

DemiLine

**Electric Heater Steam Humidifier
For Fully Demineralized Water**



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DemiLine July 2006

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



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!

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1. Introduction

Dear Customer,

Thank you for choosing a HygroMatik steam humidifier.

HygroMatik steam humidifiers represent the latest in humidification technology.

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

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

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

If you have additional questions, please contact us:

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

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

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

e-mail: 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 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 tap water or partial softened water (valid for all HYGROMATIK humidifiers types except DemiLine) or fully demineralized water / condensate water (only for humidifier type HeaterLine and DemiLine).



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.

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 from rough or careless loading and unloading.

3.2 Transport Size and Weight

Type*	Height [cm]	depth [cm]	width [cm]	weight [kg]
DemiLine 6	71	33	52	25
DemiLine 9	81	41	63	25
DemiLine 12	81	41	63	25
DemiLine 18	81	41	63	26
DemiLine 27	81	41	63	27

* Dimensions and weights 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	immediately

* Subject to change without prior notice.

3.6 Included in the Delivery

The delivery includes:

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

4. Operation and Installation

4.1 Mode of Action

The Immersion Heater Principle

One to three heater elements (8) are placed in a closed cylinder and connected to alternating current. The cylinder (9) is filled with fully demineralized water. Heat generated by the heater elements 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.

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

4.2 Installation and Method of Operation

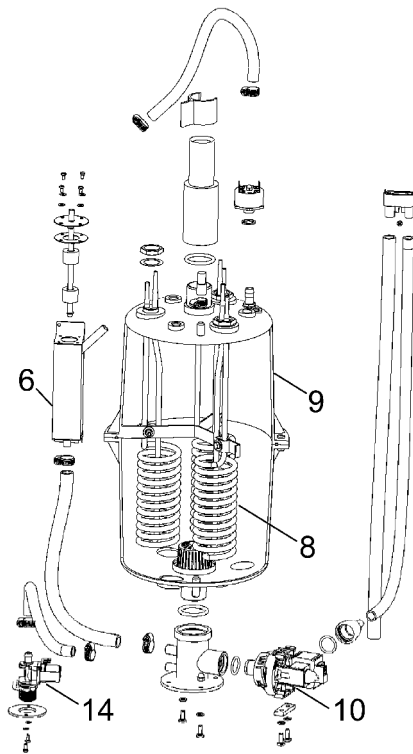
When the hygostat or controller signals a demand for humidification, the inlet solenoid valve (14) opens. The solenoid valve is designed for pressures from 100×10^3 to 100×10^4 Pascals (1 to 10 bar).

Water is fed into the cylinder (9).

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

The cylinder water level is controlled by a level control (6). The level control consists of a stainless steel cylinder with two float switches and three reed contacts. The float switches indicate the water level in the steam cylinder: "Dry Run", "Humidification" and "Max. Level". The control capsule is pressure-equalized.

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



Position	Description
6	Level control
8	Heater element
9	Steam cylinder
10	Waste water pump
14	Water solenoid valve

For more information, also see section “Exploded View.”

The steam cylinder consists of two flanged plastic halves bolted together with stainless steel nuts and bolts and sealed with an o-ring. Up to 3 heaters are installed in the top half. The cylinder can be opened easily for inspection. Any necessary replacement of heaters or temperature cut-outs can be done easily.

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”).

Although fully demineralised water contains only traces of residual minerals, operating experience has shown periodic full blow-down of the cylinder contents increases the time interval between cylinder inspections and lengthens the life cycle of heater elements. A heavy-duty waste water pump (10) is therefore used periodically to flush out any accumulated residual non-volatile matter.

Steam production is interrupted only for a few minutes.

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.

4.3 Internal Output Setting

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

5. Installation



Warning: Installation of this unit to be 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

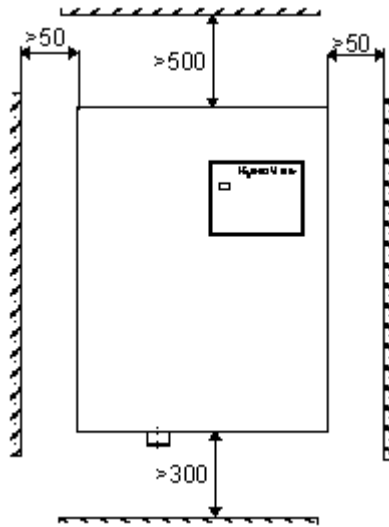


Note: When selecting the installation site for the steam humidifier, note that:

- 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

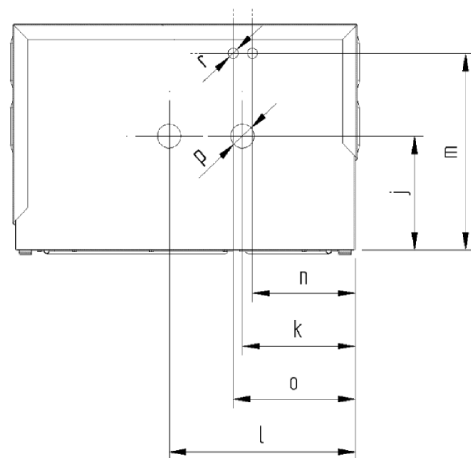
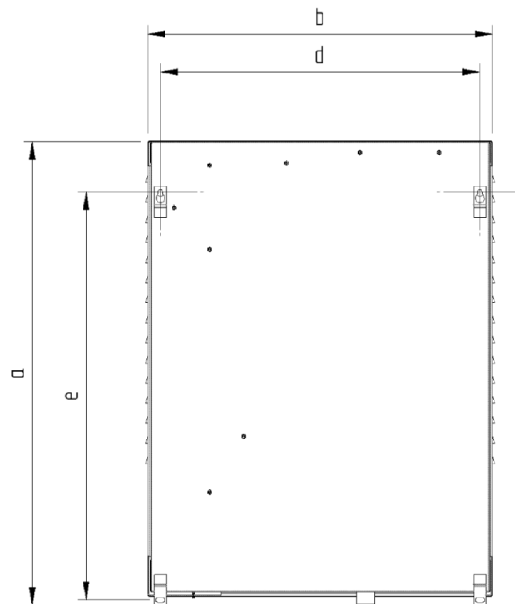
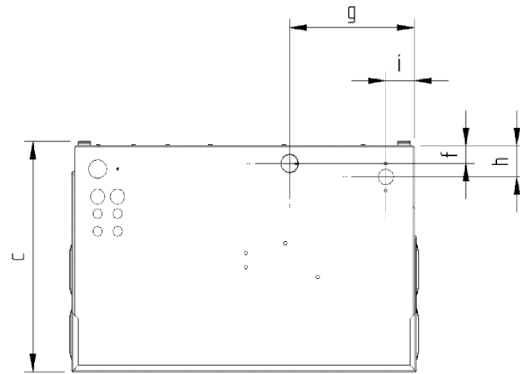
Clearances



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 DemiLine

	DemiLine
a	707
b	519
c	327
d	482
e	650
f	30
g	250
h	60
i	50
j	175
k	158
l	-
m	256
n	111
o	-
p	42
q	18



5.2 Fan Unit (option)

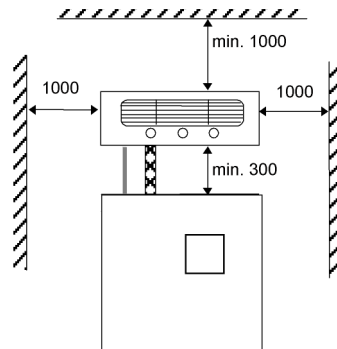


Note: The fan unit should be positioned to avoid drafts. A minimum height of 2 m is generally sufficient.

- Install the fan unit directly on a wall.

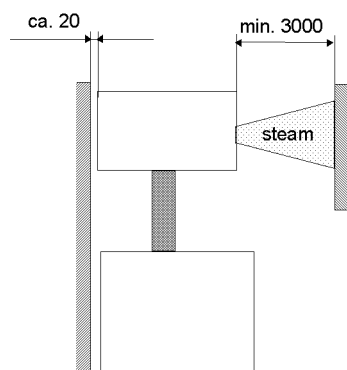
Type	Fan Unit
DemiLine 6	VG 08
DemiLine 9-12	VG 17
DemiLine 18-27	VG 30

- 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	[mmφ]	25	25	40
Condensate Outlet	[mmφ]	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

5.3 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).

