HYGROMATIK

Manual

Electrode Steam Humidifier

HyLine

IMPORTANT: READ AND SAVE THESE INSTRUCTIONS

C US

HYL.CSA
E-8881700

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HyLine CSA [16.02.2017]

Current version of this manual can be found at: www.hygromatik.de/us

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

⚠WARNING

Risk of electrical shock!

Hazardous electrical high voltage!

All electrical work to be performed by certified expert staff (electricians or expert personnel with eqivalent training) only. Disconnect power supply prior to work start!

1. Introduction

Dear Customer,

Thank you for choosing a HygroMatik steam humidifier.

HygroMatik steam humidifiers represent the latest in humidification technology.

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

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

If you have additional questions, please contact us:

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

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

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

e-mail: **hotline@HygroMatik.de**

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

1.1 Typographic Distinctions

- preceded by a bullet: general specifications

» preceded by an arrow: Procedures for servicing or maintenance which should or must be performed in the indicated order

☑ Installation step which must be checked off

italics Terms used with graphics or drawings

1.2 Documentation

Retention

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

Versions in Other Languages

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

1.3 Symbols in Use

1.3.1 Specific Symbols related to Safety Instructions

According to ANSI Z535.6 the following signal words are used within this document:

⚠DANGER

DANGER indicates a hazardous situation which, if not avoided, will result in death or serious injury.

⚠WARNING

WARNING indicates a hazardous situation which, if not avoided, could result in death or serious injury.

⚠CAUTION

CAUTION indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.

NOTICE

NOTICE is used to address practices not related to physical injury.

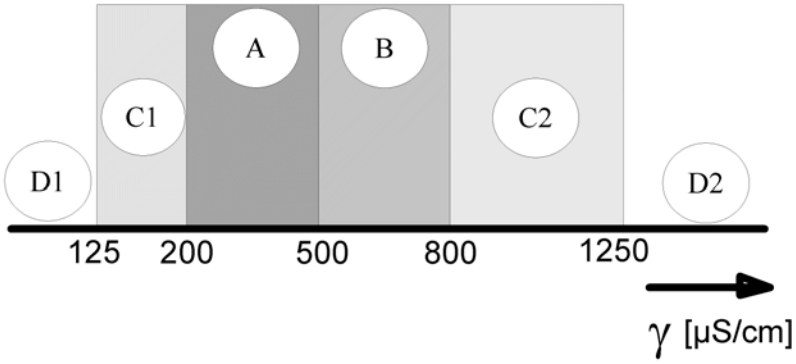
1.3.2 General Symbols

Please note This symbol is used whenever a situation requires special attention beyond the scope of safety instructions.

1.4 Intended Use

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

Only use supply water featuring a conductivity of 125 to 1250 µS/cm.



D1: Lower threshold

C1: Range of reduced conductivity (adjustments recommended)

A: Normal tap water

B: Range of heightened conductivity

C2: Range of high conductivity (adjustments recommended)

D2: Upper threshold

Proper usage also comprises the adherence to the conditions specified by HygroMatik for:

- installation
- dismantling
- reassembly
- commissioning
- operation
- maintenance
- disposal.

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 Instructions 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 Instructions at the unit‘s operational location (or near the unit).

By construction, HygroMatik steam humidifiers are not qualified for exterior application.

⚠WARNING

Risk of scalding!
Steam with a temperature of up to 212 °F is produced.
Do not inhalate steam directly in order to avoid respiratory damage!

2. Safety Instructions

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

2.1 Guidelines for Safe Operation

2.1.1 General

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

2.1.2 Unit control

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

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

⚠WARNING

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

2.1.3 Unit operation

⚠WARNING

Risk of scalding!
In case of leaking or defective components, hot steam may exit in an uncontrolled manner.
Switch off unit immediately.

NOTICE

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

- The unit must not be operated on a DC power supply
- The unit may only be used connected to a steam pipe that safely transports the steam (not valid device type Mini-Steam)

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

2.1.4 Mounting, maintenance, repair and dismantling of the unit

NOTICE

The HygroMatik steam humidifier is IP20 protected. Make sure that the unit is not object to dripping water in the mounting location.
When installation is made in a room without a drain, safety precautions must be taken in order for to shut off the humidifier‘s water supply in event of a leak.

- Use genuine spare parts only
- After any repair work, have qualified personnel check the safe operation of the unit
- Attaching or installing of **additional components** is permitted only with the **written consent** of the manufacturer
- The operator is responsible for the disposal of unit components as required by law

2.1.5 Electrical

⚠WARNING

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

NOTICE

Only use original fuses with the appropriate amperage rating.

Regularly check the unit‘s electrical equipment. Promptly repair any damage such as loose connections or burned wiring.

Responsibility for intrinsically safe installation of the HygroMatik steam humifiiers (steam generators) is incumbent on the installing specialist company.

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3. Transport

3.1 Overview

Please 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]/[inch]	Width [cm]/[inch]	Depth [cm]/[inch]	Weight [kg]/[lbs]
HY05- 08	58/22.8	56/22.0	32/12.6	16/35.3
HY13- 17	75/29.5	63/24.8	37/15.6	24/52.9
HY23	75/29.5	63/24.8	37/15.6	25/55.1
HY30	81/31.9	67/26.4	41/16.1	33/72.8
HY45	88/34.6	76/29.9	48/18.9	46/101.4
HY60	80/31.5	104/40.9	41/16.1	54/119.0
HY90- 116	90/35.4	117/46.1	48/18.9	77/169.8

CompactLine:

Type*	Height [cm]/[inch]	Width [cm]/[inch]	Depth [cm/[inch]]	Weight [kg]
C01	46/18.1	45/17.7	26/10.2	11/24.3
C02	48/18.9	44/17.3	31/12.2	12/26.5
C06	52/20.4	50/19.7	28/11.0	13/28.7
C10	58/22.8	51/20.1	31/12.2	14/30.9
C17	75/29.5	54/21.3	37/14.6	22/48.5
C22	75/29.5	54/21.3	37/14.6	22/48.5
C30	75/29.5	58/22.8	37/14.6	23/50.7
C45	81/33.1	63/24.8	41/16.1	25/55.1
C58	90/35.4	72/28.3	48/18.2	36/79.4

MiniSteam:

Type**	Height [cm]/[inch]	Width [cm]/[inch]	Depth [cm]/[inch]	Weight[kg]
MS 5	59/23.2	48/18.9	28/11.0	13/28.7
MS 10	68/26.8	51/20.1	31/12.2	15/33.1

* Dimensions and weights may vary slightly.

3.3 Packing

Please note Notice the symbols affixed to the packing box.

3.4 Interim Storage

Store the unit in a dry place and protect against 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

Please 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
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 humidifier type including selected control.
- Water installation hose 0,6m/23.6inch, 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. Functional description and device composition

4.1 Mode of Operation

Electrodes through which electrical current flows heat conductive water in a cylinder to create unpressurized, hygienic steam. Electrode steam humidifiers are suitable for use with normal tap water, as this is normally conductive.

The steam produced has a temperature of about 100°C/212°F with minimal excess pressure ("pressureless steam"). It is largely free of minerals and germ-free.

4.2 Structure and operation of the device

By pressing the control switch („Pos. I") the humidifier is turned on. When the controller specifies an increase in humidity, the main contactor is switched on and the electrodes ((48) number in paranthesis refers to exploded view fig.) 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.

The concentration of dissolved salts increases over time, which can lead to a rise in the conductivity of the water. For this reason, regular, periodic blow-downs of some of the concentrated water are very important.

Water blow-down is performed by a blow-down pump (32).

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.

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.

5. Installation

⚠WARNING

General risk of personal injury!
Personnel not familiar with professional installation methods may sustain physical damage.
Installation of this unit to be accomplished only by qualified personnel (persons with completed training in the plumbing field and in the field of electrical installation work, respectively)!

⚠WARNING

Risk of electrical shock!
Hazardous electrical high voltage!
Unit must be disconnected from electrical power supply during installation.

⚠WARNING

Risk of foot injuries!
Unit may drop during mounting involving a single person.
Helping hand of a second person is required.

Please note HygroMatik accepts no liability for damage due to faulty installation.

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

5.1 Environment Parameters to be met and Mounting Recommendations

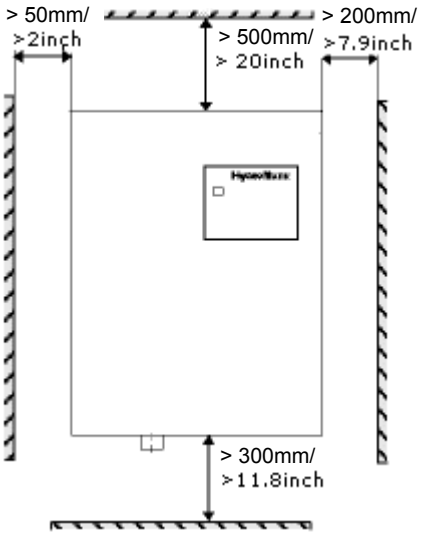
When selecting the installation site for the steam humidifier, take the following into account:

- The minimum clearances indicated in the fitting measures section must be observed in order to ensure adequate unit ventilation and allow for unobstructed access in case of maintenance
- Protection class IP20
- By design, HygroMatik steam humidifiers are not qualified for outdoor installation (electronical components and water-bearing parts may be damaged)

- Ambient temperature must lie between +41 and +104 °F in order to protect the unit electronics against damage; frost may damage the steam cylinder
- Relative humidity must not exceed 80 % r.h., since values beyond may lead to electronic malfunction or damage
- Installation in a closed room requires aeration and, eventually, temperature conditioning in order to meet the a.m. environmental conditions
- The steam humidifier should be installed as close as possible to the steam manifold. Optimum performance is only guaranteed when steam and condensate hoses are kept short
- Make use of existing water connections for supply and draining
- Hoses must be laid at a consistent 5 to 10 % incline/ decline in order to definitely prevent sagging and kinking
- Mount the unit on a stable, preferably solid wall offering the bearing capacity required (s. unit technical specifications). If such a wall is not at hand, the unit may be attached to a stand bracket firmly bolted to the floor
- Mounting the unit must be perpendicularly aligned in both the vertical and horizontal axis (plumb and level) in order to achieve uniform immersed surface areas for the electrodes
- The steam humidifier rear panel heats up during operation (to a maximum of 158 °F). Take care that the construction on which the unit is to be mounted is not made of temperature-sensitive material

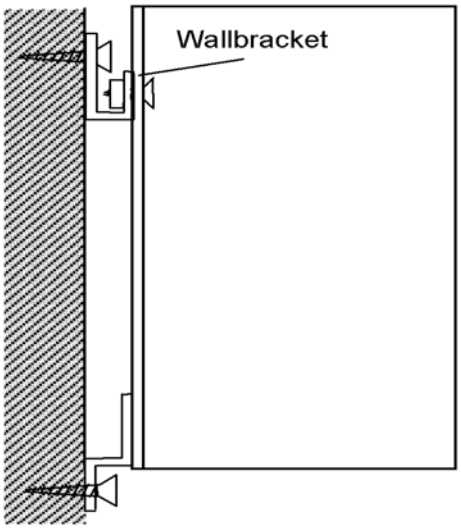
5.1.1 Fitting measures

Clearances



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

Mounting Fixtures (for HY45 to HY116)



The unit should be mounted on a stable wall.

Please note To achieve a uniform immersed surface area for the electrodes, the humidifier must be installed plumb and level.

to Install Units Type HY05- HY30:

» Place the steam humidifier in its intended location, use a level to adjust position, and secure. See chapter "Unit Dimensions".

» Attach the unit to the lower mounting fixtures.

to Install Units HY45- HY116:

» Fix bracket at the intended location. See chapter "Unit Dimensions".

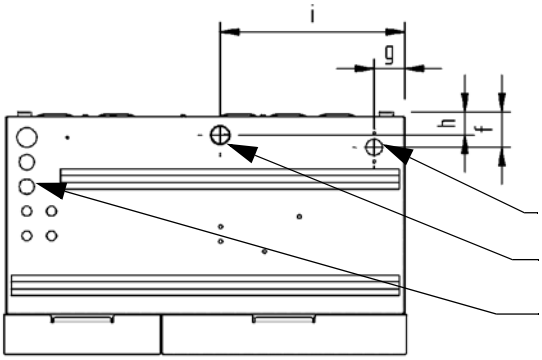
» Mount the unit, adjust position using a level, and screw tightly into the mounting fixtures.

» Attach the unit to the lower mounting fixtures.

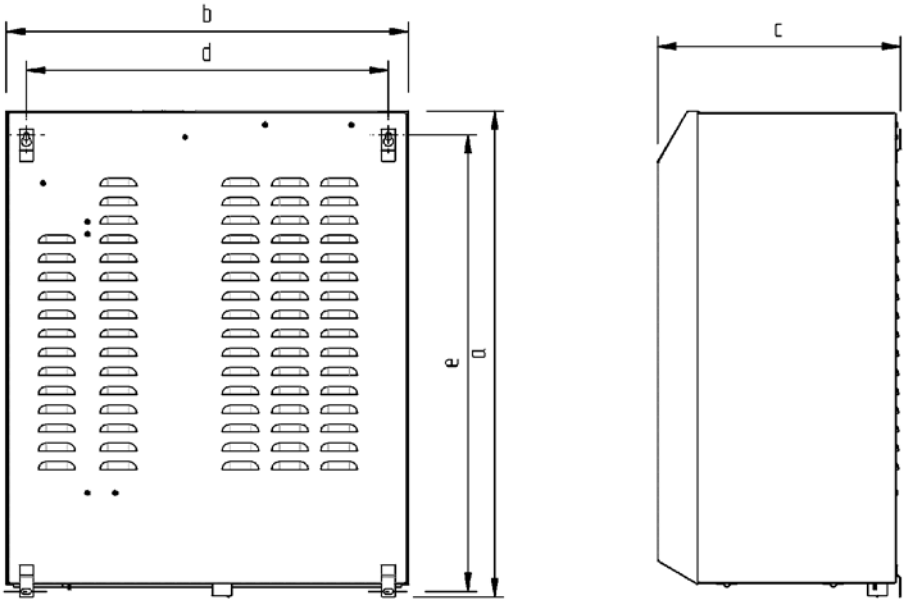
If no suitable wall is present, we recommend construction of a free-standing console anchored to the floor.

