

MANUFACTURER CAPACITY CALCULATORS		
	DOWNLOAD LINK	ACCOUNT REQUIRED
CARRIER	Ecat program available for download see your dealer	YES
	http://rpmob.wrightsoft.com/	NO
	http://www.adpnow.com/extratings/	NO
LENNOX	See Below ADP/ Lennox or Dave.Net for Lennox/Lennox	
BRYANT	Ecat program available for download see your dealer	YES
	http://rpmobbry.wrightsoft.com/	NO
	http://www.adpnow.com/extratings/	NO
RHEEM	http://www.wrightsoft.com/rheem/downloads.aspx	NO
	http://www.adpnow.com/extratings/	
RUUD	http://www.wrightsoft.com/ruud/index.asp	NO
GOODMAN	Wrightsoft Internal only	
YORK	CONTACT YOUR TERRITORY MANAGER OR DOUG MCLEISH - d.mcleish@us-ac.com(UST Program)	NO
	http://www.adpnow.com/extratings/	NO
AMANA	Wrightsoft Internal only	YES
AMERICAN STANDARD	WWW.ASDEALERNET.COM	YES
ICP CALCULATOR	http://www.arboroaks.com/ICP/eqp/Index.htm	NO
	http://www.adpnow.com/extratings/	
TRANE	https://www.comfortsite.com	YES
ADP CALCULATORS - VARIOUS OEM (Carrier, Lennox, Armstrong, York)	http://www.adpnow.com/extratings/	NO
DAY & NIGHT	http://www.arboroaks.com/ICP/eqp/Index.htm	NO
ARMSTRONG	http://www.adpnow.com/extratings/	NO
NORDYNE	http://www.adpnow.com/extratings/	NO

Manual J, D & S - Frequently Asked Questions for Connecticut

Q: Why do I need to perform a load calculation (Manual J) for a Replacement System?

A: For several reasons; buildings are improved over time (i.e. windows, insulation, and weatherization), equipment selection and system types have an impact on loads and it is unlikely a load calculation with the current sensitivities was ever performed. The load calculation is a requisite requirement for equipment selection in the Manual S process.

Q: When do I perform a Block Load versus a Room-by-Room Load calculation?

A: A block load may be performed on an existing house with an existing distribution system (for the given system type). In any case where the distribution system is being modified, added, or newly installed then a Room-by-Room procedure is required before the equipment is selected and any distribution system installed.

Q: Can I use an online load calculator tool for Manual J?

A: Code requires you to perform a load calculation using the procedures in Manual J-8. Version 8 is much more refined than previous versions and has particular sensitivities for duct locations and loads as well as window gains. The Air Conditioning Contractors of America (ACCA) has a list of software vendors who have software that is approved to perform the load calculations. All of the online calculators that have been reviewed to date do not meet the Manual J-8 capabilities; therefore you may not use them for your load calculations.

Q: Do I need to perform load calculations for Ductless Mini-Split systems?

A: YES. Be forewarned that many of the mini-split OEM's are not currently producing the engineering documentation to perform Manual S calculations correctly. Given the typical configuration of most mini-split systems using surface mounted air terminals and all of Connecticut having an outdoor design temperature below the AHRI rating temperature of 95°F, the selected system will probably have capacity in excess of its rated value. Since the surface mounted air terminals have a performance advantage of not using a ducted distribution system, there is no reason to select a system with more capacity than the given load.

Q: How do I perform a Manual J load calculation for a Ductless Mini-split system if there aren't any ducts?

A: Most Manual J load calculation software assumes you are using ducted distribution systems. Manual J-8 compliant software is required to perform more accurate duct load calculations than the outdated (and retired) Manual J-7 methods; however there isn't a "No-Ducts" option in most of the software. In

order to get the correct load calculation, you must therefore set the ducts as being “In the Conditioned Space” for both the supply and return. This basically turns off the duct calculations in the software.

Q: Can I use a Ductless Mini-Split Heat Pump as the primary heating system in a home?

A: Code requires all heat pumps to be sized to the cooling load. Code also requires that 100% of the calculated heating load is covered at design conditions. For most heat pumps, this means the size you can select will likely be short on meeting the total heating requirements of the home and therefore must provide a supplemental system to cover the balance. If your mini-split system has variable refrigerant flow technology, then you may oversize the system by 30% of cooling. If the result of this means the system has enough heating capacity to meet the heating load, then a supplemental system is not required. This situation is only likely to happen in a very well insulated and sealed home.

Q: I am installing a radiant panel heating system and have software from an OEM that performs the loads and tubing design. Can I use that for my Manual J documentation?

A: This is a bit tricky: the short answer is yes, but you will also need to use a Manual J-8 compliant software package to calculate the loads. Some radiant design packages allow you to enter the loads and dimensions for a given room to calculate the tubing layout (without entering in all the building components). Therefore you can use your results from an approved Manual J-8 software package to get the respective room heating loads for the radiant software. You should also be aware that several of the Manual J-8 software suites are also capable of designing radiant systems. If there is any cooling you will also need use the Manual J-8 software anyway, so there is almost no additional effort to get both heating and cooling calculations at the same time.

Q: What is Manual S? Can't I just replace the old system with a new system of the same capacity?

A: Manual S is the process of determining the capacity of candidate equipment for a given load at the local design conditions. This process adjusts equipment capacity for the given local altitude, outdoor air and return duct loads (entering coil). The adjusted capacity may be significantly different than its nominal rated capacity. Return duct (entering coil) loads are the combination of heat transfer through the duct walls, leakage through seams, intentional ventilation introduced into the return duct before the coil and in some cases fan heat (add-on coils).

You cannot just install a new system because the required CFM may be significantly different; many older systems had lower CFM requirements for their respective capacity, therefore the designer needs to ensure the any existing ducts can support the candidate new equipment.

In order to perform a Manual S procedure, you will need to determine the Entering Coil loads (either in Manual J software, or spreadsheet and psychrometric chart) and using the local design conditions plot these on an OEM performance table – or better yet, use one of the available online OEM capacity calculators. There are only a few OEM's who do not have a contractor-based online equipment selection tool that lets you enter the coil conditions and outdoor conditions to calculate capacity for a candidate system.

There is also the issue of using third-party coils. Unfortunately many third-party OEM's do not provide extended performance tables (as required by AHRI), or other calculators to actually determine their capacity (and other performance indicators) at your design conditions. Because of this, you may be required to contact OEM's to get custom performance calculations in order to meet Manual S requirements when using a third-party coil. We currently know of one third-party coil OEM that has a spreadsheet-based calculator.

Q: Is there a simple chart on the Manual S sizing requirements?

A: There is an entire chapter and several charts with explanations in Manual S. For your convenience, here is a boiled-down summary chart (for Connecticut):

General Cooling Capacity Factors			
Equipment Tested and Rated by AHRI	Single Speed Compressors	Multi/Variable Speed Compressors	GWHP
Total Maximum sizing factor	1.15	1.20 (multi), 1.30 (variable)	1.25(single), 1.30(multi), 1.35(variable)
Latent	Minimum = 1.0 (may go to 1.50 or higher if needed to meet sensible minimum)		
Sensible	Minimum = 0.90		
General Heating Capacity Factors			
Minimum	1.0		
Maximum	1.4 (up to 2.0 allowed)		

Q: Do I need to perform a Duct Design (Manual D) on existing systems?

A: NO. A duct design (Manual D) is only required when the distribution system is being initially installed or modified (extended) to serve a new space (i.e.: addition).

Q: Can I hire a third-party to perform my calculations?

A: YES, however you are still responsible for ensuring it is done correctly, therefore you must ensure the designer has all the pertinent information to perform such engineering. To help illustrate this, a designer needs a full set of building drawings (not just floor plans) to determine ceiling heights, slopes, overhangs, knee-walls and other features needed as inputs.

Q: Am I required to perform Infiltration or Duct Leakage testing on existing homes and duct systems?

A: The short answer is "NO" providing the duct system is not being extended, modified or replaced, however performing such tests will provide a much higher level of engineering and may provide insight and opportunity to an comfort or energy issues in the building.

Q: How much time will it take me to do all these calculations?

A: This of course depends on the complexity of the house, your proposed solution and your experience in using the various design tools available. A typical house will require 2 to 3 hours to perform a full set of Manual J, S & D calculations and produce documentation. A simple replacement can take less time.

Q: How can I provide customer quotes if I have to do a load calculation and equipment selection engineering?

A: Contractors who are already doing this often provide a menu of quotes for different equipment combinations subject to final engineering upon a contract. There are also contractors who do a home survey and perform a quick block load to get into the ballpark to provide a tighter group of quote options.

Q: I just did a load calculation and it works out to 1,283 square feet per ton. I was told cooling equipment should come in around 500 square feet per ton. How can this be?

A: Equipment capacity requirements are highly sensitive to window types and shading, including overhangs, building infiltration and duct location, R-value and leakage class. A house with average ducts located in an attic may need ½ to 1 ton or more Air Conditioning capacity than the same house where the ducts are located in the basement. This one parameter alone (duct location) is just one example of why it is important to perform a load calculation for each building. Once you've start doing more calculations you will quickly find most houses range from 700 to 1,200 square feet per ton!

Q: Where can I get help with performing load and equipment engineering?

A: There are many resources. First the software suite you are using most likely has many online videos to help you with using their software to perform a particular task. Check with your local electric utility to see if they have any programs that deal with HVAC design. Local community college or technical career schools may offer some curriculum on the subject. Suppliers often host or sponsor training. Check with the Air Conditioning Contractors of America (ACCA) to see what courses they may be offering (you do not need to be a member). You might also check in with your local trade organization(s) on hosting a class or mechanism to provide training and support. Check with colleagues (distant competitors) if they have any experience with the software or methods you are using.

Q: Do I need to own the ACCA Manuals (J, S & D) to do the engineering calculations?

A: If you are using software to perform the calculations, the manuals will not help you to use the software interfaces directly, but they will provide the background reference in case you want to know what the underlying calculations and procedures are. With that said, Manuals S & D are much more practical, and if you want or need to see examples on how to select equipment for different situations, or how to do duct designs manually (which really isn't hard), then these are the two documents we would suggest you start with.

Q: My load calculation software shows recommended tons. Is this the same as Manual S?

A: No unfortunately not. You need to select equipment with airflow and capacity that meets the design loads. The recommended tons method uses the Sensible Heat Ratio to calculate capacity. This method doesn't adjust for entering duct conditions or actual airflow available for a system.

Q: Can I reduce the indoor cooling design temperature – my customer wants the house to cool to 72 degrees?

A: Short answer is no. Your customer just gave you an important clue about the existing system and conditions: the house has excess humidity, and the customer is turning down the set point to make the system run longer to remove the moisture. Reducing the indoor design temperature is actually counter-productive for achieving the desired comfort a modern cooling system is intended to provide.

Q: What software can I use to perform load calculations?

A: Here is a list of the currently approved (ACCA) software products available at the time of this printing:

Software Vendor and Software Title	Website
AdTek AccuLoad (Manual J) and AccuDuct (Manual D)	http://www.adteksoft.com/
Avenir LoopCAD (Radiant) and HeatCAD	http://www.avenir-online.com/
Caramel Software HVAC ResLoad-J for iPad	http://www.carmelsoft.com/
Elite Software RHVAC	http://www.elitesoft.com/
EnergyGauge USA Residential Buildings	http://www.energygauge.com/
Wrightsoft Right-Suite Universal	http://www.wrightsoft.com/

Q: Where can I see the current mechanical codes for Connecticut?

A: You can view the currently enforced Connecticut codes online:

Online Resource	Website
State of CT – Department. of Administrative Services: Division of Construction Services	http://www.ct.gov/dcs/
ICC Online Code Viewer	http://publicecodes.cyberregs.com/icod/index.htm

Q: Where can I get additional help or questions answered regarding Manual J, S & D?

A: Check out ACCA's website (www.ACCA.org) , your local trade association may have members who can help, your local distributor or you may contact me (Buck Taylor) at the information provided below.

Roltay Inc. Energy Services

98 Overbrook Road

Madison, CT 06443

Phone: (203) 672-1330

E-mail: info@roltay.com



Manual S Compliance Report

Boiler

Roltay Inc. Energy Services

Job:
Date: May 01, 2015
By:

98 Overbrook Road, Madison, CT 06443 Phone: 203-672-1330 Email: buck@roltay.com Web: www.Roltay.com

Project Information

For: Manual S Demo
West Haven, CT 06516

Cooling Equipment

Design Conditions

Outdoor design DB:	84.0°F	Sensible gain:	23490	Btuh	Entering coil DB:	75.7°F
Outdoor design WB:	73.0°F	Latent gain:	4385	Btuh	Entering coil WB:	62.8°F
Indoor design DB:	75.0°F	Total gain:	27876	Btuh		
Indoor RH:	50%	Estimated airflow:	1100	cfm		

Manufacturer's Performance Data at Actual Design Conditions

Equipment type:	Split AC		
Manufacturer:	Bryant	Model:	123ANA030****C*+FX4DN(B,F)037L
Actual airflow:	1100	cfm	
Sensible capacity:	23574	Btuh	100% of load
Latent capacity:	5099	Btuh	116% of load
Total capacity:	28673	Btuh	103% of load SHR: 82%

Heating Equipment

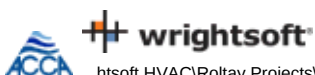
Design Conditions

Outdoor design DB:	7.0°F	Heat loss:	58557	Btuh	Entering coil DB:	70.0°F
Indoor design DB:	70.0°F					

Manufacturer's Performance Data at Actual Design Conditions

Equipment type:	Gas boiler		
Manufacturer:	Advantage	Model:	AG4-HN
Actual airflow:	0	cfm	
Output capacity:	88000	Btuh	150% of load

The above equipment was selected in accordance with ACCA Manual S.





Manual S Compliance Report

Furnace

Roltay Inc. Energy Services

Job:
Date: May 01, 2015
By:

98 Overbrook Road, Madison, CT 06443 Phone: 203-672-1330 Email: buck@roltay.com Web: www.Roltay.com

Project Information

For: Manual S Demo
West Haven, CT 06516

Cooling Equipment

Design Conditions

Outdoor design DB:	84.0°F	Sensible gain:	12703 Btuh	Entering coil DB:	75.2°F
Outdoor design WB:	73.0°F	Latent gain:	4308 Btuh	Entering coil WB:	63.7°F
Indoor design DB:	75.0°F	Total gain:	17010 Btuh		
Indoor RH:	50%	Estimated airflow:	587 cfm		

Manufacturer's Performance Data at Actual Design Conditions

Equipment type:	Split AC		
Manufacturer:	Bryant	Model:	123ANA018****C*+CNPV*2417AL*++TDR
Actual airflow:	587 cfm		
Sensible capacity:	13059 Btuh	103% of load	
Latent capacity:	4305 Btuh	100% of load	
Total capacity:	17365 Btuh	102% of load	SHR: 75%

Heating Equipment

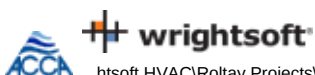
Design Conditions

Outdoor design DB:	7.0°F	Heat loss:	36351 Btuh	Entering coil DB:	68.8°F
Indoor design DB:	70.0°F				

Manufacturer's Performance Data at Actual Design Conditions

Equipment type:	Gas furnace		
Manufacturer:	York	Model:	TG8S100B12MP11
Actual airflow:	1149 cfm		
Output capacity:	80000 Btuh	220% of load	Temp. rise: 63 °F

The above equipment was selected in accordance with ACCA Manual S.





Load Short Form

Entire House

Roltay Inc. Energy Services

Job:
Date: May 01, 2015
By:

98 Overbrook Road, Madison, CT 06443 Phone: 203-672-1330 Email: buck@roltay.com Web: www.Roltay.com

Project Information

For: Manual S Demo
West Haven, CT 06516

Design Information

	Htg	Clg	Infiltration
Outside db (°F)	7	84	Method Simplified
Inside db (°F)	70	75	Construction quality Loose
Design TD (°F)	63	9	Fireplaces 1 (Semi-loose)
Daily range	-	M	
Inside humidity (%)	50	50	
Moisture difference (gr/lb)	48	40	

HEATING EQUIPMENT

Make	n/a
Trade	n/a
Model	n/a
AHRI ref	n/a
Efficiency	n/a
Heating input	
Heating output	0 Btuh
Low output baseboard	600 Btuh/ft
Total low baseboard	184 ft
High output baseboard	850 Btuh/ft
Total high baseboard	130 ft
Space thermostat	n/a

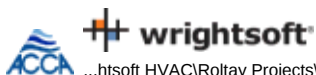
COOLING EQUIPMENT

Make	n/a
Trade	n/a
Cond	n/a
Coil	n/a
AHRI ref	n/a
Efficiency	n/a
Sensible cooling	0 Btuh
Latent cooling	0 Btuh
Total cooling	0 Btuh
Actual air flow	0 cfm
Air flow factor	0 cfm/Btuh
Static pressure	0 in H2O
Load sensible heat ratio	0

ROOM NAME		Area (ft²)	Htg load (Btuh)	Clg load (Btuh)	Baseboard (ft) Low High	Clg AVF (cfm)
Boiler	d	1777	58557	23490	98 69	1100
Furnace	d	1145	36351	12703	61 43	587
Entire House	d	2922	94909	36195	158 112	1845
Other equip loads			0	0		
Equip. @ 1.00 RSM				36195		
Latent cooling				8693		
TOTALS		2922	94909	44888	158 112	1845

Bold/italic values have been manually overridden

Calculations approved by ACCA to meet all requirements of Manual J 8th Ed.





Load Short Form

Boiler

Roltay Inc. Energy Services

Job:
Date: May 01, 2015
By:

98 Overbrook Road, Madison, CT 06443 Phone: 203-672-1330 Email: buck@roltay.com Web: www.Roltay.com

Project Information

For: Manual S Demo
West Haven, CT 06516

Design Information

	Htg	Clg		Infiltration
Outside db (°F)	7	84	Method	Simplified
Inside db (°F)	70	75	Construction quality	Loose
Design TD (°F)	63	9	Fireplaces	1 (Semi-loose)
Daily range	-	M		
Inside humidity (%)	50	50		
Moisture difference (gr/lb)	48	40		

HEATING EQUIPMENT

Make Advantage
Trade PurePro
Model AG4-HN
AHRI ref

Efficiency 83.8 AFUE
Heating input 105000 Btuh
Heating output 88000 Btuh
Low output baseboard 600 Btuh/ft
Total low baseboard 98 ft
High output baseboard 850 Btuh/ft
Total high baseboard 69 ft
Space thermostat

COOLING EQUIPMENT

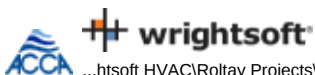
Make Bryant
Trade BRYANT HEATING AND COOLING SYS...
Cond 123ANA030****C*
Coil FX4DN(B,F)037L
AHRI ref 6937037

Efficiency 12.0 EER, 14.5 SEER
Sensible cooling 22022 Btuh
Latent cooling 6578 Btuh
Total cooling 28600 Btuh
Actual air flow 1100 cfm
Air flow factor 0.047 cfm/Btuh
Static pressure 0 in H2O
Load sensible heat ratio 0.84

ROOM NAME		Area (ft²)	Htg load (Btuh)	Clg load (Btuh)	Baseboard (ft)		Clg AVF (cfm)
					Low	High	
2nd Floor Zone	p	1145	30096	16567	50	35	773
Attic Zone	p	632	28461	9246	47	33	431
Boiler	d	1777	58557	23490	98	69	1100
Other equip loads			0	0			
Equip. @ 1.00 RSM				23490			
Latent cooling				4385			
TOTALS		1777	58557	27876	98	69	1100

Bold/italic values have been manually overridden

Calculations approved by ACCA to meet all requirements of Manual J 8th Ed.





Load Short Form Furnace Roltay Inc. Energy Services

Job:
Date: May 01, 2015
By:

98 Overbrook Road, Madison, CT 06443 Phone: 203-672-1330 Email: buck@roltay.com Web: www.Roltay.com

Project Information

For: Manual S Demo
West Haven, CT 06516

Design Information

	Htg	Clg		Infiltration
Outside db (°F)	7	84	Method	Simplified
Inside db (°F)	70	75	Construction quality	Loose
Design TD (°F)	63	9	Fireplaces	1 (Semi-loose)
Daily range	-	M		
Inside humidity (%)	50	50		
Moisture difference (gr/lb)	48	40		

HEATING EQUIPMENT

Make York
Trade Latitude TG8S
Model TG8S100B12MP11
AHRI ref

Efficiency 80 AFUE
Heating input 100000 Btuh
Heating output 80000 Btuh
Low output baseboard 600 Btuh/ft
Total low baseboard 61 ft
High output baseboard 850 Btuh/ft
Total high baseboard 43 ft
Space thermostat

COOLING EQUIPMENT

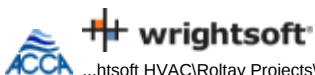
Make Bryant
Trade BRYANT HEATING AND COOLING SYS...
Cond 123ANA018****C*
Coil CNPV*2417AL***TDR
AHRI ref 6359199

Efficiency 11.0 EER, 13 SEER
Sensible cooling 13200 Btuh
Latent cooling 4400 Btuh
Total cooling 17600 Btuh
Actual air flow 587 cfm
Air flow factor 0.046 cfm/Btuh
Static pressure 0 in H2O
Load sensible heat ratio 0.75

ROOM NAME		Area (ft²)	Htg load (Btuh)	Clg load (Btuh)	Baseboard (ft) Low High	Clg AVF (cfm)
1st Floor Zone	p	1145	36351	13868	61 43	641
Furnace	d	1145	36351	12703	61 43	587
Other equip loads			0	0		
Equip. @ 1.00 RSM				12703		
Latent cooling				4308		
TOTALS		1145	36351	17010	61 43	587

Bold/italic values have been manually overridden

Calculations approved by ACCA to meet all requirements of Manual J 8th Ed.





Load Multizone Summary Report

Job:
Date: May 01, 2015
By:

Roltay Inc. Energy Services

98 Overbrook Road, Madison, CT 06443 Phone: 203-672-1330 Email: buck@roltay.com Web: www.Roltay.com

Infiltration Summary

ZONE NAME	Heating				Cooling			
	Volume ft ³	ACH	AVF cfm	HTM Btuh/ft ²	Volume ft ³	ACH	AVF cfm	HTM Btuh/ft ²
1st Floor Zone	9160	0.73	111	6.4	9160	0.35	54	0.4
2nd Floor Zone	9160	0.65	100	6.4	9160	0.32	48	0.4
Attic Zone	6703	1.12	125	6.4	6703	0.54	61	0.4
Entire House	25023	0.80	336	6.4	25023	0.39	163	0.4

Load and AVF Summary

ROOM NAME	Area ft ²	Htg load Btuh	Clg load Btuh	Htg AVF cfm	Clg AVF cfm
Area3	543	17176	5328	543	246
Area1	377	11762	5214	372	241
Area2	225	7414	3326	234	154
1st Floor Zone	1145	36351	13868	1149	641
Area4	377	11260	6556	0	306
Area5	225	6824	4584	0	214
Area6	543	12013	5427	0	253
2nd Floor Zone	1145	30096	16567	0	773
Finished Attic	632	28461	9246	0	431
Attic Zone	632	28461	9246	0	431
Entire House	2922	94909	36195	1149	1845

Project Information

For: Manual S Demo
 West Haven, CT 06516

Design Conditions

Location:			Indoor:	Heating	Cooling
New Haven AP, CT, US			Indoor temperature (°F)	70	75
Elevation: 30 ft			Design TD (°F)	63	9
Latitude: 41°N			Relative humidity (%)	50	50
			Moisture difference (gr/lb)	48.5	40.1
Outdoor:	Heating	Cooling	Infiltration:		
Dry bulb (°F)	7	84	Method	Simplified	
Daily range (°F)	-	17 (M)	Construction quality	Loose	
Wet bulb (°F)	-	73	Fireplaces	1 (Semi-loose)	
Wind speed (mph)	15.0	7.5			

Construction descriptions

	Or	Area ft²	U-value Btuh/ft²-°F	Insul R ft²-°F/Btuh	Htg HTM Btuh/ft²	Loss Btuh	Clg HTM Btuh/ft²	Gain Btuh
Walls								
12A-2sw: Frm wall, vnl ext, 1/2" wood shth, 1/2" gypsum board int	n	607	0.186	2.0	11.7	7109	4.09	2482
fnsh, r-2 ext bd ins, 2"x4" wood frm, 16" o.c. stud	ne	44	0.186	2.0	11.7	512	4.09	179
	e	862	0.186	2.0	11.7	10096	4.09	3526
	se	44	0.186	2.0	11.7	512	4.09	179
	s	661	0.186	2.0	11.7	7742	4.09	2704
	w	940	0.186	2.0	11.7	11016	4.09	3847
	all	3156	0.186	2.0	11.7	36986	4.09	12916
Partitions								
12A-0sw: Frm wall, vnl ext, 1/2" wood shth, 1/2" gypsum board int		99	0.240	0	15.1	1497	2.71	268
fnsh, 2"x4" wood frm, 16" o.c. stud								
Windows								
4A4-2ov: 2 glazing, clr outr, air gas, vnl frm mat, clr low-e innr, 1/4" gap,	n	14	0.470	0	29.6	418	8.08	114
1/8" thk; 50% blinds 45°, medium; 100% outdoor insect screen; 1 ft	e	28	0.470	0	29.6	837	29.8	842
overhang (5.3 ft window ht, 1 ft sep.); 6.67 ft head ht	w	28	0.470	0	29.6	837	29.8	842
	all	71	0.470	0	29.6	2092	25.4	1798
4A4-2ov: 2 glazing, clr outr, air gas, vnl frm mat, clr low-e innr, 1/4" gap,	n	15	0.470	0	29.6	447	8.08	122
1/8" thk; 50% blinds 45°, medium; 100% outdoor insect screen; 8 ft								
overhang (5.67 ft window ht, 1 ft sep.); 6.67 ft head ht								
4A4-2ov: 2 glazing, clr outr, air gas, vnl frm mat, clr low-e innr, 1/4" gap,	n	15	0.470	0	29.6	447	8.08	122
1/8" thk; 50% blinds 45°, medium; 100% outdoor insect screen; 6.67 ft	e	19	0.470	0	29.6	556	29.8	559
head ht	s	15	0.470	0	29.6	447	14.7	223
	w	49	0.470	0	29.6	1457	29.8	1466
	all	98	0.470	0	29.6	2908	24.1	2370
1C-c1ows: 1 glazing, clr glz, wd frm mat, 1/8" thk, clr strm; 50% blinds	ne	9	0.570	0	35.9	311	30.5	264
45°, medium; 100% outdoor insect screen; 1 ft overhang (4 ft w indow	se	9	0.570	0	35.9	311	36.5	316
ht, 1 ft sep.); 6.67 ft head ht	s	8	0.570	0	35.9	299	18.8	157
	w	17	0.570	0	35.9	599	44.0	734
	all	42	0.570	0	35.9	1520	34.8	1471

Bold/italic values have been manually overridden

4A4-2ov: 2 glazing, clr outr, air gas, vnl frm mat, clr low-e innr, 1/4" gap, 1/8" thk; 50% blinds 45°, medium; 100% outdoor insect screen; 1 ft overhang (4 ft window ht, 1 ft sep.); 6.67 ft head ht	ne	7	0.470	0	29.6	197	20.3	135
	se	7	0.470	0	29.6	197	24.5	163
	all	13	0.470	0	29.6	395	22.4	298
4A4-2ov: 2 glazing, clr outr, air gas, vnl frm mat, clr low-e innr, 1/4" gap, 1/8" thk; 50% blinds 45°, medium; 100% outdoor insect screen; 1 ft overhang (5.7 ft window ht, 1 ft sep.); 6.67 ft head ht	ne	12	0.470	0	29.6	352	20.3	241
	se	12	0.470	0	29.6	352	24.8	295
	all	24	0.470	0	29.6	703	22.5	535
4A4-2ov: 2 glazing, clr outr, air gas, vnl frm mat, clr low-e innr, 1/4" gap, 1/8" thk; 50% blinds 45°, medium; 100% outdoor insect screen; 1 ft overhang (4.5 ft window ht, 1 ft sep.); 6.67 ft head ht	e	12	0.470	0	29.6	355	29.8	357
4A4-2ov: 2 glazing, clr outr, air gas, vnl frm mat, clr low-e innr, 1/4" gap, 1/8" thk; 50% blinds 45°, medium; 100% outdoor insect screen; 1 ft overhang (5.67 ft window ht, 1 ft sep.); 6.67 ft head ht	e	15	0.470	0	29.6	447	29.8	450
4A4-2ov: 2 glazing, clr outr, air gas, vnl frm mat, clr low-e innr, 1/4" gap, 1/8" thk; 50% blinds 45°, medium; 100% outdoor insect screen; 5 ft overhang (5.67 ft window ht, 1 ft sep.); 6.67 ft head ht	e	30	0.470	0	29.6	895	18.1	547
	s	30	0.470	0	29.6	895	8.08	244
	all	60	0.470	0	29.6	1790	13.1	791
4A4-2ov: 2 glazing, clr outr, air gas, vnl frm mat, clr low-e innr, 1/4" gap, 1/8" thk; 50% blinds 45°, medium; 100% outdoor insect screen; 1 ft overhang (5.3 ft window ht, 5 ft sep.); 6.67 ft head ht	s	42	0.470	0	29.6	1255	14.7	624
4A4-2ov: 2 glazing, clr outr, air gas, vnl frm mat, clr low-e innr, 1/4" gap, 1/8" thk; 50% blinds 45°, medium; 100% outdoor insect screen; 1 ft overhang (5.33 ft window ht, 5 ft sep.); 6.67 ft head ht	s	14	0.470	0	29.6	421	14.7	209
4A4-2ov: 2 glazing, clr outr, air gas, vnl frm mat, clr low-e innr, 1/4" gap, 1/8" thk; 50% blinds 45°, medium; 100% outdoor insect screen; 1 ft overhang (5.33 ft window ht, 1 ft sep.); 6.67 ft head ht	w	18	0.470	0	29.6	526	29.8	530

