

## 09 Solar Catalogue



# metrosolar



# THE GREEN CHOICE

## SOLAR: Powered by the sun

Installing a solar hot water system in your home is possibly the biggest contribution you can make to preserving our environment. Climate change is real and global warming due to the greenhouse effect is undeniably the most serious problem our planet has ever faced. New Zealand may be small and isolated, but we are already experiencing the effects of global warming, and per capita our carbon emissions are among the highest in the world.

An average home produces approximately eight tonnes of carbon annually, and the only way to reduce this is to reduce our consumption of fossil fuels. For most Kiwis the single biggest energy consumption in the home is hot water, and the installation of a Metro Solar hot water system can reduce the carbon emissions from your home by over 60%, and save you money at the same time.

Many people think gas or electric hot water is the right choice, but gas like all fossil fuels is non renewable and produces carbon emissions. Electricity can be clean if it comes from hydro or wind but much of New Zealand's electricity comes from gas and coal, then distributed through a very inefficient national grid. Metro Solar systems operate at very high efficiencies and the hot water is generated at the point where it is required, in your home!

The environment is not ours; it's our children's and the generations to come. Many decisions you make on a daily basis effect our planet, but installing a Metro Solar hot water system is likely to be one of the "greenest" decisions you will ever make in your lifetime.

Solar hot water....powered by the kiwi sun every single day of the year.

## Solar Hot Water - Hot, wet and smart!

In addition to the environmental benefits of installing a solar hot water system there are also very significant long term financial benefits to be made. In New Zealand, households spend around \$400 - \$800 a year on water heating. The big concern for many is not the cost of heating their hot water today, but what it will be in five or ten years time. Energy prices are and will continue to increase at an alarming rate, which is a cost the homeowner has no control over.

- **Solar** is a renewable natural energy with no greenhouse gas emissions.
- **Solar** energy absorbed by a typical New Zealand house rooftop has about 50 times more energy than is required to heat an entire household's hot water supply.
- **Solar** water heating typically saves 50% to 75% of the annual water heating bill when installed correctly.
- **Solar** heating can be installed as a new system or integrated into your existing water heating system.
- **Solar** systems operate 365 days a year even on cloudy days. The more UV the higher the solar gain.



## Why you should choose Metro Solar

Metro Solar brings together Pioneer Manufacturing Limited and Dux Australia. These two companies are both market leaders in their own fields with proven technical design and manufacturing capabilities and specialise in ECO friendly yet technically oriented consumer products.

Metro Solar is a division of Pioneer Manufacturing Limited, New Zealand's leading woodfire manufacturer and owner of the "Metro" brand. Metro has an extensive and highly competent retail network throughout New Zealand trained to service the ECO friendly yet technically complex products sold under the Metro brand, namely wood fires, pellet fires and solar systems.

