HYGROMATIK®

SteamKit E

Electrode Steam Humidifier

Manual

KITE.EN
E-8881176

Certain computer programs contained in this product [or device] were developed by HygroMatik GmbH ("the Work(s)").

SteamKit E
KIT E02/06/10/15/20/30/45/65

Current version of this manual to be found on: www.hygromatik.com

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

Please note

Ensure that the system/machine in which the HygroMatik installation kit will be installed fully complies with the regulations of the directives (2006/42/EC) and the EMC directive 2014/30/EU and that all safety-relevant functions have been implemented in the control system.

⚠WARNING

Risk of electrical shock!
Hazardous electrical voltage!
All electrical work to be performed by certified expert staff (electricians or expert personnel with equivalent training) only.

⚠WARNING

Risk of scalding!
Steam with a temperature of up to 100 °C is produced.
Do not inhalate steam directly!

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1. Introduction

Dear Customer,

Thank you for choosing a HygroMatik steam humidifier kit (referred to as „kit“ in the descriptions following hereafter).

HygroMatik kits represent the latest in humidification technology.

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

Employ your kit 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 your expert dealer.

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

1.1 Typographic Distinctions

- preceded by a bullet: general specifications

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

☑ Installation step which must be checked off.

italics Terms used with graphics or drawings

1.2 Documentation

Retention

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

Versions in Other Languages

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

Co-applicability

If the kit is ordered and delivered with a HygroMatik control, the manual of that control must be regarded as an applicable document.

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

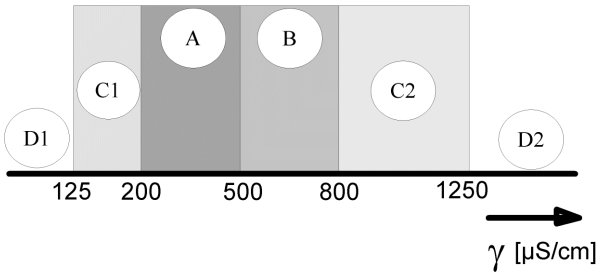
Please note

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

1.4 Intended Use

The kit serves for steam production based on tap water or partially softened water.

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



D1: Lower threshold

C1: Range of reduced conductivity (adjustment required)

A: Normal Tap water

B: Range of increased conductivity

C2: Range of high conductivity (adjustment required)

D2: Upper threshold

In the C1 and C2 ranges, adaptation of the periodic blow-down frequency may be required.

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, the kit is not qualified for exterior application.

⚠WARNING

Risk of scalding!
Steam with a temperature of up to 100 °C is produced.
Do not inhalate steam directly!

1.5 Possibility of certification

HygroMatik humidifiers are certified according to the household appliance standard DIN EN 60335-1 in accordance with the special requirements for humidifiers DIN EN 60335-2-98 and comply with the requirements of the EC Low Voltage Directive 2014/35/EU contained therein.

It has been shown by the legislator through a risk analysis in accordance with the Machinery Directive that the risks are mainly of electrical origin and that all essential safety requirements of the Machinery Directive together with the main objectives of the Low Voltage Directive are covered by the EN 60335-2-98 standard.

HygroMatik humidifier installation kits correspond in their construction to the certified humidifiers. Due to the lack of enclosure, wiring and only optional control, they are incomplete in the broader sense, but not an incomplete machine in accordance with the Machinery Directive 2006/42 / EC.

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 Scope

Comply with the accident prevention regulation „DGUV Regulation 3“ to prevent injury to yourself and others. Beyond that, national regulations apply without restrictions. This way you can protect yourself and others from harm.

2.1.2 Unit control

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

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

⚠WARNING

Restricted use.
IEC 60335-1 stipulates as follows:
This device may be used by children of eight years of age and above as well as by persons with reduced physical, sensory or mental capabilities or lack of experience and knowledge so long as they are supervised or have been instructed regarding the safe use of the device and understand the hazards that may result from it. Cleaning and user maintenance of the unit must not be undertaken by children without supervision.

The following applies to the HygroMatik installation kits:

Please note

Ensure that the system/machine in which the HygroMatik installation kit will be installed fully complies with the provisions of the directives (2006/42/EC) and the EMC directive 2014/30/EU and that all safety-relevant functions have been implemented in the control system.

2.1.3 Unit Operation

⚠WARNING

Risk of scalding!
Uncontrolled hot steam escape in case of leaking or defective components possible.
Switch off unit immediately.

⚠WARNING

For Ministeam devices applies:

Risk of scalding!
No persons may be under the cloud of steam blowing out (at a distance of approx. 1 m/40 inch in the direction of blowing out and 0.5 m/20 inch on both sides of the device).

NOTICE

Risk of material damage!

- The unit may be damaged if switched on repeatedly following a malfunction without prior repair. Rectify defects immediately!
- The unit must not be operated on a DC power supply.
- The unit may only be used connected to a steam pipe that safely transports the steam (not valid for MiniSteam units).
- Regularly check that all safety and monito-ring devices are functioning normally. Do not remove or disable safety devices.
- Steam operation is only allowed when the unit cover is closed.

NOTICE

Water leaks caused by defective connections or malfunctions are possible.

Water is constantly and automatically filled and drained in the humidifier. Connections and water-carrying components must be checked regularly for correct operation.

2.1.4 Mounting, dismantling, maintenance and repair of the unit

NOTICE

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

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

- 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

NOTICE

Do not install HygroMatik steam generators above electrical equipment such as fuse boxes, electrical appliances, etc. In the case of a leakage, leaking water can damage the underlying electrical equipment

2.1.5 Electrical

⚠WARNING

Risk of electrical shock!
Hazardous electrical voltage!

Any work on the electrical system to be performed by certified expert staff (electricians or expert personnel with comparable training) only.

Steam operation may only be started when the unit cover is closed.

During maintenance or installation work, the device must be disconnected from the power supply and secured against being switched on again. The absence of voltage must be ensured by a measurement.

Leaks can cause leakage currents. Observe safety regulations on working with voltage parts (applies to electrode steam humidifies).

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

NOTICE

Use only original fuses with the appropriate amperage rating.

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

Responsibility for intrinsically safe installation of the HygroMatik steam humidifiers is incumbent on the installing specialist company.

3. Transport

3.1 Overview

Please note

Proceed carefully when transporting the kit in order to prevent damage due to stress or careless loading and unloading.

3.2 Packing

Please note

Pay attention to the icons affixed to the packing box.

3.3 Interim Storage

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

3.4 Check for complete and correct delivery of goods

Upon receipt of the unit, confirm that model and serial number on the name plate match those specified in the order and delivery documents.

Scope of delivery

Qty.	Item
1	Console with steam cylinder/ cylinder base, solenoid valve, blow-down pump, internal tubing with elbow
1	SteamKit manual
1 1	Control (optional) „Control“ manual
1	Steamhose adaptor
1	O-Ring for steamhose adaptor
1	Clamp 20 - 32 mm for wastewater stub
3	Electrode plug
1	Sensor electrode plug
4	Blade receptacle for connection of solenoid valve and blow-down pump
4	Insulating sleeve
1	Ring cable lug for grounding

Pls., check whether the equipment is complete and all parts are in perfect condition.

Please note

A main contactor is not included and must be supplied on-site. For selection, pls. keep max. current draw of the kit in mind as specified in the electrical connection section (section 10).

Claim

In case of damage from shipment and/or missing parts, immediately notify the carrier or supplier in writing.

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

Shipping company	After receipt of goods
Carriers	no later than 4 days
Parcel service	immediately

* Time limits for some services subject to change.

