

For up to 150 litres / 220 kg
Heating machines

Thermo Schleier Jet 1500 a
Thermo Schleier Jet HT 1501 b
Schleier Jet HT 1501 a

Original operating instructions in German



Product designation

Thermo Schleier Jet 1500 a
Thermo Schleier Jet HT 1501 b
Schleier Jet HT 1501 a

Year of manufacture

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Identification

Control cabinet nameplate

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1 Important safety instructions

Only use the heating unit for the purpose described in this manual. Otherwise, you may endanger yourself or damage parts of the system.

You put yourself and others at risk if you operate the heating machine incorrectly or fail to observe the safety or warning instructions. This may result in serious injury or significant damage to property.

1.1 About this operating manual and other important user information

This manual contains important descriptions and instructions, as well as safety and warning notices regarding potential residual risks during handling and use. This operating manual is essential for the safe and effective operation and handling of the heating machine.

However, this operating manual does not contain redundant information regarding modules or optional accessories that can be combined with the heating machine. Separate, project-specific manuals are supplied for this purpose.

Furthermore, this manual provides guidance on troubleshooting operational faults and details the necessary maintenance intervals.

1.2 Terms used

Heating machine

Loading station, usually in conjunction with a fresh sheet glazing line. Here usually abbreviated to HZ

HT

High-temperature thermal veil jet HT up to max. 99°C High-temperature veil jet HT up to max. 110°C

Water injection system WIS

Continuously variable programming and supply of water to preserve and stabilise the material

Conductivity sensor

In an open-loop system, a sensor continuously measures the conductivity of the aqueous medium. Based on a pre-set setpoint, the monitoring and control unit regulates water loss through precise water dosing to compensate for the loss caused by evaporation or vaporisation. The control unit calculates the required water volume based on the deviation of the current conductivity value from the setpoint. This keeps the water content of the medium constant

Viscosity Controller

The ViskoRegler is a three-stage controller which allows you to select one of three preset values for the conductivity sensor by turning a dial.

Conveyor glazing system

The conveyor system is used to coat pastries with apricot, dry them, glaze them and, if required, decorate them.

P&R cleaning agent

Concentrated care product with a cleaning effect. For the internal cleaning of material-carrying parts of machines and systems. Available from the manufacturer Frisch Spritzmatic GmbH

1.2.1 Scope of these operating instructions

These operating instructions apply exclusively to the **heating machines (1+2)** specified on the cover page.

Furthermore, this operating manual illustrates the control-related interrelationships between the conveyor system and any other combinable modules.



Figure 1: Example combination of the large heating machine and a conveyor system

- | | | | |
|---|---------------------------|---|-----------------|
| 1 | Aprikotur heating machine | 3 | Conveyor system |
| 2 | Fondant heating machine | | |



Please refer to other operating instructions

These operating instructions do not replace the separate instructions for the **conveyor system (3)** and/or other compatible modules.

1.2.2 Applicable documents and further instructions

In addition to this manual, supplementary documents have been supplied to the operator. These supplementary documents provide important, additional information on project-specific

- Restrictions on use, as well as
- descriptions and instructions regarding any necessary maintenance and servicing work.



Cross-references in this manual

This manual contains several references to the applicable documents.

- ▶ In such cases, please also observe the safety and warning notices as well as the descriptions and instructions in the relevant documents:
 - **Electrical circuit diagram**
 - **Operating instructions** for the combinable modules, e.g. conveyor system and Masterline
 - **Operating instructions** for the combinable modules, e.g. conveyor system with optional accessories and heating tunnel

1.2.3 Storage, Provision and Handover

Storage and provision

- ▶ Please keep
 - this operating manual and
 - all relevant documentsreadily available in the operating environment at the installation.

Do not allow others to use

If the facility is ever moved to another location or transferred to another operator:

- ▶ Please provide
 - these operating instructions and
 - all relevant documentationto subsequent operators and users.

1.2.4 What this operating manual cannot do

Ensure the qualification of operating and maintenance personnel

Requirements regarding qualifications and specialist knowledge for specific tasks are set out in this manual and in the relevant documentation.

However, this manual cannot impart this necessary expertise.

If you do not yourself possess the required qualifications for certain tasks:

- ▶ Ensure that tasks requiring specialist knowledge are carried out exclusively by qualified personnel with the appropriate training.
- ▶ Never attempt to carry out tasks yourself for which you do not have the necessary qualifications.

Research operating regulations

Depending on the country and state in which the system is operated, there are different operating regulations which the operator and user must observe.

Due to these differences, the requirements of the regulations cannot be listed in this operating manual.

In addition, the rules and regulations applicable at the site of use regarding accident prevention and environmental protection, as well as any work and operating instructions issued by the operator/site, must be observed.

- ▶ Find out about any additional applicable operating regulations.

In-house instructions

Operating or accident prevention regulations may necessitate internal operating and work instructions.

These may specify additional safety and warning instructions as well as any necessary additional personal protective equipment.

In addition to these operating instructions, necessary conduct requirements for persons working on or with the system may also be specified here.

- ▶ If necessary, supplement these instructions with your internal instructions.

Training and instruction

These operating instructions provide step-by-step guidance on how to work safely and effectively on and with the system. Nevertheless, it is essential that anyone who is to work on or with the system receives thorough training and instruction.

Operating and accident prevention regulations also require the operator to follow this procedure.

- ▶ As the operator, you must instruct and train any person who is to work on or with the heating machine.
- ▶ Please refer to these instructions and, where applicable, any existing operating and work instructions.
- ▶ In particular, ensure that all safety and warning instructions are communicated.

1 Important safety instructions

1.3 Symbols and signal words used


All safety and warning instructions in this manual have been clearly highlighted. The following symbols and signal words have been used for warnings.

WARNING



Warns you of hazards that **could result in fatal or serious** injury if you do not follow these instructions.

or


 **WARNING**, directly in the context of an instructional section of this operating manual

CAUTION



Warns you of hazards that **may result in minor**, usually reversible **injury** to persons if you do not follow these instructions.

or

 **CAUTION**, directly in the context of an instructional section of this operating manual

ATTENTION

Warns you of situations that could lead to **damage to property and disruption to operations** if you do not follow these instructions.

or

ATTENTION, directly in the context of an instructional section of this operating manual

Safety chapter

Safety chapters are entire sections containing safety-related information that is essential for safe and effective operation and handling.

Hazards are also indicated by the **following pictograms**:



Warning of hazards, which are further detailed in the warning notice



Hazards caused by electric current



Warning of hot surfaces



Warning of rotating parts



Warning of pinch and entanglement hazards

Symbols used in these instructions:



Wear **a hairnet**



Wear **protective clothing**



Wear **safety footwear**



Wear **protective gloves**

1 Important safety instructions

Other **signs and symbols** used in these instructions: **Tip**

Reference to useful information regarding the use of the barrier tape.



Cross-references

Cross-references in this operating manual are marked with this symbol or in *italics*.

► Action

Instructions are marked with this symbol.

a) Action step

b) Step

c) ...

Step-by-step instructions are listed in lowercase letters in the order of the steps.

✓ Interim or final result of an action or a sequence of actions

This information makes it easier to determine whether the procedure in a step-by-step guide has been successfully completed was concluded.

■ Bullet points

are used to indicate lists in both descriptive and instructional sections of this operating manual.



Carrier



Operator



Installer



qualified electrician

1.4 Ensure authorised personnel

Ensure qualified personnel – train and instruct

Personnel who are not sufficiently qualified may cause personal injury or damage to property through incorrect operation.

Only operate the system if you

- have read and understood the contents of this operating manual and
- have received additional training on safe operation.

The descriptions and instructions contained herein assume that the operator has received appropriate training.

Where the use of a qualified person is required for a specified task, that person must, by virtue of their training and professional experience, be demonstrably capable of recognising the hazards and risks associated with or arising from the task in question.

- ▶ Always comply with the necessary requirements regarding authorised personnel.
- ▶ Observe the qualification requirements listed below.
- ▶ You must also comply with the relevant accident prevention regulations and environmental protection regulations.


The necessary qualifications of the personnel carrying out the work, as well as descriptions of the permitted and prohibited activities, are summarised in the following sub-sections.

Warning against incorrect operation due to the influence of drugs, medication or alcohol


- ▶ Never work on or with the system if you
 - under the influence of alcohol,
 - drugs or medication.


1 Important safety instructions

1.4.1 Carrier and warehouse operator

Transport and storage	
Person referred to in these instructions	Freight forwarder / warehouse operator who has received training and instruction and holds a valid driving licence for the vehicles to be used. 
Required qualifications	<ul style="list-style-type: none">■ Operating instructions, section <i>on transport and storage</i>, read and understood.■ Familiar with all basic regulations regarding occupational safety, accident prevention and environmental protection.■ Driving licence for the vehicles to be used, as well as regular training and instruction in the safe handling of industrial trucks.
Permitted activities	<ul style="list-style-type: none">■ Lifting■ Lowering■ Lashing■ Transport
Prohibited activities	<ul style="list-style-type: none">■ Operating■ Cleaning and maintenance■ Identifying and rectifying faults■ Maintenance■ Rectifying faults and defects■ Repair


1.4.2 Installation, repair and maintenance staff

Repair and maintenance – electrical equipment	
Person in this manual	Qualified electrician 
Required training	As for the operator, as well as: <ul style="list-style-type: none"> ■ a completed qualification as a qualified electrician or ■ higher-level training (electrical technician, master electrician, electrical engineer) with practical experience
Permitted activities	<ul style="list-style-type: none"> ■ Troubleshooting electrical equipment ■ Repairing electrical equipment ■ Maintaining electrical equipment
Prohibited activities	<ul style="list-style-type: none"> ■ Lifting ■ Lowering ■ Lashing ■ Transport

Installing, repairing and maintaining mechanical and pneumatic equipment	
Person in this manual	Maintenance technician 
Required training	As for the operator, as well as <ul style="list-style-type: none"> ■ Completed training as a mechanical or pneumatic technician / mechatronics technician with practical experience, or ■ higher-level training (mechanical engineering technician, master craftsman, engineer) with practical experience
Permitted activities	<ul style="list-style-type: none"> ■ Troubleshooting mechanical and pneumatic equipment ■ Repair mechanical and pneumatic equipment ■ Maintain mechanical and pneumatic equipment
Prohibited activities	<ul style="list-style-type: none"> ■ Lifting ■ Lowering ■ Lashing ■ Transport

1 Important safety instructions

1.4.3 Operator

Use	
Person in this manual	Operator / operator with training and instruction 
Required qualifications	<ul style="list-style-type: none">■ Operating instructions read and understood■ Familiar with all basic regulations regarding occupational safety, accident prevention and environmental protection■ Trained and instructed in the safe handling of the system and its components
Permitted activities	<ul style="list-style-type: none">■ Establish power supply■ Operate■ Identifying faults■ Cleaning and maintenance work■ Inspection tasks
Prohibited activities	<ul style="list-style-type: none">■ Maintenance■ Rectifying faults and defects■ Repair

2 Requirements for safe operation

Observe basic safety rules

- ▶ Use the heater only for the intended purpose described in this operating manual.
- ▶ Never attempt to tamper with or bypass safety functions or protective devices.
- ▶ Never operate the heating machine if safety functions have been triggered, protective devices are missing or you can see that it is faulty.
- ▶ In such cases, ensure that the system is restored to a safe condition or have it repaired before attempting to restart it.
- ▶ Always keep your working environment clean and tidy.
- ▶ Ensure that the floor is non-slip and level and that there is adequate lighting at your workstations.
- ✓ This will help you avoid unforeseeable safety risks when operating the system.

2 Requirements for safe operation

2.1 Intended use

The heating machine is constructed in accordance with the state of the art and recognised safety regulations. Nevertheless, improper or unauthorised use may result in danger to the life and limb of the user or third parties, or damage to the system or other property.

The heating machine is intended exclusively for

- to heat food-grade media and
- convey them.

The heating machine must only be operated in accordance with the

- operations,
- operating modes
- operating procedures.

The heating machine must always be kept in

- technically sound condition and
- in accordance with the maintenance intervals specified in these operating instructions, and
- installed and operated with due regard for safety and potential hazards.

In particular, faults that could compromise safety must be rectified immediately.

Any other use is not in accordance with the intended purpose and is therefore prohibited.

2.2 Improper and non-intended use

The following are not in accordance with the intended use

- operation outside the environmental and operating conditions specified in this manual, or
- any operation outside the specified intended and permissible use, or
- the operation and/or handling of the system at any stage of its life cycle by personnel who are not sufficiently qualified.

It is expressly prohibited to

- the operation of individual or all system components within explosive atmospheres.

2.3 Operator's obligations

Overall responsibility for safe operation

The operator bears overall responsibility for the safe operation of the heating machine throughout its entire service life and specifies the rules and conditions for the necessary organisation.

The operator ensures compliance with all necessary operating, usage and environmental conditions.

All operating and maintenance personnel must be properly trained and instructed by the operator in accordance with the operating instructions, and must be made aware of the local, site-specific hazards.

The operator must ensure that

- these operating instructions are kept readily available near the heating machine and
- any damaged or illegible operating instructions are replaced immediately.

