



The Wise Living Group

Respect for People and the Environment

INCORPORATING

SOLAR MIO ~METAL DYNAMICS~THERMALUX

PO BOX 565 ALBURY NSW 2640

AUSTRALIA

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**Solar~Mio**

**Thermosiphon**

**Installation and Owners Manual**

**WARNING**

**This water heating system must be installed in accordance with the requirements of AS 3500.4**

**The owner should also be aware of any limitations on the suitability of this heater for use with water of specified poor quality and any need for water softening treatment as per**

**AS 3500.4**



## GENERAL TECHNICAL, INSTALLATION AND MAINTENANCE INFORMATION AND REQUIREMENTS

THANK YOU FOR PURCHASING A SOLAR~MIO SOLAR HOT WATER SYSTEM. MANY YEARS OF RESEARCH HAVE GONE INTO ITS DEVELOPMENT TO MAKE SURE THAT YOU HAVE THE MOST RELIABLE SOLAR HOT WATER SYSTEM ON THE MARKET.

**\*PROUDLY DESIGNED AND MANUFACTURED IN AUSTRALIA\***

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### GENERAL

**THIS MANUAL EXPLAINS THE INSTALLATION REQUIREMENTS FOR SOLAR~MIO DOMESTIC THERMOSIPHONING HOT WATER SYSTEMS RECOMMENDATIONS FROM AUSTRALIAN STANDARDS FORM THE BASIS FOR THIS MANUAL, HOWEVER, WHERE THERE IS CONFLICT BETWEEN THE MANUAL AND THE REQUIREMENTS OF ANY REGULATING AUTHORITY, THE LATTER SHALL PREVAIL.**

#### **Hot Water Storage cylinders:**

Low Pressure, Constant Pressure and MP Calorifier Tanks are open vented and therefore not pressurised  
Medium Pressure FM hot water tanks must be open vented with a Maximum head pressure of 7 metres (70Kpa)  
Mains Pressure hot water storage cylinders require the fitting of a 500KPA or lower pressure reduction valve & 750Kpa or 850Kpa PTR Valve

#### **Solar Collectors:**

The Collectors maximum operating pressure is 1000KPA.  
The collectors are not suitable for frost prone areas without a suitable frost protection device (see below)

- 1 Low to Mild Frost Areas: (Average 0C to -3C ) Two Frost Valves per system.
- 2 High Frost Areas (0 to -15C) Standard FROST-TEC Anti freeze system (Frost-tec protection to -24C available on request) OR
- 3 Down Drain System —Total Frost & Over Boil Protection.

#### **Draining The System:**

**WARNING** The system may contain extremely hot water. Exercise caution to prevent scalding. When system is hot check that escaping water will find its way safely to ground and not deform plastic gutters and downpipes where fitted.

1. Turn off Electric Elements and/or Gas supply where fitted.
2. Turn off the cold supply to the tank.
3. On Mains pressure systems , release and leave open the Pressure/Temperature Release Valve.
4. Remove the bottom Frost Valve or Blanking Plate on the Collectors.
5. The system will now drain

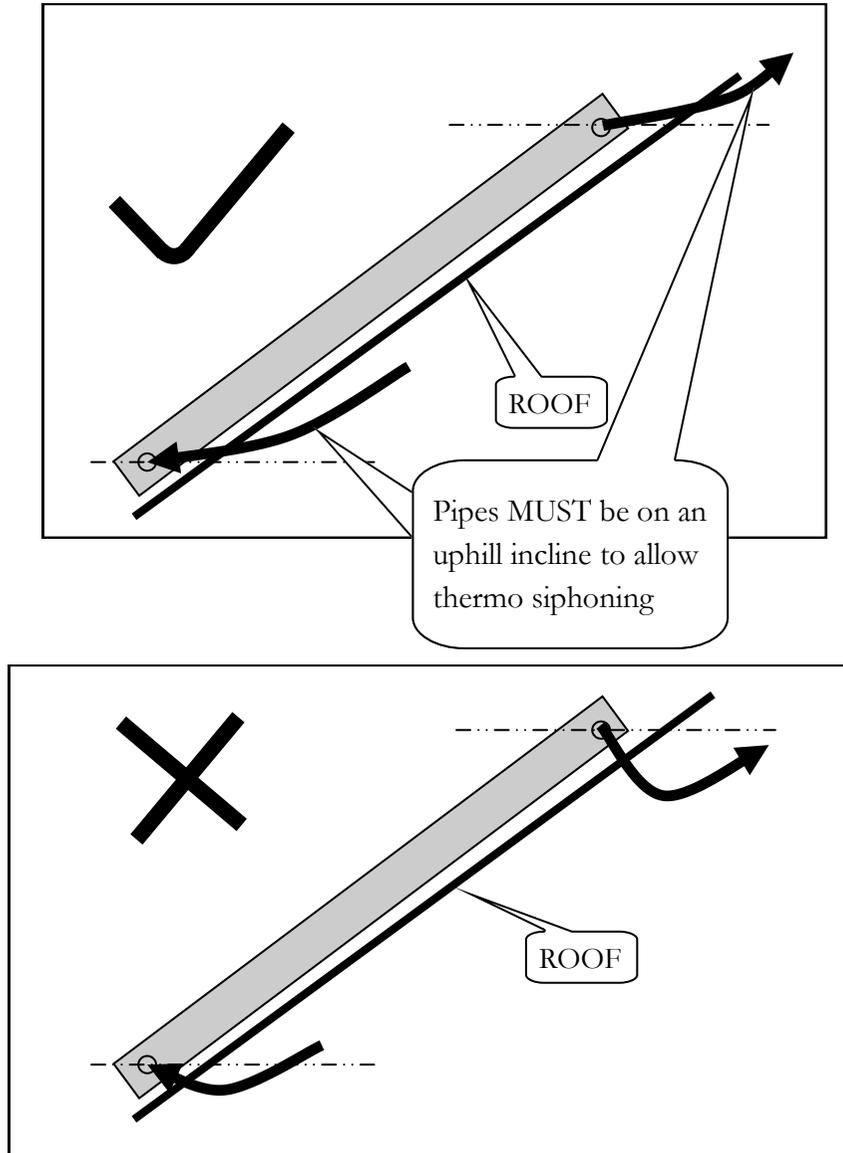
Reverse the above procedure to refill the system.

