

**Electric Heater Steam Humidifier
HeaterCompact Kit**



© Copyright HYGROMATIK GmbH; HeaterCompact Kit March 2013

Information in this manual is subject to change or alteration without prior notice.

Current version of this manual can be found at: www.hygromatik.co.uk



Warning, Hazardous Voltage: All work to be performed by trained personnel only. All electrical installation and servicing of the electrical components of this unit to be performed by qualified electricians only. Disconnect power supply before installation and servicing!

1. Introduction	5
1.1 Typographic Distinctions	5
1.2 Documentation	5
1.3 Directions for Use	6
2. Safety Notes	7
2.1 Overview	7
2.2 Guidelines for Safe Operation	7
2.3 Disposal after Dismantling	8
3. Transport	9
3.1 Overview	9
3.2 Transport Size and Weigth	9
3.3 Packing	9
3.4 Interim Storage	9
3.5 Check for Complete and Correct Delivery of Goods	9
3.6 Included in the Delivery	10
4. Mechanical Installation	11
4.1 Steam Humidifier - environmental conditions	11
5. Operation and Device Construction	12
5.1 Mode of Action	12
5.2 Installation and Method of Operation	13
5.2.1 Equipment Dimensions HeaterCompact Kit	15
5.2.2 Fitting	16
5.3 Absorption Distance BN	17
5.3.1 Determining the Absorption Distance	17
5.4 Fan Unit (option)	19
5.4.1 Fan Unit Type VG	19
5.4.2 Absorption Distance Nomogram	21
5.5 Steam Manifold	22
5.5.1 Notes on Installation	22
5.6 Steam Line	26
5.7 Cover Plate	27
5.8 Drill Pattern	28
5.9 Condensate Hose	30
5.10 Types of Installation	30
5.11 Steam Solenoid Valves	32
5.12 Unit Installation Check	32
6. Water Installation	33
6.1 Water Quality	33
6.2 Water Supply	34
6.2.1 Feed from Holding Tank	35
6.3 Water Treatment	35
6.4 Water Discharge	36

6.5 Checklist	36
7. Electrical Installation	37
7.1 Electrical Installation	38
7.2 Safety Interlock	38
7.3 Internal electrical construction	39
7.4 Internal electrical installation without HygroMatik control	39
7.4.1 Blow down	39
7.4.2 Float switch	40
7.4.3 Wiring Diagrams for internal electrical installation without HygroMatik control	41
7.5 Wiring Diagram for internal electrical installation with HygroMatik control	43
7.6 Electrical Installation Checklist	43
8. Maintenance	44
8.1 Maintenance for Operation with Demineralized Water / Condensate	45
8.2 Maintenance for Operation with Tap Water or Partially Softened Water	46
8.3 Removing and Cleaning the Steam Cylinder	46
8.4 Replacing Heater Elements	50
8.5 Replacing Thermo Sensor (for Heater Element)	51
8.6 Unlocking of a Released Thermo Sensor (for heater element)	52
8.7 Removing Inlet Solenoid Valve and Cleaning Fine Mesh Filter	52
8.8 Cleaning Blow-Down Pump	53
8.9 Cleaning connection hoses and cylinder base	54
8.10 Checking Cable Screw Connections, Heater Element Wires	54
8.11 Operational Check	54
8.12 Dismantling	54
9. Spare Parts	55
10. Fax Form - Order for spare parts	58
11. Technical Specifications	60
12. Exploded View	61

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:

Airtrend Ltd.-Gobrid. Ltd.

Kumanovska 14, 11000 Beograd

Tel. +381 11 383 68 86, 308 57 40

Faks +381 11 344 41 13

E-mail: gobrid@eunet.rs

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 Directions for Use

The proven principle of heating water by the use of electric immersion heaters is exploited to generate steam. Using different tap water qualities or partial softened water (all humidifier types) or fully demineralized water / condensate water (only for humidifier type HeaterLine, HeaterCompact/Kit and HeaterSlim).



Warning: HygroMatik steam humidifiers emit steam with a temperature of 100° C. The steam may not be inhaled directly.

Only qualified and authorised personnel may operate the unit. Persons transporting or working on the unit, must have read and understood the corresponding parts of the Operation and Maintenance Instruction and especially the 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 application.

2. Safety Notes

2.1 Overview

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

Warnings and Safety Symbols

The safety symbols below identify sections containing warnings about hazards or potential dangers. Please familiarize yourself with these symbols.



Warning: Failure to observe this warning may result in serious injury or death and/or damage to the unit.



Danger, Hazardous Voltage: Hazardous electrical current! Failure to observe this warning may result in injury or even serious injury or death.



Warning: Failure to follow these instructions may result in damage to the unit due to electrostatic discharge. The electronic components of the humidifier control are very sensitive to electrostatic discharges. In order to safeguard these components during installation and servicing, steps must be taken to protect against ESD.



Reminder: Materials and consumables must be handled and/or disposed of as required by law.



Note: Appears before explanations or cross-references which refer to other sections of the operating instructions.

2.2 Guidelines for Safe Operation

Overview

Obey all safety notes and warnings present on the unit. In case of a malfunction, switch off the unit immediately and prevent a restart. Repair malfunctions promptly. After any repair work, have qualified personnel check the safe operation of the unit.

Use original spare parts only. Additional national safety regulations also fully apply to the operation of this unit.

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.

The unit is only allowed to work with connected steam hose that

safely leads the steam.

HygroMatik steam humidifiers are IP20-protected. Make sure that the unit is protected from drips in its installed location.

Installing a humidifier in a room without water discharge requires safety devices to protect against water leakages.

Accident Prevention Regulations



Comply with the Accident Prevention Regulation Electrical Systems and Equipment to prevent injury to yourself and others.

Operation of the Unit:

Do not perform any work which compromises the safety of the unit. Regularly check that all safety and monitoring devices are functioning normally. Do not remove or disable safety devices.

Installation, Dismantling, Maintenance and Repair of the Unit:

Disconnect unit components from power supply prior to maintenance or repair work.

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

Electrical



Work on the electrical system must be performed by qualified personnel.

Disconnect unit components from power supply prior to work.

It is not allowed to connect the unit to DC voltage supply.

In case of a malfunction in the electrical power supply, switch off the unit immediately. Use only original fuses with the appropriate amperage rating. Regularly check the unit's electrical equipment. Promptly repair any damage, such as loose connections, burned wiring or defective electrical insulation. After proper electrical installation or repair, test all safety mechanisms (such as grounding resistance).

2.3 Disposal after Dismantling



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

3. Transport

3.1 Overview



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]
HC02Kit	600	400	300	5
HC03Kit	388	388	690	11
HC06Kit	388	388	690	11
HC09Kit	388	388	690	11
HC12Kit	388	388	690	14
HC18Kit	388	388	690	14
HC27Kit	388	388	690	15

* Dimensions and weighths can vary insignificantly

3.3 Packing



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.



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
Mail	24 hours at the latest
Rail	7 days at the latest
Truck and railway companies	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.
- Manuals for the steam humidifier and (optional) the control.
- Ordered accessories (steam manifold, steam hose, condensate hose, etc.).
- Maintenance o-ring set for steam cylinder.

4. Mechanical Installation



Warning: Installation of this unit should be performed by qualified personnel only. HygroMatik accept no liability for damage due to faulty installation.

Obey all safety instructions and warnings on the unit. During installation the unit must be disconnected from its power supply.

Accessory equipment may not be installed on or in the unit without prior written consent from HygroMatik. Otherwise the warranty is void.



Warning: If the installation of this unit is attempted by only one person there is a risk that the unit will drop down. We propose to carry out the installation by two persons.

4.1 Steam Humidifier - environmental conditions



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

- Ambient temperature must be between +5 and +40 °C.
- Relative humidity may not exceed 80% RH.
- 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.
- Hoses must be laid at a constant 5-10% grade to uniformly prevent sags and kinks.
- 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. Operation and Device Construction

5.1 Mode of Action

The Imersion Heater Principle

One to three heater elements (Pos. 8 in the exploded view) 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.

5.2 Installation and Method of Operation

When the hygostat 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 (27/43). 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 has to be pressure-equalized.

At the standard setting, the inlet solenoid valve (14) opens when the water level remains below "humidification" level. 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.

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").

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 the steam bath.

