

Air-Source Heat Pump Program

NYSERDA maintains the integrity of the Air-Source Heat Pump (ASHP) Program through an independent standards and quality assurance team, which manages the quality assurance (QA) system for the ASHP program. The QA system includes verifying compliance with program and installation standards using comprehensive field inspections and a commissioning checklist. QA field inspections and review of completed commissioning checklists are conducted by a qualified independent third-party competitively selected by NYSERDA and will use these checklists as their guides. Participating Installers are required to submit proof of all corrective action taken when a specific installation requirement has not been met and is deemed to be a major or critical system failure.

The checklists contained in this document represent an abbreviated form of the inspector's field inspection checklist used by the ASHP program as well as the required commissioning checklist. Participating installers should reference these checklists for each ASHP installation to serve as a verification that each pertinent requirement has been met and that each required commissioning action has been completed and documented.

Field Definitions

Installation Category — The Category field represents the highest level of the inspection checklist hierarchy and may include one or more measures.

Installation Element — The Measure field falls under a Category and represents a specific component that is open for inspection.

Installation Requirement — The Installation Requirement field falls under a Measure and represent the specific inspection checkpoints that an inspector would score for a given component.

Code/Program Manual (PM) Reference — Each installation requirement that is tied back to either the ASHP Program Manual (PM), code reference, or Manufacturer instructions. Both the New York State (NYS) Energy Conservation Construction Code and the New York City (NYC) Energy Conservation Code are based on the 2015 International Energy Conservation Code (IECC), with supplements. Citations of the IECC include the supplements. Both New York State and New York City adopted the versions of the National Electric Code (NEC), National Fire Protection Association (NFPA) and the International Mechanical Code (IMC). New York State adopted the International Residential Code (IRC) and International Building Code (IBC), although New York City's residential citations are in the NYC Building Code (NYCBC) which is substantially based on the International Building Code (IBC).

Rating

Fail (F) — The identified installation requirement has not been met.

Pass (P) — The identified **installation** requirement has been met.

N/A — The identified installation requirement is not applicable to this installation or was not able to be inspected.

Deficiency Category — Each task requirement is assigned a deficiency category of either incidental, minor, major or critical. Refer to the deficiency category descriptions below for additional detail. NYSERDA will require a participating installer to document through pictures and/or notes verification of resolution of all major and critical deficiencies. Minor and Incidental deficiencies need to be corrected but NYSERDA will not be verifying resolution.

Incidental — Not expected, on its own, to pose a substantial risk of system failure or hazard.

Minor — Require re-wiring to address but are not expected to pose a substantial risk of system failure or hazard.

Major — Present an increased risk of system failure or hazard but are not determined to be in imminent danger of failure or hazard.

Critical — Present an imminent hazard and/or probability of system failure.



Air-Source Heat Pump Program

Installation Category	Installation Element	System Size - Applies to Single-Family, Multifamily or Both	Installation Requirement	Code/Program Manual (PM) Reference	Deficiency Category	Rating		
						F	P	N/A
Ducts	Insulation	Both	Visible and accessible ducts are sealed and insulated, if applicable.	IECC sections R403.3.1, R403.3.2, and R402.4.1.1	Minor	F	P	N/A
Electrical	Access	Both	Adequate access has been provided around electric panels.	NFPA 70, NEC, 110.26 Spaces About Electrical	Minor	F	P	N/A
Electrical	Access	Both	Adequate access has been provided around disconnects.	NFPA 70, NEC, 110.26 Spaces About Electrical	Minor	F	P	N/A
Electrical	Disconnect	Both	The disconnect has suitable ampacity and is suitable for the location in which it is installed.	NFPA 70, NEC, 440.12 Rating and Interrupting Capacity	Major	F	P	N/A
Electrical	Disconnect	Both	The disconnect is installed in an accessible and appropriate location.	NFPA 70, NEC, 440.14 Location	Major	F	P	N/A
Electrical	Fuse Size	Both	Fuse/breaker size is appropriate for the installed equipment.	NFPA 70, NEC, 440.6 ampacity and Rating	Critical	F	P	N/A
Electrical	Fuse Size	Both	The conductors in the wiring are appropriate for the equipment and the overcurrent protection.	NFPA 70, NEC, 310.15 Ampacities for Conductors Rated	Critical	F	P	N/A
Electrical	Grounding	Both	The indoor unit, the outdoor unit, and the electrical panel connections are properly grounded per the NEC.	NFPA 70, NEC, Article 250	Major	F	P	N/A
Electrical	Wiring	Both	Wiring connections at the panels and heat pump units conform to the NEC.	Grounding and Bonding	Major	F	P	N/A
Electrical	Wiring	Both	Conductor size is adequate for the equipment ampacity	NFPA 70, NEC, Table 310.15(B)(16)	Critical	F	P	N/A

