Steam humidifier

Condair CP2

Technical Documentation

1115657 EN 0210

condair®

Contents

1 Introduction

1.1 To the very beginning

We thank you for having purchased a **steam humidifier Condair CP2**.

The steam humidifier Condair CP2 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 CP2, please **observe and comply with all information and safety instructions contained in the present technical documentation**.

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 technical documentation

Limitation

The subject of this technical documentation is the steam humidifier **Condair CP2** 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.

This technical documentation is restricted to:

– the **planning** of a humidifying system that is to be equipped with a steam humidifier Condair CP2

– the **installation, commissioning, operation** and **servicing** of the steam humidifier Condair CP2

The technical documentation is 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 the technical documentation.

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 this technical documentation 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

This technical documentation is available in various languages. Please contact your Condair supplier for information.

2 For your safety

Intended use

Steam humidifiers Condair CP2 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 CP2 is to be used in a steam-bath.

General safety instructions

- The steam humidifier Condair CP2 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 CP2 is operated with mains voltage. Before commencing work** on the Condair CP2, the unit is to be **rendered inoperative** in accordance with section 6.3 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**
- 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 CP2 should immediately **be shut down and secured against accidental power-up**. This can be the case under the following circumstances:

  - if the Condair CP2 is damaged
  - if the Condair CP2 is no longer operating correctly
  - if connections and/or piping are not sealed or cables are loose
- The Condair CP2 must **only be operated under the specified operating conditions** (see section 7).
- The Condair CP2 is protected according to IP20. Make sure the units are installed in a drip-proof location
- **Caution!** If the Condair CP2 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 CP2 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 CP2, the accessories and the options without the express written consent of Axair Ltd.

3 Product Overview

3.1 The various models

Steam air humidifiers Condair CP2 are available in a variety of models with different heating voltages and steam capacities ranging **from 1 kg/h up to 180 kg/h max.**.
Depending on the steam capacity a system consists of **1 to 4 basic units max.**. Systems with **multiple basic units** are interconnected via a so-called **BUS** and are operated in **Master/Slave mode**.

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

Heating voltage Volt/System	Steam capacity kg/h	Model Condair CP2	Unit size / Number of basic units		
			small	medium	large
230V/1N~/50…60 Hz	1…4	N4 [1]	1x		
	1…4	H4 [2]	1x		
	5…8	H5…H8 [3]		1x	
400V/3~/50…60 Hz	5…8	F5…F8 [3]		1x	
	9…15	F9…F15 [3]		1x	
	16…45	F16…F45 [3]			1x
	46…60	F46…F60 [3] [4]		1x	1x
	61…90	F61…F90 [3] [4]			2x
	91…105	F91…F105 [3] [4]		1x	2x
	106…135	F106…F135 [3] [4]			3x
230V/3~/50…60 Hz	5…8	G5…G8 [3]		1x	
	9…15	G9…G15 [3]		1x	
	16…30	G16…G30 [3]			1x
	31…45	G31…G45 [3] [4]		1x	1x
	46…60	G46…G60 [3] [4]			2x
	61…75	G61…G75 [3] [4]		1x	2x
	76…90	G76…G90 [3] [4]			3x

[1] Model N4 with integrated fan unit

[2] Model H4 for operation with steam nozzle (W21) or steam distribution pipe (41-..)

[3] Models H5…H8, F... and G... for operation with fan unit (FAN...) or steam distribution pipe (41-.. / 61-.. / 81-..)

[4] Systems with multiple units for operation in Master/Slave mode (module M3 or M4 is mandatory for multiple units, see chapter 4.2)

Note: Data provided in the table is limited to systems with a maximum of 3 basic units. To obtain information on models with higher capacities or different heating voltages, please contact your Condair supplier.

The steam humidifiers Condair CP2 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 CP2 with partially softened water, please contact your Condair distributor.**
The steam humidifiers Condair CP2 are equipped, as standard, with an **exchangeable steam cylinder** and are configured for **On/Off-** or **IQ-continuous control** (only for units with steam capacity >5 kg/h) via a **humidistat**. Depending on the selected module M (option) the steam humidifier can also be operated with **continuous control**. The equipment can be supplied with various other options.

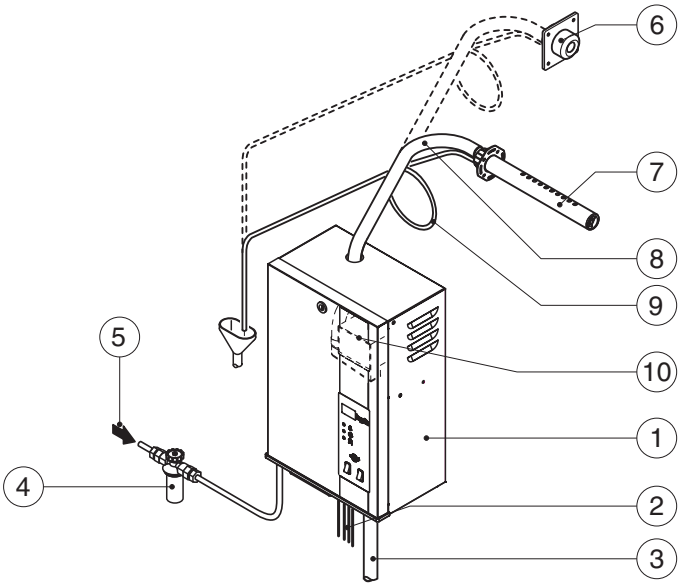
3.2 Delivery

The delivery includes:

- Steam humidifier Condair CP2 compl. (according to the model designation), equipped with the desired options.
  Note: Desired options (cleanable steam cylinder, module M, etc.) must be specified separately when ordering. Detailed information on this subject is found in chapter 4.2.
- Water connection pipe with union nut G3/4" and nipple 1/2"
- Drilling template (printed on the packing)
- Mounting set including dowels and screws
- Technical documentation
- Installation instructions
  - yellow: electrical installation
  - white: adjusting the parameters
- Spare parts list (pink)
- 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.

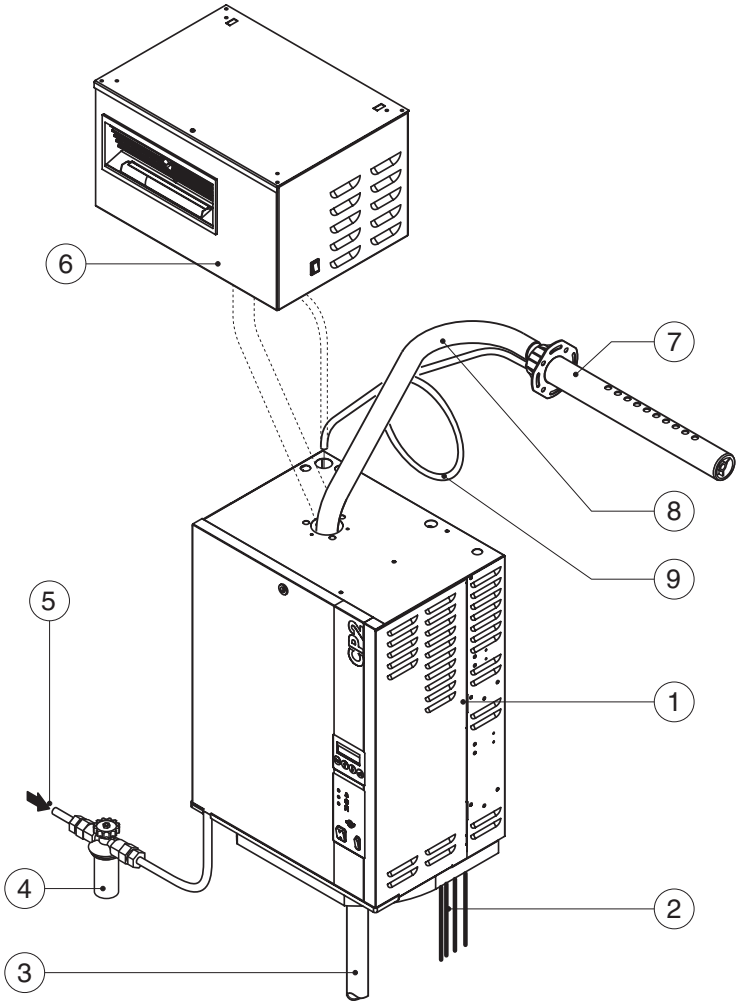
3.3 Humidification system overview

Models N4 and H4



1 Steam humidifier (N4/H4)
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”)
7 Steam distribution pipe (accessory “41-..”)
8 Steam hose (accessory “DS22”)
9 Condensate hose (accessory “KS10”)
10 Integrated fan unit (models N4 only)

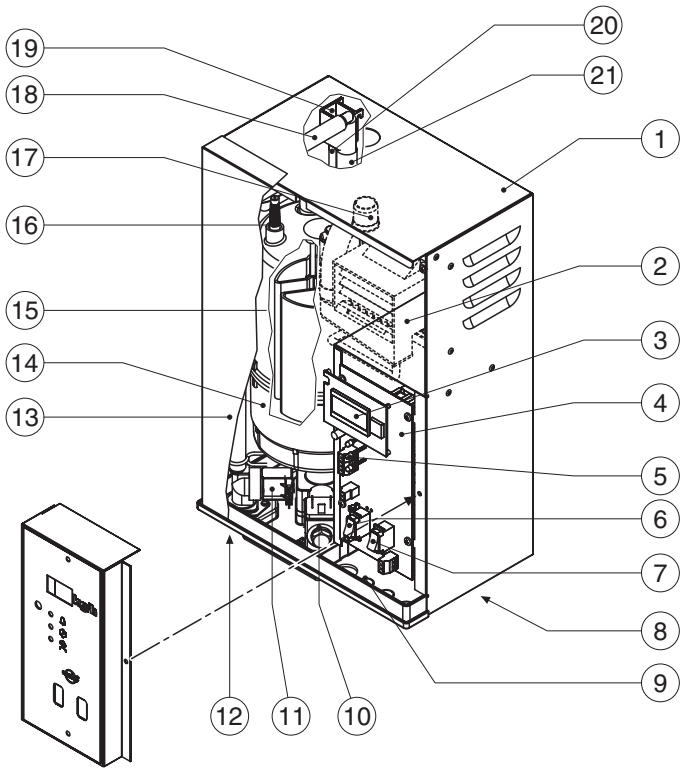
Models H5…H8, F.. and G.. (figure shows model F35)



1 Steam humidifier
2 Electrical connection
3 Water drainage Ø30 mm (accessory “DS60”)
4 Filter valve (accessory “Z261”)
5 Water supply (building side)
6 Fan unit (accessory “FAN..”)
7 Steam distribution pipe (accessory “41-../61-../81-..”)
8 Steam hose (accessory “DS60/DS80”)
9 Condensate hose (accessory “KS10”)

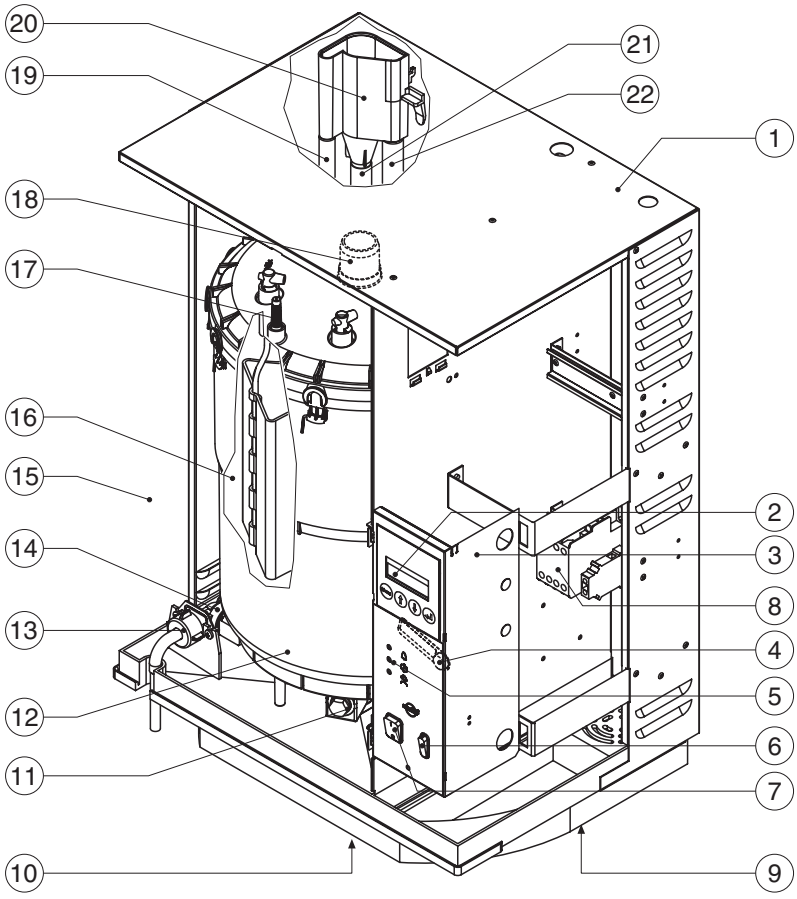
3.4 Steam humidifier construction

Models N4 and H4



1 Housing (small)
2 Integrated fan unit (models N4 only)
3 Module M (option)
4 Electronic insert
5 Status indicators (LEDs)
6 Unit switch
7 Drain/info key
8 Drain connection
9 Cable openings
10 Drain valve
11 Inlet valve
12 Water supply connection
13 Housing cover
14 Steam cylinder
15 heating electrodes
16 Level sensor
17 Steam outlet
18 Water supply hose
19 Water cup
20 Filling hose
21 Overflow hose

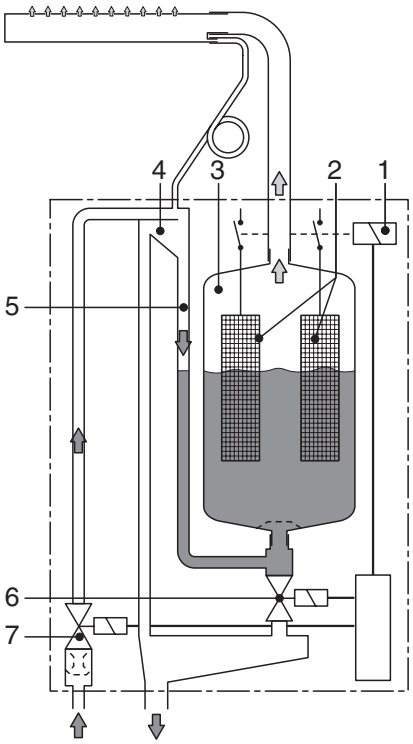
Models H5…H8, F.. and G.. (figure shows model F35)



1 Housing (medium, large)
2 Module M (option)
3 Electronic insert
4 CP2-chip
5 Status indicators (LEDs)
6 Drain/info key
7 Unit switch
8 Main contactor
9 Cable openings
10 Drain connection
11 Drain valve
12 Steam cylinder
13 Water supply connection
14 Inlet valve
15 Housing cover
16 heating electrodes
17 Level sensor
18 Steam outlet
19 Water supply hose
20 Water cup
21 Filling hose
22 Overflow hose

3.5 Functional description

The steam humidifier Condair CP2 is a **pressureless steam generator** designed for **direct or indirect room humidification**. The steam humidifier Condair CP2 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.

