

ABBREVIATIONS			
A	Area	lx	Lux
ACH	Air Changes per Hour	M	Mass
A_k	Effective Area	ma	Mixed Air
AVG	Average	m	Meters / Metres
BHP	Brake Horsepower	m^3/s	Volumetric Flow: Cubic Meters Per Second
BP	Brake Power	mbh	1000 Btu/hr
Btu	British Thermal Unit	NLA	No Load Amperage
Btu/hr or Btuh	British Thermal Unit Per Hour	NPSHA	Net Positive Suction Head Available
CL	Center Distance (used in belt formula)	oa	Outside Air
°C	Degrees Celsius	% _{oa}	% of Outside Air
C	Friction Loss Coefficient (For Duct Fittings)	Ω	Ohm
CCF	100 Cubic Foot	P	Pressure
CFM	Volumetric Flow: Cubic Feet Per Minute	P_a	Atmospheric Pressure
C_p	Specific Heat	P_{ab}	Absolute Pressure
C_v	Flow Constant (IP)	Pa	Pascals
ρ	Density	π	$\pi = 3.14$
d	Diameter	PD	Sheave Pitch Diameter
Δ	Difference or Change (Final - Initial)	P_t	Pressure at Pump Centerline
d_{imp}	Impeller Diameter	ppm	Parts Per Million
E	Volts	psi	Pounds Per Square Inch
Eff	Efficiency	psia	Pounds Per Square Inch Absolute
EP	Pump Efficiency	psig	Pounds Per Square Inch Gauge
°F	Degrees Fahrenheit	P_{vp}	Absolute Vapor Pressure
f	Friction Factor	Q (flow)	Volumetric Fluid Flow Rate
fc	foot-candle	Q (heat)	Heat Flow Rate
FLA	Full Load Amps	°R	Degrees Rankin
FPM	Feet Per Minute	r	Radius
ft	Foot	% _{ra}	% of Return Air
g	Acceleration of Gravity	R	Resistance
gal	Gallons	ra	Return Air
GPM	Gallons Per Minute	rad	Radians
h	Enthalpy	RH	Relative Humidity
H	Head	RPM	Revolutions Per Minute
Hg	Mercury	R_{value}	Thermal Resistance
h_{ma}	Mixed Air Enthalpy	s	Second
h_{oa}	Outside Air Enthalpy	SHR	Sensible Heat Ratio
HP	Horsepower	SME	Sash Movement Effect Performance Rating (SME-XX yyy)
hr	Hour	SP	Static Pressure
h_{ra}	Return Air Enthalpy	Sp Gr	Specific Gravity (for water use 1.00)
HT	Height	T	Temperature
in	Inch	T_a	Absolute Temperature ($460^\circ + T$) or °R
I	Amps	T_{ma}	Mixed Air Temperature
J	Joules	T_{oa}	Outside Air Temperature
K	Kelvin	TP	Total Pressure
K_v	Flow constant (SI)	T_{ra}	Return Air Temperature
kcal	kilocalorie	TS	Tip Speed
kg	Kilogram	U	Heat Transfer Coefficient
kJ	Kilojoule	μ	Viscosity, Dynamic
kPa	Kilopascal	V	Velocity
kW	Kilowatt	VP	Velocity Pressure
l	Liter (Litre)	W	Watt or J/s
l/s	Volumetric Flow: Liters Per Second	WD	Width
lb	Pounds	wg or wc	water gauge or water column
lm	Lumens	WHP	Water Horsepower
ln	natural log	WP	Water Power
LG	Length	ω	Humidity Ratio