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Electrical	Wiring	Both	Electrical conductors are suitable for the installation.	NFPA, NEC Article 310	Major	F	P	N/A
Electrical	Wiring	Both	Electrical raceways are properly installed with correct fittings and are properly supported.	NFPA, NEC, 300.4 Protection Against Physical Damage	Minor	F	P	N/A
Equipment	Access	Both	Service access and sufficient clearance from walls, overhangs, doors, windows, and other protrusions has been provided around the interior and exterior units, per code and manufacturer instructions. Air flow is unobstructed.	IMC 306	Minor	F	P	N/A
Equipment	Exterior Unit	Both	Outdoor unit is installed above expected snow line.	PM page 5	Minor	F	P	N/A
Equipment	Exterior Unit	Both	If the unit is set under the roof line/edge, rain/snow/ice shield or drain cap is provided.	PM page 5	Minor	F	P	N/A
Equipment	Exterior Unit	Both	Electrical equipment openings and refrigerant pipe penetrations afford protection substantially equivalent to the wall of the equipment.	NFPA 70, NEC, 110.12 Mechanical Execution of Work	Major	F	P	N/A
Equipment	Interior and Exterior Unit	Both	Interior and Exterior units are level and properly supported and anchored.	PM page 5	Minor	F	P	N/A
Equipment	Filters	Both	Ducted systems have a filter installed and meets manufacturer's specifications.	PM Page 5	Incidental	F	P	N/A

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						F	P	N/A
Equipment	Resistance Heat and Controls	Both	Where supplemental electric-resistance heating is installed as part of the system, the supplemental heat operates correctly (only on 2nd stage or higher). When outdoor conditions are such that the heat pump capacity can meet the building heating load, controls prevent supplemental heat on any normal thermostat stage.	IECC R403.1.2; C403.2.4.11	Major	F	P	N/A
Equipment	Integrated Control	Both	For dual-fuel systems, installed Integrated Control is functioning per manufacturer's specification and automatically controlling both heat pump and existing central heating system.	PM Page 4	Major	F	P	N/A
General	Equipment and Accessories	Both	All equipment and accessories are installed in a workmanlike manner.	PM page 5	Incidental	F	P	N/A
General	Equipment and Accessories	Both	The number of installed indoor/outdoor unit matches the number of invoiced units.	PM page 5	Critical	F	P	N/A
Owner Education	Documentation	Both	The owner was given a copy of the manufacturer Operation and Maintenance manual and provided with contact information for emergency service needs.	PM Page 5	Incidental	F	P	N/A

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Owner Education	Operation	Both	The owner has been given training by installer, and understands basic system operation, especially heating operation; operation and adjustment of dampers (if applicable); and controls. The owner understands how to program controls and thermostats (as needed). The owner understands basic safety and maintenance.	PM Page5	Incidental	F	P	N/A
Performance Testing	Heat Pump	Both	Controls are verified to function in all basic modes of operation that can be tested under current conditions.	PM page 5	Major	F	P	N/A
Piping	Condensate	Both	The condensate drain is installed per the manufacturer requirements and code. Is it properly sized, pitched, and configured to permit the clearing of blockages? If a condensate pump is provided, pump operates. Discharge of condensate is to a drain or outdoors, away from crawlspaces, walkways, streets, alleys, or outdoor equipment. If damage to any building components would occur as the result of overflow or blockage, a secondary condensate drain system is installed. Does the condensate line drain water?	PM Page 5; IMC 307.2.3; IRC M-1411.3	Minor	F	P	N/A

