

## HYDRONIC SYSTEM VARIABLE FLOW CONTROL ACCEPTANCE

CEC-NRCA-MCH-10-A (Revised MM/YY)

CALIFORNIA ENERGY COMMISSION



CERTIFICATE OF ACCEPTANCE		NRCA-MCH-10-A
Hydronic System Variable Flow Control Acceptance		(Page 1 of 3)
Project Name:	Enforcement Agency:	Permit Number:
Project Address:	City:	Zip Code:
System Name or Identification/Tag:	System Location or Area Served:	

<i>Note: Submit one Certificate of Acceptance for each system that must demonstrate compliance.</i>	Enforcement Agency Use: Checked by/Date
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<b>Intent:</b>	Ensure that hydronic pump speed varies with building heating and cooling loads.
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<b>A. Construction Inspection</b>	
1. Supporting documentation needed to perform test includes, but not limited to:	
a. As-built and/or Design Documents including Mechanical Equipment Schedules.	
b. <u>20132016</u> Building Energy Efficiency Standards Nonresidential Compliance Manual ( <i>NA7.5.9 Hydronic System Variable Flow Control Acceptance At-A-Glance</i> ).	
c. <u>20132016</u> Building Energy Efficiency Standards.	
2. Instrumentation to perform test includes, but not limited to:	
a. Calibrated differential pressure gauge (hydronic manometer)	
3. Installation:	
<input type="checkbox"/>	Pressure sensor location, setpoint, and reset control meets the requirements of <u>20132016</u> Building Energy Efficiency Standards section 140.4(j) 6B.
<input type="checkbox"/>	For systems without direct digital control of individual coils reporting to the central control panel, differential pressure is measured at or near the most remote heat exchanger or the heat exchanger requiring the greatest differential pressure.
<input type="checkbox"/>	For systems with direct digital control of individual coils with central control panel, the static pressure set point is reset based on the valve requiring the most pressure, and the setpoint is no less than <u>80%</u> open.
<input type="checkbox"/>	Exception taken. -(Heating hot water system or Condenser water system serving only water-cooled chillers).
4. Document that all control pressure sensors are factory or field calibrated (check one of the following):	
<input type="checkbox"/>	Factory calibrated
<input type="checkbox"/>	Provide supporting documentation
<input type="checkbox"/>	Field calibrated by Controls contractor or other.
<input type="checkbox"/>	Calibration complete. -All pressure sensors $\pm 10\%$ of calibrated reference sensor. -(Provide supporting documentation).

B. Functional Testing	Results
<b>Step 1: Minimum / Low flow test</b>	
a. Close coil control valves to achieve a maximum of 50% of design flow	<input type="checkbox"/>
b. Verify that the operating speed decreases	Y / N
c. Verify that the current operating speed has not increased (for all other systems that are not DDC)	Y / N
d. Record the system pressure as measured at the control sensor ( <i>either ft. w.c. or psig</i> )	ft w.c.
<i>Note: 2.31 ft w.c. = 1.0 psig</i>	psig
e. Record the system pressure setpoint ( <i>either ft. w.c. or psig</i> )	ft w.c.
	psig
f. Is the pressure reading on line 1.d. within 5% of pressure setpoint on line 1.e.?	Y / N
g. Did the system operation stabilize within 5 minutes after completion of step 1.a.?	Y / N
Notes:	

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CERTIFICATE OF ACCEPTANCE		NRCA-MCH-10-A
Hydronic System Variable Flow Control Acceptance		(Page 2 of 3)
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<b>Step 2: Maximum/Design flow test</b>	
a. Open control valves to achieve a minimum of 90% of design flow	<input type="checkbox"/>
b. Verify that the pump speed increases.	Y / N
c. Are the pumps operating at 100% speed?	Y / N
d. Record the system pressure as measured at the control sensor ( <i>either ft. w.c. or psig</i> )	ft. w.c.
	psig
e. Record the system pressure setpoint ( <i>either ft. w.c. or psig</i> )	ft. w.c.
	psig
f. Is the setpoint in 1.e. less than the setpoint in 2.e.?	Y / N
g. Is the pressure reading 2.d. within 5% of pressure setpoint 2.e.?	Y / N
h. Did the system operation stabilize within 5 minutes after completion of step 2.a.?	Y / N
<b>Step 3: System returned to initial operating conditions</b>	Y / N
Notes:	

<b>C. Testing Results</b>	<b>PASS / FAIL</b>	
Step 1: Select pass if Step 1b, 1f, and 1g are true (Y).	<input type="checkbox"/>	<input type="checkbox"/>
Step 2: Select pass if Steps 2b, 2c, 2f, 2g and 2h are true (Y).	<input type="checkbox"/>	<input type="checkbox"/>

