

SC ACS 80

DESCRIPTION

The **SC ACS 80** is an instantaneous domestic hot water production module that uses the working principle of a stainless steel plates exchanger.

The setting of the domestic hot water outlet temperature (secondary side) happens with the modulation of the primary circuit flow rate through a variable flow pump controlled by LFWC controller (PWM control).

The system, which works with a low primary temperature, finds a wide use in thermal solar systems and in underfloor heating.

3-way mixing valve: establishes the inlet water temperature (ideal function for the summer, in which the system exploits solar thermal panels)

CONTENTS OF KIT

<u>Description</u>	<u>Qty.</u>
1 DHW mixer in packing	1
2 Instruction manual	1
3 Circulation pump assembling instructions	1
4 Immersion sensors	2
5 Fuse	1



At the end of its life, the product should be not be disposed of as solid urban waste, but rather it should be handed over to a differentiated waste collection centre.

GENERAL SAFETY INFORMATION AND PRECAUTIONS

READ THIS MANUAL THOROUGHLY BEFORE PERFORMING ANY WORK ON THE PRODUCT.

The manufacturer reserves the right to modify the product without notice for the purpose of introducing technical improvements or to facilitate production, installation and positioning. The illustrations in this manual may therefore differ slightly from the actual product. The safety of the product and the accuracy of the instructions provided are nevertheless guaranteed.

This manual forms an integral part of the product itself and must be kept in a safe place in order to avoid damage and to permit rapid consultation throughout the working life of the product.

Ideally, this manual should be kept with the product where it can be consulted whenever needed. The manual should always accompany the product if sold or transferred to a new owner, or stay with it if the owner moves house and leaves it behind, so that the next user can consult it.

GENERAL SAFETY INFORMATION

INSTALLATION

Disconnect the product from the mains power supply before commencing any work on it.

The product must be installed in conformity to the laws and standards applicable in the country of installation.

The manufacturer's responsibility ends with the supply of the product. The product must be installed using best professional practices, in conformity to applicable standards, by suitably qualified persons employed by a company that assumes full responsibility for the completed installation.

The manufacturer cannot be held responsible for consequences deriving from the unauthorised modification of the product or from the use of non-original spare parts.



Do not expose the product to the elements. It is not designed for use outdoors

ELECTRICAL CONNECTIONS

The product must be installed and all electrical connections made by suitably qualified personnel in conformity to applicable standards.

The product's mains power cable must be connected to a fused, two-pole switch (power supply 230 VAC, 50 Hz). The product must be correctly connected to ground.



The product must be connected to the mains power supply via an earth leakage breaker in accordance with applicable standards. Correct functioning is only guaranteed provided the product is used with the pump for which it is designed. The manufacturer cannot be held responsible for the consequences of improper uses.

WATER CONNECTIONS

On completion of all transport or handling operations, always check the tightness of the water fitting ring nuts.

Take particular care when connecting the product to the water supply. When tightening a fitting, always hold the opposite fitting steady with a second tool to avoid twisting the copper pipes.

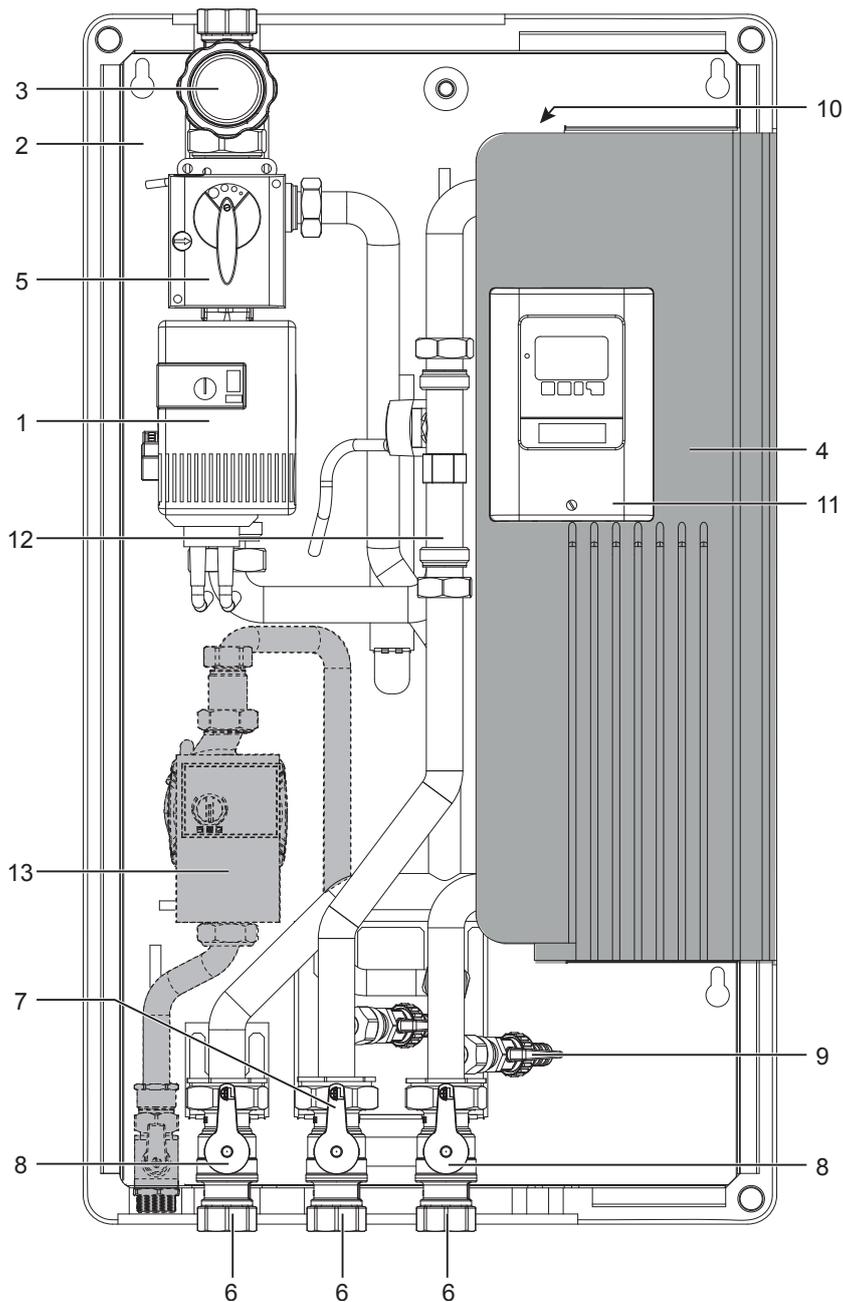


The product must be installed, connected and tested by suitably qualified persons, in conformity to applicable standards and in accordance with the instructions provided in the documentation supplied with it. **N.B. All pipes must be insulated in conformity to applicable standards.**

It is essential to respect the following precautions when using the product:

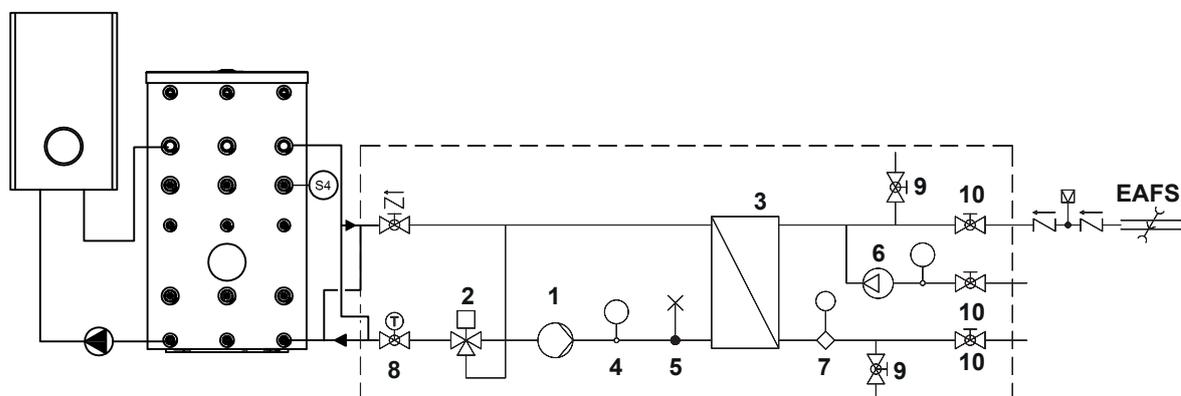
- Do not touch hot parts of the product such as the water inlet and outlet pipes. Contact with hot parts can cause painful burns.
- Do not splash water or any other liquid over the product.
- Do not rest any objects on top of the product.
- Do not expose the product to steam from a cooking hob.
- Do not allow children or inexperienced persons to operate the product.
- Do not touch the product when barefoot or wet.
- Do not pull on the electrical cables.
- Wear protective gloves and safety shoes before handling the product.

MAIN COMPONENTS



- 1 High efficiency pump
- 2 Black template frame
- 3 Black handle with red thermometer (primary circuit)
- 4 Brazed plate iron steel heat exchanger with insulation
- 5 3-way mixing valve type "TV3" DN25 with electric actuator NRYC230;
- 6 Ball valve DN25 with nut 1" 1/2
- 7 Red handle
- 8 Blue handle
- 9 Load / drain tap 1/2"
- 10 Manual air vent valve 3/8"
- 11 Electronic regulator mod. LFWC
- 12 Vortex flow sensor 5-100 l/min
- 13 Recirculation kit (separately supplied) composed by: high efficiency pump, Molex cable, ball valve- M-F 3/4", straight terminal with check valve, PT1000 sensor and sensor pocket, piping and accessories.

