

Energy Audit  
Thermal Envelope  
HVAC Loads & Scope of Work  
Funded by  
Liberty Utilities



Meriden Town Hall and Police Station  
110 Main Street Plainfield NH  
August 30, 2019



DESIGN DAY  
MECHANICALS INC

## Table of Contents

Introduction	3
Executive Summary	3-4
Historic Energy Usage	5
Thermographic Images	6
Room and Zone Loads	7-8
Boiler Photos	9
IR images from December 2012	10-12
HRV (Excerpted from 2012 report)	13-14
Load Calculation Report	15-23
Elite Audit Report Summaries	24-48
Heating and Cooling Scope of Work	49-114

## Introduction

This Energy Audit has been paid for by Liberty Utilities as part of their energy efficiency program. Funding may also be available to help reduce energy usage through weatherization efforts.

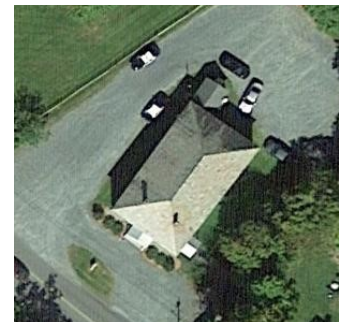
The purpose of an energy audit is to identify energy saving measures (ESM) in a building. Computer simulated and other energy models were developed for this project using multiple strategies and software. The models estimate predicted future energy consumption based on the local climate conditions, physical dimensions and characteristics of a building, mechanical systems, presumed lighting, equipment, and occupancy patterns, in addition to a number of other variables.

With the building modeled in existing conditions, energy savings can be estimated for improvements to the thermal envelope and or mechanical systems. The cost of those measures can then be analyzed in terms of predicted energy saved. The primary objective is to evaluate the level of investment warranted by energy and dollars saved from those specific measures. In this case, a capital investment is warranted to replace the oil boiler. The goals of this audit are to suggest further envelope improvements and present heating and cooling loads with a Scope of Work for soliciting an energy efficient heating and cooling system.

This audit has been prepared with the best of intentions to assist the Town of Plainfield / Meriden make informed decisions regarding improvements. We do not make any warranty, expressed or implied, or assume any legal liability or responsibility for the accuracy, completeness, or usefulness of any information, apparatus, product or process disclosed.

## Executive Summary

At least two previous energy studies had been conducted for the Meriden Town Hall (MTH): A Preliminary Assessment by Peregrine Energy Group in 2011 and a S.E.E.D.S. Limited Walk Through Assessment in December 2012. This latter study was by invitation from the Energy Committee to include a review of a proposed boiler replacement and specific questions about the windows and insulation. Excerpts of that study have been included near the end of this report for the general— and still relevant description of the building and findings at that time.



The boiler was not replaced and a primary reason for this Audit has been to inform the selection of heat pump equipment and the development of a Scope of Work (SOW) document so local contractors can respond with cost proposals. Design Day Mechanicals develop the SOW and it is included at the end of this Audit Report. Please note the Option #s in the analysis on the following page match the Option #'s described in DDM's report.

A heating and cooling load calculation report is also included at the end of this report. Loads are based on existing conditions, which includes the recent retrofit of the original wood windows. While the large windows do open and close more easily now, they remain single pane with exterior storms and operated via a rope and pulley. Therefore energy performance has been improved minimally from reducing uncontrolled air infiltration.

Air leakage at the floor level remains the most significant opportunity for further load reductions. Previous efforts to seal and insulate above the crawlspace were substantial and resulted in energy savings. The recommendation going forward is to bring relocate the thermal barrier and bring the crawlspace into conditioned space by air sealing and insulating the foundation walls. This involves not only improving (replacing in some areas) the vapor barrier on the dirt floor but also addressing the structural concerns of the brick foundation wall, particularly on the northwest wall.

This capital improvement was discussed with the facilities manager, as the cost cannot be justified by energy savings alone.

Two cost effective envelope upgrade opportunity measures which could be performed at this time are described below.

1. Weather-strip and add 4” rigid foam board to the attic hatch access. Estimated cost: \$150
2. Remove the bottom row or rows of siding and seal the sill beams from the exterior. This would greatly reduce air leakage at the floor level, reducing heat loss and improving comfort. Estimated Cost: \$437

This is not a common weatherization practice but has been successfully accomplished by the firm Shakes to Shingles from the Concord Area. While this could be safely completed without addressing the foundation, it may not make sense to do this if a more extensive foundation retrofit is being planned for the near future. The recommendation here is to contact Shakes to Shingles for a full proposal to a) seal the dirt floor b) seal the exterior sill behind the siding, and c) insulate the (new) foundation walls.

The envelope improvements described above would result in energy savings and improved comfort, but not impact load calculations nor equipment sizing and selection. The energy savings would largely depend on the selected HVAC system so have not been included in this analysis. Also, the additional air sealing would reduce air exchange enough to require using the ventilation equipment installed above the ceiling. This would of course increase electric energy usage. The functionality of that Lifebreath HRV is not known at this time at commissioning that system is advised.

The chart below summarizes the energy modeling results from four heat pump options described in DDM’s SOW. The SOW includes basic equipment costs for all options, but not the installed cost. Boreholes for Option #4 are estimated at \$33,000 and has been included in the Equipment Costs below. The SOW allows for competitive bidding.

Annual dollar costs, electric kWh consumption and Site Energy in MMBtus are for heating and cooling only for system comparison sake.

	HVAC Package	Equipment Only Cost	Annual Heating Cost	Annual Cooling Cost	Total Cost	Annual kWh Heat & Cool Only	MMBtu Site Energy	20 year Energy Costs	PV Array KW	Estimated Cost of PV Array
Exist	Existing Oil Boiler & Window AC		\$3,125	\$625	\$3,750	3472	188	\$75,000	3.1	\$10,937
#2	VRV ASHP	\$15,000	\$1,480	\$486	\$1,966	10920	37	\$39,320	9.8	\$34,398
#4	Code Compliant ASHP	\$10,845	\$1,453	\$437	\$1,890	10503	36	\$37,800	9.5	\$33,084
#1	Mini Split ASHP	\$18,000	\$1,335	\$367	\$1,702	9451	32	\$34,040	8.5	\$29,771
#3	Ground Source Water to Air Heat Pump	\$47,400	\$1,028	\$255	\$1,283	7126	24	\$25,660	6.4	\$22,447

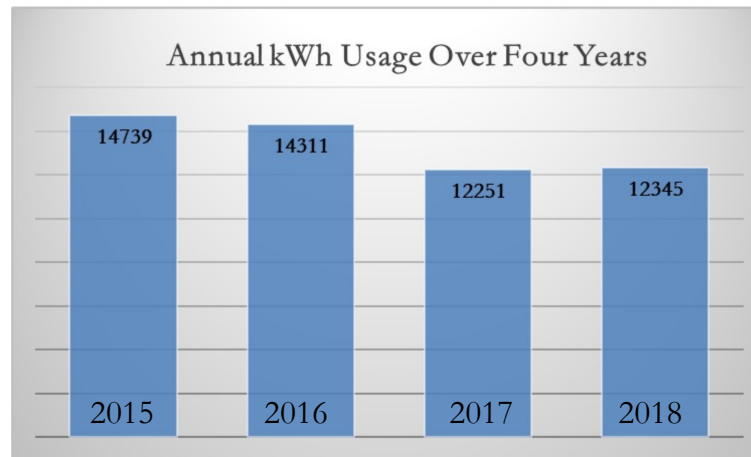
## Historic Energy Use Analysis

The energy analysis below is based on average annual energy data provided for oil and electricity for the Town Hall.

Energy	Units	Site Btus	Source Btus	\$Cost
Electric kWh	13,412	45,761,744	152,373,732	\$2,414
#2 Oil	1,272	176,172,000	202,597,800	\$3,129
Totals		221,933,744	354,971,532	\$5,543
EUI KBtu/FT <sup>2</sup>	3161	70.21	112.30	\$1.75

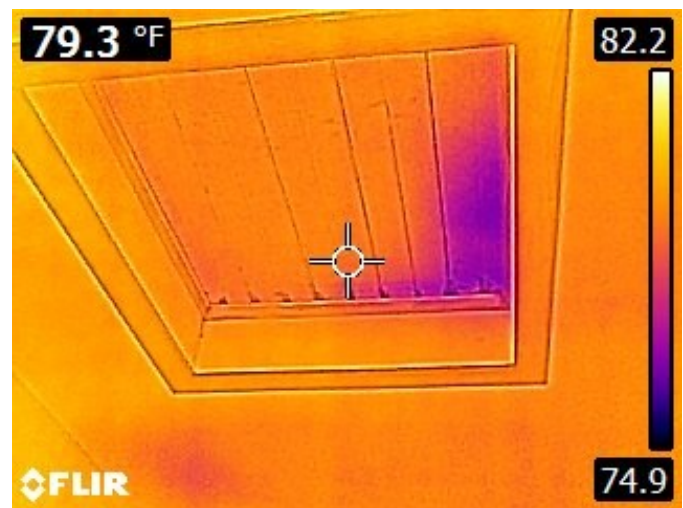
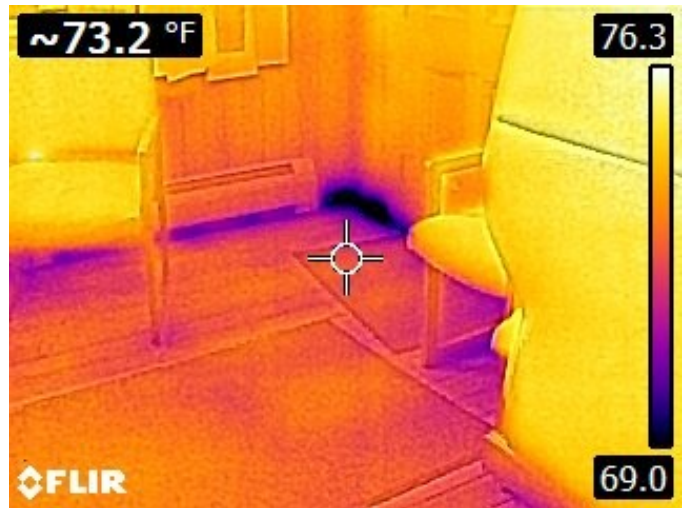
The Energy Utilization Index (EUI) offers a simple snapshot analysis of a building's energy use by looking at total amount of energy input (converted to Btu's) divided by the floor area of conditioned space. "Site Energy" refers to units of energy delivered to a site. Source energy includes transmission and total raw energy the building requires.

Based on the information provided for a two year average, the Town Hall's Site EUI is 70.2 KBtu/ft<sup>2</sup>; Source Energy EUI is estimated at 112.3KBtu/FT<sup>2</sup>. Energy costs total \$1.75 per sq ft in 2018 energy prices.



The 15% decline in usage in 2017 and 2018 likely reflects energy efficiency measures taken in 2017.

The images below were taken in June 2019 with minimal temperature difference between inside and outside. While the contrast is not as clear as 12/2012 images included later in this report, the air leakage from outside and or the crawlspace remains.



### Room and Zone Heating Loads

The total envelope heating load for the building is 81,966 Btu’s per hour based on an indoor temperature of 72°F and an outdoor temp of -5°F. This reflects a 7600Btuhr reduction from calculations performed in 2012, prior to refurbishing the large windows. Additional reductions are possible with effectively air sealing the crawl space perimeter and floor.

The envelope heating load is based on the “peak” heat loss in Btus per hour needed for the coldest hour of a region’s winter occurring 99% of the time. (-5° used for Meriden).

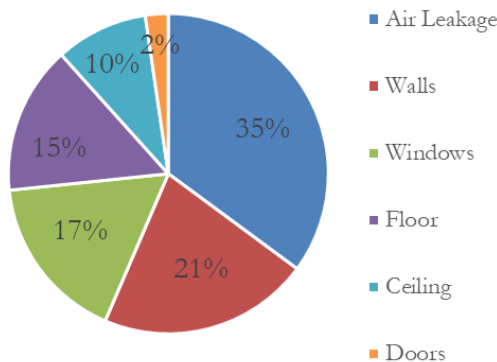
The chart below shows peak heat losses for each room and for each thermostatically controlled zone for the existing hydronic baseboard heating system room by room.

The software used for this calculation was Elite’s RHVAC, a Manual J approved program. A schematic diagram of the zones is on the next page and the RHVAC report is included at the end of this Audit report.

Area	UA	@77°Δ	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5
Foyer 103	44.5	3,569					3,569
Bathroom	11.1	1,382					1,382
Foyer 102	16.9	2,109					2,109
Town Office & Lobby	504.5	27,840	27,840				
Select Board Room	161.5	9,313	9,313				
Manager's Office	64.6	5,301					5,301
Foyer 202	30.2	2,152				2,152	
Storage 101	62.6	5,436				5,436	
Supply Room 203	26.3	2,803				2,803	
Police Evidence	32.8	1,184		1,184			
Police Lobby	37.9	2,671			2,671		
WC	17.3	1,920			1,920		
Storage 114	11.4	1,408			1,408		
Police Staff	113.6	8,771		8,771			
Police Meeting	88.7	6,107		6,107			
		81,966	37,153	16,062	5,999	10,391	12,361

The pie chart to the right breaks down the envelope components accountable for heat loss. Note the floor and air leakage offer the greatest opportunities for further reductions. The brick foundation needs attention before substantial air sealing can be performed and any air sealing will require activating the ventilation system in the attic to assure adequate outside air exchange.

Town Hall Envelope Losses

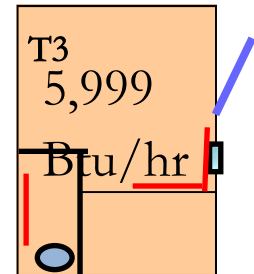
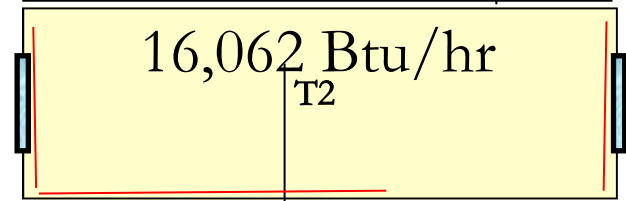
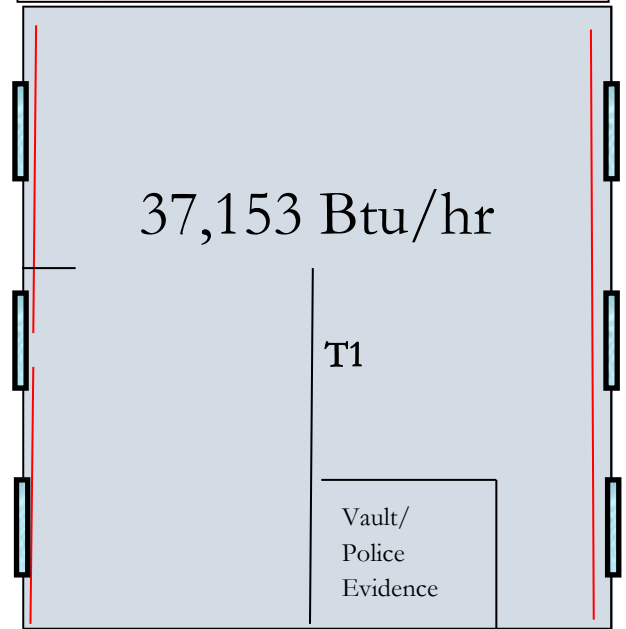
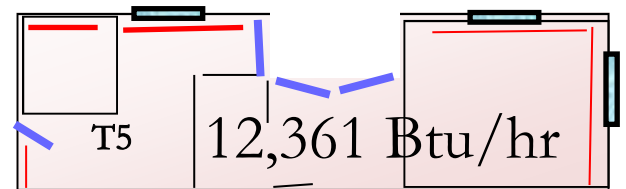
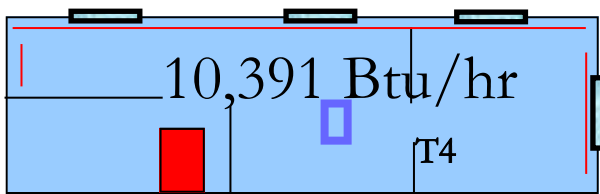


T Thermostat

Hot water baseboard

30 gallon elec DWH

Window—mostly refurbished single pane with exterior storm



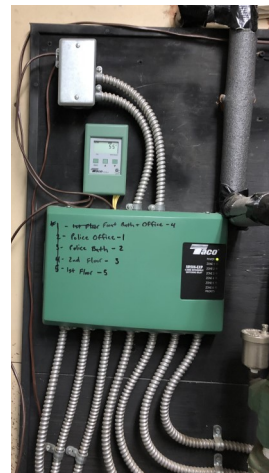
Area	Ln FT
Foyer 103	11
Bathroom	4
Foyer 102	
Town Office & Lobby	55
Select Board Room	20
Manager's Office	21
Foyer 202	10
Storage 101	27
Supply Room 203	12
Police Evidence	
Police Lobby	9
WC	
Storage 114	4
Police Staff	18
Police Meeting	26
	217

Approximate Lineal ft of hydronic baseboard

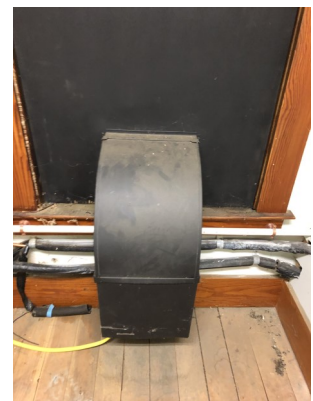


Oil Boiler—

Capacity, Model, Age unknown



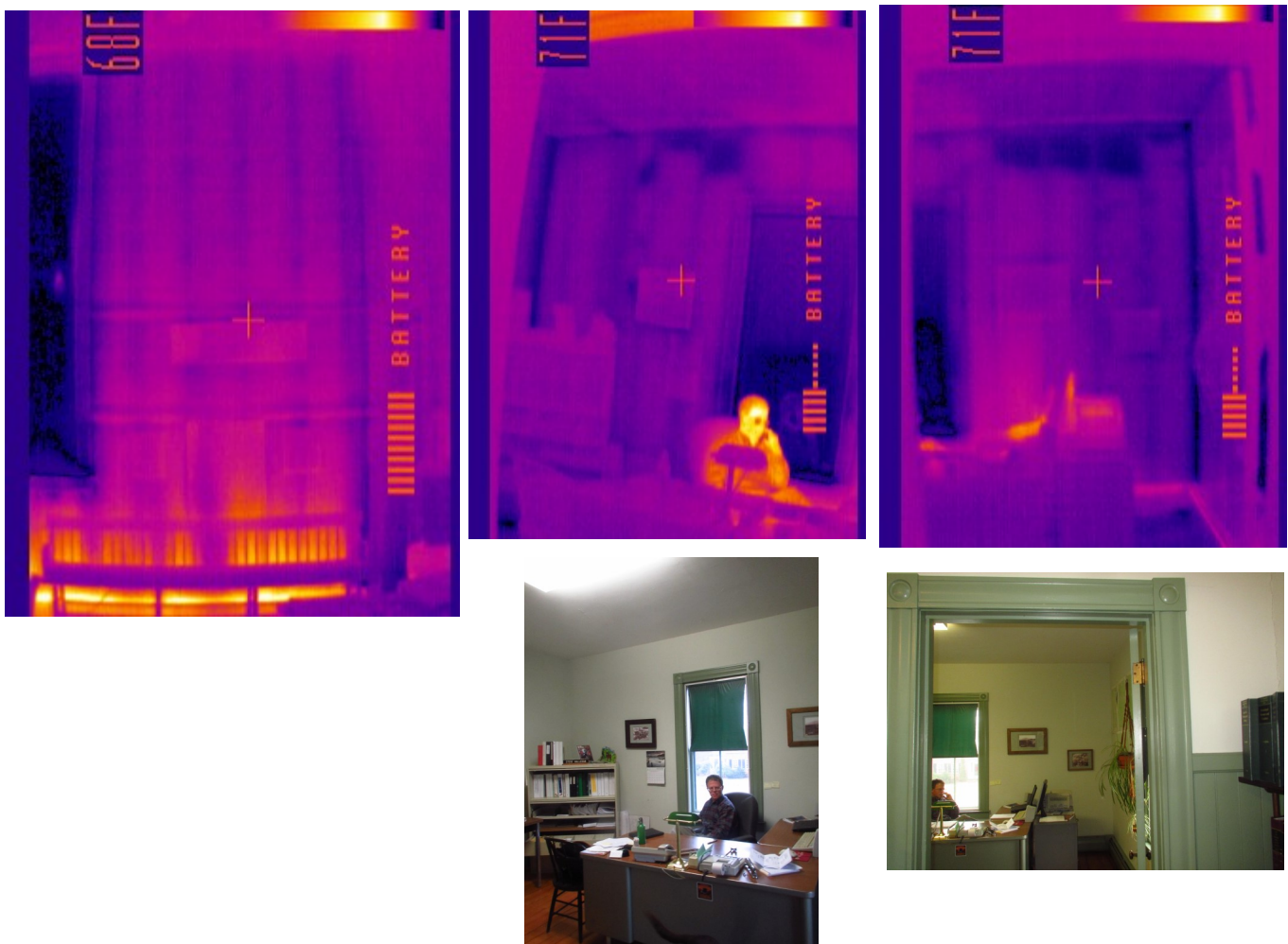
Make up air installed in window opening



## ENVELOPE ASSESSMENT—From Limited December 2012 Study

**Walls** - The estimated performance value for the whole wall (framing, insulation, surfaces etc) is R11.4. Gross surface area was calculated at 3,837 square feet.

Walls are presumed to be framed with 4” lumber, 1” board sheathing and clapboards on the exterior and lathe and plaster on the interior. Walls have been packed well with cellulose, though probably not to the 3.5lbs per cubic foot which defines ‘dense pack’. IR scan reveals the wall cavities are fully insulated with the exception of settling in seven of the twelve bays of the front office of the south wall and a few small areas in the hall and bathroom on the south wall to the east. The total area is estimated at just under five square feet and to have an effective R value of approx. R3. If it was one single area, and could be insulated with making one hole, it would be on the recommended to do list. As it would require making, patching, and painting 16 holes, the advice is to document it as an opportunity for the future.



## Main Ceiling

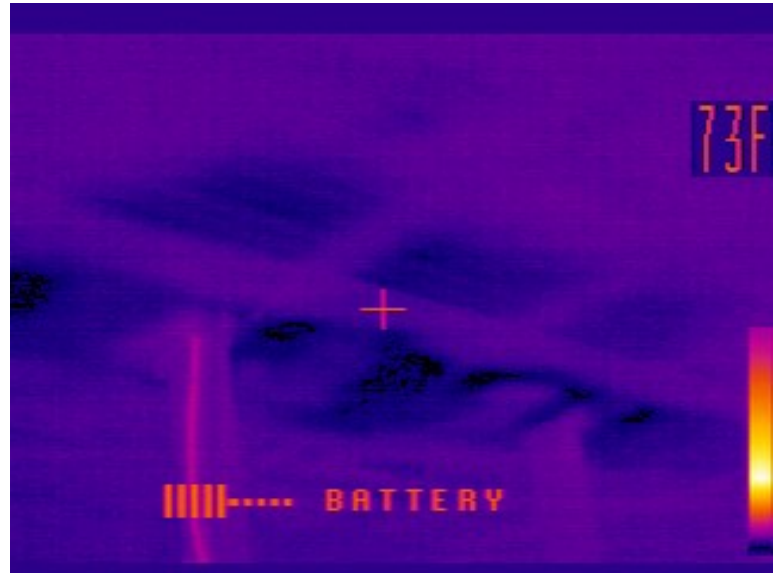
The thermal envelope exists at the floor of the attic, above a 3-4' high chase and above a well sealed air barrier. Evidenced by the fact that when the blower door fan was running and the hatch opened to the chase, there was remarkably little air movement. Insulation thickness appears to vary mostly between 6 and 8 or 9", except for a few areas of thin layers over the plastic liner as it runs over framing beams. Insulation appears to be cellulose blown over a scattered evidence of fiberglass batts.

The whole ceiling assembly has been estimated at a conservative R22.6. Blowing in an additional 8 to 10 inches would be an improvement, but with only a minimal impact compared to other upgrades. The "gap" areas, and the ceiling over the boiler room present greater impact opportunities, but the cost involved in getting a truck there etc...reduces the cost benefit. It is recommended that this be done if a low cost opportunity to do so becomes available.—and note that the best approach is to remove all existing material and blow in 15-16" cellulose at one time.

Police Station Addition Ceiling—Not inspected or assessed but guessing it was treated the same way as the main attic.

**Floor**— a R value of 16 was used for the heat loss calcs.

Insulation unknown but guessed to be 6" batts, held up by a tympar layer—rim joists and seams visibly sealed but there are gaps—and IR indicates air leakage around the perimeter of the building.



**Windows**—R1.9 was used. Discussed at length. Interior thermapane storms recommended.

**Doors**—Weather-stripping recommended.

**Air Leakage**

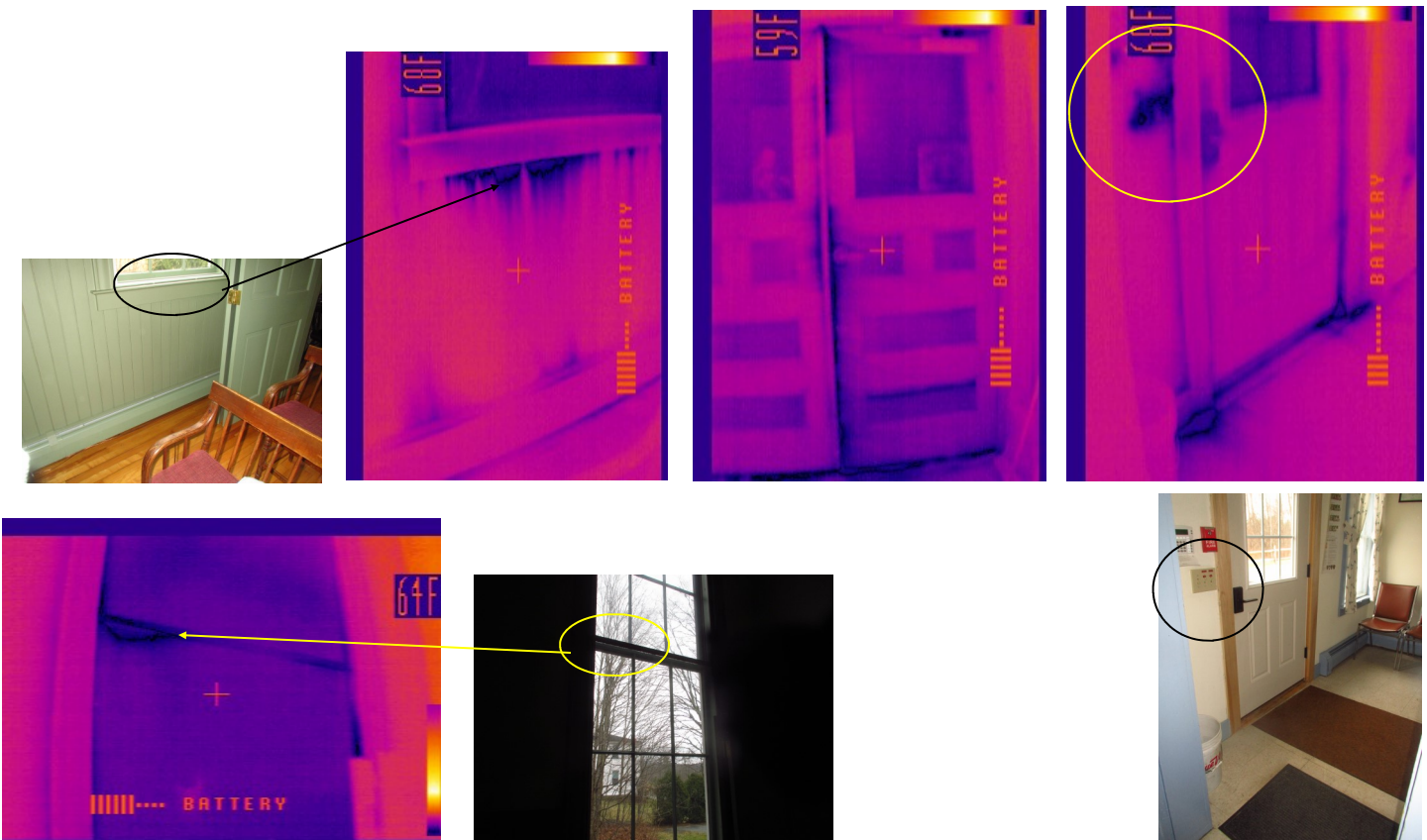
Blower door test result was 5518CFM50. That means that the blower door pulled 5500 cubic feet of air per minute to achieve the standard -50 pascals pressure difference between inside and outside. This is a test condition which would be like a 20 mph windo blowing on the building on all sides at once. Based on the calculated whole building volume of 47,176 cubic feet, this indicates that the building would exchange all of its air 7 times an hour under the same -50 pascal pressure (7ACH50). For reference, this is the maximum air leakage allowed under the residential 2009 IECC. The 2012 code reduces the limit to 3ACH50.

Estimated leakage area, or a very rough estimate of the size of hole in the shell if you added up all the gaps and cracks: 3.95 square feet.

It is estimated that under natural conditions (no big fan sucking out air), the air change would be .67 per hour in the winter and .34 per hour in the winter. The average annual air infiltration rate is .57ACH and 450 CFM.

The estimated annual costs due to air infiltration is about \$1450.

Air sealing the floor, trim, main entrance and windows could reduce air infiltration by 10 to 20% or 45-90 CFMnat, thereby saving roughly \$300 year in fuel. This is highly recommended doing, especially because you already have an HRV installed—you will be able to provide fresh air ventilation if needed with minimal energy penalty.



