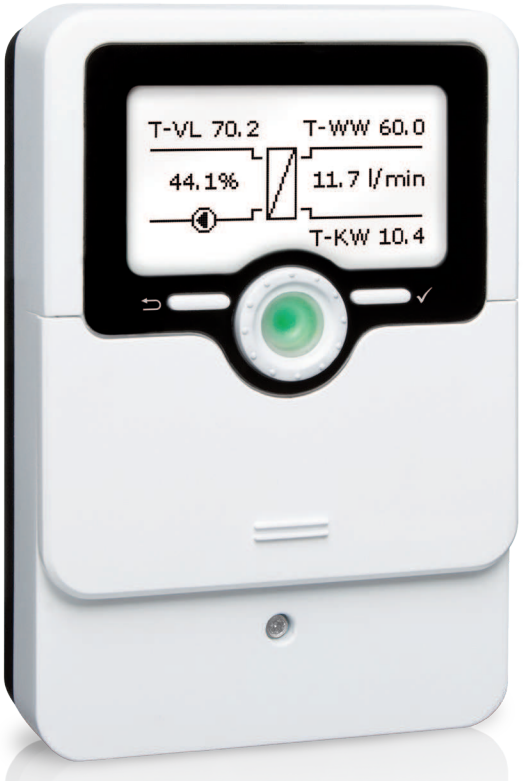
Made in Småland

Installation and Maintenance Manual

CTC EcoPack 2.0

Control unit

Software version 2.02



Translation of the original instructions.
Keep for future use.
Read carefully before use.

164 105 86-1 CR00953 2025-06-19

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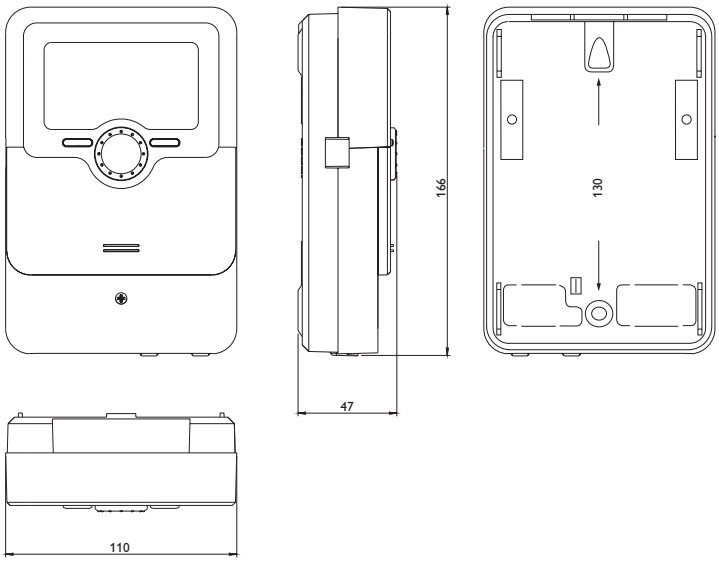
1. Overview

- Individual control of system with and without circulation circuit.
- Control of PWM pumps.
- Simple installation using start-up menu.
- Cascade connection of up to 4 units. CTC EcoPack 2.0.



Recycling

- The product packaging material must be disposed of in an environmentally correct manner.
- The product must not be disposed of together with standard waste at the end of its service life. Used products must disposed of in an environmentally correct manner by an approved body.

Information in this type of box [!] is particularly important for correctly installing and using the product.

Information in this type of box [i] is intended to help ensure that the product functions optimally.

2. Safety instructions

The installation should be preceded by an omnipolar safety switch according to overvoltage category III, which ensures disconnection from all electric power sources.

Turn off the power with an omnipolar switch before doing any work on the product.

The product must be connected to protective earth.

The product is classified as IP X1. The product must not be rinsed with water.

Never jeopardise safety by removing bolted covers, hoods or similar.

Service of the product's electrical system must only be carried out by a qualified electrician in compliance with the specific requirements of the national standard for electrical safety.

Replacement of damaged supply cable, must be carried out by the manufacturer or qualified service engineer to avoid risk.

The product must not be started if it is not filled with water; instructions are in the "Pipe installation" section.

This device can be used by children from the age of eight years and above and by people with reduced physical, sensory or mental ability or lack of experience or knowledge if they have been taught, either with supervision or with the instructions provided, how to use the device safely and understand the risks involved. Children should not play with the device. Cleaning and maintenance should not be carried out by children without supervision.

If these instructions are not followed when installing, operating and maintaining the system, CTC's commitment under the applicable warranty terms is not binding.

3. Technical data

Inputs:		
Temperature sensor:	6 units	PT1000 (4 CTC EcoPack units + 2 unit option)
Outputs: **3 relays and 2 PWM outputs, 1 relay for extra-low voltage.**		
PWM frequency:		512 Hz
PWM voltage:		11 V
Relay output (R1, R2, R3):		1 (1) A 240 V~ (solid state relay)
Relay output (R4):		1 (1) A 30 V
Total switching capacity:		4 A 240 V~
Power supply:		100–240 V~ (50–60 Hz)
Operating mode:		Type 1.B.C.Y
Nominal pulse voltage:		2.5 kV
Casing, plastic:		PC-ABS and PMMA
Use:		4 buttons and 1 settings dial (Lightwheel®)
General data		
Enclosure class:		IP 20/DIN EN 60529
Protection class:		I
Ambient temperature:		0 ... 40°C
Pollution degree:		2
Dimensions (depth x width x height) excl. packaging:	mm	110 x 166 x 47 mm
Other outputs		
Data interface: VBus®, cascade bus, MicroSD card slot:		
VBus® power supply:		60 mA

4. Installation

Do not use the unit if there is visible damage!

The control unit is equipped with 4 relay outputs that are used to control pumps, valves or similar:

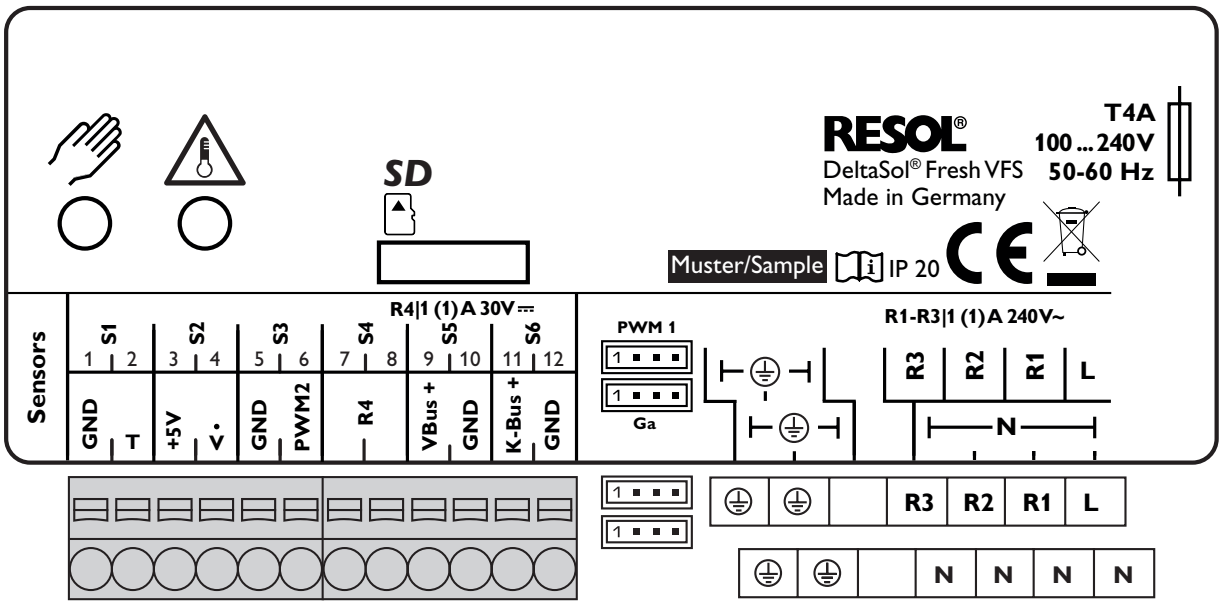
- Relay outputs R1–R3 are for 230 V ... 240 V.
- Neutral conductor N.
- Protective conductor (PE).
- Relay R4 is a potential-free relay for 30 V DC.

Depending on the product version, the mains cable and sensors will already be connected to the unit. If this is not the case, follow these steps:

- Connect **temperature sensor** with optional polarity to the terminals S1 to S6.
- Depending on the version, the volume flow sensor is connected either to the terminals T and/or Ga (analogue Grundfos Direct SensorTM).
- The terminals that are marked with **PWM** are control outputs for a high-performance pump.

NOTE!
The speed of the pump must be set to 100% when valves, for example, are connected.

5. Connection



Cascade

When installing a cascade, the following point also applies:

All CTC EcoPack 2.0s have a cascade bus for data communication with each other. Make the connection to the two terminals marked K-Bus (23/24) and note the polarity.

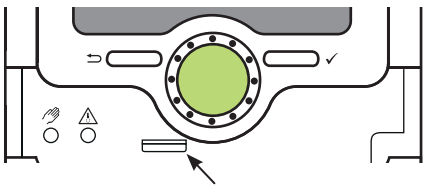
MicroSD card slot

The control unit has a microSD card slot.

The following functions can be performed with a microSD card:

- Saving measurement and balance data on the microSD card. Following transfer to a computer, the stored data can be opened and visualised with, for example, a spreadsheet program.
- Preparing settings and parameter mode on the computer and then transferring them to the control unit via the microSD card.
- Saving settings and parameter mode on the microSD card and retrieving them as needed.
- Downloading updates of the software from the Internet and uploading them to the control unit via the microSD card.

