



*Your pool heating Partner*

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# RIGID SOLAR INSTALLATION MANUAL

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By investing in a Sunlover pool heating system you will extend your swimming season. Night time swimming will become a real possibility. Installing a Sunlover pool heating system simply, and cost effectively, utilises the suns FREE energy to extend your swimming season.

This manual is designed to enable the handyman to install a professional Sunlover pool heating system quickly and easily. With the correct sized kit and a few hand tools these instructions will provide the necessary information for an easy and economical installation.

## Solar Panel Kit Sizing

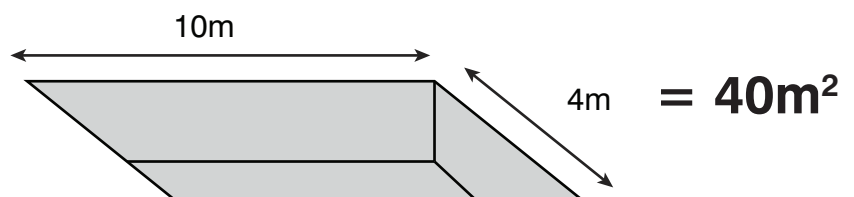
The kit size depends on the amount of solar absorber required. This is calculated using the surface area of the pool. Typically 80 – 100% is used as the area required for the absorber.

### Additional Items

Along with the Sunlover Kit you will require a method of circulating the pool water through the solar system.

These items are purchased separately as specific requirements may need to be considered

For example: A pool 10m long by 4m wide has a surface area of 40m<sup>2</sup>  
40m<sup>2</sup> x 80% = **32sqm coverage**



## 1. Sizing the System

The size of the solar system to be installed, relates directly to the exposed water surface area of the pool as this is where the heat loss occurs. In general, the panels should equate to approximately 80% of the surface area. Refer to Sunlover technical support team for sizing if panels are subject to severe shade, wind or southern roof aspect etc.

ie: 10m x 4m pool = 40m<sup>2</sup> x 80% = 32m<sup>2</sup> of panels.

Panels are available in 1.22m x 2.44m (2.9m<sup>2</sup>), 1.22m x 3.01m (3.7m<sup>2</sup>), and 1.22m x 3.66m (4.4m<sup>2</sup>).

Use larger panels where possible to lower the cost per square metre.

## 2. Where to Install

Determine the roof(s) where the panels will be installed. The panels should face (in the order of efficiency) North, flat, west or east. Panels should not face south.

In the event of freezing conditions, the water must be drained out of the collector pipe, to avoid panel damage or installed on 15° angles to ensure proper drainage.

Most roof surfaces are acceptable for installation. The system can also be installed on aluminium or wood ground mounted rack system. For more information on rack or flat roof installations, consult our technical support team.

## 3. Verify Space Requirements

Determine the available area on the roof(s) for the installation. Panels are 1220mm wide with a 80mm gap between absorbers for mounting, totalling 1300mm. Panels are placed next to each other in a row; each panel requires 1300mm horizontally (i.e. 7 x (1220mm x 3010mm) panels would be 9.1m horizontal by 3.01m vertical.)

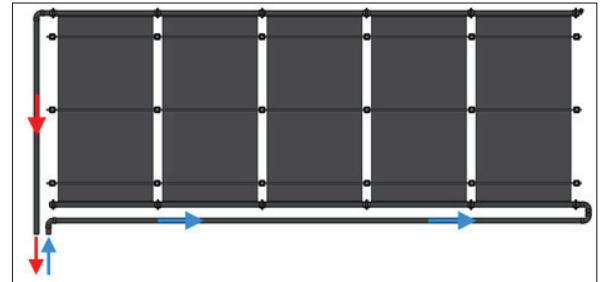
Panel Rows may be split to circumvent large obstacles, to change panel size in array, to install on separate roofs. Each split requires a "Split Kit." Panels may be spaced around small vents up to 130mm without a "Split Kit" provided they fall between panels by using a 150mm rubber connector. Each Row requires a minimum of 75mm on all sides to allow for feed and return plumbing.

