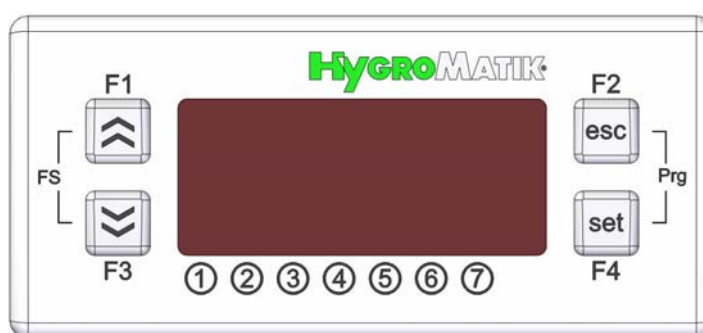


### Control

Professional [P]  
Professional [P2]



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

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Controls Professional

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



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

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## 1. Introduction

**Dear Customer,**

Thank you for choosing a HygroMatik steam humidifier.

HygroMatik steam humidifiers represent the latest in humidification technology.

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

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

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

If you have additional questions, please contact us:

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

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

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

**e-mail: [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.



Caution  
steam

### 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. Control Description and Parameters

#### 3.1 Comparison of control Professional [P] and [P2]

##### 3.1.1 Control Professional [P]

**Regulation:**

Continuous control of the HeaterLine type steam humidifier is achieved by proportional control (pulse-width modulation) of the heater elements. In this way the humidifier can be proportionally operated across the entire output range of 1% - 100% nominal capacity.

**Refilling:**The inlet solenoid valves Y1-Y4 are gradually opened one after another when the water level remains below “humidification” level for 2 seconds. The water level then rises again to “humidification” level. After reaching „humidification“ level the inlet solenoid valves Y1-Y4 are gradually closed one after another. The result is a quasi-continuous control of water refilling in order to achieve the highest possible accuracy of the vapor.

##### 3.1.2 Control Professional [P2]

**Regulation:**

An internal control signal of e.g. 60 percent has the following effect on 2 heater elements: one of the heater elements is permanently switched on via a contactor, delivering 50 percent of the output demand. The additionally required 10 percent are delivered by the second heater element under thyristor control. Continuous control of the HeaterLine type steam humidifier is achieved by proportional control of one of the heater elements and stepped addition of further heater elements. Such, the humidifier may be proportionally operated across the complete output span.

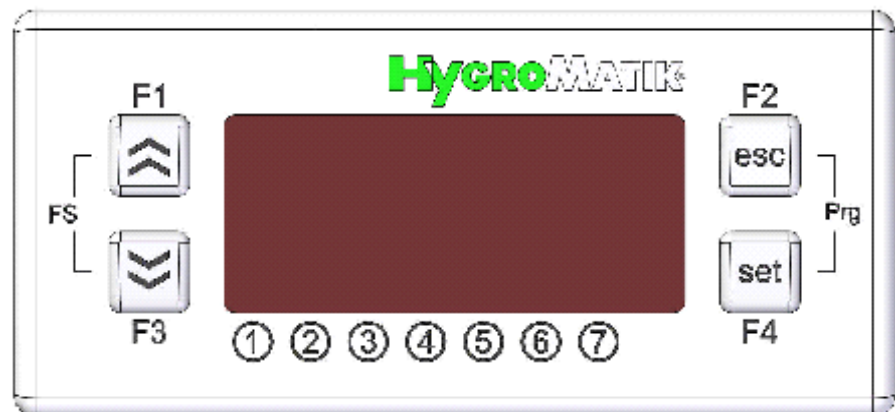
**Refilling:**

The inlet solenoid valve opens when the water level remains below “humidification” level for 10 seconds. The water level then rises again to “humidification” level.







### 3.2 General description

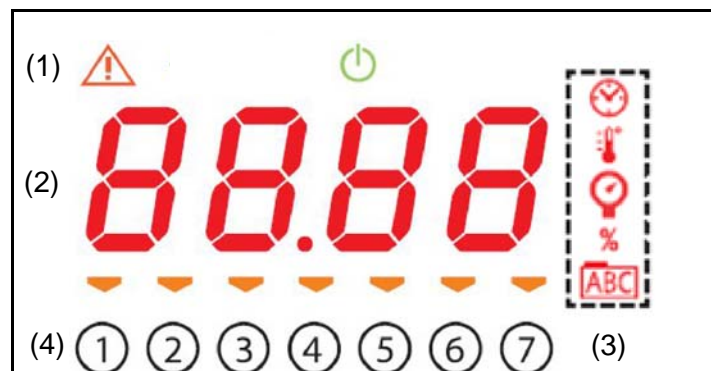
The control unit of the HygroMatik humidifier controls the entire humidifying process. User interface for operation and control of device functions is on the front of the PLC control.