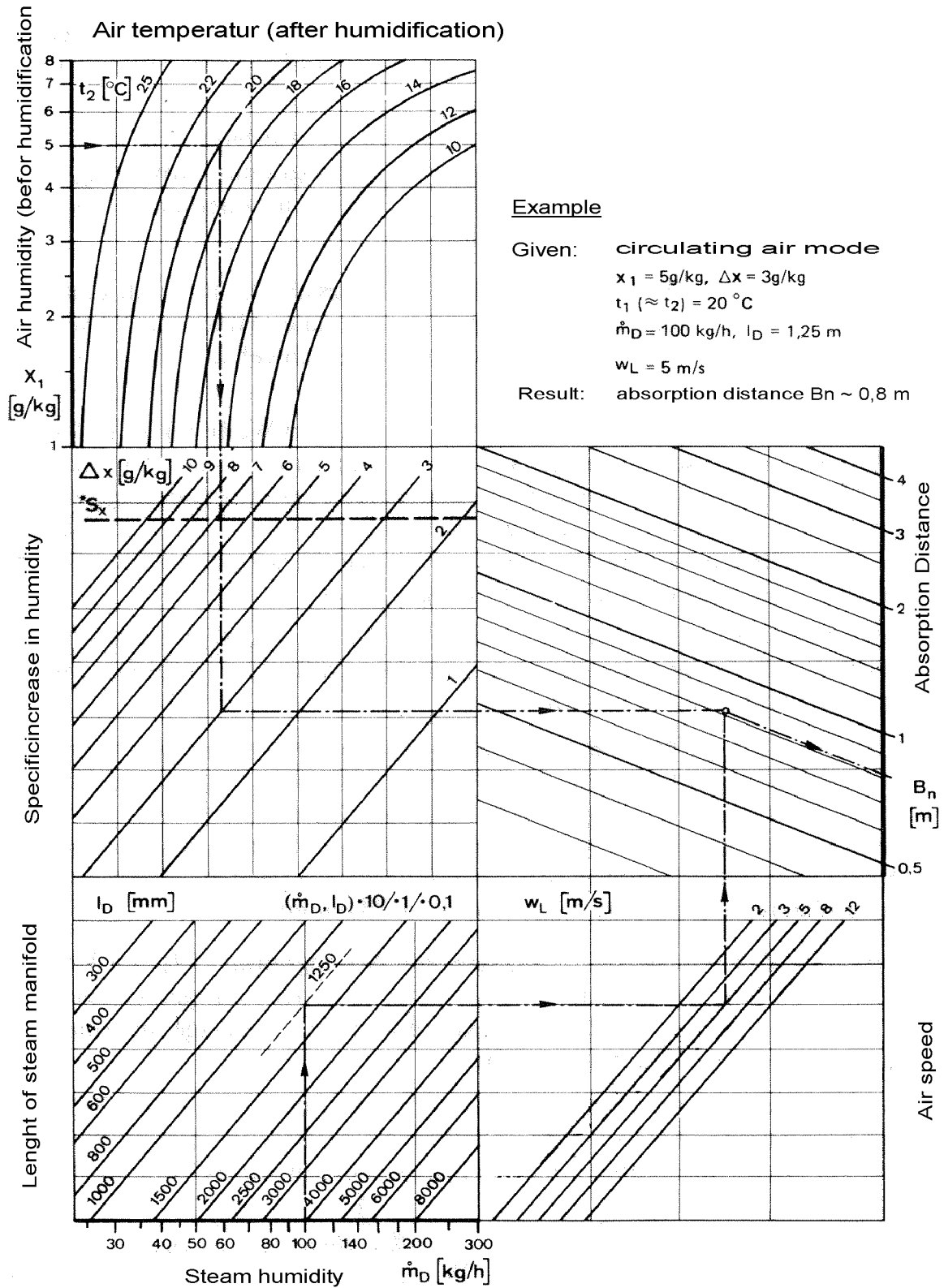
Method:

Graphically determine absorption distance B_N using the absorption distance nomogram (also see Section „Absorption Distance Nomogramm“ 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 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]

5.3.2 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	Condensate 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
C22, C30	1x40	DN40	DN12
C45**	2x40	DN40	DN12
C58	2x40	2xDN40	2xDN12

DemiLine:

Type	Steam Manifold	Steam Hose	Condensate Hose
DL6-12*	1x25	DN25	DN12
DL18-27	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
HL 60-90 ****	2x(2x40)	2x(1xDN40)	2x(1xDN12)

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

* For units HL 6 - 12 and DL6-12 HygroMatik delivers one adapter DN40 / 25.

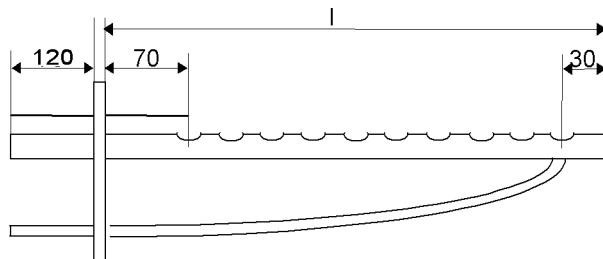
** For units HL 30 - 45 HygroMatik delivers one t-connector for separating the steam on two steam manifold.

*** Special length on request.

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



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

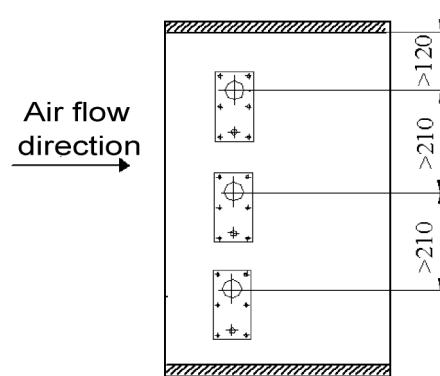
Placement of the steam manifold on the supply side of the air duct is preferred.

- 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.

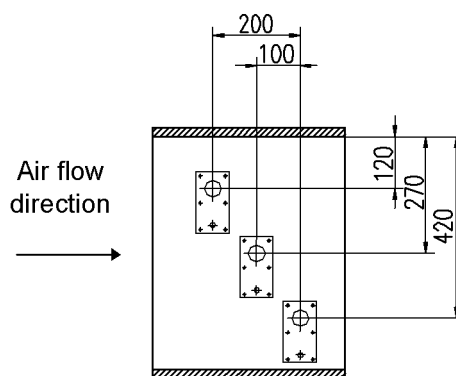
When installing the steam manifold, please note the following:

- 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.

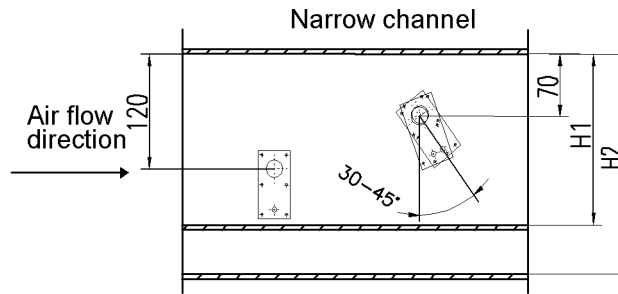


- Position the steam manifold to ensure uniform steam distribution in the air duct.
- Install the steam manifold horizontal with it ensure a clean steam out.

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.

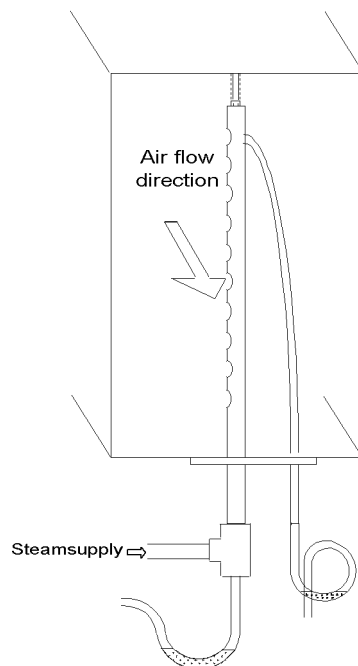


- By tilting the steam manifold 30 - 45° towards the air flow direction, the minimum upper clearance can be reduced to 70 mm.