#### **Poor Water Quality Areas:**

In areas with high or low pH, above average salt, calcium or mineral content a suitable water filter and/or water softening device may be required. Refer to your local plumber or place of purchase.

FIG 7B

**THERMOSIPHON SYSTEM  
PIPE & FITTINGS ANGLES**



**SOLAR COLLECTOR (S) INSTALLATION**

Solar Mio Panels come in two types (**Fig 1**):

**NOVA:** These collectors are mounted vertically on the roof and are the normal for most installations.

**SQUAT:** These are the same size as the Nova collectors, however they are mounted horizontally. The Squat collectors are used where there is insufficient height between tank and collectors to allow for adequate thermosiphoning or where space is an issue.

**Location of Solar Collectors**

**Shade:** Collectors should be located so as to be clear of shade for at least 3 hours either side of solar noon (12 pm Standard Time). Partial shading due to small objects e.g. antennas and flues is permissible during this period.

**Position relative to Hot Water Tank:** Collectors should be as close as possible to the hot water tank. All thermosiphon systems require the tank to be wholly above the level of the collectors to allow sufficient thermosiphoning action.

**Orientation:** Collectors should face (orientate) true north in the southern hemisphere and true south in the northern hemisphere, wherever practicable.

*In Australia deviation from north will reduce performance depending on the amount of deviation and the latitude. Deviation up to 45° will reduce performance by up to 5%. Deviation greater than 60° is not recommended.*

**Inclination:** Collectors theoretically should be inclined at a similar angle to the latitude angle of your location. Deviation from this angle by +20° or -20° reduces performance by only 5%. Practical considerations therefore favour flush mounting the collectors on pitched roofs.

The collectors should also be mounted with the outlet side slightly higher than the inlet (**Fig 2**).

**IMPORTANT**

Ensure that the roof is of adequate strength, the collectors weigh approx 38 kgs each, including the water content.

Ensure all screw holes and pipe entry points are sealed and weatherproofed to prevent entry of water.

## SOLAR COLLECTOR (S) INSTALLATION

### Pitched Metal Roof (Fig 3)

Locate and fix the top mounting brackets to the roof using a straight edge to ensure alignment. The brackets are the same length as the collectors; a gap of 70mm should be left between adjacent brackets to allow for the connectors which join the collectors together. The brackets should not run level but should rise slightly toward the hot water outlet end of the collector bank. This will help to eliminate air when the collectors are installed. Rivets or screws should be used between metal/metal interfaces to prevent corrosion. Bolt the tabs provided onto the four corners (**Fig 3a**) of each collector. Position the collectors on the roof by hooking the top tabs over the brackets previously located on the roof. Join the collectors with the 1" copper connectors provided then screw the tabs onto the top brackets. Locate and fix the lower brackets to the collectors first and then to the roof as for the top brackets.

### Flat Metal Roof (Fig 4)

If installing onto a flat roof, a Solar-Mio flat roof mounting frame can be used to enable the top of the collectors to be mounted at a suitable angle. The mounting tabs are fitted to the panels in a normal way, and the bottom mounting bracket is fitted to the tabs. The bottom mounting bracket is not used. The mounting frame is screwed directly to the mounting tabs with the base then screwed directly to the roof using appropriate sized mounting screws (not supplied) (**Fig 4a**).

