HYGROMATIK®

Manual

Electrode Steam Humidifier

CompactLine

A Word about Water Quality

The mode of operation of all electrode steam humidifiers is based on the fact that water contains minerals and is therefore conductive.

- "normal" tap water is ideal.
- but what is "normal" tap water exactly?

Users of HygroMatik units in the most diverse areas consider their tap water "normal."

HygroMatik typically defines "normal" as feed water with a conductivity between 200 and 500 µS/cm (microSiemens per centimeter) at 15° C.

Some areas, however, are supplied with tap water whose quality is outside the parameters specified by HygroMatik. If the HygroMatik steam humidifier's control is not adjusted correctly in these areas, the unit cannot perform optimally. For example, the electrodes could wear out particularly quickly or the steam production could be too low.

The operational parameters set by HygroMatik in the factory are intended for normal tap water. However, they can very easily be reprogrammed to fit the special requirements of a particular area. In addition, it is possible to install a plastic star in the cylinder in order to increase the life span of the electrodes or to provide a flushing mechanism to extend maintenance intervals.

Because of this you should monitor your new unit during initial operation. Make sure that it has been properly installed and is operating to your satisfaction.

Consult your HygroMatik specialists. We will test the quality of your water and advise you on installation and initial operation. Your HygroMatik steam humidifier will be carefully adapted to your particular application.

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

Dear Customer,

Thank you for choosing a 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: **hot1@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).

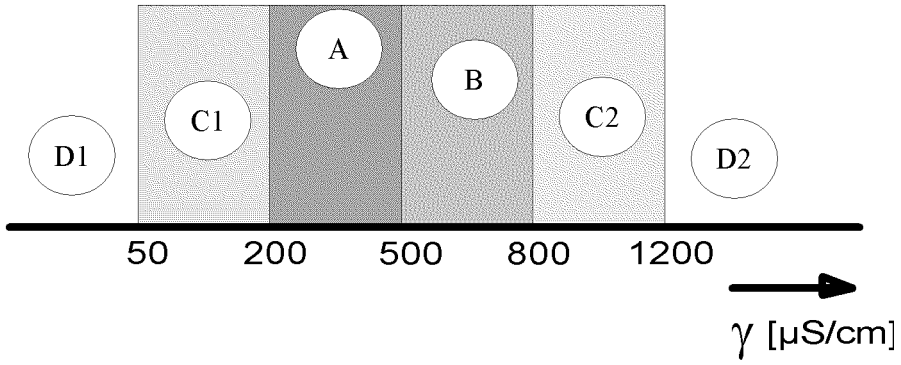
1.1 Directions for Use

The HygroMatik steam humidifier is intended for steam production.

Proper usage also entails following HygroMatik's instructions for installation, dismantling, reassembly, initial operation and operation and maintenance, as well as disposal procedures.

Only qualified, authorized personnel may operate or service the unit. Workers who transport or service the unit must have read and understood the relevant sections of the operating instructions, especially the section "Safety Notes." In addition, staff must receive safety training about potential hazards from the operator. Place a copy of the operating instructions at the location where the unit is operated..

Use feed water with a conductivity between 50 and 1200 µS/cm only



D1: Lower threshold

C1: Range of reduced conductivity

A: Normal tap water

B: Range of heightened conductivity

C2: Range of heigh conductivity

D2: Upper threshold

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

The HygroMatik Steam Humidifier is not designed for outdoor fitting

1.2 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..

1.3 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.

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.

Accident Prevention Regulations

Comply with the accident prevention regulation
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

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 or burned wiring. After proper electrical installation or repair, test all safety mechanisms (such as grounding resistance).

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.

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 due to stress or careless loading and unloading.

3.2 Carton outer Size and Weight

HyLine:

Type*	Height [cm]	Width [cm]	Depth [cm]	Weight [kg]
HY05- 08	58	56	32	16
HY13- 17	75	63	37	24
HY23	75	63	37	25
HY30	81	67	41	33
HY45	88	76	48	46
HY60	80	104	41	54
HY90- 116	90	117	48	77

CompactLine:

Type*	Height [cm]	Width [cm]	Depth [cm]	Weight [kg]
C6	52	50	28	13
C10	58	51	31	14
C17	75	54	37	22
C22	75	54	37	22
C30	75	58	37	23
C45	81	63	41	25
C58	90	72	48	36

MiniSteam:

Type**	Height [cm]	Width [cm]	Depth [cm]	Weight[kg]
MS 5	59	48	28	13
MS 10	68	51	31	15

* Dimensions and weights may vary slightly.

3.3 Packing

Note: Notice the symbols affixed to the packing box.

3.4 Interim Storage

Store the unit in a dry place and protect from frost.

3.5 Check for Complete and Correct Delivery of Goods

Upon receipt of the unit, confirm that:

- the type and serial number on the name plate match those specified in the order and delivery documents and
- the equipment is complete and all parts are in perfect condition

Note: In case of damage during shipment or missing parts, immediately notify the carrier or supplier in writing.

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

Shipping Companies	After Receipt of Goods
Mail	no later than 24 hours
Rail	no later than 7 days
Truck and Rail Carriers	no later than 4 days
Parcel Service	immediately

* Time limits for some services subject to change.

3.6 Included in the Delivery

The delivery includes:

- Unit of the selected HyLine type including selected control.
- Water installation hose 0,6m, 3/4".
- Mounting set with anchors and screws. For HyLine types HY45 to HY116, extra mounting bar.
- Operating Instructions for the unit and the control.
- Ordered accessories (steam manifold, steam hose, condensate hose, etc.).
- Maintenance o-ring set for steam cylinder.

4. Operation and Installation

4.1 Mode of Operation

The HygroMatik steam humidifier utilizes the conductivity normally present in tap water for steam production. Electrodes inside an enclosed steam cylinder are immersed directly into the tap water. They are connected to the alternating current.

The conductivity of the water generates an electric current between the electrodes. In this way, the electric power supplied is converted directly into heat without energy loss.

The amperage is a function of the available voltage, the immersed electrode surface area, the average distance between the electrodes and the water conductivity. The steam output of the humidifier is determined by electric power usage, which is regulated by increasing or decreasing the immersed surface area of the electrodes.

Concurrently, a self-regulating control keeps conductivity within a specified range.

The steam produced has a temperature of about 100°C with minimal excess pressure ("pressureless steam"). It is free of minerals and largely germ-free. Mineral deposits typically remain behind in the cylinder.

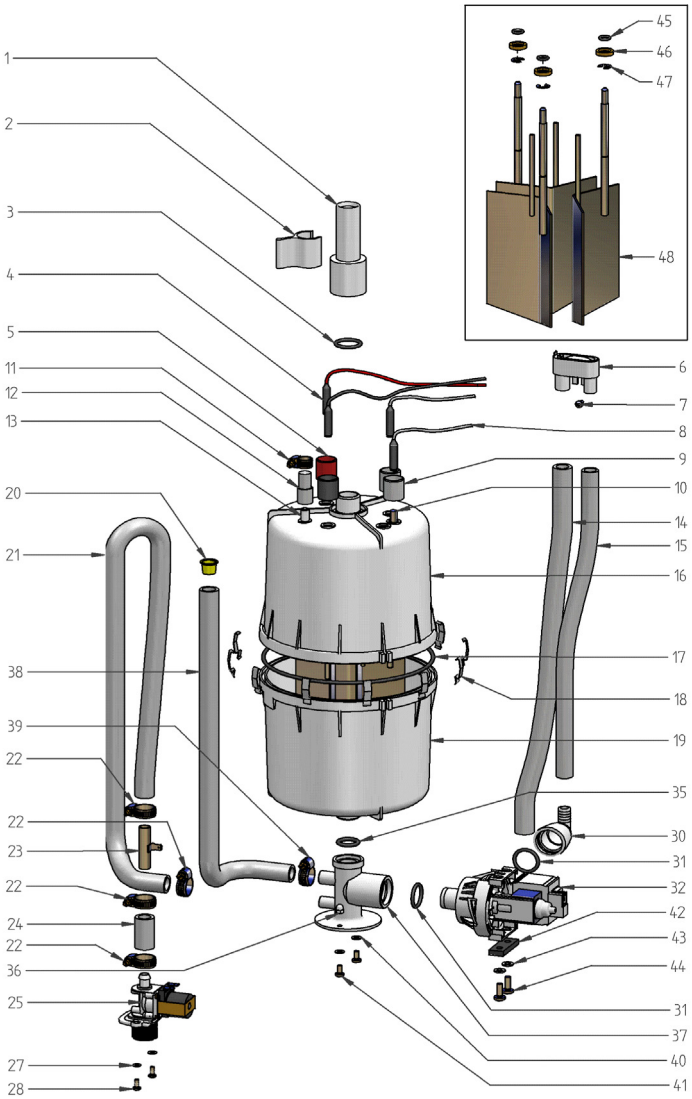
4.2 Installation and Operation

When the controller specifies an increase in humidity, the main contactor is switched on and the electrodes (48) are supplied with power. The water inlet solenoid valve (25) feeds water into the steam cylinder (16+19).

As soon as the electrodes are immersed, the current begins to flow. The water is now heated. When the pre-selected output is reached, the control turns off the solenoid valve and interrupts the water supply.

After a short heating up period, the water between the electrodes begins to boil and vaporize. The vaporization lowers the water level in the steam cylinder, reducing the output provided. The inlet solenoid valve, equipped with a fine mesh filter, intermittently admits fresh water.

Humidifier power usage is continuously monitored. With a cold start-up, the nominal current increases to 125% in order to achieve quick-start output parameters. This activates the electronic overflow limiter which causes a partial draining of the cylinder. This reduces the immersed surface area of the electrodes, lowering power usage.



Please also see Section „Exploded View“.

Location	Designation
1	adapter
6	vent pipe
10	max. water level sensor electrode
14	water drain, discharge
16	top part of steam cylinder
17	o-ring cylinder flange
18	cylinder flange and o-ring
19	lower part of cylinder
25	solenoid valve water inlet
32	blow-down pump
35	o-ring
37	cylinder base
48	electrodes

The concentration of dissolved salts increases over time, which can lead to a rise in the conductivity of the water. If this continues, conductivity may increase until a short circuit occurs. This could damage the unit, but in any case would significantly reduce the life span of the electrodes.

For this reason, regular, periodic blow-downs of some of the concentrated water are very important. Following this procedure as recommended provides stable cylinder water conductivity as well as minimal water loss for the expected service life of the cylinder.

Water blow-down is performed by a blow-down pump (32). The functioning of the blow-down pump is continuously monitored during operation. If the pump is damaged, the steam humidifier shuts down.

With normal water quality, the blow-down loss rate is between 7% and 15% of the amount of steam produced. The steam cylinder requires complete drainage every 3-8 days, regardless of the water quality.

Mineral deposits settle in the open area below the electrodes and are removed through periodic maintenance. The blow-down pump itself has wide openings and can flush out smaller pieces of mineral deposit. This extends the service life of the unit and reduces the required maintenance interval.

During blow-downs, water flows from the pump into the drainage system.

A sensor electrode (10) monitors the maximum water capacity of the cylinder. When the water level reaches the sensor electrode, the water supply is interrupted. This can occur when the water has low conductivity or when the electrodes are worn out. In the case of low water conductivity, however, this state usually lasts only a short time. The built-in control and the large area electrodes combine to produce a rapid rise in conductivity by increasing the concentration of the water.

The steam cylinder consists of a top (16) and lower (19) part joined with a cylinder flange. The seal between the cylinder and cylinder base (37), as well as between the top and lower part of the cylinder, is maintained using an o-ring (35+17).

5. Installation

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

Obey all safety notes and warnings present on the unit.

During installation the unit must be disconnected from its power supply.

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

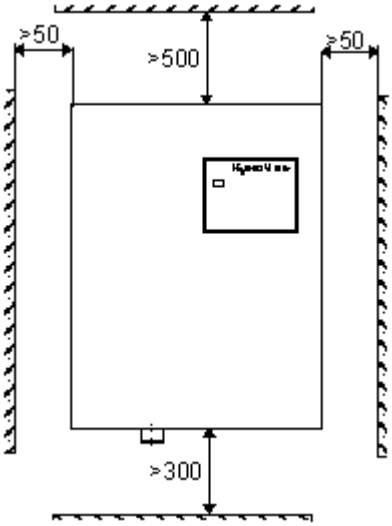
5.1 Steam Humidifier Operating Environment

Note: When selecting the installation site for the steam humidifier, note that:

- Ambient temperature must be between 5° and 40° C.
- Relative humidity must not exceed 80% RH.
- The minimum clearances indicated in the diagram below must be observed; these are necessary to ensure adequate ventilation for the housing.
- The steam humidifier should be installed as close as possible to the steam manifold. Optimal performance is guaranteed only with short lengths of steam and condensate hose
- Hoses must be laid at a consistent 5-10% incline to prevent sagging and kinking
- The rear panel of the steam humidifier heats up during operation (to a maximum of 60°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 steam humidifier is not qualified for exterior applications.

