

Heat Pump Performance

24 October 2025 00.00-09.00

Purpose.

This report has been produced to evidence the poor performance of the Mitsubishi Ecodan R290 10kW, PUZ-WZ100VAA, SN 5F00121 installed at 108 Shilton Road.

Method.

The method was to use the data available from a period of 00.00 to 09.00 on 24th October. This was chosen because it was the first available cold period following the installation of the heat pump. Overnight was chosen to minimise the impact of solar heating and activities by the occupants.

Conditions.

Conditions External Temp 7°C, Flow Temp 35°C, ΔT 3°C

The conditions were not unusual and are representative of autumnal weather.

The temperature distribution in the house is very good with less than 3°C change throughout.

The hot water cycle was run from 23.30 with a set temperature 55°C, this was achieved at 00.15 i.e. 45 minutes duration.

Data.

The data used is shown on the attached figures and is taken from the MelCloud App, the flow temperature controller panel and the Powervault Application. The data used for electricity consumption is from the Powervault application which has been in use for 20 months and is reliable. The allowance of 0.3kW for steady state consumption is based on data gathered over the 20 month installation period.

Outside temperature average 7°C, see Mitsubishi MelCloud Report Figure 1.

Flow Temperature see Mitsubishi MelCloud Report Figure 2,3,4,5,6,7,8,9 and 10.

Inside Temperature 20°C, see Figure 1

Flow rate 18 litres/min see Figure 11,12,13 and 14.

Power consumed 2.7kW, power for house 0.3 kW, power for heat pump 2.4kW, see Figure 15.

Analysis

Heat transferred

Flow rate $F=18$ litres/min

Temp difference $\Delta T=3^{\circ}\text{C}$

Heat transfer for 10% glycol and 90% water = 0.0633

Heat transferred = $F \cdot \Delta T \cdot 0.0633 = 18 \cdot 3 \cdot 0.0633 = 3.4\text{kW}$

Power consumed = 2.4kW

Coefficient of Performance = $3.4/2.4 = 1.4$

Conclusion

The performance of the heat pump, a COP of 1.4 at 7°C and a Flow Temp 35°C is unacceptably low and requires immediate rectification.

Appendix

Figure 1 Mitsubishi MelCloud Report Outside Temperature, Room Temperature and Water Temperature



Figure 2 Mitsubishi MelCloud Report Flow Temperature, Return Temperature and Water Temperature 00.00-01.00



Figure 3 Mitsubishi MelCloud Report Flow Temperature, Return Temperature and Water Temperature 01.00-02.00



Figure 4 Mitsubishi MelCloud Report Flow Temperature, Return Temperature and Water Temperature 02.00-03.00

