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v.3.11

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QuickCalcs-HVAC (FREE Version)

User Guide & Disclaimer

Calculation Spreadsheets

Feet & Inches (Math)	Mixed Air Temperature	GPM Calculations
Percentage (Common)	Mixed Water Temperature	Water Volume Inside Pipe
Percentage (Individual)	Ductwork Calculations	Airflow Calculations
Percentage (Engr./Arch.)	Louver Sizing	Fan Motor HP
Interpolation	Fan Laws	Electrical: Ohm's Law
Unit Conversions	Pump Laws	Piping Cost Estimate
Cooling & Heating Loads	100% Outside Air Unit	Chiller (Electric)

This is a FREE Version where some calculations have been disabled and sheets can not be printed.
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We can create custom calculation spreadsheets for you.
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This pdf file contains screenshots of our QuickCalcs-HVAC.xlsm calculation spreadsheets.

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Mix Air Temperature

$$T_{A+B} = T_A + \left[\left(\frac{V_B}{V_A + V_B} \right) \times (T_B - T_A) \right]$$

A	T_A	**72**	F	Temperature of "A"
	V_A	**10,000**	CFM	Airflow of "A"
B	T_B	**50**	F	Temperature of "B"
	V_B	**3,000**	CFM	Airflow of "B"
Mixed$_{A+B}$	T_{A+B} =	**66.9**	F	Mixed Air Temperature
	V_{A+B} =	**13,000**	CFM	Mixed Airflow

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DUCTWORK CALCULATIONS

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Duct Airflow Calculation

$$Airflow = \frac{W \times H}{144} \times FPM$$

Duct Cross Section: Width (W)	34	Inches
Duct Cross Section: Height (H)	24	Inches
Area =	5.67	Sq. Ft
Air Velocity	1,500	FPM
Airflow =	8,500	**CFM**

Circular Duct Air Velocity Calculation

$$AirVelocity = \frac{CFM}{\left(3.14 \times \left(\frac{Dia.}{2}\right)^2\right)/144}$$

Duct Diameter (Dia.) =	26	Inches
Airflow (CFM)	10,000	CFM
Air Velocity =	2,714	FPM

Equivalent Round Duct Size from Rect. Duct

$$Dia. = \frac{1.3 \times (W \times H)^{0.625}}{(W + H)^{0.25}}$$

Duct Cross Section: Width (W)	30	Inches
Duct Cross Section: Height (H)	24	Inches
Equilvalent Diameter (Dia.) =	29.29	Inches

Duct Velocity Pressure

$$Velocity\,\mathrm{Pr}essure = \left(\frac{V}{4005}\right)^2$$

Air Velocity	1,500	FPM
Velocity Pressure =	0.459	psi

Rectangular Duct Air Velocity Calculation

$$AirVelocity = \frac{CFM}{(Width \times Height)/144}$$

Duct Cross Section: Width (W)	DEMO	Inches
Duct Cross Section: Height (H)	DEMO	Inches
Area =	DEMO	Sq. Ft
Airflow	DEMO	CFM
Air Velocity =	DEMO	**FPM**

Duct Surface Area

$$SurfaceArea = 2(L \times W) + 2(L \times H)$$

	Inches		Feet
Duct Cross Section: Width (W)	20	=	1.67
Duct Cross Section: Height (H)	24	=	2.00
Duct Length	96	=	8.00
Total Surface Area =	58.67	Sq. Ft	

Get the Full Version of "QuickCalcs-HVAC.xlsm" to use all features.
The above calculations are also available in CalcSheet format: "D2 - Ductwork Surface Area, Weight and Cost Estimates.xlsx'
Contact us for more information. Email: hvacnotebook@yahoo.com

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INTERPOLATION

Clear Below Values

(1)	
1	10
2	20
3	30

(100th)	
12.00	10.70
19.96	20.65
28.00	30.70

(10th)	
10.0	10.5
19.4	20.0
30.0	30.7

(1,000th)	
0.001	0.060
0.002	0.070
0.003	0.080

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MATH WITH FEET & INCHES

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Feet & Inches (Addition)

