Glow-worm

# Instructions for Use

To be left with the user

# Clearly Solar System

including

# Fluropro

Solar Differential Controller

www.glow-worm.co.uk

# WARNINGS

**SAFETY**

The fluropro 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**

Danger of death by electric shock! All live parts of the system may be installed, serviced and repaired only by a competent person. Risk of overvoltage! Earth the solar circuit as potential equalisation and protection against overvoltage! Attach earthing pipe clips to the solar circuit pipes and connect the clips to a potential rail with a 16mm$^2$ copper cable.

**Glow-worm service call:** 01773 596510 **Technical helpline:** 01773 828300

**General and Sales enquiries** Tel: 01773 824639 Fax: 01773 820569

Glow-worm is a licensed member of the Benchmark Scheme which aims to improve the standards of installation and commissioning of domestic heating and hot water systems in the UK and to encourage regular servicing to optimise safety, efficiency and performance.

Benchmark is managed and promoted by the Heating and Hotwater Industry Council. For more information visit www.centralheating.co.uk

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COLLECTIVE MARK
THE MARK OF QUALITY FOR THE INSTALLATION, COMMISSIONING AND SERVICING OF DOMESTIC HEATING AND HOT WATER SYSTEMS

# Important Information

## Documents

Please retain these user instructions and all related documents in a safe place for future reference.

If you vacate the premises in which this system is installed, please give the documents to the new owner.

## Testing and Certification

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

## CE Mark

The CE mark on the Fluropro solar control and Flurocyl twin coil cylinder indicates that these products comply with the basic requirements of the applicable directives.

## General Note

Servicing/maintenance should be carried out by a **competent person** in accordance with the rules in force in the countries of destination.

## Servicing

To ensure the continued efficient and safe operation of the product it is recommended that it is checked and serviced at regular intervals. The frequency of servicing will depend upon the site conditions and usage, but in general, once a year should be enough.

To obtain service, please call your installer or Glow-worm's own service organisation using the telephone number on the inside front cover of this booklet.

## Cleaning

The Fluropro and Flurocyl can be cleaned using a mild liquid detergent with a damp cloth.

Do not use any form of abrasive or solvent cleaner as you may damage the surfaces.

## Recycling

These products comprises many recyclable parts.

The packaging and the content of the package shall not be disposed of with general domestic waste but according to the current regulations.

# Contents

# System Design

These instructions are an integral part of the controller and must, to comply with the current issue of the Gas Safety (Installation and Use) Regulations, be left with the user.

Please ensure that the installer has fully completed the Benchmark Checklist in the centre pages of the installation instructions supplied with the product and that you have signed it to say that you have received a full and clear explanation of its operation. The installer is legally required to complete a commissioning checklist as a means of complying with the appropriate Building Regulations (England and Wales).

All installations must be notified to Local Area Building Control either directly or through a Competent Persons Scheme. A Building Regulations Compliance Certificate will then be issued to the customer who should, on receipt, write the Notification Number on the Benchmark Checklist.
Please read these instructions and follow them carefully for the safe and economical use of this product.

## Solar system

The solar system is intended for the provision of solar heated domestic hot water. Any other use is considered to be improper and the manufacturers / suppliers are not liable for any resulting damage.

**IMPORTANT:** We accept no liability for any damage or injuries caused by improper use.

### Flurocyl twin coil unvented cylinder

The Flurocyl is an unvented, indirectly heated hot water cylinder for use with solar systems and suitable boilers. This cylinder is intended to supply domestic hot water and may only be used for this purpose.

## Compartment or Cupboard Installations

Ventilation is not required for compartment or cupboard installations. Do not use the compartment or cupboard for storage.

## Fluropro solar control

The Fluropro monitors the temperature within your cylinder and solar panel and controls the solar system accordingly. This control is also able to determine if the boiler is required to provide further heat.

The Fluropro solar control works on the principal of differential temperature control. The control always switches on the collector pump when the difference in temperature (collector temperature - cylinder temperature) is greater than the programmed activation difference.

The controller switches off the collector pump when the difference in temperature (collector temperature - cylinder temperature) is less than the programmed deactivation difference.

# System Functions

## Solar gain

The installation engineer  activates and configures the solar gain function within the Fluropro installer menu.

