HCC Fresh *step a valve*

Fresh water controller with weather-compensated heating circuit function for home stations.

Installation and operating instructions

Read carefully before mounting, commissioning and operation!

Table of contents

Craftsman level

You reach the craftsman level by pressing the right key for at least 5 seconds.

Deactivating the craftsman level is made possible in the menu item *8.2. menu view* (*see page 21*), with the change from *"Expert"* to "*Simple", the* subsequent confirmation twice with "*OK*" and the confirmation with "*Yes*" at *Save change?* (Or, the craftsman level deactivates itself after one hour).
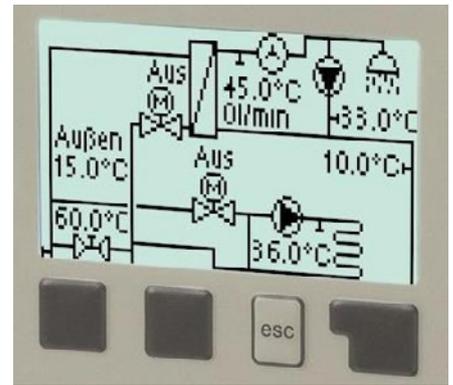
Safety instructions

EU Declaration of Conformity

By placing the CE mark on the device, the manufacturer declares that HCC Fresh *step a valve* complies with the relevant regulations:

• EU Low Voltage Directive 2014/35/EU and the
• EU Electromagnetic Compatibility Directive 2014/30/EU complies.

Conformity has been demonstrated and the relevant documentation and the EU Declaration of Conformity are on file with the manufacturer.

General notes

Absolutely read!

These mounting and operating instructions contain basic instructions and important information on safety, mounting, commissioning, maintenance and optimum use of the controller. For this reason, these instructions must be read and observed in full by the installer/specialist and the operator of the DHW station and the system before mounting, commissioning and operating the device.

This device, this fresh water regulator with heating function, is an automatic electric temperature regulator for home use.

Observe the applicable accident prevention regulations, the regulations of the electrical engineering association, the local power supply company, the applicable DIN-EN standards and the installation and operating instructions of the DHW station and the additional components system.

Installation, electrical connection, commissioning, changing of presettings and maintenance may only be carried out by a suitably trained specialist.

The configuration and default settings of the controller are specifically adapted to the scope of the selected options and the requirements of the station in the planned drinking water and heating system environment.

The device does not replace any safety equipment that may have to be provided by the customer!

For the operator:
Have the specialist instruct you in detail on the function and operation of the device. Always keep these instructions near the device.

The manufacturer accepts no liability for damage caused by misuse or non-observance of these instructions!

Symbol explanations

Danger due voltage	Failure to observe these instructions can result in life-threatening effects due to electrical voltage.
Danger to life	Failure to observe these instructions can result in serious health consequences such as scalding or even life-threatening injuries.
Attention	Failure to observe these instructions may result in destruction of the device, the DHW station, the system and/or environmental damage.
Safety note	Notes that are particularly important for the function and optimum use of the device, the DHW station and the system.
Tip	Notes that may be important for the function and optimum use of the device, the DHW station and the system.

Changes to the device

- Modifications, additions and conversions to the device require the written approval of the manufacturer.
- The installation of additional components that have not been tested together with the device is not permitted.
- If it becomes apparent, for example due to damage to the housing, that safe operation of the device is no longer possible, the device must be taken out of service immediately.
- Device parts and accessories that are not in perfect condition must be replaced immediately.
- Use only original spare parts and accessories from the manufacturer.
- Factory markings on the device must not be changed, removed or made unrecognizable.
- Only make the settings on the device described in these instructions.

	Modifications to the device can impair the safety and function of the device, the DHW station and the entire system.

Warranty and liability

The device has been produced and tested under consideration of high quality and safety requirements.
Excluded from the warranty and liability are personal injuries and property damage, for example, due to one or more of the following causes:

- Non-compliance with these mounting instructions and operating instructions
- Improper assembly, commissioning, maintenance and operation
- Improperly performed repairs
- Violation of the "Modifications to the device" section
- Improper use of the device
- Exceeding and falling below the limits specified in the technical data
- Force majeure

Disposal and pollutants

The device complies with the European RoHS Directive 2011/65/EU on the restriction of the use of certain hazardous substances in electrical and electronic equipment.

	The device must never be disposed of with household waste. Only dispose of the device at appropriate collection points or return it to the seller or manufacturer.

Technical data

Model:	HCC Fresh *step a valve*	Freshwater and Heatig Controller (Freshwater- and Heatig-Controller)
Temperature controller class	VI	
Request type heater		On/Off operation or modulating
Electrical data:		
Power supply		100 - 240 VAC, 50 - 60 Hz
Power consumption / standby		0.5 - 2.5 W/ 0.5 W
Internal fuse	1	2 A slow blow 250 V
Protection class		IP40
Protection class / overvoltage category		II / II
Inputs/Outputs:		
Sensor inputs 5		Pt1000-40 °C ... 300 °C
Sensor inputs DF sensors 1		SIKA VVX152 - 40 L/min
Mechanical relay	R1 - R3	460VA for AC1 / 460VA for AC3
Floating relay	R4	460VA for AC1 / 185VA for AC3
0..10V / PWM output	V1, V2 (PWM) V3 (PWM)	designed for 10 k Ω load / freq. 1 kHz, level 10 V
+ terminal / voltage output	+	+24VDC, max. 12W for motor-valve unit *step a valve*
Max. Cable length:		
Pt1000 outdoor temperature sensor	S1	< 30 m
Pt1000	S2 - S5	< 10 m
VVX15 sensor		< 3 m
CAN		< 3 m; for > = 3 m, a shielded twisted pair cable must be used. Connect the shielding to the protective conductor on one side. Maximum cable length of the entire system 200 m.
0-10V/PWM		< 3 m
mechanical relay		< 10 m
Permissible ambient conditions:		
for controller operation		0 °C - 40 °C, Max. 85 % rel. humidity at 25 °C
during transport/storage		0 °C - 60 °C, no condensation permitted
Other data and dimensions:		
Housing design		2-piece, ABS plastic
Installation options		Panel mounting (wall mounting)
Total dimensions		163 mm x 110 mm x 52 mm
Cut-out installation dimensions		157 mm x 106 mm x 31 mm
Display		full graphic, 128 x 64 dots
Light emitting diode		multicolor
Real-time clock		RTC with 24 hours power reserve
Operation		4 input keys

About the controller

The fresh water controller with heating function HCC Fresh *step a valve* allows efficient use and function control of your DHW station with intuitive operation.
For each input step, suitable functions are assigned to each input key and explained textually above them. In the "Measured values and settings" menu, help texts and graphics are available in addition to keywords.

The HCC Fresh *step a valve* can be used for various DHW station and system variants as a fresh water controller with heating function, *see "Hydraulic variants" on page 8.*

Important features of the HCC Fresh *step a valve*:

- Display of graphics and text in the illuminated display
- Simple query of the current measured values
- Evaluation and monitoring of the system, among other things, via graphic statistics
- Extensive setting menus with explanations
- Menu lock can be activated to prevent unintentional adjustment
- Reset to previously selected values or factory settings

Scope of delivery

- combined fresh water and heating controller HCC Fresh *step a valve*
- Instructions for use (quick start guide) for the HCC Fresh *step a valve*

Hydraulic variants

> ⚠️ The following figures are only to be understood as a schematic diagram to illustrate the respective control variants and do not claim to be complete.
> The controller in no way replaces safety-related equipment.
> Depending on the application, further system and safety components such as shut-off valves, backflow preventers, pressure shock absorbers, overpressure safety devices, floor drain, etc. are prescribed and must therefore be provided.
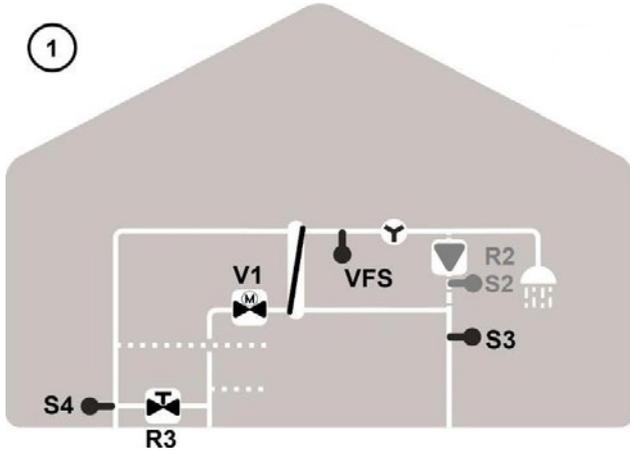
Without heating circuit control   (program 1 = *7.1.1.HK no*)

Representation with:
optional circulation S2, R2

(suitable for DHW stations **BM-T / -WP4 / -H**)
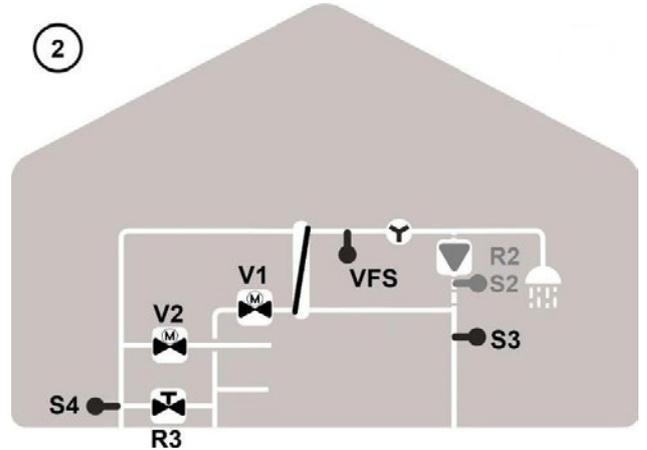
Heating circuit uncontrolled (program 2 = *7.1.2.HK uncontrolled*)