Clear Below Values

Enter Inches Only

Inches		Feet-Inches
58	=	4' - 10"
69	=	5' - 9"
45	=	3' - 9"
36	=	3' - 0"
45	=	3' - 9"
58	=	4' - 10"
45	=	3' - 9"
45	=	3' - 9"
Total	=	**33' - 5"**

Clear Below Values

Enter Feet & Inches

Feet	Inches		Inches
2	7	=	31
2	6	=	30
5	9	=	69
3	7	=	43
2	7	=	31
4	1	=	49
1	8	=	20
5	8	=	68
	Total	=	**28' - 5"**

Subtraction

Feet	Inches		
3	6	=	3' - 6"
2	6	=	2' - 6"
	Result	=	**1' - 0"**

Multiplication

Feet	Inches		
10	6	=	10' - 6"
5	6	=	5' - 6"
	Area	=	**57.75** SF

INDIVIDUAL PERCENTAGE

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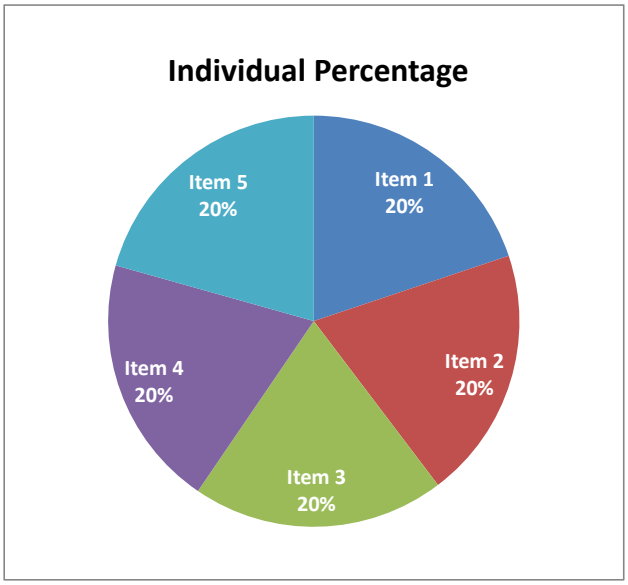
Individual Percentage of Total		
$Percentage = 1 - \left(\frac{Total - Value}{Total} \right)$		
Name	**Value**	**Individual Percentage**
Item 1	**25.00**	**19.84%**
Item 2	**25.00**	**19.84%**
Item 3	**25.00**	**19.84%**
Item 4	**25.00**	**19.84%**
Item 5	**26.00**	**20.63%**
DEMO	DEMO	DEMO
DEMO	DEMO	DEMO
DEMO	DEMO	DEMO
DEMO	DEMO	DEMO
DEMO	DEMO	DEMO
Total =	**126.00**	**100.00%**



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LOAD ESTIMATES

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COOLING LOAD ESTIMATE		
Space Area	4,500	SF
Cooling Load Estimate (SF per Ton)	350	SF/Ton
Cooling Load =	12.9	**Tons**

HEATING LOAD ESTIMATE		
Space Area	4,500	SF
Heating Load Estimate (Btuh per SF)	40	Btuh/SF
Heating Load =	180,000	Btuh
Heating Load =	180.0	**MBH**

The above calculations are also available in CalcSheet format: "L1 - Cooling and Heating Load Estimates.xlsx"