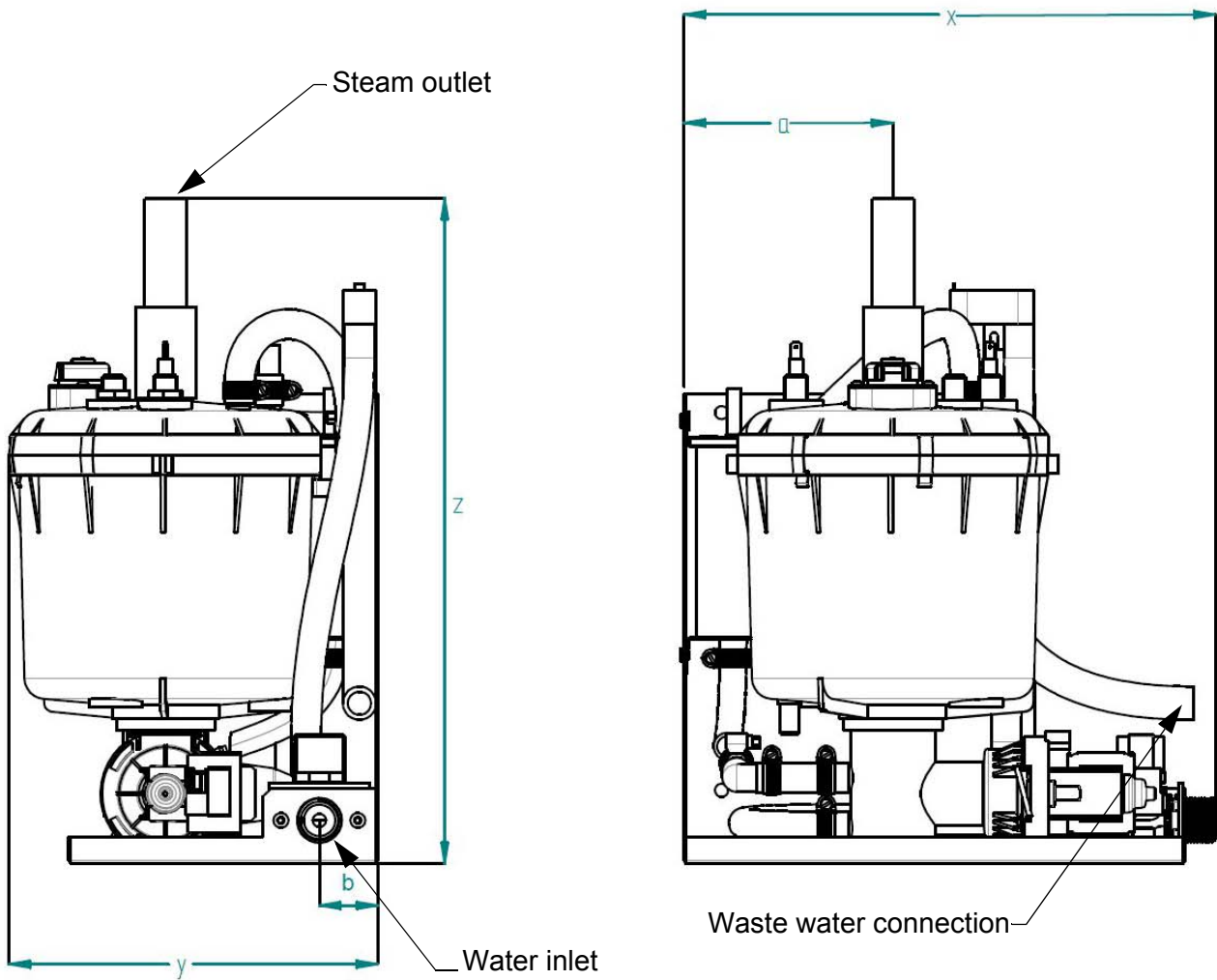


Warning: Leakage of the steam cylinder can cause a serious hazard, such as giving an electric shock.



Warning: During blow down hot water with a temperature of about 95°C is being drained. This can cause burns to the skin at direct contact.

5.2.1 Equipment Dimensions HeaterCompact Kit



	HC02 Kit	HC03-09 Kit	HC06-09 Kit HC12-HC27 Kit
a	126	126	130
b	35	35	35
x	317	317	343
y	221	221	289
z	397	520	656
all dimensions in mm			

5.2.2 Fitting



Note: It is often advantageous to use existing water connections (feed and drain) when selecting the steam humidifier. The unit is suitable for ground and wall mounting.

Ground mounting

The device can be placed on a level, firm surface. It is recommended that the unit is additionally fixed on a wall. Measures for drills for wall mounting please see table (in chapter „Equipment Dimensions“. The waste water is discharged to the side.



Note: To function properly the steam humidifier must be installed vertically.

Wall mounting

The devices should be mounted on a solid wall.



Note: To function properly the steam humidifier must be installed vertically.

Measures for drills for wall mounting please see table (in chapter „Equipment Dimensions“).

5.3 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. Inside the absorption distance, steam is visible as mist in the air stream.

Condensation may collect on anything installed inside 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
$B_d = (2,5...3) \times B_N$	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.

5.3.1 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]

5.4 Fan Unit (option)



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

- Install the fan unit directly on a wall.

Type	Fan Unit
HC03 Kit, HC06 Kit	VG 08
HC09 Kit, HC12 Kit	VG 17
HC18-27 Kit	VG 30

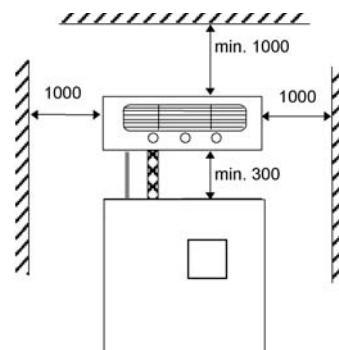


Warning:

- During operation and some time afterwards the steam nozzle is hot! This can cause burns to the skin at direct contact.
- During operation the cross-flow fan rotates. Do not touch the fan during operation.
- During operation hot steam discharges from the nozzle. In the field of the visible steam cloud contact can cause burns to the skin.
- During operation the cross-flow fan rotates. Do not touch the fan during operation.

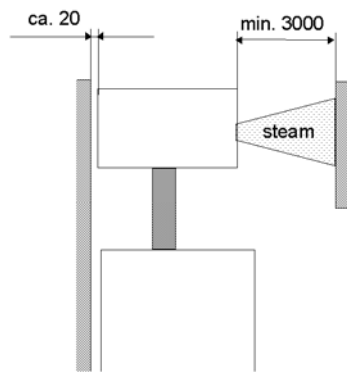
5.4.1 Fan Unit Type VG

- 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)

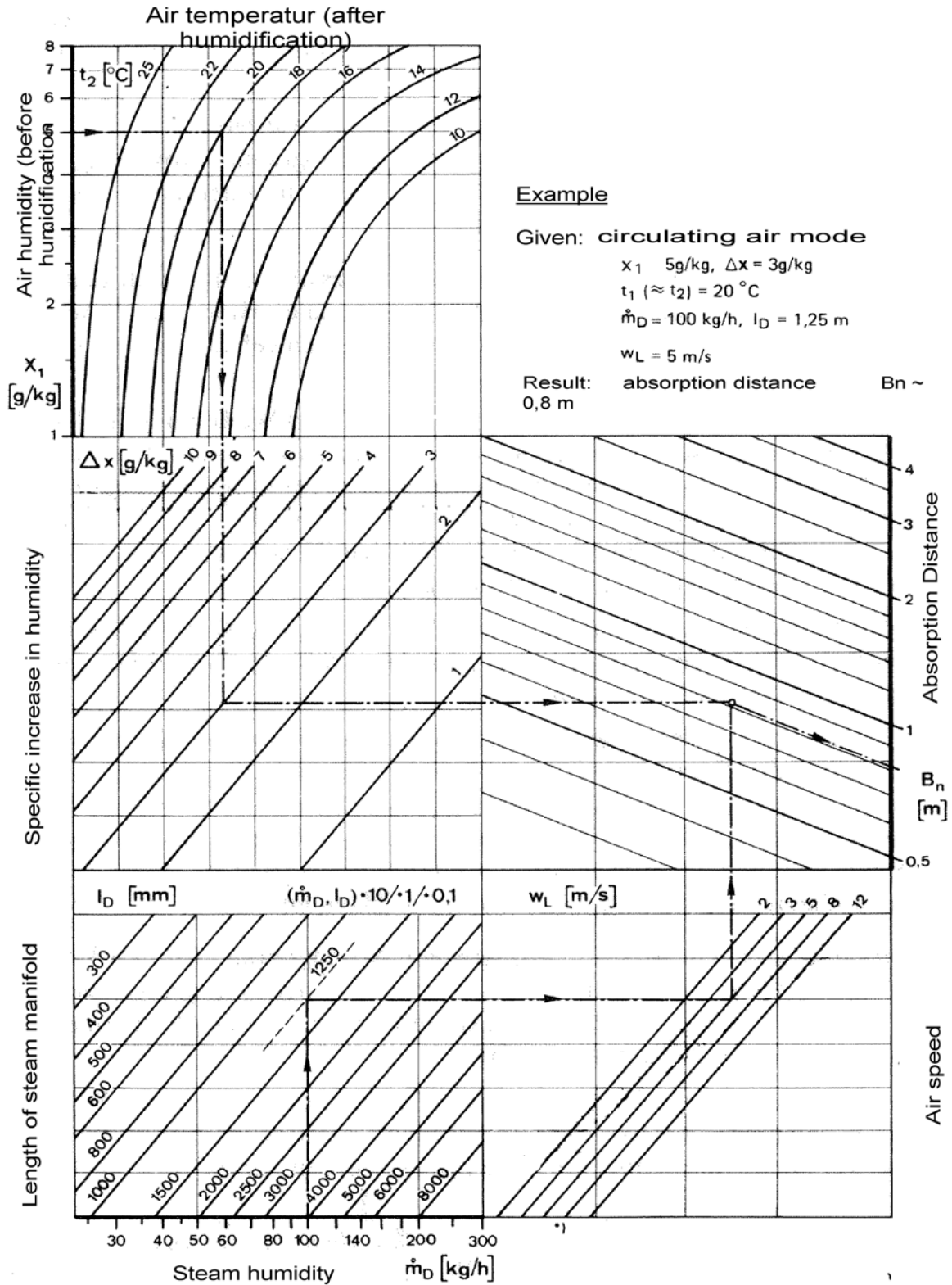
Fan unit, wall installation



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]	12	12	12
Airflow Capacity	[cbm/h]	185	185	350
Nominal Output	[W]	35	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]	4,5	6	7

