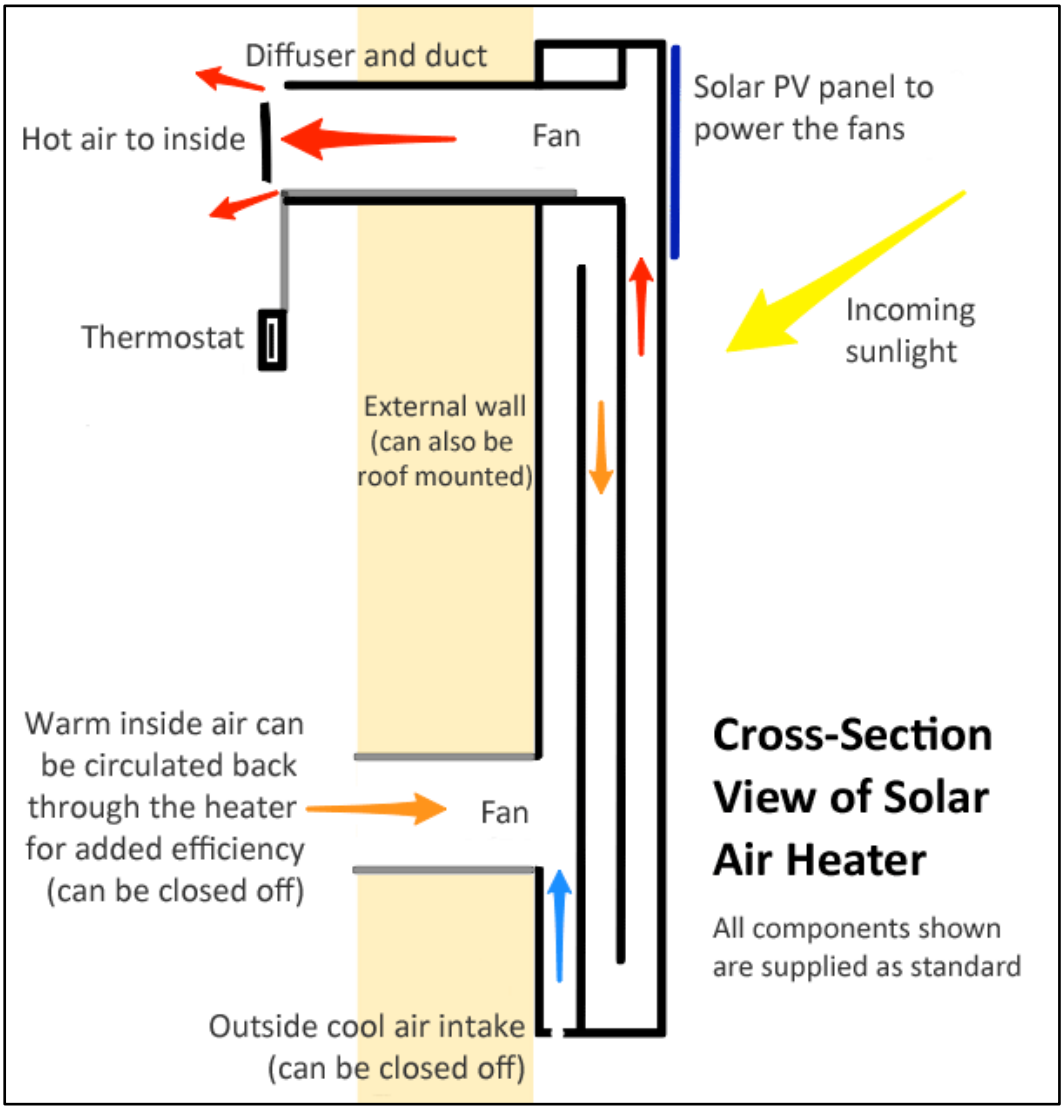
REDUCTION
REVOLUTION

Solar Air Heater Instruction Manual

WARNING: Installation should only be completed by suitably qualified personnel.

