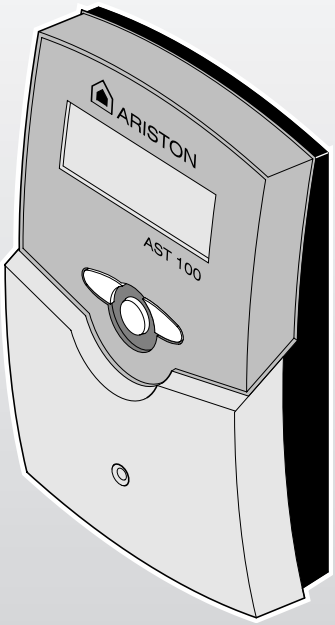
SOLARcomfort Solar Hot Water Systems AST 100 Solar Controller

ARISTON

Installation, Commissioning and User Instructions

LEAVE THESE INSTRUCTIONS WITH THE END USER



Country of Destination GB/IE CE

TABLE OF CONTENTS

1. GENERAL INFORMATION

This manual is an integral and essential part of the product. It should be kept with the product.
Please read carefully the instructions and notes about SOLARcomfort contained in this manual as they provide important information regarding the installation, commissioning and user instructions of the AST 100 Solar Controller and the SOLARcomfort system.

⚠ **IMPORTANT**
Failure to follow these instructions correctly may invalidate the guarantee.

⚠ **IMPORTANT**
Solar domestic hot water heating systems must be installed to comply with the current Building Regulations, British Standards and any applicable local regulations refer to section 5.

1.1 GUARANTEE

The SOLARcomfort AST100 Solar Controller is guaranteed for 2 years - see terms and conditions of guarantee on back page.

1.2 SYSTEM CONTENTS

The complete SOLARcomfort solar water heating system is supplied in the following consignments:-

1. 800201	Collector	1 per box
2. 3107024/5	Roof Fittings Kit	1 cardboard tube
3. 3820011/2	System Components	1 box
4. 3820001	Tyfocor antifreeze heat transfer fluid	1 x 20l container

1.3 SYSTEM INSTRUCTION BOOKS

The following instruction booklets are supplied with a complete SOLARcomfort solar water heating system:-

1. SOLARcomfort Solar Hot Water Systems Collectors 2 & 3 Collector Set.
   Covers collector installation and plumbing connection.
   Supplied in System Components box.
2. SOLARcomfort Solar Hot Water Systems Pump Group 40/60.
   Covers installation, plumbing connection, system filling, flushing and commissioning.
   Supplied in System Components box.
3. Solar Controller AST 100
   Covers installation, wiring connection and User Instructions.
   Supplied in System Components box.

1.4 SOLARcomfort

SOLARcomfort systems are highly efficient and provide cost savings on the energy used for heating hot water wherever they are used in the UK. However, the savings made will depend on local climate, installation characteristics and the households use of hot water.

It is important that the SOLARcomfort system is correctly sized for the local climate condition and the householders domestic hot water requirements.

1.5 Lifestyle

After installation of the SOLARcomfort system, changes to the householders use of hot water will be beneficial. Simple changes such as bathing in the evening instead of the morning, and putting automatic washing machines on when free hot water is available by solar energy.

In addition the timing of the dwelling's boiler controls must be modified to ensure the 'hot water ON' time is set so that the water temperature in the cylinder is at a minimum by the start of the 'solar day'.

1.6 How The System Works

The solar collectors are heated by the sun's rays. The heat generated is stored in a hot water storage cylinder e.g. an Ariston Primo twin coil stainless steel cylinder. The AST 100 Solar Controller continually compares the temperature of the water within the cylinder with the temperature of the solar collectors.

Whenever the solar collectors are hotter than the water within the cylinder, the controller switches on the system's circulating pump. The temperature differential between the collectors and the cylinder is set via the AST 100 Solar Controller. The heat transfer fluid within the solar system is then circulated through the collectors and the cylinder's heat exchanger, heating the cylinder in just the same way as a central heating boiler.

See fig. 1.6A

The cylinder typically has two coils (heat exchangers), the lower coil is heated by the solar system, therefore solar is the primary heat source. The upper cylinder is heated by an auxiliary heat source, typically a central heating boiler, which is used to heat water when there is insufficient heat generated by the solar system. The Ariston Primo twin cylinder also has two immersion heaters making it suitable for electric only heating systems.

The SOLARcomfort system is a forced circulation sealed system and therefore requires an expansion vessel and a pressure relief valve (PRV), both supplied with SOLARcomfort.

The air separator module with an integral air vent together with an automatic air vent positioned at the highest point on the system ensures that the sealed system remains free of air.

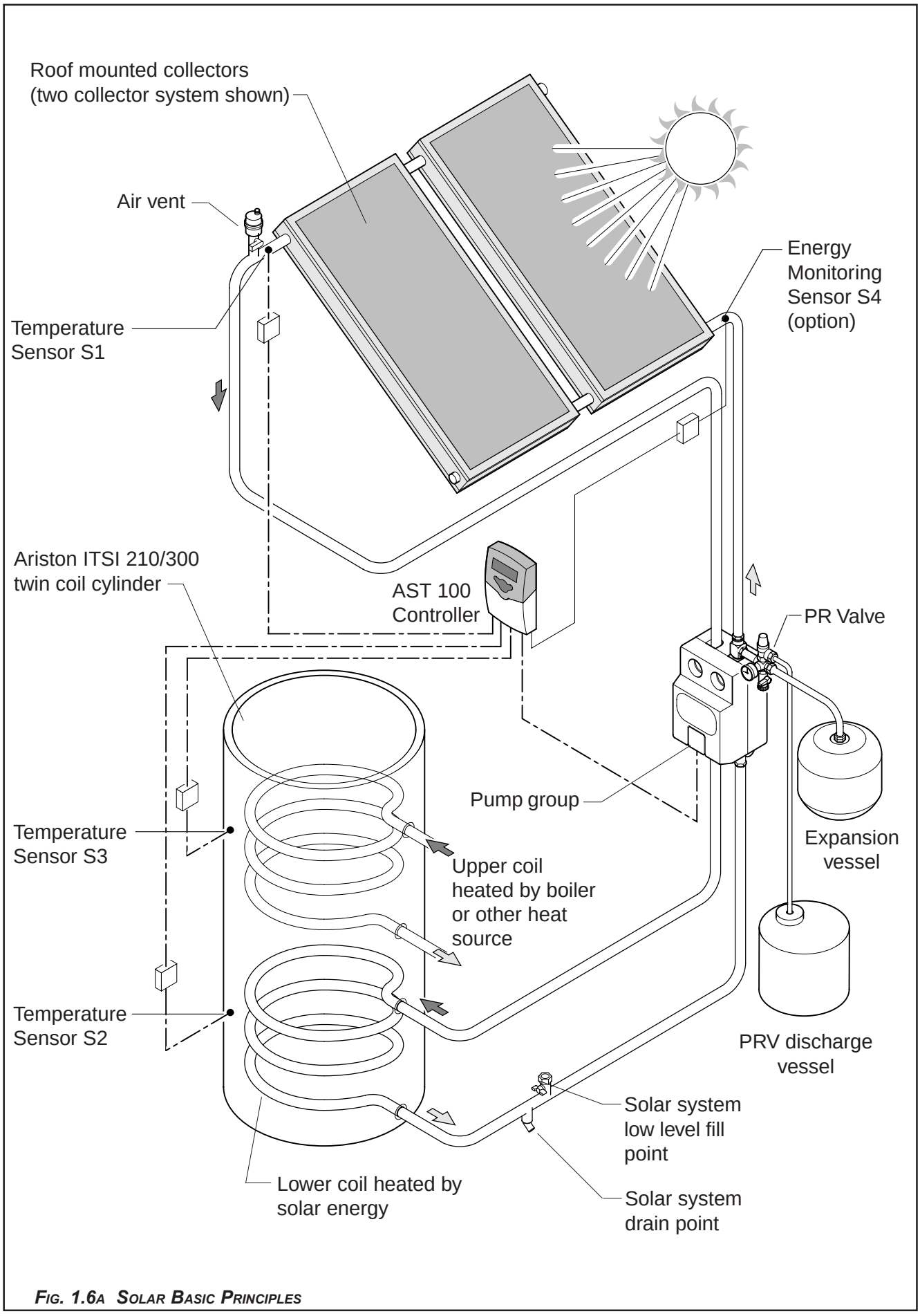


Fig. 1.6a Solar Basic Principles

2. SAFETY

WARNING

All wiring should be carried out to and comply with the current IEE Wiring Regulations.

All electrical work must comply with any relevant regulations that apply at the time of the installation.

All electrical installation and maintenance of the AST 100 Controller must be carried out by a competent qualified installer.

WARNING

TYFOCOR LS Heat Transfer Fluid.

Although non-toxic it should not be swallowed.

Refer to label on its container for storage and safety information.

A detailed technical specification is available from Ariston on request.

Caution

SOLARcomfort should be installed and commissioned by approved contractors. Failure to do so may invalidate the warranty.

Caution

The controller should be positioned so that it is inaccessible to children and cannot be tampered with.

3. TECHNICAL DATA

CONTROLLER	
Type	AST100
Housing	PC-ABS & PMMA
Dimensions	173 x 110 x 46
Mounting	Wall (2 screws)
Operation	3 Push Buttons
Protection	IP20 / DIN 40050
Environmental Temperature	0 - 40°C

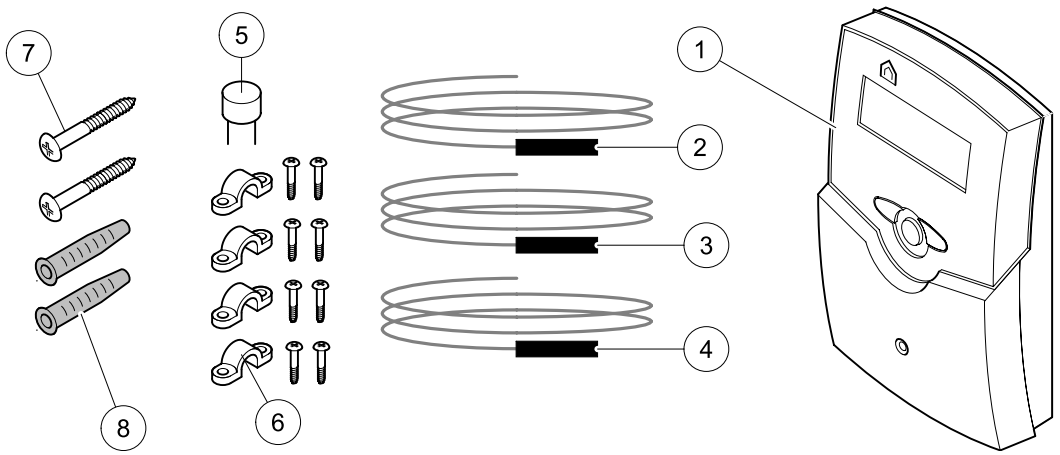
FUNCTIONS	
Temperature Differential Control	Standard
Operating Hours Counter	Standard
Energy Monitor	Option

ELECTRICAL	
Power Supply	210-240V
Electromechanical Relay	250V
Controller Mains Cable	1.0mm² 3 core heat resistant flex 3093y
Pump Cable (R1 and R2)	1.0mm² 3 core heat resistant flex 3093y

SENSORS	
Collector Sensor	S1
Cylinder lower	S2
Cylinder upper	S3
Energy monitor (collector return)	S4

3.1 Component List

Listed below are all the components supplied with the Controller.