Representation with:
optional circulation S2, R2

Optional hot water priority must also be activated! Exclusively suitable only for **BM-H** DHW stations **with hot water priority**
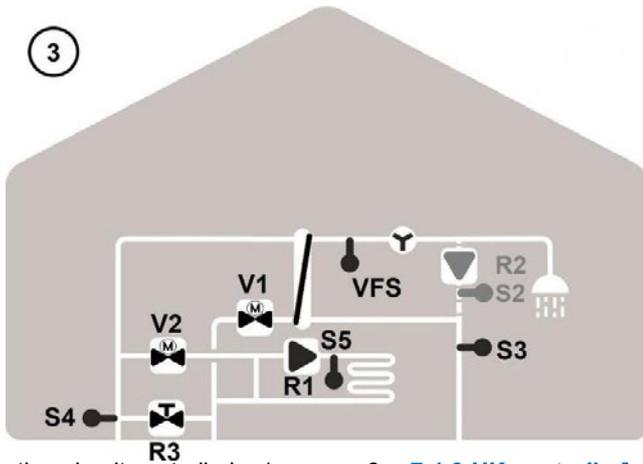
Heating circuit controlled   (program 3 = *7.1.3.HK controlled*)
(fixed value)

Representation with:
optional circulation S2, R2

(suitable for **BM-F / -HF** DHW stations)
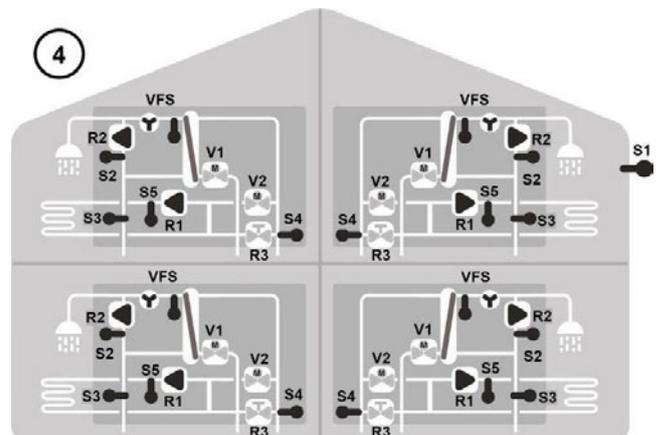
Heating circuit weather-compensated (controlled)
(Program 4 = *7.1.4.HK weather guided*)

The **outdoor temperature values** can be exchanged between the individual controllers HCC Fresh *step a valve* via CAN bus.

> ℹ️ The variants shown here are examples of possible functional combinations.
> These can be selected during commissioning or via the menu and various options can be adjusted.

On the controller board

BOX		VVX 15	CAN	CAN
1 GND	Not	1 Temp.	1 CAN high	1 CAN high
2 V4	usable	2 l/min	2 CAN low	2 CAN low
3 S8	additional	3 GND		
4 S7	Connection-	4 +5V		
5 S6	possibility			

Terminal diagram program 1 - without heating circuit control

⚠	**Extra-low voltages max. 24 VAC / DC**	*7.1.1.HK no* (suitable for DHW stations **BM-T / -WP4 / -H**)	⚡	**Mains voltages 230 VAC 50 - 60 Hz**

⚠	**Extra-low voltages max. 24 VAC / DC**

Clamp:	Connection for:	Assignment for program 1:
-	Ground (GND)	v
S1	Outdoor sensor	-
S2	Circulation sensor	o
S3	Cold water sensor	v
S4	Primary flow sensor	v
S5	HK flow sensor	-
V1	PWM *step a valve* hot water	v
V2	PWM *step a valve* heating	-
V3		-
+	+24VDC (max. 12W)	v
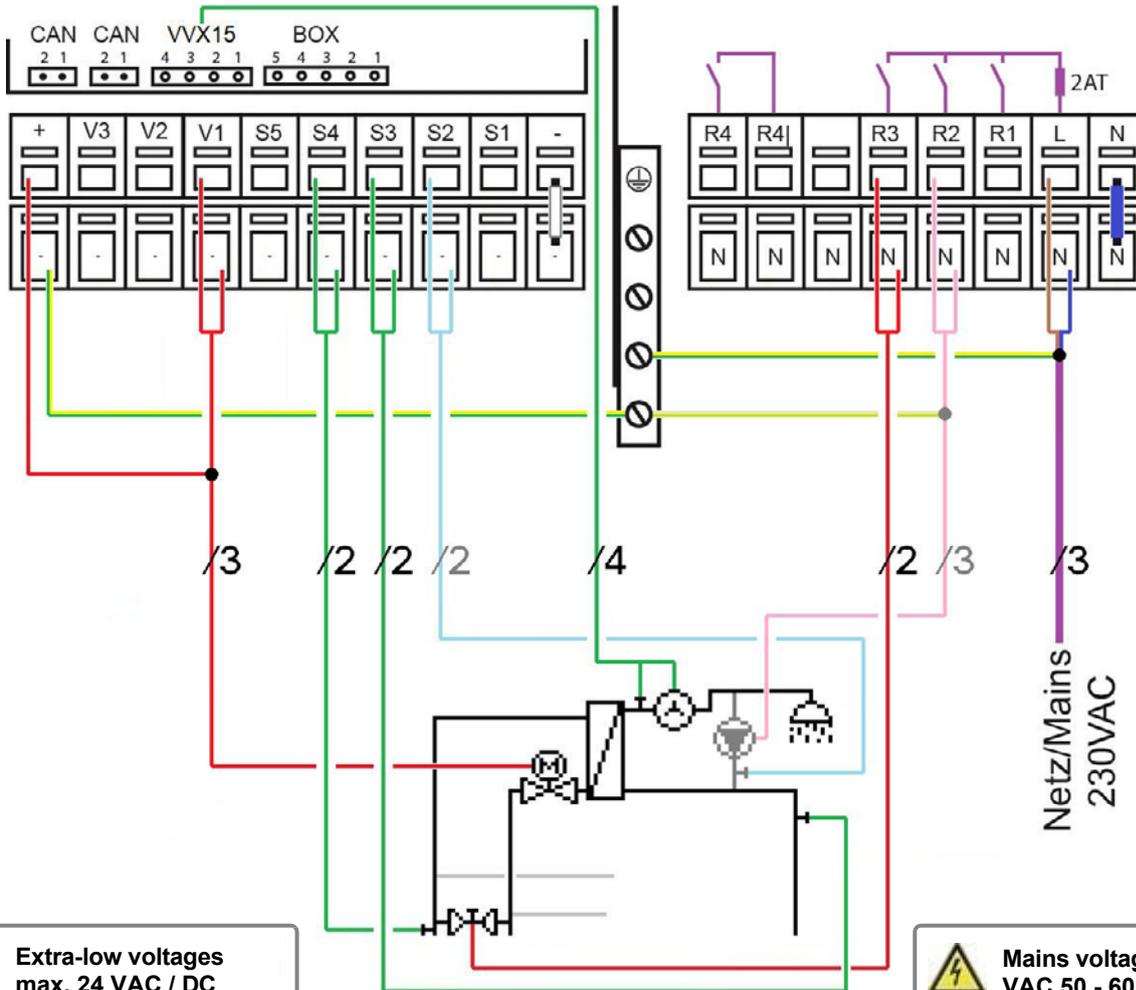
⚡	**Mains voltages 230 VAC 50 - 60 Hz**

Clamp:	Connection for:	Assignment for program 1:
N	Mains neutral	v
L	Mains phase conductor	v
R1	Heating circuit pump	-
R2	Circulation pump	o
R3	Holding	v
R4|		
R4		

Legend:

Terminal occupied?
v = yes
o = optional
- = no

❗ The ground line is connected to the lower gray terminal block "-" ground (GND). The neutral conductor N is connected to the lower blue terminal block N.
The PE protective conductor is connected to the PE metal terminal block!