5.1.1 Fitting measures

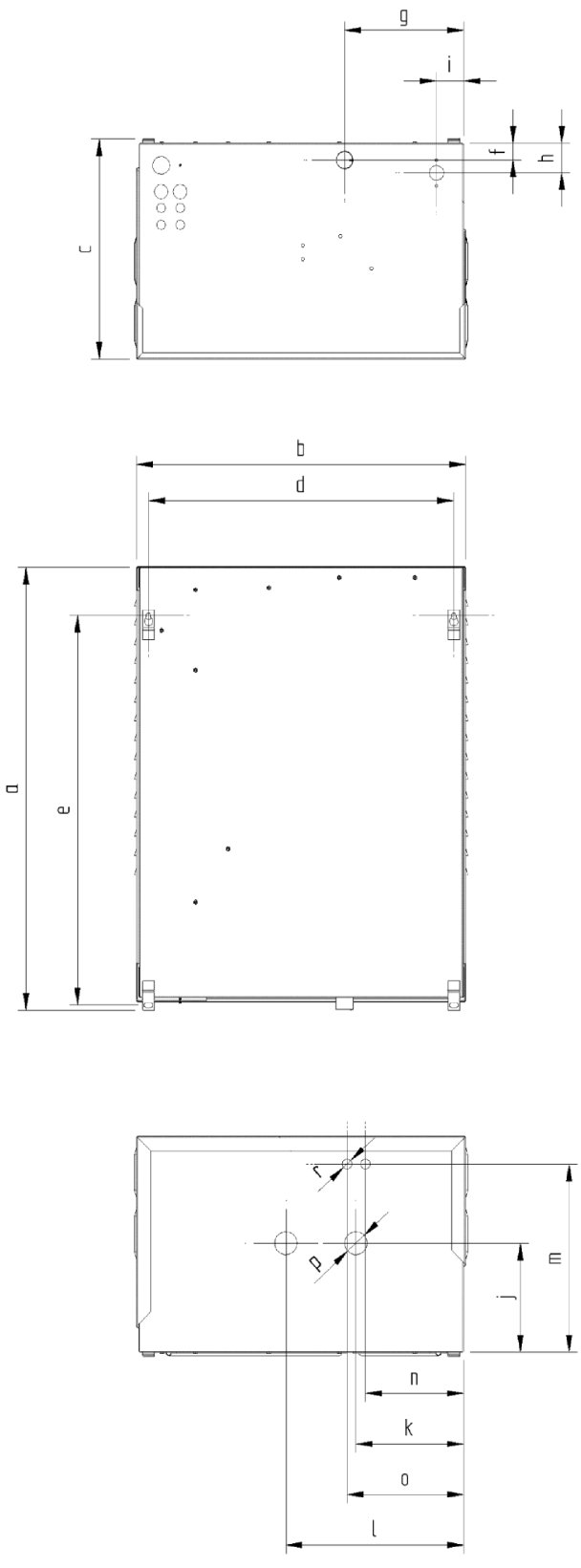
Clearances



Note: When choosing the site for the steam humidifier, consider the location of existing water installations (feed and drain lines).

5.1.2 Equipment Dimensions C6 - C58

	C6	C10	C17/ C22/ C30	C45	C58
a	438	479	653	707	790
b	393	399	472	519	606
c	187	216	283	327	392
d	351	369	435	482	564
e	394	436	609	650	740
f	34	34	38	30	38
g	133	119	214	250	302
h	43	43	62	60	60
i	33	35	39	50	52
j	102	119	152	175	195
k	104	100	136	158	201
l	-	-	-	-	330
m	144	173	233	256	336
n	57	68	89	111	183
o	-	-	-	-	217
p	26		42		
q	18,5				



5.2 Fan Unit (optional)

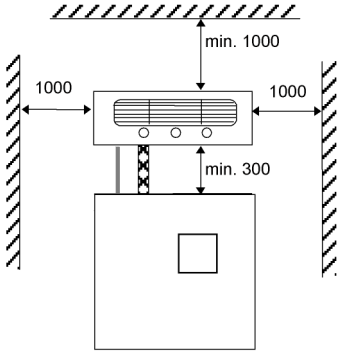
Note: The fan unit should be positioned to avoid drafts. In general, a minimum height of 2 m is sufficient.

- Install the fan unit directly on a wall.

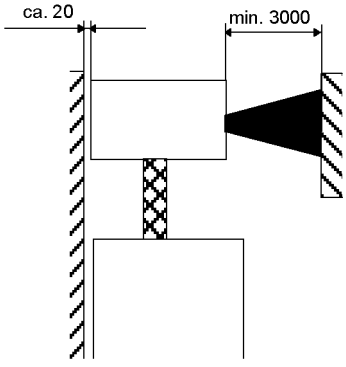
Fan Unit	Type
for wall installation	VG 08, 17, 30

5.2.1 Fan Unit Type VG

- Install the fan unit over the steam humidifier.
- When employing multiple fan units, do not exceed a maximum distance of 5 m from the steam humidifier.
- Observe the clearances specified in the diagram below:



Fan Unit Wall Installation



Side View Wall Installation

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) x B_N	for fine filters, heat registers
B_s = (2,5...3) x B_N	for particle filters
B_d = (2,5...3) x 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 $\triangle x$ in g/kg (can be determined in the h,x diagram)
- quantity of steam introduced $\dot{m}_D^o$ 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“ on page 24). 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]

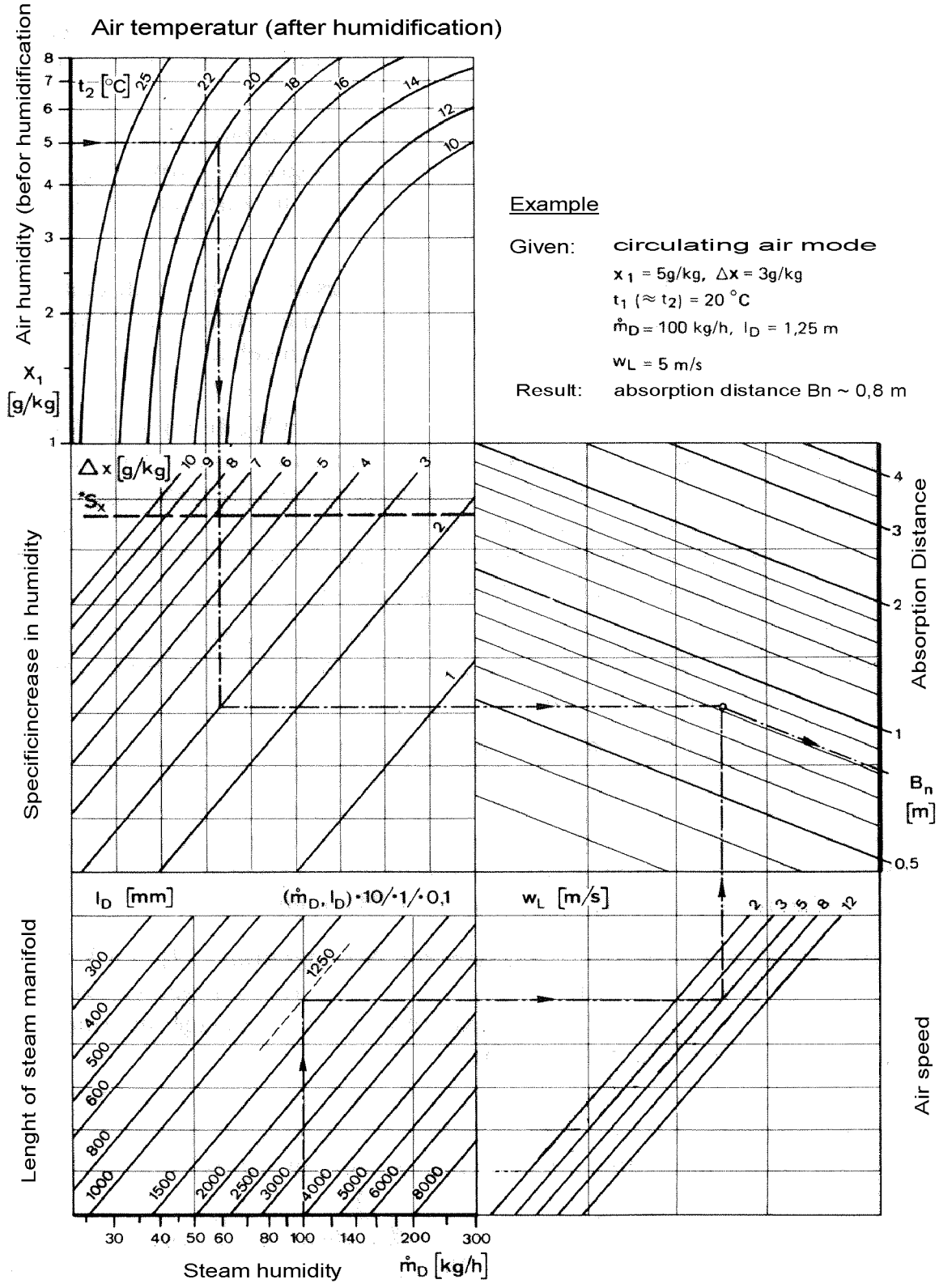
Specific increase in humidity $\triangle$ x:_____[g/kg]

quantity of steam introduced $\dot{m}_D^o$:_____[kg/h]

air speed t w_L: _____[m/s]

Total length of the steam manifold l_D: _____[mm]

5.3.2 Absorption Distance Nomogram



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

5.4 Steam Manifold

Note: Shown installation and position dimensions are based on experimental values. Special environmental conditions could require adjustments.

Please note:

- Install the steam manifold as close as possible to the steam humidifier in order to minimize steam loss through condensation.

Note: For steambath generators Type HyLine/CompactLine:

- 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.

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

HyLine:

Type	Steam Manifold	Steam hose	Condensat Hose
HY05-HY17	1x25	DN25	DN12
HY23-HY30	1x40	DN40	DN12
HY45-HY60	2x40	2xDN40	2xDN12
HY90-HY116	4x40	4xDN40	4xDN12

CompactLine:

Type	Steam Manifold	Steam Hose	Condensate Hose
C6-C17	1x25	DN25	DN12
C30	1x40	DN40	DN12
C45**	2x40	DN40	DN12
C58	2x40	2xDN40	2xDN12

DemiLine:

Type	Steam Manifold	Steam Hose	Condensate Hose
DemiLine6-12	1x25	DN25	DN12
DemiLine17-26	1x40	DN40	DN12

HeaterLine:

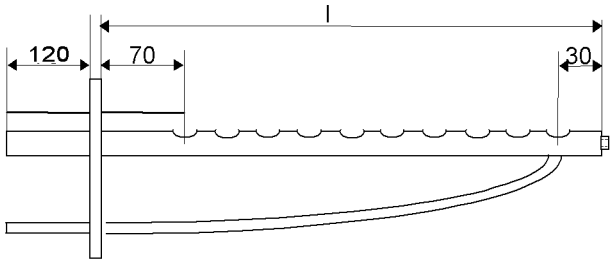
Type	Steam Manifold	Steam Hose	Condensate Hose
HL 6-12 *	1x25	DN25	DN12
HL 18-24	1x40	DN40	DN12
HL 30-45 **	2x40	1xDN40	1xDN12

Lenght of Steam Manifold [mm]*

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

* For units HL 6 - 12 HygroMatik deliver one adapter DN40 / 25.
** For units HL 30 - 45 HygroMatik deliver one t-connector for separating the steam on two steam manifold.
*** Special lenght on request.

Note: At lengths of 900mm or more, steam manifolds are shipped with an extra alternative mounting fixture (Nut, M8) on the closed end



5.4.1 Notes on Installation

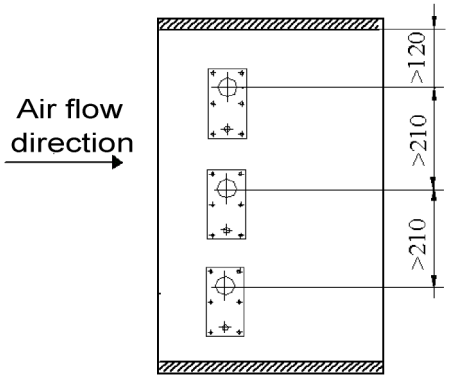
Placement of the steam manifold on the supply side of the air duct is preferred.

- Maximum allowable pressure in the air duct is 1200 Pa
- On the return side, the maximum allowable negative air pressure is 500 Pa

With high-pressure air-conditioning systems, the unit's drain or supply hose must be lengthened depending on the overall pressure. When this is the case please consult HygroMatik.

