–weishaupt–

manual

Installation and operating instructions

Solar controller WRSol 2.1

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Declaration of conformity

4800000002

Supplier: **Max Weishaupt GmbH**

Address: **Max-Weishaupt-Straße**
D-88475 Schwendi

Product: solar controller

WRSol 2.1

The above-described product complies with

the regulations of the directives:

LVD	2006 / 95 / EC
EMC	2004 / 108 / EC

This product is marked as follows:

CE

Schwendi, 02.04.2012

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1 User information

These installation and operating instructions are a component of the device and must be kept at the place of use.

1.1 User guidance

1.1.1 Symbols

 DANGER	Direct hazard with high risk. Nonobservance leads to serious bodily injury or death.
 WARNING	Hazard with moderate risk. Nonobservance can lead to environmental damage, serious bodily injury or death.
 DANGER	Hazard with low risk. Nonobservance can lead to property damage or minor to moderate bodily injuries.
	Important note.
▶	Prompts you to perform a direct action.
✓	Result after an action.
■	List
…	Value range

1.1.2 Target group

These installation and operating instructions are meant for the user and qualified, skilled personnel. They are to be observed by all persons who work on the device.

Work on the device may only be carried out by persons with the training or instruction required for it.

Persons with limited physical, sensory or mental capacities may only work on the device if they are supervised or have been instructed by an authorized person.

Children must not play on the device.

1.2 Warranty

Warranty and liability claims are excluded for personal injury and property damage if they can be ascribed to one or more of the following causes:

- Unintended use of the device
- Nonobservance of the installation and operating instructions
- Operating the device when the safety or protective equipment isn't working
- Continued use despite the occurrence of a deficiency
- Improper installation, commissioning, operation or maintenance of the device
- Unauthorized modification of the device
- Installation of additional components which have not been tested together with the device
- Improperly carried out repairs
- Weishaupt original parts not used
- Deficiency in the supply lines
- Forces of nature

2 Safety information

Your information packet
- You are currently holding the operating instructions of the solar controller in your hand.

Please read these operating instructions through carefully. They will help you optimally utilize the controller functions and operate the solar installation.
- Always keep these operating instructions near the solar controller.

Intended use

The controller is an electronic device intended for use together with a hydraulic circuit in accordance with the manufacturer specifications.

Any other use is not permissible.

Hazards when working with the device

Weishaupt products are built according to the valid standards and directives and the recognized safety rules. Nevertheless, if used improperly, life-threatening danger to the user or third parties can arise or the device or other property could be impaired.

To avoid hazards, the Weishaupt solar controller (WRSol) may only be used
- as intended
- when it is in safe, operating condition.
- under the observance of all information in the operating instructions.

Malfunctions which can impair safety are to be remedied immediately.

Personnel training

Only qualified personnel may put the Weishaupt system into operation.

Qualified personnel include persons who are familiar with the setup, installation, adjustment, commissioning and maintenance of the product and have the qualifications required for their job, such as:

Training, instruction or authorization to activate/deactivate, ground and label circuits and electric devices in accordance with the standards of safety technology.

Informal safety measures

- Also observe the instructions in the installation and operating instructions of the collectors.
- In addition to the installation and operating instructions, the nationally valid rules and regulations for accident prevention are to be observed. In particular, the relevant construction and safety regulations (e.g. EN, DIN, VDE, etc.) are to be observed.
- All safety and hazard information on the device are to be kept in legible condition.

Have the heating system professional give you extensive instruction in how to operate the solar controller.

2 Safety information

Hazards due to electrical energy

- Before beginning work, disconnect, secure against switching on again, make sure there is no voltage, ground and short circuit, and protect from neighbouring live parts.
- Have work on the electrical power supply done by a professional electrician.
- Check the electrical equipment of the device during maintenance. Fix loose connections and replace defective cables immediately.
- If work on live parts is required, the accident prevention regulations UVV VBG4 or other national regulations are to be observed and tools used in acc. with EN 60900. Have a second instructed person there to switch off the voltage supply in case of an emergency.

Constructional modifications to the device

- Do not make any modification, additions or conversions to the Weishaupt system without permission from the manufacturer. All conversion measures require written confirmation from Max Weishaupt GmbH.
- Immediately exchange any device parts which are not in perfect condition.
- No additional components may be installed which haven't been tested together with the device.
- Only use original Weishaupt spare and wear parts.

Settings

- You may only make the settings specified in these instructions. The solar installation can be damaged by faulty settings.

3 About the Weishaupt solar controller WRSol 2.1

The Weishaupt solar controller (WRSol) allows you to simply control your solar installation.

Some features of the WRSol:
- Full graphical display with a display of the animated hydraulic type
- Intuitive menu guidance with plain text display
- Simple query of solar installation information
- Temperature setpoint specifications for hot water and frost protection
- Simple resetting to previously set values or to the original status at delivery
- Recording option via the WRSol recording software or SD card
- Statistics function for the solar yield with weekly, monthly and yearly evaluation
- Speed-controlled solar or solid fuel boiler pump
- Output for power signals PMW or 0 - 10 V

The WRSol can be used as a differential controller for:
- Solar hot water tank
- Solar storage tank
- Return temperature controller
- Swimming pool
- Solid fuel

3.1 What can the solar controller do

Correctly programmed, the controller, acting together with a corresponding hydraulic circuit, makes sure that the incidental solar energy is correctly used and the operation of additional heat generators can be omitted as much as possible.

It is possible to generally operate the system after inputting the existing hydraulic type (system type). The parameters, controller and safety functions relevant to the selected type of system are automatically preset. This allows for immediate operation.

With the potential-free contact (MFA output terminals 5 and 6), a malfunction can be advanced, a burner block (generator block) or a request (generator enable) can be generated, or a high-temperature relief (cooling function) can be carried out.

3.2 What must be observed

DANGER

Do not switch off the controller

Switching off the controller can damage the solar installation if the system is not filled. (Protective functions no longer guaranteed).

The controller should only be put out of operation for the duration of maintenance and repair work.

These operating instructions are only valid for the solar controller type WRSol 2.1 (compare with the nameplate).

Conversion measures are only permitted with the written agreement from Max Weishaupt GmbH.
- Only install additional components which have been tested together with the device.
- Only use original Weishaupt parts.

4 Installation and connection

4.1 Scope of delivery

The following is included in the scope of delivery:
- WRSol 2.1 controller
- Fastening material for wall mounting
- Strain relief clamp, including screws
- Collector sensor STF 225, 1x (4 m, blue cable , -w- no. 660 262)
- Immersion sensor STF 222.2, 3x (2.5 m, gray cable, -w- no. 660 228)
- Operating instructions WRSol 2.1

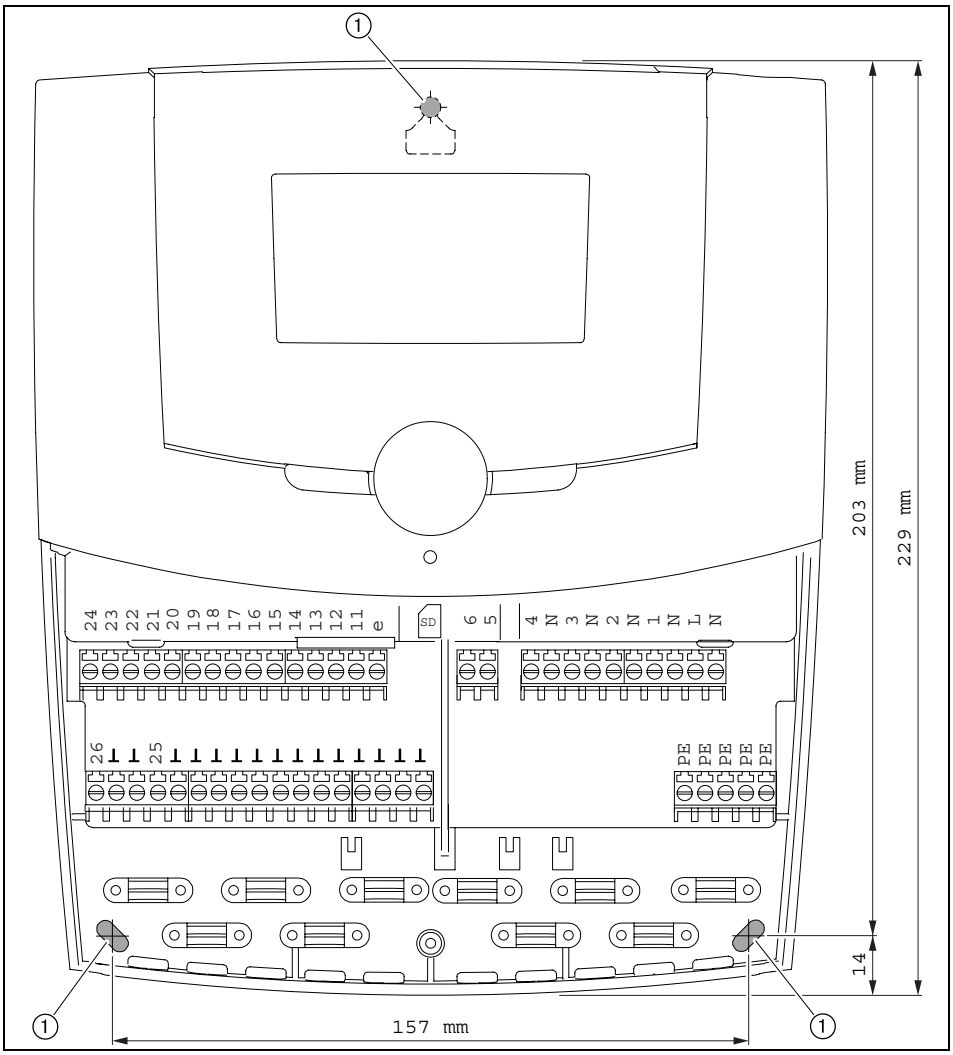
The sensors included in the scope of delivery are designed as immersion sensors. If contact sensors are required for system-related reasons, they can be ordered under order no. 660 302.

The collector sensor cannot be designed as a contact sensor.

4.2 Wall mounting

DANGER

Before fastening, break out the required cable entry glands.



① screw

Only screw in the screw so far that the controller can still be hung in.

4.3 Start-up

The WRSol is set up so that the controller function and type of setting parameters can be defined via the selection of a corresponding hydraulic type.

Then, only those selection menus and setting parameters appear which are required for the selected hydraulic type.

All other parameters are hidden.

Procedure:

1. Select desired hydraulic type. Chap. 6
2. Make the electric connection according to the selected hydraulic type. Chap. 6
3. The commissioning menu appears when the device is started for the first time. Chap. 4.4

- ▸ Select language
- ▸ Set the time and date
- ▸ Set the hydraulic type selected in step 1 on the controller.
- ▸ Select the volume pulse counter and collector return flow sensor, as well as collector flow sensor, as needed.
- ▸ Select the solar pump

DANGER

If "Output 1: Solar pump" and/or "Output 2: Solar pump 2/ solid fuel boiler / heat exchanger" is at "0: standard pump", NO electronic pump may be installed!

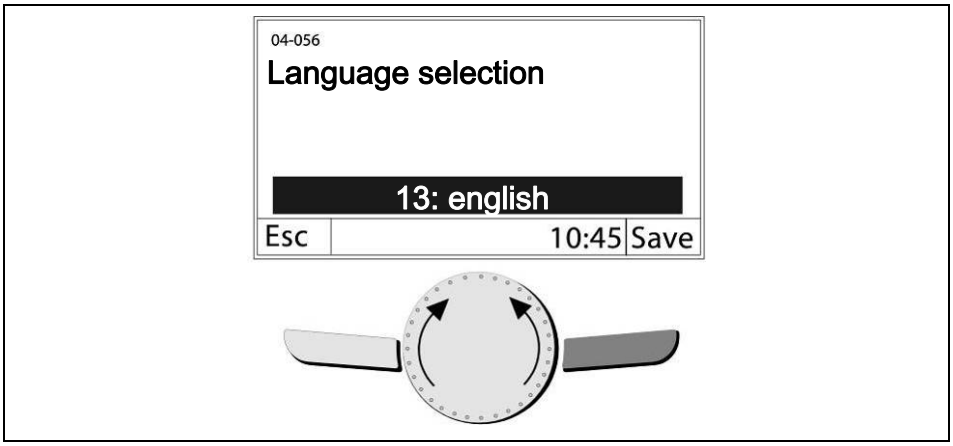
✓ The controller is restarted

4. Read out all temperatures and values and check for plausibility. Chap. 7.4
5. Check all outputs in test mode. Chap. 8.6
6. Adjust the maximum and, if necessary, minimum volume flow. Chap. 7.7

If no volume pulse counter is installed, the maximum volume flow corresponds to the read-off volume flow at 100% pump actuation.
If there is an active volume pulse counter, the flow is limited to the set minimum and maximum volume flow values.

7. Set controller back to auto mode. Chap. 7.6.1
8. Fill out the commissioning log in the appendix.

4.4 Commissioning assistant



The values can be changed using a rotary knob, and the change confirmed with the **Save** key, and the next value appears.

The following values are queried:

Language setting
Time
Date
Hydraulic type
VIZ/TKR option, volume pulse counter
TKV option
Output 1: Solar pump
Output 2: Solar pump 2 / solid fuel boiler / heat exchanger

After the commissioning assistant is finished, the device is restarted.

DANGER

If "Output 1: Solar pump" and/or "Output 2: Solar pump 2/ solid fuel boiler / heat exchanger" is at "0: standard pump", NO electronic pump may be installed!

4.5 Electrical connections

DANGER

Before fastening, break out the required cable entry glands.

WARNING

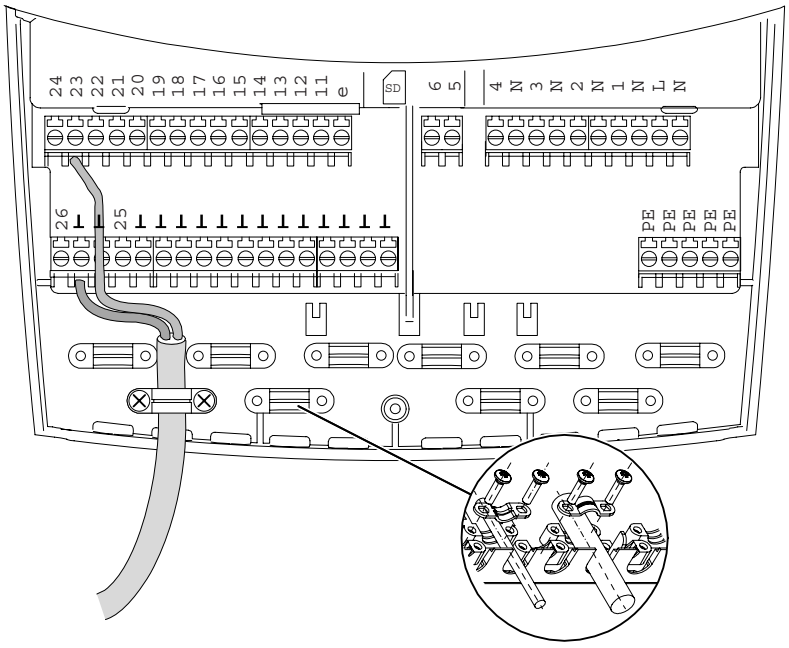
Improper installation or repair attempts can cause life-threatening electric shock. Installation may only be carried out by skilled personnel with sufficient qualifications. Opening the device and accessory parts is to be refrained from in general. Repairs may only be carried out by the manufacturer.

The supply and return lines of the solar installation must be grounded.

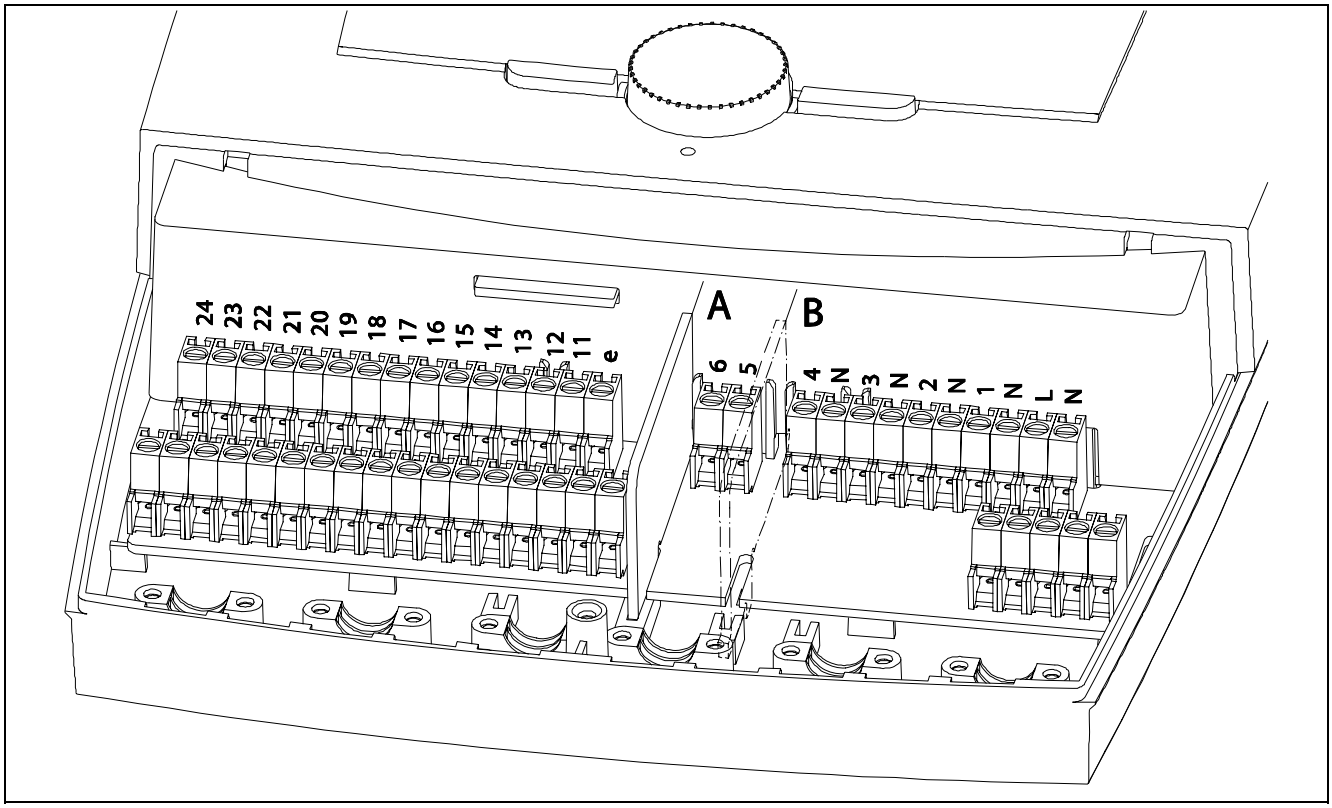
Overvoltage protection

The connected sensors do not have to be protected against overvoltage by any special protective equipment.

Terminal strip, left (sensor) Terminal strip, right (outputs/voltage supply)



- Remove terminal compartment cover.
- Connect the sensor cables, MFA output, pump or diverter valve and power supply according to the selected hydraulic type (chap. 6).
- Secure the connected lines with the strain relief elements included in the scope of delivery.

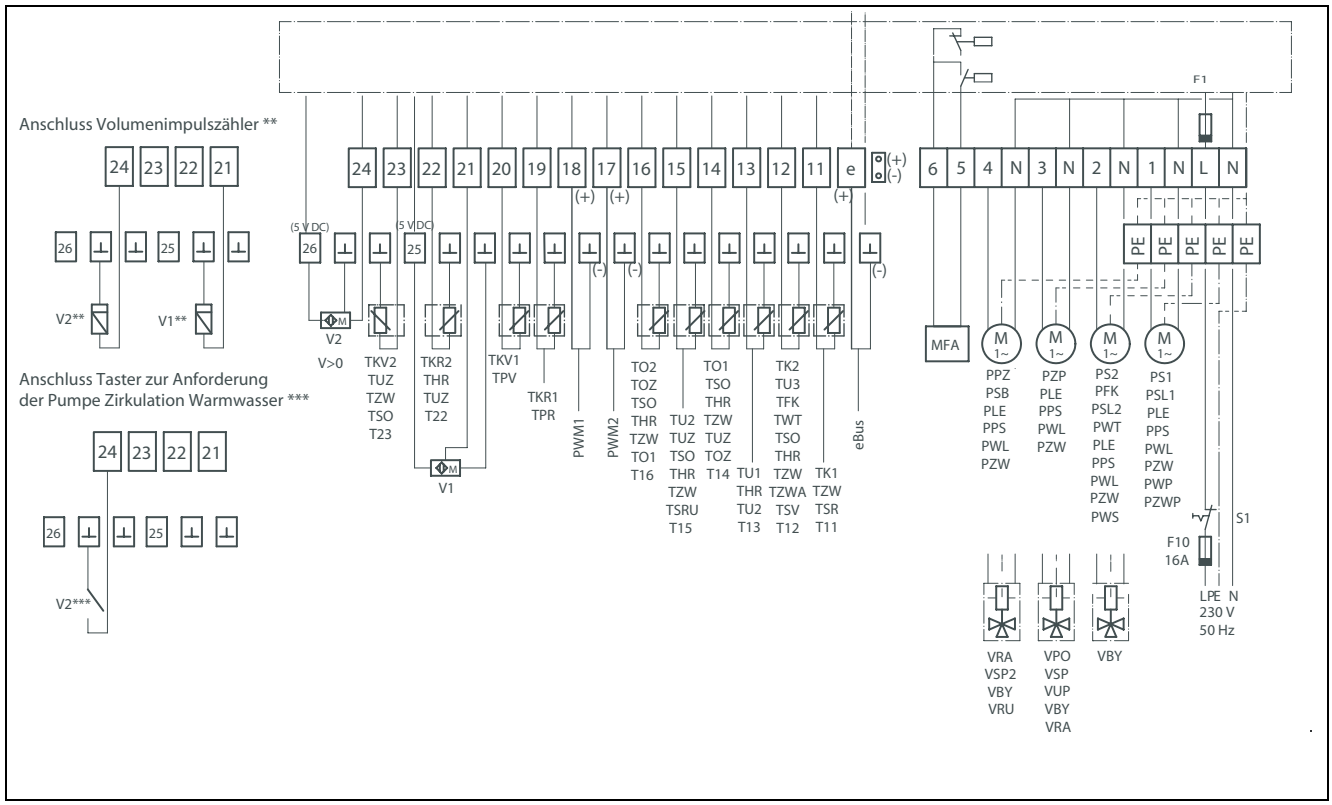


- Correctly insert the dividing wall for the MFA output according to its use.
  - (**A**) LEFT 230 V
  - (**B**) RIGHT, small voltage
- Apply voltage.
- Remount the terminal compartment cover.

The outputs 1 (PS) and 2 (PS2, PFK, etc.) may be loaded with max. 1 Ampere. Consumers with a higher current consumption must be actuated via an auxiliary relay. In addition, an RC quenching element must be connected with terminal 1/N and/or 2/N in parallel (-w- 701 890).

If the adjuster output 1 and/or 2 equal to "0: standard pump" is selected and an auxiliary relay or valve is connected, the minimum speed parameter PS must be set to 100%.

4.6 WRSol 2.1 circuit diagram



TFK	Temperature sensor, solid fuel boiler
THR	Temperature sensor, heating circuit return
TK1	Temperature sensor, collector 1
TK2	Temperature sensor, collector 2
TKR1	Temperature sensor, collector field 1, return
TKR2	Temperature sensor, collector field 2, return
TKV1	Temperature sensor, collector field 1, supply
TKV2	Temperature sensor, collector field 2, supply
TO1	Temperature sensor, tank 1, top
TO2	Temperature sensor, tank 2, top
TOZ	Additional temperature sensor, tank top
TSO	Temperature sensor, additional tank
TU1	Temperature sensor, tank 1, bottom
TU2	Temperature sensor, tank 2, bottom
TU3	Temperature sensor, tank 3, bottom
TUZ	Additional temperature sensor, tank bottom
TWT	Temperature sensor, plate heat exchanger
TZW	Temp. sensor, DHW (dom. hot water) circulation
TZWA	Tem. sensor, DHW circulation, heat exchanger outlet
TPV	Temp. sensor, primary heat exchanger supply
TPR	Temp. sensor, primary heat exchanger return
TSV	Hot water charging temperature, secondary supply
TSR	Hot water charging temperature, secondary return
TSRU	Temperature sensor, tank, return switching valve
V1/ V2	Flow rotor, volume pulse counter or button for pulse-controlled circulation pump

MFA	Multifunctional output (potential-free)
PFK	Solid fuel boiler pump
PLE	Pump for thermal disinfection
PPS	Pump, transfer charging to additional tank
PPZ	Pump transfer charging/ discharging
PS	Solar pump (1st solar circuit)
PS2	Solar pump (2nd solar circuit)
PSL1	Pump, solar charging, tank 1
PSL2	Pump, solar charging, tank 2
PWL	Pump, DHW heating
PWT	Pump, secondary external heat exchanger
PZP	Pump, transfer charging / charging
PZW	Pump, hot water circulation
PZWP	Pump, hot water circulation, reheating
PWP	Pump, primary heat exchanger
PWS	Pump, secondary heat exchanger
VBY	Valve, collector circuit bypass
VPO	Valve, charging zone, bottom / top
VRA	Valve, return temperature increase
VSP1	Valve, tank/storage tank switchover
VSP2	Valve, tank/swimming pool switchover
VUP	Valve, storage tank/heating circuit switchover
VRU	Valve, return switching valve
PWM/ 0-10 V	Output for a power signal, e.g. PS
F1	Internal device fuse, 3.15 A (time-delay fuse)
F10	Preliminary fuse max. 16 A
S1	Emergency switch

4.6.1 Connection of volume meter and return sensor

Flow rotor		V1 FlowRotor *	V2 FlowRotor *	V1 Volume pulse counter **	V2 Volume pulse counter **	V2 Button ***
GND	⊥	Green		White		
Signal	21	White		Brown		
5 V DC	25	Brown				
GND	⊥		Green		White	COM
Signal	24		White		Brown	NO
5 V DC	26		Brown			

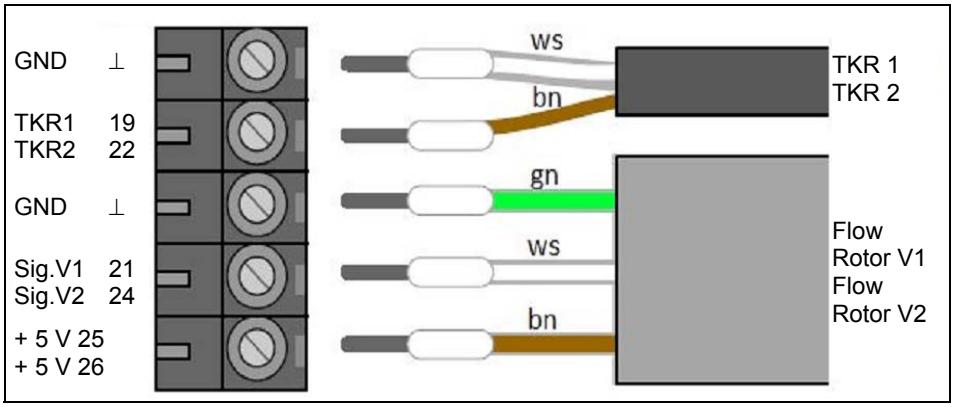
*) The existing plug of the WHI pump-sol flow rotor must be removed and connected to the WRSol terminals according to the table given above.

**) Connection of a volume pulse counter, e.g. WVZSol or WVZSol 2.

***) Connection of a button or other N/O contact (provided on-site) for the pulse-controlled request for the pump circulation of hot water PZW.

Return sensor		TKR 1	TKR 2
GND	⊥	White	
	19	Brown/Red	
GND	⊥		White
	22		Brown/Red

The drawing shows the connections of the WHI pump-sol flow rotor

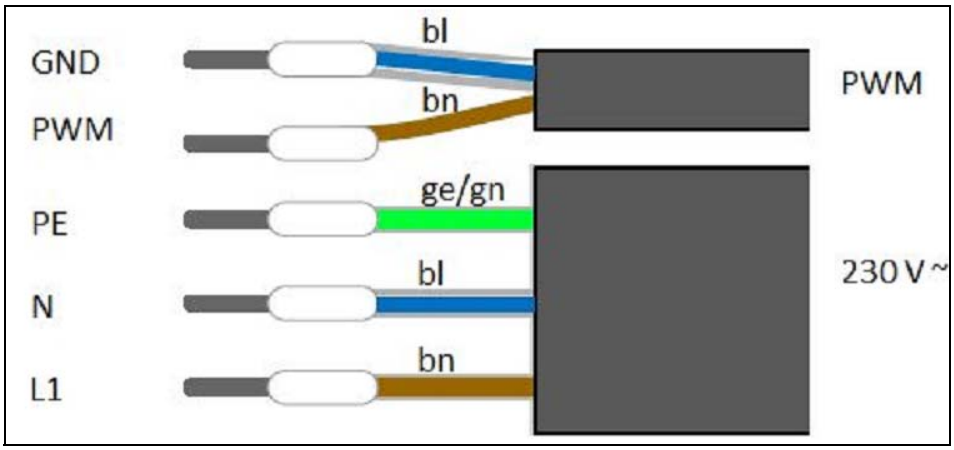


4.6.2 Connection of power signal for pump speed control

Speed signal		WHI pump-sol	Other pump	
			PWM	0 – 10 V
Output 1 PWM or 0 – 10 V	⊥	Blue	GND	-
	18	Brown	Signal	+
Output 2 PWM or 0 – 10 V	⊥	Blue	GND	-
	17	Brown	Signal	+

The cable ends of the WHI pump-sol must be connected to the terminals of the WRSol according to the table given above.

The drawing shows the wire ends of the WHI pump-sol pump.

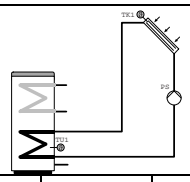
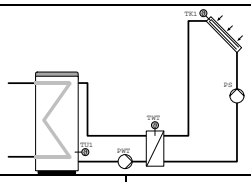
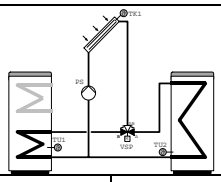
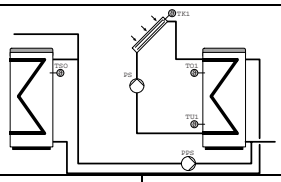


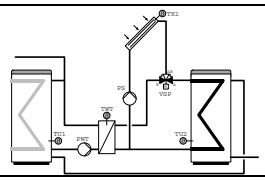
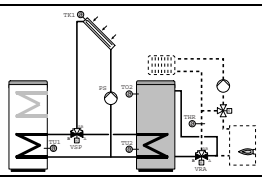
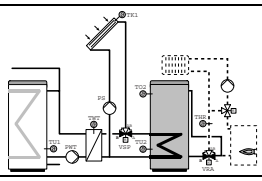
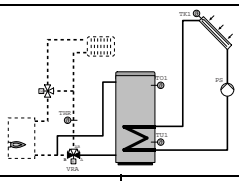
4.7 Input and output allocation of the individual hydraulic types

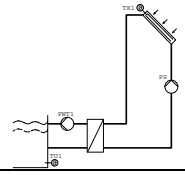
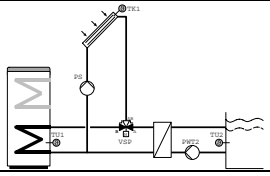
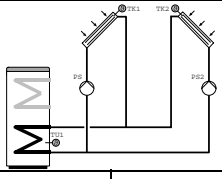
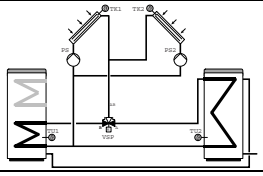
HV	Sensor terminals															Outputs				
	24	23	22	21	20	19	18	17	16	15	14	13	12	11	E	5/6	4	3	2	1
	26 ⊥	⊥	⊥	25 ⊥	⊥	⊥	⊥	⊥	⊥	⊥	⊥	⊥	⊥	⊥	⊥		N/PE	N/PE	N/PE	N/PE
1	V2			V1	TKV1	TKR1	PWM			TUZ	TO1	TU1	TZW	TK1	eBUS	MFA	VBY	PWL PLE	PZW	PS
2	V2		TUZ	V1	TKV1	TKR1	PWM	PWM	TSO	TZW	TO1	TU1	TWT	TK1	eBUS	MFA	VBY PZW	PWL PPS PLE	PWT	PS
3	V2		TUZ	V1	TKV1	TKR1	PWM		TO2	TU2	TO1 TSO	TU1	TZW	TK1	eBUS	MFA	PPS VBY PZW	VSP	PWL PLE	PS
4	V2			V1	TKV1	TKR1	PWM		TSO	TUZ	TO1	TU1	TZW	TK1	eBUS	MFA	PPS	PWL VBY PLE	PZW	PS
5	V2		TUZ	V1	TKV1	TKR1	PWM	PWM	TO2 TZW	TU2	TO1 TSO	TU1	TWT	TK1	eBUS	MFA	PWL PPS VBY PZW PLE	VSP	PWT	PS
6	V2		TUZ	V1	TKV1	TKR1	PWM		TO2	TU2	TO1 TSO TZW	TU1	THR	TK1	eBUS	MFA	VRA	VSP	PWL PPS VBY PZW PLE	PS
7				V1	TKV1	TKR1	PWM	PWM	TO2	TU2	THR	TU1	TWT	TK1	eBUS	MFA	VRA	VSP	PWT	PS
8	V2		TUZ	V1	TKV1	TKR1	PWM		THR	TSO	TO1	TU1	TZW	TK1	eBUS	MFA	VRA	PWL PLE	PPS VBY PZW	PS
9				V1	TKV1	TKR1	PWM					TU1		TK1	eBUS	MFA	PWT	VBY		PS
10	V2		TUZ	V1	TKV1	TKR1	PWM		TSO	TU2	TO1	TU1	TZW	TK1	eBUS	MFA	PWT	VSP	PWL PPS VBY PZW PLE	PS
11	V2	TKV2	TKR2	V1	TKV1	TKR1	PWM	PWM	TSO	TUZ TZW	TO1	TU1	TK2	TK1	eBUS	MFA	PZW VBY PPS	PWL PLE	PS2	PS
12	V2	TKV2	TKR2	V1	TKV1	TKR1	PWM	PWM	TO2	TU2	TO1 TSO TZW TUZ	TU1	TK2	TK1	eBUS	MFA	PWL PPS VBY PZW PLE	VSP	PS2	PS
13	V2	TKV2	TKR2	V1	TKV1	TKR1	PWM	PWM	TO2	TU2	THR	TU1	TK2	TK1	eBUS	MFA	VRA	VSP	PS2	PS
14	V2	TKV2	TKR2	V1	TKV1	TKR1	PWM	PWM	THR	TSO TZW TUZ	TO1	TU1	TK2	TK1	eBUS	MFA	VRA	PWL PPS VBY PZW PLE	PS2	PS
15	V2		TUZ	V1	TKV1	TKR1	PWM	PWM	TO2	TU2	TO1 TSO TZW	TU1	TFK	TK1	eBUS	MFA	PWL PPS VBY PZW PLE	VSP	PFK	PS
16				V1	TKV1	TKR1	PWM	PWM	TO2	TU2	THR	TU1	TFK	TK1	eBUS	MFA	VRA	VSP	PFK	PS
17	V2		TUZ	V1	TKV1	TKR1	PWM	PWM	TSO	TZW	TO1	TU1	TFK	TK1	eBUS	MFA	PWL PPS VBY PZW PLE	VUP	PFK	PS
18	V2		TUZ	V1	TKV1	TKR1	PWM	PWM	TSO	TZW	TO1	TU1	TFK	TK1	eBUS	MFA	PWL PLE	PPS PZW VBY	PFK	PS
19	V2		TUZ	V1	TKV1	TKR1	PWM	PWM	THR	TSO TZW	TO1	TU1	TFK	TK1	eBUS	MFA	VRA	PWL PPS VBY PZW PLE	PFK	PS
20	V2							PWM	THR	TSO TZW	TO1	TU1	TFK		eBUS	MFA	VRA	VUP	PFK	PWL PPS PZW

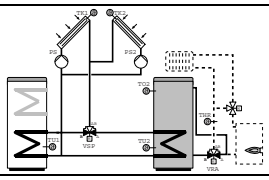
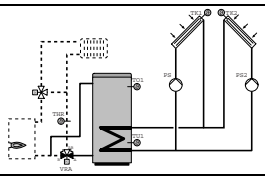
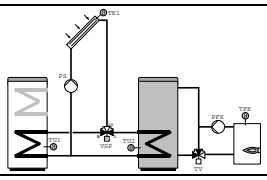
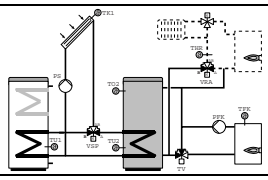
HV	Sensor terminals															Outputs				
	24	23	22	21	20	19	18	17	16	15	14	13	12	11	E	5/6	4	3	2	1
	26 ⊥	⊥	⊥	25 ⊥	⊥	⊥	⊥	⊥	⊥	⊥	⊥	⊥	⊥	⊥	⊥		N/PE	N/PE	N/PE	N/PE
21	V2		TUZ	V1	TKV1	TKR1	PWM	PWM	TO2	TU2	TO1 TSO	TU1	TZW	TK1	eBUS	MFA	PPS	PWL PLE VBY PZW	PSL2	PSL1
22	V2		TUZ	V1	TKV1	TKR1	PWM		TO2	TU2	TO1 TSO TZW	TU1	TU3	TK1	eBUS	MFA	VSP2	VSP	PWL PPS VBY PZW PLE	PS
23	V2		TUZ	V1	TKV1	TKR1	PWM		TSO		TO1	TU1	TZW	TK1	eBUS	MFA	VBY	PLE PWL	PPS PZW	PS
24	V2		TUZ	V1	TKV1	TKR1	PWM		TOZ	THR	TO1	TU1	TSO TZW	TK1	eBUS	MFA	VRA	PWL VBY PLE	PPS PZW	PS
25	V2			V1	TKV1	TKR1	PWM	PWM	TSO TZW	TUZ	TO1	TU1	TFK	TK1	eBUS	MFA	PPS VBY PZW	PWL PLE	PFK	PS
26			THR	V1	TKV1	TKR1	PWM	PWM	TOZ	TUZ	TO1	TU1	TFK	TK1	eBUS	MFA	VRA	PWL VBY PLE	PFK	PS
27	V2			V1	TKV1	TKR1	PWM		TSO	TUZ	TO1	TU1	TZW	TK1	eBUS	MFA	PPS PZW	VPO	PWL VBY PLE	PS
28	V2			V1	TKV1	TKR1	PWM		TSO	TUZ	TO1	TU1	TZW	TK1	eBUS	MFA	PPS	PWL PLE	PWZ VBY	PS
29	V2	TUZ	THR	V1	TKV1	TKR1	PWM		TOZ	TSO	TO1	TU1	TZW	TK1	eBUS	MFA	VRA	PWL VBY PZW PLE	PPS	PS
30	V2	TUZ		V1	TKV1	TKR1	PWM	PWM	TSO TZW		TO1	TU1	TWT	TK1	eBUS	MFA	PWL PPS VBY PZW PLE	VPO	PWT	PS
31	V2		TUZ	V1	TKV1	TKR1	PWM	PWM	TSO	TZW	TO1	TU1	TWT	TK1	eBUS	MFA	PPS PZW	PWL VBY PLE	PWT	PS
32	V2		TUZ	V1	TKV1	TKR1	PWM	PWM	THR	TSO TZW	TO1	TU1	TWT	TK1	eBUS	MFA	VRA	PWL PPS VBY PZW PLE	PWT	PS
33	V2		TUZ	V1	TKV1	TKR1	PWM		TO2	TU2	TO1	TU1	TSO TZW	TK1	eBUS	MFA	PPZ	PZP	PWL PPS VBY PZW PLE	PS
34	V2	TKV2	TKR2	V1	TKV1	TKR1	PWM	PWM	TO2	TU2	TO1	TU1	TK2	TK1	eBUS	MFA	PPZ	PZP	PS2	PS
35				V1	TKV1	TKR1	PWM	PWM	TO2	TU2	TO1	TU1	TFK	TK1	eBUS	MFA	PPZ	PZP	PFK	PS
36				V1	TKV1	TKR1	PWM	PWM	TO2	TU2	TO1	TU1	TWT	TK1	eBUS	MFA	PPZ	PZP	PWT	PS
37	V2		TUZ	V1	TKV1	TKR1	PWM	PWM	TO2	TU2	TO1 TSO TZW	TU1	TWT	TK1	eBUS	MFA	PWL PPS VBY PZW PLE	VSP	PWT	PS
38			TUZ	V1	TPV	TPR	PWM	PWM	-	TSRU	TOZ	THR	TZWA	TZW	eBUS	MFA	VRU	PLE VRA	PZW	PZWP
39			TUZ	V1	TPV	TPR	PWM	PWM	TO1	TSRU	TOZ	THR	TZWA	TZW	eBUS	MFA	VRU	PLE VRA	PZW	PZWP
40	V2	TSO TZW	TUZ	V1	TPV	TPR	PWM	PWM	TO1	TSRU	TO2	TU2	TSV	TSR	eBUS	MFA	VRU	PPS PLE PZW	PWS	PWP
41	V2	TSO TZW	TUZ	V1	TPV	TPR	PWM	PWM			TO1	TU1	TSV	TSR	eBUS	MFA	PZW	PPS PLE	PWS	PWP
42	V2	T23	T22	V1	TPV	TPR			T16	T15	T14	T13	T12	T11	eBUS	MFA	-	-	-	-

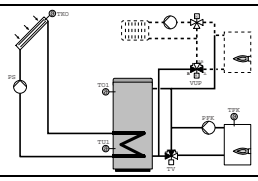
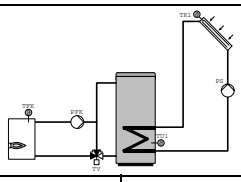
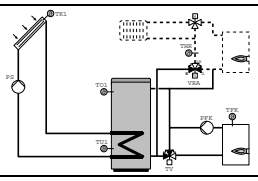
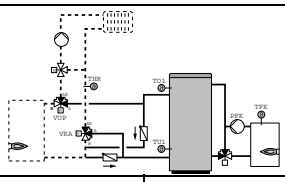
5 Overview of hydraulic types

Variant 1			Variant 2		Variant 3		Variant 4	
								
Output 2	Output 3	Output 4	Output 3	Output 4	Output 2	Output 4	Output 2	Output 3
PZW	PWL/PLE	VBY	PWL/PLE/PPS	VBY/PZW	PWL/PLE	PPS/VBY/PZW	PWZ	PWL/PLE/VBY

Variant 5	Variant 6	Variant 7	Variant 8	
				
Output 4	Output 2		Output 2	Output 3
PWL/PPS/VBY/PZW/PLE	PWL/PPS/VBY/PZW/PLE		PPS/VBY/PZW	PWL/PLE

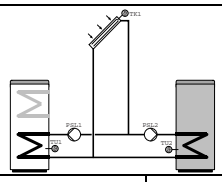
Variant 9	Variant 10	Variant 11		Variant 12
				
Output 3	Output 2	Output 3	Output 4	Output 4
VBY	PWL/PPS/VBY/PZW/PLE	PWL/PLE	PZW/VBY/PPS	PWL/PLE/PZW/VBY/PPS

Variant 13	Variant 14	Variant 15	Variant 16
			
	Output 3	Output 4	
	PWL/PLE/PZW/VBY/PPS	PWL/PLE/PPS/VBY/PZW	

Variant 17	Variant 18		Variant 19	Variant 20	
					
Output 4	Output 3	Output 4	Output 3	Output 1	Output 4
PWL/PPS/VBY/PZW/PLE	PPS/VBY/PZW	PWL/PLE	PWL/PLE/PPS/VBY/PZW	PWL/PPS /PZW	VRA

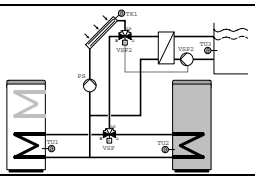
5 Overview of hydraulic types

Variant 21



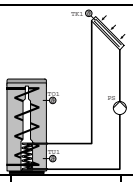
Output 3	Output 4
PWL/VBY/PZW/PLE	PPS

Variant 22



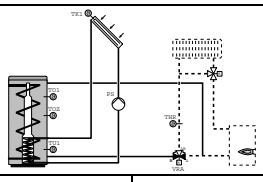
Output 2
PWL/PPS/VBY/PZW/PLE

Variant 23



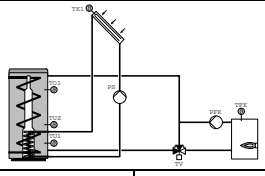
Output 2	Output 3	Output 4
PPS/PZW	PWL/PLE	VBY

Variant 24



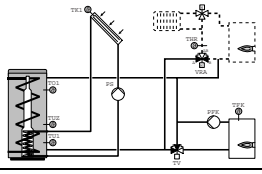
Output 2	Output 3
PPS/PZW	PWL/PLE/VBY

Variant 25



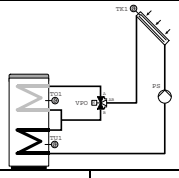
Output 3	Output 4
PWL/PLE	PZW/VBY/PPS

Variant 26



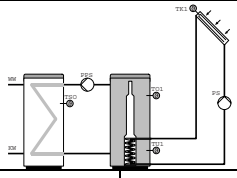
Output 3
PWL/VBY/PLE

Variant 27



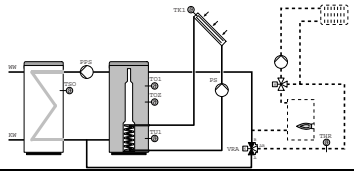
Output 2	Output 4
PWL/VBY/PLE	PPS/PZW

Variant 28



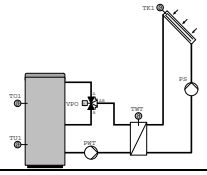
Output 2	Output 3
PZW/VBY	PWL/PLE

Variant 29



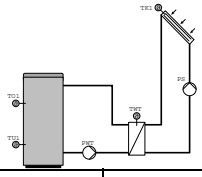
Output 3
PWL/VBY/PZW/PLE

Variant 30



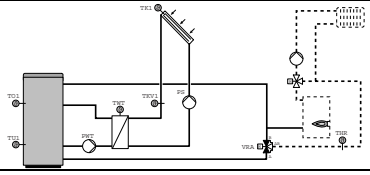
Output 4
PWL/PPS/VBY/PZW/PLE

Variant 31



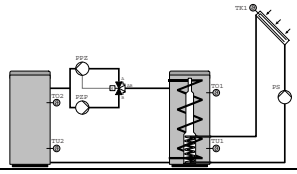
Output 3	Output 4
PWL/VBY/PLE	PPS/PZW

Variant 32



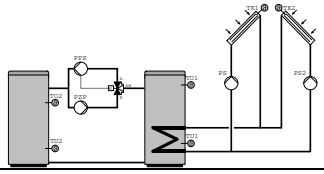
Output 3
PWL/PLE/PZW/VBY/PPS

Variant 33

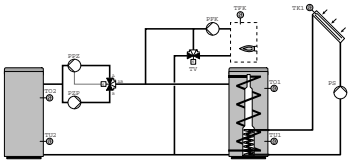


Output 3
PWL/PLE/PZW/VBY/PPS

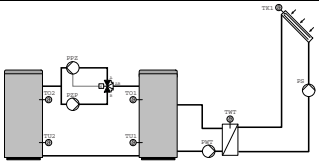
Variant 34



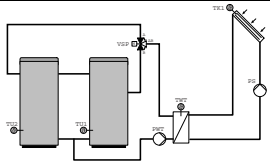
Variant 35



Variant 36

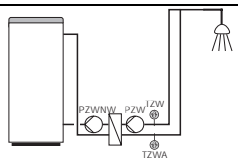


Variant 37



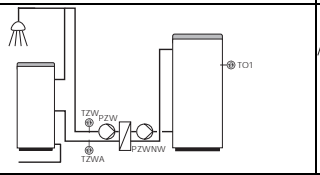
Output 4
PWL/PLE/PZW/VBY/PPS

Variant 38



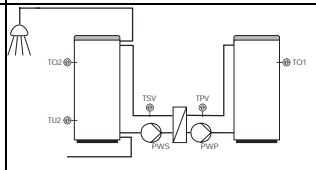
Output 3	Output 4
VRA/PLE	VRU

Variant 39



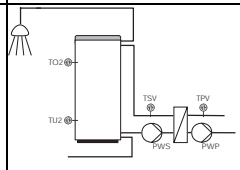
Output 3	Output 4
VRA/PLE	VRU

Variant 40



Output 3	Output 4
PZW/PLE/PPS	VRU

Variant 41



Output 3	Output 4
PPS/PLE	PZW

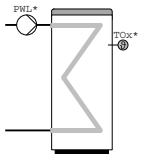
5.1 Options

In the hydraulic types, there are 4 outputs, some of which are assigned fixed functions. For every free output, one of a selection of different functions can be chosen.

All options are shown here. For the individual hydraulic types, only the respective options which come into question are shown.

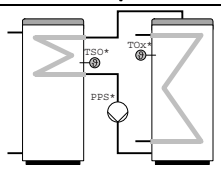
As another option for controlling the solar circuit, there is the option of including the solar supply sensor TKV as well as the solar return sensor TKR in the control.

PWL option



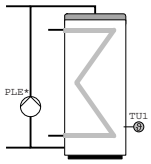
Actuator	Sensor
PWL	TOx

PPS option



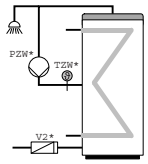
Actuator	Sensor
PPS	TOx and TSO

PLE option



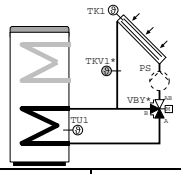
Actuator	Sensor
PLE	TUx

PZW option



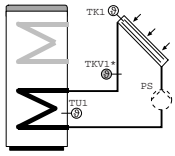
Actuator	Sensor
PZW	TZW and/or V2

VBY option



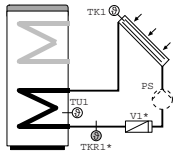
Actuator	Sensor
VBY	TKV

TKV option



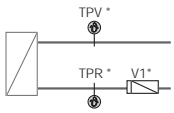
Sensor
TKV

VIZ / TKR option



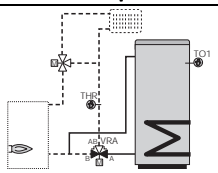
Sensor
TKR and VIZ

WMZ option



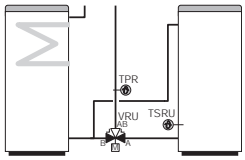
Sensor
TPV, TPR and VIZ

VRA option



Actuator	Sensor
VRA	THR and TOx

VRU option



Actuator	Sensor
VRU	TPR and TSRU

VIZ option

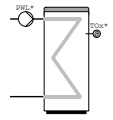
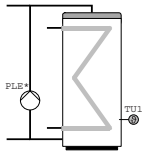
Sensor
VIZ

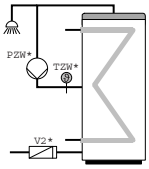
6 Hydraulic types

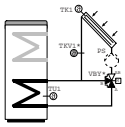
The following hydraulic types are simplified schematic diagrams. Therefore, not all components (anti-siphon valve, flow meter, etc.) are drawn in.