Terminal diagram program 2 - heating circuit uncontrolled
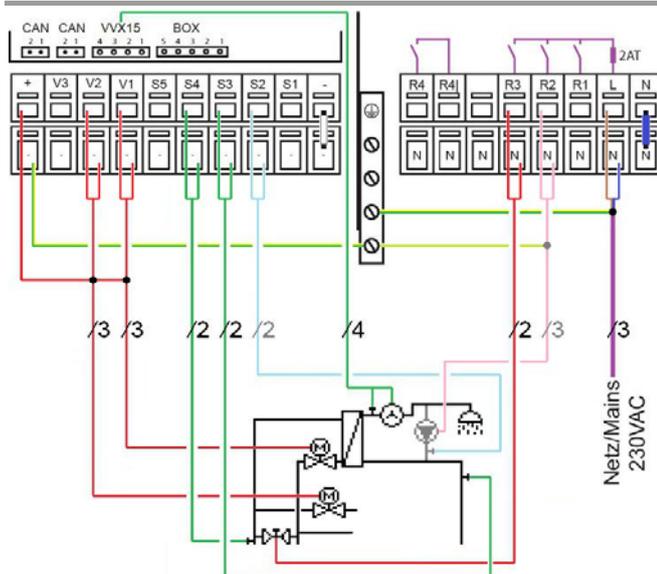
7.1.2. HK unregulated

⚠	Extra low voltages max. 24 VAC / DC		⚡	Mains voltage 230 VAC 50-60 Hz	
Cl:	Connection for:	Bel. P.2:	Cl:	Connection for:	Bel. P.2:
-	Ground (GND)	v	N	Mains neutral	v
S1	Outdoor sensor	-	L	Mains phase conductor	v
S2	Circulation sensor	o	R1	Heating circuit pump	-
S3	Cold water sensor	v	R2	Circulation pump	o
S4	Primary flow sensor	v	R3	Holding	v
S5	HK flow sensor	-			
V1	PWM step a valve WW.	v	R4|		
V2	PWM step a valve Hzg. for hot water priority	v	R4		
V3		-			
+	+24VDC (max. 12W)	v			

Legend:

Terminal occupied?
v = yes
o = optional
- = no

Terminal diagram program 3 - heating circuit controlled
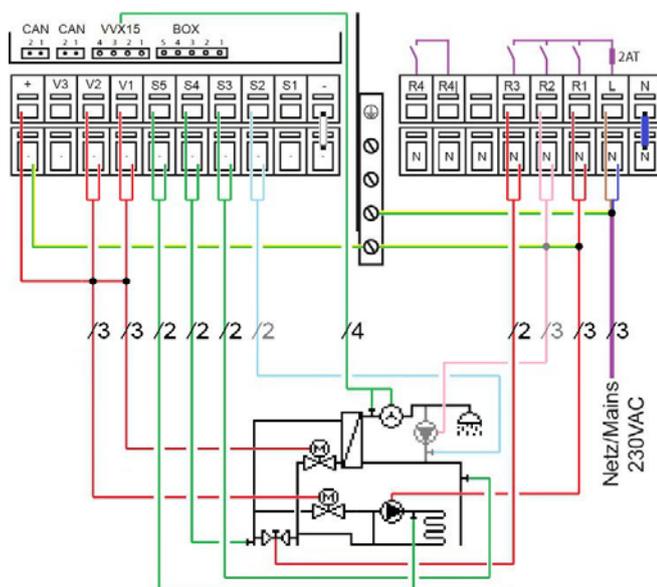
7.1.3.HK regulated (fixed value)

⚠	Extra-low voltages max. 24 VAC / DC		⚡	Mains voltages 230 VAC 50-60 Hz	
Cl:	Connection for:	Bel. P.3:	Cl:	Connection for:	Bel. P.3:
-	Ground (GND)	v	N	Mains neutral	v
S1	Outdoor sensor	-	L	Mains phase conductor	v
S2	Circulation sensor	o	R1	Heating circuit pump	v
S3	Cold water sensor	v	R2	Circulation pump	o
S4	Primary flow sensor	v	R3	Holding	v
S5	HK flow sensor	v			
V1	PWM step a valve WW.	v	R4|		
V2	PWM step a valve Hzg.	v	R4		
V3		-			
+	+24VDC (max. 12W)	v			

(suitable for BM-F / -HF)

Legend:

Terminal occupied?
v = yes
o = optional
- = no

Terminal diagram program 4 - heating circuit weather-compensated (controlled)

7.1.4.HK weather guided

⚠	Extra-low voltages max. 24 VAC / DC		⚡	Mains voltages 230 VAC 50-60 Hz	
Cl:	Connection for:	Bel. P.4:	Cl:	Connection for:	Bel. P.4:
-	Ground (GND)	v	N	Mains neutral	v
S1	Outdoor sensor	v	L	Mains phase conductor	v
S2	Circulation sensor	o	R1	Heating circuit pump	v
S3	Cold water sensor	v	R2	Circulation pump	o
S4	Primary flow sensor	v	R3	Holding	v
S5	HK flow sensor	v			
V1	PWM step a valve WW.	v			
V2	PWM step a valve Hzg.	v			
V3		-			
+	+24VDC (max. 12W)	v			

(suitable for BM-F / -HF)

Legend:

Terminal occupied?
v = yes
o = optional
- = no

Electrical connection

⚠ Before working on the device, switch off the power supply line and secure it against being switched on again! Check that no voltage is present! The electrical connection may only be carried out by a specialist in accordance with the applicable regulations.

⚠ The electrical connection may only be carried out by a specialist in compliance with the applicable regulations. The device must not be put into operation if there is visible damage to the housing, e.g. cracks.

⚠ The device must not be accessible from the rear.

⚠ Low-voltage cables such as temperature sensor cables must be routed separately from mains voltage cables. Insert temperature sensor cables only into the left-hand side and mains voltage cables only into the right-hand side of the device.

⚠ An all-pole disconnecting device, e.g. heating emergency switch, must be provided on site in the power supply of the controller.

⚠ The cables to be connected to the device may be stripped by a maximum of 55 mm and the cable sheath should reach into the housing exactly behind the strain relief.

Mounting
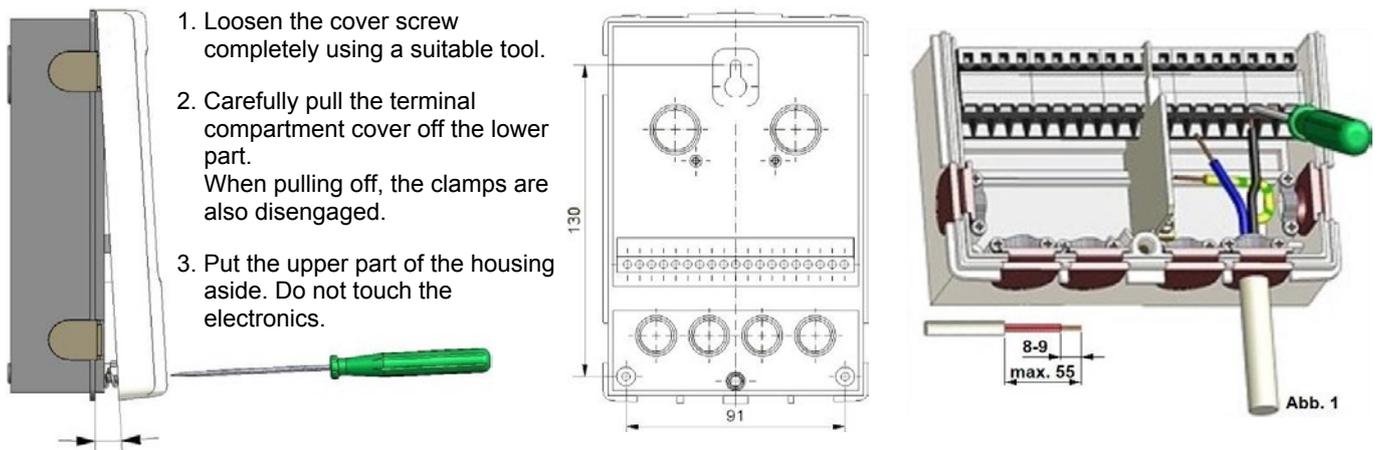
1. Loosen the cover screw completely using a suitable tool.

2. Carefully pull the terminal compartment cover off the lower part.
   When pulling off, the clamps are also disengaged.

3. Put the upper part of the housing aside. Do not touch the electronics.

Abb. 1

Installing the temperature sensors

The controller works with Pt1000 temperature sensors, which ensure temperature detection accurate to the degree in order to optimally ensure the system function in terms of control technology.

ⓘ If required, the sensor lines, e.g. for an outdoor temperature sensor, can be extended to a maximum of 30 m using a cable of at least 0.75 mm². Make sure that no contact resistances occur! Place the sensors exactly in the area to be measured! Only use the appropriate immersion, pipe contact or flat contact sensor for the respective application with the corresponding permissible temperature range.

Abb. 2
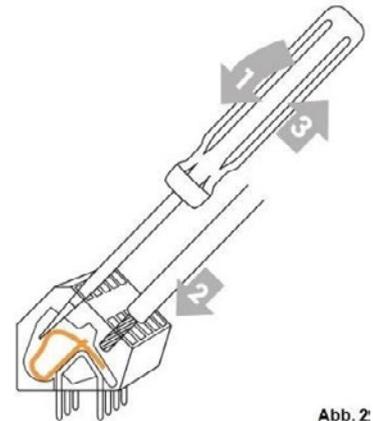
Resistance table for Pt1000 sensors

°C	-20	-10	0	10	20	30	40	50	60	70	80	90	100
Ω	922	961	1000	1039	1077	1116	1155	1194	1232	1270	1308	1347	1385

Display and input
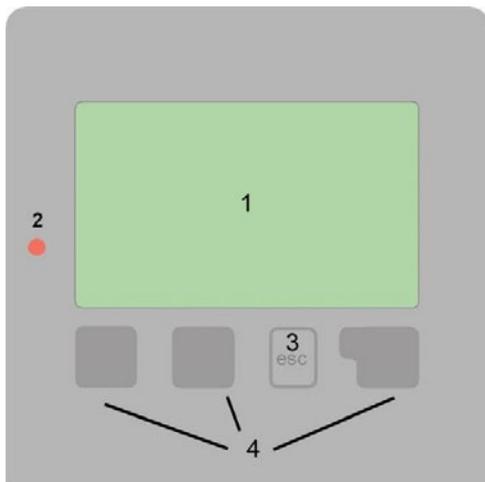
⌖ Pump (rotates during operation)

⌖ *step a valve* (black + [%]) ≙ valve open

[⋈] Valve (black) ≙ valve open o. opening

⌀ Flow meter

⌖ Service water

≣ Heating

╱ Heat exchanger

⚠ Warning/Error message

[i] New info available

**Only for program 2 - heating uncontrolled,
with hot water priority** *(see page 8 ff.)*

Shows the function of the motor-valve unit *step a valve*
in the heating line.

