

WHOLE-HOUSE HEAT LOSS & GAIN WORKSHEET

PRELIMINARY ESTIMATE

Homeowner Name _____ Phone Number _____
 Address _____ Zip _____

DESIGN CONDITIONS

WINTER: Inside Design Temperature _____ minus Outside Design Temperature _____ = Heating Temperature Difference _____ (1)
 SUMMER: Outside Design Temperature _____ minus Inside Design Temperature _____ = Cooling Temperature Difference _____

TABLE A - HEATING - WINDOWS & DOORS

Window Type		Factor	x Area	=BTUH Loss
Obl. Hung Casement Or sliding	Single Glass	1.5		
	Double Glass	.9		
	Triple Glass	.7		
Fixed	Single Glass	1.4		
	Double Glass	.9		
	Triple Glass	.6		
Basement or Jalousie, w/storms		2.2		
Sliding Doors - Double Glass		2.0		
Other Doors w/storms		1.3		
TOTAL				

TABLE B - COOLING - WINDOWS & DOORS

Direction	Outdoor Design Temperature and BTUH/Square Foot												x Area	=BTUH Gain
	Single Glass				Double Glass				Triple Glass					
	90	95	100	105	90	95	100	105	90	95	100	105		
N or shaded	20	25	30	35	15	20	20	25	10	15	15	20		
NE & NW	35	40	45	55	30	35	35	40	25	25	30	30		
E & W	55	55	60	70	45	50	50	55	35	40	40	45		
SE & SW	45	50	55	60	40	40	45	45	30	30	35	40		
S	30	30	35	45	25	25	30	30	20	20	20	25		
Doors (Sliding glass doors treated same as windows)											15			
TOTAL														

CONSTRUCTION DATA		HEATING		COOLING	
DESCRIPTION	SQ. FT.	U Factor (3)	BTUH Loss	Cooling Factor (3)	BTUH Gain
Gross Walls					
Gross Walls					
Windows & Doors (From Table A or B)					
Net Walls					
Net Walls					
Ceiling					
Floor					
People (Assume two per bedroom)				300	
Appliances (Kitchen Load)					1200
Sensible Total					
Design Temp. Diff. For Heating Latent Load Factor for Cooling			X (1)		X1.3
SUB TOTAL LOSS/GAIN					
DUCT LOSS/GAIN MULTIPLIER (2)			X1.15		X1.10
TOTALS		Heating		Cooling	

- (1) Multiply heating design temperature difference by total of heat loss shown on Sensible Total line.
- (2) Calculate only if duct is in unconditioned space. Assume minimum 2" flexible or 1" rigid insulation.
SEE ACCA Manual J Tables 3 & 6 for other multipliers.
- (3) Use factors from Table C on back. Additional factors can be obtained from ACCA Manual J.