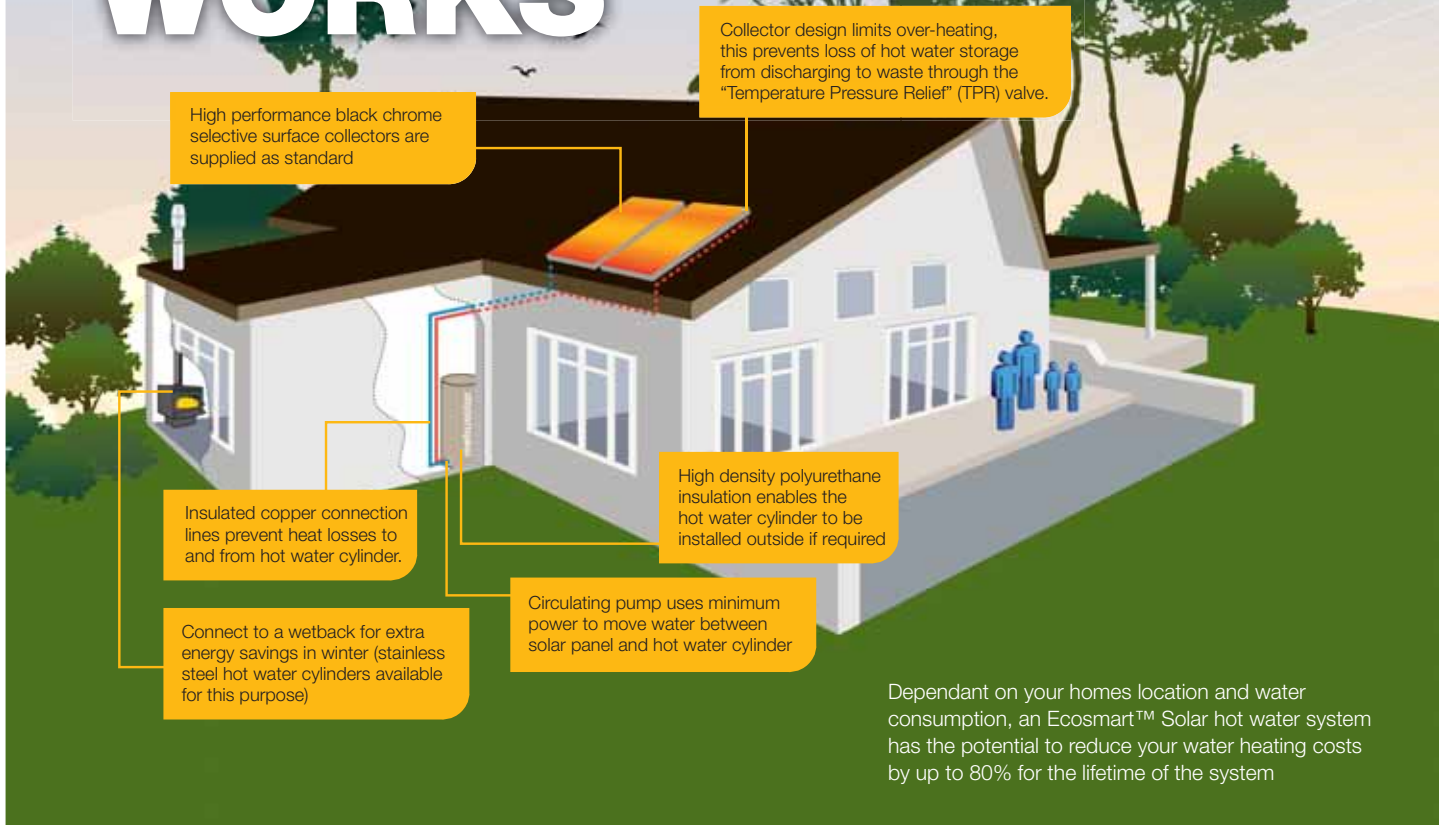
Ecosmart™ is a trademark of Dux Australia who are market leaders in the design and manufacture of award winning hot water and solar systems. Metro Solar has specifically chosen the Ecosmart™ solar systems for the New Zealand market because of the system's emphasis on efficiency, simplicity and hassle free long life.



### System efficiency

Package	Description	kW hours/year Auckland Region	kW hours/year Dunedin Region
MSSE250L2P	Ecosmart™ Vitreous Enamel 250 litre cylinder, 2 collector system	3,040	2,492
MSSE300L2P	Ecosmart™ Vitreous Enamel 315 litre cylinder, 2 collector system	3,066	2,495
MSSE300L3P	Ecosmart™ Vitreous Enamel 315 litre cylinder, 3 collector system	3,741	3,185
MSSE400L2P	Ecosmart™ Vitreous Enamel 400 litre cylinder, 2 collector system	TBA	TBA
MSSE400L3P	Ecosmart™ Vitreous Enamel 400 litre cylinder, 3 collector system	3,744	3,177

# HOW IT ALL WORKS



## SOLAR: How it all works

The main components of the Ecosmart™ solar system are the water storage cylinder, the solar collectors (usually between 2 and 3 panels), a circulating pump, the Hotlogic™ controller electric element or instantaneous gas heater.

