High-Performance Measure Details

Measure Name
Single Zone Heat Pump with Smart Thermostat

Use Category
SH – Space Heating Electrification

Effective Date
January 26, 2026

End Date
N/A

Version
2

Measure Code
LM402

Measure Stage
Early Adoption

Table of Contents

High-Performance Measure Details....1
Technology Summary....1
Alignment with CEDA Program Goals....2
CEDA Inducement Requirements....3
Incremental Measure Cost....6
Code Readiness Objectives....8
Code Reference....9
Eligible Climate Zones and Building Types....12
Measure Exclusions....12
Reviewer Checklist....13
Version History Log....15

Technology Summary

A Single Zone Heat Pump (SZHP) with a smart thermostat is designed to deliver efficient, all-electric space heating and cooling while minimizing reliance on electric resistance backup heating. These systems serve individual thermal zones and use compressor-based heat transfer to provide heating and cooling with significantly higher efficiency than resistance-based systems.

When paired with a qualifying smart thermostat, the system prioritizes compressor operation and limits auxiliary electric resistance heating to specific conditions such as defrost cycles, equipment failure, or extreme outdoor temperatures. Smart thermostat controls support programmable and automated setpoint management, stable heat calls, and coordinated auxiliary heat operation to improve efficiency, comfort, and system performance.

This measure applies to both packaged and split single-zone heat pump systems. Control strategies and capabilities vary by manufacturer and system configuration; for the purposes of this measure, a smart thermostat is an ENERGY STAR–certified or qualified control device that provides verified functionality to prioritize heat pump operation, coordinate auxiliary electric resistance heating, and, where applicable, support advanced features such as adaptive recovery or demand-responsive operation.

Alignment with CEDA Program Goals

The CEDA program supports the implementation of energy efficiency measures that advance Code Readiness's Long Term Tactical Plan (LTTP) to drive the goals of electrification, decarbonization, and load reduction.

Projects must meet one of the CEDA Inducement Requirements identified in the next section to receive an inducement and will be evaluated for the level of interest in metering to support Code Readiness Objectives.

This measure meets the CEDA program goals as follows:

- **Building partnerships with market stakeholders** by consulting on innovative technologies and best practices in energy efficiency, which can lead to the development of more effective solutions and accelerate the adoption of new technologies. As teams adopt the measure, this increases the volume of engineers able to design the equipment, contractors capable of installing the equipment, and owners able to operate the equipment.
- **Increasing the supply of high-performance measures and all-electric buildings** by combining electrification with energy efficiency that can result in projects implementing measures to achieve greater energy savings, reduced emissions, and overall improved building performance. As more buildings specify and install single zone heat pumps with smart thermostats—particularly those that minimize electric-resistance heating—it helps expand market availability, strengthens installer familiarity, and supports broader adoption across both new construction and existing buildings.
- **Increasing the demand for high-performance measures and all-electric buildings** by pushing for electrification that drives the need for technological advancements, supporting economic growth opportunities through innovation, and raising awareness of the benefits of electrification to increase consumer adoption. As demand in the market increases for newer technologies, the long-term benefit is increasing demand for manufacturers and suppliers to provide additional options available in the market.
- **Advancing new high-performance measure technology** by raising public awareness about new technologies and their benefits, helping build acceptance and demand through market support advocacy efforts that can influence stakeholder decisions that enable technological innovation.
- **Providing Codes & Standards with projects of interest** to collect metered data that will inform future California energy codes.

CEDA Inducement Requirements

The following inducement requirements are designed to accelerate market adoption of single-zone heat pump systems equipped with smart thermostat controls by enhancing energy efficiency, lowering operational costs, and reducing carbon emissions while reducing reliance on electric resistance heating. Project inducements will be determined by assessing each project's projected energy-savings impacts and its ability to support broader electrification adoption.

This HPM offers two design levels: **Essential — Electric Space Heating with Smart Thermostat Controls** and **Premium — Demand Response (DR) Readiness with Advanced Smart Thermostats**. All projects must meet the Essential-level design and documentation requirements to be eligible. Projects seeking Premium-level inducements must meet all Essential requirements and demonstrate additional DR-readiness capabilities, as defined in the Premium tier. Refer to the tier-specific System Design Requirements and Supporting Documentation Requirements for the option you are claiming.