Item	Description	Qty
1	Controller	1
2	Sensor - Collector	1
3	Sensor - Cylinder Upper	1
4	Sensor - Cylinder Lower	1
5	Spare Fuse - T4A	1
6	Cable Clips and screws	4
7	Fixing Screws	2
8	Wall Plug	2

Fig. 3.1A Controller Component List

3.2 Dimensions

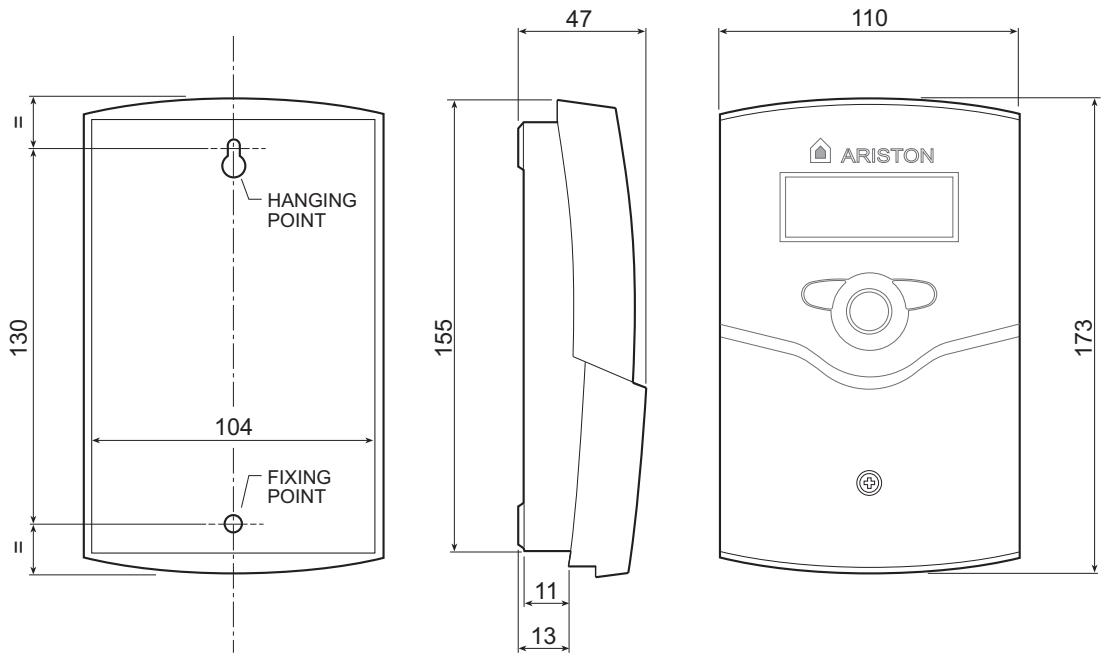


Fig. 3.2A Controller Dimensions

4. REGULATIONS & STANDARDS

SOLARcomfort hot water heating systems should be installed in compliance with the following standards and regulations.

4.1 WATER REGULATIONS

Water Supply (Water Fittings) Regulations 1999 / www.wras.co.uk

These regulations (bye-laws in Scotland) ensure a good supply of wholesome water and that only approved materials, pipes and fittings are used to convey water.

4.2 BUILDING REGULATIONS

These are statutory documents and take priority over all other regulations and recommendations. The installation of an unvented hot water storage cylinder is classified as a "Controlled Service" and Regulation G3 applies. To meet the requirements of the Regulations, installation of an unvented system should be undertaken by a "competent installer".

All installations of unvented hot water storage systems having a capacity of more than 15 litres should be notified to the relevant Local Authority by means of building notice or by the submission of full plans. It is important to note that it is a criminal offence to install an unvented hot water storage system without notifying the Local Authority. The installation of the unvented cylinder and hot water system must comply with BS 6700 and the HSE Legionella Code of Practice.

4.3 GENERAL GUIDANCE

Current guidance notes do not cover the connection of a solar thermal circuit to an unvented storage vessel (cylinder). However, if guidance is sought for compliance with current regulations the fundamental principle is to provide a fail-safe means of shutting off the solar input to the heat exchanger if the cylinder temperature should rise above the set temperature of the cylinder's energy cut out. (See Note 1).

As with all unvented hot water systems, notification of intention to install should be given to your local building control.

Option A. A non self-resetting mechanical shut-off should be installed on the solar primary flow to the cylinder. The mechanical shut-off should be suitable for use with a solar primary circuit (i.e. high temperature and glycol resistant). The mechanical shut-off should be integrated electrically with the cylinder energy cut out/s and if necessary the solar circuit temperature control, please refer to the solar controller manufacturer for further information.

Option B. Where the solar controller and hydraulic system demonstrate that by no lesser means the requirement in Option A is satisfied by other means; certification by an approvals body is required to demonstrate that in the event of the stored water going over temperature, the heat input to the cylinder is isolated by physical means and is non self-resetting.

These systems should be clearly identified with reference to the approvals body. (See Note 2).

Note 1 : Whilst most solar cylinders use a coil type heat exchanger other options such as external plate to plate devices, external annulars or 'tank in tank' systems may be used but the same control options always apply.

Note 2 : Current approved bodies include the British Board of Agrèment (BBA), WRc-NSF Limited, or KIWA.

4.4 British & European Standards

Connection of thermal solar heating systems

EN 12976: Thermal solar heating systems and their components (prefabricated systems).

ENV 12977: Thermal solar heating system and their components (bespoke systems).

BS5918: Latest version: Solar heating systems for domestic hot water.

Installation and equipment of DHW cylinders

BS5546: 2000 Specification for installation of hot water supplies for domestic purposes, using gas-fired appliances of rated input not exceeding 70 kW.

BS6700: 1997 Specification for design, installation, testing and maintenance, of servicing, supplying water for domestic use within buildings and their curtilages.

The local water company by-laws.

Electrical connection

Current IEE wiring regulations.

Health and Safety document No 635 (Electricity at Work Regulations)

4.5 UK Regulations particularly relevant for water heating equipment

The Pressure Equipment Regulations (PED) 1999 - www.eurodyn.com

The Building Regulations (L1 A&B) 2006 and Domestic Heating Compliance Guide - www.communities.gov.uk

The Building Regulations (P) 2005 - www.communities.gov.uk

Control of Substances Hazardous to Health Regulations (COSHH) 1994 - www.hse.gov.uk

4.6 UK Regulations particularly relevant for construction

Further details available from: www.hse.gov.uk

Health & Safety At Work Act (HSW) 1974

Work at Height Regulations 2005.

Reporting of Injuries, Diseases and Dangerous Occurrences Regulations (RIDDOR) 1995.

Management Health & Safety at Work Regulations (MHSWR) 1999.

Noise at Work Regulations 1989.

Construction (Health, Safety & Welfare) Regulations (CHSWA) 1996.

Electricity at Work Regulations 1989.

Construction Regulations (Head Protection) 1989.

Control of Substances Hazardous to Health Regulations (COSHH) 1994.

Construction (Design and Management) Regulations (CDM) 1994.

Personal Protective Equipment at Work Regulations 1992.

Lifting Operations and Lifting Equipment Regulations (LOLER) 1998.

Confined Spaces Regulations 1997.

Manual Handling Operations Regulations 1992.

The Workplace (Health, Safety and Welfare) Regulations 1992 (WHSWA).

Provision and Use of Work Equipment Regulations (PUWER) 1998.

Health and Safety (First Aid) Regulations 1981.

LZC - Low or zero carbon energy sources: strategic guide.

4.7 EU Directives

Further details available from: www.europa.eu.int

Construction Directive: 89/106/EEC

Electromagnetic: 89/336/EEC

Low voltage: 73/23/EEC

Machinery Directive: 98/37/EC

4.8 Other publications

Preventing hot water scalding in bathrooms: using TMVs (IP 14/03).

DTI testing of solar systems (SP300275 1-3).

Review of issues related to active solar heating systems (SP300246).

Active solar performance and data review (SP300270).

Solar heating systems for hot water (BS 5918).

Hard water scale in hot water storage cylinders (IP13/93).

Heating systems in buildings – design for water-based heating systems (PrEN 12828).

Building log books (GPG 348).

Solar heating (CIBSE DBSP WGG).

Sun in Action II (ESTIF – Sun in Action II).

Minimising the risk of legionnaires' disease (TM 13).

BRE Digest 489.

Energy Saving Trust - www.est.org.uk

CE131 Solar Water Heating Systems - Guidance for professionals, conventional Indirect Models.

4.9 Electrical Connection

BS7671 2001 Amended 2004

APD P:

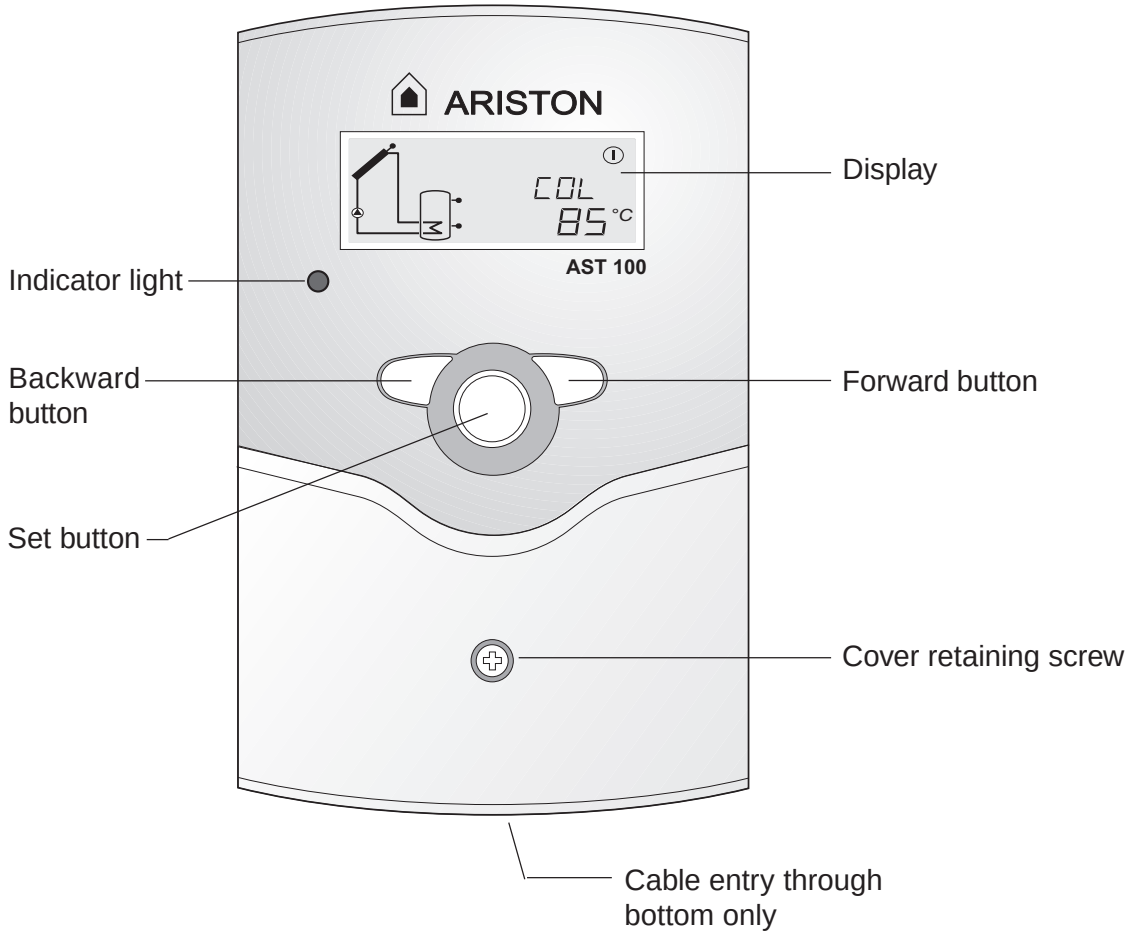
- P1 - Design, Installation, Inspection and Testing
- P2 - Provision of information

4.10 Thermal Insulation

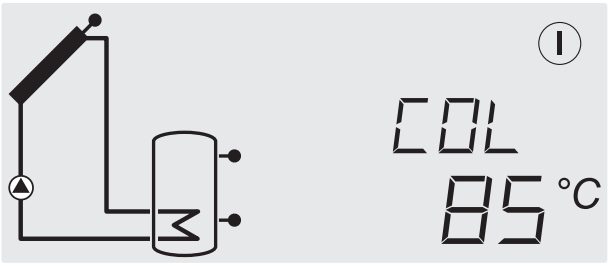
Thermal Insulation Standard TIMSA (Thermal Insulation Manufacturers and Suppliers Association).

