INSTALLER and INSPECTOR QUICK-REFERENCE:
2025 NRCA-PRC-04-F
Evaporators and Evaporator Fan Motor Variable Speed Control

Purpose and Scope of the Test

This test ensures that the evaporator fans modulate their speed in response to either the space temperature or humidity, as required per the Energy Code.

Note that control strategies using humidity are very uncommon. If humidity is included in the control logic, the design engineer should be accessible during testing.

Test Trigger

New refrigerated warehouses or new refrigeration system serving a refrigerated warehouse: Applies to functional testing and verification of evaporator fan motor variable speed controls.

Evaporator fan motor controls are required for new, or altered refrigerated warehouses that are 3,000 square feet or more and refrigerated spaces with a combined total of 3,000 square feet that are served by the same refrigeration system

Exceptions:

- Addition, alteration or replacement of less than all of the evaporators in an existing refrigerated space that does not have speed-controlled evaporators.
- Coolers within refrigerated warehouses that maintain a controlled atmosphere for which a licensed engineer has certified that the types of products stored will require constant operation at 100 percent of the design airflow. Areas within refrigerated warehouses that are designed solely for the purpose of quick chilling/freezing of products, including but not limited to spaces with design cooling capacities of greater than 240 Btu/hr-ft^2 (2 tons per 100 square feet).

Relevant Energy Code References and Required Compliance Documents

Title 24, Part 6 of the California Building Standards Code, Building Energy Efficiency Standards (Energy Code) sections 120.6(a)3B and 120.6(a)7B; NA7.10.2; NRCC-PRC-E. ; NRCI-PRC-E.

Who Can Perform the Test

There are no restrictions. The test is typically performed by the startup technician responsible for programming the setpoints in the control system. Note that the contractor can complete the test, and ATTCP certification is not required for this test at this time.

Required Tools

Performance of this test will require measuring the temperature or relative humidity of the space served by the evaporators under test. Typical instrumentation include:

- Temperature meter (-30 to 200°F range), typical accuracy ± 0.7 °F.
- Air humidity meter (0 to 100% RH range), typical accuracy ±3% RH.

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Estimated Time to Complete Test

Construction Inspection: 2 hours (for one system).

Functional testing: 4 hours (for one system).

Potential Issues and Cautions

Coordinate test procedures with the refrigeration or controls contractor, or the facility supervisor since they may be needed to assist with the manipulation of the control system. Fan speeds change slowly in normal operation, so the test requires adequate time to allow response.

Inspection Enforcement

Required:

- All temperature and RH sensors have been calibrated and read accurately.
- All sensors are mounted in a location away from direct discharge air drafts.
- All evaporator motors are operational and rotate in the correct direction.
- Fan speed control is operational and connected to evaporator fan motors.
- All speed controls are in "auto" mode.
- Records showing calibration was performed, what offsets or control system calibration values were used, and documentation of the instrumentation used for calibration.

Acceptance Criteria

- Evaporator fan controls modulate to increase fan speed, and evaporator fan speed increases in response to controls, when the test temperature (or RH) setpoint is lowered in 1 degree (or 1% RH) increments below any control dead band range.
- Evaporator fan controls modulate to decrease fan speed, and evaporator fan speed decreases in response to controls, when the test temperature (or RH) setpoint is raised in 1 degree (or 1% RH) increments below any control dead band range until fans go to minimum speed.