$\frac{CFM_n}{CFM_o} = \frac{RPM_n}{RPM_o}$ o = old, n = new CFM and RPM are interchangeable. $CFM_n = CFM_o \times \frac{RPM_n}{RPM_o}$ $RPM_n = RPM_o \times \frac{CFM_n}{CFM_o}$

$\left(\frac{CFM_n}{CFM_o}\right)^2 = \frac{Sp_n}{Sp_o}$ OR $\frac{CFM_n}{CFM_o} = \sqrt{\frac{Sp_n}{Sp_o}}$ $CFM_n = CFM_o \times \sqrt{\frac{Sp_n}{Sp_o}}$ $Sp_n = Sp_o \times \left(\frac{CFM_n}{CFM_o}\right)^2$

$\left(\frac{CFM_n}{CFM_o}\right)^3 = \frac{BHP_n}{BHP_o}$ OR $\frac{CFM_n}{CFM_o} = \sqrt[3]{\frac{BHP_n}{BHP_o}}$ $CFM_n = CFM_o \times \sqrt[3]{\frac{BHP_n}{BHP_o}}$ $BHP_n = BHP_o \times \left(\frac{CFM_n}{CFM_o}\right)^3$

Hydronics: $\Delta P = Sp$, CFM = GPM, RPM = GPM

$MAT = (OAT \times \%OA) + (RAT \times \%RA)$

O = Outside
T = Temperature
R = Return
M = Mixed
A = Air

Btuh hydronic (H_2O only) = 500 × GPM × ΔT
Btuh sensible (at sea level) = 1.08 × CFM × ΔT
Btuh latent (at sea level) = 0.68 × CFM × ΔGrains
Btuh total (at sea level) = 4.5 × CFM × ΔEnthalpy

$CFM = \frac{AC/Hr \times Volume}{60\ min}$ $V = 4005 \times \sqrt{Vp}$ $Vp = \left(\frac{V}{4005}\right)^2$

Pressure (PSI) = 0.433 × Head (feet of water)

1 IWC = 0.0360 PSI
1 PSI = 27.72 IWC

Pressure 1 × Volume 1 = Pressure 2 × Volume 2

$Rectangular\ Duct\ Area\ (ft^2) = \frac{Length \times Width}{144}$

$Area = \pi \times radius^2$

$Round\ Duct\ Area\ (ft^2) = \frac{\pi \times diameter^2}{576}$

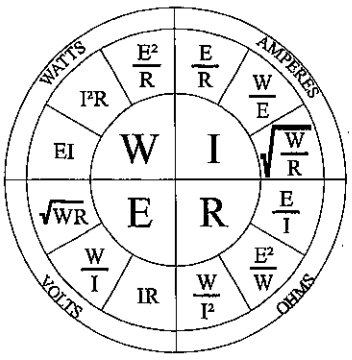
$A^2 + B^2 = C^2$

$Diameter = \frac{Circumference}{\pi}$

$CFM = Ak \times Velocity\ (fpm)$

$FR = \frac{ASP \times 100}{TEL}$ *(IWC/100)*

$CFM = Velocity\ (fpm) \times Duct\ Area\ (ft^2)$



$mfd = \frac{(2650 \times I)}{E}$

$CFM = \frac{(Watts \times 3.413)}{(\Delta T \times 1.08)}$

$C_T\ (Series) = \frac{1}{\frac{1}{C_1} + \frac{1}{C_2} + \ldots + \frac{1}{C_N}}$

