

HEAT PUMPS



What Is A Heat Pump?

Heat pump theory rests on the principle that heat will move from a higher temperature to a lower temperature. Hence, if a heat transfer coil can be kept at a lower temperature than its surrounds, it will absorb heat.



For those technically minded, the Toyési heat pump captures ambient heat from the surrounding air by drawing it through a lower temperature finned tube type heat exchanger.

The ambient heat is absorbed by the low temperature refrigerant gas circulating in the system, where its temperature is increased by a vapour-compression process and by absorbing the motor windings heat of the compressor. The heat of the high temperature refrigerant gas is then transferred to the circulating pool water via a marine grade tube-in-tube refrigerant-to-water heat exchanger.

Why Use A Heat Pump?

A flexible heat pump, such as those developed by Toyési, uses a significantly small amount of electricity to obtain large amounts of heating and cooling energy from the environment.

Heat pumps are globally recognized as being very efficient energy movers. From just one unit of electrical energy, they can produce between 4 to 5 times as much heating or cooling energy, depending on the surrounding climatic conditions and application.

Not convinced? Ask your local pool and spa retailer to compare costs of operating an air-to-water heat pump to the more traditional methods of resistive electric and/or gas-fired heating. You will be surprised to hear that you can save up to 75% on your operating costs.

Help Me Determine What I Need

Selection of heat pumps is dependent upon a variety of influencing factors including:

Location - local climatic conditions largely influence selection.

Temperature - it is your choice, however as a guide:

23 to 26°C	Training and/or lap pool
26 to 30°C	Leisure and/or fun pool
30 to 34°C	Swim school and/or therapeutic exercise
34 to 38°C	Spa and/or hot tub

Size of Pool - surface area of your pool is a significant contributing factor, and how it is exposed to the varying climatic conditions. You will need to determine the surface area in square metres and the average depth (including wading areas and spa).

Shading & Exposure to Wind - these affect the amount of evaporative heat losses (via wind) and solar gains of heated water.

Pool Position – both outdoor and indoor pools have varying factors when assessing your pool heating requirements, as does exposed pool shell surfaces that are not insulated.

Swimming Season - do you want to swim all year round or just extend the swim season to the best 9-months of the year?

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How Do We Select A Heat Pump?

Our approach in heat pump sizing is to recommend the installation of higher capacity systems where technically and economically feasible. It should be appreciated that while our software modeling is robust, the predictive heat load and subsequent predictive performance data must be treated as indicative.

Based on earlier work by the CSIRO and in accordance with AS 3634, variations can occur between predicted and actual pool heat load demands as a result of numerous factors such as un-seasonal weather, difference in local micro-climate compared with average weather source data, increased shell heat losses or ventilation rates for indoor pool enclosures compared with design, non-adherence to blanket routines, etc.

Increased heating capacity gives greater certainty to predictive outcomes and also provides operational advantages (such as faster initial heat-up, improved recovery and reduced equipment duty).

Installation Requirements

Toyési heat pumps can be installed both indoors and outdoors. Its position should consider possible noise disturbances, airflow and ventilation, and servicing requirements.

Toyési heat pumps could not be any simpler for a licensed installer. A solid base surface is required to rest the heat pump on, supply of electrical mains power through an all-weather safety isolator switch, and finally, connection of inlet and outlet water tubing to a pump set.

Electrical Supply

Smaller models are single-phase connection, whereas larger models are three-phase. Our mid sized models are offered with the domestic consumer in mind and come in either soft-start single-phase or three-phase. If available, the use of time-of-use supply tariffs will further reduce operating costs.

Do I Need To Use A Pool Blanket?

Toyési encourage energy conscious owners to use pool blankets at night and other non-use periods. An insulated pool blanket is an essential component and will ensure that most of the heat within the pool water is held there by reducing thermal losses. Depending on the usage rate of the pool, the financial savings associated with using a pool cover are:

- ✓ A reduction in the size of the heat pump required, and therefore it's up-front cost, and
- ✓ The reduction of 50 to 60% in energy consumption of heating the pool water.

The decision to use a pool cover during the winter months will allow, in most cases, all day, all year round swimming, and with today's user-friendly blanket and roller designs, it takes less than one-minute to either remove it or put it back on.

Need Further Assistance?

If you require further assistance, simply e-mail us or call our Australian Head Office. We have specially educated application engineers who can discuss and evaluate your application and any special circumstances. Alternatively, provide us with your pool design by completing our Heat Pump Sizing Request Form.

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