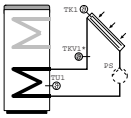
6.1 Variant 1

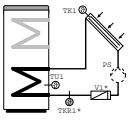
Selectable options

PWL option (chap. 8.10)	
	Output 3 PWL
	Input 14 TO1
or **PLE option (chap. 8.16)**	
	Output 3 PLE
	Input 13 TU1
	Input 15 TUZ *

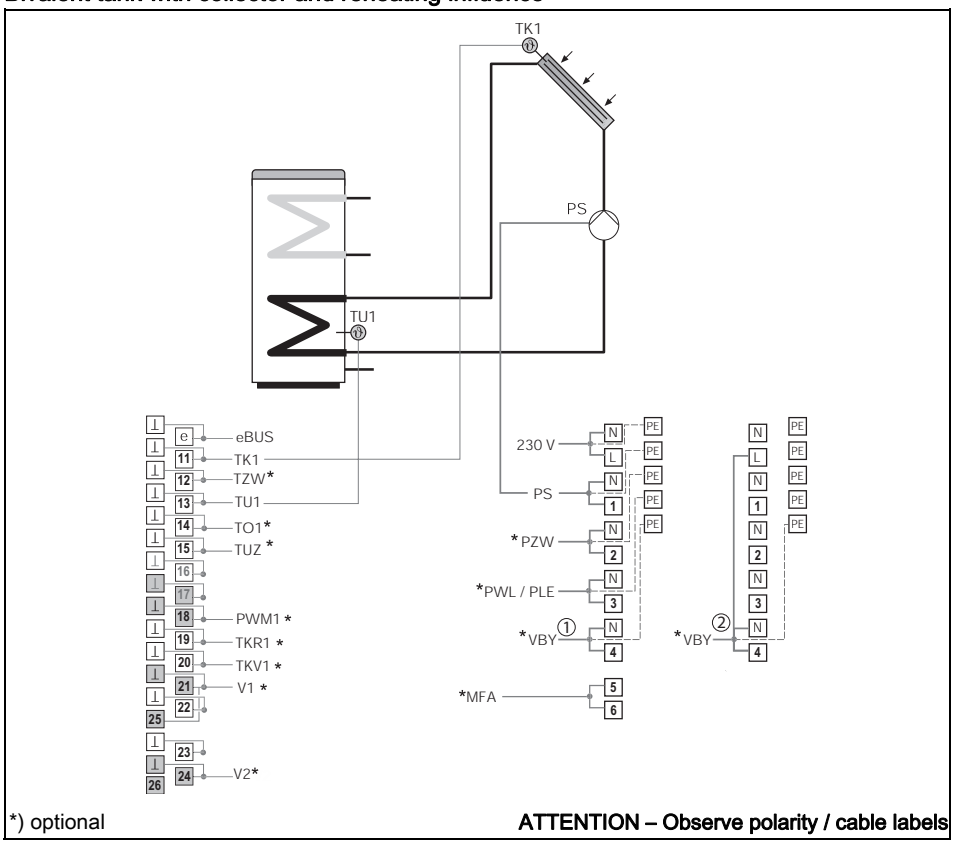
PZW option (chap. 8.17)	
	Output 2 PZW
	Input 12 TZW*
	Input 24 V2*

VBY option (chap. 8.15)	
	Output 4 VBY
	Input 20 TKV1

TKV option (chap. 8.4 ff.)	
	Input 20 TKV1

VIZ/ TKR option (chap. 8.12)	
	Input 21/25 V1
	Input 19 TKR1

Bivalent tank with collector and reheating influence



*) optional

ATTENTION – Observe polarity / cable labels

① Electrothermic actuator or drive with spring return
② Motor-driven actuator with permanent voltage

The WRSol determines the temperature difference between the collector sensor (TK) and the reference sensor (TU).

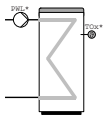
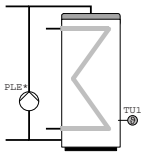
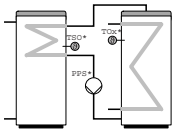
As soon as the temperature difference is greater than the set value, (**`switch-on difference TK - TU`**), the solar pump is activated, thereby charging the consumer, until the switch-off condition (**`switch-off difference TK - TU`**) or the maximum temperature of the consumer has been reached.

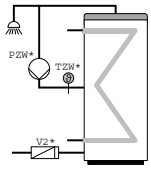
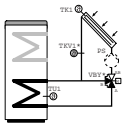
For the speed control of the solar pump PS, see chap. 8.4.

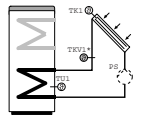
MFA options: Heat request (chap. 8.2.1)
Malfunction message (chap. 8.2.2)
High-temperature relief (chap. 8.2.3)

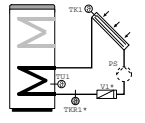
6.2 Variant 2

Selectable options

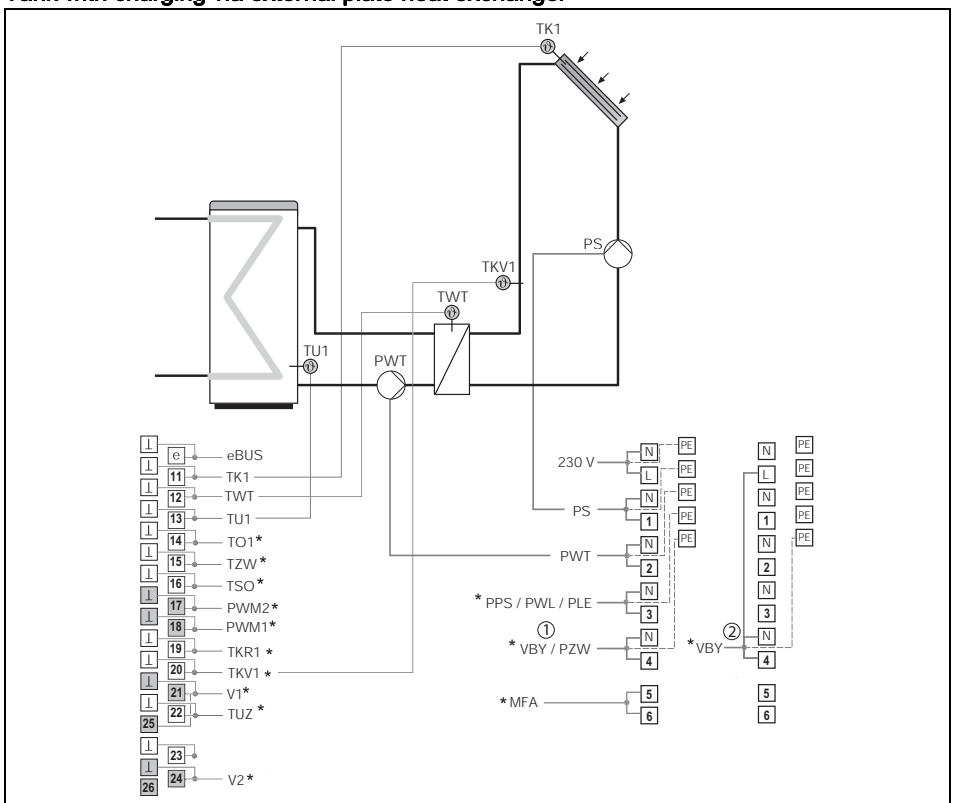
PWL option (chap. 8.10)	
	Output 3 PWL
	Input 14 TO1
or **PLE option (chap. 8.16)**	
	Output 3 PLE
	Input 13 TU1
	Input 22 TUZ *
or **PPS option (chap.8.11)**	
	Output 3 PPS
	Input 16 TSO
	Input 14 TO1

PZW option (chap. 8.17)	
	Output 4 PZW
	Input 15 TZW*
	Input 24 V2*
or **VBY option (chap.8.15)**	
	Output 4 VBY
	Input 20 TKV1

TKV option (chap. 8.4 ff.)	
	Input 20 TKV1

VIZ/ TKR option (chap. 8.12)	
	Input 21/25 V1
	Input 19 TKR1

Tank with charging via external plate heat exchanger



*) optional

ATTENTION – Observe polarity / cable labels

① Electrothermic actuator or drive with spring return
② Motor-driven actuator with permanent voltage

The WRSol determines the temperature difference between the collector sensor (TK) and the reference sensor (TU).
As soon as the temperature difference is greater than the set value **(Switch-on difference TK – TU)**, the solar pump is activated, thereby charging the consumer, until the **(Switch-off difference TK – TU)** or the maximum temperature of the consumer has been reached.

For the speed control of the solar pump PS, see chap. 8.4.

The PWT pump starts at minimum speed (30%), when the temperature at the collector flow sensor TKV is warmer than the bottom tank sensor TU by the switch-off difference plus 2 K. The goal is to reach the set charge temperature on the TWT sensor and to hold it. If the temperature at the collector flow sensor TKV is only higher than the temperature at the tank bottom TU by the switch-off condition, the secondary pump PWT is stopped.

For the speed control of the pump PWT, see chap. 8.21.

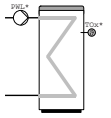
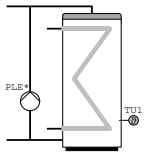
MFA options: Heat request (chap. 8.2.1)
Malfunction message (chap. 8.2.2)
High-temperature relief (chap. 8.2.3)

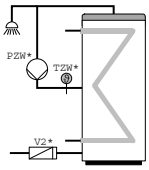
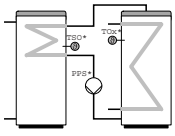
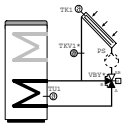
DANGER

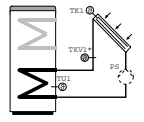
The collector flow sensor option must be activated and the sensor installed accordingly.

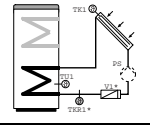
6.3 Variant 3

Selectable options

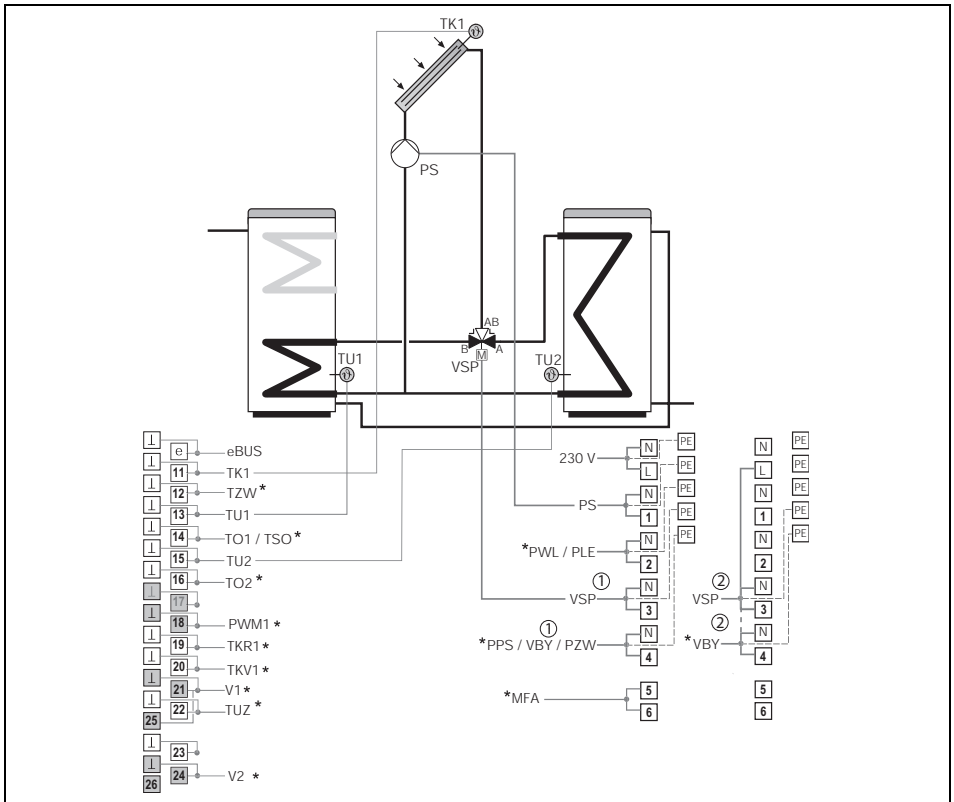
PWL option (chap. 8.10)	
	Output 2 PWL
	Input 14 TO1
or **PLE option (chap. 8.16)**	
	Output 2 PLE
	Input 13 TU1
	Input 22 TUZ *

PZW option (chap. 8.17)	
	Output 4 PZW
	Input 12 TZW*
	Input 24 V2*
or **PPS option (chap. 8.11)**	
	Output 4 PPS
	Input 14 TSO
	Input 16 TO2
or **VBY option (chap. 8.15)**	
	Output 4 VBY
	Input 20 TKV1

TKV option (chap. 8.4 ff.)	
	Input 20 TKV1

VIZ/ TKR option (chap. 8.12)	
	Input 21/25 V1
	Input 19 TKR1

Tank cascades



*) optional

ATTENTION – Observe polarity / cable labels

① Electrothermic actuator or drive with spring return
② Motor-driven actuator with permanent voltage

The WRSol determines the temperature difference between the collector sensor (TK) and the reference sensor (TU1 or TU2).
As soon as the temperature difference is greater than the set value (**`Switch-on difference TK – TU`**), the solar pump is activated, thereby charging the consumer, until the value (**`Switch-off difference TK – TU`**) or the maximum temperature of the consumer has been reached.

For the speed control of the solar pump PS, see chap. 8.4.

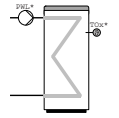
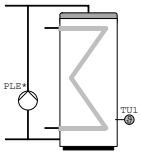
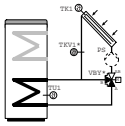
Once the set temperature of the tank is reached, the 3-way valve switches and charges the second consumer according to the priority and strategy for the charge. See chap. 8.19.

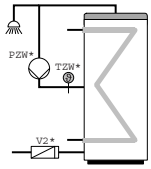
The pre-heated water is transported from the preheating tank to the standby tank through the cold water supply.

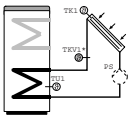
MFA options: Heat request (chap. 8.2.1)
Malfunction message (chap. 8.2.2)
High-temperature relief (chap. 8.2.3)

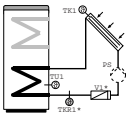
6.4 Variant 4

Selectable options

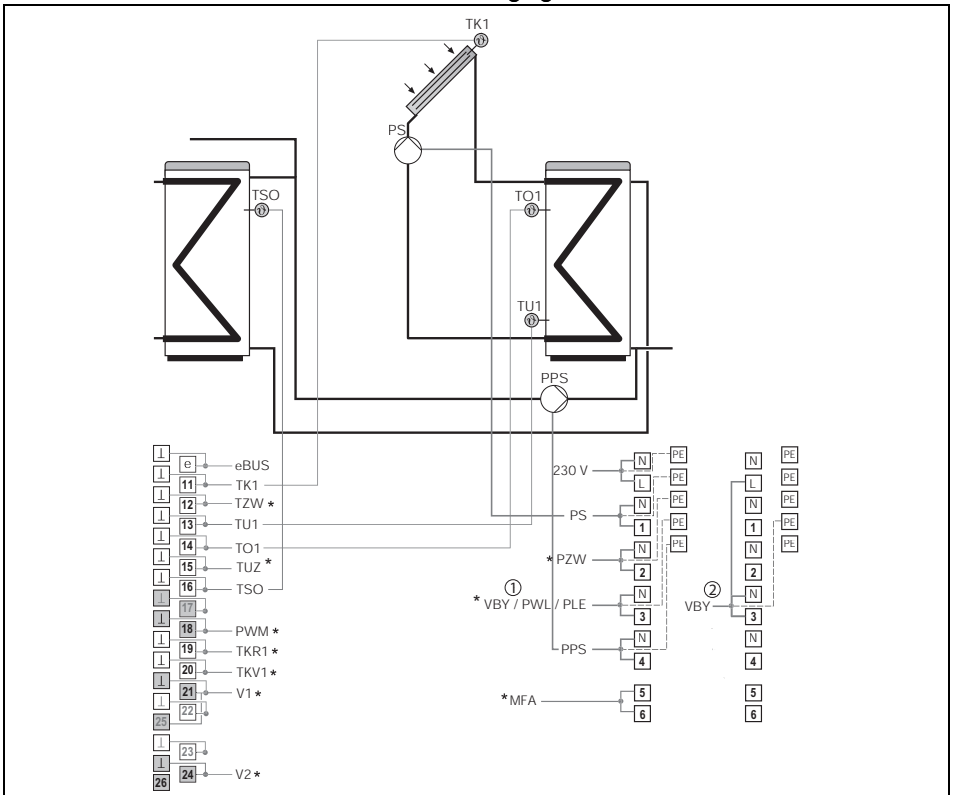
PWL option (chap. 8.10)	
	Output 3 PWL
	Input 14 TO1
or **PLE option (chap. 8.16)**	
	Output 3 PLE
	Input 13 TU1
	Input 15 TUZ
or **VBY option (chap. 8.15)**	
	Output 3 VBY
	Input 20 TKV1

PZW option (chap. 8.17)	
	Output 2 PZW
	Input 12 TZW*
	Input 24 V2*

TKV option (chap. 8.4 ff.)	
	Input 20 TKV1

VIZ/ TKR option (chap. 8.12)	
	Input 21/25 V1
	Input 19 TKR1

Series tank connection for hot water and recharging function



*) optional

ATTENTION – Observe polarity / cable labels

The WRSol determines the temperature difference between the collector sensor (TK) and the reference sensor (TU).
As soon as the temperature difference is greater than the set value **`(Switch-on difference TK – TU)`**, the solar pump is activated, thereby charging the consumer, until the **`(Switch-off difference TK – TU)`** or the maximum temperature of the consumer has been reached.

For the speed control of the solar pump PS, see chap. 8.4.

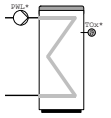
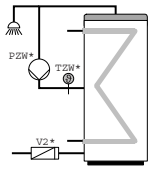
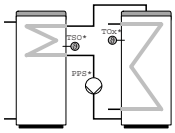
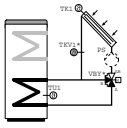
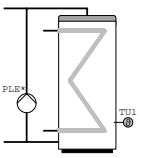
The pre-heated water is transported from the preheating tank to the standby tank through the cold water supply.

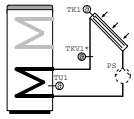
With the tank charging pump (PPS), the stored energy is restructured depending on the temperature (TO1) and temperature (TSO) (chap. 8.11).

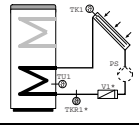
MFA options: Heat request (chap. 8.2.1)
Malfunction message (chap. 8.2.2)
High-temperature relief (chap. 8.2.3)

6.5 Variant 5

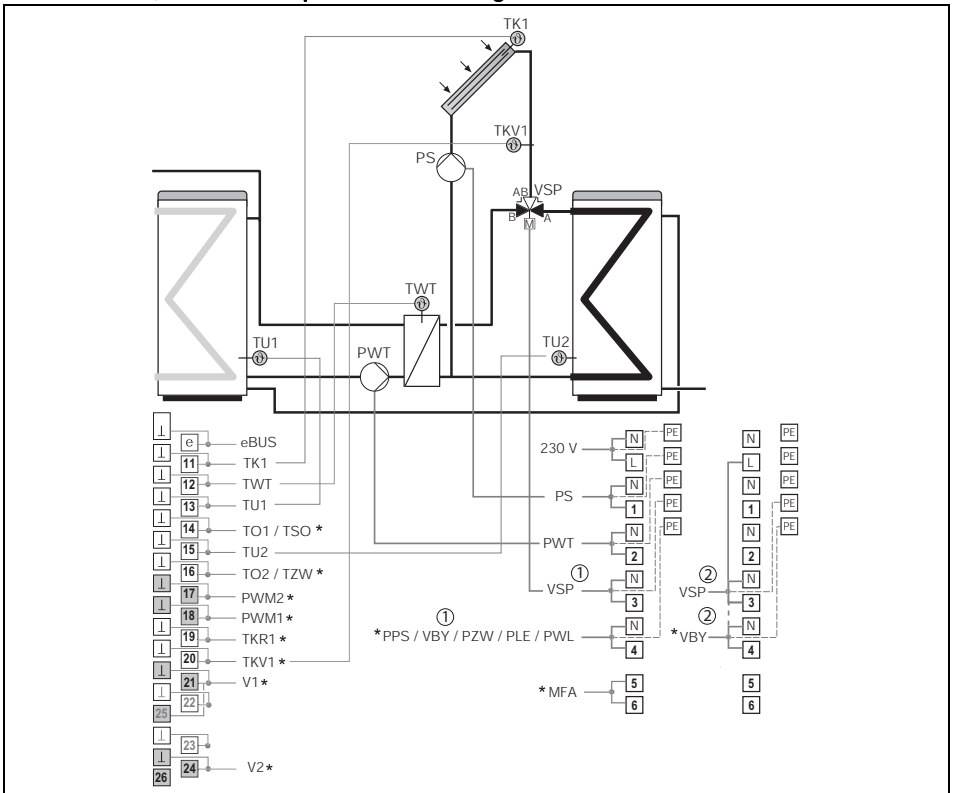
Selectable options

PWL option (chap. 8.10)	
	Output 4 PWL
	Input 14 TO1
or **PZW option (chap. 8.17)**	
	Output 4 PZW
	Input 16 TZW*
	Input 24 V2*
or **PPS option (chap. 8.11)**	
	Output 4 PPS
	Input 14 TSO
	Input 16 TO2
or **VBY option (chap. 8.15)**	
	Output 4 VBY
	Input 20 TKV1
or **PLE option (chap. 8.16)**	
	Output 4 PLE
	Input 13 TU1
	Input 22 TUZ

TKV option (chap. 8.4 ff.)	
	Input 20 TKV1

VIZ/ TKR option (chap. 8.12)	
	Input 21/25 V1
	Input 19 TKR1

Tank cascade, one tank via plate heat exchanger



*) optional

ATTENTION – Observe polarity / cable labels

① Electrothermic actuator or drive with spring return
② Motor-driven actuator with permanent voltage

The WRSol determines the temperature difference between the collector sensor (TK) and the reference sensor (TU1 or TU2). As soon as the temperature difference is greater than the set value (**`Switch-on difference TK – TU`**), the solar pump is activated, thereby charging the consumer, until the value (**`Switch-off difference TK – TU`**) or the maximum temperature of the consumer has been reached. For the speed control of the solar pump PS, see chap. 8.4. Once the set temperature of the tank is reached, the 3-way valve switches and charges the second consumer according to the priority and strategy for the charge. See chap. 8.19.
Charge to tank 1 TU1: The PWT pump starts at minimum speed (30%), when the temperature at the collector flow sensor TKV is warmer than the bottom tank sensor TU by the switch-off difference plus 2 K. The goal is to reach the set charge temperature on the TWT sensor and to hold it. If the temperature at the collector flow sensor TKV is only higher than the temperature at the tank bottom TU by the switch-off condition, the secondary pump PWT is stopped. For the speed control of the pump PWT, see chap. 8.21.
The pre-heated water is transported from the preheating tank to the standby tank through the cold water supply.

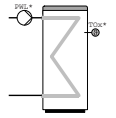
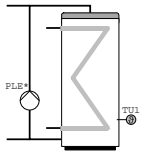
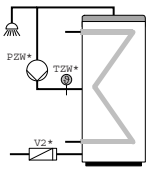
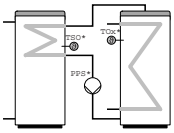
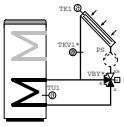
MFA options: Heat request (chap. 8.2.1)
Malfunction message (chap. 8.2.2)
High-temperature relief (chap. 8.2.3)

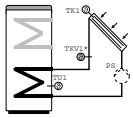
DANGER

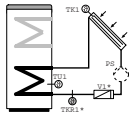
The collector flow sensor option must be activated and the sensor installed accordingly.

6.6 Variant 6

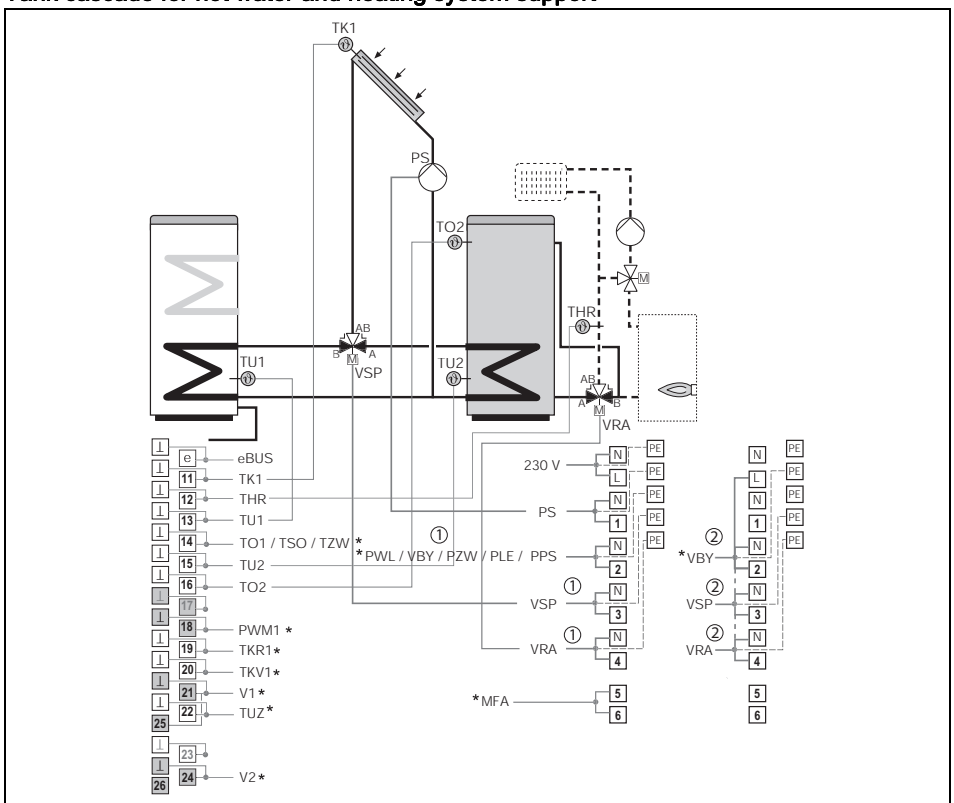
Selectable options

PWL option (chap. 8.10)
 Output 2 PWL
Input 14 TO1
or PLE option (chap. 8.16)
 Output 2 PLE
Input 13 TU1
Input 22 TUZ
or PZW option (chap. 8.17)
 Output 2 PZW
Input 14 TZW*
Input 24 V2*
or PPS option (chap. 8.11)
 Output 2 PPS
Input 14 TSO
Input 16 TO2
or VBY option (chap. 8.15)
 Output 2 VBY
Input 20 TKV1

TKV option (chap. 8.4 ff.)
 Input 20 TKV1

VIZ/ TKR option (chap. 8.12)
 Input 21/25 V1
Input 19 TKR1

Tank cascade for hot water and heating system support



*) optional

ATTENTION – Observe polarity / cable labels

① Electrothermic actuator or drive with spring return
② Motor-driven actuator with permanent voltage

The WRSol determines the temperature difference between the collector sensor (TK) and the reference sensor (TU1 or TU2).

As soon as the temperature difference is greater than the set value (**`Switch-on difference TK – TU`**), the solar pump is activated, thereby charging the consumer, until the value (**`Switch-off difference TK – TU`**) or the maximum temperature of the consumer has been reached.

For the speed control of the solar pump PS, see chap. 8.4.

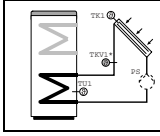
Once the set temperature of the tank is reached, the 3-way valve switches and charges the second consumer according to the priority and strategy for the charge. See chap. 8.19.

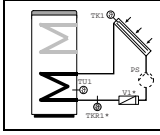
With the 3-way valve for the return temperature increase (VRA), the existing energy from the storage tank can be used depending on the temperature (TO2) and the heating system return sensor (THR). See chap. 8.24.

MFA options: Heat request (chap. 8.2.1)
Malfunction message (chap. 8.2.2)
High-temperature relief (chap. 8.2.3)

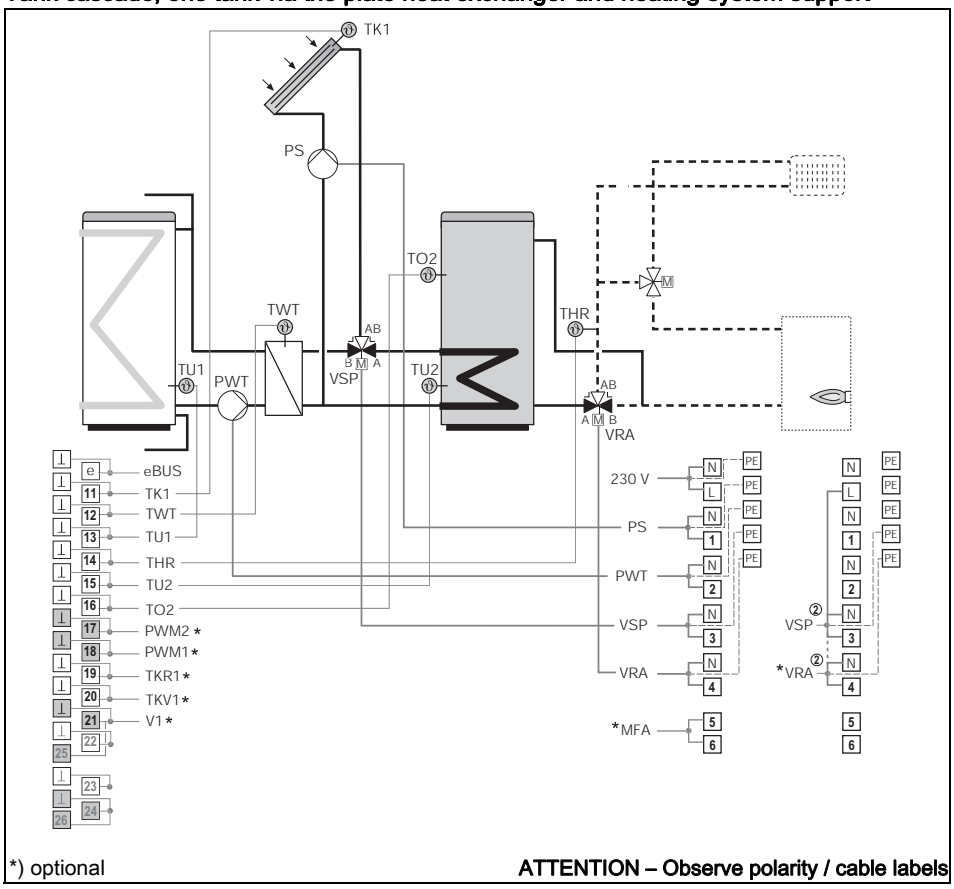
6.7 Variant 7

Selectable options

TKV option (chap. 8.4 ff.)	
	Input 20 TKV1

VIZ/ TKR option (chap. 8.12)	
	Input 21/25 V1
	Input 19 TKR1

Tank cascade, one tank via the plate heat exchanger and heating system support



*) optional

ATTENTION – Observe polarity / cable labels

① Electrothermic actuator or drive with spring return
② Motor-driven actuator with permanent voltage

The WRSol determines the temperature difference between the collector sensor (TK) and the reference sensor (TU1 or TU2). As soon as the temperature difference is greater than the set value (**`Switch-on difference TK – TU`**), the solar pump is activated, thereby charging the consumer, until the value (**`Switch-off difference TK – TU`**) or the maximum temperature of the consumer has been reached. For the speed control of the solar pump PS, see chap. 8.4. Once the set temperature of the tank is reached, the 3-way valve switches and charges the second consumer according to the priority and strategy for the charge. See chap. 8.19.
Charge to tank 1 TU1: The PWT pump starts at minimum speed (30%), when the temperature at the collector flow sensor TKV is warmer than the bottom tank sensor TU by the switch-off difference plus 2 K. The goal is to reach the set charge temperature on the TWT sensor and to hold it. If the temperature at the collector flow sensor TKV is only higher than the temperature at the tank bottom TU by the switch-off condition, the secondary pump PWT is stopped. For the speed control of the pump PWT, see chap. 8.21.

With the 3-way valve for the return temperature increase (VRA), the existing energy from the storage tank can be used depending on the temperature (TO2) and the heating system return sensor (THR). See chap. 8.24.

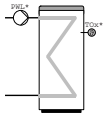
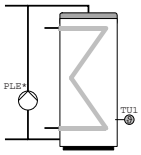
MFA options: Heat request (chap. 8.2.1)
Malfunction message (chap. 8.2.2)
High-temperature relief (chap. 8.2.3)

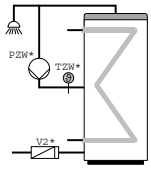
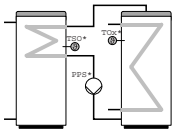
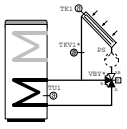
DANGER

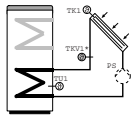
The collector flow sensor option must be activated and the sensor installed accordingly.

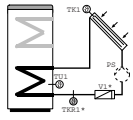
6.8 Variant 8

Selectable options

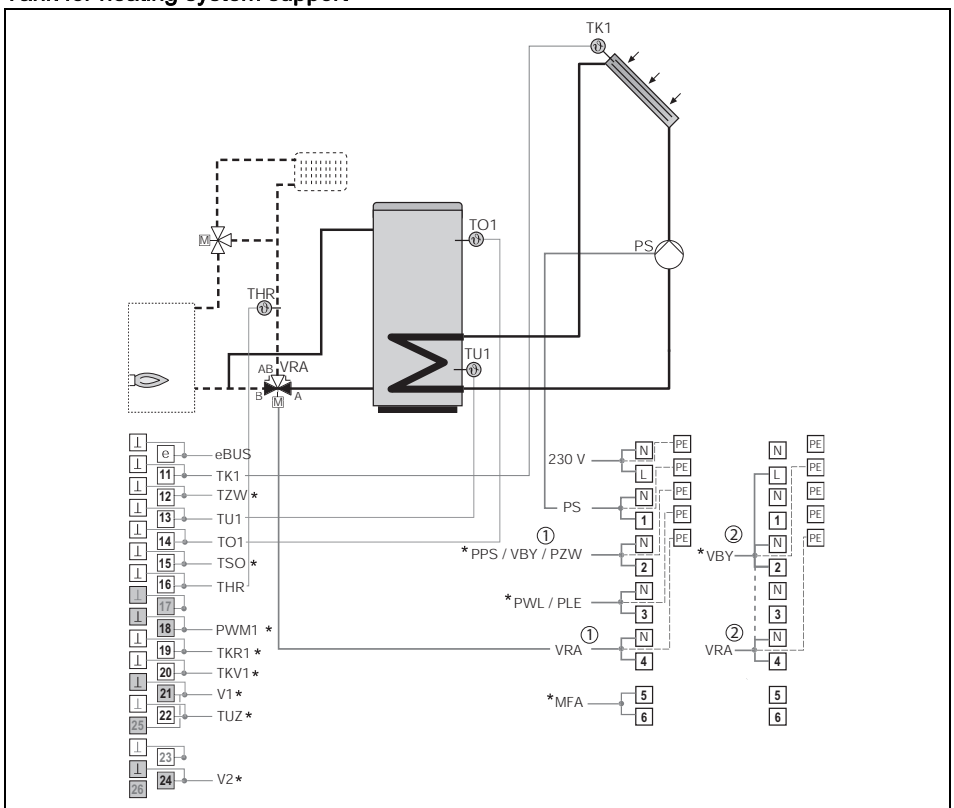
PWL option (chap. 8.10)	
	Output 3 PWL
	Input 14 TO1
or **PLE option (chap. 8.16)**	
	Output 3 PLE
	Input 13 TU1
	Input 22 TUZ

PZW option (chap. 8.17)	
	Output 2 PZW
	Input 12 TZW*
	Input 24 V2*
or **PPS option (chap. 8.11)**	
	Output 2 PPS
	Input 15 TSO
	Input 14 TO1
or **VBY option (chap. 8.15)**	
	Output 2 VBY
	Input 20 TKV1

TKV option (chap. 8.4 ff.)	
	Input 20 TKV1

VIZ/ TKR option (chap. 8.12)	
	Input 21/25 V1
	Input 19 TKR1

Tank for heating system support



*) optional

ATTENTION – Observe polarity / cable labels

① Electrothermic actuator or drive with spring return

② Motor-driven actuator with permanent voltage

The WRSol determines the temperature difference between the collector sensor (TK) and the reference sensor (TU).
As soon as the temperature difference is greater than the set value **`(Switch-on difference TK – TU)`**, the solar pump is activated, thereby charging the consumer, until the **`(Switch-off difference TK – TU)`** or the maximum temperature of the consumer has been reached.

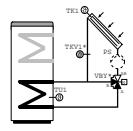
For the speed control of the solar pump PS, see chap. 8.4.

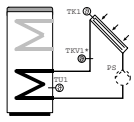
With the 3-way valve for the return temperature increase (VRA), the existing energy from the storage tank can be used depending on the temperature (TO1) and the heating system return sensor (THR). See chap. 8.24.

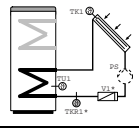
MFA options: Heat request (chap. 8.2.1)
Malfunction message (chap. 8.2.2)
High-temperature relief (chap. 8.2.3)

6.9 Variant 9

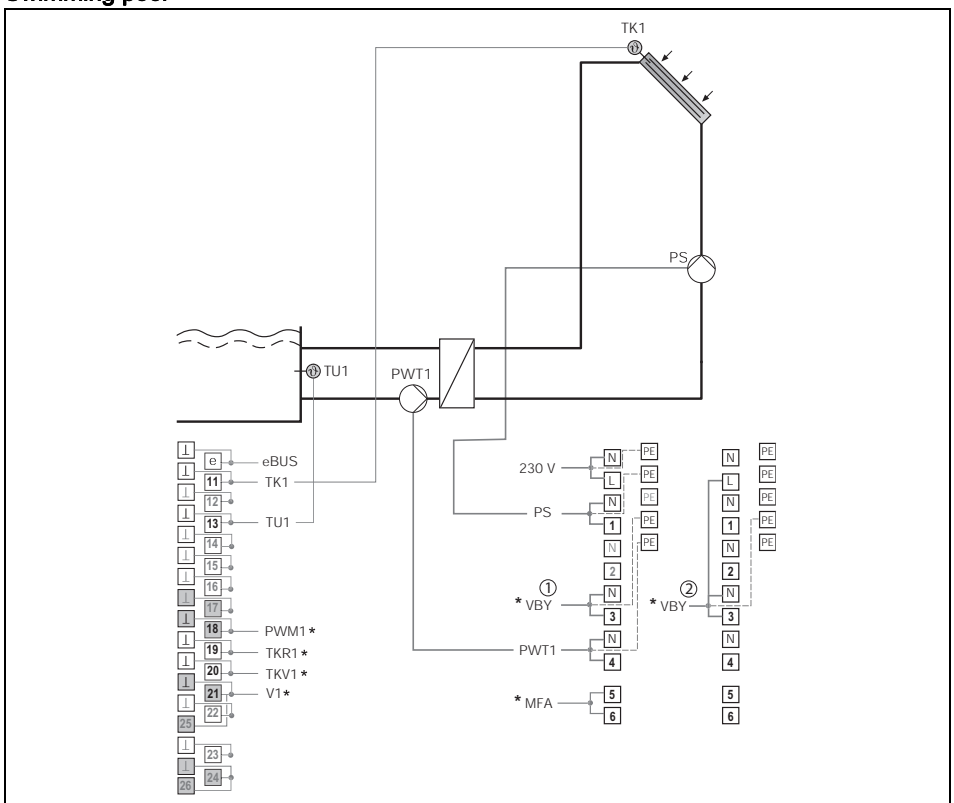
Selectable options

VBY option (chap. 8.15)	
	Output 3 VBY
	Input 20 TKV1

TKV option (chap. 8.4 ff.)	
	Input 20 TKV1

VIZ/ TKR option (chap. 8.12)	
	Input 21/25 V1
	Input 19 TKR1

Swimming pool



*) optional

ATTENTION – Observe polarity / cable labels

① Electrothermic actuator or drive with spring return
② Motor-driven actuator with permanent voltage

The WRSol determines the temperature difference between the collector sensor (TK) and the reference sensor (TU).
As soon as the temperature difference is greater than the set value **(Switch-on difference TK – TU)**, the solar pump is activated, thereby charging the consumer, until the **(Switch-off difference TK – TU)** or the maximum temperature of the consumer has been reached.

For the speed control of the solar pump PS, see chap. 8.4.

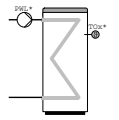
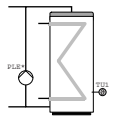
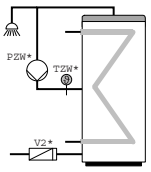
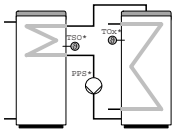
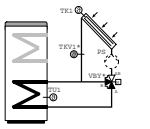
MFA options: Malfunction message (chap. 8.2.2)
High-temperature relief (chap. 8.2.3)

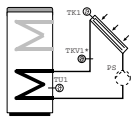
DANGER

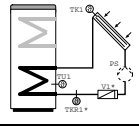
The set and maximum value for the swimming pool must be set.

6.10 Variant 10

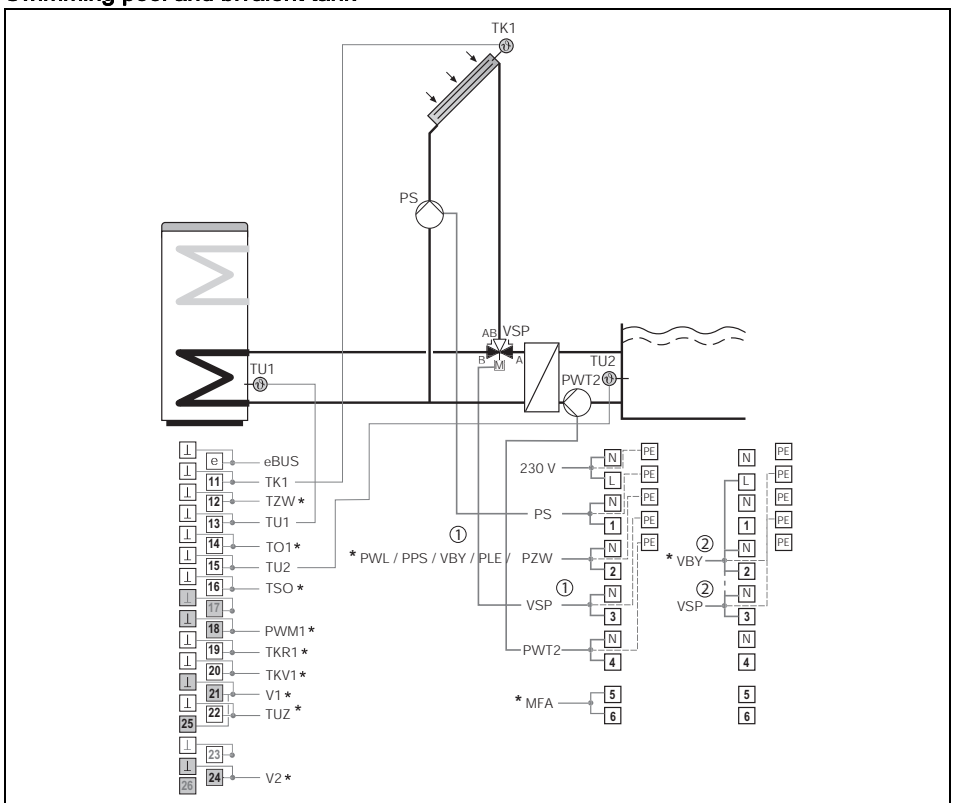
Selectable options

PWL option (chap. 8.10)	
	Output 2 PWL
	Input 14 TO1
or **PLE option (chap. 8.16)**	
	Output 2 PLE
	Input 13 TU1
	Input 22 TUZ
or **PZW option (chap. 8.17)**	
	Output 2 PZW
	Input 12 TZW*
	Input 24 V2*
or **PPS option (chap. 8.11)**	
	Output 2 PPS
	Input 16 TSO
	Input 14 TO1
or **VBY option (chap. 8.15)**	
	Output 2 VBY
	Input 20 TKV1

TKV option (chap. 8.4 ff.)	
	Input 20 TKV1

VIZ/ TKR option (chap. 8.12)	
	Input 21/25 V1
	Input 19 TKR1

Swimming pool and bivalent tank



*) optional

ATTENTION – Observe polarity / cable labels

① Electrothermic actuator or drive with spring return
② Motor-driven actuator with permanent voltage

The WRSol determines the temperature difference between the collector sensor (TK) and the reference sensor (TU1 or TU2).

As soon as the temperature difference is greater than the set value (**`Switch-on difference TK – TU`**), the solar pump is activated, thereby charging the consumer, until the value (**`Switch-off difference TK – TU`**) or the maximum temperature of the consumer has been reached.

For the speed control of the solar pump PS, see chap. 8.4.

Once the set temperature of the tank is reached, the 3-way valve switches and charges the second consumer according to the priority and strategy for the charge. See chap. 8.19.

The pump PWT for the swimming pool is actuated parallel to the valve VSP and is not speed-controlled.

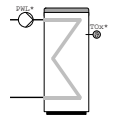
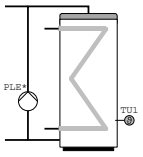
MFA options: Heat request (chap. 8.2.1)
Malfunction message (chap. 8.2.2)
High-temperature relief (chap. 8.2.3)

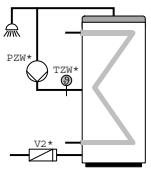
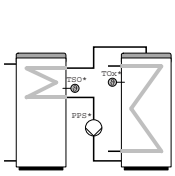
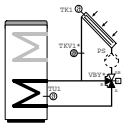
DANGER

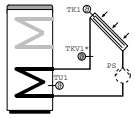
The set and maximum value for the swimming pool must be set.

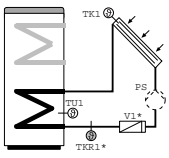
6.11 Variant 11

Selectable options

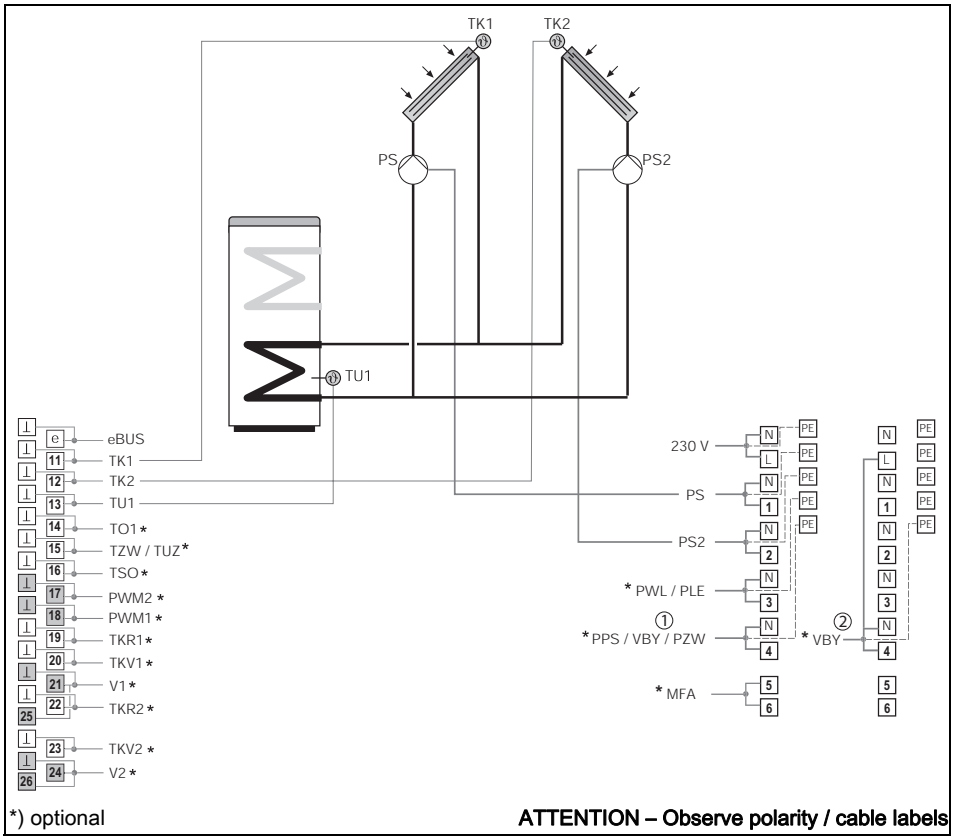
PWL option (chap. 8.10)	
	Output 3 PWL
	Input 14 TO1
or	
PLE option (chap. 8.16)	
	Output 3 PLE
	Input 13 TU1
	Input 15 TUZ

PZW option (chap. 8.17)	
	Output 4 PZW
	Input 15 TZW*
	Input 24 V2*
or	
PPS option (chap. 8.11)	
	Output 4 PPS
	Input 16 TSO
	Input 14 TO1
or	
VBY option (chap.8.15)	
	Output 4 VBY
	Input 20 TKV1

TKV option (chap. 8.4 ff.)	
	Input 20 TKV1
	Input 23 TKV2

VIZ/ TKR option (chap. 8.12)	
	Input 21/25 V1
	Input 19 TKR1
	Input 24/26 V2
	Input 22 TKR2

Bivalent tank with collector cascade



*) optional

ATTENTION – Observe polarity / cable labels

① Electrothermic actuator or drive with spring return
② Motor-driven actuator with permanent voltage

The WRSol determines the temperature difference between the collector sensor (TK) and the reference sensor (TU).
As soon as the temperature difference is greater than the set value **(Switch-on difference TK – TU)**, the solar pump is activated, thereby charging the consumer, until the **(Switch-off difference TK – TU)** or the maximum temperature of the consumer has been reached.

For the speed control of the solar pump PS, see chap. 8.4.

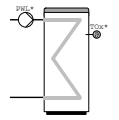
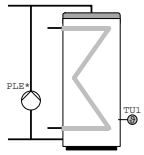
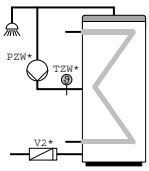
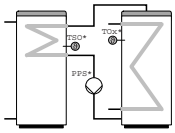
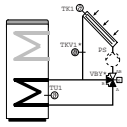
Both collector fields are operated independently of one another.

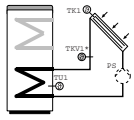
If the collector bypass option is used, but without a control function of the collector flow sensor TKV, only 1 collector flow sensor TKV1 is to be connected.
If the additional option of the collector flow sensor is used, it is mandatory that both collector flow sensors, TKV1 and TKV2, be used.

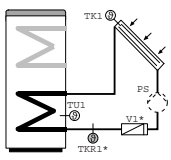
MFA options: Heat request (chap. 8.2.1)
Malfunction message (chap. 8.2.2)
High-temperature relief (chap. 8.2.3)

6.12 Variant 12

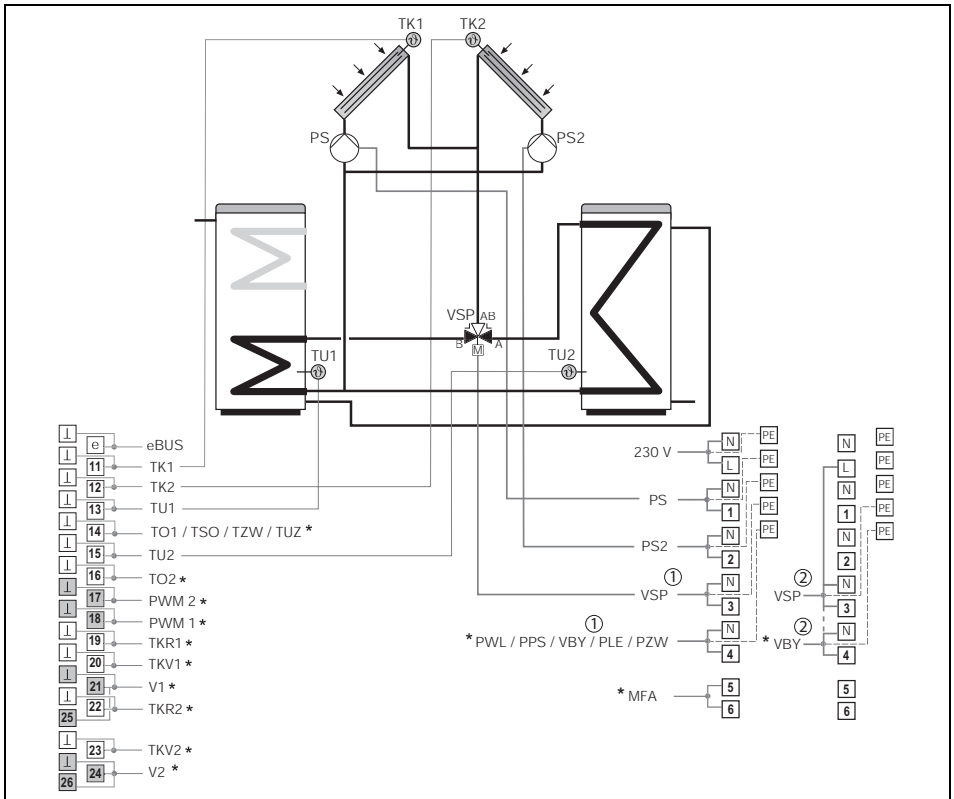
Selectable options

PWL option (chap. 8.10)	
	Output 4 PWL
	Input 14 TO1
or **PLE option (chap. 8.16)**	
	Output 4 PLE
	Input 13 TU1
	Input 14 TUZ
or **PZW option (chap. 8.17)**	
	Output 4 PZW
	Input 14 TZW*
	Input 24 V2*
or **PPS option (chap. 8.11)**	
	Output 4 PPS
	Input 14 TSO
	Input 16 TO2
or **VBY option (chap. 8.15)**	
	Output 4 VBY
	Input 20 TKV1

TKV option (chap. 8.4 ff.)	
	Input 20 TKV1
	Input 23 TKV2

VIZ/ TKR option (chap. 8.12)	
	Input 21/25 V1
	Input 19 TKR1
	Input 24/26 V2
	Input 22 TKR2

Tank cascade with collector cascade



*) optional

ATTENTION – Observe polarity / cable labels

① Electrothermic actuator or drive with spring return
② Motor-driven actuator with permanent voltage

The WRSol determines the temperature difference between the collector sensor (TK) and the reference sensor (TU1 or TU2).

