

Electric Heater Steam Humidifier HeaterCompact



Installation → yellow
Plumbing → blue
Electrics → red
Maintenance → green
General Information → white



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HeaterCompact [21.07.2017]

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▲ WARNING**Risk of electrical shock!**

Hazardous electrical high voltage!

All electrical work to be performed by certified expert staff (electricians or expert personnel with equivalent training) only.

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1. Introduction

Dear Customer,

Thank you for choosing a HygroMatik steam humidifier.

HygroMatik steam humidifiers represent the latest in humidification technology.

They will impress you with their safety, ease of use and economical operation.

In order to operate your HygroMatik steam humidifier safely, properly and efficiently, please read these operating instructions.

Employ your steam humidifier only in sound condition and as directed. Consider potential hazards and safety issues and follow all the recommendations in these instructions.

If you have additional questions, please contact us:

Tel.: +49-(0)4193 / 895-0 (Main Number)

Tel.: +49-(0)4193 / 895-293 (Technical Support Hotline)

Fax: +49-(0)4193 / 895-33

e-mail: hotline@HygroMatik.de

For all technical questions or spare parts orders, please be prepared to provide unit type and serial number (see name plate on the unit).

1.1 Typographic Distinctions

- preceded by a bullet: general specifications.
- » preceded by an arrow: Procedures for servicing or maintenance which should or must be performed in the indicated order.
- Installation step which must be checked off.
- italics* Terms used with graphics or drawings.

1.2 Documentation

Retention

Please retain these operating instructions in a secure, always accessible location. If the product is resold, turn the documentation over to the new operator. If the documentation is lost, please contact HygroMatik.

Versions in Other Languages

These operating instructions are available in several languages. If interested, please contact HygroMatik or your HygroMatik dealer.

1.3 Intended Use

The HygroMatik steam generator serves for steam production based on various water qualities or partially softened water (valid for all of the HygroMatik humidifier models). With the HeaterLine, HeaterCompact/Kit and HeaterSlim family of products, also fully desalinated water/cleaned condensate may be used.

▲ WARNING

Risk of scalding!

Steam with a temperature of 100°C is produced.
Do not inhale directly.

Only qualified and authorised personnel may operate the unit. Persons transporting or working on the unit must have read and understood the respective parts of the Operation and Maintenance Instruction and especially chapter 2, „Safety Notes“. Additionally, operating personnel must be informed of any possible dangers. You should place a copy of the Operation and Maintenance Instruction at the unit's operational location (or near the unit).

The steam humidifier is not qualified for exterior installation.

2. Safety Instructions

These safety instructions are required by law. They promote workplace safety and accident prevention.

2.1 Guidelines for Safe Operation

2.1.1 General

Comply with the accident prevention regulation „DGUV Regulation 3“ to prevent injury to yourself and others. Beyond that, national regulations apply without restrictions.

2.1.2 Unit control

Do not perform any work which compromises the safety of the unit. Obey all safety notes and warnings present on the unit.

In case of a malfunction or power grid disruption, switch off the unit immediately and prevent a restart. Repair malfunctions promptly.

▲ WARNING

Restricted use.

This unit is not designed for the use by persons (also children) with limited physical, sensory and mental abilities - or without knowledge and experience - unless they are supervised or trained by a person, who is responsible for their safety. Supervise children in order to ensure that they will not play with the unit.

2.1.3 Unit operation

▲ WARNING

Risk of scalding!

In case of leaking or defective components, hot steam may exit in an uncontrolled manner.

In case of malfunction or electrical power disruption, switch off the unit immediately and prevent from restart.

NOTICE

Risk of material damage! The unit may be damaged if switched on repeatedly following a malfunction without prior repair. Rectify defects immediately!

The unit must not be operated on a DC power supply.

The unit may only be used connected to a steam pipe that safely transports the steam (not valid device type MiniSteam).

Regularly check that all safety and monitoring devices are functioning normally. Do not remove or disable safety devices.

2.1.4 Mounting, dismantling, maintenance and repair of the unit

NOTICE

The HygroMatik steam humidifier is IP20 protected. Make sure that the unit is not object to dripping water in the mounting location.

When installation is made in a room without a drain, safety precautions must be taken in order for to shut off the humidifier's water supply in event of a leak.

Use genuine spare parts only.

After any repair work, have qualified personnel check the safe operation of the unit.

Attaching or installing of **additional components** is permitted only with the **written consent** of the manufacturer.

2.2 Electrical

⚠ WARNING

Risk of electrical shock! Hazardous electrical high voltage. Any work on the electrical system may only be performed by qualified personnel. Disconnect unit components from electrical power supply prior to work. After electrical installation or repair work, test all safety mechanisms (such as grounding resistance).

NOTICE

Use only original fuses with the appropriate amperage rating. Regularly check the unit's electrical equipment. Promptly repair any damage such as loose connections or burned wiring. Responsibility for intrinsically safe installation of the HygroMatik steam humidifiers (steam generators) is incumbent on the installing specialist company.

2.2.1 Disposal after dismantling

NOTICE

The operator is responsible for the disposal of unit components as required by law.

3. Transport

3.1 Overview

Please note

Proceed carefully when transporting the steam humidifier in order to prevent damage from rough or careless loading and unloading. If the transport of this unit is attempted by only one person there is a risk that the unit will drop down. We propose to transport the unit by two persons.

3.2 Transport Size and Weighth

Type*	depth [cm]	highth [cm]	width [cm]	weighth [kg]
HC02	33	47	46	14
HC03	36	65	51	16
HC06	36	65	51	16
HC09	36	65	51	16
HC06P	41	78	59	25
HC09P	41	78	59	25
HC12	41	78	59	26
HC18	41	78	59	26
HC27	41	78	59	27

* Dimensions and weighths can vary insignificantly

3.3 Packing

Please note

Observe the symbols affixed to the box.

3.4 Interim Storage

Keep the unit dry and protect from frost.

3.5 Check for Complete and Correct Delivery of Goods

Upon receipt of the unit, make sure that:

- type and serial number on the name plate match what is in the purchasing and delivery documents,
- equipment is complete and in perfect condition.

Please note

In case of damage during shipment and/or missing parts, immediately file a written claim with your carrier or supplier.

Time limits for filing freight claims with shipping companies are*:

Transport Company	After Receipt of Goods
Carriers	4 days at the latest
Parcel Service	immediatly

* Subject to change without prior notice.

3.6 Included in the Delivery

The delivery includes:

- Unit of the selected humidifier type including selected control.
- Water installation hose.
- Manuals for the steam humidifier and the control.
- Ordered accessories (steam manifold, steam hose, condensate hose, etc.).
- Maintenance o-ring set for steam cylinder.

4. Operation and Device Construction

4.1 Mode of Action

The Imersion Heater Principle

One to three heater elements (Pos. 8 in the exploded view, please see cover foldout) are placed in a closed cylinder and connected to alternating current. The cylinder is filled with tap water, fully demineralized water or partially softened water. Heat generated by the heater element increases water temperature to approx. 100°C.

When fully demineralized water is used, the feed water is practically free of minerals. This ensures long life for the cylinder and heater elements since virtually no mineral deposits can settle or build up. Fully demineralized water minimizes the number of service / maintenance checks.

When tap water is used, some of the minerals dissolved in the water will settle in the cylinder as solids of various compositions. Most of these scale deposits are removed by periodic flushing or use of a heavy-duty blow-down pump. See section "Servicing During Operation with Tap Water".

The generated steam has a temperature of about 100°C and minimal positive pressure ("pressureless" steam). It is virtually demineralized and germ-free.

4.2 Installation and Method of Operation

By pressing the control switch („Pos. I”) the humidifier is turned on. When the hygrostat or controller signals a demand for humidification, the inlet solenoid valve (14) opens. The solenoid valve is designed for pressures from 100×10^3 to 100×10^4 Pascals (1 to 10 bar).

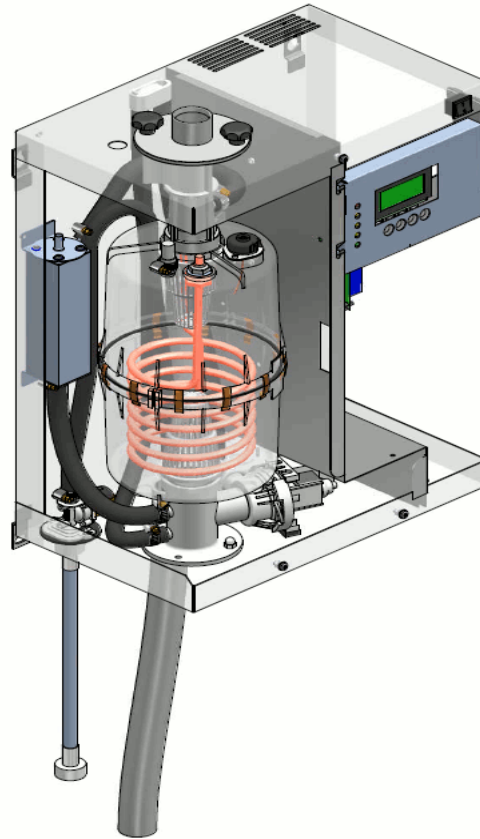
Water is fed into the cylinder.

The water level in the cylinder must be maintained within a specified range. If the water level is too high, the elbow acts as a safety overflow for water drainage. If the water level is too low, it could cause the heater element (8) to overheat. Therefore, power supply to the heater element is shut off when water levels are too low.

The cylinder water level is controlled by a level control (27). The level control consists of a stainless steel cylinder with two float switches and three reed contacts. The float switches indicate the water level in the steam cylinder: "Dry Run", "Humidification" and "Max. Level". The control capsule is pressure-equalized.

At the standard setting, the inlet solenoid valve (14) opens when the water level remains below "humidification" level for 10 seconds. The water level then rises again to "humidification" level.

The steam cylinder consists of a top (16) and lower (9) part joined with a cylinder flange. The seal between the cylinder and cylinder base (11), as well as between the top and lower part of the cylinder, is maintained using an o-ring.



General survey

The heater elements are equipped with a mechanical high temperature safety. This mechanism provides a redundant safety system in the event of excessively low water levels (“Dry Run”).

The cylinder water is periodically flushed out with a heavy-duty blow-down pump (10).

Steam is fed into air-conditioning ducts through special steam hoses and steam manifolds. Under normal conditions, this steam has virtually no heating effect on the air to be humidified. Accumulated condensate can be returned to the steam cylinder via a condensate hose.

Direct room humidification (without ducts) is performed using fan units (with blower and nozzle). The steam generator is connected to the fan unit with steam and condensate hoses.

Steam lines in steam bath cabins employ special steam hoses and piping (if required). Accumulated condensate is normally routed into the steam cabin. At a relative humidity of 100%, the supplied steam is used to heat up the steam bath. The mounting location of the humidifier must always be outside of the steam cabin.

For maintenance purposes, the cylinder water may be drained by pressing and holding the control switch in the „II“ position.

▲ WARNING**Risk of electrical shock!**

Hazardous electrical high voltage.

In case of leakage from the humidifier, switch off the unit and eliminate leakage.

▲ WARNING**Risk of scalding!**

During blow down hot water with a temperature of about 95°C is being drained. Avoid any contact with skin.

4.3 Internal Output Setting

Continuous control of the HeaterCompact Type steam humidifier is achieved by proportional control of the heater elements. In this way the humidifier can be proportionally operated across the entire output range of 5% - 100% nominal capacity.

5. Installation

⚠ WARNING

Installation of this unit to be accomplished only by qualified personnel (persons with completed training in the plumbing field and in the field of electrical installation work, respectively) !

Obey all safety notes and warnings present on the unit.

⚠ WARNING

Risk of electrical shock!

Hazardous electrical voltage.

During installation the unit must be disconnected from power supply.

HygroMatik accepts no liability for damage due to faulty installation.

Attaching or installing additional components is permitted only with the written consent of the manufacturer, or else the warranty is void.

⚠ WARNING

Risk of foot injuries!

Unit may drop during mounting involving a single person.

Helping hand of a second person is required.

5.1 Steam Humidifier - environmental conditions

Please note

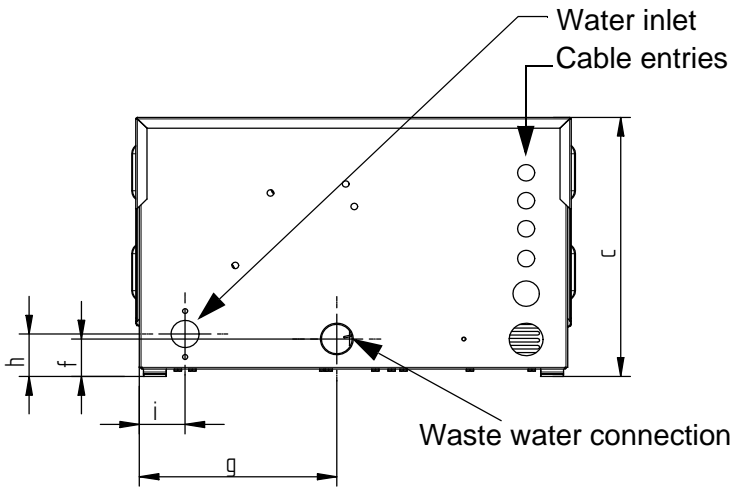
When selecting the location for steam humidifier installation, be aware of the following:

- Ambient temperature must be between +5 and +40 °C
- Observe clearances specified in the diagrams below to ensure adequate ventilation
- An Installation in a closed room requires aeration and if necessary temperature conditioning in order to reach the above mentioned environmental conditions
- HygroMatik humidifiers are not suitable for direct outdoor installation

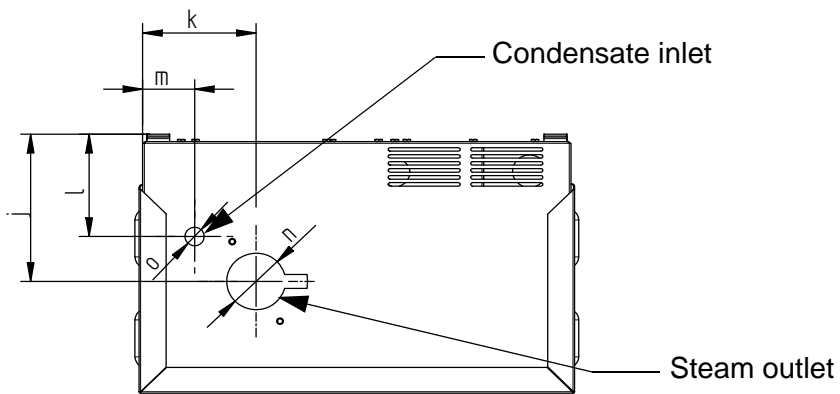
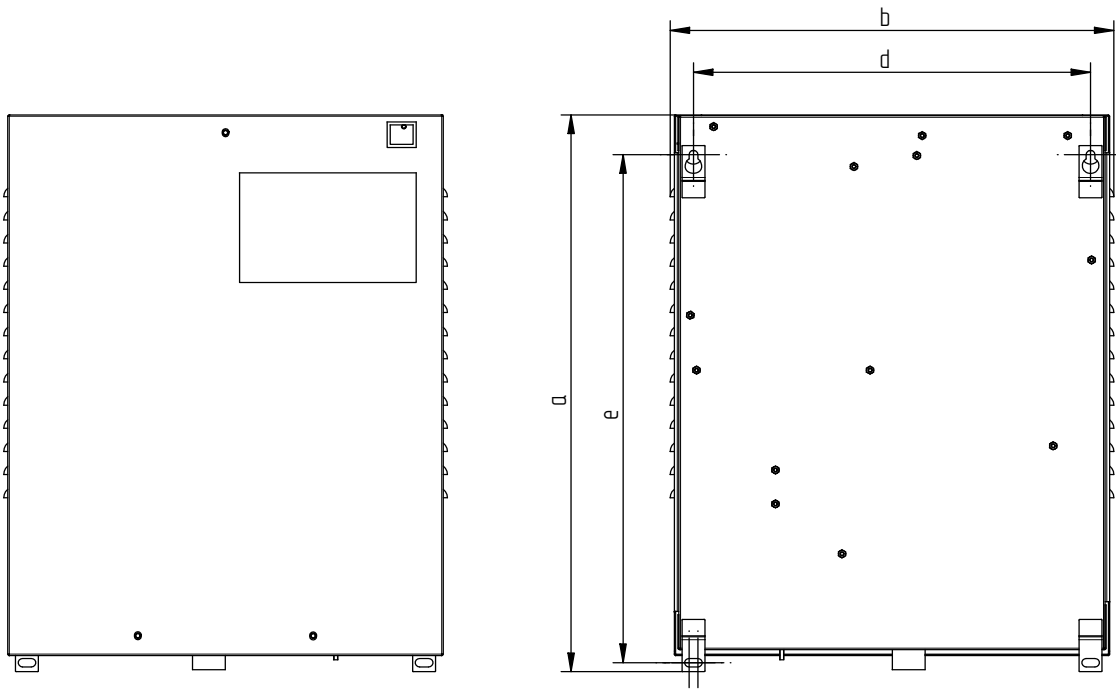
- Install the steam humidifier as close as possible to the steam manifold. Use only short lengths of steam and condensate hose to ensure optimal performance
- The back surface of the steam humidifier heats up during operation (to max. 70°C). Take care that the construction on which the unit is mounted is not made of temperature-sensitive material
- Place the steam humidifier so that the unit is easily accessible with sufficient space to perform maintenance
- The unit's protection class is IP20

