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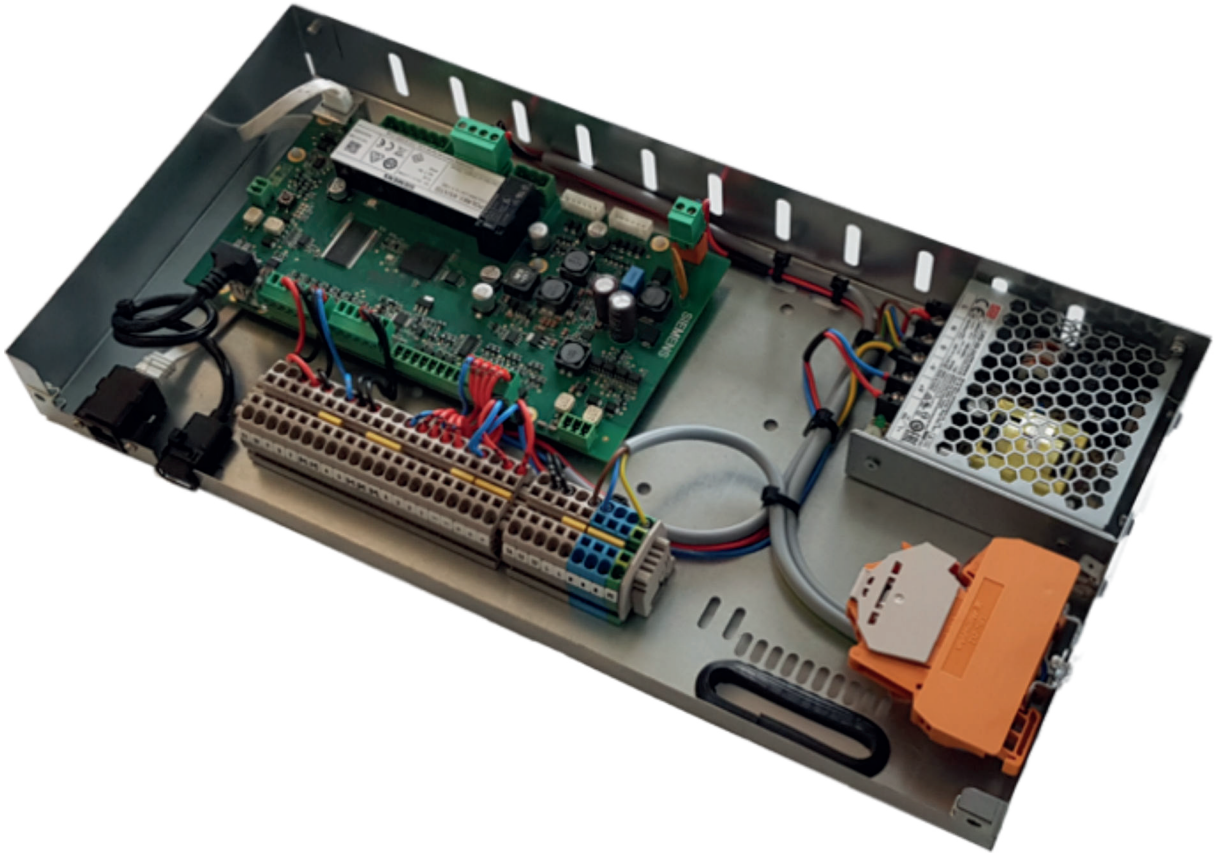
# WilSon W1

## Electronic Twin Plate HIU



# Controller Manual

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Wilson
Electronic Twin Plate HIU

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# 1 Introduction

## 1.1 Information on the operating instructions

These instructions ensure safe and efficient use of the heat interface unit controller. These instructions are a component of the product and must be kept in the immediate vicinity of the heat interface unit, where they are readily accessible for service personnel.

The service personnel must have carefully read and understood these instructions before starting any work. Compliance with all the safety warnings and instructions provided in this manual is a basic prerequisite for working safely.

In addition, the local occupational health and safety regulations and the general safety guidelines for the area of use of the controller apply.

## 1.2 Other applicable documents

| Document | Remark |
|---|---|
| Sanitary and heating installation plans | |
| Wiring diagram | |
| Climatix HMI-TM operating instructions | Available from our website: https://wilsonenergy.co.uk/ |
| Operating instructions for the heat interface unit | |

## 1.3 Glossary and abbreviations

| Abbreviation | Meaning |
|---|---|
| FR | Flow rate |
| dT | Difference in temperature |
| HMI | Human machine interface |
| HTG | Heating |
| Man. | Manual |
| Max. | Maximum |
| Min. | Minimum |
| PP | Prepaid |
| T | Temperature |
| Ctrl | Controller/control |
| SPL | Supply |
| KWF | Keep warm function |

| Abbreviation | Meaning |
|---|---|
| DHW | Domestic hot water |
| Circ. | Circulation |

# 2 Safety

## 2.1 Symbols in these instructions

**Categories and symbols for the safety warnings**

Safety warnings are indicated by symbols in these instructions. The safety warnings are introduced by signal words that indicate the extent of the danger.

**DANGER!**

This combination of symbol and signal word indicates an immediate, dangerous situation that can result in death or severe injury if it is not avoided.

**WARNING!**

This combination of symbol and signal word indicates a potentially dangerous situation that can result in death or severe injury if it is not avoided.

**NOTICE!**

This combination of symbol and signal word indicates a potentially dangerous situation that can result in property damage if it is not avoided.

**ENVIRONMENT!**

This combination of symbol and signal word indicates potential dangers for the environment.

**Safety warnings in instructions**

Safety warnings may refer to specific, individual instructions. Safety warnings like this are embedded in the instructions to ensure they do not distract the reader when performing the activity. The signal words described above are used.

Example:

1. Release the screw.
2. 

   **WARNING!**

   **Risk of injury on sharp edges!**

   Close the cover carefully.
3. Tighten the screw.

**Special safety warnings**

To draw attention to special dangers, the following symbols are used in safety warnings:

| Warning signs | Type of danger |
|---|---|
|  | Warning – high-voltage. |
|  | Warning – hot surface. |
|  | Warning – danger zone. |

**Tips and recommendations**

*This symbol highlights useful tips and recommendations, as well as information for efficient and fault-free operation.*

**Other symbols**

Instructions, outcomes, lists, references and other elements are highlighted in these instructions by the following symbols:

| Symbol | Explanation |
|---|---|
|  | Step-by-step instructions |
| ð | Outcomes of instructions |
|  | References to sections of these instructions and to other applicable documents |
| ■ | List without a specific order |
| *[Button]* | Operating element (e.g. button, switch), display element (e.g. indicator lamps) |
| *'Display'* | Screen elements (e.g. buttons, function key allocation) |

## 2.2 Proper use

The W1 Controller is a component of the heat interface unit and is only intended for use for controlling heat interface units and for verifying the current measurements.

Proper use also includes compliance with all information in these instructions.

Any use extending beyond, or use other than, proper use is considered improper use.

**WARNING!**
**Danger in the event of improper use!** Improper use of the controller may result in dangerous situations.

- Never connect the controller directly to a source of heat (e.g. boiler or solar circuit).
- Never use the controller in one of the following areas:
  - Outdoors
  - Rooms susceptible to moisture
  - Rooms in which the use of electrical units is prohibited
- Only allow trained personnel to install the controller.

## 2.3 Residual risks

The controller complies with all current safety requirements. However, there are residual risks that make caution necessary when using the station. The residual risks and the practices and measures they result in are listed in the following section.

### 2.3.1 Electric current

**Electric power**

**DANGER!**

**Danger to life due to electric power!**

There is an immediate risk of fatal electric shock if live components are touched. Damage to the insulation of the individual components can be fatal.

- Have all work on the electrical equipment performed by skilled electricians.
- In the event of damage to the insulation, cut off the power supply immediately and initiate repairs.
- Before working on live components of electrical systems and equipment, de-energise these components and secure them in this state for the duration of the work. Adhere to the following safety rules in this regard:
  - Disconnect.
  - Secure against restart.
  - Verify that components have been de-energised.
  - Ground and short-circuit.
  - Cover or shield any adjacent live components.
- Never bypass or disable any fuses. Comply with the correct amperage specification when replacing fuses.
- Keep moisture away from all live components. This may lead to short circuits.

