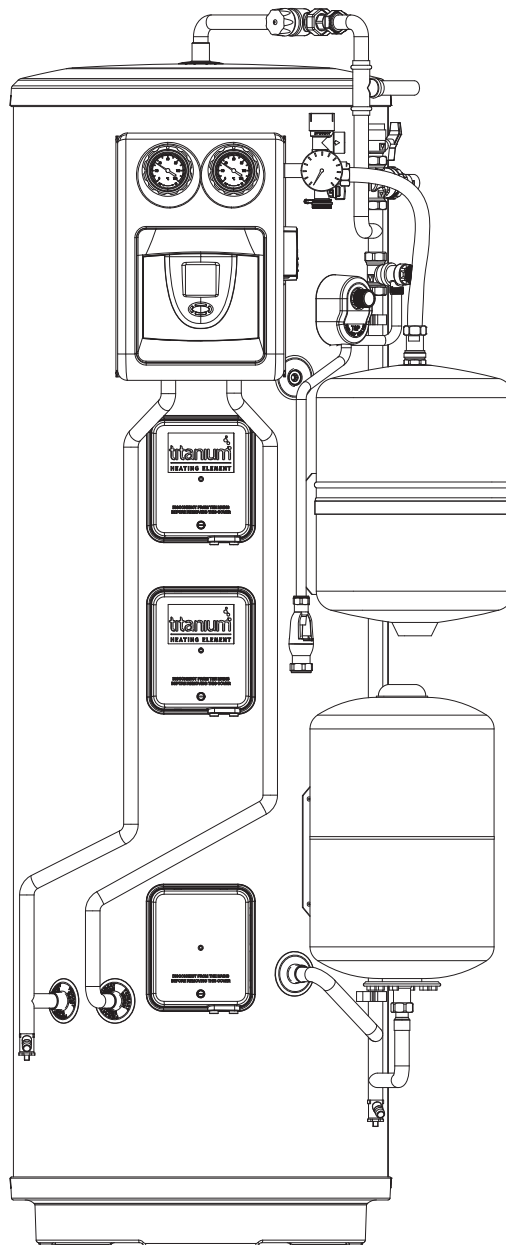




MEGAFLO Eco SolaReady Unvented Hot Water Cylinders



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Thank you for purchasing a high quality Megaflo Eco SolaReady Solar Thermal Domestic Hot Water System.

The sun is the ultimate source of most of our renewable energy supplies. Energy from the sun is clean and abundant.

There is a widely held opinion that the UK does not have enough sun to make solar systems worthwhile. In fact parts of the UK have annual solar radiation levels equal to 60% of those experienced at the equator.

However, this energy is not received uniformly throughout the year. Some 70% of UK annual radiation is received over the period April to September and 25% is received in the months of June and July.

Solar water heating technology captures energy from the sun and transfers this to a water heater to raise the water temperature therefore reducing the reliance on fossil fuel energies such as gas, oil and electricity. Up to 60% of a dwelling's annual hot water requirement can be provided by a solar water heating system. The balance is provided by traditional means via a second heat exchanger connected to a fossil fuel boiler or electrical heating by electric boiler or immersion heater.

The Megaflo Eco SolaReady water heating system provides all the principal components required for an efficient solar water heating system. The sun's energy is captured by a series of solar collector panels 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 Megaflo Eco SolaReady solar 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. Heating by the solar coil is controlled by a solar differential temperature controller that ensures the system will only operate when there is useful solar heating gain at the collector panel. As the sun's energy input to the collector panels is variable supplementary heating by a conventional boiler or electric immersion heater should be provided.



The Benchmark™ Scheme

Benchmark™ places responsibilities on both manufacturers and installers. The purpose is to ensure that customers are provided with the correct equipment for their needs, that it is installed, commissioned and serviced in accordance with the manufacturer's instructions by competent persons and that it meets the requirements of the appropriate Building Regulations. The Benchmark™ Checklist can be used to demonstrate compliance with Building Regulations and should be provided to the customer for future reference. Installers are required to carry out installation, commissioning and servicing work in accordance with the Benchmark™ Code of Practice which is available from the Heating and Hotwater Industry Council who manage and promote the Scheme.

Visit www.centralheating.co.uk for more information.

IMPORTANT NOTE TO USER: PLEASE REFER TO THE USER GUIDE SECTION ON PAGE 2 FOR IMPORTANT INFORMATION WITH RESPECT TO THE BENCHMARK SCHEME

Introduction

Congratulations on your purchase of a Megaflo Eco SolaReady unvented water heater. The Megaflo Eco SolaReady is manufactured in the UK from top quality materials and meets all the latest relevant safety and constructional standards. The high grade Duplex stainless steel cylinder offers exceptional strength and corrosion resistance which is backed by a Lifetime guarantee* Its performance and insulation levels exceed the latest requirements of Building Regulation Part L.

The Megaflo Eco SolaReady unvented water heater can be fed directly from the cold water mains supply to the property without the need for separate feed cisterns or vent pipes. It is supplied complete with all its necessary inlet and safety controls, electric immersion heater(s) and, for indirect units, a cylinder thermostat, thermal cut-out, 2-port motorised valve and wiring centre.

Generally its pressure and flowrate performance will far exceed that from a comparable vented system, thermal store, multipoint instantaneous gas heater, or combination boiler.

Please read and understand this product guide before starting work.

Please leave this product guide with the user following installation.

*See terms and conditions of user guide.

Component Checklist – see figure 1

Before commencing installation check that all the components for your Megaflo Eco SolaReady unit are contained in the package. The following components are supplied as standard with your Megaflo Eco SolaReady unit:

Supplied attached

- Tundish
- Factory fitted Indirect Thermostat and Thermal cut-out (Indirect units only)
- Factory fitted immersion heater(s) and thermal controls
- Cold Water Inlet Control Kit, comprising of:
 - 3 Bar Pressure Reducing Valve (Fig 3) Page 8
 - 8 Bar Pressure Relief Valve (Fig 4) Page 9
 - Stop cock
 - Drain Valve
- Factory fitted Temperature / Pressure Relief Valve (set at 90°C / 1 Mpa (10bar))
- Thermostatic blending valve

Supplied loose

- T&P Relief Valve Insulation Set
- Wiring Centre (Indirect units only)
- 2-Port Motorised Valve (Indirect units only)
- Solar circuit expansion vessel (including mounting bracket)
- DHW expansion vessel (including mounting bracket)
- Flexible solar expansion vessel connection pipe

Please note: For East / West array installations, the following kit is required: 95 970 169

General Requirements

Important: Please read and understand this product guide before installing the Megaflo Eco SolaReady water heater. Incorrect installation may invalidate the guarantee. This appliance is not intended for use by persons (including children) with reduced physical, sensory or mental capabilities, or lack of knowledge and experience, unless they have been given supervision or instruction concerning the use of the appliance by a person responsible for their safety. The Megaflo Eco SolaReady must be Installed, Commissioned and Maintained by a competent installer in accordance with Building Regulation G3 (England and Wales), Technical Standard P3 (Scotland) or Building Regulation P5 (Northern Ireland) and the Water Fitting Regulations (England and Wales) or Water Byelaws (Scotland). Following Installation and Commissioning, the operation of the heater should be explained to the user and the user guide left with them for future reference.

Storage

The Megaflo Eco SolaReady is supplied on a pallet with its associated control kits. It should be stored upright in a clean, dry, frost-free environment prior to installation.

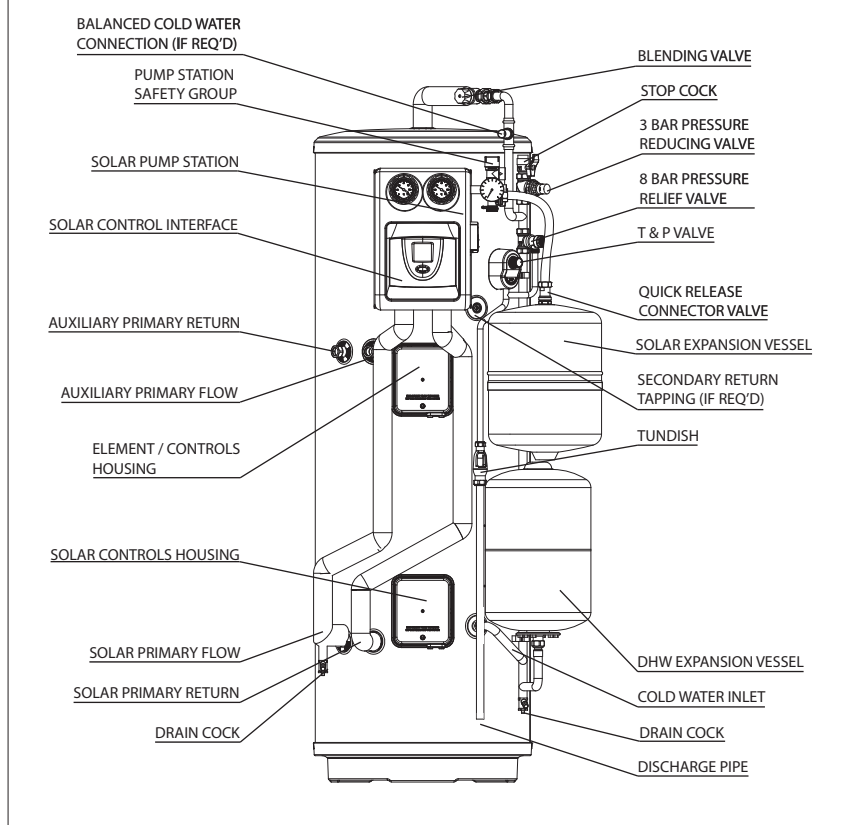
Siting the Megaflo Eco SolaReady (See Figure 1)

The Megaflo Eco SolaReady unit must be vertically floor mounted. It can be placed anywhere convenient provided the discharge pipe(s) from its safety valves can be correctly installed. Areas that are subject to freezing must be avoided. Ensure that the floor is of sufficient strength to support the "full" weight of the unit (refer to Tables 2 and 3 on page 7 for unit weights). Pipe runs should be kept as short as possible for maximum economy. Access to associated controls, immersion heaters and indirect controls should be possible for servicing and maintenance of the system.

Please do not install valves or pipework (except discharge pipe) within 50mm (2") of the T&P relief valve to allow your insulation set to be fitted. The insulation set is important to ensure heat and energy conservation. See page 12 for more information.

To aid installation, the Megaflo Eco SolaReady is provided with lifting points located in the base moulding and two lifting aids mounted on the upper rear casing. The weights of the units are noted on the tables on page 7, see tables 2 and 3.

Figure 1 – Component Checklist



Outlet / Terminal Fittings (Taps, Etc.)

The Megaflö Eco SolaReady can be used in conjunction with most types of terminal fittings. It is advantageous in many mixer showers to have balanced hot and cold water supplies, in these instances the balanced cold water supply should be teed off the supply to the Megaflö Eco SolaReady immediately after the Cold Water Combination Valve (See Figure 5 page 10). A connection is provided for this purpose, if not used it should be capped off with a suitable stop end fitting. Branches to cold drinking outlets should be taken before the valve.

Outlets situated higher than the Megaflö Eco SolaReady unit will give outlet pressures lower than that at the heater, a 10m height difference will result in a 0.1 Mpa (1 bar) pressure reduction at the outlet fitting.

NOTE: Accessories should have a rated operating pressure of at least 0.8 MPa (8 bar).

Limitations

The Megaflö Eco SolaReady unvented water heater should not be used in any of the following instances:

- Solid fuel boilers or any other boiler in which the energy input is not under effective thermostatic control unless additional and appropriate safety measures are installed.
- Gravity circulation primaries.
- Steam heating plant unless additional and appropriate safety devices are installed.
- Ascending spray type bidets or any other Class 5 back syphonage risk requiring that a Type AA, AB, AD or AG air gap be employed.
- Water supplies that have either inadequate pressure or where the supply may be intermittent.
- Situations where it is not possible to safely pipe away any discharge from the safety valves.
- Areas where the water consistently contains a high proportion of solids, eg. suspended matter that could block the strainer, unless adequate filtration can be ensured.
- The installation must be carried out in accordance with the relevant requirements of:
 - The appropriate Building Regulations: either The Building Regulations (England), The Building Regulations (Scotland) or Building Regulations (Northern Ireland).
 - The Water Fittings Regulations (England and Wales) or Water Byelaws (Scotland).

Water Supply

Bear in mind that 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 checked to ensure this demand can be met.

NOTE: A high mains water pressure will not always guarantee high flow rates.

Wherever possible the main supply pipe should be in 22mm. The minimum mains water supply requirements should be 0.15 MPa (1.5 bar) working pressure and 20 litres per minute flowrate.

At these values outlet flowrates may be poor if several outlets are used simultaneously, the higher the available pressure and flowrate the better the system performance will be.

The Megaflo Eco SolaReady has an operating pressure of 3 bar which is controlled by the 3 Bar Pressure Reducing Valve. The 3 Bar Pressure Reducing Valve can be connected to a maximum mains supply pressure of 1.6 MPa (16 bar). The water supply must be of wholesome water quality (Fluid Category 1 as defined by the Water Supply Regulations 1999).

The Megaflo Eco SolaReady is only to be used for the storage of wholesome water (max. 250mg/l chloride).

Electrical Supply

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 MEGAFLO ECO SOLAREADY.

The Environment

This product is made from many recyclable materials, therefore 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 is by means of an approved HCFC/CFC free polyurethane foam.

Specifications and Dimensions

Outline Specifications

Maximum mains water supply pressure (to Cold Water Combination Valve)	1.6 MPa (16 bar)
Operating pressure (Pressure reducing valve set pressure – non adjustable)	0.3 MPa (3 bar)
Maximum primary circuit pressure	0.3 MPa (3 bar)
Expansion relief valve set pressure	0.8 MPa (8 bar)
Temperature / Pressure Relief Valve set temp / pressure	90°C / 1MPa (10 bar)
Immersion heater rating (a.c. supply only)	3kW @ 240V, 2.7kW @ 230V

Outer casing:

White polyester coated corrosion resistant steel.

Water container:

Duplex stainless steel. 100% pressure tested to 1.5 MPa (15 bar).

Thermal insulation:

CFC/HCFC free fire retardant expanded polyurethane foam with zero ozone depletion potential. It has a Global Warming Potential (GWP) of 3.1. Nominal thickness 60mm.

Pipe connections:

All connections accept 22mm outside diameter pipe – compression nuts and olives supplied. Thread rate is ¾" BSP male parallel to accept standard ¾" BSP female fittings if required.

Safety features:

Solar primary

Manually resettable thermal cutout on electrical supply to solar differential controller

Direct units

Manually resettable thermal cut-out on each heating element

Factory fitted Temperature / Pressure Relief Valve

Indirect units

Manually resettable thermal cut-out on heating element

Manually resettable thermal cut-out for primary heating. Must be wired in conjunction with 2-port motorised valve supplied

Factory fitted Temperature / Pressure relief valve

Figure 2 – Cylinder sizing and specification

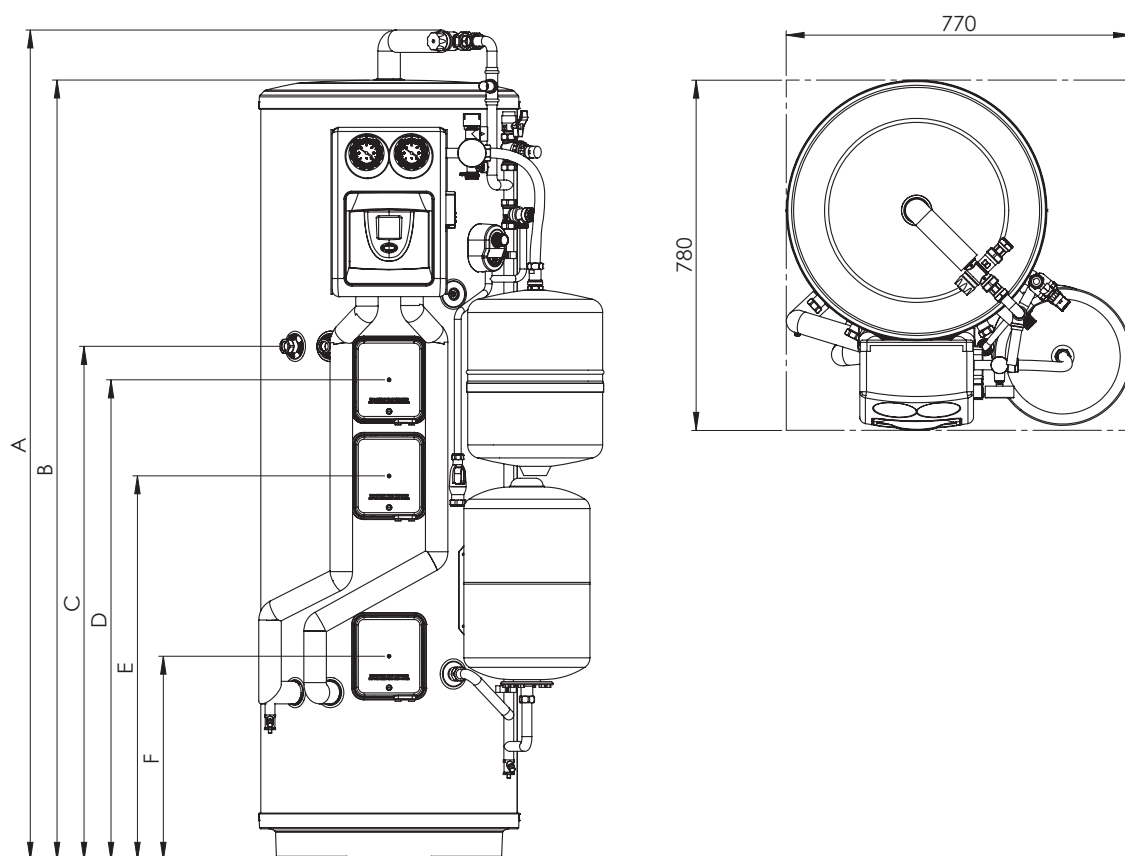


Table 1

Size	Type	Dimensions (mm)					
		A	B	C	D	E	F
250	Indirect	1845	1734	1142	1068	-	454
260	Direct	1909	1798	-	1165	916	454
300	Indirect	2160	2048	1438	1255	-	454

Table 2

Size	Unit weight (kg)		Auxiliary volume (litres)	Heat up times (mins)		
	Empty	Full		Lower (3kW)	Upper and lower (6kW)	Upper (3kW)
260	47.3	307.3	170	178	89	60

Table 3

Size	Unit weight (kg)		Auxiliary volume (litres)	Auxiliary coil specification			
	Empty	Full		Surface (m²)	Heat up (mins)	Recovery (mins)	Rating (kW)
250	56.5	306.5	145	0.73	24.5	20	18.7
300	66.5	366.5	175	0.79	22.5	19	24.5

Notes:

Heat up and recovery times are based on heating the cylinder from 15°C to 60°C.

Primary heating times are based on a primary flow temperature of 80°C at a flowrate of 15 l/min.

