

Pool and Spa Heating Options

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Inviting Swimming Pools and Spas are an attractive way for Hotels and Motels to entice new patrons and to keep existing ones. Although an inviting pool or spa may look great, the water temperature must be set to a level where the experience meets expectation, but which one to get?

As there are many options in heating a swimming pool or spa it is advisable to contact a pool heating specialist and have a heat load evaluation to find the most economical and environmentally friendly system. The most common options currently available are:

Gas

Gas has traditionally been the most common form of pool heating as it is easy to install, has a low capital outlay and can provide rapid heat up times. The heater usually has pool water pumped through a Heat Exchanger which sits above a gas fired burner tray; this heat is transferred to the water and returns to the pool. Newer style gas heaters utilise fan assistance that aids in the combustion and heat transfer process that increases efficiencies and reduces operating costs. A gas heater is an ideal stand alone system when natural gas is available or the perfect back up for Solar or Heat Pump systems.

Solar

Solar is an extremely economical way of heating a pool and has a relatively low capital cost. Water is pumped from the pool to a heat collector fitted to the roof that absorbs radiant energy from the sun and returns to the pool. This heat collector can be made in many different styles; some are made from extruded PVC Nitrile or EPDM rubber strip, moulded tube panels, glazed poly panels and more. When year round heating is required a backup system such as Gas or Heat pump is required.

High Efficiency Solar

High Efficiency Solar uses Glass Evacuated Tubes to collect the heat. A number of systems are available; some are even used in conjunction with heat exchangers and shared with the potable water system. This is a very economical system to run and although capital cost appears high, it can be amortised over the two heating systems. A backup system is normally required to guarantee a suitably heated pool.

Heat Pump

Heat Pumps have become more common for heating as capital costs have been reduced over the past few years. They can be used as a stand alone system as long as heat load calculations have been performed correctly. Heat pumps are least efficient during the coldest months and it is common practice to have a gas heater as back up for prolonged cold spells.

Heat pumps work like a reversed air conditioner. Instead of taking air from a room or building, removing the heat and returning it, a heat pump takes large quantities of air from the atmosphere, removing the heat contained in the air and transferring this to water from the pool or spa passing through the unit.

The characteristic of the heat pump of absorbing heat value from air means that the unit has a low electrical input relative to its heat transfer. A well designed heat pump will output heat at a rate of around 5:1, relative to its energy input under summer conditions. This greatly reduces total energy consumption. This factor is called the heat pump's co-efficient of performance or COP.

The capture of solar energy from air means that the heat pump's output and efficiency will vary with air temperature. Higher efficiency is gained in more temperate locations but heat pumps are capable of maintaining pool temperatures year-round in nearly all areas of Australia and New Zealand.

SMART HEATING CONTROL ELECTRONICS MEANS MAXIMUM EFFICIENCY

Even the most economical heating systems for pools and spas can require

a back up system and this is where a digital control system can pay dividends. The controller will monitor the most economical way of heating and will switch between heat sources as required.

When a gas system is utilised, electronics can be used to accurately control run times, set temperatures and heater cool down times. This ensures energy is not wasted from slow switching mechanical thermostats or thermostats that are fitted within the heaters high temperature cabinets. Peak swimming times are also allowed for.

On Solar Systems the controller will monitor the pool temperature and when heating is required will turn the solar system on if there is solar gain. When auxiliary heating is installed - normally gas or heat pump fitted in conjunction with solar - the controller will determine which heat source is best to use. If heating is required the controller will check solar temperature and if insufficient, it will switch on the auxiliary heater and it

will run until the set limit is reached or until there is sufficient solar gain. If solar gain is insufficient for the water temperature to reach the limit, then both heat sources will run concurrently. When there is enough solar gain to achieve limit the auxiliary heating will be turned off and only the more economical solar heat source will be utilised.

When Salt Chlorinators are used in multiple or smaller systems, over Chlorination is common as the Filter pump may run for extended hours to keep the Heat Pump going. The controller will turn the Salt Chlorinator off when extended heating times are required, or an electronic monitoring system should be fitted.

HOW TO SAVE ON RUNNING COSTS AND THE ENVIRONMENT

When multiple heat sources are utilised it is imperative to set the most economical heat source to a higher temperature setting than the auxiliary temperature



setting. Consequently, the cheaper heat source will push the water temperature above the auxiliary setting therefore minimising the auxiliary source's run time. The greater the temperature difference between the two settings the larger the savings will be. What needs to be considered are the minimum and maximum temperature settings that are comfortable for the user. Commonly used minimum and maximum temperatures are 26 degrees Celsius and 29 degrees Celsius respectively, however, this will differ from State to State as pool temperature needs to be set relevant to ambient air temperature to achieve a comfortable level. ■

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