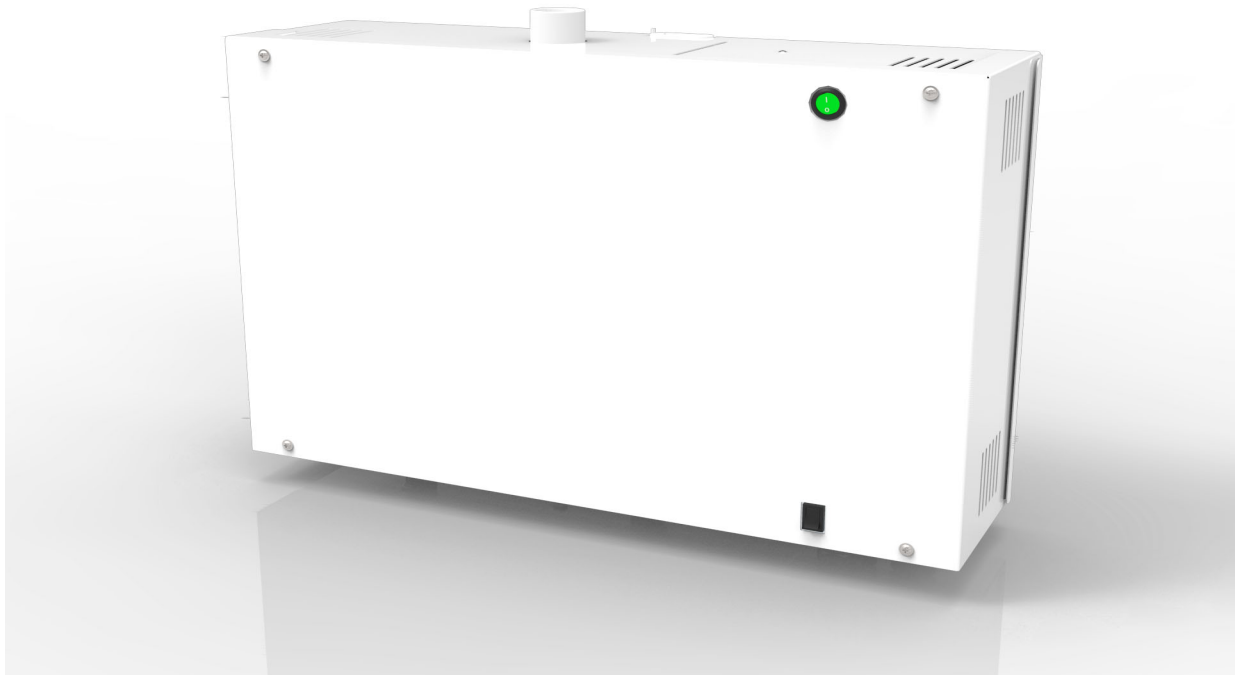




**HyGROMATIK**® SPA

# HeaterSlim

Electric Heater Steam Generator



Manual



HS.EN  
E-8881112

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HS EN

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



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: [hotline@HygroMatik.de](mailto:hotline@HygroMatik.de)**

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

### 1.1 Typographic Distinctions

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

### 1.2 Documentation

#### Retention

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

#### Versions in Other Languages

These operating instructions are available in several languages. If interested, please contact 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. Proper usage also entails following HygroMatik's instructions for installation, dismantling, reassembly, initial operation and operation and maintenance, as well as disposal procedures.

Only qualified 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



Caution steam

#### 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 „DGUV Regulation 3“ 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.

Steam operation is only allowed when the unit cover is closed.

**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

**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.



### **Installation, Dismantling, Maintenance and Repair of the Unit:**

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

#### **Electrical**



#### **Installation in accordance with CEC and/or NEC!**

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

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.

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.

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.

### 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 Packing



**Note:** Observe the symbols affixed to the box.

#### 3.3 Interim Storage

Keep the unit dry and protect from frost.

#### 3.4 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.

#### 3.5 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) are placed in a closed cylinder and connected to alternating current. The cylinder is filled with tap water, fully demineralized water (min. conductivity: 20  $\mu\text{S}/\text{cm}$ ) 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  $100 \times 10^3$  to  $100 \times 10^4$  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.



**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.



**Warning: Risk of electrical shock!**

Hazardous electrical voltage!

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.

### 5.1 Steam Humidifier - environmental conditions



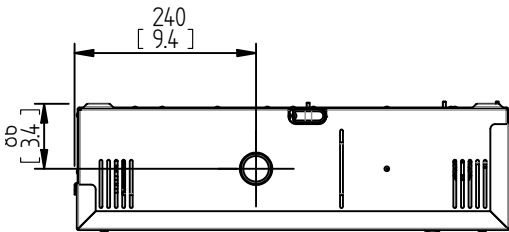
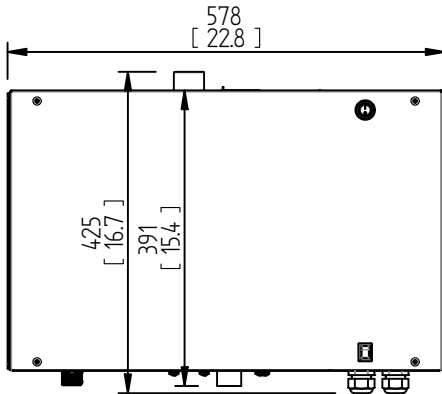
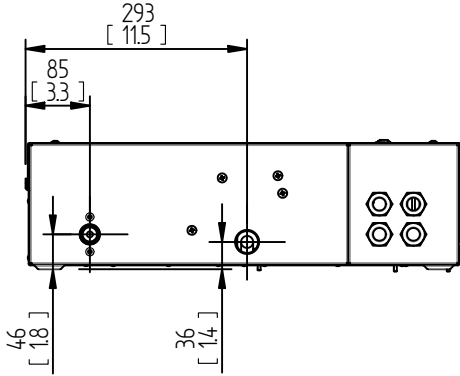
**Note:** When selecting the location for steam humidifier installation, be aware of the following:

- 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

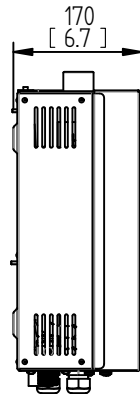
All dimension in mm/ [inch]

**Bottom view**

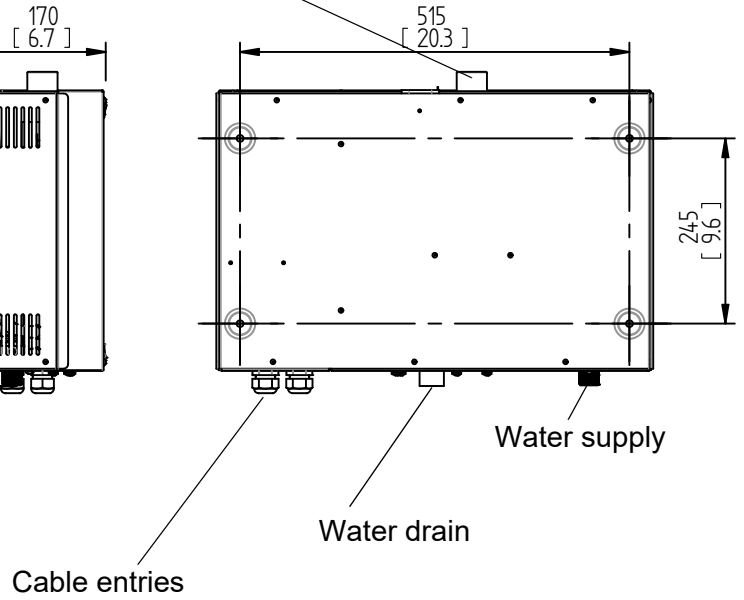


**Top view**

Steam outlet

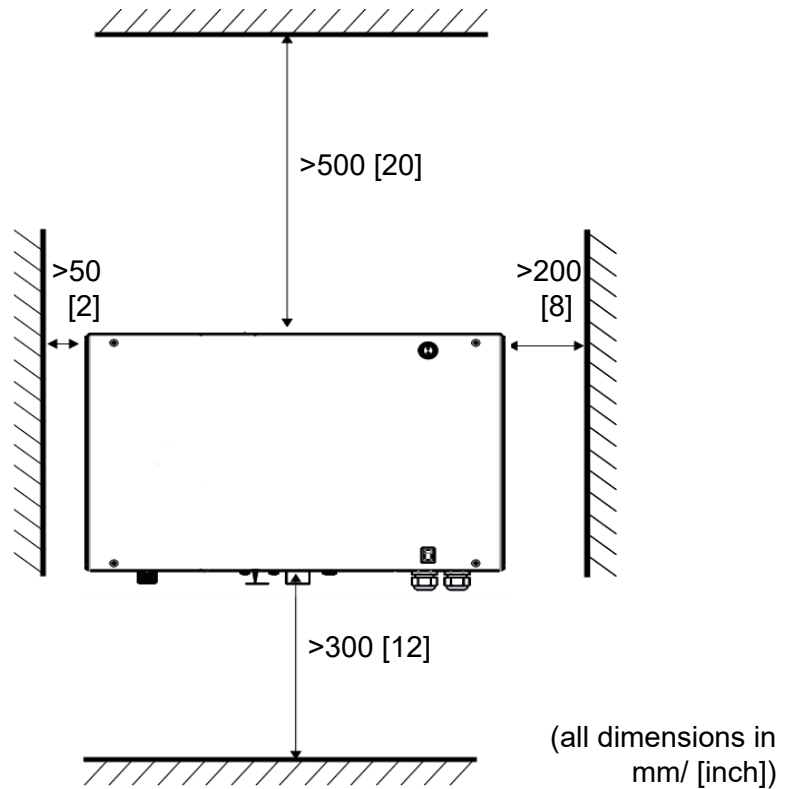


**Rear view**



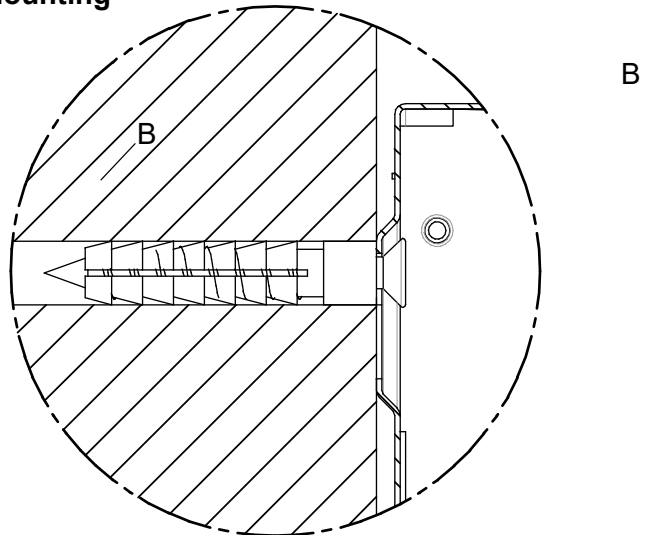
### 5.1.2 Fitting Measures

#### Wall Distance



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

#### Wall Mounting



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.



## 5.2 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:  $R_{min} = 400 \text{ mm}$

### 5.3 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?

## 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 ( $100 \times 10^3$  to  $100 \times 10^4$  Pa)<sup>1</sup>
- For water installation please use the water connecting hose that is delivered with the unit.

