# INSTALLER AND INSPECTOR QUICK-REFERENCE: 2025 NRCA-PRC-01a,b-F

# Compressed Air Systems

## Purpose and Scope of the Test

The purpose of functionally testing the controls of a compressed air system is to confirm that the controls are set up in a manner compliant with the Energy Code. A compliant system will choose the most efficient combination of compressors, given the current air demand as measured by a sensor. This test is designed for flexibility, as this covers both newer compressed air systems designed with controls and older systems retrofitted with controls for the first time.

## Test trigger

Newly Constructed and Additions/Alterations:

- Compressor systems with three or more compressors that total more than 100hp must use acceptance test NRCA-PRC-01a-F.
- Compressor systems with two or fewer compressors that total 100hp or more must use acceptance test NRCA-PRC-01b-F.
- Compressor systems that do not fall into either of these two descriptions are exempt from these acceptance tests.

Exceptions: Alterations to systems that include centrifugal compressors, or compressed air and medical gas compressors for healthcare facilities do not need to be tested.

## 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(e)2, 120.6(e)3, NA7.13.1 and NA7.13.2 (20225 NRCA-PRC-01a-F and 20225 NRCA-PRC-01b-F).

## Who Can Perform the Test

There are no restrictions.

Note that the contractor can complete the test, and ATTCP certification is not required for this test at this time.

## Required Tools

Instrumentation to perform the test includes:

- Power meter(s) for each compressor.
- Pressure transducer(s) for each compressor.
- Sensor or set of sensors to measure or infer current air demand, including but not limited to:
    - Flow meter.
    - Set of pressure transducers.
    - Pressure transducers and power meters.

## Estimated Time to Complete Test

Construction inspection: 1 to 1.5 hours (depending on complexity of the system).

Functional testing: 1 to 3 hours (depending on familiarity with the controls and issues that arise during testing).

**Potential Issues and Cautions**

For older systems, it may not be feasible to run at a steady demand for 10 minutes. In these cases, still observe the compressors to ensure that the controls are operating efficiently.

Note for NRCA-PRC-01a-F, Table A-1:

Compressor control systems vary, but common types include load/unload, modulating, variable displacement, variable speed controls, and others, each offering different levels of control and efficiency for various applications. However, the form author may use any description that they feel best describes the installation.

- Load/Unload Control: This is a simple system where the compressor runs at full capacity until a certain pressure is reached, then it unloads to conserve energy.
- Modulating Control: This more sophisticated system uses sensors to measure conditions like temperature, humidity, and pressure, then adjusts the compressor's operation for optimal performance and energy efficiency.
- Variable Displacement Control: This system adjusts the volume of air the compressor intakes, allowing for precise control of output pressure and flow without needing to start, stop, load, or unload.
- Variable Speed Control: This system uses a variable-speed motor to regulate the compressor's speed and output, allowing for precise control of pressure and flow.
- Start/Stop Control: This is a basic system where the compressor is turned on and off based on pressure thresholds.
- Dual/Auto Dual Control: This system offers flexibility, allowing the operator to choose between start/stop and load/unload control, or automatically switching between them based on demand.

**Inspection Enforcement**

Prior to the functional test, the system and compressor specifications must be documented. In addition, the method for determining the current air demand and the state of each of the compressors must also be documented. Having this documented will assist in determining if the controls are working properly.

**Required:**

NRCA-PRC-01a-F or NRCA-PRC-01b-F must be completed by the installing technician or another qualified person.

# INSTALLER AND INSPECTOR QUICK-REFERENCE: 2025 NRCA-PRC-01a,b-F

## Compressed Air Systems

**Acceptance Criteria**

The states of each compressor will be observed throughout the duration of the test. By the end of the 10-minute duration, each compressor must not exhibit short-cycling or blow-off.

For new compressed air systems, the trim compressors are the only compressors that can be partially loaded. All base compressors must be either fully loaded or off by the end of the test.

Observe that data is being recorded to a log file that can be opened and viewed to see the trends of airflow, power, and specific efficiency in at least 5 minute intervals.