A reciprocating device operating at 6000 rpm is modeled as a cold-air-standard Otto cycle with a compression ratio of 8.5 and a displacement of 0.005 m³. Before the adiabatic compression, the air is at 120 kPa and 40°C. After the constant volume heat addition, the air is at 950°C. Use $c_v = 0.713 \text{ kJ/kg-K}$ and $c_p = 1.001 \text{ kJ/kg-K}$.

(a) Sketch the cycle on $P$-$v$ and $T$-$s$ diagrams.

(b) Find the heat transfer and work (per unit mass) for each process in kJ/kg.

(c) Find the net work (per unit mass) and the efficiency of the cycle.

(d) Find the power delivered by the device in kW.