2024-09-26
English
93995-005
0000000132-017
SW: X.61.0
HW:

Stratified Charging Module with Energy-Saving Pumps

Operating Instructions

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Contents

1 General

1.1 General information

Copyright

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Subject to technical changes

We reserve the right to make technical modifications without notice. Printing and typesetting errors or changes of any kind made in the interim are not cause for claims. Individual configurations depicted or described here are only available optionally. In the event of contradictions between individual documents regarding delivery scope, the information in our current price list applies.

Software Description

The software version described in this documentation corresponds to the version valid at the time of publication. The software version installed on your product may differ from that described in this documentation.

A software update to a higher version can be carried out at any time. The required files can be found with the appropriate authorisation on www.eta.co.at.

Explanation of symbols

Instructions and information

Layout of safety instructions

SIGNAL WORD!

Type and source of danger

Possible effects

- Measures for avoiding the danger

Types of safety instruction

CAUTION!

On non-compliance with this safety instruction, there is a risk of material damage.

WARNING!

On non-compliance with this safety instruction, there is a risk of physical injury.

DANGER!

On non-compliance with this safety instruction, there is a risk of major physical injury.

1.2 Warranty, guarantee and liability

Installation in a dry, frost-proof room

A dry, frost-proof room is required for the installation.

pH value between 8 and 9

The pH value of water used to fill the heating system must be between 8 and 9.

Freeze protection content in the solar heating system

Freeze protection (glycol) is required in the solar heating system. The maximum freeze protection content must be adjusted to the local conditions and checked on an annual basis.

Expanding the control system

Only components provided by us may be used for expanding the control system, unless these are generally available standard devices, such as thermostats.

Proper installation

The installing contractor is liable for proper installation according to the corresponding installation instructions and the relevant rules and safety regulations. If you as customer have installed the heating system partly or entirely without relevant training and in particular without up-to-date practical experience, without having the installation checked by a trained and responsible expert, we exclude defects in our delivery and consequential damages resulting from this cause from our warranty, guarantee and liability.

Repairs

Repairs are only permitted using spare parts provided by us. The only exceptions are common standardised parts such as electrical fuses or fastening materials, as long as they possess the required features and do not restrict the functionality of the system.

Repair of defects

For repairs of defects carried out by the customer or by a third party, ETA shall only bear the costs or remain obligated by warranty if this work was approved in writing in advance by the customer service of ETA Heiztechnik GmbH.

2 Declaration of conformity

CE Declaration of Conformity

Manufacturer:	ETA Heiztechnik GmbH Gewerbepark 1, 4716 Hofkirchen an der Trattnach, Austria
Product:	Solar stratified charging module with energy-saving pumps
Types:	ETA SLM-E

EU Directives:

2014/35/EU	Legislation for electrical equipment: Low Voltage Directive
2014/30/EU	Legislation on electromagnetic compatibility
2011/65/EU	Directive on the restriction of the use of certain hazardous substances in electrical and electronic equipment (RoHS 2 guideline)

Applied standards:

EN 60335-1:2020	Household and similar electrical appliances - Safety - Part 1: General requirements
IEC 61000-6 1/2:2005	Electromagnetic compatibility (EMC): Generic standards - Immunity for residential, commercial and light-industrial environments (1) and industrial environments (2)
IEC 61000-6 3/4:2011 + A1:2011	Electromagnetic compatibility (EMC): Generic standards - Emission standard for residential, commercial and light-industrial environments (3) and industrial environments (4)

We hereby declare that the product in its standard design as stated here corresponds to the above provisions. The sole responsibility for issuing this declaration of conformity lies with the manufacturer. The technical documentation for this product is managed by ETA Heiztechnik GmbH. Signed for and on behalf of:

Hofkirchen, 12/01/2021

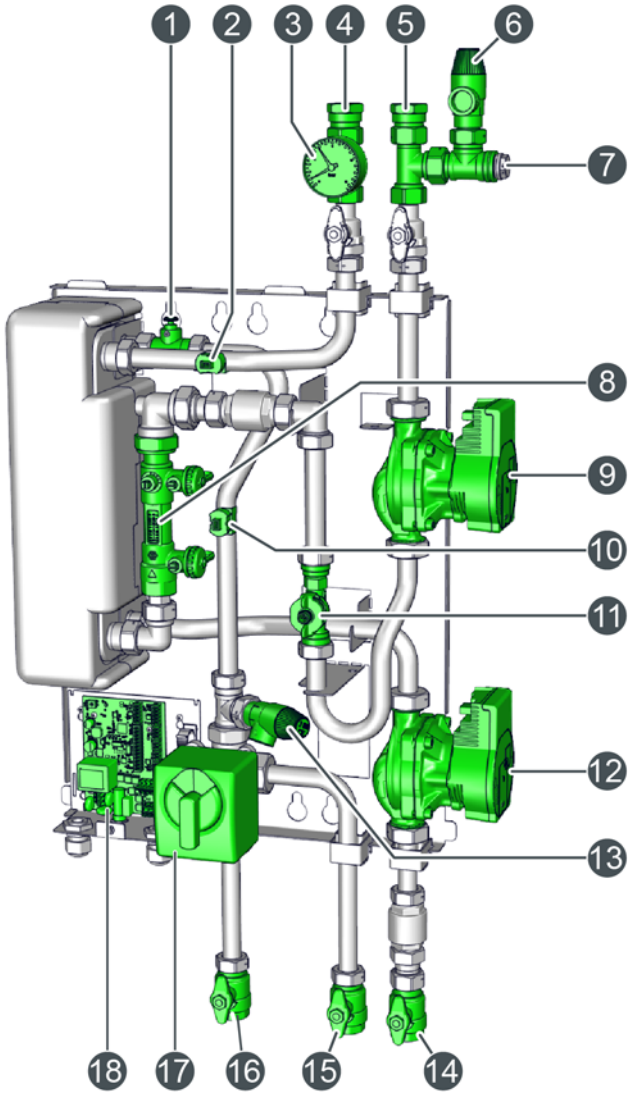
Ing. Johann Eibelhuber
Quality assurance

DI Ferdinand Tischler
Management

3 Description

3.1 Technical data

Connections on the stratified charging module



1 Bleed screw
2 Flow temperature sensor (solar heating system)
3 Pressure gauge (solar heating system)
4 3/4" flow connection for solar heating system
5 3/4" return connection for solar heating system
6 1/2" safety valve for solar heating system (6 bar)
7 Option for connecting expansion tank
8 Flow display with setting valve and purging connections for heat exchanger
9 Solar collector pump of the solar heating system (primary side of the heat exchanger)
10 Flow temperature sensor for heating water (secondary side of the heat exchanger)
11 Flow sensor with temperature sensor (solar heating system)
12 Secondary pump for heating water (for tank)
13 1/2" safety valve for heating water (3 bar)
14 3/4" return connection from tank
15 3/4" flow connection to top or bottom tank (can be freely selected)
16 3/4" flow connection to top or bottom tank (can be freely selected)
17 Actuator for shifting the changeover valve between the top and bottom area of the storage tank
18 Circuit board [EM-FC]

