NYSERDA

Sizing and Design Tools and Considerations



Training Topics

≻ Oversizing

≻ Over-zoning

Existing Duct Management

NEEP Sizing and Design Selection Tool – Live Demonstration

Sizing Considerations

Oversizing, Over-Zoning, Existing Ducts, Supplemental Heating



Oversizing



The Basics

Always specify Air conditioning, Heating & Refrigeration Institute (AHRI) indoor/outdoor matched pairs

Pull extended performance data from NEEP database or manufacturer's data



Size for heating first, cooling second

What Really Matters When Sizing For Heating

Meeting home heating load on the coldest day

Not providing too much heat on mild days

Ensuring heat in every room by choosing the right product.

The Goldilocks Principle





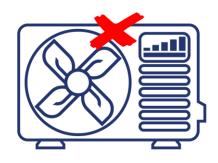
Too Small

System will not keep the house warm on the coldest days

- Poor comfort (cold and may need backup heat)
- Slow catch up if using thermostat setbacks

Just Right

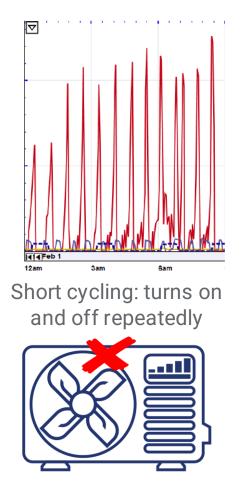
- > Comfortable
- > Efficient
- > Durable

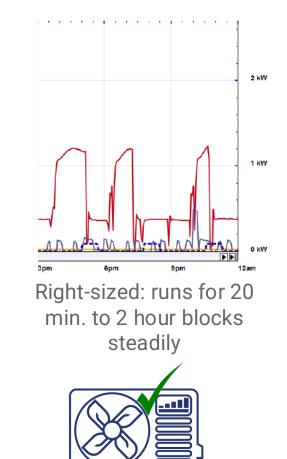


Too Big

- System will cycle on and off
- Poor comfort (humid and too warm)
- Poor energy efficiency
- Poor durability
- > More expensive

Too Much Heat Leads to Short Cycling





The Effects of Oversizing

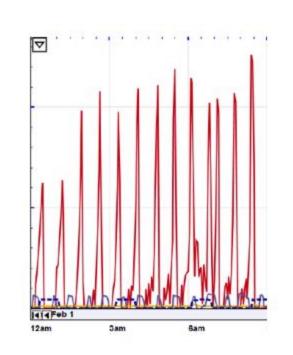
- How Oversized is Oversized?
- > Operational Issues
 - Low-Load Compressor Cycling
 - Lack of Dehumidification
 - Purge Cycling
 - Poor Comfort
- Cost Issues
 - Upfront Cost
 - Energy Usage, Inefficiency, and High Bills
 - Shorter Equipment Lifespan



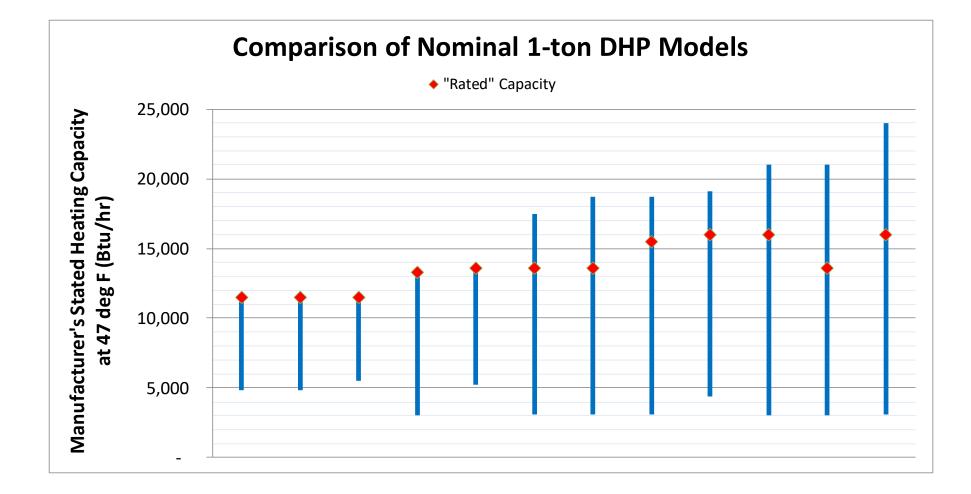


Importance of Avoiding Short Cycling

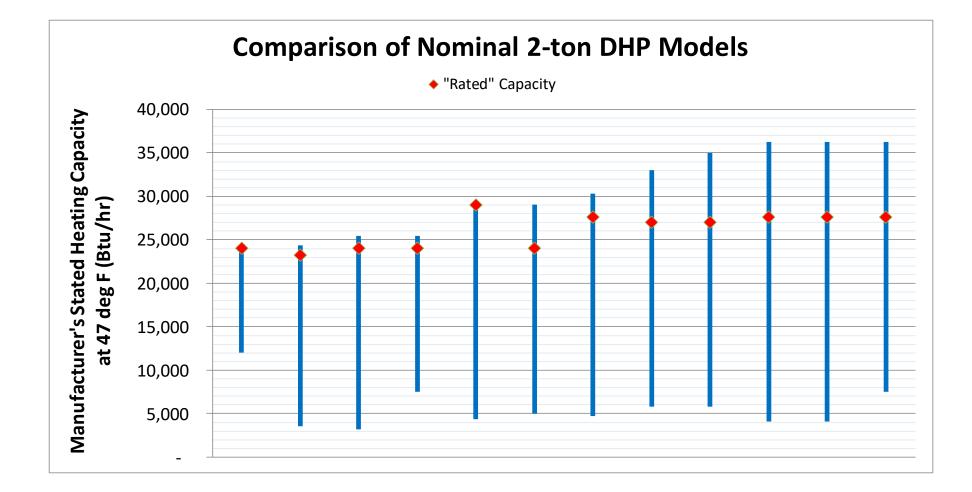
- Short Cycling Can:
 - Reduce operating COP by 15% 40% when short cycling
 - > e.g., a COP of 5.0 acts like a 4.0
- Not as critical as failing to meet design load, but the impact should not be neglected,
 - For partial load displacement it is the more critical sizing factor