WATER CIRCUIT

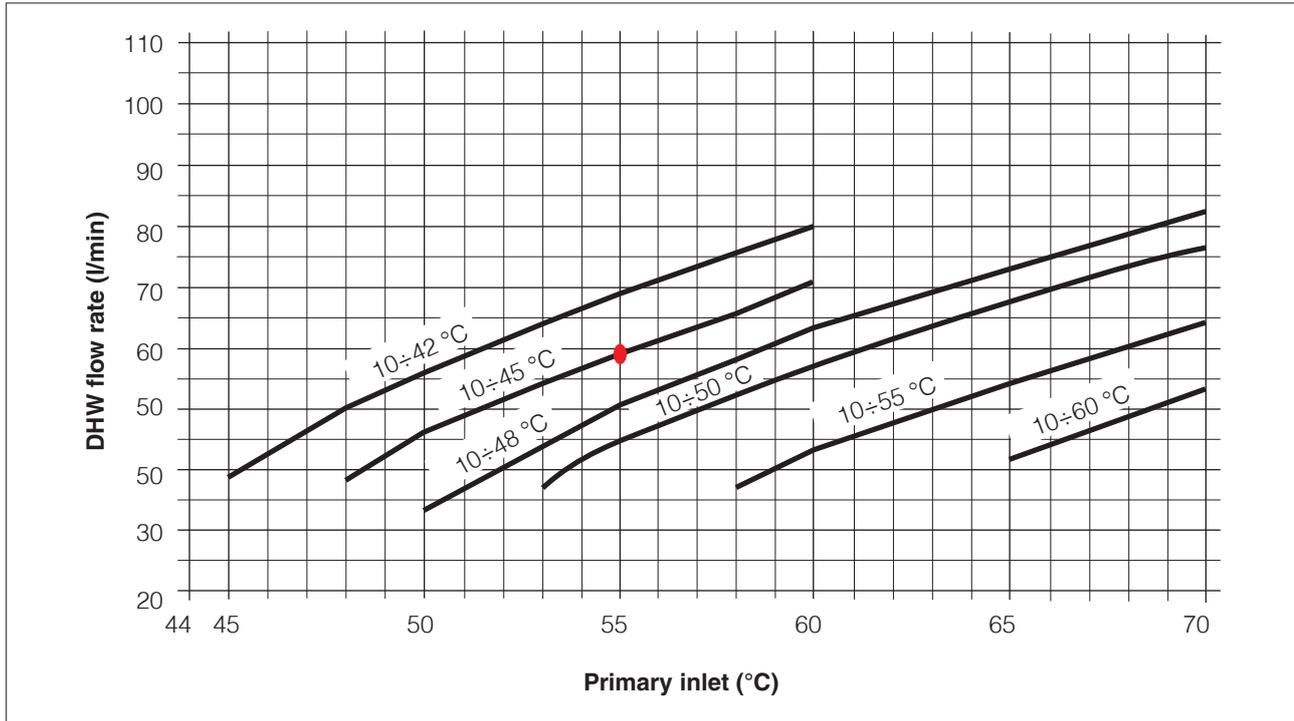


- | | |
|---|------------------------------------|
| 1 High efficiency pump primary circuit | 6 Ricirculation kit |
| 2 3-way mixing valve with electric actuator | 7 Vortex flow sensor |
| 3 Plate heat exchanger | 8 DN25 ball valve with thermometer |
| 4 Sensor pocket | 9 Load / Drain tap |
| 5 Manual air vent valve | 10 DN25 ball valve |

TECHNICAL SPECIFICATIONS

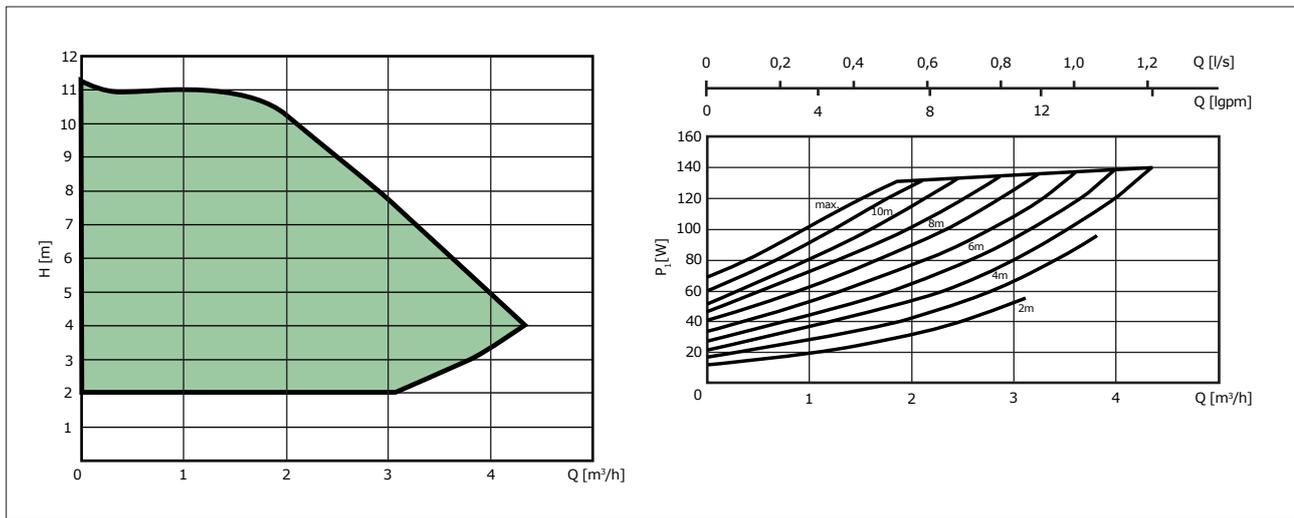
DESCRIPTION	SC ACS 80	
Thermal power supplied with storage cylinder at 50°C and DHW water delivery at 10-45°C	134	kW
Water draw at 10-45°C with storage cylinder at 50°C	55	l/min
Thermal power absorbed with storage cylinder at 55°C and DHW water delivery at 10-45°C	146	kW
Water draw at 10-45°C with storage cylinder at 55°C	60	l/min
Thermal power absorbed with storage cylinder at 60°C and DHW water delivery at 10-48°C	196	kW
Water draw at 10-48°C with storage cylinder at 60°C	64	l/min
Maximum flow-rate primary	3.600	l/h
Minimum permissible temperature, DHW circuit	2	°C
Maximum operating temperature	90	°C
Maximum operating pressure, primary circuit	6	bar
Opening pressure, primary circuit non-return valves	28	mbar
Opening pressure, DHW circuit non-return valves	28	mbar
Consumption	132	W
Power supply voltage	230	V
Power supply frequency	50-60	Hz
Control unit protection category	40	IP
Net weight	30	kg
Water capacity	19	l

Domestic hot water production graph

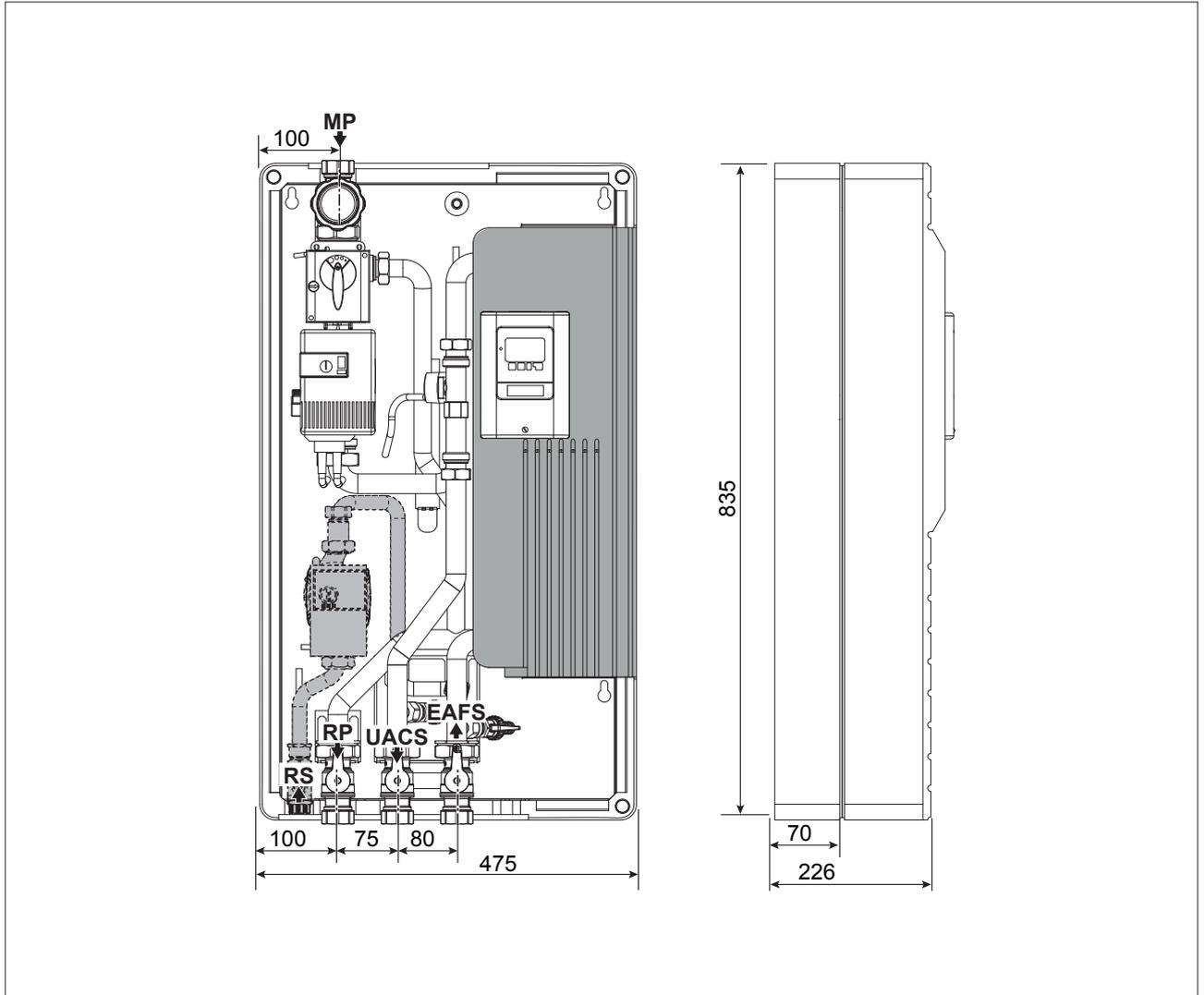


NB: Correct functioning of the product is only guaranteed if the primary circuit inlet temperature is at least 5°C higher than the DHW setpoint.