As soon as the temperature difference is greater than the set value (**`Switch-on difference TK – TU`**), the solar pump is activated, thereby charging the consumer, until the value (**`Switch-off difference TK – TU`**) or the maximum temperature of the consumer has been reached.

For the speed control of the solar pump PS, see chap. 8.4.

Once the set temperature of the tank is reached, the 3-way valve switches and charges the second consumer according to the priority and strategy for the charge. See chap. 8.19.

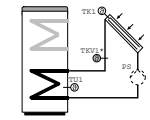
Both collector fields are operated independently of one another.

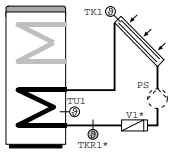
If the collector bypass option is used, but without a control function of the collector flow sensor TKV, only 1 collector flow sensor TKV1 is to be connected.
If the additional option of the collector flow sensor is used, it is mandatory that both collector flow sensors, TKV1 and TKV2, be used.

MFA options: Heat request (chap. 8.2.1)
Malfunction message (chap. 8.2.2)
High-temperature relief (chap. 8.2.3)

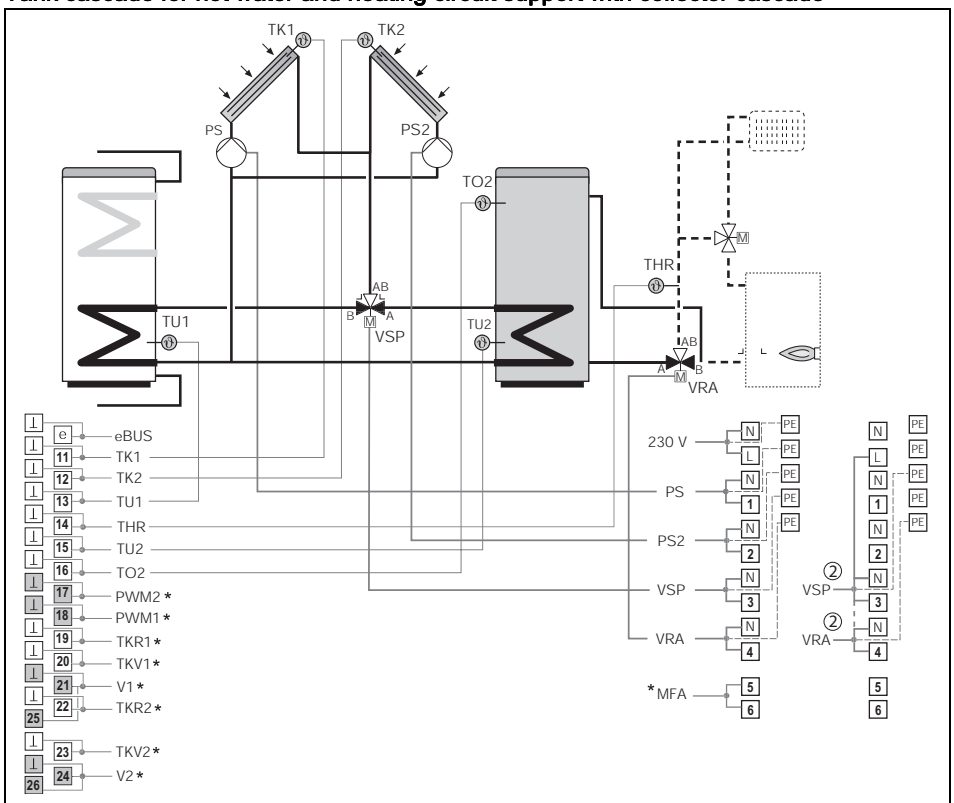
6.13 Variant 13

Selectable options

TKV option (chap. 8.4 ff.)	
	Input 20 TKV1
	Input 23 TKV2

VIZ/ TKR option (chap. 8.12)	
	Input 21/25 V1
	Input 19 TKR1
	Input 24/26 V2
	Input 22 TKR2

Tank cascade for hot water and heating circuit support with collector cascade



*) optional

ATTENTION – Observe polarity / cable labels

① Electrothermic actuator or drive with spring return
② Motor-driven actuator with permanent voltage

The WRSol determines the temperature difference between the collector sensor (TK) and the reference sensor (TU1 or TU2).

As soon as the temperature difference is greater than the set value **(Switch-on difference TK – TU**), the solar pump is activated, thereby charging the consumer, until the value (**Switch-off difference TK – TU**) or the maximum temperature of the consumer has been reached.

For the speed control of the solar pump PS, see chap. 8.4.

Once the set temperature of the tank is reached, the 3-way valve switches and charges the second consumer according to the priority and strategy for the charge. See chap. 8.19.

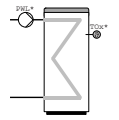
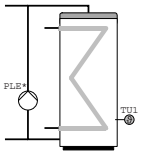
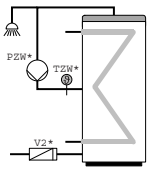
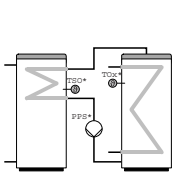
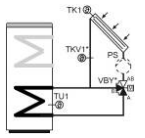
Both collector fields are operated independently of one another.

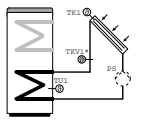
With the 3-way valve for the return temperature increase (VRA), the existing energy from the storage tank can be used depending on the temperature (TO2) and the heating system return sensor (THR). See chap. 8.24.

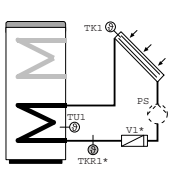
MFA options: Heat request (chap. 8.2.1)
Malfunction message (chap. 8.2.2)
High-temperature relief (chap. 8.2.3)

6.14 Variant 14

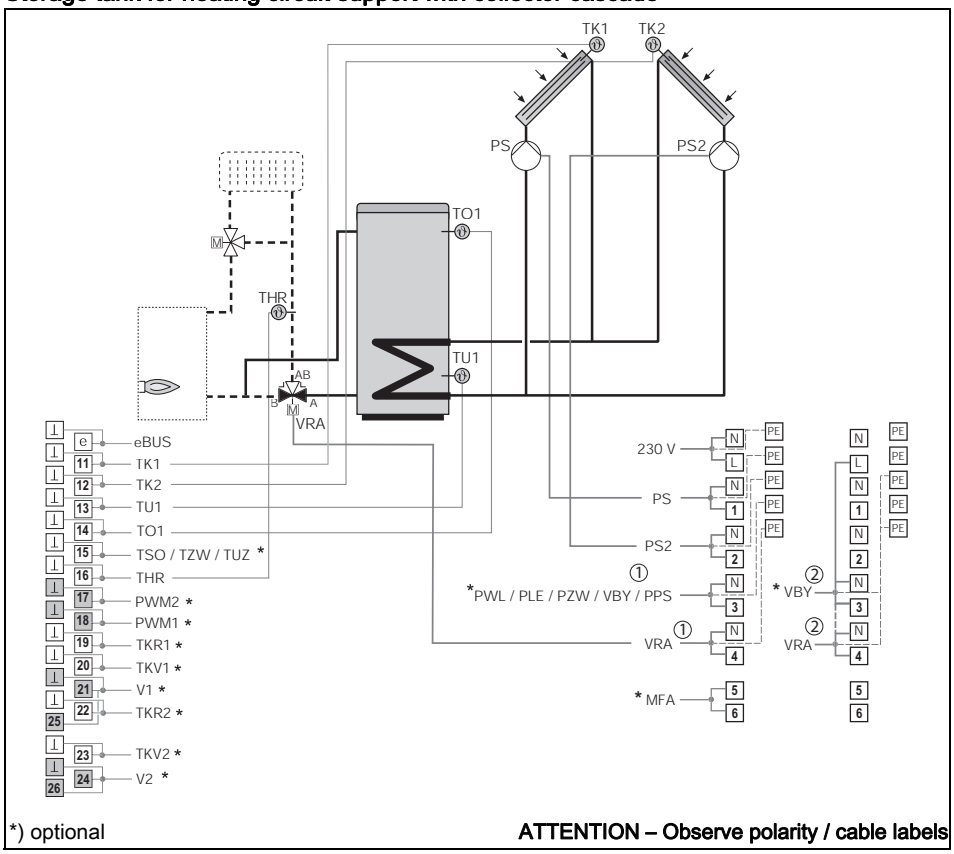
Selectable options

PWL option (chap. 8.10)	
	Output 3 PWL
	Input 14 TO1
or **PLE option (chap. 8.16)**	
	Output 3 PLE
	Input 13 TU1
	Input 15 TUZ
or **PZW option (chap. 8.17)**	
	Output 3 PZW
	Input 15 TZW*
	Input 24 V2*
or **PPS option (chap. 8.11)**	
	Output 3 PPS
	Input 15 TSO
	Input 14 TO1
or **VBY option (chap. 8.15)**	
	Output 3 VBY
	Input 20 TKV1

TKV option (chap. 8.4 ff.)	
	Input 20 TKV1
	Input 23 TKV2

VIZ/ TKR option (chap. 8.12)	
	Input 21/25 V1
	Input 19 TKR1
	Input 24/26 V2
	Input 22 TKR2

Storage tank for heating circuit support with collector cascade



*) optional

ATTENTION – Observe polarity / cable labels

① Electrothermic actuator or drive with spring return
② Motor-driven actuator with permanent voltage

The WRSol determines the temperature difference between the collector sensor (TK) and the reference sensor (TU).
As soon as the temperature difference is greater than the set value **`(Switch-on difference TK – TU)`**, the solar pump is activated, thereby charging the consumer, until the **`(Switch-off difference TK – TU)`** or the maximum temperature of the consumer has been reached.

For the speed control of the solar pump PS, see chap. 8.4.

Both collector fields are operated independently of one another.

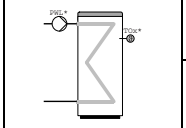
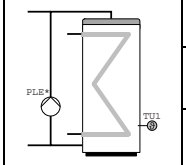
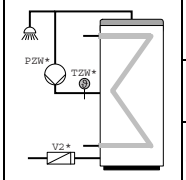
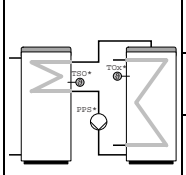
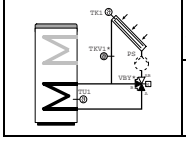
If the collector bypass option is used, but without a control function of the collector flow sensor TKV, only 1 collector flow sensor TKV1 is to be connected.
If the additional option of the collector flow sensor is used, it is mandatory that both collector flow sensors, TKV1 and TKV2, be used.

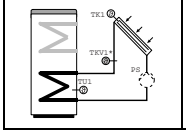
With the 3-way valve for the return temperature increase (VRA), the existing energy from the storage tank can be used depending on the temperature (TO1) and the heating system return sensor (THR). See chap. 8.24.

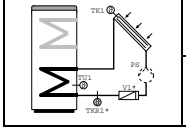
MFA options: Heat request (chap. 8.2.1)
Malfunction message (chap. 8.2.2)
High-temperature relief (chap. 8.2.3)

6.15 Variant 15

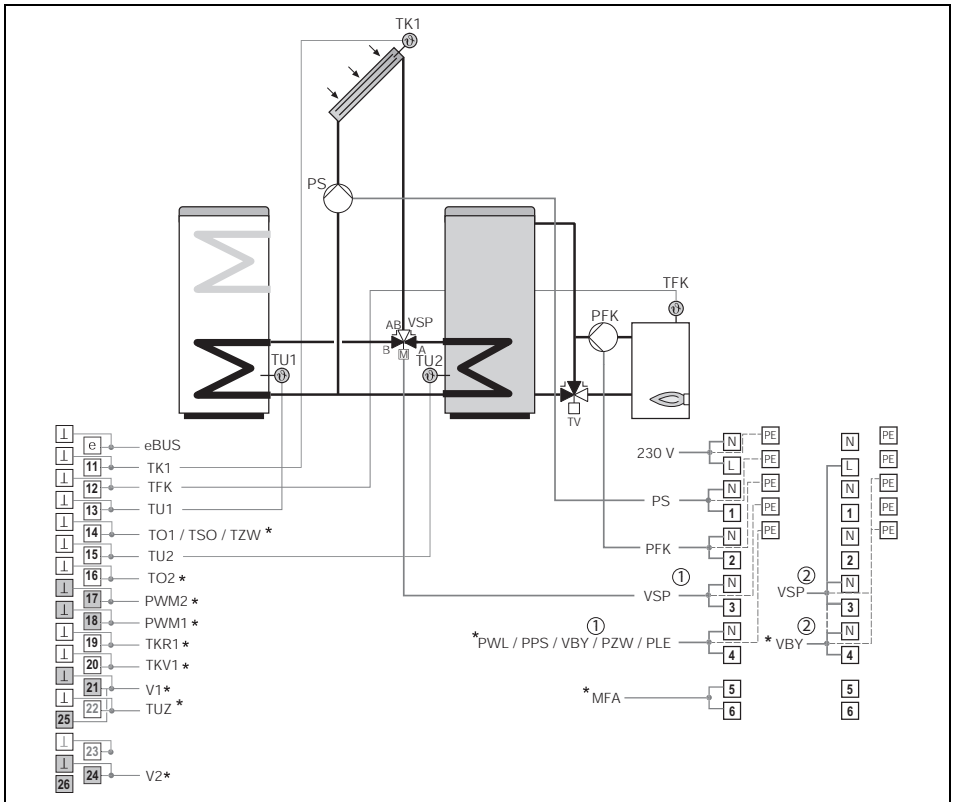
Selectable options

PWL option (chap. 8.10)
 Output 4 PWL
Input 14 TO1
or PLE option (chap. 8.16)
 Output 4 PLE
Input 13 TU1
Input 22 TUZ
or PZW option (chap. 8.17)
 Output 4 PZW
Input 14 TZW*
Input 24 V2*
or PPS option (chap. 8.11)
 Output 4 PPS
Input 14 TSO
Input 16 TO2
or VBY option (chap. 8.15)
 Output 4 VBY
Input 20 TKV1

TKV option (chap. 8.4 ff.)
 Input 20 TKV1

VIZ/ TKR option (chap. 8.12)
 Input 21/25 V1
Input 19 TKR1

Tank cascade and solid fuel boiler



*) optional

ATTENTION – Observe polarity / cable labels

① Electrothermic actuator or drive with spring return
② Motor-driven actuator with permanent voltage

The WRSol determines the temperature difference between the collector sensor (TK) and the reference sensor (TU1 or TU2).

As soon as the temperature difference is greater than the set value (**`Switch-on difference TK – TU`**), the solar pump is activated, thereby charging the consumer, until the value (**`Switch-off difference TK – TU`**) or the maximum temperature of the consumer has been reached.

For the speed control of the solar pump PS, see chap. 8.4.

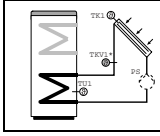
Once the set temperature of the tank is reached, the 3-way valve switches and charges the second consumer according to the priority and strategy for the charge. See chap. 8.19.

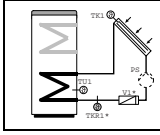
Charging the storage tank with solid fuel boiler, temperature difference control between the sensor of the solid fuel boiler (TFK) and the reference sensor (TU2).
The thermal mixing valve (TV) allows the solid fuel boiler to heat up fast.
As soon as the temperature difference is greater than the set value (**`Switch-on difference TFK – TU`**) and the minimum temperature at the TFK is reached, the pump PFK is switched on, thereby charging the consumer until the (**`Switch-off difference TFK – TU`**) is reached. See chap. 8.5.

MFA options: Heat request (chap. 8.2.1)
Malfunction message (chap. 8.2.2)
High-temperature relief (chap. 8.2.3)

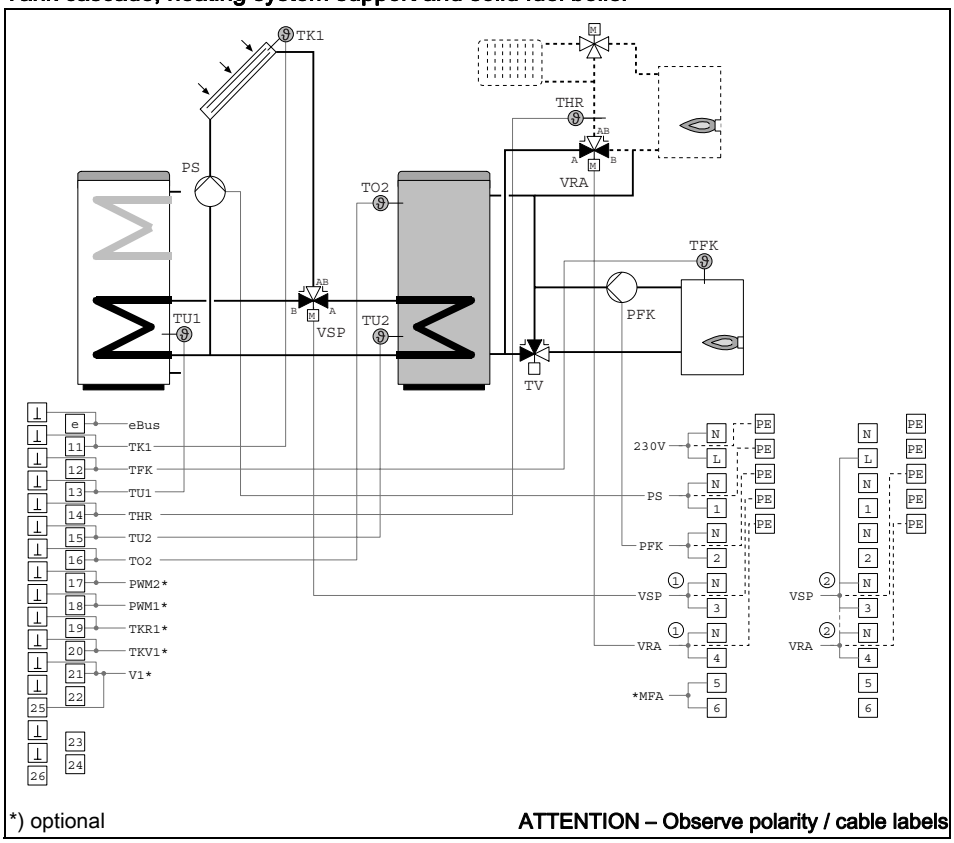
6.16 Variant 16

Selectable options

TKV option (chap. 8.4 ff.)	
	Input 20 TKV1

VIZ/ TKR option (chap. 8.12)	
	Input 21/25 V1
	Input 19 TKR1

Tank cascade, heating system support and solid fuel boiler



*) optional

ATTENTION – Observe polarity / cable labels

① Electrothermic actuator or drive with spring return
② Motor-driven actuator with permanent voltage

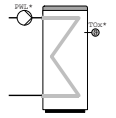
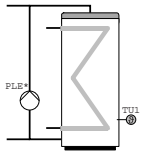
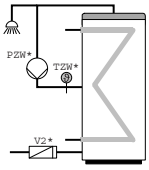
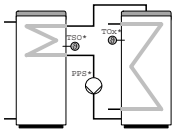
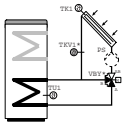
The WRSol determines the temperature difference between the collector sensor (TK) and the reference sensor (TU1 or TU2).
As soon as the temperature difference is greater than the set value **(Switch-on difference TK – TU**), the solar pump is activated, thereby charging the consumer, until the value (**Switch-off difference TK – TU**) or the maximum temperature of the consumer has been reached. For the speed control of the solar pump PS, see chap. 8.4.
Once the set temperature of the tank is reached, the 3-way valve switches and charges the second consumer according to the priority and strategy for the charge. See chap. 8.19.
Charging the storage tank with solid fuel boiler, temperature difference control between the sensor of the solid fuel boiler (TFK) and the reference sensor (TU2).
The thermal mixing valve (TV) allows the solid fuel boiler to heat up fast.
As soon as the temperature difference is greater than the set value (**Switch-on difference TFK – TU**) and the minimum temperature at the TFK is reached, the pump PFK is switched on, thereby charging the consumer until the (**Switch-off difference TFK – TU**) is reached. See chap. 8.5.

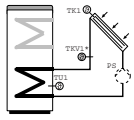
With the 3-way valve for the return temperature increase (VRA), the existing energy from the storage tank can be used depending on the temperature (TO2) and the heating system return sensor (THR). See chap. 8.24.

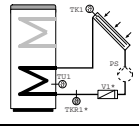
MFA options: Heat request (chap. 8.2.1)
Malfunction message (chap. 8.2.2)
High-temperature relief (chap. 8.2.3)

6.17 Variant 17

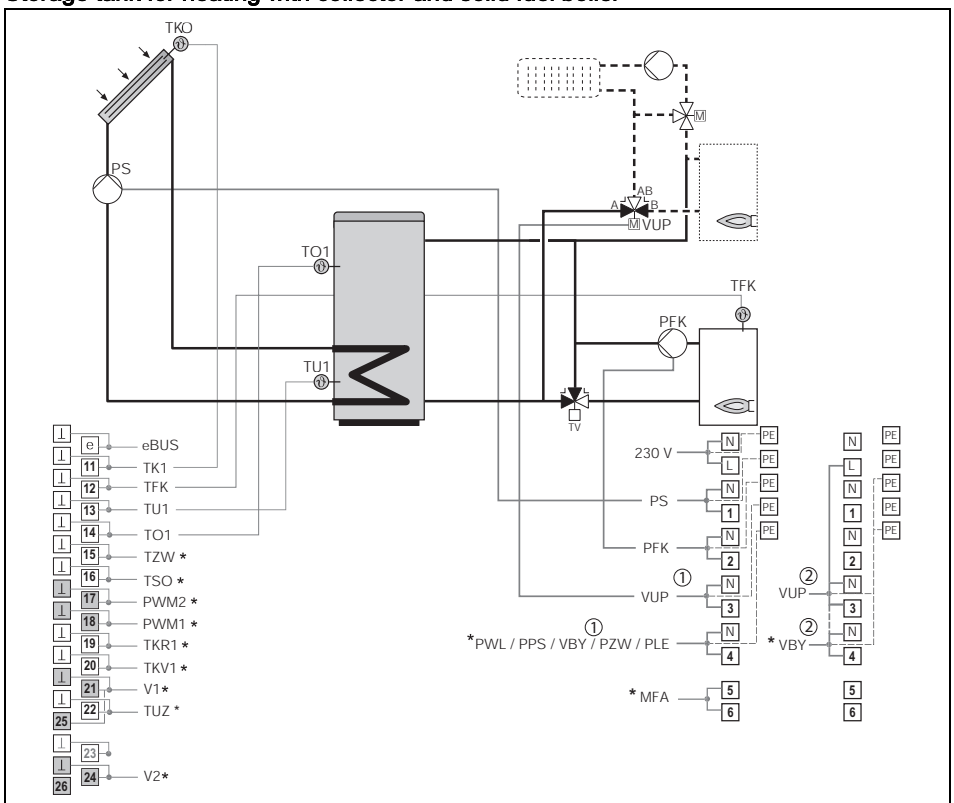
Selectable options

PWL option (chap. 8.10)
 Output 4 PWL
Input 14 TO1
or PLE option (chap. 8.16)
 Output 4 PLE
Input 13 TU1
Input 22 TUZ
or PZW option (chap. 8.17)
 Output 4 PZW
Input 15 TZW*
Input 24 V2*
or PPS option (chap. 8.11)
 Output 4 PPS
Input 16 TSO
Input 14 TO1
or VBY option (chap. 8.15)
 Output 4 VBY
Input 20 TKV1

TKV option (chap. 8.4 ff.)
 Input 20 TKV1

VIZ/ TKR option (chap. 8.12)
 Input 21/25 V1
Input 19 TKR1

Storage tank for heating with collector and solid fuel boiler



*) optional

ATTENTION – Observe polarity / cable labels

① Electrothermic actuator or drive with spring return
② Motor-driven actuator with permanent voltage

The WRSol determines the temperature difference between the collector sensor (TK) and the reference sensor (TU).
As soon as the temperature difference is greater than the set value **(Switch-on difference TK – TU)**, the solar pump is activated, thereby charging the consumer, until the **(Switch-off difference TK – TU)** or the maximum temperature of the consumer has been reached. For the speed control of the solar pump PS, see chap. 8.4.

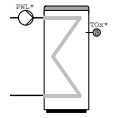
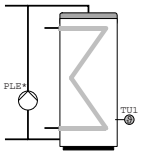
Charging the storage tank with solid fuel boiler, temperature difference control between the sensor of the solid fuel boiler (TFK) and the reference sensor (TU1).
The thermal mixing valve (TV) allows the solid fuel boiler to heat up fast.
As soon as the temperature difference is greater than the set value (**Switch-on difference TFK – TU**) and the minimum temperature at the TFK is reached, the pump PFK is switched on, thereby charging the consumer until the (**Switch-off difference TFK – TU**) is reached. See chap. 8.5.

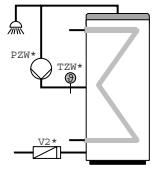
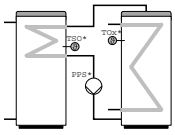
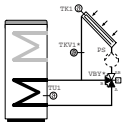
Heat generator / storage tank switchover, valve VUP. As soon as the setpoint has been reached in the storage tank on sensor TO1, the valve VUP is switched toward the storage tank and the consumers can get what they need directly from the storage tank. See chap. 8.26.

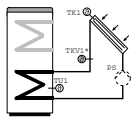
MFA options: Heat request (chap. 8.2.1)
Malfunction message (chap. 8.2.2)
High-temperature relief (chap. 8.2.3)

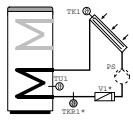
6.18 Variant 18

Selectable options

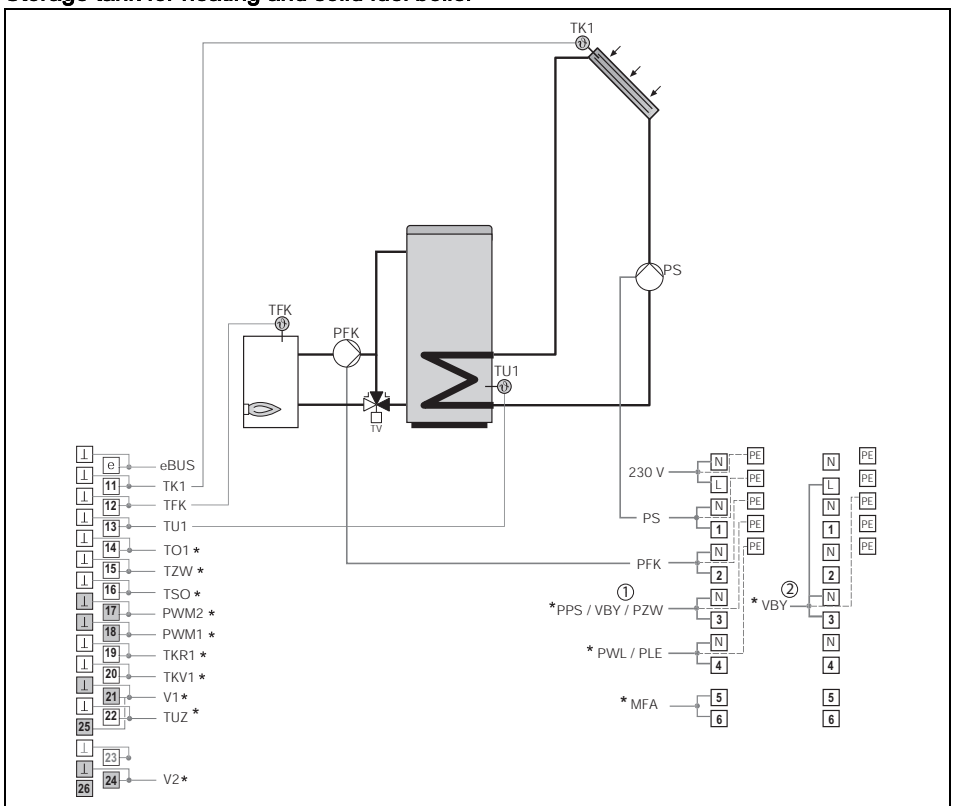
PWL option (chap. 8.10)	
	Output 4 PWL
	Input 14 TO1
or **PLE option (chap. 8.16)**	
	Output 4 PLE
	Input 13 TU1
	Input 22 TUZ

PZW option (chap. 8.17)	
	Output 3 PZW
	Input 15 TZW*
	Input 24 V2*
or **PPS option (chap. 8.11)**	
	Output 3 PPS
	Input 16 TSO
	Input 14 TO1
or **VBY option (chap. 8.15)**	
	Output 3 VBY
	Input 20 TKV1

TKV option (chap. 8.4 ff.)	
	Input 20 TKV1

VIZ/ TKR option (chap. 8.12)	
	Input 21/25 V1
	Input 19 TKR1

Storage tank for heating and solid fuel boiler



*) optional

ATTENTION – Observe polarity / cable labels

① Electrothermic actuator or drive with spring return
② Motor-driven actuator with permanent voltage

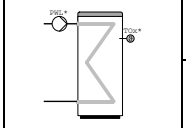
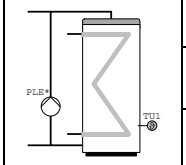
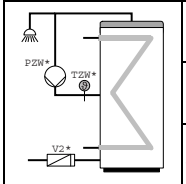
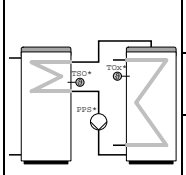
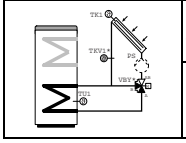
The WRSol determines the temperature difference between the collector sensor (TK) and the reference sensor (TU).
As soon as the temperature difference is greater than the set value **(Switch-on difference TK – TU)**, the solar pump is activated, thereby charging the consumer, until the **(Switch-off difference TK – TU)** or the maximum temperature of the consumer has been reached. For the speed control of the solar pump PS, see chap. 8.4.

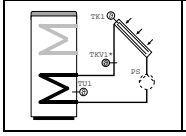
Charging the storage tank with solid fuel boiler, temperature difference control between the sensor of the solid fuel boiler (TFK) and the reference sensor (TU1).
The thermal mixing valve (TV) allows the solid fuel boiler to heat up fast.
As soon as the temperature difference is greater than the set value (**Switch-on difference TFK – TU**) and the minimum temperature at the TFK is reached, the pump PFK is switched on, thereby charging the consumer until the (**Switch-off difference TFK – TU**) is reached. See chap. 8.5.

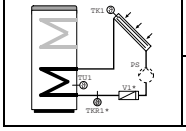
MFA options: Heat request (chap. 8.2.1)
Malfunction message (chap. 8.2.2)
High-temperature relief (chap. 8.2.3)

6.19 Variant 19

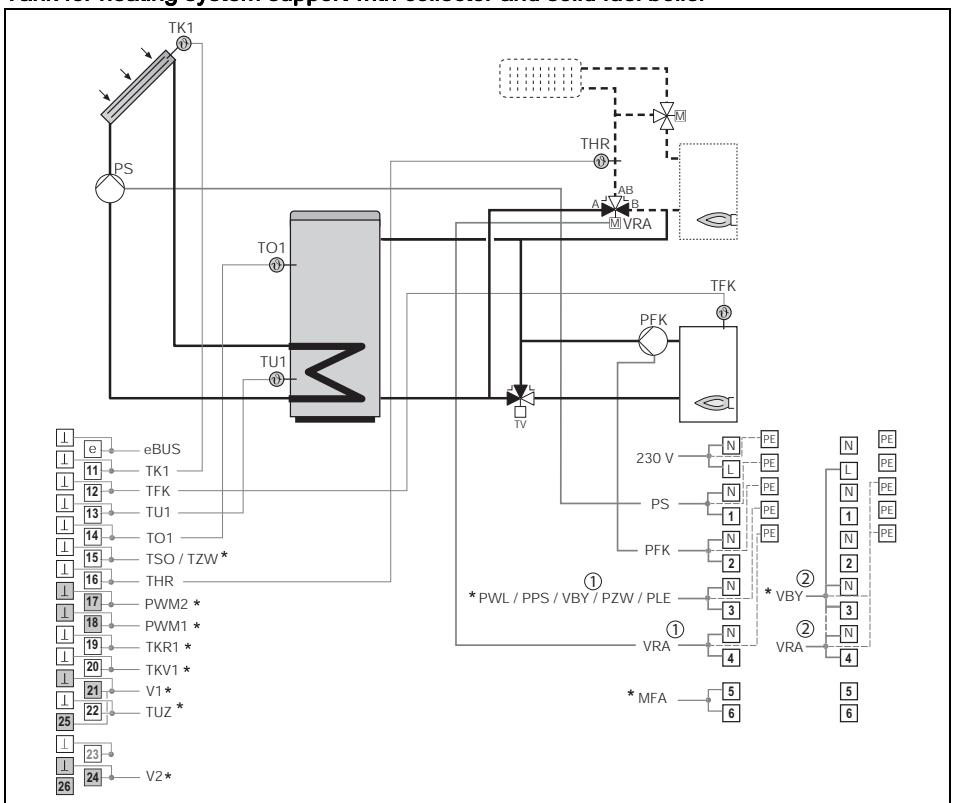
Selectable options

PWL option (chap. 8.10)
 Output 3 PWL
Input 14 TO1
or PLE option (chap. 8.16)
 Output 3 PLE
Input 13 TU1
Input 22 TUZ
or PZW option (chap. 8.17)
 Output 3 PZW
Input 15 TZW*
Input 24 V2*
or PPS option (chap. 8.11)
 Output 3 PPS
Input 15 TSO
Input 14 TO1
or VBY option (chap. 8.15)
 Output 3 VBY
Input 20 TKV1

TKV option (chap. 8.4 ff.)
 Input 20 TKV1

VIZ/ TKR option (chap. 8.12)
 Input 21/25 V1
Input 19 TKR1

Tank for heating system support with collector and solid fuel boiler



*) optional

ATTENTION – Observe polarity / cable labels

① Electrothermic actuator or drive with spring return
② Motor-driven actuator with permanent voltage

The WRSol determines the temperature difference between the collector sensor (TK) and the reference sensor (TU).
As soon as the temperature difference is greater than the set value **(Switch-on difference TK – TU)**, the solar pump is activated, thereby charging the consumer, until the **(Switch-off difference TK – TU)** or the maximum temperature of the consumer has been reached. For the speed control of the solar pump PS, see chap. 8.4.

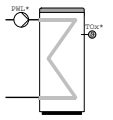
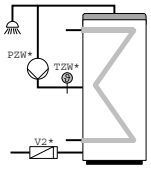
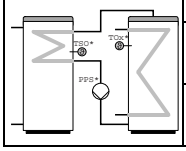
Charging the storage tank with solid fuel boiler, temperature difference control between the sensor of the solid fuel boiler (TFK) and the reference sensor (TU1).
The thermal mixing valve (TV) allows the solid fuel boiler to heat up fast.
As soon as the temperature difference is greater than the set value (**Switch-on difference TFK – TU**) and the minimum temperature at the TFK is reached, the pump PFK is switched on, thereby charging the consumer until the (**Switch-off difference TFK – TU**) is reached. See chap. 8.5.

With the 3-way valve for the return temperature increase (VRA), the existing energy from the storage tank can be used depending on the temperature (TO1) and the heating system return sensor (THR). See chap. 8.24.

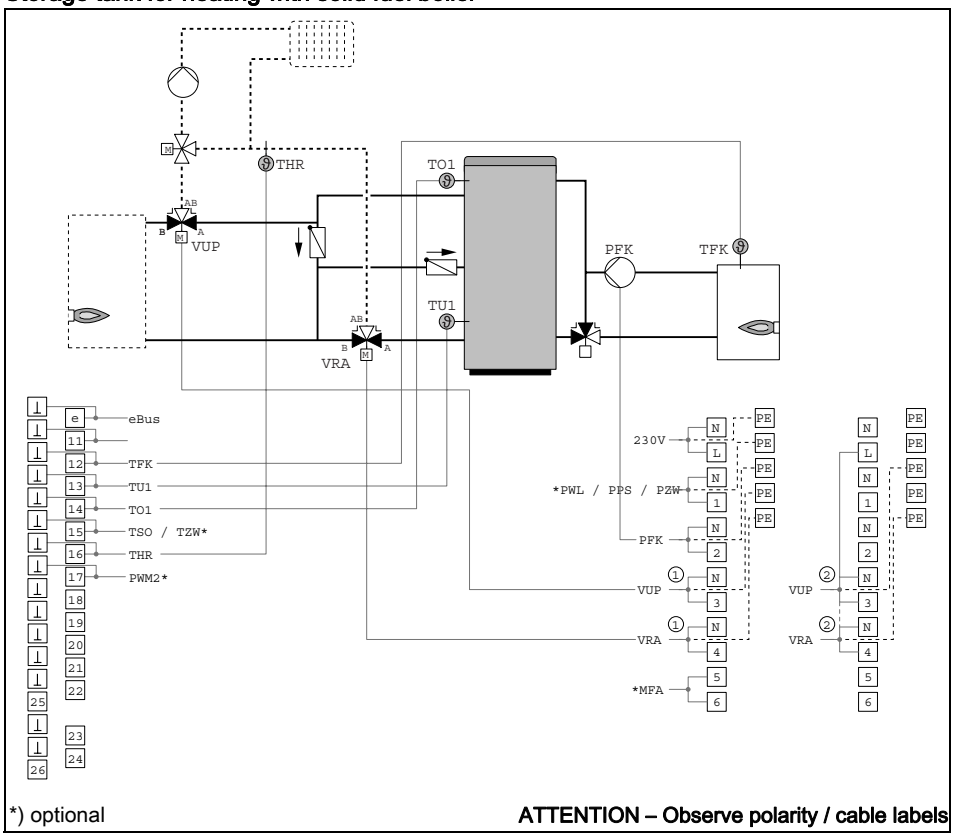
MFA options: Heat request (chap. 8.2.1)
Malfunction message (chap. 8.2.2)
High-temperature relief (chap. 8.2.3)

6.20 Variant 20

Selectable options

PWL option (chap. 8.10)	
	Output 1 PWL
	Input 14 TO1
or **PZW option (chap. 8.17)**	
	Output 1 PZW
	Input 15 TZW*
	Input 24 V2*
or **PPS option (chap. 8.11)**	
	Output 1 PPS
	Input 15 TSO
	Input 14 TO1

Storage tank for heating with solid fuel boiler



*) optional

ATTENTION – Observe polarity / cable labels

① Electrothermic actuator or drive with spring return
② Motor-driven actuator with permanent voltage

Charging the storage tank with solid fuel boiler, temperature difference control between the sensor of the solid fuel boiler (TFK) and the reference sensor (TU1).
The thermal mixing valve (TV) allows the solid fuel boiler to heat up fast.
As soon as the temperature difference is greater than the set value (**`Switch-on difference TFK – TU`**) and the minimum temperature at the TFK is reached, the pump PFK is switched on, thereby charging the consumer until the (**`Switch-off difference TFK – TU`**) is reached. See chap. 8.5.

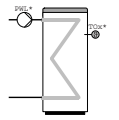
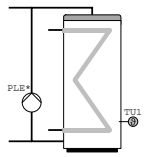
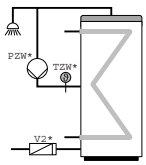
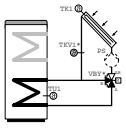
Heat generator / storage tank switchover, valve VUP. As soon as the setpoint has been reached in the storage tank on sensor TO1, the valve VUP is switched toward the storage tank and the consumers can get what they need directly from the storage tank. See chap. 8.26.

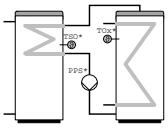
With the 3-way valve for the return temperature increase (VRA), the existing energy from the storage tank can be used depending on the temperature (TO1) and the heating system return sensor (THR). See chap. 8.24.

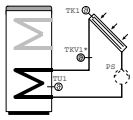
MFA options: Heat request (chap. 8.2.1)
Malfunction message (chap. 8.2.2)

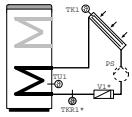
6.21 Variant 21

Selectable options

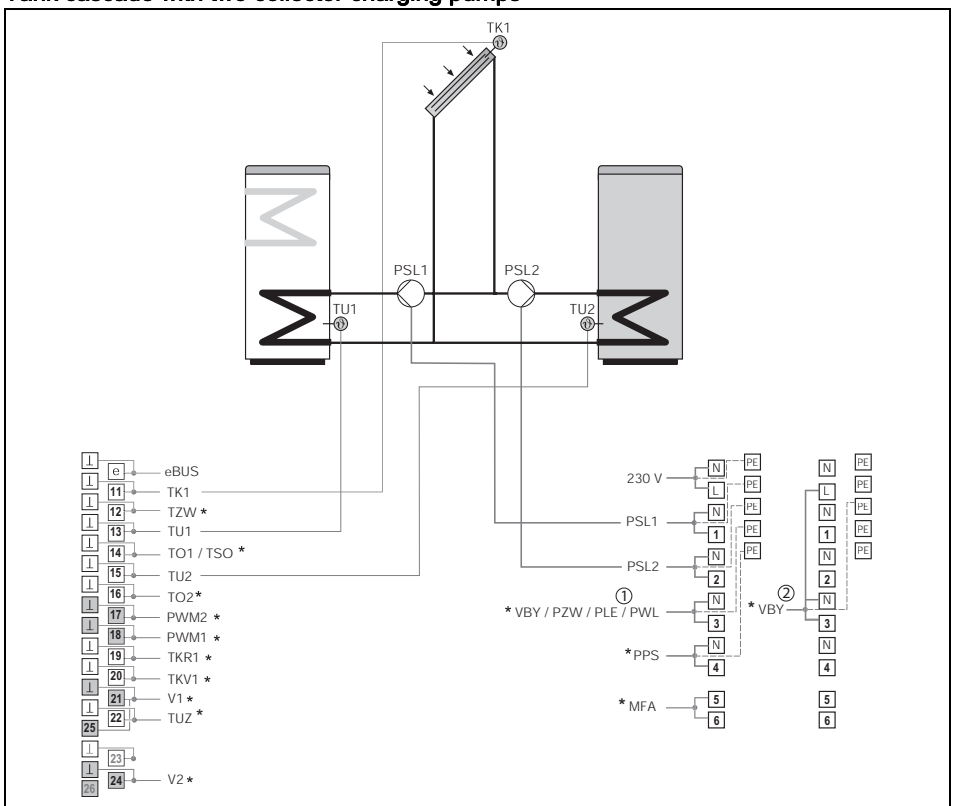
PWL option (chap. 8.10)	
	Output 3 PWL
	Input 14 TO1
or **PLE option (chap. 8.16)**	
	Output 3 PLE
	Input 13 TU1
	Input 22 TUZ
or **PZW option (chap. 8.17)**	
	Output 3 PZW
	Input 12 TZW*
	Input 24 V2*
or **VBY option (chap. 8.15)**	
	Output 3 VBY
	Input 20 TKV1

PPS option (chap. 8.11)	
	Output 4 PPS
	Input 16 TSO
	Input 16 TO2

TKV option (chap. 8.4 ff.)	
	Input 20 TKV1

VIZ/ TKR option (chap. 8.12)	
	Input 21/25 V1
	Input 19 TKR1

Tank cascade with two collector charging pumps



*) optional

ATTENTION – Observe polarity / cable labels

① Electrothermic actuator or drive with spring return
② Motor-driven actuator with permanent voltage

The WRSol determines the temperature difference between the collector sensor (TK) and the reference sensor (TU1 or TU2).

As soon as the temperature difference is greater than the set value (**`Switch-on difference TK – TU`**), the solar pump is activated, thereby charging the consumer, until the value (**`Switch-off difference TK – TU`**) or the maximum temperature of the consumer has been reached.

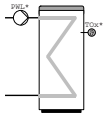
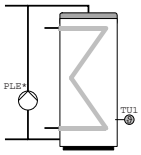
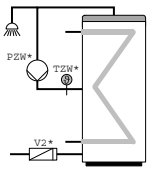
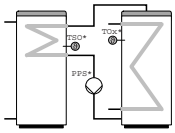
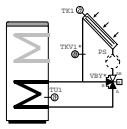
For the speed control of the solar pump PS, see chap. 8.4.

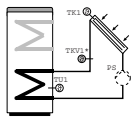
If the set temperature of tank 1 is reached, the pump PSL1 switches off and the second consumer is charged with pump PSL2 in accordance with the priority and strategy for the charge. See chap. 8.19..

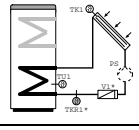
MFA options: Heat request (chap. 8.2.1)
Malfunction message (chap. 8.2.2)
High-temperature relief (chap. 8.2.3)

6.22 Variant 22

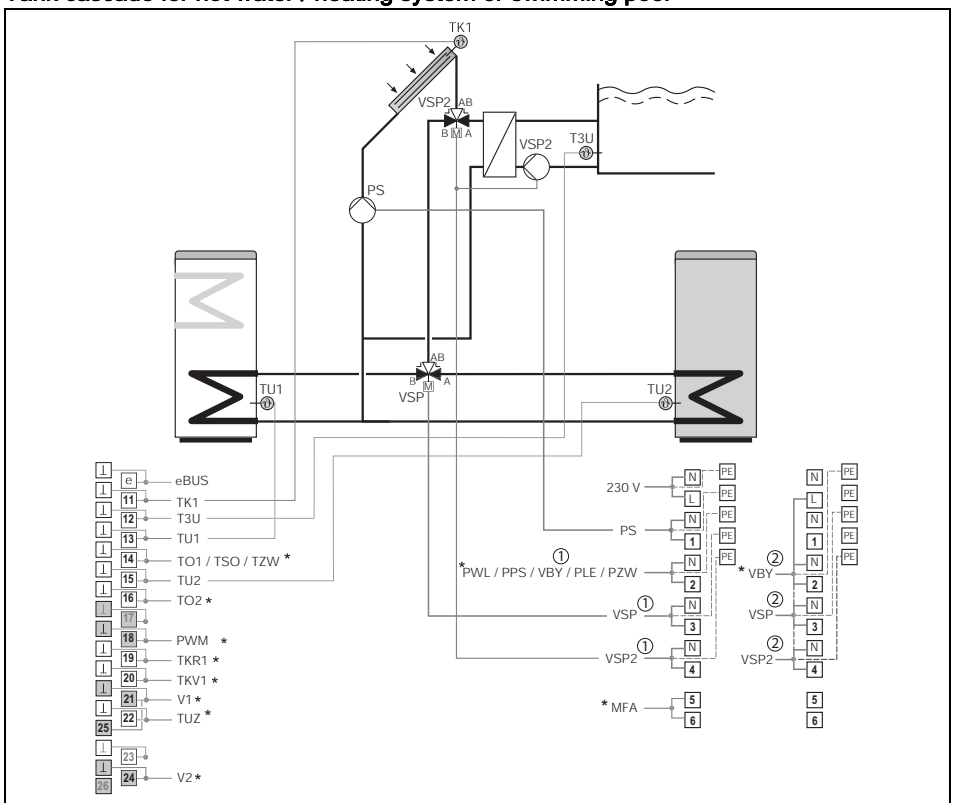
Selectable options

PWL option (chap. 8.10)	
	Output 2 PWL
	Input 14 TO1
or **PLE option (chap. 8.16)**	
	Output 2 PLE
	Input 13 TU1
	Input 22 TUZ
or **PZW option (chap. 8.17)**	
	Output 2 PZW
	Input 14 TZW*
	Input 24 V2*
or **PPS option (chap. 8.11)**	
	Output 2 PPS
	Input 14 TSO
	Input 16 TO2
or **VBY option (chap. 8.15)**	
	Output 2 VBY
	Input 20 TKV1

TKV option (chap. 8.4 ff.)	
	Input 20 TKV1

VIZ/ TKR option (chap. 8.12)	
	Input 21/25 V1
	Input 19 TKR1

Tank cascade for hot water / heating system or swimming pool



*) optional

ATTENTION – Observe polarity / cable labels

① Electrothermic actuator or drive with spring return
② Motor-driven actuator with permanent voltage

The WRSol determines the temperature difference between the collector sensor (TK) and the reference sensor (TU1 or TU3).

As soon as the temperature difference is greater than the set value (**`Switch-on difference TK – TU`**), the solar pump is activated, thereby charging the consumer, until the value (**`Switch-off difference TK – TU`**) or the maximum temperature of the consumer has been reached.
For the speed control of the solar pump PS, see chap. 8.4.

Once the set temperature of the tank 1 is reached, the 3-way valve switches and charges the second consumer according to the priority and strategy for the charge. See chap. 8.19.

Once the set temperature of the tank 2 is reached, the 3-way valve switches and charges the third tank (swimming pool) according to the priority and strategy for the charge.
The swimming pool is excluded from alternating tank operation for yield-dependent charging.

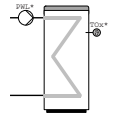
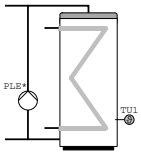
MFA options: Heat request (chap. 8.2.1)
Malfunction message (chap. 8.2.2)
High-temperature relief (chap. 8.2.3)

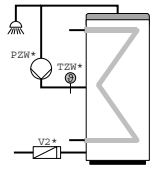
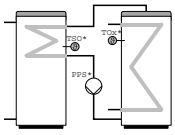
DANGER

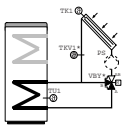
The set and maximum value for the swimming pool must be set.

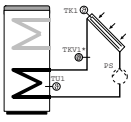
6.23 Variant 23

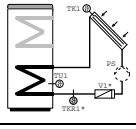
Selectable options

PWL option (chap. 8.10)	
	Output 3 PWL
	Input 14 TO1
or **PLE option (chap. 8.16)**	
	Output 3 PLE
	Input 13 TU1
	Input 22 TUZ

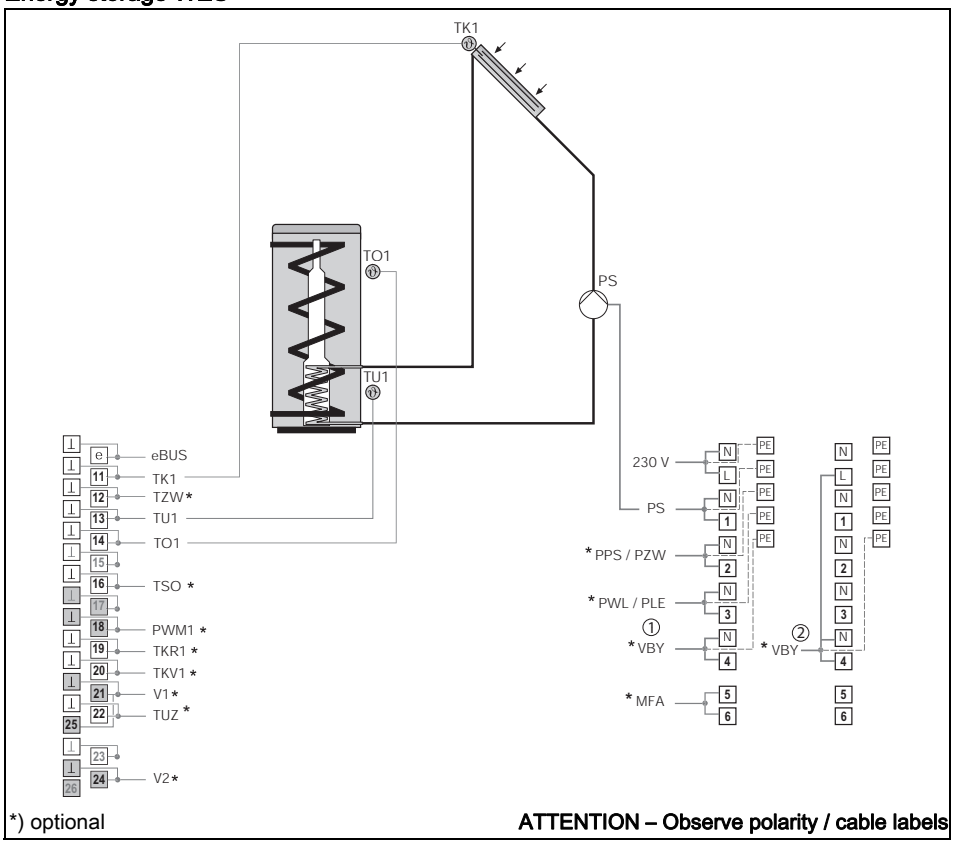
PZW option (chap. 8.17)	
	Output 2 PZW
	Input 12 TZW*
	Input 24 V2*
or **PPS option (chap. 8.11)**	
	Output 2 PPS
	Input 16 TSO
	Input 14 TO1

VBY option (chap. 8.15)	
	Output 4 VBY
	Input 20 TKV1

TKV option (chap. 8.4 ff.)	
	Input 20 TKV1

VIZ/ TKR option (chap. 8.12)	
	Input 21/25 V1
	Input 19 TKR1

Energy storage WES



*) optional

ATTENTION – Observe polarity / cable labels

① Electrothermic actuator or drive with spring return
② Motor-driven actuator with permanent voltage

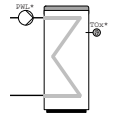
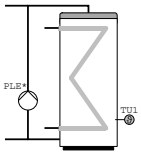
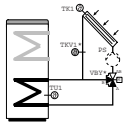
The WRSol determines the temperature difference between the collector sensor (TK) and the reference sensor (TU).
As soon as the temperature difference is greater than the set value **(Switch-on difference TK – TU)**, the solar pump is activated, thereby charging the consumer, until the **(Switch-off difference TK – TU)** or the maximum temperature of the consumer has been reached. For the speed control of the solar pump PS, see chap. 8.4.

