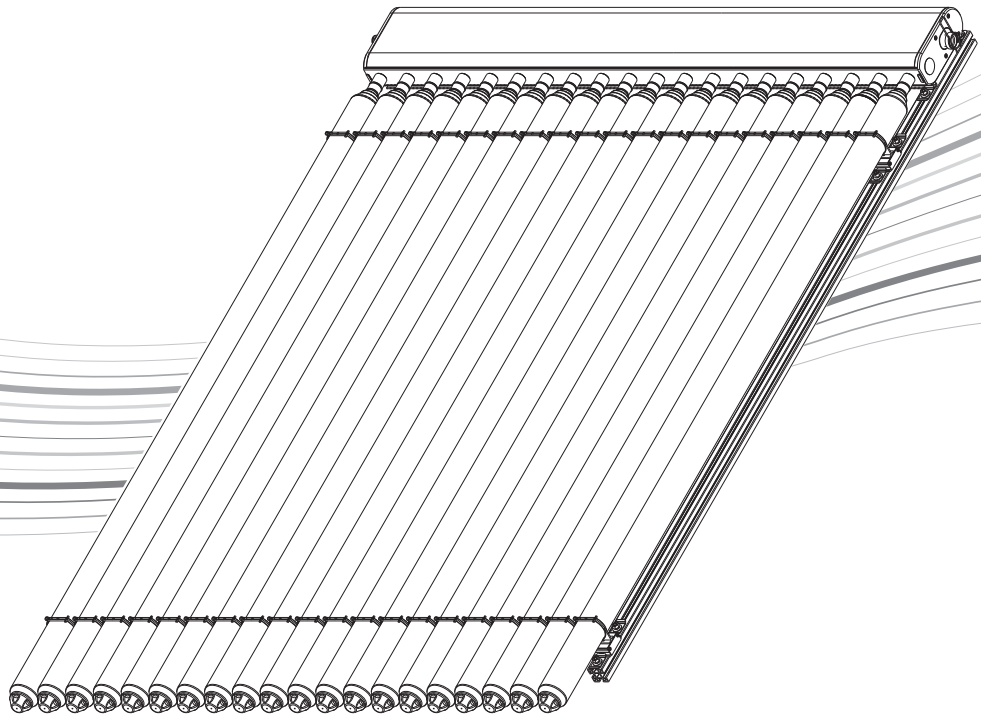


Commissioning, Maintenance & Servicing Guide



Solarflo™

Evacuated Tube Collector

Please read these instructions before installing or commissioning. Solarflo™ (Solar Thermal Domestic Hot Water System) should only be installed by a competent person.

**PLEASE LEAVE THESE INSTRUCTIONS WITH THE
USER FOR SAFE KEEPING.**

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1.1 Commissioning - General

Solarflo™ system uses an indirect sealed primary circuit which must be filled with the heat transfer fluid provided. This is mixed to the appropriate strength (40% glycol/60%water) and should not be diluted further. Use only the fluid supplied. Additional solar fluid is available in 10 litre containers - Baxi Sales Number 5130651.

DO NOT mix the fluid with other types.

The system should be filled when there is no direct radiation from the sun. If direct radiation is likely to occur the collector(s) should be shaded by covering them during filling and flushing.

Although the solar heat transfer fluid is non corrosive and biodegradable appropriate precautions should be taken when handling.

- Wear protective gloves and goggles.
- Wash with soap and water if the fluid comes into contact with skin.
- If fluid gets into eyes, rinse immediately with large quantities of clear running water.
- A full safety and specification sheet can be obtained by request.

The solar heat transfer fluid must be pumped into the system. The pump can be electric or manual but must be capable of producing a pressure of at least 2 bar.

The system should be thoroughly flushed with heat transfer fluid to remove any contaminants in the solar primary circuit prior to filling with the heat transfer fluid.

Fig. 1

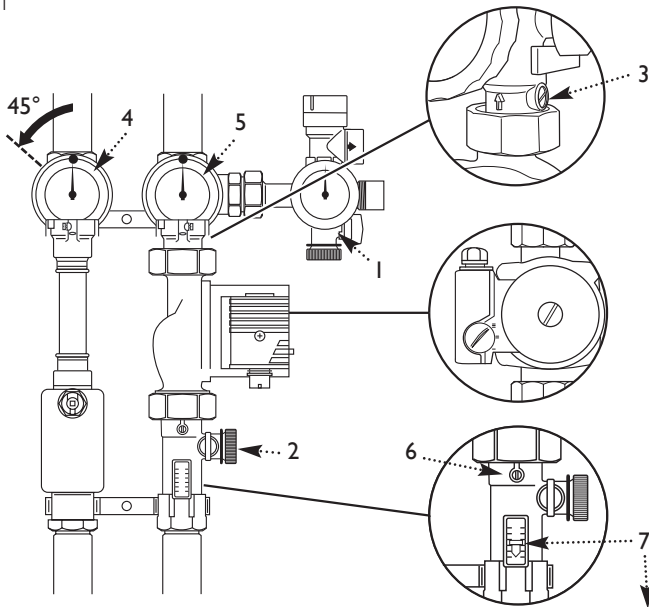


Fig. 2

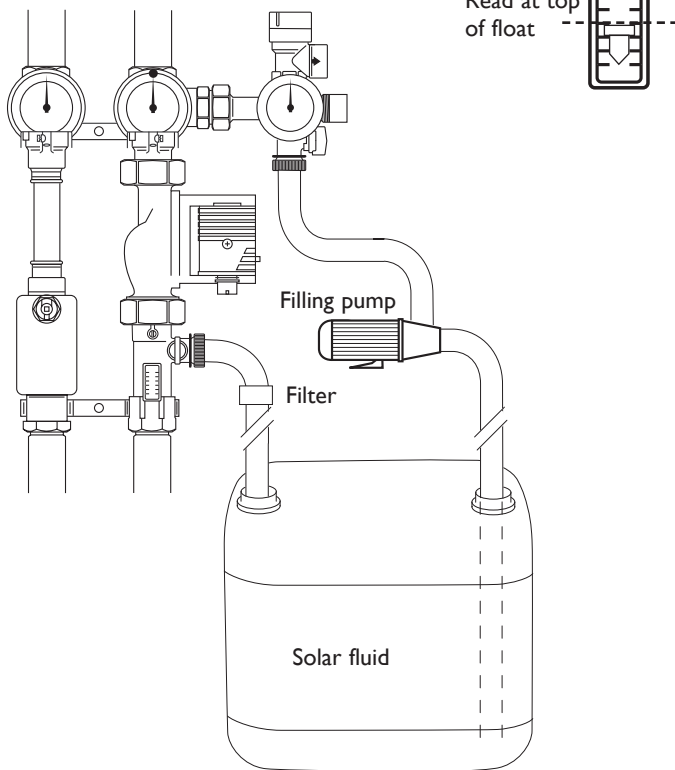
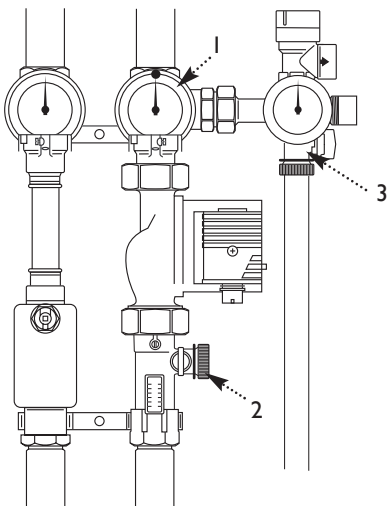


Fig. 3



1.0 Commissioning of system

1.2 Air Test

1. An air test may be used on the pipework to detect any gross leakage prior to flushing and filling with solar heat transfer fluid. Pressurise the system to a maximum of 1 bar to check for leaks.

2. Ensure that the solar expansion vessel pre-charge pressure has been set prior to flushing and filling. See Installation Instructions Section 9.8 for details.

1.3 Flushing and Filling the pipework

1. Before the system is commissioned the pipework must be flushed to remove any contaminants. **This must be done using the solar heat transfer fluid as it will be impossible to fully drain all parts of the system.**

2. Connect the flushing pipes to the fill & drain valve on the safety group (Fig. 1 Item 1) and to the fill & drain valve on the flow meter (Fig. 1 Item 2).