CHARACTERISTIC CURVES FOR PRIMARY CIRCUIT PUMPS



DIMENSIONS AND FITTINGS

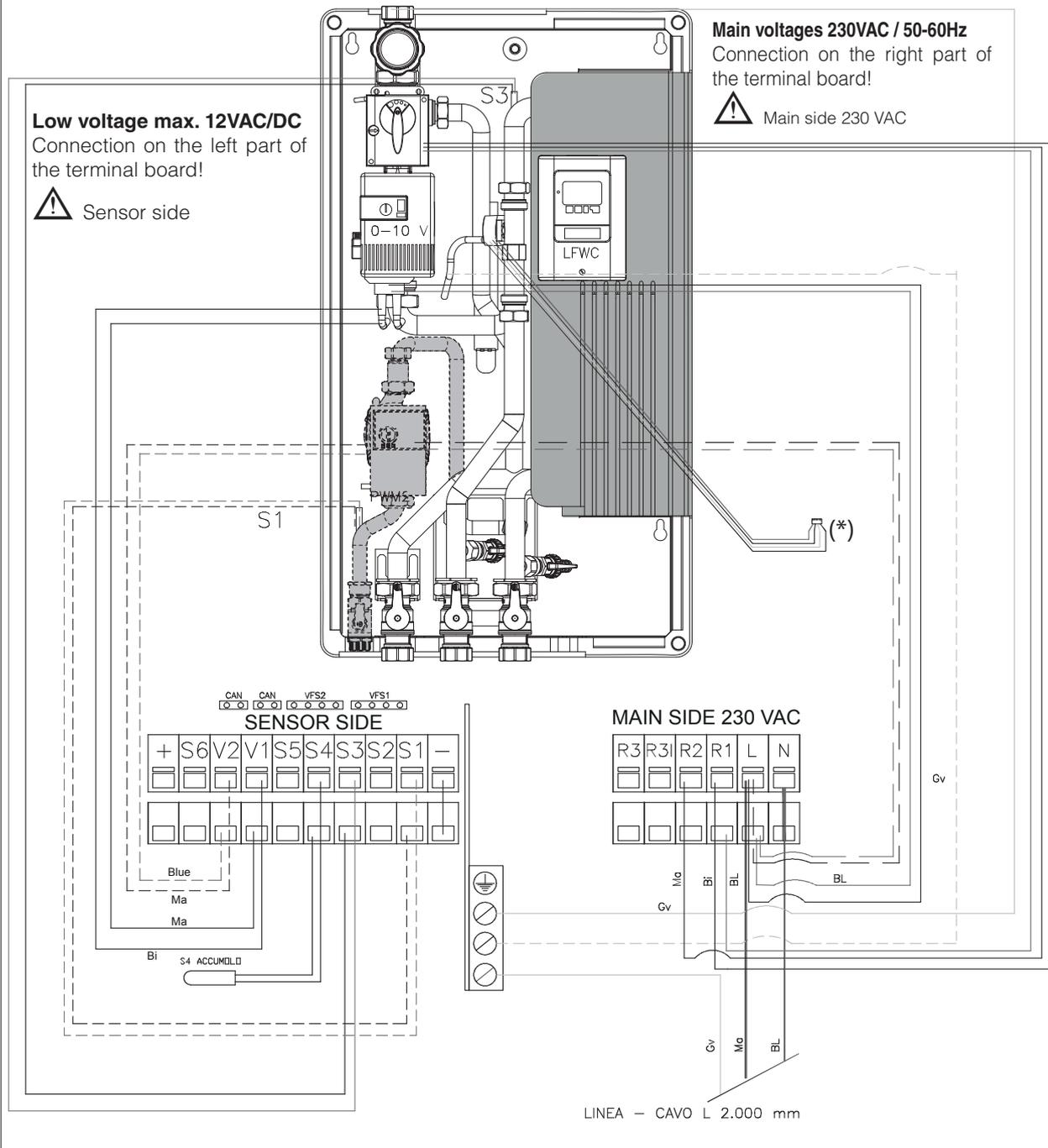


	SC ACS 80
MP - Primary inlet	1" F
RP - Primary outlet (return)	1" F
EAFS - Domestic cold water inlet	1" F
UACS - DHW outlet	1" F
RS - Recirculation union	3/4" M

WIRING DIAGRAM

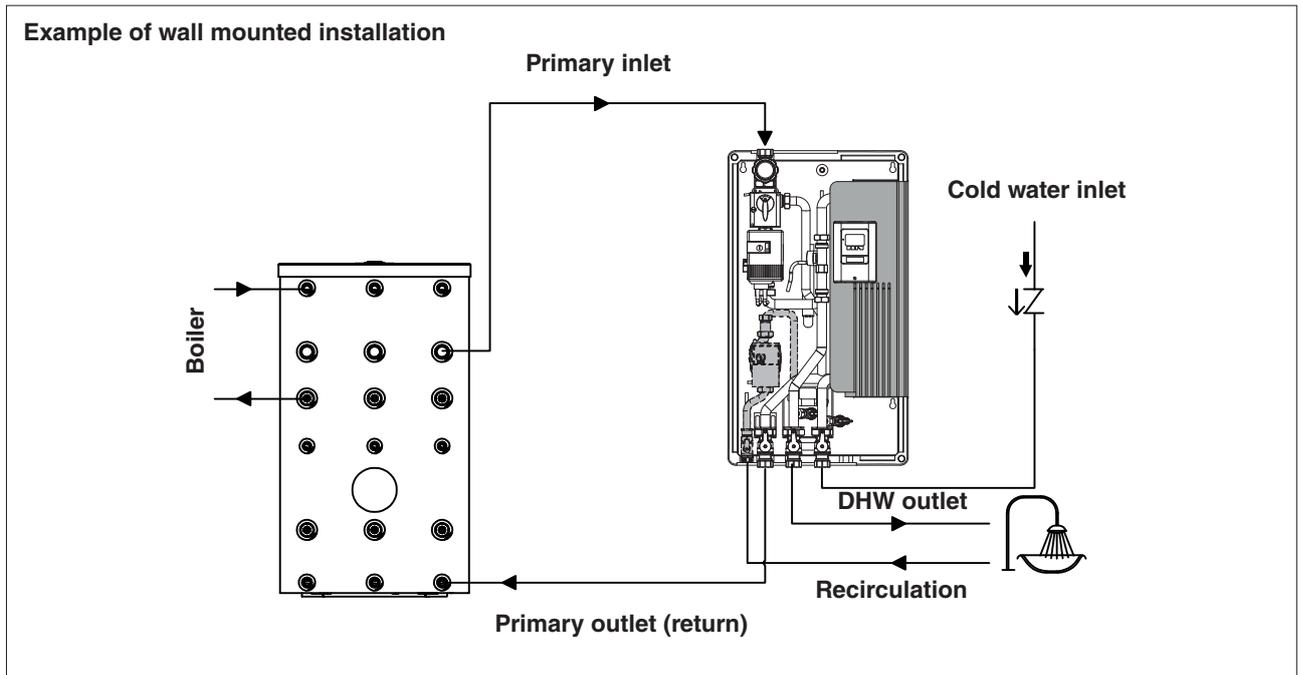
- V1** PWM1 Primary circuit pump
- V2** iPWM2 Recirculation pump
- S1** PT1000 Recirculation (S1 optional)
- S3** PT1000 primary circuit (S3)
- S4** Puffer high PT1000

- GND** Ground
- MA** phase line L / primary pump
- BL** Neutral line N / primary pump
- (*)** Connect to controller terminal VFS1



- ⚠ The polarity of the sensors is freely selectable.
- ⚠ The connection of the ground must be made to the lower part of the terminal (-)
- ⚠ Protection line PE must be connected to the metal clamp PE!

SYSTEM SCHEMATIC



In case of recirculation, provide a suitably sized expansion tank in order to avoid overpressure due to thermal expansion and water hammer.

INSTALLATION

PRELIMINARY CHECKS

Carefully remove the packing and check that the product is complete and undamaged. If any defect or damage is detected, do not install or attempt to repair the product but return it to the retailer. Dispose of packaging in compliance with applicable law.



Make sure that the installation position provides easy visibility of and access to the safety valves.



Connect the safety valves to a drain in conformity to applicable standards.



Install the product as near as practical to the storage cylinder. The product is designed to work with a pipe length of 4 metres (inlet and return) between itself and the storage cylinder. Get the storage cylinder away can result in performance drops in terms of potential and reactivity.



Disconnect the product from the mains power supply before commencing any work on it.



The product must be installed in conformity to the laws and standards applicable in the country of installation.



The manufacturer's responsibility ends with the supply of the product. The product must be installed in conformity to applicable standards by suitably qualified persons employed by a company that assumes full responsibility for the completed installation.

INSTALLATION AND PUTTING INTO SERVICE

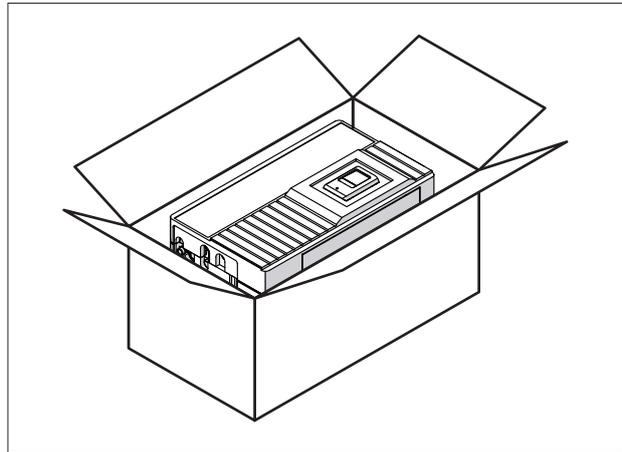
Bear in mind the following before installing the product:

- The product is designed to mix domestic hot water from a storage cylinder. Any other use, or any use incompatible with the product's technical specifications, is considered improper. Do not connect the product directly to a boiler.
- The product is not designed to be operated by children or persons with limited physical, psychological, sensorial or mental capacities.
- If the piping needed to connect the product to the water system is damaged, it must be replaced by a suitably qualified person.
- The installation must comply with all applicable laws and standards.

⚠ Installation and connection of the product must be performed by an authorised, specialist company. The company installing the product assumes all responsibility for ensuring that the installation and functioning of the product conform to applicable standards.

⚠ The product must be stored in a dry place where it is not subject to frost. The product must be installed where it is protected against splashes of water. Ambient temperature in the place of installation must not exceed 40°C during functioning of the product.

⚠ It is advisable to install the product as near as practically possible to the storage cylinder, in order to avoid unnecessary heat loss from the connecting pipes.

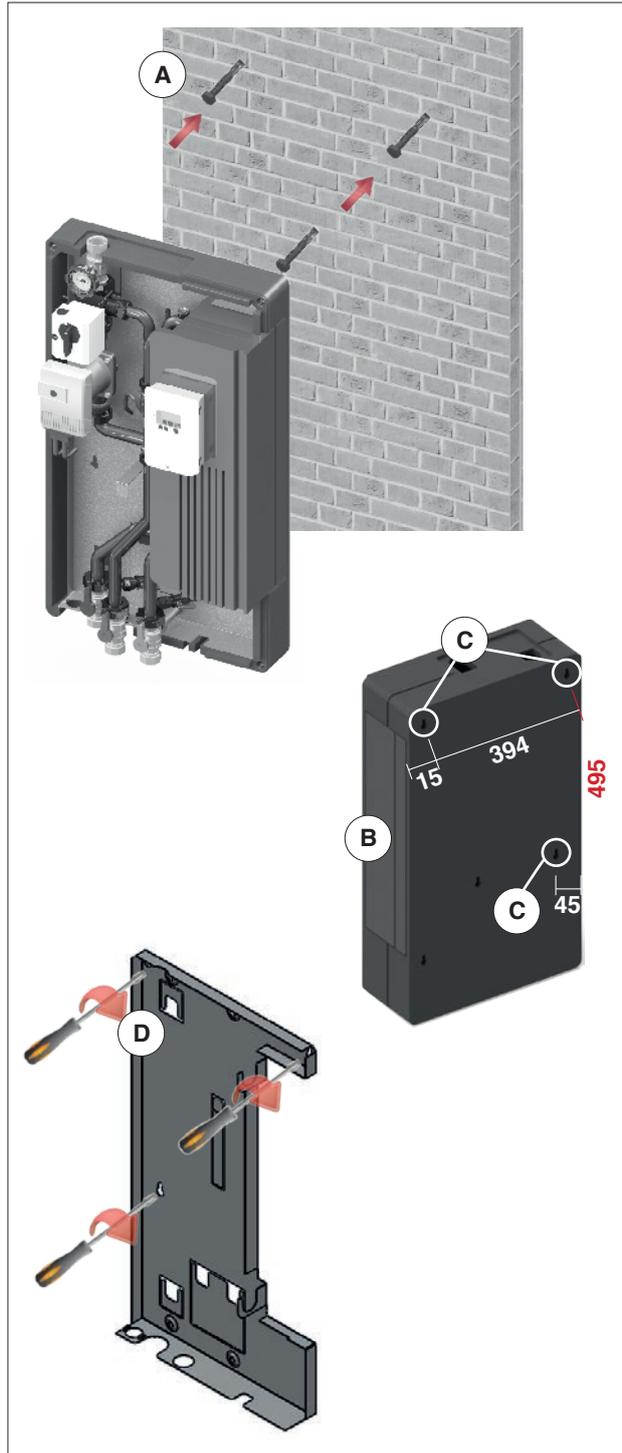


INSTALLATION ON THE WALL

⚠ Handle with care!