## 4. Typical Panel & Plumbing Layouts

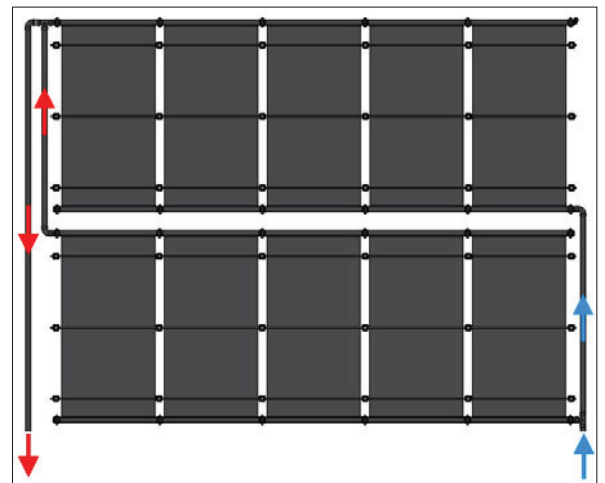
Do not use more than 12 panels in any row. Feed the water into the BOTTOM corner and return from the opposite top corner, Figure 1.

Note: Design plumbing layout to have the shortest possible return line to reduce heat losses. For larger systems, split the panels into several rows, Figure 2.

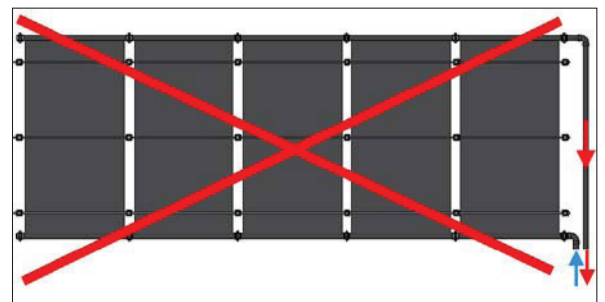
Never use "Same End Return", Figure 3, because of reduced efficiency at the opposite end panels. All bottom headers and feed plumbing should allow for gravity drain. In Warmer climates the panels and plumbing may be level; in areas where subzero temperature panels must be installed with a 45mm per metre slope towards the feed. All return lines from multiple panel rows must meet at the highest point of the system.



1. Reverse End Return



2. Double Row



3. Same End Return

## 5. Panel Installation

The following procedure assumes a shingle roof; for other roof types including flat roofs, see Section 11 for Special Roof Requirements

### Step 1

Establish a horizontal chalk line across the roof for the location of the top of the system. This line must have 20mm clearance above and below it for mounting the Header Clip on a flat surface. For tile roofs, the line should be approximately 50mm above the bottom of the tile. Note: For seasonal climates, this line must have a 25mm per metre slope towards the feed line to allow for drainage and winterization. Then drop a vertical line (90° to the horizontal line) at the left or right end of the installation to locate the first panel. Allow a minimum of 75mm on all sides of the panel row for piping. Inspect the roof for any sharp projections that may damage the panels.

### Step 2

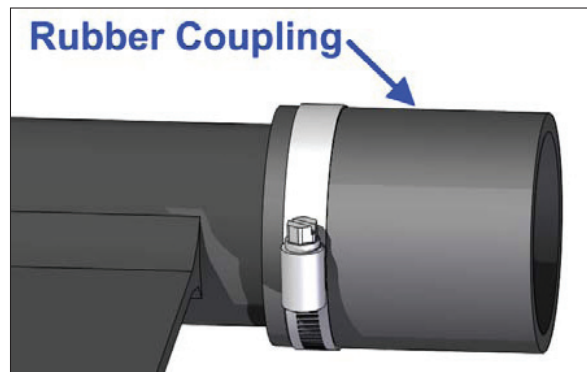
Lay out the system before securing any panels. Begin installing the panels on the left working right towards the opposite end. The panels can be installed with either side up, and should be flipped after five years to lengthen their life.