3. Open the fill & drain valves.

4. Turn the slot of the adjusting screw (Fig. 1 Item 3) in the return so the slot is vertical to open the non-return valve.

5. Turn the left hand isolating valve with integral thermometer in the flow (Fig. 1 Item 4) in the direction indicated by the arrow (to a 45° position) to open the non-return valve.

6. Ensure that the right hand isolating valve with integral thermometer in the return (Fig. 1 Item 5) is open indicated by the dot on the thermometer bezel being at the top.

7. Turn the slot of the flow meter adjusting screw (Fig. 1 Item 6) in the return vertically to open the flow limiter (Fig. 1 Item 7).

8. Flush the solar primary pump by pumping the fluid into the system via the fill and drain valve on the safety group (Fig. 1 Item 1).

9. Close right hand isolating valve (dot on thermometer bezel at 9 o'clock position). Flush solar primary pipework and collector via the fill and drain valve on the safety group. **If reusing flushed fluid ensure this is filtered before re-introducing into the system.** (see Fig. 2). Use a suitable container of a large enough volume to collect the fluid.

10. When satisfied that all pipework and component parts have been thoroughly flushed, the system can be filled.

1.3 Flushing and Filling the pipework (cont)

11. Pour an amount of the solar heat transfer fluid into the filling pump.
12. Close the fill and drain valve - safety group (Fig. 1 Item 1) and the fill and drain valve - flow meter (Fig. 1 Item 2) and pressurise the pump slightly prior to filling the system. If an electric pump is being used follow the instructions with the pump.
13. Fully open the fill and drain valve on the safety group (Fig 1, item 1) and pump fluid into the system. Whilst pumping, open the flow meter drain valve (Fig 1, item 2) slightly to allow the air to vent out of the system.
14. When the pump is down to approximately 1 litre isolate the fill and drain valves. Vent the filling pump and refill with solar heat transfer fluid.
15. Re-pressurise the filling pump and repeat steps 3 and 4 above until fluid is seen discharging from the drain valve on the flow meter. (Fig 1, item 2). Close the drain valve.
16. Continue filling at the fill and drain valve on the safety group (Fig 1, item 1) until the system pressure reaches 2 bar.
17. At this point the pump should be vented. If the system pressure drops, repressurise using the procedure above.
18. After venting the pump and checking that the system pressure is 2 bar, close the fill and drain valve on the safety group (Fig. 1 Item 1).
19. Turn the left hand isolating valve (Fig 1, item 4) back 45° clockwise until the dot on the bezel is back at 12 o'clock.
20. Turn the right hand isolating valve (Fig. 1 Item 5) back 90° clockwise until the dot on the bezel is back at 12:00 O'clock.
21. Turn on the power to the solar controller. This should display the information screen (See Section 3.1 Main Menu).
22. Key the left button once to enter the main menu screen. The 'i' icon will flash (See Sections 3.1 Main Menu and 3.2 Control Button for display and button function).
23. Press the right button twice to select the manual operation menu. Press the down button and the 'pump' symbol and the 'switch output 1' symbols should now be seen with a 'zero' displayed. Changing the 'zero' to a 'one' will operate the pump. To do this, press the right button and the 'zero' will flash.
24. Press either the up or down button to manually activate the pump, then key right to accept the setting.
25. Leave the pump running for sufficient time to allow any residual air to be purged from the system via the air separator and any bleed points fitted to the system. Use the flow meter window as a visible indicator of the air bubbles. The reading should be stable. **NOTE: During this time the system may be checked for leaks.**
26. Stop the pump using the button procedure described above. If pressure has been lost from the system during the air bleeding process, repressurise as follows:

1.3 Flushing and Filling the pipework (cont)

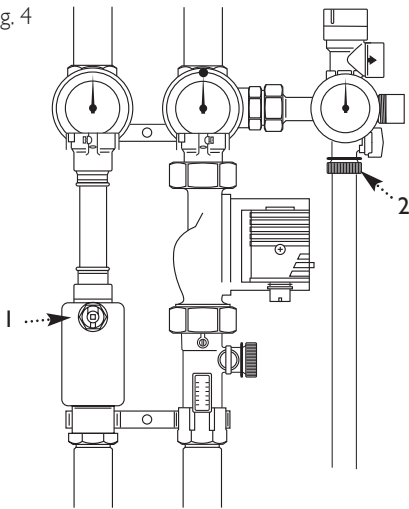
27. Repressurise the Filling Pump

- a) Open the adjusting screw (Fig. 1 Item 3) to vertical.
- b) Set the left hand isolating valve (Fig. 1 Item 4) to 45° and the right hand isolating valve (Fig. 1 Item 5) to 9:00 O'clock.
- c) Open the fill and drain valve - safety group (Fig. 1 Item 1) and repressurise the system to 2 bar.
- d) Close the fill and drain valve - safety group (Fig. 1 Item 1).
- e) Return the left hand and right hand isolating valves to 12:00 O'clock.
- f) Close the adjusting screw to horizontal.

28. Setting the System Pressure

- a) During commissioning, the system pressure should be 0.7 bar above the static pressure (1 metre height differential equals 0.1 bar). However, it must be at least 1.5 bar and no higher than 2.2 bar.
 - b) Determine the system pressure when the system is cold (20°C). This should be recorded on the Commissioning Record Sheet (page 21).
 - c) If the pressure is too low you should pump additional heat transfer fluid into the system; the fill & drain valve on the safety group (Fig. 4 Item 2) needs to be opened for this purpose. When system pressure is correctly set, ensure the fill and drain valve is closed and remove filling hose from safety group.
29. Remove all tubing from the fill and drain valve on the safety group (Fig 1, item 1) and the drain valve on the flow meter (Fig 1, item 2) and replace both the sealing caps securely, ensuring that the rubber seals are fitted.

Fig. 4



1.4 Check pressure in the solar primary pipework

1. After flushing and filling the solar primary system with heat transfer fluid the pressure must be checked.
2. Pressure test the system to between 2 to 2.5 bar. Observe the maximum pressure ratings of all components concerned.
3. Check the solar heating system for leaks.
4. Close the fill and drain valve on the safety group.

Fig. 5

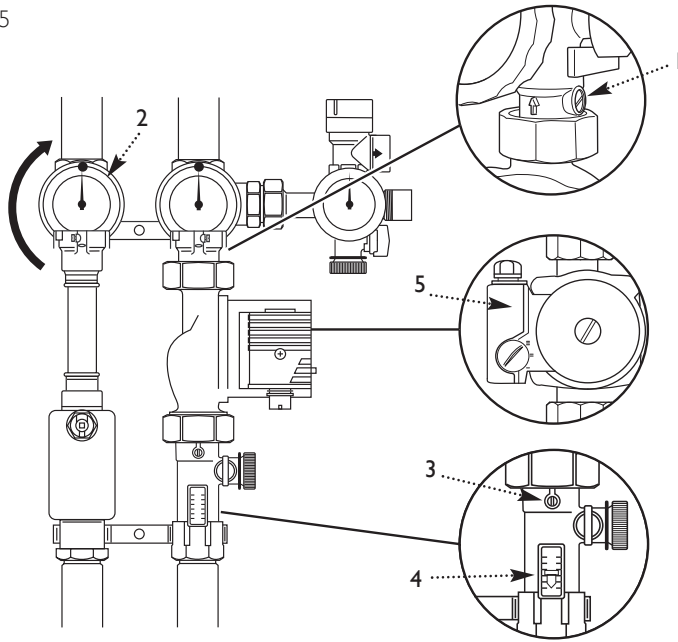
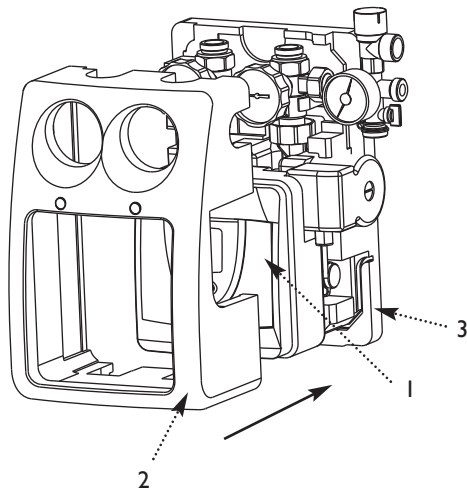


Table 1

Flow rate (when system is cold)	
Collectors	l/min
20	approx. 4
30	approx. 6

Fig. 6



2.1 Checking and adjusting the flow rate

1. Adjust the flow rate when the system is cold (20°C) (see Fig. 5).

2. The flow rate should be adjusted to give the optimum flow rate depending on the number and type of collector(s) connected.

