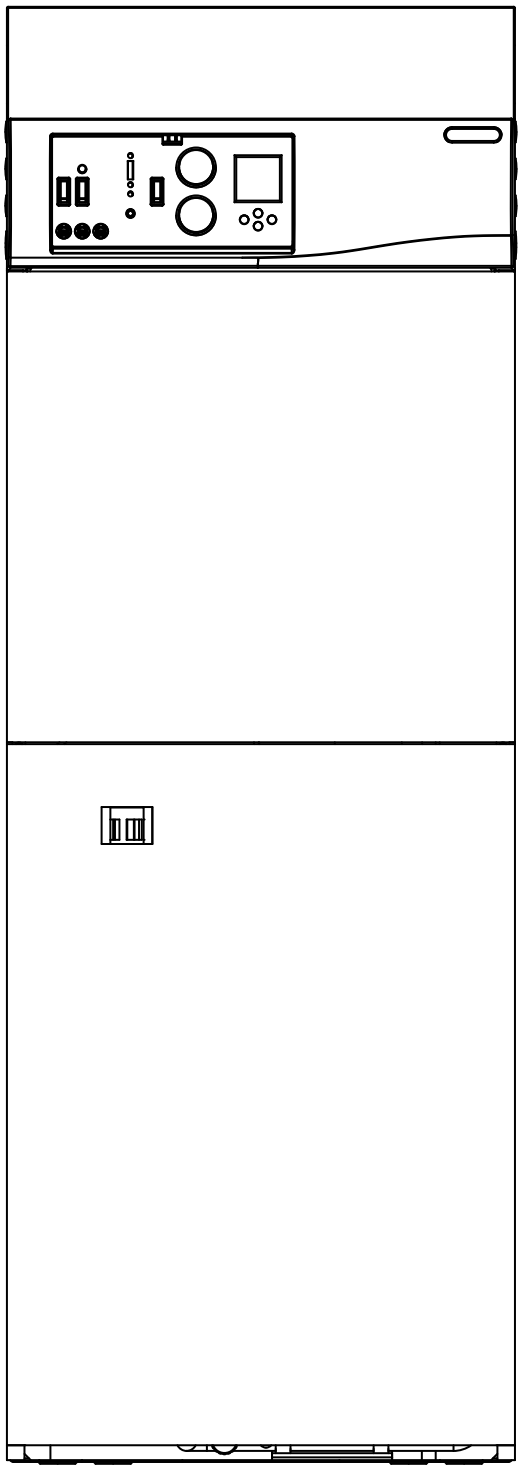
HEATRAE SADIA

The quality name in water heating



ELECTROMAX SOLAR

INSTALLATION & SERVICING INSTRUCTIONS

CONTENTS

1.0 INTRODUCTION

Thank you for purchasing a Heatrae Sadia Electromax Solar. The Electromax Solar is manufactured in the UK to the highest standards and has been designed to meet all the latest relevant safety specifications.

1.1 IMPORTANT POINTS

The Electromax Solar must be installed and commissioned by a competent person. Please read and understand these instructions before installing the Electromax Solar. Following installation and commissioning, the operation of the Electromax Solar should be explained to the user and these instructions left with them for future reference.

The Electromax Solar is not intended for use by persons (including children) with reduced physical, sensory or mental capabilities, or lack of experience and knowledge, unless they have been given supervision or instruction concerning the use of the appliance by a person responsible for their safety.

Children should be supervised to ensure they do not play with the Electromax Solar.

The Electromax Solar domestic hot water cylinder is of unvented type. Its installation is subject to Building Regulation G3 (England and Wales), Technical Standard P3 (Scotland) or Building Regulation P5 (Northern Ireland). Installation must be carried out by a competent person.

Electrical installation must be carried out in accordance with the current IEE Wiring Regulations.

The Electromax Solar electric heating boiler must be installed into a sealed (pressurised) primary system. Following installation the primary system should be flushed in accordance with BS 7593 and an inhibitor added.

The Electromax Solar does not contain any substances harmful to health; it does not contain any asbestos.

1.2 PRODUCT DESCRIPTION

The Electromax Solar is available in a number of capacities and configurations:
95 022 212 - 185 Litre, Radiator
95 022 214 - 220 Litre, Radiator
95 022 215 - 250 Litre, Radiator

95 022 312 - 185 Litre, Underfloor
95 022 314 - 220 Litre, Underfloor
95 022 315 - 250 Litre, Underfloor

95 022 216 - 185 Litre, Radiator, East / West Array
95 022 217 - 220 Litre, Radiator, East / West Array
95 022 218 - 250 Litre, Radiator, East / West Array

95 022 316 - 185 Litre, Underfloor, East / West Array
95 022 317 - 220 Litre, Underfloor, East / West Array
95 022 318 - 250 Litre, Underfloor, East / West Array

The Electromax Solar, when combined with a suitable Electromax Solar Collector kit, comprises all the principle components to provide:

- An efficient solar thermal water heating system
- An electric back up water heating system
- An electric heated wet central heating system

The Electromax Solar has an unvented domestic hot water storage cylinder manufactured from Duplex stainless steel and insulated with polyurethane foam.

The primary heat source is solar energy. The sun's energy is captured by a series of solar collector panels (supplied separately) through which a special heat transfer fluid is pumped. As the fluid passes through the collector panels its temperature is raised. The heated fluid is circulated through a heat exchanger coil in the base of the hot water storage cylinder transferring the heat gained to the stored water, gradually raising its temperature. The cooled fluid then returns to the collector panel to be heated again.

The solar primary circuit includes a circulating pump, a flow meter, an expansion relief valve, a manual air vent and two high temperature check valves, all factory fitted. Solar collectors, solar expansion vessel and heat transfer fluid are supplied as separate accessory kits.

Temperature control of the solar circuit is provided by an electronic controller housed in the main Electromax Solar control panel. Over-temperature protection is provided by a manually re-settable double pole cut out.

In the UK a well designed solar system has the potential to deliver up to 60% of a dwellings hot water requirement from solar energy, however this energy is not received uniformly throughout the year (70% of the UK annual radiation is received over the period April to September and 25% is received in the months of June and July).

The Electromax Solar also has two 3kW immersion heaters: a lower immersion heater to supplement the solar energy for periods of low solar gain, and an upper immersion heater to provide a one-hour boost.

The domestic hot water system includes a factory fitted temperature and pressure relief valve and expansion vessel. A cold water combination valve which comprises a pressure reducing valve, expansion relief valve, check valve and strainer, is supplied loose.
The Electromax Solar has a wet, sealed, central heating primary circuit suitable for connection to radiators or underfloor manifolds depending on the model purchased. The central heating circuit is separate to both the solar and domestic hot water systems.

The central heating heat source is a 9kW electric flow type boiler. The system includes a circulating pump, an expansion vessel, an expansion relief valve, an automatic air vent and an automatic bypass valve, all factory fitted.

Temperature control of the central heating system is provided by a room thermostat (supplied loose). Over-temperature protection of the central heating system is provided by an electronic control housing in the main Electromax Solar control panel.

Only Electromax Solar Collector kits should be used with the Electromax Solar.

The Solar Collector kits include Solar Collectors, Solar Collector Fixing Kit, Solar Collector Sensor, Solar Fluid, 2 Metres Flexible Stainless Steel Tube, Solar Expansion Vessel, Solar Rated Thermostaic Mixing Valve, Installation Instructions:

95 970 517 - 1 Panel, On Roof, Slate & Tile
95 970 518 - 2 Panel, On Roof, Slate & Tile
95 970 519 - 2 Panel, On Roof, Slate & Tile , East / West Array
95 970 520 - 3 Panel, On Roof, Slate & Tile , East / West Array
95 970 521 - 1 Panel, On Roof, A Frame
95 970 522 - 2 Panel, On Roof, A Frame
95 970 523 - 1 Panel In Roof, Slate
95 970 524 - 2 Panel In Roof, Slate
95 970 525 - 1 Panel In Roof, Tile
95 970 526 - 2 Panel In Roof, Tile
95 970 527 - 2 Panel In Roof, Slate, East / West Array
95 970 528 - 3 Panel In Roof, Slate, East / West Array
95 970 529 - 2 Panel In Roof, Tile, East / West Array
95 970 530 - 3 Panel In Roof, Tile, East / West Array

FIGURE 01: ELECTROMAX SOLAR BASIC FEATURES

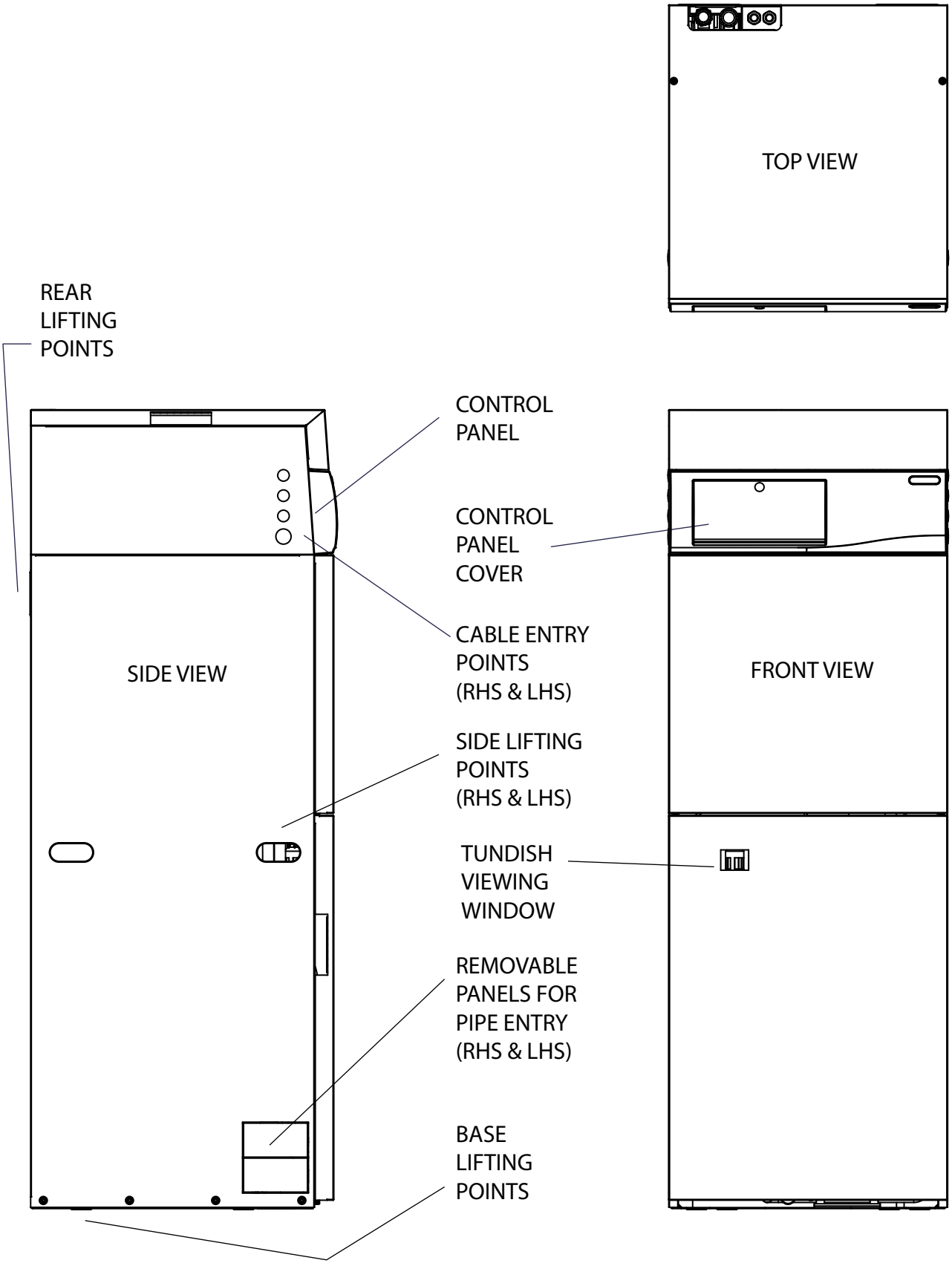


FIGURE 02: ELECTROMAX SOLAR BASIC FEATURES

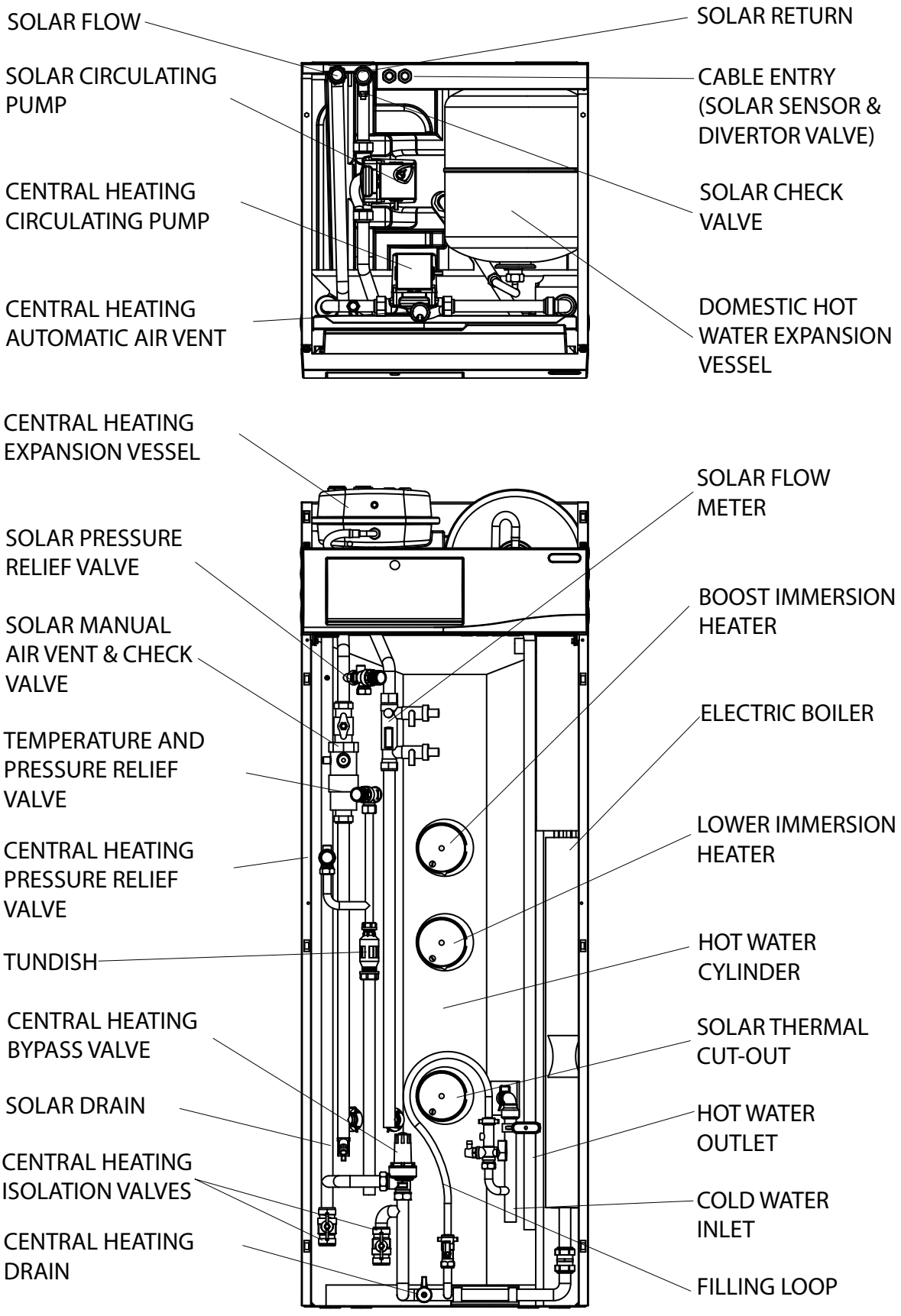
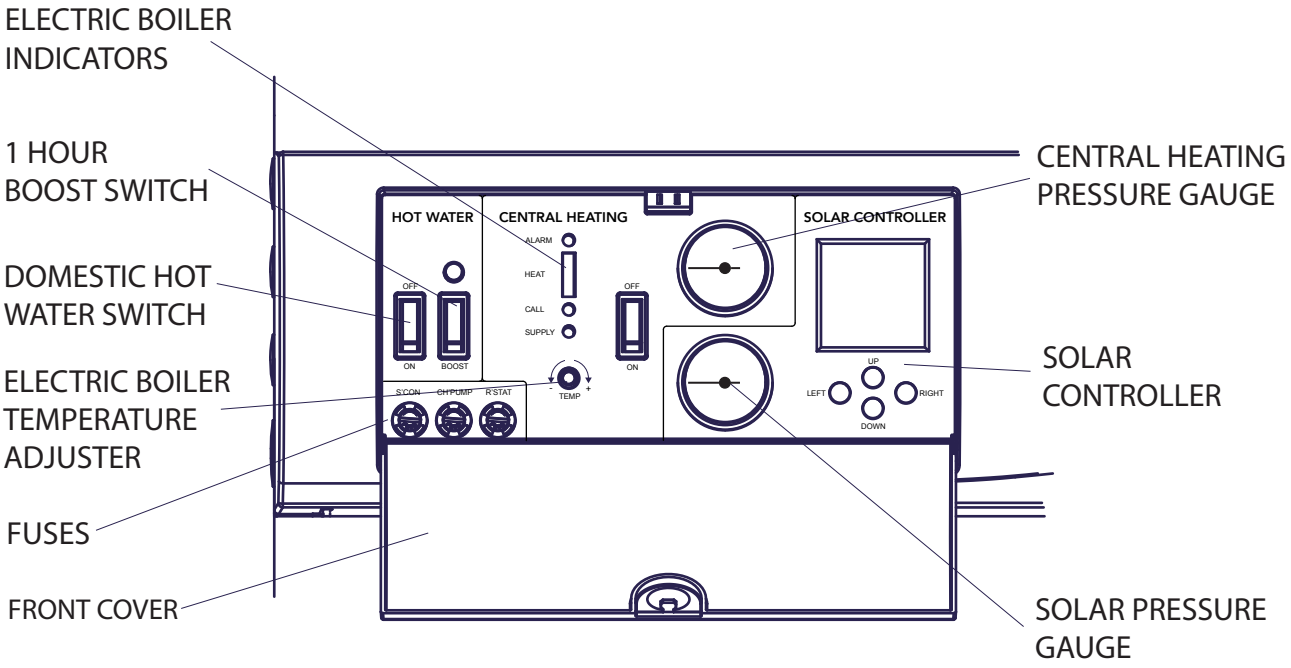


FIGURE 03: ELECTROMAX SOLAR CONTROL PANEL



1.3 STORAGE, HANDLING AND UNPACKING

The Electromax Solar is delivered in protective expanded polystyrene packaging with reinforced corner posts. The assembly is shrInk wrapped in heavy duty polythene. The Electromax Solar accessory kit is supplied boxed inside the Electromax Solar underneath the top panel. The packaging must be removed prior to installation. It is recyclable and should be disposed of in accordance with environmental guidelines.

The Electromax Solar must be stored upright, under cover in dry conditions. It must not be stacked.

Note the weight of the product and the handling instructions applied to the packaging. If using a handling device, eg. a sack barrow, to manually move the Electromax Solar, trucking must be done from the rear to avoid damage to the outer panels.

The Electromax Solar should be lifted and handled by two persons. Hand holds are provided in the rear panel, in both side panels and in the base panel to aid lifting. Stooping should be avoided and protective clothing worn when necessary.

Note: Internal packing pieces which protect the central heating expansion vessel in transit must be removed prior to installation.

1.4 COMPONENT CHECK LIST

Within the Electromax Solar packaging the following components are supplied. Please check that all parts are available before commencing installation.

- Electromax Solar
- Cold water combination valve
- Programmable room thermostat
- Immersion heater key spanner
- Hose connection adaptor for primary system drain valve
- Set of cable entry glands and blanking plugs (5 x 20mm, 1 x 25.4mm)
- Installation manual
- User instructions
- Fitting template
- Warranty card
- Divertor valve (East/West models only)

2.0 TECHNICAL SPECIFICATIONS

2.1 GENERAL

Capacity (Total)	185 litre	220 litre	250 litre
Capacity (Solar)	65 litre	75 litre	80 litre
Weight (Empty)	94kg	105.5kg	112kg
Weight (Full)	279kg	325.5kg	362kg
Height	1580mm	1800mm	1990mm
Width	550mm	550mm	550mm
Depth	600mm	600mm	600mm

2.2 DHW CYLINDER

Rated pressure	0.6 MPa (6 bar)
Operating pressure	0.35 MPa (3.5bar)
Supply pressure	0.15 MPa min (1.5bar) – 1.6 MPa max (16bar) max at PRV
Temp' & pressure relief valve	1.0 MPa (10bar) / 90ºC
Pressure reducing valve	0.35 MPa (3.5bar)
Expansion relief valve	0.6 MPa (6bar) Fitted in Cold Water Combination Valve
Expansion vessel capacity	18 litre
Expansion vessel pre charge	0.35 MPa (3.5bar)
Check Valve	Fitted in Cold Water Combination Valve
Strainer	Fitted in Cold Water Combination Valve
Coil heat exchanger	Stainless Steel tube, Ø25mm, 1.1m² surface area
Lower immersion heater	3kW 825 alloy sheathed element (curved)
Upper immersion heater	3kW 825 alloy sheathed element (straight)
Thermostatic control	10 – 70°C rod type thermostats
Over temperature Control	85ºC manually re-settable double pole cut out

2.3 SOLAR CONTROLLER & SOLAR PRIMARY CIRCUIT

Rated pressure	1.0 MPa (10bar)
Operating pressure	0.2 – 0.4 MPa (2 - 4bar)
Pressure relief valve	0.6 MPa (6 bar)
Expansion vessel capacity	24 litres (supplied separately)
Expansion vessel pre charge	0.35 MPa (3.5bar) (supplied separately)
Flow meter	2 – 15 litre/min
Air vent	Manual type, fitted
Check valves	x2 fitted
Circulating pump	Grundfos UPS 15-50
Heat transfer fluid	Glycol / Water 40/60 mix (supplied separately)
Thermostatic control	Electronic controller
Over temperature control	85ºC manually re-settable double pole cut out

2.4 ELECTRIC BOILER & CENTRAL HEATING PRIMARY CIRCUIT

Rated pressure	0.3 MPa (3bar)
Operating pressure	0.1 MPa (1bar)
Pressure relief valve	0.3 MPa (3bar)
Expansion vessel capacity	12 litres
Expansion vessel pre charge	0.1 MPa (1bar)
Automatic bypass valve `	0.05 MPa (0.5bar)
Automatic air vent	Fitted
Circulating pump	Grundfos UPS 15-50
Electric boiler	9kW Electric flow type
Thermostatic Control	Electronic Controller: Radiator 65 ºC - 80 ºC Underfloor 30 ºC - 60 ºC
Over temperature Control	85ºC manually resettable double pole cut out

2.5 CYLINDER PERFORMANCE

TABEL 01:

MODEL	AUXILIARY VOLUME	HEAT UP TIME - AUX (MINS)	HEAT UP TIME - BOOST (MINS)	STANDING HEATLOSS kWhr/24hr
185	120	126	60	1.76
220	145	152	60	1.73
250	170	178	60	1.70

Heat up time is based on raising the auxillary volume from 15ºC to 60ºC using the lower 3kW immersion heater.

Boost Volume = 57 Litres

Heating times using solar primary circuit will be variable as they will depend on the amount of solar radiation, sunshine hours, collector panel type, size and orientation.

3.0 INSTALLATION

3.1 INSTALLATION - GENERAL

It is recommended that installation of the Electromax Solar is carried out in the following order:

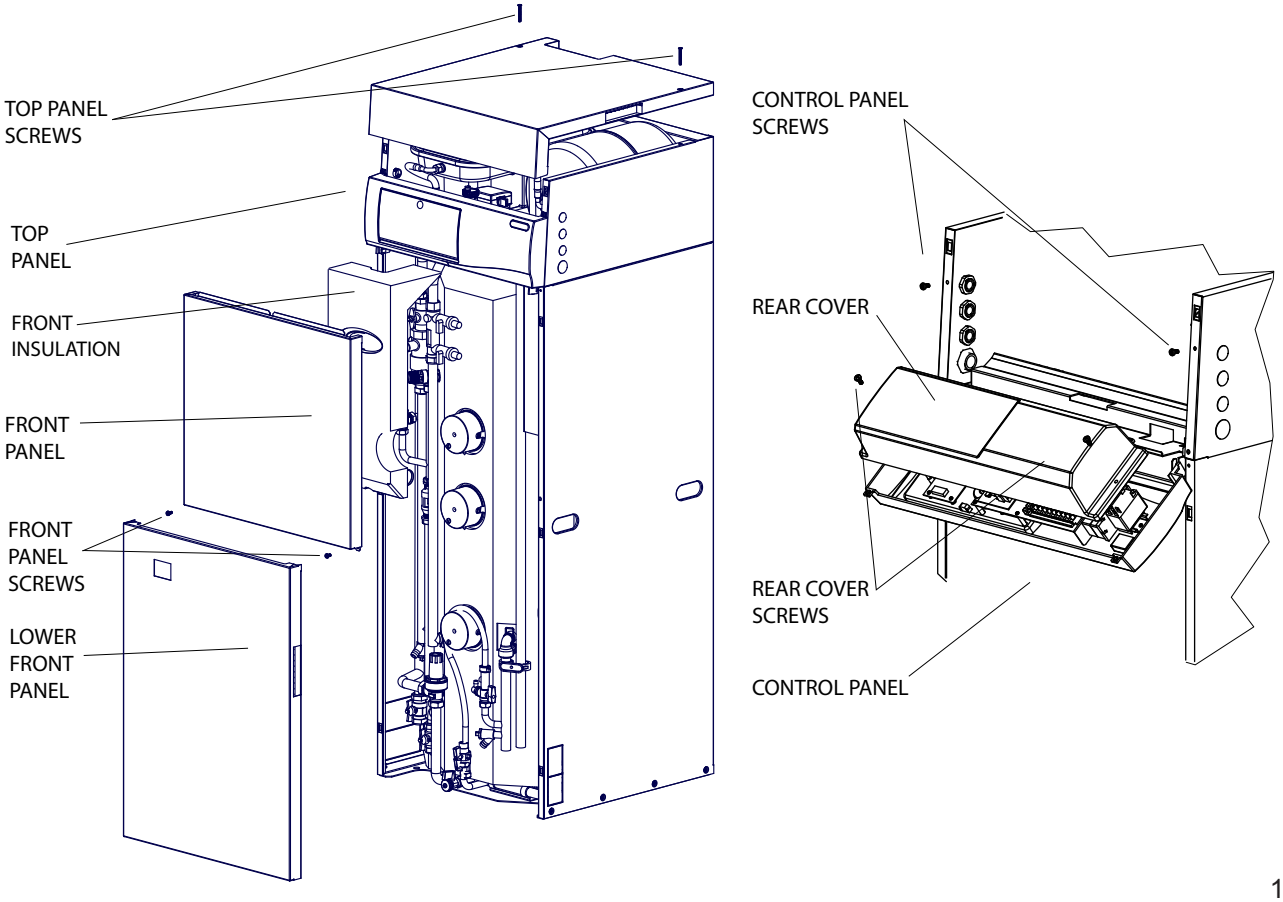
- Location
- Domestic Hot Water
- Solar
- Central Heating
- Electrical

3.2 PANEL REMOVAL

Installation will require removal of the panels:

- TOP PANEL - Unscrew the two screws located on the top face, about two thirds of the way back, pull panel towards you and lift up.
- LOWER FRONT PANEL - Pull the panel forward.
- FRONT PANEL - Remove the lower front panel. Unscrew the two screws located either side at the bottom of the front panel and pull the panel forwards.
- FRONT INSULATION - Remove front and lower front panel and pull front insualtion piece away from pipework manifolds.
- CONTROL PANEL - Remove top panels, front panels and front insulation piece. Unscrew the two screws located either side at the top of the control panel and allow the control panel to drop forwards.
- CONTROL PANEL REAR COVER - Open the control panel. Unscrew the two screws located either side of the control panel rear cover and remove the rear cover.