Doors

11D0: Door, wd sc type	n	21	0.390	0	24.6	516	8.58	180
	s	21	0.390	0	24.6	516	8.58	180
	n	21	0.390	0	24.6	516	8.58	180
	all	63	0.390	0	24.6	1548	8.58	541

Ceilings

16B-11ad: Attic ceiling, asphalt shingles roof mat, r-11 ceil ins, 1/2" gypsum board int fnsh		513	0.081	11.0	5.10	2618	3.69	1891
18A-19ad: Rf/clg ceiling, asphalt shingles roof mat, frm cons, 1/2" gypsum board int fnsh, 6" thkns, r-19 ceil ins		926	0.051	19.0	3.21	2976	1.10	1016

Floors

19A-0bvhp: Flr floor, frm flr, 8" thkns, hrd wd flr fnsh, leaky bsmt ovr		1145	0.295	0	6.98	7994	1.00	1142
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Bold/italic values have been manually overridden

Project Information

For: Manual S Demo
 West Haven, CT 06516

Design Conditions

Location:		Indoor:		Heating	Cooling
New Haven AP, CT, US		Indoor temperature (°F)		70	75
Elevation: 30 ft		Design TD (°F)		63	9
Latitude: 41°N		Relative humidity (%)		50	50
		Moisture difference (gr/lb)		48.5	40.1
Outdoor:	Heating	Cooling	Infiltration:		
Dry bulb (°F)	7	84	Method	Simplified	
Daily range (°F)	-	17 (M)	Construction quality	Loose	
Wet bulb (°F)	-	73	Fireplaces	1 (Semi-loose)	
Wind speed (mph)	15.0	7.5			

Construction descriptions

	Or	Area ft²	U-value Btuh/ft²-°F	Insul R ft²-° F/Btuh	Htg HTM Btuh/ft²	Loss Btuh	Clg HTM Btuh/ft²	Gain Btuh
Walls								
12A-2sw: Frm wall, vnl ext, 1/2" wood shth, 1/2" gypsum board int	n	418	0.186	2.0	11.7	4897	4.09	1710
fnsh, r-2 ext bd ins, 2"x4" wood frm, 16" o.c. stud	ne	33	0.186	2.0	11.7	386	4.09	135
	e	606	0.186	2.0	11.7	7098	4.09	2479
	se	33	0.186	2.0	11.7	386	4.09	135
	s	487	0.186	2.0	11.7	5707	4.09	1993
	w	637	0.186	2.0	11.7	7468	4.09	2608
	all	2214	0.186	2.0	11.7	25941	4.09	9059
Partitions								
12A-0sw: Frm wall, vnl ext, 1/2" wood shth, 1/2" gypsum board int		99	0.240	0	15.1	1497	2.71	268
fnsh, 2"x4" wood frm, 16" o.c. stud								
Windows								
4A4-2ov: 2 glazing, clr outr, air gas, vnl frm mat, clr low-e innr, 1/4" gap,	n	14	0.470	0	29.6	418	8.08	114
1/8" thk; 50% blinds 45°, medium; 100% outdoor insect screen; 1 ft	e	28	0.470	0	29.6	837	29.8	842
overhang (5.3 ft window ht, 1 ft sep.); 6.67 ft head ht	w	28	0.470	0	29.6	837	29.8	842
	all	71	0.470	0	29.6	2092	25.4	1798
1C-c1ows: 1 glazing, clr glz, wd frm mat, 1/8" thk, clr strm; 50% blinds	ne	9	0.570	0	35.9	311	30.5	264
45°, medium; 100% outdoor insect screen; 1 ft overhang (4 ft w indow	se	9	0.570	0	35.9	311	36.5	316
ht, 1 ft sep.); 6.67 ft head ht	s	8	0.570	0	35.9	299	18.8	157
	w	17	0.570	0	35.9	599	44.0	734
	all	42	0.570	0	35.9	1520	34.8	1471
4A4-2ov: 2 glazing, clr outr, air gas, vnl frm mat, clr low-e innr, 1/4" gap,	ne	7	0.470	0	29.6	197	20.3	135
1/8" thk; 50% blinds 45°, medium; 100% outdoor insect screen; 1 ft								
overhang (4 ft window ht, 1 ft sep.); 6.67 ft head ht	se	7	0.470	0	29.6	197	24.5	163
	all	13	0.470	0	29.6	395	22.4	298
4A4-2ov: 2 glazing, clr outr, air gas, vnl frm mat, clr low-e innr, 1/4" gap,	e	12	0.470	0	29.6	355	29.8	357
1/8" thk; 50% blinds 45°, medium; 100% outdoor insect screen; 1 ft								
overhang (4.5 ft window ht, 1 ft sep.); 6.67 ft head ht								
4A4-2ov: 2 glazing, clr outr, air gas, vnl frm mat, clr low-e innr, 1/4" gap,	s	42	0.470	0	29.6	1255	14.7	624
1/8" thk; 50% blinds 45°, medium; 100% outdoor insect screen; 1 ft								
overhang (5.3 ft window ht, 5 ft sep.); 6.67 ft head ht								

Bold/italic values have been manually overridden

4A4-2ov: 2 glazing, clr outr, air gas, vnl frm mat, clr low-e innr, 1/4" gap, s 1/8" thk; 50% blinds 45°, medium; 100% outdoor insect screen; 1 ft overhang (5.33 ft window ht, 5 ft sep.); 6.67 ft head ht	14	0.470	0	29.6	421	14.7	209
4A4-2ov: 2 glazing, clr outr, air gas, vnl frm mat, clr low-e innr, 1/4" gap, w 1/8" thk; 50% blinds 45°, medium; 100% outdoor insect screen; 1 ft overhang (5.33 ft window ht, 1 ft sep.); 6.67 ft head ht	18	0.470	0	29.6	526	29.8	530

Doors

11D0: Door, wd sc type	n	21	0.390	0	24.6	516	8.58	180
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Ceilings

16B-11ad: Attic ceiling, asphalt shingles roof mat, r-11 ceil ins, 1/2" gypsum board int fnsh	513	0.081	11.0	5.10	2618	3.69	1891
18A-19ad: Rf/clg ceiling, asphalt shingles roof mat, frm cons, 1/2" gypsum board int fnsh, 6" thkns, r-19 ceil ins	926	0.051	19.0	3.21	2976	1.10	1016

Floors

(none)

Bold/italic values have been manually overridden

Project Information

For: Manual S Demo
 West Haven, CT 06516

Design Conditions

Location:		Indoor:		Heating	Cooling
New Haven AP, CT, US		Indoor temperature (°F)		70	75
Elevation: 30 ft		Design TD (°F)		63	9
Latitude: 41°N		Relative humidity (%)		50	50
		Moisture difference (gr/lb)		48.5	40.1
Outdoor:	Heating	Cooling	Infiltration:		
Dry bulb (°F)	7	84	Method	Simplified	
Daily range (°F)	-	17 (M)	Construction quality	Loose	
Wet bulb (°F)	-	73	Fireplaces	1 (Semi-loose)	
Wind speed (mph)	15.0	7.5			

Construction descriptions

	Or	Area ft²	U-value Btuh/ft²-°F	Insul R ft²-°F/Btuh	Htg HTM Btuh/ft²	Loss Btuh	Clg HTM Btuh/ft²	Gain Btuh
Walls								
12A-2sw: Frm wall, vnl ext, 1/2" wood shth, 1/2" gypsum board int	n	189	0.186	2.0	11.7	2212	4.09	772
fnsh, r-2 ext bd ins, 2"x4" wood frm, 16" o.c. stud	ne	11	0.186	2.0	11.7	126	4.09	44
	e	256	0.186	2.0	11.7	2999	4.09	1047
	se	11	0.186	2.0	11.7	126	4.09	44
	s	174	0.186	2.0	11.7	2035	4.09	711
	w	303	0.186	2.0	11.7	3548	4.09	1239
	all	943	0.186	2.0	11.7	11046	4.09	3857

Partitions

(none)

Windows

4A4-2ov: 2 glazing, clr outr, air gas, vnl frm mat, clr low-e innr, 1/4" gap, n	n	15	0.470	0	29.6	447	8.08	122
1/8" thk; 50% blinds 45°, medium; 100% outdoor insect screen; 8 ft								
overhang (5.67 ft window ht, 1 ft sep.); 6.67 ft head ht								
4A4-2ov: 2 glazing, clr outr, air gas, vnl frm mat, clr low-e innr, 1/4" gap, n	n	15	0.470	0	29.6	447	8.08	122
1/8" thk; 50% blinds 45°, medium; 100% outdoor insect screen; 6.67 ft	e	19	0.470	0	29.6	556	29.8	559
head ht	s	15	0.470	0	29.6	447	14.7	223
	w	49	0.470	0	29.6	1457	29.8	1466
	all	98	0.470	0	29.6	2908	24.1	2370
4A4-2ov: 2 glazing, clr outr, air gas, vnl frm mat, clr low-e innr, 1/4" gap, n	ne	12	0.470	0	29.6	352	20.3	241
1/8" thk; 50% blinds 45°, medium; 100% outdoor insect screen; 1 ft								
overhang (5.7 ft window ht, 1 ft sep.); 6.67 ft head ht	se	12	0.470	0	29.6	352	24.8	295
	all	24	0.470	0	29.6	703	22.5	535
4A4-2ov: 2 glazing, clr outr, air gas, vnl frm mat, clr low-e innr, 1/4" gap, e	e	15	0.470	0	29.6	447	29.8	450
1/8" thk; 50% blinds 45°, medium; 100% outdoor insect screen; 1 ft								
overhang (5.67 ft window ht, 1 ft sep.); 6.67 ft head ht								
4A4-2ov: 2 glazing, clr outr, air gas, vnl frm mat, clr low-e innr, 1/4" gap, e	e	30	0.470	0	29.6	895	18.1	547
1/8" thk; 50% blinds 45°, medium; 100% outdoor insect screen; 5 ft								
overhang (5.67 ft window ht, 1 ft sep.); 6.67 ft head ht	s	30	0.470	0	29.6	895	8.08	244
	all	60	0.470	0	29.6	1790	13.1	791

Bold/italic values have been manually overridden

Doors

11D0: Door, wd sc type	n	21	0.390	0	24.6	516	8.58	180
	s	21	0.390	0	24.6	516	8.58	180
	all	42	0.390	0	24.6	1032	8.58	360

Ceilings

(none)

Floors

19A-0bvhp: Flr floor, frm flr, 8" thkns, hrd wd flr fnsh, leaky bsmt ovr	1145	0.295	0	6.98	7994	1.00	1142
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Bold/italic values have been manually overridden



Project Summary
Entire House
Roltay Inc. Energy Services

Job:
Date: May 01, 2015
By:

98 Overbrook Road, Madison, CT 06443 Phone: 203-672-1330 Email: buck@roltay.com Web: www.Roltay.com

Project Information

For: Manual S Demo
West Haven, CT 06516

Notes: Heat loss calculation, post system replacement. No site visit. Loads developed from aerial map photos, appraisal documents and owner/agent photos.

Unable to determine full attic finished space from information provided.

Design Information

Weather: New Haven AP, CT, US

Winter Design Conditions

Outside db	7 °F
Inside db	70 °F
Design TD	63 °F

Summer Design Conditions

Outside db	84 °F
Inside db	75 °F
Design TD	9 °F
Daily range	M
Relative humidity	50 %
Moisture difference	40 gr/lb

Heating Summary

Structure	89714 Btuh
Ducts	5194 Btuh
Central vent (0 cfm)	0 Btuh
Humidification	0 Btuh
Piping	0 Btuh
Equipment load	94909 Btuh

Sensible Cooling Equipment Load Sizing

Structure	33410 Btuh
Ducts	2786 Btuh
Central vent (0 cfm)	0 Btuh
Blower	0 Btuh
Use manufacturer's data	y
Rate/swing multiplier	1.00
Equipment sensible load	36195 Btuh

Infiltration

Method	Simplified
Construction quality	Loose
Fireplaces	1 (Semi-loose)

	Heating	Cooling
Area (ft ²)	2922	2922
Volume (ft ³)	25023	25023
Air changes/hour	0.80	0.39
Equiv. AVF (cfm)	336	163

Latent Cooling Equipment Load Sizing

Structure	6235 Btuh
Ducts	2458 Btuh
Central vent (0 cfm)	0 Btuh
Equipment latent load	8693 Btuh
Equipment total load	44888 Btuh
Req. total capacity at 0.70 SHR	4.3 ton

Heating Equipment Summary

Make	n/a
Trade	n/a
Model	n/a
AHRI ref	n/a
Efficiency	n/a
Heating input	
Heating output	0 Btuh
Low output baseboard	600 Btuh/ft
Total low baseboard	184 ft
High output baseboard	850 Btuh/ft
Total high baseboard	130 ft
Space thermostat	n/a

Cooling Equipment Summary

Make	n/a
Trade	n/a
Cond	n/a
Coil	n/a
AHRI ref	n/a
Efficiency	n/a
Sensible cooling	0 Btuh
Latent cooling	0 Btuh
Total cooling	0 Btuh
Actual air flow	0 cfm
Air flow factor	0 cfm/Btuh
Static pressure	0 in H2O
Load sensible heat ratio	0

Bold/italic values have been manually overridden

Calculations approved by ACCA to meet all requirements of Manual J 8th Ed.



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Project Summary

Boiler

Roltay Inc. Energy Services

Job:
Date: May 01, 2015
By:

98 Overbrook Road, Madison, CT 06443 Phone: 203-672-1330 Email: buck@roltay.com Web: www.Roltay.com

Project Information

For: Manual S Demo
West Haven, CT 06516

Notes: Heat loss calculation, post system replacement. No site visit. Loads developed from aerial map photos, appraisal documents and owner/agent photos.

Unable to determine full attic finished space from information provided.

Design Information

Weather: New Haven AP, CT, US

Winter Design Conditions

Outside db	7 °F
Inside db	70 °F
Design TD	63 °F

Summer Design Conditions

Outside db	84 °F
Inside db	75 °F
Design TD	9 °F
Daily range	M
Relative humidity	50 %
Moisture difference	40 gr/lb

Heating Summary

Structure	55671 Btuh
Ducts	2887 Btuh
Central vent (0 cfm)	0 Btuh
Humidification	0 Btuh
Piping	0 Btuh
Equipment load	58557 Btuh

Sensible Cooling Equipment Load Sizing

Structure	21130 Btuh
Ducts	2360 Btuh
Central vent (0 cfm)	0 Btuh
Blower	0 Btuh
Use manufacturer's data	y
Rate/swing multiplier	1.00
Equipment sensible load	23490 Btuh

Infiltration

Method	Simplified
Construction quality	Loose
Fireplaces	1 (Semi-loose)

	Heating	Cooling
Area (ft ²)	1777	1777
Volume (ft ³)	15863	15863
Air changes/hour	0.85	0.41
Equiv. AVF (cfm)	225	109

Latent Cooling Equipment Load Sizing

Structure	3970 Btuh
Ducts	416 Btuh
Central vent (0 cfm)	0 Btuh
Equipment latent load	4385 Btuh
Equipment total load	27876 Btuh
Req. total capacity at 0.77 SHR	2.5 ton

Heating Equipment Summary

Make	Advantage
Trade	PurePro
Model	AG4-HN
AHRI ref	
Efficiency	83.8 AFUE
Heating input	105000 Btuh
Heating output	88000 Btuh
Low output baseboard	600 Btuh/ft
Total low baseboard	98 ft
High output baseboard	850 Btuh/ft
Total high baseboard	69 ft
Space thermostat	

Cooling Equipment Summary

Make	Bryant
Trade	BRYANT HEATING AND COOLING SYS...
Cond	123ANA030****C*
Coil	FX4DN(B,F)037L
AHRI ref	6937037
Efficiency	12.0 EER, 14.5 SEER
Sensible cooling	22022 Btuh
Latent cooling	6578 Btuh
Total cooling	28600 Btuh
Actual air flow	1100 cfm
Air flow factor	0.047 cfm/Btuh
Static pressure	0 in H2O
Load sensible heat ratio	0.84

Bold/italic values have been manually overridden

Calculations approved by ACCA to meet all requirements of Manual J 8th Ed.



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Project Summary
Furnace
Roltay Inc. Energy Services

Job:
Date: May 01, 2015
By:

98 Overbrook Road, Madison, CT 06443 Phone: 203-672-1330 Email: buck@roltay.com Web: www.Roltay.com

Project Information

For: Manual S Demo
West Haven, CT 06516

Notes: Heat loss calculation, post system replacement. No site visit. Loads developed from aerial map photos, appraisal documents and owner/agent photos.

Unable to determine full attic finished space from information provided.

Design Information

Weather: New Haven AP, CT, US

Winter Design Conditions

Outside db	7 °F
Inside db	70 °F
Design TD	63 °F

Summer Design Conditions

Outside db	84 °F
Inside db	75 °F
Design TD	9 °F
Daily range	M
Relative humidity	50 %
Moisture difference	40 gr/lb

Heating Summary

Structure	34044 Btuh
Ducts	2307 Btuh
Central vent (0 cfm)	0 Btuh
Humidification	0 Btuh
Piping	0 Btuh
Equipment load	36351 Btuh

Sensible Cooling Equipment Load Sizing

Structure	12280 Btuh
Ducts	423 Btuh
Central vent (0 cfm)	0 Btuh
Blower	0 Btuh
Use manufacturer's data	y
Rate/swing multiplier	1.00
Equipment sensible load	12703 Btuh

Infiltration

Method	Simplified
Construction quality	Loose
Fireplaces	1 (Semi-loose)

	Heating	Cooling
Area (ft ²)	1145	1145
Volume (ft ³)	9160	9160
Air changes/hour	0.73	0.35
Equiv. AVF (cfm)	111	54

Latent Cooling Equipment Load Sizing

Structure	2265 Btuh
Ducts	2042 Btuh
Central vent (0 cfm)	0 Btuh
Equipment latent load	4308 Btuh
Equipment total load	17010 Btuh
Req. total capacity at 0.75 SHR	1.4 ton

Heating Equipment Summary

Make	York
Trade	Lattitude TG8S
Model	TG8S100B12MP11
AHRI ref	
Efficiency	80 AFUE
Heating input	100000 Btuh
Heating output	80000 Btuh
Low output baseboard	600 Btuh/ft
Total low baseboard	61 ft
High output baseboard	850 Btuh/ft
Total high baseboard	43 ft
Space thermostat	

Cooling Equipment Summary

Make	Bryant
Trade	BRYANT HEATING AND COOLING SYS...
Cond	123ANA018****C*
Coil	CNPV*2417AL*++TDR
AHRI ref	6359199
Efficiency	11.0 EER, 13 SEER
Sensible cooling	13200 Btuh
Latent cooling	4400 Btuh
Total cooling	17600 Btuh
Actual air flow	587 cfm
Air flow factor	0.046 cfm/Btuh
Static pressure	0 in H2O
Load sensible heat ratio	0.75

Bold/italic values have been manually overridden

Calculations approved by ACCA to meet all requirements of Manual J 8th Ed.



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Right-J® Worksheet

Entire House

Roltay Inc. Energy Services

Job:
Date: May 01, 2015
By:

98 Overbrook Road, Madison, CT 06443 Phone: 203-672-1330 Email: buck@roltay.com Web: www.Roltay.com

1	Room name						Furnace							
2	Exposed wall						149.6 ft							
3	Room height						8.0 ft				d			
4	Room dimensions													
5	Room area						1145.0 ft²							
	Ty	Construction number	U-value (Btuh/ft²·°F)	Or	HTM (Btuh/ft²)		Area (ft²) or perimeter (ft)		Load (Btuh)		Area or perimeter		Load	
					Heat	Cool	Gross	N/P/S	Heat	Cool	Gross	N/P/S	Heat	Cool
6	W	12A-2sw	0.186	n	11.72	4.09	240	189	2212	772				
	G	4A4-2ov	0.470	n	29.61	8.08	0	0	0	0				
	G	4A4-2ov	0.470	n	29.61	8.08	15	0	447	122				
	G	4A4-2ov	0.470	n	29.61	8.08	15	0	447	122				
11	D	11D0	0.390	n	24.57	8.58	21	21	516	180				
	W	12A-2sw	0.186	ne	11.72	4.09	23	11	126	44				
	G	1C-c1ows	0.570	ne	35.91	30.50	0	0	0	0				
	G	4A4-2ov	0.470	ne	29.61	20.27	0	0	0	0				
	G	4A4-2ov	0.470	ne	29.61	20.27	12	0	352	241				
	W	12A-2sw	0.186	e	11.72	4.09	320	256	2999	1047				
	G	4A4-2ov	0.470	e	29.61	29.79	0	0	0	0				
	G	4A4-2ov	0.470	e	29.61	29.79	0	0	0	0				
	G	4A4-2ov	0.470	e	29.61	29.79	15	0	447	450				
	G	4A4-2ov	0.470	e	29.61	18.10	30	16	895	547				
	G	4A4-2ov	0.470	e	29.61	29.79	19	0	556	559				
	W	12A-2sw	0.186	se	11.72	4.09	23	11	126	44				
	G	1C-c1ows	0.570	se	35.91	36.49	0	0	0	0				
	G	4A4-2ov	0.470	se	29.61	24.48	0	0	0	0				
	G	4A4-2ov	0.470	se	29.61	24.81	12	1	352	295				
	W	12A-2sw	0.186	s	11.72	4.09	240	174	2035	711				
	G	1C-c1ows	0.570	s	35.91	18.83	0	0	0	0				
	G	4A4-2ov	0.470	s	29.61	14.73	0	0	0	0				
	G	4A4-2ov	0.470	s	29.61	14.73	0	0	0	0				
	G	4A4-2ov	0.470	s	29.61	8.08	30	30	895	244				
	G	4A4-2ov	0.470	s	29.61	14.73	15	0	447	223				
	D	11D0	0.390	s	24.57	8.58	21	21	516	180				
	W	12A-2sw	0.186	w	11.72	4.09	352	303	3548	1239				
	G	1C-c1ows	0.570	w	35.91	44.03	0	0	0	0				
	G	4A4-2ov	0.470	w	29.61	29.79	0	0	0	0				
	G	4A4-2ov	0.470	w	29.61	29.79	0	0	0	0				
	G	4A4-2ov	0.470	w	29.61	29.79	49	0	1457	1466				
	R	12A-0sw	0.240	-	15.12	2.71	0	0	0	0				
	D	11D0	0.390	n	24.57	8.58	0	0	0	0				
	C	16B-11ad	0.081	-	5.10	3.69	0	0	0	0				
	C	18A-19ad	0.051	-	3.21	1.10	0	0	0	0				
	F	19A-0bvhp	0.295	-	6.98	1.00	1145	1145	7994	1142				
6	c) AED excursion									0				
	Envelope loss/gain								26368	9628				
12	a) Infiltration								7676	531				
	b) Room ventilation								0	0				
13	Internal gains: Occupants @ 230						4			920				
	Appliances/other									1200				
	Subtotal (lines 6 to 13)								34044	12280				
	Less external load								0	0				
	Less transfer								0	0				
	Redistribution								0	0				
14	Subtotal								34044	12280				
15	Duct loads						7%	3%	2307	423				
	Total room load								36351	12703				
	Low/High Baseboard / Cool Air							61	43	587				

Calculations approved by ACCA to meet all requirements of Manual J 8th Ed.





Right-J® Worksheet
Boiler
Roltay Inc. Energy Services

Job:
Date: May 01, 2015
By:

98 Overbrook Road, Madison, CT 06443 Phone: 203-672-1330 Email: buck@roltay.com Web: www.Roltay.com

1	Room name						Boiler				2nd Floor Zone			
2	Exposed wall						239.9 ft				134.6 ft			
3	Room height						8.9 ft				8.0 ft			
4	Room dimensions						d				p			
5	Room area						1777.0 ft²				1145.0 ft²			
	Ty	Construction number	U-value (Btuh/ft²·°F)	Or	HTM (Btuh/ft²)		Area (ft²) or perimeter (ft)		Load (Btuh)		Area (ft²) or perimeter (ft)		Load (Btuh)	
					Heat	Cool	Gross	N/P/S	Heat	Cool	Gross	N/P/S	Heat	Cool
6	W	12A-2sw	0.186	n	11.72	4.09	432	418	4897	1710	120	106	1241	433
	G	4A4-2ov	0.470	n	29.61	8.08	14	0	418	114	14	0	418	114
	G	4A4-2ov	0.470	n	0.00	0.00	0	0	0	0	0	0	0	0
	G	4A4-2ov	0.470	n	0.00	0.00	0	0	0	0	0	0	0	0
11	D	11D0	0.390	n	0.00	0.00	0	0	0	0	0	0	0	0
	W	12A-2sw	0.186	ne	11.72	4.09	48	33	386	135	23	16	187	65
	G	1C-c1ows	0.570	ne	35.91	30.50	9	0	311	264	0	0	0	0
	G	4A4-2ov	0.470	ne	29.61	20.27	7	0	197	135	7	0	197	135
	G	4A4-2ov	0.470	ne	0.00	0.00	0	0	0	0	0	0	0	0
	W	12A-2sw	0.186	e	11.72	4.09	646	606	7098	2479	320	280	3278	1145
	G	4A4-2ov	0.470	e	29.61	29.79	12	0	355	357	12	0	355	357
	G	4A4-2ov	0.470	e	29.61	29.79	28	0	837	842	28	0	837	842
	G	4A4-2ov	0.470	e	0.00	0.00	0	0	0	0	0	0	0	0
	G	4A4-2ov	0.470	e	0.00	0.00	0	0	0	0	0	0	0	0
	G	4A4-2ov	0.470	e	0.00	0.00	0	0	0	0	0	0	0	0
	W	12A-2sw	0.186	se	11.72	4.09	48	33	386	135	23	16	187	65
	G	1C-c1ows	0.570	se	35.91	36.49	9	1	311	316	0	0	0	0
	G	4A4-2ov	0.470	se	29.61	24.48	7	0	197	163	7	0	197	163
	G	4A4-2ov	0.470	se	0.00	0.00	0	0	0	0	0	0	0	0
	W	12A-2sw	0.186	s	11.72	4.09	552	487	5707	1993	240	183	2149	750
	G	1C-c1ows	0.570	s	35.91	18.83	8	3	299	157	0	0	0	0
	G	4A4-2ov	0.470	s	29.61	14.73	42	0	1255	624	42	0	1255	624
	G	4A4-2ov	0.470	s	29.61	14.73	14	0	421	209	14	0	421	209
	G	4A4-2ov	0.470	s	0.00	0.00	0	0	0	0	0	0	0	0
	G	4A4-2ov	0.470	s	0.00	0.00	0	0	0	0	0	0	0	0
	D	11D0	0.390	s	0.00	0.00	0	0	0	0	0	0	0	0
	W	12A-2sw	0.186	w	11.72	4.09	700	637	7468	2608	352	306	3585	1252
	G	1C-c1ows	0.570	w	35.91	44.03	17	0	598	734	0	0	0	0
	G	4A4-2ov	0.470	w	29.61	29.79	28	0	837	842	28	0	837	842
	G	4A4-2ov	0.470	w	29.61	29.79	18	0	526	530	18	0	526	530
	G	4A4-2ov	0.470	w	0.00	0.00	0	0	0	0	0	0	0	0
	R	12A-0sw	0.240	-	15.12	2.71	120	99	1497	268	120	99	1497	268
	D	11D0	0.390	n	24.57	8.58	21	21	516	180	21	21	516	180
	C	16B-11ad	0.081	-	5.10	3.69	513	513	2618	1891	513	513	2618	1891
	C	18A-19ad	0.051	-	3.21	1.10	926	926	2976	1016	0	0	0	0
	F	19A-0bvhp	0.295	-	0.00	0.00	0	0	0	0	0	0	0	0
6	c) AED excursion									0				1532
	Envelope loss/gain								40114	17703			20303	11400
12	a) Infiltration								15557	1077			6907	478
	b) Room ventilation								0	0			0	0
13	Internal gains: Occupants @ 230 Appliances/other						5			1150 1200	4			920 1200
	Subtotal (lines 6 to 13)								55671	21130			27209	13998
	Less external load								0	0			0	0
	Less transfer								0	0			0	0
	Redistribution								0	0			0	0
14	Subtotal								55671	21130			27209	13998
15	Duct loads						5%	11%	2887	2360	11%	19%	2887	2568
	Total room load								58557	23490			30096	16567
	Low/High Baseboard / Cool Air							98	69	1100		50	35	773

Calculations approved by ACCA to meet all requirements of Manual J 8th Ed.