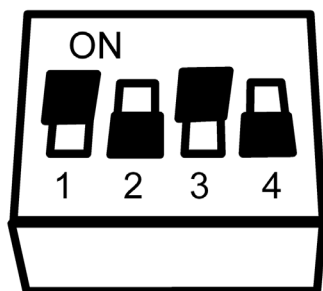
### 6.1 Water Quality

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):

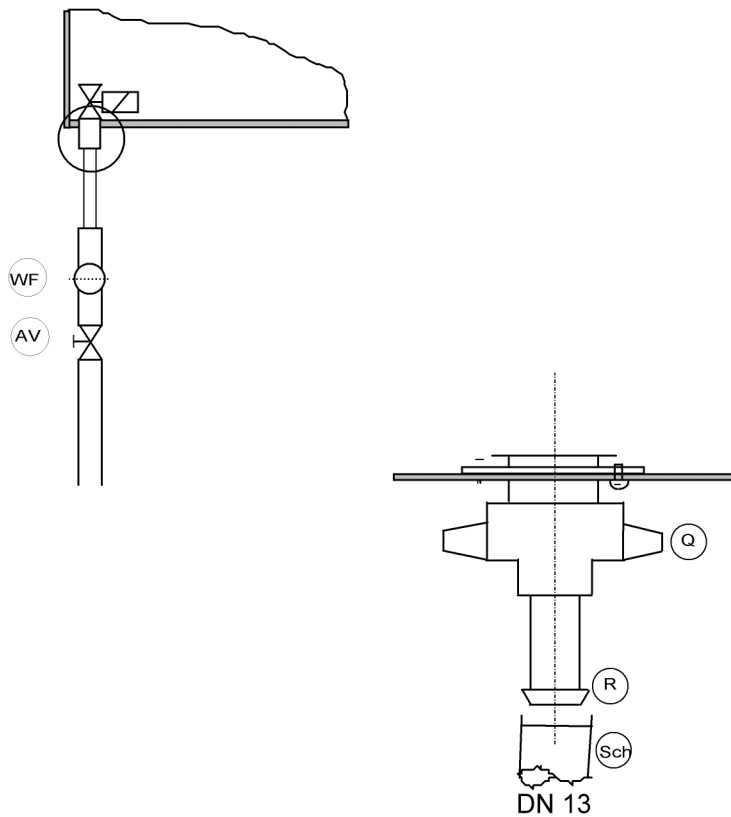
Water quality	slide switch 1	slide switch 2	slide switch 3	slide switch 4
15°gH	-	-	-	-
.	On	-	-	-
.	-	On	-	-
.	On	On	-	-
.	-	-	On	-
7°gH	On	-	On	-
.	-	On	On	-
.	On	On	On	-
.	-	-	-	On
.	On	-	-	On
1°gH or soft water	-	On	-	On
demineralized water	On	On	-	On

### 6.3 Reset of service messages via DIP switches

Function	slide switch 1	slide switch 2	slide switch 3	slide switch 4
<b>Reset service</b> message due to exceeded counter for produced steam amount	On	-	On	On
<b>Reset service</b> 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.

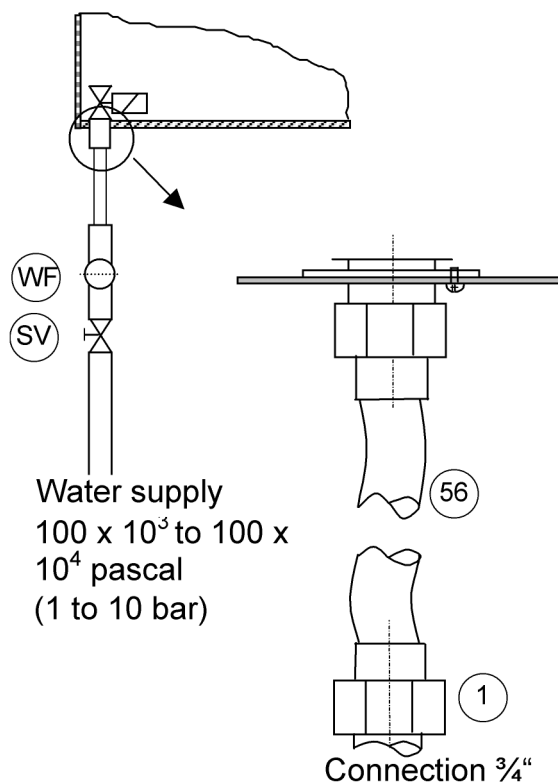
- » Slide 13mm inner diameter hose (SCH) over the pressure clip (R) and secure with a hose clamp.

## 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.

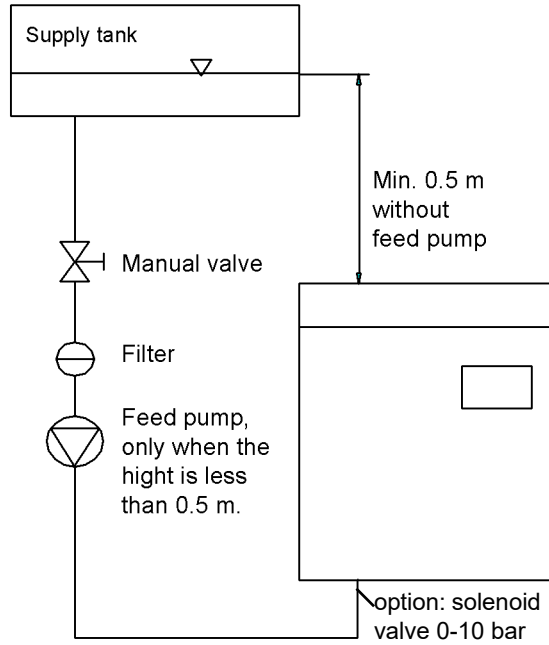


**Note:** Tightening too much will destroy the fitting. The valve strainer must be placed inside the solenoid valve.

- » 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 over24 h [l]
6	185
10	276

## 6.7 Water Discharge



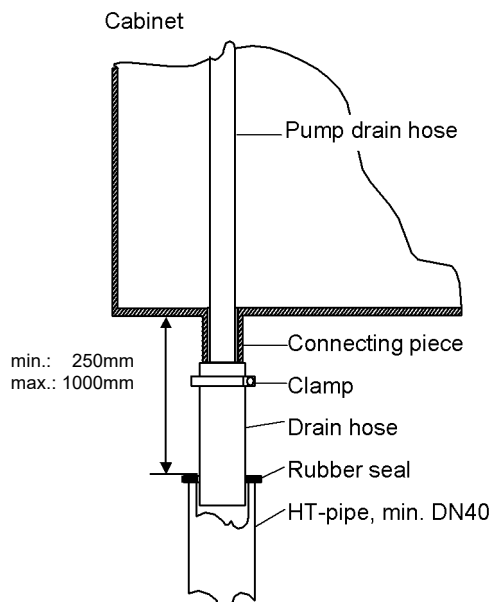
**Warning:** During blow down hot water with a temperature of about 95°C is being drained. If touched this can cause burns to the skin.



**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.
- 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.

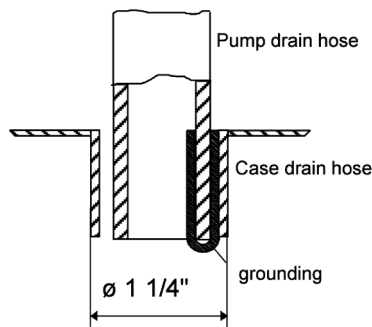
Type	Drain Hose
HS 6-10	1 x 1 1/4"

- 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.

## 7. Overview of Steam Bath Operation and Installation

The necessary steam for the operation of the steam bath is supplied by the HygroMatik Steam Generator. The recorded temperature in the steam bath is the only control variable for controlling steam production. At the default setting, the steam bath achieves a temperature of about 45°C at 100% relative humidity. A steam bath air supply fan may be used to deliver fresh air, and an exhaust fan to remove warm air from the steam bath, in order to ensure continuous steam supply and a stable temperature control.

### Heat-Up Phase:

Steam is supplied to the still cold steam bath, increasing the relative humidity to 100% at an initially constant temperature. Subsequent steam delivery then increases the temperature; the relative humidity remains at 100%.

### Operating Phase:

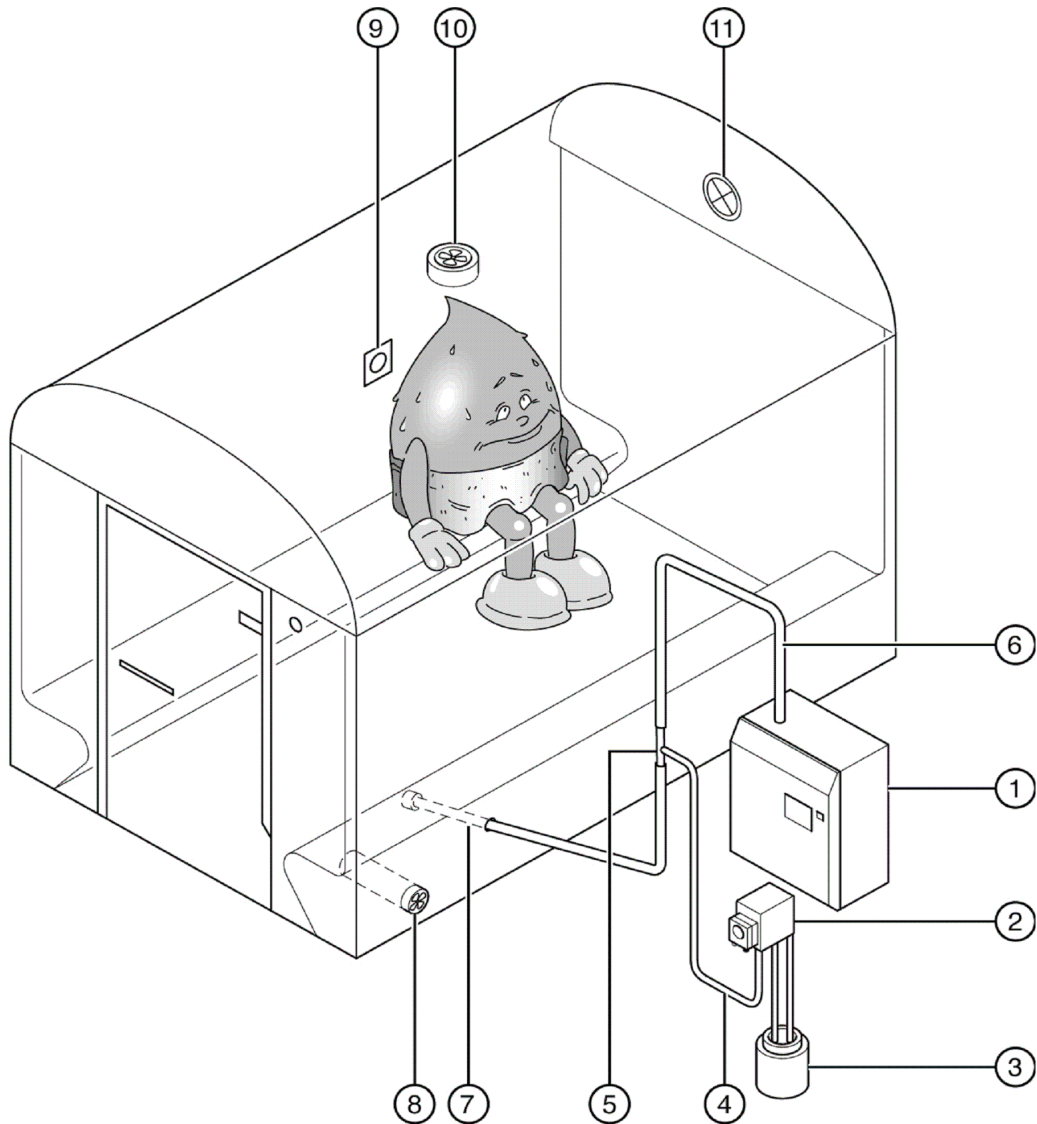
When the desired temperature (plus hysteresis) is reached, steam production is interrupted. If the steam bath temperature falls below the desired value, steam is again delivered into the cabin.