- Pull out the module from the package and remove the cover.
- Fix No. 3 plugs (A) on the wall respecting the distance as shown in rif. (B). Install the module on the the plugs through the slots (C) on the back of the module. Slide it down and fix the screws in the plugs.
- Screwing the screws (D)
- Replace the cover

⚠ Check the correct connection of the module. Before commissioning the module, make sure of the perfect tightness of the system. Also, for a good module performance, provide for the total air outlet from the system.



WATER CONNECTIONS

CONNECTION TO THE WATER CIRCUIT

-  In case of recirculation, provide a suitably sized expansion tank in order to avoid overpressure due to thermal expansion and water hammer.

DHW water network must follow the prescriptions of the current legislation.

-  The pipes between the product and the storage cylinder should be kept as short as possible.
-  Connect the product to the domestic cold water supply as instructed.
-  For domestic hot water production systems, provide a filter to collect impurities to protect the system itself. Provide an expansion tank, suitably sized, in order to avoid over-pressure due to water hammer and thermal expansion.

If the water supply is harder than 15 °Fr, a suitable treatment system should be installed upstream from the water heating system to prevent corrosion and the formation of limescale.

Bear in mind that, because of the low thermal conductivity of limescale, even deposits of only a couple of millimetres in thickness can significantly reduce the efficiency of the water heating system.

The SC ACS 80 hot water mixer is made from materials that conform to the requirements of Ministerial Decree 174/2004 (Italy) implementing Council Directive 98/83/EC.

All fittings are assembled in the factory. It is nevertheless advisable to check their tightness after installing the product. It is also necessary to test the product for water tightness at operating pressure when putting it into service.

-  Values in excess of those specified in the table alongside can damage the product and automatically invalidate the warranty. It is therefore important to analyse the water to ensure that all values are within the limits given in the table.

WATER PARAMETER	UNIT OF MEASURE	MAXIMUM PERMISSIBLE VALUE FOR COPPER-BRAZED HEAT EXCHANGERS
pH		7-9 (indicative of saturation)
Saturation index (PH delta)		-0.2<0<+0.2
Total hardness	°Fr	7-15
Conductivity	µS/cm	10...500
Solid substances	mg/l	<30
Free chlorine	mg/l	<0.5
Hydrogen sulphide	mg/l	<0.05
Ammonia	mg/l	<2
Bicarbonate	mg/l	<300
Bicarbonate/Hydrogen sulphide	mg/l	>1.0
Sulphur	mg/l	<1
Nitrate	mg/l	<100
Nitrite	mg/l	<0.1
Sulphate	mg/l	<100
Manganese	mg/l	<0.1
Dissolved iron	mg/l	<0.2
Free, aggressive carbon dioxide	mg/l	<20

ELECTRICAL CONNECTIONS

The following instructions are mandatory.

- 1 Use a multi-pole, magnetic thermal, earth leakage breaker and disconnecter that conforms to legislation in the country of installation.
- 2 Respect the L (Phase) - N (Neutral) polarity. Keep the ground wire about 2 cm longer than the power wires.
- 3 Make sure the product is correctly connected to ground.



It is strictly forbidden to use water pipes to ground the product.



Do not route the power cable near hot surfaces (like hot water pipes). Use a suitable class of cable if there is any possibility of contact with parts at temperatures above 50°C.



The manufacturer declines all responsibility for damage caused by failing to ground the product adequately or by failure to respect the wiring diagrams provided in this manual.

FILLING PROCEDURE, PRIMARY CIRCUIT



Fill and bleed the primary circuit with the water at ambient temperature.

- Open the primary circuit inlet and outlet ball valves.
- Set the controller for operation in manual mode (see parameter 3.2).
- Switch on the primary circuit pump.
- Open the vent valve.
- Pump water around the circuit until all air bubbles have been eliminated.
- Close the vent valve.
- Set the controller for operation in automatic mode (see parameter 3.1).

PUTTING INTO SERVICE



CAUTION! Completely fill the water circuit before putting the product into service.

- Check that the non-return valves are in the right position.
- Fill and bleed the primary circuit.
- Fill the secondary (DHW) circuit.
- Check that the mixer is water-tight.
- Power on the mixer.
- Check that the system works correctly.

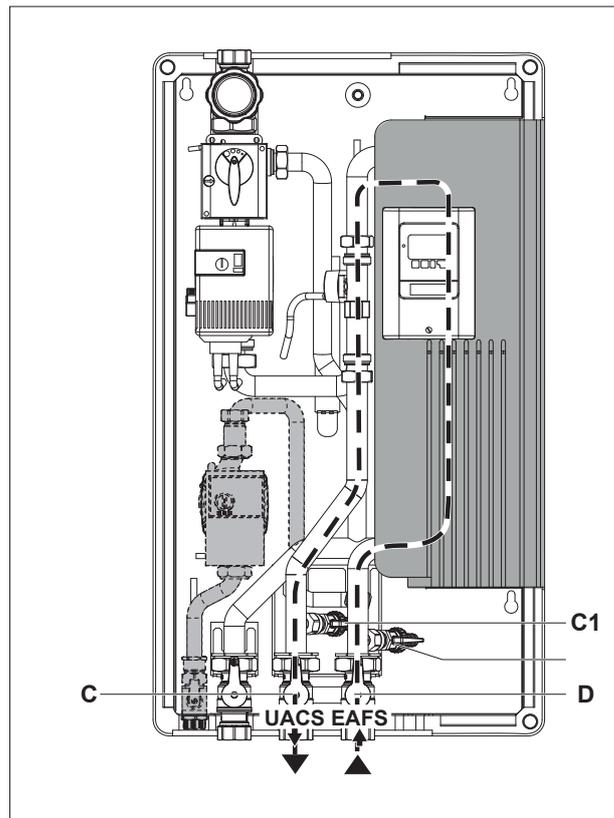


All fittings are assembled in the factory. It is nevertheless advisable to check their tightness after installing the product. It is also necessary to test the product for water tightness at operating pressure when putting it into service.

- If there is recirculation, set the parameters as described in the paragraph "DEFAULT PARAMETER SETTINGS TABLE" on page 26 or in the recirculation manual
- For changes to the parameters, refer to the table on page 26

FLUSHING THE HEAT EXCHANGER

- Intercept the flow and close the ball valves ref. C (AFS) e D (DHW)
- Introduce the fluid from the valve ref. D1
- Spill the fluid from the valve ref. C1 for the necessary flushing time.



USE AND FUNCTIONS OF THE CONTROLLER

CE Declaration of conformity

Applying the CE mark to the controller, the manufacturer guarantees that the MFWC is in conformity with the following directives:

- Low Voltage Directive 2006/95/EC
- Electromagnetic Compatibility Directive 2004/108/EC

The conformity of the product has been tested and the pertinent documentation and CE declaration of conformity are conserved by the manufacturer.

General instructions. Be certain to read the following!

This technical documentation and the accompanying installation and operating instructions contain basic information and important indications regarding safety, installation, setting, maintenance and optimum use of the controller. Accordingly, the following instructions must be read and understood by the technician and by the user of the system before installing, setting and operating the controller. All accident prevention directives, IEC standards, local power utility regulations, pertinent EN standards and installation and operating instructions accompanying system components must also be observed. Installation, electrical connection, setting and maintenance of the controller must be carried out only by expert service technicians in possession of the requisite knowledge. Always keep these instructions in the vicinity of the controller.

Changes to the controller

If changes are made to the controller, the safety and functionality both of the controller and of the entire system may be adversely affected.

- Changes, additions to or conversion of the unit are forbidden unless written permission is obtained from the manufacturer.
- It is also forbidden to install additional components that have not been tested in conjunction with the controller.
- If safe operation of the controller cannot be guaranteed, for example by reason of damage to any component part, then switch it off immediately and have it repaired/replaced.
- Any component or accessory of the controller that is not in perfect condition must be replaced immediately.
- Use only original parts and accessories supplied by the manufacturer.
- The manufacturer's name plate and other factory marks applied to the controller must not be altered, removed or made illegible.
- Only the settings described in these instructions are able to guarantee the correct operation of the controller.

ABOUT THE CONTROLLER

The MFWC controller enables efficient use and operational control of the mixer system. For each of the single setting procedures, the keys are assigned to specific functions and explained.

The controller menu contains key words for the measured values and settings, as well as help texts and graphs.

Main features of the MFWC controller:

- Backlit display showing text and graphic content
- Simple viewing of current measurement values
- Analysis and monitoring of the system by means of statistical graphs, etc.
- Extensive setting menus with explanations
- Menu lock: activated to prevent unintentional alteration of settings
- Function allowing restoration of previously selected values or factory settings
- Wide range of additional functions.

DISPOSAL

The unit conforms to the European RoHS directive 2011/65/EU for the restriction of the use of certain hazardous substances in electrical and electronic equipment.



The unit must not under any circumstances be disposed of with ordinary household refuse. Dispose of the unit only at appropriate collection points or ship it back to the seller or manufacturer.