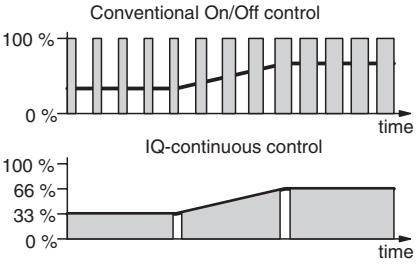
Upon reaching the requested steam capacity, the inlet valve closes. If the steam generation decreases below a certain percentage of the required capacity, due to lowering of the water level (e.g. because of the evaporation process or drainage), the inlet valve opens until the required capacity is available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

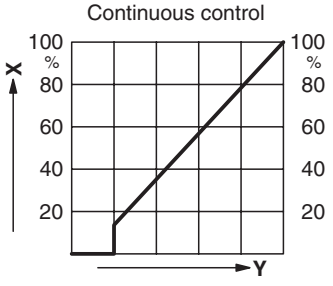
Drainage

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.



Control

On units **without the optional module M.** (standard version) the steam production is controlled via an external **humidistat (On/Off or IQ-continuous control)**.



X = Steam capacity in %
Y = Output signal of controller

On units equipped **with the optional module M.**, an additional **stepless** steam production control is employed (continuous control), with the option of using the integrated controller (applies to all modules) or an external one (applies only to modules M3 and M4). Below a minimum controllable steam output a two-point control (On/Off) is used.

Note: **Under partial load multiple units** work **sequentially** (default setting) or in **parallel**.

4 Basic planning

All the data necessary for the selection and layout of a Condair CP2 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 CP2 F30

1. Model version (heating voltage)
2. Required maximum steam capacity

4.1.1 Model version

Model version (heating voltage)

Steam humidifiers Condair CP2 are available for a variety of heating voltages (model version). The maximum obtainable steam capacity is dependent upon the type of heating voltage used.

Heating voltage	Steam capacity from…to	**Model version Condair CP2 ...**
400V/3~/50…60Hz	1...180 kg/h	**F...**
230V/3~/50…60Hz	1...120 kg/h	**G…**
230V/1N~/50…60Hz	1...8 kg/h	**H...**
230V/1N~/50…60Hz	1...4 kg/h	**N...** [1]

Condair CP2 **F**30

[1] with integrated fan unit

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

Control voltage

Condair CP2 steam humidifiers are designed for a standard **control voltage of 220…240V** (-10/+10 %).

4.1.2 Calculating the maximum required steam capacity

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

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

Condair CP2 F30

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, **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 listed formulas and values from the tables do not consider absorption or release of humidity of materials located in the room being humidified.
- It is absolutely crucial to **carefully calculate** the maximum steam capacity. Over-dimensioned steam humidifiers interfere with the control stability.
- 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 CP2.

Model Condair CP2		**N4**	**H4**	**H5...H8 F5...F8 G5...G8**	**F9...F15 G9...G15**	**F16...F45 G16...G30**	**F46...F60 G31...G45**	**F61...F90 G46...G60**	**F91...F105 G61...G75**	**F106...F135 G76...G90**
Cleanable steam cylinder (see details in chapter 4.2.2)		**–**	**–**	**D3..**	**D4..**	**D4../D6.. (depends on the size of the basic units)**				
	number	–	–	1	1	1	2	2	3	3
Module M.. (see details in chapter 4.2.2)		**M**		**M3 or M4** [1]						
	number	1	1	1	1	1	1	1	1	1
Remote operating and fault indication PCB with relay contacts for the connection of remote displays for “Operation”, “Steam”, “Fault” and “Service”.		**–**	**–**	**REL**						
	number	–	–	1	1	1	1	1	1	1
Pressure compensation kit Kit for mounting the filling cup to the unit cover when operating the steam humidifiers in systems with a duct air pressure of up to 3 kPa.		**–**	**–**	**PCK**						
	number	–	–	1	1	1	2	2	3	3
Terminal connection Separate terminals for systems where direct connection of heating voltage to main contactor (standard version) is not permitted by local regulations.		**–**	**–**	**KLS**		**KLT**				
	number	–	–	1	1	1	2	2	3	3
PG-cable gland Strain relief for electric cables		**PG40**		**PG60**		**PG80**				
	number	1	1	1	1	1	2	2	3	3
Unit housing of stainless steel		**1xR-Inox**		**1xS-Inox**		**1xT-Inox**	**1xS-Inox 1xT-Inox**	**2xT-Inox**	**1xS-Inox 2xT-Inox**	**3xT-Inox**
	number	1	1	1	1	1	2	2	3	3
Ventilator for ambient temp. up to 50°C		**–**	**–**	**TMP**						
	number	–	–	1	1	1	2	2	3	3

[1] Module M3 or M4 is mandatory for multiple units of type F46 or G31 and up

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 CP2	**F5…F8**	**F9…F15**	**F16...F25**	**F26...F45**	**F46...F60**	**F61...F90**	**F91...F105**	**F106...F135**
For water conductivity from 125 to 1250 µS/cm								
Exchangeable steam cylinder	1x A363	1x A464	1x A674	1x A664	1x A664 1x A464	2x A664	2x A664 1x A464	3x A664
Cleanable steam cylinder	1x D363	1x D464	1x D674	1x D664	1x D664 1x D464	2x D664	2x D664 1x D464	3x D664
For low water conductivity								
Exchangeable steam cylinder	1x A343	1x A444	1x A654	1x A644	1x A644 1x A444	2x A644	2x A644 1x A444	3x A644
Cleanable steam cylinder	1x D343	1x D444	1x D654	1x D644	1x D644 1x D444	2x D644	2x D644 1x D444	3x D644

Model Condair CP2	**G5…G8**	**G9…G15**	**G16...G21**	**G22...G30**	**G31...G45**	**G46...G60**	**G61...G75**	**G76...G90**
For water conductivity from 125 to 1250 µS/cm								
Exchangeable steam cylinder	1x A343	1x A444	1x A654	1x A644	1x A644 1x A444	2x A644	2x A644 1x A444	3x A644
Cleanable steam cylinder	1x D343	1x D444	1x D654	1x D644	1x D644 1x D444	2x D644	2x D644 1x D444	3x D644

Model Condair CP2	**N4/H4**	**H5…H8**
For water conductivity from 125 to 1250 µS/cm		
Exchangeable steam cylinder	1x A240	1x A342
Cleanable steam cylinder	—	1x D342

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

Modules M..

Overview modules M..

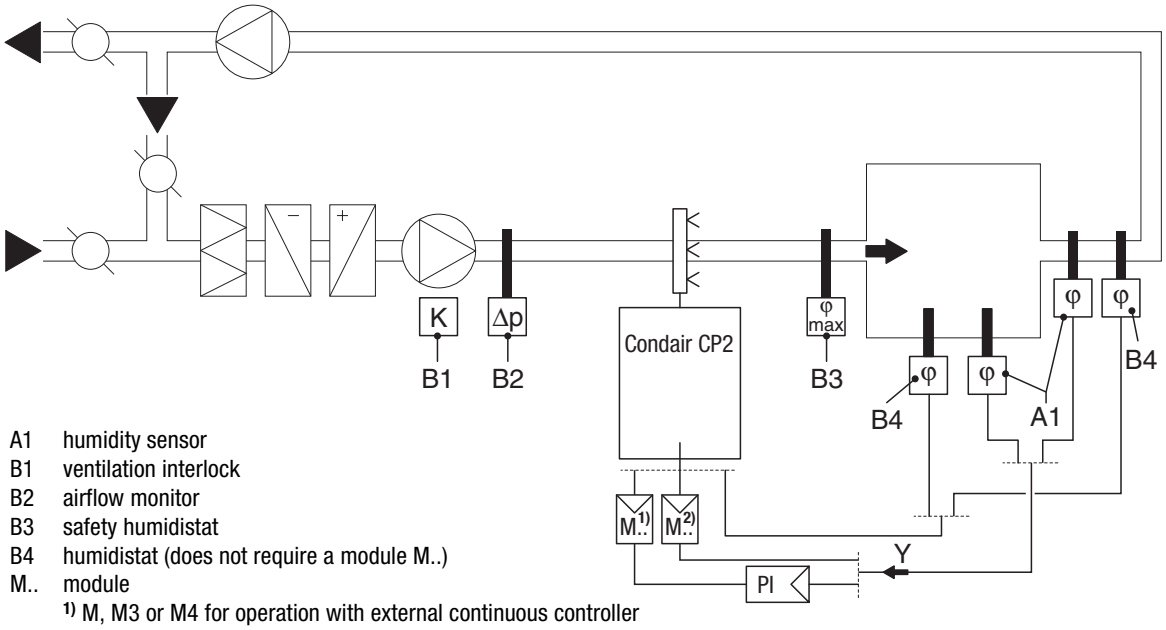
Module	Control opportunities			
	with humidistat		with continuous controller	
	On/Off	IQ	internal	external
M Module for models N4 and H4, with **numerical display** (for steam capacity and error codes) and **integrated remote fault indication** (relais contact).	X			X
M3 Module for models with steam capacities above 5 kg/h, with **numerical display** (for steam capacity and error codes) and **integrated PI-controller** with fixed settings (P= 18%, I= 480 s).	X	X	X	X
M4 Module for models with steam capacities above 5 kg/h, with **alphanumerical display** (with extended functions for indication and configuration) and **integrated PI-controller**.	X	X	X	X

Note: Module M3 or M4 is mandatory for multiple units of type F46 or G31 and up.

The various control systems

– **System 1: Room humidity control**

System 1 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 room itself or in the exhaust air duct.

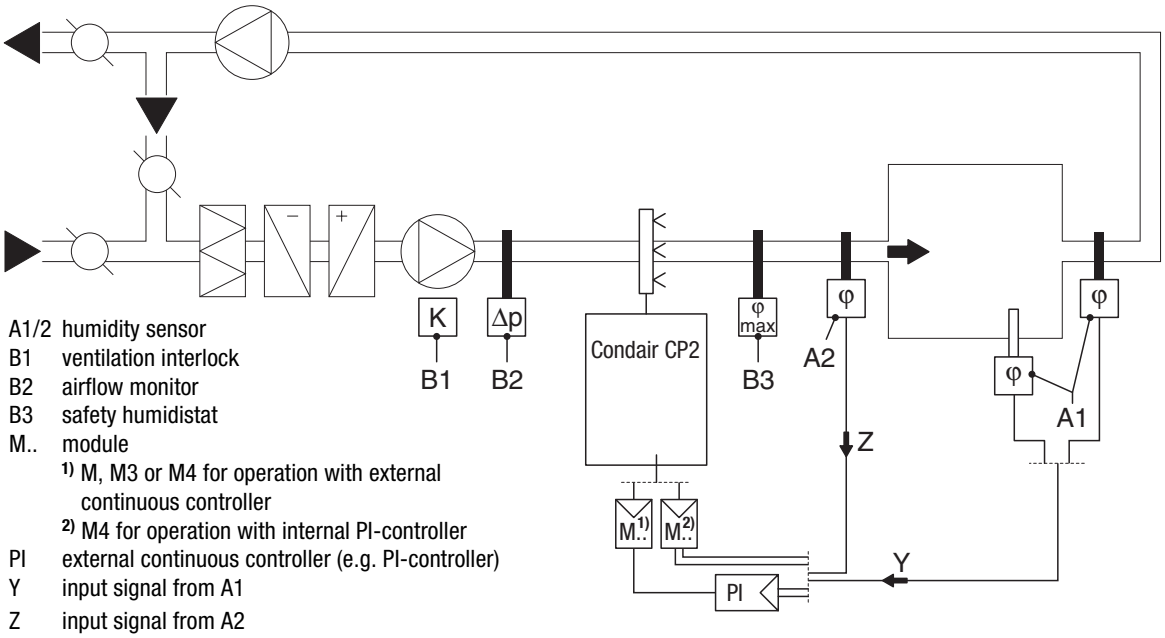


A1 humidity sensor
B1 ventilation interlock
B2 airflow monitor
B3 safety humidistat
B4 humidistat (does not require a module M..)
M.. module
1) M, M3 or M4 for operation with external continuous controller
2) M3 or M4 for operation with internal PI-controller
PI external continuous controller (e.g. PI-controller)
Y input signal from A1

– **System 2: Room humidity control with continuous limitation of the supply air humidity**

System 2 is suited for air conditioning systems with a **large porion of supply air**, **low supply air temperature**, **post-humidification**, or **variable airflow volume**. If the supply air humidity exceeds the preset value, the continuous limitation is effected prior to the room humidity control. The humidity sensor (A1) is preferably located in the exhaust air duct or in the room itself. The humidity sensor (A2) for the limitation of the supply air humidity is located in the supply air duct after the steam distribution pipe. This control system requires a continuous controller with the option to connect a second humidity sensor.

Attention! The continuous limitation of the supply air humidity is no substitute for the safety humidistat.

