

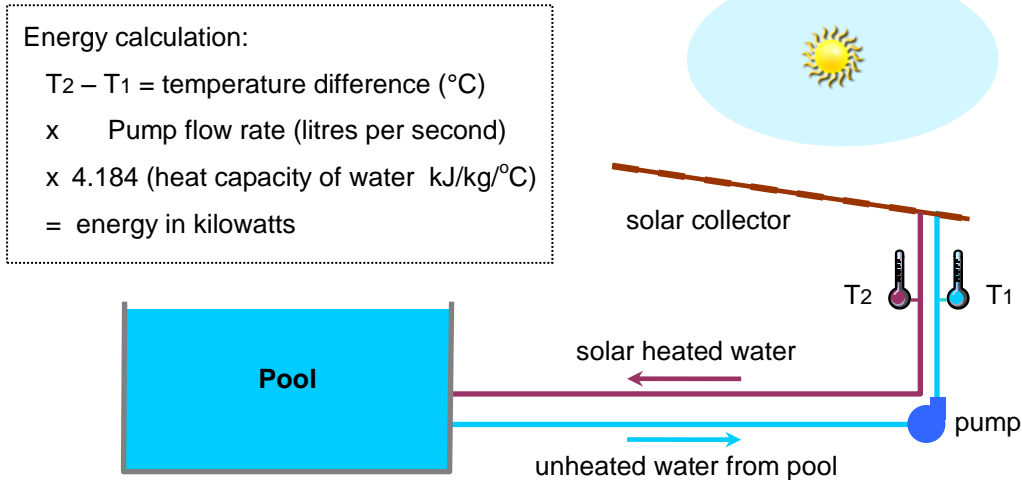


PRODUCT: Sunbather Greenhouse Gas Monitor (GHGM)

SYSTEM OVERVIEW

GHGM gives councils and other commercial pool operators the opportunity to publicly display their green initiatives in a simple, educational and interesting way.

The system measures the energy actually collected for heating pool water by the solar pool heating system. This is done by measuring the temperature of the heated water being fed into the pool in comparison with unheated water drawn from the pool.



The illuminated display board logs the real-time heat output of a solar pool heating system in kW and converts this output into accumulated GHG savings measured in tonnes CO_2 over time. The energy in kilowatts is calculated continuously and shown on the display board. The energy derived from the solar installation may be compared directly with the heat produced by a conventional gas fired or electric heater.



The accumulated total energy collected by the solar pool heating system is also calculated. This total is multiplied by a factor (established by the Australian Greenhouse Office) to give a total in tonnes of CO_2 greenhouse gas equivalent that would have been produced if the pool had been heated by a conventional method using locally available energy. The total is shown on the display board as the tonnes of greenhouse gas saved. As months and years go by this total will increase to reflect the accumulated saving.

Temperature monitoring system

Details that affect the solar systems performance are all brought to account by the water temperature differential measurement. These details include the installed area of the solar collector, angle of orientation, angle of inclination, wind exposure and measured or calculated pump flow rate.

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Thermocouples continuously log the solar collector inlet and outlet water temperatures. These temperatures are fed into the on-board computer to calculate the water temperature rise across the solar collector every 5 seconds. The digital display uses this temperature rise, together with pump flowrate to display instantaneous kW output. Accurate measurement of the system flow rate is a key factor in successfully calibrating the display and Sunbather recommend that flow rates are verified by taking a pressure rise reading across the solar circulator pump on every installation.

Accrued Greenhouse gas equivalents measured in Tonnes CO₂ are accumulated for the system for its entire service life.

Display

The display uses highly efficient bright red Gallium Aluminium Arsenide LEDs which consume only 160mW per segment. Yellow or green LED displays may be substituted but are less efficient and will have reduced visibility unless used indoors. LED display height is 60mm and highly visible from a distance of 50m.



Installation

The temperature monitoring system is typically located in the water treatment building with the solar heater control system. Temperature sensors are fitted to the pipes carrying the water to and from the solar collectors. An additional sensor is connected to the pump controller to determine when the pump is running.

The 750mm x 550mm display is connected to the monitoring system using standard Cat-5 networking cable. A cable run of up to 100 metres is supported. The display is powered by the monitoring system so no additional power is required at the point of the display. The display panel weighs 4.0 Kg and is mounted using standard wall fixtures.

An installation can normally be completed in a matter of hours.

GHGM OFFERS MULTIPLE BENEFITS:

Public benefit : the public can feel comfortable that they are swimming in an environmentally friendly pool. The monitor continually reminds them that solar energy never stops and greenhouse gas savings are cumulative.

Pool operator benefit : solar systems are often installed in hard to see locations. The GHG monitor advertises the fact that an effective solar system has been installed by the environmentally conscious pool operator.

Maintenance benefit : the kW output display provides continual visual confirmation that the solar system is working normally. Any malfunction in the solar system will be detected by a zero kW input under normal running conditions.

Everyone benefits : The world we all share is a better place when solar energy is used instead of fossil fuels. The savings in GHG equivalents is likely to astound most people as an Olympic sized pool can consume more than 150 times the energy required to run an average family household.