CLARIFICATIONS ON ELECTRIC RESISTANCE

Electric resistance integrated within PTHPs and used as an auxiliary

The integration of auxiliary electric resistance within PTHPs is not allowed per HPD's design guidelines. HPD believes that typical PTHPs currently available on the market would satisfy loads needed for typical apartments following HPD Design Guidelines (per the Heat Loss Calculation example below). However, there may be certain cases, e.g., a uniquely large apartment, where a single unit may not be sufficient. In those cases, the owner may add a second unit or may request a waiver from HPD, which may be granted in very limited cases, where heating is owner-paid, and where a Heat Loss calculation shows that the load for the space cannot be covered by the equipment. Note that the Clean Heat Program also limits the use of electric resistance heating, and funding will not be available to applicable projects not meeting the Clean Heat criteria.

To demonstrate the above, we propose the following calculations, which assume the worst conditions possible under a typical new construction apartment built according to HPD Design Guidelines.

Example Heat Loss Calculation:

Assumptions

For the purpose of this exercise, the 'worst case' conditions have been assumed for a new building:

- The apartment is sized according to HPD Design Guidelines for New Construction v2.0
 - Apartment is a 2 Bedroom, 'Top-Corner' type
 - Living Room + Kitchen: Perimeter: 20' x 10' ==> 450 SF total
 - People = 3
- Building is New Construction compliant with 2020 NYCECC
 - Lighting: 0.5 W/SF overhead; 0.5 W/SF Task
 - S and W walls for max solar, 1 window (3.5'x 5') on each wall
 - U = 0.28 (non-metal); SHGC 0.36 (SC = 0.41) (Projection Factor, PF<0.2)
 - Roof insulation = R-33ci
 - Wall insulation = R-13.25ci
- Heat Loss Calculations according to ACCA Manual J
 - Temperatures = 72F heating indoor; 13F winter outdoor
 - Infiltration = 0.15 ACH
 - Miscellaneous Loads = 500W (1706 Btu/hr)
 - No safety factors
- Ventilation is assumed to be 'exhaust-only', with no ERV

Results – Peak Loads

- Heating = 5750 Btu/hr
- Cooling = 9070 Btu/hr (Total, sensible + latent)

PTHP Sizing - Ephoca Wall Mounted Pro

For the purpose of this exercise, we're going to use the Epocha Wall Mounted Pro.

Cooling	Range [Btu/hr]	3,400 – 15,500
	Nominal [Btu/hr]	8,500
Heating 47°	Range [Btu/hr]	4,300 – 15,700
	Nominal [Btu/hr]	8,600
Heating 13°F	Range [Btu/hr]	3,200 – 7,300
	Nominal [Btu/hr]	6,900
Heating 5°F	Range [Btu/hr]	2,800 - 6,800
	Nominal [Btu/hr]	6,400

Technical Specifications

We're going to consider the 'worst case' scenario, of outdoor temperature at 5°F, and the Nominal value capacity as a conservative measure – 6,400 Btu/h

Results - Sizing

- Nominal Heating Capacity @5°F = 6,400 Btu/h
- Heating Peak Loads for 'worst case' room = 5,750 Btu/hr

The Ephoca Wall Mounted Pro Nominal Heating Capacity @5°F covers the Heating Peak Loads for a 'worst case' room in a typical apartment compliant with HPD New Construction Design Guidelines v2.0.

Important Note

The calculations shown above consider 'typical' conditions and might not be comprehensive of unique scenarios.

If a Project Team wishes to request a re-consideration of this requirement and ask for a waiver, the following information and additional documentation shall be submitted for review. This should be for each specific space where the request to use auxiliary electric resistance is being made:

- HVAC Load Calculations (inputs + outputs), performed according to ACCA Manual J, or through a software meeting ANSI Standard 183.
- Mechanical Floor Plans, Mechanical Schedules, and/or equipment cut sheets, including model numbers for the units selected.

Project Teams shall submit the request along with the required information and additional documentation and/or contact sustainability@hpd.nyc.gov with any questions.

Electric Resistance Space Heating for Back-Of-House Spaces

Per design guidelines, electric resistance space heating may be used with HPD pre-approval in back-of-house spaces where heat pumps may not be appropriate.

The following must be taken into consideration when requesting approval for electric resistance use for space heating:

- Total heating capacity is limited to 3.5 kW per enclosed space.
- Electric Resistance shall be limited to auxiliary spaces where heat is required and shall not be used if heating in that space is not required.
- Examples of spaces where electric resistance can be used are:
 - Common bathrooms (with a timer switch)
 - Common stairwells
 - Utility rooms
 - o Corridors
 - Main Lobby entrance vestibule
 - Mechanical Rooms
 - Spaces outside of the thermal envelope (e.g., an unheated cellar) to protect equipment
- Regardless of the heating capacity for each enclosed space, 90% of the overall building heating load must be met by heat pumps (note that projects seeking Clean Heat funding should comply with the Clean Heat requirement, which may be different).
- The design of the electric resistance heating systems shall include either timer or temperature limits. Thermostat to limit heating temperature to 50F.

If a Project Team wishes to request pre-approval for electric resistance space heating use in back-of-house spaces, the following information and additional documentation shall be submitted for review:

- Mechanical Floor Plans
- Mechanical Schedules and/or equipment cut sheets, including model numbers for the units selected.
- Indication of the rooms where electric resistance space heating is used and the total capacity per each enclosed space.
- Indication on which type of control is used, either a timer switch or a lower thermostat setting.

Project Teams shall submit the request along with the required information and additional documentation and/or contact sustainability@hpd.nyc.gov with any questions.