The solar gain is determined from:

- The difference of temperature between the collector flow and return.
- The flow rate setting of the flow rate adjuster.
- The operating time of the collector pump.

During installation the engineer sets the actual flow rate and enters the setting into the solar control. The solar gain is calculated and displayed by the solar control. The total gain can be called up and reset in the installer menu.

## Solar gain modulation

The rate of solar gain can be modulated to ensure the solar heat at the bottom of the cylinder has sufficient time to dissipate to the top of the cylinder. This maintains demand for solar energy and prevents excessive on and off periods that are inefficient.

The modulation is achieved by means of more frequent on and off operations of the solar pump during solar demand.

The pump is switched on and off and the rate depends upon the difference between the collector temperature and lower cylinder sensor. When the activation difference is reached, the function is started (if activated) with an activation duration of 50 % - i.e., the pump is switched on for 30 seconds and then switched off for 30 seconds. If the difference in temperature increases, the activation duration is prolonged (e.g., 45 sec. on, 15 sec. off). When the difference in temperature decreases, the activation duration is reduced (e.g., 20 sec. on, 40 sec. off). The period length is always a minute.

## Solar circuit protection function

If the solar heat exceeds the current heat requirement, i.e. the cylinder is fully charged, the temperature in the collector array can rise steeply.

To protect the solar circuit (solar pump, valves, etc.) from overheating, if the protection temperature at the collector sensor is exceeded, the collector pump is shut down and is prevented from restarting even when there is a demand for solar reheating. The solar pump is switched on again once the system has cooled down. This function is performed independently for each collector array. The control will show “PROT” whilst this function is active.

# System Functions

## Cylinder reheat

The cylinder reheat function allows the cylinder to heat up to the required temperature during a set time window, even if the solar gain is insufficient. In this case the water can be reheated using an external boiler or the immersion heater. You can set up times for reheating the solar cylinder, refer to Settings section in Instructions for Use.

## Reheat delay

To prevent unnecessary cylinder reheating by a boiler or an immersion heater, the Fluropro solar control includes a reheat delay function. This function delays the cylinder reheat by up to 30 mins if solar gain is available.

If the solar pump is off and the desired cylinder temperature is not reached after the delay period, the cylinder will be reheated using an external boiler or the immersion heater.

The reheat delay function is activated by an engineer within the Fluropro installer menu.

## Legionella protection

The Legionella protection function is designed to kill germs in the cylinder system.

When the function is activated, the cylinder, the hot water pipes, and the circulation pump (if installed), are brought to a temperature of 70°C on the programmed day(s) and at the programmed time.

In doing so, the cylinder temperature is raised to 70°C and the corresponding circulation pump is switched on (if installed). First, an attempt will be made using solar gain alone to reach the target temperature over a 90 min. period. If this is not successful, the Legionella protection is carried out using an external boiler or an immersion heater, whichever has been set up for this thermal protection. The Legionella protection function will stop once a temperature of at least 70°C has been maintained for a period of 30 minutes.

The installation engineer activates the Legionella protection function within the Fluropro installer menu and specifies whether the thermal disinfection should take place at 3:30 p.m. or at 4:00 a.m., i.e. mininal offset gain at 3:30 p.m. versus cheaper electricity at 4:00 a.m.

## Anti-seize protection for pumps

If no pumping has occurred for 23 hours, all installed pumps are switched on for approx. 3 seconds to prevent pumps from seizing.

## Secondary recirculation

The Fluropro solar control includes a programmer channel for a DHW secondary return. A secondary return should not be used with Glow-worm twin coil unvented solar cylinders.

## Calendar

The controller is equipped with a calendar so that it can automatically adjust by 1 hr between GMT and BST. To activate it, an engineer can simply enter the current date within the Fluropro installer menu.

**NOTE:** In the event of a power failure, the controller only has a power reserve of 30 minutes. After 30 minutes, the internal clock stops and the calender will not automatically resume function once power has been restored. In this case the time and date will need to be reset.

## Special functions

Please refer to Settings section for information on how to activate the following special functions.

- **Party function**

When the party function is activated, the cylinder reheat is activated until the next programmed off period. This means that the cylinder DHW temperature setting will be maintained by the auxiliary cylinder reheating if necessary.