Contact us for more information. Email: hvacnotebook@yahoo.com

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UNIT CONVERSIONS

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	Units	Conversion Basis	Enter Value			Result	
Temperatures	Celsius <=> Fahrenheit	Celsius = (5/9) x (Fahrenheit - 32)	180.00	Fahrenheit	=	82.22	Celsius
		Fahrenheit = (9/5) x Celsius + 32	13.00	Celsius	=	55.40	Fahrenheit
	Celsius <=> Kevin	Celsius = Kevin - 273.15	300.00	Kevin	=	26.85	Celsius
		Kevin = Celsius + 273.15	25.00	Celsius	=	298.15	Kevin
	Fahrenheit <=> Kevin	Fahrenheit = (9/5) x (Kevin - 273.15) + 32	290.00	Kevin	=	62.33	Fahrenheit
		Kevin = (Fahrenheit - 32) * (5/9) + 273.15	62.33	Fahrenheit	=	290.00	Kevin
	Rankine <=> Kevin	Rankine = (9/5) x Kevin	20.00	Kevin	=	36.00	Rankine
		Kevin = (5/9) x Rankine	36.00	Rankine	=	20.00	Kevin
Distance	inch <=> cm	1 inch = 2.54 cm	1.00	inches	=	2.54	cm
		cm = inches / 2.54	1.00	cm	=	0.39	inches
	inch <=> mm	1 inch = 25.4 mm	1.00	inches	=	25.40	mm
		mm = inches / 25.4	1.00	mm	=	0.04	inches
	feet <=> yard	1 yard = 3 feet	1.00	yard	=	3.00	feet
		feet = yard / 3	1.00	feet	=	0.33	yard
	feet <=> meter	1 foot = 0.3048 meter	1.00	feet	=	0.3048	meter
		1 meter = 3.28 feet	1.00	meter	=	3.28	feet
	mile <=> feet	1 mile = 5,280 feet	1.00	mile	=	5,280	feet
		feet = miles / 5,280	5,280	feet	=	1.00	mile
	mile <=> yard	1 mile = 1,760 yards	1.00	mile	=	1,760	yards
		yards = miles / 1,760	1,760	yards	=	1.00	mile
Area	sq. ft. <=> sq. in.	1 sq. ft. = 144 sq. in.	1.00	sq. ft.	=	144.0	sq. in.
		sq. in. = sq. ft / 144	1.00	sq. in.	=	0.007	sq. ft.
	sq. ft. <=> sq. meter	1 sq. ft. = 0.0929 sq. meters	1.00	sq. ft.	=	0.0929	sq. meters
		1 sq. meter = 10.76 sq. ft.	1.00	sq. meters	=	10.76	sq. ft.
	sq. ft. <=> sq. cm	1 sq. ft. = 929 sq. cm	1.00	sq. ft.	=	929	sq. cm
		sq. cm = sq. ft. / 929	1	sq. cm	=	0.00	sq. ft.
	sq. ft. <=> sq. yards	1 sq. ft. = 0.1111 sq. yards	1.00	sq. ft	=	0.1111	sq. yards
		1 sq. yard = 9 sq. ft.	1.00	sq. yards	=	9.00	sq. ft.
Veolocity	fpm <=> mph	1 ft/min = 0.0114 mph	1.0	ft/min	=	0.0114	mph
		1 mph = 87.7 fpm	1.00	mph	=	87.7	ft/min
	mph <=> fps	1 mph = 1.467 ft/sec	1.0	mph	=	1.467	ft/sec