	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



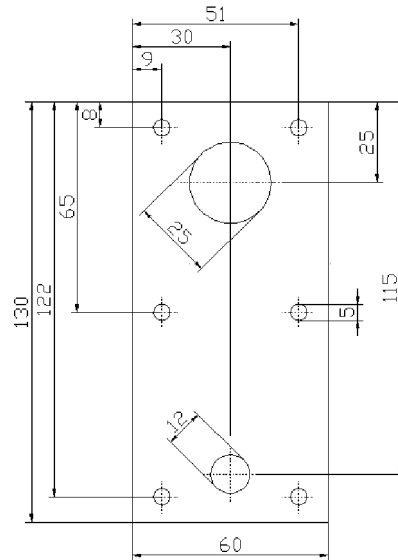
Note: When installing the steam hose, please pay attention to the following:

- 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: $R_{min} = 200 \text{ mm}$
Steam hose DN 40: $R_{min} = 400 \text{ mm}$

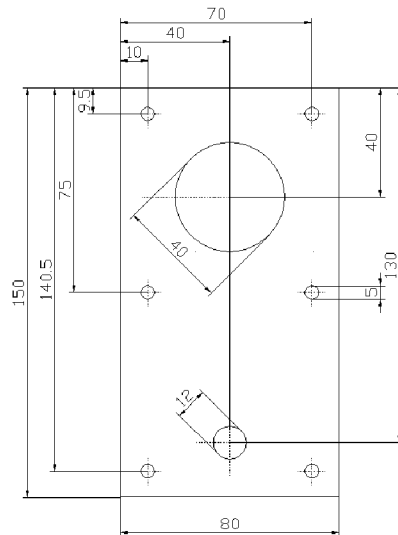
5.6 Cover Plate

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

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



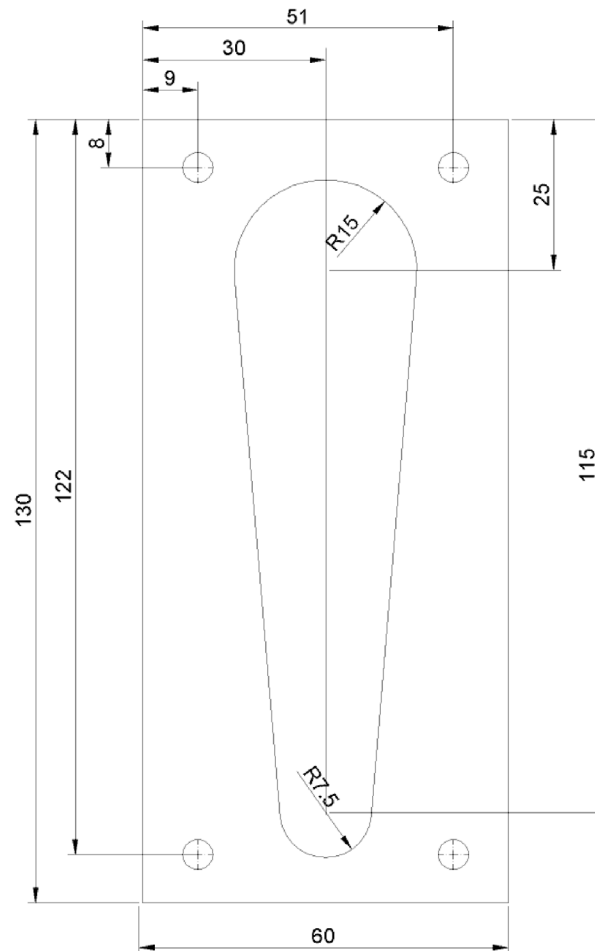
flange plate DN25 E-2604260



flange plate DN40 E-2604410

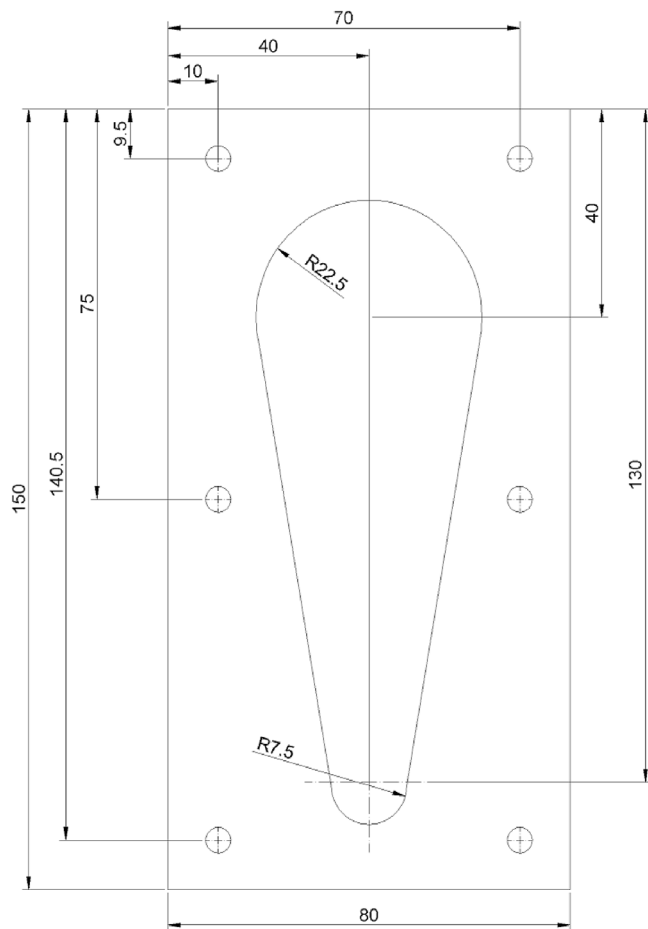
5.7 Drill Pattern

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 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:

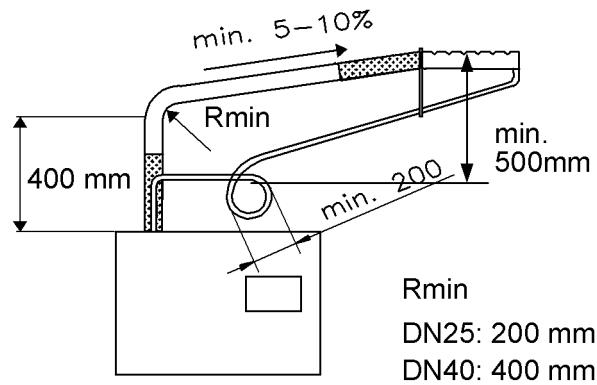
- » The condensate must be drained separately.
- » To prevent steam loss, lay a loop at least 200 mm in diameter.
- » To ensure condensate drainage, place the loop (vapor trap) as far away as possible below the steam manifold connection.
- » The condensate connection on the steam cylinder must be closed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

5.9 Types of Installation

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

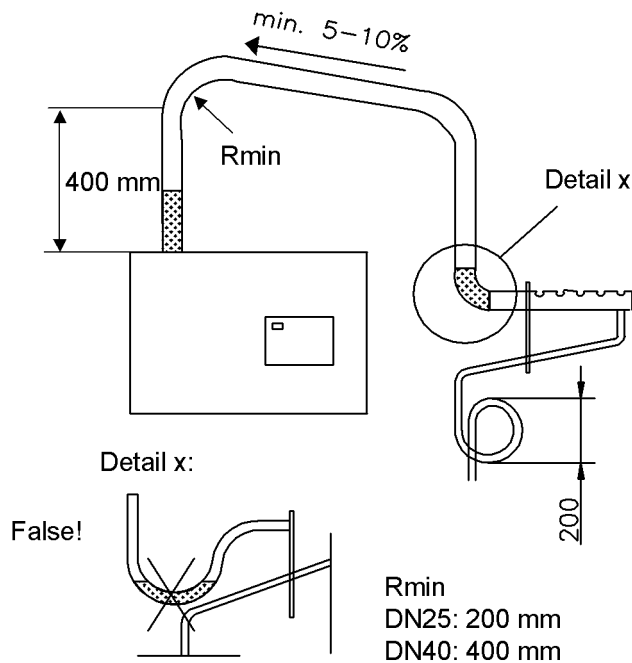
- » Lay the steam hose at a height of at least 400 mm above unit and then connect to the steam manifold with a constant rise or fall.
- » Lay condensate hose with a slope to the steam cylinder.