4. Functonal Description and Device Composition

4.1 Mode of Action

Making use of the frictional heat caused by current flow in a water tank

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

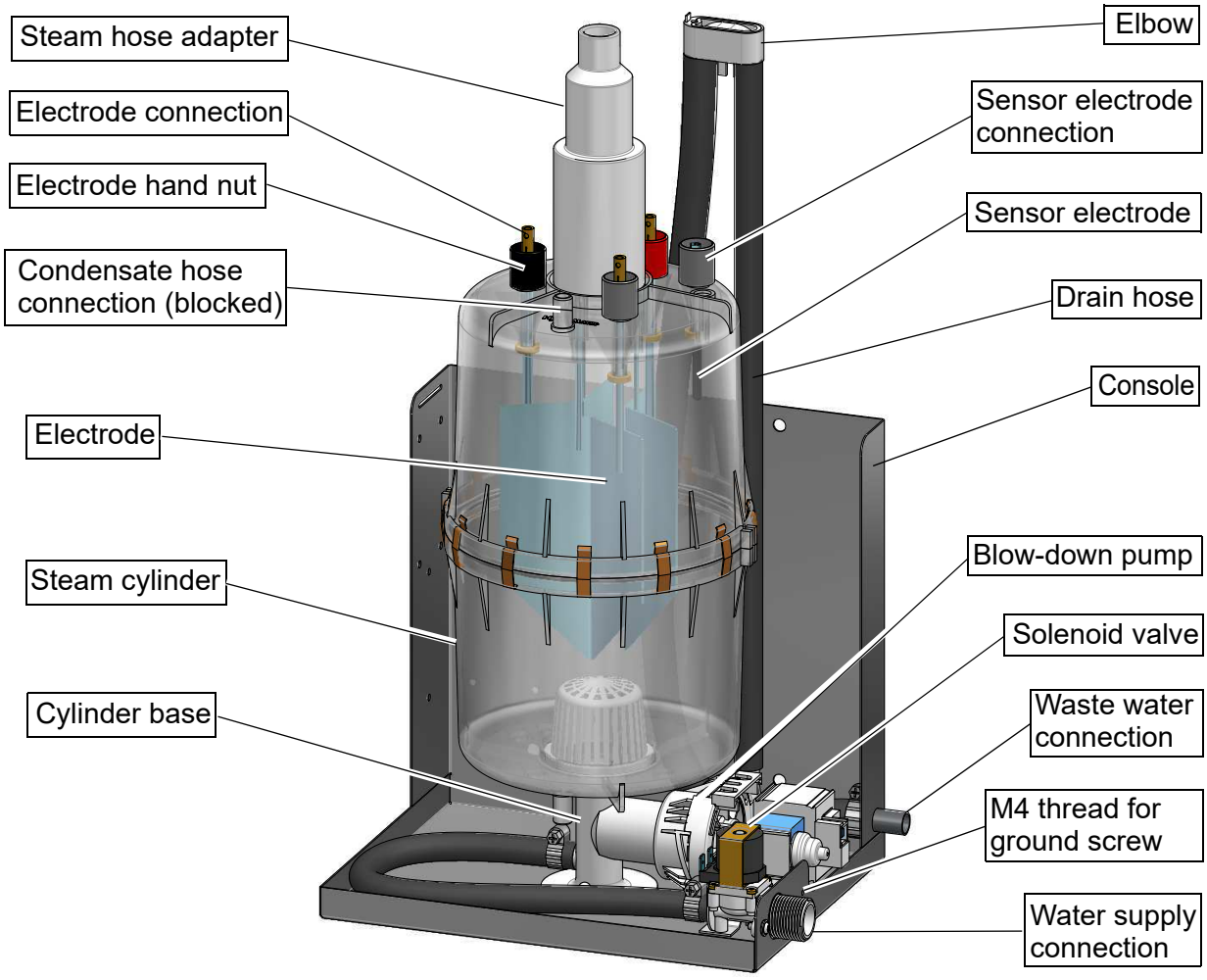
The conductivity of the water generates an electric current between the electrodes. In this way, the electric power supplied is converted directly into heat without energy loss. The steam produced has a temperature of about 100°C (212°F) with minimal excess pressure ("pressureless steam"). It is largely free of minerals and germ-free. Mineral deposits typically remain behind in the cylinder.

4.2 Mechanical Construction

The kit is designed for wall mounting or for standing on a horizontal level surface.

The device composition is demonstrated by the fig. following hereunder.

For maintenance purposes, the steam cylinder is separable in the middle.



4.3 Operating sequence

The operating sequence is determined by the electrical wiring and control of the kit. Following hereafter is the description of a typical operating sequence when a HygroMatik control „Standard“ is used:

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)*) are supplied with power. The water inlet solenoid valve (25)*) feeds water into the steam cylinder (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 period of heating up, the water between the electrodes starts boiling and then vaporizes. The vaporization lowers the water level in the steam cylinder, reducing the output provided. To compensate for that, fresh water is fed into the steam cylinder every now and then by opening the intake solenoid valve.

Humidifier power usage is continuously monitored. With a cold start-up, the nominal current increases to 113 % in order to achieve quick-start output parameters. This activates the electronic overflow limiter which causes a partial draining of the cylinder. This reduces the immersed surface area of the electrodes, lowering power usage.

The concentration of dissolved salts increases over time, which can lead to a rise in the conductivity of the water.This could damage the unit, but in any case would significantly reduce the life span of the electrodes.

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

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

With normal water quality the blow-down loss rate lies between 7 and 15 % of the amount of steam produced. Depending on water quality, a full steam cylinder blow-down is run every 3 to 8 days.

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

On blow-down, water flows from the pump into the drainage system.

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

Monitoring max. level

A sensor electrode (38)*) monitors the maximum water capacity of the cylinder. When the water level reaches the sensor electrode, the water supply is interrupted. This can occur when the water has low conductivity or when the electrodes are worn out. In the case of low water conductivity, however, this state usually lasts only a short time. The built-in control and the large area electrodes combine to produce a rapid rise in conductivity by increasing the concentration of the water.

*) numbers indicated correspond with those in the exploded view in the „Exploded view“ chapter.

5. Mechanical installation

⚠WARNING

Risk of foot injuries!
Prevent unit from dropping during installation! Helping hand of a second person is advisable.

⚠WARNING

Risk of electrical shock!
Hazardous electrical voltage.
During installation, the unit must be disconnected from power supply and secured against being switched on again. The absence of voltage must be ensured by a measurement.

5.1 Environment parameters to be met

- By design, the kits are not qualified for outdoor installation since electrical/ electro-mechanical/electronical components (depending on configuration variant) and water-bearing parts may be damaged
- Ambient temperature must lie between +5 and +40 °C (+41 and +104 °F) ; frost may damage the steam cylinder, the solenoid valve and pump, as well as make hoses burst
- 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

5.2 Mounting recommendations

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

- The kit 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; sagging and kinking prevention is a must
- Mount the unit on a stable, preferably solid wall offering the bearing capacity required (s. unit technical specifications) or standing on a horizontal, level surface. If such a wall is not at hand, the unit may be attached to a stand bracket firmly bolted to the floor.
- The steam humidifier console heats up during operation. Take care that the construction on which the unit is to be mounted is not made of temperature-sensitive material.
- The elbow is to be attached to a suitable vertical surface ba means of a screw

When selecting the mounting material to be supplied by the customer, attention must be payed to adequate strength. For the correct functioning of the steam humidifier it is required that the device is mounted level and plumb.

After mounting the kit make sure that it sits firmly.

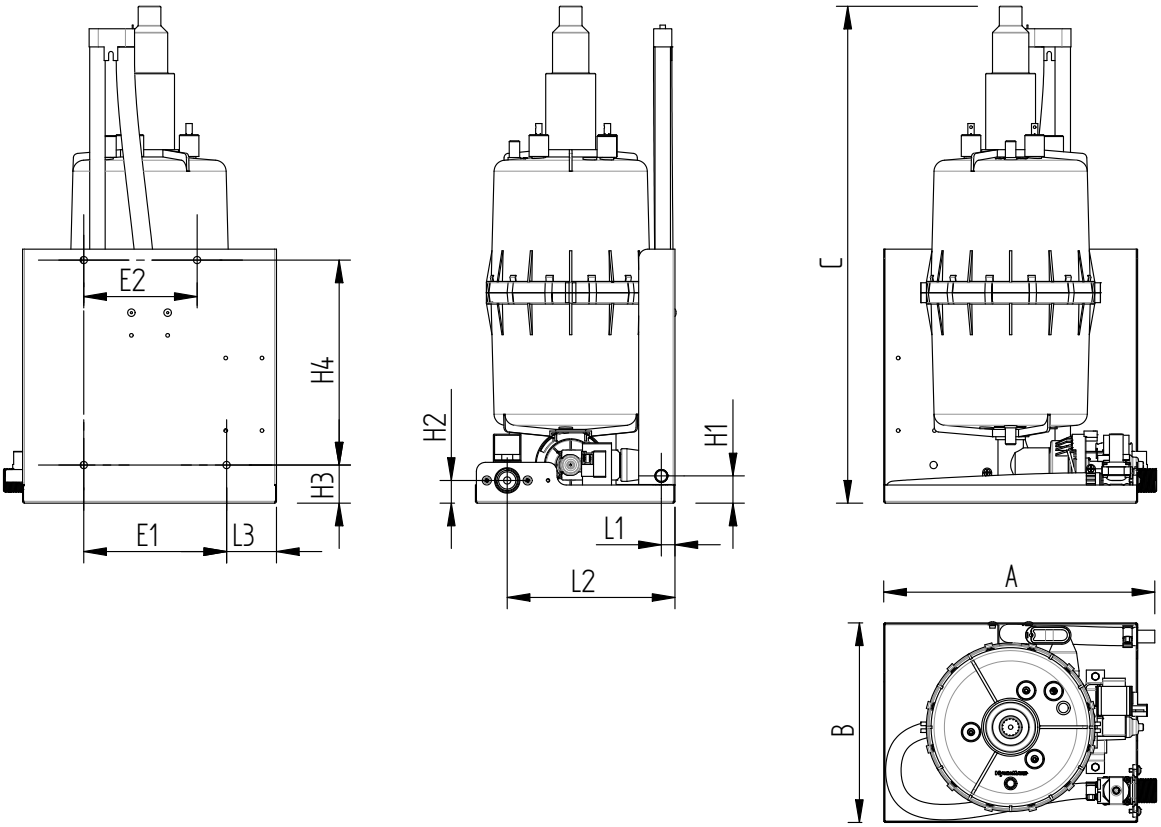
NOTICE

To fulfil all safety requirements, ensure sufficient ventilation of the installation kit in the housing.