5.1.2 Unit Dimensions HY05-HY45

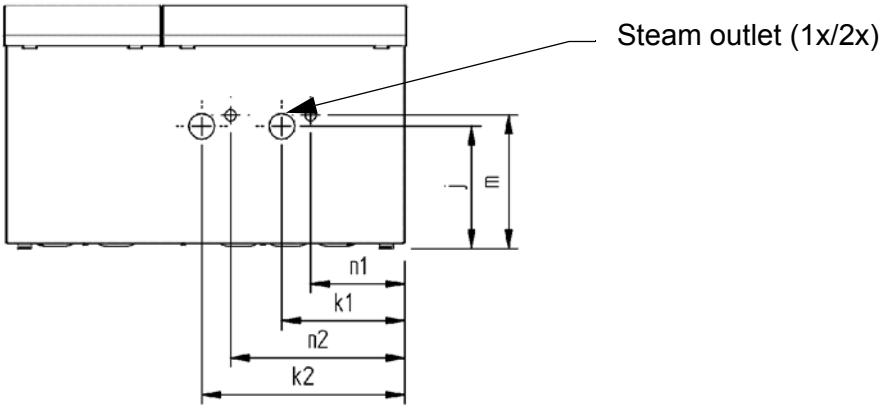
View from below



Rear view

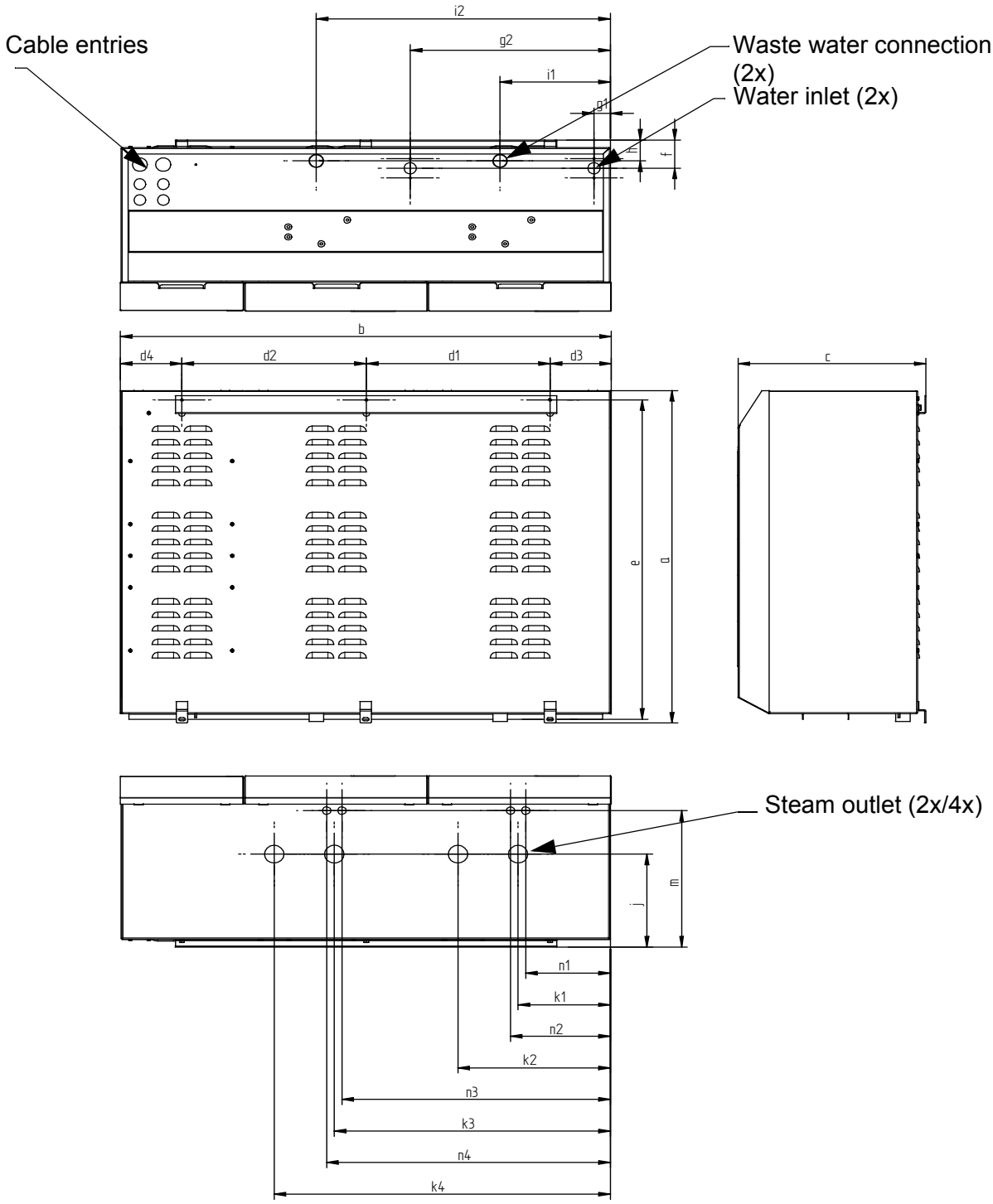


View from top



Type / Dimensions [mm]/ [inch]	a	b	c	d	e	f	g	h	i	j	k1	k2	m	n1	n2
HY05-HY08	480/ 18.9	449/ 17.7	251/ 9.9	415/ 16.3	438/ 17.2	43/ 1.7	35/ 1.4	35/ 1.4	120/ 4.7	120/ 4.7	103/ 4.1	-	147/ 5.8	65/ 2.6	-
HY13-HY23	650/ 25.6	522/ 20.6	301/ 11.9	486/ 19.1	619/ 24.4	63/ 2.5	35/ 1.4	38/ 1.5	210/ 8.3	152/ 6.0	136/ 5.4	-	184/ 7.2	96/ 3.8	-
HY30	708/ 27.9	561/ 22.1	344/ 13.5	515/ 22.3	665/ 26.2	58/ 2.3	50/ 2.0	38/ 1.5	250/ 9.8	172/ 6.8	156/ 6.1	-	197/ 7.8	106/ 4.2	-
HY45	788/ 31.0	654/ 25.7	405/ 16.0	588/ 23.2	742/ 29.2	68/ 2.7	50/ 2.0	48/ 1.9	300/ 11.8	209/ 8.2	200/ 7.9	330/ 13.0	227/ 9.0	153/ 6.0	283/ 11.1

5.1.3 Unit Dimensions HY60-HY116



Type / Dims. [mm]/ [inch]	a	b	c	d1	d2	d3	d4	e	f	g1	g2	h	i1	i2	j
HY60	709/ 27.9	927/ 36.5	333/ 13.1	327/ 12.9	371/ 14.6	95/ 3.7	133/ 5.2	680/ 26.8	67/ 2.6	46/ 1.8	368/ 14.5	50/ 2.0	195/ 7.7	525/ 20.7	186/ 7.3.
HY90-HY116	788/ 31.0	1061 41.8	403/ 15.9	398/ 15.7	398/ 15.7	132/ 5.2	132/ 5.2	758/ 29.8	67/ 2.6	35/ 1.4	432/ 17.0	50/ 2.0	238/ 9.4	635/ 25.0	220/ 8.7
Type / Dims. [mm]/ [inch]	**k1**	**k2**	**k3**	**k4**	**m**	**n1**	**n2**	**n3**	**n4**						
HY60	157/ 6.2	488/ 19.2	-	-	204/ 8.0	110/ 4.3	441/ 17.4	-	-						
HY90-HY116	199/ 7.8	329/ 13.0	597/ 23.5	727/ 28.6	324/ 12.8	183/ 7.2	216/ 8.5	580/ 22.8	613/ 24.1						

* HY60 only one steam outlet per zylinder

5.2 Fan Units (Options)

Please note

The fan units should be positioned in a way that avoids drafts. In general, a minimum height of 6 ft 7 in (2 m) above floor is sufficient. Install the fan unit directly on a wall.

⚠WARNING

Risk of skin burning or scalding!

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

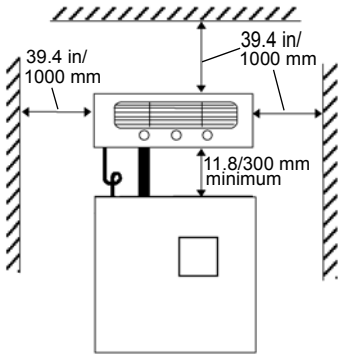
During operation hot steam discharges from the nozzles.
Avoid any contact in the field of the visible steam cloud.

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

⚠WARNING

Rotating parts!

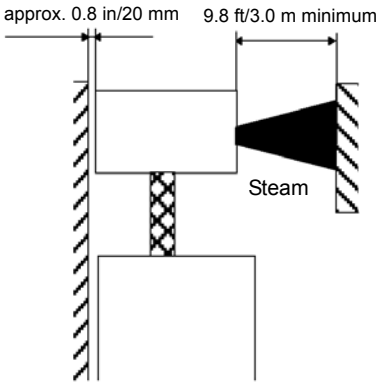
During operation the cross-flow fan rotates.
Do not touch!
Do not introduce any matter through the fan grid.



Front View Wall Installation

5.2.1 Fan Unit Type VG

- Install the fan unit above 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 figs.



Side View Wall Installation

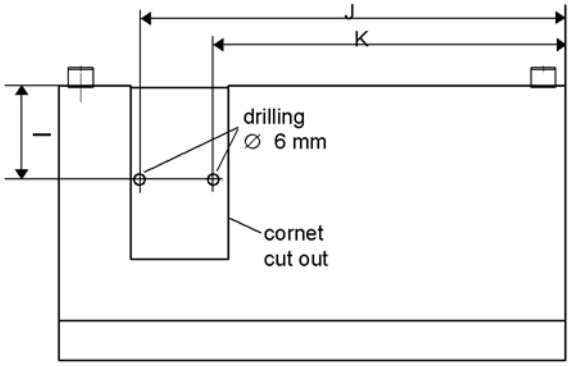
Technical of specifications VG fan units

Fan Unit		VG08	VG17	VG30
Quantity of Steam	[lb/h /kg/h]	17.6/8	37.5/17	66/30
Steam Inlet	[In/mmϕ]	0.98/25	0.98/25	1.57/40
Condensate Outlet	[in/mmϕ]	0.55/14	0.47/12	0.47/12
Nominal Output	[W]	26	35	67
Nominal voltage	[V]	230	230	230
Dimensions	W [in/mm]	17.4/441	20/507	21.7/550
	H [in/mm]	6.7/171	6.7/171	6.7/171
	D [in/mm]	7.1/180	9.3/237	11/277
Weight	[lb/kg]	7.9/3.6	13.2/6	15.4/7
Sound Level (3 ft 3.37 in /1m distance to the source of noise)	[dB(A)]	52	54	57

5.2.2 Fan Unit Cover

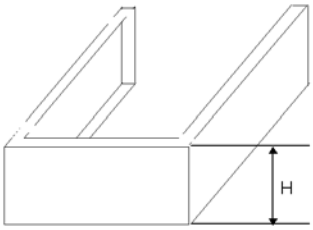
Covers for humidifier types HY05 and HY30 are optionally available to protect the steam and condensate hoses between the steam humidifier and the fan unit. The vertical distance between the humidifier and the fan unit is determined by the height of the cover (see table of dimensions, H).

» Drill two holes in the housing as specified in the following diagram.



Unit type	H [in/mm]	I [in/mm]	J [in/mm]	K [in/mm]
HY05-HY08	6.9/175	3.1/80	14.7/373	10.5/266,5
HY13-HY23	11/280	4.1/105	16.6/422	12.2/310
HY30	11/280	4.1/105	17.8/452	13.4/340

» Install the steam humidifier and fan unit on the wall at a distance given by the front cover (measure H).



» Secure the steam hose between the humidifier and fan unit with hose clamps.

» Also using a hose clamp, attach the condensate hose to the fan unit.

» Run condensate hose along the rear of the unit to the water discharge (see also chapter "Water Discharge").

» Lay the condensate hose with a 200 mm loop directly over the drain. The loop acts as a vapor barrier.

Please note Condensate cannot be fed back into the steam cylinder.

» Slide cover between humidifier and fan unit.

» Fasten cover with the two screws supplied. Screw from the steam panel outwards.

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

Condensation may occur on anything installed within the absorption distance.

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

Absorption Distance	
B_N	for normal obstructions, such as sensors, ventilators, outlets
B_c = (1,5...2) x B_N	for fine filters, heat registers
B_s = (2,5...3) x B_N	for particle filters
B_d = (3...5) 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 $\overset{o}{m}_D$ in kg/h.
- air speed w_L in m/s in air duct
- Total length l_D of the steam manifold installed in the air duct

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

Method:

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

Notes:

Air humidity before humidification x_1: _____[g/kg]

Air temperature after humidification t_2: _____[°C]

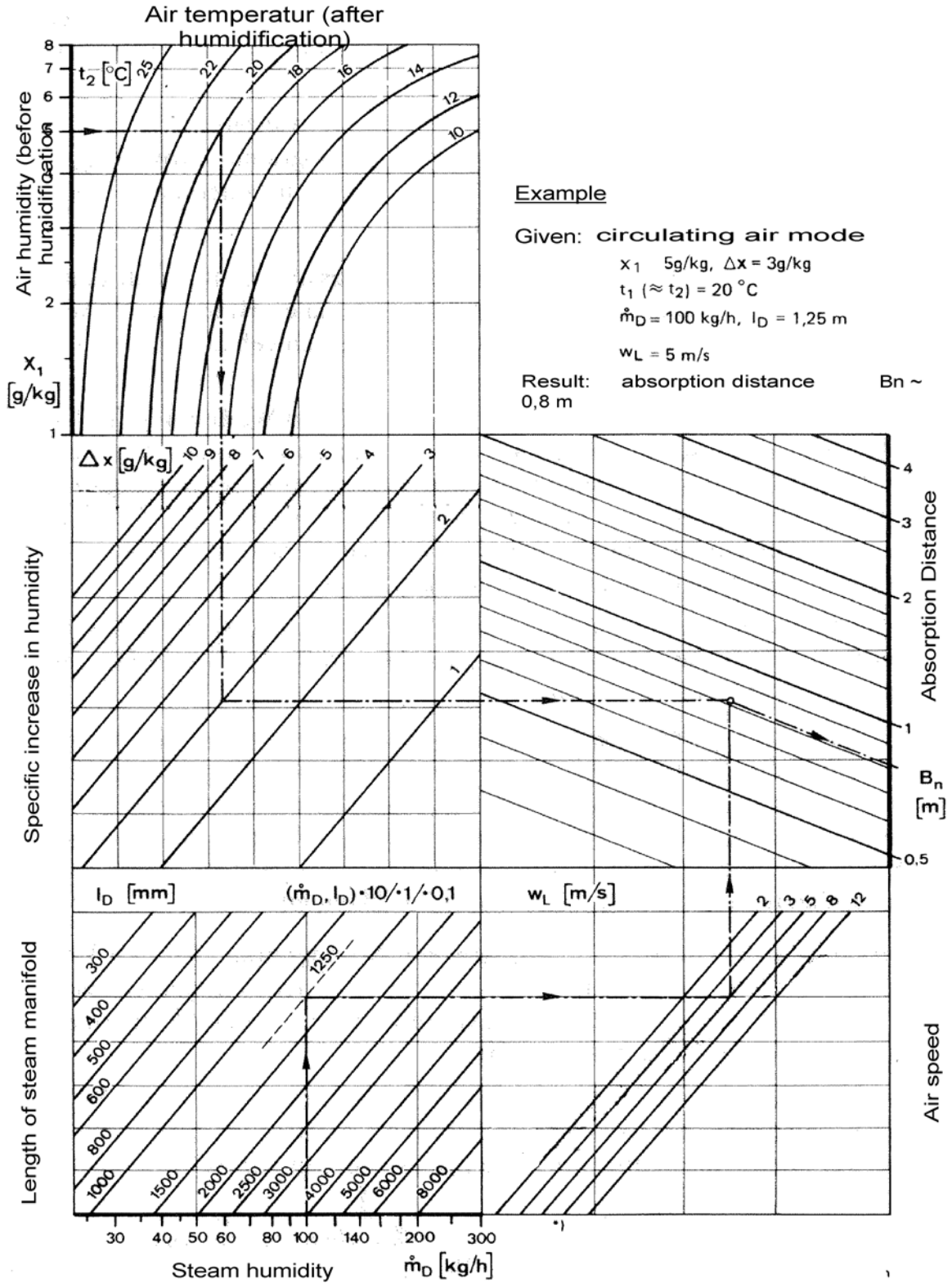
Specific increase in humidity $\triangle$ x:_____[g/kg]

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

5.4.1 Guidelines for Installation

Positioning within duct

- Install the steam manifold as close as possible to the steam humidifier in order to minimize steam loss through condensation
- Steam manifold placement on the supply side of the air duct is preferable
- Install steam manifold strictly horizontal in order to ensure proper condensate drain
- Shown installation and positioning dimensions are based on empiric values. Special environmental conditions may require adjustments. Pay special attention to avoid condensate generation in air duct

Allowable pressures

- Max. allowable pressure in air duct is 1200 Pa (Hy 05 and Hy08 1000 Pa max.)
- On suction side, max. -500 Pa is tolerable
- With high-pressure air conditioning systems, modifications of the unit‘s drain hose system may possibly be required depending on the overall pressure situation. These modifications must be **coordinated with your expert dealer.**

Water drain

- Install a water drain within the absorption distance inside the air duct

When increased airflow speed is encountered

- Air flow rates beyond 3m/s may lead to condensate drainage problems at the steam manifolds due to vacuum built-up. A possible remedy is twisting the steam manifold in its horizontal axis by few angular degrees. In case of problems, pls. consult your expert dealer.

For steam bath applications only:

NOTICE

Risk of inaccurate temperature readings.
Do not install the steam manifold near a temperature sensor.