[R] *step a valve* ≙ valve open o. opening

[R] *step a valve* ≙ Valve closed or closing

You can find more symbols at the special functions

Examples of key functions:

+/-	Increase / decrease values
▼/▲	Scroll menu down / up
Ja/Nein	Agree / Deny
Info	Further information
Zurück	To previous display
Ok	Confirm
Bestätigen	Confirm setting

The display (1) with extensive text and graphic mode enables
easy operation of the controller.

The graphic mode appears only in the craftsman level,
which you reach by pressing the right key for at least 5
seconds.
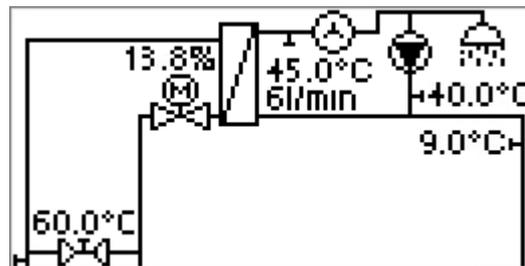
Deactivating the craftsman level is done in the menu item
"8.2. menu view", with the change from
"Expert" to "Simple", then confirming twice with "OK" and
confirming with "Yes" at
"Save change?" allows.
(Or, the craftsman level deactivates itself after one hour).

In graph mode, a keystroke on one of the two left acts,
leads to a tabular representation of the values displayed in
graph mode and back to graph mode.

```
Haupt-VL 60.0°C
WW        45.0°C
Durchfl.  6l/min
VFS1 L    15.1kW
VFS1 E    19kWh
V1        13.8%
```

An "esc" keystroke in graphic mode leads directly to the main
menu.
If the main menu is left via "esc", this leads back to the
graphics mode.

Entries are made via 4 keys (3 + 4), which are assigned
different functions depending on the situation. The "esc"
key (3) is used to cancel an entry or to exit a menu. If
necessary, a confirmation prompt follows to save changes.

The function of the other 3 keys ( ) is explained in each
case in the display line above the keys, whereby the right
key usually assumes a confirmation and selection function.

Commissioning help

Inbetriebnahmehilfe

Möchten Sie den Assistenten zur
Inbetriebnahme jetzt starten?

Nein   Ja
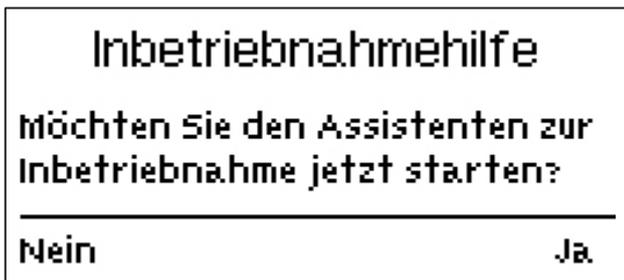
Exclusively adjustable during commissioning only:
7...1.supply "ON" / *7...1.circulation "ON*

Can also be set or changed in the menu:
7.1.program selection "1-4" / *5.3.1.target "45"* /
5.3.2.Tmax "Tset+10" / *5.3.14.WW priority "Yes"* /
5.1.3.B/W Day "18" / *5.1.4.B/W Night "12"* /
5.1.6.Characteristic "Normal" / *6.2.Frost protection
"ON"* /
5.1.10.Min.advance "15" / *5.1.11.Max.advance "52*

1. Set language and time

2. Commissioning help
a) select or
b) skip for the time being.

a) The commissioning help guides you through the
necessary basic settings in the correct sequence. Each
parameter is explained in the controller display.
Pressing the "esc" key takes you back to the previous
value in each case.
b) The commissioning help can be called up at any time via
   the menu
7.19.Commissioning can be called.

3. In the Operating mode *4.1.Manual* menu, you can test
the switching outputs with connected loads and check the
sensor values for plausibility.
Then switch on automatic mode (*see "Manual" on page 16*).

The commissioning help can be called up at any time in menu *7.19.Commissioning.*

Observe the explanations of the individual parameters on the following pages and check whether further settings
are necessary for your application.

1. measured values

Messwerte verlassen

1.1.S1   --

1.2.S2 Zirkulationsfühl +0.0°C
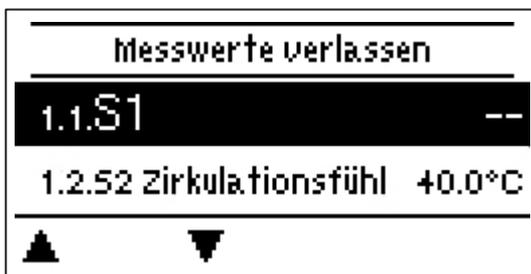
Used to display the currently measured temperatures.

If "-" or "Error" appears in the display instead of the measured value, this indicates an unconnected, defective or
incorrect temperature sensor.

Auswertung verlassen
2.1. Heute
2.2. 28 Tage
▲   ▼   OK
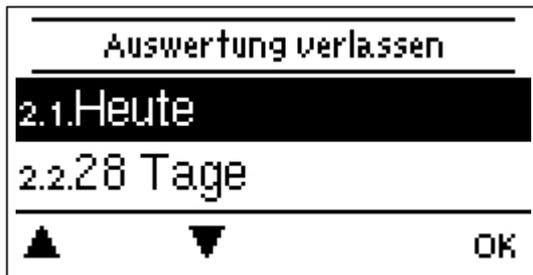
Serves for function control and long-term monitoring of the plant.

For time-dependent functions, such as circulation and the evaluation of plant data, it is essential that the time is set accurately on the controller.
Note that the clock continues to run for approx. 24 h in the event of a power interruption and must then be reset. Incorrect operation or incorrect time can cause data to be deleted, incorrectly recorded or overwritten. The manufacturer does not assume any warranty for the recorded data!

Today

2.1. Today
Temperature history for the last 24 hours
The graphic overview shows the course of the current day from 0 ... 24 o'clock is displayed. The right key changes the time unit (days) and the two left keys scroll through the diagram.

28 days

2.2. 28 days
Temperature history for the last 28 days
The graph overview shows the history of the last 28 days. The right button changes the time unit (days) and the two left buttons scroll through the graph.

Operating hours

2.3. Operating hours
The operating hours of the DHW station and the individual switching or signal outputs are displayed here. This is the total time during which the switching or signal outputs were active. The date displayed in this menu is the date of the last deletion. The current count was added up from this date.

Messages

2.4. Messages
Display of the last 20 occurred messages of the installation with date and time.

Reset/Clear

2.5. Reset/Clear
Reset and delete the individual evaluations. If "all evaluations" is selected, everything is deleted with the exception of the messages.

3. times

Zeiten verlassen

3.1. Uhrzeit & Datum

3.2. Sommerzeit   Ja

▲   ▼   OK

Setting of time, date and operating times for the heating circuit.

The associated temperature setpoints are defined in menu 5 "Settings"!

Time & Date

3.1. Time & Date

Used to set the current time and date.

For time-dependent functions, e.g. night setback, circulation, heating times, advance storage and the evaluation of system data, it is essential that the time is set accurately on the controller. Please note that the clock continues to run for approx. 24 h in the event of a power interruption and must then be reset. Data can be deleted, incorrectly recorded or overwritten due to incorrect operation or incorrect time. The manufacturer accepts no liability for the recorded data!

Summertime

3.2. Summertime "Yes

When this function is activated, the controller automatically switches to winter time or summer time (DST, Daylight Savings Time).

The following settings of the times are possible for each weekday in up to three time intervals to the minute.
A time history created for one day can be copied to the time periods Mon-Fri or Sat, Sun or Mon-Sun.

Heating circuit 1 day

3.3. Heating circuit 1 day

(Only available with selected options heating circuit weather controlled).
Used to set the heating times during the day. During the set times, the heating is constantly adjusted to the preset day heating curves and the requirements. Outside the set times, the heating is constantly adjusted to the preset lowered night heating curves and the requirements, which can lead, for example, to energy savings during the night times.

(The heating circuit is used to reheat the rooms connected via heating surfaces and can thus prevent the connected rooms from cooling down, contributing to the increase of comfort in the occupied areas).

Circ. times

3.7. Circ. times

(Only available if option: Circulation is selected).
Used to set the circulation times. During the circulation-free non-set times, there is no constant reheating, which can lead to energy savings during the night times, for example.

(The circulation prevents the connected hot water pipes from cooling down to the taps, thus contributing to the increase in tapping comfort and avoiding hot water waiting times during tapping).

Night setback

3.8. Night setback

(Only available if the option Prevent is selected).
Night setback lowers the temperature of the holding by about 15 K for the purpose of energy saving during the night hours.

