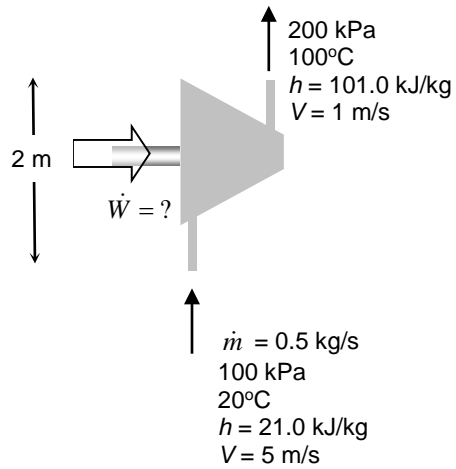## Example

0.5 kg/s of air flows steadily through a compressor. The air enters and exits the compressor at the states shown in the figure. If the compression is **adiabatic** (buzza buzza buzz) calculate the power input to the compressor.

200 kPa
100ºC
$h = 101.0$ kJ/kg
$V = 1$ m/s

2 m

$\dot{W} = ?$

$\dot{m} = 0.5$ kg/s
100 kPa
20ºC
$h = 21.0$ kJ/kg
$V = 5$ m/s

Example

0.3 kg of air is contained in a piston-cylinder assembly. Initially, the air is at 200 kPa and 20°C with a volume of V_1 = 0.126 m³. The air is then compressed in a process for which pV^2= constant until the pressure is 500 kPa.

(a) Sketch the p-V diagram and calculate the work (in kJ) into the piston cylinder.
(b) If the change in *specific* internal energy during the process is 121.0 kJ/kg, calculate the heat transfer (in kJ) into the piston cylinder during the process.