 10 seconds).

8 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 steam hose connection has not been properly executed, or the fault lies with the humidity control system.

8.1 Fault indication (units with ECCM control only)

LED on control unit ECCM		Description
yellow	red	
blinks permanently	——	Drain/info key has been pressed shortly
lights	——	Steam cylinder maintenance due or maintenance indication not reset.
lights	lights	Steam cylinder maintenance not executed or maintenance indication not reset.
——	lights	Fatal malfunction.

If the yellow or red LED lights/blinks, **press drain/info key (at least 3 seconds) until yellow (“Warning”)** or **red (“Error”) LED starts blinking intermittently**. The amount of “blinks” per interval indicates the type of malfunction.

– **Yellow LED “Warning” blinks intermittently**

  A malfunction is present. The control unit checks whether there is a temporary problem (e.g. water supply interrupted for a short time) or whether it can resolve the problem by taking necessary measures. Such malfunctions set the unit into the **“fault elimination status”**.

– **Red LED “Error” blinks intermittently**

  The control unit, after several attempts, fails to solve the problem (number of attempts depends on the type of malfunction) or the problem obstructs further operation. In this case the heating voltage is interrupted via the main contactor.

8.2 Troubleshooting guide (units with ECCM control only)

"Warning" yellow LED blinks	"Error" red LED blinks	Cause	Remedy
1x Safety circuit open	---	Ventilator interlock open. Air flow monitor activated. Safety humidistat activated.	If applicable, check/turn on ventilation system. Check ventilator/filter. Wait, if applicable, check system or increase safety humidistat.
2x Max. filling level of steam cylinder reached	---	Water conductivity too low (after initial operation). Water conductivity too low for type of steam cylinder. Phase failure heating voltage.	Wait. Select correct steam cylinder type. Check mains fuse(s) and replace if applicable.
3x Permissible filling time exceeded for more than 20 minutes (first automatic cleaning cycle)	**3x** Permissible filling time exceeded for more than 4 hours.	Current/peak-current cut-off. Water supply obstructed, water pressure too low, inlet valve defective. Excessive steam back pressure, through it water loss via filling cup. Drain valve is leaking.	See "Electric installation Condair ECCM". Open shut-off valve in the water supply pipe, clean water inlet filter, check water pressure, inspect/replace inlet valve. Inspect steam installation, install pressure compensation kit (see options). Clean/replace drain valve.
Note: if the **Jumper "L"** is **removed** from the ECCM control unit (ex factory: jumper is installed), the unit automatically triggers an error without prior warning if the admissible filling time has been exceeded for more than 20 minutes.			
4x Steam cylinder needs servicing	**4x** Interval for steam cylinder service exceeded for more than 72 hours	Interval for steam cylinder service exceeded. Mineral deposits and/or electrodes spent.	Replace steam cylinder type A, clean steam cylinder type D (see chapter 7). Important! Refer to chapter 7.5 for resetting the maintenance indicator.
Note: if the **Jumper "K"** is **installed** on the ECCM control unit (ex factory: no jumper is installed), the unit remains in warning status even if the interval time has been exceeded for more than 72 hours. No error is triggered.			
6x Electrode current to high	**6x** Electrode current to high	Steam cylinder (electrodes) defective. Faulty auto-drain function. Faulty drain valve/coil. Steam cylinder outlet obstructed. Water conductivity too high for type of steam cylinder.	Replace steam cylinder or electrodes Inspect installation/control system. Replace drain valve/coil. Clean/replace steam cylinder. Select correct steam cylinder type.
7x Foam detection in the steam cylinder	**7x** Foam control impossible	Formation of foam in steam cylinder.	Empty/flush steam cylinder. Set jumper on "DRN" (see "Electric installation Condair ECCM").
---	8x Main contactor jammed	Main contactor jammed in activated position.	Check/replace main contactor.
9x Drain valve blocked	**9x** Drain valve blocked	Drain valve blocked or defective. Steam cylinder outlet blocked.	Clean/replace drain valve. Clean steam cylinder outlet.
---	**10x** Rotary switch in wrong position	Rotary switch on control unit ECCM is set to an invalid position.	Set rotary switch to the position for the corresponding steam cylinder type (see "Electric installation Condair ECCM").

8.3 Instructions for fault elimination

When eliminating faults, the steam humidifier must **be taken out of operation** (see chapter 6.4).
Warning danger of death! Take care that the electricity supply to the main contactor is cut off (test with voltage tester).

Repair work and replacement of faulty components may **only** be carried out by **your Condair representative's service technician** or **personnel authorized to do the work**!

Warning! Malfunctions relating to the electrical installation must only be repaired by authorized personnel.

Electrical components are very sensitive to electrostatic discharge. Measures must be taken to protect these components against electrostatic discharge during all repair work (ESD protection).

