

RHVAC OVERVIEW

The Elite Software RHVAC Program quickly and accurately calculates peak heating and cooling loads for residential buildings and some light commercial applications in accordance with ACCA Manual J, D, and S. RHVAC includes a complete ACCA Manual D duct sizing capability and a complete Manual S equipment selection. Data can be manually entered or automatically taken from a floor plan drawn with the optional Drawing Board program. The Heat Transfer Multipliers (HTM values) for all the walls, windows, doors, and roofs listed in Manual J are automatically looked up by the program as needed. Although HTM values are taken from Manual J directly, the user does have the option of entering his own U-Value for each wall, roof, or glass section so that a modified HTM value is used. Additional construction materials are easily added as well. Design weather data for over 2,000 cities is built into the program. In addition, the user can revise the existing weather data and add more data as desired. Drag and drop zoning control is provided through the powerful and graphic Project Explorer feature of RHVAC. Zoning cfm adjustments are automatically handled by the program as needed. RHVAC also calculates the size of the runout ducts and the main trunk duct. Equipment can be selected from the AHRI databases that are included with RHVAC. Comprehensive reports list the general project data, equipment information, a sales proposal, total building load summary, detailed room load calculations, and a room load summary for each zone and system complete with heating and cooling cfm values. Color graphic bar graphs and pie charts can be printed as well. A load preview window shows room, zone, system and building totals as data is entered. Other outstanding features include glass shading, ventilation air, equipment loads, default room data, complete rotation and flip plan rotation of the entire building, and the ability to share data with graphic Manual D Ductsize, Bill of Materials, Energy Audit, Proposal Maker, *EnergyPro*, *Energy Gauge*, *REM/Rate*, and *ResCheck*.

SYSTEM REQUIREMENTS

RHVAC will run on any computer with Windows XP or higher, including Windows 10. *Works great on Windows 10 tablets!*

RHVAC FEATURES

- ACCA Approved Manual J, D, and S
- Quickly Calculates Peak Heating and Cooling Loads
- Calculates Duct Sizes and Total System Pressure Drop
- ACCA Manual S Equipment Certification Report
- Links to AHRI Web Site for AHRI Reference # Certification
- Creates Basic Sales Proposals and Links to **Proposal Maker**
- Calculates from Floor Plans created by **Drawing Board**
- Links with Graphic Manual D Ductsize and **Bill of Materials**
- Computes Room by Room, Zone, System, and Building
- *Includes Modern Materials such as SIPS and Spray Foam*
- Calculates Hydronic Radiant Floor Tubing Length Required
- *Links to EnergyPro, ResCheck, Energy Gauge, & REM/Rate*
- Comprehensive User Manual and Tutorial Provided
- Easy to Use with **Built-in Instruction Videos and Tutorials**
- *No Copy Protection Hassles - No Annual Fees!*

NEW Features in RHVAC Version 9

RHVAC version 9 includes all the above features plus the new features below that were not in RHVAC version 8.

- **Manual S Equipment Selection**
- **Manual D Ductsize** window allows you to enter all duct sections and fittings for calculating optimal duct sizes and total system pressure losses
- **Zoning Analysis** using new hourly room net gain report plus cooling and heating percentages printed per room
- **EnergyPro** Analysis software link
- **ACCA Design Review Form** for quality installations
- **New Equipment Load Selections Including Pool and Spas**
- **Sloped Ceiling Area Calculator**

CALCULATION METHOD

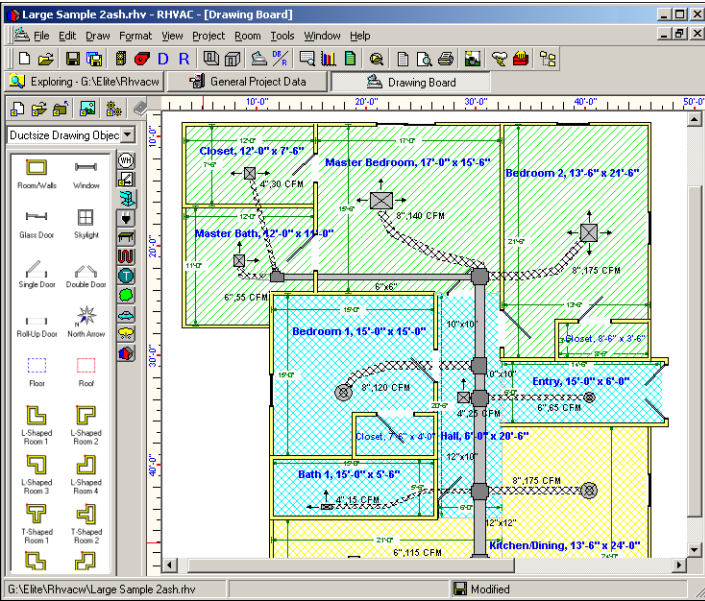
Elite Software is an ACCA Technical Partner. The RHVAC program is ACCA (Air Conditioning Contractors of America) approved and follows the procedures described in the ACCA Manual J 8th (MJ8) edition version 2.5 and the most current ACCA Manual D and ACCA Manual S.