		1 fps = 0.682 mph	1.0	ft/sec	=	0.682	mph
	mps <=> mph	1 meter/sec = 2.237 mph	1.0	meter/sec	=	2.237	mph
		1 mph = 0.447 meter/sec	1.0	mph	=	0.447	meter/sec
	fps <=> m/s	1 ft/s = 0.3048 m/s	1.0	ft/s	=	0.3048	m/s
		1 m/s = 3.2808 ft/s	1.0	m/s	=	3.2808	ft/s
	km/hr <=> m/s	1 km/hr = 0.2778 m/s	1.0	km/hr	=	0.2778	m/s
		1 m/s = 3.5997 km/hr	1.0	m/s	=	3.5997	km/hr
	mps <=> fpm	1 meter/sec = 196.85 ft/min	1.0	meter/sec	=	196.85	ft/min
		fpm = meter/sec / 196.85	1.0	ft/min	=	0.005	meter/sec
Pressure	atm <=> psia	1 atm = 14.7 psia	1.00	atm	=	14.70	psia
		psia = atm / 14.7	1.00	psia	=	0.07	atm
	atm <=> psf	1 atm = 2,116.2 lb/ft^2	1.00	atm	=	2,116.2	lb/ft^2
		lb/ft = atm / 2,116.2	1.00	lb/ft^2	=	0.00	atm
	atm <=> in. Hg	1 atm = 29.92 in. Hg	1.00	atm	=	29.92	in. Hg
		in. Hg = atm / 29.92	1.00	in. Hg	=	0.03	atm
	in. water <=> in. mercury	1 in. water = 0.0739 in mercury	1.00	in. water	=	0.0739	in. mercury
		1 in. mercury = 13.53 in. water	1.00	in. mercury	=	13.53	in. water
	in. Hg <=> in. water	1 in. Hg = 12.8 in water	1.00	in. Hg	=	12.80	in. water
		1 in. water = 0.0781 in. Hg	1.00	in. water	=	0.0781	in. Hg
	ft. H_2O <=> psi	1 ft.H_2O = 0.4335 psi	1.00	ft. H_20	=	0.4335	psi
		1 psi = 2.31 ft. H_20	1.00	psi	=	2.31	ft. H_20
	ft. H_2O <=> psf	1 ft.H_2O = 62.43 lbs./sq.ft.	1.00	ft. H_20	=	62.43	lbs/sq.ft
		psf = ft. H_20 / 62.43	1.00	lbs/sq.ft	=	0.02	ft. H_20
	mm Hg <=> psi	1 mm Hg = 0.01934 lb/in^2	1.00	mm Hg	=	0.01934	lb/in2
		1 lb/in2 = 51.71 mm Hg	1.00	lb/in2	=	51.71	mm Hg
Time	day <=> hours	1 day = 24 hours	1.00	day	=	24.0	hours
		hours = days / 24	24.00	hours	=	1.000	day
	day <=> minutes	1 day = 1,440 minutes	1.00	day	=	1,440	minutes
		minutes = days / 1,440	1.00	minutes	=	0.00	day
	hour <=> minutes	1 hour = 60 minutes	1.00	hour	=	60	minutes
		minutes = hours / 60	1.00	minutes	=	0.02	hour
	minutes <=> seconds	1 minute = 60 seconds	1.00	minutes	=	60	seconds
		seconds = minutes / 60	1.00	seconds	=	0.02	minutes
	year <=> month	1 year = 12 months	1.00	year	=	12	months
		months = years / 12	1.00	months	=	0.08	years
	year <=> weeks	1 year = 52 weeks	1.00	year	=	52	weeks
		weeks = years / 52	52.00	weeks	=	1.00	years