System Design Requirements

1. **Essential level**: Electric Space Heating with Smart Thermostat Controls
   - 1.1. For participation, this measure applies to both package heat pumps (where the compressor and air handler are combined in a single unit) and split systems (with separate indoor and outdoor units) with the following:
     - 1.1.1. The project shall install a single-zone heat pump system (packaged or split). The system shall include supplemental electric resistance heating that functions only as backup heat.
     - 1.1.2. The heat pump shall be sized to meet greater than 75% of the design heating load at the outdoor design condition, consistent with Title 24, Part 6, Section 140.4(g), Exception 2.
   - 1.2. The site shall install a qualified smart thermostat (as defined by ENERGY STAR) compatible with the heat pump system that allows configuration to prioritize compressor operation over electric resistance heating, including proper coordination of auxiliary heat calls during defrost operation.
     - 1.2.1. The site shall program the smart thermostat to minimize use of electric resistance heating, except in cases of compressor failure, defrost cycles initiated by the heat pump, or when outdoor temperatures fall below manufacturer-approved auxiliary heat enable temperatures.
     - 1.2.2. The site shall configure the smart thermostat using manufacturer-supported settings to prioritize heat pump compressor operation and coordinate auxiliary electric resistance heating during defrost events.
       - 1.2.2.1. Required configuration shall include enabling compressor protection and anti-short-cycle features and setting auxiliary electric resistance heating to operate only when necessary during defrost cycles to maintain indoor comfort.
       - 1.2.2.2. Compliance shall be demonstrated through thermostat configuration settings or manufacturer documentation showing the relevant control features are enabled.
   - 1.3. Each conditioned space served by a single-zone heat pump system shall be controlled by a dedicated smart thermostat to provide independent temperature control and support efficient system operation.
     - 1.3.1. Thermostat control operation must be consistent with Title 24, Part 6, Section 110.2(b), 110.2(c) and 120.2(b).
2. **Premium level**: Demand Response Readiness with Advanced Smart Thermostats
   - 2.1. The Premium design level builds upon Essential-tier requirements by enabling demand response (DR) readiness through advanced smart thermostat or system controller capabilities. Premium participation requires systems to be capable of receiving and responding to external demand response signals; enrollment in a utility or aggregator demand response program or participation in DR events is not required under this High-Performance Measure.

2.2. To meet the Premium design level described in Section 2.1, the site shall install an advanced smart thermostat or system controller compatible with the heat pump that, in addition to meeting all Essential-tier requirements, provides the following enhanced control and communication capabilities:
2.2.1. Support for remote setpoint adjustment and supervisory control functions.
2.2.2. Ability to coordinate supplemental heat operation, compressor staging, and fan behavior during system events (defrost, demand response, etc.).
2.2.3. Capability to maintain stable heat calls and prevent control conflicts during automated setpoint changes.
2.3. At a minimum, auxiliary electric resistance heating shall be configured to remain locked out until outdoor air temperatures fall at or below 30°F (–1°C), or the lowest lockout temperature permitted by the heat pump or thermostat manufacturer. Lockout settings shall be selected to materially reduce reliance on auxiliary electric resistance heating while maintaining manufacturer-approved system operation and occupant comfort.
2.3.1. The site shall ensure the heat pump system is capable of automatically engaging electric resistance heating only in failure mode or during defrost cycles.
2.4. The smart thermostat or controller shall be configured to be demand-ready, consistent with Title 24, Part 6, Section 110.12(a), and capable of the following:
2.4.1. Receiving an external DR signal through a utility program, aggregator, or communication interface.
2.4.2. Automatically adjusting heating and/or cooling setpoints in response to a signal.
2.4.3. Restoring original setpoints following the conclusion of a DR event.