3. Manually operate the solar pump (See Section 3.6).

4. Set the solar pump speed selector (Fig. 5 Item 5) so that the required flow rate is achieved or exceeded with the lowest possible setting. The flow limiter adjusting screw (Fig. 5 Item 3) can be used to fine-tune the flow rate.

5. Depending on the number and type of collectors installed, set the required flow rate from table (See Table 1).

6. The float in the flow meter will indicate the circulation flow rate through the flow meter sight glass (Fig. 5 Item 4).

7. Adjust screw of the flow limiter (Fig. 5 Item 3) with a screwdriver, until the upper edge of the float in the sight glass indicates the required flow rate (Fig. 5 Item 4). Turn the screw anticlockwise to increase the flow.

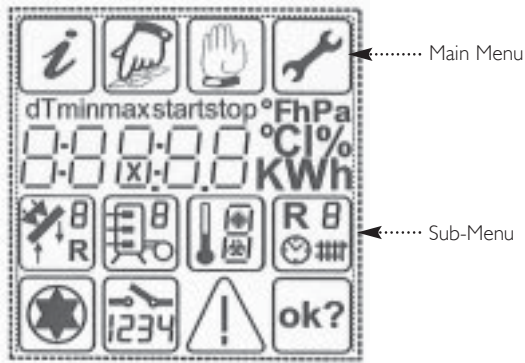
8. Ensure that the float is stable when the pump is running.

9. Set manual pump operation to off (See Section 3.6).

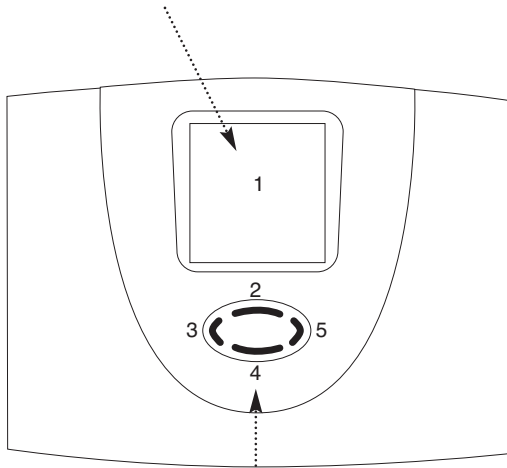
2.2 Installation of the thermal insulation

1. Refit the controller mounting moulding (Fig. 6 Item 1) onto the rear moulding.

2. Push the front thermal insulation (Fig. 6 Item 2) against the rear thermal insulation section (Fig. 6 Item 3) until it clips into place.



Display Screen



Control Button

- 2 Scroll upwards
- 4 Scroll downwards or select required main menu
- 3 Scroll left or exit to main menu
- 5 Scroll right or select to edit function

Example Screen - Programming Menu



3.0 Commissioning of solar controller

3.1 Main Menu

To make the operation of the controller clear, operating and display functions are divided into 4 main menus.

i Info Indication of current measured values.
Indication of system condition.
Indication of error messages.
Indication of operating hours and energy productivity (if installed).

Hand Programming Changes to programmable values (parameters).

Hand with star Manual operation Switching on and off connected pumps and auxiliary devices.

WARNING - During manual operation there is no automatic regulation of the system. Temperature control is isolated. System temperature could be extremely high.

Wrench Basic adjustment Information about basic adjustment for system function. To carry out any changes to this menu it must be selected within the first minute after switching the appliance on.
IMPORTANT: Adjustment and changes in this menu must only be carried out by a competent installer or service engineer.

Each active menu is shown in the upper line of the display by its corresponding icon.

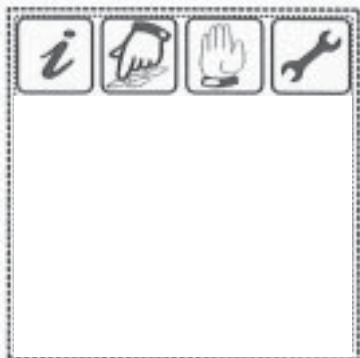
3.2 Control Button

When in the Main Menu the control button functions are as follows:

- Item 2 - Scroll upwards- no function in this menu
- Item 3 - Scroll left - moves left through the main menu options
- Item 4 - Scroll down - selects the menu option currently flashing and gives access to the sub-menu
- Item 5 - Scroll right - moves right through the main menu options

Once the sub-menu has been accessed, the flashing symbol becomes static and the button functions are then as follows:

- Item 2 - Scroll upwards- moves up through the available functions of the sub-menu
- Item 3 - Scroll left - return to main menu
- Item 4 - Scroll down - moves down through the available functions of the sub-menu
- Item 5 - Scroll right - select to edit the function displayed. The selected function will flash if it is available for editing. Use 2 to increase the required value and 4 to reduce it. Use 5 to OK.



Press or to scroll left or right to the required function. The icon will flash, press to access the submenu.

3.0 Commissioning of solar controller

3.3 Overview: Construction of main menu structure

The overview shows the whole menu structure. According to basic adjustment and system type some menu points may not be displayed.

NOTE: Items 0 to 3 in the Basic adjustment menu are not applicable to Baxi.

Info	Programming	Manual operation	Basic adjustment
Current collector temperature / Collector1	DHW Maximum temperature storage cylinder1	Pump1 off / on	0 N/A
Minimum collector temperature / Collector1	Solar pump 'ON' differential dT max (dT on)	Pump2 off / on	1 N/A
Maximum collector temperature / Collector1	Solar pump 'OFF' differential dT min (dT off)	Heating off / on	2 N/A
Current storage cylinder temperature / storage1 at bottom	Maximum temperature of storage cylinder2		3 N/A
Minimum storage cylinder temperature / storage1 at bottom	Storage cylinder2 dT max (dT on)		4 Tube collector off / on
Maximum storage cylinder temperature / storage1 at bottom	Storage cylinder2 dT min (dT off)		5 Solar gain off / on
Current storage cylinder temp / storage2 at bottom / collector 2	N/A		6 Glycol type
Minimum storage cylinder temp / storage2 at bottom / collector 2	Start temperature auxiliary heating		7 Glycol percentage
Maximum storage cylinder temp / storage2 at bottom / collector 2	Hysteresis temperature auxiliary heating / cooling dT		8 Volume flow
Current collector return temperature	N/A		9 Controlling time in seconds
Current temperature auxiliary heating	N/A		10 Storage cylinder priority
N/A	N/A		11 Frost protection off / on
Operating hours pump1	N/A		12 Frost protection sensor assignment
Solar gain kWh	Time period start 1,2,3 for the independent controller; 4 for the tube collector function - min start time 'ON' - max time 'OFF'		13 Frost protection: start temperature
Operating hours pump2	Time period stop 1,2,3 for the independent controller; 4 for the tube collector function		14 Independent controller assignment: Cooling, heating, temperature differential controller
Yield storage2	Set time		15 Sensor assignment for the independent controller
			16 Select basic configuration

For a detailed menu explanation see section 3.11

3.0 Commissioning of solar controller

3.4 Menu "Info"

In this menu mode all measured values and operating states are shown.



If the values are marked as "reset possible", they may be reset in the following way:


Choose the value with buttons  and 

Reset value by means of the button 

Message "OK?" confirm with  = no or  = yes


















Press  or  to scroll up or down to the required sub function.

The icon will flash, press  to select the function. Reset by pressing

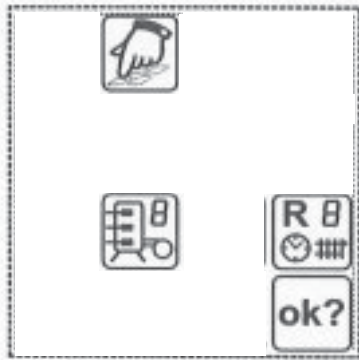
 or  for increase/decrease values. Press 

and  appears,

press  to confirm and  disappears.