**Warning:** Inside the steam cabin, safe low voltage (24V) should be employed for the fan and light.

**7.1 Steam Bath Installation (Schematic Layout)**

Location	Designation
1	Steam generator
2	Essence peristaltic pump
3	Essence reservoir
4	Essence line to steam hose
5	T-piece for essence feed into the steam hose
6	Steam hose
7	Steam manifold /steam nozzle in steam bath
8	Supply fan
9	Temperature sensor
10	Exhaust fan
11	Cabin light



## 7.2 Steam Bath - Temperature Control

With any steam bath, a temperature sensor must be installed in the cabin. The temperature sensor measures the **temperature** in the steam bath and is connected to the steam generator.

The control supervises the HygroMatik steam production according to the temperature reading. The **relative humidity** is not measured since it is **always 100%** following the heat-up phase.

In addition, depending on your order preference, you can connect an essence injector, light and fan to the steam generator.

**The sample diagram below shows how the Control of a Heater-Slim unit with one heater element functions:**

The steam bath parameters of the control are factory set as follows:

Parameter name	Value
Δ Temp. 1_steam_off	0.5K
Exhausts_fan_Δ temp.	0.5K
Supply_fan_Δ temp.	0.5K
Temp._set_value	45°C

If the temperature in the steam bath falls below **45°C**, an adjustment is made by increasing steam production.

If the temperature in the steam bath rises above **45.5°C**, steam production is shut off.

The release point for the steam generator is determined as follows:

$$\text{Temp._set_value} + \Delta \text{Temp. 1\_steam\_off} = 45^\circ\text{C} + 0.5\text{K} = 45.5^\circ\text{C}.$$

If the temperature in the steam bath rises above the programmed temperature set value of 45°C, the Control activates the steam bath exhaust fan. The control switches off the exhaust fan below 44.5°C. The release point for the steam bath exhaust fan is determined as follows:

$$\text{Temp._set_value} - \text{Exhausts\_fan\_}\Delta \text{ temp. (G3)} = 45^\circ\text{C} - 0.5\text{K} = 44.5^\circ\text{C}$$

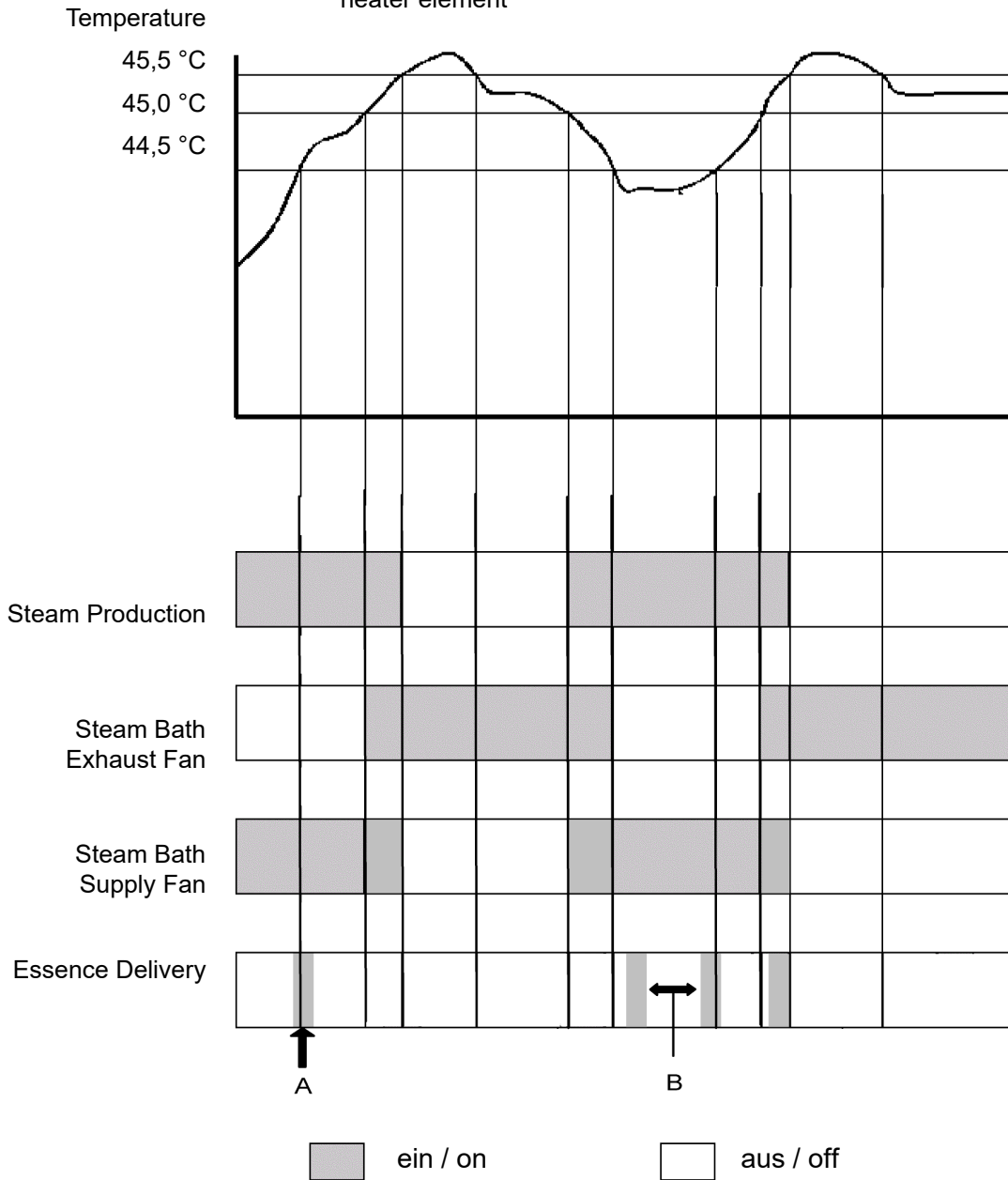
Steam is only produced as long as the temperature in the steam bath remains below the “set temperature value.” If the temperature in the steam bath remains above the “set temperature value” for a long period of time, resulting in this case in **no visible steam** production, this could be due to:

- excessively high heat supply from an additional source, e.g. from heated benches.
- a well-insulated steam bath
- too little air flow in the steam bath.

Air flow in the steam bath is facilitated by a steam bath exhaust fan, causing the temperature in the steam bath to fall more quickly. Renewed steam production compensates for the drop in temperature. In this way, the fan ensures constant, stable steam production - with visible steam in the cabin.

**7.2.1 Diagram Temperature Profile in Steam Bath**

Temperature Profile in Steam Bath using a HeaterSlim unit with one heater element



**Note:** In HeaterSlim units with 2 or 3 heater elements these are turned off at the following temperatures:

**Unit with 2 heater elements:**

Switch off temp. 2nd heater element  
 =  $\Delta \text{Temp. 1\_steam\_off} + \text{Temp. \_set\_value} + 0.5 \text{ K}$  here: 46.0 °C

**Unit with 3 heater elements:**

Switch off temp. 2nd heater element  
 =  $\Delta \text{Temp. 1\_steam\_off} + \text{Temp. \_set\_value} + 0.5 \text{ K}$  here: 46.0 °C

Switch off temp. 3rd heater element  
 =  $\Delta \text{Temp. 1\_steam\_off} + \text{Temp. \_set\_value} + 0.5 \text{ K} + 0,5 \text{ K}$  here: 46.5 °C

The restarting of the heater elements is done simultaneously if the temperature comes under the programmed temperature set value.

## 8. Mechanical Installation of Steam Bath Components

### 8.1 Temperature Sensor Installation

With steam baths, a temperature sensor must be installed in the cabin. The sensor measures the active temperature and sends the value to the control. The recorded temperature constitutes a control variable for controlling steam production.

Please note:

- Do not install the sensor close to the steam manifold.
- Mount the sensor on the wall and not in or under the wall paneling.



**Note:** The best installation location for the temperature sensor is 800 - 1000 mm above the bench surface (about the head height of the steam bather).



**Warning:** Do not manipulate steam production by tampering with the temperature sensor (e.g. do not douse with cold water or cover).



**Warning:**

#### Risk of scalding

Ensure that there is no skin contact with the hot steam in the direct area of the steam inlet to the cabin.

Make sure that possible condensate from the place where steam is fed into the booth cannot drip on the skin.

### Temperature Sensor Connection

Connect the temperature sensor cable to the designated terminals 6 and 7 on the HygroMatik steam generator (see chapter „Electrical Connection“).

Test using the table below. While the sensor has been calibrated in the factory, subsequent adjustment within a range of -5K to +5K is possible using a 2nd temperature gauge.

Temperature Resistance Table	
Temperature in °C	Resistance in kOhm
10	30,4
20	18,8
30	12,0
40	7,8
50	5,2
60	3,6
70	2,5
80	1,8
90	1,3
100	1,0

## 8.2 Peristaltic Pump

Essence delivery only occurs during steam production. The intensity of essence delivery can be set at the control unit. The essence is injected into the main steam line through an essence feed. HygroMatik supplies the necessary T-piece for this connection.

### **Please note:**

Place essence feed (Pos. 5, \*: in chapter 7.01. „Steam Bath Installation (Schematic Layout)“) as close as possible to the steam bath.

- Make sure that no essence can flow into the HygroMatik steam generator (1\*).
- Place peristaltic pump (2\*) above the essence reservoir (3\*), but not higher than 1.7m.
- The essence feed (5\*) shall not be located higher than 4m above the essence pump.

### **Installation:**

- Install essence reservoir (3\*) in the proper position.
- Install the peristaltic pump (2\*) above the essence reservoir (but no higher than 1.7m).
- Install suction pipe between peristaltic pump (2\*) and essence reservoir (3\*).
- Install essence return line between peristaltic pump (2\*) and essence reservoir (3\*) (only valid for peristaltic pump type HygroMatik DSP9911).
- Install line (4\*) between peristaltic pump (2\*) and essence feed (5\*).

## 8.3 Fan

In any steam bath, an exhaust fan (10\*) should be installed. The fan removes warm air from the steam bath in order to ensure continuous steam supply and stable temperature control.

Depending on the configuration of the steam bath, an air supply fan (8\*) can also be operated.

In the steam bath, the exhaust fan should be installed:

- high up and across from the air supply vent.

In the steam bath, the supply fan should be installed:

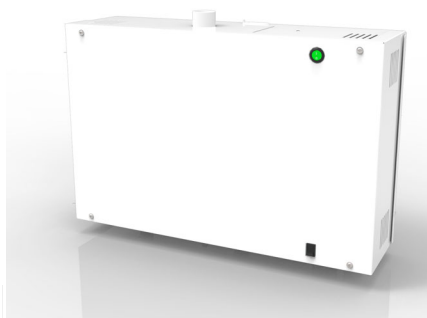
- down low and across from the exhaust vent.

## 8.4 Light

Cabin lighting may also be connected to the steam generator.

## 9. Short Description of Controls Basic Spa

Steam generator  
HeaterSlim Basic  
(HS-BS)



The HygroMatik steam generator HeaterSlim Basic is delivered without display and control unit. The steam generator is operated with the pre-set factory parameters.

If there is a failure, the LED in the main switch is flashing.

As an **option**, a "**Spa Touch Control**" can be connected to the HygroMatik HeaterSlim Basic. This is a compact wired display and control unit for HygroMatik steam generators.

The technical manual for the "Spa Touch Control" is available as a separate document.



## 10. 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.

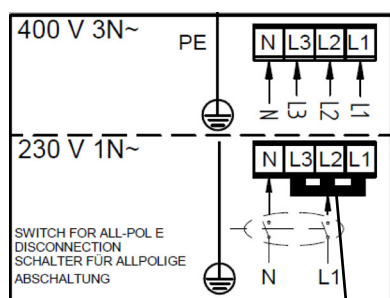


**Warning:** The electronic components of the humidifier control are very sensitive to electrostatic discharges. In order to safeguard these components during installation and servicing, steps must be taken to protect against ESD.