EQUATIONS				
TOPIC	US Equation (IP)	US Unit (IP)	Metric Equation (SI)	Metric Unit (SI)
AIRFLOW & VELOCITY	$Q = V \times A$	CFM, ft ³ /min	$Q = V \times A$	m ³ /s
	Duct Fitting Loss = C × VP	in. wg	Duct Fitting Loss = C × VP	Pa
	TP _(in wg) = VP + SP	in. wg	TP _(Pa) = VP + SP	Pa
	$V_{(std\ air)} = 4005 \times \sqrt{VP}$	FPM, ft/min in. wg	$V_{(std\ air)} = \sqrt{(1.66 \times VP)}$	m/s, Pa
	$V = 1096 \times \sqrt{\left(\frac{VP}{\rho}\right)}$	in. wg	$V = 1.414 \times \sqrt{\left(\frac{VP}{\rho}\right)}$	Pa
	$ACH = \frac{Q \times 60}{(LG \times WD \times HT)}$	air changes/hr	$ACH = \frac{Q \times 3600}{(LG \times WD \times HT)}$	air changes/hr
	$Area_{Round} = \frac{\pi \times \left(\frac{d}{2}\right)^2}{144} = \frac{(\pi \times r^2)}{144}$	in ² , ft ²	$Area_{Round} = \pi \times \left(\frac{d}{2}\right)^2 = (\pi \times r^2)$	m ²
	$Area_{(square/rectangular)} = \frac{(HT \times WD)}{144}$	in ² , ft ²	$Area_{(square/rectangular)} = (HT \times WD)$	m ²
	$Area_{Oval} = \frac{\left(HT \times (WD - HT) + \left(\pi \times \left(\frac{HT}{2}\right)^2\right)\right)}{144}$	in ² , ft ²	$Area_{Oval} = \left(HT \times (WD - HT) + \left(\pi \times \left(\frac{HT}{2}\right)^2\right)\right)$	m ²
AIR TEMPERATURE	$^{\circ}F = (1.8 \times ^{\circ}C) + 32^{\circ}$	$^{\circ}F$	$^{\circ}C = (^{\circ}F - 32) \div 1.8$	$^{\circ}C$
	$^{\circ}R = (^{\circ}F + 460)$	$^{\circ}R$	$K = (^{\circ}C + 273)$	K
	$T_{ma} = (\%_{oa} \times T_{oa}) + (\%_{ra} \times T_{ra})$	$^{\circ}F, ^{\circ}R$	$T_{ma} = (\%_{oa} \times T_{oa}) + (\%_{ra} \times T_{ra})$	$^{\circ}C, K$
	$h_{ma} = (\%_{oa} \times h_{oa}) + (\%_{ra} \times h_{ra})$	Btu/lb _{dry air}	$h_{ma} = (\%_{oa} \times h_{oa}) + (\%_{ra} \times h_{ra})$	kJ/kg _{dry air}
	$\%_{oa} = \left(\frac{h_{ra} - h_{ma}}{h_{ra} - h_{oa}}\right) \times 100$	%	$\%_{oa} = \left(\frac{h_{ra} - h_{ma}}{h_{ra} - h_{oa}}\right) \times 100$	%
	$\%_{oa} = \left(\frac{T_{ra} - T_{ma}}{T_{ra} - T_{oa}}\right) \times 100$	%	$\%_{oa} = \left(\frac{T_{ra} - T_{ma}}{T_{ra} - T_{oa}}\right) \times 100$	%
HEAT TRANSFER (AIR)	$Q_{total} = 4.5 \times CFM \times \Delta h$ <small>(Standard Air)</small>	Btu/hr	$Q_{total} = 1.2 \times \frac{1}{s} \times \Delta h$ <small>(Standard Air)</small>	W
	$Q_{total} = 60 \times \rho \times CFM \times \Delta h$ <small>(Non-Standard Air)</small>	Btu/hr	$Q_{total} = \rho \times \frac{1}{s} \times \Delta h$ <small>(Non-Standard Air)</small>	W
	$Q_{sensible} = 1.08 \times CFM \times \Delta T_{air}$ <small>(Standard Air)</small>	Btu/hr	$Q_{sensible} = 1.23 \times \frac{1}{s} \times \Delta T_{air}$ <small>(Standard Air)</small>	W
	$Q_{sensible} = 60 \times Cp \times \rho \times CFM \times \Delta T_{air}$ <small>(Non-Standard Air)</small>	Btu/hr	$Q_{sensible} = Cp \times \rho \times \frac{1}{s} \times \Delta T_{air}$ <small>(Non-Standard Air)</small>	W
	$Q_{latent} = 0.69 \times CFM \times \Delta \omega_{gr\ of\ H_2O}$ <small>(Standard Air)</small>	Btu/hr	$Q_{latent} = 3.0 \times \frac{1}{s} \times \Delta \omega_{g\ H_2O}$ <small>(Standard Air)</small>	W
	$Q_{latent} = 4840 \times CFM \times \Delta \omega_{lb\ of\ H_2O}$ <small>(Standard Air)</small>	Btu/hr		