5. OPERATION & FUNCTIONS

5.1 Controller Layout

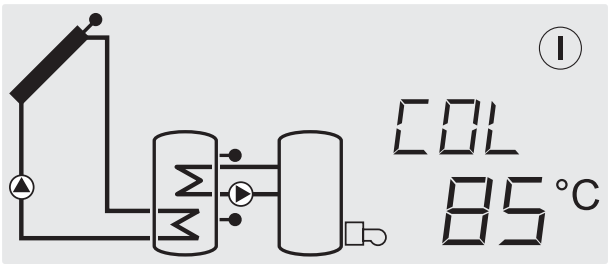


Arr 1 (default)



Typical operating display for standard system.
(The cylinder can be either a twin coil or a single coil buffer type, controlled by AST 100 Controller)

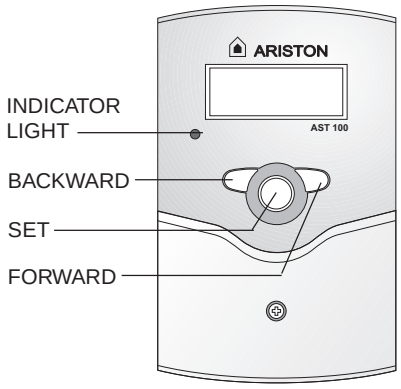
Arr 2



Typical operating display for system with auxiliary heat source control.
(Upper coil shown only when it is controlled by AST 100 Controller R2)

Fig. 5.1a AST 100 Controller

5.2 Controller Functions



Indicator Light

Off	No power to the SOLARcomfort controller.
Green	Power is On - normal condition.
Red/Green flashing	Initialisation phase. HND1 or HND2 are set to On.
Red flashing	Fault condition. Indicates one of the sensors is defective or not connected. Also a sensor symbol on the display will flash rapidly indicating which sensor is causing fault - see 5.7.

The contoller is operated by three push buttons situated below the display.

Forward Button

Use to scroll forward through menu options on the display.

Use to increase the value of a menu option when **SET** is displayed.

Backward Button

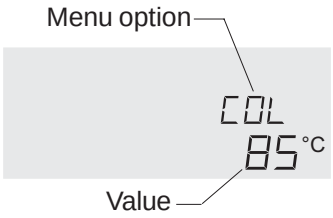
Use to scroll backward through menu options on the display.

Use to decrease value of a menu option when **SET** is displayed.

Set Button

Use to change and save, or zero menu option settings.

5.3 Menu Option and Value Display



Example shown menu option 'COL'

Menu Option

Displays the option selected using the forward and backward buttons.

Value

Displays the current set value for the menu option selected.

When **SET** is also displayed it indicates that the value can be changed or set to zero using the set button - refer to Section 5.5.

IMPORTANT
Menu options are set during commissioning and should not be changed by the householder without first contacting the installer.

5.4 Menu Navigation

The SOLARcomfort controller has two levels of menu options, information only and setup parameters.

When power is switched on to the controller it goes through an initialisation phase and then shows the first of the 'infomation only' options (COL).

The forward and backward buttons can then be used to index through the 'information only' options.

To access the 'setup parameters' use the forward button to reach the last 'infomation only' option, then press and hold the forward button until the first of the 'setup parameters' is shown (Arr).

The forward and backward buttons can then be used to index through the 'setup parameters'.

The backward button indexes the options back from the 'setup parameters' through to the 'infomation only' options. From here the 'system setup parameters' has to be accessed again by pressing and holding the forward button at the last 'display only' option.

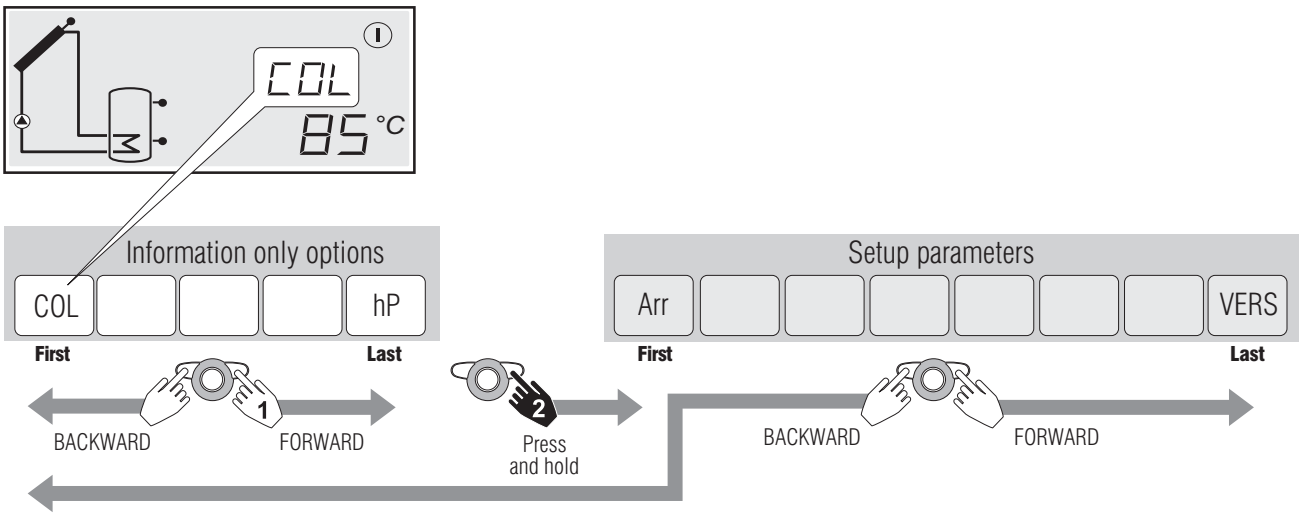
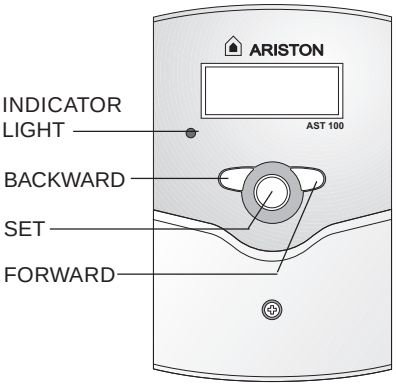
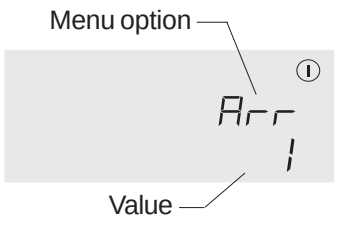


FIG. 5.4A MENU NAVIGATION

5.5 CONTROLLER SETTINGS





Example shown menu option 'Arr'

To change the menu option settings:-

1. Navigate to the required menu option - see above.

   If the menu option can be changed or reset **SET** will also be displayed.

TO CHANGE A VALUE

2. Press and hold set button until **SET** flashes.
3. The current setting will be displayed.

   Record current value so value is not forgotten.

   Press forward button to increase value or backward button to decrease value.

4. Press and hold set button again until **SET** stops flashing. The new value will now be saved.

TO RESET A VALUE

2. Press and hold set button until **SET** flashes, the value will be reset to 0.
3. To confirm press set again until it stops flashing.

To interrupt reset or change procedure, do not press any button for about 5 seconds and the controller option will return to previous setting.

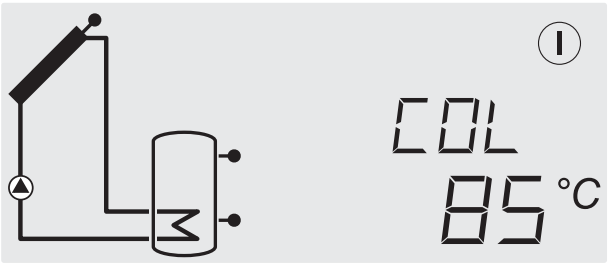
5.6 System Image

Note:-
'Arr' is set on commissioning to suit the installed system and should not be changed - see 7.1.

There are two operating displays for SOLARcomfort, which one is shown depends on the setting for setup parameter option **'Arr'**:-

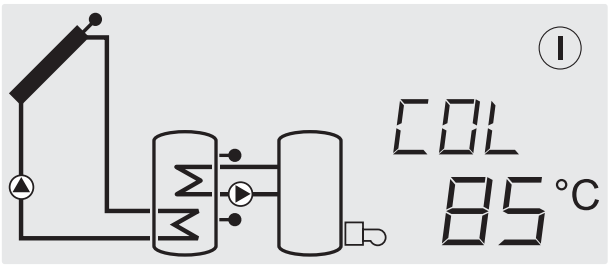
1. Standard system for twin or single coil cylinders - Arr 1.
   Only bottom coil is controlled by AST 100 (R1).
2. System with auxiliary heat source control - Arr 2.
   Both coils are controlled by AST 100 (R1 & R2).

Arr 1 (default)



Typical operating display for standard system

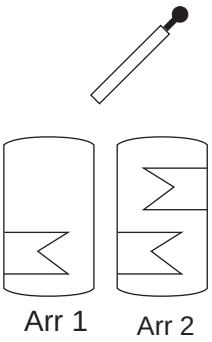
Arr 2

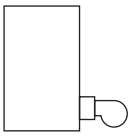


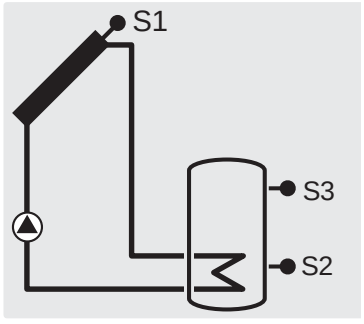
Typical operating display for system with auxiliary heat source control

FIG. 5.5A DISPLAY FOR SETTINGS ARR 1 AND ARR 2

5.7 System Image Icons







Arr 1 shown

Collector (with sensor)

Cylinder with heat exchanger

Cylinder icon will either show:-
one heater exchanger control when Arr 1 is selected, or
two heat exchanger controls when Arr 2 is selected.

Auxiliary heat source with burner symbol.
Only displayed when Arr 2 is selected.

Temperature Sensors

Icons for S1, S2 and S3 flash when the following options are selected from the information only menu:-

Arr 1

S1 flashes when	COL	is selected	- Collector temperature
S2 flashes when	TST	is selected	- Lower cylinder temperature
S3 flashes when	S3	is selected	- Upper cylinder temperature

Arr 2

S1 flashes when	COL	is selected	- Collector temperature
S2 flashes when	TSTL	is selected	- Lower cylinder temperature
S3 flashes when	TSTU	is selected	- Upper cylinder temperature

When icons flash rapidly it indicates a fault with the relevant sensor, or that the sensor is not connected - consult engineer.

Solar Pump
Shown in pipework to collectors.
Flashes when solar pump is running (R1 On).

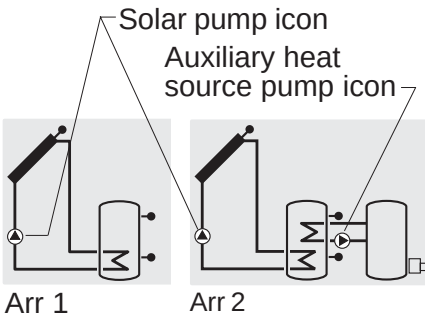
Auxiliary Heating Pump Arr 2 only
Shown in pipework to auxiliary heat source.
Flashes when auxiliary pump is running (R2 On).

5.8 Tool Bar

The tool bar icons show the current system status.