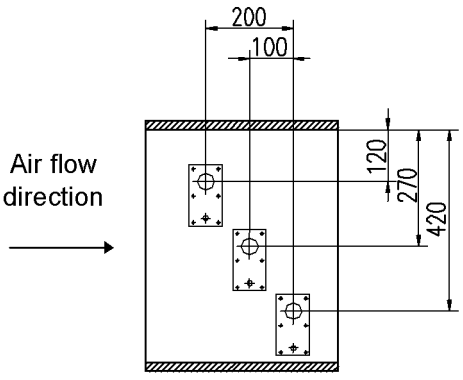
When installing the steam manifold, please note the following:

- The air intake can be positioned on the right or the left.
- Observe a minimum distance of 120 mm from the top of the air duct.
- 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.

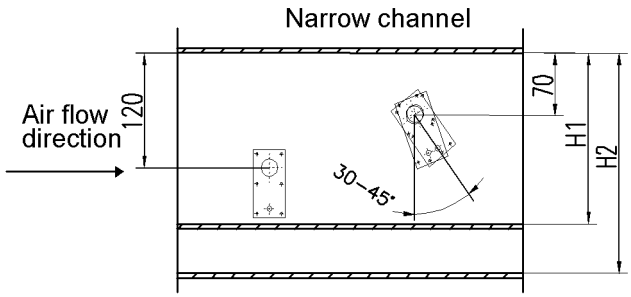


- Position the steam manifold to ensure uniform steam distribution in the air duct.
- Install the steam manifold horizontal with it ensure a clean steam out.

Air Duct	Note on Installation
low	Different lengths in the air flow direction side by side
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.

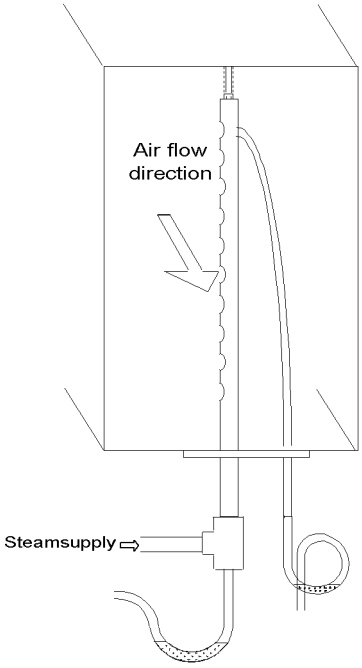


- By tilting the steam manifold 30 - 45° towards the air flow direction, the minimum upper clearance can be reduced to 70 mm.



	H1 [mm]		H2 [mm]
	30°	45°	
DN25	182	168	225
DN40	193	179	230

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



- If installation conditions are exceptional, carefully evaluate the state of the air. Above all, assess the danger of condensation in the duct.
- We note that the German Association of Engineers (VDI) Guideline 6022 specifies a water drain within the absorption distance inside the air duct.

5.5 Steam Line

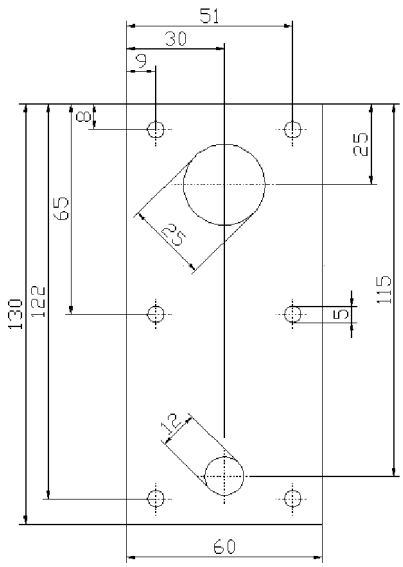
Note: When installing the steam hose, please pay attention to the following:

- 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 T-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.
- 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.
- Only genuine HygroMatik hoses are capable of withstanding the operating conditions. Allow for minimum bending radii:
  Steam hose DN 25: Rmin = 200 mm
  Steam hose DN 40: Rmin = 400 mm

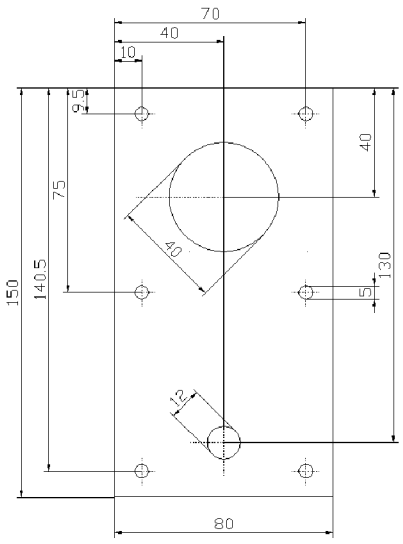
5.6 Cover Plate

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.



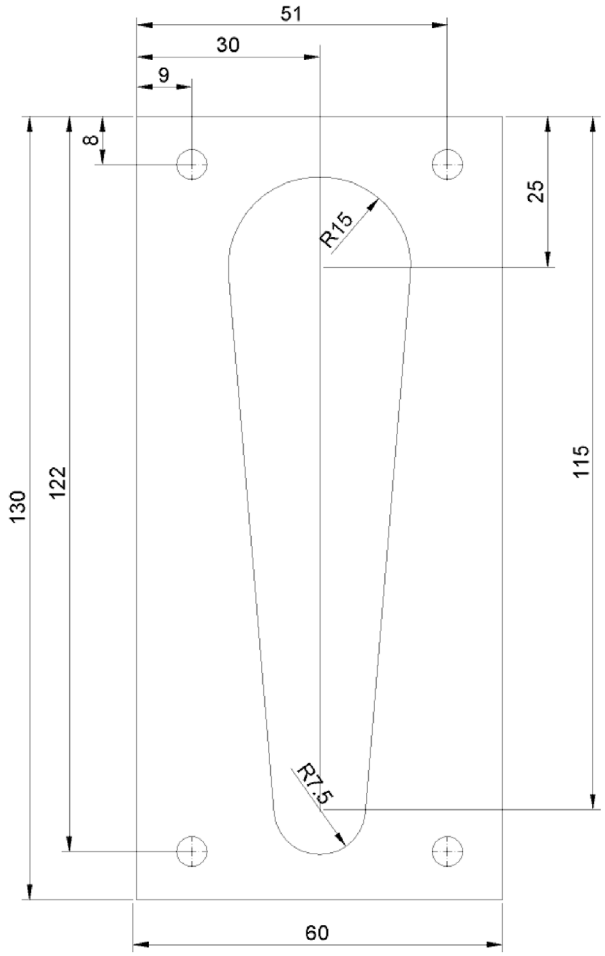
flange plate DN25 E-2604260



flange plate DN40 E-2604410

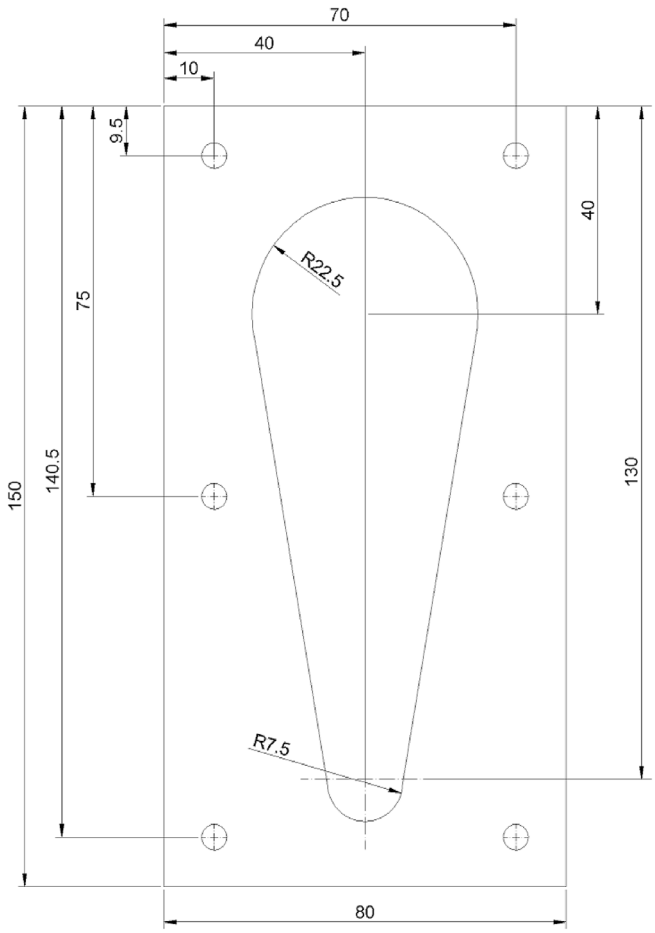
5.7 Drill Pattern

5.7.1 Drill Pattern DN25 (not to scale)



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

5.7.2 Drill Pattern DN40 (not to scale)



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

5.8 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 cylinde.

» 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.

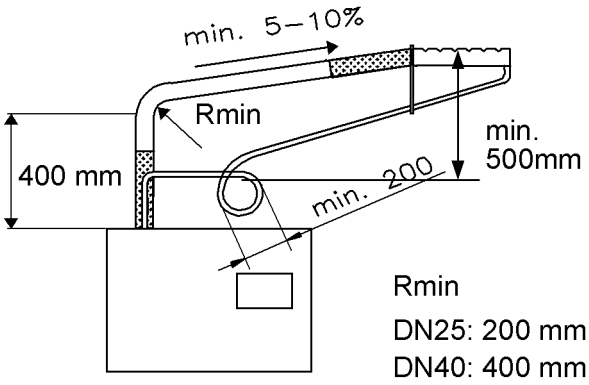
5.9 Types of Installation

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.

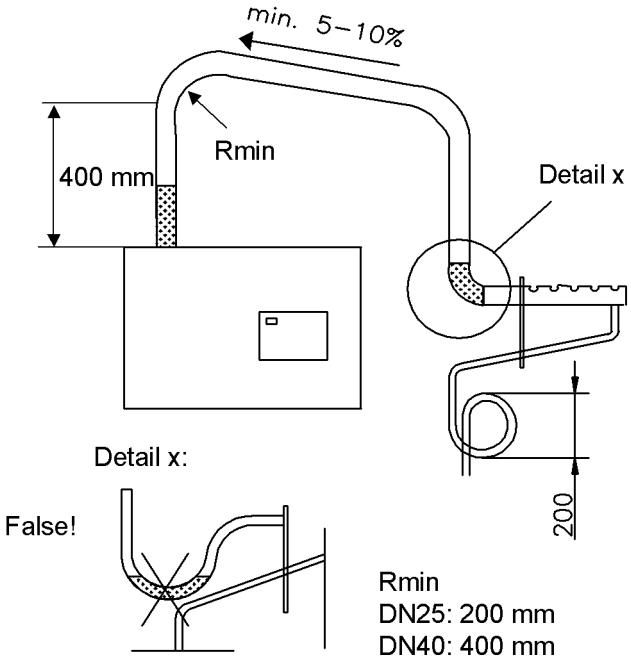
» If enough space is available, lay a loop as a vapor trap. The steam manifold must be at least 500 mm from the loop.



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.

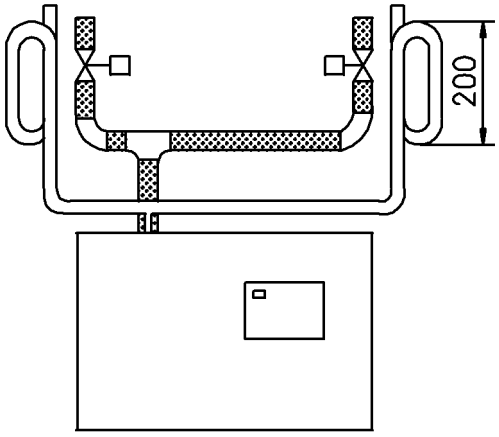


» Lay the loop of condensate hose 200 mm directly above the drain. Detail x

5.10 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 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

5.11 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: When installing the water installation, note the following:

- Have all work performed by a professional.
- Disconnect power supply before installation.
- Obey local public utility regulations
- Verify that necessary safety measures have been taken – in compliance with either German Technical and Scientific Association for Gas and Water (DVGW) guidelines (German Institute for Standardization [DIN] 1988) or local regulations – to eliminate backflow of polluted water into drinking water treatment facilities. This can mean laying the water supply line 300 mm above the unit (with automatic ventilator and extra check valve). Install a backflow preventer if necessary.
- Use feed water without chemical additives and with a conductivity between 200 and 800 µS/cm only. Above conductivity levels of 800µS/cm to a maximum of 1200µS/cm and below conductivity levels of 200µS/cm to a minimum of 50µS/cm, special adjustments are required. In this case please contact HygroMatik.
- The water supply temperature may not exceed 60° C.
- Water installation pressure: 100 x 10^3 to 100 x 10^4 pascal (1 - 10 bar).
- Blow-down water must be able to drain.