5.4.2 Absorption Distance Nomogram



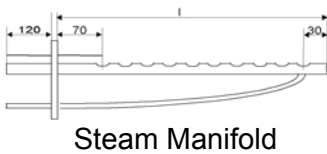
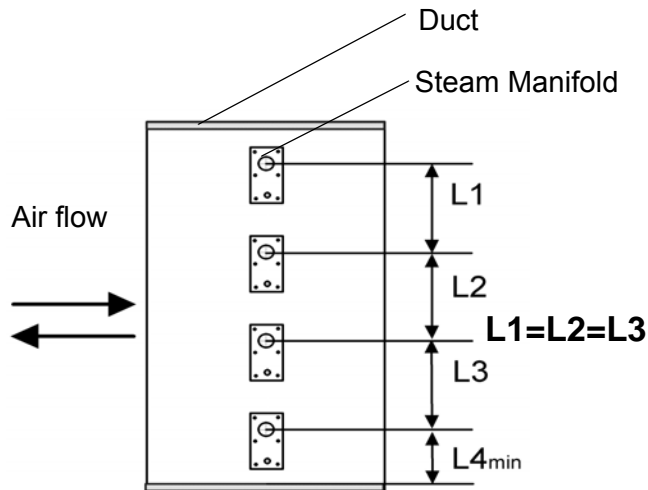
Source: Henne, Erich: Luftbefeuchtung (Air Humidification), 3rd Edition 1984 (Page 101), Oldenbourg Industrieverlag, Munich

5.5 Steam Manifold

5.5.1 Notes on Installation

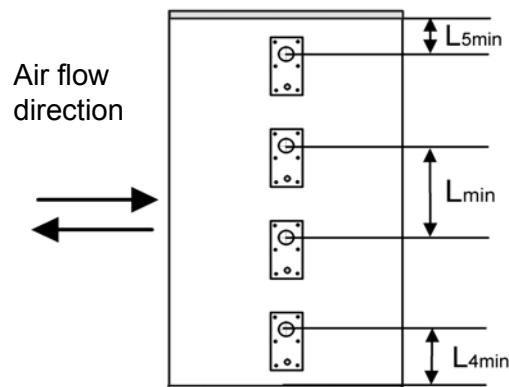
Horizontal installation of steam manifold

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



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“

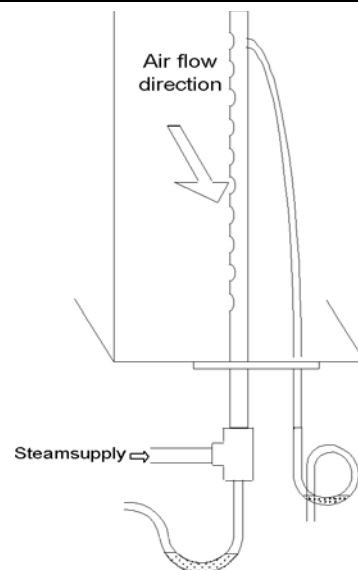
L_{4min} = 120mm: distance „lowest steam manifold - duct bottom“:**L_{5min} = 120mm**: distance „highest steam manifold - duct ceiling“

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. <table border="1" style="margin-top: 10px;"> <thead> <tr> <th colspan="4">min. distances:</th> </tr> <tr> <th></th> <th colspan="2">H1[mm]</th> <th>H2[mm]</th> </tr> <tr> <th></th> <th>30°</th> <th>45°</th> <th></th> </tr> </thead> <tbody> <tr> <td>DN25</td> <td>182</td> <td>168</td> <td>225</td> </tr> <tr> <td>DN40</td> <td>193</td> <td>179</td> <td>230</td> </tr> </tbody> </table>	min. distances:					H1[mm]		H2[mm]		30°	45°		DN25	182	168	225	DN40	193	179	230	very flat duct Narrow channel
min. distances:																						
	H1[mm]		H2[mm]																			
	30°	45°																				
DN25	182	168	225																			
DN40	193	179	230																			
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.

Note:

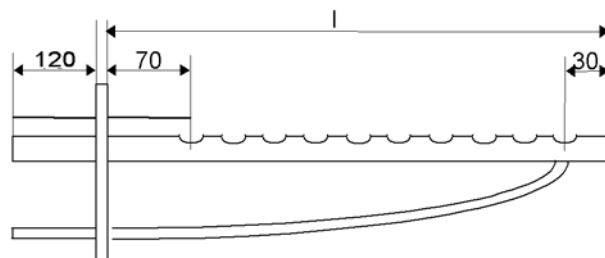


- Install the steam manifold horizontal with it ensure a clean steam out.
- Maximum allowable pressure in the air duct is 1200 Pa.
- On the return side, the maximum allowable negative air pressure is 500 Pa. Placement of the steam manifold on the supply side of the air duct is preferred.
- With high-pressure 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.
- Depending on the design of the air duct, additional mounting of the steam manifold may be required. Shown installation and position dimensions are based on experimental values. Special environmental conditions could require adjustments.
- We note that the German Association of Engineers (VDI) Guideline 6022 specifies 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



Note: At lengths of 600mm or more, steam manifolds are shipped with an extra alternative mounting fixture (Nut, M8) on the closed end.

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
C1-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

CompactLine Kit:

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

* 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.

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

5.6 Steam Line



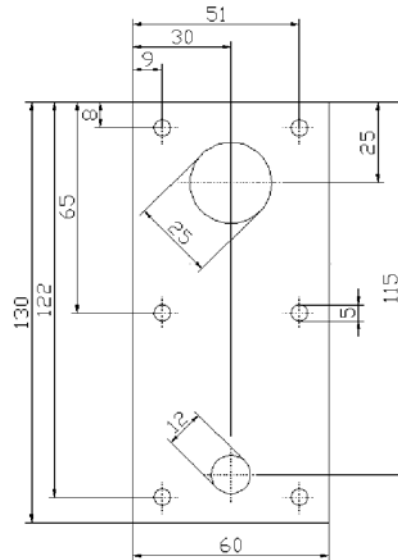
Note: When installing the steam hose, please pay attention to the following:

- 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. In case of lengths of over 5 m the hose should be insulated to avoid excess condensation.
- 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 only one steam hose is necessary for the main part, loss of condensate will be decreased. If the installation is carried out in this way 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 access to the steam hose, so that it can be inspected later.
- In case of straight lengths of several meters, it is recommended to place 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 influence pressure condition in the duct. In an exceptional case this could mean to optimize the steam line installation.
- Only genuine HygroMatik hoses are capable of withstanding the operating conditions.
Allow for minimum bending radii:
Steam hose DN 25: $R_{min} = 200 \text{ mm}$
Steam hose DN 40: $R_{min} = 400 \text{ mm}$

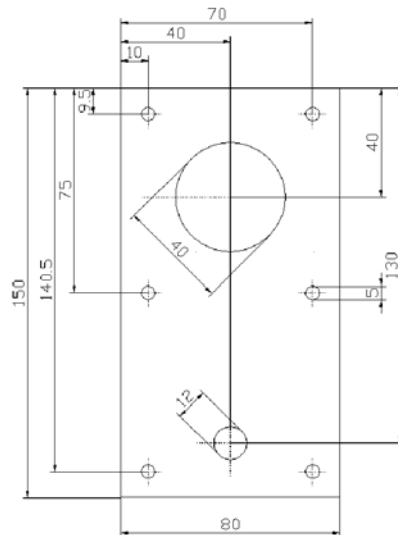
5.7 Cover Plate

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.



