SPRING 2021-Due May 31st

PREVENTATIVE MAINTENANCE CHECK SHEET

Warehouse # & Location		**Make a copy of completed PM and leave visible in motor room. Send a completed copy to: Service@millerconstructionservices.com**	
Date			
Technician Name Printed			
Technician Signature	**X**		
Manager Name Printed			
Manager Signature	**X**		
ITEM	**Required Cleanings**	**Complete: YES/NO**	**Extra Work Required/ Notes**
1	Check in with Warehouse Management		
2 	**100% Clean compressor room**. Remove all hazmats, empty garbage cans,clean rack pans of all oil/debris, sweep floor, etc. Please email photos to: Service@millerconstructionservices.com with warehouse in subject line.		
3 	**Clean evaporator coils** in the **Produce and Dairy Coolers**. ***Take BEFORE and AFTER photos of cleaning.*** Download TIME STAMP app. for iphone/android users which shows date/time and location Please email **labeled photos** to: Service@millerconstructionservices.com with the warehouse in the subject line and area.		
4 	**Drop and clean drain pans** in the **Produce and Dairy Coolers**.****Blow drain lines out with CO2 after cleanings**** ***Take BEFORE and AFTER photos of the inside of the pans.*** Download TIME STAMP app. for iphone/android users which shows date/time and location Please email **labeled photos** to: Service@millerconstructionservices.com with the warehouse in the subject line and area.		
5 	**Clean condenser coils** with pressure washer or steam cleaner.****DO NOT USE ANY DETERGENTS/ CHEMICALS**** **Take BEFORE and AFTER photos of cleanings.** Download TIME STAMP app. for iphone/android users which shows date/time and location Please email labeled photos to: Service@millerconstructionservices.com with the warehouse in the subject line and area.		

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	Leak Inspection	Complete: YES/NO	Extra Work Required/ Notes
1	Check entire warehouse for leaks by EPA certified technician with electronic leak detector for minimum of 4 hours onsite, including rooftop condensers and overhead piping. ****Note leaks repaired****		
2	Test each leak detector to confirm proper function and that they communicate with Micro Thermo or E2/PBN.Confirm notification parameters meet federal, state and local requirements. Audit and calibrate leak detectors using manufacturer recommended rocedures to ensure leak detectors: 1) Accurately detect a condectration level of 10 parts per million (PPM) of specific refrigerants used in appliances. 2) Alert the operator when a refrigeration concentration of 100 PPM of vapor of the specific refrigerants used in the appliances is reached.		
3	Test each leak detector to confirm it is working with trace amount of refrigerant. Verify that MT or E2/PBN is receiving identical PPM reading.		
	Controllers		
1	Check all circuit temperatures in controller. Verify that all systems are maintaining temperature setpoints.		
2	Check alarm logs. Identify recurring alarms that need attention.		
3	Check controllers for overrides. Determine why, if any, overrides are in place.		
4	Check and test battery backup/ UPS in each rack or controller, if present		
5	Confirm All alarm settings and temperature settings in refrigeration controller are to Costco specification. Note any adjustments or changes and notify MCS.		
6	Test and verify that local alarm lights and horn function properly. Also test and verify that refrigeration alarm connection is hooked up by simulating a rack alarm and confirming warehouse receives notification of that alarm from the alarm company.		
7	**Complete Alarm form and obtain required signatures**		