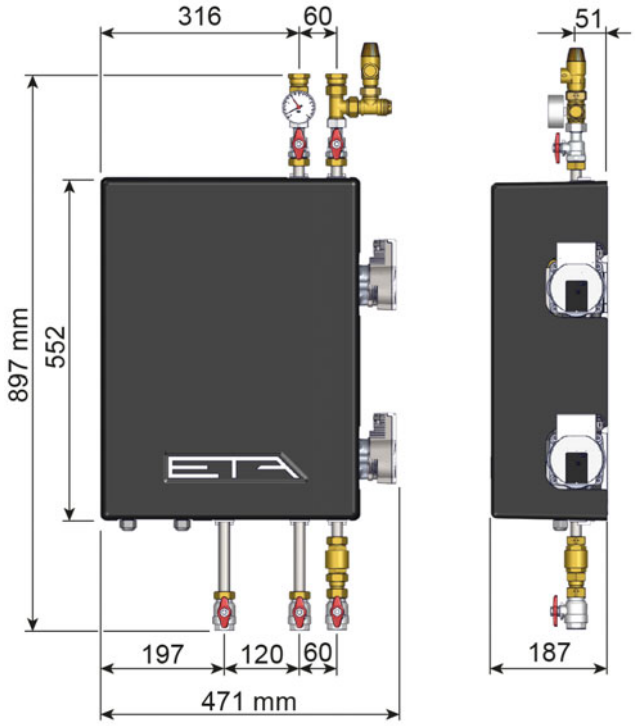
Technical data

Technical data	Unit	Value
Pump type on the heating side: WILO Para 15/7 iPWM1 Pump type on the solar side: WILO Para ST 15-130/7-50/iPWM2-12-Solar		
Number of pumps		2
Electrical power consumption at partial load	W	23
max. flow rate	l/h	1000
Free residual pump head	mWs	4
Connections for solar and hot water (female threads)	DN20 (3/4")	
Purging connections	DN15 (1/2")	

The flow rate depends on the collector surface. This results in a collector surface of up to 20 m² in "Highflow" operation with low collector temperatures and maximum solar yield.

From 20 m² to 40 m² collector surface, operation takes place in "Lowflow" with high collector temperatures and maximum tank utilisation.

Dimensions



3.2 Function

Adjusting the flow rate and integrated heat flow metering

The automatic speed adjustment of the solar collector pump is used to adapt the flow rate of the solar heating system to the respective current conditions. This keeps the temperature spread for the solar panel consistent, enabling maximum solar yield.

The flow and return temperature and the flow rate quantity are measured in order to determine the amount of thermal energy produced by the solar heating system (not a calibrated measurement), which is displayed in the control system; see Tab. 7-3: "Reading out the thermal energy".

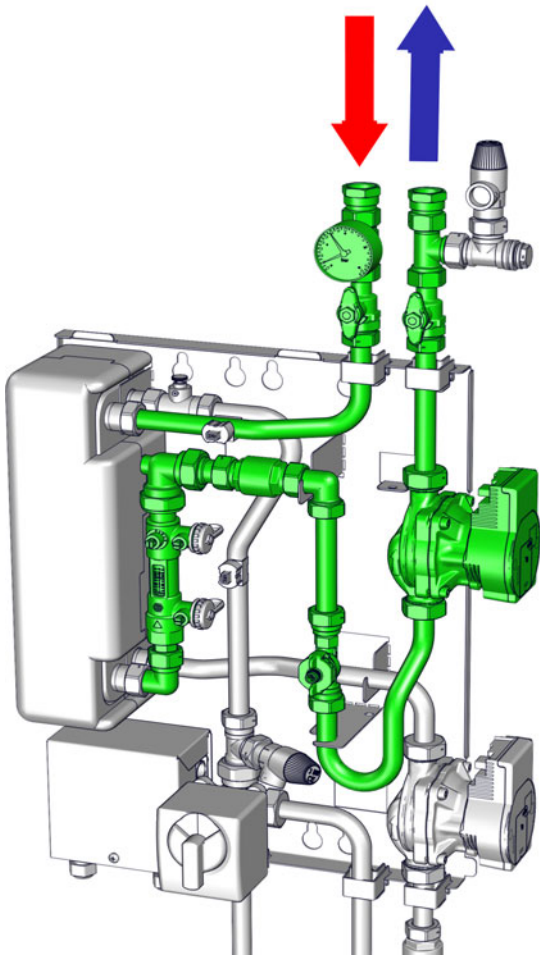


Fig. 3-1: Solar circuit

The volume flow display also features a valve that is used to manually set the flow rate of the solar heating system. However, adjustment is not usually necessary.

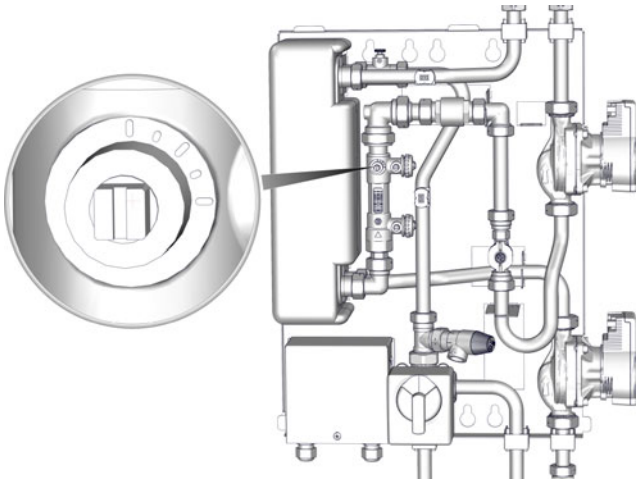


Fig. 3-2: Valve for setting the flow rate

The two connections for the boiler water circuit, which are used to load the top and bottom buffer areas respectively, can be freely selected so that the lines to the buffer do not cross.