Supporting Documentation Requirements

1. **System Design Summary:** The project shall submit a system design summary demonstrating compliance with the selected design level.
1.1. Heat Pump System Documentation
1.1.1. Provide manufacturer documentation or schedules including:
1.1.1.1. Manufacturer, model number, and AHRI certificate (where applicable)
1.1.1.2. Rated heating and cooling capacities, including performance at outdoor design conditions
1.1.1.3. Supplemental electric resistance heater capacity
1.1.1.4. Documentation demonstrating ≥75% design heating load coverage per Title 24, Part 6, Section 140.4(g), Exception 2
1.2. Smart Thermostat Documentation
1.2.1. Provide documentation confirming the installed thermostat or controller meets measure requirements, including:
1.2.1.1. ENERGY STAR certification or qualification
1.2.1.2. Description of supported control capabilities relevant to this measure, such as:
1.2.1.2.1. Compressor-first staging and auxiliary heat coordination
1.2.1.2.2. Manufacturer-approved auxiliary heat enable and lockout options
1.2.1.2.3. Compressor protection and anti-short-cycle features
1.2.1.2.4. Schedule-based operation and recovery behavior
1.2.1.2.5. Demand response or demand-readiness features, where applicable
1.3. System and Zoning Diagrams
1.3.1. Provide representative plans, schematics, or schedules identifying:
1.3.1.1. Thermal zones and corresponding thermostat locations
1.3.1.2. Heat pump indoor and outdoor unit locations serving each zone
1.4. Thermostat Configuration Summary
1.4.1. Provide a brief summary or screenshots documenting key thermostat configuration settings, including:

1.4.1.1. Compressor-first staging
1.4.1.2. Auxiliary electric resistance heat lockout or enable settings

2. Operational Evidence

2.1. Installed Equipment Verification
2.1.1. Provide representative photographs showing:
2.1.1.1. Installed heat pump indoor and outdoor units
2.1.1.2. Installed smart thermostats serving conditioned zones

2.2. Thermostat Configuration and Operation
2.2.1. Provide screenshots or exported data from the thermostat or controller interface demonstrating:
2.2.1.1. Compressor-first staging and auxiliary heat coordination settings
2.2.1.2. Heating setpoint schedules and setback or recovery configuration
2.2.1.3. Confirmation that the system does not default to emergency or resistance heat during normal operation when the compressor can meet the load

2.3. Additional Premium Tier Documentation (if applicable)
2.3.1. Projects seeking Premium-level inducements shall also provide documentation demonstrating:
2.3.1.1. Configured auxiliary heat lockout temperature consistent with Premium-tier requirements
2.3.1.2. Demand response readiness, such as available DR settings, enable/disable options, or documentation indicating compatibility with utility or aggregator DR programs
2.3.1.3. Evidence of advanced control features enabled, where supported (e.g., adaptive recovery, load-responsive staging, or weather-integrated control)

2.4. Optional Operational Data (Where Available)
2.4.1. Where supported by the installed smart thermostat or controller platform, the project may submit up to one week of available historical heating operation data, such as:
2.4.1.1. Compressor runtime
2.4.1.2. Auxiliary electric resistance heat runtime
2.4.1.3. Corresponding outdoor air temperature conditions
2.4.2. Submission of operational data is intended to support program learning and code readiness objectives and is not required where such data are unavailable.

3. System Cost Documentation

3.1. Provide system cost information sufficient to support incremental cost assessment and program evaluation. Documentation may include contractor estimates, invoices, or itemized cost summaries and should be broken out, where available, into the following categories:
3.1.1. Equipment costs (heat pump system, supplemental resistance heating, thermostat/controller, associated controls or sensors)
3.1.2. Installation labor costs (equipment installation, electrical and control wiring, system integration)
3.1.3. Commissioning costs, if applicable (thermostat programming, verification of compressor-first staging, and functional testing)

Incremental Measure Cost

The Incremental Measure Cost (IMC) represents the estimated additional first cost associated with installing a single-zone heat pump system equipped with a smart thermostat configured to prioritize compressor operation and minimize reliance on electric resistance heating, relative to a baseline single-zone heat pump system with a standard programmable thermostat.

Consistent with CEDA's market support objectives, incremental costs are presented using normalized units and representative market pricing suitable for new construction and major alterations, where individual equipment invoices are not typically available. Cost estimates reflect typical material, installation, and commissioning efforts required to achieve the measure requirements and are reviewed and updated periodically based on market data.

Base Case

The base case assumes installation of a code-compliant single-zone heat pump system (packaged or split) equipped with a standard non-smart or basic programmable thermostat.

Base case includes:

- Single-zone heat pump equipment meeting Title 24 minimum efficiency requirements
- Standard programmable thermostat
- Typical installation labor
- Basic system setup without advanced control configuration

Measure Case

The measure case assumes the same single-zone heat pump system as the base case, paired with an ENERGY STAR®–qualified smart thermostat configured to support compressor-first operation, auxiliary electric resistance heat coordination, and optimized heating control behavior.