### Step 3

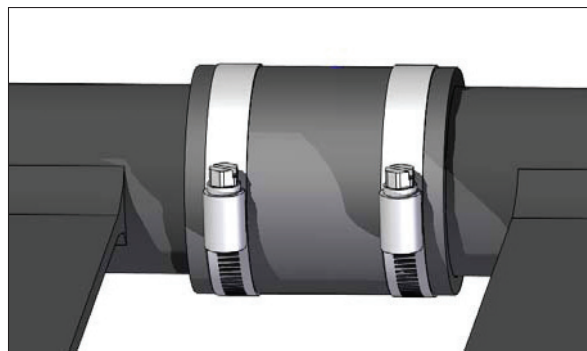
Lay the top header approximately 20mm below the horizontal chalk line. Using the parts from the Panel Kit, install a Rubber Coupling on the top right and bottom right header outlet. Slide a Hose Clamp over each Rubber Coupling and position it over the groove in the header. Rotate the head of each clamp facing up for easy access, shown in Figure 4. Then tighten until snug.

### Step 4

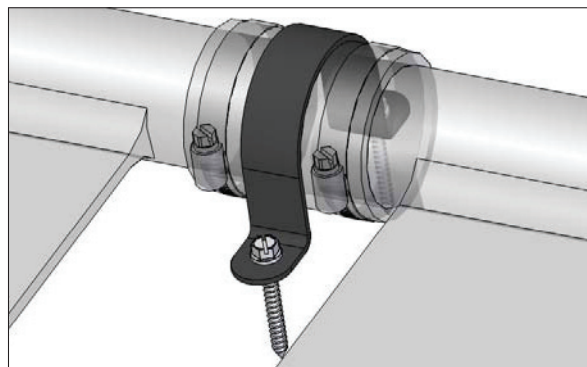
Slide another Hose Clamp over the top and bottom Rubber Coupling. Position the next panel to the right of the first panel, and insert the header outlet into the top and bottom Rubber Coupling of the first panel. Position each Hose Clamp over the groove of the second panel; facing up for easy access. Then tighten until snug. The top and bottom should resemble Figure 5 when finished. If the roof is not too steep for the panels to slide, you may continue connecting panels following Step 3 then Step 4; otherwise move to Step 5.



4. Rubber Coupling



5. Rubber Coupling Installed



6. U-Shaped Bracket

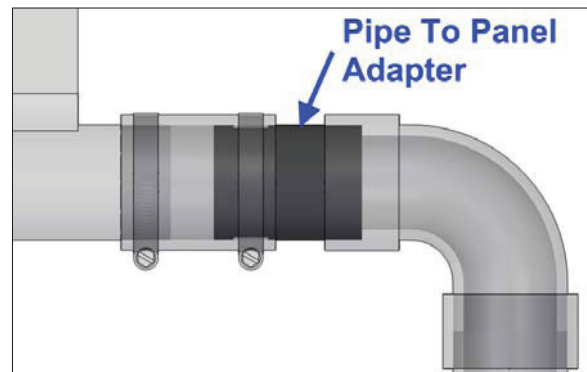
**Step 5**

Verify that the panels are in position (the top edge of the header should be parallel to the horizontal line; the left edge of the very first panel should be on the vertical line). Place a U-Shaped Bracket over the upper Rubber Coupling and mark the roof where the Hex Screw will penetrate. Remove the U-Shaped Bracket and apply a generous amount of sealant to the marked areas on the roof. Return the U-Shaped Bracket. Using a drill and a 3/8" nut driver, drive two Stainless 3/8 Hex Screws through the holes of the Bracket and into the roof. Note: The U-Shaped Bracket should be tightly secured but be sure not to over tighten the screws and strip the wood. When installed it should resemble Figure 6. Finally, apply sealant around the head of the screws.