FIGURE 04: PANEL REMOVAL



3.3 INSTALLATION - LOCATION

The Electromax Solar must not be sited outside or in any location where it could be exposed to the weather. It must be installed in a dry and frost free environment.

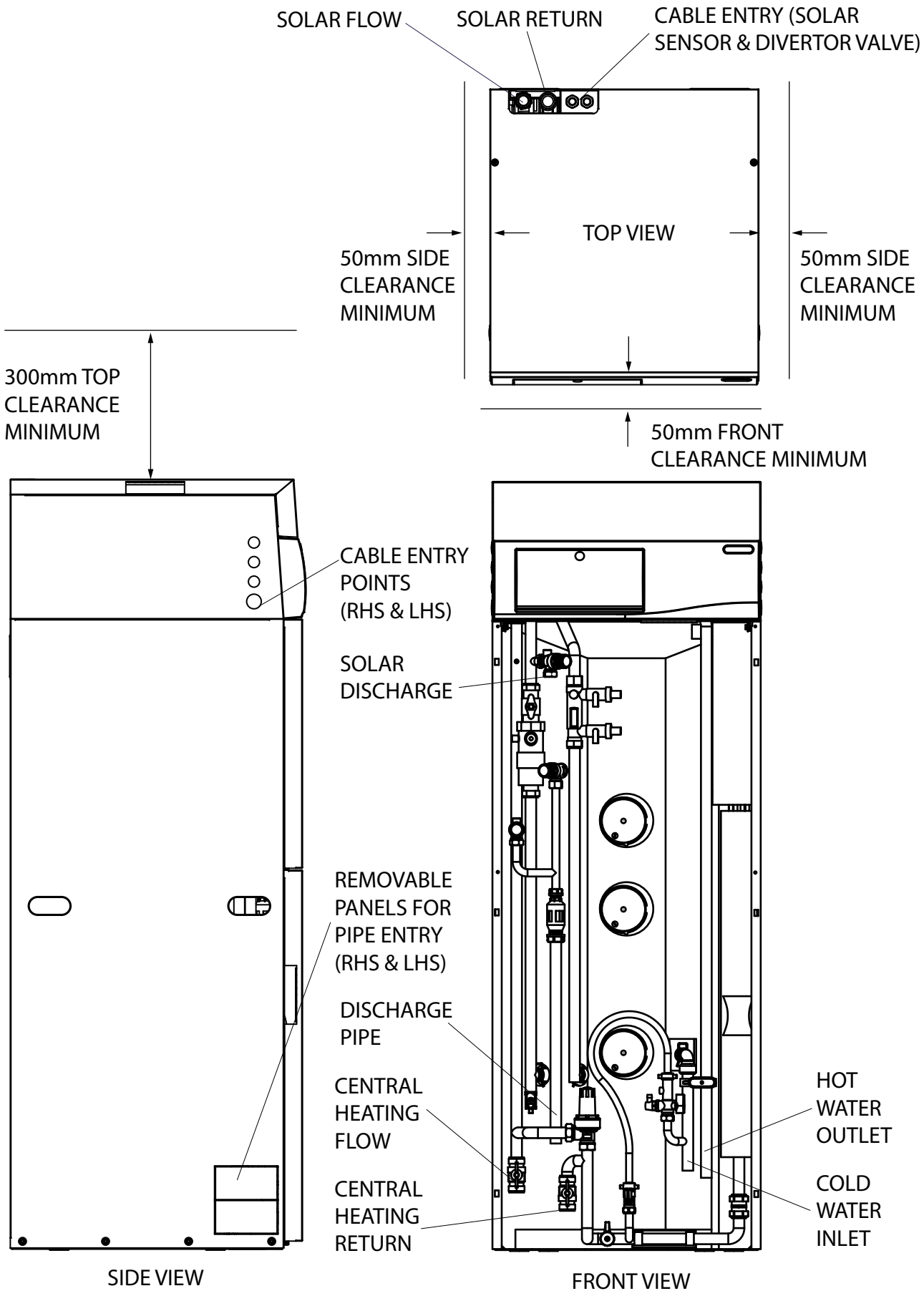
It must be vertically mounted on a flat, level surface capable of supporting its full weight when full of water.

Sufficient access must be allowed around the Electromax Solar to allow for removal of the top and front panels, and for servicing and maintenance (see figure 05).

Consideration should also be given to the location of:

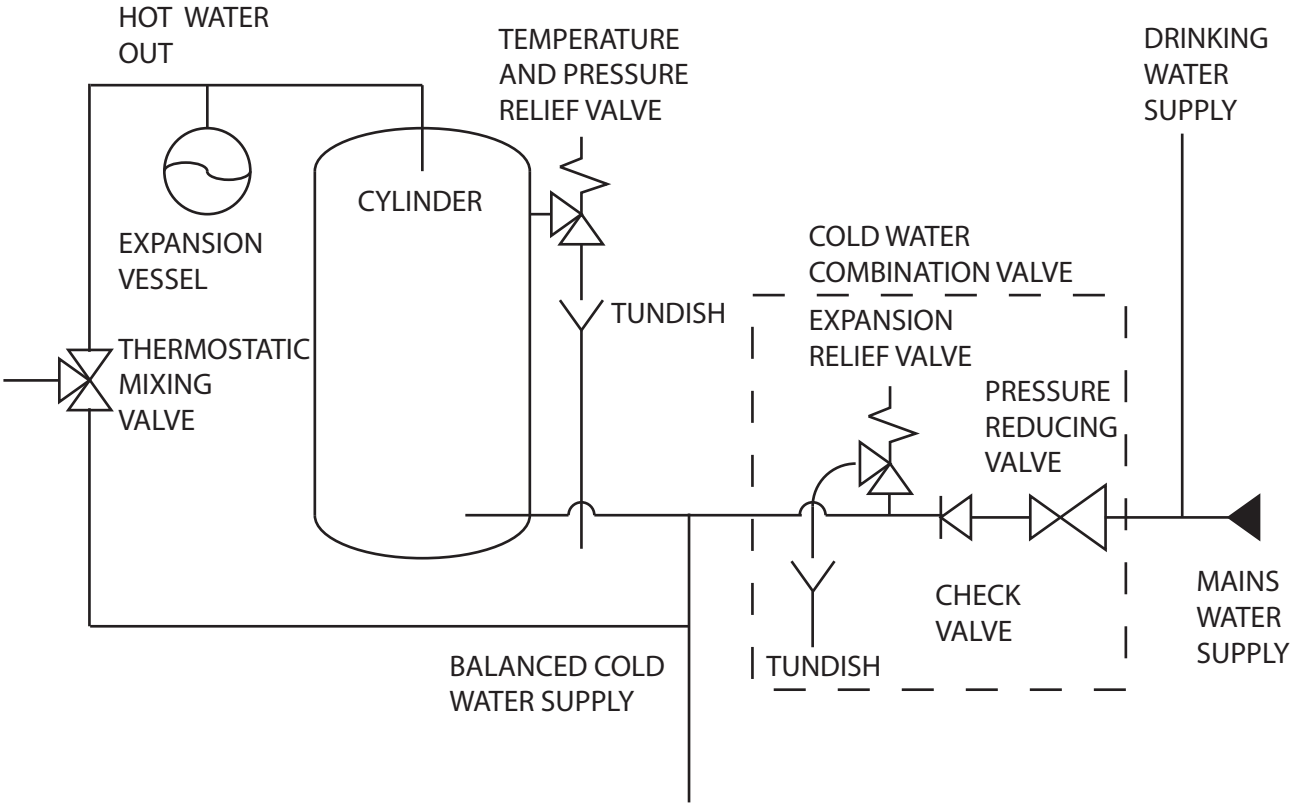
- COLD WATER INLET - this can be from underneath the Electromax Solar or through knock out panels at the front, bottom on the right hand side. Connection is made by 22mm compression fitting.
- COLD WATER COMBINATION VALVE - this must be installed in the incoming mains supply.
- HOT WATER OUTLET- this can be from underneath the Electromax Solar or through knock out panels at the front, bottom on the right hand side. Connection is made by 22mm compression fitting.
- HOT WATER DISCHARGE - discharge pipe runs are required from the Temperature and Pressure Relief Valve on the Electromax Solar and the Expansion Relief Valve on the Cold water Combination Valve.
- SOLAR COLLECTORS - connections are made at the back, top left hand side of the Electromax Solar by 22mm compressions fittings.
- SOLAR EXPANSION VESSEL - the solar expansion vessel should be sited as close to the Electromax Solar as possible, allowing sufficient access for servicing and maintenance.
- SOLAR DIVERTOR VALVE - the solar divertor valve (East/West models only) should be sited as close to the Electromax Solar as possible, allowing sufficient access for servicing and maintenance.
- SOLAR EXPANSION RELIEF - a container to hold solar fluid discharge should be sited as close to the Electromax Solar as practicably possible. A pipe run from the Solar Relief Valve to the container needs to be installed.
- CENTRAL HEATING CONNECTIONS - these can be from underneath the Electromax Solar or through knock out panels at the front, bottom on the left hand side. Connection is made by 22mm compression fittings.
- ROOM THERMOSTAT - the room thermostat is wall mounted. Provision to route the wiring back to the Electromax Solar must be allowed for.
- CABLE ENTRY POSITIONS - Cable entry can either be made from the front, top right or left hand side of the Electromax Solar.

FIGURE 05: CONNECTION POINTS AND CLEARANCE DISTANCES



3.4 INSTALLATION - DOMESTIC HOT WATER

FIGURE 06: DOMESTIC HOT WATER SCHEMATIC



Installation of the domestic hot water system requires:

- Check mains water supply
- Connection to cold water supply
- Installation of the cold water combination valve
- Installation of the solar rated thermostatic mixing valve
- Connection to hot water outlets
- Installation of discharge pipework from the Temperature & pressure relief valve and expansion relief valve.

3.4.1 WATER SUPPLY

The mains water supply to the property will be supplying both the hot and cold water requirements simultaneously. It is recommended that the maximum water demand be assessed and the water supply be checked to ensure this demand can be satisfactorily met.

A high mains water pressure will not always guarantee high flow rates. Wherever possible the mains water supply pipe should be in 22mm copper pipe or 25mm blue MDPE pipe. The minimum mains water supply requirements should be 1.0 bar (dynamic) and 20 litres per minute flow rate. At these values outlet flow rates may be poor if several outlets are used simultaneously, the higher the available pressure and flow rate the better the system performance will be.

The Electromax Solar unvented cylinder has an operating pressure of 3.5 bar which is controlled by the cold water combination valve. The cold water combination valve can be connected to a maximum mains supply pressure of 16 bar.

The water supply must be of wholesome water quality (fluid category 1 as defined by the water supply regulations 1999). In some areas of the UK the water supply may have a high level of natural hardness. Whilst this is not detrimental to the quality of the water, in water heating systems the calcium carbonate which causes the water's "hardness" can precipitate onto hot surfaces and in time adversely affect hot water performance. If the temporary hardness of the cold water mains supply exceeds 200mg/l (check with your Water Supply Company) it is recommended that some form of water treatment is considered. Any device selected must be suitable for use in unvented water heating systems and not unduly affect the flow rate capacity to the Electromax Solar cylinder, consult the manufacturer of the device for details.

3.4.2 CONNECTION TO THE COLD WATER SUPPLY

Connection to the cold water supply can be from underneath the Electromax Solar or through knock out panels at the front, bottom right hand side.

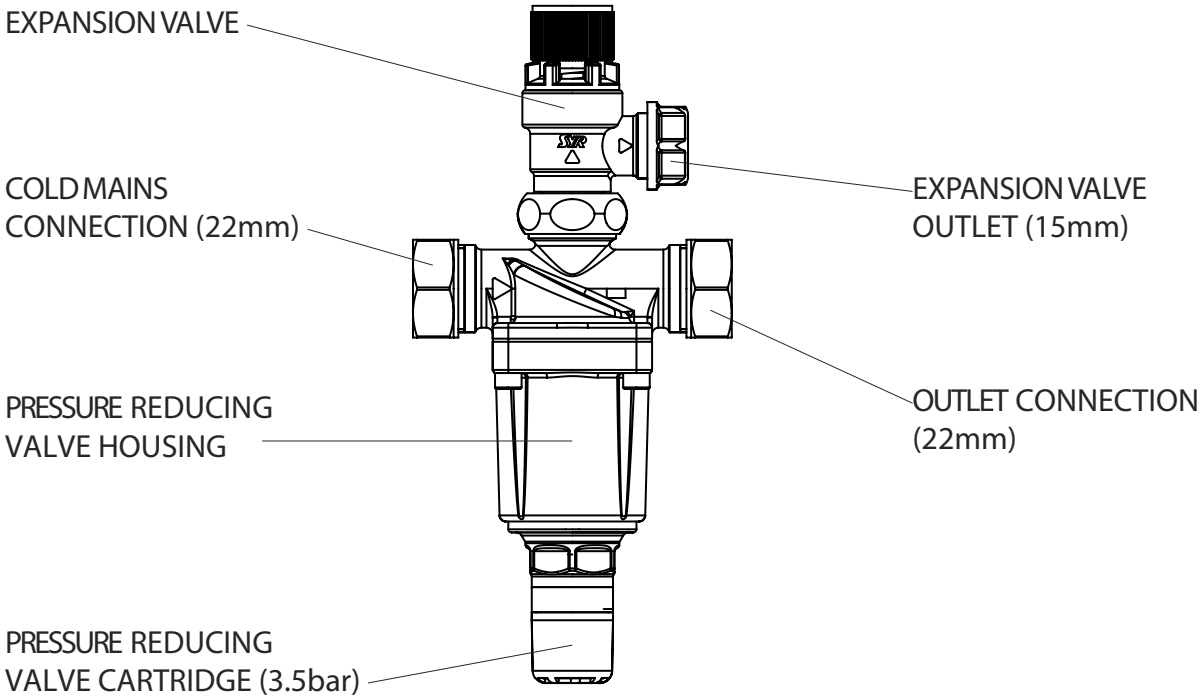
Connection is made by 22mm compression fitting.

Solder connections directly to the unit must not be made as the heat may damage the Electromax Solar insulation materials. Damage caused by heat applied to solder fittings in close proximity to the unit will not be covered by the warranty.

Solder connections may be used elsewhere in the system away from the Electromax Solar. Use water soluble flux for making soldered joints and ensure any flux residue is removed following installation

3.4.3 COLD WATER COMBINATION VALVE

FIGURE 07: COLD WATER COMBINATION VALVE



The cold water combination valve can be connected anywhere on the cold water mains supply prior to the Electromax Solar. Whilst it is often more convenient to do so, there is no requirement to site the valve close to the Electromax Solar, it can be located at a point remote from the Electromax Solar if this is more convenient. However, ensure the discharge from the expansion relief valve can be correctly installed. The expansion relief valve connection must not be used for any other purpose

The cold water combination valve is installed as a complete one-piece unit. The valve incorporates an isolating valve, a pressure reducer, a strainer, an expansion relief valve and a single check valve. The cold water combination valve can be fitted in any orientation to suit the installation, however, ensure the valve is installed with the direction of flow arrows (stamped on the side of the brass body) pointing towards the Electromax Solar.

NOTE: No other valve should be fitted between the Cold Water Combination Valve and the Electromax Solar cold inlet.

3.4.4 BALANCED COLD WATER SUPPLIES

It is advantageous in many mixer showers or taps to have balanced hot and cold water pressure. In these instances the balanced cold water supply should be teed off the supply to the Electromax Solar immediately after the cold water combination valve.
Branches to cold outlets where drinking water may be drawn should be taken directly from the main supply before the Cold Water Combination Valve to avoid the possibility of warm expanded water being drawn from cold taps.

3.4.5 CONNECTION TO HOT WATER OUTLET

Connection to the hot water outlet can be from underneath the Electromax Solar or through knock out panels at the front, bottom right hand side. Connection is made by 22mm compression fitting.

Solder connections directly to the unit must not be made as the heat may damage the Electromax Solar insulation material. Damage caused by heat applied to solder fittings in close proximity to the unit will not be covered by the warranty.

3.4.6 SOLAR THERMOSTATIC MIXING VALVE

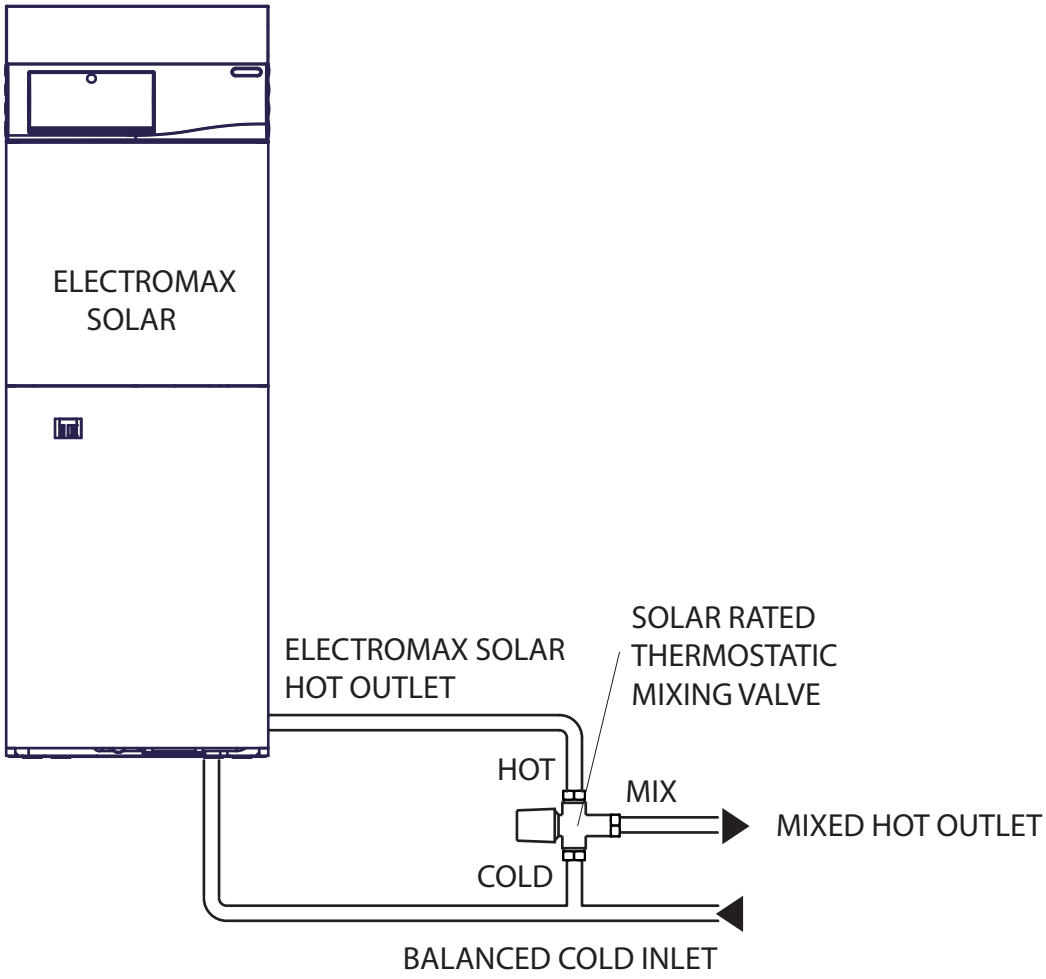
It is recomended that hot water outlets are supplied via a solar rated thermostatic mixing valve (supplied with the Heatrae Sadia Electromax Solar Colelctor kits).

The solar rated thermostatic mixer valve is connected as follows:
- Inlet marked ‘HOT’ connected to Electrommax Solar hot outlet
- Inlet marked ‘COLD’ connected to balanced cold water supply
- Outlet marked ‘MIX’ connected to hot water outlets

Connections are made by 22mm compression fittings.

The pipework from the thermostatic mixing valve to the hot outlet fittings should be in 22mm pipe with short runs of 15mm pipe to showers and basins. Small bore pipe can be used to suit some taps, but runs should be kept as short as possible. Pipe sizes may vary due to system design.

FIGURE 08: SOLAR THERMOSTATIC MIXING VALVE



3.4.7 PIPEWORK, FITTINGS AND OUTLET / TERMINAL FITTINGS

All pipework, fittings and terminal fittings must be compatible with unvented systems and have a rated operating pressure of at least 6 bar. Where plastic pipe / fittings are being used the rated pressure must be achievable at outlet temperatures that can be expected within the hot water distribution pipework. If in doubt, consult the manufacturer of the fittings selected.

3.4.8 SECONDARY CIRCULATION

Secondary circulation is not recommended for the Electromax Solar as it is intended for off peak electrical operation. Circulating the stored water would gradually cool the Electromax Solar to an unacceptable temperature during off peak periods.

3.5 INSTALLATION DISCHARGE

It is a requirement of Building Regulations that any discharge from an unvented system should be visible and safely conveyed away from the system without danger to persons in or about the building where it is installed. The discharge pipe should be fitted in accordance with the requirements and guidance notes of Building Regulations. Building Regulation G3 Requirements and Guidance section 3.9 are reproduced in the following sections.

Information Sheet No.33 available from the British Board of Agrement gives further advice on discharge pipe installation. For discharge pipe arrangements not covered by G3 Guidance or BBA Info sheet No. 33 advice should be sought from either your local Building Control Officer or Heatrae Sadia. The discharge pipework supplied fitted to the Electromax Solar will convey any discharge from the unvented cylinder Temperature and Pressure Relief Valve and the sealed system Pressure Relief Valve. A discharge pipe will also be required from the Expansion Valve fitted to the Cold Water Combination Valve. Where practical this can be teed into the discharge pipe from the Electromax. It is recommended that an additional tundish is fitted into this discharge pipe to give an early indication of operation of the Expansion Valve.

In some instances it may be possible to discharge into an internal waste system and soil stack. To do this a self sealing waste valve must be fitted into the discharge pipe after the tundish to prevent foul odours or back-pressurisation from the waste system entering the building via the tundish. In these systems it is essential that the tundish is fitted in a visible position as the final point of discharge will not be visible. Consult the manufacturer's recommendations with respect to the correct fitting, orientation and waste and soil stack materials selection. It will also be necessary to get dispensation from your local Building Control Officer to discharge in this manner. Discharges from an unvented system can be up to 95^{o}C for several minutes, ensure any waste or soil pipe connected to the discharge can safely accept these conditions.

G3 REQUIREMENT
"…there shall be precautions…to ensure that the hot water discharged from safety devices is safely conveyed to where it is visible but will not cause danger to persons in or about the building."

Water may drip from the discharge pipe of the pressure-relief device and that this pipe must be left open to the atmosphere.

The pressure-relief device is to be operated regularly to remove lime deposits and to verify that it is not blocked.

The discharge pipe connected to the pressure relief device is to be installed in a continuously downward direction and in a frost free environment

G3 GUIDANCE SECTION 3.9
The discharge pipe (D1) (see figure 8, page 19) from the vessel up to and including the tundish is generally supplied by the manufacturer of the hot water storage system. Where otherwise, the installation should include the discharge pipe(s) (D1) from the safety device(s). In either case the tundish should be vertical, located in the same space as the unvented hot water storage system and be fitted as close as possible and within 500mm of the safety device e.g. the temperature relief valve.

The discharge pipe (D2) from the tundish should terminate in a safe place where there is no risk to persons in the vicinity of the discharge, preferably be of metal and:

a. Be at least one pipe size larger than the nominal outlet size of the safety device unless its total equivalent hydraulic resistance exceeds that of a straight pipe 9m long i.e. discharge pipes between 9m and 18m equivalent resistance length should be two pipe sizes larger, and so on. Bends must be taken into account in calculating the flow resistance. Refer to table 2 and the worked example.
b. Have a vertical section of pipe at least 300mm long below the tundish before any elbows or bends in the pipework.
c. Be installed with a continuous fall.
d. Have discharges visible at both the tundish and final point of discharge, but where this is not possible or is practically difficult there should be clear visibility at one or other of these locations.

An alternative approach for sizing discharge pipes would be to follow BS6700:1987 Specification for design, installation, testing and maintenance of services supplying water for domestic use within buildings and their cartilages, appendix E, section E2 and table 21.

Examples of acceptable discharge arrangements are:

i. Ideally below a fixed grating and above the water seal in a trapped gully.
ii. Downward discharges at low level; i.e. up to 100mm above external surfaces such as car parks, hard standings, grassed areas etc. are acceptable providing that where children may play or otherwise come into contact with discharges a wire cage or similar guard is positioned to prevent contact, whilst maintaining visibility.
iii. Discharges at high level; e.g. into a metal hopper and metal down pipe with the end of the discharge pipe clearly visible (tundish visible or not) or onto a roof capable of withstanding high temperature discharges of water and 3m from any plastics guttering system that would collect such discharges (tundish visible).
iv. Where a single pipe serves a number of discharges, such as in blocks of flats, the number served should be limited to not more than 6 systems so that any installation discharging can be traced reasonably easily. The single common discharge pipe should be at least one pipe size larger than the largest individual discharge pipe (D2) to be connected. If unvented hot water storage systems are installed where discharges from safety devices may not be apparent i.e. in dwellings occupied by blind, infirm or disabled people, consideration should be given to the installation of an electronically operated device to warn when discharge takes place.

Note: The discharge will consist of scalding water and steam. Asphalt, roofing felt and non-metallic rainwater goods may be damaged by such discharges.

Worked example of discharge pipe sizing:

The example below is for a G1/2 temperature relief valve with a discharge pipe (D2) having 4 No. elbows and length of 7m from the tundish to the point of discharge.