(The storage prevents the heating water supply line from cooling down to the station and thus enables shorter hot water waiting times during the "first tapping" after longer tapping pauses, contributing to an increase in tapping comfort).

4.operating mode

```
┌─────────────────────────────────┐
│   Betriebsart verlassen          │
│ ━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━ │
│ ███████████████████████████████  │
│ 4.1.Manuell                      │
│ ───────────────────────────────  │
│                                  │
│  ▲        ▼              OK      │
└─────────────────────────────────┘
```

Manual

4.1. Manual

The individual relay and V outputs and the connected loads can be checked for function and correct assignment.

> ⚠️ The "Manual" operating mode is only to be used by the specialist for short-term function tests, e.g. during commissioning!
> **Mode of operation Manual mode: The** relays and thus the connected consumers are switched on or off by pressing a key without taking into account the current temperatures and the set parameters. At the same time, the current measured values of the temperature sensors are also shown in the display for the purpose of function control.

5. settings

```
┌─────────────────────────────────┐
│   Einstellungen verlassen        │
│ ━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━ │
│ ███████████████████████████████  │
│ 5.3.Warmwasser                   │
│ 5.6.Zirkulation                  │
│ ───────────────────────────────  │
│  ▲        ▼              OK      │
└─────────────────────────────────┘
```

> ⚠️ The safety devices to be provided on site are not replaced under any circumstances!

Heating circuit 1

Hot water

Holding

Circulation

```
┌────────────────────────────────┐
│ Schutzfunktionen verlassen     │
├────────────────────────────────┤
│ 6.1.Antiblockierschutz         │
│ 6.3.Antilegionellen            │
├────────────────────────────────┤
│  ▲        ▼            OK       │
└────────────────────────────────┘
```

Various protective functions can be activated and set by the specialist in the "Protective functions".

⚠️ The safety devices to be provided on site are not replaced under any circumstances!

Anti-blocking protection

6.1. Anti-blocking protection

If the anti-blocking protection is activated (daily, weekly, off), the controller switches on the outputs at 12 o'clock for 5 seconds one after the other to prevent the valves or the pumps from seizing in case of longer standstill.

Antifreeze

6.2. Frost protection "On

If the temperature at the outdoor sensor falls below 1 °C, the heating circuit is automatically switched on when frost protection is activated and the set flow temperature is set to the minimum flow temperature set under *5.1.10.Min.flow (see page 23).* If the outdoor temperature rises above 1 °C again, the frost protection function is switched off.

⚠️ If the frost protection function is switched off or the minimum flow temperature is set too low, serious system damage may occur.

Antilegionella

6.3. Antilegionella

With the help of the anti-legionella function (abbreviated below: AL), the domestic hot water pipe system, from the DHW station to the taps and an optional circulation pipe, can be heated manually to rid it of possible legionella.

🛈 The antilegionella function can be used to thermally disinfect the domestic hot water pipe system. In the delivery state, the anti-legionella function is switched off. *6.3.1.Antilegionella "Off*
As soon as heating has taken place with 'AL' switched on, information with date is shown in the display.

⚠️ This anti-legionella function does not provide reliable protection against legionella because the controller **relies on sufficient supplied energy**, and temperatures cannot be monitored throughout the station and the connected piping system.
During the anti-legionella function, make sure that a small amount of water is continuously taken from the taps so that the entire pipe system is heated.

6.3.1. Antilegionella "On

Antilegionella Tsoll
6.3.2. AL Tset "60.0°C"

This temperature must be reached for successful heating at the AL sensors for the AL exposure time.

Antilegionella exposure time
6.3.3. AL Reaction time "60 min

For this period of time, the AL Tset temperature must be present at the set AL sensors.

Last AL heating
6.3.4. Last AL heating "?"   This indicates when the last successful heating took place.

AL Sensor 2
6.3.5. AL Sensor 2 "S2 Circulation Sensor

If this sensor is also set, then for successful heating, in addition to the hot water sensor (VVX15), Tset AL for the action time must also be reached at this sensor.

Start manually
6.3.6. Start manually   Antilegionella heating can be started manually here at any time.

Basic things and advanced functions are set.

```
Sonderfunktionen verlassen
7.1.Programmwahl
7.2.Signaleinstellung V1
▲      ▼              OK
```

⚠️ The settings in this menu should only be made by a specialist.

Program selection

7.1. Program selection

Here, the appropriate program 1, 2, 3 or 4 (*see pages 8, 9 and 10*) is selected and set to suit the particular application.

🛈 The program selection is normally made only once during initial commissioning by the specialist. Incorrect program selection can lead to unforeseeable malfunctions.

Signal settings V1

7.2. Signal setting V1 - for the motor-valve unit *step a valve* for water heating.

⚠️ Changes to the values preset here can lead to serious malfunctions in the DHW station and/or the system and may only be carried out by a specialist after prior consultation with the manufacturer!

Signal type

7.2.1. Signal type "PWM

Control of the motor-valve unit *step a valve* via V1 or V2 by means of a PWM signal. (0-10V **Is in no case to be selected off !)**

Profile

7.2.2. Professional "Step a valve

A profile for actuators must be selected in these menus!
(Under "Manual" all settings can be made by yourself. Even after selecting a profile, the settings can be changed).

Signal shape

7.2.3. Normal" signal form

The type of actuator control is set in this menu: The motor-valve unit *step a valve* and solar pumps also provide little power when the input signal is small.
Heating pumps, on the other hand, deliver the greatest power with a small input signal.
For the motor-valve unit *step a valve* = **Normal.** (For heating pumps = inverted.)

PWM Off

7.2.4. PWM Off "0.0%

This signal is output when the motor-valve unit *step a valve* is switched off. (Actuators with cable break detection require a minimum signal).

PWM On

7.2.5. PWM On "28.0%

This signal is required to switch on the motor-valve unit *step a valve* and set it to the smallest active level.

PWM Max.

7.2.6. PWM Max. "95.0%

This value can be used to set the maximum signal for the highest active stage of the motor-valve unit *step a valve* can be specified, which is used e.g. during pre-purge or manual operation.

Show signal

7.2.10. Display signal

Displays the set signal for V1 in a graphical and text overview.

Control range

If the control range is activated, the HCC Fresh *step a valve* offers the possibility to change the control range of the motor-valve unit *step a valve* depending on the process via special internal electronics.

⚠️ Changes to the values preset here can lead to serious malfunctions in the DHW station and/or the system and may only be carried out by a specialist after prior consultation with the manufacturer!

❗ The specified percentages are guide values that may deviate to a greater or lesser extent depending on the equipment of the system and the DHW station. 100 % is the maximum possible output of the controller.

Max. Position
7.3.3.Maximum position "100%".
The maximum position of the motor-valve unit *step a valve* in % is set here. During the setting, the motor-valve unit *step a valve* opens in the respective position and the flow rate can be determined.

Min. position
7.3.4.Minimum position "10%".
The minimum position of the motor-valve unit *step a valve* in % is set here. During the setting, the motor-valve unit *step a valve* opens in the respective position and the flow rate can be determined.

Pulse min. position
7.3.6.pulses min. pos. "0%
stage during pulse operation.

Signal settings V2

7.4. Signal setting V2 - for the motor-valve unit *step a valve* for the secondary heating train.

⚠️ Changes to the values preset here can lead to serious malfunctions in the DHW station and/or the system and may only be carried out by a specialist after prior consultation with the manufacturer!

Signal type
7.4.1. Signal type "PWM
Control of the motor-valve unit *step a valve* via V1 or V2 by means of a PWM signal. (0-10V **Is in no case to be selected off !)**

Profile
7.4.2. Professional "Step a valve H
A profile for actuators must be selected in these menus!
(Under "Manual" all settings can be made by yourself. Even after selecting a profile, the settings can be changed).

Signal shape
7.4.3. Normal" signal form
The type of actuator control is set in this menu: The motor-valve unit *step a valve* and solar pumps also provide little power when the input signal is small.
Heating pumps, on the other hand, deliver the greatest power with a small input signal.
For the motor-valve unit *step a valve* **= Normal.** (For heating pumps = inverted.)

PWM Off
7.4.4. PWM Off "0.0%
This signal is output when the motor-valve unit *step a valve* is switched off. (Actuators with cable break detection require a minimum signal).

PWM On
7.4.5. PWM On "3.0%
This signal is required to switch on the motor-valve unit *step a valve* and set it to the smallest active level.

PWM Max.
7.4.6. PWM Max. "95.0%
This value can be used to set the maximum signal for the highest active stage of the motor-valve unit *step a valve* can be specified, which is used e.g. during pre-purge or manual operation.

Show signal
7.4.10.Display signal
Displays the set signal for V2 in a graphical and text overview.

Sensor calibration

7.10. Sensor calibration

Deviations in the displayed temperature values, caused for example by long cables or sensors that are not optimally positioned, can be corrected manually here. The settings are made individually for each sensor in approx. 0.3 to 0.5 °C steps.

The values preset here by the manufacturer are calibration values of the controller. Changing them can lead to malfunctions in the DHW station and/or the system and may only be carried out and documented (original value + change) by a specialist after prior consultation with the manufacturer! Adjustments are only necessary in special cases during initial commissioning by the specialist.
This is because incorrect measured values can also lead to malfunctions.

