# INSTALLER and INSPECTOR QUICK-REFERENCE: 2025 NRCA-PRC-07-F Variable Speed Screw Compressors

## Purpose and Scope of the Test

The test ensures that the applicable compressors control compressor speed in response to the refrigeration load per the Energy Code.

## Test trigger

Newly Constructed Refrigerated Warehouses: Applies to functional testing and verification of compressor variable speed controls.
Compressor variable speed controls are required on any new refrigeration systems.
Exceptions:

- Systems serving a refrigerated warehouse with less than 3,000 square feet of combined area.
- New open-drive screw compressors with more than one dedicated compressor per suction group.
- New open-drive screw compressors on a refrigeration system for which more than 20 percent of the total design refrigeration load is for quick chilling or freezing or process refrigeration cooling for other than a refrigerated space.

## 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)5C; 120.6(a)7F, NA7.10.4; 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

To perform the test, it will be necessary to override the normal operation of the controls. The control system for the compressor must be complete, including:

- Variable speed drive on all applicable screw compressors.
- Controls to control the compressor motor speed.

## Estimated Time to Complete Test

Construction Inspection: 1 hour (for one condenser).
Functional testing: 2 hours (for one condenser).

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## Potential Issues and Cautions

**Adequate Cooling Load.** The system cooling load must be sufficiently high for the test, but the compressor should be not operating at fully capacity. Artificially increase the load by decreasing the zone setpoint or decrease the load by increasing the zone setpoint or turning off evaporators as needed to perform the Functional Testing.

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.

## Inspection Enforcement

**Required**:

- All applicable single open-drive screw compressors dedicated to a suction group have variable speed control.
- All pressure and temperature sensors have been calibrated and read accurately.
- All sensor readings used by the compressor controller convert or calculate to the correct conversion units at the controller (e.g., saturated suction pressure reading is correctly converted to appropriate saturated suction temperature (SST)).
- All compressor motor speed controls are operational and connected to compressor motors.
- All speed controls are in "auto" mode.
- Compressor panel control readings for "RPMs," "percent speed," "kW," and "amps" match the readings from the controller or other control systems.
- Compressor nameplate data is correctly entered into the PLC or other control system, to the extent required for proper control (e.g., minimum speed).
- Records showing calibration was performed, what offsets or control system calibration values were used, and documentation of the instrumentation used for calibration.

## Acceptance Criteria

- Compressor speed decreases with decrease in load, and the slide valve (or other unloading means) are held at 100 percent capacity until the compressor speed reaches the minimum allowable setpoint.
- With an increase in load, the compressor slide valve (or other unloading means) should load to 100 percent capacity, and then the compressor speed should start to increase.