- » 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.

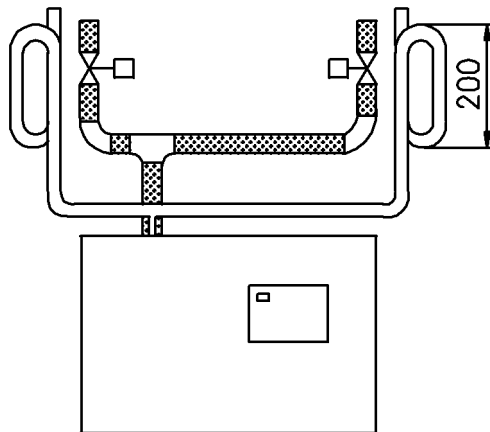


- » Lay the loop of condensate hose 200 mm directly above the drain. Detail x

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 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

5.11 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: For installation, note the following:

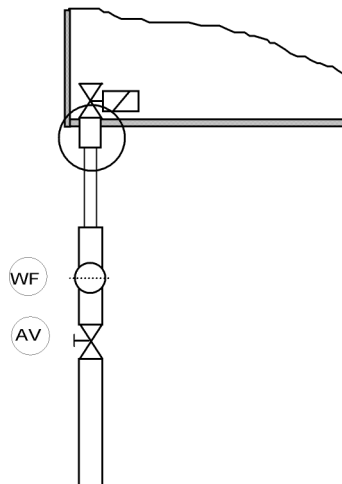
- Have all work performed by a professional.
- Disconnect power supply prior to installation.
- Obey regulations of local public utilities.
- Install a backflow preventer.
- The water supply temperature may not exceed 60 °C.
- Flushed-out water must be able to drain freely.
- The water supply line must have a minimum diameter of DN 12 (3/8").
- If (chemical) additives are present in the humidification water, health risks and/or impaired unit operation cannot be ruled out. Use of additives is not advised unless specifically recommended by the unit manufacturer.
- When employing demineralized water or purified condensate, do not use copper or brass in the supply or drain lines of the HeaterLine unit. These materials can be corroded by demineralized water or purified condensate. Instead, use stainless steel or temperature-resistant plastic pipes.
- Water installation pressure: 100×10^3 bis 100×10^4 Pascal (1 bis 10 bar).

6.1 Water Quality

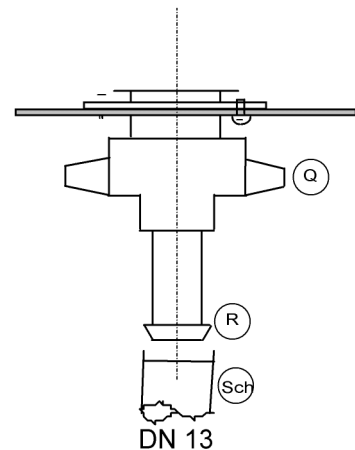
The DemiLine Type steam humidifier is designed for use with:

- fully demineralized water / cleaned condensate

6.2 Water Supply



water supply (with
backflow preventer)
1-10 bar



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



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

Install as follows:

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

The supply connection protrudes from the intermediate tray.

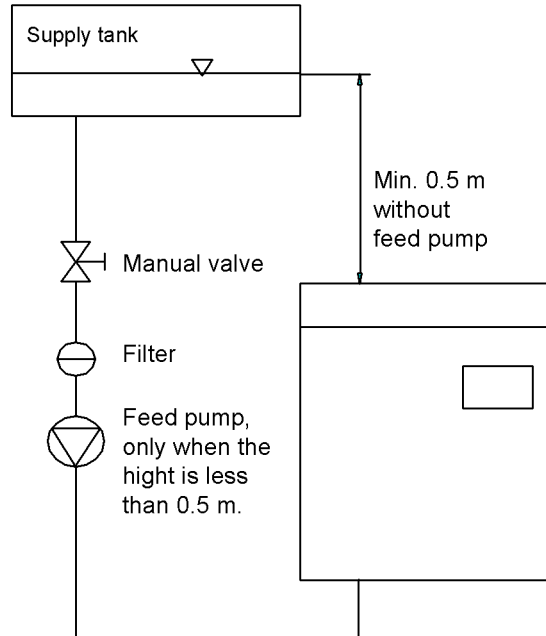


Note: Excessive tightening will damage the threads.

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

6.2.1 Feed from Holding Tank

If a holding tank will be used to supply water, make sure that the feed height is at least 1 meter. If the height is less than 1 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.

DemiLine	Max. Water Consumption in 24 h [l]
6	166
9	248
12	331
18	497
27	754

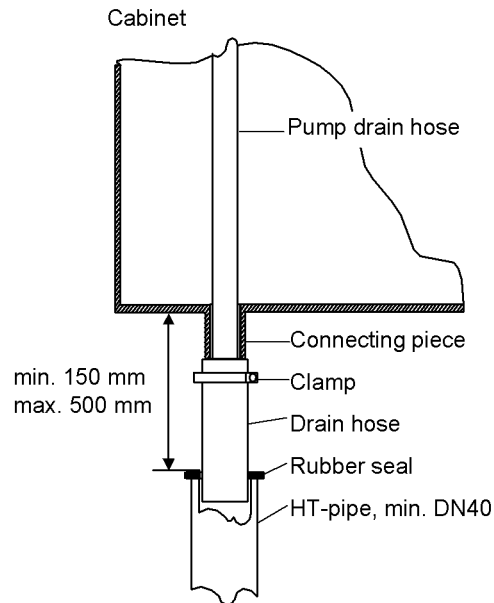
6.4 Water Discharge



Warning: Water must drain freely! We recommend installation of a drain hose for proper drainage.

Please note:

- Do not bend, shorten or lengthen the drain hose.
- For the discharge line and drain pipe, select materials temperature-resistant up to 95°C.



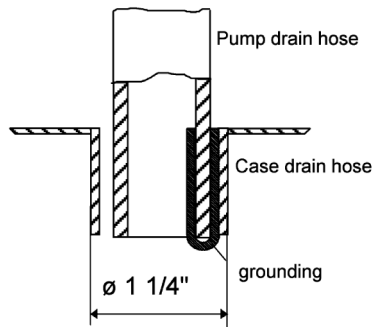
Install the water drain system as follows:

- Run 150 - 300 mm length of 1 1/4" drain hose loosely into a drainpipe with a minimum inner diameter of 40 mm.

Type	Drain Hose
DemiLine 6-27	1 x 1 1/4"

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

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



6.5 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 may 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, note the following:

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

7.1 Electrical Installation

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

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

» Install main power supply as follows:

Type	Main Power Supply
HL6-45	400V/3Phases/N
DL6-26	400V/3Phases/N

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 Consumption	Fuses
HL6	11,3	3x16 A
HL9	16,9	3x20 A
HL12	19,5	3x25 A
HL 8	29,3	3x35 A
HL24	39,0	3x50 A
HL30	39,0	3x50 A
HL36	58,5	3x63 A
HL45	58,5	3x63 A
HL60	2 x 39,0	2 x (3x63) A
HL70	2 x 58,5	2 x (3x63) A
HL80	2 x 58,5	2 x (3x63) A
HL90	2 x 58,5	2 x (3x63) A

Type	Power Consumption	Fuses
DL6	11,3	3x16 A
DL9	16,9	3x20 A
DL12	19,5	3x25 A
DL18	29,3	3x35 A
DL27	29,3	3x35 A

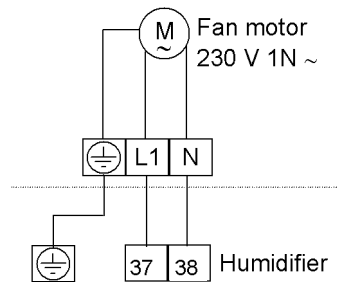
7.2 Control Connection



Warning: Set the control to prevent overly frequent activation and deactivation of the steam humidifier. Main contactors are wearing parts and are guaranteed by the manufacturer for 150,000 cycles. Operation which minimizes activation cycles will extend the life of the main contactors.