Right-J® Worksheet
Boiler
Roltay Inc. Energy Services

Job:
Date: May 01, 2015
By:

98 Overbrook Road, Madison, CT 06443 Phone: 203-672-1330 Email: buck@roltay.com Web: www.Roltay.com

1	Room name						Attic Zone							
2	Exposed wall						105.3 ft							
3	Room height						10.6 ft		p					
4	Room dimensions													
5	Room area						632.0 ft²							
	Ty	Construction number	U-value (Btuh/ft²-°F)	Or	HTM (Btuh/ft²)		Area (ft²) or perimeter (ft)		Load (Btuh)		Area or perimeter		Load	
					Heat	Cool	Gross	N/P/S	Heat	Cool	Gross	N/P/S	Heat	Cool
6	W	12A-2sw	0.186	n	11.72	4.09	312	312	3656	1277				
.	G	4A4-2ov	0.470	n	29.61	8.08	0	0	0	0				
.	G	4A4-2ov	0.470	n	0.00	0.00	0	0	0	0				
.	G	4A4-2ov	0.470	n	0.00	0.00	0	0	0	0				
11	D	11D0	0.390	n	0.00	0.00	0	0	0	0				
.	W	12A-2sw	0.186	ne	11.72	4.09	26	17	199	69				
.	G	1C-c1ows	0.570	ne	35.91	30.50	9	0	311	264				
.	G	4A4-2ov	0.470	ne	29.61	20.27	0	0	0	0				
.	G	4A4-2ov	0.470	ne	0.00	0.00	0	0	0	0				
.	W	12A-2sw	0.186	e	11.72	4.09	326	326	3820	1334				
.	G	4A4-2ov	0.470	e	29.61	29.79	0	0	0	0				
.	G	4A4-2ov	0.470	e	29.61	29.79	0	0	0	0				
.	G	4A4-2ov	0.470	e	0.00	0.00	0	0	0	0				
.	G	4A4-2ov	0.470	e	0.00	0.00	0	0	0	0				
.	G	4A4-2ov	0.470	e	0.00	0.00	0	0	0	0				
.	W	12A-2sw	0.186	se	11.72	4.09	26	17	199	69				
.	G	1C-c1ows	0.570	se	35.91	36.49	9	1	311	316				
.	G	4A4-2ov	0.470	se	29.61	24.48	0	0	0	0				
.	G	4A4-2ov	0.470	se	0.00	0.00	0	0	0	0				
.	W	12A-2sw	0.186	s	11.72	4.09	312	304	3558	1243				
.	G	1C-c1ows	0.570	s	35.91	18.83	8	3	299	157				
.	G	4A4-2ov	0.470	s	29.61	14.73	0	0	0	0				
.	G	4A4-2ov	0.470	s	29.61	14.73	0	0	0	0				
.	G	4A4-2ov	0.470	s	0.00	0.00	0	0	0	0				
.	G	4A4-2ov	0.470	s	0.00	0.00	0	0	0	0				
.	D	11D0	0.390	s	0.00	0.00	0	0	0	0				
.	W	12A-2sw	0.186	w	11.72	4.09	348	331	3883	1356				
.	G	1C-c1ows	0.570	w	35.91	44.03	17	0	598	734				
.	G	4A4-2ov	0.470	w	29.61	29.79	0	0	0	0				
.	G	4A4-2ov	0.470	w	29.61	29.79	0	0	0	0				
.	G	4A4-2ov	0.470	w	0.00	0.00	0	0	0	0				
.	R	12A-0sw	0.240	-	15.12	2.71	0	0	0	0				
.	D	11D0	0.390	n	24.57	8.58	0	0	0	0				
.	C	16B-11ad	0.081	-	5.10	3.69	0	0	0	0				
.	C	18A-19ad	0.051	-	3.21	1.10	926	926	2976	1016				
.	F	19A-0bvhp	0.295	-	0.00	0.00	0	0	0	0				
6	c) AED excursion									582				
	Envelope loss/gain								19811	8417				
12	a) Infiltration								8650	599				
	b) Room ventilation								0	0				
13	Internal gains: Occupants @ 230 Appliances/other						1			230				
	Subtotal (lines 6 to 13)								28461	9246				
	Less external load								0	0				
	Less transfer								0	0				
	Redistribution								0	0				
14	Subtotal								28461	9246				
15	Duct loads						0%	0%	0	0				
	Total room load								28461	9246				
	Low/High Baseboard / Cool Air							47	33	431				

Calculations approved by ACCA to meet all requirements of Manual J 8th Ed.





Right-J® Worksheet
Furnace
Roltay Inc. Energy Services

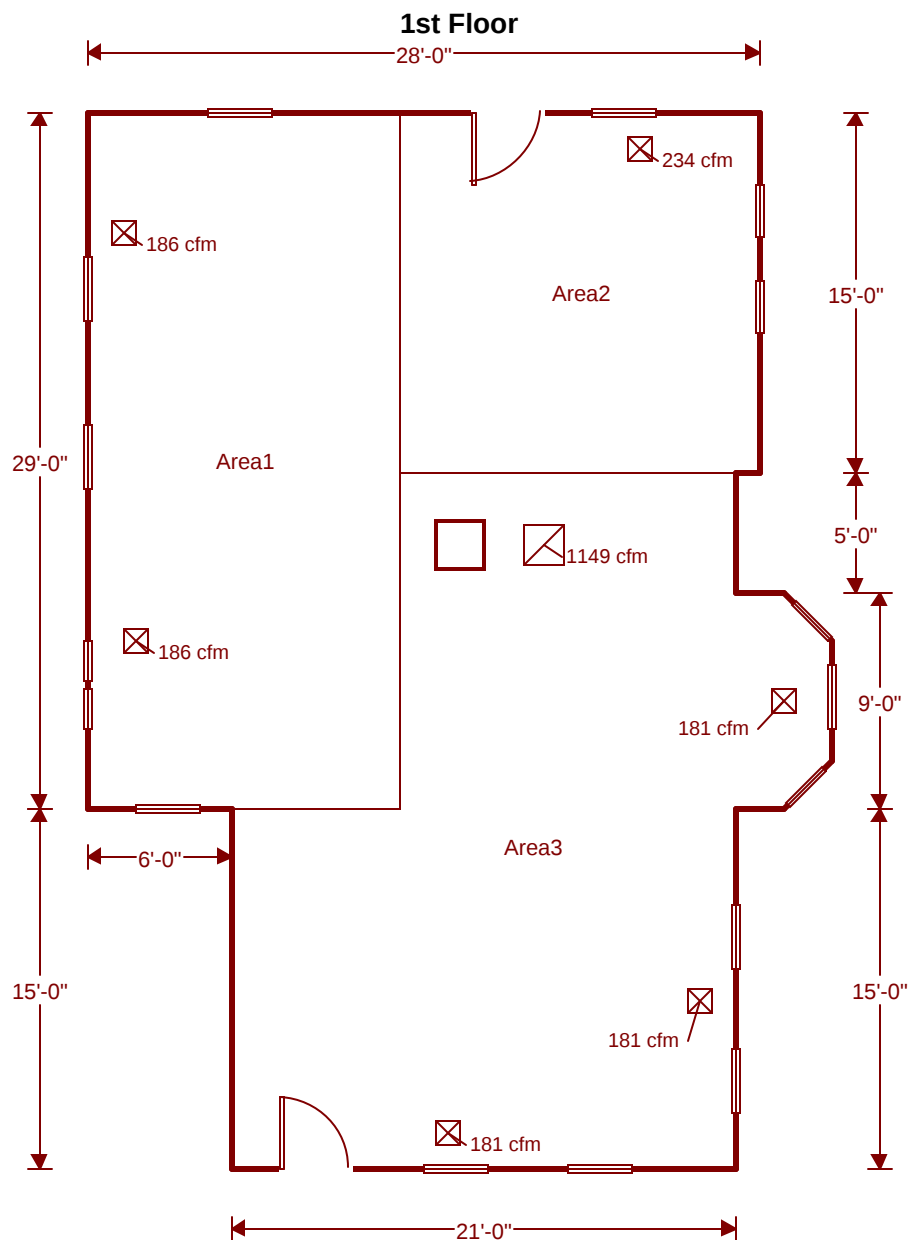
Job:
Date: May 01, 2015
By:

98 Overbrook Road, Madison, CT 06443 Phone: 203-672-1330 Email: buck@roltay.com Web: www.Roltay.com

1	Room name					Furnace					1st Floor Zone				
2	Exposed wall					149.6 ft					149.6 ft				
3	Room height					8.0 ft					8.0 ft				
4	Room dimensions					d					p				
5	Room area					1145.0 ft²					1145.0 ft²				
	Ty	Construction number	U-value (Btuh/ft²·°F)	Or	HTM (Btuh/ft²)		Area (ft²) or perimeter (ft)		Load (Btuh)		Area (ft²) or perimeter (ft)		Load (Btuh)		
					Heat	Cool	Gross	N/P/S	Heat	Cool	Gross	N/P/S	Heat	Cool	
6	W	12A-2sw	0.186	n	11.72	4.09	240	189	2212	772	240	189	2212	772	
11	G	4A4-2ov	0.470	n	0.00	0.00	0	0	0	0	0	0	0	0	
	G	4A4-2ov	0.470	n	29.61	8.08	15	0	447	122	15	0	447	122	
	G	4A4-2ov	0.470	n	29.61	8.08	15	0	447	122	15	0	447	122	
	D	11D0	0.390	n	24.57	8.58	21	21	516	180	21	21	516	180	
	W	12A-2sw	0.186	ne	11.72	4.09	23	11	126	44	23	11	126	44	
	G	1C-c1ows	0.570	ne	0.00	0.00	0	0	0	0	0	0	0	0	
	G	4A4-2ov	0.470	ne	0.00	0.00	0	0	0	0	0	0	0	0	
	G	4A4-2ov	0.470	ne	29.61	20.27	12	0	352	241	12	0	352	241	
	W	12A-2sw	0.186	e	11.72	4.09	320	256	2999	1047	320	256	2999	1047	
	G	4A4-2ov	0.470	e	0.00	0.00	0	0	0	0	0	0	0	0	
	G	4A4-2ov	0.470	e	0.00	0.00	0	0	0	0	0	0	0	0	
11	G	4A4-2ov	0.470	e	29.61	29.79	15	0	447	450	15	0	447	450	
	G	4A4-2ov	0.470	e	29.61	18.10	30	16	895	547	30	16	895	547	
	G	4A4-2ov	0.470	e	29.61	29.79	19	0	556	559	19	0	556	559	
	W	12A-2sw	0.186	se	11.72	4.09	23	11	126	44	23	11	126	44	
	G	1C-c1ows	0.570	se	0.00	0.00	0	0	0	0	0	0	0	0	
	G	4A4-2ov	0.470	se	0.00	0.00	0	0	0	0	0	0	0	0	
	G	4A4-2ov	0.470	se	29.61	24.81	12	1	352	295	12	1	352	295	
	W	12A-2sw	0.186	s	11.72	4.09	240	174	2035	711	240	174	2035	711	
	G	1C-c1ows	0.570	s	0.00	0.00	0	0	0	0	0	0	0	0	
	G	4A4-2ov	0.470	s	0.00	0.00	0	0	0	0	0	0	0	0	
	G	4A4-2ov	0.470	s	0.00	0.00	0	0	0	0	0	0	0	0	
11	G	4A4-2ov	0.470	s	29.61	8.08	30	30	895	244	30	30	895	244	
	G	4A4-2ov	0.470	s	29.61	14.73	15	0	447	223	15	0	447	223	
	D	11D0	0.390	s	24.57	8.58	21	21	516	180	21	21	516	180	
	W	12A-2sw	0.186	w	11.72	4.09	352	303	3548	1239	352	303	3548	1239	
	G	1C-c1ows	0.570	w	0.00	0.00	0	0	0	0	0	0	0	0	
	G	4A4-2ov	0.470	w	0.00	0.00	0	0	0	0	0	0	0	0	
	G	4A4-2ov	0.470	w	0.00	0.00	0	0	0	0	0	0	0	0	
	G	4A4-2ov	0.470	w	29.61	29.79	49	0	1457	1466	49	0	1457	1466	
	R	12A-0sw	0.240	-	0.00	0.00	0	0	0	0	0	0	0	0	
	D	11D0	0.390	n	0.00	0.00	0	0	0	0	0	0	0	0	
	C	16B-11ad	0.081	-	0.00	0.00	0	0	0	0	0	0	0	0	
C	18A-19ad	0.051	-	0.00	0.00	0	0	0	0	0	0	0	0		
F	19A-0bvhp	0.295	-	6.98	1.00	1145	1145	7994	1142	1145	1145	7994	1142		

Calculations approved by ACCA to meet all requirements of Manual J 8th Ed.





Job #:
Performed for:
Manual S Demo
West Haven, CT 06516

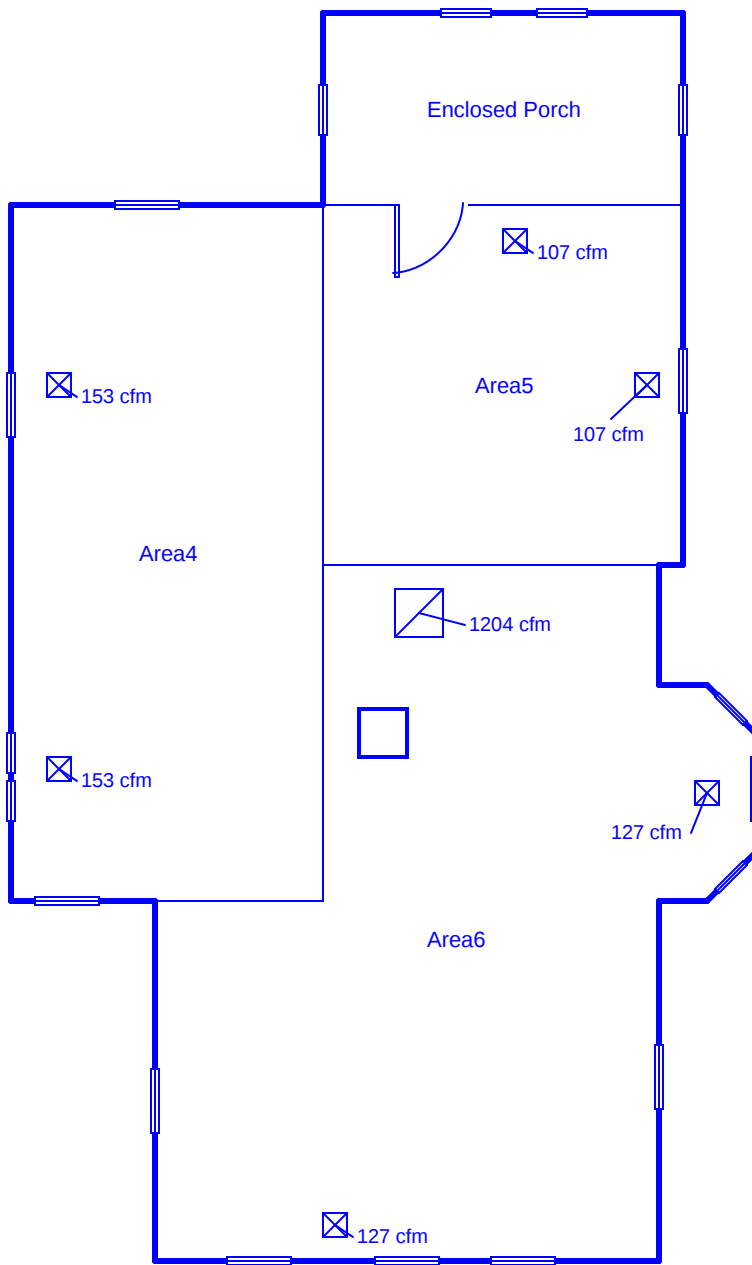
Roltay Inc. Energy Services

98 Overbrook Road
Madison, CT 06443
Phone: 203-672-1330
www.Roltay.com buck@roltay.com

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2nd Floor



Job #:
Performed for:
Manual S Demo
West Haven, CT 06516

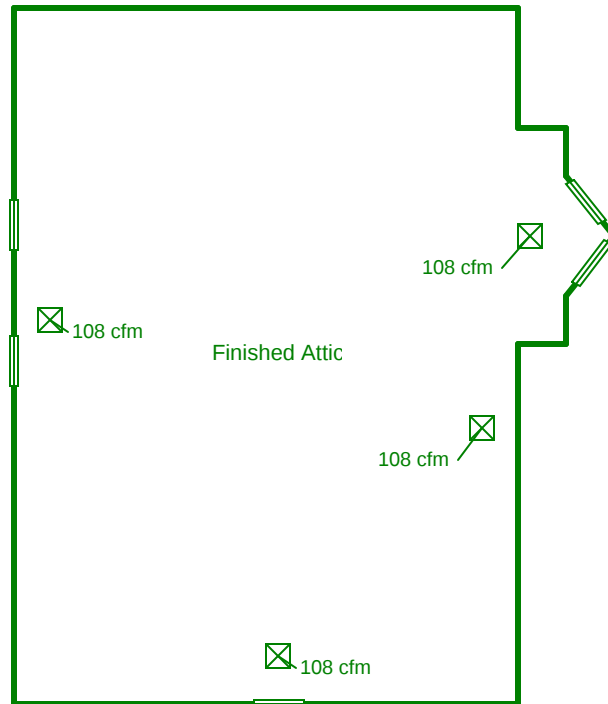
Roltay Inc. Energy Services

98 Overbrook Road
Madison, CT 06443
Phone: 203-672-1330
www.Roltay.com buck@roltay.com

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3rd Floor



Job #:
Performed for:
Manual S Demo
West Haven, CT 06516

Roltay Inc. Energy Services

98 Overbrook Road
Madison, CT 06443
Phone: 203-672-1330
www.Roltay.com buck@roltay.com

Scale: 1/8" = 1'0"
Page 3
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DETAILED COOLING CAPACITIES

EVAPORATOR AIR		CONDENSER ENTERING AIR TEMPERATURES deg F																							
CFM	EWB	75				85				95				105				115				125			
		Capacity MBtu/h†		Total System KW**	Capacity MBtu/h†		Total System KW**	Capacity MBtu/h†		Total System KW**	Capacity MBtu/h†		Total System KW**	Capacity MBtu/h†		Total System KW**	Capacity MBtu/h†		Total System KW**						
		Total	Sens ‡		Total	Sens‡		Total	Sens‡		Total	Sens‡		Total	Sens‡		Total	Sens‡							
123ANA018—A Outdoor Section With CAP**1814A** Indoor Section																									
525	72	20.46	10.76	1.21	19.55	10.41	1.36	18.59	10.05	1.53	17.62	9.69	1.71	16.57	9.30	1.91	15.40	8.88	2.13						
	67	18.79	13.26	1.22	17.95	12.90	1.37	17.05	12.52	1.53	16.12	12.14	1.72	15.13	11.74	1.92	14.03	11.30	2.13						
	62	17.27	15.73	1.22	16.49	15.36	1.37	15.68	14.97	1.54	14.83	14.55	1.72	14.00	14.00	1.92	13.15	13.15	2.13						
	57	16.78	16.78	1.23	16.15	16.15	1.37	15.48	15.48	1.54	14.77	14.77	1.72	14.00	14.00	1.92	13.15	13.15	2.13						
600	72	20.79	11.28	1.24	19.83	10.92	1.39	18.83	10.55	1.56	17.83	10.19	1.74	16.76	9.80	1.94	15.55	9.37	2.16						
	67	19.11	14.10	1.25	18.23	13.73	1.40	17.30	13.36	1.56	16.35	12.97	1.74	15.33	12.57	1.94	14.20	12.12	2.16						
	62	17.66	16.88	1.25	16.87	16.49	1.40	16.06	16.06	1.56	15.32	15.32	1.75	14.51	14.51	1.94	13.61	13.61	2.16						
	57	17.46	17.46	1.25	16.79	16.79	1.40	16.07	16.07	1.56	15.32	15.32	1.75	14.51	14.51	1.94	13.61	13.61	2.16						
675	72	21.03	11.77	1.27	20.02	11.40	1.42	18.99	11.03	1.58	17.97	10.67	1.77	16.88	10.28	1.97	15.65	9.85	2.18						
	67	19.33	14.90	1.27	18.43	14.54	1.42	17.48	14.15	1.59	16.51	13.77	1.77	15.48	13.35	1.97	14.33	12.89	2.19						
	62	18.01	17.91	1.28	17.30	17.30	1.43	16.54	16.54	1.59	15.76	15.76	1.77	14.92	14.92	1.97	13.97	13.97	2.19						
	57	18.01	18.01	1.28	17.30	17.30	1.43	16.55	16.55	1.59	15.76	15.76	1.77	14.92	14.92	1.97	13.97	13.97	2.19						

Multipliers for Determining the Performance With Other Indoor Sections

Cooling Indoor Model	Capacity	Power	Furnace Model
*CAP**1814A**	1.00	1.00	
CAP**2414A**	1.01	1.01	
CAP**2417A**	1.01	1.01	
CNPF*2418A**	1.00	1.00	
CNPH*2417A**	1.00	1.00	
CNPV*1814A**	0.99	0.99	
CNPV*2414A**	1.00	1.00	
CNPV*2417A**	1.00	1.00	
CSPH*2412A**	0.97	0.97	
FE4ANF002	1.02	0.93	
FF1ENP018	0.99	0.99	
FF1ENP024	1.01	1.01	
FV4BNF002	1.02	0.93	
FX4CNF018	1.01	0.95	
FX4CNF024	1.02	0.96	
FY4ANF018	0.99	0.99	
FY4ANF024	1.00	1.00	

Cooling Indoor Model	Capacity	Power	Furnace Model
CAP**1814A**	0.98	0.92	315(A,J)AV036070
CAP**2414A**	1.00	0.94	315(A,J)AV036070
CNPH*2417A**	0.99	0.93	315(A,J)AV036070
CNPV*1814A**	0.98	0.92	315(A,J)AV036070
CNPV*2414A**	0.99	0.93	315(A,J)AV036070
CSPH*2412A**	0.95	0.89	315(A,J)AV036070
CAP**2417A**	1.01	0.95	315(A,J)AV048090
CNPH*2417A**	0.99	0.93	315(A,J)AV048090
CNPV*2417A**	0.99	0.93	315(A,J)AV048090
CSPH*2412A**	0.95	0.90	315(A,J)AV048090
CNPH*2417A**	0.99	0.93	355AAV042040
CSPH*2412A**	0.95	0.90	355AAV042040
CAP**2417A**	1.00	0.94	355AAV042060
CNPH*2417A**	0.99	0.93	355AAV042060
CNPV*2417A**	0.99	0.93	355AAV042060
CSPH*2412A**	0.95	0.90	355AAV042060
CNPH*2417A**	0.99	0.93	355AAV042080
CSPH*2412A**	0.95	0.90	355AAV042080

See notes on pg. 21

DETAILED COOLING CAPACITIES

EVAPORATOR AIR		CONDENSER ENTERING AIR TEMPERATURES deg F																	
		75			85			95			105			115			125		
CFM	EWB	Capacity MBtu/h†		Total System KW**	Capacity MBtu/h†		Total System KW**	Capacity MBtu/h†		Total System KW**	Capacity MBtu/h†		Total System KW**	Capacity MBtu/h†		Total System KW**	Capacity MBtu/h†		Total System KW**
		Total	Sens ‡		Total	Sens ‡		Total	Sens‡		Total	Sens ‡		Total	Sens ‡		Total	Sens ‡	
123ANA024—A Outdoor Section With CAP**2414A** Indoor Section																			
700	72	27.11	14.29	1.61	25.97	13.86	1.81	24.75	13.40	2.03	23.47	12.92	2.28	22.09	12.41	2.55	20.55	11.85	2.84
	67	24.89	17.62	1.61	23.81	17.16	1.81	22.66	16.68	2.03	21.45	16.19	2.28	20.15	15.66	2.55	18.73	15.09	2.85
	62	22.86	20.91	1.61	21.86	20.44	1.81	20.81	19.93	2.04	19.72	19.39	2.28	18.65	18.65	2.56	17.57	17.57	2.86
	57	22.24	22.24	1.61	21.43	21.43	1.82	20.56	20.56	2.04	19.64	19.64	2.28	18.65	18.65	2.56	17.57	17.57	2.86
800	72	27.54	14.98	1.64	26.35	14.54	1.84	25.08	14.08	2.06	23.76	13.60	2.31	22.34	13.09	2.58	20.75	12.52	2.88
	67	25.31	18.74	1.64	24.19	18.29	1.85	23.00	17.81	2.07	21.75	17.31	2.31	20.42	16.77	2.59	18.96	16.19	2.88
	62	23.37	22.46	1.65	22.36	21.95	1.85	21.35	21.35	2.07	20.38	20.38	2.32	19.33	19.33	2.59	18.18	18.18	2.89
	57	23.14	23.14	1.65	22.28	22.28	1.85	21.36	21.36	2.07	20.38	20.38	2.32	19.33	19.33	2.59	18.18	18.18	2.89
900	72	27.83	15.64	1.68	26.61	15.19	1.88	25.31	14.72	2.10	23.96	14.25	2.34	22.50	13.73	2.61	20.87	13.16	2.91
	67	25.61	19.83	1.68	24.46	19.37	1.88	23.25	18.88	2.10	21.97	18.37	2.35	20.61	17.83	2.62	19.12	17.24	2.92
	62	23.85	23.85	1.68	22.96	22.96	1.88	22.00	22.00	2.10	20.98	20.98	2.35	19.87	19.87	2.62	18.66	18.66	2.92
	57	23.87	23.87	1.68	22.97	22.97	1.88	22.00	22.00	2.10	20.98	20.98	2.35	19.87	19.87	2.62	18.66	18.66	2.92

Multipliers for Determining the Performance With Other Indoor Sections

Cooling Indoor Model	Capacity	Power	Furnace Model
*CAP**2414A**	1.00	1.00	
CAP**2417A**	0.99	0.99	
CAP**3014A**	1.00	1.00	
CAP**3017A**	1.00	1.00	
CNPF*2418A**	0.98	0.98	
CNPH*2417A**	0.98	0.98	
CNPH*3017A**	0.99	0.99	
CNPV*2414A**	0.98	0.98	
CNPV*2417A**	0.98	0.98	
CNPV*3014A**	0.99	0.99	
CNPV*3017A**	0.99	0.99	
CSPH*2412A**	0.96	0.96	
CSPH*3012A**	0.96	0.96	
FE4ANF002	1.00	0.94	
FE4ANF003	1.00	0.94	
FF1ENP024	0.98	0.98	
FF1ENP030	0.98	0.98	
FV4BNF002	1.00	0.94	
FV4BNF003	1.00	0.92	
FX4CNF024	1.00	0.96	
FX4CNF030	1.01	0.96	
FY4ANF024	0.98	0.98	
FY4ANF030	0.99	0.99	

Cooling Indoor Model	Capacity	Power	Furnace Model
CAP**2414A**	0.98	0.94	315(A,J)AV036070
CAP**3014A**	0.99	0.95	315(A,J)AV036070
CNPH*2417A**	0.97	0.93	315(A,J)AV036070
CNPH*3017A**	0.98	0.92	315(A,J)AV036070
CNPV*2414A**	0.97	0.93	315(A,J)AV036070
CNPV*3014A**	0.98	0.97	315(A,J)AV036070
CSPH*2412A**	0.95	0.91	315(A,J)AV036070
CSPH*3012A**	0.95	0.89	315(A,J)AV036070
CAP**2417A**	0.98	0.92	315(A,J)AV048090
CAP**3017A**	0.99	0.93	315(A,J)AV048090
CNPV*2417A**	0.97	0.93	315(A,J)AV048090
CNPV*3017A**	0.98	0.92	315(A,J)AV048090
CSPH*2412A**	0.95	0.89	315(A,J)AV048090
CSPH*3012A**	0.96	0.90	315(A,J)AV048090
CSPH*2412A**	0.95	0.91	315(A,J)AV060110
CSPH*3012A**	0.96	0.90	315(A,J)AV060110
CSPH*2412A**	0.95	0.91	315(A,J)AV066135
CSPH*3012A**	0.96	0.90	315(A,J)AV066135
CSPH*3012A**	0.96	0.90	315(A,J)AV066155
CNPH*2417A**	0.97	0.93	355AAV042040
CNPH*3017A**	0.98	0.92	355AAV042040
CSPH*2412A**	0.95	0.91	355AAV042040
CSPH*3012A**	0.96	0.90	355AAV042040
CAP**2417A**	0.98	0.94	355AAV042060
CAP**3017A**	0.99	0.93	355AAV042060
CNPV*2417A**	0.97	0.93	355AAV042060
CNPV*3017A**	0.98	0.92	355AAV042060
CSPH*2412A**	0.95	0.91	355AAV042060
CSPH*3012A**	0.95	0.89	355AAV042060
CSPH*3012A**	0.96	0.90	355AAV042080
CSPH*3012A**	0.95	0.89	355AAV060080
CSPH*3012A**	0.96	0.90	355AAV060100
CSPH*3012A**	0.95	0.89	355AAV060120