*Note: The bottom headers are NOT secured with U-Shaped Brackets to allow for expansion. Continue with Step 4 and Step 5 until all panels in the row are installed.*

**Step 6**

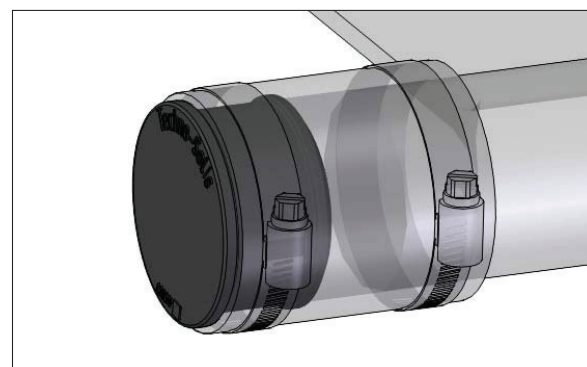
Install a Rubber Coupling on the four outside remaining header corners using the Hose Clamps. On the feed and return corners, insert the Pipe to Panel Adapters, seen in Figure 7, into the Rubber Coupling using the end that resembles a header outlet. Secure with a Hose Clamp. On the upper remaining corner, insert an End Cap and secure with a Hose Clamp, Figure 9, and secure with a Hose Clamp. On the bottom remaining corner, insert the vacuum breaker assembly, Figure 8. Secure the final two top Rubber Couplings to the roof with U-Shaped Brackets just as you did in Step 5.



7. Pipe to Panel Adapter



8. Vacuum Breaker Assembly (Vacre1)



9. End Cap



10. Hold Down Straps

**Step 7**

The Hold Down Straps may now be installed. A minimum of 3 straps is required. In high wind areas increase the number of straps per panel row, particularly for the longer panels.

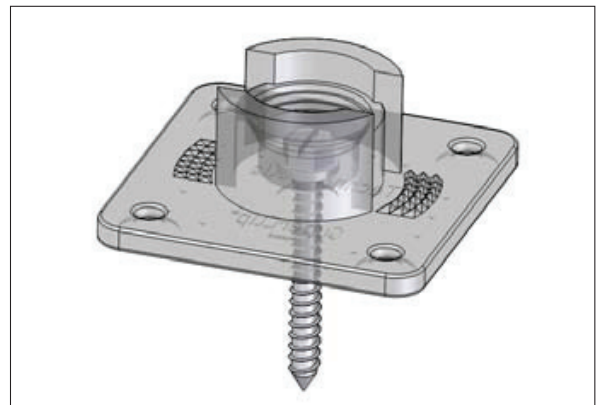
The bottom Strap is always located 300mm above the bottom header. The remaining Strap(s) are equally spaced between the bottom Strap and the top header. You may want to use a chalk line to mark this spacing before you install the panels by measuring down from the top horizontal line; or use the shingle / tile lines or rood screws as a guide.

Install SuperClips along the marked lines between all panels and at the ends of the row.

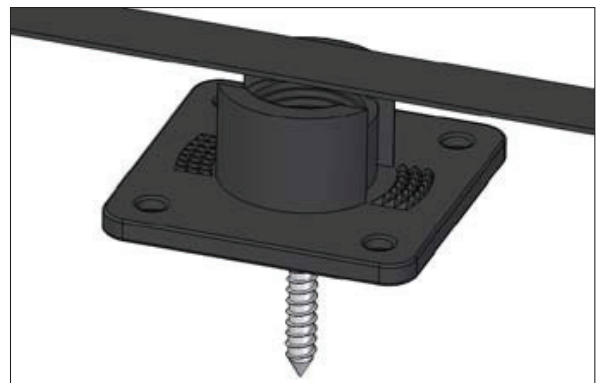
To install a SuperClip, apply a generous amount of sealant to the base of the clip. Place the base on the marked line and secure with a Stainless 3/8 Hex Screw through the centre hole of the base, Figure 11. Note: The SuperClip base should be tightly secured but be sure NOT to over tighten the screw and strip the wood. In high wind areas the base can be fastened in the four corners in addition to the center.

Lay strap across the SuperClip base at the left end of the row. Screw on SuperClip cap firmly. Stretch the strap across all the panels to the right and screw on the last SuperClip cap firmly while the strap is under tension. Now working from the centre towards the ends of the row, screw each cap on firmly.