Indication		Description	Reset possible
75°C		Indication of current collector temperature	no
min. 12°C		Indication of minimum collector temperature Re-settable to current temperature	yes
max. 105°C		Indication of maximum collector temperature Re-settable to current temperature	yes
52°C		Indication of current temperature storage tank (lower)	no
min. 40°C		Indication of minimum temperature storage tank (lower) Re-settable to current temperature	yes
max. 65°C		Frost protection or common measuring point	yes
25°C		Indication of universal temperature measuring points (T3)	no
55°C		Indication of current temperature storage tank thermostat	no
60°C		Indication of current temperature collector return	no
60°C		Heating, Sensor T1...T6	no
1234 h		Operating hours for charging storage tank Resettable to 0 h	Yes
927 kWh		Energy productivity for storage tank Resettable to 0 kWh	Yes

3.0 Commissioning of solar controller



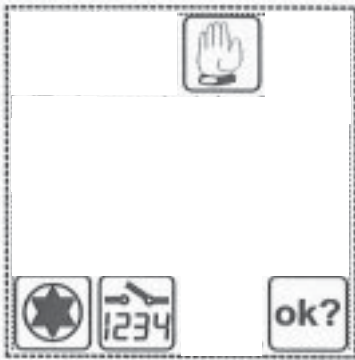
Press or to scroll up or down to the required sub function. The icon will flash, press to select the function. Reset by pressing or for increase/decrease values. Press and appears, press to confirm and disappears.

3.5 Menu "Programming"

All adjustable parameters can be checked in this menu and, if necessary, changed. The default factory setting will usually give efficient and problem free operation. However Baxi recommend the following parameters marked * must be left at the default settings. Any change to the Baxi recommended settings will invalidate the warranty.

For more information or guidance please contact the Technical Enquiries.

Indication		Description	Value range	Defaults
max 65°C		Storage 1/2: Maximum temperature	15..95°C	65°C *
dT max 7 K		Storage 1/2: Hysteresis (dT on)	3..40 K	7 K
dT min 3 K		Storage 1/2: Hysteresis (dT off)	2..35 K	3 K
min 100	12	Setting the speed control of the pump 100% = speed control off	30%..100%	100%
min 40°C		Temperature start for the function heating	20..90°C	40°C
dT 10K		Hysteresis heating	1..30K	10K
(1) min 00:00		Start time 1 for the independent controller	0:00... 23:59	00:00
(1) max 23:59		Stop time 1 for the independent controller	0:00... 23:59	23:59
(2) min 00:00		Start time 2 for the independent controller	0:00... 23:59	00:00
(2) max 23:59		Stop time 2 for the independent controller	0:00... 23:59	23:59
(3) min 00:00		Start time 3 for the independent controller	0:00... 23:59	00:00
(3) max 23:59		Stop time 3 for the independent controller	0:00... 23:59	23:59
(4) min 00:00		Start time 4 for time controlled circulation	0:00... 23:59	00:00
(4) max 23:59		Stop time 4 for time controlled circulation	0:00... 23:59	23:59
13:21		Clock	0:00...23:59	12:00



Press or to scroll up or down to the required sub function. The icon will flash, press to select the function. Reset by pressing or for increase/decrease values. Press and **ok?** appears, press to confirm and **ok?** disappears.

3.0 Commissioning of solar controller

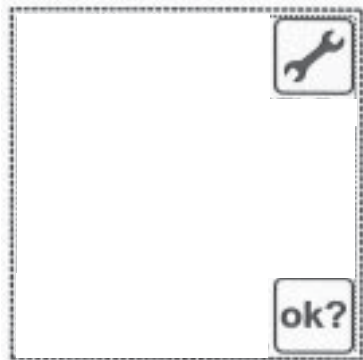
3.6 Menu "Manual operation"

For commissioning, service and test purposes the solar primary system can be manually operated. For this purpose the switch outputs may be disconnected or connected.

WARNING - During manual operation there is no automatic regulation of the system. Temperature control is isolated. System temperature could be extremely high. During manual operation there is no automatic regulation of the system.

To avoid inadmissible operating states this mode of operation changes into "Indication" after approximately 8 hours and the automatic regulation is activated again.

Indication	Description	Value range
	Switching on / off switch output A1 (solar circulation pump)	0 = off 1 = on
	Switching on / off switch output A2 (pump2)	0 = off 1 = on
	Switching on / off switch output A3 (heating)	0 = off 1 = on



Press or to scroll up or down to the required sub function. The icon will flash, press to select the function. Reset by pressing or for increase/decrease values. Press and **ok?** appears, press to confirm and **ok?** disappears.

3.0 Commissioning of solar controller

3.7 Menu "Basic adjustment"

Adjustment and changes in this menu must be carried out only by a competent installer or service engineer.

Incorrect adjustments may adversely affect the function of controller and solar primary system.










To avoid accidental changes in menu "Basic adjustment", it is not editable in normal functioning but has only a display function. To be able to carry out any changes, this menu must be chosen within the first minute after switching on the appliance. **The basic adjustment menu is 'blocked' automatically one minute after switching on if the menu is not accessed.**









Indication Parameter / value	Description	Value range	Factory set-up	Baxi recommend
0 – 0	Collector protection	0 = off 1 = on	N/A	N/A
1 – 120°C	Start temperature for the collector protection	110..150°C	N/A	N/A
2 – 0	Re-cooling function (only when collector protection is on)	0 = off 1 = on	N/A	N/A
3 – 40°C	Target temperature for the storage after collector protection activity	30..90°C	N/A	
4 – 0	Time controlled circulation with tube collectors	0 = off 1 = on	0 = off	0
5 – 0	Solar gain off/on	0 = off 1 = on	0 = off	1
6 – 0	Glycol types (see table below)	0...10	0	10
7 – 50	Glycol percentage	0 ... 100% 5% - steps	50	100
8 – 1,0	Volume flow: Litre per impulse - flow meter	0,5 ... 25 l/l 0,5l - steps	1.0	1.0
9 – 240	Time controlling in s	30...480	240	240
10 – 1	Storage priority	1...2	1	1
11 – 0	Frost protection on/off	0 = off 1 = on	N/A	
12 – 6	Sensor assignment - Frost protection	1...6	N/A	
13 – 3	Start temperature for the frost protection function	-20°C ... +7°C	N/A	
14 – 0	Select cooling thermostat or temperature differential controller	0 = off 1 = cooling 2 = heating	2	2
15 – 5	Auxiliary heating sensor assignment	1...6	5	5
16 – 0	System configuration	0...4	0	0

Glycol types (point 6):


0	Anro	6	Tyfoacor L5.5 - supplied
1	Ilexan E, Glythermin	7	Dowcal 10
2	Antifrogen L	8	Dowcal 20
3	Antifrogen N	9	Dowcal N
4	Ilexan E	10	Tyfoacor LS
5	Ilexan P		

For correct operation of the system, Baxi recommend the settings shown above.

Graphic symbol	Description	Indication in operation
Measuring points assignment		
	Temperature measuring point collector array 1	
	Temperature measuring point collector array 2	
	Temperature measuring point storage tank 1 solar (storage tank 1 charging)	
	Temperature measuring point storage tank solar (storage tank 2 charging)	
	Temperature measuring point collector - return	
	Temperature measuring point storage tank (auxiliary heating)	
	Antifreezing sensor or universal temperatures measuring point (T6) (no sensor monitoring)	
	Auxiliary heating temperature	
	Operating hours, energy productivity measurement	

Status indication		
	Solar circulation pump	Symbol revolves when solar circulation pump is on
	Switch output 1 is active	Appears when switch output 1 is active (on)
	Switch output 2 is active	Appears when switch output 2 is active (on)
	Switch output 3 is active	Appears when switch output 3 is active (on)
	Reference to system fault	Display flashes when a fault occurs in the system
	Safety query for value changes which are to be stored	Input value can be either  rejected or  accepted

3.8 Overview of display and operating elements (cont)

Graphic symbol	Description	Indication in operation
Indicator values		
dT	Temperature difference	
min	Min value	Appears when minimum values are indicated
max	Max value	Appears when maximum values are indicated
min 0:00 I	Time period I start	Appears when the differential controller is active (timeframe 1-3) or tube collector is active (timeframe 4)
Max 23:59 I	Time period I stop	Appears when the differential controller is active (timeframe 1-3) or tube collector is active (timeframe 4)
	5 x 7 segment display. Presentation of figures 00000 to 99999	Display of all values, display flashes when a value is changed
°C	Temperature in Celsius	
K	Temperature difference in Kelvin	
h	Operating hours	
kWh	Productivity indication in kWh	

3.9 Controller functions

The Solarflo™ differential temperature controller contains many functions to regulate and monitor the solar primary system. Including

- controller functions for heating the solar cylinder
- functions for system protection and system monitoring
- additional functions (other accessories may be required to achieve these functions).