The operator undertakes

only allow persons to work on or with the heating machine who

- have read and understood these operating instructions,
- are familiar with the basic regulations on occupational safety, accident prevention and environmental protection, and
- have been instructed in the safe handling of the heating machine (training) and thus
- meet the requirements and qualifications set out in these instructions.

Furthermore, the operator undertakes

ensure that maintenance work is carried out only by qualified personnel who

- have read and understood these operating instructions,
- are familiar with the basic regulations on occupational safety, accident prevention and environmental protection, and
- have been specially trained for the task in question.

2.4 Obligations of operating and maintenance personnel

Any person working on or with the heating machine is obliged to

- read and observe these operating instructions, and
- to follow all safety and warning instructions without exception,
- to follow all warnings and instructions affixed to or noted on the heating machine itself,
- familiarise yourself with the operation, functions and all safety and protective devices,
- to use the system only when it is in perfect working order and in accordance with its intended purpose, whilst being mindful of safety and potential hazards and in compliance with the operating instructions, and
- to rectify faults that could compromise safety immediately or, where necessary, have them rectified.

2 Requirements for safe operation

2.5 Space requirements around the heating machine when connected to a conveyor system

The installation site must be chosen in such a way that all minimum clearances required for safe access to plant components and control devices can be maintained. The clearances specified below in relation to all other objects and parts of the building are minimum dimensions for workstations, passageways and escape routes.

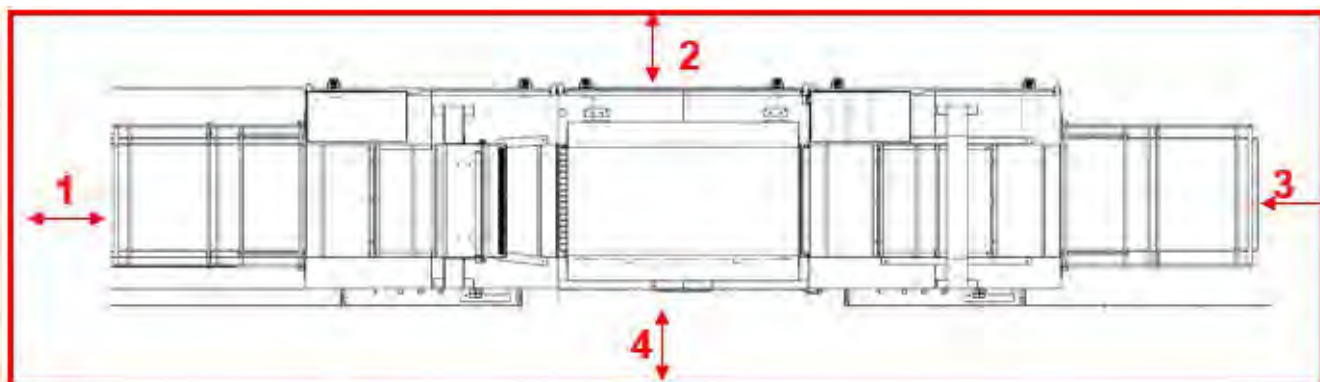


Figure 2: Space requirements around the belt conveyor system with heating units

Accessibility

1 Left – Workstation for removing baked goods

Minimum distance: 800 mm

2 Rear – Access to supply connections

Minimum clearance: 800 mm

3 Right – potential escape route

Minimum clearance: 800 mm

4 Front – operator workstation

Minimum clearance: 800 mm

3 Technical data and power ratings

Dimensions and weights*			
*Please note the additional total weight of the combined conveyor systems			
Thermo Schleier Jet 1500 a			
Height in mm	Depth in mm	Width in mm	Weight in kg
850	1000	720	290
Thermo Schleier Jet HT 1501 b			
Height in mm	Depth in mm	Width in mm	Weight in kg
850	1000	720	290
Schleier Jet HT 1501 a			
Height in mm	Depth in mm	Width in mm	Weight in kg
850	1000	720	210
*Combino conveyor system**			
Height in mm	Length in mm	Width in mm	Weight in kg
1808	4571	800	350
**Depending on the use of optional modules, the overall dimensions/weight may vary			
*Strip mill casting line**			
Height in mm	Length in mm	Width in mm	Weight in kg
1808	3568	800	230
**Depending on the use of optional modules, the overall dimensions/weight may vary			
*Performance conveyor system**			
Height in mm	Length in mm	Width in mm	Weight in kg
1808	472	983	400
**Depending on the use of optional modules, the overall dimensions/weight may vary			
*Masterline conveyor system**			
Height in mm	Length in mm	Width in mm	Weight in kg
1808	7355	1475	760
**Depending on the use of optional modules, the overall dimensions/weight may vary			

3 Technical data and rated values



Permissible ambient conditions	
Temperature during transport	-15°C to +50°C
Temperature during storage / operation	-15°C to +50°C
Relative humidity	max. 85% within the specified temperature range
Floor conditions	The quality of the hall floor must meet the requirements of a food-processing industrial floor in terms of concrete quality, concrete thickness, coating and flatness.

Noise level at the heating unit	
Normal operation	Continuous sound pressure level Average max. 70 dB(A)

Performance and load capacity of the heating unit	
Usage	(8 hours/day, 2,920 hours/year)
Cycles per year (nop)	700,800

Rated power of the heating unit	
Mains – electrical power	3/PE/N
Rated voltage	400 V
Frequency range	50/60 Hz
Rated current	16 A

4 Components and functions of the heating units

Descriptive sections of the manual do not contain instructions for use

This chapter is a descriptive section of the operating instructions. It is intended to help you understand the system and does **not** yet contain **any** instructions for use.



Figure 3: Example of a large heating machine – front and rear

- | | |
|--|---|
| <ul style="list-style-type: none"> 1 Front of heating machine with control panel 2 Material hose | <ul style="list-style-type: none"> 3 Rear of heating machine with supply connections |
|--|---|

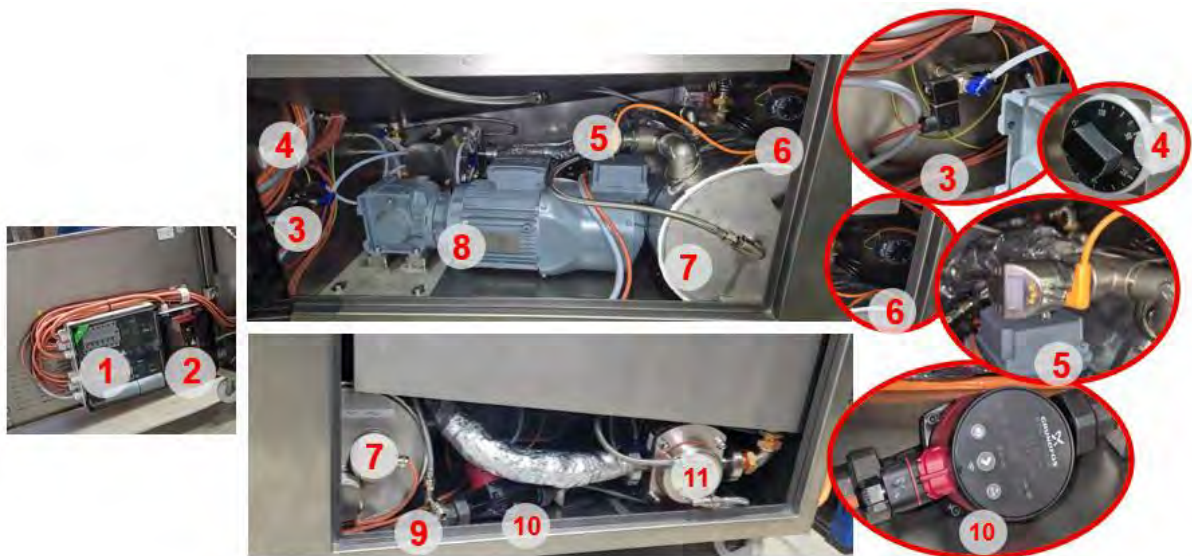


Figure 4: Example of a large heating machine – front and rear views

- | | |
|---|--|
| <ul style="list-style-type: none"> 1 Control cabinet 2 Frequency converter 3 Safety shut-off valve with solenoid valve 4 Temperature controller for material tank (optional) 5 Pressure switch 6 Controller for hose heating (optional) max. 90°C and temperature controller for heating circuit 2 (optional) | <ul style="list-style-type: none"> 7 Heat exchanger 8 Helical gear motor 9 Filling connection for water circuit (optional)
⚠ No compressed air connection!! 10 Circulation pump 11 Rotary lobe pump |
|---|--|

4 Components and Functions of Heating Machines

4.1 Functions of the heating machine

The heating machine is a feeding station designed primarily for use on a conveyor system. A high-performance rotary lobe pump conveys the medium into the interchangeable equipment fitted to the conveyor system, such as e.g. B. spray bridge, misting box and/or decoration station. The medium is applied evenly to the baked goods via this equipment. Excess material is collected in the sump and subsequently returned to the processing cycle.

Alternatively, the heating machine can also be operated using a hand-held spray gun via an adapter.

4.1.1 Heating machine with Thermo

A Thermo-Schleier-Jet/Thermo-Schleier-Jet HT differs from the standard Schleier-Jet or Schleier-Jet HT in that it features a double-walled material tank and an additional optional hose heater. Here, the entire medium is heated as in a water bath and can be processed without a drop in temperature.

The Thermo-Schleier-Jet is suitable for media up to 60°C, such as fat glaze, butter and/or fondant.

The Thermo-Schleier-Jet HT is suitable for hot materials up to 99°C, such as casting and/or apricot paste. This is protected by a separate temperature monitoring system.

4.1.2 Heating machine with hose heater (7) (optional)

The hose heater is an optional add-on for the heating machine and is used to heat the material hose inside the machine in a targeted manner. The additional heating keeps the material at a constant temperature along the entire conveying path. This prevents it from cooling or hardening during transport and ensures consistently homogeneous processing of the material.

The hose heater is particularly necessary for hardening or temperature-sensitive materials such as butter or fat glaze. It ensures that the material remains in a flowable state even during longer processing times or downtime and can be processed without a loss of heat.

4.1.3 Heating machine with water injection (optional)

A heating machine with the additional water injection option automatically adds water to the water-containing medium at regular intervals to ensure the medium remains stable over a longer period through evaporation. The feed rate is preset based on experience, but can be continuously adjusted during operation, as factors such as high humidity and room temperature can affect the consistency of the medium being processed. The water is supplied via a connection on the rear of the heating machine. A brief interruption in the illuminated injection button indicates when water is being fed into the medium.

The rotary piston pump must be flushed before and after operation. This function is ensured by a separate ball valve.

4.1.3.1 Changing the settings of the water injection system

The Logo controller is located in the heating machine's control cabinet.



Figure 5: Logo start screen

Access parameter settings whilst water injection is switched on

a) Press ESC



Figure 6: Setup

b) Press the ↓ arrow

✓ Programme is highlighted in dark.

c) Confirm with OK



Figure 7: Selecting parameters

d) Confirm with OK

✓ The Pause and Delay selection menu appears

e) Select Pause using ↓ and OK



Figure 8: Selection menu

💡 TH = Injection time (0.12 sec) (Time valve is open) TL = Pause (Time between injections)
Ta = Interval time (Time until the next injection)

Injection time (TH) = 0.12 seconds = 4 grams of water = 200 g water/hour

4 Components and Functions of Heating Machines

4.1.4 Heating machines with conductivity sensor and automatic pump flushing (optional) and viscosity controller (optional)

In a heating machine equipped with the optional conductivity sensor and visco-regulator, the conductivity of the water-containing medium is continuously monitored by a sensor in an open-loop system. Based on a pre-set setpoint, the monitoring and control unit regulates water loss through targeted water dosing to compensate for the loss caused by evaporation or vaporisation.

The control unit calculates the required water volume based on the deviation of the current conductivity value from the setpoint. This keeps the water content of the medium constant.

With this option, the rotary lobe pump is automatically flushed continuously during operation. This function is secured by a separate ball valve.

With the additional ViskoRegler function, up to three pre-defined setpoints can be stored and selected directly by operating the controller as required.

5 Combination options with the HZ



Please refer to the relevant documentation

The operating instructions for **the conveyor system** are included in the relevant documentation. See *section 1.2.2 Relevant documentation and further instructions*.

These operating instructions do not contain any redundant descriptions or instructions.

5.1 Combination with a conveyor system



Figure 9: Modules that can be combined

Combination options for conveyor system

- 1 Apricot coating conveyor
- 2 Glazing conveyor

The heating machines can be combined with the corresponding spraying equipment for individual processes or, in combination with other modules, to form an automatic conveyor system. The processes of 'apricoting', 'drying' and 'glazing' are carried out in a single operation.

5.2 Combination with a hand-held spray gun



Figure 10: Combinable modules

Combination option with a hand-held spray gun

The material hose can be connected to a hand-held spray gun using an adapter.

6 Control panel of the heating machine

6 Control panel of the heating machine

Descriptive sections of the manual do not contain instructions

This chapter is a descriptive section of the operating instructions. It is intended to aid understanding and does **not** yet contain **any** instructions for action.



