{Section 1}

{Given for Current System}
mdot_ref=62.99[g/s]
P=2403[W] {Power at typical operating conditions}
P_2=2420[kPa] {high-side operating temp}
T_4=5[C] {Evaporator temperature}

{Assumtions}
x_1=1
T_1=T_4
s_2s=s_1
P_3=P_2
P_2s=P_2
h_4=h_3
x_3=0 {Subcooled not saturated}

{Design Variables}
electricityPrice=0.1072[$/kWh]
opperatingHours=240[hr]
houseSize=830[ft^2]

{Solving}
h_1=**enthalpy**(***R410A***,***T***=T_1,***x***=x_1)
P=mdot_ref*(h_2-h_1)
s_1=**entropy**(***R410A***,***T***=T_1,***x***=x_1)
h_2s=**enthalpy**(***R410A***,***s***=s_2s,***P***=P_2s)
efficiency_isentropic=(h_2s-h_1)/(h_2-h_1)*100

h_3=**enthalpy**(***R410A***,***P***=P_3,***x***=x_3)
COP=(h_1-h_4)/(h_2-h_1)

cost_hour=P***convert**(W,kW)*electricityPrice
cost_month=cost_hour*opperatingHours

capacity=mdot_ref*(h_1-h_4)***convert**(kJ,J)/convert(kg,g)
capacity_required=houseSize*25***convert**(Btu/hr,W)

SOLUTION
Unit Settings: SI C kPa kJ mass deg

capacity = 9876 [W]	$capacity_{required}$ = 6081 [W]
COP = 4.11	$cost_{hour}$ = 0.2576 [$/hr]
$cost_{month}$ = 61.82 [$/month]	$efficiency_{isentropic}$ = 67.22 [%]
electricityPrice = 0.1072 [$/kWh]	houseSize = 830 [ft^2]
h_1 = 422.8 [kJ/kg]	h_2 = 461 [kJ/kg]
h_{2s} = 448.5 [kJ/kg]	h_3 = 266 [kJ/kg]
h_4 = 266 [kJ/kg]	$mdot_{ref}$ = 62.99 [g/s]
opperatingHours = 240 [hr]	P = 2403 [W]
P_2 = 2420 [kPa]	P_{2s} = 2420 [kPa]
P_3 = 2420 [kPa]	s_1 = 1.801 [kJ/kg-K]
s_{2s} = 1.801 [kJ/kg-K]	T_1 = 5 [C]
T_4 = 5 [C]	x_1 = 1
x_3 = 0	

3 potential unit problems were detected.

KEY VARIABLES
capacity = 9876 [W]
$efficiency_{isentropic}$ = 67.22 [%]

COP = 4.11