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	Racks	Complete: YES/NO	Extra Work Required/ Notes
1 	Oil acid test all racks and **send photos** to MCS, note below if satisfactory, marginal or unsatisfactory for each rack: Rack A: _____ Rack D: _____ Rack B: _____ Rack E: _____ Rack C: _____ Rack F: _____ ****Dispose of samples per EPA guidelines****		
2	**Record power supply voltage:** Rack A: L1-L2: _____ L2-3: _____ L1-L3: _____ Rack B:L1-L2 _____ L2-3: _____ L1-L3: _____ Rack C:L1-L2 _____ L2-3: _____ L1-L3: _____ Rack D:L1-L2 _____ L2-3: _____ L1-L3: _____ Rack E:L1-L2 _____ L2-3: _____ L1-L3: _____ Rack F:L1-L2 _____ L2-3: _____ L1-L3: _____		
3	**Verify heat reclaim setup/operations and check for leaks on tanks. Notify management of any water leaks:** Heat reclaim tank #1: water outlet temp_____F Heat reclaim tank #2: water outlet temp_____F		
4	**Check compressor oil levels and record oil reservoir level:** Rack A oil resevoir level: _____ ball (s) Rack B oil resevoir level: _____ ball (s) Rack C oil resevoir level: _____ ball (s) Rack D oil resevoir level: _____ ball (s) Rack E oil resevoir level: _____ ball (s) Rack F oil resevoir level: _____ ball (s)		
5	**Check and record refrigerant levels:** Rack A: _____% Rack D: _____% Rack B: _____% Rack E: _____% Rack C: _____% Rack F: _____%		

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PREVENTATIVE MAINTENANCE CHECK SHEET

	Racks Continued	Complete: YES/NO	Extra Work Required/ Notes
6	**Check for clear liquid line sightglass,record color of moisture indicator:** Rack A: _____ Rack D: _____ Rack B: _____ Rack E: _____ Rack C: _____ Rack F: _____		
7	**Check subcooler operations, record liquid outlet temperature:** Rack A: _____ F Rack D: _____ F Rack B: _____ F Rack E: _____ F Rack C: _____ F Rack F: _____ F		
8	**Record pressure drop on liquid line filter driers:** Rack A: _____ Rack D: _____ Rack B: _____ Rack E: _____ Rack C: _____ Rack F: _____ ****Replace if pressure drop is greater than 4psig****		
9	**Record pressure drop on coalescing oil separators:** Rack A: _____ Rack D: _____ Rack B: _____ Rack E: _____ Rack C: _____ Rack F: _____ ****Replace if pressure drop is greater than 5psig****		
10	Verify spare coalescing separator filter is on site at all times. Quote warehouse replacement filter if not present.		
11	Check transducer calibration with accurate gauge. If off less than 10psig, then calibrate transducer. If off more than 10psig, replace.		
12	Inspect and tighten all elecrical connections on racks and check compressor contactors for wear. Replace as necessary		
13	Check head fan motor operations on LT compressors. Clean fan guards.		
14	Verify phase monitor settings and test operations.		
15	Check all systems for floodback and note.		

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	Racks Continued	Complete: YES/NO	Extra Work Required/ Notes
16	Inspect all compressors for signs of short cycling and note.		
17	Check crankcase heater operation if applicable.		
18	Inspect pipe hangers. Tighten loose connections.		
19	Inspect all cushion clamps, vibration eliminators, and hoses. Note if any could be refrigerant leak issues in the future and if so, quote warehouse to be replaced. ***Super Hoses to be replaced with encapusulted controls. If hoses must be used, install Reflex-style hoses.Discharge line cushioned clamps to be replaced with high temperature style. Please submit quote if not.***		
20	Check for latest refrigerant legend and/or circuit layout. If layout is not correct, adivse for MCS to send updated drawings to be printed and posted in the motor room.		
21	Use dry nitrogen to blow out dust from pump motor vents, anti-sweat panel vents, VFD vents, etc. (If applicable)		
	Glycol (if Applicable)		
1	Check Pump Controls to insure proper operation (low temp thermostat, Pump differential pressure switches, system relief valves), note any issues		
2	Verify the pump cycling sequence is operating correctly		
3	Check the low temperature (freeze stat) turns off the liquid line solenoid valve(s)		
4	If pump bearings are not sealed (grease per manufacturer guidelines if needed)		
5	Visually inspect pumps/piping/exchangers for signs of leaks, note any leaks for repair.		
6	Record glycol Temperature with refractometer _____ F		
7	Leak check glycol system for refrigerant leaks. At valve station on top of Meat/Dairy Cooler, crack a valve to check for refrigerant being present in glycol system. If refrigerant detected, get samples and notify **MCS immediately**.		
8	Wipe down pan for glycol station		
9	Check for visible Glycol level in overflow tank.		
10	Verify two (2) two 55 gallon barrrels of glycol are on site. One barrel of 100% Glycol, a second barrel of 35% Glycol. If not, please quote warehouse to order.		