From Table 2:

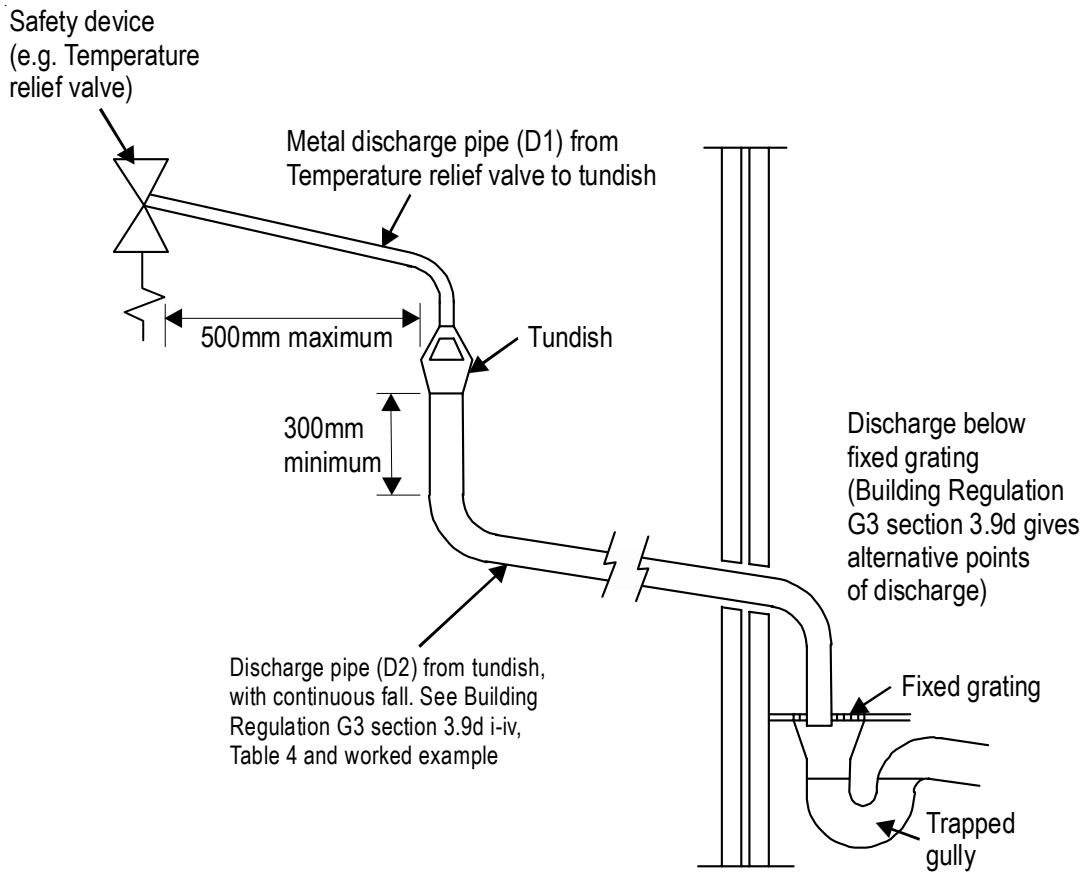
- Maximum resistance allowed for a straight length of 22mm copper discharge pipe (D2) from a G1/2 temperature relief valve is 9.0m.
- Subtract the resistance allowed for 4 No. 22mm elbows at 0.8m each = 3.2m

- Therefore the permitted length equates to: 5.8m
- 5.8m is less than the actual length of 7m therefore calculate the next largest size.
- Maximum resistance allowed for a straight length of 28mm pipe (D2) from a G1/2 temperature relief valve equates to 18m
- Subtract the resistance of 4 No. 28mm elbows at 1.0m each = 4.0m
- Therefore the maximum permitted length equates to 14.0m
- As the actual length is 7m, a 28mm (D2) copper pipe will be satisfactory.

TABLE 02:

Valve outlet size	Minimum size of discharge pipe D1	Minimum size of discharge pipe D2 from tundish	Maximum resistance allowed, expressed as a length of straight pipe (i.e. number of elbows or bends)	Resistance created by each bend.
G1/2	15mm	22mm 28mm 35mm	up to 9m up to 18m up to 27m	0.8m 1.0m 1.4m
G3/4	22mm	28mm 35mm 42mm	up to 9m up to 18m up to 27m	1.0m 1.4m 1.7m
G1	28mm	35mm 42mm 54mm	up to 9m up to 18m up to 27m	1.4m 1.7m 2.3m

FIGURE 09: DISCHARGE PIPE ARRANGEMENT



3.6 INSTALLATION SOLAR

Installation of the solar primary circuit requires:

- Installation of the collectors
- Connection to the solar flow and return
- Installation of the solar expansion vessel
- Installation of the solar discharge pipework

FIGURE 10: SOLAR PRIMARY CIRCUIT

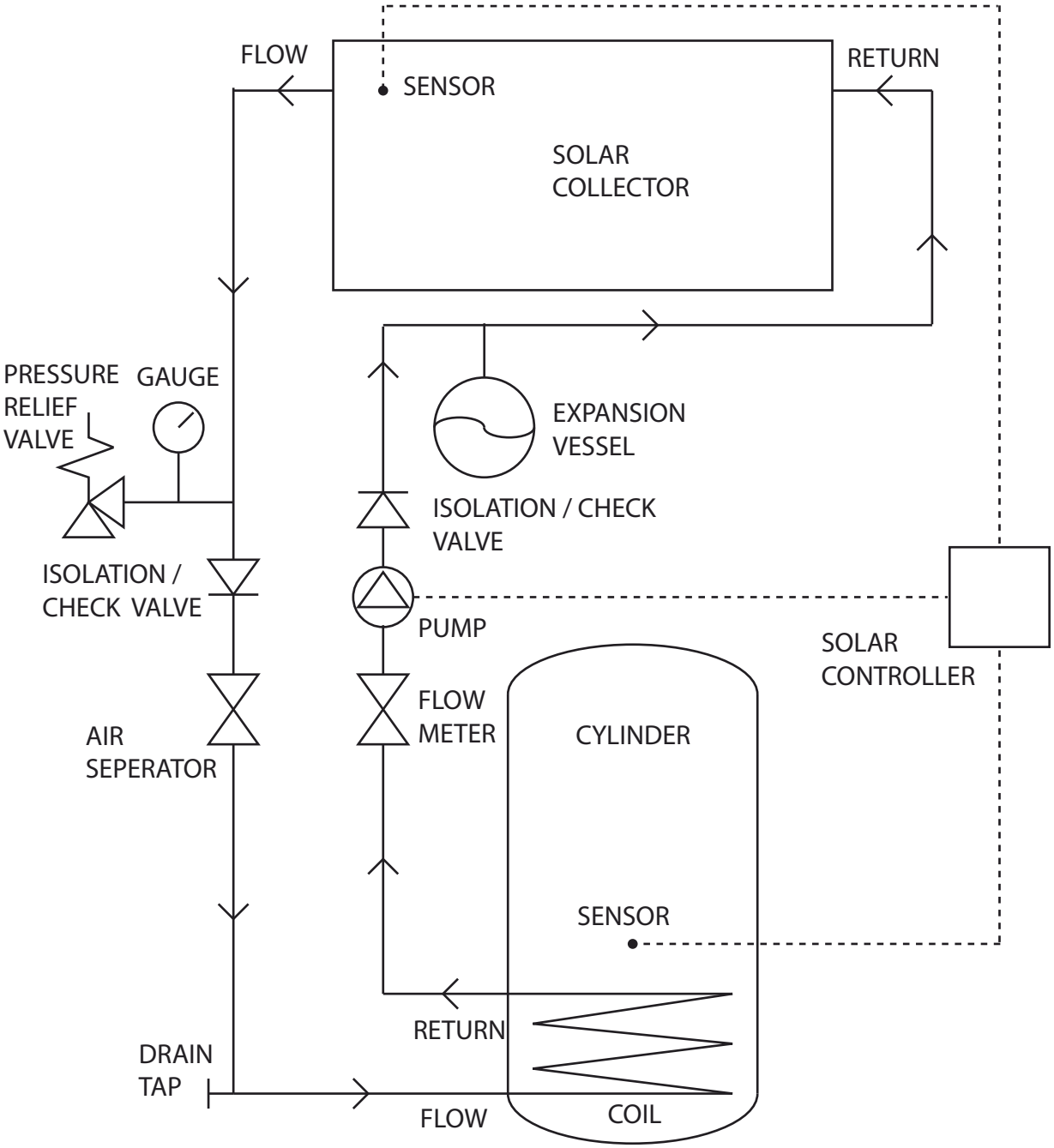
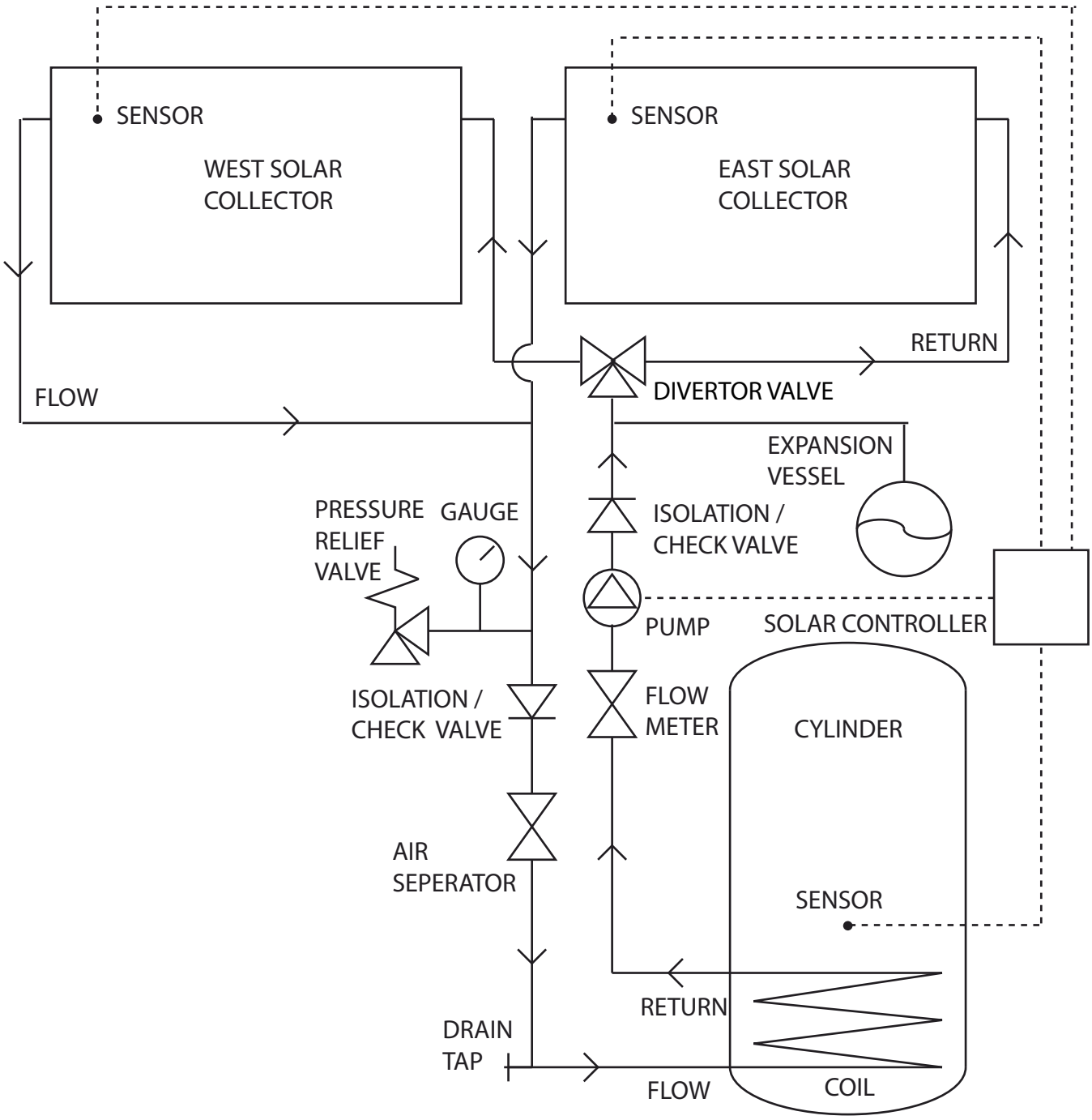


FIGURE 11: SOLAR PRIMARY CIRCUIT (EAST WEST ARRAY)



3.6.1 SOLAR COLLECTORS

Installation of the solar collectors is covered in separate installation leaflets supplied with the solar collector kits.

3.6.2 CONNECTION TO SOLAR FLOW AND RETURN

Connection to the solar flow and return is made at the back, top, left hand side of the Electromax Solar by 22mm compression fittings.

Access to the connections is gained by removing the top panel (see page 11) and moving the central heating expansion vessel to one side.

The Electromax Solar collectors kits are supplied with two 2 metre lengths of flexible stainless steel tube for connection from the Electromax Solar to the collector/s. The tubes include connections suitable for the solar panels at one end and 22mm compression fittings at the other end.

For pipe runs longer than 2 metres additional lengths of flexible stainless steel tube are supplied as accessories (accessory code 5122238). Alternatively 22mm copper pipe may be used. Adaptors to connect the stainless steel tube to 22mm copper are also available (accessory code 51222762, 51222763, 51222764).

Only compression fittings or adaptors made from copper, brass, bronze brass or stainless steel should be used. Soldered joints must not be used in the solar primary circuit.

All connections and joints must be resistant to temperatures of up to 150°C and resistant to glycol. If pipe sealants are used they must also be resistant to temperatures of up to 150°C and resistant to glycol.

NOTE: Plastic pipe must not be used.

The distance from the Electromax Solar to the collectors should be kept to a minimum to reduce system losses.

The height difference between the highest point in the solar primary circuit (the solar collector) and the Electromax Solar should not exceed 15 metres (this is referred to as the static height).

All solar primary pipework between the collectors and the Electromax Solar must be earth bonded. This work must be carried out be a qualified electrician.

Fit earthing clamps to the solar primary flow and return pipes and connect the earth clamps to the earthing system of the property using earth bonding cable of min 6mm² diameter.

External pipework should be insulated with high temperature resistant materials and also be protected against UV degredation. Internal pipework should also be insulated with high temperature resistant materials. The stainless steel flexible tube supplied with the collector kits are fitted with suitable insulation. Mark the outside of any insulation to identify the flow and return pipes.

The Electromax Solar includes an air collector / seperator and bleed point so an automatic air vent should not be needed, however any section of solar pipe work that falls and rises again may require an additional air vent to relieve any trapped air. The air vent must be compatible with solar primary systems i.e. be resistant to glycol and temperatures up to 150°C.

3.6.3 SOLAR EXPANSION VESSEL

A 24 litre solar expansion vessel is supplied with the Electromax Solar collector kits. Use only the Solar Expansion vessel supplied with these kits.

The Solar Expansion Vessel is wall mounted. A mounting bracket is supplied with the collector kits for this purpose. When full the Solar Expansion Vessel can weigh 28Kg. Ensure the wall can take the weight of the solar expansion vessel when full.

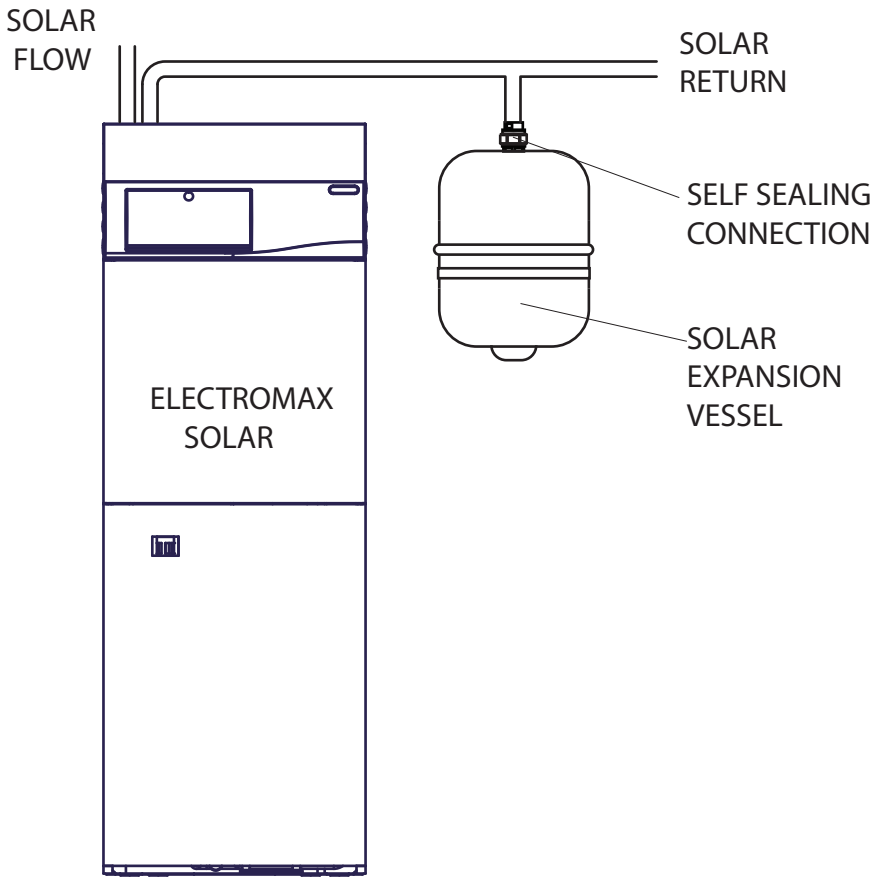
The solar expansion vessel should be connected to the solar return pipework. A short length of flexible stainless steel tube (600mm) is supplied to make this connection.

A self sealing connection is supplied in the solar connector kit which should be screwed onto the solar expansion vessel connection before connecting the flexible stainless steel tube.

The solar expansion Vessel should be sited as close to the Electromax Solar as practicably possible, allowing access to both the Electromax Solar and the expansion vessel for servicing and maintenance.

The solar expansion vessel must be installed so that the connection is at the top.

FIGURE 12: SOLAR EXPANSION VESSEL



3.6.4 SOLAR PRESSURE RELIEF VALVE

A pressure relief valve is included in the solar primary circuit.

Pipework to convey any solar fluid discharge to a suitable container must be installed.

The container should be able to withstand temperatures up to 180°C and be big enough to collect the volume of solar fluid within the solar primary circuit.

The container should be located as close to the Electromax Solar as possible.

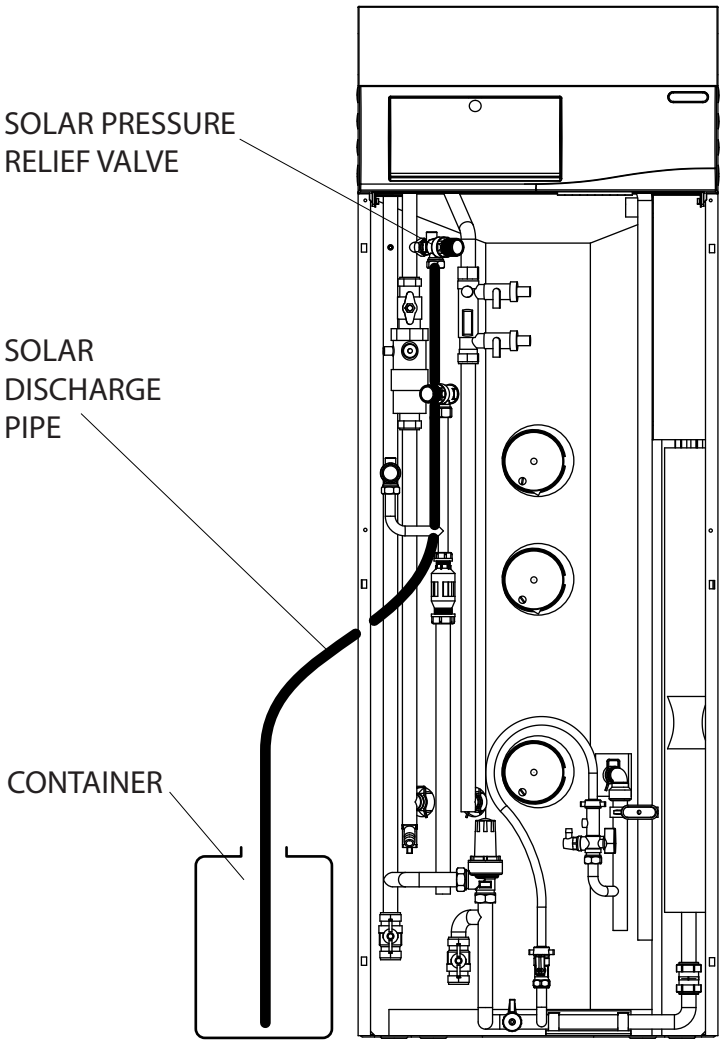
The container should be accessable.

A small amount of heat transfer fluid should be left in the container.

It is recommended that the pipework is routed vertically down from the pressure relief valve and through the left hand side panel handle.

The solar expansion relief should not be connected to the temperature and pressure relief valve discharge pipework.

FIGURE13: SOLAR DISCHARGE



3.6.5 CONNECTION TO THE DIVERTOR VALVE AND EAST WEST COLLECTORS

A divertor valve (supplied loose) is included with East/West Electromax Solar models.

The Electromax Solar, divertor valve and the solar collectors are connected as follows:

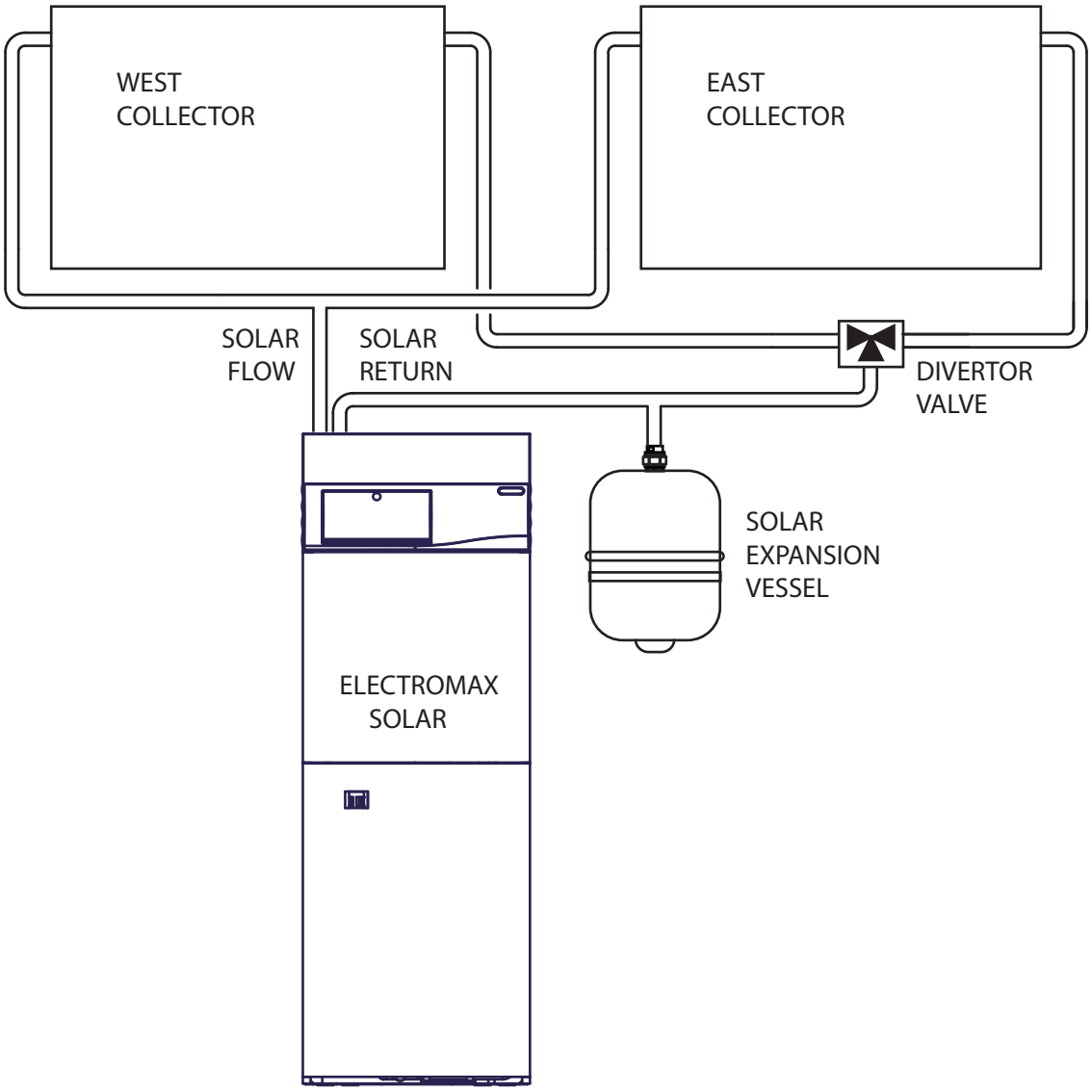
- The Electromax Solar return is connected to the divertor valve connection marked AB.
- Divertor valve connection marked A is connected to the East collector return.
- Divertor valve connection marked B is connected to the West collector return.
- The Electromax Solar flow is connected to both the East and West collector flows.

Connection to the divertor valve is made be 22mm compression fittings. 22mm copper tube or stainless steel flexible tube may be used. Adaptors to connect 22mm compression fittings to stainless steel flexible tube are available (accessory code 5122238).

The solar expansion vessel should be connected to the Electromax solar return before the divertor valve.

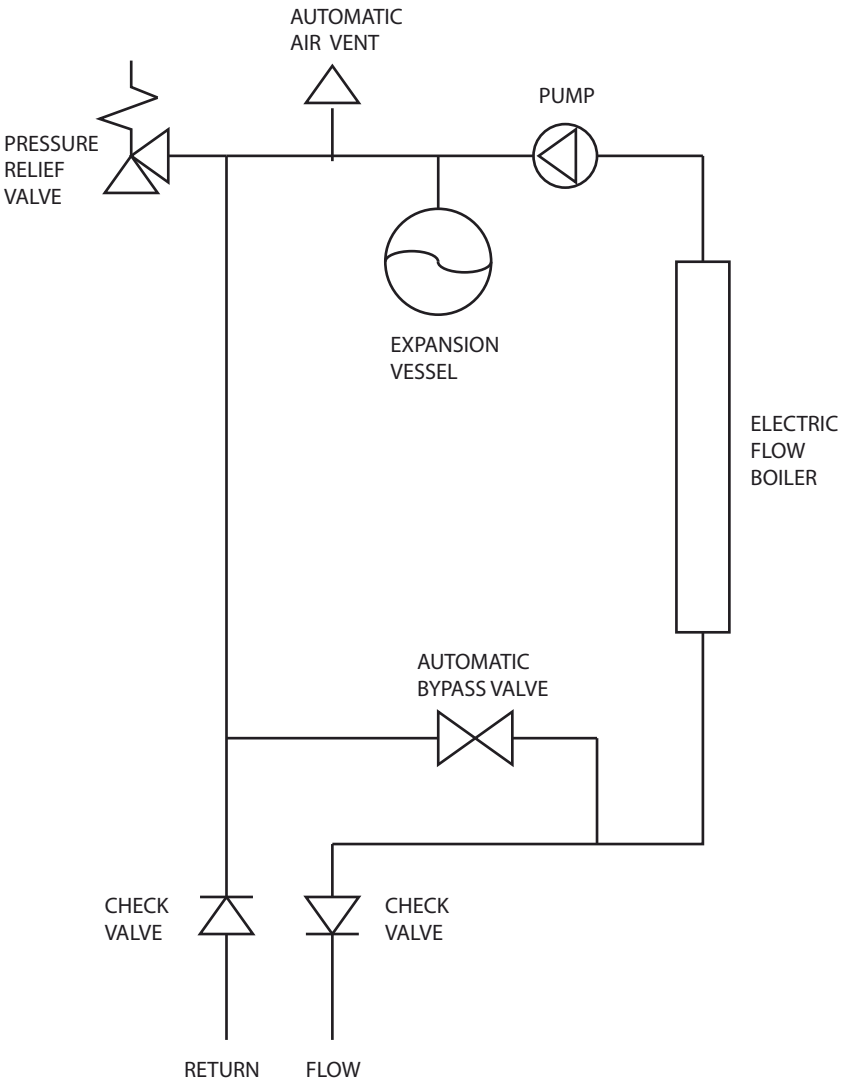
The divertor valve should be sited as close to the Electromax Solar as possible.