### Tiled Roof (Fig 5)

Install the bottom bracket first by sliding up, or removing tiles in the desired location. Attach strips strap iron (not supplied) as shown in **Fig 5** and replace the tiles. Attach the bracket to the strap iron. The brackets should not run level but should rise slightly toward the hot water outlet end of the collector bank. This will help to eliminate air when the collectors are installed. Place the collectors on the roof and let them rest against the bracket. Connect the bottom of the first collector to the angle bracket with the tabs. Bolt the tabs to the collector using the 6mm bolt supplied and then screw tab to the bracket with the TEK screw supplied. Join the next collector to the first collector with the 1" copper connectors before securing it to its angle bracket as per the first collector. Repeat the above until all the collectors are connected to their respective brackets. To secure the top of the collectors to the roof, bolt and screw the remaining brackets using the tabs to the top of the collector(s). Attach strap iron to rafter or battens above the collector(s) by removing the tiles as described above. Screw or bolt the brackets to the protruding strap iron and replace tiles.

FIG 7A

## THERMOSIPHON SYSTEM

### PIPE & FITTINGS ANGLES

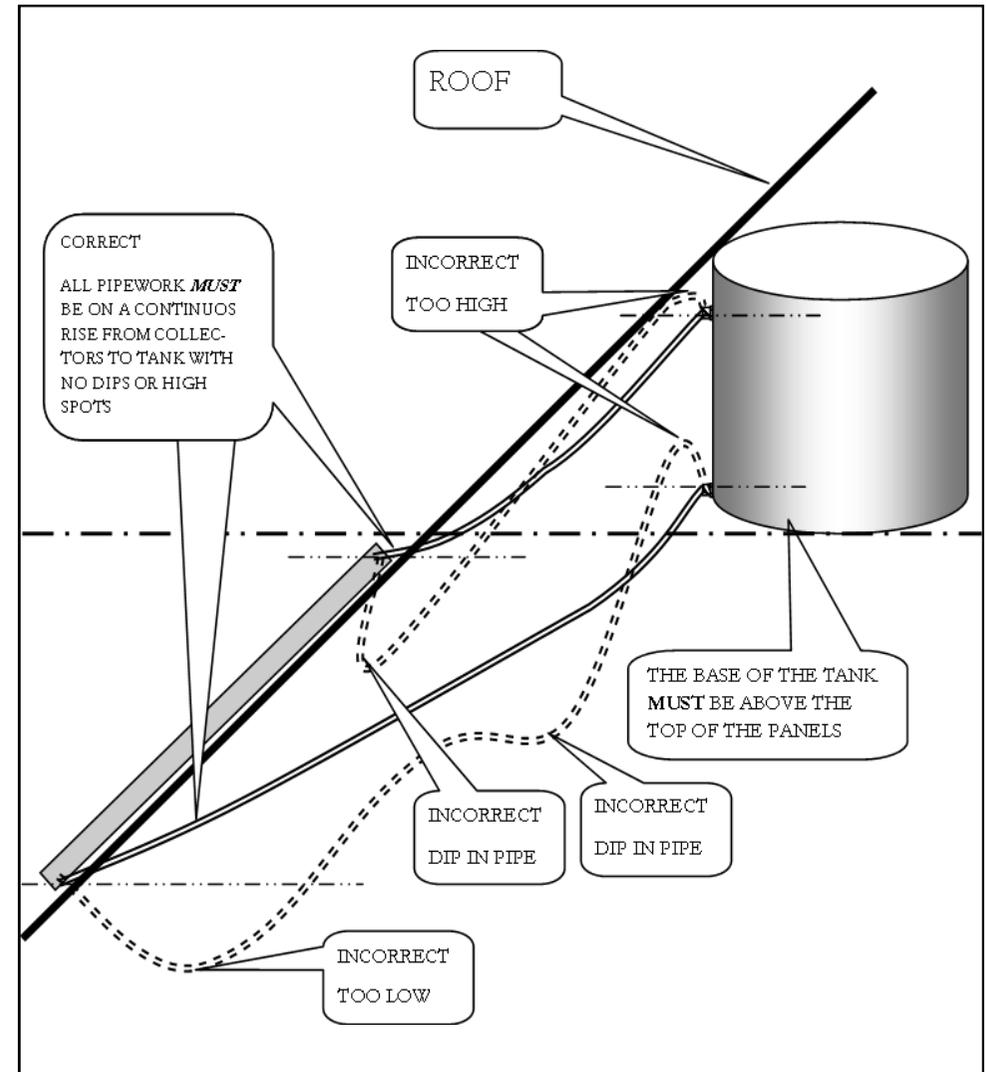
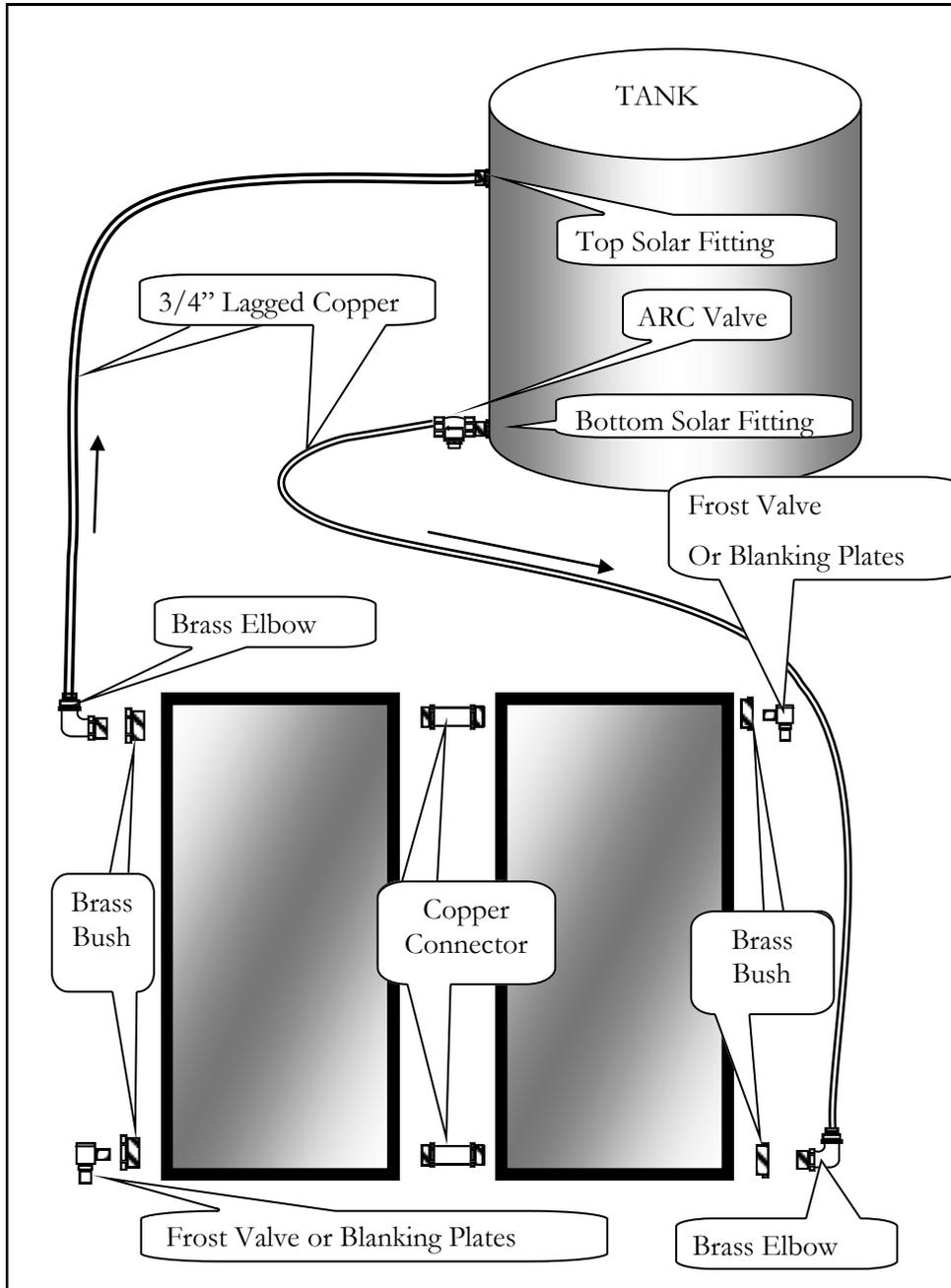


FIG 7

**THERMOSIPHON SYSTEM**

**FITTINGS**



**Panel position:** Never allow shrubs or other large obstacles to cast shade on the solar collectors. Collectors, if shaded, will not function correctly. This should be checked annually under both summer and winter conditions. Shading from newly erected buildings would also need to be considered and collectors re-located if necessary.

Heavy atmospheric fallout which settles on the solar collector glazing will also reduce performance. This seldom occurs, but if it does, clean them with water and detergent. Carry out this cleaning operation only when the collectors are cool, that is, at the beginning or end of the day or during overcast conditions.

**TANK INSTALLATION**

**Tank Position:** The tank should be positioned as close as possible to the most frequently used hot water outlet point and also minimise the pipe runs to the collectors. In all thermosiphon systems the entire solar collector circuit should be below the tank base.

