



An Investment with Real Returns



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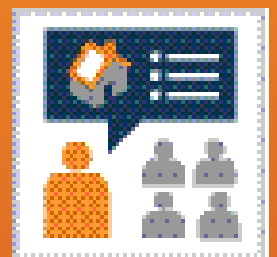
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## SunMaxx INFORMATION GUIDE

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**Solar Radiant Space Heating**



# SOLAR RADIANT SPACE HEATING

Radiant floor space heating is a common application for a solar thermal system. Oil, natural gas, propane and electricity have some of the most volatile prices of any commodity. The cost of heating a residential or commercial space can add significantly to the overall energy expenses for a home or business owner.

Space heating accounts for nearly 30% - 40% of a homeowner's average annual energy bill. The figures are roughly the same for businesses. By eliminating the need for 50% - 60% of the fuel currently used for space heating, home and business owners can save thousands of dollars every year.

A SunMaxx solar thermal space heating system can be used to augment most modern heating systems, including:

- in-floor radiant systems.
- baseboard radiator systems.
- forced hot air systems.

These are the most common types of heating systems in use today. And SunMaxx Solar has a turnkey prepackaged solution to fit any home or business.

## Radiant Space Heating Basics

### Radiant In-floor Heating

Radiant in-floor heating systems are among the most cost-effective and efficient types of heating systems available today, especially with the integration of a SunMaxx solar heating system. There are two types of radiant in-floor heating systems.

#### 1. Thermal Mass

A thermal mass system uses a large mass, such as a concrete floor, to store heat that will be radiated slowly into the surrounding room as it is needed. PEX tubing is laid within a concrete floor as it is poured. When heated HTF is fed through the PEX tubing, the heat is transferred to the surrounding mass. As the temperature in the room with the thermal mass floor drops, heat is radiated out, stabilizing the temperature automatically. A thermal mass system can use a solar or traditional heating system, or a combination of both, as the heat source.

#### 2. Wooden Sub-floor

The second type of radiant in-floor heating system uses PEX tubing looped under the subfloor of a hardwood or tile floor. As heated HTF is cycled through the PEX loops, the heat is transferred through the floor to room(s) above.

Wooden sub-floors are great for using radiant in-floor heating systems in multiple floor homes and apartment buildings.

Unlike a thermal mass system, a radiant heating system under a wooden or tile floor must include a solar hot water storage tank for thermal storage. Because of the low temperatures required for radiant heating with a thermal mass or sub-floor heating system, a larger solar hot water storage tank may be used.



**Baseboard Radiator Heating**

Baseboard radiators are extremely common in older homes, as well as many offices, hotels and apartment buildings. The relative affordability of installing these systems make them extremely popular, as well as cost-effective.

The only disadvantage of using a solar thermal heating system with baseboard radiators is that this type of system requires higher temperatures than others. This means that a smaller solar hot water storage tank should be used, lowering the overall efficiency of the solar heating system. But with the proper balance of solar collectors and solar hot water storage tank, integrating a solar heating system with a baseboard radiator heating system is an affordable and cost-effective use of solar heating.

**Forced Hot Air Heating**

Whether utilizing oil, propane, natural gas or electricity as its fuel source, forced hot air systems are extremely popular and common in residential and commercial applications.

By using an air to water heat exchanger (see the product brochure for more information) the HTF within the solar heating system can be used to heat the air within your furnace. The heat exchanger goes into the plenum of the furnace, as the HTF travels through the exchanger, the air within the furnace is heated.

The use of a solar heating system for forced hot air will dramatically reduce the amount of heating fuel you use.