Contents

How It Works



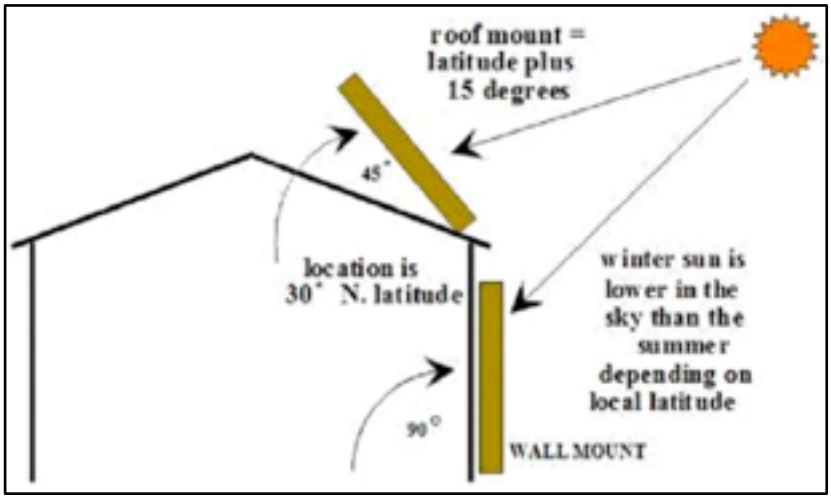
1. Fresh outside air makes three passes through the collector before entering the room (see diagram above).
2. The air is heated directly in the collector by the sun and pushed into the house by two fans.
3. The fans are powered by a solar photovoltaic panel and automatically turn off when there is no sunlight.
4. Air can be brought in from outside, or re-circulated from inside to maximise the temperature gain.
5. When the inside air exceeds the thermostat set temperature, the fans will turn off automatically. The fans will turn on again when the inside air drops below the thermostat set temperature.

Please note: The solar air heater only works during the day. It does not store heat or energy at night. There are no batteries or mains power involved.

Where to Install

Face North

The solar heater must be placed where there is the greatest opportunity of getting sunshine in winter. For the southern hemisphere, this means orientating the panel towards the north. To catch the low winter sun, a steep or vertical installation angle is best. In many cases, the ideal location for the solar air heater is on a northern facing wall. The next best option is on a roof, facing north. For peak winter performance the panel tilt angle should be your latitude +15 degrees.



Avoid Shading From Eaves

Place the solar air heater at a height where it will be in full sun in winter. If you are placing the solar air heater on a wall, remember to take into account possible shading from the building's eaves. The solar photovoltaic panel powering the fans will not work properly if it is in shade and it is located at the top of the panel. The amount of shadow will be different at different times of the year as the angle of the sun changes, however during winter there will be less shadow because the sun is lower in the sky.

Parts

The solar air heater comes with the following parts for installation:

- 1 x solar air heater panel
- 1 x thermostat controller
- 2 x flexible tube ducting (100mm diameter)
- 2 x flange to connect the ducting to the solar air heater
- 2 x diffuser plates including insect guard to connect to the ducting and act as internal wall / ceiling outlet (for 100mm cut-out size)
- 1 x pack of mounting screws
- 1 x extra electric fan for the intake of indoor air

Your installer may also need the following equipment:

- A marker pen
- Measuring tape
- PVC piping
- Cutting tools e.g. a hacksaw or utility knife
- An electric drill
- A screwdriver
- Electrical tape
- Self-tapping wood screws (if attaching the unit to timber)
- Filler, expanding foam or other gap-sealing product.

Installation Guide

Step 1

Find a suitable site where the solar panel will receive as much sunlight as possible, and where a hole can be made in the wall (or roof) through which the supplied tube ducting can be passed (see 'Where To Install' on page 3).

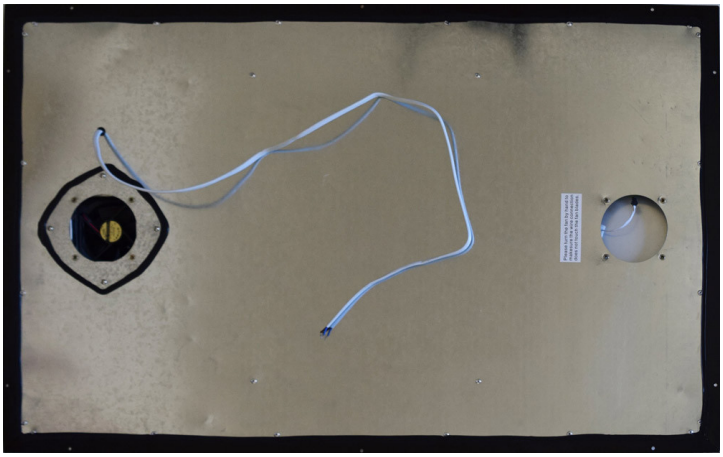
Step 2

Use the ducting as a guide to measure and mark circles for cutting holes in the wall. If the solar air heater is a short distance from the room (i.e. directly on the other side of the wall), you may want to use PVC pipe ducting instead.