EQUATIONS				
TOPIC	US Equation (IP)	US Unit (IP)	Metric Equation (SI)	Metric Unit (SI)
HEAT TRANSFER (AIR)	$Q_{\text{latent}} = \frac{1073}{7000} \times 60 \times \rho \times \text{CFM} \times \Delta \omega_{\text{gr of H}_2\text{O}} \text{ lb dry air}$ <small>(Non-Standard Air)</small>	Btu/hr	$Q_{\text{latent}} = 2.5 \times \rho \times \frac{1}{s} \times \Delta \omega_{\text{g H}_2\text{O}} \text{ / kg dry air}$ <small>(Non-Standard Air)</small>	W
	$Q_{\text{latent}} = 1073 \times 60 \times \rho \times \text{CFM} \times \Delta \omega_{\text{lb of H}_2\text{O}} \text{ lb dry air}$ <small>(Non-Standard Air)</small>	Btu/hr		W
	$\text{SHR} = Q_{\text{sensible}} \div Q_{\text{total}}$	unitless	$\text{SHR} = Q_{\text{sensible}} \div Q_{\text{total}}$	unitless
	$Q_{\text{total}} = Q_{\text{latent}} + Q_{\text{sensible}}$	Btu/hr	$Q_{\text{total}} = Q_{\text{latent}} + Q_{\text{sensible}}$	W
	$Q_{\text{Btuh}} = A_{\text{ft}^2} \times U \times \Delta T \text{ (}^\circ\text{F)}$	Btu/hr	$Q_{\text{W}} = A_{\text{m}^2} \times U \times \Delta T \text{ (}^\circ\text{C)}$	W
FAN	$\frac{\text{CFM}_2}{\text{CFM}_1} = \frac{\text{RPM}_2}{\text{RPM}_1}$	ft ³ /min, rev/min	$\frac{1/s_2}{1/s_1} = \frac{\text{m}^3/s_2}{\text{m}^3/s_1} = \frac{\text{rad}/s_2}{\text{rad}/s_1}$	l/s, m ³ /s, rad/s
	$\frac{P_2}{P_1} = \left(\frac{\text{CFM}_2}{\text{CFM}_1} \right)^2$	in. wg, ft ³ /min	$\frac{P_2}{P_1} = \left(\frac{1/s_2}{1/s_1} \right)^2 = \left(\frac{\text{m}^3/s_2}{\text{m}^3/s_1} \right)^2$	Pa, l/s, m ³ /s
	$\frac{\text{BHP}_2}{\text{BHP}_1} = \left(\frac{\text{CFM}_2}{\text{CFM}_1} \right)^3$	HP	$\frac{\text{kW}_2}{\text{kW}_1} = \left(\frac{1/s_2}{1/s_1} \right)^3 = \left(\frac{\text{m}^3/s_2}{\text{m}^3/s_1} \right)^3$	kW, l/s, m ³ /s
	$\text{Tip Speed} = \text{TS} = \frac{(\pi \times d \times \text{rpm})}{12}$	FPM, ft/min	$\text{Tip Speed} = \text{TS} = \frac{(\pi \times d \times \text{rpm})}{60}$	m/s
SHEAVE	$\text{RPM}_{\text{fan}} = \left(\frac{\text{PD}_{\text{motor}}}{\text{PD}_{\text{fan}}} \right) \times \text{RPM}_{\text{motor}}$	rev/min, in	$\frac{\text{RPM}_{\text{fan}}}{\text{RPM}_{\text{motor}}} = \frac{\text{PD}_{\text{motor}}}{\text{PD}_{\text{fan}}}$	rev/min, mm
	$\text{Fan Belt Length} = (\text{CL} \times 2) + (1.57 \times (\text{PD}_{\text{large}} + \text{PD}_{\text{small}})) + \left(\frac{(\text{PD}_{\text{large}} - \text{PD}_{\text{small}})^2}{4 \times \text{CL}} \right)$			in (IP), mm (SI)
ELECTRICAL	$E = I \times \Omega$		Volts	
	$\Omega = E \div I$		Ohms	
POWER	$W = E \times I \text{ (1 phase)}$ $W = E \times I \times 1.732 \text{ (3 phase)}$	W	$\text{kW} = \frac{(E \times I)}{1000} \text{ (1 phase)}$ $\text{kW} = \frac{(E \times I \times 1.732)}{1000} \text{ (3 phase)}$	kW
	$\text{BHP}_{1 \text{ phase}} = \frac{(E \times I \times \text{PF} \times \text{Eff})}{746}$ <small>PF=Power Factor</small>	HP	$\text{kW}_{1 \text{ phase}} = \frac{(E \times I \times \text{PF} \times \text{Eff})}{1000}$ <small>PF=Power Factor</small>	kW
	$\text{BHP}_{3 \text{ phase}} = \frac{(E \times I \times \text{PF} \times \text{Eff} \times 1.732)}{746}$ <small>PF=Power Factor = 0.8 & Eff=0.9; if not given</small>	HP	$\text{kW}_{3 \text{ phase}} = \frac{(E \times I \times \text{PF} \times \text{Eff} \times 1.732)}{1000}$ <small>PF=Power Factor</small>	kW
	$\text{BHP} = \text{HP} \times \left(\frac{(I_{\text{actual}} - (\text{NLA} \times 0.5))}{(\text{FLA}_{\text{actual}} - (\text{NLA} \times 0.5))} \right)$	HP	$\text{BkW} = \text{kW} \times \left(\frac{(I_{\text{actual}} - (\text{NLA} \times 0.5))}{(\text{FLA}_{\text{actual}} - (\text{NLA} \times 0.5))} \right)$	kW
	$\text{FLA}_{\text{actual}} = \frac{(\text{FLA}_{\text{tag}} \times E_{\text{tag}})}{E_{\text{actual}}}$	Amps	$\text{FLA}_{\text{actual}} = \frac{(\text{FLA}_{\text{tag}} \times E_{\text{tag}})}{E_{\text{actual}}}$	Amps
	$\text{Fan HP} = \frac{(\text{CFM} \times \text{SP} \times \text{SpGr})}{(6356 \times \text{Eff})}$	HP	$\text{Fan kW} = \frac{(\text{m}^3/\text{s} \times \text{SP} \times \text{SpGr})}{(1000 \times \text{Eff})}$	kW
RESISTANCE	$\frac{1}{R_{\text{TotalParallel}}} = \frac{1}{R_1} + \frac{1}{R_2} + \dots + \frac{1}{R_n}$			Ohms
	$R_{\text{TotalSeries}} = R_1 + R_2 + R_3 + \dots + R_n$			Ohms

