

Technical Requirements: Cold Climate Room Heat Pumps

General

These Technical Requirements shall be followed for all projects that propose to use room heat pumps. These are in addition to all requirements outlined in NYC codes, zoning, NYS Clean Heat program requirements (and the associated requirements of participating utilities) and the HPD Design Guidelines. In some cases, these Technical Requirements are more stringent than required by codes or by the Clean Heat requirements, and in those cases, these requirements shall be followed.

Room heat pumps include indoor-mounted heat pumps (vented through the wall) and packaged terminal heat pumps.

Requirements included here shall be reflected in the drawings and/or specifications of the construction documents. For simplicity and clarity, these requirements may be copied and pasted onto drawings on relevant pages and details. A Word version of this document can be made available for this purpose.

See endnotes for summary of items that have been revised or added.

Room Heat Pumps (Equipment)

- Shall be listed on the Northeast Energy Efficiency Partnership (NEEP) Cold Climate *Air Source Heat Pump Product List*ⁱ and meet or exceed NYS Clean Heat requirements.
- Shall be sized to cover the full design heating load and ordered without internal electric resistance heat or installed with the internal electric resistance heat disabled.
- Shall have a minimum 5-year parts warranty and 12-month labor warrantyⁱⁱ.
- Shall have variable speed compressors.

Sizing Requirements

- Size the heat pump to the heating load, per requirements in this document. System shall be designed to meet Clean Heat “Full Load” requirements.
- Heat pumps shall be used for all habitable spaces, with limited exceptions in select areas (e.g. bathrooms, spaces that require only freeze protection). Full heating is discouraged in spaces with limited duration of occupancy (e.g. corridors, stairwells, basements).

- Size systems to an indoor design heating temperature of 72 degrees, as allowed by the Energy Code. Note that NYC requires that systems be capable of ensuring that the indoor temperature is at least 68 degrees.
- Size systems to a design outdoor temperature of 13 degrees. Note that Clean Heat Program Manual uses the 99% threshold while this program requires sizing to the 99.6% heat load threshold

Supplemental Heat

- Electric resistance backup shall not be used for heat pumps (e.g. in the same space). If the heat loss in a space exceeds available equipment heat pump capacities at the winter design outdoor temperature, project teams are encouraged to reduce heat loss by improving the space envelope (insulation, windows, etc.). Otherwise, use multiple units spaced as necessary.
 - In exceptional circumstances, HPD may allow electric resistance heat in a space where the heat loss substantially exceeds what can be reasonably reduced through envelope improvements. In no cases will electric resistance backup be allowed in a majority of apartments, or in the majority of rooms in any one apartment. Written approval must be obtained for any such exceptional use of electric resistance backup heat
- Non-heat pump electric space heating (e.g., electric resistance or radiant) may be used with HPD pre-approval in spaces such as common stairwells, utility rooms, basements, vestibules, and other smaller non-occupiable spaces where heat pumps may not be appropriate. For larger spaces requiring greater than 3.5 KW space heating, use heat pumps.
- Heaters located in bathrooms shall have timer controls; all other heaters shall have automatic controls with a maximum setpoint of 50°F.
- Electric resistance space heating is not permitted in garages or plenums (unless required to prevent pipes freezing or other similar impacts), or for snow or ice melting.
- Electric resistance heaters that are used for freeze protection (e.g. common area spaces with water piping, gas meter rooms, etc.) shall have temperature limits set at 50 degrees maximum or shall be set at 50 degrees and placed under a locking cover
- Electric resistance heating is permitted in infrequent-use, high-volume applications such as laundry make-up air, but not for ventilation air.

Wiring and Condensate Piping

- Provide a condensate management strategy that addresses collection, drainage, and freeze protection, as applicable.