5.1.1 Equipment Dimensions HC

View from below

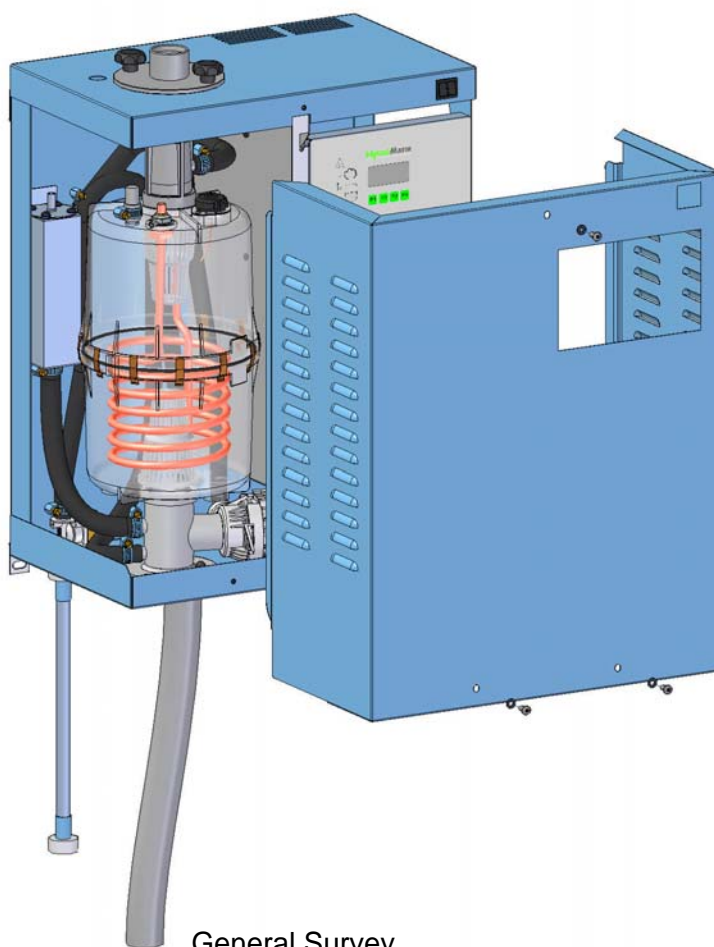


Rear view



View from top

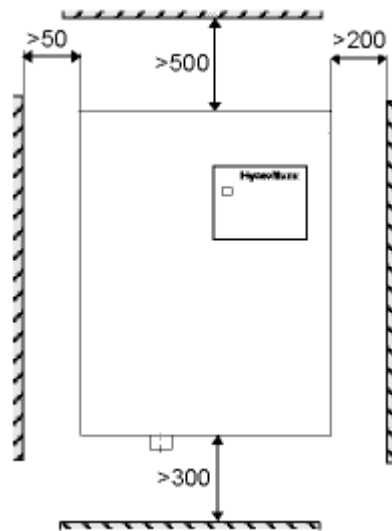
	HC02	HC03-09	HC06P-09P HC12-HC27
a	390	562	707
b	394	427	490
c	260	257	306
d	320	382	445
e	351	513	657
f	33	30	30
g	170	190	250
h	48	35	50
i	80	44	50
j	158	145	162
k	110	109	138
l	178	100	81
m	167	50	86
n	43	56	56
o	18	18	18
all dimensions in mm			



General Survey

5.1.2 Fitting Measures

Wall clearance

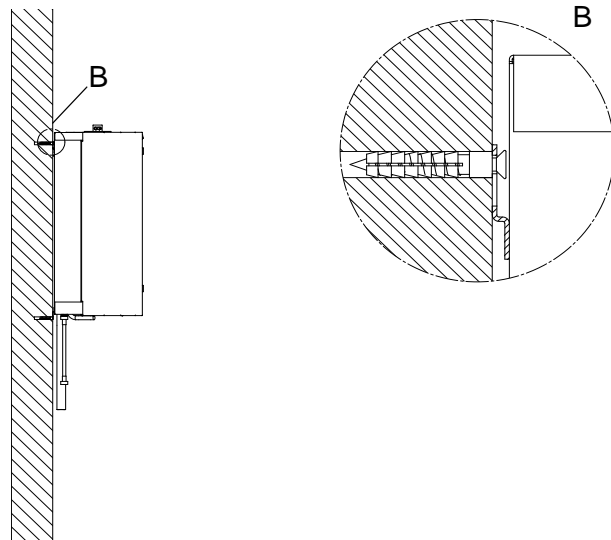


(all dimensions in mm)

Please note

When determining the steam humidifier positioning, make use of existing water connections (feed and drain).

Wall Mounting



Please note

Measures for drills for wall mounting please see table (measures d and e) in chapter „Equipment Dimensions“. If there is no suitable wall, it is recommended that the equipment is installed on brackets which can be embedded in the floor.

5.2 Absorption Distance B_N

The "absorption distance" (B_N) is defined as the distance from the steam feed to where the steam is completely absorbed in the treated air. Within the absorption distance, steam is visible as mist in the air stream.

Condensation may occur on anything installed within the absorption distance.

Although steam outside the absorption distance (B_N) is completely absorbed, it is not yet evenly diffused in the duct. If you plan to install any parts or devices inside the absorption distance, such as sensors or elbows, we recommend increasing the absorption distance using the formulae below. The absorption distances required for certain installed fittings are distinguished by separate symbols and calculated as a multiplier of the absorption distance B_N .

Absorption Distance	
B_N	for normal obstructions, such as sensors, ventilators, outlets
$B_C = (1,5...2) \times B_N$	for fine filters, heat registers
$B_S = (2,5...3) \times B_N$	for particle filters
$B_D = (3...5) \times B_N$	for humidity sensors, duct humidistats

The absorption distance has no fixed value, but depends on many factors. These are depicted in the absorption distance nomogram below.

5.2.1 Determining the Absorption Distance

To determine the absorption distance, the following parameters are required:

- Air humidity before humidification x_1 in g/kg.
- Air temperature after humidification t_2 in °C (with steam humidifiers the change in air temperature due to humidification may be disregarded t_1 or t_2).
- Specific increase in humidity Δx in g/kg (can be determined in the h,x diagram)
- quantity of steam introduced $\overset{o}{m}_D$ in kg/h.
- air speed w_L in m/s in air duct
- Total length l_D of the steam manifold installed in the air duct

Length l_D of the usable steam manifold depends on the dimensions of the air duct. The length of the absorption distance can be reduced by using multiple steam manifolds (also see section on the steam manifold).

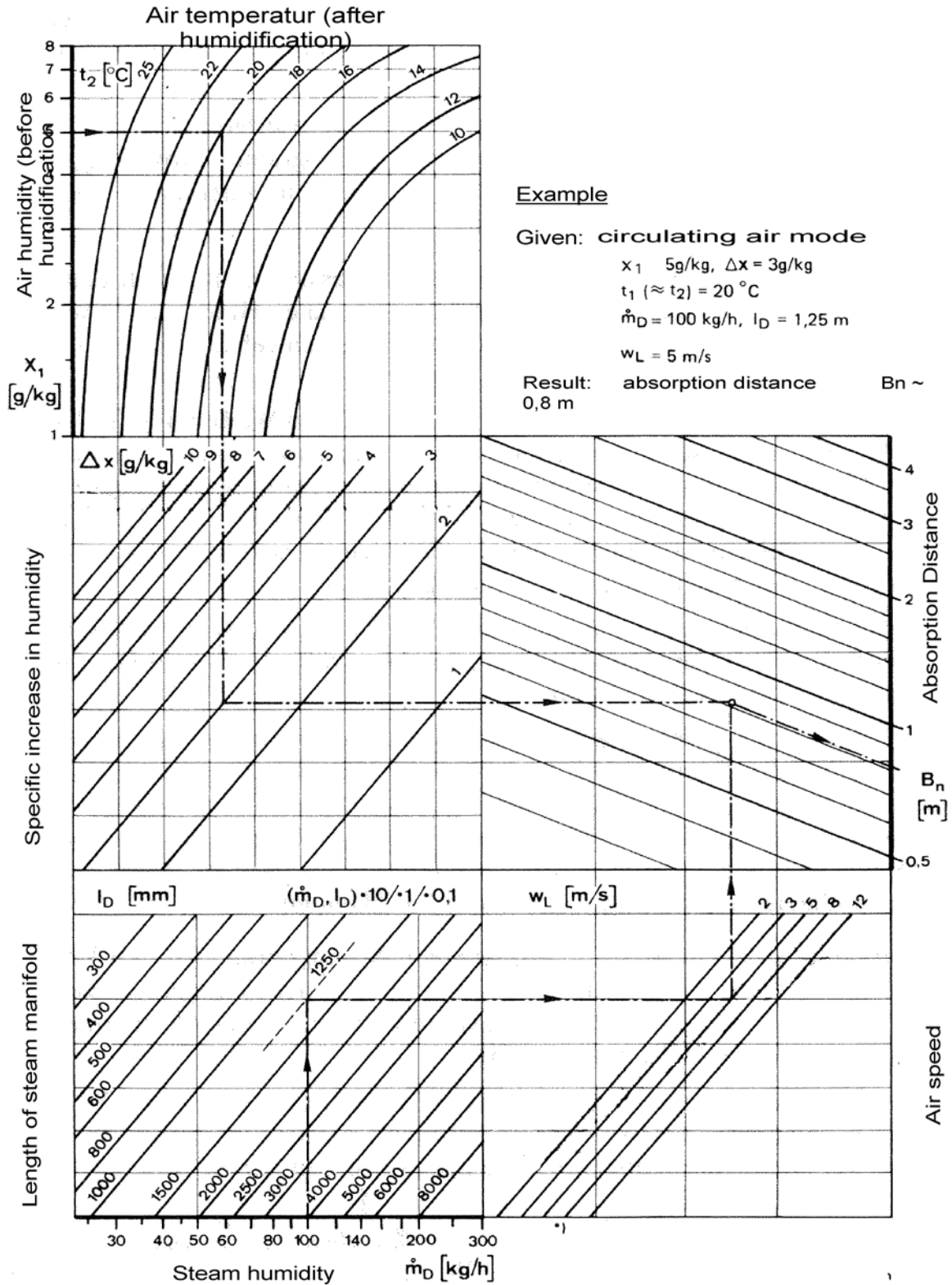
Method:

Graphically determine absorption distance B_N using the absorption distance nomogram (also see Section „Absorption Distance Nomogramm“). Enter the value of the parameters enumerated above into the respective quadrants. The resulting point of intersection indicates the value of the desired absorption distance B_N .

Notes:

- Air humidity before humidification x_1 : _____ [g/kg]
- Air temperature after humidification t_2 : _____ [°C]
- Specific increase in humidity Δx : _____ [g/kg]
- quantity of steam introduced m_D^o : _____ [kg/h]
- air speed w_L : _____ [m/s]
- Total length of the steam manifold l_D : _____ [mm]

5.2.2 Absorption Distance Nomogram



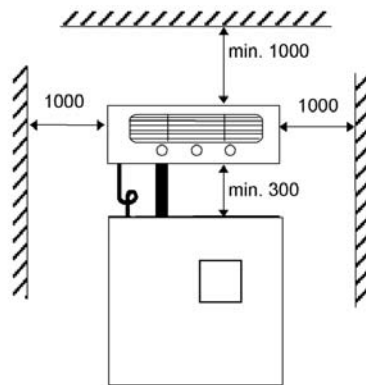
Source: Henne, Erich: Luftbefeuchtung (Air Humidification), 3rd Edition 1984 (Page 101), Oldenbourg Industrieverlag, Munich

5.3 Fan Unit (optional)

Please note The fan unit should be positioned to avoid drafts. A minimum height of 2 m is generally sufficient.

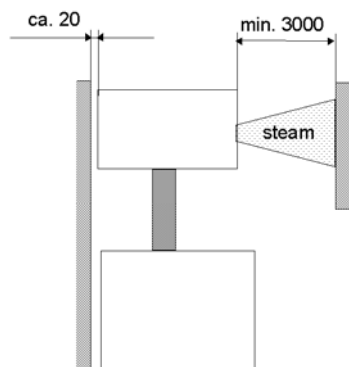
Model	Fan unit
HC02, HC03 HC06(P)	VG 08
HC09(P), HC12	VG 17
HC18 - 27	VG 30

- Install the fan directly on the wall
- The fan unit is installed above the steam humidifier
- When using multiple fan units, do not exceed a maximum distance of 5 m from the steam humidifier
- Observe the clearances specified in the diagrams below



(all dimensions in mm)

Fan unit, wall installation



Side view, wall-mounted fan unit

Technical Specifications Fan Unit VG				
Fan Unit		VG08	VG17	VG30
Quantity of Steam	[kg/h]	8	17	30
Steam Inlet	[mm ϕ]	25	25	40
Condensate Outlet	[mm ϕ]	14	12	12
Nominal Output	[W]	26	35	67
Nominal voltage	[V]	230	230	230
Dimensions	W [mm]	441	507	550
	H [mm]	171	171	171
	D [mm]	180	237	277
Weight	[kg]	3.6	6	7
Sound Level (1m dis- tance to the source of noise)	[dB(A)]	52	54	57

⚠ WARNING

Risk of skin burning or scalding!

During operation and for at least 10 mins afterwards the steam nozzles are hot. Do not touch!

During operation hot steam discharges from the nozzles. Avoid any contact in the field of the visible steam cloud!

Due to improper installation or contamination, hot water may drip from the nozzles. Do not reside in the area directly under the nozzles!

⚠ WARNING

Rotating parts!

During operation the cross-flow fan rotates.

Do not touch!

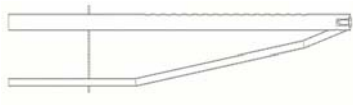
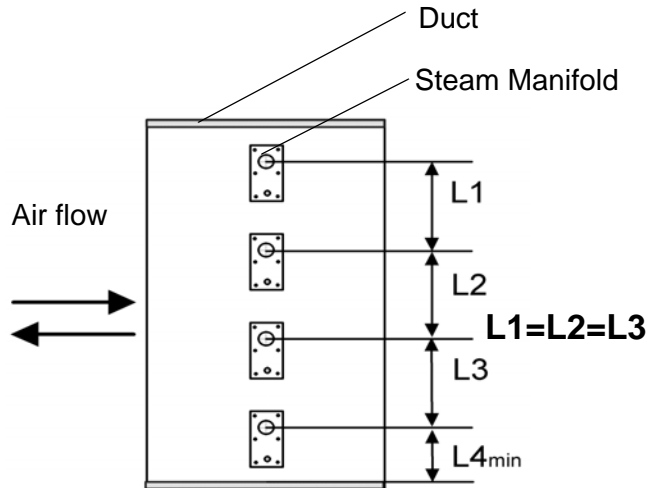
Do not introduce any matter through the fan grid.