Icon	Status	Indication
	On	Relay R1 enabled - solar pump On
	On	Relay R2 enabled - aux. pump On
	On	Set maximum store limit 'S MX' temperature exceeded (only when recooling 'OREC' is Off)
	Flashing	System cooling 'OCX' set to On and pump is running to cool system to set CMX value.
	On	Antifreeze function 'OCF' set to On
	Flashing	Recooling function 'OREC' set to On. Or - Minimum collector temp function 'OCN' is On and collector temp is below set minimum collector temp 'CMN'. Or - Antifreeze function 'OCF' is set to ON and collector temp. is below set antifreeze temperature 'CFR'.
	Flashing	Collector security shutdown active i.e:- Set emergency collector temp 'EM' has been exceeded. Or - Cylinder security shutdown active i.e:- Maximum cylinder temp 'S MX' has been exceeded
+	Flashing	Sensor defect or not connected, relevant sensor icon also flashes rapidly
+	Flashing	Manual operation 'HND' or 'HND 2' set to On
SET	On	Displayed menu option value can be changed or set to zero using set button
SET	Flashing	Value has been changed, press set button to save.

5.9 Operating Mode HND1 & HND2



When HND1 and/or HND2 are set to On or Off the following icons will be displayed flashing ⚠+✋

HND 1

Set to Auto - Normal operation.

Set to On - Relay R1 On - solar pump running - pump icon flashes.

Set to Off - Relay R1 Off - solar pump not running - pump icon not flashing.

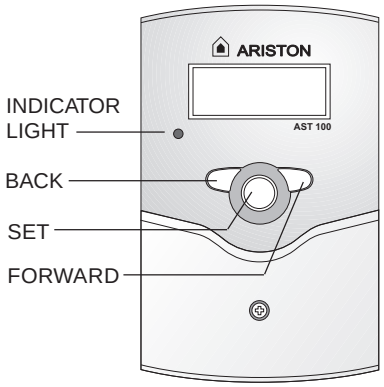
HND 2

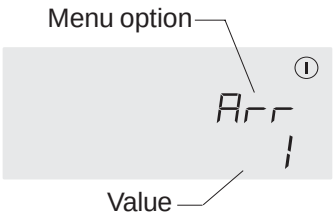
Set to Auto - Normal operation.

Set to On - Relay R2 On - auxiliary heat pump running - pump icon flashes.

Set to Off - Relay R2 Off - auxiliary heat pump not running - pump icon not flashing.

5.10 Controller Settings





Example shown menu option 'Arr'

On power up the controller will go through an initialisation phase during which the operating control light flashes red then green.

The controller then shows the system image display see 5.6.

To display menu options use forward button to scroll forward and back button to scroll backwards.

To change the menu option settings:-

1. Press forward button to scroll through to required option.

   If the menu option can be changed or reset **SET** will also be displayed.

TO CHANGE A VALUE

2. Press and hold set button until **SET** flashes.
3. The current setting will be displayed.

   Record current value so value is not forgotten.

   Press forward button to increase value or back button to decrease value.

4. Press and hold set button again until **SET** stops flashing. The new value will now be saved.

TO RESET A VALUE

2. Press and hold set button until **SET** flashes, the value will be reset to 0.
3. To confirm press **SET** again until it stops flashing.

To interrupt reset or change procedure, do not press any button for about 5 seconds and the counter will return to previous setting.

6. INSTALLATION

6.1 Positioning Controller

The pump module and air separator modules should normally be wall mounted in close proximity to the cylinder.

Fig. 6.1A gives a typical layout.

The AST 100 Solar Controller should be positioned so that the householder has easy access with good visibility of the display. Also, consideration has to given to routing for connection to the pump module, cylinder and collector temperature sensors.

Cables supplied with the sensors and control unit are nominal length and may require terminal boxes and extra cable lengths to make connections.

The controller should be positioned so that it is inaccessible to children and cannot be tampered with.

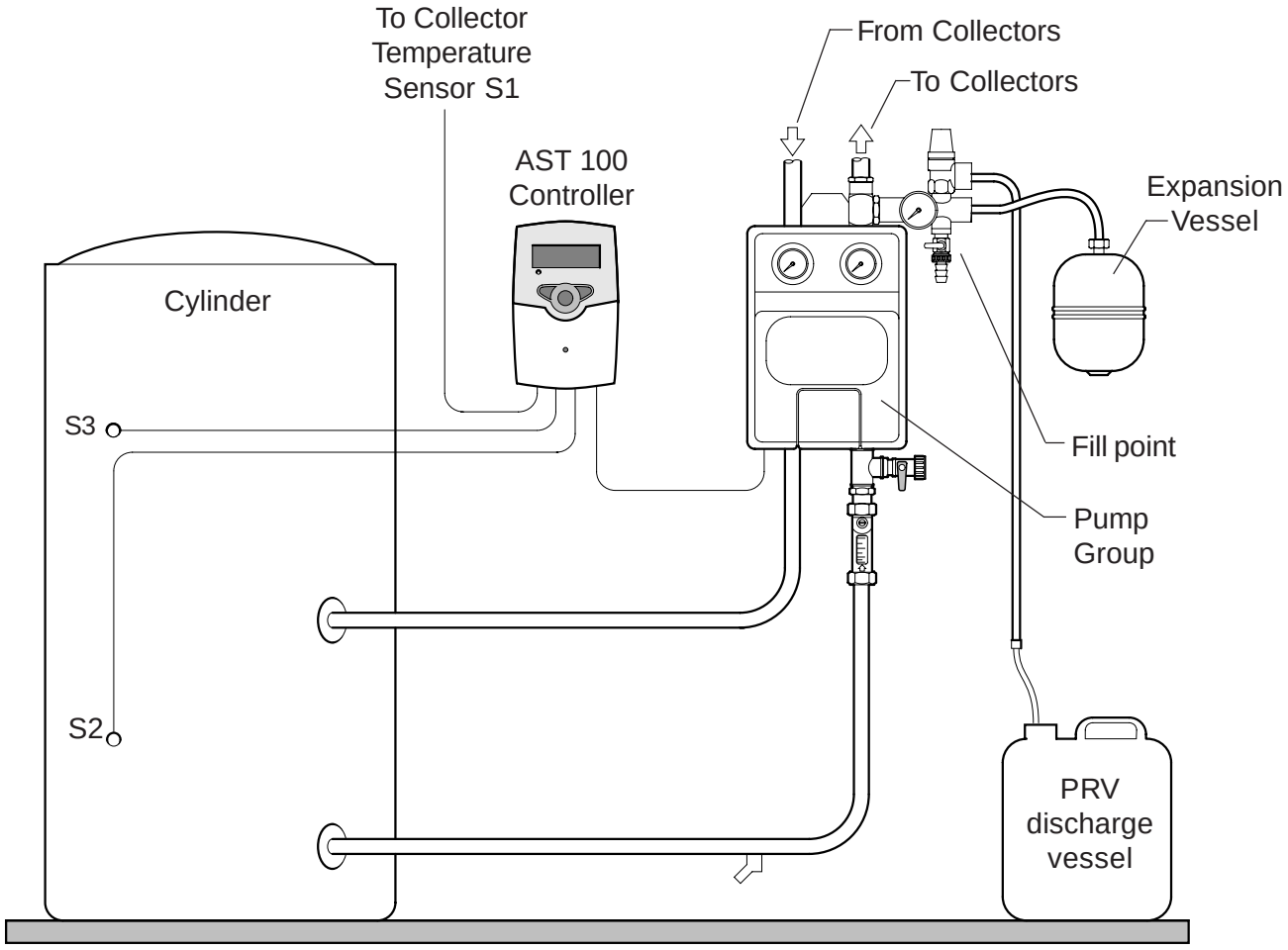


Fig. 6.1a Suggested Location

6.2 Wall Mounting Controller

The controller is wall mounted with two screws. The upper screw is used to hang the unit on, the lower screw is used to fix the unit to the wall - see fig. 4.2A.

Two wall plugs and screws are supplied.

6:3 Electrical Connections

All wiring should be carried out to and comply with the current IEE Wiring Regulations.

All electrical work must comply with any relevant regulations that apply at the time of the installation.

All electrical installation and maintenance of SOLARcomfort must be carried out by a competent qualified installer.

DO NOT drill casing for cable entry.

1. All cable sheath clamps must be correctly fitted.
2. The conductor sheaths must be continuous into joint enclosures.
3. Conductors must be correctly fastened to terminals.
4. Conductor insulation to be within 2mm of terminals.
5. All cable conductors external to joint enclosures must be insulated and sheathed.

MAINS SUPPLY

The mains supply must be from a fused double pole isolating switch fitted with 5 amp fuse or a BS1383/A kite marked domestic plug fitted with 5 amp fuse.

IMPORTANT

The mains supply cable must be separated from the sensor cables by a minimum of 15mm.

ELECTROMECHANICAL RELAYS

The SOLARcomfort controller incorporates two standard electromechanical relays which have a breaking capacity of 2(1)A 250V~.

AUXILIARY HEAT SOURCE PUMP

When the AST 100 is installed with an auxiliary heat source (and set as Arr 2), the pump for this is wired to the controller (R2) - see wiring diagram 6.5B.

The auxiliary pump must not be set at maximum speed.

ARISTON PRIMO TWIN CYLINDERS

When using an Ariston Primo twin cylinder the following must be done:-

Note: All makes of cylinders with a manual reset overheat thermostat have to be connected in the same way.

1. The lower cylinder temperature thermostat must be completely removed.
2. The manual reset overheat thermostat must be wired as shown on wiring diagram Fig. 6.4A.
3. The AST 100 sensor S1 must be inserted into the cylinder's lower temperature sensor pocket together with the overheat temperature sensor.

For other makes and models of cylinder, please refer to the manufacturer's instructions.

