

Report – Temperature and energy monitoring for TopSpa XS 01.01 – 01.09.2022

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Date

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Mission

Measurement of temperature and energy consumption for a TopSpa XS outdoor spa.

Item tested

Outdoor spa TopSpa XS, developed, designed and manufactured by SpaDealers, Korsnäs, Finland.

Technical description

The circulation pump which handles filtration (and water flow to the heater) is running 6 hours a day. Until June 1, 2022, the On/Off function was run according to the following schedule every day:

On 18.00 - Off 20.00

On 02.00 - Off 04.00

On 10.00 - Off 12.00

On June 1st, the schedule was changed so that filtration (circulation pump) is on (On) 1 hour and off (Off) 3 hours. When the temperature drops more than 1 °C during the "Off time", the heater is activated and the circulation pump starts. When the temperature reaches the set during the "Off time", both the circulation pump and the heater stop.

Fixed connection 230 V, 1x16A via service switch is used for TopSpa XS. The bath has a water volume of 1100 litres. The heater in the bath is 3000W and with a flow monitor that requires a water flow of at least 3600 l/h to activate the heater. The circulation pump's power is 250W.

The bath has a 700W air pump for bubble massage that starts automatically 2 times/day (every 12 hours) and then runs for 1 minute to stir the water.

Test set-up / Execution of the test

The test was performed outside at SpaDealers premises during the period 01.01 – 01.09.2022



The test was carried out to measure temperature and energy consumption both during the heating phase during water change and standby with filtration 6 hours per day and a set water temperature of 37 °C.

Equipment

Data logger Onset UX120-006M
 kWh meter TinyTag TGE-0001

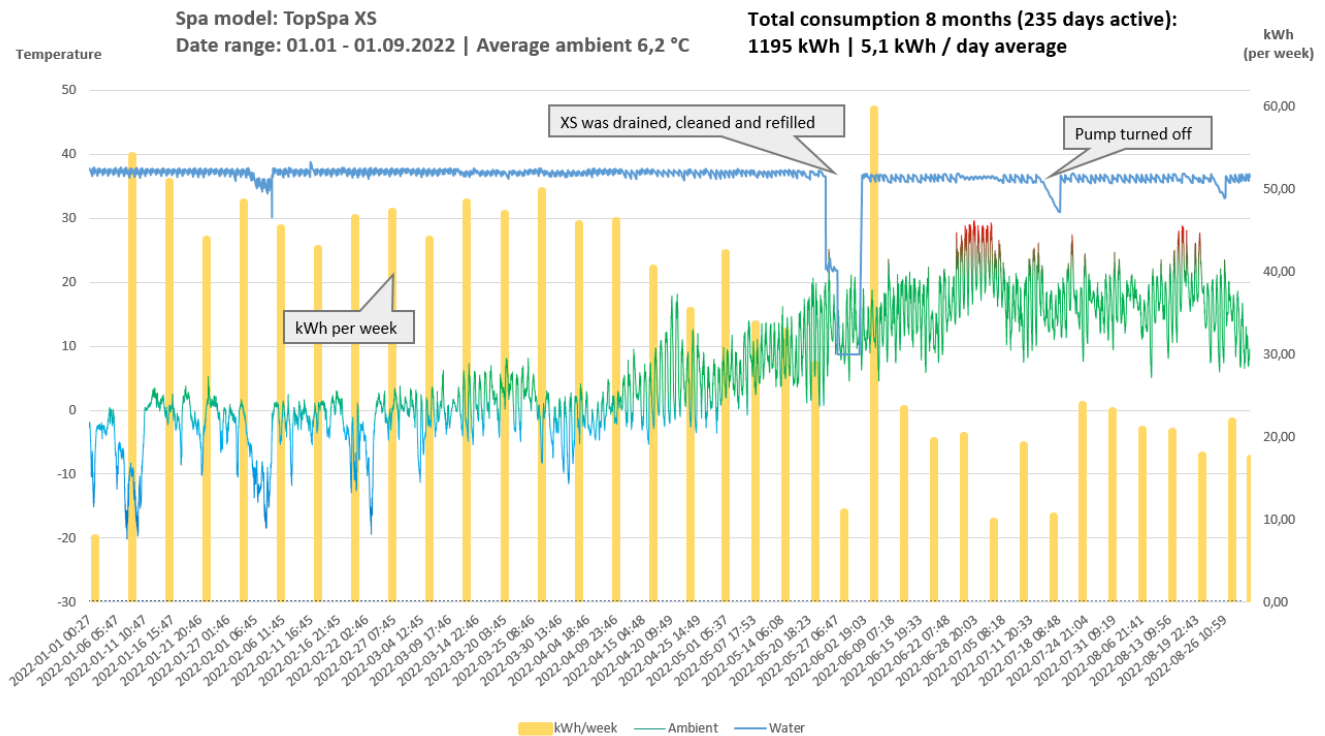


Consumption 8 months 01.01 – 01.09.2022

Total energy consumption 1195 kWh

Average consumption 5.1 kWh/day during the period

Average temperature outside 6.2 °C



Operating costs based on the above consumption (5.1 kWh/day)