### 2.3.2 High temperatures

**Hot surfaces**

**WARNING!**

**Danger of injury due to hot surfaces!**

Surfaces on components may become very hot during operation. Contact between the skin and hot surfaces can cause severe burns to the skin.

- When working near hot surfaces, always wear heatproof protective clothing and protective gloves.
- Before opening the controller box, ensure that all surfaces have cooled down to ambient temperature.

### 2.3.3 Danger due to legionella outbreak

**Proliferation of legionellae**

**WARNING!**

**Proliferation of legionellae due to stagnant water!**

If the unit is not used for an extended period, there is a risk of the proliferation of legionellae due to stagnant water.

– Upon restarting, set the operating mode to “Thermal disinfection” (Legio) to flush the drinking water lines with hot water ( *Chapter 6.3 ‘Setting the operating mode’ on page 26*).

*Legionellae are bacteria of which one species is harmful to humans. Legionellae can easily proliferate in pipes with warm, stagnant water. Flushing the pipes with water at a temperature of at least 55 °C kills the legionellae.*

## 2.4 Operator's responsibilities

**Operating company**

The operating company is the person who operates the heat interface unit with the integrated controller for commercial or economic purposes, or allows a third party to use/employ the system, and who assumes the legal product liability for protecting the user, personnel or third parties during operation.

**Operating company responsibilities**

The heat interface unit with the integrated controller may be used for commercial purposes. The operating company of the heat interface unit is therefore subject to the legal obligation to ensure occupational safety.

Along with the safety instructions in these instructions, the applicable occupational health and safety regulations and environmental protection regulations must be complied with in the area of use of the controller.

The following applies in particular:

- The operating company must be informed about the applicable occupational safety regulations and must identify additional dangers resulting from the specific working conditions at the site at which the heat interface unit is used in a hazard assessment. This must be implemented in the form of operating instructions for operation of the controller.
- The operating company must be check whether the operating instructions created by the operating company correspond to the current status of regulations, and modify them, if applicable, over the full term of use of the controller.

- The operating company must clearly assign and define responsibilities for installation, operation, troubleshooting, maintenance and cleaning.
- The operating company must ensure that all persons who work with the controller have read and understood these instructions.

Furthermore, the operating company is responsible for ensuring the controller remains in a technically flawless condition. The following therefore applies:

- The operating company must ensure that the maintenance intervals described in these instructions are complied with.
- The operating company must ensure that the electrical circuit is equipped with fuses in compliance with local regulations. Furthermore, an electrical fuse must be provided exclusively for the heat interface unit. This fuse must be clearly labelled. An easily visible description of the location of the fuse must be affixed to the heat interface unit.

## 2.5 Personnel requirements

**WARNING!**

**Danger of injury due to insufficient personnel qualification!**

If unqualified personnel perform work on the controller, this will result in dangers that can cause injury and property damage.

– All activities may only be performed by personnel qualified for the activities.

The personnel qualifications listed in the following are specified for the different areas of activity in these instructions:

**Electrician**
An electrician, due to professional training, knowledge and experience, as well as knowledge of the relevant standards and regulations, is able to perform work on electrical systems and identify and avoid potential dangers of their own accord.

The electrician is trained for the specific work environment in which work is carried out and is familiar with the relevant standards and regulations.

**Heating and sanitary technician**
The heating and sanitary technician is trained and certified for the specific area of activity in which he/she works and is familiar with the applicable standards and regulations.

The heating and sanitary technician is able to perform work on all heating and water heating systems due to his/her professional training and experience, and can identify and avoid potential dangers of his/her own accord.

Furthermore, the technician must provide proof of his/her professional qualification that certifies his/her ability to perform work on heating systems and water heating systems.

The heating and sanitary technician must have read and understood these instructions.

The skills the heating and sanitary technician must demonstrate include:

- Understanding of technical relationships
- Reading and understanding technical drawings and diagrams
- Installation of system components
- Installation and connection of heating pipes
- Performing maintenance work
- Disassembly and repair or replacement of system components when a problem occurs

**Operator**
The operator is the person who operates the unit or allows a third party to use/employ the system and who assumes the legal product liability for protecting the user or third parties during operation.

The operator is also responsible for adhering to the maintenance intervals.

The operator has been trained by manufacturer and sub-contractors in use of the unit and its components, and can identify potential dangers of their own accord and avoid dangerous situations.

**Essential requirements**

Only persons who can be expected to perform their work reliably may be approved as service personnel. Persons with an impaired ability to react, e.g. due to drugs, alcohol or medication, are not approved as service personnel.

Observe the age-related and vocation specific regulations applicable at the site of use when choosing personnel.

**Unauthorised persons**

**WARNING!**

**Danger to life for unauthorised persons due to dangers in the work area!**

Unauthorised persons who do not satisfy the requirements described here are not aware of dangers in the work area. This is why there is a danger of severe injuries or even death for unauthorised persons.

- Keep unauthorised persons away from the danger and work area.
- If in doubt, speak to the persons and instruct them to leave the danger and work area.
- Stop work as long as unauthorised persons are in the danger and work zone.

## 2.6 Environmental protection

**Danger to the environment**

**ENVIRONMENT!**

**Danger to the environment due to incorrect use of substances hazardous to the environment!**

Considerable damage to the environment can occur in the event of incorrect use of substances hazardous to the environment, and in particular in the event of disposal.

- If substances hazardous to the environment are accidentally released into the environment, take suitable measures immediately. If in doubt, inform the responsible local authorities about the damage and ask about suitable measures to take.
- Do not allow circuit boards and the HMI to enter water bodies, the sewerage system, the ground or household waste collection, and instead have them recycled or disposed of by a specialist company.

# 3 Overview

## 3.1 Functional principle

**Function of the controller**

The controller is a component of the heat interface unit. This controls the heat interface unit and verifies the current measurements. The domestic hot water control cycle is comprised of a controllable valve, a temperatur sensor on both the primary and secondary sides, and a flow rate sensor. The temperature sensor in the heating supply and a controllable valve are used as a basis to control the heating supply.

**Operation**

An HMI is connected to the circuit board for the operation of the controller ( *Chapter 6.1 'Connecting the HMI' on page 25*). Parameters are setting using this HMI ( *Chapter 6.2.1 'Setting parameters on the HMI' on page 25*).

## 3.2 Connection points

**USB connection**

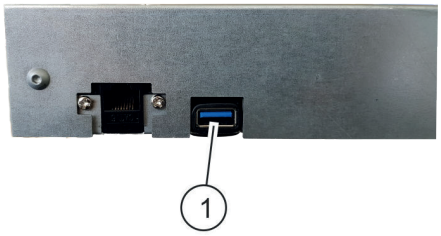



*Fig. 1: USB connection*

The USB connection is used to load and save parameters and software onto the controller. The USB connection is also used for saving data.

**LAN connection**

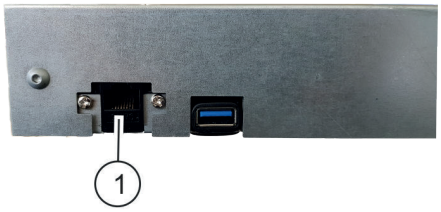



*Fig. 2: LAN connection*

The LAN connection is used to connect the HMI to the circuit board and allows operation of the controller.

**Terminals**

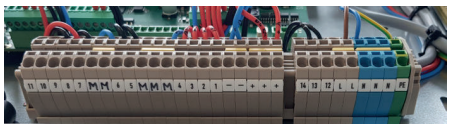


*Fig. 3: Terminal block*

All components that are managed by the controller are connected to the terminals on the terminal block.

The following components are connected to the terminals:

- Sensors (*'Sensors' on page 16*)
- Circulation pump
- Mixer valves for hot water und heating control
- Valve for keep warm module

**Sensors**

The sensors send the current values to the controller. The sensors are plugged into the terminal block.

Provision is made for the following sensors:

- Fresh water flow rate sensor
- Domestic hot water temperature sensor
- Heating supply temperature sensor
- Storage water temperature sensor

## 3.3 Components of the controller

**Controller box**

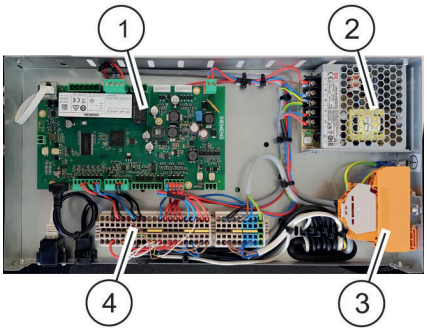



*Fig. 4: Controller box*

The controller box (Fig. 4) is integrated in the heating interface unit. The controller box contains the circuit boards (Fig. 4/1), the voltage transformer (Fig. 4/2), the fuse (Fig. 4/3) and the terminal block (Fig. 4/4).