The solar collectors contain a multi tube copper water way system bonded to a solar absorber plate, the combination of which collects solar energy and transfers it to the water within the collector circuit.

The absorber plate system is enclosed in an insulated casing covered with a high strength, low iron glass sheet that maximises energy absorption.

In this open circuit system, the circulating pump draws cold water from the bottom of the cylinder and pushes it up into the solar collectors. The water is heated in the collector by absorbing heat from the sun and continues on its pumped circulation path back to the lower solar zone of the storage cylinder where it rises to its natural thermal level within the cylinder.

### Efficiency Benefit

The Ecosmart™ "open circuit" design eliminates "heat exchanges" enabling maximum possible efficiency as the water circulating through the cylinder and collectors is the potable hot water you use in the home.

## Next generation technology

The multi award winning Ecosmart™ system brings solar hot water into the 21st century. The system's next generation technology is engineered to maximise solar absorption, increase energy efficiency and add value to your home.

Ecosmart™ hot water benefits include:

- State of the art collector technology with selective surface coating and tempered low iron glass for exceptional efficiency.
- Thermally insulated cylinders which can be located on ground level for safer installation and easy maintenance.
- The patented Hotlogic™ processor controls water circulation to suit weather conditions and usage.
- On cloudy days or during heavy usage, the booster automatically 'tops up' the hot water supply.



## Get the most from the sun

Every Ecosmart™ solar hot water system thinks for itself thanks to the patented Hotlogic™ processor technology. Hotlogic™ constantly monitors and adapts water circulation to suit changing weather conditions and water usage. Hotlogic™ checks your system over 300 times a day to ensure hot water is available from the cheapest energy source. On cloudy days it automatically engages the back up gas or electric booster.

At the same time this next generation solar technology actively protects the longevity of your system. These are just a few of the reasons Metro Solar chose Ecosmart™, as they have the most advanced and cost effective system available.

The Ecosmart™ cylinder comes assembled with the Hotlogic™ processor, circulating pump and electric heating element fitted within the cylinder's casing.

- Ecosmart™ next generation split system design eliminates that ugly roof mounted cylinder.
- Ecosmart™ utilises multiple temperature sensors and glass lined vitreous enamel water cylinders.
- Ecosmart™ cylinders have an electric boost element fitted at mid height enabling maximum solar gain using the lower cold zone, while ensuring you always have hot water available from the upper hot zone.

### Frost protection – Circulation

Ecosmart™ offers a two stage frost protection system to cope with New Zealand's harsh winter conditions.

- A temperature sensor is fitted to the top of the solar collector panels, and once the outside air temperature reduces to 5°C, the Hotlogic™ controller circulates water from the lower "solar zone" of the cylinder to the solar collector, until the water temperature within reaches 9°C.

- Should however the temperature in the solar collector continue to fall and reach 2°C (in the case of a power cut or severe weather) the circulating pump will stop and the frost protection valve mounted on the solar collector will open, allowing a small amount of water from the cold water supply to displace the chilled water from the solar collector.

### Frost protection – Drain down

- For colder areas where there are frequent sub zero conditions, we recommend installing a Metro Solar "Drain Down System" which drains water from the solar circuit & collectors during cold or no power conditions. This system is mandatory in the South Island & National Park region of the North Island.



# Metro Solar Frost/Over Temp Drain Down System



## Frost Protection

When frost temperatures are detected, the solar controller is shut down and the “cold” water normally stored in the collectors (only 1.5 litres/collector) is drained to waste eliminating the potential of damage through freezing fluids. Once the outside air temperature rises above frost temperatures, the collectors refill and power is reinstated to the solar controller.