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Water Volume Inside Pipe

$$Volume = 0.0034 \times (Dia.)^2 \times L$$

Pipe Inside Diameter (Dia.)	2	Inches
Pipe Length	50	Feet
	6	Inches
Pipe Length in Inches (L) =	606	Inches
Water Volume =	**8.24**	**Gallons**

The above calculations are also available in CalcSheet format: "P2 - Water Volume Inside Piping Estimate.xlsx"

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Fan Motor - HP

$$BHP = \frac{CFM \times SP \times SpGr}{6356 \times FanEfficiency}$$

$$MotorHP = \frac{BHP}{Motor\ /\ DriveEfficiency}$$

Fan Motor HP		
Airflow	10,000	CFM
Static Pressure	2.40	inches
Specific Gravity	1.00	
Fan Efficiency	60%	Percent
Brake HP =	6.29	BHP
Motor/Drive Effriciency	85%	
Motor HP =	7.40	**HP**

The above calculations are also available in CalcSheet format: "EQ1 - Fan Motor HP Calculation.xlsx"

Contact us for more information. Email: hvacnotebook@yahoo.com

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PERCENTAGE

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Percentage Change

$$Percent = \frac{|Original - New|}{Original} \times 100$$

Original Number	150
New Number	100
Percent Decrease =	33.3%

Change from 150 to 100 is a 33% Decrease

Part of Total Percentage (1)

$$Percent = \frac{Part}{Total} \times 100$$

Part Number	3
Total Number	30
Percent =	10.0%

3 out of 30 is 10%

Add A Percentage To A Number

$$New = Original + (Original \times Percent)$$

Percent	10%
Original Number	150
New Number =	165

Add 10% To 150 = 165

150 Plus 10% = 165

Percentage Difference

$$Percent = \frac{|A - B|}{((A + B)/2)} \times 100$$

Number A	100
Number B	50
Percent Difference =	66.7%

Difference between 100 and 50 = 67%

Percentage Greater or Less Than

$$Percent = \frac{(A - B)}{B} \times 100$$

Number A	10
Number B	25
Percent =	60.0%

10 is 60% Less than 25

Part of Total Percentage (2)

$$Total = \frac{Part}{Percent} \times 100$$

Part Number	25
Percentage	50%
Total Number =	50

25 is 50% of 50

Subtract A Percentage From A Number

$$New = Original - (Original \times Percent)$$

Percent	10%
Original Number	150
New Number =	135

Subtract 10% From 150 = 135

150 Minus 10% = 135

Percentage of a Number

$$New = Percent \times Original$$

Percent	30%
Original Number	100
New Number =	30

30% of 100 is 30

Percentage Off (1)

Original Number	100
Percentage Off	25%
New Number =	75

25% off 100 is 75

Percentage Off (2)

Original Number	100
New Number	25
Percentage Off =	75.0%

From 100 To 25 is 75% off

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GPM CALCULATIONS

Chilled Water GPM Calc.		
$GPM = \frac{Tons \times 24}{\Delta T}$		
Cooling Load (Tons)	120	Tons
Water ΔT	10	F
GPM (Evaporator) =	288	**GPM**

Hot Water GPM Calc.		
$GPM = \frac{Btu/hr}{500 \times \Delta T}$		
Heating Load	50,000	Btu/hr
Water ΔT	20	F
GPM =	5.0	**GPM**

Cooling Capacity Calc.		
$Btu/hr = 500 \times \Delta T \times GPM$		
Water Flow (GPM)	288	GPM
Water ΔT	10	F
Cooling Capacity (Btu/hr) =	1,440,000	Btu/hr
Cooling Capacity (Tons) =	120.0	**Tons**

Heating Capacity Calc.		
$Btu/hr = 500 \times \Delta T \times GPM$		
Water Flow (GPM)	288	GPM
Water ΔT	20	F
Heating Capacity (Btu/hr) =	2,880,000	Btu/hr
Heating Capacity (MBH) =	2,880	**MBH**