Only use original spare parts from your Condair supplier for the replacement of faulty components.

8.4 Replacement of fine-wire fuse on the control unit ECCM

Warning: Danger of death! Before changing the fuse on the control unit ECCM, the Condair OEM **must be switched off and secured against unintentional reconnection** as described in chapter 6.4. Take care that the electricity supply to the control unit ECCM is disconnected (check with voltage tester).

Important! If the fine-wire fuse on the control unit ECCM blows this is usually due to a faulty coil of the inlet or drain valve or the main contactor. Therefore you should test these components before replacing the fuse.

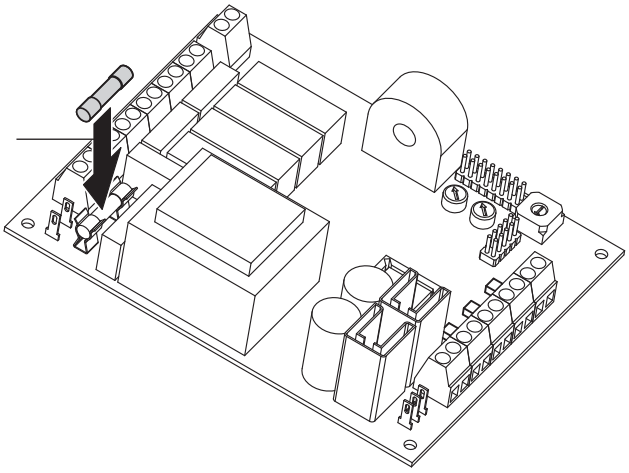
Only use a fuse of the given type with the specified nominal current strength to replace the fuse on the control unit ECCM

Warning! It is not permitted to use repaired fuses or to short-circuit the fuse holder.

(**250 mA, slow acting for 230 VAC version**)

or

(**2 A, slow acting for 24 VAC version**)



8.5 Resetting fault indication (units with ECCM control only)

In order to return the steam humidifier to operation after fault elimination ("Error", red LED lit), the **steam humidifier must be switched off for approx. 5 seconds and then switched on again.**
Note: Resetting maintenance indication see chapter 7.5.

9 Technical data

Heating voltage 230V/1N~/50..60Hz							
Model Condair OEM...		**OEM 140**	**OEM 240**	**OEM 342**			
Steam capacity kg/h		2	4	8			
Max. power consumption in kW		1.5	3	6			
Heating voltage 230V/1N~/50..60Hz							
Model Condair OEM...			**OEM 263**	**OEM 363**	**OEM 464**	**OEM 674**	**OEM 664**
Steam capacity kg/h			4	8	15	25	45
Max. power consumption in kW			3	6	11.3	18.8	33.8
Heating voltage 230V/1N~/50..60Hz							
Model Condair OEM...			**OEM 243**	**OEM 343**	**OEM 444**	**OEM 654**	**OEM 644**
Steam capacity kg/h			4	8	15	21	30
Max. power consumption in kW			3	6	11.3	15.8	22.5
Control voltage		230 VAC/50...60 Hz or 24 VAC/50...60 Hz					
Operating conditions							
Admissible water pressure		1...10 bar					
Water quality		Drinking water with a conductivity of 125 - 1250µS/cm					
Admissible water temperature		1...40 °C					
Admissible ambient temperature		1...50 °C (Control unit 1...40 °C)					
Admissible ambient humidity		max. 75 %rh, non-condensing					
Admissible duct air pressure		-0.5kPa..1.0kPa (Condair OEM 4.. and OEM 6.. with pressure compensation set only)					
Type of protection		IP00					
Conformity		produced according VDE regulations 0700 and 0700 part 98					
Equipment/Dimensions							
Steam cylinder type	A1..	x					
	A2..		x				
	A3../D3..			x			
	A4../D4..				x		
	A6../D6..					x	x
Housing (WxHxD) in mm		192x333x206	192x417x206	192x497x206	269x705x243	329x793x330	329x793x330
Net weight in kg		3	3	3	4	9	9
Operating weight in kg		8	8	20	26	49	49
Options							
Control unit ECCM (on/off control and continous control)		x	x	x	x	x	x
Plug and cable set	A	x					
	D		x	x			
	CP				x	x	x
Accessories							
Steam nozzle	W21	x	x				
Steam distribution pipe	41-..	x	x	x			
	61-..				x		
	81-..					x	x
Steam hose / meter	DS22	x	x	x			
	DS60				x		
	DS80					x	x
Condensate hose / meter	KS10	x	x	x	x	x	x

CONSULTING, SALES AND SERVICE:

Solutions for Indoor Climate

Reg.No. 40002-2

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www.waltermeier.com, international.climate@waltermeier.com