Measure case includes:

- ENERGY STAR–qualified smart thermostat
- Additional installation and commissioning effort to configure thermostat settings that prioritize heat pump operation and minimize resistance heating
- Verification of control configuration consistent with measure requirements
- The heat pump equipment itself is assumed to be comparable to the base case, with incremental costs concentrated in the thermostat upgrade and commissioning effort.

Incremental Measure Cost

Normalized Cost Basis: $/zone (or $/dwelling unit)

Essential Level – Incremental Measure Cost

Cost Component – Essential Level	Incremental Cost (Typical)
Smart thermostat equipment premium (vs. standard thermostat)	$200 per zone
Additional installation and commissioning effort	$300 per zone
Total Incremental Measure Cost (Essential)	**$500 per zone**

- **Measure IMC (Essential Level)**: $500 per conditioned zone / dwelling unit

Premium Level – Incremental Measure Cost

The Premium design level builds upon the Essential configuration by enabling demand response readiness and advanced control functionality. Incremental costs at the Premium level reflect additional commissioning effort, control configuration, and verification required to support DR-ready operation, rather than a fundamentally different system design.

Cost Component – Premium Level	Incremental Cost (Typical)
Essential Level Incremental Measure Cost	$500 per zone
Additional commissioning and configuration for DR readiness and advanced controls	$250 per zone
Total Incremental Measure Cost (Premium)	**$750 per zone**

- **Measure IMC (Premium Level)**: $750 per conditioned zone / dwelling unit

These values represents a typical incremental cost for new construction or major alterations and is intended for program inducement calibration rather than project-specific cost reconciliation.

Sources

- ENERGY STAR® Smart Thermostat product pricing from major U.S. retailers (e.g., HVAC.com, Home Depot, Amazon)
- RSMeans® Electrical and Controls Installation Cost Data (2024–2025)
- CPUC Smart Thermostat Measure Cost Documentation (eTRM SWHC039)
- Willdan internal market research and contractor cost benchmarking (2024–2025)

Code Readiness Objectives

Advance code readiness for single-zone heat pumps with smart thermostat controls by demonstrating improved efficiency and reduced reliance on electric resistance heating. Smart thermostats optimize compressor operation, limit unnecessary backup heat use, and support consistent performance across climate zones, providing evidence to inform future code updates for both packaged and split heat pump systems.

Additional research opportunities include supporting updates to building energy codes (e.g., Title 24 and ASHRAE 90.1) through documented performance data, advancing climate-responsive heat pump requirements that minimize electric resistance heating, and establishing minimum control performance criteria for thermostats to ensure efficient system operation.

Site Metering Prerequisite

To support system performance monitoring and data collection, each project shall provide access for metering and communication equipment installation according to the following:

- Projects equipped with a Building Automation System (BAS), Energy Management System (EMS), or equivalent platform should enable integration of advanced metering devices through that system to facilitate data collection and remote access.
- Projects without a BAS/EMS shall allow the Code Readiness team to install temporary stand-alone data loggers, sensors, and communication equipment as needed to monitor system performance. Metering equipment may be deployed on-site for a monitoring period of up to 12 months.
- Instrumentation and sensors will be installed or supplemented as needed to measure key system parameters sufficient to evaluate system performance (and any associated equipment or systems, where applicable).

Data Benefits

By using a dedicated thermostat in smart thermostat, homeowners and businesses can reduce energy bills, particularly during heating seasons, by:

- Maximize the efficiency of the heat pump's compressor-based heating.
- Reducing unnecessary reliance on the electric resistance backup heating, which can be a major source of energy waste.

Sample Data Points

A sample set of data points that would ideally be collected is provided below for reference. This list will be re-developed for each project based on the infrastructure and need of the monitoring effort:

Data Points to Meter	Unit	Additional Specifications
Compressor power draw	kW	Measure via CT on compressor circuit
Supplemental electric resistance heat power draw	kW	Measure via separate CT on resistance heat circuit to distinguish from compressor load
Outdoor air temperature	°F	Measure via outdoor sensor
Indoor zone temperature	°F	Measure via internal sensor
Smart thermostat heating setpoint	°F	Recorded from smart thermostat interface or API