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FAN LAWS

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New BHP

New BHP From Change in CFM

$$BHP_2 = \left(\frac{CFM_2}{CFM_1}\right)^3 \times BHP_1$$

CFM_1	10,000
BHP_1	10.00
CFM_2	7,000
BHP_2 =	3.43

New BHP From Change in RPM

$$BHP_2 = \left(\frac{RPM_2}{RPM_1}\right)^3 \times BHP_1$$

RPM_1	850
BHP_1	10.00
RPM_2	800
BHP_2 =	8.34

New BHP From Change in SP

$$BHP_2 = \left(\frac{SP_2}{SP_1}\right)^{1.5} \times BHP_1$$

SP_1	2.40
BHP_1	10.00
SP_2	2.00
BHP_2 =	7.61

New CFM

New CFM From Change in BHP

$$CFM_2 = \sqrt[3]{\frac{BHP_2}{BHP_1}} \times CFM_1$$

BHP_1	10.00
CFM_1	10,000.00
BHP_2	3.43
CFM_2 =	7,000

New CFM From Change in RPM

$$CFM_2 = \frac{RPM_2}{RPM_1} \times CFM_1$$

RPM_1	850
CFM_1	10,000
RPM_2	680
CFM_2 =	8,000

New CFM From Change in SP

$$CFM_2 = \sqrt{\frac{SP_2}{SP_1}} \times CFM_1$$

SP_1	2.40
CFM_1	10,000
SP_2	1.54
CFM_2 =	8,010

New SP

New SP From Change in CFM

$$SP_2 = \left(\frac{CFM_2}{CFM_1}\right)^2 \times SP_1$$

CFM_1	DEMO
SP_1	DEMO
CFM_2	DEMO
SP_2 =	N/A

New SP From Change in RPM

$$SP_2 = \left(\frac{RPM_2}{RPM_1}\right)^2 \times SP_1$$

RPM_1	DEMO
SP_1	DEMO
RPM_2	DEMO
SP_2 =	N/A

New SP From Change in BHP

$$SP_2 = \sqrt[1.5]{\frac{BHP_2}{BHP_1}} \times SP_1$$

BHP_1	DEMO
SP_1	DEMO
BHP_2	DEMO
SP_2 =	N/A

New RPM

New RPM From Change in CFM

$$RPM_2 = \frac{CFM_2}{CFM_1} \times RPM_1$$

CFM_1	DEMO
RPM_1	DEMO
CFM_2	DEMO
RPM_2 =	N/A

New RPM From Change in SP

$$RPM_2 = \sqrt{\frac{SP_2}{SP_1}} \times RPM_1$$

SP_1	DEMO
RPM_1	DEMO
SP_2	DEMO
RPM_2 =	N/A

New RPM From Change in BHP

$$RPM_2 = \sqrt[3]{\frac{BHP_2}{BHP_1}} \times RPM_1$$

BHP_1	DEMO
RPM_1	DEMO
BHP_2	DEMO
RPM_2 =	N/A

Get the Full Version of "M1-QuickCalcs-HVAC.xlsm" to use all features.
The above calculations are also available in CalcSheet format: "EQ5 - Fan Laws.xlsx"
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AIRFLOW CALCULATION

Room Area	170	SF
Height	9	ft
	6	Inches
Room Volume =	1,615	CF

Airflow Calc. Based on CFM/SF		
$Airflow = CFM / SF \times SF$		
Design Flow/Area	1.00	CFM/SF
Design Airflow =	170	**CFM**

Airflow Calc. Based on ACH		
$Airflow = \left(\frac{ACH}{60}\right) \times CF$		
Design ACH	6.0	ACH
Design Airflow =	162	**CFM**

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PRESSURIZATION

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Negative Pressurization		
Supply Air	8,000	CFM
Percent Negative Pressure	10%	Percent
Required Exhaust Air =	8,800	**CFM**

Positive Pressurization		
Total Exhaust Air	8,000	CFM
Percent Positive Pressure	10%	Percent
Required Outside Air =	8,800	**CFM**

Percent Negative Pressurization		
Supply Air	8,000	CFM
Exhaust Air	8,800	CFM
Percent Negative Pressure =	-10%	**Percent**

Percent Positive Pressurization		
Outside Air	1,000	CFM
Exhaust Air	800	CFM
Percent Positive Pressure =	20%	**Percent**

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LOUVER SIZING

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Louver Size Based on Velocity & Free Area		
Airflow	40,000	CFM
Face Velocity	500	FPM
Required Free Area =	80.00	Sq. Ft.
	11,520	Sq. Inches
Louver Free Area (%)	50%	Design
Louver Face (Total) Area =	160.00	Sq. Ft.
	23,040	Sq. Inches
Louver Width	45	Inches
Louver Height =	512	Inches
Required Louver Face Area =	**3' - 9" W x 42' - 8" H**	

Air Velocity Based on Airflow & Free Area		
Airflow	40,000	CFM
Louver Face Area	100	Sq. Ft.
Louver Free Area (%)	50%	Design
Resulted Free Area =	50.00	Sq. Ft.
Resulted Air Velocity =	800	**FPM**

The above calculations are also available in CalcSheet format: "A2 - Louver Sizing Using FPM.xlsx'
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ELECTRICAL: OHM'S LAW

V = Voltage (Volts) **P** = Power (Watts) **I** = Current (Amps) **R** = Resistance (Ohms)