## Ventilation, Cooling and Heat Recovery

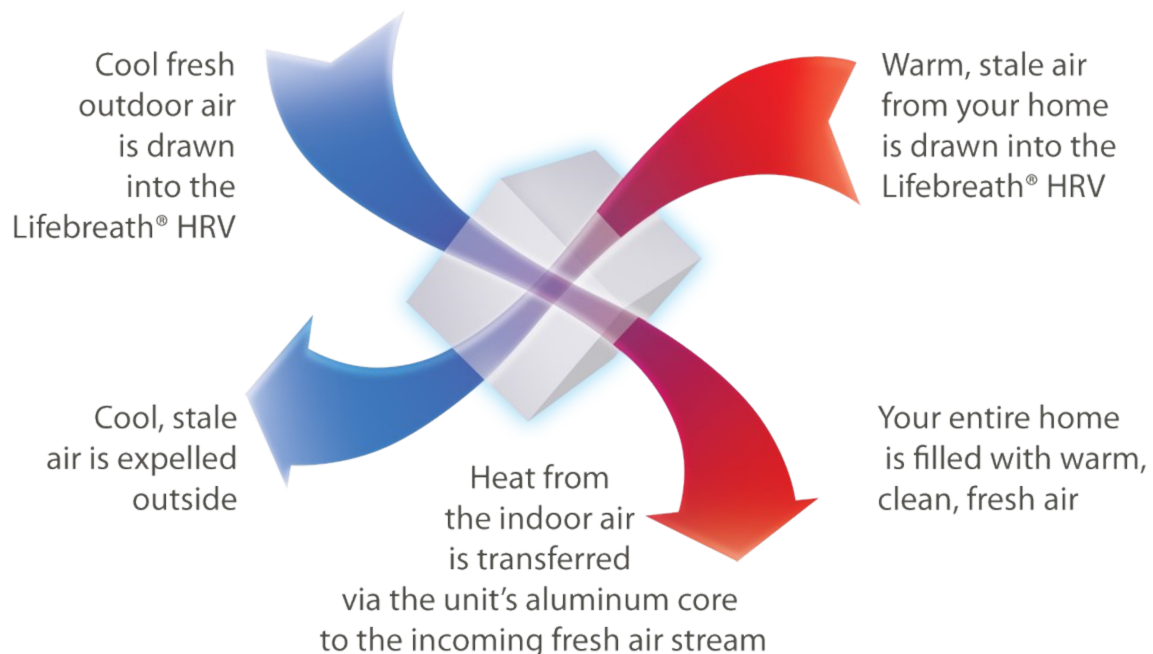
Evidently the ventilation system installed in the attic is a Lifebreath Heat Recovery Ventilation system (HRV). The graphic below depicts how it works. Apparently, it is only used in the summer, at night, with windows open, to draw in coolth and exhaust hot, stale air and does accomplish some cooling effect. If the device is properly installed, it is pre-warming incoming cool night air with warm exhaust heat exchange. More effective cooling would occur with exhaust only ventilation—consider installing an inline, ducted fan assembly in the back wall of the office, ducted to the outside of the storage room wall. Then open windows on the first floor and turn exhaust fan on at the and level.

Cooling loads would be dramatically reduced with summer shading strategies in place.

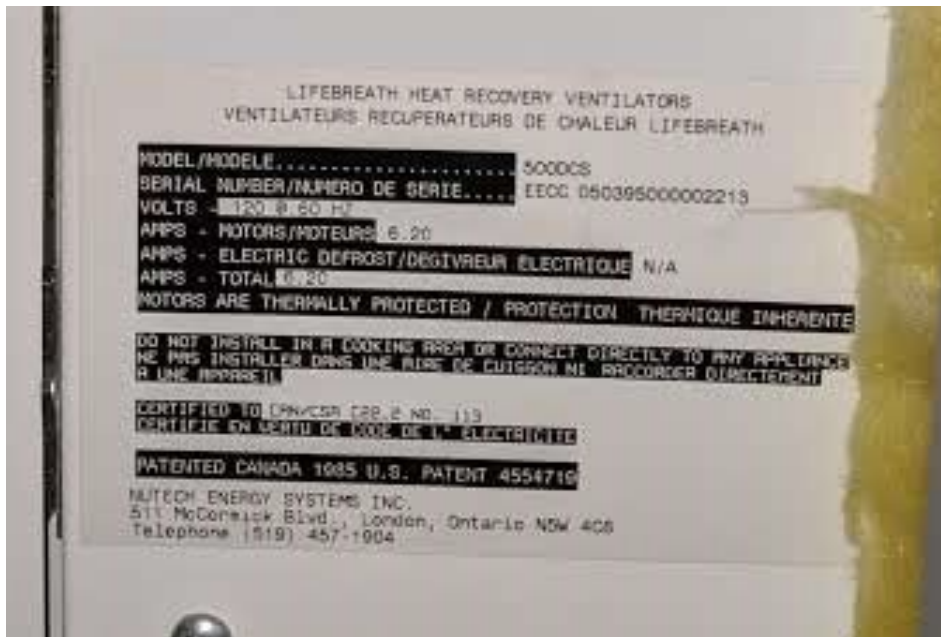


One reason to adjust the strategy is that with the recommended air sealing, the HRV will be useful if not necessary during winter hours for air exchange with 70-80% heat recovery.

Note: I am a little confused to the intake and exhaust—if both are at the louvered register on the back wall, then there isn't enough distance between the two. Perhaps the core (heat exchanger) is not in place and it is only set up as an exhaust only mode? Worth looking into the cabinet to see if that black box is present.



Two Lifebreath HRV units in attic, within thermal boundary, but Functionality suspect! Photos courtesy of Brad.



*Meriden Town Hall  
HVAC Load Calculations*

for

Meriden And Liberty Utilities



**RHVAC** RESIDENTIAL  
HVAC LOADS

Prepared By:

Margaret Dillon  
S.E.E.D.S.

Wednesday, August 7, 2019

Rhvac is an ACCA approved Manual J, D and S computer program.  
Calculations are performed per ACCA Manual J 8th Edition, Version 2, and ACCA Manual D.



## Project Report

### General Project Information

Project Title: Meriden Town Hall  
 Project Date: Tuesday, August 6, 2019  
 Client Name: Meriden And Liberty Utilities  
 Company Name: S.E.E.D.S.  
 Company Representative: Margaret Dillon  
 Company E-Mail Address: mdillon@myfairpoint.net

### Design Data

Reference City: Lebanon, New Hampshire  
 Building Orientation: Front door faces North  
 Daily Temperature Range: Medium  
 Latitude: 43 Degrees  
 Elevation: 991 ft.  
 Altitude Factor: 0.965

	Outdoor Dry Bulb	Outdoor Wet Bulb	Outdoor Rel.Hum	Indoor Rel.Hum	Indoor Dry Bulb	Grains Difference
Winter:	-5	-3.6	n/a	n/a	70	n/a
Summer:	86	69	43%	50%	75	16

### Check Figures

Total Building Supply CFM: 2,208      CFM Per Square ft.: 0.698  
 Square ft. of Room Area: 3,161      Square ft. Per Ton: 728  
 Volume (ft<sup>3</sup>): 39,619\*\*\*  
 \*\*\*Indicated volume is based on custom building volume.

### Building Loads

Total Heating Required Including Ventilation Air: 83,052 Btuh      83.052 MBH  
 Total Sensible Gain: 46,857 Btuh      90 %  
 Total Latent Gain: 5,263 Btuh      10 %  
 Total Cooling Required Including Ventilation Air: 52,120 Btuh      4.34 Tons (Based On Sensible + Latent)

### Notes

Rhvac is an ACCA approved Manual J, D and S computer program.  
 Calculations are performed per ACCA Manual J 8th Edition, Version 2, and ACCA Manual D.  
 All computed results are estimates as building use and weather may vary.  
 Be sure to select a unit that meets both sensible and latent loads according to the manufacturer's performance data at your design conditions.





## Miscellaneous Report

System 1 Input Data	Outdoor Dry Bulb	Outdoor Wet Bulb	Outdoor Rel.Hum	Indoor Rel.Hum	Indoor Dry Bulb	Grains Difference
Winter:	-5	-3.6	100%	n/a	70	n/a
Summer:	86	69	43%	50%	75	15.87

### Duct Sizing Inputs

	Main Trunk	Runouts
Calculate:	Yes	Yes
Use Schedule:	Yes	Yes
Roughness Factor:	0.00300	0.01000
Pressure Drop:	0.1000 in.wg./100 ft.	0.1000 in.wg./100 ft.
Minimum Velocity:	0 ft./min	0 ft./min
Maximum Velocity:	900 ft./min	750 ft./min
Minimum Height:	0 in.	0 in.
Maximum Height:	0 in.	0 in.

### Outside Air Data

	Winter	Summer
Infiltration Specified:	0.580 AC/hr 383 CFM	0.300 AC/hr 198 CFM
Infiltration Actual:	0.580 AC/hr	0.300 AC/hr
Building Volume:	X 39,619* Cu.ft. 22,979 Cu.ft./hr X 0.0167	X 39,619* Cu.ft. 11,886 Cu.ft./hr X 0.0167
Total Building Infiltration:	383 CFM	198 CFM
Total Building Ventilation:	0 CFM	0 CFM

\*Indicated volume is based on custom building volume.

---System 1---

Infiltration & Ventilation Sensible Gain Multiplier: 11.67 = (1.10 X 0.965 X 11.00 Summer Temp. Difference)  
 Infiltration & Ventilation Latent Gain Multiplier: 10.41 = (0.68 X 0.965 X 15.87 Grains Difference)  
 Infiltration & Ventilation Sensible Loss Multiplier: 79.59 = (1.10 X 0.965 X 75.00 Winter Temp. Difference)  
 Winter Infiltration Specified: 0.580 AC/hr (383 CFM), Construction: Loose  
 Summer Infiltration Specified: 0.300 AC/hr (198 CFM), Construction: Loose



## Load Preview Report

Scope	Net Ton	ft. <sup>2</sup> /Ton	Area	Sen Gain	Lat Gain	Net Gain	Sen Loss	Sys Htg CFM	Sys Cig CFM	Sys Act CFM	Duct Size
Building	4.34	728	3,161	46,857	5,263	52,120	83,052	1,118	2,208	2,208	
System 1	4.34	728	3,161	46,857	5,263	52,120	83,052	1,118	2,208	2,208	20x20
Zone 1			3,161	46,857	5,263	52,120	83,052	1,118	2,208	2,208	20x20
1-Foyer 103			110	1,229	89	1,318	3,617	49	58	58	1-5
2-Restroom			25	209	52	261	1,382	19	10	10	1-4
3-Foyer 102			72	399	52	451	2,137	29	19	19	1-4
4-Town Offices And Lobby			1,181	17,008	1,011	18,019	28,170	379	801	801	8-7
5-Manager's Office			208	3,511	352	3,863	5,383	72	165	165	2-6
6-Select Board Room			375	7,675	1,829	9,504	9,436	127	362	362	4-6
7-Foyer 202			130	1,424	52	1,476	2,180	29	67	67	1-6
8-Storage 201			221	2,844	157	3,001	5,521	74	134	134	2-6
9-Supply Room 203			60	1,420	89	1,509	2,851	38	67	67	1-6
10-Police Evidence 206			168	432	0	432	1,184	16	20	20	1-4
11-Police Lobby			66	1,534	284	1,818	2,716	37	72	72	1-6
12-Police Staff			288	4,413	630	5,043	8,896	120	208	208	2-7
13-Police Meeting			196	3,877	546	4,423	6,186	83	183	183	2-6
14-WC			40	494	68	562	1,957	26	23	23	1-4
15-Storage 114			21	389	52	441	1,436	19	18	18	1-4



## Duct Size Preview

Room or Duct Name	Source	Minimum Velocity	Maximum Velocity	Rough Factor	Design L/100	SP Loss	Duct Velocity	Duct Length	Htg Flow	Clg Flow	Act Flow	Duct Size
System 1												
<b>Supply Runouts</b>												
Zone 1												
1-Foyer 103	Built-In	0	750	0.01	0.1		424.8		49	58	58	1-5
2-Restroom	Built-In	0	750	0.01	0.1		112.6		19	10	10	1-4
3-Foyer 102	Built-In	0	750	0.01	0.1		215.4		29	19	19	1-4
4-Town Offices And Lobby	Built-In	0	750	0.01	0.1		374.8		379	801	801	8-7
5-Manager's Office	Built-In	0	750	0.01	0.1		421.3		72	165	165	2-6
6-Select Board Room	Built-In	0	750	0.01	0.1		460.4		127	362	362	4-6
7-Foyer 202	Built-In	0	750	0.01	0.1		341.6		29	67	67	1-6
8-Storage 201	Built-In	0	750	0.01	0.1		341.3		74	134	134	2-6
9-Supply Room 203	Built-In	0	750	0.01	0.1		340.7		38	67	67	1-6
10-Police Evidence 206	Built-In	0	750	0.01	0.1		233		16	20	20	1-4
11-Police Lobby	Built-In	0	750	0.01	0.1		368		37	72	72	1-6
12-Police Staff	Built-In	0	750	0.01	0.1		389.1		120	208	208	2-7
13-Police Meeting	Built-In	0	750	0.01	0.1		465.2		83	183	183	2-6
14-WC	Built-In	0	750	0.01	0.1		266.7		26	23	23	1-4
15-Storage 114	Built-In	0	750	0.01	0.1		210.1		19	18	18	1-4
<b>Other Ducts in System 1</b>												
Supply Main Trunk	Built-In	0	900	0.003	0.1		794.8		1,118	2,208	2,208	20x20

### Summary

System 1	
Heating Flow:	1118
Cooling Flow:	2208



### Total Building Summary Loads

Component Description	Area Quan	Sen Loss	Lat Gain	Sen Gain	Total Gain
SP with Storm: Glazing-Historic windows refurbished with good exterior storms, U-value 0.58, SHGC 0.65	343.5	14,943	0	22,593	22,593
Code 2009: Glazing-u value .35 cog, U-value 0.4, SHGC 0.75	8	240	0	597	597
11G: Door-Wood - Panel, U-value 0.54	34	1,378	0	404	404
FD 4" with cell: Wall-Frame, Custom, Full dimensioned 4" cavity bays with loose fill cellulose - some settling, U-value 0.086	2771.5	17,875	0	4,790	4,790
16B-21-zd: Roof/Ceiling-Under Attic with Insulation on Attic Floor (also use for Knee Walls and Partition Ceilings), vented attic, no radiant barrier, R-21 insulation, dark membrane, U-value 0.044	2371	7,823	0	4,799	4,799
fiberglass in joists: Floor-Over open crawl space or garage, Custom, a mix of fiberglass covered with various materials, U-value 0.05	2750	10,314	0	825	825
Subtotals for structure:		52,573	0	34,008	34,008
People:	16		3,200	3,680	6,880
Equipment:			0	3,445	3,445
Lighting:	762			2,598	2,598
Ductwork:		0	0	0	0
Infiltration: Winter CFM: 383, Summer CFM: 198		30,479	2,063	2,315	4,378
Ventilation: Winter CFM: 0, Summer CFM: 0		0	0	0	0
AED Excursion:		0	0	811	811
<b>Total Building Load Totals:</b>		<b>83,052</b>	<b>5,263</b>	<b>46,857</b>	<b>52,120</b>

#### Check Figures

Total Building Supply CFM:	2,208	CFM Per Square ft.:	0.698
Square ft. of Room Area:	3,161	Square ft. Per Ton:	728
Volume (ft³):	39,619***		

\*\*\*Indicated volume is based on custom building volume.

#### Building Loads

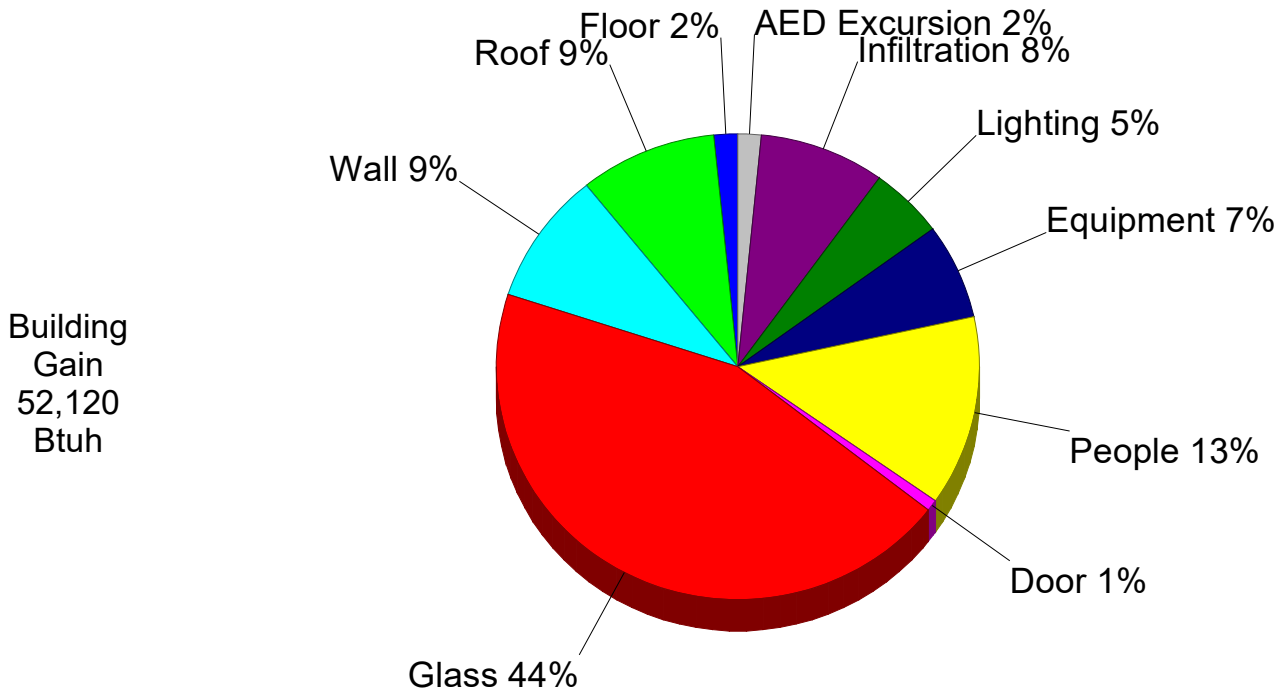
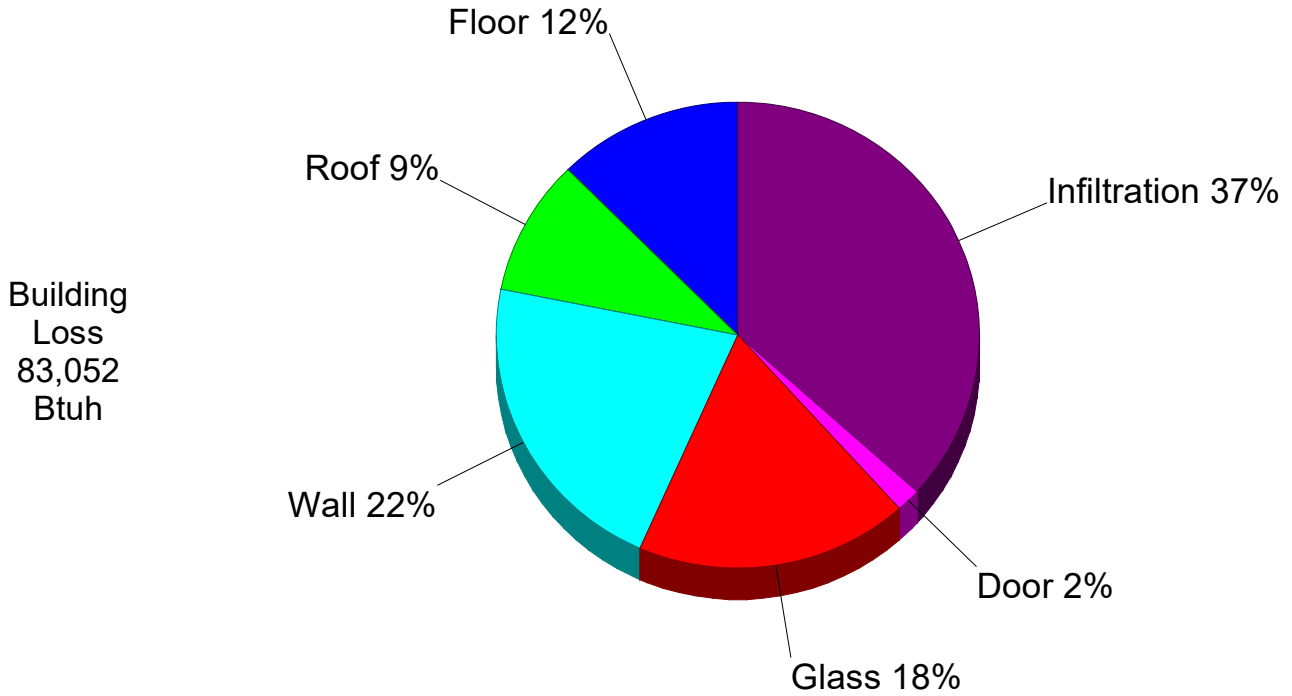
Total Heating Required Including Ventilation Air:	83,052 Btuh	83.052 MBH
Total Sensible Gain:	46,857 Btuh	90 %
Total Latent Gain:	5,263 Btuh	10 %
Total Cooling Required Including Ventilation Air:	52,120 Btuh	4.34 Tons (Based On Sensible + Latent)

#### Notes

Rhvac is an ACCA approved Manual J, D and S computer program.  
 Calculations are performed per ACCA Manual J 8th Edition, Version 2, and ACCA Manual D.  
 All computed results are estimates as building use and weather may vary.  
 Be sure to select a unit that meets both sensible and latent loads according to the manufacturer's performance data at your design conditions.



## Building Pie Chart





### System 1 Room Load Summary

Room No	Room Name	Area SF	Htg Sens Btuh	Min Htg CFM	Run Duct Size	Run Duct Vel	Clg Sens Btuh	Clg Lat Btuh	Min Clg CFM	Act Sys CFM
---Zone 1---										
1	Foyer 103	110	3,617	49	1-5	425	1,229	89	58	58
2	Restroom	25	1,382	19	1-4	113	209	52	10	10
3	Foyer 102	72	2,137	29	1-4	215	399	52	19	19
4	Town Offices And Lobby	1,181	28,170	379	8-7	375	17,008	1,011	801	801
5	Manager's Office	208	5,383	72	2-6	421	3,511	352	165	165
6	Select Board Room	375	9,436	127	4-6	460	7,675	1,829	362	362
7	Foyer 202	130	2,180	29	1-6	342	1,424	52	67	67
8	Storage 201	221	5,521	74	2-6	341	2,844	157	134	134
9	Supply Room 203	60	2,851	38	1-6	341	1,420	89	67	67
10	Police Evidence 206	168	1,184	16	1-4	233	432	0	20	20
11	Police Lobby	66	2,716	37	1-6	368	1,534	284	72	72
12	Police Staff	288	8,896	120	2-7	389	4,413	630	208	208
13	Police Meeting	196	6,186	83	2-6	465	3,877	546	183	183
14	WC	40	1,957	26	1-4	267	494	68	23	23
15	Storage 114	21	1,436	19	1-4	210	389	52	18	18
System 1 total		3,161	83,052	1,118			46,857	5,263	2,208	2,208

System 1 Main Trunk Size: 20x20 in.  
 Velocity: 795 ft./min  
 Loss per 100 ft.: 0.057 in.wg

### Cooling System Summary

	Cooling Tons	Sensible/Latent Split	Sensible Btuh	Latent Btuh	Total Btuh
Net Required:	4.34	90% / 10%	46,857	5,263	52,120

### Equipment Data

	Heating System	Cooling System
Type:	Natural Gas Furnace	Standard Air Conditioner
Model:		
Indoor Model:		
Brand:		
Efficiency:	0 AFUE	0 SEER
Sound:	0	0
Capacity:	0 Btuh	0 Btuh
Sensible Capacity:	n/a	0 Btuh
Latent Capacity:	n/a	0 Btuh

*Meriden Town Hall  
Energy Cost Analysis*

for

Liberty Utilities



**ENERGY  
AUDIT**

Residential and Light Commercial  
Energy Analysis

**OPTION #1**

Prepared By:

S.E.E.D.S.

Tuesday, August 20, 2019



Project Information

Project Title:	Meriden Town Hall	Company Name:	S.E.E.D.S.
Designed By:		Company Rep.:	
Project Date:	8/16/2019	Company Address:	
Project Comment:	Option #1 - Mini-split Air Source Heat Pumps	Company City:	
Client Name:	Liberty Utilities	Company Phone:	
Client Address:		Company Fax:	
Client City:		Company Comment:	
Client Phone:			
Client Fax:			
Client Comment:			





## Project Summary

### General Project Information

Project Title:	Meriden Town Hall	Company Name:	S.E.E.D.S.
Project Date:	8/16/2019	Company E-Mail:	mdillon@myfairpoint.net
Client Name:	Liberty Utilities	Address:	

### Design Data

Building Area:	3,161 sq.ft.	Cooling Load:	52,120 Btuh
People:	16	Heating Load:	82,000 Btuh
Occupancy:	8	Loads Adj. Factor:	0.31
		AC On Temp.:	74 °F
Actual City:	Meriden, New Hampshire		
Weather Ref. City:	Concord, New Hampshire		
Summer Outdoor:	87 °F	Winter Outdoor:	-3 °F
Summer Indoor:	75 °F	Winter Indoor:	74 °F
Cooling Hours:	775	Degree Days:	7,200

### Annual Operating Cost Estimate

System Description	Fuel Rates Set	Total Heating Cost	Total Cooling Cost	Annual Service Charges	Total Oper. Cost	Average Monthly Cost
Mini-split ASHP	1	\$1,335	\$367	\$0	\$1,701	\$142



## Input Data - System 1 - Mini-split ASHP

Estimated Cost

### Cooling

System Type:	Air Source Heat Pump	
Model:		
Efficiency:	16.70 SEER	
Capacity:	52,120 Btuh	
Cooling Load:	52,120 Btuh	
Annual Cost (Bin Data Method):		\$366.69

### Heating

System Type:	Air Source Heat Pump	
Model:		
Efficiency:	9 HSPF	
Capacity:	82,000 Btuh	
Heating Load:	82,000 Btuh	
47° Capacity:	82,000 Btuh	
17° Capacity:	82,000 Btuh	
47° COP:	3.8	
17° COP:	2.8	
Capacity Balance Point:	-3 °F	
Cutoff Temperature:	-99 °F	
Annual Cost (Bin Data Method):		\$1,334.61

### Backup

System Type:	Electric Resistance	
Efficiency:	100.00	
Capacity:	24 kW	
Annual Cost:		\$0.00

### Total Cost

Total Annual Operating Cost:		\$1,701.30
------------------------------	--	------------



## Monthly Costs - System 1 - Mini-split ASHP

### Monthly System Cost

Month	Cooling		Heating		Total Cost
	Cost	%	Cost	%	
January	\$0.00	0.0%	\$244.07	100.0%	\$244.07
February	\$0.00	0.0%	\$206.23	100.0%	\$206.23
March	\$0.00	0.0%	\$171.03	100.0%	\$171.03
April	\$3.80	3.7%	\$99.11	96.3%	\$102.91
May	\$39.70	41.9%	\$55.14	58.1%	\$94.84
June	\$75.64	74.5%	\$25.84	25.5%	\$101.48
July	\$122.03	90.5%	\$12.74	9.5%	\$134.77
August	\$85.88	78.5%	\$23.59	21.5%	\$109.47
September	\$33.41	41.8%	\$46.51	58.2%	\$79.92
October	\$6.23	6.7%	\$86.29	93.3%	\$92.53
November	\$0.00	0.0%	\$131.60	100.0%	\$131.60
December	\$0.00	0.0%	\$232.48	100.0%	\$232.48
<b>Total</b>	<b>\$366.69</b>	<b>21.6%</b>	<b>\$1,334.61</b>	<b>78.4%</b>	<b>\$1,701.30</b>

### Monthly Fuel Usage and Cost

Month	Electricity		Natural Gas		Propane		Fuel Oil	
	Cost	kWh	Cost	Therm	Cost	Gallons	Cost	Gallons
January	\$244.07	1,355.9	\$0.00	0.0	\$0.00	0.0	\$0.00	0.0
February	\$206.23	1,145.7	\$0.00	0.0	\$0.00	0.0	\$0.00	0.0
March	\$171.03	950.1	\$0.00	0.0	\$0.00	0.0	\$0.00	0.0
April	\$102.91	571.7	\$0.00	0.0	\$0.00	0.0	\$0.00	0.0
May	\$94.84	526.9	\$0.00	0.0	\$0.00	0.0	\$0.00	0.0
June	\$101.48	563.8	\$0.00	0.0	\$0.00	0.0	\$0.00	0.0
July	\$134.77	748.7	\$0.00	0.0	\$0.00	0.0	\$0.00	0.0
August	\$109.47	608.2	\$0.00	0.0	\$0.00	0.0	\$0.00	0.0
September	\$79.92	444.0	\$0.00	0.0	\$0.00	0.0	\$0.00	0.0
October	\$92.53	514.0	\$0.00	0.0	\$0.00	0.0	\$0.00	0.0
November	\$131.60	731.1	\$0.00	0.0	\$0.00	0.0	\$0.00	0.0
December	\$232.48	1,291.5	\$0.00	0.0	\$0.00	0.0	\$0.00	0.0
<b>Total</b>	<b>\$1,701.30</b>	<b>9,451.7</b>	<b>\$0.00</b>	<b>0.0</b>	<b>\$0.00</b>	<b>0.0</b>	<b>\$0.00</b>	<b>0.0</b>

Average Electric Cost Per kWh: \$0.180/kWh  
 Total annual cooling load energy: 34,021,092 BTU  
 Total annual heating load energy: 259,563,024 BTU



## Fuel Rates Set 1 -

### Electricity

Season	\$/kWh	Escalation	Service Charge
Winter	\$0.18	0.0%	\$0.00
Summer	\$0.18	0.0%	\$0.00

Summer Months: April to October

### Natural Gas

Season	\$/Therm	Escalation	Service Charge
Winter	\$0.0	0.0%	\$0.00
Summer	\$0.0	0.0%	\$0.00

Summer Months: April to October

### Propane

Season	\$/Gallon	Escalation
Winter	\$0.0	0.0%
Summer	\$0.0	0.0%

Summer Months: April to October

### Fuel Oil

Season	\$/Gallon	Escalation
Winter	\$2.3	0.0%
Summer	\$2.3	0.0%

Summer Months: April to October

*Meriden Town Hall  
Energy Cost Analysis*

for

Liberty Utilities



OPTION 2

Prepared By:

S.E.E.D.S.