Commissioning

7.19. Commissioning

The start of the commissioning help leads in the correct order through the basic settings necessary for commissioning, whereby the respective parameters are briefly explained in the display. Pressing the "esc" key takes you to the previous value in order to view the selected setting again or also to adjust it.
Pressing the "esc" key several times leads back to the selection mode to cancel the commissioning help. (*see "Commissioning help" page 13*)

Only to be started by a specialist during commissioning!
Observe the explanations of the individual parameters in these instructions and check whether further settings are necessary for your application.

Factory settings

7.20. Factory settings

All the settings made (*except for "Sensor calibration" page 19*) can be reset and the controller thus returned to the delivery state.

The entire parameterization and evaluations etc. of the controller are irretrievably lost. Subsequently, a new start-up is necessary.

Power saving mode

7.21. Power saving mode "On

In power saving mode, the display backlight is switched off after 2 minutes without any key being pressed.

If a message is present, the backlight may not turn off until the message is queried by the user.

The power saving mode can be deactivated with **7.21. Power saving mode "Off",** so that the backlight of the display remains permanently on.
Before leaving the craftsman level, e.g. via **8.2. menu view "Simple"** (*see page 22*), you should go back to **Power saving** mode **"On"** must be changed, as this is not automatically reactivated.

Network

7.22. Network

The network settings of the connected data logger may have to be set.

CAN bus ID

7.22.2. CAN bus ID "???"

Here you take the ID of the controller to the CAN bus.

Sensor transmission interval

7.22.3. Sensor transmission interval "60s

The transmission interval defines how often the sensor and output values of the controller may be transmitted via CAN. If a value changes, it is sent and starts the interval. The next values are only sent when the interval has expired. If no value changes, nothing is sent.

If there are several controllers in the CAN network, a too short transmission interval can lead to an overload of the CAN network.

8. menu lock

```
┌─────────────────────────────────┐
│    Menüsperre verlassen          │
│                                  │
│ 8.1.Menüsperre         Aus       │
│ 8.2.Menüansicht   Experte        │
│                                  │
│  ▲        ▼            OK         │
└─────────────────────────────────┘
```

Menu lock
8.1. Menu lock "Off
      If the craftsman level is left, e.g. with **8.2. menu view "Simple",** setting automatically changes to
      8.1.Menu lock "On" and the end customer can no longer set function times.
      The end customer can only change the current time under **3.1.Time & date** *(see page15).*

Menu view
8.2. Menu view " ..."
      By changing from **"Expert"** to **"Simple"**, then confirming twice with "**OK**" and confirming with "**Yes**" at **"Save change?",** the deactivation of the craftsman level is enabled. (Or, the craftsman level deactivates itself after one hour).

You can access the craftsman level by pressing the rightmost key for at least 5 seconds. (*See "Craftsman level" on page 4*)

9. service values

```
┌─────────────────────────────────┐
│  9.1.        HCC-FRESH           │
│                                  │
│  9.2.           17975u           │
│                                  │
│  9.3. RC 1 Kontr.      --         │
│                                  │
│  ▲        ▼                       │
└─────────────────────────────────┘
```

In the event of a fault, they are used, for example, for remote diagnosis by the specialist or manufacturer.

> **❗**   Note the values at the time when an error occurs.

10th language

```
┌─────────────────────────────────┐
│     Sprache verlassen            │
│                                  │
│ 10.1.Deutsch                     │
│                                  │
│ 10.2.English                     │
│                                  │
│  ▲        ▼            OK         │
└─────────────────────────────────┘
```

To select the menu language. (German / English)

During the first start-up and in case of a longer voltage interruption, the query is carried out automatically.

Function overview

The functions described below are only available to a limited extent depending on the equipment and configuration of the DHW station.

> ⚠️ In case of desired changes to the assignment of relays with functions, the item "Relay functions" on page 19 must be observed!

Heating

Heating circuit 1

5.1.heating circuit 1

Operating mode
5.1.1.Operating mode " ... "

Heating: Automatic/normal operation (program 4 = **7.1.4.HK weather-compensated**)- *see page 8 ff.*) taking into account the operating times (day, comfort increase, night reduction).

Set point: Fixed flow temperature independent of outdoor temperature (program 3 = **7.1.3.HK controlled**)-see *page 8 ff.*). The desired flow temperature must be entered in menu **5.1.5.HzK Setpoint** (*see below*).

Setpoint progr: For **screed heating**. For the next 14 days, different fixed flow temperatures can be entered for each individual day under **5.5.Setpoint progr**.
After the 14 days have elapsed, the set temperature of the 14th day is used continuously until the operating mode is changed again.

> ⚠️ Set room controllers have no influence on the setpoint program!

Heating and cooling:
Cooling: ⚠️ The DHW station is not equipped for the use of these two operating modes !

S/W Day
5.1.3. S/W Day "18°C
Summer/winter changeover in daytime operation
If this value is exceeded at the outdoor sensor during the daytime operating hours, the controller switches off the heating circuit = summer mode.
When the outdoor temperature falls below this value, the heating circuit is switched on again = winter mode.

> ⓘ In addition to the operating times in normal daytime operation, this setting also applies to the times with activated comfort boost.

S/W night
5.1.4. S/W Night "12°C
Summer/winter changeover in night mode
If this value is exceeded at the outdoor sensor during the night operating times, the controller switches off the heating circuit.
= Summer operation.
When the outdoor temperature falls below this value, the heating circuit is switched on again = winter mode.

Heating circuit set point
5.1.5. HzK Setpoint "40.0°C
Manual default value for the set flow temperature.
(Only with **5.1.1.Operating mode "Setpoint"** (*see above*) with (program 3 = **7.1.3.HK controlled**)- *see page 8 ff.*)

Characteristic

5.1.6. Characteristic "0.8"   (Setting "Normal")

Type and slope of the heating characteristic curve

The characteristic curve is used to control the heat output of the heating circuit as a function of the outside temperature. The heat demand often varies greatly depending on the type of building/building insulation/heating design/outdoor temperature. Therefore, the heating system can be operated with a straight characteristic curve ("Normal" setting) or with a bent characteristic curve ("Split" setting).

If the "Normal" setting is selected, the characteristic curve is adjusted by means of the corresponding graphic in the controller. During the adjustment of the slope, the calculated flow temperature at -12 °C and the slope value at the top right (if it is always at the top right) are displayed as an aid.

If the "Divided" setting is selected, the characteristic curve is set in 3 steps by means of the corresponding graphic in the controller:
1. Outdoor temperature for slope change
2. Slope above outdoor temperature for change
3. Slope below outdoor temperature for change
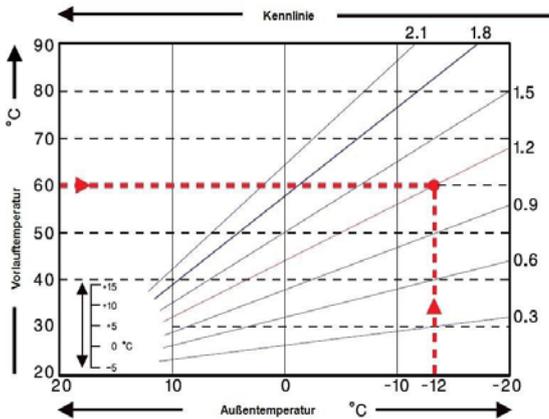
During the adjustment of the slope, the calculated flow temperature at -12 °C and the slope value at the top right (if it is always at the top right) are displayed as an aid. If the split characteristic is adjusted again, the query is made in reverse order.

The diagram opposite shows the influence of the selected characteristic slope (normal characteristic) on the calculated set flow temperature of the heating circuit. The correct characteristic curve is determined by setting the intersection of the calculated maximum flow temperature (= design temperature) at minimum outdoor temperature.

Example: Design temperature of the radiators 60 °C flow at lowest outdoor temperature according to heat demand calculation -12 °C. The intersection point in the example results in a slope of 1.2 as the set value.

Daily correction

5.1.7. Day Correct. "5.0°C"

Parallel shift of the characteristic curve

Day correction is used to perform a parallel shift of the heating characteristic curve during daytime operating hours, as it can happen that the building is not optimally heated with the set characteristic curve, depending on the outside temperature. If the characteristic curve is not optimized, the following situation often occurs: warm weather=room too cold/cold weather=room too warm. In this case, reduce the slope of the characteristic curve stepwise by 0.2 points and increase the day correction by 2 °C ... 4 °C increase

Night correction

5.1.8. Night Correct. "-2.0°C"

Parallel shift of the characteristic curve

The night correction causes a parallel shift of the heating characteristic during the night operating times. If a negative value is set for the night correction, the set flow temperature is reduced accordingly during the night operating times. Primarily at night, but also during the day when no one is in the house, the room temperature is thus lower and energy is thus saved.
Example: Day correction of +5 °C and night correction of -2 °C results in a set flow temperature reduced by 7 °C in night mode.

Comfort increase

5.1.9. Comfort approach "0.0°C

Parallel shift of the characteristic curve

The comfort increase is added to the daily correction and enables an alternative parallel shift of the heating circuit characteristic to achieve a quick heating and/or a higher temperature in the living space at a certain time.

Min. advance

5.1.10. Min. flow "15.0°C"

The set minimum flow temperature limits the heating characteristic and thus the set flow temperature of the heating circuit downwards. In addition, the minimum flow temperature is the set flow temperature for the frost protection function.