FIND VOLTAGE

$$V = \frac{P}{I}$$

Power (P)	34.0	Watts
Current (I)	5.0	Amps
Voltage (V) =	6.80	**Volts**

$$V = I \times R$$

Current (I)	5.0	Amps
Resistance (R)	6.0	Ohms
Voltage (V) =	30.00	**Volts**

$$V = \sqrt{P \times R}$$

Power (P)	DEMO	Watts
Resistance (R)	DEMO	Ohms
Voltage (V) =	N/A	**Volts**

FIND CURRENT

$$I = \frac{V}{R}$$

Voltage (V)	34.0	Volts
Resistance (R)	5.0	Ohms
Current (I) =	6.80	**Amps**

$$I = \frac{P}{V}$$

Power (P)	5.0	Watts
Voltage (V)	6.0	Volts
Current (I) =	0.83	**Amps**

$$I = \sqrt{\frac{P}{R}}$$

Power (P)	DEMO	Watts
Resistance (R)	DEMO	Ohms
Current (I) =	N/A	**Amps**

FIND POWER

$$P = I^2 \times R$$

Current (I)	5.0	Amps
Resistance (R)	5.0	Ohms
Power (P) =	125.0	**Watts**

$$P = V \times I$$

Voltage (V)	5.0	Volts
Current (I)	6.0	Amps
Power (P) =	30.0	**Watts**

$$P = \frac{V^2}{R}$$

Voltage (V)	DEMO	Volts
Resistance (R)	DEMO	Ohms
Power (P) =	N/A	**Watts**

FIND RESISTANCE

$$R = \frac{V}{I}$$

Voltage (V)	34.0	Volts
Current (I)	5.0	Amps
Resistance (R) =	6.80	**Ohms**

$$R = \frac{V^2}{P}$$

Voltage (V)	5.0	Volts
Power (P)	6.0	Watts
Resistance (R) =	4.17	**Ohms**

$$R = \frac{P}{I^2}$$

Power (P)	DEMO	Watts
Current (I)	DEMO	Amps
Resistance (R) =	N/A	**Ohms**

Please read the User Guide and Disclaimer prior to use.

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CHILLER - ELECTRIC

CHILLED WATER FLOW		
Cooling Load	120	Tons
CHW Supply Temperature	45	F
CHW Return Temperature	55	F
Required CHW flow (GPM) =	**288.0**	**GPM**

CONDENSER WATER FLOW		
Cooling Load	DEMO	Tons
CW Supply Temperature	DEMO	F
CW Return Temperature	DEMO	F
Required CW flow (GPM) =	**DEMO**	**GPM**

GIVEN CHILLER COP		
COP =	4.20	From Manufacturer
EER =	**14.33**	EER = COP x 3.412
kW/Ton =	**0.837**	kW/Ton = 3.516 / COP

GIVEN CHILLER EER		
EER =	14.33	From Manufacturer
COP =	**4.20**	COP = EER / 3.412
kW/Ton =	**0.837**	kW/Ton = 3.516 / COP

GIVEN CHILLER KW/TON		
kW/Ton =	0.837	From Manufacturer
EER =	**14.34**	EER = 12 / kW/Ton
COP =	**4.20**	COP = EER / 3.412

Please read the User Guide and Disclaimer prior to use.

Return To Main Sheet

100% OUTSIDE AIR UNIT

HEATING COIL LOAD ESTIMATE		
Outside Air Temperature Dry Bulb	11.0	F
Heating Coil Leaving Air Temperature Dry Bulb	95.0	F
Unit Airflow	5,000	CFM
Total Btu/hr =	453,600	Btu/hr
Total Heating Load =	**454**	**MBH**

COOLING COIL LOAD ESTIMATE		
Outside Air Temperature Dry Bulb	DEMO	F
Outside Air Temperature Wet Bulb	DEMO	F
Outside Air Temperature Enthalpy	DEMO	
Cooling Coil Leaving Air Temperature Dry Bulb	DEMO	F
Cooling Coil Leaving Air Temperature Wet Bulb	DEMO	F
Cooling Coil Leaving Air Temperature Enthalpy	DEMO	
Unit Airflow	DEMO	CFM
Total Btu/hr =	DEMO	Btu/hr
Total Cooling Load =	**N/A**	**Tons**

Get the Full Version of "M1-QuickCalcs-HVAC.xlsm" to use all features.

