

EXAMPLE

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Documenting Requirements for Chiller System Startup and Initial Checkout

Project _____

Date _____

The purpose of documenting the startup and checkout process is to ensure to the Owner that all recommended startup and initial checkout procedures are completed and that a written record of the work is generated.

PLAN and PROCEDURES:

1. The prefunctional checklists provided by _____, should be filled out and signed (pumps, piping, chillers, cooling towers, water treatment).
2. The following pages shall be copied from the submitted manuals. Each paragraph, installation task or feature on each page listed shall be checked and dated when completed, or written notes shall be provided for why this item was not done or does not apply. A signature and date of the technician shall be provided at the bottom of each page. Settings established or readings made for any of the tasks shall be clearly recorded.
3. This list of references does not constitute a recommendation of the full installation and startup procedures or release the installer from following all factory recommendations, the specifications, applicable codes and good practice. Other pages applicable to this piece of equipment or other procedures completed should be added.
4. Other startup record forms normally used should also be filled out and submitted.
5. All documentation will be submitted to _____ upon completion and is required prior to TAB or functional testing execution.

Chiller-1 and 2 (each chiller has own pages)

1. McQuay IM 306, p. 4-5, Location and Mounting and Oil Cooler Piping and Vent Piping.
2. McQuay IM 306, p. 5-7, Electrical
3. McQuay IM 306, p. 8, Electrical Testing Control Circuit and Surge Capacitors.
4. McQuay IM 306, p. 10, Factory startup form and warranty registration form (also sent to manufacturer).
5. McQuay IM 306, p. 11 Prestart Checklist.
6. McQuay IM 616, p. 30-31, Pre-Start Checkout.
7. McQuay IM 616, p. 33 Startup.
8. McQuay IM 561, p.7, Installation and Pre-start Checks.
9. McQuay _____ All changes to any Control Menu default values will be listed adjacent to the default values. Significant departures from the defaults will be explained in writing.

Chiller-3

1. McQuay IM 224 p. 4, Location.
2. McQuay IM 224 p. 5, Vibration Isolators.
3. McQuay IM 224 p. 8 and 9, Water Piping.
4. McQuay IM 224 p. 10, Flow Switch.
5. McQuay IM 224 p.13, Water Pressure Drop.
6. McQuay IM 224 p. 20, Relief Valve Piping.
7. McQuay IM 224 p. 40, Wiring.
8. McQuay IM 224 p.56, Pre-Start-up and Start-up.
9. McQuay IM 224, p. 71, Factory startup form and warranty registration form (also sent to manufacturer).

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10. McQuay IM 493 p. 25-31, all changes to any Control Menu default values will be listed adjacent to the default values. Significant departures from the defaults will be explained in writing.

Cooling Tower

- Baltimore Aircoil M244/1-0AA, p. 4, including "After 24 Hours" requirements.
- According to M244, p. 4, provide documentation of motor amperage and voltage readings for each phase and compare to nameplate.

Name plate = 480 V, 9.1/30.0 FLA.

	Pony-1	Main-1	Pony-2	Main-2	Pony-3	Main-3
Ph-1 V						
Ph-2 V						
Ph-3 V						
% Imbalance*						
Ph-1 A						
Ph-2 A						
Ph-3 A						
% Imbalance*						

* % Imbalance = 100 x (avg. Volts or amps - lowest phase volts or amps) / avg. volts or amps

$$\text{Avg.} = (\text{Phase A} + \text{B} + \text{C}) / 3$$

The phase imbalance should be less than 2%.

- If using a continuous bleed rate, provide calculation and final rate.
- Provide the following documentation on the sump heaters and vibration alarm checkout, per specification 15710, 3.2.B.

<p><u>CT Sump Heaters.</u></p> <p>Schedule: (setpoint = 45F)</p> <table style="margin-left: 40px;"> <tr> <td></td> <td><u>ON (F)</u></td> <td><u>OFF (F)</u></td> </tr> <tr> <td>Stage 1</td> <td>45</td> <td>43</td> </tr> <tr> <td>Stage 2</td> <td>47</td> <td>45</td> </tr> </table> <p>Starting with sump heaters not running, overwrite sump temperature to be equal to stage 1 SPt. Then, lower to stage 2 SPt. Then raise to 1 F above 2nd stage OFF SPt. Then lower to 1st stage OFF SPt. Repeat for each CT.</p>		<u>ON (F)</u>	<u>OFF (F)</u>	Stage 1	45	43	Stage 2	47	45	<p><u>Actual:</u></p> <table style="margin-left: 40px;"> <tr> <td></td> <td><u>ON (F)</u></td> <td><u>OFF (F)</u></td> </tr> <tr> <td>CT-1</td> <td></td> <td></td> </tr> <tr> <td>Stage 1</td> <td>[]</td> <td>[]</td> </tr> <tr> <td>Stage 2</td> <td>[]</td> <td>[]</td> </tr> <tr> <td>CT-2</td> <td></td> <td></td> </tr> <tr> <td>Stage 1</td> <td>[]</td> <td>[]</td> </tr> <tr> <td>Stage 2</td> <td>[]</td> <td>[]</td> </tr> <tr> <td>CT-3</td> <td></td> <td></td> </tr> <tr> <td>Stage 1</td> <td>[]</td> <td>[]</td> </tr> <tr> <td>Stage 2</td> <td>[]</td> <td>[]</td> </tr> </table>		<u>ON (F)</u>	<u>OFF (F)</u>	CT-1			Stage 1	[]	[]	Stage 2	[]	[]	CT-2			Stage 1	[]	[]	Stage 2	[]	[]	CT-3			Stage 1	[]	[]	Stage 2	[]	[]	
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Stage 1	[]	[]																																							
Stage 2	[]	[]																																							
<p><u>CT Vibration Alarm.</u></p> <p>Jump the vibration sensor to simulate a vibration alarm.</p> <p style="margin-left: 40px;"><u>CT-1:</u></p> <p style="margin-left: 40px;"><u>CT-2:</u></p> <p style="margin-left: 40px;"><u>CT-3:</u></p>	<p>Observe that an alarm is registered and that the CT fan shuts off.</p>																																								