Max. Flow

5.1.11. Max. Flow "52.0°C

This value is used to limit the set flow temperature of the heating circuit upwards. If the heating circuit temperature nevertheless exceeds the set value, the heating circuit is switched off until the temperature falls below this value again. After 55 seconds have elapsed, flushing takes place for 5 seconds.

> ⚠️ It must be checked whether an additional limiting thermostat is to be provided on site (e.g. for underfloor heating) for safety purposes, which is connected to the pumps in series. (Safety temperature limiter)

Target/actual -

5.1.12. Setpoint/Actual- "-2.0°C"

Switch-on hysteresis for the additional energy source

This value defines the permissible undershoot of the heating circuit temperature to the calculated set flow temperature. If the heating circuit flow temperature falls below the set flow temperature by the value set here, the heat request is switched on with a delay of 1 minute.

> ❗ The heat request is only started when the flow temperature is continuously below the set temperature for 1 minute.

Building factor

5.1.18.Building factor "0

Depending on the selected factor, the outdoor temperature has an influence on the flow temperature calculation after the set delay.

0= Off, 1= 15 minutes, 2= 60 minutes, 3= 120 minutes, 4= 300 minutes

> ❗ In better insulated buildings, a higher building factor can increase comfort and help save energy.

Heating valve *step a valve*

5.1.25. Heating valve

This menu contains all settings concerning the motor-valve unit *step a valve of* the heating circuit.

Direction

5.1.25.1. Direction on="right

here the right closing direction of the valve can be changed.

One Time

5.1.25.2. On-time "1.0s

For this time period in seconds, the valve is controlled, i.e. opened or closed, before a
new measurement is taken to control the flow temperature.

Off factor

5.1.25.3. Off factor "1.0

A value can be set here by which the calculated pause time of the valve is multiplied. Thus, with a
value of 1, the normal pause time is used.
A value of 0.5 halves the pause time, 4 would quadruple the pause time.

Increase

5.1.25.4. Rise "0

In the event of a rapid rise in temperature, this value is added to the flow temperature so that the valve
counteracts more quickly. If the measured temperature does not rise any further, the measured value is used
again for the calculation. The temperature measurement takes place once per minute.

Valve running time

5.1.25.5. Valve running time "60s

Valve-specific setting of the running time in seconds that the valve may require for a full travel.

Signal type

5.1.25.7. Signal type "PWM

Control by means of a PWM signal.
Only available if the function is used on output V2. The used type of the device to be controlled must be set here.

Hot water

Hot water Tset

5.3.1. Tset "45°C

Set temperature at the hot water sensor.
The controller works with the requirement to adjust the setpoint temperature set here at the hot water sensor as quickly as possible and to keep it constant.

> ⚠️ Temperature values that are set too high can lead to scalding or system damage. Provide scalding protection on site!

Hot water Tmax

5.3.2. TMax "90°C" (> Tset +10)

Maximum temperature at the hot water sensor.
When the maximum temperature at the hot water sensor is exceeded, the DHW valve is closed. When the temperature falls below the set temperature, the valve is released again.

> ⚠️ Temperature values that are set too high can lead to scalding or system damage. Provide scalding protection on site!

Hot water priority

5.3.14. WW priority "Yes

Hot water priority = reduce heating when hot water is required.
With this selection, the heat output to the heating circuit is reduced during a hot water tap.

Hot water main flow

5.3.15. Main leader "S4

Temperature sensor for the primary flow

Cold water sensor

5.3.16. Cold water sensor "S3

Temperature sensor for cold water inlet

Hot water sensor

5.3.17. Hot water sensor "VT1

Temperature sensor for hot water

Valve delay

5.3.19. Valve delay "2.0s

Value in seconds, to reduce misinterpretation rate of values output by the flow sensor.

Hot water VFS type

5.3.20. VFS type "VVX15

Type of flow sensor or combined flow/temperature sensor.

Holding

Reservation   Tmin

5.4.1. Preservation Tmin "39°C   If the temperature falls below the set value of Tmin, the hold-off is started.

Prevent hysteresis

5.4.2. Derivative action hysteresis "1°C   Switch-off hysteresis for the derivative action.

Night setback

5.4.3. Night setback "On   Activates the night setback for the reserve.

Night setback times

5.4.4. Night setback   Setting the night setback for each day of the week.

Night setback Tmin

5.4.5. Night min "25°C   Setting of the minimum temperature during the night setback.

Night setback hysteresis

5.4.6. Night hysteresis "1°C   Switch-off hysteresis during night setback.

Preliminary supply Main supply

5.4.7. Primary flow "S4   Temperature sensor for the primary flow.

Screed heating program

5.5.setpoint progr.

This function can only be used after selecting *5.1.1.Operating mode "Setpoint progr.* (*see page 22*)!

> For the next 14 days, different fixed flow temperatures can be entered here for each individual day. After the 14 days have elapsed, the setpoint temperature of the 14th day is used continuously until the operating mode is changed again.

Circulation

5.6.Circulation

A circulation pump in the DHW station is switched on depending on the temperature and time release.

Tmin

5.6.1. Circ.Tmin "35°C

> If the value at the circulation sensor falls below this value and the circulation is enabled in time or there is a request by a tapping process, the circulation pump is started.

Hysteresis

5.6.2. Circ. Hysteresis "5°C

> If the circulation Tmin value is exceeded by the value set here, the circulation pump is switched off.

Circulation sensor

5.6.3. Circulation sensor "S2

> Select temperature sensor for circulation.

Blocking time

5.6.4. Locking time "10min

> To prevent the circulation pump from being switched on too frequently, a blocking time for restarting can also be set here. If the circulation pump has switched off, it can only start up again after the time that can be set here has elapsed.

Flushing time

5.6.5. Flushing time "1min

> If the previously selected temperature at the circulation sensor is not reached during operation of the circulation pump, even after the flushing time that can be selected here has elapsed, the pump switches off. This function is intended to protect against unnecessarily long operation of the circulation pump and to contribute to energy savings.

Circulation times

5.6.6. Circ. times

> **Release time for the circulation function**
> Here the desired periods are set, in which the circulation is released temporally. Three times can be entered per weekday, and individual days can be copied to other days. Outside the set times, the circulation is switched off.

Replace fuse

⚠	Repair and maintenance may only be carried out by a specialist. Before working on the device, switch off the power supply line and secure it against being switched on again! Check that no voltage is present!

⚠	Use only the enclosed spare fuse, or a fuse of the same design with the following specifications: 2AT / 250 V.

If the controller has no function and display despite the mains voltage being switched on, the internal device fuse may be defective.

First find the external source of error (such as actuators, pump, etc.), replace it and then check the device fuse.

To change the device fuse, open the device (*as described under "Installation" on page 11*), remove the old fuse, check it and replace it if necessary.

Only then put the controller back into operation and check the function of the switching outputs in manual mode (*as described under "Manual" page 16*).

Maintenance

❗	In the course of the general annual maintenance of your heating system, you should also have the functions of the controller checked by a specialist and, if necessary, have the settings optimized.

Carrying out maintenance:

- Checking the date and time (*See "Time & date" on page 15*)
- Review/plausibility check of the evaluations (*see "Evaluation" on page 14*)
- Checking the messages that have occurred (*See "Messages" on page 14*)
- Checking/plausibility check of the current measured values (*See "Measured values" on page 13*)
- Checking the switching outputs/consumers in manual mode (*See "Manual" on page 16*)
- Possibly optimization of the set parameters (**Only at the request of the customer**)

Possible messages

⚠ Warning/error message		ℹ New available info

Messages and notes for the professional

Sensor defective "X	Means that either the sensor, sensor input on the controller or the connecting cable is/or was defective (*see "Resistance table for Pt1000 sensors" on page 11*).
Restart	Means that the controller has been restarted due to a power failure, for example. Check **time & date**!
Clock & Date	This display appears automatically after a longer mains interruption because the **time & date** must be checked and adjusted if necessary.
Strong clocking	Means that within 5 minutes the relay has been switched on and off more than 5 times.
AL failed	Antilegionella Failed appears if not at least Antilegionella Tset -5 °C for the the set exposure time on the antilegionella sensor could be maintained. (*See "Antilegionella" on page 17*)

CAN bus

z.B. Regler 1   z.B. Regler 2   z.B. Regler 3   z.B. Regler ...