$C_T\ (Parallel) = C_1 + C_2 + \ldots + C_N$

TEMPERATURE PRESSURE CHART – at sea level

Pressure (PSIG), Vacuum (in. Of Hg) – Bold Italic Figures

TEMP.		REFRIGERANT						
°F	°C	22	134a	404A	407C	410A	422D	507
-40	-40.0	0.6	***14.8***	4.3	***4.6***	10.7	***2.3***	5.4
-38	-38.9	1.4	***13.9***	5.3	***3.2***	12.0	***0.8***	6.4
-36	-37.8	2.2	***13.0***	6.3	***1.6***	13.4	0.4	7.5
-34	-36.7	3.1	***12.0***	7.4	0.0	14.8	1.2	8.6
-32	-35.6	4.0	***10.9***	8.5	0.8	16.2	2.1	9.8
-30	-34.4	4.9	***9.8***	9.6	1.6	17.8	3.0	11.0
-28	-33.3	5.9	***8.7***	10.8	2.5	19.3	3.9	12.2
-26	-32.2	6.9	***7.5***	12.0	3.5	21.0	4.9	13.5
-24	-31.1	8.0	***6.3***	13.3	4.4	22.7	5.9	14.8
-22	-30.0	9.1	***5.0***	14.6	5.4	24.4	7.0	16.2
-20	-28.9	10.2	***3.7***	16.0	6.5	26.3	8.1	17.6
-18	-27.8	11.4	***2.3***	17.4	7.6	28.1	9.2	19.1
-16	-26.7	12.6	***0.8***	18.9	8.7	30.1	10.4	20.6
-14	-25.6	13.9	0.4	20.4	9.9	32.1	11.7	22.2
-12	-24.4	15.2	1.1	22.0	11.1	34.2	12.9	23.8
-10	-23.3	16.5	1.9	23.6	12.3	36.4	14.3	25.5
-8	-22.2	17.9	2.8	25.3	13.7	38.6	15.6	27.3
-6	-21.1	19.4	3.6	27.0	15.0	40.9	17.1	29.1
-4	-20.0	20.9	4.6	28.8	16.4	43.3	18.5	30.9
-2	-18.9	22.4	5.5	30.7	17.9	45.8	20.1	32.8
0	-17.8	24.0	6.5	32.6	19.4	48.3	21.6	34.8
1	-17.2	24.9	7.0	33.6	20.2	49.6	22.5	35.8
2	-16.7	25.7	7.5	34.6	21.0	51.0	23.3	36.9
3	-16.1	26.5	8.0	35.6	21.8	52.3	24.1	37.9
4	-15.6	27.4	8.5	36.6	22.6	53.7	25.0	39.0
5	-15.0	28.3	9.1	37.7	23.5	55.0	25.8	40.0
6	-14.4	29.2	9.6	38.7	24.3	56.5	26.7	41.1
7	-13.9	30.1	10.2	39.8	25.2	57.9	27.6	42.2
8	-13.3	31.0	10.8	40.9	26.1	59.3	28.5	43.4
9	-12.8	31.9	11.3	42.0	27.0	60.8	29.5	44.5
10	-12.2	32.8	11.9	43.1	27.9	62.3	30.4	45.7
11	-11.7	33.8	12.5	44.3	28.8	63.8	31.3	46.8
12	-11.1	34.8	13.1	45.4	29.8	65.4	32.3	48.0
13	-10.6	35.8	13.8	46.6	30.7	66.9	33.3	49.3
14	-10.0	36.8	14.4	47.8	31.7	68.5	34.3	50.5
15	-9.4	37.8	15.0	49.0	32.7	70.1	35.3	51.7
16	-8.9	38.8	15.7	50.2	33.7	71.7	36.4	53.0
17	-8.3	39.9	16.4	51.5	34.7	73.4	37.4	54.3
18	-7.8	40.9	17.0	52.7	35.7	75.1	38.5	55.6
19	-7.2	42.0	17.7	54.0	36.8	76.8	39.6	56.9
20	-6.7	43.1	18.4	55.3	37.9	78.5	40.7	58.2
21	-6.1	44.2	19.1	56.6	39.0	80.3	41.8	59.6
22	-5.6	45.3	19.9	58.0	40.1	82.0	42.9	61.0
23	-5.0	46.5	20.6	59.3	41.2	83.8	44.1	62.4
24	-4.4	47.6	21.3	60.7	42.3	85.7	45.2	63.8
25	-3.9	48.8	22.1	62.1	43.5	87.5	46.4	65.2
26	-3.3	50.0	22.9	63.5	44.7	89.4	47.6	66.7
27	-2.8	51.2	23.7	64.9	45.9	91.3	48.8	68.2
28	-2.2	52.4	24.5	66.4	47.1	93.2	50.1	69.7
29	-1.7	53.7	25.3	67.8	48.3	95.2	51.3	71.2
30	-1.1	55.0	26.1	69.3	49.6	97.2	52.6	72.7
31	-0.6	56.2	26.9	70.8	50.8	99.2	53.9	74.3

