

# Component Level Test

High Performance Commercial Building Systems



Facility  
Dynamics  
Engineering

## Project Name

System Hijend Hotel CHW System CH2 Evaporator Circuit

Component or function to be tested CHWP-2

This form is intended to guide the user through a component level test that is done "on-the-fly" in the field. In general, it's purpose is to help the user quickly think through the test prior to executing it. It provides general guidance, a place to outline the proposed test procedure and a place to document the results. It can be filled out electronically and then printed for use, or the blank form can be printed out and then filled in by hand. In the electronic version, the second tab of the workbook contains guidelines for using the form, many of which are linked to the section they reference. The third tab contains an example of the form filled out for testing a freezestat.

**Purpose:** Briefly describe the purpose of the test to be performed.

Identify the current operating condition for the Chiller 2 evaporator pump  
as well as the operating point if the discharge valve is wide open. We also  
want to identify/verify the impeller size.

**Instructions:** Provide instructions regarding how the test results should be documented and what (if any) follow up actions are necessary.

1. Document all test data on the form as indicated in the procedure. Coordinate  
with the Owner's technicians to move valves, bring chillers on and off line, etc.
2. Verify that the plant is stable and back to its normal operating state before  
leaving the site.

**Equipment Required:** Note any special test equipment requirements.

1. For now, we will use the Owners gauges.
2. Cell phone strobe app to pick up pump speed.



## Component Level Test

**Acceptance Criteria:** Document the acceptance criteria that will indicate that the test was passed.

1. This is an information gathering test so there are no acceptance criteria.

**Precautions:** Document any precautions that need to be taken before, during, or subsequent to the test.

1. Coordinate with the Owner to ensure there is no disruption of service or that the short disruption created during the dead head test is acceptable under the current operating conditions.
2. Discuss steps that will be taken if there are issues with the equipment you are testing that prevents a return to normal.
3. Do not move valves, turn equipment on or off or change any set points without the direct approval of an Owner technician working with you. Ideally, you should have them make all changes to the system.
4. Do not open up any electrical equipment.
5. Exercise caution around the moving parts of the machinery like the pump shaft while taking tach readings.
6. Verify that the dead head test will not exceed the rated pressure of any component between the pump discharge and the throttling valve.
7. Use caution when throttling because for some valves, the torque required as you approach dead head can be significant. If the valve slams because you do not have a secure grip, you could cause water hammer and related issues.

**References:** List references like technical papers, CTPL library tests and other information that might be useful as supporting information for the test team.

1. Document the pump and motor nameplate.
2. Ask for submittals from the Owner if they have them for the pump and also the gauges so we have a sense of accuracy.
3. System diagram.

Requirement	Data Include units	Completed Initials, Date and Time
<b>Prerequisites:</b> List any prerequisites that must be in place to execute this test.		
1. Owner approves proceeding with the test.	—	JP 3:10 PM
<b>Preparation:</b> List steps necessary to prepare for the test.		
1. Pump coupling guard removed to facilitate tach readings.	—	HD
2. Gauges appear to be in good working order and are located at the flange taps provided by the pump manufacturer.	—	JD 3:12 PM



## Component Level Test

Procedure: List actual steps in the procedure here.

1. Document the current operating state of the plant		3:20 PM
Chiller 1 status	Off	JD
Chiller 1 CHW EWT if running		
Chiller 1 CHW LWT if running		
Chiller 1 kW if running		
Chiller 1 CW EWT if running		
Chiller 1 CH LWT if running	↓	
Chiller 2 status	On	
Chiller 2 CHW EWT if running	49.2	
Chiller 2 CHW LWT if running	42.0	
Chiller 2 kW if running	188	
Chiller 2 CW EWT if running	80.1	
Chiller 2 CH LWT if running	84.1	
Plant CHWS temperature	42.1	
Plant CHWR temperature	49.6	↓
2. Document pump nameplate data with a photograph.	✓	JD
Verify the photo is legible after taking it.	✓	JD
3. Document pump motor nameplate data with a photograph.	✓	JD
Verify the photo is legible after taking it.	✓	JD
4. Pump as found conditions		3:35 PM
Suction pressure	145 psig	JD
Discharge pressure	163 psig	JD
Differential pressure		
Discharge valve position	40% open	JD (photo)
Pump speed	1182 rpm	JD
Flow rate (read from pump curve)		
Bhp based on slip (should correlate with operating point)		
5. Coordinate with the Owner for dead head test	✓	3:45 PM
Bring on Chiller 1 if it is not running	Not	JD
Once the second chiller has stabilized, shut down Chiller 2	↓	↓
Once Chiller 2 is off line proceed with the dead head testing as indicated below	↓	↓



## Component Level Test

6. Carefully close the discharge valve and document the following items.	✓	4:00 PM
Suction pressure	147 psi	JD
Discharge pressure	169 psi	JD
Discharge valve position	Closed	JD (photo)
Differential pressure		
Pump speed	1193 rpm	JD
Impeller size (read from pump curve)		
7. Open the discharge valve fully to set up the wide open test	✓	HD
		Photo
8. Coordinate with the Owner to restart Chiller 2	✓	4:08 PM HD
9. Verify that Chiller 2 has assumed the load and the plant is stable	✓	JD
10. Shut down Chiller 1 if it was started and is not needed	Note 1	JD
11. Document the wide open operating condition		4:15 PM
Suction pressure	145 psi	JD
Discharge pressure	161 psi	JD
Differential pressure		
Discharge valve position	100%	Photo JD
Pump speed	1181 rpm	JD
Flow rate (read from pump curve)		
Bhp based on slip (should correlate with operating point)		
Follow up and Return to Normal: List follow up steps here.		5:00 PM
1. Return the discharge valve to the as found condition.	✓	HD
Discharge valve position	40% open	JD/HD
2. Verify pump DP is at the as found condition		
Suction pressure	✓	JD
Discharge pressure	✓	JD
Differential pressure		
3. Verify that the Chiller is handling the load and that the plant is stable	✓	JD HD
4. Review test results with the Owner and there team.	✓	JD HD NM
5. Continue to monitor the plant to make sure it is stable for at least 30 minutes or as requested by the Owner.	✓	↓



## Component Level Test

### Test Coordinator(s)

Name	Affiliation	Work phone	Work e-mail
Joe DeNuguy	Card Attached		

### Test Team Members

Name	Affiliation	Work phone	Work e-mail
Hortley Davidson	Hijend Hotels Engineering	Card attached	Hortley.Davidson@hijend.com
Noreen McCallister	" "	↓	Noreen.McCallister@hijend.com

### Test Completion Sign Off

*This test has been performed to the best of my ability per the requirements of the procedure. Deviations or problems encountered have been noted at the end of the test form.*

Test coordinator name (print)

Joe DeNuguy

Signature, date and time

Joe DeNuguy 5:45 pm

Comments and Notes

Note 1: Noreen O.K.ed just shutting down #2 since we would not be off long & events are over.  
Verified #1 is ready to run if we have a problem w/ #2 restart.

## Component Level Test

## Comments and Notes