

# Installation and Servicing

# Flurocyl

Solar Hot Water Cylinder

**200 l**

**250 l**

**300 l**



# Guarantee Registration

Thank you for installing a new Glow-worm solar system.

Glow-worm products are manufactured to the very highest standard so we are pleased to offer our customers a Comprehensive Guarantee.

This product is guaranteed for 24 months from the date of installation or 30 months from the date of manufacture, whichever is the shorter, for parts and labour.

The second year of the guarantee, from the beginning of the 13th month onwards after installation or manufacture, is conditional upon the product having been serviced by a competent person (i.e. clear skies registered engineer),

in accordance with the manufacturer's recommendations. We strongly recommend regular servicing of your product, but where the condition is not met, any chargeable spare parts or components issued within the applicable guarantee period still benefit from a 12 month warranty from the date of issue by the manufacturer.

The "Benchmark" Installation, Commissioning and Service Record must be completed on installation and kept up to date.

We recommend you complete and return as soon as possible your guarantee registration card. If your guarantee registration card is missing you can obtain a copy or record your registration by telephoning the Glow-worm Customer Service number 01773 596510.

## Customer Service:

01773 596510

## Technical Helpline:

01773 828300

## General and Sales enquiries:

Tel. 01773 824639

Fax: 01773 820569

## To register your Glow-worm product call:

0800 0732142



*The mark of quality for domestic heating*

These instructions consist of, Installation, Servicing, Fault Finding and Replacement of Parts. The instructions are an integral part of the product and must, be handed to the user on completion of the installation.

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# WARNINGS

## SAFETY

The fluorocyl must be installed by a competent person, who is responsible for adhering to the existing standards and regulations.

## ALTERATIONS

Under no circumstances should you ever attempt to make alterations to these components or any other part of the system

## SEALED COMPONENTS

Under no circumstances must the user interfere with or adjust sealed parts.

## Important Information

### Installation and Use Regulations

In your own interests and that of safety, it is the LAW that this product is installed by a **competent person** in accordance with the current issue of these regulations.

### Control of Substances Hazardous to Health

Under Section 6 of The Health and Safety at Work Act 1974, we are required to provide information on substances hazardous to health.

The adhesives and sealants used in this product are cured and give no known hazard in this state.

### Manual Handling

With regards to the "Manual Handling Operations, 1992 Regulations", the appliance exceeds the recommended weight for a one man lift.

### Electrical Supply

The product **MUST** be earthed.

All system components shall be of an approved type and all wiring to current I.E.E. wiring regulations.

External wiring must be correctly earthed, polarised and in accordance with the relevant standards.

**In GB**, this is BS 7671.

**In IE**, this is the current edition of ETCI rules.

The product **MUST** be connected to a permanent 230V ac, 50Hz supply.

Connection of the whole electrical system of the product, including any heating controls, to the electrical supply **MUST** be through one common isolator and must be fused 3 Amp maximum.

Isolation should be by a double pole switched fused spur box, with a minimum gap of 3mm for both poles. The fused spur box should be readily accessible and preferably adjacent to the product. It should be identified as to its use.

Alternatively connection can be made through an unswitched shuttered socket and 3A fused 3-pin plug both to the current issue of BS 1363, provided they are not used in a room containing a bath or shower.

Wiring to the product must be PVC 85°C insulated cable, not less than 0.75mm<sup>2</sup> (24/0.20mm).

### Testing and Certification

This product is tested and certificated for safety and performance. It is, therefore, important that no alteration is made to the product, without permission, in writing, by Glow-worm.

Any alteration not approved by Glow-worm, could invalidate the certification, warranty and may also infringe the current issue of the statutory requirements.

### CE Mark

The CE mark on the Fluropro solar control indicates that it complies with the basic requirements of the applicable directives as stated on the data badge.

### "Benchmark scheme"

Glow-worm support the Benchmark initiative. It is very important that the service record is completed by the installation engineer and handed over to the user.

# Statutory Requirements

## IMPORTANT:

Where no British Standards exists, materials and equipment should be fit for their purpose and of suitable quality and workmanship.

The installation of this product must be carried out by a **competent person** in accordance the rules in force in the countries of destination.

Manufacturer's instructions must not be taken as overriding statutory requirements.

## Statutory Requirements

**In GB**, the installation of the product must be carried out by a **competent person** as described in the following regulations:

The manufacturer's instructions supplied.

The Gas Safety (Installation and Use) Regulations.

The appropriate Buildings Regulations either The Building Regulations, The Building Regulations (Scotland), The Building Regulations (Northern Ireland).

The Water Fittings Regulations or Water byelaws in Scotland.

The Health and Safety at Work Act, Control of Substances Hazardous to Health (COSHH).

The Current I.E.E. Wiring Regulations.

Where no specific instructions are given, reference should be made to the relevant British Standard Code of Practice.

**In IE**, the installation must be carried out by a **competent person** and installed in accordance with the current edition of I.S.813 "Domestic Gas Installations", the current Building Regulations and reference should be made to the current ETCI rules for Electrical Installation.

**GB:** the following Codes of Practice apply:

BS4814, BS6798, BS5440 Part 1 and 2, BS5546 Part 1, BS5449, BS6891, BS6700, BS7074 Part 1 and 2, BS7593, BS7671.

**IE:** I.S.813, BS5546, BS 5449, BS 7074, BS 7593.

**NOTE:** For further information, see the current issue of the Building Regulations, approved document L1 ( in the UK) and the following current issues of:

1) Central heating system specification (CheSS)

and

2) Controls for domestic central heating system and hot water. BRECSU.

## Domestic Hot Water

All domestic hot water circuits, connections, fittings must be in accordance with the relevant standards and water supply regulations.

**GB:** Guidance G17 to G24 and recommendation R17 to R24 of the Water Regulations Guide.

**IE:** The current edition of I.S.813 "Domestic Gas Installations".

## Heating System

**In GB**, it is necessary to comply with the Water Supply (Water Fittings) Regulations 1999 (for Scotland, the Water Byelaws 2000, Scotland).

To comply with the Water regulations your attention is drawn to: The Water Regulations guide published by the Water Regulations Advisory Service (WRAS) gives full details of the requirements.

**In IE**, the requirements given in the current edition of I.S.813 "Domestic Gas Installations" and the current Building Regulations must be followed.

## Solar cylinder and cylinder installation

**Pressure equipment directive 97/23/EC** Directive of the European Parliament and Council from 29th May, 1997 for the approximation of the laws on pressure equipment of the Member States

**EN 12977-3** Thermal solar systems and components; Custom built systems, Part 3: Performance characterisation of stores for solar heating systems

**EN 12897** Water supply - specification for indirectly heated unvented (closed) storage water heaters

**EN 806-1** Specifications for installations inside buildings conveying water for human consumption - Part 1: General

**EN 1717** Protection against pollution of potable water installations and general requirements of devices to prevent pollution by backflow

**EN 60335-2-21** Safety of household and similar electrical appliances; Part 2: Particular requirements for storage water heaters (hot water cylinders and hot water boilers) (IEC 335-2-21: 1989 and supplements 1; 1990 and 2; 1990, modified)

## Regulations in Great Britain

Building Regulation, dating from 1991 (England and Wales) Requirement G3, L1 and Regulation 7

**BS 7671** Requirements for electrical installations (IEE Wiring Regulations, 16th edition)

**BS 6759-1** Directive for the usage of the safety assembly for hot water cylinders

# Safety Instructions

## Safety instructions

**NOTE:** In the event of leaks in the water pipework close the main cold water stop valve. This is often located under a kitchen sink.

**IMPORTANT:** A thermostatic mixing valve must be fitted to the outlet of the cylinder and can be adjusted to the desired domestic hot water temperature by an installation or service engineer. Otherwise there is a risk of scalding as the cylinder outlet temperature at the taps could be up to 85°C.

**IMPORTANT:** Risk of damage! Do not remove or modify any components of the solar cylinder.

In the unlikely event of a malfunction occurring of the Flurocyl, such as hot water flowing out of the temperature and pressure relief valve, switch off the boiler and the immersion heater and contact Glow-worm or your installer.

## Frost protection of the twin coil solar cylinder

You must drain the solar cylinder completely if it is to be shut down in a room prone to frost. It is drained at the cold water inlet with a T-piece with tap to be provided by the installer.