7.3 Fan Unit

» Connect fan unit as specified in the wiring diagram.



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



Note: Terminals 37 und 38 are supplied with the unit only when the fan unit and humidifier are purchased simultaneously. In other cases (i.e. retrofitting) the fan unit motor phase can be connected to Terminal 2 guided via the auxiliary contact of the main contactor.

Only cables with same diameter are allowed to be connected to one common clamp.

7.4 Safety Interlock



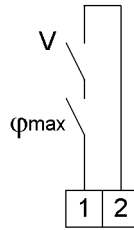
Note: Install contact interlocks, i.e. max. hygrostat, vane relay, pressure controller, air interlock etc. in series between Terminals 1 and 2.



Warning: It is standard practice to install a max. hygrostat in the safety interlock. 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.



Terminals Humidifier

7.5 Wiring Diagram

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

7.6 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.



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



Note: For initial operation, control, service, malfunctions, and circuit diagrams, consult the operation instructions for the Hygromatik-controls or at www.hygromatik.de.

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.

Check of electrical wire connections

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

Switching on Steam Humidifier

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

- Have the unit serviced only by qualified, authorized personnel.
- Obey safety regulations.
- Switch off the unit prior to maintenance and secure against restart.
- After maintenance work, have qualified personnel check that the unit is operating safely.

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

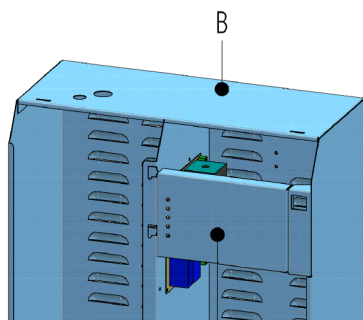
- a **green, blinking LED** on the display and operating panel.

9.1 Maintenance for Operation with Demineralized Water / Condensate

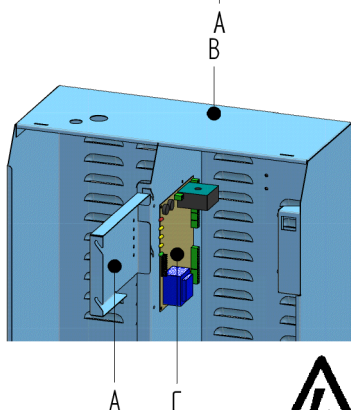
Instructions for maintenance and cleaning intervals are based exclusively on typical, empirically determined values.

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.

9.2 Access to Control Unit



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



- » The PCB (C) is now accessible.



Danger, Hazardous Voltage: Switch off unit before installing or removing the display plate.

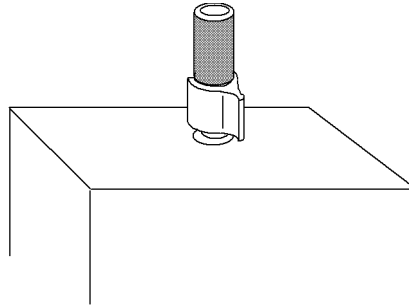
9.3 Cleaning Steam Cylinder

Removal

- » Close off water supply.
- » Drain steam cylinder (9) by setting main switch to Pos II.
- » Disconnect power supply and secure against restart (switch off control switch, remove main fuse and control fuse F1).
- » Verify absence of electric current.
- » Remove connector plug for steam cylinder lead.
- » Remove power supply cables from the temperature cut-outs.
- » Disconnect connection hoses to water level control.
- » Remove clip (2) between adapter and cabinet.
- » Push steam hose adapter upwards. (Steam hoses shorter than 0,5 m should be remove before.)
- »



- » **Note:** Push clip on to steam hose adapter on top of cabinet to prevent adapter from sliding back.



- » Lift steam cylinder (5+9) out of the base (11) and adapter (2) and remove from humidifier.
- » »Remove all cylinder bolts and open the cylinder (7).

Cleaning



Note: When cleaning do not use acids or other chemicals!

- » Remove all scale and sludge from cylinder. Small amounts of scale on the heaters are acceptable.

Reassembly

- » Replace the flange o-ring.



Note: When joining the cylinder the upper and lower parts must have a firm fit.

- » Connect upper and lower parts with bolts.
- » Remove o-ring from the lower part of the cylinder.
- » Insert a new moistened HYGROMATIK o-ring into the cylinder base.
- » Remove o-ring from the upper part of the cylinder.
- » Insert a new o-ring into adapter
- » Refit cylinder into adapter.
- » Connection for the condensate hose must be positioned at the front on the left side.

- » Position cylinder vertically and then settle firmly into cylinder base.
- » Push adapter downwards onto the steam outlet.
- » Fix adapter with clip.
- » Connect the steam and condensate hoses as well as the connection hoses to the water level control.
- » Connect the connector plug for steam cylinder lead.
- » Push in safety fuse.
- » Switch on the unit and operate for 15 to 30 minutes. Check for any leaks.

In case of any leakages disconnect steam humidifier from power supply and pay attention to safety instructions about work with voltage electrical units.

9.4 Replacing Heater Elements

Removal

- » Close off water supply.
- » Drain steam cylinder by setting main switch to Pos II.
- » Disconnect power supply and secure against restart (switch off control switch, remove main fuse and control fuse F1).
- » Verify absence of electric current.
- » Remove and open steam cylinder as described above in section "Cleaning Steam Cylinder."
- » Detach connecting cable for heater element.
- » If necessary, remove the capillary tube from the thermal cut out by detaching the retainer clips.
- » Remove heater element.
- » Clean the sealing surface on the underside of the cover around the area where the new heater element will be installed.

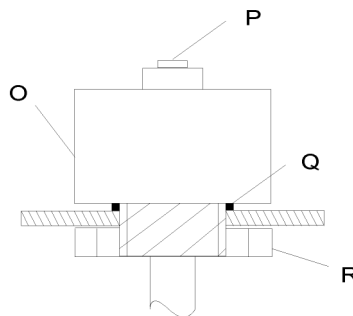
Installation

- » Install new heater element, replacing the parts in the correct sequence according to the diagram.
- » Connect the wires for the heater element. Polarity of (heater element) connecting cable is not important.
- » If necessary: Install capillary tube on the thermo sensor using retainer clips.
- » To proceed further, follow the steps described above in section "Cleaning Steam Cylinder".

9.5 Replacing Thermo Sensor (for Heater Element)

Removal

- » Close off water supply.
- » Drain steam cylinder by setting main switch to Pos II.
- » Disconnect power supply and secure against restart (switch off control switch, remove main fuse and control fuse F1).
- » Verify absence of electric current.
- » Remove and open steam cylinder as described above in section "Cleaning Steam Cylinder."
- » Remove thermo sensor cap.
- » Loosen thermo sensor screw terminals and detach wires.
- » Loosen clips of capillary tube.
- » Disconnect capillary tube from the heater elements.
- » Remove locking nut (R) of thermo sensor (O)
- » Remove thermo sensor.



O: Thermo Sensor

P: Unlocking Button for Thermo Sensor

Q: Seal

R: Mounting Counternut

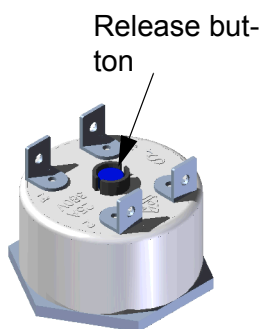


Warning: Do not bend the capillary tube of the thermo sensor!

Installation

- » Install thermo sensor. Do not screw the nut in 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 "Cleaning Steam Cylinder".