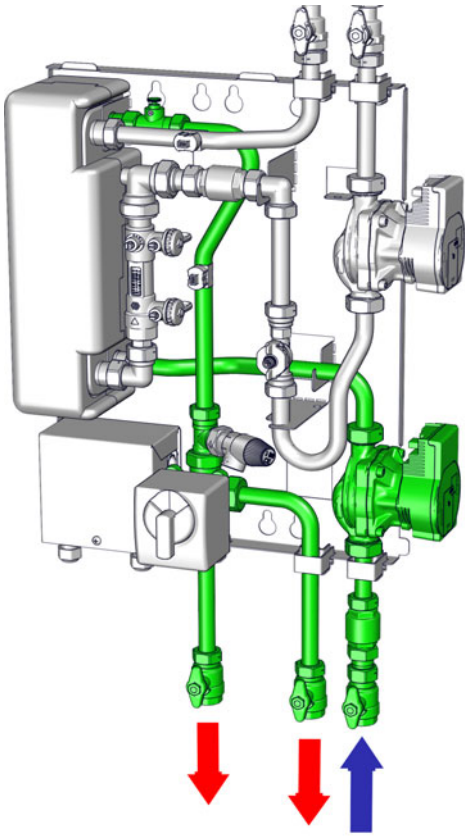
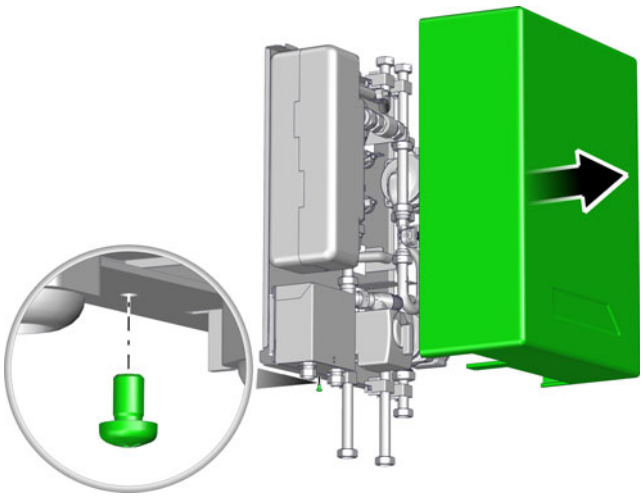


Fig. 3-3: Boiler water circuit

4 Installation

Removing the plastic cover

Prior to starting installation, remove the plastic cover by loosening the screw on the bottom side.



Fastening the stratified charging module to the wall

Find a suitable location for wall installation. The stratified charging module weighs approximately 20 kg.

The position for both screws on the top and bottom side must be transferred to the wall.

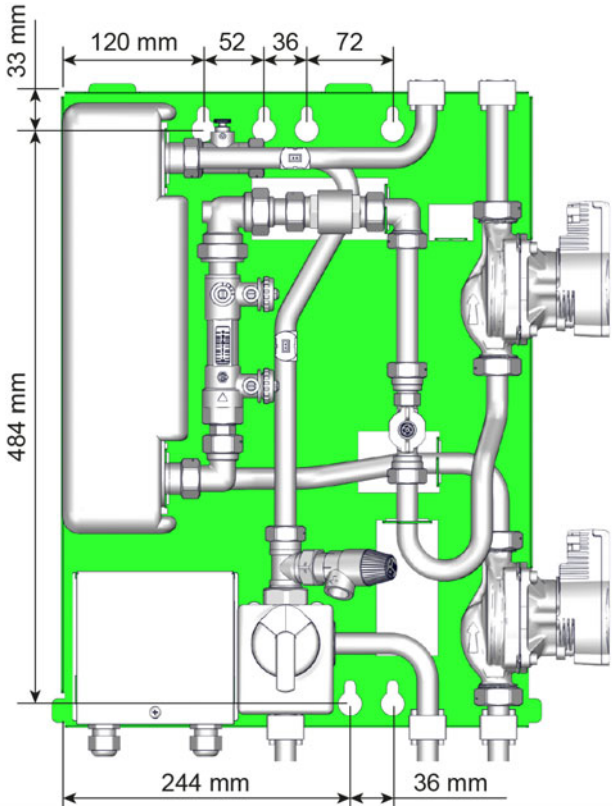


Fig. 4-1: Position of the mounting holes

Mount the 4 screws in the wall, hang the stratified charging module on these and fasten in place.

Mounting the screw joints

Mount the screw joints for the solar heating system on the top. Mount the pressure gauge and the ball valve on the flow and the safety valve and a ball valve on the return. Include flat seals with all screw joints.

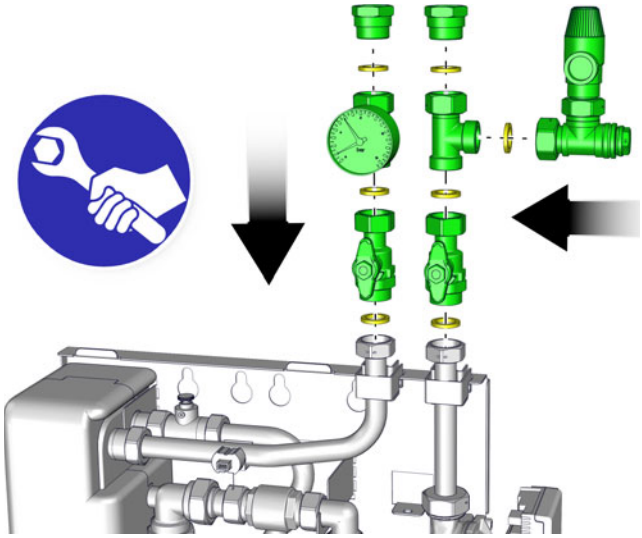


Fig. 4-2: Screw joints for the solar heating system

Mount the check valve and the ball valve on the return connection from the buffer. Include flat seals with all screw joints.

Note the flow direction of the check valve. The direction of flow must be from the buffer to the stratified charging valve.

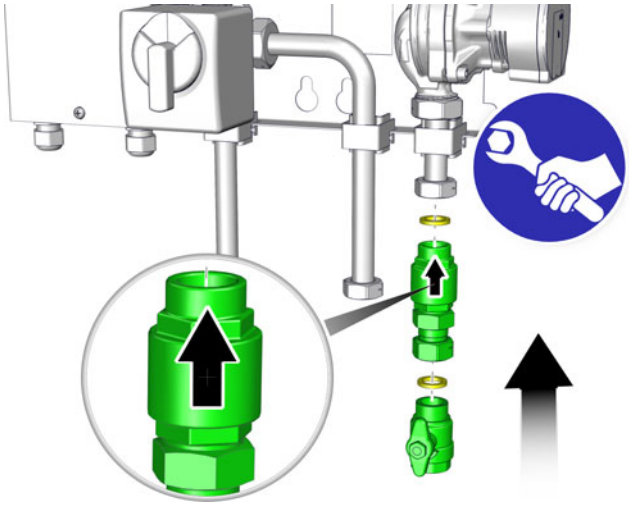


Fig. 4-3: Check valve on return connection

Mount both ball valves with inserted flat seals on the flow connections to the buffer.

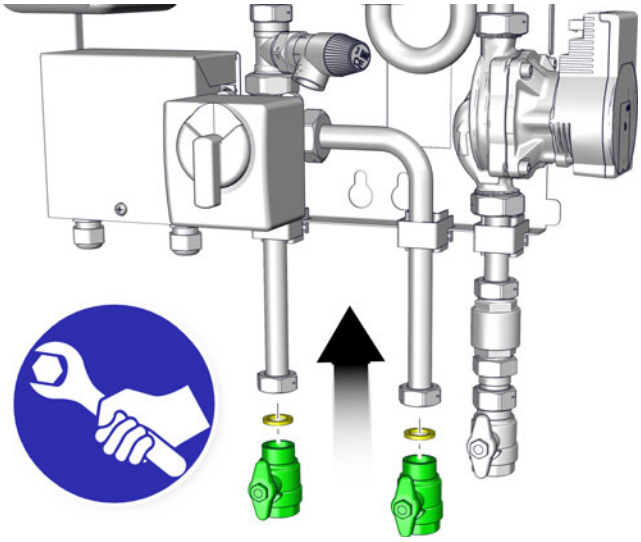


Fig. 4-4: Flow connections to the buffer

Installing the piping

Install the piping of the solar circuit and the boiler water circuit on the stratified charging module.