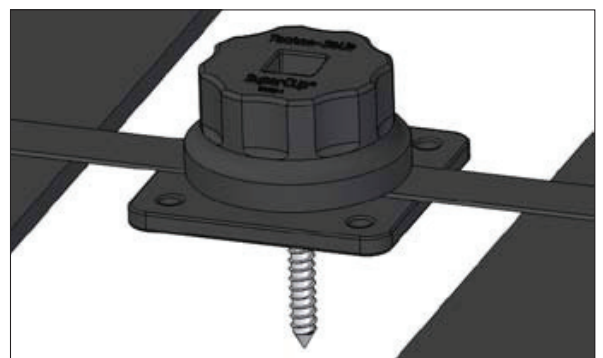
After the system is installed for several weeks or even months the Strap may need to be re-tensioned due to expansion of the strap in warmer weather.



11. SuperClip Base



12. Tensioned Strap



13. SuperClip Installed

## 6. Plumbing

### A Independent

Additional Parts Required

*Boost Pump*

**1HP Hayward Pump may vary in size of solar.**

(Instructions with Pump)

*Digital Solar Controller*

**SL3**

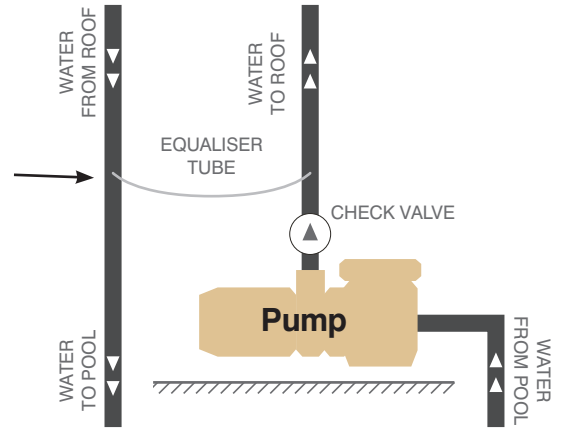
(Instructions with controller)

#### Equaliser Kit

A bleeder pipe/Equaliser tube is used to allow the roof system to drain while the solar is not operating. This is installed on the pipe work up to the roof (below the eave) connecting supply and return pipes.

To install the equaliser tube

- Drill one 9mm hole onto each of the 40mm pipes
- Insert a grommet (supplied) into each hole
- Using one tube of the solar absorber, push a joining barb into either end and push both ends into the grommets and sleeve.



### B Retro Fit

If existing pool plumbing to be used, install a Hurlcon FX 140 and SL8RT Digital controller. The pool pump must be running during solar heating hours.

This system is suitable for 2 storey installations.

Additional Parts Required

*Boost Pump*

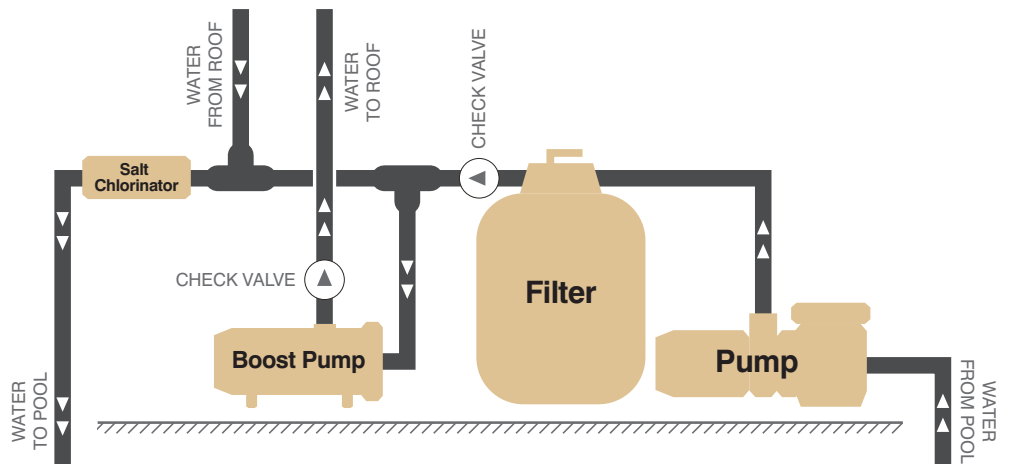
**1HP Hayward**

(Instructions with Pump)