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	Prep Room Air Handling Unit (newer warehouse design/if applicable)	Complete: YES/NO	Extra Work Required/ Notes
1	Check belts for proper tension. Replace if necessary.		
2	Change the HEPA filter (every quarter)		
3	Confirm spare air handler motor is on site		
4	Verify proper function of UV light. If		
	Exhaust Fans		
1	Check operation of all exhaust fans for Food Court equipment, Chicken Prep dishwasher, Rotisserie and Bakery Ovens, etc		
2	Check operation of machine room ventilation. Verify that exhaust fan/damper works.		
	Condensers		
1	Inspect condensers and verify that every fan motor is functional. Check condenser settings in controller. Note abnormal noises		
2	Inspect and tighten all elecrical connections on all condensers and check fan motor contactors for wear. Replace as necessary		
3	Straighten bent fins on all condenser coils		
4	Check settings on split condenser and verify operation.		
5	Check for proper air flow through condensers.		
6	Verify that all fan blades are balanced and not causing the motor to vibrate. Shut down each fan and inspect condenser fan blades for broken rivets or stress cracks. Inspect the motor support for broken welds or signs of fatigue. Replace unbalanced fan blades or broken motor supports ***immediately.***		
7	Check operation of water-cooled/adiabatic condensers per manufactuerer's recommendations if applicable		
8	If applicable: Inspect cooling tower, (if tower requires cleaning, then clean on T&M). Check overall functions of cooling tower. Grease or lube bearings, check belts, check chemical hose for leaks and alarms relaying to the controller for proper operations.		
9	**Check and record condenser subcooling**: (Subcooling = Saturated condensing temp - actual drop leg temp): Rack A _____F Rack D: _____F Rack B _____F Rack E: _____F Rack C _____F Rack F: _____F		

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PREVENTATIVE MAINTENANCE CHECK SHEET

	Self-Contained Cases	Complete: YES/NO	Extra Work Required/ Notes
1	Inspect all self contained refrigerated units for proper operation and condition of case trim (bumpers, end panels etc).		
2	Clean all self contained condensers excluding food court ice machines		
3	Clean condensers on Meat area Ice-O-Matic ice machine		
4	Complete electrical check on floral cases (drains cleaned, pan and heater checked for corrosion, float for operation). If new style floral case (on a pump) change out filters for condensers.		
	Cases/Boxes		
1	Ensure case is properly stocked and load limits are not exceeded-report deficiencies with load limits/ product stocking to warehouse management		
2	Inspect prep room filters - clean and wipe down		
3	Inspect cases for proper airflow and case operation		
4	Inspect walk-in Cooler/Freezer strip curtains for good condition. Quote to warehouse replacements.		
5	Verify thermometer operations		
6	Inspect walk-in Cooler/Freezer evaporator coils and fan guards for dirt and ice. Confirm all fans are operating		
7	Inspect case trim, shelving and frames for damage.		
8	Verify door operations to include prep room swing doors.		
9	Check all lighting in Cases, Prep rooms, POS boxes, Coolers, Shop-Ins, etc. Note those that need replacement.		
10	Check HCR Air Door(s) for proper function and make adjustment using ribbon test. Also, check belts and verify POS Freezer HCR blower/heaters are operational. Note cleanings if needed		
11	Brush off all case return air grills as needed		
12	Check anti-sweat controls if applicable, for proper operation		
13	Clean Pharmacy freezer/refrigerator condenser		

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	Final PM Requirements	Complete: YES/NO	
1	Obtain Manager's signature on Page One of PM checklist		
2	Make copy of PM packet and leave in motor room		
	Items that Require Additional Work		
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			