- **One-time cylinder reheat**

When this function is activated, the cylinder is reheated to DHW temperature setting ONCE ONLY.

- **Holiday function**

When this function is activated, the operating mode is switched to “Off” for the set holiday period (1 to 99 days). This deactivates both the solar heating and the cylinder reheat.

# User Instructions

## General Note

We recommend declaring the solar system as an increase in value to your insurance and insuring it against lightning.

## Operation of the solar system

Once the solar system is commissioned it will work automatically, you do not even need to make any adjustments when you go on holiday.

**IMPORTANT:** The collectors and pipes can become very hot – avoid touching them!

**IMPORTANT:** You must not make any changes to the Flurocyl cylinder, Fluropro control, pipework, power supply, wiring, pressure relief valves or expansion relief valves. The system operates automatically.

**IMPORTANT:** Do not switch off the solar system – even when you go on holiday or assume an error has occurred,the only exception is if, the solar panels have been damaged, resulting in a pressure drop in the solar system or solar fluid escaping.

Do not take out the fuse or switch off the fuse box.

Do not under any circumstances empty or fill the solar circuit yourself.

## Operation of the solar cylinder

The unvented Flurocyl solar cylinder is provided with connections for a solar system as well as an auxiliary cylinder reheat system.

How to control the solar system is described in the manuals for each controller.

**NOTE:** In the event of leaks in the water pipework close the main cold water stop valve. This is usually 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.

# User Control Panel

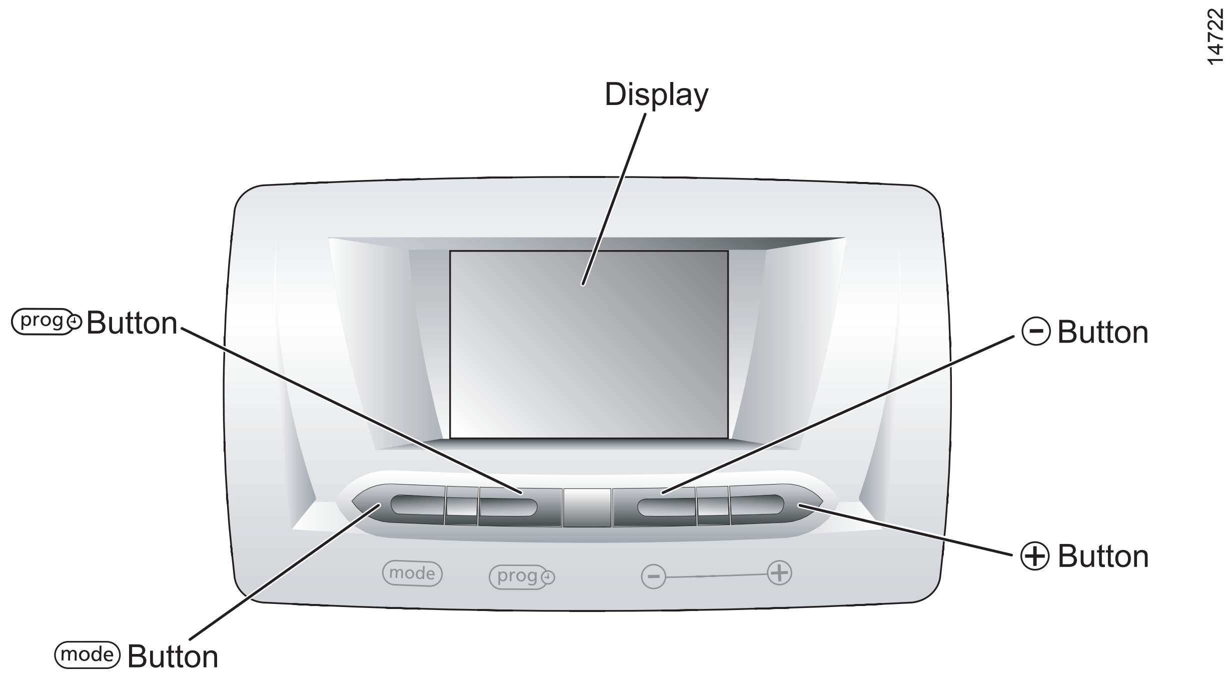



Diagram 1

# Operation

**Fluropro Cylinder Reheat Programmer**
The Fluropro incorporates a 7 day programmer for timing the domestic hot water cylinder reheat. Utilising this programmer also ensures that your boiler will only be fired when absolutely necessary, maximising solar gain and minimising gas consumption.