TECHNICAL SPECIFICATIONS

Electrical specifications

Voltage	100-230VAC
Frequency	50 - 60Hz
Consumption	0.5W – 2.5W
- electromechanical relays R1-R3	460VA for AC1 / 460W for AC3
- PMV output freq. 10kHz 10V	for 10 kΩ load
Internal fuse	T2A / 250V slow-blow
Ingress protection	IP40
Protection class	II
Sensors	6 x Pt1000 + 2 x VFS (vortex flow sensors)
Measuring range	PT 1000 -40°C up to 300°C
Vortex flow sensor	0°C to 100°C (-25°C /120°C short term)
1 l/min - 12 l/min (VFS1-12)	0-0.6 bar
1 l/min – 20 l/min (VFS1-20).	0-1 bar
2 l/min - 40 l/min (VFS2-40)	0-1.6 bar
5 l/min - 100 l/min (VFS5-100)	0-2.5 bar
10 l/min – 200 l/min (VFS10-200).	0-4 bar
.	0-6 bar
.	0-10 bar

Permissible cable length of sensors and appliances

other PT1000 sensors	<10m
VFS/RPS Sensoren	<3m
CAN	<3m
PWM / 0...10V	<3m
mechanical relay	<10m

Real Time Clock

RTC with 24 hour power reserve

Permissible ambient conditions

Ambient temperature:

- for controller operation 0°C±40°C
- for transport/storage 0°C±60°C

Air humidity:

- for controller operation max. 85% relative humidity at 25 °C
- for transport/storage no moisture condensation permitted

Other specifications and dimensions

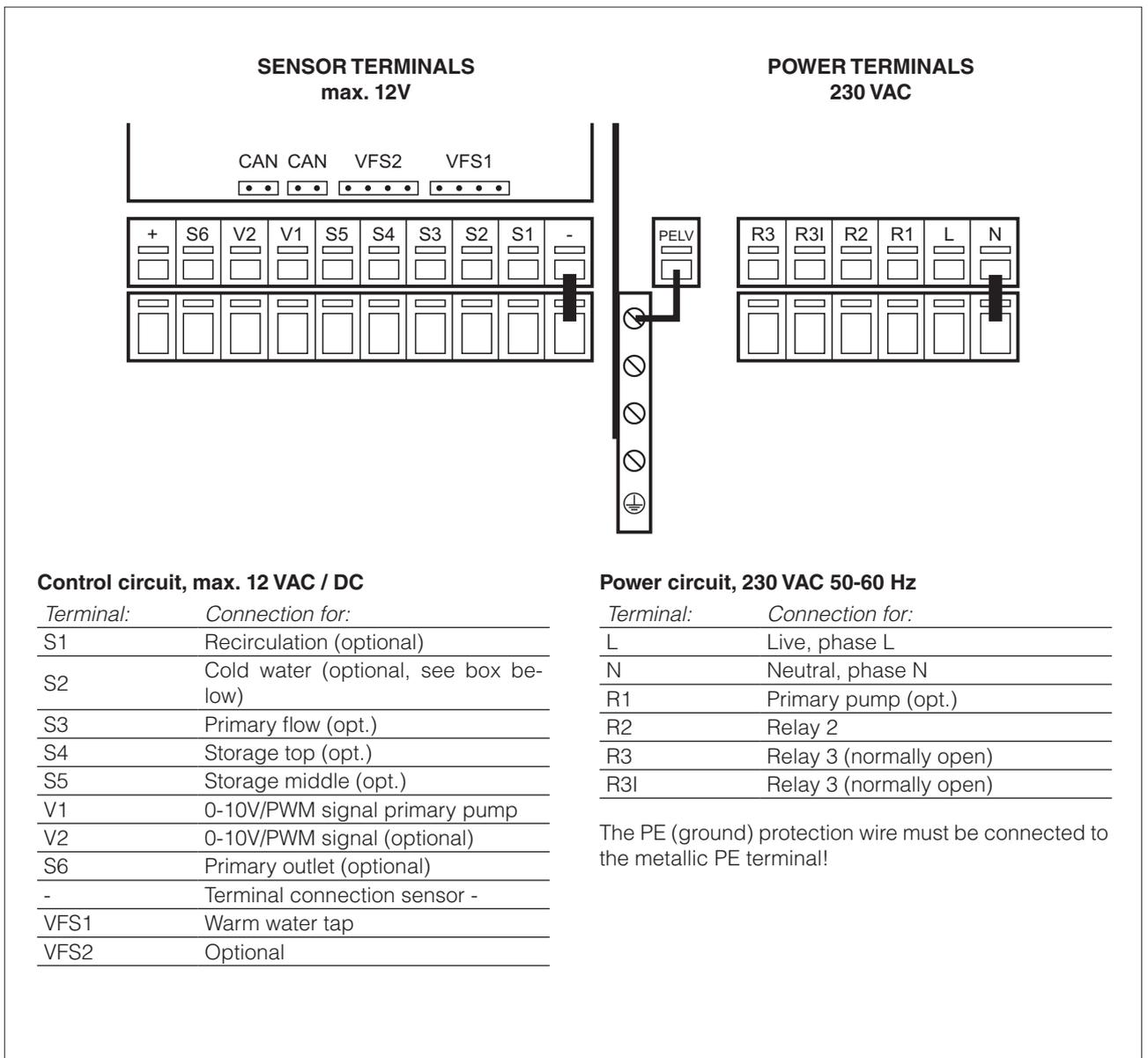
Housing	3-part, ABS plastic
Overall dimensions	163mm x 110mm x 52mm
Installation aperture dimen	157mm x 106mm x 31mm
Display	Full graphic display, 128 x 128 pixels
LED	Multicolour red/green
Programming	4 entry keys

Temperature resistance table for Pt1000 sensors

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

TERMINAL CONNECTION DIAGRAM

The polarity of the sensors is freely selectable.
 Relay connection changes depending on the additional functions selected.
 Connection of sensor earths (1-6) via terminal block sensor (-).
 VFS sensor has to be connected to the socket on the circuit board.
 Sensor 2 / Cold water: If no sensor is connected, a temperature of 10° C is set.



DISPLAY AND PROGRAMMING

Display

The display (1), with full text and graphics mode, is self-explanatory to all intents and purposes, making the controller easy to use.

The LED (2) lights up green when a relay is activated.

The LED (2) lights up red when the operating mode is "Off".

The LED (2) blinks red slowly when the operating mode is "Manual".

The LED (2) blinks red fast when an error occurs.

Commands are entered using four keys (3) and (4), which are assigned context-sensitive functions. The "esc" key (3) is used to cancel a command or exit the current menu.

When changes have been made and are applicable, the controller will prompt for confirmation to save.

The function of each of the other three keys (4) is shown in the display line immediately above; the right-hand key is generally used to confirm and select input data.

Examples of key functions:

+/- = increase/decrease values

▲/▼ = scroll menu up/down

yes/no = confirm/cancel

Info = additional information

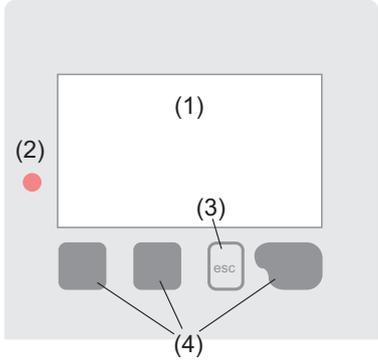
Back = return to previous screen

ok = confirm selection

Confirm = confirm setting

Finally, accessing menu 3.2 and selecting "Manual" mode, the installer can test the various outputs with the components connected, and verify whether or not the readings from the sensors are reliable. This done, automatic mode can be re-activated.

 Observe the indications for individual parameters given on the following pages, and check whether or not further settings are needed for the particular application.



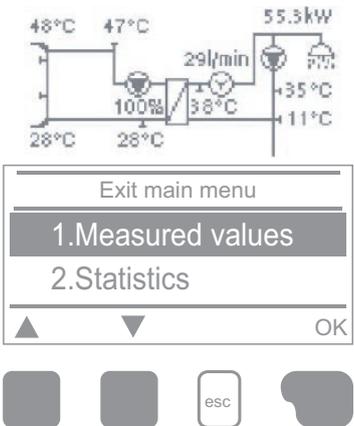
Meaning of symbols in the display:

-  Pump (revolves with pump in operation)
-  Flow meter
-  Heat exchanger
-  Temperature sensor
-  Warning / Error message
-  Information
-  Valve (black in direction of flow)
-  Thermostat

MENU SEQUENCE AND MENU STRUCTURE

Graphics or "overview" mode will appear if no key is pressed for a period of 2 minutes, or if "esc" is pressed to exit the main menu.

Pressing a key in graphics or overview mode takes you directly to the main menu.



The following menus are available

1. Measured values	Measured sensor values
2. Statistics	Operating hours counters
3. Operating mode	Automatic mode, manual mode, or controller Off
4. Settings	Management of parameters required for normal operation
5. Protections	Functions for preventing damage to the system and injury to users
6. Special functions	Program selection, sensor calibration, clock, additional sensor, etc.
7. Menu lock	Lock entry against unintentional changes at critical points
8. Service data	Operating values
9. Language	Language selection

COMMISSIONING HELP

The first time the controller is turned on and after the language and time are set, a query appears as to whether you want to parametrise the controller using the commissioning help or not.

The commissioning help can also be terminated or called up again at any time in the special functions menu.

The commissioning help guides you through the necessary basic settings in the correct order, and provides brief descriptions of each parameter in the display.

Pressing the “esc” key takes you back to the previous value so you can look at the selected setting again or adjust it if desired.

Pressing the “esc” more than once takes you back step by step to the selection mode, thus cancelling the commissioning help.

Finally, menu 4.2 under operating mode “Manual” should be used to test the switch outputs with the consumers connected, and to check the sensor values for plausibility. Then switch on automatic mode.



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

Free commissioning

If you decide not to use the commissioning help, you should make the necessary settings in the following sequence:

- **Menu 6.** Special functions - clock, Additional functions
- **Menu 5.** Settings, complete

Finally, menu 4.2 under operating mode “Manual” should be used to test the switch outputs with the consumers connected, and to check the sensor values for plausibility. Then switch on automatic mode.

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

Calibration

When the tap support is activated (during commissioning or in the menu „Circulation“), a calibration process is started after the commissioning. To ensure the correct operation, calibration is also scheduled to start on every Sunday at 3:00 AM. During commissioning, the calibration must not be interrupted

If the weekly calibration process is not successful after 10 minutes, the process is cancelled and the controller uses the former calibration values.

During the callibration process a text is shown that the flow rate is measured and no tapping is allowed.

After confirmation the circulation pump is switched off and the controller is waiting until the flow rate has dropped to 0 L/min. Afterwards only the circulation pump is switched on and after another 60 seconds the flow rate is measured.

The display shows a “Please wait” sign.

After another minute, the flow rate is measured again, and the two flow rates are compared.

If the results are identical (+- 1L/min), the result is saved.

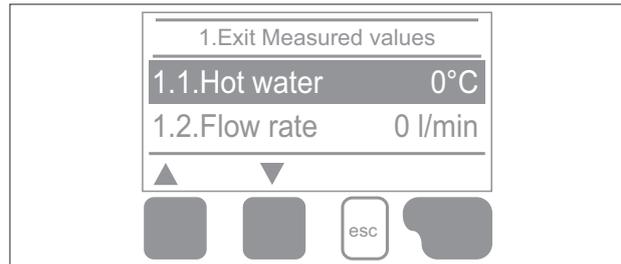
If not, the process is started over until either the results match or 10 minutes have passed and the calibration is cancelled and the former values are used.

1. MEASURED VALUES

Menu “1. Measured values” indicates the current temperatures measured. Quit the menu by pressing “esc” or selecting “Exit Measured values”.



If “Error” appears on the display instead of the measurement value, then there may be a defective or incorrect temperature sensor. If the cables are too long or the sensors are not placed optimally, the result may be small deviations in the measurement values. In this case the display values can be compensated for by making entries on the controller. Follow the instructions under 12.3. What measurement values are displayed depends on the selected program, the connected sensors and the specific device design.



