

# Idaho Power Heating and Cooling Efficiency Program

## Heat Pump Sizing Worksheet



An IDACORP Company

This worksheet verifies that a heat pump has been sized to program requirements. A copy of this completed form or outputs from Manual J or equivalent must be submitted with the incentive application.

### Customer Information

Name (on account) \_\_\_\_\_ Daytime phone ( ) \_\_\_\_\_  
 Installation address \_\_\_\_\_ City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_

### Technician Information

Technician name \_\_\_\_\_ Technician HVAC license # \_\_\_\_\_  
 Company name \_\_\_\_\_ Company phone ( ) \_\_\_\_\_  
 Company address \_\_\_\_\_ City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_

### Instructions

All equipment must be properly sized using this sizing worksheet or program approved equivalent procedure (Manual-J, etc.) The unit installed must be within ½ ton of the dominant load. When performing the cooling load calculations, technicians must use the design conditions indicated on this worksheet.

Sizing Assumptions	
<b>Outside Dry Bulb Per Region</b>	
Region	Outside dry bulb
Boise, Nampa, Payette	94-100°F
Pocatello	90-96°F
Twin Falls	95-101°F
<b>Design Conditions For All Regions</b>	
ACH	pre-1970: Max .50; 1970-1980 .30 - .40; 1990 – present .20 - .30
Duct multiplier	1.0 for all ducts in basements; 1.10 - 1.20 for return only in attics; 1.20 - 1.30 for supply and return ducts in attics
Exterior shading	Must report orientation. Big trees and buildings should be .50
Manual-S	Must report latent and sensible capacity at design conditions

For each appropriate surface, use respective R-Value (insulation), orientation (windows) and door construction to calculate heating BTUs and cooling BTUs. Then, add the ACH multiplier, number of appliances/people, and duct multiplier based on the information in the above assumptions chart.

**Design Temperature Offset:** The numbers represented in this worksheet were calculated based on an exterior winter temperature of 9°F and a summer temperature of 95°F. If using other design condition temperatures, add the percentage in the Design Temperature Offset chart that corresponds to the new design condition temperature used to your Heat/Cool BTUs calculation.

Air Source Heat Pump Selection Chart (based on 30° F balance point)	Design Heat Loss Rate (Btu/hr)	HP Size (tons)
<p>For air-source systems, the Program recommends using the 30°F balance point chart in combination with the calculated heating load when sizing a heat pump to meet heating load.</p> <p>Circle the heat pump size that corresponds to the design heating load of the house. (You can choose lower balance points, if desired.)</p>	22500	2
	25000	2
	27500	2
	30000	2
	32500	2.5
	35000	2.5
	37500	3
	40000	3
	42500	3.5
	45000	3.5
	47500	3.5
	50000	4
	52500	4
	55000	4
	57000	5
	60000	5

# Heat Pump Sizing Worksheet

Surface	R-0 Heat	R-0 Cool	R-7 Heat	R-7 Cool	R-11 Heat	R-11 Cool	R-19 Heat	R-19 Cool	R-27 Heat	R-27 Cool	R-30 Heat	R-30 Cool	R-38 Heat	R-38 Cool	Heat BTUs	Cool BTUs
Vented Attics	21.5	20.3	6.8	5.6	4.9	4.0	2.9	2.4	2.1	1.7	2.0	1.6	1.6	1.3		
Unvented Attics	21.5	28.5	6.8	7.8	4.9	5.7	3.0	3.4	2.1	2.4	2.0	2.2	1.6	1.8		
Framed Walls	16.5	6.3			5.9	2.3	4.1	1.2								
Attic Knee Walls	19.0	20.3			4.9	4.0	3.0	2.4								
Masonry Walls	18.5	5.2	7.9	2.0	5.4	1.1	3.8	0.7								
Basement Walls extends five feet or less	20.4		5.1		2.7		2.4									
Basement Walls extends five feet or more	12.6		4.1		3.0		2.2									
Vented Floors - Crawlspace or over Garage	9.2	3.8			3.1	0.8	2.4	0.5			2.1	0.3				
Unvented floor Perimeter R0 walls	6.8	2.2			3.2	1.0	2.3	0.8			1.9	0.6				
Unvented floor Perimeter R7 walls	4.8	0.7			2.7	0.5	2.0	0.4			1.7	0.3				
Unvented floor Perimeter R11 walls	4.4	0.5			2.6	0.4	2.0	0.3			1.6	0.3				
Unvented floor Perimeter R19 walls	4.1	0.3			2.5	0.3	2.0	0.3			1.5	0.2				
Slab (lineal feet)																
Basement Slab (lineal feet)	56.4		28.6		26.2											
	30.6															

Window	North Heat	North Cool	North Cool Shade 50%	NE/ NW Heat	NE/ NW Cool	NE/ NW Cool Shade 50%	East/ West Heat	East/ West Cool	East/ West Cool Shade 50%	SE/SW Heat	SE/SW Cool	SE/SW Cool Shade 50%	South Heat	South Cool	South Cool Shade 50%	Heat BTUs	Cool BTUs
Single Pane U=1.27 SHGC=.75	77.5	39.6	39.6	77.5	70.9	55.3	77.5	95.6	67.6	77.5	86.2	62.9	77.5	59.2	49.4		
Double Pane U=.60 SHGC=.60	36.6	23.4	23.4	36.6	48.4	35.9	36.6	68.1	45.8	36.6	60.6	42.0	36.6	39.0	31.2		
Double Pane Vinyl U=.5 SHGC=.5	30.5	19.5	19.5	30.5	40.4	29.9	30.5	56.8	38.1	30.5	50.5	35.0	30.5	32.5	26.0		
Double Pane U=.35 SHGC=.35	21.4	13.6	13.6	21.4	28.3	20.9	21.4	39.8	26.7	21.4	35.4	24.5	21.4	22.8	18.2		