6.4 Wiring Diagram
Standard System - Arr 1

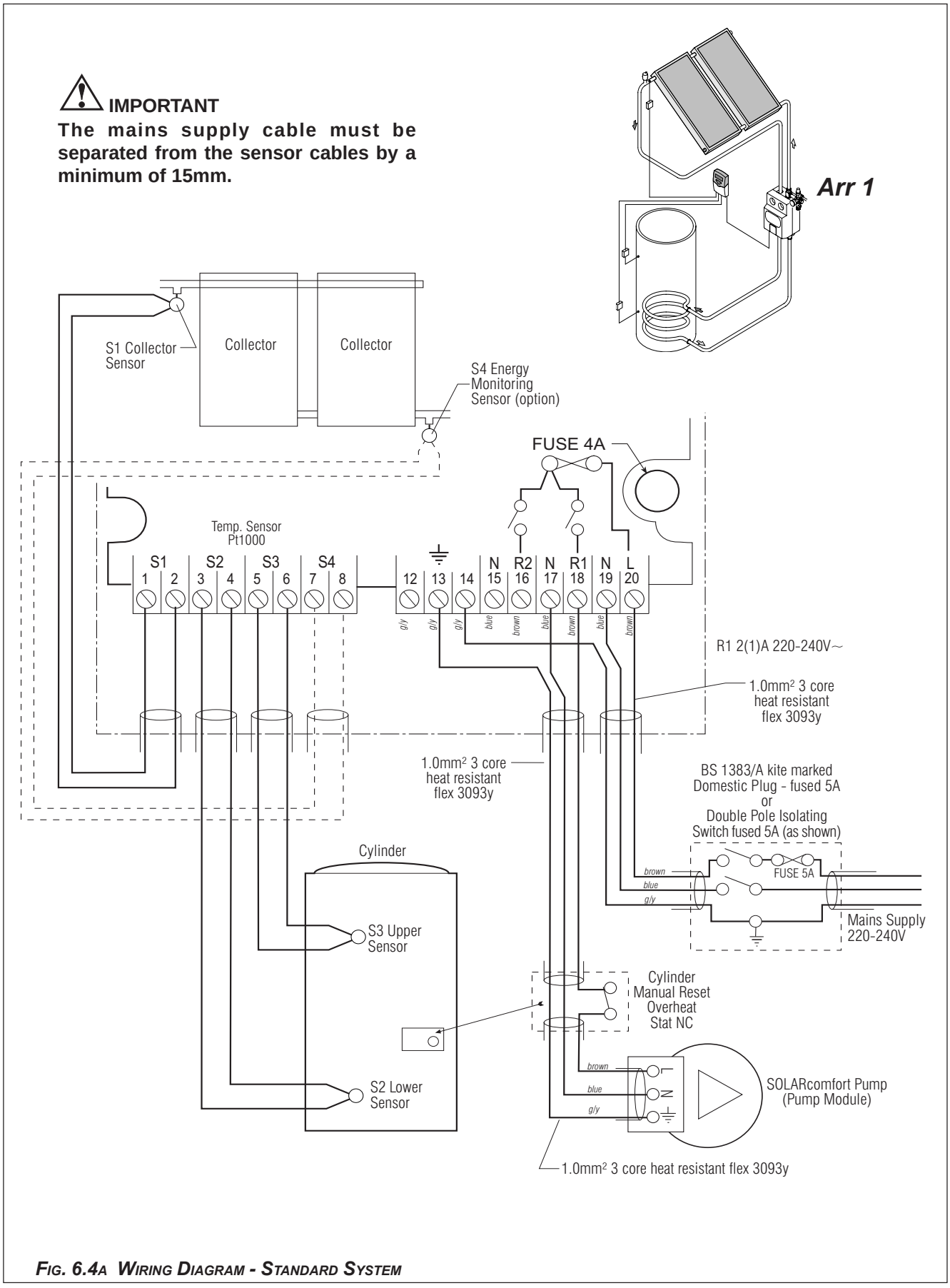


Fig. 6.4a Wiring Diagram - Standard System

6.5 Wiring Diagram
System with Auxiliary Heating - Arr 2

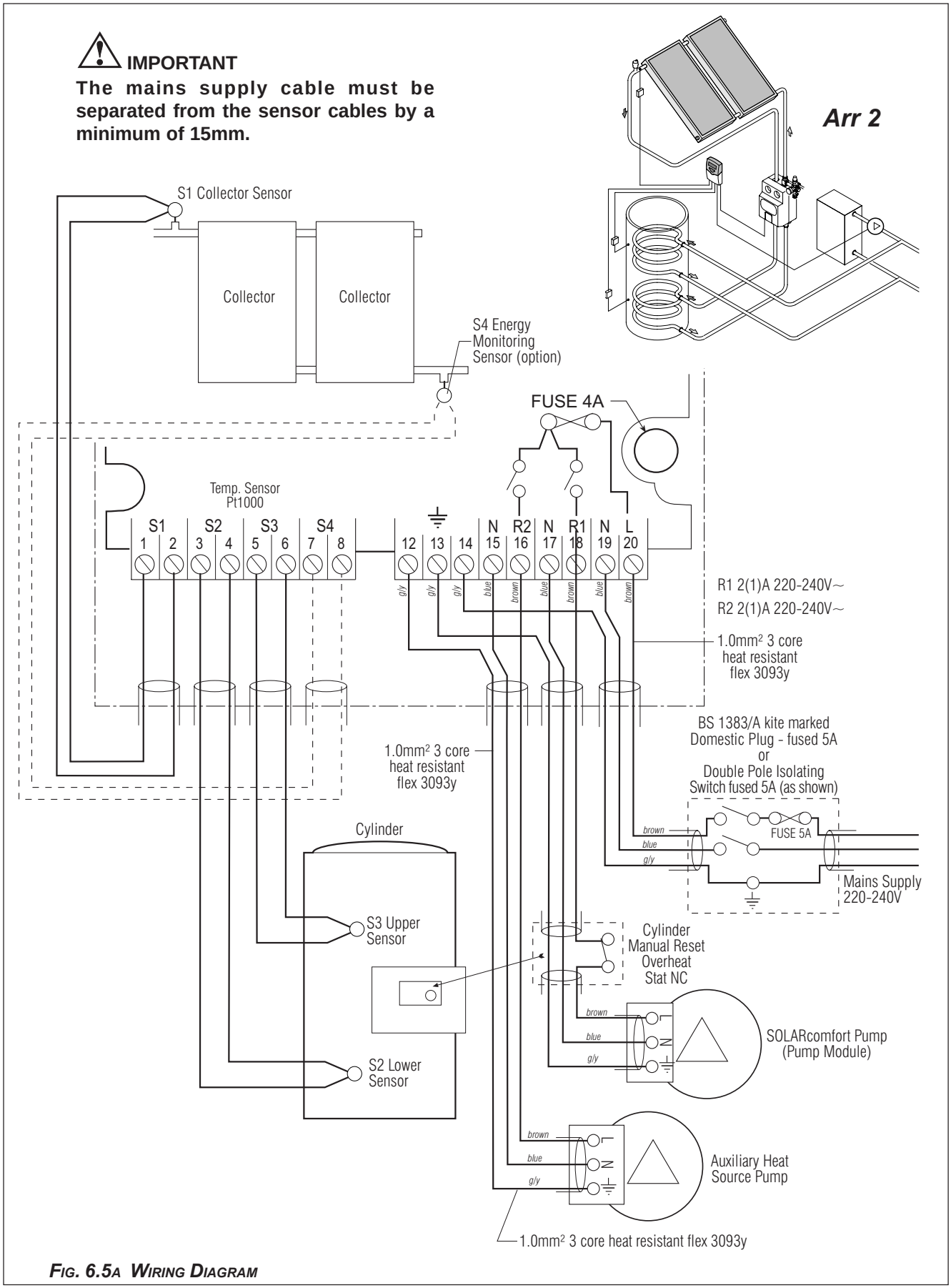


Fig. 6.5a Wiring Diagram

7. COMMISSIONING CONTROLLER

7.1 Initial Setting

To set up the AST 100 Controller the following conditions must exist:-

1. Mains lead connected to 220 - 240V fused 5 amp supply.
2. Sensor S1 connected.
3. Sensor S2 connected.
4. Sensor S3 connected.
5. Sensor S4 connected (option).

On power up the controller will go through an initialisation phase during which the operating control light flashes red then green.

IMPORTANT

OTC FUNCTION

During commissioning the OTC function must be set to ON, this runs the pump briefly to achieve accurate temperature detection.

SYSTEM Arr 1 or 2

Note To change the system settings see 5.5.

The first time the controller is powered up the default setting will be for a standard system (Arr 1).

Setting Arr 1 or Arr 2 determines which set of options are available on the display - see tables 7.2 and 7.3.

IMPORTANT

Arr 1 or Arr 2 must be set on commissioning to suit the system installed.
THE SETTING MUST NOT BE CHANGED THEREAFTER.

Arr 1

Arr 1 is used when only one cylinder heat exchanger coil is controlled by the AST 100 Controller, i.e. solar system is circulated through the coil by the solar pump controlled by R1 - see wiring diagram fig. 6.4A.

The cylinder may be a two coil cylinder or single coil buffer type, however any components or system, other than the SOLARcomfort, connected to the cylinder are NOT controlled by the AST 100.

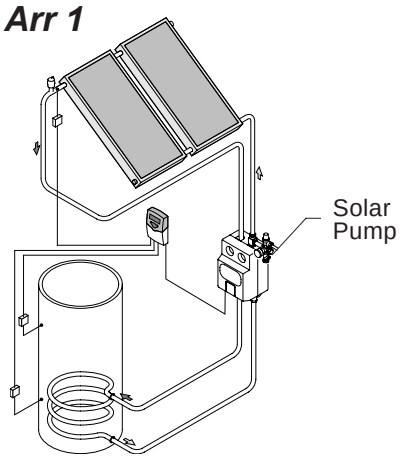


Fig. 7.1a Arr 1

Arr 2

Arr 2 is used for two coil cylinders when the use of both the upper and lower coils of the cylinder are controlled by the AST 100 Controller (R1 & R2).

There are two ways that this can be done:-

1. Arr 2 Auxiliary Heat Source

The lower solar coil is controlled by the AST 100 Controller, i.e. solar system is circulated through the lower coil by the solar pump controlled by R1 - see wiring diagram fig. 6.4A.

*The cylinder upper coil is heated by an auxiliary heat source, this is also controlled by the AST 100 Controller i.e. the auxiliary heat source circulating pump is controlled by R2 - see wiring diagram fig. 6.5A.

The pump is switched On by AHO and Off by AHF - see 7.5.20 & 7.5.21.

IMPORTANT

When Arr 2 is selected extreme care must be taken to ensure the auxiliary heat source only operates when it will not adversely affect the cylinder temperature prior to and during the 'solar day'.

2. Arr 2 Heat Circulating

The lower solar coil is controlled by the AST 100 Controller, i.e. solar system is circulated through the lower coil by the solar pump controlled by R1 - see wiring diagram fig. 6.4A.

The upper coil is used to heat a radiator when there is ample or excessive solar energy. For this a pump is fitted controlled by R2 - see wiring diagram fig. 6.5A.

The pump is switched On by AHO and Off by AHF - see 7.5.20 & 7.5.21.

IMPORTANT

***Some boilers with integral circulating pumps are not suitable for this application - consult Ariston for further details.**

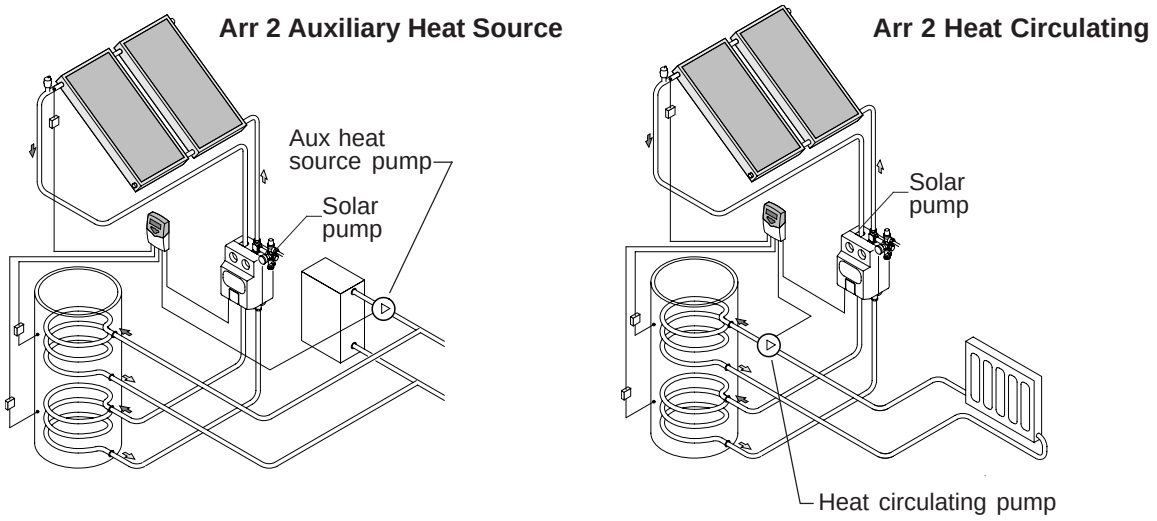


FIG. 7.1A ARR 2 OPTIONS

IMPORTANT

Arr 2 is only used for more advanced systems, the installer must have full appreciation of the system and the way the AST 100 Controller settings affect the auxiliary heat source or heat circulating system.

7.2 Options for Standard System Arr 1

Quick reference only, for further details see 7.4 and 7.5

The following menu options will be available when Arr is set to 1 - see 7.1

Set 'X' indicates value is display only.
Set '✓' *indicates value can be changed using set button.
Set 'reset' *indicates value can be reset using set button.

