

DeltaSol[®] BS/2 HE



Solar controller

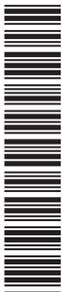
Manual for the
specialised craftsman

Installation

Operation

Functions and options

Troubleshooting



11209872

Thank you for buying this product.
Please read this manual carefully to get the best performance from this unit.
Please keep this manual carefully.

en

Manual

Safety advice

Please pay attention to the following safety advice in order to avoid danger and damage to people and property.

Instructions

Attention must be paid to the valid local standards, regulations and directives!

Information about the product

Proper usage

The solar controller is designed for electronically controlling standard solar thermal systems in compliance with the technical data specified in this manual.

Improper use excludes all liability claims.

CE-Declaration of conformity

The product complies with the relevant directives and is therefore labelled with the CE mark. The Declaration of Conformity is available upon request, please contact the manufacturer.



Note:

Strong electromagnetic fields can impair the function of the controller.

→ Make sure the controller as well as the system are not exposed to strong electromagnetic fields.

Target group

These instructions are exclusively addressed to authorised skilled personnel.

Only qualified electricians should carry out electrical works.

Initial installation must be effected by the system owner or qualified personnel named by the system owner.

Description of symbols

WARNING! Warnings are indicated with a warning triangle!



→ They contain information on how to avoid the danger described.

Signal words describe the danger that may occur, when it is not avoided.

- **WARNING** means that injury, possibly life-threatening injury, can occur.
- **ATTENTION** means that damage to the appliance can occur.



Note:

Notes are indicated with an information symbol.

→ Arrows indicate instruction steps that should be carried out.

Disposal

- Dispose of the packaging in an environmentally sound manner.
- Dispose of old appliances in an environmentally sound manner. Upon request we will take back your old appliances bought from us and guarantee an environmentally sound disposal of the devices.

Subject to technical change. Errors excepted.

The controller for standard solar thermal systems.

The DeltaSol® BS/2 HE controller provides a clear operating concept and is equipped with the combined display with system-monitoring. Flashing symbols for

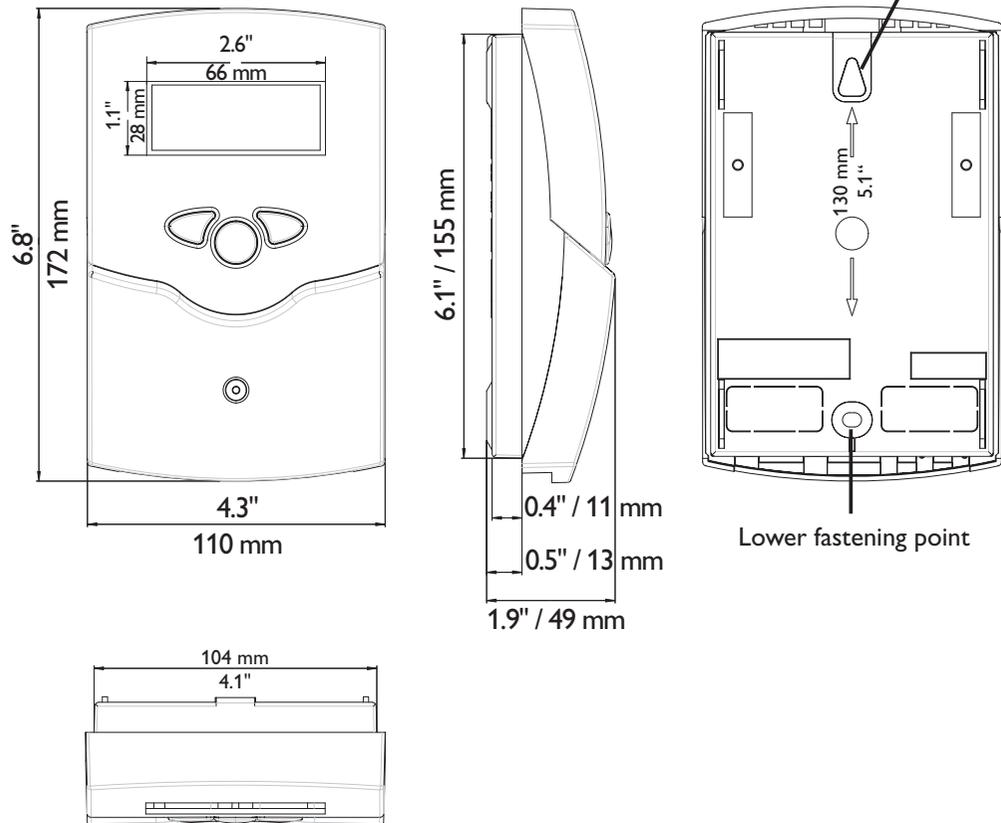
sensors and pumps enable an immediate allocation of temperatures, temperature differences and active actuators. Thus, adjusting and monitoring the solar system is quick and easy.

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1 Overview

- Especially designed for controlling a high-efficiency pump
- System-Monitoring-Display
- Up to 3 Pt1000 temperature sensors
- Heat quantity measurement



Technical data

Inputs: 3 Pt1000 temperature sensors

Outputs: 1 semiconductor relay, 1 PWM output

Switching capacity: 1 (1) A 240 V~ (semiconductor relay)

Total switching capacity: 1 A 240 V~

Power supply: 220 ... 240 V~ (50 ... 60 Hz)

Supply connection: type Y attachment

Standby: 1.54 W

Mode of operation: type 1.C.Y action

Rated impulse voltage: 2.5 kV

Data interface: VBus®

VBus® current supply: 35 mA

Functions: HE pump control, heat quantity balancing, tube collector function, antifreeze function, operating hours counter, collector minimum and maximum limitation

Housing: plastic, PC-ABS and PMMA

Mounting: wall mounting, also suitable for mounting into patch panels

Indication/Display: System-Monitoring-Display for visualisation of systems, 16-segment and 7-segment display, 8 symbols for indication of system status and operating control LED

Operation: 3 buttons at the front of the housing

Protection type: IP 20/DIN EN 60529

Protection class: II

Ambient temperature: 0 ... 40 °C

Degree of pollution: 2

Dimensions: 172 x 110 x 49 mm

2 Installation

2.1 Mounting

WARNING! Electric shock!