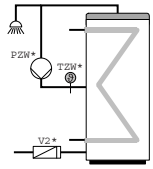
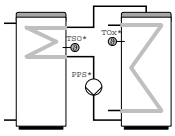
The WES function (chap. 8.27) is for optimizing the charging of the tank. Depending on the solar supply, the upper sensor is charged to quickly reach the usable temperature at the top.

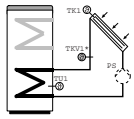
MFA options: Heat request (chap. 8.2.1)
Malfunction message (chap. 8.2.2)
High-temperature relief (chap. 8.2.3)

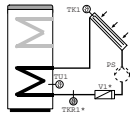
6.24 Variant 24

Selectable options

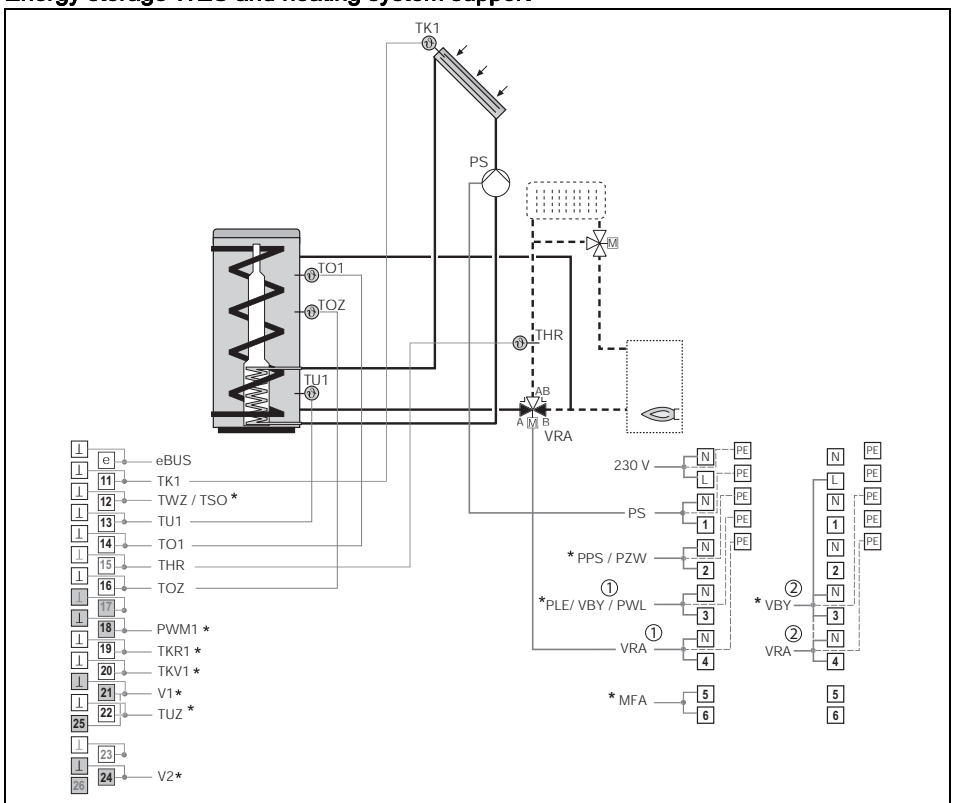
PWL option (chap. 8.10)	
	Output 3 PWL
	Input 14 TO1
or **PLE option (chap. 8.16)**	
	Output 3 PLE
	Input 13 TU1
	Input 22 TUZ
or **VBY option (chap. 8.15)**	
	Output 3 VBY
	Input 20 TKV1

PZW option (chap. 8.17)	
	Output 2 PZW
	Input 12 TZW*
	Input 24 V2*
or **PPS option (chap. 8.11)**	
	Output 2 PPS
	Input 12 TSO
	Input 14 TO1

TKV option (chap. 8.4 ff.)	
	Input 20 TKV1

VIZ/ TKR option (chap. 8.12)	
	Input 21/25 V1
	Input 19 TKR1

Energy storage WES and heating system support



*) optional

ATTENTION – Observe polarity / cable labels

① Electrothermic actuator or drive with spring return
② Motor-driven actuator with permanent voltage

The WRSol determines the temperature difference between the collector sensor (TK) and the reference sensor (TU).
As soon as the temperature difference is greater than the set value **`(Switch-on difference TK – TU)`**, the solar pump is activated, thereby charging the consumer, until the **`(Switch-off difference TK – TU)`** or the maximum temperature of the consumer has been reached. For the speed control of the solar pump PS, see chap. 8.4.

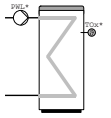
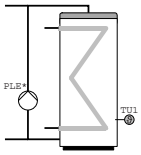
The WES function (chap. 8.27) is for optimizing the charging of the tank. Depending on the solar supply, the upper sensor is charged to quickly reach the usable temperature at the top.

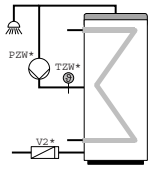
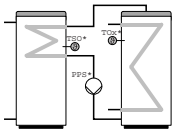
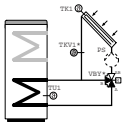
With the 3-way valve for the return temperature increase (VRA), the existing energy from the storage tank can be used depending on the temperature (TOZ) and the heating system return sensor (THR). See chap. 8.24.

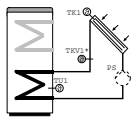
MFA options: Heat request (chap. 8.2.1)
Malfunction message (chap. 8.2.2)
High-temperature relief (chap. 8.2.3)

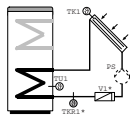
6.25 Variant 25

Selectable options

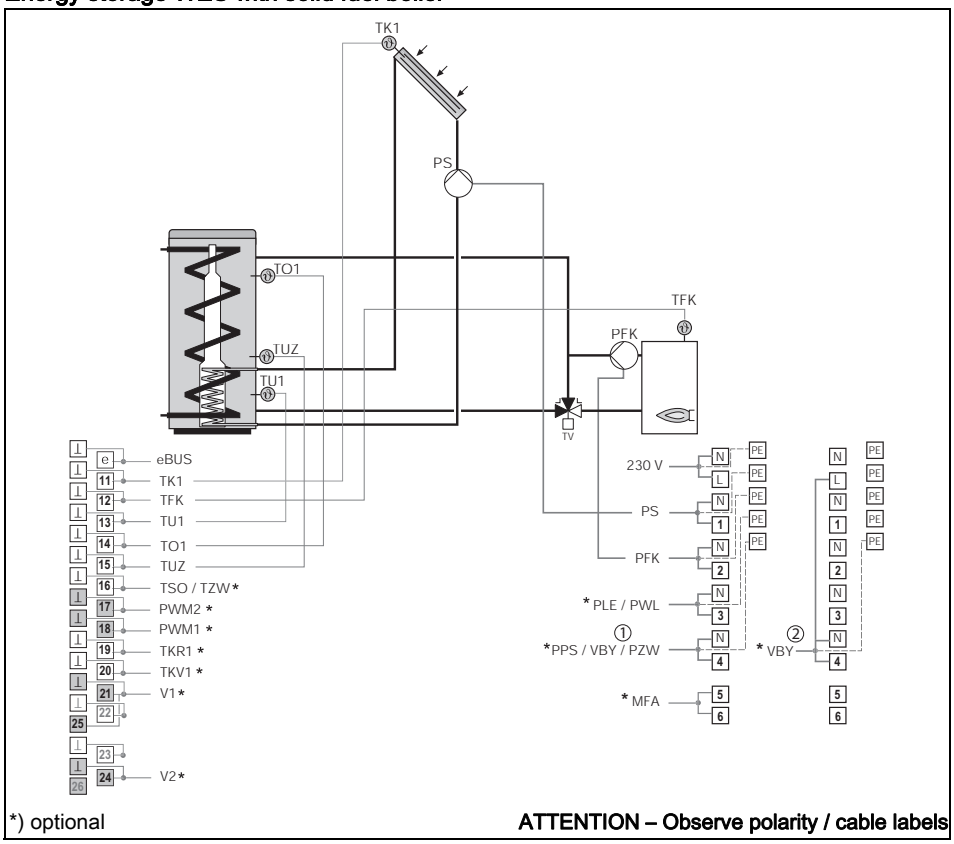
PWL option (chap. 8.10)	
	Output 3 PWL
	Input 14 TO1
or **PLE option (chap. 8.16)**	
	Output 3 PLE
	Input 13 TU1
	Input 15 TUZ

PZW option (chap. 8.17)	
	Output 4 PZW
	Input 16 TZW*
	Input 24 V2*
or **PPS option (chap. 8.11)**	
	Output 4 PPS
	Input 16 TSO
	Input 14 TO1
or **VBY option (chap. 8.15)**	
	Output 4 VBY
	Input 20 TKV1

TKV option (chap. 8.4 ff.)	
	Input 20 TKV1

VIZ/ TKR option (chap. 8.12)	
	Input 21/25 V1
	Input 19 TKR1

Energy storage WES with solid fuel boiler



*) optional

ATTENTION – Observe polarity / cable labels

① Electrothermic actuator or drive with spring return
② Motor-driven actuator with permanent voltage

The WRSol determines the temperature difference between the collector sensor (TK) and the reference sensor (TU).
As soon as the temperature difference is greater than the set value **(Switch-on difference TK – TU)**, the solar pump is activated, thereby charging the consumer, until the **(Switch-off difference TK – TU)** or the maximum temperature of the consumer has been reached. For the speed control of the solar pump PS, see chap. 8.4.

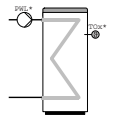
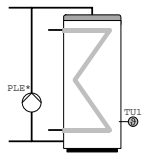
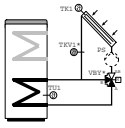
The WES function (chap. 8.27) is for optimizing the charging of the tank. Depending on the solar supply, the upper sensor is charged to quickly reach the usable temperature at the top.

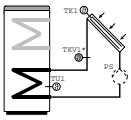
Charging the storage tank with solid fuel boiler, temperature difference control between the sensor of the solid fuel boiler (TFK) and the reference sensor (TUZ).
The thermal mixing valve (TV) allows the solid fuel boiler to heat up fast.
As soon as the temperature difference is greater than the set value (**Switch-on difference TFK – TU**) and the minimum temperature at the TFK is reached, the pump PFK is switched on, thereby charging the consumer until the (**Switch-off difference TFK – TU**) is reached. See chap. 8.5.

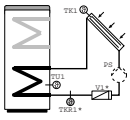
MFA options: Heat request (chap. 8.2.1)
Malfunction message (chap. 8.2.2)
High-temperature relief (chap. 8.2.3)

6.26 Variant 26

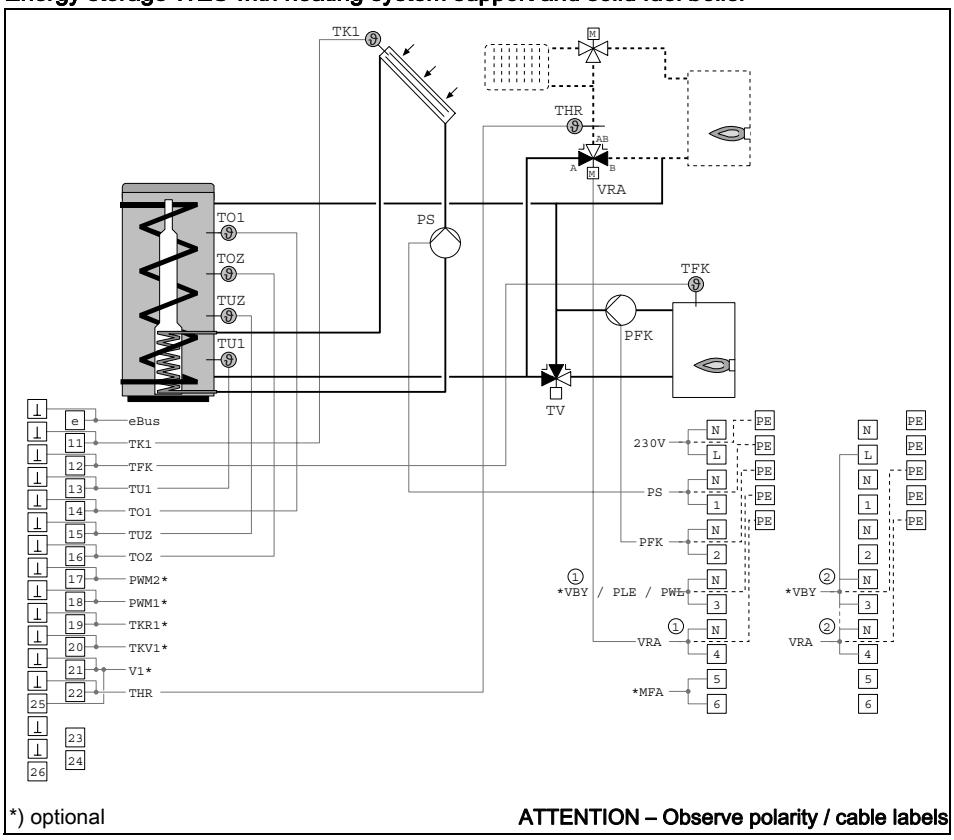
Selectable options

PWL option (chap. 8.10)	
	Output 3 PWL
	Input 14 TO1
or **PLE option (chap. 8.16)**	
	Output 3 PLE
	Input 13 TU1
	Input 15 TUZ
or **VBY option (chap. 8.15)**	
	Output 3 VBY
	Input 20 TKV1

TKV option (chap. 8.4 ff.)	
	Input 20 TKV1

VIZ/ TKR option (chap. 8.12)	
	Input 21/25 V1
	Input 19 TKR1

Energy storage WES with heating system support and solid fuel boiler



*) optional

ATTENTION – Observe polarity / cable labels

① Electrothermic actuator or drive with spring return
② Motor-driven actuator with permanent voltage

The WRSol determines the temperature difference between the collector sensor (TK) and the reference sensor (TU).
As soon as the temperature difference is greater than the set value **(Switch-on difference TK – TU)**, the solar pump is activated, thereby charging the consumer, until the **(Switch-off difference TK – TU)** or the maximum temperature of the consumer has been reached. For the speed control of the solar pump PS, see chap. 8.4.

The WES function (chap. 8.27) is for optimizing the charging of the tank. Depending on the solar supply, the upper sensor is charged to quickly reach the usable temperature at the top.

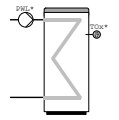
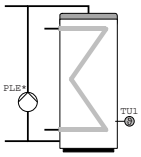
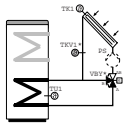
Charging the storage tank with solid fuel boiler, temperature difference control between the sensor of the solid fuel boiler (TFK) and the reference sensor (TUZ).
The thermal mixing valve (TV) allows the solid fuel boiler to heat up fast. As soon as the temperature difference is greater than the set value (**Switch-on difference TFK – TU**) and the minimum temperature at the TFK is reached, the pump PFK is switched on, thereby charging the consumer until the (**Switch-off difference TFK – TU**) is reached. See chap. 8.5.

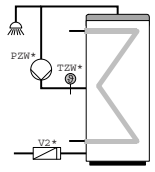
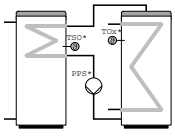
With the 3-way valve for the return temperature increase (VRA), the existing energy from the storage tank can be used depending on the temperature (TOZ) and the heating system return sensor (THR). See chap. 8.24.

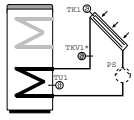
MFA options: Heat request (chap. 8.2.1)
Malfunction message (chap. 8.2.2)
High-temperature relief (chap. 8.2.3)

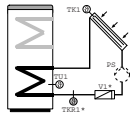
6.27 Variant 27

Selectable options

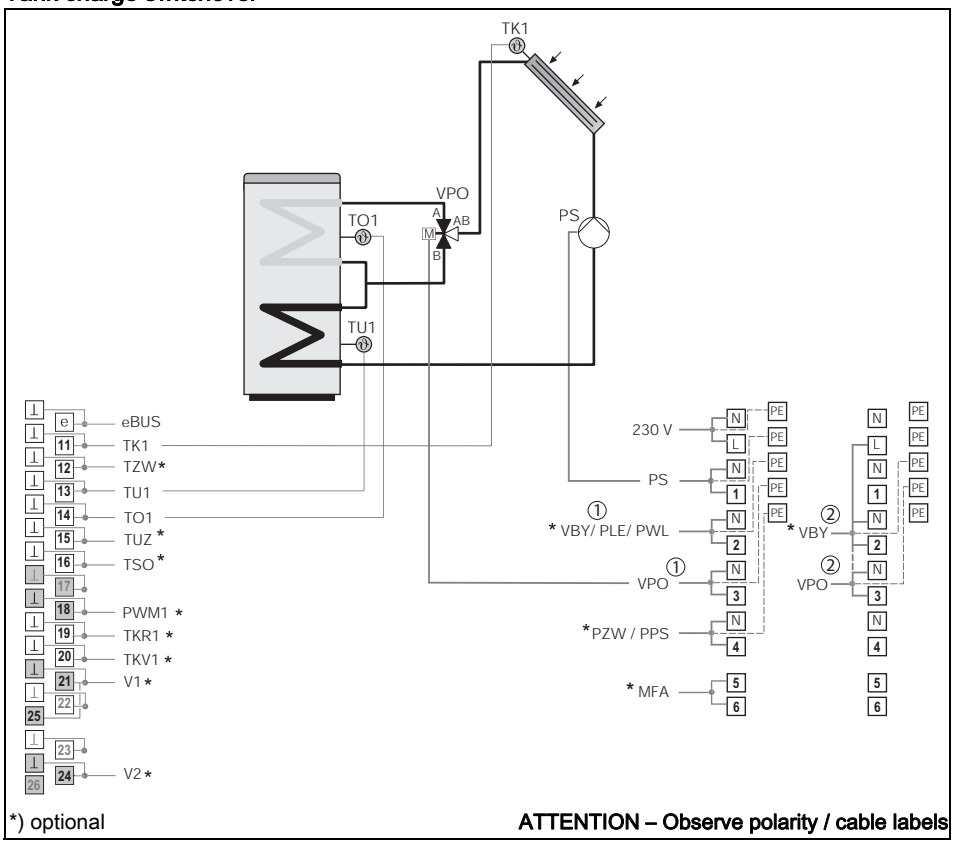
PWL option (chap. 8.10)	
	Output 2 PWL
	Input 14 TO1
or **PLE option (chap. 8.16)**	
	Output 2 PLE
	Input 13 TU1
	Input 15 TUZ
or **VBY option (chap. 8.15)**	
	Output 2 VBY
	Input 20 TKV1

PZW option (chap. 8.17)	
	Output 4 PZW
	Input 12 TZW*
	Input 24 V2*
or **PPS option (chap. 8.11)**	
	Output 4 PPS
	Input 16 TSO
	Input 14 TO1

TKV option (chap. 8.4 ff.)	
	Input 20 TKV1

VIZ/ TKR option (chap. 8.12)	
	Input 21/25 V1
	Input 19 TKR1

Tank charge switchover



*) optional

ATTENTION – Observe polarity / cable labels

① Electrothermic actuator or drive with spring return
② Motor-driven actuator with permanent voltage

The WRSol determines the temperature difference between the collector sensor (TK) and the reference sensor (TU).
As soon as the temperature difference is greater than the set value **(Switch-on difference TK – TU)**, the solar pump is activated, thereby charging the consumer, until the **(Switch-off difference TK – TU)** or the maximum temperature of the consumer has been reached. For the speed control of the solar pump PS, see chap. 8.4.

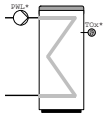
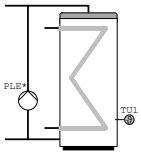
The WES function (chap. 8.27) is for optimizing the charging of the tank. Depending on the solar supply, the upper sensor is charged to quickly reach the usable temperature at the top.

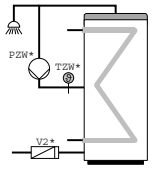
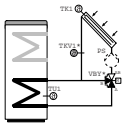
To charge at the upper zone (TO1), there is an active zone switchover via the valve VPO.

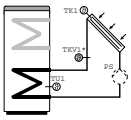
MFA options: Heat request (chap. 8.2.1)
Malfunction message (chap. 8.2.2)
High-temperature relief (chap. 8.2.3)

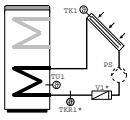
6.28 Variant 28

Selectable options

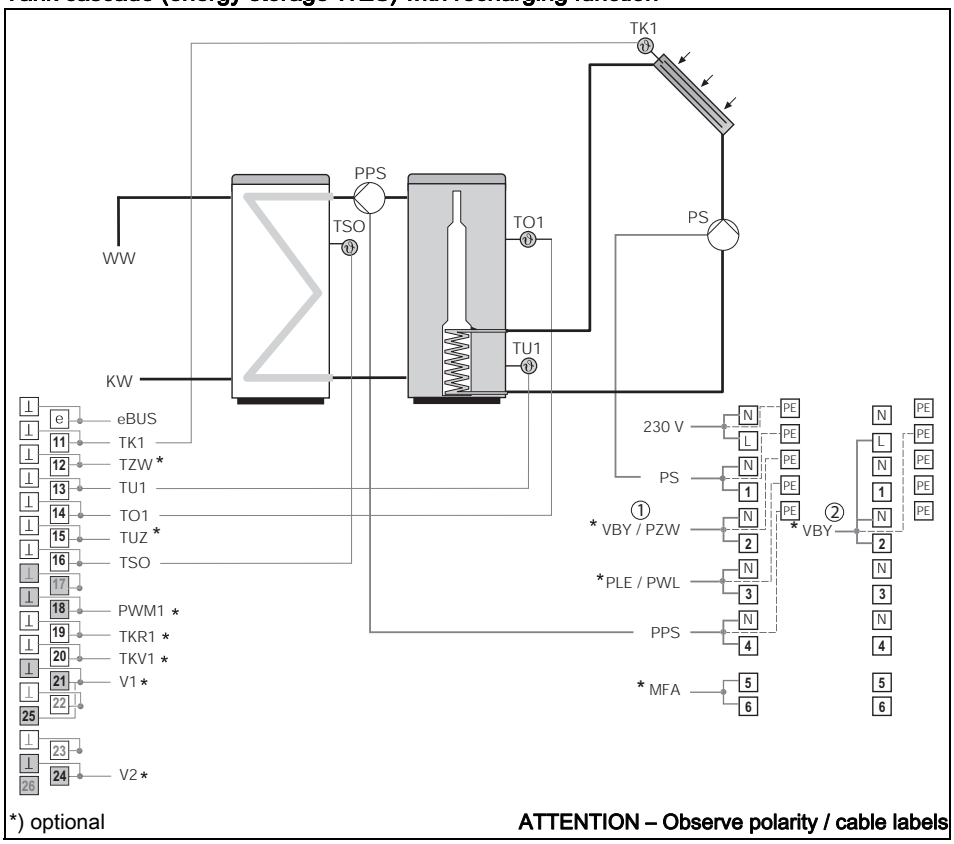
PWL option (chap. 8.10)	
	Output 3 PWL
	Input 14 TO1
or **PLE option (chap. 8.16)**	
	Output 3 PLE
	Input 13 TU1
	Input 15 TUZ

PZW option (chap. 8.17)	
	Output 2 PZW
	Input 12 TZW*
	Input 24 V2*
or **VBY option (chap. 8.15)**	
	Output 2 VBY
	Input 20 TKV1

TKV option (chap. 8.4 ff.)	
	Input 20 TKV1

VIZ/ TKR option (chap. 8.12)	
	Input 21/25 V1
	Input 19 TKR1

Tank cascade (energy storage WES) with recharging function



*) optional

ATTENTION – Observe polarity / cable labels

① Electrothermic actuator or drive with spring return
② Motor-driven actuator with permanent voltage

The WRSol determines the temperature difference between the collector sensor (TK) and the reference sensor (TU).
As soon as the temperature difference is greater than the set value **(Switch-on difference TK – TU)**, the solar pump is activated, thereby charging the consumer, until the **(Switch-off difference TK – TU)** or the maximum temperature of the consumer has been reached. For the speed control of the solar pump PS, see chap. 8.4.

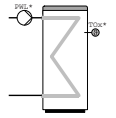
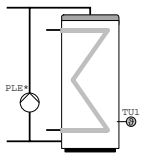
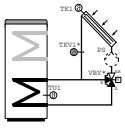
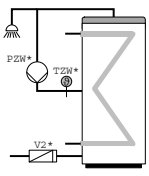
The WES function (chap. 8.27) is for optimizing the charging of the tank. Depending on the solar supply, the upper sensor is charged to quickly reach the usable temperature at the top.

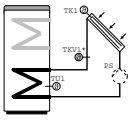
With the tank charging pump (PPS), the stored energy is restructured depending on the temperature (TO1) and temperature (TSO) (chap. 8.11).

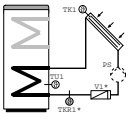
MFA options: Heat request (chap. 8.2.1)
Malfunction message (chap. 8.2.2)
High-temperature relief (chap. 8.2.3)

6.29 Variant 29

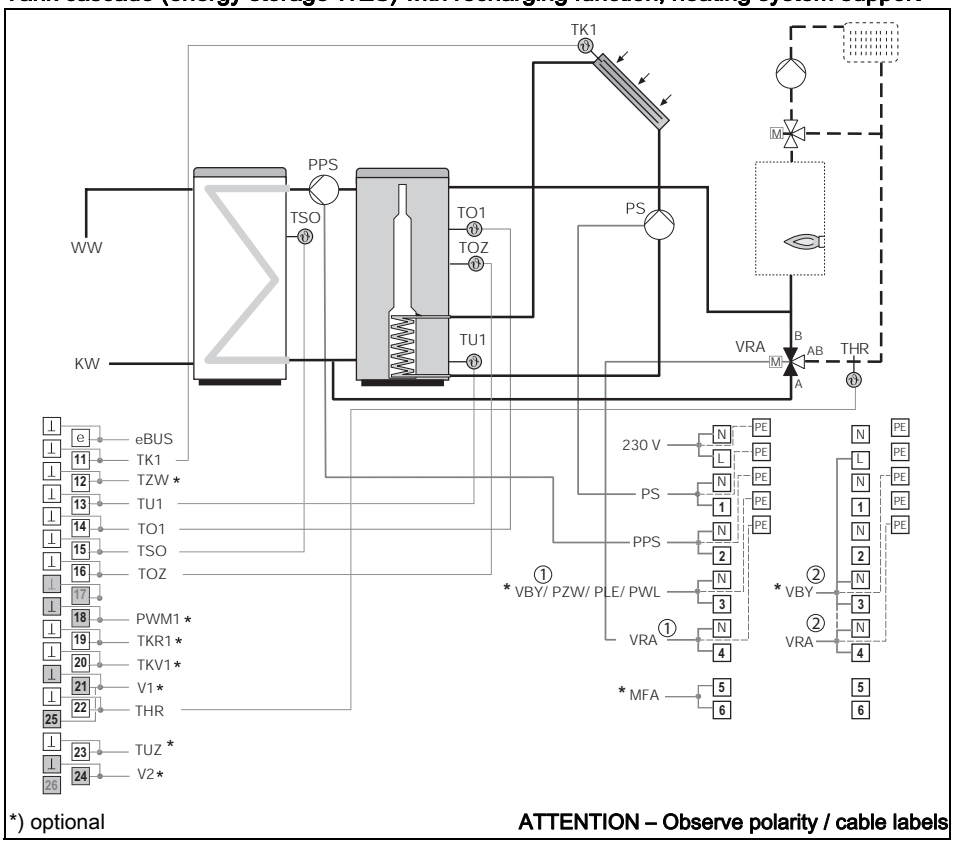
Selectable options

PWL option (chap. 8.10)
 Output 3 PWL
Input 14 TO1
or PLE option (chap. 8.16)
 Output 3 PLE
Input 13 TU1
Input 23 TUZ
or VBY option (chap. 8.15)
 Output 3 VBY
Input 20 TKV1
or PZW option (chap. 8.17)
 Output 3 PZW
Input 12 TZW*
Input 24 V2*

TKV option (chap. 8.4 ff.)
 Input 20 TKV1

VIZ/ TKR option (chap. 8.12)
 Input 21/25 V1
Input 19 TKR1

Tank cascade (energy storage WES) with recharging function, heating system support



*) optional

ATTENTION – Observe polarity / cable labels

① Electrothermic actuator or drive with spring return
② Motor-driven actuator with permanent voltage

The WRSol determines the temperature difference between the collector sensor (TK) and the reference sensor (TU).
As soon as the temperature difference is greater than the set value **(Switch-on difference TK – TU)**, the solar pump is activated, thereby charging the consumer, until the **(Switch-off difference TK – TU)** or the maximum temperature of the consumer has been reached. For the speed control of the solar pump PS, see chap. 8.4.

The WES function (chap. 8.27) is for optimizing the charging of the tank. Depending on the solar supply, the upper sensor is charged to quickly reach the usable temperature at the top.

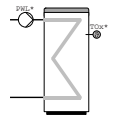
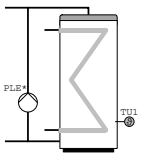
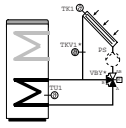
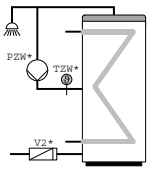
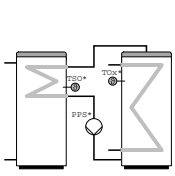
With the tank charging pump (PPS), the stored energy is restructured depending on the temperature (TO1) and temperature (TSO) (chap. 8.11).

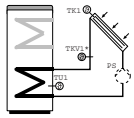
With the 3-way valve for the return temperature increase (VRA), the existing energy from the storage tank can be used depending on the temperature (TOZ) and the heating system return sensor (THR). See chap. 8.24.

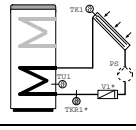
MFA options: Heat request (chap. 8.2.1)
Malfunction message (chap. 8.2.2)
High-temperature relief (chap. 8.2.3)

6.30 Variant 30

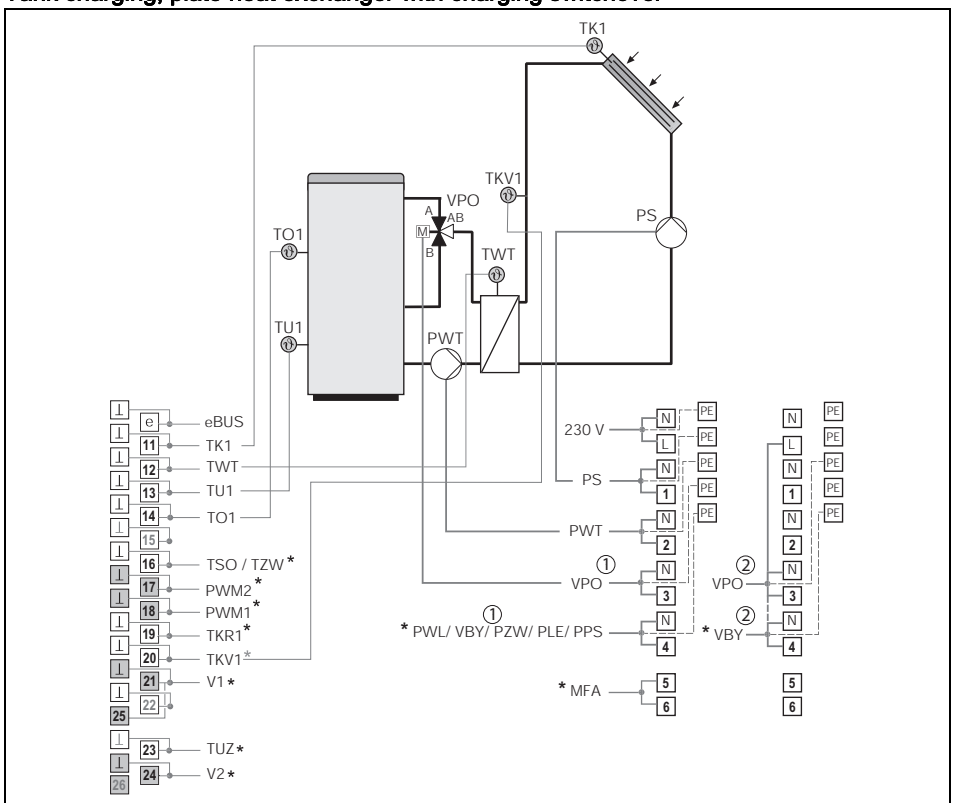
Selectable options

PWL option (chap. 8.10)	
	Output 4 PWL
	Input 14 TO1
or **PLE option (chap. 8.16)**	
	Output 4 PLE
	Input 13 TU1
	Input 23 TUZ
or **VBY option (chap. 8.15)**	
	Output 4 VBY
	Input 20 TKV1
or **PZW option (chap. 8.17)**	
	Output 4 PZW
	Input 16 TZW*
	Input 24 V2*
or **PPS option (chap. 8.11)**	
	Output 4 PPS
	Input 16 TSO
	Input 14 TO1

TKV option (chap. 8.4 ff.)	
	Input 20 TKV1

VIZ/ TKR option (chap. 8.12)	
	Input 21/25 V1
	Input 19 TKR1

Tank charging, plate heat exchanger with charging switchover



*) optional

ATTENTION – Observe polarity / cable labels

① Electrothermic actuator or drive with spring return
② Motor-driven actuator with permanent voltage

The WRSol determines the temperature difference between the collector sensor (TK) and the reference sensor (TU).
As soon as the temperature difference is greater than the set value **(Switch-on difference TK – TU)**, the solar pump is activated, thereby charging the consumer, until the **(Switch-off difference TK – TU)** or the maximum temperature of the consumer has been reached. For the speed control of the solar pump PS, see chap. 8.4.
The WES function (chap. 8.27) is for optimizing the charging of the tank. Depending on the solar supply, the upper sensor is charged to quickly reach the usable temperature at the top. To charge at the upper zone (TO1), there is an active zone switchover via the valve VPO.
The PWT pump starts at minimum speed (30%), when the temperature at the collector flow sensor TKV is warmer than the bottom tank sensor TU by the switch-off difference plus 2 K. The goal is to reach the set charge temperature on the TWT sensor and to hold it. If the temperature at the collector flow sensor TKV is only higher than the temperature at the tank bottom TU by the switch-off condition, the secondary pump PWT is stopped. For the speed control of the pump PWT, see chap. 8.21.

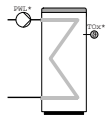
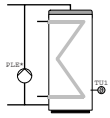
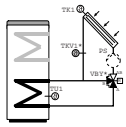
MFA options: Heat request (chap. 8.2.1)
Malfunction message (chap. 8.2.2)
High-temperature relief (chap. 8.2.3)

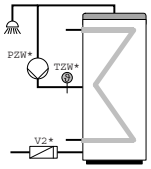
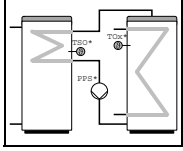

DANGER

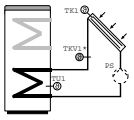
The collector flow sensor option must be activated and the sensor installed accordingly.

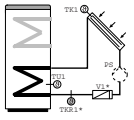
6.31 Variant 31

Selectable options

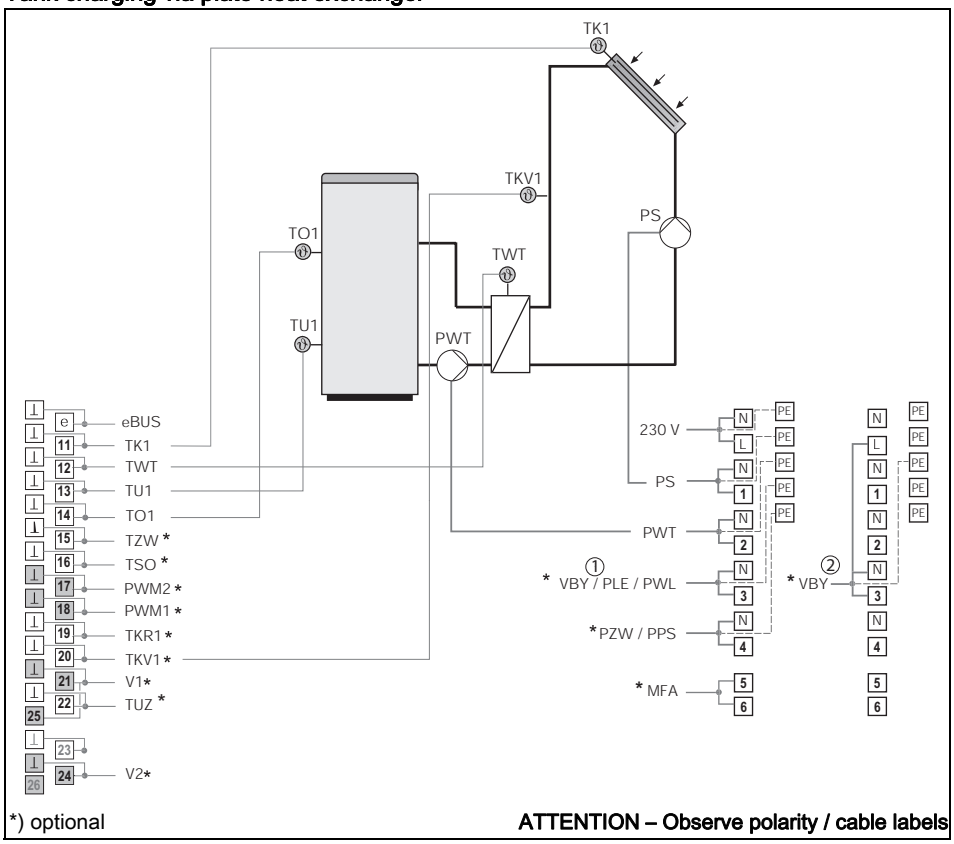
PWL option (chap. 8.10)	
	Output 3 PWL
	Input 14 TO1
or **PLE option (chap. 8.16)**	
	Output 3 PLE
	Input 13 TU1
	Input 22 TUZ
or **VBY option (chap. 8.15)**	
	Output 3 VBY
	Input 20 TKV1

PZW option (chap. 8.17)	
	Output 4 PZW
	Input 15 TZW*
	Input 24 V2*
or **PPS option (chap. 8.11)**	
	Output 4 PPS
	Input 16 TSO
	Input 14 TO1

TKV option (chap. 8.4 ff.)	
	Input 20 TKV1

VIZ/ TKR option (chap. 8.12)	
	Input 21/25 V1
	Input 19 TKR1

Tank charging via plate heat exchanger



*) optional

ATTENTION – Observe polarity / cable labels

① Electrothermic actuator or drive with spring return
② Motor-driven actuator with permanent voltage

The WRSol determines the temperature difference between the collector sensor (TK) and the reference sensor (TU).
As soon as the temperature difference is greater than the set value **`(Switch-on difference TK – TU)`**, the solar pump is activated, thereby charging the consumer, until the **`(Switch-off difference TK – TU)`** or the maximum temperature of the consumer has been reached. For the speed control of the solar pump PS, see chap. 8.4.

The PWT pump starts at minimum speed (30%), when the temperature at the collector flow sensor TKV is warmer than the bottom tank sensor TU by the switch-off difference plus 2 K. The goal is to reach the set charge temperature on the TWT sensor and to hold it. If the temperature at the collector flow sensor TKV is only higher than the temperature at the tank bottom TU by the switch-off condition, the secondary pump PWT is stopped. For the speed control of the pump PWT, see chap. 8.21.

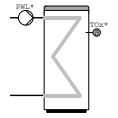
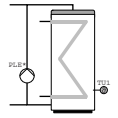
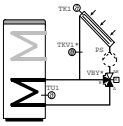
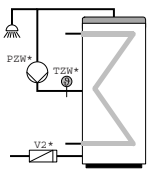
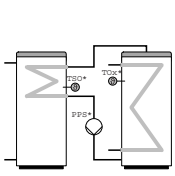
MFA options: Heat request (chap. 8.2.1)
Malfunction message (chap. 8.2.2)
High-temperature relief (chap. 8.2.3)

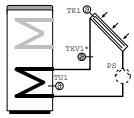
DANGER

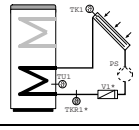
The collector flow sensor option must be activated and the sensor installed accordingly.

6.32 Variant 32

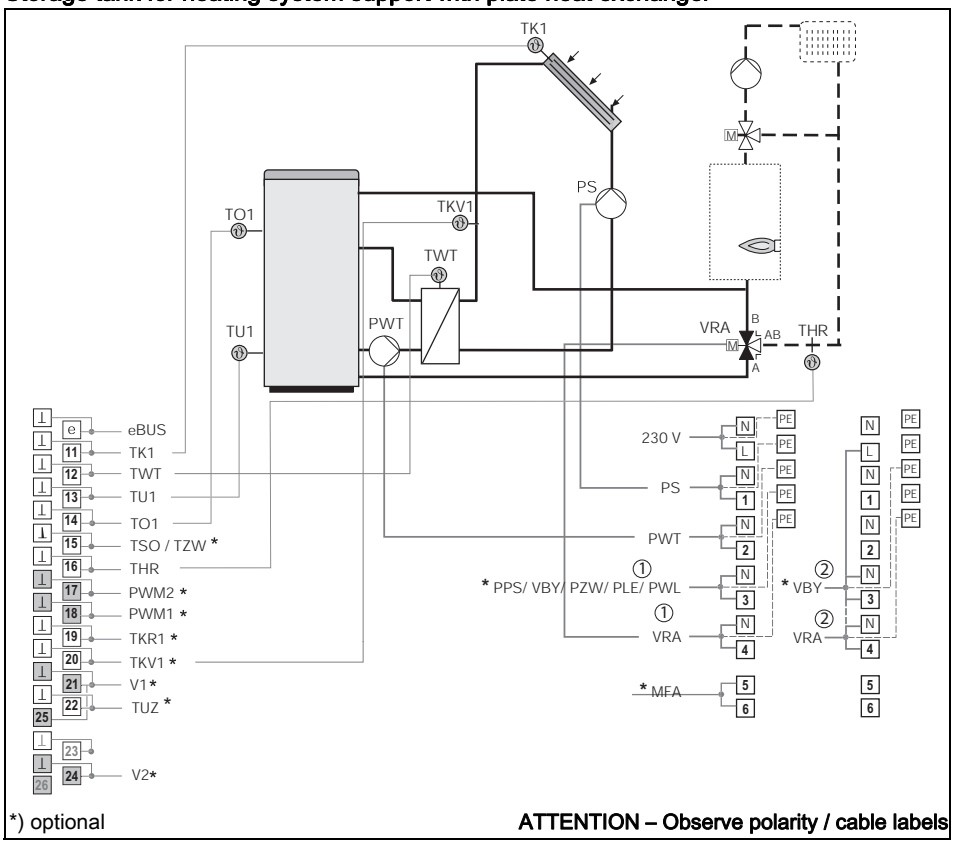
Selectable options

PWL option (chap. 8.10)
 Output 3 PWL
Input 14 TO1
or PLE option (chap. 8.16)
 Output 3 PLE
Input 13 TU1
Input 22 TUZ
or VBY option (chap. 8.15)
 Output 3 VBY
Input 20 TKV1
or PZW option (chap. 8.17)
 Output 3 PZW
Input 15 TZW*
Input 24 V2*
or PPS option (chap. 8.11)
 Output 3 PPS
Input 16 TSO
Input 14 TO1

TKV option (chap. 8.4 ff.)
 Input 20 TKV1

VIZ/ TKR option (chap. 8.12)
 Input 21/25 V1
Input 19 TKR1

Storage tank for heating system support with plate heat exchanger



*) optional

ATTENTION – Observe polarity / cable labels

① Electrothermic actuator or drive with spring return
② Motor-driven actuator with permanent voltage

The WRSol determines the temperature difference between the collector sensor (TK) and the reference sensor (TU).
As soon as the temperature difference is greater than the set value **(Switch-on difference TK – TU)**, the solar pump is activated, thereby charging the consumer, until the **(Switch-off difference TK – TU)** or the maximum temperature of the consumer has been reached. For the speed control of the solar pump PS, see chap. 8.4.

The PWT pump starts at minimum speed (30%), when the temperature at the collector flow sensor TKV is warmer than the bottom tank sensor TU by the switch-off difference plus 2 K. The goal is to reach the set charge temperature on the TWT sensor and to hold it. If the temperature at the collector flow sensor TKV is only higher than the temperature at the tank bottom TU by the switch-off condition, the secondary pump PWT is stopped. For the speed control of the pump PWT, see chap. 8.21.

With the 3-way valve for the return temperature increase (VRA), the existing energy from the storage tank can be used depending on the temperature (TO1) and the heating system return sensor (THR). See chap. 8.24.

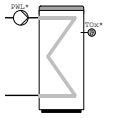
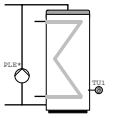
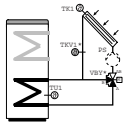
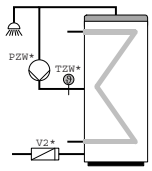
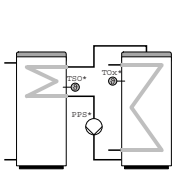
MFA options: Heat request (chap. 8.2.1)
Malfunction message (chap. 8.2.2)
High-temperature relief (chap. 8.2.3)

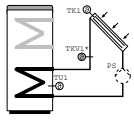
DANGER

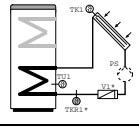
The collector flow sensor option must be activated and the sensor installed accordingly.

6.33 Variant 33

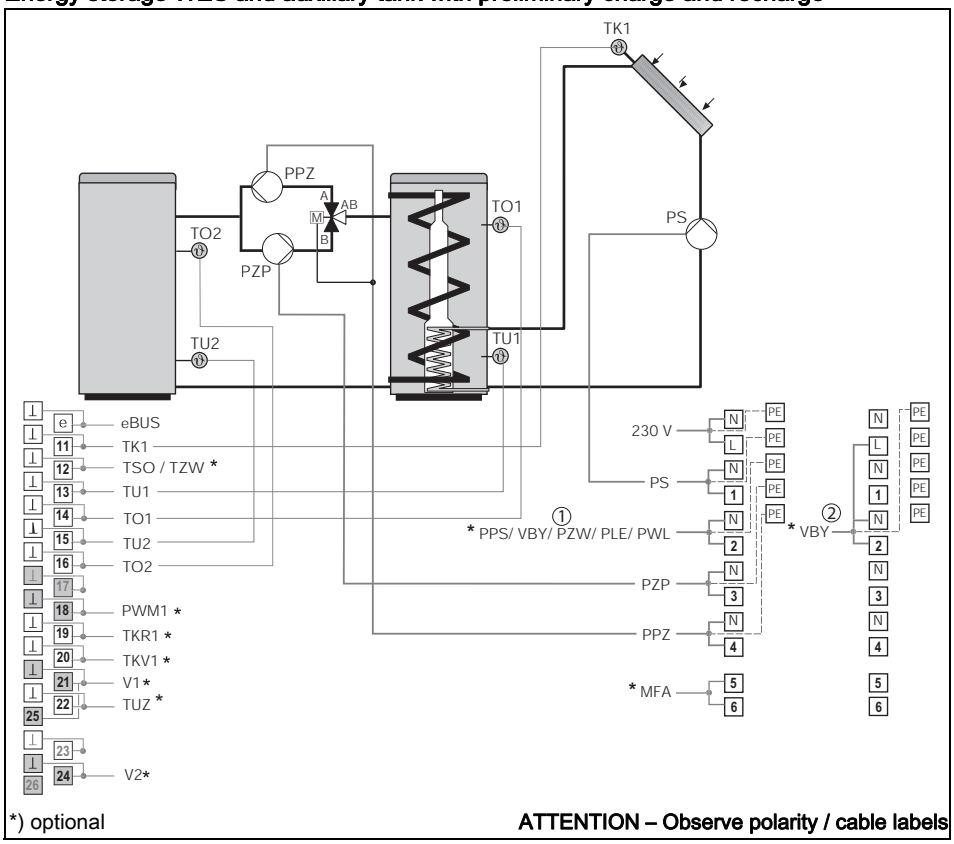
Selectable options

PWL option (chap. 8.10)
 Output 2 PWL Input 14 TO1
or PLE option (chap. 8.16)
 Output 2 PLE Input 13 TU1 Input 22 TUZ
or VBY option (chap. 8.15)
 Output 2 VBY Input 20 TKV1
or PZW option (chap. 8.17)
 Output 2 PZW Input 12 TZW* Input 24 V2*
or PPS option (chap. 8.11)
 Output 2 PPS Input 12 TSO Input 14 TO1

TKV option (chap. 8.4 ff.)
 Input 20 TKV1

VIZ/ TKR option (chap. 8.12)
 Input 21/25 V1 Input 19 TKR1

Energy storage WES and auxiliary tank with preliminary charge and recharge



*) optional

ATTENTION – Observe polarity / cable labels

① Electrothermic actuator or drive with spring return
② Motor-driven actuator with permanent voltage

The WRSol determines the temperature difference between the collector sensor (TK) and the reference sensor (TU).
As soon as the temperature difference is greater than the set value **(Switch-on difference TK – TU)**, the solar pump is activated, thereby charging the consumer, until the **(Switch-off difference TK – TU)** or the maximum temperature of the consumer has been reached. For the speed control of the solar pump PS, see chap. 8.4.

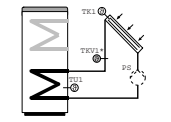
The WES function (chap. 8.27) is for optimizing the charging of the tank. Depending on the solar supply, the upper sensor is charged to quickly reach the usable temperature at the top.

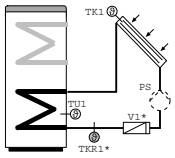
With the storage tank to auxiliary tank pump (PPZ), when the set discharging temperature on the upper storage tank temperature sensor (TO1) and lower storage tank temperature sensor (TU1) is exceeded, and when there is a sufficient difference relative to the bottom auxiliary tank temperature (TU2), the stored energy is transferred to the auxiliary tank.
Recharging is done with the storage tank to auxiliary tank pump (PZP) depending on TO1 and the upper auxiliary tank temperature (TO2) (chap.8.22).