EQUATIONS				
TOPIC	US Equation (IP)	US Unit (IP)	Metric Equation (SI)	Metric Unit (SI)
RESISTANCE	$E_{\text{primary}} \times I_{\text{primary}} = E_{\text{secondary}} \times I_{\text{secondary}}$			Volts, Amps
	Voltage Drop = $I \times R_{\text{Total}}$			Volts
PUMP	$\frac{GPM_2}{GPM_1} = \frac{RPM_2}{RPM_1}$	gal/min, rev/min	$\frac{1/s_2}{1/s_1} = \frac{m^3/s_2}{m^3/s_1} = \frac{RPM_2}{RPM_1}$	l/s, m ³ /s, RPM
	$\frac{GPM_2}{GPM_1} = \frac{d_{\text{imp}2}}{d_{\text{imp}1}}$	gal/min, in	$\frac{1/s_2}{1/s_1} = \frac{m^3/s_2}{m^3/s_1} = \frac{d_{\text{imp}2}}{d_{\text{imp}1}}$	l/s, m ³ /s, mm
	$\frac{H_2}{H_1} = \left(\frac{GPM_2}{GPM_1}\right)^2$	in wc, ft wc, psi, gal/min	$\frac{H_2}{H_1} = \left(\frac{1/s_2}{1/s_1}\right)^2 = \left(\frac{RPM_2}{RPM_1}\right)^2$	kPa, l/s, RPM
	$\frac{BHP_2}{BHP_1} = \left(\frac{GPM_2}{GPM_1}\right)^3$	HP, gal/min	$\frac{BkW_2}{BkW_1} = \left(\frac{1/s_2}{1/s_1}\right)^3 = \left(\frac{RPM_2}{RPM_1}\right)^3$	BkW, L/s, RPM
	$WHP = \frac{(GPM \times H_{ft\ wc} \times SpGr)}{3960}$ <small>SpGr = 1.0, unless given, EP use 0.7 if not given</small>	HP	$WP_{kW} = 9.81 \times m^3/s \times H_m \times SpGr$ <small>SpGr = 1.0, unless given, EP use 0.7 if not given</small>	kW
	$BHP = \frac{(GPM \times H_{ft\ wc} \times SpGr)}{(3960 \times EP)}$	HP	$WP_W = \frac{(l/s \times H_{Pa} \times SpGr)}{1000}$ <small>SpGr = 1.0, unless given, EP use 0.7 if not given</small>	W
	$EP_{in\ \%} = \frac{(WHP \times 100)}{BHP}$	%	$BP = \frac{WP}{EP}$ <small>SpGr = 1.0, unless given, EP use 0.7 if not given</small>	kW
HYDRONIC	Coil $\Delta P: P_2 = P_1 \times \left(\frac{GPM_2}{GPM_1}\right)^2$	in wc, ft wc, psi	Coil $\Delta P: P_2 = P_1 \times \left(\frac{1/s_2}{1/s_1}\right)^2$	kPa, m wc
	$C_v = \frac{GPM \times \sqrt{SpGr}}{\sqrt{\Delta P_{\text{psi}}}}$	unitless	$K_v = \frac{m^3/h \times \sqrt{SpGr}}{\sqrt{\Delta P_{\text{Bar}}}}$	unitless
	$GPM = \frac{C_v \times \sqrt{\Delta P_{\text{psi}}}}{\sqrt{SpGr}}$	GPM, gal/min	$m^3/h = \frac{K_v \times \sqrt{\Delta P_{\text{Bar}}}}{\sqrt{SpGr}}$	m ³ /h
	$\Delta P_{\text{psi}} = SpGr \times \left(\frac{GPM}{C_v}\right)^2$ <small>SpGr = 1.0, unless given</small>	psi	$\Delta P_{\text{Bar}} = SpGr \times \left(\frac{m^3/h}{K_v}\right)^2$	bar
	$NPSHA = P_a \pm P_s + \left(\frac{V^2}{2g}\right) - P_{vp} - P_f$	ft wc	$NPSHA = P_a \pm P_s + \left(\frac{V^2}{2g}\right) - P_{vp} - P_f$	m
HEAT TRANSFER (HYDRONIC)	$Q_{Btu} = 500 \times GPM \times \Delta T_{\text{°F}}$ <small>(Standard Water)</small>	Btu/hr	$Q_{kW} = 4.190 \times l/s \times \Delta T_{\text{°C}}$ <small>(Standard Water)</small>	kW
	$Q_W = 4190 \times l/s \times \Delta T_{\text{°C}}$ <small>(Standard Water)</small>			W
	$Q_{Btu} = C_p \times 60 \times \rho \times GPM \times \Delta T_{\text{°F}}$ <small>(Non-Standard Water)</small>	Btu/hr	$Q_W = C_p \times \rho \times l/s \times \Delta T_{\text{°C}}$ <small>(Non-Standard Water)</small>	W
BOILER	Output Btu = Input Btu × %Eff	Btu	Output kW = Input kW × %Eff	kW
	Boiler Operating Cost = Fire Rate _{gal/hr} × hrs Burned × \$Cost/gal	\$	Boiler Operating Cost = Fire Rate _{l/hr} × hrs Burned × \$Cost/l	\$
	Fire Rate = $\frac{\text{Input Btu}}{\text{Fuel Btu}_{\text{gal/hr}}}$	gal/hr	Fire Rate = $\frac{\text{Input MJ}}{\text{Fuel MJ}_{\text{l/hr}}}$	l/hr