3.10 General controller functions

The controller collects the temperatures of various measuring points and determines the right time to charge the storage tank on account of programmed (additional) functions and controller parameters.

3.11 Cylinder heating by solar primary system

Switching action can be adjusted through dTmax (dTon) and dTmin (dToff), but dTon cannot be set lower than dT off + 1K .The solar cylinder is heated by operating the solar pump on output A1 up to the set maximum storage temperature (recommended 65° C). Pump operation is allowed as long as the collector temperature exceeds the cylinder temperature by the amount set in the programming menu.

Corresponding values in menu
“Programming”
Maximum temperature
dT max (dT on) Switch-on temperature difference
dT min (dT off) Switch-off temperature difference

3.12 Systems with two storage cylinders

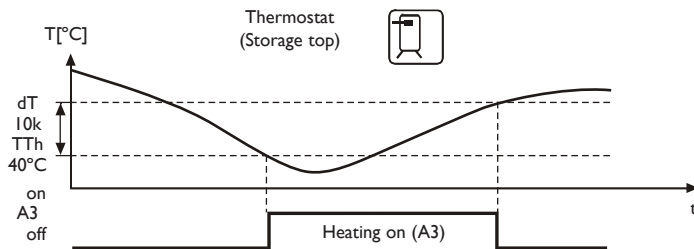
For systems with more than one storage cylinder (System Types 1 and 2) the cylinder heating can be optimised depending on the energy supply. Usually the cylinder with lower priority will have a lower temperature than that with the higher priority. Re-directing the energy to the lower priority cylinder will lower the temperature in the collector array. To “reinforce” the collector temperature the heating of the lower priority cylinder will be interrupted for a short while at fixed intervals. If the heating criteria for the higher priority cylinder is fulfilled then the lower priority cylinder will be heated. The higher priority cylinder can be selected in the “Basic Adjustment” menu point no. 10.

3.13 Rotational speed regulation

The solar circulation pump on 230V-outputs A1 and A2 can be operated either in switch-mode (two-point controller) or in a rotational speed regulated way.

If the rotational speed regulation is activated the pump power is adjusted by a controller so that switch-on temperature difference "Storage tank dTmax" is kept constant as much as possible. At lower deviation of "Storage tank dTmax" the pump is operated with the lowest power till the switch-off wave is reached.

Corresponding values in menu	
"Basic adjustment"	"Programming"
---	Rotational speed min <100%



3.14 Thermostat (heating)

The thermostat is a control circuit that's independent from the storage loading. Thus an auxiliary heating in the top area of the storage cylinder is made possible. The output A3 will be:

- Switched on, when the temperature falls below the adjusted start level.
- Switched off, when the temperature reaches the adjusted start level + hysteresis.

Corresponding values in menu	
"Basic adjustment"	"Programming"
14 -- 2	Start temperature max °C
15 -- 5	Hysteresis dT in K
	Time period (1...3) Start: min time
	Time period (1...3) Stop: max time

3.15 Thermostat (cooling)

In order to optimise the energy yield, it could be useful to "redirect" the solar energy, or to take it away from the storage when the storage temperature reaches a pre-set level. When the sensor reaches the start temperature, output A3 will be switched on. When the temperature level falls below the start temperature hysteresis, the output A3 will be switched off.


Corresponding values in menu	
"Basic adjustment"	"Programming"
14 -- 1	Start temperature max °C
15 -- 5	Hysteresis dT in K
	Time period (1...3) Start: min time
	Time period (1...3) Stop: max time

3.16 Tube collector

The function "tube collector" can be switched off/on in the "Basic setting" menu – point 4. The timeframe 4 in the "Program" menu makes it possible to activate this function only for a certain period of time. When activated, the solar pump will be switched on every 30 minutes for a period of 30 seconds. This is necessary, to measure a temperature change in the collector if there was no circulating for a long period of time.



Corresponding values in menu	
"Basic Setting"	"Programming"
4 --	Time period (4) Start: min time
	Time period (4) Stop: max time

3.17 Sensor monitoring

The sensors necessary for control functions and their connecting cables are monitored regarding break and short circuit. If a faulty sensor is recognised by the software, the symbol  is shown. By scrolling up and down you can find an error source.



The use of temperature sensors of the wrong type can also lead to an error message


Indication	Meaning
	Short circuit on temperature sensor of the current measuring point
	Break on temperature sensor of the current measuring point, circulation error at activated energy productivity measurement

3.18 Flow monitoring

If the energy productivity measurement option is deactivated, the temperature difference between collector and storage tank is checked.

If it exceeds the amount of $(60K + dT_{max})$, it is then interpreted as an error because in the case of normal system dimensioning and a pump switched on such large differences cannot take place.

If the energy productivity measurement option is activated, the flow amount when the pump is switched on is checked. If for 15 minutes no flow is recognised it is evaluated as an error. Error message is automatically reset after eliminating the failure.

Indication	Meaning
	Missing circulation in solar circuit

3.19 System protection function

The system protection function switches the system off if the "maximum collector temperature" is exceeded by 10K. As soon as the temperature drops below the "maximum collector temperature", the system is started up again. This function has higher priority and is always active, regardless of whether the collector protection is on or off.

3.20 Frost protection

This function can be switched on/off in the "Basic adjustments" menu, point 11 and the start temperature can be adjusted in point 13. Furthermore, a frost protection sensor can be selected (T1-T6, point 12).

If the measured value is lower than the start temperature, the solar pump is activated until the adjusted frost protection start temperature +5K is reached. The minimum runtime of the pump is 5 minutes.

For security reasons the function is deactivated if the temperature of the priority storage falls below 5°C.

3.21 Energy productivity measurement

For the purposes of energy productivity measurement (solar gain), a sensor on the collector return line and a flow meter are required. The yield value is calculated from the values of the temperature difference between the collector and collector return line and the value measured by the flow meter. This function is switched on and off in the "Basic settings" menu.

Corresponding values in menu		
"Basic Setting"	"Programming"	"info"
5 --	---	XXXX kWh

3.22 Operating hours meter

So long as the storage tank is charged by a pump, the operating hours meter records for each separate pump. The number of operating hours can be read in menu "info" and for each pump separately reset to 0.

Corresponding values in menu	
"Programming"	"info"
---	XXXX h

Commissioning record

The following chart should be completed during Commissioning of the system.

Installer: _____ BPEC No.: _____
 Contact details: _____ Serial Nos. Cylinder _____
 Original installation date: _____ Collector _____ Pump Station _____

General Commissioning	
All pipework correctly installed, identified and earth bonded	<input type="checkbox"/>
Solar primary system filled with heat transfer fluid supplied	<input type="checkbox"/>
System pressure test carried out	<input type="checkbox"/>
Solar expansion vessel charge pressure checked and set	<input type="checkbox"/> bar
Air vented from system	<input type="checkbox"/>
Exposed pipework insulated using high-temp and weather resistant insulation	<input type="checkbox"/>
Panel fixing bracket positions weatherproofed where necessary	<input type="checkbox"/>
Panel fixings checked and secure	<input type="checkbox"/>
Hydraulic Station	
System pressure when cold	bar
Solar primary flow when cold	l/min
Isolating/non-return valves (flow and return) in operating position	<input type="checkbox"/>
Solar Collector	
Collectors visually inspected for defects	<input type="checkbox"/>
Collectors temperature sensor correctly installed and secured	<input type="checkbox"/>
Pipe entry points to building weatherproof	<input type="checkbox"/>
Solar Differential Temperature Controller	
Record all operational parameters set (see separate table)	<input type="checkbox"/>
Pump operation tested in automatic and manual modes	<input type="checkbox"/>
All cables correctly installed and secured	<input type="checkbox"/>
Suitably fused isolating device installed	<input type="checkbox"/>
Solar Cylinder	
Cylinder installed and commissioned in accordance with cylinder installation instructions	<input type="checkbox"/>

Solar differential temperature controller - operational parameters

If any factory values are changed please enter the new values in the table below.