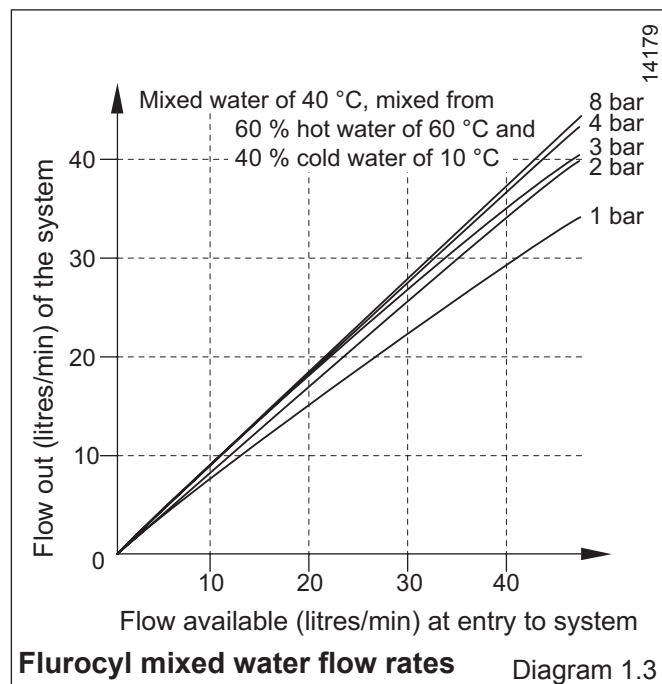
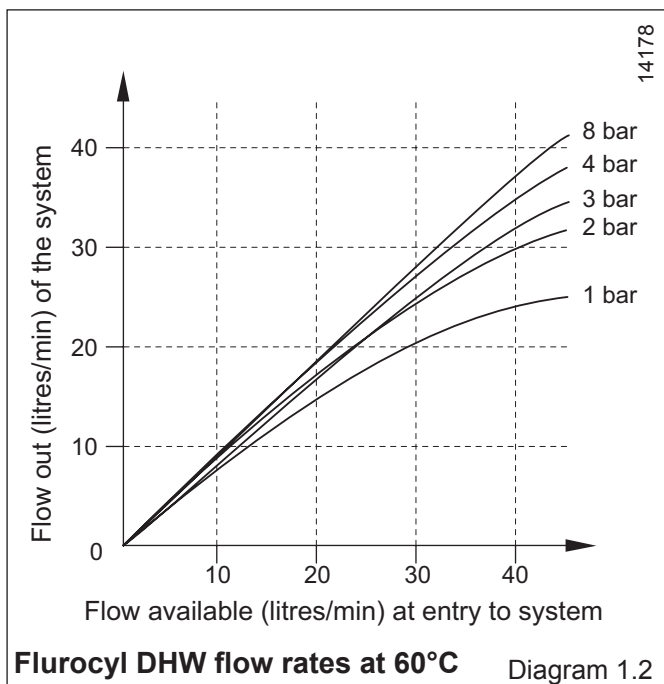
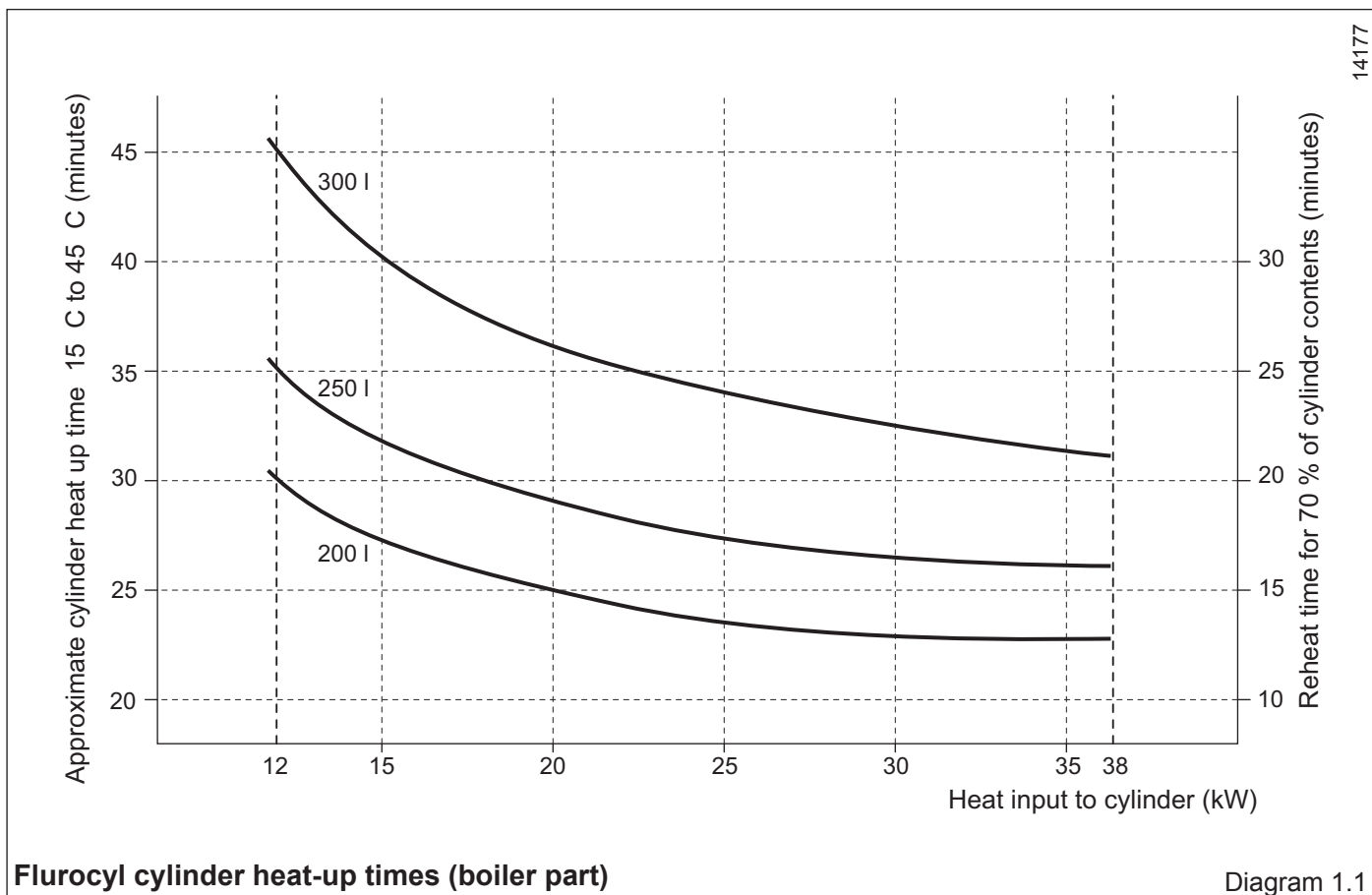
Also drain all heat exchangers which are not filled with solar fluid.

## 1 Product Specifications

|   | Unit    | Flurocyl 200 l      | Flurocyl 250 l | Flurocyl 300 l |
|---|---------|---------------------|----------------|----------------|
| <b>Cylinder:</b>                                |         |                     |                |                |
| Size  | l       | 200                 | 250            | 300            |
| Maximum water supply pressure                   | bar     | 10                  |                |                |
| Operating pressure                              | bar     | 3.5                 |                |                |
| Pressure limiting valve                         | bar     | 3.5                 |                |                |
| Expansion relief valve                          | bar     | 6.0                 |                |                |
| Hot water expansion vessel admission pressure   | bar     | 4.0                 |                |                |
| Temperature and pressure relief valve           | °C/bar  | 95 / 7.0            |                |                |
| Net weight                                      | kg      | 39                  | 44             | 49             |
| Weight (full)                                   | kg      | 245                 | 310            | 340            |
| Height  | mm      | 1499                | 1789           | 2109           |
| <b>Cylinder connections:</b>                    |         |                     |                |                |
| Cold water supply                               |         | 22 mm pressure pipe |                |                |
| Hot water connection                            |         | 22 mm pressure pipe |                |                |
| Pressure-controlled cold water outlet           |         | 22 mm pressure pipe |                |                |
| Secondary return                                | Inches  | G 3/4               |                |                |
| Flow (boiler/solar circuit)                     |         | 22 mm pressure pipe |                |                |
| Return (boiler/solar circuit)                   |         | 22 mm pressure pipe |                |                |
| <b>Electrical connections:</b>                  |         |                     |                |                |
| 3 kW immersion heater (according to ENBS 60335) |         | 230/240 V, 50 Hz    |                |                |
| Length of the immersion heater                  | mm      | 430                 |                |                |
| Motorised 2 port valve                          |         | 230/240 V, 50 Hz    |                |                |
| Cylinder thermostat                             |         | 230/240 V, 50 Hz    |                |                |
| Thermal cut out for solar pump                  |         | 230/240 V, 50 Hz    |                |                |
| <b>Heating coil:</b>                            |         |                     |                |                |
| Heat loss                                       | kW/24 h | 1.9                 | 2.1            | 2.4            |
| Heat up time (boiler part)                      | mins    | 21                  | 26             | 30             |
| Recovery (boiler part)                          | mins    | 13                  | 16             | 21             |

Table 1.1 Technical data

# 1 Product Specifications



**NOTE:** The heat-up time is based on a primary flow rate of 9 l/min at 80 °C. Temperature rise from 15 °C to 65 °C

Static operating pressure of the cold water supply

The displayed flow rates apply to installations in which the cold water supply is of appropriate dynamic pressure.

Please contact Glow-worm if the static water pressure is below 1 bar.

# 1 Product Specifications

## 1.1 Intended use

The Glow-worm Flurocyl 200 l, Flurocyl 250 l and Flurocyl 300 l are unvented, indirectly heated hot water cylinders for use with solar systems and boilers for the provision of domestic hot water.

**IMPORTANT:** Risk of damage! The appliances may only be used to heat up potable water. Damage to the appliance due to corrosion cannot be excluded if the water does not correspond to the specifications of the water ordinance.

Any other use or extended use is considered to be improper. The manufacturer/supplier is not liable for any resulting damage.

Intended use includes the observance of the instructions and the adherence to the servicing requirements.

## 1.2 Data badge

The data badge has been applied to the top of the solar cylinder by the manufacturer.

## 1.3 Safety devices

The Flurocyl solar cylinder has been provided with all safety and control devices suitable for operation as part of an unvented domestic hot water supply system.

Temperature and pressure relief valve (95°C, 7 bar)

Pressure limiting valve (3.5 bar) with line strainer

Expansion relief valve (one port valve, 6.0 bar)

Thermal cut out set to 90°C, connected to the solar pump in order to isolate this heat source in the event of failure of the solar control.