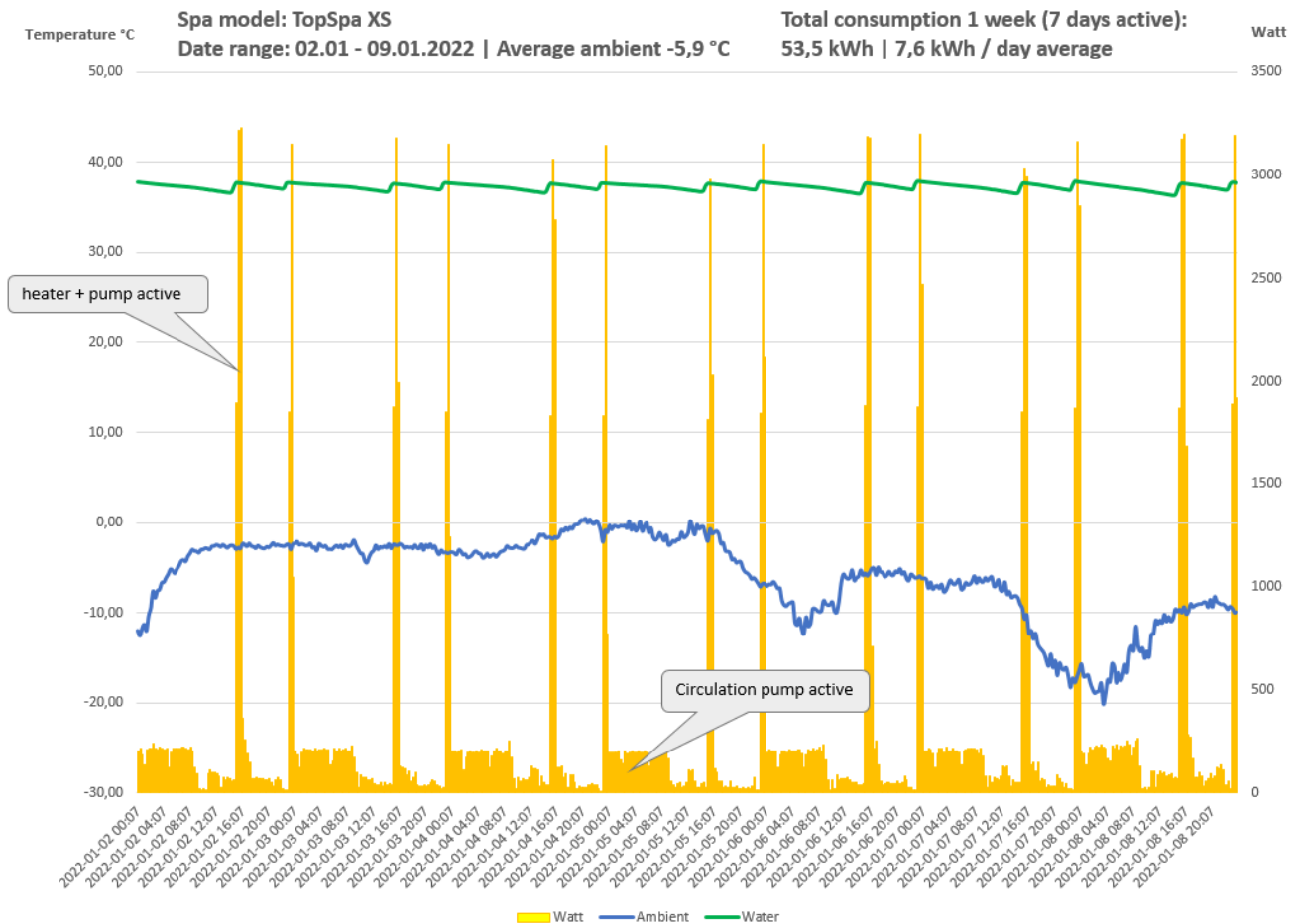
Electricity price / kWh	Day	Week	Month
0,10 €	0,51 €	3,57 €	15,81 €
0,20 €	1,02 €	7,14 €	31,62 €
0,30 €	1,53 €	10,71 €	47,43 €
0,40 €	2,04 €	14,28 €	63,24 €

Consumption winter week 02.01 – 09.01.2022

Total energy consumption 53.5 kWh

Average consumption 7.6 kWh/day during the week

Average outdoor temperature -5.9 °C



When the circulation pump (for filtration and heating) is running, around 230W of active power is used, when the water is heated (both heater and pump are active), the active power is just over 3000W.

