```
{Problem #5}

$UNITSYSTEM ENGLISH
P=14.696[psia]

{For Outdoor Air - ODA}
v_dot_oda=600[ft^3/min]
T_oda=80[F]
B_oda=70[F]
h_oda=enthalpy(AirH2O,P=P,T=T_oda,B=B_oda)
v_oda=volume(AirH2O,P=P,T=T_oda,B=B_oda)
R_oda=relhum(AirH2O,P=P,T=T_oda,B=B_oda)
HR_oda=humrat(AirH2O,P=P,T=T_oda,B=B_oda)
m_dot_oda=v_dot_oda/v_oda

{For Return Air - RA}
v_dot_ra=1200[ft^3/min]
T_ra=65[F]
B_ra=wetbulb(AirH2O,P=P,T=T_ra,R=R_ra)
h_ra=enthalpy(AirH2O,P=P,T=T_ra,R=R_ra)
v_ra=volume(AirH2O,P=P,T=T_ra,R=R_ra)
R_ra=0.30
HR_ra=humrat(AirH2O,P=P,T=T_ra,R=R_ra)
m_dot_ra=v_dot_ra/v_ra

{For Mixed Air - ma}
m_dot_ma=m_dot_oda+m_dot_ra
h_ma=(h_oda*m_dot_oda+h_ra*m_dot_ra)/m_dot_ma
HR_ma=((HR_oda*m_dot_oda+HR_ra*m_dot_ra)/m_dot_ma)
B_ma=wetbulb(AirH2O,P=P,h=h_ma,w=HR_ma)

{For Discharge Air - da}
T_da=50[F]
B_da=45[F]
h_da=enthalpy(AirH2O,P=P,T=T_da,B=B_da)
R_da=relhum(AirH2O,P=P,T=T_da,B=B_da)
HR_da=humrat(AirH2O,P=P,T=T_da,B=B_da)
m_dot_da=m_dot_ma

Q_dot_sens=m_dot_ma*(h_da-h_ma)/convert(min,hr)
Q_dot_latent=m_dot_ma*(h_ma-h_ra)/convert(min,hr)
m_dot_cond=m_dot_ma*(HR_oda-HR_ra)*convert(min,hr)
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SOLUTION

Unit Settings: Eng F psia mass deg

B_{da} = 45 [F]	B_{ma} = 57.08 [F]
B_{oda} = 70 [F]	B_{ra} = 49.37 [F]
HR_{da} = 0.005175	HR_{ma} = 0.00699
HR_{oda} = 0.01343	HR_{ra} = 0.003906
h_{da} = 17.59 [Btu/lb$_m$]	h_{ma} = 24.39 [Btu/lb$_m$]
h_{oda} = 33.91 [Btu/lb$_m$]	h_{ra} = 19.84 [Btu/lb$_m$]
$\dot{m}_{cond}$ = 0.02117 [lb$_m$-hr/min^2]	$\dot{m}_{da}$ = 133.3 [lb$_m$/min]
$\dot{m}_{ma}$ = 133.3 [lb$_m$/min]	$\dot{m}_{oda}$ = 43.17 [lb$_m$/min]
$\dot{m}_{ra}$ = 90.16 [lb$_m$/min]	P = 14.7 [psia]
$\dot{Q}_{latent}$ = 36442 [Btu/hr]	$\dot{Q}_{sens}$ = -54437 [Btu/hr]
R_{da} = 0.6808	R_{oda} = 0.6123
R_{ra} = 0.3	T_{da} = 50 [F]
T_{oda} = 80 [F]	T_{ra} = 65 [F]
$\dot{v}_{oda}$ = 600 [ft^3/min]	$\dot{v}_{ra}$ = 1200 [ft^3/min]

v_{oda} = 13.9 [ft^3/lb_m] v_{ra} = 13.31 [ft^3/lb_m]

No unit problems were detected.
EES suggested units (shown in purple) for B_ma B_ra h_da h_ma h_oda h_ra .