Periodic Maintenance

Note: for the most up-to-date maintenance information, we recommend that you visit the Legacy Chiller (USA) web site: www.Legacychillers.com

MONTHLY

1. Check for foreign debris in the condenser coil inlets of an air cooled chiller.

2. Visually inspect for water leaks and proper tank level

3. Inspect solder joints for evidence of oil or water leaks.

4. Check electrical connections and components.

5. Listen for excessive vibrations or motor noise.

6. Check system fluid for proper glycol percentage.

7. Check the liquid line sight for bubbles.

8. Check the compressor oil level in sight glass if equipped.

9. Check fan and pump rotation for free rotation and correct direction.

YEARLY

In addition to above:

1. Tighten all electrical connection screws.
2. Check the glycol solution for cleanliness. Drain and refill with clean solution if excessive sludge or dirt is present. Flush the system prior to refilling.
3. Check motor amp draws and voltage supplies. Make sure they are within name plate rating.
4. Check operating pressures of the refrigeration system.
5. Check super heat and sub cooling.
6. Inspect for leaks with a sensitive electronic leak detector.
7. Check for excess wear or burned contacts on motor starters replace if in doubt.
8. Wash out the condenser coils of an air cooled system.
9. Check the operation of the safety devices and thermostat.
10. Ensure that the pipe insulation is dry and not broken down.
11. Check mechanical mounts and vibration isolators for wear.
12. Remove and clean Magnetic Flow Switch.

OTHER MAINTENANCE ITEMS

These maintenance items are for other Legacy products that may be installed with your package chiller. **These items if applicable should be checked monthly unless otherwise specified below.**

Legacy filter bypass assemblies - Optional:

1. Check system filter housing for cracks.

2. Check system filter housing for leaks.

3. Check filter pressure differential gauge(s). On most filter models, if the differential pressure exceeds 10 PSI, the filter cartridge needs to be replaced. **Contact Legacy Chillers (877 -988-5464) to order a replacement. Make sure to have the filter housing model number available when you call.**

Legacy process drops - Optional:

1. Check assembly for any signs of cooling fluid leakage

2. Check in-line flow meter for debris that may be caught on or near the stainless steel slide.

3. Check coloration of cooling fluid.

4. Check return-side stainless steel in-line strainer for any debris that may restrict flow. Note: To perform this check, the system must be shut down. Close the supply and return side isolation valves at the top of the drop. Using the drain down valve at the bottom of the return side drop, drain the cooling fluid out of the line before opening in-line strainer. Make sure to reinstall the strainer basket and seal cap immediately. This check should be performed quarterly minimum.

5. Check condition of the supply and return pressure and temperature gauges.

6. Check supply drop circuit setter to make sure that the flow adjustment knob moves freely. Note, before moving the adjustment knob, make sure to note the original setting.

7. Once all check item have been performed, check drop for any potential leaks, re-set the circuit setter, open the main supply and return valves at the top of drop and restart your system.

Closed loop fluid testing and treatment

Most chiller systems are initially filled with municipal (main) water as a matter of convenience and overall costs. Although main water may be safe to drink, there is a multitude of bacteria and minerals that, if left un-checked, will cause considerable problems with any closed loop chiller application.

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Periodic Maintenance (continued)

To prevent fluid related problems with you new closed loop chiller equipment, Legacy highly recommends the following:

1. Have the condition of your system fluid checked by a qualified lab, a minimum of four times per year. If your area has a history of water quality related issues, testing may be required more often.
2. Based on the lab results, contract with a qualified company to provide products and services to properly maintain the quality of your closed loop fluid.
3. Create a fluid maintenance log that should contain copies of lab results, MSDS information on products used and notations of the types, amounts and dates chemicals were added to the system.

Here are some of the most common test parameters and the recommended ranges.

Common test parameters	Targets
pH	9.5—10.5
Specific Conductance micromhos, 18º C	3500 or below
Total Iron as Fe, ppm	1 ppm or below
Copper as Cu, ppm	1 ppm or below
Sodium Nitrite as NaN02, ppm	150 ppm max (See note 1)
Molybdenum as Mo, ppm	15—30 ppm
Reserve Alkalinity	(See note 2)

Notes:

1. Based on using (Legacy Part# CL-63); 800 ppm or greater is appropriate if a straight nitrite-based product is used. However, we recommend against using a straight nitrite product in chilled water systems, because it promotes the proliferation of nitrifying bacteria.
2. Reserve alkalinity is a pertinent value only if glycol is used in the loop. If glycol is used in any of your loops, you may want to include glycol in your parameters, but list a recommended value only as operating conditions dictate for proper freeze protection or something similar.
3. Systems shipped after 4/1/13 are equipped with a Magnetic Flow Switch. Fluid quality must be maintained for proper operation. Switch should be removed and cleaned every 24 to 36 months minimum.

Legacy Chiller Systems (USA) offers a complete line of closed-loop water treatment products and services. For more information:

Call toll Free 877-988-5464 today

Notes:

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Field Commissioning Checklist (PAGE 1)

Please fax completed form to Legacy Chiller Systems at 503-567-9011 as soon as possible. Complete one form for each system being started. Note: This work should only be performed by a qualified service technician who is familiar with such equipment.