FIGURE 14: DIVERTOR VALVE



3.7 INSTALLATION CENTRAL HEATING

FIGURE 15: CENTRAL HEATING PRIMARY CIRCUIT



Installation of the central heating primary circuit requires:

- Connection to the central heating flow and return.
- Room Thermostat Installation
- Central heating design consideration.

3.7.1 CONNECTION TO CENTRAL HEATING FLOW AND RETURN

Connection to the central heating flow and return can be from underneath the Electromax Solar or through knock out panels at the front, bottom left hand side.

Connection is made by 22mm compression fitting.

Solder connections directly to the unit must not be made as the heat may damage the Electromax Solar insulation material. Damage caused by heat applied to solder fittings in close proximity to the unit will not be covered by the warranty.

3.7.2 ROOM THERMOSTAT INSTALLATION

The Electromax Solar is supplied with a Danfoss TP5000 Programmable Room Thermostat. This is supplied in the accessory kit supplied with your unit.

Follow the installation instructions provided with the Programmable Room Thermostat for correct siting and mounting of the unit.

If the radiators are to be fitted with Thermostatic Radiator Valves (TRV's) the room where the Programmable Room Thermostat is located must not have a TRV fitted in compliance with Building Regulation Part L.

3.7.3 CENTRAL HEATING DESIGN CONSIDERATIONS

The Electromax Solar boiler must be installed in a sealed primary system. All necessary primary system controls are supplied fitted to the Electromax Solar.

Conventional radiator based central heating design considerations should be made in selecting the radiators and circulating pipework sizes. The maximum output from the Electromax Solar boiler is 9kW, ensure the radiator load does not exceed this.

The Electromax Solar boiler is dedicated to the space heating only, the domestic hot water uses solar thermal energy and auxillary immersion heaters, so there is no requirement to allow a hot water loading factor in designing the primary system.

The Electromax Solar central heating expansion vessel fitted has a capacity of 12 litres which will be suitable for a heating system of up to 107 litres. If in doubt the total primary system volume must be calculated to determine if additional expansion volume is required.

The Electromax Solar boiler includes an automatic air vent fitted to the central heating circulating pump. Any central heating pipework that rises and falls above this point may require an addition air vent to relive any trapped air

An automatic bypass valve is fitted to the Electromax Solar to allow thermostatic radiator valves to be fitted to the system.

3.8 INSTALLATION - ELECTRICAL

WARNING: THIS APPLIANCE MUST BE EARTHED. IT IS SUITABLE FOR A.C. SUPPLY ONLY. ELECTRICAL INSTALLATION MUST BE CARRIED OUT BY A COMPETENT ELECTRICIAN AND BE IN ACCORDANCE WITH THE LATEST I.E.E. WIRING REGULATIONS.

ENSURE THE ELECTRICAL SUPPLY IS SWITCHED OFF BEFORE MAKING ANY CONNECTIONS TO THE ELECTROMAX SOLAR.

Installation of the electrical system requires:

- Connection to a 240v 45A supply for the boiler
- Connection to a 240v 16A for the control panel and boost immersion heater
- Connection to a 240v 16A off peak supply for the immersion heater
- Connection to the room thermostat
- Connection to the solar collector sensor.
- Connection to the solar divertor valve (if fitted).

The electrical supply to the property must be checked to ensure it is of sufficient current rating and voltage.

The consumer unit must be fitted with a double pole 30mA RCD.

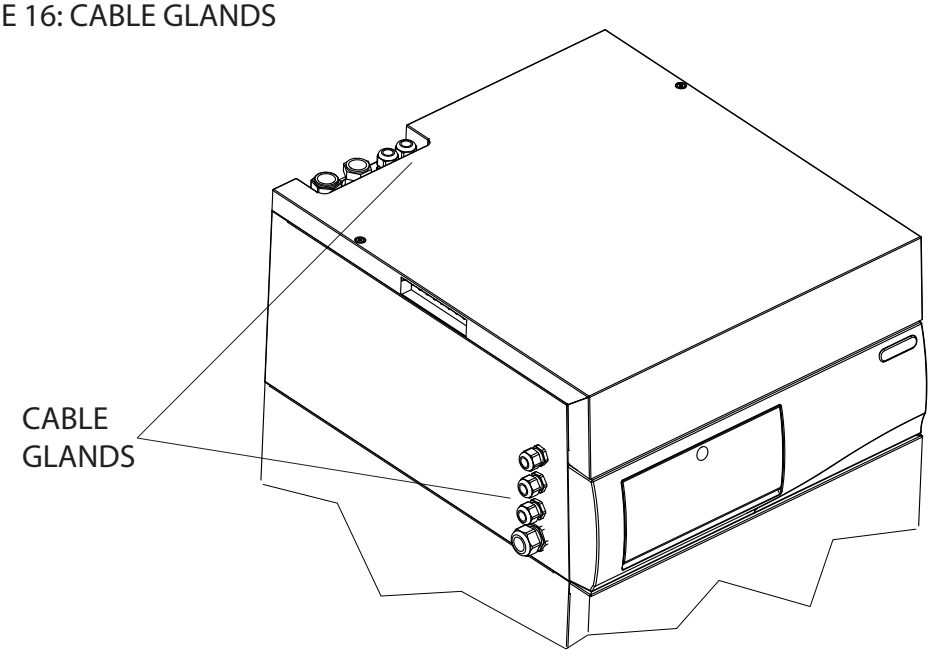
The electric boiler circuit must include a 45A MCB in the circuit.

The immersion heaters must include a 16A MCB in each circuit

Each circuit must incorporate an isolating switch with a contact separation of at least 3mm in both poles.

Immersion heater, boiler and room thermostat cables must be routed via the cable entry holes in either the right or left hand side of the upper panel. There are four holes in each side, one 25mm hole and three 20mm holes.

FIGURE 16: CABLE GLANDS



Solar sensor and divertor valve wires must be routed via the two cable entry holes at the back of the Electromax Solar.

Cable glands and snap fit blanking plugs are supplied with the Electromax Solar. The cable glands should be fitted into the cable entry holes selected for cable entry and secured in place using the locknuts supplied.

The cable glands must be used to secure the electrical supply cables, the solar collector sensor cable and the divertor valve cable (if fitted). Failure to do so can result in cables straining internal electrical connections and lead to electrical failure. Failure due to inadequate cable securing will not be covered by warranty.

The remaining holes not used should be blanked off using the snap fit blanking plugs supplied.

Connection of all cables requires removal of top and front panels and removal of the control panel rear cover. Refer to page 11 for panel removal.

3.8.1 240v 16A CONTROL PANEL AND BOOST IMMERSION HEATER CONNECTION

Connection of the control panel and boost immersion heater cable is made to the main terminal block located behind the Electromax Solar control panel.

- Use 3 core 1.5mm^2 flexible cable
- Route the cable via one of the 20mm cable glands
- Connect the Live (brown) conductor to terminal L2
- Connect the Neutral (blue) conductor to terminal N2
- Connect the Earth (green/yellow) one of the conductors marked ⏚

3.8.2 240v 16A IMMERSION HEATER CONNECTION

Connection of the immersion heater is made to the main terminal block located behind the Electromax Solar control panel.

- Use 3 core 1.5mm^2 flexible cable
- Route the cable via one of the 20mm cable glands
- Connect the Live (brown) conductor to terminal L1
- Connect the Neutral (blue) conductor to terminal N1
- Connect the Earth (green/yellow) one of the conductors marked ⏚

3.8.3 PROGRAMMABLE ROOM THERMOSTAT CONNECTION

Connection of the room thermostat cable is made to the main terminal block located behind the Electromax Solar control panel.

- Use 2 core 0.5mm^2 or 1.0mm^2 flexible cable suitable for 240v.
- Route the cable via one of the 20mm cable glands
- Connect room thermostat COM terminal B
- Connect room thermostat N/O to terminal A
- DO NOT connect to room thermostat N/C

3.8.4 SOLAR COLLECTOR SENSOR CONNECTION

Connection of the solar collector sensor is made to the green terminal block on the solar control PCB located behind the Electromax Solar control panel.

- Use the cable supplied with the collector panel kit.
- The cable may be extended using accessory 5122237
- Route the cable between the expansion vessels and through one of the 20mm cable glands in the back panel.
- Connect one conductor to 1
- Connect one conductor to 1 M

If fitting an East West array there will be two collector sensore wires.

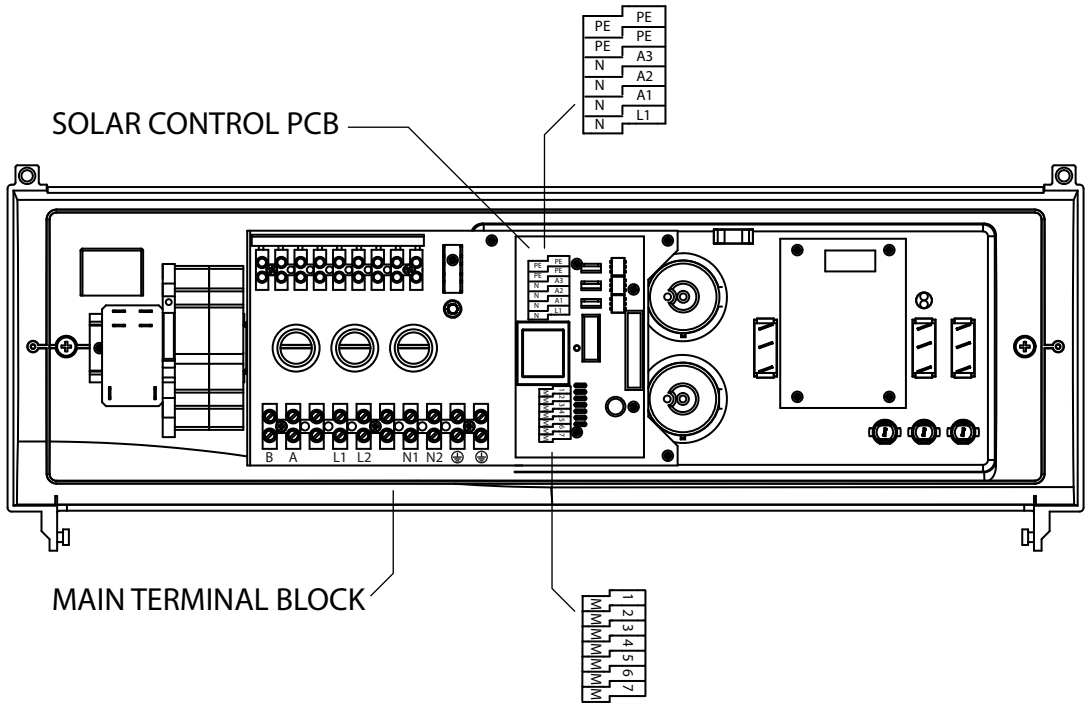
- Connect one West conductor to 1
- Connect one West conductor to 1 M
- Connect one East conductor to 1
- Connect one East conductor to 3 M

3.8.5 DIVERTOR VALVE CONNECTION

Connection of the divertor valve (East West models only) is made to the blue terminal block on the solar control PCB located behind the Electromax Solar control panel.

- Route the cable via one of the 20mm cable glands in the back panel.
- Connect the brown conductor to A2
- Connect the blue conductor to A2 N
- Connect the green/yellow connector to PE

FIGURE 17: CONTROL PANEL CONNECTIONS



3.8.6 240v 45A ELECTRIC BOILER CONNECTION

Connection of the electrical boiler is made to the supply terminal block on the electric boiler main PCB.

- Remove the boiler PCB control cover be undoing the screw located at the top of the cover. (see figure 18 below)
- Use 3 core 10mm^2 flexible cable or 10mm^2 Twin and Earth.
- Route the cable via one of the 25mm cable glands, along the wire guard, through the aperture in the centre of the wire guard and then through the cable bush located in the left hand side of the electric boiler control PCB housing.
- Connect the Live (brown) conductor to L
- Connect the Neutral (blue) conductor to N
- Connect the Earth (green/yellow) conductor to ⏚

- Check all connections are tight and refit the boiler PCB control cover.

FIGURE 18: ELECTRIC BOILER CABLE CONNECTION

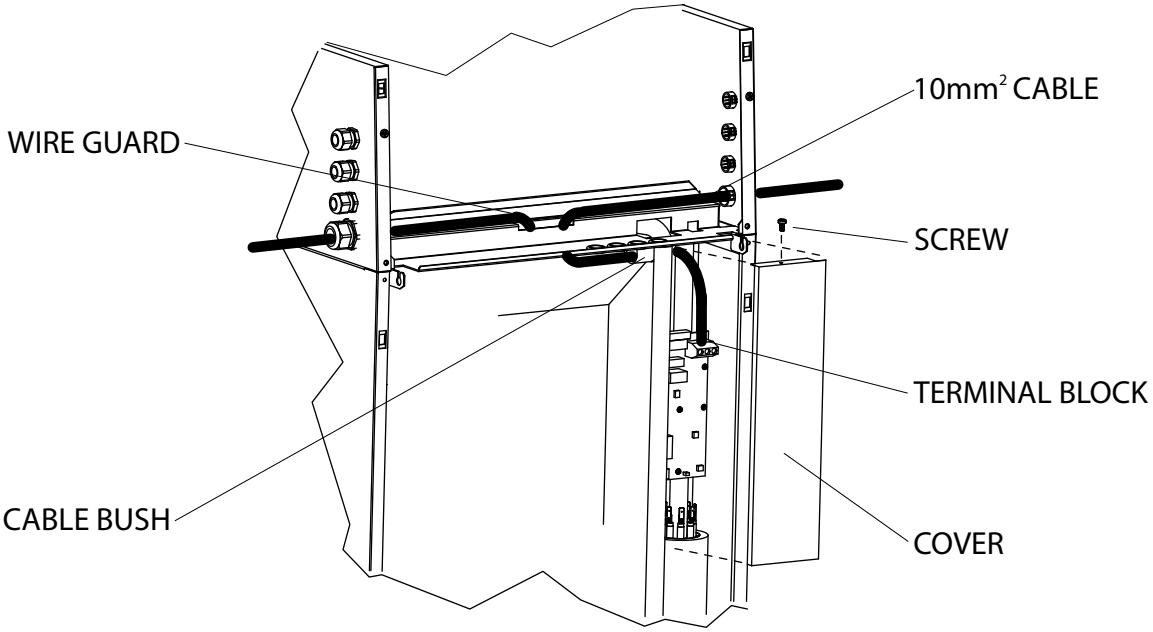


FIGURE 19: ELECTRIC BOILER MAIN PCB

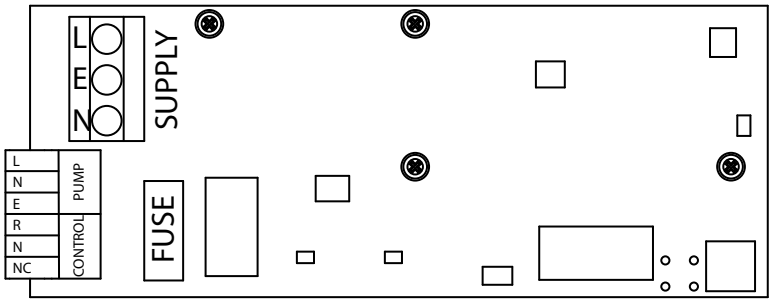
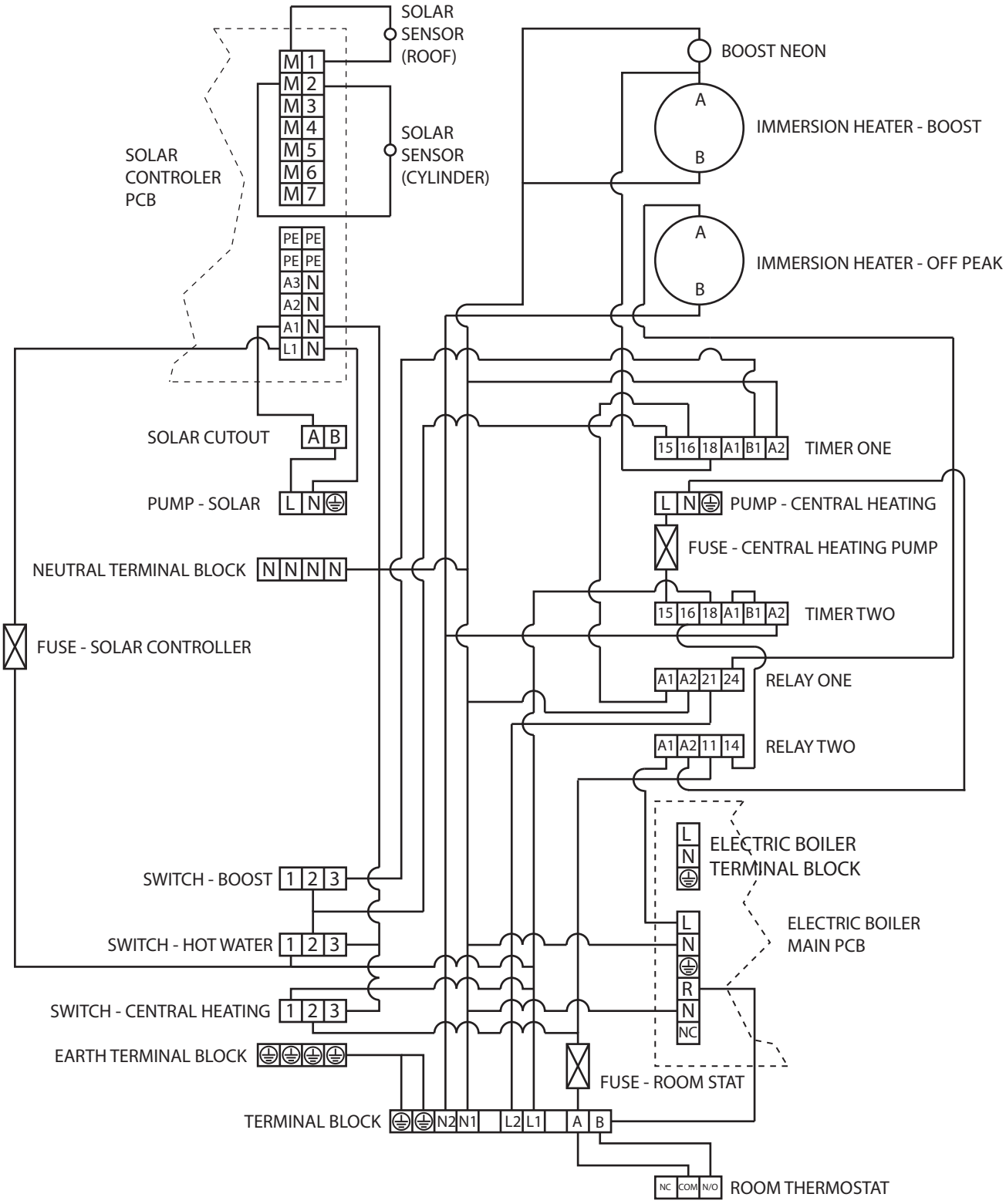


FIGURE 20: WIRING DIAGRAM



4.0 COMMISSIONING

4.1 COMMISSIONING - GENERAL

It is recommended that commissioning of the Electromax Solar is carried out in the following order:

- Domestic hot water
- Central heating
- Room thermostat
- Electrical
- Automatic bypass valve
- Solar
- Solar controller (information only)

4.2 COMMISSIONING - DHW

4.2.1 FILLING AND FLUSHING THE ELECTROMAX CYLINDER

1. Ensure all power supplies are switched off.
2. Check that all connections to the Electromax Solar are tight.
3. Check the domestic hot water expansion vessel charge pressure is set to 0.35 MPa (3.5bar) and modify if necessary. Pressure is checked using a car tyre pressure gauge. The valve is located at the opposite end of the water connection.
4. Open a hot tap furthest from the Electromax Solar.
5. Check the central heating filling loop isolating valves are closed.
6. Open the cold water supply isolating valve and allow the Electromax Solar cylinder to fill. When water issues from the tap, allow it to run for a few minutes to thoroughly flush through any residue, dirt or swarf, then close the tap.
7. Open successive hot taps and any cold outlet supplied by a balanced take off to purge any air from the system.
8. Check all connections (including immersion heater connections) for leaks and rectify as necessary.
9. The strainer housed within the cold water combination valve should be cleaned to remove any debris that may have been flushed through the main supply pipe. Refer to section 6.2 page 50 for instructions on how to do this.

NOTE: Water that is left standing in a stainless steel water cylinder for long periods without draw off will become de-oxygenated and potentially corrode the vessel material. If the installation is to be left unused following installation and commissioning the water cylinder should be drained or regularly (once per week) flushed through with fresh mains water.

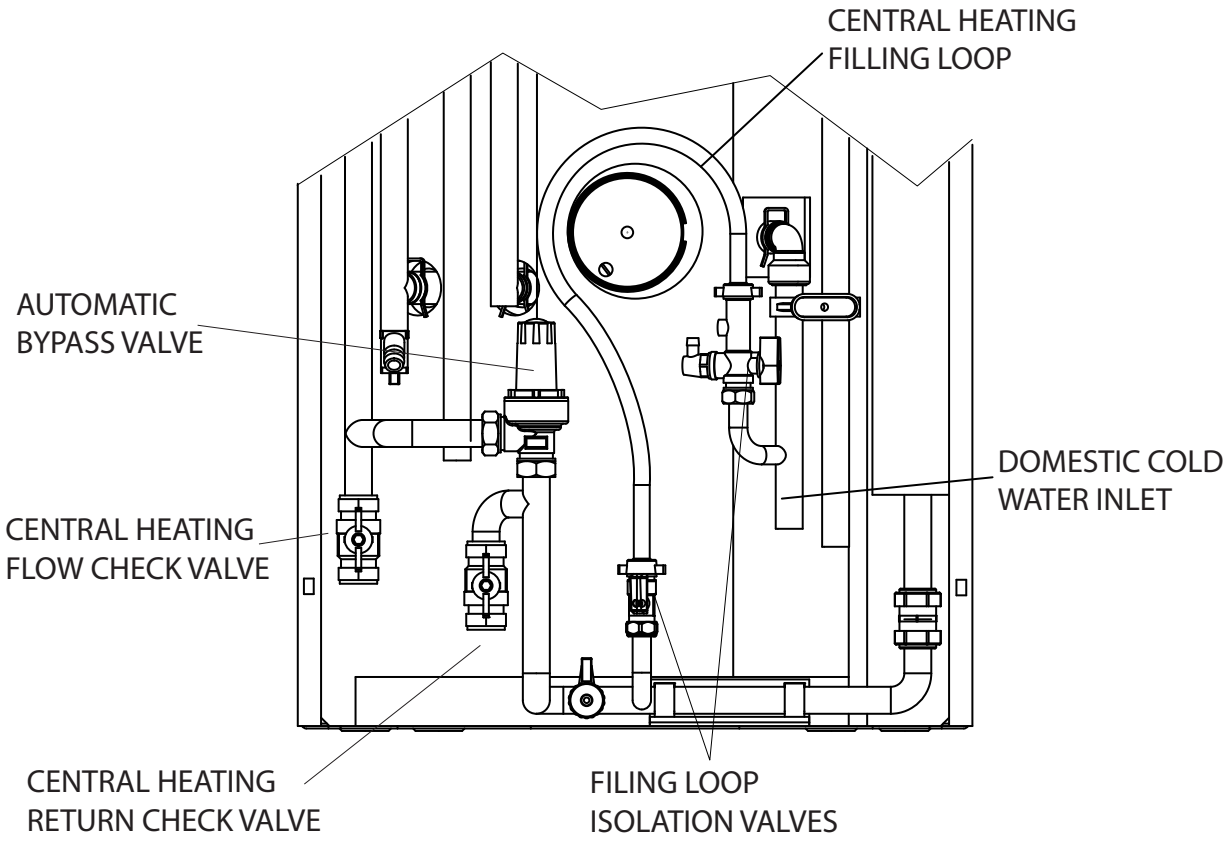
4.2.2 CHECK THE OPERATION OF THE SAFETY VALVES

1. Slowly, open the temperature and pressure relief valve on the Electromax Solar for a few seconds. Check that the water discharged runs freely away through the tundish and discharge pipework. Close the valve, ensure water flow stops and the valve reseats correctly.
2. Slowly, open the expansion relief valve on the cold water combination valve for a few seconds. Check that the water discharged runs freely away through the tundish and discharge pipework. Close the valve, ensure water flow stops and the valve reseats correctly.

4.3 COMMISSIONING – CENTRAL HEATING PRIMARY SYSTEM

4.3.1 FILLING THE SEALED SYSTEM PRIMARY CIRCUIT

FIGURE21: CENTRAL HEATING COMMISIONING



1. Ensure all power supplies are switched off.
2. Ensure the domestic hot water system has been commissioned (see section 4.2 page 34) and the mains water supply is on.
3. Check the central heating filling loop is connected and connections are tight.
4. Check the central heating expansion vessel charge pressure is set to 0.1 MPa (1bar) and modify if necessary. Pressure is checked using a car tyre pressure gauge. The valve is located at the opposite end of the water connection.
5. Open all radiator valves, and the central heating flow and return check valves.
6. Flush the central heating primary system in accordance with BS 7593 and the manufacturer's instructions supplied with the flushing agent selected.
7. Add Inhibitor to the central heating primary system.
8. To fill the primary circuit open the central heating filling loop isolating valves and allow primary system to fill until the central heating pressure gauge on the Electromax Solar control panel reads 0.2 Mpa (2.0 bar)
9. Purge air from all radiators and air vent points in the central heating system.
10. Check the central heating system pressure. This should be between 0.1 MPa and 0.15 MPa (1.0 and 1.5 bar). If lower, open the filling loop isolating valves until gauge reads 0.2 MPa (2.0 bar). Repeat air purging operation. This sequence may need to be repeated several times to ensure all air is purged from the system.

11. Check central heating system for leaks and rectify as necessary.
12. When the central heating pressure gauge remains steady at between 0.1 - 0.15 MPa (1.0 - 1.5 bar) ensure both filling loop isolating valves are closed and remove the filling loop flexible hose from the central heating system connection point.

4.3.2 CHECK THE OPERATION OF THE SAFETY VALVES

1. Slowly, manually, open the central heating expansion relief valve for a few seconds. Check that the water discharged runs freely away through the tundish and discharge pipework. Close the valve, ensure water flow stops and the valve reseats correctly.
2. Check that the central heating system pressure has not dropped below 0.1 MPa (1.0 bar). If it has re-connect the filling loop and refill until the central heating gauge reads between 0.1 - 0.15 Mpa (1.0 -1.5 bar). Ensure both filling loop isolating valves are closed and remove the filling loop flexible hose from the central heating system connection point.

4.4 SET THE PROGRAMMABLE ROOM THERMOSTAT

1. Fit the batteries supplied with the programmable room thermostat. The battery compartment is located behind the hinged cover under a snap fit panel. Ensure the batteries are inserted with the correct polarity.
2. Using the instructions supplied with the programmable room Thermostat set the time and day on the clock display.
3. The programmable room thermostat is supplied with a number of factory preset programmes, these are listed in the instruction leaflet. These can be reset to other periods depending on the users requirements.
4. To obtain lower running costs it is recommended that central heating on times be programmed to coincide (wherever feasible) with any off peak tariff periods available during the day.
5. The programmable room thermostat does not control the domestic hot water heating times.