**Circuit board**

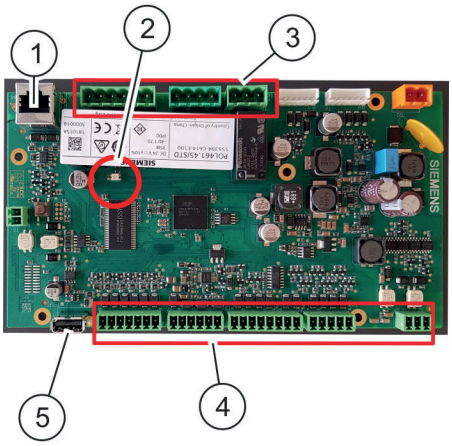



*Fig. 5: Circuit board*

1 LAN connection
2 LED status display
3 Relay
4 Terminal strips for sensor inputs and control signals
5 USB connection

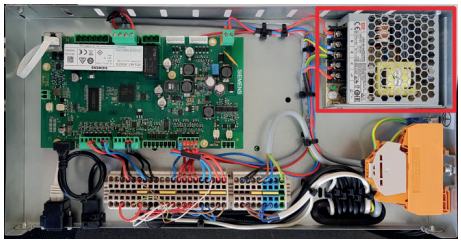
The circuit board features potential-free contacts (Fig. 5/2) to which the terminal block is connected. The LAN connection (Fig. 5/1) is used to connect the HMI to the circuit board in order to enter settings and operate the controller. The USB connection (Fig. 5/4) is used to load and save settings and software. The saved settings are retained even after a power failure.

The LED status display (Fig. 5/2) indicates the status of the controller.

The following status are displayed:

| Signal | Description |
|---|---|
| Continuous light, green | Controller operating |
| Flashing light, green | Controller starting |
| Continuous light, red | Controller stopped |

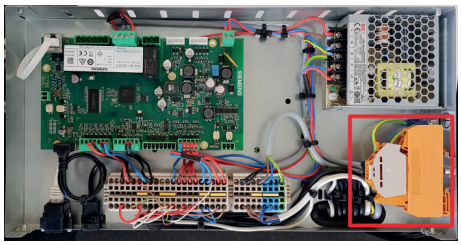
**Voltage transformer**



The voltage transformer supplies the circuit board with 24V. Compenents running with 24V are supplied via the circuit boards.

*Fig. 6: Voltage transformer*

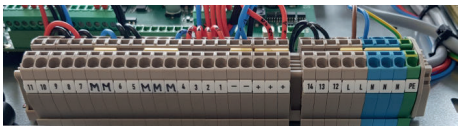
**Fuse**



The current consumption by the controller is limited to a maximum of 2.5 A by the integral fuse.

*Fig. 7: Fuse*

**Terminal block**



The sensors are connected to the terminal block. The terminal block is connected to the circuit board and sends the sensor data to the circuit board.

The terminal block is prewired. Only the wiring on the terminal block indicated in bold type (see Fig. 9) needs to be completed on site.

*Fig. 8: Terminal block*

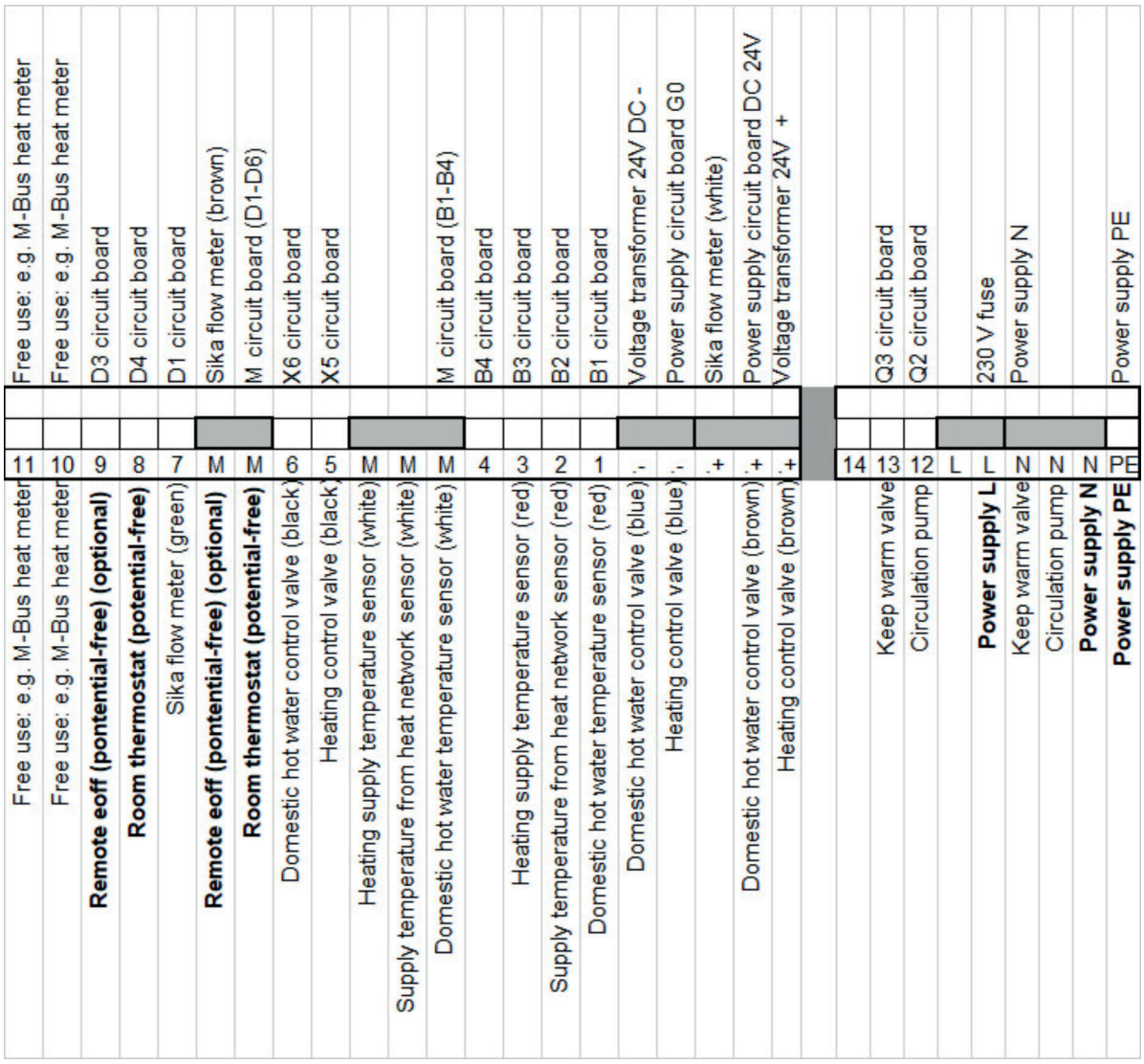



*Fig. 9: Terminal assignment*

## 3.4 Human machine interface (HMI)

The controller is operated using a human machine interface (HMI) that is connected to the LAN socket. The HMI is operated using the buttons. A number of buttons perform a different function when they are pressed and held (for more than 2 seconds). The HMI is used to display the data. Data is only saved to the circuit board.