**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.



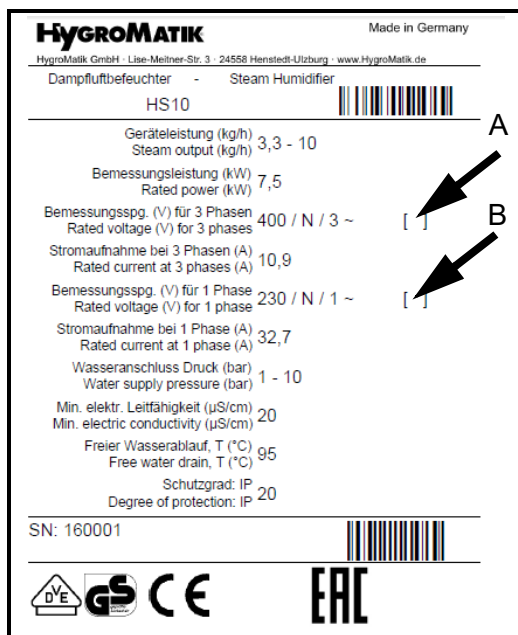
### 10.1 Power Supply

The steam generator HeaterSlim is prepared for the connection to a power supply 400V 3 N ~.

With the enclosed jumper this connection can be adapted to a power supply 230 V 1 N~. Please gather the respectively valid electrical characteristics from the table „Technical Specifications“.



**Note:** The supply voltage selected by the installer (400V 3 N~ or 230V 1 N~) must be marked on the nameplate of the steam humidifier.



Nameplate of steam humidifier

The marking is made for a supply voltage of:

- 400V 3 N~ by checking the box at position A
- 230V 1 N~ by checking the box at position B

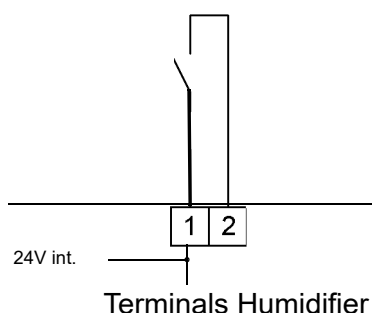
### 10.2 Electrical Installation

- » 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]
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



### 10.3 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.

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:** 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.



## 10.4 Digital input

The so-called digital input is located between terminals 26(8) and 27(9). If a pushbutton or switch is located between these two terminals, a certain device function can be activated in the switched state.

The switch function "Steam boost" is factory set for the digital input.

If the optional "Spa Touch Control" is connected to the HeaterSlim, one of the displayed switching functions can be selected from the following table.

Switching function of digital input	Digital input circuitry [using a latching switch or a push button]	Description
Steam boost (factory setting)	push button	in case of <b>activation</b> : the steam generator produces steam for a certain time (factory setting: 15 seconds) and allows an excess temperature (factory setting: setpoint of temperature +2° K).
Light	push-button	switching the light function from OFF to ON or ON to OFF
Eco	push-button	switching the ECO function from OFF to ON or ON to OFF
1-step	switch	Only if parameter 35 (control mode) is programmed to: „1-step“: <b>On</b> : Device produces steam (only with closed safety chain) <b>Off</b> : Device does not produce steam
Timer start	push button	in case of <b>activation</b> : start of the course timer
no function	-	no function

## 10.5 Cable Connections

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

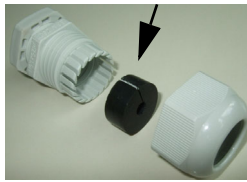
Unit	Blind Plug M16	Connection M16	Connection M25
HS06 - 10	3	2	2

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.

Sealing ring



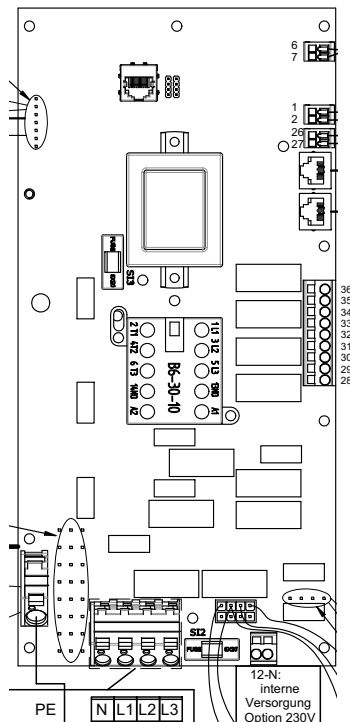
**Note:** If a communication cable is used this can be guided through the cable screw connection with the plug this way.

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.

### 10.6 Switch Outputs for the Messages Collective Fault, Exhaust Fan, Essence (1) and Light

There are four switching relays on the mainboard:

Transmitting relay / contact	Contacts	Factory setting of switching message
1	29 (NC contact) 30 (NO switch)	Supply fan
2	31 (NC contact) 32 (NO switch)	Exhaust fan
3	33 (NC contact) 34 (NO switch)	Essence 1
4	35 (NC contact) 36 (NO switch)	Light



### 10.6.1 24V or 230V Connections

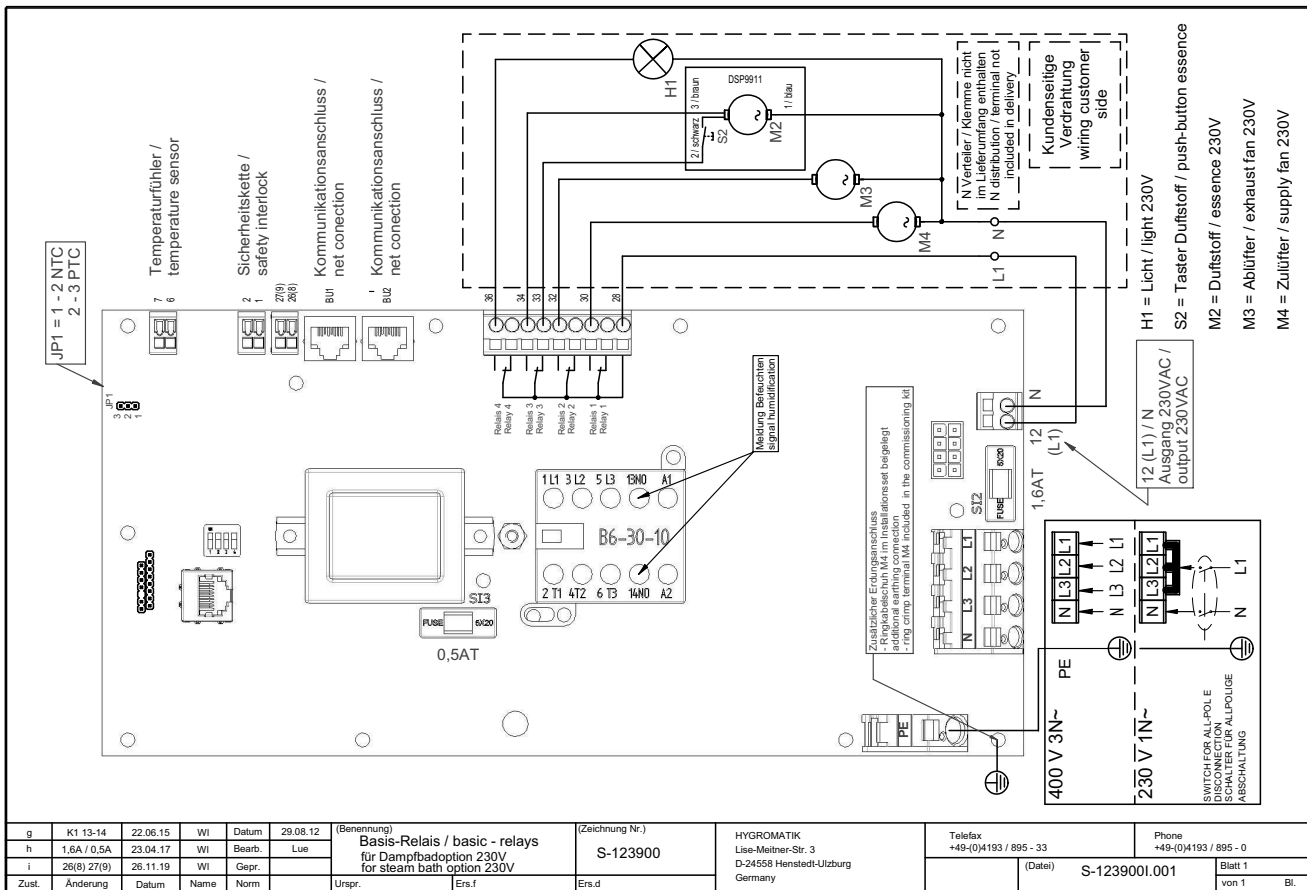
At the time of delivery of the steam generator, the relay exits for the messages supply fan, exhaust fan, essence (1) and light are still potential-free, i.e. they **do not switch any voltage**.

Switching voltage requires that contact 28 is supplied with the required voltage (choice of 24V or 230V). Mixing different voltages is not possible.

The total current on clamp 28 may not exceed 8A.

#### 10.6.1.1 230V Connection, Relay Exits on the Mainboard

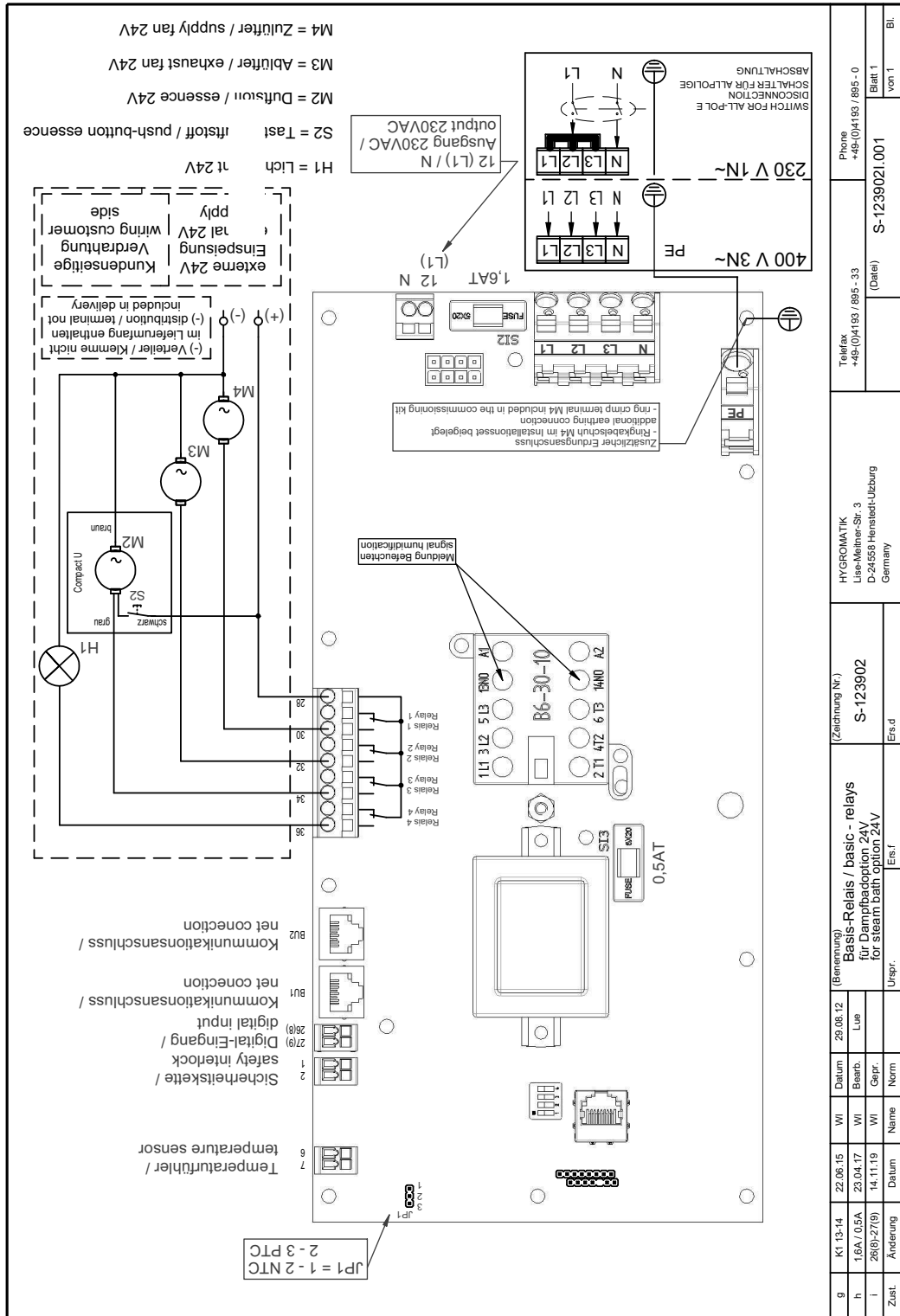
The 230V switching voltage for the relay exits must either be led to contact 28 of the 1st relay (by the customer) or can be picked off internally from clamp KL1 (contact 12) on the mainboard and be connected. In the last case, the relay exits are secured automatically with 1.6A.



g	K1 13-14	22.06.15	WI	Datum	29.08.12	(Benennung)	Zeichnung Nr.)	HYGROMATIK	Telefax	Phone
h	1,6A / 0,5A	23.04.17	WI	Bearb.	Lue	Basis-Relais / basic - relays	S-123900	Lise-Meitner-Str. 3	+49-(0)4193 / 895 - 33	+49-(0)4193 / 895 - 0
i	28(8) 27(9)	26.11.19	WI	Gepr.		für Dampfboadoption 230V		D-24558 Henstedt-Ulzburg	(Datei)	S-1239001.001
Zust.	Änderung	Datum	Name	Norm	Urspr.	Ers.f	Ers.d	Germany		Blatt 1
										von 1
										Bl.