See notes on pg. 21

DETAILED COOLING CAPACITIES

EVAPORATOR AIR		CONDENSER ENTERING AIR TEMPERATURES deg F																	
		75			85			95			105			115			125		
CFM	EWB	Capacity MBtu/h†		Total System KW**	Capacity MBtu/h†		Total System KW**	Capacity MBtu/h†		Total System KW**	Capacity MBtu/h†		Total System KW**	Capacity MBtu/h†		Total System KW**	Capacity MBtu/h†		Total System KW**
		Total	Sens ‡		Total	Sens ‡		Total	Sens ‡		Total	Sens ‡		Total	Sens ‡		Total	Sens ‡	
123ANA030—A Outdoor Section With CAP**3014A** Indoor Section																			
875	72	33.13	17.60	2.01	31.70	17.06	2.23	30.20	16.49	2.47	28.59	15.90	2.75	26.87	15.27	3.06	25.01	14.60	3.38
	67	30.12	21.64	2.01	28.78	21.09	2.23	27.37	20.50	2.48	25.87	19.89	2.76	24.27	19.25	3.07	22.59	18.58	3.42
	62	27.50	25.68	2.01	26.29	25.09	2.23	25.03	24.47	2.48	23.75	23.75	2.77	22.56	22.56	3.08	21.27	21.27	3.43
	57	26.93	26.93	2.01	25.94	25.94	2.24	24.89	24.89	2.48	23.76	23.76	2.77	22.56	22.56	3.08	21.27	21.27	3.43
1000	72	33.69	18.46	2.05	32.21	17.92	2.27	30.64	17.34	2.52	28.98	16.74	2.80	27.20	16.10	3.11	25.32	15.44	3.45
	67	30.64	23.04	2.05	29.26	22.48	2.27	27.80	21.89	2.52	26.25	21.27	2.80	24.61	20.61	3.12	22.87	19.92	3.46
	62	28.16	27.55	2.06	26.95	26.95	2.28	25.86	25.86	2.53	24.67	24.67	2.81	23.39	23.39	3.12	22.02	22.02	3.47
	57	28.03	28.03	2.06	26.98	26.98	2.28	25.86	25.86	2.53	24.67	24.67	2.81	23.39	23.39	3.12	22.02	22.02	3.47
1125	72	34.09	19.27	2.10	32.57	18.72	2.32	30.96	18.14	2.56	29.26	17.54	2.84	27.43	16.89	3.15	25.50	16.22	3.49
	67	31.03	24.36	2.10	29.61	23.80	2.32	28.12	23.20	2.57	26.54	22.57	2.85	24.86	21.90	3.16	23.10	21.19	3.50
	62	28.94	28.94	2.10	27.83	27.83	2.32	26.66	26.66	2.57	25.40	25.40	2.85	24.06	24.06	3.16	22.61	22.61	3.48
	57	28.94	28.94	2.10	27.83	27.83	2.32	26.66	26.66	2.57	25.41	25.41	2.85	24.06	24.06	3.16	22.62	22.62	3.51

Multipliers for Determining the Performance With Other Indoor Sections

Cooling Indoor Model	Capacity	Power	Furnace Model
*CAP**3014A**	1.00	1.00	
CAP**3017A**	1.00	1.00	
CAP**3614A**	1.00	1.00	
CAP**3617A**	1.00	1.00	
CAP**3621A**	1.00	1.00	
CNPF*3618A**	0.99	0.99	
CNPH*3017A**	0.99	0.99	
CNPH*3617A**	0.99	0.99	
CNPV*3014A**	0.99	0.99	
CNPV*3017A**	0.99	0.99	
CNPV*3617A**	0.99	0.99	
CNPV*3621A**	0.99	0.99	
CSPH*3012A**	0.96	0.96	
CSPH*3612A**	0.98	0.98	
FE4ANF002	0.99	0.95	
FE4ANF003	1.00	0.94	
FE4ANF005	1.03	0.94	
FF1ENP030	0.98	0.98	
FF1ENP036	1.00	1.00	
FV4BNF002	0.99	0.95	
FV4BNF003	1.00	0.94	
FV4BNF005	1.03	0.94	
FX4CN(B,F)036	1.01	0.96	
FX4CNF030	1.00	0.98	
FY4ANF030	0.99	0.99	
FY4ANF036	0.99	0.99	

See notes on pg. 21

Cooling Indoor Model	Capacity	Power	Furnace Model
CAP**3014A**	0.99	0.97	315(A,J)AV036070
CAP**3614A**	0.99	0.94	315(A,J)AV036070
CNPH*3017A**	0.98	0.94	315(A,J)AV036070
CNPH*3617A**	0.98	0.94	315(A,J)AV036070
CNPV*3014A**	0.98	0.96	315(A,J)AV036070
CSPH*3012A**	0.96	0.92	315(A,J)AV036070
CSPH*3612A**	0.97	0.93	315(A,J)AV036070
CAP**3017A**	0.99	0.94	315(A,J)AV048090
CAP**3617A**	0.99	0.95	315(A,J)AV048090
CNPV*3017A**	0.98	0.94	315(A,J)AV048090
CNPV*3617A**	0.98	0.94	315(A,J)AV048090
CAP**3621A**	0.99	0.95	315(A,J)AV060110
CNPV*3621A**	0.99	0.94	315(A,J)AV060110
CNPH*3017A**	0.98	0.96	355AAV042040
CNPH*3617A**	0.98	0.96	355AAV042040
CSPH*3012A**	0.96	0.94	355AAV042040
CSPH*3612A**	0.97	0.93	355AAV042040
CAP**3017A**	0.99	0.94	355AAV042060
CAP**3617A**	0.99	0.94	355AAV042060
CNPV*3017A**	0.98	0.94	355AAV042060
CNPV*3617A**	0.98	0.94	355AAV042060
CAP**3621A**	0.99	0.95	355AAV042080
CNPV*3621A**	0.98	0.94	355AAV042080

123A

DETAILED COOLING CAPACITIES

EVAPORATOR AIR		CONDENSER ENTERING AIR TEMPERATURES deg F																	
		75			85			95			105			115			125		
CFM	EWB	Capacity MBtu/h†		Total System KW**	Capacity MBtu/h†		Total System KW**	Capacity MBtu/h†		Total System KW**	Capacity MBtu/h†		Total System KW**	Capacity MBtu/h†		Total System KW**	Capacity MBtu/h†		Total System KW**
		Total	Sens ‡		Total	Sens ‡		Total	Sens ‡		Total	Sens ‡		Total	Sens ‡				
123ANA036—A Outdoor Section With CAP**3617A** Indoor Section																			
1050	72	40.12	21.34	2.48	38.42	20.70	2.74	36.61	20.02	3.03	34.70	19.31	3.35	32.62	18.55	3.71	30.32	17.72	4.09
	67	36.62	26.34	2.47	35.03	25.67	2.73	33.34	24.97	3.02	31.55	24.24	3.34	29.62	23.47	3.70	27.50	22.62	4.09
	62	33.54	31.31	2.46	32.11	30.61	2.72	30.61	29.86	3.01	29.06	29.06	3.34	27.62	27.62	3.70	25.99	25.99	4.09
	57	32.88	32.88	2.46	31.70	31.70	2.72	30.44	30.44	3.01	29.09	29.09	3.34	27.63	27.63	3.70	26.00	26.00	4.09
1200	72	40.72	22.34	2.54	38.96	21.69	2.80	37.09	21.00	3.09	35.11	20.28	3.41	32.97	19.51	3.76	30.60	18.67	4.15
	67	37.19	27.96	2.53	35.54	27.28	2.79	33.80	26.58	3.08	31.96	25.85	3.40	29.98	25.06	3.76	27.81	24.20	4.15
	62	34.30	33.50	2.52	32.84	32.84	2.78	31.55	31.55	3.07	30.12	30.12	3.40	28.56	28.56	3.75	26.83	26.83	4.14
	57	34.15	34.15	2.52	32.89	32.89	2.78	31.55	31.55	3.07	30.12	30.12	3.40	28.56	28.56	3.75	26.83	26.83	4.14
1350	72	41.16	23.27	2.60	39.34	22.61	2.86	37.42	21.92	3.14	35.40	21.20	3.47	33.21	20.42	3.82	30.78	19.57	4.21
	67	37.62	29.51	2.59	35.93	28.83	2.85	34.15	28.12	3.14	32.27	27.38	3.46	30.25	26.57	3.81	28.05	25.67	4.20
	62	35.18	35.18	2.58	33.86	33.86	2.84	32.45	32.45	3.13	30.95	30.95	3.46	29.31	29.31	3.81	27.50	27.50	4.20
	57	35.19	35.19	2.58	33.86	33.86	2.84	32.46	32.46	3.13	30.95	30.95	3.46	29.31	29.31	3.81	27.50	27.50	4.20

Multipliers for Determining the Performance With Other Indoor Sections

Cooling Indoor Model	Capacity	Power	Furnace Model
*CAP**3617A**	1.00	1.00	
CAP**3614A**	0.97	0.97	
CAP**3621A**	1.00	1.00	
CAP**4221A**	1.00	1.00	
CAP**4224A**	1.00	1.00	
CNPF*3618A**	0.99	0.99	
CNPH*3617A**	0.99	0.99	
CNPH*4221A**	1.00	1.00	
CNPV*3617A**	0.99	0.99	
CNPV*3621A**	0.99	0.99	
CNPV*4221A**	1.00	1.00	
CSPH*3612A**	0.99	0.99	
CSPH*4212A**	0.99	0.98	
FE4ANB006	1.04	0.95	
FE4ANF002	0.99	0.95	
FE4ANF003	1.00	0.94	
FE4ANF005	1.03	0.94	
FF1ENP036	0.99	0.99	
FV4BNB006	1.04	0.95	
FV4BNF002	0.99	0.95	
FV4BNF003	1.00	0.94	
FV4BNF005	1.03	0.94	
FX4CN(B,F)036	1.01	0.97	
FX4CN(B,F)042	1.02	0.98	
FY4ANF036	0.99	0.99	
FY4ANF042	1.01	1.01	

See notes on pg. 21

Cooling Indoor Model	Capacity	Power	Furnace Model
CAP**3614A**	0.97	0.95	315(A,J)AV036070
CNPH*3617A**	0.98	0.96	315(A,J)AV036070
CNPH*4221A**	1.01	0.96	315(A,J)AV036070
CSPH*3612A**	0.98	0.93	315(A,J)AV036070
CSPH*4212A**	1.00	0.98	315(A,J)AV036070
CAP**3617A**	0.99	0.95	315(A,J)AV048090
CNPV*3617A**	0.98	0.94	315(A,J)AV048090
CAP**3621A**	0.99	0.95	315(A,J)AV060110
CAP**4221A**	1.00	0.96	315(A,J)AV060110
CNPV*3621A**	0.99	0.98	315(A,J)AV060110
CNPV*4221A**	1.02	0.96	315(A,J)AV060110
CAP**4224A**	1.00	0.94	315(A,J)AV066135
CAP**4224A**	0.99	0.95	355AAV042040
CNPH*3617A**	0.98	0.96	355AAV042040
CNPH*4221A**	1.01	0.96	355AAV042040
CSPH*3612A**	0.98	0.93	355AAV042040
CSPH*4212A**	0.99	0.98	355AAV042040
CAP**3617A**	0.99	0.95	355AAV042060
CNPH*4221A**	1.01	0.97	355AAV042060
CNPV*3617A**	0.98	0.96	355AAV042060
CAP**3621A**	0.99	0.97	355AAV042080
CAP**4221A**	0.99	0.95	355AAV042080
CNPV*3621A**	0.99	0.99	355AAV042080
CNPV*4221A**	1.01	0.96	355AAV042080

DETAILED COOLING CAPACITIES

EVAPORATOR AIR		CONDENSER ENTERING AIR TEMPERATURES deg F																	
		75			85			95			105			115			125		
CFM	EWB	Capacity MBtu/h†		Total System KW**	Capacity MBtu/h†		Total System KW**	Capacity MBtu/h†		Total System KW**	Capacity MBtu/h†		Total System KW**	Capacity MBtu/h†		Total System KW**	Capacity MBtu/h†		Total System KW**
		Total	Sens ‡		Total	Sens ‡		Total	Sens ‡		Total	Sens ‡		Total	Sens ‡		Total	Sens ‡	
123ANA042—A Outdoor Section With CAP**4221A** Indoor Section																			
1225	72	48.51	25.52	3.33	46.40	24.71	3.68	44.17	23.86	4.08	41.83	22.99	4.51	39.30	22.05	4.99	36.50	21.03	5.51
	67	44.49	31.40	3.31	42.53	30.57	3.66	40.46	29.71	4.06	38.30	28.81	4.50	35.96	27.87	4.98	33.41	26.84	5.51
	62	40.85	37.25	3.29	39.08	36.40	3.65	37.24	35.50	4.04	35.33	34.54	4.48	33.39	33.39	4.97	31.44	31.44	5.50
	57	39.76	39.76	3.29	38.32	38.32	3.64	36.79	36.79	4.04	35.17	35.17	4.48	33.41	33.41	4.97	31.45	31.45	5.50
1400	72	49.22	26.65	3.40	47.02	25.82	3.76	44.72	24.97	4.15	42.30	24.08	4.59	39.69	23.14	5.07	36.79	22.10	5.59
	67	45.18	33.25	3.38	43.15	32.40	3.74	41.00	31.53	4.13	38.76	30.63	4.57	36.37	29.68	5.05	33.74	28.63	5.58
	62	41.71	39.81	3.37	39.92	38.90	3.72	38.04	38.04	4.12	36.38	36.38	4.56	34.50	34.50	5.05	32.41	32.41	5.58
	57	41.28	41.28	3.37	39.74	39.74	3.72	38.11	38.11	4.12	36.38	36.38	4.56	34.50	34.50	5.05	32.41	32.41	5.58
1575	72	49.76	27.73	3.48	47.49	26.90	3.84	45.12	26.04	4.23	42.63	25.14	4.67	39.95	24.19	5.14	36.99	23.14	5.66
	67	45.71	35.04	3.46	43.61	34.19	3.82	41.42	33.32	4.21	39.13	32.41	4.65	36.68	31.44	5.13	33.99	30.36	5.65
	62	42.55	42.13	3.45	40.89	40.89	3.80	39.17	39.17	4.20	37.34	37.34	4.64	35.37	35.37	5.12	33.16	33.16	5.65
	57	42.52	42.52	3.45	40.89	40.89	3.80	39.17	39.17	4.20	37.35	37.35	4.64	35.37	35.37	5.12	33.16	33.16	5.65

Multipliers for Determining the Performance With Other Indoor Sections

Indoor Model	Capacity	Power	Furnace Model
*CAP**4221A**	1.00	1.00	
CAP**4224A**	1.00	1.00	
CAP**4817A**	0.98	0.98	
CAP**4821A**	1.01	1.01	
CAP**4824A**	1.01	1.01	
CNPF*4818A**	1.01	1.01	
CNPH*4221A**	1.00	1.00	
CNPH*4821A**	1.01	1.01	
CNPV*4221A**	1.00	1.00	
CNPV*4821A**	0.99	0.99	
CNPV*4824A**	1.01	1.01	
CSPH*4212A**	0.99	0.99	
CSPH*4812A**	1.00	1.00	
FE4ANB006	1.04	0.95	
FE4ANF003	0.99	0.94	
FE4ANF005	1.02	0.96	
FV4BNB006	1.04	0.95	
FV4BNF003	0.99	0.94	
FV4BNF005	1.01	0.95	
FX4CN(B,F)042	1.01	0.99	
FX4CN(B,F)048	1.04	0.99	
FY4ANF042	1.00	1.00	
FY4ANF048	1.02	1.02	

See notes on pg. 21

Indoor Model	Capacity	Power	Furnace Model
CNPH*4221A**	0.99	0.97	315(A,J)AV036070
CNPH*4821A**	1.00	0.98	315(A,J)AV036070
CSPH*4212A**	0.98	0.96	315(A,J)AV036070
CSPH*4812A**	0.98	0.96	315(A,J)AV036070
CAP**4817A**	0.98	0.93	315(A,J)AV048090
CAP**4221A**	0.99	0.97	315(A,J)AV060110
CAP**4821A**	1.00	0.96	315(A,J)AV060110
CNPV*4221A**	0.98	0.93	315(A,J)AV060110
CNPV*4821A**	1.00	0.96	315(A,J)AV060110
CAP**4224A**	0.99	0.94	315(A,J)AV066135
CAP**4824A**	1.00	0.94	315(A,J)AV066135
CNPV*4824A**	0.99	0.93	315(A,J)AV066135
CAP**4224A**	0.98	0.96	355AAV042040
CAP**4824A**	1.00	0.98	355AAV042040
CNPH*4221A**	0.98	0.96	355AAV042040
CNPH*4821A**	0.99	0.97	355AAV042040
CNPV*4824A**	1.00	0.98	355AAV042040
CSPH*4212A**	0.98	0.96	355AAV042040
CSPH*4812A**	0.98	0.96	355AAV042040
CAP**4817A**	0.98	0.93	355AAV042060
CAP**4221A**	0.98	0.96	355AAV042080
CAP**4821A**	0.99	0.97	355AAV042080

123A

DETAILED COOLING CAPACITIES

EVAPORATOR AIR		CONDENSER ENTERING AIR TEMPERATURES deg F																	
		75			85			95			105			115			125		
CFM	EWB	Capacity MBtu/h†		Total System KW**	Capacity MBtu/h†		Total System KW**	Capacity MBtu/h†		Total System KW**	Capacity MBtu/h†		Total System KW**	Capacity MBtu/h†		Total System KW**	Capacity MBtu/h†		Total System KW**
		Total	Sens ‡		Total	Sens ‡		Total	Sens ‡		Total	Sens ‡		Total	Sens ‡		Total	Sens ‡	
123ANA048—A Outdoor Section With CAP**4821A** Indoor Section																			
1400	72	55.04	28.49	3.35	52.62	27.54	3.75	50.08	26.56	4.20	47.38	25.54	4.72	44.49	24.45	5.30	41.25	23.26	6.01
	67	49.86	34.52	3.35	47.63	33.55	3.75	45.27	32.56	4.21	42.77	31.51	4.73	40.10	30.41	5.33	37.08	29.19	6.08
	62	45.26	40.60	3.35	43.30	39.77	3.76	41.26	38.91	4.22	39.15	38.04	4.74	37.27	37.27	5.34	35.05	35.05	6.09
	57	44.65	44.65	3.35	42.99	42.99	3.76	41.23	41.23	4.22	39.35	39.35	4.74	37.33	37.33	5.34	35.06	35.06	6.09
1600	72	56.06	29.65	3.42	53.54	28.69	3.82	50.89	27.69	4.27	48.09	26.65	4.79	45.09	25.55	5.36	41.76	24.34	6.06
	67	50.79	36.35	3.42	48.45	35.38	3.82	46.00	34.36	4.28	43.40	33.30	4.80	40.63	32.17	5.39	37.50	30.93	6.14
	62	46.36	43.45	3.42	44.40	42.66	3.83	42.52	41.92	4.17	40.77	40.77	4.81	38.63	38.63	5.40	36.19	36.19	6.15
	57	46.41	46.41	3.42	44.64	44.64	3.83	42.77	42.77	4.28	40.78	40.78	4.81	38.63	38.63	5.40	36.19	36.19	6.15
1800	72	56.83	30.71	3.49	54.22	29.73	3.89	51.49	28.72	4.34	48.61	27.66	4.85	45.53	26.54	5.43	42.11	25.32	6.12
	67	51.48	38.05	3.49	49.06	37.05	3.89	46.53	36.02	4.35	43.86	34.94	4.87	41.00	33.80	5.46	37.80	32.58	6.20
	62	47.45	46.27	3.50	45.69	45.69	3.90	44.03	44.03	4.36	41.94	41.94	4.88	39.69	39.69	5.47	37.12	37.12	6.21
	57	47.87	47.87	3.49	46.01	46.01	3.90	44.04	44.04	4.36	41.95	41.95	4.88	39.69	39.69	5.47	37.13	37.13	6.21

Multipliers for Determining the Performance With Other Indoor Sections

Cooling Indoor Model	Capacity	Power	Furnace Model
*CAP**4821A**	1.00	1.00	
CAP**4817A**	0.99	0.99	
CAP**4824A**	1.00	1.00	
CAP**6021A**	1.02	1.02	
CAP**6024A**	1.02	1.02	
CNPF*4818A**	0.98	0.98	
CNPH*4821A**	1.00	1.00	
CNPH*6024A**	1.02	1.02	
CNPV*4221A**	0.97	0.97	
CNPV*4821A**	1.00	1.00	
CNPV*4824A**	1.00	1.00	
CNPV*6024A**	1.02	1.02	
CSPH*4812A**	0.99	0.99	
CSPH*6012A**	1.00	1.00	
FE4ANB006	1.02	0.96	
FE4ANF005	1.01	0.97	
FV4BNB006	1.02	0.96	
FV4BNF005	1.01	0.97	
FX4CN(B,F)048	1.02	1.00	
FX4CN(B,F)060	1.03	0.99	
FY4ANB060	1.01	1.01	
FY4ANF048	1.00	1.00	

Cooling Indoor Model	Capacity	Power	Furnace Model
CAP**4817A**	0.99	0.97	315(A,J)AV048090
CNPH*4821A**	0.98	0.96	315(A,J)AV048090
CNPH*6024A**	1.00	0.98	315(A,J)AV048090
CSPH*4812A**	0.97	0.95	315(A,J)AV048090
CSPH*6012A**	0.98	0.96	315(A,J)AV048090
CAP**4821A**	0.98	0.96	315(A,J)AV060110
CAP**6021A**	1.03	1.01	315(A,J)AV060110
CNPH*4821A**	0.99	0.97	315(A,J)AV060110
CNPH*6024A**	1.00	0.98	315(A,J)AV060110
CNPV*4221A**	0.97	0.95	315(A,J)AV060110
CNPV*4821A**	0.98	0.96	315(A,J)AV060110
CAP**4824A**	0.99	0.97	315(A,J)AV066135
CAP**6024A**	1.01	0.97	315(A,J)AV066135
CNPV*4824A**	0.99	0.97	315(A,J)AV066135
CNPV*6024A**	1.00	0.96	315(A,J)AV066135
CAP**4821A**	0.98	0.98	355AAV060080
CAP**6021A**	1.00	0.98	355AAV060080
CNPH*4821A**	0.98	0.98	355AAV060080
CNPH*6024A**	1.00	0.98	355AAV060080
CNPV*4221A**	0.97	0.97	355AAV060080
CNPV*4821A**	0.98	0.98	355AAV060080
CSPH*4812A**	0.97	0.97	355AAV060080
CSPH*6012A**	0.98	0.96	355AAV060080
CAP**4821A**	0.98	0.94	355AAV060100
CNPH*4821A**	0.98	0.96	355AAV060100
CNPH*6024A**	1.00	0.98	355AAV060100
CAP**4824A**	0.98	0.96	355AAV060120
CAP**6024A**	1.00	0.96	355AAV060120
CNPV*4824A**	0.99	0.97	355AAV060120
CNPV*6024A**	1.00	0.98	355AAV060120

See notes on pg. 21

DETAILED COOLING CAPACITIES

EVAPORATOR AIR		CONDENSER ENTERING AIR TEMPERATURES deg F																	
		75			85			95			105			115			125		
		Capacity MBtu/h†		Total System KW**	Capacity MBtu/h†		Total System KW**	Capacity MBtu/h†		Total System KW**	Capacity MBtu/h†		Total System KW**	Capacity MBtu/h†		Total System KW**	Capacity MBtu/h†		Total System KW**
CFM	EWB	Total	Sens ‡		Total	Sens ‡		Total	Sens ‡		Total	Sens ‡		Total	Sens ‡		Total	Sens ‡	
123ANA060—A Outdoor Section With CAP**6024A** Indoor Section																			
1750	72	67.65	35.66	4.15	64.56	34.48	4.58	61.30	33.25	5.06	57.89	31.98	5.58	54.20	30.63	6.15	50.10	29.15	6.77
	67	62.07	43.94	4.10	59.24	42.75	4.53	56.25	41.50	5.01	53.12	40.22	5.54	49.74	38.85	6.11	46.03	37.38	6.74
	62	57.01	52.17	4.06	54.45	50.95	4.49	51.79	49.66	4.97	49.04	48.27	5.50	46.34	46.34	6.08	43.50	43.50	6.72
	57	55.50	55.50	4.04	53.42	53.42	4.48	51.22	51.22	4.96	48.89	48.89	5.50	46.35	46.35	6.08	43.51	43.51	6.72
2000	72	68.69	37.30	4.26	65.46	36.09	4.69	62.07	34.85	5.16	58.54	33.56	5.69	54.71	32.19	6.26	50.48	30.69	6.87
	67	63.07	46.60	4.21	60.11	45.38	4.64	57.00	44.12	5.11	53.75	42.82	5.64	50.27	41.45	6.21	46.44	39.94	6.84
	62	58.17	55.80	4.16	55.57	54.47	4.59	52.95	52.95	5.07	50.49	50.49	5.61	47.78	47.78	6.19	44.74	44.74	6.82
	57	57.57	57.57	4.16	55.35	55.35	4.59	52.99	52.99	5.07	50.50	50.50	5.61	47.78	47.78	6.19	44.74	44.74	6.82
2250	72	69.44	38.83	4.36	66.10	37.62	4.79	62.61	36.36	5.27	58.97	35.06	5.79	55.04	33.67	6.36	50.70	32.16	6.97
	67	63.79	49.12	4.31	60.73	47.89	4.74	57.53	46.62	5.21	54.20	45.31	5.74	50.63	43.90	6.31	46.72	42.34	6.93
	62	59.18	59.18	4.27	56.90	56.90	4.70	54.41	54.41	5.18	51.77	51.77	5.72	48.91	48.91	6.30	45.70	45.70	6.93
	57	59.25	59.25	4.27	56.90	56.90	4.70	54.42	54.42	5.18	51.78	51.78	5.72	48.91	48.91	6.30	45.70	45.70	6.93

Multipliers for Determining the Performance With Other Indoor Sections

Cooling Indoor Model	Capacity	Power	Furnace Model
*CAP**6024A**	1.00	1.00	
CAP**6021A**	0.98	0.98	
CNPH*6024A**	0.97	0.97	
CNPV*6024A**	0.99	0.99	
CSPH*6012A**	0.98	0.98	
FE4ANB006	0.99	0.97	
FV4BNB006	0.99	0.97	
FX4CN(B,F)060	1.01	1.01	
FY4ANB060	0.98	0.98	

Cooling Indoor Model	Capacity	Power	Furnace Model
CAP**6021A**	0.97	0.97	315(A,J)AV060110
CSPH*6012A**	0.97	0.97	315(A,J)AV060110
CAP**6024A**	0.98	0.98	315(A,J)AV066135
CNPH*6024A**	0.97	0.96	315(A,J)AV066135
CNPV*6024A**	0.97	0.97	315(A,J)AV066135
CSPH*6012A**	0.97	0.95	315(A,J)AV066135
CAP**6024A**	0.98	0.97	315(A,J)AV066155
CNPH*6024A**	0.98	0.97	315(A,J)AV066155
CNPV*6024A**	0.98	0.97	315(A,J)AV066155
CSPH*6012A**	0.97	0.95	315(A,J)AV066155

NOTE: When the required data fall between the published data, interpolation may be performed. Extrapolation is not an acceptable practice.

* Detailed cooling capacities are based on indoor and outdoor unit at the same elevation per ARI standard 210/240–94. If additional tubing length and/or indoor unit is located above outdoor unit, a slight variation in capacity may occur.

** Total system kW is total of indoor and outdoor unit kilowatts.

† Total and sensible capacities are net capacities. Blower motor heat has been subtracted.

‡ Sensible capacities shown are based on 80°F (27°C) entering air at the indoor coil. For sensible capacities at other than 80°F (27°C), deduct 835 Btu/h (245 kW) per 1000 CFM (480 L/S) of indoor coil air for each degree below 80°F (27°C), or add 835 Btu/h (245 kW) per 1000 CFM (480 L/S) of indoor coil air per degree above 80°F (27°C).

When the required data fall between the published data, interpolation may be performed.

MANUFACTURER CAPACITY CALCULATORS		
	DOWNLOAD LINK	ACCOUNT REQUIRED
CARRIER	Ecat program available for download see your dealer	YES
	http://rpmob.wrightsoft.com/	NO
	http://www.adpnow.com/extratings/	NO
LENNOX	See Below ADP/ Lennox or Dave.Net for Lennox/Lennox	
BRYANT	Ecat program available for download see your dealer	YES
	http://rpmobbry.wrightsoft.com/	NO
	http://www.adpnow.com/extratings/	NO
RHEEM	http://www.wrightsoft.com/rheem/downloads.aspx	NO
	http://www.adpnow.com/extratings/	
RUUD	http://www.wrightsoft.com/ruud/index.asp	NO
GOODMAN	Wrightsoft Internal only	
YORK	CONTACT YOUR TERRITORY MANAGER OR DOUG MCLEISH - d.mcleish@us-ac.com(UST Program)	NO
	http://www.adpnow.com/extratings/	NO
AMANA	Wrightsoft Internal only	YES
AMERICAN STANDARD	WWW.ASDEALERNET.COM	YES
ICP CALCULATOR	http://www.arboroaks.com/ICP/eqp/Index.htm	NO
	http://www.adpnow.com/extratings/	
TRANE	https://www.comfortsite.com	YES
ADP CALCULATORS - VARIOUS OEM (Carrier, Lennox, Armstrong, York)	http://www.adpnow.com/extratings/	NO
DAY & NIGHT	http://www.arboroaks.com/ICP/eqp/Index.htm	NO
ARMSTRONG	http://www.adpnow.com/extratings/	NO
NORDYNE	http://www.adpnow.com/extratings/	NO

Manual J, D & S - Frequently Asked Questions for Connecticut

Q: Why do I need to perform a load calculation (Manual J) for a Replacement System?

A: For several reasons; buildings are improved over time (i.e. windows, insulation, and weatherization), equipment selection and system types have an impact on loads and it is unlikely a load calculation with the current sensitivities was ever performed. The load calculation is a requisite requirement for equipment selection in the Manual S process.

Q: When do I perform a Block Load versus a Room-by-Room Load calculation?

A: A block load may be performed on an existing house with an existing distribution system (for the given system type). In any case where the distribution system is being modified, added, or newly installed then a Room-by-Room procedure is required before the equipment is selected and any distribution system installed.

Q: Can I use an online load calculator tool for Manual J?