The two connections for the boiler water circuit, which are used to load the top and bottom buffer areas respectively, can be freely selected so that the lines to the tank do not cross.

Directing the safety valve of the solar circuit into a canister

A safety valve with 6 bar opening pressure has already been installed for the solar circuit at the factory.

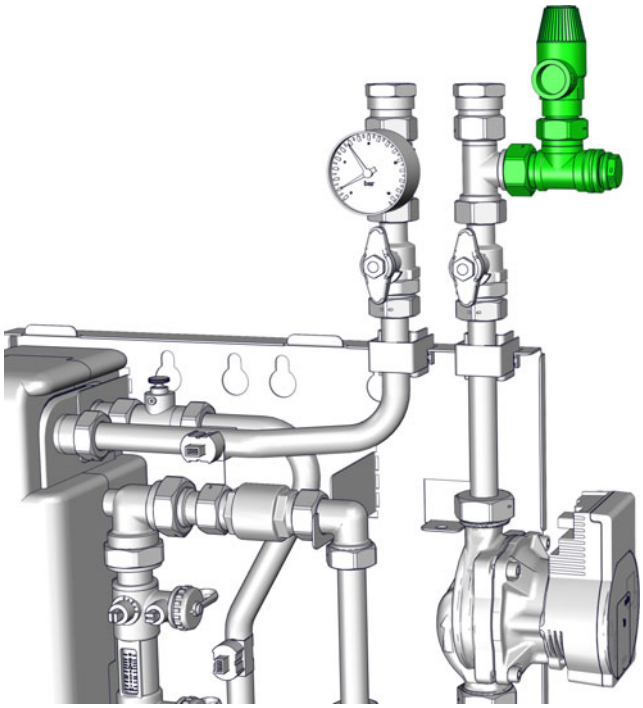


Fig. 4-5: Solar circuit safety valve

DANGER!

Safety valve outlet

The safety valve outlet must be directed to a canister with sufficient dimensions in a pipe so nobody is endangered by hot water or steam.

- The safety valve outlet must be directed into the canister via a clearly visible, open route (siphon funnel). This will ensure that malfunctions, especially a failure of the safety valve to close, can be detected. In the same way, the frost protection of the solar heating system (glycol) is collected when opening the safety valve and can filled into the solar heating system again later.

Routing the boiler water safety valve

A safety valve with 3 bar opening pressure has already been installed for the boiler water circuit at the factory.

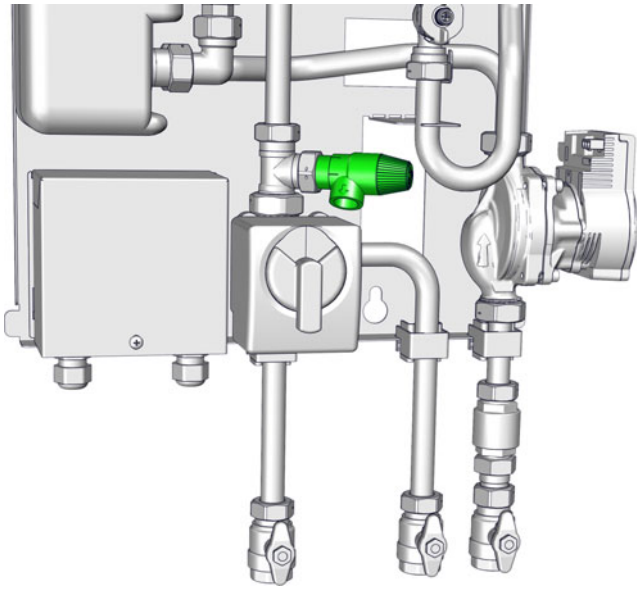


Fig. 4-6: Boiler water safety valve

DANGER!

Safety valve outlet

The safety valve outlet must be directed to the ground in a pipe so nobody is endangered when hot water or steam is drained.

- The safety valve outlet must be fed to the sewage system (e.g. duct) via a clearly visible, open route (siphon funnel). This will ensure that malfunctions, especially a failure of the safety valve to close, can be detected. If no connection is available to the sewage system, the outlet must be directed to the ground in a pipe.

5 Configuration

Content of this configuration

Only the steps required for the configuration of this product are described below. The configuration of the complete heating system is described in the "Configuration" manual supplied with the boiler.

Required software version

Different minimum software versions are required for the configuration. Therefore, first check the current software version of your heating system. The individual possibilities are listed below.

- up to software version X.35.X
  → Adjustments required, see chapter 8 "Operation with software version up to X.35.X".
- from X.36.0 to X.55.X
  → Update to X.56.3 (or above) required
- from X.56.3
  → no update necessary

Setting the freeze protection content in the control system

After the configuration, a message appears on the screen that the freeze protection content of the solar heating system must be set.

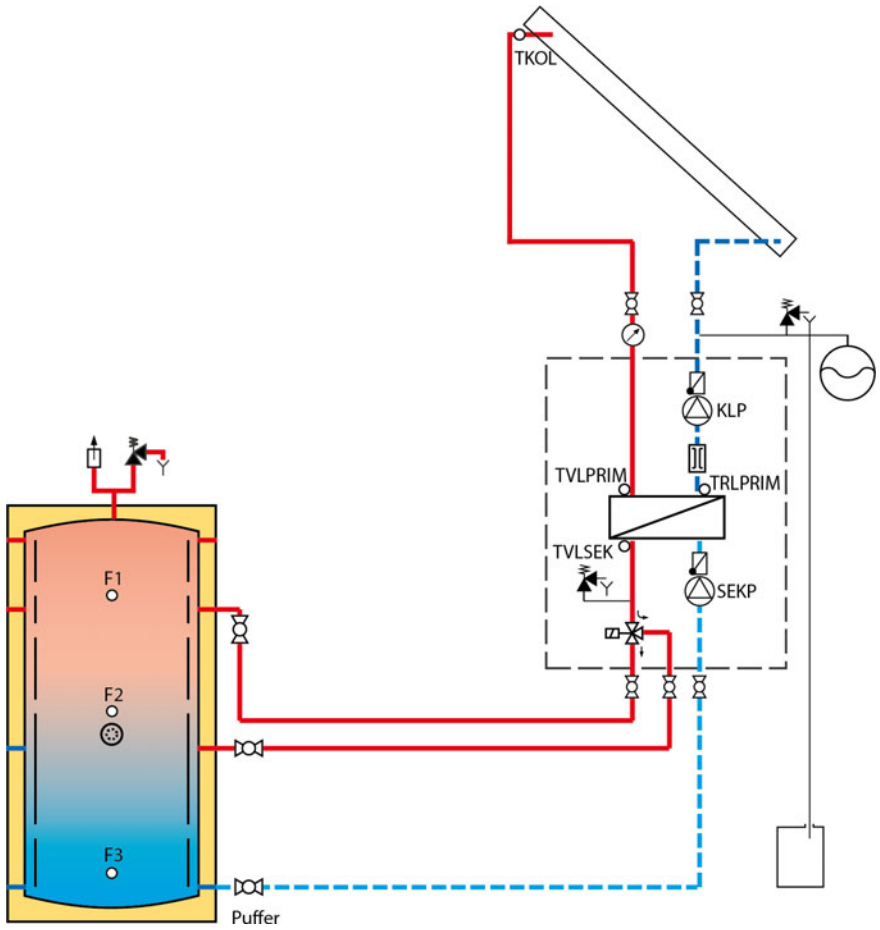
To configure, raise the authorisation to [Service]. Select the [Solar] function block and press the button to switch to the text menu. The parameter can be found under:

Output
► Glycol content

Tab. 5-1: Input glycol content

5.1 Sample

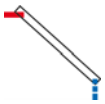
Hydraulic schematic



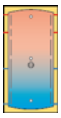
The heat exchanger with the stratified charging is also available as a ready-made unit as "ETA stratified charging module". The following configuration and terminal allocation apply to this.

- [Charging by demand]:
  The current requests of the consumers on the buffer and the set minimum temperature of the solar heating system ([Buffer top min. solar]) are used to calculate the temperature required for buffer charging. The solar heating system will only begin to charge the buffer once the collector temperature is greater than the calculated temperature (for charging the buffer).
  As long as the requested temperature of the consumers and the [Buffer top min. solar] in the buffer at the top are not fulfilled, charging only takes place upwards, unless the boiler is charging into the buffer.
- [Optimise yield]:
  The solar heating system will begin to charge the buffer as soon as the collector temperature is greater than the current buffer temperature.
  The solar heating system only charges into the buffer at the bottom. Unless there is a heat exchanger with a stratified charging valve, in which case charging still takes place at the top if the secondary flow temperature [Secondary flow] is higher than the [Buffer top] temperature.
- [Charging according to buffer top min. solar]:
  The solar heating system only begins to charge the buffer once the collector temperature is greater than the set minimum temperature of the solar heating system ([Buffer top min. solar]).
  As long as the set [Buffer top min. solar] in the buffer at the top is not filled, charging only takes place to the top, unless the boiler is charging into the buffer.

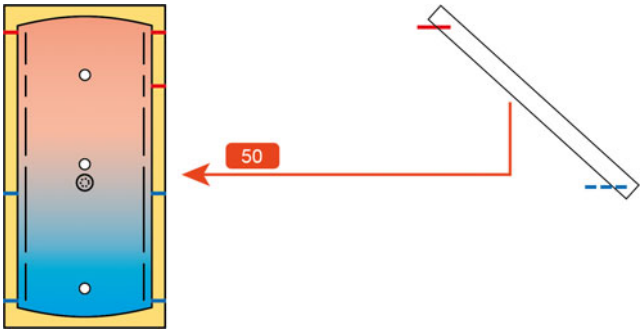
Circuit board [EM-FC 1]

Function blocks			Description
	Solar heating system		Solar heating system with ETA stratified charging module
	Settings		
	Tank 1	Heat exchanger with stratified charging valve	
	Tank 2	not available	
	Heat meter	with flow rate sensor and temperature sensor	

Circuit board [GM-C 0]

Function blocks			Description
	BufferFlex		Buffer storage tank
	Basic settings		
	Temperature sensor number	3	
	Consumer levels	1	
	Solar heating system		
	Solar heating system	Heat exchanger with stratified charging	
	Additional functions		
	Combination tank	No	
	Start relief for log boiler	No	

Connections



= type [SolarMedium]

Producers	Consumers
50 EM-FC 1: Solar: Tank 1	50 GM-C 0: BufferFlex: Solar bottom

6 Electrical connections

6.1 Requirements

Electrical connection must only be made by qualified specialist personnel

The electrical installation must only be performed by specialist personnel with the corresponding qualifications.

Power supply of the stratified charging module

Power is supplied to the stratified charging module via the power plug that has already been mounted; this is performed independent of the boiler. However, the power supply can also be securely wired to the electronic distributor.

DANGER!

Electric shock

There are live parts on the circuit boards. If touched, they can cause injury and property damage.

- ▶ Before beginning any work, isolate the system completely from all power sources, ensure that it cannot be switched back on, and verify that it is safely isolated from the power supply.

WARNING!

Damage to circuit boards

Circuit boards can be damaged by electrostatic discharge. Therefore, observe the ESD protection measures when handling the circuit boards.

- ▶ Dissipate electrostatic energy before and while touching circuit boards. Discharge yourself, for example, by touching earthed metallic objects (boiler body, heating pipes). Conductive straps or special ESD work shoes are recommended.
- ▶ Do not bring the circuit board into contact with conductive objects whose electrostatic charge has not yet dissipated.
- ▶ Only touch the circuit board at the outer edges and not at the terminals and solder joints.

CAUTION!

Flexible stranded conductors

If flexible stranded conductors are not used for the wiring, the contacts in the plug connections will be subjected to excessive mechanical strain. In this case, the warranty for the electronics would be invalidated.

- ▶ Only use flexible stranded conductors for the wiring.

Maximum outputs

230 V output	maximale Output
A single output	250 W
Sum of all outputs	700 W

6.2 CAN bus installation

Notes for CAN Bus cables

The CAN Bus cables must have the following specification:

- As topology in the CAN Bus, only one "line topology" is allowed. A "star topology" is not permitted.
- The maximum total length of all used CAN-Bus cables is 400 m. When laying the cables, make sure the distance between the circuit boards is as short as possible. If the total length is disregarded, proper operation cannot be guaranteed.

  The optional CAN router circuit board [EC-R] can be used to extend the CAN network. For more information, please refer to the instructions for the circuit board [EC-R].
- If the factory-supplied CAN Bus cables are too short, CAT-6 or higher quality cables must be used instead. The CAN Bus lines must not be lengthened (split).
- If CAN Bus lines are more than 50 m long or are laid outside the building, CAT-6 or higher quality cables must be used.