Upon opening the housing, live parts are exposed!

→ **Always disconnect the device from power supply before opening the housing!**



Note:

Strong electromagnetic fields can impair the function of the controller.

→ Make sure the controller as well as the system are not exposed to strong electromagnetic fields.

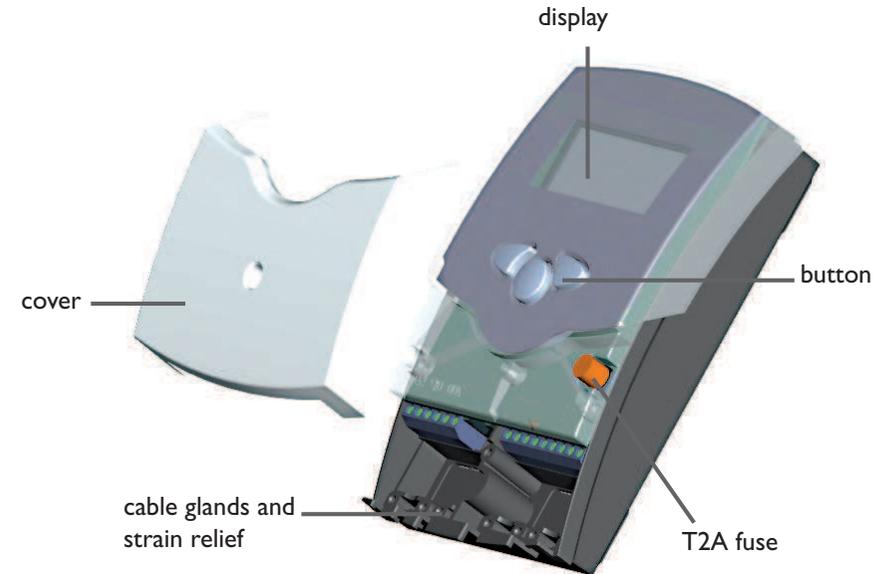
The unit must only be located in dry interior rooms.

The controller must additionally be supplied from a double pole switch with contact gap of at least 3 mm.

Please pay attention to separate routing of sensor cables and mains cables.

In order to mount the device to the wall, carry out the following steps:

- Unscrew the crosshead screw from the cover and remove it along with the cover from the housing.
- Mark the upper fastening point on the wall. Drill and fasten the enclosed wall plug and screw leaving the head protruding.
- Hang the housing from the upper fastening point and mark the lower fastening point (centres 130 mm).
- Insert lower wall plug.
- Fasten the housing to the wall with the lower fastening screw and tighten.
- Carry out the electrical wiring in accordance with the terminal allocation (see page 6).
- Put the cover on the housing.
- Attach with the fastening screw.



2.2 Electrical connection

WARNING! Electric shock!



Upon opening the housing, live parts are exposed!

→ **Always disconnect the device from power supply before opening the housing!**

ATTENTION! ESD damage!



Electrostatic discharge can lead to damage to electronic components!

→ **Take care to discharge properly before touching the inside of the device!**



Note:

Connecting the device to the power supply must always be the last step of the installation!



Note:

It must be possible to disconnect the device from the mains at any time.

- Install the mains plug such that it is accessible at any time.
- If this is not possible, install a switch that can be accessed.

Do not use the device if it is visibly damaged!

The power supply of the device must be 220 ... 240V~ (50 ... 60Hz). Attach flexible cables to the housing with the enclosed strain relief and the corresponding screws.

The controller is equipped with 1 semiconductor relay to which a load such as a pump, a valve, etc. can be connected:

- Relay 1
 - 18 = Conductor R1
 - 17 = Neutral conductor N
 - 13 = Grounding terminal

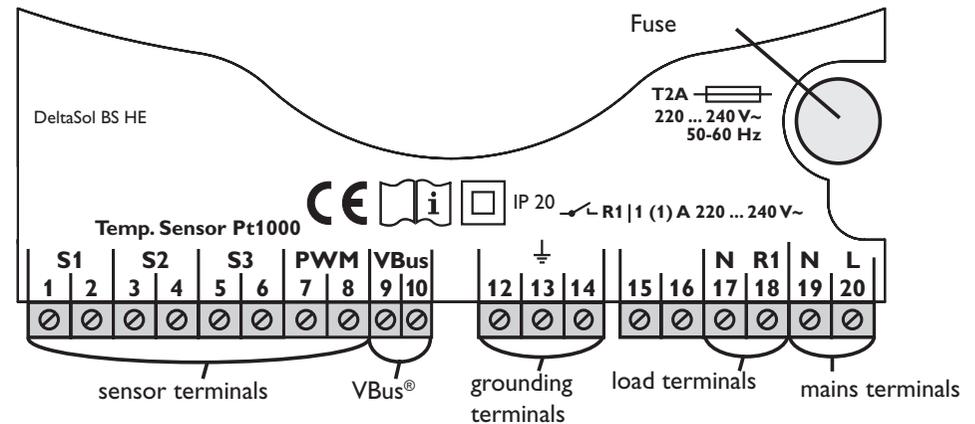
The **mains connection** is at the following terminals:

- 19 = Neutral conductor N
- 20 = Conductor L
- 12 = Grounding terminal \perp

The terminals marked **PWM** are control outputs for a high-efficiency pump.

- 7 = PWM -
- 8 = PWM +

Speed control of a HE pump is possible via a PWM signal. The pump has to be connected to the relay as well as to the PWM output of the controller. Power supply to the HE pump is effected by switching the relay on or off.



Connect the **temperature sensors** (S1 to S3) to the corresponding terminals with either polarity:

1/2 = Sensor 1 (e. g. collector sensor)

3/4 = Sensor 2 (e. g. store sensor)

5/6 = Sensor 3 (e. g. store sensor top)

2.3 Data communication/Bus

The controller is equipped with the **VBus®** for data transfer and energy supply to external modules. The connection is to be carried out at the terminals marked **VBus** (any polarity).

One or more **VBus®** modules can be connected via this data bus, such as:

- DL2 Datalogger
- DL3 Datalogger

Furthermore, the controller can be connected to a PC or integrated into a network via the VBus®/USB or VBus® /LAN interface adapter (not included).