Table 4

Nominal capacity (litres)	Standing heat loss	
	Per day (kWh/24h)	Per year (kWh/year)
250	1.56	569.40
260	1.63	594.95
300	1.84	671.60

Table:

Figures measured in accordance with KIWA Test Criteria for compliance with UK Building and Water Regulations

Direct	
Supplier's name or trade mark	Megaflo Eco SolaReady
Supplier's model identifier	260D
Storage volume V in litres	260.0
Mixed water at 40 °C V40 in litres	271.0
The declared load profile	XL
The water heating energy efficiency class of the model	C
The water heating energy efficiency in %	38.3
The annual electricity consumption in kWh	4377
Daily fuel consumption Q _{fuel} in kWh	20.190
The thermostat temperature settings of the water heater, as placed on the market by the supplier	60°C
Specific precautions that shall be taken when the water heater is assembled, installed or maintained and disposed of at end of life	See page 4 to 42

Indirect		
Model(s)	250Si	300Si
Energy efficiency class	C	C
Storage volume V in litres	250.0	300.0
Standing loss in W	80.0	88.0

Table: Technical parameters in accordance with European Commission regulations 814/2013 and 812/2013

General Installation

Pipe Fittings

All pipe connections to the Megaflo Eco SolaReady are made via 22mm compression fittings directly to the unit (nuts and olives supplied).

Cold Water Supply

A 22mm cold water supply is recommended, however, if a 15mm (½") supply exists which provides sufficient flow (see Section 1 Page 6 "Water Supply") this may be used. More flow noise may be experienced from small bore pipes due to the increased water velocity through them.

The Cold Water Inlet Control kit supplied fitted to the Megaflo Eco SolaReady incorporates a full flow isolating valve which will enable the Megaflo Eco SolaReady to be isolated from the mains supply for maintenance or servicing. To close the valve the blue handle should be turned so that it lies at 90° to the direction of flow. To open, turn the handle so that it lies parallel to the direction of flow.

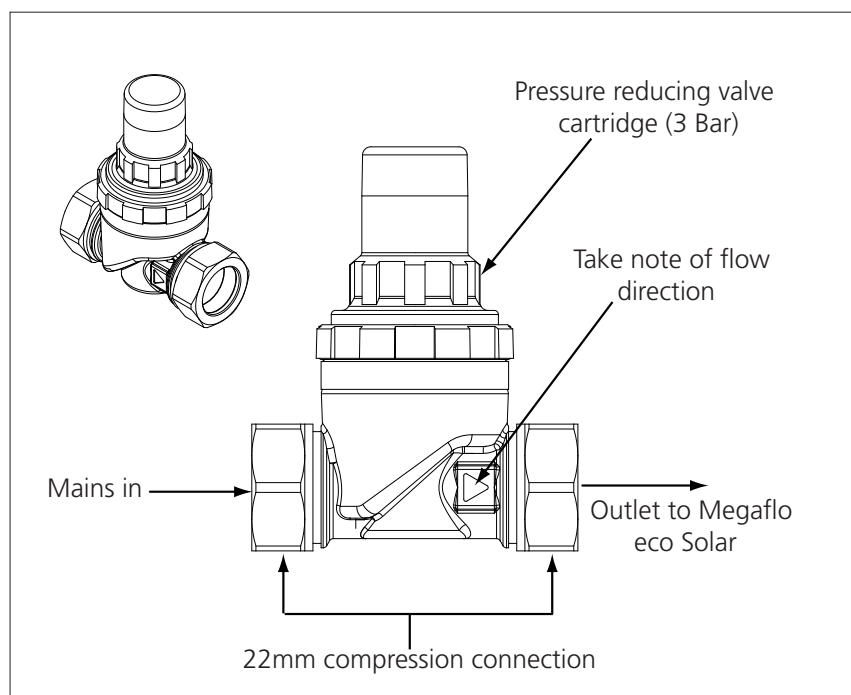
3 Bar Pressure Reducing Valve – supplied fitted (see figure 3)

The 3 Bar pressure Reducing Valve is installed as a complete one-piece unit and incorporates the stopcock. The valve incorporates a factory set, non-adjustable Pressure Reducer / Strainer and a single Check Valve. However, the 3 Bar Pressure Reducing Valve can be connected anywhere on the cold water mains supply prior to the Megaflo Eco SolaReady unit. There is no requirement to site it close to the unit, it can be located at a point where the mains supply enters the premises if this is more convenient but you must install a non-return valve just after the reducing valve for ease of maintenance.

If a balanced pressure cold water supply is required to a thermostatic shower mixer valve this may be teed off the supply to the Megaflo Eco SolaReady immediately after the 3 Bar Pressure Reducing Valve (See Figure 5, page 10).

A connection is provided for this purpose (see fig 1 page 5). If this is not required the connection pipe must be capped off with a suitable stop end fitting.

Figure 3 – 3 Bar Pressure Reducing Valve



8 Bar Pressure Relief (Expansion) Valve – supplied fitted (see figure 4)

This is installed between the 3 bar Pressure Reducing Valve and the Megaflo Eco SolaReady cylinder. Branches to drinking water outlets should be taken before the Pressure Relief Valve to avoid the possibility of warm expanded water being drawn from the tap.

The Pressure Relief (Expansion) Valve is supplied pre-plumbed to the inlet connection of the Megaflo Eco SolaReady unit. No other valve should be fitted between the Pressure Relief (Expansion) Valve and the cylinder inlet.

Figure 4 – 8 Bar Pressure Relief Valve

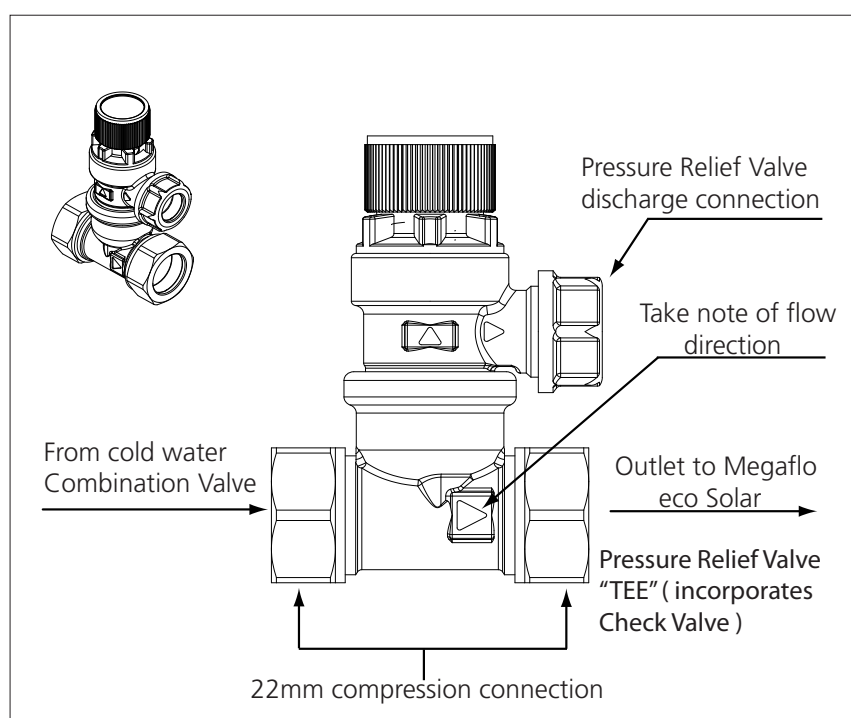


Figure 5 – Cold and hot water supply circuits

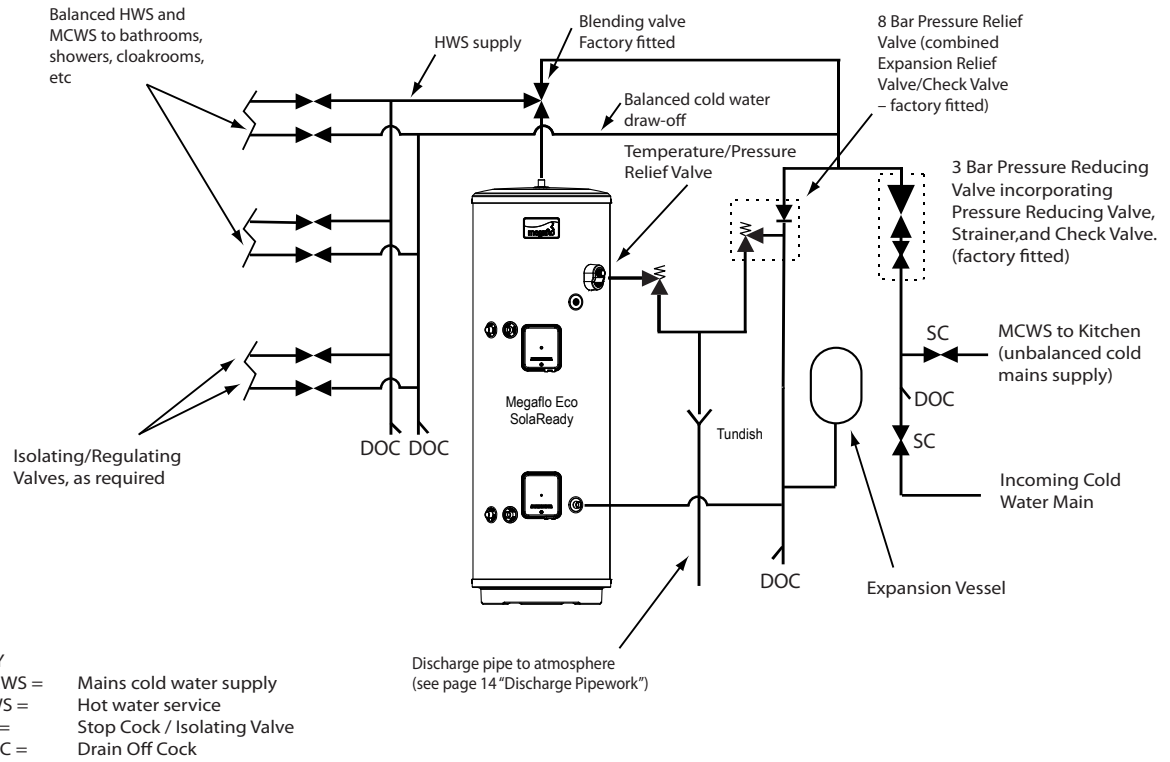
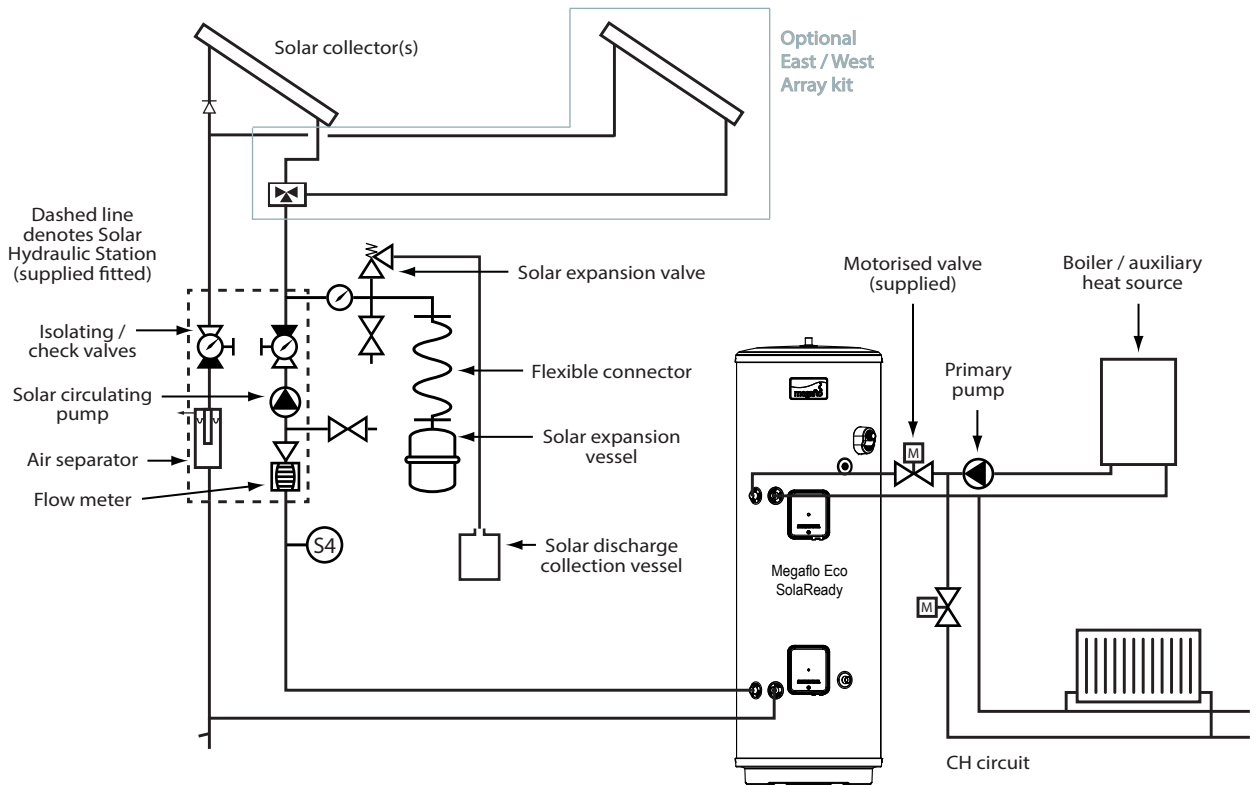


Figure 6 – Solar and CH primary circuits



Drain Tap

A drain tap is supplied fitted in the cold water supply to the Megaflo Eco SolaReady unit between the 8 Bar Pressure Relief Valve and the heater at the lowest point of the cold water supply pipe. It is recommended that the outlet point of the drain pipe work be at least 1 metre below the level of the heater (this can be achieved by attaching a hose pipe to the drain tap outlet spigot). Ensure any drain-off points are positioned well away from any electrical components.

Outlet Pipework

Ideally the pipework from the Megaflo Eco SolaReady to the outlet fittings should be in 22mm pipe with short runs of 15mm pipe to showers and basin taps. Small bore pipe can also be used to suit some taps, but runs should be of minimum length. Pipe sizes may vary due to system design.

Thermostatic blending valve

The hot outlet pipework is connected to the "blended water" port of the thermostatic blending valve which is factory fitted. The valve is preset to a temperature of 55°C, but can be set to a maximum of 65°C $\pm 2^\circ\text{C}$.

NOTE: Storage temperature must be set at $>55^\circ\text{C}$ for the blended temperature to be achieved.

DHW expansion vessel

The Expansion Vessel accommodates expansion that results from heating the water inside the unit. The unit is pre-charged at 0.35 MPa (3.5 bar). The Expansion Vessel must be connected between the 8 Bar Pressure Relief Valve and the Megaflo Eco SolaReady cylinder (See Figure 5). An Expansion Vessel mounting bracket is supplied for this purpose.

NOTE: DO NOT USE THE POTABLE WATER EXPANSION VESSEL SUPPLIED WITH THE MEGAFLO ECO SOLAREADY FOR ANY OTHER PURPOSE. IT MUST NOT BE USED IN PLACE OF THE SOLAR PRIMARY SYSTEM EXPANSION VESSEL.

Secondary Circulation

If a secondary circulation system is required it is recommended that it be connected to the Megaflo Eco SolaReady as shown in Figure 7. To achieve this the 1/2" BSP Sensor Pocket must be removed. The secondary return pipe should be in 15mm pipe and incorporate a check valve to prevent backflow. A suitable WRAS approved bronze circulation pump will be required. On large systems, due to the increase in system water content, it may be necessary to fit additional expansion volume to the system by fitting an additional expansion vessel to the secondary circuit. This should be done if the capacity of the secondary circuit exceeds 10 litres. To conserve energy it is recommended any secondary circulation pump is timed to operate only during periods of water draw-off demands.

Pipe capacities (copper)

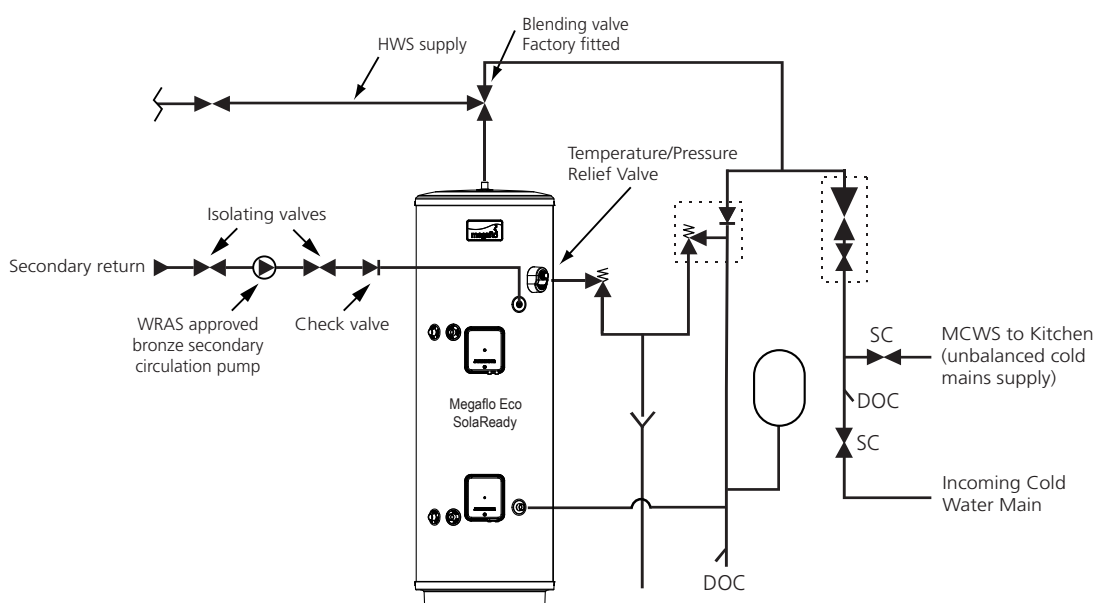
15mm o/d = 0.13 litres per metre run (10 litres = 77m)

22mm o/d = 0.38 litres per metre run (10 litres = 26m)

28mm o/d = 0.55 litres per metre run (10 litres = 18m)

NOTE: Secondary circulation is NOT recommended for direct electric units connected to an off-peak electrical supply.

Figure 7 – Secondary Circulation Connection



T&P Relief Valve Insulation

A set of insulating components is supplied with the Megaflo Eco SolaReady water heater and should be installed to gain maximum heat and energy saving benefits. See Figure 8 (below), for installation instructions.

Warnings

Under no circumstances should the factory fitted Temperature /Pressure Relief Valve be removed other than by authorised Heatrae Sadia personnel. To do so will invalidate any guarantee or claim.

The Cold Water Inlet Control kit must be fitted to the mains water supply to the Megaflo Eco SolaReady unit.

No control or safety valves should be tampered with.

Water may drip from the discharge pipe of the pressure relief device (Expansion Valve) and this pipe must be left open to atmosphere. The discharge pipe should not be blocked or used for any other purpose.

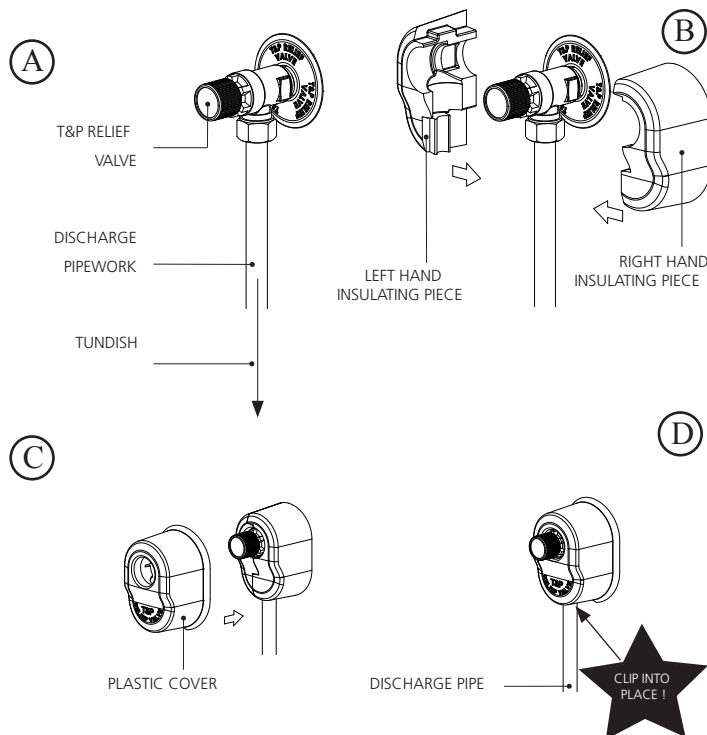
The discharge connections from the Pressure Relief (Expansion) Valve and the Temperature & Pressure Relief Valve must not be used for any other purposes.