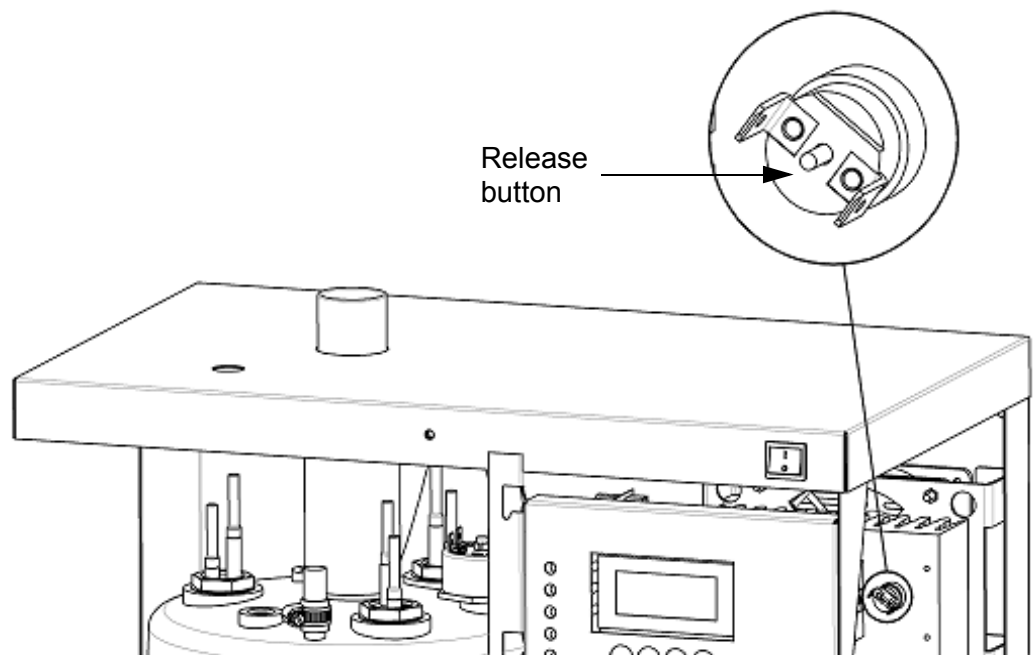
9.6 Unlocking of a Released Thermo Sensor (for heater element)



If a thermo sensor (for heater element) has released due to a too high temperature the blue button (P) is on the same level as the top of its holder. Additionally the control reports a failure „thermo sensor activated“. After the system has cooled down the release button (P) can be unlocked by pressing it down a few millimetres.

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

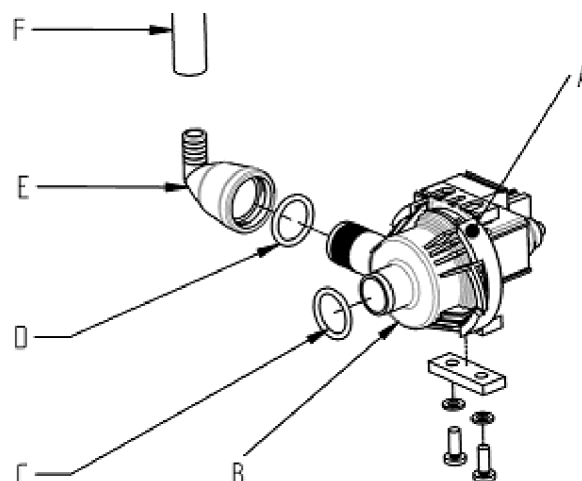
If a thermo sensor (for solid state relay) has released due to a too high temperature ($>100^{\circ}\text{C} \pm 5^{\circ}\text{K}$) the control reports a failure „thermo sensor activated“. After the system has cooled down the release pin (that lays between the both plain connectors) can be released by pressing it carefully down until there is a click sound.



9.8 Cleaning Blow-Down Pump

- » Close off water supply.
- » Drain steam cylinder by setting the main switch to Pos II.
- » Disconnect power supply and secure against restart (switch off control switch, remove main fuse and control fuse F1).
- » Verify absence of electric current.
- » Detach electrical connector from the pump.
- » Detach union adapter (E) from the pump.
- » Remove screws (G) and take the pump out of the base.
- » Open pump (bayonet lock).
- » Remove all residue from the drain hoses and pump (possibly replace o-ring (A) and wave seal (B) if these parts are no longer in good condition).
- » Assemble pump.
- » Moisten o-ring (C) and place in the side connection of the base.
- » Push pump into the base and secure tightly with screws (G).
- » Moisten o-ring (D) and place on the side connection of the pump.
- » Slide union adapter (E) over the side connection of the pump.
- » Connect electrical connector to the pump (polarity not specified).
- » Open water supply.
- » Switch on unit and check for leaks after 15-30 minutes of operation.

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



9.9 Removing Inlet Solenoid Valve and Cleaning Fine Mesh Filter

Removal

- » Close off water supply.
- » Drain steam cylinder by setting main switch to Pos II.
- » Disconnect power supply and secure against restart (switch off control switch, remove main fuse and control fuse F1).
- » Verify absence of electric current.
- » Remove cylinder as described above in section “Cleaning Steam Cylinder.”
- » 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”.
- » 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!

9.10 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.

9.11 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.

9.12 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.

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:
Demi Line (DL): DL06, DL09, DL12, DL18, DL27

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: <i>Reference number:</i>	Ausgabedatum: <i>Edition:</i>	Referenznummer: <i>Reference number:</i>	Ausgabedatum: <i>Edition:</i>
EN 60335-1:2002	A11:2004 + A1:2004	DIN EN 60335-1	07 / 05
EN 61000-4-4	A1:2000, A2:2001, 07 / 02	DIN EN 60335-2-98	05 / 04
EN 61000-4-5	A1 :2000, 12 / 01	EN 60335-2-98	2003
DIN EN 61000-6-2	01 / 05	DIN EN 50366	11 / 03

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

Henstedt-Ulzburg, den / the 01.01.2006

Hygromatik LTA GmbH

Maike Nielsen
General Manager

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.

This declaration certifies the conformity to the specified directives but contains no assurance of properties. The safety documentation accompanying the product shall be considered in detail.