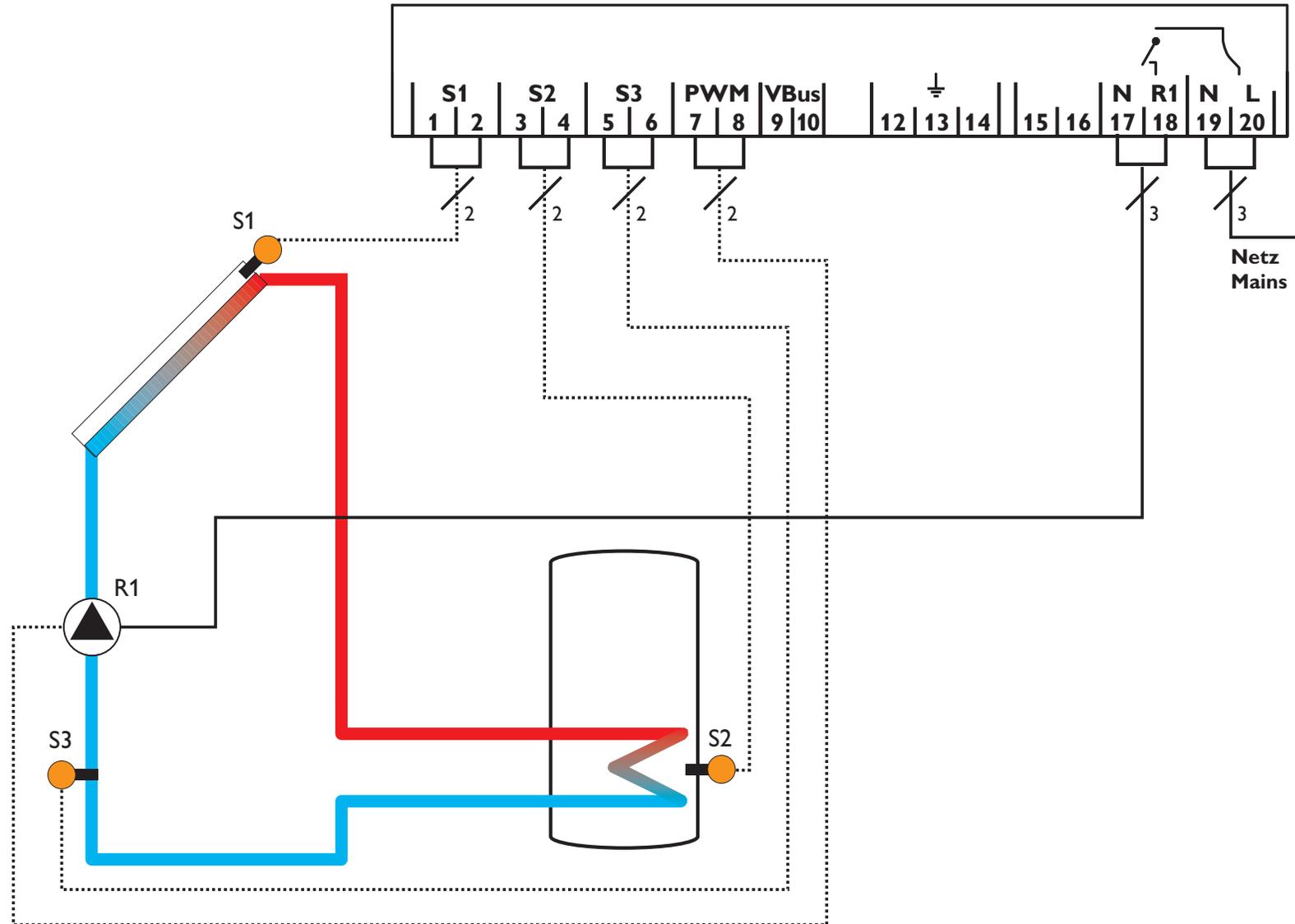
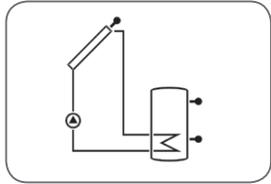
Note:

More accessories on page 20.

2.4 System: Standard solar system with 1 store

The controller calculates the temperature difference between collector sensor S1 and store sensor S2. If the difference is larger than or identical to the adjusted switch-on temperature difference (DTO), the solar pump will be activated by the relay, and the store will be loaded until the switch-off temperature difference (DTF) or the maximum store temperature (S MX) is reached.

Sensor S3 can optionally be connected for measurement purposes. If heat quantity measurement (OHQM) is activated, S3 is to be used as the return sensor.



Display channels

Channel		Description	Connection terminal	Page
COL	x	Temperature collector	S1	11
TST	x	Temperature store	S2	11
S3	x	Temperature sensor 3	S3	11
TR	x*	Temperature return sensor	S3	11
n%	x	Speed R1	R1	11
hP	x	Operating hours R1	R1	11
kWh	x*	Heat quantity in kWh	-	11
MWh	x*	Heat quantity in MWh	-	11

Legend:

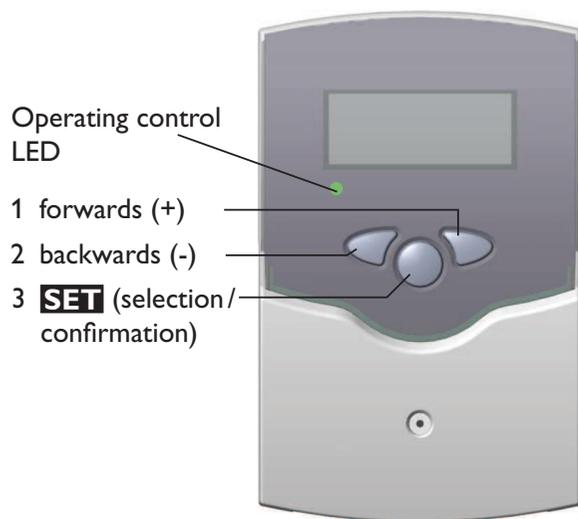
Symbol	Description
x	Channel is available
x*	Channel is available, if the corresponding option is activated.