6.1 Operation with Softened Water

Warning: Unless special measures are taken, feeding softened water into the HygroMatik steam humidifier is dangerous. It can cause

- unacceptably high conductivity
- the formation of salt bridges between the electrodes and the electrode leads on the inner surface of the top part of the steam cylinder
- foaming in the steam cylinder

Salt bridges cause electrical arcs. These are indicated by the presence of black grooves in the top part of the cylinder. The top part must be replaced to prevent further damage to the cylinder material, as well as short circuits which trip main circuit breakers.

Foam comes into contact with the maximum water level sensor electrode and triggers a signal indicating the cylinder is filled to capacity, even though this is false and the nominal current has not yet been reached.

Note: Please contact HygroMatik if you wish to operate the unit with softened water.

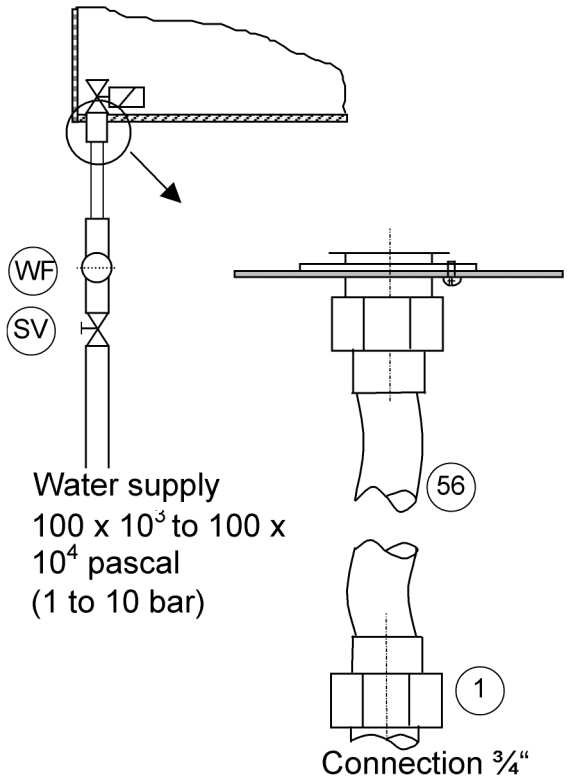
- If using a water softening system, we recommend diluting the softened water with normal tap water to produce an overall hardness between 4-8°dH.
- When feed water contains softened water, the level of conductivity is typically higher at operating temperature. Install a HygroMatik "cylinder star" to extend the service life of the electrodes.

6.2 Water Supply

» Install a shut-off valve (SV) in the supply line.

» Install a water filter (WF) if water quality requires it.

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.

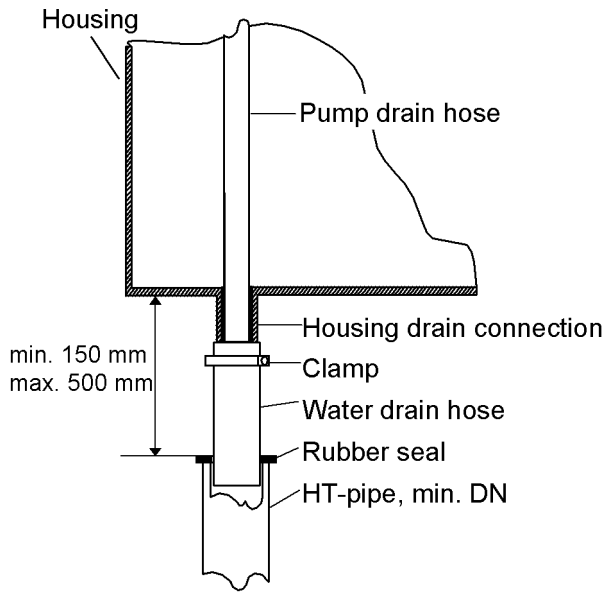
Install as follows:

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

Note: Tightening too much will destroy the fitting. The valve strainer (29) must be placed inside the solenoid valve.

» Use a cap nut (internal thread ¾“) with inner seal for a customer-provided water installation.

6.3 Water discharge



Warning: Water must drain freely! For water discharge, we recommend installation of a flexible water drain hose.

Please note:

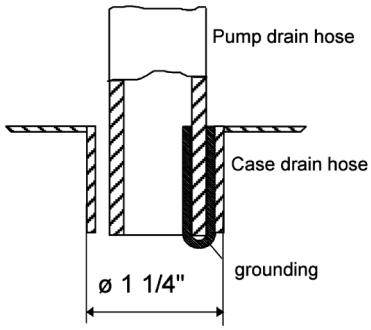
- Do not bend, shorten or lengthen the drain hose.
- Install discharge line and drain pipe made from temperature resistant material (to 95° C).

Install water discharge as follows

- Loosely insert a length of 1 1/4 " drain hose, approx. 150 - 300 mm, into a drain pipe with a minimum inner diameter of 40 mm and seal with a rubber gasket.
- Fit water drain hose over the pump drain hose and fasten to the housing drain connection.

A grounding clip is fixed on the inner surface of the housing drain connection. The end of the pump drain hose is pushed into this clip. During blow-down, the grounding clip is in direct contact with the water and shunts potential residual electric currents away from the housing.

There is a 3mm-wide crack between the pump drain hose jacket and the inner surface of the housing drain connection. If water collects in the base plate, it will flow through this crack into the drainage system.



6.4 Water Installation Check

Go down the following water installation checklist:

- ☑ Are all screws and clamps properly tightened?
- ☑ Is the water supply pipe flushed?
- ☑ Was the water installation correctly installed?(See Section 6.2)
- ☑ Can the blow-down water drain freely?
- ☑ Was the water discharge correctly installed?
- ☑ Is there no leakage from the water supply pipe and water discharge?

Warning: Flush the water supply pipe before connecting to the solenoid valve, especially a newly installed pipe. This prevents premature damage.

7. Electrical Connection

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

Danger, Hazardous Voltage: Do not plug the steam humidifier into 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 protect these components during any type of installation, steps must be taken to guard against damage from electrostatic discharge (ESD protection).

Warning: For electrical installation, note the following:

- Disconnect power supply before installation and protect against restart.
- Verify the absence of electric current.
- Make sure the unit is switched off before installing or removing the display plate or basic PCB.
- Professionally lay electrical connector cable.
- Install the electrical connections according to the wiring diagram.
- For units with rated power over 33 kW, only a permanent connection to a permanent wire is allowable (German Association for Electrical, Electronic & Information Technologies [VDE] Standard 0700 Section 98).
- Verify that all terminals have been tightened.

7.1 Electrical Installation

» Fuses must have a contact gap of at least 3mm per pole.

» Install a separate main connection for each steam cylinder, complete with main contactor, main switch, etc.

» Connect potential equalization to the outer ground bolt.

» Observe the German Association for Electrical, Electronic & Information Technologies [VDE] Standard 0100 when selecting a connection cross section.

» Install main power supplies as follows:

HyLine:

Type	Main Power Supply
HY05 - HY45	1 x 400V/3Phase/N
HY60 - HY116	2 x 400V/3Phase/N

CompactLine:

Type	Main Power Supply
CompactLine	1 x 400V/3Phase/N

MiniSteam:

Type	Main Power Supply
MS5 MS10	1 x 400V/3Phase/N
MS5	1 x 230/1Phase/N

DBE:

Type	Main Power Supply
DBE 2	1 x 230V/1Phase
DBE 6-45	1 x 400V/3Phase/N

Other voltages are available on request.

We recommend employing quick or medium blow main fuses (applicable only to the grid voltages above). See table below indicating maximum power usage for each circuit protection:

HyLine:

Type	Power Usage	Circuit Protection
HY05	5,4 A	3 x 6A
HY08	8,7 A	3 x 10A
HY13	14,1 A	3 x 16 A
HY17	18,4 A	3 x 20 A
HY23	24,9 A	3 x 35 A
HY30	32,5 A	3 x 35 A
HY45	48,8 A	3 x 63 A
HY60	2 x 32,5 A	6 x 35 A
HY90	2 x 48,8 A	6 x 63 A
HY116	2 x 62,8 A	6 x 63 A

CompactLine:

Type	Power Usage	Circuit Protection
C6	6,5 A	3 x 10 A
C10	10,8 A	3 x 16 A
C17	18,4 A	3 x 20 A
C22	23,8	3 x 35 A
C30	32,5 A	3 x 35 A
C45	48,8 A	3 x 63 A
C58	62,8 A	3 x 63 A

MiniSteam:

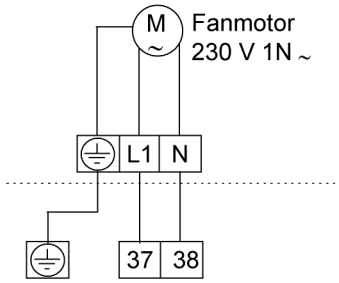
Type	Power Usage	Circuit Protection
MS5, 230V/1/N	15,7 A	1 x 16 A
MS5, 400V/3/N	5,4 A	3 x 6 A
MS10, 400V/3/N	10,8 A	3 x 16 A

DBE:

Type	Power Usage	Circuit Protection
DBE 2	6,5 A	1 x 10 A
DBE 6	6,5 A	3 x 10 A
DBE 10	10,8 A	3 x 16 A

7.2 Fan Unit

» Connect fan unit according to the wiring diagram.



Terminals Humidifier

The fan unit operates in parallel with the humidifier.

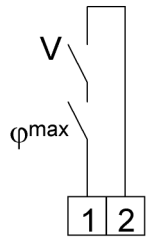
Note: Terminals 37 and 38 are only installed if the option „fan unit“ is ordered.

7.3 Safety Interlock

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

Warning: A max-hygrostat should be installed in the safety interlock. The max-hygrostat acts as a safety device in case the humidity sensor malfunctions.

Warning: Contacts laid between terminals 1 and 2 must be potential free and rated for 230V switches.



terminals
humidifier

7.4 Wiring Diagram

Please remove the wiring diagram from the technical manual supplied with the control used with your humidifier. Every steam humidifier comes with one technical manual for the unit and one for the control.

7.5 Electrical Installation Checklist

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

- ☑ Is the power grid voltage compatible with the voltage on the name plate?
- ☑ Have all electrical connections been made according to the terminal connection diagram?
- ☑ Have all electrical cable and plug connections been properly tightened?
- ☑ Are all electrical socket connections secure?
- ☑ Is the unit grounded?

After this check the unit can be switched on.

Warning: The unit must be closed and locked. This guarantees that the cover is grounded. (only humidifier type HyLine and MiniSteam)

Note: For initial operation, control, service, malfunctions, and circuit diagrams, consult the operation instructions for the Hygro-Matik-controls.

8. Commissioning

Warning: This unit is only to be started by qualified personnel.

Switching off steam humidifier

Warning: 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.

Switching on Steam Humidifier

» 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.

» Switch on main breaker.

» Open water supply stopcock valve. Operating pressure 100 x 10^3 to 100 x 10^4 Pa (0.2 to 10 bar).

» Switch on unit by setting control switch to “I”.

» Set control of initial operation check to humidity demand.

The following functions are operating:

- The unit performs a self-test. If the control includes a display, the message “self-test“ is displayed.
- When there is a demand for humidity, the water inlet solenoid valve opens and feeds water into the steam cylinder.
- Initiation of steam production can take up to 20 minutes.

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, and in doing so:

Attention, Hazardous Voltage! Follow safety instructions for work on live components.

9. Maintenance

The HygroMatik steam humidifier is easy to maintain. However, 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 note:

- The unit is only to be serviced by qualified, authorized personnel.
- Observe safety notes.
- Switch off the unit before maintenance and protect against restart.
- After maintenance work, have qualified personnel check that the unit is operating safely.

The steam humidifier's performance and maintenance intervals primarily depend on the water quality (carbonate hardness, conductivity) and the quantity of steam produced since the last maintenance. Abnormal water quality can shorten or lengthen maintenance intervals. Ongoing maintenance intervals can be estimated based on the amount and type of residue found in the steam cylinder.

Indications that cylinder maintenance is required immediately include:

Control	Indicator
Basic	maintenance message: **red and green LED** are blinking: Unit has switched itself off automatically.
Comfort Comfort Plus	**Maintenance** message on the display (**red and green LED** are blinking). Unit has switched itself off automatically*. The maintenance message can also be sent by the open programmable potentialfree contact(only available for control type Comfort and Comfort Plus). See manual for control.

9.1 Maintenance Work

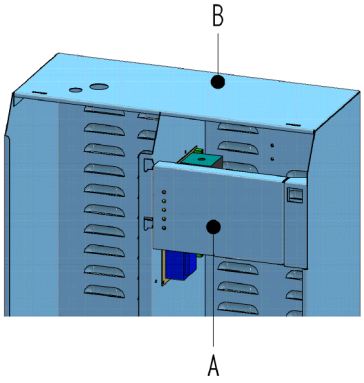
Mineral deposits precipitate and crystallize very differently in different types of water, even when two types have the same conductivity and hardness levels (the various constituents in the water interact differently).