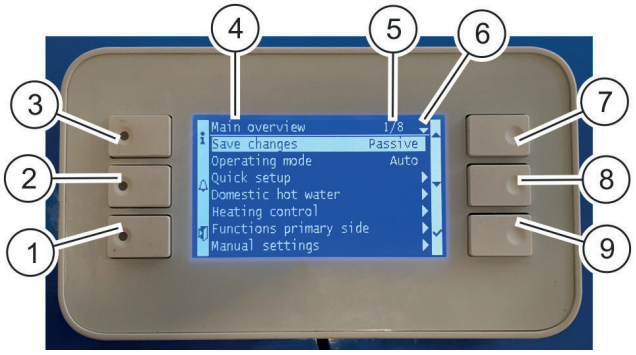



*Fig. 10: Buttons*

| Position | Element | Description |
|---|---|---|
| 1 | *[ESC]* | Exits a parameter setting without saving any changes made. |
| | | Returns to the previous page. |
| | | When a measurement is activated and *[ESC]* is pressed and held, a trend recording starts on the display. |
| 2 | *[ALARM]* | Flashes red as soon as there is a new error message.<br>Jumps directly to the current error message, or to the full list of alarms. |
| 3 | *[INFO]* | Jumps to the start page. |
| 4 | Heading | Describes the page being displayed. |
| 5 | Row selected/ number of rows | Indicates how many rows there are on the page, and which row is currently activated. |
| 6 | | Indicates which user level is active:<br>■ No key = not logged in<br>■ = User<br>■ = Service<br>■ = Factory |
| 7 | *[UP]* | Moves one row up in the list. Counts upwards when numbers are displayed. |
| | | Counts upwards faster when pressed and held. |
| 8 | *[DOWN]* | Moves one row down in the list. Counts downwards when numbers are displayed. |
| | | Counts downwards faster when pressed and held. |
| 9 | *[ENTER]* | Selects an element. |
| | | Confirms the selection. |
| | | The log-in page is opened when pressed and held. |

# 4 Functional description

## 4.1 Operating modes

**Automatic mode (Auto)**

The heat interface unit operates using the standard controller function in automatic mode. Measurements can be viewed, and setpoints can be entered.

**Manual mode (Man)**

The signals for the heat interface unit are determined manually in manual mode. The setpoints for the parameter settings are ignored when manual mode is active. A switchover to automatic mode occurs after a predefined period of time.

The following components are controlled in manual mode:

- Valve for domestic hot water
- Valve for heating supply
- Heating circulation pump
- Valve for keep warm function

**Thermal disinfection (Legio)**

Legionellae are killed off by thermal disinfection in this operating mode. The lines are flushed at a water temperature of at least 55 °C over a preset period. Once this preset period has elapsed, a switch-over back to automatic mode occurs.

**WARNING!**

**Proliferation of legionellae due to stagnant water!**

If the unit is not used for an extended period, there is a risk of the proliferation of legionellae due to stagnant water.

– Upon restarting, set the operating mode to “Thermal disinfection” (Legio) to flush the drinking water lines with hot water (*Chapter 6.3 ‘Setting the operating mode’ on page 26*).

*Legionellae are bacteria of which one species is harmful to humans. Legionellae can easily proliferate in pipes with warm, stagnant water. Flushing the pipes at a water temperature of at least 55 °C kills off the legionellae.*

**Test procedure (Test)**

All components of the system are activated to test their function for approx. 1 min. in an automated process in this operating mode. Once this time has elapsed, a switchover back to automatic mode occurs.

## 4.2 Drinking hot water control

As soon as a flow is detected in the domestic hot water, the corresponding control valve is used to make adjustments to the set nominal temperature.

The following functions for automatic adjustment of the specified setpoint prevent excessive heat from being drawn from the heat network.

**Setpoint reduction**

If the temperature in the supply from the heat network is too low to allow the specified setpoint to the reached, then the controller automatically reduces the nominal temperature to a value that can be reached. As soon as the temperature from the heat network is sufficient again, then the set nominal temperature is used again.

**Setpoint reduction to actual value**

If the current nominal temperature is not reached for an extended period, then the controller reduces the setpoint to the hot water temperature currently reached for a few minutes.

**Maximum domestic hot water | temperature**

If the domestic hot water temperature exceeds a specified maximum temperature, then the drinking water control switches off until the temperature has cooled down again (this setting can only be made by service personnel).

## 4.3 Heating control

If there is a heat request from the room thermostat (potential free contact closed), then the heating supply is adjusted to the specified setpoint by means of the corresponding control valve.

The following functions for automatic adjustment of the specified setpoint prevent excessive heat from being drawn from the heat network.

**Setpoint reduction**

If the temperature in the supply from the heat network is too low to allow the specified setpoint to the reached, then the controller automatically reduces the nominal temperature to a value that can be reached. As soon as the temperature from the heat network is sufficient again, then the set nominal temperature is used again.

**Setpoint reduction to actual value**

If the current nominal temperature is not reached for an extended period, then the controller reduces the setpoint to the temperature of the heating supply currently reached for a few minutes.

**Maximum supply temperature**

If the temperature of the heating supply exceeds a specified maximum temperature, then the heating control switches off until the temperature has cooled down again (this setting can only be made by service personnel).

**Frost protection**

If the supply temperature is approaching freezing point, the control is activated. The circulation pump starts and the valve makes adjustments to set a minimum setpoint. When the supply temperature reaches 8 °C, the control continues operating for a number of minutes before switching off again. This prevents water from freezing in the pipes.

**Anti-lock protection**

If the pump does not operate for several days, then the pump is briefly moved without opening the valve. This prevents the pump from locking up mechanically.

## 4.4 Special functions

**Remote off**

There is the option of equipping the controller circuit board with remote off. Remote off also overrides manual mode and frost protection. The shutoff function is inactive, which is why the contact on the corresponding terminals is open.

**Keep warm function**

A valve in the primary supply keeps the supply line to the unit warm for fast hot water preparation. The keep warm function keeps the supply line at a temperature between the parameter settings for ON level KWF and Off level KWF.

## 4.5 Password protection

Only basic values are available in the HMI if no log-in as service personnel has occurred by entering the corresponding PIN. The log-in procedure and the description of potential additional settings and functions are listed in a separate appendix for the service personnel.

## 4.6 Data recording

*The controller can continually record measured data and parameters (e.g. domestic hot water flow rate). This function can be deactivated by the service personnel by using the instructions in the corresponding appendix.*

# 5 Installation

**Electric current**

**DANGER!**

**Danger due to electric current!**

When working with power cables, there is an immediate danger of severe, or even fatal, injury due to electric current.

- Ensure that the cable is not live when performing installation work.
- Only have work on electric cables performed by an electrician.
- Never connect voltage to open cables.
- Before connecting the cable to voltage, ensure that no persons are near electric cables.

**Dry operation (damage to pump)**

**NOTICE!**

**Damage to the pump due to dry operation!**

The controller is a component of the heat interface unit. The controller and the heat interface unit draw energy from the same connector. If the controller is connected to the mains power before filling the heat interface unit, then the pumps operate dry and will be damaged.

– Fill the heat interface unit before connecting the controller to the mains power.

*The controller is prewired and ready-to-plug. The operating company only needs to produce the following connections:*

- *Input HTG demand*
- *Remote off (optional)*
- *Power cable*

**Installation**

Personnel: ■ Electrician

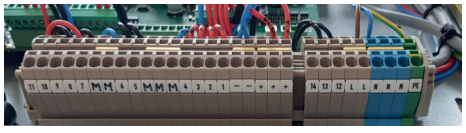


*Fig. 11: Terminal block*

1. Open the controller box.
2. Connect the wiring in accordance with the terminal diagram (*'Terminal block' on page 17*).

*A number of connections must be potential-free ( 'Terminal block' on page 17).*

3. Close the controller box and screw the housing together.
4. Ensure that there is a socket available and it is protected from short circuit by means of a residual current device.

5. Plug the connector plug for the controller into the socket provided.

   ⇨ The heat interface unit and the controller start automatically.

> *As soon as the controller can draw electric current, the program starts. It can take up to 30 seconds until the controller is ready for operation.*

# 6 Commissioning and operation

When commissioning, the parameters have already been set at the factory ( *Chapter 7 'Parameter settings and display values' on page 27*) and can be changed on the HMI ( *Chapter 6.2.1 'Setting parameters on the HMI' on page 25*).

**NOTICE!**

**Damage to the pump due to dry operation!**

The controller is a component of the heat interface unit. The controller and the heat interface unit draw energy from the same connector. If the controller is connected to the mains power before filling the heat interface unit, then the pumps operate dry and will be damaged.

– Fill the heat interface unit before connecting the controller to the mains power.

## 6.1 Connecting the HMI

Personnel:
- Operator
- Heating and sanitary technician

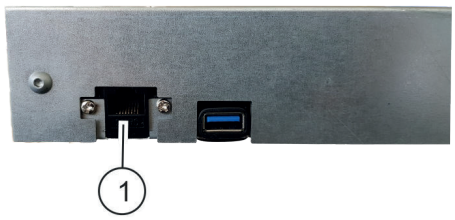



*Fig. 12: LAN connection*

→ Connect the HMI plug to the LAN connection (Fig. 12/1).