Code Reference

2025 CA Title 24, Part 6, Section 110.2– Mandatory Requirements for Space-Conditioning Equipment

110.2(b) Controls for heat pumps with supplementary heaters*:*

Control requirements for heat pumps with supplementary heaters in single-family residential buildings are specified in Section 150.0(h)7 and Section 150.0(i)2. Heat pumps with supplementary heaters in nonresidential and multifamily buildings shall have controls:

1. *That prevent supplementary heater operation when the heating load can be met by the heat pump alone; and*
2. *In which the cut-on temperature for heat pump heating is higher than the cut-on temperature for supplementary heating, and the cut-off temperature for heat pump heating is higher than the cut-off temperature for supplementary heating.*

Exception 1 to Section 110.2(b): *The controls may allow supplementary heater operation during:*

A. Defrost; and
B. Transient periods such as start-ups and following room thermostat setpoint advance, if the controls provide preferential rate control, intelligent recovery, staging, ramping or another control mechanism designed to preclude the unnecessary operation of supplementary heating.

Exception 2 to Section 110.2(b): *Room air-conditioner heat pumps.*

110.2(c) Thermostats*:*

All heating or cooling systems not controlled by a central energy management control system (EMCS) shall have a setback thermostat.

1. *Setback capabilities. All thermostats shall have a clock mechanism that allows the building occupant to program the temperature setpoints for at least four periods within 24 hours. Thermostats for heat pumps shall meet the requirements of Section 110.2(b).*

Exception 1 to Section 110.2(c): *Gravity gas wall heaters, gravity floor heaters, gravity room heaters, noncentral electric heaters, fireplaces or decorative gas appliances, wood stoves, room air conditioners and room air conditioner heat pumps.*

2025 CA Title 24, Part 6, Section 110.12– Mandatory Requirements for Demand Management

110.12(a) Demand responsive controls*:*

1. *All demand responsive controls shall be either:*
   A. *A certified OpenADR 2.0a or OpenADR 2.0b Virtual End Node (VEN), as specified under Clause 11, Conformance, in the applicable OpenADR 2.0 Specification; or a certified Baseline Profile OpenADR 3.0 Virtual End Node; or*
   B. *Certified to the Energy Commission as being capable of responding to a demand response signal from a certified OpenADR 2.0b or a certified Baseline Profile OpenADR 3.0 Virtual End Node by automatically implementing the control functions requested by the Virtual End Node for the equipment it controls.*

2. *All demand responsive controls shall be capable of communicating with the VEN using a wired or wireless bidirectional communication protocol.*
3. *RESERVED*
4. *When the demand response signal is disabled or unavailable, all demand responsive controls shall continue to perform all other control functions provided by the control.*
5. *Demand responsive control thermostats shall comply with Reference Joint Appendix 5 (JA5), Technical Specifications for Occupant Controlled Smart Thermostats.*

110.12(b) Demand responsive zonal HVAC controls*:*

Nonresidential HVAC systems with DDC to the Zone level shall be programmed to allow centralized demand shed for noncritical zones as follows:

1. *The controls shall have the capability to remotely increase the operating cooling temperature set points by 4 degrees or more in all noncritical zones on signal from a centralized contact or software point within an Energy Management Control System (EMCS).*
2. *The controls shall have the capability to remotely decrease the operating heating temperature set points by 4 degrees or more in all noncritical zones on signal from a centralized contact or software point within an EMCS*
3. *The controls shall have capabilities to remotely reset the temperatures in all noncritical zones to original operating levels on signal from a centralized contact or software point within an EMCS.*
4. *The controls shall be programmed to provide an adjustable rate of change for the temperature increase, decrease, and reset.*
5. *The controls shall have the following features:*
    A. *Disabled. Disabled by authorized facility operators; and*
    B. *Manual control. Manual control by authorized facility operators to allow adjustment of heating and cooling set points globally from a single point in the EMCS; and*
    C. *Automatic Demand Shed Control. Upon receipt of a demand response signal, the space-conditioning systems shall conduct a centralized demand shed, as specified in Sections 110.12(b)1 and 110.12(b)2, for noncritical zones during the demand response period.*

2025 CA Title 24, Part 6, Section 120.2– Required Controls for Space-Conditioning Systems

120.2(b) Criteria for zonal thermostatic controls*:*

4. Thermostatic controls for all single zone, air conditioners and heat pumps shall comply with the requirements of Sections 110.2(c) and 110.12(a) and, if equipped with DDC to the Zone level, with the Automatic Demand Shed Controls of Section 110.12(b).

