task_bln2sqhr55mlxrj3_with_calculation

Student Group

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Exercise E3 Conversion: Vacuum Cleaner

Your $18~{\rm V}$ vacuum cleaner is equipped with a $4.0~{\rm Ah}$ battery, it runs $15~{\rm minutes}$.
How much electrical power is consumed by the motor during this time on average?

Result

Solution

$$288~{\rm W}$$

$$\begin{aligned} W &= 18~{\rm V} \cdot 4.0~{\rm Ah} = 72~{\rm Wh} \\ \\ t &= 15~{\rm min} = 0.25~{\rm h} \\ \\ P &= {{W } \over {t }} \\ &= {{72~\rm Wh} \over {0.25~\rm h }} = 288~{\rm W} \end{aligned}$$