Adjustable in menu "Programming"	Typical adjustment	Current adjustment
Storage tank1: Maximum storage temperature	65°C	*
Storage tank1: switch-on difference (dT _{on})	7 K	
Storage tank1: switch-off difference (dT _{off})	3 K	
Storage tank2: Maximum storage temperature	90°C	*
Storage tank2: switch-on difference (dT _{on})	7 K	
Storage tank2: switch-off difference (dT _{off})	3 K	
Minimum pump power on rotational speed regulation	100%	
Switch-on temperature of thermostat function	40°C	
Hysteresis of thermostat function	10 K	
2nd temperature differential controller maximum temperature T _{max}	65°C	
2nd temperature differential controller hysteresis dT _{max}	7 K	

Adjustable in menu "Basic adjustments"	Typical adjustment	Current adjustment
Switching on or off the function collector protection	0 = off	*
Temperature at which the collector protection function is active	120°C	*
Switching on or off the function recooling (only when the collector protection is on)	0 = off	*
Temperature to which the storage tank is recooled when collector protection function is on	40°C	*
Function for time-controlled circulation in operation with tube collectors	0 = off	
Switching on or off the function energy productivity measurement	0 = off	
Choice of glycol types used	0 = Anro	
Mixture ratio of coolants	50%	
Litres per impulse of the flowmeter	1.0 L/l	
Switching on or off the function antifreezing	0 = off	
Temperature at which the antifreezing is active	-1°C	
Alternative choice of the cooling, thermostat function or the 2nd temperature differential controller	0 = none	
System type	type 0	
Time control in secs	240	
Storage priority	I	

* Baxi recommends these settings are left at the default value.

Servicing and maintenance record

Please complete the following record after any Servicing or Maintenance of the Baxi Solarflo system. Refer to the Commissioning Record charts for details of the original system for reference. Refer to Maintenance section for recommended Maintenance periods

	Date / /	Date / /	Date / /	Date / /	Date / /	Date / /	Date / /	Date / /	Date / /	Date / /	Date / /	Date / /	Date / /	Date / /	Date / /
Check condition of all pipework	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Check condition of insulation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Check frost protection of solar fluid (every 2 years) Concentration Protection to °C Next check date	— — —	— — —	— — —	— — —	— — —	— — —	— — —	— — —	— — —	— — —	— — —	— — —	— — —	— — —	— — —
Check solar expansion vessel charge pressure	bar	bar	bar	bar	bar	bar	bar	bar	bar	bar	bar	bar	bar	bar	bar
Check solar primary system pressure (cold)	bar	bar	bar	bar	bar	bar	bar	bar	bar	bar	bar	bar	bar	bar	bar
Check solar primary system flow rate	l/min	l/min	l/min	l/min	l/min	l/min	l/min	l/min	l/min	l/min	l/min	l/min	l/min	l/min	l/min
Check operation of PRV	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Check sensor operation (use resistance/temperature table. See page 22)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Check solar cylinder in accordance with manufacturer's instructions	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Ensure system is free of air	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Visually check condition of solar collectors	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Visually check condition of collector brackets and fixings (every 2 years)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Visually check condition of any waterproofing (around pipe entries to roof and roof fixings)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Engineers initials	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
BPEC Number	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.0 Maintenance

4.1 Check heat transfer fluid

The heat transfer fluid must be checked every year with regard to its antifreeze and pH value.

- Check antifreeze using antifreeze tester. Target value is approximately -21 deg C (40% concentration).
-

4.2 Maintenance of the collector

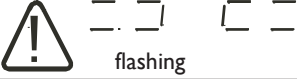
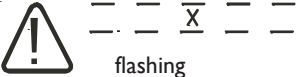


The collector or the collector array must be checked/serviced annually to check for any damage, leaks and contamination.

4.3 Cylinder

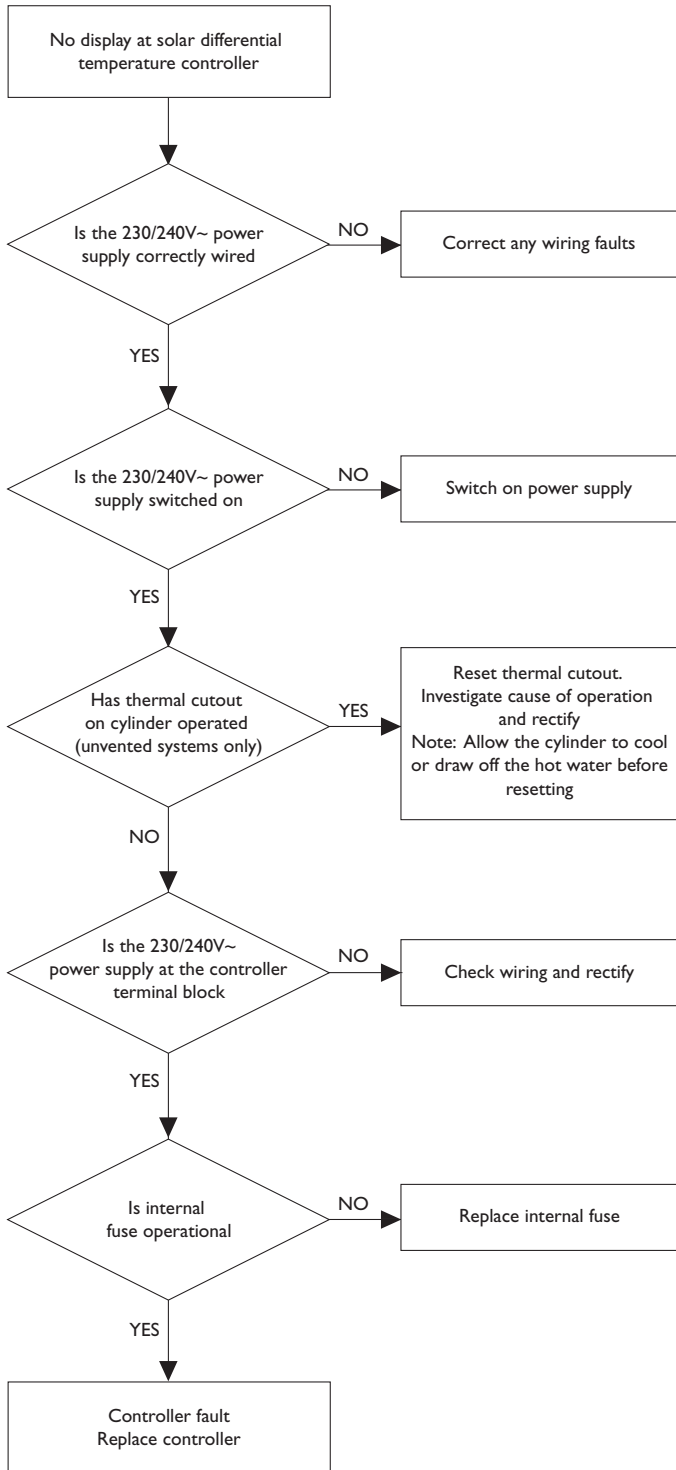
Refer to manufacturers documentation.

5.1 Failures with error message

Some system failure modes can be recognised by the solar differential temperature controller and will be indicated by an error message on the controller display. Refer to the table below for details of possible errors and suggested measures to rectify.