Electrical connections and components should not be placed where they could be splashed in the event of a malfunction, i.e. away from any discharge pipe, the tundish and various valve and pipe connections.

Figure 8 – Installation of T&P insulation set

IMPORTANT INFORMATION: HOW TO INSULATE YOUR T&P RELIEF VALVE

TO SAVE HEAT AND ENERGY A SET OF INSULATING PARTS FOR THE T&P RELIEF VALVE HAVE BEEN SUPPLIED WITH THIS WATER HEATER. INSTALL THE HEATER FIRST THEN FIT THE INSULATING PARTS BY FOLLOWING THE DIAGRAMS BELOW.



Discharge Pipework

It is a requirement of Building Regulations that any discharge from an unvented system is conveyed to where it is visible, but will not cause danger to persons in or about the building. The tundish and discharge pipes should be fitted in accordance with the requirements and guidance notes of Building Regulations. Building Regulation G3 Requirements and Guidance are reproduced in the following sections.

For discharge pipe arrangements not covered by G3 Guidance advice should be sought from your local Building Control Officer. Any discharge pipe connected to the pressure relief devices (Expansion Valve and Temperature / Pressure Relief Valve) must be installed in a continuously downward direction and in a frost free environment.

The 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.

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".

Notes:

- 1) Discharge pipe-work D2 can now be a plastic pipe but only pipes that have been tested to a minimum 110°C must be used.
- 2) Discharge pipe D2 can now be plumbed into the soil stack but only soil stacks that can handle temperatures of 99°C or greater for prolonged periods should be used.

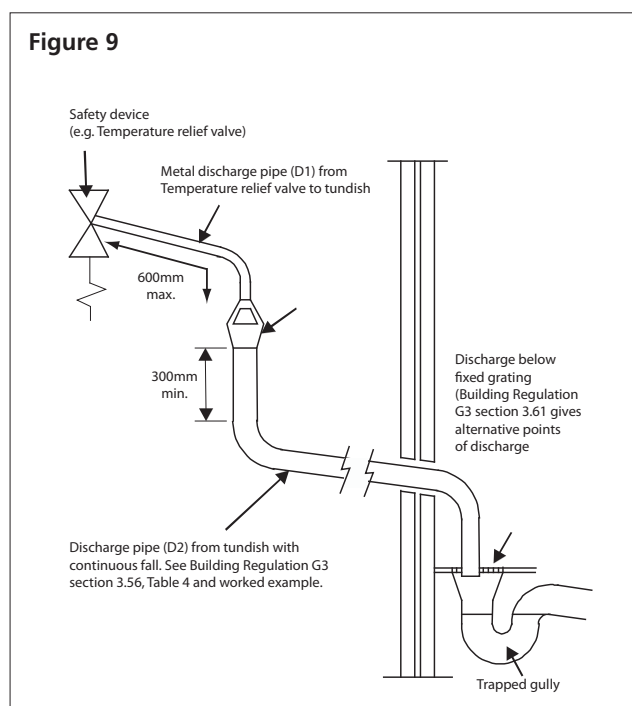


Table 5

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. no elbows or bends)	Resistance created by each elbow
G ½	15mm	22mm 28mm 35mm	Up to 9m Up to 18m Up to 27m	0.8m 1.0m 1.4m
G ¾	22mm	28mm 35mm 42mm	Up to 9m Up to 18m Up to 27m	1.0m 1.4m 1.7m
G 1	28mm	35mm 42mm 54mm	Up to 9m Up to 18m Up to 27m	1.4m 1.7m 2.3m

Worked example of discharge pipe sizing

This example is for a G½ 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 5:

Maximum resistance allowed for a straight length of 22mm copper discharge pipe (D2) from a G½ temperature relief valve is 9m.

Subtract the resistance 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 G½ temperature relief valve equates to 18m.

Subtract the resistance of 4 No. 28mm elbows at 1m each = 4m

Therefore the maximum permitted length equates to: 14m

As the actual length is 7m, a 28mm (D2) copper pipe will be satisfactory.

The following extract is taken from the latest G3 Regulations

Discharge pipes from safety devices

Discharge pipe D1

- 3.50 Safety devices such as temperature relief valves or combined temperature and pressure and pressure relief valves (see paragraphs 3.13 or 3.18) should discharge either directly or by way of a manifold via a short length of metal pipe (D1) to a tundish.
- 3.51 The diameter of discharge pipe (D1) should be not less than the nominal outlet size of the temperature relief valve.
- 3.52 Where a manifold is used it should be sized to accept and discharge the total discharge from the discharge pipes connected to it.
- 3.53 Where valves other than the temperature and pressure relief valve from a single unvented hot water system discharge by way of the same manifold that is used by the safety devices, the manifold should be factory fitted as part of the hot water storage system unit or package.

Tundish

- 3.54 The tundish should be vertical, located in the same space as the unvented hot water storage system and be fitted as close as possible to, and lower than, the valve, with no more than 600mm of pipe between the valve outlet and the tundish (see Diagram 1).

Note: To comply with the Water Supply (Water Fittings) Regulations, the tundish should incorporate a suitable air gap.

- 3.55 Any discharge should be visible at the tundish. In addition, where discharges from safety devices may not be apparent, e.g. in dwellings occupied by people with impaired vision or mobility, consideration should be given to the installation of a suitable safety device to warn when discharge takes place, e.g. electronically operated.

Discharge pipe D2

- 3.56 The discharge pipe (D2) from the tundish should:
 - (a) have a vertical section of pipe at least 300mm long below the tundish before any elbows or bends in the pipework (see Diagram 1); and
 - (b) be installed with a continuous fall thereafter of at least 1 in 200.
 - 3.57 The discharge pipe (D2) should be made of:
 - (a) metal; or
 - (b) other material that has been demonstrated to be capable of safely withstanding temperatures of the water discharged and is clearly and permanently marked to identify the product and performance standard (e.g. as specified in the relevant part of BS 7291).
 - 3.58 The discharge pipe (D2) should 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. for discharge pipes between 9m and 18m the equivalent resistance length should be at least two sizes larger than the nominal outlet size of the safety device; between 18 and 27m at least 3 sizes larger, and so on; bends must be taken into account in calculating the flow resistance. See Diagram 1, Table 1 and the worked example.
- Note: An alternative approach for sizing discharge pipes would be to follow Annex D, section D.2 of BS 6700:2006 Specification for design, installation, testing and maintenance of services supplying water for domestic use within buildings and their curtilages.
- 3.59 Where a single common discharge pipe serves more than one system, it should be at least one pipe size larger than the largest individual discharge pipe (D2) to be connected.
 - 3.60 The discharge pipe should not be connected to a soil discharge stack unless it can be demonstrated that that the soil discharge stack is capable of safely withstanding temperatures of the water discharged, in which case, it should:
 - (a) contain a mechanical seal, not incorporating a water trap, which allows water into the branch pipe without allowing foul air from the drain to be ventilated through the tundish;
 - (b) be a separate branch pipe with no sanitary appliances connected to it;
 - (c) if plastic pipes are used as branch pipes carrying discharge from a safety device they should be either polybutylene (PB) to Class S of BS 7291-2:2006 or cross linked polyethylene (PE-X) to Class S of BS 7291-3:2006; and
 - (d) be continuously marked with a warning that no sanitary appliances should be connected to the pipe.

Note:

- 1. Plastic pipes should be joined and assembled with fittings appropriate to the circumstances in which they are used as set out in BS EN ISO 1043-1.
- 2. Where pipes cannot be connected to the stack it may be possible to route a dedicated pipe alongside or in close proximity to the discharge stack.

Termination of discharge pipe

- 3.61 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.
- 3.62 Examples of acceptable discharge arrangements are:
 - b) to a trapped gully with the end of the pipe below a fixed grating and above the water seal;
 - (c) 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 a wire cage or similar guard is positioned to prevent contact, whilst maintaining visibility; and
 - (d) discharges at high level: e.g. into a metal hopper and metal downpipe with the end of the discharge pipe clearly visible or onto a roof capable of withstanding high temperature discharges of water and 3m from any plastic guttering system that would collect such discharges.
- 3.63 The discharge would consist of high temperature water and steam. Asphalt, roofing felt and non-metallic rainwater goods may be damaged by such discharges.

Installation of solar primary hydraulic station

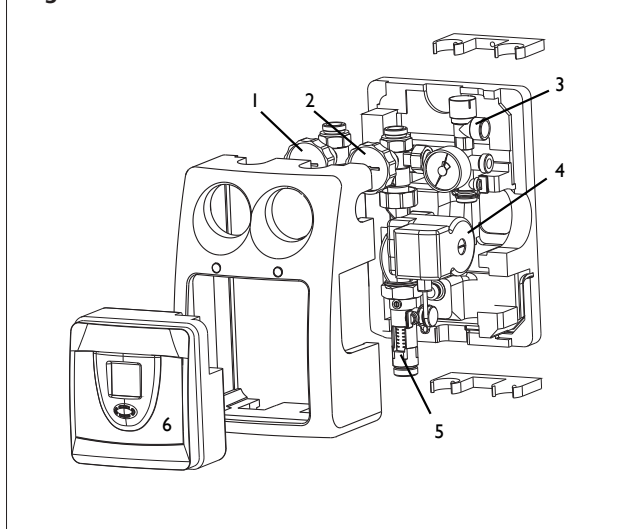
The solar primary hydraulic station and differential temperature controller are supplied pre-fitted to the Megaflo Eco SolaReady unit. The solar pump and various thermal sensors are pre-wired to the controller, but will require correct installation in the solar primary circuit.

Identification of components

The main components of the hydraulic station are:

- Two isolating valves (Fig. 10, Item 1 & 2) with integral thermometers which display the solar primary flow and return temperatures.
- A safety group (Fig. 10, Item 3), which protects the solar primary circuit. The pressure relief valve and pressure gauge are integrated in the safety group.
- A non-return valve in both feed and return prevents the possibility of gravity circulation in the solar primary circuit.
- A solar circulation pump (Fig. 10, Item 4).
- A flow meter with fill & drain valve and shut-off valve (Fig. 10, Item 5).
- An air separator.

Figure 10



The heat transfer fluid is circulated by the solar circulation pump integrated in the hydraulic pump station (Fig. 10).

The hydraulic station has a solar differential temperature controller (Fig. 10, Item 6) integrated into the front insulation moulding. This is pre-wired to the solar pump and thermal controls.

Pipework installation – general (see Fig 6)

In Solar Heating Systems, the collectors, the hydraulic station and solar cylinder must be connected with brazed or silver soldered copper pipes, compression fittings or the multifit accessory flexible steel tube and insulation. (See brochure for details) N.B. Plastic pipes MUST NOT be used for the solar primary pipework.

Connections supplied are suitable for pipe diameters of 22mm. However for short pipe runs (up to 10m flow and return) the use of 15mm diameter pipe is acceptable.

All connections and joints must be resistant to temperatures of up to 150°C and resistant to glycol.

If any pipe sealants are used these should be resistant to glycol and be able to withstand temperatures of up to 150°C.

The solar collectors (panels or evacuated tubes) must be installed according to the instructions supplied with those selected. We can only guarantee the system performance if installed in conjunction with Megaflo supplied collectors.

The difference in height between the highest point in the pipework (collector) and the level of the hydraulic pump station determines the static head for the system. The static head is 0.1 bar times this height in metres. This static head is used when setting the solar primary expansion vessel precharge pressure and the system pressure.

If the static head is greater than 1.5 bar (15m) then a larger expansion vessel may be required for larger collector arrays.

If the pipe runs between the solar collector and pump station are short (<6m) then a protection vessel (Accessory No. 5131963) should be installed between the pump station and expansion vessel.

Earthing pipework – all solar primary pipework between the solar collectors, hydraulic station and solar cylinder should be earth bonded in accordance with current IEE wiring regulations.;

Venting the pipework – the hydraulic station includes an air collector/separator and bleed point so an automatic air vent is not necessary. Any section of solar pipework that falls and rises again should be fitted with an additional air vent valve to relieve any trapped air which may cause air locking in the system. The automatic air vent and isolating valve used must be compatible with solar primary systems, i.e. be resistant to glycol and temperatures up to 180°C.

Insulating the pipework – external pipework should be insulated with high temperature resistant materials and be protected against UV degradation. The insulation must be peck-proof and rodent-proof. Internal pipework, especially through unheated spaces such as a loft space, should also be insulated with high temperature resistant materials. Mark the outside of any insulation to identify the flow and return pipes. The collectors are supplied with 2x2m pre insulated flexible stainless steel tubes. Additional lengths (30m) of stainless steel flexible tubes and high temperature insulation can be supplied.

Connecting the solar expansion vessel

Mount the solar expansion vessel (Fig 11 Item 5) adjacent to the hydraulic station so that the vessel can be connected to the vessel connection of the safety group (Fig 11 Item 3) using the flexible pipe (Fig 11 Item 6) supplied. (Note: Solar expansion vessel, mounting bracket, self sealing connection and flexible pipe are supplied in the Ancillary Components kit).

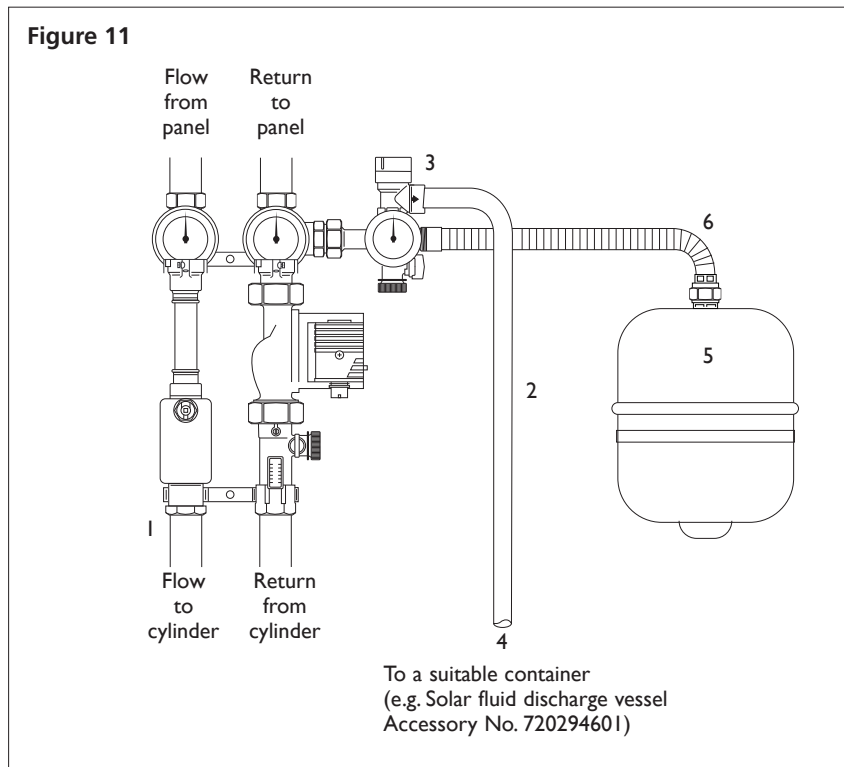
The vessel must be mounted as shown (connection to top) and securely supported using the bracket supplied. The self sealing vessel connection should be screwed onto the vessel connection before connecting the flexible pipe (Fig. 16 Item 5).

DO NOT replace the solar expansion vessel with either a potable water expansion vessel or boiler sealed system vessel.

The charge pressure of the solar expansion vessel must be adjusted (when the fluid circuit is empty or de-pressurised) to a pressure equal to the static head + 0.4 bar, or a minimum of 1.2 bar. (NOTE: the static head is the height difference between the highest point in the pipework (collector) and the hydraulic station in metres x 0.1 bar. The charge pressure should not normally exceed 1.9 bar – see also Commissioning of the hydraulic station (page 24).

Connecting pipework

Connect the flow and return pipes from the solar collector panels / tubes to the pump station via compression fittings (Fig 17). Fittings are for 22mm o/dia pipe. Support the hydraulic assembly when tightening connections.



Direct Model

Immersion Heater(s)

The Megaflo Eco SolaReady Direct is supplied with two factory fitted immersion heaters, each rated 3kW at 240V. See fig 2 page 7 for positions.

Wiring (See Figure 16)

All electrical wiring should be carried out by a competent electrician and be in accordance with the latest I.E.E. Wiring Regulations. Each circuit must be protected by a suitable fuse and double pole isolating switch with a contact separation of at least 3mm in both poles. The immersion heater(s) should be wired in accordance with Figure 14 below. The immersion heaters **MUST** be earthed. The supply cable should be a minimum of 1.5mm² 3 core HOFR sheathed.

DO NOT OPERATE THE IMMERSION HEATER(S) UNTIL THE MEGAFLO ECO SOLAREADY HAS BEEN FILLED WITH WATER.

Access to Control Unit:

DISCONNECT FROM MAINS SUPPLY BEFORE REMOVING ANY COVERS.

Removing the Control Cover:

Unscrew the large screw using a flat ended screw driver. Lift from bottom of cover at point indicated until cover comes away freely (see Fig 12).

Operation

See Figure 13 for details on how to adjust the temperature setting of the heater. The thermostat incorporates a thermal cut-out that will switch off the immersion heater in the event of a thermostat failure. The thermal cut-out reset button position is indicated on Figure 13. **DO NOT BYPASS THE THERMAL CUT-OUT IN ANY CIRCUMSTANCES.**

The lower immersion heater can be operated via the solar differential controller (refer to fig. 16, "Block wiring diagram C") for wiring details. See the Commissioning Section for setup details.

Note: The solar differential controller is rated at 3 amp and cannot directly switch the immersion heater. This must be done via the Auxiliary Immersion Relay provided. The upper immersion is for boost purposes only and should be manually switched via a separate 13 amp circuit.

Replacing the Control Cover:

Tilt and align the top 2 lugs in the holes indicated. Firmly press the cover until it "snaps" back in place. Tighten the large screw (**DO NOT OVER TIGHTEN**).