Exception 1 to Section 120.2(b)4: *Systems serving non-covered process loads that must have constant temperatures to prevent degradation of materials, a process, plants or animals.*

Exception 2 to Section 120.2(b)4: *Package terminal air conditioners, package terminal heat pumps, room air conditioners and room air conditioner heat pumps.*

Exception 3 to Section 120.2(b)4: *Systems serving healthcare facilities.*

2025 CA Title 24, Part 6, Section 140.4– Prescriptive Requirements for Space Conditioning Systems

140.4(g) Electric resistance heating*:*

Electric resistance heating systems shall not be used for space heating.

Exception 1 to Section 140.4(g): *Where an electric resistance heating system supplements a heating system in which at least 60 percent of the annual energy requirement is supplied by site-solar or recovered energy.*

Exception 2 to Section 140.4(g): *Where an electric resistance heating system supplements a heat pump heating system, and the heating capacity of the heat pump is more than 75 percent of the design heating load calculated in accordance with Section 140.4(a) at the design outdoor temperature specified in Section 140.4(b)4.*

Exception 3 to Section 140.4(g): *Where the total capacity of all electric resistance heating systems serving the entire building is less than 10 percent of the total design output capacity of all heating equipment serving the entire building.*

Exception 4 to Section 140.4(g): *Where the total capacity of all electric resistance heating systems serving the entire building, excluding those allowed under Exception 2, is no more than 3 kW.*

Exception 5 to Section 140.4(g): *Where an electric resistance heating system serves an entire building that is not a hotel/motel building; and has a conditioned floor area no greater than 5,000 square feet; and has no mechanical cooling; and is in an area where natural gas is not currently available.*

Exception 6 to Section 140.4(g): *Heating systems serving as emergency backup to gas heating equipment.*

Exception 7 to Section 140.4(g): *Supplemental electric resistance heating systems complying with Section 140.4(a)3C.*

2025 CA Title 24, Part 6, Section 160.3– Mandatory Requirements for Space Conditioning Systems in Multifamily Buildings

160.3(c) Heat pump controls*:*

All heat pumps with supplementary electric resistance heaters shall be installed with controls that comply with Section 110.2(b).

Eligible Climate Zones and Building Types

Eligible Climate Zones

This measure applies statewide in **California Climate Zones 1-16** (Title 24). Applicants must identify the project's climate zone in the submittal.

Eligible Building Types

This measure applies to:

- **High-Rise Multifamily**: Buildings with **four (4) or more habitable stories above grade**.
- **Nonresidential**: Commercial, public, agricultural, and industrial facilities (e.g., offices, retail, lodging, education, healthcare, food service, warehouses, manufacturing, civic buildings).

Eligible Project Scopes

This measure applies to:

- **New construction**, **additions**, and **major alterations/retrofits** installing single-zone heat pumps with qualified smart thermostats.

Measure Exclusions

This High-Performance Measure does not apply to the following:

- Multi-zone heat pump systems, including but not limited to multi-zone mini-split, VRF, or VRV systems.
- Heat pump systems paired with non-qualifying thermostats, including but not limited to:
  - Thermostats that are not ENERGY STAR®–certified or qualified
  - Thermostats that do not support compressor-first staging or coordinated auxiliary electric resistance heat control
  - Thermostats that do not provide compressor protection or anti-short-cycle functionality
  - Thermostats that do not allow configuration or verification of heating setpoints, schedules, or auxiliary heat behavior
- Heat pump systems controlled through a qualifying Building Management System (BMS) that is eligible under the CEDA Building Management Systems High-Performance Measure.

Reviewer Checklist

High-Performance Measure Review Checklist: Single Zone Heat Pump with Smart Thermostat

Checklist Description: This checklist captures the elements that must be present in the project design to be eligible for the high-performance measure inducement or consideration for additional site metering.

