Problem 2

The walls of a cylinder of base 1 dm^2, the piston and the inner dividing wall are perfect heat insulators (*Fig. 10*). The valve in the dividing wall opens if the pressure on the right side is greater than on the left side. Initially there is 12 g helium in the left side and 2 g helium in the right side. The lengths of both sides are 11.2 dm each and the temperature is 0°C. Outside we have a pressure of 100 kPa. The specific heat at constant volume is $c_\mathrm{v} = 3.15$ J/gK, at constant pressure it is $c_\mathrm{p} = 5.25$ J/gK. The piston is pushed slowly towards the dividing wall. When the valve opens we stop then continue pushing slowly until the wall is reached. Find the work done on the piston by us.

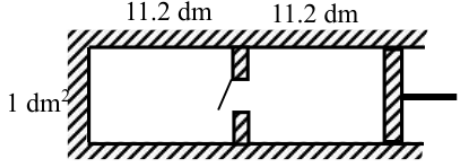


Figure 10