⚠WARNING

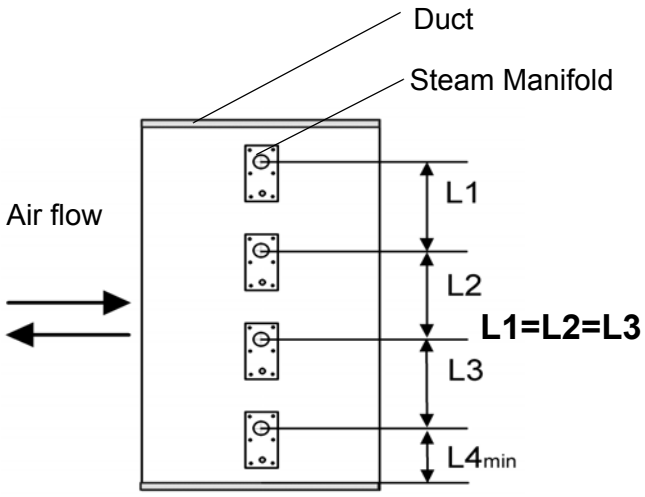
Risk of scalding!
Hot steam with a temperature of up to 212 °F exits the steam manifold.
Install the steam manifold safe from contact with people.

5.4.2 Recommendations for dimensioning

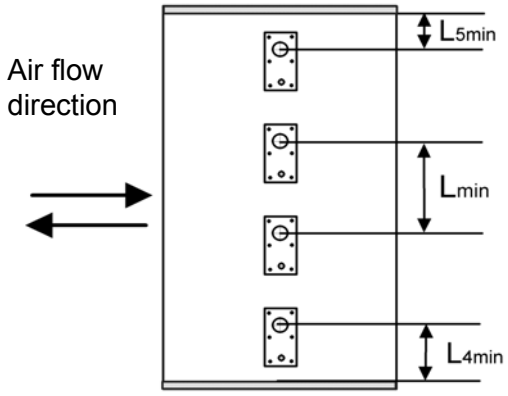
Horizontal installation of steam manifold

The recommendations given below are based on homogenous air flow in the duct.

Standard steam manifold arrangement



An even distribution of steam manifolds ensures a uniform steam distribution.
Please use the total hight of the duct!



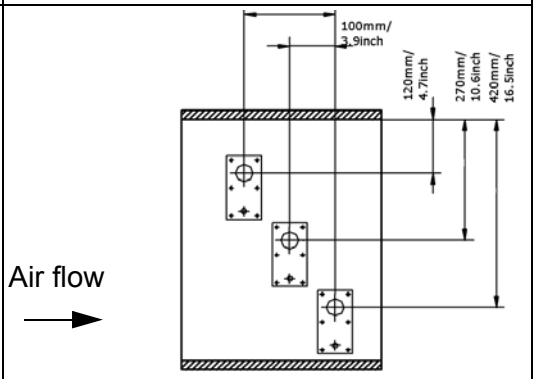
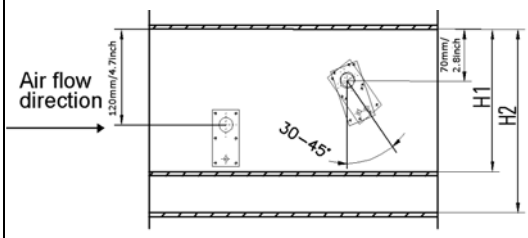
Minimum distances in order to avoid condensation:

Lmin = 210mm/8.3inch: distance „ steam manifold - next steam manifold“

L4min = 120mm/4.7inch: distance „lowest steam manifold - duct bottom“:

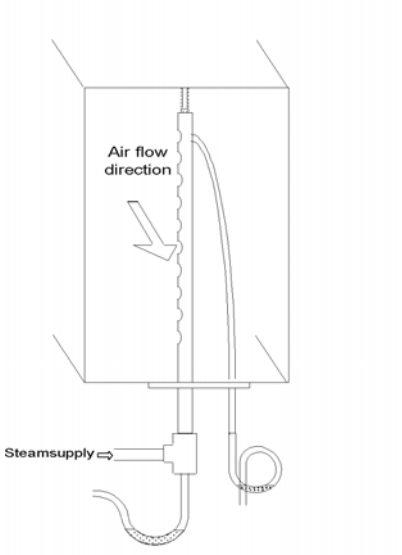
L5min = 120mm/4.7inch: distance „highest steam manifold - duct ceiling“

Steam manifold arrangement for special air duct shapings

<table>
<tr><th>Air duct</th><th>Positioning of steam manifolds</th><th>Sample</th></tr>
<tr><td>flat</td><td>Staggered vertically and laterally</td><td> 
</td></tr>
<tr><td>very flat</td><td>By tilting the steam manifold 30 - 45° towards the air flow direction, the minimum upper clearance can be reduced to 70mm/2.8inch.
<table>
<tr><th>min. distances:</th><th colspan="2">H1[mm]/[inch]</th><th>H2[mm]/[inch]</th></tr>
<tr><th></th><th>30°</th><th>45°</th><th></th></tr>
<tr><td>DN25/1“</td><td>182/7.2</td><td>168/6.6</td><td>225/8.6</td></tr>
<tr><td>DN40/1 1/2“</td><td>193/7.6</td><td>179/7.0</td><td>230/9.1</td></tr>
</table></td><td>very flat duct
 
</td></tr>
<tr><td>narrow, high</td><td>Identical lenghts one on top of the other. Staggered laterally if possible.</td><td></td></tr>
<tr><td>square</td><td>Identical lenghts, staggered vertically and laterally</td><td></td></tr>
<tr><td>low,
very wide</td><td>facing each other</td><td></td></tr>
</table>

Vertical installation of steam manifold

Steam manifold placement:

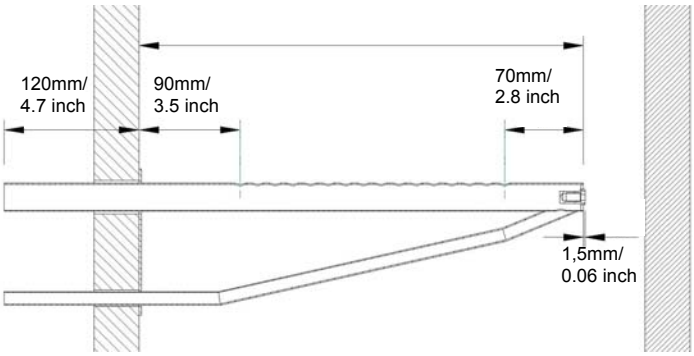


- Horizontal installation of the steam manifolds is preferred. However, installation from below into the air duct is possible.

Length of steam manifold [mm]/[inch]*:

l	220/ 8.7	400/ 15.7	600/ 23.6	900/ 35.4	1200/ 47.2	1450/ 57.1
DN25/1“	x	x	x	x	x	x
DN40/1 1/2“	x	x	x	x	x	x

* special lenght on request



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	1xDN25/ 1 x 1“	DN25/ 1 x 1“	DN12/ 1 x 1/2“
HY23-HY30	1xDN40/ 1 x 1 1/2“	DN40/ 1 x 1 1/2“	DN12/ 1 x 1/2“
HY45-HY60	2xDN40/ 2 x 1 1/2“	2xDN40/ 2 x 1 1/2“	2xDN12/ 2 x 1/2“
HY90-HY116	4xDN40/ 4 x 1 1/2“	4xDN40/ 4 x 1 1/2“	4xDN12/ 4 x 1/2“

CompactLine:

Type	Steam Manifold	Steam Hose	Condensate Hose
C01-C17	1xDN25/ 1 x 1“	DN25/ 1 x 1“	DN12/ 1 x 1/2“
C22, C30	1xDN40/ 1 x 1 1/2“	DN40/ 1 x 1 1/2“	DN12/ 1 x 1/2“
C45	2xDN40/ 2 x 1 1/2“	DN40/ 1 x 1 1/2“	DN12/ 1 x 1/2“
C58	2xDN40/ 2 x 1 1/2“	2xDN40/ 2 x 1 1/2“	2xDN12/ 2 x 1/2“

HeaterLine:

Type	Steam Mani-fold	Steam Hose	Condensate Hose
HL 6-12 *	1xDN25/ 1 x 1“	DN25/ 1 x 1“	DN12/ 1 x 1/2“
HL 18-30	1xDN40/ 1 x 1 1/2“	DN40/ 1 x 1 1/2“	DN12/ 1 x 1/2“
HL 36-45 **	2xDN40/ 2 x 1 1/2“	2xDN40/ 2 x 1 1/2“	1xDN12/ 1 x 1/2“

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

** For units HL 36 - 45 HygroMatik delivers one t-connector for separating the steam on two steam manifold.

*** Special lenght on request.

5.5 Steam line and condensate hose layout

Please note Because of the high requirements on hose material under the operating conditions given, it is recommended to use genuine HygroMatik hoses only.

5.5.1 Guidelines for steam line design

- Steam hose nominal diameter must not be smaller than the steam outlet of the HygroMatik steam humidifier (do not restrict the cross-section, otherwise back pressure will increase)
- Steam hoses must be laid without sags and kinks and with a continuous slope of 5-10% (otherwise sags may result).
- Steam hoses should be kept as short as possible. Implement lengths beyond 5 m/16 ft as insulated fixed piping to keep energy loss and condensate generation to a minimum. Fixed piping is generally recommended for straight steam line segments
- Since the steam hose adapter is made of plastic, the steam hose fixing clamp must not be excessively tightened
- When 2 steam manifolds are to be installed (other than with a standard implementation), a Y-piece for steam distribution is required (must be ordered separately). Place the Y-piece as close as possible to the steam manifolds. Such, for the main part of the piping, just one steam hose is required resulting in minimum condensate loss
- In contrast, when installing the steam line for the Compact-Line C45 unit, the Y-piece included in the delivery is to be installed close to the humidifier to keep the shared DN40 hose part as short as possible. The longer distance to the steam manifolds is then covered by two DN40 hoses allowing for a better steam throughput due to lower counter pressure
- Allow easy access to the steam pipe/steam hose installation
- Pressure conditions within the duct are influenced by device steam output, steam line layout and the duct composition itself. In some rare situations, it may become necessary to optimize steam line layout for achieving the results intended
- Respect minimum bending radii:

  DN 25 Steam hose: Rmin = 200 mm/8 inch
  DN 40 Steam hose: Rmin = 400 mm/16 inch

5.5.2 Condensate hose layout

The condensate hose may be run from the steam manifold back to the steam cylinder, as depicted in the schematic drawing below with concern to installation type 1. Depending on the particular model, the condensate hose is then connected to a stub on the cylinder top directly (1 condensate hose) or via a T-piece (2 condensate hoses). Alternatively, the condensate hose(s) may be fed directly in a wastewater pipe or a drain (s. installation type 2).

5.5.3 Steam line and condensate hose installation types

Installation type 1

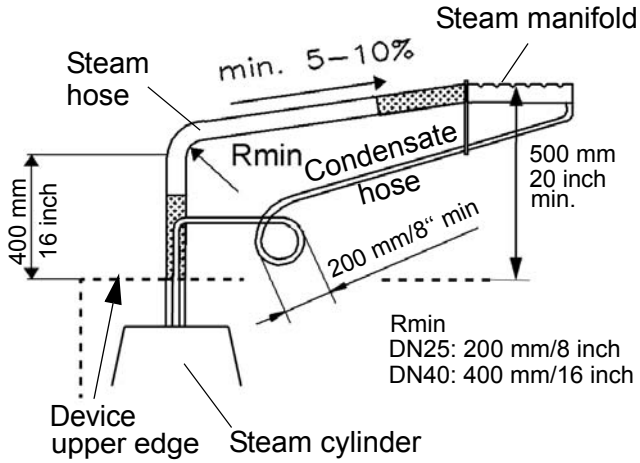
Steam manifold is positioned more than 500 mm/20 inch above device upper edge:

» Run steam hose(s) to a height of 400 mm/16 inch minimum above the steam humidfier and then to the steam manifold(s) with a continous incline of 5 to 10 %.

Please note If the intension is to feed the condensate hose back to the steam cylinder (s. next step), the connection stub on the cylinder top must be drilled-out first using a 8 mm drill (ANSI drill size „O“). Exception for CompactLine C01 and C06 models: use a 5 mm drill (ANSI drill size „22“). CompactLine C45 condensate hose connection involves the use of a T-piece in order to support 2 condensate hoses (see section and fig. below).

» Run condensate hose(s) from steam manifold(s) with a 5 to 10 % decline and feed through the steam humidifier housing bore to steam cylinder. Affix on connection stub with clamp. Alternatively, feed condensate directly into wastewater pipe or drain.

» As a steam barrier, lay out a 200mm/8 inch min. loop (s. schematic representation below). Minimum distance from steam manifold to loop must be 500 mm/20 inch. Fill loop with water prior to steam humidifier commissioning.



Installation type 1,
schematic representation

How to connect two condensate hoses to the C45 steam cylinder

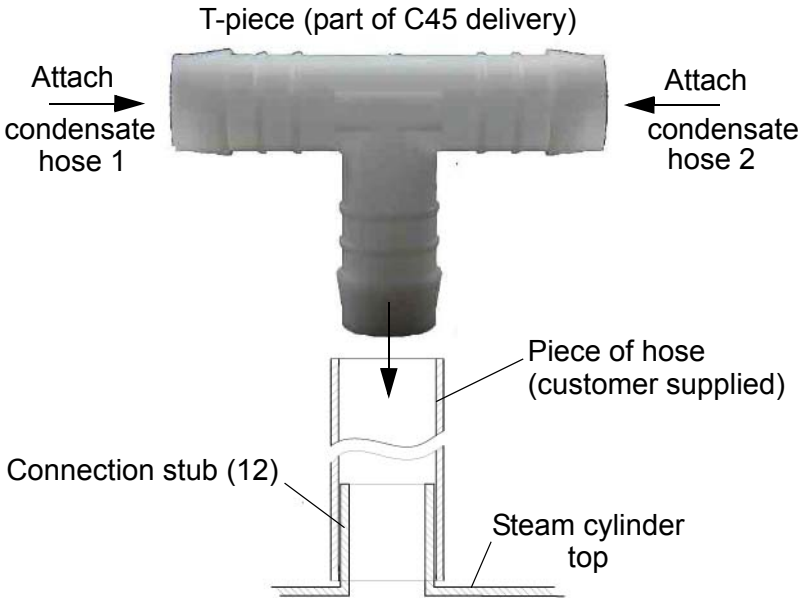
For connecting two condensate hoses, steam humidifier model C45 delivery comprises a Nylon T-piece.

» Open the connection stub (12) on the steam cylinder top by drilling it out with a 8 mm drill (ANSI drill size „O“).

» Connect a short piece of DN12 hose (not included in delivery) to the stub and secure with a clamp.

» Insert the T-piece outlet into the piece of hose connected in the step before and secure with a clamp.

» Connect the 2 condensate hoses from the steam manifold to the T-piece inlets and secure with clamps.



CompactLine C45 condensate hose attachment
(number in paranthesis refers to exploded view fig.)

Installation type 2

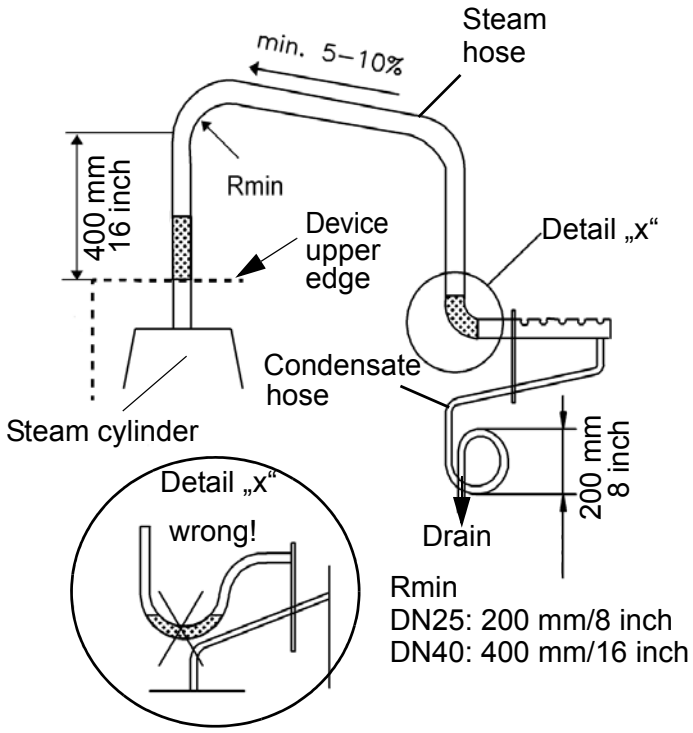
Steam manifold is positioned less than 500 mm/20 inch above or below device upper edge:

Please note

In this arrangement the condensate hose cannot be fed back to the steam humidifier.