Tuesday, August 20, 2019



**Project Information**

Project Title:	Meriden Town Hall	Company Name:	S.E.E.D.S.
Designed By:		Company Rep.:	
Project Date:	8/16/2019	Company Address:	
Project Comment:	Option #2 VRV Air Source Heat Pump	Company City:	
Client Name:	Liberty Utilities	Company Phone:	
Client Address:		Company Fax:	
Client City:		Company Comment:	
Client Phone:			
Client Fax:			
Client Comment:			



## Project Summary

### General Project Information

Project Title:	Meriden Town Hall	Company Name:	S.E.E.D.S.
Project Date:	8/16/2019	Company E-Mail:	mdillon@myfairpoint.net
Client Name:	Liberty Utilities	Address:	

### Design Data

Building Area:	3,161 sq.ft.	Cooling Load:	52,120 Btuh
People:	16	Heating Load:	82,000 Btuh
Occupancy:	8	Loads Adj. Factor:	0.31
		AC On Temp.:	74 °F
Actual City:	Meriden, New Hampshire		
Weather Ref. City:	Concord, New Hampshire		
Summer Outdoor:	87 °F	Winter Outdoor:	-3 °F
Summer Indoor:	75 °F	Winter Indoor:	74 °F
Cooling Hours:	775	Degree Days:	7,200

### Annual Operating Cost Estimate

System Description	Fuel Rates Set	Total Heating Cost	Total Cooling Cost	Annual Service Charges	Total Oper. Cost	Average Monthly Cost
VRV ASHP	1	\$1,480	\$486	\$0	\$1,966	\$164



## Input Data - System 1 - VRV ASHP

### Estimated Cost

#### Cooling

System Type:	Air Source Heat Pump	
Model:		
Efficiency:	12.60 EER	
Capacity:	52,120 Btuh	
Cooling Load:	52,120 Btuh	
Annual Cost (Bin Data Method):		\$486.02

#### Heating

System Type:	Air Source Heat Pump	
Model:		
Efficiency:	9 HSPF	
Capacity:	82,000 Btuh	
Heating Load:	82,000 Btuh	
47° Capacity:	82,000 Btuh	
17° Capacity:	82,000 Btuh	
47° COP:	3.5	
17° COP:	2.5	
Capacity Balance Point:	-3 °F	
Cutoff Temperature:	-99 °F	
Annual Cost (Bin Data Method):		\$1,479.64

#### Backup

System Type:	Electric Resistance	
Efficiency:	100.00	
Capacity:	24 kW	
Annual Cost:		\$0.00

#### Total Cost

Total Annual Operating Cost:		\$1,965.66
------------------------------	--	------------





## Monthly Costs - System 1 - VRV ASHP

### Monthly System Cost

Month	Cooling		Heating		Total Cost
	Cost	%	Cost	%	
January	\$0.00	0.0%	\$273.88	100.0%	\$273.88
February	\$0.00	0.0%	\$231.78	100.0%	\$231.78
March	\$0.00	0.0%	\$188.86	100.0%	\$188.86
April	\$5.04	4.5%	\$108.17	95.5%	\$113.22
May	\$52.62	46.8%	\$59.84	53.2%	\$112.46
June	\$100.25	78.2%	\$27.93	21.8%	\$128.19
July	\$161.73	92.2%	\$13.74	7.8%	\$175.47
August	\$113.82	81.7%	\$25.50	18.3%	\$139.33
September	\$44.28	46.8%	\$50.41	53.2%	\$94.69
October	\$8.26	8.1%	\$94.07	91.9%	\$102.33
November	\$0.00	0.0%	\$144.44	100.0%	\$144.44
December	\$0.00	0.0%	\$261.03	100.0%	\$261.03
<b>Total</b>	<b>\$486.02</b>	<b>24.7%</b>	<b>\$1,479.64</b>	<b>75.3%</b>	<b>\$1,965.66</b>

### Monthly Fuel Usage and Cost

Month	Electricity		Natural Gas		Propane		Fuel Oil	
	Cost	kWh	Cost	Therm	Cost	Gallons	Cost	Gallons
January	\$273.88	1,521.5	\$0.00	0.0	\$0.00	0.0	\$0.00	0.0
February	\$231.78	1,287.7	\$0.00	0.0	\$0.00	0.0	\$0.00	0.0
March	\$188.86	1,049.2	\$0.00	0.0	\$0.00	0.0	\$0.00	0.0
April	\$113.22	629.0	\$0.00	0.0	\$0.00	0.0	\$0.00	0.0
May	\$112.46	624.8	\$0.00	0.0	\$0.00	0.0	\$0.00	0.0
June	\$128.19	712.1	\$0.00	0.0	\$0.00	0.0	\$0.00	0.0
July	\$175.47	974.8	\$0.00	0.0	\$0.00	0.0	\$0.00	0.0
August	\$139.33	774.0	\$0.00	0.0	\$0.00	0.0	\$0.00	0.0
September	\$94.69	526.0	\$0.00	0.0	\$0.00	0.0	\$0.00	0.0
October	\$102.33	568.5	\$0.00	0.0	\$0.00	0.0	\$0.00	0.0
November	\$144.44	802.4	\$0.00	0.0	\$0.00	0.0	\$0.00	0.0
December	\$261.03	1,450.2	\$0.00	0.0	\$0.00	0.0	\$0.00	0.0
<b>Total</b>	<b>\$1,965.66</b>	<b>10,920.3</b>	<b>\$0.00</b>	<b>0.0</b>	<b>\$0.00</b>	<b>0.0</b>	<b>\$0.00</b>	<b>0.0</b>

Average Electric Cost Per kWh: \$0.180/kWh  
 Total annual cooling load energy: 34,021,092 BTU  
 Total annual heating load energy: 259,563,024 BTU



## Fuel Rates Set 1 -

### Electricity

Season	\$/kWh	Escalation	Service Charge
Winter	\$0.18	0.0%	\$0.00
Summer	\$0.18	0.0%	\$0.00

Summer Months: April to October

### Natural Gas

Season	\$/Therm	Escalation	Service Charge
Winter	\$0.0	0.0%	\$0.00
Summer	\$0.0	0.0%	\$0.00

Summer Months: April to October

### Propane

Season	\$/Gallon	Escalation
Winter	\$0.0	0.0%
Summer	\$0.0	0.0%

Summer Months: April to October

### Fuel Oil

Season	\$/Gallon	Escalation
Winter	\$2.3	0.0%
Summer	\$2.3	0.0%

Summer Months: April to October

*Meriden Town Hall  
Energy Cost Analysis*

for

Liberty Utilities



**ENERGY  
AUDIT**

Residential and Light Commercial  
Energy Analysis

## OPTION 3

Prepared By:

S.E.E.D.S.

Tuesday, August 20, 2019



**Project Information**

Project Title:	Meriden Town Hall	Company Name:	S.E.E.D.S.
Designed By:		Company Rep.:	
Project Date:	8/16/2019	Company Address:	
Project Comment:	Option #3 Water Source Heat Pump	Company City:	
Client Name:	Liberty Utilities	Company Phone:	
Client Address:		Company Fax:	
Client City:		Company Comment:	
Client Phone:			
Client Fax:			
Client Comment:			



## Project Summary

### General Project Information

Project Title:	Meriden Town Hall	Company Name:	S.E.E.D.S.
Project Date:	8/16/2019	Company E-Mail:	mdillon@myfairpoint.net
Client Name:	Liberty Utilities	Address:	

### Design Data

Building Area:	3,161 sq.ft.	Cooling Load:	52,120 Btuh
People:	16	Heating Load:	82,000 Btuh
Occupancy:	8	Loads Adj. Factor:	0.31
		AC On Temp.:	74 °F
Actual City:	Meriden, New Hampshire		
Weather Ref. City:	Concord, New Hampshire		
Summer Outdoor:	87 °F	Winter Outdoor:	-3 °F
Summer Indoor:	75 °F	Winter Indoor:	74 °F
Cooling Hours:	775	Degree Days:	7,200

### Annual Operating Cost Estimate

System Description	Fuel Rates Set	Total Heating Cost	Total Cooling Cost	Annual Service Charges	Total Oper. Cost	Average Monthly Cost
Water Source Heat Pump	1	\$1,028	\$255	\$0	\$1,283	\$107



## Input Data - System 1 - Water Source Heat Pump

Estimated Cost

### Cooling

System Type:	Ground Source Heat Pump	
Model:		
Efficiency:	24.00 EER	
Capacity:	52,120 Btuh	
Cooling Load:	52,120 Btuh	
Annual Cost (Bin Data Method):		\$255.16

### Heating

System Type:	Ground Source Heat Pump	
Model:		
Efficiency:	4.13 COP	
Capacity:	82,000 Btuh	
Heating Load:	82,000 Btuh	
47° Capacity:	114,600 Btuh	
17° Capacity:	114,600 Btuh	
47° COP:	4.0	
17° COP:	4.0	
Capacity Balance Point:	-3 °F	
Cutoff Temperature:	-99 °F	
Annual Cost (Bin Data Method):		\$1,027.52

### Backup

System Type:	None
--------------	------

### Total Cost

Total Annual Operating Cost:		\$1,282.68
------------------------------	--	------------



## Monthly Costs - System 1 - Water Source Heat Pump

### Monthly System Cost

Month	Cooling		Heating		Total Cost
	Cost	%	Cost	%	
January	\$0.00	0.0%	\$166.39	100.0%	\$166.39
February	\$0.00	0.0%	\$141.31	100.0%	\$141.31
March	\$0.00	0.0%	\$132.83	100.0%	\$132.83
April	\$2.65	3.0%	\$86.49	97.0%	\$89.14
May	\$27.63	35.0%	\$51.24	65.0%	\$78.87
June	\$52.63	67.7%	\$25.11	32.3%	\$77.75
July	\$84.91	86.9%	\$12.75	13.1%	\$97.66
August	\$59.76	72.2%	\$22.97	27.8%	\$82.73
September	\$23.25	34.6%	\$44.00	65.4%	\$67.25
October	\$4.34	5.4%	\$76.51	94.6%	\$80.85
November	\$0.00	0.0%	\$108.51	100.0%	\$108.51
December	\$0.00	0.0%	\$159.41	100.0%	\$159.41
<b>Total</b>	<b>\$255.16</b>	<b>19.9%</b>	<b>\$1,027.52</b>	<b>80.1%</b>	<b>\$1,282.68</b>

### Monthly Fuel Usage and Cost

Month	Electricity		Natural Gas		Propane		Fuel Oil	
	Cost	kWh	Cost	Therm	Cost	Gallons	Cost	Gallons
January	\$166.39	924.4	\$0.00	0.0	\$0.00	0.0	\$0.00	0.0
February	\$141.31	785.0	\$0.00	0.0	\$0.00	0.0	\$0.00	0.0
March	\$132.83	737.9	\$0.00	0.0	\$0.00	0.0	\$0.00	0.0
April	\$89.14	495.2	\$0.00	0.0	\$0.00	0.0	\$0.00	0.0
May	\$78.87	438.2	\$0.00	0.0	\$0.00	0.0	\$0.00	0.0
June	\$77.75	431.9	\$0.00	0.0	\$0.00	0.0	\$0.00	0.0
July	\$97.66	542.6	\$0.00	0.0	\$0.00	0.0	\$0.00	0.0
August	\$82.73	459.6	\$0.00	0.0	\$0.00	0.0	\$0.00	0.0
September	\$67.25	373.6	\$0.00	0.0	\$0.00	0.0	\$0.00	0.0
October	\$80.85	449.1	\$0.00	0.0	\$0.00	0.0	\$0.00	0.0
November	\$108.51	602.8	\$0.00	0.0	\$0.00	0.0	\$0.00	0.0
December	\$159.41	885.6	\$0.00	0.0	\$0.00	0.0	\$0.00	0.0
<b>Total</b>	<b>\$1,282.68</b>	<b>7,126.0</b>	<b>\$0.00</b>	<b>0.0</b>	<b>\$0.00</b>	<b>0.0</b>	<b>\$0.00</b>	<b>0.0</b>

Average Electric Cost Per kWh: \$0.180/kWh  
 Total annual cooling load energy: 34,021,092 BTU  
 Total annual heating load energy: 259,563,024 BTU



## Fuel Rates Set 1 -

### Electricity

Season	\$/kWh	Escalation	Service Charge
Winter	\$0.18	0.0%	\$0.00
Summer	\$0.18	0.0%	\$0.00

Summer Months: April to October

### Natural Gas

Season	\$/Therm	Escalation	Service Charge
Winter	\$0.0	0.0%	\$0.00
Summer	\$0.0	0.0%	\$0.00

Summer Months: April to October

### Propane

Season	\$/Gallon	Escalation
Winter	\$0.0	0.0%
Summer	\$0.0	0.0%

Summer Months: April to October

### Fuel Oil

Season	\$/Gallon	Escalation
Winter	\$2.3	0.0%
Summer	\$2.3	0.0%

Summer Months: April to October



*Meriden Town Hall  
Energy Cost Analysis*

for

Liberty Utilities



**ENERGY  
AUDIT**

Residential and Light Commercial  
Energy Analysis

## OPTION 4

Prepared By:

S.E.E.D.S.

Tuesday, August 20, 2019



Project Information

Project Title:	Meriden Town Hall	Company Name:	S.E.E.D.S.
Designed By:		Company Rep.:	
Project Date:	8/16/2019	Company Address:	
Project Comment:	Option #4 Code Compliant ASHP	Company City:	
Client Name:	Liberty Utilities	Company Phone:	
Client Address:		Company Fax:	
Client City:		Company Comment:	
Client Phone:			
Client Fax:			
Client Comment:			



## Project Summary

### General Project Information

Project Title:	Meriden Town Hall	Company Name:	S.E.E.D.S.
Project Date:	8/16/2019	Company E-Mail:	mdillon@myfairpoint.net
Client Name:	Liberty Utilities	Address:	

### Design Data

Building Area:	3,161 sq.ft.	Cooling Load:	52,120 Btuh
People:	16	Heating Load:	82,000 Btuh
Occupancy:	8	Loads Adj. Factor:	0.31
		AC On Temp.:	74 °F
Actual City:	Meriden, New Hampshire		
Weather Ref. City:	Concord, New Hampshire		
Summer Outdoor:	87 °F	Winter Outdoor:	-3 °F
Summer Indoor:	75 °F	Winter Indoor:	74 °F
Cooling Hours:	775	Degree Days:	7,200

### Annual Operating Cost Estimate

System Description	Fuel Rates Set	Total Heating Cost	Total Cooling Cost	Annual Service Charges	Total Oper. Cost	Average Monthly Cost
Code Compliant ASHP	1	\$1,453	\$437	\$0	\$1,891	\$158



## Input Data - System 1 - Code Compliant ASHP

Estimated Cost

### Cooling

System Type:	Air Source Heat Pump	
Model:		
Efficiency:	14.00 SEER	
Capacity:	52,120 Btuh	
Cooling Load:	52,120 Btuh	
Annual Cost (Bin Data Method):		\$437.41

### Heating

System Type:	Air Source Heat Pump	
Model:		
Efficiency:	8.2 HSPF	
Capacity:	82,000 Btuh	
Heating Load:	82,000 Btuh	
47° Capacity:	82,000 Btuh	
17° Capacity:	51,482 Btuh	
47° COP:	3.7	
17° COP:	2.46	
Capacity Balance Point:	21 °F	
Cutoff Temperature:	-99 °F	
Annual Cost (Bin Data Method):		\$1,453.22

### Backup

System Type:	Electric Resistance	
Efficiency:	100.00	
Capacity:	24 kW	
Annual Cost:		\$0.00

### Total Cost

Total Annual Operating Cost:		\$1,890.63
------------------------------	--	------------



## Monthly Costs - System 1 - Code Compliant ASHP

### Monthly System Cost

Month	Cooling		Heating		Total Cost
	Cost	%	Cost	%	
January	\$0.00	0.0%	\$274.69	100.0%	\$274.69
February	\$0.00	0.0%	\$231.52	100.0%	\$231.52
March	\$0.00	0.0%	\$185.59	100.0%	\$185.59
April	\$4.54	4.2%	\$103.57	95.8%	\$108.11
May	\$47.36	45.6%	\$56.57	54.4%	\$103.93
June	\$90.23	77.5%	\$26.18	22.5%	\$116.41
July	\$145.56	91.9%	\$12.81	8.1%	\$158.37
August	\$102.44	81.1%	\$23.90	18.9%	\$126.34
September	\$39.85	45.6%	\$47.52	54.4%	\$87.37
October	\$7.43	7.6%	\$89.82	92.4%	\$97.25
November	\$0.00	0.0%	\$140.06	100.0%	\$140.06
December	\$0.00	0.0%	\$260.99	100.0%	\$260.99
<b>Total</b>	<b>\$437.41</b>	<b>23.1%</b>	<b>\$1,453.22</b>	<b>76.9%</b>	<b>\$1,890.63</b>

### Monthly Fuel Usage and Cost

Month	Electricity		Natural Gas		Propane		Fuel Oil	
	Cost	kWh	Cost	Therm	Cost	Gallons	Cost	Gallons
January	\$274.69	1,526.1	\$0.00	0.0	\$0.00	0.0	\$0.00	0.0
February	\$231.52	1,286.2	\$0.00	0.0	\$0.00	0.0	\$0.00	0.0
March	\$185.59	1,031.1	\$0.00	0.0	\$0.00	0.0	\$0.00	0.0
April	\$108.11	600.6	\$0.00	0.0	\$0.00	0.0	\$0.00	0.0
May	\$103.93	577.4	\$0.00	0.0	\$0.00	0.0	\$0.00	0.0
June	\$116.41	646.7	\$0.00	0.0	\$0.00	0.0	\$0.00	0.0
July	\$158.37	879.8	\$0.00	0.0	\$0.00	0.0	\$0.00	0.0
August	\$126.34	701.9	\$0.00	0.0	\$0.00	0.0	\$0.00	0.0
September	\$87.37	485.4	\$0.00	0.0	\$0.00	0.0	\$0.00	0.0
October	\$97.25	540.3	\$0.00	0.0	\$0.00	0.0	\$0.00	0.0
November	\$140.06	778.1	\$0.00	0.0	\$0.00	0.0	\$0.00	0.0
December	\$260.99	1,449.9	\$0.00	0.0	\$0.00	0.0	\$0.00	0.0
<b>Total</b>	<b>\$1,890.63</b>	<b>10,503.5</b>	<b>\$0.00</b>	<b>0.0</b>	<b>\$0.00</b>	<b>0.0</b>	<b>\$0.00</b>	<b>0.0</b>

Average Electric Cost Per kWh: \$0.180/kWh  
 Total annual cooling load energy: 34,021,092 BTU  
 Total annual heating load energy: 259,563,024 BTU



## Fuel Rates Set 1 -

### Electricity

Season	\$/kWh	Escalation	Service Charge
Winter	\$0.18	0.0%	\$0.00
Summer	\$0.18	0.0%	\$0.00

Summer Months: April to October

### Natural Gas

Season	\$/Therm	Escalation	Service Charge
Winter	\$0.0	0.0%	\$0.00
Summer	\$0.0	0.0%	\$0.00

Summer Months: April to October

### Propane

Season	\$/Gallon	Escalation
Winter	\$0.0	0.0%
Summer	\$0.0	0.0%

Summer Months: April to October

### Fuel Oil

Season	\$/Gallon	Escalation
Winter	\$2.3	0.0%
Summer	\$2.3	0.0%

Summer Months: April to October

8/19/19

HEATING AND AIR CONDITIONING SCOPE OF WORK

- I. Purpose - The purpose for this Heating and Air Conditioning (H/AC) Scope of Work (SOW) is to solicit Design/ Build proposals for H/AC system for the existing Meriden Town Hall, 110 Main Street, Meriden, NH. The Brad Atwater is the Town’s Representative, the reviewing Mechanical Engineer is Doug Waitt of Design Day Mechanicals, Inc., hereafter known as the Engineer, and the Design/ Build H/AC and Contractor shall be hereafter known as the Contractor.
  - A. Heating and air conditioning load calculations have been performed by Margaret Dillon of S.E.E.D.S and reviewed by the Engineer based on expected existing envelope insulation and air sealing.
  - B. The Contractor is responsible for visiting the site to observe existing conditions with the Town’s Representative and to correlate existing rooms names with those listed in this SOW. The Contractor will be responsible for all subtrades associated with providing a complete system, including cutting, patching and touch-up painting that may be required. The Contractor shall review all proposed ductwork systems with the Town’s Representative for approval prior to any fabrication or installation.
  - C. A licensed electrician retained by the Contractor shall provide all required power wiring. The Contractor shall provide all control wiring.
- II. Proposed Work:
  - A. Four (4) new H/AC system options are described herein. Each shall be priced separately. Detailed equipment Submittals are provided with this SOW, with budget pricing from the manufacturer’s representatives, and the manufacturer’s representatives contact information. The Contractor shall contact the manufacturer’s representative for details on what is and is not included in budget pricing.
  - B. Provide, install, duct, pipe and control wire complete new heat pump systems with space thermostats for each option for the four (4) zones of control as described on the Equipment Submittal Sheets. Equipment shall be located in the space above the main level ceiling or in the crawl space. Duct and piping design shall be by the Contractor.
  - C. Refer to attached Options #1 through #4.
- III. Start-up, commission and warranty all equipment and systems for one year from the date of acceptance/ final payment by the Owner.

End of Heating and Air Conditioning Scope of Work

---

Andrew W. Arsenault, P.E.	•	81 Pointed Fir Blvd, Wells, ME 04090	•	(207) 337-2473	•	andya@designdaymech.com
Douglas C. Waitt	•	P.O. Box 447, New Ipswich, NH 03071	•	(603) 801-6000	•	dougw@designdaymech.com
Richard D. Gagnon	•	84 Gilford Street, Manchester, NH 03102	•	(603) 668-5027	•	rickg@designdaymech.com
John L. Waitt	•	148 Beaver Ridge Rd, Ctr. Barnstead, NH 03225	•	(603) 269-7253	•	johnw@designdaymech.com
David C. Magnuson	•	65 Old Center Rd, Deerfield, NH 03037	•	(603) 463-1086	•	davem@designdaymech.com
Monique R. Magnuson	•	65 Old Center Rd, Deerfield, NH 03037	•	(603) 463-1086	•	moniquem@designdaymech.com

Option #1 – Mini-split Air Source Heat Pumps and Second Stage Electric Heat, Refer to Equipment Submittal Sheets. Budget Equipment Price - \$18,000, Manufacturer's Representative – DXS, Attention: Adam Camillo, 1-978-977-9911, [adam.camillo@dxseng.com](mailto:adam.camillo@dxseng.com)





## Submittal Data Sheet

1.5-Ton DC Ducted Unit  
FBQ18PVJURZQ18TAVJU

### Option #1

Two (2) separate systems one (1) each for:  
Zone #1 - Lower Level - Town Admin, Entrance, and Toilet Area  
Zone #2 - Upper Level Offices

#### FEATURES

- External static pressure (ESP) capabilities up to 0.8" W.G.
- Three user selected fan speeds available plus fan "Auto" logic
- Low ambient cooling operation down to 0°F (with optional wind baffle(s))
- Built-in condensate pump
- Maximum piping length up to 164 ft. allows flexible placement of indoor unit
- Maximum piping height separation up to 98 ft.
- 10 year limited parts and compressor warranty

#### BENEFITS

- DC fan motor provides improved efficiency
- Bottom access for easy service

#### INDOOR UNIT



#### OUTDOOR UNIT





## Submittal Data Sheet

1.5-Ton DC Ducted Unit

FBQ18PVJURZQ18TAVJU

### SYSTEM PERFORMANCE

Indoor Unit Model No.	FBQ18PVJU	Indoor Unit Name:	Sky-Air DC Ducted
Outdoor Unit Model No.	RZQ18TAVJU	Outdoor Unit Name:	Sky-Air Heat Pump ODU
Rated Cooling Capacity (Btu/hr):	18,000	Rated Cooling Conditions:	Indoor (°F DB/WB): 80 / 67 Ambient (°F DB/WB): 95 / 75
Sensible Capacity (Btu/hr):	14,800	Rated Piping Length(ft):	25
Max/Min Cooling Capacity (Btu/hr):	/	Rated Height Difference (ft):	0.00
Cooling Input Power (kW):	2.120	Rated Heating Conditions:	Indoor (°F DB/WB): 70 / 60 Ambient (°F DB/WB): 47 / 43
<b>SEER (Non-Ducted/Ducted):</b>	<b>/ 16.70</b>		
<b>EER (Non-Ducted/Ducted):</b>	<b>/ 13.00</b>		
Rated Heating Capacity (Btu/hr):	20,000		

### SYSTEM DETAILS

Refrigerant Type:	R-410A	Cooling Operation Range (°F DB):	23 - 122
Holding Refrigerant Charge (lbs):	6.4	Heating Operation Range (°F WB):	-4 - 60
Additional Charge (lb/ft):	0.04	Max. Pipe Length (Vertical) (ft):	98
Pre-charge Piping (Length) (ft):	15	Cooling Range w/Baffle (°F DB):	23 - 122
Max. Pipe Length (Total) (ft):	164	Heating Range w/Baffle (°F WB):	-
Max Height Separation (Ind to Ind ft):	0		

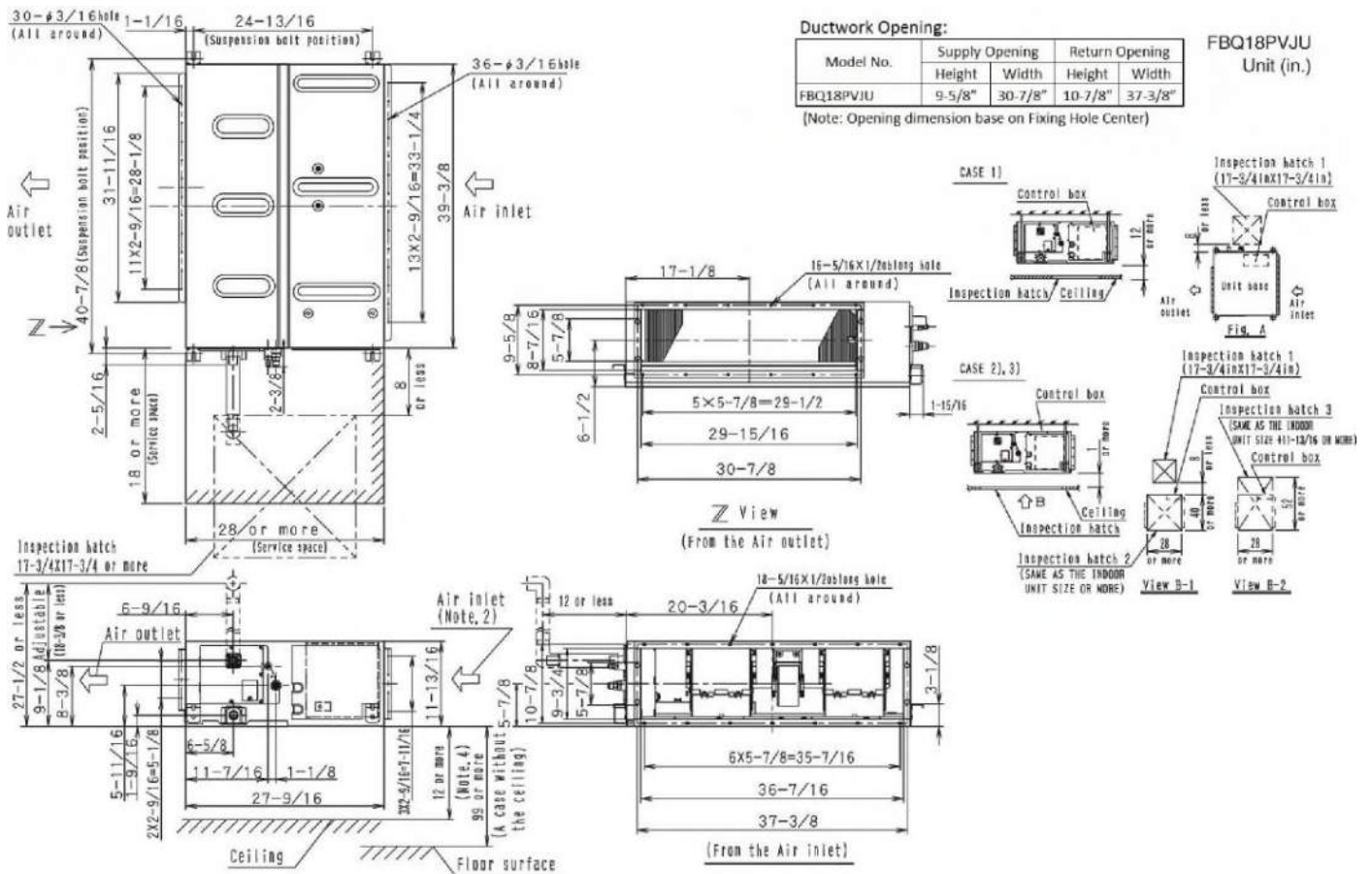


# Submittal Data Sheet

1.5-Ton DC Ducted Unit  
FBQ18PVJURZQ18TAVJU

## INDOOR UNIT DETAILS

Power Supply (V/Hz/Ph):	208-230 / 60 / 1	Airflow Rate (H/M/L) (CFM):	635/582/529
Power Supply Connections:	L1, L2, Ground	Moisture Removal (Gal/hr):	
Min. Circuit Amps MCA (A):	1.6	Gas Pipe Connection (inch):	5/8
Max Overcurrent Protection (MOP) (A):	15	Liquid Pipe Connection (inch):	3/8
Dimensions (HxWxD) (in):	11-13/16 x 39-3/8 x 27-9/16	Condensate Connection (inch):	1
Net Weight (lb):	80	Sound Pressure (H/M) (dBA):	41/39
Ext. Static Pressure (Rated/Max) (inWg):	0.8 / 0.8	Sound Power Level (dBA):	



