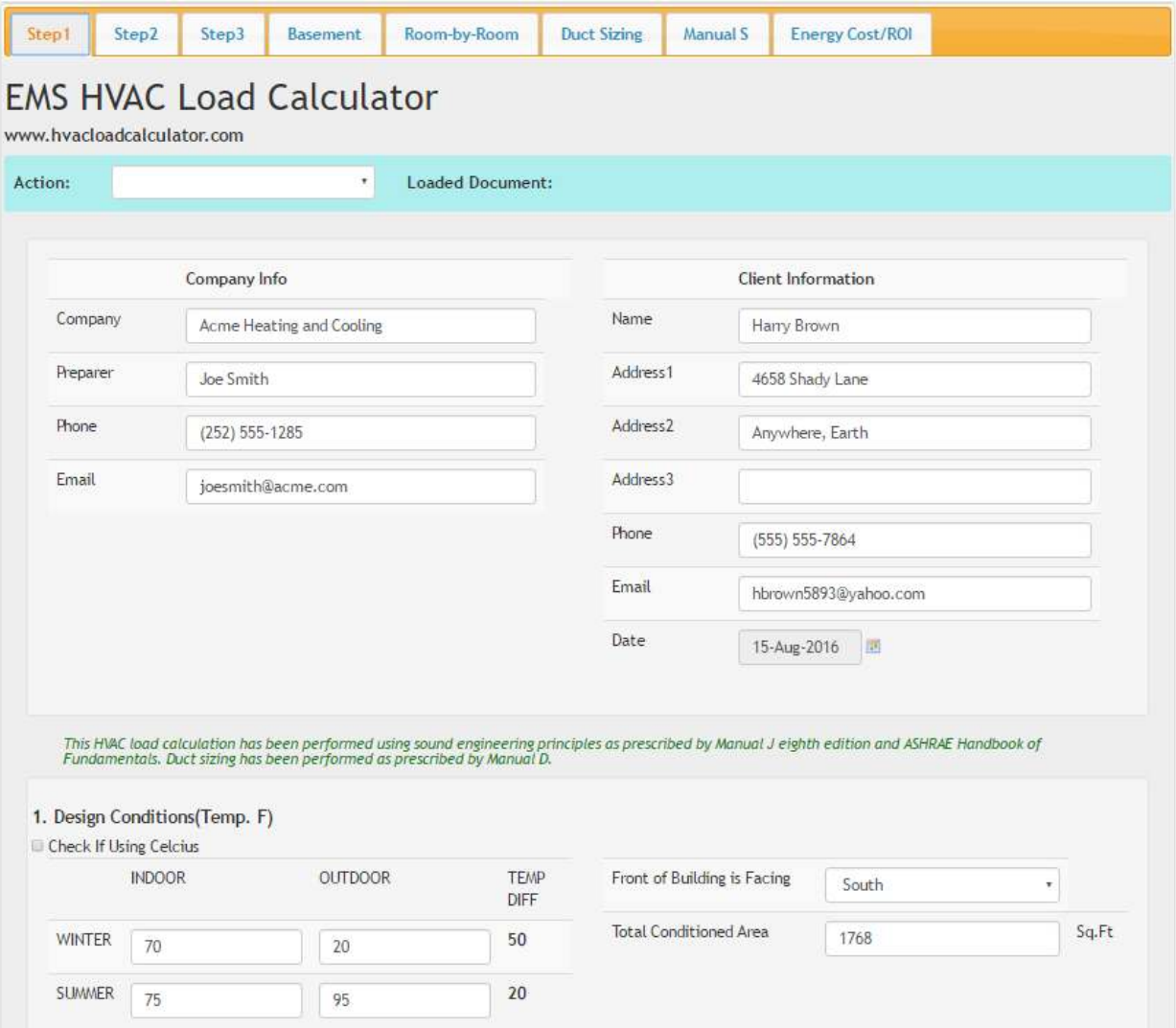
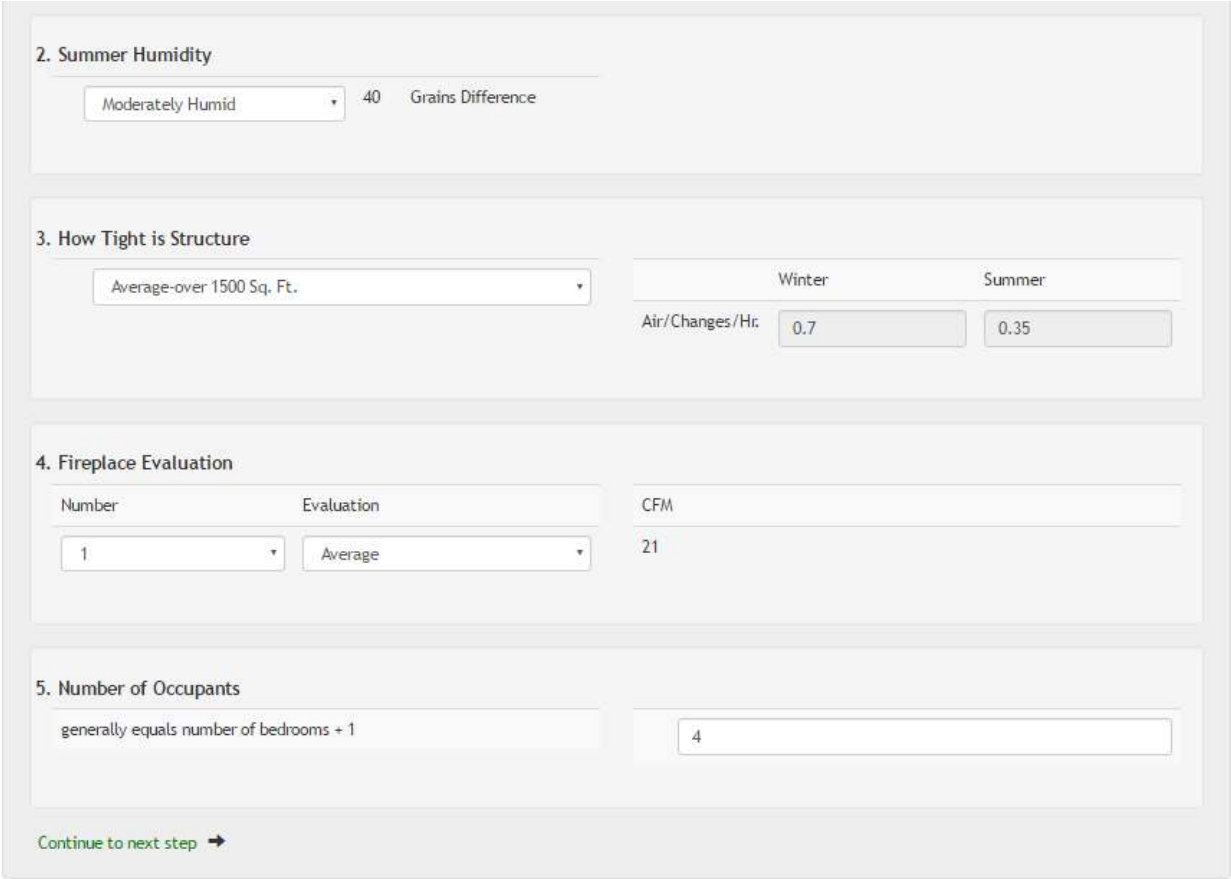
STEP 1