#### Description of button functions:

-  (F1): - increase value  
- to next designator
-  (F3): - reduce value  
- to previous designator
-  (F2): - quit without saving the setting  
- back to previous level
-  (F4): - confirm value/ quit and save setting  
- to next level (call menu, submenu, parameter, value)  
- call reading level






## Description of display and LED functions



The display is structured in the following sections:

- (1) Operational mode icons
- (2) Values
- (3) Explanation of the value indicated
- (4) Switching status

### Operational mode icons

Icon	Description	Colour
	Error  (error codes F1...F8 are displayed; detailed description see below)	red
	Operation (humidifying)	green
	No demand  (the safety chain is closed, but the demand is below the turn-on threshold)	green
	Relative humidity [%]	red
	Incorrect control signal  (control signal is incorrect or missing - humidification is interrupted)	red

## Description of switching states



State	Description	LED Colour
1	Maintenance/malfunction	orange
2	Operation (main contactor K1 on)	orange
3	Solenoid valve Y1 active	orange
4	Solenoid valve Y2 active	orange
5*)	Solenoid valve Y3 active	orange
6*)	Solenoid valve Y4 active	orange
7*)	Blow-down pump active	orange
*)	with extension module only	

### 3.3 Menu

#### Starting the system

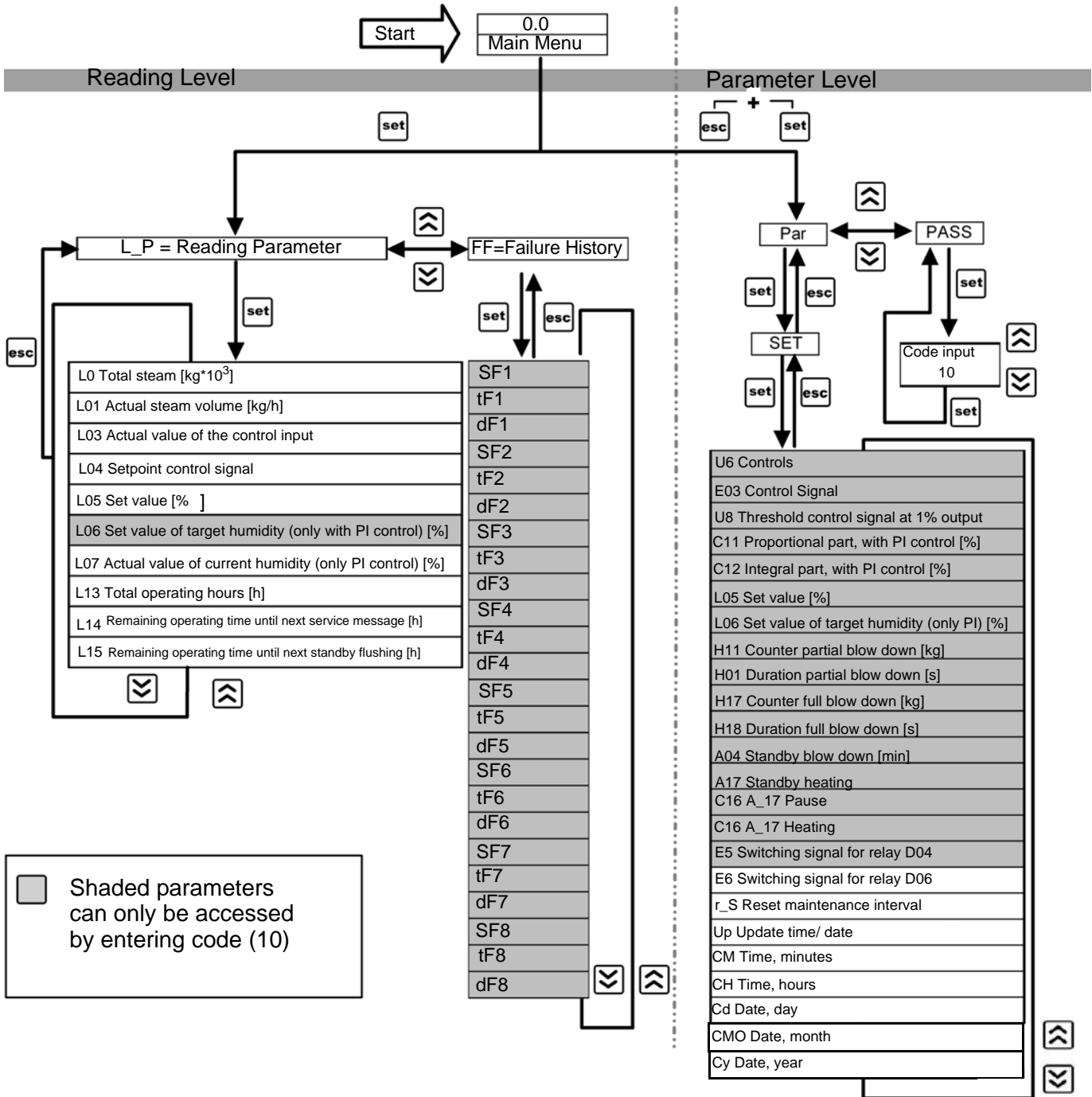
After switching on the Hygromatik HeaterLine HL with the main switch, a self-test is started and the water level in the cylinder is filled to operating level when the safety chain is closed.