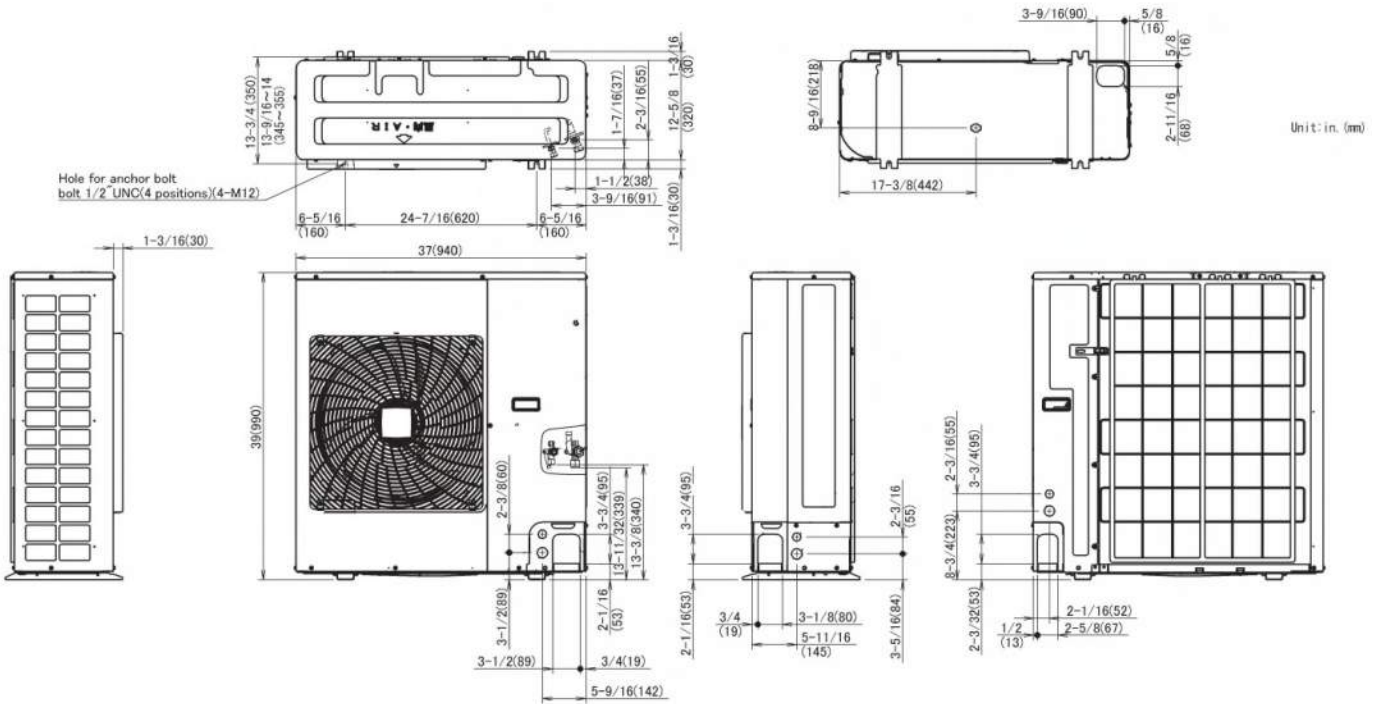


## Submittal Data Sheet

1.5-Ton DC Ducted Unit  
FBQ18PVJURZQ18TAVJU

### OUTDOOR UNIT DETAILS

Power Supply (V/Hz/Ph):	208-230 / 60 / 1	Compressor Stage:	
Power Supply Connections:	L1, L2, Ground	Capacity Control Range (%):	14 - 100
Min. Circuit Amps MCA (A):	16.5	Airflow Rate (H) (CFM):	2682
Max Overcurrent Protection (MOP) (A):	25	Gas Pipe Connection (inch):	5/8
Max Starting Current MSC(A):		Liquid Pipe Connection (inch):	3/8
Rated Load Amps RLA(A):	15.3	Sound Pressure (H) (dBA):	58
Dimensions (HxWxD) (in):	39 x 37 x 12-5/8	Sound Power Level (dBA):	
Net Weight (lb):	172		





Option #1  
Zone #3 - Main Office and Meeting Room

## Submittal Data Sheet

3.5-Ton DC Ducted Unit  
FBQ42PVJURZQ42TAVJU

### FEATURES

- External static pressure (ESP) capabilities up to 0.8" W.G.
- Three user selected fan speeds available plus fan "Auto" logic
- Low ambient cooling operation down to 0°F (with optional wind baffle(s))
- Built-in condensate pump
- Maximum piping length up to 230 ft. allows flexible placement of indoor unit
- Maximum piping height separation up to 98 ft.
- 10 year limited parts and compressor warranty

### BENEFITS

- DC fan motor provides improved efficiency
- Bottom access for easy service

### INDOOR UNIT



### OUTDOOR UNIT





## Submittal Data Sheet

3.5-Ton DC Ducted Unit

FBQ42PVJURZQ42TAVJU

### SYSTEM PERFORMANCE

Indoor Unit Model No.	FBQ42PVJU	Indoor Unit Name:	Sky-Air DC Ducted
Outdoor Unit Model No.	RZQ42TAVJU	Outdoor Unit Name:	Sky-Air 3.5 Ton Heat Pump ODU
Rated Cooling Capacity (Btu/hr):	40,500	Rated Cooling Conditions:	Indoor (°F DB/WB): 80 / 67 Ambient (°F DB/WB): 95 / 75
Sensible Capacity (Btu/hr):	30,500	Rated Piping Length(ft):	25
Max/Min Cooling Capacity (Btu/hr):	/	Rated Height Difference (ft):	0.00
Cooling Input Power (kW):	3.490	Rated Heating Conditions:	Indoor (°F DB/WB): 70 / 60 Ambient (°F DB/WB): 47 / 43
<b>SEER (Non-Ducted/Ducted):</b>	<b>/ 16.00</b>		
<b>EER (Non-Ducted/Ducted):</b>	<b>/ 10.10</b>		
Rated Heating Capacity (Btu/hr):	47,000		

### SYSTEM DETAILS

Refrigerant Type:	R-410A	Cooling Operation Range (°F DB):	23 - 122
Holding Refrigerant Charge (lbs):	7.9	Heating Operation Range (°F WB):	-4 - 60
Additional Charge (lb/ft):	0.04	Max. Pipe Length (Vertical) (ft):	98
Pre-charge Piping (Length) (ft):	15	Cooling Range w/Baffle (°F DB):	0 - 122
Max. Pipe Length (Total) (ft):	230	Heating Range w/Baffle (°F WB):	-
Max Height Separation (Ind to Ind ft):	0		

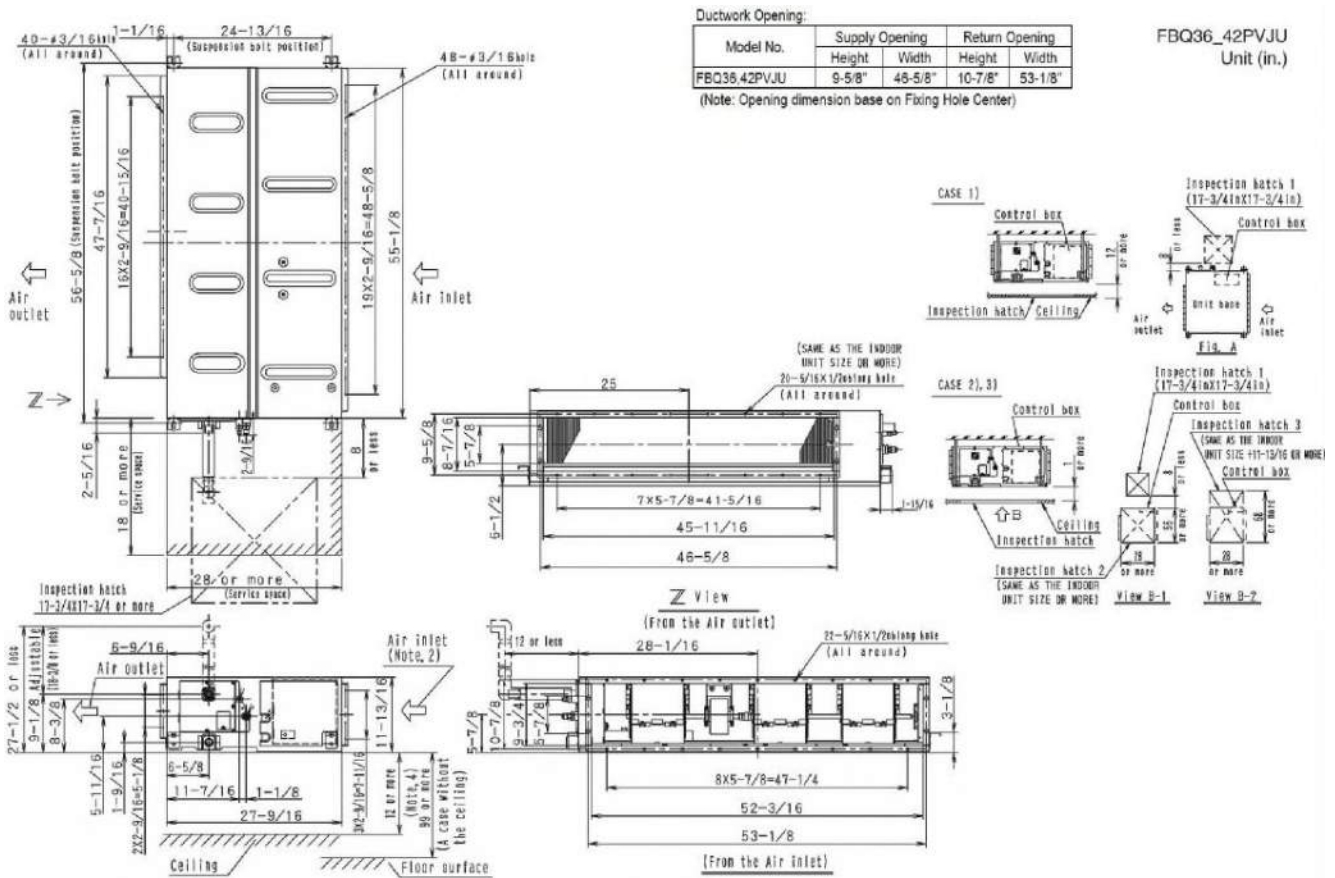


# Submittal Data Sheet

3.5-Ton DC Ducted Unit  
FBQ42PVJURZQ42TAVJU

## INDOOR UNIT DETAILS

Power Supply (V/Hz/Ph):	208-230 / 60 / 1	Airflow Rate (H/M/L) (CFM):	1377/1,165/988
Power Supply Connections:	L1, L2, Ground	Moisture Removal (Gal/hr):	
Min. Circuit Amps MCA (A):	3.4	Gas Pipe Connection (inch):	5/8
Max Overcurrent Protection (MOP) (A):	15	Liquid Pipe Connection (inch):	3/8
Dimensions (HxWxD) (in):	11-13/16 x 55-1/8 x 27-9/16	Condensate Connection (inch):	1
Net Weight (lb):	102	Sound Pressure (H/M) (dBA):	44/42
Ext. Static Pressure (Rated/Max) (inWg):	0.8 / 0.8	Sound Power Level (dBA):	



Daikin North America LLC, 5151 San Felipe, Suite 500, Houston, TX, 77056

Daikin City Generated Submittal Data

[www.daikinac.com](http://www.daikinac.com) [www.daikincomfort.com](http://www.daikincomfort.com)

(Daikin's products are subject to continuous improvements. Daikin reserves the right to modify product design, specifications and information in this data sheet without notice and without incurring any obligations)

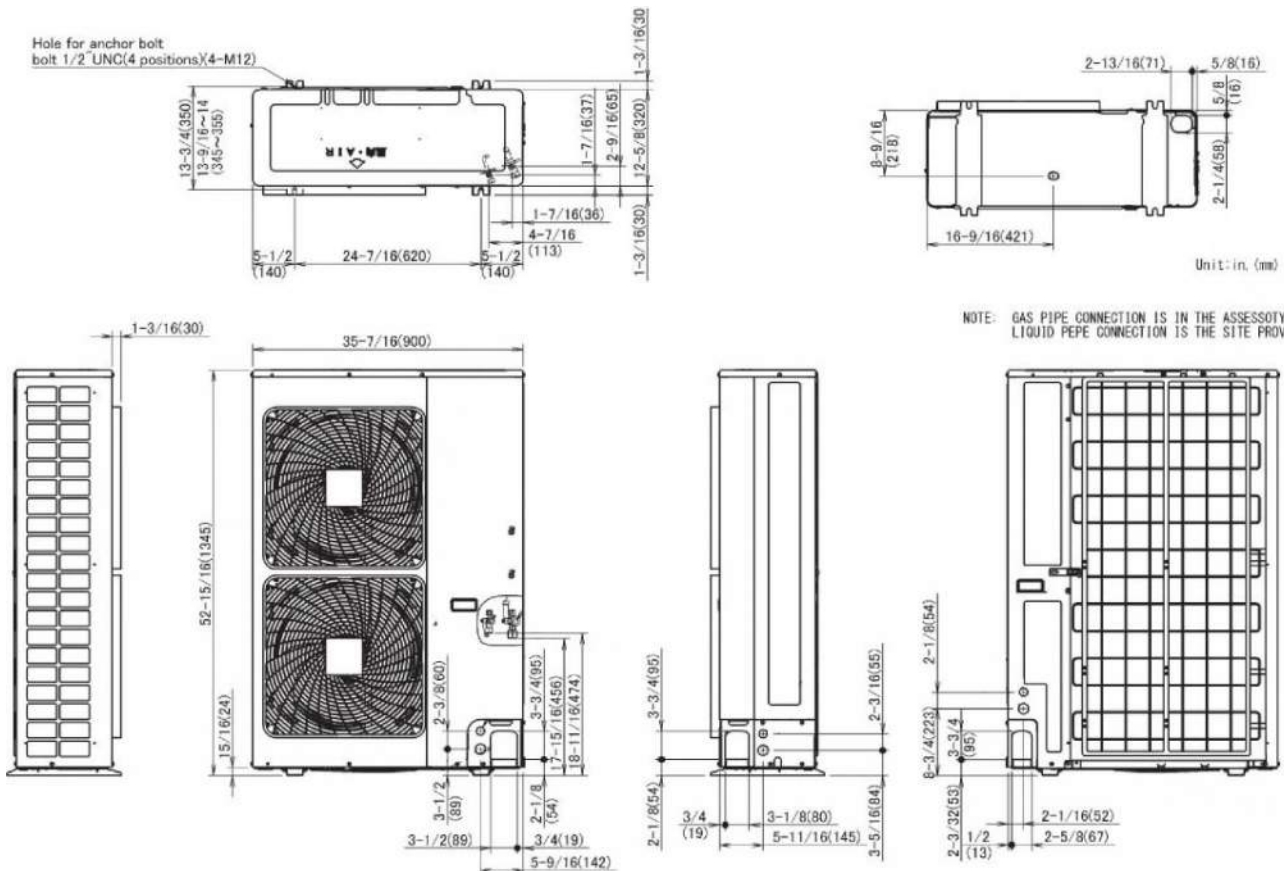


## Submittal Data Sheet

3.5-Ton DC Ducted Unit  
FBQ42PVJURZQ42TAVJU

### OUTDOOR UNIT DETAILS

Power Supply (V/Hz/Ph):	208-230 / 60 / 1	Compressor Stage:	
Power Supply Connections:	L1, L2, Ground	Capacity Control Range (%):	14 - 100
Min. Circuit Amps MCA (A):	29.1	Airflow Rate (H) (CFM):	3741
Max Overcurrent Protection (MOP) (A):	35	Gas Pipe Connection (inch):	5/8
Max Starting Current MSC(A):		Liquid Pipe Connection (inch):	3/8
Rated Load Amps RLA(A):	19	Sound Pressure (H) (dBA):	57
Dimensions (HxWxD) (in):	52-15/16 x 35-7/16 x 12-5/8	Sound Power Level (dBA):	
Net Weight (lb):	225		







Option #1  
Zone #4 - Police Department

## Submittal Data Sheet

2.0-Ton DC Ducted Unit  
FBQ24PVJURZQ24TAVJU

### FEATURES

- External static pressure (ESP) capabilities up to 0.8" W.G.
- Three user selected fan speeds available plus fan "Auto" logic
- Low ambient cooling operation down to 0°F (with optional wind baffle(s))
- Built-in condensate pump
- Maximum piping length up to 164 ft. allows flexible placement of indoor unit
- Maximum piping height separation up to 98 ft.
- 10 year limited parts and compressor warranty

### BENEFITS

- DC fan motor provides improved efficiency
- Bottom access for easy service

### INDOOR UNIT



### OUTDOOR UNIT





## Submittal Data Sheet

2.0-Ton DC Ducted Unit

FBQ24PVJURZQ24TAVJU

### SYSTEM PERFORMANCE

Indoor Unit Model No.	FBQ24PVJU	Indoor Unit Name:	Sky-Air DC Ducted
Outdoor Unit Model No.	RZQ24TAVJU	Outdoor Unit Name:	Sky-Air 2.0 Ton Heat Pump ODU
Rated Cooling Capacity (Btu/hr):	24,000	Rated Cooling Conditions:	Indoor (°F DB/WB): 80 / 67 Ambient (°F DB/WB): 95 / 75
Sensible Capacity (Btu/hr):	18,700	Rated Piping Length(ft):	25
Max/Min Cooling Capacity (Btu/hr):	/	Rated Height Difference (ft):	0.00
Cooling Input Power (kW):	2.120	Rated Heating Conditions:	Indoor (°F DB/WB): 70 / 60 Ambient (°F DB/WB): 47 / 43
<b>SEER (Non-Ducted/Ducted):</b>	<b>/ 16.50</b>		
<b>EER (Non-Ducted/Ducted):</b>	<b>/ 12.00</b>		
Rated Heating Capacity (Btu/hr):	27,000		

### SYSTEM DETAILS

Refrigerant Type:	R-410A	Cooling Operation Range (°F DB):	23 - 122
Holding Refrigerant Charge (lbs):	6.4	Heating Operation Range (°F WB):	-4 - 60
Additional Charge (lb/ft):	0.04	Max. Pipe Length (Vertical) (ft):	98
Pre-charge Piping (Length) (ft):	15	Cooling Range w/Baffle (°F DB):	0 - 122
Max. Pipe Length (Total) (ft):	164	Heating Range w/Baffle (°F WB):	-
Max Height Separation (Ind to Ind ft):	0		

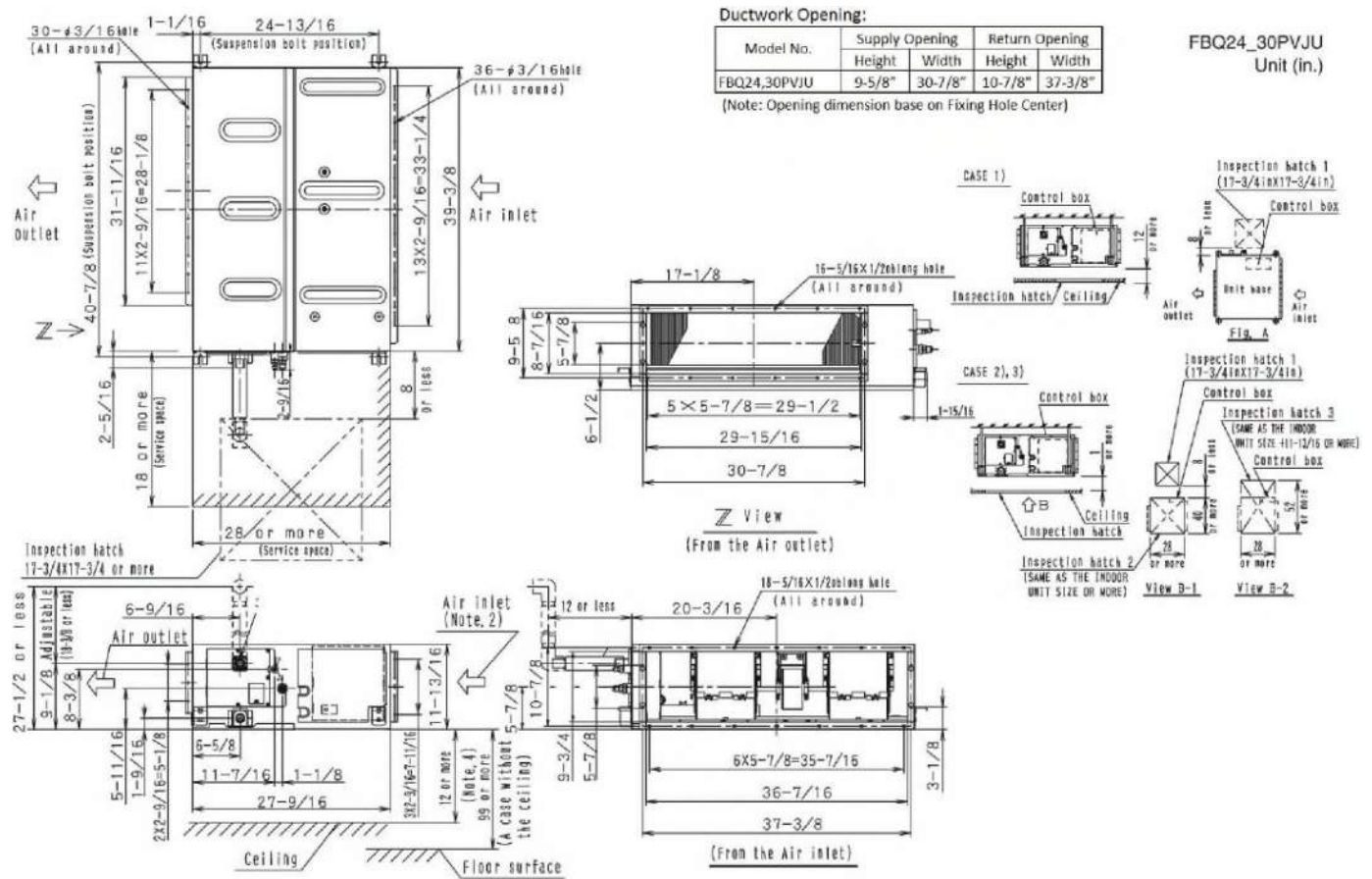


# Submittal Data Sheet

2.0-Ton DC Ducted Unit  
FBQ24PVJURZQ24TAVJU

## INDOOR UNIT DETAILS

Power Supply (V/Hz/Ph):	208-230 / 60 / 1	Airflow Rate (H/M/L) (CFM):	688/618/565
Power Supply Connections:	L1, L2, Ground	Moisture Removal (Gal/hr):	
Min. Circuit Amps MCA (A):	1.8	Gas Pipe Connection (inch):	5/8
Max Overcurrent Protection (MOP) (A):	15	Liquid Pipe Connection (inch):	3/8
Dimensions (HxWxD) (in):	11-13/16 x 39-3/8 x 27-9/16	Condensate Connection (inch):	1
Net Weight (lb):	80	Sound Pressure (H/M) (dBA):	42/40
Ext. Static Pressure (Rated/Max) (inWg):	0.8 / 0.8	Sound Power Level (dBA):	



Daikin North America LLC, 5151 San Felipe, Suite 500, Houston, TX, 77056

Daikin City Generated Submittal Data

[www.daikinac.com](http://www.daikinac.com) [www.daikincomfort.com](http://www.daikincomfort.com)

(Daikin's products are subject to continuous improvements. Daikin reserves the right to modify product design, specifications and information in this data sheet without notice and without incurring any obligations)

Submittal Date: 6/3/2019 8:21:45 AM

Page 3 of 4

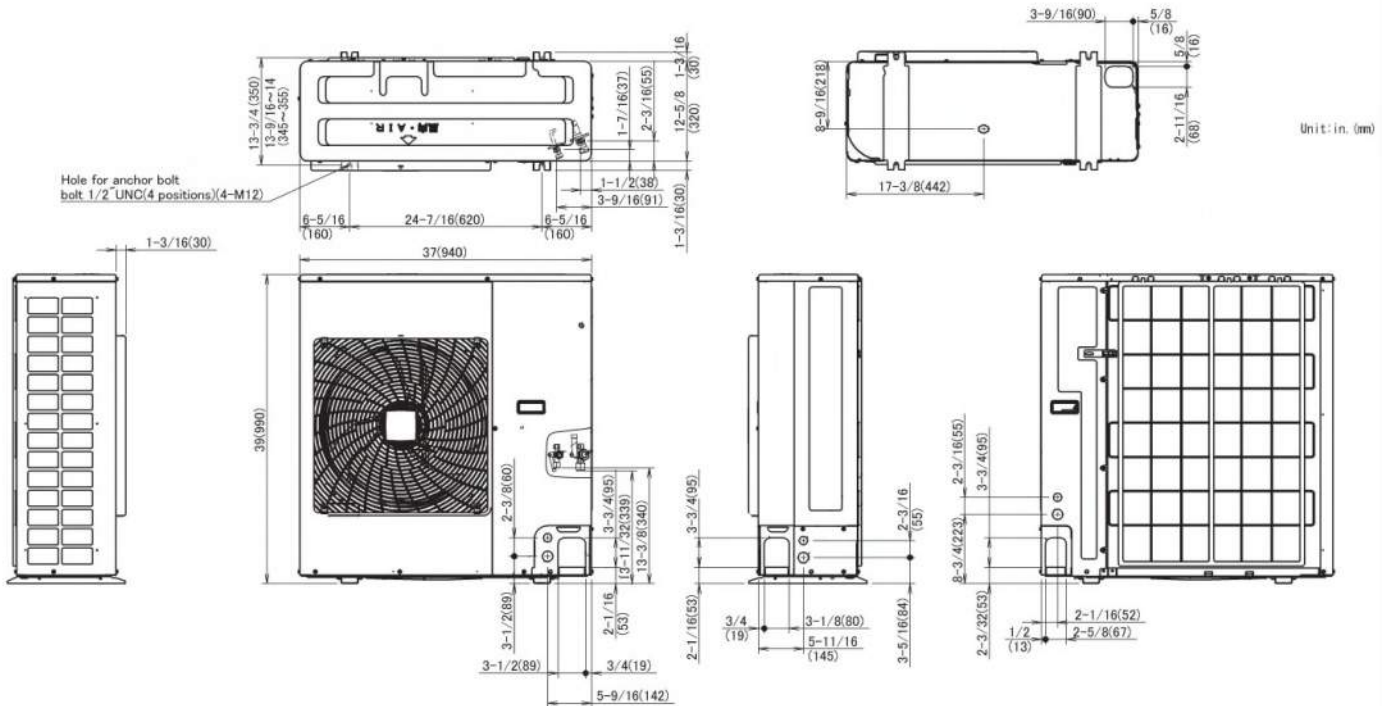


## Submittal Data Sheet

2.0-Ton DC Ducted Unit  
FBQ24PVJURZQ24TAVJU

### OUTDOOR UNIT DETAILS

Power Supply (V/Hz/Ph):	208-230 / 60 / 1	Compressor Stage:	
Power Supply Connections:	L1, L2, Ground	Capacity Control Range (%):	14 - 100
Min. Circuit Amps MCA (A):	16.5	Airflow Rate (H) (CFM):	2862
Max Overcurrent Protection (MOP) (A):	25	Gas Pipe Connection (inch):	5/8
Max Starting Current MSC(A):		Liquid Pipe Connection (inch):	3/8
Rated Load Amps RLA(A):	15.3	Sound Pressure (H) (dBA):	58
Dimensions (HxWxD) (in):	39 x 37 x 12-5/8	Sound Power Level (dBA):	
Net Weight (lb):	172		



Daikin North America LLC, 5151 San Felipe, Suite 500, Houston, TX, 77056

Daikin City Generated Submittal Data

[www.daikinac.com](http://www.daikinac.com) [www.daikincomfort.com](http://www.daikincomfort.com)

(Daikin's products are subject to continuous improvements. Daikin reserves the right to modify product design, specifications and information in this data sheet without notice and without incurring any obligations)

Submittal Date: 6/3/2019 8:21:45 AM

Page 4 of 4

Option #2 - VRV Heat Pump System with Electric Second Stage Heat, Refer to Equipment Submittal Sheets. Budget Equipment Price - \$15,000, Manufacturer's Representative – DXS, Attention: Adam Camillo, 1-978-977-9911, [adam.camillo@dxseng.com](mailto:adam.camillo@dxseng.com)



## Submittal Data Sheet

8 Ton, 230V VRV IV HP - RXYQ96TATJU

Project: Meriden NH Town Hall

Submitted by: Mark Brazell of DXS NEW ENGLAND INC on 8/14/2019

Submitted to: No Engineer Name Specified

Tags: ACCU- 1

**Option #2**  
**One Outdoor VRV Heat Pump to**  
**serve four (4) separate indoor air**  
**handlers with distributed refrigerant**  
**piping system**

## FEATURES

- Larger capacity single modules ranging up to 14 tons and systems up to 34 tons allow for a more flexible system design
- Variable Refrigerant Temperature (VRT) control allows the VRV IV to deliver up to 28% of improvement in seasonal cooling efficiency compared to previous Daikin VRV heat pump systems
- Modular and lightweight enables flexibility in system layout and installation with larger capacity single modules reducing electrical, piping connections
- System wide auto-climate adjustment technology to increase the energy efficiency
- Improved efficiency with IEER values now up to 28
- The rated seasonal cooling efficiency has been improved by an average of 11%
- All inverter compressors to increase the efficiency and avoid starting current inrush
- Same product structure for 230V and 460V simplifies ordering
- New configurator software designed to simplify the commissioning and maintenance of the system
- Factory standard coil guards
- Assembled in the US to increase flexibility and reduce lead times
- Standard Limited Warranty: 10-year limited parts warranty



## BENEFITS

- Can operate up to 16 indoor units on a single piping network
- Modular and lightweight - enables flexibility in system layout and installation
- Refrigerant cooled inverted technology to avoid influence from ambient temperatures
- Integrated inverter technology deliver maximum efficiency during part load conditions and provide precise individual zone control
- Heat exchanger coil wraps around on all 4 sides of the unit to increase the surface area and efficiency
- Corrosion resistance 1000hr salt spray tested Daikin PE blue fin heat exchanger
- Design flexibility with long piping lengths up to 3,280 ft. total and 100 ft. vertical separation between indoor units
- Designed with reduced MOP to optimize installation cost
- Digital display on the unit for improved and faster configuration, commissioning, and trouble shooting



VRV IV





## Submittal Data Sheet

8 Ton, 230V VRV IV HP - RXYQ96TATJU

Project: Meriden NH Town Hall

Submitted by: Mark Brazell of DXS NEW ENGLAND INC on 8/14/2019

Submitted to: No Engineer Name Specified

Tags: ACCU- 1

### PERFORMANCE

Outdoor Unit Model No.	RXYQ96TATJU	Outdoor Unit Name:	8 Ton, 230V VRV IV HP
Type:	Heat Pump	Unit Combination:	
Rated Cooling Conditions:	Indoor (°F DB/WB): 80 / 67 Ambient (°F DB/WB): 95 / 75	Rated Heating Conditions:	Indoor (°F DB/WB): 70 / 60 Ambient (°F DB/WB): 47 / 43
Rated Piping Length(ft):			
Rated Height Difference (ft):			
Rated Cooling Capacity (Btu/hr):	92,000	Rated Heating Capacity (Btu/hr):	103,000
Nom Cooling Capacity (Btu/hr):	96,000	Nom Heating Capacity (Btu/hr):	108,000
Cooling Input Power (kW):	6.11	Heating Input Power (kW):	6.62
<b>EER (Non-Ducted/Ducted):</b>	<b>14.00 / 12.60</b>	<b>Heating COP (Non-Ducted/Ducted):</b>	<b>4.0 / 3.5</b>
<b>IEER (Non-Ducted/Ducted):</b>	<b>27.30 / 22.50</b>	<b>Heating COP 17F (Non-Ducted/Ducted):</b>	<b>2.6 / 2.5</b>