Safety

DO NOT BYPASS THE THERMAL CUT-OUT(S) IN ANY CIRCUMSTANCES

DISCONNECT FROM THE MAINS SUPPLY BEFORE REMOVING ANY COVERS

NEVER ATTEMPT TO REPLACE AN IMMERSION HEATER OTHER THAN WITH THE RECOMMENDED HEATRAE SADIA MEGAFLO ECO SOLAR SPARE PART

Figure 12

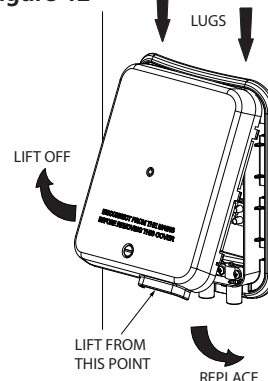


Figure 14

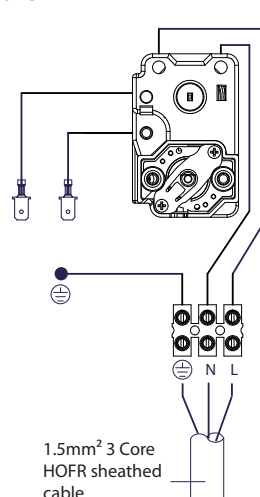
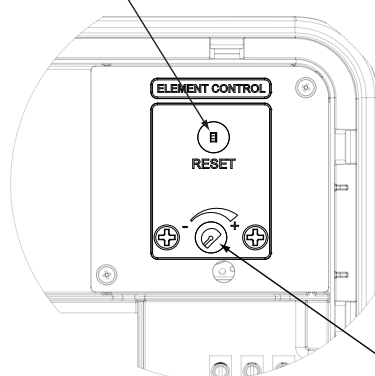


Figure 13

THERMAL CUT-OUT RESET BUTTON



SPINDLE POSITIONS

☺ = MINIMUM TEMP

☹ = MAXIMUM TEMP

☺ = APPROX 60 °C

ROTATE SPINDLE CLOCKWISE FOR TEMPERATURE INCREASE AND COUNTER CLOCKWISE FOR TEMPERATURE DECREASE

TEMPERATURE ADJUSTING SPINDLE

Indirect Model

Boiler Selection

The Megaflo Eco SolaReady Indirect models are supplied with an auxiliary heating coil and are suitable for use with most gas or oil fired boilers compatible with unvented systems i.e. fitted with a temperature control thermostat and thermal cut-out. If in doubt consult the boiler manufacturer. Solid fuel boilers or any other boiler in which the energy input is not under effective thermostatic control, unless additional and appropriate safety measures are installed, **SHOULD NOT** be used. The boiler used can either be a sealed system or open vented type, maximum primary circuit pressure 0.3Mpa (3 bar). The primary flow from the boiler **MUST** be pumped. Gravity circulation will not work due to the special design of the primary heat exchanger. It is recommended that an air bleed point or automatic air vent is incorporated in the primary return pipework close to the Megaflo Eco SolaReady unit. The boiler flow temperature should usually be set to 82°C (maximum flow temperature to primary heat exchanger 89°C). The boiler cannot be vented through the Megaflo eco Solar unit.

Indirect Thermal Cut-Out And 2-Port Motorised Valve

To comply with Building Regulations, and to prevent the Megaflo Eco SolaReady from overheating the 2-port motorised valve supplied **MUST** be fitted to the primary flow to the indirect coil (see Figure 6).

Wiring

All electrical wiring should be carried out by a competent electrician and be in accordance with the latest I.E.E. Wiring Regulations.

The Megaflo Eco SolaReady Indirect combined thermostat and thermal cut-out are factory pre-wired. The 2-port motorised valve supplied **MUST** be wired in series with the Indirect controls such that the power supply to the valve is interrupted should either the Thermostat or Thermal cut-out operate. Figure 16, diagrams A, B, D and E detail the wiring required between these controls and the motorised valve. Wiring to external controls is made via the terminal block fitted. The cable should be routed through the aperture in the terminal cover and secured using the cable grip provided. The Indirect Thermal cut-out **MUST NOT** be bypassed.

Heating System Controls

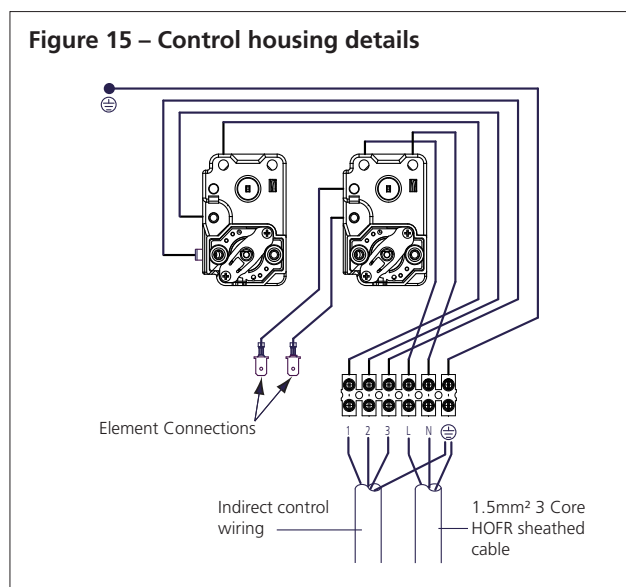
The controls provided with the Megaflo Eco SolaReady will ensure the safe operation of the Megaflo Eco SolaReady within a central heating system. Other controls will be necessary to control the space heating requirements and times that the system is required to function. Depending on the boiler selected, heating circuit design and controls used it may be beneficial to incorporate a system bypass in the heating system pipework.

The Megaflo Eco SolaReady is compatible with most heating controls, examples of electrical circuits are given in the block wiring schemes. However, other systems may be suitable, refer to the controls manufacturers' instructions, supplied with the controls selected, for alternative system wiring schemes.

The auxiliary indirect heating source can be controlled via the Solar Differential Controller – refer to block wiring schemes B and E and Commissioning Section for setup details.

NOTE: The auxiliary backup immersion heater must have a separate 13 amp fused supply and cannot be operated via the Solar Differential Controller on indirect models.

Figure 15 – Control housing details



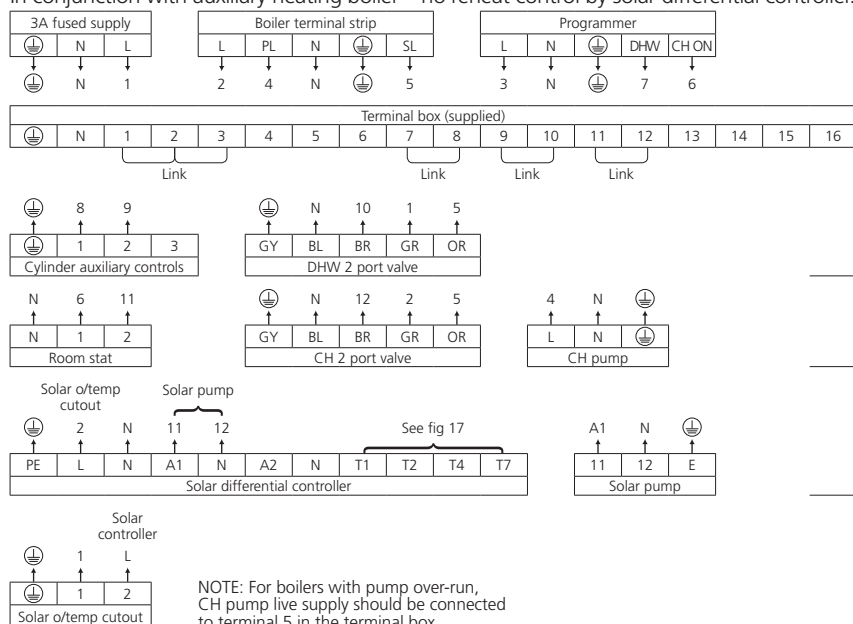
Immersion Heater(s)

The Megaflo Eco SolaReady indirect units (Indirect models) are supplied with an immersion heater which can be used as an alternative heat source should the boiler supply need to be isolated from the Megaflo Eco SolaReady unit. The immersion heater is located within the upper controls housing. Refer to page 17 "Wiring and Operation" for details of wiring and operation of the immersion heater.

Figure 16 – Wiring diagrams

Diagram A

In conjunction with auxiliary heating boiler – no reheat control by solar differential controller.



Key

L	Live
N	Neutral
GY	Green & yellow
BL	Blue
BR	Brown
GR	Grey
OR	Orange
WH	White
PL	Pump live
SL	Switched live
PE / E / ⚡	Protective earth

Diagram B

In conjunction with auxiliary heating boiler – reheat control via solar controller.

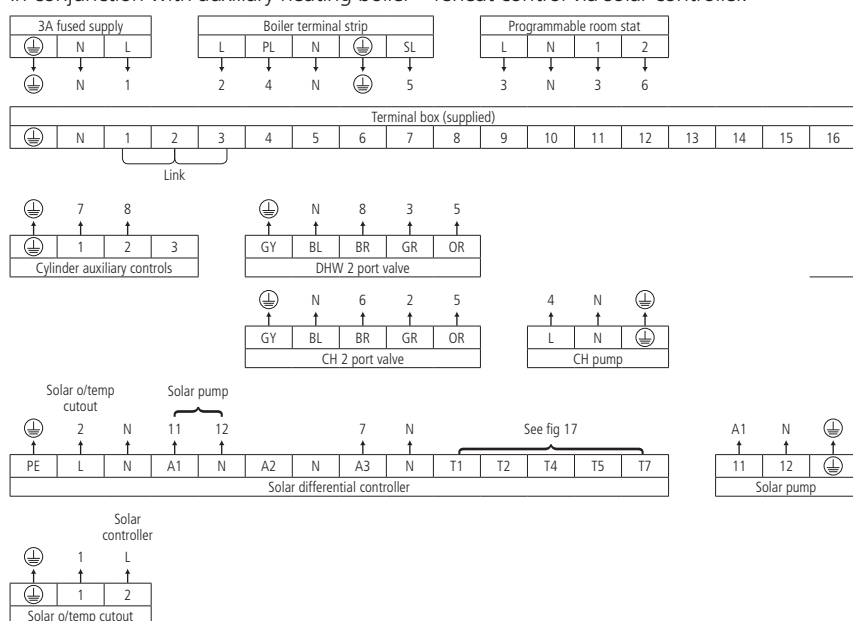


Diagram C

Auxiliary heating by immersion heater – reheat control via solar controller.

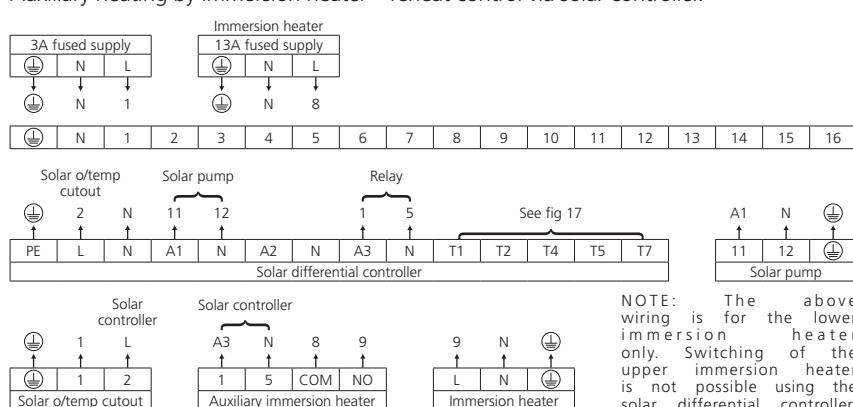


Diagram D

In conjunction with auxiliary heating boiler with a 3 port mid position valve system – no reheat control via solar controller.

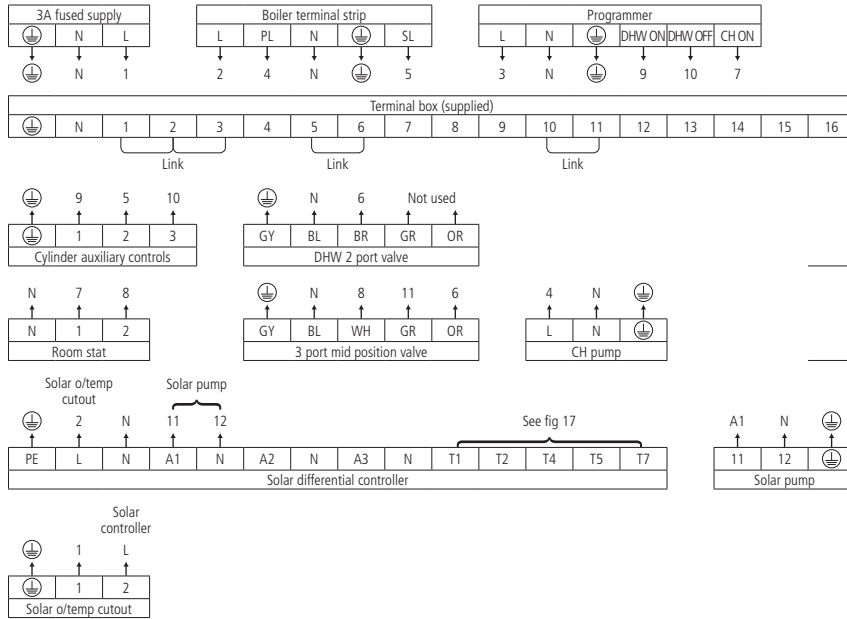
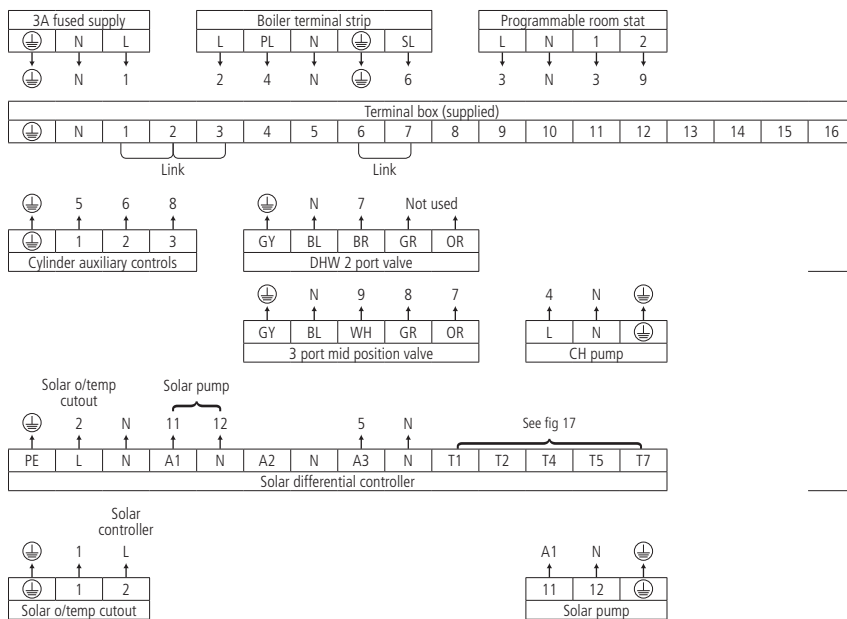


Diagram E

In conjunction with auxiliary heating boiler with a 3 port mid position valve system – reheat control via solar controller.



Installation of solar differential temperature controller

The solar differential temperature controller is fitted on the solar hydraulic pump station. It must be removed from the moulded housing for access to electrical connections.

Electrical connection overview

Always disconnect from the mains before opening the controller cover. The electrical installation must conform to all current Wiring Regulations and be carried out by a competent electrician.

The connection of all electrical cables is to the terminal block located on the backplate of the controller. The terminals on the right side of the terminal block are for extra low voltage connections (temperature sensors and flow transmitters). The terminals on the left side of the terminal block are for 230/240 V~ connections.

General connection guidelines.

In the case of all connecting wires the outer sheath should be stripped back to 80mm. The individual conductor sleeving should be stripped approx. 10mm.

Cables are inserted in the controller through knockouts provided in the controller backplate.

Flexible cables must be secured against straining by suitable strain relief bushes or devices.

The controller must be earthed.

230/240V~ connections

For 230V connections you must follow the following points:

The mains supply to the controller should be via a suitable double pole isolating switch with a contact separation of at least 3mm in both poles. The controller is pre-wired to the solar coil over-temperature cut-out. Mains connection should be into the lower solar controls terminal box such that power is interrupted to the controller and hydraulic station in the event of the cylinder overheating (see Fig. 16 Block wiring diagrams and Fig 18).

Controllers are intended for the operation in 230/240V~/50Hz mains. Any motorised valves connected must be suitable for this voltage.

All earth wires must be connected to terminals marked with PE. Any bare wire earth conductors must be sleeved with green/yellow sleeving.

The neutral terminals (N) are electrically connected and are not switched.

All switch outputs (A1, A2 and A3) are 230/240V~ closers. If potential-free contacts are needed, appropriate accessories are required.

Figure 17

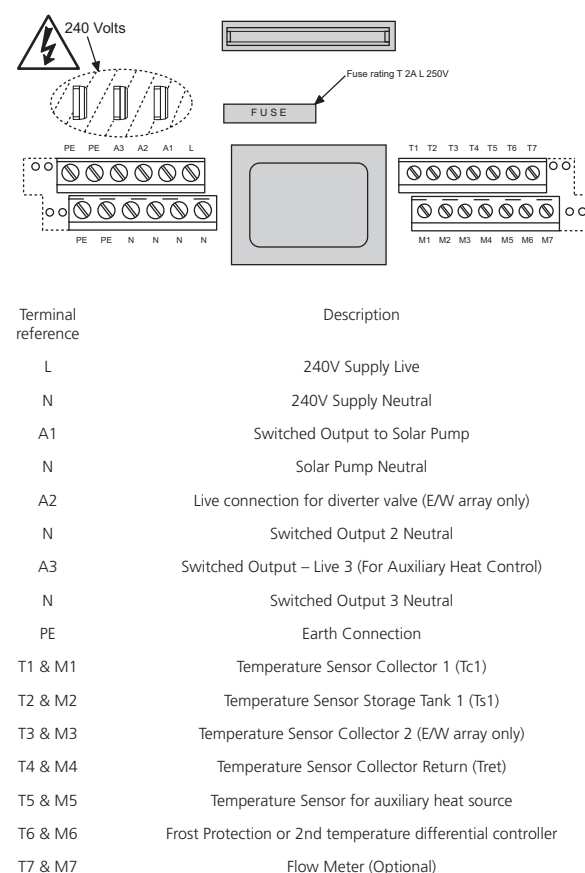
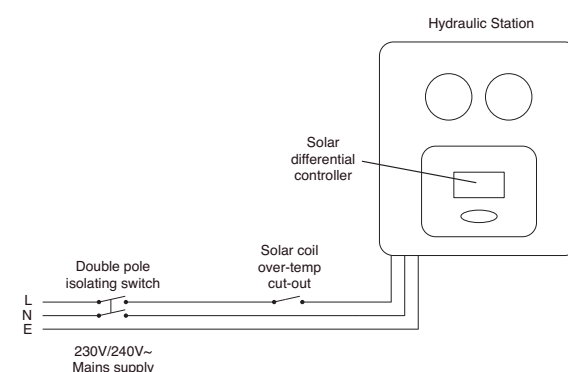


Figure 18



Commissioning

DO NOT SWITCH ON THE SOLAR DIFFERENTIAL CONTROLLER, AUXILIARY HEAT SOURCE OR IMMERSION HEATER(S) UNTIL THE UNIT IS FULL OF WATER.

Filling and flushing the Megaflo Eco SolaReady

Ensure that all fittings and immersion heaters are correctly fitted and tightened. An immersion heater key spanner is provided to aid in tightening the immersion heater(s).

Open a hot tap furthest from the Megaflo Eco SolaReady.

Open the isolating valve on the 3 Bar Pressure Reducing Valve by turning the blue handle on the stop cock (if fitted in this position) so that it lies parallel to the direction of flow. Open the mains stop cock to fill the unit. When water issues from the tap, allow to run for a few minutes to thoroughly flush through any residue, dirt or swarf, then close tap.

Open successive hot taps to purge any air from the system.

Check all connections for leaks and rectify as necessary.

The Strainer housed within the 3 Bar Pressure Reducing Valve should be cleaned to remove any debris that may have been flushed through the main supply pipe. Refer to Maintenance, page 37 for instructions on how to do this.