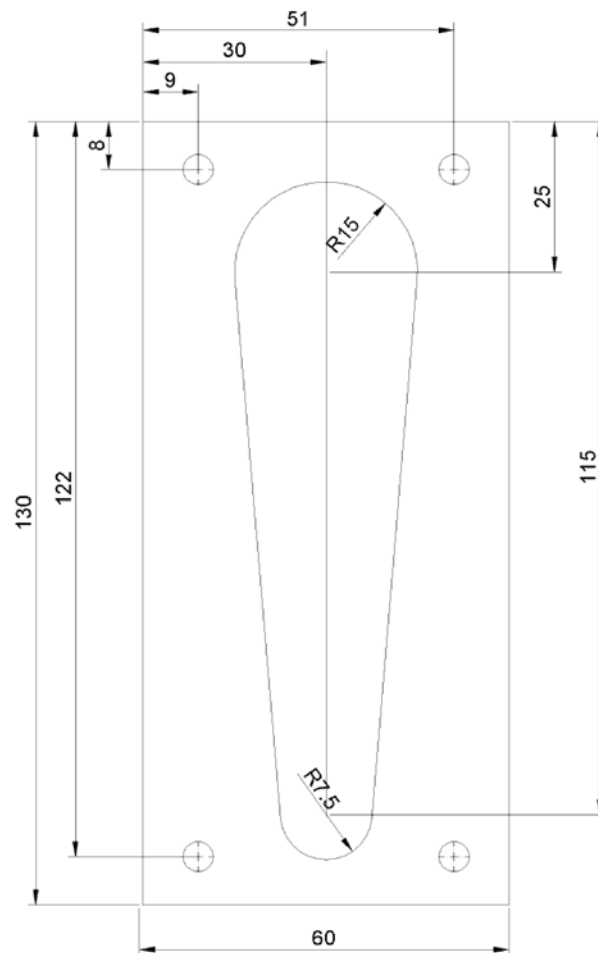
flange plate DN25 E-2604260



flange plate DN40 E-2604410

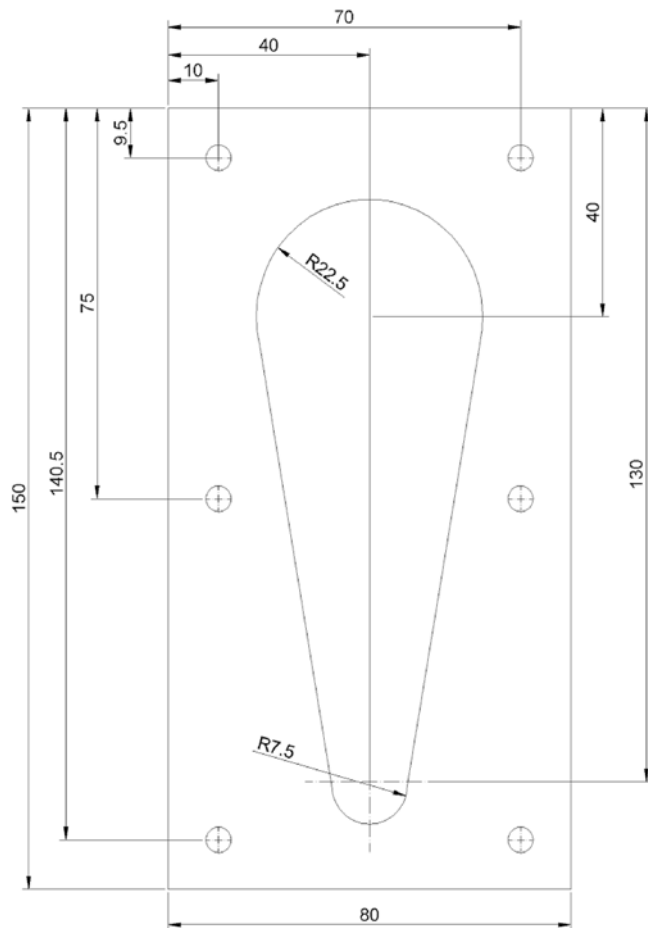
5.8 Drill Pattern

Drill Pattern DN25 (not to scale)



Note: Due to variable print media the dimensions are not to scale.

Drill Pattern DN40 (not to scale)



Note: Due to variable print media the dimensions are not to scale.

5.9 Condensate Hose



Note: When installing the condensate hose, please pay attention to the following:



Warning: To keep condensate from accumulating in the duct, make sure condensate can drain freely.

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

- » Remove the condensate plug (12) from the connection fitting on the cylinder.
- » Lay the condensate hose at an approximate incline of 5-10% to the steam cylinder connection fitting, to allow the condensate to drain freely.



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.

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

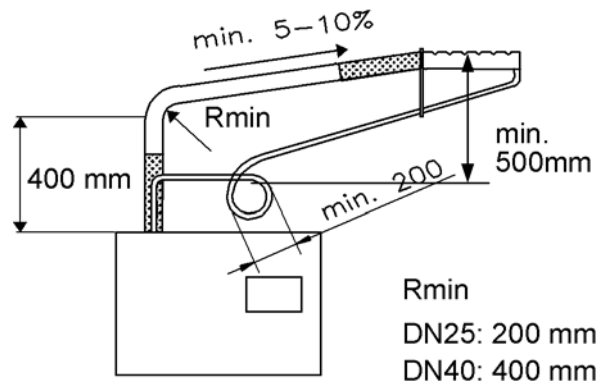
- » The condensate must be drained separately.
- » To prevent steam loss, lay a loop at least 200 mm in diameter.
- » To ensure condensate drainage, place the loop (vapor trap) as far away as possible below the steam manifold connection.
- » The condensate connection on the steam cylinder must be closed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

5.10 Types of Installation

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

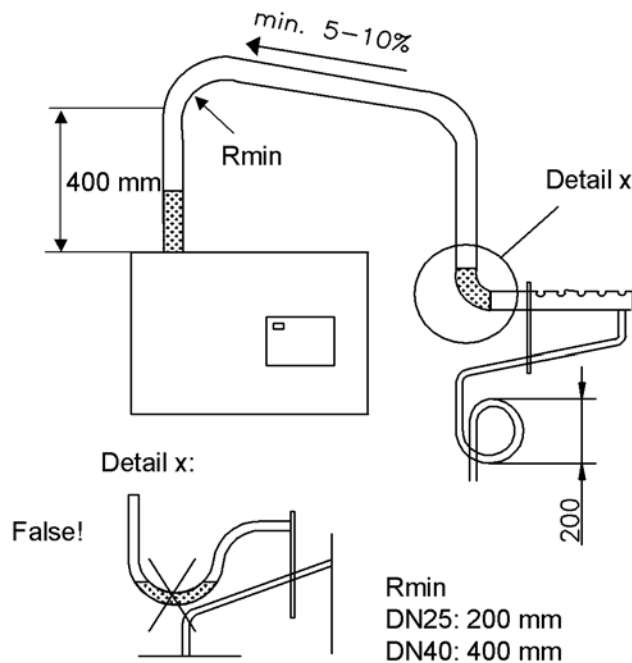
- » Lay the steam hose at a height of at least 400 mm above unit and then connect to the steam manifold with a constant rise or fall.
- » Lay condensate hose with a slope to the steam cylinder.

- » 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.

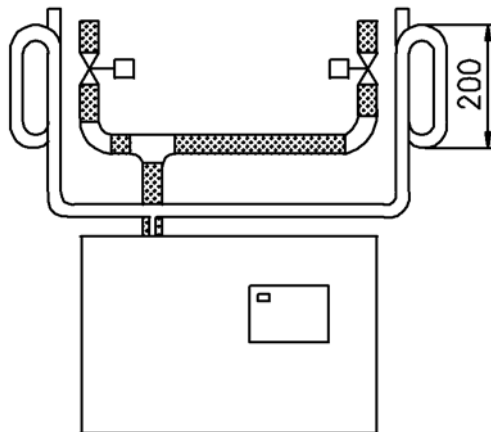


- » Lay the loop of condensate hose 200 mm directly above the drain. Detail x

5.11 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.



Installation of Steam Solenoid Valve

5.12 Unit Installation Check



Attention: This unit may only be operated by qualified and properly trained personnel.

Please check the installation using the following list:

- Does unit hang vertically?
- Are wall distances to the unit within the range
- 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: For installation, note the following:

- Have all work performed by a professional.
- Disconnect power supply prior to installation.
- 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. This can mean installing a backflow preventer.
- The water supply temperature may 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 HeaterCompact 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)

6.1 Water Quality

The HeaterCompact Type steam humidifier is designed for use with:

- tap water with a max. total hardness of 15°gH
- demineralized water (min. conductivity 3µS/cm)
- fully cleaned condensate (min. conductivity 3µS/cm)
- partially softened water (when using a softening device please blend the water to a value between 4-6°gH total hardness)

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.

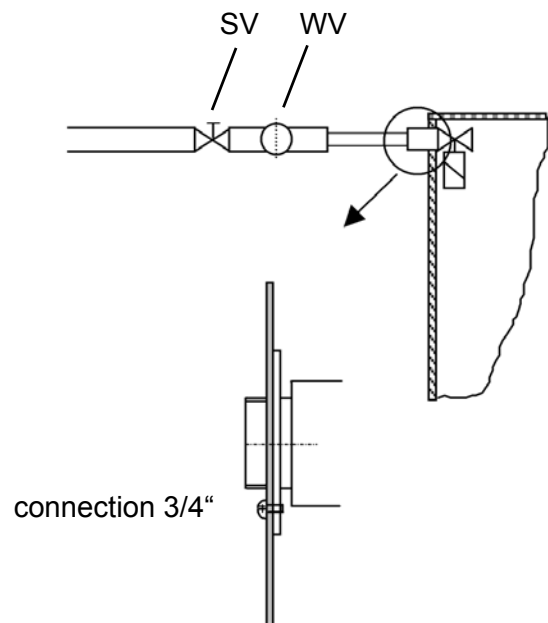
6.2 Water Supply

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



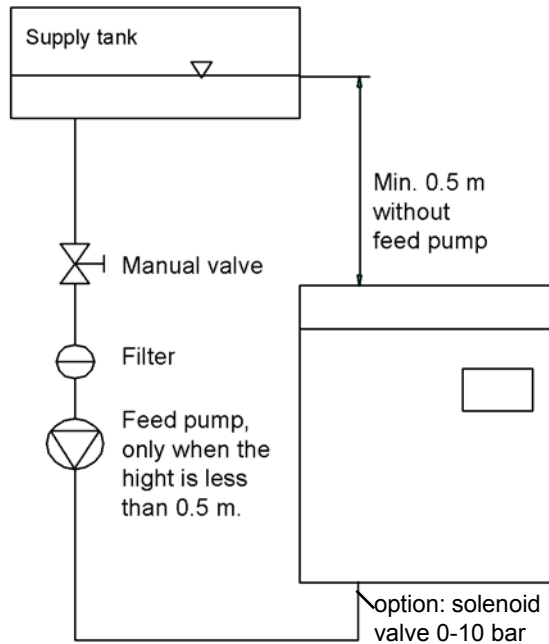
Note: Shut-off valve (SV) and water filter (WF) are not supplied with the unit

water supply
1 - 10 bar



6.2.1 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.



6.3 Water Treatment

For water treatment system specifications, use the following table. The figures below assume that the humidifier has been running for 24 hours at 100% output.

