

2016 Title 24 Code Change Advocacy

Request for Input:

Nonresidential HVAC Economizer Modifications

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April 2014

Email Introduction

The California Investor Owned Utilities (IOUs) are actively supporting the California Energy Commission in updating the California Building Energy Efficiency Standards (Title 24). Their joint intent is to achieve significant energy savings through the development of reasonable, responsible, and cost-effective code change proposals for the 2016 code update and beyond. Through Codes and Standards Enhancement (CASE) Reports, the IOUs will provide the Energy Commission with the technical and cost-effectiveness information required to make informed judgments on proposed standards for promising energy efficiency design practices and technologies. This Request for Input provides an opportunity for stakeholders to help inform the development of these codes change proposals. The IOUs encourage participation in this step of the process through the submission of data— both primary sources and references to existing data, e.g., reports, spreadsheets, etc. Further opportunities to provide feedback regarding these code change proposals will follow this Request for Input.

How to submit responses:

Please submit responses to the questions presented below by Tuesday, May 13, 2014 to: info@title24stakeholders.com.

Summary of Potential Code Change Proposal

The 2013 Title 24 prescriptively requires that economizers be installed on air-cooled unitary direct-expansion units with cooling capacity equal to or greater than 54,000 Btu/h.

Air Economizer Controls Acceptance

A mandatory control requirement for these economizers is a Fault Detection and Diagnostic (FDD) system that meets a list of requirements in section 120.2(i).¹ The controls requirements have been reviewed by the industry and the FDD Committee of the Western HVAC Performance Alliance, and are approved and listed by the California Energy Commission.² Recent laboratory testing has developed new insights to the performance of economizers.³ In response to stakeholder concerns and laboratory results, a set of modifications and additions are proposed for the 2013 code, including the following:

1. Delete refrigerant pressure sensors requirements in Section 120.2(i)3.
2. Clarify how faults required in Section 120.2(i)7 shall be reported.

¹ Available at: <http://energycodeace.com/site/custom/public/reference-ace-2013/index.html#!Documents/section1202requiredcontrolsforspaceconditioningsystems.htm>

² Available at: http://www.energy.ca.gov/title24/equipment_cert/fdd/

³ Forthcoming documents from WO32 and from Robert Davis at the PG&E ATS lab.

3. Clarify that controls for the economizer can be either stand alone or integrated into the system controller. Manufacturers must list their compliant controller, either standalone or integrated, with the CEC.
4. Modify Sections 120.2(i)8, 120.5(a)4, 140.4(e), NA7.5.4, and potentially other sections of the standards to address lab findings indicating that when economizer dampers are fully open, airflow is not equal to 100% of the design airflow.
5. Modify Section 120.2(i)8, 120.5(a)4, 140.4(e), NA7.5.4 and potentially other sections of the standards to address field study findings indicating that leakage through economizer dampers is much higher than designed.
6. Integrate the Economizer Testing Guidance document into the Nonresidential Appendix and other appropriate locations.⁴
7. Develop the scope of work for lab and field data necessary for projected 2019 Title 24 modifications.

⁴ Available at: http://www.energy.ca.gov/title24/equipment_cert/fdd/FDD_Certification_Guidance.pdf

Questions for Interested Parties

The CASE Team is requesting responses to the specific questions listed below regarding Nonresidential HVAC Economizer Modifications in California. Answers to these questions will inform the cost-effectiveness analysis, energy savings estimates, environmental impacts, and market impacts that will be presented in CASE Reports.

1. Please tell us about yourself. Check all that apply to your current job description:
 General contractor HVAC contractor Controls Contractor
 Mechanical Engineer Facilities Manager or Engineer
 Building inspector Compliance documentation author
 Other (please describe): _____
2. What fraction of your business is in serving the California nonresidential or commercial market?

3. How are economizer FDD devices typically connected to rooftop units? Are they stand alone devices? Are they integrated into the rooftop unit (RTU) controller?
4. How often do you use RTUs that integrate Economizer Controls and FDD into the equipment control board?
5. For Original Equipment Manufacturers (OEMs): What range of technologies, strategies, or methods are employed to report economizer faults? Which are least expensive or most commonly employed?
 - a. Hard-wired
 - b. Radio frequency
 - c. Wifi
 - d. Other?
6. What maintenance do economizers require and on what interval is it needed?
7. In order to notify appropriate personnel to repair economizer equipment in commercial settings, what notification method would customers prefer? What would be the most effective? Why?
 - a. A clearly visible indicator light on the rooftop unit
 - b. A clearly visible indicator light in an occupied space
 - c. A telephone call, email, or text message
 - d. Other?
8. For RTUs, do return air dampers typically have sealed edges with low leakage? What is the AMCA leakage class?
9. What percent of the design airflow do you recommend be required when the damper is fully open?
10. For RTUs, how much time would be necessary for an acceptance test to verify that a minimum required percentage of the design airflow can be delivered? What are the steps that need to be performed?

11. What AMCA leakage class do you recommend be required for the outdoor air damper and the return air damper? If they are different what is the reason for the difference?
12. At the time of installation, are economizers tested for leakage when completely closed? What can practically be done to minimize leakage thru the economizer dampers when in the closed position?
13. Are you aware of data sources indicating the prevalence of economizers providing too much or too little air?
14. What proportion of new RTUs have economizer dampers with blade edge seals and side seals meeting Class 1 requirements? When installed, what is the lifetime of these seals, and can they be easily replaced?
15. Does current economizer FDD technology detect when the economizer is providing excess outdoor air? Or providing inadequate outdoor air? How accurately? How is it done?
16. Please review the attached Guidance document and provide your input.
17. Do you have any further comments on any of the proposed measures?