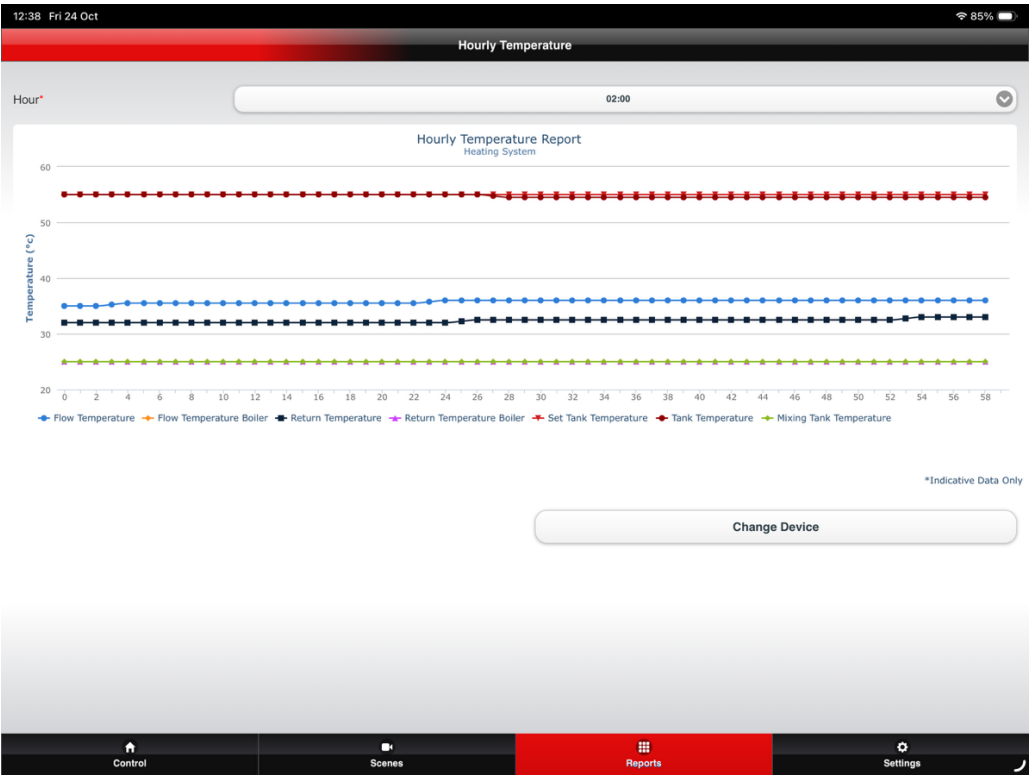


Figure 5 Mitsubishi MelCloud Report Flow Temperature, Return Temperature and Water Temperature 03.00-04.00

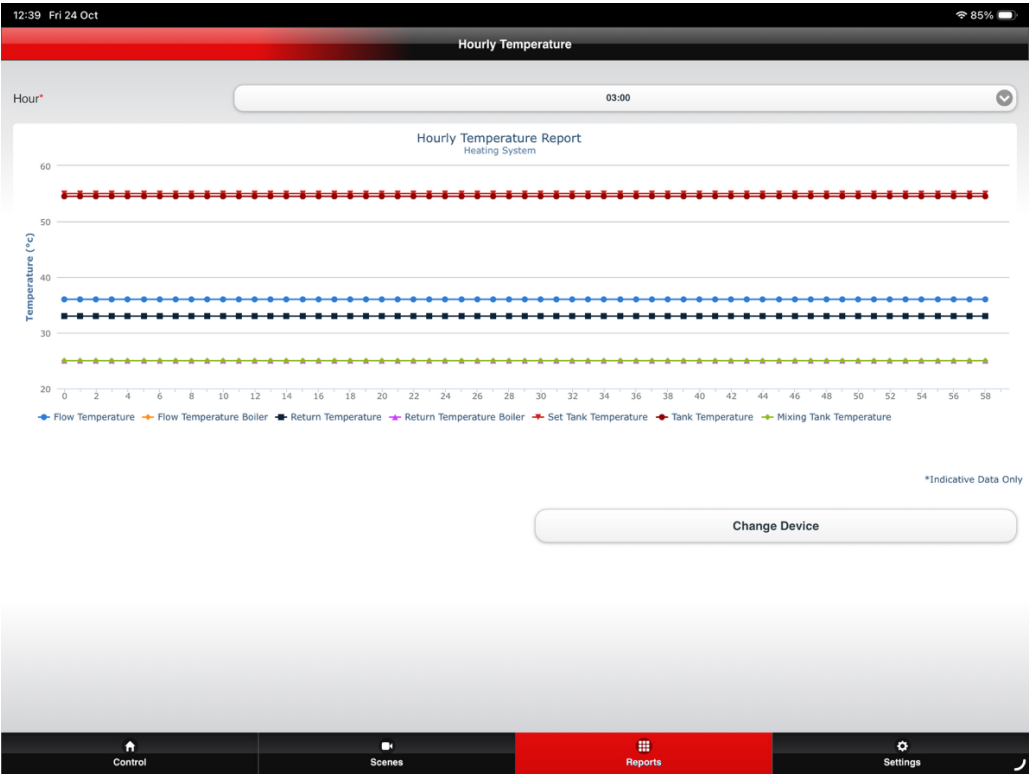


Figure 6 Mitsubishi MelCloud Report Flow Temperature, Return Temperature and Water Temperature 04.00-05.00