5.3 Dimensions of the unit

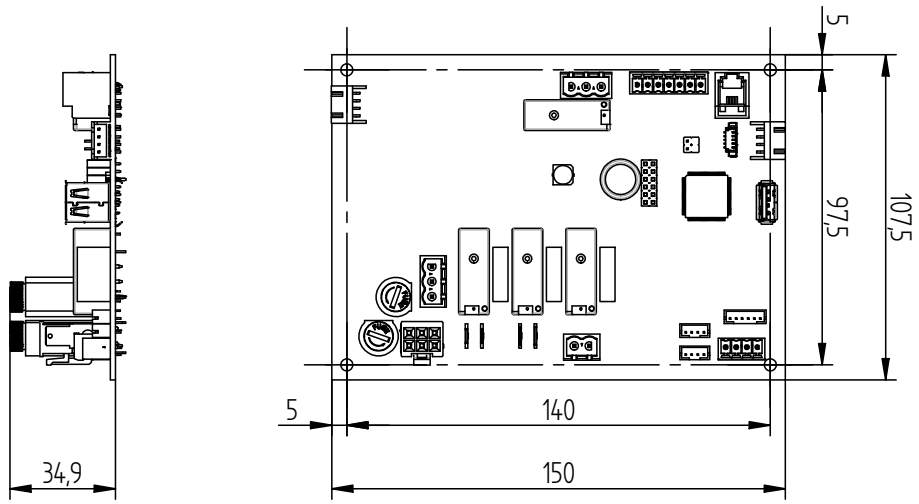
Table of dimensions

Model	A [mm]	B [mm]	C [mm]	E1 [mm]	E2 [mm]	H1 [mm]	H2 [mm]	H3 [mm]	H4 [mm]	L1 [mm]	L2 [mm]
KIT E02 / KIT H02	300	220	400	157,5	125	30	25	42	226	15	185
KIT E06	300	220	530	157,5	125	30	25	42	226	15	185
KIT E10 / KIT H03/06/09	300	220	550	157,5	125	30	25	42	226	15	185
KIT E15 /20/30/ KIT H15/25	350	285	700	270	270	35	25	80	160	15	250
KIT E45/65 / KIT H30/40/50	420	400	785	280	280	35	25	100	200	15	365



5.4 Dimensions of the board

FlexLine / StandardLine



5.5 Unit Installation Check

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

- ☑ Kit perpendicularly aligned in both the vertical and horizontal axis ?
- ☑ Steam hose installed with a 5 - 10 % minimum incline/decline (see chapter "Steam line“) ?
- ☑ Condensate hose features a loop functioning as a steam barrier (see chapter „Condensate hose“) ?
- ☑ Steam manifold(s) properly positioned?
- ☑ All bolts and clamps properly tightened?
- ☑ Steam manifold(s) horizontally mounted and suspended on the free end, if required ?
- ☑ All seals (o-rings) in place?

5.6 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 fiters, 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.

5.6.1 Determining the Absorption Distance

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

- Air humidity before humidification x_1 in g/kg
- Air temperature after humidification t_2 in °C (with steam humidifiers the change in air temperature due to humidification may be disregarded t_1 or t_2)
- Specific increase in humidity $\triangle x$ in g/kg (can be determined in the h,x diagram)
- quantity of steam introduced $\dot{m}_D$ 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]

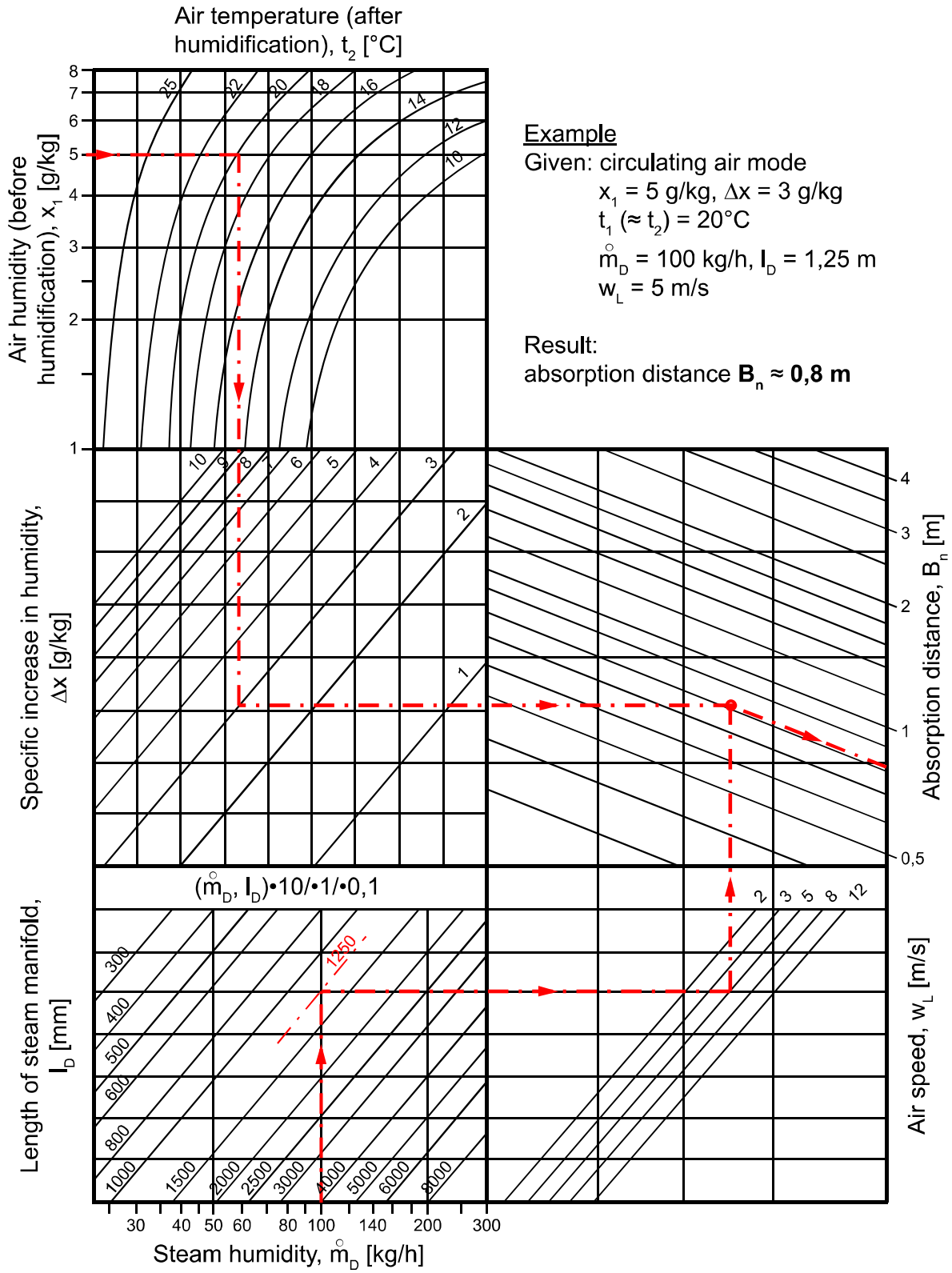
Specific increase in humidity $\triangle x$:.....[g/kg]

Quantity of steam introduced $\dot{m}_D$:.....[kg/h]

Air speed W_L:.....[m/s]

Total length of steam manifold l_D:.....[mm]

5.6.2 Absorption Distance Nomogram



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

5.7 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.

5.7.1 Guide lines 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 must be supported every 500 mm (20 inches) by clamp brackets
- 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. Beyond 10 m (32 ft.) insulated installation is a must. Fixed piping is generally recommended for straight steam line segments
- When 2 steam manifolds are in use (other than with a standard implementation), place steam Y piece as close as possible to the steam manifolds. Such, for the main part of the piping just one steam hose is required and condensate loss is minimized
- 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“
  DN 40 Steam hose: Rmin = 400 mm/16“

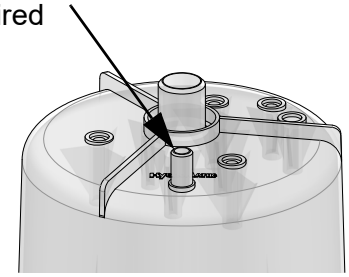
5.7.2 Condensate hose layout (only for electrode steam humidifiers)

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. Alternatively, the condensate hose may be fed directly in a wastewater pipe or a drain (s. installation type 2).

Please note

Should condensate return into the steam cylinder be intended, the connection stub on the cylinder upper part must be drilled out first with a ANSI drill size „O“ drill. To do so, the steam cylinder must be removed from the housing (s. maintenance chapter, section „Steam cylinder removal and reinstallation“). In case of a console instead of a housing, the cylinder is to be lifted off the cylinder base for drilling the stub or may even remain in place.

Drill out condensate hose connection stub with an 8 mm (ANSI drill size „O“) drill, if required



Steam cylinder top view

For heater element humidifiers:

If condensate return is necessary, please contact the HygroMatik hotline.