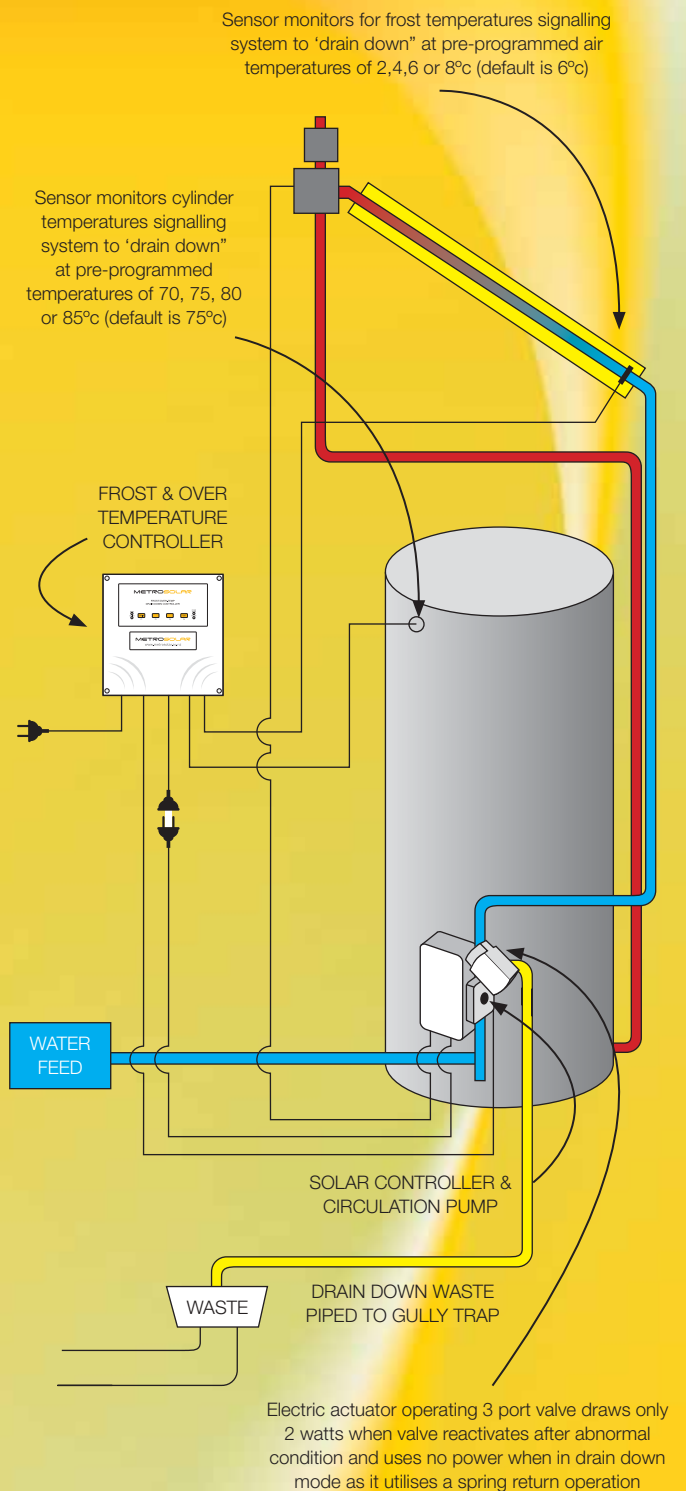
## Extreme UV

New Zealand's high UV levels over summer can result in excessive solar gain causing very high temperatures within the solar storage cylinder which reduce its working life. If the water cylinder temperatures reach the mid 80 degrees the PTR valve will blow resulting in the majority of the cylinders contents being dumped leaving the home owner without hot water, and the entire days solar energy wasted. The Metro Solar drain down system also monitors water temperatures at the top of the solar cylinder, and prior to high temperatures being reached the solar controller is shut down and the “excessively hot” water in the collectors (only 1.5 litres/collector) is drained to waste leaving the collectors dormant. Thus eliminating the potential of the solar storage cylinder being overheated or dumping its contents. Once a reduction in cylinder temperature is detected the collectors automatically refill and solar collection restarts.

Long life, efficiency and reliability are key aims for the Metro Solar protection system. Pre-programmed temperature sets for both frost and over-temp sensors are provided, as well as incorporating self diagnostic fault monitoring resulting in the system going to drain down mode during power cuts or a controller or sensor fault being detected.