Figure 11: Front view of HZ

- 1 Overpressure safety valve (only for Thermo Schleier Jet/ Thermo Schleier Jet HT)
- 2 Material inlet connection
- 3 Control
- 4 Pump On/Off
- 5 SEW controller
- 6 WIS pushbutton with indicator light
- 7 Main switch
- 8 Viscosity controller (only with the option including a conductivity sensor)
- 9 Material connection outlet

The heating units heat the medium and pump it into the stations of the conveyor system using a rotary lobe pump. Direct processing **without** a conveyor system is possible using an adapter and a spray gun.

6.1 Control unit (3)



Figure 12: Control unit

- 1 LCD display
- 2 Heater 1/ Function key F3
- 3 Heater 2/ Function key F4
- 4 Plus button/ Function key F1
- 5 Minus key/F2 function key
- 6 Alarm indicator
- 7 Selection button
- 8 Cleaning
- 9 Return key

The +, -, 1 and 2 keys are assigned the dual functions **F1**, **F2**, **F3** and **F4**.



Chapter 19 contains the control unit wiring diagram.

6.1.1 Control unit functions (1)

Descriptive sections of the manual do not contain instructions

This chapter is a descriptive section of the operating instructions. It is intended to aid understanding and does **not** yet contain **any** instructions for action.



Figure 13: Membrane keypad

6 Control panel of the heating machine



Home screen

Figure 14: Display start screen



Operating display

The system supports one heating circuit. Either the display for apricot glaze or casting.

Figure 15: Operating indicator display 1



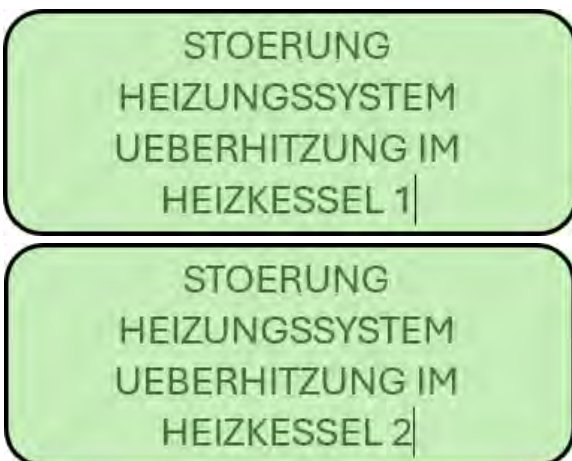
Or the display for fondant or fat glaze.

Figure 16: Display operating indicator 2

The setpoint temperature of the heater can be preselected between 20°C and 110°C. The value can be changed by pressing the + (4) or – (5) buttons.

If a change is made, this is indicated by a red flashing LED in the Return button (9). Pressing the Return button (9) confirms the value.

Pressing button 1 (2) or 2 (3) switches on the respective heater.



Overheating protection

To protect the heaters, a safety thermostat is fitted in the heat exchanger within the heating system. This limits the temperature to the set value.

In the event of overheating, this trips and switches off the heating for the respective heating circuit. It cannot be switched on again until the fault has been rectified.

Figure 17: Overheating fault

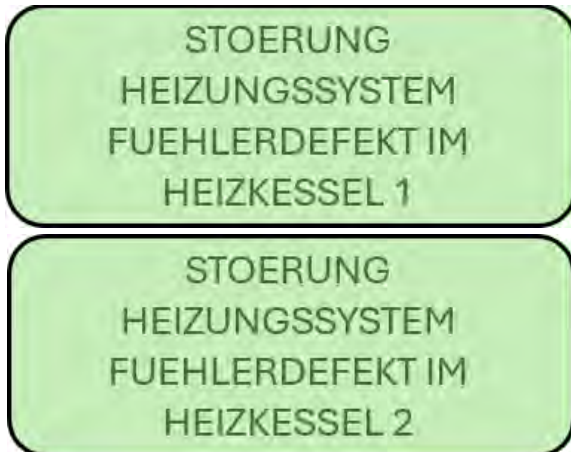


Figure 18: Sensor fault

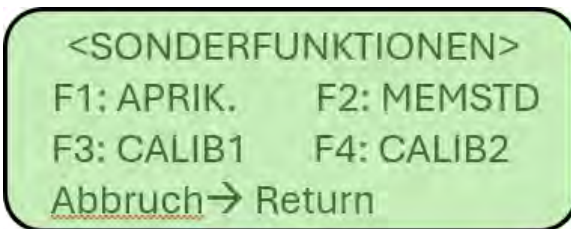


Figure 19: Special functions display 1



Figure 20: Special functions display 2

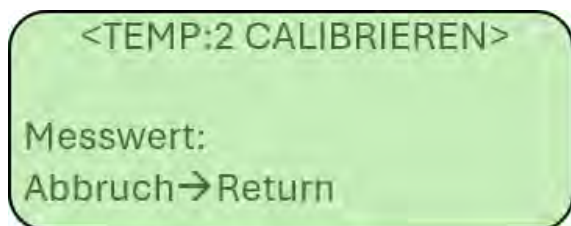
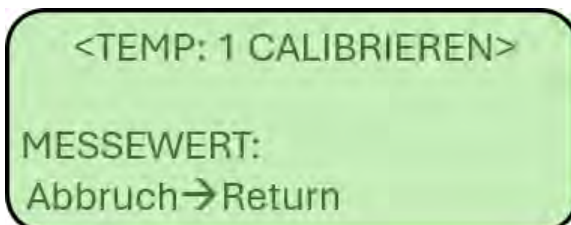


Figure 21: Special functions display 3

Temperature sensor monitoring

The temperature sensor measures the temperature in the heat exchanger. This is continuously monitored for short circuits and open circuits.

In the event of a short circuit or other faults, the heating for the relevant heating circuit switches off. It will not switch back on.

Special functions

The control unit includes a number of special functions that are not required for everyday use.

You can access these by pressing the following key combination whilst the heating unit is switched off

Hold down **Return** (9), **+** (4) and **-** (5) and switch on the main switch at the same time.

F1:

Use the **F1** (4) **key** to switch your heating machine from apricot glaze to cast glaze or fat glaze.

F2:

The **F2 function** takes you to the memory. The parameters required for the function are stored here. Pressing the **F2 key** resets the parameters.

F3 and F4:

The control unit measures temperature via a PT 100 sensor connected to an integrated measurement amplifier. The electronics must be calibrated to ensure optimal temperature measurement (this is carried out at the factory).

6.1.2 Display messages German - English

STOERUNG
HEIZUNGSSYSTEM
UEBERHITZUNG IM
HEIZKESSEL 1

STOERUNG
HEIZUNGSSYSTEM
UEBERHITZUNG IM
HEIZKESSEL 2

Figure 22: Overheating fault display DE

ERROR
HEATING SYSTEM
OVERHEAT
BOILER 1

ERROR
HEATING SYSTEM
OVERHEAT
BOILER 2

Figure 23: Overheating fault display EN

STOERUNG
HEIZUNGSSYSTEM
FUEHLERDEFEKT IM
HEIZKESSEL 1

STOERUNG
HEIZUNGSSYSTEM
FUEHLERDEFEKT IM
HEIZKESSEL 2

Figure 24: Fault display: Sensor fault (German)

ERROR
HEATING SYSTEM
SENSOR
BOILER 1

ERROR
HEATING SYSTEM
SENSOR
BOILER 2

Figure 25: Sensor fault error message EN

<STANDARTWERTE>
DIE STANDARDWERTE
WERDEN ÜBERNOMMEN

Figure 26: Display Default values DE

<DEFAULT VALUES>
DEFAULT VALUES
WILL RESET

Figure 27: Standard values display EN

<SONDERFUNKTIONEN>
F1: APRIK. F2: MEMSTD
F3: CALIB1 F4: CALIB2
Abbruch → Return

Figure 28: Special functions display DE

<SPECIAL FUNKTIONEN>
F1: TEST F2: MEMSTD
F3: CALIB1 F4: CALIB 2
EXIT- → Return

Figure 29: Special functions display EN

<TEMP: 1 CALIBRIEREN>
MESSEWERT:
Abbruch → Return

<TEMP:2 CALIBRIEREN>
Messwert:
Abbruch → Return

Figure 30: Calibrate temperature display DE

<CALIBRATE TEMP.1>
VALUE:
Exit -> Return

<CALIBRATE TEMP.2>
VALUE:
Exit -> Return

Figure 31: Calibrate temperature display EN

6 Control panel of the heating machine

6.2 Control unit rear view



Figure 32: Rear of the control unit

- 1 Mains plug X1
- 2 DIP switch
- 3 Connector X2

6.2.1 Connections and settings

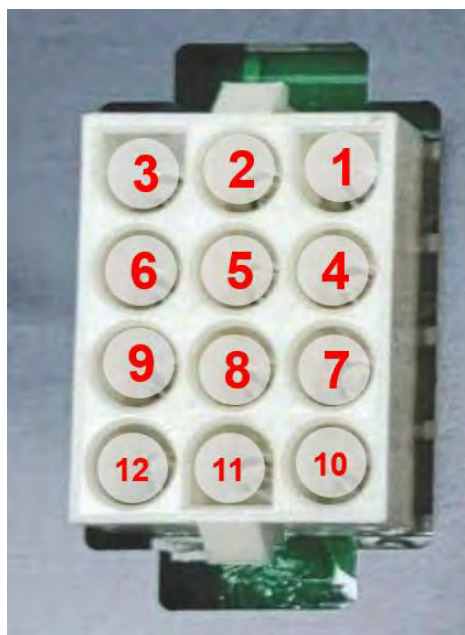


Figure 33: Rear view of connector X1

Connector/mains plug X1

- 1,4,7,10 Mains connection 230 V or 2 x 115 V
 - Depending on the operating voltage, jumpers may be required; see *Section 19.1 Circuit diagram*.
- 9,12 Protective earth
 - A protective conductor must be connected.
- 2 Relay heater 1 (L1)
- 5 Relay output for cleaning valve (L1)
- 8 Relay output for heating 2 (L1)
- 11 Relay output (not assigned)
- 3 Safety thermostat 1

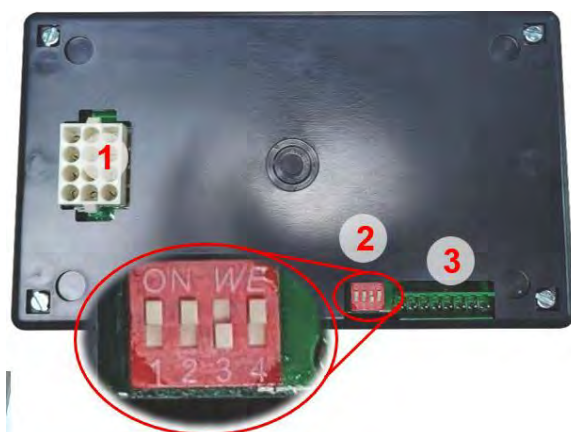


Figure 34: Rear view of DIP switch

DIP switch settings 2

- Switch position: up = on / down = off
- Aprikotur heating circuit
- N** Heating circuit Fondant
- W** German/ English
- E** Water flushing
- At least 1 heating circuit must be switched on, otherwise an error message will appear on the display

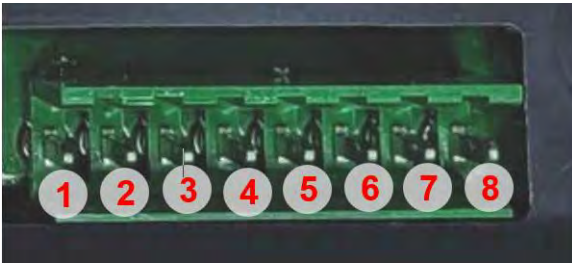


Figure 35: Rear view of connector X2

Connector X2

1,2,3 PT 100 sensor for heating circuit 1 (red, red, white) 4,5,6 PT 100 sensor for heating circuit 2 (red, red, white) 7,8 Earth connection possible

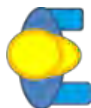
7 Workstations

Descriptive sections of the manual do not contain instructions

This chapter is a descriptive section of the operating instructions. It is intended to aid understanding and does **not** yet contain **any** instructions for use.



Figure 36: Workstations



Workstations during operation

To start the heating machine, the operator must connect the supply connections at the rear and switch on the heating machine at the front, adjusting it if necessary.



Adjustment options

During maintenance and cleaning work, the operator must be able to reach virtually all system components.

8 Safety and protective devices

Descriptive sections of the manual do not contain instructions for use

This chapter is a descriptive section of the operating instructions. It is intended to aid understanding and does **not** yet contain **any** instructions for use.

8.1 Design and technical safety measures

Design measures

Design measures to prevent hazards were already taken into account and incorporated during the design phase.

Technical measures and user information

However, despite the system being designed and built in accordance with the state of the art, residual risks cannot be completely ruled out.

For this reason, in addition to the design measures, technical protective measures have been implemented to further reduce exposure to hazards, and user information has been provided to enable the rapid and improved identification of residual risks.

