

Heating Hot tubs faster

A more efficient solution that reduces heat-up time and energy costs

Introduction

The hot tub market has seen spectacular growth over the past few years. Led originally by 'high end' domestic and leisure users, the market has developed significantly both in the domestic mass market and the leisure industry. However, the slow heat-up times and high energy costs of many hot tubs have become a significant factor and many users are actively seeking a more efficient heating solution.



Heating issues

Historically, most hot tubs have been installed with electric heaters of around 3 kW output. However, in operation many users find this method of heating unsatisfactory, due to extremely slow pool heat-up times, which in turn lead high energy costs.

Slow heat-up time

A typical 3kW electric heater will require up to 24 hours to heat a hot tub from cold (depending on capacity, outside temperature and heater type). This is due to the heater being only sufficient to raise the water temperature by just 1 - 2°C per hour. Whilst an irritation for single tub domestic users, for multi-tub operators, such as holiday parks, this can create major logistical issues during guest change-over at peak occupancy times.

Increased energy costs

With the average cost of electricity being more than double the price of gas per kWh*, it's no surprise that many hot tub users experience a sharp increase in electricity costs, if their tubs are in regular use. Private domestic users regularly report additional electricity costs of £500.00 + per annum. For commercial multi-tub operators, this increase can seriously impact on business profitability.

The environmental factor

Based on figures published by the Energy Savings Trust (EST), electricity has a carbon dioxide factor of 0.496 kg CO₂/kWh*, compared to gas, which is just 0.184 kg CO₂/kWh*. In fact the EST's figures show that electricity has the worst environmental performance when used for heating, beaten even by coal at 0.315 kg CO₂/kWh.*

The efficient heating solution

Many users have already realised the need to switch to a more efficient heating solution for their hot tubs. One of the most efficient solutions currently available is to switch to a boiler fired heat source (either gas or biomass), used in conjunction with a Bowman heat exchanger that both heats hot tubs faster and reduces energy costs.



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How does the system work?

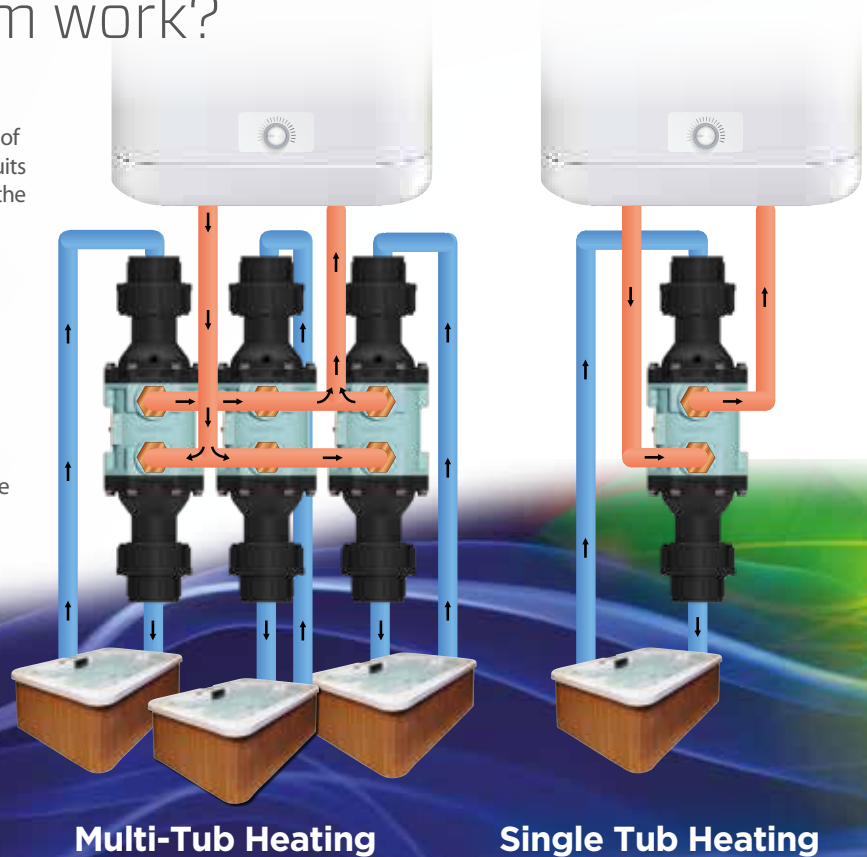
In many ways the operation is similar to that of a conventional swimming pool system. Basically, there are two separate water circuits – the heating circuit and the pool water circuit. The use of a Bowman heat exchanger ensures the water in these two circuits is always kept separate from each other, avoiding corrosion to the boiler internals and contamination of the hot tub water.

The heating circuit

Heated water from the boiler (shown in red on the adjacent illustration) is pumped to the heat exchanger inlet, where it flows through the unit in a counterflow direction to the hot tub water, passing between the outer 'shell' and inner tube core, to provide the most efficient method of heat transfer. Having transferred its heat load to the pool water, it exits the heat exchanger and returns to the boiler for re-heating in a continuous cycle.



A typical multi-tub boiler heating installation



The pool water circuit

Cooler pool water (shown in blue on the adjacent illustration) is pumped from the hot tub to the inlet of the heat exchanger, where it flows through the central tube core in a counterflow path to the heating water circuit.

Single or multi-tub installation

Bowman heat exchangers are suitable for single tub or multi-tub installations. For commercial operators, where a number of individual hot tubs are to be heated from a single boiler, this can be easily achieved by linking in parallel a number of heat exchangers to the boiler, as shown in the adjacent schematic illustration.

Results that speak for themselves

A gas or biomass fuelled heating system, used in conjunction with a Bowman heat exchanger, reduces hot tub heating times significantly – typically to within 2-3 hours**, due to its ability to raise water temperature by up to 12°C per hour. This significantly reduces hot tub running costs and heat energy used, plus ensures the tubs are available for use much quicker.

Case study: the KP Club, Yorkshire

Based in the Yorkshire Wolds, the KP Club, a prestige golf and leisure resort, recently opened 24 new woodland lodges, each with its own outdoor hot tub. Looking for a more energy efficient solution for heating the tubs than previously used electric heaters, they adopted a system that heated each tub from their central biomass boiler via a Bowman EC100 heat exchanger. Compared to previous electrically heated tubs, the total energy saving across the 24 hot tubs worked out to £12,000 per year. Additionally, the tubs were heated up to temperature in just 2-3 hours; a massive time saving when servicing the tubs between guest change-overs!



*Energy Saving Trust – energy calculations – March 2016

**Figures supplied from the KP Club's own heating installation

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BS EN ISO 9001-2008
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