HeaterCompact Kit	Max. Water Consumption in over24 h [l]
3	83
6	166
9	248
12	331
18	497
27	745

6.4 Water Discharge



Warning: Please pay attention to free and non-pressure drainage of the water! During blow down up to 0.3L/s is being drained. 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:

- The water drainage takes place directly through the drain hose (23) which is connected to the pipe bends.
- Do not bend drain hose.
- For the discharge line and/or drain pipe, select materials temperature-resistant up to 95°C.

6.5 Checklist

Verify correct system installation using the checklist below:

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



Warning: Flush out the water supply line before connecting to the solenoid valve, especially when installing a new line. This prevents dirt particles from damaging the solenoid valve.

7. Electrical Installation



Warning, Hazardous Voltage! All work related to electrical installation should be performed by authorized personnel only (electricians or professionals with equivalent training). The customer is responsible for checking qualifications.



Warning, Hazardous Voltage! Do not connect the steam humidifier to the power grid until after all installation work has been completed. Please obey all local regulations concerning electrical installation.



Warning: The electronic components of the humidifier control are very sensitive to electrostatic discharges. In order to safeguard these components during installation and servicing, steps must be taken to protect against ESD.



Warning: For installation and maintenance, note the following:

- Disconnect power supply prior to installation and secure against restart.
- Verify the absence of electric current.
- 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 (observe European Directives shown in chapter „EC Declaration of Conformity“).
- Ensure that all terminals have been tightened.
- We recommend to install a fault current circuit breaker.

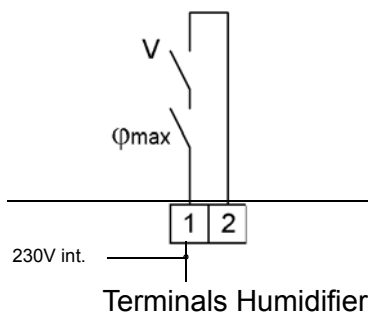
7.1 Electrical Installation

- » Breakers must have a contact gap of at least 3 mm per pole.
- » Connect potential equalization inside the unit to the external ground bolt (located on the underside of the cabinet beside the cable connections).

Observe European Directives shown in chapter „EC Declaration of Conformity.

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 Kit	230V/1Phases/N	6,5 A	1x10 A
HC03 Kit	230V/1Phases/N	9,8 A	1x10 A
HC06 Kit	230V/1Phases/N	19,6A	1x20 A
HC06 Kit	400V/3Phases/N	11,3A	3x16 A
HC12 Kit	400V/3Phases/N	19,5A	3x25 A
HC18 Kit	400V/3Phases/N	29,3A	3x35 A
HC27 Kit	400V/3Phases/N	29,3A	3x35 A



7.2 Safety Interlock

Between terminal 1 and 2 of the humidifier the so called safety interlock is located. If the safety interlock is not closed the humidifier is not allowed to work.

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

There is no electrical bridge between terminal 1 and 2 ex works.

If neither a Remote Switch nor any safety devices are wired to terminal 1 and 2 an electrical bridge has to be set.



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



Warning: 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.



Warning: Contacts laid between Terminals 1 and 2 must be potential free and rated for 230V switches. Terminal 1 is supplied with **230V** AC after switching on the humidifier.

7.3 Internal electrical construction

The internal electrical construction of a humidifier type Heater-Compact Kit is always performed by the customer.

Two variants are possible:

- Variant 1) HeaterCompact Kit without HygroMatik electronic: the control is a function of the reported water level in the steam cylinder (by the float switch).
- Variant 2) HeaterCompact Kit with HygroMatik electronic (Type: Basic, Comfort or Comfort Plus): the entire control and monitoring device functions are supervised by a HygroMatik electronic. Errors can be detected and reported.

7.4 Internal electrical installation without HygroMatik control

7.4.1 Blow down

To desludge the humidifier, the time interval should be set so that the pump blows down for 7 seconds after 60 minutes steam production.

For operation with tap water, an increase of the desludging cycles can extend the specific maintenance interval.

Consult HygroMatik in this case.

7.4.2 Float switch

The installed float switch is a reed switch. The basic element of this reed switch is a pair of contact blades made of ferromagnetic material. The blades are aligned in parallel to each other, overlapping and are melted into a glass tube. The actual float surrounds the glass tube and contains a permanent magnet whose magnetic field operates the reed contact.

Float switch contacts

	HeaterCompact Kit WITHOUT HygroMatik control	HeaterCompact Kit WITH HygroMatik control
Contact	Colour	Colour
Neutral	Brown	Black
Max Level	Red	Blue
Refilling	Orange	Red
Dry Level	Black	White

Allocation of the float switch contact protective circuit of the float switch reed contact

For failure-free operation of the float switch, we recommend installing a varistor for its protection. It must be connected according to the circuit diagram. The varistor included in the delivery scope lowers the load peaks affecting the float switch. This varistor is not to be provided if the humidifier is operated with a HygroMatik control.

7.4.3 Wiring Diagrams for internal electrical installation without HygroMatik control

Konzept:
externe Freigabe für Heizkörper 230V/1/N
mit 10A/16A/20A Absicherung

Konzept:
external control for Heating element 230V/1/N
with 10A/16A/20A main fuse

Wasserzufuhr und HK gesteuert über Schwimmerschalter mit 3 Schaltkontakten für MV off, MV on und HK ein

Water level and heating element controlled by floating switch with 3 contacts for MV off, MV on und heating element on.

S3 MV off

S2 MV on

S1 min. Niveau, HK ein / Heatin Element on

R1 Heizkörper / Heating element

STB1 Thermowächter / thermo switch

K1 Hauptschutz / Main contactor

K21 Hilfsrelais / auxiliary relay

Y1 Magnetventil / solenoid valve

M1 Abschlämppumpe / drain pump

VAR1 Varistor / varistor

Hauptsicherung / main fuse size:

10A	in HC02	1,5 KW	Heizkörper / heating element
16A	in HC03	2,25 KW	Heizkörper / heating element
20A	in HC06	4,5 KW	Heizkörper / heating element

R1	in HC02	1,5 KW	Heizkörper / heating element
R1	in HC03	2,25 KW	Heizkörper / heating element
R1	in HC06	4,5 KW	Heizkörper / heating element

a	(Benennung)	15.03.13	Datum
b	HC02-06 220-240V/1/N/50-60 Hz	Lue	Bearb.
c	Einfachsteuerung / Easy control		Gepr.
Zust.	Urspr.		Norm
Änderung	Ers.f		

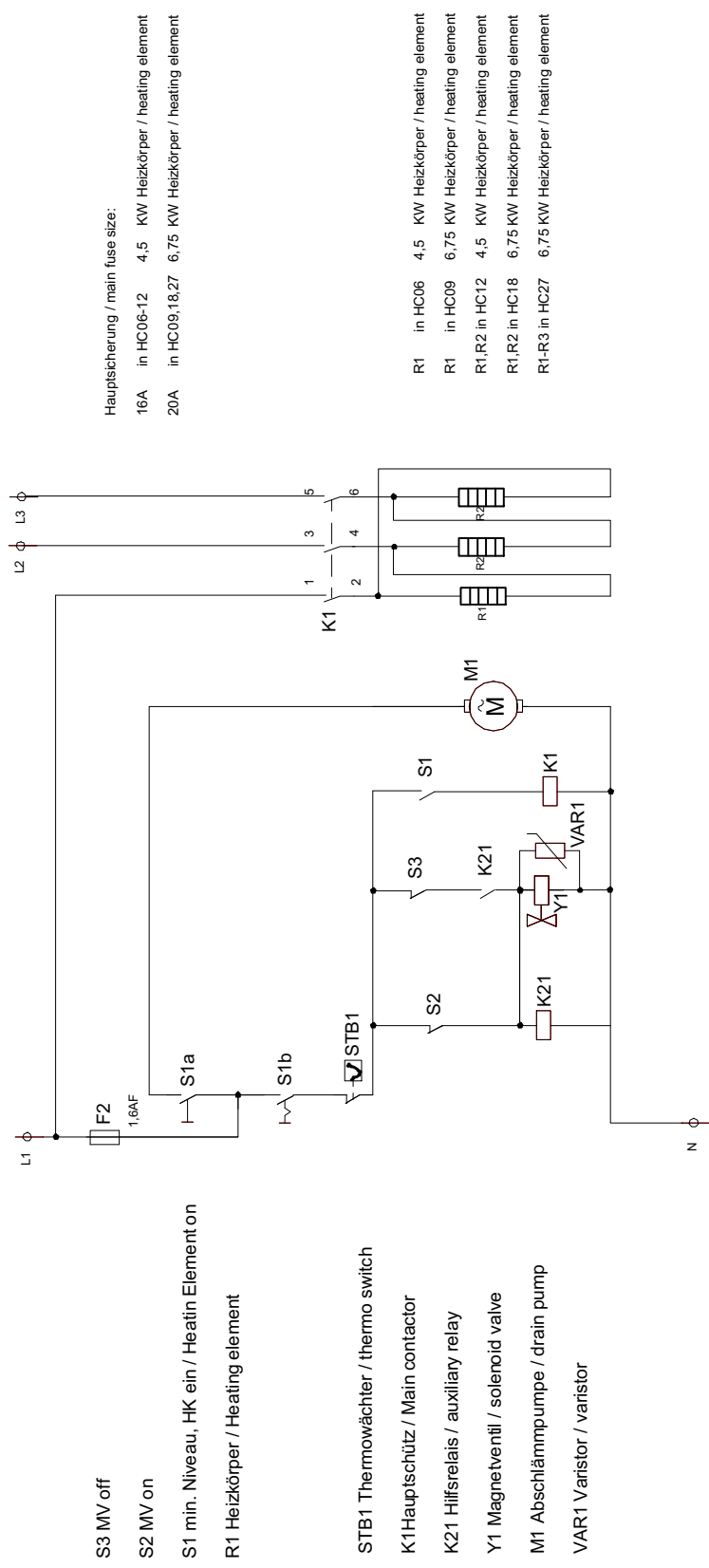
HYGROMATIK Lise-Meine-Str. 3 D-24559 Henstedt-Ulzburg Germany	(Zeichnung Nr.) S-053505	Phone +49-(0)4193 / 895 - 0
		(Datei) S-053505A.001
		Blatt 1 von 1
		Bl.