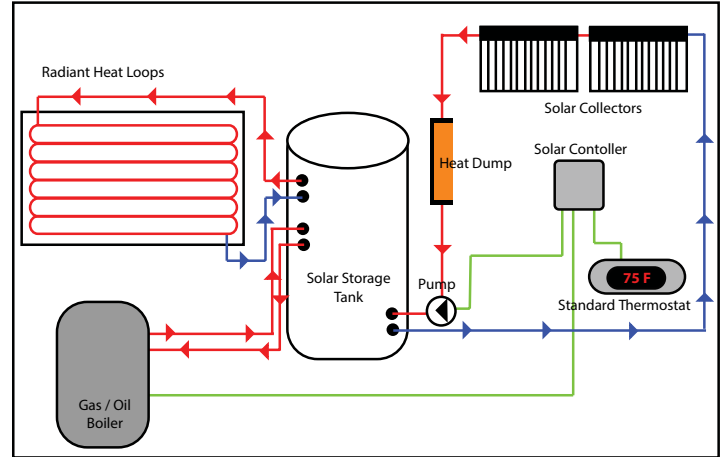


# SOLAR RADIANT SPACE HEATING

## Typical System Components

### Radiant In-floor System - Thermal Mass

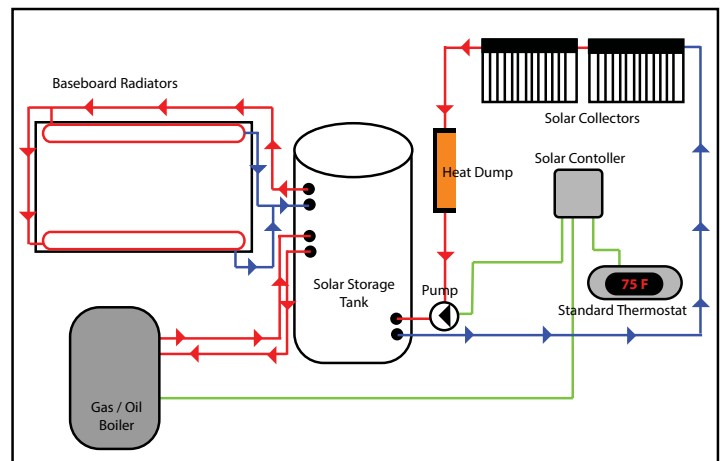
- Solar collectors - typically evacuated tube collectors
- Solar storage tank - with internal heat exchangers
  - (1) or more for solar loop input
  - (1) or more for radiant zone output
  - (1) or more to tie-in domestic hot water heating
- Or, thermal mass - concrete floor
- PEX tubing (rated for 180 °F, or above)
- Controller (for solar loop control)
- Zone controllers/thermostats
- Solar hot water circulator pumps
  - Circulator(s) for solar collector loop
  - Circulator(s) for radiant heating zones
- Assorted plumbing hardware to complete installation



### Baseboard Radiator Heating

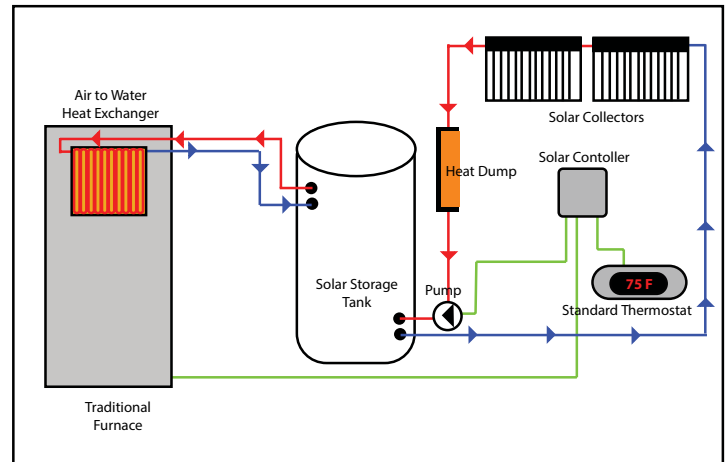
- Solar collectors - typically evacuated tube collectors
- Solar storage tank - with internal heat exchangers
  - (1) or more for solar loop input
  - (1) or more for radiant zone output
  - (1) or more to tie-in domestic hot water heating
- PEX tubing (rated for 180 °F, or above)
- Controller (for solar loop control)
- Zone controllers / thermostats
- Solar hot water circulator pumps
  - Circulator(s) for solar collector loop
  - Circulator(s) for radiant heating zones

Assorted plumbing hardware to complete installation



## Forced Hot Air System

- Solar collectors - typically evacuated tube collectors
- Solar storage tank - with internal heat exchangers
  - (1) or more for solar loop input
  - (1) or more for radiant zone output
  - (1) or more to tie-in domestic hot water heating
- PEX tubing (rated for 180 °F, or above)
- Controller (for solar loop control)
- Zone controllers / thermostats
- Solar hot water circulator pumps
  - Circulator(s) for solar collector loop
  - Circulator(s) for radiant heating zones
- Assorted plumbing hardware to complete installation





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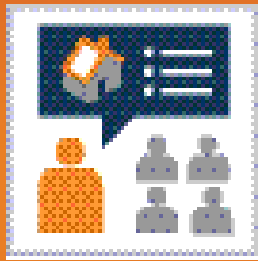
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