8.2 Safety functions

Safety function and event	Risk reduction and ✓ response	Classification according to EN ISO 13849-1
SF001 The temperature limiter has tripped	Prevent overheating ✓ The heating is off and cannot be switched on	PL d
SF002 Temperature limiter has not tripped (risk of rupture) The 3.5 bar pressure relief valve on the heat exchanger releases pressure (Schleier Jet HT)	Prevent overpressure in the heat exchanger ✓ If the pressure is too high, the pressure relief valve opens	PL d
SF003 Temperature controller on the tank has not shut off (risk of rupture) The 1 bar pressure relief valve on the tank releases pressure (Thermo-Schleier-Jet HT)	Prevent overpressure in double-walled tank ✓ If the pressure is too high, the pressure relief valve opens	PL d
SF004 Pump pressure too high (risk of rupture) Pressure switch on the rotary lobe pump has tripped	Pressure in the rotary lobe pump is too high ✓ The pump switches off ✓ Frequent tripping reduces the pump load.	PL d

8.3 Main switch




Figure 37: Main switch

Main switches are used to switch on the power supply to the respective control cabinet and to safely disconnect the system component from the power supply.

8.4 Fixed protective barriers

Various protective devices, such as the design, provide protection against access to hazardous areas. These must always be intact, closed and fully fitted to the system.

9 Transport and storage

Transport and storage	
Person in this manual	Haulier/warehouse operator who has received training and instruction and holds a valid driving licence for the vehicles to be used. 
Required training and permitted activities	See <i>section 1.4.1 'Freight forwarder and warehouse operator'</i> in these operating instructions.

Before transport

- ▶ Have all system components taken out of service by suitably trained personnel before you begin transport.
- ▶ Transport all system components separately from one another.
- ▶ Protect all system components against moisture, dirt and dust.

WARNING



Warning of danger to bystanders

During transport, bystanders may be injured through lack of awareness.

- ▶ Deploy additional personnel to provide instructions during loading and transport operations.
- ▶ Cordon off the danger zone to unauthorised persons.

9.1 Transporting the heating unit

WARNING



Warning: risk of heavy parts tipping over or falling

- ▶ Please note the weight specifications for the equipment in the technical data,
- ▶ Use a suitable industrial truck or
- ▶ push it carefully to the location you have chosen.
- ▶ When connecting the unit, observe the connection ratings in *Chapter 3: Technical Data and Connection Ratings*.

Warning: risk of heavy parts falling during internal transport

System components may tip over during transport.

- ▶ Transport must only be carried out by trained specialist personnel.



Figure 38: Lifting the heating machine with a pallet truck or industrial truck

- ▶ Use a suitable industrial truck.
- ▶ Secure the heating machine against any unintended movement – including during internal transport.
- ▶ Avoid subjecting the heating unit to shocks and collisions with other objects.
- ✓ This is the only way to ensure the safe transport of the heating unit

9.2 Transporting combinable modules

WARNING



Warning: risk of heavy parts tipping over or falling

- ▶ Please note the system's weight specifications in the technical data,
- ▶ Transport the system components only when securely lashed down on a transport pallet and
- ▶ use a suitable industrial truck.

Warning: risk of heavy parts falling during internal transport

System components may tip over during transport.

- ▶ Transport must only be carried out by trained specialist personnel.



Figure 39: Lifting conveyor belts using a pallet truck or industrial truck

- ▶ Transport all system components exclusively in a horizontal position and
- ▶ Use a suitable industrial truck.

CAUTION: The system components have an off-centre centre of gravity.

- ▶ Secure all system components against any unintended movement – including during internal transport.
- ▶ Avoid subjecting the system components to shocks and collisions with other objects.
- ✓ This is the only way to ensure the safe transport of the system components.

9.3 Storage location



Always maintain the ambient conditions at the storage location in accordance with *Chapter 3 Technical Data and Connection Values*

Protect all system components by taking appropriate measures before, during and at the end of storage against

- damage,
- water ingress, dirt, dust or other substances,
- significant fluctuations in temperature and humidity,
- frost,
- direct sunlight,
- contact with chemicals and
- Condensation.

The subfloor must have sufficient load-bearing capacity at all times.

10 Setup and Installation

The instructions in this chapter are intended for specially trained personnel	
Person in these instructions	Depending on the task to be carried out: <ul style="list-style-type: none"> ■ Qualified electrician and/or maintenance technician 
Required training and authorised tasks	See <i>section 1.4.2 Installation, repair and maintenance personnel</i> in this operating manual.
Wear personal protective equipment	

WARNING



Inadequately qualified personnel may cause personal injury or property damage The assembly and installation of the heating unit require the expertise of a trained specialist. The heating unit must only be assembled and installed by personnel specially trained for this purpose.

Such knowledge cannot be imparted through these instructions.

- ▶ Have all system components assembled and installed only by trained specialists.
- ▶ Please ensure that any assembly or installation work is carried out by the **manufacturer** themselves or by a **specialist company authorised** by the manufacturer.




Danger from electric current

The system operates at high voltage.

- ▶ **Never** open control cabinets, control units or other electrical equipment unless you are a **qualified electrician**.

10.1 Setting up system components



- ▶ Observe site requirements
 - ▶ Ensure that the ambient and site conditions listed in *Chapter 3* are met.
 - ▶ Install the system components in accordance with the installation plan; refer to *section 2.5 Space requirements* in this operating manual.
 - ▶ Please also note the specific number of optional system components for your heating machines with conveyor system components.
-  **WARNING:** Ensure that the basket conveyor does not tip over.
- ▶ When installing, refer to the relevant documentation for the optional system components. See *section 1.2.2 Relevant documentation and further instructions*.
 - ▶ When connecting, observe the connection values in *Chapter 3 Technical Data and Connection Values*.

10.2 Integrating the heating unit into the conveyor system

Ensure compliance with standards

The interface between the heating machine and the optional conveyor system has been designed by the manufacturer to be intrinsically safe and meets all standardised, safety-related requirements.

If a conveyor system other than the optional conveyor system from the manufacturer Frisch Spritzmatic GmbH is to be used, the interface must be re-evaluated for potential hazards throughout the entire service life of the system.



Figure 40: HZ with conveyor system

Integrating the heating machine into the conveyor system

- a) Slide the HZ into the designated position beneath the conveyor system.
- b) Secure all roller brakes on the positioned modules.
Please refer to the pneumatic circuit diagram in *section 1.2.2, 'Applicable documents and further instructions'*.

10.3 Connect the power supply

⚠ WARNING



Prevent electric shocks

The system operates at life-threatening voltages.

- ▶ Only work on electrical equipment if you are a qualified electrician.

Risk of electric shock from faulty cables or plugs

- ▶ Check cables and plugs for damage.
- ▶ Use only undamaged cables and plugs.



Figure 41: Connecting the power supply

The power supply connections for the individual modules are located on the rear of the control cabinet.



CAUTION: Tripping hazard

- ▶ Lay the electrical connection cable in such a way that it is protected from mechanical damage and always kept out of the way of foot traffic.
 - ▶ Plug the CEE plug, which is connected to the cable leading out of the conveyor system, into the designated 400 V, 16 A socket.
- Please note the power consumption specified in *Chapter 3, Technical Data and Connection Values*.

10.4 Establish the water supply

CAUTION

To prevent malfunctions of the solenoid valve,

- ▶ a drinking water filter and a shut-off valve for the drinking water supply must be installed on site

RISK OF FLOODING!!!

For heating units with automatic water flushing, a ball valve must be installed between the heating unit and the main connection. The flush valve is open when de-energised, meaning that water flows continuously when the heating unit is switched off. The absence of a stop valve can lead to unwanted water flow.



Figure 42: WIS water supply

Connecting the water supply to the heating unit

The connections are located at the rear of the heating unit.

Please refer to the *media connection diagram* in accordance with *point*

1.2.2 *Relevant documents and further instructions.*


⚠ CAUTION: Risk of tripping

- ▶ Use a pressure vessel for this purpose or
- ▶ Lay the water pipe so that it is protected from mechanical damage and always away from walkways.

⚠ CAUTION

For Thermo-Schleier-Jet units used for processing fat glaze, the water supply must only be connected to the "CLEANING INLET"!

11 Integrating HZ into the conveyor system

The instructions in this chapter are intended for the operator	
Person in this manual	Operator / operator who has received training and instruction 
Required training and authorised activities	See <i>section 1.4.3 'Operator'</i> in this operating manual.

11.1 Preparing apricot purée/fondant

11.1.1 Manufacturer's recipe suggestions



Tip

The quality of the end product depends largely on the raw materials used. The information provided here is intended as guidance. All products used previously may continue to be used.

Aprikotur: 12.5 kg apricot jam (35% fruit content) approx.
1.8 litres water

Fondant: 15 kg block fondant
Approx. 1.2 litres of water
Approx. 0.2 kg glucose

15 kg Frankenfondant, spreadable
Approx. 0.3 litres of water
Approx. 0.2 kg glucose

Integrate 11 Hz into the conveyor system

11.2 Prepare the heating machines

- ▶ The medium must be prepared in accordance with the manufacturer's specifications and the components of the conveyor system (WIS), poured into the tanks of the heating machine and then processed further in accordance with the recipes.

CAUTION

Avoid contamination/clumping

During commissioning and after cleaning, the residual liquid must be flushed out of the pump. Proceed as follows:

- ▶ Fill the tank of the heating machine with the medium to be processed.
- ▶ Connect the material hose to the outlet of the pump and hold the other end into a bucket.
- ▶ Start the pump.
- ▶ Pump until the clean medium flows into the bucket.
- ▶ Stop the pump:
- ▶ Connect the material hose to the Hz and start the pump.
- ✓ The medium is now being circulated within the heating machine

To prevent lumps in the fat glaze

- ▶ Pour 3–4 litres of cooking oil into the tub.
- ▶ Connect the material hose to the outlet of the pump and hold the other end into a bucket.
- ▶ Start the pump.
- ▶ Pump until the oil flows into the bucket.
- ▶ Switch off the pump and
- ▶ pour the fat glaze into the material tank and seal it with the lid.
- ✓ Once the heater is switched on, the fat glaze will begin to melt. **The pump MUST remain switched off!!**

Once the fat glaze has reached the desired temperature,

- ▶ Hold the end of the material hose in the bucket and
- ▶ Start the pump.
- ▶ Pump until the clean fat glaze flows into the bucket.
- ▶ Stop the pump.
- ▶ Connect the material hose to the heating unit and start the pump.
- ✓ The medium is now being circulated in the heating machine

- Work on the **heating units** of the conveyor system



Figure 43: Heating machine position



Figure 44: Connection hoses

Connection hoses supplied

- 1 Drain hose
- 2 Inlet hose for oil tank
- 3 Inlet hose for heating units



Figure 45: Oil pressure tank

Oil pressure vessel for flushing with oil, with inlet hose (2)

Integrate 11 Hz into the conveyor system

11.2.1 Flush the pump with grease

CAUTION

Avoid clumping

For heating machines with grease glaze, it is recommended to flush the pump with cooking oil to ensure that there is no contact with water.

- ▶ To do this, connect a pressure vessel filled with oil instead of the water hose and carry out the pump flushing as described below.



Figure 46: Flushing a heating machine with grease glaze

Flushing the pump

- a) Connect the oil-filled pressure vessel (2) to the “**Cleaning Inlet**” at the rear of the heating machine.
 - b) Connect the waste water hose (1) to the rear of the heating machine at “**Cleaning Outlet**”
- ▶ Flush the pump with cooking oil for 1 minute when starting work.
 - ✓ Oil flows between the pump seals and drains out via the waste water hose.
 - ▶ First disconnect the drain hose and then the inlet hose (1+2) from the HZ.
This maintains the pressure inside the pump.

11.2.2 Flushing the pump without a conductivity sensor



Figure 47: Flushing the HZ without a conductivity sensor

Flushing the pump

- a) Connect the water inlet hose (3) to the rear of the HZ at “**Injection**”.
 - b) Connect the drain hose (1) to the rear of the heating machine at “**Cleaning Outlet**”
- ▶ Flush the pump for 1 minute at the start and end of the operation.
 - ✓ Water flows between the pump seals and drains out via the drain hose.
 - c) Disconnect the drain hose (1) from the heating unit.

11.2.3 Flushing the pump with a conductivity sensor

CAUTION

Switch off the injection when pumping the medium backwards!

If this is not observed, water will enter the medium



sensor

Flush the pump

- a) Connect the **inlet hose (blue) (3)** to the rear of the heater at the "Injection" point.
 - b) Connect the transparent drain hose (1) to the rear of the heating unit at "**Cleaning Outlet**"
- ✓ The pump is flushed
 - ✓ Water flows continuously into the pump and out again via the drain hose.
 - ▶ Switch on the main switch of the heating unit.
 - ✓ The solenoid valve in the machine closes.
 - ✓ The machine stops flushing.