PROGRAM INPUT

Data can be entered manually into RHVAC using simple “fill in the blank” screens or it can be automatically loaded from a drawing created with Elite Software’s optional **Drawing Board** program. All input data is checked as it is entered. Two types of data are requested: general project data and specific room data. The general project data includes the summer and winter design conditions, the outside air requirements, exterior shading and overhang data, the project name, the client name, and the designer name. The room input data includes specific information on the roof, walls, doors, and windows as well as general information on the room name, the number of occupants, and the equipment, lighting, and appliance loads. Help is provided on all inputs.

DEMONSTRATION VERSION

If you would like to evaluate RHVAC in further detail, you can **download free of charge** a functional demo of RHVAC from Elite Software’s website, www.elitesoft.com



Equipment Data - System 1 - Main Floor

Cooling

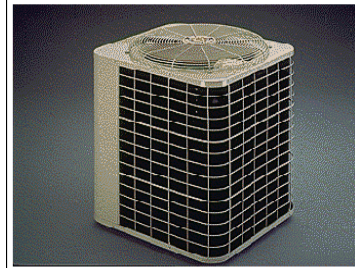
System Type: Standard Air Conditioner
 Outdoor Model: QC-C12
 Indoor Model: S12
 Tradename: Quikcool AS Series
 Outdoor Manufacturer: Quikcool HVAC Manufacturing
 Indoor Manufacturer: Quikcool Coils
 Description: 12.4
 Nominal Capacity: 12000
 Adjusted Capacity: 17529
 Adjusted Sensible Capacity: 14803
 Adjusted Latent Capacity: 2727
 Efficiency: 12.4 SEER



Heating

System Type: Natural Gas Furnace
 Model: QC-F38-E78-G
 Tradename: Quikcool FE Series
 Manufacturer: Quikcool HVAC Manufacturing
 Description: 78.3
 Capacity: 38000
 Efficiency: 78.3 AFUE

Cooling Equipment Picture



Heating Equipment Picture



System 1 Room Load Summary

Room No	Room Name	Area SF	Htg Sens Btuh	Min Htg CFM	Run Duct Size	Run Duct Vel	Clg Sens Btuh	Clg Lat Btuh	Min Clg CFM	Act Sys CFM
--Zone 1--										
1	Living Room	210	12,456	164	7.7	-	6,193	779	285	285
2	Kitchen	120	4,340	57	7	-	3,030	708	139	139
3	Bedroom	225	9,129	120	6.6	-	3,467	1,298	159	159
Duct Latent								108		
Return Duct		1,041					945	260		
System 1 total		555	26,966	340			13,634	3,152	583	583

System 1 Main Trunk Size: 12 in
 Velocity: 742 ft/min
 Loss per 100 ft.: 0.069 in.wg

Duct size results above are from Manual D Ductsize.
 Runout duct velocities are not printed with duct size results from Manual D Ductsize since they can vary within the room.
 See the Manual D Ductsize report for duct velocities and other data.

Cooling System Summary

	Cooling Tons	Sensible/Latent Split	Sensible Btuh	Latent Btuh	Total Btuh
Net Required:	1.40	81% / 19%	13,634	3,152	16,786
Recommended:	1.48	77% / 23%	13,634	4,072	17,706
Actual:	1.00	77% / 23%	9,240	2,760	12,000

Manual S Performance Data - System 1 - Main Floor

Cooling Loads and Design Conditions

Outdoor Dry Bulb:	95	Sensible Gain:	13,634
Outdoor Wet Bulb:	75.22	Latent Gain:	3,152
Indoor Dry Bulb:	75	Total Gain:	16,786
Indoor RH:	50	Load SHR:	0.81
Elevation:	308	Supply Airflow:	583
Latitude:	40	Entering Dry Bulb:	76.5
Altitude Factor:	0.99	Entering Wet Bulb:	63.1