CAN-Verbindung: 2 Adern

Ein Außentemperatur-Fühler-Anschluss
für merhrere witterungsgeführte Regler.
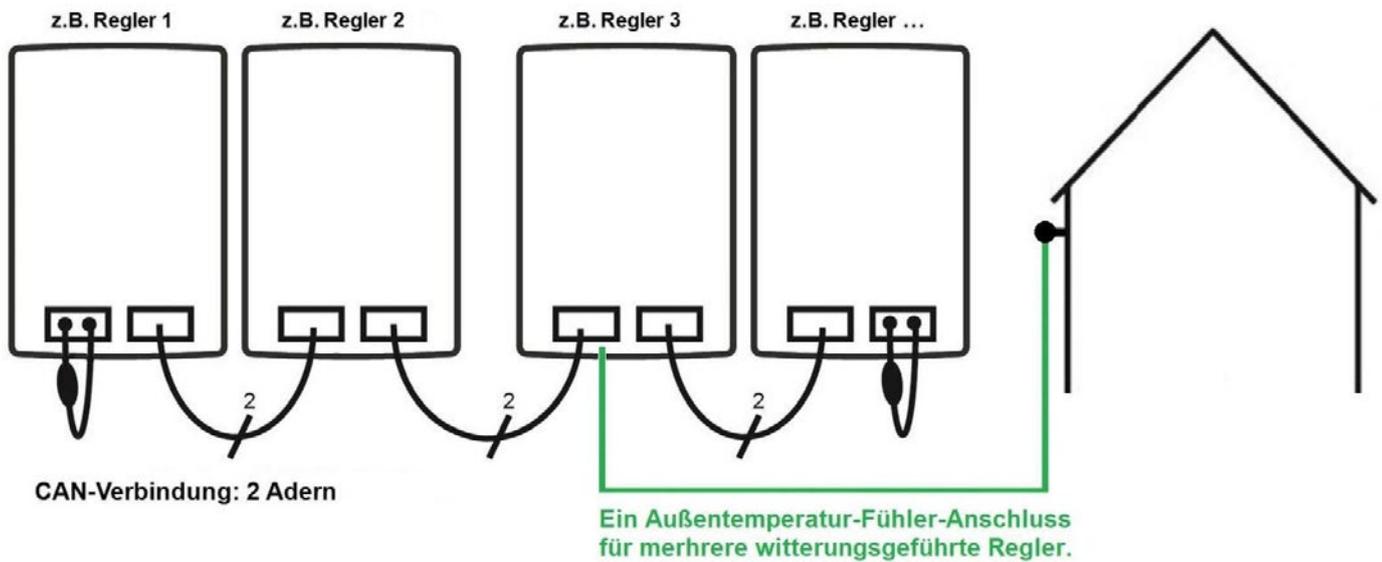
1. The controllers HCC Fresh *step a valve* are connected in series with the CAN bus cable.
2. The first and the last controller in this series connection must be provided with a terminating resistor.
3. The wiring of the two CAN sockets in the HCC Fresh *step a valve* controllers is arbitrary.
4. For cable lengths greater than 3 m, use a shielded twisted pair cable.
5. The maximum cable length of the entire system is 200 m.

Tips

In addition to current measured values and operating states, the service values also contain all settings of the controller. Write down the service values once after successful commissioning!

In case of uncertainties about the control behavior or malfunctions, the service values are a proven and successful method for remote diagnosis. Write down the service values at the time of the malfunction. Send the service value table by fax or e-mail with a brief description of the fault to the specialist or manufacturer!

Log the evaluations and data that are particularly important to you at regular intervals to protect against data loss.

Support

If errors occur with your device, please proceed as follows:
1. Read operating instructions
2. Check FAQ
3. Talk to installer/specialist
4. Contact your contact person (p.32) - have the following information ready:

What is the problem?	• Setup problem • Emerging problem • Change request
Serial number and production date of the station	
Software version (9.2.)	
Program (7.1.)	
Functions (5.1. to 5.6.)	
Accessories (e.g. room thermostats + software version)	
Sensor values of the probes (1.1. to 1.10.)	
Error messages/ frequency of error/ error description	
More hints	

Example of signal settings

0-5% Stop
5-20% Kabelbruchdetektion
25% Start
25-90% Regelbereich

Technical data PWM
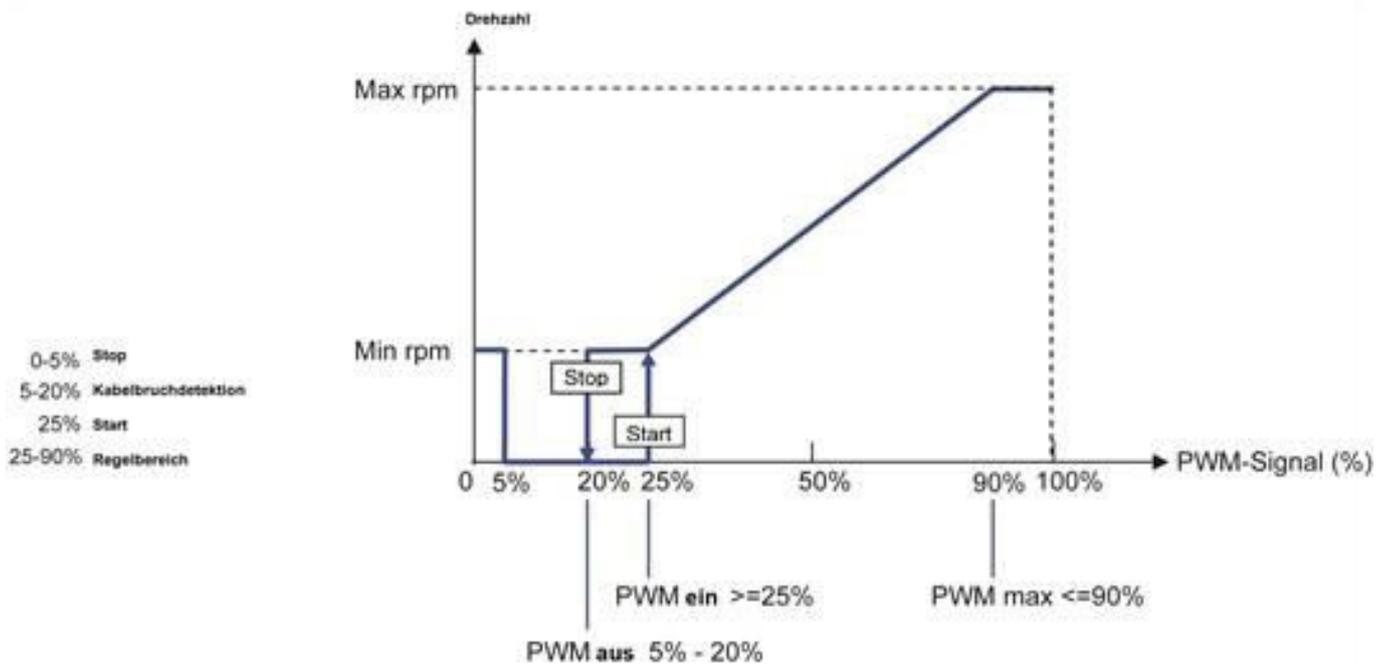
PWM: 20% bis 100%, 1kHz
Ausgelegt auf eine Bürde von
10K Ohm
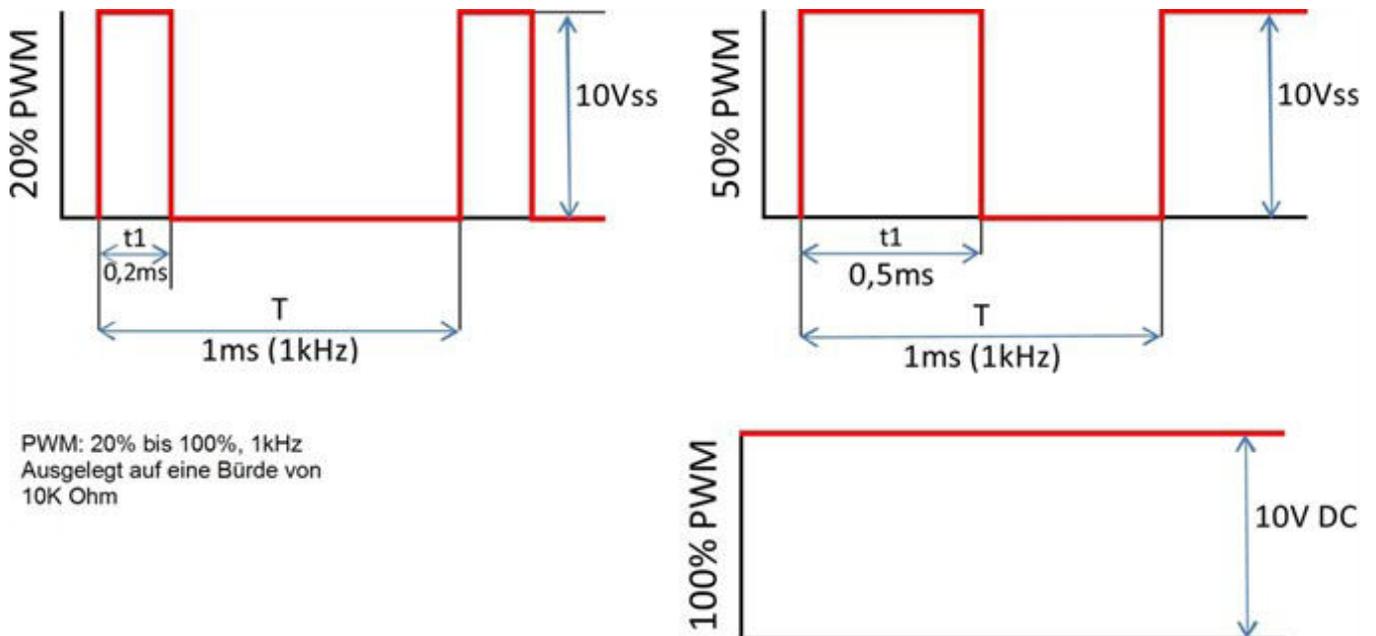
Final declaration

Although these installation and operating instructions have been prepared with the greatest possible care, incorrect or incomplete information cannot be ruled out. Errors and technical changes are reserved.

If anything is unclear, please contact a suitably trained specialist at the manufacturer of the DHW station with your questions

Date and time of installation:

Name of the installation company:

Space for annotations:

Your contact person:

HCC Fresh
step a valve
30.03.2021