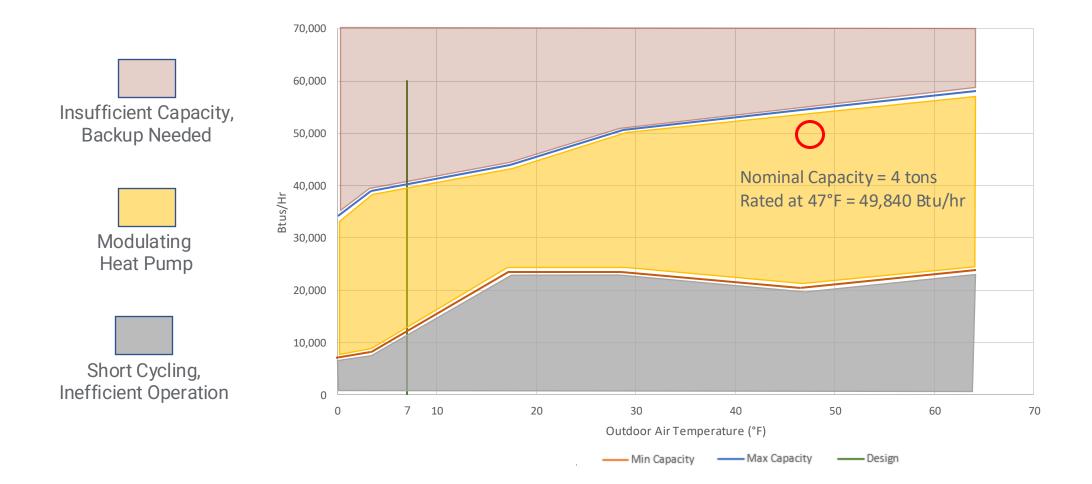
Maximum-Minimum Capacity Ranges



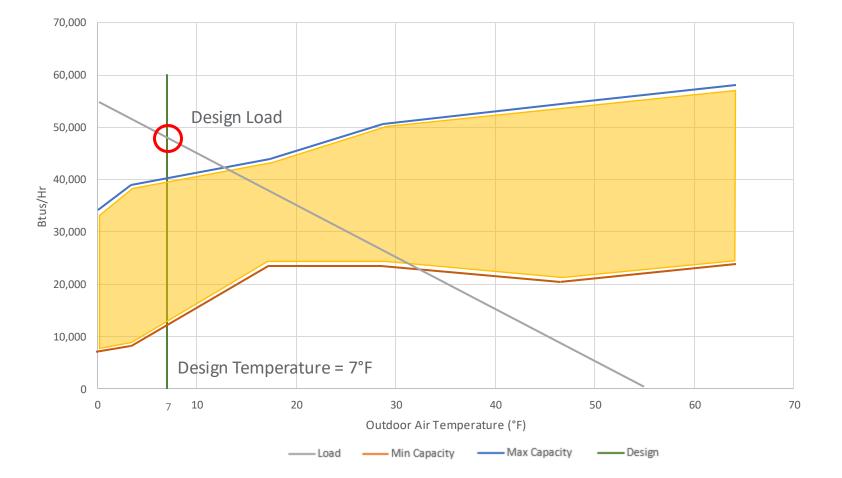
Maximum-Minimum Capacity Ranges



VCHP Modulating Zone

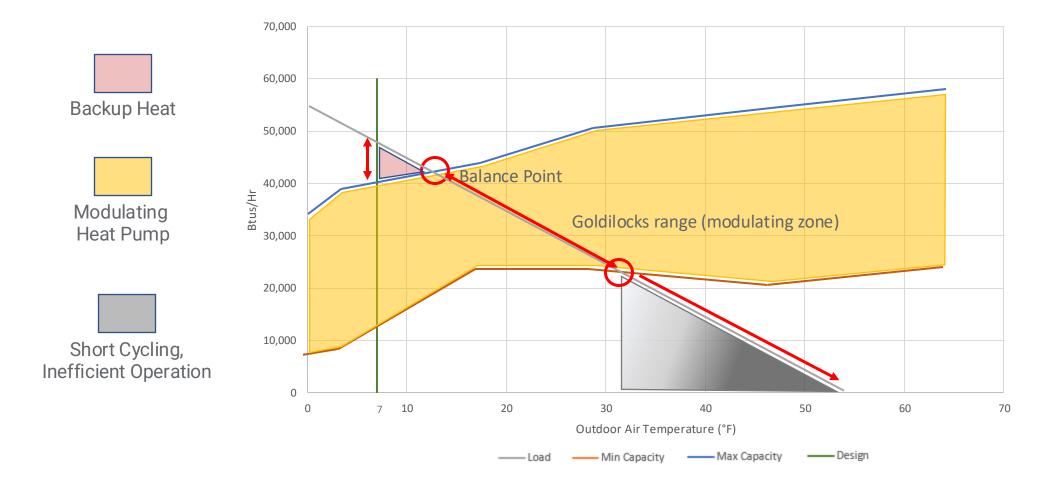


Home Load Line





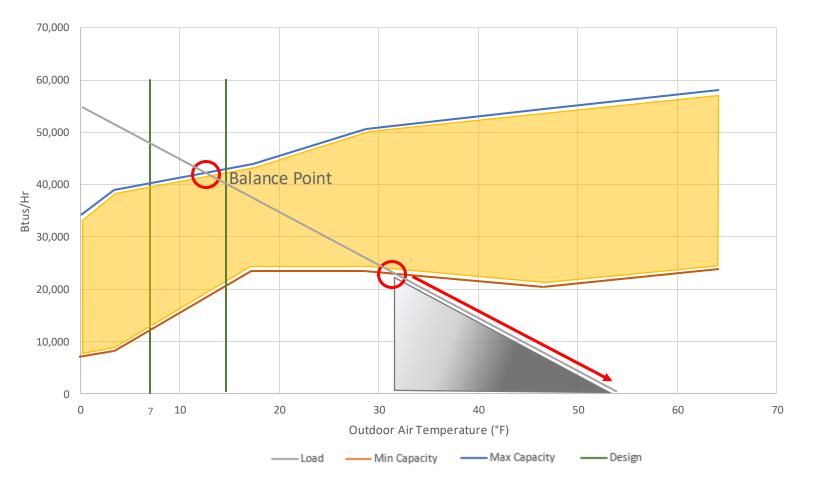
Goldilocks Sizing – Let it Modulate



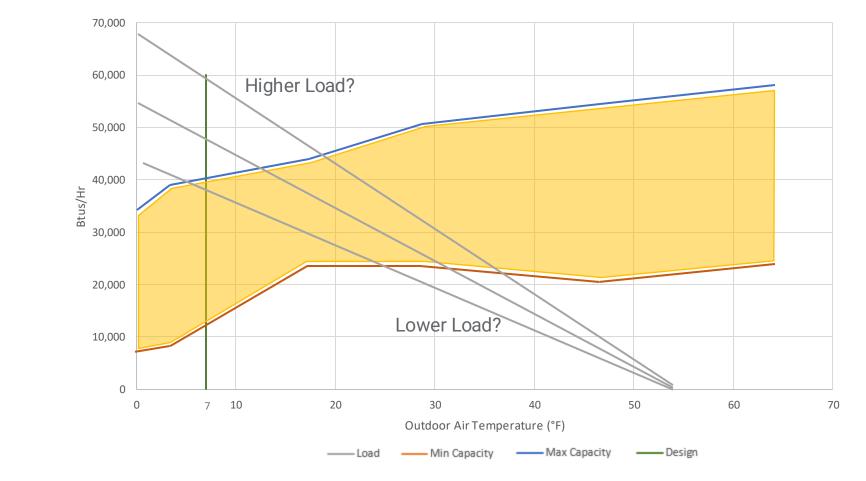
Different Design Temperature?



Short Cycling, Inefficient Operation

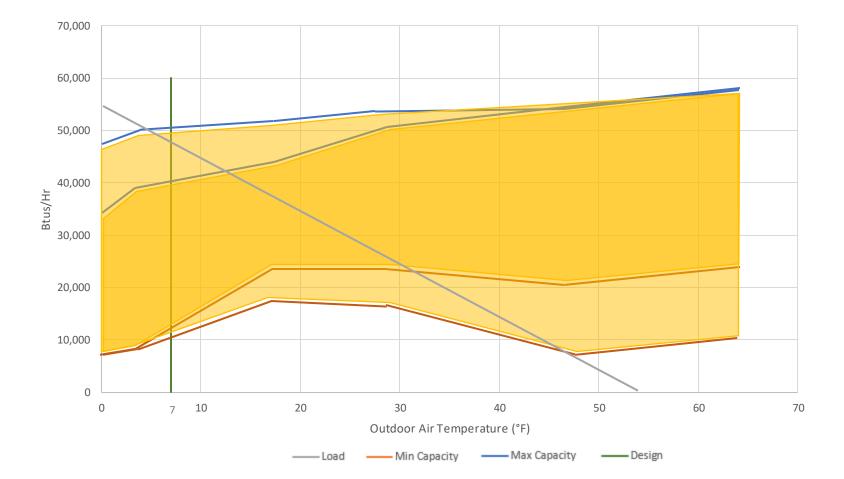


Wrong/Improved Load Line?



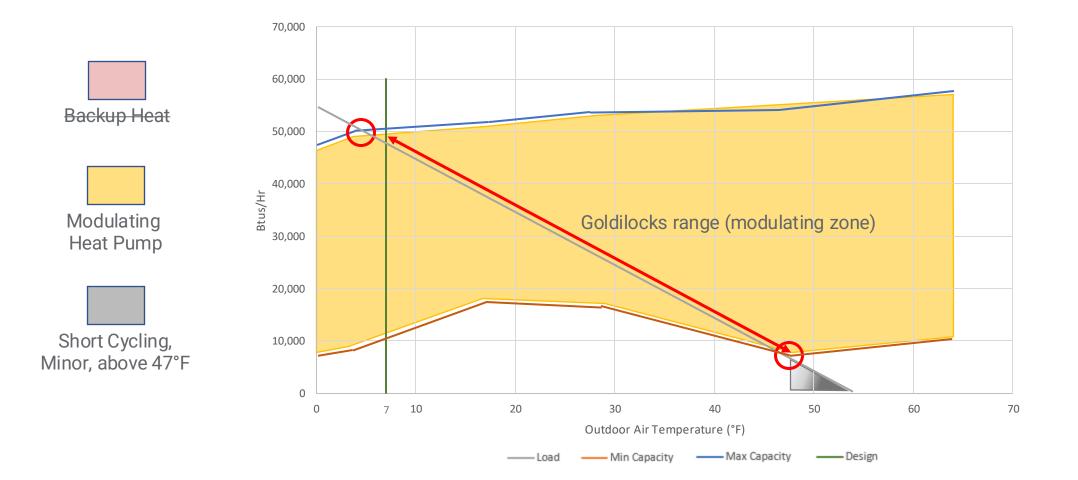
Modulating Heat Pump

Better Sizing – Different Heat Pump?



Modulating Heat Pump

Better Sizing – Different Heat Pump?



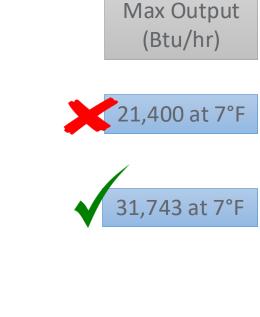
How to Avoid Oversizing

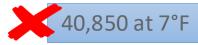
- Conduct an ACCA Manual J Load Calculation
- Use the Correct Design Temperature
- Complete Building Take-offs
- Prepare for the Building's Future
- > Look for Systems with Higher Turndown Ratios
- Look at the latent-cooling load, and be prepared to install supplementary dehumidification as needed



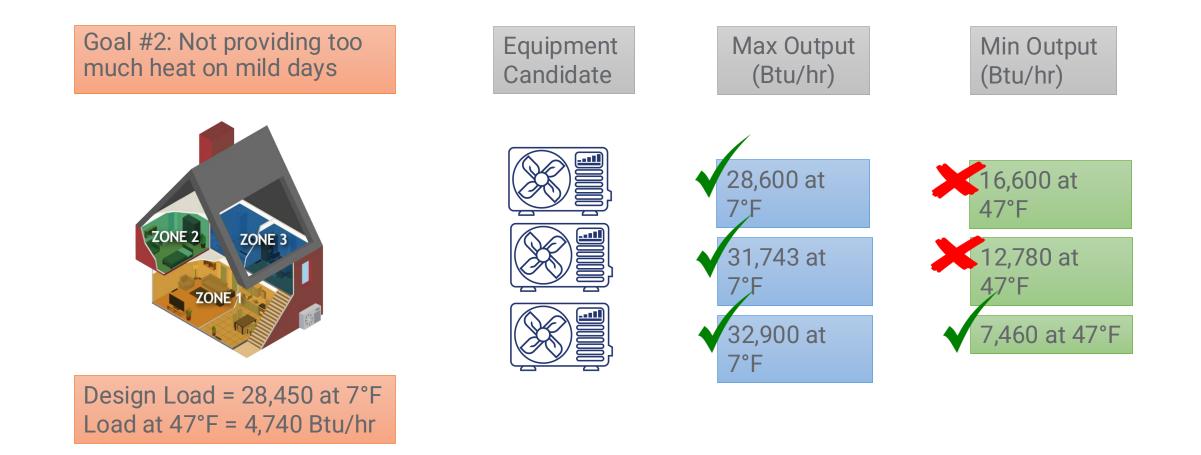
Heat Pump Selection and Sizing

Goal #1: Meeting home Equipment heating load on the coldest day Candidate ZONE 3 ZONE 2 ZONE Design Load = 28,450 at 7°F





Heat Pump Selection and Sizing



Heat Pump Selection and Sizing

Goal #3: Choose the right product for your need



- > Energy efficiency
 - Heating Heating Seasonal Performance Factor (HSPF): >10 is preferred
 - Cooling Seasonal Energy Efficiency Rating (SEER): >15 is preferred
 - Manufacturer's extended performance data has higher granularity of efficiency ratings that can help optimize the decision
- Other features/functions
 - Automation and controls
 - Integrated back-up heat
 - > Noise rating
- Price higher efficiency tends to be more expensive

Don't Oversize

- This resource provides information on:
 - The risks of oversizing a heat pump
 - How to identify signs of oversizing
 - ➢ How to avoid oversizing
 - > Terms to know
- PDF available on the Clean Heat Connect website
 - <u>CHC-CON-ashp-oversize-fs-1-v1.pdf (ny.gov)</u>



Over-zoning



Design Intention: Zonal vs. Whole Home

- The home is split into zones, each with its own heating
- Each zone has its own thermostat and controls
- Best for larger homes
- Best for complicated layout



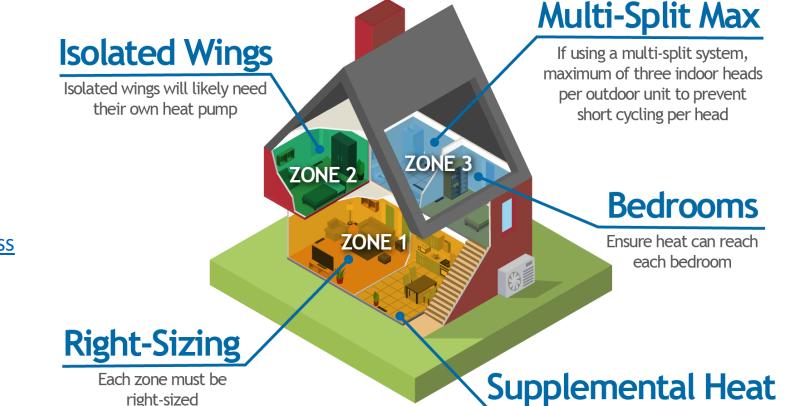
- > One thermostat controls the entire home
- Best for smaller homes of simple geometry
- Best with ducted systems



Heat Pump Selection and Sizing Multi-Zone or Multi-Split Design

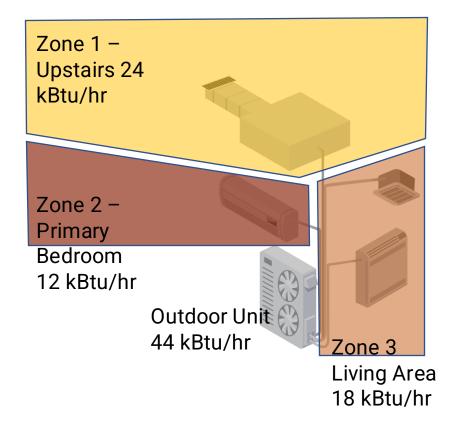
For more information about multisplit and single-split head systems, checkout NYSERDA's Clean Heat Connect resources at <u>cleanheatconnect.ny.gov</u>.