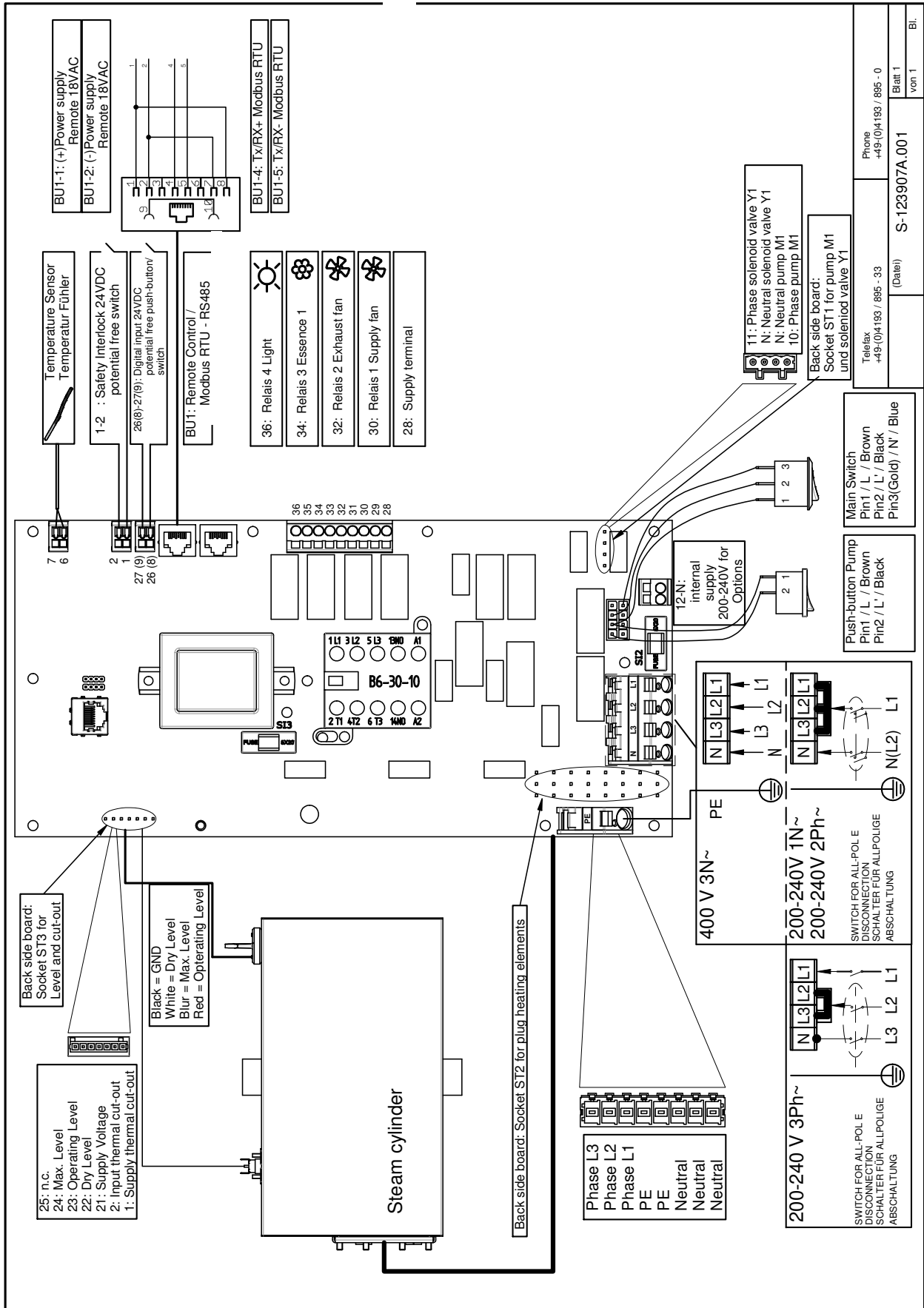
### 10.6.1.2 24-V Connection, Relay Exits on the Mainboard

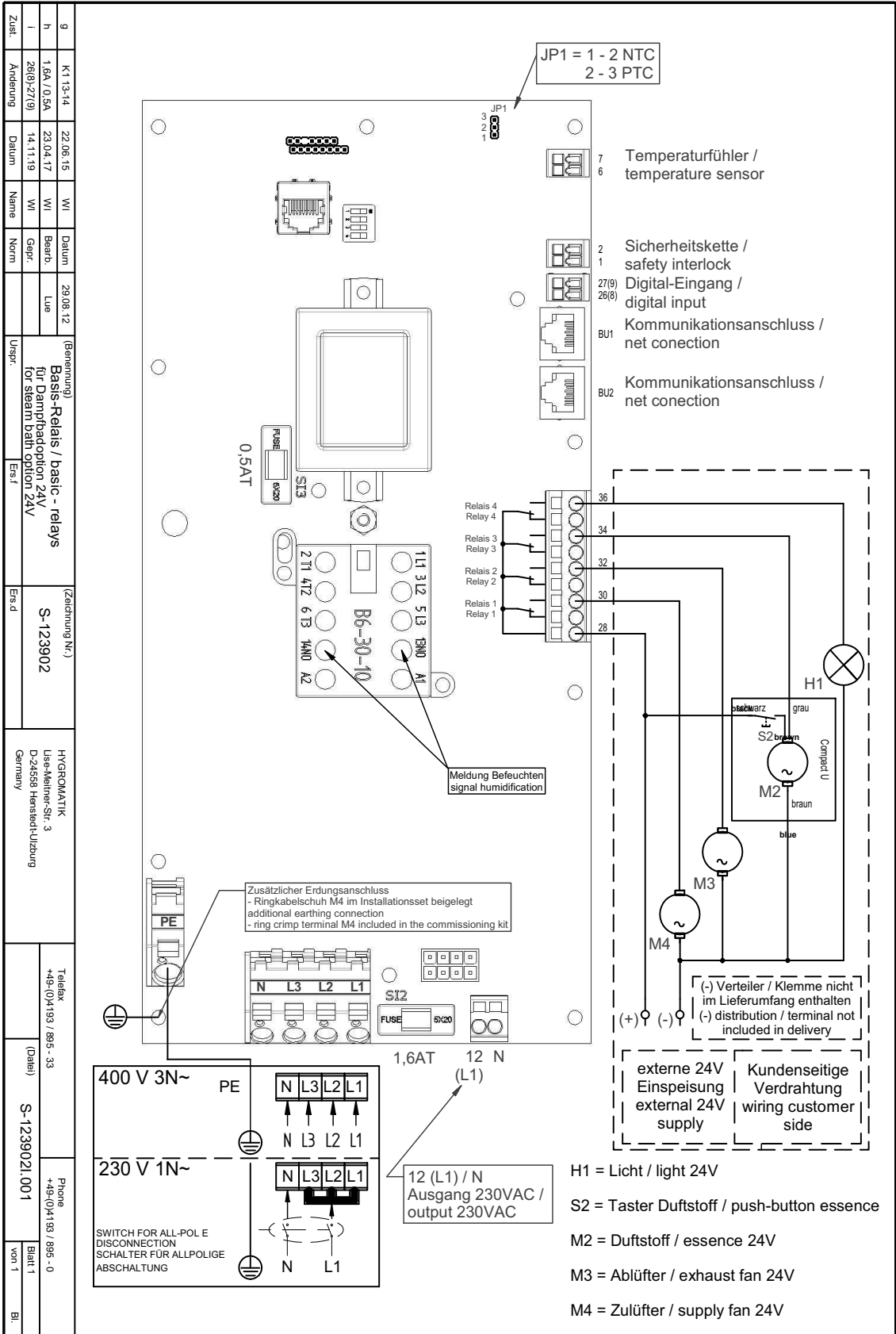
The 24V switching voltage for the relay exits must be led (by the customer) to contact 28 of the 1st relay.



9	K1 13-14	22.06.15	WI	Datum	20.08.12	(Benennung)	Basis-Relais / basic - relays für Dampfbadoption 24V for steam bath option 24V	S-123902	HYGROMATIK Lise-Meiner-Str. 3 D-24559 Henstedt-Üzburg Germany	Telefax +49(0)41 93 / 895 - 33	Phone +49(0)41 93 / 895 - 0	Blatt 1 von 1
h	1.6A / 0.5A	23.04.17	WI	Bearb.	Lue							
i	26(9) / 27(9)	14.11.19	WI	Gepr.								
Zust.	Änderung	Datum	Name	Norm	Urspr.	Ers.f	Ers.d	S-123902	(Date)	S-123902.001		