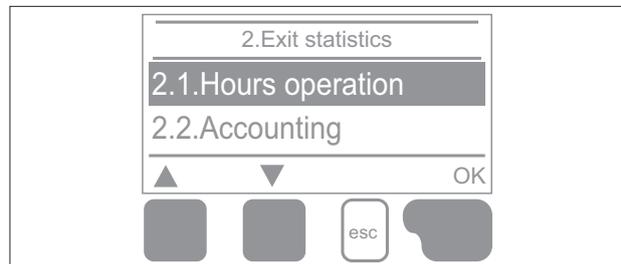
2. STATISTICS

Use menu “2. Statistics” for function control and long-term monitoring of the system.

To quit the Statistics menu, press “esc” or select “Exit statistics”.



For system data statistics it is essential for the time to be set accurately on the controller. Please note that the clock continues to run for about 24 hours if the mains voltage is interrupted, and after that has to be reset. Improper operation or an incorrect time may result in data being cleared, recorded incorrectly or overwritten. The manufacturer accepts no liability for the recorded data!



2.1 Operating hours HW

Shows the total hours that the relays connected to the controller have been in operation.

2.2 Heat output

Metering of heat produced by the system, in kWh.



Heat output data are only approximate for control functions

2.3 Graphic overview

Provides a clear overview of the data listed under headings 2.1-2.2 in the form of a bar graph. Various time ranges are available to allow comparison. Use the two keys on the left to scroll through the data

2.4 Error messages

Shows the last 15 events recorded by the system, indicating the date and time.

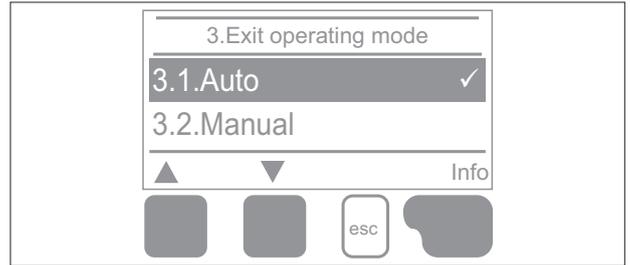
2.5 Reset/clear

Resets and deletes single analyses. The “all statistics” function clears all information except for error messages.

3. OPERATING MODE

Menu “3. Operating mode” allows selection of the desired mode of operation: automatic, off, or manual.

To quit the menu, press “esc” or select “Exit operating mode”.



3.1 Automatic

Automatic is the normal operating mode of the controller. Only automatic mode guarantees correct operation of the system, taking account of the current temperatures and the selected parameter settings!

When restarted following a mains power failure, the controller will revert automatically to the operating mode last selected!

3.2 Manual

The relay — and the component connected to the relay contacts — are switched on or off by pressing a key, regardless of current temperatures and parameter settings. Measured temperatures are also displayed on the screen, for monitoring and control purposes.



When “Manual” mode is activated, current temperatures and parameter settings are ignored by the controller. In this situation, the system is liable to overheat and suffer serious damage. “Manual” operating mode must be used only by an expert for conducting functional tests of short duration, or when setting up the controller!

3.3 Off



Selecting “Off” mode, all functions of the controller will be deactivated. This should be avoided normally, as it could cause the solar collector or other system components to overheat, for example. Measured temperatures continue to be displayed so that the overview remains available.

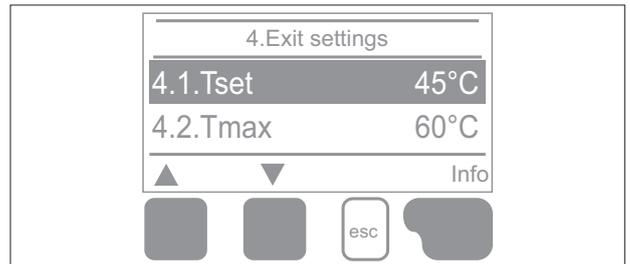
4. SETTINGS

The parameters essential to normal operation of the controller are presented in menu 4. “Settings”.



This does not under any circumstances replace the safety facilities to be provided by the customer!

To quit the menu, press “esc” or select “Exit settings”.



4.1 Tset = Setpoint at VFS sensor

The controller LFWC provides this hot water temperature (tap temperature) constant and as soon as possible.

4.2 Tmax = Maximum draw-off temperature at the vortex flow sensor

The controller LFWC provides this hot water temperature (tap temperature) constant and as soon as possible.



Temperature values which are set too high can lead to scalding or damage to the system. Scalding protection must be provided by the customer!

4.3 VFS type

Set the type of Vortex Flow Sensors.

In this menu the type of Vortex Flow Sensor can be set.

4.4 Recirculation

4.4.1 Recirculation

When the mode “**Request**” is active, the circulation pump is switched on after a corresponding tapping of water has occurred and stays on until the circulation target temperature (Circ Tmin + hysteresis) is reached at the circulation sensor. In mode “**Periods**” the circulation pump is enabled in the set periods and the set circulation minimum temperature is undershot and stays on until the circulation target temperature (Circ Tmin + hysteresis) is reached at the circulation sensor.

Request+Time: The circulation pump is switched on in the enabled periods and the set circulation minimum temperature is undershot, or when water is tapped. Circulation stays on till the circulation target temperature (Circ Tmin + hysteresis) is reached at the circulations sensor.

Always on: Circulation pump is switched on in set periods.

4.4.2 Circ. Tmin. = Minimum temperature at sensor S2

If the temperature drops below Circ.Tmin and the circulation is enabled the circulation pump is started.

4.4.3 Circ. hysteresis = Switch-off hysteresis of the circulation pump

If the temperature exceeds T_{minS2} by this value, the circulation pump is switched off.

4.4.4 Circ. maximum Flow rate = Maximum flow rate of the circulation pump

If the flow rate measured at sensor 6 exceeds this value (because water is being drained from the system) the circulation pump is switched off.

4.4.5 Circulation period = Period where the circulation pump is enabled.

Set the operation times of the circulation pump. 3 different periods can be set for every weekday, which can also be copied to other days.



This settings are only available if circulation mode "Periods" or "Request + Time" is chosen.



In periods not defined circulation is inactive. The set periods are only used in the circulation mode "Periods and "Request + Time".

4.4.6 Tap support

To ensure a constant temperature even with small amount of tap water, the circulation pump can be used as support pump. Not only does the circulation pump switch on under normal conditions, but also when a small tapping occurs. When a storage sensor is connected, tap support is only switched on when the Min storage Temp is reached at the storage sensor.

4.4.7 Minimum storage temperature

Tap support is deactivated when the storage temperature drops below „Min storage temp“.

4.4.8 Tap support calibration

See "F3. - Calibration".

4.11 Comfort

If this function is activated, the heat exchanger will rinse for 5 seconds every 15 minutes, so that hot water is available as soon as possible.

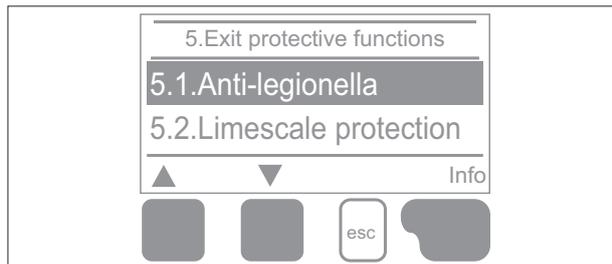
5. PROTECTIVE FUNCTIONS

Menu "5. - Protective functions" can be used to set and activate a number of protective functions.

To quit the menu, press "esc" or select "Exit Protective functions".



This does not under any circumstances replace the safety facilities to be provided by the customer!



5.1 Anti-legionella

With the AL-function activated, the LFWC makes it possible to heat the storage in selectable intervals, (AL interval) for the set residence time (AL resid. time), starting at the set time (AL start time) until the temperature AL Tset is reached. The temperature measured at S5 has a reference of AL Tset +5 °C. For the time the AL function is active, Tmax is set to AL Tset +10° to prevent system shutdown due to high temperature.

Only when a temperature of at least „AL Tset“-5 °C is reached at the Hot water sensor and, if present, at the circulation sensor for the time set in „AL resid. time“, the AL function is regarded as successful. This is displayed as "Last AL heat.". If AL is unsuccessful after 2 hours, the attempt is cancelled and will be started again the next day and an error message is displayed.



During the Anti-legionella function the storage cylinder is heated to high temperatures that can lead to scalding and damage to the system.



The user must make sure that the Anti-legionella function terminates successfully at the set periods.



The AL function is switched off by default. A message containing the date is shown as soon as the AL function terminates successfully. The AL start time should be set during a period in which little hot water is drawn off.



The user must make sure that the temperature of the storage cylinder is at AL Tset +5° when starting the AL cycle manually. If sensor S3 is installed, the AL function will not start until a temperature of AL Tset +5° is reached.



The AL function does not provide total protection against legionella because it is not possible to monitor temperatures throughout the storage cylinder and in all connecting pipes.

5.2 Limescale protection

To prevent the accumulation of limescale, the circulation pump can continue to rinse the heat exchanger after a tapping for at least 5 seconds or for longest 30 seconds or till the VFS sensor drops below Tset.

5.3 Discharge Protection

If the temperature in the primary circuit is not always guaranteed to suffice, this function is used.

With this function activated:

When no storage sensor is connected:

If the setpoint temperature is not reached after 60 seconds, the currently measured temperature -3°C is used as new setpoint temperature. Once the pump in the primary circuit stops, the setpoint temperature is raised to the set Tset again.

When the storage sensor is connected

If the temperature at the storage sensor is smaller than Tset -5 °C, the target temperature is lowered to the currently measured storage temperature -5 °C.

In both cases "Circ Tmin" is lowered to the new setpoint temperature - Circ. hysteresis - 5 °C, where "Circ Tmin is not lower than 0 °C and not higher than the set Circ Tmin.

5.4 Seizing protection

If seizing protection is active, the controller switches on the relay and the connected components for 5 seconds every day at 12:00 ("Daily" setting), or every Sunday at 12:00 ("Weekly" setting), in order to prevent the pump and/or the valve from seizing up after a lengthy idle period.

Settings range: Daily, Weekly, Off / Default: see table.

6. SPECIAL FUNCTIONS

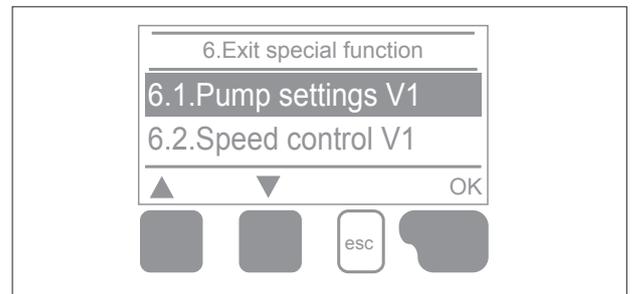
Menu "6. Special functions" is used to set basic items and expanded functions.