4.5 COMMISSIONING - ELECTRICAL

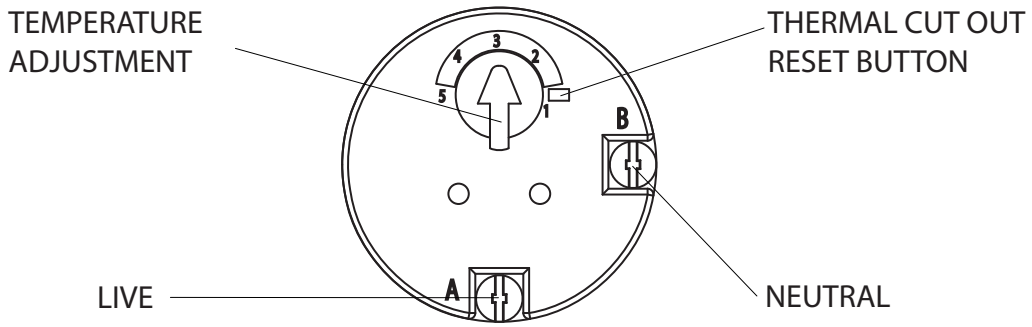
4.5.1 PRELIMINARY CHECKS

1. Ensure all power supplies are switched off.
1. Check all electrical connections are tight.
2. Check all earth bonding links are connected, tight and un-damaged.
3. Check earth continuity, short circuits, polarity and resistance to earth.

4.5.2 IMMERSION HEATER OPERATION

1. Switch on the 240v 16A power supply to the control panel and boost immersion heater. The information screen on the solar control LCD screen should illuminate.
2. Switch on the hot water switch and press the hot water boost switch. The hot water switch and hot water boost neon should illuminate and the immersion heater switch on. NOTE: The boost immersion heater will operate for one hour or until the temperature on its control thermostat is reached. Switch off the hot water switch to turn off the boost immersion heater.
3. Switch on the off peak 240v 16A power supply to the lower immersion heater.
4. Switch on the hot water switch. The switch should illuminate and the lower immersion heater operate. NOTE: If connected to an off peak tariff as recommend the lower immersion heater will only operate during off peak times.
5. The set temperature of the immersion heaters can be adjusted by rotating the thermostat controls. Access to the thermostat control is gained by removing the immersion heater covers. Ensure the power is switched off before removing the immersion heater covers. It is recommended that both thermostats are set between positions 4 and 5 (60 - 65ºC), however they can be set between 1 and 5 (10 - 70ºC). In hard water areas it is recommended that the maximum temperature is restricted to prevent build up of scale.

FIGURE 22: THERMOSTAT



4.5.3 ELECTRIC BOILER OPERATION

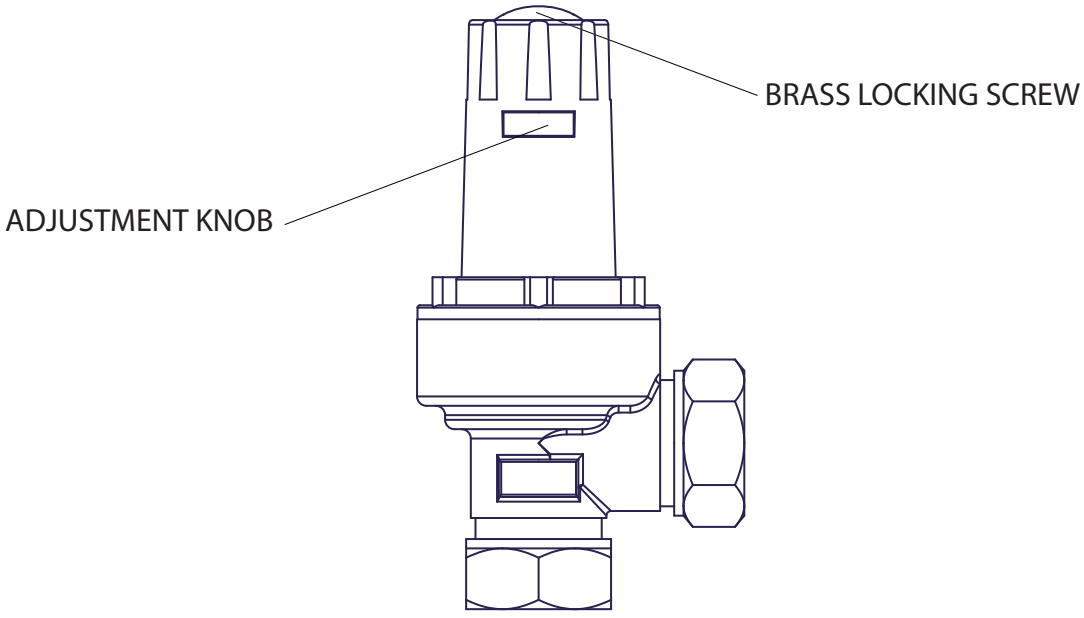
1. Switch on the 240v 45A power supply to the electric boiler.
2. Switch on the central heating switch. The switch should illuminate.
3. Set the flow temp adjustment to minimum position and the programmable room thermostat to be calling for heat (refer to the programmable room thermostat instructions). The boiler demand indicator will flash green and the pump should run.

4. After 2-3 minutes the demand indicator will remain illuminated and the heat indicator will illuminate. The height of the heat indicator will vary as the boiler heat input modulates the power.
5. Check the central heating flow pipework from the Electromax Solar begins to rise in temperature.
6. When the boiler is operating at its maximum power output the heat indicator should be fully illuminated. Set the pump speed to give a 5 - 10ºC differential between the central heating flow and return connections at the boiler. The pump speed can be set between 1 and 3 (1 = 1700 rpm, 2 = 2100 rpm and 3 = 2300 rpm). The switch to adjust the pump speed is located on the top of the pump housing. You will need to lift the central heating expansion vessel to gain access to the switch.
7. Set the programmable room thermostat to be satisfied (refer to the programmable room thermostat instructions). The heat and demand indicators should switch off. The pump may continue to run for a short period to dissipate the heat from the electric boiler.
8. When the system is hot, bleed all the radiators and air vents to remove any residual air from the system.

4.6 COMMISSIONING - AUTOMATIC BY-PASS VALVE

1. Switch off all radiators with TRV's
2. Loosen the brass locking screw on top of the adjustment cap of the by-pass valve
3. Turn the adjustment knob fully clockwise so that the number 5 coincides with the indicator arrow on the body of the valve.
4. With the boiler on (demand and heat indicators illuminated) and the pump running, slowly turn the adjustment knob anti-clockwise until hot water can be felt on the outlet side of the by-pass valve.
5. Turn the adjustment knob clockwise by half a turn. Lock in position by tightening the brass locking screw.

FIGURE 23: AUTOMATIC BYPASS VALVE



4.7 COMMISSIONING - SOLAR

The Electromax Solar circuit system should only be flushed and 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 flushing and filling.

Use only the heat transfer fluid supplied with the Electromax Solar collector kits. Additional solar fluid is available, accessory code 5119549 for flat plate collectors and 5130225 for evacuated tube collectors.

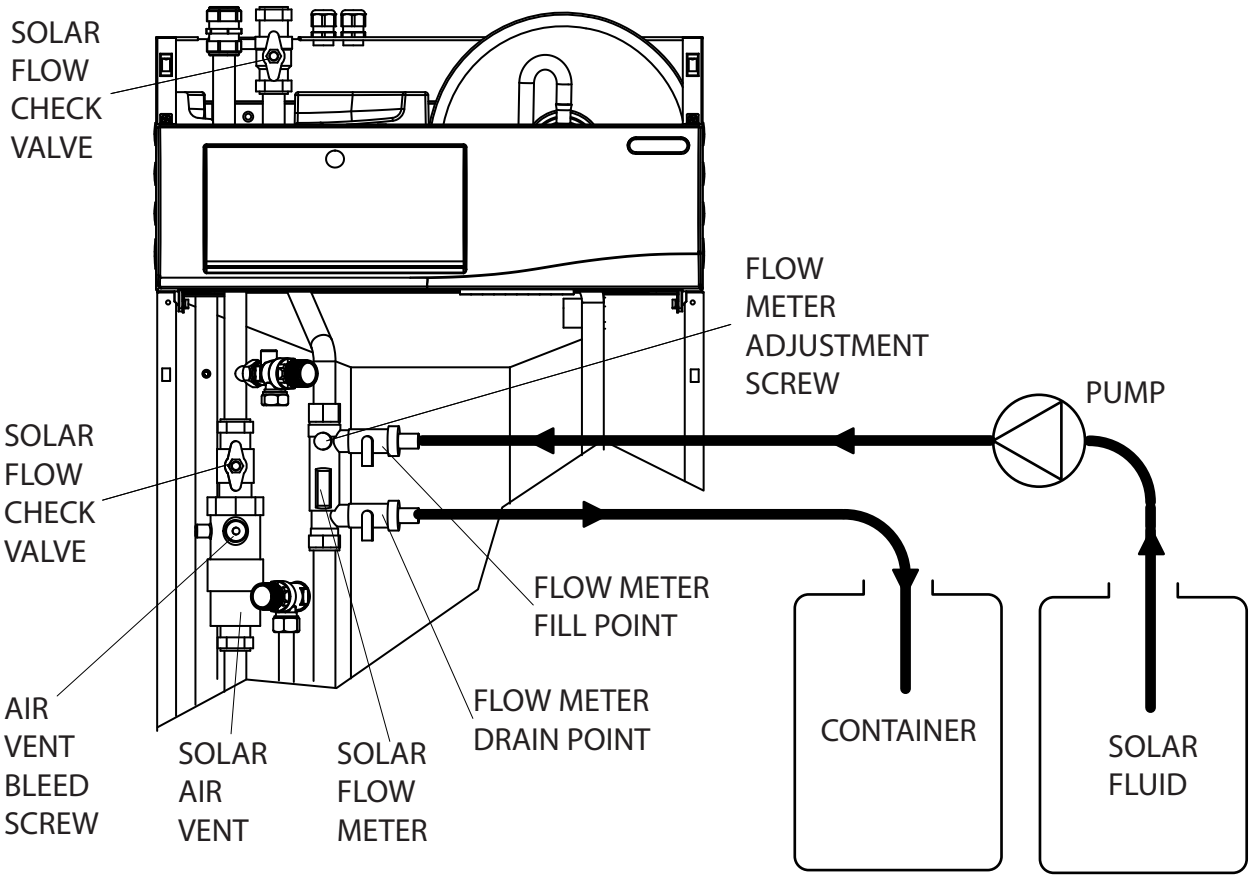
Although the solar heat transfer fluid is non-corrosive and biodegradable appropriate precautions should be taken when handling.

- 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 0.2 MPA (2.0 bar).

It is recommended that the pipework is checked for leaks prior to flushing and filling. This may be achieved by an air test. Pressurise the system to a maximum of 0.1 MPa (1.0 bar) to check for leaks.

FIGURE 24: SOLAR COMMISIONING



4.7.1 SET EXPANSION VESSEL CHARGE PRESSURE

1. The solar expansion vessel charge pressure should be set before the solar primary circuit is flushed and filled.
2. Calculate the system pressure: The system pressure should be 0.07 MPa (0.7bar) above the static pressure (static pressure = 0.01 MPa (0.1bar) x static height where the static height = the distance in metres between the top of the Electromax Solar and the highest point of the solar primary circuit, usually the top of the collectors), however it must be at least 0.15 MPa (1.5bar) and no more than 0.22 MPa (2.2bar).
3. Set the solar expansion vessel charge pressure to 0.05 MPa (0.5bar) below the system pressure. Pressure is checked using a car tyre pressure gauge. The valve is located at the opposite end of the solar fluid connection.

4.7.2 FLUSHING THE SOLAR PRIMARY PIPEWORK

1. Before the system is commissioned the pipework must be flushed to remove any contaminates. This must be done using the solar heat transfer fluid as it will be impossible to fully drain all parts of the system.
2. Ensure power is switched off.
3. Connect a filling hose to the top fill point on the solar flow meter and the filling pump.
4. Connect a drain hose to the bottom drain point on the solar flow meter. The drain hose should convey flushed heat transfer fluid to a suitable container.
5. Open the fill and drain valve on the flow meter (the handles should be turned so they are horizontal)
6. Open both solar check valves (the handles should be turned so they are vertical).
7. Close the flow meter adjustment screw (turn the slot so that it is horizontal).
8. Pump the heat transfer fluid into the solar circuit until it starts to come out of the drain hose.
9. Continue to pump heat transfer fluid through the solar system until all the pipework and components have been thoroughly flushed. NOTE: Flushed fluid may be re used if it has been filtered.
10. When satisfied that all pipework and components have been flushed the system can be filled

4.7.3 FILLING THE SOLAR PRIMARY PIPEWORK

1. Ensure power is switched off and fill and drain hoses are connected as described on section 4.7.2 steps 3 and 4 above.
2. Pour an amount of solar heat transfer fluid into the filing pump.
3. Close the fill valves on the flow meter (the handles should be turned so they are vertical) and pressurise the pump slightly prior to filling the system. If an electric pump is being used follow the instructions with the pump.
4. Open the fill valve on the flow meter (the handle should be turned so it is horizontal) and pump fluid into the system. Whilst pumping, open the flow meter drain valve slightly to allow air to vent out of the system.
5. When the pump is down to approximately 1 litre isolate the fill and drain valves. Vent the pump and re fill with solar heat transfer fluid.
6. Re-pressurise the filing pump and repeat steps 6 & 7 until fluid is seen discharging from the flow meter drain valve. Close the drain valve.

7. Continue to fill the solar primary circuit until the system pressure reaches 0.2 MPa (2.0 bar).
   At this point the pump should be vented. If the system pressure drops, repressurise as explained above.
8. After checking that the system pressure is correct, close the fill and drain valve on the flow meter
9. Turn on the power to the solar controller. This should display the information screen
10. Key the left button once to enter the main menu screen. The ‘i’ icon will flash.
11. 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.
12. Press either the up or down button to manually activate the pump, then key right to accept the setting.
13. Leave the pump running for sufficient time to allow any residual air to collect in the air separator
14. With the pump running, open the air bleed screw slowly to purge air from the system. Close the valve when heat transfer fluid starts to flow out.
15. Allow the pump to run for a short period of time and re-open the bleed screw.
16. Repeat step 15 until all air has been purged. 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.
17. Stop the pump using the button procedure described above.
18. The system pressure and flow rate can now be set.

4.7.4 SETTING THE SYSTEM PRESSURE AND FLOW RATE

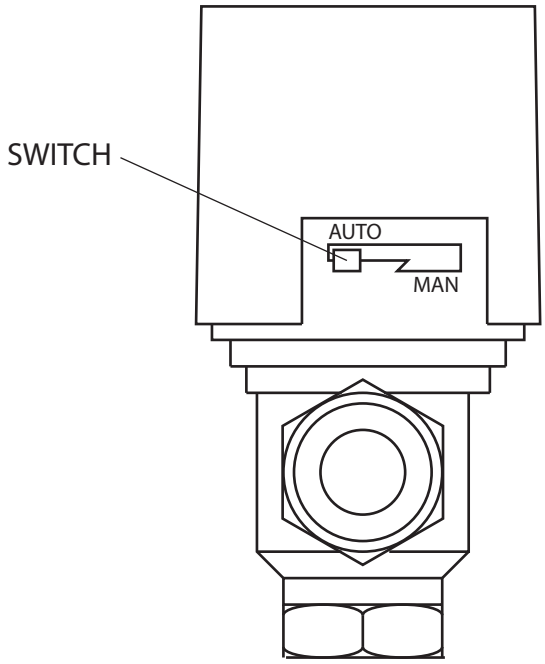
1. It is likely that system pressure will have been lost during the air bleeding process.
2. With the filling pump still connected to the flow metre fill point, open the fill valve and pump heat transfer fluid into the system until the system pressure reaches the level calculated in section 4.7.1. NOTE: The system pressure should be set when the system is cold (20°C).
3. Close the fill valve. Remove the fill and drain hoses and replace the sealing caps on the fill and drain valves. NOTE: Take care not to spill heat transfer fluid onto the immersion heaters below.
4. The solar controller will automatically regulate the speed of the solar circulting pump.
5. Ensure the flow meter adjustment screw is fully opened (the slot should be vertical).
6. Set the solar pump speed selector to 3. The switch to adjust the pump speed is located on the top of the pump housing. You will need to lift the central heating expansion vessel to gain access to the switch.
7. Manually operate the solar pump (section 4.7.3 steps 9 - 12).
8. The float in the flow meter will indicate the circulation flow rate through the flow meter sight glass.
9. Ensure the float is stable when the pump is running.
10. Stop the pump using the button procedure described in section 4.7.3 steps 10 - 12.

4.7.5 COMMISSIONING EAST/ WEST COLLECTOR INSTALLATIONS

Before filling and commissioning an East West collector array move the switch on the side of the divertor valve to MANUAL.

When the system has been and commissioned flick the switch back to AUTO.

FIGURE 25: DIVERTOR VALVE SWITCH



4.8 COMMISSIONING - SOLAR CONTROLLER

The solar controller is pre set at the factory and should require no adjustment. The following sections are provided for infomation purposes only.

The Electromax Solar control panel incorporates a micro processor based differential temperature controller which contains many functions to regulate and monitor the solar primary system, this includes:

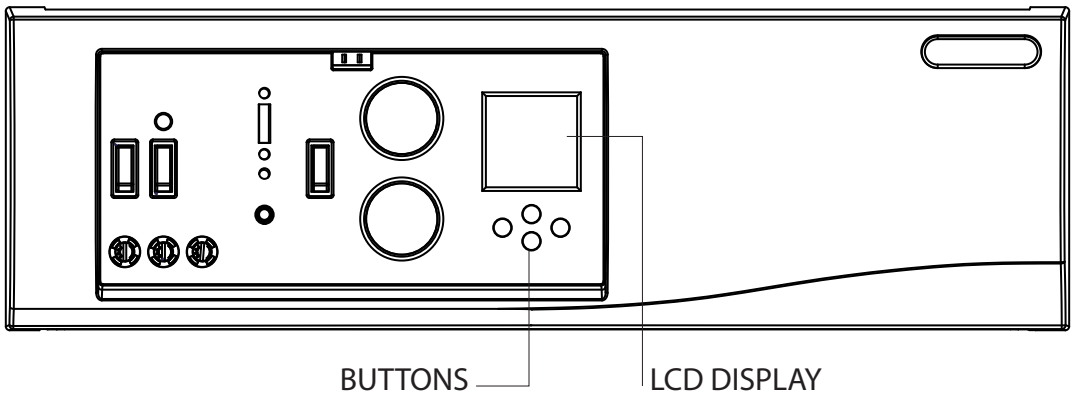
- Functions for heating the solar cylinder
- Functions to monitor the solar system
- Functions to protect the solar system

The controller collects temperatures from the sensors located in the solar collector and the solar cylinder and determines the right time to charge the storage tank (i.e. turn the pump on and off).

4.8.1 CHANGING VALUES

The Solar controller user interface comprises an LCD screen and four buttons through which information may be viewed and altered as described in the sections below.

FIGURE 26: SOLAR CONTROLLER

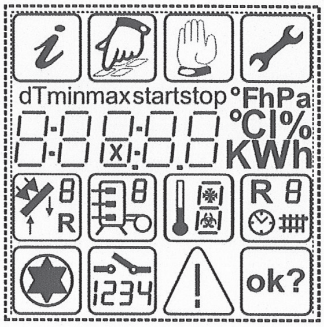


4.8.2 LCD SCREEN

The LCD screen is split into four sections:

- Main menu
- Display values
- Measuring points
- Status indication

FIGURE 27: SOLAR CONTROL LCD DISPLAY



MAIN MENU

DISPLAY VALUES

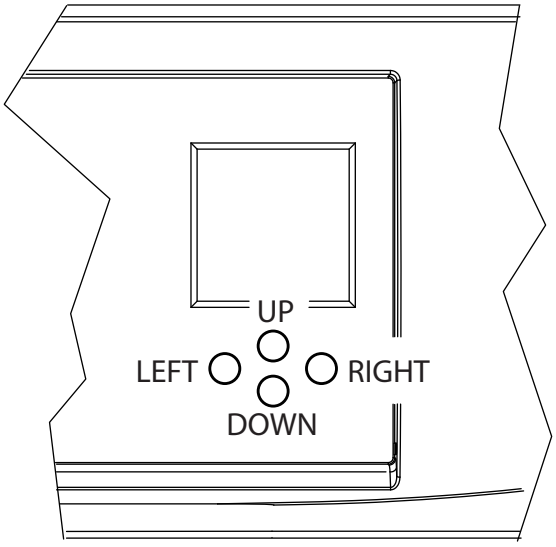
MEASURING POINTS ASSIGNMENT

STATUS INDICATION

4.8.3 CONTROL BUTTONS

Navigation and operation of the solar controller is made via four buttons: UP, DOWN, RIGHT, LEFT.

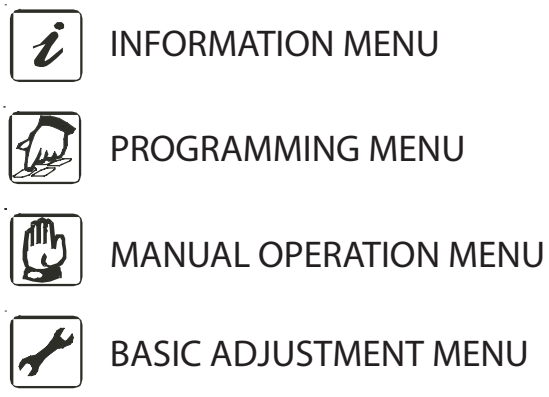
FIGURE 28: SOLAR CONTROL BUTTONS



4.8.4 MAIN MENU

The Main menu is divided into four sub menu's:
- Information menu
- Programming menu
- Manual operation menu
- Basic adjustment menu

FIGURE 29: MAIN MENU ICONS



To select a sub menu:
Press RIGHT or LEFT to the required sub menu.
The sub menu icon will flash.
Press DOWN to access the sub menu.
Once accessed the sub menu icon will stop flashing.

Note: If you are already in a sub menu, press LEFT until you return to the main menu.

4.8.5 INFORMATION MENU

The information menu is used to view measuring values and operating states.

FIGURE 30: INFORMATION MENU ICONS

INDICATION		DESCRIPTION	RESETTABLE
	01°C	CURRENT COLLECTOR TEMPERATURE	NO
	23°C min.	MINIMUM COLLECTOR TEMPERATURE	YES
	45°C max.	MAXIMUM COLLECTOR TEMPERATURE	YES
	67°C	CURRENT STORAGE TANK TEMPERATURE (LOWER)	NO
	89°C min.	MINIMUM STORAGE TANK TEMPERATURE (LOWER)	YES
	01°C max.	FROST PROTECTION OR CURRENT MEASURING POINT	YES
	89°C	HEATING SENSOR T1 - T6	NO
	0123 h	OPERATING HOURS FOR CHARGING STORAGE TANK	YES

To view a value:
Select the information sub menu as shown in section 4.8.4
Press UP or DOWN to select the required value.

The values marked RESETTABLE may be reset.
To reset a value press RIGHT. The OK icon will flash.
Press RIGHT for yes or LEFT for no.

4.8.6 PROGRAMMING MENU

The programming menu is used to the check parameters which may be changed.

FIGURE 31: PROGRAMMING MENU ICONS

INDICATION		DESCRIPTION	FACTORY SET	RANGE
	01°C max.	MAXIMUM STORAGE TANK TEMPERATURE	65°C	15 - 95°C
	dT max 7 K	STORAGE TANK SWITCH ON DIFFERENCE (dTon)	7K	3 - 40 K
	dT min 3 K	STORAGE TANK SWITCH OFF DIFFERENCE (dToff)	3K	2 - 25 K
	min 100	PUMP SPEED CONTROL (100% = SPEED CONTORL OFF)	100%	30 - 100%

To check / alter a parameter:
- Select the programming sub menu as shown in section 4.8.4
- Press UP or DOWN to scroll to the required parameter.
- Press RIGHT to select the parameter. The icon will flash.
- Press UP to increase the parameter value.
- Press DOWN to decrease the parameter value.
- Press RIGHT and the OK icon will flash.
- Press RIGHT to confirm the parameter setting.

4.8.7 MANUAL OPERATION MENU

The manual operation menu allows the solar sytem to be operated by hand for test / service purposes.

NOTE: During manual operation there is no auotmatic regulation of the system.

FIGURE 32: MANUAL OPERATION MENU ICONS

INDICATION	DESCRIPTION	RANGE
	SWITCH SOLAR CIRCULATION PUMP ON / OFF	1 = ON 0 = OFF

To manually operate the solar pump:
- Select the manual operation sub menu as shown in section 4.8.4
- Press UP or DOWN to switch the pump ON or OFF.
- Press RIGHT to confirm the setting.

NOTE: Automatic regulation will be re actived after 8 hours.

4.8.8 BASIC ADJUSTMENT MENU

The basic adjustment menu may be used to view and / or alter factorty pre set operating parameters.

NOTE: Adjustment of any parameters may effect the operation of the Electromax Solar and should only be carried out by a competent person.

FIGURE 33: BASIC ADJUSTMENT MENU SETTINGS

PARAMETER	DESCRIPTION	RANGE	FACTORY SET
0	COLLECTOR PROTECTION ON / OFF	1 = ON 0 = OFF	0 = OFF
1	COLLECTOR PROTECTION TEMPERATURE START	110 - 150°C	120°C
2	RECOOLING FUNCTION ON / OFF (ONLY WHEN COLLECTOR PROTECTION IS ON)	1 = ON 0 = OFF	0 = OFF
3	TEMPERATURE TO WHICH THE STORAGE TANK IS RECOOLED AFTER ACTIVE COLLECTOR PROTECTION	30 - 90°C	40°C
4	TIME CONTOLLED CIRCULATION WITH TUBE COLLECTORS	1 = ON 0 = OFF	0 = OFF
5	ENERGY PRODUCTIVITY MEASUREMENT ON / OFF	1 = ON 0 = OFF	0 = OFF
6	GLYCOL TYPE	0 - 10	0
7	GLYCOL MIX	0 - 100%	50
8	VOLUME FLOW LPM	0,5 - 25,0	10,0
9	ANTIFREEZING ON / OFF	1 = ON 0 = OFF	0
10	ANTIFREEZE TEMPERATURE START	-20 - +7°C	0
11	CHOICE OF FUNCTION	0 - 3	0
12	SYSTEM TYPE	0 - 4	0 = SOUTH 3 = EAST/WEST

To view a system parameter:
- Select the basic adjustment sub menu as shown in section 4.8.4
- Press UP or DOWN to scroll to the required parameter.

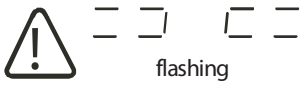
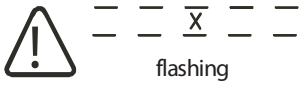
NOTE: To avoid accidental changes to the parameters within the basic adjustment sub menu it is only adjustable within one minute of switching the Electromax Solar on. After one minute access to the basic adjustment sub menu is limited to viewing only.

