Calculations

State 1
$P_1 = 20\,kPa$
$T_1 = 60.1$
$h_1 = h_f @ 20kPa = 251\ kJ/kg$
$v_1 = v_f @ 20kPa = 0.00102\ m^3/kg$
$s_1 = 0.8320\ kJ/kg \cdot K$

$W_{pump\,1,in} = (0.00102)(140-20)$
$= 0.1224$

State 2
$P_2 = 140kPa$ $v_2 = 0.00105\ m^3/kg$
$T_2 = 109.3°C$ $s_2 = 7.2446\ kJ/kg \cdot K$
$h_2 = 458\ kJ/kg$

State 3
$P_3 = 620\,kPa$ $h_3 = 676\ kJ/kg$
$v_3 = 0.0011\ m^3/kg$
$T_3 = 160.1$

State 4
$P_4 = 620\,kPa$ $v_3 = v_4$ $h_4 = 676\ kJ/kg$

State 5
$W_{pump\,2,in} = (0.0011)(5000-620)$
$= 4.818$

$P_5 = 5000\,kPa$ $v_5 = 0.00117$ $s_5 = 5.973\ kJ/kg \cdot K$
$T_5 = 21$ $h_5 = 898\ kJ/kg$

State 6
$P_6 = 5000\,kPa$ $T_6 = 210.1°C$ $h_6 = 898\ kJ/kg$

State 7
$P_7 = 5000\,kPa$ $h_7 = 3900\ kJ/kg$
$T_7 = 700°C$ $s_7 = 7.514$

State 8
$P_8 = 1910\,kPa$ $T_8 = 210.1°C$ $v_8 = 0.00117$ $h_8 = 3515\ kJ/kg$
$s_8 = 7.514$

State 9
$P_9 = 620\,kPa$ $T_9 = 160.1°C$ $v_9 = 0.0011\ m^3/kg$ $h_9 = 3154\ kJ/kg$
$s_9 = 7.514$

State 10
$P_{10} = 140\,kPa$ $T_{10} = 109.3°C$ $v_{10} = 0.00105\ m^3/kg$
$h_{10} = 2799\ kJ/kg$ $s_{10} = 7.514$

State 11
$P_{11} = 20kPa$ $T_{11} = 60.1°C$ $v_{11} = 0.00102\ m^3/kg$ $h_{11} = 2478\ kJ/kg$
$s_{11} = 7.514$

State 14
$P_{14} = 140kPa$ $T_{14} = 109.3°C$ $v_{14} = 0.00105\ m^3/kg$ $h_{14} = 458\ kJ/kg$
$s_{14} = 7.907$

State 15
$P_{15} = 20\,kPa$ $T_{15} = 60.1°C$ $v_{15} = 0.00102\ m^3/kg$ $h_{15} = 251\ kJ/kg$
$s_{15} = 7.907\ kJ/kg \cdot K$