Check the operation of the Safety Valves

Slowly, manually open (turn black knob on end counter-clockwise), for a few seconds, the Temperature and Pressure Relief Valve (T&P Valve) situated on the Megaflo Eco SolaReady unit (see Figure 1, page 5). Check water discharged runs freely away through the tundish and discharge pipework. Close valve, ensure water flow stops and valve reseats correctly.

Repeat for the 8 Bar Pressure Relief Valve (see Figure 1, page 5).

NOTE: The water discharged may be very hot

Direct Units

Switch on the electrical supply to the immersion heater(s) and allow the unit to heat up. Check that the thermostat operates correctly. A storage temperature of approx. 60°C is recommended. If necessary the temperature can be adjusted by inserting a flat bladed screwdriver in the adjustment knob on top of the immersion heater thermostat and rotating clockwise (see Figure 13, page 17). The full adjustment represents a temperature range of between 12° and 68°C. Check that no water is discharged from either the Expansion Valve or Temperature and Pressure Relief Valve during the heating cycle.

Indirect Units

Fill the indirect (primary) circuit following the boiler manufacturer's commissioning instructions. To ensure the primary heating coil in the Megaflo Eco SolaReady is filled the 2-port motorised valve (supplied) should be manually opened by moving the lever on the motor housing to the MAN OPEN position. When the primary circuit is full return the lever to the AUTO position. Vent any trapped air by opening the air bleed.

Switch on the boiler, ensure the programmer is set to Domestic Hot Water. Allow the Megaflo Eco SolaReady unit to heat up and check that the indirect thermostat and 2-port motorised valve operate correctly. A storage temperature of approx. 60°C is recommended. If necessary the temperature can be adjusted by inserting a flat bladed screwdriver in the adjustment knob (located on the front of the thermostat mounting bracket see Figure 16, page 23) and rotating clockwise to increase the temperature or counter clockwise to reduce the temperature. The minimum thermostat setting is 12°C. The adjustment range on the combined thermostat and thermal cut-out is 12°C-68°C

Check that no water is discharged from either the Expansion Valve or Temperature and Pressure Relief Valve during the heating cycle.

Commissioning of solar primary system

Air Test

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

Ensure that the solar expansion vessel pre-charge pressure has been set prior to flushing and filling.

Flushing and Filling the pipework

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

Connect the flushing pipes to the fill & drain valve on the safety group (Fig. 19 Item 1) and to the fill & drain valve on the flow meter (Fig. 19 Item 2).

Open the fill & drain valves.

Turn the slot of the adjusting screw (Fig. 19 Item 3) in the return so the slot is vertical to open the non-return valve.

Turn the left hand isolating valve with integral thermometer in the flow (Fig. 19 Item 4) in the direction indicated by the arrow (to a 45° position) to open the non-return valve.

Ensure that the right hand isolating valve with integral thermometer in the return (Fig. 19 Item 5) is open indicated by the dot on the thermometer bezel being at the top.

Turn the slot of the flow meter adjusting screw (Fig. 19 Item 6) in the return vertically to open the flow limiter (Fig. 19 Item 7).

Flush the solar primary pump by pumping the fluid into the system via the fill and drain valve on the safety group (Fig. 19 Item 1).

Close right hand isolating valve (dot on thermometer bezel at 9 o'clock position). Flush solar primary pipework and collector via the fill and drain valve on the safety group. If reusing flushed fluid ensure this is filtered before re-introducing into the system. (see Fig. 20). Use a suitable container of a large enough volume to collect the fluid.

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

Pour an amount of the solar heat transfer fluid into the filling pump.

Figure 19

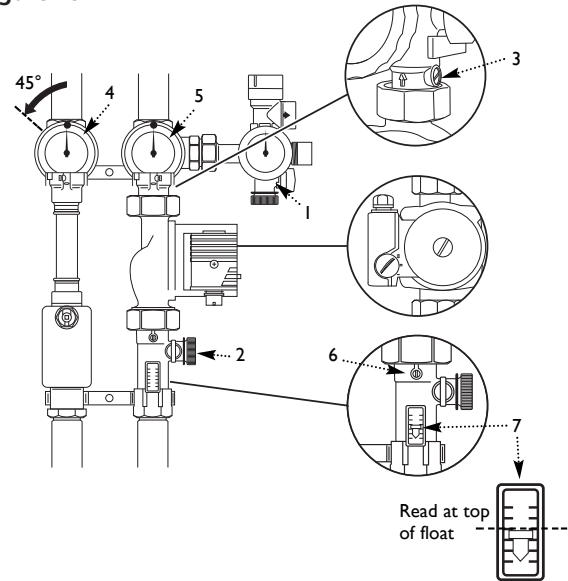
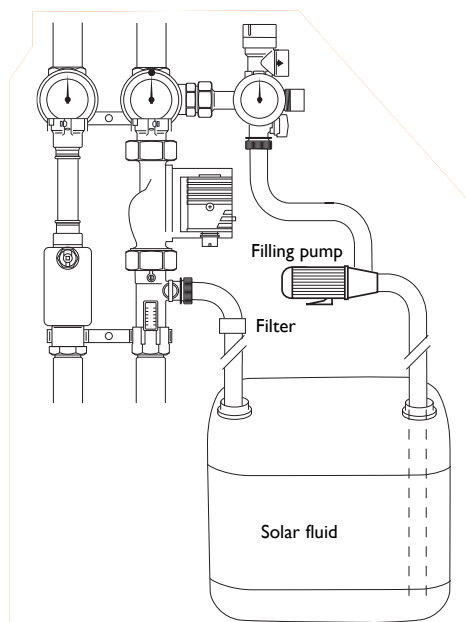


Figure 20



Close the fill and drain valve - safety group (Fig. 19 Item 1) and the fill and drain valve - flow meter (Fig. 19 Item 2) and pressurise the pump slightly prior to filling the system. If an electric pump is being used follow the instructions with the pump.

Fully open the fill and drain valve on the safety group (Fig 19, item 1) and pump fluid into the system. Whilst pumping, open the flow meter drain valve (Fig 19, item 2) slightly to allow the air to vent out of the system.

When the pump is down to approximately 1 litre isolate the fill and drain valves. Vent the filling pump and refill with solar heat transfer fluid.

Re-pressurise the filling pump and repeat the steps above until fluid is seen discharging from the drain valve on the flow meter. (Fig 19, item 2). Close the drain valve.

Continue filling at the fill and drain valve on the safety group (Fig 19, item 1) until the system pressure reaches 2 bar.

At this point the circulation pump should be vented. If the system pressure drops, repressurise using the procedure above.

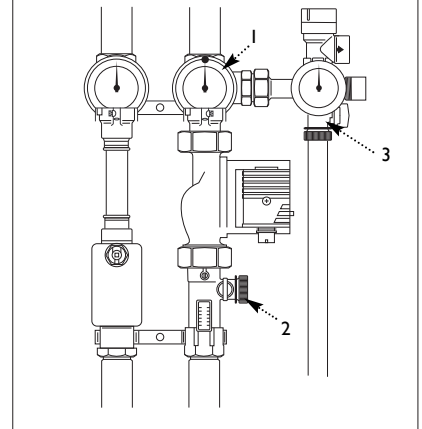
After venting the pump and checking that the system pressure is 2 bar, close the fill and drain valve on the safety group (Fig. 19 Item 1), and check the system for leaks.

Turn the left hand isolating valve (Fig 19, item 4) back 45° clockwise until the dot on the bezel is back at 12 o'clock.

Turn the right hand isolating valve (Fig. 19 Item 5) back 90° clockwise until the dot on the bezel is back at 12 o'clock.

Turn the slot of the adjusting screw (Fig. 19 Item 3) back to the horizontal position.

Figure 21



Commissioning of hydraulic station

Ensure the solar primary system is free from air

Switch on the power supply to the solar differential temperature controller.

Manually switch the circulation pump ON and OFF via the solar differential temperature controller (see section 11.5) to pump fluid around the solar primary system.

Turn the pump off and open the airbleed screw on the air separator (Fig. 22 Item 1).

Bleed any air from the air separator.

If the system pressure drops top up by opening the fill and drain valve (Fig. 27 Item 2) on the safety group and pumping in more solar fluid to restore the pressure. This must be repeated until the pressure remains stable.

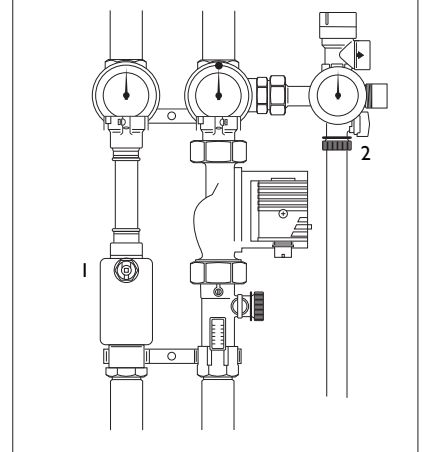
Setting the system pressure

During commissioning, the system pressure should be 0.7 bar above the static pressure (1 metre height differential equals 0.1 bar). However, it must be at least 1.5 bar and no higher than 2.2 bar.

Determine the system pressure when the system is cold (20°C). This should be recorded on the Commissioning Record Sheet.

If the pressure is too low you should pump additional heat transfer fluid into the system; the fill & drain valve on the safety group (Fig. 22 Item 2) needs to be opened for this purpose. When system pressure is correctly set, ensure the fill and drain valve is closed and remove filling hose from safety group.

Figure 22



Commissioning of solar differential temperature controller

On completion of commissioning the Solar Controller, note all the required information in the Solar Commissioning Record Sheet on page 35.

Main Menu

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

Info

Indication of current measured values.

Indication of system condition.

Indication of error messages.

Indication of operating hours and energy productivity (if installed).

Programming

Changes to programmable values (parameters).

Manual operation

Switching on and off connected pumps and auxiliary devices.

WARNING - During manual operation there is no automatic regulation of the system. Temperature control is isolated.

System temperature could be extremely high.

Basic adjustment

Information about basic adjustment for system function.

To carry out any changes to this menu it must be selected within the first minute after switching the appliance on.

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

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

Control Buttons (see Fig 23)

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

Item 2 - Scroll upwards - no function in this menu

Item 3 - Scroll left - moves left through the main menu options

Item 4 - Scroll down - selects the menu option currently flashing and gives access to the sub-menu

Item 5 - Scroll right - moves right through the main menu options

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

Item 2 - Scroll upwards- moves up through the available functions of the sub-menu

Item 3 - Scroll left - return to main menu

Item 4 - Scroll down - moves down through the available functions of the sub-menu

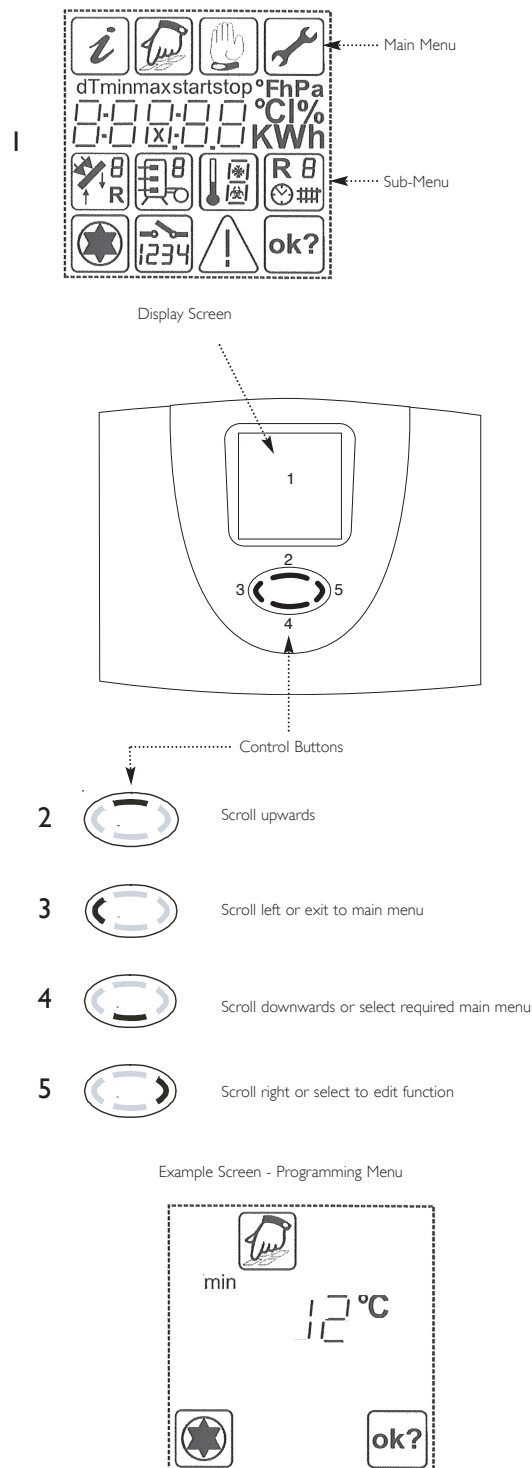
Item 5 - Scroll right - select to edit the function displayed.

The selected function will flash if it is available for editing.

Use 2 to increase the required value and 4 to reduce it.

Use 5 to OK.

Figure 23



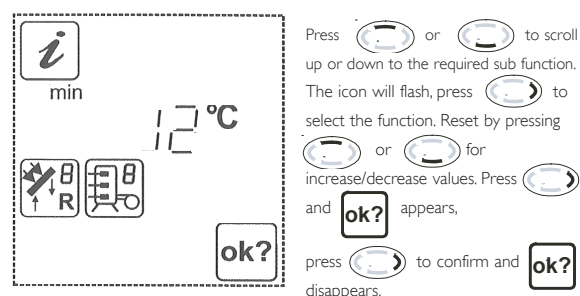
Commissioning of solar controller

Info Menu (Fig 24)

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

If the values are marked as "reset possible" they may be reset as shown in figure 24.

Figure 24



Indication e.g.		Meaning	Reset possible?
75°C		Indication of current collector(s) temperature.	No
min. 12°C		Indication of minimum collector(s) temperature. Resettable to current temperature.	Yes
max. 105°C		Indication of maximum collector(s) temperature. Resettable to current temperature.	Yes
52°C		Indication of current temperature storage tank(s).	No
min. 40°C		Indication of minimum temperature storage tank(s). Resettable to current temperature.	Yes
max. 65°C		Indication of maximum temperature storage tank(s). Resettable to current temperature.	Yes
60°C		Displays current temperature.	No
60°C		Heating, cooling, temperature difference controller T1-T6. Only displayed when active.	No
35°C		Temperature difference controller for heat consumer. Only displayed if temperature sensor fitted (not supplied as standard).	No
25°C		Antifreeze sensor. Indication of universal temperature measuring points (T6). Only displayed if temperature sensor fitted (not supplied as standard).	No
1234 h		Operating hours for charging storage tank(s). Resettable to 0 h.	Yes
927 kWh		Energy productivity for storage tank(s). Resettable to 0 h.	Yes

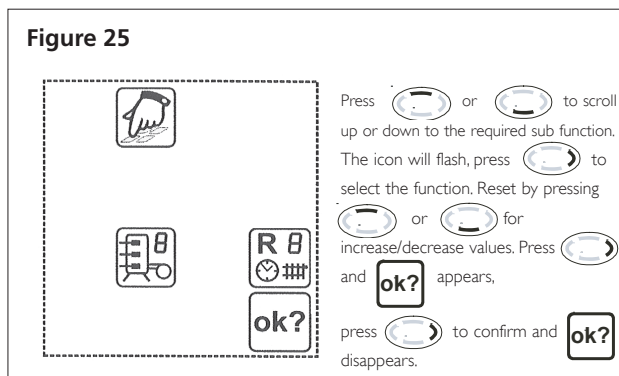
Commissioning of solar controller

Programming Menu (Fig 25)

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

For more information or guidance please contact the Technical Enquiries.

Figure 25



Indication		Meaning	Value range	Typical adjustment
max. 65°C		Storage tank – max. permissible temperature.	15-65°C	65°C * MAX
dT max. 7K		Storage tank – switch-on differential (dT _{on}).	3-40K	7K
dT min. 3K		Storage tank – switch-off differential (dT _{off}).	2-35K	3K
min. 100		Adjustment of pump rotational speed. 100% = rotational speed regulation set to "off."	30-100%	100%
13:21		Time	0:00-23:59	12:00
40°C		Switch-on temperature for heating / cooling function.	20-90°C	40°C
dT 10 K		Hysteresis for heating / cooling function.	1-30K	10K
dT max. 7K		Temperature difference controller – hysteresis dT max. Not used in this configuration.	3-40K	7K
dT min. 3K		Temperature difference controller – hysteresis dT min. Not used in this configuration.	2-35K	3K
min. 00:00 1(2,3)		Timeframe 1(2,3): Start.	0:00-23:59	00:00
max. 23:59 1(2,3)		Timeframe 1(2,3): Stop	0:00-23:59	23:59
min. 06:00 4		Timeframe 1(2,3): Start for the collector function.	0:00-23:59	06:00
max. 20:00 4		Timeframe 1(2,3): Stop for the controller function.	0:00-23:59	20:00

Commissioning of solar controller

Manual Operation Menu (Fig 26)

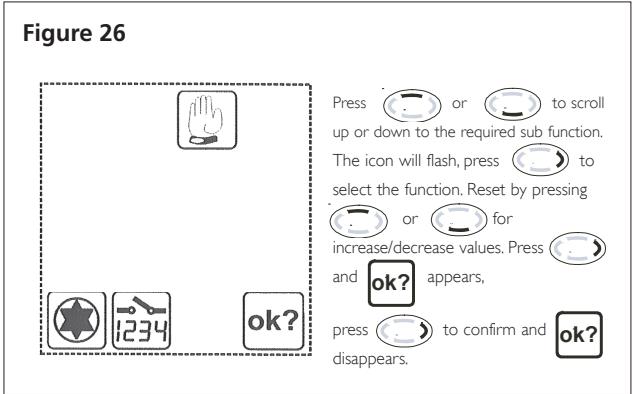
For commissioning, service and test purposes the solar primary system can be manually operated. For this purpose the switch outputs may be disconnected or connected.

WARNING - During manual operation there is no automatic regulation of the system. Temperature control is isolated.

System temperature could be extremely high.

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

NOTE: Exiting this menu will automatically return the system to normal automatic operation.



Indication	Meaning	Value range
	Switching on/of switch output A1 (solar circulation pump) by hand.	0 = off 1 = on
	Switching on/of switch output A2 by hand. Not used in this configuration	0 = off 1 = on
	Switching on/off switch output A3 (cooling, thermostat or 2 nd temperature difference controller function) by hand.	0 = off 1 = on

Commissioning of solar controller

Basic Adjustment Menu (Fig 27)

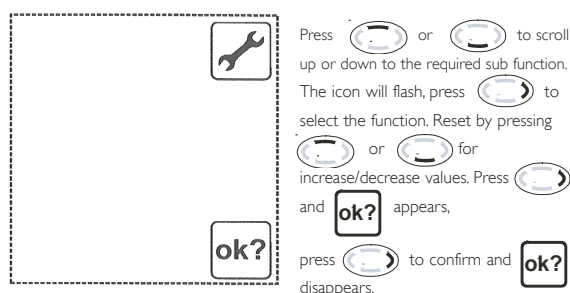
Adjustment and changes in this menu must be carried out only by a competent installer or service engineer.