Equipment Performance Data at System Design Conditions

Standard Air Conditioner Model: QC-C12-S12, Nominal Capacity: 12,000

Entered Interpolation Data:

EWB °F	Air Flow CFM	ODB °F	Total Capacity MBtuh	Power Input kW	EDB 75 °F		EDB 80 °F	
					S/T	Sensible Capacity MBtuh	S/T	Sensible Capacity MBtuh
60	600	95	17.5	2.1	0.84	14.7	0.85	14.875
65	650		18.1	2.4	0.87	15.747	0.88	15.928
60	600		17.4	2.12	0.83	14.442	0.85	14.79
65	650		17.8	2.42	0.86	15.308	0.89	15.842

Interpolation Results:

	Load	Percent of Load
Sensible Capacity:	14,803	109%
Latent Capacity:	2,727	86%
Total Capacity:	17,529	104%
Power Input:	2.17	

Manual S Performance Data

Total Building Summary Loads

Component Description	Area Quan	Sen Loss	Lat Gain	Sen Gain	Total Gain
1G-cm-s: Glazing-Double pane with storm, clear, metal frame no break, u-value 0.55, SHGC 0.62	21	831	0	483	483
1G-cm-s: Glazing-Double pane with storm, clear, metal frame no break, external shade screen coefficient of 0.25 and 100% coverage, u-value 0.55, SHGC 0.62	42	1,663	0	1,171	1,171
1A-cw-o: Glazing-Single pane, operable window, clear, wood frame, u-value 0.9, SHGC 0.84	4	259	0	177	177
9Bc-sw: Glazing-Skylight, Dome double pane clear plastic, transmittance = 0.87, small curb, wood sash, wood curb, no insulation, plywood shaft, no insulation, with a tilt angle of 30°, u-value 0.88, SHGC 0.52	12	760	0	1,707	1,707
1C-cm: Glazing-Single pane window with storm, clear, metal frame no break, light color drapes with medium weave with 100% coverage, u-value 0.87, SHGC 0.67	24	1,504	0	644	644
11F: Door-Wood - Solid Core With Metal Storm	21	423	0	182	182
12B-4sw: Wall-Frame, R-11 insulation in 2 x 4 stud cavity, R-4 board insulation, siding finish, wood studs	241	1,267	0	431	431
12B-0sw: Wall-Frame, R-11 insulation in 2 x 4 stud cavity, no board insulation, siding finish, wood studs	479	3,344	0	1,352	1,352
16CR-19-ad: Roof/Ceiling-Under Attic with insulation on Attic Floor (also use for Knee Walls and Partition Ceilings), vented attic with radiant barrier, R-19 insulation, dark asphalt	543	1,916	0	1,198	1,198
22C-10ph: Floor-Slab on grade, Horizontal board insulation extends 4' under slab, any floor cover, R-10 insulation, passive, heavy moist soil	35	3,077	0	0	0
20P-13-c: Floor-Over open crawl space or garage, Passive, R-13 blanket insulation, carpet covering	120	588	0	122	122
20P-13-v: Floor-Over open crawl space or garage, Passive, R-13 blanket insulation, vinyl covering	225	1,102	0	230	230
Subtotals for structure:		16,734	0	7,697	7,697
People:	5		1,000	1,150	2,150
Equipment:			800	1,500	2,300
Lighting:	0			0	0
Ductwork:			367	2,401	2,768
Infiltration: Winter CFM: 78, Summer CFM: 41		6,086	985	886	1,871
Ventilation: Winter CFM: 0, Summer CFM: 0		0	0	0	0
Total Building Load Totals:		26,966	3,152	13,634	16,786

Check Figures

Total Building Supply CFM:	583	CFM Per Square ft.:	1.051
Square ft. of Room Area:	555	Square ft. Per Ton:	376
Volume (ft³) of Cond. Space:	4,440		

Building Loads

Total Heating Required Including Ventilation Air:	26,966 Btuh	26,966 MBH
Total Sensible Gain:	13,634 Btuh	81 %
Total Latent Gain:	3,152 Btuh	19 %
Total Cooling Required Including Ventilation Air:	16,786 Btuh	1.40 Tons (Based On Sensible + Latent)
		1.48 Tons (Based On 77% Sensible Capacity)

Notes

Rhvac is an ACCA approved Manual J and Manual D computer program.
 Calculations are performed per ACCA Manual J 8th Edition, Version 2, and ACCA Manual D.
 All computed results are estimates as building use and weather may vary.