Thermal cut out of the immersion heater

Thermal cut out set to 90°C, connected to the motorised 2 port valve, in order to isolate the primary heat source in the event of failure of the domestic water thermostat.

## 1.4 Safety regulations

This product has been checked for adherence to the building regulations for unvented hot water cylinder systems. It may not be changed or modified in any way whatsoever.

It should be installed by a qualified specialist, who should observe the applicable regulations of the local authorities, the building regulations, the building regulations for Scotland, the building regulations for Northern Ireland and the directives of the local water supply companies. Only original spare parts may be used for the replacement of parts.

## 1.5 Contents

Check the contents of the pack, see diagram 2.1.

Make sure the cylinder is stored in an upright position in a dry environment prior to its installation.

## 1.6 Transport

A cylinder carrying handle is supplied to make the transport to the installation site easier.

Fasten the carrying handle to the hot water outlet connection of the solar cylinder.

## 1.7 Solar Cylinder Characteristics

Flurocyl solar cylinders are available in three sizes: 200, 250 and 300 litres. The containers are made of stainless steel and insulated with EPS. The cylinders are equipped with all necessary cold and hot water control devices and a motorised 2 port valve.

The Flurocyl cylinders are operated at the pressure of the water supply pipe and do not need a cold water tank for their supply. They have hot and cold water connections of 22 mm diameter. A cold water supply of appropriate pressure and flow rate is required to operate the solar cylinder ideally, refer to section 2.6.

### Temperature control

The solar water heating control thermostat is part of the solar control with sensor attached to the Flurocyl solar cylinder.

The cylinder includes the boiler and immersion heater control thermostats that are factory fitted and set.

A thermostatic mixing valve must be fitted to the outlet of the cylinder and must be adjusted to the desired domestic hot water temperature.

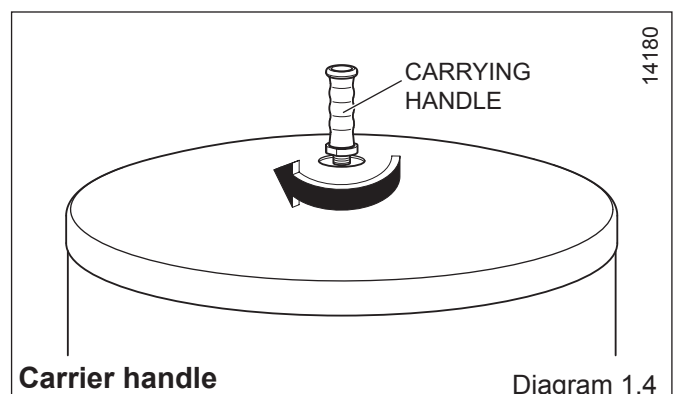
The cylinder also includes the solar, boiler and immersion heater thermal cut outs that are factory fitted and set.

The solar pump must be connected to the solar control via the solar thermal cut out (TCO). It ensures the solar pump is switched off if the hot water temperature in the cylinder rises above 90°C.

### Immersion heater

The Flurocyl solar cylinders are equipped with an additional immersion heater of 3 kW, including the control thermostat and thermal cut out. The immersion heater is situated behind the front plate.

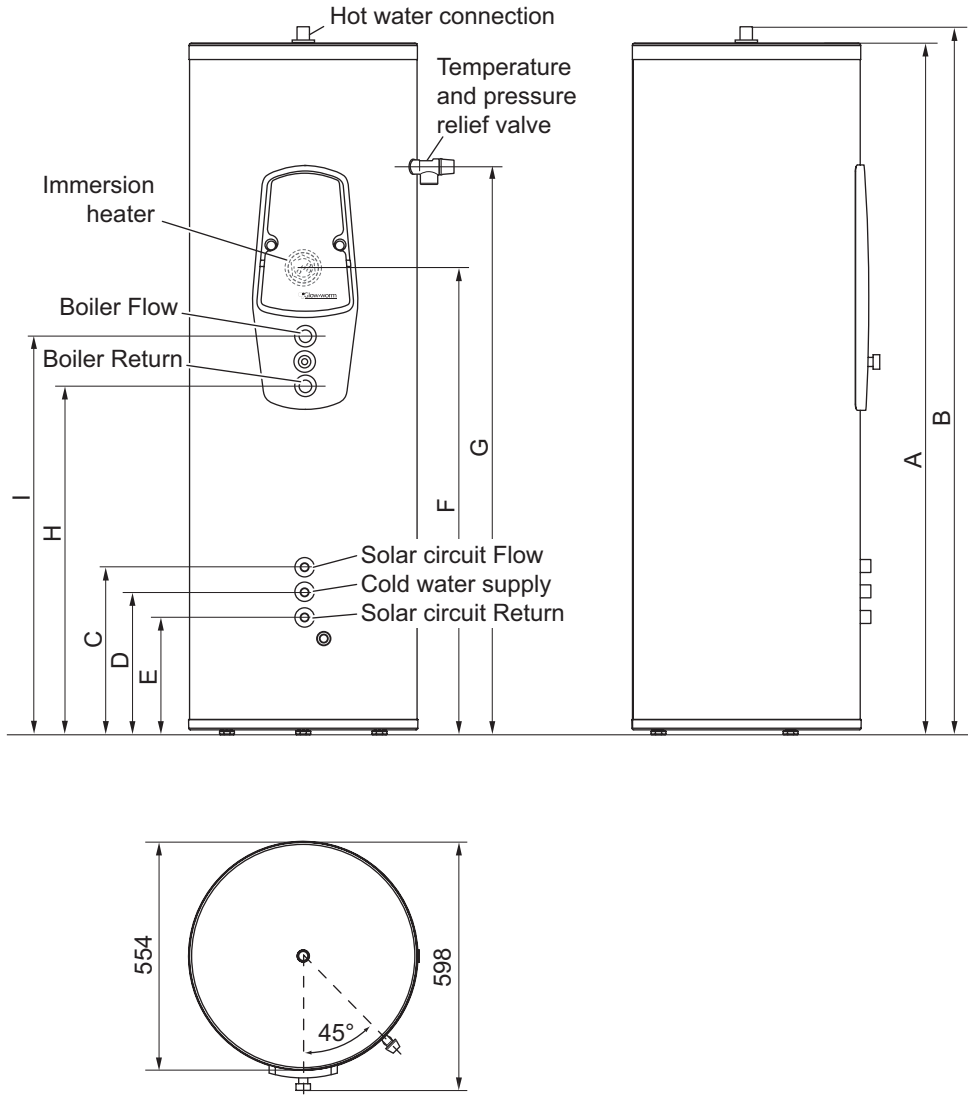
**NOTE:** In the event of a replacement, only the right immersion heater equipped with a thermal cut out for overheating protection may be used.





# 1 Product Specifications

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**Dimensions**

Diagram 1.5

|                | A    | B    | C   | D   | E   | F   | G    | H    | I    |
|----------------|------|------|-----|-----|-----|-----|------|------|------|
| Flurocyl 200 l | 1468 | 1499 | 454 | 384 | 314 | 589 | 1118 | 813  | 953  |
| Flurocyl 250 l | 1758 | 1789 | 454 | 384 | 314 | 589 | 1408 | 924  | 1064 |
| Flurocyl 300 l | 2078 | 2109 | 454 | 384 | 314 | 589 | 1648 | 1101 | 1241 |