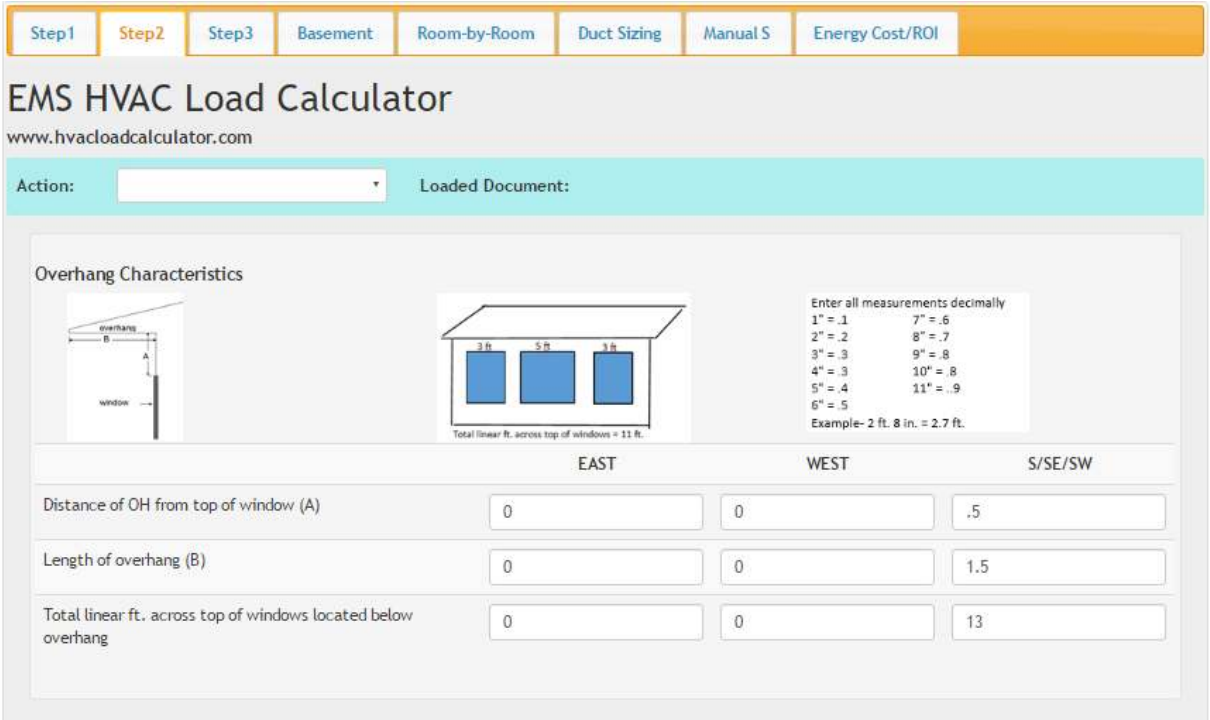
1. Enter your company information.
2. Enter your client information.
3. Enter the design temperatures – The indoor design temperatures are normally 70F for the winter and 75F for the summer, however, you may enter other temperatures if needed. The *outdoor* design temperatures can be found on Table 1 in Manual J or by searching for 'outdoor design temperatures' on the internet. Note: the outdoor design temperature for Raleigh, NC is listed as 92F. Experience has shown the temperature regularly reaches the mid 90's, therefore, I took the liberty to use 95F.
4. Enter the direction house is facing.
5. Enter the heated or cooled area of the house.
6. Select the humidity level for your area.
7. Select the tightness of the construction.
8. Select the number and tightness of fireplaces if any exist. Ventless fireplaces and those obtaining all combustion air from outside are considered *tight*
9. Enter the number of occupants in the home. Typically, this is the number of bedrooms plus one.



STEP 2

Overhang characteristics

1. Enter the distance between the top of the windows and the overhang (A) for each corresponding direction. Enter only *feet decimally.* For example: 6 inches =.5
2. 2. Enter the distance the overhang sticks out from the wall (B) for each corresponding direction. Enter only *feet decimally.* For example: 1 foot 6 inches = 1.5
3. Enter the total linear feet across the top of all windows under the overhang for each corresponding direction. For example: if there are four windows under an overhang facing east and each is 3’, 4’, 3’ and 5’ across the top, respectively, then you would enter 15.



Is it an overhang or a porch?

If the window is located under a structure that is always totally shaded such as a porch, awning or carport, then it is considered as facing north thus, its area should be included with the north facing windows. In the Sample House Plan the only window facing east is under a covered porch, therefore, its area is added to the North facing windows and there are no east facing windows.

Fenestration (Glass)

1. If the window manufacture's specs are available, check the box and enter the latitude, U-value and SHGC. (Do not select type of glass if manufacture's specs are used)
2. Enter the area (sq. Ft.) of all windows facing **north.** Include any permanently shaded windows, even if facing another direction.
   Enter the area of all remaining windows facing their respective direction.
3. **If you did not use manufacture's specs**, select the type of glass from the dropdown**.**
4. If glass has reflective coating, select YES, otherwise NO
5. Enter area (sq. ft.) of skylight and select type of glass

The **total solar gain** is the total amount of btuh entering the house through all glass surfaces. It takes into account both radiation and conduction.

Solar GainThrough Glass

☐ Check this box if using manufacturer specifications and enter the latitude, U-value and SHGC

Latitude	0	U-Value		SHGC	

Facing	Area(sq ft)	Type Glass	HTM	Unshaded	Shaded	BTUH
N/Shaded	84	Double	24.00	0	128	3,077
NE/NW	0		0.00	0	0	0
South	59	Double	40.00	15	44	592
SE/SW	0		0.00	0	0	0
East	0		0.00	0	0	0
West	24	Double	75.00	24	0	1,800
Does glass have reflective coating?		No	1			5,469
Skylight	0		0			0
					Total Solar Gain	5,469

Ducts

1. Select location of duct work
2. Select insulation on ducts
3. Select whether 'sealed' or 'unsealed'
4. Enter the ceiling or floor area the ductwork is either above or below. For example: The Sample House is one story and all ductwork is in the attic, laying on a 1768 sq. ft. ceiling. Therefore, enter 1678. If, however, the home is 2 stories (839 sq. ft. on each floor) then only the duct work in the upper ceiling would be exposed to outside conditions. In which case, you would enter 839.
5. Select the attic temperature. **Make your best guess** as this is a function of radiant heat, conduction and attic ventilation.