Error representation on display	Possible reasons	Measures
 <p>flashing</p>	<ul style="list-style-type: none"> • Sensor wire broken • Sensor defect 	<ul style="list-style-type: none"> • Check wire • Check sensor resistance, if necessary exchange sensor
 <p>flashing</p>	<ul style="list-style-type: none"> • Short circuit in sensor wire • Sensor defect 	<ul style="list-style-type: none"> • Check wire • Check sensor resistance, if necessary exchange sensor
<p>Circulation error: no flow</p>  <p>flashing</p> <p>Additionally at energy productivity measurement:</p> 	<ul style="list-style-type: none"> • Error in pump connection • Pump defect • Air in the system • Connection with flow meter defect • Sensor wire broken • Sensor defect 	<ul style="list-style-type: none"> • Check cabling • Exchange pump • Check the float of the flow meter moves when the system runs (if visible) • Check wire • Check wire • Check sensor resistance, if necessary exchange sensor

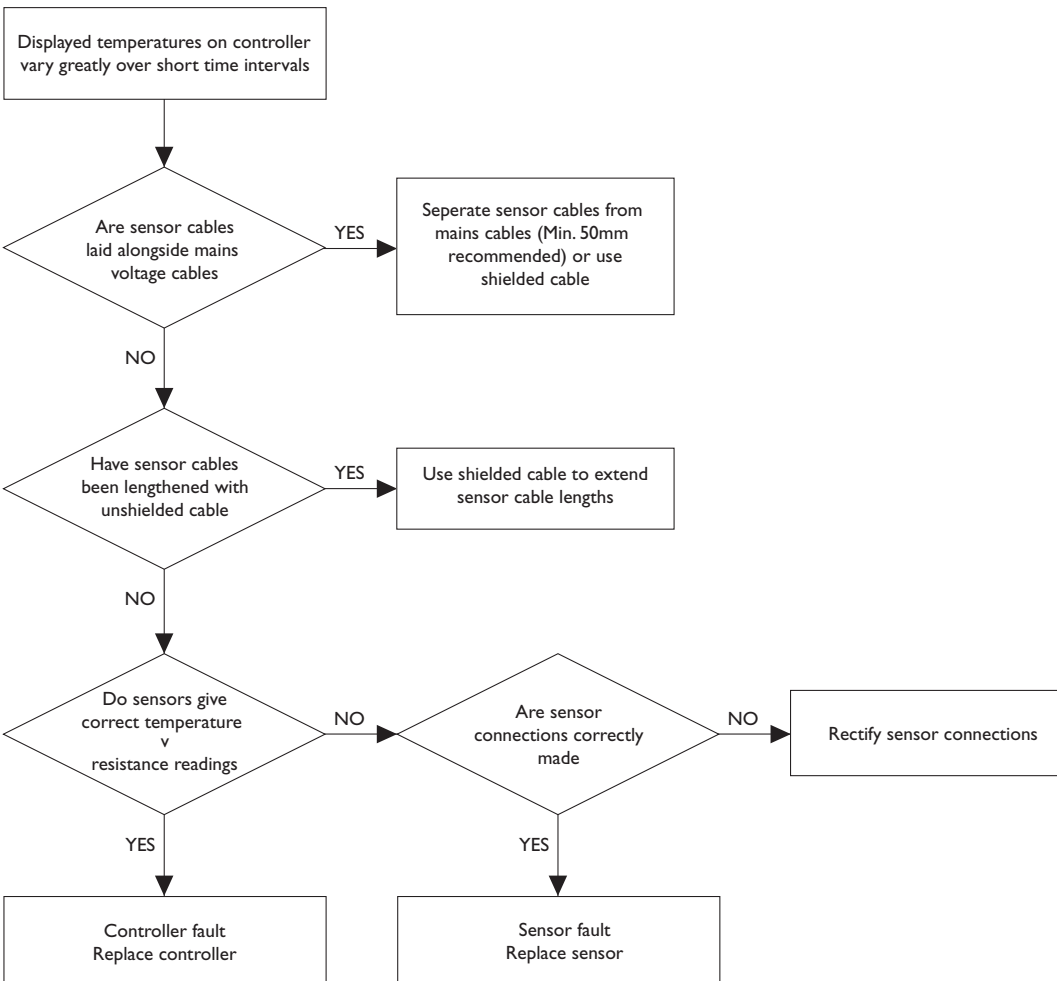
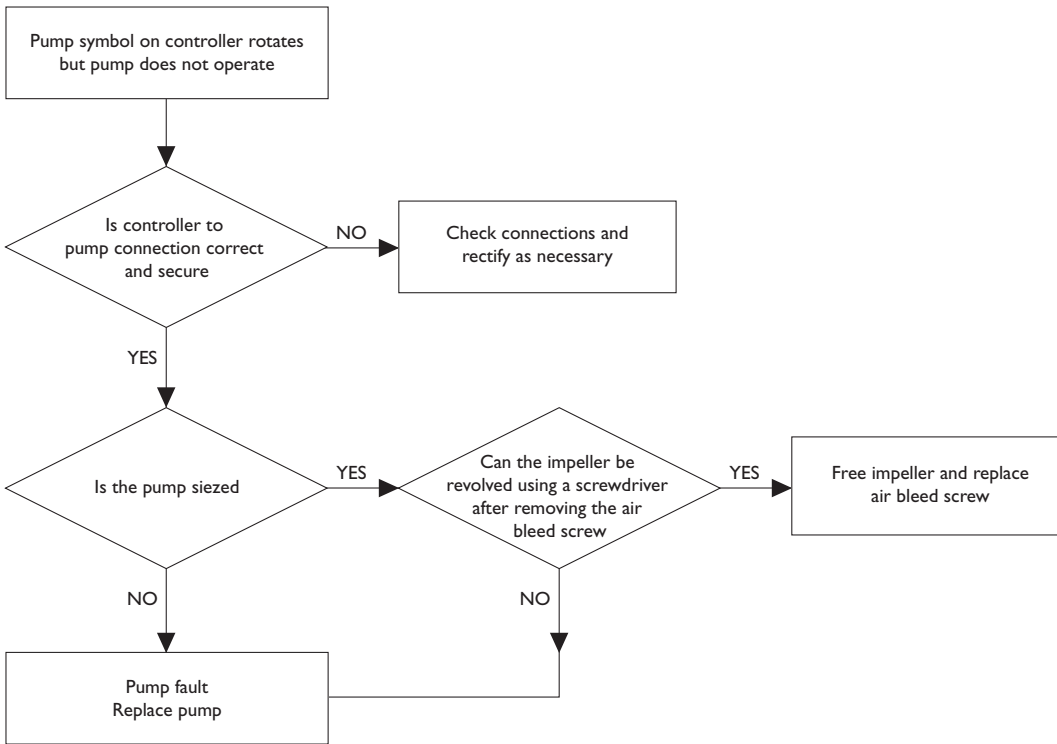
5.0 Fault finding



Resistance table PT1000.

The correct function of temperature sensors can be checked on the basis of the following temperature resistance table with a resistance measuring instrument:

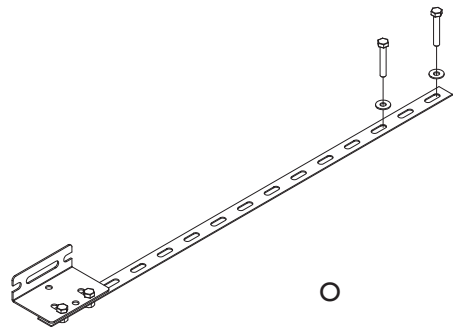
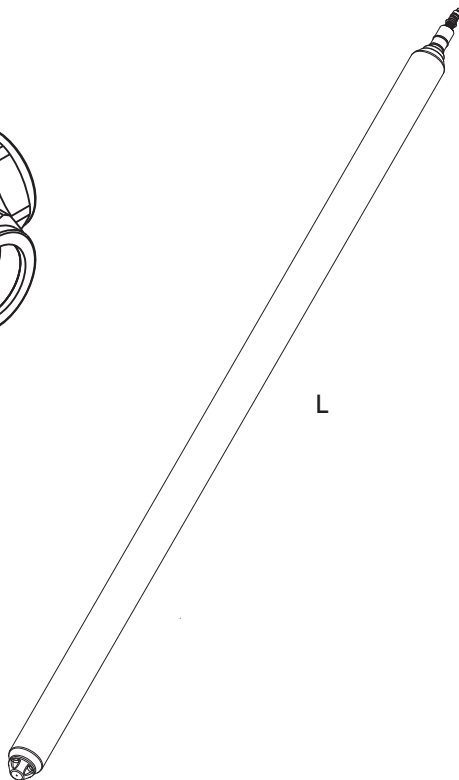
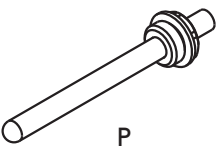
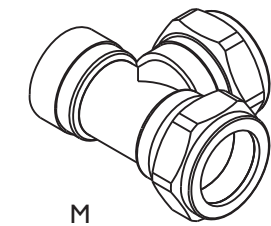
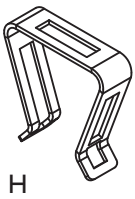
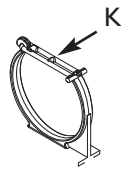
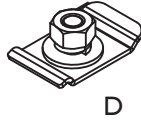
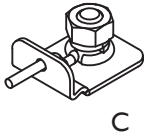
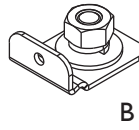
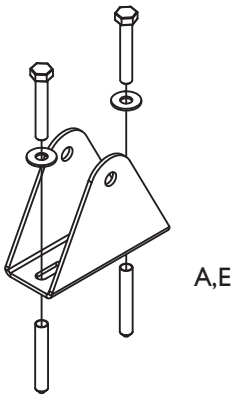
Temperature in °C	Resistance in Ohm
-30	882
-20	921
-10	960
0	1000
10	1039
20	1077
30	1116
40	1155
50	1194
60	1232
70	1271
80	1309
90	1347
100	1385
120	1461
140	1535
200	1758