MicroSD card is not included in the scope of delivery.

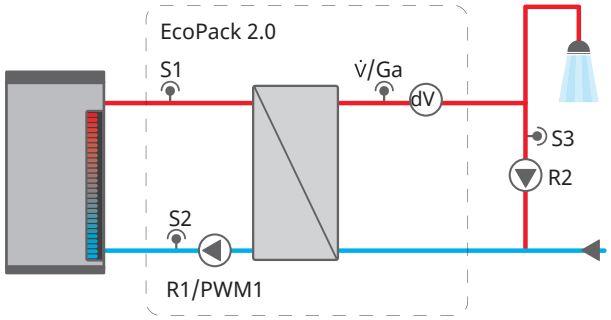


MicroSD card slot

NOTE!
MicroSD card is not included in the scope of delivery.

6. Overview of relay and sensor placement

Individual station (schematic diagram)

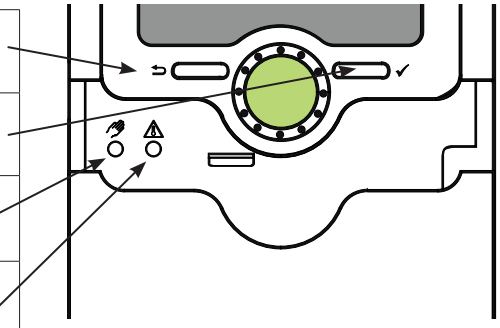


Component	Designation
S1 (1/2)	Temperature sensor for primary circuit
S2 (3/4)	Return sensor for primary circuit
S3 (5/6)	DHW circ. temperature sensor
S4 (7/8)	Not used
S5 (9/10)	Not used
V̇/Ga	Hot water sensor (temperature and flow).
R4 (19/20)	Relay output for alarm
VBus (21/22)	Not used
K-Bus (23/24)	Used in cascade connection (multiple EcoPacks)
PWM1	Circulation pump, primary circuit
R3	-
R2	DHW circ. pump
R1	Circulation pump, primary circuit

7. The control system — operation and function

7.1 Buttons and settings dial

	Left button	- Escape button to switch to previous menu
	Right button	- Confirm, select
	Micro switch 1	- Manual mode
	Micro switch 2	- Emergency mode



Settings dial — scroll up/down, increase settings values/reduce settings values

7.2 Micro switches for manual mode and emergency mode

The control unit has two micro switches which are accessed by sliding the controller down. Using these buttons, you can access the menus for holiday function and manual mode.

	Micro switch 1	- Manual mode. When "Micro switch 1" is pressed for a short period, the control unit switches to the menu for manual mode.
	Micro switch 2	- Emergency mode is activated with "Micro switch 2".

7.3 Control LED

Colour	Permanently lit	Flashing
Green	Everything in order	Note
Red		Malfunction/warning. The fault relay is active, manual mode is active
Yellow	Parameter mode active	Storage active

7.4 Parameter mode

When the installer's operator code is entered, the control unit moves to parameter mode.

- If you want to enter settings in the menu, press the "Right button". The control unit switches to the main menu, where settings can be made at installer level.
- If you want to save the settings, press "Micro switch 1" and hold it down for approx. 3 seconds or select the menu option to save in the main menu.
- To stop parameter mode and cancel previously entered settings, hold down the "Left button" for approx. 3 seconds.

Installation mode is completed and the control unit is restarted.

NOTE!
The control process is stopped in parameter mode, and the message **Control stopped — parameter mode active** is displayed. The LED in the dial lights up yellow.

7.5 Select menu option and enter values

During normal operation of the control unit, the main menu is displayed.

If no button is pressed within 2 minutes, the display will switch to standby. After a further 10 seconds, the lighting on the display will go out.

If you want to move from the status menu to the main menu, press the "Left button".

Press any button to reactivate the display lighting. To switch between menu options, turn the settings dial.

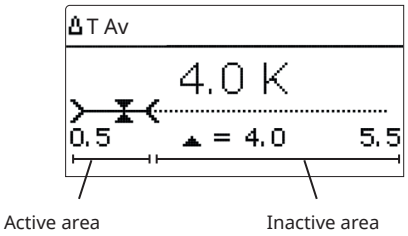
Values and options can be set in various ways:

Numeric values are set using a slider. The minimum value is displayed on the left and the maximum value on the right. The large number above the slider shows the current setting. The upper slider can be moved to the left and right using the settings dial.

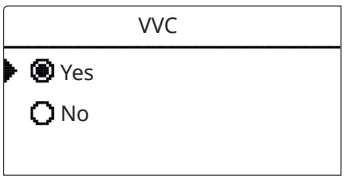
The large figure only displays the new value once the setting is confirmed with the "Right button". If the setting is confirmed again with the "Right button", the new value will be saved.

Once the maximum and minimum values have been set, the ability to enter settings will then be limited.

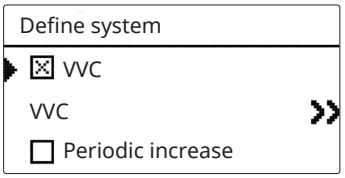
In this case, the active range of the slider is limited and the inactive range is displayed as a dashed line. The display of the maximum and minimum values adjusts to this limit.



If only one of several options can be selected, this is displayed using "radio buttons". Once an option is selected, the radio button will be marked.



If several options can be selected, they are displayed with check boxes. Once an option has been selected, an x will be displayed in the check box.



7.6 Set weekly schedule

Weekly schedule is used to limit operation of the function to specific days/times.

In the Select day of week menu, you can select days of the week.

Several days can be selected simultaneously.

The menu option Next is located on the bar below Sunday. If you select Next, you will move to the menu for setting a weekly schedule.

Add time window:

Select a New weekly schedule.

Set **start and stop** for the weekly schedule.

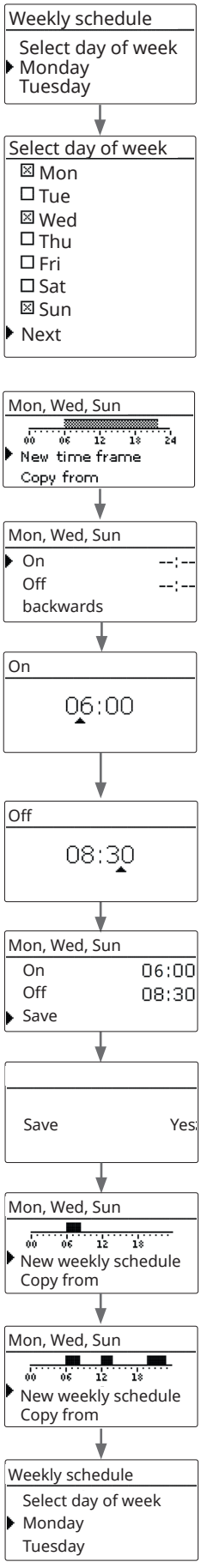
The time can be set in 10-minute increments.

To save the weekly schedule, select the menu option **Save** and confirm the query with **Yes**.

To add further to a weekly schedule, repeat the previous steps.

It is possible to set 6 time windows per day.

Press the "Left button" to return to selection of day.



Copy time window

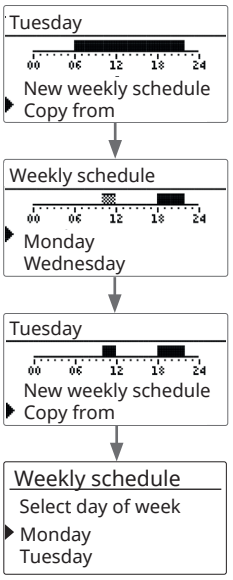
If you want to use a time window that has previously been created for another one or more days, proceed as follows:

- Select the day or days whose time windows are to be copied and select **Copy from**.

The days that have a time window are displayed.

- Select the day whose time window is to be copied.

The time window that was created for the selected day is confirmed. Existing time window is overwritten.

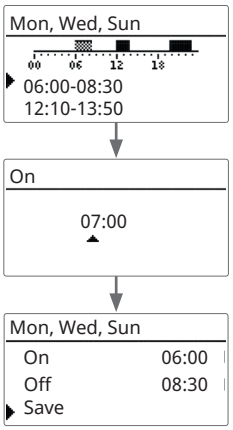


Change time window:

To change a time window, proceed as follows:

- Select the time window to be changed.
- Make the desired change.

- If you want to save a time window, select the menu option **Save** and confirm the query with **Yes**.

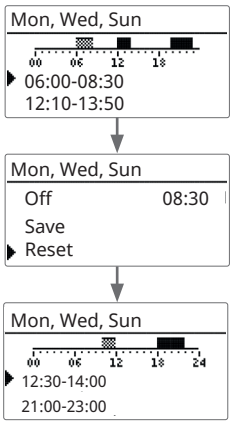


Remove a time window:

- To delete a time window, proceed as follows:

Select the time window to be removed.

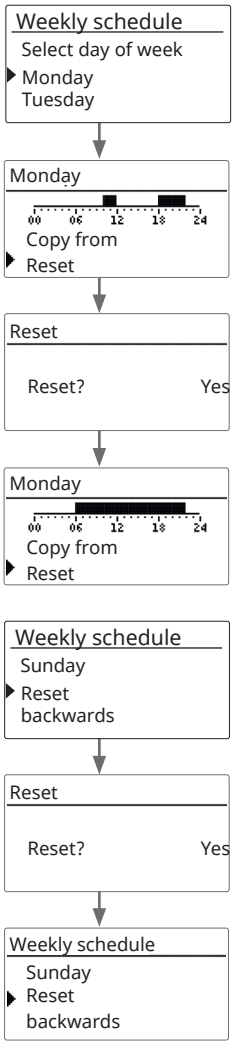
Select the menu option **Remove** and confirm the query with **Yes**.