DUCTS OR PIPES

Location(Heating)	Trunk and branches in attic	Duct Loss	0.11
Location(Cooling)	Trunk and branches in attic	Duct Gain	0.25
Duct/Pipe Insulation	R-8		
Duct Leakage	sealed		
Area of Attic or Floor Where Duct is Located	1768		
Attic Temperature(If ducts located in attic)	120		

Load calculation

1. Enter the gross area of all exposed walls* the wall. Gross area is the total area including windows and doors

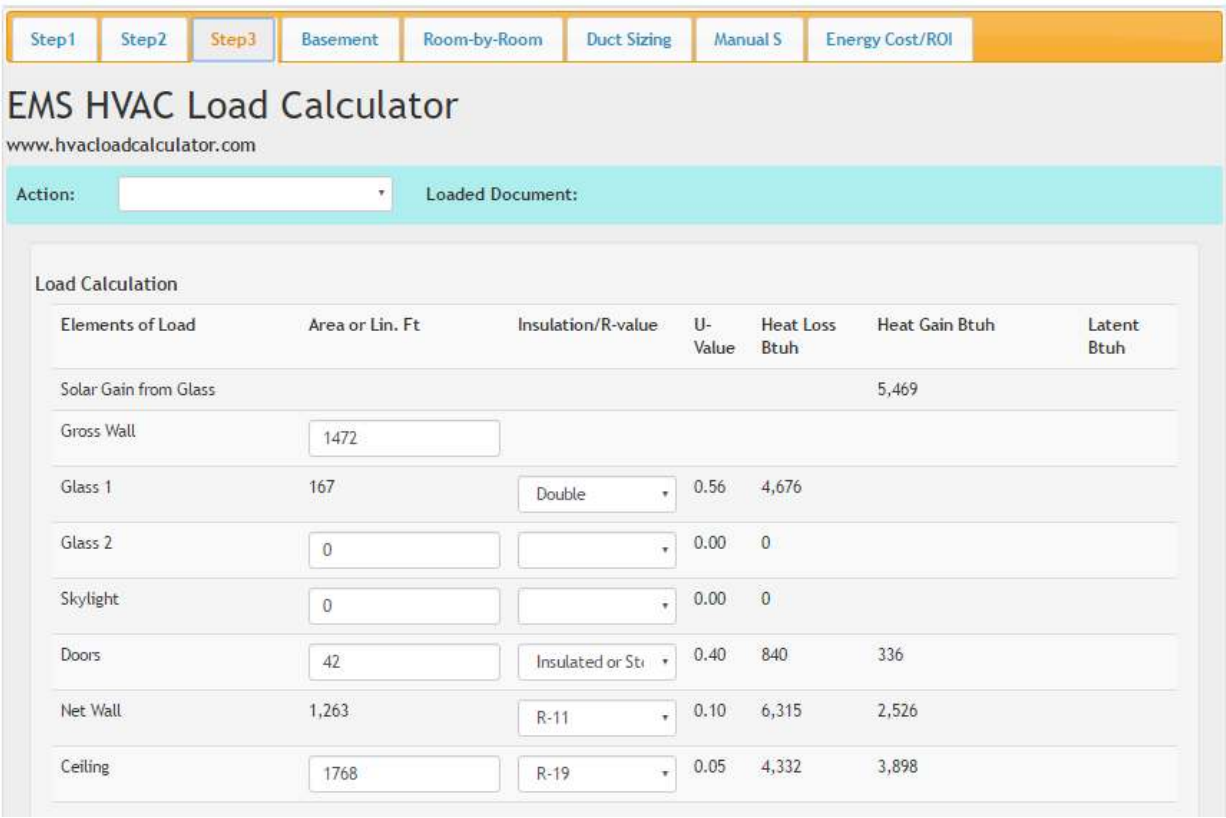
Gross area = perimeter of house x wall height

**Exposed wall* means any wall that is exposed to the outdoor conditions. Also includes any wall between a conditioned and unconditioned space. Example: the wall between the house and unheated garage is exposed.

2. Glass 1- Value is entered automatically. Select type of glass
3. Glass 2- Enter the area (sq. ft.) only if there is a significant amount of different glass. For example: one half the house has single glass while the other half is double glass.
4. Skylight- Enter the area (sq. ft.) of skylight and select type of glass.
5. Doors- Enter area of doors and select insulation value. (Note: separate the glass from doors. If a west facing 3' x 7' door is half-glass, then enter 11 sq. ft. in the door cell and 10 sq. ft. in Step 2, west facing windows **Sliding glass doors** should be treated as windows
6. Net Wall- Automatically calculated

Net Wall = Gross wall - all openings

7. Ceiling- Enter the area of all *exposed* ceilings. The Sample house has 1768 sq. ft. of *exposed* ceiling, If the house were 2 stories (839 sq. ft. on each floor) then it would only have 839 sq. ft. of exposed ceiling



Elements of Load	Area or Lin. Ft	Insulation/R-value	U-Value	Heat Loss Btuh	Heat Gain Btuh	Latent Btuh
Solar Gain from Glass					5,469	
Gross Wall	1472					
Glass 1	167	Double	0.56	4,676		
Glass 2	0		0.00	0		
Skylight	0		0.00	0		
Doors	42	Insulated or St	0.40	840	336	
Net Wall	1,263	R-11	0.10	6,315	2,526	
Ceiling	1768	R-19	0.05	4,332	3,898	

8. The EMS lad calculator offers three types of floors:
    a. Floors over crawl space – enter square feet, select insulation
    b. Floors over open area - enter square feet, select insulation
    c. Slab floors – enter **linear feet,** select insulation
9. Infiltration: Enter the cubic feet of the house (area x average ceiling height). The program will calculate the heating and cooling loads due to infiltration based on the tightness selected in Step 1
10. Appliances – A default value of 1200 btuh is programed into the software. If you wish to change the value, click on the check box next to 'Enter Value' and enter a new value. Use this feature if an abnormal number of appliances are present, such as computers and big screen TV's.
11. Summary – The summary will give the heating and cooling loads.

    Heating Load – Use this load to size the furnace or boiler. Always use the **output** rating.

Cooling Load – The cooling load is divided between *sensible, latent* and *total* loads. The air conditioning equipment chosen must be able to handle *all three* loads at outdoor design temperatures.

Note: the example below indicates a 1.99-ton AC unit is needed. Typically, a 2-ton AC would be chosen for the job. However, the manufacturer's specifications indicate their 2-ton unit has a sensible capacity of 18,000 btuh and a latent capacity of 6000 btuh. We may, therefore, need to move up to a 2.5-ton unit to cover both loads. Some, but not all, of the excess latent capacity may be used to make up for the sensible deficient. To properly select equipment a Manual S calculation should be performed.

Floor

Over Crawl or Unheated Basement	0		0.00	0	0	
Open-Beach House Above Carport	0		0.00	0	0	
Slab On Grade - enter-linear ft	184	No Insulation	0.80	7,360	0	
Infiltration-Enter cubit-ft of building	14144			10,231	1,815	
		People			920	800
		Appliances		Enter Value	1200	
		Sub Total		33,753	16,164	
		Duct Loss/Gain		3,839	4,068	650
		Total Sensible Load		37,592	20,232	
		Latent Load				2,244
		Total Latent Load				3,694

SUMMARY

Heating Load	Sensible Cooling	Latent Cooling	Total Cooling Load	Nominal Tons
37,592	20,232	3,694	23,927	1.99

If the home has a basement and you wish to heat and/or cool the basement with the same unit serving the story above, the program will indicate the total loads for both stories under 'Summary Including Basement'

SUMMARY

Heating Load	Sensible Cooling	Latent Cooling	Total Cooling Load	Nominal Tons
37,592	20,232	3,694	23,927	1.99

Summary Including Basement

Heating Load	Sensible Cooling	Latent Cooling	Total Cooling Load	Nominal Tons
37,592	20,232	3,694	23,927	1.99

Whole House (Block Load) Completed
Scroll to top For Additional Options →

Basement Tab (not shown)