The above calculations are also available in CalcSheet format: "L8 - 100% Outside Air Unit Coils Sizing.xlsx"

Contact us for more information. Email: hvacnotebook@yahoo.com

Please read the User Guide and Disclaimer prior to use.

Return To Main Sheet

Piping Cost Estimate

Item#	Tag	Item	Quantity	Unit	Pipe Unit Price	Item Unit Price	Item Total	Assumption / Remarks
1	A-B	4" dia. Sch 40 Welded	10	LF	$36.22		$362.20	Main from header
2	A-B	4" Valve	1	EA		$200.00	$200.00	
3	B-C	4" dia. Sch 40 Welded	20	LF	$36.22		$724.40	Segment B-C
4	C-D	3" dia. Sch 40 Welded	2	LF	$29.46		$58.92	
5	D-E	3" Valve	1	EA		$150.00	$150.00	Isolation Valves
6	E-F	3" dia. Sch 40 Welded	6	LF	$29.46		$176.76	
7	F-G	2-1/2" dia. Sch 40 Welded	20	LF	$25.29		$505.80	
8	G-H	2" dia. Sch 40 Welded	10	LF	$19.32		$193.20	
9								
10								
						Subtotal =	$2,371.28	
					Allowance:	25%	$592.82	
						GRAND TOTAL =	**$2,964.10**	

The above calculations are also available in CalcSheet format: "P1 - Piping Cost Estimate.xlsx"

We can custom create a Piping Cost Estimate sheet for you. (Copper, Stainless Steel, Etc.)

Contact us for more information. Email: hvacnotebook@yahoo.com

User Guide

1) To enter pipe in Item column, pick pipe diameter from pull-down list than enter length in Quantity column. Pipe Unit Price (Data from Unit Price Table) and Item Total will automatically appear.

2) To enter a non-pipe item, type a name in the Item column and than enter its unit price in Item Unit Price column. Item Total will automatically appear.

3) If both pipe size is selected and Item Unit Price is entered, Item Total will be highlighted red to indicate an error. Either pipe or item can be on one line. To fix, delete value in Item Unit Price or type an item in Item column.

Unit Price Table (Per LF)				
Welded, Sch 40 Black Steel with yoke & roll hanger, 10' O.C.				
Item	**Materials**	**Labor**	**Equipment**	**Total**
1" dia. Sch 40 Welded	$3.70	$7.25	$0.60	$11.55
1-1/4" dia. Sch 40 Welded	$4.93	$8.00	$0.67	$13.60
1-1/2" dia. Sch 40 Welded	$5.65	$8.85	$0.74	$15.24
2" dia. Sch 40 Welded	$7.40	$11.00	$0.92	$19.32
2-1/2" dia. Sch 40 Welded	$9.80	$14.30	$1.19	$25.29
3" dia. Sch 40 Welded	$12.50	$15.65	$1.31	$29.46
3-1/2" dia. Sch 40 Welded	$13.90	$17.25	$1.44	$32.59
4" dia. Sch 40 Welded	$16.50	$18.20	$1.52	$36.22
5" dia. Sch 40 Welded	$24.00	$21.00	$1.76	$46.76
6" dia. Sch 40 Welded	$30.00	$29.00	$1.56	$60.56
8" dia. Sch 40 Welded	$47.00	$36.00	$1.94	$84.94
10" dia. Sch 40 Welded	$88.00	$43.50	$2.34	$133.84
12" dia. Sch 40 Welded	$122.00	$55.00	$2.96	$179.96
14" dia. Sch 40 Welded	$85.00	$69.50	$3.74	$158.24
16" dia. Sch 40 Welded	$114.00	$80.50	$4.32	$198.82
18" dia. Sch 40 Welded	$120.00	$95.00	$5.10	$220.10
20" dia. Sch 40 Welded	$146.00	$116.00	$6.25	$268.25
24" Dia. Sch 40 Pipe	$186.00	$131.00	$7.00	$324.00
Add Others…				$0.00