Konzept:
externe Freigabe für Heizkörper 230V/1/N
mit 10A/16A/20A Absicherung

Konzept:
external control for Heating element 230V/1/N
with 10A/16A/20A main fuse

Wasserzufuhr und HK gesteuert über Schwimmerschalter mit 3 Schaltkontakten für MV off, MV on und HK ein

Water level and heating element controlled by floating switch with 3 contacts for MV off, MV on und heating element on.



a	erstellt	15.03.13	Datum	15.03.13	(Zählung Nr.)	HYGROMATIK Lise-Melmer-Str. 3 D-24558 Henstedt-Uiburg Germany	Telephone +49-(0)4193 / 895 - 33	Phone +49-(0)4193 / 895 - 0
b			15.03.13	15.03.13	S-053506		(Date)	S-053506A.001
c								Blatt 1
Zust.	Änderung	Datum	Name	Norm	Urspr.	Ers.f		von 1
								Bl.

7.5 Wiring Diagram for internal electrical installation with HygroMatik control

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.

7.6 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.



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: When performing maintenance work, please follow these instructions:

- During operation and also for a while after switching off the unit the steam cylinder is hot. Before touching the cylinder, check its temperature.
- Drained cylinder water could have a temperature up to 95°C.
- Before removing the steam cylinder make sure that it is completely drained and that it does not contain any hot water.
- During disassembling a steam hose hot steam could leave the steam hose if several humidifiers are working on the same air duct, although the currently maintained unit is switched off.
- Have the unit serviced only by qualified, authorized personnel.
- Obey safety regulations.
- Switch off the unit prior to maintenance and secure against restart.
- Verify the absence of electrical current.
- After maintenance work, have qualified personnel check that the unit is operating safely.
- If a defective cable is detected through a visual check switch off the unit, secure it against restart and replace the cable.
- The clamps that fix the steam cylinder halves have partially sharp edges and could spring out uncontrolled during removal. Prevent springing out clamps by covering the clamps with one hand during removal.

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.

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.



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

8.3 Removing and Cleaning the Steam Cylinder



Warning: Please follow the detailed instructions in these operating instructions! The unit is only to be serviced by qualified, authorized personnel. Note the warnings and safety notes in the operating instructions. Failure to observe warnings and safety notes may result in injury, serious injury or death, and/or damage to the unit. The steam cylinder may still be hot when you begin maintenance work. Handle carefully!

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

Dismantling:

- » Switch off the power supply for the device.
- » Check to see if the device is voltage-free and secure it.
- » Pull the 7-pin system plug for the electrical supply of the steam cylinder out of the plug connection.



Warning: The humidifier cylinder heats up during operation.



Warning: Allow the cylinder to cool off before doing maintenance work.

- » Drain cylinder water if possible. Alternatively:
- » Release the clip on the solenoid valve (14). Pull off the hose and drain the steam cylinder. Put the hose back on and fasten it with the clip.
- » Release the clip on the connection hose (3) for level control (29) and pull the hose off the steam cylinder lid (16).
- » Pull the steam hose adapter (2) off the steam outlet.
- » Lift the steam cylinder out of the cylinder base (11).
- » Remove the clamps on the cylinder flange.
- » Split the steam cylinder, remove the old flange sealing (15).

Cleaning

When using lime dissolvers or cleaning agents for cylinder and heater, ensure that the device is rinsed thoroughly before recommissioning it. Use lime dissolvers and cleaning agents only for cleaning cylinders, heaters and control cylinders.



Note: Excessive mechanical cleaning of cylinders/heaters can damage them.

- » Remove all deposits mechanically. A low quantity of hardening components on the heater is harmless.

Assembly

- » Insert the new flange sealing (15) in the groove of the cylinder flange.
- » Put the cylinder halves together and connect them with clamps (42).
- » Put the steam cylinder into the cylinder base (11).
- » Reattach steam hose and connections for level control.
- » Plug the 7-pin system plug for the electrical supply of the steam cylinder into the plug connection.
- » Switch the power supply for the device back on.

Check the device for tightness after 15-30 minutes of operation.

In case of a leak, switch off the device with the control switch and disconnect it from the voltage supply according to the safety instructions. Subsequently repair the leak and switch the device back on.

Cleaning of Steam Cylinder and Cylinder base

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



Note: Overly strong mechanical cleaning can damage the cylinder / heater elements.

- » Remove all deposits.
- » 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 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 or alternatively 43) and control cylinder housing (29).
- » Pull out floating switch (27 or alternatively 43) and clean it carefully.
- » Take off sealing (28) and clean it.



Note: The rod assembly may not be lubricated.

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

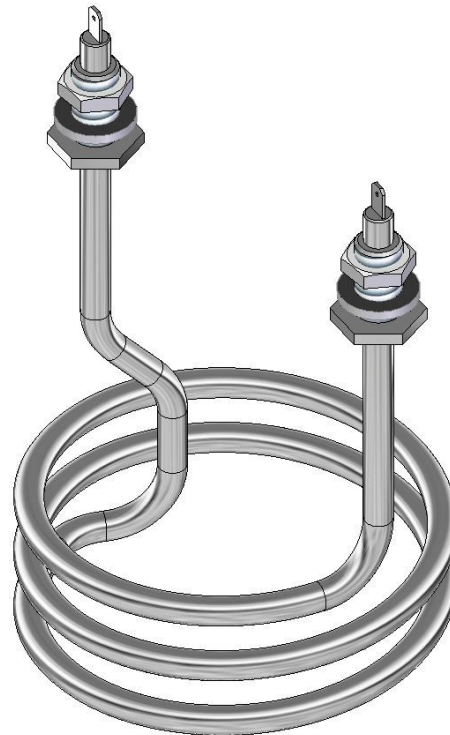
8.4 Replacing Heater Elements

Removal

- » Remove and open the steam cylinder as described above in section “Removing and Cleaning the Steam Cylinder.”
- » Remove the M14 mounting nuts of the fastening bolts and the melting fuse.
- » Remove locking washer.
- » Remove the capillary tube from the thermo sensor by detaching the retainer clips.
- » Pull heater element downward out of the steam cylinder lid.
- » Clean the sealing surface on the underside of the cover around the area where the new heater element will be installed.

Installation

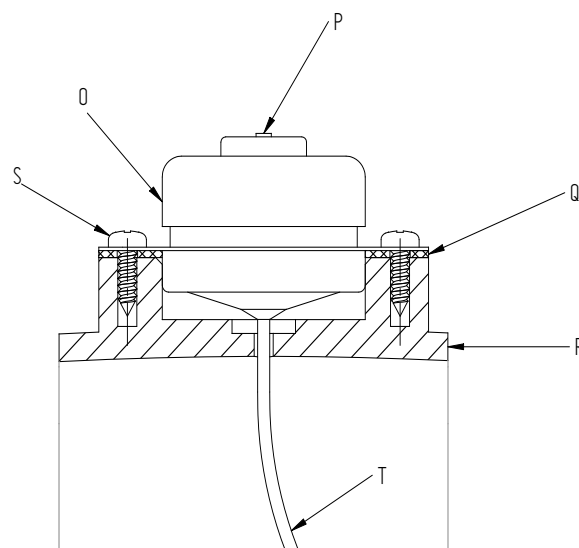
- » Install new heater element (with sealing), insert locking washers and screw nuts.
- » Install capillary tube on the thermo sensor using retainer clips.
- » To proceed further, follow the steps described above in section “Removing and Cleaning the Steam Cylinder”.



8.5 Replacing Thermo Sensor (for Heater Element)

Removal

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



- O: Thermo Sensor
- P: Unlocking Button for Thermo Sensor
- Q: Seal
- R: Steam Cylinder
- S: Screw
- T: Capillary tube



Warning: Do not bend the capillary tube of the thermo sensor!
Installation

- » Install thermo sensor with new sealing. Do not fix the screws too tightly!
- » Neatly connect the capillary tube to the heater element. Having humidifiers with two or more heating elements the capillary tube is connected to two heating elements.
- » To proceed further, follow the steps described above in section “Removing and Cleaning the Steam Cylinder - Assembly”.

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

If a thermo sensor (for heater element) has released due to a too high temperature the red release button (P) is some millimetres above the level of the top of its holder. After the system has cooled down the release button (P) can be unlocked by pressing it down a few millimetres.

8.7 Removing Inlet Solenoid Valve and Cleaning Fine Mesh Filter

Removal

- » Remove the steam cylinder as described above in section “Removing and Cleaning the Steam Cylinder - Removal.”
- » Seal off water supply and remove screw joint from fresh water connection.
- » Detach connector hose from base.
- » Remove electrical connectors from solenoid.
- » Remove solenoid valve mounting screws.
- » Take the solenoid valve out of hole.