Link to PDF: https://cleanheatconnect.ny.gov/ass ets/pdf/Multi vs Single SplitSyste ms 10 2024 v1.pdf



Utilize supplemental heat in specific locations where needed, such as mud rooms

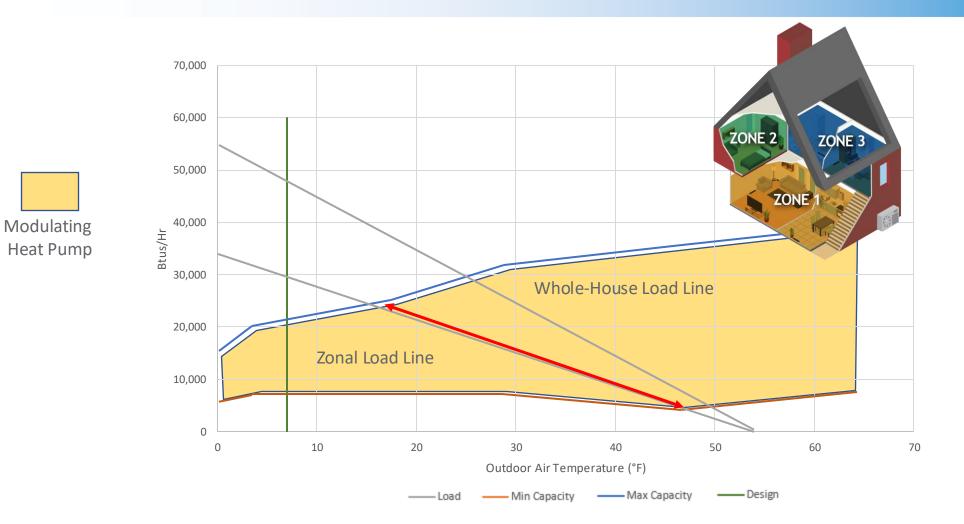
Avoid Multi-Split Oversizing



What happens when only one zone is calling for heat?

- Confirm zonal turn down and minimum capacity
- Can impact humidity control as well if short cycling during the cooling season

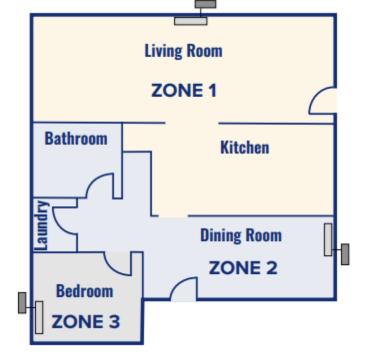
Zonal Load Sizing

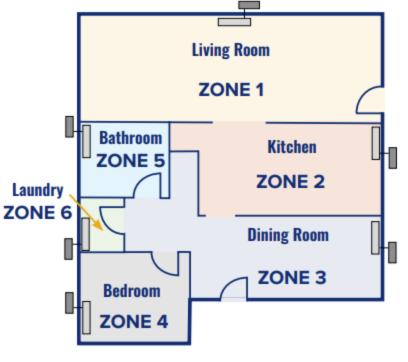


Correctly Zoned vs Over-Zoned

Example home:

- > Single-family
- Two story
- Saratoga county
- Design temperature: 1°F
- Equipment specifications from ductless single zone products listed on the <u>NEEP</u> <u>ASHP Product List</u>.



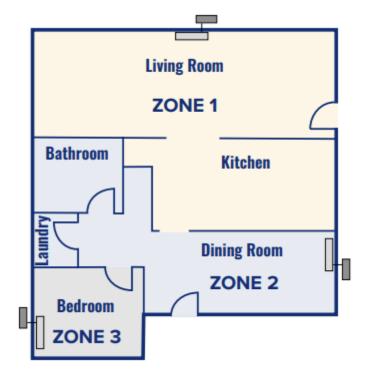


Room by room design load

Room	Living Room	Kitchen	Dining Room	Bedroom	Bathroom	Laundry Room	Total
Design Load	15,641	3,535	14,690	8,416	3,018	1,356	46,656
(Btu/hour)		5,555	14,000	0,410	5,010	1,000	40,000

Proper Zoning Design Equipment Performance

Clear air pathways between rooms allow this system to provide sufficient comfort.



	PROPER ZONING						
	Zone 1	Zone 2	Zone 3				
	Living Room Kitchen	Dining Room Bathroom Laundry	Bedroom	Total			
Nominal Capacity (Btu/hour)	15,000	18,000	6,000 ¹	39,000			
Max. Capacity at Design Temp. (°F)	18,258	21,689	9,778	49,725			
Percent Design Load Served ²	99.6%	113.8%	116.2 %	107 %			
Percent Annual Heating Load Modulating ³	75.2 %	79.6 %	86.8%	-			
Percent Annual Heating Load with Low Load Cycling ⁴	14.7 %	12.7 %	6.2%	-			

Over-Zoning Design Equipment Performance

	OVER ZONING						
	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Zone 6	
	Living Room	Kitchen	Dining Room	Bedroom	Bathroom	Laundry	Total
Nominal Capacity (Btu/hour)	15,000	6,000	15,000	9,000	6,000	6,000	57,000
Max. Capacity Design Temp. (°F)	18,258	9,778	18,258	10,792	9,778	9,778	76,642
Percent Design Load Served ⁵	116.7%	364.7 %	124.3%	128.2%	324%	721.1%	134.4%
Percent Annual Heating Load Modulating ⁶	74.1%	53.1%	70.9%	88.2%	60%	21.4%	-
Percent Annual Heating Load with Low Load Cycling ⁷	18.7%	44.6 %	22.8%	6.2%	37.6%	77.1%	-

The six-zone system performance data shows how improperly zoning a system may lead to oversizing. Three of the systems are substantially oversized, even when using the smallest available products.

This system will result in poor performance, more callbacks, and customer complaints.

Reduce Over Zoning

Air Source Heat Pumps Reduce Over Zoning

Over zoning may result in system over sizing, higher costs, comfort issues, and call backs

Zoning offers improved comfort, control and flexibility

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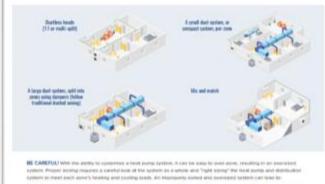
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12 Tips for Joning with Heat Pumps

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Percent Design Low! Served*	185.7%	36475	134.2%	108.2%	324%	721/5	134.45	
Parcent Annual Heating Load Medulating ⁴	34.95	6275	2016	88.2%	605	25.4%		
Persont Annual Heating Load with Low Load Cycling	18.75	44.05	22.8%	6.25	274%	7795		

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Link to PDF: https://cleanheatconnect.ny.gov/assets/pdf/Reduce%20Overzoning 10 2024 v2.pdf



Existing Duct Management



Assessing Existing Ductwork

- Is ductwork visible?
- > When was the duct work installed?
 - Older ductwork may not be installed to current building codes
- Was the ductwork installed for heating or cooling?
 - If sized for heating and are newer ducts, may be able to modify for a heat pump system
 - If sized for cooling, the ductwork may be undersized and require more work to make ready for a heat pump system
- Is the ductwork in good condition and properly sealed?





Evaluating a Duct System

Best practices:

- Kitchen table discussion
- Visual inspection
- Sizing evaluation

- Duct testing
- Duct balancing
- Always use an approved Manual D for duct sizing

Duct Retrofit Best Practices



- Interview the homeowner
- ✓ Visually evaluate the ducts
- Confirm duct capacity meets heat pump needs
- ✓ Non-diagnostic commissioning

- ✓ All ★ items
- Check total external static pressure (TESP)
- Verify duct balancing
- Measure airflow at registers with flowhood



- ✓ All ★ and ★★ items
- Assess duct leakage with duct-blaster or blower door and pressure pan
- Complete a Manual D and compare to existing ducts

Testing the Ductwork

- > Measure air flow
- > Check for duct leakage
- > Verify duct balancing
- > Inform the homeowner:
 - Condition of ducts
 - Needed repairs
 - Necessary modifications
 - Why the ductwork should *not* be reused (when applicable)



Air Source Heat Pump: **Cold-Climate Duct Evaluation Guide**

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anemometer to measure CFM at each register

2. Calculate the total airflow into each room

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Air Source Heat Pump Cold-Climate Duct Evaluation Guide

Evaluate the Duct Sectem Before Heat Pump Installation

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Verify Duct Balancing



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Doct Retrofit Best Practice *

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- 3. Are the supply branches able to handle the airflew? Earther the sapple tranch capacities are large enough to handle the company without in the least they would
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2354 2464 24246 24246 24246	942 400 400 70	23x8 24x8 38x8 38x8	111111	22x8 24x8 25x8 25x8 25x8 35x8 35x8 35x8 35x8 35x8 35x8	000 020 040 040 040 040 040 040 040	20+9 24-70 24-70 24-70 34-70 34-70 34-70 34-70	1410 1410 1410 1410 1410 1410 1410 1410	10x0 24x12 38x0 38x0 38x0 10x0 10x0 58x0 58x0
2354 2464 24246 24246 24246	9 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	2348 2442 2848 3848 1048	111111	22+8 24+8 25+8 28+8 28+8 32+8 32+8 32+8 32+8 32+8 32	988 989 989 989 989 989 980 280 280	2045 2448 2448 2448 2448 3448 3448 3448 3448	400 100 100 100 100 100 100 100 100 100	10x0 28x0 38x0 38x0 38x0 10x0 10x0 38x0 38x0
	and Tack and the second s	er Duct 4° CPut 4°	4* CPUL 9* 8x8 01 4x8 8x8 111 4x8 8x8 111 4x8 8x8 111 4x8 10x8 111 4x8 10x8 211 10x8 10x8 211 10x8 10x8 211 10x8	error error in ensementing 2011 error in ensementin ensementing 2011 error	International State Image:	er 71 R anamatery 17 rr R anamatery 17 rr R anamatery 101 rr re dual system to status at re dual system to status at re dual system to staty and status at re dual system to status at re	er n	er 71 er 71 er 71 er 80 er 90 er

MIS Clean Heat

Link to PDF: https://cleanheatconnect.ny.gov/assets/pdf/CHC-CON-ashp-oversize-fs-1-v2_acc.pdf