After double-checking your measurements, cut the hole/s in the wall.

Note: For the re-heating of inside air you will need two holes (optional).

If you are in a cold climate and would like to reheat the inside air for maximum efficiency, you will need to cut a second hole.



This is the back of the solar air heater panel. Note that the hole on the left is for air entering the house (essential). The hole on the right is for the inside air to enter the solar air heater and be re-heated (optional, for colder climates).

The distance between the two holes is as follows:

Small Unit: 774 mm

Large Unit: 1124 mm

Step 3 (optional)

The intake and re-heating of inside air may not be necessary for warmer climates, and so to reduce installation time, you may choose not to install this feature.

If this is the case, cover up the second hole on the back of the solar air heater panel (the one without a fan installed) with electrical tape.

Step 4 (optional)

If you choose to use the method of reheating inside air, connect the extra fan (supplied) to the second hole on the back of the solar air heater. Plug the fan into the wires coming out of the hole and attach it with the screws provided.

Step 5

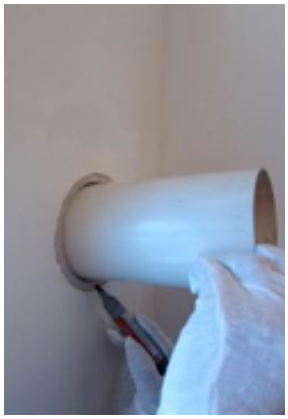
Note the attachment holes in the outside border of the solar air heater panel. Using these holes, place the solar heater against the wall and make marks on the wall where the attachment screws will be.

Step 6

Make holes in the wall for the attachment screws at the points you have just marked. If attaching to brick, stone or concrete, drill 8mm diameter holes for the screws at the attachment points and place the matching sized plastic wall plugs into the holes. If attaching to wood, it is likely that the heater can be erected using self-tapping wood screws and no prior hole-drilling will be needed.

Step 7

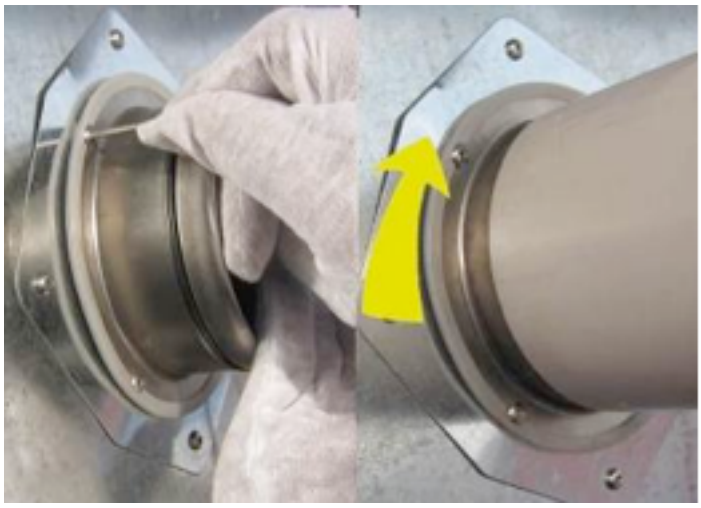
Measure the thickness of the wall by passing the ducting/pipe through the wall and marking it where it comes out. Shorten the ducting to the required length.



Note: PVC piping can be used for short distances instead of the supplied flexible tube ducting.

Step 8

Connect the ducting/pipe to the back of the solar air heater using the flange/s. Fasten with the screws supplied.



Step 9

Pass the tubing and electrical wires through the wall. Use filler, expanding foam or some other product to seal any gaps.

Step 10

Fasten the solar air heater panel to the wall by using the screws provided. Do not tighten the screws fully until you are sure that the tubing is in-line with the connector on the reverse of the panel.