MFA options: Heat request (chap. 8.2.1)
Malfunction message (chap. 8.2.2)
High-temperature relief (chap. 8.2.3)

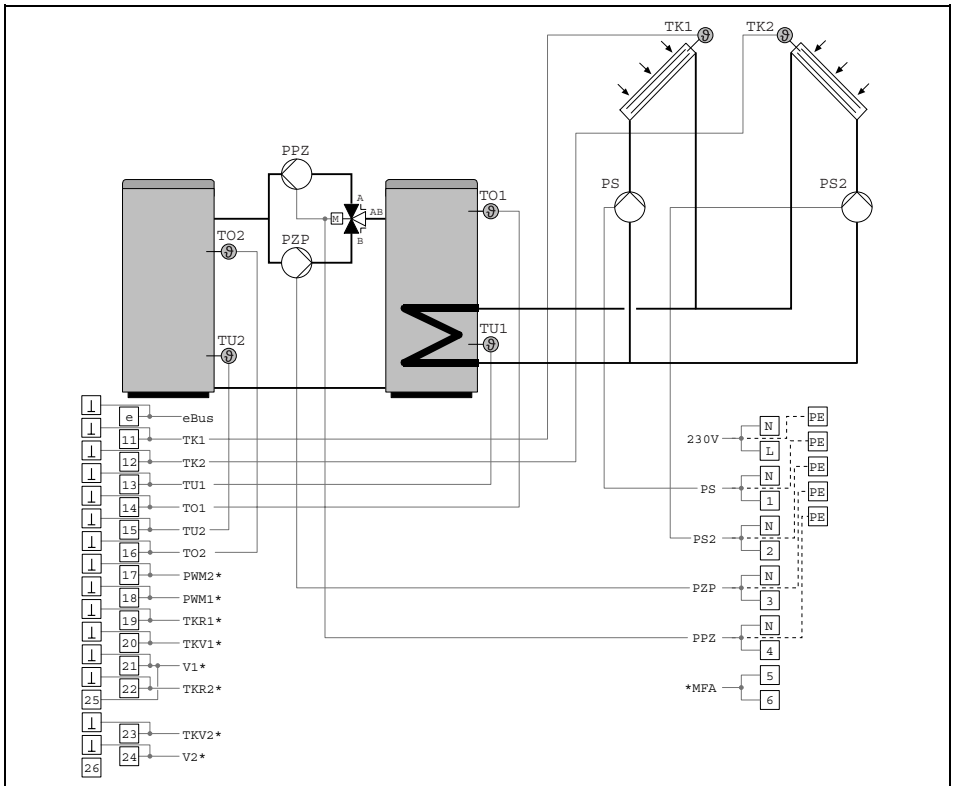
6.34 Variant 34

Selectable options

TKV option (chap. 8.4 ff.)	
	Input 20 TKV1
	Input 23 TKV2

VIZ/ TKR option (chap. 8.12)	
	Input 21/25 V1
	Input 19 TKR1
	Input 24/26 V2
	Input 22 TKR2

Storage tank and auxiliary tank with preliminary charge and recharge and collector cascade



*) optional

ATTENTION – Observe polarity / cable labels

The WRSol determines the temperature difference between the collector sensor (TK) and the reference sensor (TU).
As soon as the temperature difference is greater than the set value **(Switch-on difference TK – TU)**, the solar pump is activated, thereby charging the consumer, until the **(Switch-off difference TK – TU)** or the maximum temperature of the consumer has been reached.

For the speed control of the solar pump PS, see chap. 8.4.

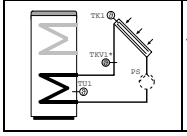
Both collector fields are operated independently of one another.

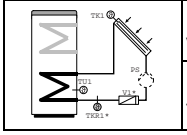
With the storage tank to auxiliary tank pump (PPZ), when the set discharging temperature on the upper storage tank temperature sensor (TO1) and lower storage tank temperature sensor (TU1) is exceeded, and when there is a sufficient difference relative to the bottom auxiliary tank temperature (TU2), the stored energy is transferred to the auxiliary tank.
Recharging is done with the storage tank to auxiliary tank pump (PZP) depending on TO1 and the upper auxiliary tank temperature (TO2) (chap.8.22).

MFA options: Heat request (chap. 8.2.1)
Malfunction message (chap. 8.2.2)
High-temperature relief (chap. 8.2.3)

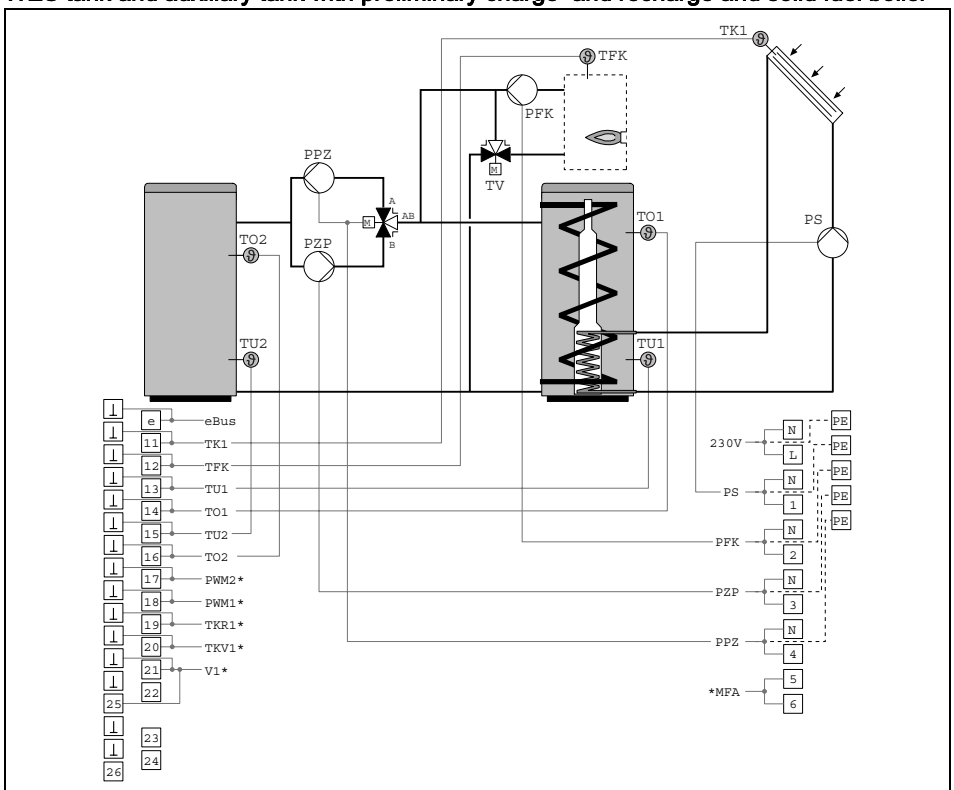
6.35 Variant 35

Selectable options

TKV option (chap. 8.4 ff.)	
	Input 20 TKV1

VIZ/ TKR option (chap. 8.12)	
	Input 21/25 V1
	Input 19 TKR1

WES tank and auxiliary tank with preliminary charge and recharge and solid fuel boiler



*) optional

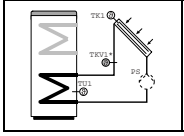
ATTENTION – Observe polarity / cable labels

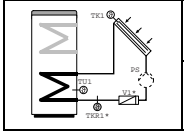
The WRSol determines the temperature difference between the collector sensor (TK) and the reference sensor (TU). As soon as the temperature difference is greater than the set value **(Switch-on difference TK – TU)**, the solar pump is activated, thereby charging the consumer, until the **(Switch-off difference TK – TU)** or the maximum temperature of the consumer has been reached. For the speed control of the solar pump PS, see chap. 8.4.
The WES function (chap. 8.27) is for optimizing the charging of the tank. Depending on the solar supply, the upper sensor is charged to quickly reach the usable temperature at the top.
With the storage tank to auxiliary tank pump (PPZ), when the set discharging temperature on the upper storage tank temperature sensor (TO1) and lower storage tank temperature sensor (TU1) is exceeded, and when there is a sufficient difference relative to the bottom auxiliary tank temperature (TU2), the stored energy is transferred to the auxiliary tank.
Recharging is done with the storage tank to auxiliary tank pump (PZP) depending on TO1 and the upper auxiliary tank temperature (TO2) (chap.8.22).
Charging the storage tank with solid fuel boiler, temperature difference control between the sensor of the solid fuel boiler (TFK) and the reference sensor (TU1).
The thermal mixing valve (TV) allows the solid fuel boiler to heat up fast. As soon as the temperature difference is greater than the set value (**Switch-on difference TFK – TU**) and the minimum temperature at the TFK is reached, the pump PFK is switched on, thereby charging the consumer until the (**Switch-off difference TFK – TU**) is reached. See chap. 8.5.

MFA options: Heat request (chap. 8.2.1)
Malfunction message (chap. 8.2.2)
High-temperature relief (chap. 8.2.3)

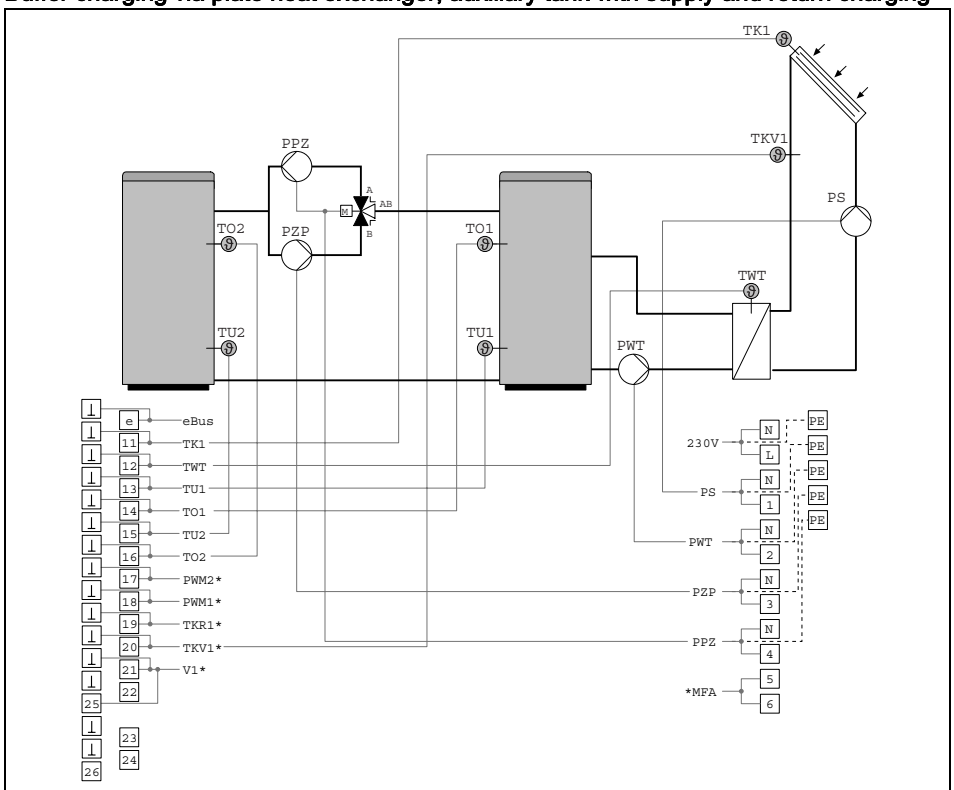
6.36 Variant 36

Selectable options

TKV option (chap. 8.4 ff.)	
	Input 20 TKV1

VIZ/ TKR option (chap. 8.12)	
	Input 21/25 V1
	Input 19 TKR1

Buffer charging via plate heat exchanger, auxiliary tank with supply and return charging



*) optional

ATTENTION – Observe polarity / cable labels

The WRSol determines the temperature difference between the collector sensor (TK) and the reference sensor (TU). As soon as the temperature difference is greater than the set value **(Switch-on difference TK – TU)**, the solar pump is activated, thereby charging the consumer, until the **(Switch-off difference TK – TU)** or the maximum temperature of the consumer has been reached. For the speed control of the solar pump PS, see chap8.4. The PWT pump starts at minimum speed (30%), when the temperature at the collector flow sensor TKV is warmer than the bottom tank sensor TU by the switch-off difference plus 2 K. The goal is to reach the set charge temperature on the TWT sensor and to hold it. If the temperature at the collector flow sensor TKV is only higher than the temperature at the tank bottom TU by the switch-off condition, the secondary pump PWT is stopped. For the speed control of the pump PWT, see chap. 8.21.
With the storage tank to auxiliary tank pump (PPZ), when the set discharging temperature on the upper storage tank temperature sensor (TO1) and lower storage tank temperature sensor (TU1) is exceeded, and when there is a sufficient difference relative to the bottom auxiliary tank temperature (TU2), the stored energy is transferred to the auxiliary tank.
Recharging is done with the storage tank to auxiliary tank pump (PZP) depending on TO1 and the upper auxiliary tank temperature (TO2) (chap.8.22).

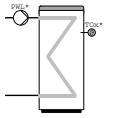
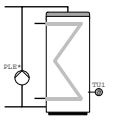
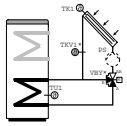
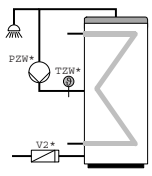
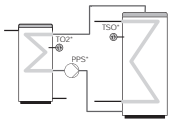
MFA options: Heat request (chap. 8.2.1)
Malfunction message (chap. 8.2.2)
High-temperature relief (chap. 8.2.3)

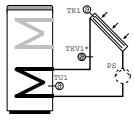
DANGER

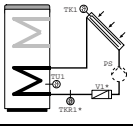
The collector flow sensor option must be activated and the sensor installed accordingly.

6.37 Variant 37

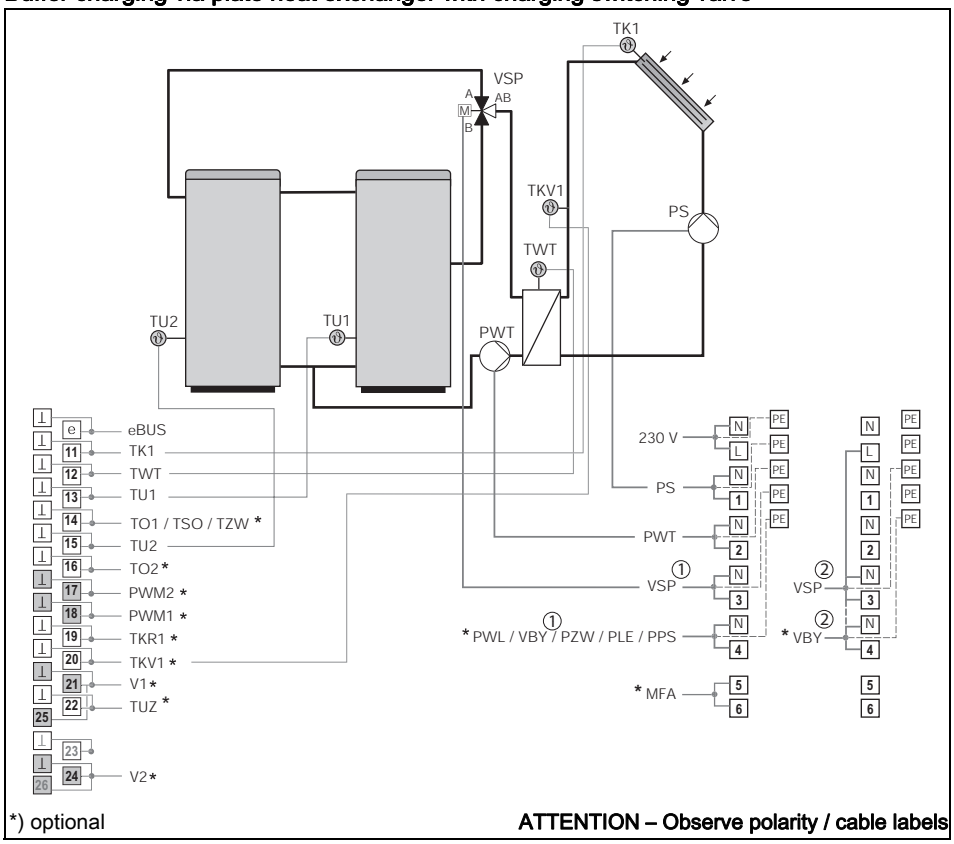
Selectable options

PWL option (chap. 8.10)
 Output 4 PWL Input 14 TO1
or PLE option (chap. 8.16)
 Output 4 PLE Input 13 TU1 Input 22 TUZ
or VBY option (chap. 8.15)
 Output 4 VBY Input 20 TKV1
or PZW option (chap. 8.17)
 Output 4 PZW Input 14 TZW* Input 24 V2*
or PPS option (chap. 8.11)
 Output 4 PPS Input 14 TSO Input 16 TO2

TKV option (chap. 8.4 ff.)
 Input 20 TKV1

VIZ/ TKR option (chap. 8.12)
 Input 21/25 V1 Input 19 TKR1

Buffer charging via plate heat exchanger with charging switching valve



*) optional

ATTENTION – Observe polarity / cable labels

① Electrothermic actuator or drive with spring return
② Motor-driven actuator with permanent voltage

The WRSol determines the temperature difference between the collector sensor (TK) and the reference sensor (TU1 or TU2).

As soon as the temperature difference is greater than the set value **(`Switch-on difference TK – TU`)**, the solar pump is activated, thereby charging the consumer, until the value (**`Switch-off difference TK – TU`**) or the maximum temperature of the consumer has been reached. For the speed control of the solar pump PS, see chap. 8.4.

Once the set temperature of the tank is reached, the 3-way valve switches and charges the second consumer according to the priority and strategy for the charge. See chap. 8.19.

The PWT pump starts at minimum speed (30%), when the temperature at the collector flow sensor TKV is warmer than the bottom tank sensor TU by the switch-off difference plus 2 K. The goal is to reach the set charge temperature on the TWT sensor and to hold it. If the temperature at the collector flow sensor TKV is only higher than the temperature at the tank bottom TU by the switch-off condition, the secondary pump PWT is stopped. For the speed control of the pump PWT, see chap. 8.21.

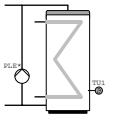
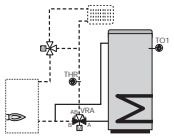
MFA options: Heat request (chap. 8.2.1)
Malfunction message (chap. 8.2.2)
High-temperature relief (chap. 8.2.3)

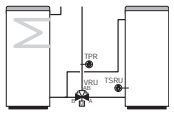
DANGER

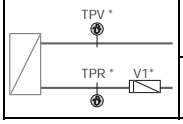
The collector flow sensor option must be activated and the sensor installed accordingly.

6.38 Variant 38

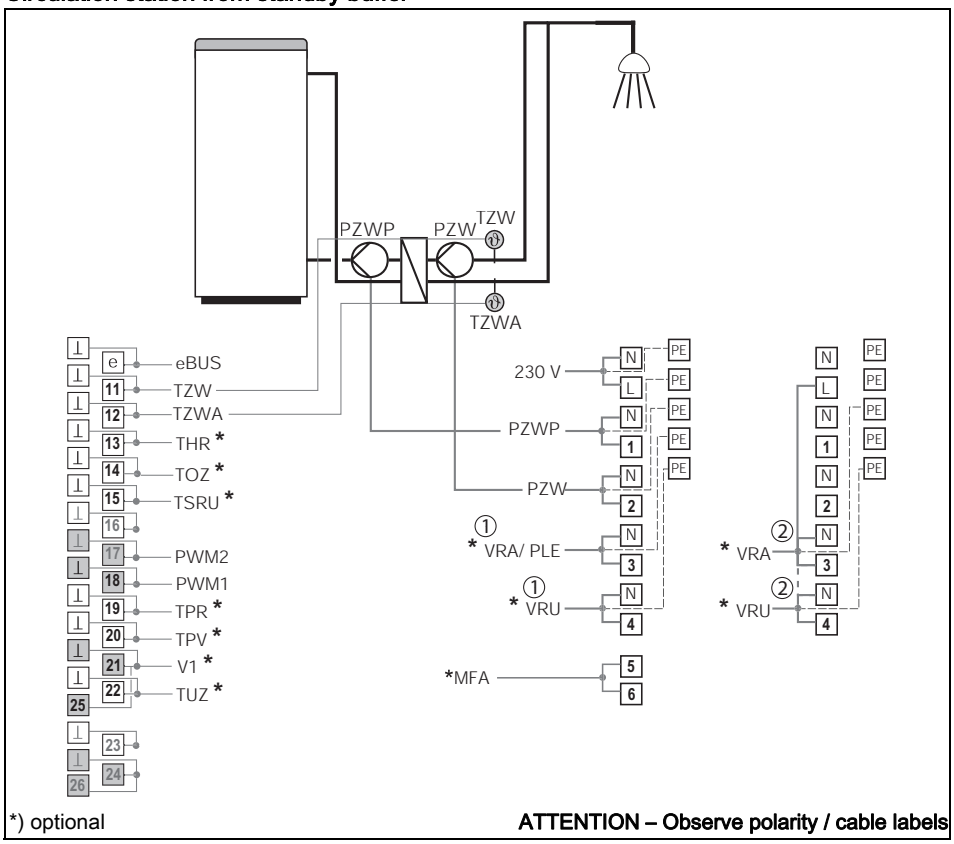
Selectable options

PLE option (chap. 8.16)	
	Output 3 PLE
	Input 22 TUZ
or **VRA option (chap. 8.24)**	
	Output 3 VRA
	Input 13 THR
	Input 14 TOZ2

VRU option (chap. 8.25)	
	Output 4 VRU
	Input 15 TSRU
	Input 19 TPR

WMZ option (chap. 8.13)	
	Input 21/25 V1
	Input 19 TPR
	Input 20 TPV

Circulation station from standby buffer



*) optional

ATTENTION – Observe polarity / cable labels

① Electrothermic actuator or drive with spring return
② Motor-driven actuator with permanent voltage

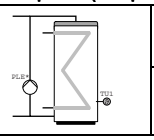
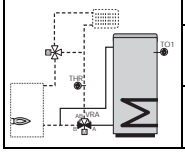
The WRSol controls hot-water circulation by reheating via a heat exchanger. It is expected that the standby buffer always has a sufficient temperature level. The function can be influenced via the `DHW circulation` clock program. The circulation temperature is limited to a maximum with the TZWA sensor.

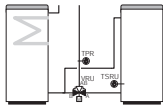
See chap. 8.18.1

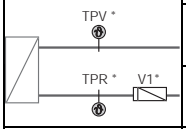
MFA options: Malfunction message (chap. 8.2.2)

6.39 Variant 39

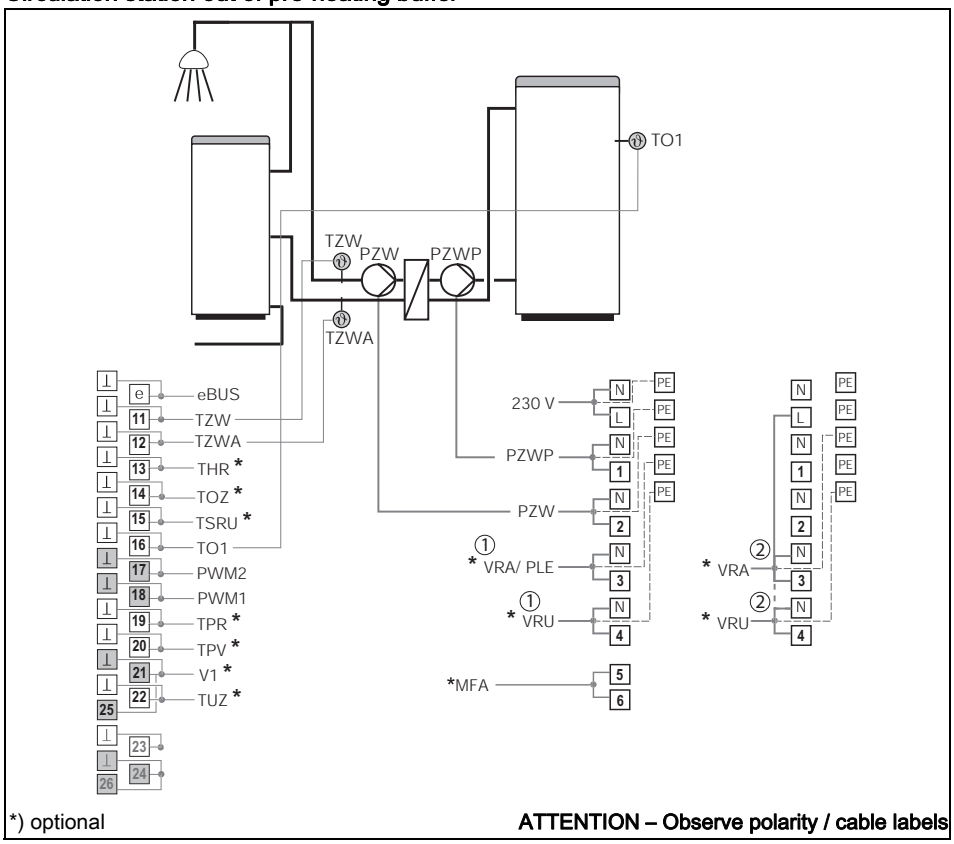
Selectable options

PLE option (chap. 8.16)	
	Output 3 PLE
	Input 22 TUZ
or **VRA option (chap. 8.24)**	
	Output 3 VRA
	Input 13 THR
	Input 14 TOZ2

VRU option (chap. 8.25)	
	Output 4 VRU
	Input 15 TSRU
	Input 19 TPR

WMZ option (chap. 8.13)	
	Input 21/25 V1
	Input 19 TPR
	Input 20 TPV

Circulation station out of pre-heating buffer



*) optional

ATTENTION – Observe polarity / cable labels

① Electrothermic actuator or drive with spring return
② Motor-driven actuator with permanent voltage

The WRSol controls hot-water circulation by reheating via a heat exchanger. The function can be influenced via the `DHW circulation` clock program. As soon as the temperature difference between TO1 and TZW is greater than the set value `Switch-on difference TO - TZW`, the pump PZWP is switched on, thereby heating the circulation water via the heat exchanger, until the switch-off condition `Switch-off difference TO - TZW` is reached.

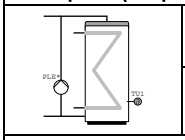
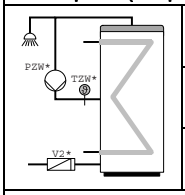
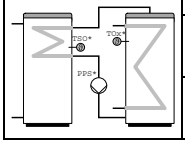
The circulation temperature is limited to a maximum with the TZWA sensor.

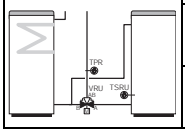
See chap. 8.18.2

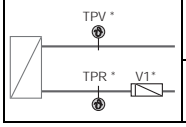
MFA options: Malfunction message (chap. 8.2.2)

6.40 Variant 40

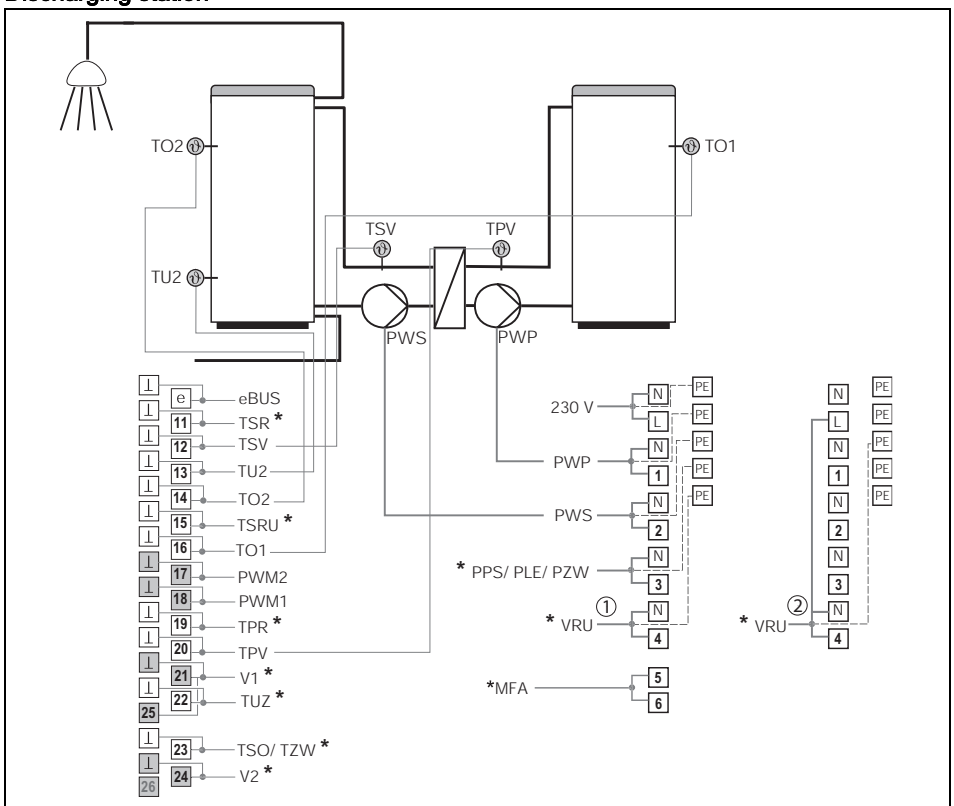
Selectable options

PLE option (chap. 8.16)	
	Output 3 PLE
	Input 22 TUZ*
or **PZW option (chap. 8.17)**	
	Output 3 PZW
	Input 23 TZW*
	Input 24 V2*
or **PPS option (chap. 8.11)**	
	Output 3 PPS
	Input 23 TSO
	Input 14 TO2

VRU option (chap. 8.25)	
	Output 4 VRU
	Input 15 TSRU
	Input 19 TPR

WMZ option (chap. 8.13)	
	Input 21/25 V1
	Input 19 TPR
	Input 20 TPV

Discharging station



*) optional

ATTENTION – Observe polarity / cable labels

① Electrothermic actuator or drive with spring return
② Motor-driven actuator with permanent voltage

The WRSol controls the redeployment of saved energy via a heat exchanger.

The function is enabled when the temperature at sensor TO2 is less than the set value `Set tank temperature - switch-on hysteresis`. If the temperature at sensor TU2 is greater than the set value `Set tank temperature - switch-off hysteresis`, the function is ended.

As soon as the temperature difference between TO1 and TO2 is greater than the set value `Discharge switch-on difference`, the pump PWP is switched on. Only once the temperature of TO2 is reached on sensor TPV is the pump PWS also switched on, thereby charging tank 2. The setpoint of the charging temperature TSV to TO2 is raised via the speed control of pump PWS.

Charging is interrupted if the switch-off condition `Discharge switch-off difference` between TO1 and TU2 is fallen short of.

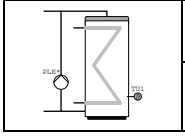
The charging temperature is limited to a maximum with the TSV sensor.

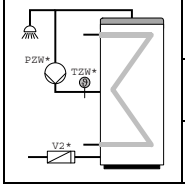
See chap. 8.23.1

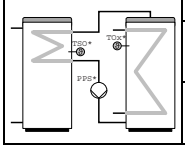
MFA options: Heat request (chap. 8.2.1)
Malfunction message (chap. 8.2.2)

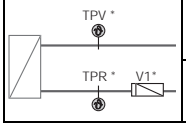
6.41 Variant 41

Selectable options

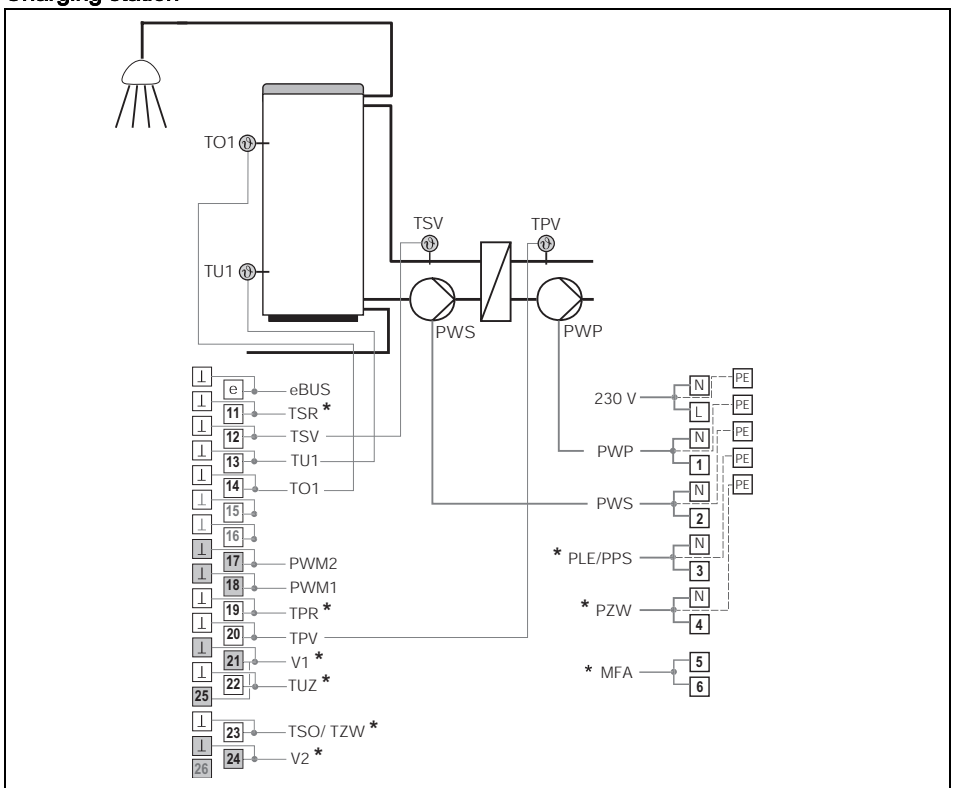
PLE option (chap. 8.16)	
	Output 3 PLE
	Input 22 TUZ *

PZW option (chap. 8.17)	
	Output 4 PZW
	Input 23 TZW*
	Input 24 V2*

PPS option (chap. 8.11)	
	Output 3 PPS
	Input 23 TSO
	Input 14 TO1

WMZ option (chap. 8.12)	
	Input 21/25 V1
	Input 19 TPR
	Input 20 TPV

Charging station



*) optional

ATTENTION – Observe polarity / cable labels

① Electrothermic actuator or drive with spring return
② Motor-driven actuator with permanent voltage

The WRSol controls the charging of a tank via a heat exchanger.

If a sufficient temperature level is not constantly available, a heat request to an external heat exchanger can be realized via the MFA contact.

The function can be influenced via the `Hot-water` (DHW) clock program.

The function is enabled when the temperature at sensor TO1 is less than the set value `Set tank temperature - switch-on hysteresis`. If the temperature at sensor TU1 is greater than the set value `Set tank temperature - switch-off hysteresis`, the function is ended.

Only once the temperature of TO1 is reached on sensor TPV is the pump PWS also switched on, thereby charging tank 2. The setpoint of the charging temperature TSV to the set value `Set tank temperature` is raised via the speed control of pump PWS.

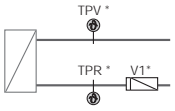
The charging temperature is limited to a maximum with the TSV sensor.

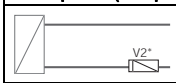
See chap. 8.23.2

MFA function Heat request (chap. 8.2.1) is always active.

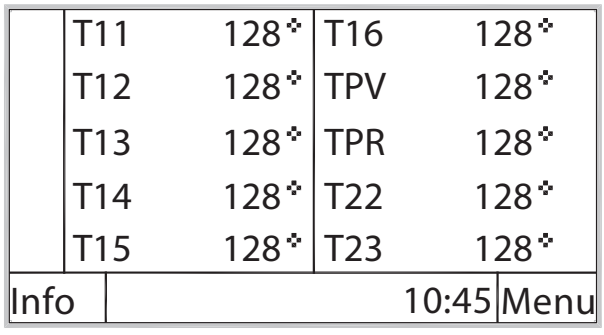
6.42 Variant 42

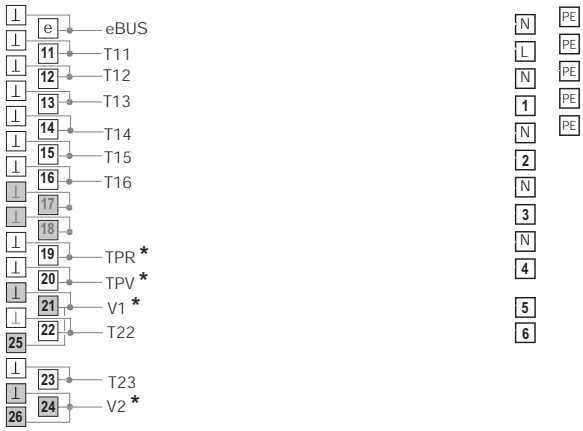
Selectable options

WMZ option (chap. 8.12)	
	Input 21/25 V1
	Input 19 TPR
	Input 20 TPV

VIZ option (chap. 8.28)	
	Input 24/26 V2

Monitoring





*) optional

ATTENTION – Observe polarity / cable labels

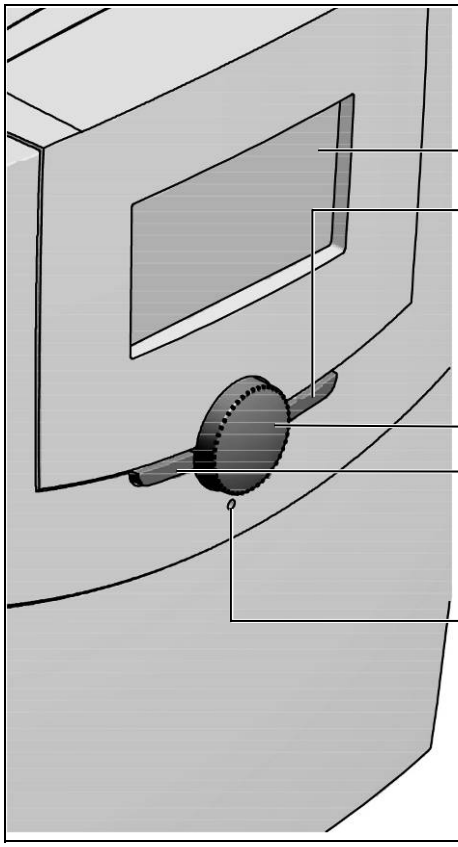
The WRSol has no control function.

The values are measured at all temperature inputs and displayed. In addition, a heat meter can be shown with the temperatures TPV and TPR, as well as the volume pulse input V1.

Furthermore, a water volume meter can be shown with the volume pulse input V2.

7 Operation

7.1 Operating and display elements



LC display

Confirmation key
By pressing, a selection or change is confirmed.

Rotary knob

Escape key
Back to basic display With this key, you can cancel the settings. Unsaved changes will be lost. Jump back by 1 level.

Reset
By pressing the reset button, the processor with the previously set values are restarted. No factory settings can be started.
The factory settings can be restored under **`Configuration`** with **`Reset`**.

7.2 Display

Mode selection or info

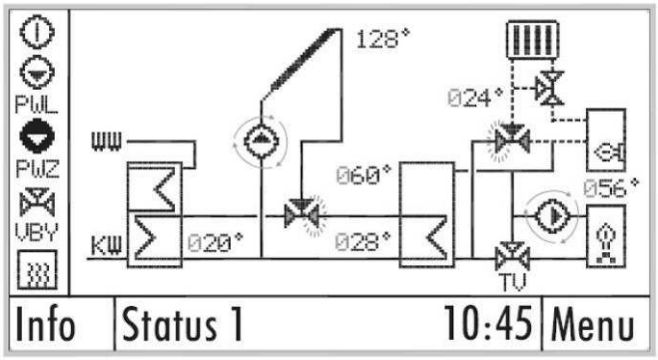
PWL option, hot-water charging or PLE therm. disinfection

PPS transfer charging or PWZ circulation

Collector bypass option

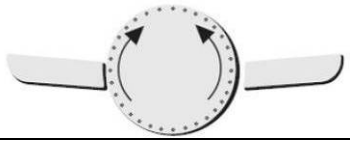
Multifunctional output MFA

Information menu

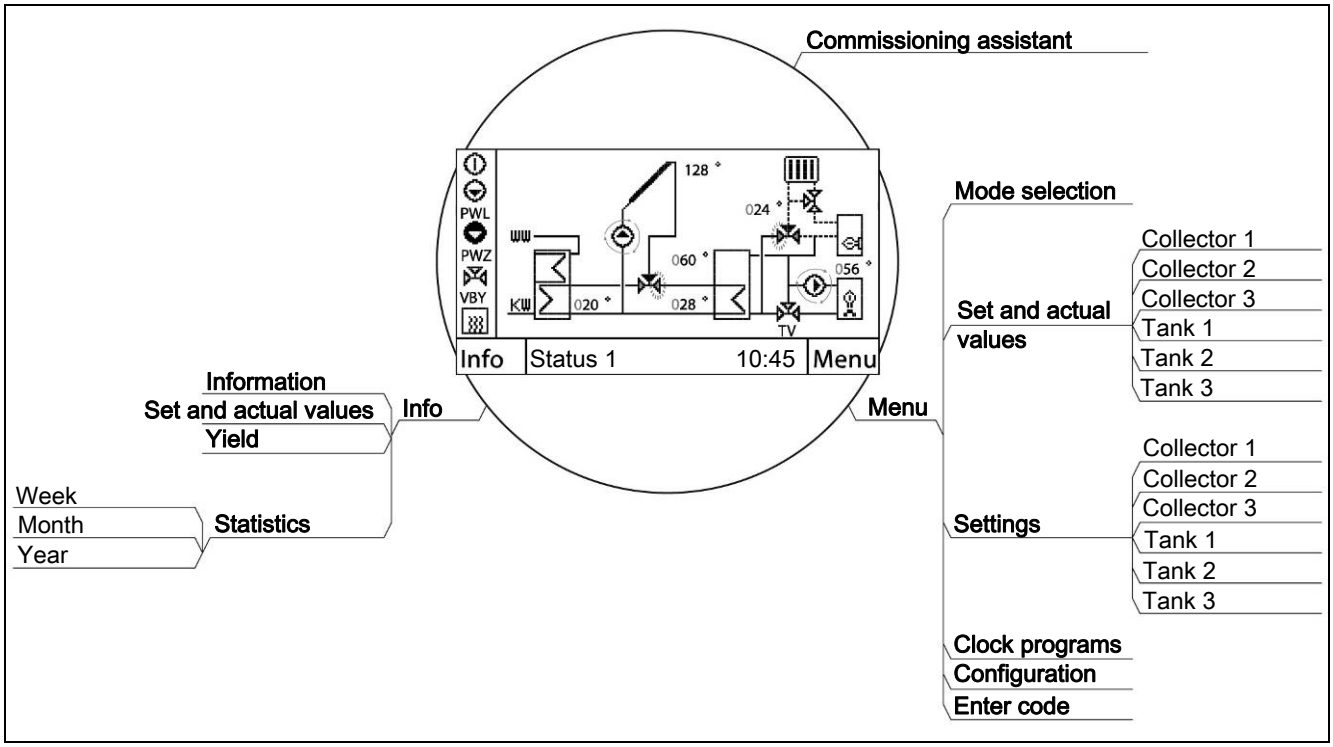


Active hydraulic types with the display of the current temperatures, the actuators are animated, and if the pump is working, it rotates. The diverter valves show the current direction of flow.

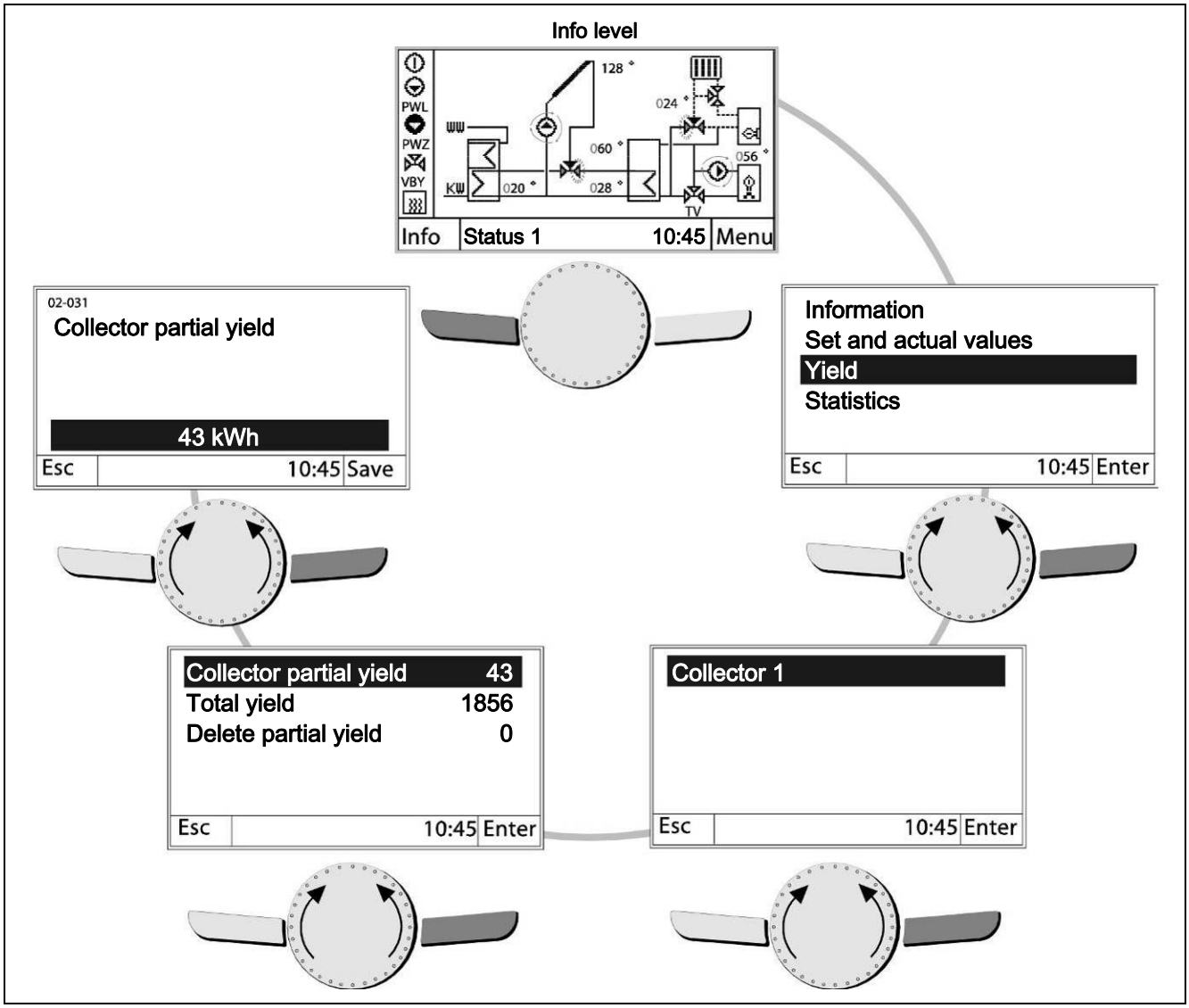
Adjuster / configuration



7.3 Navigation menu structure



7.4 Navigation menu info



7.4.1 Set/actual values

In this menu, all nominal/actual values are shown.

Value	Name
THR	Return temperature of a heating circuit
TSO	Upper hot water tank temperature, additional tank
TFK	Solid fuel boiler, supply temperature
TK	Solar collector temperature (outlet temperature)
TO	Upper tank temperature
TU	Lower tank temperature
TKV	Solar collector supply temperature (TKV)
TKR	Solar collector return temperature (TKR)
FLOW	Volume flow for the heat energy measurement in the solar circuit
TZW	Temperature in the hot water circulation line

Value	Name
TZWA	Temperature in the hot water circulation line ath the heat exchanger outlet
TPV	Supply temperature in the primary circuit
TPR	Return temperature in the primary circuit
VWM	Volume flow for the heat energy measurement in the primary circuit
TSV	Hot-water charging temperature, secondary supply
TSR	Hot-water charging temperature, secondary return
TSRU	Tank temperature for return switching valve
TOZ	Upper tank temperature, additional sensor
TUZ	Lower tank temperature, additional sensor
Pakt	Current calculated collector capacity
Qakt	Currently calculated heat
Status	Solar function status
Status BW	Hot-water function status
NALAD	Current status of the MFA for heat request / boiler disable
HTE	Current status of the MFA for the high-temperature relief
PS	Current speed of the solar pump in %
PZW	Current speed of the hot water circulation pump PZW
PZWP	Current speed of the pump for circulation/reheating PZWP
PWL	Current status of the recharging pump PWL
PLE	Current status of the pump PLE, thermal disinfection
PSL	Current speed PSL, tank charging pump
PPS	Current status of the transfer pump PPS
PFK	Current status of the charging pump PFK (charging the tank through the solid fuel boiler)
PZP	Current status of the PZP pump, transfer pump, transfer charging
PPZ	Current status of the PPZ pump, discharging pump transfer charging
PWT	Current speed, PWT, heat exchanger pump
PWP	Current speed, PWP pump, primary heat exchanger
PWS	Current speed, PWS pump, secondary heat exchanger
VBY	Current status of the collector bypass valve VBY
VRA	Current status of the diverter valve, return temperature increase VRA
VRU	Current status of the return switching diverter valve VRU
VSP	Current status of the diverter valve
VPO	Current status of the diverter valve, zone charging
VUP	Current status of the diverter valve, tank/heating circuit

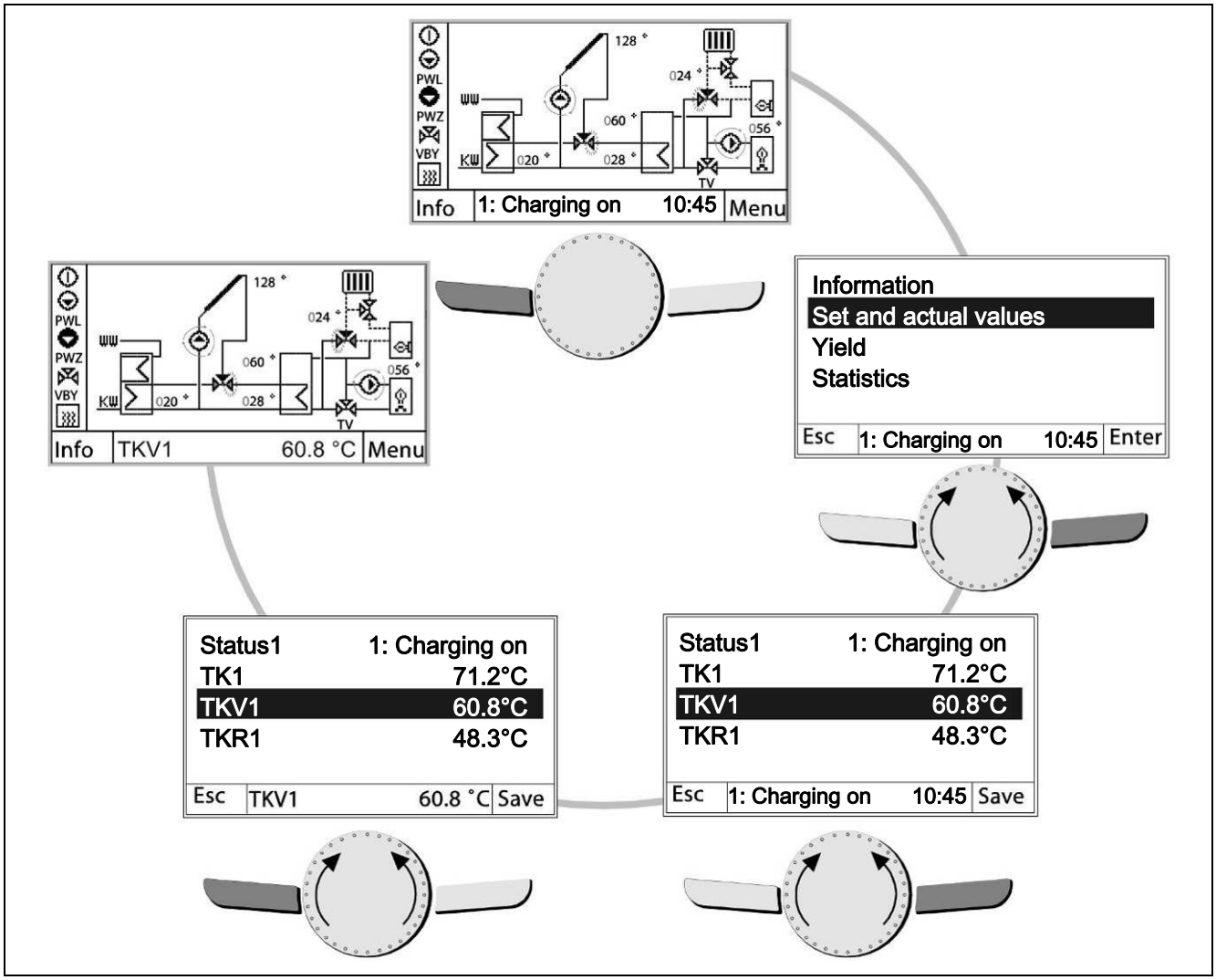
The following values are only visible for code input.