A: Code requires you to perform a load calculation using the procedures in Manual J-8. Version 8 is much more refined than previous versions and has particular sensitivities for duct locations and loads as well as window gains. The Air Conditioning Contractors of America (ACCA) has a list of software vendors who have software that is approved to perform the load calculations. All of the online calculators that have been reviewed to date do not meet the Manual J-8 capabilities; therefore you may not use them for your load calculations.

Q: Do I need to perform load calculations for Ductless Mini-Split systems?

A: YES. Be forewarned that many of the mini-split OEM's are not currently producing the engineering documentation to perform Manual S calculations correctly. Given the typical configuration of most mini-split systems using surface mounted air terminals and all of Connecticut having an outdoor design temperature below the AHRI rating temperature of 95°F, the selected system will probably have capacity in excess of its rated value. Since the surface mounted air terminals have a performance advantage of not using a ducted distribution system, there is no reason to select a system with more capacity than the given load.

Q: How do I perform a Manual J load calculation for a Ductless Mini-split system if there aren't any ducts?

A: Most Manual J load calculation software assumes you are using ducted distribution systems. Manual J-8 compliant software is required to perform more accurate duct load calculations than the outdated (and retired) Manual J-7 methods; however there isn't a "No-Ducts" option in most of the software. In

order to get the correct load calculation, you must therefore set the ducts as being “In the Conditioned Space” for both the supply and return. This basically turns off the duct calculations in the software.

Q: Can I use a Ductless Mini-Split Heat Pump as the primary heating system in a home?

A: Code requires all heat pumps to be sized to the cooling load. Code also requires that 100% of the calculated heating load is covered at design conditions. For most heat pumps, this means the size you can select will likely be short on meeting the total heating requirements of the home and therefore must provide a supplemental system to cover the balance. If your mini-split system has variable refrigerant flow technology, then you may oversize the system by 30% of cooling. If the result of this means the system has enough heating capacity to meet the heating load, then a supplemental system is not required. This situation is only likely to happen in a very well insulated and sealed home.

Q: I am installing a radiant panel heating system and have software from an OEM that performs the loads and tubing design. Can I use that for my Manual J documentation?

A: This is a bit tricky: the short answer is yes, but you will also need to use a Manual J-8 compliant software package to calculate the loads. Some radiant design packages allow you to enter the loads and dimensions for a given room to calculate the tubing layout (without entering in all the building components). Therefore you can use your results from an approved Manual J-8 software package to get the respective room heating loads for the radiant software. You should also be aware that several of the Manual J-8 software suites are also capable of designing radiant systems. If there is any cooling you will also need use the Manual J-8 software anyway, so there is almost no additional effort to get both heating and cooling calculations at the same time.

Q: What is Manual S? Can't I just replace the old system with a new system of the same capacity?

A: Manual S is the process of determining the capacity of candidate equipment for a given load at the local design conditions. This process adjusts equipment capacity for the given local altitude, outdoor air and return duct loads (entering coil). The adjusted capacity may be significantly different than its nominal rated capacity. Return duct (entering coil) loads are the combination of heat transfer through the duct walls, leakage through seams, intentional ventilation introduced into the return duct before the coil and in some cases fan heat (add-on coils).

You cannot just install a new system because the required CFM may be significantly different; many older systems had lower CFM requirements for their respective capacity, therefore the designer needs to ensure the any existing ducts can support the candidate new equipment.

In order to perform a Manual S procedure, you will need to determine the Entering Coil loads (either in Manual J software, or spreadsheet and psychrometric chart) and using the local design conditions plot these on an OEM performance table – or better yet, use one of the available online OEM capacity calculators. There are only a few OEM's who do not have a contractor-based online equipment selection tool that lets you enter the coil conditions and outdoor conditions to calculate capacity for a candidate system.

There is also the issue of using third-party coils. Unfortunately many third-party OEM's do not provide extended performance tables (as required by AHRI), or other calculators to actually determine their capacity (and other performance indicators) at your design conditions. Because of this, you may be required to contact OEM's to get custom performance calculations in order to meet Manual S requirements when using a third-party coil. We currently know of one third-party coil OEM that has a spreadsheet-based calculator.

Q: Is there a simple chart on the Manual S sizing requirements?

A: There is an entire chapter and several charts with explanations in Manual S. For your convenience, here is a boiled-down summary chart (for Connecticut):

General Cooling Capacity Factors			
Equipment Tested and Rated by AHRI	Single Speed Compressors	Multi/Variable Speed Compressors	GWHP
Total Maximum sizing factor	1.15	1.20 (multi), 1.30 (variable)	1.25(single), 1.30(multi), 1.35(variable)
Latent	Minimum = 1.0 (may go to 1.50 or higher if needed to meet sensible minimum)		
Sensible	Minimum = 0.90		
General Heating Capacity Factors			
Minimum	1.0		
Maximum	1.4 (up to 2.0 allowed)		

Q: Do I need to perform a Duct Design (Manual D) on existing systems?

A: NO. A duct design (Manual D) is only required when the distribution system is being initially installed or modified (extended) to serve a new space (i.e.: addition).

Q: Can I hire a third-party to perform my calculations?

A: YES, however you are still responsible for ensuring it is done correctly, therefore you must ensure the designer has all the pertinent information to perform such engineering. To help illustrate this, a designer needs a full set of building drawings (not just floor plans) to determine ceiling heights, slopes, overhangs, knee-walls and other features needed as inputs.

Q: Am I required to perform Infiltration or Duct Leakage testing on existing homes and duct systems?

A: The short answer is "NO" providing the duct system is not being extended, modified or replaced, however performing such tests will provide a much higher level of engineering and may provide insight and opportunity to an comfort or energy issues in the building.

Q: How much time will it take me to do all these calculations?

A: This of course depends on the complexity of the house, your proposed solution and your experience in using the various design tools available. A typical house will require 2 to 3 hours to perform a full set of Manual J, S & D calculations and produce documentation. A simple replacement can take less time.

Q: How can I provide customer quotes if I have to do a load calculation and equipment selection engineering?

A: Contractors who are already doing this often provide a menu of quotes for different equipment combinations subject to final engineering upon a contract. There are also contractors who do a home survey and perform a quick block load to get into the ballpark to provide a tighter group of quote options.

Q: I just did a load calculation and it works out to 1,283 square feet per ton. I was told cooling equipment should come in around 500 square feet per ton. How can this be?

A: Equipment capacity requirements are highly sensitive to window types and shading, including overhangs, building infiltration and duct location, R-value and leakage class. A house with average ducts located in an attic may need ½ to 1 ton or more Air Conditioning capacity than the same house where the ducts are located in the basement. This one parameter alone (duct location) is just one example of why it is important to perform a load calculation for each building. Once you've start doing more calculations you will quickly find most houses range from 700 to 1,200 square feet per ton!

Q: Where can I get help with performing load and equipment engineering?

A: There are many resources. First the software suite you are using most likely has many online videos to help you with using their software to perform a particular task. Check with your local electric utility to see if they have any programs that deal with HVAC design. Local community college or technical career schools may offer some curriculum on the subject. Suppliers often host or sponsor training. Check with the Air Conditioning Contractors of America (ACCA) to see what courses they may be offering (you do not need to be a member). You might also check in with your local trade organization(s) on hosting a class or mechanism to provide training and support. Check with colleagues (distant competitors) if they have any experience with the software or methods you are using.

Q: Do I need to own the ACCA Manuals (J, S & D) to do the engineering calculations?

A: If you are using software to perform the calculations, the manuals will not help you to use the software interfaces directly, but they will provide the background reference in case you want to know what the underlying calculations and procedures are. With that said, Manuals S & D are much more practical, and if you want or need to see examples on how to select equipment for different situations, or how to do duct designs manually (which really isn't hard), then these are the two documents we would suggest you start with.

Q: My load calculation software shows recommended tons. Is this the same as Manual S?

A: No unfortunately not. You need to select equipment with airflow and capacity that meets the design loads. The recommended tons method uses the Sensible Heat Ratio to calculate capacity. This method doesn't adjust for entering duct conditions or actual airflow available for a system.

Q: Can I reduce the indoor cooling design temperature – my customer wants the house to cool to 72 degrees?

A: Short answer is no. Your customer just gave you an important clue about the existing system and conditions: the house has excess humidity, and the customer is turning down the set point to make the system run longer to remove the moisture. Reducing the indoor design temperature is actually counter-productive for achieving the desired comfort a modern cooling system is intended to provide.

Q: What software can I use to perform load calculations?

A: Here is a list of the currently approved (ACCA) software products available at the time of this printing:

Software Vendor and Software Title	Website
AdTek AccuLoad (Manual J) and AccuDuct (Manual D)	http://www.adteksoft.com/
Avenir LoopCAD (Radiant) and HeatCAD	http://www.avenir-online.com/
Caramel Software HVAC ResLoad-J for iPad	http://www.carmelsoft.com/
Elite Software RHVAC	http://www.elitesoft.com/
EnergyGauge USA Residential Buildings	http://www.energygauge.com/
Wrightsoft Right-Suite Universal	http://www.wrightsoft.com/

Q: Where can I see the current mechanical codes for Connecticut?

A: You can view the currently enforced Connecticut codes online:

Online Resource	Website
State of CT – Department. of Administrative Services: Division of Construction Services	http://www.ct.gov/dcs/
ICC Online Code Viewer	http://publicecodes.cyberregs.com/icod/index.htm

Q: Where can I get additional help or questions answered regarding Manual J, S & D?

A: Check out ACCA's website (www.ACCA.org) , your local trade association may have members who can help, your local distributor or you may contact me (Buck Taylor) at the information provided below.

Roltay Inc. Energy Services

98 Overbrook Road

Madison, CT 06443

Phone: (203) 672-1330

E-mail: info@roltay.com



Manual S Compliance Report

Boiler

Roltay Inc. Energy Services

Job:
Date: May 01, 2015
By:

98 Overbrook Road, Madison, CT 06443 Phone: 203-672-1330 Email: buck@roltay.com Web: www.Roltay.com

Project Information

For: Manual S Demo
West Haven, CT 06516

Cooling Equipment

Design Conditions

Outdoor design DB:	84.0°F	Sensible gain:	23490 Btuh	Entering coil DB:	75.7°F
Outdoor design WB:	73.0°F	Latent gain:	4385 Btuh	Entering coil WB:	62.8°F
Indoor design DB:	75.0°F	Total gain:	27876 Btuh		
Indoor RH:	50%	Estimated airflow:	1100 cfm		

Manufacturer's Performance Data at Actual Design Conditions

Equipment type:	Split AC		
Manufacturer:	Bryant	Model:	123ANA030****C*+FX4DN(B,F)037L
Actual airflow:	1100 cfm		
Sensible capacity:	23574 Btuh	100% of load	
Latent capacity:	5099 Btuh	116% of load	
Total capacity:	28673 Btuh	103% of load	SHR: 82%

Heating Equipment

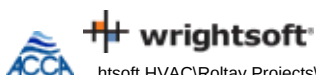
Design Conditions

Outdoor design DB:	7.0°F	Heat loss:	58557 Btuh	Entering coil DB:	70.0°F
Indoor design DB:	70.0°F				

Manufacturer's Performance Data at Actual Design Conditions

Equipment type:	Gas boiler		
Manufacturer:	Advantage	Model:	AG4-HN
Actual airflow:	0 cfm		
Output capacity:	88000 Btuh	150% of load	

The above equipment was selected in accordance with ACCA Manual S.





Manual S Compliance Report

Furnace

Roltay Inc. Energy Services

Job:
Date: May 01, 2015
By:

98 Overbrook Road, Madison, CT 06443 Phone: 203-672-1330 Email: buck@roltay.com Web: www.Roltay.com

Project Information

For: Manual S Demo
West Haven, CT 06516

Cooling Equipment

Design Conditions

Outdoor design DB:	84.0°F	Sensible gain:	12703 Btuh	Entering coil DB:	75.2°F
Outdoor design WB:	73.0°F	Latent gain:	4308 Btuh	Entering coil WB:	63.7°F
Indoor design DB:	75.0°F	Total gain:	17010 Btuh		
Indoor RH:	50%	Estimated airflow:	587 cfm		

Manufacturer's Performance Data at Actual Design Conditions

Equipment type:	Split AC		
Manufacturer:	Bryant	Model:	123ANA018****C*+CNPV*2417AL*++TDR
Actual airflow:	587 cfm		
Sensible capacity:	13059 Btuh	103% of load	
Latent capacity:	4305 Btuh	100% of load	
Total capacity:	17365 Btuh	102% of load	SHR: 75%

Heating Equipment

Design Conditions

Outdoor design DB:	7.0°F	Heat loss:	36351 Btuh	Entering coil DB:	68.8°F
Indoor design DB:	70.0°F				

Manufacturer's Performance Data at Actual Design Conditions

Equipment type:	Gas furnace		
Manufacturer:	York	Model:	TG8S100B12MP11
Actual airflow:	1149 cfm		
Output capacity:	80000 Btuh	220% of load	Temp. rise: 63 °F

The above equipment was selected in accordance with ACCA Manual S.



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Page 2



Load Short Form

Entire House

Roltay Inc. Energy Services

Job:
Date: May 01, 2015
By:

98 Overbrook Road, Madison, CT 06443 Phone: 203-672-1330 Email: buck@roltay.com Web: www.Roltay.com

Project Information

For: Manual S Demo
West Haven, CT 06516

Design Information

	Htg	Clg	Infiltration
Outside db (°F)	7	84	Method Simplified
Inside db (°F)	70	75	Construction quality Loose
Design TD (°F)	63	9	Fireplaces 1 (Semi-loose)
Daily range	-	M	
Inside humidity (%)	50	50	
Moisture difference (gr/lb)	48	40	

HEATING EQUIPMENT

Make	n/a
Trade	n/a
Model	n/a
AHRI ref	n/a
Efficiency	n/a
Heating input	
Heating output	0 Btuh
Low output baseboard	600 Btuh/ft
Total low baseboard	184 ft
High output baseboard	850 Btuh/ft
Total high baseboard	130 ft
Space thermostat	n/a

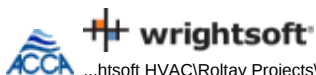
COOLING EQUIPMENT

Make	n/a
Trade	n/a
Cond	n/a
Coil	n/a
AHRI ref	n/a
Efficiency	n/a
Sensible cooling	0 Btuh
Latent cooling	0 Btuh
Total cooling	0 Btuh
Actual air flow	0 cfm
Air flow factor	0 cfm/Btuh
Static pressure	0 in H2O
Load sensible heat ratio	0

ROOM NAME		Area (ft²)	Htg load (Btuh)	Clg load (Btuh)	Baseboard (ft) Low High	Clg AVF (cfm)
Boiler	d	1777	58557	23490	98 69	1100
Furnace	d	1145	36351	12703	61 43	587
Entire House	d	2922	94909	36195	158 112	1845
Other equip loads			0	0		
Equip. @ 1.00 RSM				36195		
Latent cooling				8693		
TOTALS		2922	94909	44888	158 112	1845

Bold/italic values have been manually overridden

Calculations approved by ACCA to meet all requirements of Manual J 8th Ed.





Load Short Form

Boiler

Roltay Inc. Energy Services

Job:
Date: May 01, 2015
By:

98 Overbrook Road, Madison, CT 06443 Phone: 203-672-1330 Email: buck@roltay.com Web: www.Roltay.com

Project Information

For: Manual S Demo
West Haven, CT 06516

Design Information

	Htg	Clg		Infiltration
Outside db (°F)	7	84	Method	Simplified
Inside db (°F)	70	75	Construction quality	Loose
Design TD (°F)	63	9	Fireplaces	1 (Semi-loose)
Daily range	-	M		
Inside humidity (%)	50	50		
Moisture difference (gr/lb)	48	40		

HEATING EQUIPMENT

Make Advantage
Trade PurePro
Model AG4-HN
AHRI ref

Efficiency 83.8 AFUE
Heating input 105000 Btuh
Heating output 88000 Btuh
Low output baseboard 600 Btuh/ft
Total low baseboard 98 ft
High output baseboard 850 Btuh/ft
Total high baseboard 69 ft
Space thermostat

COOLING EQUIPMENT

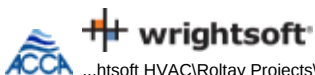
Make Bryant
Trade BRYANT HEATING AND COOLING SYS...
Cond 123ANA030****C*
Coil FX4DN(B,F)037L
AHRI ref 6937037

Efficiency 12.0 EER, 14.5 SEER
Sensible cooling 22022 Btuh
Latent cooling 6578 Btuh
Total cooling 28600 Btuh
Actual air flow 1100 cfm
Air flow factor 0.047 cfm/Btuh
Static pressure 0 in H2O
Load sensible heat ratio 0.84

ROOM NAME		Area (ft²)	Htg load (Btuh)	Clg load (Btuh)	Baseboard (ft)		Clg AVF (cfm)
					Low	High	
2nd Floor Zone	p	1145	30096	16567	50	35	773
Attic Zone	p	632	28461	9246	47	33	431
Boiler	d	1777	58557	23490	98	69	1100
Other equip loads			0	0			
Equip. @ 1.00 RSM				23490			
Latent cooling				4385			
TOTALS		1777	58557	27876	98	69	1100

Bold/italic values have been manually overridden

Calculations approved by ACCA to meet all requirements of Manual J 8th Ed.





Load Short Form Furnace Roltay Inc. Energy Services

Job:
Date: May 01, 2015
By:

98 Overbrook Road, Madison, CT 06443 Phone: 203-672-1330 Email: buck@roltay.com Web: www.Roltay.com

Project Information

For: Manual S Demo
West Haven, CT 06516

Design Information

	Htg	Clg		Infiltration
Outside db (°F)	7	84	Method	Simplified
Inside db (°F)	70	75	Construction quality	Loose
Design TD (°F)	63	9	Fireplaces	1 (Semi-loose)
Daily range	-	M		
Inside humidity (%)	50	50		
Moisture difference (gr/lb)	48	40		

HEATING EQUIPMENT

Make York
Trade Latitude TG8S
Model TG8S100B12MP11
AHRI ref

Efficiency 80 AFUE
Heating input 100000 Btuh
Heating output 80000 Btuh
Low output baseboard 600 Btuh/ft
Total low baseboard 61 ft
High output baseboard 850 Btuh/ft
Total high baseboard 43 ft
Space thermostat

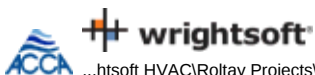
COOLING EQUIPMENT

Make Bryant
Trade BRYANT HEATING AND COOLING SYS...
Cond 123ANA018****C*
Coil CNPV*2417AL***TDR
AHRI ref 6359199
Efficiency 11.0 EER, 13 SEER
Sensible cooling 13200 Btuh
Latent cooling 4400 Btuh
Total cooling 17600 Btuh
Actual air flow 587 cfm
Air flow factor 0.046 cfm/Btuh
Static pressure 0 in H2O
Load sensible heat ratio 0.75

ROOM NAME		Area (ft²)	Htg load (Btuh)	Clg load (Btuh)	Baseboard (ft) Low High	Clg AVF (cfm)
1st Floor Zone	p	1145	36351	13868	61 43	641
Furnace	d	1145	36351	12703	61 43	587
Other equip loads			0	0		
Equip. @ 1.00 RSM				12703		
Latent cooling				4308		
TOTALS		1145	36351	17010	61 43	587

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Calculations approved by ACCA to meet all requirements of Manual J 8th Ed.





Load Multizone Summary Report

Job:
Date: May 01, 2015
By:

Roltay Inc. Energy Services

98 Overbrook Road, Madison, CT 06443 Phone: 203-672-1330 Email: buck@roltay.com Web: www.Roltay.com

Infiltration Summary

ZONE NAME	Heating				Cooling			
	Volume ft ³	ACH	AVF cfm	HTM Btuh/ft ²	Volume ft ³	ACH	AVF cfm	HTM Btuh/ft ²
1st Floor Zone	9160	0.73	111	6.4	9160	0.35	54	0.4
2nd Floor Zone	9160	0.65	100	6.4	9160	0.32	48	0.4
Attic Zone	6703	1.12	125	6.4	6703	0.54	61	0.4
Entire House	25023	0.80	336	6.4	25023	0.39	163	0.4

Load and AVF Summary

ROOM NAME	Area ft ²	Htg load Btuh	Clg load Btuh	Htg AVF cfm	Clg AVF cfm
Area3	543	17176	5328	543	246
Area1	377	11762	5214	372	241
Area2	225	7414	3326	234	154
1st Floor Zone	1145	36351	13868	1149	641
Area4	377	11260	6556	0	306
Area5	225	6824	4584	0	214
Area6	543	12013	5427	0	253
2nd Floor Zone	1145	30096	16567	0	773
Finished Attic	632	28461	9246	0	431
Attic Zone	632	28461	9246	0	431
Entire House	2922	94909	36195	1149	1845

Project Information

For: Manual S Demo
 West Haven, CT 06516

Design Conditions

Location:			Indoor:	Heating	Cooling
New Haven AP, CT, US			Indoor temperature (°F)	70	75
Elevation: 30 ft			Design TD (°F)	63	9
Latitude: 41°N			Relative humidity (%)	50	50
			Moisture difference (gr/lb)	48.5	40.1
Outdoor:	Heating	Cooling	Infiltration:		
Dry bulb (°F)	7	84	Method	Simplified	
Daily range (°F)	-	17 (M)	Construction quality	Loose	
Wet bulb (°F)	-	73	Fireplaces	1 (Semi-loose)	
Wind speed (mph)	15.0	7.5			

Construction descriptions

	Or	Area ft²	U-value Btuh/ft²-°F	Insul R ft²-° F/Btuh	Htg HTM Btuh/ft²	Loss Btuh	Clg HTM Btuh/ft²	Gain Btuh
Walls								
12A-2sw: Frm wall, vnl ext, 1/2" wood shth, 1/2" gypsum board int	n	607	0.186	2.0	11.7	7109	4.09	2482
fnsh, r-2 ext bd ins, 2"x4" wood frm, 16" o.c. stud	ne	44	0.186	2.0	11.7	512	4.09	179
	e	862	0.186	2.0	11.7	10096	4.09	3526
	se	44	0.186	2.0	11.7	512	4.09	179
	s	661	0.186	2.0	11.7	7742	4.09	2704
	w	940	0.186	2.0	11.7	11016	4.09	3847
	all	3156	0.186	2.0	11.7	36986	4.09	12916
Partitions								
12A-0sw: Frm wall, vnl ext, 1/2" wood shth, 1/2" gypsum board int		99	0.240	0	15.1	1497	2.71	268
fnsh, 2"x4" wood frm, 16" o.c. stud								
Windows								
4A4-2ov: 2 glazing, clr outr, air gas, vnl frm mat, clr low-e innr, 1/4" gap,	n	14	0.470	0	29.6	418	8.08	114
1/8" thk; 50% blinds 45°, medium; 100% outdoor insect screen; 1 ft	e	28	0.470	0	29.6	837	29.8	842
overhang (5.3 ft window ht, 1 ft sep.); 6.67 ft head ht	w	28	0.470	0	29.6	837	29.8	842
	all	71	0.470	0	29.6	2092	25.4	1798
4A4-2ov: 2 glazing, clr outr, air gas, vnl frm mat, clr low-e innr, 1/4" gap,	n	15	0.470	0	29.6	447	8.08	122
1/8" thk; 50% blinds 45°, medium; 100% outdoor insect screen; 8 ft								
overhang (5.67 ft window ht, 1 ft sep.); 6.67 ft head ht								
4A4-2ov: 2 glazing, clr outr, air gas, vnl frm mat, clr low-e innr, 1/4" gap,	n	15	0.470	0	29.6	447	8.08	122
1/8" thk; 50% blinds 45°, medium; 100% outdoor insect screen; 6.67 ft	e	19	0.470	0	29.6	556	29.8	559
head ht	s	15	0.470	0	29.6	447	14.7	223
	w	49	0.470	0	29.6	1457	29.8	1466
	all	98	0.470	0	29.6	2908	24.1	2370
1C-c1ows: 1 glazing, clr glz, wd frm mat, 1/8" thk, clr strm; 50% blinds	ne	9	0.570	0	35.9	311	30.5	264
45°, medium; 100% outdoor insect screen; 1 ft overhang (4 ft w indow	se	9	0.570	0	35.9	311	36.5	316
ht, 1 ft sep.); 6.67 ft head ht	s	8	0.570	0	35.9	299	18.8	157
	w	17	0.570	0	35.9	599	44.0	734
	all	42	0.570	0	35.9	1520	34.8	1471

Bold/italic values have been manually overridden

4A4-2ov: 2 glazing, clr outr, air gas, vnl frm mat, clr low-e innr, 1/4" gap, 1/8" thk; 50% blinds 45°, medium; 100% outdoor insect screen; 1 ft overhang (4 ft window ht, 1 ft sep.); 6.67 ft head ht	ne	7	0.470	0	29.6	197	20.3	135
	se	7	0.470	0	29.6	197	24.5	163
	all	13	0.470	0	29.6	395	22.4	298
4A4-2ov: 2 glazing, clr outr, air gas, vnl frm mat, clr low-e innr, 1/4" gap, 1/8" thk; 50% blinds 45°, medium; 100% outdoor insect screen; 1 ft overhang (5.7 ft window ht, 1 ft sep.); 6.67 ft head ht	ne	12	0.470	0	29.6	352	20.3	241
	se	12	0.470	0	29.6	352	24.8	295
	all	24	0.470	0	29.6	703	22.5	535
4A4-2ov: 2 glazing, clr outr, air gas, vnl frm mat, clr low-e innr, 1/4" gap, 1/8" thk; 50% blinds 45°, medium; 100% outdoor insect screen; 1 ft overhang (4.5 ft window ht, 1 ft sep.); 6.67 ft head ht	e	12	0.470	0	29.6	355	29.8	357
4A4-2ov: 2 glazing, clr outr, air gas, vnl frm mat, clr low-e innr, 1/4" gap, 1/8" thk; 50% blinds 45°, medium; 100% outdoor insect screen; 1 ft overhang (5.67 ft window ht, 1 ft sep.); 6.67 ft head ht	e	15	0.470	0	29.6	447	29.8	450
4A4-2ov: 2 glazing, clr outr, air gas, vnl frm mat, clr low-e innr, 1/4" gap, 1/8" thk; 50% blinds 45°, medium; 100% outdoor insect screen; 5 ft overhang (5.67 ft window ht, 1 ft sep.); 6.67 ft head ht	e	30	0.470	0	29.6	895	18.1	547
	s	30	0.470	0	29.6	895	8.08	244
	all	60	0.470	0	29.6	1790	13.1	791
4A4-2ov: 2 glazing, clr outr, air gas, vnl frm mat, clr low-e innr, 1/4" gap, 1/8" thk; 50% blinds 45°, medium; 100% outdoor insect screen; 1 ft overhang (5.3 ft window ht, 5 ft sep.); 6.67 ft head ht	s	42	0.470	0	29.6	1255	14.7	624
4A4-2ov: 2 glazing, clr outr, air gas, vnl frm mat, clr low-e innr, 1/4" gap, 1/8" thk; 50% blinds 45°, medium; 100% outdoor insect screen; 1 ft overhang (5.33 ft window ht, 5 ft sep.); 6.67 ft head ht	s	14	0.470	0	29.6	421	14.7	209
4A4-2ov: 2 glazing, clr outr, air gas, vnl frm mat, clr low-e innr, 1/4" gap, 1/8" thk; 50% blinds 45°, medium; 100% outdoor insect screen; 1 ft overhang (5.33 ft window ht, 1 ft sep.); 6.67 ft head ht	w	18	0.470	0	29.6	526	29.8	530

Doors

11D0: Door, wd sc type	n	21	0.390	0	24.6	516	8.58	180
	s	21	0.390	0	24.6	516	8.58	180
	n	21	0.390	0	24.6	516	8.58	180
	all	63	0.390	0	24.6	1548	8.58	541

Ceilings

16B-11ad: Attic ceiling, asphalt shingles roof mat, r-11 ceil ins, 1/2" gypsum board int fnsh		513	0.081	11.0	5.10	2618	3.69	1891
18A-19ad: Rf/clg ceiling, asphalt shingles roof mat, frm cons, 1/2" gypsum board int fnsh, 6" thkns, r-19 ceil ins		926	0.051	19.0	3.21	2976	1.10	1016

Floors

19A-0bvhp: Flr floor, frm flr, 8" thkns, hrd wd flr fnsh, leaky bsmt ovr		1145	0.295	0	6.98	7994	1.00	1142
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Bold/italic values have been manually overridden

Project Information

For: Manual S Demo
 West Haven, CT 06516

Design Conditions

Location:		Indoor:		Heating	Cooling
New Haven AP, CT, US		Indoor temperature (°F)		70	75
Elevation: 30 ft		Design TD (°F)		63	9
Latitude: 41°N		Relative humidity (%)		50	50
		Moisture difference (gr/lb)		48.5	40.1
Outdoor:	Heating	Cooling	Infiltration:		
Dry bulb (°F)	7	84	Method	Simplified	
Daily range (°F)	-	17 (M)	Construction quality	Loose	
Wet bulb (°F)	-	73	Fireplaces	1 (Semi-loose)	
Wind speed (mph)	15.0	7.5			