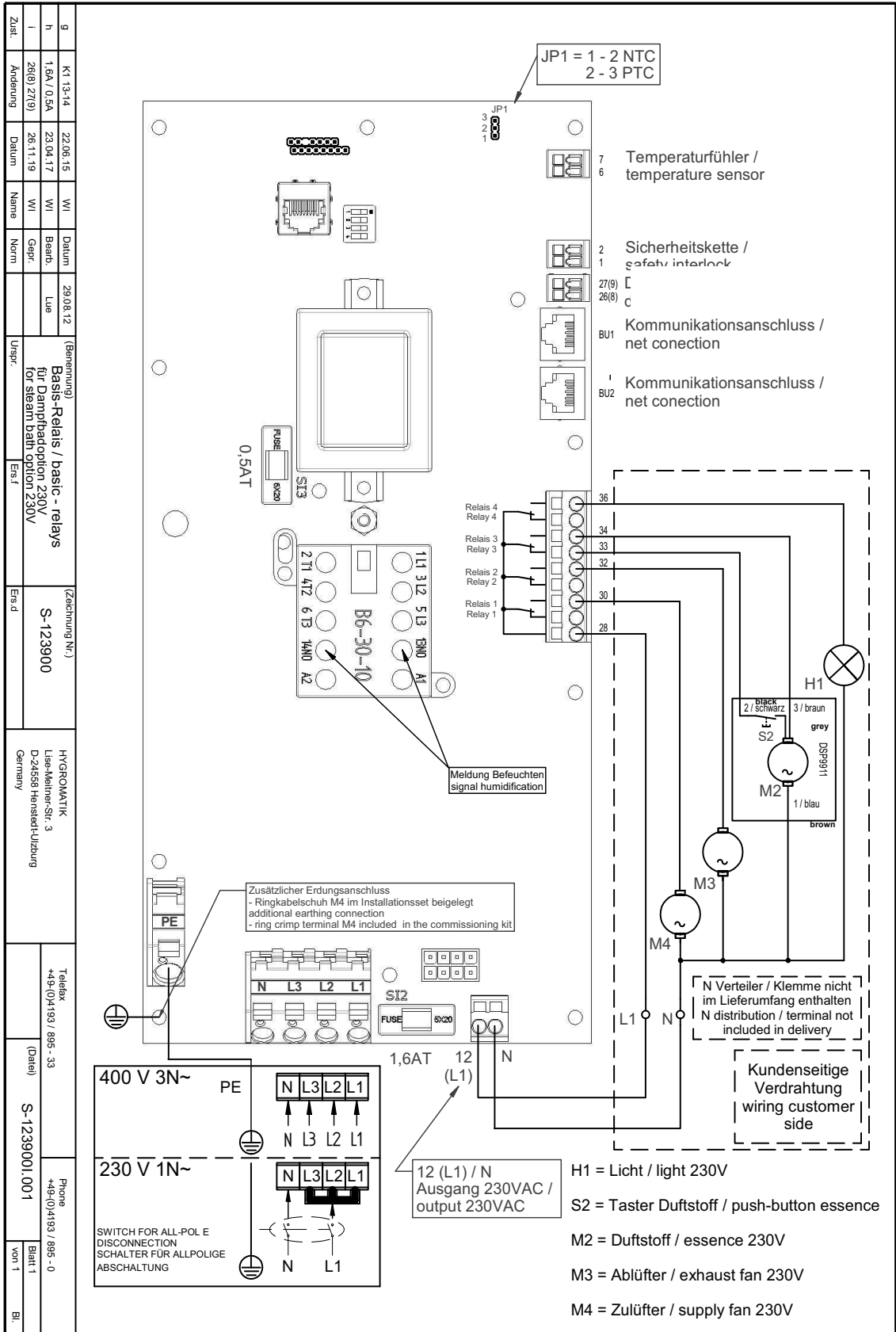
# Wiring Diagram



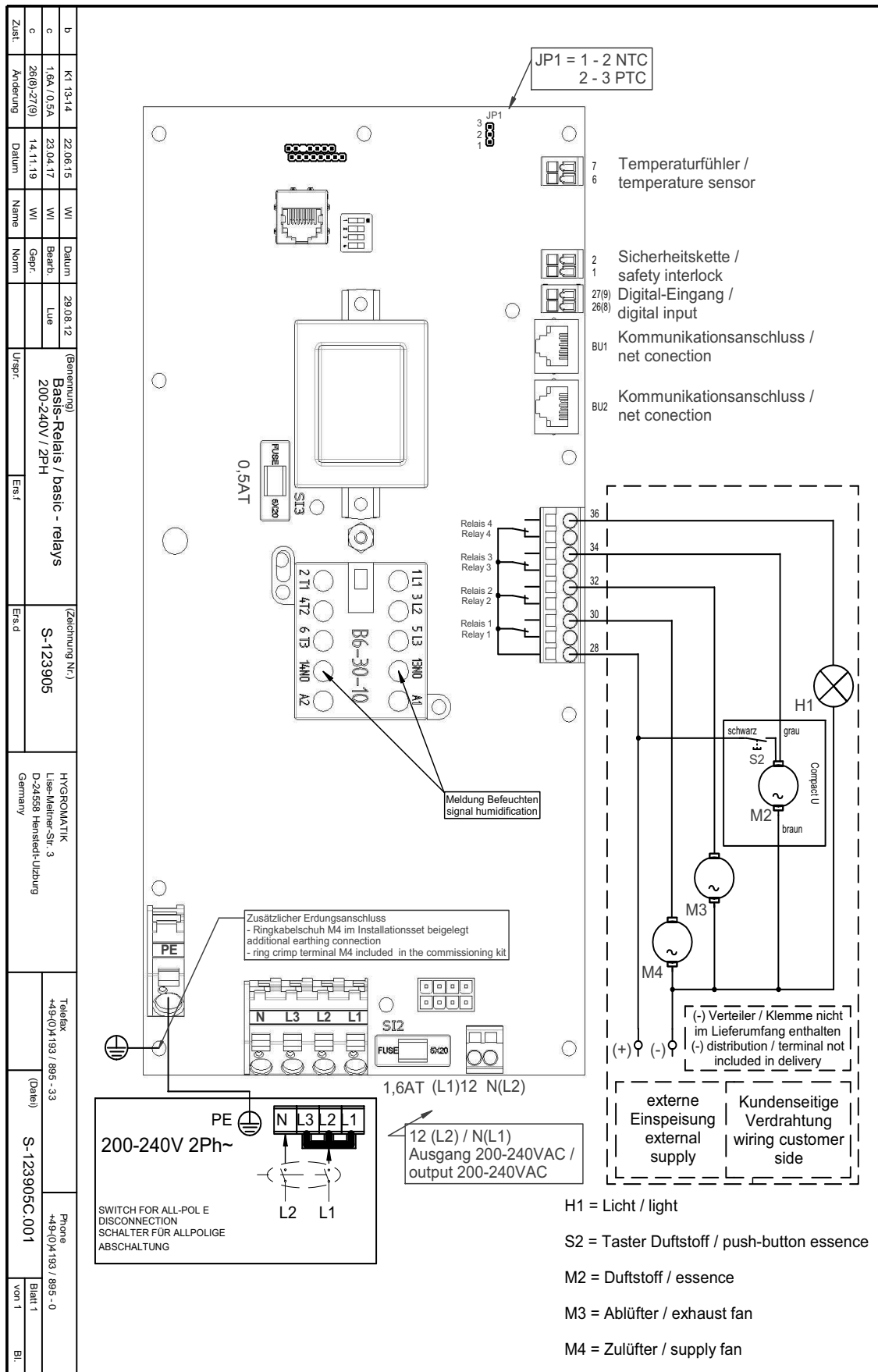


g	K1 13-14	22.06.15	WI	Datum	29.08.12	(Benennung) Basis-Relais / basic - relays für Dampfbedeutung 24V für Standard DSH 0210N 24V	Zeichnung (Nr.) S-123902	HYGROMATIK Lise-Meiner-Str. 3 D-24559 Harnstedt-Ulzburg Germany	Telefax +49-(0)4193 / 895 - 33	Phone +49-(0)4193 / 895 - 0
h	1,6A / 0,5A	23.04.17	WI	Bearb.	Lue				(Date)	Blatt 1
i	26(8)/27(9)	14.11.19	WI	Gepr.					S-1239021.001	von 1
Zust.	Änderung	Datum	Name	Norm	Urspr.	Ers1	Ers4			Bl.





Zust.	g	K1 13-14	22.06.15	WI	Datum	29.08.12	(Benennung)	Zzeichnung (N°)
	h	1,6A / 0,5A	23.04.17	WI	Beatr.	Line	Basis-Relais / basic - relays für Dampfbadoption 230V for steam bath option 230V	S-123900
Änderung	i	26(8) 27(9)	26.11.19	WI	Gepr.			
				Name				
				Norm				
				Urspr.				
				Ers.f				
				Ers.d				
							HYGROMATIK Lise-Mahner-Str. 3 D-24558 Henstedt-Ulzburg Germany	
				Telefax			+49 (0)4193 / 895 - 33	
				(Datei)			S-1239001.001	
				Phone			+49-04193 / 895 - 0	
				Blatt 1			von 1	Bl.



b	K1-13-14	22.06.15	WI	Datum	29.08.12	(Benennung)	Basiss-Relais / basic - relays 200-240V / 2Ph	S-123905	HYGROMATIK Liebe-Mahler-Str. 3 D-24558 Henstedt-Ulzburg Germany	Telefax +49-04193 / 895 - 33 (Datei)	S-123905C.001	Phone +49-04193 / 895 - 0 Blatt 1
c	1,6A / 0,5A	23.04.17	WI	Bearb.	Lue							
c	26(8)/27(9)	14.11.19	WI	Gepr.		Urspr.	Ersf	Ersd				Bl. 1

## 10.7 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.com.en](http://www.hygromatik.com.en).

## 11. 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 inexploded view) 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.

### 11.1 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“.

### 11.2 Maintenance for Operation with Demineralized Water / Condensate

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

Cycle	Maintenance Task
<b>4 Weeks after Initial Operation</b>	Visual check of electrical and mechanical connections. Visual check of water level control. Visual check of steam cylinder interior.
<b>Annually</b>	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.

### **11.3 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.

### 11.3.1 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**”.
- Tightening torque for the heater bundle: 3 Nm.

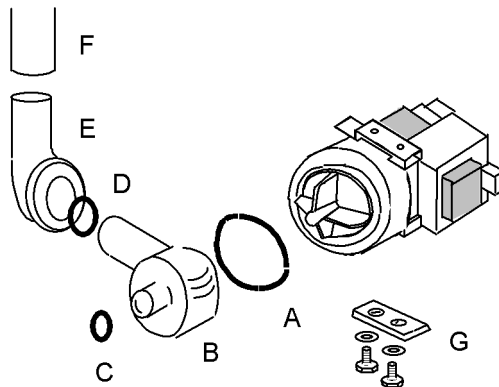
### 11.3.2 Cleaning the Pump

- » 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.
- » 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.

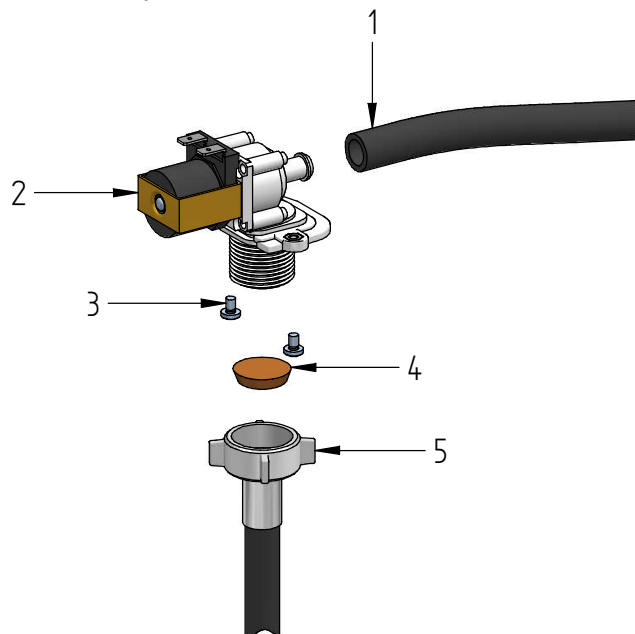
In case of any leakages disconnect steam humidifier from power supply and pay attention to safety instructions about work with voltage electrical units.



### 11.3.3 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 „Reassembly 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.

#### **11.3.4 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.

#### **11.3.5 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.

#### **11.4 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.

## 11.5 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.

## 12. 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  $100 \times 10^3$  to  $100 \times 10^4$  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.