Adjustment channels

Channel		Description	Factory setting	Page
DT O	x	Switch-on temperature difference	6.0K	12
DT F	x	Switch-off temperature difference	4.0K	12
DT S	x	Set temperature difference	10.0K	12
RIS	x	Rise	2K	13
S MX	x	Maximum store temperature	60°C	13
EM	x	Collector emergency temperature	130°C	13
OCX	x	Collector cooling option	OFF	14
CMX	x*	Maximum collector temperature	110°C	14
OCN	x	Collector minimum limitation option	OFF	14
CMN	x*	Collector minimum temperature	10°C	14
OCF	x	Antifreeze option	OFF	14
CFR	x*	Antifreeze temperature	4.0°C	14
OREC	x	Recooling option	OFF	15
OTC	x	Tube collector option	OFF	15
OHQM	x	Heat quantity measurement option	OFF	15
FMAX	x*	Maximum flow rate	6.0 l	15
MEDT	x*	Antifreeze type	1	15
MED%	x*	Antifreeze concentration (only if MEDT = propylene or ethylene glycol)	45%	15
nMX	x*	Maximum speed relay 1	100%	16
nMN	x	Minimum speed relay 1	30%	16
MAN	x	Manual mode R1	Auto	16
LANG	x	Language	dE	16
VERS		Version number		

3 Operation and function

3.1 Buttons



The controller is operated via the 3 push buttons below the display.

Button 1 (+) - Scrolling forwards, increasing adjustment values.

Button 2 (-) - Scrolling backwards, reducing adjustment values.

Button 3 (OK) - confirming/selecting.

During normal operation, display channels will be displayed.

→ In order to scroll between display channels, press buttons 1 and 2.

Access to adjustment channels:

→ Use button 1 in order to scroll to the last display channel, then press and hold down button 1 for approx. 2 s.

If an **adjustment channel** is shown on the screen, **SET** will be displayed on the right-hand side next to the channel name.

→ Press button 3 in order to select an adjustment channel.

SET starts flashing.

→ Adjust the desired value with buttons 1 and 2.

→ Briefly press button 3.

SET permanently appears, the adjusted value has been saved.

4 System-Monitoring-Display

System-Monitoring-Display



The System-Monitoring-Display consists of 3 blocks: channel display, tool bar and system screen.

Channel display



The channel display consists of 2 lines. The upper display line is an alphanumeric 16-segment display. In this line, mainly channel names and menu items are displayed. In the lower 16-segment display, values are displayed.

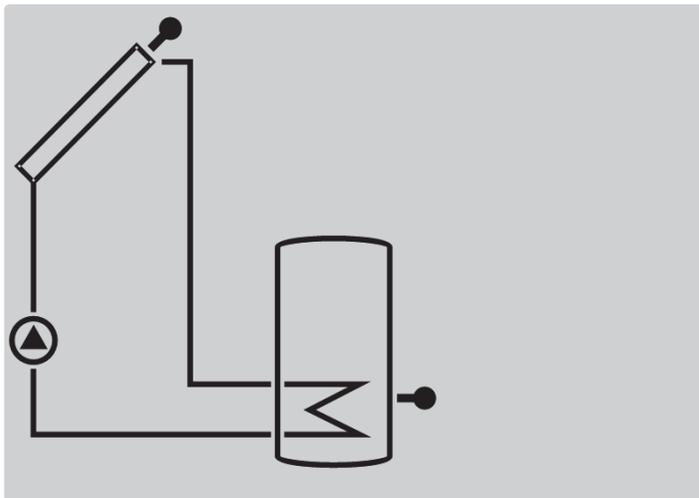
Tool bar



The additional symbols in the tool bar indicate the current system state.

4.1 System screen

The system selected is indicated in the System-Monitoring-Display. It consists of several system component symbols which are – depending on the current status of the system – either flashing, permanently shown or not indicated.



Collector
with collector sensor



Temperature sensor



Store
with heat exchanger



Pump

4.2 Other indications

System screen

- Pump symbol is flashing when the relay is active
- Sensor symbols are flashing, if the corresponding sensor display channel is selected
- Sensors are flashing quickly in the case of a sensor fault

Operating control LED

Green: Everything OK

Red/green flashing: Initialisation active
Manual mode

Red flashing: Sensor fault (sensor symbol is flashing quickly)

Permanently shown	Flashing	Status indications:
ⓘ		Relay 1 active
☀		Maximum store temperature exceeded
	⚠ + ☀	Store emergency shutdown active
	⚠	Collector emergency shutdown active
ⓘ	☀	Collector cooling active
ⓘ	☀	Recooling active
	❄	Collector minimum limitation active
❄		Antifreeze function activated
ⓘ	❄	Antifreeze function active
👤 + ⓘ	⚠	Manual mode relay 1 ON
👤	⚠	Manual mode relay 1 OFF
🔧	⚠	Sensor fault

5 Channel overview

5.1 Display channels



Note:

The display and adjustment channels as well as the adjustment ranges depend on the functions and options as well as on the system components connected to the controller.

Display of collector temperatures



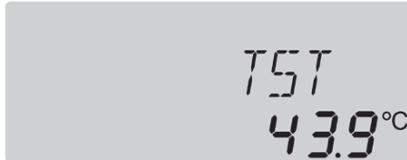
COL

Collector temperature

Display range: -40 ... +260 °C

Indicates the collector temperature.

Display of store temperatures



TST

Store temperature

Display range: -40 ... +260 °C

Indicates the store temperature.

Display of sensor S3



S3

Sensor temperature

Display range: -40 ... +260 °C

Indicates the current temperature at the additional sensor (without control function).



Note:

Only if a sensor is connected to the corresponding terminal, will a value be displayed.

Indication of return temperature



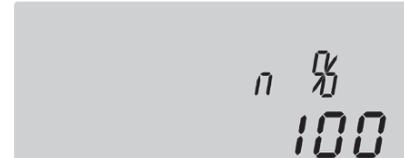
TR

Return temperature

Display range: -40 ... +260 °C

If the heat quantity measurement is activated, the temperature at sensor S3 will be indicated as TR.

Indication of current pump speed



n%

Current pump speed

Display range: 20 ... 100 %

Indicates the current pump speed.

Display of heat quantity



kWh/MWh

Heat quantity in kWh/MWh

Display channel

Indicates the heat quantity produced in the system. For this purpose, the heat quantity measurement option has to be enabled. The flow rate as well as the values of the reference sensors flow and return are used for calculating the heat quantity supplied. It is shown in kWh in the **kWh** channel and in MWh in the **MWh** channel. The overall heat quantity results from the sum of both values.