Construction descriptions

	Or	Area ft²	U-value Btuh/ft²-°F	Insul R ft²-° F/Btuh	Htg HTM Btuh/ft²	Loss Btuh	Clg HTM Btuh/ft²	Gain Btuh
Walls								
12A-2sw: Frm wall, vnl ext, 1/2" wood shth, 1/2" gypsum board int	n	418	0.186	2.0	11.7	4897	4.09	1710
fnsh, r-2 ext bd ins, 2"x4" wood frm, 16" o.c. stud	ne	33	0.186	2.0	11.7	386	4.09	135
	e	606	0.186	2.0	11.7	7098	4.09	2479
	se	33	0.186	2.0	11.7	386	4.09	135
	s	487	0.186	2.0	11.7	5707	4.09	1993
	w	637	0.186	2.0	11.7	7468	4.09	2608
	all	2214	0.186	2.0	11.7	25941	4.09	9059
Partitions								
12A-0sw: Frm wall, vnl ext, 1/2" wood shth, 1/2" gypsum board int		99	0.240	0	15.1	1497	2.71	268
fnsh, 2"x4" wood frm, 16" o.c. stud								
Windows								
4A4-2ov: 2 glazing, clr outr, air gas, vnl frm mat, clr low-e innr, 1/4" gap,	n	14	0.470	0	29.6	418	8.08	114
1/8" thk; 50% blinds 45°, medium; 100% outdoor insect screen; 1 ft	e	28	0.470	0	29.6	837	29.8	842
overhang (5.3 ft window ht, 1 ft sep.); 6.67 ft head ht	w	28	0.470	0	29.6	837	29.8	842
	all	71	0.470	0	29.6	2092	25.4	1798
1C-c1ows: 1 glazing, clr glz, wd frm mat, 1/8" thk, clr strm; 50% blinds	ne	9	0.570	0	35.9	311	30.5	264
45°, medium; 100% outdoor insect screen; 1 ft overhang (4 ft w indow	se	9	0.570	0	35.9	311	36.5	316
ht, 1 ft sep.); 6.67 ft head ht	s	8	0.570	0	35.9	299	18.8	157
	w	17	0.570	0	35.9	599	44.0	734
	all	42	0.570	0	35.9	1520	34.8	1471
4A4-2ov: 2 glazing, clr outr, air gas, vnl frm mat, clr low-e innr, 1/4" gap,	ne	7	0.470	0	29.6	197	20.3	135
1/8" thk; 50% blinds 45°, medium; 100% outdoor insect screen; 1 ft								
overhang (4 ft window ht, 1 ft sep.); 6.67 ft head ht	se	7	0.470	0	29.6	197	24.5	163
	all	13	0.470	0	29.6	395	22.4	298
4A4-2ov: 2 glazing, clr outr, air gas, vnl frm mat, clr low-e innr, 1/4" gap,	e	12	0.470	0	29.6	355	29.8	357
1/8" thk; 50% blinds 45°, medium; 100% outdoor insect screen; 1 ft								
overhang (4.5 ft window ht, 1 ft sep.); 6.67 ft head ht								
4A4-2ov: 2 glazing, clr outr, air gas, vnl frm mat, clr low-e innr, 1/4" gap,	s	42	0.470	0	29.6	1255	14.7	624
1/8" thk; 50% blinds 45°, medium; 100% outdoor insect screen; 1 ft								
overhang (5.3 ft window ht, 5 ft sep.); 6.67 ft head ht								

Bold/italic values have been manually overridden

4A4-2ov: 2 glazing, clr outr, air gas, vnl frm mat, clr low-e innr, 1/4" gap, s 1/8" thk; 50% blinds 45°, medium; 100% outdoor insect screen; 1 ft overhang (5.33 ft window ht, 5 ft sep.); 6.67 ft head ht	14	0.470	0	29.6	421	14.7	209
4A4-2ov: 2 glazing, clr outr, air gas, vnl frm mat, clr low-e innr, 1/4" gap, w 1/8" thk; 50% blinds 45°, medium; 100% outdoor insect screen; 1 ft overhang (5.33 ft window ht, 1 ft sep.); 6.67 ft head ht	18	0.470	0	29.6	526	29.8	530

Doors

11D0: Door, wd sc type	n	21	0.390	0	24.6	516	8.58	180
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Ceilings

16B-11ad: Attic ceiling, asphalt shingles roof mat, r-11 ceil ins, 1/2" gypsum board int fnsh	513	0.081	11.0	5.10	2618	3.69	1891
18A-19ad: Rf/clg ceiling, asphalt shingles roof mat, frm cons, 1/2" gypsum board int fnsh, 6" thkns, r-19 ceil ins	926	0.051	19.0	3.21	2976	1.10	1016

Floors

(none)

Bold/italic values have been manually overridden

Project Information

For: Manual S Demo
 West Haven, CT 06516

Design Conditions

Location:		Indoor:		Heating	Cooling
New Haven AP, CT, US		Indoor temperature (°F)		70	75
Elevation: 30 ft		Design TD (°F)		63	9
Latitude: 41°N		Relative humidity (%)		50	50
		Moisture difference (gr/lb)		48.5	40.1
Outdoor:	Heating	Cooling	Infiltration:		
Dry bulb (°F)	7	84	Method	Simplified	
Daily range (°F)	-	17 (M)	Construction quality	Loose	
Wet bulb (°F)	-	73	Fireplaces	1 (Semi-loose)	
Wind speed (mph)	15.0	7.5			

Construction descriptions

	Or	Area ft²	U-value Btuh/ft²-°F	Insul R ft²-°F/Btuh	Htg HTM Btuh/ft²	Loss Btuh	Clg HTM Btuh/ft²	Gain Btuh
Walls								
12A-2sw: Frm wall, vnl ext, 1/2" wood shth, 1/2" gypsum board int	n	189	0.186	2.0	11.7	2212	4.09	772
fnsh, r-2 ext bd ins, 2"x4" wood frm, 16" o.c. stud	ne	11	0.186	2.0	11.7	126	4.09	44
	e	256	0.186	2.0	11.7	2999	4.09	1047
	se	11	0.186	2.0	11.7	126	4.09	44
	s	174	0.186	2.0	11.7	2035	4.09	711
	w	303	0.186	2.0	11.7	3548	4.09	1239
	all	943	0.186	2.0	11.7	11046	4.09	3857

Partitions

(none)

Windows

4A4-2ov: 2 glazing, clr outr, air gas, vnl frm mat, clr low-e innr, 1/4" gap, n	n	15	0.470	0	29.6	447	8.08	122
1/8" thk; 50% blinds 45°, medium; 100% outdoor insect screen; 8 ft								
overhang (5.67 ft window ht, 1 ft sep.); 6.67 ft head ht								
4A4-2ov: 2 glazing, clr outr, air gas, vnl frm mat, clr low-e innr, 1/4" gap, n	n	15	0.470	0	29.6	447	8.08	122
1/8" thk; 50% blinds 45°, medium; 100% outdoor insect screen; 6.67 ft	e	19	0.470	0	29.6	556	29.8	559
head ht	s	15	0.470	0	29.6	447	14.7	223
	w	49	0.470	0	29.6	1457	29.8	1466
	all	98	0.470	0	29.6	2908	24.1	2370
4A4-2ov: 2 glazing, clr outr, air gas, vnl frm mat, clr low-e innr, 1/4" gap, n	ne	12	0.470	0	29.6	352	20.3	241
1/8" thk; 50% blinds 45°, medium; 100% outdoor insect screen; 1 ft								
overhang (5.7 ft window ht, 1 ft sep.); 6.67 ft head ht	se	12	0.470	0	29.6	352	24.8	295
	all	24	0.470	0	29.6	703	22.5	535
4A4-2ov: 2 glazing, clr outr, air gas, vnl frm mat, clr low-e innr, 1/4" gap, e	e	15	0.470	0	29.6	447	29.8	450
1/8" thk; 50% blinds 45°, medium; 100% outdoor insect screen; 1 ft								
overhang (5.67 ft window ht, 1 ft sep.); 6.67 ft head ht								
4A4-2ov: 2 glazing, clr outr, air gas, vnl frm mat, clr low-e innr, 1/4" gap, e	e	30	0.470	0	29.6	895	18.1	547
1/8" thk; 50% blinds 45°, medium; 100% outdoor insect screen; 5 ft								
overhang (5.67 ft window ht, 1 ft sep.); 6.67 ft head ht	s	30	0.470	0	29.6	895	8.08	244
	all	60	0.470	0	29.6	1790	13.1	791

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Doors

11D0: Door, wd sc type	n	21	0.390	0	24.6	516	8.58	180
	s	21	0.390	0	24.6	516	8.58	180
	all	42	0.390	0	24.6	1032	8.58	360

Ceilings

(none)

Floors

19A-0bvhp: Flr floor, frm flr, 8" thkns, hrd wd flr fnsh, leaky bsmt ovr	1145	0.295	0	6.98	7994	1.00	1142
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Bold/italic values have been manually overridden



Project Summary
Entire House
Roltay Inc. Energy Services

Job:
Date: May 01, 2015
By:

98 Overbrook Road, Madison, CT 06443 Phone: 203-672-1330 Email: buck@roltay.com Web: www.Roltay.com

Project Information

For: Manual S Demo
West Haven, CT 06516

Notes: Heat loss calculation, post system replacement. No site visit. Loads developed from aerial map photos, appraisal documents and owner/agent photos.

Unable to determine full attic finished space from information provided.

Design Information

Weather: New Haven AP, CT, US

Winter Design Conditions

Outside db	7 °F
Inside db	70 °F
Design TD	63 °F

Summer Design Conditions

Outside db	84 °F
Inside db	75 °F
Design TD	9 °F
Daily range	M
Relative humidity	50 %
Moisture difference	40 gr/lb

Heating Summary

Structure	89714 Btuh
Ducts	5194 Btuh
Central vent (0 cfm)	0 Btuh
Humidification	0 Btuh
Piping	0 Btuh
Equipment load	94909 Btuh

Sensible Cooling Equipment Load Sizing

Structure	33410 Btuh
Ducts	2786 Btuh
Central vent (0 cfm)	0 Btuh
Blower	0 Btuh
Use manufacturer's data	y
Rate/swing multiplier	1.00
Equipment sensible load	36195 Btuh

Infiltration

Method	Simplified
Construction quality	Loose
Fireplaces	1 (Semi-loose)

	Heating	Cooling
Area (ft ²)	2922	2922
Volume (ft ³)	25023	25023
Air changes/hour	0.80	0.39
Equiv. AVF (cfm)	336	163

Latent Cooling Equipment Load Sizing

Structure	6235 Btuh
Ducts	2458 Btuh
Central vent (0 cfm)	0 Btuh
Equipment latent load	8693 Btuh
Equipment total load	44888 Btuh
Req. total capacity at 0.70 SHR	4.3 ton

Heating Equipment Summary

Make	n/a
Trade	n/a
Model	n/a
AHRI ref	n/a
Efficiency	n/a
Heating input	
Heating output	0 Btuh
Low output baseboard	600 Btuh/ft
Total low baseboard	184 ft
High output baseboard	850 Btuh/ft
Total high baseboard	130 ft
Space thermostat	n/a

Cooling Equipment Summary

Make	n/a
Trade	n/a
Cond	n/a
Coil	n/a
AHRI ref	n/a
Efficiency	n/a
Sensible cooling	0 Btuh
Latent cooling	0 Btuh
Total cooling	0 Btuh
Actual air flow	0 cfm
Air flow factor	0 cfm/Btuh
Static pressure	0 in H2O
Load sensible heat ratio	0

Bold/italic values have been manually overridden

Calculations approved by ACCA to meet all requirements of Manual J 8th Ed.



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Project Summary

Boiler

Roltay Inc. Energy Services

Job:
Date: May 01, 2015
By:

98 Overbrook Road, Madison, CT 06443 Phone: 203-672-1330 Email: buck@roltay.com Web: www.Roltay.com

Project Information

For: Manual S Demo
West Haven, CT 06516

Notes: Heat loss calculation, post system replacement. No site visit. Loads developed from aerial map photos, appraisal documents and owner/agent photos.

Unable to determine full attic finished space from information provided.

Design Information

Weather: New Haven AP, CT, US

Winter Design Conditions

Outside db	7 °F
Inside db	70 °F
Design TD	63 °F

Summer Design Conditions

Outside db	84 °F
Inside db	75 °F
Design TD	9 °F
Daily range	M
Relative humidity	50 %
Moisture difference	40 gr/lb

Heating Summary

Structure	55671 Btuh
Ducts	2887 Btuh
Central vent (0 cfm)	0 Btuh
Humidification	0 Btuh
Piping	0 Btuh
Equipment load	58557 Btuh

Sensible Cooling Equipment Load Sizing

Structure	21130 Btuh
Ducts	2360 Btuh
Central vent (0 cfm)	0 Btuh
Blower	0 Btuh
Use manufacturer's data	y
Rate/swing multiplier	1.00
Equipment sensible load	23490 Btuh

Infiltration

Method	Simplified
Construction quality	Loose
Fireplaces	1 (Semi-loose)

	Heating	Cooling
Area (ft ²)	1777	1777
Volume (ft ³)	15863	15863
Air changes/hour	0.85	0.41
Equiv. AVF (cfm)	225	109

Latent Cooling Equipment Load Sizing

Structure	3970 Btuh
Ducts	416 Btuh
Central vent (0 cfm)	0 Btuh
Equipment latent load	4385 Btuh
Equipment total load	27876 Btuh
Req. total capacity at 0.77 SHR	2.5 ton

Heating Equipment Summary

Make	Advantage
Trade	PurePro
Model	AG4-HN
AHRI ref	

Efficiency	83.8 AFUE
Heating input	105000 Btuh
Heating output	88000 Btuh
Low output baseboard	600 Btuh/ft
Total low baseboard	98 ft
High output baseboard	850 Btuh/ft
Total high baseboard	69 ft
Space thermostat	

Cooling Equipment Summary

Make	Bryant
Trade	BRYANT HEATING AND COOLING SYS...
Cond	123ANA030****C*
Coil	FX4DN(B,F)037L
AHRI ref	6937037
Efficiency	12.0 EER, 14.5 SEER
Sensible cooling	22022 Btuh
Latent cooling	6578 Btuh
Total cooling	28600 Btuh
Actual air flow	1100 cfm
Air flow factor	0.047 cfm/Btuh
Static pressure	0 in H2O
Load sensible heat ratio	0.84

Bold/italic values have been manually overridden

Calculations approved by ACCA to meet all requirements of Manual J 8th Ed.



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Project Summary
Furnace
Roltay Inc. Energy Services

Job:
Date: May 01, 2015
By:

98 Overbrook Road, Madison, CT 06443 Phone: 203-672-1330 Email: buck@roltay.com Web: www.Roltay.com

Project Information

For: Manual S Demo
West Haven, CT 06516

Notes: Heat loss calculation, post system replacement. No site visit. Loads developed from aerial map photos, appraisal documents and owner/agent photos.

Unable to determine full attic finished space from information provided.

Design Information

Weather: New Haven AP, CT, US

Winter Design Conditions

Outside db	7 °F
Inside db	70 °F
Design TD	63 °F

Summer Design Conditions

Outside db	84 °F
Inside db	75 °F
Design TD	9 °F
Daily range	M
Relative humidity	50 %
Moisture difference	40 gr/lb

Heating Summary

Structure	34044 Btuh
Ducts	2307 Btuh
Central vent (0 cfm)	0 Btuh
Humidification	0 Btuh
Piping	0 Btuh
Equipment load	36351 Btuh

Sensible Cooling Equipment Load Sizing

Structure	12280 Btuh
Ducts	423 Btuh
Central vent (0 cfm)	0 Btuh
Blower	0 Btuh
Use manufacturer's data	y
Rate/swing multiplier	1.00
Equipment sensible load	12703 Btuh

Infiltration

Method	Simplified
Construction quality	Loose
Fireplaces	1 (Semi-loose)

	Heating	Cooling
Area (ft ²)	1145	1145
Volume (ft ³)	9160	9160
Air changes/hour	0.73	0.35
Equiv. AVF (cfm)	111	54

Latent Cooling Equipment Load Sizing

Structure	2265 Btuh
Ducts	2042 Btuh
Central vent (0 cfm)	0 Btuh
Equipment latent load	4308 Btuh
Equipment total load	17010 Btuh
Req. total capacity at 0.75 SHR	1.4 ton

Heating Equipment Summary

Make	York
Trade	Lattitude TG8S
Model	TG8S100B12MP11
AHRI ref	
Efficiency	80 AFUE
Heating input	100000 Btuh
Heating output	80000 Btuh
Low output baseboard	600 Btuh/ft
Total low baseboard	61 ft
High output baseboard	850 Btuh/ft
Total high baseboard	43 ft
Space thermostat	

Cooling Equipment Summary

Make	Bryant
Trade	BRYANT HEATING AND COOLING SYS...
Cond	123ANA018****C*
Coil	CNPV*2417AL*++TDR
AHRI ref	6359199
Efficiency	11.0 EER, 13 SEER
Sensible cooling	13200 Btuh
Latent cooling	4400 Btuh
Total cooling	17600 Btuh
Actual air flow	587 cfm
Air flow factor	0.046 cfm/Btuh
Static pressure	0 in H2O
Load sensible heat ratio	0.75

Bold/italic values have been manually overridden

Calculations approved by ACCA to meet all requirements of Manual J 8th Ed.



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Right-J® Worksheet
Entire House
Roltay Inc. Energy Services

Job:
Date: May 01, 2015
By:

98 Overbrook Road, Madison, CT 06443 Phone: 203-672-1330 Email: buck@roltay.com Web: www.Roltay.com

1	Room name						Entire House				Boiler			
2	Exposed wall						8.6 ft				8.9 ft			
3	Room height						389.5 ft				239.9 ft			
4	Room dimensions						d				d			
5	Room area						2922.0 ft²				1777.0 ft²			
	Ty	Construction number	U-value (Btuh/ft²·°F)	Or	HTM (Btuh/ft²)		Area (ft²) or perimeter (ft)		Load (Btuh)		Area (ft²) or perimeter (ft)		Load (Btuh)	
					Heat	Cool	Gross	N/P/S	Heat	Cool	Gross	N/P/S	Heat	Cool
6	W	12A-2sw	0.186	n	11.72	4.09	672	607	7109	2482	432	418	4897	1710
	G	4A4-2ov	0.470	n	29.61	8.08	14	0	418	114	14	0	418	114
	G	4A4-2ov	0.470	n	29.61	8.08	15	0	447	122	0	0	0	0
	G	4A4-2ov	0.470	n	29.61	8.08	15	0	447	122	0	0	0	0
11	D	11D0	0.390	n	24.57	8.58	21	21	516	180	0	0	0	0
	W	12A-2sw	0.186	ne	11.72	4.09	71	44	512	179	48	33	386	135
	G	1C-c1ows	0.570	ne	35.91	30.50	9	0	311	264	9	0	311	264
	G	4A4-2ov	0.470	ne	29.61	20.27	7	0	197	135	7	0	197	135
	G	4A4-2ov	0.470	ne	29.61	20.27	12	0	352	241	0	0	0	0
	W	12A-2sw	0.186	e	11.72	4.09	966	862	10096	3526	646	606	7098	2479
	G	4A4-2ov	0.470	e	29.61	29.79	12	0	355	357	12	0	355	357
	G	4A4-2ov	0.470	e	29.61	29.79	28	0	837	842	28	0	837	842
	G	4A4-2ov	0.470	e	29.61	29.79	15	0	447	450	0	0	0	0
	G	4A4-2ov	0.470	e	29.61	18.10	30	16	895	547	0	0	0	0
	G	4A4-2ov	0.470	e	29.61	29.79	19	0	556	559	0	0	0	0
	W	12A-2sw	0.186	se	11.72	4.09	71	44	512	179	48	33	386	135
	G	1C-c1ows	0.570	se	35.91	36.49	9	1	311	316	9	1	311	316
	G	4A4-2ov	0.470	se	29.61	24.48	7	0	197	163	7	0	197	163
	G	4A4-2ov	0.470	se	29.61	24.81	12	1	352	295	0	0	0	0
	W	12A-2sw	0.186	s	11.72	4.09	792	661	7742	2704	552	487	5707	1993
	G	1C-c1ows	0.570	s	35.91	18.83	8	3	299	157	8	3	299	157
	G	4A4-2ov	0.470	s	29.61	14.73	42	0	1255	624	42	0	1255	624
	G	4A4-2ov	0.470	s	29.61	14.73	14	0	421	209	14	0	421	209
	G	4A4-2ov	0.470	s	29.61	8.08	30	30	895	244	0	0	0	0
	G	4A4-2ov	0.470	s	29.61	14.73	15	0	447	223	0	0	0	0
	D	11D0	0.390	s	24.57	8.58	21	21	516	180	0	0	0	0
	W	12A-2sw	0.186	w	11.72	4.09	1052	940	11016	3847	700	637	7468	2608
	G	1C-c1ows	0.570	w	35.91	44.03	17	0	598	734	17	0	598	734
	G	4A4-2ov	0.470	w	29.61	29.79	28	0	837	842	28	0	837	842
	G	4A4-2ov	0.470	w	29.61	29.79	18	0	526	530	18	0	526	530
	G	4A4-2ov	0.470	w	29.61	29.79	49	0	1457	1466	0	0	0	0
	R	12A-0sw	0.240	-	15.12	2.71	120	99	1497	268	120	99	1497	268
	D	11D0	0.390	n	24.57	8.58	21	21	516	180	21	21	516	180
	C	16B-11ad	0.081	-	5.10	3.69	513	513	2618	1891	513	513	2618	1891
	C	18A-19ad	0.051	-	3.21	1.10	926	926	2976	1016	926	926	2976	1016
	F	19A-0bvhp	0.295	-	6.98	1.00	1145	1145	7994	1142	0	0	0	0
6	c) AED excursion									0				0
	Envelope loss/gain								66481	27331			40114	17703
12	a) Infiltration								23233	1608			15557	1077
	b) Room ventilation								0	0			0	0
13	Internal gains: Occupants @ 230 Appliances/other						9			2070 2400	5			1150 1200
	Subtotal (lines 6 to 13)								89714	33410			55671	21130
	Less external load								0	0			0	0
	Less transfer								0	0			0	0
	Redistribution								0	0			0	0
14	Subtotal								89714	33410			55671	21130
15	Duct loads						6%	8%	5194	2786	5%	11%	2887	2360
	Total room load								94909	36195			58557	23490
	Low/High Baseboard / Cool Air							158	112	1845		98	69	1100

Calculations approved by ACCA to meet all requirements of Manual J 8th Ed.





Right-J® Worksheet

Entire House

Roltay Inc. Energy Services

Job:
Date: May 01, 2015
By:

98 Overbrook Road, Madison, CT 06443 Phone: 203-672-1330 Email: buck@roltay.com Web: www.Roltay.com

1	Room name						Furnace							
2	Exposed wall						149.6 ft							
3	Room height						8.0 ft				d			
4	Room dimensions													
5	Room area						1145.0 ft²							
	Ty	Construction number	U-value (Btuh/ft²·°F)	Or	HTM (Btuh/ft²)		Area (ft²) or perimeter (ft)		Load (Btuh)		Area or perimeter		Load	
					Heat	Cool	Gross	N/P/S	Heat	Cool	Gross	N/P/S	Heat	Cool
6	W	12A-2sw	0.186	n	11.72	4.09	240	189	2212	772				
	G	4A4-2ov	0.470	n	29.61	8.08	0	0	0	0				
	G	4A4-2ov	0.470	n	29.61	8.08	15	0	447	122				
	G	4A4-2ov	0.470	n	29.61	8.08	15	0	447	122				
11	D	11D0	0.390	n	24.57	8.58	21	21	516	180				
	W	12A-2sw	0.186	ne	11.72	4.09	23	11	126	44				
	G	1C-c1ows	0.570	ne	35.91	30.50	0	0	0	0				
	G	4A4-2ov	0.470	ne	29.61	20.27	0	0	0	0				
	G	4A4-2ov	0.470	ne	29.61	20.27	12	0	352	241				
	W	12A-2sw	0.186	e	11.72	4.09	320	256	2999	1047				
	G	4A4-2ov	0.470	e	29.61	29.79	0	0	0	0				
	G	4A4-2ov	0.470	e	29.61	29.79	0	0	0	0				
	G	4A4-2ov	0.470	e	29.61	29.79	15	0	447	450				
	G	4A4-2ov	0.470	e	29.61	18.10	30	16	895	547				
	G	4A4-2ov	0.470	e	29.61	29.79	19	0	556	559				
	W	12A-2sw	0.186	se	11.72	4.09	23	11	126	44				
	G	1C-c1ows	0.570	se	35.91	36.49	0	0	0	0				
	G	4A4-2ov	0.470	se	29.61	24.48	0	0	0	0				
	G	4A4-2ov	0.470	se	29.61	24.81	12	1	352	295				
	W	12A-2sw	0.186	s	11.72	4.09	240	174	2035	711				
	G	1C-c1ows	0.570	s	35.91	18.83	0	0	0	0				
	G	4A4-2ov	0.470	s	29.61	14.73	0	0	0	0				
	G	4A4-2ov	0.470	s	29.61	14.73	0	0	0	0				
	G	4A4-2ov	0.470	s	29.61	8.08	30	30	895	244				
	G	4A4-2ov	0.470	s	29.61	14.73	15	0	447	223				
	D	11D0	0.390	s	24.57	8.58	21	21	516	180				
	W	12A-2sw	0.186	w	11.72	4.09	352	303	3548	1239				
	G	1C-c1ows	0.570	w	35.91	44.03	0	0	0	0				
	G	4A4-2ov	0.470	w	29.61	29.79	0	0	0	0				
	G	4A4-2ov	0.470	w	29.61	29.79	0	0	0	0				
	G	4A4-2ov	0.470	w	29.61	29.79	49	0	1457	1466				
	R	12A-0sw	0.240	-	15.12	2.71	0	0	0	0				
	D	11D0	0.390	n	24.57	8.58	0	0	0	0				
	C	16B-11ad	0.081	-	5.10	3.69	0	0	0	0				
	C	18A-19ad	0.051	-	3.21	1.10	0	0	0	0				
	F	19A-0bvhp	0.295	-	6.98	1.00	1145	1145	7994	1142				
6	c) AED excursion									0				
	Envelope loss/gain								26368	9628				
12	a) Infiltration								7676	531				
	b) Room ventilation								0	0				
13	Internal gains: Occupants @ 230						4			920				
	Appliances/other									1200				
	Subtotal (lines 6 to 13)								34044	12280				
	Less external load								0	0				
	Less transfer								0	0				
	Redistribution								0	0				
14	Subtotal								34044	12280				
15	Duct loads						7%	3%	2307	423				
	Total room load								36351	12703				
	Low/High Baseboard / Cool Air							61	43	587				

Calculations approved by ACCA to meet all requirements of Manual J 8th Ed.





Right-J® Worksheet
Boiler
Roltay Inc. Energy Services

Job:
Date: May 01, 2015
By:

98 Overbrook Road, Madison, CT 06443 Phone: 203-672-1330 Email: buck@roltay.com Web: www.Roltay.com

1	Room name						Boiler				2nd Floor Zone			
2	Exposed wall						239.9 ft				134.6 ft			
3	Room height						8.9 ft				8.0 ft			
4	Room dimensions						d				p			
5	Room area						1777.0 ft²				1145.0 ft²			
	Ty	Construction number	U-value (Btuh/ft²·°F)	Or	HTM (Btuh/ft²)		Area (ft²) or perimeter (ft)		Load (Btuh)		Area (ft²) or perimeter (ft)		Load (Btuh)	
					Heat	Cool	Gross	N/P/S	Heat	Cool	Gross	N/P/S	Heat	Cool
6	W	12A-2sw	0.186	n	11.72	4.09	432	418	4897	1710	120	106	1241	433
	G	4A4-2ov	0.470	n	29.61	8.08	14	0	418	114	14	0	418	114
	G	4A4-2ov	0.470	n	0.00	0.00	0	0	0	0	0	0	0	0
	G	4A4-2ov	0.470	n	0.00	0.00	0	0	0	0	0	0	0	0
11	D	11D0	0.390	n	0.00	0.00	0	0	0	0	0	0	0	0
	W	12A-2sw	0.186	ne	11.72	4.09	48	33	386	135	23	16	187	65
	G	1C-c1ows	0.570	ne	35.91	30.50	9	0	311	264	0	0	0	0
	G	4A4-2ov	0.470	ne	29.61	20.27	7	0	197	135	7	0	197	135
	G	4A4-2ov	0.470	ne	0.00	0.00	0	0	0	0	0	0	0	0
	W	12A-2sw	0.186	e	11.72	4.09	646	606	7098	2479	320	280	3278	1145
	G	4A4-2ov	0.470	e	29.61	29.79	12	0	355	357	12	0	355	357
	G	4A4-2ov	0.470	e	29.61	29.79	28	0	837	842	28	0	837	842
	G	4A4-2ov	0.470	e	0.00	0.00	0	0	0	0	0	0	0	0
	G	4A4-2ov	0.470	e	0.00	0.00	0	0	0	0	0	0	0	0
	G	4A4-2ov	0.470	e	0.00	0.00	0	0	0	0	0	0	0	0
	W	12A-2sw	0.186	se	11.72	4.09	48	33	386	135	23	16	187	65
	G	1C-c1ows	0.570	se	35.91	36.49	9	1	311	316	0	0	0	0
	G	4A4-2ov	0.470	se	29.61	24.48	7	0	197	163	7	0	197	163
	G	4A4-2ov	0.470	se	0.00	0.00	0	0	0	0	0	0	0	0
	W	12A-2sw	0.186	s	11.72	4.09	552	487	5707	1993	240	183	2149	750
	G	1C-c1ows	0.570	s	35.91	18.83	8	3	299	157	0	0	0	0
	G	4A4-2ov	0.470	s	29.61	14.73	42	0	1255	624	42	0	1255	624
	G	4A4-2ov	0.470	s	29.61	14.73	14	0	421	209	14	0	421	209
	G	4A4-2ov	0.470	s	0.00	0.00	0	0	0	0	0	0	0	0
	G	4A4-2ov	0.470	s	0.00	0.00	0	0	0	0	0	0	0	0
	D	11D0	0.390	s	0.00	0.00	0	0	0	0	0	0	0	0
	W	12A-2sw	0.186	w	11.72	4.09	700	637	7468	2608	352	306	3585	1252
	G	1C-c1ows	0.570	w	35.91	44.03	17	0	598	734	0	0	0	0
	G	4A4-2ov	0.470	w	29.61	29.79	28	0	837	842	28	0	837	842
	G	4A4-2ov	0.470	w	29.61	29.79	18	0	526	530	18	0	526	530
	G	4A4-2ov	0.470	w	0.00	0.00	0	0	0	0	0	0	0	0
	R	12A-0sw	0.240	-	15.12	2.71	120	99	1497	268	120	99	1497	268
	D	11D0	0.390	n	24.57	8.58	21	21	516	180	21	21	516	180
	C	16B-11ad	0.081	-	5.10	3.69	513	513	2618	1891	513	513	2618	1891
	C	18A-19ad	0.051	-	3.21	1.10	926	926	2976	1016	0	0	0	0
	F	19A-0bvhp	0.295	-	0.00	0.00	0	0	0	0	0	0	0	0
6	c) AED excursion									0				1532
	Envelope loss/gain								40114	17703			20303	11400
12	a) Infiltration								15557	1077			6907	478
	b) Room ventilation								0	0			0	0
13	Internal gains: Occupants @ 230 Appliances/other						5			1150 1200	4			920 1200
	Subtotal (lines 6 to 13)								55671	21130			27209	13998
	Less external load								0	0			0	0
	Less transfer								0	0			0	0
	Redistribution								0	0			0	0
14	Subtotal								55671	21130			27209	13998
15	Duct loads						5%	11%	2887	2360	11%	19%	2887	2568
	Total room load								58557	23490			30096	16567
	Low/High Baseboard / Cool Air							98	69	1100		50	35	773

Calculations approved by ACCA to meet all requirements of Manual J 8th Ed.





