

Electric Heater Steam Humidifier HeaterSlim



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HeaterSlim 15. April 2013

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

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1. Introduction

Dear Customer,

Thank you for choosing a HygroMatik steam humidifier.

HygroMatik steam humidifiers represent the latest in humidification technology.

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

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

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

If you have additional questions, please contact us:

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

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

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

e-mail: hot1@HygroMatik.de

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

1.1 Typographic Distinctions

- preceded by a bullet: general specifications.
- » preceded by an arrow: Procedures for servicing or maintenance which should or must be performed in the indicated order.
- ☒ Installation step which must be checked off.
- italics* Terms used with graphics or drawings.

1.2 Documentation

Retention

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

Versions in Other Languages

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

1.3 Directions for Use

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



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

Only qualified and authorised personnel may operate the unit. Persons transporting or working on the unit, must have read and understood the corresponding parts of the Operation and Maintenance Instruction and especially the chapter 2. „Safety Notes“. Additionally, operating personnel must be informed of any possible dangers. You should place a copy of the Operation and Maintenance Instruction at the unit's operational location (or near the unit).

The steam humidifier is not qualified for exterior application.

2. Safety Notes

2.1 Overview

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

Warnings and Safety Symbols

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



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



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



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



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



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

2.2 Guidelines for Safe Operation

Overview

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

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

This unit is not designed for the use by persons (also children) with limited physical, sensory and mental abilities - or without knowledge and experience. Unless they are supervised or trained by a person, who is responsible for their safety.

Supervise children in order to ensure that they will not play with the unit.

The unit is only allowed to work with connected steam hose that safely leads the steam.

Accident Prevention Regulations



Attention: In the event of leaky or faulty components uncontrolled hot steam may flow.

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

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

Accident Prevention Regulations



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

Operation of the Unit:

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

Installation, Dismantling, Maintenance and Repair of the Unit:

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

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

Electrical



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

Disconnect unit components from power supply prior to work.

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

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

2.3 Disposal after Dismantling



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

3. Transport

3.1 Overview



Note: Proceed carefully when transporting the steam humidifier in order to prevent damage from rough or careless loading and unloading.

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

3.2 Transport Size and Weighth

Type*	depth [cm]	highth [cm]	width [cm]	weighth [kg]
HS03	155	368	575	16
HS06	155	368	575	16
HS10	155	368	575	16

* Dimensions and weighths can vary insignificantly

3.3 Packing



Note: Observe the symbols affixed to the box.

3.4 Interim Storage

Keep the unit dry and protect from frost.

3.5 Check for Complete and Correct Delivery of Goods

Upon receipt of the unit, make sure that:

- type and serial number on the name plate match what is in the purchasing and delivery documents,
- equipment is complete and in perfect condition.



Note: In case of damage during shipment and/or missing parts, immediately file a written claim with your carrier or supplier.

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

Transport Company	After Receipt of Goods
Mail	24 hours at the latest
Rail	7 days at the latest
Truck and railway companies	4 days at the latest
Parcel Service	immediatly

* Subject to change without prior notice.

3.6 Included in the Delivery

The delivery includes:

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

4. Operation and Device Construction

4.1 Mode of Action

The Imersion Heater Principle

One to three heater elements (Pos. 8 in the exploded view, please see cover foldout) are placed in a closed cylinder and connected to alternating current. The cylinder is filled with tap water, fully demineralized water (min. conductivity: 3 μ S/cm) or partially softened water. Heat generated by the heater element increases water temperature to approx. 100°C.

When fully demineralized water is used, the feed water is practically free of minerals. This ensures long life for the cylinder and heater elements since virtually no mineral deposits can settle or build up. Fully demineralized water minimizes the number of service / maintenance checks.

When tap water (max. 15°gH) is used, some of the minerals dissolved in the water will settle in the cylinder as solids of various compositions. Most of these scale deposits are removed by periodic flushing or use of a heavy-duty blow-down pump. See section "Servicing During Operation with Tap Water".

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

4.2 Installation and Method of Operation

By pressing the control switch (51) the humidifier is turned on. When there is a demand for humidification, the inlet solenoid valve (14) opens. The solenoid valve is designed for pressures from 100×10^3 to 100×10^4 Pascals (1 to 10 bar).

Water is fed into the cylinder (9).

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

The cylinder water level is controlled by a level control (6). The level control consists of three sensor electrodes and one reference electrode. The level control indicates the water level in the steam cylinder: "Dry Run", "Humidification" and "Max. Level".

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

The heater elements are equipped with a mechanical high temperature safety. This mechanism provides a redundant safety system in the event of excessively low water levels ("Dry Run").

The cylinder water is periodically flushed out with a heavy-duty blow-down pump (10).

SPA applications:

Steam lines in steam bath cabins employ special steam hoses and piping (if required). Accumulated condensate is normally routed into the steam cabin. At a relative humidity of 100%, the supplied steam is used to heat the steam bath.

Air-conditioning applications

Steam is fed into air-conditioning ducts through special steam hoses and steam manifolds. Under normal conditions, this steam has virtually no heating effect on the air to be humidified.

Direct room humidification (without ducts) is performed using fan units (with blower and nozzle). The steam generator is connected to the fan unit with steam and condensate hoses.



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

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

4.3 Internal Output Setting

Control of the HeaterSlim steam humidifier is achieved by a 1 to 3 stage control (depending on the unit size) of the heater elements.

5. Mechanical Installation



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

Obey all safety instructions and warnings on the unit. During installation the unit must be disconnected from its power supply. Accessory equipment may not be installed on or in the unit without prior written consent from HYGROMATIK. Otherwise the warranty is void.



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

5.1 Steam Humidifier - environmental conditions

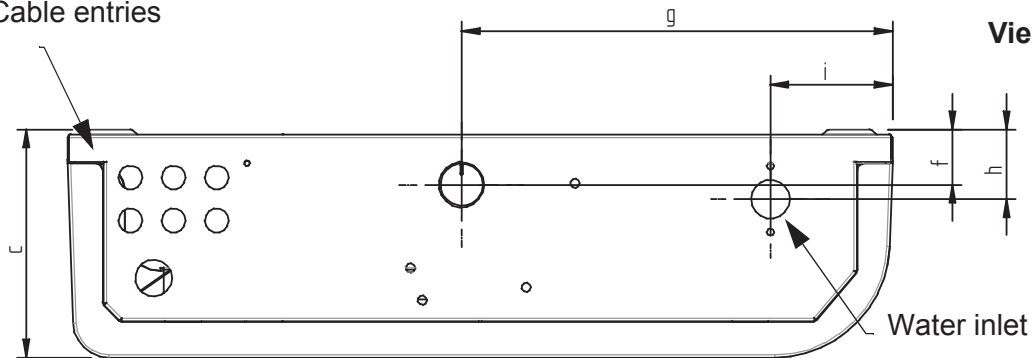


Note: When selecting the location for steam humidifier installation, be aware of the following:

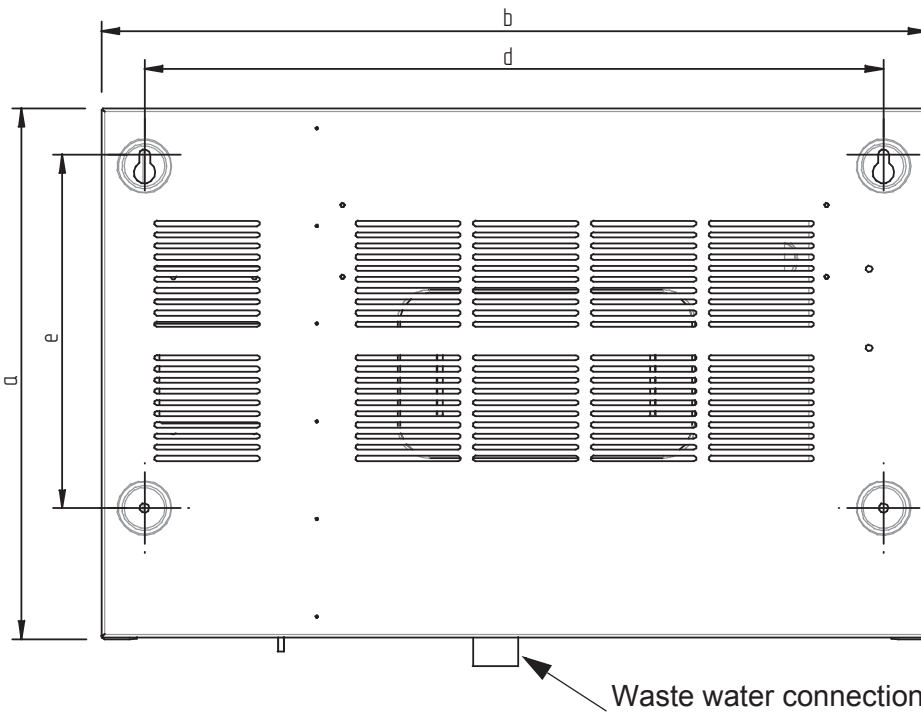
- Ambient temperature must be between +5 and +40 °C.
- Relative humidity may not exceed 80% RH.
- Observe clearances specified in the diagrams below to ensure adequate ventilation.
- An Installation in a closed room requires aeration and if necessary temperature conditioning in order to reach the above mentioned environmental conditions.
- HygroMatik humidifiers are not suitable for direct outdoor installation.
- Install the steam humidifier as close as possible to the steam manifold. Use only short lengths of steam and condensate hose to ensure optimal performance.
- Hoses must be laid at a constant 5-10% grade to uniformly prevent sags and kinks.
- The back surface of the steam humidifier heats up during operation (to max. 70°C). Take care that the construction on which the unit is mounted is not made of temperature-sensitive material.
- Place the steam humidifier so that the unit is easily accessible with sufficient space to perform maintenance.
- The unit's protection class is IP20.

5.1.1 Equipment Dimensions HeaterSlim

Cable entries

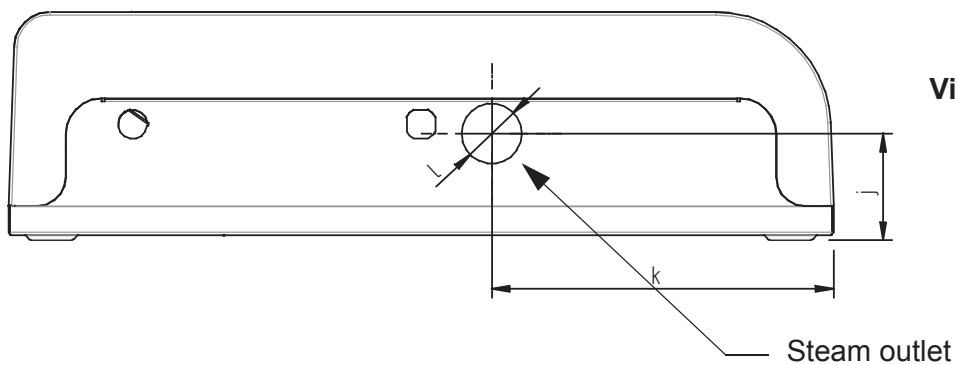


View from below



Rear view

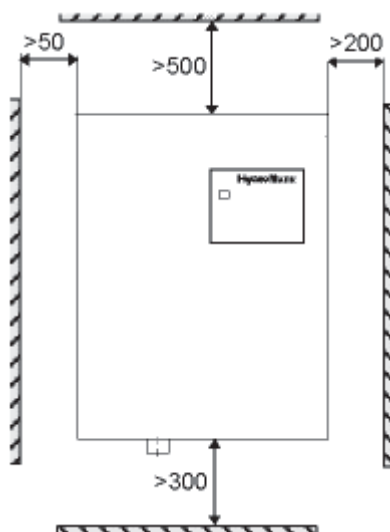
	HS03-10
a	369,0
b	574,5
c	159,0
d	514,5
e	246,0
f	38,5
g	300
h	48,5
i	85,0
j	74,0
k	238,0
l	42,0
all dimensions in mm	



View from top

5.1.2 Fitting Measures

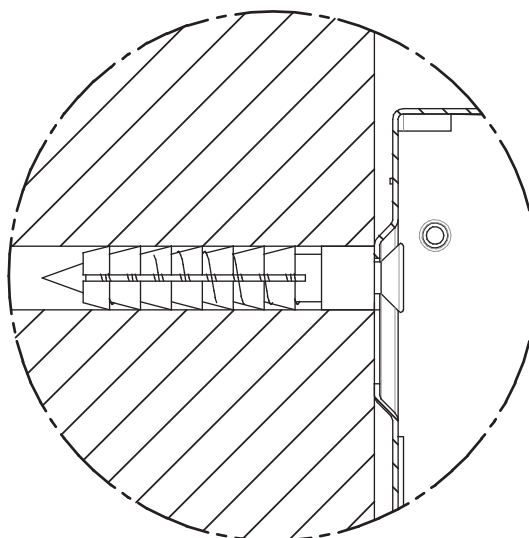
Wall Distance



(all dimensions in mm)



Note: It is often advantageous to use existing water connections (feed and drain) when selecting the steam humidifier.



Measures for drills for wall mounting please see table (measures d and e) in chapter „Equipment Dimensions“. If there is no suitable wall, it is recommended that the equipment is installed on brackets which can be embedded in the floor.

- » mark the holes for the screws for the upper suspension brackets
- » drill holes and dowel them
- » screw in the supplied mounting screws - the screws have to protrude about 12mm



Note: Check the viability of the screws!

- » hang the unit safely
- » mark the holes for the screws for the lower suspension brackets
- » remove the unit
- » drill holes and dowel them
- » hang the unit and fix the lower screws



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



Note: The installation of the humidifier is only allowed on closed surfaces or walls.

6. Water Installation



Warning: For installation, note the following:

- Have all work performed by a professional.
- Disconnect power supply prior to installation.
- Obey regulations of local public utilities. Verify that necessary safety measures have been taken - in compliance with either German Technical and Scientific Association for Gas and Water (DVGW) guidelines (DIN EN1717) or local regulations - to eliminate backflow of polluted water into drinking water treatment facilities. This can mean installing a backflow preventer. Within the humidifier, two double check valves (58) are located in the water supply lines. They prevent - in accordance with DIN EN 61770 - the backflow of water.
- The water supply temperature may not exceed 40 °C.
- Flushed-out water must be able to drain freely.
- The water supply line must have a minimum diameter of DN 12 (3/8").
- If (chemical) additives are present in the humidification water, health risks and/or impaired unit operation cannot be ruled out. Use of additives is not advised unless specifically recommended by the unit manufacturer.
- When employing demineralized water or purified condensate, do not use copper or brass in the supply or drain lines of the HeaterSlim unit. These materials can be corroded by demineralized water or purified condensate. Instead, use stainless steel or temperature-resistant plastic pipes.
- Water installation pressure: 1 to 10 bar (100×10^3 to 100×10^4 Pa)¹
- For water installation please use the water connecting hose that is delivered with the unit.

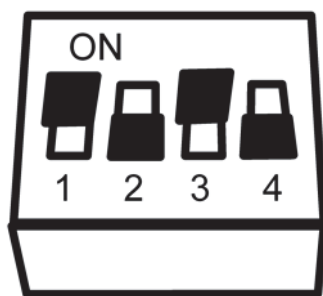
6.1 Water Quality

The HeaterSlim Type steam humidifier is designed for use with:

- tap water of different qualities (up to 15°gH total hardness)
- demineralized water (min. conductivity 3µS/cm)
- fully cleaned condensate (min. conductivity 3µS/cm)
- partially softened water.

