{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]=9293.460431
C[1]=206.9141431
C[2]=163.3466375
C[3]=3.672799287
C[4]=1.957443702
C[5]=-2.358658254
C[6]=0.008241227732
C[7]=-0.01308792094
C[8]=-0.01510579503
C[9]=0.007534949734

W[0]=-11.64166785
W[1]=-14.20991885
W[2]=24.22068232
W[3]=-0.1159905293
W[4]=0.3229410557
W[5]=-0.2410616324
W[6]=-0.0001343056965
W[7]=0.001119644695

W[8]=-0.002063122392
W[9]=0.001503874012

m[0]=165.7200568
m[1]=2.653310094
m[2]=-0.8551055247
m[3]=0.03212726118
m[4]=0.002873563208
m[5]=0.008444636298
m[6]=7.57E-05
m[7]=-6.65E-05
m[8]=1.41E-05
m[9]=-4.06E-05

SOLUTION

Unit Settings: SI C kPa kJ mass deg

capacity = 3060 [W]
correctionFactor = 0.75
$efficiency_{isentropic}$ = 68.57 [%]
h_2 = 439.3 [kJ/kg]
h_{3s} = 467.8 [kJ/kg]
power = 617.8 [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 = 4.952
$cost_{month}$ = 15.9 [$/month]
electricityPrice = 0.1072 [$/kWh]
h_3 = 480.9 [kJ/kg]
mdot = 14.85 [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.