### 13. 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: HS06, HS10**  
**In den Ausführungen / Type:** Basic

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

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:*

<b>Referenznummer:</b>	<b>Ausgabedatum:</b>	<b>Referenznummer:</b>	<b>Ausgabedatum:</b>
<i>Reference Number:</i>	<i>Edition:</i>	<i>Reference Number:</i>	<i>Edition:</i>
DIN EN 61000-6-2	2006-03	DIN EN 60335-1	2010-11
DIN EN 61000-6-3	2007-09	DIN EN 60335-1/A15	2012-03
		DIN EN 60335-2-98	2009-04
		DIN EN 62233	2008-11
		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 25.02.2014

HygroMatik GmbH



Dirc Menssing  
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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spirax sarco Gruppe

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

## 14. Spare Parts

*	HS06	HS10	Article No.	Description
				<b>Cabinet</b>
	1	1	B-2129013	Cabinet HS without hole for remote control
	1	1	B-2129015	Cabinet HS with hole for remote control
	1	1	E-2124002	Key for safety lock
				<b>Steam Generation</b>
9			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 electrode
8			B-2205771	flange plate incl 1 heater element 2.5kW and terminal
8	1		B-2205773	flange plate incl 2 heater elements each 2.5kW and terminal
8		1	B-2205775	flange plate incl 3 heater elements each 2.5kW and terminal
15	1	1	E-2205154	Gasket for HS cylinder
25	1	1	B-2504153	Mounting nut set for heater
	1	1	B-2504151	Mounting set for sensor electrode
	1	1	B-3216013	O-ring set for HS03-10
5	1	1	E-2205124	Thermal circuit breaker with manual reset, 110°C ± 5K
2	1	1	E-3221008	adapter for steam hose DN40
24	1	1	E-2209002	Clip for steam hose adapter DN40
4	1	1	E-2204022	O-ring for steam hose adapter DN40

	HS06	HS10	Article No.	Description
<b>Water feed</b>				
14	1	1	B-2304115	solenoid valve 0,5l/min, 200-240V, 0,2-10 bar
	1	1	E-2304016	fine filter in solenoid valve inlet
	1	1	E-2304103	captive coupling ring for solenoid valve 3/4"
	1	1	E-2304107	gasket for inlet screwed fitting, solenoid
	1	1	B-2304031	hose for water connection, 0,6m 3/4" cap nuts on both sides, seal included
32	1	1	E-2304036	rubber seal solenoid valve - cabinet
	1	1	B-2304040	mounting set for solenoid valve
31	1,15	1,15	E-2604002	hose solenoid valve - Non-return valve - cylinder
6	1	1	B-2504147	sensor electrode for water level control, compl with plug, sensor sticks, cable
33	1	1	B-2504151	mounting plate for level control
	1	1	E-2525264	rubber seal for water level control
<b>Water Drain</b>				
11	1	1	E-2206086	cylinder base for C, Hy, HC, DN40
4	1	1	E-2204022	O-Ring for cylinder base DN40
10	1	1	B-2404027	Drain pump 230V/ 50-60Hz without mounting set
	1	1	B-2424014	Mounting set for drain pump
18	1	1	E-3220005	O-ring for drain pump
	1	1	E-2420423	Drain hose 1 1/4"
	1	1	B-3401007	Drain hose system for HS03-10



	HS06	HS09	Article No.	Description
<b>Control</b>				
51	1	1	E-2502418	Control button ON/OFF, green light
52	1	1	E-2502420	Pump button, momentary ON
	1	1	E-2501005	Main contactor
<b>Basic</b>				
	1	1	B-2528201	Elektronic pcb type Slim Basic SPA without Modbus before 02/2018
	1	1	B-2528203	Elektronic pcb type Slim Basic SPA with Modbus since 02/2018
	1	1	E-2528220	Insert bridge 3pole
<b>Accessories</b>				
			E-2604034	Reducing piece DN40/DN25 for steam hose
			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-2604021	Condensate connector T-piece DN12
58			E-2604094	Double check valves
<b>If you order any spare parts, specify type and serial number of the unit, please.</b> * see exploded view				

**15. 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.

## 16. Faults and Messages / Conditions



Switch off the steam humidifier immediately if a fault occurs. Faults are only to be remedied by qualified personnel following the proper safety instructions.

If an error occurs, the main switch flashes. Different flashing codes describe different error messages. A blink code sequence consists of 7 LED states. The following table shows the assignment of Flash code to an error message.

Fault	Flash code
Fault blow-down	S,O,S,O,S,O;S
Fault full blow-down	L,O,S,O,S,O,S
Fault filling	S,O,L,O,S,O,S
Fault thermo sensor	L,O,L,O,S,O,S
Fault max.-level	S,O,S,O,L,O,S
Fault level sensor	S,O,L,O,L,O,S
Fault steam down time	L,O,L,O,L,O,S
Fault °C sensor	S,O,S,O,S,O,L
Fault °C max	L,O,S,O,S,O,L
Fault °C sensor 2	S,O,L,O,S,O,L
Fault °C max 2	L,O,L,O,S,O,L
Fault temperature deviation	S,O,S,O,L,O,L
System Failure	L,O,S,O,L,O,L

S: Short = 0,5 sec flashing time

L: Long = 3 sec flashing time

O: Off = 0,5 sec timeout

After every complete flash code the LED is off for 5 seconds.

Message / Malfunction Displayed*	Probable Cause	Resolution
<p><b>Fault blow-down / Fault full blow-down</b> Unit shuts off automatically</p>	<ul style="list-style-type: none"> <li>• Blow-down pump has not been electrically activated               <ul style="list-style-type: none"> <li>- Cable connections are faulty.</li> <li>- The relay on the main PCB is not operating.</li> </ul> </li> <li>• Defective blow-down pump</li> <li>• Solenoid valve does not close properly. Water level in the cylinder sinks very slowly even though blow-down pump flushes out water.</li> <li>• Blow-down pump operates, but no water is pumped out, i.e. the cylinder drain is blocked.</li> <li>• Blow-down pump is blocked up with mineral deposits.</li> </ul>	<ul style="list-style-type: none"> <li>• Check or replace cable connections.</li> <li>• Measure voltage at PCB. Terminals against N or replace PCB.</li> <li>• Replace blow-down pump.</li> <li>• Check solenoid valve.</li> <li>• Thoroughly clean steam cylinder and base to prevent short-term blockage from reoccurring.</li> <li>• Check blow-down pump, drain assembly and cylinder for mineral deposits and clean.</li> </ul>
<p><b>System failure</b> Unit shuts off automatically</p>	<ul style="list-style-type: none"> <li>• Mainboard is defective.</li> </ul>	<ul style="list-style-type: none"> <li>• Check mainboard. If necessary - change mainboard.</li> </ul>
<p><b>Fault Max.-Level</b> Unit shuts off automatically.</p>	<ul style="list-style-type: none"> <li>• If the water level “max. level” is reached, the pump switches on and drains the cylinder until the water level lowers to “operation.” If the “max.-level” is reached five times, “max.-level” is displayed.</li> <li>• Solenoid valve does not close properly. Water level in the cylinder rises slowly even though the solenoid valve has not been activated.</li> <li>• Water is supplied even though the steam humidifier is switched off. Solenoid valve remains open.</li> </ul>	<ul style="list-style-type: none"> <li>• Check solenoid valve.</li> <li>• Clean solenoid valve.</li> </ul>
<p><b>Fault filling</b> Unit shuts off automatically.</p>	<ul style="list-style-type: none"> <li>• Solenoid valve is fouled or defective.</li> <li>• Strainer in steam cylinder is dirty.</li> <li>• Defective coil.</li> <li>• Water supply is not open.</li> <li>• Solenoid valve has not been electrically activated.               <ul style="list-style-type: none"> <li>- The cable connections are faulty.</li> <li>- The relay on the main PCB is not operating.</li> </ul> </li> <li>• The steam hose has not been laid at enough of an incline, causing a water pocket to form. The steam flow is obstructed.</li> </ul>	<ul style="list-style-type: none"> <li>• Clean or replace solenoid valve.</li> <li>• Clean strainer.</li> <li>• Measure coil and replace.</li> <li>• Open water supply.</li> <li>• Check or replace cable connections.</li> <li>• Measure voltage at PCB terminal against Nor replace PCB.</li> <li>• Check placement of steam hose. Remove water pocket.</li> </ul>
<p><b>Fault °C sensor</b></p>	<ul style="list-style-type: none"> <li>• Temperature sensor or line defective.</li> </ul>	<ul style="list-style-type: none"> <li>• Check temperature sensor and sensor line, replace if needed.</li> </ul>

Message / Malfunction Displayed*	Probable Cause	Resolution
Unit shuts off automatically.	<ul style="list-style-type: none"> <li>• Short circuit in sensor wire (no resistance).</li> </ul>	<ul style="list-style-type: none"> <li>• Replace temperature sensor.</li> </ul>
<b>Fault level sensor</b>  Unit shuts off automatically.	<ul style="list-style-type: none"> <li>• Water level sensor is defective.</li> <li>• Cable connections for the water level sensor are faulty.</li> </ul>	<ul style="list-style-type: none"> <li>• Dismantle and check water level sensor. Clean sensor if necessary</li> <li>• Check cable connections, replace if needed.</li> </ul>
<b>Fault °C Max</b>  Unit shuts off automatically.	<ul style="list-style-type: none"> <li>• Heat buildup in the cabin.</li> <li>• Additional heat source in the steam cabin.</li> </ul>	<ul style="list-style-type: none"> <li>• Ensure continuous heat removal.</li> </ul>
<b>Fault thermo sensor</b>  Unit shuts off automatically.	<ul style="list-style-type: none"> <li>• Thermo sensor has been activated.</li> <li>• Plug for the water level sensor is not connected to the control.</li> </ul>	<ul style="list-style-type: none"> <li>• Disconnect power supply. Press the release pin back down with bent needle-nose pliers or a screwdriver.</li> <li>• Connect plug to the control.</li> </ul>
<b>Fault steam-down time exceeded</b>  Unit shuts off automatically.	<ul style="list-style-type: none"> <li>• Heater element is defective.</li> <li>• Phase failure. (External breaker has been tripped or is defective.)</li> <li>• Heater element is not being supplied with current.</li> <li>• Main contactor is not switching correctly.</li> <li>• PCB does not activate main contactor.</li> </ul>	<ul style="list-style-type: none"> <li>• Replace heater element and identify cause.</li> <li>• Replace circuit breaker and identify cause.</li> <li>• Check cable connections. Measure voltage.</li> <li>• Check main contactor, replace if needed..</li> <li>• Measure voltage at PCB against N. Replace PCB if necessary.</li> </ul>
<b>Safety stop</b>	<ul style="list-style-type: none"> <li>• Parameter for limitation of operating time is activated. The steam generator stopped operation after the safety interlock has been closed for the programmed time.</li> </ul>	<ul style="list-style-type: none"> <li>• By opening and closing the safety interlock the steam generator restarts operation for the programmed hours.</li> </ul> <p>Alternatively set parameter for „limitation of operation time“ to 0 and restart system. The function „limitation of operating time“ is deactivated.</p>
<b>Service</b>	<ul style="list-style-type: none"> <li>• The service interval is displayed when the preset amount of steam was produced or the preset number of switching cycles of the main contactor has been reached.</li> </ul>	<p>The service message can be reset in the menu Service or via the DIP switches on the main PCB.</p>