11. Spare Parts

*	DL6	DL9	DL12	DL18	DL27	Artikel Nr.	Bezeichnung
							Cabinet DL
	1	1	1	1	1	B-2129005	Cabinet DL
							Steam Generation
	1					B-2205443	Cylinder DL compl., incl. 1 heater element 4,5kW and 1 thermal sensor
			1			B-2205447	Cylinder DL compl., incl. 2 heater element 4,5kW and 1 th.sensor
		1				B-2205445	Cylinder DL compl., incl. 1 heater element 6,75kW and 1 th. sensor
				1		B-2205449	Cylinder DL compl., incl. 2 heater element 6,75kW and 1 th. sensor
					1	B-2205451	Cylinder DL compl., incl. 3 heater element 6,75kW and 1 th. sensor
	1	1				B-2205101	Top part of cylinder, empty, for 1 heater element and 1 th. sensor
			1	1		B-2205105	Top part of cylinder, empty, for 2 heater element and 1 th. sensor
					1	B-2205107	Top part of cylinder, empty, for 3 heater element and 1 th. sensor
	1	1	1	1	1	E-2206200	lower part of DL cylinder, with strainer
8		1		2	3	B-2209003	Heater element 400V / 6,75 kW
8	1		2			B-2209001	Heater element 400V / 4,5 kW
7	2	2	4	4	6	E-2204006	Gasket for heater element
5	1	1	2	2	3	E-2204007	Mounting nut for heater
3	1	1	1	1	1	E-2205027	Thermal cut-out
	4	4	8	12	20	E-2205028	Clamps for thermal sensor
34	1	1	2	2	3	E-2205030	Gasket for thermal sensor
21	18	18	18	18	18	E-2204040	Screws for cylinder flange M6x20
22	18	18	18	18	18	E-2204041	U-washer for cylinder flange Ø6,2
23	18	18	18	18	18	E-2204042	Nut for cylinder flange M6
15	1	1	1	1	1	E-2204019	O-ring seal for cylinder flange
13	1	1	1	1	1	E-2204022	O-ring seal for cylinder base
11	1	1	1	1	1	E-2206086	Cylinder base DN40/25i/15/12
12	1	1	1	1	1	B-2214023	Mounting set for cylinder base
24	1	1	1	1	1	E-2205026	Mounting kit for heaters with 3 clamps
25	1	1	1	1	1	E-2204035	Condensate plug
2	1	1	1	1	1	E-2209012	Adapter steam hose DN40
1	1	1	1	1	1	E-2209002	Clip for adapter DN40
4	1	1	1	1	1	E-2204022	O-ring seal for adapter steam hose DN40
	1	1	1			E-2604031	Reducing piece DN40/DN25 steam hose
	1	1	1	1	1	B-2207039	O-ring set
	1	1	1	1	1	E-9301030	Hose connector (hose for: control cylinder-steam cylinder)
							Water Feed
14	1	1	1	1	1	B-2304021	Solenoid valve, 0,2-10 bar, 2,5 l/min
	x	x	x	x	x	B-2304105	Solenoid valve, 0,0-3,5 bar, optional
	1	1	1	1	1	E-2304029	Fine filter in solenoid valve inlet
	1	1	1	1	1	E-2304103	Captive coupling ring for solenoid valve 3/4"
	1	1	1	1	1	E-2304107	Gasket for inlet screwed fitting, solenoid
	1	1	1	1	1	E-8501034	Hose collar for inlet screwed fitting, 3/4", Solenoid
26	1	1	1	1	1	E-2304036	Rubber seal solenoid valve - cabinet
27	1	1	1	1	1	B-2304040	Rubber seal solenoid valve - cabinet
	1	1	1	1	1	B-3320406	Filling cup
28	1	1	1	1	1	E-2425004	Elbow with vent pipe
29	0,35	0,35	0,35	0,35	0,35	E-2604004	Connecting hose filling cup - T-piece, cylinder base
	0,70	0,70	0,70	0,70	0,70	E-2604004	Connecting hose filling cup - cylinder base
	1	1	1	1	1	B-2504129	Water level control cylinder, compl. with flow-switch
6	1	1	1	1	1	E-2504124	Water level control cylinder, compl. without flow-switch
30	1	1	1	1	1	E-2525246	Flow-switch
31	1	1	1	1	1	E-2304038	Rubber seal for water level control
32	0,45	0,45	0,45	0,45	0,45	E-2604002	Connecting hose water control cylinder - steam cylinder
	0,70	0,70	0,70	0,70	0,70	E-2604002	Connecting hose water solenoid valve - filling cup
33	0,45	0,45	0,45	0,45	0,45	E-2604002	Connecting hose water solenoid valve - cylinder base

*	DL6	DL9	DL12	DL18	DL27	Artikel Nr.	Bezeichnung
Water Drain							
10	1	1	1	1	1	B-2404027	Drain pump 230V50-/60Hz without mounting set
35	1	1	1	1	1	B-2424014	Mounting set for drain pump
	1	1	1	1	1	E-2404008	Drain pump housing
	1	1	1	1	1	E-2404024	O-ring seal for drain pump
19	1	1	1	1	1	E-2425002	Adapter pump - drain hose, straight model, connections DN25/13
36	0,69	0,69	0,69	0,69	0,69	E-2604004	Connecting hose vent pipe - water outflow
	0,64	0,64	0,64	0,64	0,64	E-2604004	Connecting hose filling cup - water outflow
37	0,68	0,68	0,68	0,68	0,68	E-2604002	Connecting hose drain pump - filling cup
17	1	1	1	1	1	E-3220005	O-ring for adapter pump - drain hose
18	1	1	1	1	1	E-3220005	O-ring for cylinder base - pump
Electronic							
	1					E-2501005	Main contactor 16A, coil voltage 230V, 50/60Hz
		1	1			E-2501006	Main contactor 24A, coil voltage 230V, 50/60Hz
				1	1	E-2505007	Main contactor 40A, coil voltage 230V, 50/60Hz
	1	1				B-2205501	Solid state relais 25 A, 1ph.,heat sink (small), van, thermal cut out
			1	1		B-2205503	Solid state relais 50 A, 2ph.,heat sink (small) van, thermal cut out
					1	B-2205505	Solid state relais 50 A, 2ph.,heat sink (big), van, thermal cut out
	1	1				E-2205100	Protection cap against contact for single phase solid state relais
			1	1	1	E-2205102	Protection cap against contact for double phase solid state relais
	1	1	1	1		E-2205116	Heat sink, small 150 x 50 mm
					1	E-2205118	Heat sink, big150 x 80 mm
	1	1	1	1	1	E-2205108	Thermal cut out with manual reset, 100°C ± 5K
	1	1	1	1	1	E-3720010	Van, 230VAC
	1	1	1	1		E-2525506	Jack 6pole, 6mm ² (mounted on metal sheet)
					1	E-2525502	Jack 9pole, 6mm ² (mounted on metal sheet)
Control							
Basic							
	1	1	1	1	1	B-2526203	Electronic pcb Basis for heater element humidifier
	(1)	(1)	(1)	(1)	(1)	B-2526213	Electronic pcb Basis for heater element humidifier steambath
	1	1	1	1	1	B-2120901	Mounting plate with foil for Basic (without display)
	1	1	1	1	1	E-2525410	Foil for mounting plate, type Basic
	(1)	(1)	(1)	(1)	(1)	B-2526301	Relais pcb for Basis pcb, 4 switch over contacts
Comfort							
	1	1	1	1	1	B-2526203	Electronic pcb Basis for heater element humidifier
	(1)	(1)	(1)	(1)	(1)	B-2526213	Electronic pcb Basis for heater element humidifier steambath
	1	1	1	1	1	B-2526401	Comfort display incl. mounting plate with foil
	(1)	(1)	(1)	(1)	(1)	B-2120903	Mounting plate with foil for Comfort unit with display
Comfort Plus							
	1	1	1	1	1	B-2526203	Electronic pcb Basis for heater element humidifier
	(1)	(1)	(1)	(1)	(1)	B-2526213	Electronic pcb Basis for heater element humidifier steambath
	1	1	1	1	1	B-2526403	Comfort Plus display incl. mounting plate with foil
	(1)	(1)	(1)	(1)	(1)	B-2120905	Mounting plate with foil for Comfort Plus with display
Accessories							
	x	x	x			E-2604012	Steam hose DN 25, per m
				x	x	E-2604013	Steam hose DN 40, per m
	x	x	x	x	x	E-2604002	Condensate hose DN 12, per m
	x	x	x			E-2404004	Steam hose clamp DN 25
				x	x	E-2604016	Steam hose clamp DN 40
	x	x	x	x	x	E-2304015	Condensate hose clamp DN 12
	x	x	x			E-2604019	Steam manifold T-piece DN 25
				x	x	E-2604023	Steam manifold T-piece DN 40, stainless steel
	x	x	x	x	x	E-2604021	Condensate connector T-piece DN 12
	x	x	x	x	x	B-2604026	Steam solenoid valve 0-0,4 bar, compl., DN 25, coil voltage 230V

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

* see exploded view

12. Fax Form - Order for spare parts



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)