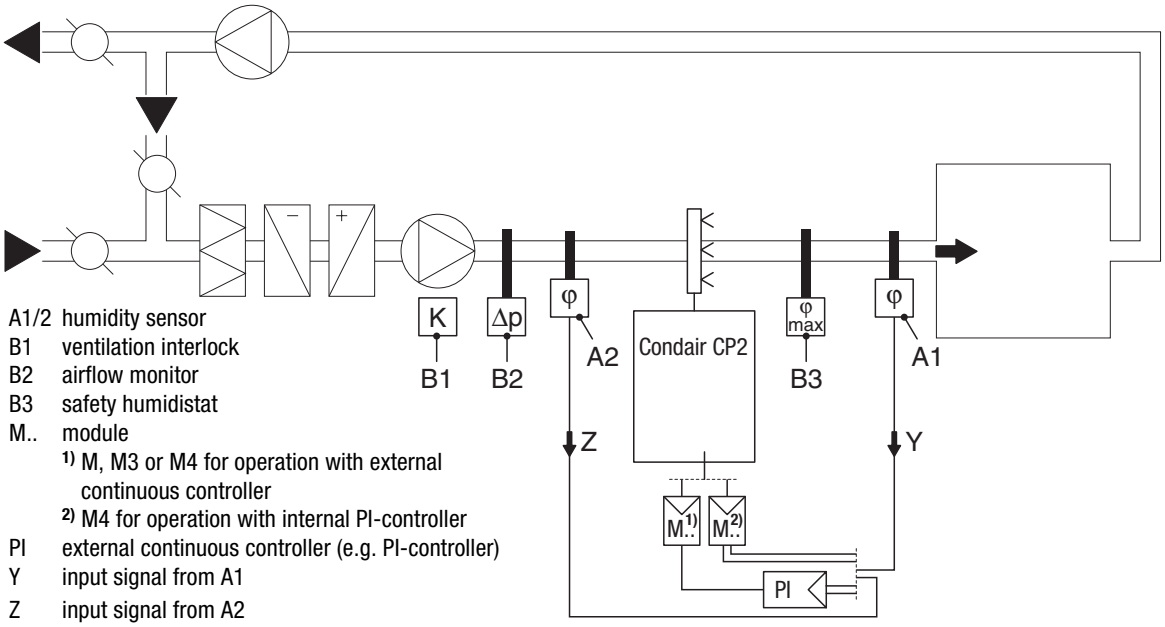


A1/2 humidity sensor
B1 ventilation interlock
B2 airflow monitor
B3 safety humidistat
M.. module
1) M, M3 or M4 for operation with external continuous controller
2) M4 for operation with internal PI-controller
PI external continuous controller (e.g. PI-controller)
Y input signal from A1
Z input signal from A2

– **System 3: Supply air humidity control with continuous output limitation**

Supply air humidity control (humidity sensor installed in supply air duct) should be used only where room humidity control is impracticable for technical reasons. Such systems always require a PI-controller.

The humidity sensor (A1) is located in the supply air duct after the steam distribution pipe. The humidity sensor (A2) for the continuous output limitation is located in the supply air duct before the steam distribution pipe. Such a system requires a PI-controller with the option to connect a second humidity sensor.



A1/2 humidity sensor
B1 ventilation interlock
B2 airflow monitor
B3 safety humidistat
M.. module
1) M, M3 or M4 for operation with external continuous controller
2) M4 for operation with internal PI-controller
PI external continuous controller (e.g. PI-controller)
Y input signal from A1
Z input signal from A2

Which humidity control system for which application?

Application	Location of the humidity sensor	
	Room or exhaust air duct	supply air duct
Air conditioning systems with:		
supply air portion up to 33%	System 1	System 1
supply air portion up to 66%	System 1 or 2	System 2 or 3
supply air portion up to 100%	System 2	System 3
Supply air humidity control	——	System 3
Direct room humidification	System 1	——

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

– Humidification of small rooms up to 200 m^3
– 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

Selecting the Module M..

Control	Control systems		
	System 1	System 2	System 3
Continuous control with external controller	M, M3 or M4	M, M3 or M4 *	M, M3 or M4 **
PI-control with internal controller	M3 or M4	M4	M4
On/Off- or IQ-continuous control	without module	——	——

* External controller requires a second sensor to be connected for limitation of supply air humidity
** External controller requires a second sensor to be connected for continuous output limitation

Input signals

Control with external controller Control signals	Control with internal PI controller Humidity sensor signals
1 ... 5 VDC	Condair SHD2 / SHR2
0 ... 10 VDC	0 ... 1 VDC
2 ... 10 VDC	0 ... 5 VDC
0 ... 16 VDC	0 ... 10 VDC
0 ... 20 VDC	0 ... 20 mA
Potentiometer 135 Ω ... 10 kΩ	
0 ... 20 mA	
4 ... 20 mA	
Humidistat	

Note: Further information regarding the input signals can be found in the separate documentation for the electric installation.

4.3 Accessories

4.3.1 Accessories overview

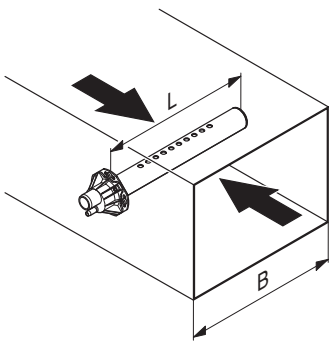
The following table presents an overview of all accessories which are available for the steam humidifier Condair CP2.

Model Condair CP2	**N4**	**H4**	**H5...H8 F5...F8 G5...G8**	**F9...F15 G9...G15**	**F16...F45 G16...G30**	**F46...F60 G31...G45**	**F61...F90 G46...G60**	**F91...F105 G61...G75**	**F106...F135 G76...G90**
Steam nozzle (details see chapter 4.3.2)	–	**W21**	–	–	–	–	–	–	–
number	–	1	–	–	–	–	–	–	–
Steam distribution pipe (details see chapter 4.3.2)	–	**1 x 41-..**	**1 x 41-..**	**1 x 61-..**	**1 x 81-..**	**1 x 61-..** **1 x 81-..**	**2 x 81-..**	**1 x 61-..** **2 x 81-..**	**3 x 81-..**
OptiSorp steam distribution system (details see chapter 4.3.2)	–	–	–	**System 1**		**System 2**		**System 3**	
number	–	–	–	1		1		1	
Fan unit (details see chapter 4.3.2)	–	–	**1xFAN15**		**1xFAN45**	**1xFAN15** **1xFAN45**	**2xFAN45**	**1xFAN15** **2xFAN45**	**3xFAN45**
Steam hose / meter	–	**1xDS22**		**1xDS60**	**1xDS80**	**1xDS60** **1xDS80**	**2xDS80**	**1xDS60** **2xDS80**	**3xDS80**
Condensate hose / meter	–	**1xKS10**				**2xKS10**		**3xKS10**	
Filtervalve	**Z261** (1 pc. per system)								
Humidistat	**all commercial models** (1 pc. per system)								
Duct air humidity sensor	–	–	**SHD2** (1-2 pcs. per system)						
Room air humidity sensor	–	–	**SHR2** (1 pc. per system)						
Humidity control potentiometer, duct	–	**HPH1000** (1 pc. per system)							
Humidity control potentiometer, room	**HRP1000** (1 pc. per system)								

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 CP2			**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

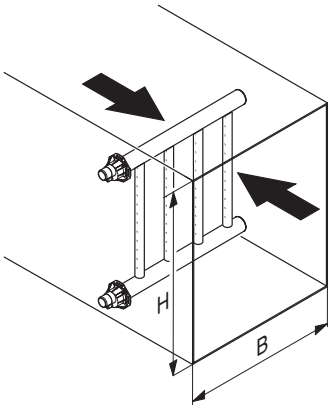
[2] special length on request

[3] up to max. 30 kg/h steam capacity

Note: If the humidification distance (see chapter 5.3.1) has to be reduced for technical reasons, the amount of steam per basic unit must be divided between two steam distribution pipes or the **steam distribution system OptiSorp** must be used. If this is the case, contact your Condair supplier.

OptiSorp steam distribution system

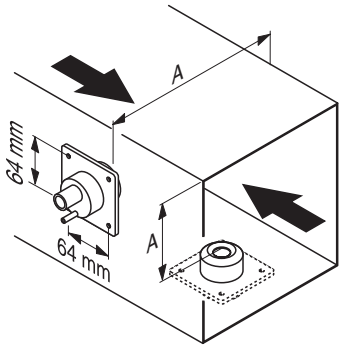
The OptiSorp steam distribution system is used in ventilation ducts with a short humidification distance (for the calculation of the humidification distance refer to chapter 5.3.1). When ordering an OptiSorp system the duct dimension must be specified. Please consult the data in the following table.



OptiSorp	Number of steam connections	Max. steam capacity in kg/h [1]	Duct dimensions	
			Width in mm	Height in mm
System 1	1	45 (30)	450...2700	450...1650
System 2	2	90 (60)	450...2700	450...2200
System 3	3	135 (90)	450...2700	800...3200
System 4	4	180 (120)	450...2700	800...3200

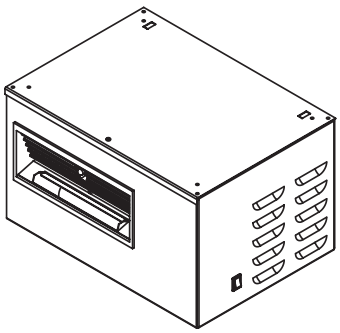
[1] For duct widths <600 mm the values in brackets apply

Steam nozzle (for models H4 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.

Fan unit



The fan units – in combination with the steam humidifiers Condair CP2 – are used for the direct room humidification. They are mounted **separately above the unit** to the wall.
The type of fan unit (FAN15 or FAN45) and the amount required is dependent on the steam capacity of the basic unit(s) and can be gathered from the table in chapter 4.3.1.

Note: Further information on the Condair FAN can be found in the separate Technical Documentation supplied with the Condair FAN.

The fan units are delivered with:

– Installation accessories including steam hose for wall mounting
– Technical Documentation Condair FAN

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 technical documentation, 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 this technical documentation 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

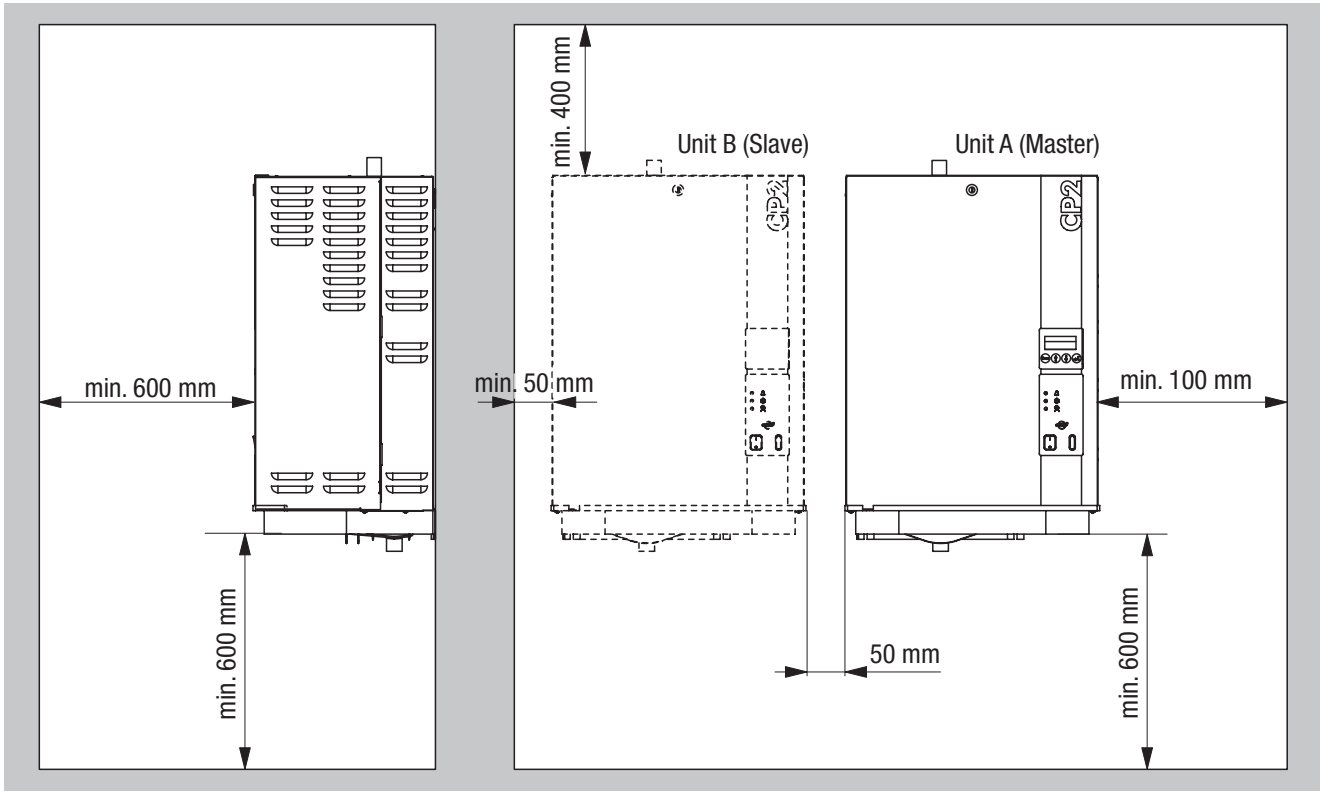
The installation site of the steam humidifier depends largely on the location of the steam distribution pipe/steam nozzle or fan unit (see chapter 5.3.1 and 5.3.2), respectively. To ensure proper functioning of the steam humidifier and to obtain an optimal efficiency, the following points must be considered 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 u**p-slope (20 %)** or **down-slope (5 %)** of the steam hose is observed (see chapter 5.3.3).
- The steam humidifiers Condair CP2 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.