Boiling normal tap water always produces lime. Lime deposits on the surface of the heater elements may reduce their lifetime. We recommend to use a water treatment device in order to prevent scaling.

In case of any questions regarding water treatment devices please contact HygroMatik.



E.g.: setting to a water hardness of 7°gH

6.2 Adjusting the unit to the water quality

Since the humidifier can be operated with different feed water qualities, there is the possibility to adapt the blow down frequency.

The setting of the blow down frequency is performed via so-called DIP switches on the electronic board. Here the degree of hardness of the water (given in °gH/german hardness) is set by the use of slide switches. The positions of the slide switches for different degrees of hardness are shown in the following table (ON means: slide switch is switched to the upper position):

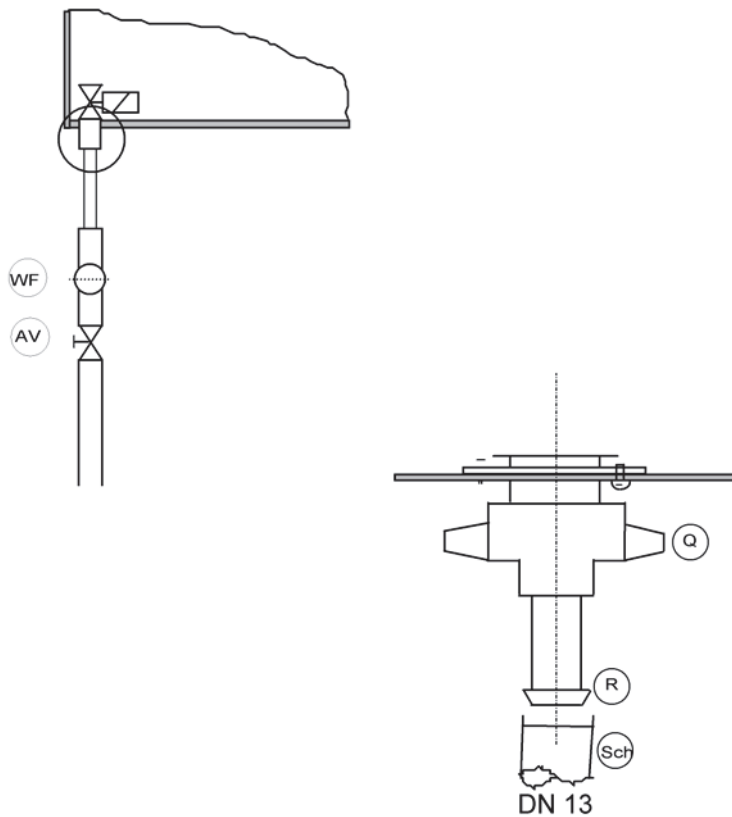
Water quality	slide switch 1	slide switch 2	slide switch 3	slide switch 4
15°gH	-	-	-	-
.	On	-	-	-
.	-	On	-	-
.	On	On	-	-
.	-	-	On	-
7°gH	On	-	On	-
.	-	On	On	-
.	On	On	On	-
.	-	-	-	On
.	On	-	-	On
1°gH or soft water	-	On	-	On
demineralized water	On	On	-	On

6.3 Reset of service messages via DIP switches

Function	slide switch 1	slide switch 2	slide switch 3	slide switch 4
Reset service message due to exceeded counter for produced steam amount	On	-	On	On
Reset service message due to exceeded counter for switching cycles of main contactor	-	On	On	On

For setting the DIP switches to reset function please turn off the unit. Choose the right DIP switches positions for the desired reset function and turn on the unit for a few second. Then turn off the unit and switch off all slide switches (=confirmation). Turn on the unit for a few seconds. Then turn off the unit and return to the old DIP switch positions for water quality.

6.4 Water Supply (For Operation with Demineralized Water or Purified Condensate)



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



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

Install as follows:

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

The supply connection protrudes from the intermediate tray.



Note: Excessive tightening will damage the threads.

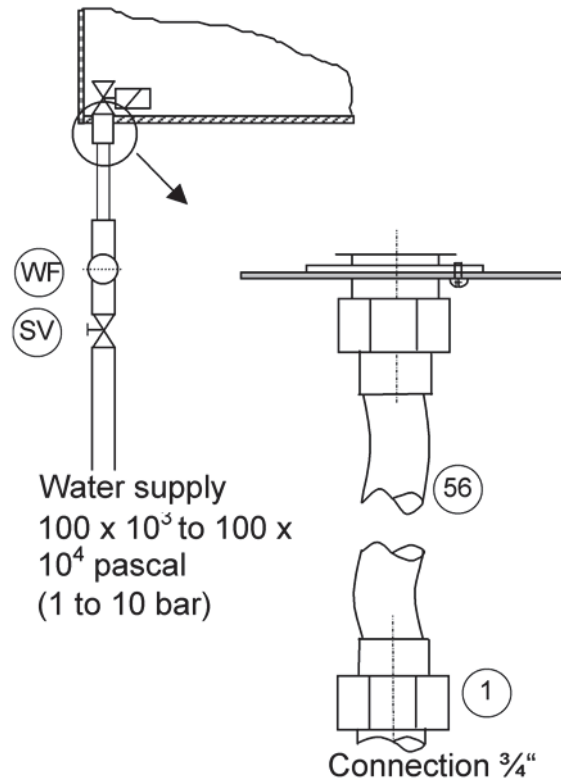
- » Slide 13mm inner diameter hose (SCH) over the pressure clip (R) and secure with a hose clamp.

6.5 Water Supply (For Operation with Tap Water or Partially Softened Water)

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



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



- » HygroMatik provides a water hose with a cap nut at both ends which can be used for water installation.

Install as follows:

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

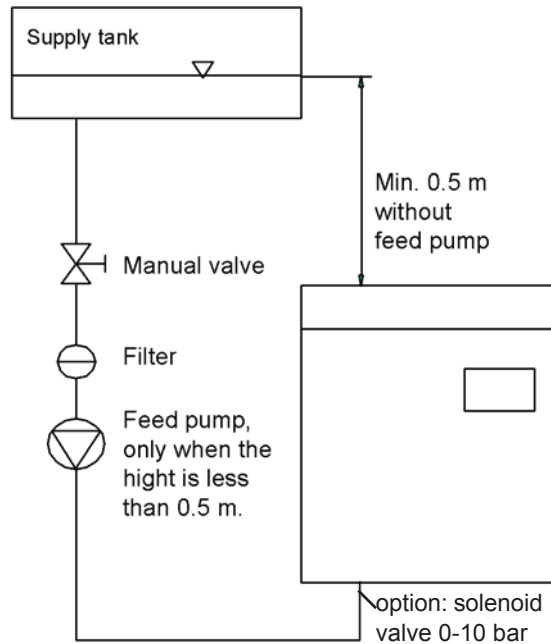


Note: Tightening too much will destroy the fitting. The valve strainer must be placed inside the solenoid valve.

- » Use a cap nut (internal thread 3/4") with inner seal for a customer-provided water installation.

6.5.1 Feed from Holding Tank

If a holding tank will be used to supply water, the „option solenoid valve 0-10bar” must be ordered. Make sure that the feed height is at least 0.5 meter. If the height is less than 0.5 m, insert a feed pump or install the humidifier lower if possible.