⇨ The HMI lights up. The operating software and the current data are loaded onto the HMI from the controller. The main overview appears.

## 6.2 Setting parameters

### 6.2.1 Setting parameters on the HMI

Personnel:
- Heating and sanitary technician

Prerequisite:

- The HMI has been connected

→ Set parameters using the buttons ( *Chapter 3.4 'Human machine interface (HMI)' on page 18*).

*Lists with parameters and setting ranges can be found in Chapter 7 'Parameter settings and display values' on page 27.*

### 6.2.2 Saving changes

**NOTICE!**
The set parameters are retained even when they have not been saved. However, they will be lost in the event of a power failure. To ensure the set parameters are retained after a power failure, they must be saved actively.

Personnel:
- Operator
- Heating and sanitary technician

1. On the main page, select *'Save settings'* .
2. Press *[ENTER]*.

## 6.3 Setting the operating mode

*The controller automatically starts in automatic mode, and its control function starts straight away.*

Personnel:
- Operator
- Heating and sanitary technician

1. On the main page, open *'Operating mode'* .
2. Select *'Automatic'* , *'Manual'* , *'Legio'* or *'Test'* .

*The operating modes "Manual mode" (Manual), "Thermal disinfection" (Legio) and "Test procedure" (Test) switch back to automatic mode (Automatic) after a preset time.*

# 7 Parameter settings and display values

> *The values without a value range correspond to the display values of sensors, control signals or software statuses. Values with value ranges are parameter settings.*
>
> *To delete the value ranges, see the appendix.*

**Main overview**

| HMI text | Description | Value range |
|---|---|---|
| Save changes | Saves changes to the settings to ensure they are not lost in the event of a power failure. The parameter automatically resets to “Passive”. | Active<br>Passive |
| Operating mode | Setting the operating mode:<br>**Automatic**: Normal control<br>**Manual**: The unit is operated using the manual settings (see section on Manual control).<br>**Legio**: The setpoint of the domestic hot water is raised to a higher temperature for a specific period for thermal disinfection (see DHW parameters section).<br>**Test**: Valves and pumps are activated briefly to test that activation is correct.<br>(All modes are automatically switched over to Automatic after a specific time.) | Auto<br>Man<br>Legio<br>Test |

**Main overview ► Quick setup**

| HMI text | Description | Value range |
|---|---|---|
| Setpoint DHW | Setpoint for the domestic hot water preparation | 25 – 90 °C |
| Setpoint HTG supply | Setpoint for the supply temperature of the heating water | 15 – 70 °C |
| Save changes | Saves changes to the settings to ensure they are not lost in the event of a power failure. The parameter automatically resets to “Passive”. | Active<br>Passive |

**Main overview ► Domestic hot water**

| HMI text | Description | Value range |
|---|---|---|
| DHW temperature | Temperature of the domestic hot water | |
| Current flow DHW | Current flow rate of the domestic hot water | |
| Setpoint DHW | Setpoint for the domestic hot water preparation | 25 – 90 °C |

| HMI text | Description | Value range |
|---|---|---|
| Setpoint th. disinfection | Setpoint of domestic hot water heating during thermal disinfection | 55 – 90 °C |
| Duration th. disinfection | Duration of “Disinfection” operating mode. Once this time has elapsed, a switchover to Automatic occurs automatically. | 0 – 240 min |

**Main overview ► Heating control**

| HMI text | Description | Value range |
|---|---|---|
| HTG supply temperature | Supply temperature of the heating water | |
| Setpoint HTG supply | Setpoint for the supply temperature of the heating water | 15 – 70 °C |

**Main overview ► Functions primary side**

| HMI text | Description | Value range |
|---|---|---|
| Heat supply temperature | Temperature of the water from the heat network | |
| On level KWF | If the temperature on the primary side (supply from the heat network) falls below this level, then the keep warm function is switched to active. | 10 – 70 °C |
| Off level KWF | If the temperature on the primary side (supply from the heat network) exceeds this level, then the keep warm function is deactivated. | 10 – 70 °C |

**Main overview ► Manual settings**

| HMI text | Description | Value range |
|---|---|---|
| DHW valve (Man.) | Control value for the valve for domestic hot water control when manual operating mode is used (100% = valve fully open) | 0 – 100% |
| HTG Valve (Man.) | Control value for the valve for heating water control when manual operating mode is used (100% = valve fully open) | 0 – 100% |
| HTG Pump (Man.) | Activation of the circulation pump for the heating circuit in manual operating mode:<br>Off: Pump not operating<br>On: Pump operating | Off<br>On |
| Bypass valve (Man.) | Activation of the valve for the keep warm function on the primary side when manual operation is used:<br>Off: Valve is closed<br>On: Valve is open (**Note**: Return temperature to the heat network may increase considerably!) | Off<br>On |
| Heat Demand (Man.) | Manual heat request for the activation of the heating water control when manual operating mode is used (instead of the room thermostats)<br>Off: no heat request<br>On: Heat request | Off<br>On |

**Main overview ► System**

| HMI text | Description | Value range |
|---|---|---|
| Language | Language selection | English<br>German |
| Imperial unit sys. | Switchover between imperial and metric system of units<br><br>Passive: metric system of units<br>Active: imperial system of units | Passive<br>Active |

**Main overview ► System ► Versions**

| HMI text | Description | Value range |
|---|---|---|
| BSP version | Version of the operating system | |
| GUID application | Software version | |
| GUID HMI | Version of the operating screen on the HMI | |
| GUID OBH | Version of configurations supported (e.g. languages) | |
| Controller board | Controller board version | |

# 8 Maintenance

## 8.1 Safety during maintenance

**Electric current**

**DANGER!**

**Danger due to electric current!**

When working with power cables, there is an immediate danger of severe, or even fatal, injury due to electric current.

- Ensure that the cable is not live when performing installation work.
- Only have work on electric cables performed by an electrician.
- Never connect voltage to open cables.
- Before connecting the cable to voltage, ensure that no persons are near electric cables.

**Hot surfaces**

**WARNING!**

**Danger of injury due to hot surfaces!**

Surfaces on components may become very hot during operation. Contact between the skin and hot surfaces can cause severe burns to the skin.

- When working near hot surfaces, always wear heatproof protective clothing and protective gloves.
- Before opening the controller box, ensure that all surfaces have cooled down to ambient temperature.

## 8.2 Overview of maintenance work

The following tables list the maintenance work that is necessary to ensure optimal and fault-free operation of the controller.

If increased wear is identified during regular inspections, shorten the required maintenance intervals to correspond to the actual signs of wear. Should you have any questions regarding the maintenance work and intervals, contact Customer Service (see page 3 for the contact details).

| Interval | Maintenance work | Personnel |
|---|---|---|
| Every year | Check the date and time, and adjust if necessary. | Heating and sanitary technician |
| | Appraise evaluations and check for plausibility. | Heating and sanitary technician |
| | Check current measurements and check for plausibility. | Heating and sanitary technician |
| | Check the error memory. | Heating and sanitary technician |
| | Check the switch outputs and consumption in manual operating mode. | Heating and sanitary technician |
| | Optimise the set parameters. | Heating and sanitary technician |

# 9 Faults

## 9.1 Safety instructions when repairing faults

**Securing against a restart**

**WARNING!**

**Danger to life due to unauthorised restart!**

An unauthorised restart of the power supply when repairing faults presents a danger of severe injuries or even death for persons in the danger zone.

– Before starting any work, shut off all power supplies and secure them against a restart.

## 9.2 Fault display

**LED on the circuit board.**

The LED on the circuit board lights up red when the software is not able to run correctly. For further information about the error, connect the HMI ( *Chapter 6.1 'Connecting the HMI' on page 25*) and observe the alarm message ( *Chapter 9.3.2 'Fault table' on page 33*).

**LED on the HMI**

The LED in the *[ALARM]* button flashes red as soon as an error occurs. Pressing the button allows details about the alarm ( *'Faults with error message' on page 33*) to be viewed.

**LEDs on the valve**

The LEDs on the valve flash in alternation as soon as a fault occurs on the valve. For further information about the fault, connect the HMI *Chapter 6.1 'Connecting the HMI' on page 25*) and observe the alarm message ( *Chapter 9.3.2 'Fault table' on page 33*), and repair the fault on the valve in accordance with the documentation for the valve.