## How it works

Metro Solar “Frost & Over Temperature Controller” analyses data from both the frost sensor and the upper cylinder sensor, thus controlling the 3 port drain down valve, and overriding the solar controller when required.



## Installation Pack

The Metro Solar “Frost & Over-Temperature Drain Down System” is supplied as an installation pack which includes;

- Metro Solar “Frost & Over-Temp Controller” (complete with power supply lead, solar controller power feed, frost and over temperature sensors/leads)
- 3 port ball valve & electric actuator
- Installation & operation manual
- Solar rated check valve
- Frost sensor “Thermowell”
- Strainer

## System components

### Storage cylinder

It is by far the best option to install a complete system. Solar hot water storage cylinders are purpose designed to give you maximum solar efficiency. It is recommended that your solar water cylinder holds a minimum volume of 1.5 times your daily hot water consumption. Note;

1. If you require a wetback you need to install a Metro Solar 300 litre or 400 litre stainless steel cylinder which is fitted with a heat exchanger coil.
2. If you wish to use your existing hot water cylinder, it will be necessary to determine if it is of suitable design to enable solar hot water to be efficiently installed.

**Important** – If a solar system is retrofitted to an existing water storage cylinder, the efficiency of the system will be compromised. Generally an existing cylinder will have insufficient storage capacity and will not have a dedicated lower “solar zone” within the cylinder which enables the system to achieve maximum solar gain.

### Collector Panels

For optimum performance Ecosmart™ light weight high efficiency collectors must be installed facing or within 45° of geographical north, and be clear of shading from trees, buildings etc.

The ideal inclination of the installed collectors is the angle equal to the latitude of your home + or -20° [Kaitia = 35° & Invercargill = 46.5° latitude].

The number of solar collectors installed for optimum performance varies on geographical location, collector orientation, cylinder size and hot water usage. As a guide the adjacent table indicates the number of solar collectors required for each of the solar cylinders, but when the collector orientation or other factors exist that are less than ideal, we suggest installing an additional collector.

**Important** – Due to the variables involved in selecting the appropriate number of solar collectors, it is recommended at the time of installation to allow space for the installation of an additional collector at a later date if required.

## System and boost options

### Boost options

The lower half of the Metro Solar Ecosmart™ solar cylinders is a “solar zone”. Cool water is fed from this zone to the collectors then returned to the upper area of the “solar zone”. For times of low solar gain or high water use a backup boost is required;

- Electric boost simply requires the pre-fitted element in the cylinder to be connected.
- Gas boost requires the addition of an Ecosmart™ instantaneous gas unit as illustrated.
- Wetback boost is usually connected in addition to electric or gas boost as a wetback is generally only used during the cooler winter months.

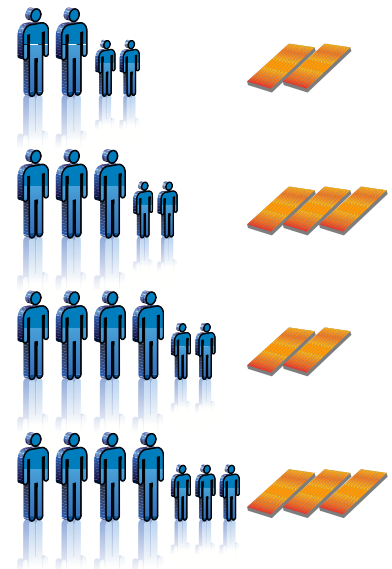


### Ecosmart™ Gas Boost

The Ecosmart™ premium gas instantaneous water heater is available as LPG or natural gas. Featuring a stainless steel outer casing, this top of the range unit takes the water preheated by solar, then boosts it to 70°C at a maximum flow rate of 26 litres per minute.