What is in the Duct Evaluation Guide

- Duct Evaluation Guide guides through the duct evaluation process at the time of bid
 - Understanding the difference between a heat pump and a furnace supply air temperature
 - The need for properly sized ductwork and how to determine duct sizing
 - > What impacts the cost of duct replacement
 - > Help your customers determine when to:
 - Use existing ducts
 - Modify ducts
 - Replace or decommission ducts
- > Additional resources at <u>CEE1.org</u>



NEEP ccASHP Product List

Heat Pump Sizing and Selection Tutorial



NEEP ccASHP Product List

- > Tool Summary
- > Selecting Inputs
- > Sizing a Heat Pump
- > Comparing Products
- > Building a Multiple Compressor System
- > Other Features

Tool Summary

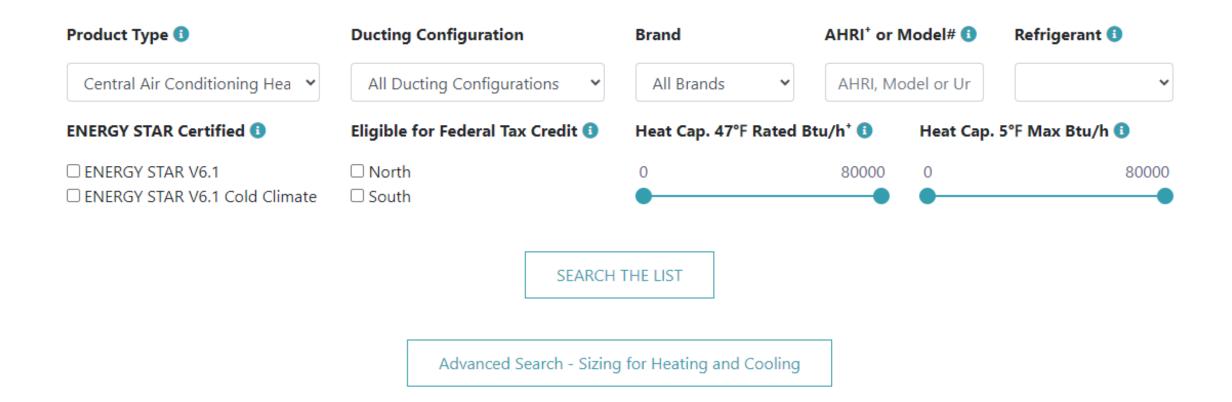


NEEP Tool Walkthrough

- > The NEEP Tool is a product selection tool that searches NEEP's database for cold-climate ASHPs that best fit your project.
- > You can use this tool to select properly sized equipment, compare alternative systems, print submittal documents, and show your customer how well the proposed system fits their home.
- > All information is manufacturer submitted.
- > Open the below link and follow along while we walk you through a mock product selection.
- > https://ashp.neep.org/#!/

NEEP Selection Tool

Ready to search the list?



Selecting Inputs



NEEP Sizing and Selection ccASHP



Search Products

Consumer and Installer Resources

er Resources

About ASHP Initiative

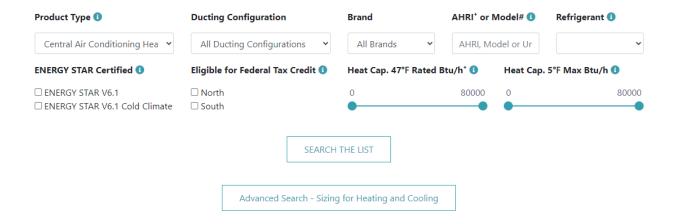
About NEEP

Login

On behalf of clean energy and energy efficiency stakeholders, NEEP is pleased to host the Cold Climate Air Source Heat Pump (ccASHP) Product List. This Product List was originally launched in 2015; for more on the background, visit the ASHP Initiative. The list includes ASHP systems that meet the latest version of the ccASHP Specification. The voluntary specification includes requirements for both performance levels and a series of reported performance standards.

Please note that being listed does not necessarily mean a product is appropriate for all cold climate applications. Consumers, contractors, and designers should review building loads, equipment capacities at design temperatures, and other important factors before selecting equipment. Visit NEEP's Installer and Consumer Resources for more information.

Ready to search the list?



DISCLAIMER- Some of the performance values reported as part of the Cold Climate ASHP Specification are NOT derived from industry standard test procedures or third-party tested/verified (e.g. performance values at 5°F). Performance in some instances may be represented by manufacturer's engineering data. This site also uses cookies to improve consumer experience.

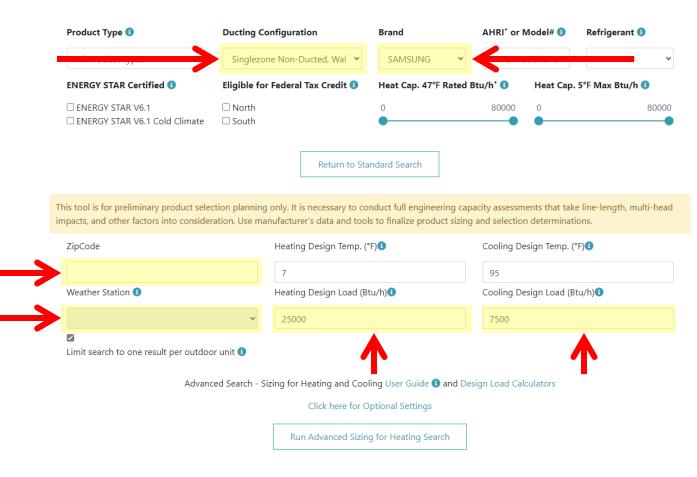
*AHRI certified and verified product information. Source: ahridirectory.org

Step 1) Select Advanced Search – Sizing for Heating

Ready to search the list?

Product Type 🕕	Ducting Configuration	Brand	AHRI [⁺] or I	Nodel# 🕕	Refrigerant 🕄
Central Air Conditioning Hea 💙	All Ducting Configurations	All Brands	AHRI, Mo	odel or Ur	~
ENERGY STAR Certified 🕕	Eligible for Federal Tax Credit 🕕	Heat Cap. 47°F Rated B	tu/h⁺ 🚺	Heat Cap.	5°F Max Btu/h 🕕
 ENERGY STAR V6.1 ENERGY STAR V6.1 Cold Climate 	 North South 	0 THE LIST	80000	0	80000
	Advanced Search - Sizing	g for Heating and Cooling			

Step 2) Initial Data



Our mock project is best suited for a multi-zone ductless system.

The project is located in Glens Falls, NY nearest to the Floyd Bennet Memorial weather station.

The Manual J we conducted resulted in a Heating Design Load of 42,000 Btu/h.

The mock distributor sells mainly Mitsubishi Electric products.

Step 3) Click Run Advanced Sizing for Heating Search

Product Type 🚺	Ducting Configuration	Brand	AHRI ⁺ or №	Nodel# 🕕	Refrigerant 🕕
All Product Types	All Ducting Configurations	Mitsubishi Elect 💙	AHRI, Mo	odel or Ur	~
ENERGY STAR Certified 🕕	Eligible for Federal Tax Credit 🕕	Heat Cap. 47°F Rated I	Btu/h⁺ 🕕	Heat Cap.	5°F Max Btu/h 📵
ENERGY STAR V6.1 ENERGY STAR V6.1 Cold Climate	□ North □ South	0	80000	0	80000
This tool is for preliminary product selec	ction planning only. It is necessary to co		-		-
ZipCode	ation. Use manufacturer's data and too Heating Design Temp. (esign Temp. (
12801	-2		85		
Weather Station 🚯	Heating Design Load (B	tu/h)	Cooling De	sign Load (B	tu/h)
Floyd Bennet Memorial, Winter De	sign Tei 👻 42000		7500		
Limit search to one result per outdoor	or unit 🕕				

Advanced Search - Sizing for Heating and Cooling User Guide (1) and Design Load Calculators

Click here for Optional Settings

Run Advanced Sizing for Heating Search

Sizing a Heat Pump



Step 4) Sort and analyze the products

able Inform	ation 🚯										
Current Filte	rs		(from table below)					V			
Add. View	Brand Name v	AHRI Reference #*	✓ Outdoor Unit Model #*.x.		Ducting Config* ~	Max Cap @ Design Temp (Btu/h).	. Capacity Balance Point (°F).	. % Design Load Served .x	% Annual Load Served .x.	% Annual Load Modulating ~	Min Capacity Threshold (
				Number(s)*		Greater Than ↔ Less Than	Greater Thai ↔ Less Than	Greater Th ↔ Less Than	Greater Th ↔ Less Than	Greater Than ↔ Less Than	Greater Than ↔ Less Th
+ %	MITSUBISHI ELECTRIC	202680599	MUZ-GL15NAH***	MSZ-GL15NA***	Singlezone Non-Ducted,	No capacity at design Temperature	32	No capacity at design Te	56.4%	53.2%	52
+ %	Trane / Mitsubishi Ele	211016466	NTXMSM36A142B*		Multizone Mix of Ducted	25,228	12	60.1%	83.5%	48.0%	34
+ %	Mitsubishi Electric	211016480	MXZ-SM36NAM2		Multizone Mix of Ducted	25,228	12	60.1%	83.5%	48.0%	34
+ %	TRANE / MITSUBISHI	211497116	TRUZA0421KA70**	TPVA0A0421AA***	Singlezone Ducted, Centr	No capacity at design Temperature	15	No capacity at design Te	75.2%	44.2%	36
+ %	TRANE / MITSUBISHI	211497073	NTXSKH30A112AA	NAXAMT30A112**	Singlezone Ducted, Centr	29,511	13	70.3%	80.5%	61.8%	42
+ %	MITSUBISHI ELECTRIC	211259279	PUZ-HA36NKA	PVA-A36AA*	Singlezone Ducted, Centr	35,044	4	83.4%	89.1%	58.1%	36
+ %	MITSUBISHI ELECTRIC	211259274	PUZ-HA30NKA	PVA-A30AA*	Singlezone Ducted, Centr	29,511	13	70.3%	80.5%	57.7%	40
+ %	MITSUBISHI ELECTRIC	211259270	PUZ-HA24NHA1	PCA-A24KA*	Singlezone Non-Ducted,	23,978	21	57.1%	72.3%	59.6%	45
+ %	MITSUBISHI ELECTRIC	209949001	MXZ-3C30NA3***		Multizone Mix of Ducted	No capacity at design Temperature	24	No capacity at design Te	65.7%	30.2%	34
+ %	TRANE / MITSUBISHI	211150918	TRUZA0241HA70**	PAA-A18BA*	Singlezone Ducted, Centr	10,844	35	25.8%	60.2%	43.5%	43
+ %	MITSUBISHI ELECTRIC	210435439	PUZ-HA36NKA*	PAA-A36CA1	Singlezone Ducted, Centr	35,044	4	83.4%	89.1%	51.5%	33
+ %	MITSUBISHI ELECTRIC	209447985	PUZ-A36NKA7***	PAA-A36CA1	Singlezone Ducted, Centr	22,878	17	54.5%	76.1%	40.6%	34
+ %	TRANE / MITSUBISHI	207702848	TRUZH0241HA10**	TPEADA0241AA***	Singlezone Ducted, Com	23,056	22	54.9%	71.5%	58.8%	45
+ %	MITSUBISHI ELECTRIC	207702722	SUZ-KA30NAHZ	PEAD-A30AA*	Singlezone Ducted, Com	29,511	13	70.3%	80.5%	57.7%	40

You can sort the products by clicking any of the categories. The most prevalent to product sizing are: **% Annual Load Modulating** – The percentage of annual hours that the heat pump is operating within its modulating range. You want this to be as high as possible to maximize the efficiency and minimize the time spent cycling on/off.