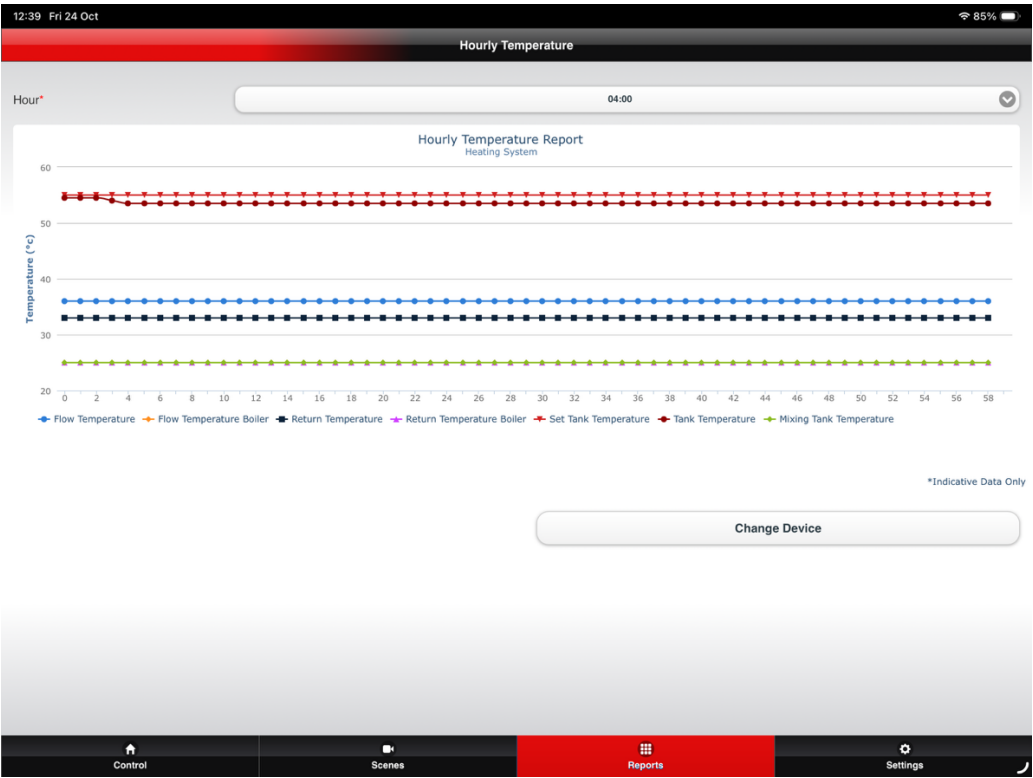


Figure 7 Mitsubishi MelCloud Report Flow Temperature, Return Temperature and Water Temperature 05.00-06.00