- Condensate piping shall be minimum $\frac{3}{4}$ " PEX, PVC or CPVC. Vinyl tubing and corrugated tubing shall not be used. Note that code-approved materials (Mechanical Code 307.2.2) for condensate disposal does not include plain steel, and so abandoned steam piping can generally not be used for condensate disposal on its own.
- Fastening of condensate piping shall be hose clamp (worm drive clamp) or approved crimp rings, for PEX or approved connectors or approved adhesive for PVC or CPVC.
- Wiring and condensate piping penetrations of walls and roofs shall be sealed on both sides of the penetration. Sealing material used outdoors shall be UV-resistant. Sealing should be around and between all pipes and wires/conduit.
- Piping and wiring indoors shall be concealed unless otherwise approved. "Concealed" means: In chases, in ceiling or floor cavities, in basements or attics, or in drywall-finished soffits, or other approved means of concealment.
- Exposed wiring conduit and condensate piping on exterior walls shall be concealed in a cover in a color to match the wall. Cover type/color to be submitted and approved prior to ordering.
- Design should use gravity drainage of condensate from the units wherever possible. If gravity drainage is not possible, condensate pumps shall be concealed to the extent feasible. Condensate discharge to building drainage shall be through indirect waste connection by means of an air gap.

Air Sealing and Insulation

Air sealing shall accomplish complete weatherproofing, air-tightness, and insulation levels that match or exceed adjacent construction, and result in a long-term, low-maintenance solution. Provide thermal breaks to mitigate thermal bridging at PTHP sleeves or unit penetrations, continuous air sealing at all PTHP penetrations through the building envelope, and insulation between intake and outlet ductwork; ensure tight sealing around any condensate line or other penetrations. See "required submittals" section for requirements of a mock-up. Final design and documents shall include the following:

- Room heat pump air sealing and thermal break detailsⁱⁱⁱ
- Interior wall-mounted room heat pumps typically need to be installed on a smooth wall surface, to rest perfectly against the wall so the weatherstripping on the back of the unit makes a tight seal against the wall sleeves. This may require a piece of plywood to be installed on the wall behind the sheetrock.
- Air-seal wall penetrations on both the outside and inside with 20-year silicone caulk or approved alternate, using a backer rod if the gap is larger than $\frac{1}{8}$ ", and foam if the gap is larger than $\frac{1}{2}$ ". If air/water barrier is identified behind the facade material, seal to this barrier.
- Sleeves should be pitched to the outside. Follow manufacturer's instructions.

- Sleeves should be insulated in order to reduce heat loss and to prevent condensation inside the sleeves, unless they are penetrating solid insulation (such as an insulation-fully-filled wall cavity). For example, if they are installed in a masonry wall where the insulation is only on the outside of the building, the sleeve should be insulated.
- If the room heat pump is not installed on an exterior wall and a plenum is used to duct the room heat pump, it must be fully sealed and insulated. Furthermore, the outdoor intake and exhaust air streams must be properly separated all the way to the exterior (e.g. even through the louver), so there is no short circuiting.
- Projects designing to Passive House standards will need to incorporate thermal breaks into any sleeves installed through the thermal boundary to ensure that passive house standards are met. Thermal bridge modeling may be required by the Passive House certifying agency.
- Projects designing to Passive House standards are required to perform air leakage testing on a mocked-up installation to confirm that the unit will comply with Passive House standards. Please work closely with the project's Certified Passive House Consultant to develop any modifications for Passive House compliance and confirm these modifications achieve the performance desired through air leakage testing.

Other

- Set unit level and true.
- Comply with all relevant codes and standards.

Thermostats and Controls

- A 7-day programmable thermostat is required, per the energy code. Controls shall be fixed, wall-mounted or unit-mounted types that are simple and easy to read.
- Mount controls on the heat pump or on an interior wall, 60" above the finished floor, unless a lower height is required for accessibility (ADA) or unit-mounted
- Easy-to-read instructions must be provided to residents outlining thermostat settings, thermostat use, basic functions including overrides, "away" mode, information about energy savings, etc.
- Provide hands-on training to residents to ensure full understanding of operations and options

Dual Power Systems

If it is proposed to provide dual power supplies to units, in order for metering to be switched between tenant meter (for example, for cooling) to the house meter (for example, for heating), the design team should be aware of safety concerns: Someone servicing a unit could turn off one

power supply, assume power to the unit is off, and then be at safety risk if the second source of power is live. Accordingly, for such approaches, HPD requires:

- A “dual power source” warning label on the unit.
- A warning label at both the house panel and apartment panel.
- A single disconnect at the unit that fully shuts all power to the unit.

