

# SOLAR WATER HEATING SYSTEMS



## SPECIFICALLY DESIGNED FOR NEW ZEALAND CONDITIONS

We are very pleased to be able to offer a New Zealand made product with a proven history of quality, reliability and efficiency. The ecogise solar water heating system has been designed, developed and installed over the past 25 years.

Because we manufacture our own systems we have the ability to custom build solar collectors and large systems. We can also colour code the solar collectors to the approved roof colour and the customer has the added assurance that their system is built specifically for New Zealand conditions.

ecogise solar water heating systems are approved to the NZ Standard.

## HOW DOES SOLAR WATER HEATING WORK?

The way the sun heats your water is best explained by likening it to a glasshouse, or perhaps the way a car parked in the sun heats up.

The incoming sun rays are long rays which can penetrate through glass or other materials such as clear plastic. After penetrating and striking any solid object behind the glass, the rays break up into short rays which cannot travel back through the glass, and the heat is trapped.

ecogise solar panels are made of highly conductive material with copper waterways and a small circulation pump. The pump circulates fluid from the water cylinder through the solar panels where it is heated and then back to the water cylinder, where it is stored awaiting use.

An electronic controller and temperature sensors control when the pump turns on to circulate the fluid through the solar panels. This is to achieve maximum efficiency and avoid heat loss in colder weather.



# SOLAR WATER HEATING INFORMATION



## WE USE ACCREDITED INSTALLERS

All ecogise solar water heating installations must be carried out by an accredited ecogise installer, as stipulated in the warranty document.

All installers must have completed training conducted by ecogise and meet the Solar Industries Association standard. Accredited ecogise installers aim to maintain the highest possible efficiency, reliability, customer satisfaction and quality of workmanship.

## COUNCIL CONSENT

Consent forms are available for download from the ecogise website: [www.ecogise.co.nz](http://www.ecogise.co.nz)

## WATER QUALITY

Copper is generally very stable and long lasting, however there are certain areas in New Zealand where the water is very corrosive to copper cylinders. Generally this is untreated water (not town supply), or some bore supplies.

If this is a problem in your area of installation, you must either inform the customer they require a stainless steel cylinder or arrange supply of a Superheat copper cylinder with a special coating on the bottom dome that increases the cylinder life. Generally less than 1% of households have water supplies that will affect copper barrelled hot water cylinders.

## POWER FAILURE

If a power failure were to occur the only effect would be the solar circulation pump would stop circulating fluid around the solar system. The system cannot boil itself dry due to in-built safety parameters.

At the customer's request or in areas where power cuts are a problem an optional stand-by battery power supply can be fitted to keep the system operating until power is restored.

## CONNECTION TO EXISTING SYSTEMS

If desired, ecogise can connect its solar system to an existing water cylinder by way of an external heat exchanger. However, we would not recommend this solution if the existing cylinder is old or small - a new, efficient cylinder with a large storage capacity is more ideal.

## LEGIONELLA PROTECTION

The timer supplied with the ecogise solar hot water system is designed to eliminate the possible growth of Legionella bacteria. This is an industry requirement.

**ecogise - knowledge is power**



# SOLAR WATER HEATING INFORMATION



## CLOSED LOOP/OPEN LOOP

A closed loop system is one where fluid in the solar system is separated from the potable water in the water cylinder by way of a heat exchanger. In an open loop system the potable water in the cylinder also travels through the solar system.

An open loop system often has better heat transfer qualities, however the ecogise closed loop system is designed for peace of mind operation and quality of performance.

## FROST PROTECTION

ecogise solar hot water heating systems are protected from frost damage by virtue of being part of an indirect (closed loop) system, incorporating food grade glycol suitable for temperatures down to -25°C.

The system also incorporates an automatic drain-down system that removes the fluid from the collectors when the outside temperature drops below a specified differential. This removes the need for pressure/temperature relief valves (venting onto roofs), reducing system component failures and maintenance costs.

## FLUID EXPANSION

When the fluid within the system gets hot it expands, so pressure and fluid will need to be released.

Many companies use an expansion valve on the roof, as pressure builds up the valve releases pressure and excess hot water onto the roof. This can often cause damage to plastic guttering and valves failures are common, causing fluid to continuously leak out.

ecogise have designed our own expansion vessel

within the system, where the fluid can easily expand without being lost and energy is not wasted. The design of the expansion vessel also works to eliminate air bubbles/blockages from the system. This reduces maintenance and improves the reliability, longevity and efficiency of our system.

Many systems need to be covered over if they are not going to be used for a week or two, for example, when you are away on holiday. This is not the case with an ecogise system due to design parameters and the use of an expansion vessel.

## PUMPED SYSTEMS

A pumped system uses an efficient pump to circulate fluid from the water cylinder, through the solar collectors and back to the cylinder. We usually provide pumped systems to our customers as this avoids the need for an aesthetically unpleasant water cylinder on the roof of the house, and there are no building consent weight issues.