METRIC EQUIVALENTS		
Unit of	Metric Unit (SI)	Equivalent US Unit (IP)
acceleration	1 m/s ²	3.281 ft/sec ²
area	1 m ²	10.764 ft ²
area	1 mm ²	0.0016 in ²
energy	1 kcal	3.968 Btu/hr
energy	1 W	3.413 Btu/hr
energy	1 kW	3413 Btu/hr
length	1 m	3.281 ft
length	1 m	39.37 in
length	1 cm	0.39 in
length	1 mm	0.039 in
lighting intensity	1 lx	0.093 fc
lighting intensity	1 lm/m ²	0.0931 fc
mass	1 kg	2.2 lb
power (motor)	1 kW	1.34 HP
power (energy)	1 J/hr	0.000948 Btu/hr
pressure	1 Pa	0.004 in wg
pressure	1 kPa	0.145 psi
pressure	1 kPa	0.3345 ft wc
pressure	1 kPa	0.296 in Hg
velocity	1 m/s	196.9 fpm
velocity	1 m/s	3.28 fps
volume	1 m ³	35.31 ft ³
volumetric flow rate (air)	1 m ³ /s	2118.88 cfm
volumetric flow rate (air)	1 l/s	2.12 cfm
volumetric flow rate (air)	1 m ³ /hr	0.589 cfm
volumetric flow rate (water)	1 l/s	15.88 gpm
volumetric flow rate (water)	1 m ³ /s	15880 gpm

ENGINEERING CONSTANTS		
Definition	US Units (IP)	Metric Units (SI)
Atmospheric Pressure @ Sea Level	1 atm = 29.92 in Hg = 14.7 psi	101.325 kPa
Atmospheric Pressure @ Sea Level (coll)	1 bar = 14.5 psi = 29.53 in Hg	100 kPa
Heat of Evaporation	970 Btu/lb	2257 kJ/kg
Heat of Condensation	970 Btu/lb	2257 kJ/kg
Heat of Fusion	144 Btu/lb	335 kJ/kg
Mass (1 lb of moisture)	7000 grains	N/A
Density of Air (Std)	0.075 lb/ft ³	1.204 kg/m ³
Density of Water (Std)	62.4 lb/ft ³	1000 kg/m ³
Density of Water (Std)	8.33 lb/gal	1000 kg/m ³
Specific Heat (Cp) of dry air	0.24 Btu/(lb x °F) @ 68°F	1.005 kJ/(kg x K) @ 20°C
Specific Heat (Cp) ice	0.50 Btu/(lb x °F) @ 32°F	2.05 kJ/(kg x K) @ 0°C
Specific Heat (Cp) vapor	0.45 Btu/lb x °F @ 68°F	1.996 kJ/(kg x K) @ 20°C
Specific Heat (Cp) water	1.00 Btu/lb x °F @ 68°F	4.187 kJ/(kg x K) @ 20°C
Standard Temperature & Pressure (STP)	68°F at Sea Level (14.7 psi)	20°C at Sea Level (101.325 kPa)
Standard Temperature & Pressure (STP)	68°F at Sea Level (29.92 in. Hg)	20°C at Sea Level (101.325 kPa)
Ton of refrigeration	12,000 Btu/hr	3.516 kW
Ton of refrigeration (evaporator)	12,000 Btu/hr	3.516 kW
Ton of refrigeration (condenser)	15,000 Btu/hr	4.395 kW
Volume	1 CF = 7.49 gallons	N/A