% Design Load Served – The percentage of the home's heating load served by the heat pump at the design temperature. For a full-load system, you want this to be 100-120% to avoid the need for supplemental heat and avoid oversizing.

Step 5) Select a product to view more info

↓

Aeld.	View	Brand Name \vee	AHRI Reference #* V	Outdoor Unit Model #*.x.	Indoor Model v	Ducting Config* \sim	Max Cap @ Design Temp (Btu/h)	Capacity Balance Point (°F)	% Design Load Served .x	% Annual Load Served .x.	% Annual Load Modulating 🔹	Min Capacity Threshold (°F)
					Number(s)*	•	Greater Than ↔ Less Than	Greater Tha ↔ Less Than	Greater Tł ↔ Less Than	Greater Tł ↔ Less Than	Greater Than 😁 Less Than	Greater Than ↔ Less Than
+	8	TRANE / MITSUBISHI	213361523	NTXSPB18B112A*	NAXWPH18B112A*	Singlezone Non-Ducted,	20,706	20	49.3%	75.4%	72.2%	52
	90	MITSUBISHI ELECTRIC	209832208	MUZ-FS18NAH***	MSZ-FS18NA***	Singlezone Non-Ducted,	20,706	20	49.3%	75.4%	72.2%	52
+	8	TRANE / MITSUBISHI	209833000	MUZ-FS18NA***	NTXWPH18B112A*	Singlezone Non-Ducted,	20,706	20	49.3%	75.4%	72.2%	52
+	•	TRANE / MITSUBISHI	209832262	NTXSPH18B112A*	NTXWPH18B112A*	Singlezone Non-Ducted,	20,706	20	49.3%	75.4%	72.2%	52
+	8	MITSUBISHI ELECTRIC	207679246	MUZ-GS24NA***	MSZ-GS24NA***	Singlezone Non-Ducted,	16,754	21	39.9%	73.3%	65.7%	48
+	•	Mitsubishi Electric	207679251	MUZ-GS24NAH***	MSZ-GS24NA***	Singlezone Non-Ducted,	16,754	21	39.9%	73.3%	65.7%	48
+	•	TRANE / MITSUBISHI	207705522	NTXSST24B112**	NAXWST24B112**	Singlezone Non-Ducted,	16,754	21	39.9%	73.3%	65.7%	48
+	•	TRANE / MITSUBISHI	213361521	NTXSPB15B112A*	NAXWPH15B112A*	Singlezone Non-Ducted,	17,431	26	41.5%	68.8%	65.6%	52
+	•	TRANE / MITSUBISHI	209832261	NTXSPH15B112A*	NTXWPH15B112A*	Singlezone Non-Ducted,	17,431	26	41.5%	68.8%	65.6%	52
+	•	MITSUBISHI ELECTRIC	209832206	MUZ-FS15NAH***	MSZ-FS15NA***	Singlezone Non-Ducted,	17,431	26	41.5%	68.8%	65.6%	52
+	•	TRANE / MITSUBISHI	209832995	MUZ-FS15NA***	NTXWPH15B112A*	Singlezone Non-Ducted,	17,431	26	41.5%	68.8%	65.6%	52
+	9	Trane / Mitsubishi Ele	207705540	NTXSSH18A112**	NAXWST18B112**	Singlezone Non-Ducted,	17,028	26	40.5%	69.2%	63.0%	49

Note: You can select multiple products to provide alternate options. The first product is not always the best option or readily available at your distributor.

Available Data

Protect Energy EPFFCIENCY		Basic View 🕚
		Advanced Data - System Sizing
MITSUBISHI ELECTRIC M-Se		Sizing
Central Air Conditioning Heat Pump (Singlezone Non-Ducted, Wall Placeme		
AHRI Cert #*: 209832208		
Outdoor Unit Model #*: MUZ-FS18N/ Indoor Model #*: MSZ-FS18NA***	AH***	
Maximum Heating Capacity (Btu/h)	@5°F: 23,000	
A Rated Heating Capacity (Btu/h) @47		
Rated Cooling Capacity (Btu/h) @9	5°F": 17,200	
		engineering capacity assessments that take line-length, mul
ZipCode	consideration. Use manufacturer's data and tools to Heating Design Temp. (°F)	Cooling Design Temp. (°F)
12801	-2	85
Weather Station (1)	Heating Design Load (Btu/h)	Cooling Design Load (Btu/h)
Weather Station	Heating Design Load (Biti/II)	Cooling Design Load (Btd/1)
Floyd Bennet Memorial, Winter	Design 🖌 🖌 42000	7500
Advan	nced Search - Sizing for Heating and Cooling User Gu	ide 🚯 and Design Load Calculators
	Click here for Optional Setti	ings
		7
	Run System Sizing	
Graph Information (1)		
Graph Information ()	stem Capacity, Heating and Cooling Load	, and Weather Data Graph
	stem Capacity, Heating and Cooling Load	, and Weather Data Graph
75k Sys	stem Capacity, Heating and Cooling Load	
75k Sys	stem Capacity, Heating and Cooling Load	
75k Sys	stem Capacity, Heating and Cooling Load	, and Weather Data Graph
75k	stem Capacity, Heating and Cooling Load	III.
75k Sys 75k 000000000000000000000000000000000000	stem Capacity, Heating and Cooling Load	, and Weather Data Graph
75k Sys		
5ys		
5ys	0 5 10 1517 20 25 30 35 40 Octoor Temperature (°F) Modulating Heat Pump Potential	4547 50 55 60 65 70 75 80 82 85 90 Low-Load Cycling Design Temperature
50k 50k 25k 0 -25 - 20 - 1513 - 10 - 5 Supplemental Heat + Heating Max. Cap.	0 5 10 1517 20 25 30 35 40 Octdoor Temperature (*F) Modulating Heat Pump Heating Min Cap. • • Heating	4547 50 55 60 65 70 75 80 82 85 90 Low-Load Cycling acd Line (BLIN) = Gooing Modelisting Zone
5ys	0 5 10 1517 20 25 30 35 40 Octdoor Temperature (*F) Modulating Heat Pump Heating Min Cap. • • Heating	Low-Load Cycling case Une (Burh) Design Temperature Coordinate (Burh)

Product Sizing For Heating			
View Oversizing Effects () Definition/Use Cases ()		Definition/Use Cases 1	
Capacity Balance Point (°F)	20	Annual Btu's Covered by Supplemental Heat (MMBtu)	23.6
Minimum Capacity Threshold (°F)	52	Hours Requiring Supplemental Heat	958
Maximum Capacity at Design Temp (Btu/h)	20,706	Percent Hours Requiring Supplemental Heat	15.9%
Percent Design Load Served	49.3%	Percent Annual Load Modulating	72.2%
Annual Heating Load (MMBtu)	96.0	Percent Annual Load with Low-Load Cycling	2.5%
Percent Annual Heating Load Served	75.4%		

P	r)	d	u	C.	t :	S	12	Z	r	10	g	F	C	r	1	C	0	C	þ	I	n	ļ

Credit Eligibility

View Oversizing Effects 1 Definition/Use Cases 1		Definitions/Use Cases ()
Minimum Capacity Threshold (°F)	85	Percent Annual Cooling Load
Maximum Capacity at Design Temp (Btu/h)	22,923	Percent Annual Load Modulat
Percent Design Load Served	305.6%	Percent Annual Load with Low
Annual Cooling Load (MMBtu)	3.3	
Product Sizing For Cooling View Oversizing Effects ① Definition/Use Cases ①		Definitions/Use Cases ()
Minimum Capacity Threshold (°F)	85	Percent Annual Cooling Load Served
Maximum Capacity at Design Temp (Btu/h)	22,923	Percent Annual Load Modulating
Percent Design Load Served	305.6%	Percent Annual Load with Low-Load Cy
Annual Cooling Load (MMBtu)	3.3	

Definitions/Use Cases ()	
Percent Annual Cooling Load Served	100.0%
Percent Annual Load Modulating	15.1%
Percent Annual Load with Low-Load Cycling	84.9%

	Definitions/Use Cases 🚯	
85	Percent Annual Cooling Load Served	100.0%
22,923	Percent Annual Load Modulating	15.1%
305.6%	Percent Annual Load with Low-Load Cycling	84.9%
3.3		

Information Ta	ables	renorma	ince Spece	>				
Brand	MITSUBISHI ELECTRIC	Heating /	Outdoor	Indoor Dry				
Series	M-Series	Cooling	Dry Bulb	Bulb	Unit	Min	Rated*	Max
Ducting	Singlezone Non-Ducted, Wall Placement	Cooling	95°F	80°F	Btu/h*	6,450	17,200	21,000
Configuration					kW	0.41	1.38	2.22
AHRI Certificate	209832208				COP	4.61	3.65	2.77
 Outdoor Unit	MUZ-FS18NAH***	Cooling	82°F	80°F	Btu/h*	7,150	-	23,500
Model #*	MUZ-FSTONAH				kW	0.31		1.87
Indoor Model #*	MSZ-FS18NA***				COP	6.76	-	3.68
Indoor Unit	Mini-Splits	Heating	47°F	70°F	Btu/h*	5,150	19,000	30,000
Туре*					kW	0.43	1.61	4
Furnace Model* #	•				COP	3.51	3.46	2.2
EER*	12.5	Heating	17°F	70°F	Btu/h*	4,460	12,800	27,000
SEER*	21				kW	0.73	1.28	3.82
HSPF (Region IV)*	12	Heating	5°F	70°F	COP Btu/h*	1.79 3,810	2.93	2.07 23,000
EER2*	12.5	Heating	51	70 F	kW	0.64		3.25
SEER2*	21				COP	1.74	-	2.07
HSPF2 (Region	10.3	Heating	-13°F	70°F	Btu/h ⁺	2.830		17,100
IV)*		rieading	-131	701	kW	0.54		2.63
HSPF2 (Region V)	8.1				COP	1.54	-	1.91
ENERGY STAR V6.1	×							
ENERGY STAR V6.1 Cold Climate	*							
ENERGY STAR V5.0								
Federal Tax	✓							