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

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

*** Factory settings for these parameters must not be altered**

Figure 27



Indication Line / value	Description	Value range	Factory set-up
0 -- 0	Collector protection function.	0 = off 1 = on	0*
1 -- 120°C	Collector protection function.	110-150°C	120°C
2 -- 0	Recooling function (only if the collector protection is on).	0 = off 1 = on	0
3 -- 40°C	Recooling storage tank temperature.	30-90°C	40°C
4 -- 0	Tube collector function – time-controlled.	0 = off 1 = on	0
5 -- 2 <small>Note: This solar collector has the ability to calculate the energy yield without the use of a flow meter. The flow meter is now available as an accessory – code no. 5122979.</small>	Energy yield measurement – off.	0	2
	Energy yield measurement with flow meter.	1	
	Energy yield measurement without flow meter.	2	
6 -- 11	Energy yield measurement – sets glycol type (see table below).	0-11	11
7 -- 100	Energy yield measurement – glycol mixture.	0-100% (5% steps)	100%
8 -- 10	No value shown, when item 5 is set to 0.	–	10
	Adjustment value when item 5 is set to 1.	0.5-25 litres per impulse	
	Adjustment value when item 5 is set to 2.	0.1-75 litres per impulse	
9 -- 240	Multiple tank storage systems. Controller response time in seconds.	30-480	240*
10 -- 1	First priority storage tank selection.	1-2	1*
11 -- 0	Antifreeze function.	0 = off 1 = on	0
12 -- 6	Antifreeze function – reference sensor selection.	1-6	6
13 -- 3°C	Antifreeze function start temperature.	-20-+7°C	3
14 -- 2	Independent controller function.	0 = off	2*
		1 = cooling	
		2 = thermostat	
15 -- 5	Independent controller reference sensor.	1-6	5*

0	Anro	6	Tyfocon L5.5 – supplied
1	Ilexan E, Glythermin	7	Dowcal 10
2	Antifrogen L	8	Dowcal 20
3	Antifrogen N	9	Dowcal N
4	Ilexan E	10	Tyfocon LS
5	Ilexan P	11	Fernox S1

Commissioning of solar controller

Overview of display and operating elements (Fig 28)

Graphic	Description	Indication in operation
Measuring points assignment		
	Temperature measuring point collector array 1	
	Temperature measuring point collector array 2	Not used in this configuration
	Temperature measuring point storage tank 1 solar (storage tank 1 charging)	
	Temperature measuring point storage tank 1 solar (storage tank 1 charging)	Not used in this configuration
	Temperature measuring point collector – return	
	Temperature measuring point storage tank (auxiliary heating)	
	Antifreezing sensor or universal temperatures measuring point (T6) (no sensor monitoring)	
	Auxiliary heating temperature	
	Operating hours, energy productivity measurement	
Status indication		
	Solar circulation pump	Symbol revolves when solar circulation pump is on
	Switch output 1 is active	Appears when switch output 1 is active (on)
	Switch output 2 is active	Not used in this configuration
	Switch output 3 is active	Appears when switch output 3 is active (on)
	Reference to system fault	Display flashes when a fault occurs in the system
	Solar query for value changes which are to be stored	Input value can be either rejected or accepted
Indicator values		
dT	Temperature difference	
min	Min value	Appears when minimum values are indicated
max	Max value	Appears when maximum values are indicated
min. 0:00 1	Time period 1 start	Appears when the differential controller is active (timeframe 1-3) or tube collector is active (timeframe 4)
max. 23:59 1	Time period 1 stop	Appears when the differential controller is active (timeframe 1-3) or tube collector is active (timeframe 4)
	5 x 7 segment display Presentation of figures 00000 to 99999	Display of all values, display flashes when a value is changed
°C	Temperature in celsius	
K	Temperature difference in Kelvin	
h	Operating hours	
kWh	Productivity indication in kWh	

Commissioning of solar controller

Controller functions

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

Including

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

General controller functions

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

Cylinder heating by solar primary system

Switching action can be adjusted through dTmax (dTon) and dTmin (dToff). The solar cylinder is heated by operating the solar pump on output A1 up to the set maximum storage temperature (65°C). Pump operation starts when the collector temperature exceeds the cylinder temperature by more than dTon and continues while the collector temperature is above cylinder temperature + dToff, as set in the programming menu. dTon cannot be set lower than dToff + 1K.

Corresponding values in menu	
"Basic adjustment"	"Programming"
---	Maximum temperature
---	dT max (dT on) Switch-on temperature difference
---	dT min (dT off) Switch-off temperature difference

Rotational speed regulation

The solar circulation pump on 230V-outputs A1 and A2 can be operated either in switch-mode (two-point controller) or in a rotational speed regulated way. If the rotational speed regulation is activated the pump power is adjusted by a controller so that switch-on temperature difference "Storage tank dTmax" is kept constant as much as possible. At lower deviation of "Storage tank dTmax" the pump is operated with the lowest power till the switch-off wave is reached.

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

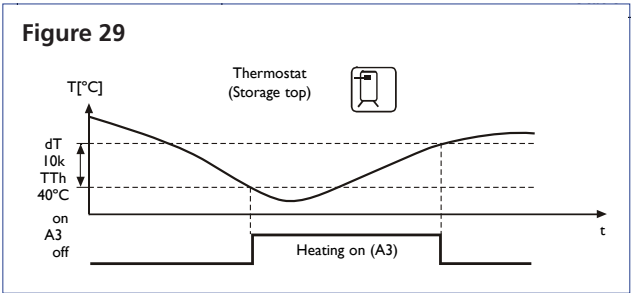
Thermostat (heating)

The thermostat is an independent control circuit from the storage loading. Thus, auxiliary heating of the top area of the storage cylinder is made possible.

The output A3 will be (see Fig 29):

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

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



Tube collector

The function "tube collector" can be switched off/on in the "Basic setting" menu – point 4. Timeframe 4 in the "Program" menu makes it possible to activate this function during certain periods of the day. When activated, the solar pump will be switched on every 30 minutes for a period of 30 seconds to check for any heat gain in the collector.

Corresponding values in menu	
"Basic adjustment"	"Programming"
4 -- 1	Time period (4) Start: min time
	Time period (4) Stop: min time

Sensor monitoring

The sensors and their connecting cables are constantly monitored for any break or short circuit. If a faulty sensor is detected by the controller, the symbol is shown. By scrolling up and down you can detect the source of the error.

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

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


Flow monitoring

If during normal operation the flow temperature rises above 90°C a warning indication will be shown.

If the energy productivity measurement option is deactivated, the temperature difference between collector and storage tank is checked. If the temperature differential exceeds 60K + dT_{max} an error message will occur, as under normal system operation where the pump is running, large temperature differences would not normally be seen.

If the energy productivity measurement option is activated, the flow rate is checked, if no flow is detected for 15 minutes an error message will be seen (Applicable if Flow Meter fitted).

NOTE: these error conditions will automatically reset after a short period of operation once normal flow/temperature conditions are restored.

Indication	Meaning
	Fluid flow is above 90°C (indication) / Missing circulation in solar circuit

System protection function

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

Frost protection

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

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

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

Energy productivity measurement

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

Corresponding values in menu		
"Basic Setting"	"Programming"	"Info"
5 -- 1	---	XXXX kWh

Operating hours meter

When the storage tank is being charged by a pump, the operating hours meter records for each separate pump. The number of operating hours can be read in the "info" menu. This may be reset to '0'.

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

Setting the system flow rate

Checking and adjusting the flow rate

Adjust the flow rate when the system is cold (approx 20°C) (see Fig. 30).

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

Manually operate the solar pump (See page 28 – Manual Operation).

Set the solar pump speed selector (Fig. 30 Item 5) so that the required flow rate is achieved or exceeded with the lowest possible setting. The flow limiter adjusting screw (Fig. 30 Item 3) can be used to fine-tune the flow rate.

Depending on the number and type of collectors installed, set the required flow rate from table (See Table 6).

The float in the flow meter will indicate the circulation flow rate through the flow meter sight glass (Fig. 30 Item 4).

Adjust screw of the flow limiter (Fig. 30 Item 3) with a screwdriver, until the upper edge of the float in the sight glass indicates the required flow rate (Fig. 30 Item 4). Turn the screw anticlockwise to increase the flow.

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

Unstable flows may indicate air is trapped within the system. Follow procedure on page 24 to remove air entrapped. Check and if necessary reset flow after removal of air.

Set manual pump operation to off (See page 28 – Manual Operation).

12.2 Installation of the thermal insulation

Refit the controller mounting moulding (Fig. 31 Item 1) onto the rear moulding.

Push the front thermal insulation (Fig. 31 Item 2) against the rear thermal insulation section (Fig. 31 Item 3) until it clips into place.

Benchmark™ Log Book

On completion of the installation and commissioning procedures detailed in this Product Guide the Benchmark™ "Installation, Commissioning and Service Record Log, pages 48 and 49" should be completed and signed off by the competent installer or commissioning engineer in the relevant sections. The various system features, location of system controls, user instructions and what to do in the event of a system failure should be explained to the customer. The customer should then countersign the Benchmark™ commissioning checklist (page 48) to accept completion. The Service Record (page 50) should be filled in when any subsequent service or maintenance operation is carried out on the Megaflo Eco SolaReady unit (See Maintenance and Servicing, page 37).

Figure 30

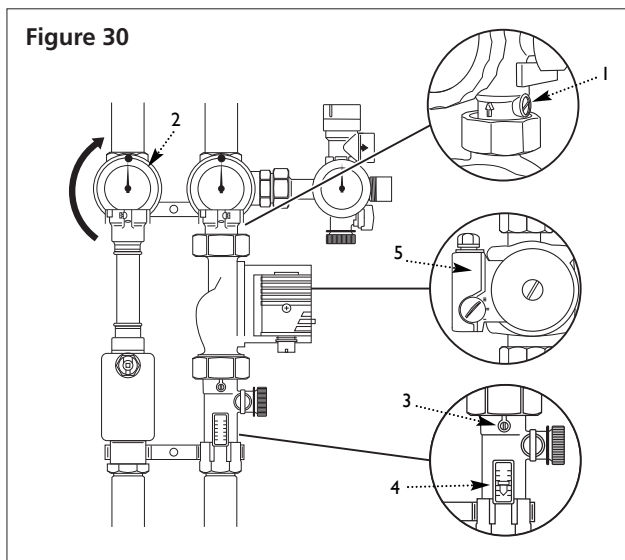
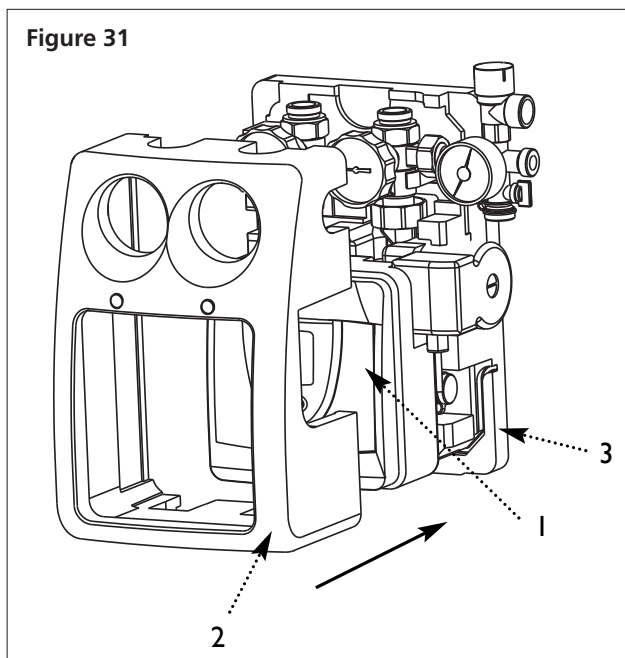


Table 6

Flow rate (when system is cold)	
Area	l/min
2m ²	2 - 4
3m ²	3 - 6
4m ²	4 - 8
5m ²	5 - 10
6m ²	6 - 12

Figure 31



Commissioning record

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

Installer: _____ BPEC No.: _____

Contact details: _____ Serial Nos. Cylinder _____

Original commissioning date: _____ Collector _____

Pump Station Serial Number: _____

Solar differential temperature controller - operational parameters

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

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

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

Adjustable in menu "Basic adjustments"	Typical adjustment	Current adjustment
Switching on or off the function collector protection	0 = off	*
Temperature at which the collector protection function is active	120°C	*
Switching on or off the function recooling (only when the collector protection is on)	0 = off	*
Temperature to which the storage tank is recooled when collector protection function is on	40°C	*
Function for time-controlled circulation in operation with tube collectors	0 = off	
Switching on or off the function energy productivity measurement	2 = on	
Choice of glycol types used	0 = Anro	
Mixture ratio of coolants	50%	
Litres per min	10 l/m	
Switching on or off the function antifreezing	0 = off	
Temperature at which the antifreezing is active	3°C	
Alternative choice of the cooling, thermostat function or the 2nd temperature differential controller	2	
System type	type 0	
Time control in secs	240	
Storage priority	I	

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

Servicing and maintenance record

Servicing and maintenance record

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

	Date / /	Date / /	Date / /	Date / /	Date / /	Date / /	Date / /	Date / /	Date / /	Date / /	Date / /	Date / /	Date / /	Date / /	Date / /	Date / /	Date / /	Date / /	Date / /	Date / /
Check condition of all pipework + insulation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Check condition of mountings	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Check frost protection of solar fluid (every 2 years) Concentration Check pH (7.0 - 9.5) Protection to °C Next check date	— — — — —	— — — — —	— — — — —	— — — — —	— — — — —	— — — — —	— — — — —	— — — — —	— — — — —	— — — — —	— — — — —	— — — — —	— — — — —	— — — — —	— — — — —	— — — — —	— — — — —	— — — — —	— — — — —	— — — — —
Check solar expansion vessel charge pressure	bar	bar	bar	bar	bar	bar	bar	bar	bar	bar	bar	bar	bar	bar	bar	bar	bar	bar	bar	bar
Check solar primary system pressure (cold)	bar	bar	bar	bar	bar	bar	bar	bar	bar	bar	bar	bar	bar	bar	bar	bar	bar	bar	bar	bar
Check solar primary system flow rate	l/min	l/min	l/min	l/min	l/min	l/min	l/min	l/min	l/min	l/min	l/min	l/min	l/min	l/min	l/min	l/min	l/min	l/min	l/min	l/min
Check operation of PRV	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Check discharge vessel fluid level	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Check sensor operation (use resistance/temperature table. See page 43)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Check solar cylinder in accordance with manufacturer's instructions	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Ensure system is free of air	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Visually check condition of solar collector mountings	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
KWh recorded (if applicable)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Visually check condition of any waterproofing (around pipe entries to roof and roof fixings)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Engineer's initials	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
BPEC Number	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Maintenance

Maintenance requirements

To ensure the continued optimum performance of the Megaflo Eco SolaReady it should be regularly maintained. This is of particular importance in hard water areas or where the water supply contains particulate matter. Maintenance should be carried out by a competent person and any replacement parts used should be authorised Megaflo Eco SolaReady spare parts. It is recommended that maintenance is carried out every 12 months and includes the checks detailed below.

In hard water areas consideration should be given to periodically descaling the immersion heater elements. To do this the Megaflo Eco SolaReady unit will need to be drained, details below list how to drain the unit and remove the immersion heater(s).

Check operation of Safety Valves

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. Check valve reseats correctly when released.

NOTE: The water discharged may be very hot.

Repeat the procedure for the 8 Bar Pressure Relief Valve.

Clean the strainer

The strainer is incorporated within the Pressure Reducing Valve housing of the Cold Water Combination Valve (see Figure 33, page 43). To inspect and clean the strainer:

Turn off the isolating valve on the 3 Bar Pressure Reducing Valve by turning the blue handle (if fitted in this position) so it lies 90° to the direction of flow or main stop cock to the house.

Open the lowest hot tap in the system to relieve the system pressure.

Using a spanner unscrew the pressure reducing cartridge and remove the moulded housing. The strainer will be removed with the cartridge.

Wash any particulate matter from the strainer under clean running water.

Replace the strainer and screw the Pressure Reducing Valve cartridge into the moulded housing.

Close hot tap, turn on isolating valve by turning handle so it lies parallel to the direction of flow. Check for leaks.

Draining the Megaflo Eco SolaReady unit

Switch off the electrical supply to the immersion heater(s) and shut down the boiler on indirect units. Turn off the mains water supply to the Megaflo Eco SolaReady unit. Attach a hosepipe to the drain cock having sufficient length to take water to a suitable discharge point below the level of the unit, at least one metre below the unit is recommended. Open hot water tap nearest to the Megaflo Eco SolaReady to relieve the system pressure. Open drain cock. If water fails to drain from the Megaflo Eco SolaReady vent the unit by manually opening the Temperature / Pressure Relief Valve.

Descaling immersion heater(s)

Open the cover(s) to the immersion heater housing(s) and disconnect wiring from immersion heater(s). Disconnect the two wires to the element tabs. Remove the thermostat capillaries, 2 or 4 depending on which unit being serviced. Unscrew immersion heater backnut(s) and remove immersion heater from the unit. A key spanner is supplied with the Megaflo Eco SolaReady unit for easy removal / tightening of the immersion heater(s). Over time the immersion heater gasket may become stuck to the mating surface. To break the seal insert a round shafted screwdriver into one of the pockets on the immersion heater and gently lever up and down.

Carefully remove any scale from the surface of the element(s). 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 a new gasket.

Replace immersion heater(s) ensuring the lower (right angled) element hangs vertically downwards towards the base of the unit. It may be helpful to support the immersion heater using a round shafted screwdriver inserted into one of the thermostat pockets whilst the backnut is tightened. Replace the thermostat(s) by carefully plugging the two male spade terminations into the corresponding terminations on the element.

Rewire the immersion heater(s) in accordance with Figure 14, page 17 or Figure 15, page 18. Close and secure terminal cover(s).

Expansion Vessel Charge Pressure

Remove the dust cap from the top of the expansion vessel. Check the charge pressure using a tyre pressure gauge.

The charge pressure (with the system depressurised) should be 0.3MPa (3 bar). If it is lower than the required setting it should be re-charged using a tyre pump (schrader valve type). DO NOT OVER CHARGE. Re-check the pressure and when correct replace the dust cap.

Refilling system

DO NOT switch on the immersion heater(s) or boiler until the system has been completely refilled.

Close the drain tap. With the hot tap open, turn on mains water supply. When water flows from the hot tap allow to flow for a short while to purge air and to flush through any disturbed particles. Close hot tap and then open successive hot taps in system to purge any air. The electrical supply can now be switched on.

Check solar heat transfer fluid

The heat transfer fluid must be checked every year with regard to its antifreeze and pH value. (7.0 - 9.5) – Check antifreeze using antifreeze tester. Target value is approximately -21 deg C (40% concentration). Replace fluid if necessary.

% volume	Density at 20°C g/cu.cm	Refractive Index nD20	Frost protection °C
25	1.023	1.3627	-10
30	1.029	1.3690	-14
35	1.033	1.3747	-17
40	1.037	1.3801	-21
45	1.042	1.3855	-26
50	1.045	1.3910	-32

Maintenance of the collector

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

In areas where there may be a build up of dirt on the collector, only non-abrasive cleaning materials and methods should be used to clean the collectors and mounting system components.

Benchmark™

On completion of any maintenance or service of the Megaflo Eco SolaReady, the Benchmark™ "Installation, Commissioning and Service Record" should be filled in to record the actions taken and the date the work was undertaken (page 50).

Fault finding

The Fault finding flow diagrams (Fig 32) will enable operational faults to be identified and their possible causes rectified.

Any work carried out on the Megaflo Eco SolaReady unvented water heater and its associated controls **MUST** be carried out by a competent installer for unvented water heating systems. In case of doubt contact the Megaflo Eco SolaReady Service Department.