Instructions on maintenance and cleaning intervals, or on electrode service life, are based entirely on empirical data.

Cycle	Maintenance Work
4 Weeks after initial operation (with normal water quality)	Visual inspection of electrical and mechanical connections Remove mineral deposits from steam cylinder, water drain hose and blow-down pump Check electrodes for erosion
Semiannually (with normal water quality and "normal" operation = 8h/day)	Visual inspection of electrical and mechanical connections Remove mineral deposits from steam cylinder, water drain hose and blow-down pump und ggf. erneuern.Check electrodes for erosion

In most cases, the conductivity levels given in Section "Directions for Use" of these instructions can be considered normal. Individual parameter setting of the control may be necessary.

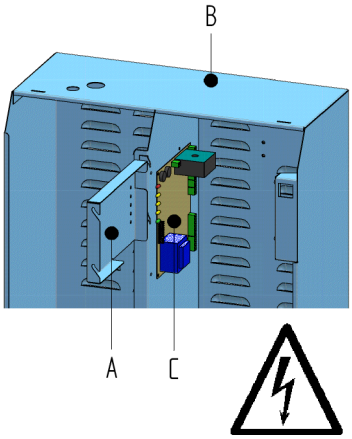
In extreme cases, water pretreatment may be necessary (softening by dilution to approx. 4 - 8 °dH; decarbonization/partial desalination to achieve target reductions in carbonate hardness). HygroMatik would be pleased to refer you to companies specializing in water treatment systems.



9.2 Access Electrical Enclosure

» Remove cover from humidifier (B) and lift display plate (A) of guiding.

» Turn display plate (please see sketch) and hang up display plate by using the „front guiding“.



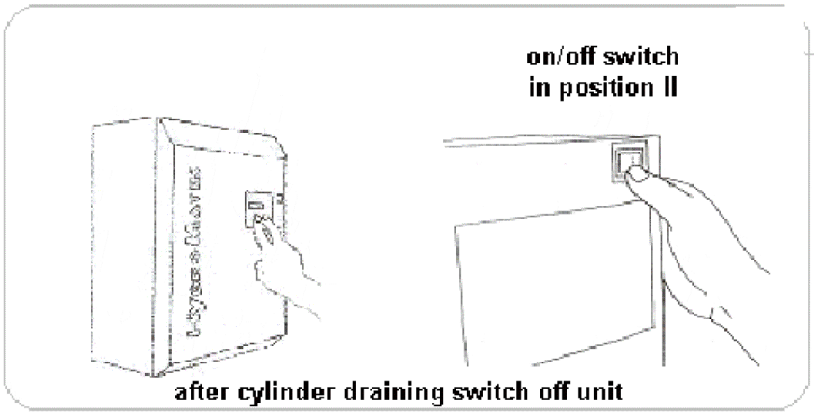
» The basic PCB (C) is now accessable.

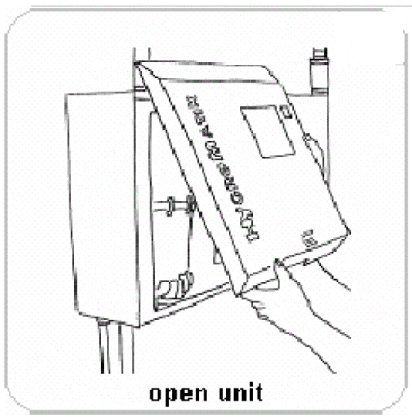
Danger, Hazardous Voltage: Make sure the unit is switched off before installing or removing the display plate.

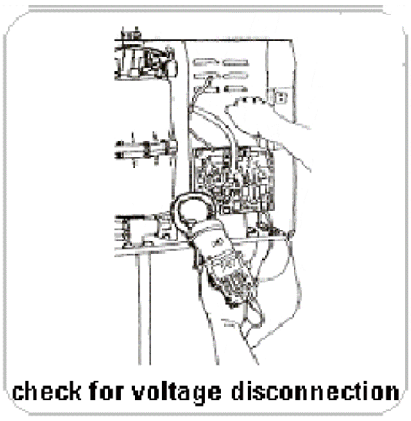
9.3 Removing and Cleaning the Steam Cylinder

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!

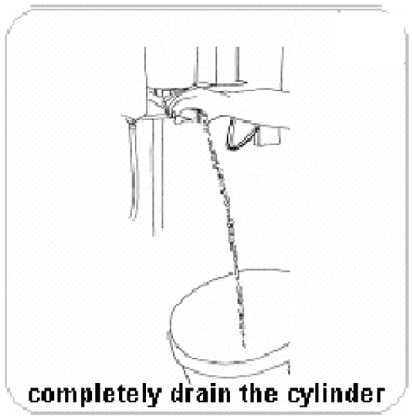
Note: After a longer period of operation the steam cylinder could shrink a little. This doesn‘t matter but could lead to tightness discrepancies when only one half of the cylinder is being exchanged. Therefore we recommend not to change only one half of the cylinder but a complete cylinder.

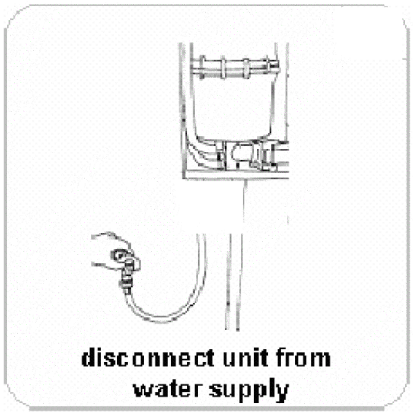


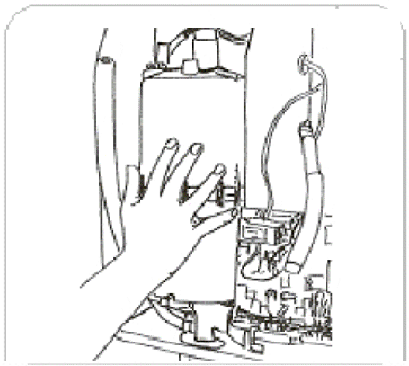


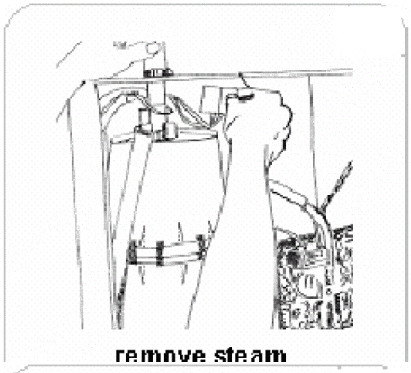

check for voltage disconnection

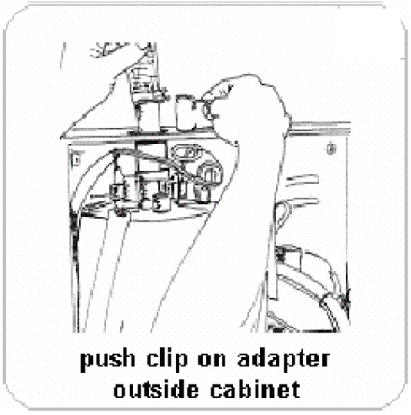

remove stopper

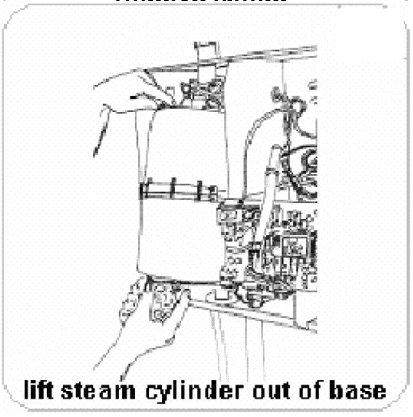

completely drain the cylinder

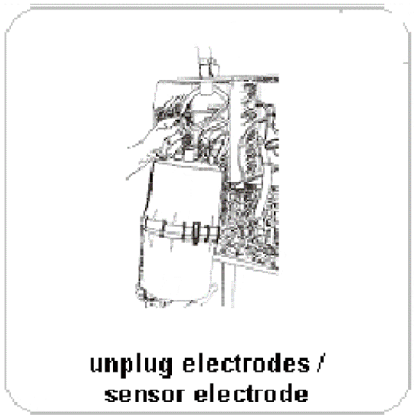

disconnect unit from water supply

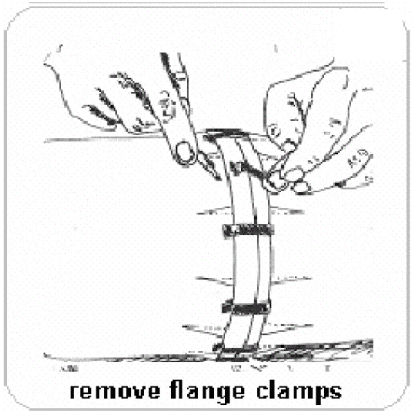


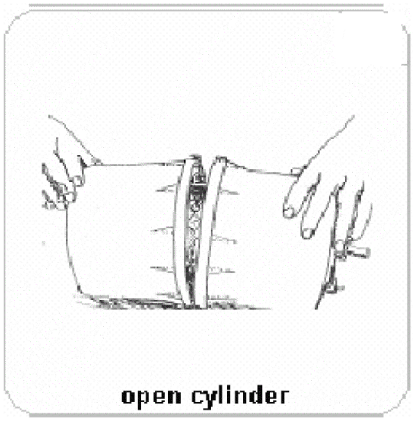

remove steam


push clip on adapter outside cabinet

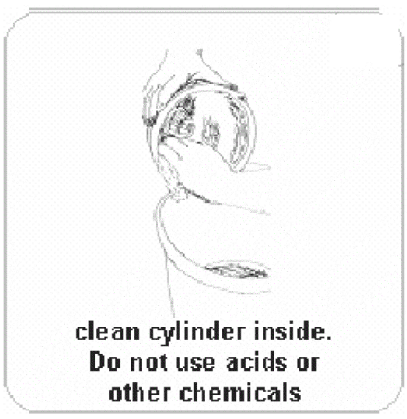

lift steam cylinder out of base

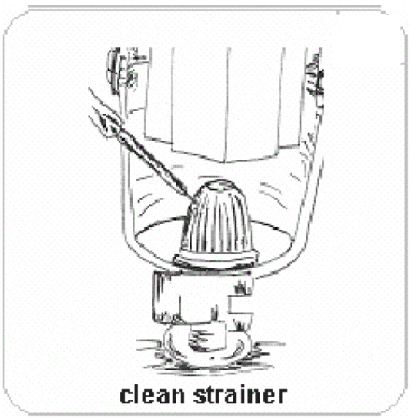

unplug electrodes /
sensor electrode


remove flange clamps


open cylinder


remove used O-ring


clean cylinder inside.
Do not use acids or
other chemicals

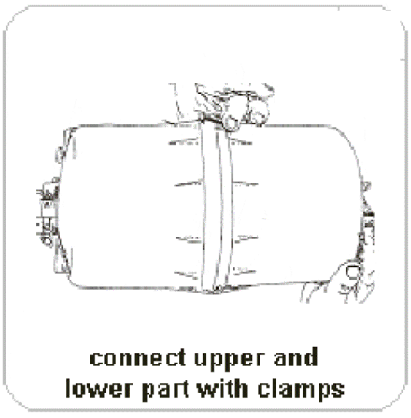

clean strainer

Warning: Check the inside of the top part of steam cylinder for crust build-up and possible salt bridges (black grooves between the electrode leads). If present, wash away completely .

Note: If electrical arcs have burned deep grooves in the material, the top part of the cylinder must be replaced.

Warning: Clean the sensor electrode until it is bright.

insert new O-ring



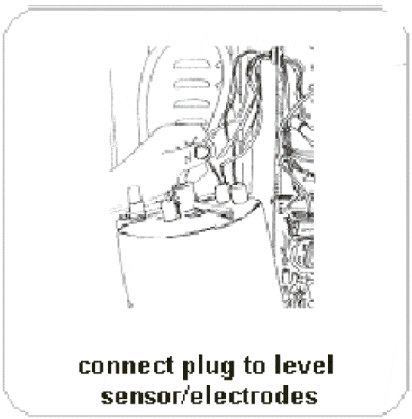
connect upper and lower part with clamps

Note: When putting the cylinder back together, the joints and reinforcements of both sections must fit together snugly.