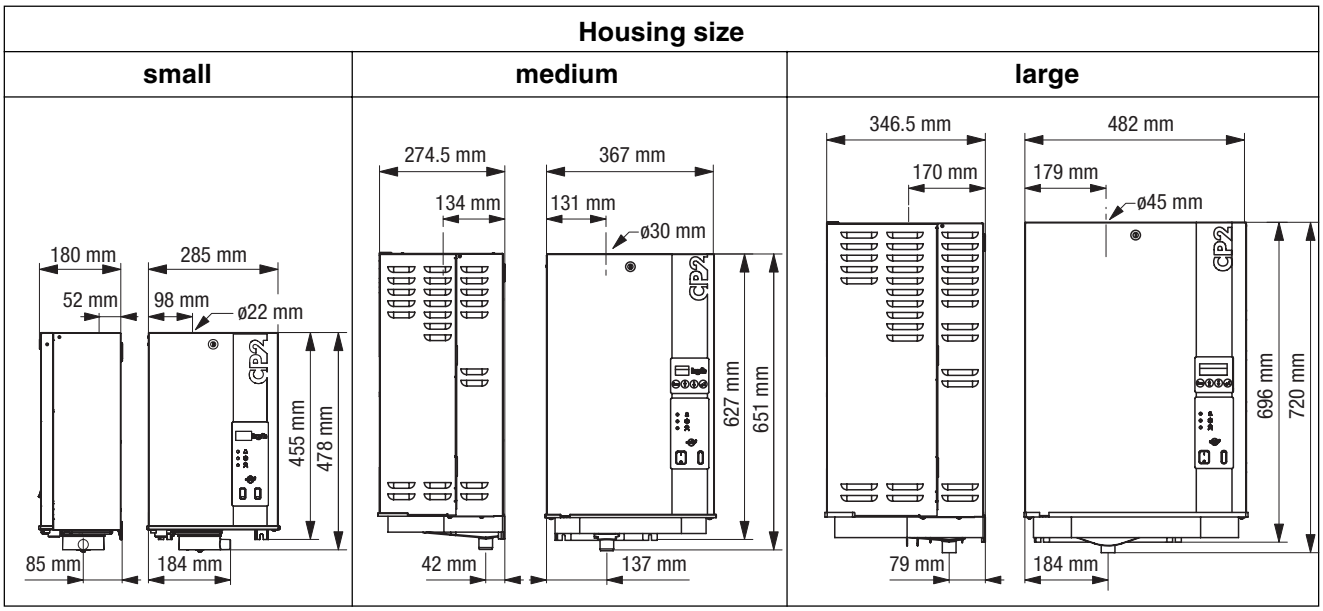
  

  Warning! Do not mount the steam humidifier directly to the ventilation duct (insufficient stability).
- The back panel of the Condair CP2 is retaining heat during operation (max. surface temperature of the metal housing approx. 60 - 70 °C). Make sure, therefore, that the construction (wall, pillar, etc.) to which the units are to be mounted, does not consist of heat-sensitive material.
- For operation involving a fan unit, the steam humidifier must always be installed lower than the fan unit.
- Install the steam humidifier in such a manner that it is freely accessible with sufficient space available for maintenance purposes (refer to the following illustration for minimum distances).

Minimum distances to observe



Dimensions

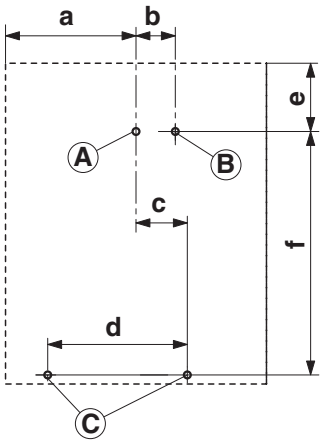


Weights

Model Condair CP2		N4	H4	H5...H8 F5...F8 G5...G8	F9...F15 G9...G15	F16...F45 G16...G30	F46...F60 G31...G45	F61...F90 G46...G60	F91...F105 G61...G75	F106...F135 G76...G90
Housing size	small	1	1	–	–	–	–	–	–	–
	medium	–	–	1	1	–	1	–	1	–
	large	–	–	–	–	1	1	2	2	3
Netweight in kg		6	6	14	15	20	1x15/1x20	2x20	1x15/2x20	3x20
Grossweight in kg		11	11	30	35	60	1x35/1x60	2x60	1x35/2x60	3x60

5.2.2 Mounting the humidifier

Caution! When fixing the Condair CP2 use **only the fixing materials supplied with the unit**. If fixing with the materials supplied is not possible in your particular case, select a method of fixing that is of similar stability. In case of doubt, please contact your Condair supplier.



Measure	Housing size		
	small	medium	large
a	92.0 mm	172.0 mm	241.0 mm
b	50.0 mm	50.0 mm	50.0 mm
c	156.0 mm	54.0 mm	82.0 mm
d	212.0 mm	190.0 mm	288.0 mm
e	40.0 mm	40.0 mm	40.0 mm
f	405.0 mm	577.0 mm	646.0 mm

- Use the supplied drilling template (printed on the packing) to mark attachment point “A” on the wall.
- Drill (Ø8 mm) hole, insert the supplied plastic plug, and tighten the screw until the distance between the wall and the screw head is 5 mm.
- Remove the front panel, hang up the unit on the screw, and use the spirit level to adjust it horizontally and vertically.
- Mark attachment points “B” and “C”. When finished, remove the unit again.
- Drill holes in accordance with diagram and insert the supplied plastic plugs.
- Hang the unit up on the screw again before attaching it with the remaining two screws. Before tightening the screws, readjust the unit with the spirit level.
- Reattach the front panel and lock it.

5.2.3 Inspecting the installed unit

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

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

☐ Is/are the unit(s) correctly aligned vertically and horizontally?

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

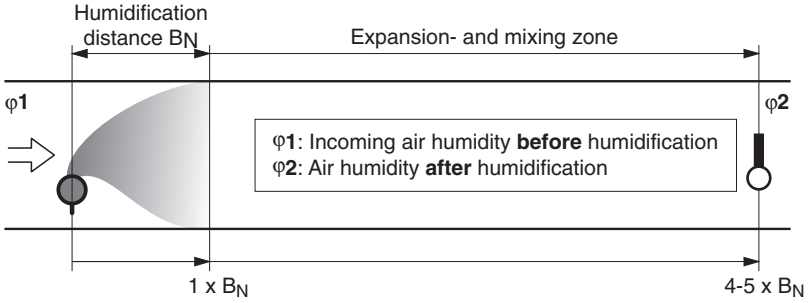
5.3 Steam installation

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 vapor, 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 **in bold print only apply to steam distribution pipes 41-../61-.. and 81-..**, the **values in brackets apply to the OptiSorp steam distribution system**.

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** (0.22)	**1.1** (0.28)	**1.4** (0.36)	**1.8** (0.48)	**2.3** (0.66)	**3.5** (1.08)
10	**0.8** (0.20)	**1.0** (0.26)	**1.3** (0.34)	**1.7** (0.45)	**2.2** (0.64)	**3.4** (1.04)
20	**0.7** (0.16)	**0.9** (0.22)	**1.2** (0.30)	**1.5** (0.41)	**2.1** (0.58)	**3.2** (0.96)
30	**0.5** (0.10)	**0.8** (0.17)	**1.0** (0.25)	**1.4** (0.36)	**1.9** (0.52)	**2.9** (0.88)
40	**–**	**0.5** (0.11)	**0.8** (0.20)	**1.2** (0.30)	**1.7** (0.45)	**2.7** (0.79)
50	**–**	**–**	**0.5** (0.13)	**1.0** (0.24)	**1.5** (0.38)	**2.4** (0.69)
60	**–**	**–**	**–**	**0.7** (0.16)	**1.2** (0.30)	**2.1** (0.58)
70	**–**	**–**	**–**	**–**	**0.8** (0.20)	**1.7** (0.45)

For duct widths <600 mm the humidification distance for the OptiSorp system increases by approx. 50%

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

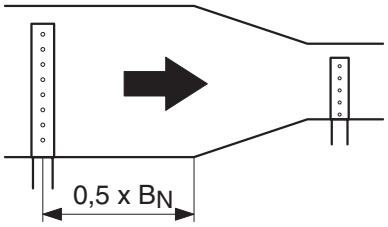
Example	
given:	φ1= 30 %rh, φ2= 70 %rh
humidification distance B_N:	**1,4 m** (0.36 m for steam distribution system OptiSorp)

Note: If the humidification distance has to be reduced for technical reasons, the amount of steam per basic unit must be divided between **two steam distribution pipes** or the **steam distribution system OptiSorp** must be used. If this is the case, contact your Condair supplier.

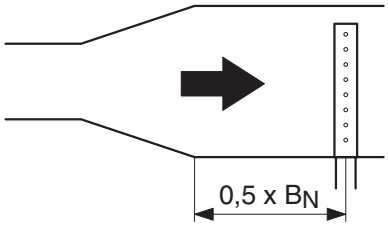
Minimum distances to be observed

To prevent the water vapor, 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").

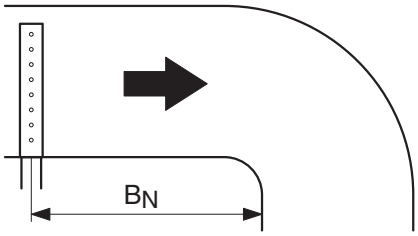
before/after constriction



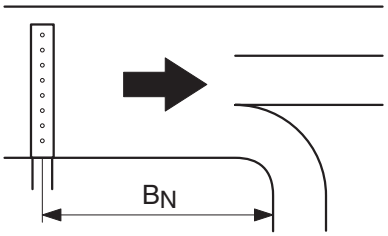
after expansion



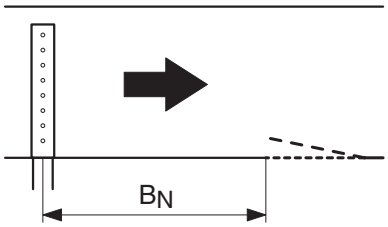
before bend



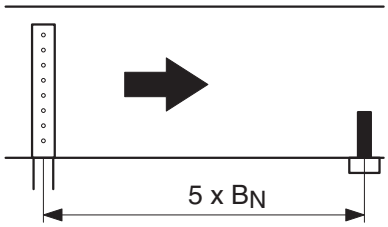
before branch



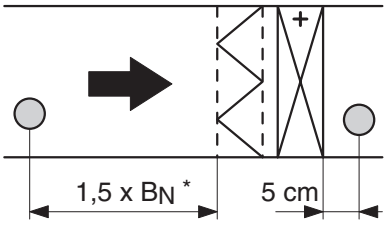
before diffuser



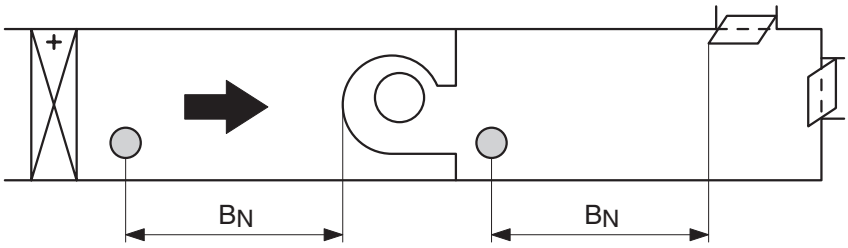
before control sensor



before/after filter/register



before/after fan, zone exit



2,5 x B_N before aerosol filter

Installation notes and dimensions

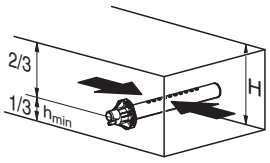
The steam distribution pipes are designed for either **horizontal** installation (on the duct wall) or, with accessories, for **vertical** installation (in the duct floor). The **outlet orifices should always point upwards and at right angles to the airflow**.

If possible, the steam distribution pipes should be installed on the **pressure side** of the duct (**max. duct pressure 1500 Pa**). If the steam distribution pipes are installed on the suction side of the duct, the **maximum vacuum must not exceed 800 Pa**.

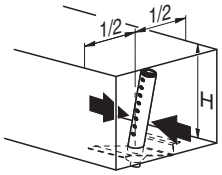
Select a location for the installation, tailored to suit your duct (see the following illustrations) and position the steam distribution pipes in the duct so that a uniform distribution of steam is achieved.

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

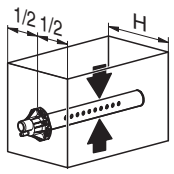
f_{min}= 150 mm
g_{min}= 100 mm
h_{min}= 85 mm



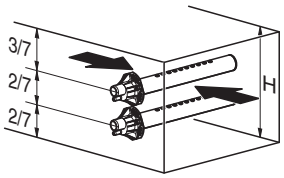
min H= 250 mm



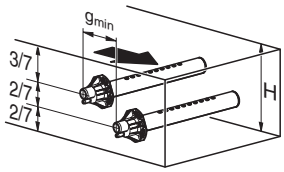
H ≥400 mm



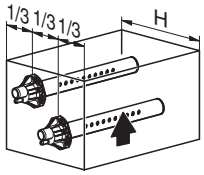
min H= 200 mm



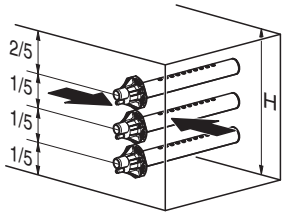
min H= 400 mm



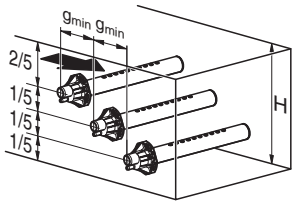
min H= 350 mm



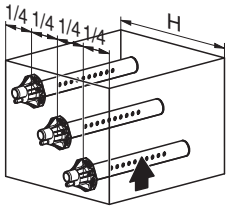
min H= 300 mm



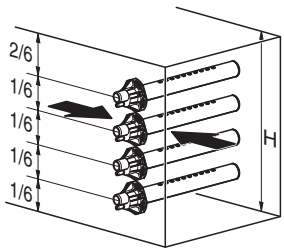
min H= 600 mm



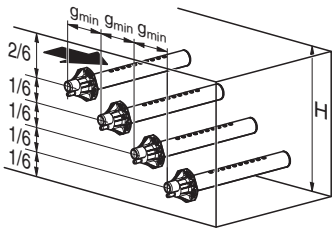
min H= 500 mm



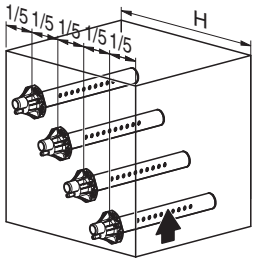
min H= 400 mm



min H= 720 mm



min H= 600 mm



min H= 500 mm

Note: When locating the OptiSorp steam distribution system please note the instructions in the separate documentation for this product.

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.