11.3 Switch on the heating machine without the conductivity sensor and preheat



Tip

Heating phase for 120 kg of fondant in the Thermo Schleier Jet: approx. 45 minutes (45°C water bath temperature)

Heating phase for 120 kg of moulding in the Thermo Schleier Jet HT: approx. 45 minutes (water bath temperature 95°C)

Heating phase for 120 kg of apricot paste in the Schleier Jet HT: approx. 10 minutes (water bath temperature 95°C) Heating phase for 120 kg of fondant in a heating machine with a conductivity sensor: approx. 45 minutes

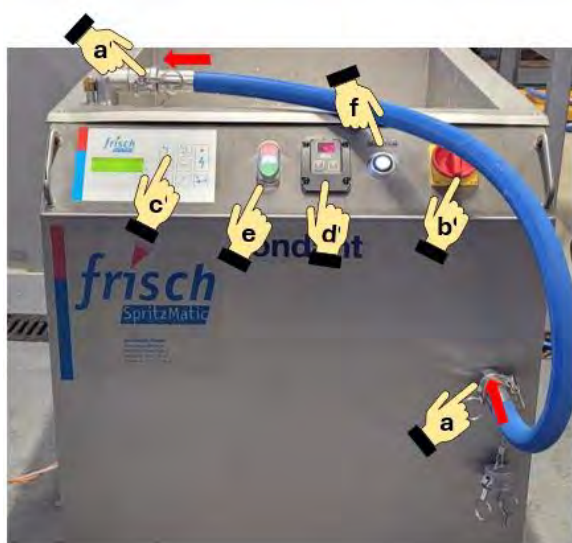


Figure 49: Switching on the heating machine without the conductivity sensor

Switch on the heating machine

- a) Connect the material hose to the inlet and outlet of the heating machine
 - b) Switch on the main switch
 - ▶ Flush the pump as described in Chapter 11.2.2 Flushing the pump without a conductivity sensor
 - c) Switch on the heating via the “Display”
 - (1) For the heating unit for apricot paste
 - (2) For the heating unit for fondant
 - d) Set the pump speed on the SEW controller to a value between 10 and 15.
 - e) Switch on the pump by pressing the **green** button.
 - ✓ The pump starts to run
 - ✓ The pump slowly circulates the fluid.
- Once the temperature has been reached,**
- f) switch on the injection
 - ✓ The injection indicator light turns **yellow**.
 - ✓ During injection, this button flashes white.

Warning:

Water injection must NOT be switched on for kilns with a grease glaze!!!

CAUTION

Automatic activation of water injection

If the machine is switched off via the main switch whilst water injection is active, the last operating mode set is saved.

When the main switch is switched on again, water injection is automatically reactivated.

11.4 Switch on and programme the heating machine with the conductivity sensor (during initial commissioning)

- ▶ Prepare a **bucket** of the base mixture for the medium using your own recipe
e.g. mix a bucket of apricot jam with 1,800 ml of water, and
- ▶ pour this into the heating machine.



Figure 50: Programming the HZ with LWS

Switch on the heating machine

- ▶ Open the tap.
- ✓ The pump is flushed automatically
- a) Connect the material hose to the inlet and outlet of the heating machine
- b) Switch on the main switch
- ✓ The pump flushing stops
- c) Switch on the heating on the 'display'
- (1) for the heating unit for Aprikotur
- (2) For the fondant heating unit

Remove any residual water from the pump. To do this, proceed as follows. Please observe the warnings in section 11.2 Preparing the heating machine

- ▶ Disconnect the material hose from the tank inlet and hold it over a bucket.
- ▶ Switch on the pump by pressing the **green** button on the combination switch.
- ▶ Pump until clean medium flows into the bucket.
- ▶ Switch off the pump by pressing the **red** button on the combination switch.
- ▶ Reconnect the material hose to the tank inlet
- d) Set the pump speed on the SEW controller to a value between 10 and 15.
- e) Switch the pump on by pressing the **green** button on the combination switch.
- ✓ The pump starts to run and circulates the fluid.

Integrate 11 Hz into the conveyor system

- ✓ Once the set temperature has been reached (approx. 15 minutes)



Figure 51: Programming HZ with LWS 2

- f) Set the viscosity control to the desired level (3 settings available).
- g) Press and hold the illuminated injection button for **10 seconds**.
 - ✓ The illuminated injection button flashes rapidly.
 - ✓ The setting has been accepted.
 - ✓ The injection light button lights up **yellow** continuously.
- ▶ Now add the remaining raw material.
 - ✓ The heating machine automatically mixes the required liquid.
 - Example: After adding 5 buckets of fondant, the medium takes 45 minutes to reach the set target value and temperature.
- ✓ Once the medium has reached the setpoint, the injection light button flashes **green 3 times** every 60 seconds.

11.4.1 Switch on the heating machine with conductivity sensor and preheat (daily)



Figure 52: Switching on the heating machine with LWS

Switch on the heater

- a) Switch on the main switch.
 - ✓ The pump flush will switch off.
- b) Switch on the relevant heating element on the 'display': Apricot/1 Fondant/2
- c) Set a value between 10 and 15 on the SEW controller.
- d) Switch on the pump by pressing the **green** button on the combination switch.
- e) Set the viscosity control to the desired level.
- f) Switch on the injection.
 - ✓ The indicator light remains lit **in yellow**.

- ▶ Preheat the heating unit to the temperature you have set. Please note the preheating time.

Once the set target value has been reached,

- ✓ The LED indicator flashes **green** three times every 60 seconds.

ATTENTION

Automatic activation of water injection

If the machine is switched off at the main switch whilst water injection is active, the last operating mode set is saved.

When the main switch is switched on again, water injection is automatically reactivated.

11.5 Connect HZ to conveyor system



Observe the relevant documentation

The **conveyor system** manual is included in the relevant documentation. See *section 1.2.2 Relevant documentation and further manuals*.

These operating instructions do not contain any redundant descriptions or instructions.

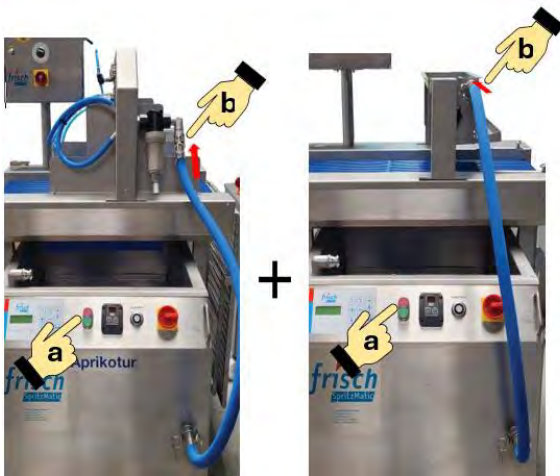


Figure 53: Connecting the HZ to the conveyor system

Connect the heating unit to the apricot-peeling bridge, steaming box or interchangeable equipment

a) Switch off the pump by pressing the **red** button. Follow the specified sequence; this can also be found in the media connection diagram under *section 1.2.2, 'Relevant documents and further instructions'*.

- ✓ Pump is switched off
- b) Disconnect the material hose from the Kamlok coupling on the HZ and connect it to the misting box, apricot bridge or the interchangeable equipment.

▶ Switch on the pumps and start the glazing process as described in the *relevant documentation for the conveyor system*.


▶ Press one of the two buttons on the setpoint controller to set the appropriate pump speed.

The set value depends on the medium to be processed. The more liquid the medium, the higher the set value.



Figure 54: Controlling pump speed

12 Start finishing

The instructions in this chapter are intended for the operator	
Person in this manual	Operator / operator who has received training and instruction 
Required training and permitted activities	See <i>section 1.4.3 'Operator'</i> in this operating manual.




Observe applicable documents

The **conveyor system** manual is included in the relevant documentation. See *section 1.2.2 Relevant documentation and further manuals*.

These operating instructions do not contain any redundant descriptions or instructions.

- ▶ Connect the conveyor system to the power supply.
- ▶ To do this, follow the original operating instructions for the conveyor system.
Also refer to the *media connection diagram* in *section 1.2.2, 'Applicable documents and further instructions'*.
- ▶ Start the finishing process.

13 Disconnect/switch off the heating unit from the conveyor system

The instructions in this chapter are intended for the operator	
Person in this manual	Operator / operator who has received training and instruction 
Required training and authorised activities	See section 1.4.3 'Operator' in these operating instructions.



If the heating unit is to be taken out of service for an extended period:

- ▶ Make sure that the heating unit is completely drained.
- ▶ Then clean the heating unit as described in section 15.3

- ▶ Work on the heating machine.

13.1 Rinse heating machines with grease glaze and disconnect from the conveyor system

CAUTION

Avoid clumping

For heating machines with grease glaze, it is recommended to flush the pump with oil to prevent contact with water.

- ▶ To do this, connect a pressure vessel filled with oil instead of the water hose and carry out the pump flushing as described below.



Figure 55: Pump capacity

- ▶ Set the pump speed to a negative value.
- ✓ The medium is pumped from the decoration station, misting box or interchangeable equipment back into the Hz.
- ▶ Pump until air is discharged into the tank.
- ✓ There is no more fat glaze left in the decoration station and pump.

13 Disconnect/switch off the heating unit from the conveyor system



Figure 56: Close the material outlet

Remove the material hose

- a) Switch off the rotary lobe pump
 - b) Disconnect the material hose from the decoration station.
 - c) Disconnect the material hose from the Hz and
 - d) seal the outlet of the Hz with the supplied blind plug.
- ▶ Clean the material hose and leave it to dry.

- ▶ Flush the heating unit as described in *Section 11.2.1 Flushing the pump with fat glaze.*
- ▶ Seal the tank with the lid supplied.
- ▶ DO NOT switch off the heating machine!

13.2 Disconnect the heating unit (without the conductivity sensor) from the conveyor system and flush it



Figure 57: Disconnecting the material hose 1

Disconnect the material hose from the conveyor system

- a) Switch off the rotary lobe pump
- b) Disconnect the material hose from the apricot bridge or the veil box.
- c) Connect the material hose to the heating unit.

- ▶ Flush the heating machine as described in *Section 11.2.2 Flushing the pump without a conductivity sensor.*
- ▶ Seal the tank with the lid supplied.
- ▶ Close the water tap on the water supply for safety.
- ▶ Switch off the heating machine!

13.3 Disconnect the heating unit with the conductivity sensor from the conveyor system and flush it



Figure 58: Disconnecting the material hose 2

Disconnect the material hose from the conveyor system

- a) Switch off the rotary lobe pump
- b) Disconnect the the material hose from the apricot bridge or the veil box.
- c) Connect the material hose to the Hz.

- ▶ Flush the heating machine as described in *Section 11.2.3 Flushing the pump with conductivity sensor.*
- ▶ Seal the tank with the lid supplied.
- ▶ Switch off the heating machine!



On heating units with a conductivity sensor, the solenoid valve opens automatically when the main switch is turned off.

- ▶ After switching off the machine, close the tap on the water supply pipe or disconnect the water supply pipe.

13.4 Switch off the heating machine and secure it against being switched on again



If the heating machine is to be taken out of service for an extended period:

- ▶ Ensure that the heating machine has already been completely drained.
See *section 15.3. Cleaning.*



Figure 59: Switch off the main switch on the control panel


Disconnect the power supply



- ▶ Switch off the main switch on the control panel.
- ✓ The power supply is now disconnected.

Secure against accidental restart

- ▶ Secure the main switch against being switched on again using a padlock.
- ✓ The system is safely shut down.

14 Error and fault messages – taking action

The instructions in this chapter are intended for the operator	
Person in this manual	Operator / operator who has received training and instruction 
Required training and permitted activities	See section 1.4.3 'Operator' in this operating manual.

Some instructions in this chapter are intended for the qualified technician	
<p>This chapter describes various tasks that require specialist knowledge which cannot be conveyed in this manual.</p> <ul style="list-style-type: none"> ▶ Consult a qualified professional trained in the relevant task if the instructions require you to do so. ▶ Never attempt to carry out these tasks yourself if you lack the necessary expertise and training. ▶ Ensure that any specialist personnel you call in have read and understood these instructions before attempting to rectify faults. 	
People in these instructions	Depending on the task to be carried out: <ul style="list-style-type: none"> ■ Qualified electrician and/or plumber  
Required training and authorised tasks	See section 1.4.2 <i>Installation, repair and maintenance personnel</i> in this operating manual.

Read and understand all sub-sections of this chapter


Often, a fault is detected simply because of a malfunction,
 e.g. a rotary lobe pump is no longer delivering any material.


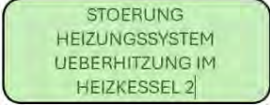

In addition to emergency stop situations, a wide range of causes can lead to error messages.


The following instructions may be **required** for **various** measures and troubleshooting procedures.

- ▶ Read this chapter and its sub-sections in full before you begin to take any action.
- ▶ Never attempt to carry out these tasks yourself if you lack the necessary expertise and training.
- ▶ Never open any parts of the electrical equipment unless you are a qualified electrician.