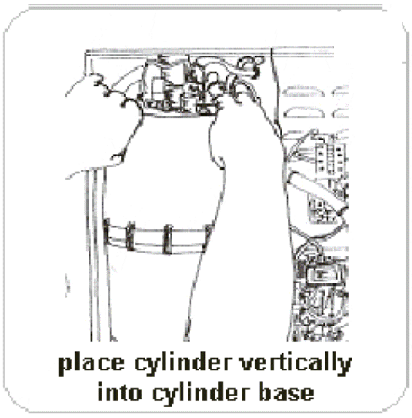
remove used O-ring

insert new O-ring

remove old O-ring
insert new O-ring



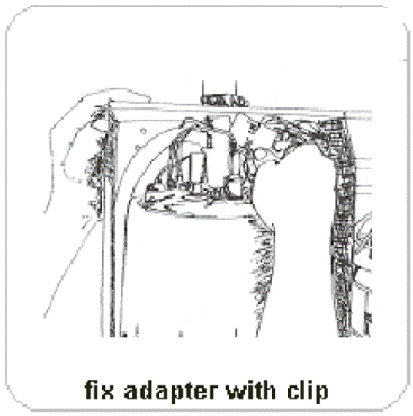
connect plug to level sensor/electrodes

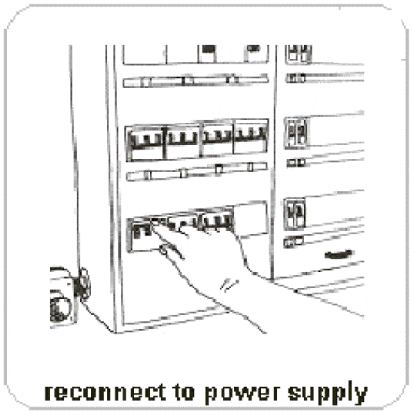


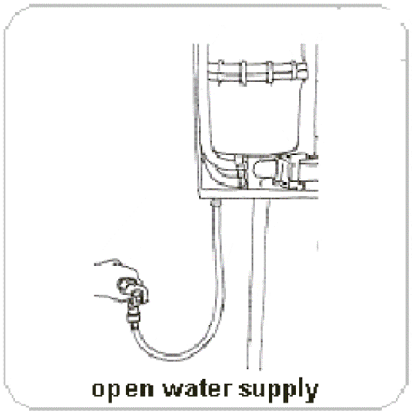
Warning: The plug must be pressed down onto the electrode as far as it will go.

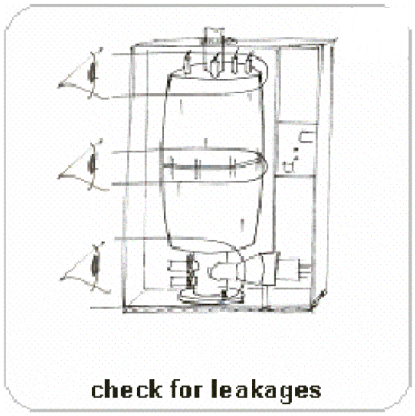
Note: Connect plugs to the correct electrodes. Note the color of the knurled nut.

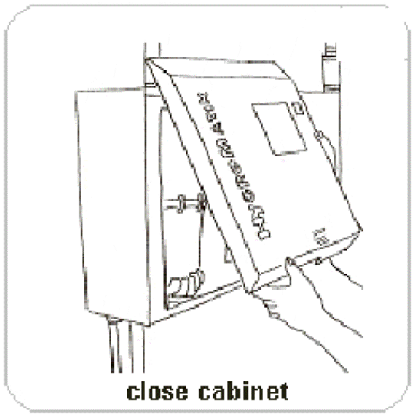
Note: Condensate connection must be showing in the front on the left.











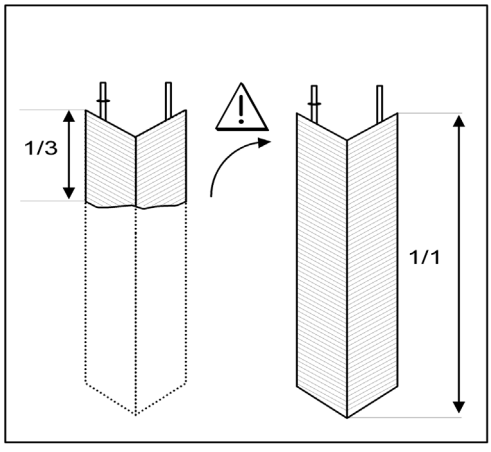
Warning: The unit must be closed and locked. This guarantees that the cover is grounded. (Only with hymidifier type HyLine and MiniSteam)

Switch on the unit and check for leaks after 15-30 minutes of operation.

9.4 Electrode wear

Electrode wear depends on:

- feed water composition and conductivity.
- the quantity of steam produced.



Warning: At the latest, electrodes must be replaced if a maintenance message is displayed. The maintenance message appears after one hour of operation at maximum water level. The humidifier switches itself off. Also see Section "Maintenance." When the electrodes are less than 1/3 to 1/2 of their original length, replace them.

9.4.1 Original Electrode Lengths

Original lengths of HygroMatik large area stainless-steel electrodes are:

HyLine:

Type	HY05-HY08	HY13-HY60	HY90-HY116
Length [mm]	155	235	300

CompactLine:

Type	C6	C10	C17-45	C58
Length [mm]	125	155	235	300

MiniSteam:

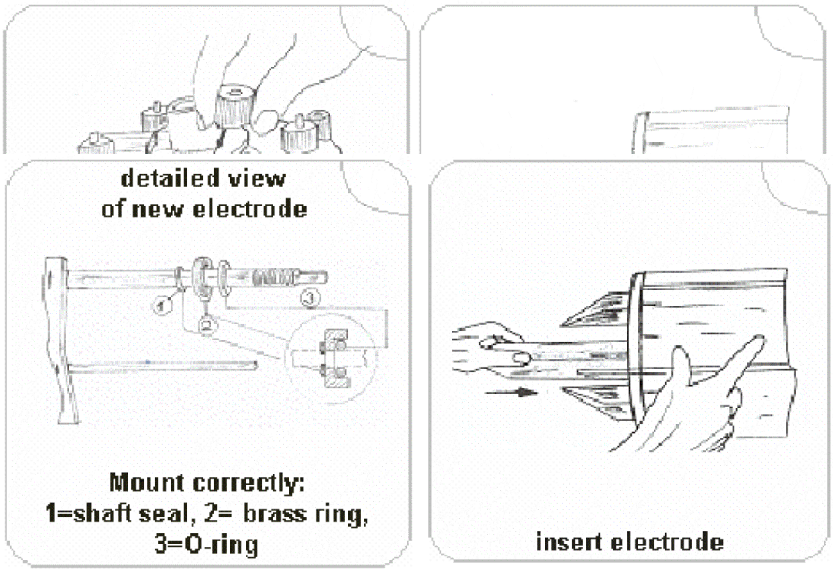
Type	MS5	MS10
Length [mm]	125	155

9.4.2 Uneven Electrode Lengths

In most case, the longer electrode(s) will not be supplied with electricity for a time. Therefore they will not wear. The cause of the problem, such as a tripped circuit breaker, can be repaired. However, since the shorter electrode(s) have a greater specific load, the electrodes continue to wear unevenly.

Note: Replace electrodes with significantly uneven wear. Check the power supply (breaker, voltage drop). Also see electronic operation, Section "Malfunctions."

9.5 Replacing Electrodes



» Remove and open cylinder, as described in Section 8.3 "Removing and Cleaning Steam Cylinder."

» Loosen knurled nuts (5) and remove electrodes (48).

» Install new electrodes and hand tighten the nuts.

Use solvent-free, HygroMatik-quality o-rings (for flange, cylinder base and steam hose adapter).

» Assemble steam cylinder and place it into cylinder

» Connect plugs (4) directly to the electrodes (48) (with gray, red and black knurled nuts). It is not necessary to detach the knurled nuts!

Warning: The plug must be pressed down onto the electrode as far as it will go.

Note: Connect plugs to the correct electrodes. Pay attention to the color of the knurled nut.

» Attach plug (8) to the sensor electrode. (Knurled nut (9) - gray)

» Switch breaker back on.

» Switch on the unit and check for leaks after 15-30 minutes of operation.

If leakage occurs, switch off power supply and follow safety instructions for work on live components.

Note: In the following cases:

- the electrodes must be frequently replaced,
- black slime collects inside the cylinder, or
- there is "lightning" in the cylinder,

the conductivity of the water is too high or it isn't decanted often enough. In this case please contact HygroMatik.

9.6 Cleaning the Blow- Down Pump

» Remove cylinder

» Detach e-cable from the pump.

» Detach adapter (30) from the pump.

» Loosen screws (44) and remove the pump from the base.

» Open the pump (bayonet lock).

» Remove residues from the drain hoses and pump (if neccessary replace o-ring (33) or housing (34) if these components are no longer in excellent condition).

» Reassemble the pump.

» Moisten o-ring (31) and insert in the side connection of the base.

» Push pump into the base and mount tightly with screws (44).

» Moisten o-ring (31) and insert in adapter (30).

» Fit adapter (30) over the side connection of the pump.

» Connect e-cable to the pump.

» Install cylinder.

» Switch on the unit and check for leaks during operation.

If leakage occurs, switch off power supply and follow safety instructions for work on live components.

9.7 Cleaning the Water Inlet Solenoid Valve

Removal

» Shut off water supply and loosen water installation hose connection.

» Remove cylinder please also see chapter „Removing and Cleaning Steam Cylinder“

» Loosen connecting hose (21) from the base.

» Detach e-cable from the solenoid valve.

» Loosen solenoid valve mounting screws (28).

» Remove solenoid valve from the borehole.

» Remove fine mesh filter (29) from the solenoid valve, clean and replace if needed.

Installation

» Insert fine mesh filter (29).

» Place solenoid valve with seal in the borehole of the unit housing.

» Attach solenoid valve tightly with screws (28).

» Screw on water installation hose.

» Connect e-cable to the solenoid valve.

» Attach connecting hose (21) to the base.

» Install cylinder.

» Turn on the tap.

» Switch on the unit and check for leaks during operation.

If leakage occurs, switch off power supply and follow safety instructions for work on live components.

9.8 Checking Cable Connections and Electrode Cables

» Make sure that no cable and plug connections are loose.

Warning: Plugs must be pressed down onto electrodes as far as they will go.

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

» Check electrode plug isolation, replace plugs as needed.

Warning: Replace electrode plugs after removing and reinstalling them several times.

9.9 Checking Operation

Start up the unit and operate for a few minutes at maximum output if possible.

» Check safety devices.

» Check hose connections for possible leaks.

9.10 Dismantling

After you stop using the steam humidifier, dismantle (demolish or scrap) it by following the installation procedures in reverse order.

Warning: Dismantling of the unit is only to be attempted by qualified personnel. Electrical dismantling is only to be attempted by trained professionals.

Note the information provided in Section 2 "Safety Notes," especially the guidelines for disposal.

10. EC-Declaration of Conformity
EG-Konformitätserklärung
EC Declaration of Conformity

Hersteller: **Hygromatik LTA GmbH**
Manufacturer: Hygromatik LTA GmbH

Anschrift: Lise-Meitner-Straße 3
Address: D-24558 Henstedt-Ulzburg / Germany

Produktbezeichnung / *Product description*:
Hy-Line: HY05, HY08, HY13, HY17, HY23, HY30, HY45, HY60, HY90, HY116
C-Line: C06, C10, C17, C22, C30, C45, C58
MiniSteam: MS05, MS10

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:

89/336/EWG Richtlinie des Rates zur Angleichung der Rechtsvorschriften der Mitgliedstaaten über die elektromagnetische Verträglichkeit (geändert durch 92/31/EWG, 93/68/EWG und 93/97/EWG).

Council Directive on the approximation of the laws of the Member States relating to electromagnetic compatibility (amended by 92/31/EEC, 93/68/EEC and 93/97/EEC).

73/23/EWG Richtlinie des Rates zur Anleitung der Rechtsvorschriften der Mitgliedstaaten betreffend elektrische Betriebsmittel zur Verwendung innerhalb bestimmter Spannungsgrenzen (geändert durch 93/68/EWG).

Council Directive on the approximation of the laws of the Member States related to electrical equipment designed for use within certain voltage limits (amended by 93/68/EEC).

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: *Reference number:*	**Ausgabedatum:** *Edition:*	**Referenznummer:** *Reference number:*	**Ausgabedatum:** *Edition:*
DIN EN 55022 B	11 / 01	DIN EN 60335-1	07 / 03
DIN EN 61000-4-2	12 / 01	DIN EN 60335-2-98	05 / 04
DIN EN 61000-4-3	11 / 03	DIN EN 50366	11 / 03
EN 61000-4-4	IEC61000-4-4 :1995 + A1 : 2000+ A2 : 2001	DIN EN 60519-1 Geräte/*Units* ab/*from* 480 bis/*to* 690 V	08 / 95
EN 61000-4-5	IEC61000-4-5 :1995 + A1 :2000	DIN EN 60519-2 Geräte/*Units* ab/*from* 480 bis/*to* 690 V	03 / 95
EN 61000-4-6	IEC61000-4-6 :1996 + A1 :2000		

Die Anforderungen des Geräte- und Produktsicherheitsgesetzes GPSG) §4 Abs. 1 bis 3 werden eingehalten. *The requirements of the Appliance and Product Safety Law paragraph 4 clause 1 to 3 are met.*

Henstedt-Ulzburg, den / *the* 01.07.2005

Hygromatik LTA GmbH

Maike Nielsen
General Manager

i.V.
Dirc Menssing
Technical Manager / Quality Manager

Diese Erklärung bescheinigt die Übereinstimmung mit den genannten Richtlinien, ist jedoch keine Zusicherung von Eigenschaften. Die Sicherheitshinweise der mitgelieferten Produktdokumentation sind zu beachten.