Commissioning and System Testing

Commissioning (Cx) and Testing shall be performed in accordance with the submitted Cx Plan and Functional Testing Plan. The following tests shall be part of those commissioning and testing plans:

- Program room heat pump temperature controls to 70°F heating and 78°F cooling (occupied mode), unless provided written instructions otherwise.
- Ensure that filters on room heat pumps are clean and free of construction dust.
- For outdoor temperatures below 60° F, force heat pump into heating at maximum compressor speed (for example, by calling for heat at a high indoor setpoint temperature), and then record outdoor air temperature in the shade, total system electric current (amps), return air temperature, and supply air temperature.
- For outdoor temperatures above 60° F, force heat pump into cooling at maximum compressor speed (for example, by calling for cooling with low indoor setpoint temperature), and then record outdoor air temperature in the shade, total heat pump electric current (amps), return air temperature, return relative humidity (%), and supply air temperature.
- Provide a written report of test results (above) and manufacturer-required startup tests.
- For further commissioning requirements, refer to the Energy Code and to: [Commissioning Requirements - New York City Commercial Code](#)

Removal of Fossil Fuel Equipment

Where existing fossil fuel equipment is being removed, comply with requirements in this subsection.

- Permanently seal the bottom and top of chimneys/vents and outdoor air combustion intake openings, and air-seal and insulate these penetrations per energy code. Permanently seal, ridged as with plywood or masonry, air sealed, waterproofed, insulated, and with a vapor barrier. If a chimney is being reused, for example for a smaller hot water flue, the sealing should occur around new flue at top and bottom.
- Permanently cap abandoned gas piping. Do not simply close shutoff valves.
- Remove oil tanks and oil piping and accessories.

- For the removal of existing oil tank(s), GC to submit all DEP and FDNY decommissioning documents of the oil tank(s) to HPD. Removal of tanks 1100 gallons or larger must also comply with NYC DEC removal and documentation requirements.

Best Practices

In addition, consider best practices as outlined by HPD, including:

- FAQ: Heat Pump System Design
- PTHP Maintenance Plan, including bi-annual (routine) and annual maintenance. Refer to this document for best practices: [HPD/NYSERDA PTHP Maintenance & Service Overview](#)

These can be found at the following web site: [HPD's REDi webpage](#)

Required Submittals

Submittals For Design Approval:

- Drawings and Specifications conforming to all requirements herein. Include room heat pump air sealing and other similar details in construction drawings.
- Complete design calculations demonstrating compliance with the design temperature and performance requirements included in this Technical Requirements document.
- A comprehensive maintenance and service plan for the heat pump system. You may use [HPD/NYSERDA PTHP Maintenance & Service Overview](#) for reference (required for REDi projects, recommended for other projects)
- Inclusion of Mock-up requirement in Construction Documents

Submittals Prior to Construction:

- Commissioning (Cx) Plan: Narrative description of commissioning activities and timeline, including personnel intended to accomplish the activities, a list of equipment and systems to be tested, functions to be tested, and required testing conditions.
- Functional Testing Plan: Narrative of blank form indicated planned testing procedures, protocols, and acceptance criteria.
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Submittals During Construction:

- To assist with requisition reimbursements, submit construction photos of each major step of construction (preparation of exterior wall penetrations, installation, sealing,

anchoring/installing, power connections, or similar details) and a brief summary of work completed as units are installed along with applicable payment applications.

- Mock-up: Construct a physical mock-up of each unique type of room heat pump demonstrating the required installation of the heat pump to ensure compliance with standards described herein for attachment, insulation, wiring, condensate management, and air-sealing. Verify air tightness using an approved pressure test or similar method. Incorporate details of approved mock-up into contract requirements.
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Submittals Prior to Completion:

- Functional Performance Testing Reports: Testing reports with any issues and resolution actions
- Final Cx Report: Final report as accepted by ownership that includes results of all functional performance tests, deficiencies found during testing and corrective measures taken, and functional performance test procedures

ⁱ Newly clarified requirement, May 2026

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