Comparing Products



Step 6) Select a products to compare

dd.	/iew. Brand Name ~	AHRI Reference #*	✓ Outdoor Unit Model #*.x.	Indoor Model V	Ducting Config* \sim	Max Cap @ Design Temp (Btu/h):.	Capacity Balance Point (°F)	% Design Load Served .x	% Annual Load Served	% Annual Load Modulating 💌	Min Capacity Threshold (°F)
				Number(s)*	•	Greater Than 😁 Less Than	Greater Tha ↔ Less Than	Greater Tł ↔ Less Than	Greater Tł ↔ Less Than	Greater Than 😁 Less Than	Greater Than ↔ Less Than
+	S TRANE / MITSUBISHI	213361523	NTXSPB18B112A*	NAXWPH18B112A*	Singlezone Non-Ducted,	20,706	20	49.3%	75.4%	72.2%	52
+	✤ MITSUBISHI ELECTRIC	209832208	MUZ-FS18NAH***	MSZ-FS18NA***	Singlezone Non-Ducted,	20,706	20	49.3%	75.4%	72.2%	52
+	STRANE / MITSUBISHI	209833000	MUZ-FS18NA***	NTXWPH18B112A*	Singlezone Non-Ducted,	20,706	20	49.3%	75.4%	72.2%	52
+	💊 TRANE / MITSUBISHI	209832262	NTXSPH18B112A*	NTXWPH18B112A*	Singlezone Non-Ducted,	20,706	20	49.3%	75.4%	72.2%	52
+	✤ MITSUBISHI ELECTRIC	207679246	MUZ-GS24NA***	MSZ-GS24NA***	Singlezone Non-Ducted,	16,754	21	39.9%	73.3%	65.7%	48
+	% Mitsubishi Electric	207679251	MUZ-GS24NAH***	MSZ-GS24NA***	Singlezone Non-Ducted,	16,754	21	39.9%	73.3%	65.7%	48
+	STRANE / MITSUBISHI	207705522	NTXSST24B112**	NAXWST24B112**	Singlezone Non-Ducted,	16,754	21	39.9%	73.3%	65.7%	48
+	💊 TRANE / MITSUBISHI	213361521	NTXSPB15B112A*	NAXWPH15B112A*	Singlezone Non-Ducted,	17,431	26	41.5%	68.8%	65.6%	52
+	STRANE / MITSUBISHI	209832261	NTXSPH15B112A*	NTXWPH15B112A*	Singlezone Non-Ducted,	17,431	26	41.5%	68.8%	65.6%	52
+	✤ MITSUBISHI ELECTRIC	209832206	MUZ-FS15NAH***	MSZ-FS15NA***	Singlezone Non-Ducted,	17,431	26	41.5%	68.8%	65.6%	52
+	STRANE / MITSUBISHI	209832995	MUZ-FS15NA***	NTXWPH15B112A*	Singlezone Non-Ducted,	17,431	26	41.5%	68.8%	65.6%	52
+ 1	💊 Trane / Mitsubishi Ele	207705540	NTXSSH18A112**	NAXWST18B112**	Singlezone Non-Ducted,	17.028	26	40.5%	69.2%	63.0%	49

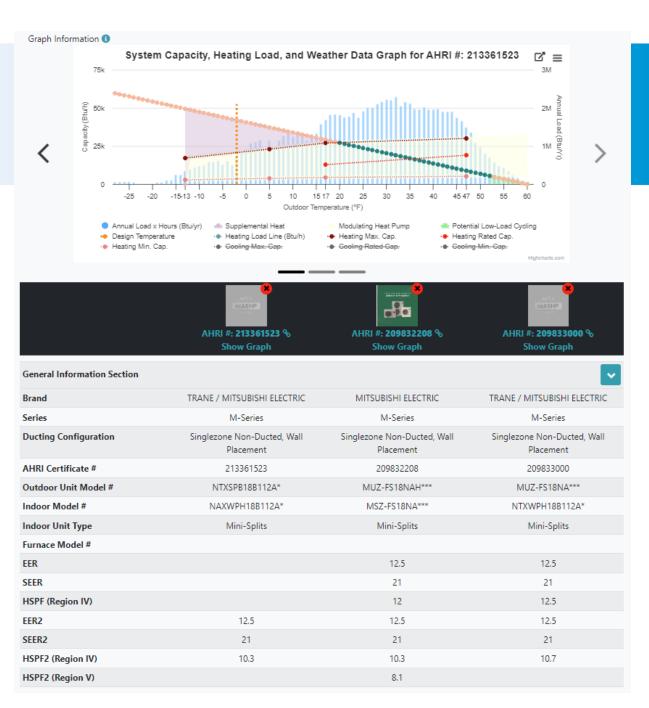
Note: You can select multiple products to compare. The first product is not always the best option or readily available at your distributor.

Step 7) Click Compare Products

dd. Vie	ew.	Brand Name	AHRI Reference #* ~	Outdoor Unit Model #*		✓ Ducting Config ⁺	Max Cap @ Design Temp (Btu/h):	. Capacity Balance Point (°F).	% Design Load Served .x	% Annual Load Served	% Annual Load Modulating 💌	Min Capacity Threshold (°F)
					Number(s)*	•	Greater Than 😁 Less Than	Greater Tha ↔ Less Than	Greater Tł ↔ Less Than	Greater Tł ↔ Less Than	Greater Than 😁 Less Than	Greater Than ↔ Less Than
٩	6	TRANE / MITSUBISHI	213361523	NTXSPB18B112A*	NAXWPH18B112A*	Singlezone Non-Ducted,	20,706	20	49.3%	75.4%	72.2%	52
્	6	MITSUBISHI ELECTRIC	209832208	MUZ-FS18NAH***	MSZ-FS18NA***	Singlezone Non-Ducted,	20,706	20	49.3%	75.4%	72.2%	52
<mark>ا م</mark>	ъ	TRANE / MITSUBISHI	209833000	MUZ-FS18NA***	NTXWPH18B112A*	Singlezone Non-Ducted,	20,706	20	49.3%	75.4%	72.2%	52
્	6	TRANE / MITSUBISHI	209832262	NTXSPH18B112A*	NTXWPH18B112A*	Singlezone Non-Ducted,	20,706	20	49.3%	75.4%	72.2%	52
<mark>،</mark> م	ъ	MITSUBISHI ELECTRIC	207679246	MUZ-GS24NA***	MSZ-GS24NA***	Singlezone Non-Ducted,	16,754	21	39.9%	73.3%	65.7%	48
<mark>،</mark> ع	6	Mitsubishi Electric	207679251	MUZ-GS24NAH***	MSZ-GS24NA***	Singlezone Non-Ducted,	16,754	21	39.9%	73.3%	65.7%	48
. q	6	TRANE / MITSUBISHI	207705522	NTXSST24B112**	NAXWST24B112**	Singlezone Non-Ducted,	16,754	21	39.9%	73.3%	65.7%	48
. q	6	TRANE / MITSUBISHI	213361521	NTXSPB15B112A*	NAXWPH15B112A*	Singlezone Non-Ducted,	17,431	26	41.5%	68.8%	65.6%	52
. q	6	TRANE / MITSUBISHI	209832261	NTXSPH15B112A*	NTXWPH15B112A*	Singlezone Non-Ducted,	17,431	26	41.5%	68.8%	65.6%	52
. q	6	MITSUBISHI ELECTRIC	209832206	MUZ-FS15NAH***	MSZ-FS15NA***	Singlezone Non-Ducted,	17,431	26	41.5%	68.8%	65.6%	52
. q	6	TRANE / MITSUBISHI	209832995	MUZ-FS15NA***	NTXWPH15B112A*	Singlezone Non-Ducted,	17,431	26	41.5%	68.8%	65.6%	52
م	6	Trane / Mitsubishi Ele	. 207705540	NTXSSH18A112**	NAXWST18B112**	Singlezone Non-Ducted,	17,028	26	40.5%	69.2%	63.0%	49
٩	6	Trane / Mitsubishi Ele	. 207705527	NTXSSH18A112*	MSZ-GS18NA***	Singlezone Non-Ducted,	17,028	26	40.5%	69.2%	63.0%	49
٩	6	American Standard /	. 207705502	MUZ-GS18NAHZ***	NAXWST18B112**	Singlezone Non-Ducted,	17,028	26	40.5%	69.2%	63.0%	49
٩	6	TRANE / MITSUBISHI	209832993	NTXSPB12B112A*	MSZ-FS12NA***	Singlezone Non-Ducted,	13,255	32	31.6%	63.9%	62.1%	54
. q	6	MITSUBISHI ELECTRIC	209832204	MUZ-FS12NAH***	MSZ-FS12NA***	Singlezone Non-Ducted,	13,255	32	31.6%	63.9%	62.1%	54
م	6	TRANE / MITSUBISHI	209832990	MUZ-FS12NA***	NTXWPH12B112A*	Singlezone Non-Ducted,	13,255	32	31.6%	63.9%	62.1%	54
م	6	TRANE / MITSUBISHI	209832260	NTXSPH12B112A*	NTXWPH12B112A*	Singlezone Non-Ducted,	13,255	32	31.6%	63.9%	62.1%	54
. q	6	TRANE / MITSUBISHI	211497073	NTXSKH30A112AA	NAXAMT30A112**	Singlezone Ducted, Centr	29,511	13	70.3%	80.5%	61.8%	42
، م	6	MITSUBISHI ELECTRIC	213617714	SUZ-KA30NAHZ1***	SVZ-KP30NA*	Singlezone Ducted, Centr	29,511	13	70.3%	80.5%	61.8%	42
م	6	TRANE / MITSUBISHI	209832988	NTXSPB09B112A*	MSZ-FS09NA***	Singlezone Non-Ducted,	10,194	36	24.3%	62.2%	61.7%	57
. q	6	MITSUBISHI ELECTRIC	209832202	MUZ-FS09NAH***	MSZ-FS09NA***	Singlezone Non-Ducted,	10,194	36	24.3%	62.2%	61.7%	57
. q	8	TRANE / MITSUBISHI	209832985	MUZ-FS09NA***	NTXWPH09B112A*	Singlezone Non-Ducted,	10,194	36	24.3%	62.2%	61.7%	57
م	6	TRANE / MITSUBISHI	209832259	NTXSPH09B112A*	NTXWPH09B112A*	Singlezone Non-Ducted,	10,194	36	24.3%	62.2%	61.7%	57
Q	6	MITSUBISHI			×	×	×					
ą	6	MITSUBISHI		CASHP	T		CCASHP	, NEER,		NGA		
٩	6	TRANE / MI	elect up to 5 products	Super-State			Sugar Con	ccASHP		CCASHP		
٩	- I	MITSUBISHI		TRANE / MITS		ITSUBISHI ELECTRIC	TRANE / MITSUBISHI					
9	-	TRANE / MI		ELECTRI		Model Series: M-Series AHRI #: 209832208	ELECTRIC					
• •	6	TRANE / MI		Model Series: M-S	erles	Count: 1	Model Series: M-Series					

Compare Products

Graph displays only one product selected. You can cycle through the graph for each selected product.



Data for all products selected will be displayed side by side below the graph.