* **SET** will be displayed on screen

MENU OPTION	SET	DESCRIPTION	RANGE	DEFAULT SETTING	SET VALUE	REFER TO:-
COL	X	**Collector Temperature** as detected by sensor S1	-40°C to +250°C	-	-	7.4.1
TST	X	**Lower Cylinder Temperature** as detected by sensor S2	-40°C to +250°C	-	-	7.4.2
S3	X	**Upper Cylinder Temperature** as detected by sensor S3	-40°C to +250°C	-	-	7.4.3
TRF	X	**Collector Return Temperature** as detected by sensor S4 *Only displayed when OHQM is set to On*	-40°C to +250°C	-	-	7.4.4
hP	reset	**Operating Hours Counter**	-	-	-	7.4.5
kWh	reset	**Heat generated - kW per hour** *Only displayed when OHQM is set to On*	-	-	-	7.4.6
MWh	reset	**Heat generated - MWh per hour** *Only displayed when OHQM is set to On*	-	-	-	7.4.6
PRESS AND HOLD FORWARD BUTTON TO ACCESS SETUP PARAMETERS MENU OPTIONS BELOW						
Arr	✓	**System arrangement 1** = standard system	Arr 1 or Arr 2	1	1	7.5.1
DT O	✓	**Solar pump switch On temperature differential.**	1.0 to 20.0K	6.0K		7.5.2
DT F	✓	**Solar pump switch Off temperature differential.**	0.5K to 19.5K	4.0K		7.5.3
S MX	✓	**Maximum Cylinder Temperature.**	2°C to 95°C	60°C		7.5.4
EM	✓	**Maximum Collector Temperature** (emergency shutdown)	110°C to 200°C	140°C		7.5.5
OCX	✓	**System Cooling (Collector)**	OFF or ON	OFF		7.5.3
CMX	✓	**System Cooling Temperature (Collector)** *Only active when OCX is set to ON*	100°C to 190°C	120°C		7.5.6
OCN	✓	**Minimum Collector Temperature**	OFF or ON	OFF		7.5.7
CMN	✓	**Minimum Collector Temperature** *Only active when OCN is set to ON*	-10°C to 90°C	10°C		7.5.7
OCF	✓	**Antifreeze Function**	OFF or ON	OFF		7.5.8
CFR	✓	**Antifreeze Temperature** *Only active when OCF is set to ON*	-10°C to 10°C	4.0°C		7.5.8
OREC	✓	**Re-cooling Function**	OFF or ON	OFF		7.4.9
OTC	✓	**Collector Temperature Monitoring Function**	OFF or ON	ON	ON	7.5.10
OHQM	✓	**Energy measurement**	OFF or ON	OFF		7.5.11
FMAX	✓	**System Flow Rate** - enter current setting *Only active when OHQM is set to ON*	0 to 6.0l/min	6.0l/min		7.5.12
MEDT	✓	**Antifreeze Type**. *Only active when OHQM is set to ON*	0,1,2 or 3	1		7.5.13
MED-%	✓	**Concentration of antifreeze (Vol%)** *Only active when OHQM is set to ON*	20 to 70%	45		7.5.14
HND1	✓	**Operating Mode of R1** (Manual operation of solar pump)	OFF, AUTO or ON	AUTO		7.5.15
HND2	✓	**Operating Mode of R2** (Manual operation of R2) *Not used on Arr 1 system*	OFF, AUTO or ON	AUTO		7.5.16
LANG	✓	**Language** dE=German, En=English, It=Italian	dE,En or It	En		7.5.17
PROG	-	**Programme Number**	-	-		7.5.18
VERS	-	**Version Number**	-	-		7.5.19

7.3 Options for System with Auxiliary Heat Arr 2

Quick reference only, for further details see 7.4 and 7.5

The following menu options will be available when Arr is set to 1 - see 7.1
Set 'X' indicates value is display only.
Set '✓' *indicates value can be changed using set button.
Set 'reset' *indicates value can be reset using set button.
* **SET** will be displayed on screen

MENU OPTION	SET	DESCRIPTION	RANGE	DEFAULT SETTING	SET VALUE	REFER TO:-
COL	X	**Collector Temperature** as detected by sensor S1	-40°C to +250°C	-	-	7.4.1
TSTL	X	**Lower Cylinder Temperature** as detected by sensor S2	-40°C to +250°C	-	-	7.4.2
TSTU	X	**Upper Cylinder Temperature** as detected by sensor S3	-40°C to +250°C	-	-	7.4.3
S4	X	**Collector Return Temperature** as detected by sensor S4 *Only displayed when OHQM is set to On*	-40°C to +250°C	-	-	7.4.4
hP1	reset	**Operating Hours Counter -** Solar Pump (R1)	-	-	-	7.4.5
hP2	reset	**Operating Hours Counter -** Auxiliary Pump (R2)	-	-	-	7.4.5
kWh	reset	**Heat generated - kW per hour** *Only displayed when OHQM is set to On*	-	-	-	7.4.6
MWh	reset	**Heat generated - MWh per hour** *Only displayed when OHQM is set to On*	-	-	-	7.4.6
PRESS AND HOLD FORWARD BUTTON TO ACCESS SETUP PARAMETERS MENU OPTIONS BELOW						
Arr	✓	**System arrangement 2** = auxiliary heat source system	Arr 1 or Arr 2	2	2	7.5.1
DT O	✓	**Solar pump switch On temperature differential.**	1.0 to 20.0K	6.0K		7.5.2
DT F	✓	**Solar pump switch Off temperature differential.**	0.5K to 19.5K	4.0K		7.5.3
S MX	✓	**Maximum Cylinder Temperature.**	2°C to 95°C	60°C		7.5.4
EM	✓	**Maximum Collector Temperature** (emergency shutdown)	110°C to 200°C	140°C		7.5.5
OCX	✓	**System Cooling (Collector)**	OFF or ON	OFF		7.5.3
CMX	✓	**System Cooling Temperature (Collector)** *Only active when OCX is set to ON*	100°C to 190°C	120°C		7.5.6
OCN	✓	**Minimum Collector Temperature**	OFF or ON	OFF		7.5.7
CMN	✓	**Minimum Collector Temperature** *Only active when OCN is set to ON*	-10°C to 90°C	10°C		7.5.7
OCF	✓	**Antifreeze Function**	OFF or ON	OFF		7.5.8
CFR	✓	**Antifreeze Temperature** *Only active when OCF is set to ON*	-10°C to 10°C	4.0°C		7.5.8
OREC	✓	**Re-cooling Function**	OFF or ON	OFF		7.4.9
OTC	✓	**Collector Temperature Monitoring Function**	OFF or ON	ON	ON	7.5.10
AH O	✓	**Thermostat Switch On Temperature**	0.0 to 95.0°C	40.0°C	Refer to 7.5	
AH F	✓	**Thermostat Switch Off Temperature**	0.0 to 95.0°C	45.0°C		
OHQM	✓	**Energy measurement**	OFF or ON	OFF		7.5.11
FMAX	✓	**System Flow Rate** - enter current setting *Only active when OHQM is set to ON*	0 to 6.0l/min	6.0l/min		7.5.12
MEDT	✓	**Antifreeze Type**. *Only active when OHQM is set to ON*	0,1,2 or 3	1		7.5.13
MED%	✓	**Concentration of antifreeze (Vol %)** *Only active when OHQM is set to ON*	20 to 70%	45		7.5.14
HND1	✓	**Operating Mode of R1** (Manual operation of solar pump)	OFF, AUTO or ON	AUTO		7.5.15
HND2	✓	**Operating Mode of R2** (Manual operation of aux. pump)	OFF, AUTO or ON	AUTO		7.5.15
LANG	✓	**Language** dE=German, En=English, It=Italian	dE,En or It	En		7.5.17
PROG	-	**Programme Number**	-	-		7.5.18
VERS	-	**Version Number**	-	-		7.5.19

7.4 Information Only Menu Options

The following menu options are display only.

When power is switched on to the controller it goes through an initialisation phase and then shows the first of the 'information only' options (COL).

The forward ⊃ and backward ⊂ buttons can then be used to index through the 'information only' options.

Note
Options that display SET can be set to zero - for procedure see 5.5.

7.4.1 COL Collector Temperature

Range -40°C to +250°C - Display Only

Temperature of the collector flow as detected by sensor S1.

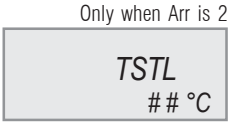
Only displayed when a sensor is connected to S1.

IMPORTANT
OTC option must be set to ON to ensure a correct temperature reading is obtained.

7.4.2 TST, TSTL Lower Cylinder Temperature

Only when Arr is 1

Only when Arr is 2



Range -40°C to +250°C - Display Only

TST is displayed when Arr 1 is set.
TSTL is displayed when Arr 2 is set.

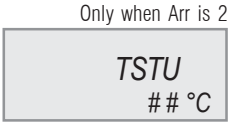
Temperature of the cylinder as detected by lower cylinder sensor S2.

Only displayed when a sensor is connected to S2.

7.4.3 S3, TSTU Lower Cylinder Temperature

Only when Arr is 1

Only when Arr is 2



Range -40°C to +250°C - Display Only

S3 is displayed when Arr 1 is set.
TSTU is displayed when Arr 2 is set.

Temperature of the cylinder as detected by upper cylinder sensor S3.

Only displayed when a sensor is connected to S3.

7.4.4 S4, TRF Panel Return Temperature (option)

Arr1 Only when OHQM is On

Arr 2 Only when OHQM is On

Range -40°C to +250°C - Display Only

Arr 1
TRF is displayed when Energy Monitoring function OHQM is On.

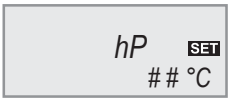
Arr 2
S4 is displayed when Energy Monitoring function OHQM is On.

Temperature of the collector return as detected by sensor S4.

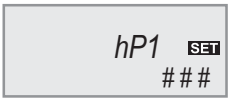
Only displayed when a sensor is connected to S4.

7.4.5 hP, hP1, hP2 Operating Hours Counter

Only when Arr is 1



Only when Arr is 2

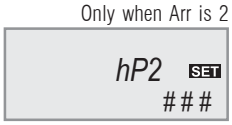


Display Only

Arr 1
hP Displays the total hours solar has operated as defined by relay R1 - Solar pump ON time.

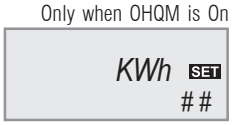
Arr 2
hP1 Displays the total hours solar has operated as defined by relay R1 - Solar pump ON time.

Only when Arr is 2

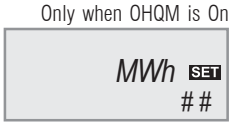


hP2 Displays the total hours auxiliary heat source has operated as defined by relay R2 - Auxiliary pump ON time.

Only when OHQM is On



Only when OHQM is On



7.4.6 KWh and MWh Energy Monitoring

Display Only

These options are only shown when Energy Monitoring OHQM function is set to ON and a sensor S4 is connected to the collector return pipework.

The heat quantity transported is determined from :-

1. The flow volume, as set by 'FMAX'
2. The flow temperature of the collector, as detected by sensor S1.
3. The return temperature, as detected by sensor S4 (TRF).

The sum of both menu option KWh + MWh equals the total heat output.

Example *MWh = 45 KWh = 750*

45,000 + 750 = 45,750kW/h or 45.750MWh

7.5 Setup Parameters Menu Options

Note
Options that display SET can be set changed - for procedure see 5.5.

To access the 'setup parameters' use the forward button to reach the last 'information only' option, then press and hold the forward button until the first of the 'setup parameters' is shown (Arr).

The forward and backward buttons can then be used to index through the 'setup parameters'.

Arr SET 1

Arr SET 2

7.5.1 Arr System Arrangement

Range - Arr 1 or Arr 2 ~ Default Arr 1

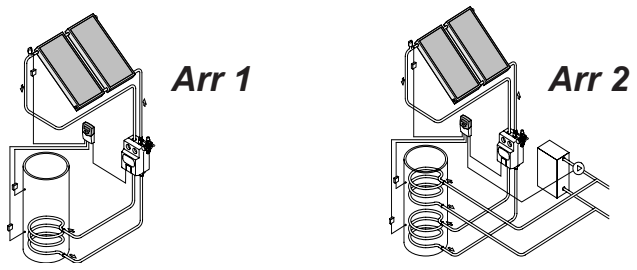


Fig. 7.5a Arr 1 and Arr 2 System Arrangements

Arr 1 Sets the system for solar only heating control.
Only setup parameters for standard system will be shown.

Arr 2 Sets the system for solar and auxiliary heat source or heat circulating control.
Only setup parameters for system with auxiliary heat source or heat circulating will be shown.