5.4 Steam Manifold

5.4.1 Notes on Installation

Horizontal installation of steam manifold

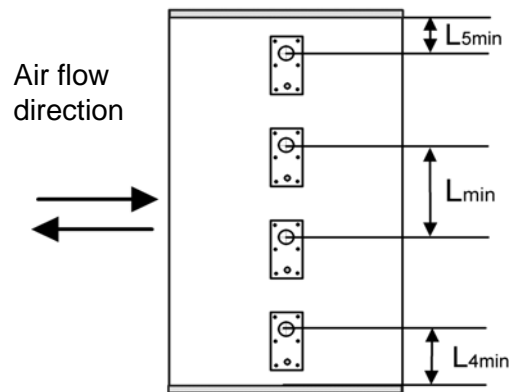
These notes are based on a homogeneous Standard steam manifold installation:



Steam Manifold

An even distribution of steam manifolds ensures a uniform steam distribution.

Please use the total height of the duct!



Minimum distances in order to avoid condensation:

L_{min} = 210mm: distance „ steam manifold - next steam manifold“

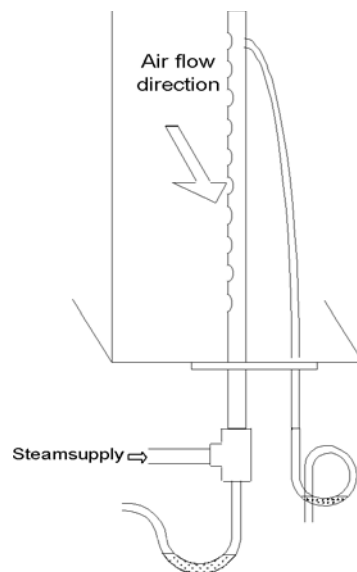
L_{4min} = 120mm: distance „lowest steam manifold - duct bottom“

L_{5min} = 120mm: distance „highest steam manifold - duct ceiling“ Installations depending on special designs of air ducts

Air duct	Positioning of steam manifolds	Sample												
flat	Staggered vertically and laterally													
very flat	By tilting the steam manifold 30 - 45° towards the air flow direction, the minimum upper clearance can be reduced to 70mm. min. distances: <table border="1" style="display: inline-table; vertical-align: middle;"> <thead> <tr> <th></th> <th>H1[mm]</th> <th>H2[mm]</th> </tr> </thead> <tbody> <tr> <td></td> <td>30°</td> <td>45°</td> </tr> <tr> <td>DN25</td> <td>182</td> <td>168</td> </tr> <tr> <td>DN40</td> <td>193</td> <td>179</td> </tr> </tbody> </table>		H1[mm]	H2[mm]		30°	45°	DN25	182	168	DN40	193	179	very flat duct
	H1[mm]	H2[mm]												
	30°	45°												
DN25	182	168												
DN40	193	179												
narrow, high	Identical lengths one on top of the other. Staggered laterally if possible.													
square	Identical lengths, staggered vertically and laterally													
low, very wide	facing each other													

Vertical installation of steam manifold

Steam manifold placement:



Horizontal installation of the steam manifolds is preferred. However, installation from below into the air duct is possible.

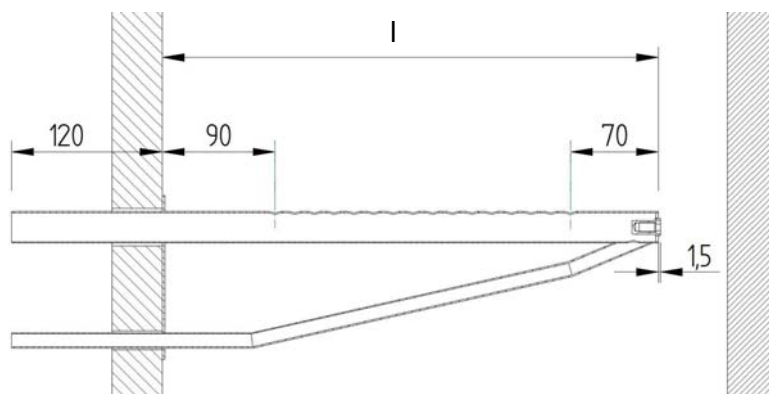
Please note

- Install the steam manifold horizontal with it ensure a clean steam out.
- Maximum allowable pressure in the air duct is 1200 Pa. For Hy05 and Hy08 the maximum allowable pressure is 1000 Pa.
- On the return side, the maximum allowable negative air pressure is 500 Pa. Placement of the steam manifold on the supply side of the air duct is preferred.
- With high-pressure air-conditioning systems, the unit's drain hose system must be modified depending on the over pressure. When this is the case please consult HygroMatik.
- Install the steam manifold as close as possible to the steam humidifier in order to minimize steam loss through condensation.
- Shown installation and position dimensions are based on experimental values. Special environmental conditions could require adjustments.
- Install a water drain within the absorption distance inside the air duct. For steam bath applications: Install the steam manifold safe from contact with people in order to prevent injuries or burns. Do not install the steam manifold near a temperature sensor or inaccurate readings may result. Air flow rates over 3m/s can possibly lead to condensate drainage problems at the steam manifolds which may require adaptation measures.

Length of steam manifold [mm]*:

I	220	400	600	900	1200	1450
DN25	x	x	x	x	x	x
DN40	x	x	x	x	x	x

* special lenght on request



installed steam manifold

The number and size of appropriate steam manifolds, as well as the nominal width of their respective steam and condensate hoses, are found in the tables below.

HyLine:

Type	Steam Manifold	Steam Hose	Condensate hose
HY05-HY17	1xDN25	DN25	DN12
HY05DS - HY17DS (for SPA)	1xDN40	DN40	DN12
HY23-HY30	1xDN40	DN40	DN12
HY45-HY60	2xDN40	2xDN40	2xDN12
HY90-HY116	4xDN40	4xDN40	4xDN12

CompactLine:

Type	Steam Manifold	Steam Hose	Condensate Hose
C01-C06	1xDN25	DN25	DN09
C06-C17	1xDN25	DN25	DN12
C10-DS, C17DS (for SPA)	1xDN40	DN40	DN12
C22, C30	1xDN40	DN40	DN12
C45**	2xDN40	DN40	DN12
C58	2xDN40	2xDN40	2xDN12

HeaterCompact/Kit:

Type	Steam Manifold	Steam Hose	Condensate Hose
HC02/Kit	1 xDN25	DN25	DN12
HC03-12*	1xDN25	DN25	DN12
HC03-12/Kit	1xDN40	DN40	DN12
HC16-27/Kit	1xDN40	DN40	DN12
HC3-27 (for SPA)	1xDN40	DN40	DN12

HeaterLine:

Type	Steam Manifold	Steam Hose	Condensate Hose
HL 6-12 *	1xDN25	DN25	DN12
HL 6-12 (for SPA)	1xDN40	DN40	DN12
HL 18-30	1xDN40	DN40	DN12
HL 36-45 **	2xDN40	1xDN40	1xDN12
HL 60-90 ***	2x(2xDN40)	2x(1xDN40)	2x(1xDN12)

CompactLineKit:

Type	Steam Manifold	Steam Hose	Condensate Hose
C01 Kit - C06 Kit	1x25	DN25	DN9
C10 Kit - C17 Kit	1x25	DN25	DN12
C22 Kit / C30 Kit	1x40	DN40	DN12
C45 Kit	2x40	DN40	DN12

* For units HL 6 - 12 and HC3-12 HygroMatik delivers one adapter DN40 / 25 (but not for SPA applications).** For units HL 36 - 45 HygroMatik delivers one t-connector for separating the steam on two steam manifolds.

***HI 60.-90 are double units and consist of HI 30-45 units.

5.5 Steam Line

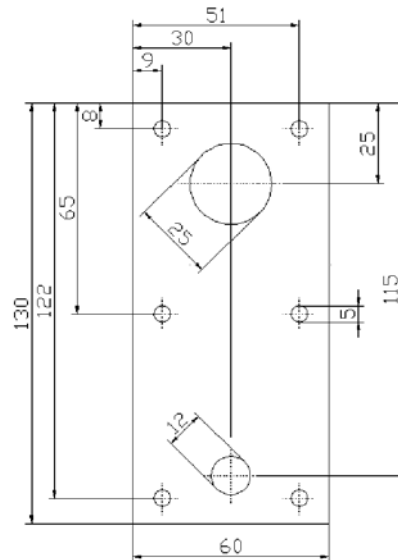
Please note When installing the steam hose, please pay attention to the following:

- Because of the high requirements on hose material under the operating conditions given, it is recommended to use genuine HygroMatik hoses only
- The steam hose diameter may not be smaller than the steam outlet of the HygroMatik steam humidifier (do not restrict the cross-section, otherwise back pressure will increase)
- The steam hose must be without sags and kinks and be laid with a continuous slope of 5-10% (otherwise sags will be formed)
- The steam hose should be as short as possible
- Run steam pipe lengths over 5m as hard piping
- The hose clamp for fixing the steam hose on the steam hose adapter should not be tightened too hard since the steam hose adapter is made of plastic
- In the case that steam output is distributed on two steam manifolds, the Y-pieces for the steam and condensate hose should be installed near the manifolds. If the installation is carried out in this way, since only one steam hose is necessary for the main part, loss of condensate will be decreased. In deviation of this the y-piece that is delivered ex works with a humidifier type C45, HL36, HL45 should be installed near the humidifier
- Depending on how the hose is laid, hose clips should be set at intervals of approx. 500 mm
- Allow easy access to the steam hose, so that it can be inspected later. In case of straight lengths of several meters, it is recommended to lay the steam hose in temperature resistant plastic pipe (40 mm dia for hose DN25; 60 mm dia for hose DN40) or to use copper pipe
- Device output, steam line installation, and the duct itself all influence pressure condition in the duct. Such, in a particular situation, this could mean that optimisation of the steam line installation will be required
- Allow for minimum bending radii:
Steam hose DN25: $R_{min} = 200 \text{ mm}$
Steam hose DN40: $R_{min} = 400 \text{ mm}$
Steam hose DN 40: $R_{min} = 400 \text{ mm}$

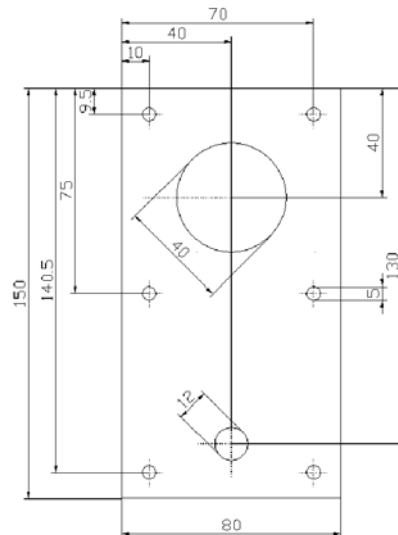
5.6 Cover Plate

HygroMatik flange plates may be used to neatly complete installation of the steam humidifier in the air duct.

Two-piece flange plates are available for the DN25 and DN40 steam manifolds.



flange plate DN25 E-2604260



flange plate DN40 E-2604410

5.7 Condensate Hose

NOTICE

To keep condensate from accumulating in the duct, ensure that the condensate drains freely.

If the steam manifold is positioned higher than 500 mm above the steam humidifier:

- » Bore up the connection stub on the upper steam cylinder part (Diameter: 8mm; for units type C01 and C06: 5mm).
- » Lay the condensate hose at an approximate incline of 5-10% to the steam cylinder connection fitting, to allow the condensate to drain freely.

Please note

It is recommended to form a loop of 200 mm diameter as a vapour trap provided there is enough space. Possible operating noises can be reduced in this manner. The loop should be filled with water before commissioning.

If the steam manifold is positioned lower than 500 mm above the steam humidifier:

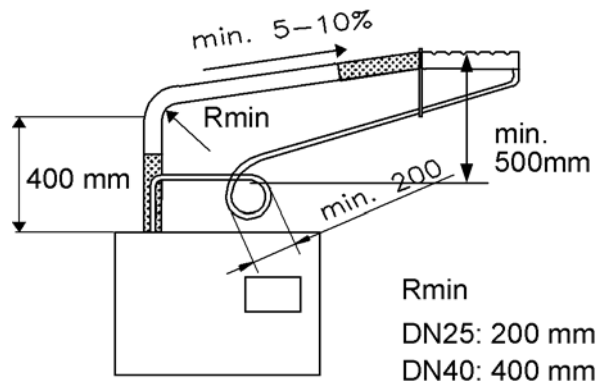
- » The condensate must be drained separately.
- » To prevent steam loss, lay a loop at least 200 mm in diameter. The loop should be filled with water before commissioning.
- » To ensure condensate drainage, place the loop (vapor trap) as far away as possible below the steam manifold connection.
- » The condensate connection on the steam cylinder must be closed with a sealing cap.
- » Place hose clamps at intervals of at least 500 mm, depending on how the hose is laid.

5.8 Types of Installation

If the steam manifold is positioned higher than 500 mm above the steam humidifier:

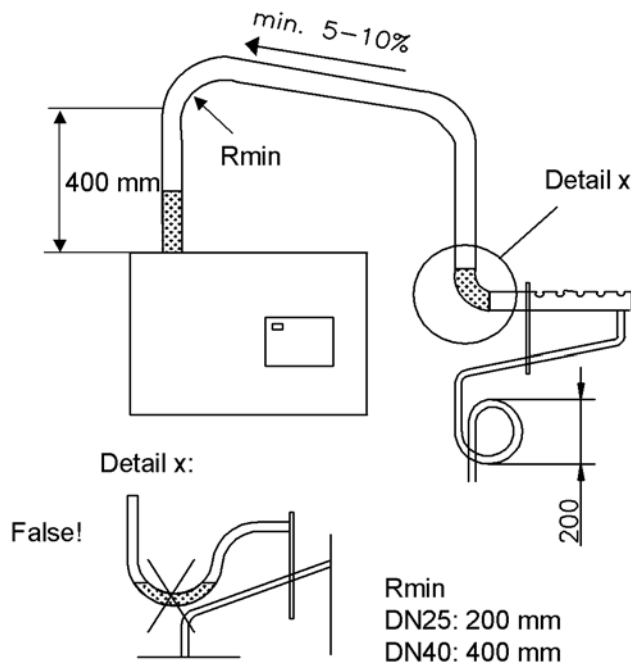
- » Lay the steam hose at a height of at least 400 mm above unit and then connect to the steam manifold with a constant rise or fall.
- » Lay condensate hose with a slope to the steam cylinder.

- » If enough space is available, lay a loop as a vapor trap. The steam manifold must be at least 500 mm from the loop.



If the steam manifold is positioned lower than 500 mm above the steam humidifier:

- » Lay steam hose at a height of at least 400 mm above unit and then connect to the steam manifold with a constant fall.
- » Lay condensate hose with a loop of 200 mm diameter (vapour trap) to the drain. The distance between vapour trap and steam manifold should have at least 500mm.

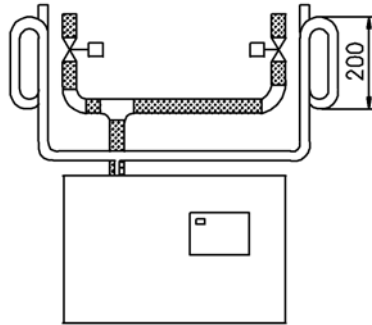


- » Lay the loop of condensate hose 200 mm directly above the drain. Detail x

5.9 Steam Solenoid Valves

When humidifying a number of loads, which are to be controlled separately, using a single steam humidifier, steam solenoid valves can be included in the steam hoses. Valve control has to be provided by the customer.