» Run steam hose to a height of 400 mm/16 inch minimum above the steam humidfier and then to the steam manifold with a continous decline of 5 to 10 %.

» Feed condensate hose to a wastewater pipe/drain with a 200 mm/8 inch diameter loop as a steam barrier (5 to 10 % decline is mandatory). Minimum distance from steam manifold to loop must be 500 mm/20 inch). Fill loop with water.



Installation type 2, schematic representation

5.6 Unit Installation Check

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/8 inch?
- ☑ Is steam manifold positioned correctly? Are all bolts and clamps tightened?

6. Water Installation

⚠WARNING

Risk of scalding!
Very hot water on the humidifier drain side!
Have all installation work done by expert staff in order to avoid scalding hazards due to improper water guidance.

⚠WARNING

Risk of electrical shock!
Hazardous electrical high voltage!
Before starting installation work make sure that the unit is not connected to the power supply.

General rules

- Obey local public utility regulations
- Verify that necessary safety measures have been taken to eliminate backflow of polluted water into drinking water treatment facilities. This may require the installation of a system separator and free discharge into the drainage system. Within the humidifier, a double check valve (58) is incorporated in the water supply line. It prevents the backflow of water. Alternatively, units are available that feature the DVGW-conform HyFlow system separator making further safety measures obsolete
- Use feed water without chemical additives and with a conductivity between 200 and 800 µS/cm only. Beyond conductivity levels of 800 µS/cm up to a maximum of 1250 µS/cm and below conductivity levels of 200 µS/cm to a minimum of 125 µS/cm, special adjustments are required. In this case please contact your specialist dealer
- Supply water temperature must not exceed 40 °C/104 °F
- Allowable range of water pressure: 1 bar/14.5 psi min., 10 bar max./145 psi max
- Blow-down water must drain freely

6.1 Operation with Softened Water

NOTICE

Do not use softened water unless special measures are taken!
When feeding softened water into the HygroMatik steam humidifier, the aspects outlined below must be taken into account.

Softened water may 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 cylinder must then 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.

Recommendations

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/71-142 ppm. This value can be set lower if the water does not foam.

When blending softened water with deionized water (conductivity = 5-20 µS/cm) it must be ensured that the mixture neither foams nor is too low in conductivity.

When feed water contains softened water, the level of conductivity is typically higher at operating temperature.

6.2 Water Supply

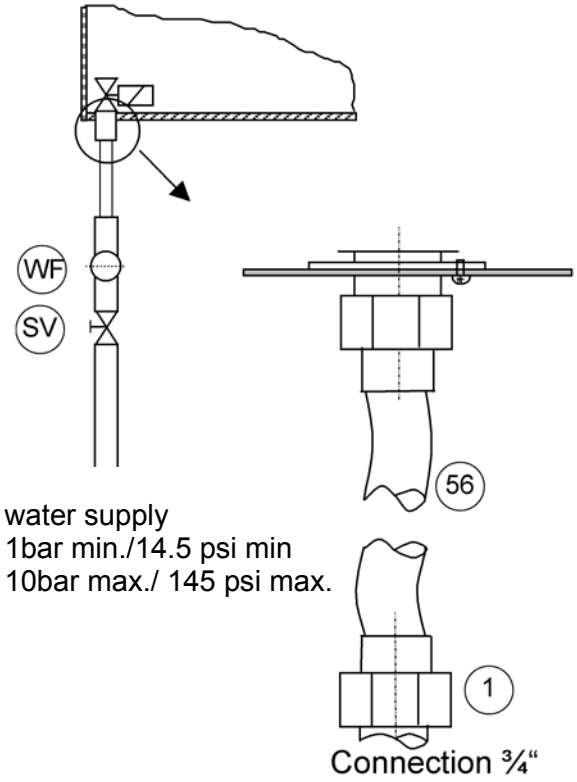
NOTICE

Risk of material damage!
Foreign material in water supply pipe may cause premature damage to the solenoid valve.
Flush water supply pipe before making connection to the solenoid valve (this is of particular importance in case of a newly installed pipe).

Please note In case of no safety device for drinking water protection according to DIN EN 1717 present in the house installation system, a system separator at least of the CA type is mandatory. Alternatively, a HygroMatik steam humidifier special type featuring the HyFlow provision may be used.

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

» Install a water filter (WF) if necessary.



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

For connection to the water supply line, the water hose (56) with cap nuts at both ends included in the delivery may be used. Make installation as follows:

» Check presence of solenoid valve strainer (29) and insert strainer, if not yet in place.

» Screw one of the cap nuts with its inner seal ring onto the connection stub protruding from the humdifier housing and tighten.

NOTICE

Risk of material damage!
Excessive tightening will destroy the solenoid fitting thread.
Do not overtighten the cap nut.

» Screw the other hose end cap nut with its inner seal on a customer-provided water tap (cup nut internal thread is ¾“).

6.3 Water discharge

⚠WARNING

Risk of scalding!
During blow down up to .3 l/sec (.08 gal./sec) are being drained with a temperature of about 95 °C/203 °F.
Wastewater must drain freely and pressureless!
Avoid contact in order not to burn skin.

Please note With the optional wastewater cooling system **HyCool**, HygroMatik offers an option for limiting the wastewater temperature of the steam humidifier in order to protect thermosensitive wastewater pipe lines. By blending with cold water during the blow-down and rinse process, it is ensured that the wastewater always has a temperature below 60°C/140°F.

Please note Steam humidifier and wastewater discharge must be on the same pressure level.

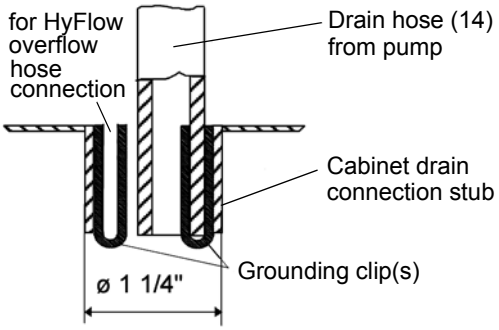
Guidelines for water discharge composition

- Use of flexible drain hose is advisable
- Do not buckle the drain hose
- For discharge line and drain pipe implementation, select temperature-resistant materials allowing up to 95°C/203°F
- Take care that ascending vapor does not condensate on humidifier cabinet

How to proceed

» Run a 1 1/4 " drain hose of 10 to 40 inch length into a pressure-free outlet (DIN EN 1717 is a good design reference for adequate drain composition).

» Slide other drain hose end over cabinet drain connection stub on the housing bottom side and secure with a clamp.



For grounding purposes, one or two metallic clip(s) is/are attached to the cabinet drain connection stub (s. fig. aside) making contact to the pump drain hose end (14) and the HyFlow drain hose (66), if present. When water flows through the pump drain hose during blow-down or in case of a HyFlow overflow, any stray current that might have built up in the drain water is grounded.

Between the pump drain hose jacket and the inner surface of the cabinet drain connection, a gap exists due to the diverging diameters. If water collects on the base plate, it will flow through this gap into the drain hose and then into the drainage system.

6.4 HyFlow Provision (Special order unit types)

DVGW CERT Anschlusssicher W 540

HygroMatik HyLine and CompactLine humidifiers are available featuring the certified plastic HyFlow system separator (DVGW CERT AS-0625CP0094 for HyLine, DVWG CERT AS-0625CP0095 for CompactLine).

The functions of the HyFlow cup are:

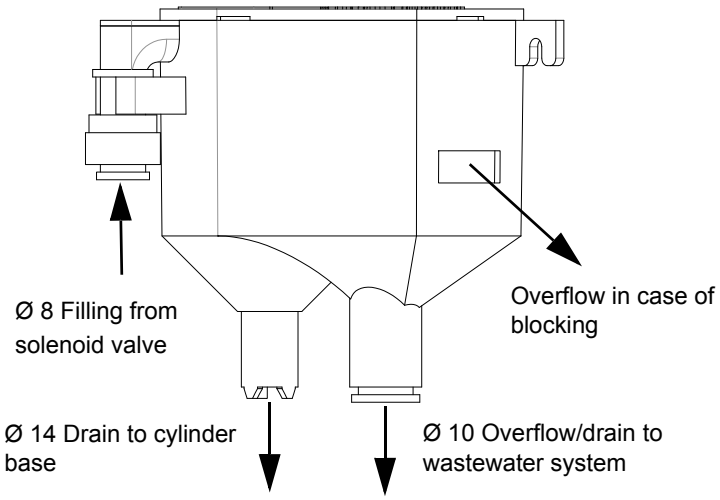
- cylinder filling
- separation of feed water supply and cylinder water, according to DIN EN 1717
- overflow protection in case of cylinder intake blocking

Cylinder filling

When the solenoid valve opens, water flows into the HyFlow cup and then into the cylinder base.The cylinder is filled by the static pressure of the water column.

Overflow protection

If the water level in the HyFlow cup gets too high, water flows over a partition panel into the draining system. In the unlikely case of both the cylinder intake and the drain being blocked, the water flows out through the overflow breakout and leaves the device through the wastewater hose. Contamination of the drinking water is thus excluded.



6.5 Water Installation Checklist

Verify correct system installation using the checklist below:

- ☑ All screws and clamps been properly tightened?
- ☑ Water supply line carefully flushed out?
- ☑ Water installation performed correctly?
- ☑ Drainage system correctly installed?
- ☑ Flushed-out water can drain freely?
- ☑ Water supply and drain free of leaks?

7. Electrical Connection

⚠WARNING

Risk of electrical shock!
Hazardous electrical high voltage!
All work related to electrical installation to be performed by authorized personnel only (electricians or professionals with equivalent training).

Please note The customer is responsible for checking qualifications.

Do not connect the steam humidifier to the live power supply before all installation work has been completed!

General installation rules

- All wiring must confirm to CEC, NEC and local electrical codes.
- Install the electrical connections according to the wiring diagram.
- Only a permanent connection to permanent wiring is allowable (UL998 CSA Std 222.2).
- Electric connector cables to be laid professionally

NOTICE

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

7.1 Electrical Installation

- Class 1 wiring only
- Fuses must have a contact gap of at least 3mm/0.12 inch 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 (UL998 CSA Std 222.2) when selecting wire cross-sections
- Verify that all terminals have been tightened

Fusing

We recommend employing medium blow main fuses. The tables below show input currents and the circuit protection required for the various HygroMatik humidifier models.

Please note *) After full blow down, power input is 1.3 times higher than in normal operation. The circuit protection recommended takes this into account. However, should problems arise when using expulsion fuses close to their specific limit it is recommended to employ fuses with a higher range.

HyLine:

Model		HY05	HY08	HY13	HY17	HY23
Data at 208 V3 Phase, 60 Hz	Power Rating [kW]	3.8	5.8	9.8	10.8	17.3
	Input Current [A]	10.4	16.0	27.0	30.0	47.9
	Circuit Protection [A] *)	3 x 15	3 x 20	3 x35	3 x 40	3 x 60
Data at 480 V/3 Phase, 60 Hz	Power Rating [kW]	3.8	6.0	9.8	12.8	17.3
	Input Current [A]	4.5	7.2	11.7	15.3	20.7
	Circuit Protection [A] *)	3 x 10	3 x 10	3 x 20	3 x 20	3 x 25
Data at 600 V/3 Phase, 60 Hz	Power Rating [kW]	3.8	6	9.8	12.8	17.3
	Input Current [A]	3.6	5.8	9.4	12.3	16.6
	Circuit Protection [A] *)	3 x 10	3 x 10	3 x 15	3 x 15	3 x 20

Model		HY30	HY45	HY60	HY90	HY116
Data at 208 V/3 Phase, 60 Hz	Power Rating [kW]	21.6	28.8	2x21.6	2x28.8	-
	Input Current [A]	60.0	80.0	2 x 60.0	2 x 80.0	-
	Circuit Protection [A] *)	3 x 75	3 x 100	6 x 75	6 x 100	-
Data at 480 V/3 Phase, 60 Hz	Power Rating [kW]	22.5	33.8	2x22.5	2x33.8	2x43.5
	Input Current [A]	27.1	40.6	2 x 27.1	2 x 40.6	2 x 52.3
	Circuit Protection [A] *)	3 x 35	3 x 45	6 x 35	6 x 45	6 x 65
Data at 600 V/3 Phase, 60 Hz	Power Rating [kW]	22.5	33.8	45.0	67.5	87.0
	Input Current [A]	21.7	32.5	2 x 21.7	2 x 32.5	2 x 41.9
	Circuit Protection [A] *)	3 x 30	3 x 40	6 x 30	6 x 40	6 x 50

CompactLine:

Technical Specifications Steam Humidifier CompactLine C01-C58 (with Basic, Comfort/-Plus control)										
Unit type		**C01**	**C02**	**C06**	**C10**	**C17**	**C22**	**C30**	**C45**	**C58**
Data at 208 V/3 Phase, 60 Hz	Power Rating [kW]	0.75	1.5	4.5	5.8	9.7	10.8	17.3	21.6	28.8
	Input Current [A]	3.6	7.2	12.5	16.0	27.0	30.0	47,9	60	80
	Circuit Protection [A] *)	2 x 6	2 x 10	3 x 15	3 x 20	3 x 35	3 x 40	3 x 60	3 x 75	3 x 100
Data at 480 V/3 Phase, 60 Hz	Power Rating [kW]	-	-	4.5	7.5	12.8	16.5	22.5	33.8	43.5
	Input Current [A]	-	-	5.4	7.2	15.3	19.8	27.1	40.6	52.3
	Circuit Protection [A] *)	-	-	3 x 10	3 x 10	3 x 20	3 x 25	3 x 30	3 x 45	3 x 60
Data at 600 V/3 Phase, 60 Hz	Power Rating [kW]	-	-	-	7.5	12.8	16.5	22.5	33.8	43.5
	Input Current [A]	-	-	-	5.8	12.3	15.9	21.7	32.5	41.9
	Circuit Protection [A] *)	-	-	-	3 x 10	3 x 15	3 x 20	3 x 25	3 x 35	3 x 50

MiniSteam:

Technical Specifications Steam Humidifier MiniSteam			
Model		**MS05**	**MS10**
Data at 208V/1 Phase, 60 Hz	Power Rating [kW]	3.3	3.3
	Input Current [A]	16	16
	Circuit Protection [A]*)	2 x 20	2 x 20
Data at 208V/3 Phase, 60 Hz	Power Rating [kW]	3.8	5.8
	Input Current [A]	10.4	16.0
	Circuit Protection [A]*)	3 x 15	3 x 20
Data at 480V/3 Phase, 60 Hz	Power Rating [kW]	3.8	7.5
	Input Current [A]	4.5	9.0
	Circuit Protection [A]*)	3 x 10	3 x 10
Data at 600V/3 Phase, 60 Hz	Power Rating [kW]	3.8	7.5
	Input Current [A]	3.6	7.2
	Circuit Protection [A]*)	3 x 10	3 x 10

7.2 Cable Connections

The table below shows the **number and size of the cable connections** provided in the various electrode steam humidifiers:

Unit type	Connection M16	Connection M25	Connection M32
HY05, HY08	4	3	-
HY13, HY17, HY23, HY30, Hy45	4	2	1
HY60, HY90, HY116	-	4	2
C01, C02	3	2	-
C6	3	2	-
C10	3	3	-
C17, C22, C30	4	3	-
C45, C58	4	2	1
MS05, MS10	-	2	-

Characteristics of metric cable connections

Thread	across-flats dimensions [mm] ([inch])	for cable diameter [mm] ([inch])
M16x1,5	19 (~ 0.75)	4,5 - 10 (~ 0.18 - 0.39)
M25x1,5	30 (~ 1.2)	9 - 17 (~ 0.35 - 0.67)
M32x1,5	36 (~ 1.4)	11 - 21 (~ 0.43 - 0.83)

7.3 Safety Interlock

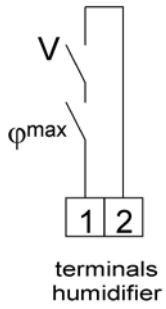
Please note Install contact interlocks, i.e. max. hygrostat, vane relay, pressure controller, air interlock, etc. in series across terminals 1 and 2.

NOTICE

Use max.-hygrostat for protection!
A max-hygrostat should be installed in the safety interlock. The max-hygrostat acts as a safety device in case the humidity sensor malfunctions.