*The thermostat on the tank should be set at a minimum of 60°C*

**Roof Mounted Tanks:** Tanks must be placed on a strongly constructed flat, level platform in a properly drained safe tray in accordance with AS 2002-1987 considering the weight of the tank plus water (1litre=1kg). This platform should be positioned so that the load is supported over one or more soundly constructed load bearing walls or a suitably designed beam, roof truss or similar substantial support. The tank must be separated from the safe-tray by the use of timber battens with a minimum thickness of 12mm. These should be evenly spaced and in contact with 60% of the base of the tank whilst just projecting past the tank base perimeter. (Fig 6)

**Constant or low pressure tanks:** As the domestic hot water flow produced by these tanks is proportional to their height above hot water outlets, they should be elevated as high as possible in the building and as close as possible to the hot water draw-off points. The solar collectors should be mounted so as the base of the tank is higher than the top of the solar collectors, to allow for adequate thermosiphoning.

**Calorifier/MP Tanks:** The domestic hot water flow from these type of tanks is not dependant on the height above the outlet points however the tank should still be positioned with the base of the tank higher than the top of the solar collectors to allow adequate thermosiphoning.

**Medium and Mains Pressure Cylinders:( Fig 6a)**

A Solar-Mio correctly designed mains pressure cylinder can also be installed as a thermosiphon system provided that the cylinder is located above the level of the collectors.

**For complete tank installation instructions, please refer to the installation manual supplied with your tank.**

### Pipe work & Fittings

With the solar collectors and tank fixed in position, pipe runs can be fitted off using lagged (minimum 10mm lagging) weatherproof 3/4" copper pipe. Keep pipe runs as short as possible to reduce heat losses. If extended pipe runs are required, 1" copper pipe may be used. All connections to the collectors are by Neoprene rubber "O" ring – minimal torque is required to be applied to these connections to achieve a seal. *Do not use Teflon or Hemp.* It is important to ensure all pipe work is at a **constant rise** toward the tank to allow proper thermosiphoning.

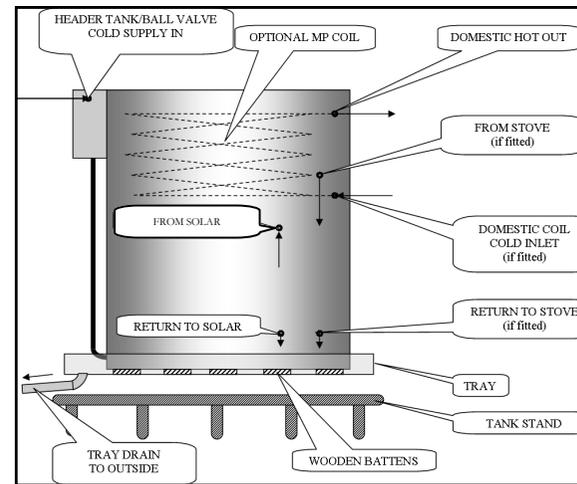
Inlet and outlet pipes should be plumbed at diagonally opposing corners of the solar array, (Fig 7 – 7A- 7B) using the elbows supplied with the unit with either Frost Valves (if fitted), or Blanking Plates installed in the other two ports.

The ARC valve (Anti Reverse Circulation) is fitted to the bottom (return) line at the tank. Use the arrows on the label to check ARC valve flow direction and orientation is correct.

Ensure that all connective pipes have a continuous rise from the collectors to the tank and that all connections are firm.

Fill the system using the header tank on the ceiling mounted tank, or via the Duo Valve on a mains pressure cylinder, when the tank is filled the panels will automatically fill at the same time. The thermosiphon action will start as soon as the sun heats the panels.

FIG 6  
CEILING MOUNTED TANK  
(IN ROOF SPACE)



### Wise Living Warranty

The Wise Living Group warrants their Solar Mio Solar Collectors to be free from defects in materials and workmanship and under normal use and service in accordance with the attached installation and operating instructions for a period of 5 years from the date of original purchase on the terms herein shall repair or replace without cost to the original customer any part thereof which shall be returned to our factory or designated agent, transportation charges prepaid and which our inspection shows to be thus defective.

This Warranty does not apply to glass breakage or the discoloration of the surface or tarnishing of the fittings.

The Wise Living Group warrants the Frost Valves, Pressure & Temperature Relief Valves, Anti Reverse Circulation Valves, Pumps and Controllers, (where fitted) to be free from defects in materials and workmanship and under normal operating conditions, where installed and used with the attached installation and operating instructions for a period of 12 Months.

The Wise Living Group will repair or replace, without cost to the original purchaser, any part that is found to be defective, that is returned, transport or postage paid, to our factory or designated agent within this period. All Valves, Pumps and Controllers require normal service to maintain them.

