

Electrical Power Supply Advice

This document is designed to give you the best advice before you decide to purchase a Swimming Pool Electric Heater.



Safety First!



All fixed wired electrical installation works (i.e not a 13 amp plug) must by law be carried out by a part 'P' fully qualified electrician, and you should receive an electrical installation certificate confirming correct installation and testing.

Remember electricity & water KILL.

Kilo watts(kw) & Amps?

Most electric heaters will be listed by their Kilo Watt (kw) size. This is an important guide to firstly the power of the heater, but also the size of electrical supply needed to safely run the heater. The chart below demonstrates Kilo Watts in relation to power required. The modern household generally has a 220 - 240 volt 100 amp single phase supply cable coming into the main household fuse board. This is then divided down into the normal household power and lighting circuits. Adding a large kilo watt heater can overload your installation, so it is important to know your power requirements and capabilities. Always consult your qualified electrician for specific installation advice.

1 Kilo Watts approximately equates to a 4 Amp current draw, so:

- 3.0 Kw Pool Heater requires 13amps – single phase
- 4.5 Kw Pool Heater requires 20amps – single phase
- 6.0 Kw Pool Heater requires 25amps – single phase
- 9.0 Kw Pool Heater requires 38amps – single phase or 11 amps Three Phase (440v)
- 12 Kw Pool Heater requires 50amps – single phase or 17 amps Three Phase (440v)
- 15 Kw Pool Heater requires 63amps – single phase or 21 amps Three Phase (440v)
- 18 Kw Pool Heater requires 75amps – single phase or 25 amps Three Phase (440v)
- 21 Kw Pool Heater requires 88amps – single phase or 29 amps Three Phase (440v)
- 24 Kw Pool Heater requires 100amps – single phase or 34 amps Three Phase (440v)

As you can see from the list, once the heater size gets into the higher ranges, it really is ideal to run the heaters on a three phase supply.



Cost of a Kilo watts(kw) of Pool Water Heating Per Hour?

So now we know how many kw/h our heater needs it makes it very easy to cost out each heater size per hour and also compare the cost of different types of heaters. General electric pool heaters are element type heaters which are similar to an immersion heater or kettle, they have tend to have a coefficient of performance (C.O.P) of 1 to 1. This means for every 1kilo watt of power used, they convert this into 1 kilo watts of heat so typically running costs are as shown below.

Standard Tariff Electricity Costs for Element Electric Heaters

(Using the following unit prices: Standard day unit of 12.8 pence – Night Economy 7 unit of 5.25 pence – these unit prices exclude vat)

3.0 Kw Pool Heater will cost 38.4p per/hour standard & 15.75p Economy 7
4.5 Kw Pool Heater will cost 57.6p per/hour standard & 23.62p Economy 7
6.0 Kw Pool Heater will cost 76.8p per/hour standard & 31.2p Economy 7
9.0 Kw Pool Heater will cost £1.15 per/hour standard & 47.25p Economy 7
12 Kw Pool Heater will cost £1.53 per/hour standard & 63p Economy 7
15 Kw Pool Heater will cost £1.92 per/hour standard & 78p Economy 7
18 Kw Pool Heater will cost £2.30 per/hour standard & 94p Economy 7
21 Kw Pool Heater will cost £2.68 per/hour standard & £1.10 Economy 7
24 Kw Pool Heater will cost £3.07 per/hour standard & £1.26 Economy 7

Electric Heat pumps are another form of pool water heating, these use a reverse refrigeration system to pull heat out of the air and into your pool water via a heat exchanger. The advantage of a heat pump is the lower running costs as they tend to have a coefficient of performance (C.O.P) of 4 or 5 to 1. This means for every 1 kilo watt of power used, they convert this into 4 or 5 kilo watts of heat, so typical running costs are dramatically cheaper. The disadvantage to this type of heater is the initial cost of these units, as they are more complex than an element heater.



Cost comparison between an Element Heater & Heat Pump

If we take the average pool, covered with a good quality solar cover, with the heater running for an average of 4 hours a day for the duration of a 16 week season, we would have the following day costs £1.53 per/hour (excluding vat):

12 Kw Element Pool Heater - 4 x 7 x 16 weeks - Day Units Total Cost - **£688**

12 Kw (2.4kw) Heat Pump - 4 x 7 x 16 weeks - Day Units Total Cost - **£138**

So the heat pump would save you in this comparison **£550** per season and if you assume the heaters have a similar life expectancy of 5 years, then **£2750** total energy savings start to more than compensate for the increased initial cost. It is also worth noting that as the 12 kilo watt Heat pump only requires 2.4 kilo watts input supply, installation costs are considerably cheaper, in fact the 12kw Heat pump will typically come with a 13 amp factory fitted plug on a long flex.

If you are fortunate to have economy 7, and you solely run the heaters during the Economy 7 times then the costs would typically be as follows:

12 Kw Element Pool Heater - 4 x 7 x 16 weeks – Economy 7 units Total Cost **£282**

12 Kw (2.4kw) Heat Pump - 4 x 7 x 16 weeks - Economy 7 Units Total Cost - **£56**

So in the Economy 7 example the heat pump would save you **£226** per season and if you assume the heaters have a similar life expectancy of 5 years, then **£1130** total energy savings.

With the advent of Titanium heat exchangers becoming the norm, the primary cause of heat pump failure is now greatly reduced, making heat pumps a better long term investment than the old fashioned style kettle elements.

If it is one thing we can count on, fuel & tax's will always go up, so minimising your need for big energy usage will always be beneficial in the long term.