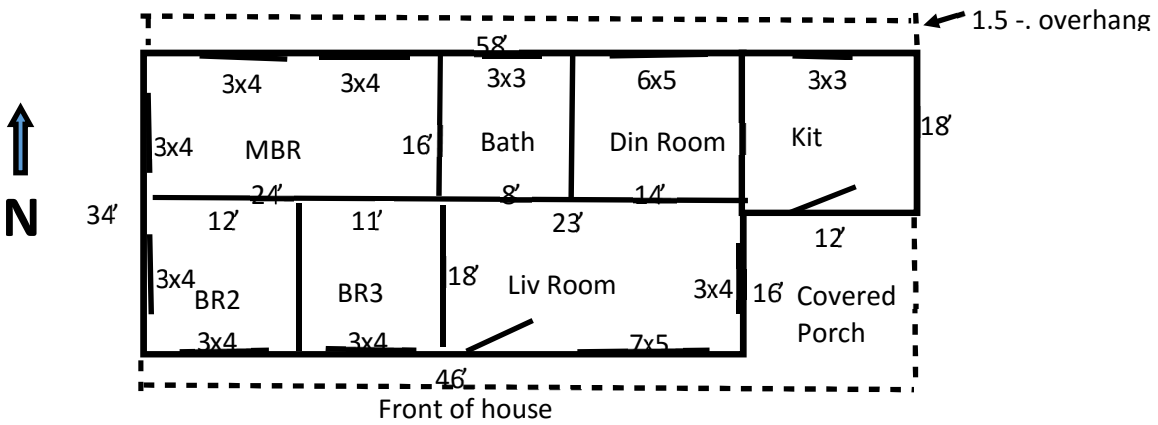
What is a basement? A basement is an area that has a floor at least **2 feet** below grade. Otherwise, it is simply the first floor and its components should be entered in Steps 1, 2 and 3.

Enter the areas/volume as asked and select insulation.

Note two exceptions:

1. Separate the above grade and below grade wall areas. Remember.
2. Enter the **square feet** of the *basement floor*. Note: for slab floors on grade the heat loss is along the perimeter, but for slab floors two feet or deeper below grade, the heat loss is throughout the slab.

