INSTALLER and INSPECTOR QUICK-REFERENCE: 2025 NRCA-MCH-13-A Automatic Fault Detection Diagnostics (FDD) for Air Handling Units and Zone Terminal Units

Purpose and Scope of the Test

Fault Detection and Diagnostics (FDD) can also be used to detect common faults with air handling units and zone terminal units. Many FDD tools are standalone software products that process trend data offline. Maintenance problems with built-up air handlers and variable air volume boxes are often not detected by energy management systems because the required data and analytical tools are not available. Performing the FDD analysis within the distributed unit controllers is more practical because of the large volume of data.

The acceptance tests are designed to verify that the system detects common faults in air handling units and terminal units. FDD systems for air handling units and zone terminal units require direct digital controls to the zone level. Successful completion of this test provides a compliance credit when using the performance approach. An FDD system that does not pass this test may still be installed, but no compliance credit will be given.

Test trigger

Newly Constructed and Additions/Alterations: Applies to any FDD system installed on an air handling unit or a zone terminal unit. A minimum of 5 percent of the terminal boxes (VAV box) shall 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 120.2(i), 120.5(a)12, 160.3(a)2H, 160.3(d)1L; NA7.5.12; NRCC-MCH-E, NRCC-PRF-E, LMCCMCH-E, LMCC-PRF-E.

Who Can Perform the Test

This test must be performed by an acceptance test technician certified by a CEC-approved Acceptance Test Technician Certification Provider, using compliance document NRCA-MCH-13-A.

Required Tools

FDD tests for air handling units and zone terminal units require no additional instrumentation for testing since control algorithms are embedded in unit controllers.

Estimated Time to Complete Test

Construction Inspection: 0.5 hour.

Functional testing: Acceptance tests will take 1 to 2 hours for each air handler. Time for acceptance testing for terminal units depends on the number of terminal units to be tested.

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Potential Issues and Cautions

Difficulties could be encountered with manipulating the control system if not familiar with the programming language. Therefore, a controls contractor should be on site to assist with the testing.

Inspection Enforcement

Verify the inspector is in receipt of one NRCA-MCH-13-A for EACH system that must demonstrate compliance. All NRCA forms for Mechanical Systems must have a water mark logo from a certified Mechanical ATTCP Provider.

Required:

- Verify on the Certificate of Compliance and Certificate of Installation or sensor specifications that locally installed supply air, outside air, and return air (if applicable) temperature sensors have an accuracy of ±2°F over the range of 40°F to 80°F.

Acceptance Criteria

- The system is able to detect common faults with air handling units, such as sensor failures, damper failures, actuator failures, or improper operating modes.
- The system is able to detect and report common faults with zone terminal units, such as damper failure, actuator failure, or a control tuning issue.