- Install the vertical risers with flow from bottom to top
- The best position is just above the steam humidifier



Steam solenoid valve installation principle

5.10 Unit Installation Check

⚠ WARNING

Improper unit handling hazard! This unit may only be brought into operation by qualified personnel.

Before start-up, please check proper unit installation following the list below:

- Is the unit perpendicularly aligned in both the vertical and horizontal axis?
- Have all clearances been obeyed?
- Does steam hose have a slope of 5-10%?
- Is condensate hose installed with a loop of min. 200 mm?
- Is steam manifold positioned correctly?
- Are all bolts and clamps tightened?

6. Water installation

⚠ WARNING

Risk of scalding!

Very hot water on the humidifier drain side!

Have all work performed by professional staff (plumber or personnel with equivalent training) to avoid risk of scalding by inadequate water flow.

⚠ WARNING

Risk of electrical shock!

Hazardous electrical high voltage!

Before starting installation work ensure yourself that the unit is not connected to the power supply.

General rules

- Obey regulations of local public utilities
- Verify that necessary safety measures have been taken - in compliance with either German Technical and Scientific Association for Gas and Water (DVGW) guidelines (DIN EN1717) or local regulations - to eliminate backflow of polluted water into drinking water treatment facilities. If this is not the case, implementing of a system separator of at least the CA-type (when free discharge into drainage is supported) or of the DVGW-conform HyFlow system separator (retrofit option for installation by the customer) is required. For DIN EN 61770 compliance, the water intake within the humidifier features two double check valves (58)
- Water supply temperature must not exceed 40 °C
- Flushed-out water must be able to drain freely
- The water supply line must have a minimum diameter of DN 12 (3/8"). If (chemical) additives are present in the humidification water, health risks and/or impaired unit operation cannot be ruled out
- Use of additives is not advised unless specifically recommended by the unit manufacturer
- When employing demineralized water or purified condensate, do not use copper or brass in the supply or drain lines of the HeaterLine unit. These materials can be corroded by demineralized water or purified condensate. Instead, use stainless steel or temperature-resistant plastic pipes
- Water installation pressure: 1 to 10 bar (100×10^3 to 100×10^4 Pa)
- For water installation please use the water connecting hose that is delivered with the unit

6.1 Water Quality

The HeaterLine Type steam humidifier is designed for use with:

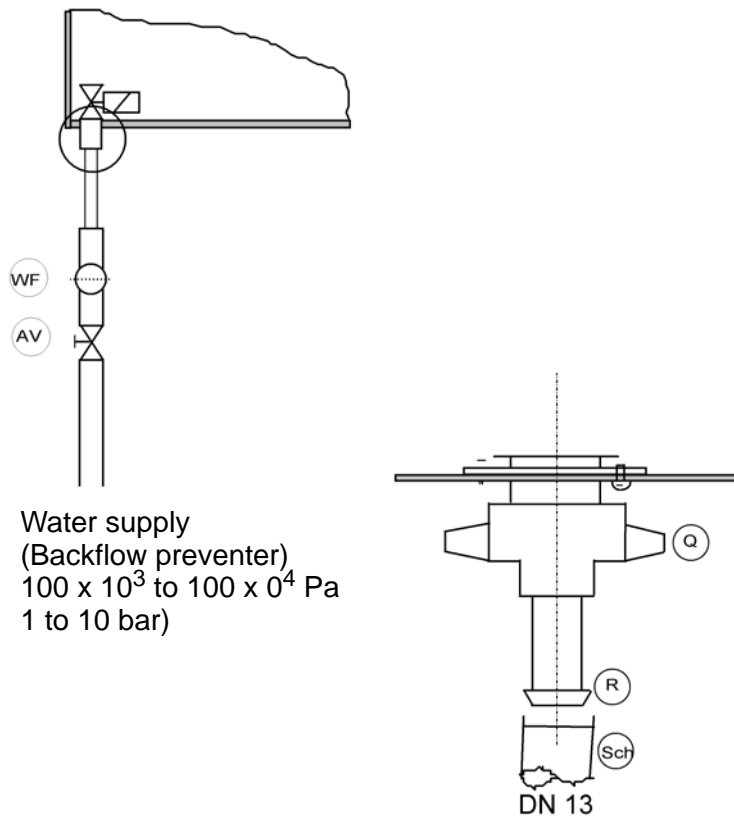
- tap water with a total hardness of max. 18.8 °e
- demineralized water (min. conductivity 3µS/cm)
- fully cleaned condensate (min. conductivity 3µS/cm)
- partially or fully softened water

Boiling normal tap water always produces lime.

Lime deposits on the surface of the heater elements may reduce their lifetime. We recommend to use a water treatment device in order to prevent scaling.

In case of any questions regarding water treatment devices please contact HygroMatik.

6.2 Water Supply (For Operation with Demineralized Water or Purified Condensate)



- » Install a shut-off valve (AV) in the supply hose.
- » Install a water filter (WF) if required by water quality.
- » Make sure that a backflow preventer is installed in the water supply line.

Please note Shut-off valve (AV), water filter (WF) and backflow preventer are not provided by HygroMatik.

Install as follows:

- » Check whether the valve strainer has been inserted in the solenoid valve.
- » Screw cap nut (Q) onto the supply connection. Tighten by hand.

The supply connection protrudes from the intermediate tray.

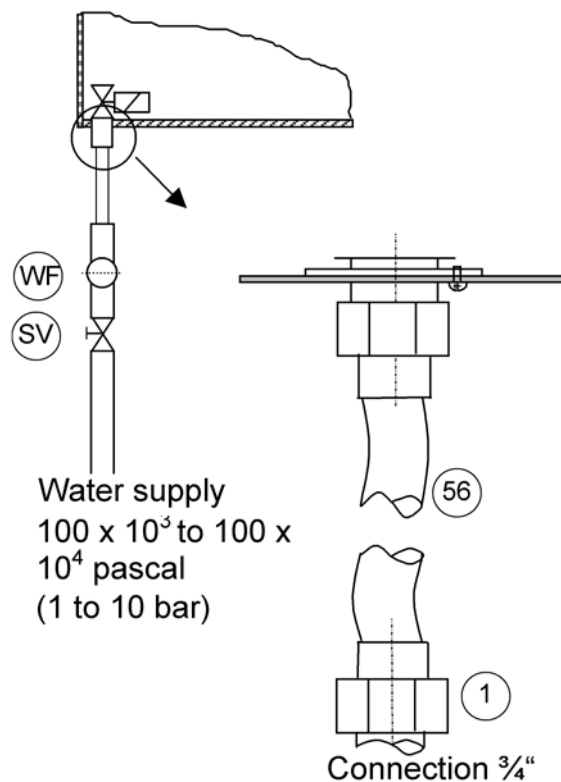
Please note Excessive tightening will damage the threads.

- » Slide 13mm inner diameter hose (SCH) over the pressure clip (R) and secure with a hose clamp.

6.3 Water Supply (For Operation with Tap Water or Partially/Fully Softened Water)

- » Install a shut-off valve (SV) in the supply line.
- » Install a water filter (WF) if required by water quality.
- » Make sure that a backflow preventer is installed in the water supply line.

Please note Shut-off valve (SV) and water filter (WF) are not supplied with the unit.



HygroMatik provides a water hose (56) with a cap nut at both ends which can be used for water installation.

Install as follows:

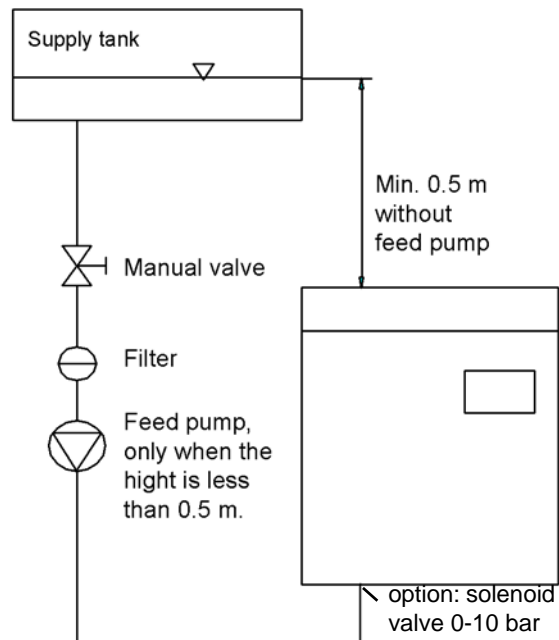
Screw and tighten the cap nut with its inner seal ring around the water supply screw connection that protrudes from the base.

Please note Excessive tightening will destroy the fitting. The valve strainer (29) must be placed inside the solenoid valve.

Use the cap nut (internal thread 3/4") with inner seal for connection to the customer-provided water system.

6.4 Feed from Holding Tank

If a holding tank will be used to supply water, the „option solenoid valve 0-10bar” must be ordered. Make sure that the feed height is at least 0.5 meter. If the height is less than 0.5 m, insert a feed pump or install the humidifier lower if possible.



6.5 Water Treatment

For water treatment system specifications, use the following table.

The figures below assume that the humidifier runs for 24 hours at 100% output.

Heater-Compact	Max. Water Consumption in 24 hrs [l]
02	55
03	83
06	166
09	248
12	331
18	497
27	745

6.6 Water Discharge

⚠ WARNING

Risk of scalding!

Wastewater must drain freely and pressureless!

During blow down up to 0.3 l/s are being drained with a temperature of about 95 °C.

Avoid contact in order not to burn skin.

For water discharge, we recommend installation of a flexible water drain hose. Humidifier and waste water discharge must be on the same pressure level.

Please note:

- Do not bend the drain hose, respect length specification
- For the discharge line and drain pipe, select materials temperature-resistant up to 95 °C or use the „HyCool“ option

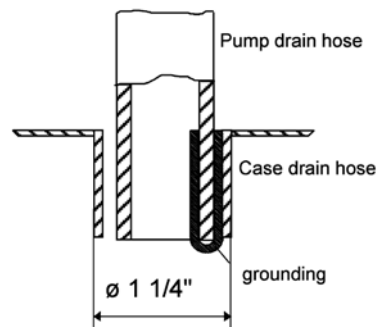
Install the water drain system as follows:

- » Install a drain hose 1 1/4 ", 250 - 1000 mm long, into a pressureless outlet according to DIN EN 1717. Locate the outlet sideways of the humidifier so that ascending vapor does not condensate on the humidifier`s housing

Model	
HC 02 - 27	1 x 1 1/4"
HC 03 -10	

- » Slide the drain hose over the pump discharge hose and secure to the cabinet drain connection

A grounding clip is fixed on the inner surface of the cabinet drain connection. Slide the end of the pump drain hose onto this clip. There is a 3 mm-wide gap between the pump drain hose jacket and the inner surface of the cabinet drain connection. If water collects on the base plate, it will flow through this gap into the drainage system.



6.7 Water Connection Installation Checklist

Verify correct system installation using the checklist below:

- Can flushed-out water drain freely?
- Have all screws and clamps been properly tightened?
- Was the water supply line flushed out properly?
- Has the water installation been performed correctly?
- Is the drainage system (including pump drain hose) correctly installed?
- Are water supply and drain lines free of leaks?

NOTICE

Foreign material in water supply pipe may cause premature damage to the solenoid valve!

Flush the water supply pipe before making connection to the solenoid valve. This is of particular importance in case of a newly installed pipe.

7. Electrical Installation

⚠ WARNING

Risk of electrical shock!

Hazardous electrical high voltage!

All work related to electrical installation may be performed by authorized personnel only (electricians or professionals with equivalent training).

Do not connect the steam humidifier to the power grid until after all installation work has been completed.

Please note The customer is responsible for checking qualifications.

General installation rules

- » All local regulations concerning electrical installation must be obeyed
- » Disconnect power supply prior to installation and secure against restart
- » Verify the absence of electric current. Installation or removal of the display and control unit may only be performed when the unit is switched off. See also section "Access to Control"
- » Electrical connector cables must be wired by qualified personnel
- » Install electrical connections as specified in the wiring diagrams
- » For units with power ratings over 33 kW, only a permanent connection to a permanent installation is permitted
- » Ensure that all terminals have been tightened

NOTICE

Take care of ESD protection!

The electronic components of the humidifier are very sensitive to electrostatic discharge. In order to protect these components during any type of installation, steps must be taken to guard against damage from electrostatic discharge.

7.1 Electrical Installation

- » Breakers must have a contact gap of at least 3 mm per pole
- » Each steam cylinder requires a separate main power supply including main fuses, main breaker, etc.
- » Connect potential equalization inside the unit to the external ground bolt (located on the underside of the cabinet beside the cable connections)

We recommend using a main fuse with medium blow rating (applies only to the mains voltages above.) See table below indicating maximum power consumption corresponding to each type of circuit protection:

Type	Power Supply	Power Consumption	Fuses
HC02	230 V/1Phases/N	6.5 A	1x10 A
HC03	230 V/1Phases/N	9.8 A	1x10 A
HC06	230 V/1Phases/N	19.6 A	1x20 A
HC06(P)	400 V/3Phases/N	11.3 A	3x16 A
HC09(P)	400 V/3Phases/N	16.9 A	3x20 A
HC12	400 V/3Phases/N	19.5 A	3x25 A
HC18	400 V/3Phases/N	29.3 A	3x32 A
HC27	400 V/3Phases/N	29.3 A	3x32 A

Please note The steam humidifier should be operated with a residual current device (RCD).

7.2 Safety Interlock

Between terminal 1 and 2 of the humidifier, the so called safety interlock is established. If the safety interlock is not closed, humidifier operation is not enabled.

Any additional safety devices (see below) must be installed between those terminals. The safety interlock is also used for an On/Off control mode (remote switch).

There is no jumper between terminal 1 and 2 ex works. If neither a remote switch nor a safety device is wired to terminal 1 and 2, a wire bridge has to be connected.

Install contact interlocks, i.e. max. hygrostat, vane relay, pressure controller, air interlock etc. in series between Terminals 1 and 2.

Please note It is standard practice for air-conditioning to install a max. hygrostat in the safety interlock (not valid for steam bath applications). The max. hygrostat acts as a safety device in the event of a humidity sensor malfunction and protects against overhumidification.

Please note Contacts laid between Terminals 1 and 2 must be potential free and rated for 230V switches.

⚠ WARNING

Risk of electrical shock!

Hazardous electrical high voltage.

When power is switched on, terminal 1 shows **230 VAC**.

7.3 Control Connection

Within the scope of this manual, only a **short description** of the „Adjustment of the Control with respect to the control signal” is given below. More detailed information can be found in the control technical manual also delivered with the HeaterCompact device.

The HeaterCompact unit is used for both steam bath and air conditioning applications. Since the humidifier is controlled by temperature in steam bath applications and by air humidity in air conditioning applications, different control device types are required. Consequently, the control connection descriptions differ as well.

7.4 Control Connection - Steam Bath Application

Valid for Controls: Basic-DS (B-DS), Comfort-DS (C-DS) und ComfortPlus-DS (CP-DS).

7.4.1 Temperature Sensor Connection

Connect the temperature sensor cable to the designated terminals 6 and 7 on the HygroMatik steam generator.

The factory setting for the value for the set point of steam bath temperature is 45°C. After switching the main switch to I (=ON) the humidifier starts to produce steam if the cabin temperature is a) below setpoint of temperature and b) if the safety interlock is closed (please see also chapter „Safety Interlock”).

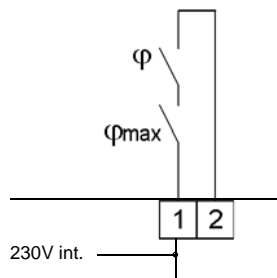
Connection for other steam bath components is described in the technical manual for the DS-Control.

7.5 Control Connection - Air Conditioning Application

Valid for Controls: Basic (B), Comfort (C) und ComfortPlus (CP).

Please note The factory setting for the controls is to an „External control signal, 0-10 VDC“, if no other setting is described in the humidifier delivery note.

Please note Set the control in a way that switches the humidifier on and off not too oftenly. Main contactors are wearing parts. Operation which minimizes activation cycles will extend the life of the main contactors.