Cleaning

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

Installation

- » 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 connector hose to the base by using clamps.
- » Install cylinder as described above in section “Cleaning Steam Cylinder - Assembly”.
- » Open water supply.
- » Switch on unit and check for leakage after 15-30 minutes of operation.

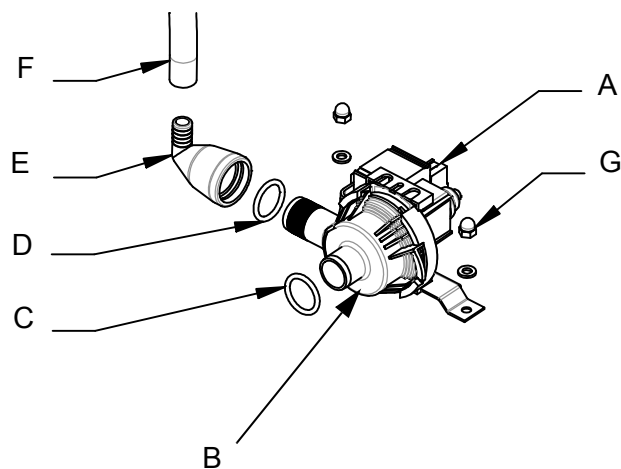
If leakage occurs, switch off power supply and repair the leaks, following safety instructions for work on live components!

8.8 Cleaning Blow-Down Pump

Removal

- » Remove the steam cylinder as described above in section "Removing and Cleaning the Steam Cylinder - Removal."
- » Detach electrical connector from the pump (10).
- » Detach union adapter (E) from the pump.
- » Remove cap nuts (G) and take the pump out of the cylinder base (11).
- » Open pump (bayonet lock).
- » Remove all residue from the 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 cap nuts (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 repair the leaks, following safety instructions for work on live components!



8.9 Cleaning connection hoses and cylinder base

All connection hoses should be free of deposits and under good conditions.

As wellcheck all connections of the cylinder base (11) and the steam hose adapter (2) for deposits and remove if neccessary.

8.10 Checking Cable Screw Connections, Heater Element Wires

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



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

8.11 Operational Check

- » Start up the unit and operate for a few minutes, ideally at maximum output.
- » Check safety devices.
- » Check hose connections for possible leaks.

8.12 Dismantling

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



Warning: Dismantling of the unit may only be performed by qualified personnel. Electrical dismantling may only be performed by trained electricians.

Obey the safety guidelines in section “Safety Instructions,” especially the guidelines for disposal.

9. Spare Parts

*	HC02 Kit	HC03 Kit	HC06 Kit	HC09 Kit	HC12 Kit	HC18 Kit	HC27 Kit	Article No.	Description
									Bracket
	1							E-2101002	Bracket for steam section HC02 Kit
		1	1	1				E-2100998	Bracket for steam section HC02 Kit
					1	1	1	E-2100996	Bracket for steam section HC02 Kit
40	1	1	1	1	1	1	1	E-2101000	Pump holder
									Steam Generation
	1							B-2205495	Cylinder compl., with 1 heater element 1.5kW, 1 thermal sensor and terminal, 230V
		1						B-2205521	Cylinder compl. Incl 1 heater element 2.25kW, 1 thermal sensor and terminal
			1					B-2205523	Cylinder compl. Incl 1 heater element 4.5kW, 1 thermal sensor and terminal 230V
			1					B-2205525	Cylinder compl. Incl 1 heater element 4.5kW, 1 thermal sensor and terminal 400V
				1				B-2205527	Cylinder compl. Incl 1 heater element 6.75kW, 1 thermal sensor and terminal
					1			B-2205529	Cylinder compl. Incl 2 heater elements 4.5kW, 1 thermal sensor and terminal
						1		B-2205531	Cylinder compl. Incl 2 heater elements 6.75kW, 1 thermal sensor and terminal
							1	B-2205533	Cylinder compl. Incl 3 heater elements 6,755kW, 1 thermal sensor and terminal
	1							B-3216046	top part of cylinder CY4, empty for 1 heater element and 1 th. Sensor, including strainer
16		1	1	1				B-3216050	top part of cylinder CY8, empty for 1 heater element and 1 th. Sensor, including strainer
16					1	1		B-2206059	top part of cylinder CY17, empty for 2 heater elements and 1 th. Sensor, including strainer
16							1	B-2206061	top part of cylinder CY17, empty for 3 heater elements and 1 th. Sensor, including strainer
9	1	1	1	1				B-3216052	lower part of cylinder Cy08, including strainer
9					1	1	1	B-2206053	lower part of cylinder Cy17, including strainer
8	1							B-2209037	heater element 230V/ 2.25kW 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					2			B-2209001	heater element 400V/ 4.5kW with sealing and mounting set
8						2	3	B-2209003	heater element 400V/ 6.75kW with sealing and mounting set
	2	2	2	2				E-2205138	Gasket M14
					4	4	6	E-2204006	Gasket for heater element
	2	2	2	2				E-2205140	Mounting nut M14 for heater
					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	E-2206050	O-ring seal for cylinder flange
42	12	12	12	12	20	20	20	E-3216022	Clip
	1							B-3216015	O-ring set for HC02 Kit
		1	1	1				B-3216095	O-ring set for HC03-09 Kit
					1	1	1	B-3216097	O-ring set for HC06-27 Kit
5	1	1	1	1	1	1	1	B-2205031	Thermal sensor 1pole
	6	6	6	6	8	8	10	E-2205012	Clamp for thermal sensor 1pole
6	1	1	1	1	1	1	1	E-2205010	Gasket for thermal sensor 1pole
	1							E-3221002	Adapter for steam hose DN25
2		1	1	1	1	1	1	B-2205025	Adapter for steam hose DN40
	1							E-3221006	O-ring for steam hose adapter DN25
		1	1	1	1	1	1	E-2204022	O-ring for steam hose adapter DN40
12		1	1	1	1	1	1	E-2204035	condensate plug

*	HC02 Kit	HC03 Kit	HC06 Kit	HC09 Kit	HC12 Kit	HC18 Kit	HC27 Kit	Article No.	Description
Water feed									
14	1							E-2204096	Solenoid valve, 0.2-10 bar, 200-240VAC, 0.5 l/min
14		1	1	1				B-2304081	Solenoid valve, 0.2-10 bar, 200-240VAC, 1.2 l/min
14					1	1	1	B-2304043	Solenoid valve, 0.2-10 bar, 200-240VAC, 2.5 l/min
	1	1	1	1	1	1	1	E-2304024	Fine filter in solenoid valve inlet
	1	1	1	1	1	1	1	E-2304103	Captive coupling ring for solenoid valve 3/4"
	1	1	1	1	1	1	1	E-2304107	Gasket for inlet screwed fitting, solenoid
	1	1	1	1	1	1	1	E-8501034	Hose collar for inlet screwed fitting, 3/4" solenoid
32	1	1	1	1	1	1	1	E-2304036	Rubber seal solenoid valve - cabinet
	1	1	1	1	1	1	1	B-2304040	Mounting set for solenoid valve
31	0,3	0,3	0,3	0,3	0,4	0,4	0,4	E-2604002	Hose solenoid valve - cylinder
	1	1	1	1	1	1	1	E-2604044	Buckling protection for hose
	1	1	1	1	1	1	1	B-2504131	Water level control, compl with flow switch for control B/C/CP
								B-2504127	Water level control, compl with flow switch for easy control cylinder
29	1	1	1	1	1	1	1	E-2504144	Water level control, without flow switch
27	1	1	1	1	1	1	1	E-2525260	Flow switch incl. Sealings for control B/C/CP
43								E-2525262	Flow switch incl. Sealings for easy control
	1	1	1	1	1	1	1	E-2504146	Lid for water level control for easy control
28	1	1	1	1	1	1	1	E-2304058	Rubber seal for water level control (with HygroMatik control B/C/CP)
28	4	4	4	4	4	4	4	E-2304056	Rubber seal for water level control (easy control)
30	0,1	0,1	0,1	0,1	0,2	0,2	0,2	E-2604002	Hose, cylinder base - control cylinder
41	1	1	1	1	1	1	1	E-2604025	Hose connector 90°
3	0,3	0,4	0,4	0,04	0,6	0,6	0,6	E-2604002	Hose, water level control- cylinder
		6	6	6	6	6	6	E-2304015	Hose clamp DN12
		2	2	2	2	2	2	E-8501064	Hose clamp DN14,2
Water Drain									
11	1	1	1	1	1	1	1	E-2206086	Cylinder base for C, Hy, HC, DN40
13	1	1	1	1	1	1	1	E-2204022	O-Ring for cylinder base DN40
10	1	1	1	1	1	1	1	B-2404027	Drain pump 230V/ 50-60Hz without mounting set
	1	1	1	1	1	1	1	B-2424014	Mounting set for drain pump
	1	1	1	1	1	1	1	E-2404008	Drain pump housing
18	1	1	1	1	1	1	1	E-3220005	O-ring cylinder base - drain pump
21	1	1	1	1	1	1	1	E-3425002	Adapter, pump - drain house, angled DN25/13
17	1	1	1	1	1	1	1	E-3220005	O-ring for drain pump
7	1	1	1	1	1	1	1	E-2425004	Elbow with vent pipe
22	0,3	0,45	0,45	0,45	0,63	0,63	0,63	E-2604002	Hose, drain pump-elbow
23	0,35	0,55	0,55	0,55	0,6	0,6	0,6	E-2604004	Drain hose, elbow-outlet
	1							B-3401027	Drain hose system for HC02 Kit
		1	1	1				B-3401035	Drain hose system for HC03-09 Kit, consisting of pos. 7, 17, 21, 22, 23
					1	1	1	B-3401037	drain hose system for HC06-27 Kit, consisting of pos. 7, 17, 22, 23