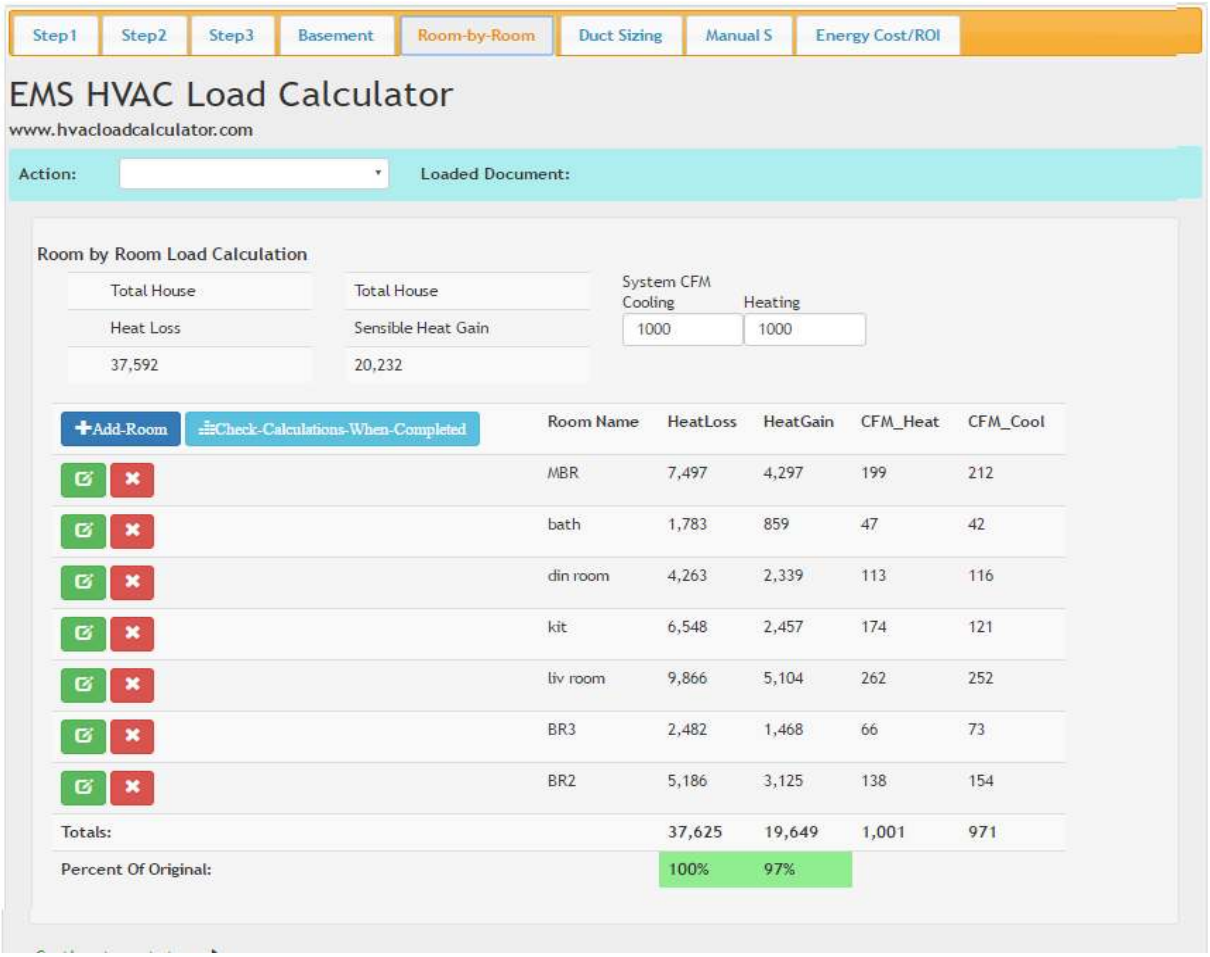
Room-by-Room Tab

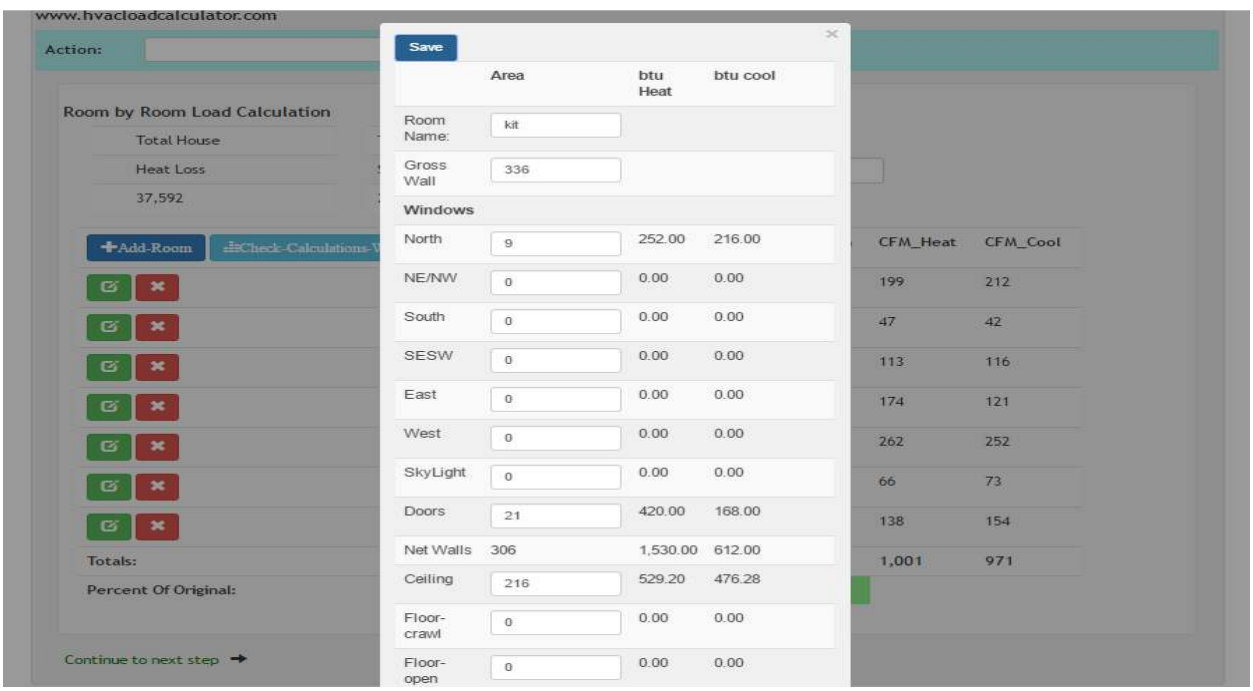


Notice in the drawing above, the rooms are drawn as number of rectangles. Also, note we did not complicate our drawing by showing or drawing closets, halls and stairwells even though their areas *are* i*ncluded* in the drawing.

1. System CFM – Enter the system CFM for cooling and heating (how? See below)
    a. Determine the equipment size from the *summary* on **Step 3**
    b. Consult manufacturer's specs to obtain the CFM
2. Click on **+ Add Room,** then name the room and enter the area of each component in the room.
   Note: only enter areas that are exposed to the outdoor temperature.
   Example 1: BR2 has *two* walls exposed while BR3 has only *one* wall exposed.
   Example 2: If there is a conditioned area *above* a room, then that room has no ceiling.
   Example 3: If there is a conditioned area *below* a room, then that room has no floor.
   Example 4: Treat a wall between unheated areas, such as house and garage, as outside.

3. Click **Save**
4. To add next room, click **+ Add Room** and repeat until all rooms are accounted for.
5. After adding all rooms, click on **'Check Calculation When Completed'.** If the calculated room-by-room load is within 5% of the whole house load (Step 3) then your entries are considered accurate. If the load is not within 5% then you must re-check your entries. The reason for the inaccuracy is the values entered for each room do not add up to those in Step 3. For example: The area of the walls in Step 3 is 1472 sq. ft. If you were to add up the area of each individual room wall, it should equal 1472 sq. ft. Any other value would indicate a mistake. Ditto for windows, doors, ceilings and floors



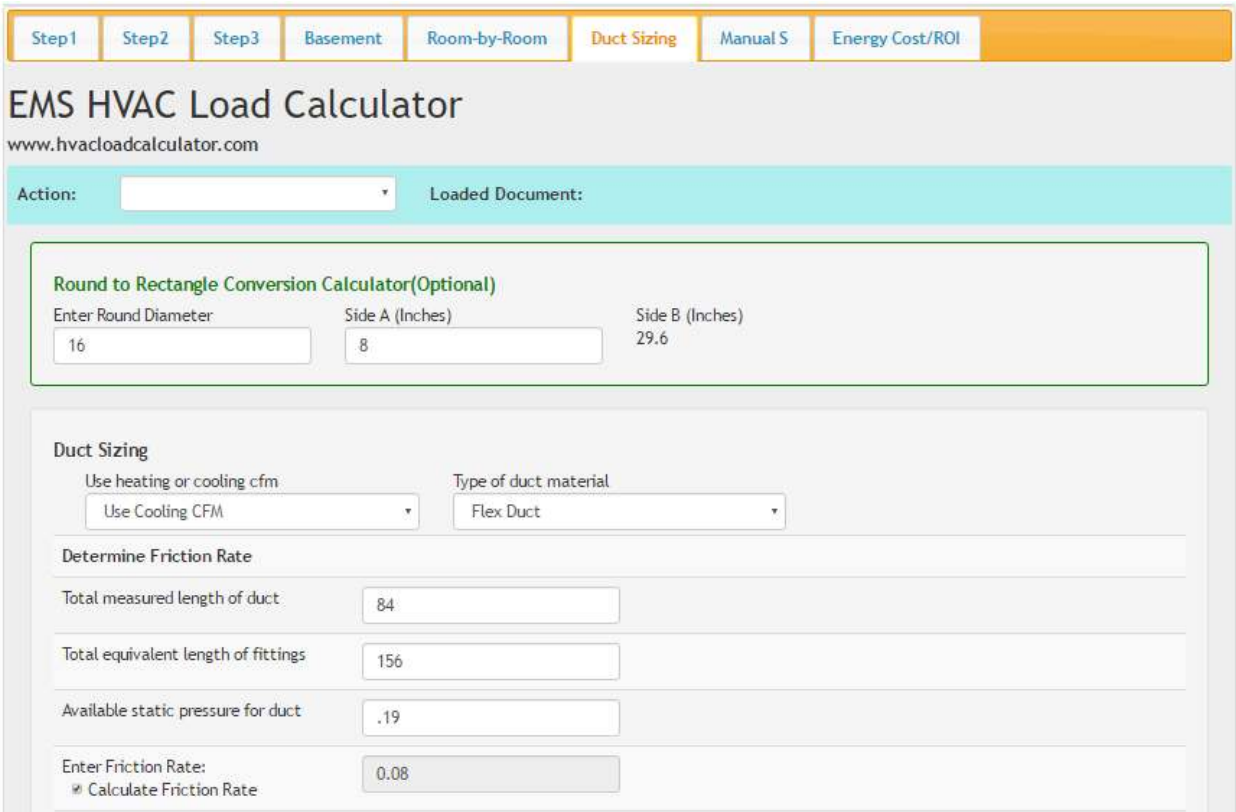


Duct sizing **(A Room-by-Room load calculation must be performed before sizing ducts)**

Round to Rectangular Conversion Calculator (use only if needed):

The EMS load calculator gives duct sizes in round duct diameters. If you need to convert a round duct to rectangulaar duct, enter the round duct size into the first cell and the desired size of one side into the second cell (side A). The other side of the rectangular duct will be (B).

Example: The duct calculator indicates a 16 inch round duct is required, however you need to use a rectangular duct that can be no higher than 8 inches. The resulting size would be 8” x 29.6”



1. ‘Use heating or cooling CFM’ - Select the mode requiring the most CFM
2. Select the duct type.
3. **Determine the friction rate (see below for alternative method)**

The calculation for determining the friction rate is:

Friction Rate = Available pressure x 100/Total effective length

Available pressure = External pressure of fan (may include air handler casing) minus all air side components (registers, grilles, dampers, filters coils, etc.). All of this data is available from the respective manufacturer’s specifications.

Total effective length = total measured length plus the total equivalent lengths of all fittings and bends.

Measured length = actual measured length from the farthest supply opening to the farthest return opening

Equivalent length = stated length of fittings and turns compared to that of straight duct. A ninety degree round to rectangular floor boot offers as much resistance to the flow of air as 80 feet of straight duct, therefore, it has an equivalent length of 80 feet. ACCA Manual D lists the equivalent lengths of duct components.