6.0 Spares

Short Parts List

Key No.	Description	Manufacturer's Part No.
A	Bracket Foot	5130637
B	Clamp Manifold Vertical	5130640
C	Clamp Manifold Horizontal	5132704
D	Clamp Support Rail	5130641
E	Bracket Rear Foot	5130638
F	Clip Manifold Connection	5130643
G	O-ring Manifold Connection	5130644
H	Clip Tube Retainer	5130645
J	O-ring Evac Tube	5130646
K	Clamp Rubber Evac Tube	5130647
L	DFI00 Evac Tube 1 off	5130648
M	Tee Piece Manifold	5132722
N	Fluid Tyfocor LS Solar 20Ltr (Not Illustrated)	5130225
O	Bracket Roof	5130639
P	Sensor Pocket Manifold	5132723



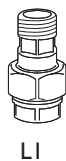
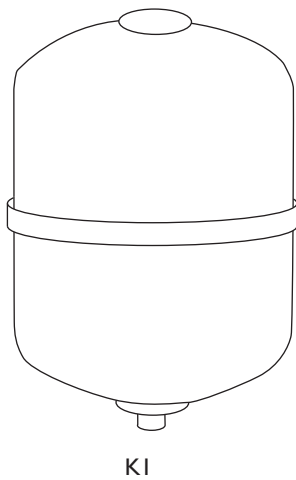
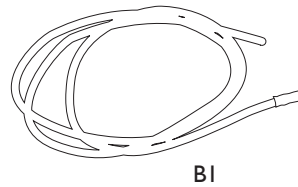
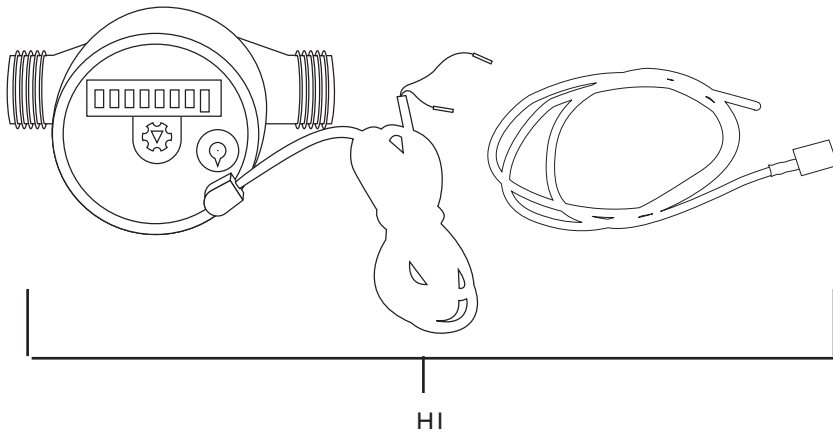
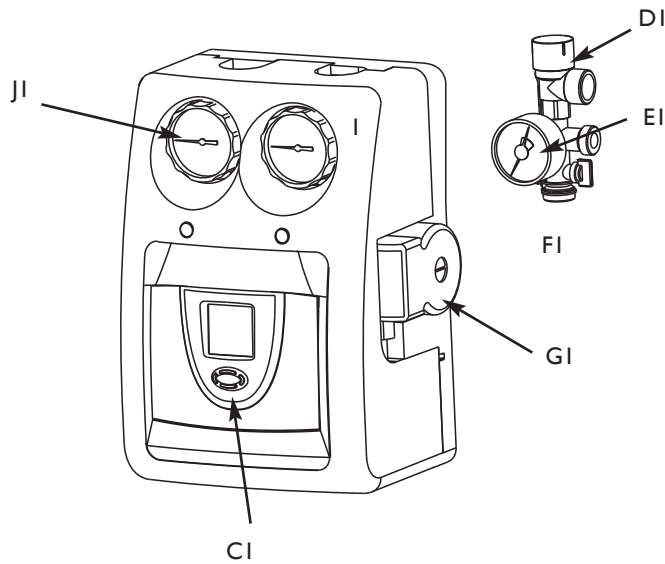
6.0 Spares

6.1 Spare parts

A number of Spare Parts are available should any part of the Solarflo™ system require replacement. Use only genuine parts obtained from Baxi, use of other non Baxi parts may cause system malfunctions and will invalidate the warranty. Fitting of any spare parts must be carried out by a competent installer or authorised service engineer or agent.

Short Parts List

Key No.	Description	Manufacturer's Part No.
AI	Connection Washer	5119535
BI	Temperature Sensor	5119536
CI	Solar Differential Temperature Controller	5119537
DI	Pressure Relief Valve	5119538
EI	Pressure Gauge	5119539
FI	Safety Group	5119540
GI	Solar Primary Circulating Pump	5119541
HI	Flow Meter Assembly	5119542
J1	Temperature Gauge	5119543
KI	Solar Expansion Vessel 24Litres	5119548
LI	Expansion Vessel Self-sealing Connection	5119779



7.1 Standard Warranty Terms & Conditions

Solar Collectors 5 Years

Solar Control Station 2 Years

To receive your free warranty please complete the form supplied with the Solarflo™ system within 30 days of installation, or simply call heateam, the service division of Baxi Heating UK Ltd on 0844 871 1568.

Our promise to you

If you experience a fault with your new Solarflo™ system, we aim to provide a safe and high quality repair service supported by our dedicated national network of highly skilled engineers. If your installer can't resolve the problem for you, we will do everything we can to get an engineer out to you as quickly as possible. Nothing in this warranty will affect your statutory consumer rights.

What you need to do if you experience a problem with your Solarflo™ system.

You should always contact your installer first because the fault may not be related to the Solarflo™ system. If your installer confirms that the fault is within the Solarflo™ system itself and he/she decides they cannot repair it our friendly customer service team is on hand to help. Simply call our service division heateam on 0844 871 1568 to book an engineer visit or for any general advice that you may need. Our contact centre is open Monday to Friday 8am - 6pm, weekends and Bank Holidays 8.30am - 2pm, excluding Christmas Day and New Years Day.

When calling heateam you must have the following information to hand: -

- Solarflo™ system serial numbers
- Solarflo™ system model number
- Your installer name, address details and contact details
- Proof of purchase (if you do not have the Solarflo™ serial number)

All descriptions and illustrations provided in this leaflet have been carefully prepared but we reserve the right to make changes and improvements in our products which may affect the accuracy of the information contained in this leaflet. All goods are sold subject to our standard Conditions of Sale which are available on request.

BAXI

A Trading Division of Baxi Heating UK Ltd (3879156),

Brooks House, Coventry Road, Warwick. CV34 4LL

Technical Enquiries 0844 871 1525

Our contact centre is open Monday to Friday 8am to 6pm,

Weekends and Bank Holidays 8.30am to 2pm.

We are closed Christmas Day and New Years Day.

Website www.baxi.co.uk

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