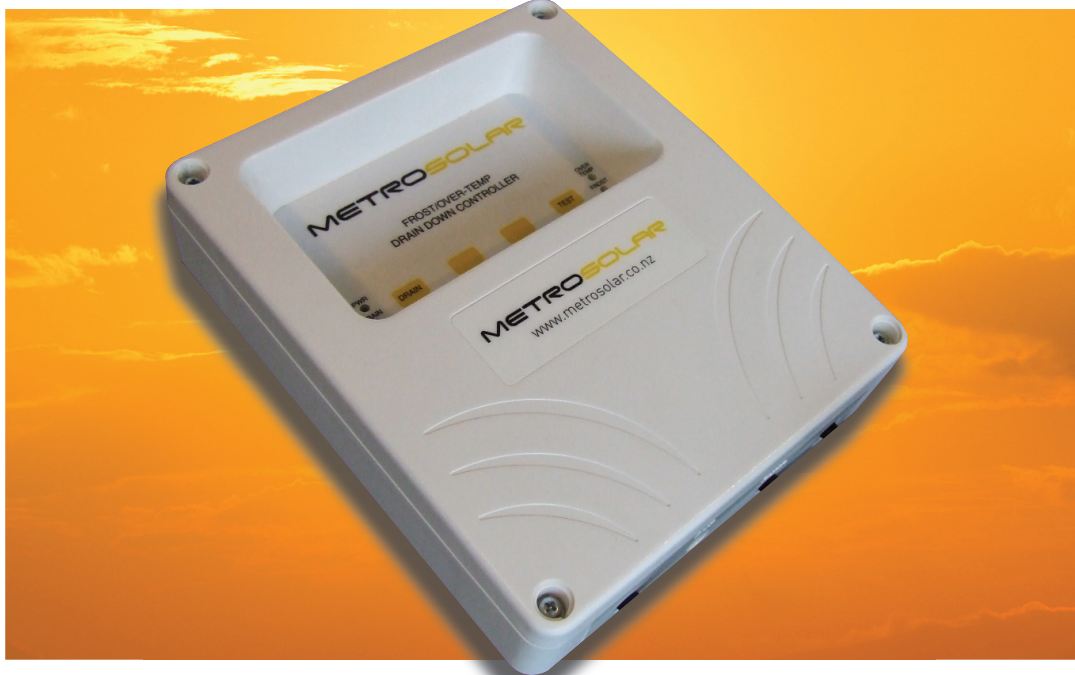


Metro Solar Frost/Over Temp Drain Down System Technical Bulletin



metrosolar

Metro Solar is committed to developing the most efficient hot water solar systems possible for the New Zealand home owner, and for this reason Metro Solar core systems are “direct” (open loop) circuits which “do not” use heat exchangers and glycol fluids, both of which reduce efficiency. With Metro Solar core solar systems the water that is heated in the solar collector is the same water that comes out of your tap, enabling the maximum efficiency possible. Historically the downside to these highly efficient “Direct circuit” systems, has been the need to circulate warm water through the collectors during times of frost to avoid damaging them, which although effective is in-efficient.

Metro Solar engineers have searched the world and combined the latest technology and componentry to achieve the ultimate in solar protection systems, designed specifically for New Zealand’s extremes of severe winter frosts and high summer UV.

Key Features

- Allows maximum efficiency “direct circuit” solar in frost prone regions
- Valve uses only 2 watts in operating mode (nil consumption in drain down mode)
- Controller and valve are silent during both modes of operation
- Extends solar storage cylinder life through over-temp protection
- Adapts to all “direct circuit” solar systems
- Supplied complete with pre-wired sensors and electrical connections
- Self diagnostic, power cut safeguard, and test facility built in.
- Sensor variables pre-loaded for installer to program

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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 cylinder's contents being dumped leaving the home owner without hot water, and the entire day's 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.

Installation Pack

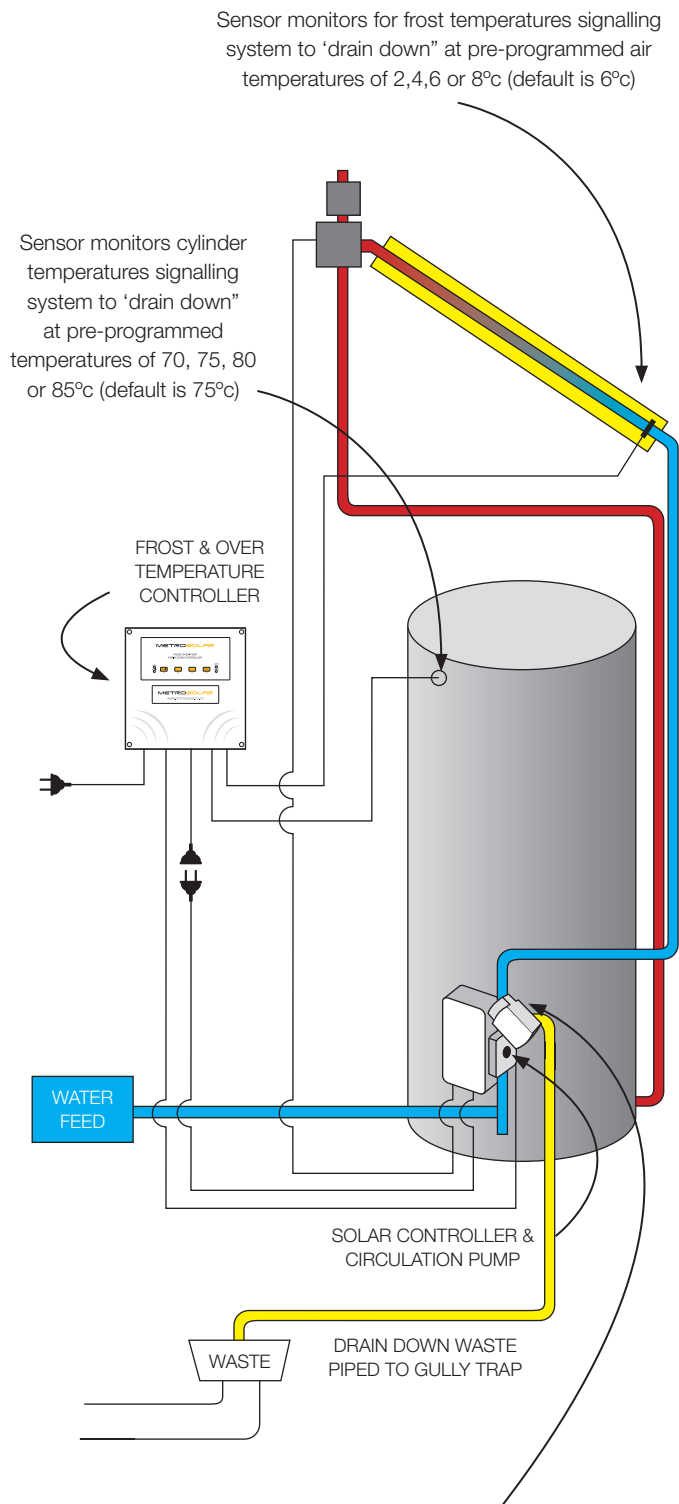
The Metro Solar “Frost & Over-Temperature Drain Down System” is supplied as an installation pack which includes;

- 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
- Strainer
- Top sensor attaching clip

Note: The Metro Solar “Frost & Over-Temperature Drain Down System” also comes in a weather proof enclosure as an option for outside installations

How it works

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



Electric actuator operating 3 port valve draws only 2 watts when valve reactivates after abnormal condition and uses no power when in drain down mode as it utilises a spring return operation