Value	Name
SetTK	Calculated nominal collector temperature, reference for the speed control of the PS solar pump
SetTO	Calculated nominal temperature on the upper tank sensor, reference for wide range of functions, such as recharging, solar charging, etc.
SetTU	Calculated nominal temperature on the lower tank sensor, reference for wide range of functions, such as thermal disinfection, solar charging, etc.
SetTZW	Calculated nominal temperature on the hot water circulation line sensor TWZ.

7 Operation

Value	Name
SetTZWA	Calculated nominal temperature on the hot water circulation line sensor, heat exchanger outlet TZW.

The values from the nominal/actual values level can be accepted to the status line of the title page with "Save".

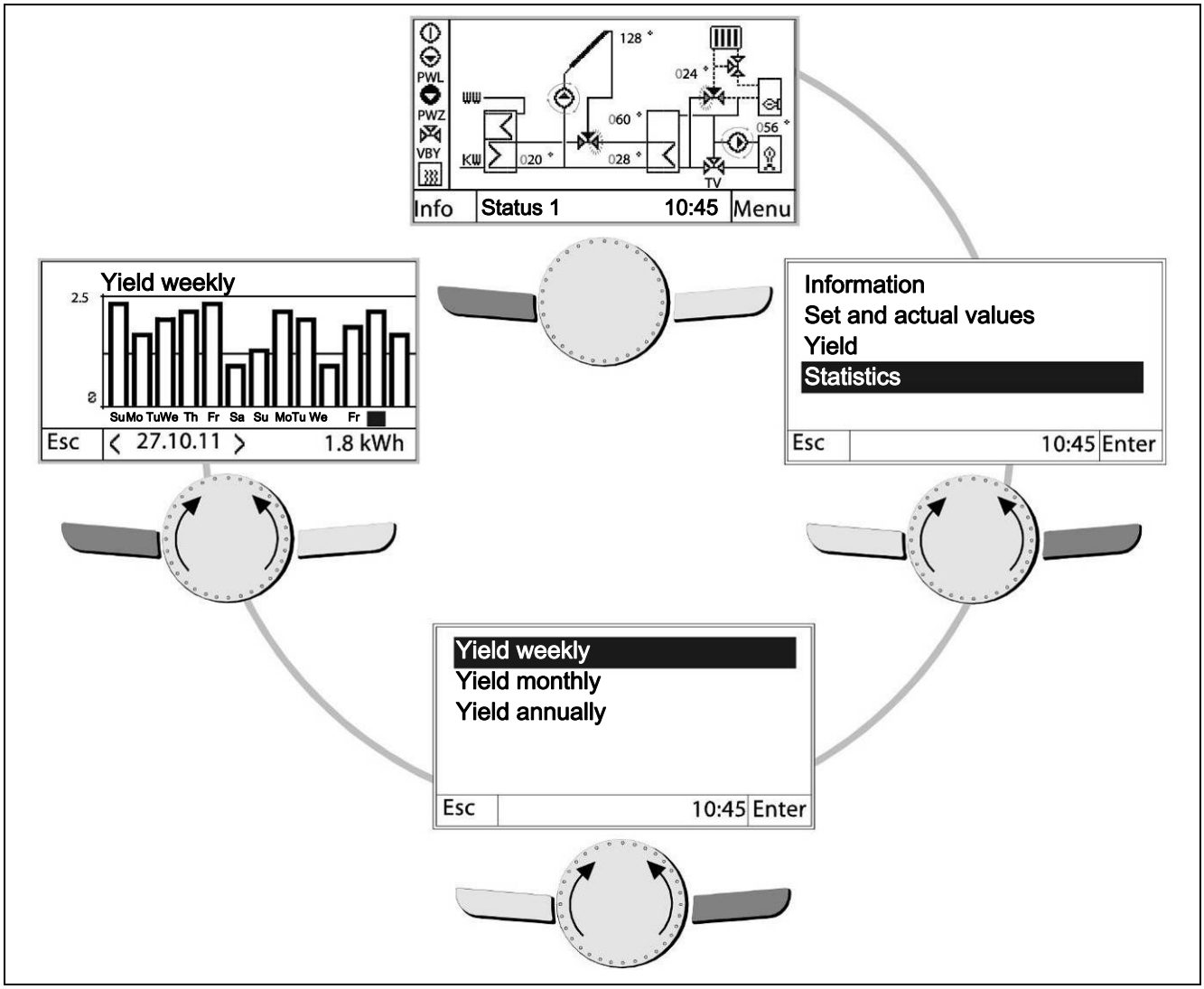


7.4.2 Yield

In this menu, all yields and heats are shown, e.g.:

Value	Name
Collector partial yield	Accumulated solar energy in kWh, can be reset
Run time PS pump solar pump	Accumulated operating hours on the PS solar pump
Total collector yield	Accumulated solar energy in kWh
Delete partial yield?	Reset the partial yield 0 : No 3 : Yes

7.5 Navigation of Statistics menu

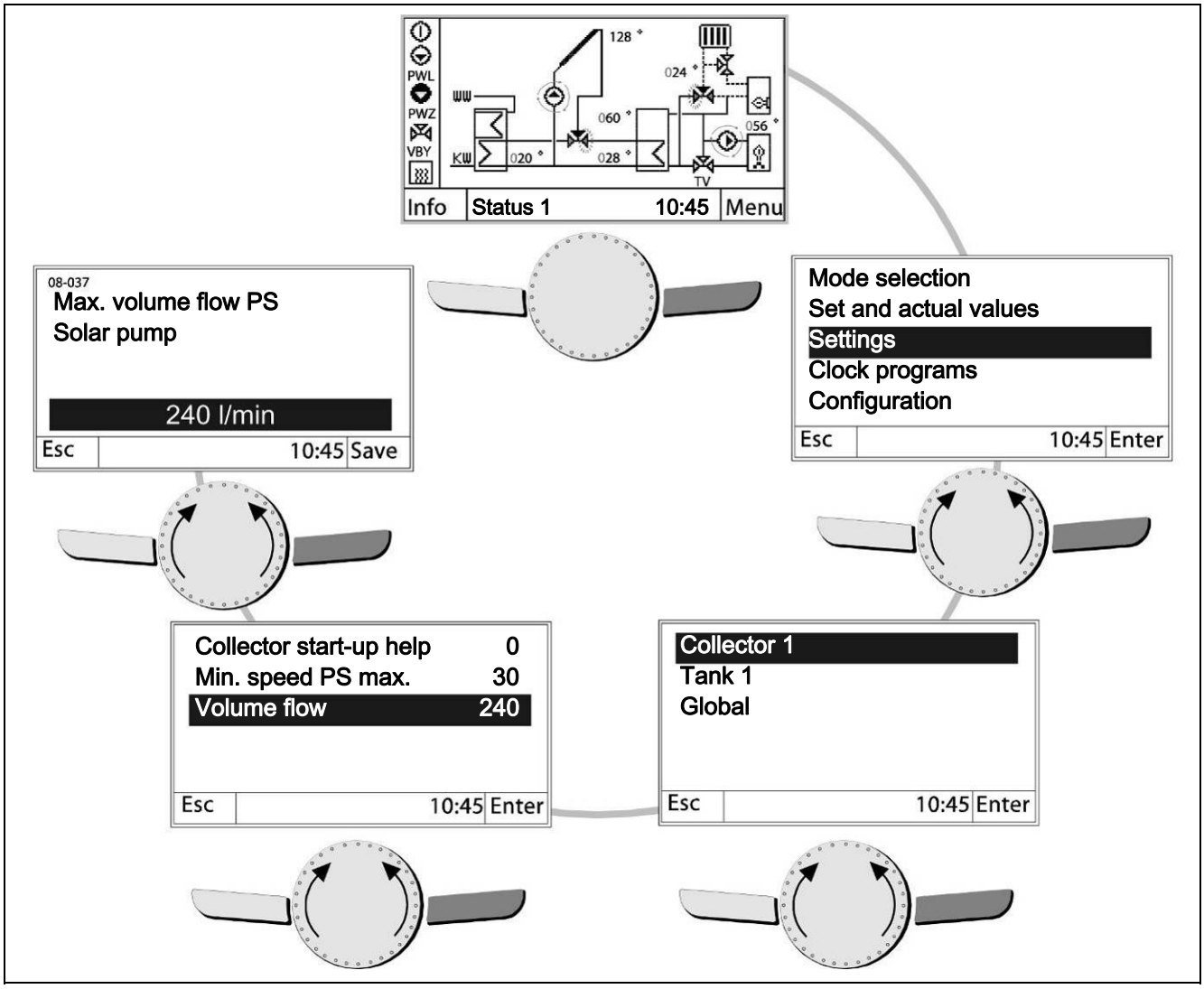


In this **`Info`** menu, the solar yields, the heat meters and the flow meters are graphically illustrated.

One can choose, e.g. for the collector, between the yields for the week, the last 13 days, the month, the last 13 months, and for the year and the last 13 years.

In the graphics, one can use the rotary knob to select a bar graph for display. At the bottom, then, the selection appears with the corresponding value.

7.6 Navigation / menu structure (change flow)



In the menu:

- The operating mode can be changed.
- The nominal/actual values can be read out.
- The adjusters can be adjusted.
- The clock programs can be changed.
- The controller can be configured.

7.6.1 Mode selection

Mode selection

Value	ID	Setting range	Factory reset	Password
Mode selection	08-045	0 ... 3	1	-
	The following operating modes can be selected: 0 : Off System OFF, protective functions active (pump blocking protection, collector protection, if (08-005) at "On", cooling off function if (08-074) active) 1 : Automatic The control functions are active according to the selected hydraulic type and parameterization 3 : Test The output functions can be manually set in the menu and checked. See chap. 8.6. Attention: No protective functions are active.			

7.6.2 Set/actual values

Collector 1

Value	ID	Name
TK collector temperature	00-014	Solar collector temperature (outlet temperature)
TKV collector flow temperature	00-060	Solar collector supply temperature (TKV)
TKR collector return flow temperature	00-061	Solar collector return temperature (TKR)
FLOW collector flow	00-062	Volume flow for the heat energy measurement in the solar circuit
Current collector capacity	02-030	Current calculated collector capacity
PS solar pump speed	01-050	Current speed of the SP solar pump in %
VBY collector bypass diverter valve output	22-100	Current status of the collector bypass valve VBY

With password

Value	ID	Name
Current set collector temperature	01-014	Calculated nominal collector temperature, reference for the speed control of the PS solar pump
Average PS solar pump speed	02-035	Average speed of the PS solar pump

Collector 2

Value	ID	Name
TK collector temperature	00-014	Solar collector temperature (outlet temperature)
TKV collector flow temperature	00-060	Solar collector supply temperature (TKV)
TKR collector return flow temperature	00-061	Solar collector return temperature (TKR)
FLOW collector flow	00-062	Volume flow for the heat energy measurement in the solar circuit
Current collector capacity	02-030	Current calculated collector capacity
PS solar pump speed	01-050	Current speed of the SP solar pump in %

With password

Value	ID	Name
Current set collector temperature	01-014	Calculated nominal collector temperature, reference for the speed control of the PS solar pump
Average PS solar pump speed	02-035	Average speed of the PS solar pump

Tank 1

Value	ID	Name
THR heating circuit return flow temperature	00-003	Return temperature of a heating circuit
TSO DHW temperature	00-004	Upper hot water tank temperature, additional tank
TFK solid fuel boiler temperature	00-007	Solid fuel boiler, supply temperature
TO tank-top temperature	00-015	Upper tank temperature
TU tank-bottom temperature	00-016	Lower tank temperature
TZW circulation circuit temperature	00-118	Temperature in the hot water circulation line
TZWA circulation temperature. outlet WT	21-068	Temperature in the hot water circulation line, heat exchanger outlet
Output MFA recharging Heat request	01-049	Current status of the MFA output for heat request/boiler disable
Output VSP diverter valve	01-052	Current status of the diverter valve.
Output PZW pump circulation circuit	01-065	Current speed of the hot water circulation pump PZW
Output PZWP pump, circulation/reheating	22-114	Current speed of the pump for circulation/reheating PZWP
TWT local heat exchanger temperature	00-121	Temperature of heat exchanger
TOZ additional tank top temperature	21-065	Upper tank temperature, additional sensor
TUZ additional tank bottom temperature	21-067	Lower tank temperature, additional sensor
PWL pump output DHW heating	22-101	Current status of the recharging pump PWL
PPS charging pump output	22-102	Current status of the transfer pump PPS
PWT local heat exchanger pump speed	22-106	Current speed, PWT local heat exchanger pump
VRA output, diverter valve,return temperature increase	22-107	Current status of the diverter valve, return temperature increase VRA

Value	ID	Name
PFK solid fuel boiler pump speed	22-108	Current status of the charging pump PFK (charging the tank through the solid fuel boiler)
VPO zone charging diverter valve output	22-109	Current status of the VPO zone charging diverter valve
VUP tank diverter valve - heating circuit output	22-110	Current status of the VUP diverter valve, tank/heating circuit
PLE thermal disinfection pump output	22-111	Current status of the tank circulation pump PLE, for thermal disinfection
PSL tank charging pump speed	22-113	Current speed PSL, tank charging pump
TSV hot-water charging temperature, secondary supply	00-117	Supply temperature, secondary heat exchanger
TSR hot-water charging temperature, secondary return	00-127	Return temperature, secondary heat exchanger
PWS pump speed, DHW heating, secondary	01-115	Current speed, PWS hot-water charging pump, secondary heat exchanger

With password

Value	ID	Name
Current set tank-top temperature	01-015	Calculated nominal temperature on the upper tank sensor, reference for wide range of functions, such as recharging, solar charging, etc.
Current set tank-bottom temperature	01-016	Calculated nominal temperature on the lower tank sensor, reference for wide range of functions, such as thermal disinfection, solar charging, etc.
Current set circulation circuit temperature	01-118	Calculated nominal temperature on the hot water circulation line sensor TZW.
Current nominal circulation temperature, heat exchanger outlet	22-068	Calculated nominal temperature on the hot-water circulation line sensor, heat exchanger outlet TZWA.
Current nominal hot-water charging temperature	01-117	Calculated nominal temperature at supply sensor, secondary heat exchanger, TSV

Tank 2

Value	ID	Name
THR heating circuit return flow temperature	00-003	Return temperature of a heating circuit
TSO DHW temperature	00-004	Upper hot water tank temperature, additional tank
TFK solid fuel boiler temperature	00-007	Solid fuel boiler, supply temperature
TO tank-top temperature	00-015	Upper tank temperature
TU tank bottom temperature	00-016	Lower tank temperature
TZW circulation circuit temperature	00-118	Temperature in the hot water circulation line
Output MFA recharging Heat request	01-049	Current status of the MFA output for heat request/boiler disable
VSP output diverter valve	01-052	Current status of the diverter valve.
PZW outout pump circulation circuit	01-065	Current status of the hot water circulation pump PZW
PWL pump output DHW heating	22-101	Current status of the recharging pump PWL
PPS output, charging pump, tank	22-102	Current status of the transfer pump PPS

Value	ID	Name
VRA output, diverter valve, return temperature increase	22-107	Current status of the diverter valve, return temperature increase VRA
PFK solid fuel boiler pump speed	22-108	Current status of the charging pump PFK (charging the tank through the solid fuel boiler)
PLE thermal disinfection pump output	22-111	Current status of the tank circulation pump PLE, for thermal disinfection
PSL tank charging pump speed	22-113	Current speed PSL, tank charging pump
TSV hot-water charging temperature, secondary supply	00-117	Supply temperature, secondary heat exchanger
TSR hot-water charging temperature, secondary return	00-127	Return temperature, secondary heat exchanger
PWS pump speed, DHW heating, secondary	01-115	Current speed, PWS hot-water charging pump, secondary heat exchanger

With password

Value	ID	Name
Current set tank-top temperature	01-015	Calculated nominal temperature on the upper tank sensor, reference for wide range of functions, such as recharging, solar charging, etc.
Current set tank-bottom temperature	01-016	Calculated nominal temperature on the lower tank sensor, reference for wide range of functions, such as thermal disinfection, solar charging, etc.
Current set circulation circuit temperature	01-118	Calculated nominal temperature on the hot water circulation line sensor TZW.
Current nominal hot-water charging temperature	01-117	Calculated nominal temperature at supply sensor, secondary heat exchanger, TSV

Tank 3

Value	ID	Name
TU tank-bottom temperature	00-016	Lower tank temperature

With password

Value	ID	Name
Current set tank-bottom temperature	01-016	Calculated nominal temperature on the lower tank sensor, reference for wide range of functions, such as thermal disinfection, solar charging, etc.

Global

Value	ID	Name
Solar control status	02-056	Solar function status: 0 : Charging off 1 : Charging on 2 : Fault 3 : Info
Hot-water control status	02-052	Hot-water/charging function status: 0 : Charging off 1 : Charging on 2 : thermal disinfection 5 : Fault 7 : Warning
SW version	04-092	Display of the installed software version
TWT central heat exchanger temperature	00-120	Temperature of heat exchanger
PZP output, charging pump transfer charging	22-103	Current status of the PZP pump, charging pump transfer
PPZ output, discharging pump, transfer charging	22-104	Current status of the PPZ pump, discharging pump transfer
PWT central heat exchanger pump speed	22-105	Current speed, PWT heat exchanger pump, centralized
MFA high-temperature relief output	22-112	Current status of the output, high-temperature relief
Primary circuit flow	21-071	Volume flow for the heat energy measurement in the primary circuit
Volume measurement flow rate	21-072	Volume flow for the flow rate measurement
Current heat capacity	23-003	Currently calculated heat capacity
TSRU return switching valve tank temperature	21-069	Temperature in the tank for the return switching valve
VRU output return switching diverter valve	22-115	Current status of the return switching diverter valve VRU
TPV PWT primary supply temperature	21-023	Supply temperature, primary heat exchanger
TPR PWT primary return temperature	21-024	Return temperature, primary heat exchanger
Speed PWP pump, DHW heating, primary	01-114	Current speed, PWP hot-water charging pump, primary heat exchanger

With password

Value	ID	Name
Commissioning date	04-089	Display of the commissioning date
Current nominal return charging temperature, primary	22-024	Calculated nominal temperature on the return sensor, primary heat exchanger, TPR

7.7 Settings

In this menu, the settings for the collector, tank and general settings can be changed.

Note: Some adjusters are only visible after entering a code.

Collector 1

Value	ID	Setting range	Factory reset	Password
Collector protection function	08-005	0 ... 1	0	-
	With this setting, the protective function for collector overheating is set: 0 : Off ... (no collector protection) 1 : On ... (collector protection active) If collector protection is active and the temperature on the collector rises above the set collector maximum temperature (08-011), the solar charging is enabled regardless of the set tank maximum temperature (08-059). If the collector protection temperature (08-010) or the tank protection temperature (08-060) should be exceeded, the solar charging is disabled .			
Collector fluid heat capacity	08-009	0.01 ... 9.99 kJ/kg*K	3.70 kJ/kg*K	-
	Spec. heat capacity of the collector fluid at 50 °C, -weishaupt- solar heat transfer medium Tyfocor L (45% propylene glycol) or in acc. with data sheet			
Collector protective temperature	08-010	80 ... 180 °C	120°C	11
	If the temperature at the collector sensor rises above the set value, solar charging is disabled.			
Collector maximum temperature	08-011	80 ... 150 °C	90°C	11
	If the collector protection is active (08-005) and the temperature rises at the collector sensor above the set value, solar charging is enabled. **Note:** The temperature for switching on again after switching off for protection is at the set value minus 10 K.			
Collector minimum temperature	08-012	-15 ... 90 °C	20°C	-
	Minimum collector temperature, at which the solar installation is enabled/disabled (fixed hysteresis -5 K).			
Collector frost protection temperature	08-013	-50 ... 10 °C	-20°C	-
	Deactivated when the set value is -50°C. Frost protection mode active when the collector temperature falls below the set value. Frost protection mode is ended when the set value is fallen below by 2 K. Fixed hysteresis 2 K.			
Collector start-up help	08-015	0 ... 1	0	-
	Start-up aid is for optimizing the system. Due to a positive temperature change at the collector sensor, the solar pump is switched on for a limited runtime. See (08-017). After this time elapses, the pump switches off again. The temperature on the collector is measured. If the temperature difference to the tank is sufficient, the solar pump switches "On". If the switch-on criteria are not met, the solar pump is switched on again after a variable waiting time (min. 15 minutes, max. 100 minutes). The waiting time is defined based on the collector temperature and the temperature change during rinsing. 0 : Off 1 : On ... (collector start-up aid active)			

Value	ID	Setting range	Factory reset	Pass word
Start-up help pump runtime	08-017	0.5 ... 20.0 min	0.5 min	11
	Runtime of the pump with active collector start-up aid function.			
Min. speed PS solar pump	08-035	5 ... 100%	40%	-
	Minimum control variable for the speed control of the PS solar pump. **Note:** Speed-controlled pumps are always started at 100% and run 5 s at this starting speed. This ensures that the pump starts up without problems.			
Max. volume flow, PS solar pump	08-037	10 ... 12000 l/h	240 l/h	-
	If the VIZ / TKR option is not activated, the volume flow of the solar circuit is set, which adjusted itself at a solar pump speed of 100%. This value is used for calculating the current and nominal collector capacity as well as the yield. **If the VIZ / TKR option is activated**, the maximum permissible volume flow of the solar circuit is set. The current volume flow is limited to this value via the pump speed control.			
Min. volume flow PS solar pump	08-038	0 ... 12000 l/h	60 l/h	-
	If the VIZ / TKR option is activated, the minimum permissible volume flow of the solar circuit is set. The current volume flow is limited to this value via the pump speed control.			
Manual setting PS solar pump	08-085	0 ... 100%	100%	-
	Specification of the control variable/status in test mode.			
Min. standby time PS solar pump	08-093	0 ... 200 s	10 s	11
	Off-time for the output. After switching off, the output is blocked for starting up again by this time. Adjuster for high-efficiency or electronic pumps (relay protective function)			
Max. temperature difference collector-tank	08-091	10 ... 80 K	80 K	11
	If the temperature difference between the collector and tank temperature for active solar charging during the set time (08-092) is greater than the set value, an error message (Err 71, 73) is generated.			
Collector-tank DT error message waiting period	08-092	0 ... 180 min	30 min	11
	If the temperature difference between the collector and tank temperature is too high during the set time with solar charging active, an error message is generated according to (08-091). 0: Error message suppressed!			
VIZ / TKR option volume pulse counter/ collector return flow sensor	08-107	0 ... 1	1	-
	Option - flow rate measurement 0: Off 1: On If the flow rate meter is active, a pulse rate (17-001) must be defined. When the flow is measured, a collector return flow sensor (TKR) is activated at the same time. **Note:** If there are 2 collector fields, this adjuster applies to both. A volume pulse counter and a return sensor must be installed for each collector field.			
VIZ impulse rate	17-001	1 ... 9999 pulses/l	180 pulses/l	-
	The pulse constant defines how many pulses per liter the sensor gives off. Set values for typical volume pulse encoder: WHI pump-sol 20... (WHPSol EA) 180 Imp. / l WHI pump-sol 25... 80 Imp. / l WHI sol/heat... 55 Imp. / l WHI sol/aqua... 55 Imp. / l WVZ Sol 4 Imp. / l … Settings for another volume pulse encoder can be found in the specifications on the encoder.			

Value	ID	Setting range	Factory reset	Password
Offset impulse rate VIZ-collector flow	28-020	-200 ... 200 l/h	15 l/h	11
	Offset flow sensor, collector This is added to the measurement to get the finished value.			
TKV option, collector flow sensor	08-108	0 ... 1	1	-
	Option - collector flow sensor 0: Off 1: On The option for the TKV collector flow sensor can be connected as an additional measuring point and then serves as a reference sensor for the speed control of the solar charge. **Note:** If there are 2 collector fields, this adjuster applies to both. A collector flow sensor must be installed for each collector field.			
VBY option collector bypass	08-109	0 ... 1	0	-
	Option - collector bypass 0 : Off 1: On			
Manual setting VBY collector bypass diverter valve	08-125	0 ... 1	0	-
	Specification of the control variable/status in test mode. 0 : Off 1: On			

Collector 2

Value	ID	Setting range	Factory reset	Password
Collector minimum temperature	08-012	-15 ... 90 °C	20°C	-
	Minimum collector temperature, at which the solar installation is enabled/disabled (fixed hysteresis -5 K).			
Min. speed PS solar pump	08-035	5 ... 100%	40%	-
	Minimum control variable for the speed control of the PS solar pump. **Note:** Speed-controlled pumps are always started at 100% and run 5 s at this starting speed. This ensures that the pump starts up without problems.			
Max. volume flow, PS solar pump	08-037	10 ... 12000 l/h	240 l/h	-
	If the VIZ / TKR option is not activated, the volume flow of the solar circuit is set, which adjusted itself at a solar pump speed of 100%. This value is used for calculating the current and nominal collector capacity as well as the yield. **If the VIZ / TKR option is activated**, the maximum permissible volume flow of the solar circuit is set. The current volume flow is limited to this value via the pump speed control.			
Min. volume flow PS solar pump	08-038	0 ... 12000 l/h	60 l/h	-
	If the VIZ / TKR option is activated, the minimum permissible volume flow of the solar circuit is set. The current volume flow is limited to this value via the pump speed control.			
Manual setting PS solar pump	08-085	0 ... 100%	100%	-
	Specification of the control variable/status in test mode.			
Min. standby time PS solar pump	08-093	0 ... 200 s	10 s	11
	Off-time for the output. After switching off, the output is blocked for starting up again by this time. Adjuster for high-efficiency or electronic pumps (relay protective function)			
VIZ impulse rate	17-001	1 ... 9999 pulses/l	180 pulses/l	-
	The pulse constant defines how many pulses per liter the sensor gives off. Set values for typical volume pulse encoder: WHI pump-sol 20... (WHPSol EA) 180 Imp. / l WHI pump-sol 25... 80 Imp. / l WHI sol/heat... 55 Imp. / l WHI sol/aqua... 55 Imp. / l WVZ Sol 4 Imp. / l … Settings for another volume pulse encoder can be found in the specifications on the encoder.			
Offset impulse rate VIZ-collector flow	28-020	-200 ... 200 l/h	15 l/h	11
	Offset flow sensor, collector This is added to the measurement to get the finished value.			

Tank 1

Value	ID	Setting range	Factory reset	Password
Switch-on difference TK – TU collector - tank bottom	08-001	0 ... 50 K	7 K	-
	With this adjuster, the switch-on difference between the solar reference temperature and the collector temperature is set.			
Switch-off difference TK- TU collector - tank bottom	08-002	0 ... 50 K	4 K	-
	With this adjuster, the switch-off difference between the solar reference temperature and the collector temperature is set.			
Tank control difference	08-064	5 ... 50 K	15 K	-
	The pump speed control attempts to hold the collector temperature higher than the temperature at the lower tank sensor (TU1) by the set control deviation.			
Tank tzpe	08-055	0 ... 4	1/ 3/ 4	11
	0 : Off No consumer active 1 : Heating tank If the nominal tank value is set under 20°C, this is considered to be frost protection mode. The nominal tank value is lowered to 10 °C. 3 : Hot water tank All options for charging strategy open. Depending on the application, the set values for switching over to alternating tank operation (08-065 and 08-066) are adjusted. Additional return temperature increase function is only enabled after the nominal tank value (E 8-062) is reached. 4 : Swimming pool Excluded from alternating tank operation			
Priority tank	08-056	1 ... 3	1	-
	Each tank can be allocated a priority for solar charging here. Note: If the same priorities are assigned by mistake, an information message 303, 304 or 306 is generated.			
Tank temperature setpoint	08-062	10 ... 90 °C	55°C	-
	Reference parameter for different tank charging functions. If the value at the tank sensor is exceeded, the setpoint is met. Switchpoint for charging at set point. Setpoint, tank recharging. Basic target setpoint for calculating the optimized speed control setpoint rise when charging at the nominal value.			
Switch-on hysteresis to set tank temperature	08-063	1 ... 30 K	2 K	-
	If the temperature in the tank is less than the setpoint minus the set value, this results in a charging request.			
Maximum tank temperature	08-059	10 ... 95 °C	90°C	-
	If the temperature at the tank sensor is above the set value, solar charging is disabled for this tank. Note: When collector protection is active (08-005), this limit is not observed. (08-060) applies.			
Protective tank temperature	08-060	10 ... 99 °C	95°C	11
	If the temperature at the tank sensor increases above the set value, solar charging is disabled, even for active overheating protection.			
Switch-off hysteresis for set tank temperature to TU	08-067	-10 ... 50 K	5 K	11
	With this adjuster, the switch-off difference to the setpoint for the end of hot-water charging on the switch-off sensor is defined. Charging is ended when TOx > setpoint (08:062) and TUx > setpoint (08:062) - value			

Value	ID	Setting range	Factory reset	Password
Active collector protection / night cooling tank	08-074	0 ... 2	0	-
	This allows the tank to recool via the collector with a negative temperature difference if the maximum tank temperature (08-059) and/or the maximum collector temperature (08-011) is exceeded during the day. 0 : Off 1 : At tank maximum temp. Cooling-off function is set, if tank temp. > max. tank temp. (08-059) 2 : Collect./max. tank temp. Cooling-off function is set, if tank temp. > max. tank temp. (08-059) and collector temp. > Collector protection temp. (08-010)			
Tank switch-on threshold, alternating tank operation	08-065	0 ... 20 K	5 K	11
	If the tank temperature minus the set value is less than the temperature in the tank with the lower priority, solar charging is enabled on this tank. **Note:** By setting different switch-on and switch-off thresholds, alternating tank operation can be optimized for tanks with large volumes or temperature levels.			
Tank switch-off threshold, alternating tank operation	08-066	0 ... 20 K	5 K	11
	If the tank temperature plus the set value is greater than the temperature in the next tank, solar charging is disabled on this tank. **Note:** By setting different switch-on and switch-off thresholds, alternating tank operation can be optimized for tanks with large volumes or temperature levels.			
Max. volume flow PSL Pump tank charging	28-037	10 ... 12000 l/h	240 l/h	-
	If the VIZ / TKR option is not activated, the volume flow of the solar circuit is set, which adjusted itself at a solar pump speed of 100%. This value is used for calculating the current and nominal collector capacity as well as the yield. **If the VIZ / TKR option is activated**, the maximum permissible volume flow of the solar circuit is set. The current volume flow is limited to this value via the pump speed control.			
Min. volume flow PSL Pump tank charging	28-038	0 ... 12000 l/h	60 l/h	-
	If the VIZ / TKR option is activated, the minimum permissible volume flow of the solar circuit is set. The current volume flow is limited to this value via the pump speed control.			
Manual setting PSL tank loading pump	08-082	0 ... 100%	100%	-
	Specification of the control variable/status in test mode.			
Manual setting VSP diverter valve	08-087	0 ... 1	0	-
	Specification of the control variable/status in test mode. 0 : Off 1: On			
Sensor selection, setpoint	08-007	0 ... 1	1	11
	Selection of the reference sensor for measuring or set temperature function 0 : Lower sensor ... (TUx lower sensor in the tank) 1 : Upper sensor ... (TOx upper sensor in the tank)			
Sensor selection, maximum value	08-008	0 ... 1	1	11
	Selection of the reference sensor for measuring or maximum temperature function 0 : Lower sensor ... (TUx lower sensor in the tank) 1 : Upper sensor ... (TOx upper sensor in the tank)			

Value	ID	Setting range	Factory reset	Password
Circulation function	05-006	0 ... 8	0	-
	Selection of the desired circulation function. The hot water circulation pump PZW can become active according to the following criteria. 0: Inactive 1: Clock program and temp. 3: Temperature controlled 4: Pulse controlled 5: according to clock program 6: Temp.- and pulse control. 7: Temp.- and pulse-contr. acc. to time 8: Pulse-contr. according to time prog.			
Circulation circuit Set temperature	05-054	0 ... 90 °C	45°C	-
	If the set value at the TZW sensor is fallen short of, the hot water circulation pump is active. Note: For active thermal disinfection, this value is replaced by the thermal disinfection temperature (05-004).			
Max. circulation temperature	05-072	10 ... 90 °C	70°C	-
	Specification of a maximum value for circulation. If the temperature on the circulation sensor TWZA rises above this value, pump PZWP is stopped.			
Waiting time for info message set circulation temperature not reached	05-042	0 ... 180 min	120 min	11
	If the nominal temperature in the circulation circuit is not reached during the set time while reheating is active, info message 056 is generated.			
PZW pump runtime for pulse control	05-070	0 ... 30 min	3 min	-
	If the PZW hot water circulation pump is operated with pulse control, the runtime of the PZW pump is defined with this value.			
PZW pump off-time for pulse control	05-071	0 ... 240 min	10 min	-
	After the runtime of the PZW pump (05-070) has elapsed, its operation is disabled by the set value time.			
Switch-on difference TO – TZW, tank (top) - hot-water circulation	05-073	0 ... 50 K	5 K	-
	With this adjuster, the switch-on difference between the circulation return temperature and the tank temperature for reheating is set.			
Switch-off difference TO – TZW, tank (top) - hot-water circulation	05-074	0 ... 50 K	3 K	-
	With this adjuster, the switch-off difference between the circulation return temperature and the tank temperature for reheating is set.			
Speed PZW pump circulation circuit	05-107	5 ... 100%	100%	-
	Parameter for the speed of the hot-water circulation pump PZW Note: Speed-controlled pumps are always started at 100% and run 5 s at this starting speed. This ensures that the pump starts up without problems.			
Manual setting PZW pump circulation circuit	05-122	5 ... 100%	100%	-
	Specification of the control variable/status in test mode.			
Speed, PZWP pump, circulation/reheating	05-109	5 ... 100%	100%	-
	Parameter for the speed of the hot-water circulation pump PZW, reheating PZWP Note: Speed-controlled pumps are always started at 100% and run 5 s at this starting speed. This ensures that the pump starts up without problems.			

Value	ID	Setting range	Factory reset	Password
Manual setting, PZWP pump, primary circulation	05-124	5 ... 100%	100%	-
	Specification of the control variable/status in test mode.			
PWL option **Pump, DHW heating**	08-100	0 ... 1	0	-
	Option PWL - tank charging/recharging. 0 : Off 1: On			
Manual setting PWL pump **DHW heating**	08-089	0 ... 1	0	-
	Specification of the control variable/status in test mode. 0 : Off 1: On			
MFA option recharging heat request	08-113	0 ... 1	0	-
	Option - heat request/ boiler disable 0 : Off 1: On			
Manual setting MFA recharging **Heat request**	08-124	0 ... 1	0	-
	Specification of the control variable/status in test mode. 0 : Off 1: On			
Setpoint reduction for high solar yield	08-072	0 ... 20 K	15 K	11
	If a high solar or daily yield is detected according to adjuster (08-070) or (08-071), the normal nominal tank value (08-062) is reduced by the set value for recharging with a conventional heat generator.			
Thermal disinfection function	05-014	0, 10, 11, 12, 13, 14	0	-
	Selection whether thermal disinfection is desired and what actuator is for recirculating the tank. In addition, a clock program can be edited for thermal disinfection. The hot water is heated to the set **thermal disinfection temperature** according to the clock program and held for 30 minutes (05-043) 0: No function 10: With PLE pump for tank recirculation with PLE pump 11: With PZW pump for tank recirculation with PZW pump 12: With PPS pump for tank recirculation with PPS pump 13: With pump PLE and sensor TUZ - tank recirculation with pump PLE 14: With pump PPS and sensor TUZ - tank recirculation with pump PPS			
Thermal disinfection temperature	05-004	50 ... 80 °C	60°C	-
	Setting the desired temperature when the **thermal disinfection function** is active. After reaching the temperature at the lower tank sensor, this is held for 30 minutes.			
Min. holding time, nominal thermal disinfection temperature	05-043	0 ... 480 min	30 min	11
	This adjuster defines how long the setpoint for thermal disinfection must be held for the function to be successfully ended.			
Thermal disinfection, manual	05-084	0 ... 1	0	-
	With this adjuster, thermal disinfection can be started manually for a fixed 4 hours. Independent of the clock program, the consumer is charged at the nominal thermal disinfection temperature. 0 : Off 1: On			
Manual setting PLE circulation pump, thermal disinfection	28-002	0 ... 1	0	-
	Specification of the control variable/status in test mode. 0 : Off 1: On			

Value	ID	Setting range	Factory reset	Password
PPS option Discharging	08-101	0 ... 1	0	-
	Option - transfer charging 0 : Off 1: On			
Manual setting PPS charging pump	08-120	0 ... 1	0	-
	Specification of the control variable/status in test mode. 0 : Off 1: On			
DHW temperature setpoint	05-051	10 ... 90 °C	55°C	-
	Set temperature of the additional tank, to which charging is done with the PPS transfer function.			
Switch-on difference transfer charging PPS	08-098	2 ... 50 K	5 K	-
	If the temperature at the tank sensor is greater than the active set tank value plus 2 K, and if the temperature difference from the TSO sensor increases above the set value, the transfer charging PPS is enabled.			
Switch-off difference transfer charging PPS	08-099	0 ... 20 K	3 K	-
	If the temperature at the tank sensor is less than the active nominal tank value, or if the temperature difference from the TSO sensor falls below the set value, the transfer charging PPS is disabled.			
Manual setting PWT local heat exchanger pump	08-127	0 ... 100%	30%	-
	Specification of the control variable/status in test mode. 0 : Off 1: On			
Min. speed, PWT local heat exchanger pump	08-024	5 ... 100%	30%	-
	Minimum control variable for the speed control for secondary pump of the external heat exchanger. **Note:** The secondary pump of the external heat exchanger is always started at 100% and runs for 5 s at this starting speed. This ensures that the pump starts up without problems.			
Min. standby time, PWT local heat exchanger pump	28-000	0 ... 200 s	10 s	11
	Off-time for the output. After switching off, the output is blocked for starting up again by this time. Adjuster for high-efficiency or electronic pumps (relay protective function)			
Max. tank temperature for VRA return temperature increase	07-008	30 ... 105 °C	70°C	-
	Specification of the maximum tank temperature for the return temperature increase function. If the temperature at the tank top sensor, TOx, rises above the set value, the return temperature increase function is disabled.			
Switch-on difference VRA return temperature increase	08-080	0 ... 50 K	10 K	-
	If the temperature at the tank sensor rises above the heating circuit return temperature plus the set value, the return temperature increase is enabled. If the max. tank temperature for the return temperature increase (07-008) is exceeded, the return temperature increase is disabled.			
Switch-off difference VRA return temperature increase	08-081	0 ... 50 K	5 K	-
	If the temperature at the tank sensor falls below the heating circuit return temperature plus the set value, the return temperature increase is disabled.			
Manual setting VRA diverter valve return temperature increase	08-121	0 ... 1	0	-
	Specification of the control variable/status in test mode. 0 : Off 1: On			

Value	ID	Setting range	Factory reset	Password
Manual setting PFK pump, solid fuel boiler	08-083	0 ... 100%	30%	-
	Specification of the control variable/status in test mode.			
Switch-on difference TFK-TU solid fuel boiler - tank bottom	08-003	0 ... 50 K	10 K	-
	With this adjuster, the switch-on difference between the charging reference temperature and the solid fuel boiler temperature is set.			
Switch-off difference TFK-TU solid fuel boiler - tank bottom	08-004	0 ... 50 K	5 K	-
	With this adjuster, the switch-off difference between the charging reference temperature and the solid fuel boiler temperature is set.			
Min. standby time, PFK pump, solid fuel boiler	08-094	0 ... 200 s	10 s	11
	Off-time for the output. After switching off, the output is blocked for starting up again by this time. Adjuster for high-efficiency or electronic pumps (relay protective function)			
Minimum temperature, TFK solid fuel boiler	09-032	10 ... 90 °C	50°C	-
	Minimum temperature at which charging from the solid fuel boiler to the storage tank is enabled/disabled (fixed hysteresis -5 K). Example: Enable at 50 °C Disable at 45 °C (= 50 °C - 5 K)			
Min. speed, PFK pump, solid fuel boiler	09-039	5 ... 100%	30%	-
	Minimum control variable for the speed control of the solid fuel boiler pump. **Note:** The pump is always started at 100% and runs for 5 s at this starting speed. This ensures that the pump starts up without problems.			
Manual setting VOP diverter valve Zone charging	08-122	0 ... 1	0	-
	Specification of the control variable/status in test mode. 0 : Off 1: On			
Manual setting VUP diverter valve Tank / heating circuit	28-001	0 ... 1	0	-
	Specification of the control variable/status in test mode. 0 : Off 1: On			
Min. speed, PWS pump, secondary heat exchanger	28-013	5 ... 100%	100%	-
	Minimum parameter for the speed of the PWS pump for the secondary heat exchanger.			
Max. speed, PWS pump, secondary heat exchanger	28-014	5 ... 100%	100%	-
	Maximum parameter for the speed of the PWS pump for the secondary heat exchanger. **Note:** Speed-controlled pumps are always started at 100% and run 5 s at this starting speed. This ensures that the pump starts up without problems.			
Manual setting, PWS pump, secondary heat exchanger	28-012	5 ... 100%	100%	-
	Specification of the control variable/status in test mode.			
Control difference TSV for PWS pump, secondary heat exchanger	28-018	0 ... 50 K	5 K	11
	This adjuster sets the setpoint for the temperature TSV at the outlet of the heat exchanger. By controlling the speed of the pump PWS, it is attempted to reach the setpoint and to hold it.			
Setpoint formation TSV, secondary supply temperature	28-019	0 ... 1	0/ 1	11
	The setpoint formation TSV is defined with this adjuster 0: Tank setpoint: Set temperature TSV = nominal tank temperature + set value 1: Temperature difference: Set temperature TSV = current tank (top) temperature + set value			

Value	Tank 2 ID	Setting range	Factory reset	Password
Switch-on difference TK-TU collector - tank bottom	08-001	0 ... 50 K	7 K	-
	With this adjuster, the switch-on difference between the solar reference temperature and the collector temperature is set.			
Switch-off difference TK-TU collector - tank bottom	08-002	0 ... 50 K	4 K	-
	With this adjuster, the switch-off difference between the solar reference temperature and the collector temperature is set.			
Tank control difference	08-064	5 ... 50 K	15 K	-
	The pump speed control attempts to hold the collector temperature higher than the temperature at the lower tank sensor (TU2) by the set control deviation.			
Tank tzpe	08-055	0 ... 4	1/ 3 / 4	11
	0 : Off No consumer active			
	1 : Heating tank If the nominal tank value is set under 20°C, this is considered to be frost protection mode. The nominal tank value is lowered to 10 °C.			
	3 : Hot water tank All options for charging strategy open. Depending on the application, the set values for switching over to alternating tank operation (08-065 and 08-066) are adjusted. Additional return temperature increase function is only enabled after the nominal tank value (08-062) is reached.			
	4 : Swimming pool Excluded from alternating tank operation			
Priority tank	08-056	1 ... 3	2	-
	Each tank can be allocated a priority for solar charging here. Note: If the same priorities are assigned by mistake, an information message 303, 304 or 306 is generated.			
Tank temperature setpoint	08-062	10 ... 90 °C	55°C	-
	Reference parameter for different tank charging functions. If the value at the tank sensor is exceeded, the setpoint is met. Switchpoint for charging at setpoint. Setpoint, tank recharging. Basic target setpoint for calculating the optimized speed control setpoint rise when charging at the nominal value.			
Switch-on hysteresis to set tank temperature	08-063	1 ... 30 K	2 K	-
	If the temperature in the tank is less than the setpoint minus the set value, this results in a charging request.			
Maximum tank temperature	08-059	10 ... 95 °C	90°C	-
	If the temperature at the tank sensor is above the set value, solar charging is disabled for this tank. Note: When collector protection is active (08-005), this limit is not observed. (08-060) applies.			
Protective tank temperature	08-060	10 ... 99 °C	95°C	11
	If the temperature at the tank sensor increases above the set value, solar charging is disabled, even for active collector protection.			
Switch-off hysteresis for set tank temperature to TU	08-067	-10 ... 50 K	5 K	11
	With this adjuster, the switch-off difference to the setpoint for the end of hot-water charging on the switch-off sensor is defined. Charging is ended when TOx > setpoint (08:062) and TUx > setpoint (08:062) - value			

Value	ID	Setting range	Factory reset	Password
Active collector protection / night cooling tank	08-074	0 ... 2	0	-
	This allows the tank to recool via the collector with a negative temperature difference if the maximum tank temperature (08-059) and/or the maximum collector temperature (08-011) is exceeded during the day. 0 : Off 1 : At tank maximum temp. Cooling-off function is set, if tank temp. > max. tank temp. (08-059) 2 : Collect./max. tank temp. Cooling-off function is set, if tank temp. > max. tank temp. (08-059) and collector temp. > Collector protection temp. (08-010)			
Tank switch-on threshold, alternating tank operation	08-065	0 ... 20 K	5 K	11
	If the tank temperature minus the set value is less than the temperature in the tank with the lower priority, solar charging is enabled on this tank. **Note:** By setting different switch-on and switch-off thresholds, alternating tank operation can be optimized for tanks with large volumes or temperature levels.			
Tank switch-off threshold, alternating tank operation	08-066	0 ... 20 K	5 K	11
	If the tank temperature plus the set value is greater than the temperature in the next tank, solar charging is disabled on this tank. **Note:** By setting different switch-on and switch-off thresholds, alternating tank operation can be optimized for tanks with large volumes or temperature levels.			
Max. volume flow PSL pump, tank charging	28-037	10 ... 12000 l/h	240 l/h	-
	If the VIZ / TKR option is not activated, the volume flow of the solar circuit is set, which adjusted itself at a solar pump speed of 100%. This value is used for calculating the current and nominal collector capacity as well as the yield. **If the VIZ / TKR option is activated**, the maximum permissible volume flow of the solar circuit is set. The current volume flow is limited to this value via the pump speed control.			
Min. volume flow PSL pump, tank charging	28-038	0 ... 12000 l/h	60 l/h	-
	If the VIZ / TKR option is activated, the minimum permissible volume flow of the solar circuit is set. The current volume flow is limited to this value via the pump speed control.			
Manual setting PSL tank loading pump	08-082	0 ... 100%	100%	-
	Specification of the control variable/status in test mode.			
Manual setting VSP diverter valve	08-087	0 ... 1	0	-
	Specification of the control variable/status in test mode. 0 : Off 1: On			
Sensor selection, setpoint	08-007	0 ... 1	1	11
	Selection of the reference sensor for measuring or set temperature function 0 : Lower sensor ... (TUx lower sensor in the tank) 1 : Upper sensor ... (TOx upper sensor in the tank)			
Sensor selection, maximum value	08-008	0 ... 1	1	11
	Selection of the reference sensor for measuring or maximum temperature function 0 : Lower sensor ... (TUx lower sensor in the tank) 1 : Upper sensor ... (TOx upper sensor in the tank)			

Value	ID	Setting range	Factory reset	Password
Circulation function	05-006	0 ... 8	0	-
	Selection of the desired circulation function. The hot water circulation pump PZW can become active according to the following criteria. 0: Inactive 1: Clock program and temp. 3: Temperature controlled 4: Pulse controlled 5: according to clock program 6: Temp.- and pulse control. 7: Temp.- and pulse-contr. acc. to time 8: Pulse-contr. according to time prog.			
Circulation circuit Set temperature	05-054	0 ... 90 °C	45°C	-
	If the set value at the TZW sensor is fallen short of, the hot water circulation pump is active. **Note:** For active thermal disinfection, this value is replaced by the **thermal disinfection temperature** (05-004).			
PZW pump runtime for pulse control	05-070	0 ... 30 min	3 min	-
	If the PZW hot water circulation pump is operated with pulse control, the runtime of the PZW pump is defined with this value.			
PZW pump off-time for pulse control	05-071	0 ... 240 min	10 min	-
	After the runtime of the PZW pump (05-070) has elapsed, its operation is disabled by the set value time.			
Manual setting PZW pump circulation circuit	05-122	0 ... 1	0	-
	Specification of the control variable/status in test mode. 0 : Off 1: On			
PWL option DHW heating	08-100	0 ... 1	0	-
	Option PWL - tank charging/recharging. 0 : Off 1: On			
Manual setting PWL pump DHW heating	08-089	0 ... 1	0	-
	Specification of the control variable/status in test mode. 0 : Off 1: On			
MFA option - recharging, heat request	08-113	0 ... 1	0	-
	Option - heat request/ boiler disable 0 : Off 1: On			
Manual setting of MFA recharging, heat request	08-124	0 ... 1	0	-
	Specification of the control variable/status in test mode. 0 : Off 1: On			
Setpoint reduction for high solar yield	08-072	0 ... 20 K	15 K	11
	If a high solar or daily yield is detected according to adjuster (08-070) or (08-071), the normal nominal tank value (08-062) is reduced by the set value for recharging with a conventional heat generator.			

Value	ID	Setting range	Factory reset	Password
Thermal disinfection function	05-014	0, 10, 11, 12, 13, 14	0	-
	Selection whether thermal disinfection is desired and what actuator is for recirculating the tank. In addition, a clock program can be edited for thermal disinfection. The hot water is heated to the set **thermal disinfection temperature** according to the clock program and held for 30 minutes (05-043) 0: No function 10: With PLE pump for tank recirculation with PLE pump 11: With PZW pump for tank recirculation with PZW pump 12: With PPS pump for tank recirculation with PPS pump 13: With pump PLE and sensor TUZ - tank recirculation with pump PLE 14: With pump PPS and sensor TUZ - tank recirculation with pump PPS			
Thermal disinfection temperature	05-004	50 ... 80 °C	60°C	-
	Setting the desired temperature when the **thermal disinfection function** is active. After reaching the temperature at the lower tank sensor, this is held for 30 minutes.			
Min. holding time, nominal thermal disinfection temperature	05-043	0 ... 480 min	30 min	11
	This adjuster defines how long the setpoint for thermal disinfection must be held for the function to be successfully ended.			
Thermal disinfection, manual	05-084	0 ... 1	0	-
	With this adjuster, thermal disinfection can be started manually for a fixed 4 hours. Independent of the clock program, the consumer is charged at the nominal thermal disinfection temperature. 0 : Off 1: On			
Manual setting PLE circulation pump, thermal disinfection	28-002	0 ... 1	0	-
	Specification of the control variable/status in test mode. 0 : Off 1: On			
PPS option discharging	08-101	0 ... 1	0	-
	Option - transfer 0 : Off 1: On			
Manual setting PPS charging pump	08-120	0 ... 1	0	-
	Specification of the control variable/status in test mode. 0 : Off 1: On			
DHW temperature setpoint	05-051	10 ... 90 °C	55°C	-
	Set temperature of the additional tank, to which charging is done with the PPS transfer function.			
Switch-on difference transfer charging PPS	08-098	2 ... 50 K	5 K	-
	If the temperature at the tank sensor is greater than the active set tank value plus 2 K, and if the temperature difference from the TSO sensor increases above the set value, the transfer PPS is enabled.			
Switch-off difference transfer charging PPS	08-099	0 ... 20 K	3 K	-
	If the temperature at the tank sensor is less than the active nominal tank value, or if the temperature difference from the TSO sensor falls below the set value, the transfer PPS is disabled.			