The accumulated heat quantity can be set back to zero. As soon as one of the display channels of the heat quantity is selected, the symbol **SET** is displayed.

→ In order to access the reset mode of the counter, press button 3 for approx. 2 s.

SET starts flashing and the heat quantity value will be set back to zero.

→ In order to finish the reset process, press button 3.

In order to interrupt the reset process, do not press any button for about 5 s. The display returns to the display mode.

Operating hours counter



h P

Operating hours counter

Display channel

The operating hours counter accumulates the operating hours of the corresponding relay (**h P**).

Full hours are displayed.

The accumulated operating hours can be set back to zero. As soon as the operating hours channel is selected, the symbol **SET** is displayed.

→ In order to access the reset mode of the counter, press button 3 for approx. 2 s.

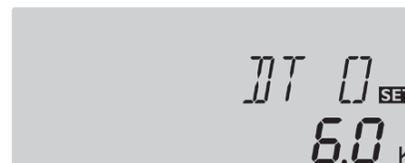
SET starts flashing and the operating hours value will be set back to zero.

→ In order to finish the reset process, press button 3.

In order to interrupt the reset process, do not press any button for about 5 s. The display returns to the display mode.

5.2 Adjustment channels

ΔT control



DT O

Switch-on temperature difference

Adjustment range: 1.0 ... 20.0 K

Factory setting: 6.0 K

The controller works as a standard differential controller. If the temperature reaches or exceeds the switch-on temperature difference, the pump switches on. When the temperature difference reaches or falls below the adjusted switch-off temperature difference, the respective relay switches off.



Note:

The switch-on temperature difference must be at least 0.5 K higher than the switch-off temperature difference.



DT F

Switch-off temperature difference

Adjustment range: 0.5 ... 19.5 K

Factory setting: 4.0 K

Speed control



DT S

Set temperature difference

Adjustment range: 1.5 ... 30.0 K

Factory setting: 10.0 K



Note:

For pump speed control, the operating mode of the relay must be set to **AUTO** (adjustment channel **MAN**)!



RIS

Rise

Adjustment range: 1 ... 20 K

Factory setting: 2 K

If the temperature difference reaches or exceeds the switch-on temperature difference, the pump switches on at 100% speed for 10 s. Then, the speed is reduced to the minimum pump speed value.

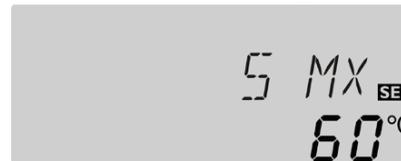
If the temperature difference reaches the adjusted set value, the pump speed increases by one step (10%). The response of the controller can be adapted via the parameter Rise. Each time the difference increases by the adjustable rise value, the pump speed increases by 10 % until the maximum pump speed of 100% is reached. If the temperature difference decreases by the adjustable rise value, pump speed will be decreased by one step.



Note:

The set temperature difference must be at least 0.5 K higher than the switch-on temperature difference.

Maximum store temperature



SMX

Maximum store temperature

Adjustment range: 4 ... 95 °C

Factory setting: 60 °C

If the store temperature reaches the adjusted maximum temperature, the store will no longer be loaded in order to avoid damage caused by overheating. A hysteresis of 2 K is set for the maximum store temperature.

If the maximum store temperature is exceeded, ☼ is displayed.



Note:

If the collector cooling or the system cooling function is activated, the adjusted maximum store temperature may be exceeded. In order to prevent system damage, the controller is also equipped with an integrated store emergency shutdown, deactivating the system if the store reaches 95 °C.

Collector emergency shutdown



EM

Collector limit temperature

Adjustment range: 80 ... 200 °C

Factory setting: 130 °C

When the collector temperature exceeds the adjusted collector limit temperature, the solar pump (R1) switches off in order to protect the system components against overheating (collector emergency shutdown). If the maximum collector temperature is exceeded, ⚠ is displayed (flashing).

Collector cooling



OCX

Collector cooling option
Adjustment range: OFF/ON
Factory setting: OFF



CMX

Collector maximum temperature
Adjustment range: 70... 160 °C
Factory setting: 110 °C

The collector cooling function keeps the collector temperature within the operating range by heating the store. If the store temperature reaches 95 °C the function will switch off for safety reasons.

If the store temperature exceeds the adjusted maximum store temperature, the solar system is switched off. If the collector temperature increases to the adjusted maximum collector temperature, the solar pump is activated until the collector temperature falls below the maximum collector temperature. The store temperature may then exceed the maximum temperature, but only up to 95 °C (emergency shutdown of the store).

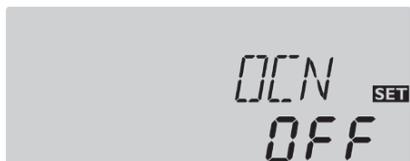
If the collector cooling function is active, and are displayed (flashing).



Note:

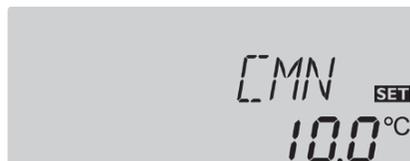
The cooling function will not become active as long as solar loading is possible.

Minimum collector limitation



OCN

Collector minimum limitation option
Adjustment range: OFF/ON
Factory setting: OFF



CMN

Minimum collector temperature
Adjustment range: 10.0... 90.0 °C
Factory setting: 10.0 °C

If the collector minimum limitation option is activated, the pump (R1) will only be switched on if the adjustable collector minimum temperature is exceeded. The minimum temperature prevents the pump from being switched on too often at low collector temperatures. A hysteresis of 5 K is set for this function.

If the collector minimum limitation is active, is displayed (flashing).



Note:

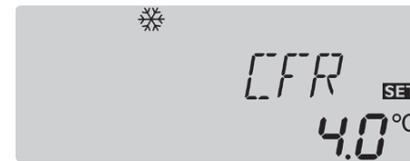
If **OCF** is active, the collector minimum limitation will be overridden. In that case, the collector temperature may fall below **CMN**.