## THERMOSYPHON SYSTEM

A Thermosyphon system circulates the fluid through the system naturally as the sun heats the water, the water rises and draws the cold water back into the inlet of the collector. The water cylinder needs to be above the height of the solar collectors for this to work and this is why many companies mount the water cylinder on the roof.

ecogise might install this type of system when we have the ability to mount the water cylinder inside the roof and above the height of the collectors. This requires a fairly high roof pitch, and sometimes is just not possible.

# SOLAR WATER HEATING INFORMATION



## SOLAR CONTROLLERS

The solar controller has a number of different reasons:

1. To control when the circulation pump comes on. The controller measures the temperature at the outlet of the solar collectors and at the outlet of the heat exchanger in the water cylinder. When the difference between these two temperatures is greater than 8°C the pump will come on. When the temperature differential drops to less than 4°C the pump will stop. This prevents heat being taken from the cylinder and lost through the collectors at night or in cold weather.
2. To display temperature, solar gains and system status. It also shows settings that have been set by ecogise at the time of installation.
3. To activate the lower electric element in the water cylinder. This must happen once a week to heat all the water in the cylinder to above 65°C for a period of time. This is to eliminate legionella bacteria, and is an industry requirement that must be met.

## THE WATER CYLINDER

Our water cylinders are manufactured to our specific requirements in New Zealand and so we have a number of combinations available to us. We usually have two electric elements installed in the cylinder, one at the bottom for legionella protection, and another about a third from the top of the cylinder.

At any one time, hot water usage is generally limited to only some of the water in the top part of the cylinder. Having an element near the top of the cylinder enables the system to heat this water to the required temperature (about 65°C) and reduces the top up

energy used. This allows the solar system to work more efficiently.

## MAINS, MEDIUM & LOW PRESSURE

Older homes may be on low pressure, with a header tank in the roof which uses gravity to provide pressure to the hot water cylinder. In these homes the cold water has much better pressure than the hot, as the cold water comes directly from the high pressure town supply. These days plumbers commonly install a pressure valve, which drops the town supply cold water to a predetermined pressure before it enters the water cylinder. These valves will drop the pressure to medium or mains pressure depending on your preference, the capability of the cylinder, and also the bathroom fitting installed.

ecogise recommend that people use medium pressure as apposed to mains pressure for a number of reasons:

- Less pressure on the system improves its longevity
- A copper cylinder is cheaper than stainless steel
- Use less water and save on your water rates
- Less hot water used means energy savings.

Many people want mains pressure systems installed to improve their water pressure, but a medium pressure system and the installation of quality medium pressure tap ware can create a similar effect.

Consult with your plumber or installer for further clarification.

# SOLAR WATER HEATING INFORMATION



## FLAT PLATE vs EVACUATED TUBE

There are two main types of solar water heating collectors - flat plate and evacuated tube. In New Zealand and Australia around 80% of the systems sold are flat plate. Flat plate technology has been around for over 40 years, while evacuated tube technology is fairly new to the market, and mostly built in China.

Although evacuated tube systems can heat the water to higher temperatures, we usually only require hot water at around 65°C. Hotter temperature will increase pressure on the system, reducing its lifespan and increase maintenance requirements.

The ecogise system is design to heat the water to the required temperature and no more which ensures longevity, efficiency, reliability, no overheating issues, and no component damage.

## MOUNTING

ecogise have developed a mounting system that ensures the integrity of the roofing, withstands high wind loading, is non-corrosive and at the same time is aesthetically pleasing. Some systems may need to be pitched up to the required pitch for optimum performance (30-40°) and ecogise can do this without bulky stands.

## ROOF PENETRATIONS

ecogise have patented roof penetrations for all roof types that prevent damage to roof claddings and water ingress within the roof.

## SOLAR WATER FOR HYDRONIC SPACE HEATING

As a rule approximately 50kw of power is required to heat a 150m<sup>2</sup> dwelling per night. Approximately 500 watts per m<sup>2</sup> are available at the collector under ideal conditions. From these figures it is evident that home heating using solar energy alone is impractical if not impossible, especially when you take into consideration the fact that the time of year when you require the most space heating is the time of year when the least solar energy is available.

Because we want it to work properly, ecogise solar water heating systems will only be offered as an assisting heat source in conjunction with a primary heating option such as a gas fire.

## WHY BUY NZ MADE?

The ecogise solar water heating system is designed and built in New Zealand to meet New Zealand conditions. There are many advantages of having a New Zealand made system:

- Custom built options available
- Built to withstand New Zealand conditions
- Technical support close at hand
- Assurance of warranty fulfilment
- Less freight miles/carbon footprint
- Supports our economy.