Right-J® Worksheet
Boiler
Roltay Inc. Energy Services

Job:
Date: May 01, 2015
By:

98 Overbrook Road, Madison, CT 06443 Phone: 203-672-1330 Email: buck@roltay.com Web: www.Roltay.com

1	Room name						Attic Zone							
2	Exposed wall						105.3 ft							
3	Room height						10.6 ft		p					
4	Room dimensions													
5	Room area						632.0 ft²							
	Ty	Construction number	U-value (Btuh/ft²·°F)	Or	HTM (Btuh/ft²)		Area (ft²) or perimeter (ft)		Load (Btuh)		Area or perimeter		Load	
					Heat	Cool	Gross	N/P/S	Heat	Cool	Gross	N/P/S	Heat	Cool
6	W	12A-2sw	0.186	n	11.72	4.09	312	312	3656	1277				
.	G	4A4-2ov	0.470	n	29.61	8.08	0	0	0	0				
.	G	4A4-2ov	0.470	n	0.00	0.00	0	0	0	0				
.	G	4A4-2ov	0.470	n	0.00	0.00	0	0	0	0				
11	D	11D0	0.390	n	0.00	0.00	0	0	0	0				
.	W	12A-2sw	0.186	ne	11.72	4.09	26	17	199	69				
.	G	1C-c1ows	0.570	ne	35.91	30.50	9	0	311	264				
.	G	4A4-2ov	0.470	ne	29.61	20.27	0	0	0	0				
.	G	4A4-2ov	0.470	ne	0.00	0.00	0	0	0	0				
.	W	12A-2sw	0.186	e	11.72	4.09	326	326	3820	1334				
.	G	4A4-2ov	0.470	e	29.61	29.79	0	0	0	0				
.	G	4A4-2ov	0.470	e	29.61	29.79	0	0	0	0				
.	G	4A4-2ov	0.470	e	0.00	0.00	0	0	0	0				
.	G	4A4-2ov	0.470	e	0.00	0.00	0	0	0	0				
.	G	4A4-2ov	0.470	e	0.00	0.00	0	0	0	0				
.	W	12A-2sw	0.186	se	11.72	4.09	26	17	199	69				
.	G	1C-c1ows	0.570	se	35.91	36.49	9	1	311	316				
.	G	4A4-2ov	0.470	se	29.61	24.48	0	0	0	0				
.	G	4A4-2ov	0.470	se	0.00	0.00	0	0	0	0				
.	W	12A-2sw	0.186	s	11.72	4.09	312	304	3558	1243				
.	G	1C-c1ows	0.570	s	35.91	18.83	8	3	299	157				
.	G	4A4-2ov	0.470	s	29.61	14.73	0	0	0	0				
.	G	4A4-2ov	0.470	s	29.61	14.73	0	0	0	0				
.	G	4A4-2ov	0.470	s	0.00	0.00	0	0	0	0				
.	G	4A4-2ov	0.470	s	0.00	0.00	0	0	0	0				
.	D	11D0	0.390	s	0.00	0.00	0	0	0	0				
.	W	12A-2sw	0.186	w	11.72	4.09	348	331	3883	1356				
.	G	1C-c1ows	0.570	w	35.91	44.03	17	0	598	734				
.	G	4A4-2ov	0.470	w	29.61	29.79	0	0	0	0				
.	G	4A4-2ov	0.470	w	29.61	29.79	0	0	0	0				
.	G	4A4-2ov	0.470	w	0.00	0.00	0	0	0	0				
.	R	12A-0sw	0.240	-	15.12	2.71	0	0	0	0				
.	D	11D0	0.390	n	24.57	8.58	0	0	0	0				
.	C	16B-11ad	0.081	-	5.10	3.69	0	0	0	0				
.	C	18A-19ad	0.051	-	3.21	1.10	926	926	2976	1016				
.	F	19A-0bvhp	0.295	-	0.00	0.00	0	0	0	0				
6	c) AED excursion									582				
	Envelope loss/gain								19811	8417				
12	a) Infiltration								8650	599				
	b) Room ventilation								0	0				
13	Internal gains: Occupants @ Appliances/other 230						1			230				
	Subtotal (lines 6 to 13)								28461	9246				
	Less external load								0	0				
	Less transfer								0	0				
	Redistribution								0	0				
14	Subtotal								28461	9246				
15	Duct loads						0%	0%	0	0				
	Total room load								28461	9246				
	Low/High Baseboard / Cool Air							47	33	431				

Calculations approved by ACCA to meet all requirements of Manual J 8th Ed.





Right-J® Worksheet
Furnace
Roltay Inc. Energy Services

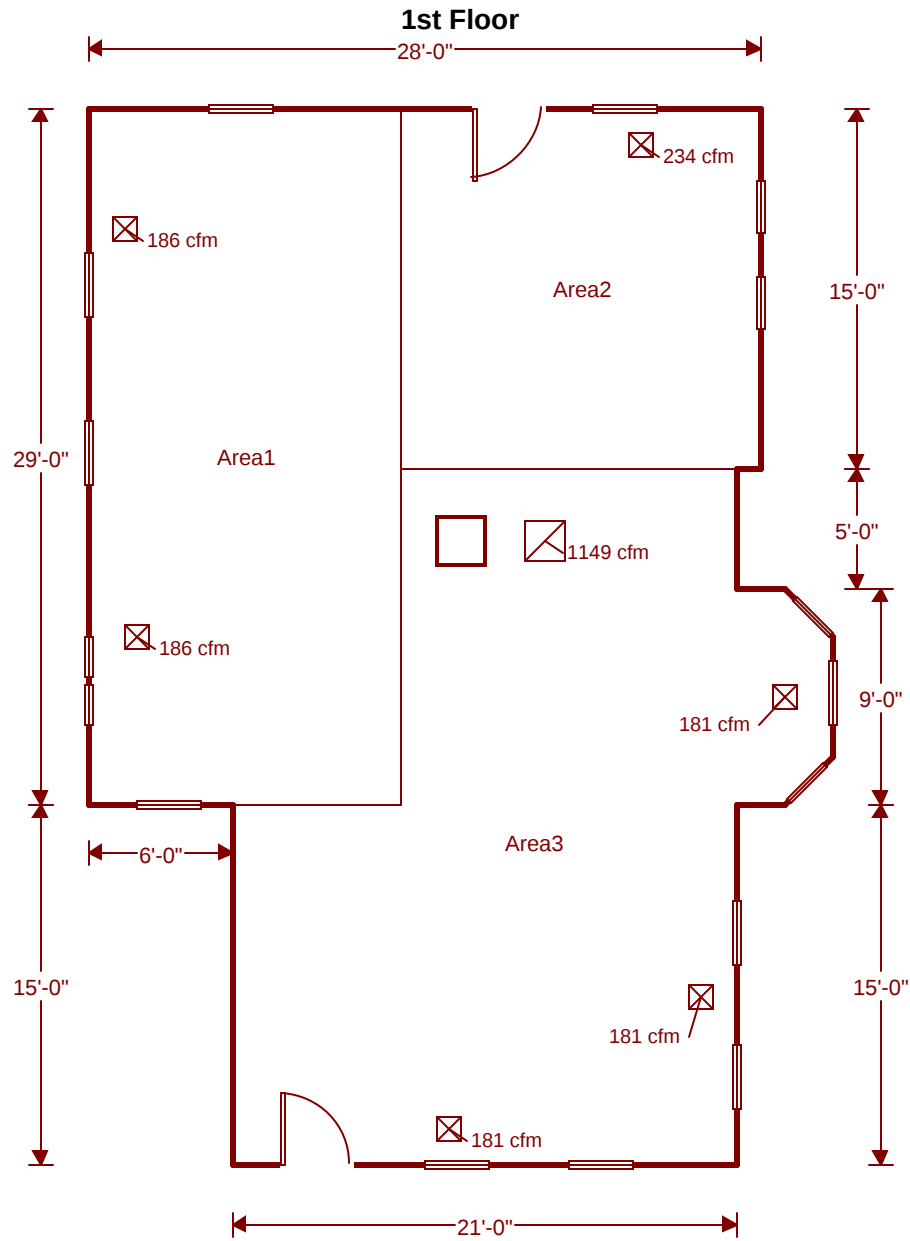
Job:
Date: May 01, 2015
By:

98 Overbrook Road, Madison, CT 06443 Phone: 203-672-1330 Email: buck@roltay.com Web: www.Roltay.com

1	Room name					Furnace				1st Floor Zone				
2	Exposed wall					149.6 ft				149.6 ft				
3	Room height					8.0 ft				8.0 ft				
4	Room dimensions					d				p				
5	Room area					1145.0 ft²				1145.0 ft²				
	Ty	Construction number	U-value (Btuh/ft²·°F)	Or	HTM (Btuh/ft²)		Area (ft²) or perimeter (ft)		Load (Btuh)		Area (ft²) or perimeter (ft)		Load (Btuh)	
					Heat	Cool	Gross	N/P/S	Heat	Cool	Gross	N/P/S	Heat	Cool
6	W	12A-2sw	0.186	n	11.72	4.09	240	189	2212	772	240	189	2212	772
11	G	4A4-2ov	0.470	n	0.00	0.00	0	0	0	0	0	0	0	0
	G	4A4-2ov	0.470	n	29.61	8.08	15	0	447	122	15	0	447	122
	G	4A4-2ov	0.470	n	29.61	8.08	15	0	447	122	15	0	447	122
	D	11D0	0.390	n	24.57	8.58	21	21	516	180	21	21	516	180
	W	12A-2sw	0.186	ne	11.72	4.09	23	11	126	44	23	11	126	44
	G	1C-c1ows	0.570	ne	0.00	0.00	0	0	0	0	0	0	0	0
	G	4A4-2ov	0.470	ne	0.00	0.00	0	0	0	0	0	0	0	0
	G	4A4-2ov	0.470	ne	29.61	20.27	12	0	352	241	12	0	352	241
	W	12A-2sw	0.186	e	11.72	4.09	320	256	2999	1047	320	256	2999	1047
	G	4A4-2ov	0.470	e	0.00	0.00	0	0	0	0	0	0	0	0
	G	4A4-2ov	0.470	e	0.00	0.00	0	0	0	0	0	0	0	0
11	G	4A4-2ov	0.470	e	29.61	29.79	15	0	447	450	15	0	447	450
	G	4A4-2ov	0.470	e	29.61	18.10	30	16	895	547	30	16	895	547
	G	4A4-2ov	0.470	e	29.61	29.79	19	0	556	559	19	0	556	559
	W	12A-2sw	0.186	se	11.72	4.09	23	11	126	44	23	11	126	44
	G	1C-c1ows	0.570	se	0.00	0.00	0	0	0	0	0	0	0	0
	G	4A4-2ov	0.470	se	0.00	0.00	0	0	0	0	0	0	0	0
	G	4A4-2ov	0.470	se	29.61	24.81	12	1	352	295	12	1	352	295
	W	12A-2sw	0.186	s	11.72	4.09	240	174	2035	711	240	174	2035	711
	G	1C-c1ows	0.570	s	0.00	0.00	0	0	0	0	0	0	0	0
	G	4A4-2ov	0.470	s	0.00	0.00	0	0	0	0	0	0	0	0
	G	4A4-2ov	0.470	s	0.00	0.00	0	0	0	0	0	0	0	0
11	G	4A4-2ov	0.470	s	29.61	8.08	30	30	895	244	30	30	895	244
	G	4A4-2ov	0.470	s	29.61	14.73	15	0	447	223	15	0	447	223
	D	11D0	0.390	s	24.57	8.58	21	21	516	180	21	21	516	180
	W	12A-2sw	0.186	w	11.72	4.09	352	303	3548	1239	352	303	3548	1239
	G	1C-c1ows	0.570	w	0.00	0.00	0	0	0	0	0	0	0	0
	G	4A4-2ov	0.470	w	0.00	0.00	0	0	0	0	0	0	0	0
	G	4A4-2ov	0.470	w	0.00	0.00	0	0	0	0	0	0	0	0
	G	4A4-2ov	0.470	w	29.61	29.79	49	0	1457	1466	49	0	1457	1466
	R	12A-0sw	0.240	-	0.00	0.00	0	0	0	0	0	0	0	0
	D	11D0	0.390	n	0.00	0.00	0	0	0	0	0	0	0	0
	C	16B-11ad	0.081	-	0.00	0.00	0	0	0	0	0	0	0	0
C	18A-19ad	0.051	-	0.00	0.00	0	0	0	0	0	0	0	0	
F	19A-0bvhp	0.295	-	6.98	1.00	1145	1145	7994	1142	1145	1145	7994	1142	

Calculations approved by ACCA to meet all requirements of Manual J 8th Ed.





Job #:
Performed for:
Manual S Demo
West Haven, CT 06516

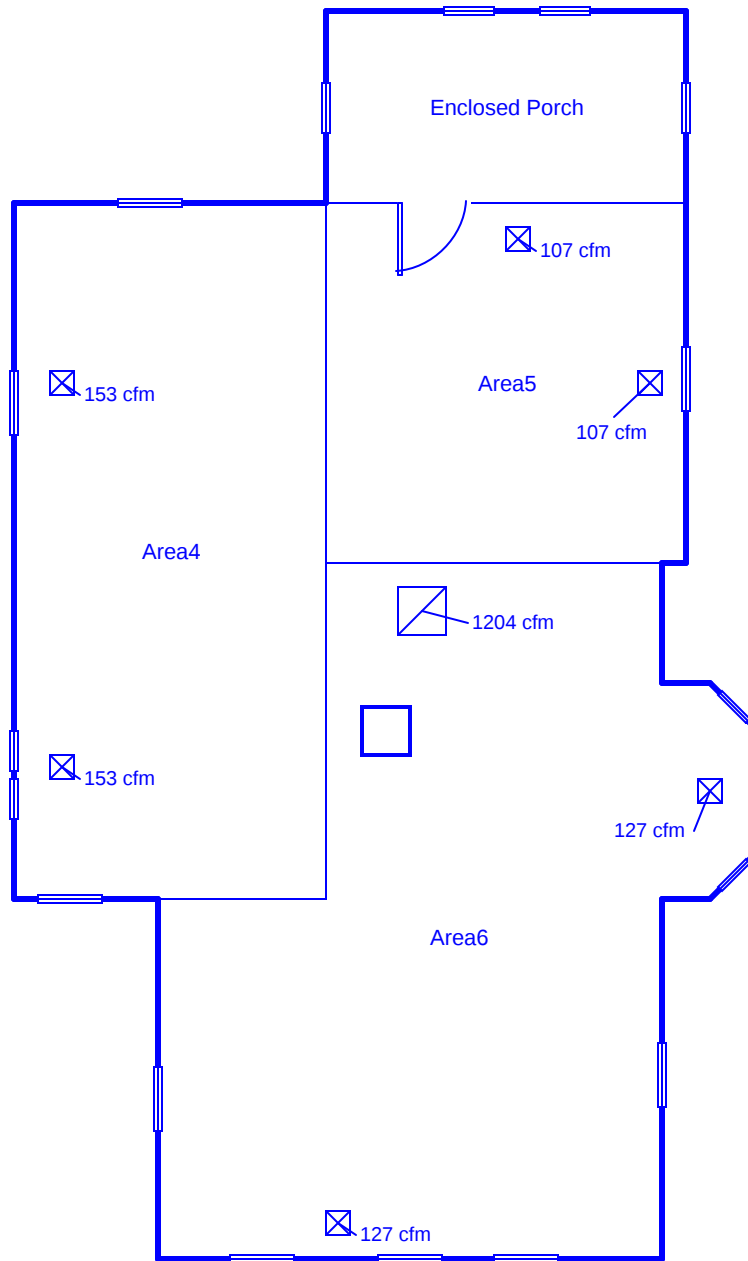
Roltay Inc. Energy Services

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Madison, CT 06443
Phone: 203-672-1330
www.Roltay.com buck@roltay.com

Scale: 1/8" = 1'0"
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2nd Floor



Job #:
Performed for:
Manual S Demo
West Haven, CT 06516

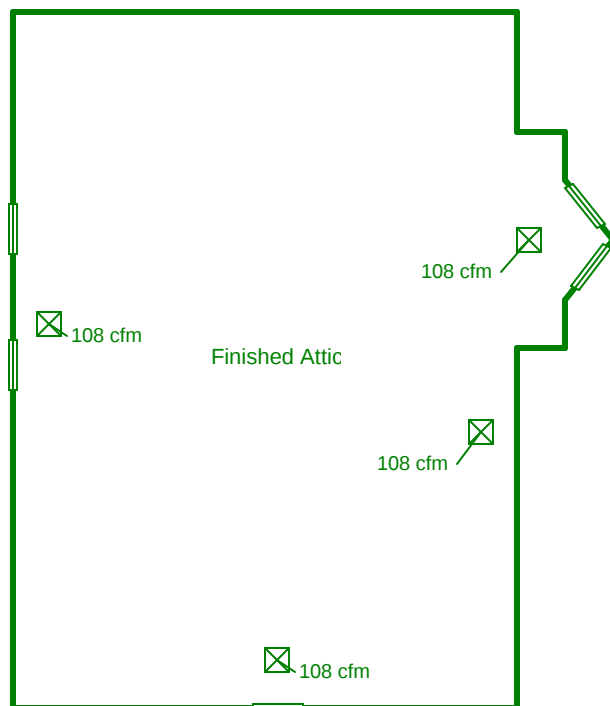
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3rd Floor



Job #:
Performed for:
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West Haven, CT 06516

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Page 3
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DETAILED COOLING CAPACITIES

EVAPORATOR AIR		CONDENSER ENTERING AIR TEMPERATURES deg F																							
CFM	EWB	75				85				95				105				115				125			
		Capacity MBtu/h†		Total System KW**	Capacity MBtu/h†		Total System KW**	Capacity MBtu/h†		Total System KW**	Capacity MBtu/h†		Total System KW**	Capacity MBtu/h†		Total System KW**	Capacity MBtu/h†		Total System KW**						
		Total	Sens ‡		Total	Sens‡		Total	Sens‡		Total	Sens‡		Total	Sens‡		Total	Sens‡							
123ANA018—A Outdoor Section With CAP**1814A** Indoor Section																									
525	72	20.46	10.76	1.21	19.55	10.41	1.36	18.59	10.05	1.53	17.62	9.69	1.71	16.57	9.30	1.91	15.40	8.88	2.13						
	67	18.79	13.26	1.22	17.95	12.90	1.37	17.05	12.52	1.53	16.12	12.14	1.72	15.13	11.74	1.92	14.03	11.30	2.13						
	62	17.27	15.73	1.22	16.49	15.36	1.37	15.68	14.97	1.54	14.83	14.55	1.72	14.00	14.00	1.92	13.15	13.15	2.13						
	57	16.78	16.78	1.23	16.15	16.15	1.37	15.48	15.48	1.54	14.77	14.77	1.72	14.00	14.00	1.92	13.15	13.15	2.13						
600	72	20.79	11.28	1.24	19.83	10.92	1.39	18.83	10.55	1.56	17.83	10.19	1.74	16.76	9.80	1.94	15.55	9.37	2.16						
	67	19.11	14.10	1.25	18.23	13.73	1.40	17.30	13.36	1.56	16.35	12.97	1.74	15.33	12.57	1.94	14.20	12.12	2.16						
	62	17.66	16.88	1.25	16.87	16.49	1.40	16.06	16.06	1.56	15.32	15.32	1.75	14.51	14.51	1.94	13.61	13.61	2.16						
	57	17.46	17.46	1.25	16.79	16.79	1.40	16.07	16.07	1.56	15.32	15.32	1.75	14.51	14.51	1.94	13.61	13.61	2.16						
675	72	21.03	11.77	1.27	20.02	11.40	1.42	18.99	11.03	1.58	17.97	10.67	1.77	16.88	10.28	1.97	15.65	9.85	2.18						
	67	19.33	14.90	1.27	18.43	14.54	1.42	17.48	14.15	1.59	16.51	13.77	1.77	15.48	13.35	1.97	14.33	12.89	2.19						
	62	18.01	17.91	1.28	17.30	17.30	1.43	16.54	16.54	1.59	15.76	15.76	1.77	14.92	14.92	1.97	13.97	13.97	2.19						
	57	18.01	18.01	1.28	17.30	17.30	1.43	16.55	16.55	1.59	15.76	15.76	1.77	14.92	14.92	1.97	13.97	13.97	2.19						

Multipliers for Determining the Performance With Other Indoor Sections

Cooling Indoor Model	Capacity	Power	Furnace Model
*CAP**1814A**	1.00	1.00	
CAP**2414A**	1.01	1.01	
CAP**2417A**	1.01	1.01	
CNPF*2418A**	1.00	1.00	
CNPH*2417A**	1.00	1.00	
CNPV*1814A**	0.99	0.99	
CNPV*2414A**	1.00	1.00	
CNPV*2417A**	1.00	1.00	
CSPH*2412A**	0.97	0.97	
FE4ANF002	1.02	0.93	
FF1ENP018	0.99	0.99	
FF1ENP024	1.01	1.01	
FV4BNF002	1.02	0.93	
FX4CNF018	1.01	0.95	
FX4CNF024	1.02	0.96	
FY4ANF018	0.99	0.99	
FY4ANF024	1.00	1.00	

Cooling Indoor Model	Capacity	Power	Furnace Model
CAP**1814A**	0.98	0.92	315(A,J)AV036070
CAP**2414A**	1.00	0.94	315(A,J)AV036070
CNPH*2417A**	0.99	0.93	315(A,J)AV036070
CNPV*1814A**	0.98	0.92	315(A,J)AV036070
CNPV*2414A**	0.99	0.93	315(A,J)AV036070
CSPH*2412A**	0.95	0.89	315(A,J)AV036070
CAP**2417A**	1.01	0.95	315(A,J)AV048090
CNPH*2417A**	0.99	0.93	315(A,J)AV048090
CNPV*2417A**	0.99	0.93	315(A,J)AV048090
CSPH*2412A**	0.95	0.90	315(A,J)AV048090
CNPH*2417A**	0.99	0.93	355AAV042040
CSPH*2412A**	0.95	0.90	355AAV042040
CAP**2417A**	1.00	0.94	355AAV042060
CNPH*2417A**	0.99	0.93	355AAV042060
CNPV*2417A**	0.99	0.93	355AAV042060
CSPH*2412A**	0.95	0.90	355AAV042060
CNPH*2417A**	0.99	0.93	355AAV042080
CSPH*2412A**	0.95	0.90	355AAV042080

See notes on pg. 21

DETAILED COOLING CAPACITIES

EVAPORATOR AIR		CONDENSER ENTERING AIR TEMPERATURES deg F																	
		75			85			95			105			115			125		
CFM	EWB	Capacity MBtu/h†		Total System KW**	Capacity MBtu/h†		Total System KW**	Capacity MBtu/h†		Total System KW**	Capacity MBtu/h†		Total System KW**	Capacity MBtu/h†		Total System KW**	Capacity MBtu/h†		Total System KW**
		Total	Sens ‡		Total	Sens ‡		Total	Sens‡		Total	Sens ‡		Total	Sens ‡		Total	Sens ‡	
123ANA024—A Outdoor Section With CAP**2414A** Indoor Section																			
700	72	27.11	14.29	1.61	25.97	13.86	1.81	24.75	13.40	2.03	23.47	12.92	2.28	22.09	12.41	2.55	20.55	11.85	2.84
	67	24.89	17.62	1.61	23.81	17.16	1.81	22.66	16.68	2.03	21.45	16.19	2.28	20.15	15.66	2.55	18.73	15.09	2.85
	62	22.86	20.91	1.61	21.86	20.44	1.81	20.81	19.93	2.04	19.72	19.39	2.28	18.65	18.65	2.56	17.57	17.57	2.86
	57	22.24	22.24	1.61	21.43	21.43	1.82	20.56	20.56	2.04	19.64	19.64	2.28	18.65	18.65	2.56	17.57	17.57	2.86
800	72	27.54	14.98	1.64	26.35	14.54	1.84	25.08	14.08	2.06	23.76	13.60	2.31	22.34	13.09	2.58	20.75	12.52	2.88
	67	25.31	18.74	1.64	24.19	18.29	1.85	23.00	17.81	2.07	21.75	17.31	2.31	20.42	16.77	2.59	18.96	16.19	2.88
	62	23.37	22.46	1.65	22.36	21.95	1.85	21.35	21.35	2.07	20.38	20.38	2.32	19.33	19.33	2.59	18.18	18.18	2.89
	57	23.14	23.14	1.65	22.28	22.28	1.85	21.36	21.36	2.07	20.38	20.38	2.32	19.33	19.33	2.59	18.18	18.18	2.89
900	72	27.83	15.64	1.68	26.61	15.19	1.88	25.31	14.72	2.10	23.96	14.25	2.34	22.50	13.73	2.61	20.87	13.16	2.91
	67	25.61	19.83	1.68	24.46	19.37	1.88	23.25	18.88	2.10	21.97	18.37	2.35	20.61	17.83	2.62	19.12	17.24	2.92
	62	23.85	23.85	1.68	22.96	22.96	1.88	22.00	22.00	2.10	20.98	20.98	2.35	19.87	19.87	2.62	18.66	18.66	2.92
	57	23.87	23.87	1.68	22.97	22.97	1.88	22.00	22.00	2.10	20.98	20.98	2.35	19.87	19.87	2.62	18.66	18.66	2.92

Multipliers for Determining the Performance With Other Indoor Sections

Cooling Indoor Model	Capacity	Power	Furnace Model
*CAP**2414A**	1.00	1.00	
CAP**2417A**	0.99	0.99	
CAP**3014A**	1.00	1.00	
CAP**3017A**	1.00	1.00	
CNPF*2418A**	0.98	0.98	
CNPH*2417A**	0.98	0.98	
CNPH*3017A**	0.99	0.99	
CNPV*2414A**	0.98	0.98	
CNPV*2417A**	0.98	0.98	
CNPV*3014A**	0.99	0.99	
CNPV*3017A**	0.99	0.99	
CSPH*2412A**	0.96	0.96	
CSPH*3012A**	0.96	0.96	
FE4ANF002	1.00	0.94	
FE4ANF003	1.00	0.94	
FF1ENP024	0.98	0.98	
FF1ENP030	0.98	0.98	
FV4BNF002	1.00	0.94	
FV4BNF003	1.00	0.92	
FX4CNF024	1.00	0.96	
FX4CNF030	1.01	0.96	
FY4ANF024	0.98	0.98	
FY4ANF030	0.99	0.99	