Antifreeze function



OCF

Antifreeze option
Adjustment range: OFF/ON
Factory setting: OFF



CFR

Antifreeze temperature
Adjustment range: -40.0... +10.0 °C
Factory setting: +4.0 °C

The antifreeze function activates the loading circuit between the collector and the store when the temperature falls below the adjusted antifreeze temperature. This will protect the fluid against freezing or coagulating. If the adjusted antifreeze temperature is exceeded by 1 K, the loading circuit will be deactivated.

If the antifreeze function is activated, is displayed. If the antifreeze function is active, and are displayed (flashing).



Note:

Since this function uses the limited heat quantity of the store, the antifreeze function should only be used in regions with few days of temperatures around the freezing point.

The antifreeze function will be suppressed if the store temperature falls below +5 °C in order to protect the store from frost damage.

Recooling function



OREC

Recooling option

Adjustment range: OFF/ON

Factory setting: OFF

When the recooling function is activated, the controller aims to cool down the store during the night in order to prepare it for solar loading on the following day. If the adjusted maximum store temperature (**SMX**) is exceeded and the collector temperature falls below the store temperature, the system will be reactivated in order to cool down the store. Cooling will continue until the store temperature has fallen below the adjusted maximum store temperature (**SMX**) again. A hysteresis of 2 K is set for the recooling function.

Reference thresholds for the recooling function are **DTO** and **DTF**. While recooling is active, ① and ☀ (flashing) will be indicated on the display.

Tube collector function



OTC

Tube collector function

Adjustment range: OFF/ON

Factory setting: OFF

If the controller detects an increase by 2 K compared to the previously stored collector temperature, the solar pump will be switched on for about 30 s in order to detect the fluid temperature. The current collector temperature will then be saved as a new reference value. If the measured temperature (new reference value) is exceeded by 2 K, the solar pump will again run for 30 s. If the switch-on difference between the collector and the store is exceeded during the runtime of the solar pump or the loading break, the controller will automatically switch to solar loading. If the collector temperature decreases by 2 K during a loading break, the switch-on value for the tube collector function will be recalculated.

Heat quantity measurement



OHQM

Heat quantity measurement

Adjustment range: OFF/ON

Factory setting: OFF



MEDT

Heat transfer fluid

Adjustment range: 0 ... 3

Factory setting: 1



FMAX

Flow rate in l/min

Adjustment range: 0.5 ... 100.0

Factory setting: 6.0



MED%

Antifreeze ratio

in Vol-% (MED% is not indicated when MEDT 0 or 3 is used.)

Adjustment range: 20 ... 70%

Factory setting: 45%

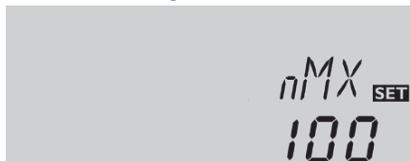
If OHQM is activated, the heat quantity gained can be calculated and displayed. Heat quantity measurement is possible if a flowmeter is used.

The heat quantity balancing (estimation) uses the difference between the flow and return temperatures and the entered flow rate (at 100 % pump speed).

- ➔ Read the flow rate (l/min) and adjust it in the **FMAX** channel.
- ➔ Adjust the antifreeze type and concentration of the heat transfer fluid in the channels **MEDT** and **MED%**.

Heat transfer fluid:

- 0: Water
- 1: Propylene glycol
- 2: Ethylene glycol
- 3: Tyfocor® LS/G-LS

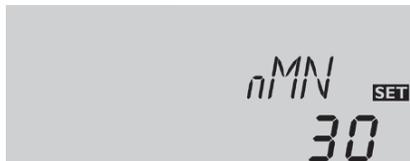
Maximum speed**nMX**

Maximum speed

Adjustment range: 22 ... 100%

Factory setting: 100%

A relative maximum pump speed can be allocated to the PWM output via the adjustment channel **nMX**.

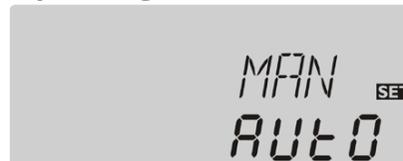
Minimum speed**nMN**

Minimum speed

Adjustment range: 20 ... 98%

Factory setting: 30%

A relative minimum pump speed can be allocated to the PWM output via the adjustment channel **nMN**.

Operating mode**MAN**

Operating mode

Adjustment range: OFF, AUtO, ON

Factory setting: AUtO

For control and service work, the operating mode of the relay can be manually adjusted. For this purpose, select the adjustment channel **MAN** in which the following adjustments can be made:

Operating mode

OFF : Relay off ⚠ (flashing) + 🖱

Auto : Relay in automatic operation

ON : Relay off ⚠ (flashing) + 🖱

**Note:**

Always adjust the operating mode back to **AUtO** when the control and service work is completed. Normal operation is not possible in manual mode.

Language**LANG**

Language selection

Selection: dE, En

Factory setting: dE

In this adjustment channel the menu language can be selected.

- dE : Deutsch
- En : English

6 Troubleshooting

If a malfunction occurs, the display symbols will indicate an error code:



Operating control LED is permanently off.

Check the power supply of the controller. Is it disconnected?

no

The fuse of the controller could be blown. The fuse holder (which holds the spare fuse) becomes accessible when the cover is removed. The fuse can then be replaced.

yes

Check the supply line and reconnect it.

The symbol is indicated on the display and the symbol is flashing.

Sensor fault. An error code instead of a temperature is shown on the sensor display channel.

888.8

- 88.8

Cable is broken. Check the cable.

Short circuit. Check the cable.

Disconnected Pt1000 temperature sensors can be checked with an ohmmeter. Please check the resistance values correspond with the table.

°C	Ω	°C	Ω
-10	961	55	1213
-5	980	60	1232
0	1000	65	1252
5	1019	70	1271
10	1039	75	1290
15	1058	80	1309
20	1078	85	1328
25	1097	90	1347
30	1117	95	1366
35	1136	100	1385
40	1155	105	1404
45	1175	110	1423
50	1194	115	1442

Resistance values of Pt1000 sensors

Pump is overheated, but no heat transfer from the collector to the store, flow and return have the same temperature; perhaps also bubbling in the lines.