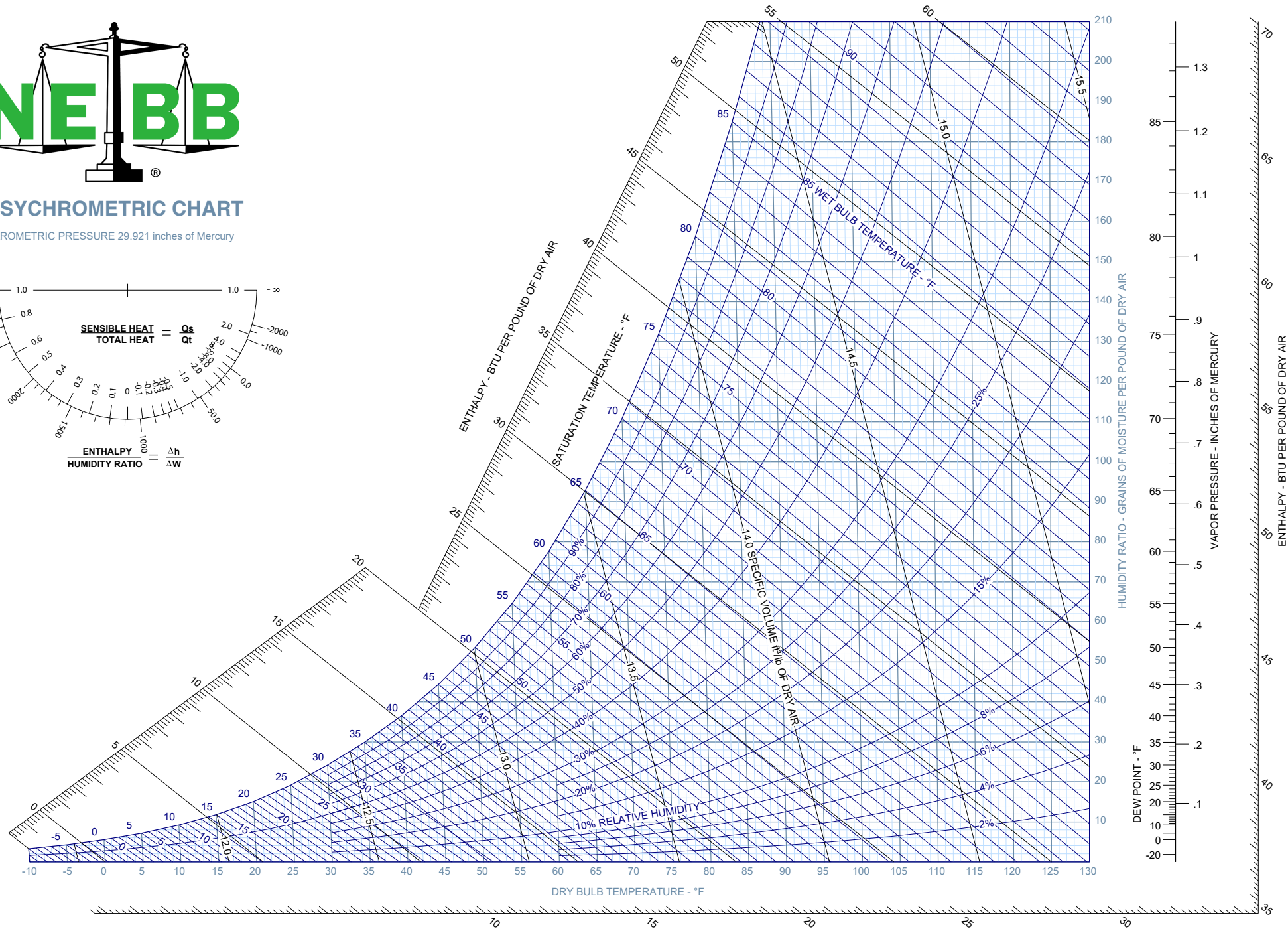
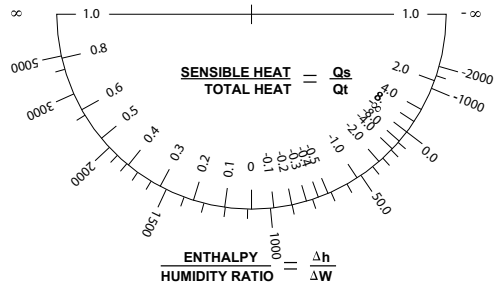
CONVERSIONS			
Unit of	To Convert	Into	Multiply by
energy	CCF	Btu	100,000
energy	mbh	Btu/hr	1,000
power	HP	Btu/hr	2545
power	HP	watts	746
pressure	ft. wc	psi	0.434
pressure	psi	ft. wc	2.31
pressure	psi	in. Hg	2.036