Table 1.2 Dimensions

# 1 Product Specifications

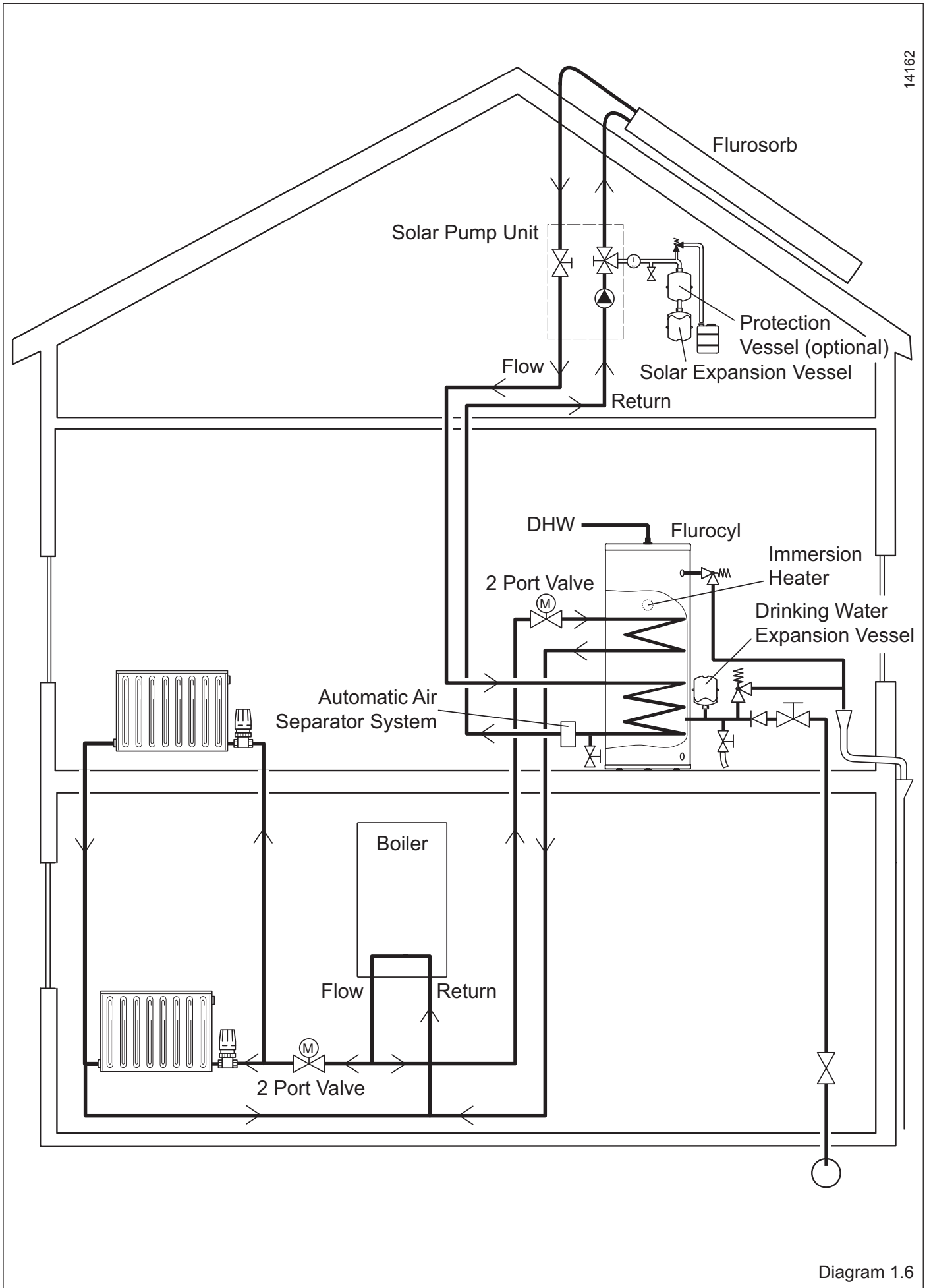
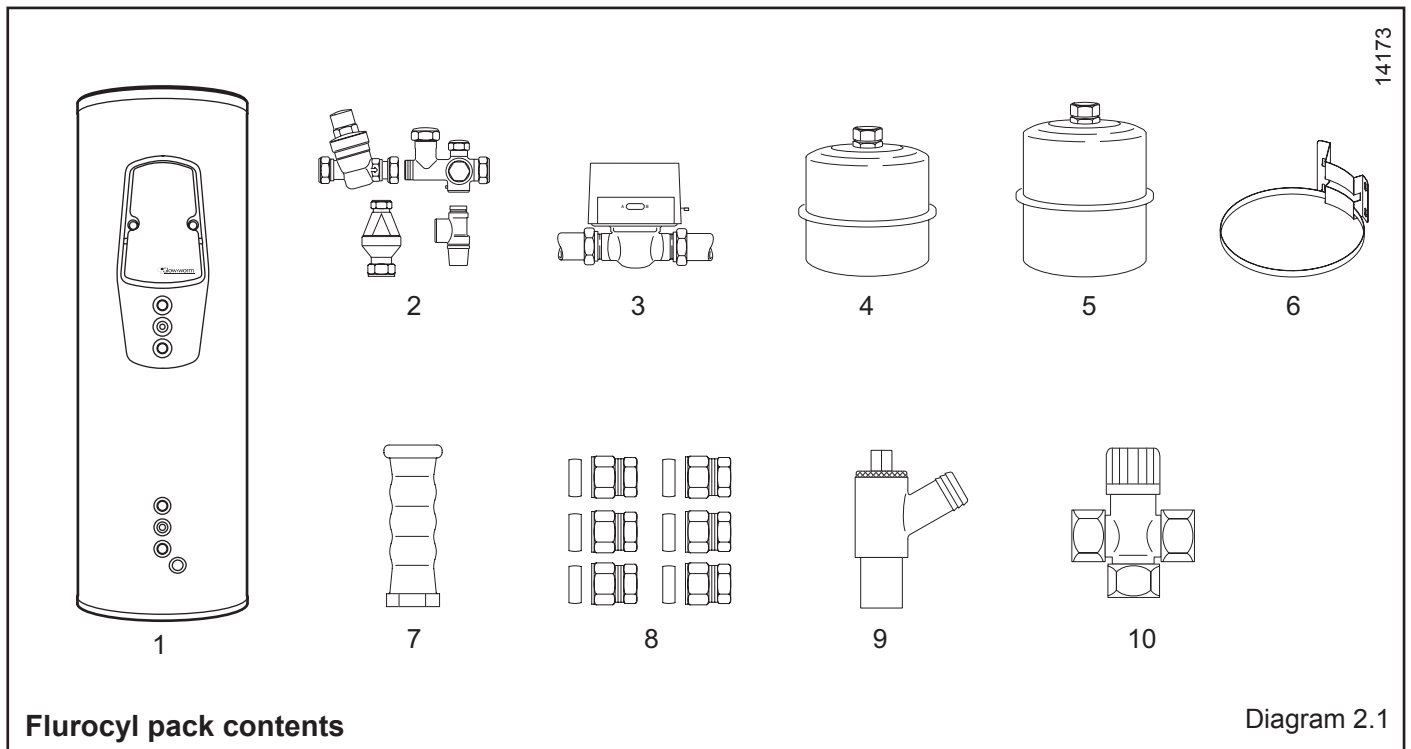


Diagram 1.6

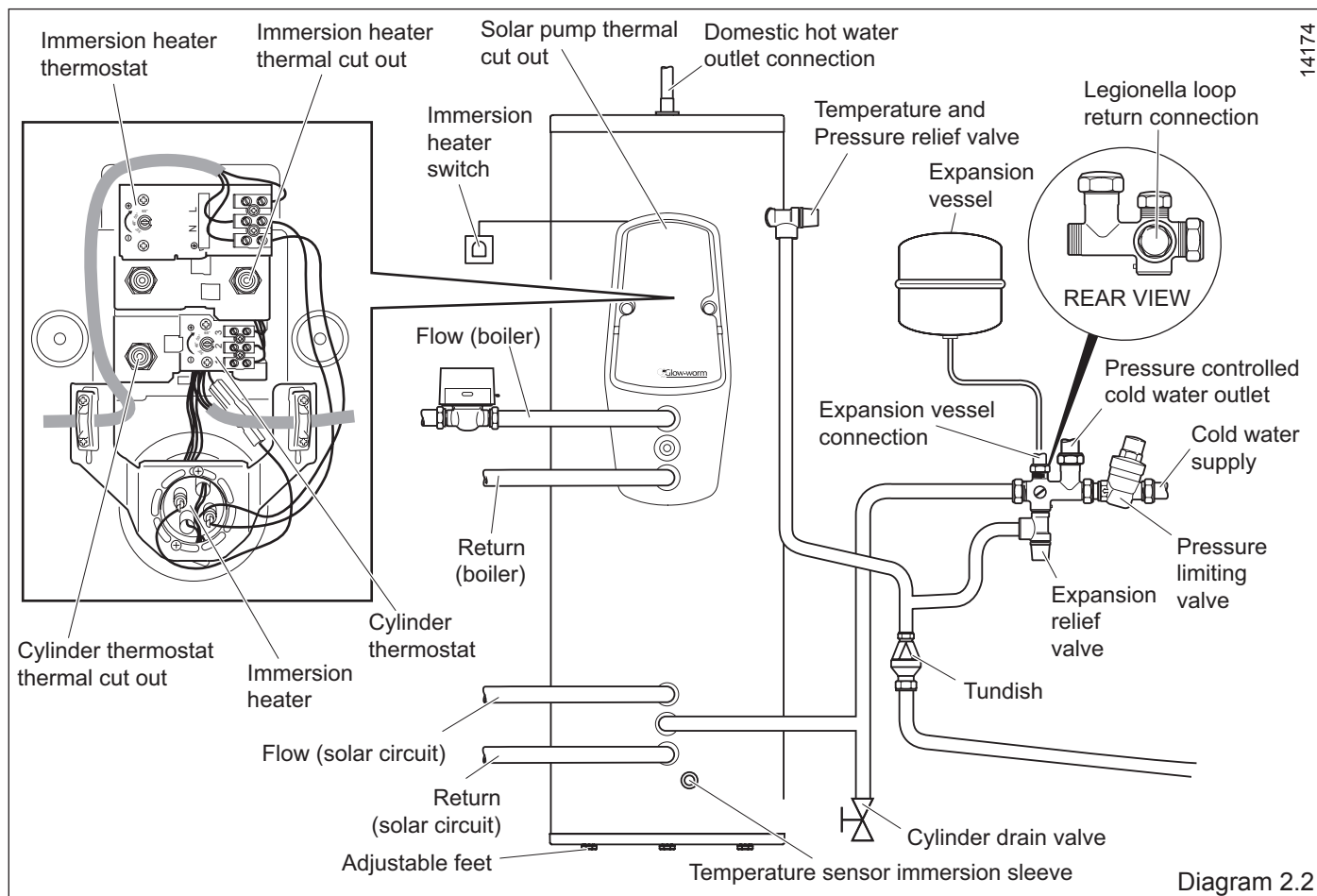
## 2 Installation



| Item | Description                           | Qty.             | Qty.    | Qty.    |
|------|---------------------------------------|------------------|---------|---------|
| 1    | Flurocyl solar cylinder               | 200 l            | 250 l   | 300 l   |
|      |                                       | Part no. 307 206 | 307 207 | 307 208 |
| 2    | Cold water control pack with tundish  | 1                | 1       | 1       |
| 3    | Motorised 2 port valve                | 1                | 1       | 1       |
| 4    | DHW expansion vessel 18 l             | 1                |         |         |
| 5    | DHW expansion vessel 25 l             |                  | 1       | 1       |
| 6    | DHW Expansion vessel mounting bracket | 1                | 1       | 1       |
| 7    | Carrying handle                       | 1                | 1       | 1       |
| 8    | Compression Fittings                  | 1                | 1       | 1       |
| 9    | Drain valve                           | 1                | 1       | 1       |
| 10   | Thermostatic Mixing Valve             | 1                | 1       | 1       |

Table 2.1 Flurocyl pack contents

# 2 Installation



14174

Diagram 2.2

## 2.1 Locating the cylinder

Locate the solar cylinder at an appropriate place in the building, while observing the following:

The discharge pipe from the tundish must be installed at a minimum slope of 1:200 and end at a safe and visible point, refer to section 2.9.