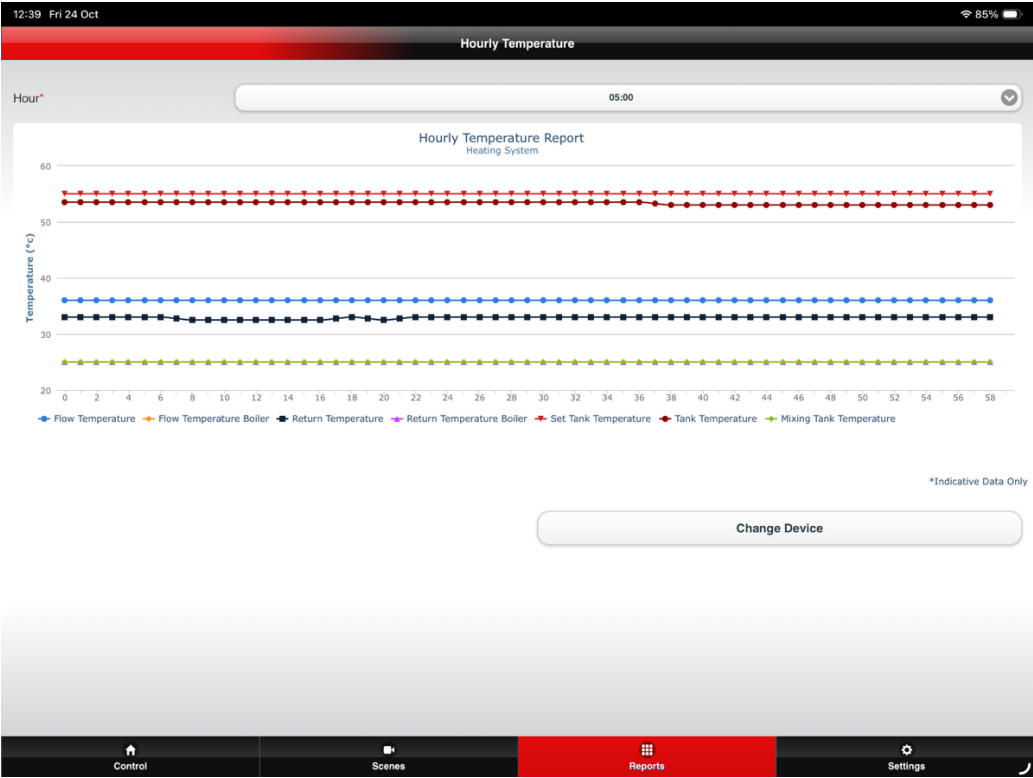


Figure 8 Mitsubishi MelCloud Report Flow Temperature, Return Temperature and Water Temperature 06.00-07.00

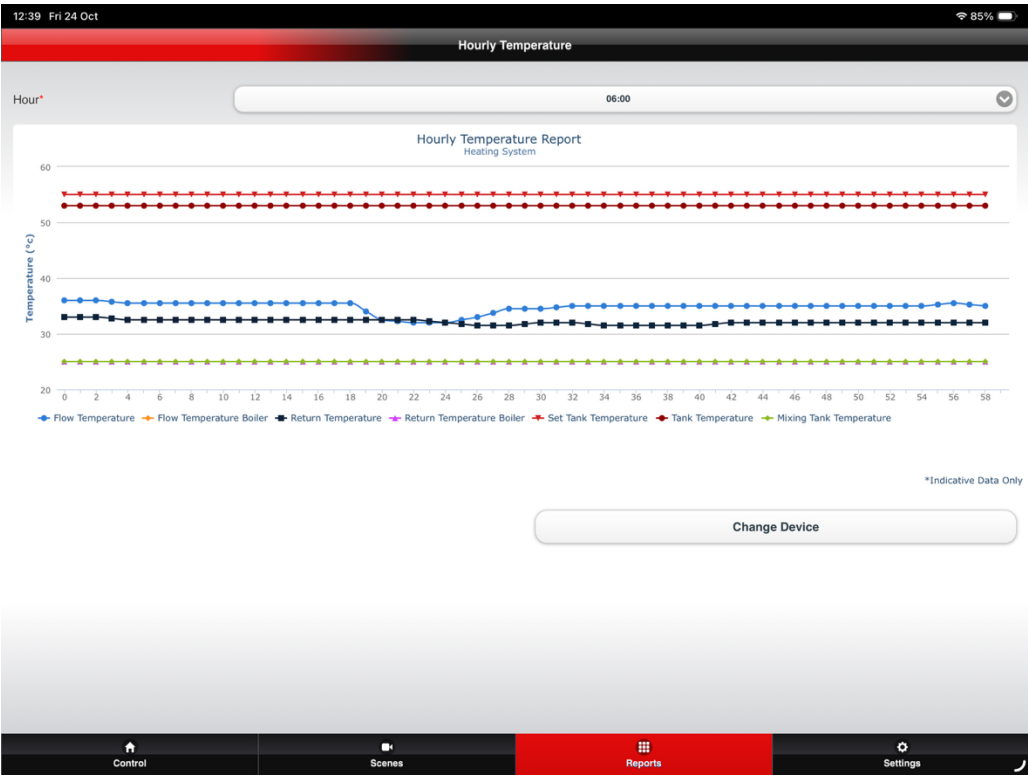


Figure 9 Mitsubishi MelCloud Report Flow Temperature, Return Temperature and Water Temperature 07.00-08.00