Relay R2 is used for auxiliary source or heat circulating pump.

IMPORTANT
Arr 1 or Arr 2 must be set on commissioning to suit the system installed.
THE SETTING MUST NOT BE CHANGED THEREAFTER.

DT O SET ##.#

7.5.2 DT O Solar Pump Switch ON Temperature Differential

Range - 1.0K to 20.0K ~ Default 6.0K

The collector temperature as detected by S1 minus the cylinder temperature as detected by S2 equals the solar temperature differential.

Solar Temperature Differential = S1 temp. - S2 temp.

The solar pump is switched On (R1 On) when the solar temperature differential exceeds the set DT O value.

When 'COL' S1 temp. - S2 temp. > DT O R1 is On.

DT O recommended setting = 6°C
DT O must be at least 1°C above set DT F value.

DT F SET 4.0K

7.5.3 DT F Solar Pump Switch OFF Temperature Differential

Range - 0.5K to 19.5K ~ Default 4.0K
Also see DT O 7.5.2.

The solar pump is switched Off (R1 Off) when the solar temperature differential is below the set DT F value.

When 'COL' S1 temp. - S2 temp. < DT F R1 is Off.

DT F recommended setting = 4°C
DT O must be at least 1°C below set DT O value.

S MX SET
4.0°K

7.5.4 S MX Maximum Cylinder Temperature

Range - 0.5K to 19.5K ~ Default 4.0K

S MX is the maximum temperature the cylinder is allowed to reach.

In the event of the set S MX value being exceeded, further heating of the cylinder is prohibited by switching R1 Off (solar pump stopped).

☼ will be displayed.

The S MX setting is overridden when, OCX is set to On and/or OREC is set to On - see 7.5.6 & 7.5.9.

EM SET
140°C

7.5.5 EM Maximum Collector Temperature

Range - 110°C to 200°C ~ Default 140°C

EM is the emergency shut down temperature of the collectors, designed to prevent damage to the solar components due to overheating.

When a temperature higher than the set EM value is detected by sensor S1 the solar pump will be switched Off (R1 Off).

⚠ will flash on the display.

The pump will restart when the maximum temperature is underrun.

OCX SET
Off

Only when OCX is On

CMX SET
120°C

7.5.6 OCX & CMX System Cooling (Collector)

OCX Range - On or Off ~ Default Off
CMX Range - 100°C to 190° ~ Default 120°C

OCX On System Cooling Active

CMX is only available when OCX is set to On.

If the maximum cylinder temperature (S MX) is reached the solar pump is switched Off (R1 Off). When OCX is set to ON and the collector temperature rises to the set CMX value the solar pump remains active (R1 On) until the set CMX value is under run again.

The cylinder temperature may continue to rise above the S MX value up to 95°C, the cylinder emergency shut down temperature.

If the cylinder temperature is higher than the set S MX value and the collector temperature is cooler than the actual cylinder temperature by at least 5°C, then the solar pump remains On until the cylinder is cooled down to below the S MX temperature.

During the system cooling process the ☼ will flash on the display.

The system cooling function enables the solar system to remain active for longer periods on hot summer days. It also reduces the possibility of the system PRV valve opening thus preventing loss of heat transfer fluid.

OCN SET
Off

CMN SET
10.0°C

7.5.7 OCN & CMN Minimum Collector Temperature

OCN Range - On or Off ~ Default Off
CMN Range - -10°C to 90°C ~ Default 10°C

CMN is only available when OCN is set to On.

When OCN is set to On the collector temperature has to exceed the set CMN value before the solar pump will be switched ON (R1 On). This avoids intermittent switching on of the solar system for low collector temperatures.

When OCN is set to On and the collector temperature is less than the value set for CMN, ❄ will flash in the display.

OCF SET
Off

Only when OCF is On

CFR SET
4°C

Note
For details of filling the system with glycol see pump manual.

7.5.8 OCF & CFR Antifreeze function

OCF Range - On or Off ~ Default Off
CFR Range - -10°C to 10°C ~ Default 4°C

CFR is only available when OCF is set to On.

When OCF is set to On and the collector temperature falls below the set CFR value the solar pump will be switched ON (R1 On). This has the effect of the water from the cylinder warming the collectors to prevent freezing.

When the temperature of the collectors exceeds the set CFR value by 1°C the pump is switched Off (R1 Off).

The solar system must always be filled with heat transfer fluid (glycol) at the recommended solution. This will give protection of the system down to - 28°C. Therefore the antifreeze function is not normally required in the UK.

OREC SET
Off

7.5.9 OREC Re-cooling Function

OREC Range - On or Off ~ Default Off

When OREC is set to On and the maximum cylinder temperature (S MX) is reached, the solar pump will continue to run (R1 On) to prevent the collectors overheating. When the cylinder temperature falls back below the set S MX the pump is switched Off (R1 Off). This prevents the collectors overheating, ideal for hot summer days.

The re-cooling does increase the cylinder temperature, however it will only rise up to 95°C, the cylinder emergency shut down temperature, at which point the pump will be switched Off (R1 Off).

In the evening the pump continues to run until the cylinder is cooled to the maximum set cylinder temperature (SMX).

OTC SET
On

7.5.10 OTC Collector Temperature Monitoring Function

OTC Range - On or Off ~ Default On

IMPORTANT

OTC must be set to On during commissioning and should not be changed thereafter.

When OTC is set to On the controller monitors and stores the temperature of the collectors as detected by sensor S1, whenever there is a temperature rise of 2°C the solar pump will be switched On (R1 On) for a period of 30 seconds.

Collector Temperature Monitoring will occur between the set DTO and DTF values - see 7.5.2 and 7.5.3.

OHQM SET
Off

7.5.11 OHQM Energy Monitoring

Range - On or Off ~ Default Off

For Energy Monitoring a sensor S4 has to be fitted - see 6.4 & 6.5.

Optional Sensor code: 3820003

Information only menu options KWh and MWh are only displayed when Energy Monitoring function OHQM is On - see 7.4.6.

FMAX, MEDT and MED% and KWh are only displayed when Energy Monitoring function OHQM is On - see over.

Only when OHQM is On

FMAX SET
6.0l/min

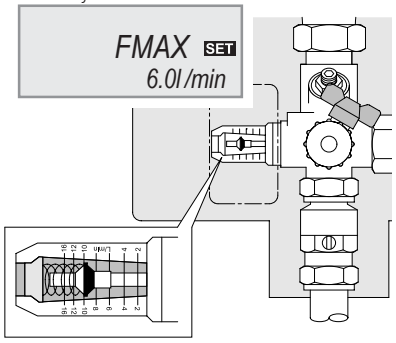


FIG. 7.5B FLOW RATE SETTING

7.5.12 FMAX System Flow Rate

Range - 0 to 6.0 l/min ~ Default 6.0 l/min

FMAX is only displayed when OHQM is set to On.

Enter the actual flow rate as set on the pump module - see fig 7.5B, also refer to Pump Manual.

Only when OHQM is On

MEDT SET
1

7.5.13 MEDT Antifreeze type

Range - 0 to 3 ~ Default 1

MEDT is only displayed when OHQM is set to On.

Set 0 for Water
Set 1 for Propylene glycol
Set 2 for Ethylene glycol
Set 3 for Tyfocor (supplied with SOLARcomfort)

Only when OHQM is On
Only when MEDT is 1 or 2

MED% SET
45%

7.5.14 MED% Concentration of Antifreeze

Range - 20% to 70% ~ Default 45%

MED% is only displayed when OHQM is set to On and MEDT is set to 1 (Propylene glycol) or 2 (Ethylene).

Set value to the dilution of the antifreeze used in the system.

As Tyfocor is supplied with the system MED% will not be required.

HND1 SET
Auto

7.5.15 HND1 Operating Mode of R1

Range - Off, Auto, On ~ Default Auto

Auto must be selected for normal operation.

On and Off should only used during commissioning and setting up.

On Relay R1 On, solar pump running.
Indicator light flashes red/green

⚠+ and flashes on display.

Off Relay R1 Off, solar pump off.

⚠+ flashes on display - does not flash.

Only used when Arr is 2

HND2 SET
Auto

7.5.16 HND2 Operating Mode of R2

Range - Off, Auto, On ~ Default Auto

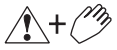
HND2 is only used when Arr 2 is set.

Auto must be selected for normal operation.

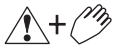
On and Off should only used during commissioning and setting up.

continued>>>>>

On Relay R2 On, auxiliary heat source pump running. Indicator light flashes red/green

 and  flashes on display.

Off Relay R2 Off, auxiliary heat source pump running.

 flashes on display -  does not flash.

7.5.17 LANG Language Setting

Range - dE, En or It ~ Default En

dE set for German

En set for English

It set for Italian

7.5.18 PROG Programme Number

Display only

Displays the current programme number.

7.5.19 VERS Programme Version

Display only

Displays the current programme version.

7.5.20 AHO R2 Thermostat Switch On Temperatures

AHO Range 0 to 95°C ~ Default 40°C

AHO is only available when Arr 2 is set.

7.5.21 AHF R2 Thermostat Switch Off Temperatures

AHF Range 0 to 95°C ~ Default 40°C

AHF is only available when Arr 2 is set.

AHO and AHF

R2 can be used in two ways:-

Normal Systems To switch On an auxiliary heat souce to heat the cylinder upper coil when solar is not available or at low performance.

Set AHO lower than AHF.

The defaut settings of AHO 40° & AHF 45°C are for 'normal' systems.

Alternative To switch On a pump and/or motorised valve to enable extra heat produced by solar to heat radiators connected to the cylinder upper coil of the cylinder, see 7.1.

Set AHO greater than AHF.

IMPORTANT **When Arr 2 is selected extreme care must be taken to ensure the auxiliary heat source only operates when it will not adversely affect the cylinder temperature prior to and during the 'solar day'.**

8. MAINTENANCE

8.1 Fuse Replacement

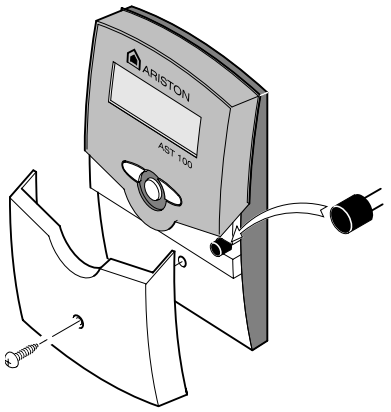


Fig. 8.1A Fuse Location

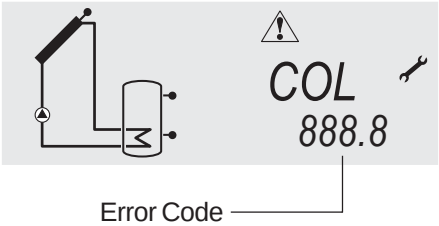
The AST Controller has a internal fuse located under the front cover - see fig. 8.1A.

If the display or Indicator lamp do not light up when power to the controller is switched On it indicates a possible fuse or power failure.

A spare fuse is supplied with the controller.

Fuse type SMTX T4/250V.

8.2 Sensor Failure



Symptoms of a sensor failure are:-

Indicator lamp flashes red, ⚠+ displayed and an error code displayed in place of the sensor temperature.

There are two error codes:-

888.8 indicates a line break to cable or sensor.

-88.8 indicates short circuit of cable or sensor.

Pt1000 temperature sensors can be checked with a multi meter.

The chart below gives resistance values Ω corresponding to temperatures

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

8.3 Controller failure

If the controller fails to start (operating lamp On and display lit) then check wiring, fuses and power supply. If these are all OK then the controller is faulty.

The operation of the controllers Relays R1 and R2 can be checked using manual switching (HND, HND1 and HND 2) see section 7.

⚠ **IMPORTANT**

No attempt should be made to repair the controller - consult Ariston.

8.4 Fault Finding

The following two pages have fault finding procedures.

If the display or indicator lamp do not light up when power to the controller is switched On it indicates a possible fuse or power failure - see 8.1.