To alter a system parameter:
- Select the basic adjustment sub menu as shown in section 4.8.4
- Press UP or DOWN to scroll to the required parameter.
- Press RIGHT to select the parameter. The icon will flash.
- Press UP to increase the parameter value.
- Press DOWN to decrease the parameter value.
- Press RIGHT and the OK icon will flash.
- Press RIGHT to confirm the parameter setting.

4.8.9 ERROR CODES

Some system failure modes can be recognised by the solar controller and will be indicated with an error message on the controller display.

FIGURE 34: ERROR CODES

INDICATION	POSSIBLE CAUSE
 flashing	SENSOR WIRE BROKEN SENSOR DEFECT
 flashing	SHORT CIRCUIT IN SENSOR WIRE SENSOR DEFECT
 flashing	ERROR IN PUMP CONNECTION PUMP DEFECT AIR IN SYSTEM

5.0 DEMONSTRATION TO USER

Following commissioning all panels and covers must be replaced and fully secured.

Operation of the Electromax Solar should be explained fully to the user:

5.1 ELECTROMAX SOLAR CONTROL PANEL

1. Demonstrate how the control cover is opened and closed.
2. Explain what each of the switches does and what each of the indicators / displays show.

5.2 DOMESTIC HOT WATER

1. Explain how the whole cylinder is heated when there is sufficient solar energy.
2. Explain how part of the cylinder is heated by the lower immersion heater if sufficient solar energy is not available.
3. Explain how the one hour boost immersion heater is operated.

5.3 CENTRAL HEATING

1. Explain how the central heating system works.
2. Explain how the programmable room thermostat is operated and how it has been set.

5.4 SYSTEM MALFUNCTION

1. Explain how to isolate electrical and water supplies in the case of a system fault.
2. Explain that a qualified plumber and or electrician should be contacted if there is a system fault.
3. Explain how to identify / check for basic system faults:

- Hot water temperature
- Central heating temperature
- Pressure relief valve discharge
- Solar and central heating system pressures
- Electric boiler alarm indicator
- Solar controller alarm indicator

5.5 SYSTEM MAINTENANCE

1. Explain the necessity to carry out regular maintenance of the Electromax Solar to ensure its continued safe and efficient operation.

5.6 LITERATURE

Hand over the following literature:

- Electromax Solar installation instructions
- Electromax Solar collector installation instructions
- Electromax Solar user instructions
- Programmable room thermostat instructions

6.0 MAINTENANCE

WARNING: DISCONNECT FROM ALL ELECTRICAL SUPPLIES BEFORE BEGINNING ANY WORK ON THE ELECTROMAX SOLAR. FLUID CONTAINED IN THE DOMESTIC HOT WATER, CENTRAL HEATING AND SOLAR CIRCUITS MAY BE VERY HOT!

To ensure the continued safe and efficient operation of the Electromax Solar it should be regularly maintained.

Maintenance should be carried out by a competent person and any replacement parts used should be authorized Heatrae Sadia Electromax Solar spare parts.

It is recommended that maintenance is carried out annually and should include the checks detailed in the sections below:

6.1 PREPARATION

1. Switch off all electrical supplies to the Electromax Solar.
2. Turn off the mains water supply to the Electromax Solar and release the system pressure by opening a hot tap. Some hot water will flow for a short while, this is normal.
3. Remove front and top panels.
4. Visually check all pipework for leaks

6.2 COLD WATER COMBINATION VALVE

The strainer is incorporated within the pressure reducing valve housing of the cold water combination valve. To inspect and clean the strainer:

1. Turn off the cold water supply and drain the Electromax Solar.
2. Using a spanner unscrew the pressure reducing cartridge and remove the moulded housing. The strainer will be removed with the cartridge.
3. Wash any particulate matter from the strainer under clean running water.
4. Replace the strainer and screw the pressure reducing valve cartridge into the moulded housing.
5. Turn on the cold water supply , refill the Electromax Solar and check for leaks.

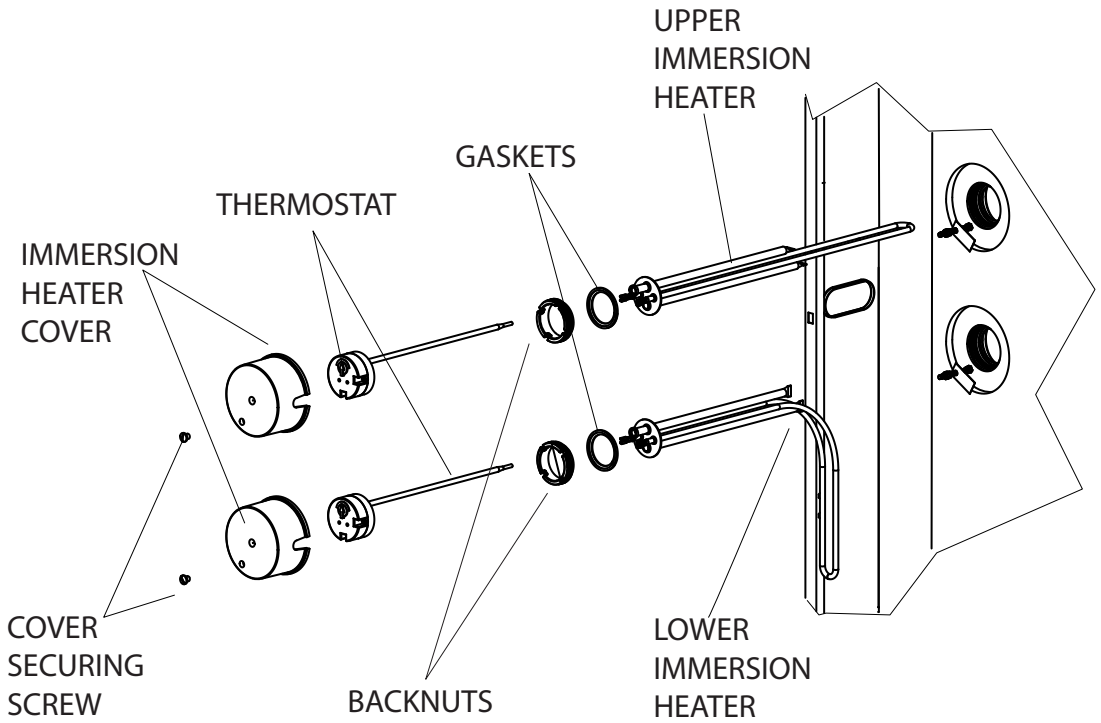
6.3 DOMESTIC HOT WATER EXPANSION VESSEL

1. Remove the dust cap from the expansion vessel.
2. Check the charge pressure of the vessel using a tyre pressure gauge. The pressure (with system de-pressurised) should be 0.35 MPa. If lower than the required setting it should be re-charged using a tyre pump (Schraeder valve type). DO NOT over charge.
3. Re-check the charge pressure and when correct replace the dust cap.

6.4 IMMERSION HEATERS

1. Connect a hose to the domestic hot water drain point and unscrew square headed stop plug to drain the cylinder. If water fails to drain from the cylinder, vent the unit by manually opening the temperature and pressure relief valve.
2. Ensure all electrical supplies are isolated.
3. Remove the immersion heater covers by unscrewing the securing screws.
4. Disconnect the wiring from the immersion heater thermostats. Remove the thermostats by carefully pulling outwards from the immersion heaters.
5. Unscrew immersion heater backnuts using the key spanner supplied with the unit. Remove the immersion heaters. Over time the immersion heater gaskets may become stuck to the mating surface, to break the seal insert a round bladed screwdriver into one of the pockets on the immersion heater and gently lever up and down.
6. Carefully remove any scale from the surface of the immersion heater elements. DO NOT use a sharp implement as damage to the element surface could be caused. Ensure sealing surfaces are clean and seals are undamaged. If in doubt fit new sealing gaskets.
7. Replace the immersion heaters ensuring the right angled element is inserted into the lower immersion heater boss and hangs vertically downwards towards the base of the unit.
8. Secure the immersion heaters in place using the backnuts previously removed. It may be helpful to support the immersion heater using a round bladed screwdriver inserted into one of the thermostat pockets whilst the backnut is tightened.
9. Replace the thermostats by carefully plugging the two male spade terminations on the underside of the thermostat head into the corresponding terminations on the element.
10. Rewire the immersion heaters in accordance with figure 19, page 32. Refit and secure the immersion heater covers.
11. Close the drain tap and turn on mains water supply.
12. When water flows from the hot tap allow to flow for a short while to purge air and flush through any disturbed particles.
13. Close hot tap and then open successive hot taps to purge any air.

FIGURE 35: IMMERSION HEATER REMOVAL



6.4 OPERATION OF HOT WATER SAFETY VALVES

1. Slowly open the temperature and pressure relief valve by twisting its cap for a few seconds. Check water is discharged and that it flows freely through the tundish and discharge pipework. Release the valve cap and check water flow stops and valve re-seats correctly.
2. Repeat step 2 for the expansion relief valve located on the cold water combination valve.

6.5 OPERATION OF PRIMARY SYSTEM SAFETY VALVE

1. Close the central heating flow and return isolating valves.
2. Slowly open the central heating system pressure relief valve by twisting its cap for a few seconds.
3. Check water is discharged and that it flows freely through the tundish and discharge pipework.
4. Release the valve cap and check water flow stops and valve re-seats correctly.

6.6 PRIMARY SYSTEM EXPANSION VESSEL CHARGE PRESSURE

1. Drain the central heating primary circuit (see section 8.2 page 57) until the central heating pressure gauge reads 0 MPa (0bar).
2. Remove the dust cap from the central heating expansion vessel.
3. Check the charge pressure of the expansion vessel using a tyre pressure gauge. The pressure (with system de-pressurised) should be 0.1 MPa (1.0bar). If lower than the required setting it should be re-charged using a tyre pump (Schraeder valve type). DO NOT over charge. Re-check the charge pressure and when correct replace the dust cap.
4. Connect the filling loop. Open the filling loop isolating valves and allow system to repressurise to approximately 0.15 MPa (1.5 bar).
5. Close the filling loop isolating valves and remove the flexible hose.

6.7 ELECTRICAL CHECKS

1. Inspect all electrical terminations for signs of over-heating.
2. Check all terminations are tight.
3. Check cable glands are tightened and grip cables secure.

6.8 SOLAR HEAT TRANSFER FLUID

Using an antifreeze tester check that the value is approximately -21ºC (40% concentration)

6.9 SOLAR COLLECTOR

Check the collector for signs of leaks, damage and contamination.

6.10 SOLAR PRESSURE RELIEF VALVE

1. Slowly open the solar pressure relief valve by twisting its cap.
2. Check fluid is discharged and that it flows freely through the discharge pipework.
3. Release the valve cap and check that the fluid flow stops and valve re-seats correctly.

6.11 SOLAR SYSTEM EXPANSION VESSEL CHARGE PRESSURE

1. Drain the solar primary circuit until the solar pressure gauge reads 0 (see section 8.3 page 58)
1. Remove the dust cap from the solar expansion vessel
2. Check the charge pressure of the expansion vessel using a tyre pressure gauge. The pressure (with system de-pressurised) should be 0.35 MPa (3.5bar). If lower than the required setting it should be re-charged using a tyre pump (Schraeder valve type). DO NOT over charge. Re-check the charge pressure and when correct replace the dust cap.
3. Top up the heat transfer fluid and re set the solar system pressure (see section 4.7.1 , 4.7.3 and 4.7.4, pages 40 and 41). Ensure that the correct Heat Transfer fluid is used accessory code 5119549 for flat plate collectors and 5130225 for evacuated tube collectors.

6.12 RE COMMISSIONING THE ELECTROMAX SOLAR

1. Check that the domestic hot water, central heating and solar circuits are full and at the correct pressure.
2. Replace and secure all panels.
3. Check the settings of the programmable room thermostat.
4. Check operation of the immersion heaters and electric boiler (section 4.5.2 & 4.5.3 page 37)
5. Check operation of the solar pump (section 4.8.7 page 46).
6. Fill in the maintenance record (page 78-79)

Following servicing all covers must be replaced and fully secured and the service record filled in on page 78-79.

7.0 FAULT FINDING

WARNING: DISCONNECT FROM ALL ELECTRICAL SUPPLIES BEFORE BEGINNING ANY WORK ON THE ELECTROMAX SOLAR. FLUID CONTAINED IN THE DOMESTIC HOT WATER, CENTRAL HEATING AND SOLAR CIRCUITS MAY BE VERY HOT!

The Electromax Solar should give trouble free operation, however should a problem occur, the tables below should enable most faults to be identified with ease.

Fault Finding should be carried out by a competent person and any replacement parts used should be authorised Heatrae Sadia Electromax Solar spare parts.

7.1 FAULT FINDING - DOMESTIC HOT WATER

FAULT	POSSIBLE CAUSE	REMEDY
No water	Mains supply switched off.	Check and open stop cock.
	Strainer blocked	Turn off water supply. Remove strainer and clean.
	Cold water combination valve is fitted incorrectly	Check and re fit as required.
No hot water	Off Peak electrical supply switched off	Check and switch on.
	Off Peak immersion thermostat setting too low	Check and adjust setting is required.
	Off Peak immersion heater cut out has operated	Check and reset by pushing button.
	Off Peak immersion heater has failed	Check and replace if required.
	No solar gain	Go to 7.2
No boost	Boost electrical supply switched off	Check and switch on.
	Boost immersion thermostat setting too low	Check and adjust setting is required.
	Boost immersion heater cut out has operated	Check and reset by pushing button.
	Boost immersion heater has failed	Check and replace if required.
Water discharges from expansion relief valve	Expansion vessel volume has reduced.	Check pressure and re charge if required
	Cold water combination valve not working correctly	Check pressure from valve. If greater than 3 bar replace pressure reducer cartridge.
	Expansion valve seat damaged.	Remove expansion relief valve and check condition of seat. Replace if necessary.
Water discharges from temperature and pressure relief valve	Thermal control failure	Switch off power. DO NOT turn off water supply. Check all thermal controls and replace if faulty

7.2. FAULT FINDING - SOLAR PRIMARY CIRCUIT

FAULT	POSSIBLE CAUSE	REMEDY
Pressure gauge reading Low	Leak	Check pipework for signs of leaks and repair if required and re fill system.
	PRV operating	Check discharge container for signs of discharge. Identify reason and rectify. Re Fill system.
	Expansion vessel	Check charge pressure and re charge if required.
	Faulty gauge	Check system pressure. Replace gauge if found to be faulty.
	Incorrect set up	Check for above faults. If none are present initial set up may be wrong. Re commission Solar primary system.
No display on solar controller	No electrical supply	Check electrical supply and switch on.
	Fuse	Check fuse. Replace if necessary
	Solar thermal cutout has operated.	Check solar thermal cut out. Re set if necessary
	Internal wiring	Check connections at solar PCB are correct and tight.
	Faulty solar control PCB	Check for above faults. If none are present replace Solar controller and / or solar display PCBs
Erratic readings on solar controller	Sensor cables laid next to mains voltage cables.	Ensure there is a minimum of 50mm between mains voltage and sensor cables
	Sensor cables are not shielded.	Check sensor cables and replace if necessary
	Internal wiring	Check connections at solar PCB are correct and tight.
	Faulty controller	Check for above faults. If none are present replace Solar controller and / or solar display PCBs
No circulation	Pump seized	Check the impeller can be rotated using a screwdriver after removing the air bleed screw.
	Faulty solar control PCB	See above
	Isolation valves closed	Check valves and open if necessary
	Faulty pump	Check for above faults. If none are present replace solar circulating pump

7.3 FAULT FINDING - CENTRAL HEATING PRIMARY CIRCUIT

FAULT	POSSIBLE CAUSE	REMEDY
No heat	No electrical supply	Check electrical supply and switch on.
	Room thermostat fuse	Check fuse on Electromax Solar control panel. Replace if necessary
	Electric boiler main PCB fuse	Check fuse on electric boiler main PCB. Replace if necessary
	Programmer not set	Check settings and re programme if necessary
	Internal wiring	Check all electrical connections are correct and tight.
	Room thermostat	Check for above faults. Manually set room thermostat to call for heat. Replace room thermostat if found to be faulty.
	Boiler element failure	Check element resistance, replace boiler if below 19 ohms.
	Faulty PCB's	Check for above faults. If none are present replace electric boiler main PCB and / or electric boiler display PCB
Pressure gauge reading low	Leak	Check pipework for signs of leaks and repair if required and re fill system.
	PRV operating	Check expansion valve for signs of discharge. Identify reason and rectify. Re Fill system.
	Expansion vessel	Check charge pressure and re charge if required.
	Faulty gauge	Check system pressure. Replace gauge if found to be faulty.
	Incorrect set up	Check for above faults. If none are present initial set up may be wrong. Re commission solar primary system.
No circulation	Pump seized	Check the impeller can be rotated using a screwdriver after removing the air bleed screw.
	Faulty electric boiler PCB	See above
	Isolation valves closed	Check valves and open if necessary
	Faulty pump	Check for above faults. If none are present replace central heating circulating pump

8.0 PART REPLACEMENT

WARNING: DISCONNECT FROM ALL ELECTRICAL SUPPLIES BEFORE BEGINNING ANY WORK ON THE ELECTROMAX SOLAR. FLUID CONTAINED IN THE DOMESTIC HOT WATER, CENTRAL HEATING AND SOLAR CIRCUITS MAY BE VERY HOT!

Replacement of parts should be carried out by a competent person. Any replacement parts used should be authorised Heatrae Sadia Electromax Solar spare parts.

Having identified the fault (section 7, pages 54 - 56) and obtained the correct replacement part/s switch off the power supplies and remove the appropriate panels (section 3.2 page 11).

Drain the domestic hot water / central heating / solar circuit if required and replace the part. NOTE: The domestic hot water / central heating / solar circuit may be hot. Allow to cool first before draining.

Having replaced the part, re commission the Electromax Solar (section 4, pages 34 - 48) and confirm any fault has been rectified.

Replace the top and front panels and fill in the maintenance and servicing record (page 78-79)

8.1 DRAINING THE DOMESTIC HOT WATER CYLINDER

1. Turn off the mains water supply to the Electromax Solar and release the system pressure by opening a hot tap. Some hot water will flow for a short while, this is normal.
2. Remove front and top panels.
3. Connect a hose to the domestic hot water drain point and unscrew square headed stop plug to drain the cylinder. If water fails to drain from the cylinder, vent the unit by manually opening the temperature and pressure relief valve.

8.2 DRAINING THE CENTRAL HEATING PRIMARY CIRCUIT

1. Close the central heating isolating valves. This will allow the central heating primary circuit to be drained and worked on without draining the complete radiator or underfloor circuit.
2. Open the central heating pressure relief valve and allow water to flow until the system pressure gauge drops to zero.
3. Remove the sealing cap from the front of the central heating drain valve and replace it with the hose connector supplied.
4. Connect a hose to the hose connector and secure in place with a hose clip. Open the central heating drain valve and allow the central heating primary circuit to drain.

8.3 DRAINING THE SOLAR PRIMARY CIRCUIT

The Electromax Solar circuit system should only be drained 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 draining.

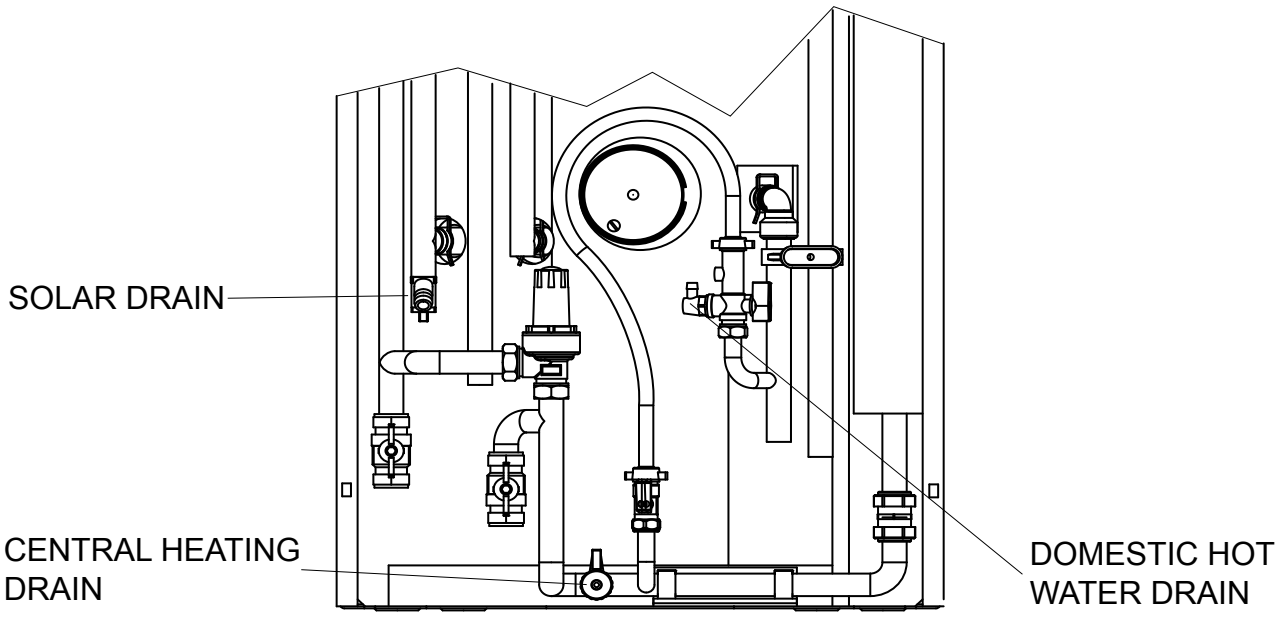
To drain the complete solar primary circuit (including collectors):

1. Turn the handles of both solar check valves so they are at 45°.
2. Connect a hose to the solar drain valve and secure in place with hose clip. Open the solar drain valve and allow the heat transfer fluid to drain into a suitable container.

To partially drain the solar primary circuit (not the collectors):

1. Turn the handles of both solar check valves so are horizontal to the pipework.
2. Connect a hose to the solar drain valve and secure in place with hose clip. Open the solar drain valve and allow the heat transfer fluid to drain into a suitable container.

FIGURE 36: DRAIN POINTS



8.4 REPLACING THE IMMERSION HEATERS

1. Drain the domestic hot water cylinder
2. Remove the immersion heater cover by unscrewing the securing screw.
3. Disconnect the wiring from the immersion heater thermostat. Remove the thermostat by carefully pulling outwards from the immersion heaters.
4. Unscrew immersion heater backnut using the key spanner supplied with the Electromax Solar. Remove the immersion heater. Over time the immersion heater gasket may become stuck to the mating surface, to break the seal insert a round bladed screwdriver into one of the pockets on the immersion heater and gently lever up and down.
5. Replace the immersion heater. NOTE: The upper and lower immersion heaters are different. The upper immersion heater is straight and the lower immersion heater is right angled. Ensure the correct immersion heater is fitted. When fitting a lower immersion heater ensure it is fitted so the right angle faces down.
6. Secure the immersion heater in place using the backnut previously removed. It may be helpful to support the immersion heater using a round bladed screwdriver inserted into one of the thermostat pockets whilst the backnut is tightened.
7. Replace the thermostat by carefully plugging the two male spade terminations on the underside of the thermostat head into the corresponding terminations on the element.
8. Rewire the immersion heaters in accordance with figure 20, page 33. Refit and secure the immersion heater covers.

8.5 IMMERSION HEATER THERMOSTATS

Note: The domestic hot water cylinder does not need to be drained to replace the Immersion heater thermostats.

1. Remove the immersion heater covers by unscrewing the securing screws.
2. Disconnect the wiring from the thermostat and remove carefully by pulling outwards from the immersion heaters.
3. Replace the thermostat by carefully plugging the two male spade terminations
4. Rewire the thermostat in accordance with figure 20, page 33. Refit and secure the immersion heater covers.

8.6 TEMPERATURE AND PRESSURE RELIEF VALVE

1. Drain the domestic hot water cylinder.
2. Undo the compression connections connecting the discharge pipework (D1) to the temperature and pressure relief valve and the central heating pressure relief Valve
3. Unscrew the temperature and pressure relief valve from the domestic hot water cylinder.
4. Fit the new temperature and pressure relief valve and re connect both parts of the discharge pipework.

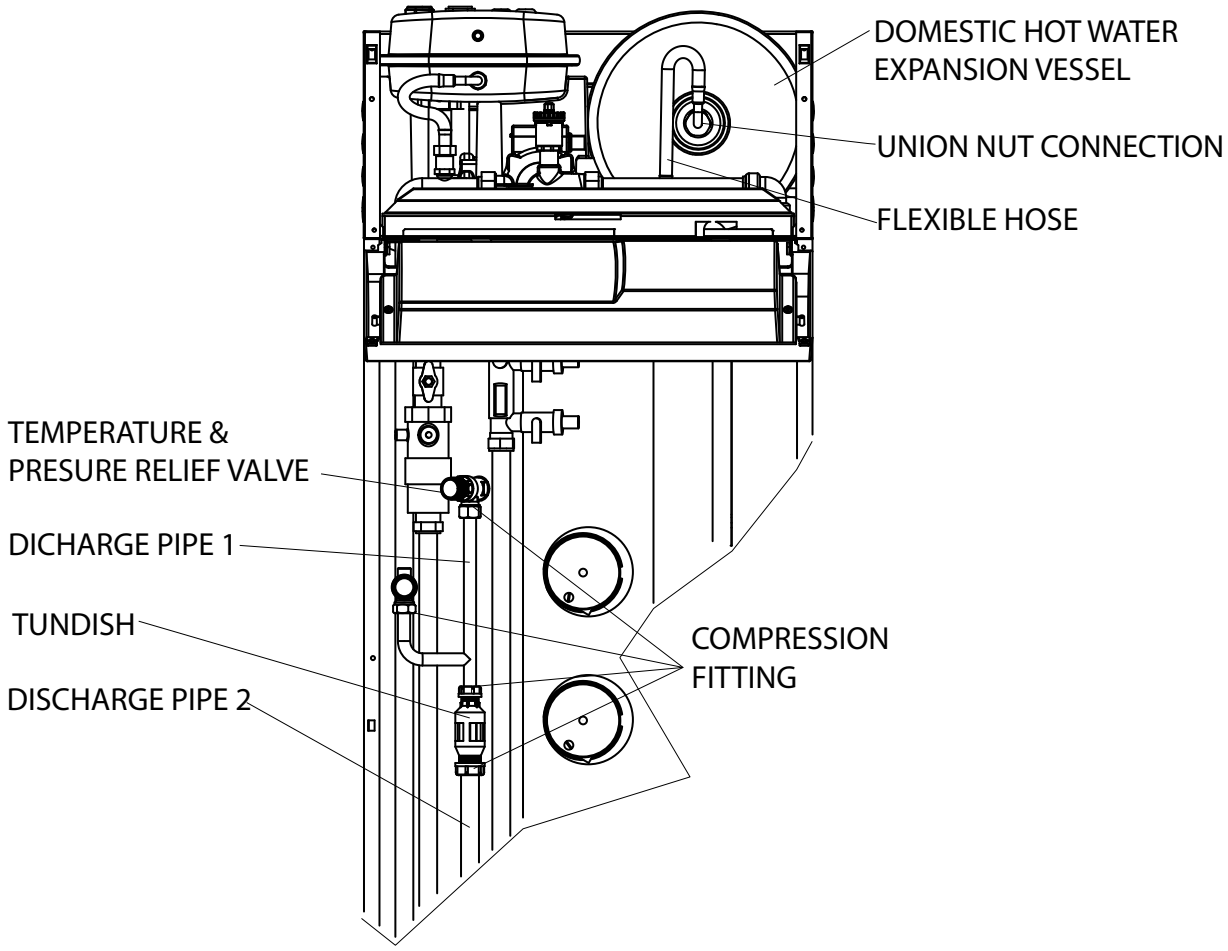
8.7 DOMESTIC HOT WATER EXPANSION VESSEL

1. Switch off mains water supply.
2. Depressurise the system by opening a hot tap.
3. Loosen the union nut connection between the expansion vessel and the flexible hose coupling and catch any water with a cloth.
4. When water stops flowing, undo the union nut fully.
5. Lift the expansion vessel from the moulded support nest. NOTE: the expansion vessel may contain some water, take care not to spill this into the Electromax Solar.
6. Fit the new expansion vessel and re connect the flexible house coupling.