The installation surface must be level and able to bear the weight of the full cylinder, refer to table 1.1.

The installation site may not be prone to frost. A frost protection thermostat must be installed if necessary.

There must be sufficient space to install, check and repressurise the expansion vessel.

Floor unevenness should not be greater than the compensation offered by the adjustable feet of the solar cylinder.

## 2.2 Boiler heating circuit piping

Copper pipes with a minimum diameter of 22mm should be used for the pipes in the reheating circuit between the boiler and the solar cylinder.

Larger pipe diameters may be necessary for relatively large distances between the boiler and the cylinder.

## 2.3 Motorised 2 port valve

To prevent the Flurocyl cylinder from overheating the 2 port motorised valve supplied must be fitted to the primary flow to the indirect coil.

## 2.4 Domestic hot water pipework

Connect the hot water outlet to the 22mm hot water connection of the solar cylinder.

Lay a further 22mm pipe to the first T-piece.

A pipe of 15mm diameter should then be sufficient.

If the pipe is very long or several outlets are supplied, continue with another 22mm pipe.

## 2.5 Thermostatic mixing valve

A hot water thermostatic mixing valve ensures the hot water from the cylinder is mixed with cold water to a desired maximum temperature between 30°C and 60°C.

Set the thermostatic mixing valve to the desired maximum temperature during the solar system commissioning.

**IMPORTANT:** Risk of scalding, Set the thermostat mixer to 60°C or below and check the temperature at a hot water tap to ensure effective protection against scalding.

## 2 Installation

14244

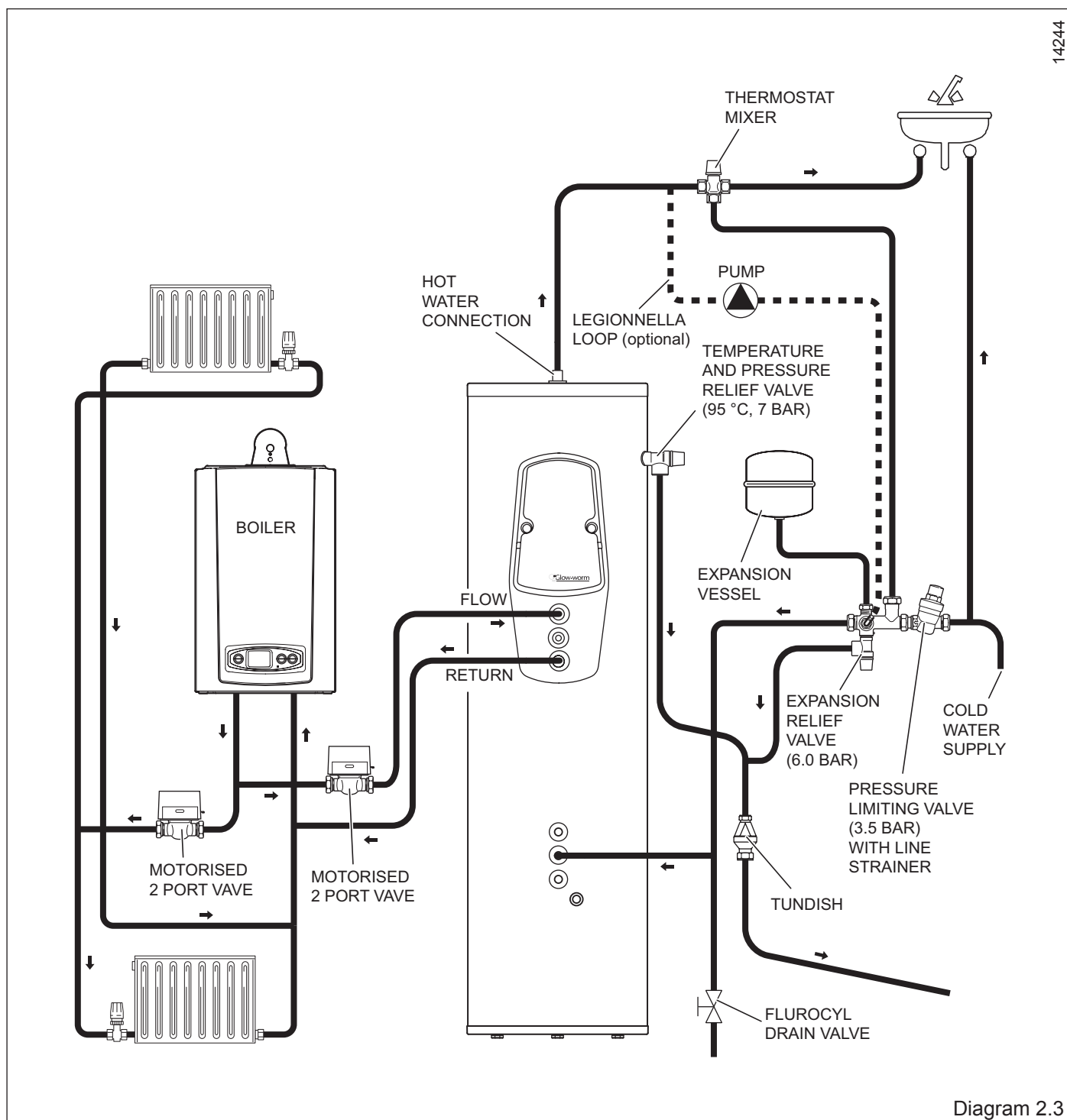


Diagram 2.3

### 2.6 Mains water supply

The performance of unvented cylinders depends on the available mains water pressure and the pipe size.

In order for the performance of the Flurocyl solar cylinder to be ideal, an appropriate cold water supply must be available. The measured static pressure must be at least 2.0 bar. A corresponding flow rate of at least 20 - 25 l/min should be available.

**NOTE:** The mains water pressure is reduced during periods of high water consumption. Make sure you take measurements during these periods.

**Example:** The available flow rate of mixed water at 40°C is 25 l/min (15 l/min hot water of 60°C from the solar cylinder mixed with 10 l/min cold water of 10°C) if the measured static cold mains water pressure is 2 bar.

The solar cylinder operates satisfactorily at a mains water pressure of below 2 bar, but at a reduced flow rate. The unvented solar cylinder should not be installed if the mains water pressure is below 1 bar. You can obtain information on alternative hot water supply systems from Glow-worm.

To keep the friction losses at a minimum, a minimum diameter of 22mm is recommended for the cold water supply in the building, satisfactory performances can also be achieved with 15mm pipes however.

## 2 Installation

### 2.7 Cold water inlet controls and pipework

Connect both parts of the water control pack.

When installing the valves, make sure they are aligned in such a way that the 15mm connection of the expansion relief valve can be connected to the tundish.

Install the assembled water control pack in the cold water supply at an appropriate place next to the solar cylinder. Make sure there is sufficient space for maintenance and the connection of the discharge pipe from the expansion relief valve.

Install the drain valve in the cold water supply at the lowest point between the solar cylinder and the water control pack.

We recommend applying a hose, which reaches about 1m under the base of the cylinder, to the outlet of the drain valve.

**IMPORTANT:** Risk of bursts for the solar cylinder! No stop valve may be installed between the cold water control pack and the cylinder.

Install the water pack so that a discharge pipe of the expansion relief valve can be fitted with constant outward slope which can end at a safe, visible point where there is no risk of freezing.

**IMPORTANT:** Risk of the solar cylinder bursting due to overpressure! The outlet of the expansion relief valve must not be covered or closed.

Test the expansion relief valve regularly to avoid calcification.

To ensure an optimum performance of the solar cylinder, in particularly buildings in which a pressure controlled cold water is used, copper pipes with a diameter of at least 22mm should be used for the pipe from the main stop valve of the building to the solar cylinder.

If the discharge pipes are all together, the expansion relief valve may not be installed more than 500 mm away from the temperature and pressure relief valve.

The Flurocyl solar cylinder is supplied with an external hot water expansion vessel (DW EV).

Connect this expansion vessel to the installed water control pack as follows:

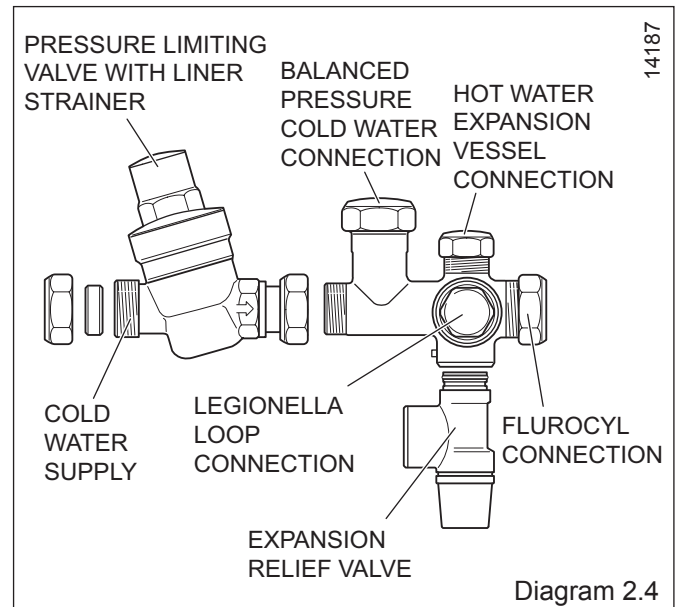
Screw the expansion vessel directly onto the water control pack, via the connection intended for this purpose or

Connect the expansion vessel to the water control pack with a copper pipe or an appropriate hose. Make sure the expansion vessel is supported sufficiently.