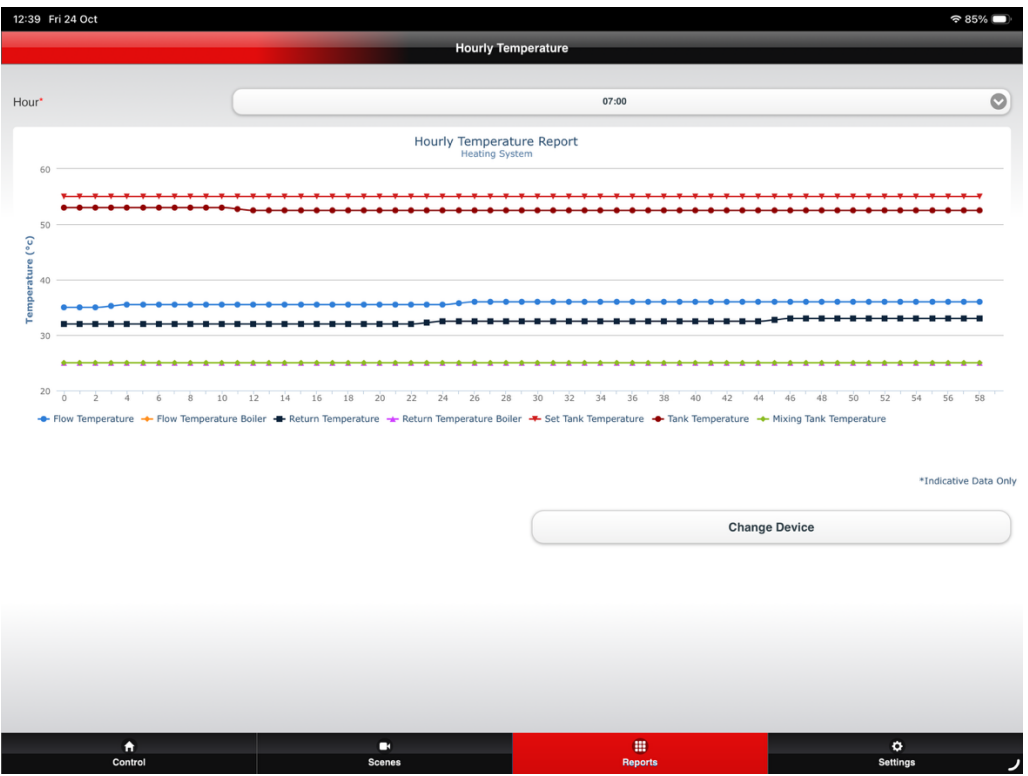


Figure 10 Mitsubishi MelCloud Report Flow Temperature, Return Temperature and Water Temperature 08.00-09.00