Start up date:	Departure or Arrival date (circle one):
Technicians Name:	Return or Completion date (circle one):
Checked in at site with:	Legacy billing PO# if applicable:
Full address of installation site:	

Power OFF system checks	
1. Unit Model:	
2. Unit Serial:	
4. Condenser air clearance (TOP):	Feet:____ Inches:____ Open:_____
5. Condenser air clearance (SIDE):	Feet:____ Inches:____ Open:_____
6. Service access clearance (avg. all sides):	Feet:____ Inches:____ Open:_____
7. Chiller disconnect fuses (check):	Proper size:_____ Tight:_____
8. Chiller main block fuses (check):	Proper size:_____ Tight:_____
9.Check ALL electrical connections (check):	Proper size:_____ Tight:_____
10.Check water connections to chiller (check):	Proper size:_____ Tight:_____
11.Check condenser fan mounting brack-ets (check):	Proper size:_____ Tight:_____
Power ON compressor OFF	
1. Main power supply voltage and phase:	Volts: _____ Phase:_____
2. Main system pump rotation & RLA:	Rot.OK: __ Rot.Not Ok:__ RLA_____
3. Tank pump rotation & RLA:	Rot OK: __ Rot Not Ok:__ RLA_____
4. Signs of fluid leakage inside the chiller:	

***** Important *****

A. Pumps (Lack of fluid): DO NOT TURN THE CHILLER ON UNTIL THE CHILLER IS FULL OF FLUID. When the micro-processor is turned tank re-circulation pumps (PZAT models only) will automatically start. Running ANY pump with limited fluid supply WILL cause damage to pumps seals.

B. Pumps (Rotation): Once fluid levels are confirmed, pump rotation must be confirmed. Failure to confirm pump rotation WILL result in pump damage.

***** IMPORTANT NOTE FOR THREE PHASE CHILLERS*****

If pump(s) are running the wrong rotation, the three phase compressor will also be running in the wrong rotation. To correct this issue, reverse any two of the three phase power wires coming into the chiller at the main bus. Once this is done, check rotation of all three phase motors again to confirm correct rotation.

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Field Commissioning Checklist (PAGE 2)

Power on <u>compressor OFF</u> (cont..)		Notes:
5. With system pump on and running for 30 minutes, clean tank recirc strainer on tank model chillers.	Checked: _____ Clean:_____	
6. Check micro processor programming. See pages 27-37 of this booklet		
Power on <u>compressor ON></u>		
1. Ambient temperature:	DEG(F):_____ or DEGC):_____	
2. What is current freeze point of fluid?	DEG(F):_____ or DEGC):_____	
3. Compressor head pressure:	CKT1(PSI):_____ CKT2(PSI):_____	
4. Compressor Suction pressure:	CKT1(PSI):_____ CKT2(PSI):_____	
5. Super heat reading:	CKT1(F):_____CKT2(F):_____	
6. Compressor RLA:	COMP1: _____COMP2:_____	
7. Supply voltage on each leg:	L1:_____ L2:_____ L3:_____	
8. Visual check of refer pipe connections for signs of leaks (check one):	Found:_____, None found:_____ Make location of any leaks on right>	
9. Checked refer service caps for tightness:	All tight:_____, Tightened:_____	
10. Condenser fan rotation & RLA:	Rot.OK:__ Rot.Not Ok:__ RLA:_____	
11. Tank temperature control set point	Degrees F:_____ .	
12. Verify all setpoints indicated on factory order confirmation with setpoints an values on chillers HMI	Checked: _____	
13. VFD compressor, VFD Pump and VFD condenser fan controls, verify all target setpoints. Any questions call factory technical support.		

Important: <u>THREE PHASE COMPRESSORS ONLY</u>: On scroll compressor commissioning, there is a 50% chance that compressor rotation may be off. On initial commissioning, if the compressor sounds louder than normal and your suctions and discharge pressures are not within a normal range, there is a high possibility that the compressor is running in reverse. If this is the case, reverse any two legs of power TO THE COMPRESSOR and attempt to restart. RUNNING A SCROLL COMPRESSOR IN REVERSE FOR AN EXTENDED PERIOD OF TIME <u>WILL CAUSE DAMAGE TO THE COMPRESSOR</u>. SUCH DAMAGE IS NOT COVERED UNDER THE MANUFACTURES WARRANTY.

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Field Commissioning Checklist (PAGE 3)

Site information		Notes:
1. Unit location (check):	Ground pad:_____ Roof: _____	
2. Location of main loop filter (check):	Main loop: _____ Drop:_____	
3. Location of main loop bypass:		
4. Type of main loop bypass used (check):	Hand ball valve: ____ Automatic_____	
5. Main loop insulation (check):	Insulated:_____ Not insulated:_____	
6. Supply pressure at process drop:	PSI:_____ (or) Bar: _____	
7. Return pressure at process drop:	PSI:_____ (or) Bar: _____	
8. Supply temperature at process drop:	Degrees F:____ (or) Degrees C:_____	
9. Return temperature at process drop:	Degrees F:____ (or) Degrees C:_____	
10. Flow rate through farthest process drop:	GPM:_____ (or) LPM: _____	

Technicians Signature:		Customers Signature:	
Printed Technicians name:		Printed Technicians name:	
Date:		Date:	

Legacy Chiller Systems (USA)
www.LegacyChillers.com
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Supplemental Information

For up-to-date support first try our on-line Knowledgebase AT: http://www.legacychillers.com/kb

For factory replacement parts visit:

http://www.legacychillers.com/onlinestore/products.asp

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