

NEEP's Cold Climate ASHP Resources are more relevant than ever!

- Dave Lis, Director, Technology and Market Solutions
- Northeast Energy Efficiency Partnerships (NEEP)
- NEEA Product Council Meeting
- March 14, 2023



Northeast Energy Efficiency Partnerships

Mission

We seek to accelerate regional collaboration to promote advanced energy efficiency and related solutions in homes, buildings, industry, and communities.

Approach

Drive market transformation regionally by fostering collaboration and innovation, developing tools, and disseminating knowledge



Agenda



- Genesis of ccASHP Spec/Product list
- Elements of specification
- Features of product list
- Genesis of sizing for heating tool
- Features of tool
- What's next with sizing tool

Regional Market Transformation Strategies



1. Increase Consumer Education and Awareness

2. Increase Installer/Builder Awareness of, and Confidence in, ASHP through expanded training and education

3. Reduce Upfront Costs of installed systems through robust and aligned promotional programs and the support of alternative business models

4. Mobilize State and Local Policymakers to expand support for ASHPs

5. Promote Advanced Control technologies to allow automated coordination among multiple heating systems

6. Enable the promotion of climate-appropriate ASHPs through Improved Performance Metrics

7. Develop more accurate tools to predict energy, cost and GHG savings associated with ASHP installation through collection and analysis of Real World Performance Data



High performance systems
+ Quality design/sizing
+ Quality installation
+ Operation and Maintenance

= Realized ASHP performance

NEEP Cold Climate ASHP Specification = Performance and Reporting Requirements



- COP@5F <u>></u> 1.75
- For Non-Ducted systems:
 - HSPF2 \geq 8.5 (10 HSPF equivalent)
 - SEER2 ≥ 15 (15 SEER equivalent)
- For Ducted systems:
 - HSPF2_ \geq 7.7 (9 HSPF equivalent)
 - SEER2 ≥ 14.3 (15 SEER equivalent)

				Capacity Leve	
Outdoor Dry Bulb (°F)	Indoor Dry Bulb (°F)		Minimum	Rated	Maximum
47	70	Btu/h			
		kW			
		СОР			
17	70	Btu/h			
		kW			
		СОР			
5	70	Btu/h			
		kW			
		СОР			
Lowest	70	Btu/h			
Cataloged		kW			
Temperature		СОР			

NEEP's Cold-Climate ASHP Product List



ashp.neep.org

One-stop-shop for cold-climate qualified air source heat pumps



Now 40,000+ systems from over 100 major brands

Demo time



- Categories
- Search capabilities
- List view/sorting features
- Detailed view/info
- Print report
- ENERGY STAR/CEE filters update

Installer Guidance- Improve Design and Installation





neep.org/ASHPInstallerResources

Sizing ASHPs in Cold Climates is a challenge



- Not enough to just be on a list
- Too small for heating?
- Too big for heating/cooling?
- The right ASHP can check all boxes



What do I do with this?

no op

Heating / Cooling	Outdoor Dry Bulb	Indoor Dry Bulb	Unit	Min	Rated	Max
Cooling	95°F	80°F	Btu/h	3,400	12,000	13,300
			kW	0.14	0.96	1.27
			COP	7.12	3.66	3.07
Cooling	82°F	80°F	Btu/h	3,600	-	14,400
			kW	0.12	-	1.09
			COP	8.79	-	3.87
Heating	47°F	70°F	Btu/h	2,800	14,500	19,100
			kW	0.14	1.03	1.67
			COP	5.86	4.13	3.35
Heating	17°F	70°F	Btu/h	3,200	8,800	12,700
			kW	0.36	0.88	1.39
			COP	2.61	2.93	2.68
Heating	5°F	70°F	Btu/h	2,700	-	10,700
			kW	0.33	-	1.28
			COP	2.4	-	2.45
20k	I	Heating/Coo	oling Ca	apacity Gr	aph	
15k —						•
Stu/hr	*****		*******			
Capacity (••••					
эк •			•			e
0 5	17		47	mparatura (°E)		82 9



Project Load Calcs required



- ACCA Manual J
- 3rd Party Manual J Software (i.e. Wrightsoft)
- Better Built HVAC- Sizing Tool

Sizing tool - Product view



Highcharts.com

ne ed

Product Sizing For Heating

Field Information 🕕	
Balance Point (°F)	5
Minimum Capacity Threshold (°F)	44
Maximum Capacity at Design Temp (Btu/hr)	25,220
Percent Design Load Served	98.9%
Annual Heating Load (MMBtu)	61.7
Percent Annual Heating Load Served	97.9%