Fault finding

Solar differential temperature controller error messages

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

NOTE: These error messages will automatically reset when the fault has been rectified. In the case of the circulation error this may take a few minutes to clear once normal flow has resumed.






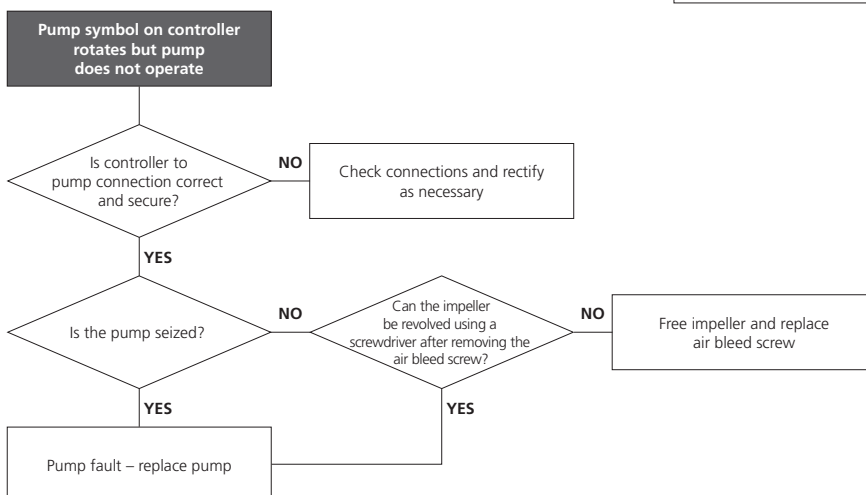
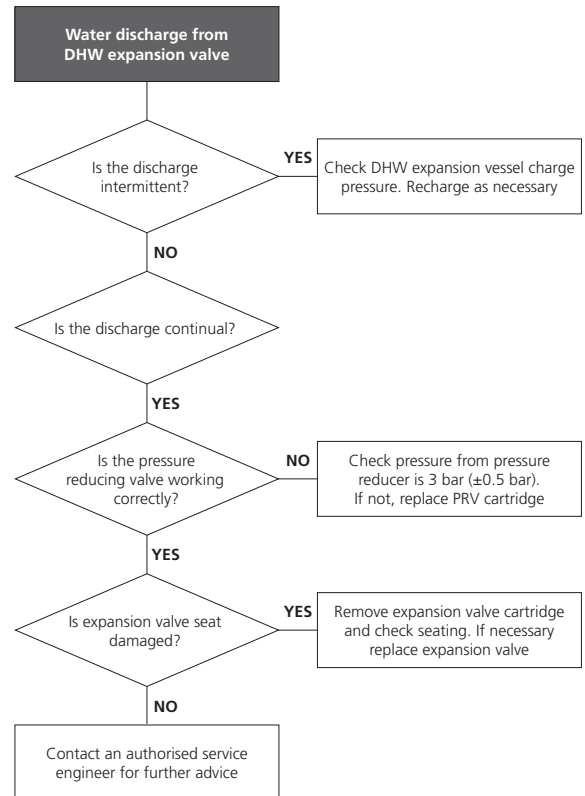
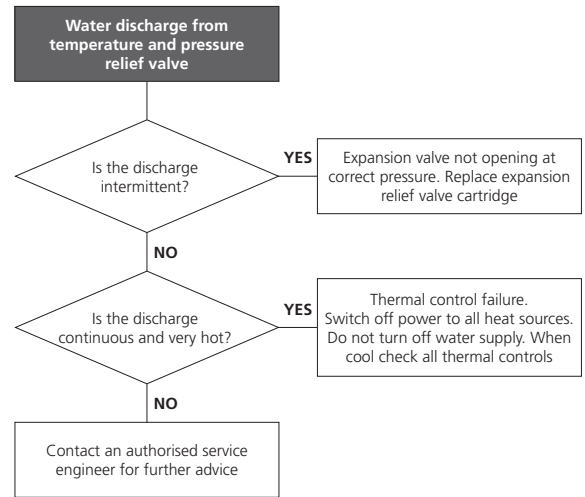
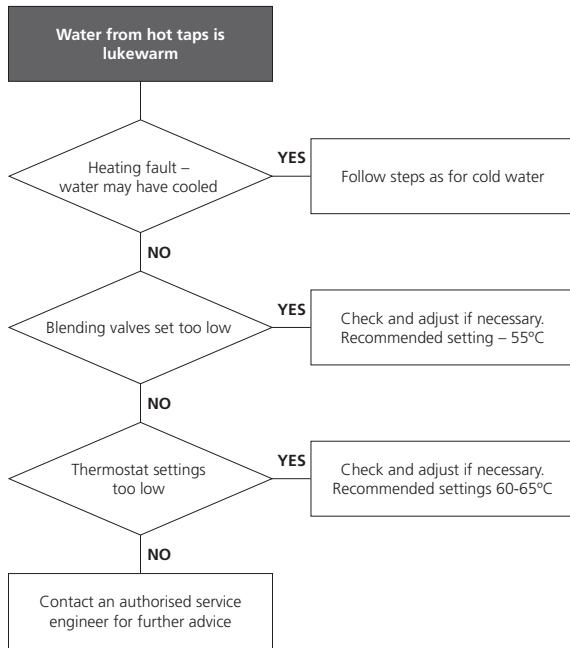
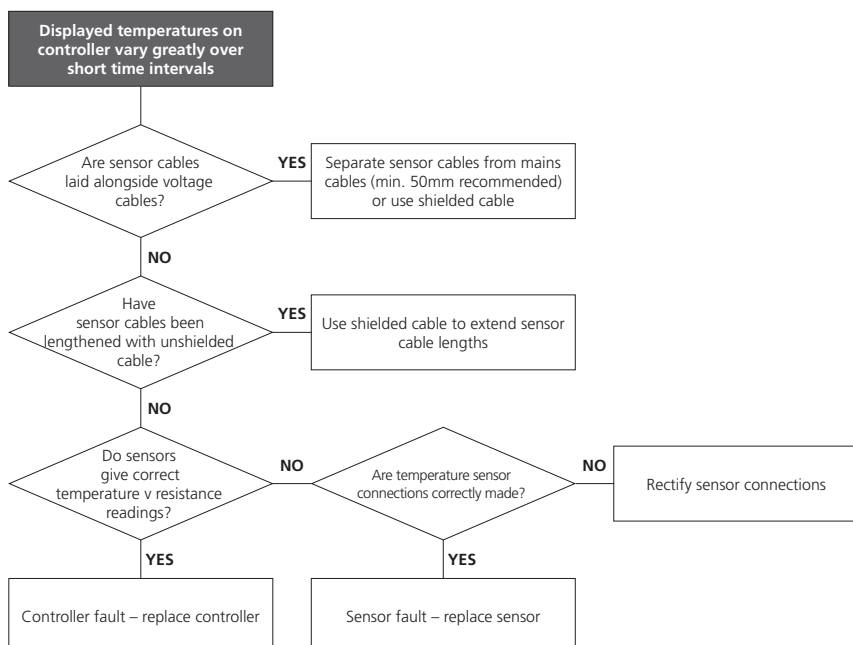
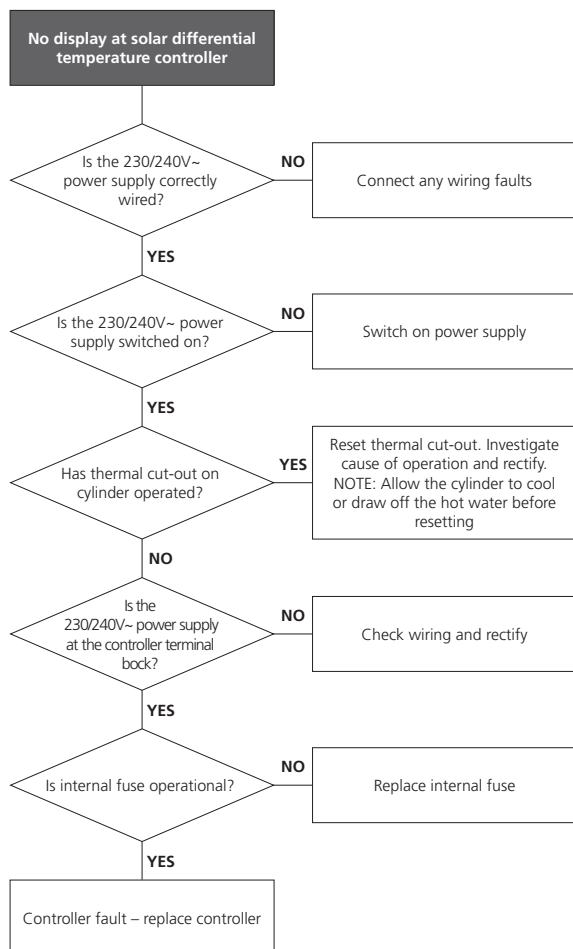
Error representation on display	Possible reasons	Measures
 flashing	<ul style="list-style-type: none"> • Sensor wire broken • Sensor defect • Sensor missing 	<ul style="list-style-type: none"> • Check wire • Check sensor resistance, if necessary exchange sensor • Check parameter settings and sensor installation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

Figure 32 – Fault finding flow diagrams







Resistance table PT1000.

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

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

Servicing

Important

Servicing should only be carried by authorised heating engineers, Agents or by installers competent in the installation and maintenance of unvented water heating systems and solar water heating systems.

Any spare parts used MUST be authorised Megaflo Eco SolaReady parts.

Disconnect the electrical supply before removing any electrical equipment covers.

NEVER bypass any thermal controls or operate system without the necessary safety valves.

Water contained in the Megaflo Eco SolaReady unit may be very hot, especially following a thermal control failure. Caution must be taken when drawing water from the unit.

Spares

Spare parts

A full range of spare parts are available for the Megaflo Eco SolaReady range. Refer to the Technical Data label on the unit to identify the model installed and ensure the correct part is ordered.

Description	Part no.
Cold Water Inlet Control Kit - Complete	95:605:894
3 Bar Pressure Reducing Valve - Complete	95:605:886
8 Bar Pressure Relief Valve - Complete	90:605:893
Stopcock	95:605:885
Immersion Heater Backnut	95:607:940
Immersion Heater Gasket	95:611:822
Immersion Heater Key	95:607:861
Immersion Heater Blanking Plug	95:605:881
Titanium Immersion Heater - Upper	95:606:989
Titanium Immersion Heater - Lower	95:606:988
Direct Combined Thermostat / Thermal Cut-Out	95:612:717
Tundish	95:605:838
Direct Titanium Control Cover	95:614:119
Mounting Plate (Direct)	95:607:929
3 way Terminal Block (Direct)	95:607:932
3 way Terminal Block (Solar)	95:607:939
Insulation Set (T & P Relief Valve)	95:607:922
Indirect Accessory Kit (210L, 250L & 300L)	95:970:554
Mounting Plate (Indirect)	95:607:931
Indirect Control Cover	95:614:118
6 way Terminal Block	95:607:933
2 Port Motorised Valve (22mm Connections)	95:605:819
Incoloy Immersion Heater - Lower	95:606:984
Titanium Immersion Heater - Upper	95:606:985
Indirect Combined Thermostat and Cut-out	95:612:716
Temperature / Pressure Relief Valve	95:605:810
Set of Compression Nuts and Olives	95:607:838
Drain Valve 1/4 Turn	95:605:051
Mounting Plate, Solar	95:607:937
1/2" BSP Sensor Pocket Assembly Short	95:607:938
Twin Solar Temperature Pocket	95:606:990
Expansion Vessel (24 Litre)	95:607:612
Solar Thermal Cut-Out	95:612:698
Sensor Cable 13m	5122237
Diverter Valve	95:605:078

Figure 33 – Exploded view of 3 bar inlet control valve

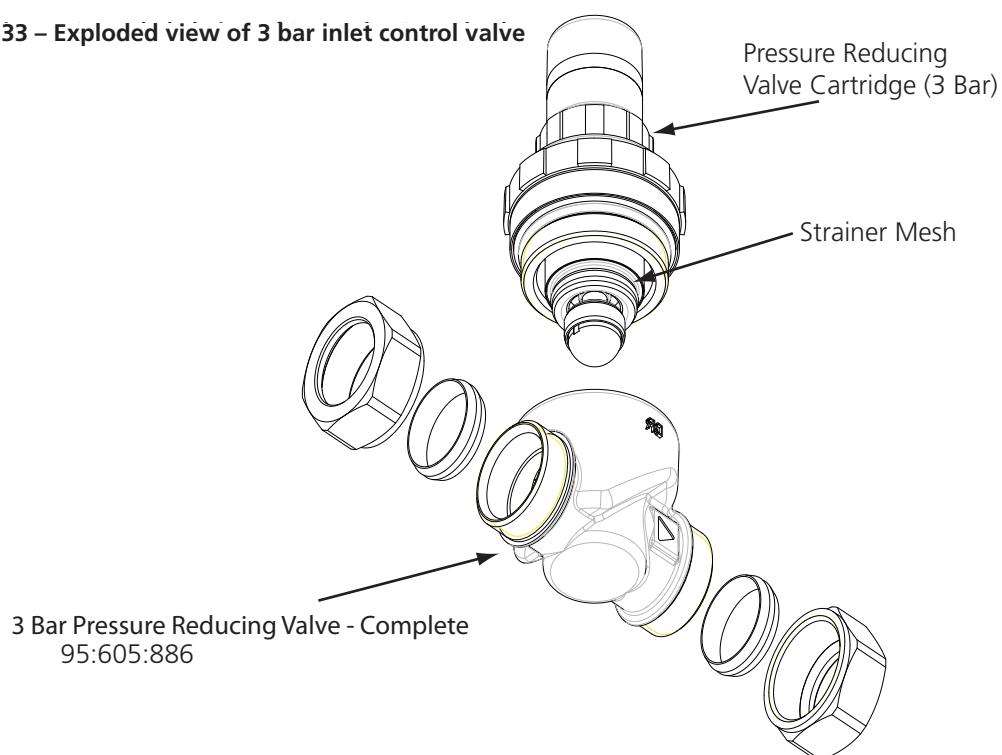
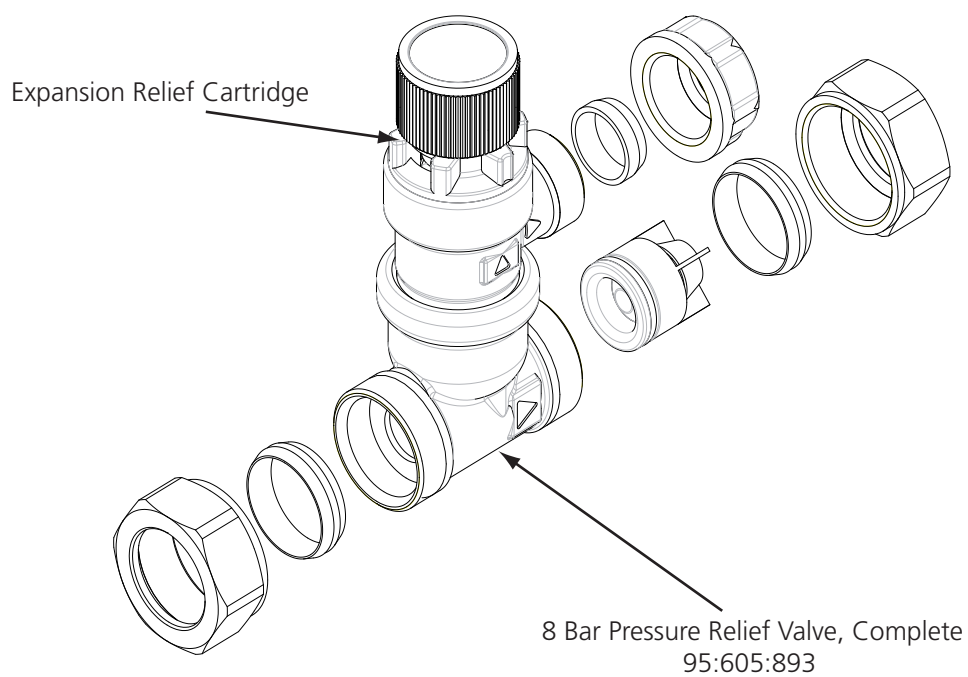
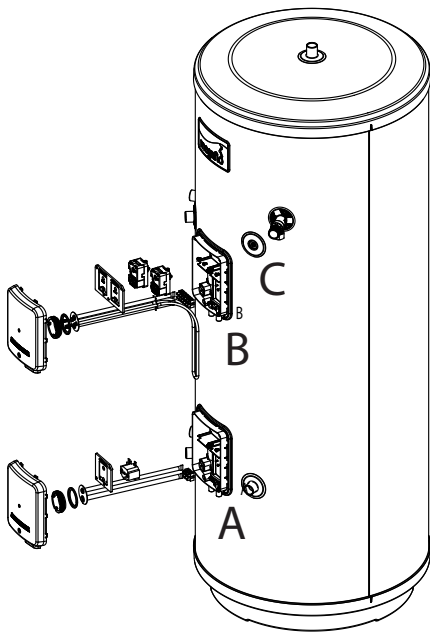


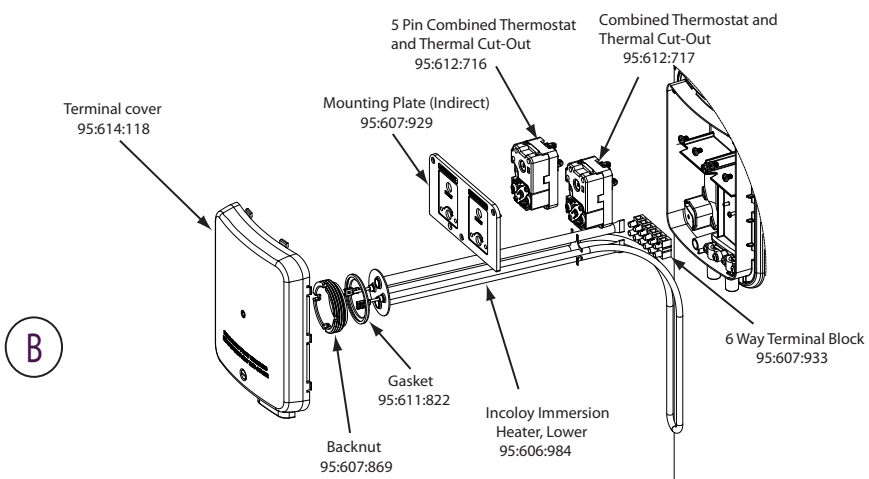
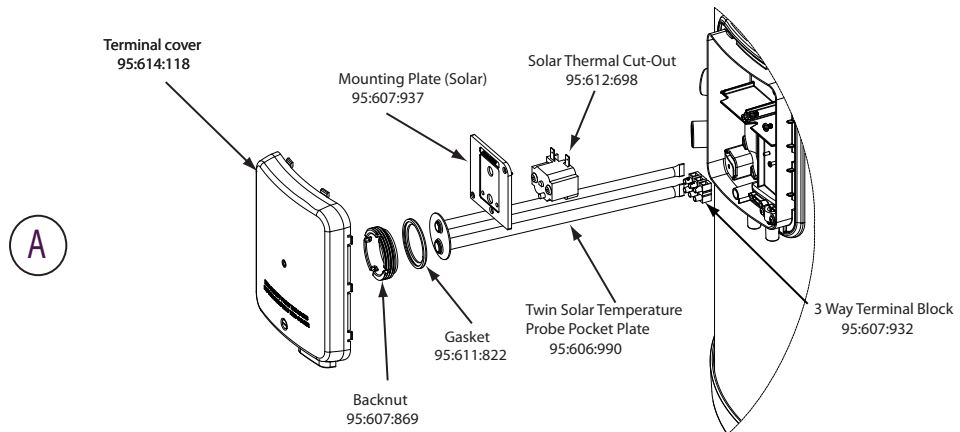
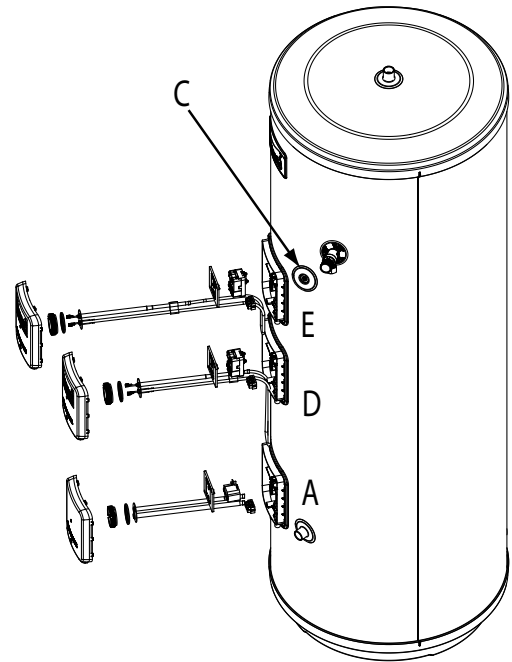
Figure 34 – Exploded view of 8 bar pressure relief valve