### OUTDOOR UNIT DETAILS

Power Supply (V/Hz/Ph):	208-230 / 60 / 3	Compressor Stage:	Inverter
Power Supply Connections:	L1, L2, L3 Ground	Capacity Control Range (%):	16 - 100
Min. Circuit Amps MCA (A):	36.3	Capacity Index Limit:	48.0 - 124.0
Max Overcurrent Protection (MOP) (A):	45	Airflow Rate (H) (CFM):	5827
Max Starting Current MSC(A):		Gas Pipe Connection (inch):	7/8
Rated Load Amps RLA(A):	23.8	Liquid Pipe Connection (inch):	3/8
Dimensions (Height) (in):	66-11/16	H/L Pressure Connection (inch)	
Dimensions (Width) (in):	48-7/8	H/L Equalizing Connection (inch)	
Dimensions (Depth) (in):	30-3/16	Sound Pressure (H) (dBA):	61
Net Weight (lb):	525	Sound Power Level (dBA):	81
		Max. No. of Indoor Units:	16



## Submittal Data Sheet

8 Ton, 230V VRV IV HP - RXYQ96TATJU

Project: Meriden NH Town Hall

Submitted by: Mark Brazell of DXS NEW ENGLAND INC on 8/14/2019

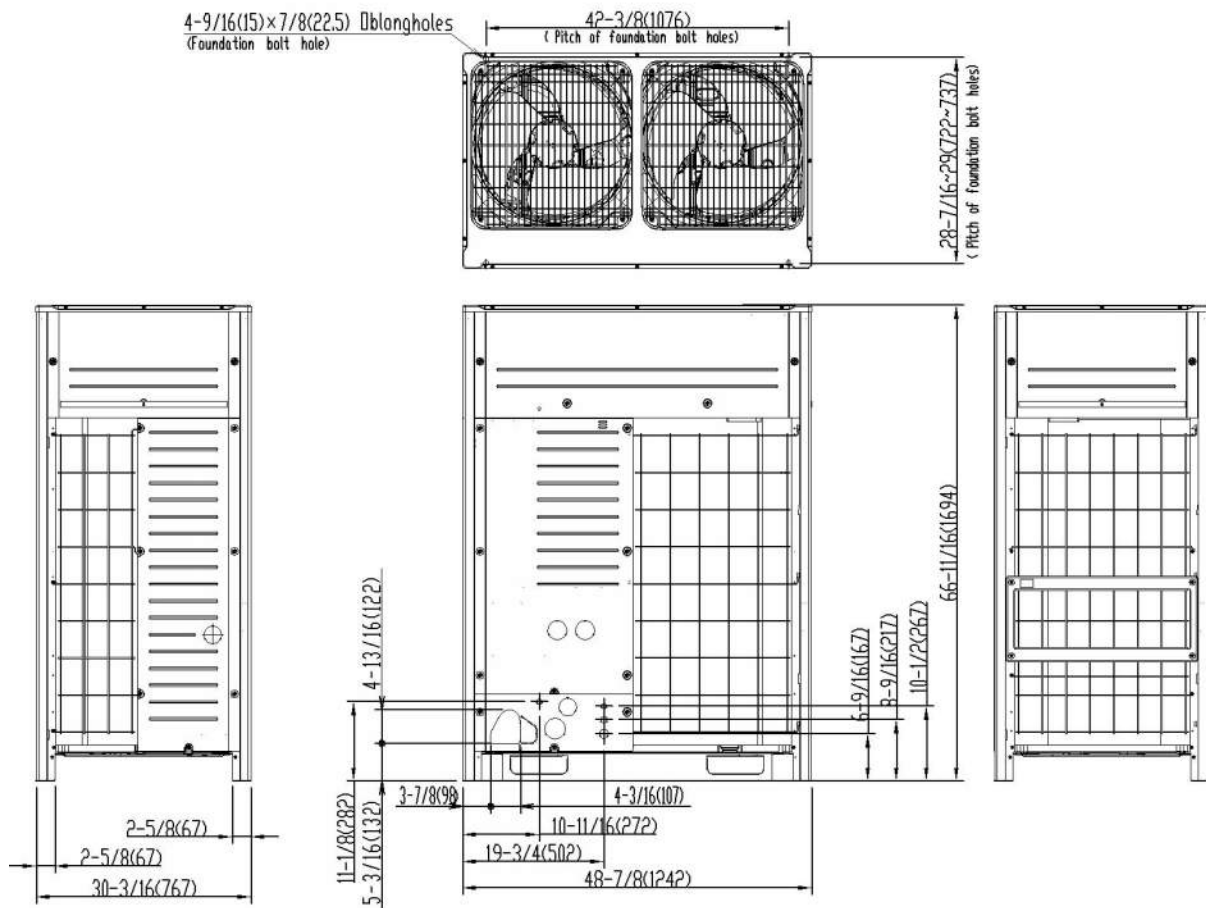
Submitted to: No Engineer Name Specified

Tags: ACCU- 1

### SYSTEM DETAILS

Refrigerant Type:	R-410A	Cooling Operation Range (°F DB):	23 - 122
Holding Refrigerant Charge (lbs):	22.7	Heating Operation Range (°F WB):	-4 - 60
Additional Charge (lb/ft):		Max. Pipe Length (Vertical) (ft):	295
Pre-charge Piping (Length) (ft):		Cooling Range w/Baffle (°F DB):	-
Max. Pipe Length (Total) (ft):	540	Heating Range w/Baffle (°F WB):	-
Max Height Separation (Ind to Ind ft):			

### DIMENSIONAL DRAWING







## Submittal Data Sheet

1.0-Ton MSP Concealed Ducted Unit - FXSQ12TAVJU

Project: Meriden NH Town Hall

Submitted by: Mark Brazell of DXS NEW ENGLAND INC on 8/14/2019

Submitted to: No Engineer Name Specified

Tags: FCU- 1, FCU- 2

### Option #2

Two (2) separate systems one (1) each for:

Zone #1 - Lower Level - Admin, Entrance, and Toilet Area

Zone #2 - Upper Level Offices

## FEATURES

- Eleven capacity options from 5,800 Btu/h to 54,000 Btu/h
- External static pressure up to 0.6 in. w.g. (150 Pa)
- Low profile height of 9-5/8" (245 mm) for all models
- 5-speed DC fan motor with selectable Auto fan speed
- Ease of installation with auto adjusting airflow at commissioning based on external static pressure
- Independently configurable auxiliary heat on/off temperature settings
- Factory rear-return, field convertible to bottom-return
- Integral condensate pump with up 25-5/16" (643 mm) of lift from the drain outlet
- Drain pan inspection port
- Standard Limited Warranty: 10-year limited parts warranty

## BENEFITS

- Requires as little as 11-1/4" (285 mm) of clearance above the ceiling thanks to the low profile design.
- Auto fan speed control optimizes fan energy use by automatically adjusting the unit's fan speed as the room temperature approaches the set point.
- The drain pan inspection port simplifies maintenance by allowing for simple and easy inspection of the drain pan conditions.
- Designed for quiet operation, with sound levels as low as 28 dB(A).





## Submittal Data Sheet

1.0-Ton MSP Concealed Ducted Unit - FXSQ12TAVJU

Project: Meriden NH Town Hall

Submitted by: Mark Brazell of DXS NEW ENGLAND INC on 8/14/2019

Submitted to: No Engineer Name Specified

Tags: FCU- 1, FCU- 2

### PERFORMANCE

Indoor Unit Model No.	FXSQ12TAVJU	Indoor Unit Name:	1.0-Ton MSP Concealed Ducted Unit
Type:	Ducted	Rated Cooling Conditions:	Indoor (°F DB/WB): 80 / 67 Ambient (°F DB/WB): 95 / 75
Rated Cooling Capacity (Btu/hr):	12,000	Rated Heating Conditions:	Indoor (°F DB/WB): 70 / 60 Ambient (°F DB/WB): 47 / 43
Sensible Capacity (Btu/hr):	9,700	Rated Piping Length(ft):	
Cooling Input Power (kW):	0.111	Rated Height Separation (ft):	
Rated Heating Capacity (Btu/hr):	13,500		
Heating Input Power (kW):	0.11		

### INDOOR UNIT DETAILS

Power Supply (V/Hz/Ph):	208/230 / 60 / 1	Airflow Rate (H/M/L) (CFM):	335/283/247
Power Supply Connections:	L1, L2, G	Moisture Removal (Gal/hr):	
Min. Circuit Amps MCA (A):	0.8	Gas Pipe Connection (inch):	1/2
Max Overcurrent Protection (MOP) (A):	15	Liquid Pipe Connection (inch):	1/4
Dimensions (HxWxD) (in):	9-11/16 x 21-11/16 x 31-1/2	Condensate Connection (inch):	1
Net Weight (lb):	55	Sound Pressure (H/M/L) (dBA):	34/32/30
Ext. Static Pressure (Rated/Max) (inWg):	0.2 / 0.6	Sound Power Level (dBA):	62

### Submittal Data Sheet

1.0-Ton MSP Concealed Ducted Unit - FXSQ12TAVJU

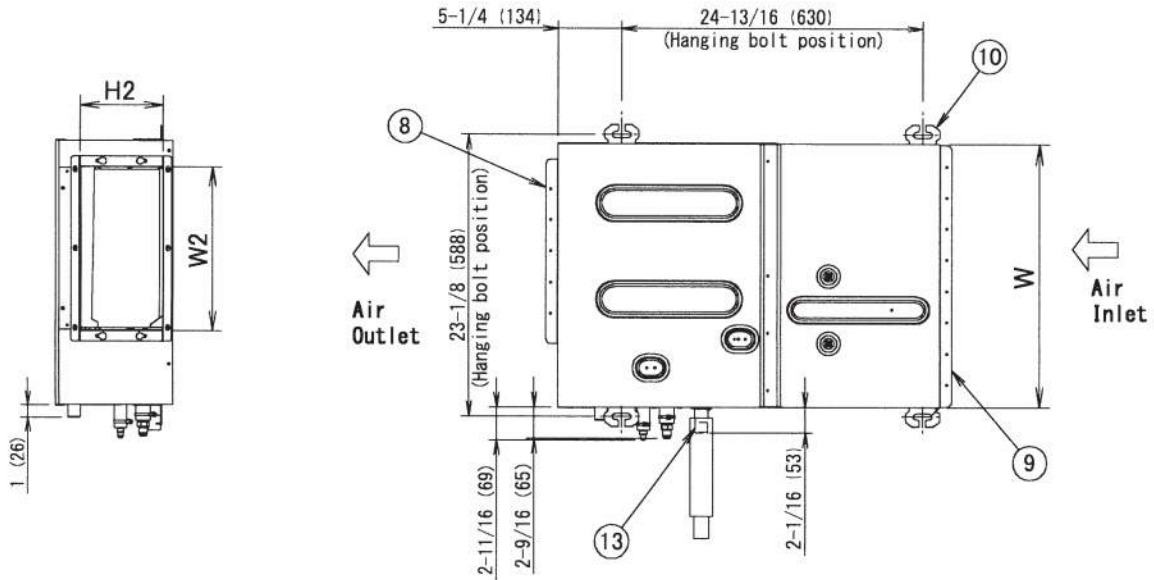
Project: Meriden NH Town Hall

Submitted by: Mark Brazell of DXS NEW ENGLAND INC on 8/14/2019

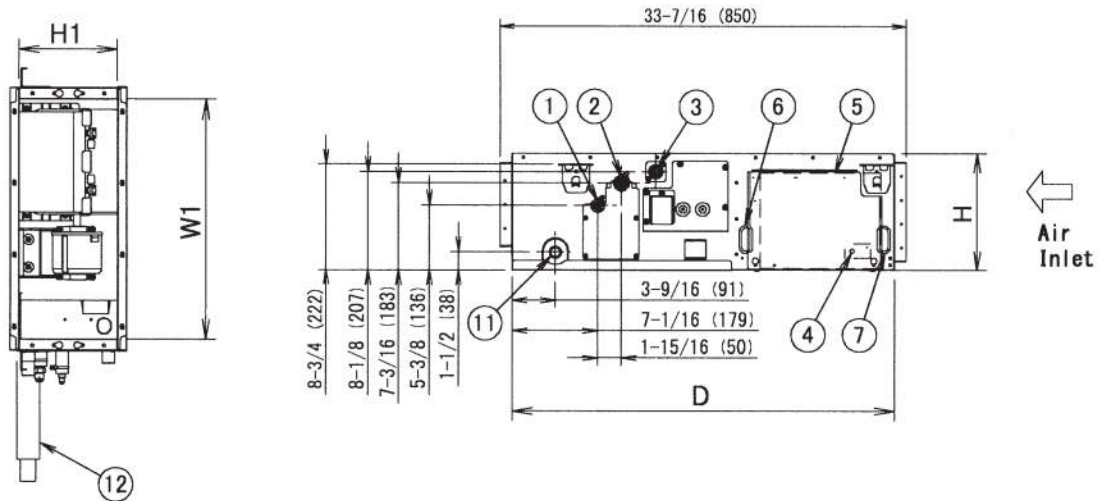
Submitted to: No Engineer Name Specified

Tags: FCU- 1, FCU- 2

## DIMENSIONAL DRAWING



(From the Air Outlet)



1 3	Drain socket	
1 2	Drain hose (Accessory)	
1 1	Socket (for maintenance)	O. D. $\phi 1"$ ( $\phi 26$ )
1 0	Hanger	For M10 or equivalent
9	Air Inlet flange	
8	Air Outlet flange	
7	Power supply wiring connection	
6	Transmission and remote controller wiring connection	
5	Control box (inside)	
4	Ground terminal (Control box)	M4
3	Drain pipe connection	O. D. $\phi 1\text{-}1/4"$ ( $\phi 32$ )
2	Gas pipe connection	$\phi 1/2"$ ( $\phi 12.7$ ) Flare connection
1	Liquid pipe connection	$\phi 1/4"$ ( $\phi 6.4$ ) Flare connection
ITEM	PART NAME	REMARK

H		$9\text{-}11/16$ (245)
W		$21\text{-}11/16$ (550)
D		$31\text{-}1/2$ (800)
Air Inlet	H1	$8\text{-}3/16$ (208)
Air Inlet	W1	$19\text{-}3/4$ (502)
Air Outlet	H2	$6\text{-}15/16$ (176)
Air Outlet	W2	$13\text{-}1/4$ (337)



## Submittal Data Sheet

4.0-Ton MSP Concealed Ducted Unit - FXSQ48TAVJU

Project: Meriden NH Town Hall

Submitted by: Mark Brazell of DXS NEW ENGLAND INC on 8/14/2019

Submitted to: No Engineer Name Specified

Tags: FCU- 3

Option #2  
Zone #3 - Main Office and Meeting Room

## FEATURES

- Eleven capacity options from 5,800 Btu/h to 54,000 Btu/h
- External static pressure up to 0.6 in. w.g. (150 Pa)
- Low profile height of 9-5/8" (245 mm) for all models
- 5-speed DC fan motor with selectable Auto fan speed
- Ease of installation with auto adjusting airflow at commissioning based on external static pressure
- Independently configurable auxiliary heat on/off temperature settings
- Factory rear-return, field convertible to bottom-return
- Integral condensate pump with up 25-5/16" (643 mm) of lift from the drain outlet
- Drain pan inspection port
- Standard Limited Warranty: 10-year limited parts warranty

## BENEFITS

- Requires as little as 11-1/4" (285 mm) of clearance above the ceiling thanks to the low profile design.
- Auto fan speed control optimizes fan energy use by automatically adjusting the unit's fan speed as the room temperature approaches the set point.
- The drain pan inspection port simplifies maintenance by allowing for simple and easy inspection of the drain pan conditions.
- Designed for quiet operation, with sound levels as low as 28 dB(A).





## Submittal Data Sheet

4.0-Ton MSP Concealed Ducted Unit - FXSQ48TAVJU

Project: Meriden NH Town Hall

Submitted by: Mark Brazell of DXS NEW ENGLAND INC on 8/14/2019

Submitted to: No Engineer Name Specified

Tags: FCU- 3

### PERFORMANCE

Indoor Unit Model No.	FXSQ48TAVJU	Indoor Unit Name:	4.0-Ton MSP Concealed Ducted Unit
Type:	Ducted	Rated Cooling Conditions:	Indoor (°F DB/WB): 80 / 67 Ambient (°F DB/WB): 95 / 75
Rated Cooling Capacity (Btu/hr):	48,000	Rated Heating Conditions:	Indoor (°F DB/WB): 70 / 60 Ambient (°F DB/WB): 47 / 43
Sensible Capacity (Btu/hr):	34,300	Rated Piping Length(ft):	
Cooling Input Power (kW):	0.360	Rated Height Separation (ft):	
Rated Heating Capacity (Btu/hr):	54,000		
Heating Input Power (kW):	0.36		

### INDOOR UNIT DETAILS

Power Supply (V/Hz/Ph):	208/230 / 60 / 1	Airflow Rate (H/M/L) (CFM):	1307/1,112/918
Power Supply Connections:	L1, L2, G	Moisture Removal (Gal/hr):	
Min. Circuit Amps MCA (A):	2.8	Gas Pipe Connection (inch):	5/8
Max Overcurrent Protection (MOP) (A):	15	Liquid Pipe Connection (inch):	3/8
Dimensions (HxWxD) (in):	9-11/16 x 55-1/8 x 31-1/2	Condensate Connection (inch):	1
Net Weight (lb):	104	Sound Pressure (H/M/L) (dBA):	42/39/35
Ext. Static Pressure (Rated/Max) (inWg):	0.2 / 0.6	Sound Power Level (dBA):	70

### Submittal Data Sheet

4.0-Ton MSP Concealed Ducted Unit - FXSQ48TAVJU

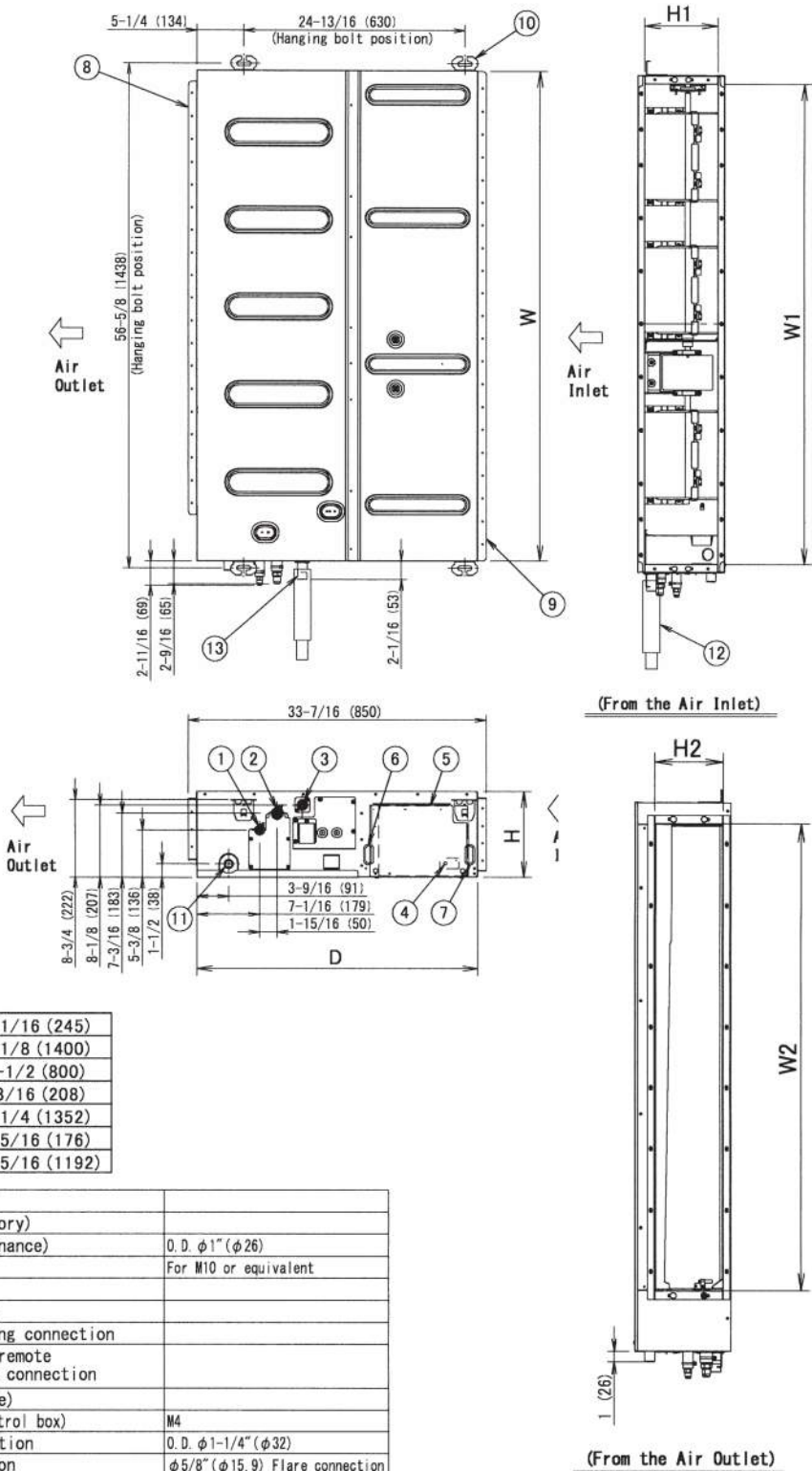
Project: Meriden NH Town Hall

Submitted by: Mark Brazell of DXS NEW ENGLAND INC on 8/14/2019

Submitted to: No Engineer Name Specified

Tags: FCU- 3

## DIMENSIONAL DRAWING



H	9-11/16 (245)	
W	55-1/8 (1400)	
D	31-1/2 (800)	
Air Inlet	H1	8-3/16 (208)
	W1	53-1/4 (1352)
Air Outlet	H2	6-15/16 (176)
	W2	46-15/16 (1192)

13	Drain socket	
12	Drain hose (Accessory)	
11	Socket (for maintenance)	O. D. $\phi$ 1" ( $\phi$ 26)
10	Hanger	For M10 or equivalent
9	Air Inlet flange	
8	Air Outlet flange	
7	Power supply wiring connection	
6	Transmission and remote controller wiring connection	
5	Control box (inside)	
4	Ground terminal (Control box)	M4
3	Drain pipe connection	O. D. $\phi$ 1-1/4" ( $\phi$ 32)
2	Gas pipe connection	$\phi$ 5/8" ( $\phi$ 15.9) Flare connection
1	Liquid pipe connection	$\phi$ 3/8" ( $\phi$ 9.5) Flare connection
ITEM	PART NAME	REMARK

Daikin North America LLC, 5151 San Felipe, Suite 500, Houston, TX, 77056

Note: For additional dimensional data and clearance information, refer to Engineering Data

(Daikin's products are subject to continuous improvements. Daikin reserves the right to modify product design, specifications and information in this data sheet without notice and without incurring any obligations)



Option #2  
Zone #4 - Police Department

## Submittal Data Sheet

2.0-Ton MSP Concealed Ducted Unit - FXSQ24TAVJU

Project: Meriden NH Town Hall

Submitted by: Mark Brazell of DXS NEW ENGLAND INC on 8/14/2019

Submitted to: No Engineer Name Specified

Tags: FCU- 4

## FEATURES

- Eleven capacity options from 5,800 Btu/h to 54,000 Btu/h
- External static pressure up to 0.6 in. w.g. (150 Pa)
- Low profile height of 9-5/8" (245 mm) for all models
- 5-speed DC fan motor with selectable Auto fan speed
- Ease of installation with auto adjusting airflow at commissioning based on external static pressure
- Independently configurable auxiliary heat on/off temperature settings
- Factory rear-return, field convertible to bottom-return
- Integral condensate pump with up 25-5/16" (643 mm) of lift from the drain outlet
- Drain pan inspection port
- Standard Limited Warranty: 10-year limited parts warranty

## BENEFITS

- Requires as little as 11-1/4" (285 mm) of clearance above the ceiling thanks to the low profile design.
- Auto fan speed control optimizes fan energy use by automatically adjusting the unit's fan speed as the room temperature approaches the set point.
- The drain pan inspection port simplifies maintenance by allowing for simple and easy inspection of the drain pan conditions.
- Designed for quiet operation, with sound levels as low as 28 dB(A).



VRV





## Submittal Data Sheet

2.0-Ton MSP Concealed Ducted Unit - FXSQ24TAVJU

Project: Meriden NH Town Hall

Submitted by: Mark Brazell of DXS NEW ENGLAND INC on 8/14/2019

Submitted to: No Engineer Name Specified

Tags: FCU- 4

### PERFORMANCE

Indoor Unit Model No.	FXSQ24TAVJU	Indoor Unit Name:	2.0-Ton MSP Concealed Ducted Unit
Type:	Ducted	Rated Cooling Conditions:	Indoor (°F DB/WB): 80 / 67 Ambient (°F DB/WB): 95 / 75
Rated Cooling Capacity (Btu/hr):	24,000	Rated Heating Conditions:	Indoor (°F DB/WB): 70 / 60 Ambient (°F DB/WB): 47 / 43
Sensible Capacity (Btu/hr):	17,100	Rated Piping Length(ft):	
Cooling Input Power (kW):	0.222	Rated Height Separation (ft):	
Rated Heating Capacity (Btu/hr):	27,000		
Heating Input Power (kW):	0.22		

### INDOOR UNIT DETAILS

Power Supply (V/Hz/Ph):	208/230 / 60 / 1	Airflow Rate (H/M/L) (CFM):	742/618/512
Power Supply Connections:	L1, L2, G	Moisture Removal (Gal/hr):	
Min. Circuit Amps MCA (A):	1.8	Gas Pipe Connection (inch):	5/8
Max Overcurrent Protection (MOP) (A):	15	Liquid Pipe Connection (inch):	3/8
Dimensions (HxWxD) (in):	9-11/16 x 39-3/8 x 31-1/2	Condensate Connection (inch):	1
Net Weight (lb):	77	Sound Pressure (H/M/L) (dBA):	36/32/29
Ext. Static Pressure (Rated/Max) (inWg):	0.2 / 0.6	Sound Power Level (dBA):	64



### Submittal Data Sheet

2.0-Ton MSP Concealed Ducted Unit - FXSQ24TAVJU

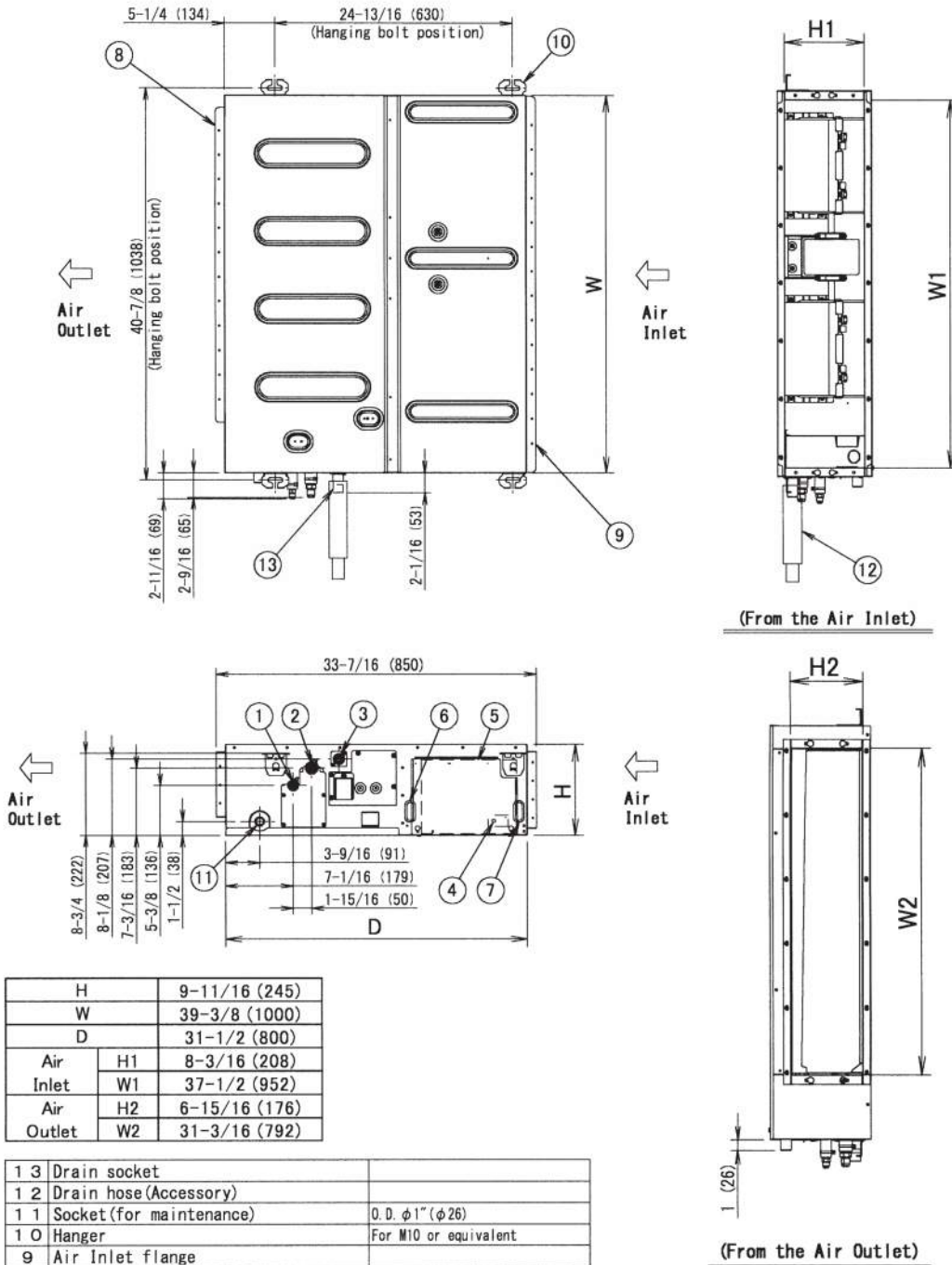
Project: Meriden NH Town Hall

Submitted by: Mark Brazell of DXS NEW ENGLAND INC on 8/14/2019

Submitted to: No Engineer Name Specified

Tags: FCU- 4

## DIMENSIONAL DRAWING



Option #3 – Water Source Heat Pump System, Refer to Equipment Submittal Sheets. Budget Equipment Price - \$14,400, Manufacturer's Representative – HTS New England, Attention: Derek Anneser, 1-978-977-9911, [Derek.Anneser@hts.com](mailto:Derek.Anneser@hts.com)  
Geothermal Borehole estimate \$33,000. Contact Cushing and Sons, Bart Cushing, 1-800-831-8883, [Bart@CushingAndSons.com](mailto:Bart@CushingAndSons.com)

Job Information		Technical Data Sheet	
Job Name	Meriden NH Town Hall WSHPs		
Date	8/13/2019		
Submitted By	Derek Anneser		
Software Version	08.00		
Unit Tag	14000 - Lower Level Town Admin Office and Entrance		



Option #3 - Zone #1

## Unit Overview

Model Number	Voltage V/Hz/Phase	Air Flow CFM	Fluid Flow gpm	Cooling Capacity Btu/hr	Cooling Efficiency EER @ design	Heating Capacity Btu/hr	Heating Efficiency COP @ design
WCCW5012	208-230/60/1	400	3.00	14129	24.03	15778	4.13

## Unit

Model Number:	WCCW5012		
Unit Type:	Enfinity - Horizontal, Geothermal Range		
Unit Construction:	Standard Fiberglass Insulation w/1-inch Filter Rack		
Approval:	ETL, CETL, AHRI		
Refrigerant Type		Refrigerant Weight	
R-410A		31.5 oz	

## Unit Performance

Air & Water Flow					
Airflow	Total External Static Pressure	Fluid Flow	Fluid Type	Glycol Concentration	Fluid Pressure Drop
400 CFM	0.20 inH <sub>2</sub> O	3.00 gpm / 3.00 gpm/ton	Propylene Glycol	20.0 %	13.21 ft H <sub>2</sub> O

Cooling Performance									
Fluid Temperature		Air Temperature				Capacity		Heat of Rejection Btu/hr	EER @ design
Entering °F	Leaving °F	Entering		Leaving		Total Btu/hr	Sensible Btu/hr		
		Dry Bulb °F	Wet Bulb °F	Dry Bulb °F	Wet Bulb °F				
32.0	43.0	80.0	67.0	56.9	55.2	14129	9824	16096	24.03

Heating Performance						
Fluid Temperature		Air Temperature		Capacity	Heat of Absorption Btu/hr	COP @ design
Entering °F	Leaving °F	Entering	Leaving	Total Btu/hr		
		Dry Bulb °F	Dry Bulb °F			
70.0	61.8	70.0	106.6	15778	12057	4.13

## Electrical

Unit Voltage	Minimum Voltage	Total Unit MCA	Total Unit Full Load Current
208-230/60/1	197 v	8.00 A	6.60 A
Compressor RLA	Compressor LRA	Motor FLA	Maximum Recommended Fuse Size / HACR Breaker Size
5.60 A	29.0 A	1.00 A	15 A


**Power Connection**  
Unit Mounted Non-Fused Disconnect Switch

\*Short-Circuit Current = 5 kA rms symmetrical, 600 V maximum

Physical						
Unit						
Length	Height	Width	Weight		Connections	
			Shipping	Operating	Water, FPT	Condensate, FPT
40.00 in	11.50 in	20.00 in	145 lb	115 lb	0.5	0.75 in
Cabinet						
Construction Type				Color		
Standard Fiberglass Insulation w/1-inch Filter Rack				Galvanized		
Fan					Controls	
Type	Motor		Drive		Type	
	Type	Horsepower	Type			
DWDI Centrifugal	Standard PSC	0.125 HP	Direct	Microtech III		
Airstream						
Air				Filter		
Discharge		Return		(Quantity) Filter Dimensions		
Straight Discharge		Right Hand Return Air		(1) 10 in x 26 in x 1 in		

Options		
Heating		
Heat Exchanger:	Copper Inner Tube / Steel Outer Tube	
	0 A	0.00 A
Controls		
Power Connection:	Unit Mounted Non-Fused Disconnect Switch	
Control Transformer:	50VA Control Transformer	

Warranty	
Unit Warranty:	4 Yr Compressor Only Extended Parts Warranty, 1st Yr Labor Allowance

AHRI Certification	
	All equipment is rated and certified in accordance with AHRI / ISO 13256-1 and tested, investigated, and determined to comply with the requirements of the standards for Heating and Cooling Equipment UL-1995 for the United States and CAN/CSA-C22.2 NO.236 for Canada.