NEBB Fundamental Formulas



PSYCHROMETRIC CHART

BAROMETRIC PRESSURE 29.921 inches of Mercury



NEBB Fundamental Formulas

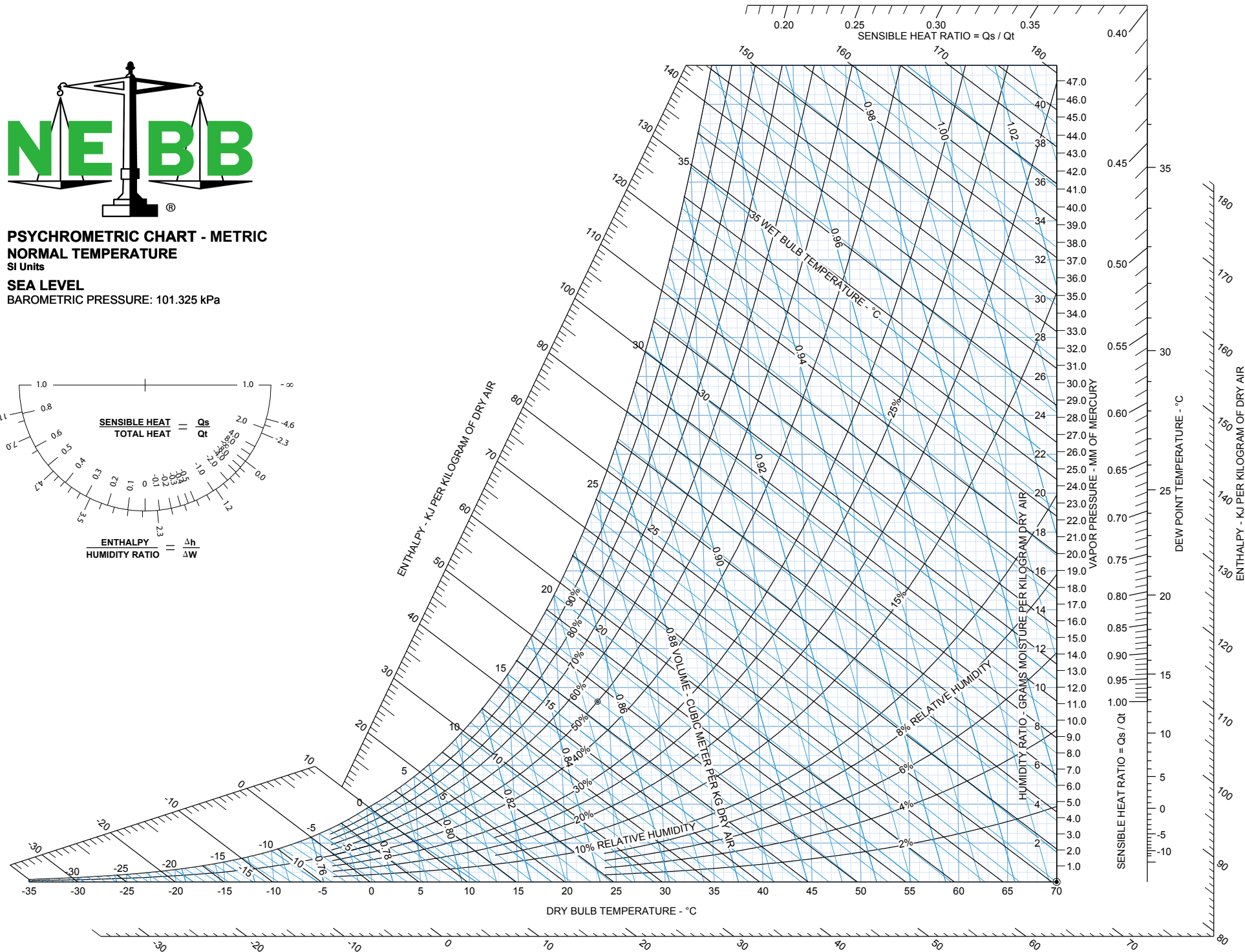
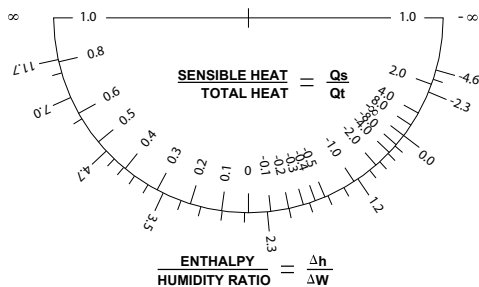