Alternative method (Not recommended by ACCA but works on almost all homes)

1. Leave measured length, effective length and available static pressure blank
2. *Uncheck* ‘calculate friction rate’ and enter .08 as the Friction Rate. For an extremely quiet system, use .05

Supply Trunk or branch	cfm			duct dia	air vel
First section off AH	1,000			16	715
1st reduction or branch	597			13	631
2nd reduction or branch	121			7	428
3rd reduction or branch	0			0	
4th reduction or branch	0			0	
5th reduction or branch	0			0	
Return Trunk or branch	**cfm**			**duct dia**	**air vel**
First section off AH	1000			16	715
1st reduction or branch	500			12	604
2nd reduction or branch	500			12	604
3rd reduction or branch	0			0	
4th reduction or branch	0			0	
5th reduction or branch	0			0	
Room Runs	**cfm**	**no of outlets**	**outlet cfm**	**duct dia**	**air vel**
MBR	199	3	66	6	370
bath	47	1	47	5	341
din room	113	1	113	7	421
kit	174	2	87	6	395
liv room	262	3	87	6	395
BR3	66	1	66	6	369
BR2	138	2	69	6	373

3. **Room Runs** - It is perferable to size the room runs first. Enter the number of outlets for each room. The calculator will show the room CFM, each outlet CFM, the duct diameter and the velocity of the air. If the velocity is greater than 700 FPM increase the duct by one size.
4. **Supply Trunk Sizing** - After sizing the room runs, size the supply in the following manner:
    a. The first section off the air handler must supply all the equipment CFM (1000 CFM from sample).
    b. After serving the master bedroom, bedroom 2 and bedroom 3 which total 403 CFM, a reduction is made. The new trunk must carry 597 CFM (1000 – 403). Enter 597
    c. After serving the bath, living room and dining room a second reduction is made, The new trunk must carry the remaing 121 CFM. Enter 121
5. **Return Trunk Sizing –** Our example has two returns, each handling 500 CFM. Enter 500 for each reduction.

Manual S – Equipment Selection

1. Check 'Auto Complete' and the calculated loads will automatically fill in.

Step1 | Step2 | Step3 | Basement | Room-by-Room | Duct Sizing | Manual S | Energy Cost/ROI

EMS HVAC Load Calculator

www.hvacloadcalculator.com

Action: Loaded Document:

Equipment selection as per Manual S

Instructions: enter load, weather and manufacture's data in white cells

☑ Auto Complete

	BTUH			
Total Heat Loss	37592	Design Conditions	Outdoor	Indoor
Total Heat Gain	23927		20	70
Sensible Heat Gain	20232		95	75
Latent Heat Gain	3,694	ID Design RH	50%, 63F WB	
Sensible/Total Ratio	1	Altitude	300	
target clg Temp. Drop	21	Predominantly	Cooling climate	

Manufactures Equipment Specifications

Equipment	Manufacturer	Model No	BTUH output(heating)	Total capacity@ OD design temp	Sensible BTUH	Latent BTUH
Furnace	0	0	0			
Boiler	0		0			
Heat Pump or Air Conditioner	Amme	HP 024		26000	21200	4800
Evaporator Coil	Acme	HPC 030				
Air Handler	Acme	AH 030				
Total Capacity with Altitude Correction			0	25883	21104.600000000002	4778.400000000001
Selected Equipment Size			OK	OK	OK	OK

a

2. Enter the altitude above sea level for your area.
3. Select whether your climate is predominantly heating or cooling.
4. **Manufacturer's equipment specifications**

   Using the manufacture's specification sheets, enter the equipment manufacturer, model number and btuh output if a furnace or boiler is used for heating. For air conditioners and heat pumps, enter the *cooling* capacities associated with your area's outdoor design temperature @ 63-degree wet bulb temperature (63 WB corresponds to 50% RH) Below is an example of a typical performance data sheet for a 2.5-ton heat pump. The highlighted area is ARI's testing conditions (32,100 btuh total capacity, 78% or 25,000 btuh sensible capacity, therefore leaving 7100 btuh latent capacity.) However, if your area has an outdoor design temperature of 105 degrees, the total capacity of the unit will drop to 30,500 btuh, with 81% or 24,000 btuh sensible and the balance, 5500 btuh latent.