The system is then in the **main menu**, i.e. the current steam output is displayed.

From here, you can get to the **reading level** and read out current reading parameters (L1...L15) or get to the **programming level** where parameters can be set or changed.

There is a detailed illustration of the programming steps in the following subchapter "Menu set-up and parameterisation".

### 3.3.1 Menu Structure Code 10



↑ - Increase value  
↑ - Next identifier

↓ - Decrease value  
↓ - Previous identifier

esc - Exit without parameter modifying  
- Back to the previous level

set - Confirm value/ exit with parameter modifying  
- Next level (entering main menu, parameter value)  
- Entering menu „reading parameter“

### 3.3.2 Reading level

In the reading level, the following reading parameters can be called:

L0	Totalssteam volume meter [kgx10 <sup>3</sup> ]
L01	Actual steam volume [kg/h]
L03	Actual value of the control input
L04	Set point control signal
L05	Set value [%]
L06	Set value of target humidity [%] (valid only with PI control)
L07	Actual value of current humidity [%] (valid only with PI control)
L13	Total operating hours [h]
L14	Remaining operating time until next service message [h]
L15	Remaining operating time until next standby flushing [h]

### 3.3.3 Password (Code) entry

- » Press button F2 and F4 simultaneously
- » The display shows „Par“
- » Press button F1 until the display shows „PASS“
- » Press button F4
- » Set the desired value by using the F1 or F3 buttons

To confirm the modified value press F4 button and go automatically back one level.

### 3.3.4 Parameter setting

Press F2 and F4 buttons simultaneously  
The display shows „Par“.

- » Press button F4 twice

The display shows the first parameter.

- » Select the requested parameter by using buttons F1 and F3
- » Call up the parameter by pressing button F4
- » Set the desired value by using button F1 or F3
- » To confirm the modified value press button F4 and go automatically back one level.

or

- » Press button F2 and go automatically back one level without saving the change

### 3.3.5 Set Time of Day

- » When in main menu press F2 and F4 buttons simultaneously

The display shows „Par“.

- » Press F4 button twice

The display shows „UP“.

- » Press F4 button, input „2“ and press F4 button again
- » Using F1 and F3 buttons, call up time setting parameters and input the values desired
- » For saving, call up UP-parameter again and input „1“

When saving is complete „0“ is shown. **View Parameter Settings**

- » When in main menu press F2 and F4 buttons simultaneously

The display shows „Par“.

- » Press F4 button twice

The first parameter is displayed.

- » Using F1 and F3 buttons, select the parameter in question
- » Press F4 button to view parameter value
- » Press F2 button to exit

### 3.3.6 Programming level

Within the programming level, the following parameters can be changed:

Parameter	Designation	Selection option
U6	Control type	0 = external controller 1 = single-stage / on-off
E03	Control signal	4 = 0 - 10V DC 3 = 4 - 20mA DC
U8	Threshold control signal at 1% output	1.0 - 50.0
C11	P fraction, with PI humidity control	5 - 20%
C12	I fraction, with PI humidity control	5 - 50%
L05	Steam generation output limitation	25 - 100%
L06	Target value rel. humidity	10 - 100%
H11	Meter Partial blow-down	0 - 999kg (0=Off)
H01	Flushing time Partial blow-down	2 - 30sec
H17	Meter Full blow-down	0 - 9999kg (0=Off)
H18	Flushing time Full blow-down	2 - 100sec
A04	Standby blow-down	0 - 1440min (0=Off) factory setting: 1440min
A17	Standby heating	ON/OFF factory setting: OFF
C16	A_17 Pause	0 - 99 mins Factory setting 25 mins
C17	A_17 Heating interval	0 - 99 secs Factory setting 15 secs
r_S	Reset service message	ON/OFF
E06	programmed switching signal, relay D04	see table: program- mable switching signals
E07	programmed switching signal, relay D06	see table: program- mable switching signals
UP	Update Time	
CII	Minute	
CH	Hour	
Cd	Day	
CPIO	Month, Cy Year	

Table: Programmable switching signals for E06 und E07

Value	Description
0	Off (Function is switched off)
1	Error
2	Safety chain closed
3	Stand by
4	No demand
5	Humidification active
6	Blow down active
7	Main contactor active
8	Filling active
9	No error
10	Dry level (level sensor)
11	Operating level (level sensor)
12	Max-level (level sensor)

**Level FF = Error history (only reading parameters)**

Parameter	Description
SF1...F8*	Designation of error message
tF1...F8	Time of error message
dF1...F8	Date of error message
rESE	Reset error history

(\*: see also chapter „Overview of error messages“)




### 3.4 Operation

If the HygroMatik Heater Line HL is enabled (i.e. the safety chain is closed) and a control signal above the turn-on threshold is applied, then the water is evaporated.