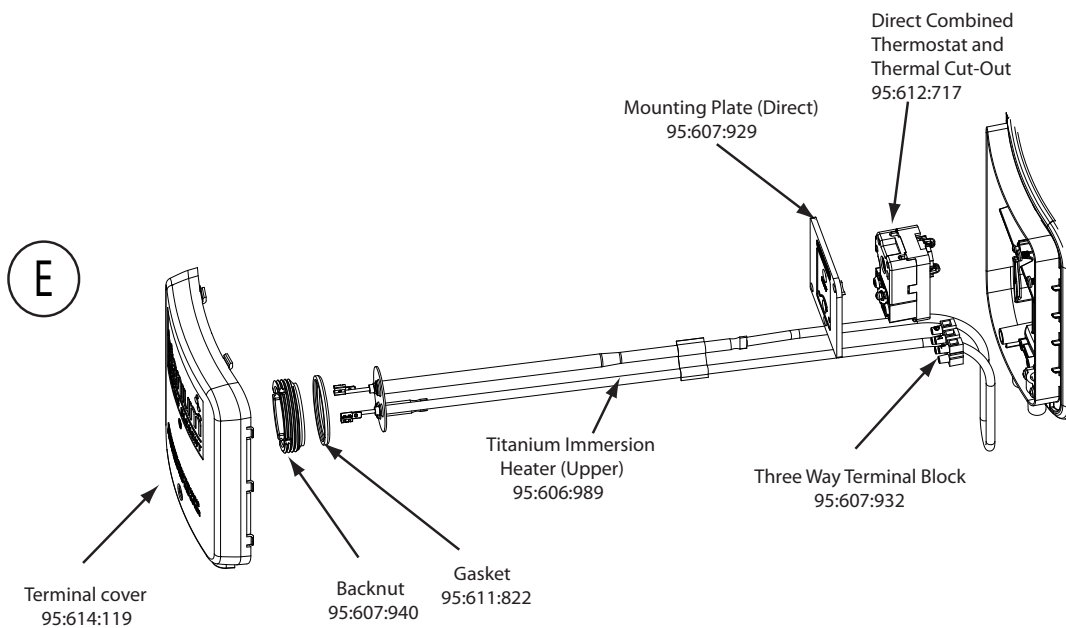
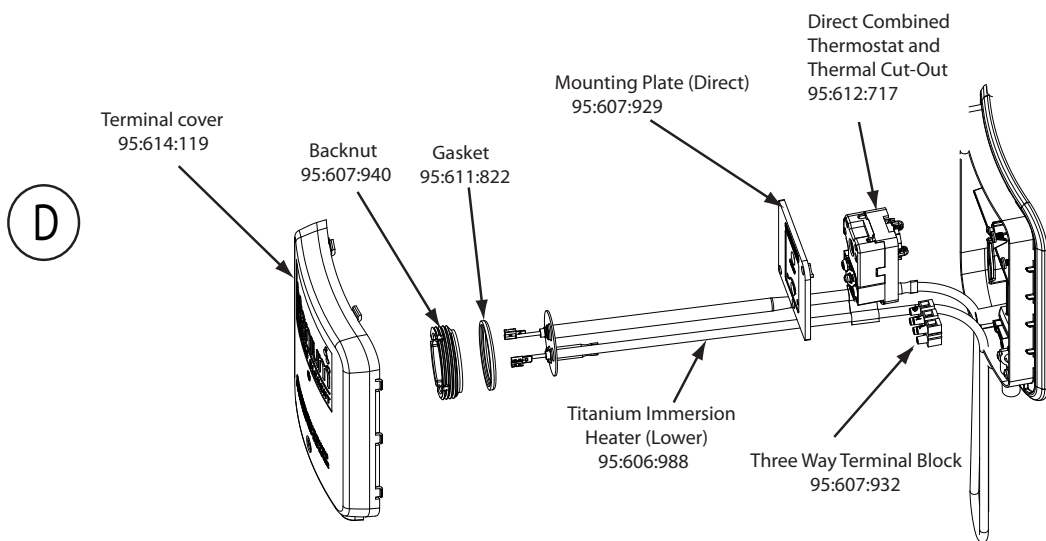
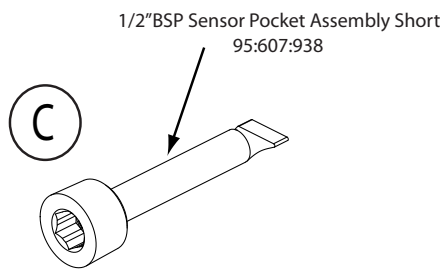


Indirect units

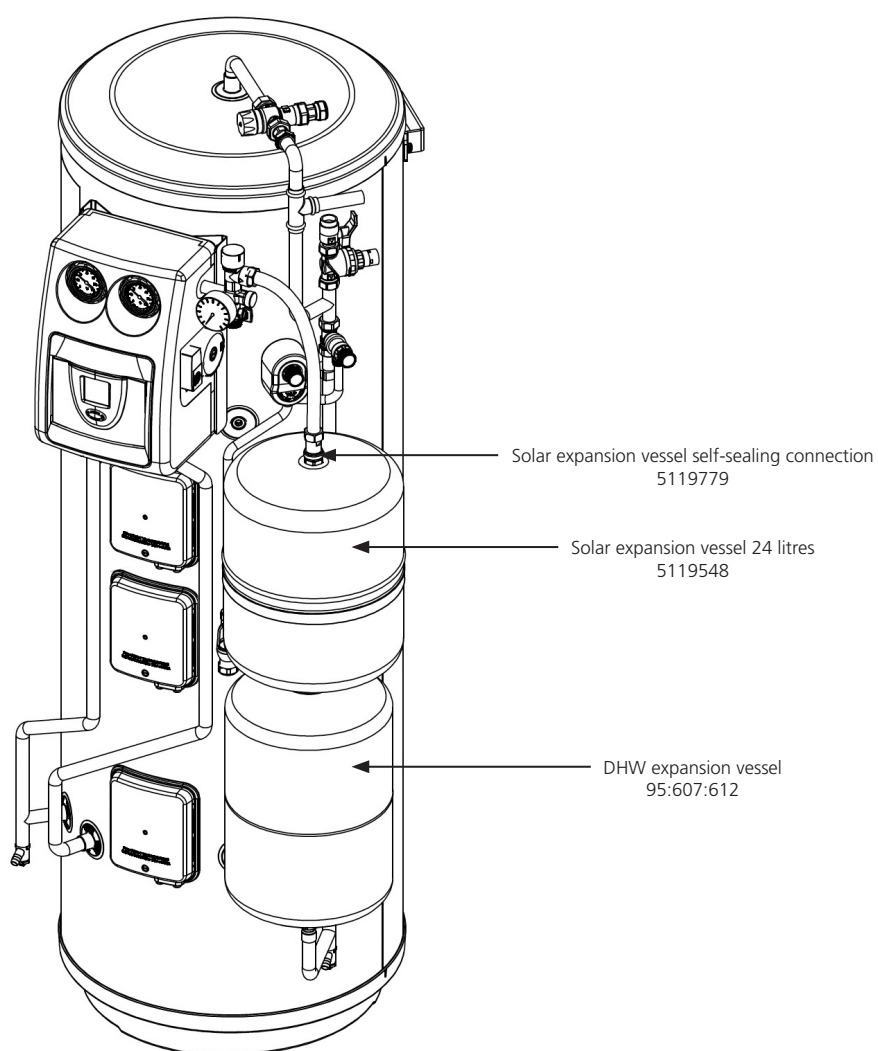
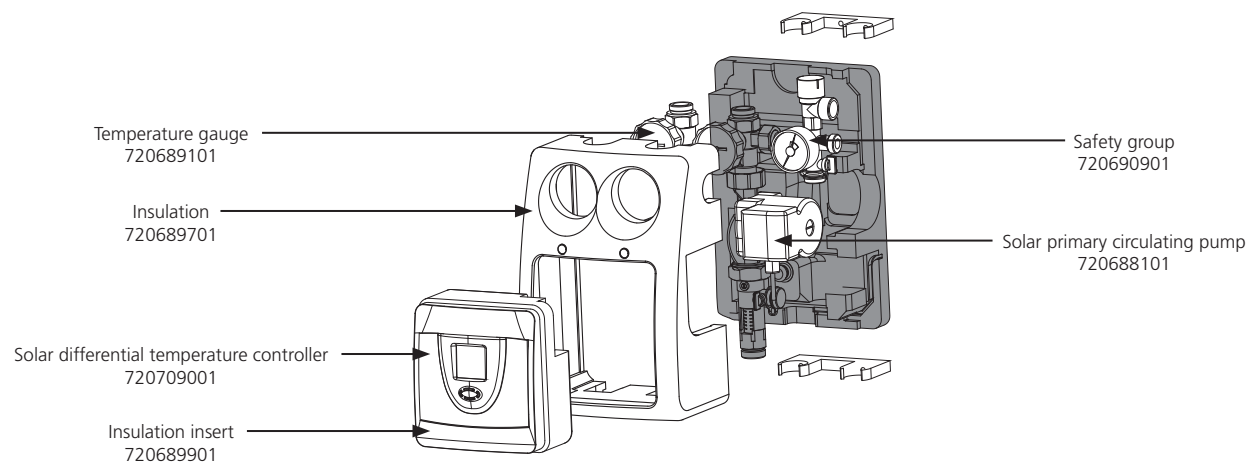


Direct units





Spares



Spares Stockists

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

SPD
Special Product Division
Units 9 & 10
Hexagon Business Centre
Springfield Road
Hayes
Middlesex
UB40 0TY
Tel: 0208 5730574

Parts Center
Network 65 Business Park
Bentley Wood Way
Burnley
Lancashire
BB11 5ST
Tel: 01282 834403
www.partscenter.co.uk

Newey & Eyre
Specialist Products Division
Please Contact your Local Branch

UK Spares Ltd
Unit 1155 Aztec West
Almondsbury
Bristol
BS32 4TF
Tel: 01454 620500

William Wilson Ltd
Unit 3A
780 South Street
Whiteinch
Glasgow
G14 0SY
Tel: 0141 434 1530

MAINS PRESSURE HOT WATER STORAGE SYSTEM COMMISSIONING CHECKLIST

This Commissioning Checklist is to be completed in full by the competent person who commissioned the storage system as a means of demonstrating compliance with the appropriate Building Regulations and then handed to the customer to keep for future reference.

Failure to install and commission this equipment to the manufacturer's instructions may invalidate the warranty but does not affect statutory rights.

Customer Name _____ Telephone Number _____
 Address _____
 Cylinder Make and Model _____
 Cylinder Serial Number _____
 Commissioned by (print name) _____ Registered Operative ID Number _____
 Company Name _____ Telephone Number _____
 Company Address _____
 Commissioning Date _____

To be completed by the customer on receipt of a Building Regulations Compliance Certificate*:

Building Regulations Notification Number (if applicable) _____

ALL SYSTEMS PRIMARY SETTINGS (indirect heating only)

Is the primary circuit a sealed or open vented system? Sealed ☐ Open ☐
 What is the maximum primary flow temperature? _____ °C

ALL SYSTEMS

What is the incoming static cold water pressure at the inlet to the system? _____ bar
 Has a strainer been cleaned of installation debris (if fitted)? Yes ☐ No ☐
 Is the installation in a hard water area (above 200ppm)? Yes ☐ No ☐
 If yes, has a water scale reducer been fitted? Yes ☐ No ☐
 What type of scale reducer has been fitted? _____
 What is the hot water thermostat set temperature? _____ °C
 What is the maximum hot water flow rate at set thermostat temperature (measured at high flow outlet)? _____ l/min
 Time and temperature controls have been fitted in compliance with Part L of the Building Regulations? Yes ☐
 Type of control system (if applicable) Y Plan ☐ S Plan ☐ Other ☐
 Is the cylinder solar (or other renewable) compatible? Yes ☐ No ☐
 What is the hot water temperature at the nearest outlet? _____ °C
 All appropriate pipes have been insulated up to 1 metre or the point where they become concealed Yes ☐

UNVENTED SYSTEMS ONLY

Where is the pressure reducing valve situated (if fitted)? _____
 What is the pressure reducing valve setting? _____ bar
 Has a combined temperature and pressure relief valve and expansion valve been fitted and discharge tested? Yes ☐ No ☐
 The tundish and discharge pipework have been connected and terminated to Part G of the Building Regulations Yes ☐
 Are all energy sources fitted with a cut out device? Yes ☐ No ☐
 Has the expansion vessel or internal air space been checked? Yes ☐ No ☐

THERMAL STORES ONLY

What store temperature is achievable? _____ °C
 What is the maximum hot water temperature? _____ °C

ALL INSTALLATIONS

The hot water system complies with the appropriate Building Regulations Yes ☐
 The system has been installed and commissioned in accordance with the manufacturer's instructions Yes ☐
 The system controls have been demonstrated to and understood by the customer Yes ☐
 The manufacturer's literature, including Benchmark Checklist and Service Record, has been explained and left with the customer Yes ☐

Commissioning Engineer's Signature _____
 Customer's Signature _____
 (To confirm satisfactory demonstration and receipt of manufacturer's literature)

*All installations in England and Wales must be notified to Local Authority Building Control (LABC) either directly or through a Competent Persons Scheme. A Building Regulations Compliance Certificate will then be issued to the customer.

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SOLAR THERMAL COMMISSIONING CHECKLIST

This Commissioning Checklist is to be completed in full by the competent person who commissioned the Solar Thermal System and associated equipment as a means of demonstrating compliance with the appropriate Building Regulations and then handed to the customer to keep for future reference.

Failure to install and commission this equipment to the manufacturer's instructions may invalidate the warranty but does not affect statutory rights.

Customer Name _____ Telephone Number _____
 Address _____
 Commissioned by (print name) _____
 Company Name _____ Telephone Number _____
 Company Address _____
 Commissioning Date _____

To be completed by the customer on receipt of a Building Regulations Compliance Certificate.

Building Regulations Notification Number (if applicable) _____

Confirmation that required areas of the installation have been notified to Local Authority Building Control (LABC)

a). Initials of commissioning engineer _____

b). Competent Persons Scheme (CPS) details or details of LABC direct notification _____

Confirmation that panels have been installed without lessening the structure, weathering and fire resistance of the roof in accordance with the relevant Building Regulations and standards. Initials of commissioning engineer _____

COLLECTOR DETAILS

Make of collector _____ Model of collector _____
 Serial number of each collector: (if more than 6 collectors please append additional sheet)
 i. _____ ii. _____ iii. _____
 iv. _____ v. _____ vi. _____

INSTALLATION DETAILS

Solar System Operating Pressure _____ bar (cold) Expansion vessel air/nitrogen charge _____ bar (cold)
 Expansion or drain back vessel size _____ litres
 Operating correctly: Yes ☐ Treated for leaks and flushed: Yes ☐ Filled and purged for air: Yes ☐
System heat transfer fluid details:
 What type/make of heat transfer fluid used? _____ System volume _____ litres
 What is the fluid mix: Water _____ % Glycol _____ %
 Frost protection provided to _____ °C
 Is the installation in a hard water area (above 200ppm)? Yes ☐ No ☐
 If yes, has a water scale reducer been fitted or has T_{max} been limited to 60°C? Yes ☐ No ☐
 What type of scale reducer has been fitted? _____
 Air purged from solar primary circuit: Yes ☐ Primary circuit valves and air vent(s) set to final operating positions: Yes ☐
 Pump speed setting recorded: Speed setting _____ Max flow rate _____ litres/min
 Solar primary circuit pressure relief valves tested for correct operation: Yes ☐ Location _____
 Device for limiting hot water temperature outlets has been fitted: Yes ☐ No ☐
 Type _____ Location _____
 All exposed pipework lagged in accordance with regulations using suitably temperature rated materials Yes ☐
 For unvented hot water storage cylinder, will controls stop solar fluid circulation in the event of cylinder overheating? Yes ☐

SOLAR SYSTEM CONTROLS

Make and model of DTC _____
 Temperature sensors checked and operating correctly Yes ☐
 Differential Temperature Controller (DTC) settings: T on _____ °C T off _____ °C
 T max _____ °C Other DTC Settings _____
 Thermostat located in back-up heating zone of cylinder Yes ☐ No ☐
 Have optimum settings for HW controls been explained to the customer? Yes ☐ No ☐
 Does this include Legionella Bacteria protection settings with back up heating system to bring boiler volume to 60°C for an hour once a day? Yes ☐ No ☐
 Electrical installation is in accordance with BS7671 Yes ☐
 Location of electrical isolation switch to solar control/pump unit _____

ALL INSTALLATIONS

The heating and hot water system complies with the appropriate Building Regulations Yes ☐
 The system and associated products have been installed and commissioned in accordance with the manufacturer's instructions Yes ☐
 The efficient operation of system and its controls have been demonstrated to and understood by the customer Yes ☐
 The manufacturer's literature, including Benchmark Checklist and Service Record, has been explained and left with the customer Yes ☐

Commissioning Engineer's Signature _____

Customer's Signature _____

To confirm satisfactory demonstration and receipt of manufacturer's literature)

* All installations in England and Wales must be notified to Local Authority Building Control (LABC) either directly or through a Competent Persons Scheme. A Building Regulations Compliance Certificate will then be issued to the customer.



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SERVICING

It is recommended that your hot water system is serviced regularly and that the appropriate Service Record is completed.

Before completing the appropriate Service Record below, please ensure you have carried out the service as described in the manufacturer's instructions.

SERVICE 10	Date _____
Engineer Name _____	
Company Name _____	
Telephone Number _____	
Comments _____ _____ _____ _____	
Signature _____	



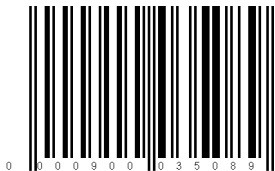
Customer service

Telephone:
0344 8711535

Facsimile:
0344 8711528

E-mail:
megafloservice@heateam.co.uk

MegaFlo
Hurricane Way
Norwich
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NR6 6EA



BY **HEATRAESADIA**