Accessories	
Optional	
Part Number	Description
668996003	Kit, Mtrzd Valve, 1/2" 2-Way, NC, 30 PSi Close Off
107293071	MT III Enfinity BACNet Comm Module for WSHP
910121748	Programmable Electronic, 2-Stage (2H/2C)
106582907	Hose, Kit, Auto Flow, Strainer, Ball Vlv, 0.50" x 2ft, 3.5 GPM

Job Information		Technical Data Sheet	
Job Name	Meriden NH Town Hall WSHPs		
Date	8/13/2019		
Submitted By	Derek Anneser		
Software Version	08.00		
Unit Tag	12000 - Second Floor Offices	Option #3 - Zone #2	



Unit Overview							
Model Number	Voltage V/Hz/Phase	Air Flow CFM	Fluid Flow gpm	Cooling Capacity Btu/hr	Cooling Efficiency EER @ design	Heating Capacity Btu/hr	Heating Efficiency COP @ design
WCCW5009	208-230/60/1	315	2.30	12056	25.60	12833	4.39

Unit	
Model Number:	WCCW5009
Unit Type:	Enfinity - Horizontal, Geothermal Range
Unit Construction:	Standard Fiberglass Insulation w/1-inch Filter Rack
Approval:	ETL, CETL, AHRI
Refrigerant Type	R-410A
Refrigerant Weight	19.0 oz

Unit Performance									
Air & Water Flow									
Airflow	Total External Static Pressure	Fluid Flow		Fluid Type	Glycol Concentration	Fluid Pressure Drop			
315 CFM	0.48 inH <sub>2</sub> O	2.30 gpm / 3.07 gpm/ton		Propylene Glycol	20.0 %	11.63 ft H <sub>2</sub> O			
Cooling Performance									
Fluid Temperature		Air Temperature				Capacity		Heat of Rejection Btu/hr	EER @ design
Entering °F	Leaving °F	Entering		Leaving		Total Btu/hr	Sensible Btu/hr		
		Dry Bulb °F	Wet Bulb °F	Dry Bulb °F	Wet Bulb °F				
32.0	44.2	80.0	67.0	54.2	54.1	12056	8858	13631	25.60
Heating Performance									
Fluid Temperature		Air Temperature				Capacity	Heat of Absorption Btu/hr	COP @ design	
Entering °F	Leaving °F	Entering		Leaving		Total Btu/hr			
		Dry Bulb °F		Dry Bulb °F					
70.0	61.1	70.0		107.8		12833	9982	4.39	

Electrical			
Unit Voltage	Minimum Voltage	Total Unit MCA	Total Unit Full Load Current
208-230/60/1	197 v	6.00 A	5.00 A
Compressor RLA	Compressor LRA	Motor FLA	Maximum Recommended Fuse Size / HACR Breaker Size
4.00 A	22.0 A	1.00 A	15 A
Power Connection			
Unit Mounted Non-Fused Disconnect Switch			


\*Short-Circuit Current = 5 kA rms symmetrical, 600 V maximum

Physical						
Unit						
Length	Height	Width	Weight		Connections	
			Shipping	Operating	Water, FPT	Condensate, FPT
34.00 in	11.50 in	20.00 in	130 lb	99 lb	0.5	0.75 in
Cabinet						
Construction Type				Color		
Standard Fiberglass Insulation w/1-inch Filter Rack				Galvanized		
Fan					Controls	
Type	Motor		Drive		Type	
	Type	Horsepower	Type			
DWDI Centrifugal	Standard PSC	0.125 HP	Direct	Microtech III		
Airstream						
Air				Filter		
Discharge		Return		(Quantity) Filter Dimensions		
Straight Discharge		Right Hand Return Air		(1) 10 in x 20 in x 1 in		

Options	
Heating	
Heat Exchanger:	Copper Inner Tube / Steel Outer Tube
	0 A 0.00 A
Controls	
Power Connection:	Unit Mounted Non-Fused Disconnect Switch
Control Transformer:	50VA Control Transformer

Warranty	
Unit Warranty:	4 Yr Compressor Only Extended Parts Warranty, 1st Yr Labor Allowance

**AHRI Certification**



All equipment is rated and certified in accordance with AHRI / ISO 13256-1 and tested, investigated, and determined to comply with the requirements of the standards for Heating and Cooling Equipment UL-1995 for the United States and CAN/CSA-C22.2 NO.236 for Canada.

Accessories	
Optional	
Part Number	Description
668996003	Kit, Mtrzd Valve, 1/2" 2-Way, NC, 30 PSi Close Off
107293071	MT III Enfinity BACNet Comm Module for WSHP
910121748	Programmable Electronic, 2-Stage (2H/2C)
106582905	Hose, Kit, Auto Flow, Strainer, Ball Vlv, 0.50" x 2ft, 2.5 GPM

Job Information		Technical Data Sheet	
Job Name	Meriden NH Town Hall WSHPs		
Date	8/13/2019		
Submitted By	Derek Anneser		
Software Version	08.00		
Unit Tag	42000 - Main Office and Meeting Rooms	Option #3 - Zone #3	



Unit Overview							
Model Number	Voltage V/Hz/Phase	Air Flow CFM	Fluid Flow gpm	Cooling Capacity Btu/hr	Cooling Efficiency EER @ design	Heating Capacity Btu/hr	Heating Efficiency COP @ design
WCCW5036	208-230/60/1	1200	9.00	36097	23.87	43183	4.52

Unit	
Model Number:	WCCW5036
Unit Type:	Enfinity - Horizontal, Geothermal Range
Unit Construction:	Standard Fiberglass Insulation w/1-inch Filter Rack
Approval:	ETL, CETL, AHRI
Refrigerant Type	R-410A
Refrigerant Weight	49.0 oz

Unit Performance									
Air & Water Flow									
Airflow	Total External Static Pressure		Fluid Flow		Fluid Type	Glycol Concentration		Fluid Pressure Drop	
1200 CFM	0.55 inH <sub>2</sub> O		9.00 gpm / 3.00 gpm/ton		Propylene Glycol	20.0 %		10.68 ft H <sub>2</sub> O	
Cooling Performance									
Fluid Temperature		Air Temperature				Capacity		Heat of Rejection Btu/hr	EER @ design
Entering °F	Leaving °F	Entering		Leaving		Total Btu/hr	Sensible Btu/hr		
		Dry Bulb °F	Wet Bulb °F	Dry Bulb °F	Wet Bulb °F				
32.0	41.4	80.0	67.0	60.7	57.1	36097	24532	41156	23.87
Heating Performance									
Fluid Temperature		Air Temperature				Capacity	Heat of Absorption Btu/hr	COP @ design	
Entering °F	Leaving °F	Entering		Leaving		Total Btu/hr			
		Dry Bulb °F	Dry Bulb °F	Dry Bulb °F	Dry Bulb °F				
70.0	62.3	70.0	70.0	103.4	103.4	43183	33874	4.52	


Electrical			
Unit Voltage	Minimum Voltage	Total Unit MCA	Total Unit Full Load Current
208-230/60/1	197 V	23.80 A	19.70 A
Compressor RLA	Compressor LRA	Motor FLA	Maximum Recommended Fuse Size / HACR Breaker Size
16.70 A	79.0 A	3.00 A	40 A
Power Connection			
Unit Mounted Non-Fused Disconnect Switch			

\*Short-Circuit Current = 5 kA rms symmetrical, 600 V maximum

Physical						
Unit						
Length	Height	Width	Weight		Connections	
			Shipping	Operating	Water, FPT	Condensate, FPT
46.00 in	20.00 in	21.00 in	242 lb	223 lb	0.75	0.75 in
Cabinet						
Construction Type				Color		
Standard Fiberglass Insulation w/1-inch Filter Rack				Galvanized		
Fan					Controls	
Type	Motor		Drive		Type	
	Type	Horsepower	Type			
DWDI Centrifugal	Standard PSC	0.500 HP	Direct	Microtech III		
Airstream						
Air				Filter		
Discharge		Return		(Quantity) Filter Dimensions		
Straight Discharge		Right Hand Return Air		(1) 19 in x 27 in x 1 in		

Options	
Heating	
Heat Exchanger:	Copper Inner Tube / Steel Outer Tube
	0 A 0.00 A
Controls	
Power Connection:	Unit Mounted Non-Fused Disconnect Switch
Control Transformer:	50VA Control Transformer

Warranty	
Unit Warranty:	4 Yr Compressor Only Extended Parts Warranty, 1st Yr Labor Allowance

AHRI Certification	
	<p>All equipment is rated and certified in accordance with AHRI / ISO 13256-1 and tested, investigated, and determined to comply with the requirements of the standards for Heating and Cooling Equipment UL-1995 for the United States and CAN/CSA-C22.2 NO.236 for Canada.</p>

Accessories	
Optional	
Part Number	Description
107293071	MT III Enfinity BACNet Comm Module for WSHP
910121748	Programmable Electronic, 2-Stage (2H/2C)
106582925	Hose, Kit, Auto Flow, Strainer, Ball Vlv, 0.75" x 2ft, 10.0 GPM
668996006	Kit, Mtrzd Valve, 3/4" 2-Way, NC, 30 PSi Close Off



Job Information		Technical Data Sheet	
Job Name	Meriden NH Town Hall WSHPs		
Date	8/13/2019		
Submitted By	Derek Anneser		
Software Version	08.00		
Unit Tag	25000 - Police Department	Option #3 - Zone #4	



Unit Overview							
Model Number	Voltage V/Hz/Phase	Air Flow CFM	Fluid Flow gpm	Cooling Capacity Btu/hr	Cooling Efficiency EER @ design	Heating Capacity Btu/hr	Heating Efficiency COP @ design
WCCW5024	208-230/60/1	800	6.20	27638	29.35	28885	4.64

Unit	
Model Number:	WCCW5024
Unit Type:	Enfinity - Horizontal, Geothermal Range
Unit Construction:	Standard Fiberglass Insulation w/1-inch Filter Rack
Approval:	ETL, CETL, AHRI
Refrigerant Type	R-410A
Refrigerant Weight	39.5 oz

Unit Performance									
Air & Water Flow									
Airflow	Total External Static Pressure	Fluid Flow		Fluid Type	Glycol Concentration	Fluid Pressure Drop			
800 CFM	0.60 inH <sub>2</sub> O	6.20 gpm / 3.10 gpm/ton		Propylene Glycol	20.0 %	14.42 ft H <sub>2</sub> O			
Cooling Performance									
Fluid Temperature		Air Temperature				Capacity		Heat of Rejection	EER @ design
Entering °F	Leaving °F	Entering		Leaving		Total Btu/hr	Sensible Btu/hr	Btu/hr	
		Dry Bulb °F	Wet Bulb °F	Dry Bulb °F	Wet Bulb °F				
32.0	42.2	80.0	67.0	58.8	55.5	27638	18044	30788	29.35
Heating Performance									
Fluid Temperature		Air Temperature				Capacity	Heat of Absorption	COP @ design	
Entering °F	Leaving °F	Entering	Leaving			Total Btu/hr	Btu/hr		
		Dry Bulb °F	Dry Bulb °F		Dry Bulb °F				
70.0	62.5	70.0	103.5		28885	22825	4.64		


Electrical			
Unit Voltage	Minimum Voltage	Total Unit MCA	Total Unit Full Load Current
208-230/60/1	197 V	18.78 A	15.40 A
Compressor RLA	Compressor LRA	Motor FLA	Maximum Recommended Fuse Size / HACR Breaker Size
13.50 A	58.3 A	1.90 A	30 A
Power Connection			
Unit Mounted Non-Fused Disconnect Switch			

\*Short-Circuit Current = 5 kA rms symmetrical, 600 V maximum

Physical						
Unit						
Length	Height	Width	Weight		Connections	
			Shipping	Operating	Water, FPT	Condensate, FPT
42.00 in	19.00 in	20.00 in	214 lb	195 lb	0.5	0.75 in
Cabinet						
Construction Type				Color		
Standard Fiberglass Insulation w/1-inch Filter Rack				Galvanized		
Fan					Controls	
Type	Motor		Drive		Type	
	Type	Horsepower	Type			
DWDI Centrifugal	Standard PSC	0.333 HP	Direct	Microtech III		
Airstream						
Air				Filter		
Discharge		Return		(Quantity) Filter Dimensions		
Straight Discharge		Right Hand Return Air		(1) 18 in x 24 in x 1 in		

Options	
Heating	
Heat Exchanger:	Copper Inner Tube / Steel Outer Tube
	0 A 0.00 A
Controls	
Power Connection:	Unit Mounted Non-Fused Disconnect Switch
Control Transformer:	50VA Control Transformer

Warranty	
Unit Warranty:	4 Yr Compressor Only Extended Parts Warranty, 1st Yr Labor Allowance

AHRI Certification	
	<p>All equipment is rated and certified in accordance with AHRI / ISO 13256-1 and tested, investigated, and determined to comply with the requirements of the standards for Heating and Cooling Equipment UL-1995 for the United States and CAN/CSA-C22.2 NO.236 for Canada.</p>

Accessories	
Optional	
Part Number	Description
668996003	Kit, Mtrzd Valve, 1/2" 2-Way, NC, 30 PSi Close Off
107293071	MT III Enfinity BACNet Comm Module for WSHP
910121748	Programmable Electronic, 2-Stage (2H/2C)
106582912	Hose, Kit, Auto Flow, Strainer, Ball Vlv, 0.50" x 2ft, 6.0 GPM

Option #4 – Air Source Heat Pumps and Second Stage Electric Heat, Refer to Equipment Submittal Sheets. Budget Equipment Price - \$10,845, Manufacturer's Representative – DCNE, Attention: Brian LaFramboise, 1-978-977-9911, BLAFRAMBOISE2dcne.com

## 1.5 Ton HP Split

Project: MERIDAN TOWN HALL  
Prepared By:

08/15/2019

Option #4 - Two (2) separate systems one (1) each for:  
Zone #1 - Lower Level - Town Admin, Entrance, and Toilet Area  
Zone #2 - Upper Level Offices

## 1.5 Ton HP Split

**Submittal Cover Sheet  
Unit Report  
Performance Summary Report  
Acoustic Summary  
Certified Drawings  
Guide Specifications  
Feature Sheet**

## Unit Report For 1.5 Ton HP Split

Project: ~Untitled7  
Prepared By:

08/15/2019



### Outdoor Unit Parameters

Unit Model:.....**25HBC**  
Unit Size:..... **1.5 Tons (Size 18)**  
Voltage:..... **208/230-1-60** V-Ph-Hz

### Indoor Coil Parameters

Unit Model:.....**FB4C**  
Unit Size:..... **18,000 Btuh (Size 018)**  
Cabinet Style:..... **TXV**  
Voltage:..... **208-1-60** V-Ph-Hz  
Refrigerant Type: ..... **Puron**  
Heating Size:..... **No Heat**

### Outdoor Unit Dimensions and Weight

Unit Length:..... **31.1875** in  
Unit Width: ..... **31.1875** in  
Unit Height: ..... **28.6875** in  
Unit Shipping Weight:..... **207.** lb

### Indoor Coil Dimensions and Weight

Unit Length:..... **22.0625** in  
Unit Width:..... **14.3125** in  
Unit Height: ..... **42.6875** in  
Unit Shipping Weight:..... **112.** lb

### WARRANTY - OTHER APPLICATIONS

The warranty period is five (5) years on the compressor, and one (1) year on all other parts. The warranty is the original owner only and is not available for subsequent owners.

### Ordering Information

Part Number	Description	Quantity
<b>Outdoor Unit</b>		
25HBC518A003	25HBC Carrier Comfort Heat Pump with Puron 1.5 Tons Cooling 15 SEER @ ARI Conditions	1
	Dense Grille	
<b>Indoor Coil</b>		
FB4CNP018L00	FB4C Base Series Fan Coil with Puron 18000 BTU Cooling 208/230-1-60	1
	TXV	
	Aluminum	
<b>Accessories</b>		
KFCEH0801N08	8 kW, Electric Heater, Non-fused, 1 phase, with relays for Indoor Unit	

The Product and Ratings Data in this program is subject to change at any time and without notice. Please refer to the latest product literature and the AHRI directory at [www.ahridirectory.org](http://www.ahridirectory.org) for the most up-to-date information.

# Performance Summary For 1.5 Ton HP Split

Project: ~Untitled7  
Prepared By:

08/15/2019

## System Performance

<b>System:</b> .....	<b>25HBC/FB4C</b>	Actual Clg Airflow: .....	<b>600.0</b>	CFM
System Quantity: .....	<b>1</b>	Standard Clg Airflow: .....	<b>600.0</b>	CFM
Altitude: .....	<b>0.0</b> ft	Total Net Clg Capacity: .....	<b>17.60</b>	MBH
Linear Pipe Length: .....	<b>50.0</b> ft	Net Sensible Clg Capacity: .....	<b>13.45</b>	MBH
COP @ 47 F: .....	<b>3.70</b>	Htg HP Capacity: .....	<b>17.80</b>	MBH
COP @ 17 F: .....	<b>2.46</b>	Htg HP Integrated Capacity: .....	<b>17.80</b>	MBH
SEER @ ARI Conditions: .....	<b>14.0</b>	Heating HP Compressor Power: .....	<b>1.42</b>	kW
EER @ ARI Conditions: .....	<b>11.5</b>	Total System Power: .....	<b>1.46</b>	kW
HSPF @ ARI Conditions: .....	<b>8.2</b>			

## System Parameters

### Outdoor Unit Parameters

Unit Model: .....	<b>25HBC518A003</b>
Unit Size (Nominal): .....	<b>1.5 Tons (Size 18)</b>
Voltage: .....	<b>208/230-1-60</b> V-Ph-Hz
Clg Ent Air DB Ambient: .....	<b>95.0</b> °F
Htg Ent Air DB Ambient: .....	<b>47.0</b> °F

### Indoor Coil Parameters

Unit Model: .....	<b>FB4CNP018L00</b>
Unit Size (Nominal): .....	<b>18,000 Btuh (Size 018)</b>
Voltage: .....	<b>208-1-60</b> V-Ph-Hz
Ent Air DB: .....	<b>80.00</b> °F
Ent Air WB: .....	<b>67.00</b> °F
Ent Enthalpy: .....	<b>31.44</b> BTU/lb
Lvg Air DB: .....	<b>59.25</b> °F
Lvg Air WB: .....	<b>57.82</b> °F
Lvg Enthalpy: .....	<b>24.92</b> BTU/lb
Htg Ent Air DB: .....	<b>70.0</b> °F
Htg Lvg Air DB: .....	<b>97.8</b> °F
Heating Size (Nominal): .....	<b>No Heat</b>
Total External Static Pressure: .....	<b>0.50</b> in wg

## Electrical Data

### Outdoor Electrical Data

Unit Voltage: .....	<b>208/230-1-60</b> V-Ph-Hz
Fan Motor FLA: .....	<b>0.50</b> Amps
MCA: .....	<b>11.8</b> Amps
Max Fuse: .....	<b>20</b> Amps
Operating Range Min: .....	<b>197</b> V
Operating Range Max: .....	<b>253</b> V
Compressor RLA: .....	<b>9.0</b> Amps
Compressor LRA: .....	<b>48.0</b> Amps

### Indoor Electrical Data

Unit Voltage: .....	<b>208-1-60</b> V-Ph-Hz
Motor HP: .....	<b>1/3</b> HP
Motor FLA: .....	<b>2.8</b> Amps

### Accessory Electric Heater Data

EH Part Number: .....	<b>KFCEH0801N08</b>
Electric Heater kW: .....	<b>8.0</b> kW
<b>For 2 wire operation (single circuit):</b>	
Heater Amps: .....	<b>28.9</b> Amps
Heater + Motor MCA: .....	<b>44.7</b> Amps
Heater + Motor MOCP: .....	<b>45</b> Amps
Accessory Voltage: .....	<b>208-1-60</b> V-Ph-Hz

The Product and Ratings Data in this program is subject to change at any time and without notice. Please refer to the latest product literature and the AHRI directory at [www.ahridirectory.org](http://www.ahridirectory.org) for the most up-to-date information.

## Acoustic Summary For 1.5 Ton HP Split

Project: ~Untitled7  
Prepared By:

08/15/2019

**Outdoor Unit Parameters:**

Unit Model: ..... **25HBC**  
 Unit Size: ..... **1.5 Tons (Size 18)**  
 Variations: ..... **Dense Grille**

Octave Band Center Frequency, Hz	125	250	500	1k	2k	4k	8k	dB
Sound Power, dB	49.0	58.0	66.5	67.5	64.0	60.0	54.0	
A-Weighted Sound Power, dBA								72.0

**Indoor Coil Parameters:**

Unit Model: **FB4C**  
 Unit Size: **18,000 Btuh (Size 018)**  
 Cabinet Style: **TXV**

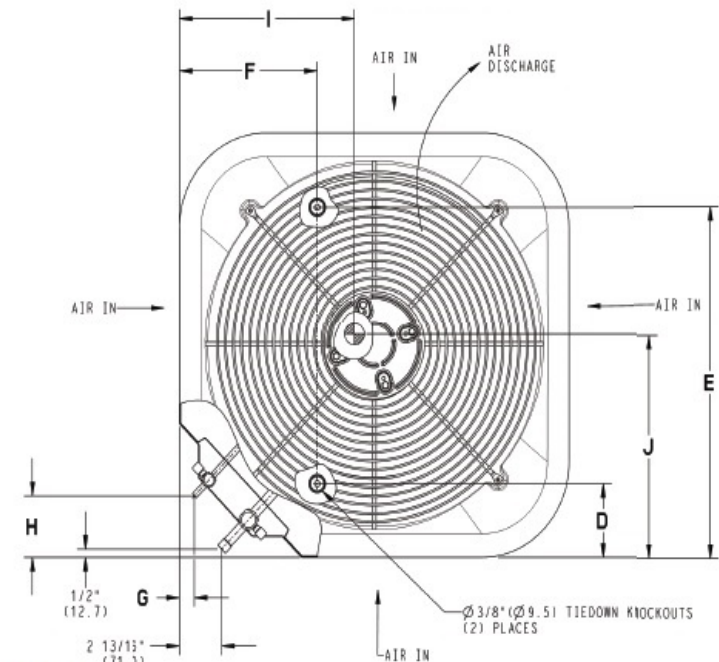
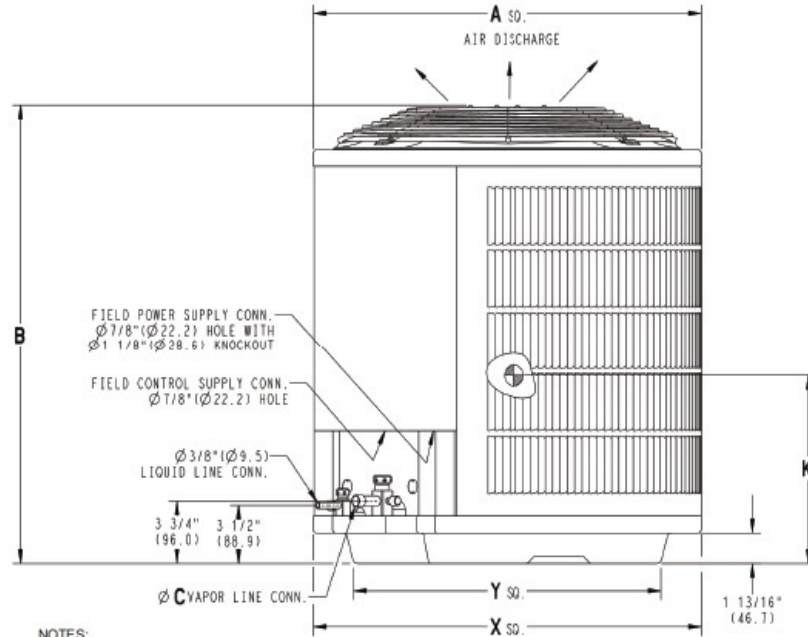
Octave Band Center Frequency, Hz	63	125	250	500	1k	2k	4k
Sound Power, dB	64.7	60.7	56.7	53.7	51.7	49.7	45.7

The Product and Ratings Data in this program is subject to change at any time and without notice. Please refer to the latest product literature and the AHRI directory at [www.ahridirectory.org](http://www.ahridirectory.org) for the most up-to-date information.

# Certified Drawing For 1.5 Ton HP Split

Project: ~Untitled7  
Prepared By:

08/15/2019



- NOTES:
1. ALLOW 24" (609.6) CLEARANCE TO SERVICE SIDE OF UNIT, 48" (1219.2) ABOVE UNIT, 6" (152.4) ON ONE SIDE, 12" (304.8) ON REMAINING SIDE, AND 24" (609.6) BETWEEN UNITS FOR PROPER AIRFLOW.
  2. CENTER OF GRAVITY
  3. SERIES DESIGNATION IS THE 13TH POSITION OF THE UNIT MODEL NUMBER.

**Outdoor Model**

Unit Model: .....**25HBC**  
 Unit Size: ..... **1.5 Tons (Size 18)**  
 Voltage: ..... **208/230-1-60** V-Ph-Hz  
 SEER: ..... **15**  
 PartNumber: ..... **25HBC518A003**

Shipping Dimensions and Weights	Outdoor Unit
Height	33.19 in
Width	33.31 in
Length	33.31 in
Operating Weight	169. lb
Shipping Weight	207. lb

Dimensions										
A	B	C	D	E	F	G	H	I	J	K
31.19 in	28.69 in	0.63 in	6.56 in	24.69 in	9.13 in	1.13 in	3.81 in	16.00 in	15.00 in	14.00 in

The Product and Ratings Data in this program is subject to change at any time and without notice. Please refer to the latest product literature and the AHRI directory at [www.ahridirectory.org](http://www.ahridirectory.org) for the most up-to-date information.