5.7.3 Steam line and condensate hose installation types

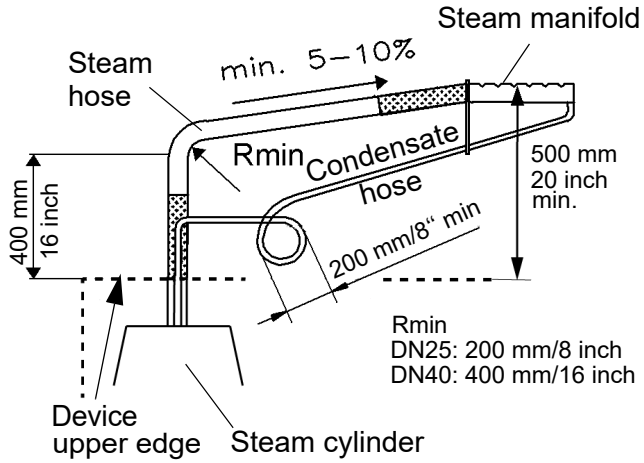
Installation type 1

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

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

» Feed condensate hose from steam manifold with a decline into waste-water pipe or drain.

» As a steam barrier, lay out a 200 mm/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

Installation type 2

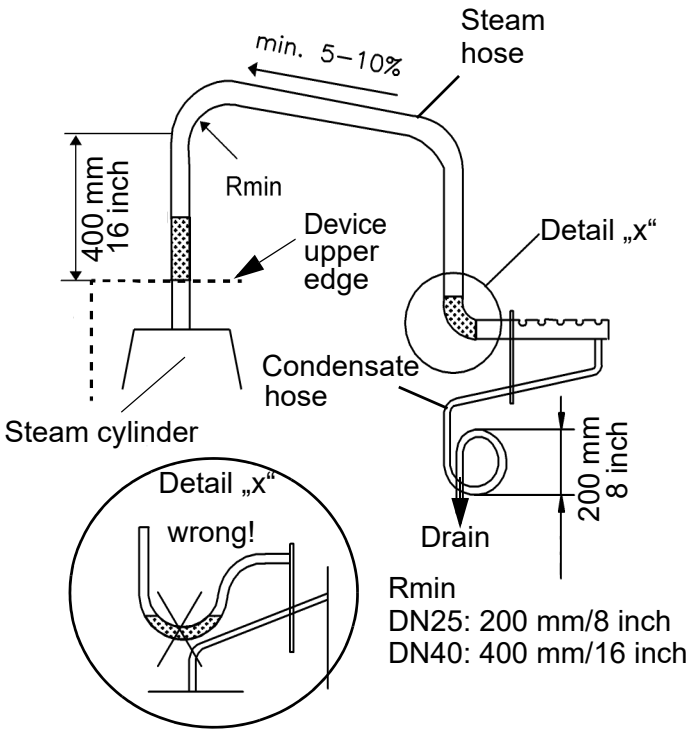
Steam manifold is positioned less than 500 mm above or below device upper edge:

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 mm minimum above the steam humidifier and then to the steam manifold with a continuos decline of 5 to 10 %.

» Feed condensate hose to a waste-water pipe/drain with a 200 mm/8 inch diameter loop as a steam barrier. Minimum distance from steam manifold to loop must be 500 mm/20 inch. Fill loop with water.



Installation type 2, schematic representation

5.8 Steam Manifold

5.8.1 General installation guidelines

When installing steam manifolds, pls. follow these guidelines:

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 1500 Pa/.218 PSI (exemption: SLE02, SLH02, KIT E02 and KIT H02 only allow for 1200 Pa/.174 PSI)
- On suction side, max. -500 Pa (.07 PSI) 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

- We point out that according to the German Association of engineers (VDI) guideline VDI 6022, a water drain must be provided within the absorption distance inside the air duct

When increased airflow speed is encountered

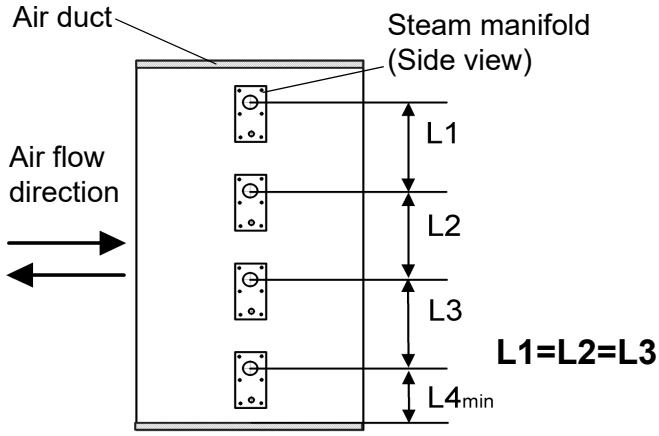
- Air flow rates beyond 3m/s (9.84 ft/s) may lead to condensate drainage problems at the steam manifolds due to vacuum built-up. A possible remedy is twisting the steam manifold in its horizontal axis by few angular degrees. In case of problems, pls. consult your expert dealer.

5.8.2 Recommendations for dimensioning

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

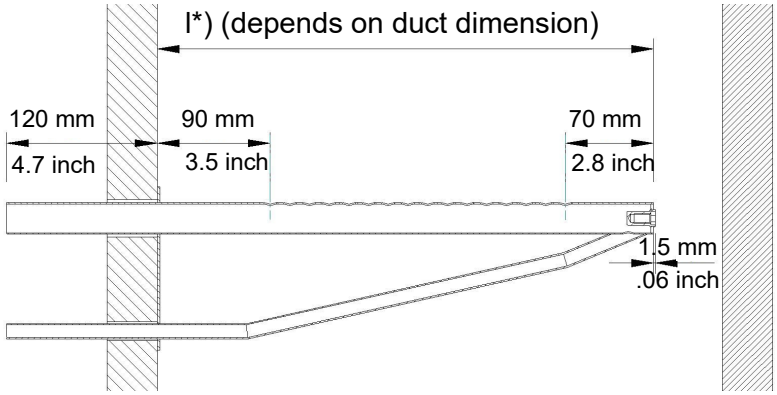
Horizontal installation of steam manifold

Standard steam manifold arrangement:

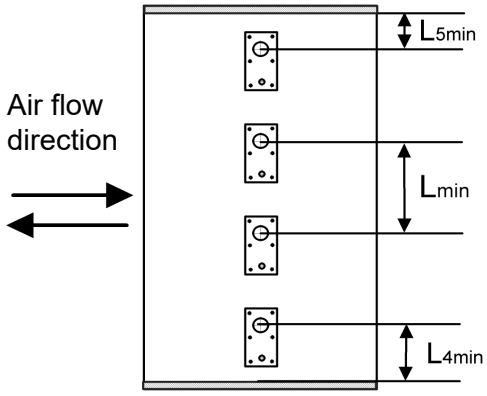


An even distribution of steam manifolds ensures a uniform steam distribution.

Please use the total hight of the duct!



*) s. table of manifold lengths **Horizontal assembly position in duct**



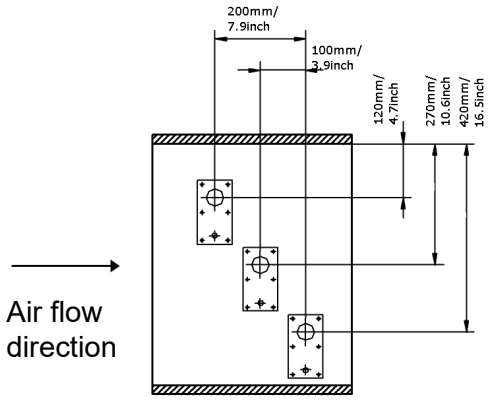
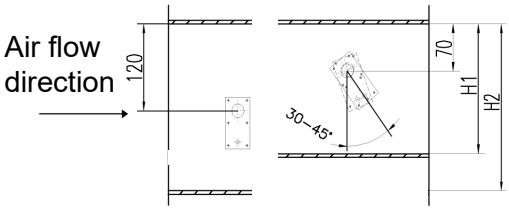
Minimum distance for condensation avoidance:

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

L4min = 120mm/4.7 inch: „Lowest steam manifold - Duct bottom plane“ distance

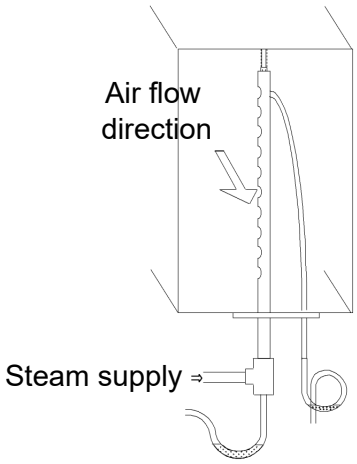
L5min = 120mm/4.7 inch: „Highest steam manifold - Duct ceiling plane“ distance

Steam manifold arrangement for special air duct shapings

<table>
<tr>
<td>flat</td>
<td>steam manifold laterally staggered (with respect to air flow direction) in case of Lmin (s. above) not to be met</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 70 mm/2.8 inch.
<table>
<tr><th>Min[mm/inch]</th><th colspan="2">H1</th><th>H2</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>179/7.2</td><td>230/9.1</td></tr>
</table></td>
<td>narrow channel
 
</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 lengths, staggered vertically and laterally</td>
<td></td>
</tr>
<tr>
<td>low, very wide</td>
<td>facing each other</td>
<td></td>
</tr>
</table>

Vertical steam manifold installation

Steam manifold arrangement



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

Standard manifold dimensions [mm]/ [inch]*:**

220/ 8.7	400/ 15.7	600/ 23.6	900/ 35.4	1200/ 47.2	1450/ 57.1

*** Special lengths on demand.

Number and size of the steam manifolds available as well as the nominal diameter of the repective steam and condensate hoses may be taken from the tables shown in chapter „Technical Data“.