Field Information ()	
Annual Btu's Covered by Supplemental Heat (MMBtu)	1.3
Hours Requiring Supplemental Heat	54
Percent Hours Requiring Supplemental Heat	0.9%
Percent Annual Load Modulating	83.9%
Percent Annual Load with Low-Load Cycling	12.69

Accessing tools via ccASHP Product List



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Heat Pump List	Search Products	Consumer and Installer Resources	About ASHP Initiative	About NEEP
	On behalf of clean energy and energy efficient Product List was originally launched in 2015; for of the coLOP Specification. The volumbry upo Please north tab their placed, engineement capa Commune Resources for nore information. Ready to search the list?	y stakeholders, NEEP is pleased to host the Cold Climate Air in more on the background, visit the AIS ¹⁰ holdshin. The list offication includes inquirements for both performance levels in general product a specification and an experimental pro- toines and design temperatures, and other important factors be	Source Heat Rump (ccASHP) Product List. This includes ASHP systems that meet the latest reveal as a series of reported performance translards. Jons. Consumers, contractors, and designers one selecting equipment. Violt NEP's installer an	a d
	Brand AHRI, Model, Unit	Ducting Heating Capacity (Rated B Configuration @47*1)	tu/hr Heating Capacity (Max Btu/hr @5'F) 0	
	All Brands 👻 AHRI, Model or	Ur All Configurati 👻 0	80000 0 80000	
Heat Pump List	Search Products	Advanced Search - Scing for Heating User Guide O	ner and Installer Resources	About ASHP Initiative
		DAIKIN Singlezone Non-ducted. Roor Pla AHRI Cert # 207158010 Outdoor Unit # FIXM12VVJU Indoor Unit # FIXM12VVJU Maximum Heating Capacity (Bu/h Brated Cooling Capacity (Bu/h ion Tables	cement س/hr) ©5'۴: 13,600 ©47'۴: 13,600) ©95'۴: 12,000 Parformance Space	Advanced Data - Sizing for Heating
	Brand	DAIKIN	Heating / Outdoor Inde	oor Dry
	Series		Cooling Dry Bulb Bul	b Unit Min Rated Max
	Ducting Co	nfiguration Singlezone Non-ducted, Floor Placement	Cooling 95°F 80°I	F Btu/h 4,800 12,000 16,000 kW 0,27 0,91 1.4
	AHRI Certi'	ficate No. 207158010		COP 5.21 3.86 3.35
	0	-14 # DVM1200/81	C F 0205 000	F D: A F100 17000

13.2

Mini-Splits

FTXM12VVJU

Heating 47°F

kW 0.24

COP 6.23

1.23

4.05

22,600

13 600

EER

Variable Capacity

Indoor Unit Type

Indoor Unit #

Advanced Search

• Product View

Demo time



- Assessing product performance match with application
 - Visualization
 - Calculations
- Impact of sizing choices within same product line
- Impact of potential load reductions
- Down selecting complete list

Tool users



• Contractors:

- New insights into selection decisions
- Differentiator with customers
- Distributors:
 - Confirm they are stocking well for local climates, giving confidence
 - Use at the counter for showing contractors
 - Swap outs due to supply chain issues
- Programs:
 - Contractor training tool
 - Contractors QC
 - 1:1 coaching
- Homeowners:
 - Consumer empowerment
 - Sanity check on quotes

What's next?



• Version 2.0 of sizing tools

- Multi-product buildup
- Weather station selection improvement
- Multi-unit comparison view
- Cooling capacity, latent load cross check
- Fuel cost calculator
- Capacity reduction factor
- Building balance point edit
- Load-line estimator
- If-then load-line comparisons
- Updated Sizing/Selection Best Practice Guides







- Cold Climate Air-source Heat pump Product List (including sizing tools); <u>https://ashp.neep.org/</u>
- User Guide: Cold Climate Heat Pump Sizing Support Tools; <u>https://ashp-</u> production.s3.amazonaws.com/NEEP_ccASHP+Heating+Visualization+User+Guide_v2.2_TRC_04.01.22.pdf
- Cold Climate Air-source Heat pump Specification; <u>https://neep.org/heating-electrification/ccashp-specification-product-list</u>
- Installer Guides/Videos; <u>https://neep.org/high-performance-air-source-heat-pumps/air-source-heat-pump-installer-and-consumer-resources</u>
- Heat Pump Initiative; <u>https://neep.org/smart-efficient-low-carbon-building-energy-solutions/air-source-heat-pumps</u>



THANK YOU!

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