14.1 Understanding faults, causes and possible remedies

Fault/error	Possible cause	Action
Pump is not running	<ul style="list-style-type: none"> ■ No power 	<ul style="list-style-type: none"> ▶ Check the power supply and, if necessary, contact a qualified electrician
	<ul style="list-style-type: none"> ■ Heating is set too low 	<ul style="list-style-type: none"> ▶ Increase the temperature and, if necessary, contact the customer service department at Frisch Spritzmatic GmbH; see <i>Chapter 17 Emergency Service, Customer Service</i>
	<ul style="list-style-type: none"> ■ Error message on the frequency converter 	<ul style="list-style-type: none"> ▶ You can find information at https://download.sew-euro-drive.com/download/html/31960413/de-DE/14374155.html or contact the customer service department at Frisch Spritzmatic GmbH (see <i>Chapter 17: Emergency Service, Customer Service</i>).
Pressure switch has tripped, pump is not pumping	<ul style="list-style-type: none"> ■ Pump is building up too much pressure 	<ul style="list-style-type: none"> ▶ Reduce the pump speed and, if necessary, contact the customer service department at Frisch Spritzmatic GmbH (see <i>Chapter 17: Emergency Service, Customer Service</i>)
Fluid is not getting hot enough	<ul style="list-style-type: none"> ■ Not enough water in the heat exchanger 	<ul style="list-style-type: none"> ▶ Fill the heat exchanger as described in <i>Chapter 15.4.2 Filling the heat exchanger</i> or contact the customer service department at Frisch Spritzmatic GmbH; see <i>Chapter 17 Emergency Service, Customer Service</i>.
If the injection indicator light Button (HZ with conductivity sensor)	<ul style="list-style-type: none"> ■ The medium is too fluid. ■ The solenoid valve is not closing 	<ul style="list-style-type: none"> ▶ Notify maintenance. They can clean the solenoid valve or contact the customer service department at Frisch Spritzmatic GmbH; see <i>Chapter 17 Emergency Service, Customer Service</i>. <div style="text-align: center;">  </div> <p style="text-align: center;"><i>Figure 60: Solenoid valve</i></p>
Water constantly leaking from the cleaning outlet	<ul style="list-style-type: none"> ■ Solenoid valve is dirty 	<ul style="list-style-type: none"> ▶ Notify maintenance. They can clean the solenoid valve or contact the customer service department at Frisch Spritzmatic GmbH; see <i>Chapter 17 Emergency Service, Customer Service</i>.

Fault/Error	Possible cause	Action
<p>Water is leaking from the rotary lobe pump during the flushing process</p>	<ul style="list-style-type: none"> Rotary piston pump is defective The pump must no longer be flushed 	<ul style="list-style-type: none"> From 2024 onwards: Close the safety ball valve on the injection line in the control unit and contact the customer service department at Frisch Spritzmatic GmbH; see <i>Chapter 17: Emergency Service, Customer Service.</i>  <p><i>Figure 61: Safety ball valve</i></p> <ul style="list-style-type: none"> Hz prior to 24: Disconnect the water connection and contact the customer service department at Frisch Spritzmatic GmbH; see <i>Chapter 17: Emergency Service, Customer Service.</i>
<p>Display</p>  <p><i>Figure 62: Fault message or Boiler 1</i></p>	<ul style="list-style-type: none"> Temperature limiter has tripped 	<ul style="list-style-type: none"> Push the green pin of the limiter back in  <p><i>Figure 63: Temperature limiter</i></p>
<p>Error messages on the frequency converter</p>	<ul style="list-style-type: none"> Error message on the frequency converter 	

Note: LED indicator from model year 2026 onwards		
LED colour	Possible causes	Description and actions
LED flashes red slowly	<ul style="list-style-type: none"> ■ No conductivity value set. 	<ul style="list-style-type: none"> ▶ To do this, follow the instructions in section 11.4 'Switching on and programming the heating unit with a conductivity sensor' or contact the customer service department at Frisch Spritzmatic GmbH (see <i>section 17 'Emergency service, customer service'</i>).
LED flashes red slowly	<ul style="list-style-type: none"> ■ The alarm range has been exceeded ■ The medium is too fluid 	<ul style="list-style-type: none"> ▶ Inform the maintenance department. They can clean the solenoid valve, or contact the customer service department at Frisch Spritzmatic GmbH (see <i>Chapter 17: Emergency Service, Customer Service</i>).
LED flashes red rapidly	<ul style="list-style-type: none"> ■ Conductivity sensor defective 	<ul style="list-style-type: none"> ▶ Inform maintenance or contact the customer service department at Frisch Spritzmatic GmbH; see <i>Chapter 17 Emergency Service, Customer Service</i>.
LED is lit continuously in red	<ul style="list-style-type: none"> ■ Water pressure sensor has triggered 	<ul style="list-style-type: none"> ▶ Check the water supply <div style="text-align: center; margin: 10px 0;">  </div> <p style="text-align: center; font-size: small; margin: 5px 0;"><i>Figure 64: Water pressure sensor</i></p> <ul style="list-style-type: none"> ▶ Notify maintenance or contact the customer service department at Frisch Spritzmatic GmbH; see <i>Chapter 17 Emergency Service, Customer Service</i>.

15 Cleaning, Servicing and Maintenance

The instructions in this chapter are intended for the following people		
Person in this manual	Operators who have received training and instruction	
Required training and authorised activities	See <i>section 1.4.3 'Operator'</i> in this operating manual.	
Person in this manual	Depending on the task to be performed: <ul style="list-style-type: none"> ■ Qualified electrician and/or maintenance technician 	
Required training and authorised activities	See <i>section 1.4.2 Installation, repair and maintenance personnel</i> in this operating manual.	
Wear personal protective equipment		

WARNING



Personnel who are not sufficiently qualified may cause personal injury or property damage through incorrect operation

The specialist trained for the respective task must, on the basis of their training and work experience, be demonstrably capable of recognising the hazards and risks that arise or may arise from the respective task.

- ▶ Only carry out maintenance or repairs on system components if you are a qualified technician trained for the task in question.



Prevent contact with live parts

The system's control cabinets and electrical equipment operate at life-threateningly high voltages.

- ▶ Never open control cabinets and/or electrical equipment on the system for cleaning purposes unless you are a qualified electrician.

CAUTION

Protect materials

- ▶ **Never** use **corrosive** cleaning agents.
- ▶ Never spray electrical equipment or components with a water jet.
- ✓ This prevents short circuits and protects sensitive parts from damage.

15.1 Prepare the necessary conditions



Switch off the heating unit and secure it against being switched on again

Cleaning, maintenance and servicing work must be carried out when the system has been safely shut down.

- ▶ Make sure that the heating unit is switched off and secured to prevent it from being switched on again.

15.2 Intervals

Cleaning, servicing and maintenance intervals are safety-critical

Carrying out the cleaning, servicing and maintenance tasks specified in this operating manual ensures safety in your workplace.

- ▶ Always carry out the tasks specified in this operating manual within the intervals stated below.
- ✓ This will prevent dangerous situations arising during use of the heating machine which could result from failure to observe the care, cleaning and inspection intervals.



Observe applicable documentation

These system-wide operating instructions contain only a summary of the necessary cleaning, maintenance and servicing intervals for the heating machine.

However, further instructions on cleaning, maintenance and servicing activities are also provided in the applicable original operating manuals for the conveyor system.

These are not listed redundantly in this operating manual.

- ▶ Carry out the cleaning, maintenance and servicing activities strictly in accordance with the instructions in this operating manual **and** the applicable original operating manuals.



See section 1.2.2, 'Applicable documents and further instructions'.

The following list of intervals also provides information on the relevant sections from which you can obtain the operating instructions.

If, during the cleaning, maintenance and servicing work described below, you discover a fault in any system component:

- ▶ Always consult a suitably qualified specialist for any necessary repair or maintenance work.
- ▶ Have any defect repaired immediately.
- ▶ Only operate the heating unit if you can confirm that all parts are in good condition and functioning correctly.

15 Cleaning, Servicing and Maintenance

Minimum requirements for regular inspection and maintenance	🛠 Intervals:				
	As required				
	Before and after each use				
	2–3 times a week				
	Every 2 years or every 3,000 operating hours				
Every 4 years or 6,000 operating hours					
Relevant documents and further instructions:					
 Operator					
Flush the pump	X	X			<i>in accordance with Section 11.2</i>
Deep clean of the living room			X		<i>In accordance with Chapter 15.3</i>
Clean combinable modules	X	X			<i>in accordance with the relevant original operating instructions</i>
 qualified technician					
Oil change				X	<i>in accordance with section 15.4.1</i>
Top up heat exchanger				X	<i>in accordance with Section 15.4.2</i>
Replace the pressure relief valve				X	<i>in accordance with section 15.4.3</i>

15.3 Cleaning



Observe the accompanying documents

The **belt conveyor** instructions are included in the relevant documentation. See *section 1.2.2 Relevant documentation and further instructions*.



Tip

To ensure consistent hygiene and functionality, it is recommended that the heating units are cleaned regularly.

Cleaning should be carried out every two days.

If there are several heating units, it is advisable to clean them in turn so as not to interrupt the production process.

Emptying the heating machine



For heating machines with fat glaze:

Pump the fat glaze out of the decorating station as described in *section 13.1*.

- ▶ Switch off the pump.
- ▶ Disconnect the material hose from the glazing or decorating station and place this end into a bucket or a drain.
- ▶ Switch on the pump.
- ✓ The pump will pump the medium out of the tank.
- ▶ Switch off the pump if air comes out of the material hose.
- ▶ Switch off the pump.
- ▶ Connect the material hose to the pump.
- ▶ Fill the tank with plenty of warm water and start the pump.
- ▶ Clean the tank and the outside of the heat exchanger using a suitable low-pressure cleaning system
- ▶ Use a suitable cleaner to remove the scale build-up in the heat exchanger





CAUTION: Never use corrosive cleaning agents.

We recommend P & R cleaning agent. This is available from Frisch Spritzmatic.

- ▶ Switch off the pump and allow the cleaning agent to work for approx. 5 minutes.
- ▶ Repeat this process about three times.
- ▶ Switch off the pump and disconnect the material hose from the top of the HZ.
- ▶ Hold the material hose into a drain and Pump the cleaning agent out of the tank as described in this chapter.
- ▶ Rinse the tank and pump with plenty of fresh water to ensure that no cleaning agent residue remains in the heating unit.
- ▶ *Prepare the heating unit as described in Chapter 11.2, 'Preparing the heating unit'.*

15.4 Maintaining the heating unit

The instructions in this chapter are intended for specially trained personnel	
<p>This chapter involves various tasks that require specialist knowledge which cannot be covered in this manual.</p> <ul style="list-style-type: none"> ▶ Consult a qualified professional trained in the relevant task if the manual instructs you to do so. ▶ Never attempt to carry out these tasks yourself if you lack the necessary expertise and training. ▶ Ensure that any specialist personnel you call in have read and understood these instructions before attempting to rectify faults. 	
<p>People in these instructions</p>	<p>Depending on the task to be carried out:</p> <ul style="list-style-type: none"> ■ Qualified electrician and/or plumber <div style="text-align: right;">   </div>
<p>Required training and authorised tasks</p>	<p>See section 1.4.2 'Installation, repair and maintenance personnel' in this operating manual.</p>

15.4.1 Carrying out an oil change

- ▶ When working on the rotary lobe pump

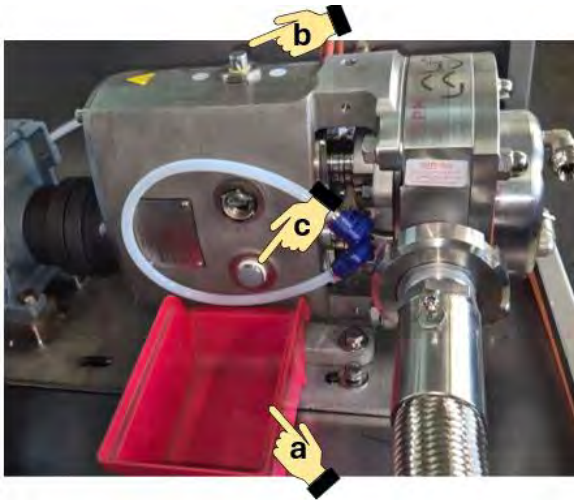


Figure 65: Special functions display EN

Draining the oil

- Place an oil collection container under the oil drain plug (c).
 - Open the oil filler plug
 - Open the oil drain plug
- ✓ The used oil will drain out. Once all the oil has drained out,
- ▶ Seal the oil drain plug with Teflon tape and screw it back into the pump housing.

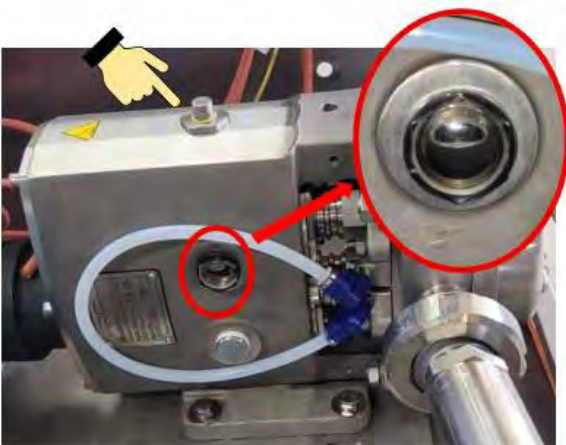


Figure 66: Oil sight glass

Top up the oil

- ▶ Pour approx. 0.5 litres of CLP HC 150 industrial gear oil into the oil filler opening (Schleier-ÖL)
- ⚠ Make sure that the sight glass is filled to a maximum of 2/3!**
- ▶ Tighten the oil filler plug.