Reset the timer:

To reset a previously set time window (day by day), proceed as follows:

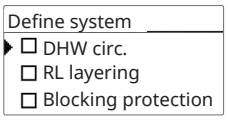
- Select desired day.
- Select **Reset** and confirm the query with Yes.



- Select desired day.
- Select **Reset** and confirm the query with Yes.

All settings that have been made for the timer are deleted.

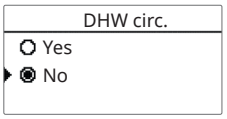
7.7 Define system

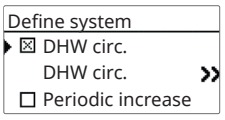


In the menu **Define System**, you can set optional functions.

- DHW circ.
- RL layering (not used)
- Blocking protection (function test)
- Comfort
- Periodic increase
- Fault relay

If you want to activate a function, select the desired function and confirm with **Yes**.





If a function has been activated, an **x** is displayed within the check box as well as a new menu bar with the icon ». If you select this menu bar, a submenu opens where you can make all the necessary settings. Save the settings by selecting **save** in the main menu or by holding down "Micro switch 1" for approx. 3 seconds.

If you want to remove a function, select the function in the menu **Define System** and confirm the query with **No**.

8. Commissioning

Once the heating and hot water system is filled and ready for operation, the control unit must be connected to the mains.

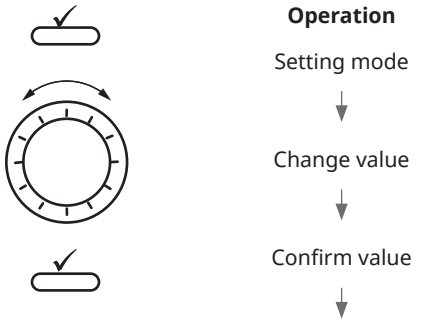
Also check that the power cable of the circulation pump is connected.

The control unit runs through a start-up phase when the settings dial lights up green.

During commissioning or after resetting the control unit, the commissioning menu will start after the start-up phase. The menu guides the user through the key settings to operate the system.

Commissioning menu

The commissioning menu consists of the steps described below. If you want to make a setting, change the desired value with the dial and confirm with the right button. Next step is displayed in the display.



8.1 Commissioning

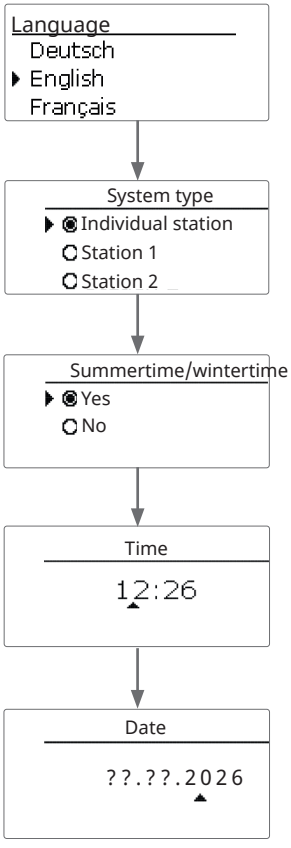
1. **Language:**
   - Select desired menu language.

2. **System type:**
   - Set the system type Individual station.

3. **Switching to summertime/wintertime:**
   - Activate or deactivate automatic switching between summertime and wintertime.

4. **Time:**
   - Set the current time. First set hours and then minutes.

5. **Date:**
   - Set the current date. First set the year, then the month and the day.



6. Temperature of hot water setpoint:

Set the desired temperature for the hot water.

7. Hot water circulation (DHW circulation):

- Activate or deactivate DHW circulation. When DHW circulation is activated, more menus are displayed:

> **DHW circ. temperature sensor S3 is required for all types of circulation.**

- Select circulation type.

Activate or deactivate the timer for DHW circulation.

> **No water draw-off may be performed during the adjustment time. All ball valves must be completely open (normal position).**

- Set the speed of the DHW circ. pump.
- Once the desired temperature difference is reached, confirm the setting with ✓ "Right button".

- Start the adjustment.

The current temperature difference between the hot water sensor and the return sensor is displayed as ΔT.

The optimal temperature difference is 5 K.

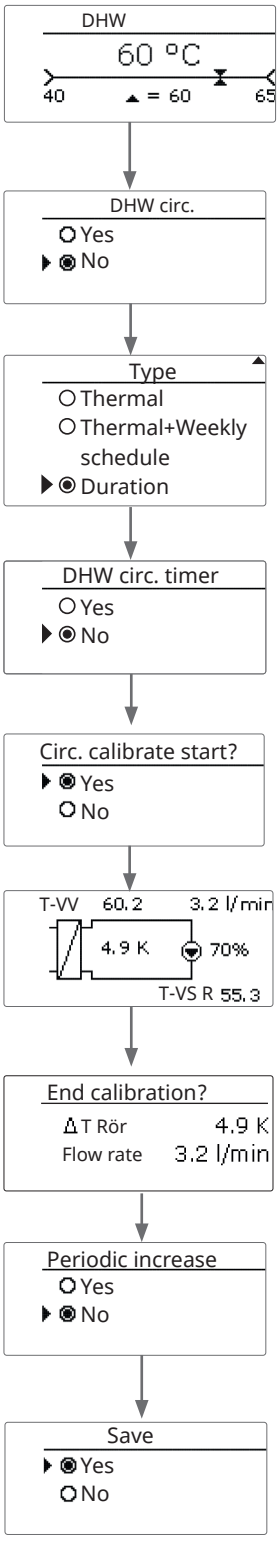
8. Periodic increase:

- Activate or deactivate periodic increase.

9. Leave the commissioning menu:

- If you want to save the settings, select the menu option Save. The control unit is now ready for operation and should enable optimal operation of the system with the factory settings.

The settings that have been made in the commissioning menu can be changed in the corresponding setting menu at any time after commissioning. Additional functions and options can also be activated and set.



> **Before handing over to the system operator, you must enter the user code (see chapter "User code").**

8.2 Cascade connection during commissioning

Station 1 is cascade master, stations 2 to 4 are cascade slaves. Menu settings must be performed in each control unit, starting in the cascade master (station 1). The settings for station 1 are automatically adopted by the other stations.

1.1.1 Cascade master

1. **Language:**
   - Set the desired menu language.

2. **System type:**
   - Set the system type Station 1.
   - Activate or deactivate additional stations in the cascade connection.

3. **Switching to summertime/wintertime:**
   - Activate or deactivate automatic switching between summertime and wintertime.

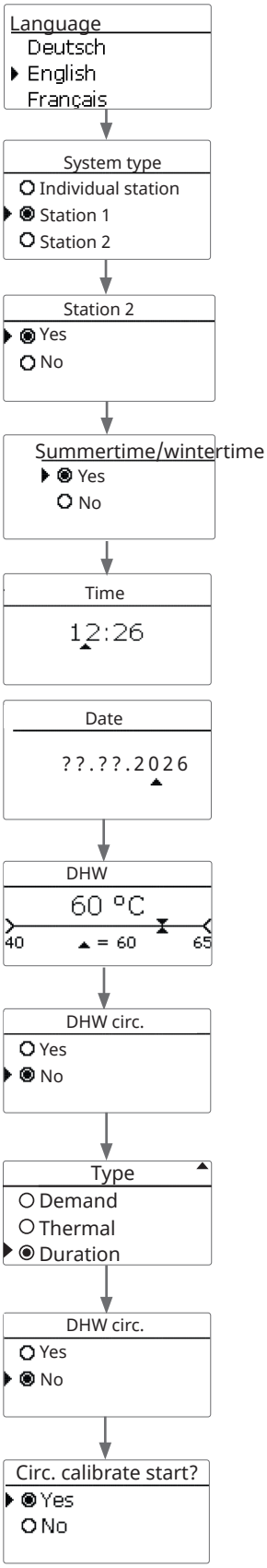
4. **Time:**
   - Set the current time. First set hours and then minutes.

5. **Date:**
   - Set the current date. First set the year, then the month and finally the day

6. **Setting hot water temperature:**

Set the desired hot water temperature.

7. **DHW circulation:**
   - Activate or deactivate DHW circulation. When DHW circulation is activated, more menus are displayed:
   - Select circulation type.
   - Activate or deactivate the timer for DHW circulation.



No draw-off may be performed during the adjustment time. All stations' ball valves must be completely open (normal position).

DHW circ. temperature sensor S3 is required for all types of circulation.

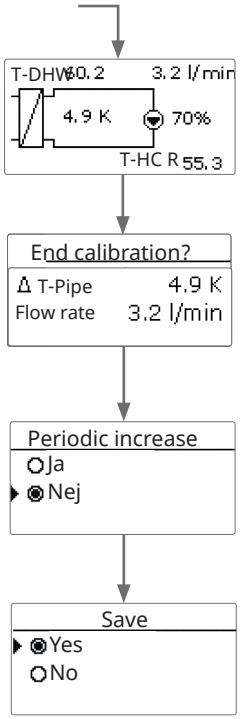
- Set the speed of the DHW circ. pump.
- Once the desired temperature difference is reached, confirm the setting with the "Right button". ✓
- Start the adjustment.

The current temperature difference between the hot water sensor and the return sensor is displayed as **ΔT.**

- The optimal temperature difference is 5 K.
- Confirm the setting with the "Right button". ✓

8. **Periodic increase:**
   - Activate or deactivate periodic increase.