Air or gas bubbles in the system?

no

yes

Vent the system; increase the system pressure to a static primary pressure of at least plus 0.5 bar [7.25 psi]; if necessary continue to increase the pressure; switch the pump on and off for a short time.

Are the valves or the non-return valves defective or is the dirt trap blocked?

yes

Clean the dirt trap or replace defective component

Pump starts up very late.

Switch-on temperature difference ΔT_{on} too large?

no

yes

Change ΔT_{on} and ΔT_{off} correspondingly.

Non-ideal position of the collector sensor (e. g. flatscrew sensor instead of sensor in immersion sleeves).

no

yes

Put the solar pump (R1) into the manual mode On for a short time during irradiation. Check whether the collector temperature significantly increases.

Minimum limitation active

o.k.

Pump starts for a short moment, switches off, switches on again, etc.

Temperature difference at the controller too small?

no

yes

Change ΔT_{on} and ΔT_{off} correspondingly.

Wrong position of collector sensors?

no

yes

Mount the collector sensor at solar flow (warmest collector output); use immersion sleeve of the respective collector.

Plausibility control of the option tube collector function

The temperature difference between store and collector increases enormously during operation; the collector circuit cannot dissipate the heat.

Collector circuit pump/zone valve defective?

no

yes

Check or replace, if necessary

Heat exchanger calcified?

no

yes

Decalcify it

Heat exchanger blocked?

no

yes

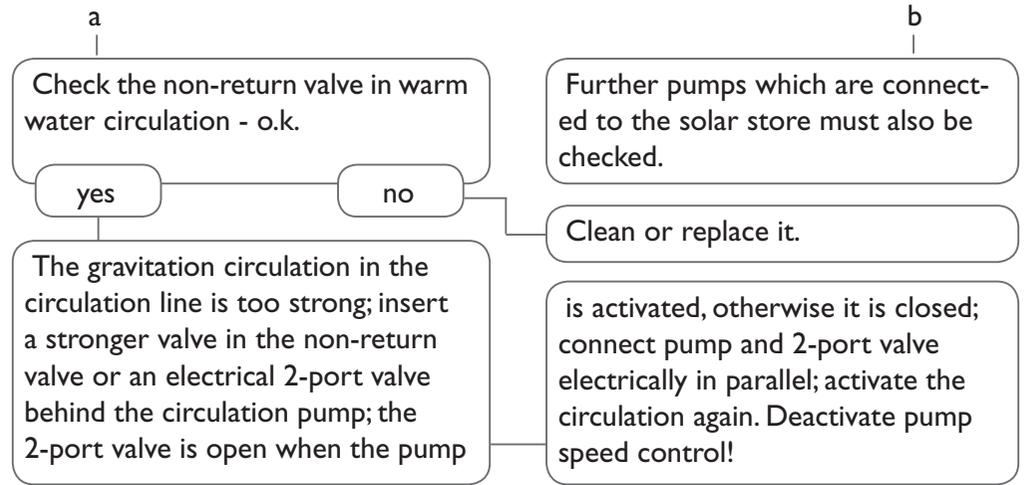
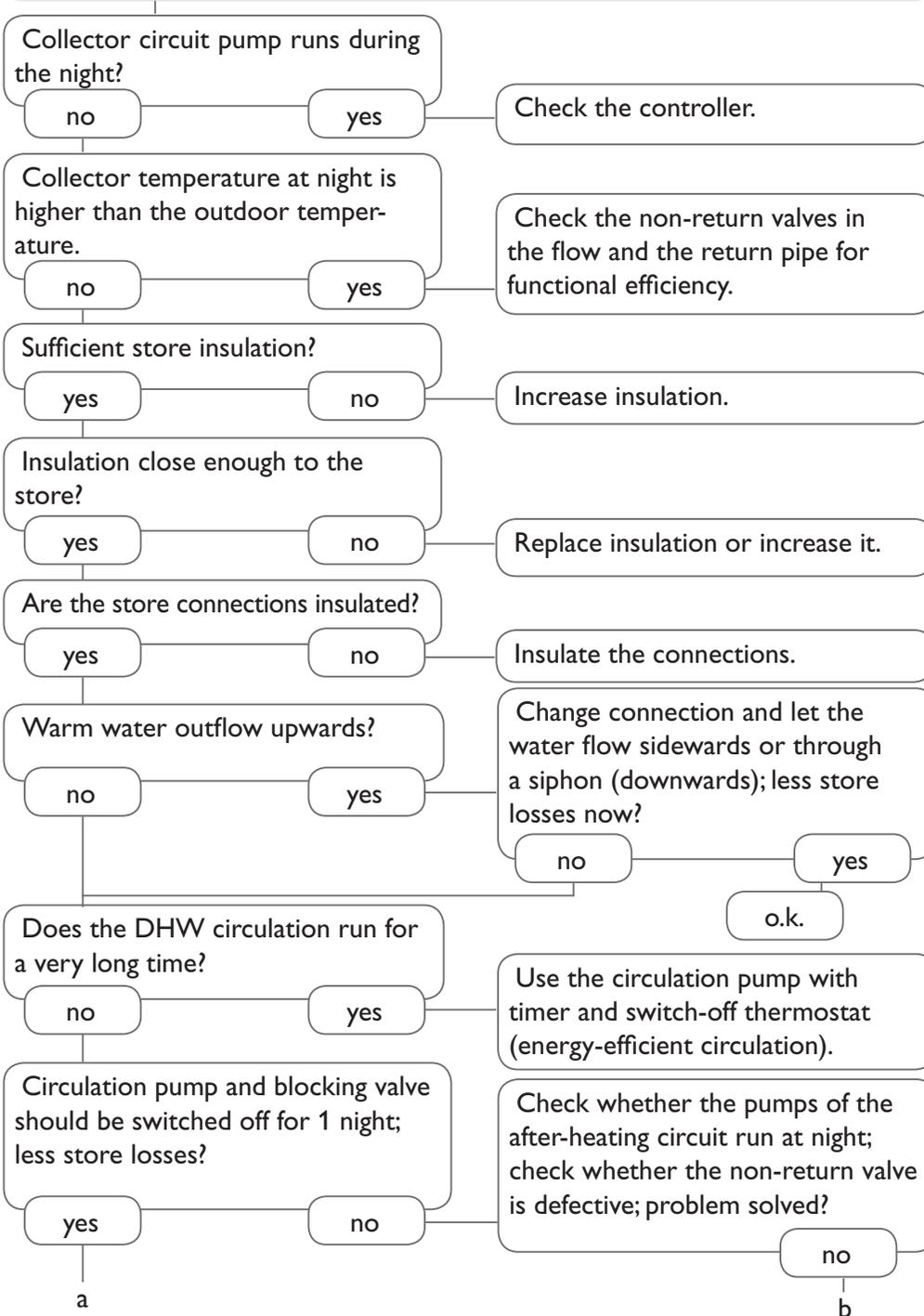
Clean it

Heat exchanger too small?