8.8 COLD WATER COMBINATION VALVE

1. Drain the domestic hot water cylinder.
2. Undo the compression connections to the mains water supply and the expansion relief valve discharge pipework and remove the cold water combination valve.
3. Fit the new cold water combination valve and re connect the compression fittings to the mains water supply and the expansion relief valve discharge pipework.

FIGURE 37: DOMESTIC HOT WATER COMPONENTS



8.9 SOLAR EXPANSION VESSEL

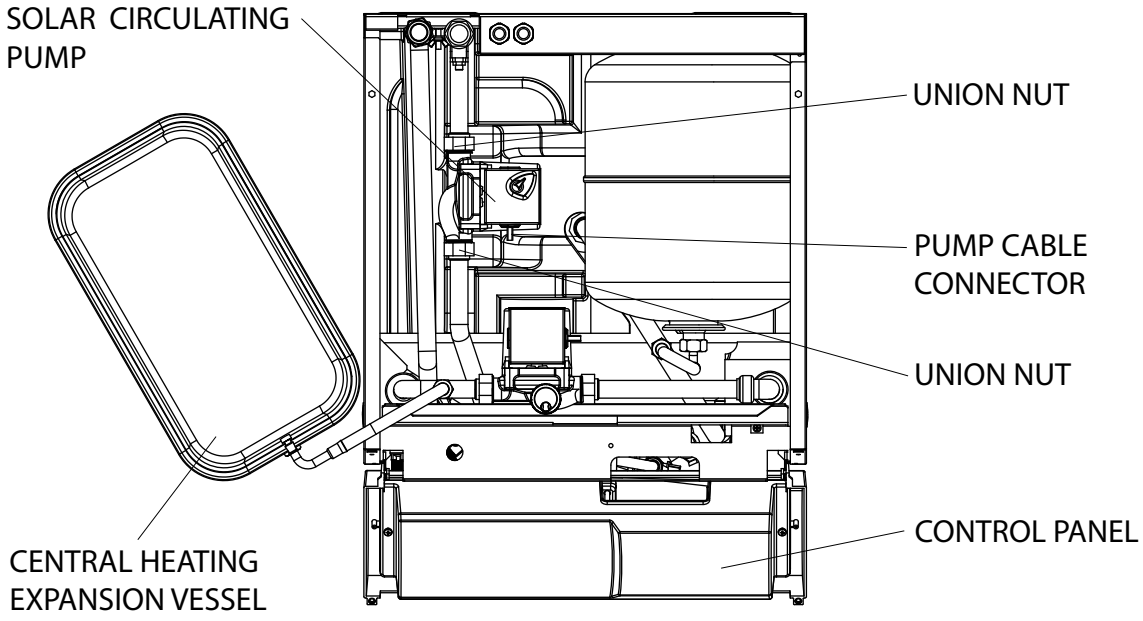
Note: The solar primary circuit does not need to be drained to replace the solar expansion vessel if the self sealing connection has been used.

1. Remove the expansion vessel from the wall mounted bracket.
2. Unscrew the expansion vessel from the self sealing connector (leaving the self sealing connector connected to the solar pipework)
3. .Replace the expansion vessel and re fit to the wall mounted bracket.

8.10 SOLAR CIRCULATING PUMP

1. Close the solar check valves and drain the solar primary circuit.
2. Unscrew the two screws holding the Electromax Solar control panel in place and allow it to drop forward.
3. Move the central heating expansion vessel to one side.
4. Disconnect the solar pump cable from the solar pump housing
5. Undo the two solar pump union nuts.
6. Replace the solar pump. Re connect the two union nuts and re connect the solar pump cable. Re fit the central heating expansion vessel and the Electromax Solar control panel.

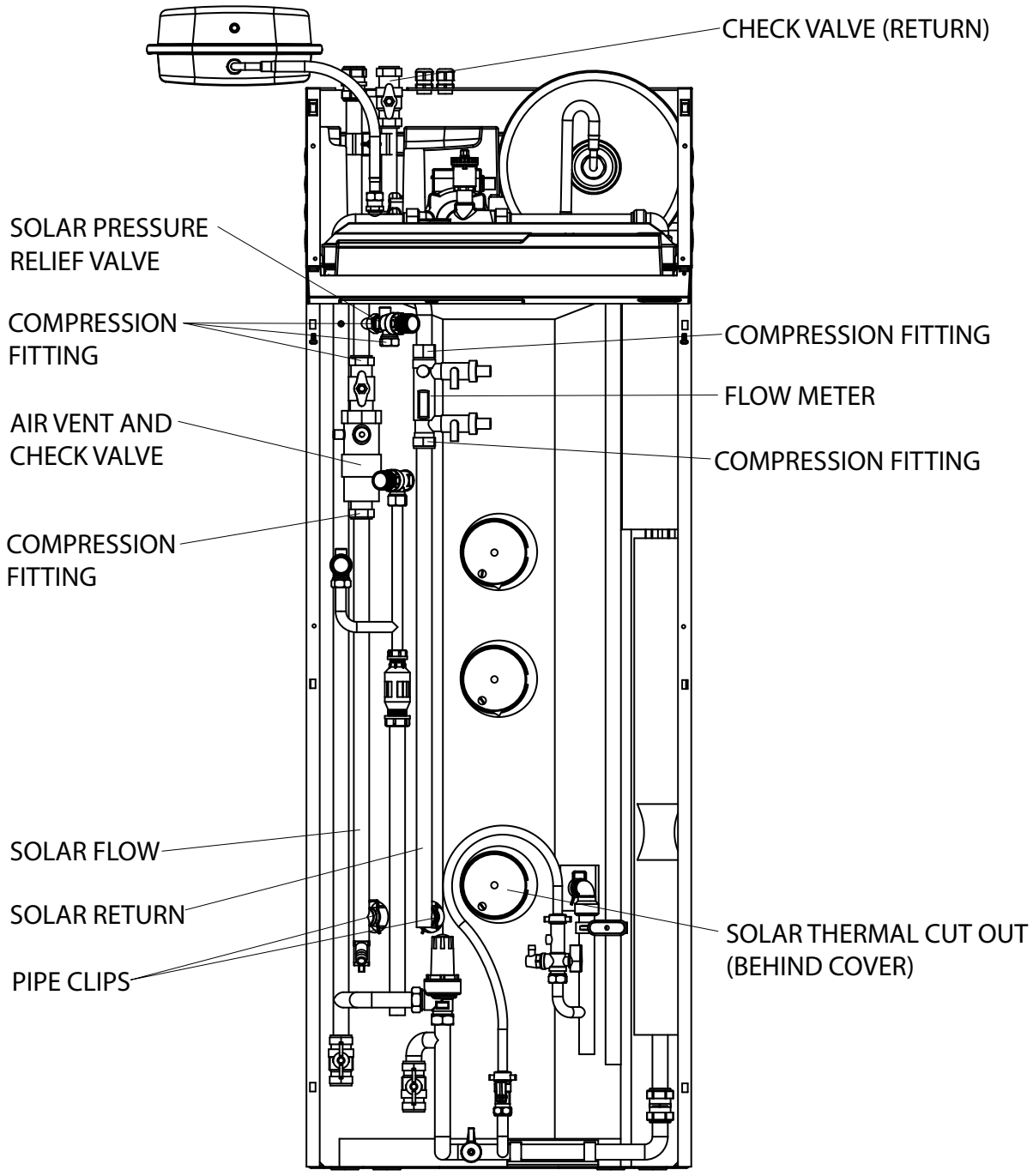
FIGURE 38: SOLAR CIRCULATING PUMP



8.11 SOLAR FLOW METER

1. Close the solar check valves and drain the solar primary circuit.
2. Un clip and remove the solar return pipework from the domestic hot water cylinder.
3. Undo the two compression connections to the solar flow meter.
4. Replace the solar flow meter. Re connect the two compression connections. Fit and re clip the solar return pipework to the domestic hot water cylinder.

FIGURE 39: SOLAR PRIMARY SYSTEM COMPONENTS



8.12 SOLAR AIR VENT & CHECK VALVE

1. Fully drain the solar primary circuit.
2. Un clip and remove the solar flow pipework from the domestic hot water cylinder.
3. Undo the two compression connections to the solar air vent and check valve
4. Replace the solar air vent and check valve. Re connect the two compression connections. Fit and re clip the solar flow pipework to the domestic hot water cylinder.

8.13 SOLAR CHECK VALVE (RETURN)

1. Fully drain the solar primary circuit.
2. Unscrew the two screws holding the Electromax Solar control panel in place and allow it to drop forward.
3. Move the central heating expansion Vessel to one side.
4. Undo the two return check valve compression connections.
5. Replace the return check valve. Re connect the two compression connections. Re fit the central heating expansion vessel and the Electromax Solar control panel.

8.14 SOLAR PRESSURE RELIEF VALVE

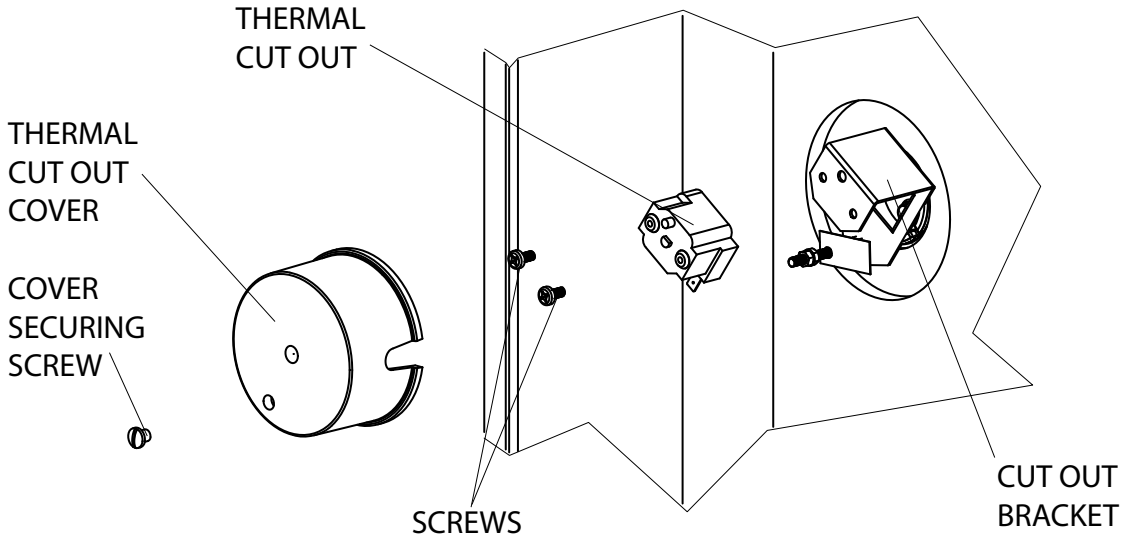
1. Fully drain the solar primary circuit.
2. Disconnect the solar discharge pipework from the solar pressure relief valve.
3. Undo the compression fitting connecting the solar pressure relief valve to the solar primary circuit.
4. Fit the new solar pressure relief valve. Tighten the compression fitting between the solar pressure relief valve and the solar primary circuit. Refit the solar discharge pipework.

8.15 SOLAR THERMAL CUT OUT

Note: The Solar primary circuit does not need to be drained to replace the solar thermal cut out.

1. Remove the thermal cut out cover by unscrewing the securing screw.
2. Disconnect the wiring from the solar cut out.
3. Undo the two screws holding the solar thermal cut out to the cut out bracket and remove the thermal cutout sliding the capillary probe and the solar controller sensor from the cut out pocket
4. Fit the new solar thermal cut out. Slide the thermal cut out probe and then the solar controller sensor into the cut out pocket into the cut out pocket . Tighten the two screws holding the solar thermal cut out to cut out bracket. Re connect the wiring. Refit and secure the solar thermal cut out cover.

FIGURE 40: SOLAR THERMAL CUT OUT



8.16 CENTRAL HEATING EXPANSION VESSEL

1. Close the central heating isolation valves and drain the central heating primary circuit.
2. Unscrew the two screws holding the Electromax Solar control panel in place and allow it to drop forward.
3. Unscrew the union nut connection between the expansion vessel and the flexible hose coupling.
4. Lift the expansion vessel from the moulded support nest. NOTE: the expansion vessel may contain some water, take care not to spill this into the Electromax Solar.
5. Fit the new expansion vessel and re connect the flexible hose coupling

8.17 CENTRAL HEATING CIRCULATING PUMP

1. Close the central heating isolation valves and drain the central heating primary circuit.
2. Unscrew the two screws holding the Electromax Solar control panel in place and allow it to drop forward.
3. Disconnect the pump cable from the pump housing.
4. Undo the two pump union nuts.
5. Replace the pump. Re connect the two union nuts and re connect the pump cable. Re fit the Electromax Solar control panel.

FIGURE 41: CENTRAL HEATING CIRCULATING PUMP

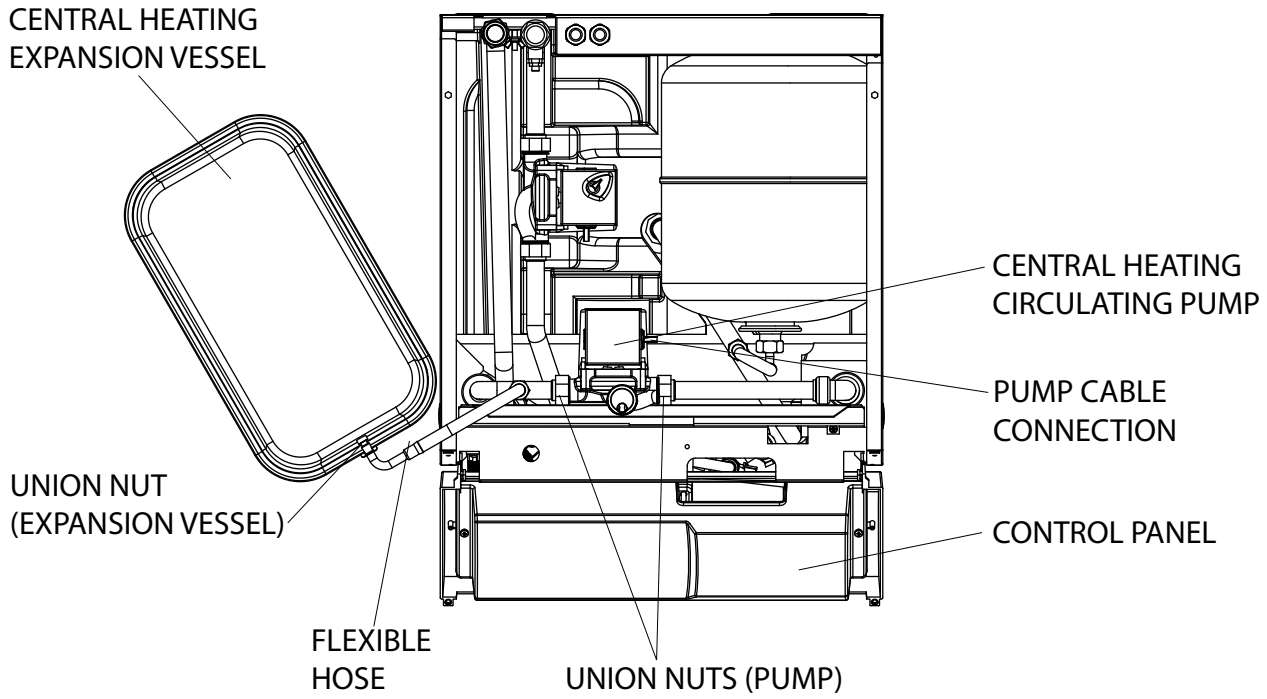
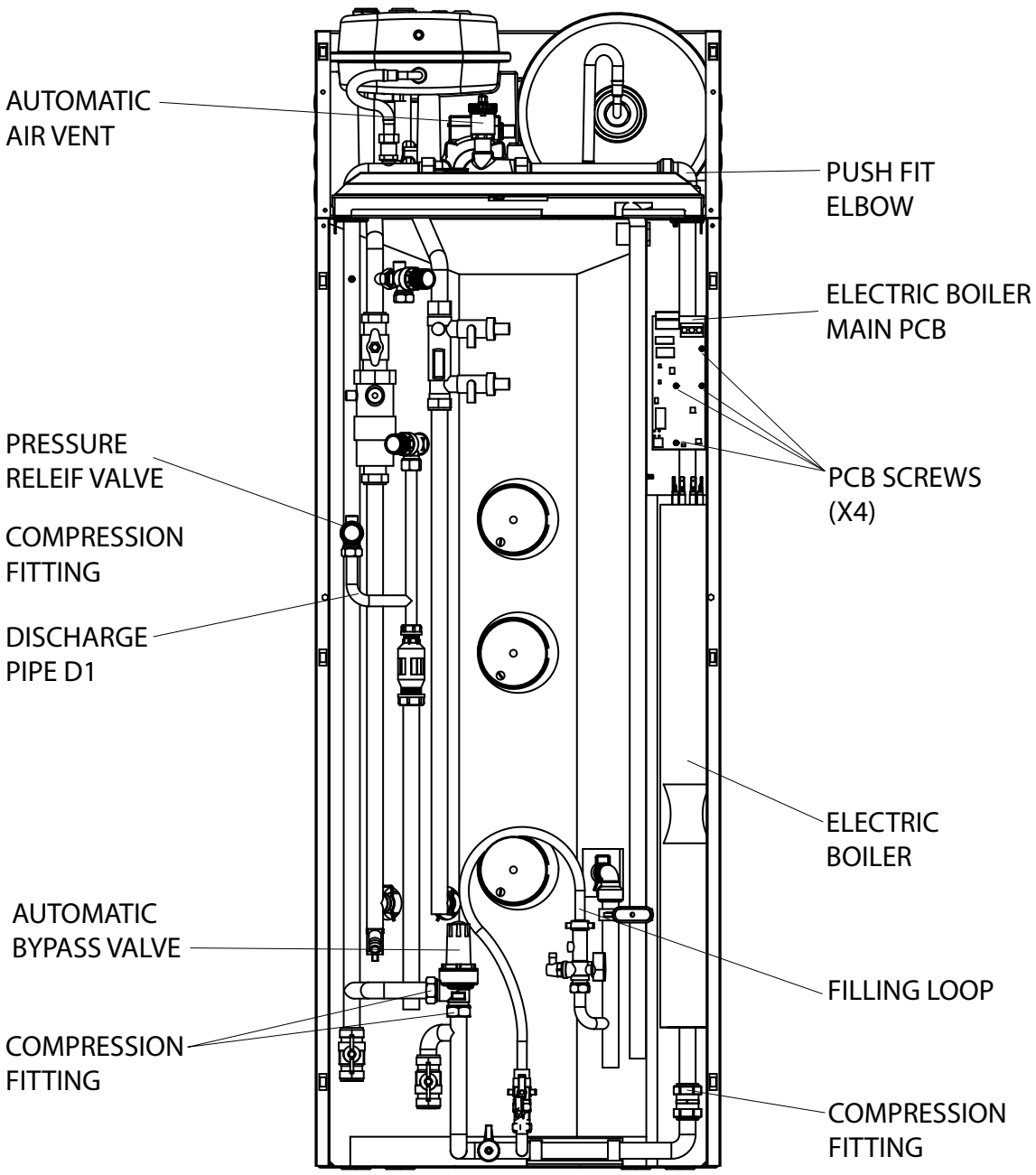


FIGURE 42: CENTRAL HEATING PRIMARY SYSTEM COMPONENTS



8.18 CENTRAL HEATING AUTOMATIC AIR VENT

1. Close the central heating isolation valves and drain the central heating primary circuit.
2. Unscrew the two screws holding the Electromax Solar control panel in place and allow it to drop forward.
3. Unscrew the automatic air vent from the central heating pump housing.
4. Replace the automatic air vent. Re fit the Electromax Solar control panel.

8.19 CENTRAL HEATING PRESSURE RELIEF VALVE

1. Close the central heating isolation valves and drain the central heating primary circuit.
2. Undo the compression connection connecting the discharge pipework (D1) at the tundish.

3. Undo the compression connections connecting the discharge pipwork (D1) to the temperature and pressure relief valve and the central heating pressure relief valve.
4. Disconnect the central heating pressure gauge from the central heating pressure relief valve.
5. Undo the compression fitting connecting the central heating pressure relief valve to the central heating primary circuit.
6. Fit the new central heating pressure relief valve. Tighten the compression fitting between the central heating pressure relief valve and the central heating primary circuit and re connect the discharge pipework.

8.20 CENTRAL HEATING AUTOMATIC BYPASS VALVE

1. Close the central heating isolation valves and drain the central heating primary circuit.
2. Undo the two compression fittings connection the automatic bypass valve to the central heating primary circuit.
3. Fit the new automatic bypass valve. Tighten the two compression fittings

8.21 ELECTRIC BOILER

1. Close the central heating isolation valves and drain the central heating primary circuit.
2. Unscrew the screw holding the electric boiler PCB housing cover in place and remove the cover.
3. Disconnect the cables from the Electric Boiler PCB terminal blocks.
4. Undo the compression fitting connecting the electric boiler to the central heating primary circuit and remove the electric boiler, disconnecting it from the push fit elbow.
5. Fit the new electric boiler. Re fit the electric boiler housing and secure to the Electromax Solar right hand side panel. Re connect the cables to the PCB terminal blocks. Tighten the compression fitting. Replace the PCB housing cover and secure in place with the screw.

8.22 ELECTRIC BOILER MAIN PCB

Note: The central heating circuit does not need to be drained to replace the electric boiler PCB.

1. Unscrew the screw holding the electric boiler PCB housing cover in place and remove the cover.
2. Disconnect the cables from the Electric Boiler PCB terminal blocks (conn1 & conn5).
3. Disconnect the thermistor wire (conn4), the over temperature cut out wire (conn3) and the ribbon cable (conn2) from the Electric Boiler PCB.
4. Disconnect the six wires to the electric boiler heating elements (note which wires are connected to which element leg)
5. Unscrew the four screws holding the PCB in place
6. Fit the new PCB and secure in place with the four screws (ensure that sufficient heatsink compound is applied between the electric boiler pipe and the PCB heatsink). Re connect all wires. Re fit the electric boiler PCB housing cover and secure with screw.

8.23 CONTROL PANEL

1. Turn the solar check valves to 45°, close the central heating isolation valves and drain both the central heating and solar primary circuits.
2. Disconnect the solar pump cable at the solar pump.
3. Disconnect the central heating pump cable at the pump.
4. Undo the immersion heater covers and disconnect the immersion heater wires.
5. Remove the solar thermal cut out bracket and diconnect the two wires.
6. Remove the domestic hot water solar sensor from the sensor pocket.
7. Unscrew the two screws holding the Electromax Solar control panel in place and allow it to drop forward.
8. Unscrew the two screws holding the control panel back cover in place and remove the back cover.
9. Disconnect the two 240v 16a supplies
10. Disconnect the solar collector sensor wires (and the solar divertor valve wires if fitted) from the solar PCB.
11. Disconnect the electric boiler control PCB ribbon cable from the electric boiler main PCB.
12. Disconnect the room thermostat wires.
13. Disconnect the earth wires.
14. Disconnect the solar and central heating capillaries from the solar and central heating pressure relief valves.
15. Remove the control panel from it's hinges taking care so that the disconnected wires do not get caught in the process.
16. Fit the new control panel and re connect all cables and capillaries.

8.24 ELECTRIC BOILER CONTROL PCB

1. Unscrew the two screws holding the Electromax Solar control panel in place and allow it to drop forward.
2. Unscrew the screw holding the control panel back cover in place and remove the back cover.
3. Unscrew the two screws holding the electric boiler PCB housing cover in place and remove the cover.
4. Disconnect the electric boiler control PCB ribbon cable from the electric boiler main PCB.
5. Unscrew the four screws holding the electric boiler control PCB in place and remove the PCB.
6. Fit the new PCB and secure in place with four screws. Re connect the ribbon cable to the electric boiler main PCB. Refit the electric boiler PCB housing cover, the control panel back cover and the Electromax Solar control panel.

8.25 SOLAR CONTROL PCB

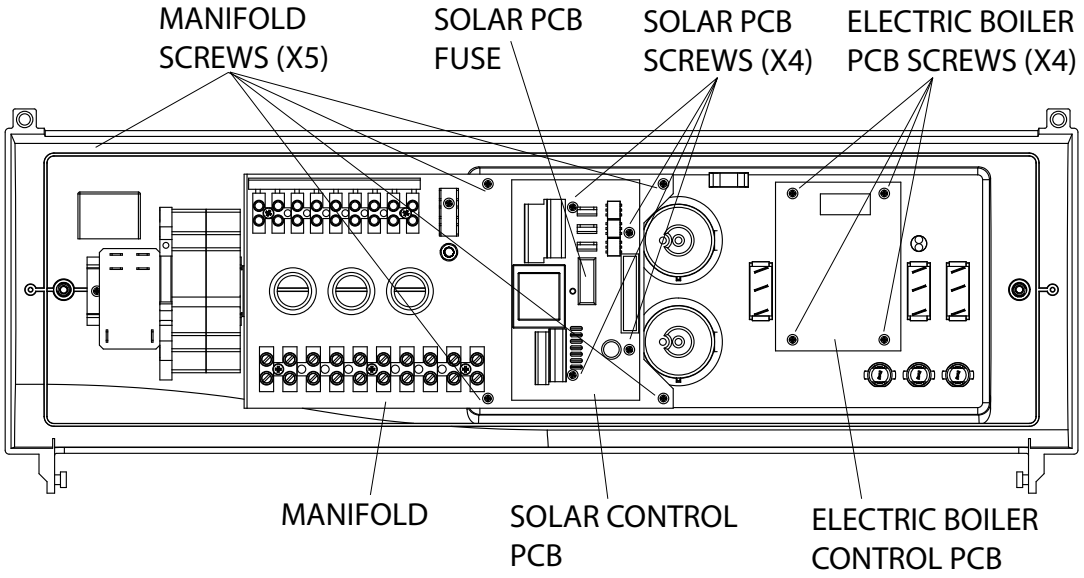
1. Unscrew the two screws holding the Electromax Solar Control Panel in place and allow it to drop forward.
2. Unscrew the screw holding the control panel back cover in place and remove the back cover.
3. Disconnect the wires and the ribbon cable to the Solar control PCB.
4. Unscrew the four screws holding the solar control PCB in place.

5. Fit the new PCB and secure in place with four screws. Re connect the wires and ribbon cable. Re fit the control panel back cover and the Electromax Solar control panel.