*	HC02 Kit	HC03 Kit	HC06 Kit	HC09 Kit	HC12 Kit	HC18 Kit	HC27 Kit	Article No.	Description
Control									
	1	1	1	1	1	1	1	E-2525154	Terminal 3-pole
	1	1	1	1	1	1	1	E-2525156	Terminal 4-pole
	1	1	1	1	1	1	1	E-2525158	Terminal 5-pole
	1	1	1	1	1	1	1	E-2525150	Terminal 6-pole
	4	4	4	4	4	4	4	E-3504070	Standoff for pcb
	1	1	1	1	1	1	1	E-2525252	Solid state relais 25 A, 1ph., cooling device 150 x
Basic									
		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)	B-2526213	Elektronic pcb type Basic for HC steam bath
		1	1	1	1	1	1	B-2120901	Mounting plate with foil for Basic (without display)
		(1)	(1)	(1)	(1)	(1)	(1)	B-2120909	Mounting plate with foil for Basic DS (without display)
		(1)	(1)	(1)	(1)	(1)	(1)	B-2526301	Relais pcb for Basis pcb
Comfort									
		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)	B-2526213	Elektronic pcb type Basic for HC steam bath
		(1)	(1)	(1)	(1)	(1)	(1)	B-2526401	Comfort display incl. mounting plate with foil
		(1)	(1)	(1)	(1)	(1)	(1)	B-2526445	Comfort display incl. mounting plate with foil steam bath
		(1)	(1)	(1)	(1)	(1)	(1)	B-2120903	Mounting plate with foil for Comfort unit (without display)
		(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	B-2526203	Elektronic pcb type Basic
								B-2526203	Elektronic pcb type Basic for Slave-units
		(1)	(1)	(1)	(1)	(1)	(1)	B-2526213	Elektronic pcb type Basic for HC steam bath
		(1)	(1)	(1)	(1)	(1)	(1)	B-2526403	Comfort Plus Display incl. Mounting plate and foil
		(1)	(1)	(1)	(1)	(1)	(1)	B-2120905	mounting plate with foil for Comfort Plus unit (without display)
			(1)	(1)	(1)	(1)		B-2120907	Comfort Plus Display incl. mounting plate for steam bath
		(1)	(1)	(1)	(1)	(1)	(1)	B-2526447	Comfort plus display incl. mounting plate with foil steam bath
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
								E-2604042	Steam manifold piece DN25, stainless steel
								E-2604023	Steam manifold piece DN40, stainless steel
								E-2604021	Condensate connector T-piece DN12
3			1	1	1	1	1	E-2604021	T-piece condensate manifold, type TS12, DN12
								E-2604029	hose nozzle DN 25 - R 3/4"
58		2	2	2	2	2	2	E-2604094	Double check valves
								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
<p>If you order any spare parts, specify type and serial number of the unit, please.</p> <p>* see exploded view</p>									

10. Fax Form - Order for spare parts

Airtrend Ltd.-Gobrid. Ltd.
Kumanovska 14, 11000 Beograd
Tel. +381 11 383 68 86, 308 57 40
Faks +381 11 344 41 13
E-mail: gobrid@eunet.rs

Fax Form

Please copy, fill in and fax to
Fax.No. **+381 11 344 41 13**

Order of spare parts

unit type * _____ serial no.* _____

commission: _____ order no.: _____

quantity	article	article no.

date of delivery _____ forwarder _____ shipment by _____

delivery address (if different
from invoice address)

company stamp (delivery adress)

date/signature

* Order can only be processed if unit type and unit serial no. are filled in.

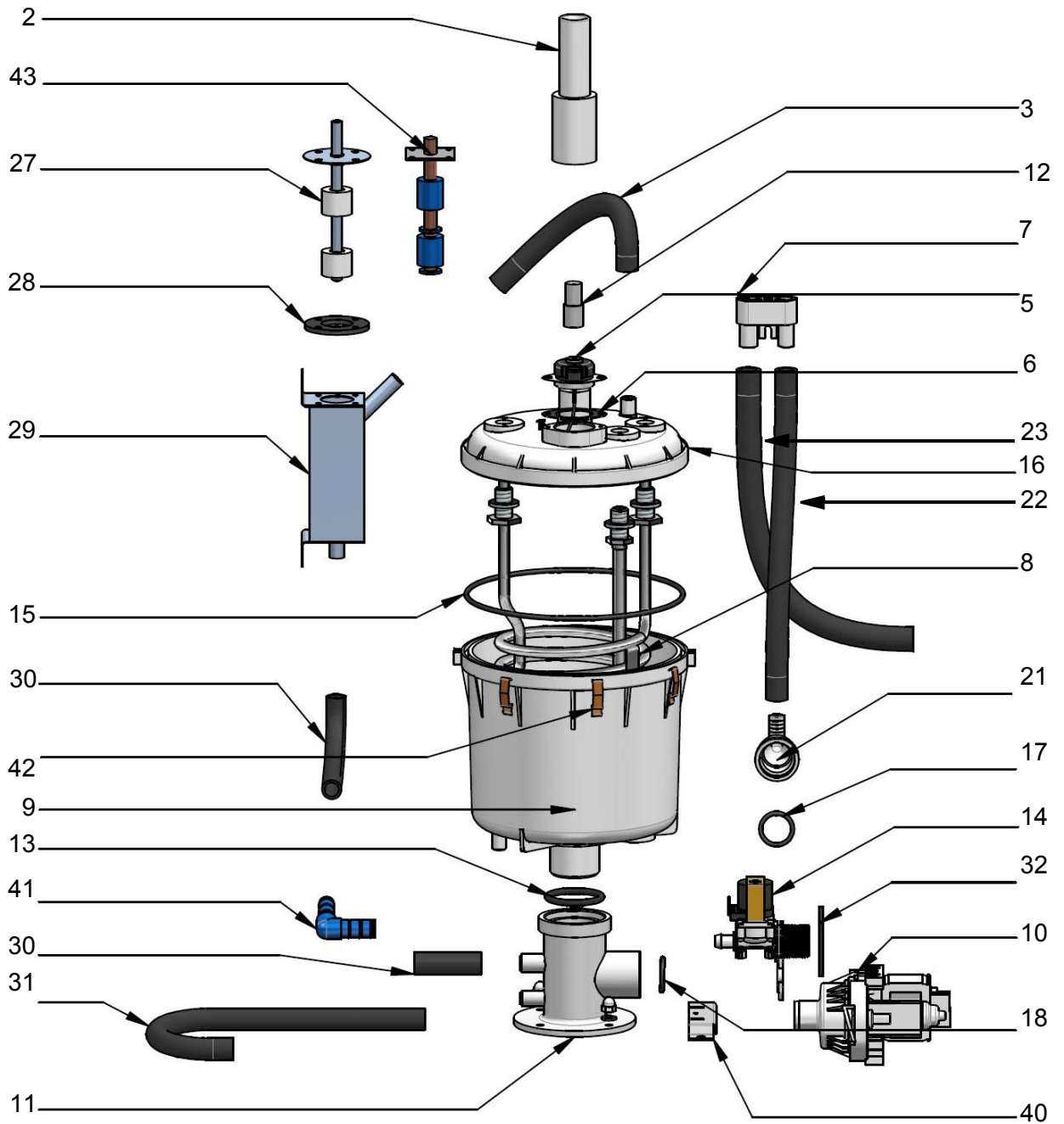
11. Technical Specifications

HeaterCompact Kit								
Type	HC02 Kit	HC03 Kit	HC06 Kit	HC06 Kit	HC09 Kit	HC12 Kit	HC18 Kit	HC27 Kit
Steam Output [kg/h]	2	3	6	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	9,0	13,5	20,3
Power Consumption [A]**	6,5	9,8	19,6	11,3	16,9	19,5	29,3	29,3
Circuit Protection [A]	1 x 10	1x10	1x20	3x16	3x20	3x25	3x35	3x35
Control Type (optional)	Basic, Comfort and Comfort Plus							
Number of Steam Cylinder	1							
Number of Heater Elements	1	1	1	1	1	2	2	3
Steam Hose Connection	1x25mm	1x40mm (reducing piece DN40 to DN25 available)						
Condensate Hose Connection	1x12mm							
Net Weight [kg]	3,5	10	10	10	10	13	13	14
Operating Weight [kg]	5	13	13	13	13	31	31	32
Height [mm]	397	520				656		
Width [mm]	317	317				343		
Depth [mm]	221	221				289		
Water Supply	Fully Demineralized Water / Cleaned Condensate: 1 to 10 bar 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	VG17	VG30	VG30
Airflow Capacity of Fan Unit [m ³ /h]	160	160	160	160	185	185	350	350
* Other voltages upon request. ** Current load of phases is not uniform. See table below.								

Max. current load [A] according to phase:

Phase	HC06 Kit	HC09 Kit	HC12 Kit	HC18 Kit	HC27 Kit
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

12. Exploded View





HYGROMATIK®

Predstavništvo u Beogradu
Airtrend Ltd.-Gobrid. Ltd.
Kumanovska 14, 11000 Beograd
Tel. +381 11 383 68 86, 308 57 40
Faks +381 11 344 41 13
E-mail: gobrid@eunet.rs