# Certified Drawing For 1.5 Ton HP Split

Project: ~Untitled7  
Prepared By:

08/15/2019

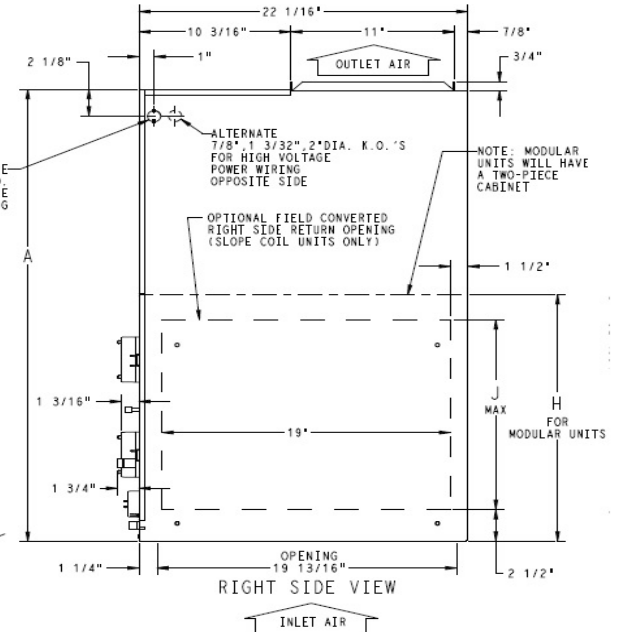
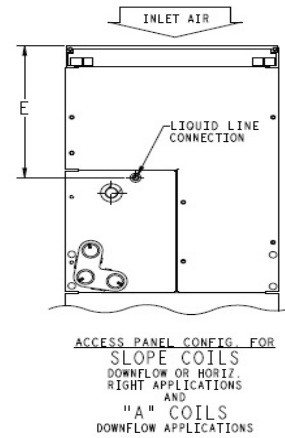
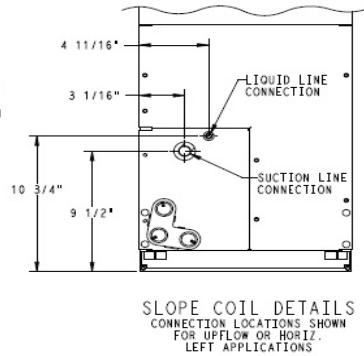
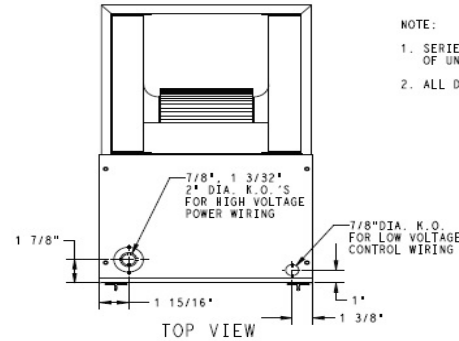
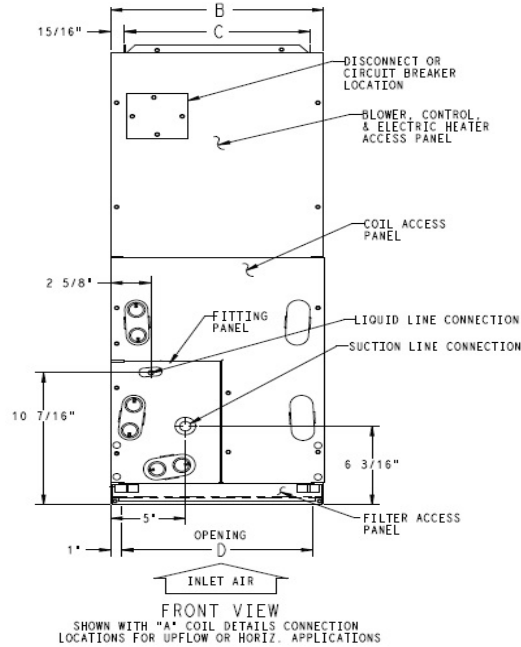
### UNIT CONNECTION SIZES

SUCTION: 018 & 024 - 5/8" I.D. SWEAT  
030 & 036 - 3/4" I.D. SWEAT  
042 THRU 060 - 7/8" I.D. SWEAT  
LIQUID: 3/8" I.D. SWEAT  
CONDENSATE: 3/4" FPT

**NOTE:**

1. SERIES DESIGNATION IS THE 14TH POSITION OF UNIT PRODUCT NUMBER
2. ALL DIMENSIONS ARE IN "INCHES" UNLESS NOTED.

NOTE: ALLOW 21" FROM FRONT FOR SERVICE



**Indoor Coil**

Unit Model:..... **FB4C**  
Unit Size:..... **18,000 Btuh (Size 018)**  
Voltage:..... **208-1-60** V-Ph-Hz  
Cabinet Style:..... **TXV**  
PartNumber:..... **FB4CNP018L00**

Dimensions and Weights	Indoor Coil
Height	42.69 in
Width	14.31 in
Length	22.06 in
Shipping Weight	112. lb

Dimensions									
A	B	C	D	E	F	G	H	J	
42.69 in	14.31 in	12.44 in	12.31 in	10.44 in	18.13 in	18.63 in	--	12.00 in	

The Product and Ratings Data in this program is subject to change at any time and without notice. Please refer to the latest product literature and the AHRI directory at [www.ahrirectory.org](http://www.ahrirectory.org) for the most up-to-date information.

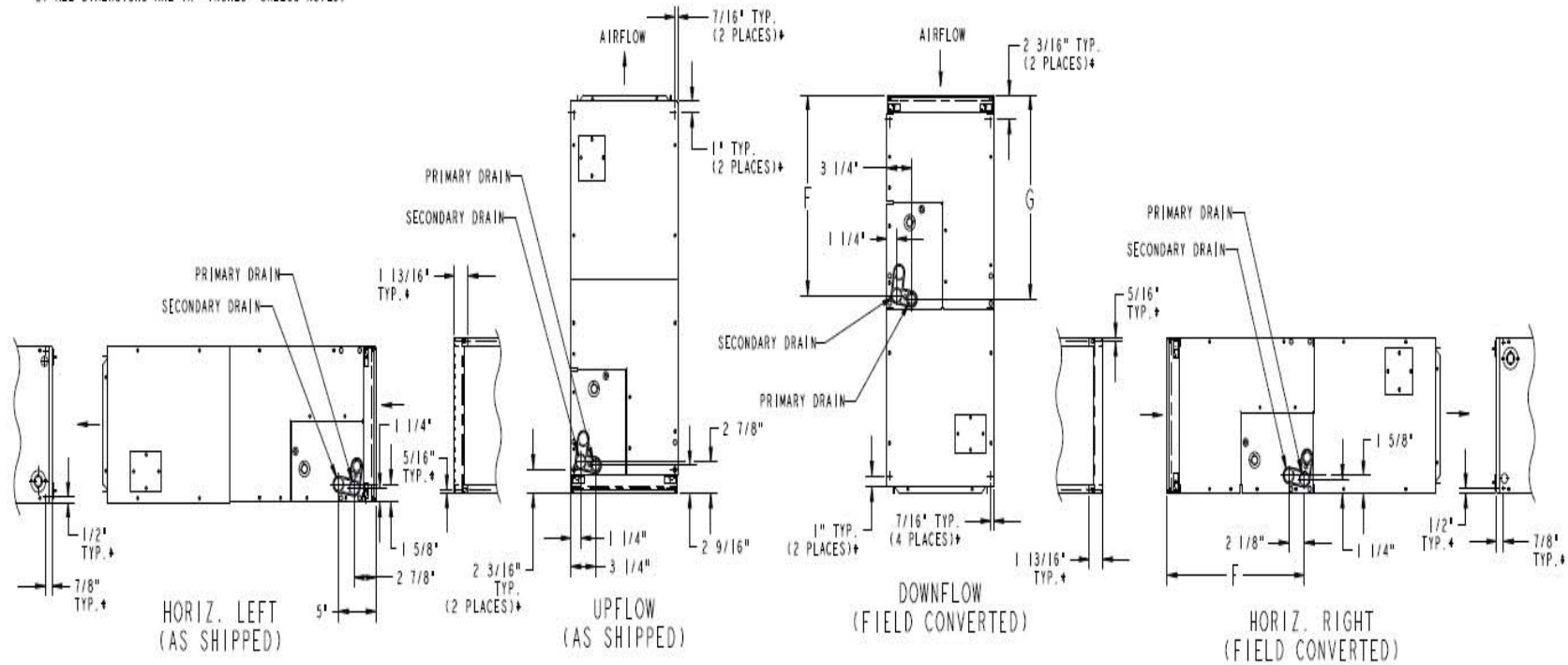
# Certified Drawing For 1.5 Ton HP Split

Project: ~Untitled7  
Prepared By:

08/15/2019

- NOTES:  
1. CONDENSATE PAN DRAIN CAPS NOT SHOWN FOR CLARITY.  
2. ALL DIMENSIONS ARE IN "INCHES" UNLESS NOTED.

## SLOPE COIL



**Indoor Coil**

Unit Model:..... **FB4C**  
 Unit Size:..... **18,000 Btuh (Size 018)**  
 Voltage:..... **208-1-60** V-Ph-Hz  
 PartNumber:..... **FB4CNP018L00**

The Product and Ratings Data in this program is subject to change at any time and without notice. Please refer to the latest product literature and the AHRI directory at [www.ahridirectory.org](http://www.ahridirectory.org) for the most up-to-date information.

**25HBC5  
Base 15 Heat Pump  
with Puron® Refrigerant  
1–1/2 to 5 Nominal Tons**



## Product Data



Carrier heat pumps with Puron® refrigerant provide a collection of features unmatched by any other family of equipment. The 25HBC has been designed utilizing Carrier's Puron refrigerant. The environmentally sound refrigerant allows consumers to make a responsible decision in the protection of the earth's ozone layer.

As an Energy Star® Partner, Carrier Corporation has determined that this product meets the Energy Star® guidelines for energy efficiency. Refer to the combination ratings in the Product Data for system combinations that meet Energy Star® guidelines.

**NOTE:** Ratings contained in this document are subject to change at any time. Always refer to the AHRI directory ([www.ahridirectory.org](http://www.ahridirectory.org)) for the most up-to-date ratings information.

### INDUSTRY LEADING FEATURES / BENEFITS

#### Efficiency

- 15 SEER/ 12.5 EER / 8.0 - 9.0 HSPF
- Microtube Technology™ refrigeration system
- Indoor air quality accessories available

#### Sound

- Sound level as low as 69 dBA
- Sound levels as low as 68 dBA with accessory sound blanket

#### Comfort

- System supports Edge® Thermidistat™ or standard thermostat controls

#### Reliability

- Puron® refrigerant - environmentally sound, won't deplete the ozone layer and low lifetime service cost.
- Scroll compressor
- Internal pressure relief valve
- Internal thermal overload
- High pressure switch
- Loss of charge switch
- Filter drier
- Balanced refrigeration system for maximum reliability

#### Durability

WeatherArmor™ protection package:

- Solid, durable sheet metal construction
- Dense wire coil guard standard
- Baked-on powder paint

#### Applications

- Long-line - up to 250 feet (76.20 m) total equivalent length, up to 200 feet (60.96 m) condenser above evaporator, or up to 80 ft. (24.38 m) evaporator above condenser (See Longline Guide for more information.)
- Low ambient cooling (down to -20°F/-28.9°C) with accessory kit

**FB4C  
Base Series Fan Coil  
Sizes 018 thru 061**



## Product Data

### AIR HANDLER TECHNOLOGY AT ITS FINEST



A10082

The FB4C fan coil has the proven technology of Carrier fan coil units with Puron® refrigerant as well as vertical and horizontal applications. The design features contoured condensate pans with rugged drain connections, ensuring that little water is left in the unit at the end of the cooling duty cycle. The lack of standing condensate and corrosion free pans improves IAQ and product life, features homeowners appreciate.

Standard features include grooved tubing and louvered fins. Coil circuiting has also been updated to make the most of all Carrier heat pumps and air conditioners. Units come with solid state fan controls, 1-inch (25mm) thick insulation with R-value of 4.2, multi-speed motors, and fully-wettable coils. Units can accommodate factory- and/or field-installed heaters from 3 to 30 kW.

The FB4C fan coil design is loaded with popular features. These fan coils utilize the latest in electronic commutation motor (ECM) technology through the use of high efficiency, multi-tap ECM motors allowing reliable air delivery with increased static pressure. It comes in a pre-painted (taupe metallic) galvanized steel casing and a factory-supplied power plug for ease of installation. The FB4C unit is shipped with a factory-installed Teflon-ring piston FB4CNF(018-048) or a Puron refrigerant TXV FB4CNP (018-061).

In order to meet the California Title 24 requirement of 1.4% air leakage at 0.5" water, an accessory kit is available. (Refer to Accessories section.

## **3.5 Ton HP Split**

Project: ~Untitled7  
Prepared By:

08/15/2019

**Option #4 - Zone #3 - Main Office and Meeting Room**

### **3.5 Ton HP Split**

**Submittal Cover Sheet  
Unit Report  
Performance Summary Report  
Acoustic Summary  
Certified Drawings  
Guide Specifications  
Feature Sheet**

## Unit Report For 3.5 Ton HP Split

Project: ~Untitled7  
Prepared By:

08/15/2019



### Outdoor Unit Parameters

Unit Model: ..... **25HBC**  
Unit Size: ..... **3.5 Tons (Size 42)**  
Voltage: ..... **208/230-1-60** V-Ph-Hz

### Indoor Coil Parameters

Unit Model: ..... **FB4C**  
Unit Size: ..... **42,000 Btuh (Size 042)**  
Cabinet Style: ..... **TXV**  
Voltage: ..... **208-1-60** V-Ph-Hz  
Refrigerant Type: ..... **Puron**  
Heating Size: ..... **No Heat**

### Outdoor Unit Dimensions and Weight

Unit Length: ..... **35** in  
Unit Width: ..... **35** in  
Unit Height: ..... **28.6875** in  
Unit Shipping Weight: ..... **290.** lb

### Indoor Coil Dimensions and Weight

Unit Length: ..... **22.0625** in  
Unit Width: ..... **21.125** in  
Unit Height: ..... **49.625** in  
Unit Shipping Weight: ..... **157.** lb

### WARRANTY - OTHER APPLICATIONS

The warranty period is five (5) years on the compressor, and one (1) year on all other parts. The warranty is the original owner only and is not available for subsequent owners.

### Ordering Information

Part Number	Description	Quantity
<b>Outdoor Unit</b>		
25HBC542A003	25HBC Carrier Comfort Heat Pump with Puron 3.5 Tons Cooling 15 SEER @ ARI Conditions	1
	Dense Grille	
<b>Indoor Coil</b>		
FB4CNP042L00	FB4C Base Series Fan Coil with Puron 42000 BTU Cooling 208/230-1-60	1
	TXV	
	Aluminum	
<b>Accessories</b>		
KFCEH3001F15	15 kW, Electric Heater, Fused, Stageable, with relays for Indoor Unit	

The Product and Ratings Data in this program is subject to change at any time and without notice. Please refer to the latest product literature and the AHRI directory at [www.ahridirectory.org](http://www.ahridirectory.org) for the most up-to-date information.

# Performance Summary For 3.5 Ton HP Split

Project: ~Untitled7  
Prepared By:

08/15/2019

## System Performance

<b>System:</b> .....	<b>25HBC/FB4C</b>	Actual Clg Airflow:.....	<b>1400.0</b>	CFM
System Quantity:.....	<b>1</b>	Standard Clg Airflow:.....	<b>1400.0</b>	CFM
Altitude:.....	<b>0.0</b> ft	Total Net Clg Capacity:.....	<b>42.50</b>	MBH
Linear Pipe Length:.....	<b>50.0</b> ft	Net Sensible Clg Capacity:.....	<b>31.75</b>	MBH
COP @ 47 F:.....	<b>3.70</b>	Htg HP Capacity:.....	<b>42.00</b>	MBH
COP @ 17 F:.....	<b>2.56</b>	Htg HP Integrated Capacity:.....	<b>42.00</b>	MBH
SEER @ ARI Conditions:.....	<b>14.0</b>	Heating HP Compressor Power:.....	<b>3.36</b>	kW
EER @ ARI Conditions:.....	<b>12.0</b>	Total System Power:.....	<b>3.54</b>	kW
HSPF @ ARI Conditions:.....	<b>8.2</b>			

## System Parameters

### Outdoor Unit Parameters

Unit Model:.....	<b>25HBC542A003</b>
Unit Size (Nominal):.....	<b>3.5 Tons (Size 42)</b>
Voltage:.....	<b>208/230-1-60</b> V-Ph-Hz
Clg Ent Air DB Ambient:.....	<b>95.0</b> °F
Htg Ent Air DB Ambient:.....	<b>47.0</b> °F

### Indoor Coil Parameters

Unit Model:.....	<b>FB4CNP042L00</b>
Unit Size (Nominal):.....	<b>42,000 Btuh (Size 042)</b>
Voltage:.....	<b>208-1-60</b> V-Ph-Hz
Ent Air DB:.....	<b>80.00</b> °F
Ent Air WB:.....	<b>67.00</b> °F
Ent Enthalpy:.....	<b>31.44</b> BTU/lb
Lvg Air DB:.....	<b>59.00</b> °F
Lvg Air WB:.....	<b>57.47</b> °F
Lvg Enthalpy:.....	<b>24.69</b> BTU/lb
Htg Ent Air DB:.....	<b>70.0</b> °F
Htg Lvg Air DB:.....	<b>97.8</b> °F
Heating Size (Nominal):.....	<b>No Heat</b>
Total External Static Pressure:.....	<b>0.50</b> in wg

## Electrical Data

### Outdoor Electrical Data

Unit Voltage:.....	<b>208/230-1-60</b> V-Ph-Hz
Fan Motor FLA:.....	<b>1.20</b> Amps
MCA:.....	<b>27.6</b> Amps
Max Fuse:.....	<b>40</b> Amps
Operating Range Min:.....	<b>197</b> V
Operating Range Max:.....	<b>253</b> V
Compressor RLA:.....	<b>21.1</b> Amps
Compressor LRA:.....	<b>109.0</b> Amps

### Indoor Electrical Data

Unit Voltage:.....	<b>208-1-60</b> V-Ph-Hz
Motor HP:.....	<b>1/2</b> HP
Motor FLA:.....	<b>4.1</b> Amps

### Accessory Electric Heater Data

(Single point power for unit WITH electric heaters)	
EH Part Number:.....	<b>KFCEH3001F15</b>
Electric Heater kW:.....	<b>15.0</b> Kw

### For 2 wire operation (single circuit):

Heater Amps:.....	<b>54.2</b> Amps
Heater + Motor MCA:.....	<b>76.3</b> Amps
Heater + Motor MOCP:.....	<b>80</b> Amps
(Single point wiring kit KFASP0101SPK required if 2 wires.)	

### For 4 wire operation (dual circuit):

Heater Amps L1/L2:.....	<b>36.2</b> Amps
Heater + Motor MCA L1/L2:.....	<b>53.8</b> Amps
Heater + Motor MOCP L1/L2:.....	<b>60</b> Amps
Heater Amps L3/L4:.....	<b>18.1</b> Amps
Heater + Motor MCA L3/L4:.....	<b>22.7</b> Amps
Heater + Motor MOCP L3/L4:.....	<b>25</b> Amps
Accessory Voltage:.....	<b>208-1-60</b> V-Ph-Hz

The Product and Ratings Data in this program is subject to change at any time and without notice. Please refer to the latest product literature and the AHRI directory at [www.ahridirectory.org](http://www.ahridirectory.org) for the most up-to-date information.

## Acoustic Summary For 3.5 Ton HP Split

Project: ~Untitled7  
 Prepared By:

08/15/2019

**Outdoor Unit Parameters:**

Unit Model: ..... **25HBC**  
 Unit Size: ..... **3.5 Tons (Size 42)**  
 Variations: ..... **Dense Grille**

Octave Band Center Frequency, Hz	125	250	500	1k	2k	4k	8k	dB(A)
Sound Power, dB	55.5	60.0	63.5	71.5	65.0	62.5	59.0	
A-Weighted Sound Power, dBA								77.0

**Indoor Coil Parameters:**

Unit Model: **FB4C**  
 Unit Size: **42,000 Btuh (Size 042)**  
 Cabinet Style: **TXV**

Octave Band Center Frequency, Hz	63	125	250	500	1k	2k	4k
Sound Power, dB	68.4	64.4	60.4	57.4	55.4	53.4	49.4

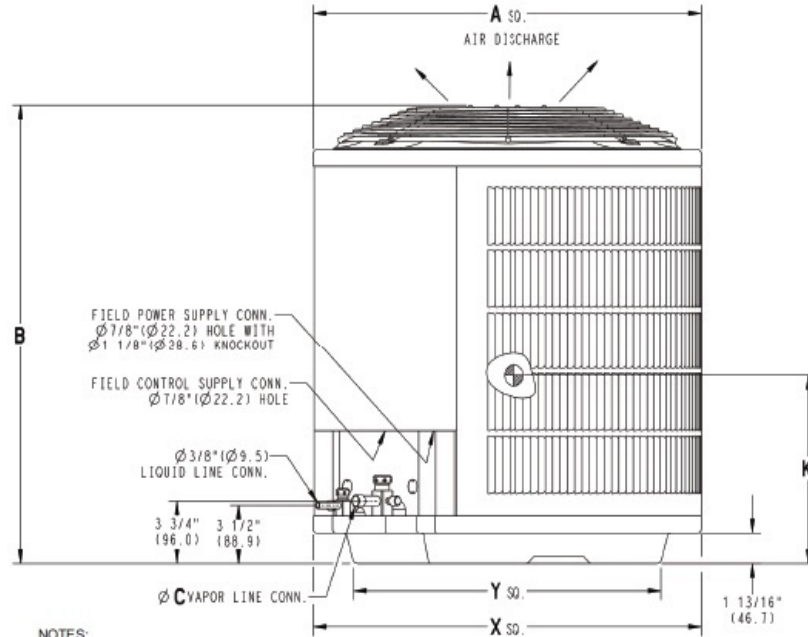
The Product and Ratings Data in this program is subject to change at any time and without notice. Please refer to the latest product literature and the AHRI directory at [www.ahridirectory.org](http://www.ahridirectory.org) for the most up-to-date information.



# Certified Drawing For 3.5 Ton HP Split

Project: ~Untitled7  
Prepared By:

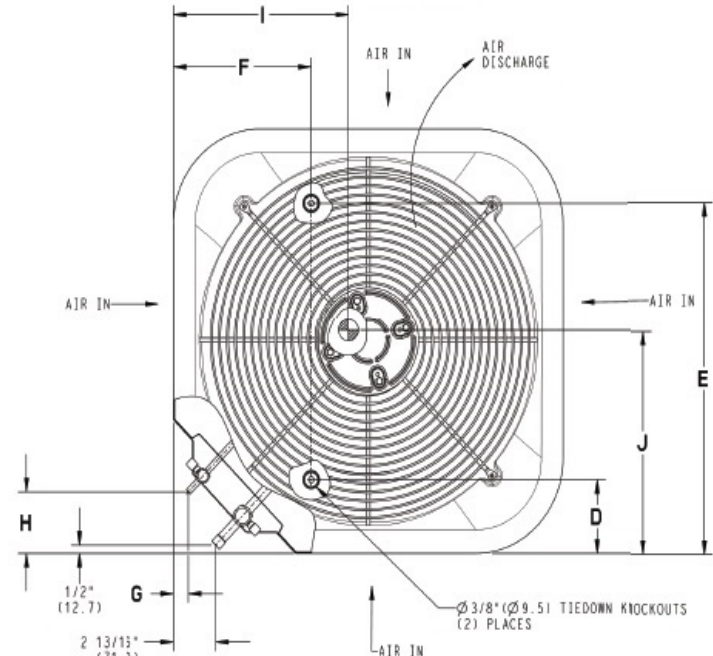
08/15/2019



**NOTES:**

1. ALLOW 24" (609.6) CLEARANCE TO SERVICE SIDE OF UNIT, 48" (1219.2) ABOVE UNIT, 6" (152.4) ON ONE SIDE, 12" (304.8) ON REMAINING SIDE, AND 24" (609.6) BETWEEN UNITS FOR PROPER AIRFLOW.

2. CENTER OF GRAVITY
3. SERIES DESIGNATION IS THE 13TH POSITION OF THE UNIT MODEL NUMBER.



**Outdoor Model**

Unit Model: .....**25HBC**  
 Unit Size: ..... **3.5 Tons (Size 42)**  
 Voltage: ..... **208/230-1-60** V-Ph-Hz  
 SEER: ..... **15**  
 PartNumber: ..... **25HBC542A003**

Shipping Dimensions and Weights	Outdoor Unit
Height	33.19 in
Width	37.13 in
Length	37.13 in
Operating Weight	245. lb
Shipping Weight	290. lb

Dimensions										
A	B	C	D	E	F	G	H	I	J	K
35.00 in	28.69 in	0.88 in	6.56 in	28.44 in	9.13 in	1.13 in	3.81 in	17.00 in	16.75 in	14.75 in

The Product and Ratings Data in this program is subject to change at any time and without notice. Please refer to the latest product literature and the AHRI directory at [www.ahrirectory.org](http://www.ahrirectory.org) for the most up-to-date information.

# Certified Drawing For 3.5 Ton HP Split

Project: ~Untitled7  
Prepared By:

08/15/2019

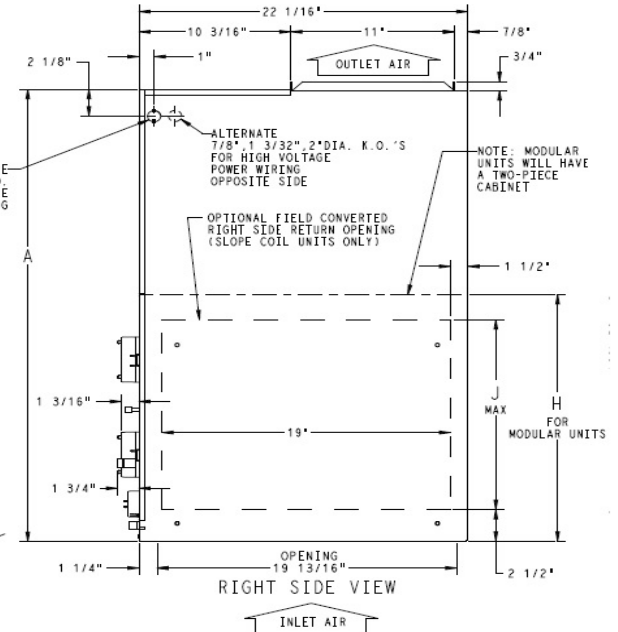
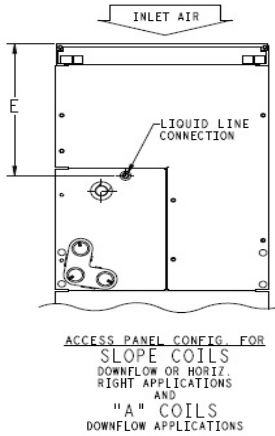
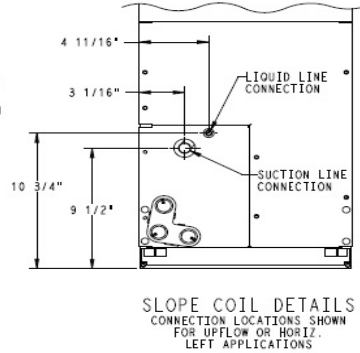
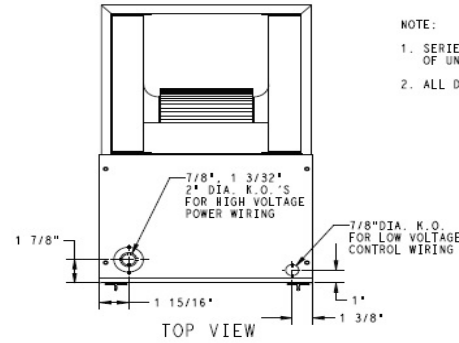
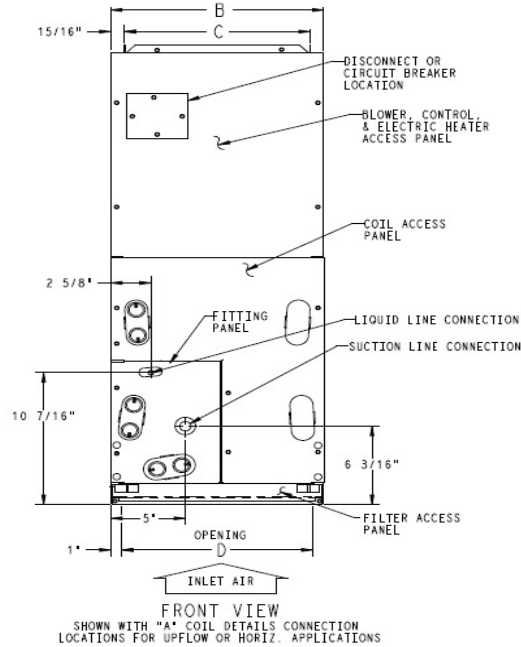
### UNIT CONNECTION SIZES

SUCTION: 018 & 024 - 5/8" I.D. SWEAT  
030 & 036 - 3/4" I.D. SWEAT  
042 THRU 060 - 7/8" I.D. SWEAT  
LIQUID: 3/8" I.D. SWEAT  
CONDENSATE: 3/4" FPT

**NOTE:**

1. SERIES DESIGNATION IS THE 14TH POSITION OF UNIT PRODUCT NUMBER
2. ALL DIMENSIONS ARE IN "INCHES" UNLESS NOTED.

NOTE: ALLOW 21" FROM FRONT FOR SERVICE



**Indoor Coil**

Unit Model:..... **FB4C**  
Unit Size:..... **42,000 Btuh (Size 042)**  
Voltage:..... **208-1-60** V-Ph-Hz  
Cabinet Style:..... **TXV**  
PartNumber:..... **FB4CNP042L00**

Dimensions and Weights	Indoor Coil
Height	49.63 in
Width	21.13 in
Length	22.06 in
Shipping Weight	157. lb

Dimensions									
A	B	C	D	E	F	G	H	J	--
49.63 in	21.13 in	19.25 in	19.13 in	15.69 in	23.44 in	23.13 in	--	--	--

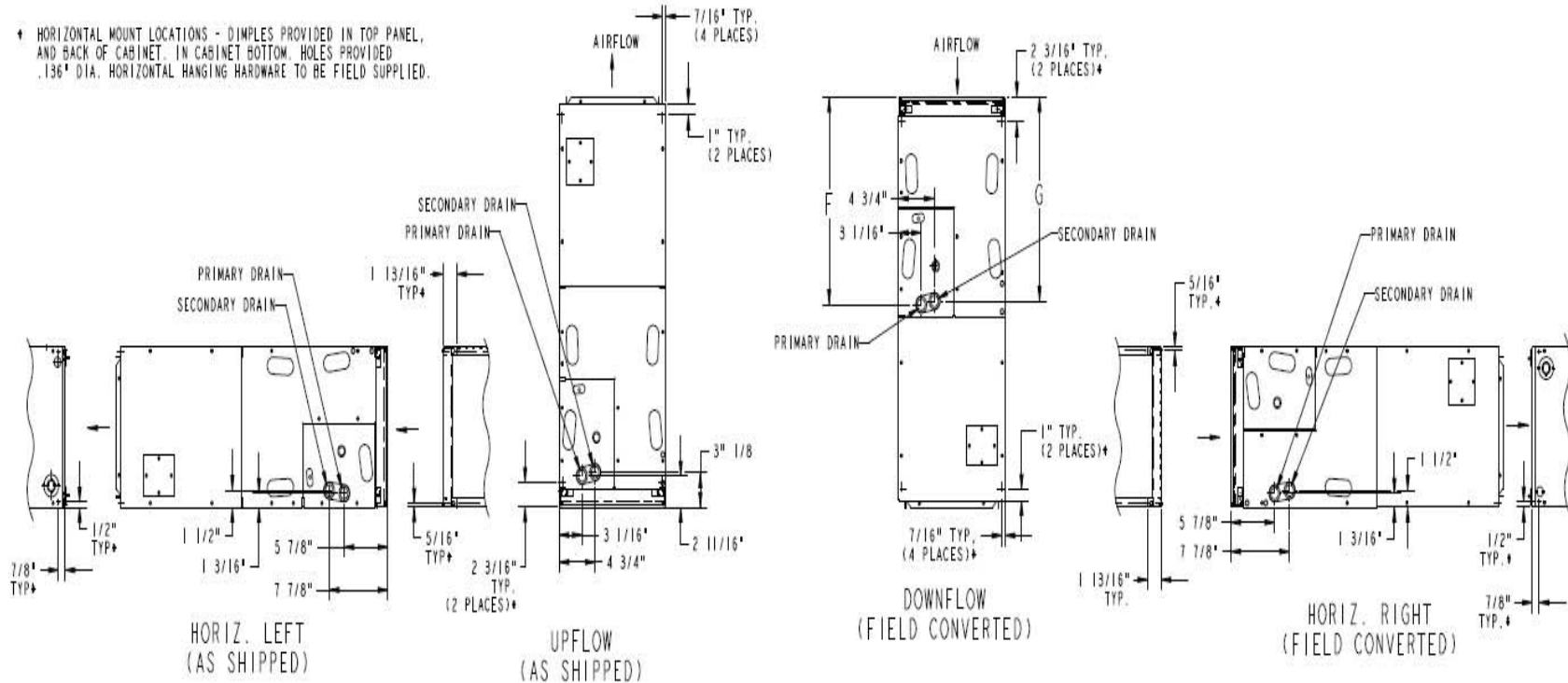
The Product and Ratings Data in this program is subject to change at any time and without notice. Please refer to the latest product literature and the AHRI directory at [www.ahrirectory.org](http://www.ahrirectory.org) for the most up-to-date information.