PSYCHROMETRIC CHART - METRIC NORMAL TEMPERATURE

SI Units

SEA LEVEL

BAROMETRIC PRESSURE: 101.325 kPa



Air Density Correction Factors (US Units) Standard Air Density (Sea Level & 70°F) = 0.075 lb/ft ³ @ 29.92 in Hg												
Altitude (ft)		Sea Level	1000	2000	3000	4000	5000	6000	7000	8000	9000	10000
Barometer (in Hg)		29.92	28.86	27.82	26.82	25.84	24.90	23.98	23.09	22.22	21.39	20.58
(in wg)		407.50	392.80	378.60	365.00	351.70	333.90	326.40	314.80	302.10	291.10	280.10
Air Temperature °F	-40°	1.26	1.22	1.17	1.13	1.09	1.05	1.01	0.97	0.93	0.90	0.87
	-0°	1.15	1.11	1.07	1.03	0.99	0.95	0.91	0.89	0.85	0.82	0.79
	40°	1.06	1.02	0.99	0.95	0.92	0.88	0.85	0.82	0.79	0.76	0.73
	70°	1.00	0.96	0.93	0.89	0.86	0.83	0.80	0.77	0.74	0.71	0.69
	100°	0.95	0.92	0.88	0.85	0.81	0.78	0.75	0.73	0.70	0.68	0.65
	150°	0.87	0.84	0.81	0.78	0.75	0.72	0.69	0.67	0.65	0.62	0.60
	200°	0.80	0.77	0.74	0.71	0.69	0.66	0.64	0.62	0.60	0.57	0.55
	250°	0.75	0.72	0.70	0.67	0.64	0.62	0.60	0.58	0.56	0.54	0.51
	300°	0.70	0.67	0.65	0.62	0.60	0.58	0.56	0.54	0.52	0.50	0.48
	350°	0.65	0.62	0.60	0.58	0.56	0.54	0.52	0.51	0.49	0.50	0.45
	400°	0.62	0.60	0.57	0.55	0.53	0.51	0.49	0.48	0.46	0.44	0.42
	450°	0.55	0.56	0.54	0.52	0.50	0.48	0.46	0.45	0.43	0.42	0.40
	500°	0.58	0.53	0.51	0.49	0.47	0.45	0.44	0.43	0.41	0.39	0.38
	550°	0.53	0.51	0.49	0.47	0.45	0.44	0.52	0.41	0.39	0.38	0.36
600°	0.50	0.48	0.46	0.45	0.43	0.41	0.40	0.39	0.37	0.35	0.34	
700°	0.46	0.44	0.43	0.41	0.39	0.38	0.37	0.35	0.34	0.33	0.32	
800°	0.42	0.40	0.39	0.37	0.36	0.35	0.33	0.32	0.31	0.30	0.29	
Water Temperature °F							60°	150°	200°	250°	300°	340°
Feet head differential per inch Hg differential							1.046	1.070	1.090	1.110	1.150	1.165

Air Density Correction Factors (Metric Units) Standard Air Density (Sea Level & 20°C) = 1.204 kg/m ³ @ 101.325 kPa												
Altitude (m)		Sea Level	250	500	750	1000	1250	1500	1750	2000	2500	3000
Barometer (kPa)		101.33	98.30	96.30	93.20	90.20	88.20	85.10	83.10	80.00	76.00	71.90
Air Temperature °C	0°	1.08	1.05	1.02	0.99	0.96	0.93	0.91	0.88	0.86	0.81	0.76
	20°	1.00	0.97	0.95	0.92	0.89	0.87	0.84	0.82	0.79	0.75	0.71
	50°	0.91	0.89	0.86	0.84	0.81	0.79	0.77	0.75	0.72	0.68	0.64
	75°	0.85	0.82	0.80	0.78	0.75	0.73	0.71	0.69	0.67	0.63	0.60
	100°	0.79	0.77	0.75	0.72	0.70	0.68	0.66	0.65	0.63	0.59	0.56
	125°	0.74	0.72	0.70	0.68	0.66	0.64	0.62	0.60	0.59	0.55	0.52
	150°	0.70	0.68	0.66	0.64	0.62	0.60	0.59	0.57	0.55	0.52	0.49
	175°	0.66	0.64	0.62	0.62	0.59	0.57	0.55	0.54	0.52	0.49	0.46
	200°	0.62	0.61	0.59	0.57	0.56	0.54	0.52	0.51	0.49	0.47	0.44
	225°	0.59	0.56	0.56	0.54	0.53	0.51	0.50	0.48	0.47	0.44	0.42
	250°	0.56	0.55	0.53	0.52	0.50	0.49	0.47	0.46	0.45	0.42	0.40
	275°	0.54	0.52	0.51	0.49	0.48	0.47	0.45	0.44	0.43	0.40	0.38
	300°	0.51	0.50	0.49	0.47	0.46	0.45	0.43	0.42	0.41	0.38	0.36
	325°	0.49	0.48	0.47	0.45	0.44	0.43	0.41	0.40	0.39	0.37	0.35
	350°	0.47	0.46	0.45	0.43	0.42	0.41	0.40	0.39	0.38	0.35	0.33
	375°	0.46	0.44	0.43	0.42	0.41	0.39	0.38	0.37	0.36	0.34	0.32
	400°	0.44	0.43	0.41	0.40	0.39	0.38	0.37	0.36	0.35	0.33	0.31
	450°	0.41	0.40	0.38	0.37	0.36	0.35	0.34	0.33	0.32	0.31	0.29
500°	0.38	0.37	0.36	0.35	0.34	0.33	0.32	0.31	0.30	0.28	0.27	
Water Temperature °C							15.5°	65.5°	93.2°	121°	148.7°	170.9°