## 9.3 Fault repair

### 9.3.1 Viewing an error message

The last error message and the error list containing all faults can be viewed on the HMI.

Pressing the *[ALARM]* button several times toggles between the following overviews:

- Error details of the last current error
- List of all current errors. The selection button can be used to select a specific error message and open the corresponding details page.
- List of all previous errors (history)
- Select the current error list or the history

*The error message also indicates the priority level of the error. Depending on the priority level, the unit is switched off:*

- *Critical (A) = unit is switched off, because there is an error that is critical for the installation.*
- *Low (B) = parts of the unit are switched off.*
- *Warning (C) = unit continues operating.*

### 9.3.2 Fault table

**Faults with error message**

The following sections describe faults and work required to repair them, which are displayed on the HMI.

| Fault description | Cause | Remedy | Personnel |
|---|---|---|---|
| **01 Supply temperature: noSensor** Signal fault on the heat network supply temperature sensor. Valves are closed, circulation pump is off. | Sensor incorrect or not connected. | Check the wiring and reconnect the sensor, if necessary. | Electrician<br>Heating and sanitary technician |
| | Sensor defective. | Replace the sensor. | Electrician<br>Heating and sanitary technician |
| **10 Supply temperature too high: Active** Temperature of the heat network supply higher than the defined maximum value. DHW valve is closed. | Water temperature in the supply is higher than allowed. | Check the heat supply. | Heating and sanitary technician |
| **20 DHW temperature; no Sensor** Signal fault on the domestic hot water sensor. DHW valve is closed. | Sensor incorrect or not connected. | Check the wiring and reconnect the sensor, if necessary. | Electrician<br>Heating and sanitary technician |
| | Sensor defective. | Replace the sensor. | Electrician<br>Heating and sanitary technician |
| **21 DHW temperature too high: Active** Temperature of the domestic hot water higher than the defined maximum value. | Control valve defective. | Replace the control valve. | Heating and sanitary technician |
| | A setpoint that is too high has been saved. | Correct the setpoint. | Heating and sanitary technician |
| **30 DHW setpoint reduction: Active** Setpoint reduction for domestic hot water is active. | Temperature of supply heat network insufficient for the setpoint saved. | Increase the temperature of the supply heat network.<br>Reduce the nominal temperature for the domestic hot water. | Heating and sanitary technician |

| Fault description | Cause | Remedy | Personnel |
|---|---|---|---|
| **31 DHW setpoint unreached**<br>Domestic hot water temperature not reached for 3 minutes.<br>Setpoint reduction to actual value. | Domestic hot water requirements too high. | Reduce domestic hot water requirements. | Operator |
| | Calcination in the heat exchanger or strainer dirty. | Check the water quality and, if necessary, take appropriate measures to comply with country-specific regulations regarding water quality. | Heating and sanitary technician |
| | Control valve defective. | Replace the control valve. | Heating and sanitary technician |
| **32 DHW flow too high: Active**<br>Flow rate is higher than the defined maximum flow rate. | Increased domestic hot water requirements. | Reduce domestic hot water requirements. | Operator |
| **40 Temperature HTG supply: noSensor**<br>Signal fault on the heating supply temperature sensor.<br>HTG valve is closed, circulation pump is off. | Sensor incorrect or not connected. | Check the wiring and reconnect the sensor, if necessary. | Electrician<br>Heating and sanitary technician |
| | Sensor defective. | Replace the sensor. | Electrician<br>Heating and sanitary technician |
| **41 Htg supply temperature too high: Active**<br>Heating supply temperature higher than the defined maximum value.<br>HTG valve is closed, circulation pump is off. | Control valve defective. | Replace the control valve. | Heating and sanitary technician |
| | A setpoint that is too high has been saved. | Correct the setpoint. | Heating and sanitary technician |
| **50 HTG setpoint reduction: Active**<br>Setpoint reduction for heating active. | Temperature of supply heat network insufficient for the setpoint saved. | Increase the temperature of the supply heat network.<br>Reduce the heating setpoint. | Heating and sanitary technician |
| **51 HTG setpoint unreached: Active** Heating supply temperature not reached for 3 minutes.<br>Setpoint reduction to actual value. | Domestic hot water requirements too high. | Reduce domestic hot water requirements. | Operator |
| | Heat exchanger or strainer dirty. | Check the water quality and, if necessary, take appropriate measures to comply with country-specific regulations regarding water quality. | Heating and sanitary technician |

| Fault description | Cause | Remedy | Personnel |
|---|---|---|---|
| **51 HTG setpoint unreached: Active** Heating supply temperature not reached for 3 minutes.<br>Setpoint reduction to actual value. | Control valve defective. | Replace the control valve. | Heating and sanitary technician |
| **80 Input remote-off: Active**<br>Remote off is active.<br>The entire control is inactive. | Heat interface unit was switched off externally. | Switch on the heat interface unit again using an external signal. | Operator |

**Faults without an error message**

The following sections describe faults that are not displayed on the HMI, and how to repair them.

| Fault description | Cause | Remedy | Personnel |
|---|---|---|---|
| Domestic hot water or heating supply is cold. | Supply heat network is cold. | Check the installation and values on the HMI. | Operator |
| | No flow on the primary side. | Check the installation and values on the HMI. Proceed in the same way as you would for the “No flow on the primary side” fault, if necessary. | Heating and sanitary technician |
| No flow on the primary side. | Strainer blocked. | Replace the strainer. | Heating and sanitary technician |
| | Valves closed or defective. | Open or replace the valves. | Heating and sanitary technician |
| | Flow sensor is dirty or defective. | Clean or replace the flow sensor. | Electrician |
| | Prior installation faulty. | Check the installation of the heat interface unit. | Heating and sanitary technician |
| | Air in the system. | Remove the air from the system. | Heating and sanitary technician |
| HMI does not display any information about the heat interface unit. | HMI not correctly connected. | Reconnect the HMI ( *Chapter 6.1 ‘Connecting the HMI’ on page 25*). | Operator |
| | HMI defective. | Replace the HMI. A new HMI can be sourced from the supplier. | Operator |
| | Circuit board defective. | Replace the circuit board ( *Chapter 9.4.2 ‘Replacing the circuit board’ on page 36*). | Electrician |
| | Internal wiring of the LAN connection faulty. | Open the controller and check the wiring, and replace it, if necessary. | Electrician |

| Fault description | Cause | Remedy | Personnel |
|---|---|---|---|
| Flow rate is not measured, although fresh water is flowing. | Flow sensor for fresh water is dirty or defective. | Clean or replace the flow sensor. | Electrician |
| | Circuit board defective. | Replace the circuit board ( *Chapter 9.4.2 'Replacing the circuit board' on page 36*). | Electrician |
| | Wiring faulty. | Check the wiring and replace it, if necessary. | Electrician |

## 9.4 Work required for repairing faults

### 9.4.1 Work required for repairing faults on the heat interface unit

*When performing work required to repair faults affecting the heat interface unit, observe the operating instructions for the heat interface unit Chapter 1.2 'Other applicable documents' on page 5).*

### 9.4.2 Replacing the circuit board

Personnel: ■ Electrician

1. Save the set parameters externally (service personnel only).
2. Disconnect the connector from the socket.
3. Unplug the LAN cable and USB cable.
4. Remove the screws in the controller box to open the controller box.
5. Unplug the terminal plugs from the terminal strips on the circuit board.
6. Remove the circuit board.
7. Insert a new circuit board and click it into place.
8. Plug the terminal plugs into the terminal strips on the circuit board.
9. Close the controller box and screw it together.
10. Connect the HMI to the controller ( *Chapter 6.1 'Connecting the HMI' on page 25*).
11. Connect the connector to the socket.
12. Reset the parameters ( *Chapter 6.2.1 'Setting parameters on the HMI' on page 25*) or load them using a USB stick (service personnel only).

# 10 Decommissioning and restarting

## 10.1 Decommissioning

*When decommissioning, observe the instructions for the heat interface unit ( Chapter 1.2 ‘Other applicable documents’ on page 5).*

## 10.2 Restarting

**Proliferation of legionellae**

**WARNING!**

**Proliferation of legionellae due to stagnant water!**

If the unit is not used for an extended period, there is a risk of the proliferation of legionellae due to stagnant water.