When using the Fluropro DHW programmer, the domestic hot water channel of any existing programmer is not used.

The Fluropro control will only signal to the boiler if the cylinder is below the required temperature, if the solar system is not operating and if the programmer is on.

**Alternative DHW Programmer**
However there are circumstances when the Fluropro domestic hot water programmer cannot be used due to installation limitations or where the householder is familiar with an existing domestic hot water programmer and does not want to revert to the Fluropro programmer. In such cases an alternative DHW programmer can be used.

**NOTE:** Programme the alternative domestic hot water programmer to provide hot water when required. Consider carefully when the solar system might be running and try to time to HW programmer to run when there is unlikely to be any solar gain.

**NOTE:** The Fluropro will only control the solar system.

## Operating the controller

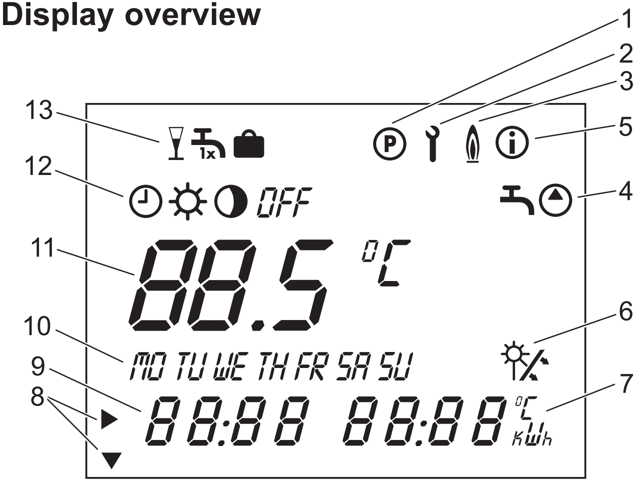
The Fluropro solar control is similar to use as the Glow-worm Climapro programmable room thermostat by allowing the user to scroll through options and settings menus via a single button, multi press function. Adjustments are made to the control settings by pressing the ⊕ and ⊖ buttons.

Special functions are accessed and activated by pressing the prog button.

Installer and service menus must only be accessed by service or installation engineers.

# Display

## Display overview




**Key**
1 Programming menu
2 Service/diagnostic menu
3 Cylinder reheat
4 Not used
5 Info menu
6 Solar gain (blinks if solar gain is available)
7 Units
8 Cursor
9 Multifunction display
10 Days of the week
11 Target/actual value
12 Operating modes
13 Special functions

## Display symbols

**Timer programs:**

Cylinder reheat

Not used

**Operating modes:**

Cylinder reheat function in timed mode

Cylinder reheat function in constant mode

No cylinder reheat

OFF Solar pump(s) not activated
No cylinder reheat

**Special functions:**

Party function

One time cylinder reheat

Holiday function

Diagram 2

# Display Modes

## Operating menu

The operating menu appears when the appliance is switched on. Please refer to Settings section for information on how to set and change the values.

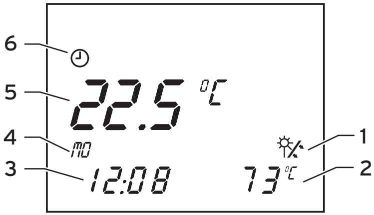



Diagram 3

**Operating menu**

**Key**

1 Indicates that solar gain is available (collector pump is running)
2 Actual collector temperature
3 Current time, or LEG for Legionella protection function (if active)
4 Current day of the week
5 Actual cylinder temperature
6 Current operating mode

## Special functions

By pressing the prog button, you can access the special functions: party, one-time cylinder reheat and holiday function. After approximately ten seconds, the selected function is activated and the display returns to the main operating screen.