15.4.2 Filling the heat exchanger

CAUTION

Risk of rupture due to incorrect connection!

Never connect compressed air to the filling connection of the water circuit. This can lead to ruptures and serious damage to the material tank.

15.4.2.1 Fill the heat exchanger Thermo-Schleier-Jet

- a) Remove the pressure relief valve.



Figure 67: Safety valve connection point

Filling with water

- b) Connect the water pipe and fill the water system **until water emerges from the outlet of the pressure relief valve.**
- c) Remove the water pipe
- d) Heat the heating unit to the maximum temperature of 60°C as described in *Chapter 0*.
- ✓ The heater warms up
 - ✓ Excess water flows out of the outlet of the pressure relief valve.
- e) Leave the heater switched on for 10 minutes.
- f) Switch off the heater.



Figure 68: Filling connection

- g) Seal the pressure relief valve thread with Teflon tape and
- h) screw it back into the thread.



Figure 69: Pressure relief valve

15.4.2.2 Filling the heat exchanger Thermo-Schleier-Jet HT



Figure 70: Safety valve

- a) Remove the pressure relief valve.



Figure 71: Filling connection

Filling with water

- b) Connect the water pipe and fill the water system until you can feel the water at the mark with your hand.
- c) Remove the water pipe
- d) Heat the heating unit to the maximum temperature of 99°C as described in *Chapter 0*.
- ✓ The heater becomes warm
 - ✓ No water must escape from the outlet of the pressure relief valve.
- e) Leave the heater switched on for 10 minutes.
- f) Switch off the heater.
- g) Seal the pressure relief valve thread with Teflon tape and
- h) screw it back into the thread.



Figure 72: Safety valve

15.4.2.3 Filling the heat exchanger Schleier Jet HT



Figure 73: Heat exchanger safety valve



- ▶ Remove the pressure relief valve.
- ▶ Fill the heat exchanger with water.
- ▶ Seal the thread of the pressure relief valve with Teflon tape and
- ▶ Screw it back into the thread.

- ▶ Heat the heat exchanger to maximum temperature so that the excess water can escape.
- 💡 Wrap a cloth around the pressure relief valve to prevent burns.
- ▶ Allow the boiler to heat up to maximum temperature for approx. 2 hours with the doors open.

15.4.3 Replacing the pressure relief valve

- ▶ To do this, proceed as described in *Section 15.4.2.1 Filling the heat exchanger*.
- ▶ Fit a new pressure relief valve.

16 Dismantling and disposal

The instructions in this chapter are intended for specially trained personnel	
Person in these instructions	Depending on the task to be carried out: <ul style="list-style-type: none"> ■ Qualified electrician and/or plumber 
Required training and authorised tasks	See <i>section 1.4.2 'Installation, repair and maintenance personnel'</i> in this operating manual.
Wear personal protective equipment	

WARNING



Danger from electric current

The system operates at high voltage.

- ▶ **Never** open the control cabinet, the control unit or other electrical equipment unless you are a **qualified electrician**.

Meet the requirements



Dismantling must be carried out when the system has been safely shut down.

- ▶ Switch off the heating unit and secure the switched-off main switch against being switched on again.
To do this, follow the instructions in *Section 13.4 Switching off the heating unit and securing it against being switched on again*.
- ▶ Disconnect
 - all supply connections to the system,
 - the compatible modules from one another
 To do this, follow the instructions in *Chapter 13* of this operating manual.

WARNING



Inadequately qualified personnel may cause personal injury or damage to property.

Dismantling work requires the expertise of a trained specialist and must only be carried out by personnel specially trained for this purpose.
Such knowledge cannot be imparted by these instructions.

Disposal



Be aware of the rules and regulations regarding disposal

- ▶ Once the materials have been separated, send the components for recycling.
- ▶ Have the components separated for recycling
 - steel,
 - non-ferrous metals,
 - plastics and
 - electrical waste.
- ▶ Ensure that industry-specific and local regulations are followed when disposing of the various materials.
- ▶ When handling oils and greases,
 - the safety data sheets applicable to the product, as well as
 - environmental protection regulations.



Logo:
Recycling

Dispose of individual parts safely

- ▶ Have the materials disposed of in accordance with local regulations or
- ▶ return the components to the manufacturer.
- ▶ Never dispose of electrical or electronic components in household waste.

17 Emergency service, customer service

To resolve technical issues and faults with the heating machine, please contact the service team at Frisch Spritzmatic GmbH.

Frisch Spritzmatic GmbH
Rammingen Straße 4
D- 89129 Öllingen

Tel: +49 (0)7345 20095 0

Web: www.frisch-spritzmatic.de

Email: info@frisch-spritzmatic.de

18 EC Declaration of Conformity

within the meaning of the **EC Machinery Directive 2006/42/EC, Annex II 1 A**, OJ L 157/24 of 09.06.2006

We, the manufacturer, hereby declare, under our sole responsibility, that the equipment specified below, in its design and construction as well as in the version placed on the market by us, complies with the provisions and requirements of the above-mentioned Directive and thus with the relevant Union harmonisation legislation.

We further declare that the equipment listed below complies with the safety objectives of the EU

Directive

Electrical Equipment "Low Voltage" 2014/35/EU, Annex I OJ L 96/357 of 29 March 2014, as well as compliance with the essential requirements of the EU Directive

Electromagnetic Compatibility 'EMC' 2014/30/EU, Annex I, OJ L 96/79 of 29 March 2014.

We further declare that the pressure equipment optionally incorporated into the product complies with the requirements of the **EU Pressure Equipment Directive 2014/68/EU** OJ L 189/164 of 27 June 2014

All parts of the machine that come into contact with **food** also comply with the requirements of the EU regulations on **food contact materials** and **plastics**

REGULATION (EC) No 1935/2004, OJ L 338/4, 13 November 2004,

REGULATION (EU) No 10/2011, OJ L 12/1 of 15 January 2011

and their amending regulations, as well as on good manufacturing practice for food contact materials and articles

REGULATION (EC) No 2023/2006, OJ L 384, p. 75, 29 December 2006

Equipment designation

Thermo Schleier Jet 1500 a
Thermo Schleier Jet HT 1501 b
Schleier Jet HT 1501 a

Identification

Type plate on the control cabinet

Year of manufacture

2025

Manufacturer and address

Frisch Spritzmatic GmbH
Ramminger Straße 4
D- 89129 Öllingen

Authorised representative for documentation

Jürgen Frisch

Applied harmonised standards, in particular

Safety of machinery and systems

EN ISO 12100:2010 – Risk assessment

EN ISO 13849-1:2023 –

SRP/CS EN ISO 13849-2:2012

– SRP/CS EN ISO 13850:2015 –

Emergency stop

EN ISO 13857:2019 – Safety distances

EN ISO 14118:2018 – Unexpected start-up

EN ISO 14120:2015 – Partitioning guards

EN ISO 19353:2019 – Fire protection

EN 619:2022 – Continuous conveyors and systems

EN 1672-2:2005+A1:2009 – Food processing machinery

EN 60204-1:2018 – Electrical equipment

Electromagnetic compatibility EN

61000-6-3:2011-09 – Emission EN

55011:2018-05 – Immunity

EN 61800-3:2014-04 – Variable-speed electric drive systems

Technical documentation

EN IEC / IEEE 82079-1:2021 – Requirements for user manuals

Jürgen Frisch – Managing Director

The original document, signed by hand, forms part of the product documentation.