11. Spare Parts

*	C6	C10	C17	C22	C30	C45	C58	Article No.	Description
									Steam generation
	1							B-3216067	Steam cylinder CY4 compl. with electrodes and hand nuts *
		1						B-3204031	Steam cylinder CY8 compl. with electrodes and hand nuts *
			1					B-2204101	Steam cylinder CY17 compl. with electrodes and hand nuts *
				1				B-2204151	Steam cylinder CY17 DN40 compl. with 3 electrodes and hand nuts *
					1			B-2204111	Steam cylinder CY17 DN40 compl. with 6 electrodes and hand nuts *
						1		B-2204105	Steam cylinder CY30 compl. with electrodes and hand nuts *
							1	B-2204109	Steam cylinder CY45 compl. with electrodes and hand nuts *
16	1							E-3216043	Top part of steam cylinder CY4 DN20/9, empty
16		1						E-3226005	Top part of steam cylinder CY8 DN25/12, empty
16			1					E-2206068	Top part of steam cylinder CY17 DN25/12, empty
16				1	1			E-2206082	Top part of steam cylinder CY17 DN40/12, empty
16						1		E-2206069	Top part of steam cylinder CY30 DN40/12, empty
16							1	E-2207001	Top part of steam cylinder CY45 DN40/12, empty
19	1							B-3216044	Lower part of steam cylinder compl. with strainer CY4 *
19		1						B-3216007	Lower part of steam cylinder compl. with strainer CY8 *
19			1	1	1			B-2206046	Lower part of steam cylinder compl. with strainer CY17*
19						1		B-2206071	Lower part of steam cylinder compl. with strainer CY30*
19							1	B-2207002	Lower part of steam cylinder compl. with strainer CY45*
17	1							E-3216046	O-ring seal for cylinder flange, transparent cylinder
17		1						E-3216010	O-ring seal for cylinder flange, transparent cylinder
17			1	1	1			E-2206050	O-ring seal for cylinder flange, transparent cylinder
17						1		E-2206051	O-ring seal for cylinder flange, transparent cylinder
17							1	E-2207011	O-ring seal for cylinder flange, transparent cylinder
35	1	1						E-3216011	O-ring seal for cylinder base
35			1	1	1	1	1	E-2204022	O-ring seal for cylinder base
48	1							B-3216061	Electrodes compl. with hand nuts, set=3pc. for CY4
48		1						B-3204019	Electrodes compl. with hand nuts, set=3pc. for CY8
48			1					B-2204081	Electrodes compl. with hand nuts, set=3pc. for CY17
				1				B-2206227	Electrodes compl. with hand nuts, set=3pc. for CY17, CY30 DN40
48					1	1		B-2204083	Electrodes compl. with hand nuts, set=6pc. for CY17, CY30 DN40
48							1	B-2204085	Electrodes compl. with hand nuts, set=6pc. for CY45 DN40
10	1							B-3204037	Sensor electrode compl. with hand nut
10		1						B-3204027	Sensor electrode compl. with hand nut
10			1	1	1	1	1	B-2204075	Sensor electrode compl. with hand nut
4	1	1	1	1	1	1		E-3216025	Plug-in contact with insulating hose for sensor electrode
4	3	3						E-3216024	Plug-in contact with insulating hose for steam generating electrodes

*	C6	C10	C17	C22	C30	C45	C58	Article No.	Description
4			3	3	6	6		E-2206059	Plug-in contact with insulating hose for steam generating electrodes
4							6	E-2207016	Plug-in contact with insulating hose for steam generating electrodes
18	12	12	18	18	18	24	36	E-3216022	Cylinder flange clamp
37	1	1						E-3220000	Cylinder base DN 20/25i/15/12
37			1	1	1	1	1	E-2206086	Cylinder base DN 40/25i/15/12
	1	1	1	1	1	1	1	B-3216023	Mounting set for cylinder base
1	1							E-3221000	Adapter DN20/25 for steam hose DN25
1		1						E-3221002	Adapter for steam hose DN25
1			1					E-2209000	Adapter for steam hose DN25
1				1	1			E-2209004	Adapter for steam hose DN40
1						1		E-2209006	Adapter for steam hose DN40
1							2	E-2209008	Adapter for steam hose DN40
	1							B-3216077	maintenance kit for cylinder**
		1						B-3216079	maintenance kit for cylinder**
			1					B-2207029	maintenance kit for cylinder**
				1				B-2207043	maintenance kit for cylinder**
					1			B-2207031	maintenance kit for cylinder**
						1		B-2207033	maintenance kit for cylinder**
							1	B-2207035	maintenance kit for cylinder**
12	1							E-3216021	Condensate cap DN9
12		1	1	1	1	1	1	E-2204035	Condensate cap DN12
2	1	1	1					E-3221004	Clip for adapter DN25
2				1	1	1	2	E-2209002	Clip for adapter DN40
3				1	1	1	2	E-2209010	O-ring for adapter DN40
3	1							E-3216011	O-ring for adapter DN20/25
3		1	1					E-3221006	O-ring for adapter DN25
3				1	1	1	2	E-2204022	O-ring for adapter DN40
									Water feed
21	0,60	0,60	0,60	0,60	0,60	0,60	1,90	E-2604002	Connecting hose, solenoid valve - cylinder base, per m
25	1							B-2304081	Solenoid valve, servo controlled, straight type, 0,2 - 10bar, 1,2 l/min
25		1						B-2304083	Solenoid valve, servo controlled, straight type, 0,2 - 10bar, 2,5 l/min
25			1	1	1	1	1	B-2304085	Solenoid valve, servo controlled, straight type, 0,2 - 10bar, 3,0 l/min
29	1	1	1	1	1	1	1	E-2304016	fine filter for inlet solenoid valve
56	1	1	1	1	1	1	1	B-2304031	Hose for water connection, 3/4" cap nuts on both sides
	1	1	1	1	1	1	1	E-2305002	Sealing for hose for water connection
38	0,40	0,40	0,60	0,60	0,60	0,60	0,80	E-2604004	Hose for manual water drain
20	1	1	1	1	1	1	1	E-2604062	Stopper, conical, lock for hose E-2604010
									Water drain
	1							B-3401015	Pump-drain-hose-system (Pos. 6, 14, 15, 30, 31)
		1						B-3401017	Pump-drain-hose-system (Pos. 6, 14, 15, 30, 31)
			1	1	1			B-3401019	Pump-drain-hose-system (Pos. 6, 14, 15, 30, 31)
						1		B-3401013	Pump-drain-hose-system (Pos. 6, 14, 15, 30, 31)
							1	B-3401021	Pump-drain-hose-system (Pos. 6, 14, 15, 30, 31)

*	C6	C10	C17	C22	C30	C45	C58	Article No.	Description
31	1	1	1	1	1	1	1	E-3220005	O-ring for pump - cylinder base
31	1	1	1	1	1	1	1	E-3220005	O-ring for pump - adapter
33	1	1	1	1	1	1	1	E-2404024	O-ring for drain pump (cover-motor)
32	1	1	1	1	1	1	1	B-2404027	Drain pump without mounting set
	1	1	1	1	1	1	1	B-2424014	Mounting set for drain pump
57	1	1	1	1	1	1	1	E-2420423	Drain hose 1 1/4"
6	1	1	1	1	1	1	1	E-2425004	Elbow with vent pipe
									Electronic universal
	1	1						E-2501005	Main contactor 16A, 230V
			1					E-2501006	Main contactor 24A, 230V
				1	1			E-2505007	Main contactor 40A, 230V
						1	1	E-0505009	Main contactor 63A, 230V
	1	1	1	1	1	1	1	E-2505206	Control fuse 1,6A, 5x20 mm
4	1	1						B-3526019	Connecting cables for electrodes with plug-in contact, set=3pc
4			1					B-2524201	Connecting cables for electrodes with plug-in contact, set=3pc
				1				B-2524249	Connecting cables for electrodes with plug-in contact, set=3pc
4					1			B-2524205	Connecting cables for electrodes with plug-in contact, set=6pc
4						1		B-2524209	Connecting cables for electrodes with plug-in contact, set=6pc
4							1	B-2524213	Connecting cables for electrodes with plug-in contact, set=6pc
	1	1						B-2525051	Connecting cable for sensor electrode with plug-in contact,630mm
			1	1	1	1	1	B-2525055	Connecting cable for sensor electrode with plug-in contact, 1150mm
									Steam generation with electrical supply higher than 500V
			1	1	1			E-2206054	O-ring CY17, silicone, for cylinder flange
						1		E-2206056	O-ring CY30, silicone, for cylinderflange
							1	E-2207014	O-ring CY45, silicone, for cylinderflange
			1	1				B-2208007	Cylinder star CY17/3
					1			B-2208013	Cylinder star CY17/6
						1		B-2208009	Cylinder star CY 30
							1	B-2208011	Cylinder star CY 45
			2,5		5	8		E-9000110	Cable H07V-K2,5 [m]
			3		6	6		E-2206059	Plug-in conatct for electrode 35A
							8	E-9000132	Cable H07V-K6,0 [m]
							6	E-2207016	Plug-in conatct for electrode 63A
									Control, electrical supply higher than 500V
			1		1	1	1	E-2504158	Transformer 690V/230V, 25VA
			1		1	1	1	E-2504168	Transformer 480V-500V/230V
			1		1	1	1	E-2504160	Transformer 600V/230V
			1		1	1	1	E-2504166	Transformer 660V-690V/230V, 130VA
							1	E-2507024	Main contactor 60A, 230V/690V
					1	1		E-2507022	Main contactor 40A, 230V/690V
			1					E-2507018	Main contactor 25A, 230V/690V
			1		1	1	1	E-2590102	Line safety switch, 1 A

*	C6	C10	C17	C22	C30	C45	C58	Article No.	Description
									Control, electrical supply between 416V and 480V
							1	E-2507024	Main contactor 60A, 230V/690V
			1		1	1		E-2507022	Main contactor 40A, 230V/690V
		1	1					E-2507018	Main contactor 25A, 230V/690V
		1	1		1	1	1	E-2504157	Transformer 208V-460V/230V
		1	1		1	1	1	E-2504168	Transformer 480V/230V
									Control, electrical supply below 230V
							1	E-2504092	Main contactor 100 A, 230V
					1	1		E-0505009	Main contactor 63A, 230V
			1					E-2505007	Main contactor 40A, 230V
		1						E-2501006	Main contactor 24A, 230V
						1		B-2524209	Cable for electrode 35A/6mm²
									Basic Control
	1	1	1	1	1	1	1	B-2526201	Basic Mainboard
51	1	1	1	1	1	1	1	E-2502412	Control switch, double pole
	1	1	1	1	1	1	1	B-2120901	Mounting plate (Basic)
									Comfort Control
	1	1	1	1	1	1	1	B-2526201	Basic Mainboard
51	1	1	1	1	1	1	1	E-2502412	Control switch, double pole
	1	1	1	1	1	1	1	B-2120903	Mounting plate (Comfort)
	1	1	1	1	1	1	1	B-2526401	Display (Comfort)
									Comfort Plus Control
	1	1	1	1	1	1	1	B-2526201	Basic Mainboard
51	1	1	1	1	1	1	1	E-2502412	Control switch, double pole
	1	1	1	1	1	1	1	B-2120905	Mounting plate (Comfort Plus)
	1	1	1	1	1	1	1	B-2526403	Display (Comfort Plus)
									DS-Control
	1	1	1	1	1	1	1	B-2526211	DS-Basic Mainboard (PCB)
51	1	1	1	1	1	1	1	E-2502412	Control switch, douple-pole
	1	1	1	1	1	1	1	B-2120903	Mounting plate (Comfort)
	1	1	1	1	1	1	1	B-2120905	Mounting plate (Comfort Plus)
	1	1	1	1	1	1	1	B-2526401	Display (Comfort)
	1	1	1	1	1	1	1	B-2526403	Display (Comfort Plus)
	x	x	x	x	x	x	x	E-0605228	Temperature sensor for steam bath control version V
	x	x	x	x	x	x	x	B-2505207	Holder for temperature sensor incl. mounting set
	x	x	x	x	x	x	x	E-0605232	Temperature Sensor ATF 2 for surface mounting
	x	x	x	x	x	x	x	E-2505206	Fuse for light, fan, essence injector 1.6A, 5x20mm
	x	x	x	x	x	x	x	E-3516020	Fuse for essence injection 2.5A, 2x20mm
	x	x	x	x	x	x	x	E-2504039	Fuse for transformer (E-2504154) 5A, 5x20mm
	x	x	x	x	x	x	x	E-2504154	Transformer 230/24V/130VA