Cooling Indoor Model	Capacity	Power	Furnace Model
CAP**2414A**	0.98	0.94	315(A,J)AV036070
CAP**3014A**	0.99	0.95	315(A,J)AV036070
CNPH*2417A**	0.97	0.93	315(A,J)AV036070
CNPH*3017A**	0.98	0.92	315(A,J)AV036070
CNPV*2414A**	0.97	0.93	315(A,J)AV036070
CNPV*3014A**	0.98	0.97	315(A,J)AV036070
CSPH*2412A**	0.95	0.91	315(A,J)AV036070
CSPH*3012A**	0.95	0.89	315(A,J)AV036070
CAP**2417A**	0.98	0.92	315(A,J)AV048090
CAP**3017A**	0.99	0.93	315(A,J)AV048090
CNPV*2417A**	0.97	0.93	315(A,J)AV048090
CNPV*3017A**	0.98	0.92	315(A,J)AV048090
CSPH*2412A**	0.95	0.89	315(A,J)AV048090
CSPH*3012A**	0.96	0.90	315(A,J)AV048090
CSPH*2412A**	0.95	0.91	315(A,J)AV060110
CSPH*3012A**	0.96	0.90	315(A,J)AV060110
CSPH*2412A**	0.95	0.91	315(A,J)AV066135
CSPH*3012A**	0.96	0.90	315(A,J)AV066135
CSPH*3012A**	0.96	0.90	315(A,J)AV066155
CNPH*2417A**	0.97	0.93	355AAV042040
CNPH*3017A**	0.98	0.92	355AAV042040
CSPH*2412A**	0.95	0.91	355AAV042040
CSPH*3012A**	0.96	0.90	355AAV042040
CAP**2417A**	0.98	0.94	355AAV042060
CAP**3017A**	0.99	0.93	355AAV042060
CNPV*2417A**	0.97	0.93	355AAV042060
CNPV*3017A**	0.98	0.92	355AAV042060
CSPH*2412A**	0.95	0.91	355AAV042060
CSPH*3012A**	0.95	0.89	355AAV042060
CSPH*3012A**	0.96	0.90	355AAV042080
CSPH*3012A**	0.95	0.89	355AAV060080
CSPH*3012A**	0.96	0.90	355AAV060100
CSPH*3012A**	0.95	0.89	355AAV060120

See notes on pg. 21

DETAILED COOLING CAPACITIES

EVAPORATOR AIR		CONDENSER ENTERING AIR TEMPERATURES deg F																	
		75			85			95			105			115			125		
CFM	EWB	Capacity MBtu/h†		Total System KW**	Capacity MBtu/h†		Total System KW**	Capacity MBtu/h†		Total System KW**	Capacity MBtu/h†		Total System KW**	Capacity MBtu/h†		Total System KW**	Capacity MBtu/h†		Total System KW**
		Total	Sens ‡		Total	Sens ‡		Total	Sens ‡		Total	Sens ‡		Total	Sens ‡		Total	Sens ‡	
123ANA030—A Outdoor Section With CAP**3014A** Indoor Section																			
875	72	33.13	17.60	2.01	31.70	17.06	2.23	30.20	16.49	2.47	28.59	15.90	2.75	26.87	15.27	3.06	25.01	14.60	3.38
	67	30.12	21.64	2.01	28.78	21.09	2.23	27.37	20.50	2.48	25.87	19.89	2.76	24.27	19.25	3.07	22.59	18.58	3.42
	62	27.50	25.68	2.01	26.29	25.09	2.23	25.03	24.47	2.48	23.75	23.75	2.77	22.56	22.56	3.08	21.27	21.27	3.43
	57	26.93	26.93	2.01	25.94	25.94	2.24	24.89	24.89	2.48	23.76	23.76	2.77	22.56	22.56	3.08	21.27	21.27	3.43
1000	72	33.69	18.46	2.05	32.21	17.92	2.27	30.64	17.34	2.52	28.98	16.74	2.80	27.20	16.10	3.11	25.32	15.44	3.45
	67	30.64	23.04	2.05	29.26	22.48	2.27	27.80	21.89	2.52	26.25	21.27	2.80	24.61	20.61	3.12	22.87	19.92	3.46
	62	28.16	27.55	2.06	26.95	26.95	2.28	25.86	25.86	2.53	24.67	24.67	2.81	23.39	23.39	3.12	22.02	22.02	3.47
	57	28.03	28.03	2.06	26.98	26.98	2.28	25.86	25.86	2.53	24.67	24.67	2.81	23.39	23.39	3.12	22.02	22.02	3.47
1125	72	34.09	19.27	2.10	32.57	18.72	2.32	30.96	18.14	2.56	29.26	17.54	2.84	27.43	16.89	3.15	25.50	16.22	3.49
	67	31.03	24.36	2.10	29.61	23.80	2.32	28.12	23.20	2.57	26.54	22.57	2.85	24.86	21.90	3.16	23.10	21.19	3.50
	62	28.94	28.94	2.10	27.83	27.83	2.32	26.66	26.66	2.57	25.40	25.40	2.85	24.06	24.06	3.16	22.61	22.61	3.48
	57	28.94	28.94	2.10	27.83	27.83	2.32	26.66	26.66	2.57	25.41	25.41	2.85	24.06	24.06	3.16	22.62	22.62	3.51

Multipliers for Determining the Performance With Other Indoor Sections

Cooling Indoor Model	Capacity	Power	Furnace Model
*CAP**3014A**	1.00	1.00	
CAP**3017A**	1.00	1.00	
CAP**3614A**	1.00	1.00	
CAP**3617A**	1.00	1.00	
CAP**3621A**	1.00	1.00	
CNPF*3618A**	0.99	0.99	
CNPH*3017A**	0.99	0.99	
CNPH*3617A**	0.99	0.99	
CNPV*3014A**	0.99	0.99	
CNPV*3017A**	0.99	0.99	
CNPV*3617A**	0.99	0.99	
CNPV*3621A**	0.99	0.99	
CSPH*3012A**	0.96	0.96	
CSPH*3612A**	0.98	0.98	
FE4ANF002	0.99	0.95	
FE4ANF003	1.00	0.94	
FE4ANF005	1.03	0.94	
FF1ENP030	0.98	0.98	
FF1ENP036	1.00	1.00	
FV4BNF002	0.99	0.95	
FV4BNF003	1.00	0.94	
FV4BNF005	1.03	0.94	
FX4CN(B,F)036	1.01	0.96	
FX4CNF030	1.00	0.98	
FY4ANF030	0.99	0.99	
FY4ANF036	0.99	0.99	

See notes on pg. 21

Cooling Indoor Model	Capacity	Power	Furnace Model
CAP**3014A**	0.99	0.97	315(A,J)AV036070
CAP**3614A**	0.99	0.94	315(A,J)AV036070
CNPH*3017A**	0.98	0.94	315(A,J)AV036070
CNPH*3617A**	0.98	0.94	315(A,J)AV036070
CNPV*3014A**	0.98	0.96	315(A,J)AV036070
CSPH*3012A**	0.96	0.92	315(A,J)AV036070
CSPH*3612A**	0.97	0.93	315(A,J)AV036070
CAP**3017A**	0.99	0.94	315(A,J)AV048090
CAP**3617A**	0.99	0.95	315(A,J)AV048090
CNPV*3017A**	0.98	0.94	315(A,J)AV048090
CNPV*3617A**	0.98	0.94	315(A,J)AV048090
CAP**3621A**	0.99	0.95	315(A,J)AV060110
CNPV*3621A**	0.99	0.94	315(A,J)AV060110
CNPH*3017A**	0.98	0.96	355AAV042040
CNPH*3617A**	0.98	0.96	355AAV042040
CSPH*3012A**	0.96	0.94	355AAV042040
CSPH*3612A**	0.97	0.93	355AAV042040
CAP**3017A**	0.99	0.94	355AAV042060
CAP**3617A**	0.99	0.94	355AAV042060
CNPV*3017A**	0.98	0.94	355AAV042060
CNPV*3617A**	0.98	0.94	355AAV042060
CAP**3621A**	0.99	0.95	355AAV042080
CNPV*3621A**	0.98	0.94	355AAV042080

123A

DETAILED COOLING CAPACITIES

EVAPORATOR AIR		CONDENSER ENTERING AIR TEMPERATURES deg F																	
		75			85			95			105			115			125		
CFM	EWB	Capacity MBtu/h†		Total System KW**	Capacity MBtu/h†		Total System KW**	Capacity MBtu/h†		Total System KW**	Capacity MBtu/h†		Total System KW**	Capacity MBtu/h†		Total System KW**	Capacity MBtu/h†		Total System KW**
		Total	Sens ‡		Total	Sens ‡		Total	Sens ‡		Total	Sens ‡		Total	Sens ‡		Total	Sens ‡	
123ANA036—A Outdoor Section With CAP**3617A** Indoor Section																			
1050	72	40.12	21.34	2.48	38.42	20.70	2.74	36.61	20.02	3.03	34.70	19.31	3.35	32.62	18.55	3.71	30.32	17.72	4.09
	67	36.62	26.34	2.47	35.03	25.67	2.73	33.34	24.97	3.02	31.55	24.24	3.34	29.62	23.47	3.70	27.50	22.62	4.09
	62	33.54	31.31	2.46	32.11	30.61	2.72	30.61	29.86	3.01	29.06	29.06	3.34	27.62	27.62	3.70	25.99	25.99	4.09
	57	32.88	32.88	2.46	31.70	31.70	2.72	30.44	30.44	3.01	29.09	29.09	3.34	27.63	27.63	3.70	26.00	26.00	4.09
1200	72	40.72	22.34	2.54	38.96	21.69	2.80	37.09	21.00	3.09	35.11	20.28	3.41	32.97	19.51	3.76	30.60	18.67	4.15
	67	37.19	27.96	2.53	35.54	27.28	2.79	33.80	26.58	3.08	31.96	25.85	3.40	29.98	25.06	3.76	27.81	24.20	4.15
	62	34.30	33.50	2.52	32.84	32.84	2.78	31.55	31.55	3.07	30.12	30.12	3.40	28.56	28.56	3.75	26.83	26.83	4.14
	57	34.15	34.15	2.52	32.89	32.89	2.78	31.55	31.55	3.07	30.12	30.12	3.40	28.56	28.56	3.75	26.83	26.83	4.14
1350	72	41.16	23.27	2.60	39.34	22.61	2.86	37.42	21.92	3.14	35.40	21.20	3.47	33.21	20.42	3.82	30.78	19.57	4.21
	67	37.62	29.51	2.59	35.93	28.83	2.85	34.15	28.12	3.14	32.27	27.38	3.46	30.25	26.57	3.81	28.05	25.67	4.20
	62	35.18	35.18	2.58	33.86	33.86	2.84	32.45	32.45	3.13	30.95	30.95	3.46	29.31	29.31	3.81	27.50	27.50	4.20
	57	35.19	35.19	2.58	33.86	33.86	2.84	32.46	32.46	3.13	30.95	30.95	3.46	29.31	29.31	3.81	27.50	27.50	4.20

Multipliers for Determining the Performance With Other Indoor Sections

Cooling Indoor Model	Capacity	Power	Furnace Model
*CAP**3617A**	1.00	1.00	
CAP**3614A**	0.97	0.97	
CAP**3621A**	1.00	1.00	
CAP**4221A**	1.00	1.00	
CAP**4224A**	1.00	1.00	
CNPF*3618A**	0.99	0.99	
CNPH*3617A**	0.99	0.99	
CNPH*4221A**	1.00	1.00	
CNPV*3617A**	0.99	0.99	
CNPV*3621A**	0.99	0.99	
CNPV*4221A**	1.00	1.00	
CSPH*3612A**	0.99	0.99	
CSPH*4212A**	0.99	0.98	
FE4ANB006	1.04	0.95	
FE4ANF002	0.99	0.95	
FE4ANF003	1.00	0.94	
FE4ANF005	1.03	0.94	
FF1ENP036	0.99	0.99	
FV4BNB006	1.04	0.95	
FV4BNF002	0.99	0.95	
FV4BNF003	1.00	0.94	
FV4BNF005	1.03	0.94	
FX4CN(B,F)036	1.01	0.97	
FX4CN(B,F)042	1.02	0.98	
FY4ANF036	0.99	0.99	
FY4ANF042	1.01	1.01	

See notes on pg. 21

Cooling Indoor Model	Capacity	Power	Furnace Model
CAP**3614A**	0.97	0.95	315(A,J)AV036070
CNPH*3617A**	0.98	0.96	315(A,J)AV036070
CNPH*4221A**	1.01	0.96	315(A,J)AV036070
CSPH*3612A**	0.98	0.93	315(A,J)AV036070
CSPH*4212A**	1.00	0.98	315(A,J)AV036070
CAP**3617A**	0.99	0.95	315(A,J)AV048090
CNPV*3617A**	0.98	0.94	315(A,J)AV048090
CAP**3621A**	0.99	0.95	315(A,J)AV060110
CAP**4221A**	1.00	0.96	315(A,J)AV060110
CNPV*3621A**	0.99	0.98	315(A,J)AV060110
CNPV*4221A**	1.02	0.96	315(A,J)AV060110
CAP**4224A**	1.00	0.94	315(A,J)AV066135
CAP**4224A**	0.99	0.95	355AAV042040
CNPH*3617A**	0.98	0.96	355AAV042040
CNPH*4221A**	1.01	0.96	355AAV042040
CSPH*3612A**	0.98	0.93	355AAV042040
CSPH*4212A**	0.99	0.98	355AAV042040
CAP**3617A**	0.99	0.95	355AAV042060
CNPH*4221A**	1.01	0.97	355AAV042060
CNPV*3617A**	0.98	0.96	355AAV042060
CAP**3621A**	0.99	0.97	355AAV042080
CAP**4221A**	0.99	0.95	355AAV042080
CNPV*3621A**	0.99	0.99	355AAV042080
CNPV*4221A**	1.01	0.96	355AAV042080

DETAILED COOLING CAPACITIES

EVAPORATOR AIR		CONDENSER ENTERING AIR TEMPERATURES deg F																	
		75			85			95			105			115			125		
CFM	EWB	Capacity MBtu/h†		Total System KW**	Capacity MBtu/h†		Total System KW**	Capacity MBtu/h†		Total System KW**	Capacity MBtu/h†		Total System KW**	Capacity MBtu/h†		Total System KW**	Capacity MBtu/h†		Total System KW**
		Total	Sens ‡		Total	Sens ‡		Total	Sens ‡		Total	Sens ‡		Total	Sens ‡		Total	Sens ‡	
123ANA042—A Outdoor Section With CAP**4221A** Indoor Section																			
1225	72	48.51	25.52	3.33	46.40	24.71	3.68	44.17	23.86	4.08	41.83	22.99	4.51	39.30	22.05	4.99	36.50	21.03	5.51
	67	44.49	31.40	3.31	42.53	30.57	3.66	40.46	29.71	4.06	38.30	28.81	4.50	35.96	27.87	4.98	33.41	26.84	5.51
	62	40.85	37.25	3.29	39.08	36.40	3.65	37.24	35.50	4.04	35.33	34.54	4.48	33.39	33.39	4.97	31.44	31.44	5.50
	57	39.76	39.76	3.29	38.32	38.32	3.64	36.79	36.79	4.04	35.17	35.17	4.48	33.41	33.41	4.97	31.45	31.45	5.50
1400	72	49.22	26.65	3.40	47.02	25.82	3.76	44.72	24.97	4.15	42.30	24.08	4.59	39.69	23.14	5.07	36.79	22.10	5.59
	67	45.18	33.25	3.38	43.15	32.40	3.74	41.00	31.53	4.13	38.76	30.63	4.57	36.37	29.68	5.05	33.74	28.63	5.58
	62	41.71	39.81	3.37	39.92	38.90	3.72	38.04	38.04	4.12	36.38	36.38	4.56	34.50	34.50	5.05	32.41	32.41	5.58
	57	41.28	41.28	3.37	39.74	39.74	3.72	38.11	38.11	4.12	36.38	36.38	4.56	34.50	34.50	5.05	32.41	32.41	5.58
1575	72	49.76	27.73	3.48	47.49	26.90	3.84	45.12	26.04	4.23	42.63	25.14	4.67	39.95	24.19	5.14	36.99	23.14	5.66
	67	45.71	35.04	3.46	43.61	34.19	3.82	41.42	33.32	4.21	39.13	32.41	4.65	36.68	31.44	5.13	33.99	30.36	5.65
	62	42.55	42.13	3.45	40.89	40.89	3.80	39.17	39.17	4.20	37.34	37.34	4.64	35.37	35.37	5.12	33.16	33.16	5.65
	57	42.52	42.52	3.45	40.89	40.89	3.80	39.17	39.17	4.20	37.35	37.35	4.64	35.37	35.37	5.12	33.16	33.16	5.65

Multipliers for Determining the Performance With Other Indoor Sections

Indoor Model	Capacity	Power	Furnace Model
*CAP**4221A**	1.00	1.00	
CAP**4224A**	1.00	1.00	
CAP**4817A**	0.98	0.98	
CAP**4821A**	1.01	1.01	
CAP**4824A**	1.01	1.01	
CNPF*4818A**	1.01	1.01	
CNPH*4221A**	1.00	1.00	
CNPH*4821A**	1.01	1.01	
CNPV*4221A**	1.00	1.00	
CNPV*4821A**	0.99	0.99	
CNPV*4824A**	1.01	1.01	
CSPH*4212A**	0.99	0.99	
CSPH*4812A**	1.00	1.00	
FE4ANB006	1.04	0.95	
FE4ANF003	0.99	0.94	
FE4ANF005	1.02	0.96	
FV4BNB006	1.04	0.95	
FV4BNF003	0.99	0.94	
FV4BNF005	1.01	0.95	
FX4CN(B,F)042	1.01	0.99	
FX4CN(B,F)048	1.04	0.99	
FY4ANF042	1.00	1.00	
FY4ANF048	1.02	1.02	

See notes on pg. 21

Indoor Model	Capacity	Power	Furnace Model
CNPH*4221A**	0.99	0.97	315(A,J)AV036070
CNPH*4821A**	1.00	0.98	315(A,J)AV036070
CSPH*4212A**	0.98	0.96	315(A,J)AV036070
CSPH*4812A**	0.98	0.96	315(A,J)AV036070
CAP**4817A**	0.98	0.93	315(A,J)AV048090
CAP**4221A**	0.99	0.97	315(A,J)AV060110
CAP**4821A**	1.00	0.96	315(A,J)AV060110
CNPV*4221A**	0.98	0.93	315(A,J)AV060110
CNPV*4821A**	1.00	0.96	315(A,J)AV060110
CAP**4224A**	0.99	0.94	315(A,J)AV066135
CAP**4824A**	1.00	0.94	315(A,J)AV066135
CNPV*4824A**	0.99	0.93	315(A,J)AV066135
CAP**4224A**	0.98	0.96	355AAV042040
CAP**4824A**	1.00	0.98	355AAV042040
CNPH*4221A**	0.98	0.96	355AAV042040
CNPH*4821A**	0.99	0.97	355AAV042040
CNPV*4824A**	1.00	0.98	355AAV042040
CSPH*4212A**	0.98	0.96	355AAV042040
CSPH*4812A**	0.98	0.96	355AAV042040
CAP**4817A**	0.98	0.93	355AAV042060
CAP**4221A**	0.98	0.96	355AAV042080
CAP**4821A**	0.99	0.97	355AAV042080

123A

DETAILED COOLING CAPACITIES

EVAPORATOR AIR		CONDENSER ENTERING AIR TEMPERATURES deg F																	
		75			85			95			105			115			125		
CFM	EWB	Capacity MBtu/h†		Total System KW**	Capacity MBtu/h†		Total System KW**	Capacity MBtu/h†		Total System KW**	Capacity MBtu/h†		Total System KW**	Capacity MBtu/h†		Total System KW**	Capacity MBtu/h†		Total System KW**
		Total	Sens ‡		Total	Sens ‡		Total	Sens ‡		Total	Sens ‡		Total	Sens ‡		Total	Sens ‡	
123ANA048—A Outdoor Section With CAP**4821A** Indoor Section																			
1400	72	55.04	28.49	3.35	52.62	27.54	3.75	50.08	26.56	4.20	47.38	25.54	4.72	44.49	24.45	5.30	41.25	23.26	6.01
	67	49.86	34.52	3.35	47.63	33.55	3.75	45.27	32.56	4.21	42.77	31.51	4.73	40.10	30.41	5.33	37.08	29.19	6.08
	62	45.26	40.60	3.35	43.30	39.77	3.76	41.26	38.91	4.22	39.15	38.04	4.74	37.27	37.27	5.34	35.05	35.05	6.09
	57	44.65	44.65	3.35	42.99	42.99	3.76	41.23	41.23	4.22	39.35	39.35	4.74	37.33	37.33	5.34	35.06	35.06	6.09
1600	72	56.06	29.65	3.42	53.54	28.69	3.82	50.89	27.69	4.27	48.09	26.65	4.79	45.09	25.55	5.36	41.76	24.34	6.06
	67	50.79	36.35	3.42	48.45	35.38	3.82	46.00	34.36	4.28	43.40	33.30	4.80	40.63	32.17	5.39	37.50	30.93	6.14
	62	46.36	43.45	3.42	44.40	42.66	3.83	42.52	41.92	4.17	40.77	40.77	4.81	38.63	38.63	5.40	36.19	36.19	6.15
	57	46.41	46.41	3.42	44.64	44.64	3.83	42.77	42.77	4.28	40.78	40.78	4.81	38.63	38.63	5.40	36.19	36.19	6.15
1800	72	56.83	30.71	3.49	54.22	29.73	3.89	51.49	28.72	4.34	48.61	27.66	4.85	45.53	26.54	5.43	42.11	25.32	6.12
	67	51.48	38.05	3.49	49.06	37.05	3.89	46.53	36.02	4.35	43.86	34.94	4.87	41.00	33.80	5.46	37.80	32.58	6.20
	62	47.45	46.27	3.50	45.69	45.69	3.90	44.03	44.03	4.36	41.94	41.94	4.88	39.69	39.69	5.47	37.12	37.12	6.21
	57	47.87	47.87	3.49	46.01	46.01	3.90	44.04	44.04	4.36	41.95	41.95	4.88	39.69	39.69	5.47	37.13	37.13	6.21

Multipliers for Determining the Performance With Other Indoor Sections

Cooling Indoor Model	Capacity	Power	Furnace Model
*CAP**4821A**	1.00	1.00	
CAP**4817A**	0.99	0.99	
CAP**4824A**	1.00	1.00	
CAP**6021A**	1.02	1.02	
CAP**6024A**	1.02	1.02	
CNPF*4818A**	0.98	0.98	
CNPH*4821A**	1.00	1.00	
CNPH*6024A**	1.02	1.02	
CNPV*4221A**	0.97	0.97	
CNPV*4821A**	1.00	1.00	
CNPV*4824A**	1.00	1.00	
CNPV*6024A**	1.02	1.02	
CSPH*4812A**	0.99	0.99	
CSPH*6012A**	1.00	1.00	
FE4ANB006	1.02	0.96	
FE4ANF005	1.01	0.97	
FV4BNB006	1.02	0.96	
FV4BNF005	1.01	0.97	
FX4CN(B,F)048	1.02	1.00	
FX4CN(B,F)060	1.03	0.99	
FY4ANB060	1.01	1.01	
FY4ANF048	1.00	1.00	

Cooling Indoor Model	Capacity	Power	Furnace Model
CAP**4817A**	0.99	0.97	315(A,J)AV048090
CNPH*4821A**	0.98	0.96	315(A,J)AV048090
CNPH*6024A**	1.00	0.98	315(A,J)AV048090
CSPH*4812A**	0.97	0.95	315(A,J)AV048090
CSPH*6012A**	0.98	0.96	315(A,J)AV048090
CAP**4821A**	0.98	0.96	315(A,J)AV060110
CAP**6021A**	1.03	1.01	315(A,J)AV060110
CNPH*4821A**	0.99	0.97	315(A,J)AV060110
CNPH*6024A**	1.00	0.98	315(A,J)AV060110
CNPV*4221A**	0.97	0.95	315(A,J)AV060110
CNPV*4821A**	0.98	0.96	315(A,J)AV060110
CAP**4824A**	0.99	0.97	315(A,J)AV066135
CAP**6024A**	1.01	0.97	315(A,J)AV066135
CNPV*4824A**	0.99	0.97	315(A,J)AV066135
CNPV*6024A**	1.00	0.96	315(A,J)AV066135
CAP**4821A**	0.98	0.98	355AAV060080
CAP**6021A**	1.00	0.98	355AAV060080
CNPH*4821A**	0.98	0.98	355AAV060080
CNPH*6024A**	1.00	0.98	355AAV060080
CNPV*4221A**	0.97	0.97	355AAV060080
CNPV*4821A**	0.98	0.98	355AAV060080
CSPH*4812A**	0.97	0.97	355AAV060080
CSPH*6012A**	0.98	0.96	355AAV060080
CAP**4821A**	0.98	0.94	355AAV060100
CNPH*4821A**	0.98	0.96	355AAV060100
CNPH*6024A**	1.00	0.98	355AAV060100
CAP**4824A**	0.98	0.96	355AAV060120
CAP**6024A**	1.00	0.96	355AAV060120
CNPV*4824A**	0.99	0.97	355AAV060120
CNPV*6024A**	1.00	0.98	355AAV060120

See notes on pg. 21

DETAILED COOLING CAPACITIES

EVAPORATOR AIR		CONDENSER ENTERING AIR TEMPERATURES deg F																	
		75			85			95			105			115			125		
CFM	EWB	Capacity MBtu/h†		Total System KW**	Capacity MBtu/h†		Total System KW**	Capacity MBtu/h†		Total System KW**	Capacity MBtu/h†		Total System KW**	Capacity MBtu/h†		Total System KW**	Capacity MBtu/h†		Total System KW**
		Total	Sens ‡		Total	Sens ‡		Total	Sens ‡		Total	Sens ‡		Total	Sens ‡		Total	Sens ‡	
123ANA060—A Outdoor Section With CAP**6024A** Indoor Section																			
1750	72	67.65	35.66	4.15	64.56	34.48	4.58	61.30	33.25	5.06	57.89	31.98	5.58	54.20	30.63	6.15	50.10	29.15	6.77
	67	62.07	43.94	4.10	59.24	42.75	4.53	56.25	41.50	5.01	53.12	40.22	5.54	49.74	38.85	6.11	46.03	37.38	6.74
	62	57.01	52.17	4.06	54.45	50.95	4.49	51.79	49.66	4.97	49.04	48.27	5.50	46.34	46.34	6.08	43.50	43.50	6.72
	57	55.50	55.50	4.04	53.42	53.42	4.48	51.22	51.22	4.96	48.89	48.89	5.50	46.35	46.35	6.08	43.51	43.51	6.72
2000	72	68.69	37.30	4.26	65.46	36.09	4.69	62.07	34.85	5.16	58.54	33.56	5.69	54.71	32.19	6.26	50.48	30.69	6.87
	67	63.07	46.60	4.21	60.11	45.38	4.64	57.00	44.12	5.11	53.75	42.82	5.64	50.27	41.45	6.21	46.44	39.94	6.84
	62	58.17	55.80	4.16	55.57	54.47	4.59	52.95	52.95	5.07	50.49	50.49	5.61	47.78	47.78	6.19	44.74	44.74	6.82
	57	57.57	57.57	4.16	55.35	55.35	4.59	52.99	52.99	5.07	50.50	50.50	5.61	47.78	47.78	6.19	44.74	44.74	6.82
2250	72	69.44	38.83	4.36	66.10	37.62	4.79	62.61	36.36	5.27	58.97	35.06	5.79	55.04	33.67	6.36	50.70	32.16	6.97
	67	63.79	49.12	4.31	60.73	47.89	4.74	57.53	46.62	5.21	54.20	45.31	5.74	50.63	43.90	6.31	46.72	42.34	6.93
	62	59.18	59.18	4.27	56.90	56.90	4.70	54.41	54.41	5.18	51.77	51.77	5.72	48.91	48.91	6.30	45.70	45.70	6.93
	57	59.25	59.25	4.27	56.90	56.90	4.70	54.42	54.42	5.18	51.78	51.78	5.72	48.91	48.91	6.30	45.70	45.70	6.93

Multipliers for Determining the Performance With Other Indoor Sections

Cooling Indoor Model	Capacity	Power	Furnace Model
*CAP**6024A**	1.00	1.00	
CAP**6021A**	0.98	0.98	
CNPH*6024A**	0.97	0.97	
CNPV*6024A**	0.99	0.99	
CSPH*6012A**	0.98	0.98	
FE4ANB006	0.99	0.97	
FV4BNB006	0.99	0.97	
FX4CN(B,F)060	1.01	1.01	
FY4ANB060	0.98	0.98	

Cooling Indoor Model	Capacity	Power	Furnace Model
CAP**6021A**	0.97	0.97	315(A,J)AV060110
CSPH*6012A**	0.97	0.97	315(A,J)AV060110
CAP**6024A**	0.98	0.98	315(A,J)AV066135
CNPH*6024A**	0.97	0.96	315(A,J)AV066135
CNPV*6024A**	0.97	0.97	315(A,J)AV066135
CSPH*6012A**	0.97	0.95	315(A,J)AV066135
CAP**6024A**	0.98	0.97	315(A,J)AV066155
CNPH*6024A**	0.98	0.97	315(A,J)AV066155
CNPV*6024A**	0.98	0.97	315(A,J)AV066155
CSPH*6012A**	0.97	0.95	315(A,J)AV066155

NOTE: When the required data fall between the published data, interpolation may be performed. Extrapolation is not an acceptable practice.

* Detailed cooling capacities are based on indoor and outdoor unit at the same elevation per ARI standard 210/240–94. If additional tubing length and/or indoor unit is located above outdoor unit, a slight variation in capacity may occur.

** Total system kW is total of indoor and outdoor unit kilowatts.

† Total and sensible capacities are net capacities. Blower motor heat has been subtracted.

‡ Sensible capacities shown are based on 80°F (27°C) entering air at the indoor coil. For sensible capacities at other than 80°F (27°C), deduct 835 Btu/h (245 kW) per 1000 CFM (480 L/S) of indoor coil air for each degree below 80°F (27°C), or add 835 Btu/h (245 kW) per 1000 CFM (480 L/S) of indoor coil air per degree above 80°F (27°C).

When the required data fall between the published data, interpolation may be performed.