NOTICE

Contacts across terminals 1 and 2 must be potential-free and properly rated!
Rating must comply with the control voltage in use (24 VAC or 208-240 VAC, see technical data on the unit‘s name plate).



7.4 Wiring Diagram

Please find the wiring diagram in the technical manual supplied with the control used with your humidifier. Every steam humidifier comes with a technical manual for the unit itself and one for the control unit.

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?

On the succesful completion of all of the checks the unit is ready for switching on.

⚠WARNING

Risk of electrical shock!
Personal safety in case of leaking currents is not guaranteed w/o proper grounding.
For grounding to function properly, the unit cover must be in place and the lock must be engaged (applies only to humidifier types HyLine and MiniSteam).

Please note Detailed information concerning initial operation, control, service and malfunctions as well as circuit diagrams can be found in the operation manuals for HygroMatik control units.

8. Commissioning

⚠WARNING

Risk of electrical shock!
Hazardous high electrical voltage!
Start-up of the unit is restricted to expert staff only (electricians or expert personnel with equivalent training).

Step 1: Check of mechanical integrity

» Check cylinder seating.

» Check steam and condensate hose clamps.

Step 2: Check of electrical wire connections

» Check that all electrical wire connections (including steam cylinder wiring) are tight and secure.

Step 3: Switching on the steam humidifier

» Switch on main breaker.

» Open water supply stopcock (operating pressure should be 1bar min., 10bar max./14.5 psi min., 145 psi max.).

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

Step 4: The unit performs a self-test

• If the control includes a display, the message “self-test“ is displayed

Please note For the next steps, control must be set in a way that permanent steam demand is requested.

Step 5: Normal operation starts

• the water solenoid valve opens and feeds water into the steam cylinder

• Initiation of steam production may take up to 20 mins

» 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 completed

Step 6: Monitor unit for leaks

» Let unit operate for 15 to 30 minutes.

» If leaks appear, switch off the unit.

Step 7: Repair leaks

» Repair leaks and check again.

9. Maintenance

Perform regular maintenance to give your unit a long life span. Inadequate or improper maintenance may cause operational malfunctions.

⚠WARNING

Risk of electrical shock!
Unit must be switched off and protected against restart by expert staff (electricians or expert personnel with equivalent training) before any maintenance work is commenced.

NOTICE

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

The steam humidifier's performance and maintenance intervals primarily depend on 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.

Cylinder maintenance is required the latest if the following conditions apply:

Control	Indicator
Basic	Maintenance message: **red and green LEDs** blinking: Unit has switched itself off automatically.
Comfort Comfort Plus	**Maintenance** message on display (**red and green LED** blinking). Unit has switched itself off automatically.

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.
Semi-annually (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. 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.

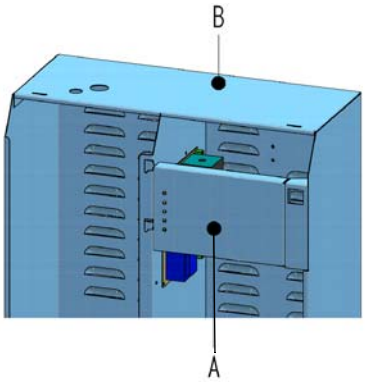
In extreme cases, water pretreatment may be necessary (softening by dilution to approx. 4 - 8 °dH; decarbonization/partial desalination to achieve target reductions in carbonate hardness).

HygroMatik would be pleased to refer you to companies specializing in water treatment systems.

9.2 Access to Electrical Enclosure

⚠WARNING

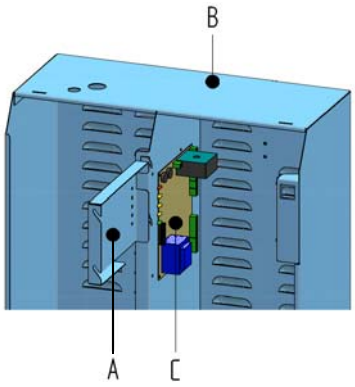
Risk of electrical shock!
Hazardous electrical high voltage!
Make sure the unit is switched off before installing or removing the display panel.



» Remove cover from humidifier (B) and lift display panel (A) off guiding.

» Turn display panel by 90 degrees (see fig. on the left) and attach display panel to the humidifier cabinet by placing the two guide pins in the corresponding slots.

» The basic PCB (C) is now accessable.



9.3 Removing and Cleaning the Steam Cylinder

⚠WARNING

Risk of skin burning!
Hot steam cylinder during operation and for some time afterwards.
Drain steam cylinder before any maintenance work is commenced.
Switch off unit and protect against restart.
After that, wait approx. 10 mins before starting maintenance work.
Check steam cylinder temperature by cautious approximation with hand (do not touch!).

Please note

After beeing in use for a long time some mechanical cylinder shrinkage may occur. While this has no effect on the device function, it may cause a problem when only one half of the cylinder is exchanged. Such, it is generally advisable to exchange the complete cylinder.

⚠CAUTION

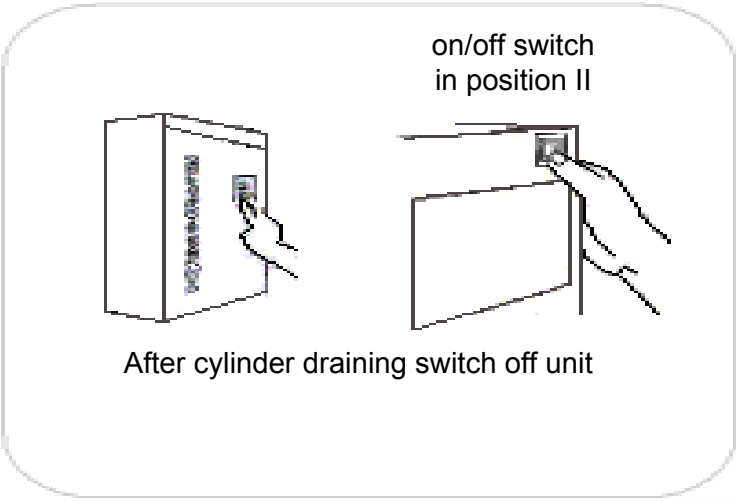
Risk of injuries to the eyes!
Cylinder clips may jump off due to pretension.
Wear proper PPE (Personal protection equipment)!

⚠CAUTION

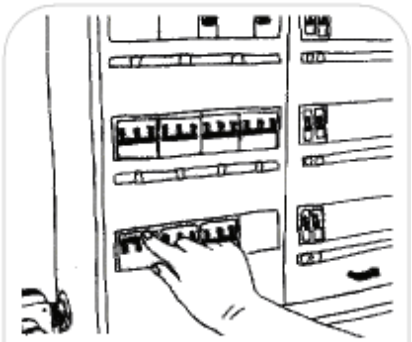
Risk of cut injuries!
Both the clamps that fix the steam cylinder halves and the electrodes have sharp edges and angles.
Wear proper PPE (Personal protection equipment)!

⚠WARNING

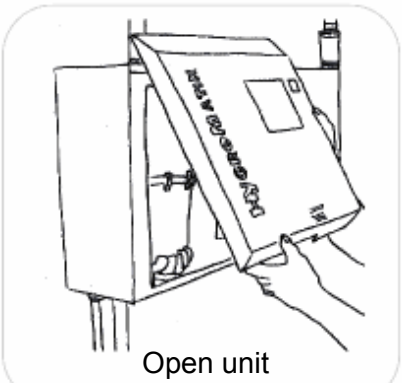
Risk of electrical shock!
Hazardous electrical high voltage!
Disconnect the appliance from power supply before removing cover.



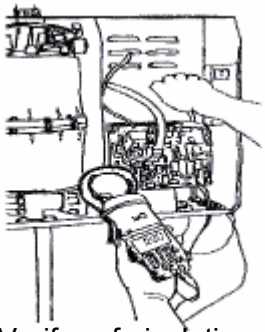
After cylinder draining switch off unit



Disconnect unit from power grid and secure against reconnection



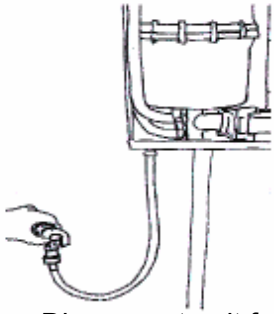
Open unit



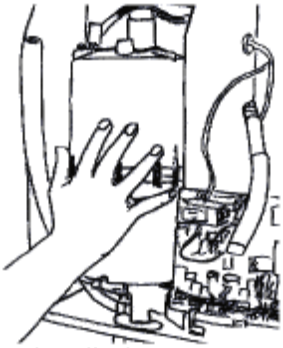
Verify safe isolation

Remove stopper

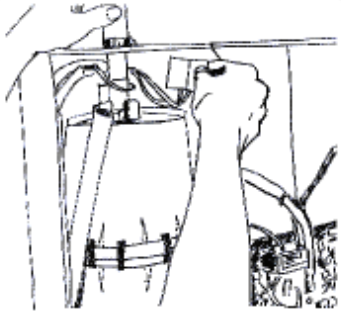
Completely drain the cylinder



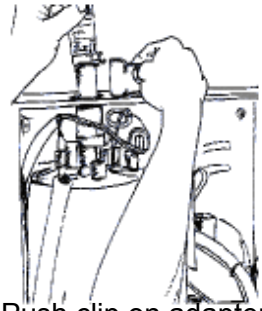
Disconnect unit from water supply



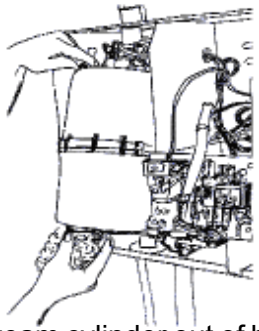
Check cylinder temperature



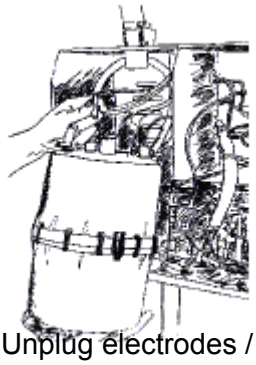
Remove steam hose from adapter



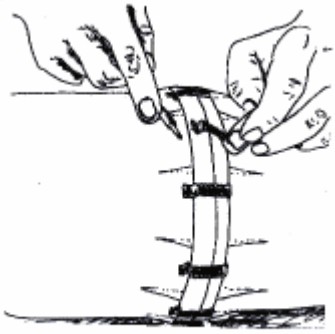
Push clip on adapter outside cabine



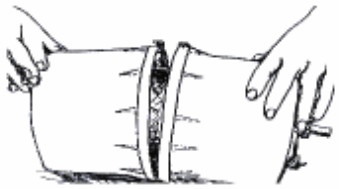
Lift steam cylinder out of base



Unplug electrodes / sensor electrode

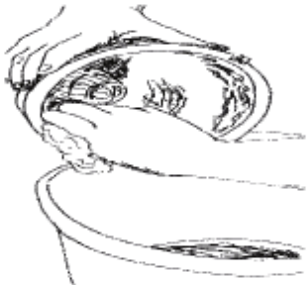


Remove flange clamps

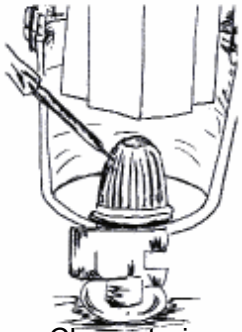


Open cylinder

Remove used O-ring



Clean cylinder inside. Do not use acids or other chemicals.



Clean strainer

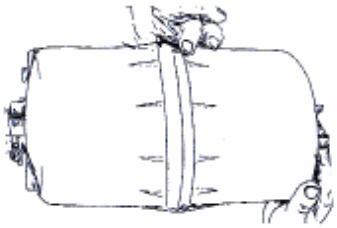
» Check the inside of the top part of steam cylinder for crust build-up and possible salt bridges (black grooves between the electrode leads). If present, wash away completely.

Please note If electrical arcs have burned deep grooves into the material, the top part of the cylinder (better: the complete cylinder, s. above) must be replaced.

» Clean the sensor electrode until it is bright.

Reassembly

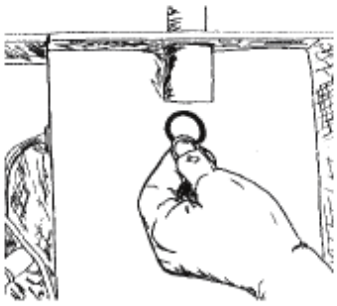
Insert new O-ring



Connect upper and lower part with clamps

Please note When re-assembling the cylinder, 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

Please note Before the electrode plugs are attached, please make sure that they are free of corrosion. Replace relevant electrode plug, if corrosion is found.

» Connect plugs to the correct electrodes.

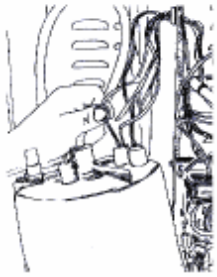
NOTICE

Ensure proper plug seating on electrodes!

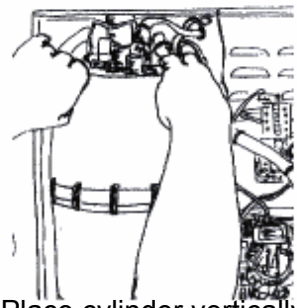
The plugs must be pressed down onto the electrodes as far as they will go.

Please note Wiring color corresponds with the color of the knurled nut.

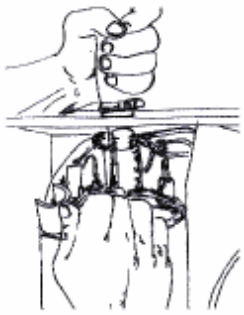
Please note When reinstalling the steam cylinder, make sure that the condensate connection shows towards the unit front on the left hand side.



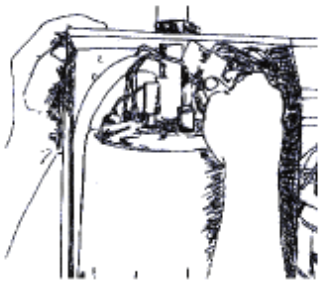
Connect plug to level sensor / electrodes



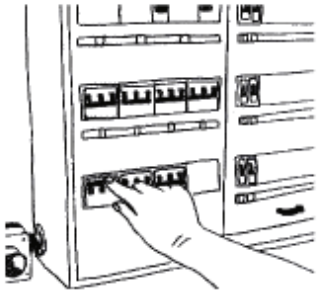
Place cylinder vertically into cylinder base



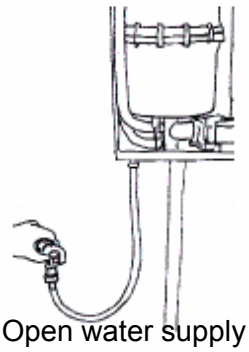
Attach adapter to steam outlet



Hold adapter in place with clip



Reconnect to power grid



Open water supply

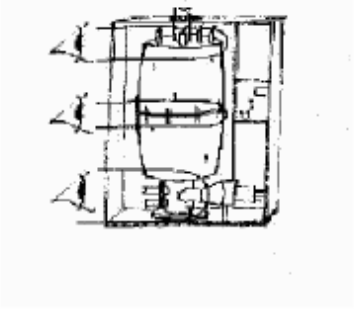
⚠WARNING

Risk of electrical shock!
Hazardous electrical high voltage!
Follow safety instructions for work on live equipment.

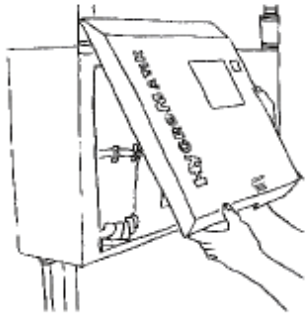
» Switch on unit and monitor for leakage during 15-30 minutes of operating.

» In case of leakage switch of unit and redeem leakage(s).

» Monitor again; repeat procedure until no more leakages are detected.