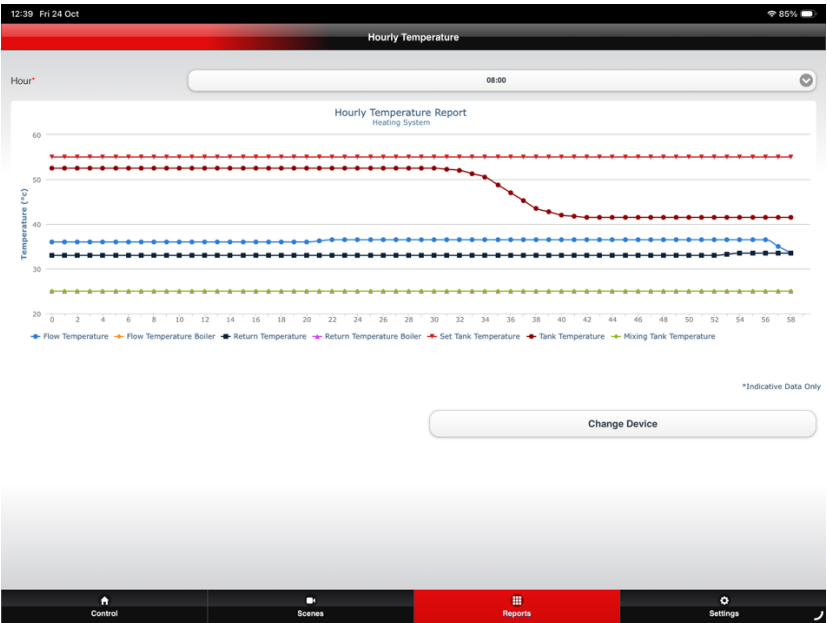


Figure 11 Flow Temp, Return Temp and Flow Rate 07.00-07.20

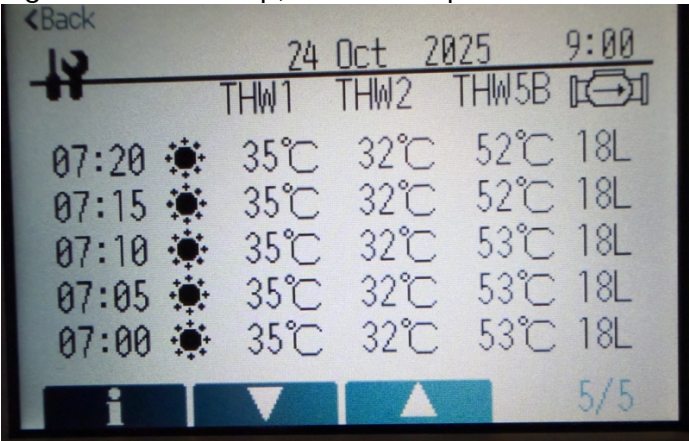


Figure 12 Flow Temp, Return Temp and Flow Rate 07.50-08.10

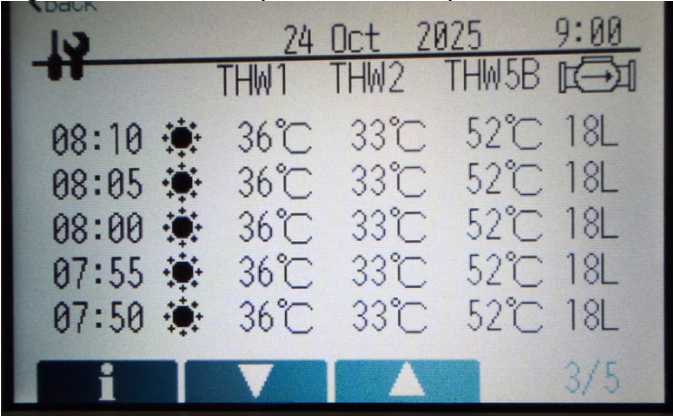


Figure 13 Flow Temp, Return Temp and Flow Rate 08.15-08.35