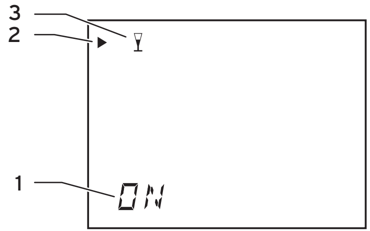



Diagram 4

**Special functions**

**Key**
1 Special function activated
2 Cursor (marks the special function selected)
3 Symbol for the special function selected

## Info menu

To access the info menu press and hold (prog) button.
The display initially appears as seen in the diagram below.
You can call up additional information by pressing the info buttons again (see Settings section). The information called up appears on the display for approximately five minutes, then the display returns to the main operating menu.

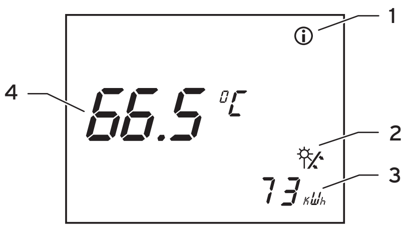



Diagram 5

**Info menu**

**Key**

1 Info menu
2 Solar gain indicator (collector pump is running)
3 Solar gain in kWh
4 Not used

# Display Modes

## Programmer menu

Refer to Diagram 1.

- Press (mode) 5 times.
Select with ⊕ or ⊖ buttons, press to accept.

- H1 flashes. Press ⊕ to increase, H1, H2, H3, press ⊖ to decrease, press (prog) to accept.

- Day indicators flash. Press ⊕ and ⊖ to select day or group of days the programme applies to, press (prog) to accept.

- Start time "hh" flashes. Use ⊕ or ⊖ to select start time hours, press (prog) to accept.
Start time "mm" now flashes. Use ⊕ or ⊖ to select start time mins (to nearest 10 mins only), press (prog) to accept.

- Repeat process for End time.

- If further programmes are to be added, press (prog) to repeat the process.

- On completion of programme setup, press (mode) button to return to main running screen.

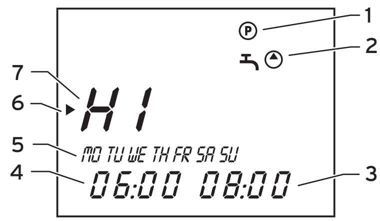



Diagram 6

**Programming menu**

**Key**
1 Programmer menu
2 Timer program for reheating the solar cylinder
3 End time
4 Start time
5 Day of the week or block of days
6 Cursor (marks the value to be changed)
7 Time period

## Settings in the Operating menu

### Changing the operating mode

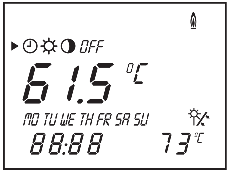



Diagram 7

From the main screen press the mode button once. The operating mode icons are then displayed on screen. The current operating mode symbol flashes. To change the operating mode press the ⊕ or ⊖ button. The operating modes available are detailed in section 5.3 “Display Overview”. Press mode button repeatedly until the main screen is again displayed.

### Changing the current day

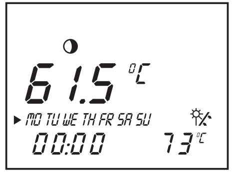



Diagram 8

From the main screen press the mode button two times. The current day of the week is flashing. To change the current day press the ⊕ or ⊖ buttons. When the required day is flashing press mode to accept. Press mode repeatedly until the main screen is displayed again.

### Changing the current time hh:mm

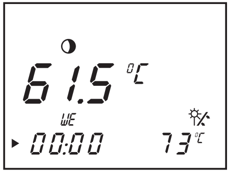



Diagram 9

From the main screen press the (mode) button three times. The current hour then flashes. You can adjust the hour by pressing the ⊕ or ⊖ buttons. Press (mode) once. The current minute indicator flashes. Again using the ⊕ or ⊖ buttons adjust the minute indicator. When the required time is displayed, press mode. Press (mode) repeatedly until the main screen is displayed again.

## Settings in the Programmer menu

### Settings in the Programmer menu

You can create a DHW program with up to three time periods for reheating the solar cylinder. The Fluropro includes a default program which can be customised to meet your individual needs.

| Time window | Weekday / Block of days | Start time | End time |
|---|---|---|---|
| H 1 | MO - SU | 6:00 | 22:00 |
| H 2 | — | — | — |
| H 3 | — | — | — |

**Table 1. Default cylinder reheat program**

# Settings

There are four steps to setting the times you require.