Single Pane U=1.27 SHGC=.75	77.5	39.6	39.6	77.5	70.9	55.3	77.5	95.6	67.6	77.5	86.2	62.9	77.5	59.2	49.4		
Double Pane U=.60 SHGC=.60	36.6	23.4	23.4	36.6	48.4	35.9	36.6	68.1	45.8	36.6	60.6	42.0	36.6	39.0	31.2		
Double Pane Vinyl U=.5 SHGC=.5	30.5	19.5	19.5	30.5	40.4	29.9	30.5	56.8	38.1	30.5	50.5	35.0	30.5	32.5	26.0		
Double Pane U=.35 SHGC=.35	21.4	13.6	13.6	21.4	28.3	20.9	21.4	39.8	26.7	21.4	35.4	24.5	21.4	22.8	18.2		

Single Pane U=1.27 SHGC=.75	77.5	39.6	39.6	77.5	70.9	55.3	77.5	95.6	67.6	77.5	86.2	62.9	77.5	59.2	49.4		
Double Pane U=.60 SHGC=.60	36.6	23.4	23.4	36.6	48.4	35.9	36.6	68.1	45.8	36.6	60.6	42.0	36.6	39.0	31.2		
Double Pane Vinyl U=.5 SHGC=.5	30.5	19.5	19.5	30.5	40.4	29.9	30.5	56.8	38.1	30.5	50.5	35.0	30.5	32.5	26.0		
Double Pane U=.35 SHGC=.35	21.4	13.6	13.6	21.4	28.3	20.9	21.4	39.8	26.7	21.4	35.4	24.5	21.4	22.8	18.2		

Single Pane U=1.27 SHGC=.75	77.5	39.6	39.6	77.5	70.9	55.3	77.5	95.6	67.6	77.5	86.2	62.9	77.5	59.2	49.4		
Double Pane U=.60 SHGC=.60	36.6	23.4	23.4	36.6	48.4	35.9	36.6	68.1	45.8	36.6	60.6	42.0	36.6	39.0	31.2		
Double Pane Vinyl U=.5 SHGC=.5	30.5	19.5	19.5	30.5	40.4	29.9	30.5	56.8	38.1	30.5	50.5	35.0	30.5	32.5	26.0		
Double Pane U=.35 SHGC=.35	21.4	13.6	13.6	21.4	28.3	20.9	21.4	39.8	26.7	21.4	35.4	24.5	21.4	22.8	18.2		

# Heat Pump Sizing Worksheet

Total from Page 1

	Heat BTUs	Cool BTUs

SQ. Feet	North Heat	North Cool	NE/NW Heat	NE/NW Cool	East/West Heat	East/West Cool	SE/SW Heat	SE/SW Cool	South Heat	South Cool
<b>Sky Lights</b>										
Single Pane	83.57	62.19	83.57	93.48	83.57	118	83.57	108.7	83.57	81.73
Double Pane	45.14	38.43	45.14	65.96	45.14	87.65	45.14	79.36	45.14	55.63

	Heat BTUs	Cool BTUs

SQ. Feet	Heat	Cool
<b>Doors</b>		
Wood Doors	20.67	11.11
Insulated Doors	15.37	8.265

	Heat BTUs	Cool BTUs

Air Changes/hour (ACH)	Heat (0.2)	Cool (0.2)	Heat (0.3)	Cool (0.3)	Heat (0.4)	Cool (0.4)	Heat (0.5)	Cool (0.5)	Heat (0.6)	Cool (0.6)	Heat (0.7)	Cool (0.7)	Heat (0.8)	Cool (0.8)
(Select ACH based on vintage indicated in the sizing assumptions.)	1.6	0.5	2.4	0.8	3.2	1.1	4.0	1.3	4.8	1.6	5.6	1.8	6.4	2.1

	Cool BTUs

	Cool
<b>Number of appliances</b>	Add 1,200 BTUs per appliance for cooling only
<b>Number of people</b>	Add 300 BTUs per person for cooling only

	Heat BTUs	Cool BTUs

Sub Total

	Heat BTUs	Cool BTUs

Duct Heat Loss/Heat Gain	Heat	Cool	Heat	Cool	Heat	Cool
	All ducts in basement		Return only in attic		Supply and return in attic	
	1.0	1.0	1.10	1.10	1.20	1.30
Duct Multiplier	1.0		1.10		1.30	
Multiply subtotal by appropriate multiplier.						

	Heat BTUs	Cool BTUs

Design Temperature Offset °F	Heat 8°F	Cool 96°F	Heat 7°F	Cool 97°F	Heat 6°F	Cool 98°F	Heat 5°F	Cool 99°F	Heat 3°F	Cool 100°F	Heat 1°F	Cool 110°F	Heat -6°F
See instructions on page 1. Multiply post duct heat loss/heat gain by appropriate multiplier.	1.015	1.015	1.03	1.03	1.045	1.045	1.06	1.06	1.09	1.075	1.105	1.12	1.21

	Heat BTUs	Cool BTUs

Total