With the exception of the clock, all settings must be entrusted solely to expert service technicians. To quit the menu, press "esc" or select "Exit special functions".



The numbering of the menu items may change from one system to another.



6.1 Pump menu

This menu contains the settings for 0-10V or PWM pump control.



The power supply of HE pumps with 0-10V / PWM pumps can be connected to the corresponding relay (V1 -> R1, R2 -> V2), since the relays are switched on and off with the signal.

6.1.1 Pump type

This menu is used to set the type of pump and speed control.

0-10V: speed control of e.g. High efficiency pumps by 0-10V signal;

PWM: speed control of e.g. High efficiency pumps by PWM signal.

6.1.2 Pump

In this menu, predefined profiles for various pumps can be selected. Please note that individual settings are still possible even when a profile has been selected.

6.1.3 Output signal

This menu determines the type of pump used: Solar pumps perform at their highest power when the signal is also maxed, heating pump on the other hand are set to highest power when the control signal is at the lowest. Solar = normal, heating = Inverted. For 0-10V pump is always to select the "Normal" setting.

6.1.4. 0-10V off / PWM off

This signal / this voltage is put out when the pump is switched off (Pumps that can detect cable break need a minimum signal).

6.1.5. 0-10V on / PWM on

This signal / this voltage is needed to turn the pump on at minimum speed / minimum voltage.

6.1.6. 0-10V Max / PWM Max

This determines the output signal / the output voltage for the highest speed of the pump, that is used e.g. during purging or manual operation.

6.1.7. Show signal

Displays the set signal in text and a graphical diagram.

6.2 Speed control

The settings in this menu are used to limit the speed of connected 0-10V and PWM pumps.

6.2.1 Max speed

This is where the maximum speed of the pump is set. During the setting procedure, the pump runs at the selected speed so that the flow rate can be determined.



The indicated percentages are guide values that may vary to a greater or



The indicated percentages are guide values that may vary to a greater or lesser extent depending on the system, pump and pump stage.

6.2.2 Min speed

This is where the minimum speed of the pump connected to relay R1 is set. During the setting procedure, the pump runs at the selected speed so that the flow rate can be determined.



The indicated percentages are guide values that may vary to a greater or lesser extent depending on the system, pump and pump stage.. 100% is the maximum possible voltage/frequency of the controller.

6.5 Relay functions for free relays

The additional functions explained in this section can be assigned to any relay which is unused in the selected hydraulic scheme. Every additional function can only be used once.

All activated additional functions, for which any parameters can be adjusted, also appear in menu "4. Settings".

In the factory settings (basic hydraulic scheme), relay 1 is set to "always on" by default.

Relay 2 is taken for the function "circulation" in the basic scheme. Please note that the settings for circulation are only shown in the menu if the function "circulation" is assigned to a relay.

In order to change the assignment of a relay, the previously assigned additional function must be switched off.

Pay special attention to the technical data of the relays

6.5.1 Recirculation

Set this function to unused relay. In factory settings, this function is assigned to relay 2

6.5.2 Storage heating

To heat up the storage on demand, the necessary parameters can be set here.

6.5.2.1 Storage heating

Activate or deactivate function.

6.5.2.2 Tmin storage

If the temperature measured at the corresponding storage sensor falls below this value outside of the defined heating times, heating is activated anyways.

6.5.2.3. Tset storage

If the temperature measured at the corresponding storage sensors falls below this value during the defined heating times, heating is activated.

6.5.2.4. Switch-off hysteresis for storage heating

The storage target temperature is calculated from Tmin or Tset storage at the given operating time plus the hysteresis set here. If the target temperature at the corresponding storage sensor is reached, storage heating is switched off.

6.5.2.5 Heating periods = Storage heating activation times

In this menu, the operating times for the storage heating can be adjusted, where 3 periods can be set per day which can be copied to subsequent days.

6.5.3. Storage stratification

Storage stratification switches a valve in the primary return flow depending on the temperature.

Temperature is measured in the primary circuit and optionally in the middle zone of the storage.

6.5.3.1 Storage stratification

Activates or deactivates stratification.

6.5.3.2. ΔT storage return = Temperature difference for stratification

If the temperature in the primary circuit exceeds the temperature difference set here, the valve is switched to load the upper storage zone.

If the temperature drops below this temperature, the valve is switched off again.

When no storage sensor is connected, a temperature of 25°C is assumed.

6.5.4. AL heating

With this function, a relay switches a boiler to anti-legionella mode as needed. The relay switches on when an anti-legionella heating starts. The relay switches off when the AL-heating was completed successfully or if the enable time for the AL-heating is exceeded.

6.5.5 AL heating

Activate or deactivate the AL heating

6.5.6. Error message

The additional function error message activates the relay in certain events and switches off only when the information alert has been read.

6.5.7. Error message

Switch error message on or off

6.5.8. Additional pump

A second pump in the primary circuit is switched on to support the primary pump. Whenever the measured flow rate exceeds "flow rate on", and if this conditions is met throughout the period "delay", the relay is switched on.

6.5.8.1. Additional pump

Switch additional pump on or off.

6.5.8.2. Flow rate on

Adjustable flow rate in l/h, at which the additional pump is switched on.

6.5.8.3. Flow rate off

Adjustable flow rate in l/h, at which the additional pump is switched off.

6.5.8.4. Delay

The additional pump is switched on with a delay of the time set here.

6.5.9 Primary mixer

By activating this function, the water in the primary circuit is mixed with that of the return through a mixing valve.

In this way, in the event of high storage temperatures, the water reaches the user with a lower amount of heat, because mixed with the return.

6.5.9.1. Primary mixer

Switch primary mixer on or off

6.5.9.2. Primary flow min

Setpoint temperature at mixing valve at min. flow rate

6.5.9.3. Primary flow max

Setpoint temperature at mixing valve at max. flow rate

6.5.9.4. Turn time

Length of a mixer cycle

6.5.9.5. Pause factor

Adjustment of mixer pause time

6.5.9.6. Increase

Influence of fast temperature rises

6.5.10. Solar

This function adds a solar circuit which is controlled by the collector and storage temperature.

6.5.10.1. Solar

Switch solar on or off.

6.5.10.2. Tmin collector

Release temperature collector sensor: If this value is exceeded at the given sensor and also the other conditions are met, the controller activates the corresponding pump.

6.5.8.3. ΔT Solar

Switch-on / Switch-off temperature difference for collector sensor:

If the temperature difference ΔT Solar is exceeded between the reference sensors and if also the other conditions are met, the controller activates the pump on the corresponding relay. If the temperature difference falls to ΔT off, the pump is switched off again.

6.5.8.4. Tmax storage

If the (lower) storage temperature set here is exceeded, the controller switches the pump off.

6.5.8.5. Start aid function

With some solar systems, especially with vacuum tube collectors, it may occur that the measurement value acquisition at the collector sensor occurs too slowly or too inaccurately because the sensor is often not at the hottest position. When the start help is activated the following sequence is carried out: If the temperature at the collector sensor increases by the value specified under "Increase" within one minute, then the solar pump is switched on for the set "Purging time" so that the medium to be measured can be moved to the collector sensor. If this still does not result in a normal switch-on condition, then the start help function is subject to a 5-minute lockout time.



This function should only be activated by a specialist if problems arise with acquisition of measurement values. In particular follow the instructions of the collector manufacturer.

6.5.10.6. System protection

Priority protection function

The system protection prevents the installed components in the system from overheating by automatic shutdown of the solar pump.

6.5.10.6.1. System protection

Switch system protection on or off.

6.5.10.6.2. SP Ton/off

If the value "SP Ton" is exceeded at the collector, the pump is switched off after 60 seconds and will not be switched on again, in order to protect the collector e.g. from steam hammering. The pump will only be switched on again, when the collector temperature falls below "SP Toff".

6.5.11. Parallel operation V1

The relay is switched on at the same time as the set output signal V1/V2 for 0-10V/ PWM is switched on.



For high-efficiency pumps with 0-10V / PWM signal input, power supply can be realised by using the additional function „always on“ or „parallel operation“ for relay 1-3.

6.5.11.1. Parallel operation V1

Activate this function further it is possible to activate this function inverted.

6.5.11.2. Delay

The relay switches on after this delay time.

6.5.11.3. Followup time

Follow up time for the relay after output V1/V2 is switched off.

6.5.12. Parallel operation V2

Activates in parallel the relay assigned with V2 0-10 V / PMW output. (see 6.5.9.)

6.5.13. Always on

Relay is permanently switched on.



High efficiency pumps with a 0-10V / PWM signal can be powered using the additional function "Always on" or "Parallel functioning V1/V2" via relays 1-3.

6.5.13.1. Always on

Activate or deactivate "always on".

6.6. Relay 2

See the functions for Relay 1.

6.7. Relay 3

See the functions for Relay 1.

6.8. V2 signal

With this function the PMW/0-10V output 2 is used for an additional high-efficiency pump. If a pump function is activated (e.g. circulation), additional parameters for pump settings V2 and V2 speed -control have to be set. For other functions (e.g. zone valve) the output signal switch from 0 to 10 V. For other switching variants an additional relay box can be used to switch a potential-free relay at this output. Please note the technical information about the PMW/0-10V outputs

6.8.1. V2 signal

See the functions for Relay 1.

6.8.2. Pressure control

This menu is used to set the system pressure control with direct probe. The message is shown and the LED blinks red when the pressure drops below the minimum level or exceeds the maximum level.

6.8.3. Pressure control

Activate or deactivate the function

6.8.4. RPS1 / RPS2 = Type of pressure sensor

This menu is used to determine the type of pressure sensor used.

Please note: If e.g. VFS1 is connected, RPS1 option is not shown.

6.8.5. Pmin

Min pressure. If the pressure drops under this value, an error message is displayed and the LED links red.

6.8.6. Pmax

Max pressure. If the pressure exceeds this value, an error message is displayed and the LED links red.

6.9. Sensor calibration

Deviations in the temperature values displayed, for example due to cables which are too long or sensors which are not positioned optimally, can be compensated for manually here. The settings can be made for each individual sensor in steps of 0.5°C.



Settings are only necessary in special cases at the time of initial commissioning by the specialist. Incorrect measurement values can lead to unpredictable errors.

6.10. Commissioning

Starting the commissioning help guides you in the correct order through the basic settings necessary for commissioning, and provides brief descriptions of each parameter in the display. Pressing the "esc" key takes you back to the previous value so you can look at the selected setting again or adjust it if desired. Pressing the "esc" more than once takes you back to the selection mode, thus cancelling the commissioning help.



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

6.11. Factory settings

All of the settings that have been made can be reset, thus returning the controller to its delivery state.



The entire parametrisation, analyses, etc. of the controller will be lost irrevocably. The controller must then be commissioned once again.

6.12. Time and date

This menu is used to set the current time and date.



For proper functioning of the controller and statistics for the system data it is essential for the time to be set accurately on the controller. Please note that the clock continues to run for about 24 hours if the mains voltage is interrupted, and after that has to be reset.