1. Select the time period for reheating
2. Select a weekday or block of days
3. Set the start time
4. Set the end time.

You can specify up to three time periods. The time periods cannot overlap each other, see below:

From the main running screen, press (mode) button 5 times. The programming screen is displayed, the cursor is flashing beside the reheat (tap) symbol.

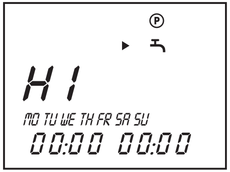


Diagram 10

Press the (prog) button once. The cursor moves to beside "H1" which is now flashing. To change the number of time periods, use the (+) and (−) buttons. When adjusted as required press (prog) button once.

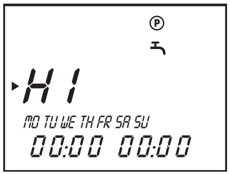


Diagram 11

The cursor marks the block of days display, which also flashes. Select a block of days or a single day of the week by repeatedly pressing the (+) or (−) buttons.
Press (prog) button once when required block is selected.

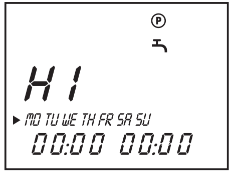


Diagram 12

The cursor marks the start time and the hour display flashes. Select the start time by using the (+) and (−) buttons. Press the (prog) button when the required hour is selected.

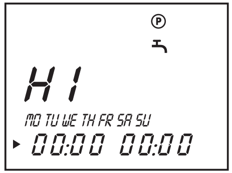


Diagram 13

# Settings

The cursor marks the start time and the minute display flashes. Select the start time minutes by using the ⊕ and ⊖ buttons. Press the (prog) button when the required minutes are selected.
**NOTE**: The minutes will increase and decrease in 10 minute steps.
The cursor marks the end time and the hour display flashes. Select the end time by using the ⊕ and ⊖ buttons. Press the (prog) button when the required hour is selected.

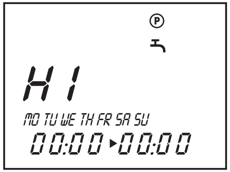



Diagram 14

The cursor marks the end time and the minute display flashes. Select the end time minutes by using the ⊕ and ⊖ buttons. Press the (prog) button when the required minutes are selected.
**NOTE**: The minutes will increase and decrease in 10 minute steps.

## Special functions

**Party function**
Press the prog button once, the party symbol flashes for approximately ten seconds in the display, then the function is activated.
The function is deactivated automatically when the next reheating period begins.
If you want to deactivate the function before, simply reselect the function.
The function can only be activated in the reheating operation mode.

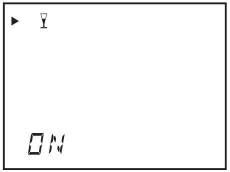



Diagram 15

**One-time reheating**
Press the prog button twice, the one-time reheating symbol flashes in the display for approximately ten seconds, then the function is activated.
If you want to deactivate the function before, press mode.

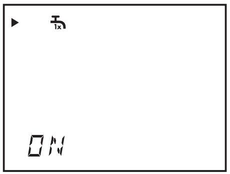



Diagram 16

**Holiday function**
Press the prog button three times, the holiday function symbol flashes in the display for approximately ten seconds. To set the number of holidays use + and − buttons to increase or decrease, as required.
Finally, the function is activated for the set time.
If you want to deactivate the function before, simply reselect the function.
If the anti-Legionnaire's disease function is activated, the protection will be carried out on the last holiday.

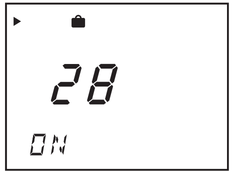



Diagram 17

# Settings

## Settings in the info menu

You can call up values for the settings successively by pressing prog.