9. **Leave the commissioning menu:**
   - If you want to save the settings, select the menu option Save. The control unit is now ready for operation and should enable optimal operation of the system with the factory settings.

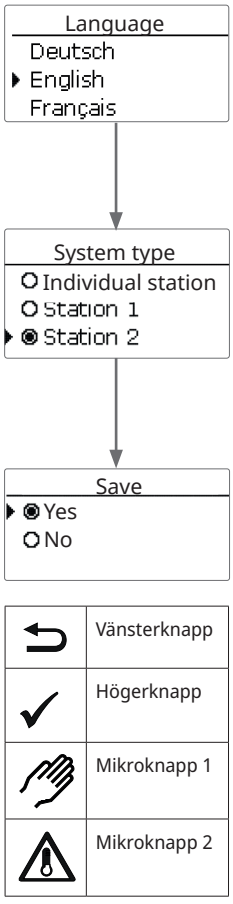


1.1.1 Cascade slaves

1. **Language:**
   - Set the desired menu language.

2. **System type:**
   - Set the system type Station 2.
   - Activate or deactivate additional stations in the cascade connection.

3. **Leave the commissioning menu:**
   - If you want to save the settings, select the menu option **Save**. The control unit is now ready for operation and should enable optimal operation of the system with the factory settings.
   - If other stations in the cascade connection have been activated, go through the commissioning menu for the corresponding stations (**station 3...4**).



The settings that have been made in the commissioning menu can be changed in the corresponding setting menu at any time after commissioning. Additional functions and options can also be activated and set.

Before handing over to the system operator, you must enter the user code (see chapter "User code").

9. Main menu

9.1 Main menu for Individual station

In this menu, the various menu sections can be selected. You can choose between the following menu sections.

Status
DHW
Define system
Basic settings
SD card
User code
Manual operation

If no button is pressed, the display will switch to standby after 2 minutes. After a further 10 seconds, the lighting on the display will go out.

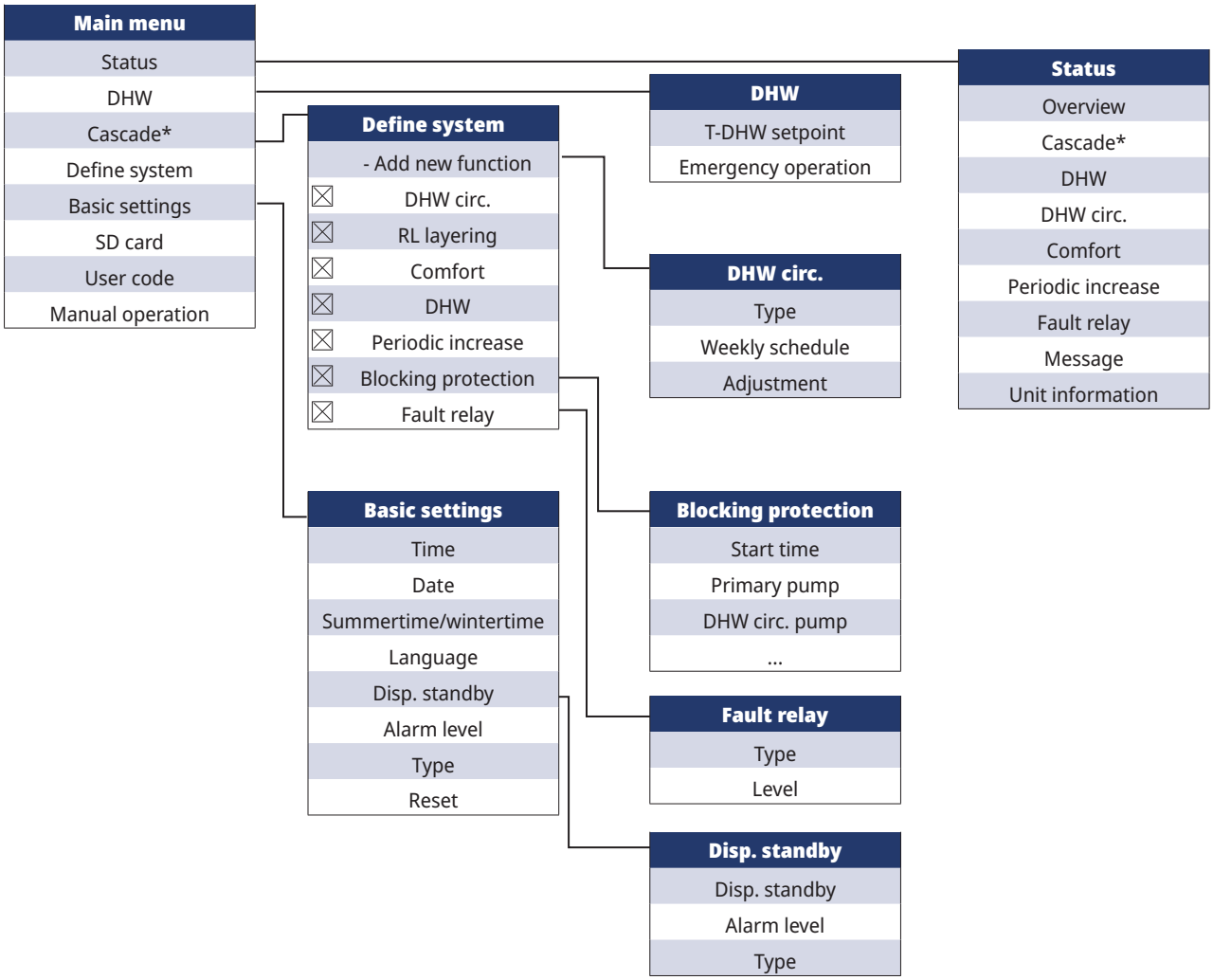
9.2 Main menu section 1

In this menu, you can select different information. The following objects can be selected in cascade mode:

Status
DHW
Cascade*
Define system
Basic settings
SD card
User code
Manual operation

In cascade mode, all settings are made on the cascade master (station 1). Stations 2–4 are cascade slaves and receive all information from the cascade master. Stations 2–4 are cascade slaves and receive all information from the cascade master, where all important settings are made. Abbreviated menus are available for the slaves.

9.3 Menu structure

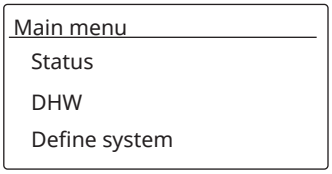


The available menu options and settings vary and depend on the settings that have already been made. To clarify the menu structure, the illustration only shows a sample section of the full menu.

* Only available with system type Station 1

10. Status

The status menu of the control unit contains status messages for each menu section.

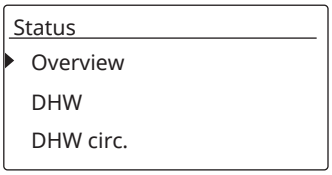


Summary values for the display

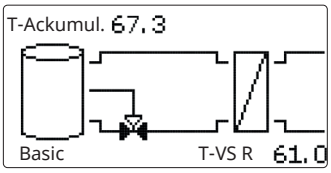
Display	Meaning
T-Accumulator tank	-
Lower/middle	-
T-HC R	Return flow temperature
T-FL	Flow temperature, primary circuit
T-DHW	Temperature for hot water
T-DHW setpoint	Temperature of the hot water setpoint
Flow rate	Flow rate hot water
Primary pump	Speed of pump, primary circuit
DHW circ. pump	Speed of circulation pump
Valve	Setting valve position

10.1 Status/Overview of an individual station

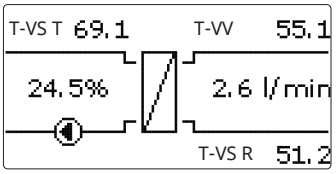
In the menu **Status/Overview**, all relevant measurement values are displayed with clear system graphics. Depending on the settings that have already been made, the system graphics are divided into three sections:

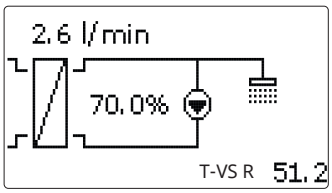


The first section shows the primary side with respective values.

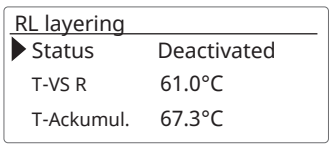


The second section shows the heat exchanger, and the third section shows the secondary side with respective values. To switch between the sections, turn the settings dial clockwise.



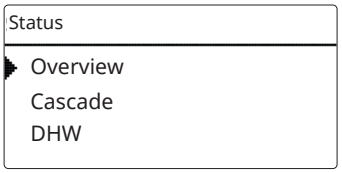


The information from the system graphics can also be displayed in text form.
Press on the desired section and press the “Right button”.
To return to the diagram, press the “Left button”.

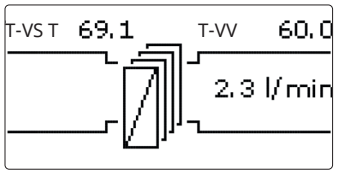


10.2 Status/Overview Cascade connection

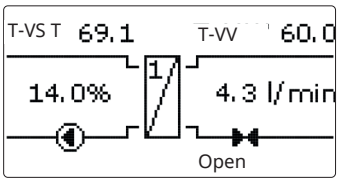
In the menu Status/Overview, the relevant measurement values for the respective station are displayed in a overview image.

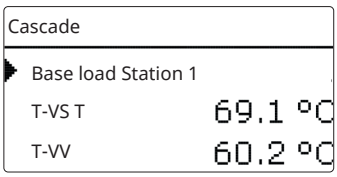


To display the values for the respective station, turn the settings dial clockwise.