Value	ID	Setting range	Factory reset	Password
Manual setting PWT local heat exchanger pump	08-127	0 ... 100%	30%	-
	Specification of the control variable/status in test mode. 0 : Off 1: On			
Min. speed, PWT local heat exchanger pump	08-024	5 ... 100%	30%	-
	Minimum control variable for the speed control for secondary pump of the external heat exchanger. Note: The secondary pump of the external heat exchanger is always started at 100% and runs for 5 s at this starting speed. This ensures that the pump starts up without problems.			
Min. standby time, PWT local heat exchanger pump	28-000	0 ... 200 s	10 s	11
	Off-time for the output. After switching off, the output is blocked for starting up again by this time. Adjuster for high-efficiency or electronic pumps (relay protective function)			
VRA option return temperature increase	08-103	0 ... 1	0	-
	Return temperature increase option 0 : Off 1: On			
Max. tank temperature for VRA return temperature increase	07-008	30 ... 105 °C	70°C	-
	Specification of the maximum tank temperature for the return temperature increase function. If the temperature at the tank top sensor, TOx, rises above the set value, the return temperature increase function is disabled.			
Switch-on difference VRA return temp. Increase	08-080	0 ... 50 K	10 K	-
	If the temperature at the tank sensor rises above the heating circuit return temperature plus the set value, the return temperature increase is enabled. If the max. tank temperature for the return temperature increase (07-008) is exceeded, the return temperature increase is disabled.			
Switch-off difference VRA return temp. Increase	08-081	0 ... 50 K	5 K	-
	If the temperature at the tank sensor falls below the heating circuit return temperature plus the set value, the return temperature increase is disabled.			
Manual setting VRA diverter valve, return temp. increase	08-121	0 ... 1	0	-
	Specification of the control variable/status in test mode. 0 : Off 1: On			
Manual setting PFK pump, solid fuel boiler	08-083	0 ... 100%	30%	-
	Specification of the control variable/status in test mode.			
Switch-on difference TFK-TU solid fuel boiler - tank bottom	08-003	0 ... 50 K	10 K	-
	With this adjuster, the switch-on difference between the charging reference temperature and the solid fuel boiler temperature is set.			
Switch-off difference TFK-TU solid fuel boiler - tank bottom	08-004	0 ... 50 K	5 K	-
	With this adjuster, the switch-off difference between the charging reference temperature and the solid fuel boiler temperature is set.			
Min. standby time, PFK pump, solid fuel boiler	08-094	0 ... 200 s	10 s	11
	Off-time for the output. After switching off, the output is blocked for starting up again by this time. Adjuster for high-efficiency or electronic pumps (relay protective function)			
Minimum temperature, TFK solid fuel boiler	09-032	10 ... 90 °C	50°C	-
	Minimum temperature at which charging from the solid fuel boiler to the storage tank is enabled/disabled (fixed hysteresis -5 K). Example: Enable at 50 °C Disable at 45 °C (= 50 °C - 5 K)			

Value	ID	Setting range	Factory reset	Password
Min. speed, PFK pump, solid fuel boiler	09-039	5 ... 100%	30%	-
	Minimum control variable for the speed control of the solid fuel boiler pump. **Note:** The pump is always started at 100% and runs for 5 s at this starting speed. This ensures that the pump starts up without problems.			
Min. speed, PWS pump, secondary heat exchanger	28-013	5 ... 100%	100%	-
	Minimum parameter for the speed of the PWS pump for the secondary heat exchanger.			
Max. speed, PWS pump, secondary heat exchanger	28-014	5 ... 100%	100%	-
	Maximum parameter for the speed of the PWS pump for the secondary heat exchanger. **Note:** Speed-controlled pumps are always started at 100% and run 5 s at this starting speed. This ensures that the pump starts up without problems.			
Manual setting, PWS pump, secondary heat exchanger	28-012	5 ... 100%	100%	-
	Specification of the control variable/status in test mode.			
Control difference TSV for PWS pump, secondary heat exchanger	28-018	0 ... 50 K	5 K	11
	This adjuster sets the setpoint for the temperature TSV at the outlet of the heat exchanger. By controlling the speed of the pump PWS, it is attempted to reach the setpoint and to hold it.			
Setpoint formation TSV, secondary supply temperature	28-019	0 ... 1	0/ 1	11
	The setpoint formation TSV is defined with this adjuster 0: Tank setpoint: Set temperature TSV = nominal tank temperature + set value 1: Temperature difference: Set temperature TSV = current tank (top) temperature + set value			

Tank 3

Value	ID	Setting range	Factory reset	Password
Switch-on difference TK-TU collector - tank bottom	08-001	0 ... 50 K	7 K	-
	With this adjuster, the switch-on difference between the solar reference temperature and the collector temperature is set.			
Switch-off difference TK-TU collector - tank bottom	08-002	0 ... 50 K	4 K	-
	With this adjuster, the switch-off difference between the solar reference temperature and the collector temperature is set.			
Tank control difference	08-064	5 ... 50 K	15 K	-
	The pump speed control attempts to hold the collector temperature higher than the temperature at the lower tank sensor (TU3) by the set control deviation.			
Tank tzpe	08-055	0 ... 4	4	11
	0 : Off No consumer active 1 : Heating tank If the nominal tank value is set under 20°C, this is considered to be frost protection mode. The nominal tank value is lowered to 10 °C. 3 : Hot water tank All options for charging strategy open. Depending on the application, the set values for switching over to alternating tank operation (08-065 and 08-066) are adjusted. Additional return temperature increase function is only enabled after the nominal tank value (08-062) is reached. 4 : Swimming pool Excluded from alternating tank operation			

Value	ID	Setting range	Factory reset	Password
Priority tank	08-056	1 ... 3	3	-
	Each tank can be allocated a priority for solar charging here. **Note:** If the same priorities are assigned by mistake, an information message 303, 304 or 306 is generated.			
Tank temperature setpoint	08-062	10 ... 90 °C	30°C	-
	Reference parameter for different tank charging functions. If the value at the tank sensor is exceeded, the setpoint is met. Switchpoint for charging at setpoint. Setpoint, tank recharging. Basic target setpoint for calculating the optimized speed control setpoint rise when charging at the nominal value.			
Switch-on hysteresis to set tank temperature	08-063	1 ... 30 K	2 K	-
	If the temperature in the tank is less than the setpoint minus the set value, this results in a charging request.			
Maximum tank temperature	08-059	10 ... 95 °C	35°C	-
	If the temperature at the tank sensor is above the set value, solar charging is disabled for this tank. Note: When collector protection is active (08-005), this limit is not observed. (08-060) applies.			
Protective tank temperature	08-060	10 ... 99 °C	40°C	11
	If the temperature at the tank sensor increases above the set value, solar charging is disabled, even for active collector protection.			
Active collector protection / night cooling tank	08-074	0 ... 2	0	-
	This allows the tank to recool via the collector with a negative temperature difference if the maximum tank temperature (08-059) and/or the maximum collector temperature (08-011) is exceeded during the day. 0 : Off No consumer active 1 : At tank maximum temp. Cooling-off function is set, if tank temp. > max. tank temp. (08-059) 2 : Collect./max. tank temp. Cooling-off function is set, if tank temp. > max. tank temp. (08-059) and collector temp. > Collector protection temp. (08-010)			

Value	Global ID	Setting range	Factory reset	Password
Solar charging strategy	08-050	0 ... 3	0/ 3	-
	A strategy can be selected for solar charging: In the charging strategies, it is attempted to charge the tank to the desired set or maximum temperature in as few charging cycles as possible. Based on the solar supply, the controller attempts to hold an even setpoint rise, setpoint rise (08-064) or optimized setpoint rise on the collector sensor during the entire charge. The optimized setpoint rise is limited downward using adjuster (08-064). In strategy 3 , this calculation is only used for a high solar yield. 0: For yield The setpoint for speed control results from the temperature on the tank sensor plus the setpoint rise (08-064). For several consumers, charging is done in alternating tank operation. Here, the tank with the lower temperature is charged first. 1: At set temperature The setpoint for speed control results from the temperature at the tank sensor + optimized setpoint rise. For several tanks, the charge is done according to tank priority (08-056) at the setpoint. The tank with priority 1 is first charged at the setpoint (08-062). 3: Automatic yield/nominal The setpoint for speed control results according to the active strategy, yield-dependent strategy switchover between 0 and 1. Charging is done based on yield, in parallel in alternating tank operation, or according to priority of the tank at the setpoint.			
Change-over solar charging (high yield)	08-051	30 ... 100%	50%	11
	If the comparison of the current solar capacity with the calculated nominal capacity results in a factor which lies above the set value, it switches from parallel mode (swinging) to the nominal or maximum charge. Note: Calculation of the nominal capacity from max. volume flow (08-037), spec. heat capacity (08-009) and tank control deviation (08-064).			
Switch-on threshold detection of high solar energy	08-070	0 ... 100%	50%	11
	If the comparison of the current solar capacity and the nominal capacity results in a factor above the set value, and if the reduced nominal tank temperature [(08-062) - (0-072)] exceeded, recharging is only allowed with a conventional heat exchanger at the reduced nominal temperature. If the factor is 10% below the set value, the normal nominal tank temperature (08-062) is reactivated, except if the long-term disable prevents this. See (08-071).			
Switch-on threshold recognition high daily energy	08-071	0 ... 100%	80%	11
	If the daily yield lies below the set value, and if the set tank temperature (08-062) is exceeded, recharging is only allowed for 18 h with a conventional heat generator at the reduced setpoint (long-term disable). If the reduced setpoint is fallen short of, recharging is done to the set tank temperature (08-062).			
Min. speed, PWT central heat exchanger pump	08-025	5 ... 100%	30%	-
	Minimum control variable for the speed control for secondary pump of the external heat exchanger. Note: The pump is always started at 100% and runs for 5 s at this starting speed. This ensures that the pump starts up without problems.			
Manual setting PWT central heat exchanger pump	08-084	0 ... 100%	30%	-
	Specification of the control variable/status in test mode.			

Value	ID	Setting range	Factory reset	Password
Min. standby time PWT heat exchanger pump, central	28-003	0 ... 200 s	10 s	11
	Off-time for the output. After switching off, the output is blocked for starting up again by this time. Adjuster for high-efficiency or electronic pumps (relay protective function)			
Switch-on difference PZP recharging	08-075	5 ... 50 K	7 K	-
	If the temperature at the sensor of the tank is less than the active set tank value minus the switch-on hysteresis (08-063), and if the temperature difference relative to the recharging sensor rises above the set value, charging/recharging with pump PZP is enabled.			
Switch-off difference PZP recharging	08-076	2 ... 20 K	4 K	-
	If the temperature at the tank sensor is greater than the active set tank value, or if the temperature difference relative to the recharging sensor falls below the set value, charging/recharging with pump PZP is disabled.			
Manual setting PZP charging pump, transfer charging	08-126	0 ... 1	0	-
	Specification of the control variable/status in test mode. 0 : Off 1: On			
Transfer charging set temperature	08-069	10 ... 90 °C	20/60°C	-
	Recharging from a primary tank to an additional tank, discharging, is only enabled when the temperature in the primary tank exceeds the transfer setpoint.			
Switch-on difference PPZ discharging	08-077	5 ... 50 K	10 K	-
	If the temperature at the tank sensor is greater than the transfer setpoint + hysteresis, and if the temperature difference from the discharging sensor increases above the set value, the discharging PPZ is enabled.			
Switch-off difference PPZ discharging	08-078	2 ... 20 K	5 K	-
	If the temperature at the tank sensor is less than the transfer setpoint, or if the temperature difference from the discharging sensor falls below the set value, the discharging PPZ is disabled.			
Manual setting PPZ pump Discharging pump, transfer	08-086	0 ... 1	0	-
	Specification of the control variable/status in test mode. 0 : Off 1: On			
MFA option, high-temperature relief	08-110	0 ... 1	0	-
	High-temperature relief option, for protecting the collectors from stagnation. With this function, overtemperature should be prevented on the collectors. By removing heat directly from the consumers or from the collector, the excess heat can be removed, ... if TO1 > max. tank temperature (08-059) = HTE active, if TO1 < max. tank temperature (08-059) = HTE disabled 0 : Off 1: On **Note:** The collector protection function (08-005) must be activated.			
MFA option error output	08-111	0 ... 1	0	-
	Option - collective malfunction message 0 : Off 1: On			
Manual setting MFA high-temperature relief	08-123	0 ... 1	0	-
	Specification of the control variable/status in test mode. 0 : Off 1: On			

Value	ID	Setting range	Factory reset	Password
Heat meter option	08-117	0 ... 1	0	-
	Heat meter option 0: Off 1: On If the option is active, a pulse rate (17-019) must be defined. With the heat metering, a supply (TPV) and return sensor (TPR) and the pulse input 1 VIZ 1 are activated at the same time.			
Pulse rate VIZ, heat meter	17-019	1 ... 9999 pulses/l	180 pulses/l	-
	The pulse constant defines how many pulses per liter the sensor gives off. The setting can be found in the specifications on the encoder.			
Offset FLOW, volume flow, primary circuit	28-021	-200 ... 200 l/h	15 l/h	11
	Offset flow sensor, primary circuit Added to the measurement to get the finished value.			
VIZ option, flow rate measurement	08-118	0 ... 1	0	-
	Flow rate measurement option 0: Off 1: On If the flow rate meter is active, a pulse rate (17-020) must be defined.			
Pulse rate VIZ, flow rate measurement	17-020	1 ... 9999 pulses/l	180 pulses/l	-
	The pulse constant defines how many pulses per liter the sensor gives off. The setting can be found in the specifications on the encoder.			
Offset FLOW, volume flow, flow rate measurement	28-022	-200 ... 200 l/h	15 l/h	11
	Offset flow sensor, flow rate measurement Added to the measurement to get the finished value.			
Min. speed, PWP pump, primary heat exchanger	28-005	5 ... 100%	100%	-
	Minimum parameter for the speed of the PWP pump for the primary heat exchanger.			
Maximum speed, PWP pump, primary heat exchanger	28-006	5 ... 100%	100%	-
	Minimum parameter for the speed of the PWP pump for the primary heat exchanger. **Note:** Speed-controlled pumps are always started at 100% and run 5 s at this starting speed. This ensures that the pump starts up without problems.			
Manual setting, PWP pump, primary heat exchanger	28-004	5 ... 100%	100%	-
	Specification of the control variable/status in test mode.			
Control difference, PWP pump, primary heat exchanger	28-010	0 ... 50 K	10 K	11
	This adjuster determines the setpoint for the temperature difference between TPV/TSR and TPR. By controlling the speed of the pump PWP, it is attempted to reach the setpoint and to hold it.			

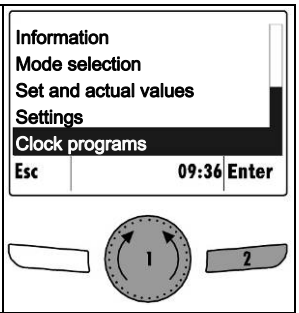
Value	ID	Setting range	Factory reset	Password
Control function, PWP pump, primary heat exchanger	28-011	0 ... 2	2	11
	With this adjuster, it is defined how the pump PWP is controlled: 0: Temperature difference, primary (TPV – TPR) in acc. with adjuster 28-010 1: Temperature difference, return (TPV – TPR) in acc. with adjuster 28-010 2: Constant speed in acc. with adjuster 28-006			
VRU option, return switching valve	05-110	0 ... 1	0	-
	Return switching valve option 0 : Off 1: On			
Switch-on difference, VRU return switching valve	05-104	5 ... 40 K	5 K	-
	If the temperature at the tank sensor TSRU rises above the return temperature TPR plus the set value, the return switching valve is enabled.			
Switch-off difference, VRU return switching valve	05-105	-10 ... +5 K	2 K	-
	If the temperature at the tank sensor TSRU falls below the return temperature TPR plus the set value, the return switching valve is disabled.			
Manual setting, VRU return switching diverter valve	05-120	0 ... 1	0	-
	Specification of the control variable/status in test mode. 0 : Off 1: On			

7.8 Setting time programs

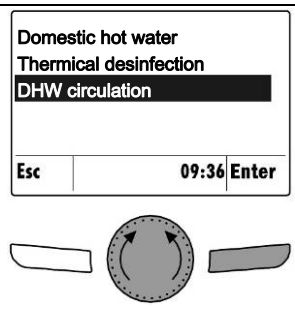
The time programs for hot water/thermal disinfection/hot-water circulation can be changed and saved.
The function must be enabled beforehand for the corresponding hydraulic type, so that the clock programming can be done.

Example:
Hot water circulation (DHW circulation)

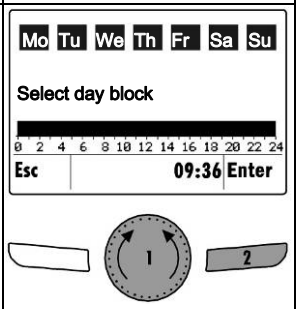
1. Select the ***Clock program*** with the adjusting knob and press ***Enter***.



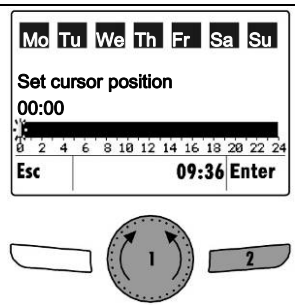
2. Select ***DHW circulation*** in the submenu and press ***Enter***.



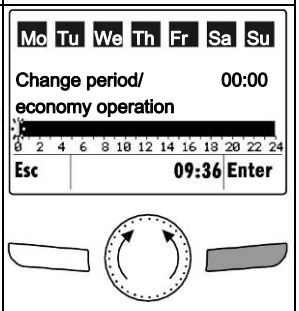
3. Select ***Select day block*** with the adjusting knob and press ***Enter***.
- Either blocks of days or individual days can be selected.
- Days programmed the same way are consolidated into blocks.



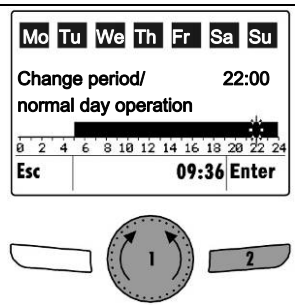
4. Select ***Set cursor position*** with the adjusting knob and press ***Enter***.



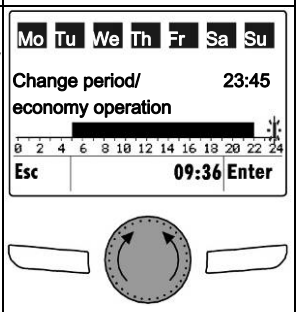
5. By repeatedly pressing ***Enter***, the following functions appear:
- Adapt period normal heating
- Adapt period economy heating
- Set cursor position



6. A period can be programmed with the adjusting knob, e.g. normal mode period.
- By pressing ***Enter***, the function is changed, as described under step 5.

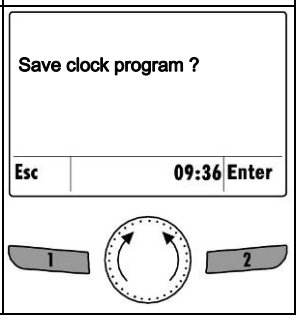


7. A period can be programmed with the rotary knob, e.g. Heating mode economy.

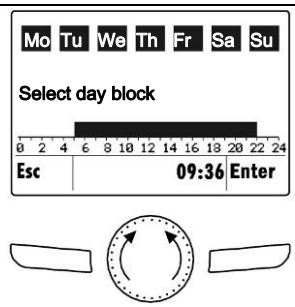


8. In order to save the changed program, the ***Esc key*** must be pressed until the display shown here appears.
- By ***pressing*** **Save**, the clock program can be definitely saved.

9. After pressing ***Save***, the controller jumps to the clock program selection functions.



10. By pressing ***Enter***, the previously programmed clock program can be checked.



7.9 Configuration

Value	ID	Setting range	Factory reset	Password
Hydraulic type	04-006	1 - 42	1	-
	Setting the desired hydraulic type After selecting and confirming with Save, the controller is restarted.			
Language selection	04-056	0 ... 15	0	-
	Selecting the desired language. 0: deutsch 1: français 2: nederlands 3: italiano 4: español 5: svenska 6: dansk 7: polski 8: slovenski 9: hrvatski 10: slovenskŷ 11: českŷ 12: magyar 13: english 14: română 15: norsk			
Date	02-070	01.01.2011 - 31.12.2099	-	-
	Setting of the current date			
Time	02-072	00:00 - 23:59	-	-
	Setting of the current time			
eBUS address	04-020	2 … 16	2	-
	Setting the current eBUS address of the controller			
eBUS feed	04-036	0 … 1	1	11
	Switch the eBUS power supply on/off 0 : Switched off 1 : Switched on			
Output 1: Solar pump	04-030	0 ... 4	1	-
	Selection of the signal type for the 1st signal output (terminal 18). The control variable of output 1 is then output in the selected signal. For a setting not equal to 0, the output only switches 100% (On) or 0% (Off). 0: Standard pump 1: PWM 2: Special PWM inverse 3: 0 - 10 V 4: Special 0 - 10 V inverse			

DANGER

If "Output 1: Solar pump" to "0: standard pump", NO electronic pump may be installed!

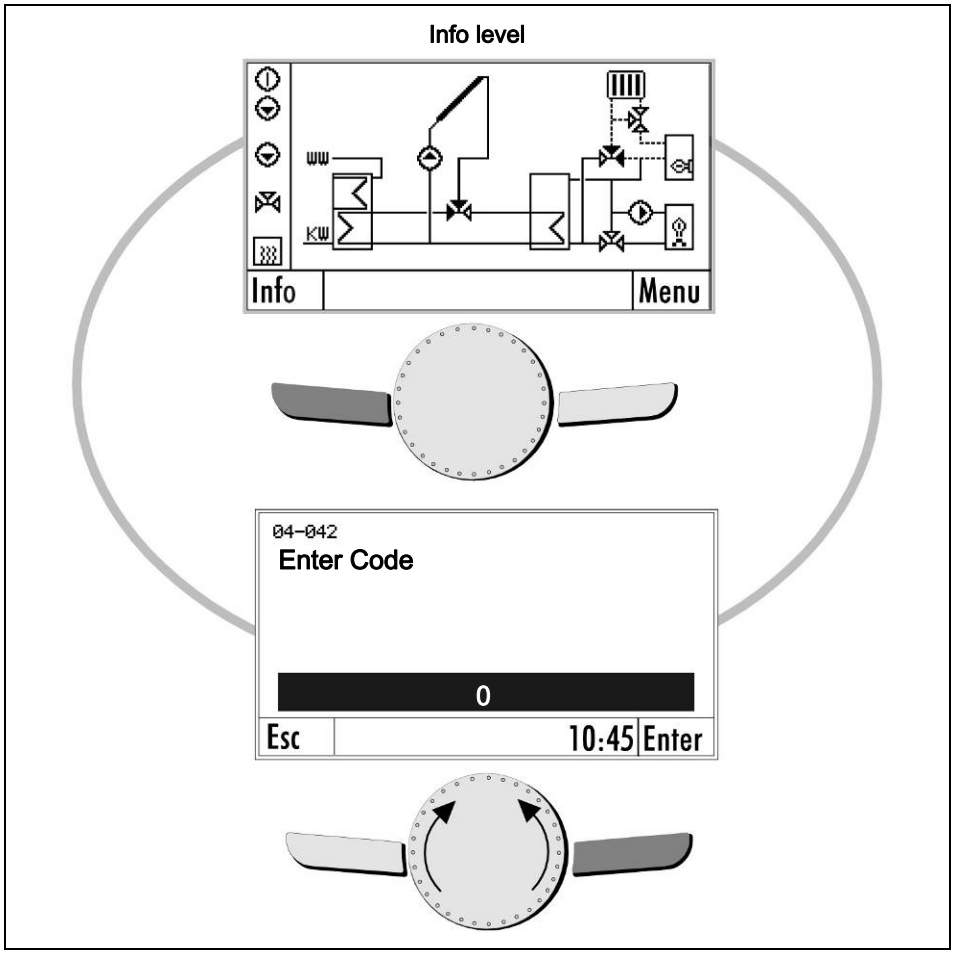
Value	ID	Setting range	Factory reset	Password
Output 2: Solar pump 2 / solid fuel boiler / heat exchanger	04-031	0 ... 4	1	-
	Selection of the signal type for the 2nd signal output (terminal 17). The control variable of output 2 is then output in the selected signal. For a setting not equal to 0, the output only switches 100% (On) or 0% (Off). 0: Standard pump 1: PWM 2: Special PWM inverse 3: 0 - 10 V 4: Special 0 - 10 V inverse			

DANGER

If "Output 2: Solar pump 2/ solid fuel boiler / heat exchanger" is at "0: standard pump", NO electronic pump may be installed!

Normal position MFA	08-000	0 ... 1	0	11
	Definition of the switching/effective direction of the multifunctional output, terminal 5/ 6. Here, it can be set whether the output for the heat request, high-temperature relief or collective malfunction message functions should work as N/C contacts or N/O contacts. 0 : N/O contact ... (electric specification of the resting status NO) 1 : N/C contact ... (electric specification of the resting status NC)			
Data logging	04-115	0 ... 1	0	-
	Adjuster for starting or stopping data recording on the SD card. 0 : Stop 1 : Start Starting from this time, all actual and status values are recorded. In addition, an error history is also logged and the changes to the adjusters.			
Reset	04-045	0, 29	0	-
	All adjusters can be reset to factory setting. 0: No function 29: Factory reset All counters (except statistics) are reset. The commissioning menu is restarted.			

7.10 Navigation code input



- ▸ To input the password, press the left key for longer than 5 s.
- ✓ The window appears to input the password.
- ▸ Enter password "11" and confirm with "Save".
- ✓ It jumps back to the title screen, and the menu levels are reloaded.

8 Functions

8.1 Collector protection

In addition to the basic function of the controller, the system can be further protected from overheating via a passive and/or active protective function. In the basic function (setting 0), when the maximum tank temperature is exceeded, the solar pump is switched off. It also switches off if the collector protection temperature is exceeded. The pump is switched on again after the collector cools off 10 K below the maximum collector temperature.

1. Collector protection function:

If the collector temperature rises above the maximum temperature, and if the tank temperature is above the maximum temperature, the solar pump is operated at 100%. The tank is now charged to the protective tank temperature independent of the maximum tank temperature setting. It still switches off if the collector protection temperature (120 °C) is exceeded.
It switches on again at 10 K below the maximum collector temperature or when the tank temperature falls 5 K below the protective tank temperature without the collector protection temperature being exceeded.

2. Active collector protection / night cooling tank

In addition to collector protection, cooling via the collectors can be activated.
2.1 Enable cooling function as soon as the maximum tank temperature has been reached.
2.2 Enable cooling function as soon as the collector protection temperature and maximum tank temperature have been reached.
After the cooling function has been enabled, when the collector temperature falls below the tank temperature by 8 K, the solar pump is actuated and the tank discharged. The discharge ends as soon as the collector temperature only lies 4 K above the tank temperature or when the maximum tank temperature is fallen short of by 15 K.

WARNING

The collector protection active setting (08-005) must not occur in connection with a tank whose permissible maximum temperature lies under 95 °C. This setting is also not permitted when there is no scalding protection on the potable water line.

If no cooling function is desired, the setting 0 must be selected.

8.2 MFA output

The multifunctional output can be used for the following functions:
- Heat generator disable/enable
- Retransmission of malfunction message
- Removal of excess heat (high-temperature relief)

The MFA contact is a potential-free contact.
To actuate a heat generator or a circulation pump, the supply voltage of terminal L to terminal 5 must be bridged.

The following parameters are available for the three functions:
- MFA option - high-temperature relief (08-110)
- MFA option - error output (08-111)
- MFA option - recharging, heat request (08-113)

The factory setting for these parameters is "0" (= off).
If one of these parameters is set to "1" (= on), the other parameters are hidden.

8.2.1 Heat generator disable, heat generator enable

Depending on the tank temperature and solar capacity, a controller-external heat generator can be disabled, or an existing enable for this heat generator can be interrupted.

Heat generator enable function: For the tank (tank 1 or 2), a nominal value can be set which is monitored at the upper tank sensor TOx (TO1 or TO2).

If the set tank temperature (08-062) is fallen below by the switch-on hysteresis (08-064), the heat generator is enabled and the MFA contact closes. In addition, however, the Hot water clock program has an effect on the heat generator enable, i.e. the heat generator is only requested if the nominal value is fallen short of within the Hot water clock program.

Switching criteria for heat generator disable, heat generator enable:
- If the current tank temperature is greater than the nominal tank temperature (08-062), the heat generator is disabled.
- If the current capacity of the solar installation is greater than 50% of the nominal capacity and the current tank temperature is greater than the nominal tank temperature (08-062) minus the **`nominal value reduction at high solar yield`** (08-072), the heat generator is disabled. If one of the two conditions is no longer met, the disable is cancelled.
- If the current capacity of the solar installation is greater than 80% of the nominal capacity, once the nominal tank temperature (08-062) is reached, the burner disable is activated for 18 hours. If the tank temperature falls below the **`set tank temperature`** minus the **`setpoint reduction at high solar yield`** (08-072), the disable is deactivated.

Sensors and actuators

`TO tank-top temperature`	00-015	Upper tank temperature
`Current set tank-top temperature`	01-015	Calculated set temperature on upper tank sensor
`Output MFA charging heat request`	01-049	Current status of the MFA output for heat request/boiler disable

Adjuster on tank level:

Tank temperature setpoint	08-062	10 ... 90 °C	55°C	-
Switch-on hysteresis to set tank temperature	08-063	1 ... 30 K	2 K	-
Setpoint reduction for high solar yield	08-072	0 ... 20 K	15 K	11
Manual setting of MFA recharging, heat request	08-124	0 ... 1	0	-

Adjuster on general level:

Switch-on threshold detection of high solar energy	08-070	0 ... 100%	50%	11
Switch-on threshold recognition high daily energy	08-071	0 ... 100%	80%	11

Reversal of the effective direction

In the factory settings, the mode of operation of the MFA contact is as described above (for cold tank, MFA closed). If the effective direction should be reversed, the parameter **Effective direction MFA** (08-000) is to be set from "0" to "1".

Application case of the heat generator disable in connection with a heat generator with its own tank charging function: The hot water tank is recharged via a hot water sensor in the tank charging control system. If the set temperature in the tank is exceeded by the solar installation, the heat generator does not recharge. In this case, a boiler disable via the solar controller WRSol 2.1 is not mandatory.

However, with the boiler disable, the heat generator can be made to only recharge at a reduced setpoint for solar yield.

Example: The set temperature for the hot-water charging of the external heat generator is 55 °C. The boiler would recharge the tank at 50 °C (hysteresis - 5K). When the solar installation goes into operation and a larger amount of hot water is tapped at the same time (tank drops to 49 °C), the boiler recharges the tank.

If a boiler disable is installed via WRSol, this would prevent recharging as long as the tank does not drop below 40 °C (**nominal tank temperature** minus **nominal value reduction at high solar yield**).

8.2.2 Retransmission of malfunction message

If an occurring malfunction should be indicated with an acoustic or optical signal, or if the malfunction message should be transmitted to a building services management system, this can be done via the potential-free MFA switch contact.

The function is activated via the parameter **MFA option error output** (08-111).

If a malfunction occurs, which appears on the display of the solar controller, the controller-internal relay contact closes.

If the relay contact should open when a malfunction occurs, the parameter **Effective direction MFA** (08-000) is to be set from "0" to "1".

8.2.3 High-temperature relief

With this function, the tank can already be cooled via an additional cooling circuit during the day. For this, an additional circulation pump is connected to the tank, for example, which is controlled via the MFA output.

The MFA output is actuated when the tank has reached the set **`Maximum tank temperature`** (08-059). There is a shutdown when the maximum temperature is fallen short of by 5 K.

To prevent the solar pump from switching off as soon as the **`maximum tank temperature`** is reached, the **`collector protection`** (08-005) must be set to "1".

Sensors and actuators

`TO tank-top temperature`	00-015	Upper tank temperature
`MFA high-temperature relief output`	22-112	Current status of the output, high-temperature relief

Adjuster on general level:

`Manual setting MFA high-temperature relief`	08-123	0 ... 1	0	-

8.3 Pump maintenance

To prevent the connected actuators from getting stuck, the outputs are activated every 24 hours for approx. 35 seconds.

8.4 Pump speed control in connection with collectors

The controller has speed control, with which the pump is controlled by means of a power signal (0 – 10 V or PWM) or by means of an oscillation packet.

The actuation depends on the following factors:

- A setpoint rise, **`tank control difference`** (08-064), is added to the temperature at the reference sensor (TUx).
  The speed control now tries to regulate the collector temperature (TKx) to this value.

Example:
The target collector temperature results from:

Set setpoint rise: 15 K + actual tank temperature: 40 °C (TU1) = nominal collector temperature: 55 °C (TKx)

If the actual collector temperature drops toward the target collector temperature, the speed is modulated within the specified limits.

If the collector flow sensor option TKV (08-108) is active, the temperature is included in the speed control of the solar pump PS and is also included in the switch-off condition of the solar charge.

The collector return temperature with the volume pulse counter option / TKR active, this is also included in the control of the solar charge and speed control. See chap. 8.12

The switch-on and switch-off conditions for the pump are adjustable (see chap. 7.7).
If the factory setting is maintained and the collector temperature exceeds the tank temperature by + 7 K (**`switch-on difference TK - TU`**), the pump is switched on.
If the collector temperature falls below the value of the tank temperature + 4 K (**`switch-off difference TK - TU`**), the pump is switched off.

For the setting **`Output 1 = 0: Standard pump`**, this can result in a pulsating volume flow due to the speed control in modulation mode, which can be noticed due to the flow noises or due to oscillations in flexible lines.

8.5 Pump actuation in connection with a solid fuel boiler

The controller has speed control, with which the pump is controlled by means of a power signal (0 – 10 V or PWM) or by means of an oscillation packet.

Switch-on conditions

1.) The **minimum temperature TFK** must be reached.

and

2.) If the solid fuel boiler temperature reaches the lower tank temperature (TUx) plus the **switch-on difference TFK – TU** (08-003), the pump runs at the slowest speed.

TFK > **minimum temperature TFK** (09-032) and
TFK > TUx + **switch-on difference TFK - TU** (08-003)
✓ ▸ Pump runs at slowest speed

Via the speed control, it is attempted to reach the set tank temperature (08-062) and to maintain this.

If the current solid fuel boiler temperature drops toward the target set temperature, the speed is modulated within the specified limits. Below this set temperature, the pump runs at minimum capacity.

For the setting **Output 2 = 0: Standard pump**, this can result in a pulsating volume flow due to the speed control in modulation mode, which can be noticed due to the flow noises or due to oscillations in flexible lines.

Switch-off conditions

1.) The **minimum temperature TFK** is fallen short of by the switching differential of 5 K.

or

2.) If the current solid fuel boiler temperature falls below the lower tank temperature (TUx) plus the **switch-off difference TFK - TU** (08-004), the pump switches off.

TFK < **minimum temperature TFK** (09-032) - 5 K or
TFK < TUx + **switch-off difference TFK - TU** (08-004)
▸ Pump off

8.6 Test function

- In the selection menu under mode selection, set the selection to "Test".
- All outputs are actuated according to the factory settings.
- In the "Settings" submenu, the outputs can be activated/deactivated and the speed changed.

In the test function, the volume flow of the system can be set at 100% pump capacity. The volume flow to be set can be found in the installation and operating instructions of the collector.

Value	ID	Setting range	Factory reset	Password
	Collector 1			
Manual setting PS solar pump	08-085	0 ... 100%	100%	-
Manual setting VBY bypass diverter valve	08-125	0 ... 1	0	-
	Collector 2			
Manual setting PS solar pump	08-085	0 ... 100%	100%	-
	Tank 1			
Manual setting PSL tank loading pump	08-082	0 ... 100%	100%	-
Manual setting VSP diverter valve	08-087	0 ... 1	0	-
Manual setting PZW pump circulation circuit	05-122	0 ... 100%	100%	-
Manual setting, PZWP pump, primary circulation	05-124	0 ... 100%	100%	-
Manual setting PWL pump, DHW heating	08-089	0 ... 1	0	-
Manual setting of MFA recharging, heat request	08-124	0 ... 1	0	-
Manual setting PLE circulation pump, thermal disinfection	28-002	0 ... 1	0	-
Manual setting PPS charging pump	08-120	0 ... 1	0	-
Manual setting PWT local heat exchanger pump	08-127	0 ... 100%	30%	-
Manual setting VRA diverter valve, return temp. increase	08-121	0 ... 1	0	-
Manual setting PFK pump, solid fuel boiler	08-083	0 ... 100%	30%	-
Manual setting VOP zone charging diverter valve	08-122	0 ... 1	0	-
Manual setting VUP tank-heating circuit diverter valve	28-001	0 ... 1	0	-
Manual setting, PWS pump, secondary heat exchanger	28-012	0 ... 100%	100%	-
	Tank 2			
Manual setting PSL pump	08-082	0 ... 100%	100%	-
Manual setting VSP diverter valve	08-087	0 ... 1	0	-
Manual setting PZW pump circulation circuit	05-122	0 ... 100%	100%	-
Manual setting PWL pump, DHW heating	08-089	0 ... 1	0	-
Manual setting of MFA recharging, heat request	08-124	0 ... 1	0	-
Manual setting PPS charging pump	08-120	0 ... 1	0	-
Manual setting PLE circulation pump, thermal disinfection	28-002	0 ... 1	0	-
Manual setting PWT local heat exchanger pump	08-127	0 ... 100%	30%	-
Manual setting VRA diverter valve, return temp. increase	08-121	0 ... 1	0	-
Manual setting PFK pump, solid fuel boiler	08-083	0 ... 100%	30%	-
Manual setting, PWS pump, secondary heat exchanger	28-012	0 ... 100%	100%	-

Value	ID	Setting range	Factory reset	Password
	Global			
Manual setting PWT pump	08-084	0 ... 100%	30%	-
Manual setting PZP pump	08-126	0 ... 1	0	-
Manual setting PPZ pump	08-086	0 ... 1	0	-
Manual setting MFA high-temperature relief	08-123	0 ... 1	0	-
Manual setting, PWP pump, primary heat exchanger	28-012	0 ... 100%	100%	-
Manual setting, VRU return switching diverter valve	05-120	0 ... 1	0	-

8.7 Energy yield calculation

In this solar controller, there is an energy yield calculation included as a function based on the temperature difference between the collector temperature (TKx) and the reference sensor (TUx) over the flow rate (volume flow).

After setting the volume flow, at a pump speed of 100% via the flow limiter, the scale value must be read off and input in the selection group settings -> Collector in the max. volume flow parameter.

Also, for another heat transfer medium, the heat transfer medium capacity at 50°C (heat capacity) must be adjusted.

If the option **TKV option, collector flow sensor** is active, this is used as a reference sensor instead of TKx for the yield calculation.

If the option **VIZ / TKR option, volume pulse counter / collector return flow sensor** is active, TKR is used as the reference sensor instead of TUx for the yield calculation. The measured volume flow is also included in the calculation.

Heat capacity at 50°C
- -weishaupt- Solar heat transfer medium Tyfocor L (45% propylene glycol): 3.70 kJ/lK
- Water: 4.19 kJ/lK

8.8 Start-up help function

Due to a positive temperature change on the collector sensor TKx, the solar pump is switched on for the **Start-up help pump runtime** (08-017).

After this time elapses, the pump switches off again.
The temperature on the collector is measured. If the temperature difference to the tank is sufficient, the solar pump switches "On".
If the switch-on criteria are not met, after a variable waiting time from 15 to 100 minutes, the solar pump is switched on again for the **Start-up help pump runtime** (08-017). The waiting time is defined based on the collector temperature and the temperature change.

8.9 Collector cascade

The collector cascade is handled the same way as two independent differential controls. Fundamentally, the collector cascade is to be considered like two separate differential controls, both on the same consumer.
If the option **VIZ / TKR option volume pulse counter / collector return flow sensor** or **TKV option collector flow sensor** is active, this always applies to both collector circuits.

8.10 PWL option DHW heating

If the temperature at the tank top (TOx) is less than the current set tank temperature minus the hysteresis (08-063), recharging is enabled or heat is requested.
If the current setpoint is exceeded at the tank top (TOx), recharging is disabled or the heat request is ended.

TOx < Set tank temperature (08-062) - hysteresis (08-063), then PWL active

TOx > Set tank temperature (08-062), then PWL disabled

Note:
For a high solar yield, the setpoint is reduced by the value **`High solar energy reduction of tank temperature setpoint`** (08-072).
Recharging can only be done if the setpoint is fallen short of within the **`hot water`** clock program.

Sensors and actuators

`TO tank-top temperature`	00-015	Upper tank temperature
`Current set tank-top temperature`	01-015	Calculated set temperature on upper tank sensor
`Output PWL pump, DHW heating`	22-101	Current status of the output PWL

Adjuster on tank level

`Tank temperature setpoint`	08-062	10 ... 90 °C	55°C	-
`Switch-on hysteresis to set tank temperature`	08-063	1 ... 30 K	2 K	-
`Setpoint reduction for high solar yield`	08-072	0 ... 20 K	15 K	11
`Manual setting PWL pump, DHW heating`	08-089	0 ... 1	0	-

Adjuster on general level

`Switch-on threshold detection of high solar energy`	08-070	0 ... 100%	50%	11
`Switch-on threshold recognition high daily energy`	08-071	0 ... 100%	80%	11

8.11 PPS option discharging

PPS option - Transfer to existing hot-water tank with TSO and definable set hot-water temperature
If the temperature at the tank top (TOx) is greater than the temperature at the additional tank sensor TSO, the additional tank can be charged.
Transfer PPS is enabled when the **DHW temperature setpoint** (05-051) at the additional tank sensor TSO is fallen short of and the temperature at the tank top sensor TOx is greater by the **Switch-on difference transfer charging PPS** (08-098) and the **Tank temperature setpoint** (08-062) is reached.

TSO < **DHW temperature setpoint** (05-051) - hysteresis (08-063) and
TOx > **Tank temperature setpoint** (08-062) and
TOx > TSO + **Switch-on difference transfer charging PPS** (08-098),
then PPS active

TSO > **DHW temperature setpoint** (05-051) or
TOx < **Tank temperature setpoint** (08-062) - hysteresis (08-063) or
TOx < TSO + **Switch-off difference transfer charging PPS** (08-099),
then PPS disabled

Sensors and actuators

TSO DHW temperature	00-004	Upper hot water tank temperature, additional tank
TO tank-top temperature	00-015	Upper tank temperature
PPS output, charging pump, tank	22-102	Current status of the transfer charging pump PPS

Adjuster on tank level

DHW temperature setpoint	05-051	10 ... 90 °C	55°C	-
Tank temperature setpoint	08-062	10 ... 90 °C	55°C	-
Switch-on hysteresis to set tank temperature	08-063	1 ... 30 K	2 K	-
Switch-on difference transfer charging PPS	08-098	2 ... 50 K	5 K	-
Switch-off difference transfer charging PPS	08-099	0 ... 20 K	3 K	-
Manual setting PPS transfer charging pump	08-120	0 ... 1	0	-

8.12 VIZ / TKR option volume pulse counter/ collector return flow sensor

If the flow rate measurement is activated, a **VIZ pulse rate**(17-001) must be defined. With this option, a collector return flow sensor is also activated.

The flow rate is included in the capacity and yield calculation. The return temperature TKR is taken into consideration instead of the tank bottom temperature for the capacity and yield calculation.

For the speed control of the solar pump, instead of TU (lower tank temperature), the collector return flow sensor TKR is used.

If the flow meter is active, the volume flow is limited to the two limits **Min. volume flow, PS solar pump** (08-038) and **Max. volume flow, PS solar pump** (08-037) in the collector circuit.

Sensors and actuators

TKR collector return flow temperature	00-061	Solar collector return temperature (TKR)
FLOW collector flow	00-062	Volume flow for the heat energy measurement in the solar circuit

Adjuster on collector level

VIZ impulse rate	17-001	1 ... 9999 pulses/l	180 pulses/l	-
Offset impulse rate VIZ-collector flow	28-020	-200 ... 200 l/h	15 l/h	11
Max. volume flow, PS solar pump	08-037	10 ... 12000 l/h	240 l/h	-
Min. volume flow PS solar pump	08-038	0 ... 12000 l/h	60 l/h	-

8.13 Heat meter option

A heat meter can be displayed with the temperatures TPV and TPR as well as the flow rate of the primary circuit (V1). The pulse rate VIZ, heat meter (17-019) must be defined.
The current heat capacity, the subtotal of the heat energy, the total heat energy, as well as a graphical display of the daily, monthly and yearly values are shown.

Sensors and actuators

TPV PWT primary supply temperature	21-023	Primary circuit, supply temperature
TPR PWT primary return temperature	21-024	Primary circuit, return temperature
FLOW volume flow rate, primary	21-071	Volume flow for the heat energy measurement in the primary circuit

Adjuster on collector level

Pulse rate VIZ, heat meter	17-019	1 ... 9999 pulses/l	180 pulses/l	-
Offset FLOW, volume flow, primary side	28-021	-200 ... 200 l/h	15 l/h	11

8.14 VIZ option, flow rate measurement

A water consumption meter can be shown with the flow rate of the volume measurement (V2). The pulse rate of the VIZ flow rate measurement (17-020) must be defined.
A display of the current flow rate, the subtotal and total volume, as well as a graphical display of the daily, monthly and yearly values appears.

Sensors and actuators

Volume measurement flow rate	21-072	Volume flow for the flow rate measurement

Adjuster on collector level

Pulse rate VIZ, flow rate measurement	17-020	1 ... 9999 pulses/l	180 pulses/l	-
Offset FLOW flow rate measurement	28-022	-200 ... 200 l/h	15 l/h	11

8.15 VBY option collector bypass

Is used for optimization on large systems or for long line distances.

The valve generates a short circuit (bypass) in the collector circuit so that no cold medium gets into the consumer.
Only when the sensor (TKV) in the supply of the collector circuit reaches the temperature of the tank bottom sensor (TUx) plus the **switch-off difference** (08-002) plus 2 K is tank charging enabled.

TKV > TUx + **switch-off difference** (08-002) + 2 K, then VBY active

TKV < TxU + **switch-off difference** (08-002), then VBY disabled

Note:
If the collector flow sensor TKV is also used for controlling the speed of the solar pump PS and flows into the capacity calculation, the **TKV option collector flow sensor** (08-108) must be activated.

Sensors and actuators

TKV collector flow temperature	00-060	Solar collector supply temperature (TKV)
VBY collector bypass diverter valve output	22-100	Current status of the collector bypass valve VBY

Adjuster on collector level

Manual setting VBY bypass diverter valve	08-125	0 ... 1	0	-

8.16 PLE option Thermal disinfection

If disinfection is enabled according to the **Thermal disinfection** clock program, the pump PLE is switched on and the burner disable deactivated.

If the **Thermal disinfection temperature** is reached at sensor TUx and is maintained for 30 minutes (adjuster 05-043) or if disinfection is no longer enabled according to the clock program, the pump PLE is switched off.

If the **Thermal disinfection temperature** is not reached, an informational message appears.

If necessary, the thermal disinfection function can also be triggered manually. To do this, set the manual thermal disinfection adjuster (05-084) to 1. This way, the function is enabled independently of the clock program for 4 hours.

Note:
If recharging is active, the setpoint for recharging is automatically raised to the **Thermal disinfection temperature**. With the help of the clock program, this function can be adapted to the hot-water requirement.

The pump for circulating the tank can be defined in the adjuster **Thermal disinfection** (05-014).

10 = ... with pump PLE
11 = ... with pump PZW
12 = ... with pump PPS
13 = ... with pump PLE and sensor TUZ
14 = ... with pump PPS and sensor TUZ

Note:
Thermal disinfection can only be selected if, in the adjuster **Tank type** (08-055) of the respective tank **3: Hot-water tank** is selected.

Sensors and actuators

TU tank-bottom temperature	00-016	Lower tank temperature
TUZ additional tank bottom temperature	21-067	Lower tank temperature, additional sensor
PLE thermal disinfection pump output	22-111	Current status of the circulation pump, thermal disinfection
Output PZW pump circulation circuit	22-111	Current status of the hot-water circulation pump
PPS output, charging pump, tank	22-102	Current status of the transfer charging pump

Adjuster on tank level

Thermal disinfection temperature	05-004	50 ... 80 °C	60°C	-
Min. holding time, nominal thermal disinfection temperature	05-043	0 ... 480 minutes	30 minutes	11
Thermal disinfection, manual	05-084	0 ... 1	0	-

8.17 PZW option Hot-water circulation

For the circulation in the hot-water line, one can choose from various functions and their combinations. The circulation pump PZW can be enabled according to the **Hot-water circulation ("DHW circulation")** clock program, temperature-controlled and/or pulse-controlled.

0 : No function

1 : Temperature-controlled and according to clock program

3 : Temperature controlled

4 : Pulse controlled *

5 : according to clock program

6 : Temperature- and pulse-controlled *
Example: PZW on, if TZW < 43 °C and pulse V2 closed
PZW off, if TZW > 45 °C or timer for pump PZW runtime has expired.

7 : Temperature, pulse-controlled and according to clock program *
Example: PZW on, if TZW < 43 °C and pulse V2 closed and is enabled by active clock program
PZW off, if TZW > 45 °C or timer for pump PZW runtime has expired or is disabled by clock program

8 : Pulse-controlled and according to clock program *

If the **Circulation circuit set temperature** (05-054) at the sensor TZW is fallen short of by the switching differential of 2 K. the circulation pump PZW is switched on.

A pulse is triggered by a tapping operation or button, which activates the PZW pump for the adjustable **Runtime PZW pump with pulse control** (05-070). For this, a button is clamped to the pulse input V2, for example.

*) Cannot be selected for 2 collector fields!

Sensors and actuators

TZW circulation temperature	00-118	Temperature in the hot water circulation line
Current set circulation circuit temperature	01-118	Calculated nominal temperature on the hot water circulation line sensor TZW.
Output PZW pump circulation circuit	01-065	Current status of the hot water circulation pump PZW

Adjuster on tank level

Circulation circuit Set temperature	05-054	0 ... 90 °C	45°C	-
Max. circulation temperature	05-072	0 ... 90 °C	70°C	-
PZW pump runtime for pulse control	05-070	0 ... 30 min	3 min	-
PZW pump off-time for pulse control	05-071	0 ... 240 min	10 min	-
Manual setting PZW pump circulation circuit	05-122	0 ... 1	0	-

8.18 Hot-water circulation station via heat exchanger

The circulation water can be heated via a heat exchanger with hydraulic types 38 and 39.

8.18.1 Heating from standby buffer

Hot-water circulation with reheating via a heat exchanger is controlled with the hydraulic type 38. It is expected that the standby buffer always has a sufficient temperature level. The pump PZW in the hot-water circulation circuit switches on and runs according to the adjuster speed PWZ as long as the clock program for hot-water circulation is active. Alternatively, the pump can be operated with temperature or pulse control (chap. 8.17).

The pump PZWP in the hot-water circuit upstream from the heat exchanger is simultaneously switched on with the pump PZW and runs according to the adjuster speed PWZP. If the temperature at the outlet sensor TZWA lies above the value set in "Max. circulation temperature", only pump PZWP is stopped. An information message will appear.

If the nominal circulation circuit temperature is not reached at the outlet sensor TZWA after 30 minutes (05-042), an information message will appear. If the temperature falls below 3°C at one of the sensors, TZW or TZWA, the frost protection function will be activated. Both pumps will be switched on and an information message generated.

Optionally, a heat meter can be displayed with the temperatures TPV and TPR as well as the flow rate of the primary circuit (V1) on the hot-water side before the heat exchanger (chap. 8.13)

8.18.2 Heating from the pre-heating buffer

Hot-water circulation with reheating via a heat exchanger is controlled with the hydraulic type 39. The pump PZW in the hot-water circulation circuit switches on and runs according to the adjuster speed PWZ as long as the clock program for hot-water circulation is active. Alternatively, the pump can be operated with temperature or pulse control (chap. 8.17). The pump PZWP in the hot-water circuit upstream from the heat exchanger is simultaneously switched on with the pump PZW and runs according to the adjuster speed PWZP. The precondition for this, however, is that the temperature TO1 in the buffer be higher than the temperature TZW in the return of the circulation line, plus the set value for the switch-on difference, TO - TZW. If TO1 is less than TZW plus the set value for the switch-off difference, TO - TZW, PZWP will switch off. If the temperature at the outlet sensor TZWA lies above the value set in "Max. circulation temperature", only pump PZWP is stopped. An information message will appear. If the nominal circulation circuit temperature is not reached at the outlet sensor TZWA after 30 minutes (05-042), an information message will appear. The precondition for this, however, is that the temperature TO1 is at least 10K higher than the nominal circulation circuit temperature. If the temperature falls below 3°C at one of the sensors, TZW or TZWA, the frost protection function will be activated. Both pumps will be switched on and an information message generated.

Optionally, a heat meter can be displayed with the temperatures TPV and TPR as well as the flow rate of the primary circuit (V1) on the hot-water side before the heat exchanger (chap. 8.13).

8.19 Solar charging strategy

0 : **For yield**
The setpoint for speed control results from the temperature on the tank sensor plus the setpoint rise (08-064).
For several consumers, charging is done in alternating tank operation. Here, the tank with the lower temperature is charged first.

1 : **For set temperature**
The setpoint for speed control results from the temperature on the tank sensor plus the optimized setpoint rise.
For several tanks, the charge is done according to tank priority (08-056) at the setpoint. The tank with priority 1 is first charged at the setpoint (08-062).

3 : **Automatic yield/nominal**
The setpoint for speed control results according to the active strategy, yield-dependent strategy switchover between 0 and 1.
Charging is done based on yield, in parallel in alternating tank operation, or according to priority of the tank at the setpoint.

8.20 Strategy switchover

8.20.1 Calculation of nominal capacity

The nominal capacity is calculated from the adjuster **Max. volume flow, PS solar pump** (08-037), the **Collector fluid heat capacity** (08-009) and the **Tank control difference** (08-064).

8.20.2 Charging for yield

0 : Parallel charging
3 : Charge yield / nominal:

This charging strategy is used when there is a low solar yield, i.e. when the current capacity is less than the percentage of the set value of the **nominal charge switchover (high yield)** (08-051) of the nominal capacity.