			Outdoor Ambient Temperature																							
			65°F				75°F				85°F				95°F				105°F				115°F			
			Entering Indoor Wet Bulb Temperature																							
IDB	Airflow		59	63	67	71	59	63	67	71	59	63	67	71	59	63	67	71	59	63	67	71	59	63	67	71
70	1292	MBh	33.9	35.1	38.5	-	33.1	34.3	37.6	-	32.3	33.5	36.7	-	31.5	32.7	35.8	-	30.0	31.1	34.0	-	27.8	28.8	31.5	-
		S/T	0.74	0.62	0.43	-	0.76	0.64	0.44	-	0.78	0.65	0.45	-	0.81	0.68	0.47	-	0.84	0.70	0.49	-	0.85	0.71	0.49	-
		ΔT	18	16	12	-	18	16	12	-	18	16	12	-	18	16	12	-	18	15	12	-	17	14	11	-
		kW	2.52	2.57	2.65	-	2.70	2.76	2.84	-	2.86	2.92	3.01	-	3.01	3.07	3.17	-	3.13	3.19	3.29	-	3.23	3.30	3.41	-
		Amps	10.6	10.8	11.1	-	11.3	11.5	11.9	-	12.1	12.4	12.7	-	12.9	13.1	13.5	-	13.6	13.9	14.3	-	14.3	14.6	15.0	-
		Hi Pr	237	255	270	-	266	287	303	-	303	326	344	-	345	371	392	-	388	418	441	-	429	461	487	-
		Lo Pr	112	119	130	-	118	128	137	-	123	131	143	-	129	137	150	-	135	144	157	-	140	149	162	-
	1150	MBh	32.9	34.1	37.4	-	32.2	33.3	36.5	-	31.4	32.5	35.6	-	30.6	31.7	34.8	-	29.1	30.2	33.0	-	26.9	27.9	30.6	-
		S/T	0.70	0.59	0.41	-	0.73	0.61	0.42	-	0.75	0.62	0.43	-	0.77	0.64	0.45	-	0.80	0.67	0.46	-	0.81	0.67	0.47	-
		ΔT	19	16	12	-	19	16	12	-	19	16	12	-	19	16	12	-	19	16	12	-	17	15	11	-
		kW	2.50	2.55	2.63	-	2.68	2.74	2.82	-	2.84	2.90	2.99	-	2.98	3.05	3.14	-	3.10	3.17	3.27	-	3.21	3.27	3.38	-
		Amps	10.5	10.7	11.0	-	11.2	11.4	11.8	-	12.0	12.3	12.6	-	12.8	13.0	13.4	-	13.5	13.8	14.2	-	14.2	14.5	14.9	-
		Hi Pr	235	253	267	-	264	284	300	-	300	323	341	-	341	367	388	-	384	413	437	-	424	457	482	-
		Lo Pr	111	118	129	-	117	124	136	-	122	129	141	-	128	136	148	-	134	142	155	-	138	147	161	-
	1008	MBh	30.4	31.5	34.5	-	29.7	30.8	33.7	-	29.0	30.0	32.9	-	28.3	29.3	32.1	-	26.9	27.8	30.5	-	24.9	25.8	28.2	-
		S/T	0.68	0.57	0.39	-	0.70	0.59	0.41	-	0.72	0.60	0.42	-	0.74	0.62	0.43	-	0.77	0.65	0.45	-	0.78	0.65	0.45	-
		ΔT	19	16	12	-	19	16	13	-	19	16	13	-	19	17	13	-	19	16	12	-	18	15	12	-
		kW	2.45	2.49	2.57	-	2.62	2.67	2.75	-	2.78	2.83	2.92	-	2.91	2.97	3.07	-	3.03	3.09	3.19	-	3.13	3.20	3.30	-
		Amps	10.3	10.5	10.8	-	11.0	11.2	11.5	-	11.8	12.0	12.3	-	12.4	12.7	13.1	-	13.1	13.4	13.8	-	13.8	14.1	14.5	-
		Hi Pr	228	245	259	-	256	275	291	-	291	313	330	-	331	356	376	-	373	401	423	-	412	443	468	-
		Lo Pr	107	114	125	-	113	121	132	-	118	125	137	-	124	132	144	-	130	138	151	-	134	143	156	-
75	1292	MBh	34.6	35.5	38.4	41.2	33.7	34.7	37.5	40.3	32.9	33.8	36.6	39.3	32.1	33.0	35.7	38.4	30.5	31.4	34.0	36.4	28.2	29.1	31.5	33.8
		S/T	0.84	0.75	0.57	0.37	0.87	0.78	0.59	0.38	0.89	0.80	0.60	0.39	0.92	0.82	0.62	0.40	0.95	0.85	0.65	0.42	0.96	0.86	0.65	0.42
		ΔT	21	19	16	11	21	19	16	11	21	19	16	11	21	19	16	11	21	19	16	11	19	18	15	10
		kW	2.54	2.59	2.67	2.75	2.72	2.78	2.86	2.95	2.89	2.95	3.04	3.13	3.03	3.09	3.19	3.29	3.15	3.22	3.32	3.43	3.26	3.33	3.43	3.55
		Amps	10.7	10.9	11.2	11.5	11.4	11.6	12.0	12.3	12.2	12.5	12.8	13.3	13.0	13.2	13.6	14.1	13.7	14.0	14.4	14.9	14.4	14.7	15.2	15.7
		Hi Pr	240	258	272	284	269	289	306	319	306	329	348	363	348	375	396	413	392	422	445	465	433	466	492	513
		Lo Pr	113	120	131	140	119	127	139	148	124	132	144	153	130	139	151	161	137	145	159	169	141	150	164	175
	1150	MBh	33.5	34.5	37.3	40.0	32.7	33.7	36.4	39.1	31.9	32.9	35.6	38.2	31.1	32.1	34.7	37.2	29.6	30.5	33.0	35.4	27.4	28.2	30.5	32.8
		S/T	0.80	0.72	0.54	0.35	0.83	0.74	0.56	0.36	0.85	0.76	0.58	0.37	0.88	0.78	0.59	0.38	0.91	0.81	0.62	0.40	0.92	0.82	0.62	0.40
		ΔT	21	20	16	11	22	20	16	11	22	20	16	11	22	20	16	11	22	20	16	11	20	19	15	10
		kW	2.52	2.57	2.65	2.73	2.70	2.76	2.84	2.93	2.86	2.92	3.01	3.11	3.01	3.07	3.17	3.27	3.13	3.19	3.30	3.40	3.23	3.30	3.41	3.52
		Amps	10.6	10.8	11.1	11.4	11.3	11.5	11.9	12.2	12.1	12.4	12.7	13.2	12.9	13.1	13.5	14.0	13.6	13.9	14.3	14.8	14.3	14.6	15.0	15.5
		Hi Pr	237	255	270	281	266	287	303	316	303	326	344	359	345	371	392	409	388	418	441	460	429	461	487	508
		Lo Pr	112	119	130	138	118	126	137	146	123	131	143	152	129	137	150	160	135	144	157	167	140	149	162	173
		MBh	30.9	31.8	34.4	37.0	30.2	31.1	33.6	36.1	29.5	30.3	32.8	35.2	28.7	29.6	32.0	34.4	27.3	28.1	30.4	32.7	25.3	26.0	28.2	30.3

TOTAL CAPACIY with altitude correction is the net capacity of the equipment at your area's altitude and must be considered when selecting equipment.

Notice the "Cooling cfm (rec.)". This is the cfm recommended to control humidity in the cooling mode. Using the manufacture's specs (blower performance chart), enter the external static pressure* corresponding to the recommended cfm in the adjacent cell labeled, "Ext. static pressure of blower." Once the external static pressure is entered, it will automatically be re-entered in the available static pressure section below.

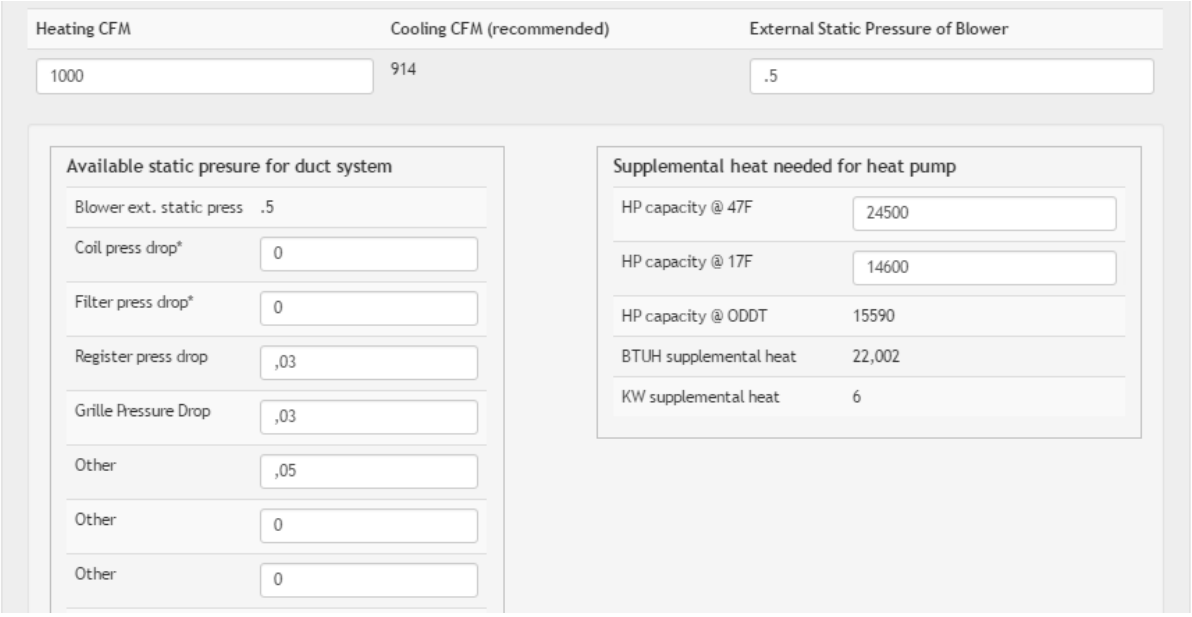
5. In the available static pressure for duct system section, enter the pressure drops caused by each component in the system (coils, registers, dampers, etc.)

*The external static pressure is the pressure the air exerts upon the ductwork as it leaves the air handler. Some manufactures post an external static pressure that allows for a coil and/or filter in place (you must read footnotes to blower performance chart). If the external static pressure includes coils or filters leave the corresponding cells blank.