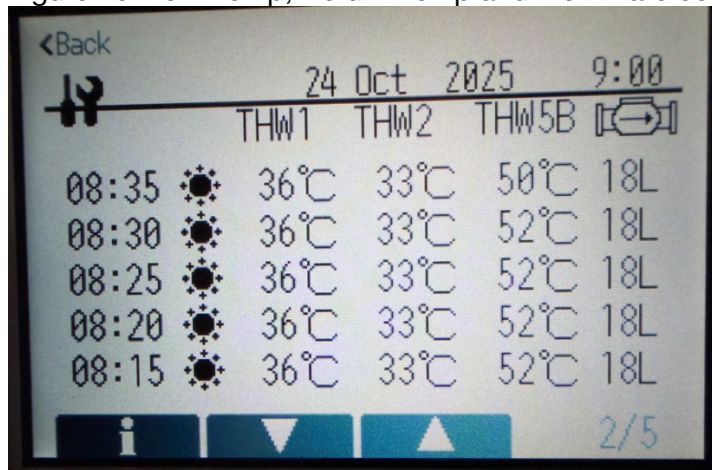


Figure 14 Flow Temp, Return Temp and Flow Rate 08.15-08.35

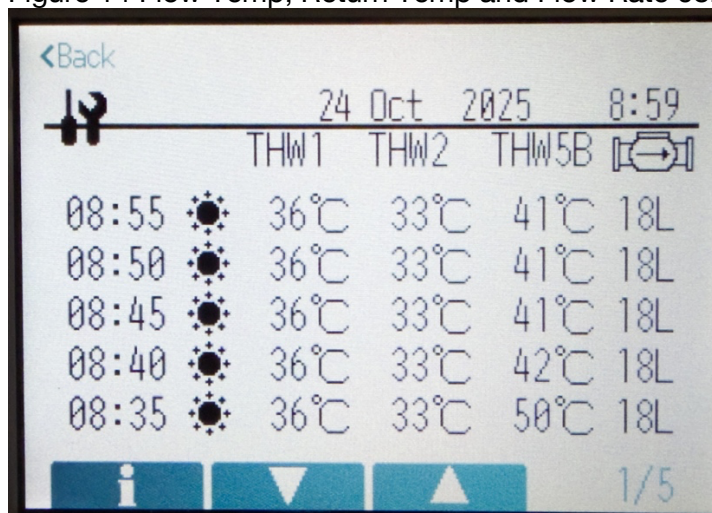
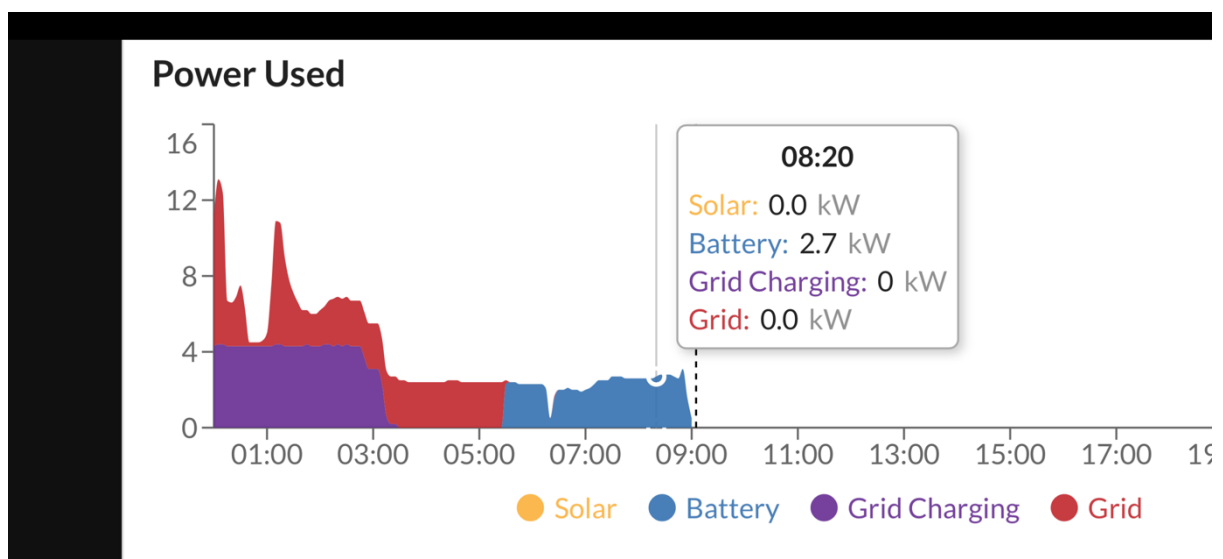


Figure 15 Energy Consumed 24 Oct 00.00-09.00



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