

## **Ever wondered why your swimming pool “heat pump” dehumidifier cost so much to run?**

It's because it is not a heat pump it's a dehumidifier. Now I know that that sounds confusing but let me explain, first let us establish a definition of heat pumps.

A **heat pump** is a device that provides heat energy from a source of heat, or "heat sink", to a destination. Heat pumps are designed to move thermal energy opposite to the direction of spontaneous heat flow by absorbing heat from a cold space and releasing it to a warmer one. A heat pump uses some amount of external power to accomplish the work of transferring energy from the heat source to the heat sink. While air conditioners and freezers are familiar examples of heat pumps, the term "heat pump" is more general and applies to many HVAC devices used for space heating or space cooling. When a heat pump is used for heating it employs the same basic refrigeration-type cycle used by an air conditioner or a refrigerator, but in the opposite direction - releasing heat into the air-conditioned space rather than the surrounding environment. In this use heat pumps generally draw heat from the cooler external air or from the ground.[1]

Now the important consideration here is that the heat source and the heat destination are separate, for instance in an air source heat pump you are cooling down the atmosphere and heating the internal space, in a bore hole you are cooling down ground water to heat the internal space and or water tank. The important thing is that the source is not being used in the space.

Now let's have a look at the definition of a refrigerate base dehumidifier.

**Refrigeration dehumidifiers** usually work by drawing moist air over a refrigerated coil with a fan. The cold evaporator coil of the refrigeration device condenses the water, which is removed, and then the air is reheated by the condenser coil. The now dehumidified warm air is released into the room.

You see in this definition there is no separation between the source of heat and the destination, you cool the air down and then heat the same air back up again, therefore, it is not a heat pump it is a dehumidifier. This is what the swimming pool recirculation systems are.

Now I hear shouts of “so what, who cares what they call them?” but the point is that the term heat pump has become synonymous with energy efficiency (which is not entirely justified because a heat pump is just an efficient way of using electricity to heat, and electricity is expensive to produce.). So companies that add the term heat pump into their product description are trying to mislead the buyer into thinking their unit is more efficient than it actually is. A more accurate description would be refrigeration dehumidifier.

They also make a big point of saying that their systems can recover both sensible and latent energy (sensible energy is absorbed when cooling the air, and latent energy is absorbed when dehumidifying the air). On recirculation systems any sensible energy that is absorbed has to be replaced, unless you are trying to cool the pool hall, which can happen but only for small periods during the summer. So any sensible cooling done in these recirculation machines is detrimental to the efficiency of the unit, they should be trying to limit the amount of sensible cooling not bragging about it.

So the next time you are told by a bloke down the pub that his fresh air ventilation system is more efficient than your “heat pump” you'll know the reasons why.