If you do not know the pressure drops of the registers and grilles. The generic pressure drop exerted by registers and grilles is about .03. Therefore, enter .03 in the cell next to registers and .03 in the cell next to grilles.

Other- enter manufactures stated pressure drop of any other items in the system. (electric strips, dampers etc.) these may be added together and entered as one total. *Available static pressure for duct (per 100 feet) - In order to assure the correct system cfm, the ductwork must be sized based in this static pressure. *Once the available static pressure is known, it must be adjusted according to the ductwork's measured and equivalent lengths. This adjustment is commonly referred to as the friction rate. The friction rate is the pressure used on duct calculators and friction charts FR= (Adj. SP x 100)/ total effective length This calculation is automatically made on the duct sizing tab.

Supplemental heat needed for heat pump. From the manufactures specs enter the heat pump's capacity at 47 degrees F and 17 degrees F. The program will calculate the amount of supplemental heat needed expressed in both BTUH and KW



Energy cost/ ROI

1. Enter the heating and cooling degree days (obtain from the maps below)

System 1

1. Enter the SEER of the air conditioner and the cost per KWHR. Example entry: if a KWHR costs 14 cents, enter .14
2. Under **Heating,** select type of heating system.
3. Enter the efficiency and fuel cost
   a. For **furnaces and boilers** enter the AFUE and cost per therm, 100 CCF or gallon
   b. For **heat pumps** enter the HSPF and cost [per KWHR
   c. For **electric heat** enter 1.00 and cost per KWHR

System 2

4. Enter the SEER of the air conditioner and the cost per KWHR. Example entry: if a KWHR costs 14 cents, enter .14
5. Under **Heating,** select type of heating system.
6. Enter the efficiency and fuel cost
   d. For **furnaces and boilers** enter the AFUE and cost per therm, 100 CCF or gallon
   e. For **heat pumps** enter the HSPF and cost [per KWHR
   f. For **electric heat** enter 1.00 and cost per KWHR

Payback and ROI

1. Enter the cost of the new or more efficient system and the cost of the less efficient system and any rebates.

Step1 | Step2 | Step3 | Basement | Room-by-Room | Duct Sizing | Manual S | Energy Cost/ROI

EMS HVAC Load Calculator

www.hvacloadcalculator.com

Action: Loaded Document:

Energy Cost Analysis

Heat Loss	37,592.10	Heating Degree Days	3326
Heat Gain	23,926.81	Cooling Degree Days	1840
Summer Design Temp	95	Summer Design Temp Diff	20
Winter Design Temp	20	Winter Design Temp Diff	50

System #1 (Old or less efficient system)

	Efficiency	Fuel Cost	
Air Conditioning	14	.11	276.73
Heating Heat Pump	8	.11	706.01
		Total annual operating cost of system 1	982.74

System #2 (Old or less efficient system)

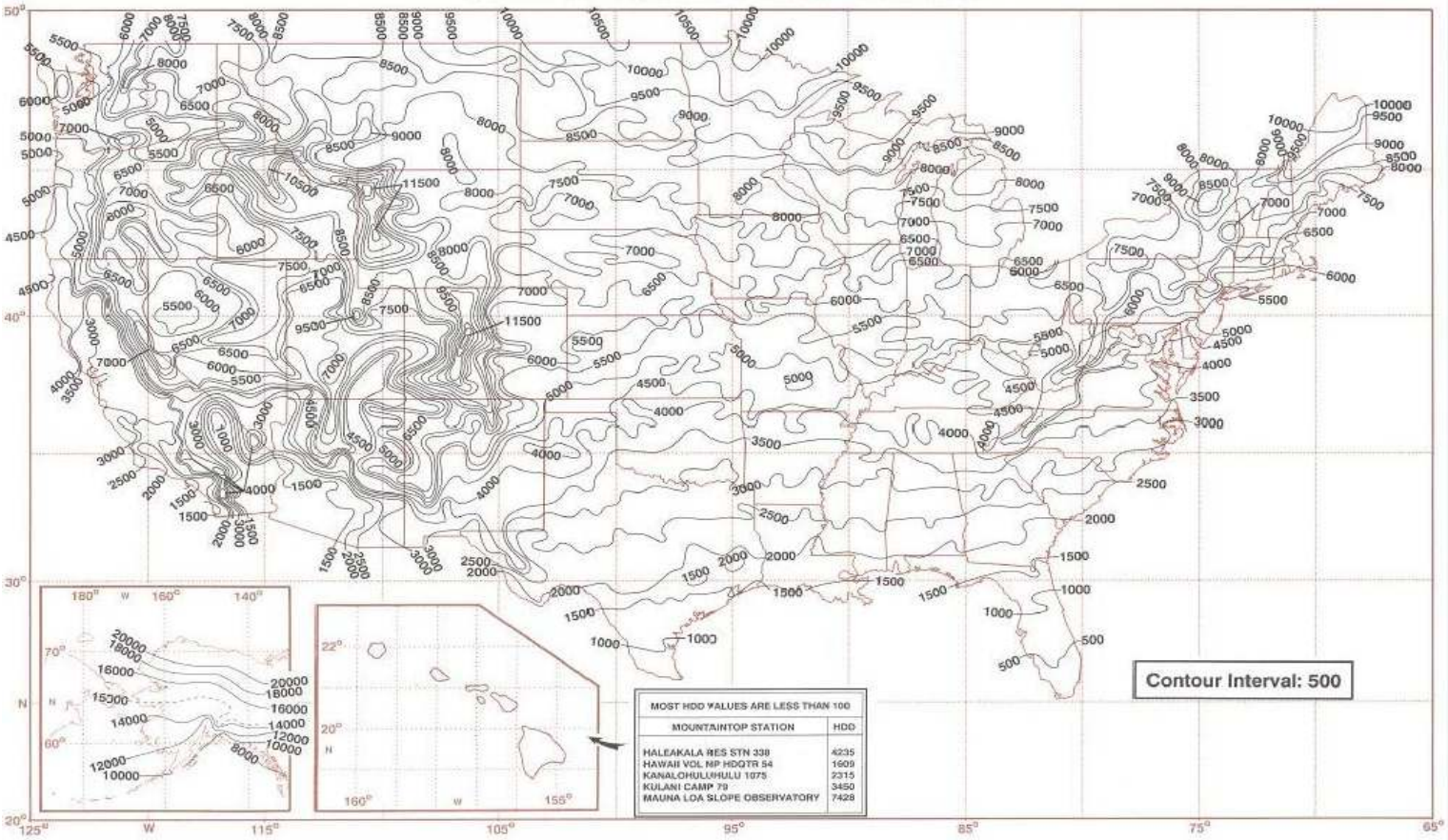
	Efficiency	Fuel Cost	
Air Conditioning	18	.11	215.23
Heating Heat Pump	10	.11	564.81
		Total annual operating cost of system 1	780.04

PAYBACK AND ROI

Cost of new or more efficient system	7230.00
Cost of less efficient system	6290.00
Rebates or credits	0
Additional Investment	940.00
Yearly Savings	202.70
Payback(Years)	4.64
Return on Investment (ROI)	21.56

ANNUAL HEATING DEGREE DAYS

BASED ON NORMAL PERIOD 1961-1990



ANNUAL COOLING DEGREE DAYS

BASED ON NORMAL PERIOD 1961-1990