The nominal capacity is calculated from the adjuster Max. volume flow, PS solar pump (08-037), the specific heat capacity cp (08-009) and the tank control deviation (08-064). The advantage is the optimized energy utilization at low collector capacity.

For 2 tanks, first the consumer is charged at the lowest temperature level until there is no longer a temperature difference. Then the tank temperature is increased by the adjuster **Tank switch-off threshold, alternating tank operation** (08-066). Afterwards, the next consumer is charged up to the temperature difference **Tank switch-on threshold, alternating tank operation** (08-065).
The consumers are charged alternately up to the respective **Tank temperature setpoint** (08-062).

Afterwards, all consumers are charged alternately to the **Maximum tank temperature** (08-059).

8.20.3 Charging to temperature

1 : Nominal charge
3 : Charge yield / nominal:

This charging strategy is used when there is a high solar yield, i.e. when the current capacity is greater than the percentage of the set value of the **`Change-over solar charging (high energy levels)`** (08-051) of the nominal capacity. Hereby, the consumers are charged according to the set order of the **`Priority tank`** (08-056), first to the respective **`Tank temperature setpoint`** (08-062) and then to the maximum temperature.

First, the consumer with the highest priority is charged to its set nominal value. Afterwards, the other consumers are charged to their setpoints according to their priority.

Once all consumers have reached their set nominal values and if there is still sufficient collector capacity available, the consumers are charged to the respectively set **`Maximum tank temperature`** (08-059) according to priority.

8.21 Tank charging function via plate heat exchanger

If the collector temperature TKO rises above TUx by the switch-on difference, solar charging is started.

Note:
The TKV collector flow sensor option must be active.

In order to prevent unnecessary tank cooling via the plate heat exchanger, the secondary pump only runs when the collector flow sensor is warmer than the lower tank sensor by the **`Switch-off difference (TK – TU)`** plus 2 K.
If the temperature at the collector flow sensor is only higher than the tank bottom temperature TUx by the **`Switch-off condition (TK – TU)`**, the secondary pump PWT is stopped.

The PWT pump runs at its lowest speed (30%), until the nominal collector temperature is reached at the TWT sensor. During charging, it is attempted to reach a temperature at the TWT sensor which is higher than at the TUx sensor by the **`Tank control difference`** (08-064) via speed control and to maintain this.

If the temperature difference between TKO and TUx is less than the switch-off difference, the pump switches off.

Frost protection:

If charging is active, it is monitored on the collector flow sensor or collector sensor whether there is a risk of frost for the plate heat exchanger.
If the temperature at the TKV sensor is less than 3 °C, the secondary pump PWT runs independent of the start-up relief to prevent freezing by means of circulation through the secondary side of the heat exchanger.
If the temperature at the TKV sensor rises above 5 °C, the frost protection function for the plate heat exchanger is ended.

8.22 Preliminary charge and recharge in different tanks

8.22.1 Discharging (PPZ)

If the tank is charged, the heat can be transferred to a reserve storage tank. As soon as the temperature at the upper and lower tank sensors reaches the **Transfer charging set temperature** (08-069) plus the hysteresis (08-063) and the temperature at the top is higher than the lower tank sensor TU2 of the reserve storage tank by the **Switch-on difference PPZ discharging** (08-077), this is charged and the discharging pump PPZ is active.
If the temperature at the upper tank sensor TO1 or lower tank sensor TU1 drops below the **Transfer charging set temperature** (08-069) or at the upper sensor below the **Switch-off difference PPZ discharging** (08-078) plus the temperature value of the lower tank sensor of the reserve storage tank TU2, its charging is ended and the discharging pump PPZ is stopped.

TO1 and TU1 > **Transfer charging set temperature** (08-069) + hysteresis (08-063) and
TO1 > TU2 + **Switch-on difference PPZ discharging** (08-077)
then PPZ active

TO1 or TU1 < **Transfer charging set temperature** (08-069) or
TO1 < TU2 + **Switch-off difference PPZ discharging** (08-078)
then PPZ disabled

8.22.2 Charging / recharging (PZP)

If the solar supply is no longer sufficient to charge the tank, the heat can be transferred from the reserve storage tank.
As soon as the current setpoint for recharging minus the hysteresis (08-063) is fallen short of at the upper tank sensor TO1 and the temperature at the upper tank sensor TO2 of the reserve storage tank is higher by the **Switch-on difference PZP recharging** (08-075), the tank is charged and the charging pump PZP is active.
If the temperature at the upper tank sensor TO1 of the tank rises above the setpoint or the temperature at the upper tank sensor of the reserve storage tank TO2 falls below the **Switch-off difference PZP recharging** (08-076), charging is ended and the charging pump PZP is stopped.

Depending on the average solar capacity, the consumer setpoint for recharging is reduced by the value `High solar energy reduction of tank temperature setpoint` (08-072).

TO2 > TO1 + **Switch-on difference PZP recharging** (08-075) and
TO1 < Hysteresis setpoint (E 08-063)
then PZP active

TO2 < TO1 + **Switch-off difference PZP recharging** (08-076) or
TO1 > setpoint
then PZP disabled

8.23 Transfer charging and shift charging in various tanks

8.23.1 Transfer charging

With hydraulic type 40, the redeployment of stored energy from a storage tank to another tank via a heat exchanger is controlled. If the temperature at sensor TO2 in the tank (top) is less than the value set for the nominal tank 2 temperature minus the switch-on hysteresis for the set temperature, the reverse charging function is enabled.

If the temperature at temperature TU2 in the tank (bottom) is greater than the value set for the nominal tank temperature minus the switch-off hysteresis for the set tank temperature at TU, the function is ended.

Another precondition for enabling the transfer charging function is that the temperature TO1 in the storage tank (top) to be discharged must be greater than the value set for the set reverse charging temperature.

As soon as the temperature difference between TO1 in the storage tank (top) to be discharged and TO2 in the tank (top) to be charged is greater than the value set for the discharge switch-on difference PPZ/PWP, the pump PWP in front of the heat exchanger is switched on and operated according to the adjuster "Max. speed PWP".

Only once the temperature of TO2 is reached on sensor TPV in the supply to the heat exchanger is the pump PWS after the heat exchanger also switched on. The charging is interrupted if the temperature difference between TO1 and TU2 is less than the set value for the discharging switch-off difference PPZ/PWP.

The setpoint of the charging temperature TSV to TO2 is raised by 5K via the speed control of pump PWS (control difference TSV for PWS). With the sensor TSV, the charging temperature is limited to max. 70°C (maximum temperature, tank 2). For this, even before reaching the maximum temperature, the pump PWP is slowed down. If the temperature at sensor TSV is higher than 70°C, pump PWP stays off.

As an option, on the primary side in front of the heat exchanger, a heat meter can be displayed with the temperatures TPV and TPR as well as the flow rate of the primary circuit (V1).

8.23.2 Shift charging

With hydraulic type 41, the charging of a tank is controlled, e.g. by an external heat exchanger or via a district-heating transfer station via a heat exchanger.

If a sufficient temperature level is not constantly available, the heat request to the external heat exchanger can be realized via the potential-free MFA contact.

If, for an active hot-water clock program, the temperature at sensor TO1 in the tank (top) is less than the set value of the nominal tank temperature minus the switch-on hysteresis for the nominal temperature, the charging function is enabled and the pump PWP in front of the heat exchanger is switched on and operated according to the adjuster "Max. speed PWP".

If the temperature at temperature TU1 in the tank (bottom) is greater than the value set for the nominal tank temperature minus the switch-off hysteresis for the nominal tank temperature at TU, the function is ended.

Only once the temperature of TO1 is reached on sensor TPV in the supply to the heat exchanger is the pump PWS after the heat exchanger also switched on.

The setpoint of the charging temperature TSV to is raised by 5K to the set nominal tank temperature value via the speed control of pump PWS (control difference TSV for PWS).

With the sensor TSV, the charging temperature is limited to max. 70°C (maximum temperature, tank). For this, even before reaching the maximum temperature, the pump PWP is slowed down. If the temperature at sensor TSV is higher than 70°C, pump PWP stays off. As an option, on the primary side in front of the heat exchanger, a heat meter can be displayed with the temperatures TPV and TPR as well as the flow rate of the primary circuit (V1).

8.23.3 Setpoint formation TSV, secondary supply temperature

The calculation of the setpoint for the charging temperature TSV at the outlet of the heat exchanger can be influenced with the adjuster for the TSV setpoint formation, secondary supply temperature (28-019). The temperature is corrected via speed control for pump PWS after the heat exchanger.

0: Tank setpoint

The setpoint for TSV is calculated from the set tank temperature plus the control difference TSV for PWS

1: Temperature difference

The setpoint for TSV is calculated from the current temperature in the tank (top) to be charged plus the control difference TSV for PWS

8.23.4 Speed control, primary pump PWP

Alternatively, speed control can also be activated for the primary pump. With the adjuster for the control function of the PWP pump of the primary heat exchanger, the following can be selected:

0: dT primary

Es wird versucht, den im Einsteller Regeldiff. Drehzahlregelung PWP eingestellten Wert zwischen den primärseitigen Temperaturen TPV und TPR auszuregeln

1: dT return

Es wird versucht, den im Einsteller Regeldiff. Drehzahlregelung PWP eingestellten Wert zwischen den Rücklauftemperaturen TPR und TSR auszuregeln

2: constant

The control of pump PWP is deactivated. The pump is operated with the set value "Max. speed PWP".

8.24 Heating return temperature increase (VRA)

If the upper tank temperature (TOx) is higher than the heating return temperature (THR) by the **`Switch-on difference VRA return temperature increase`** (08-080), the heating return temperature increase VRA output switches on.

If the temperature difference between TOx and THR is less than the **`Switch-off difference VRA return temperature increase`** (08-081), the heating return temperature increase VRA output switches off.

If the value **`Max. tank temperature for VRA return temperature increase`** (07-008) is exceeded at the tank top sensor (TOx), the return temperature increase function is blocked.

During an active thermal disinfection function, the function VRA is not executed.

If the adjuster for the tank type is set to 3 (hot-water tank), the valve VRA is only actuated when the temperature in the tank (top) has exceeded the nominal tank temperature.

8.25 VRU option, return switching valve

If the temperature TSRU in the tank is higher than the primary return temperature TPR of the heat exchanger by the switch-on difference VRU, return switching valve, the output VRU switches on. If the temperature difference between TSRU and TPR is less than the switch-off difference VRU, return switching valve, the output VRU switches off.

8.26 Switchover function for storage tank, oil, gas boiler (VUP)

If the actual value of the temperature of the tank top sensor, TOx, is greater than the **`Tank temperature setpoint`** (08-062), the diverter valve VUP is actuated.

If TOx falls below the **`Tank temperature setpoint`** (08-062) by 5 K, the output is switched off.

8.27 WES function

Depending on the average solar yield when charging to the sensor TU1, the solar controller calculates whether reducing the pump speed leads to a sufficient setpoint rise at the collector sensor TKO or collector flow sensor TKV, in order to make charging to the tank top sensor TO1 possible.

If the **`Switch-off difference TK - TU`** (08-002) is fallen short of during the charging operation to the sensor TO1, the controller switches back to charging to TU1.

Charging to TO1 is also done when the temperature at the sensor TKO or TKV has exceeded the temperature and sensor TO1 by the **`Switch-on difference TK - TU`** (08-001).

If the **`Tank temperature setpoint`** (08-062) is reached on the tank top sensor TO1, charging no longer takes place at the tank top sensor TO1.

8.28 Monitoring

The monitoring variant (HV 42) is for recording/displaying data independent of the function and hydraulic variant.
Eight temperatures, one heat value (option 08-117) with the supply and return sensors and one flow rate (option 08-118) can be measured and displayed.

DANGER

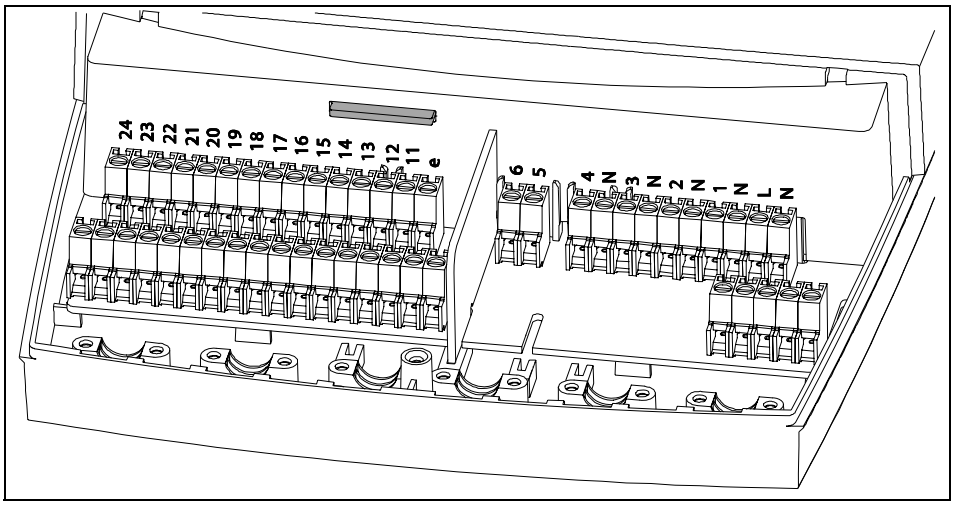
Error monitoring is not active in this hydraulic type!

8.29 Data logging

After inserting the SD card, the data recording can only be started by a professional with the adjuster **`Data logging`** (04-115). If no SD card is inserted, the adjuster cannot be changed.

WARNING

Before inserting the SD card, de-energize the device. SD card slot under the terminal compartment cover.
Before removing the SD card, the recording must be stopped. If the card is removed without stopping the recording, the card can be rendered useless.



The values are written to a conventional SD card, 2 - 4 GB, in CSV format. This format can be opened with the usual table calculation programs, such as Microsoft Excel.

Periodically, the operating parameters and, in the case of changes, adjusters and occurring errors are recorded.

8.29.1 Recording of operating parameters

Every 30 s, the values analogous to the "Nominal/actual values" menu under Info are recorded. Every day, a file VarYYMMDD.csv, e.g. Var120123.csv, is saved.

Example:

Time	00-004/0	01-004/0	00-016/2
10.06.11 13:39:17	49.5	50.0	16.7

A new file is generated at the beginning of every day.

8.29.2 Recording of parameter blocks

All adjustable, scalable parameters are recorded during adjustment.

Example:

Time	ID	Value
15.06.11 08:15:00	04	030/0 3
15.06.11 08:15:00	04	100/0 4
15.06.11 08:15:01	05	090/0 30.0

The same file is always used: ParYYMMDD.csv, e.g. Par110701.csv.

8.29.3 Recording of errors

All occurring errors and information is logged in a file ErrYYMMDD.csv, e.g. Err120131.csv

Example:

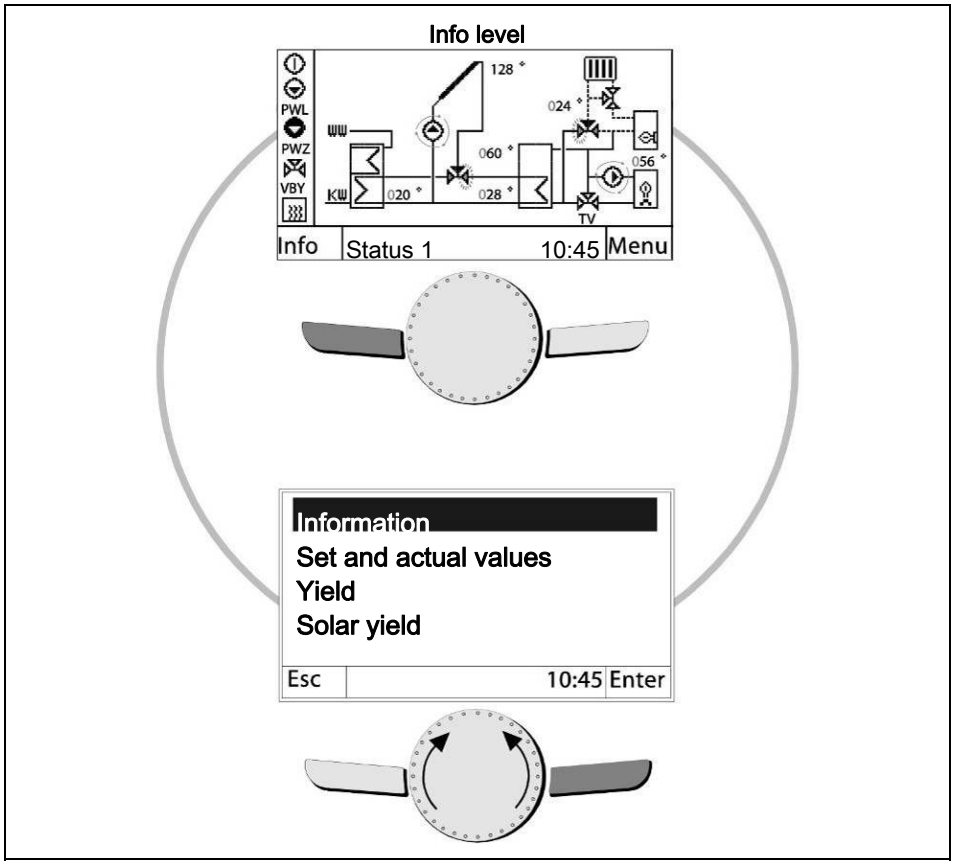
Time	Error code
10.06.11 20:15:00	105
15.06.11 08:15:00	163
30.09.11 12:43:01	301

The same file is always used.

9 What to do if ... ?

9.1 Malfunction messages (error display)

If a malfunction should occur or if there is an informational message from the plausibility check, this is indicated on the controller. In addition, this information can also be further processed via the potential-free output 5/6 via the **`MFA option error output`**.



In the event of an error, the display flashes red and instead of the symbol of the current operating mode, a warning triangle is visible. As soon as there is an operation, the background color changes back to the standard white.

In the **`Info`** menu, the error can be read out and acknowledged under **`Information`**. More information about the error or information text can be found on the following pages.

If an error is pending due to a sensor defect, this is acknowledged automatically, as soon as the error has been rectified, as are the information messages from the plausibility check.

All other errors must be acknowledged. If an error is acknowledged by mistake, but is still present, the error message will appear again.

Errors are written to the SD card during active data recording.

Error display structure:
Example:

U2 ERROR 147 TO tank (top), sensor 1

- TO tank (top), sensor 1 — Error descrip: The sensor for tank 1 (top) is defective
- ERROR 147 — Error code 147
- U2 — Error on controller with address 2

Error text	Code	Description	Cause
Thermal disinfection, temperature not reached	54	Temperature for thermal disinfection was not reached in the specified time (05-043)	System check
Attention: Frost protection active	55	Sensor in system < 3 °C ! Danger of freezing! (HV38, 39, 40 and 41)	System check
Set circulation temperature not reached	56	Set circulation temperature was fallen short of for the time (05-042)	System check
Maximum circulation temperature exceeded	57	Maximum circulation temperature (05-072) has been exceeded.	System check
Max. DT collector 1 - tank	71	Error charging from collector 1 to tank x, lower zone (temperature difference between collector and tank remains high) Note: (E 08-092) = 0, monitoring off	No heat transfer, air in charging circuit, no hydraulic compensation, output, pump defective
Max. DT collector 2 - tank	73	Error charging from collector 2 to tank x, lower zone (temperature difference between collector and tank remains high) Note: (E 08-092) = 0, monitoring off	No heat transfer, air in charging circuit, no hydraulic compensation, output, pump defective
TZW circulation circuit sensor	112	TZW hot-water circulation sensor outside of measuring range.	Sensor short-circuit / interruption
TFK solid fuel boiler sensor	114	TFK solid fuel boiler sensor outside of the measuring range.	Sensor short-circuit / interruption
TK1 collector sensor 1	119	TK collector 1 sensor outside of the measuring range.	Sensor short-circuit / interruption
THR heating circuit return sensor	123	THR heating circuit return sensor outside of the measuring range.	Sensor short-circuit / interruption
TU tank-bottom sensor	146	TUX tank bottom sensor outside of the measuring range	Sensor short-circuit / interruption
TO tank-top sensor	147	TOx tank top sensor outside of the measuring range	Sensor short-circuit / interruption
TK2 collector sensor 2	149	TK collector 2 sensor outside of the measuring range.	Sensor short-circuit / interruption
TPV primary supply sensor	151	TPV primary supply sensor, heat exchanger, out of measuring range.	Sensor short-circuit / interruption
TKV collector flow sensor	157	TKV collector flow sensor outside of the measuring range.	Sensor short-circuit / interruption
TKR collector return flow sensor	158	THR collector return flow sensor outside of the measuring range.	Sensor short-circuit / interruption
FLOW collector flow sensor	159	FLOW volume flow sensor / direct sensor outside of the measuring range.	Sensor short-circuit / interruption
TSO additional DHW tank sensor	160	THR additional tank sensor outside of the measuring range.	Sensor short-circuit / interruption
TWT Local heat exchanger sensor	161	TWT local heat exchanger sensor outside of the measuring range	Sensor short-circuit / interruption
TWT Central heat exchanger sensor	162	TWT central heat exchanger sensor outside of the measuring range	Sensor short-circuit / interruption
TKV collector flow sensor	163	TKV bypass collector circuit sensor outside of the measuring range.	Sensor short-circuit / interruption
TPR primary return sensor	172	TPV primary return sensor, heat exchanger, outside of measuring range.	Sensor short-circuit / interruption
TUZ tank bottom sensor	179	TUZ additional tank bottom sensor outside of the measuring range	Sensor short-circuit / interruption
TOZ tank top sensor	180	TOZ additional tank top sensor outside of the measuring range	Sensor short-circuit / interruption

Error text	Code	Description	Cause
TZWA circulation sensor, heat exchanger, outlet	181	TZWA hot-water circulation sensor, heat exchanger outlet, outside of measuring range.	Sensor short-circuit / interruption
TSRU tank return switching valve sensor	182	TSRU sensor, tank return switching valve, outside of measuring range.	Sensor short-circuit / interruption
FLOW sensor, volume flow, primary circuit	183	FLOW volume flow sensor / direct sensor outside of the measuring range.	Sensor short-circuit / interruption
TSV secondary supply sensor	184	TPV secondary supply sensor, heat exchanger, outside of measuring range.	Sensor short-circuit / interruption
TSR secondary return sensor	185	TSR secondary return sensor, heat exchanger, outside of measuring range.	Sensor short-circuit / interruption

Information text	Code	Description	Cause
Set temperature > Maximum tank temperature	300	Normal set tank temperature > Maximum tank temperature	Incorrect basic setting SPEIC x (08-062) > (08-059)
Maximum temperature > Protective tank temperature	301	Maximum tank temperature > Protective tank temperature	Incorrect basic setting (08-059) > (08-060)
Thermal disinfection temperature > Maximum tank temperature	302	Thermal disinfection temperature > Maximum tank temperature	Incorrect basic setting (05-004) > (08-059)
Priority tank 1 and 2 identical	303	Priority for tank 1 set the same as the priority for tank 2	Incorrect basic setting Priority (08-056) tank 1 = Priority 08-056) tank 2
Priority tank 1 and 3 identical	304	Priority for tank 1 set the same as the priority for tank 3	Incorrect basic setting Priority (08-056) tank 1 = Priority 08-056) tank 3
Priority tank 2 and 3 identical	306	Priority for tank 2 set the same as the priority for tank 3	Incorrect basic setting Priority (08-056) tank 2 = Priority 08-056) tank 3
PZP recharging: Switch-off difference >= Switch-on difference (hysteresis)	309	Recharging switch-off difference PZP > = Recharging switch-on difference PZP	Incorrect basic setting (08-075) => (08-076)
PPZ discharging: Switch-off difference >= Switch-on difference (hysteresis)	310	Discharging switch-off difference PPZ > = Discharging switch-on difference PPZ	Incorrect basic setting (08-077) => (08-078)
VRA: Switch-off difference >= Switch-on difference (hysteresis) (return temperature increase)	311	Switch-off setpoint rise for return temperature increase => Switch-on setpoint rise for return temperature increase	Incorrect basic setting (08-081) => (08-080)
Maximum collector temperature > Protective temperature, collector	312	Maximum collector temperature > than the protective collector temperature	Incorrect basic setting (08-011) > (08-010)
Switch-off difference TK - TU >= Switch-on difference TK - TU	313	Setpoint rise, collector/tank for charging OFF => Setpoint rise, collector/tank for charging ON	Incorrect basic setting (08-002) => (08-001)
Switch-off difference TFK - TU >= Switch-on difference TFK - TU	314	Setpoint rise, additional boiler/tank for charging OFF => Setpoint rise, additional boiler/tank for charging ON	Incorrect basic setting (08-004) => (08-003)
No tank active, all tank types set to 0	315	Attention: No tank / consumer active. All tanks are switched off (E 8-055) = 0	Incorrect basic setting (08-055) = 0

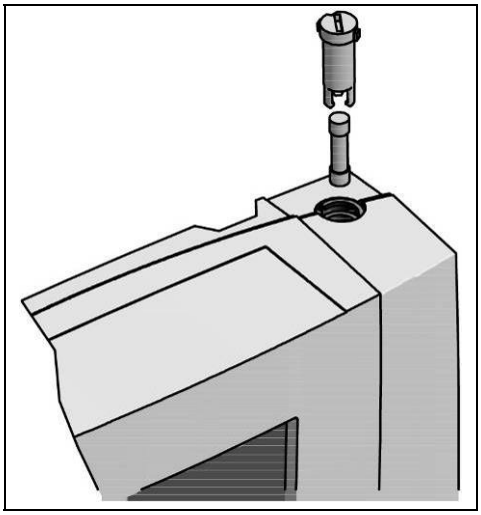
9.2 Cause and remedy of malfunctions

Observation	Cause	Remedy
Solar pump doesn't switch off	The current consumption of the consumer is too low	Select other relay (higher current consumption)
		Use RC element
	Frost protection temperature set too high	Check parameter and adjust, if necessary

10 Technical data

10.1 Electric data

Fine fuse 3.15 A slow-blow



Mains voltage	230 V ± 10%
Mains frequency	50-60 Hz
Power consumption	8 VA
Measuring circuit voltage	5.0 V / protectively insulated 3.3 KV

Switching capacity, outputs:

Electronic outputs	~230 V / 1 (1) A / 50 Hz
Minimum current	20 mA
Mechanical outputs	~230 V / 3.15 (2) A / 50 Hz

External device fuse	16 A
Internal device fuse	3.15 A slow-blow
Degree of protection	IP 40 – EN 60529
Protection class	II according to EN 60730 for installation according to regulations

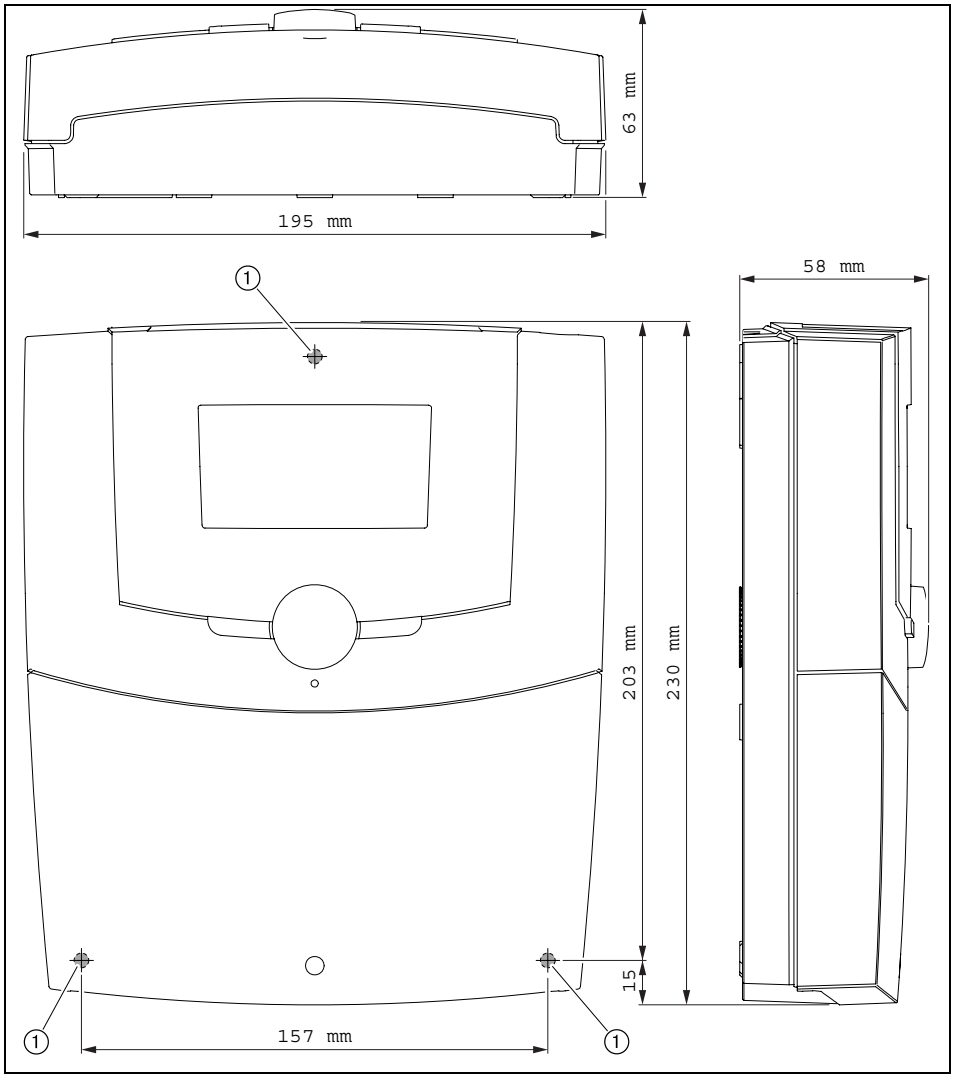
Lines:

Sensor line, length / cross-section	max. 100 m / 0.75 mm²
eBUS	2-wire bus
Bus line, length / cross-section	max. 100m / 0.75 mm²

10.2 Permissible ambient conditions

Temperature	Humidity	Requirements regarding EMC	Low-voltage directives
During operation 0°C…50°C Transport/storage -20°C…+60°C	Max. 85% rel. humidity at 25°C No condensation	Directive 2004/108/EC EN 50082-1 EN 50081-1	Directive 2006/95/EC EN 60335

10.3 Dimensions



① screw

10.4 Temperature sensor data

Sensor element NTC 5000 Ω at 25°C

Sensor	Measuring range	Measuring precision	Ambient temperature	Cable material	Cable length	Order number
Immersion sensor STF 225	-10…240 °C	0…70 °C ± 0.5 K	-50…250 °C	Silicone (blue)	4 m	660 262
Immersion sensor STF 222.2	-10…130 °C	0…50 °C ± 0.5K 0…70 °C ± 0.8K	-50…90 °C	PVC (gray)	2.5 m	660 228
Contact sensor ZVF 210 (accessory)	-10…130 °C	0…50 °C ± 0.5K 0…70 °C ± 0.8K	-50…90 °C	PVC (gray)	2.5 m	660 302

10.5 Sensor characteristic values

Sensor characteristic curves

(Resistance values without self-heating) The Weishaupt controller system allows the all sensors to be properly connected and the respectively measured temperature to be displayed. To check the sensor and simulation of the corresponding sensor temperatures, value pairs (sensor temperature / resistance value) are listed below for the used devices.

NTC sensor (blue cable)	T [°C]	R [Ω]	T [°C]	R [Ω]	T [°C]	R [Ω]
Collector sensor: TK1, TK2	-40	112 k	60	1.45 k	160	115
	-35	84.1 k	65	1.24 k	165	105
Solid fuel sensor: TFK	-30	63.6 k	70	1.06 k	170	95
	-25	48.6 k	75	914	175	86
as immersion sensor	-20	37.4 k	80	789	180	79
Order no.: 660 262	-15	29.1 k	85	684	185	72
	-10	22.8 k	90	595	190	66
	-5	18.0 k	95	520	195	60
	0	14.3 k	100	455	200	55
	5	11.4 k	105	400	205	51
	10	9.21 k	110	353	210	47
	15	7.47 k	115	312	215	43
	20	6.10 k	120	276	220	40
	25	5.00 k	125	246	225	37
	30	4.13 k	130	219	230	34
	35	3.42 k	135	196	235	31
	40	2.86 k	140	175	240	29
	45	2.40 k	145	157	245	27
	50	2.02 k	150	142		
	55	1.71 k	155	128		

NTC sensor (gray cable)	T [°C]	R [Ω]	T [°C]	R [Ω]	T [°C]	R [Ω]
Reference sensor: TOx, TUx, THR, TKV1, TKV2, TKR1, TKR2, TWT, TZO, TUZ, TZW	-20	48.5 k	10	9.95 k	60	1.24 k
	-18	43.5 k	12	9.05 k	65	1.04 k
	-16	38.6 k	14	8.23 k	70	880
	-14	34.5 k	16	7.50 k	75	740
as immersion sensor	-12	30.9 k	18	6.84 k	80	630
Order no.: 660 228	-10	27.7 k	20	6.25 k	85	540
	-8	24.8 k	22	5.71 k	90	390
as contact sensor:	-6	22.3 k	24	5.23 k	100	340
Order no.: 660 302	-4	20.1 k	26	4.79 k	105	290
	-2	18.1 k	30	4.03 k	110	260
	0	16.3 k	35	3.27 k	120	200
	2	14.5 k	40	2.66 k	130	150
	4	13.3 k	45	2.18 k	140	120
	6	12.1 k	50	1.80 k		
	8	11.0 k	55	1.49 k		

11 Appendix

11.1 Checklist

- Controller wired according to the selected variant.
- Supply connected according to diagram (only with emergency switch and preliminary fuse).
- Are the connected sensors displayed?
- Check temperatures and values for plausibility.
- Is the pump actuated (possibly via manual mode)?

11.2 Commissioning log of adjustable parameters (please fill out)

Collector 1

Value	ID	Setting range	Factory reset	Password	Set
Collector protection function	08-005	0 ... 1	0	-	
Collector fluid heat capacity	08-009	0.01 ... 9.99 kJ/kg*K	3.70 kJ/kg*K	-	
Collector protective temperature	08-010	80 ... 180 °C	120°C	11	
Collector maximum temperature	08-011	80 ... 150 °C	90°C	11	
Collector minimum temperature	08-012	-15 ... 90 °C	20°C	-	
Collector frost protection temperature	08-013	-50 ... 10 °C	-20°C	-	
Collector start-up help	08-015	0 … 1	0	-	
Start-up help pump runtime	08-017	0.5 ... 20.0 min	0.5 min	11	
Min. speed PS solar pump	08-035	5 ... 100%	40%	-	
Max. volume flow, PS solar pump	08-037	10 ... 12000 l/h	240 l/h	-	
Min. volume flow PS solar pump	08-038	0 ... 12000 l/h	60 l/h	-	
Min. standby time PS solar pump	08-093	0 ... 200 s	10 s	11	
Max. temperature difference collector-tank	08-091	10 ... 80 K	80 K	11	
Collector-tank DT error message waiting period	08-092	0 ... 180 min	30 min	11	
VIZ / TKR option volume pulse counter/collector return flow sensor	08-107	0 ... 1	1	-	
VIZ impulse rate	17-001	1 ... 9999 pulses/l	180 pulses/l	-	
Offset impulse rate VIZ-collector flow	28-020	-200 ... 200 l/h	15 l/h	11	
TKV option collector flow sensor	08-108	0 ... 1	1	-	
VBY option collector bypass	08-109	0 ... 1	0	-	

Collector 2

Value	ID	Setting range	Factory reset	Password	Set
Collector minimum temperature	08-012	-15 ... 90 °C	20°C	-	
Min. speed PS solar pump	08-035	5 ... 100%	40%	-	
Max. volume flow, PS solar pump	08-037	10 ... 12000 l/h	240 l/h	-	
Min. volume flow PS solar pump	08-038	0 ... 12000 l/h	60 l/h	-	
Min. standby time PS solar pump	08-093	0 ... 200 s	10 s	11	
VIZ impulse rate	17-001	1 ... 9999 pulses/l	180 pulses/l	-	
Offset impulse rate VIZ-collector flow	28-020	-200 ... 200 l/h	15 l/h	11	

Tank 1

Value	ID	Setting range	Factory reset	Password	Set
Switch-on difference TK-TU collector - tank bottom	08-001	0 ... 50 K	7 K	-	
Switch-off difference TK-TU collector - tank bottom	08-002	0 ... 50 K	4 K	-	
Tank control difference	08-064	5 ... 50 K	15 K	-	
Tank tzpe	08-055	0 ... 4	1/ 3/ 4	11	
Priority tank	08-056	1 ... 3	1	-	
Tank temperature setpoint	08-062	10 ... 90 °C	55°C	-	
Switch-on hysteresis to set tank temperature	08-063	1 ... 30 K	2 K	-	
Maximum tank temperature	08-059	10 ... 95 °C	90°C	-	
Protective tank temperature	08-060	10 ... 99 °C	95°C	11	
Switch-off hysteresis for nominal tank temperature to TU	08-067	-10 ... 50 K	5 K	11	
Active collector protection / night cooling tank	08-074	0 ... 2	0	-	
Tank switch-on threshold, alternating tank operation	08-065	0 ... 20 K	5 K	11	
Tank switch-off threshold, alternating tank operation	08-066	0 ... 20 K	5 K	11	
Max. volume flow PSL Pump tank charging	28-037	10 ... 12000 l/h	240 l/h	-	
Min. volume flow PSL Pump tank charging	28-038	0 ... 12000 l/h	60 l/h	-	
Sensor selection, setpoint	08-007	0 ... 1	1	11	
Sensor selection, maximum value	08-008	0 ... 1	1	11	
Circulation function	05-006	0 ... 8	0	-	
Circulation circuit Set temperature	05-054	0 ... 90 °C	45°C	-	
Max. circulationtemperature	05-072	10 ... 90 °C	70°C	-	
Waiting time for info message nominal circulation temperature not reached	05-042	0 ... 180 min	120 min	11	
PZW pump runtime for pulse control	05-070	0 ... 30 min	3 min	-	
PZW pump off-time for pulse control	05-071	0 ... 240 min	10 min	-	
Switch-on difference TO – TZW, tank (top) - hot-water circulation	05-073	0 ... 50 K	5 K	-	

Value	ID	Setting range	Factory reset	Password	Set
Switch-off difference TO – TZW, tank (top) - hot-water circulation	05-074	0 ... 50 K	3 K	-	
Speed PZW pump circulation circuit	05-107	5 ... 100%	100%	-	
Speed, PZWP pump, circulation/reheating	05-109	5 ... 100%	100%	-	
PWL option Pump, DHW heating	08-100	0 ... 1	0	-	
MFA option recharging, heat request	08-113	0 ... 1	0	-	
Setpoint reduction for high solar yield	08-072	0 ... 20 K	15 K	11	
Thermal disinfection function	05-014	0, 10, 11, 12, 13, 14	0	-	
Thermal disinfection temperature	05-004	50 ... 80 °C	60°C	-	
Min. holding time, nominal thermal disinfection temperature	05-043	0 ... 480 min	30 min	11	
Thermal disinfection, manual	05-084	0 ... 1	0	-	
PPS option Discharging	08-101	0 ... 1	0	-	
DHW temperature setpoint	05-051	10 ... 90 °C	55°C	-	
Switch-on difference transfer charging PPS	08-098	2 ... 50 K	5 K	-	
Switch-off difference transfer charging PPS	08-099	0 ... 20 K	3 K	-	
Min. speed, PWT local heat exchanger pump	08-024	5 ... 100%	30%	-	
Min. standby time, PWT local heat exchanger pump	28-000	0 ... 200 s	10 s	11	
Max. tank temperature for VRA return temperature increase	07-008	30 ... 105 °C	70°C	-	
Switch-on difference VRA return temperature increase	08-080	0 ... 50 K	10 K	-	
Switch-off difference VRA return temperature increase	08-081	0 ... 50 K	5 K	-	
Switch-on difference TFK-TU solid fuel boiler - tank bottom	08-003	0 ... 50 K	10 K	-	
Switch-off difference TFK-TU solid fuel boiler - tank bottom	08-004	0 ... 50 K	5 K	-	
Min. standby time, PFK pump, solid fuel boiler	08-094	0 ... 200 s	10 s	11	
Minimum temperature, TFK solid fuel boiler	09-032	10 ... 90 °C	50°C	-	
Min. speed, PFK pump, solid fuel boiler	09-039	5 ... 100%	30%	-	
Min. speed, PWS pump, secondary heat exchanger	28-013	5 ... 100%	100%	-	
Max. speed, PWS pump, secondary heat exchanger	28-014	5 ... 100%	100%	-	
Control difference TSV for PWS pump, secondary heat exchanger	28-018	0 ... 50 K	5 K	11	
Setpoint formation TSV, secondary supply temperature	28-019	0 ... 1	0/ 1	11	

Tank 2

Value	ID	Setting range	Factory reset	Password	Set
Switch-on difference TK-TU collector - tank bottom	08-001	0 ... 50 K	7 K	-	
Switch-off difference TK-TU collector - tank bottom	08-002	0 ... 50 K	4 K	-	
Tank control difference	08-064	5 ... 50 K	15 K	-	
Tank tzpe	08-055	0 ... 4	1/ 3/ 4	11	
Priority tank	08-056	1 ... 3	2	-	
Tank temperature setpoint	08-062	10 ... 90 °C	55°C	-	
Switch-on hysteresis to set tank temperature	08-063	1 ... 30 K	2 K	-	
Maximum tank temperature	08-059	10 ... 95 °C	90°C	-	
Protective tank temperature	08-060	10 ... 99 °C	95°C	11	
Switch-off hysteresis for nominal tank temperature to TU	08-067	-10 ... 50 K	5 K	11	
Active collector protection / night cooling tank	08-074	0 ... 2	0	-	
Tank switch-on threshold, alternating tank operation	08-065	0 ... 20 K	5 K	11	
Tank switch-off threshold, alternating tank operation	08-066	0 ... 20 K	5 K	11	
Max. volume flow PSL pump, tank charging	28-037	10 ... 12000 l/h	240 l/h	-	
Min. volume flow PSL pump, tank charging	28-038	0 ... 12000 l/h	60 l/h	-	
Sensor selection, setpoint	08-007	0 ... 1	1	11	
Sensor selection, maximum value	08-008	0 ... 1	1	11	
Circulation function	05-006	0 ... 8	0	-	
Circulation circuit Set temperature	05-054	0 ... 90 °C	45°C	-	
PZW pump runtime for pulse control	05-070	0 ... 30 min	3 min	-	
PZW pump off-time for pulse control	05-071	0 ... 240 min	10 min	-	
PWL option pump, DHW heating	08-100	0 ... 1	0	-	
MFA option - recharging, heat request	08-113	0 ... 1	0	-	

Value	ID	Setting range	Factory reset	Password	Set
Setpoint reduction for high solar yield	08-072	0 ... 20 K	15 K	11	
Thermal disinfection function	05-014	0, 10, 11, 12, 13, 14	0	-	
Thermal disinfection temperature	05-004	50 ... 80 °C	60°C	-	
Min. holding time, nominal thermal disinfection temperature	05-043	0 ... 480 min	30 min	11	
Thermal disinfection, manual	05-084	0 ... 1	0	-	
PPS option discharging	08-101	0 ... 1	0	-	
DHW temperature setpoint	05-051	10 ... 90 °C	55°C	-	
Switch-on difference transfer charging PPS	08-098	2 ... 50 K	5 K	-	
Switch-off difference transfer charging PPS	08-099	0 ... 20 K	3 K	-	
Min. speed, PWT local heat exchanger pump	08-024	5 ... 100%	30%	-	
Min. standby time, PWT local heat exchanger pump	28-000	0 ... 200 s	10 s	11	
VRA option return temperature increase	08-103	0 ... 1	0	-	
Max. tank temperature for VRA return temperature increase	07-008	30 ... 105 °C	70°C	-	
Switch-on difference VRA return temp. Increase	08-080	0 ... 50 K	10 K	-	
Switch-off difference VRA return temp. Increase	08-081	0 ... 50 K	5 K	-	
Switch-on difference TFK-TU solid fuel boiler - tank bottom	08-003	0 ... 50 K	10 K	-	
Switch-off difference TFK-TU solid fuel boiler - tank bottom	08-004	0 ... 50 K	5 K	-	
Min. standby time, PFK pump, solid fuel boiler	08-094	0 ... 200 s	10 s	11	
Minimum temperature, TFK solid fuel boiler	09-032	10 ... 90 °C	50°C	-	
Min. speed, PFK pump, solid fuel boiler	09-039	5 ... 100%	30%	-	
Min. speed, PWS pump, secondary heat exchanger	28-013	5 ... 100%	100%	-	
Max. speed, PWS pump, secondary heat exchanger	28-014	5 ... 100%	100%	-	
Control difference TSV for PWS pump, secondary heat exchanger	28-018	0 ... 50 K	5 K	11	
Setpoint formation TSV, secondary supply temperature	28-019	0 ... 1	0/ 1	11	

Tank 3

Value	ID	Setting range	Factory reset	Password	Set
Switch-on difference TK-TU collector - tank bottom	08-001	0 ... 50 K	7 K	-	
Switch-off difference TK-TU collector - tank bottom	08-002	0 ... 50 K	4 K	-	
Tank control difference	08-064	5 ... 50 K	15 K	-	
Tank tzpe	08-055	0 ... 4	4	11	
Priority tank	08-056	1 ... 3	3	-	
Tank temperature setpoint	08-062	10 ... 90 °C	30°C	-	
Switch-on hysteresis to set tank temperature	08-063	1 ... 30 K	2 K	-	
Maximum tank temperature	08-059	10 ... 95 °C	35°C	-	
Protective tank temperature	08-060	10 ... 99 °C	40°C	11	
Active collector protection / night cooling tank	08-074	0 ... 2	0	-	

Global

Value	ID	Setting range	Factory reset	Password	Set
Solar charging strategy	08-050	0 ... 3	0/ 3	-	
Change-over solar charging (high yield)	08-051	30 ... 100%	50%	11	
Switch-on threshold detection of high solar energy	08-070	0 ... 100%	50%	11	
Switch-on threshold recognition high daily energy	08-071	0 ... 100%	80%	11	
Min. speed, PWT central heat exchanger pump	08-025	5 ... 100%	30%	-	
Min. standby time PWT heat exchanger pump, central	28-003	0 ... 200 s	10 s	11	
Switch-on difference PZP recharging	08-075	5 ... 50 K	7 K	-	
Switch-off difference PZP recharging	08-076	2 ... 20 K	4 K	-	
Transfer charging set temperature	08-069	10 ... 90 °C	20/60°C	-	
Switch-on difference PPZ discharging	08-077	5 ... 50 K	10 K	-	
Switch-off difference PPZ discharging	08-078	2 ... 20 K	5 K	-	
MFA option high-temperature relief	08-110	0 ... 1	0	-	
MFA option error output	08-111	0 ... 1	0	-	
Heat meter option	08-117	0 ... 1	1	-	
Pulse rate VIZ, heat meter	17-019	1 ... 9999 pulses/l	180 pulses/l	-	
Offset FLOW, volume flow, primary circuit	28-021	-200 ... 200 l/h	15 l/h	11	
VIZ option, flow rate measurement	08-118	0 ... 1	0	-	
Pulse rate VIZ, flow rate measurement	17-020	1 ... 9999 pulses/l	180 pulses/l	-	

Value	ID	Setting range	Factory reset	Password	Set
Offset FLOW flow rate measurement	28-022	-200 ... 200 l/h	15 l/h	11	
Min. speed, PWP pump, primary heat exchanger	28-005	5 ... 100%	100%	-	
Maximum speed, PWP pump, primary heat exchanger	28-006	5 ... 100%	100%	-	
Control difference, PWP pump, primary heat exchanger	28-010	0 ... 50 K	10 K	11	
Control function, PWP pump, primary heat exchanger	28-011	0 ... 2	2	11	
VRU option, return switching valve	05-110	0 ... 1	0	-	
Switch-on difference, VRU return switching valve	05-104	5 ... 40 K	5 K	-	
Switch-off difference, VRU return switching valve	05-105	-10 ... 5 K	2 K	-	

Configuration

Value	ID	Setting range	Factory reset	Password	
Hydraulic type	04-006	1 - 42	1	-	
Language selection	04-056	0 ... 15	0	-	
Date	02-070	01.01.2011 - 31.12.2099	-	-	
Time	02-072	00:00 - 23:59	-	-	
eBUS address	04-020	2 … 16	2	-	
eBUS feed	04-036	0 … 1	1	11	
Output 1: Solar pump	04-030	0 ... 4	1	-	
Output 2: Solar pump 2 / solid fuel boiler / heat exchanger	04-031	0 ... 4	1	-	
Normal position MFA	08-000	0 ... 1	0	11	
Data logging	04-115	0 ... 1	0	-	
Reset	04-045	0, 29	0	-	

11.3 Commissioning log of adjustable options

(please fill out)

Collector 1

Value	ID	Setting range	Factory reset	Password	Set
VIZ / TKR option volume pulse counter/ collector return flow sensor	08-107	0 ... 1	1	-	
TKV option collector flow sensor	08-108	0 ... 1	1	-	
VBY option collector bypass	08-109	0 ... 1	0	-	

Tank 1

Value	ID	Setting range	Factory reset	Password	Set
Circulation function	05-006	0 ... 8	0	-	
PWL option Pump, DHW heating	08-100	0 ... 1	0	-	
MFA option - recharging, heat request	08-113	0 ... 1	0	-	
Thermal disinfection function	05-014	0, 10, 11, 12, 13, 14	0	-	
PPS option Discharging	08-101	0 ... 1	0	-	

Tank 2

Value	ID	Setting range	Factory reset	Password	Set
Circulation function	05-006	0 ... 8	0	-	
PWL option pump, DHW heating	08-100	0 ... 1	0	-	
MFA option - recharging, heat request	08-113	0 ... 1	0	-	
Thermal disinfection function	05-014	0, 10, 11, 12, 13, 14	0	-	
PPS option discharging	08-101	0 ... 1	0	-	
VRA option return temperature increase	08-103	0 ... 1	0	-	

Global

Value	ID	Setting range	Factory reset	Password	Set
MFA option high-temperature relief	08-110	0 ... 1	0	-	
MFA option error output	08-111	0 ... 1	0	-	
Heat meter option	08-117	0 ... 1	0	-	
VIZ option, flow rate measurement	08-118	0 ... 1	0	-	
VRU option, return switching valve	05-110	0 ... 1	0	-	

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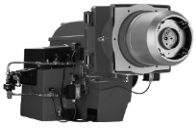
Weishaupt nearby?
Addresses, telephone numbers, etc. can be found under www.weishaupt.de

Product		Description	Power
	W burner	The compact series, proven a million times over: Economical, reliable, fully automatic. Oil, gas and dual-fuel burner for single and multi-family homes as well as business establishment. As a purflam burner, oil is nearly burned without soot and NOx emissions are reduced.	Up to 570 kW
	monarch® and industrial burner	The legendary industrial burner: Proven, durable, easy to use. Oil, gas and dual-fuel burner for central heat supply systems.	Up to 11,700 kW
	multiflam® burner	Innovative Weishaupt technology for large burners: Minimum emission values, particularly for powers over 1 MW. Oil, gas and dual-fuel burner with patented fuel distribution.	Up to 17,000 kW
	WK industrial burner	Power packets in the modular system: Adaptable, robust, powerful. Oil, gas and dual-fuel burner for industrial systems.	Up to 22,000 kW
	Thermo Unit	The Thermo Unit heating systems made of cast iron or steel: Modern, economical, reliable. For environmentally-friendly heating of single and multi-family homes. Fuel: Either gas or oil.	Up to 55 kW
	Thermo Condens	The innovative gas condensing boilers with SCOT system: Efficient, low-emissions, versatile. Ideal for apartments, single and multi-family homes. And for high heat requirements as floor-standing gas condensing boiler with up to 1200 kW of power (cascade).	Up to 1,200 kW
	Heat pumps	The heat pump program offers solutions for utilizing heat from the air, the ground or ground water. The systems are suitable for renovations or new buildings. Cascading from several heat pumps is possible.	Up to 130 kW
	Solar installations	Free energy from the sun: Perfectly tuned components, innovative, proven. Attractive flat-roof collectors for heating system support and potable water heating.	
	Water heater / energy storage devices	The attractive program for heating up potable water includes classical water heaters, which are supplied via a heating system and energy storage devices, which can be fed via solar installations.	
	Instrumentation and control technology / building automation	From the control cabinet to the complete control of building technology – at Weishaupt, you will find the entire product range of modern instrumentation and control technology. Future-oriented, economical and flexible.	