Use the supplied mounting bracket if the expansion vessel is to be mounted on the wall.

Connect thermostatic mixing valve cold supply to the pressure controlled cold water connection of the water control pack (if convenient).

**NOTE:** In areas with high water pressure (4 bar or more), a bath or shower mixer valve could also be connected to the pressure-controlled cold water connection of the water control pack. This is to ensure the pressure of the hot and cold water supply to the mixer valve is about the same. Any second cold water supply connection should be installed between the water control pack and the solar cylinder by means of a T-piece.



### 2.8 Discharge pipework

The outlet connections of both the temperature / pressure relief valve and expansion relief valve should be connected in 15mm copper pipe to the tundish supplied. The tundish should be installed vertically, as close to the Flurocyl as possible and within 500mm of the temperature and pressure relief outlet. It must be positioned away from any electrical components and installed in the same space as the Flurocyl cylinder, so that it is visible to the user. The D1 discharge pipe from the T&P Valve/Expansion valve can be teed together upstream of the tundish.

The discharge pipework must be installed using minimum 22mm copper pipework from the 22mm connection on the tundish to a safe and visible discharge point.

There must be a vertical section of pipe at least 300mm long, below the tundish before any bends or elbows in the pipework. Increase the diameter of the pipework if the total resistance of the discharge pipework exceeds the figures shown in table 2.2. The installation of the discharge pipework must be in accordance with G3 refer to Statutory Requirements.

## 2 Installation

| Minimum diameter of the discharge pipe from the tundish | Maximum permissible total resistance, expressed as straight pipe length (without elbows or bends) | Resistance due to each elbow or bend (straight length equivalent) |
|---|---|---|
| 22mm  | Up to 9m  | 0.8m  |
| 28mm  | Up to 18m   | 1.0m  |
| 35mm  | Up to 27m   | 1.4m  |

Table 2.2 Resistance

### Examples:

22mm discharge pipe with 4 elbows and of 7m length from the tundish to the discharge point:

Resistance for 4 elbows per 0.8m = 3.2m  
 Resistance for discharge pipe = 7.0m  
 Total resistance = 10.2m

The total resistance of the discharge pipe is higher than the maximum permissible value for 22mm pipes (9m). Base your calculations therefore on the next largest pipe diameter.

28mm discharge pipe with 4 elbows and of 7m length from the tundish to the discharge point:

Resistance for 4 elbows per 1.0m = 4.0m  
 Resistance for discharge pipe = 7.0m  
 Total resistance = 11.0m

The total resistance of the discharge pipe is lower than the maximum permissible value for 28mm pipes (18m), which means this pipe diameter can be used.

Water which is almost boiling may escape from the discharge pipe in the event of an error.

**IMPORTANT:** Risk of being scalded by escaping hot water! Make sure the discharge pipe ends at a safe point inside or outside the building (safe and visible), where there is no risk of anyone coming in contact with hot water.

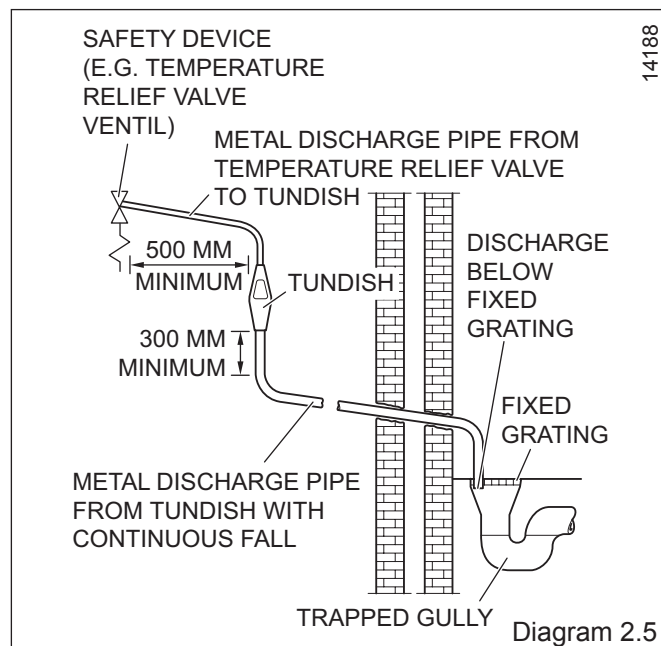
A suitable point is, for example, under a fixed grating above the trap of a trapped gully. Low discharge pipes, for example up to 100mm above external surfaces, such as parking spaces, grasslands etc., can be used, provided they are secured by a wire fence or something similar to prevent children from coming in contact with the waste water, and the system is visible. No valves or taps may be installed in the discharge pipe.

Make sure the discharge pipe is at a constant slope of at least 1:200 from the tundish to the discharge point.

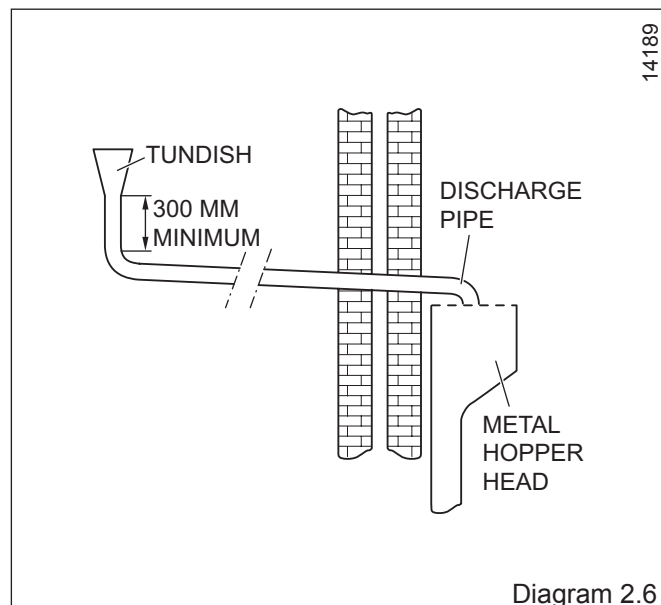
The discharge pipe from the pressure relief valve of the boiler (if applicable) can be connected to the horizontal discharge pipe of the solar cylinder behind the tundish with a T-piece.

### 2.9 High level discharge termination

Providing that the point of termination is such that persons in or around the building will not be endangered should discharge take place, this method of termination is satisfactory. Points to consider when deciding whether a location for the high level of discharge is suitable are:



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The possibility, taking into account wind effect, that someone may be in the path of the water being discharged and if so, whether the temperature of the discharge water will have been sufficiently reduced to not be dangerous. Thermal conductivity of the structure's surface, climatic conditions and location and orientation of the discharge pipe may or may not have an effect on reducing the temperature of the discharge water.

The location of windows and similar openings.

The likelihood of a pram being left beneath the point of discharge.

The ability of structures surface to withstand near boiling water.

The possibility of ice formation if water is discharged onto pedestrian walkways.

# 2 Installation

## 2.10 Electrical installation

Remove the front fascia panel.

Wiring should be performed by a **competent person** in accordance with the building regulations, Part P of the current IEE regulations and further applicable regulations and directives.

The discharge pipes of the tundish, drain valves, motorised valves etc. should be laid at a safe distance to electrical components.

**IMPORTANT:** Danger of death from electric shock! You must earth the solar cylinder for potential equalisation.

## 2.11 Immersion heater

The Flurocyl solar cylinders incorporate an immersion heater.

**IMPORTANT:** Danger of death from electric shock! You must earth the immersion heater for potential equalisation.

Install a separate electrical power supply line for the immersion heater in accordance with current IEE regulations (BS 7671).

You must lay a heat-resistant line (3 x 2.5 mm<sup>2</sup>) from a double pole isolating switch for the immersion heater. The circuit must be protected by a 13 A fuse.

The connection of the immersion heater is illustrated in detail in diagram 2.7.

**IMPORTANT:** Risk of damage! The immersion heater is equipped with a thermal cut out and may under no circumstance be replaced by a standard immersion heater.

Only correct original Glow-worm spare parts are permitted.

## 2.12 Thermostat setting

The entire inner wiring has been pre-assembled at the factory.

**IMPORTANT:** Risk of damage! Switch off the power supply before resetting the thermal cut out or making any other changes to the temperature setting of the cylinder thermostat.

The cylinder thermostats for the regulation of the hot water temperature are factory set at 65°C as the Domestic Hot Water temperature is controlled by the adjustable thermostatic mixing valve. Ensure both control thermostats are adjusted fully clockwise.

Actuate the reset buttons, to reset the thermal cut outs if necessary, see diagram 2.7.

**IMPORTANT:** Risk of damage! If the immersion heater is not connected, you must connect the earth wire to terminal E on the terminal strip of the immersion heater. You can find a wiring scheme on the inside of the cylinder cover.