### System options

- 250 litre Cylinder  
2 collector panels
- 315 litre Cylinder  
2 or 3 collector panels
- 300 S/S litre Cylinder  
with wetback coil  
2 or 3 collector panels
- 400 litre Cylinder  
3 collector panels



### Legionella protection

To comply with New Zealand’s Solar Hot Water Standards, your Metro Solar System will ensure that the water stored within the solar cylinder will be heated to 60 degrees even when there has been no sunshine. This is to ensure that legionella bacteria can not establish within the water cylinder. For this reason the electric element must always be connected to a 230 volt power supply.

When a gas booster is connected after the solar water cylinder, the electric element does not need to be connected, but the gas booster is required to boost the water temperature to 70 degrees C.

# Metro Solar Specifications

## Water Quality

Ecosmart™ and Metro Solar water cylinders are manufactured to suit the water conditions of most New Zealand metropolitan areas. Harsh water supplies can have a detrimental effect on the on the cylinder and reduce its life expectancy. If you are unsure about your water quality you can obtain information from your local supply authority.

All Ecosmart™ cylinders contain a sacrificial anode which requires replacing every 5 years. If total dissolved solids exceed 600ppm the magnesium alloy anode must be replaced with an aluminum alloy anode. Water can also be very corrosive and water outside the specified parameters may void warranty.

More specific data on water quality criteria is detailed within the manual supplied with every Ecosmart™ and Metro Solar cylinder, and available from your Metro Solar retailer.

## Warranty

Metro Solar and Ecosmart™ solar systems are covered by a comprehensive 12 month warranty from date of installation. Ecosmart™ solar collectors and cylinders are covered by a 5 year warranty from date of installation and Metro Solar Duplex stainless steel cylinders are covered by a 7 year warranty.

Refer to the cylinder's installation and operation manual for full warranty details.

	Part No.	Description	Dimensions
ENAMEL	9BES250	250 litre Ecosmart™ Solar cylinder (includes 3.6kW element, circulating pump and Hotlogic™ controller)	1444mm high x 617* mm dia.
	9BES315	315 litre Ecosmart™ Solar cylinder (includes 3.6kW element, circulating pump and Hotlogic™ controller)	1754mm high x 617* mm dia.
	9BES400	400 litre Ecosmart™ Solar cylinder (includes 3.6kW element, circulating pump and Hotlogic™ controller)	1703mm high x 705* mm dia.
DUPLEX	9BMS300	300 litre S/S cylinder, 1 coil, Wet-back (includes 3kW mid height element / solar direct circuit)	1760mm high x 575mm dia.
	9BMS4001C	400 litre S/S cylinder, 1 coil, Wet-Back (includes 3kW mid height element / solar direct circuit)	1730mm high x 650mm dia.
	9DCOL	Ecosmart solar collector (2 sq m)	2012mm x 1000 wide
	DCON2	Ecosmart solar 2 collector Connection kit	
	9DCON3	Ecosmart solar 3rd collector Connection kit	
	9EMS5PHCC	5 port hot connection kit, (includes Frost valve, Air bleed, solar check valve)	
	9FESSPHCMB	Ecosmart Solar pump & Hotlogic controller assembly	
	9PESSCYL	Ecosmart Sensors, Pair/cylinder (upper or lower)	
	9PEMSDDCI	Metro Solar Drain-down system, Indoor-frost & over-temp protection with sensors & actuating valve	
GAS	9CESNGIWH	Ecosmart Natural gas instantaneous – Solar premium	350 w x 610 h x 185 d
	9CESLPGIWH	Ecosmart LPG instantaneous – Solar premium	350 w x 610 h x 185 d
	9CESWRK	Ecosmart wall recess kit for instantaneous	370 w x 1030 h x 150 d

\*Cylinder diameter excludes the Hotlogic™ controller and pump module (320h x 190w) which protrudes 100mm from the lower section of the cylinder.

Water Cylinder Cupboard - It is recommended that when installing into cupboards a minimum width of 400mm plus the cylinder diameter, and a height of 1.5 x cylinder height (to enable anode replacement) is available for easy installation/servicing.



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All measurements listed are correct at time of printing.



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