6. Water connection

⚠WARNING

Risk of scalding!
Very hot water to be found in and around the kit during and after operation**.**

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 ensure that the unit is not yet connected to the power supply.

General Rules

- Obey local water utility regulations
- Verify that necessary safety measures have been taken – in compliance with either German Technical and Scientific Association for Gas and Water (DVGW) guidelines (DIN EN1717) or local regulations – 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
- Supply water must not exceed 40 °C (104 °F)
- Allowable range of water pressure: 100000 to 1000000 Pa (14.5 to 145 psi)
- For connection to the water supply pipe, make use of a water hose
- Blow-down water must drain freely
- Min. conductivity of the supply water must be 3 S/cm

6.1 Water supply

NOTICE

Foreign material in water supply pipe may cause premature wear of the solenoid valve.
Flush the water supply pipe before making connection to the solenoid valve. This is of particular importance in case of a newly installed pipe.

On-site, a shut-off valve and - if required by the water quality - a water filter in the supply line is to be installed. Use a connection hose with a 3/4“ cap nut für connection to the water inlet (solenoid valve) of the kit.

Water pressure of the supply line is allowable from 1 to 10 bar (100 x 10^3 to 100 x 10^4 Pascal, 14.5 to 145 psi).

Please note

Strainer must be placed inside the solenoid valve.

6.2 Water discharge

⚠WARNING

Risk of scalding!
During blow down up to 0.3 l/sec (.08 gal./sec) are being drained with a temperature of about 95 °C (203 °F).
Ensure that the drain hose is reliably fastened and wastewater can drain freely and pressureless.

Please note

Humidifier kit installation location and wastewater discharge must be on the same pressure level.

Guidelines for water discharge composition

- Do not buckle drain hose
- Discharge line and drain pipe material must be temperature resistant up to 95 °C (203 °F)

How to proceed

» Fit 14 mm (.55 inch) drain hose with a clamp to the wastewater connection and run into a pressure-free outlet according to DIN EN 1717.

6.3 Water connections final check

Go down the following water installation checklist:

☑ All screws and clamps properly tightened?

☑ Water supply line flushed before making connections?

☑ Water connection properly installed?

☑ Water discharge properly installed?

☑ Does blow-down water drain freely?

☑ Water supply line and water discharge leakage-free?

7. Electrical connection

⚠WARNING

Danger of electrical shock!
Dangerous electrical voltage!
All work relating to the electrical installation may only be carried out by designated specialist personnel (electrician or qualified person with equivalent training).

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

Please note

The customer is responsible for monitoring the qualifications of the specialist personnel.

General installation rules

- All local rules concerning the implementation of electrical installations must be obeyed
- Electric connector cables to be laid professionally
- Install the electrical connections according to the wiring diagram

NOTICE

Possible electronical components destruction through electrostatical discharge!
Prior to commencing electrical installation work, steps must be taken to guard the sensitive electronical components of the unit control against damage from electrostatical discharge.

7.1 Electrical installation approach

» Provide fuses with a contact gap of at least 3mm per pole.

» Make main connection according to the table below.

Main connection

Please refer to the table of technical data (see chapter at the end of this manual) for the connection values of the installation kits.

Fusing

HygroMatik recommends the use of slow blowing up to middle time-lag main fuses (only applies to the a.m. mains supply voltage).

Please note

The kit installation should encorporate an individual residual current device (Type A-RCD).

Maximum current draw of the kit models and the required fusing resulting from that can be found in the technical data (see chapter at the end of the manual).

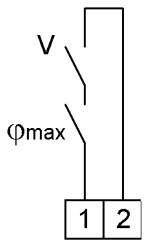
7.2 Safety interlock

The descriptions following hereafter relate to the usage of a kit in combination with a HygroMatik control.

⚠WARNING

Risk of electrical shock!
Hazardous electrical voltage!
When standard wiring was made, terminal 1 shows 208 - 240 VAC after commisioning.

Across terminal 1 and 2 the so-called safety interlock is wired. This wiring allows for integration of safety devices. In case of an open safety interlock the steam humidifier does not operate.



Safety interlock terminals 1/2

Please note

Factory setting leaves the safety interlock open!

Install contact interlocks, e.g. a max. hygrostat in series across terminal 1 and 2.

Please note

Contacts across terminals 1 and 2 must be potential free and rated for 240 VAC.

Best practice implies the integration of a max. hygrostat in the safety interlock wiring to protect against over-humidification due to a r.h. sensor malfunction.

7.3 Connection diagrams

In case of a HygroMatik control „Standard“ to be used with the kit, The device-specific wiring diagrams are included in the scope of delivery. Please use them for the installation and keep them in a safe place.
For all other types of use, the connection of the electrical components is the responsibility of the customer.

8. Commissioning

The descriptions given hereafter particularly relate to the usage of a kit with the Control Standard.

⚠WARNING

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

Step 1: Check of mechanical integrity and wiring

» Check cylinder seating.

» Check steam, condensate and drainhose clamps.

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

Step 2: Switching on the steam humidifier

» Switch on main breaker.

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

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

Step 3: The unit performs a self-test and, then, commences normal operation

- During self-test, the display flashes for a couple of seconds (only with Control Standard)
- On completion of the test, the software version is displayed for a short moment (only with Control Standard). Consequently, normal operation is commenced. However, steam is not produced

Step 4: Trigger steam demand

» Set control to 1-step operation, i.e. permanent steam demand, and close safety interlock.

- The water inlet solenoid valve opens and feeds water into the steam cylinder

Step 5: Monitor unit function and check for leakage

» Let unit operate for 15 to 30 minutes.

» If leaks appear, switch off the unit.

⚠WARNING

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

Step 6: Repair leaks

» Find leaks and eliminate.

» Check again for leaks.

9. Maintenance

9.1 General

For the achievement of a long unit life span, regular maintenance is a must. Maintenance works to be performed refer to unit assemblies that underlie either mechanical or electrical wear and tear, or may be impeded by residues in their proper functioning.

The steam humidifier's performance and maintenance intervals primarily depend on the water quality encountered and the amount of steam produced. A particular water quality may shorten or lengthen maintenance intervals. The amount of residues found in the steam cylinder allows for a hint on future maintenance intervals.

As part of the maintenance work, screw terminals and plug connections must be checked every time. If required, retightening the teminal screws is a must as well as ensuring tight fit of all of the plug connections.

Since steam and condensate hoses are subject to wear as well, hoses must also be checked regularly.

Seals are wear parts. As such, seal integrity checks and replacement if required, is also a part of the regular maintenance work (s. spare parts section -> O-ring sets).

9.1.1 Safety instructions for maintenance

⚠WARNING

Risk of electrical shock!
Hazardous electrical voltage. 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.

⚠WARNING

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

⚠WARNING

Risk of scalding!
Water pumped or drained from the steam cylinder may have a temperature of up to 95 °C (203 °F).
Wear proper PPE (Personal Protection Equipment)!

The notice following herafter is of particular significance when a HygroMatik control is used. It is a general rule, however, whenever electronic components are in use.

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.

9.2 Maintenance frame 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.

In most cases, the conductivity levels given in the "Directions for Use" section of this manual may be considered as typical values. Individual parameter settings as part of the control software may be necessary.

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

For any questions with regard to water treatment systems pls. contact your expert dealer.

Cycle time	Maintenance work
4 weeks after commisioning **(also after installation of a new steam cylinder)** (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 burn-off • Re-tighten electrode hand nuts and all screw terminals
semiannually* (with normal water quality and “normal“ operation, i.e. 8 hours per day	• Visual inspection of electrical and mechanical connections • Remove mineral deposits from steam cylinder, water drain hose and blow-down pump • Check electrodes for burn-off • Re-tighten electrode hand nuts and all screw terminals • Check O-rings for signs of wear • Cleaning the vent hole in the pipe bend • Cleaning the fine filter of the solenoid valve • Checking the hoses

* If the water quality differs, this could result in a more frequent need for maintenance.

9.3 Maintenance steps

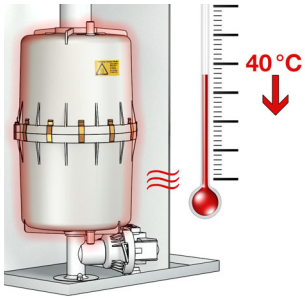
9.3.1 Removal of the steam cylinder

» Drain cylinder water making use of blow-down pump.

» Disconnect unit from power supply- and secure against reconnection.

» Shut off the water supply.

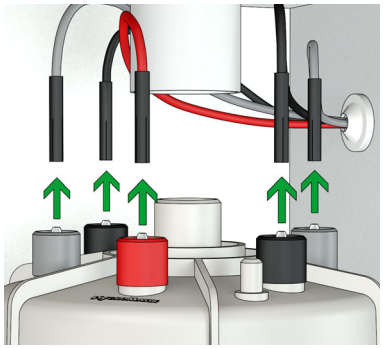
» Wait 10 minutes so that the possibly hot cylinder can cool down.