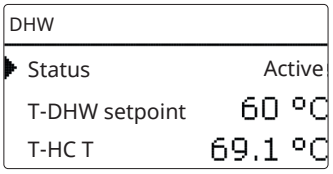
Information on the respective station can also be displayed in text form. To do this, press the “Right button”. To return to the diagram, press the “Left button”.





10.3 DHW

In the menu **Status/Domestic** hot water, the status for DHW heating is displayed.

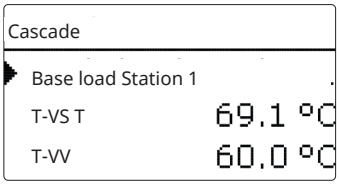


10.4 Cascade connection*

* Only available with system type Station 1

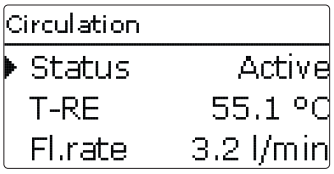
In the menu Status/Cascade, different items of status information for the cascade connection are displayed.

The overview displays the cascade connection’s highest temperatures and the total volume flow. To display the values for the individual stations, turn the dial clockwise and select the desired station.



10.5 DHW circulation

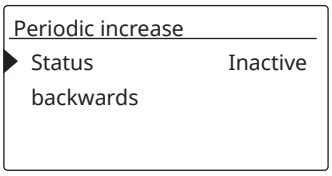
Status information for the function is displayed in the menu **Status/ Circulation.**



	Left button
	Right button
	Micro switch 1
	Micro switch 2

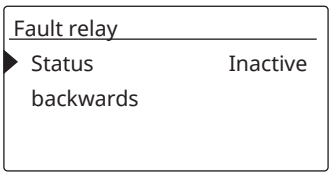
10.6 Periodic increase

Information on function status is displayed in the menu Status/Periodic increase.



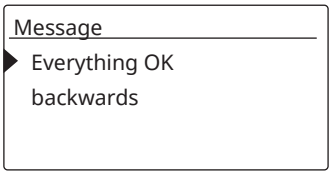
10.7 Fault relay

The menu Status/Fault relay displays whether the potential-free fault relay is active or inactive.



10.8 Message

In the Status/Messages menu, error and warning messages are displayed. In normal operation, Everything OK is displayed.



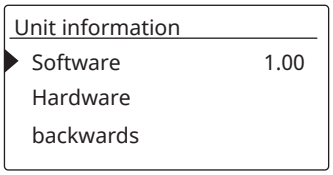
A short circuit or a wire breakage at a sensor input is displayed as a !sensor error. If an error occurs, the LED on the dial flashes red.

The messages are divided into comment (Note!), malfunction and warnings. A comment is used as a data carrier. In a malfunction, the corresponding function or station fails. In a warning, station 1 displays an error due to a station having failed.

Message	Category	Cause/meaning
!Blocking protection	Comment (Note!)	Blocking protection for an active output
!Manual operation	Comment (Note!)	At least one relay in manual mode
!Casc. settings.	Comment (Note!)!	The cascade configuration is not correct
!Control unit stopped	Comment (Note!)	Parameter mode active
!Control unit error type	Comment (Note!)	Different station variants are available
!DHW-deviation T	Comment (Note!)	Offset adjustment of the circulation has not been completed
!Date/time	Malfunction	Time update has failed
!T-HC R	Malfunction	The sensor is defective (wire breakage, short circuit or missing sensor)
!T-accumulator tank	Malfunction	
!T-VS T	Malfunction	
!T-DHW setpoint	Malfunction	
!Flow rate	Malfunction	
!Valve open	Malfunction	Flow detected at the station despite the fact there should be no flow
!Periodic increase	Warning	Return sensor circulation is absent
!Individual control	Warning	The cascade configuration is not correct
!Program updating	Warning	Different software versions in cascade connection are available
!Timeout station 1 ... 4	Warning	No K-bus signal present, station uneven
!Valve closed	Warning	No flow at the station
!DHW emergency mode operation	Warning	Emergency function active
!Circulation pump	Warning	No volume flow measured despite circulation pump being active

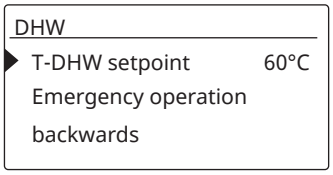
10.9 Information about the unit

The menu **Status/unit info** displays information on hardware and software.

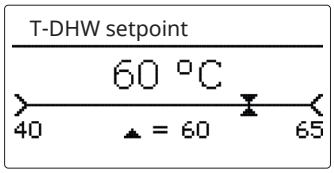


11. DHW

All settings for DHW heating are made in this menu. The following parameters and functions are available:



- Temperature of the hot water setpoint
- Emergency mode



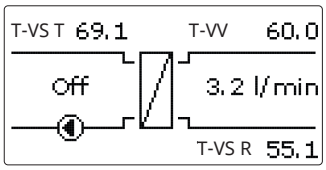
Temperature of the hot water setpoint
Main menu/Hot water/T-DHW setpoint

Menu	Meaning	Setting range/ Off option	Factory setting
T-DHW setpoint	Temperature of the hot water setpoint	40 ... 65°C	60°C

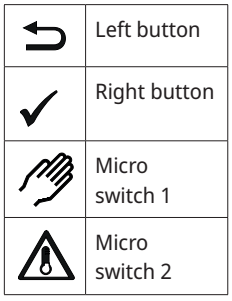
This parameter is used to set the **setpoint temperature of the hot water** that must be reached at the hot water sensor. The control unit then adjusts the speed of the primary circuit's pump so that the temperature at the hot water sensor on the secondary side permanently maintains the desired temperature that is required for the hot water setpoint.

Emergency operation
Main menu/Hot water/Emergency operation

Emergency operation is used to ensure water heating even if there is an error at the sensor. In this case, the primary circuit's pump runs permanently at the adjustable emergency speed. The speed during emergency operation must be adjusted to the resulting hot water temperature. The T-DHW display menu enables this to be set directly in the menu for setting emergency operation as soon as emergency operation has been activated.



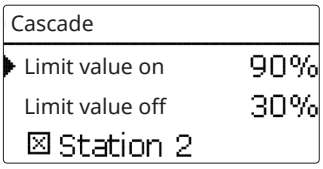
- To set the speed in emergency operation, turn the settings dial and confirm the setting with the "Right button".



NOTE!
If there is a sensor error that prevents heating of the hot water, activate emergency operating mode in the settings menu for emergency operation.

NOTE!
In cascade operation, emergency operating mode can be activated individually for stations 1–4.

12. Cascade connection



The Cascade menu is only available if the **system type Station 1** has been selected.

Menu	Meaning	Adjustment range/option	Factory setting
Limit value on	Limit value to activate next station in the cascade connection.	84 ... 100%	90%
Limit value off	Limit value to shut down the last connected station in the cascade connection.	0... 42%	30%
Station 2	Option Station 2 in the cascade connection		
Station 3	Option Station 3 in the cascade connection		
Station 4	Option Station 4 in the cascade connection		
back			

Main menu/Cascade

The parameter Limit value on defines the percentage by which the station's maximum flow rate must be exceeded to activate the next station. The parameter **Limit value off** defines the percentage by which the maximum flow must fall short before the last station is deactivated. If you want to prevent an additional station being activated and deactivated too often, you can reduce the **Limit shut-off** value.

The parameters **Station 1** to **Station 4** are used to select the number of stations in a cascade connection.

In cascade operation, all settings are made on the cascade master (station 1). Stations 2–4 are cascade slaves and receive all information from the cascade master, where all important settings are made. There are abbreviated menus for the slaves.

13. Optional functions

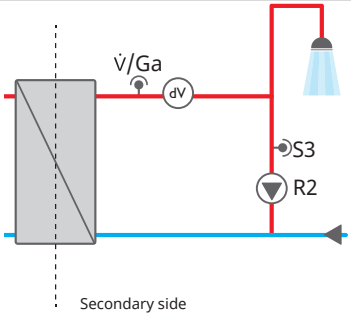
In this menu, optional functions can be selected and set.

DHW circ.
Type Duration
☐ Weekly schedule
Adjustment

DHW circulation

Main menu/Select functions/DHW circulation

Menu	Meaning	Setting range/ option	Factory setting
DHW circ.	Activation of the function	Yes, No	No
Type	Variant	Thermal+Demand, Thermal, Duration, Off	Duration
Weekly schedule	Option for weekly schedule	Yes, No	No
DT On	Temperature at connection	10 ... 59°C	40°C
DT Off	Temperature difference at shut-off	2 ... 4 K	3 K
Duration	Operating time circulation pump	01:00 ... 15:00 min	03:00 min
Pause time	Pause time circulation pump	10 ... 60 min	30 min
Adjustment	Calibration of the circulation pump	-	-
Start adjustment	Start the adjustment		
End adjustment	End the adjustment		
DT Pipe	Display of the temperature drop between the hot water sensor and the return sensor	-	-
Flow rate	Display of saved data flow rate	-	-
back			



Perform adjustment:

NOTE!
No draw-off may be performed during the adjustment time.
The stations' ball valves must be completely open (normal position).
The adjustment only needs to be done once, e.g. at commissioning.

- To make the adjustment, select the parameter **Adjustment**.

The DHW circulation function is used to adjust and control a circulation pump. There are 5 variants available for the control logic:

- Thermal
- Sustained
- Demand
- Off
- Thermal+Demand

NOTE!
DHW circ. temperature sensor S3 is required for all types of circulation.

When one of the variants is selected, the relevant setting parameters are displayed. Each variant has a timer that makes it possible to set a weekly schedule for the function. The variants function in the following way within the established time interval:

Thermal
The temperature at the return sensor is monitored. The circulation pump starts when the temperature falls below the set start temperature. If the connection temperature is exceeded by the temperature difference for shut-off, the circulation pump is turned off.