– Upon restarting, set the operating mode to “Thermal disinfection” (2 = Legio) to flush the drinking water lines with hot water ( *Chapter 6.3 ‘Setting the operating mode’ on page 26*).

*Legionellae are bacteria of which one species is harmful to humans. Legionellae can easily proliferate in pipes with warm, stagnant water. Flushing the pipes at a water temperature of at least 55 °C kills off the legionellae.*

**Restarting**

*Restart the controller in accordance with Chapter 6 ‘Commissioning and operation’ on page 25.*

# 11 Disassembly, disposal

## 11.1 Safety instructions for disassembly/disposal

**Electrical installation**

**DANGER!**

**Danger due to electric current!**

Danger to life in the event of contact with live components. Electrical components may make unchecked movements when switched on and cause severe injuries.

– Switch off the power supply before starting disassembly, and disconnect it for good.

## 11.2 Disassembling the controller

Personnel: ■ Heating and sanitary technician

1. Disconnect the connector from the socket.
2. Disconnect the LAN cable for the HMI, if installed.
3. Unplug the terminals on the terminal block.
4. Release the screws.
5. Remove the circuit board.
6. Remove operating materials and resources and dispose of them in an environmentally friendly manner.
7. Dismantle subassemblies and components in accordance with the applicable local occupational health and safety regulations and environmental regulations.

## 11.3 Disposing of the controller

**ENVIRONMENT!**

**Danger to the environment due to incorrect disposal!**

Incorrect disposal can cause a hazard for the environment.

– Have electrical scrap, electronic components, lubricants and other resources disposed of by a certified specialist company.
– If in doubt, obtain information about environmentally responsible disposal from the local authorities or specialised disposal companies.

If no agreement covering return and disposal was made, then dispose of dismantled components by recycling them:

- Scrap metals.
- Give plastic elements to a recycling company.
- Dispose of other components after sorting them by material.

# 12 Technical data

## 12.1 Design and operating data

*Observe the supplementary design and operating data in the data sheet ( Chapter 1.2 'Other applicable documents' on page 5).*

## 12.2 Connection values

**Electrical**

| Data | Value | Unit |
|---|---|---|
| Voltage | 230 ± 10% | VAC |
| Power consumption, maximum | 120 | W |
| Grid frequency | 50/60 | Hz |
| IP code | IP 20 | |
| Protection class | I | |
| Internal fuse (20 mm/2.5 A/F) | 2.5 | A |

## 12.3 Type plate

The type plate can be found on the front of the controller box.

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# A Appendix for service personnel

This appendix contains additional instructions and information that are only intended for the heating and sanitary technician.

## A.1 Logging in/out

*The PIN for logging in as service personnel is 1190.*

Personnel: ■ Heating and sanitary technician

**1.** Press and hold *[ENTER]* for min. 2 seconds.

⇨ If a PIN has already been entered, a log-in window opens. Otherwise a prompt to enter the PIN will appear straight away (continue with step 3).

**2.** Select *'Log in'* .

**3.** Select number using *[UP]* and *[DOWN]*.

**4.** Confirm using *[ENTER]*.

**5.** Repeat steps 3 and 4 for all numbers in the PIN.

⇨ or appears on the screen. The user is logged in.

*The user is automatically logged out after 10 minutes of inactivity.*

## A.2 Saving/loading

### Resetting to factory setting

*To save data, a USB stick with the FAT or FAT32 file system should be used.*

Personnel: ■ Heating and sanitary technician

1. Open *'System'* .
2. Open *'Save/load'* .
3. Activate *'Reset factory settings'* .

### Loading a new parameter set

Personnel: ■ Heating and sanitary technician

Material: ■ USB stick

1. Insert a USB stick with the parameter file.
2. Open *'System'* .
3. Open *'Save/load'* .
4. Select *'Load settings from USB'* .

### Saving a parameter set externally.

Personnel: ■ Heating and sanitary technician

Material: ■ USB stick

1. Insert a USB stick.
2. Open *'System'* .
3. Open *'Save/load'* .
4. Activate *'Save settings to USB'* .

*The data are saved in a format that can only be read using special software. The data can, however, be loaded directly onto other controllers.*

### Activating trend recording

The software features a range of predefined parameters that can be continuously recorded. This function must be activated for recording to be performed.

Personnel: ■ Heating and sanitary technician

1. Open *'System'* .
2. Open *'Save/load'* .

**3.** Activate *'Activation trend recording'* .

*There are 4,650 data points available for each parameter. When a longer recording is made, the oldest data are continuously overwritten.*

*There are 3 types of recordings:*

- *Recording interval **long**: Allows data to be tracked over several days.*
- *Recording interval **short**: Allows more exact data to be tracked over several hours.*
- *Recording in the event of a change (**COV**): Only makes a recording when the parameter changes, allowing recordings to be made over an extended period.*

*The short and long recording intervals can be set by means of the corresponding parameter settings on the 'Save/load' page.*

**Saving trends**

*The trends cannot be displayed on the HMI. They must be copied onto a USB stick to display them on a computer. The trends are saved as a csv file.*

Personnel: ■ Heating and sanitary technician

Material: ■ USB stick

**1.** Log in on the HMI (*Appendix A.1 'Logging in/out' on page 48*).

**2.** Insert a USB stick.

**3.** Open *'System'* .

**4.** Activate *'Save trends to USB'* .

⇨ The parameter is set to "Active".

*It can take several minutes to save the data. The parameter is only reset to "Passive" when data saving is complete.*

*If a USB stick is left inserted, a copy of the data is saved to the USB stick from the circuit board automatically once the time defined in 'Aut. trend saving interval' has expired.*

**Trends**

| Trend no. | Description | Recording interval |
|---|---|---|
| 1 | Supply temperature | long |
| 2 | Domestic hot water flow rate | long |
| 3 | Raw flow rate sensor data (domestic hot water flow rate × server pulse rate) | short |
| 4 | Domestic hot water temperature | long |
| 5 | Domestic hot water temperature | short |
| 6 | Domestic hot water valve control value | long |
| 7 | Domestic hot water valve control value | short |
| 8 | Input from room thermostat | COV |
| 9 | Heating supply temperature | long |
| 10 | Heating supply temperature | short |
| 11 | Heating valve control value | long |
| 12 | Heating valve control value | short |
| 13 | Signal at heating pump | COV |
| 14 | Signal at bypass valve for keep warm function | COV |
| 15 | On ratio of the bypass valve control | long |
| 16 | Input from remote off | COV |

**Loading new software**

A new package for the operating system, software and operating application can be loaded by means of a USB stick. The corresponding files must be obtained from the supplier, and be copied onto the USB stick.

Personnel: ■ Electrician

Material: ■ USB stick

1. Disconnect the power supply to the controller.
2. Insert the USB stick with the corresponding data.
3. Open the controller box.

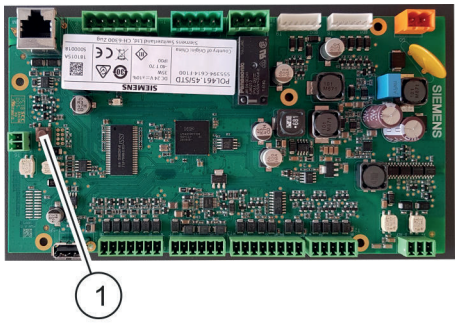


*Fig. 13: Service button*

**4.** Press and hold the service button (Fig. 13/1).

**5.** Switch on the power supply.

**NOTICE!**
Certain cables in the controller box are live with 230 V voltage.

**6.** Hold the service button until the LED status display slowly switches from green to red.

**7.** Let go of the service button and wait until the LED status display on the circuit board lights up red.

*If a new operating system is being loaded, the controller will automatically restart and therefore start to flash green.*

**8.** Disconnect the power supply to the controller.

**9.** Close the controller box and install it in the heat interface unit.

**10.** Switch on the power supply.

## A.3 Parameter settings and display values for service personnel

*The values without a value range correspond to the display values of sensors, control signals or software statuses. Values with value ranges are parameter settings.*

*The values marked with * only appear when the log-in as service personnel has been performed using the PIN ( Appendix A.1 'Logging in/out' on page 48).*