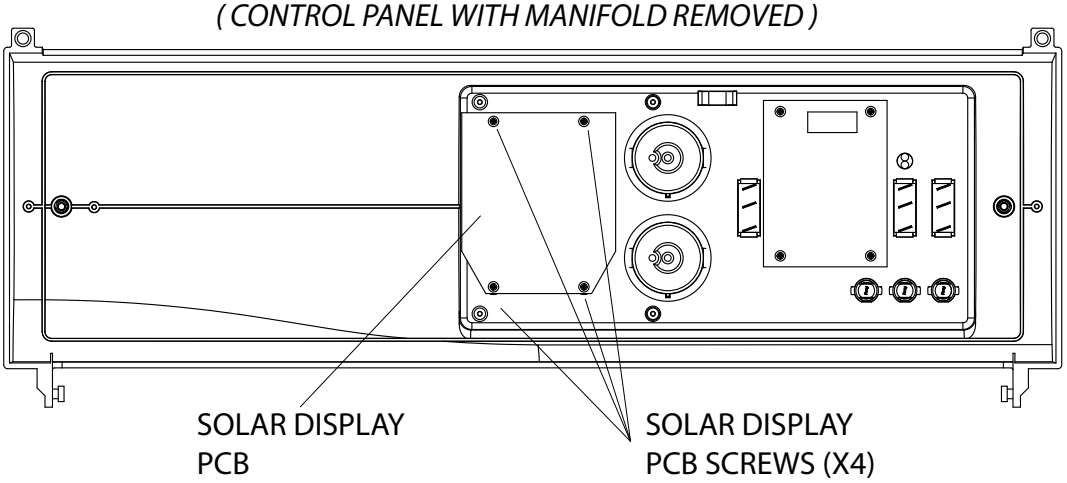
8.26 SOLAR DISPLAY PCB

1. Unscrew the two screws holding the Electromax Solar control panel in place and allow it to drop forward.
2. Unscrew the two screws holding the control panel back cover in place and remove the back cover.
3. Unscrew the five screws holding the control manifold in place.
4. Unscrew the four screws holding the solar display PCB in place.
5. Disconnect the ribbon cable.
6. Fit the new PCB and secure in place with the four screws. Re connect the ribbon cable. Re fit the control panel manifold. Re fit the control panel back cover and the Electromax Solar control panel.

FIGURE 43: PART REPLACMENT - CONTROL PANEL



(CONTROL PANEL WITH MANIFOLD REMOVED)



8.27 CENTRAL HEATING PRESSURE GAUGE

1. Drain the central heating primary circuit.
2. Undo the capillary connection at the central heating pressure relief valve.
3. Unscrew the two screws holding the Electromax Solar control panel in place and allow it to drop forward.
4. Unscrew the two screws holding the control panel back cover in place and remove the back cover.
5. Unclip the central heating pressure gauge from control panel housing.
6. Clip the new pressure gauge to the control panel housing. Re fit the control panel back cover. Re fit the Electromax Solar control panel. Connect the capillary to the central heating pressure relief valve.

8.28 SOLAR PRESSURE GAUGE

1. Drain the solar primary circuit.
2. Undo the capillary connection at the solar heating pressure relief valve.
3. Unscrew the two screws holding the Electromax Solar control panel in place and allow it to drop forward.
4. Unscrew the two screws holding the control panel back cover in place and remove the back cover.
5. Unclip the central heating pressure gauge from control panel housing.
6. Clip the new pressure gauge to the control panel housing. Re fit the control panel back cover. Re fit the Electromax Solar Control Panel. Connect the capillary to the solar pressure relief valve.

8.29 IMMERSION HEATER THERMAL CUT OUT RESET:

1. Remove the immersion heater cover by unscrewing the securing screw.
2. Press the red button on the immersion heater.
3. Re fit and secure the immersion heater cover.

8.30 SOLAR THERMAL CUT OUT RESET:

1. Remove the thermal cut out cover by unscrewing the securing screw.
2. Press the red button on the solar thermal cut out.
3. Refit and secure the solar thermal cut out cover.

8.31 FUSES

The following circuits are protected by replaceable fuses:

- Room thermostat
- Central heating circulating pump
- Solar circulating pump
- Electric boiler main PCB
- Solar controller control PCB

To replace the fuse for the room thermostat, the central heating circulating pump or the solar circulating pump:

1. Open the Electromax Solar Control Panel front cover by pressing at the top middle to release the catch and allow the cover to drop forward.
2. Locate the correct fuse holder (bottom left hand corner of the control panel).
3. Open the fuse holder using a screw driver and remove the fuse.
4. Fit a new fuse and replace the fuse holder cover.

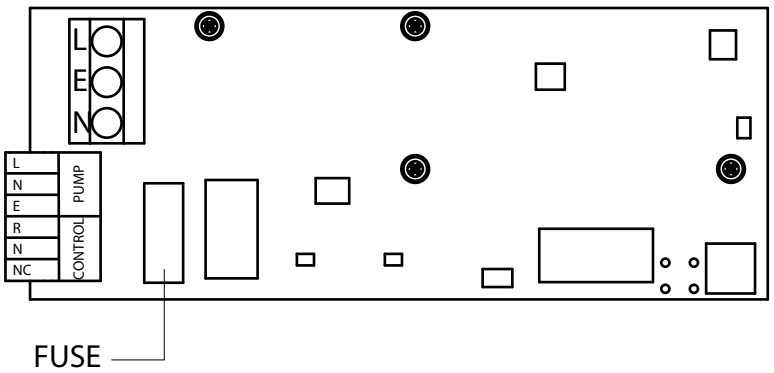
To replace the fuse for the solar control PCB:

1. Unscrew the two screws holding the Electromax Solar control panel in place and allow it to drop forward.
2. Unscrew the two screws holding the control panel back cover in place and remove the back cover.
3. Locate the fuse holder on the solar control PCB.
4. Remove the fuse from the fuse holder.
5. Fit a new fuse and replace the Electromax Solar control back cover and the Electromax Solar control panel.

To replace the fuse for the electric boiler main PCB:

1. Unscrew the screw holding the electric boiler PCB housing cover in place and remove the cover.
2. Locate the fuse holder on the electric boiler main PCB.
3. Remove the fuse from the fuse holder.
4. Fit a new fuse and replace the electric boiler PCB housing cover.

FIGURE 44: ELECTRIC BOILER MAIN PCB FUSE



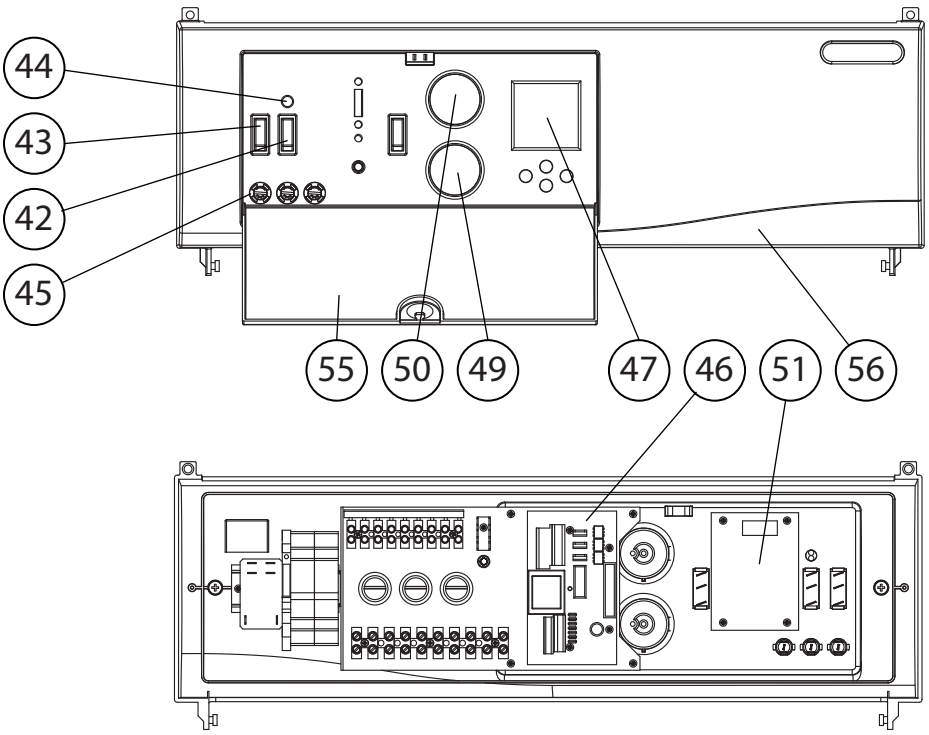
9.0 SPARES

The following spare parts are available for the Electromax Solar:

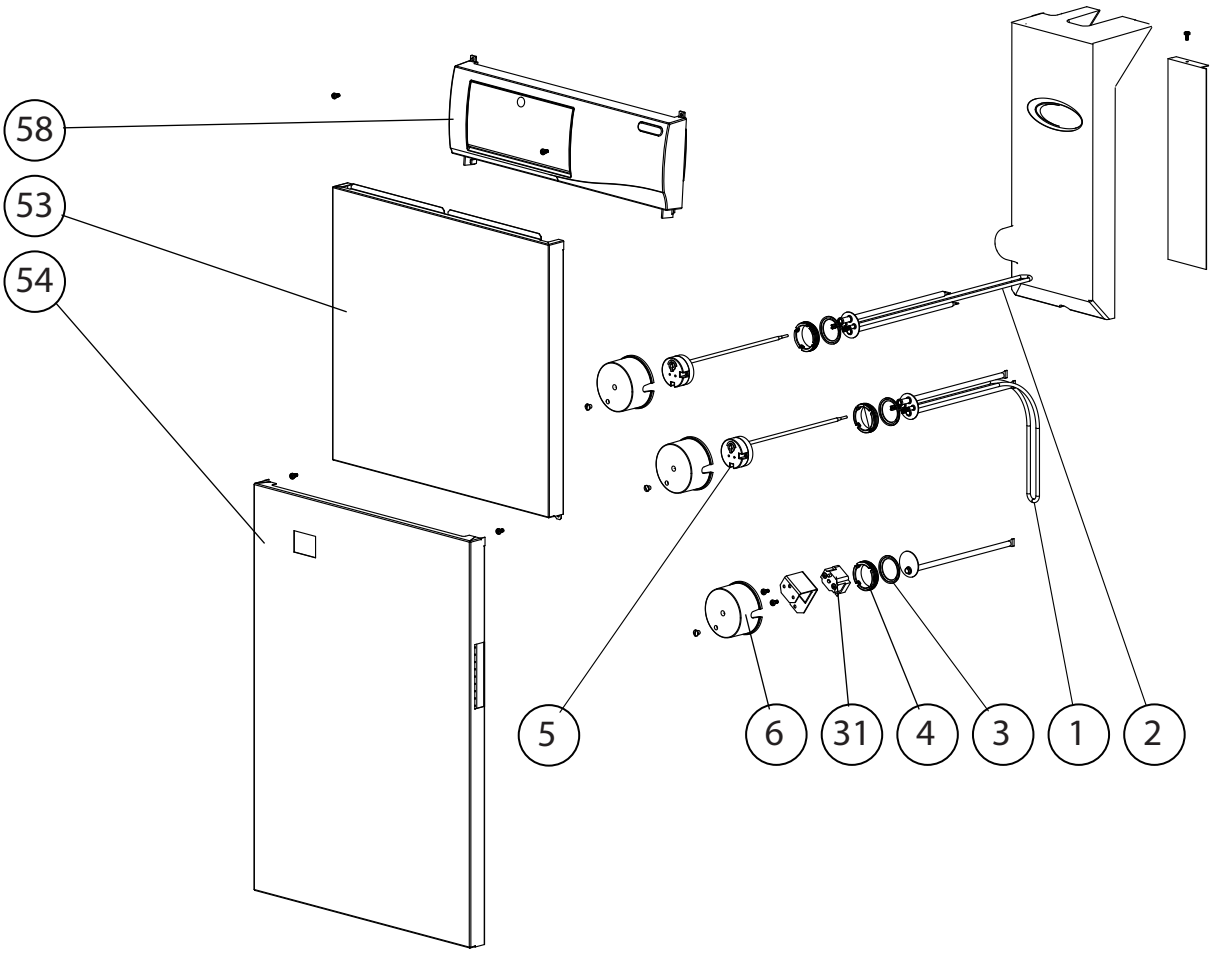
ITEM	PART NUMBER	DESCRIPTION
1.	95 606 963	Immersion heater (lower)
2.	95 606 964	Immersion heater (upper)
3.	95 611 822	Immersion heater gasket
4.	95 607 869	Immersion heater back nut
5.	95 612 026	Thermostat
6.	95 614 020	Immersion heater cover
7.	95 607 861	Immersion heater key spanner (not shown)
8.	95 607 864	Domestic hot water expansion vessel
9.	95 605 873	Pressure reducing valve (not shown)
10.	95 605 033	Cold control pack (not shown)
11.	95 605 870	Expansion relief valve cartridge 8 bar (not shown)
12.	95 605 871	Cold water combination valve body including isolation valve (not shown)
13.	95 605 872	Expansion valve housing (not shown)
14.	95 605 023	Temperature and pressure relief valve
15.	95 607 215	Domestic hot water expansion vessel hose
16.	95 605 838	Tundish
17.	95 607 040	22mm Inlet connection
18.	5119548	Solar expansion vessel (not shown)
19.	95 611 013	Solar circulating pump + washers
20.	95 605 074	Solar pressure relief valve
21.	95 607 217	Solar flow meter
22.	95 605 076	Solar air vent & check valve
23.	95 605 077	Solar check valve (return)
24.	5119536	Solar temperature sensor - panel (not shown)
25.	95 607 218	Solar temperature sensor - cylinder (not shown)
26.	5119779	Solar expansion vessel self sealing connection (not shown)
27.	95 607 221	Solar expansion vessel washer (not shown)
28.	95 607 229	Solar o rings
29.	95 611 014	Solar washers (not shown)
30.	95 605 078	Divertor valve (not shown)
31.	95 612 040	Solar thermal cut out
32.	95 607 034	Central heating expansion vessel
33.	95 607 314	Central heating expansion vessel hose
34.	95 605 032	Central heating circulating pump
35.	95 605 036	Central heating pressure relief valve
36.	95 605 034	Central heating automatic by pass valve
37.	95 607 039	Central heating filing loop
38.	95 605 035	Central heating isolating valve
39.	95 605 031	Central heating automatic air vent
40.	95 605 038	Central heating drain valve
41.	95 607 044	Programmable room thermostat (not shown)

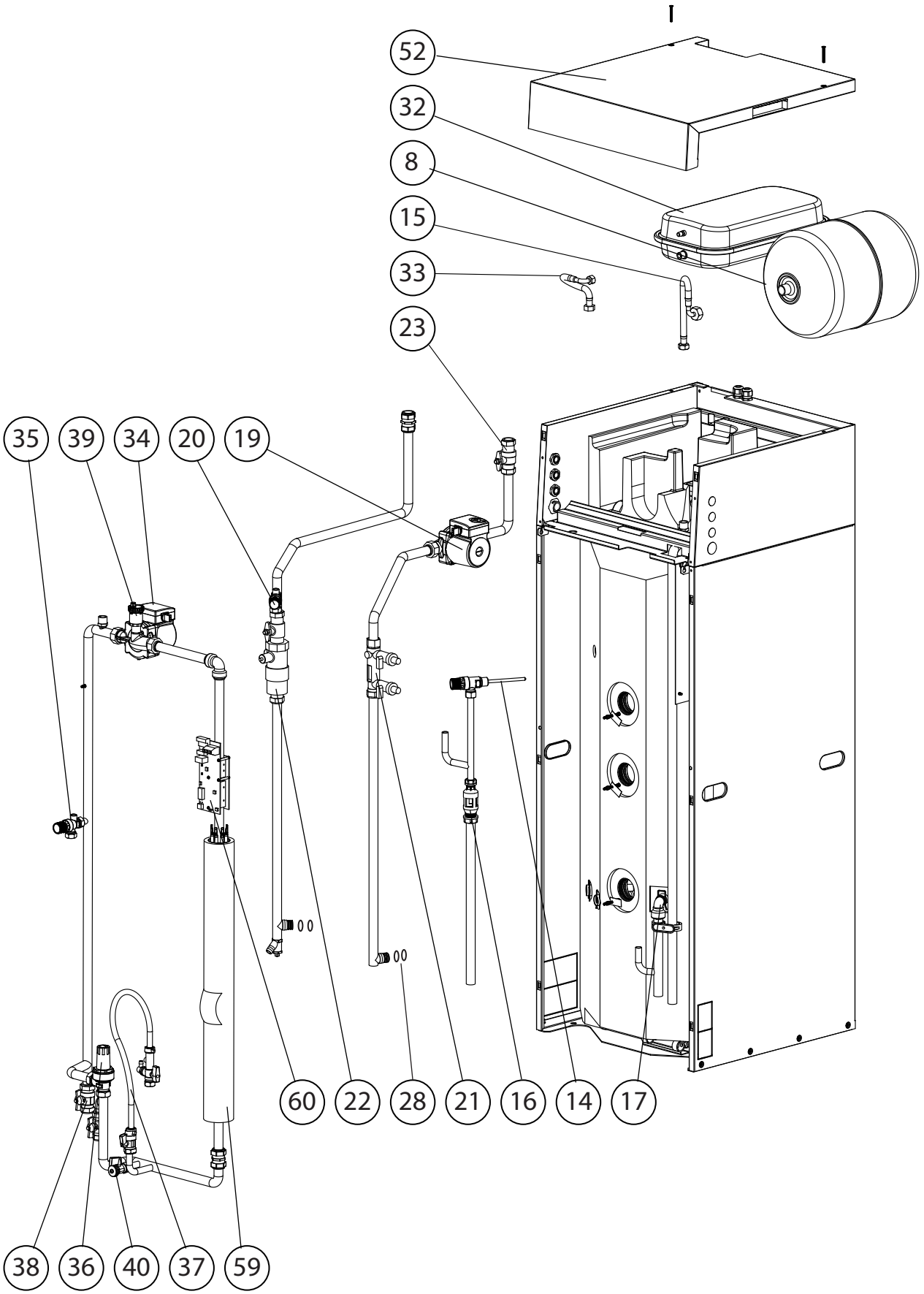
FIGURE 45: SPARES

CONTROL PANEL, FRONT VIEW, FRONT COVER OPEN



CONTROL PANEL, REAR VIEW, REAR COVER REMOVED.

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42.	95 613 002	Black switch
43.	95 613 001	Green switch
44.	95 607 033	Green neon
45.	95 612 034	Control panel fuse
46.	95 615 059	Solar controller connection PCB
47.	95 615 060	Solar controller display PCB east west
	95 615 061	Solar controller display PCB
48.	95 612 709	Solar PCB fuse (not shown)
49.	95 607 268	Solar pressure gauge
50.	95 607 269	Central heating pressure gauge
51.	95 615 008	Electric boiler control PCB radiator
	95 615 053	Electric boiler control PCB underfloor
52.	95 608 007	Top panel
53.	95 608 008	Front panel (upper)
54.	95 608 009	Front panel 185 (lower)
	95 608 010	Front panel 220 (lower)
	95 608 011	Front panel 250 (lower)
55.	95 614 113	Electromax solar control panel front cover
56.	95 614 114	Electromax solar control panel front moulding
57.	95 614 115	Electromax solar control panel rear cover (not shown)
58.	95 608 012	Control panel 185 radiator (complete)
	95 608 013	Control panel 220 radiator (complete)
	95 608 014	Control panel 250 radiator (complete)
	95 608 015	Control panel 185 underfloor (complete)
	95 608 016	Control panel 220 underfloor (complete)
	95 608 017	Control panel 250 underfloor (complete)
	95 608 018	Control panel 185 radiator east west (complete)
	95 608 019	Control panel 220 radiator east west (complete)
	95 608 020	Control panel 250 radiator east west (complete)
	95 608 021	Control panel 185 underfloor east west (complete)
	95 608 022	Control panel 220 underfloor east west (complete)
	95 608 023	Control panel 250 underfloor east west (complete)
59.	95 608 002	Electric Boiler Heat Exchanger
60.	95 615 047	Electric boiler main PCB
61.	95 612 709	Electric boiler PCB fuse (not shown)
62.	95 613 628	Temperature Switch (not shown)
63.	95 612 706	Thermistor Assembly (not shown)

10.0 ACCESSORIES

The following accessories are available for the Electromax Solar:

PART NUMBER	DESCRIPTION
95 970 517	1 Panel, On Roof, Slate & Tile
95 970 518	2 Panel, On Roof, Slate & Tile
95 970 519	2 Panel, On Roof, Slate & Tile , East / West Array
95 970 520	3 Panel, On Roof, Slate & Tile , East / West Array
95 970 521	1 Panel, On Roof, A Frame
95 970 522	2 Panel, On Roof, A Frame
95 970 523	1 Panel In Roof, Slate
95 970 524	2 Panel In Roof, Slate
95 970 525	1 Panel In Roof, Tile
95 970 526	2 Panel In Roof, Tile
95 970 527	2 Panel In Roof, Slate, East / West Array
95 970 528	3 Panel In Roof, Slate, East / West Array
95 970 529	2 Panel In Roof, Tile, East / West Array
95 970 530	3 Panel In Roof, Tile, East / West Array
5122762	Multifit Solar 6 X 22mm High Temperature Pipe Compression Fittings - MALE
5122763	Multifit Solar 6 X 22mm High Temperature Pipe Compression Fittings - FEMALE
5122764	Multifit Solar 6 X 22mm High Temperature Pipe Compression Fittings - TEE
5122238	Multifit Solar 30m Flexible Stainless Steel Pipe kit
5130225	Multifit Solar Solar Fluid Type LS 20 Ltr (Pink) Can be used to fill either panel or tube collectors
5119549	Multifit Solar Solar Fluid Type L 20 Ltr (Blue) Can be used to fill panel collectors
5130234	Multifit Solar Electric Fluid Filling Pump
5122761	Multifit Solar Electric Hand Filling Pump
5122237	Multifit Solar 13m Solar Senor Wire
5119559	Multifit Solar Refractometer Antifreeze Test Kit
5122979	Solar Gain Flow Meter
5122980	Solar Gain Sensor
95 970 539	Solar Sensor Wire Connection Box
95 970 540	Roof Tile Flashing for Solar Panel Pipes

11.0 GUARANTEE

This Electromax Solar is guaranteed against faulty materials and manufacture provided that:

- The Electomax Solar has been installed in accordance with the installation and service instructions and all relevant Codes of Practice and Regulations in force at the time of installation, and that all necessary controls and safety valves have been fitted correctly.
- Any valves and controls fitted are of Heatrae Sadia recommended type and specification.
- The Electromax Solar has not been modified or tampered with in any way, and has been regularly maintained as detailed in these instructions.
- The domestic hot water cylinder has only been used for the storage of wholesome water as defined by the Water Supply (Water Fittings) Regulations 1999.
- The central heating primary circuit has been flushed and treated with a suitable inhibitor and is used only for domestic heating purposes.
- Within 60 days of installation the user completes and returns the guarantee registration card supplied with the unit in order to register the product.

The unit is not guaranteed against damage by frost, and the immersion heaters are not guaranteed against excessive scale build-up.

Periodic loss of charge pressure from the expansion vessels is normal (indicated by an intermittent discharge of water from the pressure relief valves) and is not covered under the product guarantee.

The following guarantee periods apply from the date of purchase:

Stainless steel domestic hot water cylinder	10 years
All other components	2 years

This guarantee does not affect your statutory rights.

12.0 ENVIRONMENTAL INFORMATION

This product is manufactured from many recyclable materials. At the end of its useful life it should be disposed of at a Local Authority Recycling Centre in order to realise the full environmental benefits.

Insulation of the domestic hot water cylinder is by means of an approved CFC/HCFC free polyurethane foam with an ozone depletion factor of zero and a Global Warming Potential (GWP) of 3.1.

13.0 COMMISSIONING AND SERVICE RECORD.

ELECTROMAX SOLAR INSTALLATION

Installation Date:_____
Model and Serial Number: _____
Installer (Plumbing): _____
Contact Details: _____
Competency Scheme & ID Number: _____
Building Control Notification Number: _____
Installer (Electrical): _____
Contact Details: _____
Competency Scheme & ID Number: _____
Building Control Notification Number: _____

COLLECTOR INSTALLATION

Installation Date: _____
Model and Serial Number: _____
Installer: _____
Contact Details: _____
Competency Scheme & ID Number: _____
Building Control Notification Number: _____

DOMESTIC HOT WATER COMMISSIONING

Mains supply pressure and flow rate	
Cold water combination valve fitted	
Discharge pipework in line with G3	
Pipework checked for leaks	
Pipework bonded	
Expansion vessel pressure checked	
Pressure relief valve operation checked	
Temperature and pressure relief valve operation checked	
Immersion heater settings checked	
Immersion heater operation checked	

SOLAR PRIMARY CIRCUIT COMMISSIONING

Pipework checked for leaks	
Pipework bonded	
System pressure checked	
Expansion vessel pressure checked	
Discharge pipework installed	
Expansion relief valve operation checked	
Circulating pump operation checked.	

CENTRAL HEATING PRIMARY CIRCUIT COMMISSIONING

Pipework checked for leaks	
Pipework bonded	
System pressure checked	
Expansion vessel pressure checked	
Pressure relief valve operation checked	
Circulating pump operation checked	
Room thermostat programmed	
Electric boiler operation checked	
Filing loop disconnected	
Automatic bypass valve set	

SERVICE RECORD

Service Date:_____
Engineer: _____
Contact Details: _____
Competency Scheme & ID Number: _____
Comments: _____
_____
_____

Service Date:_____
Engineer: _____
Contact Details: _____
Competency Scheme & ID Number: _____
Comments: _____
_____
_____

Service Date:_____
Engineer: _____
Contact Details: _____
Competency Scheme & ID Number: _____
Comments: _____
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Service Date:_____
Engineer: _____
Contact Details: _____
Competency Scheme & ID Number: _____
Comments: _____
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Service Date:
Engineer:
Contact Details:
Competency Scheme & ID Number:
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Contact Details:
Competency Scheme & ID Number:
Comments:

Service Date:
Engineer:
Contact Details:
Competency Scheme & ID Number:
Comments:

Service Date:
Engineer:
Contact Details:
Competency Scheme & ID Number:
Comments:

14.0 SPARES STOCKISTS

For the fast and efficient supply of spares please contact the stockists listed below.

Advanced Water Company Ltd.
Unit D5 Enterprise way
Vale park, Evesham
Worcs, WR11 1GS
Tel: 01386 760066
Fax: 01386 760077

Electric Water Heating Co.
2 Horsecroft Place, Pinnacles
Harlow, Essex, CM19 5BT
Tel: 0845 0553811
E-Mail: sales@ewh.co.uk

SPD
Units 9 & 10 Hexagon Business Centre
Springfield Road, Hayes
Middlesex, UB40 0TY
Tel: 020 8606 3567

Parts Center
Tel: 0845 2709800
www.partscenter.co.uk

Newey & Eyre
Specialist Products Division
Please contact your local branch

UK Spares Ltd.
Tower Lane, Warmley
Bristol, BS30 8XT
Tel: 0117 961 6670

William Wilson Ltd.
Unit 3A, 780 South Street
Whiteinch, Glasgow, G14 OSY
Tel: 0141 434 1530