Duration
The circulation pump starts within the set time interval and is turned off outside the set time interval.

Demand
When a draw-off pulse (tapping 1–4 s) is registered, the volume flow sensor turns on the control unit on the circulation pump. The circulation pump then remains on during the set operating time. If the circulation pump has been in operation and the operating time has expired, all further tapping impulses during the pause time are ignored and the circulation pump remains turned off.

Off
The circulation pump is turned off.

Thermal + Demand
The temperature at the return flow sensor is monitored. The circulation pump starts when the temperature falls below the set start temperature and a draw-off pulse (tapping 1–4 s) is registered at the volume flow sensor. The circulation pump then remains on during the set operating time. If the connection temperature is exceeded by the difference between the connection temperature and the disconnection temperature during this period, the circulation pump turns off. If the circulation pump was turned on and the operating time has expired, all further tap impulses during the pause time are ignored and the circulation pump remains turned off.

NOTE!
In cascade mode, only the types Duration, Thermal and Off are available.

Calibration of the circulation pump

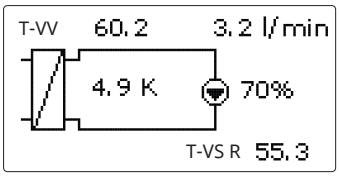
The temperature difference between the hot water sensor and the return sensor can be reduced by increasing the speed of the circulation pump. The current temperature difference between the hot water sensor and the return sensor is displayed as **ΔT.**

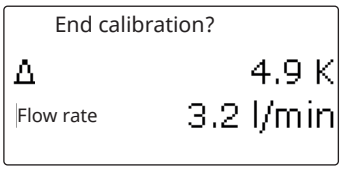
The optimal temperature difference is 5 K.

- Select the menu option Calibration.
- If you want to start calibration, select Start calibration.
- Set the speed of the circulation pump.
- Once the desired temperature difference is reached, confirm the setting with the "Right button". ✓

The menu **End calibration?** is displayed.

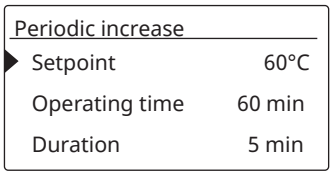
- Confirm the setting with the "Right button". ✓





↩	Left button
✓	Right button
	Micro switch 1
	Micro switch 2

Periodic increase



Main menu/Select functions/Periodic increase

Menu	Meaning	Setting range/option	Factory setting
Periodic increase	Activation of the function	Yes, No	No
Start	Manual start of periodic increase		
Setpoint temp.	Set temperature of periodic increase	60 ... 75°C	60°C
Operating time	Operating time of periodic increase functions	30 ... 240 min	60 min
Duration	Duration of periodic increase	1 ... 240 min	5 min
Hysteresis	Hysteresis for periodic increase	1 ... 5 K	5 K
Off delay	Pump off delay	1 ... 60 min	10 min
Time	Time of automatic start of periodic increase	00:00 ... 23:59	01:00
Monday ... Sunday	Selection of days for automatic start of periodic increase	Monday ... Sunday	all
back			

This function is used to prevent the spread of Legionella in the hot water and circulation lines of the secondary circuit of the heat exchanger. **Periodic increase** starts automatically when **the Time has** been reached. The function can also be started manually via the menu option **Start?** When the periodic increase starts, the circulation pump starts. The circulation pump remains turned on during the settable **operating time**.

The speed of the pump of the primary circuit is controlled during the periodic increase so that the **set temperature** is maintained at the hot water sensor. The progress of the periodic increase is displayed in % in the status menu. The periodic increase is successful if the temperature at the return sensor has exceeded the setpoint for **temperature — hysteresis value for the set time** without interruption within the set operating time. The date of the most recent disinfection is displayed in the status menu.

Once disinfection has finished, the circulation pump will remain on during the set off delay. If disinfection is active, it can be interrupted at any time using the menu option Cancel?

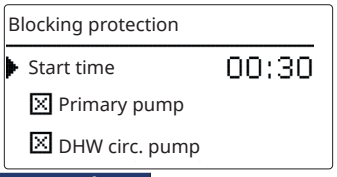
WARNING!!
If the set temperature is higher than 60°C, there is a risk of scalding.
Ensure that no draw-off of water occurs during the periodic increase.

NOTE! A sufficiently high temperature must be guaranteed in the storage tank during periodic increase.
Ensure that the accumulator tank is sufficiently heated before periodic increase is started.

NOTE! In cascade mode, the operation is allocated between the individual stations, starting with the numerically lowest station. The periodic increase is only considered to be completed once all existing stations have undergone periodic increase.

NOTE! The periodic increase function is only available if the circulation function is activated.

Blocking protection



Main menu/Options/Blocking protection/Function test

Menu	Meaning	Setting range/option	Factory setting
Blocking protection	Activation of the function	Yes, no	No
Start time	Start time of the function	00:00 ... 23:50	00:30
Primary pump	Blocking protection for pump, primary circuit	Yes, no	Yes
Valve*	Valve for blocking protection	Yes, no	Yes
DHW circ. pump	Blocking protection, circulation pump	Yes, no	Yes
back			

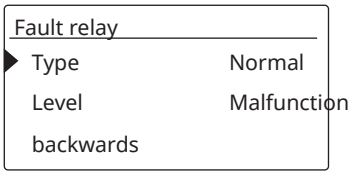
* Only available with the system type Station 1

The **Blocking protection** function is used to prevent the selected pumps and valves from stopping after an idle period. The Blocking protection is performed successively for the selected relays each day at the set **start time**.

NOTE!
In cascade mode, the Blocking protection is performed for all stations successively.

Fault relay

Main menu/Options/Fault relay



Menu	Meaning	Setting range/option	Factory setting
Fault relay	Activation of the function	Yes, no	No
Type	Type of fault relay	Inverted, Normal, Off	Off
Level	Error category of the message	Malfunction, Warning, Comment	Malfunction
back			

The **Fault relay function** is used to connect a relay in the event of error. For example, a signal transmitter can be connected to report an error.

If the **Normal** type is selected, the control unit switches on the potential-free relay when there is an error. If the **Inverted** type is selected, the relay is always switched on when there is no error. If an error occurs, the control unit turns off the potential-free relay.

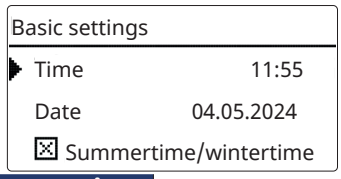
The error category of the message can be selected using the parameter **Level**. The subsequent message is reported according to the selection:

Malfunction = Malfunctions

Warning = error + warnings

Comment = error + warnings + comments

14. Basic settings



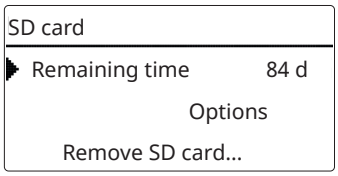
Main menu/Basic settings

Menu	Meaning	Setting range/option	Factory setting
Time	Time setting	00:00 ... 23:59	-
Date	Setting of date	01.01.2025 ... 31.12.2099	01.01.2025
Summertime/ wintertime	Automatic time change	Yes, no	Yes
Language	Choice of language in the menu	Swedish, English, German	German
Type	System type of the control unit	Individual Station, Station 1, Station 2, Station 3, Station 4	Individual Station
Reset	Back to factory settings	Yes, no	No
back			

In the **Basic settings** menu, all basic parameters for the control unit can be set. Normally, these settings will have already been made in the commissioning menu. They can be changed here later.

NOTE!
In cascade operation, one reset of the respective control unit can be performed per cascade.

15. SD card



The control unit has an SD card slot for a standard SD card. The following functions can be performed with an SD card:

- Registering measurement and balance values. Once the saved values have been transferred to a computer, they can be opened and visualised using a spreadsheet program, for example.
- Saving settings and parameters on the SD card and resetting them as required.
- Installing firmware updates on the control unit:

  Firmware updates are available as a ZIP file.

  Extract the file to the SD card.

	Left button
✓	Right button
	Micro switch 1
	Micro switch 2

Install firmware updates

- When the SD card that contains a firmware update is inserted, the message Update (display)? is displayed.
- To update, select **Yes** and confirm with the "Right button". ✓

The update happens automatically. **Please wait** and a progress indicator are displayed on the display. Once the update is finished, the control unit restarts automatically and goes through a brief initialisation phase.

NOTE!
Do not remove the card until the initialisation phase is completed and the main menu of the control unit can be displayed again!

- If no update is to be performed, select **No**. The control unit starts normal operation.

NOTE! The control unit only recognises updates of the firmware if they are stored in an ECOPACK folder on the first level of the SD card.

Create an ECOPACK folder on the SD card and unzip the downloaded ZIP file in this folder.
NOTE! If the update prompt is not displayed, the path to the folder might not be correct!
In this case, check the path: ECOPACK folder where the relevant update file is located.

Start logging

- Insert the SD card in the adapter.
- Set the recording type and recording interval. The recording starts immediately.

Stop logging

- Select the menu option **Remove card**.
- Remove the card from the card slot when "Remove card" is displayed.

If **Linear is set** in the menu option, data logging ends the logging once the capacity limit is reached. The message Card is full is displayed. Using the **Cyclic** setting, the oldest data on the card is written over as soon as the capacity limit is reached.

NOTE! The remaining recording time does not reduce linearly with increasing data volume. The amount of data does not increase at a regular rate and the type of data (e.g. additional information or metadata) may also be changed. This may affect the remaining recording time.