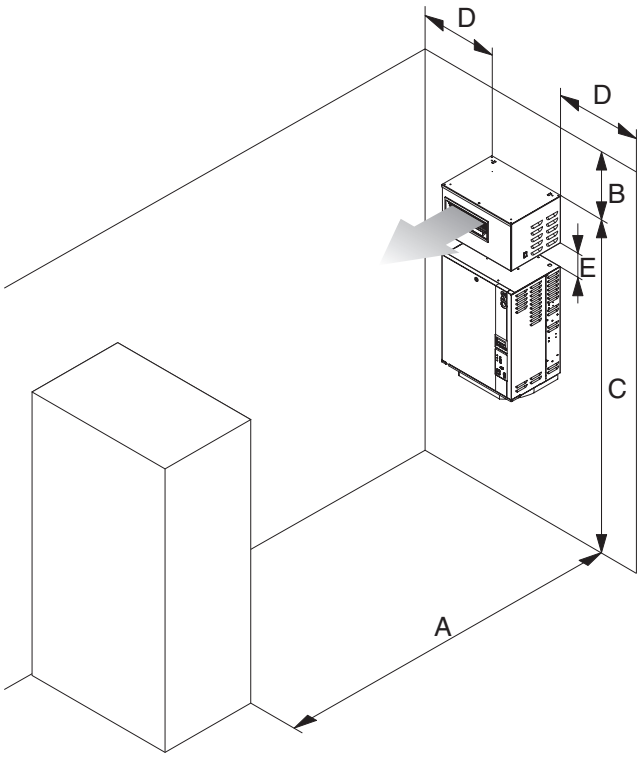
If you have questions relating to the dimensioning of ventilation ducts in combination with steam humidifiers Condair CP2, contact your Condair supplier.

Installing the steam pipes/steam nozzle and the OptiSorp steam distribution system

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

5.3.2 Positioning and mounting of the fan unit

The fan unit is mounted on the wall **separately above the unit**. To allow the steam coming from the fan unit to spread out evenly, without condensing on obstacles (ceilings, joists, pillars, etc.), the following minimum dimensions must be observed when selecting the location for the fan unit or units N4 with integrated fan.



	N4 with FAN	FAN15		FAN45	
m_D max.	4 kg/h	8 kg/h	15 kg/h	30 kg/h	45 kg/h
A min.	**2.0 m**	**3.0 m**	**6.0 m**	**8.0 m**	**10.0 m**
B min.	**0.5 m**	**0.5 m**	**0.7 m**	**1.0 m**	**1.5 m**
C ca.	**2.0 m**	**2.2 m**	**2.2 m**	**2.2 m**	**2.2 m**
D ca.	**0.5 m**	**0.5 m**	**0.7 m**	**1.0 m**	**1.5 m**
E	**—**	**0.15 ... 2.0 m**	**0.2 ... 2.0 m**	**0.3 ... 2.0 m**	**0.5 ... 2.0 m**

Note: The minimum spaces in the table apply for a room atmosphere of 15 °C and max. 60 %rh. For lower temperatures and/or higher humidity the values should be adjusted accordingly

Note: In order to achieve a uniform distribution of the humidity within the room, additional factors such as the room size, the room height, etc., must be taken into consideration besides observing the minimum distances. If you have questions concerning the direct room humidification, please contact your Condair supplier.

Further information is provided in the separate “Technical documentation for the fan unit”.

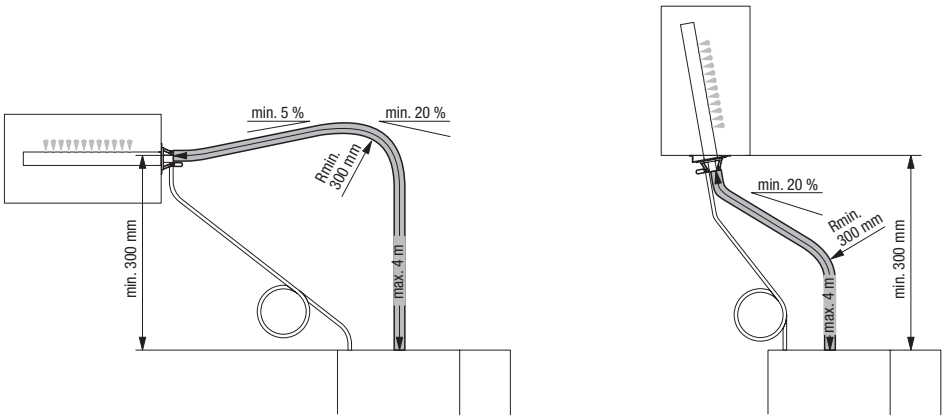
5.3.3 Installing the steam hose

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

Instructions for the hose layout

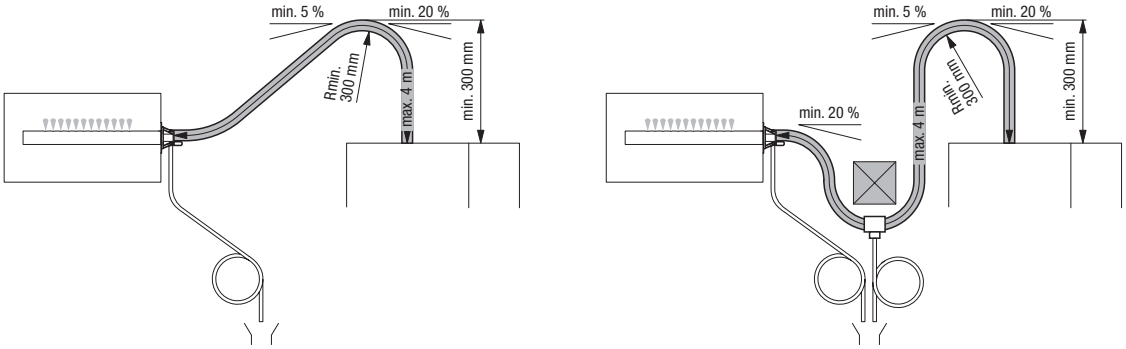
The hose layout depends on the position of the steam distribution pipe:

– Steam distribution pipe is mounted **more than 300 mm above the top edge of the humidifier**:



Initially, lead the steam hose with an **upslope of at least 20% over a minimum height of 300 mm**, then lead the hose with a **minimum upslope of 20%** and/or a **minimum downslope of 5%** to the steam distribution pipe.

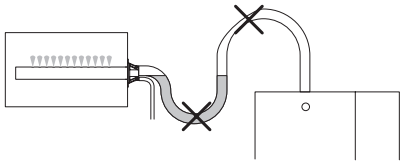
– Steam distribution pipe is mounted **less than 300 mm above the top edge of the humidifier**:



Initially, the steam hose is led with an **upslope of at least 20 % over a minimum height of 300 mm** above the top edge of the humidifier and then down to the steam distribution pipe with a **minimum slope of 5 %**.

– 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.



– 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.
– **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 humidifier steam outlet by means of **hose clamps**.
Caution! Do not overtighten the hose clamp on the steam connector of the steam humidifier.

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

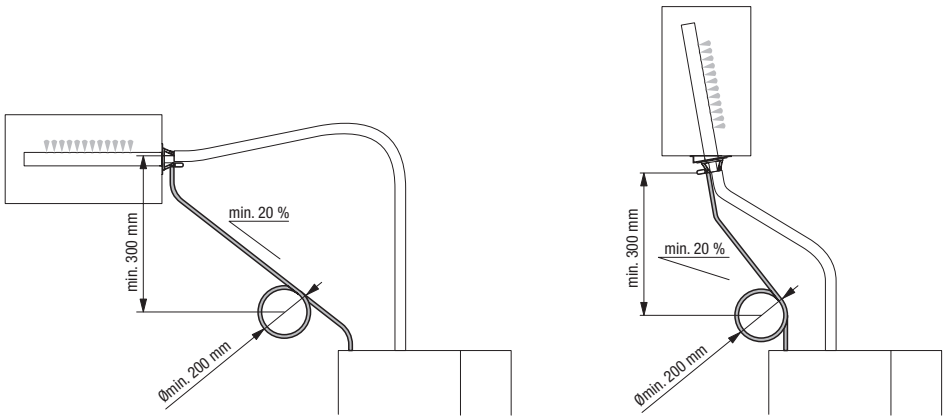
Important! Use original Condair condensate hose exclusively. Other types of hoses can cause operational malfunctions.

The hose layout depends on the position of the steam distribution pipe:

– Steam distribution pipe is mounted **more than 300 mm above the top edge of the humidifier**:

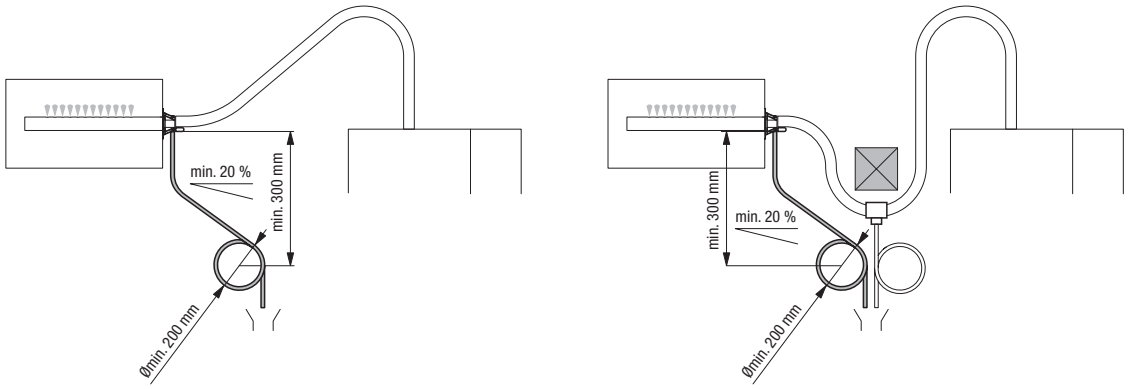
  Condensate hose is led down to the humidifier with a **minimum slope of 20 %**, in the form of a **siphon (min. hose bend radius Ø200 mm)**, and inserted about 2 cm into the specified opening.

  Note: this layout of the condensate hose is not applicable to **model H4**.



– Steam distribution pipe is mounted **less than 300 mm above the top edge of the humidifier**:

  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.



Note: If your unit feeds a number of steam distribution pipes, the individual condensate hoses are to be led into the 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.

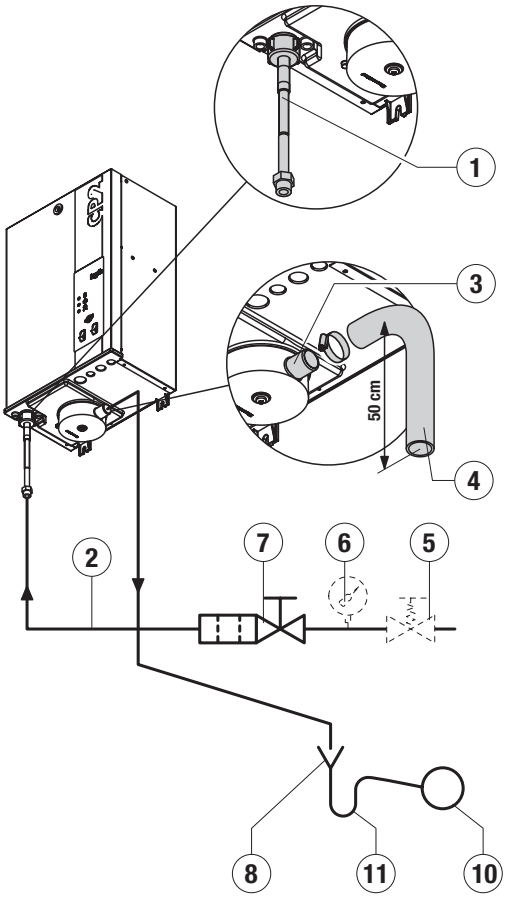
Please observe **all local regulations** concerning the installation of appliances to the mains and waste water systems.

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**.

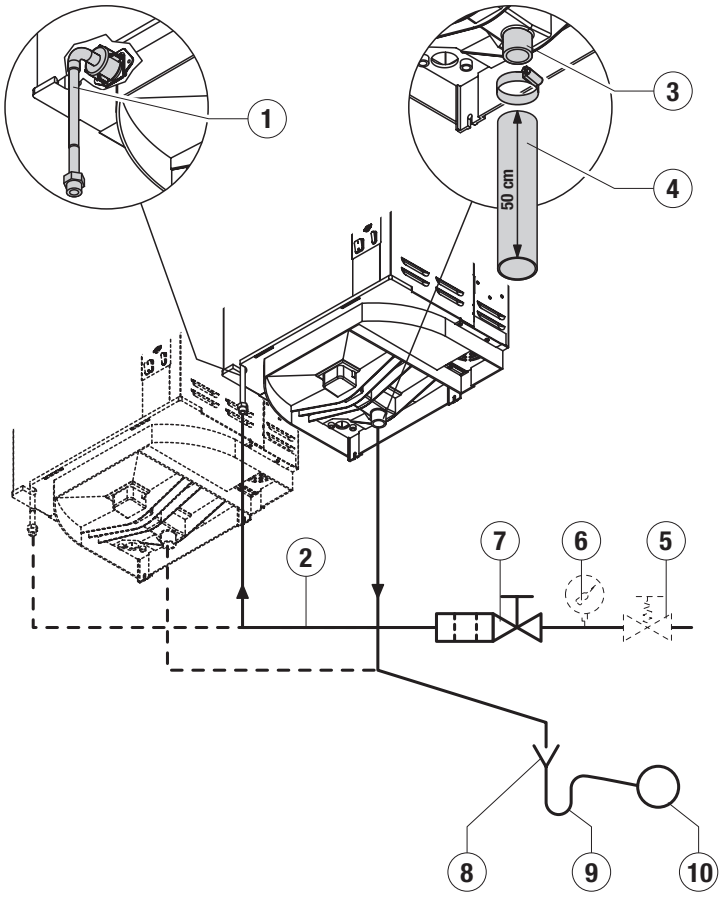
5.4.1 Performing the water installation

Overview water installation

models N4/H4



all other models



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 Ø30 mm (models N4/H4: Ø22 mm)
4 Drain pipe (min. inner Ø: 30 mm (models N4/H4: Ø22 mm), 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 on unit: **G 3/4" (Union nut)**

– 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 CP2 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 30 mm (models N4/H4: Ø22 mm) must be maintained for the entire length. Make certain that the drain pipe is correctly fixed and easily accessible for inspections and cleaning purposes.