Building a Multiple Compressor System



Step 8) Select a product to stack

dd. \	iew. Brand Name V	AHRI Reference #*	 Outdoor Unit Model #*.x. 		Ducting Config* \sim	Max Cap @ Design Temp (Btu/h):.	Capacity Balance Point (°F)	% Design Load Served .x	% Annual Load Served .x.	% Annual Load Modulating 🔹	Min Capacity Threshold (°F)
				Number(s)*	•	Greater Than 😁 Less Than	Greater Tha ↔ Less Than	Greater Tł ↔ Less Than	Greater Tł ↔ Less Than	Greater Than 😁 Less Than	Greater Than ↔ Less Than
+	S TRANE / MITSUBISHI	. 213361523	NTXSPB18B112A*	NAXWPH18B112A*	Singlezone Non-Ducted,	20,706	20	49.3%	75.4%	72.2%	52
+	MITSUBISHI ELECTRIC	209832208	MUZ-FS18NAH***	MSZ-FS18NA***	Singlezone Non-Ducted,	20,706	20	49.3%	75.4%	72.2%	52
+	S TRANE / MITSUBISHI	209833000	MUZ-FS18NA***	NTXWPH18B112A*	Singlezone Non-Ducted,	20,706	20	49.3%	75.4%	72.2%	52
+	TRANE / MITSUBISHI	209832262	NTXSPH18B112A*	NTXWPH18B112A*	Singlezone Non-Ducted,	20,706	20	49.3%	75.4%	72.2%	52
+	S MITSUBISHI ELECTRIC	207679246	MUZ-GS24NA***	MSZ-GS24NA***	Singlezone Non-Ducted,	16,754	21	39.9%	73.3%	65.7%	48
+ 1	Nitsubishi Electric	207679251	MUZ-GS24NAH***	MSZ-GS24NA***	Singlezone Non-Ducted,	16,754	21	39.9%	73.3%	65.7%	48
+	S TRANE / MITSUBISHI	207705522	NTXSST24B112**	NAXWST24B112**	Singlezone Non-Ducted,	16,754	21	39.9%	73.3%	65.7%	48
+	TRANE / MITSUBISHI	213361521	NTXSPB15B112A*	NAXWPH15B112A*	Singlezone Non-Ducted,	17,431	26	41.5%	68.8%	65.6%	52
+	S TRANE / MITSUBISHI	209832261	NTXSPH15B112A*	NTXWPH15B112A*	Singlezone Non-Ducted,	17,431	26	41.5%	68.8%	65.6%	52
+	S MITSUBISHI ELECTRIC	209832206	MUZ-FS15NAH***	MSZ-FS15NA***	Singlezone Non-Ducted,	17,431	26	41.5%	68.8%	65.6%	52
+	S TRANE / MITSUBISHI	209832995	MUZ-FS15NA***	NTXWPH15B112A*	Singlezone Non-Ducted,	17,431	26	41.5%	68.8%	65.6%	52
+ 1	Trane / Mitsubishi Ele	207705540	NTXSSH18A112**	NAXWST18B112**	Singlezone Non-Ducted,	17,028	26	40.5%	69.2%	63.0%	49

Note: You can select the same product, multiple times to stack. The first product is not always the best option or readily available at your distributor.

Step 9) Click Stack Products

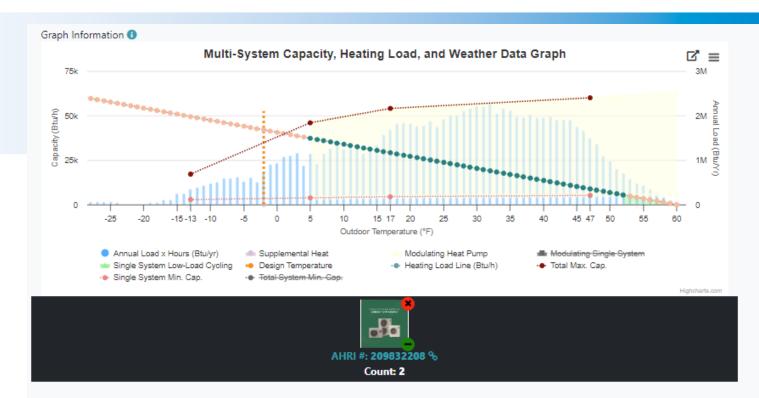
Table Information 🚯

(from table below) Û Current Filters Add. View. Brand Name AHRI Reference #* V Outdoor Unit Model #*.x. Indoor Model Ducting Config Max Cap @ Design Temp (Btu/h).x. Capacity Balance Point (*F)... % Design Load Served .x. % Annual Load Served .x. % Annual Load Modulating 🕶 Min Capacity Threshold (*F) Number(s)* Greater Than 😁 Less Than Greater Tha 😁 Less Than Greater Th ↔ Less Than Greater Th ↔ Less Than Greater Than ↔ Less Than Greater Than 😁 Less Than TRANE / MITSUBISHI ... 213361523 NTXSPB18B112A* NAXWPH18B112A* Singlezone Non-Ducted, ... 20,706 20 49.3% 75.4% 72.2% 52 + % 52 MITSUBISHI ELECTRIC 209832208 MUZ-FS18NAH*** MSZ-FS18NA*** Singlezone Non-Ducted, ... 20,706 20 49.3% 75.4% 72.2% 4 TRANE / MITSUBISHI ... 209833000 MUZ-FS18NA*** NTXWPH18B112A* Singlezone Non-Ducted, ... 20,706 20 49.3% 75.4% 72.2% 52 20 75.4% 72.2% 52 TRANE / MITSUBISHI ... 209832262 NTXSPH18B112A* NTXWPH18B112A* Singlezone Non-Ducted, ... 20,706 49.3% MITSUBISHI ELECTRIC 207679246 MUZ-GS24NA*** MSZ-GS24NA*** Singlezone Non-Ducted 16.754 21 39.9% 73.3% 65.7% 48 21 39.9% 65.7% 48 MUZ-GS24NAH*** MSZ-GS24NA*** Singlezone Non-Ducted, ... 16,754 73.3% Mitsubishi Electric 207679251 NTXSST24B112** Singlezone Non-Ducted, ... 16,754 21 39.9% 73.3% 65.7% 48 TRANE / MITSUBISHI ... 207705522 NAXWST24B112** 26 52 41.5% 68.8% 65.6% TRANE / MITSUBISHI ... 213361521 NTXSPB15B112A* NAXWPH15B112A* Singlezone Non-Ducted, ... 17,431 TRANE / MITSUBISHI ... 209832261 NTXSPH15B112A* NTXWPH15B112A* Singlezone Non-Ducted, ... 17,431 26 41.5% 68.8% 65.6% 52 26 52 MITSUBISHI ELECTRIC 209832206 MUZ-FS15NAH*** MSZ-FS15NA*** Singlezone Non-Ducted, ... 17,431 41.5% 68.8% 65.6% TRANE / MITSUBISHI ... 209832995 MUZ-FS15NA*** Singlezone Non-Ducted, ... 17,431 26 41.5% 68.8% 65.6% 52 NTXWPH15B112A* 26 40.5% 63.0% 49 Trane / Mitsubishi Ele... 207705540 Singlezone Non-Ducted, ... 17,028 69.2% NTXSSH18A112** NAXWST18B112** Trane / Mitsubishi Ele... 207705527 NTXSSH18A112* MSZ-GS18NA*** Singlezone Non-Ducted, ... 17,028 26 40.5% 69.2% 63.0% 49 MUZ-GS18NAHZ*** NAXWST18B112** Singlezone Non-Ducted, ... 17.028 26 40.5% 69.2% 63.0% 49 American Standard / ... 207705502 TRANE / MITSUBISHI ... 209832993 NTXSPB12B112A* MSZ-FS12NA*** Singlezone Non-Ducted, ... 13,255 32 31.6% 63.9% 62.1% 54 32 54 MITSUBISHI ELECTRIC 209832204 MUZ-FS12NAH*** MSZ-FS12NA*** Singlezone Non-Ducted, ... 13,255 31.6% 63.9% 62.1% 32 31.6% 63.9% 62.1% 54 TRANE / MITSUBISHI ... 209832990 MUZ-FS12NA*** NTXWPH12B112A* Singlezone Non-Ducted, ... 13,255 32 54 TRANE / MITSUBISHI ... 209832260 NTXSPH12B112A* NTXWPH12B112A* Singlezone Non-Ducted, ... 13,255 31.6% 63.9% 62.1% TRANE / MITSUBISHI ... 211497073 NTXSKH30A112AA NAXAMT30A112** Singlezone Ducted, Centr... 29,511 13 70.3% 80.5% 61.8% 42 SUZ-KA30NAHZ1** 13 70.3% 80.5% 61.8% 42 MITSUBISHI ELECTRIC 213617714 SV7-KP30NA* Singlezone Ducted, Centr... 29,511 Singlezone Non-Ducted, ... 10,194 36 24.3% 62.2% 61.7% 57 + TRANE / MITSUBISHI ... 209832988 NTXSPB09B112A* MSZ-FS09NA*** 57 36 24.3% 62.2% 61.7% MITSUBISHI ELECTRIC 209832202 MUZ-FS09NAH*** MSZ-FS09NA*** Singlezone Non-Ducted, ... 10,194 36 24.3% 62.2% 61.7% 57 TRANE / MITSUBISHI ... 209832985 MUZ-FS09NA*** NTXWPH09B112A* Singlezone Non-Ducted, ... 10,194 36 24.3% 57 ÷ TRANE / MITSUBISHI ... 209832259 NTXSPH09B112A* NTXWPH09B112A* Singlezone Non-Ducted, ... 10,194 62.2% 61.7% MITSUBISH + % + % MITSUBISH TRANE / M 🔸 🔍 👞 Select up to 5 products MITSUBISHI ELECTRIC MITSUBISH Model Series: M-Series TRANE / M 9 AHRI #: 209832208 TRANE / N + % Count 2

Stacked Products

Shows multiple compressors and data based on running those products together graphically

Shows multiple compressors and data based on running those products



Stacked Product Sizing For Heating

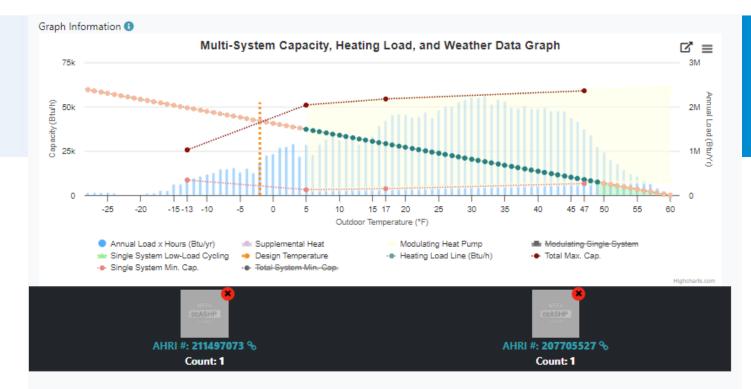
Field Information 🚯	
Capacity Balance Point (°F)	-2
Minimum Capacity Threshold (°F)	52
Maximum Capacity at Design Temp (Btu/h)	No capacity at design Temperature
Percent Design Load Served	No capacity at design Temperature
Percent Annual Heating Load Served	93.0%
Annual Btu's Covered by Supplemental Heat (MMBtu)	6.7

Field Information ()	
Hours Requiring Supplemental Heat	144
Percent Annual Load Modulating	89.8%
Percent Annual Load with Low-Load Cycling	%
Heat Pump Primacy Threshold	45
Annual Hours Primacy Cycling	1066
Percent Annual Load Primacy Cycling	8.4