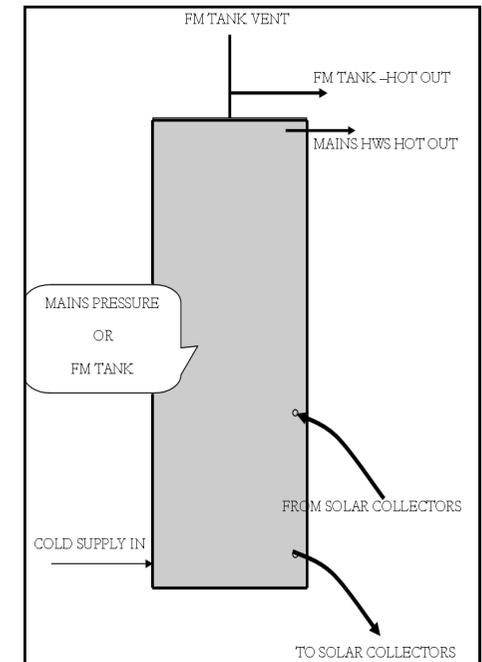
Under the terms of this Warranty The Wise Living Group assumes no responsibility for the labour costs involved in removing or replacing the above items nor shall The Wise Living Group be liable for any injury, loss or damage (direct, indirect or consequential) arising out of the use or inability to use the product or its removal or replacement.

All other warranties, expressed or implied, are excluded to extent possible by law. Consumers also have rights under relevant State or Commonwealth law

The Retailers have no authority to alter this Warranty

FIG 6A

MAINS PRESSURE HWS OR FM TANK  
(MUST BE LOCATED ABOVE  
SOLAR COLLECTORS)



For complete tank installation instructions please refer to the installation manual supplied with your tank