7.5.1 1-step control

In case of 1-step control operation, the external hygrostat or a external control switch are wired in series with the contacts of the safety interlock.

Please note Contacts laid between terminals 1 and 2 must be potentialfree and rated for 230V switches

When a **Basic** control is use:

For 1-step control operation the jumpers must be set as indicated below:



Basic Control

When a **Comfort/Comfort-Plus** control is in use:

For 1-step control operation, parameter U6 must be set to “1-step,” s. also „Parameter Setting with Codes (P0=10) / Advanced Customer level“ section in the control technical manual.



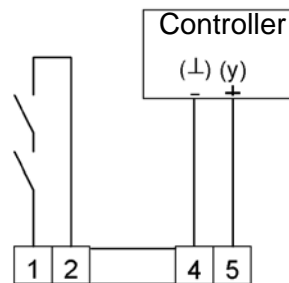
Comfort Control

7.5.2 Proportional Control with an external control signal

The control may be adjusted to the following external control signals:

- 0(2) - 5 V DC
- 0(2) - 10 V DC
- 0(4) - 20 V DC
- 0(4) - 10 mA DC
- 0(4) - 20 mA DC
- 0 - 140 Ohm

Factory setting is a 0 - 10 V control signal.



Humidifier Terminals



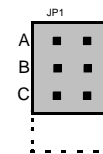
Basic Control

When a **Basic** control is in use:

For proportional control operation with an external control signal the jumpers must be set as indicated below:

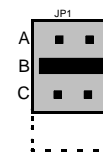
Setting for External Control Signal:

0(2) - 10 V DC



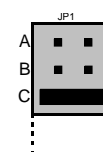
Setting for External Control Signal:

0(4)-20 mA



Setting for External Control Signal:

0-140 Ohm





Comfort Control

When a **Comfort/Comfort-Plus** control is in use:

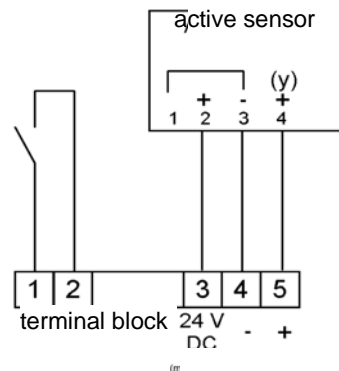
For proportional control operation when connected to an external control signal, software parameters U6 and E3 must be set as indicated below:

Control signal type	Parameter	
	U6	E3
0(2) - 10 V DC	ext. controller	0 - 10 V
0(4) - 20 mA DC	ext. controller	0 - 20 mA
0 - 140 Ohm	ext. controller	0 - 140 Ohm

7.5.3 Proportional Control with Built-In PI-Controller

Upon request, HygroMatik will provide an active sensor with a control signal of 0-10 V DC. Sensors with other output signals may also be used; the control (only available at Comfort or Comfort-Plus Control) need only be set to them.

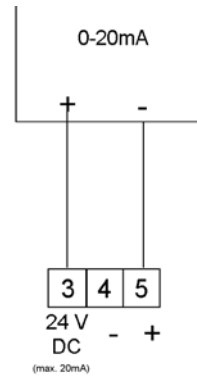
Connection: Active Sensor, one-cylinder and double-cylinder humidifier; voltage output



If other types of active sensors are used Parameter E3 has to be adjusted:

Sensor signal type	Parameter	
	U6	E3
0(2) - 10 V DC	PI controller	0 - 10 V
0(4) - 20 mA DC	PI controller	0 - 20 mA
0 - 140 Ohm	PI controller	0 - 140 Ohm

Connection: active sensor;
current output, single-cylinder and double cylinder units,
two-wire system



Humidifier Terminals

Please note The desired relative humidity value is set at Parameter **P8** (factory setting: P8=50%).

7.6 Cable Connections

The table below shows the cable connections provided in HeaterLine steam humidifiers:

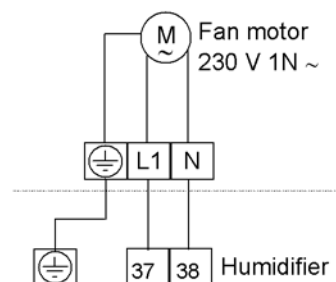
Model	Connection	Connection	Connection
HC02 -09	4	2	0
HC06P - HC09P HC12 - HC27	4	2	1

Characteristics of metric cable connections:

Thread	across-flats dimensions [mm]	for cable diameter [mm]
M16x1,5	19	4.5 - 10
M25x1,5	30	9 - 17
M32x1,5	36	11 - 21

7.7 Fan Unit

» Connect fan unit as specified in the wiring diagram.



The fan unit is activated/deactivated in parallel with humidification.

Please note Terminals 37 und 38 are supplied with the unit only when the fan unit and humidifier are purchased simultaneously. In other cases (i.e. retrofitting) the fan unit motor phase can be connected to Terminal 2 guided via the auxiliary contact of the main contactor. Only cables with same diameter are allowed to be connected to one common clamp.

7.8 Wiring Diagram

Please refer to the wiring diagram in the technical manual supplied with the control used with your humidifier. Every steam humidifier comes with a unit-specific technical manual and a manual for the control. In addition, you will find downloadable wiring diagrams and technical manuals at www.hygromatik.de.

7.9 Electrical Installation Checklist

Perform electrical installation checks in compliance with customer site requirements and public power utility regulations:

- Does the mains voltage match the voltage on the name plate?
- Have all electrical connections been made according to the terminal diagram?
- Have all electrical cable and plug connections been properly tightened?
- Are all electrical plug connections secure?
- Is the unit grounded?

After this check the unit can be switched on.

Please note For initial operation, control, service, malfunctions, and circuit diagrams, consult the operation instructions for the HygroMatik-controls or at www.hygromatik.de

8. Maintenance

The HygroMatik steam humidifier is easy to maintain. Nevertheless, inadequate or improper maintenance can lead to operational malfunctions. Perform regular maintenance to give your unit a long life span.

▲ WARNING

The unit is only to be serviced by qualified personnel!

All safety instructions must be observed.

After maintenance work, have qualified personnel check that the unit is operating safely.

▲ WARNING

Risk of electrical shock!

Hazardous electrical high voltage.

Switch off the unit before **maintenance works** and protect against restart.

When performing a **trial run** for leakage detection without the unit cover attached, safety instructions for working on live components must be followed.

▲ WARNING

Risk of injuries caused by rotating parts!

A fan is attached to the semiconductor relay heat sink.

When in trial run mode without the unit cover attached, make sure not to insert fingers in the rotating fan.

NOTICE

Take care of ESD protection!

The electronic components of the humidifier control are very sensitive to electrostatic discharges. In order to protect these components during maintenance, steps must be taken to guard against damage from electrostatic discharge.

Maintenance work is mainly restricted to checking all of the unit parts including the steam cylinder interior and the control cylinder, and a unit trial run.

Since steam and condensate hoses are also subject to wear, they have to be checked regularly. Seals are wearing parts and as such must be examined during periodic maintenance and replaced, if required.

As part of the maintenance works, the screw terminals must be checked and retightened, if necessary.

The steam humidifier's performance and maintenance intervals depend primarily on the existing water quality and the quantity of steam generated. Variable water quality can lengthen or shorten the maintenance interval. Ongoing maintenance intervals can be estimated based on the amount and type of residue found in the steam cylinder. Immediate cylinder maintenance is indicated by:

Immediate cylinder maintenance is indicated by:

- a **green, blinking LED** on the display and operating panel.
- the display reads **Service** (only with controls of Type Comfort and Comfort Plus).

8.1 Maintenance for Operation with Demineralized Water / Condensate

Instructions for maintenance and cleaning intervals are based exclusively on typical, empirically determined values.

Cycle	Maintenance Task
4 Weeks after Initial Operation	Visual check of electrical and mechanical connections. Visual check of water level control. Visual check of steam cylinder interior.
Annually	Visual check of electrical and mechanical connections. Visual check of water level control. Visual check of heater elements / thermo sensor. Visual inspection of interior of steam cylinder. If needed, cleaning of steam cylinder, heater elements and thermo sensor.

8.2 Maintenance for Operation with Tap Water or Partially Softened Water

No precise maintenance intervals can be specified because these always depend on water quality and quantity of steam generated. It is advisable to adjust the frequency of maintenance to the specific operational application.

HYGROMATIK recommends to open and check the steam cylinder two weeks after commissioning. Ongoing maintenance intervals can be estimated based on the amount and type of residue found in the steam cylinder.

Blow-Down Cycles

The vaporization process causes mineral (calcium) deposits of different compositions to settle in the steam cylinder. Part of this solid build-up is removed through periodic blow-downs and fresh tap water refills.

Water quality

When using tap water, note that cleaning intervals shorten as the carbonate hardness level in the water increases. As a general rule, it is preferable to operate the unit with fully demineralized water. Operation will not be affected by mineral deposits and flushing losses will be minimized.

Please note

If desired, maintenance intervals can be lengthened by moderately increasing blow-down rates. Please consult HygroMatik.

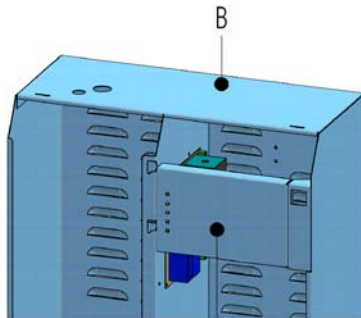
8.3 Access to Control Unit

⚠ WARNING

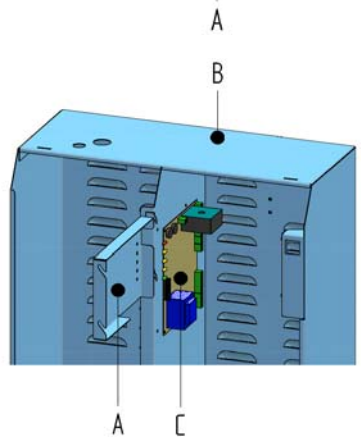
Risk of electrical shock

Hazardous electrical high voltage!

Make sure the unit is switched off before installing or removing the display panel.



- » Remove cover (or electric compartment cover) and lift display panel (A) off its guide.
- » Turn display panel (see drawing) and hang display panel on the humidifier cabinet (B) by placing the two guide pins in the two front guides.



The PCB (C) is now accessible.

8.4 Removing and Cleaning the Steam Cylinder

⚠ WARNING

Risk of skin burning!

Hot steam cylinder during operation and for some time afterwards.

Drain steam cylinder before any maintenance work is commenced.

Switch off unit and protect against restart.

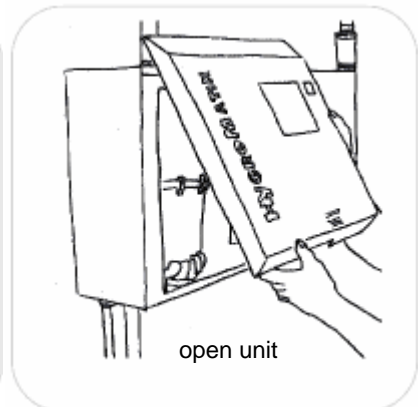
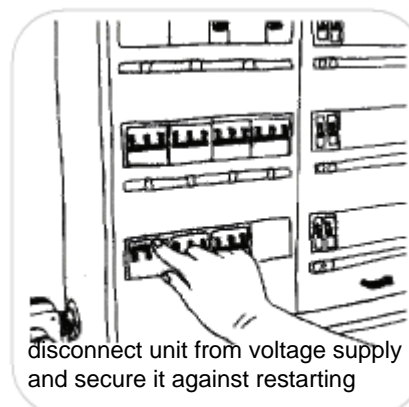
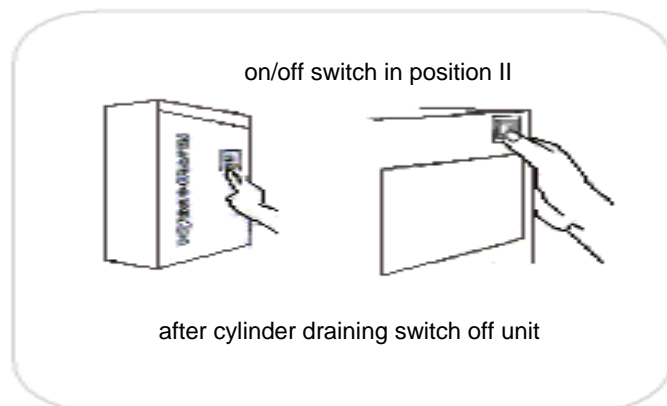
After that, wait approx. 10 mins before starting maintenance work.

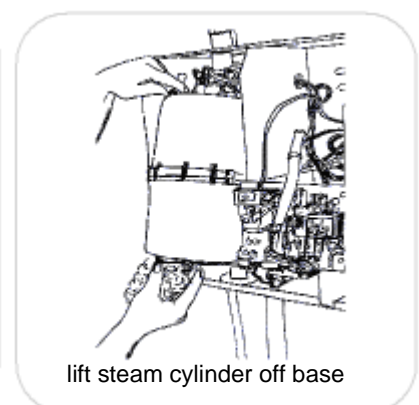
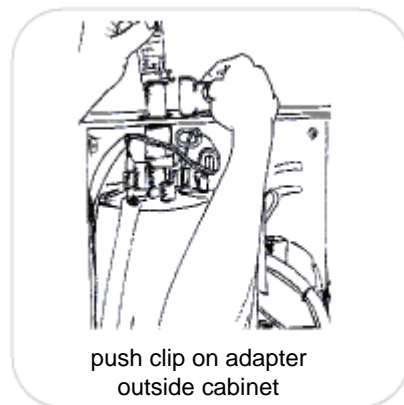
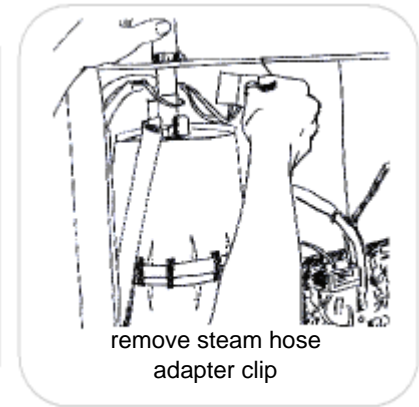
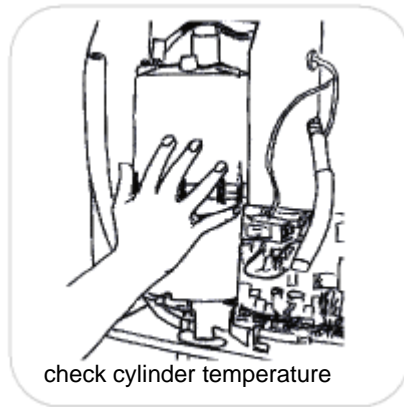
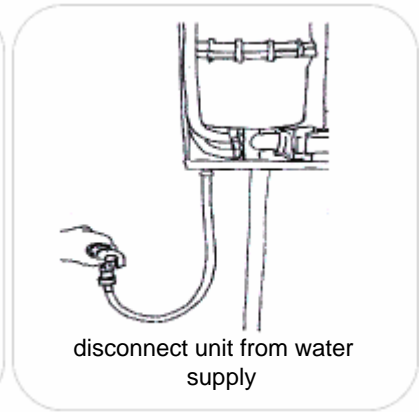
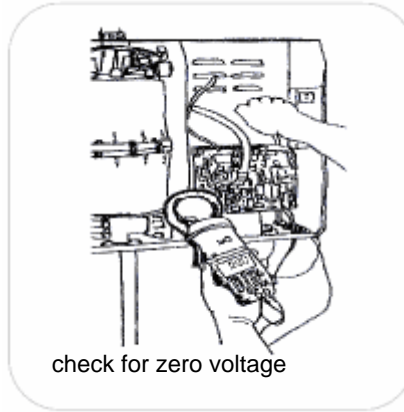
Check steam cylinder temperature by cautious approximation with hand (do not touch!).