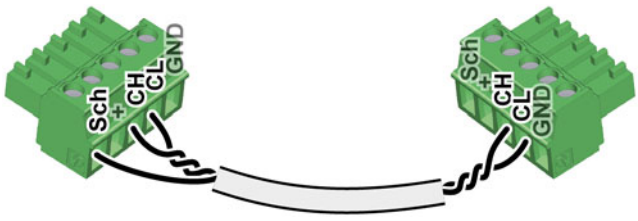


Fig. 6-1: CAN Bus cable (2-wire and one-sided shield)

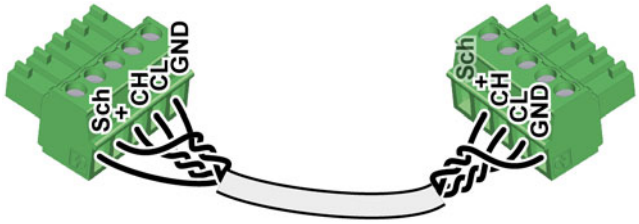


Fig. 6-2: CAN Bus cable (4-wire and one-sided shield)

Terminal designation

Sch	Shield
+	Power supply
CH	Data line CH
CL	Data line CL
GND	Earth

Establishing a CAN-Bus connection

To establish the CAN-Bus connection to the boiler, there a two terminals and the associated cable in the delivery scope.

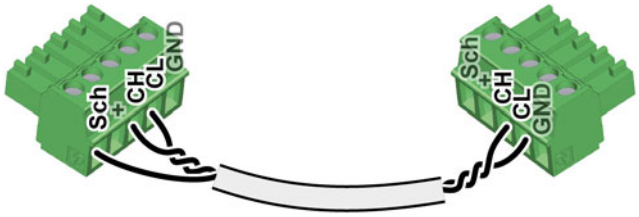
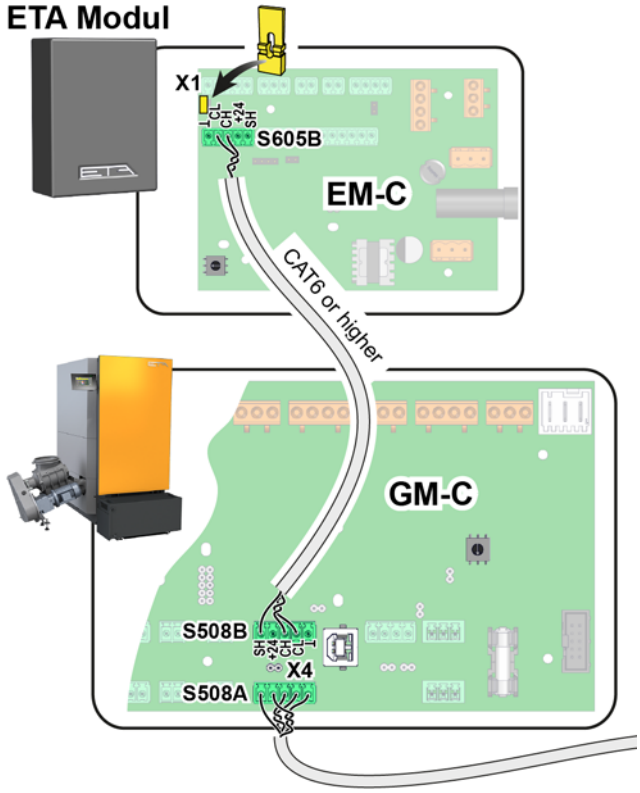


Fig. 6-3: CAN-Bus cable

Only clamp the "Sch" shield on one side. Do **not** connect the "+" and "Gnd" wires.

Example: connection to circuit board [GM-C]



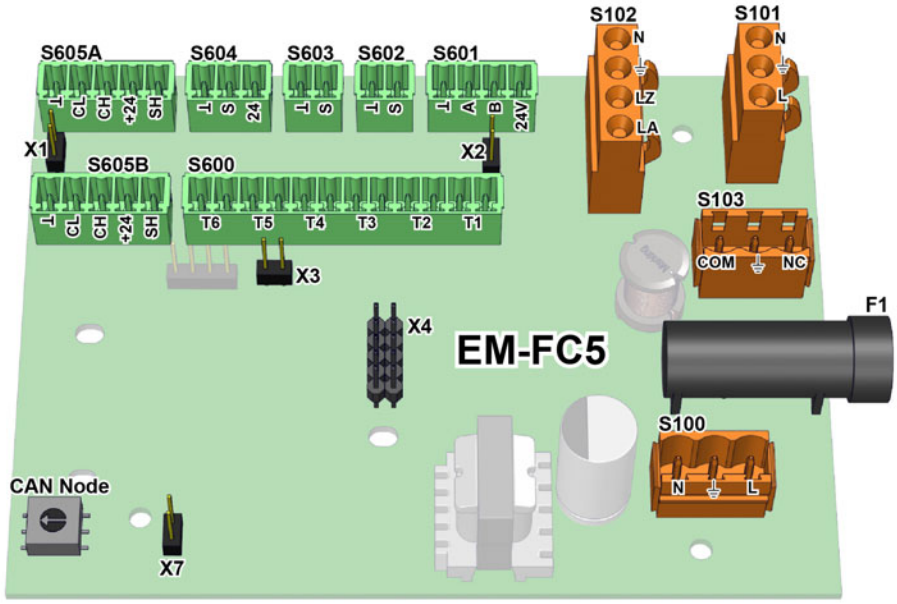
A terminal resistor (yellow jumper) must be set at the end of the CAN-Bus. If both CAN-Bus terminals are allocated, the terminal resistor must be removed on this circuit board.
In the example above, the terminal resistor must be removed from the [GM-C] circuit board at [X4] and placed on the [EM-FC] circuit board at [X1].

Check the node numbers if the circuit boards are the same design

If several identical circuit boards (for example: two [EM-FC]) are connected to each other via CAN-Bus, these circuit boards must have consecutive node numbers. So that these can identified and configured in the CAN-Bus.

Therefore, compare the node numbers of the individual circuit boards of the same design and set them as needed using the node switch.

6.3 Circuit board [EM-FC5]



Only use flexible cables, e.g. for: pumps, mixers and temperature sensors. Please observe the wiring instructions, see 6.1 "Requirements" and CAN-Bus lines see 6.2 "CAN bus installation".

These terminals can be used

Terminal	Function	Minimum cross-section	Standard assignment
S600 T3	Temperature input	3 x 1 mm²	Collector
S600 T4	Temperature input	3 x 1 mm²	Free (can be used for top or bottom solar buffer)
S600 T5	Temperature input	3 x 1 mm²	Free (can be used for top or bottom solar buffer)
S601	RS-485 bus		
S605A	CAN-Bus	see 6.2 "CAN bus installation"	From boiler
S605B	CAN-Bus	see 6.2 "CAN bus installation"	

These terminals are already pre-wired at the factory

Terminal	Function	Standard assignment
CAN node	CAN-Bus node switch	Position "1"
F1	Fuse T 3,15 A (Mains power input)	
S100	Supply 230 V	**Mains power input**
S101	230 V output	Solar collector pump and secondary pump
S102	230 V output	Actuator for shifting changeover valve
S103	230 V input	On the factory side, the contacts "NC" and "COM" are connected (bridged), because otherwise all 230 V outputs are locked.
S600 T1	Temperature input	Secondary flow
S600 T2	Temperature input	Primary flow
S600 T6	Temperature input	Primary return
S601	RS-485 bus	

These terminals are already pre-wired at the factory

Terminal	Function	Standard assignment
S602	PWM output	Speed control for secondary pump
S603	PWM output	Speed control for solar collector pump
S604	Analogue, digital, counter input	Flow sensor with temperature sensor
X1	Terminal resistor for CAN-Bus	
X2	Terminal resistor for RS-485 bus	
X3	Terminal resistor	To simply delete the configuration the jumper must be set once when restarting.
X7	Terminal resistor for software X.35.X	The jumper must only be set for operation with the software version up to X.35.X.