If the system is not operating as expected, it is recommended that the first course of action is to set all values to the default values OR the values recorded by the commissioning engineer; these are shown in section 7.

Pump is overheated, but no heat transfer from collector to the cylinder; flow and return are equally warm.

Is there air in system?

NO

Is collector circuit dirty/ blocked?

YES

Remove dirt/blockage.

YES

Vent the system; increase system pressure to at least static primary pressure +0.5 bar; if necessary continue to increase, switch the pump off and on for a short time.

Pump starts up very late then stops shortly afterwards.

Is switch on temperature difference (DTO) too high?

NO

Collector sensor not registering temperature correctly?

YES

Set Collector Temperature Monitoring Function (OTC) to On

YES

Reset DTO and DTF

Pump perpetually stops and starts.

Are temperature differentials DTO and DTF too close?

NO

Is the collector sensor correctly fitted/located?

NO

Refit sensor correctly.

YES

Set Collector Temperature Monitoring Function (OTC) to On

YES

Reset DTO and DTF

The collector temperature increases considerably more than the cylinder temperature, the system cannot dissipate the heat.

Is the solar pump operating correctly ?

NO

Check HND1 is in Auto. Check pump wiring. Replace pump.

YES

Is the cylinder heat exchanger blocked?

NO

Is the cylinder heat exchanger scaled?

NO

Is the cylinder heat exchanger too small?

YES

Replace with larger heat exchanger

YES

Descale

YES

unblock/clean

The solar circuit pump does not run although the collector is obviously warmer than the cylinder.

Does the Indicator Light flash?

NO

There is no power. Check fuses and power supply.

YES

Does the pump run in manual operation (HND1 On)?

NO

Does the controller switch to 'pump On' (R1 On)?

NO

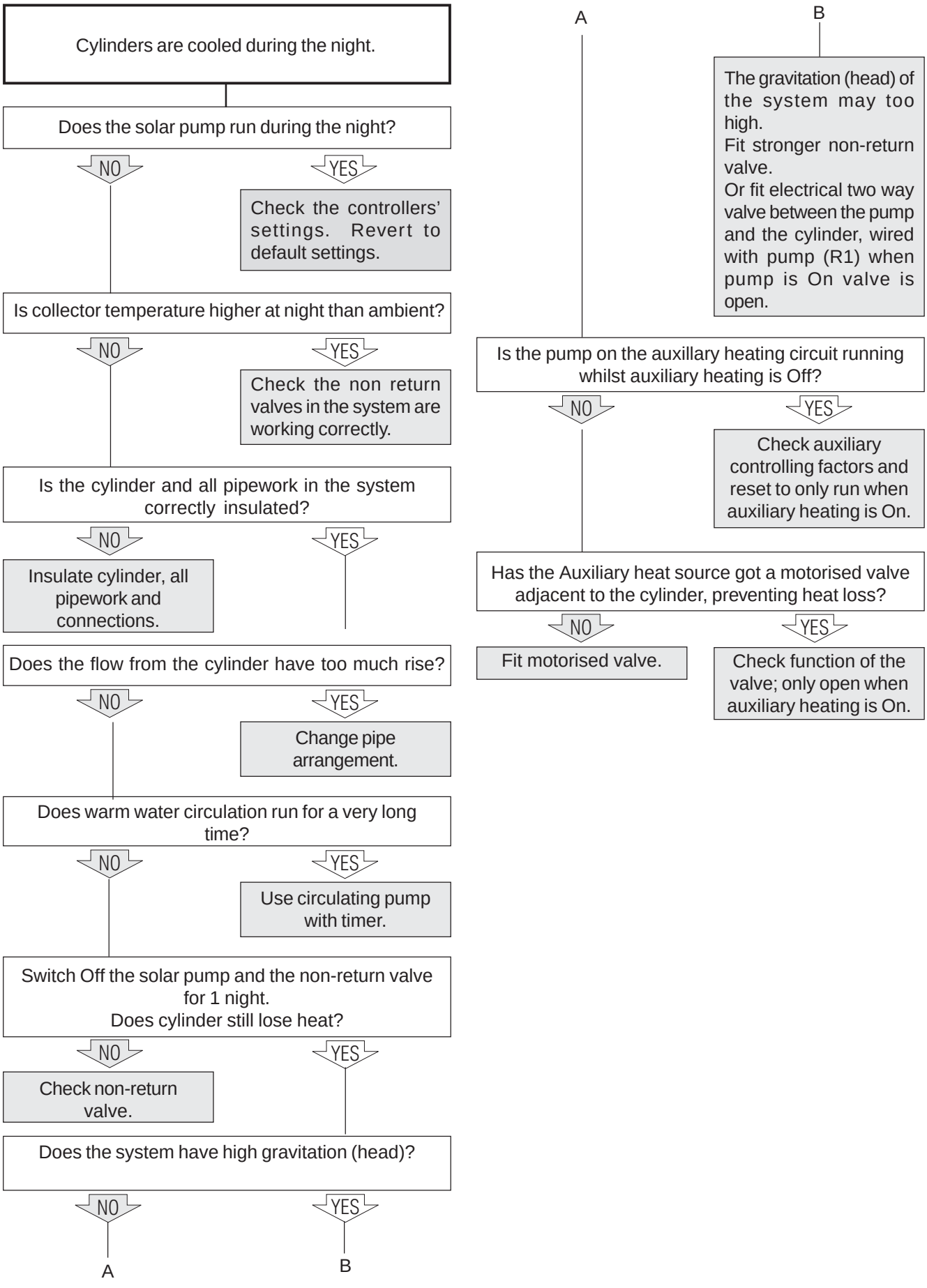
Suspect fault with controller, consult Ariston.

YES

Check pump wiring. Service / replace pump.

YES

DTO set too High lower setting


Cylinders are cooled during the night.
Does the solar pump run during the night?
NO
YES
Check the controllers' settings. Revert to default settings.
Is collector temperature higher at night than ambient?
NO
YES
Check the non return valves in the system are working correctly.
Is the cylinder and all pipework in the system correctly insulated?
NO
YES
Insulate cylinder, all pipework and connections.
Does the flow from the cylinder have too much rise?
NO
YES
Change pipe arrangement.
Does warm water circulation run for a very long time?
NO
YES
Use circulating pump with timer.
Switch Off the solar pump and the non-return valve for 1 night.
Does cylinder still lose heat?
NO
YES
Check non-return valve.
Does the system have high gravitation (head)?
NO
YES
A
B
A
B
The gravitation (head) of the system may too high.
Fit stronger non-return valve.
Or fit electrical two way valve between the pump and the cylinder, wired with pump (R1) when pump is On valve is open.
Is the pump on the auxillary heating circuit running whilst auxiliary heating is Off?
NO
YES
Check auxiliary controlling factors and reset to only run when auxiliary heating is On.
Has the Auxiliary heat source got a motorised valve adjacent to the cylinder, preventing heat loss?
NO
YES
Fit motorised valve.
Check function of the valve; only open when auxiliary heating is On.

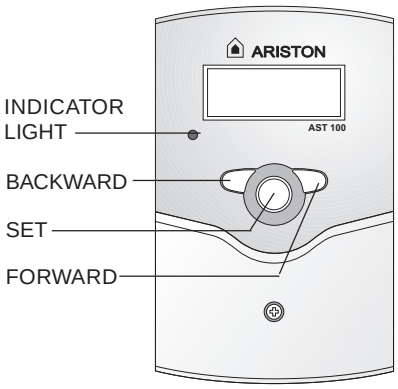
9. USER INSTRUCTIONS

IMPORTANT

The AST 100 Controller will have been set by the installer to reflect the system as installed. Under no circumstances should any of the system parameters be changed by the householder.

The householder may reset the hour counters and energy monitor - see 9.3.

9.1 CONTROLLER FUNCTIONS



Indicator Light

Off	No power to the SOLARcomfort Controller.
Green	Power is On - normal condition.
Red/Green flashing	Initialisation phase. HND1 or HND2 are set to On.
Red flashing	Fault condition. Indicates one of the sensors is defective or not connected. Also a sensor symbol on the display will flash rapidly indicating which sensor is causing fault - see 5.7.

The controller is operated by three pushbuttons situated below the display.

Forward Button

Use to scroll forward through menu options on the display.

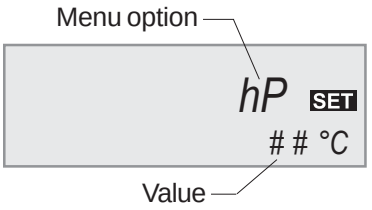
Backward Button

Use to scroll backward through menu options on the display.

Set Button

Use to zero menu hour counters and energy monitor.

9.2 MENU OPTION AND VALUE DISPLAY



Menu Option

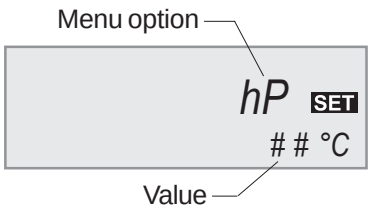
Displays the option selected using the forward and backward buttons.

Value

Displays the current set value for the menu option selected.

When **SET** is also displayed it indicates that the value can be changed or set to zero using the set button - refer to Section 9.4.

9.3 HOUSEHOLDER RESET OPTIONS



Above example - menu option 'hP' (Arr1)

The only options the householder should reset are:-

Operating hours counters:-

hP or hP1	The operating hours counter for the solar pump.
hP2	The operating hours counter for the auxiliary heat source control.

Energy monitor:-

Only available when heat monitoring function has been set by the installer.

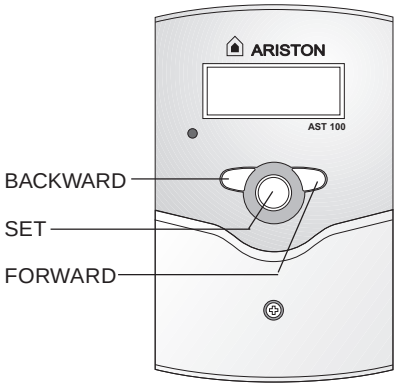
kWh	Energy monitor kW
kWh	Energy monitor mW

The sum of both menu option KWh + MWh equals the total heat output.

Example *MWh = 45 KWh = 750*

45,000 + 750 = 45,750kW/h or 45.750MWh

9.4 How to Reset Counters



TO RESET A COUNTER

1. Press forward button to scroll through to required option.

   If the menu option can be changed or reset **SET** will also be displayed.

2. Press and hold set button until **SET** flashes, the value will be reset to 0.

3. To confirm press set again until it stops flashing.

To interrupt reset procedure, do not press any button for about 5 seconds and the controller option will return to previous setting.

9.5 Fault Condition

The householder must not attempt to reset the system. In the event of a system failure the installer should be contacted.

TERMS AND CONDITIONS OF GUARANTEE

The SOLARcomfort AST 100 Controller is guaranteed for 2 years.

Please read these terms and conditions which are in addition to any terms and conditions detailed in this book or any registration card supplied with your appliance.

SOLARcomfort solar thermal systems must only be installed and commissioned by Ariston trained and approved installers. Failure to comply with this requirement will invalidate the warranty.

A charge will be made to the owner of the appliance if:-

1. The reason for any service visit is as a direct result of a failure to install the appliance in accordance with the manufacturer's instructions.

2. Your installer does not complete the necessary commissioning process and procedure as detailed in the Installation and Operating Instruction manuals.

3. Your appliance is not serviced on or before the 12 month anniversary of installation.

4. Our service engineer calls as requested and the failure is a non-manufacturing defect.

Failure to pay an invoice for any such occurrence **will** be assumed by MTS that you accept that your appliance has not been installed correctly and understand that any manufacturer's guarantee has been withdrawn.

On the 12 month anniversary of the appliance installation, you must have it serviced to continue any guarantee offered into the following year. Failure to do so **will** invalidate your guarantee and should an MTS engineer be required to attend and no proof of service documentation is made available, then MTS **will** charge.

If you have a problem with commissioning on installation, please contact our Technical Department on 0870 241 8180.

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