Tuesday, November 5, 2019 7:45 PM

#Task1

Weather Forecast Website example:

Umidità: Relative humidity, Atmospheric Pressure : Air total pressure (1 hPa: 0.1 kPa)

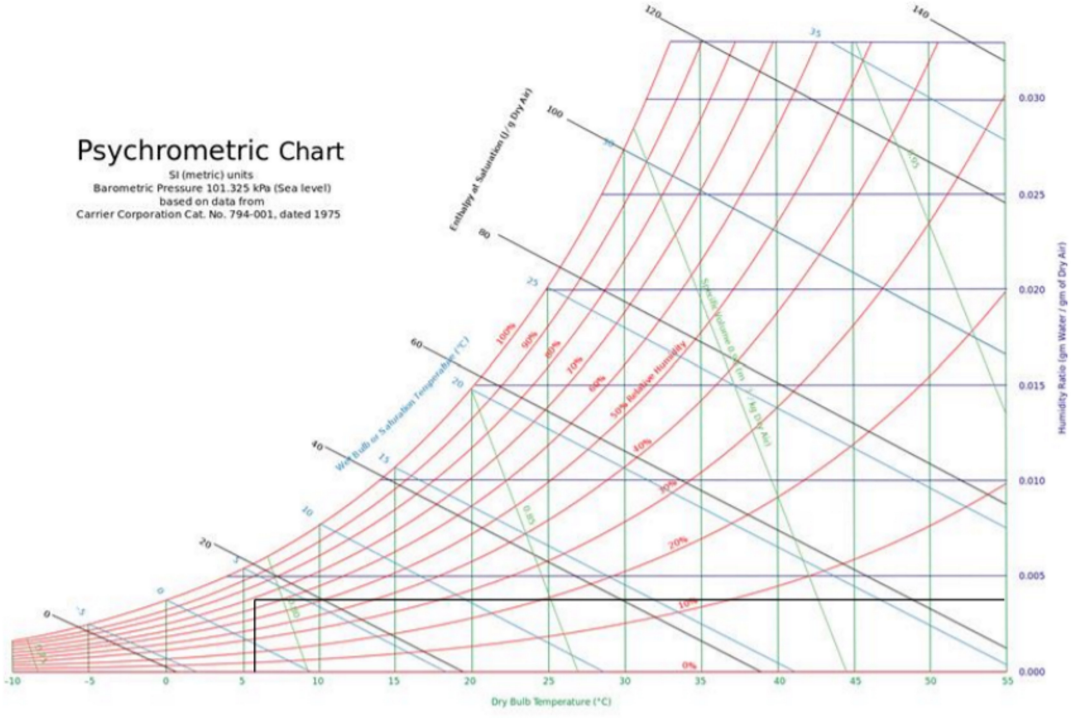
Effective temprature: temperature to be utilized.

Chosen time : 18:00

Relative humidity = 70%

Total air pressure = 1026hPa = 102.6kPa

Temperature =6°C



Absolute humidity =0.0041

$Pv = \frac{P*\omega}{0.622*\omega} = \frac{102.6*0.0041}{0.622+0.0041} = 0.67kPa$

$Mv = 0.67 * \frac{v}{0.4615*(273+6)}$ =5.2 *10-3 Kg*V

#Task2;

INTERNAL GAINS:

qig,s= 136 + 2.2Acf + 22Noc = 136 + 2.2 *200 + 22 * 2 = 620 W

qig,l = 20 + 0.22Acf + 12Noc = 20 + 0.22 * 200 + 12 * 2 = 88 W

INFILTRATION

Aul= 1.4 cm2/m2 Aes = Awall + Aroof = 200 + 144 = 344 m2

AL = Aes *Aul = 344 × 1.4 = 481.6 cm2

IDF heating = 0.073 L/s*cm2
IDF cooling = 0.033 L/s*cm2
Vi, heating= AL * IDF heating = 481.6*0.065= 31.30L/s
Vi ,cooling = AL * IDF cooling = 481.6 * 0.033=15.41L/s
Qv = 0.05Acf+ 3.5(N br+ 1) = 0.05 * 200 + 3.5 * (1 + 1) = 17 L/S
Qi–v, heating= Qi, heating+ Qv= 35.157 + 17 = 48.30 L/s
Qi–v, cooling= Qi, cooling+ Qv= 15.893 + 17 = 32.41 L/s
C sensible=1.23,
C latent=3010
ΔT cooling 31.1-24 7.1°C
ΔT heating 20-4.1 15.9°C
ωout 0.0143 Kgwater/KgDryAir
ωin 0.0093 Kgwater/KgDryAir
ωΔ 0.005 Kgwater/KgDryAir

$$\dot{Q}_{inf-ventilation_{cooling_{sensible}}} = C_{sensible}\dot{V}\Delta T_{Cooling} = 1.23 * 32.41 * 7.1 = 283.04\,W$$

$$\dot{Q}_{\mathrm{inf-ventilation_{cooling_{latent}}}} = C_{\mathrm{latent}}\dot{V}\Delta\omega_{\mathrm{Cooling}} = 3010 * 32.41 * 0.005 = 487.7\ \mathrm{W}$$

$$\dot{Q}_{\mathrm{inf-ventilation_{heatingg_{sensible}}}} = C_{\mathrm{sensible}}\dot{V}\Delta T_{\mathrm{heating}} = 1.23 * 48.3 * 15.9 = 944.6\ \mathrm{W}$$