FIG 5 MOUNTING SOLAR COLLECTORS ON  
TILED ROOF

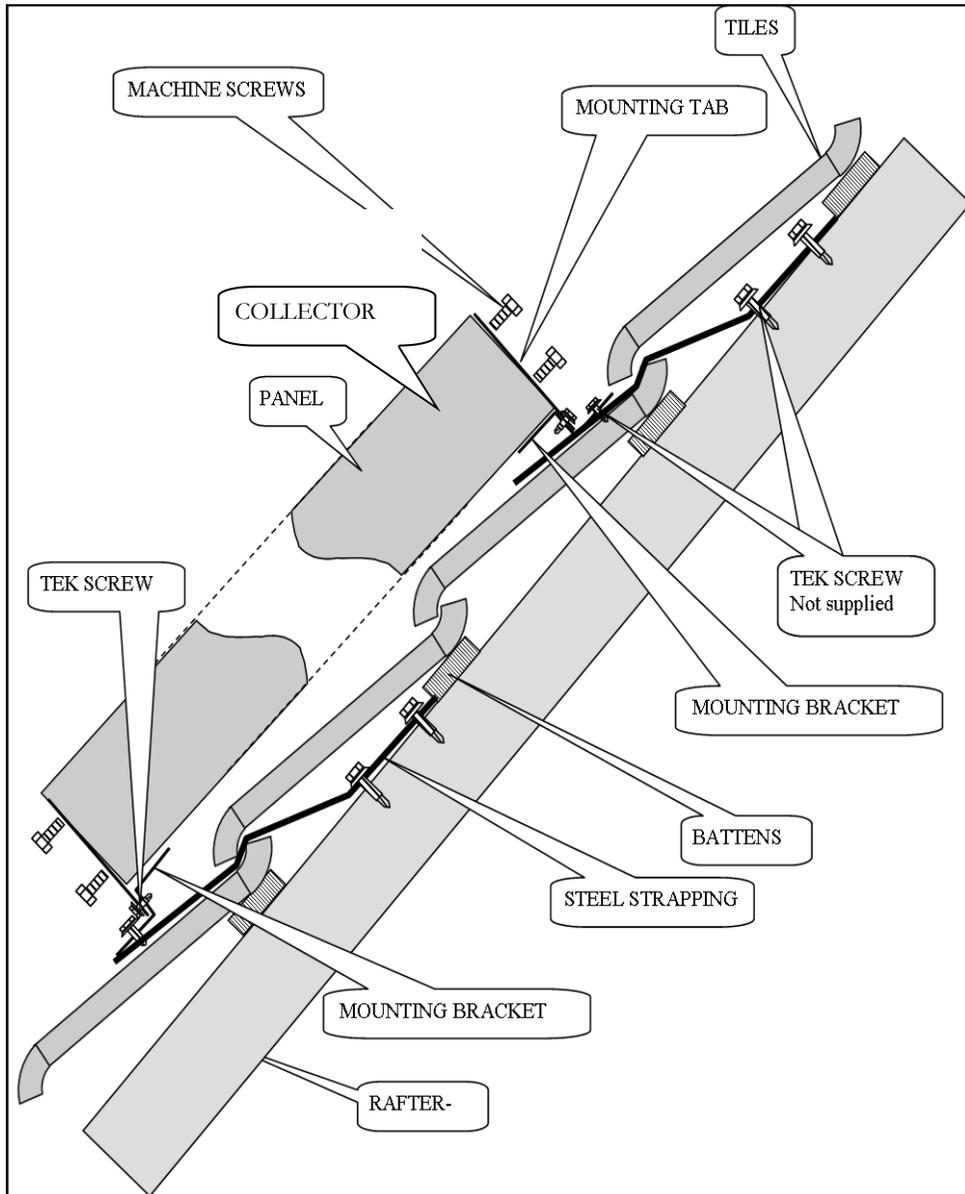


FIG 1 SOLAR COLLECTOR STYLES  
AND SIZES

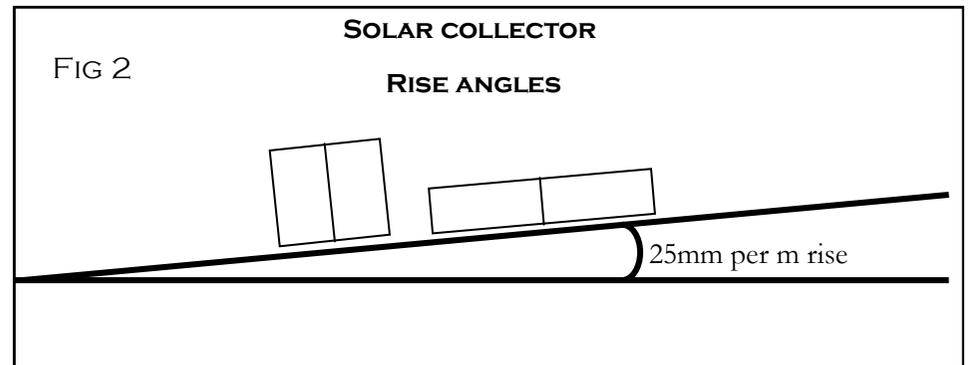
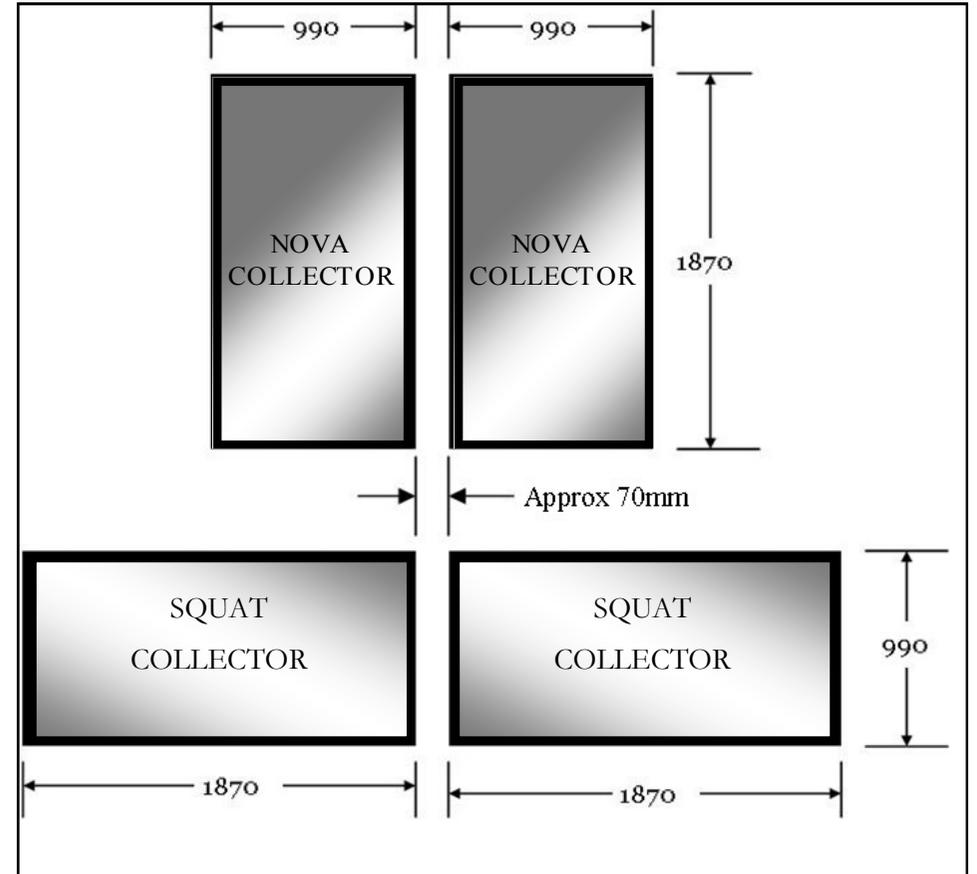