<b>D. Evaluation</b>
<input type="checkbox"/> PASS: All <b>Construction Inspection</b> responses are complete and all <b>Testing Results</b> responses are "Pass"
Notes:

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Hydronic System Variable Flow Control Acceptance		(Page 3 of 3)
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<b>DOCUMENTATION AUTHOR'S DECLARATION STATEMENT</b>		
1. I certify that this Certificate of Acceptance documentation is accurate and complete.		
Documentation Author Name:	Documentation Author Signature:	
Documentation Author Company Name:	Date Signed:	
Address:	ATT Certification Identification (If applicable):	
City/State/Zip:	Phone:	
<b>FIELD TECHNICIAN'S DECLARATION STATEMENT</b>		
I certify the following under penalty of perjury, under the laws of the State of California:		
<ol style="list-style-type: none"> <li>The information provided on this Certificate of Acceptance is true and correct.</li> <li>I am the person who performed the acceptance verification reported on this Certificate of Acceptance (Field Technician).</li> <li>The construction or installation identified on this Certificate of Acceptance complies with the applicable acceptance requirements indicated in the plans and specifications approved by the enforcement agency, and conforms to the applicable acceptance requirements and procedures specified in Reference Nonresidential Appendix NA7.</li> <li>I have confirmed that the Certificate(s) of Installation for the construction or installation identified on this Certificate of Acceptance has been completed and signed by the responsible builder/installer and has been posted or made available with the building permit(s) issued for the building.</li> </ol>		
Field Technician Name:	Field Technician Signature:	
Field Technician Company Name:	Position with Company (Title):	
Address:	ATT Certification Identification (if applicable):	
City/State/Zip:	Phone:	Date Signed:
<b>RESPONSIBLE PERSON'S DECLARATION STATEMENT</b>		
I certify the following under penalty of perjury, under the laws of the State of California:		
<ol style="list-style-type: none"> <li>I am the Field Technician, or the Field Technician is acting on my behalf as my employee or my agent and I have reviewed the information provided on this Certificate of Acceptance.</li> <li>I am eligible under Division 3 of the Business and Professions Code in the applicable classification to accept responsibility for the system design, construction or installation of features, materials, components, or manufactured devices for the scope of work identified on this Certificate of Acceptance and attest to the declarations in this statement (responsible acceptance person).</li> <li>The information provided on this Certificate of Acceptance substantiates that the construction or installation identified on this Certificate of Acceptance complies with the acceptance requirements indicated in the plans and specifications approved by the enforcement agency, and conforms to the applicable acceptance requirements and procedures specified in Reference Nonresidential Appendix NA7.</li> <li>I have confirmed that the Certificate(s) of Installation for the construction or installation identified on this Certificate of Acceptance has been completed and is posted or made available with the building permit(s) issued for the building.</li> <li>I will ensure that a completed, signed copy of this Certificate of Acceptance shall be posted, or made available with the building permit(s) issued for the building, and made available to the enforcement agency for all applicable inspections. I understand that a signed copy of this Certificate of Acceptance is required to be included with the documentation the builder provides to the building owner at occupancy.</li> </ol>		
Responsible Acceptance Person Name:	Responsible Acceptance Person Signature:	
Responsible Acceptance Person Company Name:	Position with Company (Title):	
Address:	CSLB License:	
City/State/Zip:	Phone:	Date Signed:

**NRCA-MCH-10-A User Instructions****Section A. Construction Inspection**

This pre-test section consists of check boxes and data entry requirements. Complete check boxes and enter data as instructed.

**Section B. Functional Testing**

This section consists of check boxes and yes or no questions arranged by individual test. Check each box or circle the correct answer for each specific test or line item.

**Section C. Testing Results**

This section consists of check boxes for each test procedure. Complete check boxes as instructed.

**Section D. Evaluation**

Check the appropriate box as instructed.

**Declaration Statements of Acceptance**

This section contains fillable fields for three declaration statements: one from the Documentation Author, one from the Field Technician, and one from the Responsible Person. Each area contains a combination of check boxes and data entry requirements, including signature; date; and license number. Complete check boxes and enter data as instructed.

The Documentation Author is the person completing the form. The Field Technician is responsible for performing and documenting the results of the acceptance procedures on the Certificate of Acceptance forms. The Field Technician must sign the Certificate of Acceptance to certify that the information he or she provides on the Certificate of Acceptance is true and correct. It is important to note that the Field Technician is not required to have a contractor's, architect's or engineer's license. A Responsible Person is eligible under Division 3 of the Business and Professions code in the applicable classification to take responsibility for the scope of work specified by the Certificate of Acceptance document. The Responsible Person can also perform the field testing and verification work, and if this is the case the Responsible Person must complete and sign both the Field Technician's signature block and the Responsible Person's signature block on the Certificate of Acceptance form. The Responsible Person assumes responsibility for the acceptance testing work performed by the Field Technician agent or employee.