6.6 Water Treatment

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

HeaterSlim	Max. Water Consumption in over 24 h [l]
3	91
6	185
10	276

6.7 Water Discharge



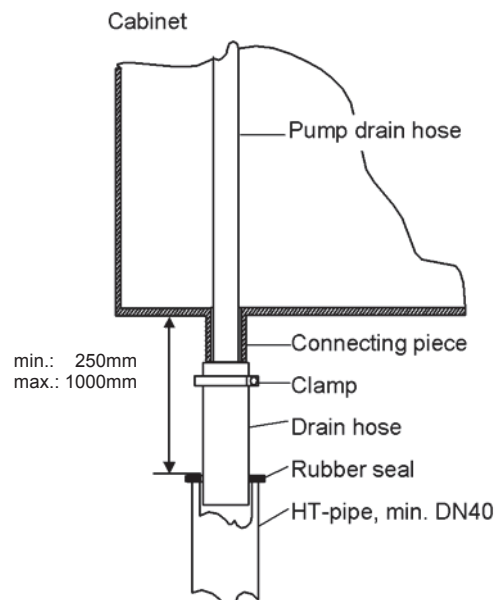
Warning: During blow down hot water with a temperature of about 95°C is being drained. If touched this can cause burns to the skin.



Warning: Please pay attention to free and non-pressure drainage of the water! During blow down up to 0,3L/s is being drained. For water discharge, we recommend installation of a flexible water drain hose. Humidifier and waste water discharge must be on the same pressure level.

Please note:

- Do not bend, shorten or lengthen the drain hose.
- Der Wasserablaufschlauch darf nicht direkt nach draußen verlegt werden.
- For the discharge line and drain pipe, select materials temperature-resistant up to 95°C.



Install the water drain system as follows:

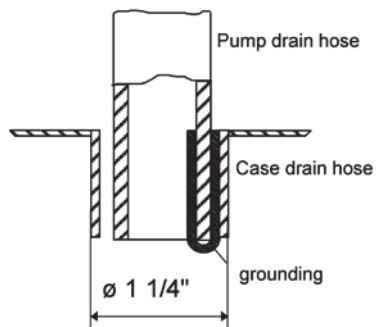
- Run 250 - 1000 mm length of 1 1/4" drain hose loosely into a drainpipe with a minimum inner diameter of 40 mm.

Type	Drain Hose
HS 3-10	1 x 1 1/4"

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

A grounding clip is fixed on the inner surface of the cabinet drain connection. Slide the end of the pump drain hose onto this clip. During blow-down, the grounding clip will be in direct contact with the water and will conduct any residual currents which may appear away from the cabinet.

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



6.8 Checklist

Verify correct system installation using the checklist below:

- ☒ Can flushed-out water drain freely?
- ☒ Have all screws and clamps been properly tightened?
- ☒ Is the water supply line properly flushed out?
- ☒ Has the water installation been performed correctly?

Is the drainage system correctly installed?

Are the water supply and drain lines free of leaks?



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

6.9 Steam Line



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

- The steam hose diameter may not be smaller than the steam outlet of the HygroMatik steam humidifier (do not restrict the cross-section, otherwise back pressure will increase).
- The steam hose must be without sags and kinks and be laid with a continuous slope of 5-10% (otherwise sags will be formed).
- The steam hose should be as short as possible. In case of lengths of over 5 m the hose should be insulated to avoid excess condensation.
- In the case that steam output is distributed on two steam manifolds the Y-pieces for the steam and condensate hose should be installed near the manifolds. If the installation is carried out in this way only one steam hose is necessary for the main part, loss of condensate will be decreased. If the installation is carried out in this way only one steam hose is necessary for the main part, loss of condensate will be decreased.
- Depending on how the hose is laid, hose clips should be set at intervals of approx. 500 mm.
- Allow access to the steam hose, so that it can be inspected later.
- In case of straight lengths of several meters, it is recommended to place the steam hose in temperature resistant plastic pipe (40 mm dia for hose DN25; 60 mm dia for hose DN40) or to use copper pipe.
- Device output, steam line installation, and the duct influence pressure condition in the duct. In an exceptional case this could mean to optimize the steam line installation.
- Only genuine HygroMatik hoses are capable of withstanding the operating conditions.
Allow for minimum bending radii:
Steam hose DN 25: $R_{min} = 200 \text{ mm}$
Steam hose DN 40: $R_{min} = 400 \text{ mm}$

6.10 Unit Installation Check



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

Please check the installation using the following list:

- ☒ Does unit hang vertically?
- ☒ Are wall distances to the unit within the range
- ☒ Does steam hose have a slope of 5-10%?
- ☒ Is condensate hose (if used) installed with a loop of min. 200 mm?
- ☒ Is steam manifold positioned correctly? Are all bolts and clamps tightened?
- ☒ Are all bolts and clamps tightened?
- ☒ Is the steam hose without sags and kinks?

7. Electrical Installation



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



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



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



Warning: For installation, note the following:

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

7.1 Connection and assembly of the remote control to the HeaterSlim TR(S)

Remote control in charging cradle:

Front view

Rear view



Retaining bracket:



Sealing ring



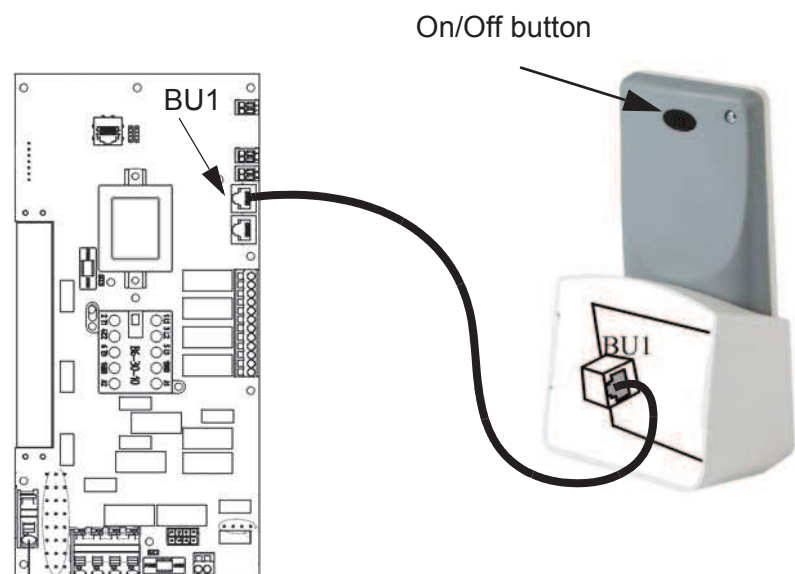
The HeaterSlimTR(S) remote control is placed in the charging cradle to charge.

The charging cradle can be installed on the wall with the retaining bracket or simply put on the table free-standing. The retaining bracket is pushed into the charging cradle from behind and fixed in place with one screw from the bottom. It can be attached to the wall with the two keyhole bores. A communication cable with RJ45 plugs (available from HygroMatik with the lengths 3m, 5m, 10m) is laid from the charging cradle to the mainboard of HeaterSlim PR(S) through the large hole on the rear or alternately through the hole on the bottom of the retaining bracket. It is used for data transmission and electric power supply.

7.1.1 Connection from remote control to mainboard

If you pull the retaining bracket out of the charging cradle you can see a small electronics board on the rear of the charging cradle. Switch off HeaterSlim PR(S) and insert the plug (RJ45) of the communication cable in bushing BU1. The other side of the cable is pulled through one of the cable screw connections inside the housing of HeaterSlim PR(S) and inserted in bushing BU1 there.

Note: If you unscrew the retainer nut of the cable screw connection you can dismantle the sealing ring inside. It can be replaced with a slotted sealing ring (in the enclosed accessories package) that can be bent open to insert the communication cable. The communication cable can be guided through the cable screw connection with the plug this way.



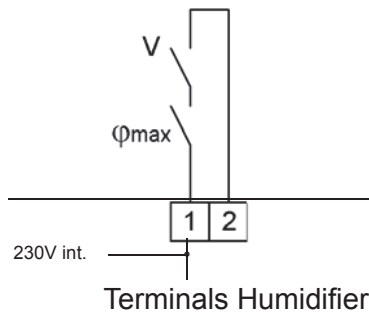
7.2 Electrical Installation

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

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

We recommend using a main fuse with medium blow rating (applies only to the mains voltages above.) See table below indicating maximum power consumption corresponding to each type of circuit protection:

Type	Power Supply	Power Consumption [A]	Fuses [A]
HS03	230V/1Phase/N	10,9	1 x 16
	400V/3Phases/N	10,9	1 x 16
HS06	230V/1Phase/N	21,7	1 x 25
	400V/3Phases/N	10,9	3 x 16
HS10	230V/1Phase/N	32,6	1 x 35
	400V/3Phases/N	10,9	3 x 16



7.3 Safety Interlock

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

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

There is no jumper between terminal 1 and 2 ex works.