# Certified Drawing For 3.5 Ton HP Split

Project: ~Untitled7  
Prepared By:

08/15/2019

† HORIZONTAL MOUNT LOCATIONS - DIMPLES PROVIDED IN TOP PANEL, AND BACK OF CABINET. IN CABINET BOTTOM, HOLES PROVIDED .136" DIA. HORIZONTAL HANGING HARDWARE TO BE FIELD SUPPLIED.



A-COIL

**Indoor Coil**

Unit Model:..... **FB4C**  
 Unit Size:..... **42,000 Btuh (Size 042)**  
 Voltage:..... **208-1-60** V-Ph-Hz  
 PartNumber:..... **FB4CNP042L00**

The Product and Ratings Data in this program is subject to change at any time and without notice. Please refer to the latest product literature and the AHRI directory at [www.ahrirectory.org](http://www.ahrirectory.org) for the most up-to-date information.

**25HBC5  
Base 15 Heat Pump  
with Puron® Refrigerant  
1–1/2 to 5 Nominal Tons**



## Product Data



Carrier heat pumps with Puron® refrigerant provide a collection of features unmatched by any other family of equipment. The 25HBC has been designed utilizing Carrier's Puron refrigerant. The environmentally sound refrigerant allows consumers to make a responsible decision in the protection of the earth's ozone layer.

As an Energy Star® Partner, Carrier Corporation has determined that this product meets the Energy Star® guidelines for energy efficiency. Refer to the combination ratings in the Product Data for system combinations that meet Energy Star® guidelines.

**NOTE:** Ratings contained in this document are subject to change at any time. Always refer to the AHRI directory ([www.ahridirectory.org](http://www.ahridirectory.org)) for the most up-to-date ratings information.

### INDUSTRY LEADING FEATURES / BENEFITS

#### Efficiency

- 15 SEER/ 12.5 EER / 8.0 - 9.0 HSPF
- Microtube Technology™ refrigeration system
- Indoor air quality accessories available

#### Sound

- Sound level as low as 69 dBA
- Sound levels as low as 68 dBA with accessory sound blanket

#### Comfort

- System supports Edge® Thermidistat™ or standard thermostat controls

#### Reliability

- Puron® refrigerant - environmentally sound, won't deplete the ozone layer and low lifetime service cost.
- Scroll compressor
- Internal pressure relief valve
- Internal thermal overload
- High pressure switch
- Loss of charge switch
- Filter drier
- Balanced refrigeration system for maximum reliability

#### Durability

WeatherArmor™ protection package:

- Solid, durable sheet metal construction
- Dense wire coil guard standard
- Baked-on powder paint

#### Applications

- Long-line - up to 250 feet (76.20 m) total equivalent length, up to 200 feet (60.96 m) condenser above evaporator, or up to 80 ft. (24.38 m) evaporator above condenser (See Longline Guide for more information.)
- Low ambient cooling (down to -20°F/-28.9°C) with accessory kit

**FB4C  
Base Series Fan Coil  
Sizes 018 thru 061**



## Product Data

### AIR HANDLER TECHNOLOGY AT ITS FINEST



A10082

The FB4C fan coil has the proven technology of Carrier fan coil units with Puron® refrigerant as well as vertical and horizontal applications. The design features contoured condensate pans with rugged drain connections, ensuring that little water is left in the unit at the end of the cooling duty cycle. The lack of standing condensate and corrosion free pans improves IAQ and product life, features homeowners appreciate.

Standard features include grooved tubing and louvered fins. Coil circuiting has also been updated to make the most of all Carrier heat pumps and air conditioners. Units come with solid state fan controls, 1-inch (25mm) thick insulation with R-value of 4.2, multi-speed motors, and fully-wettable coils. Units can accommodate factory- and/or field-installed heaters from 3 to 30 kW.

The FB4C fan coil design is loaded with popular features. These fan coils utilize the latest in electronic commutation motor (ECM) technology through the use of high efficiency, multi-tap ECM motors allowing reliable air delivery with increased static pressure. It comes in a pre-painted (taupe metallic) galvanized steel casing and a factory-supplied power plug for ease of installation. The FB4C unit is shipped with a factory-installed Teflon-ring piston FB4CNF(018-048) or a Puron refrigerant TXV FB4CNP (018-061).

In order to meet the California Title 24 requirement of 1.4% air leakage at 0.5" water, an accessory kit is available. (Refer to Accessories section.

## 2.0 Ton HP Split

Project: ~Untitled7  
Prepared By:

08/15/2019

Option #4 - Zone #4 - Police Department

## 2.0 Ton HP Split

**Submittal Cover Sheet  
Unit Report  
Performance Summary Report  
Acoustic Summary  
Certified Drawings  
Guide Specifications  
Feature Sheet**

## Unit Report For 2.0 Ton HP Split

Project: ~Untitled7  
Prepared By:

08/15/2019



### Outdoor Unit Parameters

Unit Model: ..... **25HBC**  
Unit Size: ..... **2 Tons (Size 24)**  
Voltage: ..... **208/230-1-60** V-Ph-Hz

### Indoor Coil Parameters

Unit Model: ..... **FB4C**  
Unit Size: ..... **30,000 Btuh (Size 030)**  
Cabinet Style: ..... **TXV**  
Voltage: ..... **208-1-60** V-Ph-Hz  
Refrigerant Type: ..... **Puron**  
Heating Size: ..... **No Heat**

### Outdoor Unit Dimensions and Weight

Unit Length: ..... **35** in  
Unit Width: ..... **35** in  
Unit Height: ..... **32.0625** in  
Unit Shipping Weight: ..... **233.** lb

### Indoor Coil Dimensions and Weight

Unit Length: ..... **22.0625** in  
Unit Width: ..... **17.625** in  
Unit Height: ..... **49.625** in  
Unit Shipping Weight: ..... **122.** lb

### WARRANTY - OTHER APPLICATIONS

The warranty period is five (5) years on the compressor, and one (1) year on all other parts. The warranty is the original owner only and is not available for subsequent owners.

### Ordering Information

Part Number	Description	Quantity
<b>Outdoor Unit</b>		
25HBC524A003	25HBC Carrier Comfort Heat Pump with Puron 2 Tons Cooling 15 SEER @ ARI Conditions	1
	Dense Grille	
<b>Indoor Coil</b>		
FB4CNP030L00	FB4C Base Series Fan Coil with Puron 30000 BTU Cooling 208/230-1-60	1
	TXV	
	Aluminum	
<b>Accessories</b>		
KFCEH0801N08	8 kW, Electric Heater, Non-fused, 1 phase, with relays for Indoor Unit	

The Product and Ratings Data in this program is subject to change at any time and without notice. Please refer to the latest product literature and the AHRI directory at [www.ahridirectory.org](http://www.ahridirectory.org) for the most up-to-date information.

# Performance Summary For 2.0 Ton HP Split

Project: ~Untitled7  
Prepared By:

08/15/2019

## System Performance

<b>System:</b> .....	<b>25HBC/FB4C</b>	Actual Clg Airflow: .....	<b>800.0</b>	CFM
System Quantity: .....	<b>1</b>	Standard Clg Airflow: .....	<b>800.0</b>	CFM
Altitude: .....	<b>0.0</b>	Total Net Clg Capacity: .....	<b>23.80</b>	MBH
Linear Pipe Length: .....	<b>50.0</b>	Net Sensible Clg Capacity: .....	<b>18.09</b>	MBH
COP @ 47 F: .....	<b>3.88</b>	Htg HP Capacity: .....	<b>24.00</b>	MBH
COP @ 17 F: .....	<b>2.62</b>	Htg HP Integrated Capacity: .....	<b>24.00</b>	MBH
SEER @ ARI Conditions: .....	<b>15.0</b>	Heating HP Compressor Power: .....	<b>1.81</b>	kW
EER @ ARI Conditions: .....	<b>12.5</b>	Total System Power: .....	<b>1.90</b>	kW
HSPF @ ARI Conditions: .....	<b>8.5</b>			

## System Parameters

### Outdoor Unit Parameters

Unit Model: .....	<b>25HBC524A003</b>
Unit Size (Nominal): .....	<b>2 Tons (Size 24)</b>
Voltage: .....	<b>208/230-1-60</b> V-Ph-Hz
Clg Ent Air DB Ambient: .....	<b>95.0</b> °F
Htg Ent Air DB Ambient: .....	<b>47.0</b> °F

### Indoor Coil Parameters

Unit Model: .....	<b>FB4CNP030L00</b>
Unit Size (Nominal): .....	<b>30,000 Btuh (Size 030)</b>
Voltage: .....	<b>208-1-60</b> V-Ph-Hz
Ent Air DB: .....	<b>80.00</b> °F
Ent Air WB: .....	<b>67.00</b> °F
Ent Enthalpy: .....	<b>31.44</b> BTU/lb
Lvg Air DB: .....	<b>59.06</b> °F
Lvg Air WB: .....	<b>57.68</b> °F
Lvg Enthalpy: .....	<b>24.83</b> BTU/lb
Htg Ent Air DB: .....	<b>70.0</b> °F
Htg Lvg Air DB: .....	<b>97.8</b> °F
Heating Size (Nominal): .....	<b>No Heat</b>
Total External Static Pressure: .....	<b>0.50</b> in wg

## Electrical Data

### Outdoor Electrical Data

Unit Voltage: .....	<b>208/230-1-60</b> V-Ph-Hz
Fan Motor FLA: .....	<b>0.50</b> Amps
MCA: .....	<b>16.5</b> Amps
Max Fuse: .....	<b>25</b> Amps
Operating Range Min: .....	<b>197</b> V
Operating Range Max: .....	<b>253</b> V
Compressor RLA: .....	<b>12.8</b> Amps
Compressor LRA: .....	<b>58.3</b> Amps

### Indoor Electrical Data

Unit Voltage: .....	<b>208-1-60</b> V-Ph-Hz
Motor HP: .....	<b>1/3</b> HP
Motor FLA: .....	<b>2.8</b> Amps

### Accessory Electric Heater Data

EH Part Number: .....	<b>KFCEH0801N08</b>
Electric Heater kW: .....	<b>8.0</b> kW

### For 2 wire operation (single circuit):

Heater Amps: .....	<b>28.9</b> Amps
Heater + Motor MCA: .....	<b>44.7</b> Amps
Heater + Motor MOCP: .....	<b>45</b> Amps
Accessory Voltage: .....	<b>208-1-60</b> V-Ph-Hz

The Product and Ratings Data in this program is subject to change at any time and without notice. Please refer to the latest product literature and the AHRI directory at [www.ahridirectory.org](http://www.ahridirectory.org) for the most up-to-date information.



## Acoustic Summary For 2.0 Ton HP Split

Project: ~Untitled7  
 Prepared By:

08/15/2019

**Outdoor Unit Parameters:**

Unit Model: ..... **25HBC**  
 Unit Size: ..... **2 Tons (Size 24)**  
 Variations: ..... **Dense Grille**

Octave Band Center Frequency, Hz	125	250	500	1k	2k	4k	8k	dB
Sound Power, dB	54.5	64.0	69.0	69.5	67.5	64.0	58.0	
A-Weighted Sound Power, dBA								75.0

**Indoor Coil Parameters:**

Unit Model: **FB4C**  
 Unit Size: **30,000 Btuh (Size 030)**  
 Cabinet Style: **TXV**

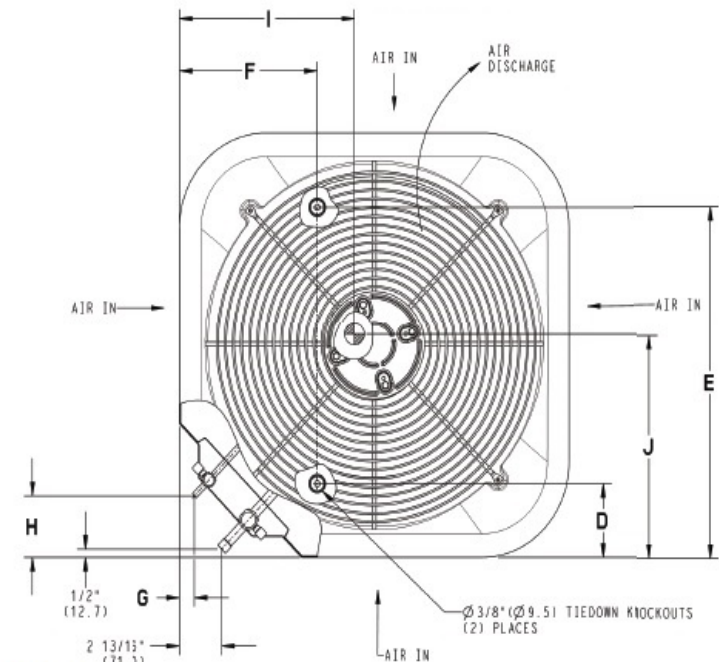
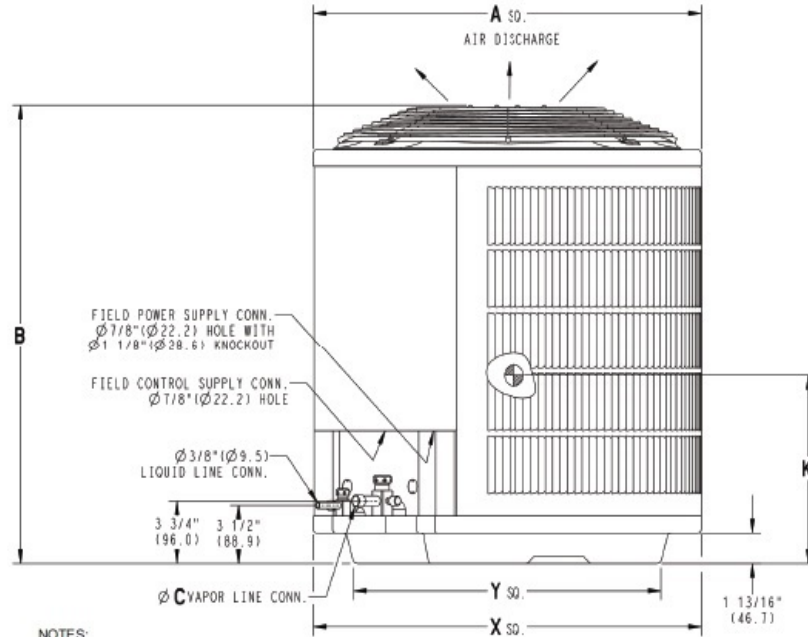
Octave Band Center Frequency, Hz	63	125	250	500	1k	2k	4k
Sound Power, dB	67.0	63.0	59.0	56.0	54.0	52.0	48.0

The Product and Ratings Data in this program is subject to change at any time and without notice. Please refer to the latest product literature and the AHRI directory at [www.ahridirectory.org](http://www.ahridirectory.org) for the most up-to-date information.

# Certified Drawing For 2.0 Ton HP Split

Project: ~Untitled7  
Prepared By:

08/15/2019



- NOTES:
1. ALLOW 24" (609.6) CLEARANCE TO SERVICE SIDE OF UNIT, 48" (1219.2) ABOVE UNIT, 6" (152.4) ON ONE SIDE, 12" (304.8) ON REMAINING SIDE, AND 24" (609.6) BETWEEN UNITS FOR PROPER AIRFLOW.
  2. CENTER OF GRAVITY
  3. SERIES DESIGNATION IS THE 13TH POSITION OF THE UNIT MODEL NUMBER.

**Outdoor Model**

Unit Model: .....25HBC  
 Unit Size: ..... 2 Tons (Size 24)  
 Voltage: ..... 208/230-1-60 V-Ph-Hz  
 SEER: ..... 15  
 PartNumber: ..... 25HBC524A003

Shipping Dimensions and Weights	Outdoor Unit
Height	36.63 in
Width	37.13 in
Length	37.13 in
Operating Weight	200. lb
Shipping Weight	233. lb

Dimensions										
A	B	C	D	E	F	G	H	I	J	K
35.00 in	32.06 in	0.63 in	6.56 in	28.44 in	9.13 in	1.13 in	3.81 in	15.75 in	16.75 in	16.50 in

The Product and Ratings Data in this program is subject to change at any time and without notice. Please refer to the latest product literature and the AHRI directory at [www.ahrirectory.org](http://www.ahrirectory.org) for the most up-to-date information.

# Certified Drawing For 2.0 Ton HP Split

Project: ~Untitled7  
Prepared By:

08/15/2019

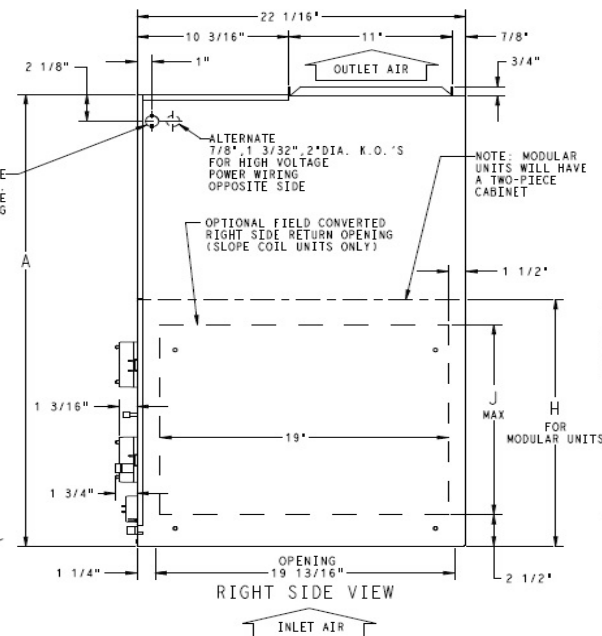
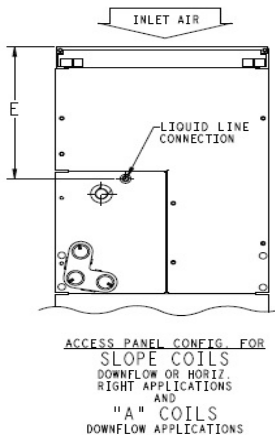
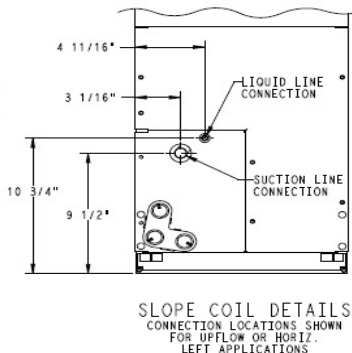
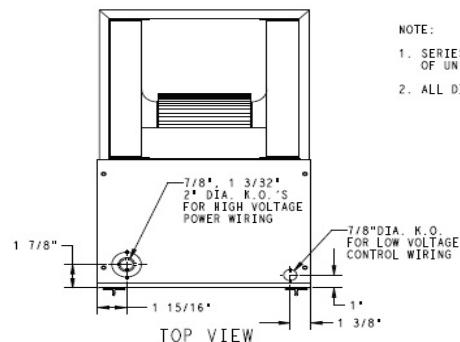
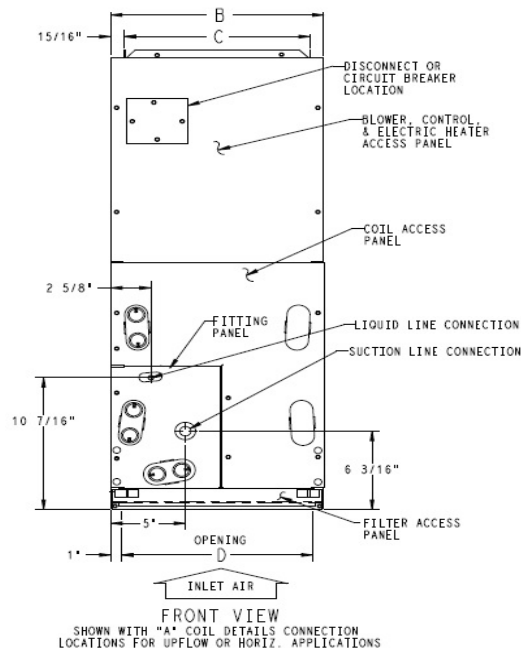
### UNIT CONNECTION SIZES

SUCTION: 018 & 024 - 5/8" I.D. SWEAT  
030 & 036 - 3/4" I.D. SWEAT  
042 THRU 060 - 7/8" I.D. SWEAT  
LIQUID: 3/8" I.D. SWEAT  
CONDENSATE: 3/4" FPT

**NOTE:**

1. SERIES DESIGNATION IS THE 14TH POSITION OF UNIT PRODUCT NUMBER
2. ALL DIMENSIONS ARE IN "INCHES" UNLESS NOTED.

NOTE: ALLOW 21" FROM FRONT FOR SERVICE



**Indoor Coil**

Unit Model:..... **FB4C**  
Unit Size:..... **30,000 Btuh (Size 030)**  
Voltage:..... **208-1-60** V-Ph-Hz  
Cabinet Style:..... **TXV**  
PartNumber:..... **FB4CNP030L00**

Dimensions and Weights	Indoor Coil
Height	49.63 in
Width	17.63 in
Length	22.06 in
Shipping Weight	122. lb

Dimensions									
A	B	C	D	E	F	G	H	J	
49.63 in	17.63 in	15.75 in	15.63 in	15.38 in	23.13 in	23.63 in	--	17.00 in	

The Product and Ratings Data in this program is subject to change at any time and without notice. Please refer to the latest product literature and the AHRI directory at [www.ahrirectory.org](http://www.ahrirectory.org) for the most up-to-date information.

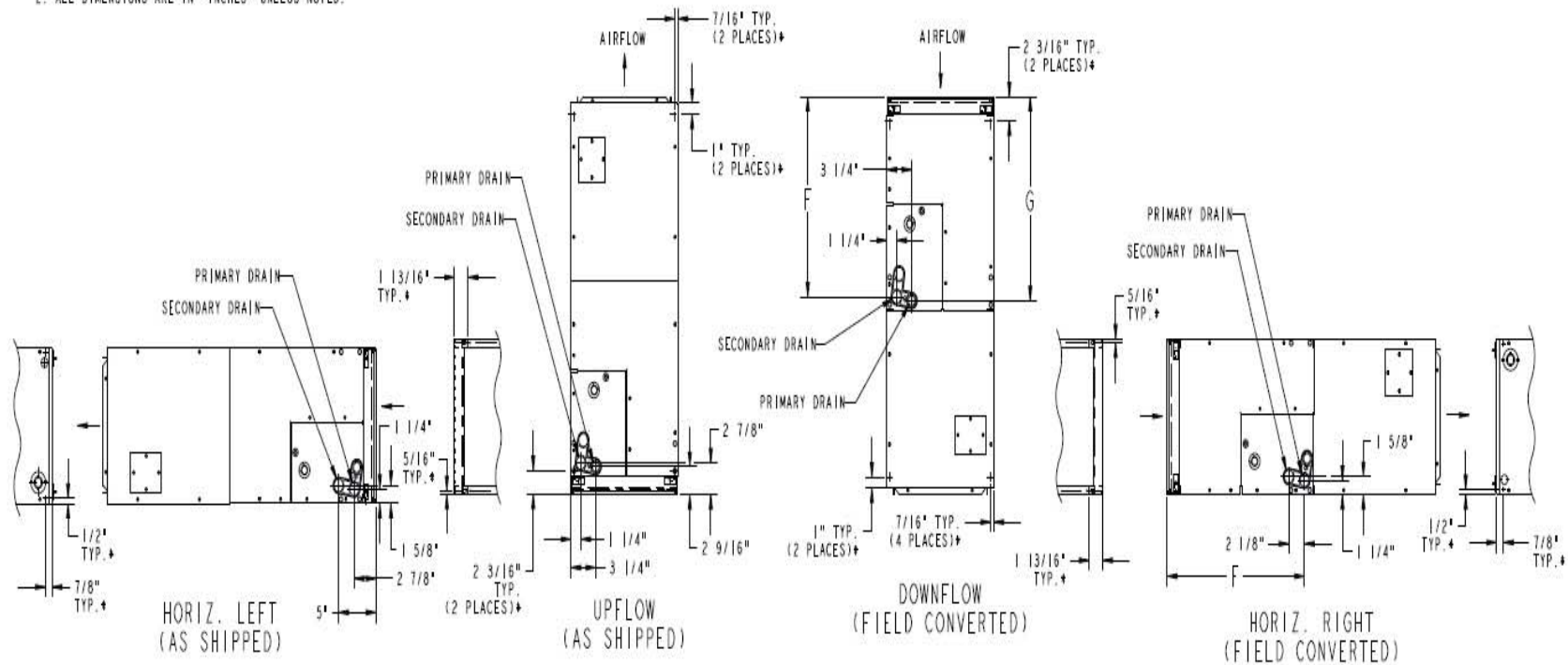
# Certified Drawing For 2.0 Ton HP Split

Project: ~Untitled7  
Prepared By:

08/15/2019

- NOTES:  
1. CONDENSATE PAN DRAIN CAPS NOT SHOWN FOR CLARITY.  
2. ALL DIMENSIONS ARE IN "INCHES" UNLESS NOTED.

## SLOPE COIL



### Indoor Coil

Unit Model:..... **FB4C**  
 Unit Size:..... **30,000 Btuh (Size 030)**  
 Voltage:..... **208-1-60** V-Ph-Hz  
 PartNumber:..... **FB4CNP030L00**

The Product and Ratings Data in this program is subject to change at any time and without notice. Please refer to the latest product literature and the AHRI directory at [www.ahridirectory.org](http://www.ahridirectory.org) for the most up-to-date information.

**25HBC5  
Base 15 Heat Pump  
with Puron® Refrigerant  
1–1/2 to 5 Nominal Tons**



## Product Data



Carrier heat pumps with Puron® refrigerant provide a collection of features unmatched by any other family of equipment. The 25HBC has been designed utilizing Carrier's Puron refrigerant. The environmentally sound refrigerant allows consumers to make a responsible decision in the protection of the earth's ozone layer.

As an Energy Star® Partner, Carrier Corporation has determined that this product meets the Energy Star® guidelines for energy efficiency. Refer to the combination ratings in the Product Data for system combinations that meet Energy Star® guidelines.

**NOTE:** Ratings contained in this document are subject to change at any time. Always refer to the AHRI directory ([www.ahridirectory.org](http://www.ahridirectory.org)) for the most up-to-date ratings information.

### INDUSTRY LEADING FEATURES / BENEFITS

#### Efficiency

- 15 SEER/ 12.5 EER / 8.0 - 9.0 HSPF
- Microtube Technology™ refrigeration system
- Indoor air quality accessories available

#### Sound

- Sound level as low as 69 dBA
- Sound levels as low as 68 dBA with accessory sound blanket

#### Comfort

- System supports Edge® Thermidistat™ or standard thermostat controls

#### Reliability

- Puron® refrigerant - environmentally sound, won't deplete the ozone layer and low lifetime service cost.
- Scroll compressor
- Internal pressure relief valve
- Internal thermal overload
- High pressure switch
- Loss of charge switch
- Filter drier
- Balanced refrigeration system for maximum reliability

#### Durability

WeatherArmor™ protection package:

- Solid, durable sheet metal construction
- Dense wire coil guard standard
- Baked-on powder paint

#### Applications

- Long-line - up to 250 feet (76.20 m) total equivalent length, up to 200 feet (60.96 m) condenser above evaporator, or up to 80 ft. (24.38 m) evaporator above condenser (See Longline Guide for more information.)
- Low ambient cooling (down to -20°F/-28.9°C) with accessory kit

**FB4C  
Base Series Fan Coil  
Sizes 018 thru 061**



## Product Data

### AIR HANDLER TECHNOLOGY AT ITS FINEST



A10082

The FB4C fan coil has the proven technology of Carrier fan coil units with Puron® refrigerant as well as vertical and horizontal applications. The design features contoured condensate pans with rugged drain connections, ensuring that little water is left in the unit at the end of the cooling duty cycle. The lack of standing condensate and corrosion free pans improves IAQ and product life, features homeowners appreciate.

Standard features include grooved tubing and louvered fins. Coil circuiting has also been updated to make the most of all Carrier heat pumps and air conditioners. Units come with solid state fan controls, 1-inch (25mm) thick insulation with R-value of 4.2, multi-speed motors, and fully-wettable coils. Units can accommodate factory- and/or field-installed heaters from 3 to 30 kW.

The FB4C fan coil design is loaded with popular features. These fan coils utilize the latest in electronic commutation motor (ECM) technology through the use of high efficiency, multi-tap ECM motors allowing reliable air delivery with increased static pressure. It comes in a pre-painted (taupe metallic) galvanized steel casing and a factory-supplied power plug for ease of installation. The FB4C unit is shipped with a factory-installed Teflon-ring piston FB4CNF(018-048) or a Puron refrigerant TXV FB4CNP (018-061).

In order to meet the California Title 24 requirement of 1.4% air leakage at 0.5" water, an accessory kit is available. (Refer to Accessories section.

- III. Start-up, commission and warranty all equipment and systems for one year from the date of acceptance/ final payment by the Owner.

End of Heating and Air Conditioning Scope of Work