**Main overview**

| HMI text | Description | Value range |
|---|---|---|
| Setting Save | Saves changes to the settings to ensure they are not lost in the event of a power failure. The parameter automatically resets to "Passive". | Active<br>Passive |
| Operating mode | Setting the operating mode:<br>**Automatic**: Normal control<br>**Manual**: The unit is operated using the manual settings (see section on Manual control).<br>**Legio**: The setpoint of the domestic hot water is raised to a higher temperature for a specific period for thermal disinfection (see DHW parameters section).<br>**Test**: Valves and pumps are activated briefly to test that activation is correct.<br>(All modes are automatically switched over to Automatic after a specific time.) | Auto<br>Man<br>Legio<br>Test |

**Main overview ► Quick setup**

| HMI text | Description | Value range |
|---|---|---|
| Setpoint DHW | Setpoint for the domestic hot water preparation | 25 – 90 °C |
| Setpoint HTG supply | Setpoint for the supply temperature of the heating water | 15 – 70 °C |
| Setting Save | Saves changes to the settings to ensure they are not lost in the event of a power failure. The parameter automatically resets to "Passive". | Active<br>Passive |

**Main overview ► Quick setup ► Date/ time input**

| HMI text | Description | Value range |
|---|---|---|
| *Year | Current date: Year | 1970 – 9999 |
| *Month | Current date: Month | 1 – 12 |
| *Day | Current date: Day | 1 – 31 |
| *Hour | Current time: Hours | 0 – 23 |
| *Minute | Current time: Minutes | 0 – 59 |
| *Second | Current time: Seconds | 0 – 59 |

**Main overview ► Domestic hot water**

| HMI text | Description | Value range |
|---|---|---|
| DHW temperature | Temperature of the domestic hot water | |
| Current flow DHW | Current flow rate of the domestic hot water | |
| *Ctrl value DHW valve | Control value for the domestic hot water control valve | |
| Setpoint DHW | Setpoint for the drinking water preparation | 25 – 90 °C |
| Setpoint th. disinfection | Setpoint of domestic hot water heating during thermal disinfection | 55 – 90 °C |
| Duration th. disinfection | Duration of “Disinfection” operating mode. Once this time has elapsed, a switchover to automatic mode occurs automatically. | 0 – 240 min |

**Main overview ► Domestic hot water ► Service settings DHW**

| HMI text | Description | Value range |
|---|---|---|
| *Max. DHW supply temperature | Specifies the maximum temperature allowed for the domestic hot water. If this temperature is exceeded, this will result in the valve for the domestic hot water control being closed until the temperature has fallen below this value again. | 50 – 95 °C |
| *Max. flow DHW | Specifies the maximum flow rate for which this unit is designed. Exceeding this flow rate will result in a warning message. | 5 – 60 l/min |
| *On-level DHW ctrl | Activation threshold for the domestic hot water control. If this flow rate is exceeded, the domestic hot water control starts. | 0 – 25 l/min |
| *Off-level DHW ctrl | Deactivation threshold for the domestic hot water control. If the value falls below this flow rate, the valve for domestic hot water control closes. | 0 – 25 l/min |
| *Min. dT Supply-DHW | Minimum temperature difference allowed between the supply temperature from the heat network and the nominal domestic hot water temperature. If this temperature difference is not guaranteed, then the nominal domestic hot water temperature is reduced automatically. | 0 – 10 °C |

**Main overview ► Heating control**

| HMI text | Description | Value range |
|---|---|---|
| HTG supply temperature | Supply temperature of the heating water | |
| *Ctrl value HTG valve | Control value for the control valve of the heating control | |
| Setpoint HTG supply | Setpoint for the supply temperature of the heating water | 15 – 70 °C |
| *Input HTG demand | Input signal from the room thermostat<br>Passive: No heat request<br>Active: Heat request | |
| *Relay heating pump | Signal at heating circulation pump<br>0%: No signal<br>100%: Pump activated | |

**Main overview ► Heating control ►**
**Service settings Htg**

| HMI text | Description | Value range |
|---|---|---|
| *Max. HTG supply temperature | Specifies the maximum temperature allowed in the heating supply. If this value is exceeded in the heating supply, the valve for the heating supply control closes and the circulation pump stops. | 20 – 80 °C |
| *Min. dT Supply-T_Htg | Minimum temperature difference allowed between the supply temperature from the heat network and the setpoint for the heating supply temperature. If this temperature difference is not guaranteed, the setpoint is reduced automatically. | 0 – 10 °C |

**Main overview ► Functions primary side**

| HMI text | Description | Value range |
|---|---|---|
| Heat supply temperature | Temperature of the water from the heat network | |
| *Max. heat supply temperature | Specifies the maximum temperature allowed in the heating supply. | 50 – 100 °C |
| On level KWF | If the temperature on the primary side (supply from the heat network) falls below this level, then the keep warm function is switched to active. | 10 – 70 °C |
| Off level KWF | If the temperature on the primary side (supply from the heat network) exceeds this level, then the keep warm function is deactivated. | 10 – 70 °C |
| *Relay KW function | Signal for the keep warm function valve<br>Off: Valve closed<br>On: Valve open | |
| *Input remote-off | Input signal from prepaid circuit<br>Passive: Contact open<br>Active: Contact closed | |

**Main overview ► Manual settings**

| HMI text | Description | Value range |
|---|---|---|
| DHW valve (Man.) | Control value for the valve for domestic hot water control when manual operating mode is used (100% = valve fully open) | 0 – 100% |
| HTG Valve (Man.) | Control value for the valve for heating water control when manual operating mode is used (100% = valve fully open) | 0 – 100% |
| HTG Pump (Man.) | Activation of the circulation pump for the heating circuit in manual operating mode:<br>Off: Pump not operating<br>On: Pump operating | Off<br>On |
| Bypass valve (Man.) | Activation of the valve for the keep warm function on the primary side when manual operation is used:<br>Off: Valve is closed<br>On: Valve is open (**Note**: Return temperature to the heat network may increase considerably!) | Off<br>On |
| Heat Demand (Man.) | Manual heat request for the activation of the heating water control when manual operating mode is used (instead of the room thermostats)<br>Off: no heat request<br>On: Heat request | Off<br>On |
| *Duration man. mode | Time after which manual operating mode is automatically switched over to Automatic again. | 0.5 – 24 h |

**Main overview ► System**

| HMI text | Description | Value range |
|---|---|---|
| Language | Language selection | English<br>German |
| Imperial unit sys. | Switchover between imperial and metric system of units<br>Passive: metric system of units<br>Active: imperial system of units | Passive<br>Active |

**Main overview ► System ► Date/Time input**

| HMI text | Description | Value range |
|---|---|---|
| *Year | Current date: Year | 1970 – 9999 |
| *Month | Current date: Month | 1 – 12 |
| *Day | Current date: Day | 1 – 31 |
| *Hour | Current time: Hours | 0 – 23 |
| *Minute | Current time: Minutes | 0 – 59 |
| *Second | Current time: Seconds | 0 – 59 |

**Main overview ► System ►Save/load**

| HMI text | Description | Value range |
|---|---|---|
| *Reset factory settings | Resets all parameters to the delivery status ex-works | Passive<br>Active |
| *Load settings from USB | Copy all settings from the USB stick (*Appendix A.2 'Saving/loading' on page 49*) | Passive<br>Active |
| *Save settings to USB. | Save all settings onto the USB stick (*Appendix A.2 'Saving/loading' on page 49*) | Passive<br>Active |
| *Activation trend recording. | Activation of the pre-programmed recording of the trend data | Passive<br>Active |
| *Save trends to USB | Manual saving of the trend data to a USB stick<br>Passive: No saving in progress<br>Metric: Values saved in metric unit system<br>Imperial: Values saved in imperial unit system | Passive metric Imperial |
| *Data interval trends long | Save interval for the pre-programmed parameters allocated to this time (*'Trends' on page 51*) | 2 – 3,600 s |
| *Data interval trends short | Save interval for the pre-programmed parameters allocated to this time (*'Trends' on page 51*) | 2 – 3,600 s |
| *Interval aut. trend save | Time interval for manual saving of the recording data to a USB stick | 1 – 720 h |

**Main overview ► System ► Versions**

| HMI text | Description | Value range |
|---|---|---|
| BSP version | Version of the operating system | |
| GUID application | Software version | |
| GUID HMI | Version of the operating screen on the HMI | |
| GUID OBH | Version of configurations supported (e.g. languages) | |
| Controller board | Controller board version | |