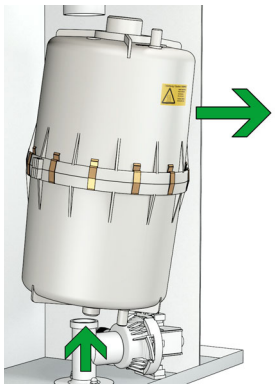
» Check the temperature by carefully approaching it with your hand, do not touch the cylinder if the rest heat should be too strong.

» Remove the steam hose from the steam hose adapter.

» Disconnect the cabling.



» Lift steam the cylinder from the cylinder base.



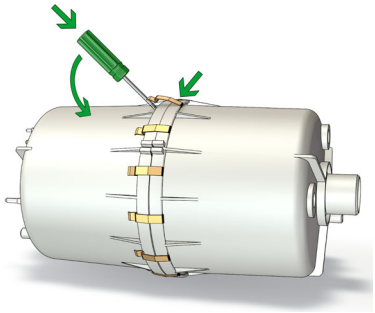
9.3.2 Cylinder cleaning / O-ring replacement

For cleaning, mechanical removal of the deposits is usually sufficient.

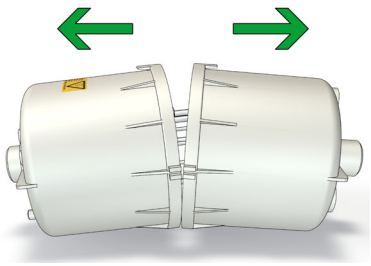
⚠CAUTION

Risk of eye injuries!
The clips that fix the steam cylinder halves have sharp edges and can jump off during dismantling.
Eye injuries are possible.
Wear proper PPE (Personal Protection Equipment)!

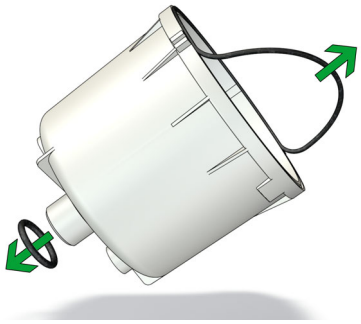
» Remove the cylinder flange clamps.



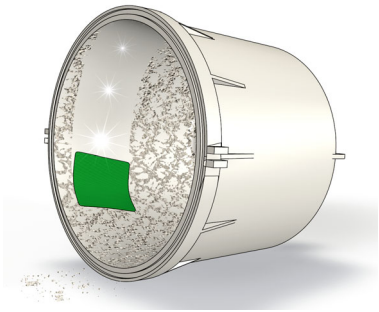
» Separate cylinder halves.



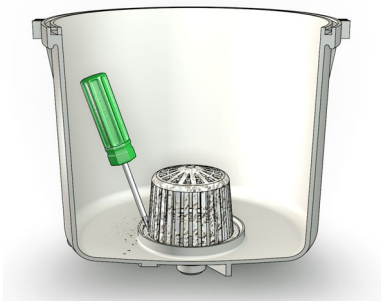
» Remove the used O-rings between the cylinder halves, in the base and in the steam hose adapter.



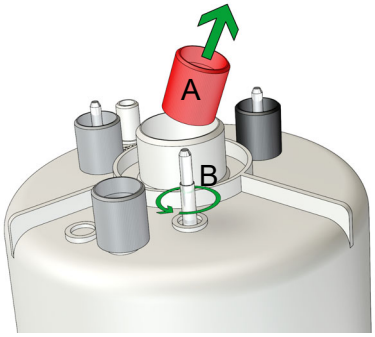
» Clean the cylinder inside.



» Clean the strainer.



» Unscrew the hand nuts (A).



» Remove electrodes (B).

» Clean electrodes and check electrode wear (s. „Changing electrodes“ section).

» Check sensor electrode for salt deposits and remove them if necessary (until metallically bright).

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

» Remove the deposits by scraping / scrubbing them off.

» Replace the O-rings of the electrodes.

» Install new electrodes (48). Make sure that the electrodes are positioned correctly (see exploded view).

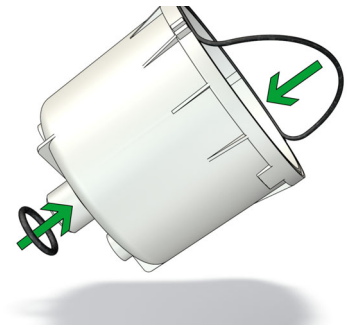
NOTICE

The deposits in the upper part of the cylinder can be conductive and lead to unwanted currents between the electrode connections and the sensor electrode and thus to the message "cylinder full".

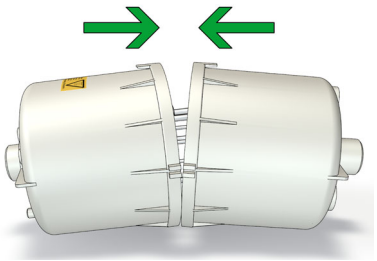
If electrical bridges have penetrated deep into the material, the steam cylinder must be replaced.

» Check the base and its connections for limescale deposits and clean if necessary.

» Insert new O-rings between the cylinder halves, in the base and in the steam hose adapter.



» Put the cylinder halves together and reconnect them with the flange clamps.



» When assembling the cylinder, make sure that the brackets and reinforcements are on top of each other.

NOTICE

Risk of functional disruption!

We generally advise against using limescale removers or other cleaners. If these are nevertheless used to clean the cylinder and the electrodes, rinse the parts cleaned with them thoroughly before putting the unit back into operation. The cleaners may impair the conductivity of the cylinder water.

9.3.3 Cleaning the connecting hoses, base connections, fine filter and drain pump

» Check the connection hoses for condition and free passage.

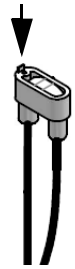
» Check all connections of the cylinder base for free passage.

» Clean the hoses and connections if necessary.

» Remove the fine filter on the water connection side from the solenoid valve and clean it under running water.

» Clean the drain pump as described in the section of the same name..

9.3.4 Cleaning the vent hole on the pipe elbow



» Check the small opening on the top of the pipe elbow for dirt.

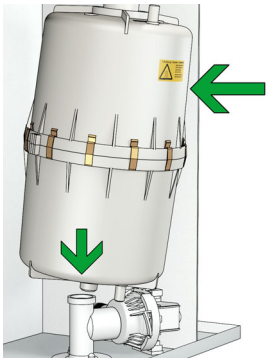
» Remove any dirt, e.g. with a small screwdriver.

Please note

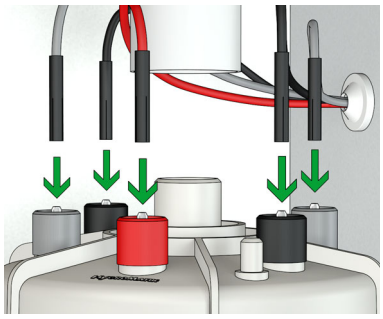
The vent hole should be checked for free circulation during every maintenance. A blocked vent hole has a negative effect on the drainage process (see also chapter "Trouble shooting" in the manual of the control).

9.3.5 Reinstallation of the steam cylinder

» Place the cylinder vertically in cylinder base.



» Reconnect the electrode cabling.



Please note

The colour of the respective connection cable must match the colour of the respective electrode hand nut.

» Check all cabling screw terminals and plugs for tight seating. Plugs must sit on their respective contacts as far as they will go.

» Check electrode plugs for corrosion. Replace, if stained.

NOTICE

Risk of functional disruption!
Risk of material damage!

Loose cable connections may result in increased transition resistance and contact area overheating.

» Reattach Super Flush solenoid hose (if applicable) to steam cylinder bottom stub.

» Attach steam hose adapter to cylinder.

» Follow the handling instructions in the section **Leakage test**.

9.4 Removal and installation of unit components

9.5 Blow-down pump (removal, cleaning, reinstallation)

Removal and cleaning

» Remove steam cylinder as described in „Removal of steam cylinder“ section.

» Detach adapter (30) from pump (32).

» Detach electrical cable from pump.

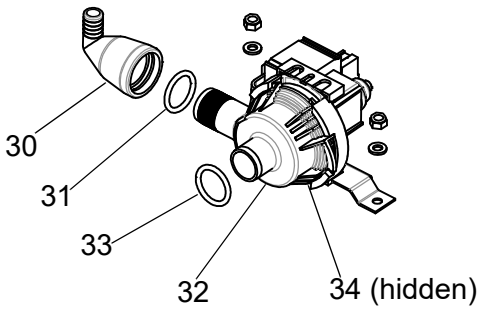
» Remove nuts securing pump on console bottom plate.

» Remove cap nuts securing cylinder base ((37) in exploded view).

» Remove pump and cylinder base from console and separate.

» Open pump bayonet lock.

» Remove residues from pump and drain hoses (replace O-ring (34) if required).



Reinstallation

» Moisten O-ring (33) and insert into cylinder base (37) horizontal stub.

» Push pump back into cylinder base and position the combination of pump and base on the stud bolts of the console.

» Reattach cap nuts (cylinder base) and nuts (pump).

» Moisten O-ring (31) and insert into adapter.

» Slide adapter (30) onto pump stub.

» Refit electrical cable to pump connector (no polarisation).

» Follow the handling instructions in the section **Leakage tes**t.