6.13. Daylight saving time

When this function is active, the controller's clock changes automatically to and from DST (DST, Daylight Saving Time).

6.14. Eco display mode

When this function is active, the controller's backlight is automatically switched off when no button has been pressed for 2 minutes.



If a message is waiting, the backlight is not switched off.

6.15. Temperature unit

This menu changes the displayed temperature unit.

7. MENU LOCK

Menu "7. Menu lock" can be used to secure the controller against unintentional changing of the set values. The menu is closed by pressing "esc" or selecting "Exit menu lock".

7.1 Menu lock

The menus listed below remain completely accessible despite the menu lock being activated, and can be used to make adjustments if necessary:

1. Measurement values
2. Analysis
3. Display mode
7. Menu lock
8. Service values

To lock the other menus, select "Menu lock ON".

To enable the menus again, select "Menu lock OFF".

7.2 Expert mode

This menu is used to switch between expert mode, in which all settings are available, and simple mode, in which only the following menus are available:

1. Measurement values
2. Statistics
- 4.3 Tset
- 4.4.1 Circulation mode
- 4.4.7 Circ. Periods
- 6.13 Time and Date
7. Menu lock without 7.1
9. Language

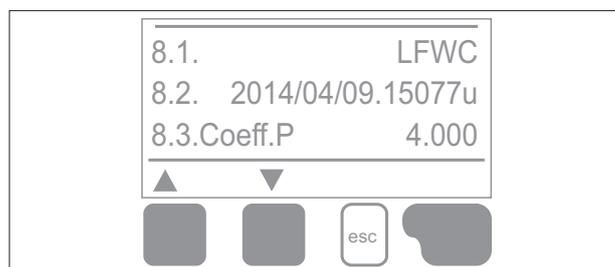
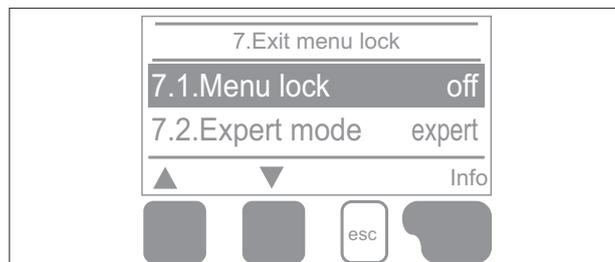
8. SERVICE DATA

The menu "8. Service values" can be used for remote diagnosis by a specialist or the manufacturer in the event of an error, etc.

The menu can be closed at any time by pressing "esc".

9. LANGUAGE

Menu "9. Language" can be used to select the language for the menu guidance. This is queried automatically during initial commissioning. The choice of languages may differ, however, depending on the device design. Language selection is not available in every device design!



MALFUNCTIONS

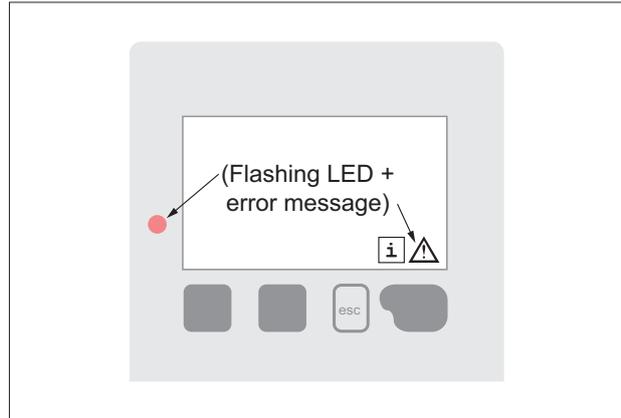
MALFUNCTIONS AND ERROR MESSAGES

If the controller detects a malfunction, the red LED blinks and the warning symbol appears on the display.

If the malfunction resolves itself, the warning symbol becomes an information symbol and the red LED stops blinking.

To view details of the error, press the key under the warning or information symbol.

- ⚠ End users must not attempt to resolve malfunctions in person. Always refer malfunctions to specialist personnel!



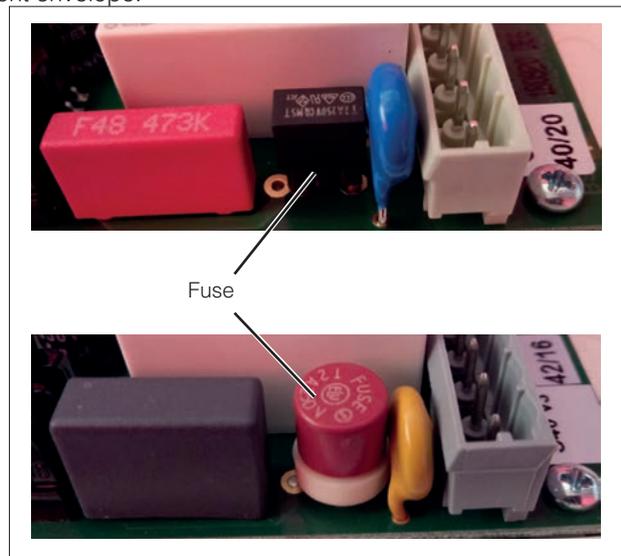
Possible error messages	Note for service personnel
Sensor x error	This means that there is/was a fault in the sensor, input to the controller or connecting cable.
Time & date	This message appears automatically after a power failure to indicate that the time and date must be checked and reset if necessary.

REPLACING THE FUSE

- ⚠ Replace the fuse with the one contained into the document envelope.
- ⚠ Repairs and maintenance may only be performed by a specialist. Before working on the unit, switch off the power supply and secure it against being switched on again! Check for the absence of power!
- ⚠ Only use the supplied spare fuse or a fuse of the same design with the following specifications: T2A 250V

If the mains voltage is switched on and the controller still does not function or display anything, then the internal device fuse may be defective. In that case, open the device as described under 3.1, remove the old fuse and check it.

Exchange the defective fuse for a new one, locate the external source of the error (e.g. pump) and exchange it. Then first recommission the controller and check the function of the switch outputs in manual mode.



MAINTENANCE

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

Performing maintenance:

- Check the date and time
- Assess/check plausibility of analyses
- Check the error memory
- Verify/check plausibility of the current measurement values
- Check the switch outputs/consumers in manual mode
- Poss. optimise the parameter settings

DEFAULT PARAMETER SETTINGS TABLE

NOTE	MENU DESCRIPTION	DESCRIPTION	SETTINGS RANGE	DEFAULT SC ACS 80	NOTE
	4. SETTINGS				
	4.1	T set	30°C ÷ 90°C	45°C	
	4.2	T max.	50°C ÷ 95°C	55°C	
	4.3	VFS type	"1÷12 / 1÷20 / 2÷40 / 5÷100 / 10÷200 / 200÷400 l/min"	5÷100 l/min	
RECIRCULATION	4.4	Recirculation	on / off	off	on if present
	4.4.1	Recirculation	Request / periods / request+periods / always on	periods	
	4.4.2	T min recirculation	10°C ÷ 85°C	35°C	
	4.4.3	Recirculation hysteresis	1 K ÷ 20 K	5 K	
	4.4.4	Maximum recirculation flow	1 ÷ 50 l/min	20 l/min	
	4.4.5	Recirculation periods	00:00 ÷ 23:59	06:00 ÷ 20:00	
	4.4.6	Draw-off support	on / off	on	
	MIX	4.8	Primary mix		
	4.8.1	Min primary delivery	from 30 to 80 °C	48°C	
	4.8.2	Max primary delivery	from 30 to 80 °C	65°C	
	4.8.3	Rotation time	from 1 to 3 seconds	1 sec	
	4.8.4	Pause factor	from 0,1 to 4 seconds	1 sec	
	4.8.5	Increase	from 0 to 20	0	
	4.16	Comfort	on / off	off	
	5. PROTECTIVE FUNCTIONS				
	5.1	Anti-legionella	on / off	off	
	5.2	Limescale protection	on / off	off	
	5.3	Setpoint auto-regulation	on / off	off	
	5.4	Sizing protection	Daily / Weekly / off	off	
	6. SPECIAL FUNCTIONS				
	PRIMARY CIRCULATOR	6.1	V1 Pump	Primary pump	-
	6.1.1	Pump type	0 - 10V	0 - 10V	
	6.1.2	Pump	Solar / Heating Profile / Heating 1-11 / Manual	Profile 7	
	6.1.3	Output signal	normal / inverted	normal	
	6.1.4	0 - 10 V OFF	0-2,0	0,7 V	
	6.1.5	0 - 10 V ON	0,7-5	2,0 V	
	6.1.6	0 - 10 V MAX	5-10	10,0 V	
	6.2	V1 Pump speed	Primary pump range	-	
6.2.1	Max speed	15 ÷ 100 %	100%		

NOTE	MENU DESCRIPTION	DESCRIPTION	SETTINGS RANGE	DEFAULT SC ACS 80	NOTE
	6.2.2	Min. speed	10 ÷ 95 %	25%	
	RECIRCULATION	6.3	V2 Pump	Recirculation pump	-
	6.3.1	Pump type	0 - 10V -PWM	PWMs	
	6.3.2	Pump	-	(Solar) Recirculation	
	6.3.3	Output signal	normal / inverted	Normal	
	6.3.4	PWM off	0 ÷ 15 %	2%	
	6.3.5	PWM on	2 ÷ 50 %	13%	
	6.3.6	PWM max	9 ÷ 100%	93%	
	6.4	V2 Pump speed	-	-	
	6.4.1	V2 Pump speed on	-	on	
MIX	6.5	Relay 1	Always on / Off	Primary mix AP	
	6.6	Relay 2	on / off	Primary mix CH	
CASC.	6.7	Relay 3	Relay / cascade Kit	-	
RECIRCULATION	6.8	V2 signal			
	6.8.1	Recirculation			
	6.8.1.1	Recirculation	on/off	on	
	6.9	Pressure sensor	on / off	off	
	6.9.2	RPS1/RPS2	Off / 0÷0,6 bar / 0÷1 bar / 0÷1,6 bar / 0÷2,5 bar / 0÷4 bar / 0÷6 bar / 0÷10 bar	-	
	6.10	Sensor calibration	-	-	
	6.14	Daylight savings time	Yes / No	Yes	
	6.15	Energy saving mode	on / off	on	
	7. 7. MENU LOCK				
	7.1	Menu lock	on / off	off	
	7.2	Expert mode	Simple / Expert	Expert	
Control unit software: 19060					

CHECKS

On completion of the installation, perform the checks listed in the table below.

DESCRIPTION	OK
All automatic or manual filling pumps removed.	
Safety valve calibrated to 6 bar, and flow open.	
Drain pipe from safety valve routed suitably.	
Expansion vessel correctly located and pre-charged to 2.5 bar	

RECIRCULATION PARAMETERS SETTING

Refer to the recirculation sections of the table on page 26

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The manufacturer strives to continuously improve all products. Appearance, dimensions, technical specifications, standard equipment and accessories are therefore liable to modification without notice.