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): **Ø30 mm (models N4/H4: Ø22 mm)**

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

– Min. inner Ø of drain line: **30 mm (models N4/H4: Ø22 mm)**

– 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 30 mm (models N4/H4: Ø22 mm) 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

Separate electrical installation instructions are supplied for this purpose, giving all necessary details (connection data, diagrams, etc.) for the correct installation of the electrics. The **details in the electrical installation instructions must be followed**. Please also note the following safety instruction:

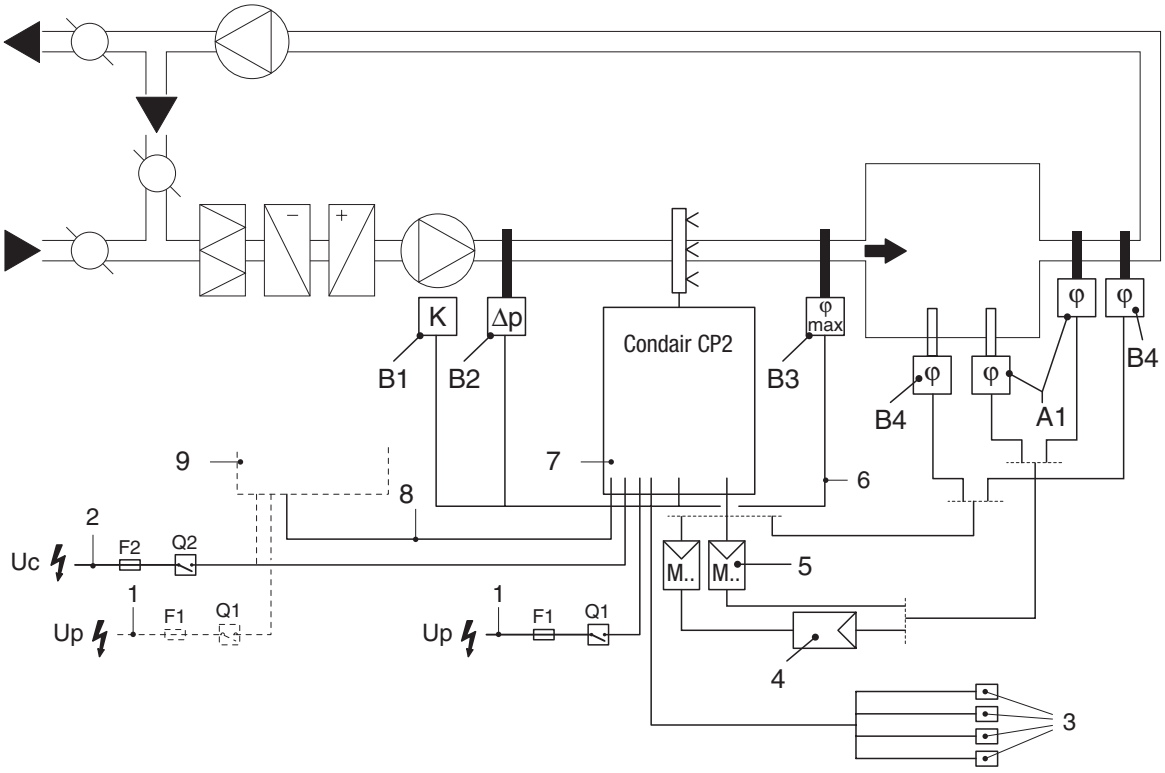
– All work concerning the electric installation must be performed only by **adequately qualified personnel (electrician or workman with equivalent training)**. Ascertaining the qualifications is the customer‘s responsibility.

– **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.

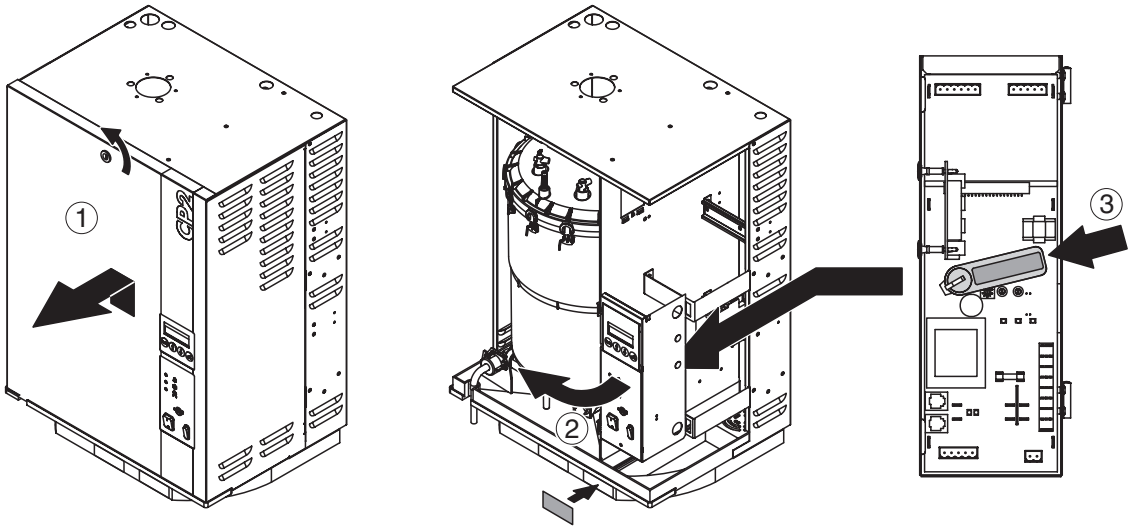
– **Warning! Electronic** components inside the unit are very susceptible to electrostatic discharges. For the protection of these components, measures must be taken during all installation work to prevent damage caused by electrostatic discharge (ESD–protection).

5.5.1 Electric installation overview



1	Supply heating voltage Up	8	BUS connection Master-Slave(s)
2	Supply control voltage Uc	9	Steam humidifier “Slave” units
3	Remote operating and fault indication (option “REL”)	A1	Humidity sensor (supply air/room/exhaust)
		B1	Ventilation interlock
4	External continuous controller	B2	Airflow monitor
5	Module M..	B3	Safety humidistat
6	External safety circuit	B4	Humidistat
7	Steam humidifier “Master” unit		

5.5.2 Inserting CP2-chip (models H5...H8, F... and G... only)



All important operating parameters such as the maximum steam capacity, the heating voltage and the number of base units are permanently stored on the CP2-chip.
Before you start the electrical installation, **check whether the CP2-chip is installed**. If it is not, **check whether the type designation on the CP2-chip supplied corresponds with the type designation on the data plate of the units)**. If the designations match, place the CP2-chip in the control print with the data plate to the front (see figure above). Then cover the data plate on the right side of the unit with the data plate supplied (self-adhesive).
If the type designation on the CP2-chip and the data plate do not match, the CP2-chip must not be installed. If this is the case, contact your Condair supplier.

Note for multiple units: Only use CP2-chips with the **same serial number** in the basic unit of a model group. To identify the individual basic units a letter (A, B, C, etc.) follows the serial number. **Install CP2-chip marked "A" into the "Master" unit** equipped with display or module M.. respectively (in configurations with units of different sizes the "Master" unit is always a large unit). Install the **other CP2-chips into the respective "Slave" units (Important: the model designation of the CP2-chip must correspond to the model designation on the data plate of the respective unit)**.

Important! CP2-chips for individual units cannot be used in multiple units and CP2-chips for multiple units cannot be used in individual units.

5.5.3 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?

☐ Is/are the CP2-chip(s) correctly used?

☐ 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 connecting cables fastened?

☐ Are the connecting cables free of tension (passed through cable boltings?)

☐ Are the units configured correctly?

6 Operation

6.1 Operational safety instructions

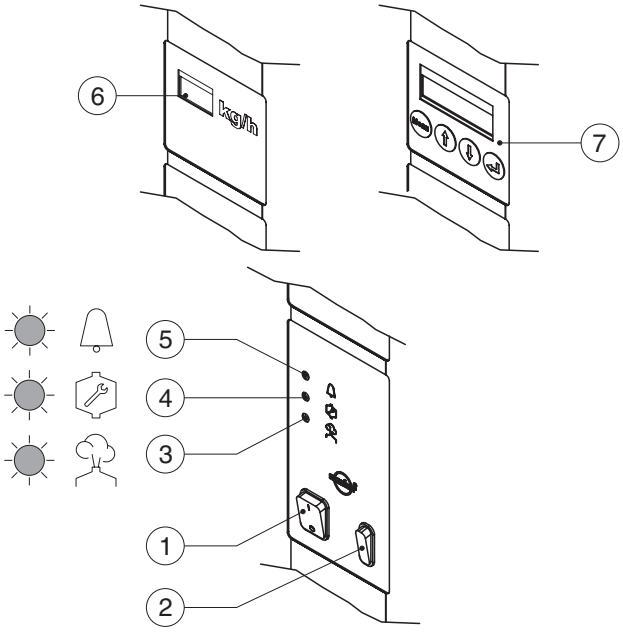
– Initial commissioning: Before the steam humidifier is put into operation for the first time, all **installations** and the **unit configuration** must be **inspected** by the responsible persons to see that everything is **correct** (see also checklist for the individual installations). Any defects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

  The initial commissioning may only be carried out by your Condair representative's service technician or specially-trained personnel.

– The Condair CP2 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!** When the unit cover is open, conductive parts can be touched. Before the service switch for network supplies (heating and control voltage) is switched on, the casing cover of the steam humidifier must be replaced and fastened.

6.2 Display and operating elements



1 Unit switch

2 Drain/info key

  – press **shortly**: manual draining
    Note: The drain valve is automatically closed after 10 minutes, or manually by pressing the drain/info key again.

  – **keep pressed**: Activates operating status display

3 Steam production display (green LED)

4 Warning and information display (yellow LED)

5 Error display (red LED)

6 Display Module M and M3

7 Display and operating unit Module M4
  Note: See separate documentation "Condair CP2 - Adjusting the parameters" for operating the module M4

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**.
- Check whether the unit covers are correctly in place and fastened.
- Open the shut-off valve to the water feed.
- Switch on the **service switch for network supplies** (heating and control voltage).
- **Switch on the unit switch** on the steam humidifier.
  The steam humidifier carries out a system test, during which all the LEDs light up in sequence.
  Note: During the system test a corresponding message appears in the display of units equipped with module M4.

  If, after the system test:
  – **the yellow LED blinks permanently**, a BUS failure is present (see chapter 6.6).
  – **the yellow LED lights permanently**, steam cylinder maintenance is due (see chapter 6.5) or the maintenance indication has not been reset (see chapter 6.5.5). The remote indication relay "Service" is activated.
  – **the yellow LED and the red LED light permanently**, the steam cylinder maintenance (see chapter 6.5) has not been executed or the maintenance indication has not been reset (see chapter 6.5.5). The remote indication relays "Service" and "Error" are activated.
  – **the red LED light permanently**, a fatal malfunction has occurred (see chapter 6.6). The remote indication relay "Error" is activated.

  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 6.6 "Fault elimination".

  After the system test the unit is ready for operation.
  Note: In ready mode, the display of units equipped with module M or M3 shows "0" and the display of units equipped with module M4 shows a corresponding ready message.

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 and after a few minutes (approx. 5–10 minutes, depending on the conductivity of the water) steam is produced. The remote indication relay "Steam production" is activated.
Note: On units equipped with module M or M3 the display shows the overall steam capacity in kg/h. On units equipped with module M4 the display shows the overall steam capacity in kg/h and the actual steam capacity demand in %.

Operating status display

By holding down the drain/info key on the relevant basic unit for at least 3 seconds, the unit's current operating status can be displayed by the LEDs.
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

– On units equipped with **module M or M3** the **actual steam capacity demand in %** is displayed.

– The **yellow LED blinking at regular intervals** shows that there is a **malfunction** which the **control of the steam humidifier is trying to repair**. The rate at which it blinks shows what sort of problem there is. In-depth details are in chapter 6.6.

– The **red LED blinking at regular intervals** shows that there is a malfunction which the control of the steam humidifier cannot repair. The rate at which it blinks shows what sort of problem there is. For units with M and M3 module, the relevant error code is also shown, for units with M4 module, the relevant error notice is shown. In-depth details are in chapter 6.6.

Remote operating and fault indication

If your steam humidifier is equipped with the optional remote operating and fault indication (option "REL") the operating status is shown as follows:

Display on unit	Meaning	Activated remote indic. relay
Red LED lit	"Error", vaporization off	**H1 "Error"**
Yellow LED lit	Steam cylinder service due	**H2 "Service"**
Yellow LED blinks	drain/info key was pressed or BUS failure is present	no message
Green LED lit or blinks regularly after drain/info key pressed and held down	"Warning" malfunction repair	no message
Green LED lit or blinks regularly after after drain/info key pressed and held down	Steam production	**H3 "Steam production"**
Unit switched on	Unit ready	**H4 "Switched on"**

Further operating instructions

– 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.

– To operate unit which are equipped with an M4 module, please note the information in the separate documentation "Condair CP2 - Adjusting the parameters".

– For IQ-continuous control by a humidistat the initial adjustment process takes a long time. Do not disturb this adjustment process by switching the unit on and off via the target value dial.

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 (on all steam humidifiers) briefly**. The heating voltage is cut off and the steam cylinder empties. The **yellow LED blinks**.
- Wait until the steam cylinder is empty (approx. 5-10 minutes). Then **switch off the unit switches on all steam humidifiers**.
- **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.**

6.5 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.
- You should only use original Condair spare parts to replace faulty parts.
- **Before starting maintenance work the Condair CP2 must be switched off as described in chapter 6.4 and secured against accidental switching on.**

6.5.1 Instructions for Maintenance

To maintain operational safety the Condair CP2 steam humidifier must be maintained at regular intervals. This is differentiated between the **first maintenance after approx. 500 operating hours (●)**, **steam cylinder maintenance after the yellow LED lights up (▲)** and **annual maintenance (■)**.

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**
	●	▲	■	
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 6.5.2).
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 cyl. 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 inc. 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.

6.5.2 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).