9.5.1 Solenoid valve (removal, reinstallation)

Removal

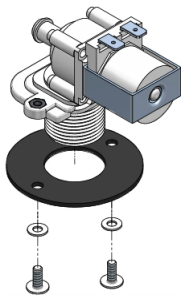
» Shut off water supply and disconnect tap water hose cap screw connection.

» Remove connecting hose (20*) from cylinder base.

» Detach electrical cable connector from solenoid valve (25*).

» Unscrew solenoid valve mounting screws.

» Remove solenoid valve from housing bore.



Reinstallation

» Reinsert fine filter into solenoid valve.

» Reinsert solenoid valve with seal in unit housing bore.

» Bolt-down solenoid valve.

» Reestablish tap water connection.

» Reconnect electrical cable to solenoid valve.

» Reattach connecting hose (20) to cylinder base using clamp.

» Follow the handling instructions in the section **Leakage test.**

*) the numbers refer to the exploded view in the same named chapter

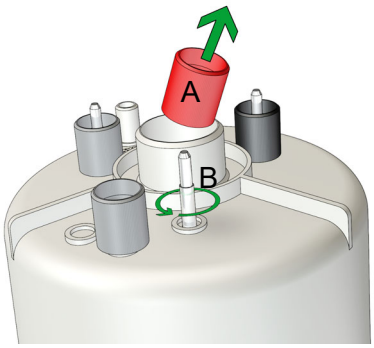
9.5.2 Electrode replacement

» Remove the cylinder and open it (see also chapter Removal of the steam cylinder).

Please note

When mounting the electrodes, make sure that the hand nut colours corresponding with the wiring colours remain in the same position as before in order to omit any unwanted shift of electrical potential. Hence, the hand nut positions must be recorded before they are removed. During reassembly, particular care must be taken to ensure that no grey wire is connected to the electrode plug next to the (grey) sensor electrode hand nut.

» Unscrew hand nuts (A).



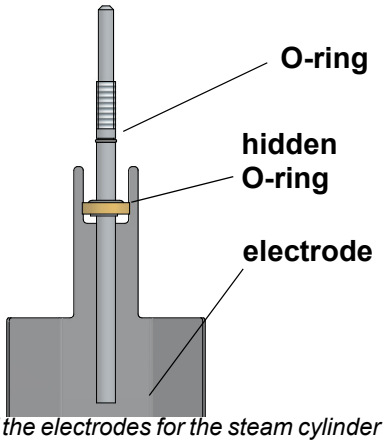
» Remove electrodes (B).

» Install new electrodes (48). Make sure that the electrodes are positioned correctly (see exploded view)

» When installing the new electrodes, make sure that there is a new o-ring in the cup-like holder.

Please note

The electrodes for use with the CY45/2 steam cylinder feature a two-fold sealing (s. following fig.) In order to allow for the problemfree electrode installation, moisten the upper o-ring with water or soap solution.



Two-fold sealing of the electrodes for the steam cylinder CY45/2 (SLE50/65)

» Hand tighten the nuts.

» Reassemble the cylinder and insert it into the unit (see chapter **Reinstallation of the steam cylinder**).

» Follow the instructions in the section **Leak test**.

Genuine electrode length

HygroMatik large area electrodes made from stainless steel have the following genuine lengths:

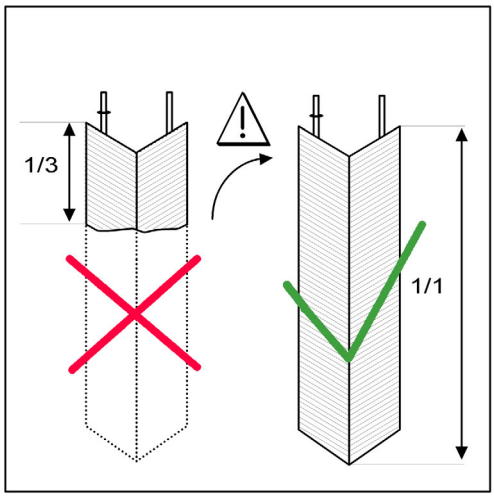
Model	Lenght [mm]
Kit E02 / SLE 02	80
Kit E06 400 V/3 Ph	125
Kit E06 220-240 V/1 Ph **Kit E10 / SLE 05/10**	155
Kit E15/30 / SLE15	235
Kit E20 / SLE20	210
Kit E45/65 / SLE45/65	300
Kit E02 / SLE 02	80
Kit E02 / SLE 02	80

*) The electrodes installed in the new CY45/2 steam cylinder feature a length of 300 mm

Electrode wear

Eelctrode wear depends on:

- composition and conductivity of the supply water
- the amount of steam produced



In case of the electrodes being burned-off to less than one third to half of their genuine length, electrode replacement should be made.

Please note

When cylinder water maximum level is detected for a period of 60 mins, an error message (s. FlexLine control manual, „Faults and warnings“ section) is generated and unit operation is cut. At the latest, electrode replacement should then be made.

9.6 Leak test

⚠WARNING

Risk of electrical shock!
Hazardous electrical voltage!
Follow safety instruction for work on live components.
Leakages may invoke leak currents.

The leak test described below must be done after all maintenance work that affects the water circuit inside the unit. If work has been done at several points, the final leak test is enough, although this work step is listed for all parts of the work.

The leak test must be done with the unit open, paying particular attention to the warning above.

» Open the water supply.

» Switch on the unit and check the inside for leaks (hose connections, O-rings, seals) after 15-30 minutes of operation.

» In case of leakage turn off power supply and secure against being switched on again.

» Find leakage and eliminate.

» Check again.

» Follow the instructions in the section **funktional check**.

9.7 Functional check

» Run the system with maximum output for a couple of minutes

» Check hose connections and seals for leakage.

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

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

Disposal after dismantling

The humidifier is made up of metal parts and plastic parts. In reference to European Union directive 2012/19/EU issued on 4 July 2012 and the related national legislation, please note that:

The components of the electrical and electronic devices must not be disposed of as municipal waste, and therefore the method of waste separation must be applied. The public or private waste collection systems defined by local legislation must be used.

NOTICE

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

11. Spare parts

*	KitE02	KitE06	KitE10	KitE15	KitE20	KitE30	KitE45	KitE65	Article No.	Description
										Steam generation
16	1								SP-01-00000	Steam cylinder CY02 complete
16		1							B-3216067	Steam cylinder CY04 complete for 380-415V/3
16		1							B-3216119	Steam cylinder CY04 complete for 220-240V/1/N
16			1						SP-03-00000	Steam cylinder CY08 complete
16				1					SP-04-00002	Steam cylinder CY17 complete with 3 electrodes
16					1				SP-04-00000	Steam cylinder CY17 complete with 3 electrodes
16						1			SP-04-00100	Steam cylinder CY17 complete with 6 electrodes
16							1	1	SP-06-00000	Steam cylinder CY45/2 complete with 6 electrodes
48	1								B-3204043	Electrodes without hand nuts, set=2pcs
48		1							B-3216063	Electrodes without hand nuts, set=3pcs
48		1							B-3216053	Electrodes without hand nuts, set=3pcs
48			1						B-3204021	Electrodes without hand nuts, set=3pcs
48				1					B-2204087	Electrodes without hand nuts, set=3pcs
48					1				B-2206221	Electrodes without hand nuts, set=3pcs
48						1			B-2204089	Electrodes without hand nuts, set=6pcs
48							1	1	SP-06-00010	Electrodes without hand nuts, set=6pcs
38	1								B-3204047	Sensor electrode without hand nut
38		1							B-3204039	Sensor electrode without hand nut
38			1						B-3204029	Sensor electrode without hand nut
38				1	1	1	1	1	B-2204073	Sensor electrode wihtout hand nut
49	1								B-2207099	Hand nuts M6 for cylinder CY2, set=2pcs
49		1	1						B-2207101	Hand nuts M6 for cylinder CY04 and CY08, set=3pcs
49				1	1				B-2207103	Hand nuts M8 for cylinder CY17, set=3pcs
49						1			B-2207105	Hand nuts M8 for cylinder CY17, set=6pcs
49							1	1		Hand nuts M10 for cylinder CY45/2, set=6pcs
8	1	1	1	1	1	1	1	1	E-2204202	Hand nut M6, grey, for sensor electrode
18	1	1	1	1	1	1	1	1	B-3216021	Cylinder flange clamps, set=24pcs
37	1	1	1						E-3220002	Cylinder base
37				1	1	1	1	1	E-2206090	Cylinder base
1	1	1							E-3221000	Adapter for Steam hose DN25
1			1	1					E-2209018	Adapter for Steam hose DN25
1					1	1	1	1	E-2209008	Adapter for Steam hose DN40
	1								AC-01-00000	O-ringset (Pos. 3, 17, 31, 33, 34, 35, 36)
		1							B-3216071	O-ringset (Pos. 3, 17, 31, 33, 35, 36)
			1						AC-03-00000	O-ringset (Pos. 3, 17, 31, 33, 34, 35, 36)
				1	1				AC-04-00000	O-ringset (Pos. 3, 17, 31, 33, 34, 35, 36)
						1			AC-04-00100	O-ringset (Pos. 3, 17, 31, 33, 34, 35, 36)
							1	1	AC-06-00002	O-ringset (Pos. 3, 17, 31, 33, 34, 35, 36)
										Water feed
25	1	1	1						B-2304251	Solenoid valve, SL 1,1l/min, 220-240V, 0,2 - 10bar, with mounting set
25				1	1	1			B-2304253	Solenoid valve, SL 2,3l/min, 220-240V, 0,2 - 10bar, with mounting set
25							1	1	B-2304257	Solenoid valve, SL 2,3l/min, 220-240V, 0,2 - 10bar, with mounting set
20	0,4	0,4	0,4	0,5	0,5	0,6	0,6	0,6	E-2604002	Connecting hose solenoid valve - cylinder base [m]
22	3	3	3	3	3	3	3	3	E-8501064	Hose clamp 12-22mm
										Water drain
	1	1	1						B-2425005	Drain hose system (Pos. 6, 14, 15, 30, 31)
				1	1	1	1	1	B-2425009	Drain hose system (Pos. 6, 14, 15, 30, 31)
32	1	1	1	1	1	1	1	1	B-2404027	Drain pump without mounting set, with 2 o-rings