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



Warning: It is standard practice for **air-conditioning** to install a max. hygostat in the safety interlock (**not valid for steam bath applications**). The max. hygostat acts as a safety device in the event of a humidity sensor malfunction and protects against overhumidification.



Warning: Contacts laid between Terminals 1 and 2 must be potential free and rated for 24V switches. Terminal 1 is supplied with **24V** AC after switching on the humidifier.

7.4 Cable Connections

The table below shows the cable connections provided in HeaterSlim steam humidifiers:

Unit	Blind Plug M16	Connection M16	Connection M25
HS03 - 10	3	2	2

Characteristics of metric cable connections:

Thread	across-flats dimensions [mm]	for cable diameter [mm]
M16x1,5	19	4,5 - 10
M25x1,5	30	9 - 17

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

7.5 Wiring Diagram

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

7.6 Electrical Installation Checklist

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

- ☒ Does the mains voltage match the voltage on the name plate?
- ☒ Have all electrical connections been made according to the terminal diagram?
- ☒ Have all electrical cable and plug connections been properly tightened?
- ☒ Are all electrical plug connections secure?
- ☒ Is the unit grounded?

After this check the unit can be switched on.



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

8. Maintenance

The HygroMatik steam humidifier is easy to maintain. Nevertheless, inadequate or improper maintenance can lead to operational malfunctions. Perform regular maintenance to give your unit a long life span.



Warning: When performing maintenance work, please follow these instructions:

- During operation and also some time after switching off the unit the steam cylinder (9) and the heater bundle (8) are hot.
- Drained cylinder water could have a temperature up to 95°C.
- Before removing the steam cylinder make sure that it is completely drained and that it does not contain any hot water.
- During disassembling a steam hose hot steam could leave the steam hose if several humidifiers are working on the same air duct, although the currently maintained unit is switched off.
- Have the unit serviced only by qualified, authorized personnel.
- Obey safety regulations.
- Switch off the unit prior to maintenance and secure against restart.
- After maintenance work, have qualified personnel check that the unit is operating safely.
- If a defective cable is detected through a visual check switch off the unit, secure it against restart and replace the cable.

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

8.1 Service message and reset of message

The HygroMatik steam humidifier type HeaterSlim distributes a service message in two cases:

1. After expiry of a certain quantity of produced steam (in accordance to the setting of the DIP switches to the feed water quality).
2. After expiry of the permitted switching games up to the recommended exchange of the main contactor.

The service messages are represented by the device as follows:

1st case: the light in the main switch is turned off every 3. 5 seconds for 0. 5 seconds.

2nd case: the light in the main switch is turned off every 2. 5 seconds 2 times for 0. 5 seconds.

In addition units equipped with touch control will report the service message in the display. If one uses such an equipment the reset of the service message can be done via software.

Reset of a service message by the use of DIP switches is described in chapter „Reset of service messages via DIP switches“.

8.2 Maintenance for Operation with Demineralized Water / Condensate

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

Cycle	Maintenance Task
4 Weeks after Initial Operation	Visual check of electrical and mechanical connections. Visual check of water level control. Visual check of steam cylinder interior.
Annually	Visual check of electrical and mechanical connections. Visual check of water level control. Visual check of heater elements / thermo sensor. Visual inspection of interior of steam cylinder. If needed, cleaning of steam cylinder, heater elements and thermo sensor.

8.3 Maintenance for Operation with Tap Water or Partially Softened Water

No precise maintenance intervals can be specified because these always depend on water quality and quantity of steam generated. It is advisable to adjust the frequency of maintenance to the specific operational application.

HYGROMATIK recommends to open and check the steam cylinder two weeks after commissioning. Ongoing maintenance intervals can be estimated based on the amount and type of residue found in the steam cylinder.

Blow-Down Cycles

The vaporization process causes mineral (calcium) deposits of different compositions to settle in the steam cylinder. Part of this solid build-up is removed through periodic blow-downs and fresh tap water refills.

Water quality

When using tap water, note that cleaning intervals shorten as the carbonate hardness level in the water increases. As a general rule, it is preferable to operate the unit with fully demineralized water. Operation will not be affected by mineral deposits and flushing losses will be minimized.

Removal of Steam Cylinder

- » Drain residual water in the cylinder by pressing the button (52) for the drain pump.
- » Disconnect steam humidifier from power supply. Control switch OFF and remove safety fuse F1. Secure against restart.
- » Check that unit is without power.
- » Remove plug from connecting cable for thermal cut-out/sensor electrode (6).
- » Remove plug from connecting cable for heater bundle (8).
- » Remove clip (24) between adapter (2) and cabinet.
- » Push steam hose adapter upwards. (Steam hoses shorter than 0.5 m should be removed before.)



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

- » Lift steam cylinder (9) out of the base (11) and remove adapter (2) from humidifier.
- » Remove all nuts (25) on the flange plate of the heater bundle (8).
- » Remove heater bundle (8).

Cleaning



Note: The use of acids (max. 10% acid concentration) is allowed!

- » Remove all scale and sludge from cylinder. Small amounts of scale on the heaters are acceptable.
- » Clean flange plate of heater bundle (8).
- » Unscrew mounting plate (33) for level control and pull out the level control (6).
- » Clean level control (6). By the use of acidic cleaners do not contact the plastic parts.
- » Insert water level control (6) and fix mounting plate (33) for level control.

Reassembly of the Steam Cylinder

- » Replace the flange plate sealing (15) with original HygroMatik solvent-free sealing.
- » Insert heater bundle (8) and fix it.
- » Remove o-ring (4) from the lower spout of the cylinder (9) and clean cylinder base (11).
- » Insert a new solvent-free, moistened HygroMatik o-ring into the cylinder base (11).
- » Remove o-ring (4) from the upper spout of the cylinder.
- » Insert a new solvent-free, moistened HygroMatik o-ring into adapter (2).
- » Position cylinder vertically and then settle firmly into cylinder base.
- » Push adapter (2) downwards onto the steam outlet.
- » Fix adapter with clip (24).
- » Connect the steam hose.
- » insert plug from connecting cable for thermal cut-out/sensor electrode (6).
- » Insert plug from connecting cable for heater bundle (8).
- » Push in safety fuse.

- » Switch on the unit and operate for 15 to 30 minutes. Check for any leaks.

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

8.3.1 Replacing Heater Bundle (incl. Heater Element and Thermal Cut-Out)



Note: The Heater Bundle can only be replaced as a whole.

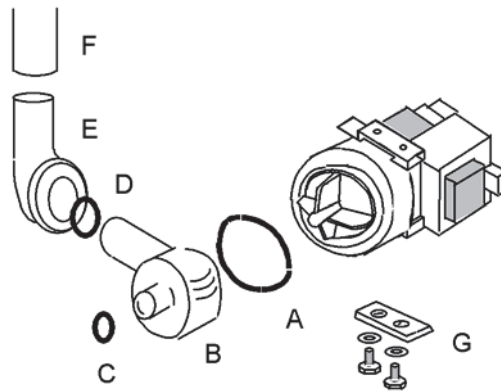
- » Remove and open the steam cylinder as described above in section “**Removal of Steam Cylinder.**”
- » Replace heater bundle and assemble all as described above in section “**Reassembly of the Steam Cylinder.**”

8.3.2 Cleaning the Pump

- » Drain residual water in the cylinder by pressing the switch (52).
- » Disconnect steam humidifier from power supply. Control switch OFF and remove safety fuse. Secure against restart.
- » Check that unit is without power.
- » Disassemble the cylinder, as described in section “**Removal of Steam Cylinder.**”
- » AnschlussRemove electric cable from pump.
- » Remove adapter (E) from pump.
- » Remove screws (G) and the pump from cylinder base.
- » Open pump (bayonet joint).
- » Remove residues from discharge hoses and pump. Replace o-ring (A), or body (B) as necessary if any of these parts are no longer in perfect condition.