Possible Conditions	Probable Cause	Resolution
Water is collecting on the base plate	<ul style="list-style-type: none"> <li>• Cylinder improperly assembled after maintenance: O- Ring has been damaged, has not been replaced, or has not been inserted               <ul style="list-style-type: none"> <li>- Flange has not been sealed properly</li> <li>- Mineral deposits in the flange.</li> </ul> </li> <li>• The water cannot drain away during flushing.</li> </ul>	<ul style="list-style-type: none"> <li>• Clean cylinder and install properly.</li> <li>• Make sure drain is unobstructed.</li> </ul>
<b>No steam production, even though the steam generator has been activated.</b> The display is active.	<ul style="list-style-type: none"> <li>• The heater element or thermo sensor has not been properly installed.</li> <li>• Steam hose adapter has not been correctly installed or o-ring has not been changed.</li> <li>• If the temperature exceeds the set desired value, no steam demand is present.</li> <li>• The unit has been switched off remotely. (Terminals 1 and 2 in the steam generator are not bridged.)</li> <li>• Poor air circulation, steam bath temperature has remained above the programmed set value for a long period of time.</li> </ul>	<ul style="list-style-type: none"> <li>• Install heater element and thermo sensor as specified in the unit manual.</li> <li>• Replace o-ring and correctly install steam hose adapter.</li> <li>• Check desired and actual temperature values.</li> <li>• Switch on the unit using the remote switch, or install a jumper between terminals 1 and 2.</li> <li>• Install a fan.</li> </ul>
	<ul style="list-style-type: none"> <li>• Water supply is not open or solenoid valve has not been electrically triggered.</li> </ul>	<ul style="list-style-type: none"> <li>• Open water supply.</li> <li>• Also see <b>Fault Filling</b>.</li> </ul>
The set temperature has not been reached.	<ul style="list-style-type: none"> <li>• Incorrect output estimate.</li> <li>• Phase failure. (external fuse).</li> </ul>	<ul style="list-style-type: none"> <li>• Check output data, steam bath insulation and dimensions.</li> <li>• Install fuse.</li> </ul>
No visible steam in the cabin.	<ul style="list-style-type: none"> <li>• Steam bath is too well insulated.</li> <li>• Insufficient air circulation in the steam bath.</li> <li>• Excessive heat supply (i.e. from heated benches).</li> </ul>	<ul style="list-style-type: none"> <li>• Provide for removal of heat.</li> <li>• Install exhaust fan or check exhaust fan performance.</li> <li>• Reduce ancillary heat supply.</li> </ul>
Temperature is too high	<ul style="list-style-type: none"> <li>• Temperature sensor has not been correctly calibrated.</li> </ul>	<ul style="list-style-type: none"> <li>• Check Parameter "Adjustment Actual Temperature Value" (G0).</li> </ul>
Essence delivery into the steam bath is absent or insufficient	<ul style="list-style-type: none"> <li>• No essence in reservoir.</li> <li>• Essence injector has not been activated.</li> <li>• Fuse or relay in the control for essence delivery is faulty (when employing 24 V).</li> <li>• Tube in peristaltic pump is defective (essence flows back into the essence reservoir through the return line).</li> </ul>	<ul style="list-style-type: none"> <li>• Replenish essence.</li> <li>• Activate essence injector. (Check power supply to the essence solenoid valve and peristaltic pump).</li> <li>• Replace fuse. (Check power supply to the essence solenoid valve.)</li> <li>• Replace tube into peristaltic pump.</li> </ul>

<b>Possible Conditions</b>	<b>Probable Cause</b>	<b>Resolution</b>
Excessive essence delivery into the steam bath Blow-down pump is working, but no water is being flushed	<ul style="list-style-type: none"> <li>• Essence intensity is too high.</li> <li>• Cylinder base or blow-down system is blocked.</li> </ul>	<ul style="list-style-type: none"> <li>• Reduce essence intensity.</li> <li>• Clean cylinder base or blow-down system.</li> </ul>
Cylinder has completely drained after a blow-down, even though pump is switched off.	<ul style="list-style-type: none"> <li>• Vent pipe is blocked.</li> </ul>	<ul style="list-style-type: none"> <li>• Clean or replace vent tube.</li> <li>• Replace vent pipe adapter.</li> <li>• Also see unit manual.</li> </ul>
No steam is exiting the steam nozzle.  Water leaks periodically from the drain hose while the pump is not running.	<ul style="list-style-type: none"> <li>• false steam direction installation (waterbag).</li> <li>• Blockage in steam pipe work.</li> </ul>	<ul style="list-style-type: none"> <li>• Lay steam hose as specified in Section "types of installation" in the unit manual.</li> <li>• Remove blockage.</li> </ul>

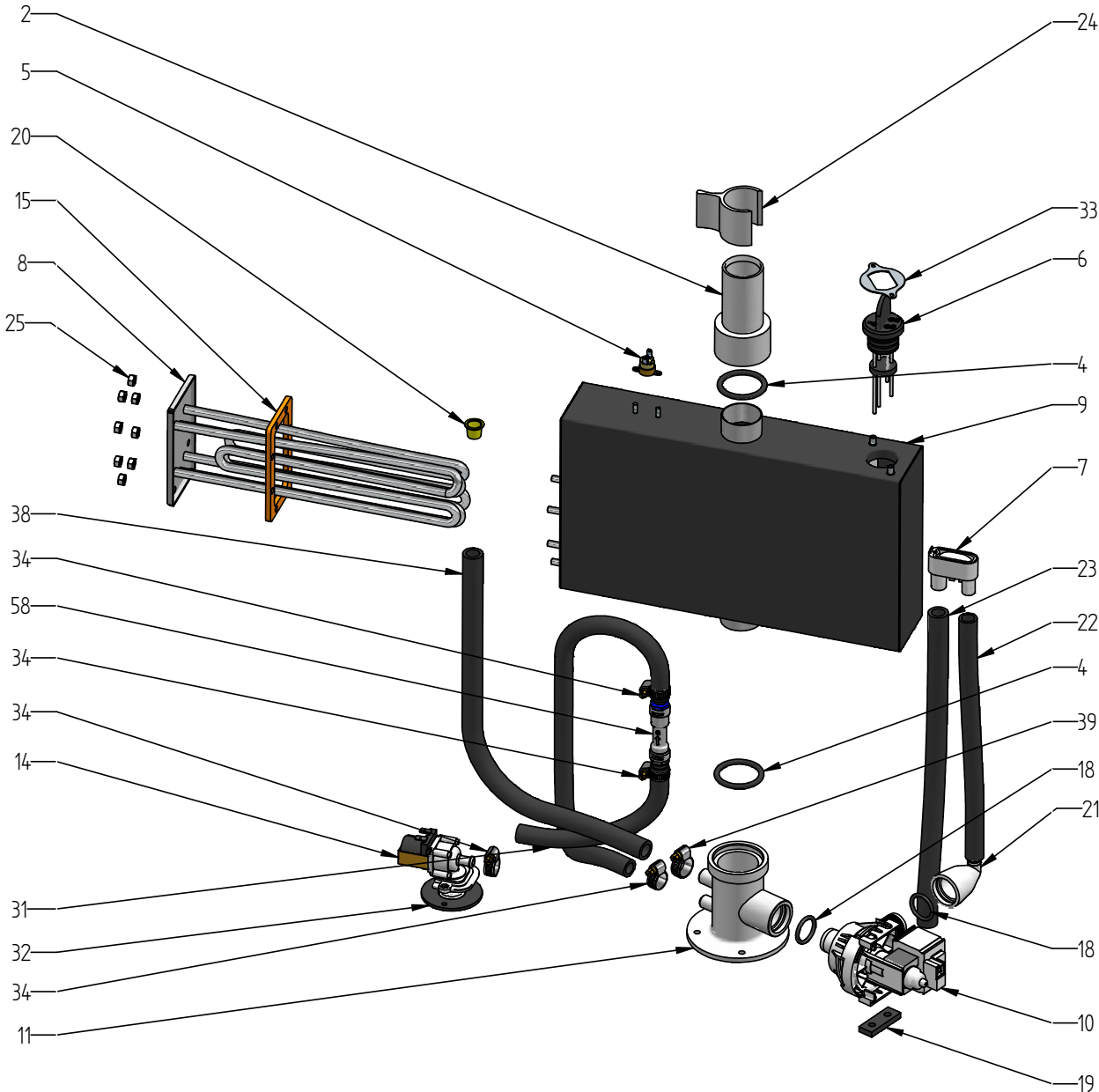
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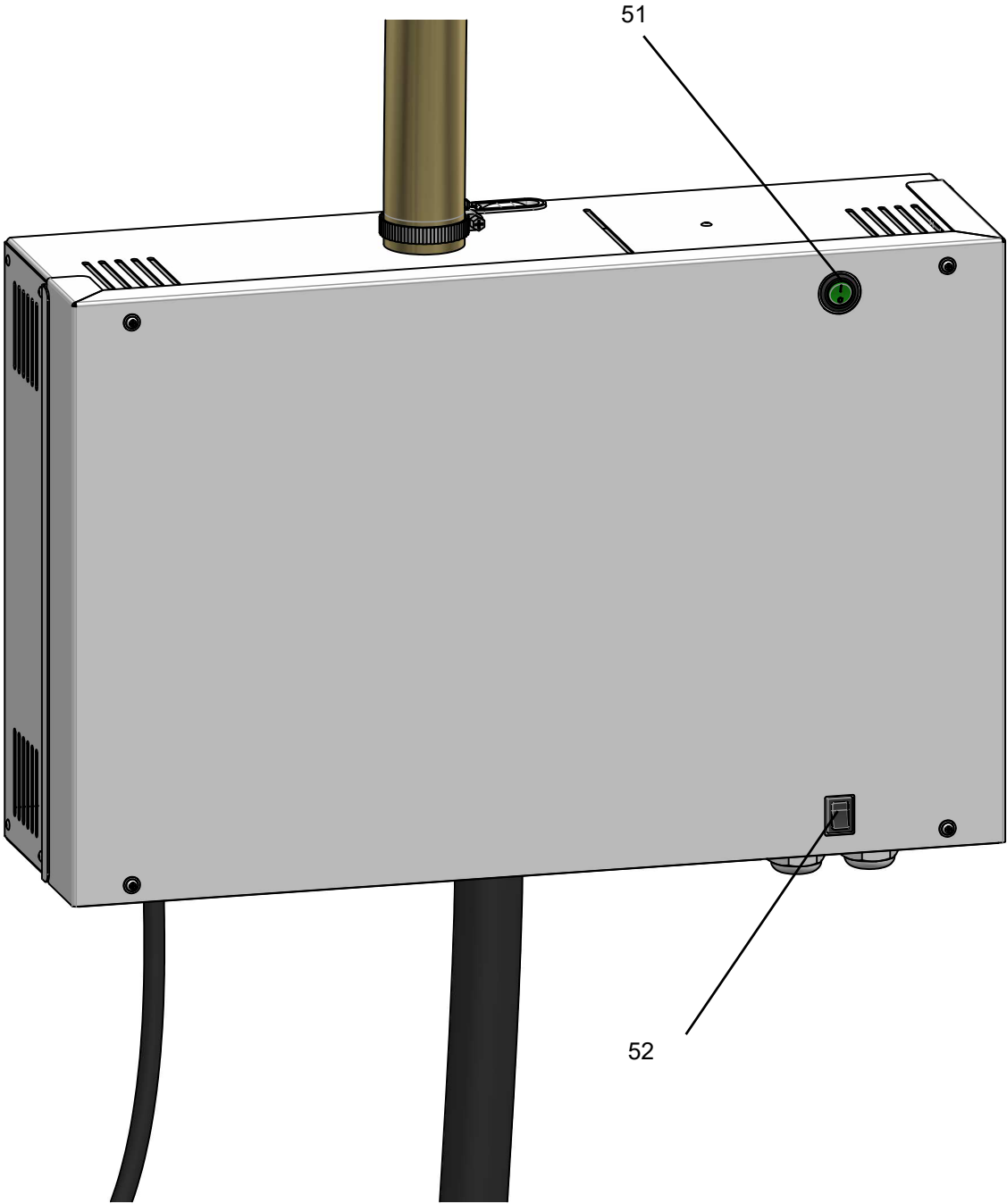
## 17. Technical Specifications

HeaterSlim				
Type	HS06	HS10	HS06	HS10
Steam Output [kg/h]	6,6	10,0	6,6	10,0
Electrical Supply*	230V/1/N		400V/3/N 50-60Hz	
Power Rating [kW]	5,0	7,5	5,0	7,5
Power Consumption [A]	21,7	32,6	10,9	10,9
Circuit Protection [A]	1x25	1x35	3x16	3x16
Control Type	Basic			
Number of Steam Cylinder	1			
Number of Heater Elements	2	3	2	3
Steam Hose Connection	1x40mm			
Condensate Hose Connection	1x12mm			
Net Weight [kg]	15	15	15	15
Operating Weight [kg]	18	18	18	18
Dimensions**	Height [mm]	391		
	Width [mm]	578		
	Depth [mm]	170		
Water Supply	Fully Demineralized Water / Cleaned Condensate (min. 3µS/cm conductivity): 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.				
** Outer dimensions of width and depth. Height incl. drain connection.				

18. Exploded View



19. View of Cabinet



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