* position no. in exploded view

Spare Parts (continued)

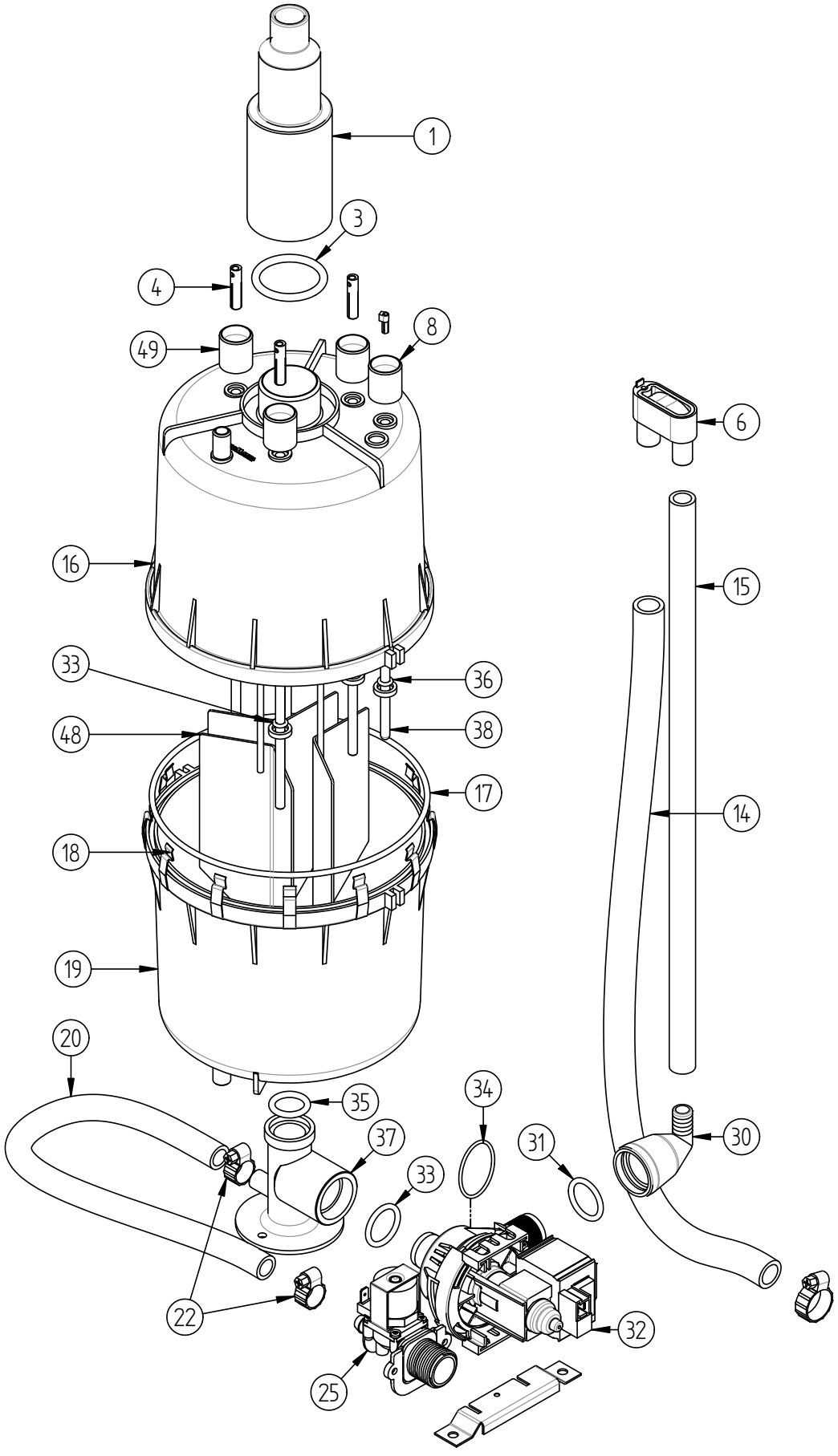
*	KitE02	KitE06	KitE10	KitE15	KitE20	KitE30	KitE45	KitE65	Article No.	Description
										Accessories
	1	1	1	1	1	1	1	1	CN-07-00000	Mainboard of control Standard
	1	1	1	1	1	1	1	1	CN-07-00001	Display StandardLine
	1	1	1						WR-03-00001	Connecting cables for electrodes and sensor electrode, Standard control
				1	1				WR-04-00001	Connecting cables for electrodes and sensor electrode, Standard control
						1			WR-04-00101	Connecting cables for electrodes and sensor electrode, Standard control
							1	1	WR-06-00001	Connecting cables for electrodes and sensor electrode, Standard control
70	x	x	x	x					E-2604012	Steam hose DN25, per m
70					x	x	x	x	E-2604013	Steam hose DN40, per m
	x	x	x	x	x	x	x	x	E-2604002	Condensate hose DN12, per m
	x	x	x	x					E-2404004	Steam hose clamp DN25
					x	x	x	x	E-2604016	Steam hose clamp DN40
	x	x	x	x	x	x	x	x	E-8501064	Condensate hose clamp
	x	x	x	x					E-2604042	Connectors for steam distribution T-piece DN25, stainless steel
					x	x	x	x	E-2604023	Connectors for steam distribution T-piece DN40, stainless steel
	x	x	x	x	x	x	x	x	E-2604021	Connectors for condensate T-piece DN12

* Position no. in der exploded view

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

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

12. Exploded view



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13. Technical specifications

Technical data SteamKit E (Electrodes)				
Unit type	**KIT E02**	**KIT E06**		**KIT E10**
Steam output [kg/h]	1,9 - 2,1	4,4 - 4,8	5,6 - 6,3	9,5 - 10,4
Electrical connection[1]	220 - 240V /1Ph /N /50-60Hz		380 - 415V /3Ph /N /50-60Hz	
Rated power [kW]	1,4 - 1,6	3,3 - 3,6	4,2 - 4,7	7,1 - 7,8
Nominal current [A]	6,5	15	6,5	10,8
Fuse [A][2]	1 x 10	1 x 20	3 x 10	3 x 16
Control	optional: Standard			
Control voltage separate	220 - 240V / 1,6A			
Steam hose connection [mm]	1 x 25			
Water consumption[7] [l/h]	2,5	5,8	7,5	12,5
Water flow rate[8] [l/min]	1,3			
Max. filling capacity [l]	2,9	2,6		4,8
Empty weight [kg]	3,4	3,6		4
Operation weight [kg]	8	7		9
Width [mm]	300			
Height [mm]	400	530		550
Depth [mm]	220			
Water connection	tap water of varying qualities 1 to 10 bar, 3/4" external thread			
Drain water connection	Connection Ø 1 1/4"			

Technical data SteamKit E (Electrodes)					
Unit type	**KIT E15**	**KIT E20**	**KIT E30**	**KIT E45**	**KIT E65**
Steam output [kg/h]	14,2 - 15,5	19,0 - 20,8	28,5 - 31,1	42,7 - 46,7	61,8 - 67,5
Electrical connection[1]	380 - 415V /3Ph /N /50-60Hz				
Rated power [kW]	10,7 - 11,6	14,3 - 15,6	21,4 - 23,4	32,1 - 35	46,3 - 50,6
Nominal current [A]	16,2	21,7	32,5	48,7	70,4
Fuse [A][2]	3 x 20	3 x 32	3 x 40	3 x 63	3 x 80
Control	optional: Standard				
Control voltage separate	220 - 240V / 1,6A				
Steam hose connection [mm]	1 x 40			2 x 40	
Water consumption[7] [l/h]	18,6	25,0	37,3	56,0	81,0
Water flow rate[8] [l/min]	2,8			4,1	
Max. filling capacity [l]	13,2			35,7	
Empty weight [kg]	7		8	13	
Operation weight [kg]	21		22	49	
Width [mm]	350			420	
Height [mm]	700			785	
Depth [mm]	285			400	
Water connection	tap water of varying qualities 1 to 10 bar, 3/4" external thread				
Drain water connection	Connection Ø 1 1/4"				

[1] Other voltages on request

[2] 1.1 times the current consumption after full blowdown. Observe tripping characteristics of circuit breakers. If necessary, select next higher circuit breaker level

[7] Maximum water consumption at 100% demand plus blow down losses. Water consumption depends on the water quality and options installed.

[8] Flow rate of feed during refilling.

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