- » Reassemble the pump.
- » Insert moistened o-ring (C) in the cylinder base lateral opening.
- » Insert pump into cylinder base and fasten pump with screws (G).
- » Slide the moistened o-ring (D) on to the pump inlet opening.
- » Push adapter (E) over the pump outlet opening.
- » Connect electric cable to pump.
- » oben im Kapitel „Assemble cylinder, as described in section „**Reassembly of the Steam Cylinder**”.
- » Switch on unit and operate for 15 to 30 minutes. Check for any leaks.

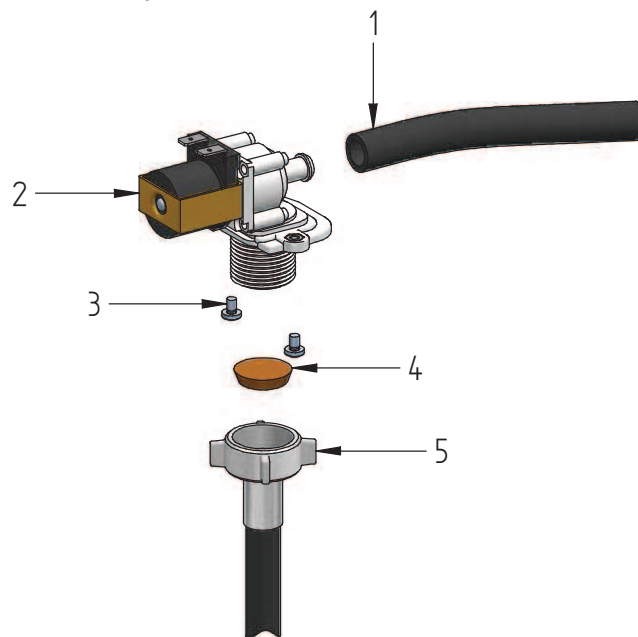
In case of any leakages disconnect steam humidifier from power supply and pay attention to safety instructions about work with voltage electrical units.



8.3.3 Cleaning the Solenoid Inlet Valve

Disassembly

- » Disassemble the cylinder, as described in section **“Removal of Steam Cylinder.”**
- » Turn off water supply and loosen nut to the fresh water connection (5).
- » Release connecting hose (1) to cylinder base.
- » Pull out cable plugs from solenoid valve (2).
- » Remove fitting screws (3) from solenoid valve.
- » Remove solenoid valve.
- » Remove filter (4) in the inlet and clean. Exchange filter, if necessary.



Assembly

- » Insert filter (4).
- » Insert solenoid valve into unit.
- » Firmly fasten solenoid valve with screws (3).
- » Connect water supply (5).
- » Connect cable plugs to solenoid valve.
- » Connect connection hose (1) to solenoid valve.
- » „Assemble cylinder, as described in section „**Reas-**

sembly of the Steam Cylinder”.

- » Open water supply.
- » Switch on the unit and operate for 15 to 30 minutes. Check for any leaks.

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

8.3.4 Check Cable Connections and Heater Cables

- » Check all connections to be firmly tightened.
- » Electrical equipment of the unit must be checked regularly. Defects such as loose connections or scorched cables or damaged electrical insulation, have to be removed immediately.



Attention: Loose cable connections lead to excessive contact resistance and overheating of the contact surface.

8.3.5 Reset the thermal cut-out

At over temperature the thermic cut out (5) triggers.

After the system has cooled down the release button on the thermic cut out can be unlocked by pressing it down.

Cleaning of Hoses and Cylinder Base

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

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

8.4 Operational Check

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

8.5 Dismantling

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



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

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

9. Commissioning



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

Switching off steam humidifier



Warning: Before starting up the unit, make sure you know how to switch it off.

- » Switch off unit by setting control switch (51) to “0”
- » Close water supply stopcock valve.

Check of electrical wire connections

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

Switching on Steam Humidifier

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

The following functions are operating:

- The unit runs a self-test.
- If there is a demand for steam (and the safety chain is closed), the water inlet solenoid valve opens and feeds water into the steam cylinder. Filling the steam cylinder can take up to 5 minutes. The main contactor is switched and a few minutes later steam production starts.

Further checks:

- ☒ Let all electrically-driven operations run to completion.

As soon as the solenoid valve begins replenishing the water periodically, the steam humidifier operates at steady nominal output and the cold start sequence is complete.

- » Monitor the unit and let it operate for 15 to 30 minutes. If leaks appear, switch off the unit.
- » Repair leaks, and in doing so:



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

10. EC-Declaration of Conformity



EG-Konformitätserklärung EC Declaration of Conformity

Hersteller / Manufacturer: HygroMatik GmbH
Anschrift / Address: Lise-Meitner-Straße 3, D-24558 Henstedt-Ulzburg, Germany
Produktbezeichnung / Product description: HeaterSlim: HS03, HS06, HS10
In den Ausführungen / Type: Basic, Touch, Touch Remote, Dampfbad / Spa (S)

Die bezeichneten Produkte stimmen in der von uns in Verkehr gebrachten Ausführung mit den Vorschriften folgender Europäischer Richtlinien überein:
The products described above in the form as delivered are in conformity with the provisions of the following European Directives:

- | | |
|--------------------|---|
| 2004/108/EG | Richtlinie des Rates zur Angleichung der Rechtsvorschriften der Mitgliedstaaten über die elektromagnetische Verträglichkeit.
<i>Council Directive on the approximation of the laws of the Member States relating to electromagnetic compatibility.</i> |
| 2006/95/EG | Richtlinie des Rates zur Angleichung der Rechtsvorschriften der Mitgliedstaaten betreffend elektrische Betriebsmittel zur Verwendung innerhalb bestimmter Spannungsgrenzen.
<i>Council Directive on the approximation of the laws of the Member States related to electrical equipment designed for use within certain voltage limits.</i> |

Die Konformität mit den Richtlinien wird nachgewiesen durch die Einhaltung folgender Normen:
Conformity to the Directives is assured through the application of the following standards:

Referenznummer:	Ausgabedatum:	Referenznummer:	Ausgabedatum:
<i>Reference Number:</i>	<i>Edition:</i>	<i>Reference Number:</i>	<i>Edition:</i>
DIN EN 61000-4-2	2009-12	DIN EN 61000-6-2	2006-03
EN 61000-4-3	2006 + A1:2008 + A2:2010	DIN EN 61000-6-3	2007-09
EN 61000-4-4	2004 + A1:2010	DIN EN 60335-1	2010-11
DIN EN 61000-4-5	2007-06	DIN EN 60335-1/A15	2012-03
DIN EN 61000-4-6	2009-12	DIN EN 60335-2-98	2009-04
DIN EN 61000-4-11	2005-02	DIN EN 62233	2008-11
DIN EN 61000-4-13	2002 + A1:2009	DIN EN 62233 Ber.1	2009-04

Die Anforderungen des Produktsicherheitsgesetzes ProdSG §3 Abs. 1 bis 2 werden eingehalten. Eine vom Lieferzustand abweichende Veränderung des Gerätes führt zum Verlust der Konformität.
The requirements of the German Product Safety Law (ProdSG) paragraph 3 clause 1 to 2 are met. Product modifications after delivery may result in a loss of conformity.

Henstedt-Ulzburg, den / the 12.04.2013

HygroMatik GmbH

i.V.