Operating costs based on the above consumption (7.6 kWh/day)

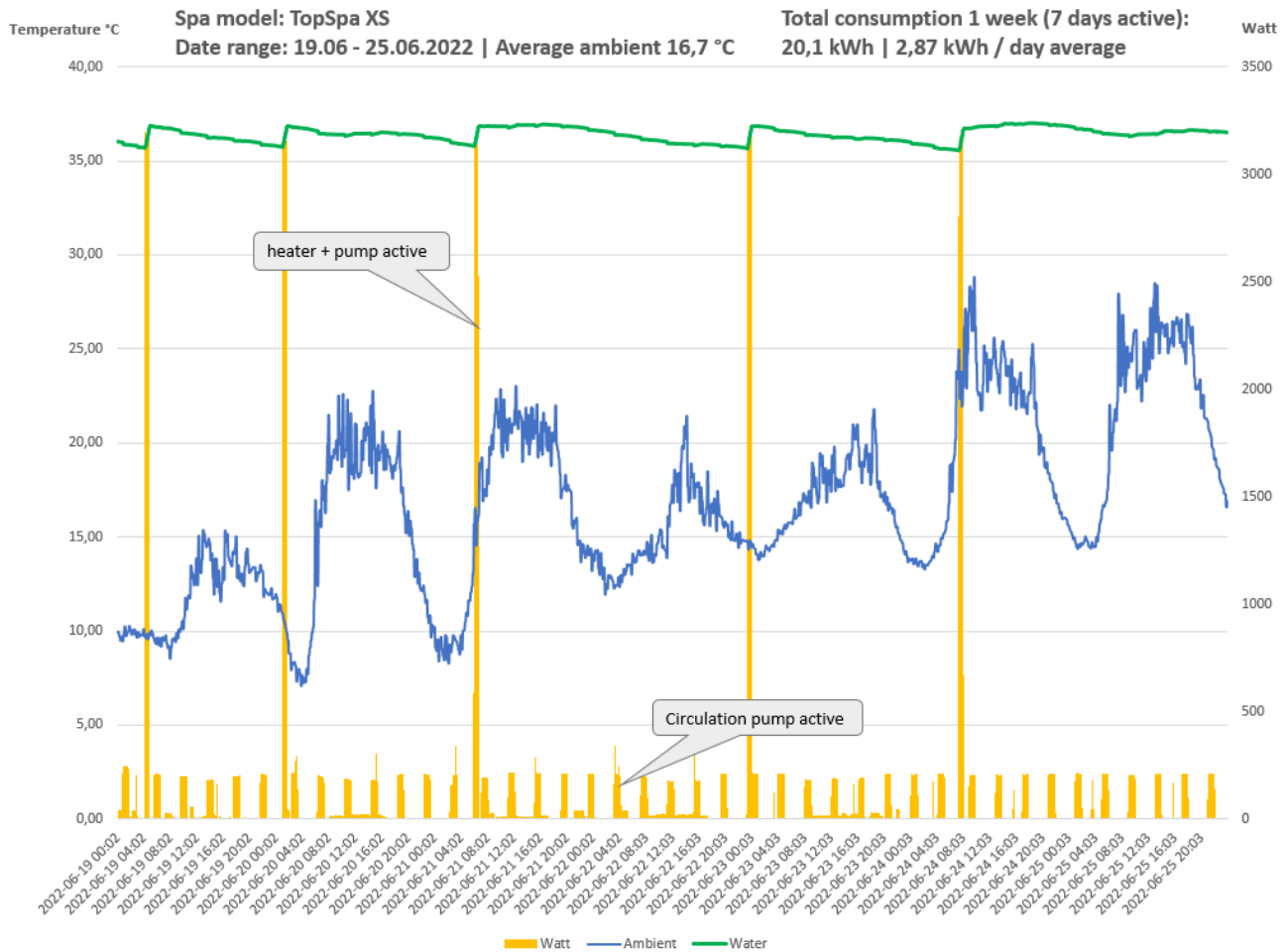
Electricity price / kWh	Day	Week	Month
0,10 €	0,76 €	5,32 €	23,56 €
0,20 €	1,52 €	10,64 €	47,12 €
0,30 €	2,28 €	15,96 €	69,75 €
0,40 €	3,04 €	21,28 €	94,24 €

Consumption summer week 19.06 – 25.06.2022

Total energy consumption 20.1 kWh

Average consumption 2.87 kWh/day during the week

Average temperature outside 16.7 °C



During the summer months, the heater does not need to start as often (during the test week 5 times) but the circulation pump and bubble system run according to the schedule to keep the water clean and moving.

Operating costs based on the above consumption (2.7 kWh/day)

Electricity price / kWh	Day	Week	Month
0,10 €	0,28 €	1,96 €	8,68 €
0,20 €	0,57 €	3,99 €	17,67 €
0,30 €	0,86 €	6,02 €	26,66 €
0,40 €	1,15 €	8,05 €	35,65 €

SUMMATION

The total consumption was 1195 kWh during the period 01.01 - 01.09-2022 for filtration and stand-by at 37 degrees, the cost was €120.

The winter week 02.01 – 09.01.2022 led to a cost of €5.50 for a consumption of 53.5 kWh

During the summer week 19.06 – 25.06.2022 with consumption 20.1 kWh the cost was €2

Here, costs for electricity transmission have not been taken into account and the average for electricity costs was 10 c/kWh during the test period.