19 Attached information n

19.1 Control circuit diagram (6.1)

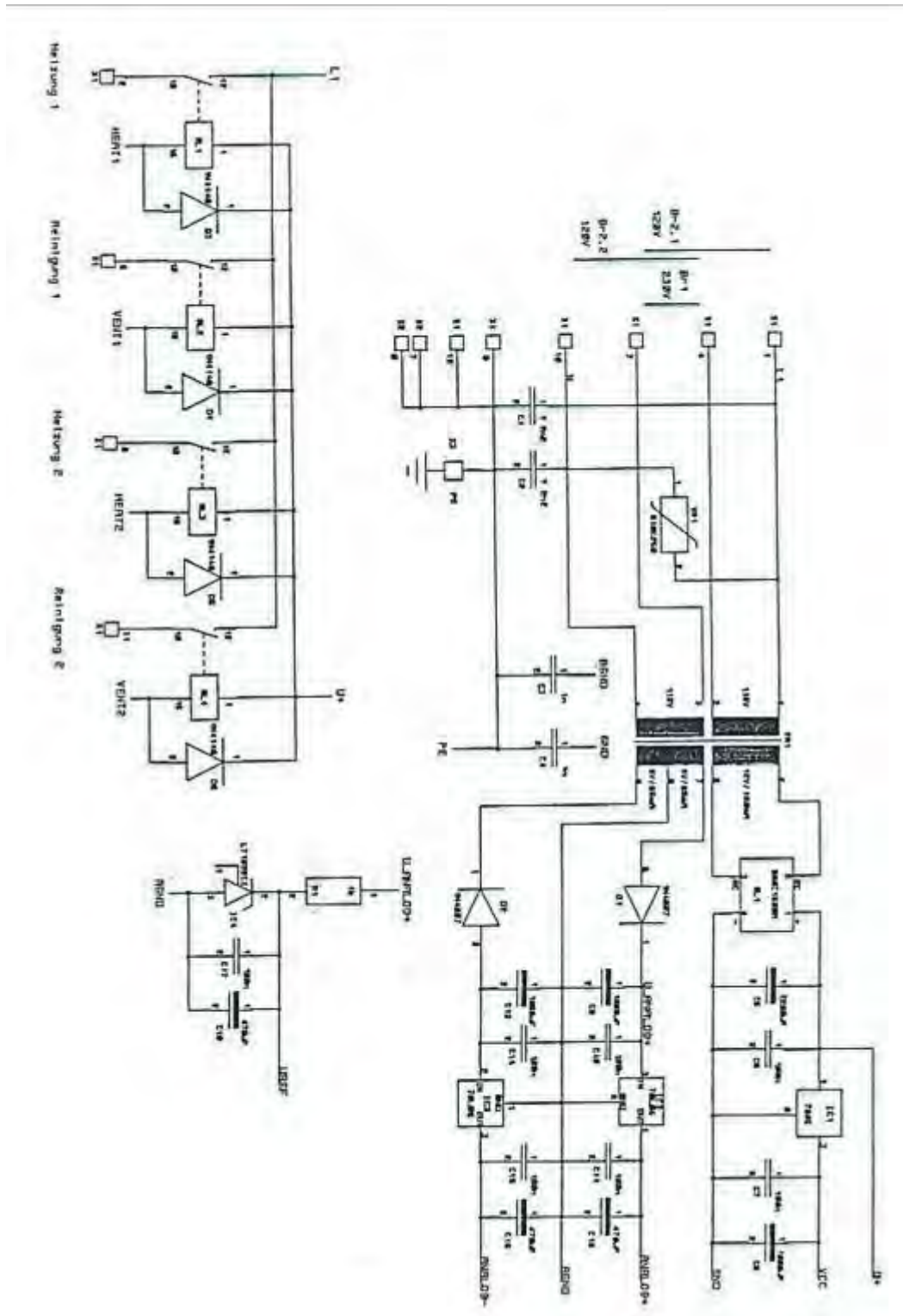


Figure 74: Control circuit diagram 1

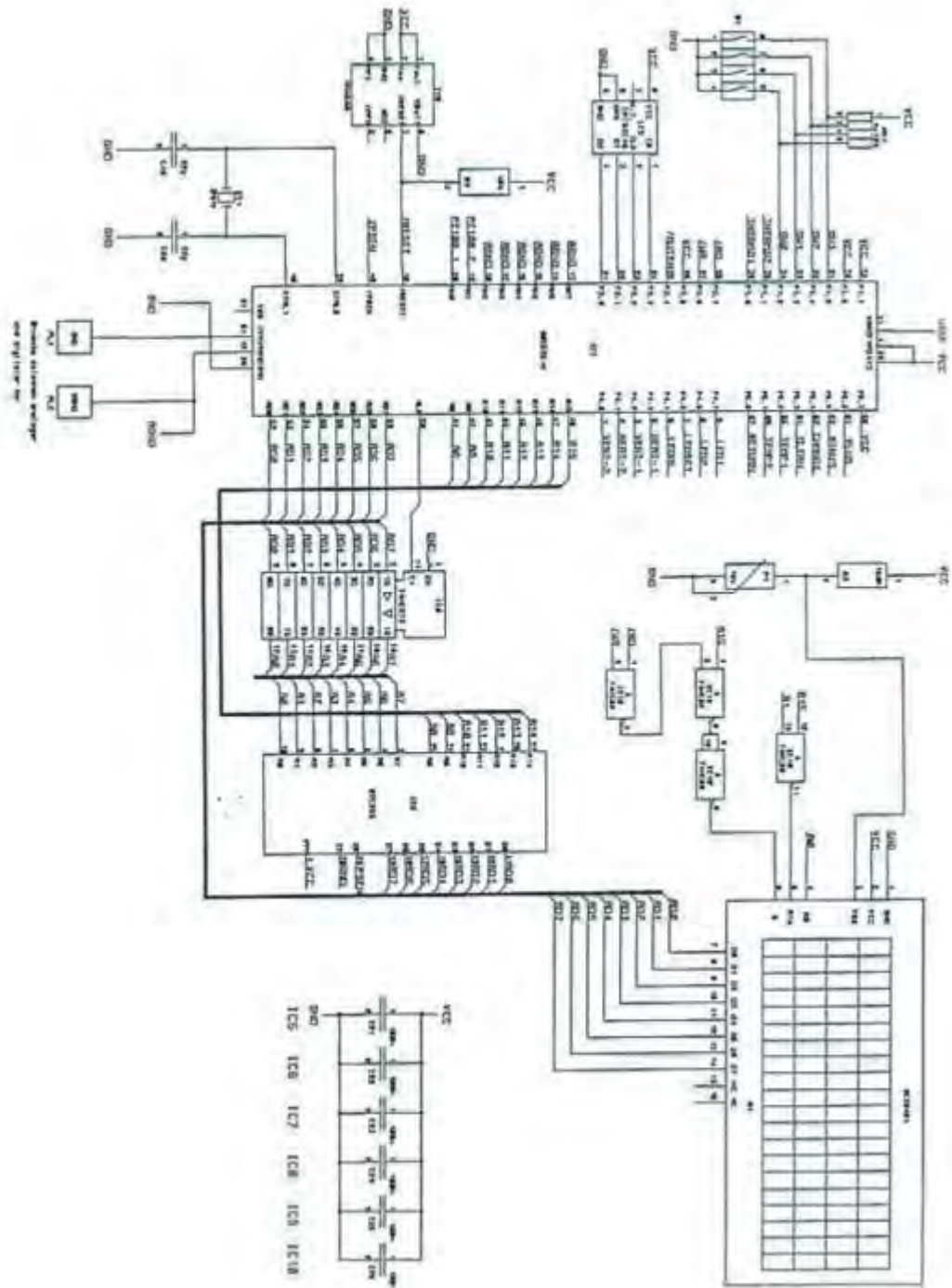


Figure 75: Control circuit diagram 2

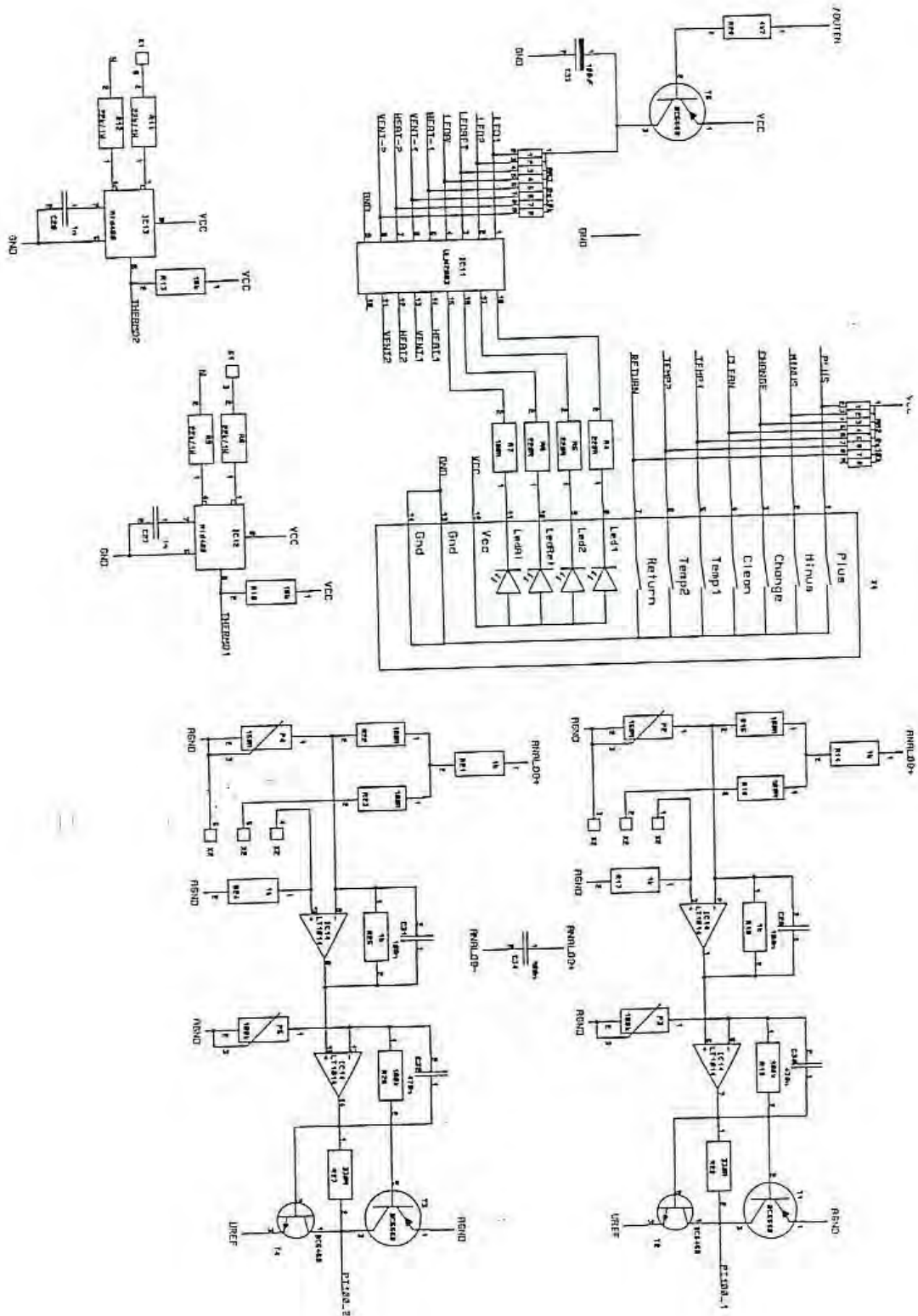


Figure 76: Control circuit diagram 3

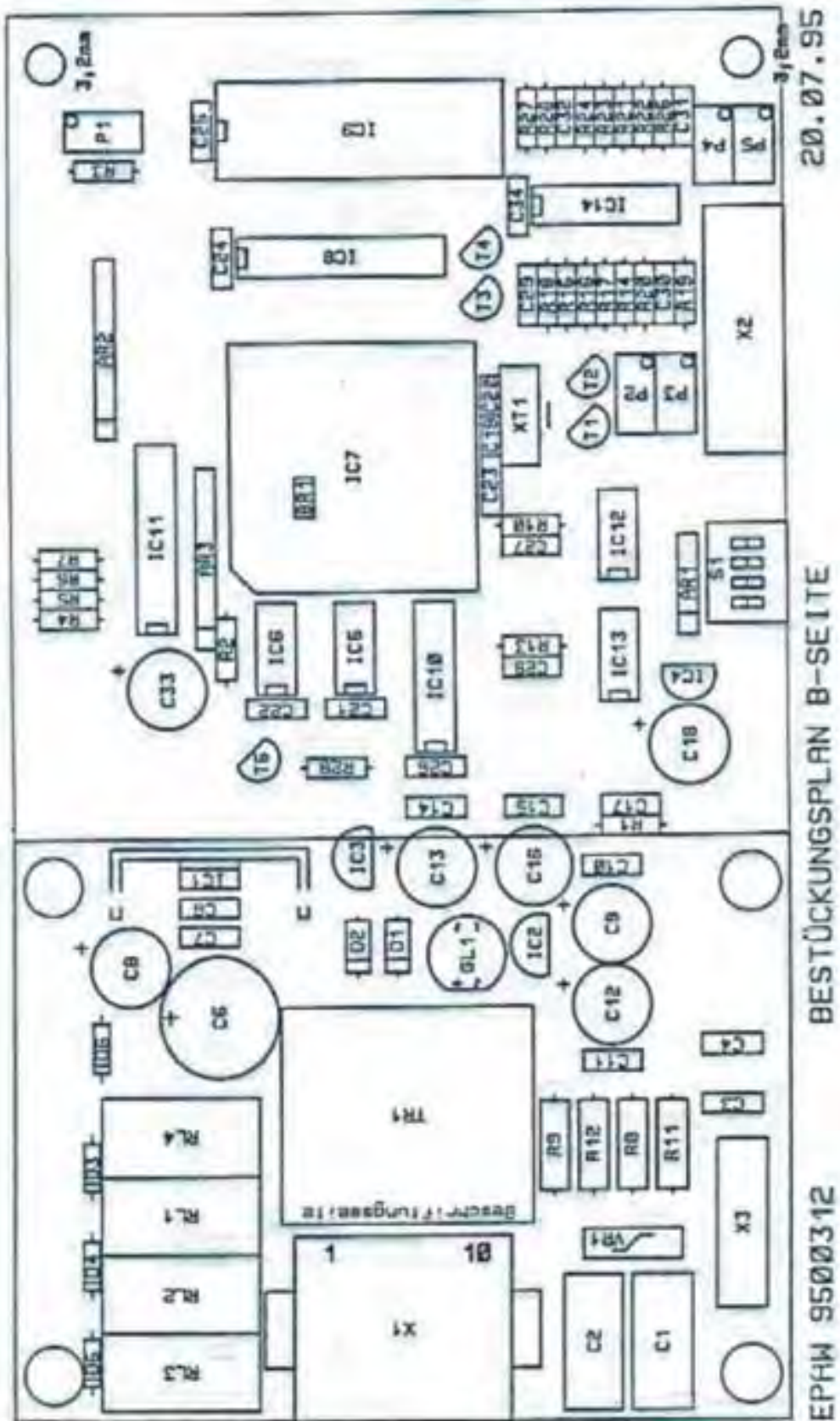


Figure 77: Control circuit diagram 4

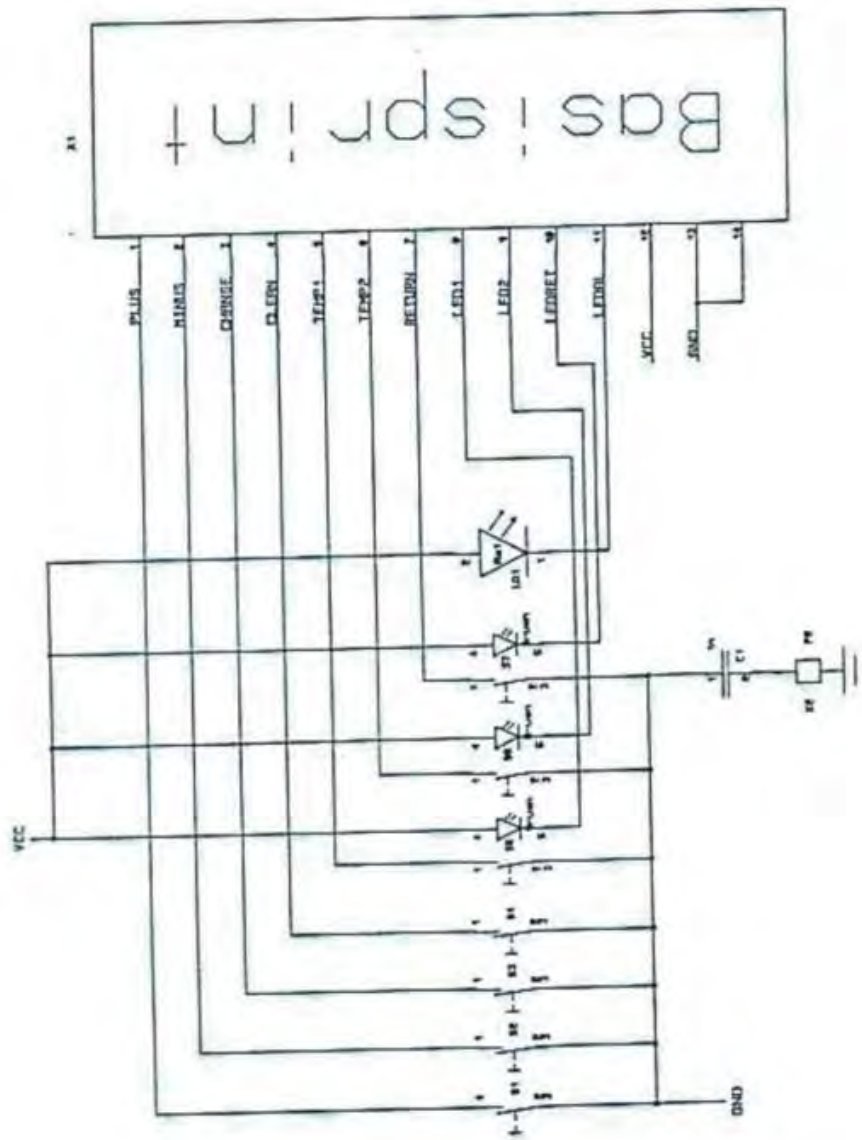


Figure 78: Control circuit diagram 5

19.2 Default settings for pressure switch

- SP 2 to 14 bar
- RP 2 to 13.5 bar
- OU 2 to Hnc