*	C6	C10	C17	C22	C30	C45	C58	Article No.	Description
									Essence Injection
	x	x	x	x	x	x		B-2604091	pump, peristaltic DSP9111; 230V/50Hz; 3l/h
	x	x	x	x	x	x		B-2604083	pump, peristaltic DSP9111; 24V/50Hz; 3l/h
	x	x	x	x	x	x		E-2604072	hose for peristaltic pump DSP9431
	x	x	x	x	x	x		E-2604074	hose for peristaltic pump DSP9111
	x	x	x	x	x	x		E-2604076	hose connector for silicon hoses, 6mm
	x	x	x	x	x	x		E-2604070	hose, silicon, for essence; 6x1,5
	x	x	x	x	x	x		B-2604067	T-piece for essence injection (DN25)
	x	x	x	x	x	x		B-2604069	T-piece for essence injection (DN40)
									Accessories
	x	x	x					E-2604012	Steam hose DN25, per m
				x	x	x	x	E-2604013	Steam hose DN40, per m
	x	x	x	x	x	x	x	E-2604002	Condensate hose DN12, per m
	x	x	x					E-2404004	Steam hose clamp DN25
				x	x	x	x	E-2604016	Steam hose clamp DN40
		x	x	x	x	x	x	E-2304015	Condensate hose clamp
	x	x	x					B-2604026	Steam solenoid valve 0-0,4bar, compl. for steam hose DN 25
				x	x	x	x	B-2604040	Steam solenoid valve 0-0.4bar, compl. for steam hose DN40
	x	x	x					E-2604042	Connectors for steam distribution T-piece DN25, stainless steel
				x	x	x	x	E-2604023	Connectors for steam distribution T-piece DN40, stainless steel
	x	x	x	x	x	x	x	E-2604021	Connectors for condensate T-piece DN12
	÷	1						B-2208005	Cylinder star
			1	1				B-2208007	Cylinder star
					1			B-2208013	Cylinder star
						1		B-2208009	Cylinder star
								B-2208011	Cylinder star
	÷	1						B-2304063	Super flush complete
			1	1	1	1	1	B-2304065	Super flush complete
	x	x	x	x	x	x	x	B-2304031	Water connection hose, flexible, 0.6 m 3/4", with connector
	x	x	x	x	x	x	x	B-3320406	Filling cup complete

If you order any spare parts, please specify type and serial number of the unit.

* see Exploded View

** If the Super Flush System is installed, consider to order also a new nozzle (B-2304079), please.

*** Maintenance kit contains: Electrodes without hand nuts, O-ring for adapter, O-ring seal for cylinder base, O-ring seal for cylinder flange, Cylinder flange clamps

12. Fax Form - Order for spare parts

HYGROMATIK
We humidify the air.

Lise-Meitner-Str. 3
24558 Henstedt-Ulzburg
Tel. +4904193/895-0

Fax Form

Please copy, fill in and fax to

Fax.No. **+49(0)4193/895-33**

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.

13. Technical Data

Technical Data Steam Humidifiers CompactLine C6-C58							
Type	**C6**	**C10**	**C17**	**C22**	**C30**	**C45**	**C58**
Steam Output [kg/h]	6,0	10,0	17,0	22	30,0	45,0	58,0
Electrical Supply*	400V/3/N 50-60 Hz						
Electrical Power [kW]	4,5	7,5	12,8	16,5	22,5	33,8	43,5
Current [A]	6,5	10,8	18,4	23,8	32,5	48,8	62,8
Fuse [A]****	3x10	3x16	3x20	3x35	3x35	3x63	3x63
Control Type	Basic, Comfort, Comfort Plus						
Control Voltage	230V						
Steam Hose Connection [mm]	1x25	1x25	1x25	1x40	1x40	1x40**	2x40
Condensate Hose Connection[mm]	1x12	1x12	1x12	1x12	1x12	1x12***	2x12
Empty Weight [kg]	10	12	19	19	20	22	31
Operational Weight [kg]	13	18	37	37	38	49	77
Dimensions Height [mm]	438	480	652	652	652	706	789
Width [mm]	370	406	472	472	472	519	608
Depth [mm]	187	216	282	282	282	326	391
Water Supply	100 x 10^3 til 100 x 10^4 Pascal, for ¾" external thread						
Fan Unit, wallmounted	VG08	VG17	VG17		VG30	2 x VG30	2 x VG30
Air Circulation of Fan Unit [m³/h]	160	185	185		350	2 x 350	2 x 350

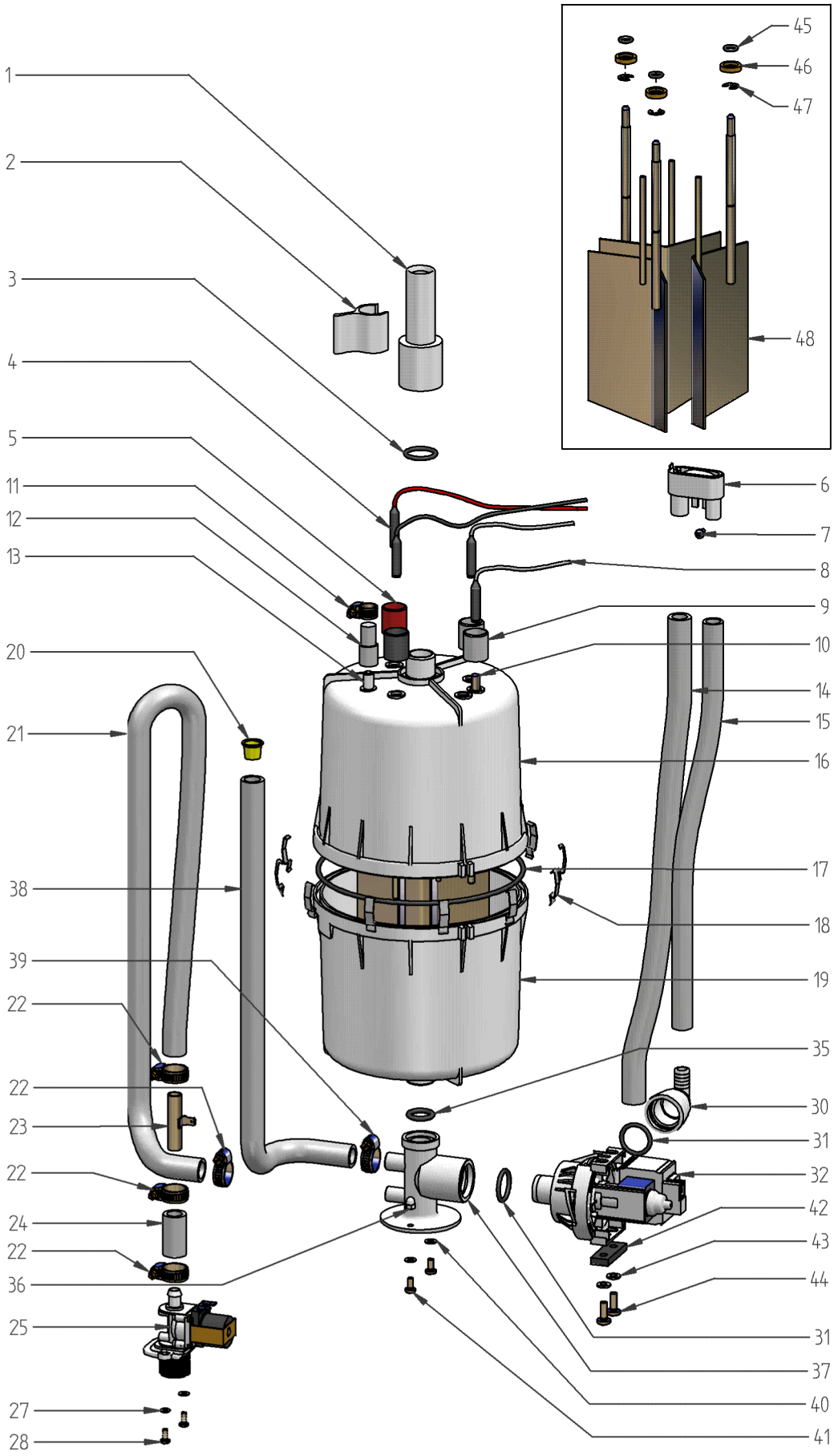
**** Times 1.3 power input after Full Blow Down. If expulsion fuses are used close to their specific limit we recommend to choose expulsion fuses with a higher range.

*** The delivery includes T-pieces to condensate return of two manifolds.

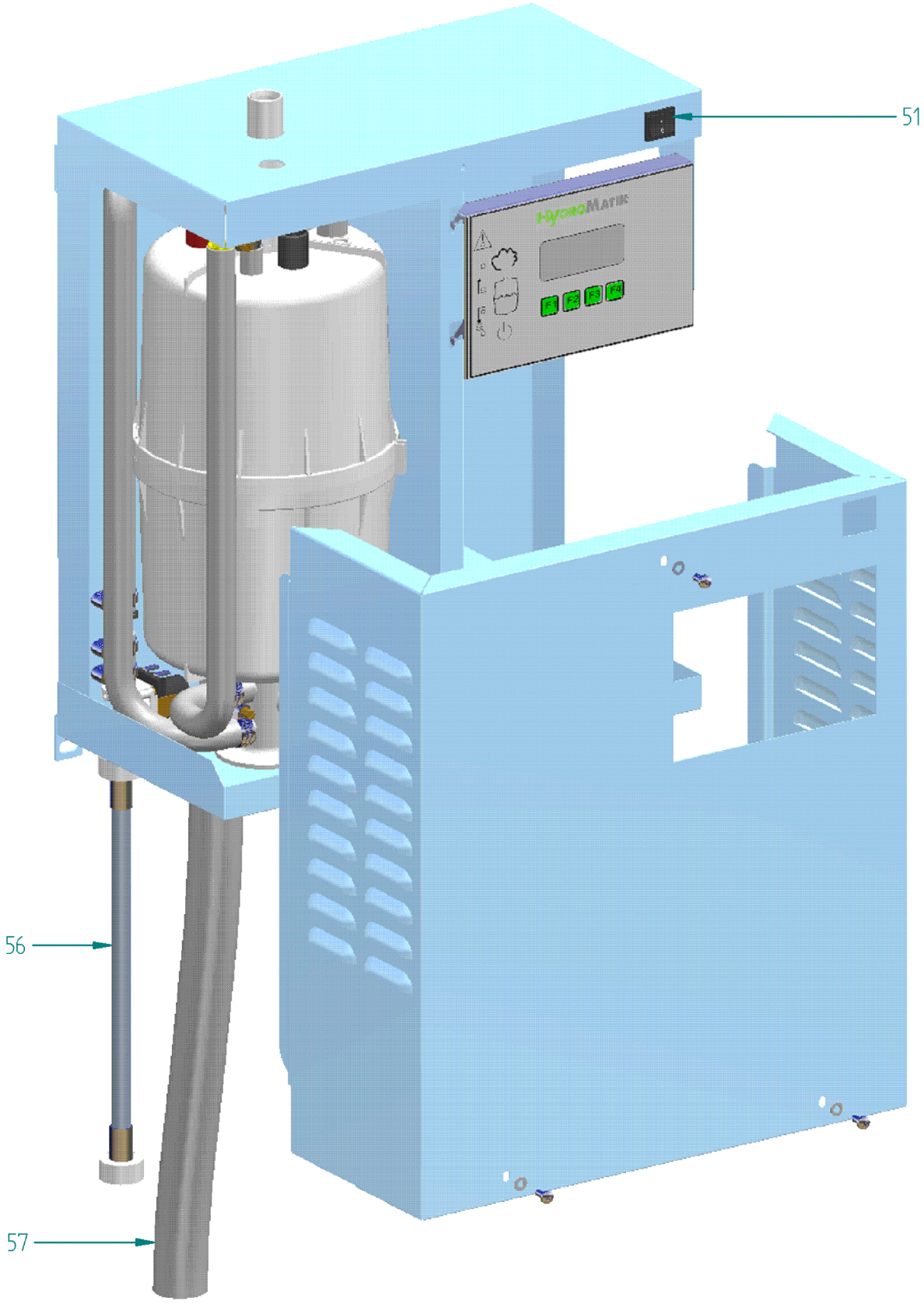
** The delivery includes required T-pieces for connection of two manifolds.

* Other voltages on request.

14. Exploded View



15. View of housing



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