

HVAC Condensate Drain Pan Treatment and Line Flushing

1.0 Maintenance Objective & Frequency

The objective of this procedure is to prevent condensate drain line blockages, microbial growth, and water damage in HVAC air handling units (AHUs) and fan coil units (FCUs). This PM ensures unobstructed condensate removal, reduces the risk of overflow damage to ceilings and equipment, and maintains indoor air quality by eliminating biological contaminants. The recommended frequency is quarterly (every 3 months) or more frequently in high-humidity environments or units with a history of drain issues.

2.0 Lockout/Tagout (LOTO) & Safety

- **Electrical Isolation:** Lock out and tag out the HVAC unit at the dedicated disconnect switch or breaker panel. Verify zero voltage with a multimeter before accessing any electrical components.
- **Mechanical Isolation:** Ensure the fan and any moving parts have come to a complete stop before opening access panels.
- **Chemical Safety:** Wear chemical-resistant gloves (nitrile), safety glasses, and a face shield when handling biocide tablets or liquid drain treatments. Work in a well-ventilated area.
- **Slip/Trip Hazard:** Condensate water may be present on the floor. Use absorbent mats and caution signage.
- **PPE:** Safety glasses, chemical-resistant gloves, closed-toe steel-toed boots, and a face shield (if splashing risk exists).

3.0 Required Tools, Parts & Lubricants

- Biocide condensate pan treatment tablets (e.g., PanGuard or equivalent, EPA-registered for HVAC use)
- Liquid drain line cleaner (e.g., Nu-Calgon 4171-75 or equivalent, non-acidic)
- Wet/dry vacuum with crevice tool and hose attachment
- Garden hose with nozzle or pressurized water source (max 60 psi)
- Bucket (5-gallon) for waste water collection
- Flashlight or inspection mirror
- Adjustable wrench or pliers (for drain plug removal if applicable)
- Screwdriver set (flathead and Phillips)
- Rags or absorbent towels
- Disposable gloves and safety glasses

4.0 Step-by-Step Maintenance Procedure

1. **Perform LOTO:** Lock out and tag out the HVAC unit at the disconnect switch. Confirm zero voltage with a multimeter. Allow fan to coast to a complete stop.
2. **Access the condensate drain pan:** Remove the access panel(s) to the drain pan area. Use a flashlight to inspect the pan for standing water, debris, algae, or sludge. Note any signs of corrosion or cracks.

3. Remove standing water: Use a wet/dry vacuum to remove all standing water from the drain pan. Vacuum any visible debris, sediment, or biological growth from the pan surface and corners.
4. Clean the drain pan: Scrub the pan with a rag or soft brush using a mild detergent solution (or a dedicated HVAC coil cleaner if heavily soiled). Rinse thoroughly with clean water and vacuum dry. Do not use abrasive pads that could damage the pan coating.
5. Locate the condensate drain line outlet: Identify the drain line connection at the pan (typically a PVC or copper pipe). If a threaded plug is present, remove it to access the drain line opening.
6. Flush the drain line: Attach a garden hose to the drain line outlet (using an adapter if needed) or insert the hose directly into the opening. Flush the line with clean water at moderate pressure (max 60 psi) for 2-3 minutes. Observe the downstream drain exit for free flow and any debris discharge. If flow is restricted, use a wet/dry vacuum to suction the line from the exit end, then repeat flushing.
7. Apply liquid drain line cleaner: Following manufacturer instructions, pour the recommended amount of liquid drain line cleaner (e.g., 8 oz per ton of cooling capacity) directly into the drain pan or drain line opening. Allow it to sit for the specified dwell time (typically 10-15 minutes) to dissolve biofilm and organic buildup.
8. Final flush and verify drainage: Flush the drain line again with clean water for 1-2 minutes. Confirm that water exits freely at the drain termination point. Check the drain pan for any residual water; vacuum if necessary.
9. Install biocide treatment tablet: Place one biocide condensate pan treatment tablet in the drain pan, positioned away from the drain outlet to ensure continuous contact with water. Do not place the tablet directly in the drain line.
10. Reassemble and restore: Replace the drain plug (if removed), reinstall all access panels, and secure all fasteners. Remove LOTO tags and locks. Restore power to the unit.

5.0 Verification & Return to Service

1. Energize the HVAC unit and set the thermostat to call for cooling. Allow the system to run for at least 15 minutes to generate condensate.
2. Visually inspect the drain pan for proper water level (should be minimal, with water flowing freely toward the drain outlet). Confirm the biocide tablet is not blocking the drain.
3. Check the drain line termination point for a steady drip or stream of condensate water. Ensure no leaks at any joints or connections.
4. Inspect the area around the unit for any signs of water leakage or overflow. Verify that the drain line is not dripping onto electrical components or structural elements.
5. If the unit operates normally and drainage is unobstructed, sign off on the PM work order in ServiceGrid. Document any findings (e.g., corrosion, recurring blockages) for future reference.

Regulatory Disclaimer: This document is a generic maintenance template provided for educational and informational purposes only. It does not constitute professional engineering or reliability advice. The end-user assumes all liability for validating all step sequences, torque specs, and LOTO protocols against specific machinery OEM manuals before deployment to a live production floor.