LED 2 for the state "Operation" lights up.


The current steam output in kg/h is simultaneously shown on the display.

The top display line additionally shows operation with  .


### 3.5 Function of the safety chain

In the main display window, you can see whether the system is enabled for operation. Enabling (=closing of the safety chain between terminals X1.1 and X1.2) requires a customer-provided potential-free make contact. Several safety contacts (opener/NC) can be serially connected here.

#### No requirement:


If programmable logic controller shows  then the safety chain is closed but the requirement is below the turn-on threshold. There is no need for humidification.

#### Ready for use:

If  is not shown and the display shows 0.0 kg/h, then the safety chain is open (terminals X1.1 and X1.2 are not bypassed). The HygroMatik Heater Line HL is operational.

### 3.6 Collective Fault

If an error in the HygroMatik Heater Line HL is detected by the control, then the allocated changeover relay is deenergized (terminals X1.28-30 NC).

At the same time, the display shows a specific error message (F1 ... F8) and the icon  lights up in red. The HygroMatik Heater Line HL is switched off.

If there is no error, then the changeover relay is energized.

Please refer to the following table for a detailed description of the error and ways to remove them.

### 3.7 Overview of error messages

Error No.	Fault report	Description	Possible cause	Rectification
F1	Blow-down error	<p>Blow-down pump is not actuated electrically.</p> <p>Water level in the cylinder is dropping very slowly even though the blow-down pump blows down water.</p> <p>Blow-down pump is working but no water is pumped out.</p> <p>Blow-down pump blocked by hardeners.</p>	<p>Cable connections are not OK.</p> <p>Relay on the main board not energized.</p> <p>Blow-down pump defective.</p> <p>Solenoid valve does not close properly.</p> <p>Cylinder drain clogged.</p>	<p>Check cable connections, replace if necessary.</p> <p>Measure voltage on the board terminal against N, replace board if necessary.</p> <p>Replace blow-down pump.</p> <p>Check solenoid valve.</p> <p>Completely clean steam cylinder and support to preclude renewed short-term clogging.</p> <p>Check blow-down pump, drain system and cylinder for hardeners and clean.</p>

<b>Error No.</b>	<b>Fault report</b>	<b>Description</b>	<b>Possible cause</b>	<b>Rectification</b>
F2	Thermo sensor error	Thermo sensor has tripped.	<p>Too much lime in the heater.</p> <p>Flue openings blocked.</p>	<p>Disconnect power supply. Wait until cylinder has cooled down. Remove black cover cap. Push back the blue release pin with bent needle nose pliers or a screw driver.</p> <p>Remove lime from the heater.</p> <p>Remove blockage</p>
F3	Error Max_Niveau	Water level very frequently at max. level.	<p>Solenoid valve does not close properly. The water level in the cylinder is rising slowly even though the solenoid valve is not actuated.</p> <p>Water is fed despite switched off steam humidifier. The inlet solenoid valve stays open.</p> <p>The inlet solenoid valve receives a constant electrical signal. (Water supply is stopped when the device is switched off).</p>	<p>Check solenoid valve.</p> <p>Clean solenoid valve.</p> <p>One or more relays for the solenoid valves hook. Measure on the terminals, replace board if necessary.</p>

<b>Error No.</b>	<b>Fault report</b>	<b>Description</b>	<b>Possible cause</b>	<b>Rectification</b>
F4	Filling error	<p>Cylinder is not filled.</p> <p>Solenoid valve is not actuated electrically.</p>	<p>Solenoid valve or supply line dirty or defective.</p> <p>Coil defective.</p> <p>Water supply not opened.</p> <p>Cable connections are not OK.</p> <p>Relays on the main board are not energized.</p> <p>The steam hose was not laid with sufficient slope/incline so that a water bag has formed. The steam flow is obstructed. The steam builds up pressure in the cylinder and presses the water into the drain via drain hose.</p>	<p>Clean or replace solenoid valve or supply line.</p> <p>Measure and replace coil.</p> <p>Open water supply.</p> <p>Check cable connections, replace if necessary.</p> <p>Check voltage an output terminals.</p> <p>Check laying of steam hose. Remove water bag.</p>
F5	Error RH sensor	The value of a connected humidity sensor (option) is outside the normal range.	<p>Humidity sensor defective.</p> <p>Line break.</p>	<p>Replace humidity sensor.</p> <p>Replace line.</p>
F6	Error extension module	Controller cannot identify extension module	LAN cable defective or not connected	<p>Replace LAN cable</p> <p>Check connection</p>