Project Name: _____ **Review Date:** _____

Assessment:

- ☐ Approved
- ☐ Not approved

Notes:

Reviewer: _____ **Signature:** _____

Inducement Requirements – Essential Level	Comments
☐ Does the project install a single-zone heat pump system (packaged or split) with supplemental electric resistance heating functioning only as backup heat? (*Ref. 1.1.1)*	
☐ Is the heat pump sized to meet ≥75% of the design heating load at the outdoor design condition, consistent with Title 24, Part 6, Section 140.4(g), Exception 2? (*Ref. 1.1.2*)	
☐ Is an ENERGY STAR–qualified smart thermostat installed and compatible with the heat pump system? (*Ref. 1.2*)	
☐ Is the smart thermostat programmed to minimize use of electric resistance heating, except during compressor failure, defrost cycles, or manufacturer-approved low outdoor temperature conditions? (*Ref. 1.2.1*)	
☐ Is the smart thermostat configured using manufacturer-supported settings to prioritize compressor operation and coordinate auxiliary electric resistance heating during defrost events? (*Ref. 1.2.2*)	
☐ Are compressor protection and anti-short-cycle features enabled, with auxiliary resistance heat limited to necessary defrost operation? (*Ref. 1.2.2.1*)	
☐ Is compliance demonstrated through thermostat configuration screenshots or manufacturer documentation? (*Ref. 1.2.2.2*)	
☐ Does each conditioned space served by a single-zone heat pump have a dedicated smart thermostat? (*Ref. 1.3*)	
☐ Is thermostat control operation consistent with Title 24, Part 6, Sections 110.2(b), 110.2(c), and 120.2(b)? (*Ref. 1.3.1*)	

Inducement Requirements – Premium Level	Comments
☐ Have all Essential-level requirements been met? (*Ref. 2.1*)	
☐ Has the site installed an advanced smart thermostat or system controller compatible with the heat pump that meets Premium-level control requirements? (*Ref. 2.2*)	
☐ Does the controller support remote setpoint adjustment and supervisory control functions? (*Ref. 2.2.1*)	
☐ Can the controller coordinate compressor staging, auxiliary heat operation, and fan behavior during system events (e.g., defrost, demand response)? (*Ref. 2.2.2*)	
☐ Is the controller capable of maintaining stable heat calls and preventing control conflicts during automated setpoint changes? (*Ref. 2.2.3*)	

- ☐ Is auxiliary electric resistance heating locked out until ≤30°F (–1°C) or the lowest manufacturer-permitted lockout temperature? (*Ref. 2.3*)
- ☐ Is the system configured such that electric resistance heating engages only in failure mode or during defrost cycles? (*Ref. 2.3.*1)
- ☐ Is the thermostat or controller configured to be demand-ready, consistent with Title 24, Part 6, Section 110.12(a)? (*Ref. 2.4*)
- ☐ Can the system receive an external demand response signal? (*Ref. 2.4.1*)
- ☐ Does the system automatically adjust heating and/or cooling setpoints in response to a DR signal and restore original setpoints after the event? (*Ref. 2.4.2–2.4.3*)

Supporting Documentation Requirements – Both Levels	Comments

- ☐ Have all heat pump system specifications been provided (manufacturer, model, capacity, resistance heater capacity, ≥75% load coverage)? (*Ref. 1.*1)
- ☐ Have all smart thermostat specifications been provided, including ENERGY STAR qualification and relevant control capabilities? (*Ref. 1.2*)
- ☐ Have system and zoning diagrams been provided showing thermal zones, thermostat locations, and equipment locations? (*Ref. 1.3*)
- ☐ Has thermostat configuration documentation (summary or screenshots) been provided demonstrating compressor-first staging and auxiliary heat settings? (*Ref. 1.4*)
- ☐ Have representative photographs of installed heat pump equipment and smart thermostats been provided? (*Ref. 2.1*)
- ☐ Have operational screenshots or exported data been provided demonstrating thermostat configuration and normal operation? (*Ref. 2.2*)
- ☐ Has system cost documentation been provided sufficient to support incremental cost assessment? (*Ref. 3.1)*

Supporting Documentation Requirements – Premium Level	Comments

- ☐ Has documentation been provided demonstrating Premium-specific control features, including auxiliary heat lockout settings and DR readiness? (*Ref. 2.3.1–2.3.2)*
- ☐ Where available, has optional operational data (e.g., compressor and auxiliary heat runtime) been provided to support program learning? (*Ref. 2.4*)

Version History Log

Version	Effective Date	End Date	Change Description
1	September 9, 2024	January 25, 2026	N/A
2	January 26, 2026	Current	Updated format, measure requirements, code references, eligibility, exclusions, checklist