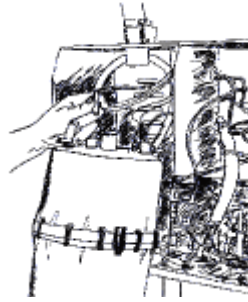
Please note

After a longer period of operation the steam cylinder may shrink a little. This doesn't matter but could lead to tightness discrepancies when only one half of the cylinder is exchanged. Therefore we recommend not to change only one half of the cylinder but the complete cylinder.

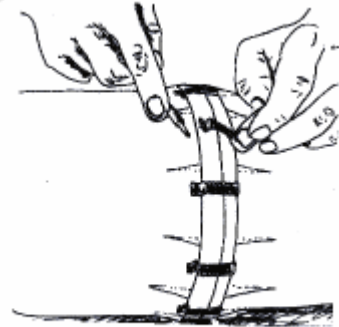
Removal



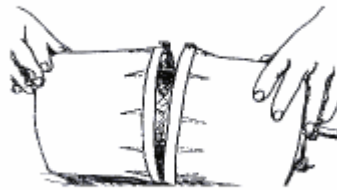




detach connecting cable for
heater element(s)



remove flange clamps



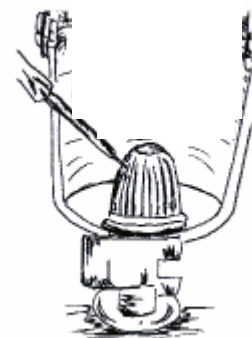
open cylinder



remove used O-ring



clean cylinder interior



clean the two strainers

Cleaning of Steam Cylinder and Cylinder base

Please note When using mineral deposit removers or cleaners to clean the cylinder and heater elements, make sure to thoroughly rinse the unit before returning reassembling it. Use mineral deposit removers **only** for cylinder and heater elements.

NOTICE

Risk of material damage!

Excessive mechanical cleaning may damage the cylinder and/or the heater elements.

- » Check cylinder inner surface and heater elements. Remove all deposits. However, small amounts of scale deposits on the heater elements (8) are harmless.
- » Cylinder base (11) and the connections have also to be checked for deposits and cleaned if necessary.

Cleaning of the Control Cylinder

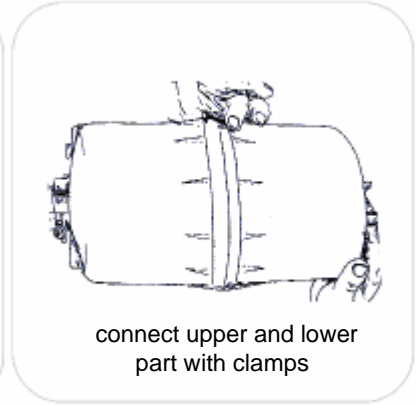
The control cylinder (27, 28, 29) monitors the water level. When cleaning the steam cylinder the control cylinder should also be cleaned. Therefore:

- » Loosen the four top screws that interconnect floating switch (27) and control cylinder housing (29).
- » Pull out floating switch and clean it carefully.
- » Take off sealing (28) and clean it.

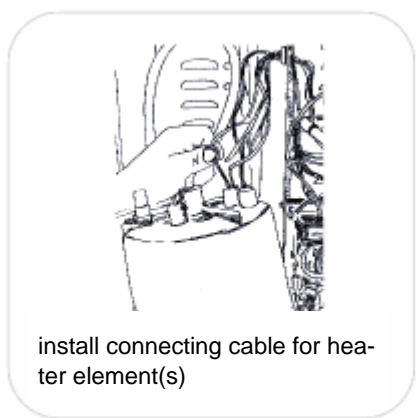
Please note The rod assembly must not be lubricated.

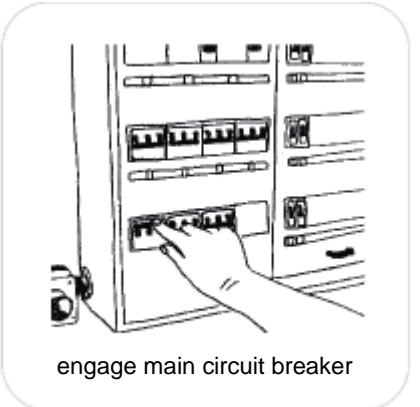
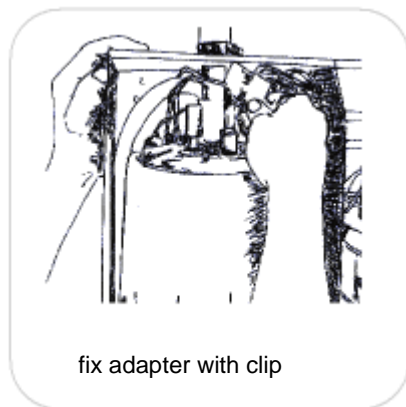
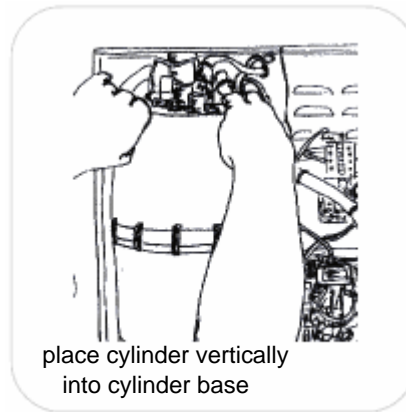
- » Clean the sealing surface of the control cylinder housing (28).
- » For installation mount the a.m. components in reverse order.

Assembly



Please note When reassembling the cylinder halves, the joints and reinforcements of both sections must fit together snugly.





- » Switch on unit and check for leakages during 15 to 30 mins. trial run.
- » Redeem leakages, if applicable.
- » Check again.
- » Reassemble unit cover only when all of the remaining maintenance steps are accomplished.

8.5 Maintenance of the Control Cylinder

When cleaning the steam cylinder the control cylinder should also be cleaned.

As the access to the control cylinder is only possible if the steam cylinder is removed one can find the sub chapter „Cleaning of the Control Cylinder” in chapter „Cleaning the Steam Cylinder”.

Cleaning the steam hose adapter nozzle

From the top of the control cylinder a hose runs to the steam hose adapter connecting piece. The nozzle integrated in the connecting piece must be cleaned regularly otherwise blocking by hardeners might occur.

8.6 Replacing Heater Elements

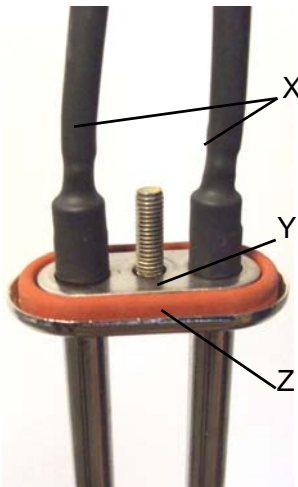
Removal

- » Remove and open the steam cylinder as described above in section “Removing and Cleaning the Steam Cylinder.”
- » Detach connecting cable for the heater element in question. Mark these two terminals.
- » If necessary, remove the capillary tube of the thermo sensor from the heater element by detaching the retainer clips.
- » Detach the heater element from the cover by removing the nut and adjusting washer.
- » If present detach cable lug for grounding.
- » Pull heater element downward out of the steam cylinder.
- » Clean the sealing surface on the underside of the cover around the area where the new heater element will be installed.

Installation

- » Install new heater element (with sealing), replacing the parts in the correct sequence, and screw nut.
- » Insert the heater element’s connecting cable into the two marked terminals and tighten. Polarity of (heater element) connecting cable is not important.
- » If necessary: Install capillary tube of the thermo sensor on the heater element using retainer clips.
- » To proceed further, follow the steps described above in section “Removing and Cleaning the Steam Cylinder”.

8.7 Replacing the Heater Element Sealing



Detail: Electrical connection - heater element

- » Remove heater element as described above in „Replacing Heater Elements/Removal“ section.
- » If necessary, slit shrink sleeving (X) and remove.
- » Lift retaining plate (Y) and slide over connecting wires away from heater element.
- » Remove old sealing (Z) and install a new one.
- » Push retaining (Y) plate over connecting wires and mounting bolt.
- » If the shrink sleeves (X) were removed in a preceding step, install adequate shrink tubing and shrink to size with a heat gun.
- » Install heater element as described above in section „Replacing Heater Elements/Installation“.

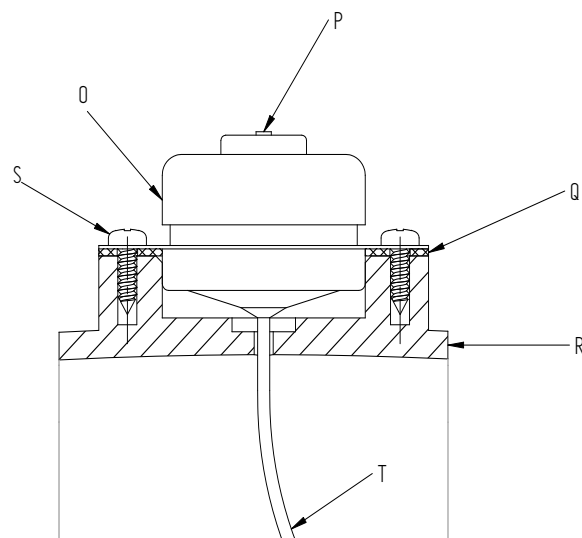
Please note

Do not remove the two washers on the mounting bolt in order to ensure the correct holding plate distance towards the cylinder top.

8.8 Replacing Thermo Sensor (for Heater Element)

Removal

- » Remove and open the steam cylinder as described above in “Removing and Cleaning the Steam Cylinder” section.
- » Detach capillary tube (T) clips.
- » Disconnect capillary (T) tube from heater elements (8).
- » Remove the two screws (S) holding the thermo sensor (O) in place.
- » Remove thermo sensor.



NOTICE

Risk of material damage!

Do not buckle the thermo sensor capillary tube.

Reinstallation

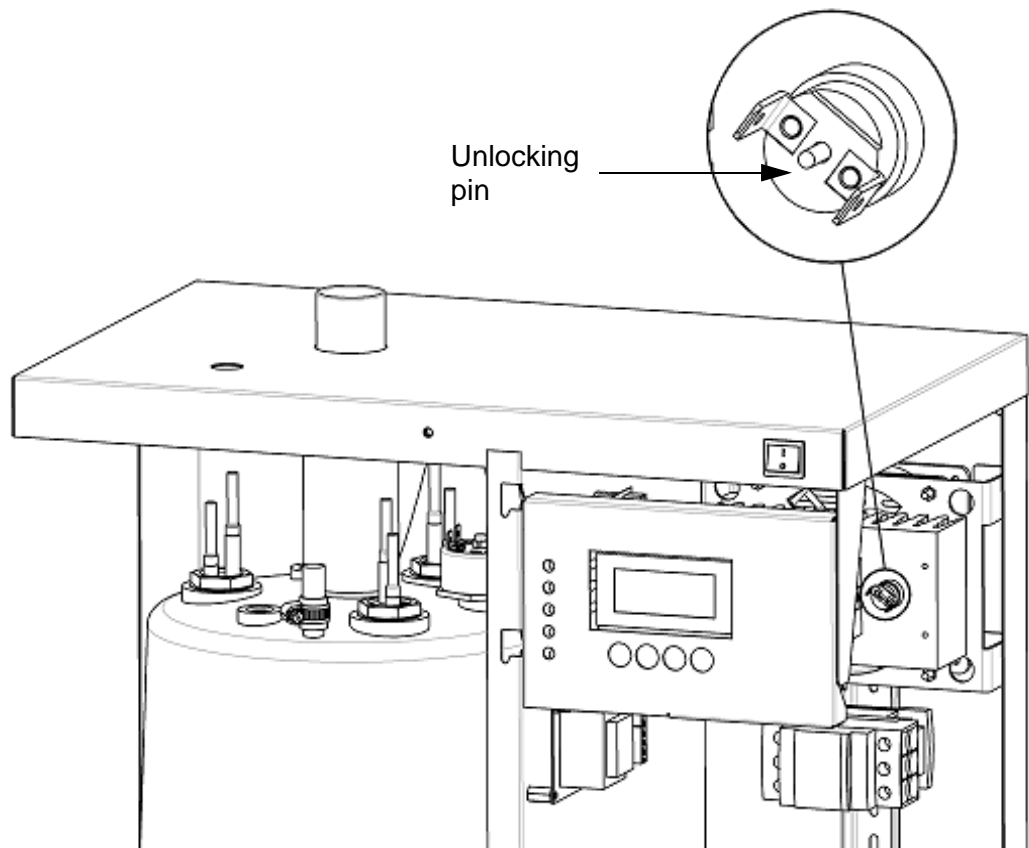
- » Install thermo sensor with new sealing. Do not overfasten screws!
- » Neatly connect the capillary tube to the heater element. In case of humidifiers with two or more heating elements, the capillary tube is attached to two heating elements.
- » To proceed further, follow the steps described above in “Cleaning Coarse Strainer in Cylinder Base -Assembly” section.

8.9 Unlocking of a Released Thermo Sensor (for heater element)

If a thermo sensor (for heater element) has released due to a temperature too high, the red unlock button (P) protrudes a few millimetres from its holder top. After the system has cooled down, the thermo sensor may be unlocked by forcefully pressing the unlock button (P) back down in its holder for a few millimetres.

8.10 Unlocking of a Released Thermo Sensor (for Solid State Relay)

If a thermo sensor (for the solid state relay) has released due to a temperature too high ($>100^{\circ}\text{C} \pm 5^{\circ}\text{K}$), the control reports the „Thermo sensor activated“ fault. After the system has cooled down, the thermo sensor may be unlocked by cautiously pressing the unlocking pin between the both plain connectors down until there is a klick sound.



8.11 Removing Inlet Solenoid Valve and Cleaning Fine Mesh Filter

Removal

- » Remove and open the steam cylinder as described above in section “Removing and Cleaning the Steam Cylinder - Removal.”
- » Shut off water supply and remove cap nut of the fresh water connection.
- » Detach connecting hose from base.
- » Remove electrical connectors from solenoid valve.
- » Remove solenoid valve mounting screws.
- » Lift solenoid valve out of bore.

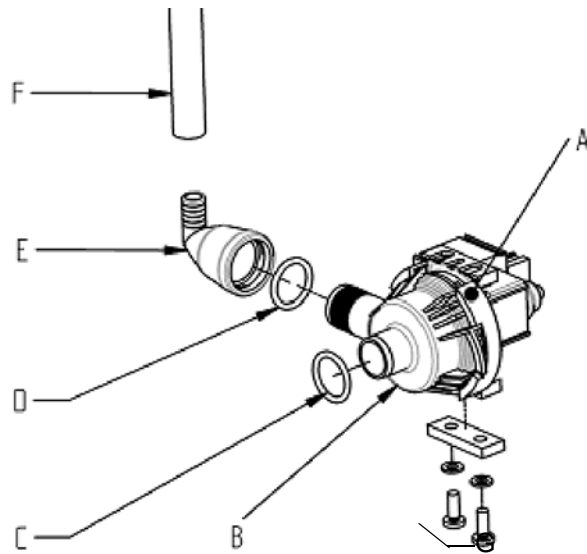
Cleaning

- » Remove fine mesh filter from the solenoid valve and clean.

Reinstallation

- » Place solenoid valve with seal in the hole in the unit cabinet.
- » Secure solenoid valve tightly with screws.
- » Attach fresh water connection.
- » Connect electrical cable to the solenoid valve.
- » Attach connecting hose to base using clamps.
- » Install cylinder as described above in “Cleaning Steam Cylinder - Assembly” section.
- » Open water supply.
- » Switch on unit and check for leakage after 15-30 minutes of operation.
- » If leakage occurs, switch off power supply and redeem leaks.
- » Check again.