Dirc Mönssing
Geschäftsführer / General Manager

Dr. Andreas Bock
Technischer Leiter / Head of Engineering

Diese Erklärung bescheinigt die Übereinstimmung mit den genannten Richtlinien, ist jedoch keine Zusicherung von Eigenschaften. Die Sicherheitshinweise der mitgelieferten Produktdokumentation sind zu beachten.
This declaration certifies the conformity to the specified directives but contains no assurance of properties. The safety documentation accompanying the product shall be considered in detail.

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USt-ID-Nr. DE 134945785
Ein Unternehmen der
spirax / sarco Gruppe

Deutsche Bank
Kto. 6256689 00 . BLZ 200 700 00
IBAN DE12 2007 0000 0625 6689 00
BIC: DEUTDE33

11. Spare Parts

*	HS03	HS06	HS10	Article No.	Description
					Cabinet HC
	1	1	1	B-2129013	Cabinet HS without hole for remote control
	1	1	1	B-2129015	Cabinet HS with hole for remote control
	1	1	1	E-2124002	Key for safety lock
					Steam Generation
9	1			B-2205761	Cylinder compl., with 1 heater element 2,5kW, 1 thermal sensor, sensor electrode, and terminal
9		1		B-2205763	Cylinder compl. Incl 2 heater elements each 2.5kW, 1 thermal sensor and sensor electrode
9			1	B-2205765	Cylinder compl. Incl 3 heater elements each 2.5kW, 1 thermal sensor and sensor
8	1			B-9905771	flange plate incl 1 heater element 2.5kW and terminal
8		1		B-9905773	flange plate incl 2 heater elements each 2.5kW and terminal
8			1	B-9905775	flange plate incl 3 heater elements each 2.5kW and terminal
15	1	1	1	E-2205154	Gasket for HS cylinder
25	1	1	1	B-2504153	Mounting nut set for heater
	1	1	1	B-2504151	Mounting set for sensor electrode
	1	1	1	B-3216013	O-ring set for HS03-10
5	1	1	1	E-2205124	Thermal circuit breaker with manual reset, 110°C ± 5K
2	1	1	1	E-3221008	adapter for steam hose DN40
24	1	1	1	E-2209002	Clip for steam hose adapter DN40
4	1	1	1	E-2204022	O-ring for steam hose adapter DN40

	HS03	HS06	HS10	Article No.	Description
					Water feed
14	1	1	1	B-2304115	solenoid valve 0,5l/min, 200-240V, 0,2-10 bar
	1	1	1	E-2304016	fine filter in solenoid valve inlet
	1	1	1	E-2304103	captive coupling ring for solenoid valve 3/4"
	1	1	1	E-2304107	gasket for inlet screwed fitting, solenoid
	1	1	1	B-2304031	hose for water connection, 0,6m 3/4" cap nuts on both sides, seal included
32	1	1	1	E-2304036	rubber seal solenoid valve - cabinet
	1	1	1	B-2304040	mounting set for solenoid valve
31	1,15	1,15	1,15	E-2604002	hose solenoid valve - Non-return valve - cylinder
6	1	1	1	B-2504147	sensor electrode for water level control, compl with plug, sensor sticks, cable
33	1	1	1	E-2525270	mounting plate for level control
	1	1	1	E-2525264	rubber seal for water level control
					Water Drain
11	1	1	1	E-2206086	cylinder base for C, Hy, HC, DN40
4	1	1	1	E-2204022	O-Ring for cylinder base DN40
10	1	1	1	B-2404027	Drain pump 230V/ 50-60Hz without mounting set
	1	1	1	B-2424014	Mounting set for drain pump
	1	1	1	E-2404008	Drain pump housing
18	1	1	1	E-3220005	O-ring cylinder base - drain pump
21	1	1	1	E-3425002	adapter, pump - drain house, angled DN25/13
18	1	1	1	E-3220005	O-ring for drain pump
7	1	1	1	E-2425004	Elbow with vent pipe
22	0,45	0,45	0,45	E-2604002	hose, drain pump-elbow
23	0,55	0,55	0,55	E-2604004	drain hose, elbow -outlet
	1	1	1	E-2420423	Drain hose 1 1/4"
	1	1	1	B-3401051	drain hose system for HS03-10

	HS03	HS06	HS09	Article No.	Description
					Control
51	1	1	1	E-2502418	control button ON/OFF, green light
52	1	1	1	E-2502420	pump button, momentary ON
					Basic
	1	1	1	B-2528201	Elektronic pcb type Slim Basic SPA
	1	1	1	B-2528203	Elektronic pcb type Slim Basic HVAC
	1	1	1	E-2528220	insert bridge 3pole
	(1)	(1)	(1)	B-2528301	Electronic pcb type Slim Plus (relais pcb)
					Touch
	1	1	1	B-2528201	Elektronic pcb type Slim Basic SPA
	1	1	1	B-2528203	Elektronic pcb type Slim Basic HVAC
	1	1	1	B-2528441	remote control Slim
	1	1	1	B-9926447	fixation HS incl. Contact pcb non wireless
	(1)	(1)	(1)	B-2528301	Electronic pcb type Slim Plus (relais pcb)
					Touch Remote
	1	1	1	B-2528201	Elektronic pcb type Slim Basic SPA
	1	1	1	B-2528203	Elektronic pcb type Slim Basic HVAC
	1	1	1	B-2528441	remote control Slim
	1	1	1	B-2528445	external docking station compl.
	(1)	(1)	(1)	B-2528301	relais pcb ind. assembly base
					Accessories
				E-2604034	Reducing piece DN40/DN25 for steam
				E-2604012	Steam hose DN25, per m
				E-2604013	Steam hose DN40, per m
				E-2604002	Condensate hose DN12, per m
				E-2404004	Steam hose clamp DN25
				E-2604016	Steam hose clamp DN40
				E-2304015	Condensate hose clamp DN12
				E-2604042	Steam manifold piece DN25, stainless steel
				E-2604023	Steam manifold piece DN40, stainless steel
				E-2604021	Condensate connector T-piece DN12
58				E-2604094	Double check valves
				B-2604025	steam solenoid valve 0-0,4 bar, compl. for steam hose DN 25
				B-2604040	steam solenoid valve 0-0,4 bar, compl. for steam hose DN 40
If you order any spare parts, specify type and serial number of the unit, please.					
* see exploded view					

12. Fax Form - Order for spare parts

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

Fax Form

Please copy, fill in and fax to
Fax.No. **+49(0)4193/895-31**

Order of spare parts

unit type * _____ serial no.* _____

commission: _____ order no.: _____

quantity	article	article no.

date of delivery _____ forwarder _____ shipment by _____

delivery address (if different
from invoice address)

company stamp (delivery adress)