FIG 3

MOUNTING SOLAR COLLECTORS ON SLOPING STEEL ROOF

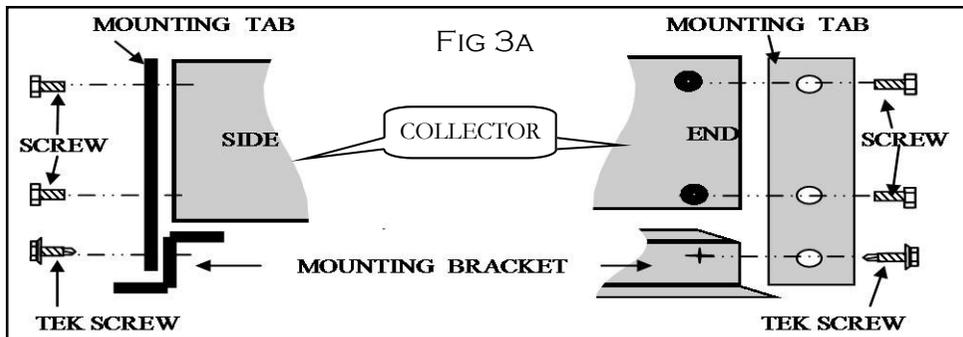
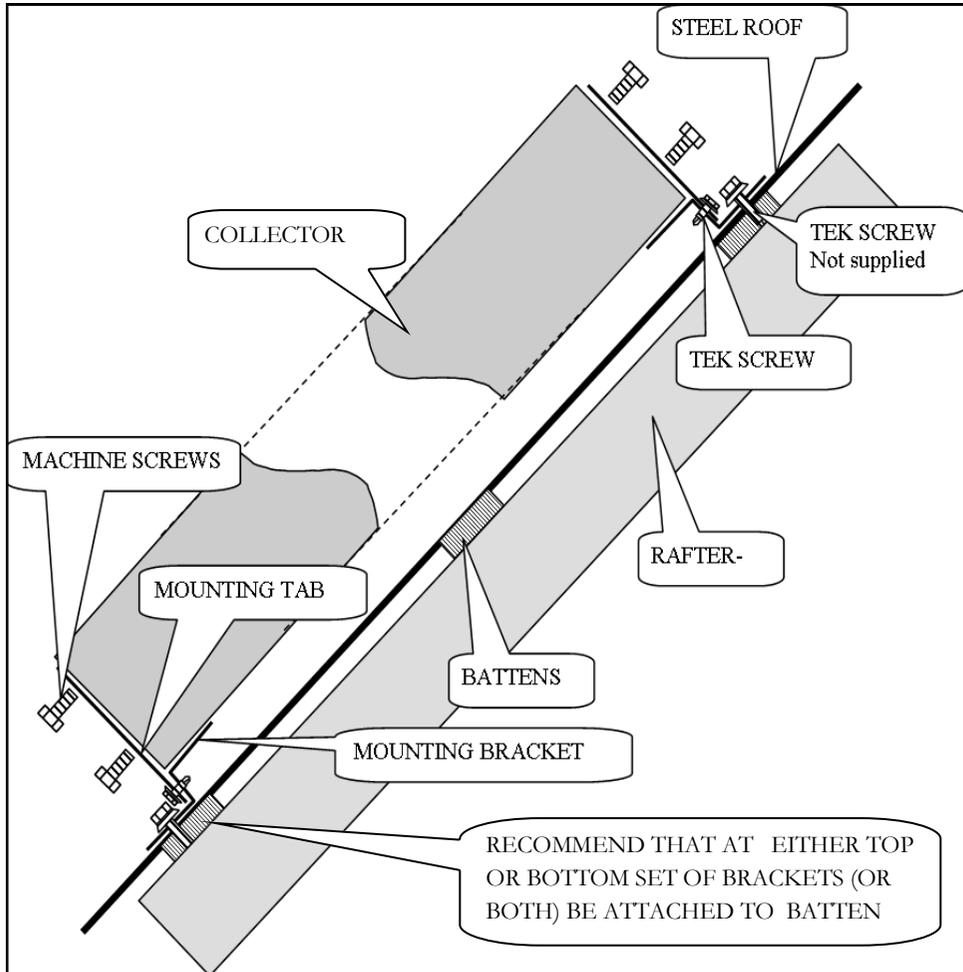


FIG 4

MOUNTING SOLAR COLLECTORS ON FLAT METAL ROOF