Save settings for the control unit

- If you want to save the control unit settings on the SD card, select the menu option **Save settings.**
- **Wait** will be displayed during saving, followed by the message **Ready!** The control unit settings are saved in a .SET file on the SD card.

Settings for the control unit

- If you want to load the settings for the control unit from an SD card, select the menu option Load settings. The file selection window is displayed.
- Select the desired .SET file. Wait is displayed during loading, followed by the message Ready!

NOTE! To remove the SD card safely, always select the menu option Remove card first.

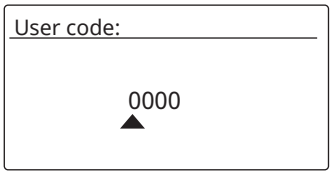
NOTE! In cascade mode, the SD card menu is available for each control unit. If you want to register the values in a cascade or save or load settings for a control unit, insert an SD card into each control unit in the cascade connection.

Main menu/SD card

Menu	Meaning	Setting range/option	Factory setting
Remove the SD card...	Remove the card safely	-	-
Save settings	Save settings	-	-
Load settings	Load settings	-	-
Log interval	Log interval	00:01 ... 20:00 (mm:ss)	01:00
Log type	Log type	Cyclic, linear	Linear
back			

16. User code

A **user code** can be entered in the menu User code. Each digit in the four-digit code must be entered and confirmed individually. Once you have confirmed the last digit, you will automatically jump to a higher menu level.



To access the menu sections at installer level, you must enter the installer's operator code:

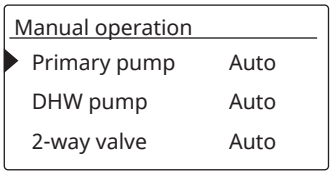
Installer: 0262 Customer code: 0000

Once the installer's user code has been entered, the control unit changes to parameter mode.

NOTE!
For security reasons, the user code must generally be set to the customer's code before the control unit is handed over to the customer!

17. Manual operation

In the menu for **manual mode**, the operating mode for all relays used can be set.



Auto = Relay in automatic mode

0 ... 100% = The pump is run at the set speed (manual operation)

Middle/bottom = Valve in set mode

Open/close* = The valve is open or closed

Error/OK = Fault relay in **error** or **OK mode**

NOTE! After having performed service and maintenance work, the operating mode must be reset to Auto. Otherwise, normal operation is not possible.

Main menu/Manual mode

Menu	Meaning	Setting range/option	Factory setting
Primary pump	Selection of operating mode for the primary pump	Auto, 0 ... 100%	Auto
Valve*	Selection of operating mode for the valve	Auto, Open, Closed, Off	Auto
Circulation pump	Selection of operating mode for the circulation pump	Auto, 0 ... 100%	Auto
Fault relay	Selection of operating mode for the fault relay	Error, OK, Auto	Auto

* Only available in cascade mode

NOTE!
In cascade mode, you set the manual operation of the relays for the respective station.

18. Troubleshooting

If an error occurs, a message is displayed in the control unit display.

- The settings dial flashes red.
- Sensor error. In the corresponding sensor display channel, a temperature is displayed instead. The message !Sensor error is displayed.

Short circuit or wire breakage.

- **A disconnected temperature sensor can be checked with a resistance meter and has the resistance values that are displayed below at corresponding temperatures.**

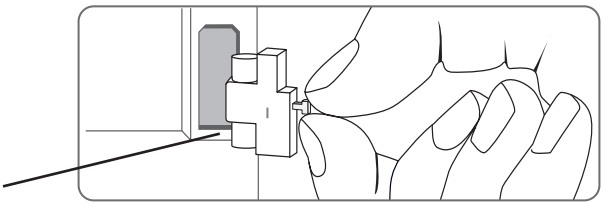
Resistance PT1000

Temperature °C	Resistance Ω	Temperature °C	Resistance Ω
-10	960	60	1232
0	1000	70	1271
10	1039	80	1309
20	1077	90	1347
30	1116	100	1385
40	1155	120	1461
50	1194	140	1535

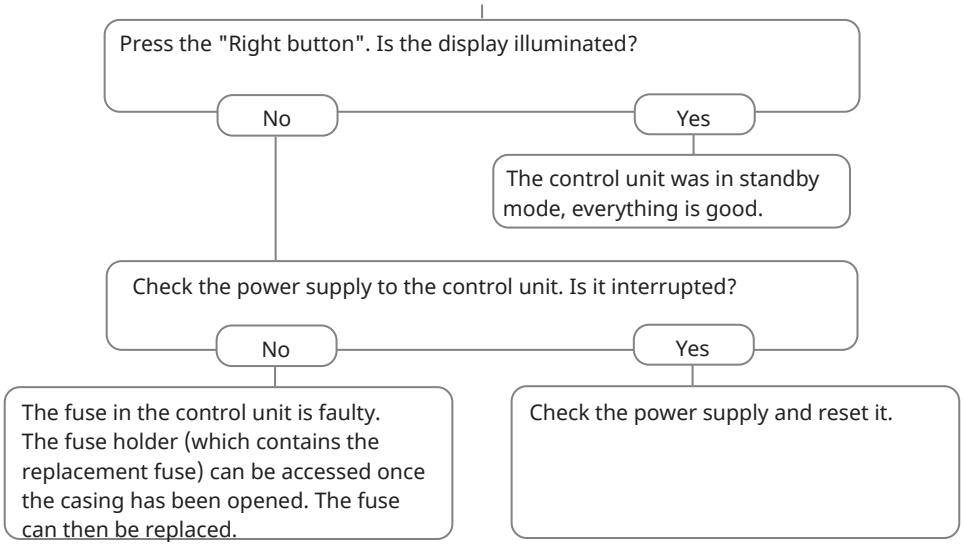
WARNING!!
When the casing is open, live components are exposed!

- Always disconnect the unit from the mains power at all terminals before opening the casing!

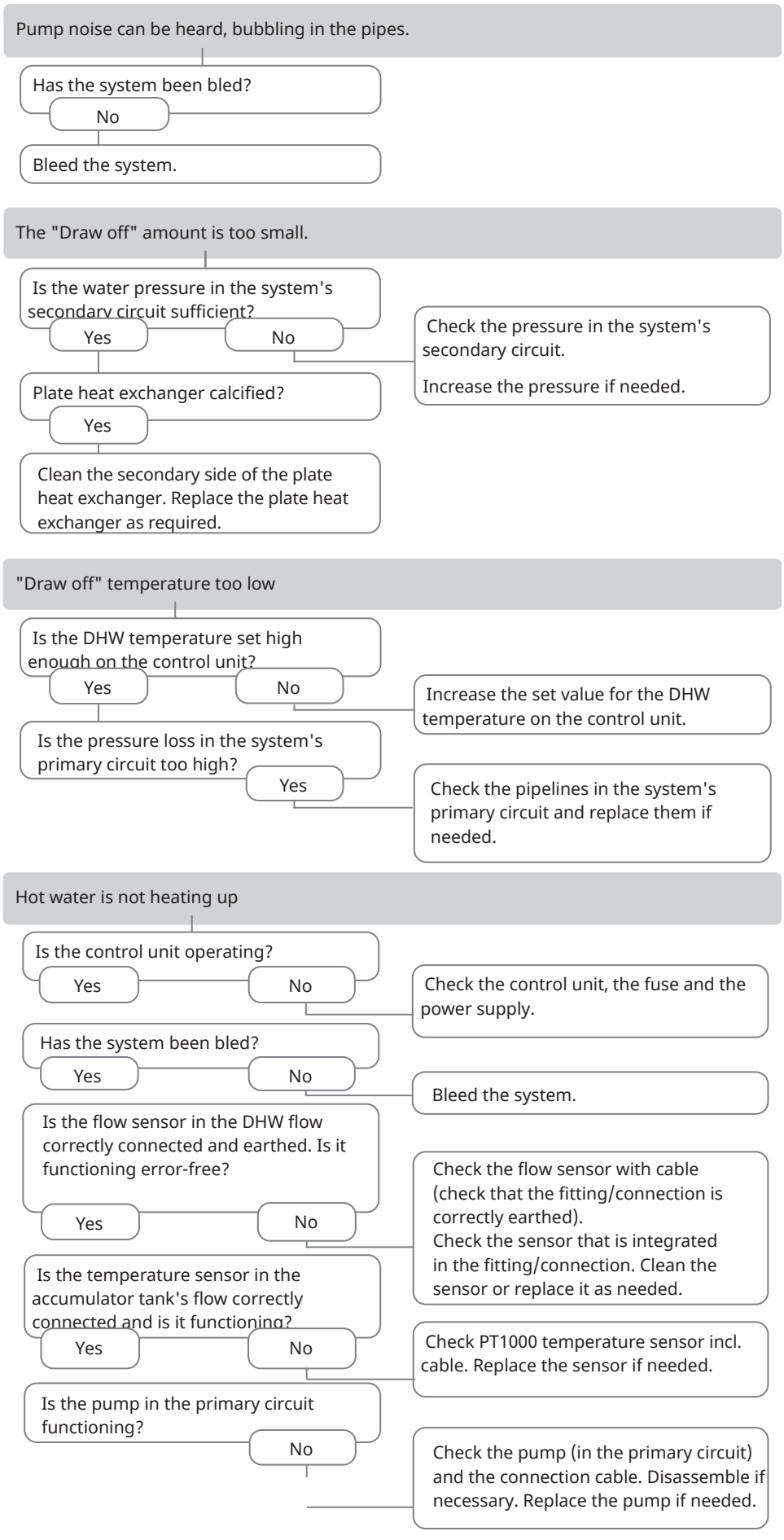
Fuse



The control unit is protected by a fuse. Once you have removed the cover, you will access the fuse holder, which also contains the replacement fuse. To replace the fuse, pull the fuse holder forwards out of the socket.