TEMP.		REFRIGERANT						
°F	°C	22	134a	404A	407C	410A	422D	507
32	0.0	57.5	27.8	72.4	52.1	101.2	55.2	75.8
33	0.6	58.8	28.6	73.9	53.4	103.3	56.5	77.4
34	1.1	60.2	29.5	75.5	54.8	105.4	57.9	79.0
35	1.7	61.5	30.4	77.1	56.1	107.5	59.3	80.7
36	2.2	62.9	31.3	78.7	57.5	109.7	60.6	82.3
37	2.8	64.3	32.2	80.3	58.9	111.9	62.0	84.0
38	3.3	65.7	33.1	82.0	60.3	114.1	63.5	85.7
39	3.9	67.1	34.1	83.7	61.7	116.3	64.9	87.5
40	4.4	68.6	35.0	85.4	63.2	118.6	66.4	89.2
42	5.6	71.5	37.0	88.8	66.1	123.2	69.4	92.8
44	6.7	74.5	39.0	92.4	69.2	127.9	72.5	96.4
46	7.8	77.6	41.1	96.0	72.3	132.8	75.6	100.2
48	8.9	80.8	43.2	99.8	75.5	137.8	78.9	104.0
50	10.0	84.1	45.4	103.6	78.8	142.9	82.2	108.0
52	11.1	87.4	47.7			148.1		112.0
54	12.2	90.8	50.0			153.5		116.1
56	13.3	94.4	52.4			159.0		120.4
58	14.4	98.0	54.9			164.7		124.7
60	15.6	101.6	57.4			170.4		129.1
62	16.7	105.4	60.0			176.3		133.7
64	17.8	109.3	62.7			182.4		138.3
66	18.9	113.2	65.4			188.6		143.1
68	20.0	117.3	68.2			194.9		147.9
70	21.1	121.4	71.1			201.4		152.9
72	22.2	125.7	74.1			208.0		158.0
74	23.3	130.0	77.1			214.8		163.2
76	24.4	134.5	80.2			221.8		168.5
78	25.6	139.0	83.4			228.9		174.0
80	26.7	143.6	86.7			236.1		179.5
82	27.8	148.4	90.0			243.6		185.2
84	28.9	153.2	93.5			251.2		191.0
86	30.0	158.2	97.0			258.9		197.0
88	31.1	163.2	100.6			266.8		203.0
90	32.2	168.4	104.3			274.9		209.2
92	33.3	173.7	108.1			283.2		215.5
94	34.4	179.1	112.0			291.6		222.0
96	35.6	184.6	115.9			300.3		228.6
98	36.7	190.2	120.0			309.1		235.3
100	37.8	195.9	124.2			318.1		242.2
102	38.9	201.8	128.4			327.2		249.2
104	40.0	207.7	132.7			336.6		256.3
106	41.1	213.8	137.2			346.2		263.7
108	42.2	220.0	141.7			355.9		271.1
110	43.3	226.4	146.4			365.9		278.7
112	44.4	232.8	151.1			376.1		286.5
114	45.6	239.4	156.0			386.4		294.4
116	46.7	246.1	160.9			397.0		302.4
118	47.8	253.0	166.0			407.8		310.7
120	48.9	260.0	171.2			418.8		319.1
125	51.7	278.0	184.6			447.4		340.8
130	54.4	296.9	198.7			477.4		363.6

To determine superheat for 404A, 407C, and 422D, use DEW POINT values (50°F and below).

To determine subcooling, use BUBBLE POINT values (above 50°F - gray background).