Check for leakages



Close cabinet

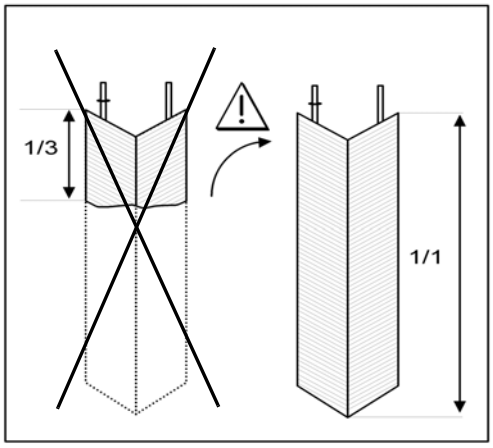
⚠WARNING

Risk of electrical shock!
Personal safety by proper grounding may not be ensured.
In order for the unit cover to be safely grounded, the cover must be fully closed and the lock must be engaged (this refers only to humidifier types HyLine and MiniSteam).

9.4 Electrode wear

Electrode wear depends on:

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



NOTICE

Monitor electrode lengths!

When the electrodes are less than 1/3 to 1/2 of their original length, they should be replaced . At the latest, the replacement should be carried out when a maintenance message is displayed asking for replacement. This maintenance message will appear after one hour of operation at maximum water level. The humidifier operation will then stop.

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
[inch]	6.1	9.25	11.8

CompactLine:

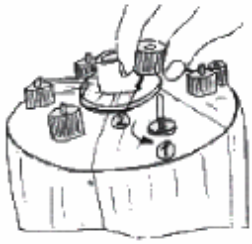
Type	C01	C02	C06	C10	C17- 45	C58
Length [mm]	115	80	125	155	235	300
[inch]	4.5	3.2	4.9	6.1	9.25	11.8

9.4.2 Uneven Electrode Lengths

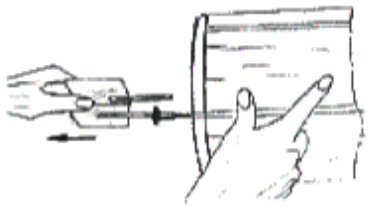
In most case, the longer electrode(s) were not supplied with power for a period of time and thus did not underlie any wear. The cause of the problem, such as a tripped circuit breaker, may have been resolved already. However, since the shorter electrode(s) have a greater specific load, the electrodes continue to wear unevenly.

Please note Replace electrodes with significantly uneven wear. Check the power supply (circuit breaker, voltage drop). Also see operating manual of the relevant HygroMatik control, section "Faults and Messages."

9.5 Replacing Electrodes

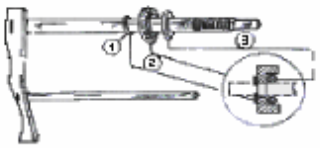


remove handnut



remove electrode

detailed view of new electrode



Mount correctly:
1 = shaft seal, 2 = brass ring, 3 = O-ring

insert electrode

fasten handnut hand-tight
L1=black, L2=red, L3=grey
B1=grey

The numbers in paranthesis refer to the exploded view figure.

» 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!

NOTICE

Ensure proper plug seating on electrodes!
The plugs must be pressed down onto the electrodes as far as they will go.

Please note Connect plugs to the corresponding electrodes as indicated by 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.

Please note Water conductivity is too high or water is not decanted oftenly enough if the following phenomina are observed:

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

In all of these cases please contact your expert dealer.

9.6 Cleaning the blow- down pump

The numbers in paranthesis refer to the exploded view figure.

» Remove cylinder.
» Detach e-cable from pump.
» Detach adapter (30) from pump.
» Loosen screws (44) and remove pump from base.
» Open pump (bayonet lock).
» Remove residues from drain hoses and pump (if neccessary replace o-ring (33) or housing (34) if these components are no longer in excellent condition).
» Reassemble pump.
» Moisten o-ring (31) and insert in side connection of base.
» Push pump into base and mount tightly with screws (44).
» Moisten o-ring (31) and insert in adapter (30).
» Fit adapter (30) over the side connection of pump.
» Connect e-cable to pump.
» Re-install cylinder.

⚠WARNING

Risk of electrical shock!
Hazardous electrical high voltage!
Follow safety instructions for work on live equipment.

» Switch on unit and monitor for leakage during 15-30 minutes of operation.
» In case of leakage switch off unit and redeem leakage(s).
» Monitor again; repeat procedure until no more leakages are detected.

9.7 Cleaning the Water Inlet Solenoid Valve

The numbers in paranthesis refer to the exploded view figure.

Removal

» Shut off water supply and loosen water installation hose connection.
» Remove cylinder.
» Remove connecting hose (21) from cylinder base.
» Detach electrical cable from solenoid valve.
» Unscrew solenoid valve mounting screws and remove solenoid valve from housing.
» Clean solenoid valve intake area
» Remove mesh filter (29) from solenoid valve and clean. Replace if required.

Re-installation

» Insert fine mesh filter.

» Reinsert solenoid valve with seal in unit housing opening an bolt down.

» Screw on water installation hose.

» Connect electrical cable to solenoid valve.

» Attach connecting hose (21) to cylinder base.

» Install cylinder.

» Turn on water supply tap.

⚠WARNING

Risk of electrical shock!
Hazardous electrical high voltage!
Follow safety instructions for work on live equipment.

» Switch on unit and monitor for leakage during 15-30 minutes of operation.

» In case of leakage switch off unit and redeem leakage(s).

» Monitor again; repeat procedure until no more leakages are detected.

9.8 Cleaning the Water Inlet Solenoid Valve and HyFlow System Separator (special models only)

Removal

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

» Remove cylinder.

» Remove grounding sleeve (62) from solenoid valve (63). To do so, push the collet into the John-Guest connection fitting and pull out the grounding sleeve with the HyFlow connecting hose attached.

» Remove connecting hose from HyFlow to cylinder base.

» Detach electrical cable from solenoid valve (63).

» Remove solenoid valve and HyFlow mounting screws.

» Remove solenoid valve and HyFlow from the housing.

» Clean inlet section of solenoid valve.

Re-installation

» Reinsert solenoid valve with seal in the unit housing opening and bolt down.
» Screw on water supply hose.
» Connect electrical cable to the solenoid valve.
» Attach HyFlow with screw.
» Attach connecting hose (21) to the base. Squeeze the John Guest connections firmly.
» Install cylinder.
» Turn on tap.

⚠WARNING

Risk of electrical shock!
Hazardous electrical high voltage!
Follow safety instructions for work on live equipment.

» Switch on unit and monitor for leakage during 15-30 minutes of operation.
» In case of leakage switch off unit and redeem leakage(s).
» Monitor again; repeat procedure until no more leakages are detected.

9.9 Checking Cable Connections and Electrode Cables

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

NOTICE

Ensure proper plug seating on electrodes!
The plugs must be pressed down onto the 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.

Please note Electrode plugs wear out when removed and reinstalled for several times. Replace plugs when required.

9.10 Checking Hoses

Since steam and condensate hoses are also subject to wear they have to be checked regularly.

9.11 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.

10. Dismantling

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

⚠WARNING

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

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

11. CSA Certificate of Compliance

CSA Group

Certificate of Compliance

Certificate: 1887098 **Master Contract:** 238708

Project: 70027121 **Date Issued:** March 23, 2015

Issued to: **Hygromatik GmbH**
Lise-Meitner Strasse 3
Henstedt-Ulzburg, D-24558
GERMANY
Attention: Michael Lutkemann

The products listed below are eligible to bear the CSA Mark shown with adjacent indicators 'C' and 'US' for Canada and US or with adjacent indicator 'US' for US only or without either indicator for Canada only.

C US

Issued by: *Joginder Dhaliwal*
Joginder Dhaliwal

PRODUCTS
CLASS - C121106 - COMFORT CONDITIONING EQUIPMENT-Humidifiers and Evaporative Coolers
CLASS - C121186 - COMFORT CONDITIONING EQUIPMENT-Humidifiers and-Evaporative Coolers - Certified to U.S. Standards

For details related to rating, size, configuration, etc. reference should be made to the CSA Certification Record or the descriptive report.

Humidifiers, electrode type, stationary, industrial or commercial, rated 600V or less, 60Hz, 1 ph or 3 ph, as follows:

Models MS05, MS10, 3,5 kW max. (1 ph) and 7.5 kW max (3 ph).
Models C01. C02, C06, C10, C17, C22, C30, C45, C58; 14.4 kW max. (1 ph) and 43.5 kW max (3 ph).

Models HY05, HY08, HY13, HY17, HY23, HY30, HY45, HY60, HY90, HY116; 28.8 kW max (1ph) and 87 kW max (3 ph).

Notes:
1. Model designation may be followed by suffix letters and numbers denoting type of control, supply voltage, number of phases.
2. Installation of the equipment in the field is subject to acceptance by the local inspection authority.

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CSA Group

Certificate: 1887098 **Master Contract:** 238708
Project: 70027121 **Date Issued:** March 23, 2015

APPLICABLE REQUIREMENTS

CSA Std C22.2 No. 104-11 (4th Ed) - Humidifiers
UL Std No. 998 (5th Ed) - Humidifiers

CSA Group

Supplement to Certificate of Compliance

Certificate: 1887098 **Master Contract:** 238708

The products listed, including the latest revision described below, are eligible to be marked in accordance with the referenced Certificate.

Product Certification History

Project	Date	Description
70027121	Mar 23 2015	Update report 1887098 to add new model Series MS and add 230 V Control option.
2479304	Nov 29 2011	Update Report 1887098 to add new models C01 and 02, those are similar to the existing models.
1887098	Aug 31 2007	Transfer Report LR 86547-3 and add alternate Class 2 ELV controller board & UL Recognized transformers to Certified HY & C line models.

12. Spare Parts

	HY05	HY13								
*	HY08	HY17	HY23	HY30	HY45	HY60	HY90	HY116	Article No.	Description
55									E-2124010	Keys for safety, set=2pc.
54									E-2124012	Safety lock incl. 2 keys
										Steam generation universal
	1								B-3204031	Steam cylinder CY8 compl. with electrodes and hand nuts **
		1							B-2204101	Steam cylinder CY17 DN 25 compl. with electrodes and hand nuts **
			1						B-2204111	Steam cylinder CY17 DN 40 compl. with electrodes and hand nuts **
				1		2			B-2204105	Steam cylinder CY30 compl. with electrodes and hand nuts **
					1		2	2	B-2204109	Steam cylinder CY45 compl. with electrodes and hand nuts **
16	1								E-3226005	Top part of steam cylinder CY8 DN 25/12, empty
16		1							E-2206068	Top part of steam cylinder CY17 DN 25/12, empty
16			1						E-2206082	Top part of steam cylinder CY17 DN 40/12, empty
16				1		2			E-2206069	Top part of steam cylinder CY30 DN 40/12, empty
16					1		2	2	E-2207001	Top part of steam cylinder CY45 2 x DN 40/12, empty
19	1								B-3216007	Lower part of steam cylinder CY8 compl. with strainer **
19		1	1						B-2206046	Lower part of steam cylinder CY17 compl. with strainer * *
19				1		2			B-2206071	Lower part of steam cylinder CY30 compl. with strainer **
19					1		2	2	B-2207002	Lower part of steam cylinder CY45 compl. with strainer **
17	1								E-3216010	O-ring seal for cylinder flange CY8, transparent cylinder
17		1	1						E-2206050	O-ring seal for cylinder flange CY17, transparent cylinder
17				1		2			E-2206051	O-ring seal for cylinder flange CY30, transparent cylinder
17					1		2	2	E-2207011	O-ring seal for cylinder flange CY45, transparent cylinder
35	1								E-3216011	O-ring seal for cylinder base
35		1	1	1	1	2	2	2	E-2204022	O-ring seal for cylinder base

	HY05	HY13								
*	HY08	HY17	HY23	HY30	HY45	HY60	HY90	HY116	Article No.	Description
10	1								B-3204027	Sensor electrode compl. with hand nut
10		1	1	1	1	2	2	2	B-2204075	Sensor electrode compl. with hand nut
10	1	1	1	1	1	2	2	2	E-3216025	Plug-in contact with isolating hose for sensorelectrode
4	3								E-3216024	Plug-in contact with isolating hose for steam generating electrodes
4		3	6	6		12			E-2206059	Plug-in contact with isolating hose for steam generating electrodes
4					6		12	12	E-2207016	Plug-in contact with isolating hose for steam generating electrodes
18	12	18	18	24	24	48	48	48	E-3216022	Clamp for flange of transparent cylinder
37	1								E-3220000	Cylinder base DN20/25/15/12
37		1	1	1	1	2	2	2	E-2206086	Cylinder base DN40/25i/15/12
	1	1	1	1	1	1	1	1	B-3216023	Mounting set for Cylinder base
12	1	1	1	1	1	2	2	2	E-2204035	Condensate cap DN12
1	1								E-3221002	Adapter for steam hose DN25, CY8
1		1							E-2209000	Adapter for steam hose DN25, CY17
1			1						E-2209004	Adapter for steam hose DN40, CY17
1				1		4			E-2209006	Adapter for steam hose DN40, CY 30
1					2		4	4	E-2209008	Adapter for steam hose DN40, CY 45
2	1	1							E-3221004	Clip for adapter DN25
2			1	1	2	4	4	4	E-2209002	Clip for adapter DN40
3	1	1							E-3221006	O-ring for adapter DN25
3			1	1	2	4	4	4	E-2204022	O-ring for adapter DN40
	1								B-3216073	O-ring set CY8 (Pos. 3, 17, 35)
		1							B-2207021	O-ring set CY17 DN25 (Pos. 3, 17, 35)
			1						B-2207023	O-ring set CY17 DN40 (Pos. 3, 17, 35)
				1		2			B-2207025	O-ring set CY30 (Pos. 3, 17, 35)
					1		2	2	B-2207027	O-ring set CY45 (Pos. 3, 17, 35)

	HY05	HY13								
*	HY08	HY17	HY23	HY30	HY45	HY60	HY90	HY116	Article No.	Description
										Steam generation with electrical supply 500V and higer
	1								B-3204033	Steam cylinder CY8 compl. with electrodes and hand nuts **
		1							B-2206109	Steam cylinder CY17 DN 25 compl. with electrodes and hand nuts **
			1						B-2206113	Steam cylinder CY17 DN 40 compl. with electrodes and hand nuts **
				1		2			B-2206115	Steam cylinder CY30 compl. with electrodes and hand nuts **
					1		2	2	B-2206117	Steam cylinder CY45 compl. with electrodes and hand nuts **
16	1								E-3226005	Top part of steam cylinder CY8 DN 25/12, empty
16		1							E-2206068	Top part of steam cylinder CY17 DN 25/12, empty
16			1						E-2206082	Top part of steam cylinder CY17 DN 40/12, empty
16				1		2			E-2206069	Top part of steam cylinder CY30 DN 40/12, empty
16					1		2	2	E-2207001	Top part of steam cylinder CY45 2 x DN 40/12, empty
		1	1						E-2206054	O-ring CY17, silicone, for cylinder flange
				1		2			E-2206056	O-ring CY30, silicone, for cylinderflange
					1		2	2	E-2207014	O-ring CY45, silicone, for cylinderflange
		1							B-2208007	Cylinder star CY17/3
			1						B-2208013	Cylinder star CY17/6
				1		2			B-2208009	Cylinder star CY 30
					1		2	2	B-2208011	Cylinder star CY 45
	3								E-3216024	Plug-in contact for electrode 16A
		3	6	6		12			E-2206059	Plug-in contact for electrode 35A
					6		12	12	E-2207016	Plug-in contact for electrode 63A
	1								B-3216083	O-ring set CY8 (Pos. 3, 17, 35)
		1							B-2207051	O-ring set CY17 DN25 (Pos. 3, 17, 35)
			1						B-2207053	O-ring set CY17 DN40 (Pos. 3, 17, 35)
				1		2			B-2207055	O-ring set CY30 (Pos. 3, 17, 35)
					1		2	2	B-2207057	O-ring set CY45 (Pos. 3, 17, 35)
48	1								B-3204013	Electrodes compl. with hand nuts (M6), set=3pc. for CY8
48		1							B-2204081	Electrodes compl. with hand nuts (M8), set=3pc. for CY17
48			1						B-2204083	Electrodes compl. with hand nuts (M8), set=6pc. for CY17
				1		2			B-2204095	Electrodes compl. with hand nuts (M8), set=6pc. for CY30
48					1		2	2	B-2204085	Electrodes compl. with hand nuts (M10), set=6pc. for CY45
	1								B-2207127	maintenance set for steam cylinder CY8 ***
		1							B-2207129	maintenance set for steam cylinder CY17 DN25 ***
			1						B-2207133	maintenance set for steam cylinder CY17 DN40 ***
				1		2			B-2207135	maintenance set for steam cylinder CY30 ***
					1		2	2	B-2207137	maintenance set for steam cylinder CY45 ***