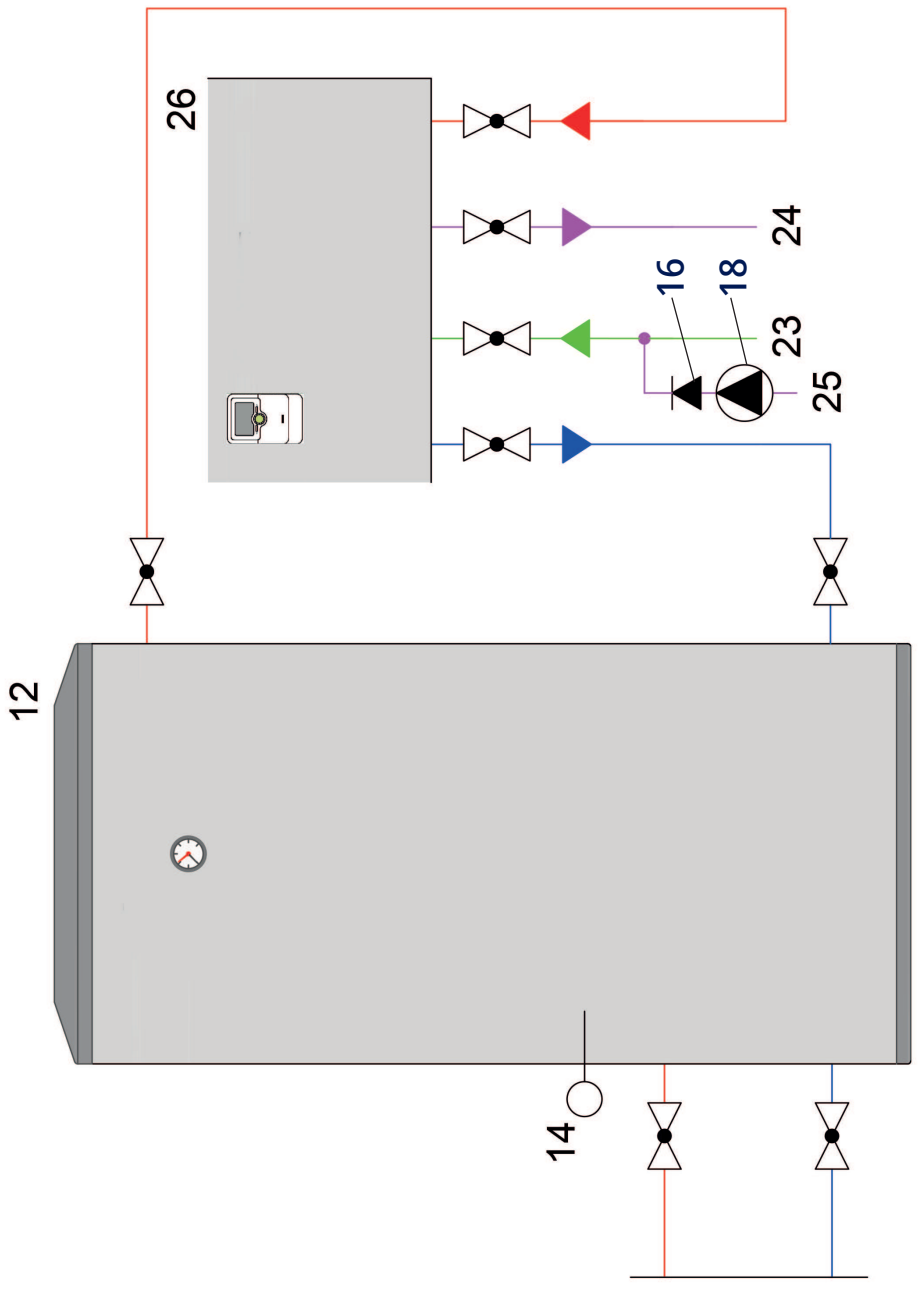
	Left button
	Right button
	Micro switch 1
	Micro switch 2


Pump noise can be heard, bubbling in the pipes.
Has the system been bled?
No
Bleed the system.
The "Draw off" amount is too small.
Is the water pressure in the system's secondary circuit sufficient?
Yes
No
Check the pressure in the system's secondary circuit.
Increase the pressure if needed.
Plate heat exchanger calcified?
Yes
Clean the secondary side of the plate heat exchanger. Replace the plate heat exchanger as required.
"Draw off" temperature too low
Is the DHW temperature set high enough on the control unit?
Yes
No
Increase the set value for the DHW temperature on the control unit.
Is the pressure loss in the system's primary circuit too high?
Yes
Check the pipelines in the system's primary circuit and replace them if needed.
Hot water is not heating up
Is the control unit operating?
Yes
No
Check the control unit, the fuse and the power supply.
Has the system been bled?
Yes
No
Bleed the system.
Is the flow sensor in the DHW flow correctly connected and earthed. Is it functioning error-free?
Yes
No
Check the flow sensor with cable (check that the fitting/connection is correctly earthed).
Check the sensor that is integrated in the fitting/connection. Clean the sensor or replace it as needed.
Is the temperature sensor in the accumulator tank's flow correctly connected and is it functioning?
Yes
No
Check PT1000 temperature sensor incl. cable. Replace the sensor if needed.
Is the pump in the primary circuit functioning?
No
Check the pump (in the primary circuit) and the connection cable. Disassemble if necessary. Replace the pump if needed.

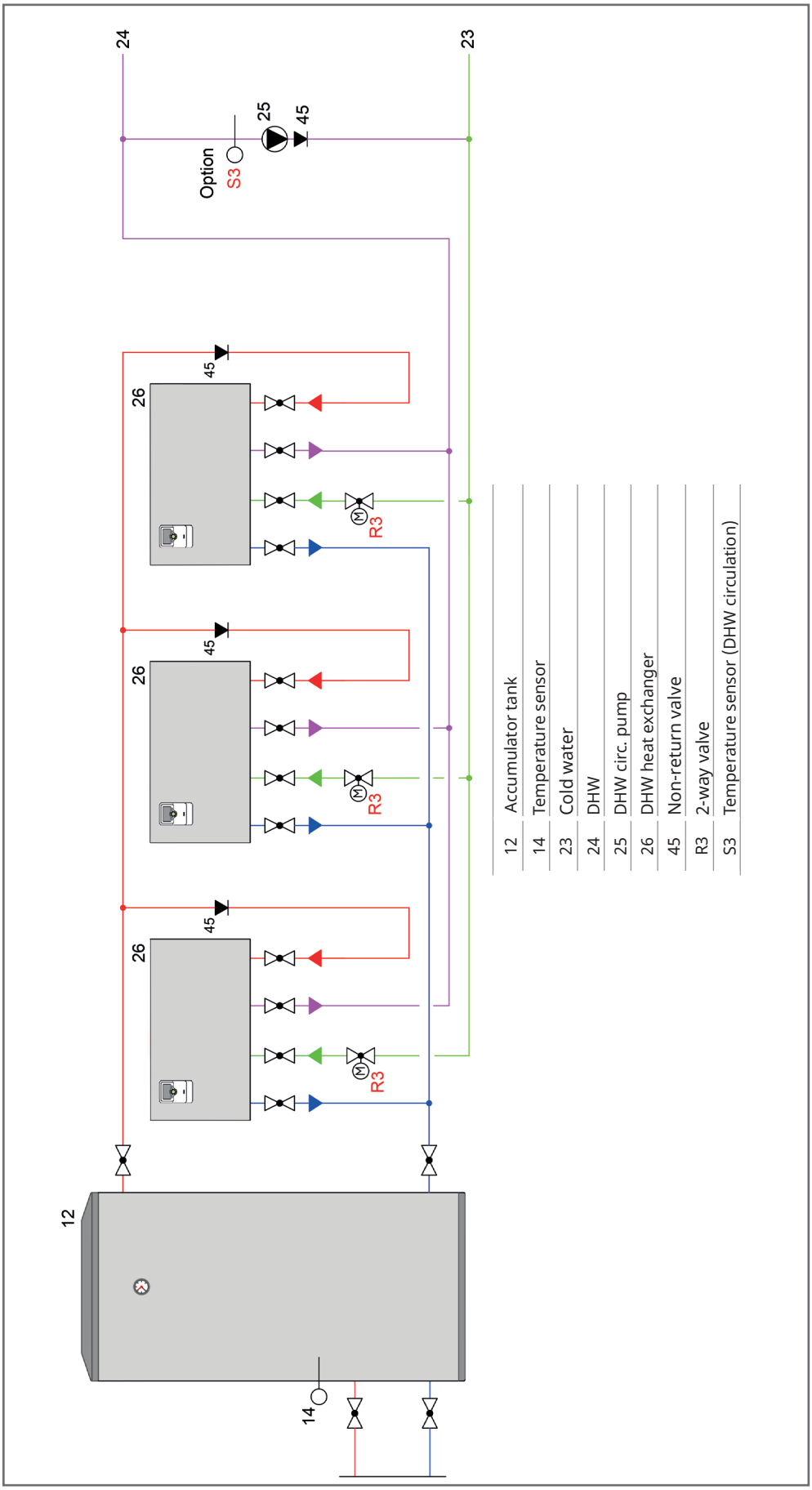
19. Installation diagrams

19.1 Integration EcoPack

12	Accumulator tank
14	Temperature sensor
16	DHW circ. pump
18	Non-return valve
23	Cold water
24	DHW
25	DHW circulation
26	DHW heat exchanger



19.2 Cascade connection of EcoPack



Notes

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