{Section 3c - CP22K8ME-PFV}

T_evap=5[C]
P_cond=2420[kPa]
electricityPrice=0.1072[$/kWh]
correctionFactor=0.75
superheat=15[C]
subcool=10[C]

{Assumptions}
T_1=T_evap
x_1=1.0
P_1=P_evap
P_4=P_cond
x_4=0.0
T_4=T_cond
P_2=P_1
T_2=T_1+superheat
s_3s=s_2
P_3s=P_4

{Solve}
P_1=**pressure**(***R410A***,***T***=T_1,***x***=x_1)
T_4=**temperature**(***R410A***,***P***=P_4,***x***=x_4)

capacity=(C[0]+(C[1]*T_1)+(C[2]*T_4)+(C[3]*T_1^2)+(C[4]*T_1*T_4)+(C[5]*T_4^2)+(C[6]* T_1^3)+(C[7]*T_4*T_1^2)+(C[8]* T_1*T_4^2)+(C[9]*T_4^3))***convert**(Btu/hr,w)*correctionFactor

power=W[0]+(W[1]*T_1)+(W[2]*T_4)+(W[3]*T_1^2)+(W[4]*T_1*T_4)+(W[5]*T_4^2)+(W[6]* T_1^3)+(W[7]*T_4*T_1^2)+(W[8]* T_1*T_4^2)+(W[9]*T_4^3)*correctionFactor

mdot=(M[0]+(M[1]*T_1)+(M[2]*T_4)+(M[3]*T_1^2)+(M[4]*T_1*T_4)+(M[5]*T_4^2)+(M[6]* T_1^3)+(M[7]*T_4*T_1^2)+(M[8]* T_1*T_4^2)+(M[9]*T_4^3))***convert**(lb_m/hr,g/s)*correctionFactor

COP=capacity/power

cost_month=power***convert**(W,kW)*electricityPrice*240

h_2=**enthalpy**(***R410A***,***P***=P_2,***T***=T_2)
s_2=**entropy**(***R410A***,***P***=P_2,***T***=T_2)
power=mdot*(h_3-h_2)
h_3s=**enthalpy**(***R410A***,***P***=P_3s,***s***=s_3s)
efficiency_isentropic=(h_3s-h_2)/(h_3-h_2)*100

{Coefficents}
C[0]=-3957.961381
C[1]=1213.724604
C[2]=256.6592867
C[3]=5.913531234
C[4]=-13.25473112
C[5]=-1.168179404
C[6]=0.01720849503
C[7]=-0.03324154833
C[8]=0.04853011721
C[9]=-0.00329759596

W[0]=2318.802413
W[1]=-34.26340731
W[2]=-25.18508254
W[3]=-0.4511599559
W[4]=0.8331550691
W[5]=0.1648776491
W[6]=-0.003695735428
W[7]=0.006614888271

W[8]=-0.004215340349
W[9]=-0.0001600304257

m[0]=104.5511514
m[1]=13.07182007
m[2]=-2.001541182
m[3]=0.03815445222
m[4]=-0.15083255
m[5]=0.04198394854
m[6]=0.000200298596
m[7]=-0.000111599993
m[8]=0.0006744688395
m[9]=-0.0002345065605

SOLUTION

Unit Settings: SI C kPa kJ mass deg

capacity = 1789 [W]
correctionFactor = 0.75
$\eta_{isentropic}$ = 20.88 [%]
h_2 = 439.3 [kJ/kg]
h_{3s} = 467.8 [kJ/kg]
power = 1525 [W]
P_2 = 933.2 [kPa]
P_4 = 2420 [kPa]
P_{evap} = 933.2 [kPa]
superheat = 15 [C]
s_{3s} = 1.859 [kJ/kg-K]
T_2 = 20 [C]
T_{cond} = 39.9 [C]
x_1 = 1

COP = 1.173
$cost_{month}$ = 39.23 [$/month]
electricityPrice = 0.1072 [$/kWh]
h_3 = 575.9 [kJ/kg]
mdot = 11.16 [g/s]
P_1 = 933.2 [kPa]
P_{3s} = 2420 [kPa]
P_{cond} = 2420 [kPa]
subcool = 10 [C]
s_2 = 1.859 [kJ/kg-K]
T_1 = 5 [C]
T_4 = 39.9 [C]
T_{evap} = 5 [C]
x_4 = 0

5 potential unit problems were detected.