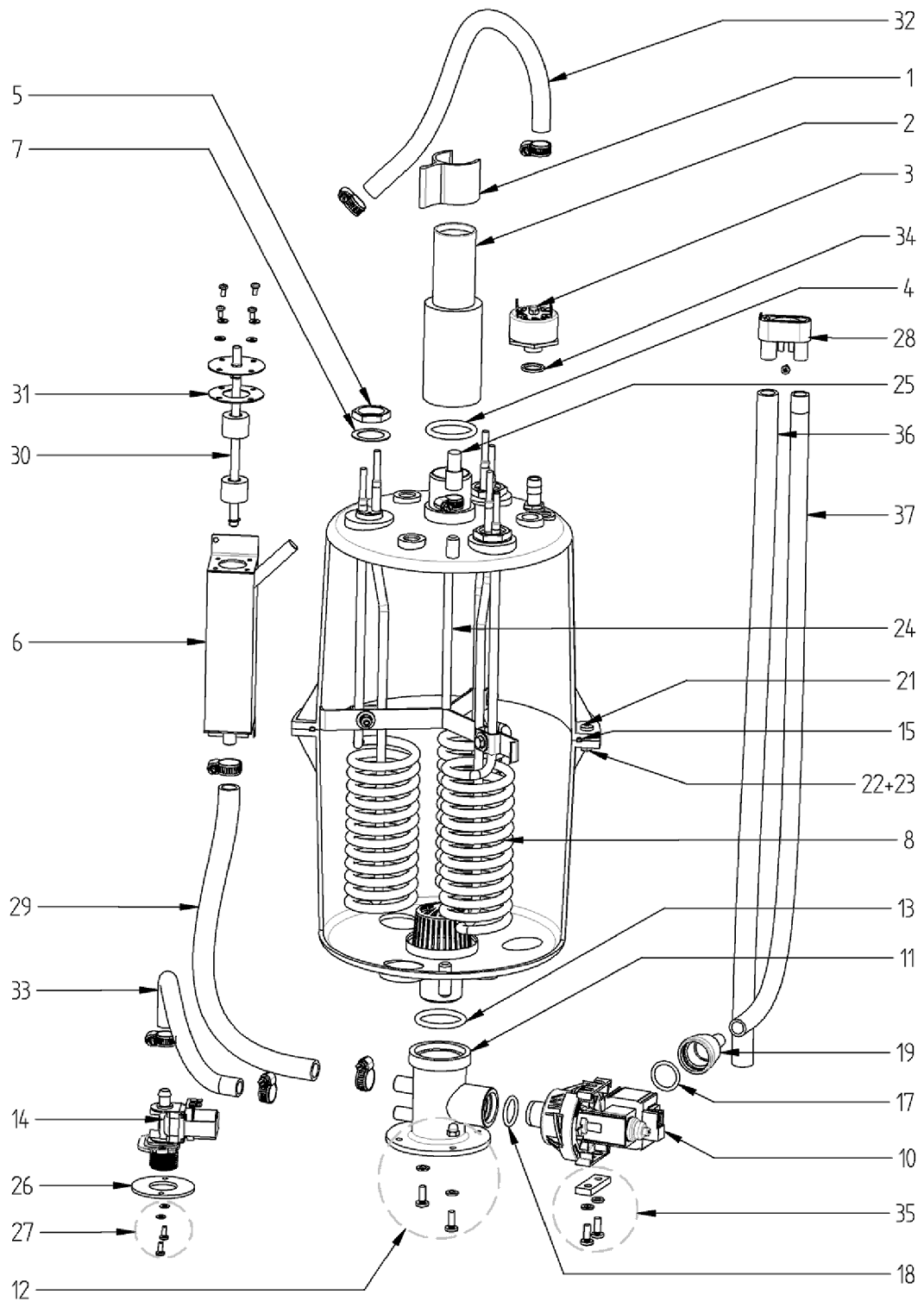
date/signature

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

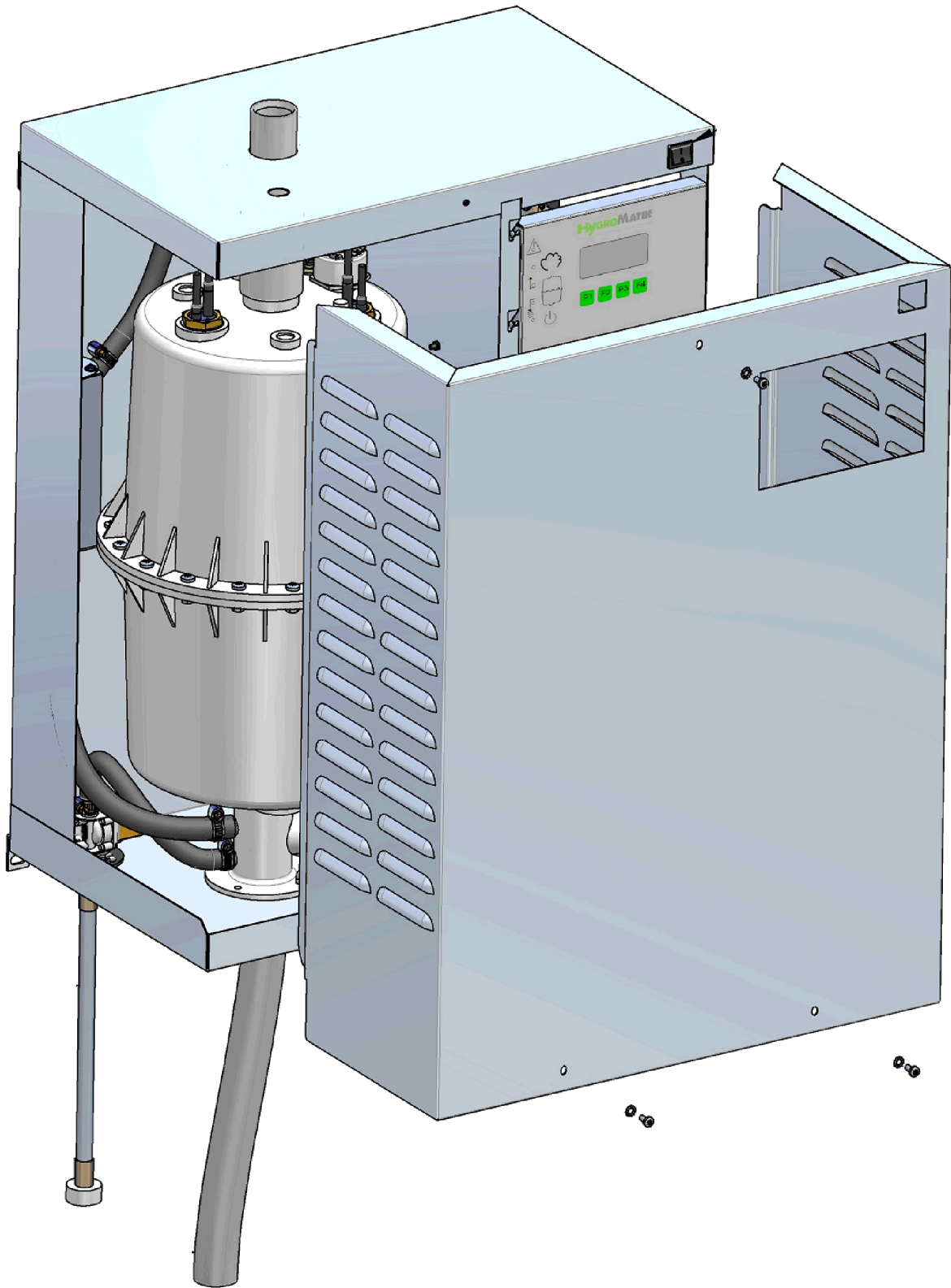
13. Technical Specifications

DemiLine DL					
Type	DL06	DL09	DL12	DL18	DL27
Steam Output [kg/h]	6	9	12	18	27
Electrical Supply*	400V/3/N 50-60Hz				
Power Rating [kW]	4,5	6,75	9,0	13,5	20,25
Power Consumption [A]	11,3	16,9	19,5	29,3	29,3
Circuit Protection [A]	3x16	3x20	3x25	3x35	3x35
Control Type	Basic, Comfort and Comfort Plus				
Number of Steam Cylinder	1				
Number of Heater Elements	1	1	2	2	3
Steam Hose Connection	1x25mm**			1x40mm	
Condensate Hose Connection	1x12mm				
Net Weight [kg]	25	25	26	26	27
Operating Weight [kg]	43	43	44	44	45
Height [mm]	706				
Width [mm]	527				
Depth [mm]	326				
Water Supply	Fully Demineralized Water / Cleaned Condensate 100 x 10 ³ to 100 x 10 ⁴ Pa (1 to 10 bar), 13mm Hose				
Fan Unit, Wall-Mounted	VG08	VG17	VG17	VG30	VG30
Airflow Capacity of Fan Unit [m ³ /h]	160	185	185	350	350
* Other voltages upon request ** Reducing Piece DN40/DN25 included					

14. Exploded View



15. View of Cabinet





HyGROMATIK[®]

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