8.12 Cleaning Blow-Down Pump



- » Remove and open the steam cylinder as described above in the “Removing and Cleaning the Steam Cylinder - Removal” section.
- » Detach electrical connector from the pump (10).
- » Detach union adapter (E) from the pump.
- » Remove screws (G) and take the pump out of the base (11).
- » Open pump (bayonet lock).
- » Remove all residue from drain hoses and pump (possibly replace o-ring (A)).
- » Assemble pump.
- » Moisten o-ring (C) and place in the side connection of the base.
- » Push pump into the base and secure tightly with screws (G).
- » Moisten o-ring (D) and place on the side connection of the pump.
- » Slide union adapter (E) over the side connection of the pump.
- » Connect electrical connector to the pump (polarity not specified).
- » Open water supply.
- » Switch on unit and check for leaks after 15-30 minutes of operation.
- » If leakage occurs, switch off power supply and redeem leaks.
- » Check again.

8.13 Cleaning connecting hoses and cylinder base

Regular maintenance also comprises the check of the connecting hoses for good order and free passage.

Also, all of the cylinder base (11) and steam hose adapter (2) connections must be checked for free passage and cleaned, if necessary.

8.14 Checking Cable Screw Connections, Heater Element Wires

NOTICE

Risk of material damage!

Loose cable connections may cause excessive contact resistance and overheating of contact surfaces.

- » Check that all cable screw connections are securely tightened.
- » Ensure that heating element cabling is not damaged.

8.15 Functional Check

- » Switch on the unit and let it run for a few minutes, ideally at maximum output.
- » Check safety devices.
- » Check hose connections and seals for leaks that may show up.

8.16 Dismantling

Once the steam humidifier will no longer be used, dismantle (demolish or scrap) it by following the installation procedures in reverse order.

⚠ WARNING

Risk of electrical shock!

Hazardous electrical high voltage.

Dismantling must only be accomplished by expert staff (electricians or personnel with equivalent training).

All safety guidelines as outlined in the “Safety Instructions” section must be obeyed, especially the guidelines for disposal.

9. Commissioning

▲ WARNING

Risk of operating error!

Start-up of the unit is restricted to expert staff only (electricians or expert personnel with equivalent training).

Switching off steam humidifier

Please note

Before starting up the unit, make sure you know how to switch it off.

- » Switch off unit by setting control switch to “0”Close water supply stopcock valve.

Check of electrical wire connections

- » Check that all electrical wire connections, including heater element wire connections, are tight and secure.
- » Check cylinder seating, and if necessary steam and condensate hose clamps

Switching on Steam Humidifier

- » Switch on main breaker
- » Open water supply stopcock valve. Operating pressure 100×10^3 to 100×10^4 Pa (1 to 10 bar overpressure).
- » Switch on unit by setting control switch to “1”.
- » Set control for initial operation check to humidity demand for initial operation check.

The following operational steps are executed:

- The unit performs a self-test. If the control includes a display, the message “self-test“ is displayed.
- If the safety interlock (see also chapter „Safety interlock“) is closed, the water inlet solenoid valve opens and feeds water into the steam cylinder.

If there is a demand for humidity, the main contactor is switched and a few minutes later steam production starts. Initiation of steam production can take up to 20 minutes.

Further checks:

- Let all electrically-driven operations run to completion.

As soon as the solenoid valve begins replenishing the water periodically, the steam humidifier operates at steady nominal output and the cold start sequence is complete.

- » Monitor the unit and let it operate for 15 to 30 minutes.
- » If leaks appear, switch off the unit.
- » Repair leaks, obeying the following security instruction:

⚠ WARNING

Risk of electrical shock!

Hazardous electrical high voltage!

Follow safety instructions for work on live components.

10. EC-Declaration of Conformity



EG-Konformitätserklärung EC Declaration of Conformity

Hersteller / Manufacturer: HygroMatik GmbH
Anschrift / Address: Lise-Meitner-Straße 3, D-24558 Henstedt-Ulzburg, Germany
Produktbezeichnung / Product description:
Heater Compact (HC): HC02, HC03, HC06, HC06P, HC09, HC09P, HC12, HC18, HC27
In den Ausführungen / Type: Basic, Comfort, Comfort Plus, Dampfbad / Steam bath (DS)

Die bezeichneten Produkte stimmen in der von uns in Verkehr gebrachten Ausführung mit den Vorschriften folgender Europäischer Richtlinien überein:

The products described above in the form as delivered are in conformity with the provisions of the following European Directives:

- 2004/108/EG** Richtlinie des Rates zur Angleichung der Rechtsvorschriften der Mitgliedstaaten über die elektromagnetische Verträglichkeit.
Council Directive on the approximation of the laws of the Member States relating to electromagnetic compatibility.
- 2006/95/EG** Richtlinie des Rates zur Angleichung der Rechtsvorschriften der Mitgliedstaaten betreffend elektrische Betriebsmittel zur Verwendung innerhalb bestimmter Spannungsgrenzen.
Council Directive on the approximation of the laws of the Member States related to electrical equipment designed for use within certain voltage limits.

Die Konformität mit den Richtlinien wird nachgewiesen durch die Einhaltung folgender Normen:
Conformity to the Directives is assured through the application of the following standards:

Referenznummer:	Ausgabedatum:	Referenznummer:	Ausgabedatum:
<i>Reference Number:</i>	<i>Edition:</i>	<i>Reference Number:</i>	<i>Edition:</i>
DIN EN 61000-6-2	2006-03	DIN EN 60335-1	2010-11
DIN EN 61000-6-3	2011-09	DIN EN 60335-1/A15	2012-03
		DIN EN 60335-2-98	2009-04
		DIN EN 62233	2008-11
		DIN EN 62233 Ber.1	2009-04

Die Anforderungen des Produktsicherheitsgesetzes ProdSG §3 Abs. 1 bis 2 werden eingehalten. Eine vom Lieferzustand abweichende Veränderung des Gerätes führt zum Verlust der Konformität.
The requirements of the German Product Safety Law (ProdSG) paragraph 3 clause 1 to 2 are met. Product modifications after delivery may result in a loss of conformity.

Henstedt-Ulzburg, den / the 18.12.2013

HygroMatik GmbH

Dirc Menssing
Geschäftsführer / General Manager

Dr. Andreas Bock
Technischer Leiter / Head of Engineering

Diese Erklärung bescheinigt die Übereinstimmung mit den genannten Richtlinien, ist jedoch keine Zusicherung von Eigenschaften. Die Sicherheitshinweise der mitgelieferten Produktdokumentation sind zu beachten.
This declaration certifies the conformity to the specified directives but contains no assurance of properties. The safety documentation accompanying the product shall be considered in detail.

HygroMatik GmbH
Postfach 12 19 · 24549 Henstedt-Ulzburg
Lise-Meitner-Str. 3 · 24558 Henstedt-Ulzburg
Germany

T +49 4193 895 - 0
F +49 4193 895 - 33
hy@hygromatik.de
www.hygromatik.com

Geschäftsführung:
Dirc Menssing
Maike Nielsen
Nicholas J. Anderson

AG Kiel HR B 1282 No
USt-ID-Nr. DE 134846785
Ein Unternehmen der
spirax
sarco Gruppe

Deutsche Bank
Kto. 6256689 00 · BLZ 200 700 00
IBAN DE12 2007 0000 0625 6689 00
BIC DEUTDE33

11. Spare Parts

*	HC02	HC03	HC06	HC09	HC06P	HC09P	HC12	HC18	HC27	Article No.	Description
											Cabinet HC
											Steam Generation
	1									B-2205493	Cylinder compl., with 1 heater element 1,5kW, 1 thermal sensor and terminal, 230V
		1								B-2205481	Cylinder compl., with 1 heater element 2,25kW, 1 thermal sensor and terminal, 230V
			1							B-2205455	Cylinder compl. Incl 1 heater element 4.5kW, 1 thermal sensor and terminal
				1						B-2205459	Cylinder compl. Incl 1 heater element 6.75kW, 1 thermal sensor and terminal
					1					B-2205463	Cylinder compl. Incl 1 heater element 4.5kW, 1 thermal sensor and terminal
						1				B-2205467	Cylinder compl. Incl 1 heater element 6.75kW, 1 thermal sensor and terminal
							1			B-2205471	Cylinder compl. Incl 2 heater elements 4.5kW, 1 thermal sensor and terminal
								1		B-2205475	Cylinder compl. Incl 2 heater elements 6.75kW, 1 thermal sensor and terminal
									1	B-2205479	Cylinder compl. Incl 3 heater elements 6.75kW, 1 thermal sensor and terminal
16	1									B-3216046	top part of cylinder Cy2, empty
16		1	1	1						B-3216050	top part of cylinder, empty for 1 heater element and 1 th. Sensor, including strainer
16					1	1				B-2206051	top part of cylinder, empty for 1 heater elements and 1 th. Sensor, including strainer
16							1	1		B-2206059	top part of cylinder, empty for 2 heater elements and 1 th. Sensor, including strainer
16									1	B-2206061	top part of cylinder, empty for 3 heater elements and 1 th. Sensor, including strainer
19	1	1	1	1						B-2216052	lower part of cylinder Cy08, including strainer
19					1	1	1	1	1	B-2206083	lower part of cylinder Cy17, including strainer
8				1			1	1		B-2209111	heater element 230V/ 4.5 kW incl. Nuts/sealing
	1									B-2209031	heater element 230V/ 1.5 kW with sealing and mounting set, big diameter
8		1								B-2209029	heater element 230V/ 2.25kW with sealing and mounting set, big diameter
8			1							B-2209025	heater element 230V / 4.5kW with sealing and mounting set, big diameter
8			1							B-2209021	heater element 400V / 4.5kW with sealing and mounting set, big diameter
8				1						B-2209023	heater element 400V/ 6.75kW with sealing and mounting set, big diameter
8					1		2			B-2209101	heater element 400V/ 4.5kW with sealing and mounting set
8						1		2	3	B-2209103	heater element 400V/ 6.75kW with sealing and mounting set
26	2	2	2	2						E-2205138	Gasket for heater element
25	2	2	2	2						E-2205140	Mounting nut for heater
26					2	2	4	4	6	E-2204006	Gasket for heater element
25					1	1	2	2	3	E-2204007	Mounting nut for heater
15	1	1	1	1						E-3216010	O-ring seal for cylinder flange
15					1	1	1	1	1	E-2206050	O-ring seal for cylinder flange
	1									B-3216015	O-ring set für HC02
		1	1	1						B-3216095	O-ring set for HC06-09
					1	1	1	1	1	B-3216097	O-ring set for HC06P-27
59	1									B-2209035	protective tube incl melting fuse
5	1	1	1	1	1	1	1	1	1	B-2205031	Thermal sensor 1pole
6	6	6	6	6	6	6	8	8	10	E-2205012	Clamp for thermal sensor 1pole
6	1	1	1	1	1	1	1	1	1	E-2205010	gasket for thermal sensor 1pole
2	1									E-2209000	adapter for steam hose DN25
	1									E-2209014	adapter for steam outlet DN40/DN25
24	1									E-3221004	Clip for steam hose adapter DN25
	1									E-2204022	O-ring for cylinder base and steam hose adapter
2		1	1	1	1	1	1	1	1	B-2205025	adapter for steam hose DN40
24		1	1	1	1	1	1	1	1	E-2209002	Clip for steam hose adapter DN40
4		1	1	1	1	1	1	1	1	E-2204022	O-ring for steam hose adapter DN40
1		2	2	2	2	2	2	2	2	E-2205088	star knob screw, fixation for steam hose adapter
12		1	1	1	1	1	1	1	1	E-2204035	condensate plug

*	HC02	HC03	HC06	HC09	HC06P	HC09P	HC12	HC18	HC27	Article No.	Description
Cabinet HC											
Steam Generation											
	1									B-2205493	Cylinder compl., with 1 heater element 1,5kW, 1 thermal sensor and terminal, 230V
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			1							B-2205455	Cylinder compl. Incl 1 heater element 4.5kW, 1 thermal sensor and terminal
				1						B-2205459	Cylinder compl. Incl 1 heater element 6.75kW, 1 thermal sensor and terminal
					1					B-2205463	Cylinder compl. Incl 1 heater element 4.5kW, 1 thermal sensor and terminal
						1				B-2205467	Cylinder compl. Incl 1 heater element 6.75kW, 1 thermal sensor and terminal
							1			B-2205471	Cylinder compl. Incl 2 heater elements 4.5kW, 1 thermal sensor and terminal
								1		B-2205475	Cylinder compl. Incl 2 heater elements 6.75kW, 1 thermal sensor and terminal
									1	B-2205479	Cylinder compl. Incl 3 heater elements 6.75kW, 1 thermal sensor and terminal
16	1									B-3216046	top part of cylinder Cy2, empty
16		1	1	1						B-3216050	top part of cylinder, empty for 1 heater element and 1 th. Sensor, including strainer
16					1	1				B-2206051	top part of cylinder, empty for 1 heater elements and 1 th. Sensor, including strainer
16							1	1		B-2206059	top part of cylinder, empty for 2 heater elements and 1 th. Sensor, including strainer
16									1	B-2206061	top part of cylinder, empty for 3 heater elements and 1 th. Sensor, including strainer
19	1	1	1	1						B-2216052	lower part of cylinder Cy08, including strainer
19					1	1	1	1	1	B-2206083	lower part of cylinder Cy17, including strainer
8				1			1	1		B-2209111	heater element 230V/ 4.5 kW incl. Nuts/sealing
	1									B-2209031	heater element 230V/ 1.5 kW with sealing and mounting set, big diameter
8		1								B-2209029	heater element 230V/ 2.25kW with sealing and mounting set, big diameter
8			1							B-2209025	heater element 230V / 4.5kW with sealing and mounting set, big diameter
8			1							B-2209021	heater element 400V / 4.5kW with sealing and mounting set, big diameter
8				1						B-2209023	heater element 400V/ 6.75kW with sealing and mounting set, big diameter
8					1		2			B-2209101	heater element 400V/ 4.5kW with sealing and mounting set
8						1		2	3	B-2209103	heater element 400V/ 6.75kW with sealing and mounting set
26	2	2	2	2						E-2205138	Gasket for heater element
25	2	2	2	2						E-2205140	Mounting nut for heater
26					2	2	4	4	6	E-2204006	Gasket for heater element
25					1	1	2	2	3	E-2204007	Mounting nut for heater
15	1	1	1	1						E-3216010	O-ring seal for cylinder flange
15					1	1	1	1	1	E-2206050	O-ring seal for cylinder flange
	1									B-3216015	O-ring set für HC02
		1	1	1						B-3216095	O-ring set for HC06-09
					1	1	1	1	1	B-3216097	O-ring set for HC06P-27
59	1									B-2209035	protective tube incl melting fuse
5	1	1	1	1	1	1	1	1	1	B-2205031	Thermal sensor 1pole
6	6	6	6	6	6	6	8	8	10	E-2205012	Clamp for thermal sensor 1pole
6	1	1	1	1	1	1	1	1	1	E-2205010	gasket for thermal sensor 1pole
2	1									E-2209000	adapter for steam hose DN25
	1									E-2209014	adapter for steam outlet DN40/DN25
24	1									E-3221004	Clip for steam hose adapter DN25
	1									E-2204022	O-ring for cylinder base and steam hose adapter
2		1	1	1	1	1	1	1	1	B-2205025	adapter for steam hose DN40
24		1	1	1	1	1	1	1	1	E-2209002	Clip for steam hose adapter DN40
4		1	1	1	1	1	1	1	1	E-2204022	O-ring for steam hose adapter DN40
1		2	2	2	2	2	2	2	2	E-2205088	star knob screw, fixation for steam hose adapter
12		1	1	1	1	1	1	1	1	E-2204035	condensate plug