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Piping	Exterior Pipe Penetration	Both	Exterior pipe penetrations are sealed weather tight (where visible) and resistant to rodents. Provide flashing as necessary.	IRC P2606, P2607; IBC 1405.4	Minor	F	P	N/A
Piping	Insulation	Both	Pipes are insulated (no exposed copper). Insulation is installed correctly, of the correct thickness, and meets code (R-3 minimum) and manufacturer requirements.	IECC R403.4; IECC Table C403.2.10; PM Page 5	Minor	F	P	N/A
Piping	Insulation	Both	Exterior pipe insulation is covered with UV resistant cover or coating.	Required by insulation manufacturer	Incidental	F	P	N/A
Piping	Interior Pipe Penetrations	Multifamily	Pipe penetrations of rated walls and ceilings (where visible) have been fire stopped with a listed material or assembly.	IBC Chapter 7	Minor	F	P	N/A
Piping	Interior Pipe Penetrations	Multifamily	Where refrigerant piping penetrates a floor, ceiling or roof, the installation conforms to one of the exceptions in the mechanical code.	IMC 1107.2	Minor	F	P	N/A
Piping	Joining	Both	Refrigerant leak detector yields no leaks in the accessible fittings.	PM Page 5	Major	F	P	N/A
Piping	Sizing	Both	The refrigerant pipe sizing, height change, and line length meets manufacturer requirements.	PM Page 5	Major	F	P	N/A

Installation Category	Installation Element	System Size - Applies to Single-Family, Multifamily or Both	Installation Requirement	Code/Program Manual (PM) Reference	Deficiency Category	Rating		
						F	P	N/A
Piping	Supports	Both	Pipe supports and support spacing, where visible, conform to the code and manufacturer instructions; piping and piping supports appear to be securely installed.	IMC 305	Minor	F	P	N/A
System Documentation	Confirmation of Startup Report	Both	The system was pressure tested with nitrogen and evacuated to 250 microns (or manufacturer's required evacuation limit).	PM Page 5, IMC 1108, Manufacturer's Instructions	Major	F	P	N/A
System Documentation	Equipment	Both	The model number of the installed unit matches the submitted documentation.	PM Page 4	Critical	F	P	N/A
System Documentation	Equipment	Both	The model number of the installed unit is listed on the NEEP Cold Climate ASHP Specification Listing.	PM Page 4	Critical	F	P	N/A
System Documentation	Integrated Control	Both	For dual-fuel systems, the model number of the installed unit matches the submitted documentation.	PM Page 4	Critical	F	P	N/A
System Documentation	Labeling	Both	Electrical circuits in panel are labeled and panel directory is updated.	NFPA 70, NEC, 110.22 Identification of Disconnecting	Incidental	F	P	N/A
System Documentation	Property	Both	The property is a full-time occupied, residential property served by a CEF or SBC utility payment.	PM Page 4	Critical	F	P	N/A
System Documentation	Warranty	Both	Warranty was provided and it adheres to the System Warranty section of the Air Source Heat Pump Program Manual (PM).	PM Page 5	Minor	F	P	N/A

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Air-Source Heat Pump Commissioning Checklist



Project Application No.:		
Site Owner Name:		
Manufacturer:		Model #:

Heat Load Served by ASHP (Check only one)

- ASHP project serves whole-house (90% and 120% of peak heating load)
- ASHP project is full replacement of existing heating system
- ASHP project is partial displacement of existing heating system
- ASHP project serves isolated zone only

For Whole-House Solution ASHP System Installations Only

I attest that I have used the following tools to calculate the home's heating and cooling loads: (select all that apply)

- ACCA Manual J
- ACCA Manual S
- ACCA Manual D
- Custom Calculator
- Manufacturer's Software
- Standardized Lookup Tables
- Other

Installer to Complete - Check Done or N/A in the columns, fill in blanks. Installer to Sign.