*Digital Controller*

**SL8RT**

(Instructions with controller)



## 7. Pipe Layout

Use 40mm PVC plastic piping between the risers and the panels. Black pipe is recommended because of its excellent outdoor life. The pipe may be painted with a good outdoor paint to match the structure or roof. 40mm pipe may be used on splits between panel rows. All plumbing should allow for gravity drain. In tropic or sub-tropic climates, the panels and plumbing may be level; in southern climates, they must be installed with a 20mm per 3m slope towards the pool equipment. The panels should gravity drain back to the pool. If it is not possible to route plumbing to allow for panel drainage, a manual drain valve or line should be installed, or the end plugs may be removed to drain panels. Support all pipes every 1.2m using Galvanized Pipe Clamps.

## 8. Flow Rate

The required flow rates for the system is determined by adding together the recommended flow rates for all the panels installed. Pump sizing is determined by required flow rate and the head pressure of the system (varies, depending on individual system). Refer to Pump performance charts to select pump.

### Flow Rates (l/min)

| Panel size  | 3.66m | 3.01m | 2.44m |
|-------------|-------|-------|-------|
| Max         | 37.86 | 37.86 | 37.89 |
| Min         | 11.36 | 9.47  | 9.47  |
| Recommended | 18.55 | 18.55 | 18.55 |

## 9. Startup & Testing

Consult the owner's manual for complete startup procedure. After system is filled with water, check all fittings, hose couplings and panels for leaks. Set the time clock to operate during the solar day, typically 9am to 5pm. Feel the surface of each panel to ensure proper flow; as the pool water flows through it on startup it will cool to the temperature of the pool water. Check for air bubbles from the pool returns.

## 10. Special Roof Requirements

Variations in the installation procedures are outlined below. Consult the technical support for other types of roof installations.

### Flat Tile or Barrel Tile Roofs:

The mounting screws need to be screwed through the tiles and into the pine battens below.

Determine location of battens and drill a pilot hole through tiles to batten. **DON'T DRILL INTO THE BATTEN.**

Apply a generous amount of sealant to saddle and screw the saddle into batten. This will ensure the bracket is firmly fixed to the roof sub structure and does not place undue pressure on the tile, causing it to crack

### Flat Built-up Gravel Roofs:

Use caution when installing on this type of roof. The preferred method is to have a roofing contractor install "roof curbs" where the mounting hardware will be installed.

### Open Beam Roofs:

Any ceiling with exposed beams must be checked to avoid the screw ends from penetrating into the interior space. Call for alternate installation method.

### Metal Roofs:

If the metal roof is installed on a plywood surface, you may proceed using the normal installation method. If the metal roof is installed on pine battens, the mounting hardware must penetrate into the pine battens to insure a good seal and to avoid bending the metal surface.

### Kliplock Roof

To install the panels on a flat kliplock roof, the panels will need to be installed sideways (90° offset) to the edge of the roof. This enables all the fixings and superclips to be attached to the ridges of the roof profile.

When installing on a Kliplock roof, use the butterfly clip and an extra stainless steel clamp to secure the panels to ridges of kliplock roof profile. NO fixings should be installed in pans of Kliplock roof, as this may lead to future roof leaks. Contact Sunlover Technical support if needed.

### Rubber or Asphalt Modified:

This type of roof is typically installed flat. Using a 50 – 60mm fender washer under the mounting hardware will provide additional mounting surface. Be sure to use a generous amount of sealant under the washer, between the washer and the mounting hardware, and on top of the mounting screw.

### Roof or Ground Mounted Rack Systems:

Rack systems can be made from pressure treated wood or aluminum. For roof mounted racks aluminum is preferred for its additional strength and longevity. Aluminum racks are available in a kit form. To order a kit, or to request a wood rack design specification sheet, call the technical support line.