	HY05	HY13								
*	HY08	HY17	HY23	HY30	HY45	HY60	HY90	HY116	Article No.	Description
										Steam generation with electrical supply between 380 and 480V
	1								B-3204031	Steam cylinder CY8 compl. with electrodes and hand nuts **
		1							B-2204101	Steam cylinder CY17 DN 25 compl. with electrodes and hand nuts **
			1						B-2204111	Steam cylinder CY17 DN 40 compl. with electrodes and hand nuts **
				1		2			B-2204105	Steam cylinder CY30 compl. with electrodes and hand nuts **
					1		2	2	B-2204109	Steam cylinder CY45 compl. with electrodes and hand nuts **
16	1								E-3226005	Top part of steam cylinder CY8 DN 25/12, empty
16		1							E-2206068	Top part of steam cylinder CY17 DN 25/12, empty
16			1						E-2206082	Top part of steam cylinder CY17 DN 40/12, empty
16				1		2			E-2206069	Top part of steam cylinder CY30 DN 40/12, empty
16					1		2	2	E-2207001	Top part of steam cylinder CY45 2 x DN 40/12, empty
		1	1						E-2206054	O-ring CY17, silicone, for cylinder flange
				1		2			E-2206056	O-ring CY30, silicone, for cylinderflange
					1		2	2	E-2207014	O-ring CY45, silicone, for cylinderflange
48	1								B-3204019	Electrodes compl. with hand nuts (M6), set=3pc. for CY8
48		1							B-2204081	Electrodes compl. with hand nuts (M8), set=3pc. for CY17
48			1						B-2204083	Electrodes compl. with hand nuts (M8), set=6pc. for CY17
				1		2			B-2204095	Electrodes compl. with hand nuts (M8), set=6pc. for CY30
48					1		2	2	B-2204085	Electrodes compl. with hand nuts (M10), set=6pc. for CY45
		1							B-2208007	Cylinder star CY17/3
			1						B-2208013	Cylinder star CY17/6
				1		2			B-2208009	Cylinder star CY 30
					1		2	2	B-2208011	Cylinder star CY 45
	3								E-3216024	Plug-in contact for electrode 16A
		3	6	6		12			E-2206059	Plug-in contact for electrode 35A
					6		12	12	E-2207016	Plug-in contact for electrode 63A
	1								B-3216073	O-ring set CY8 (Pos. 3, 17, 35)
		1							B-2207021	O-ring set CY17 DN25 (Pos. 3, 17, 35)
			1						B-2207023	O-ring set CY17 DN40 (Pos. 3, 17, 35)
				1		2			B-2207025	O-ring set CY30 (Pos. 3, 17, 35)
					1		2	2	B-2207027	O-ring set CY45 (Pos. 3, 17, 35)
	1								B-3216079	maintenance set for steam cylinder CY8 ***
		1							B-2207029	maintenance set for steam cylinder CY17 DN25 ***
			1						B-2207031	maintenance set for steam cylinder CY17 DN40 ***
				1		2			B-2207033	maintenance set for steam cylinder CY30 ***
					1		2	2	B-2207035	maintenance set for steam cylinder CY45 ***

*	HY05 HY08	HY13	HY23	HY30	HY45	HY60	HY90	HY116	Article No.	Description
										Steam generation with electrical supply 240V or lower
	1								B-3216109	Steam cylinder CY8 compl. with electrodes and hand nuts **
		1							B-2204101	Steam cylinder CY17 DN 25 compl. with electrodes and hand nuts **
			1						B-2204111	Steam cylinder CY17 DN 40 compl. with electrodes and hand nuts **
				1		2			B-2204105	Steam cylinder CY30 compl. with electrodes and hand nuts **
					1		2	2	B-2204109	Steam cylinder CY45 compl. with electrodes and hand nuts **
48	1								B-3204009	Electrodes compl. with hand nuts (M6), set=3pc. for CY8
48		1							B-2204081	Electrodes compl. with hand nuts (M8), set=3pc. for CY17
48			1						B-2204083	Electrodes compl. with hand nuts (M8), set=6pc. for CY17
				1		2			B-2204095	Electrodes compl. with hand nuts (M8), set=6pc. for CY30
48					1		2	2	B-2204085	Electrodes compl. with hand nuts (M10), set=6pc. for CY45
	1									maintenance set for steam cylinder CY8 ***
		1							B-2207129	maintenance set for steam cylinder CY17 DN25 ***
			1						B-2207133	maintenance set for steam cylinder CY17 DN40 ***
				1		2			B-2207135	maintenance set for steam cylinder CY30 ***
					1		2	2	B-2207137	maintenance set for steam cylinder CY45 ***
16					1		2	2	E-2207001	Top part of steam cylinder CY45 2 x DN 40/12, empty
		1	1						E-2206050	O-ring CY17, for cylinder flange
				1		2			E-2206051	O-ring CY30, for cylinderflange
					1		2	2	E-2207011	O-ring CY45, for cylinderflange
	3								E-3216024	Plug-in contact for electrode 16A
		3	6	6		12			E-2206059	Plug-in contact for electrode 35A
					6		12	12	E-2207016	Plug-in contact for electrode 63A
	1								B-3216073	O-ring set CY8 (Pos. 3, 17, 35)
		1							B-2207021	O-ring set CY17 DN25 (Pos. 3, 17, 35)
			1						B-2207023	O-ring set CY17 DN40 (Pos. 3, 17, 35)
				1		2			B-2207025	O-ring set CY30 (Pos. 3, 17, 35)
					1		2	2	B-2207027	O-ring set CY45 (Pos. 3, 17, 35)
	1								B-3216079	maintenance set for steam cylinder CY8 ***
		1							B-2207229	maintenance set for steam cylinder CY17 DN25 ***
			1						B-2207231	maintenance set for steam cylinder CY17 DN40 ***
				1		2			B-2207233	maintenance set for steam cylinder CY30 ***
					1		2	2	B-2207235	maintenance set for steam cylinder CY45 ***

*	HY05 / HY08	HY13 / HY17	HY23	HY30	HY45	HY60	HY90	HY116	Article No.	Description
										Water feed
21	0,90	1,60	1,60	1,60	1,90	1,60	1,90	1,90	E-2604002	Connecting hose solenoid valve - cylinder base, per m
25	1								B-2304029	Solenoid valve, servo controlled, straight type, 0,2-10bar, 2,5 l/min. (at 4 bar), 24V
25		1	1	1	1	2	2	2	B-2304027	Solenoid valve, servo controlled, straight type, 0,2-10bar, 3,5 l/min. (at 4 bar), 24V
56	1	1	1	1	1	2	2	2	B-2304031	Hose for w ater connection, 3/4" cap nuts on both sides, seal included
	1								E-3320400	Flow rate controller 2,5 l/min
		1	1	1	1	2	2	2	E-2321100	Flow rate controller 3,5l /min
	(1)								B-2304045	Double solenoid valve for Super flush applications, 2.5l/min (at 4 bar), 24V
		(1)	(1)	(1)	(1)	(2)	(2)	(2)	B-2304047	Double solenoid valve for Super flush applications, 3.5l/min (at 4 bar), 24V
	1								B-2304301	Solenoid valve HY05/08 2,5l/min at 4bar, 200-240V
		1	1	1	1	1	1	1	B-2304303	Solenoid valve HY13-116 3,5l/min at 4bar, 200-240V
	1								B-2304305	Double solenoid valve SuperFlush HY05/08, HL06-27 2,5l/min at 4bar, 200-240V
		1	1	1	1	1	1	1	B-2304307	Double solenoid valve SuperFlush HY13-116, HL30-45 3,5l/min at 4bar, 200-240V
	1								B-2304405	Double solenoid valve HyCool Hy05/08, C10 2,2 l/min & 8l/min, 0,2-10bar
		1	1	1	1	1	1	1	B-2304407	Double solenoid valve HyCool Hy13-116, C17-58 3,5 l/min & 8l/min, 0,2-10bar
29	(1)	(1)	(1)	(1)	(1)	(2)	(2)	(2)	E-2304024	Fine filter in the inlet fitting of solenoid valve
38	0,40	0,70	0,70	0,70	0,80	0,70	0,80	0,80	E-2604004	Hose for manual w ater drain, per m
20	1	1	1	1	1	1	1	1	E-2604066	Handhold stopper, black
	1	1	1	1	1	2	2	2	E-2305002	seal for hose for w ater connection (B-2304031)
										Water drain
	1								B-3401017	Drain-hose-system (Pos. 6, 14, 15, 30, 31)
		1	1						B-3401019	Drain-hose-system (Pos. 6, 14, 15, 30, 31)
				1		2			B-3401013	Drain-hose-system (Pos. 6, 14, 15, 30, 31)
					1		2	2	B-3401021	Drain-hose-system (Pos. 6, 14, 15, 30, 31)
31	1	1	1	1	1	2	2	2	E-3220005	O-ring for pump-adapter
31	1	1	1	1	1	2	2	2	E-3220005	O-ring for cylinder base -pump
33		1	1	1	1	1	1	1	E-2404024	O-ring for drain pump (cover-motor)
32	1	1	1	1	1	2	2	2	B-2404025	Drain pump w ithout mounting set
32	1	1	1	1	1	2	2	2	B-2404027	Drain pump w ithout mounting set
	1	1	1	1	1	2	2	2	B-2424014	Mounting set for drain pump
6	1	1	1	1	1	2	2	2	E-2425004	Elbow w ith vent pipe
57	1	1	1	1	1	2	2	2	E-2420423	Drain hose 1 1/4"
										Control
										universal
	1	1							B-2507043	Main contactor 20 A incl. 2x NO contact, 24V
			1	1		2			B-2507063	Main contactor 35 A incl. 2x NO contact, 24V
							2		B-2507073	Main contactor 50 A incl. 2x NO contact, 24V
					1			2	B-2507083	Main contactor 65 A incl. 2x NO contact, 24V
	1	1							B-2507041	Main contactor 20 A, 230 V
			1	1		2			B-2507061	Main contactor 35 A, 230 V
							2		B-2507071	Main contactor 50 A, 230 V
					1			2	B-2507081	Main contactor 65 A, 230 V
	2	2	2	2	2	4	4	4	E-2504039	Control fuse (fast acting) 5 A, 5x20 mm
	1	1	1	1	1	2	2	2	E-2505206	Control fuse (fast acting) 1,6 A, 5x20 mm
4	1								B-3526021	Connecting cables for electrodes w ith plug-in contact, set=3pc
4		1							B-2524323	Connecting cables for electrodes w ith plug-in contact, set=3pc
4			1						B-2524325	Connecting cables for electrodes w ith plug-in contact, set=6pc
4				1					B-2524327	Connecting cables for electrodes w ith plug-in contact, set=6pc
4					1				B-2524329	Connecting cables for electrodes w ith plug-in contact, set=6pc
4						2			B-2524331	Connecting cables for electrodes w ith plug.,set=6pc

	HY05	HY13								
*	HY08	HY17	HY23	HY30	HY45	HY60	HY90	HY116	Article No.	Description
										Control, electrical supply 500V or higher
	1	1	1	1	1	2	2	2	E-2504158	Transformer 690V/230V, 25VA
	1	1	1	1	1	2	2	2	E-2504224	Transformer 210-540V / 24V
	1	1	1	1	1	2	2	2	E-2504220	Transformer 230-400-460-520V / 230V
	2	2	2	2	2	4	4	4	E-2504042	Safety fuse 0,5A
	1	1	1	1	1	2	2	2	E-2590102	Line safety switch, 1 A
	1								B-3526021	Connecting cables for electrodes with plug-in contact, set=3pc
		1							B-2524301	Connecting cables for electrodes with plug-in contact, set=3pc
			1						B-2524305	Connecting cables for electrodes with plug-in contact, set=6pc
				1					B-2524307	Connecting cables for electrodes with plug-in contact, set=6pc
					1				B-2524309	Connecting cables for electrodes with plug-in contact, set=6pc
						2			B-2524307	Connecting cables for electrodes with plug.,set=6pc
							2	2	B-2524309	Connecting cables for electrodes with plug., set=6pc
										Control, electrical supply between 380V and 480V
	1	1	1	1	1	2	2	2	E-2504224	Transformer 210-540V / 24V
	1	1	1	1	1	2	2	2	E-2504220	Transformer 230-400-460-520V / 230V
	2	2	2	2	2	4	4	4	E-2504042	Safety fuse 0,5A
	1								B-2524201	Connecting cables for electrodes with plug-in contact, set=3pc
		1							B-2524201	Connecting cables for electrodes with plug-in contact, set=3pc
			1						B-2524205	Connecting cables for electrodes with plug-in contact, set=6pc
				1					B-2524209	Connecting cables for electrodes with plug-in contact, set=6pc
					1				B-2524213	Connecting cables for electrodes with plug-in contact, set=6pc
						2			B-2524209	Connecting cables for electrodes with plug.,set=6pc
							2	2	B-2524213	Connecting cables for electrodes with plug., set=6pc

	HY05	HY13								
*	HY08	HY17	HY23	HY30	HY45	HY60	HY90	HY116	Article No.	Description
										Control, electrical supply 240V or lower
	1	1	1	1		2	2		E-2504224	Transformer 210-540V / 24V
	1	1	1	1	1	2	2	2	E-2504220	Transformer 230-400-460-520V / 230V
							2		B-2507113	Main contactor 80 A incl. 2 x NO contact, 24V
			1	1		2			B-2507083	Main contactor 65 A incl. 2 x NO contact, 24V
		1							B-2507063	Main contactor 35 A incl. 2 x NO contact, 24V
	1								B-2507043	Main contactor 20 A incl. 2 x NO contact, 24V
					1				E-2504092	Main contactor 100 A, 230 V
			1	1		2			B-2507081	Main contactor 65 A, 230 V
		1							B-2507061	Main contactor 35 A, 230 V
	1								B-2507041	Main contactor 20 A, 230 V
				1					B-2524015	Cable for electrode 35A/6mm²
		2	2	2		4	4		E-2504044	Safety fuse 1,0A
	1								B-3526021	Connecting cables for electrodes with plug-in contact, set=3pc
		1							B-2524323	Connecting cables for electrodes with plug-in contact, set=3pc
			1						B-2524325	Connecting cables for electrodes with plug-in contact, set=6pc
				1					B-2524327	Connecting cables for electrodes with plug-in contact, set=6pc
									B-2524329	Connecting cables for electrodes with plug-in contact, set=6pc
						2			B-2524327	Connecting cables for electrodes with plug.,set=6pc
							2		B-2524329	Connecting cables for electrodes with plug., set=6pc
										Basic Control
	1	1	1	1	1	2	2	2	B-2526207	Basic Mainboard, 24V
	1	1	1	1	1	2	2	2	B-2526201	Basic Mainboard, 230V
52	1	1	1	1	1	2	2	2	E-2502412	Control switch, double pole
	1	1	1	1	1	2	2	2	B-2120901	Mounting plate for Basic with foil
										Comfort Control
	1	1	1	1	1	2	2	2	B-2526207	Basic Mainboard, 24V
	1	1	1	1	1	2	2	2	B-2526201	Basic Mainboard, 230V
52	1	1	1	1	1	2	2	2	E-2502412	Control switch, double pole
	1	1	1	1	1	2	2	2	B-2120903	Mounting plate (standard) with foil
	1	1	1	1	1	2	2	2	B-2526401	Display (standard) with mounting plate and foil
										Comfort Plus
	1	1	1	1	1	2	2	2	B-2526207	Basic Mainboard, 24V
	1	1	1	1	1	2	2	2	B-2526201	Basic Mainboard, 230V
52	1	1	1	1	1	2	2	2	E-2502412	Control switch, double pole
	1	1	1	1	1	2	2	2	B-2120905	Mounting plate (advanced) with foil
	1	1	1	1	1	2	2	2	B-2526403	Display (advanced) with mounting plate and foil
										DS-Control
	1	1	1	1	1				B-2526217	DS-Basic Mainboard, 24V
	1	1	1	1	1				B-2526211	DS-Basic Mainboard, 230V
52	1	1	1	1	1				E-2502412	Control switch, single pole, middle position "0"
	x	x	x	x	x				B-2120903	Mounting plate (standard) with foil