**Values for settings**


Diagram 18. Cylinder temperature setting

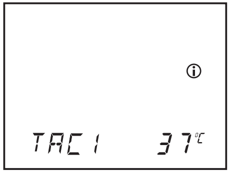



Diagram 19. Upper cylinder sensor value

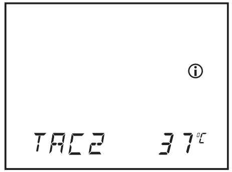



Diagram 20. Lower cylinder sensor value

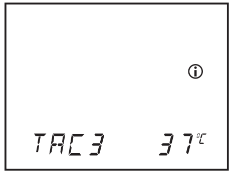



Diagram 21. Not used

# Settings

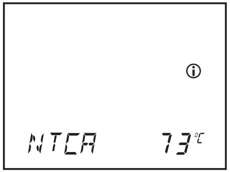



Diagram 22. Collector sensor value (array 1)

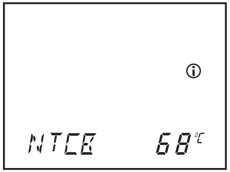



Diagram 23. Collector sensor (array 2 if applicable)

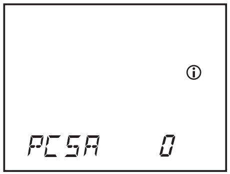



Diagram 24. Operating hours for collector pump (array 1)

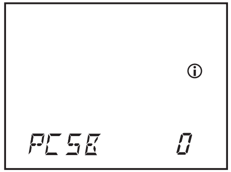



Diagram 25. Operating hours for collector pump (array 2 if applicable)

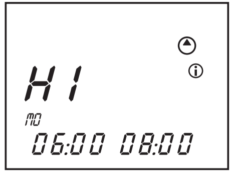



Diagram 26. Not used

# Servicing, Maintenance and Spare Parts

## General Note

Servicing/maintenance should be carried out by a **competent person** in accordance with the rules in force in the countries of destination.

If this appliance is installed in a rented property in the UK there is a duty of care imposed on the owner of the property.

To obtain service, please call your installer or Glow-worm's own service organisation using the telephone number on the inside front cover of this booklet.

## Cleaning the collectors

The collectors do not have to be cleaned.

Solar collectors become dirty in the same way as roof windows, they are cleaned sufficiently by rain.

## Solar system fluid

The solar system should be checked for frost protection once a year by your installer or Glow-worms own service organisation.

Do not refill the solar circuit with fluid. Do not mix the solar fluid with other fluids.

## Frost protection of the solar cylinder

Make sure the central heating remains switched on and the temperature in all rooms and the installation room of the Flurocyl solar cylinder are protected from freezing, especially if you are absent for long periods.

**IMPORTANT:** Risk of frost!

The cylinder must be completely drained if its is to be shut down for a long period of time in an unheated room (e.g. winter holidays etc.).

## Sealed Water Systems

The draining, re-filling and pressurising **MUST** be carried out by a **competent person**, contact your Installation/Servicing company or Glow-worm Service.

## Spare Parts

REMEMBER, When replacing a part on this product, use only spare parts that you can be assured conform to the safety and performance specification that we require. Do not use reconditioned or copy parts that have not been clearly authorised by Glow-worm.

If replacement parts are required contact Glow-worm's own service organisation using the telephone number on the inside front cover of this booklet.

# System - Fault Finding

| Fault | Action |
|---|---|
| … fluid drips out of the system? | Collect it (in a bucket) if possible and notify a qualified servi-cing company. |
| … the fluid level rises in the collecting container under the solar pump unit? | Notify a qualified servicing company. |
| … fluid or steam comes out of the expansion relief valve? | Notify a qualified servicing company. |
| … "Sensor defective" or "Broken cable" is displayed on the controller? | Notify a qualified servicing company. |
| … the pressure on the pressure gauge falls below minimum operating pressure? | Notify a qualified servicing company. |
| … no temperature difference is visible between the flow and return thermometer at the solar pump unit? | Wait five to ten minutes. If the system is then still running, the system may be defective.<br>Notify a qualified servicing company. |
| … the pane of a flat plate collector has been damaged? | Do not touch the collector interior. Cover the collector with a canvas as protection against rain.<br>Notify a qualified servicing company. |
| ... the cylinder does not deliver enough hot water? | Check the hot water thermostat mixer setting (approx. 60°C recommended). If the settings are correct, the cylinder maybe calcified.<br>In this case notify a qualified servicing company. |

If an error message is displayed ('Err') on the Fluropro solar control, notify a qualified service company.

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

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