***This worksheet is not recommended for a room-by-room calculation, which is necessary for proper duct design.**

CALCULATION PROCEDURE	A.C.C.A I.D. No.	CONSTRUCTION DATA (See ACCA Manual J for Additional Factors)	HEATING U Factor BTUH Per °F Temperature Difference	COOLING Outdoor Design Temperature and BTUH Per Square Foot				
				90	95	100	105	
<p>1. For reference purposes, record customer's name, address and phone number in the spaces provided.</p> <p>2. Record inside and outside design temperatures in the spaces provided and calculate the temperature differences Use local code or practices or ACCA Manual J* as a guide.</p> <p>3. Measure total area of windows and doors and record for each construction in Tables A and B. Total area at the bottom of Table A should equal total area at the bottom of Table B. Multiply each area by its appropriate factor.</p> <p>4. Find gross wall area by multiplying total length of exposed walls by ceiling height. Use more than one line, if needed, for different types of wall construction. Record on gross wall line in sq. ft. column of Construction Data.</p> <p>5. Subtract total Windows and Doors area from Gross Wall area. Record under Net Walls.</p> <p>6. Record exposed ceiling area.</p> <p>7. Record exposed floor area. If floor is concrete slab or floor of heated crawl space, record linear feet of exposed perimeter.</p> <p>8. Select proper heat transfer multipliers from Table C (additional U factors for heating can be obtained from ACCA Manual J, Table 2, by using the 100° temperature difference column in the manual and dividing by 100. This represents the U factor. Cooling factors can be obtained directly from Tables 4 and 5 of Manual J. Record factors in their proper columns.</p> <p>9. Multiply area by their factors and enter in the BTUH loss and BTUH gain columns.</p> <p>10. Record number of people (usually based on 2 people per bedroom) and multiply by 300. Enter total in BTUH gain column.</p> <p>11. Total the BTUH loss and gain columns and record as sensible total. Heat loss total represents loss per degree temperature difference. Heat gain total represents entire sensible load not including latent load (moisture removal).</p> <p>12. Multiply heat loss by design temperature difference that you selected as your Design Condition for heating. Multiply heat gain by 1.3 latent heat factor. Record on Sub-Total line.</p> <p>13. If a large percentage of ductwork is not in the conditional space, multiply the BTUH Loss and Gain Sub-Totals by the duct loss/gain factors. This becomes your total BTUH HEAT LOSS AND HEAT GAIN for equipment selection.</p>	10a	WALLS Wood Frame with sheathing and siding, veneer or other exterior finish. a) No insulation b) R-5 insulation (1"-1 ½") c) R-7 insulation (2") d) R-11 insulation (3") e) R-19 insulation (6")	.30	6	8	10	11	
	10b		.11	3.5	4.5	5.5	7	
	10c		.10	3	3.5	4.5	5.5	
	10d		.07	2.5	3	4	5	
	10g		.04	1.8	2.4	3	3.9	
	12a	Solid Masonry, Blocks, Brick plus Heated Basement or Crawl Space. a) Above Grade, no insulation b) R-5 insulation (1" - 1 ½") c) Below grade, with/without insulation	.40	9	11	14	17	
	13c		.14	3.5	5	6	7	
	13g		.06	0	0	0	0	
	14a	CEILINGS Under unconditioned space or vented attic. a) No insulation b) R-5 insulation (1"-1 ½") c) R-11 insulation (3") d) R-19 insulation (6") e) R-33 Insulation (9") f) R-38 Insulation (12") g) Under conditioned room	.70	10	11	12	14	
			.15	4	4	4.5	5	
			.10	2.5	3	3	3.5	
			.05	1.5	2	2	2.5	
			.03	1.1	1.2	1.3	1.5	
.025			.9	1.1	1.2	1.3		
.30			3.5	3.5	4.5	5.5		
17a	FLOORS Wood Frame a) One unconditioned room b) Over open space or garage, no insul. c) R-5 insulation (1"-1 ½") d) R-7 insulation (2") e) R-11 insulation (3") f) R-19 insulation (6") g) Over basement (more than 4' below grade)	.14	2.5	3.5	5	6		
		.28	3.5	5	7	8.5		
		.15	2.3	3.3	4.5	4.5		
		.09	1	1.5	2	2.5		
		.07	.5	1	1.5	2		
		.04	.5	1	1	1.5		
		0	0	0	0	0		
		.03	0	0	0	0		
		20a	Basement Floor Concrete slab, unheated, (BTUH per foot or perimeter) a) No edge insulation b) R-5 insulation (1") c) R-11 insulation (2")	.80	0	0	0	0
				.60	0	0	0	0
.50	0			0	0	0		
21a	Concrete slab, heating ducts in perimeter (BTUH per foot) a) No edge insulation b) R-5 insulation (1") c) R-11 insulation (2")	2	0	0	0	0		
		1.5	0	0	0	0		
		1	0	0	0	0		
22a	Floor of heated crawl space a) Less than 18" below grade b) 18" of more below grade	.80	0	0	0	0		
		.50	0	0	0	0		
Note: Factors are based on 75 F Indoor Temperature. *NOTE: Since this worksheet has been designed to be compatible with ACCA Manual J, it is recommended that you obtain a copy of this manual from the Air Conditioning Contractor Association (ACCA), 1228 17 th Street NW., Washington, D.C., 20036. Manual J can be used as a study guide for this worksheet.								