Step 11

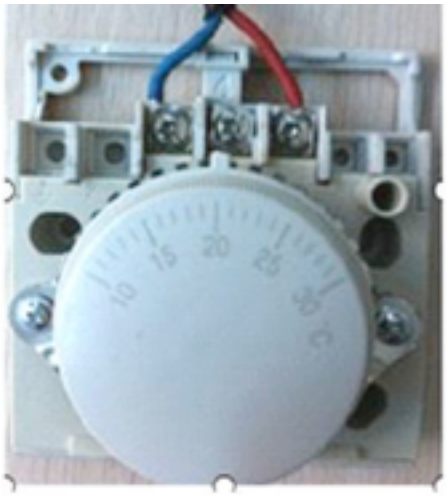
Inside, mount the diffuser/s to the interior wall. Pull out the wires in order to connect the thermostat.

Step 12

Mount the thermostat. If attaching to a wall, drill 6mm diameter holes for the screws at the attachment points and place the matching sized plastic wall plugs into the holes.

Step 13

Connect the wires to the thermostat.
Connect one of the wires to position 1, and the other wire to position 3.



Step 14

Fit the thermostat cover.

Winter Operation

Option 1 – Heating outdoor air

This option is good for more temperate climates or for warmer times of the year. It has the benefit of ventilating the house by introducing fresh outdoor air.

Exterior air inlets = OPEN
Interior diffusers = OPEN
Thermostat = SET TO DESIRED TEMPERATURE

Option 2 – Heating indoor air

This option is good for colder climates and is the most efficient way of operating the solar air heater. For those with the extra ducting installed, the heater will work by re-heating semi-warm interior air (which is much warmer than outdoor air). This maximises the efficiency of the system, as less energy is required to heat the air to the desired temperature.

Exterior air inlets = CLOSED
Interior diffusers = OPEN
Thermostat = SET TO DESIRED TEMPERATURE

Adjusting The Thermostat

Set the temperature on the thermostat by turning the knob so that the desired temperature is in line with the centre mark.

When the inside air exceeds the thermostat set temperature, the fans will turn off automatically. The fans will turn on again when the inside air drops below the thermostat set temperature.

We recommend setting the thermostat to the maximum temperature so that it will continue to work at all times when in sunlight. You can then turn it down when the solar air heater starts producing too much heat.

Summer Operation

Option 1 – Simple

During the warmer months, turn the thermostat down to its lowest temperature setting so that the fans turn off. To stop hot outside air from entering the house, close the exterior air inlet panel and/or the indoor diffuser/s.

Option 2 – Optional

This option is for systems with extra ducting installed for the intake of interior air.

The solar air heater may be used to assist with cooling in summer by removing hot air from the house. To do this:

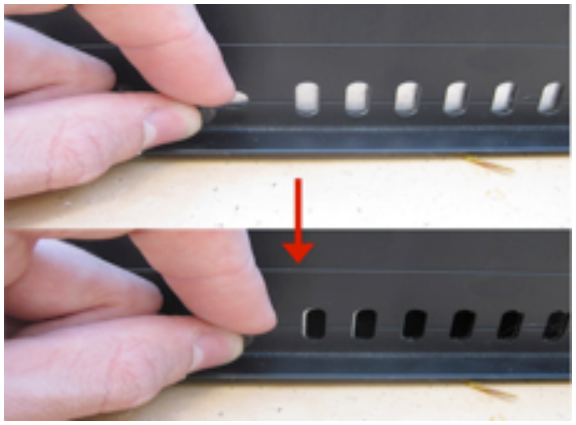
1. Close the first indoor diffuser to stop the air from the solar air heater from entering the room.

2. Open the second indoor diffuser for the intake of interior air.

3. Open the exterior air inlet panel on the solar air heater unit, to let the hot air out.

4. Turn the thermostat up to a temperature where the fans will operate.

This way the solar air heater should work as an extraction fan to remove hot air from the house.



Open and close the exterior air inlets by sliding the metal panel across.

Maintenance

If possible, occasionally clean the outside of the solar air heater. Dirt, dust, leaves or debris may block the sun's rays from heating the air inside the unit or cause the solar photovoltaic panel to work less efficiently.

The fans have a lifetime of 30,000 hours. If the fan fails, just pull out the connector in the circuit to exchange the fan.

If you choose to install any air filters with your system (not recommended as they will reduce system performance), please ensure that they are cleaned regularly to maximise airflow rate.