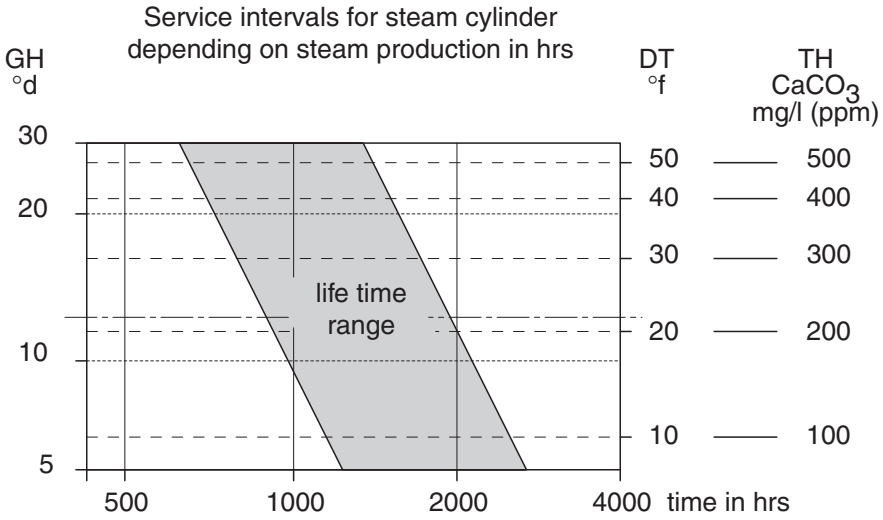
The following apply in general: When the yellow LED lights up:

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

– Cleanable steam cylinder **Type D... should be cleaned**, as long as the maximum life time (5,000 hrs) has not yet 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.



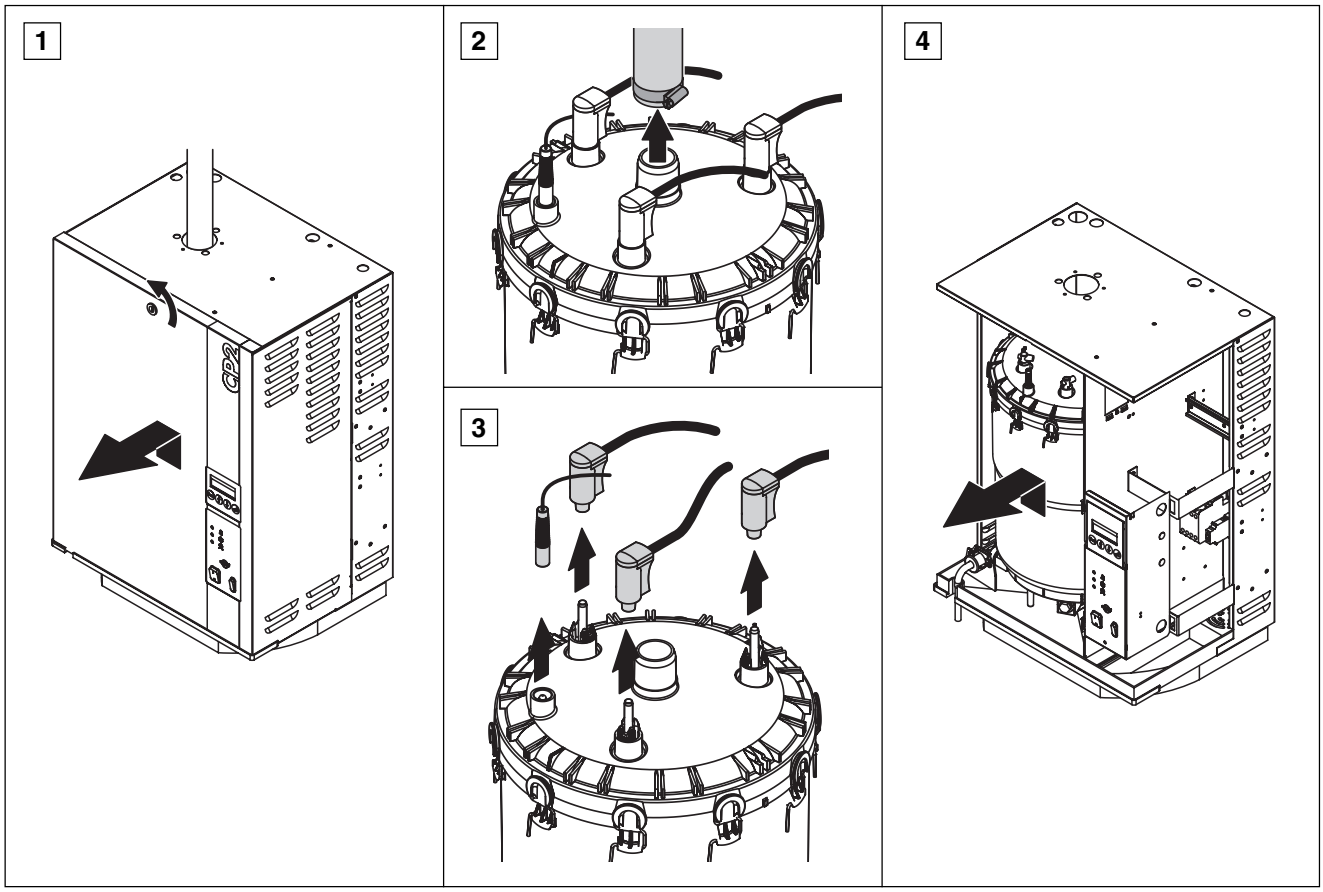
GH: Gesamthärte
DT: Dureté totale
TH: Total hardness

6.5.3 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 fastening of front cover using screwdriver (turn 90° to left) and remove front cover.
2. Release hose clamp on the steam hose using screwdriver and detach hose upwards from the steam connection.
3. Detach plug on electrode cable and on the sensor cable.
4. Carefully push steam cylinder upwards from the holding devices on the side or the rear respectively and take out from front.

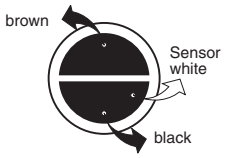
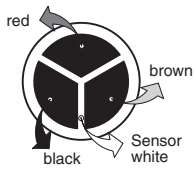
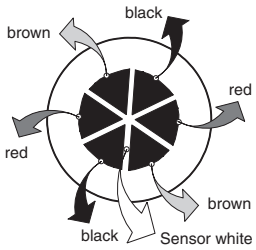
Warning! Put steam cylinder down carefully.

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.

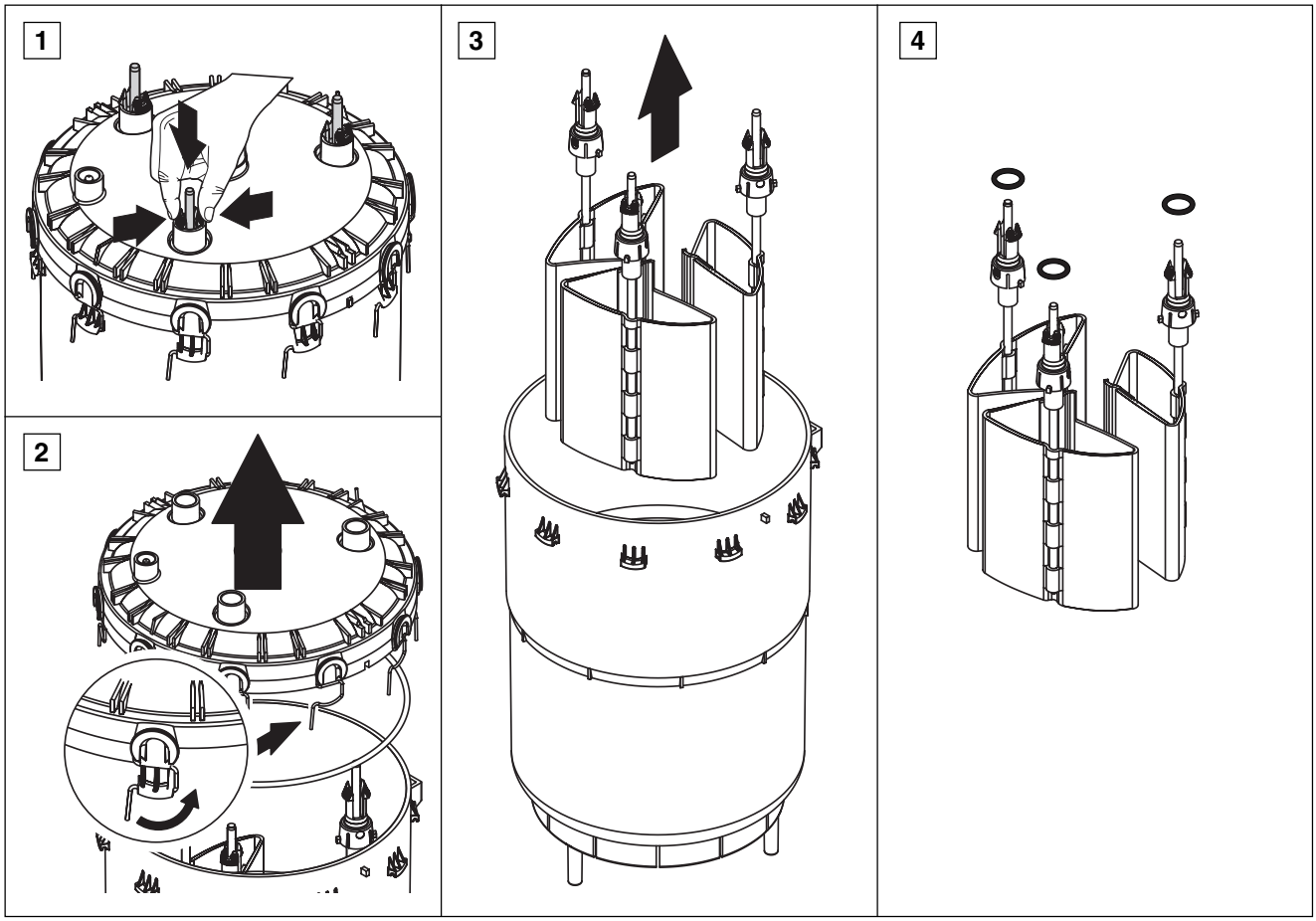
– Place steam cylinder in the holding devices on both sides of the unit or the rear respectively. Carefully push steam cylinder downwards into the drain valve until it stops.

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

	Steam cylinder type		
	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.

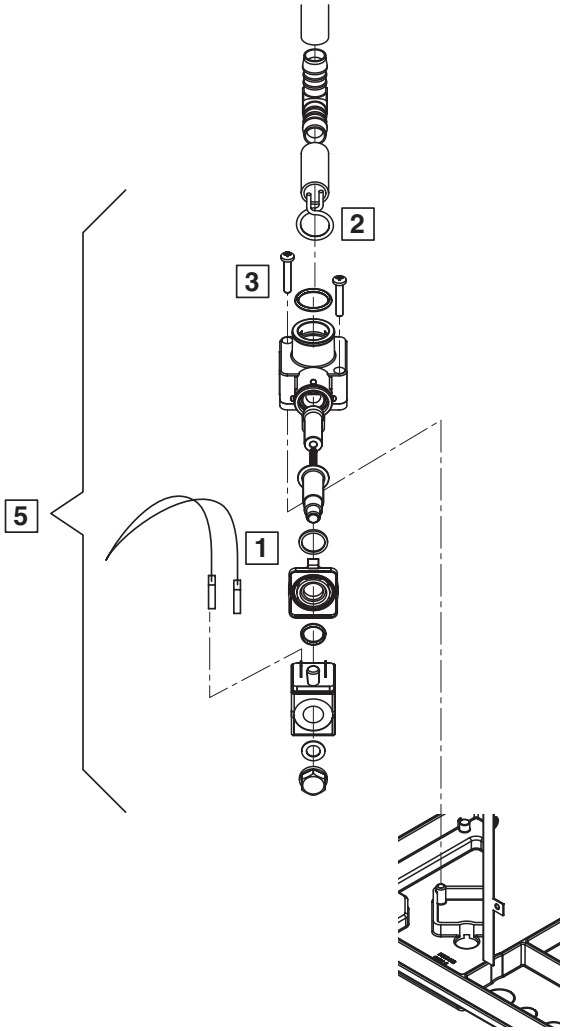
– Place O-rings on the electrodes. Insert electrodes in steam cylinder cover. Snap fastening must engage.

– 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.

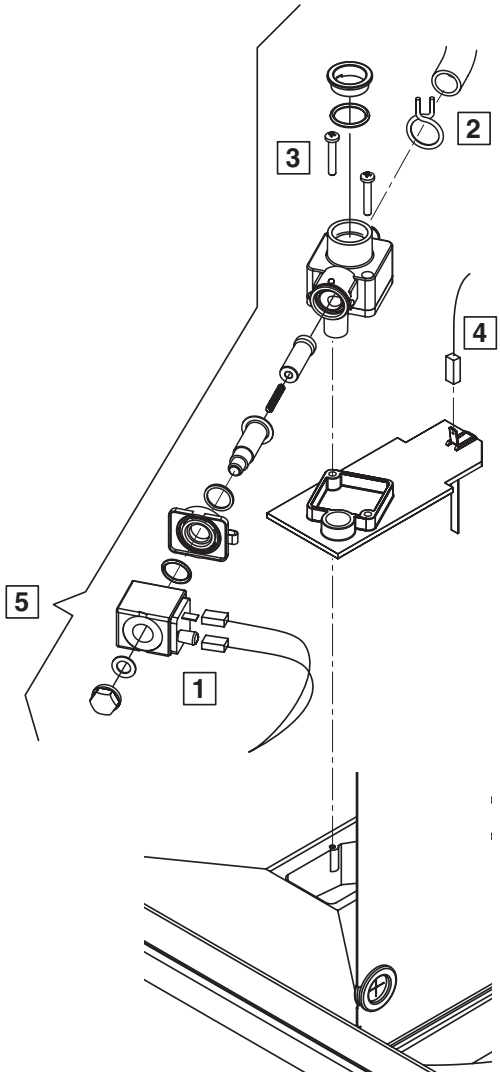
Removal and installation of drain valves

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

models N4/H4



all other models



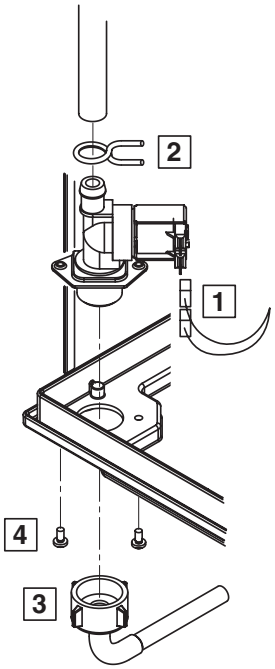
1. Detach electric cable.
2. Release hose clamp and detach filling hose.
3. Release two fixing screws using screwdriver and remove drain valve.
4. Unplug earth cable from drain cover and remove drain cover.
5. Disassemble drain valve.