<b>Error No.</b>	<b>Fault report</b>	<b>Description</b>	<b>Possible cause</b>	<b>Rectification</b>
F7	Level sensor error	Illogical water levels are recorded.	<p>Float switch is defective.</p> <p>The cable connection for the float switch is not OK.</p> <p>The plug for the float switch is not connected with the control.</p>	<p>Remove and check float switch.</p> <p>Check cable connection, replace if necessary.</p> <p>Insert plug in the control.</p>
F8	Vaporization error	No water evaporated despite requirement.	<p>Heater defective.</p> <p>Failure of a phase. (External fuse has tripped or is defective).</p>	<p>Measure resistance of heater, replace heater if necessary. Resistance Heater 4.5kW: approx. 36 ohm and heater 6.75kW: 24 ohm</p> <p>Replace external fuse and look for the cause.</p>

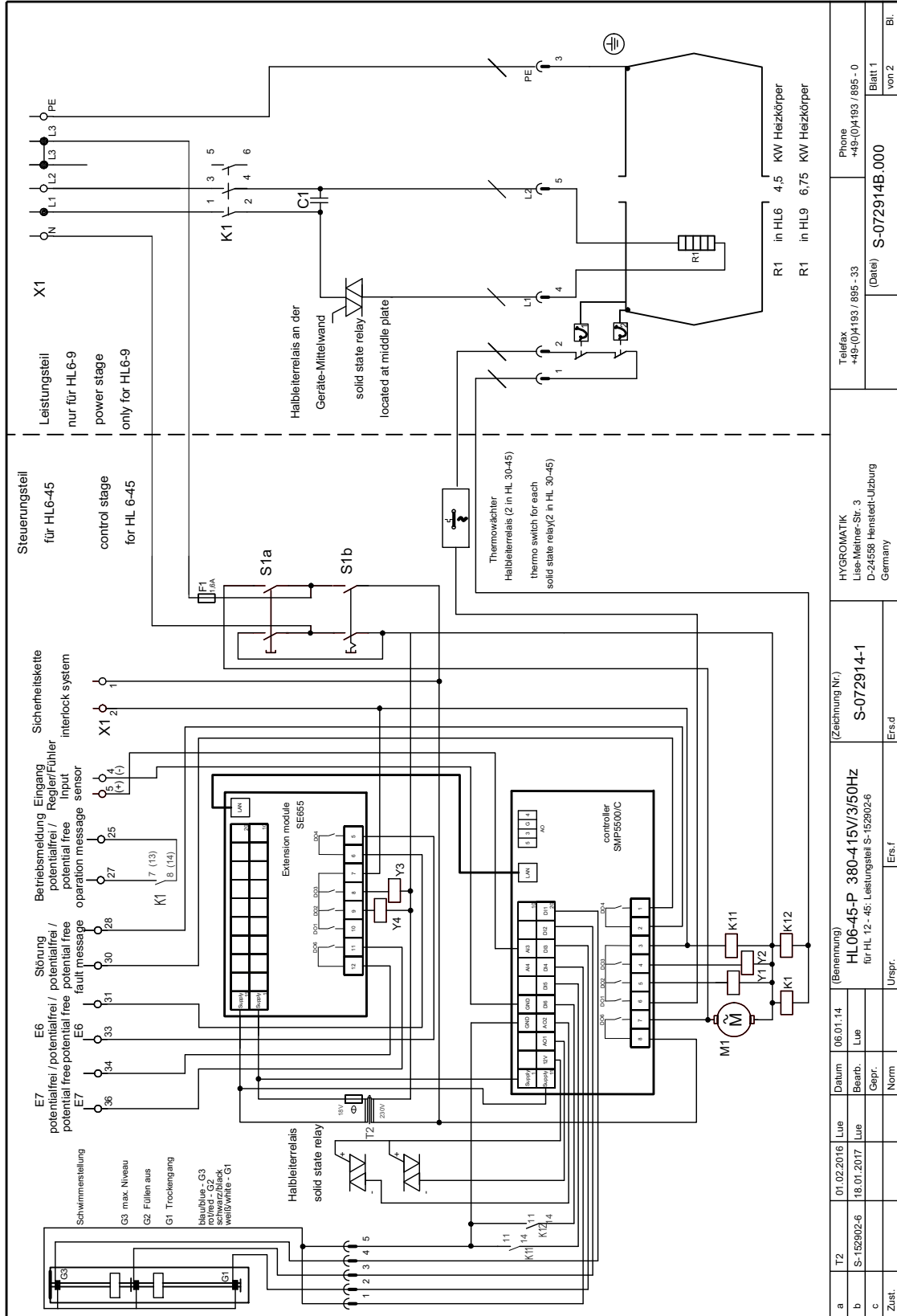
## 4. Wiring diagrams

For HeaterLine units type HLXX-**P** equipped with a control Professional [**P**] the following wiring diagrams are valid:

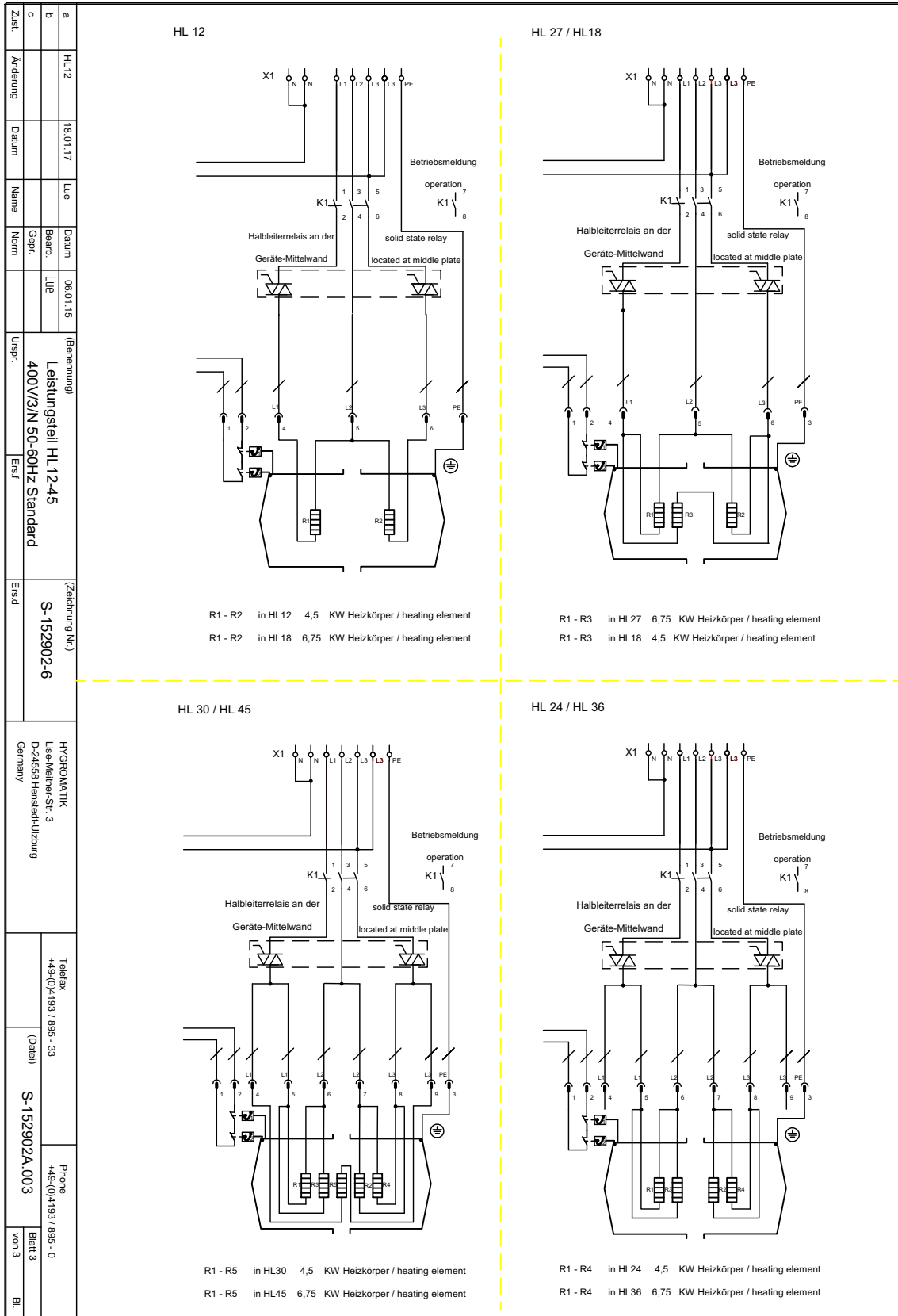
S-072914-1 und S-152902-6

For HeaterLine units type HLXX-**P2** equipped with a control Professional [**P2**] the following wiring diagrams are valid:

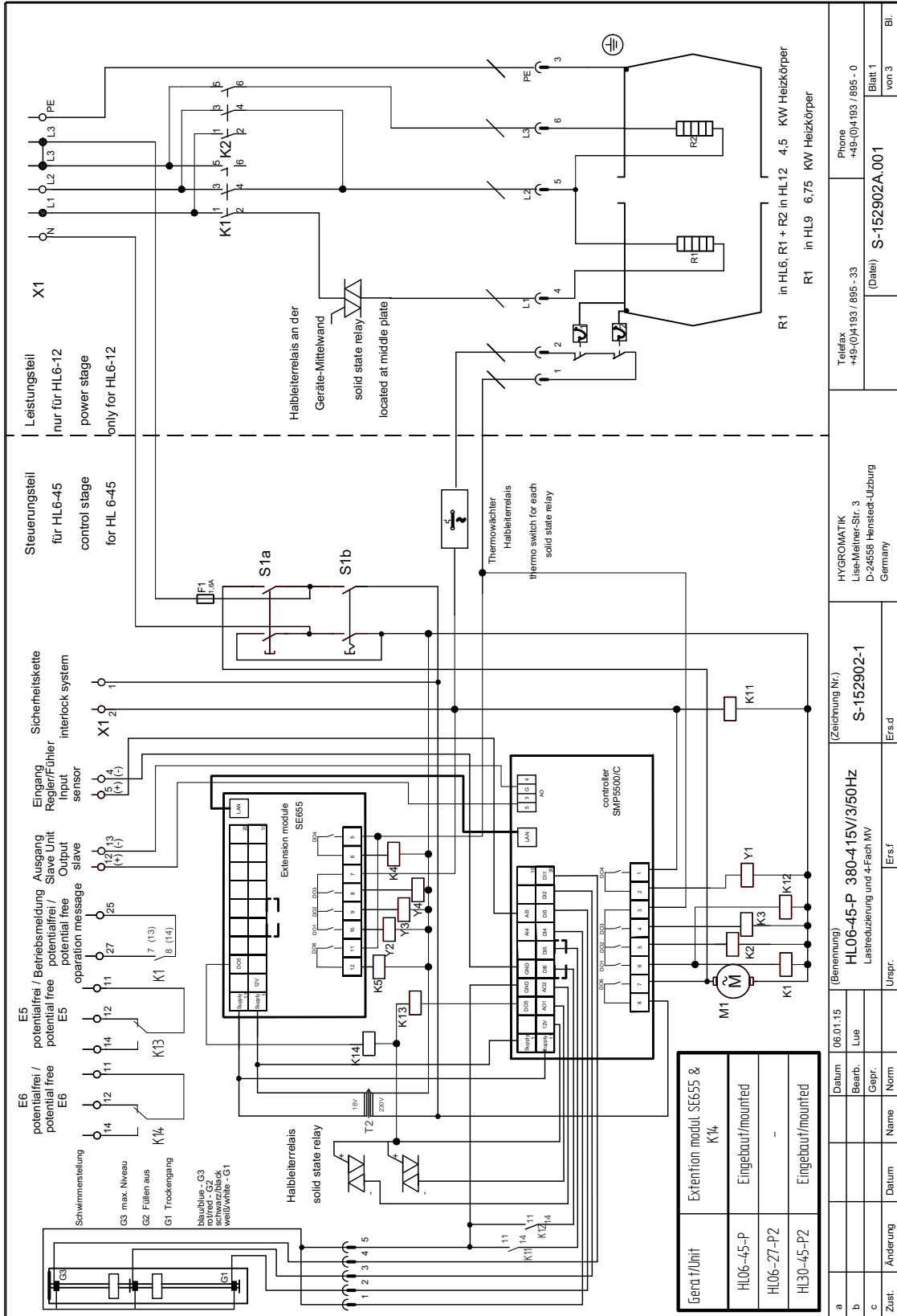
S-152902-1 und S-152902-5



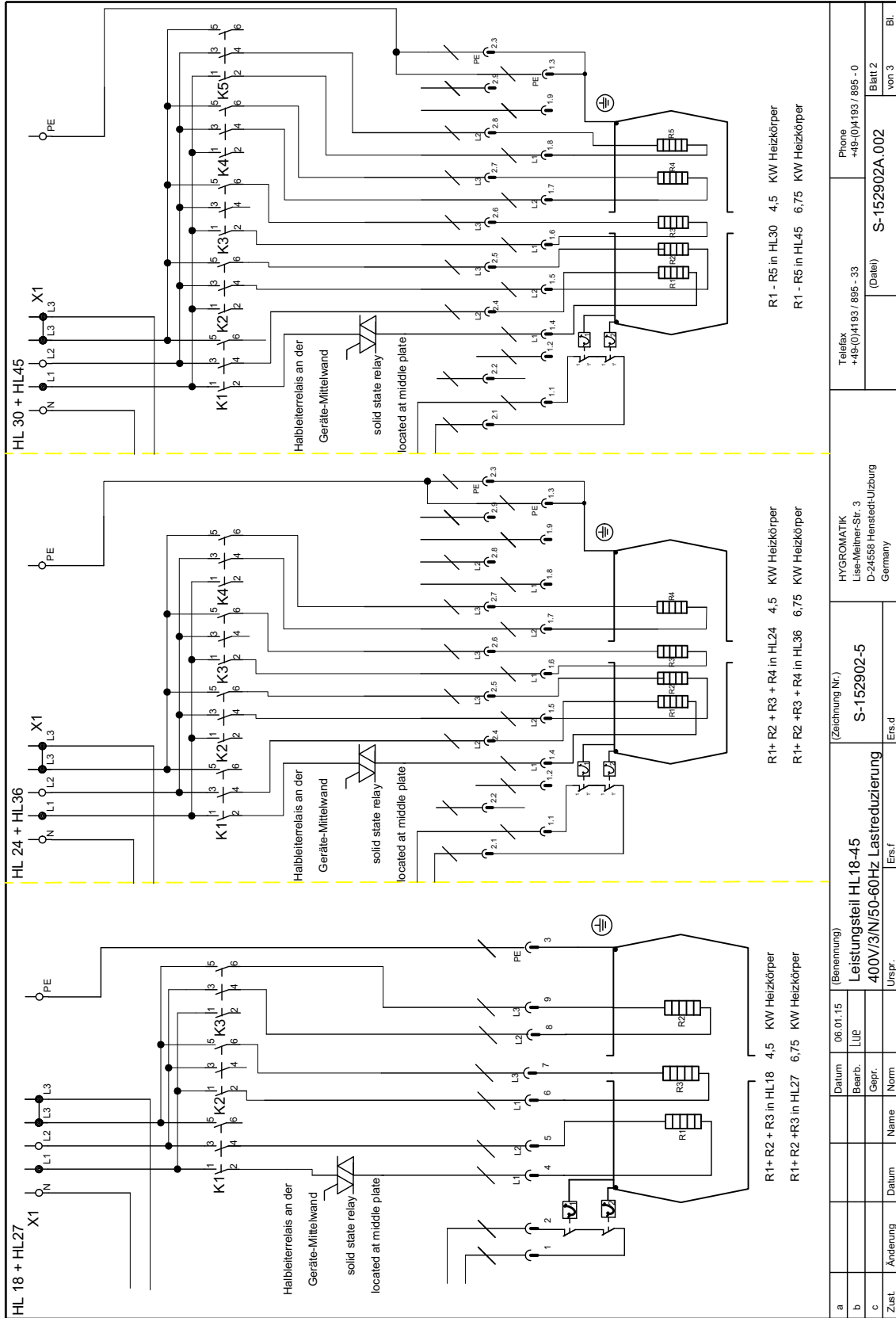
a	T2	01.02.2016	Lue	06.01.14	(Benennung)	(Zeichnung Nr.)	HYGROMATIK Lisa-Meiner-Str. 3 D-24568 Henstedt-Ulzburg Germany	Phone +49-(0)4193 / 895 - 33	Blatt 1 von 2
b	S-152902-6	18.01.2017	Lue		HL06-45-P 380-415V/3/50Hz für HL 12 - 45; Leistungssteil S-152902-6	S-072914-1		Telefax +49-(0)4193 / 895 - 33	
c			Gepr.					(Date)	S-072914B.000
Zust.			Norm		Urspr.	Ers.f			







a	Datum	06.01.15	(Benennung)	HL06-45-P 380-415V/3/50Hz	(Zeichnung Nr.)	S-152902-1	HYGROMATIK Lise-Mäner-Str. 3 D-24658 Henstedt-Ulzburg Germany	Telefax +49-(0)4193 895-33	Phone +49-(0)4193 895-0
b	Bearb.	Lue	Lastrედუზუგ und 4-Fach MV					(Datei)	S-152902A.001
c	Gepr.								
Zust.	Änderung	Datum	Name	Norm	Urspr.	Ers.f	Ers.d		Blatt 1 von 3 Bl.



a		Datum		06.01.15		(Benennung)		HYGROMATIK		Telefax		Phone	
b		Bearb.		LUE		Leistungsteil HL18-45		Lise-Meiner-Sr. 3		+49-(0)4193/895-33		+49-(0)4193/895-0	
c		Gepr.				400V/3N/50-60Hz Lastreduzierung		D-24558 Henstedt-Ützburg		(Date)		S-152902A.002	
Zust.		Änderung		Datum		Name		Norm		Ers.f		von 3	
										Ers.d		Blatt 2	
												Bl. 2	

## 5. Technical specifications Technical Specifications

Heater Element Steam Humidifier									
Type HeaterLine	HL06	HL09	HL12	HL18	HL24	HL27	HL30	HL36	HL45
Steam Output [kg/h]	6	9	12	18	24	27	30	36	45
Power Rating [kW]	4,5	6,8	9,0	13,5	18,0	20,3	22,5	27,0	33,8
Power Consumption [A]	11,3	16,8	19,5	29,3	39,0	29,3	39	58,5	58,5
Circuit Protection [A]	3x16	3x20	3x25	3x35	3x50	3x35	3x50	3x63	3x63
Electrical Connection* per unit	400V/3/N 50-60Hz								
Control Voltage	230V/50-60Hz								

\*Other voltages upon request.



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