Select better fitting products

V	nt Filters			(from table below)									
Add.	View	Brand Name v	AHRI Reference #*	 Outdoor Unit Model #*.x. 	Indoor Model	✓ Ducting Config [*] ✓	Max Cap @ Design Temp (Btu/h)	Capacity Balance Point (°F):.	% Design Load Served .x	% Annual Load Served	% Annual Load Modulating 💌	Min Capacity Threshold	
					Number(s)*	· · · · · · · · · · · · · · · · · · ·	Greater Than 😁 Less Than	Greater Tha ↔ Less Than	Greater Tł ↔ Less Than	Greater Tł ↔ Less Than	Greater Than 😁 Less Than	Greater Than ↔ Less	
+	90	TRANE / MITSUBISHI	213361523	NTXSPB18B112A*	NAXWPH18B112A*	Singlezone Non-Ducted,	20,706	20	49.3%	75.4%	72.2%	52	
+	90	MITSUBISHI ELECTRIC	209832208	MUZ-FS18NAH***	MSZ-FS18NA***	Singlezone Non-Ducted,	20,706	20	49.3%	75.4%	72.2%	52	
+	8	TRANE / MITSUBISHI	209833000	MUZ-FS18NA***	NTXWPH18B112A*	Singlezone Non-Ducted,	20,706	20	49.3%	75.4%	72.2%	52	
+	90	TRANE / MITSUBISHI	209832262	NTXSPH18B112A*	NTXWPH18B112A*	Singlezone Non-Ducted,	20,706	20	49.3%	75.4%	72.2%	52	
+	8	MITSUBISHI ELECTRIC	207679246	MUZ-GS24NA***	MSZ-GS24NA***	Singlezone Non-Ducted,	16,754	21	39.9%	73.3%	65.7%	48	
+	90	Mitsubishi Electric	207679251	MUZ-GS24NAH***	MSZ-GS24NA***	Singlezone Non-Ducted,	16,754	21	39.9%	73.3%	65.7%	48	
+	8	TRANE / MITSUBISHI	207705522	NTXSST24B112**	NAXWST24B112**	Singlezone Non-Ducted,	16,754	21	39.9%	73.3%	65.7%	48	
+	90	TRANE / MITSUBISHI	213361521	NTXSPB15B112A*	NAXWPH15B112A*	Singlezone Non-Ducted,	17,431	26	41.5%	68.8%	65.6%	52	
+	•	TRANE / MITSUBISHI	209832261	NTXSPH15B112A*	NTXWPH15B112A*	Singlezone Non-Ducted,	17,431	26	41.5%	68.8%	65.6%	52	
+	90	MITSUBISHI ELECTRIC	209832206	MUZ-FS15NAH***	MSZ-FS15NA***	Singlezone Non-Ducted,	17,431	26	41.5%	68.8%	65.6%	52	
+	•	TRANE / MITSUBISHI	209832995	MUZ-FS15NA***	NTXWPH15B112A*	Singlezone Non-Ducted,	17,431	26	41.5%	68.8%	65.6%	52	
+	90	Trane / Mitsubishi Ele	207705540	NTXSSH18A112**	NAXWST18B112**	Singlezone Non-Ducted,	17,028	26	40.5%	69.2%	63.0%	49	
+	•	Trane / Mitsubishi Ele	207705527	NTXSSH18A112*	MSZ-GS18NA***	Singlezone Non-Ducted,	17,028	26	40.5%	69.2%	63.0%	49	
+	•	American Standard /	207705502	MUZ-GS18NAHZ***	NAXWST18B112**	Singlezone Non-Ducted,	17,028	26	40.5%	69.2%	63.0%	49	
+	•	TRANE / MITSUBISHI	209832993	NTXSPB12B112A*	MSZ-FS12NA***	Singlezone Non-Ducted,	13,255	32	31.6%	63.9%	62.1%	54	
+	90	MITSUBISHI ELECTRIC	209832204	MUZ-FS12NAH***	MSZ-FS12NA***	Singlezone Non-Ducted,	13,255	32	31.6%	63.9%	62.1%	54	
+	•	TRANE / MITSUBISHI	209832990	MUZ-FS12NA***	NTXWPH12B112A*	Singlezone Non-Ducted,	13,255	32	31.6%	63.9%	62.1%	54	
+	8	TRANE / MITSUBISHI	209832260	NTXSPH12B112A*	NTXWPH12B112A*	Singlezone Non-Ducted,	13,255	32	31.6%	63.9%	62.1%	54	
+	•	TRANE / MITSUBISHI	211497073	NTXSKH30A112AA	NAXAMT30A112**	Singlezone Ducted, Centr	29,511	13	70.3%	80.5%	61.8%	42	
+	•	MITSUBISHI ELECTRIC	213617714	SUZ-KA30NAHZ1***	SVZ-KP30NA*	Singlezone Ducted, Centr	29,511	13	70.3%	80.5%	61.8%	42	
+	•	TRANE / MITSUBISHI	209832988	NTXSPB09B112A*	MSZ-FS09NA***	Singlezone Non-Ducted,	10,194	36	24.3%	62.2%	61.7%	57	
+	•	MITSUBISHI ELECTRIC	209832202	MUZ-FS09NAH***	MSZ-FS09NA***	Singlezone Non-Ducted,	10,194	36	24.3%	62.2%	61.7%	57	
+	Ф	TRANE / MITSUBISHI	209832985	MUZ-FS09NA***	NTXWPH09B112A*	Singlezone Non-Ducted,	10,194	36	24.3%	62.2%	61.7%	57	
+	8	TRANE / MITSUBISHI	209832259	NTXSPH09B112A*	NTXWPH09B112A*	Singlezone Non-Ducted,	10,194	36	24.3%	62.2%	61.7%	57	
+	Ф	MITSUBISHI			×	8							
+	8	MITSUBISHI		CCASHP		CASHP	NA EO.	, NIER,		, NI EA.			
+	Ф.	TRANE / MI	ect up to 5 produc	rts			Sugard C	A second s		August /			
+	8	MITSUBISHI		TRANE / MITS	SUBISHI Tra	ane / Mitsubishi Electric							
+	es.	TRANE / MI		ELECTR	IC	Model Series: NV-Serles AHRI #: 207705527							

Selecting the right equipment



Stacked Product Sizing For Heating

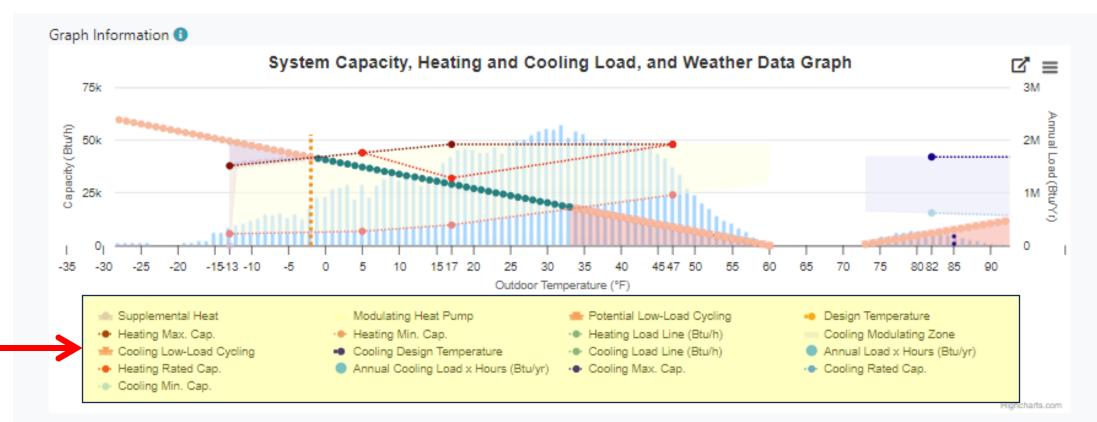
Field Information 🕕	
Capacity Balance Point (°F)	-9
Minimum Capacity Threshold (°F)	49
Maximum Capacity at Design Temp (Btu/h)	No capacity at design Temperature
Percent Design Load Served	No capacity at design Temperature
Percent Annual Heating Load Served	97.1%
Annual Btu's Covered by Supplemental Heat (MMBtu)	2.8

	Field Information 🚯	
	Hours Requiring Supplemental Heat	55
	Percent Annual Load Modulating	90.9%
	Percent Annual Load with Low-Load Cycling	%
	Heat Pump Primacy Threshold	36
	Annual Hours Primacy Cycling	2028
	Percent Annual Load Primacy Cycling	23.9

Other Features



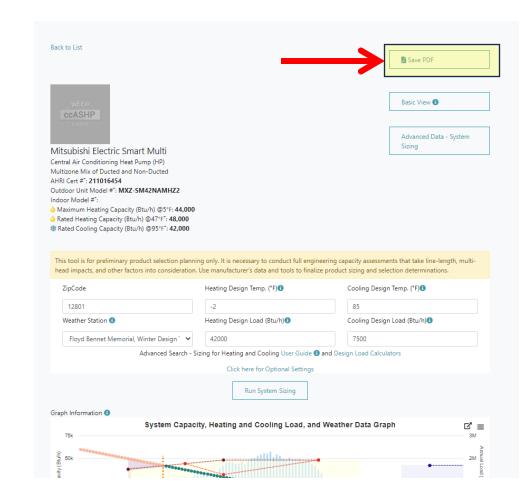
Cooling Load



Note: Cooling and heating data can be turned on and off. Data graph normally has cooling load data turned off.

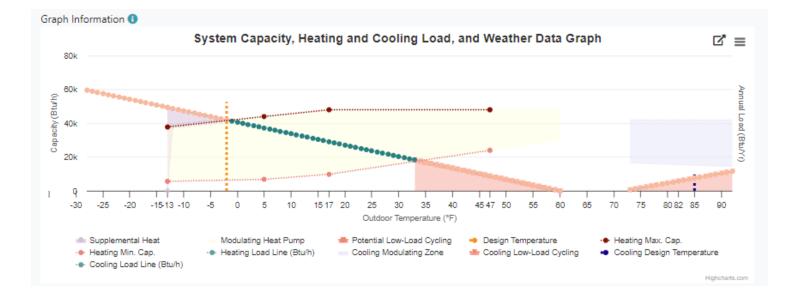
Download and Save

Download and save a PDF version of the data for the heat pump system that you selected



Basic View

Changes the graphically displayed information to a simpler version that can be used to show customers.



www.CleanHeatConnect.ny.gov

Clean Heat Connect RESOURCES TRAININGS **Clean Heat Connect** Clean Heat Connect is a network of contractors, distributors, and manufacturers dedicated to expanding the adoption of heat pumps in homes across New York State. Find distributor and manufacturer hosted trainings, learn about sales and marketing strategies, and explore resources from NYSERDA, NEEP and trusted partners. VIEW ALL INSTALLER RESOURCES >

Thank You

JJ Sawicki <u>JSawicki@trccompanies.com</u> <u>CleanHeatConnect@trccompanies.com</u>