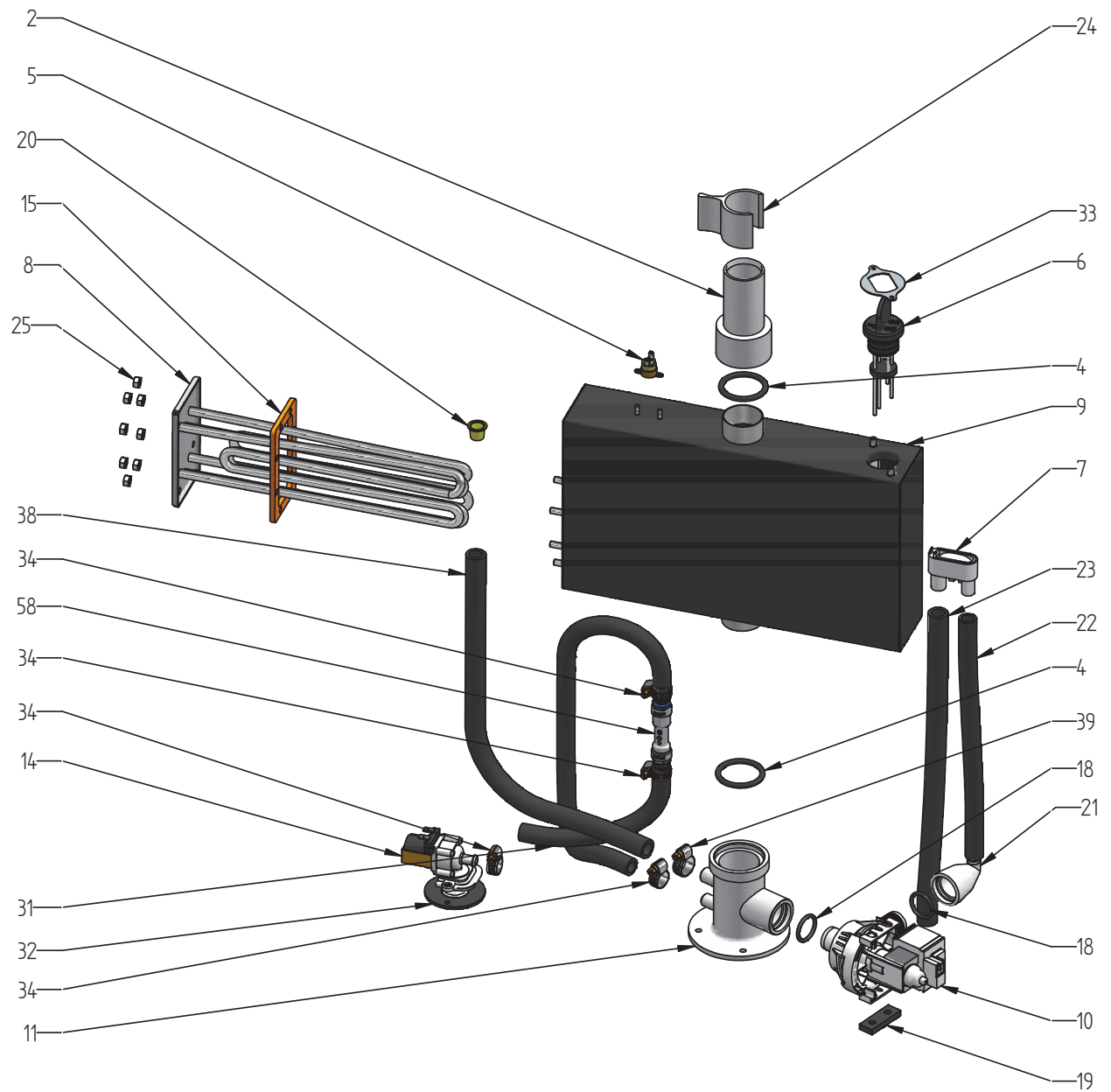
date/signature

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

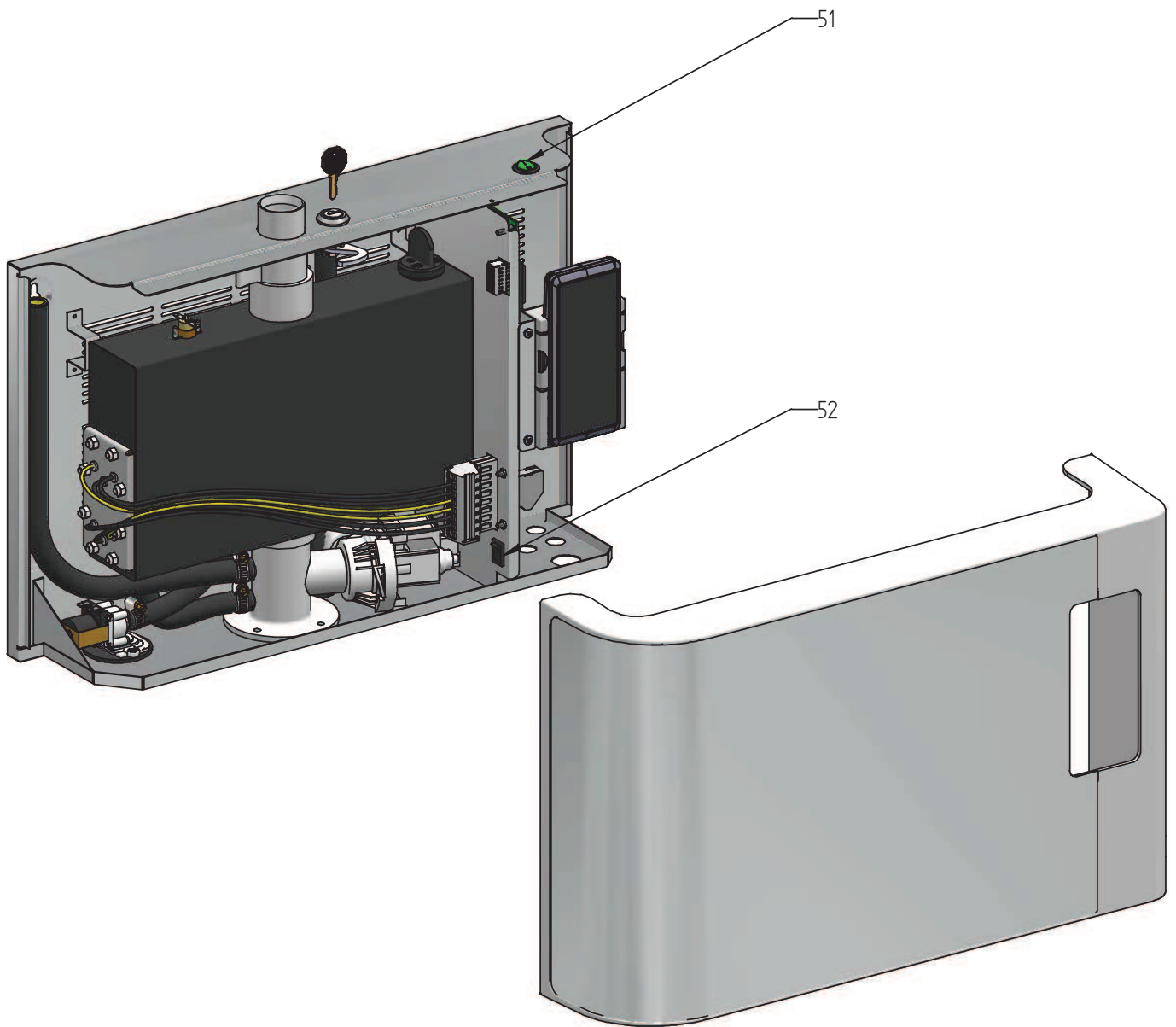
13. Technical Specifications

HeaterSlim						
Type	HS03	HS06	HS10	HS03	HS06	HS10
Steam Output [kg/h]	3,3	6,6	10,0	3,3	6,6	10,0
Electrical Supply*	230V/1/N			400V/3/N 50-60Hz		
Power Rating [kW]	2,5	5,0	7,5	2,5	5,0	7,5
Power Consumption [A]	10,9	21,7	32,6	10,9	10,9	10,9
Circuit Protection [A]	1x16	1x25	1x35	1x16	3x16	3x16
Control Type	Basic, Touch, Touch Remote					
Number of Steam Cylinder	1					
Number of Heater Elements	1	2	3	1	2	3
Steam Hose Connection	1x40mm					
Condensate Hose Connection	1x12mm					
Net Weight [kg]	15	15	15	15	15	15
Operating Weight [kg]	18	18	18	18	18	18
Height [mm]	370,5					
Width [mm]	574,5					
Depth [mm]	164,0					
Water Supply	Fully Demineralized Water / Cleaned Condensate (min. 3µS/cm conductivity): 1 to 10 bar, 13mm Hose Partially Softened Water / Tap Water (different qualities, max. total hardness: 15°gH): 1 to 10 bar, for 3/4” external thread					
* Other voltages upon request.						

14. Exploded View



15. View of Cabinet





HyGROMATIK®

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