Done	N/A	Item Description
Heat Pump Units		
		Outdoor unit height above grade (inches) to avoid snow line: _____.
		Outdoor unit is under roof drip line and is protected by ice/snow shield.
		Outdoor unit was measured to be level and is fastened to structure or mechanical pad.
		Outdoor unit has unobstructed airflow as required by manufacturer.
		Indoor unit has clearance for service and operation as required by manufacturer.
		Indoor unit is properly located, properly fastened to structure, and is level.
		Condensate line is supported every 4 feet, is pitched to outlet, and drains water.
Line Set		
		Diameter of line set _____
		Minimum line set length per manufacturer _____ Maximum Length _____
		Maximum line set length permitted by manufacturer for factory charge _____
		Maximum line set vertical difference per manufacturer _____
		Installed line set length _____ Installed vertical difference _____
		Line set length exceeds manufacturer's requirements for factory charge
		Refrigerant added: Pounds _____ Ounces _____
		Line set purged with N ₂ ; Pressure tested with N ₂ ; Evacuated to 250 _{µm} or per manufacturer.
		N ₂ test pressure (PSIG) _____ Test duration (minutes) _____
		Vacuum Level (_{µm}) _____ Vacuum duration (minutes) _____
		Brazing joint(s) was required. N ₂ purge used during brazing operations.
		Flare connection tightened per mfg.'s recommended torque. Torque setting _____
		Line sets and units were sensed with refrigerant detector and no leaks were found.
		Insulation completely covers line sets. Insulation UV protection provided exterior of building.
		Floor/Wall/Ceiling pipe penetrations are sealed.

Air-Source Heat Pump Commissioning Checklist (continued)

Done	N/A	Item Description
Operation/Controls		
		Unit(s) were operated in heating and cooling modes to verify proper operation.
		Continuous fan function disabled.
		Dual fuel outdoor cutoff control installed and functioning as designed to optimize use of ASHP for heating.
Ducted Units		
		Design airflow _____ Design discharge static pressure _____
		Measured airflow _____ Measured static pressure _____
		Ducts were sized to ACCA Manual D or equivalent.
		Ducts are sealed, and no leaks are evident.
		Any ducts outside condition space are insulated to Code.
Integrated Control		
		I have installed the Integrated Control to provide automatic changeover from the Heat Pump to the existing central heating system per the manufacturer's instructions.
Information to Site Owner		
		I have provided an Owner's Manual for the Heat Pump to the Site Owner.
		I showed the Site Owner how to control the Heat Pump including turning on and off, adjust the temperature, and switch between heating and cooling, I explained preventive maintenance requirements including how to clean and/or change the filter. I showed the Site Owner what alarms look like when the heat pump is not functioning properly.
		I provided the Warranty to the Site Owner. The Site Owner understands who to contact for service.
		I have informed the Site Owner that I am a participating installer in NYSERDA's ASHP Program and therefore NYSERDA or its representatives may complete a Quality Assurance field inspection of the installed Heat Pump.
		If this installation involved a Whole-House Solution ASHP System* and/or an Integrated Control**, the Site Owner's Invoice demonstrates the incentive amount(s) being passed onto them.
Installer Signature:		Date:
Installer Name:		

* **Whole-House Solution ASHP System:** An ASHP System installed as a home's primary heating source, designed with a full-load heating capacity between 90% and 120% of peak heating load, corresponding to the approved heat load calculation determined by utilizing a Manual J or an equivalent energy simulation program or calculator.

** **Integrated Control:** NYSERDA qualified integrated control package or dual fuel thermostat that can switch between a qualifying ASHP system and a central heating system.