Installation of the drain valve follows the reverse sequence.

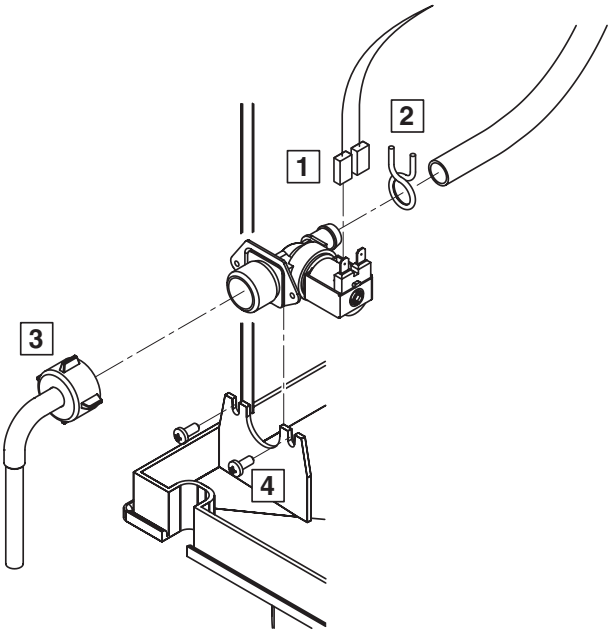
Removal and installation of the inlet valve

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

models N4/H4



all other models



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.

6.5.4 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.**

6.5.5 Resetting maintenance indication

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 unit switch.
- Hold drain key down until the system test is completed (approx. 10 seconds).

6.6 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.

6.6.1 Fault indication

LED yellow	LED red	Display on module M and M3	Display on module M4	Description
blinks	——	——	Steam output 21 kg/h [Σ] **BUS Line/Traffic interrupted**	BUS failure present
			Steam output 21 kg/h [Σ] **Manual drain unit [A] off**	Drain/info key has been pressed shortly
lights	——	——	Steam output 21 kg/h [Σ] **Steam Cylinder Maintenance [B]**	Steam cylinder maintenance due or maintenance indication not reset
lights	lights	**E4B**	**Steam Cylinder Maintenance [B] Maintenance Acc. The Instructions**	Steam cylinder maintenance not executed or maintenance indication not reset
——	lights	**E5B**	**No Electrode Current [B] Phase Interrupt Outlet-V Leaking**	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 humidifier control 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"**.

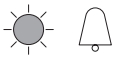
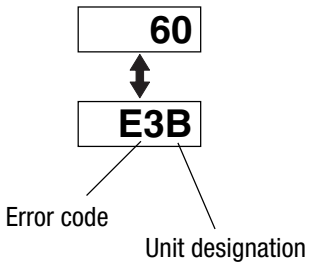
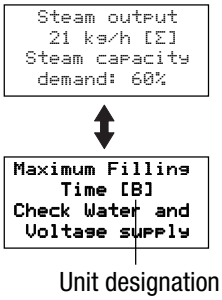
Example:

Yellow LED "Warning"	Indication on module M and M3	Indication on module M4
blinks in intervals 3x	Steam capacity demand in % (no special warning message) **60**	System message alternates with warning message Steam output 21 kg/h [Σ] Steam capacity demand: 60% ↕ Steam output 21 kg/h [Σ] **Maximum Filling Time [B]** Unit designation

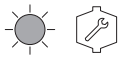
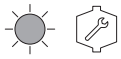
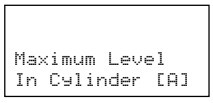
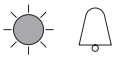
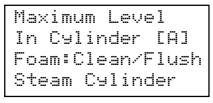
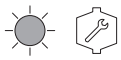
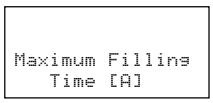
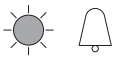
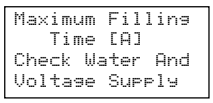
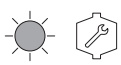
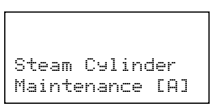
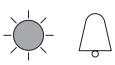
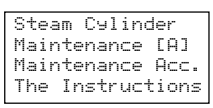
– **Red LED “Error” blinks intermittently**

The control, 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.

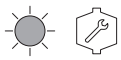
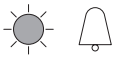
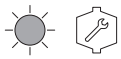
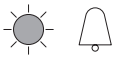
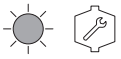
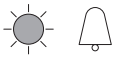
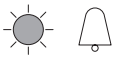
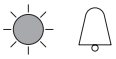
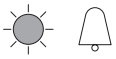
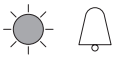
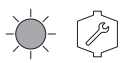
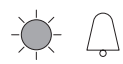
Example:

Red LED “Error”	Indication on module M and M3	Indication on module M4
blinks in intervals 3x 	Steam capacity demand in % alternates with error code indication 	System message alternates with error message 

6.6.2 Malfunction list

Indication/Malfunction					
“Warning”		“Error”			
yellow LED blinks	on module M4	red LED blinks	on module M/M3	on module M4	
1x 		---	---	---	
Safety circuit open					
2x 		2x 	E2A		
Max. filling level of steam cylinder reached		Foam detection, more then 4 times in 24 h.			
3x 		3x 	E3A		
Permissible filling time exceeded (30 Minutes)		Permissible filling time exceeded > 2 hr			
4x 		4x 	E4A		
Steam cylinder needs servicing		Interval for steam cylinder service exceeded			

	Cause	Remedy
	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.
	Water conductivity too low (after initial operation). Water conductivity too low for type of steam cylinder. Phase failure heating voltage. Formation of foam in steam cylinder.	Wait. Select correct steam cylinder type. Check mains fuse(s) and replace if applicable. Empty/flush steam cylinder.
	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 CP2/Module M..”. 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.
	Mineral deposits and/or electrodes spent.	Replace steam cylinder type A, clean steam cylinder type D (see chapter 6.5). **Important!** Refer to chapter 6.5.5 for resetting the maintenance indicator.

Indication/Malfunction					
"Warning"		"Error"			
yellow LED blinks	on module M4	red LED blinks	on module M/M3	on module M4	
5x 	No Electrode Current [A]	**5x** 	**E5A**	No Electrode Current [A] Phase Interrupt Outlet-V Leaking	
Electrode current to low (less then 30 minutes)		Electrode current to low (more then 2 hours)			
6x 	Excess Current Of Electrode [A]	**6x** 	**E6A**	Excess Current Of Electrode [A] Outelet Clogged/ Cyl. Maintenance	
Electrode current to high		Electrode current to high			
Indication on master unit		Indication on slave unit			
7x  or blinks permanently with drain/info key released	BUS Line/Traffic interrupted	**7x** 	---	---	
---	---	**8x** 	**E8A**	Current Flow even there is no Capacity Demand Check Contactor	
		Main contactor jammed			
---	---	**9x** 	**E9A**	Check Correct Setting of Steam Cylinder Type on Electronic Board	
		Rotary switch in position TEST			
---	---	**10x** 	**E10**	CP2 Chip Missing Insert CP2 Chip For Help Contact Condair Supplier	
		CP2-Chip missing			
---	---	**11x** 	**E11**	Humidity Sensor Disturbed Check Sensor and Connections	
		Humidity sensor defective			
12x 	Humidity Warning Too Low/Too High	**12x** 	---	Humidity Warning Too Low/Too High Check the Air Condition Plant	
Humidity too high/too low for more then 30 minutes		Humidity too high/too low for more then 2 hours			

	Cause	Remedy
	Phase failure heating voltage.	Turn on mains service switch, Inspect main fuses and replace if applicable.
	GFCI activated.	See “Electric-Installation Condair CP2/Module M..”.
	Current/peak-current cut-off.	See “Electric-Installation Condair CP2/Module M..”.
	Water supply obstructed, water pressure too low, inlet valve defective.	Open shut-off valve, clean water inlet filter, check water pressure, inspect/replace inlet valve.
	Drain valve is leaking.	Clean/replace drain valve.
	Fine-wire fuse on control PCB open due to faulty coil.	Check valve/contactor coils and replace if applicable. Replace fine-wire fuse.
	Faulty auto-drain function.	Inspect installation/control system.
	Faulty drain valve/coil.	Replace drain valve/coil.
	Steam cylinder outlet obstructed.	Clean/replace steam cylinder.
	Water conductivity too high for type of steam cylinder.	Select correct steam cylinder type.
	Units turned off or defective.	Switch on/repair units.
	Open BUS connection between basic units.	Reestablish BUS connection.
	The number of basic units does not match the number of units memorized on the CP2-chip.	Insert correct CP2-chip (see chapter 5.5.2 “Inserting CP2-chip”).
	Main contactor jammed in activated position.	Check/replace main contactor.
	Rotary switch on control PCB is set to position TEST.	Set rotary switch to the position for the corresponding steam cylinder type (see “Electric-Installation Condair CP2/Module M..”).
	CP2-Chip not installed on control board .	Install CP2-Chip (see chapter 5.5.2 “Inserting CP2-chip”) or contact your Condair supplier.
	No sensor signal present, humidity sensor defective.	Check/replace humidity sensor.
	Humidity to high/too low.	Inspect ventilation system.

6.6.3 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.

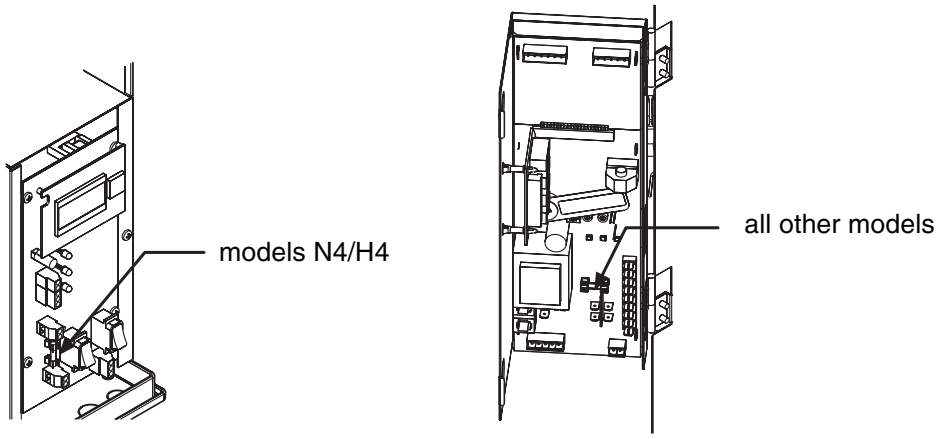
6.6.4 Replacement of fine-wire fuse on the control print

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

Important! If the fine-wire fuse on the control print 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 fuses of the given type with the specified nominal current strength to replace the fuse

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



6.6.5 Resetting fault indication (red LED lit)

In order to return the steam humidifier to operation after fault elimination ("Error"), the **steam humidifier must be switched off for approx. 5 seconds and then switched on again.**
Note: Resetting maintenance indication see chapter 6.5.5.

7 Technical data

Heating voltage 230V/1N~/50…60Hz [1]									
Model Condair CP2...	**N4**	**H4**	**H5...H8**						
Steam capacity in kg/h	1…4	1…4	5…8						
Max. power consumption in kW [3]	0.75...3.0	0.75...3.0	3.8...6.0						
Heating voltage 400V/3~/50…60Hz [1]									
Model Condair CP2...			**F5...F8**	**F9...F15**	**F16.....F45**	**F46...F60**	**F61...F90**	**F91...F105**	**F106...F135**
Steam capacity in kg/h [2]			5...8	9...15	16...45	46...60	61...90	91...105	106...135
Max. power consumption in kW [3]			3.8...6.0	6.8...11.3	12.0...33.8	34.5...45.0	45.8...67.5	68.3...78.8	79.5...101.4
Heating voltage 230V/3~/50…60Hz [1]									
Model Condair CP2...			**G5...G8**	**G9...G15**	**G16...G30**	**G31...G45**	**G46...G60**	**G61...G75**	**G76...G90**
Steam capacity in kg/h [2]			5...8	9...15	16...30	31...45	46...60	61...75	76...90
Max. power consumption in in kW [3]			3.8...6.0	6.8...11.3	12.0...22.5	23.3...33.8	34.5...45.0	45.8...56.3	57.0...67.5
Control voltage	**230V/1N~/50...60Hz**								
Operating conditions									
Permitted water pressure	1...10 bar								
Water quality	Tap water with a conductivity of 125...1250 µS/cm								
Permitted water temperature	1...40 °C								
Permitted ambient temperature	1...40 °C								
Permitted ambient humidity	max. 75 %rh								
Permitted duct air pressure	–0.8 kPa...1.5 kPa, with pressure equalizer set (option) up to 3.0 kPa								
Type of protection	IP20								
Conformity	CE, VDE/GS, DVGW								
Equipment/Dimensions									
Steam cylinder type A2...	1	1							
A3.../D3...			1						
A4.../D4...				1		1		1	
A6.../D6...					1	1	2	2	3
Housing (WxHxD) in mm 290x455x180	1	1							
375x630x275			1	1		1		1	
490x700x350					1	1	2	2	3
Net weight in kg	6	6	14	15	20	35	40	55	60
Operating weight in kg	11	11	30	35	60	95	120	155	180
Options									
Control module M	1	1							
M3 or M4			1	1	1	1	1	1	1
Remote operating and fault ind. REL			1	1	1	1	1	1	1
Accessories									
Steam nozzle W21		1							
Steam distribution pipe 41-..		1	1						
61-..				1		1		1	
81-..					1	1	2	2	3
OptiSorp steam distribution system				System 1	System 1	System 2	System 2	System 3	System 3
Fan unit FAN15			1	1		1		2	
FAN45					1	1	2	2	3
Steam hose / m DS22		1	1						
DS60				1		1		1	
DS80					1	1	2	2	3
Condensate hose / m KS10		1	1	1	1	2	2	3	3

[1] Other heating voltages on request
[2] Greater steam capacities on request
[3] Effective output see rating plate

Notes

Reg.No. 40002-2

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