	HY05	HY13								
*	HY08	HY17	HY23	HY30	HY45	HY60	HY90	HY116	Article No.	Description
	x	x	x	x	x				B-2120905	Mounting plate (advanced) with foil
	x	x	x	x	x				B-2526401	Display (standard) with mounting plate and foil
	x	x	x	x	x				B-2526403	Display (advanced) with mounting plate and foil
	x	x	x	x	x				E-0605228	Temperature sensor TF104
	x	x	x	x	x				B-2505207	Holder for temperature sensor TF104 incl. mounting set
	x	x	x	x	x				E-2505206	Fuse for light, fan, essence injector 1.6A, 5x20mm
	x	x	x	x	x				E-2504039	Fuse for transformer 5A, 5x20mm
	x	x	x	x	x				E-2504224	Transformer 210-540V / 24V
										Essence injection
	x	x	x	x	x				E-2604074	Hose for peristaltic pump DSP9111 (since 07/2002)
	x	x	x	x	x				E-2604076	hose connector for silicon hoses, 6mm
	x	x	x	x	x				E-2604070	Hose for essence injection; silicon 6x1,5
	x	x	x	x	x				B-2604067	T-piece for essence injection (DN25)
	x	x	x	x	x				B-2604069	T-piece for essence injection (DN40)
										Accessoires
	x	x							E-2604012	Steam hose DN 25, per m
			x	x	x	x	x	x	E-2604013	Steam hose DN 40, per m
	x	x	x	x	x	x	x	x	E-2604002	Condensate hose DN 12, per m
	x	x							E-2404004	Steam hose clamp DN 25
			x	x	x	x	x	x	E-2604016	Steam hose clamp DN 40
	x	x	x	x	x	x	x	x	E-2304015	Condensate hose clamp
	x	x							B-2604025	Steam solenoid valve 0-0,4 bar, cpl. for steam hose DN 25
			x	x	x	x	x	x	B-2604040	Steam solenoid valve 0-0.4 bar, cpl. for steam hose DN 40
	x	x							E-2604042	Steam connector, T-piece DN 25, stainless steel
			x	x	x	x	x	x	E-2604023	Steam connector, T-piece DN 40, stainless steel
	x	x	x	x	x	x	x	x	E-2604021	Connectors for condensate T-piece DN 12
	x								B-2208005	Cylinder star, complete
		x							B-2208007	Cylinder star, complete
			x						B-2208013	Cylinder star, complete
				x		x			B-2208009	Cylinder star, complete
					x		x	x	B-2208011	Cylinder star, complete
	x	x							B-2304095	Super flush
			x	x	x	x	x	x	B-2304097	Super flush
	x	x	x	x	x	x	x	x	B-2304031	Water connection hose, flexible, 0.6 m 3/4", with connector

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

* see Exploded View

** If the Super Flush System is installed, consider to order also a new nozzle (B-2304079), please.
The nozzle will be already installed in the lower part of steam cylinder.

*** Maintenance set consists of: electrodes (without hand nuts), O-ring for steam hose adapter, O-ring for cylinder flange, O-ring cylinder

13. Fax Form - Order for spare parts

Fax Form

Please copy, fill in and fax to

Fax.No. **+49(0)4193/895-31**

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

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.

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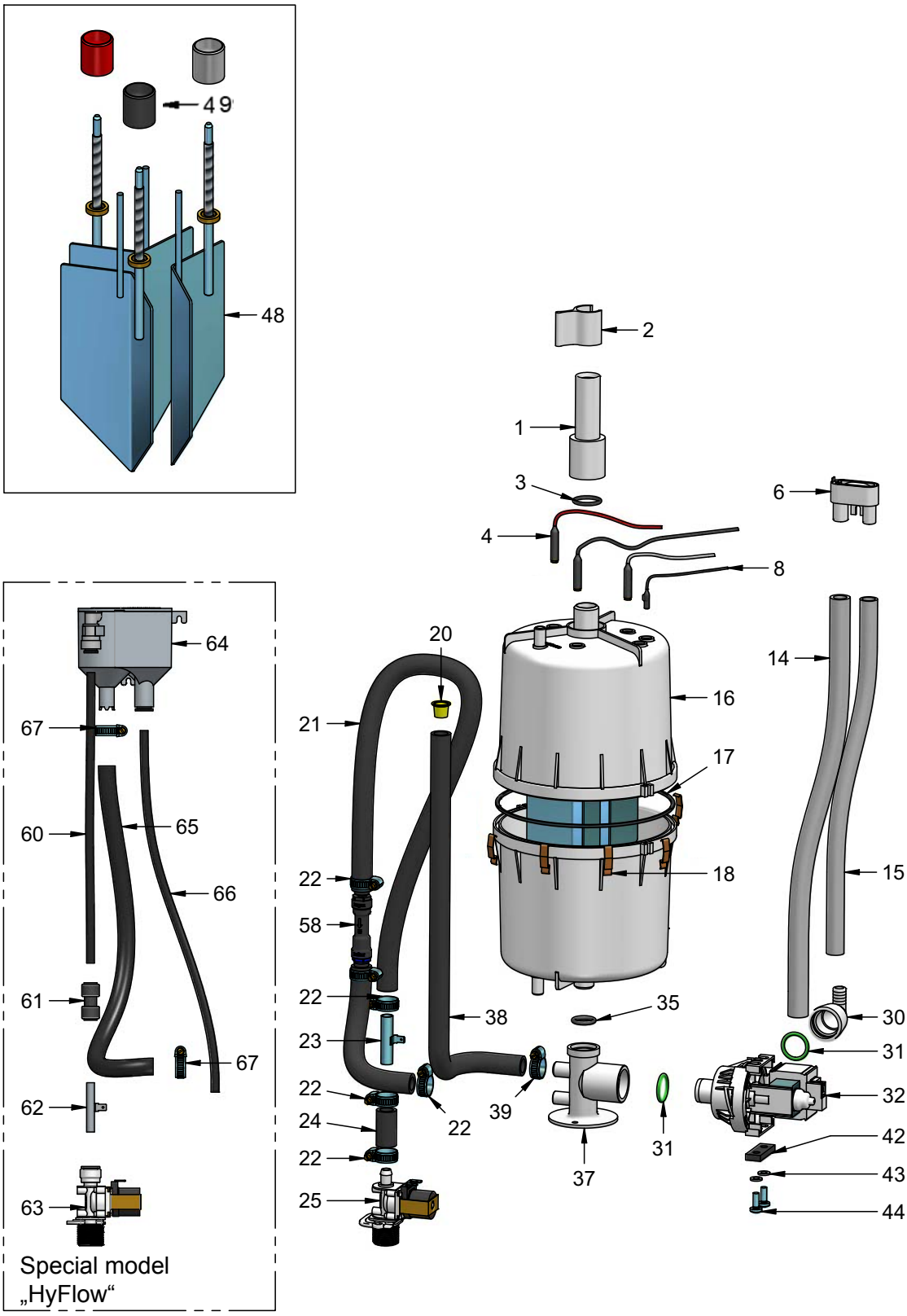
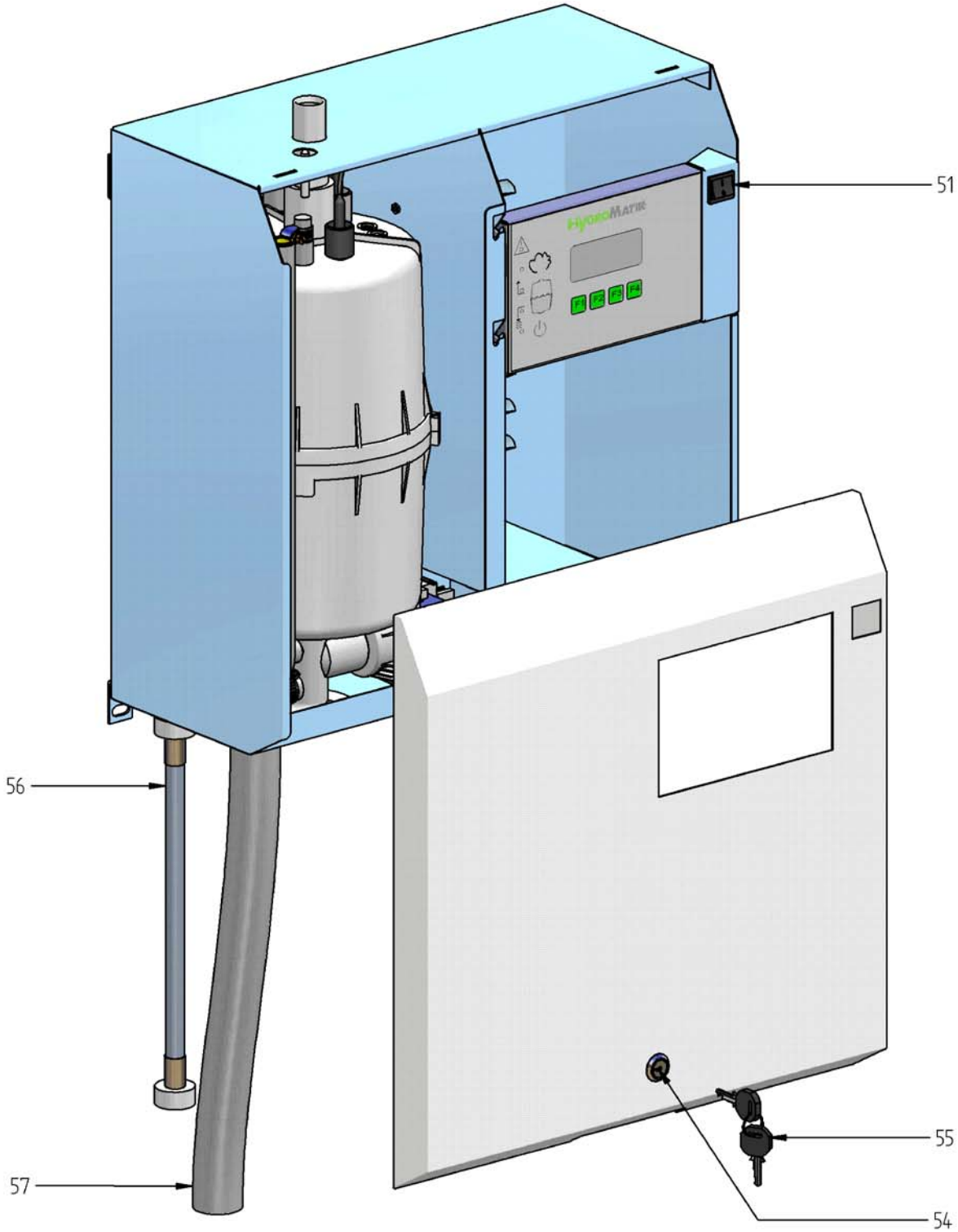
14. Exploded View



15. View of housing



16. Technical Specification

Technical Specifications Steam Humidifier HyLine (with Basic, Comfort/-Plus control)						
Type		**HY05**	**HY08**	**HY13**	**HY17**	**HY23**
Data at 208V/3 Phase, 60 Hz	Steam output [kg/h / lbs/h]	5.0 / 11	7.7 / 17	13.0 / 29	14.4 / 32	23.0 / 51
	Power Consumption [kW]	3.75	5.8	9.7	10.8	17.3
	Input Current [A]	10.4	16.0	27.0	30.0	47.9
	Circuit Protection [A]***	3 x 15	3 x 20	3 x 35	3 x 40	3 x 60
Data at 480V/3 Phase, 60 Hz	Steam output [kg/h / lbs/h]	5.0 / 11	8.0 / 18	13.0 / 29	17.0 / 37	23.0 / 51
	Power Consumption [kW]	3.74	6.0	9.8	12.8	17.3
	Input Current [A]	4.5	7.2	11.7	15.3	20.7
	Circuit Protection [A]***	3 x 10	3 x 10	3 x 20	3 x 20	3 x 25
Data at 600V/3 Phase, 60 Hz	Steam output [kg/h / lbs/h]	5.0 / 11	8.0 / 18	13.0 / 29	17.0 / 37	23.0 / 51
	Power Consumption [kW]	3.74	6	9.8	12.8	17.3
	Input Current [A]	3.6	5.8	9.4	12.3	16.6
	Circuit Protection [A]***	3 x 10	3 x 10	3 x 15	3 x 15	3 x 20
	Control voltage	24V/ 208-240V				
Steam hose connection [mm/inch]		1 x 25/ 1 x 1	1 x 25/ 1 x 1	1 x 25/ 1 x 1	1 x 25/ 1 x 1	1 x 40/ 1 x 1 1/2
Condensate hose connection [mm/inch]		1 x 12/ 1 x 1/2	1 x 12/ 1 x 1/2	1 x 12/ 1 x 1/2	1 x 12/ 1 x 1/2	1 x 12/ 1 x 1/2
Empty weight [kg/lbs]		13/28.7	13/28.7	20/44.1	20/44.1	22/48.5
Operational weight [kg/lbs]		19/41.9	19/41.9	38/83.8	38/83.8	40/88.2
Dimensions	Height [mm/inch]	480/18.9	480/18.9	650/25.6	650/25.6	650/25.6
	Width [mm/inch]	449/17.7	449/17.7	522/20.6	522 20.6	522/ 20.6
	Depth [mm/inch]	251/9.9	251/9.9	301/11.9	301/11.9	301/11.9
Water supply		1bar min., 10bar max./14.5 psi min, 145 psi max 3/4“ for external thread				

Technical Specifications Steam Humidifier HyLine (with Basic, Comfort/-Plus control)						
Type		**HY30**	**HY45**	**HY60**	**HY90**	**HY116**
Data at 208V/3 Phase, 60 Hz	Steam output [kg/h / lbs/h]	28.8 / 63	38.4 / 85	57.6 / 127	76.9 / 170	-
	Power Consumption [kW]	21.6	28.8	43.2	57.6	-
	Input Current [A]	60.0	80.0	2 x 60.0	2 x 80.0	-
	Circuit Protection [A]***	3 x 75	3 x 100	6 x 75	6 x 100	-
Data at 480V/3 Phase, 60 Hz	Steam output [kg/h / lbs/h]	30.0 / 66	45.0 /99	60.0 / 132	90.0 / 198	116.0 /256
	Power Consumption [kW]	22.5	33.8	45.0	67.5	87.0
	Input Current [A]	27.1	40.6	2 x 27.1	2 x 40.6	2 x 52.3
	Circuit Protection [A]***	3 x 35	3 x 45	6 x 35	6 x 45	6 x 65
Data at 600V/3 Phase, 60 Hz	Steam output [kg/h / lbs/h]	30.0 / 66	45.0 / 99	60.0 / 132	90.0 / 198	116.0 / 256
	Power Consumption [kW]	22.5	33.8	45.0	67.5	87.0
	Input Current [A]	21.7	32.5	2 x 21.7	2 x 32.5	2 x 41.9
	Circuit Protection [A]***	3 x 30	3 x 40	6 x 30	6 x 40	6 x 50
	Control voltage	24V/ 208-240V				
Steam hose connection [mm]/[inch]		1 x 40/ 1 x 1 1/2	2 x 40/ 2 x 1 1/2	2 x 40/ 2x 1 1/2	4 x 40/ 4x 1 1/2	4 x 40/ 4x 1 1/2
Condensate hose connection [mm]/[inch]		1 x 12/ 1x 1/2	2 x 12/ 2x 1/2	2 x 12/ 2x 1/2	4 x 12/ 4x 1/2	4 x 12/ 4x 1/2
Empty weight [kg/lbs]		28/61.7	39/86	47/103.6	70/154.3	70/154.3
Operational weight [kg/lbs]		55/121.3	85/187.4	101/222.7	162/357.1	162/357.1
Dimensions****	Height [mm/inch]	708/27.9	788/31.0	709/27.9	788/ 31.0	788/31.0
	Width [mm/inch]	561/22.1	654/25.7	927/36.5	1061/41.8	1061/41.8
	Depth [mm/inch]	344/ 13.5	403 /15.9	334/13.1	403/15.9	403/15.9
Water supply		1bar min., 10bar max./14.5 psi min, 145 psi max 3/4“ for external thread				

* Other voltages on request.
** Not included with delivery.
*** Multiply power input by 1.3 after full blow-down. Note overload capacity of automatic breakers. If necessary, select the next higher rating.
**** Outer dimensions of width and depth. Hight incl. drain connection.

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