Counter inputs or frequency inputs record digital frequencies and are therefore intended for special sensors (e.g. digital flow rate sensors).

7 Commissioning

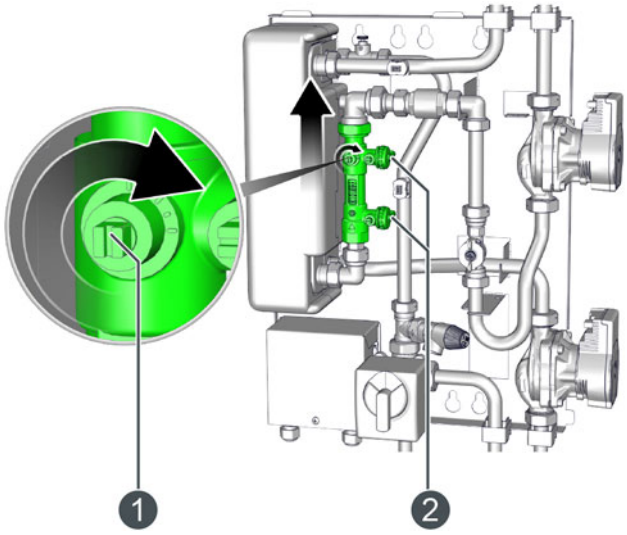
Monitoring the screw joints

Due to vibration and thermal expansion, all screw joints must be inspected and tightened prior to commissioning.

Filling and rinsing the solar heating system

The stratified charging module features two connections for the purpose of rinsing the solar heating system. Pay attention to the direction of flow.

The setting valve must be closed during filling and rinsing.



1 Setting valve

2 Connections for filling the solar heating system

Do not forget the necessary frost protection (glycol).

Bleeding before commissioning

A bleed screw for bleeding the boiler water circuit is located on the top of the stratified charging module.

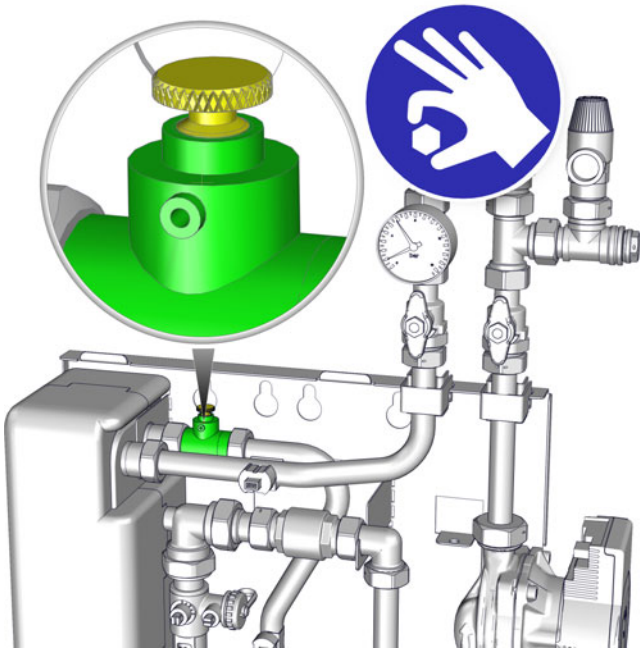


Fig. 7-1: Bleed screw

Checking the current setting for the changeover valve

The current setting of the actuator for the shifting changeover valve is displayed in the text menu of the [Solar] function block under the [Stratified charging valve] parameter.

Solar heating system
► Stratified charging valve

Tab. 7-1: Checking the current setting

The [Top] setting indicates that the top area of the buffer is charged. The [Middle] setting indicates that the central area is charged.

If the piping of the buffer runs contrary to this, i.e. if the bottom area is charged when the [Top] setting is selected, then the direction of rotation of the actuator must be changed in the control system, see Tab. 7-2: "Inverting the output".

Changing the direction of rotation

The direction of rotation is changed by inverting the output for the actuator.

To change, raise the authorisation to [Service]. Select the [Solar] function block and press the button to switch to the text menu. The parameter can be found under:

Outputs
► Stratified charging valve
► Stratified charging valve
► Invert

Tab. 7-2: Inverting the output

Set the selection to [Yes] and save.

Reading out the thermal energy

The heat flow metering is already integrated at the factory and can be seen in the text menu of the [Solar] function block. The individual values can be found here:

Output
► Heat amount
► Yield today
► Yield yesterday

Tab. 7-3: Reading out the thermal energy

The value given for the parameter [Output] corresponds to the current output of the solar heating system. The value [Heat amount] corresponds to the total thermal energy supplied since the solar heating system was commissioned.

Mounting the plastic cover

Reattach the plastic cover after commissioning. Pull off the protective film and affix the ETA logo in the corresponding recess.

8 Operation with software version up to X.35.X

The following steps are only required for use with software versions up to X.35.X

The ETA module is delivered from the factory with software 3.56.3 and can therefore not be operated immediately with an ETAtouch control system up to software version X.35.X. Therefore, the following steps are only necessary if:

- the ETA module is connected via CAN-Bus in a heating system with the ETAtouch control system
- and in addition the heating system is used with software up to version X.35.X

If the ETA module is operated without a CAN-Bus connection (if possible), i.e. standalone, then these steps can be skipped.

Install software X.35.17 (or above)

In order to install the X.35.17 (or later) software, the factory-installed X.56.3 software must first be deleted from the circuit board.

Before carrying out the following steps, first disconnect the power supply to the ETA module (e.g.: fresh water module, stratified charging module or others). If there is already a CAN-Bus connection between the ETA module and the heating system, this must also be disconnected.

1. Download software version X.35.17 (or above) and save it on a USB drive. Then update the software of the heating system to this version.

   The required files for the software update can be found in the login area on the website www.eta.co.at and also on www.meinETA.at.

2. Remove the covers on the ETA module to access the circuit board. Set a jumper at terminal [X3] so that the factory-installed software is deleted after switching on.

   Only necessary for the [EM-FC] circuit board: Set another jumper at terminal [X7] so that the [EM-FC] is recognised in the CAN-Bus.