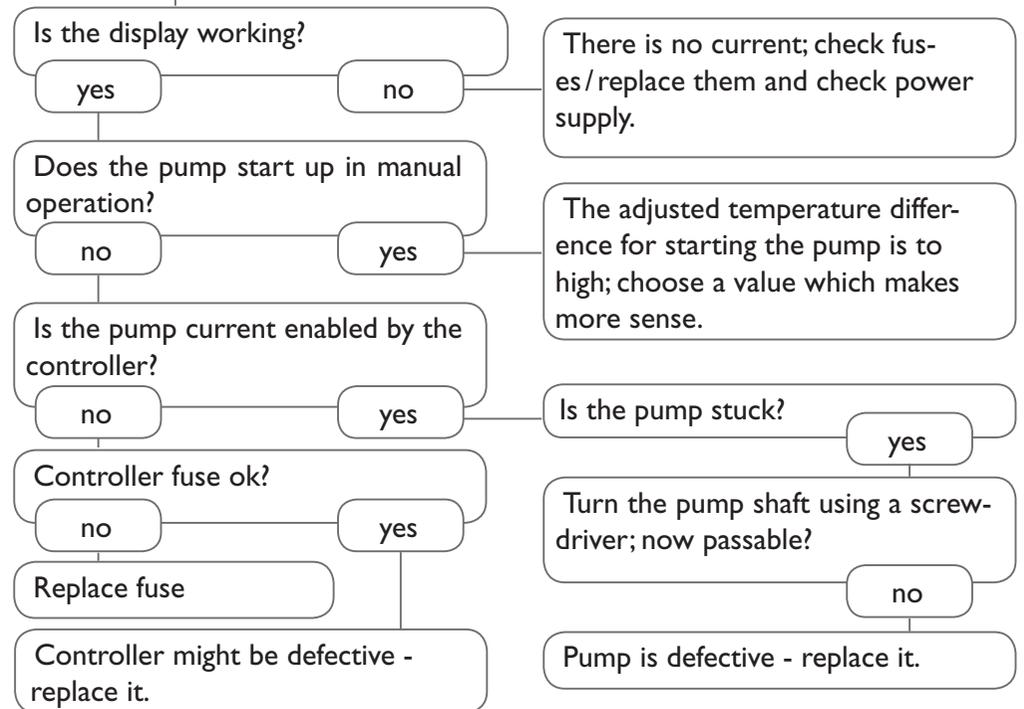
yes

Replace with correctly sized one.

Stores cool down at night.



The solar circuit pump does not work, although the collector is considerably warmer than the store.





Sensors



Overvoltage protection device



SD3 Smart Display / GA3 Large Display



AM1 Alarm Module



KM1 Communication module



DL2 Datalogger



VBus®/USB & VBus®/LAN interface adapters

7.1 Sensors and measuring instruments

Sensors

The product range includes high-precision platinum temperature sensors, flatscrew sensors, outdoor temperature sensors, indoor temperature sensors, cylindrical clip-on sensors, also as complete sensors with immersion sleeve.

Overvoltage protection device

In order to avoid overvoltage damage at collector sensors (e. g. caused by local lightning storms), we recommend installing the overvoltage protection SP10.

7.2 VBus® accessories

SD3 Smart Display/ GA3 Large Display

The Smart Display is designed for simple connection to controllers with VBus®. It is used for visualising data issued by the controller: collector temperature, store temperature and energy yield of the solar thermal system. The use of high-efficiency LEDs and filter glass assures a high optical brilliance. An additional power supply is not required. One module is required per controller.

The GA3 is a completely mounted large display module for visualisation of collector- and store temperatures as well as the heat quantity yield of the solar system via one 6-digit and two 4-digit 7-segment displays. An easy connection to all controllers with VBus® is possible. The front plate is made of antireflective filterglass and is printed with a light-resistant UV-lacquering. The universal VBus® allows the parallel connection of 8 large displays as well as additional VBus® modules.

AM1 Alarm Module

The AM1 Alarm Module is designed to signal system failures. It is to be connected to the VBus® of the controller and issues an optical signal via the red LED if a failure has occurred. The AM1 also has a relay output, which can e. g. be connected to a building management system (BMS). Thus, a collective error message can be issued in the case of a system failure.

KM1 Communication module

The KM1 Communication module is the network connection for solar and heating systems, especially suited for technicians managing large systems, heating installers and home owners who like to keep a close eye on their system. The system can be parameterised over the Internet. VBus.net enables e. g. controlling the system yield in a comprehensive system scheme image.

DL2 Datalogger

This additional module enables the acquisition and storage of large amounts of data (such as measuring and balance values of the solar system) over a long period of time. Over the VBus.net Internet portal, the system can be accessed with just a few clicks. For transmission of the data stored in the internal memory of the DL2 to a PC, an SD card can be used.

The DL2 is appropriate for all controllers with VBus®. It can be connected directly to a PC or router for remote access and thus enables comfortable system monitoring for yield monitoring or for diagnostics of faults.

7.3 Interface adapters

VBus®/USB & VBus®/LAN interface adapters

The VBus®/USB interface adapter is the interface between the controller and a personal computer. With its standard mini-USB port it enables a fast transmission of system data for processing, visualising and archiving data via the VBus®. The ServiceCenter software is included.

The VBus®/LAN interface adapter is designed for the direct connection of the controller to a PC or router. It enables easy access to the controller via the local network of the owner. Thus, controller access and data charting can be effected from every workstation of the network and the system data can be read out with the ServiceCenter software. The VBus®/LAN interface adapter is suitable for all controllers equipped with a VBus®. The ServiceCenter software is included.

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