## 2.13 Thermostat and sensor wiring

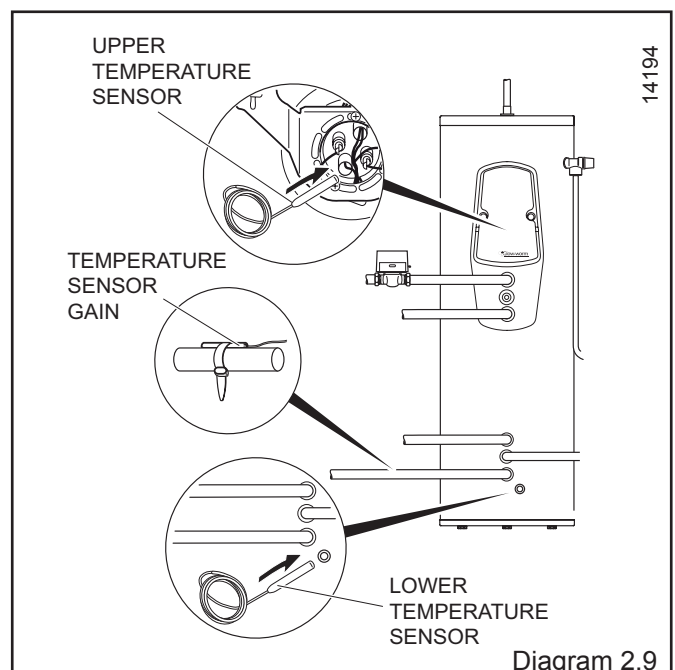
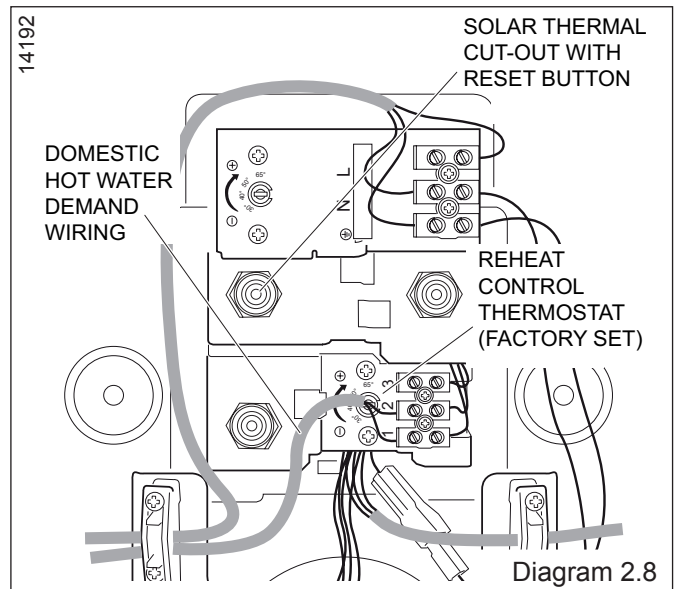
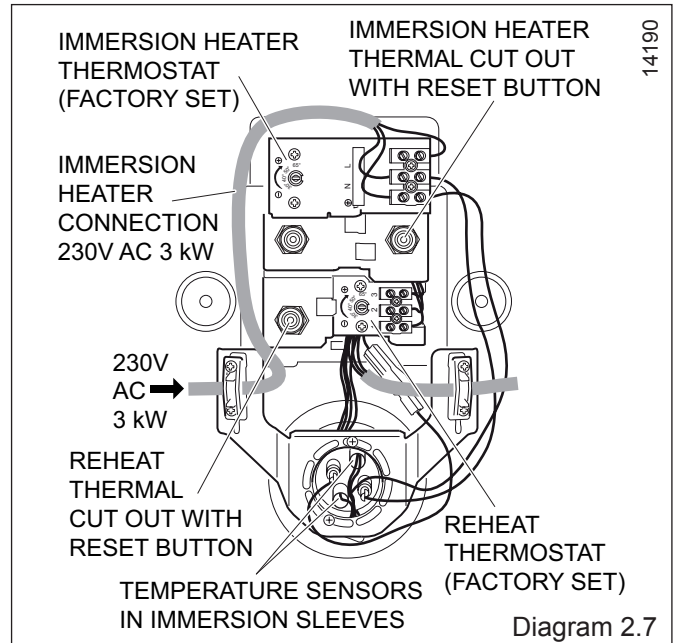
Connect the domestic hot water demand wiring to the reheat control thermostat as shown in diagram 2.8 and 2.10.

Connect the solar pump live via the solar thermal cut out and ensure this thermal cut out is earthed, as shown in diagram 2.8. and 2.10.

Install the two temperature sensors in the solar cylinder, see diagram 2.9, and connect to the solar control, see diagram 2.10.

Attach the solar gain sensor to the solar circuit return, see diagram 2.9.

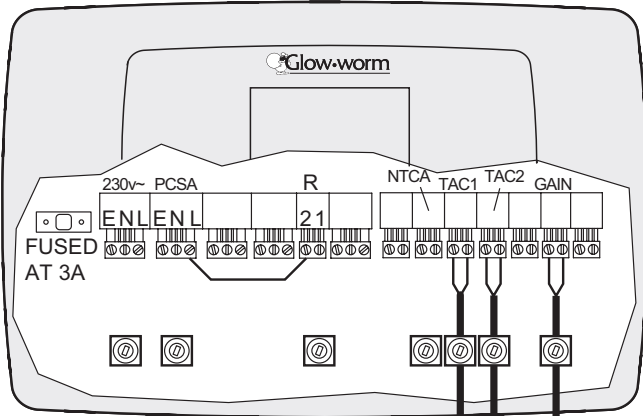
Replace the front fascia panel.





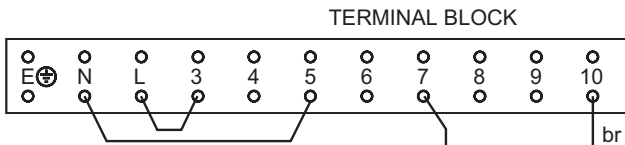
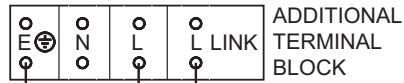
# 2 Installation

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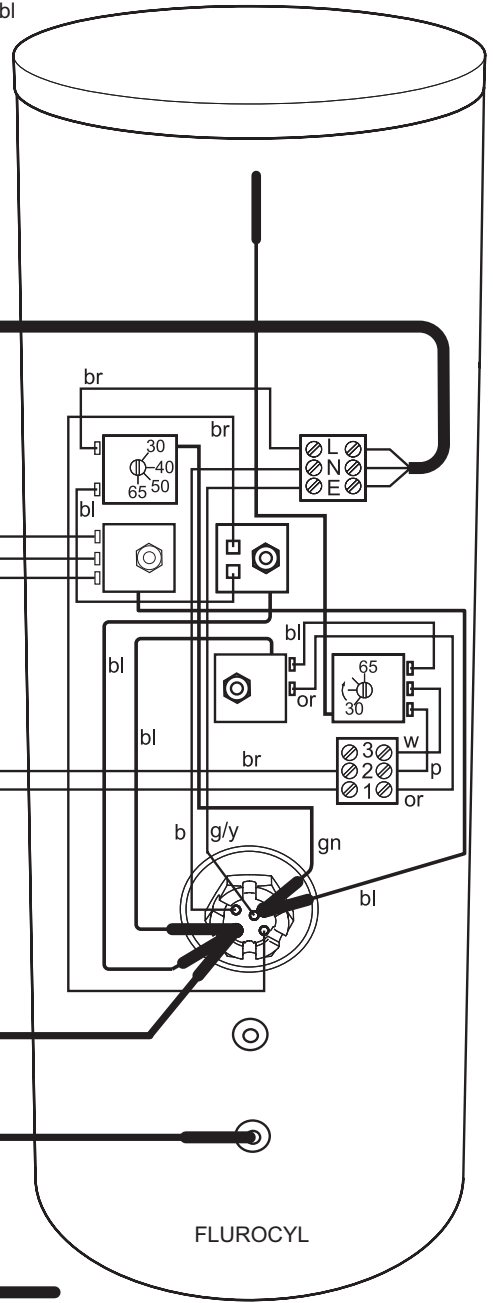
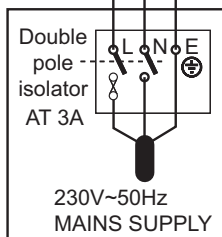


FLUROPRO CONTROLLER

| KEY           |     |
|---------------|-----|
| BROWN         | br  |
| BLUE          | b   |
| BLACK         | bl  |
| ORANGE        | or  |
| WHITE         | w   |
| PURPLE        | p   |
| GREEN         | gn  |
| GREY          | g   |
| GREEN /YELLOW | g/y |



COMMON 230V MAINS TERMINAL BLOCK



FLUROCYL

RETURN PIPE

Wiring diagram

Diagram 2.10

# 3 Commissioning

## 3.1 Filling the secondary circuit

**IMPORTANT:** Risk of damage! Do not manually open the temperature/pressure relief valve or the expansion vessel for venting purposes. Any foreign matter in the pipework may cause damage to the valve seats.

Make sure the cylinder drain valve is closed.

Open all cold and hot water taps and the corresponding outlets.

Open the mains water supply to the Flurocyl and fill it with water until it flows freely out of the outlets. Make sure all air bubbles have been removed.

Close the outlets and check the system for leaks. Check in particular the immersion heater connection for leaks.