*	HC02	HC03	HC06	HC09	HC06P	HC09P	HC12	HC18	HC27	Article No.	Description
											Control
	1									E-2501005	main contactor 16A, (ABB), coil voltage.230VAC
		1	1	1	1	1	1			B-2507041	main contactor 20A, DILM7, coil voltage.230VAC
								1	1	B-2507061	main contactor 35A, DILM17, coil voltage 230VAC
51	1	1	1	1	1	1	1	1	1	E-2502412	control button 2 pole Basic, L3/DS, middle 0
	1									E-2205110	solid state relais 25 A, without cooler
		1	1	1	1	1				B-2602001	solid state relay 25 A, 1ph., cooling device 150 x 50 mm, thermal circuit breaker
							1	1		B-2602103	solid state relay 50 A, 2ph., cooling device 150 x 50 mm, thermal circuit breaker (not at Slave-units)
									1	B-2602009	solid state relay 75 A, 1ph., cooling device 150 x 80 mm, thermal circuit breaker (not at Slave-units)
	1		1	1		1				B-2602107	solid state relay 25 A, 1ph.
							1	1		B-2602109	solid state relay 50 A, 2ph.
										B-2602111	solid state relay 75 A, 1ph.
							1	1		E-2205102	Protection cap against contact with cutout
		1	1	1	1	1	1	1		E-2205116	cooling device 150 x 50 mm
									1	E-2205118	cooling device 150 x 80 mm
	1	1	1	1	1	1	1	1	1	E-2205108	Thermal circuit breaker with manual reset, 100°C ± 5K
					1	1	1	1	1	E-3720010	Fan, 230VAC
											Basic
	1	1	1	1	1	1	1	1	1	B-2526203	Elektronic pcb type Basic
										B-2526203	Elektronic pcb type Basic for Slave-units
	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	B-2526213	Elektronic pcb type Basic for HC steam bath
	1									B-2120915	Mounting plate with foil for Basic (without display), small
		1	1	1	1	1	1	1	1	B-2120901	Mounting plate with foil for Basic (without display)
	(1)									B-2120919	Mounting plate with foil for Basic DS (without display), small
		(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	B-2120909	Mounting plate with foil for Basic DS (without display)
	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	B-2526301	Relais pcb for Basis pcb
											Comfort
	1	1	1	1	1	1	1	1	1	B-2526203	Elektronic pcb type Basic
										B-2526203	Elektronic pcb type Basic for Slave-units
	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	B-2526213	Elektronic pcb type Basic for HC steam bath
	1									B-2526489	Comfort display C01/02 HC02, small
		(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	B-2526401	Comfort display incl. mounting plate with foil
	1									B-2526487	Comfort Display DS C01/02 HC02
		(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	B-2526445	Comfort display incl. mounting plate with foil steam bath
	1									B-2120917	mounting plate with foil for Comfort unit (without display), small
		(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	B-2120903	mounting plate with foil for Comfort unit (without display)
	1									B-2120919	mounting plate with foil for Comfort unit for steam bath DS (without display), small
		(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	B-2120911	mounting plate with foil for Comfort unit for steam bath DS (without display)
											Comfort Plus
		1	1	1	1	1	1	1	1	B-2526203	Elektronic pcb type Basic
										B-2526203	Elektronic pcb type Basic for Slave-units
		(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	B-2526213	Elektronic pcb type Basic for HC steam bath
		(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	B-2526403	Comfort Plus Display incl. Mounting plate
		(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	B-2120905	mounting plate with foil for Comfort Plus unit (without display)
		(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	B-2526447	Comfort plus display incl. mounting plate with foil steam bath

*	HC02	HC03	HC06	HC09	HC06P	HC09P	HC12	HC18	HC27	Article No.	Description
											Accessories
										E-2604034	Reducing piece DN40/DN25 for steam hose
										E-2604012	Steam hose DN25, per m
										E-2604013	Steam hose DN40, per m
										E-2604002	Condensate hose DN12, per m
										E-2404004	Steam hose clamp DN25
										E-2604016	Steam hose clamp DN40
										E-2304015	Condensate hose clamp DN12
57										E-2420423	Drain hose 1 1/4"
										E-2604042	Steam manifold piece DN25, stainless steel
										E-2604023	Steam manifold piece DN40, stainless steel
										E-2604021	Condensate connector T-piece DN12
										B-2604025	steam solenoid valve 0-0,4 bar, compl. for steam hose DN 25
										B-2604040	steam solenoid valve 0-0,4 bar, compl. for steam hose DN 40
If you order any spare parts, specify type and serial number of the unit, please. * see exploded view											

For ordering spare parts, a template can be found on the www.hygromatik.com website under the „Contact“ tab. Your spare parts order may as well be directed per e-mail to the HygroMatik main office using the address hy@hygromatik.de.

Please make sure to specify your unit model and serial number.

12. Technical Specifications

HeaterCompact HC										
Type	HC02	HC03	HC06	HC06	HC09	HC06P	HC09P	HC12	HC18	HC27
Steam Output [kg/h]	2	3	6	6	9	6	9	12	18	27
Electrical Supply*	230V/1/N			400V/3/N 50-60Hz						
Power Rating [kW]	1,5	2,25	4,5	4,5	6,8	4,5	6,8	9,0	13,5	20,3
Power Consumption [A]**	6,5	9,8	19,6	11,3	16,9	11,3	16,9	19,5	29,3	29,3
Circuit Protection [A]	1 x 10	1x10	1x20	3x16	3x20	3x16	3x20	3x25	3x32	3x32
Control Type	Basic, Comfort and Comfort Plus									
Number of Steam Cylinder	1									
Number of Heater Elements	1	1	1	1	1	1	1	2	2	3
Steam Hose Connection	1x25mm***								1x40mm	
Condensate Hose Connection	1x12mm									
Net Weight [kg]	12	16	16	16	16	22	22	23	23	24
Operating Weight [kg]	15	20	20	20	20	36	36	37	37	38
Height [mm]****	390	562				704				
Width [mm]****	394	427				490				
Depth [mm]****	260	260				309				
Water Supply	Fully Demineralized Water / Cleaned Condensate: 1 to 10 bar, 13mm Hose Partially Softened Water / Tap Water (different qualities): 1 to 10 bar, for 3/4" external thread									
Fan Unit, Wall-Mounted	VG08	VG08	VG08	VG08	VG17	VG08	VG17	VG17	VG30	VG30
Airflow Capacity of Fan Unit [m ³ /h]	150	150	150	150	185	150	185	185	350	350
* Other voltages upon request. ** Current load of phases is not uniform. See table below. *** incl. reducing piece DN40/DN25 **** Outer dimensions of width and depth.										

Max. current load [A] according to phase:

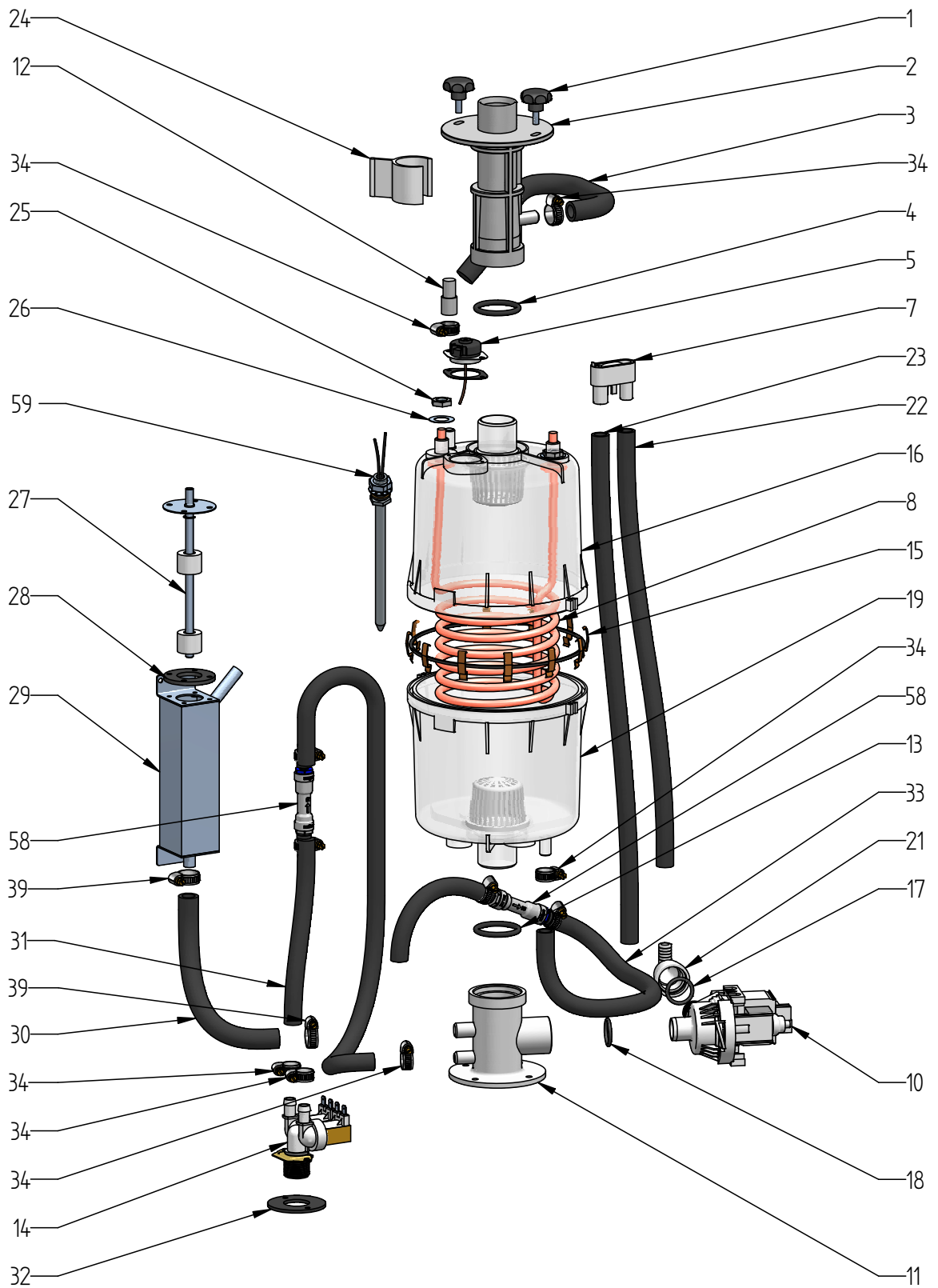
Phase	HC06(P)	HC09(P)	HC12	HC18	HC27
Electrical Supply*	400V/3/N 50-60Hz				
L1	11,3	16,9	11,3	16,9	29,3
L2	11,3	16,9	19,5	29,1	29,3
L3	0,2	0,2	11,3	16,9	29,3

HeaterCompact HC for SPA									
HC03..-DS - HC27..-DS									
Type	HC03	HC06	HC06	HC09	HC06P	HC09P	HC12	HC18	HC27
Steam Output [kg/h]	3	6	6	9	6	9	12	18	27
Electrical Supply*	230V/1/N		400V/3/N 50-60Hz						
Power Rating [kW]	2,25	4,5	4,5	6,8	4,5	6,8	9,0	13,5	20,3
Power Consumption [A]**	9,8	19,6	11,3	16,9	11,3	16,9	19,5	29,3	29,3
Circuit Protection [A]	1x10	1x20	3x16	3x20	3x16	3x20	3x25	3x32	3x32
Control Type	Basic-DS, Comfort-DS and ComfortPlus-DS								
Number of Steam Cylinder	1								
Number of Heater Elements	1	1	1	1	1	1	2	2	3
Steam Hose Connection	1x40mm								
Condensate Hose Connection	1x12mm								
Net Weight [kg]	16	16	16	16	25	25	26	26	27
Operating Weight [kg]	18	18	18	18	43	43	44	44	45
Height [mm]***	562				707				
Width [mm]***	427				490				
Depth [mm]***	257				306				
Water Supply	Fully Demineralized Water / Cleaned Condensate: 1 to 10 bar, 13mm Hose Partially Softened Water / Tap Water (different qualities): 1 to 10 bar, for 3/4" external thread								
* Other voltages upon request.									
** Current load of phases is not uniform. See table below.									
*** Outer dimensions of width and depth. Height incl. drain connection.									

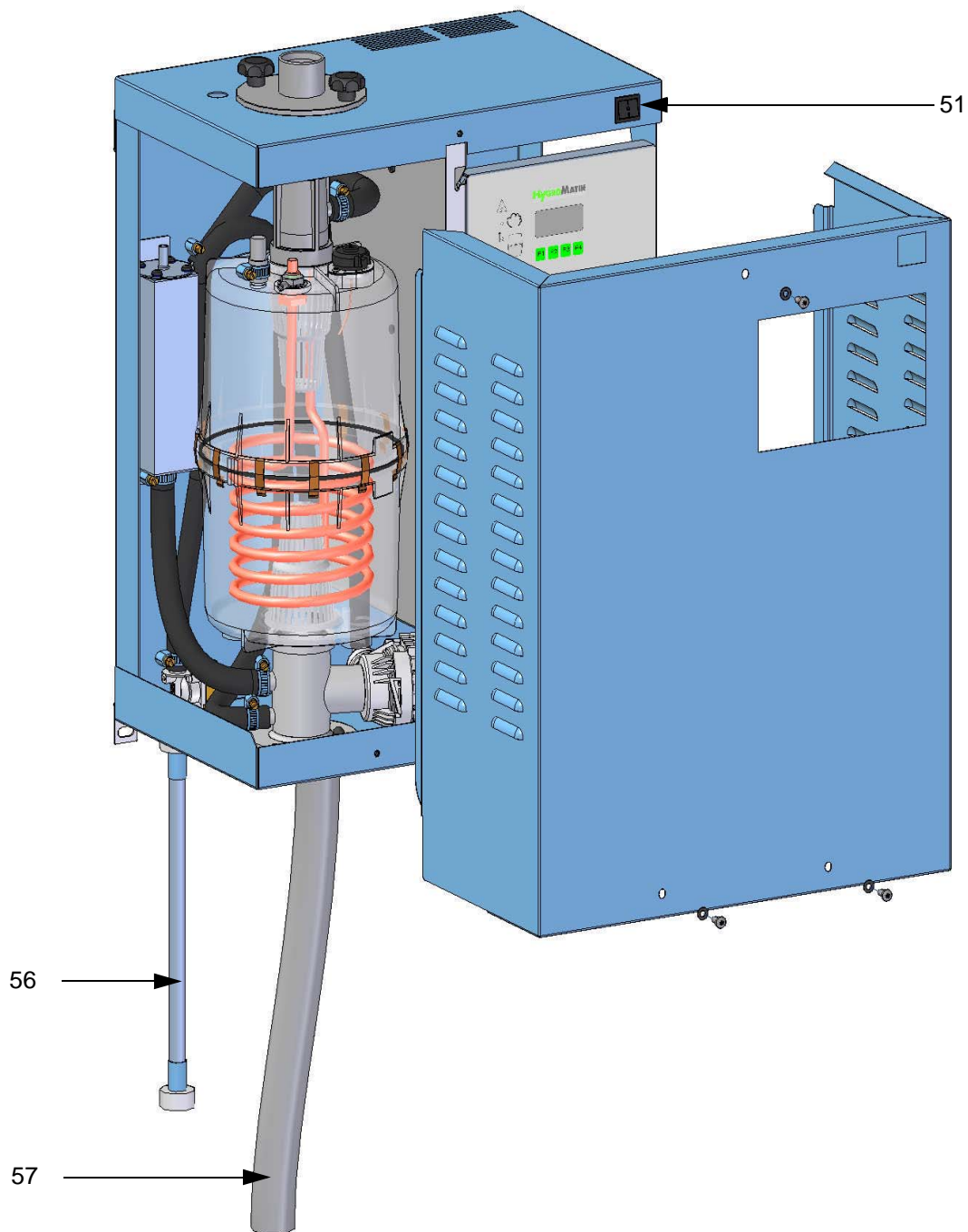
Max. current load [A] according to phase:

Phase	HC06(P)	HC09(P)	HC12	HC18	HC27
Electrical Supply*	400V/3/N 50-60Hz				
L1	11,3	16,9	11,3	16,9	29,3
L2	11,3	16,9	19,5	29,1	29,3
L3	0,2	0,2	11,3	16,9	29,3

13. Exploded View



14. View of Cabinet





HyGROMATIK®

Lise-Meitner-Str.3 • D-24558 Henstedt-Ulzburg
Phone +49(0)4193/ 895-0 • Fax -33
eMail hy@hygromatik.de • www.hygromatik.com
A member of the **spirax/sarco** Group