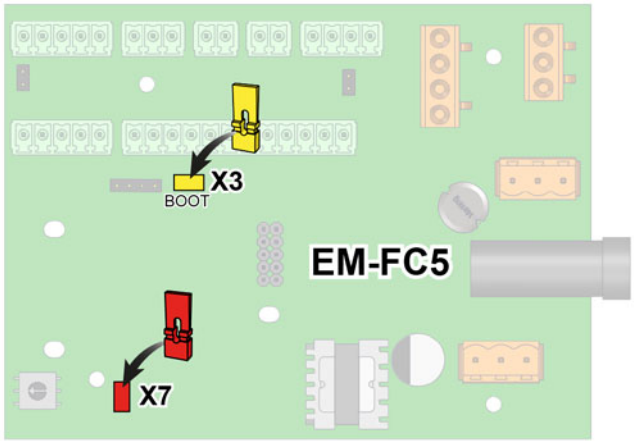


Fig. 8-1: Setting the jumper

3. Restore the power supply and also the CAN-Bus connection from the ETA module to the heating system. After switching on the power supply, a software update is performed on the circuit board.

   Approximately 10 seconds after switching on, remove the jumper from terminal [X3].

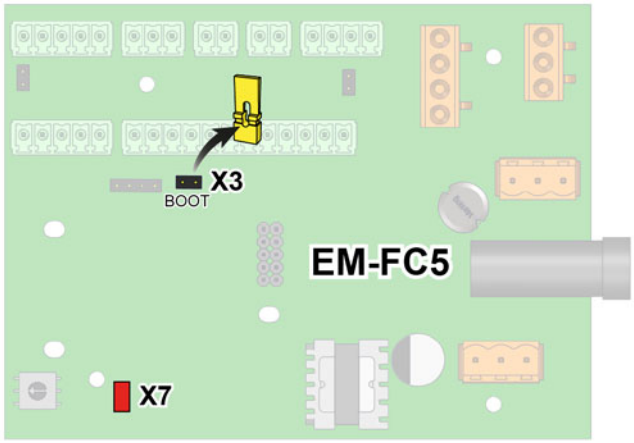


Fig. 8-2: Removing the jumper from [X3]

As soon as the software update is complete, start the configuration wizard. See the steps below for this.

8.1 Configuration

Adding function block [Solar heating system]

The following description shows the configuration with the circuit board [EM-FC].

From column [Possible function blocks], select the [Solar heating system] function block and add it.

► EM-FC 1
► Solar heating system

Select the following options:

Solar heating system	
Options:	
☑	Ext. heat exchanger
☑	... with stratified charging valve
☑	Heat flow meter

Save the changes.

Establishing connections

Due to the stratified charging module, the solar heating system is twice the producer and the buffer is twice the consumer. You therefore need to create two separate connections.

Connections
SolarMedium
Producers
EM-FC 1: Solar: Tank 1 bottom
Consumers
GM-C 0: Buffer: Solar bottom

Then create a second connection.

Connections
SolarMedium
Producers
EM-FC 1: Solar: Tank 2
Consumers
GM-C 0: Buffer: Solar top

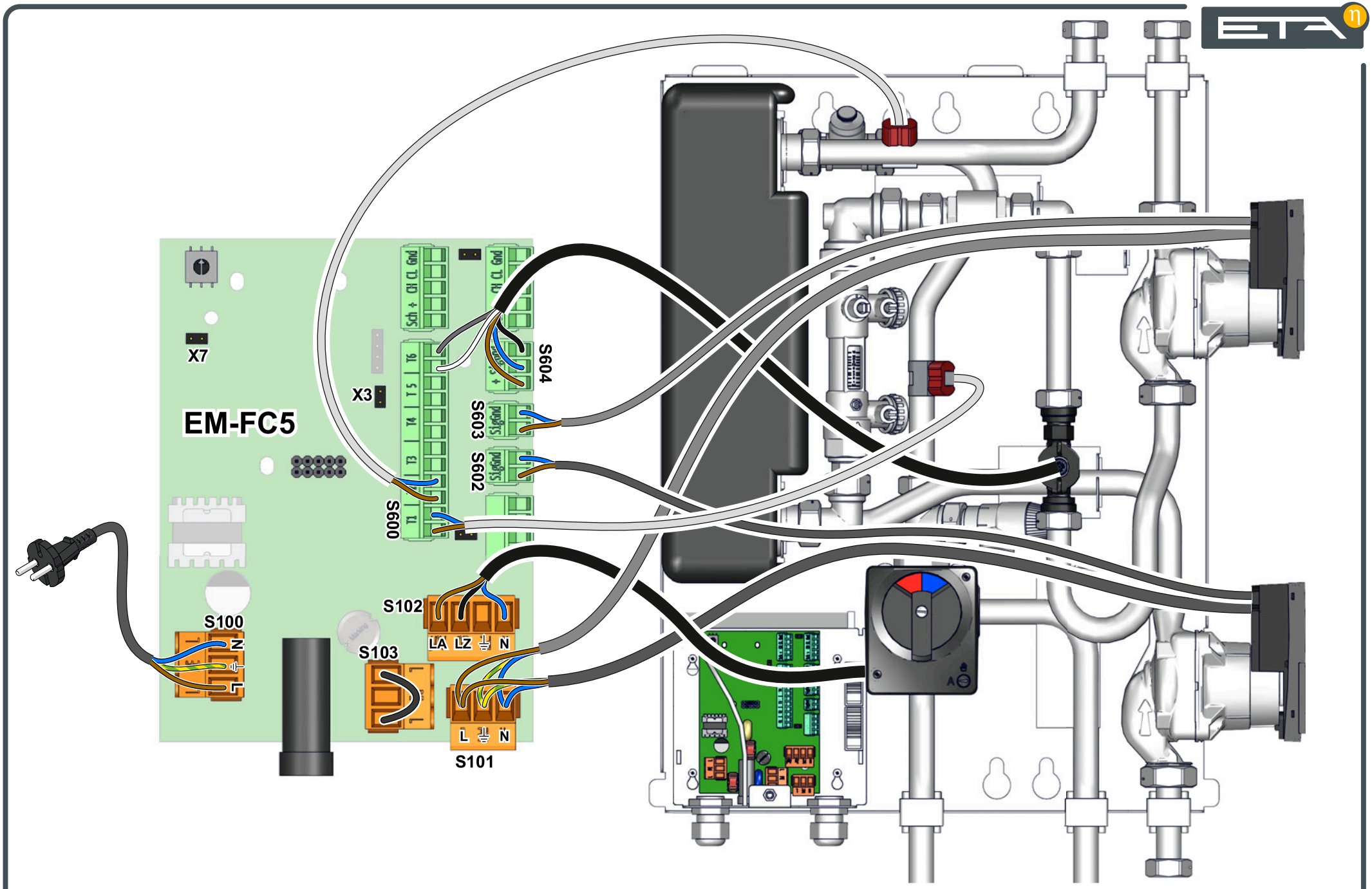
Installing a configuration

Finish by pressing [Apply] to install the configuration. The configuration will then be adopted and the software restarted.

Continue installation

Continue the installation from chapter 6 "Electrical connections".

9 Simplified electrical connection (overview)



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