The system must now be flushed thoroughly.

Open the hot water taps at the opposite ends of the systems and let the water flow out for at least 5 minutes.

Close the hot water taps.

## 3.2 Setting the thermostatic mixing valve

The hot water from the solar cylinder can be set to a desired maximum temperature between 30 °C and 70 °C by mixing hot and cold water.

Set the hot water thermostatic mixing valve with the adjusting knob to maintain the householders desired temperature at the hot water taps.

**IMPORTANT:** Risk of being scalded by hot water! Set the thermostat mixer to 60 °C or below and check the temperature at a hot water tap to ensure effective protection against scalding.

## 3.3 Reheat circuit (boiler circuit)

**NOTE:** Do not use the pressure relief valve of the boiler (if applicable) for bleeding.

Flush the entire primary central heating system with cold and hot water. Fill and bleed the central heating system according to the installation manual of the boiler.

Set the lever on the motorised 2 port valve to MANUAL and lock it in this position, see diagram 3.1.

Fill and bleed the central heating system after draining it completely.

Unlock the lever on the motorised 2 port valve by setting it back to AUTO.

Start up the boiler, refer to section 3.4, until the solar cylinder is at operating temperature and all radiators in the system are warm. Then drain the entire central heating system again to remove any residue from the pipes. Fill and bleed it again afterwards as described above.

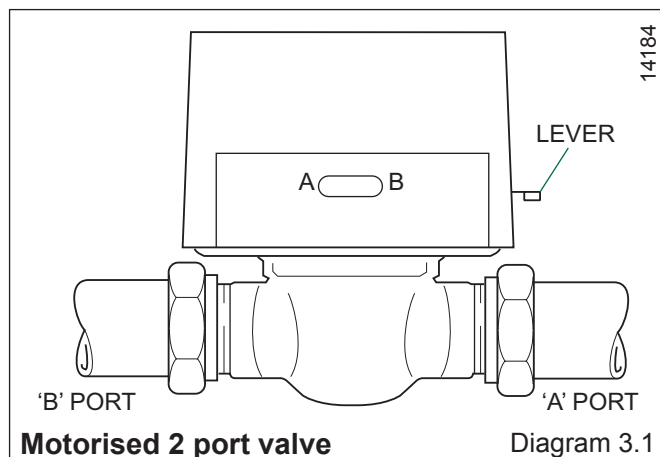
## 3.4 Starting up the boiler

Switch on the main switch of the boiler.

Make sure the control device and the thermostats are set in such a way that heating is necessary.

Check whether the boiler starts up and the water in the solar cylinder and radiators is heated up according to the hot water and room thermostat settings.

Perform the commissioning and testing procedures in accordance with the installation manual for the boiler.



**GB:** It is a requirement that the “Benchmark” Installation, Commissioning and Service Record is completed and left with the user.

**IE:** it is necessary to complete a “Declaration of Conformity” to indicate compliance to I.S.813. An example of this is given in the current edition of I.S.813.

## 3.5 Handing over to the householder

- Hand over all manuals to the householder.
- Advise the householder to keep the manuals near to the system.
- Draw special attention to the safety instructions which the householder must follow.
- Review the user instructions with the householder and answer any questions.
- Show the householder how to operate the solar control, CH control and any separate DHW control.
- Inform the householder that the cylinder temperature is factory set at 65°C and that the DHW temperature can be adjusted using the TMV by the installer.
- Inform the householder that the immersion heater is intended as a standby device and should not be used simultaneously with the boiler to heat the cylinder.
- Inform the householder that they are not permitted to change the settings made on the solar system.
- Inform the householder that to ensure the continued efficient and safe operation of the solar system it is recommended that it is checked and serviced at regular intervals. The frequency of servicing will depend upon the installation conditions and usage, but in general, once a year should be enough.
- Inform the householder that the boiler and solar cylinder should be serviced by a qualified engineer annually.

Leave these instructions and the “Benchmark” Installation, Commissioning and Service record document with the user.

# 4 Inspection and Maintenance

## 4.1 Checking the temperature / pressure relief valve and expansion relief valve

Actuate each valve manually by turning the valve cap and check whether the water flows unhindered to the discharge point via the tundish. Make sure both valves fit properly in idle position.

## 4.2 Checking the charge pressure of the expansion vessel

Block the water supply and open the nearest hot water tap to reduce the pressure from the secondary water system.

Check the pressure of the expansion vessel at the measurement point with a pressure gauge. If the pressure is below 3.0 bar, increase it with an appropriate air pressure pump.

**NOTE:** Only use original spare parts from Glow-worm for the replacement of parts.

## 4.3 Maintenance Checklist

### Reheating

Check the circulation pump annually.

Check the timer/time programme settings annually.

Reheating: does it deliver the desired deactivation temperature? annually.

### Solar cylinder

Bleed the heat exchanger if necessary annually.

Check the connections for leaks annually.

Check the temperature and pressure relief valve annually.

Checking the expansion relief valve annually.

# 5 Fault Finding

The following tables provide information on possible malfunctions during the operation of the solar cylinder as well as their cause and remedy.

**NOTE:** Only use original spare parts from Glow-worm. for the replacement of parts. We recommend making a maintenance agreement.

| Malfunction  | Cause   | Remedy  |
|--|---|---|
| <b>Solar cylinder</b>  |   |   |
| The cylinder cools down at night. The flow and return temperatures vary after switching off the pump. The collector temperature is higher than the air temperature at night. | 1. The gravity brake is blocked.  | 1. Check the position of the blue handle.<br>2. Check the gravity brake for tightness (jammed cuttings, particles of dirt in the sealing face).<br>3. Do not connect the solar heat exchanger directly, rather pull the supply pipes downwards and then upwards to the collector (syphon supports the gravity brake) or install a 2-port valve, which is switched on at the same time as the pump.              |
|  | 2. One-pipe circulation in the event of short pipe networks with low pressure loss.       | Install a gravity brake (as close as possible to the cylinder).   |
| Reheating is not working. The boiler runs for a short time, goes off and then back on again. This is repeated until the cylinder is at its target temperature.               | 1. Air in the reheating heat exchanger.   | Bleed the reheating heat exchanger.   |
|  | 2. Heat exchanger surface area too small.   | Compare the specifications of the boiler manufacturer with those of the cylinder manufacturer. The problem may be able to be solved by a higher setting of the flow temperature at the boiler.  |
| Only cold or lukewarm water comes out of the taps.   | 1. Cold and hot water connections on the cylinder have been mixed up.                     | Turn off the cold water supply, then let water flow out via the hot water connection. Only a few litres of water flow out if the connection is laid correctly. The inlet of the hot water draw-off pipe then rests in the air space; no further emptying is possible. If the entire solar cylinder runs empty via the hot water connection, the connections have been laid incorrectly. Change the connections! |
|  | 2. Hot water thermostat mixer set too low.  | Increase the setting.   |
|  | 3. Solar heating insufficient; boiler does not reheat.<br>External control device faulty. | Check whether the boiler is working.<br><br>Check whether the external control device is working.<br>Check whether the two port valve is in the hot water position.<br>Replace the two port valve.  |
|  | Air in the reheating heat exchanger<br><br>Cylinder temperature sensor defective.         | Bleed the reheating heat exchanger.<br><br>Check the thermal cut out and reset it.<br>Replace the cylinder thermostat.  |

Table 5.1 Fault Finding

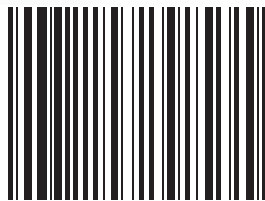
## 5 Fault Finding

| Malfunction  | Cause  | Remedy  |
|--|--|---|
| Water flows out of the expansion relief valve (only when heating up).                | Dirt on the valve seat of the expansion relief valve.                | Check the expansion relief valve and reset it manually.   |
|  | Pressure limiting valve defective.                                   | Switch off the boiler and immersion heater and check whether the pressure behind the pressure limiting valve is lower than 3.0 bar if water flows out only when heating up. If so, replace the pressure limiting valve. |
|  | Expansion vessel defective.  | Check the pressure in the expansion vessel. If the pressure is insufficient, re-establish the pressure and check whether the equalisation tank maintains the pressure.  |
|  | Expansion relief valve defective.                                    | If the pressure is normal, replace the expansion relief valve.  |
| Water comes out of the temperature and pressure relief valve (only when heating up). | Dirt on the valve seat of the temperature and pressure relief valve. | Check the seat of the temperature and pressure relief valve and reset it manually.  |
|  | Temperature control of the boiler defective.                         | Check the temperature control of the boiler if water only comes out when reheating with the boiler. Check whether the two port valve switches to the heating position after reaching the cylinder temperature.          |
|  | Cylinder temperature sensor defective.                               | Check the cylinder temperature sensor and the corresponding thermal cut outs and replace the temperature sensor and reset the thermal cut outs if necessary.  |
|  | Two port valve defective.  | Check whether the two port valve is working and replace it if necessary.  |
|  | Temperature and pressure relief valve defective.                     | Replace the temperature and pressure relief valve if water only comes out when heating up with the immersion heater.  |
|  | Immersion heater defective.  | Check the temperature sensor of the immersion heater and the corresponding thermal cut out and replace the immersion heater if necessary.   |

Table 5.1 Fault Finding (continued)







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0020055006-02 07.07

**Glow-worm**, Nottingham Road, Belper, Derbyshire. DE56 1JT

*Because of our constant endeavour for improvement, details may vary slightly from those shown in these instructions.*



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