

Chiller System Coolant Level and Pressure Verification

1.0 Maintenance Objective & Frequency

The objective of this procedure is to verify and adjust the coolant level and system pressure on the industrial chiller to ensure proper heat exchange, prevent pump cavitation, and avoid compressor damage due to low refrigerant or coolant flow. This PM is to be performed weekly or every 200 operating hours, whichever comes first.

2.0 Lockout/Tagout (LOTO) & Safety

- **Electrical Isolation:** Disconnect and lock out the main disconnect switch for the chiller unit. Verify zero energy with a voltmeter.
- **Pressurized System Hazard:** The coolant loop may be under pressure. Do not open any fill or drain valves until pressure is verified at 0 psi on the gauge.
- **Hot Surface Hazard:** Allow the chiller to cool for 15 minutes after shutdown before touching any components.
- **Mandatory PPE:** Safety glasses, chemical-resistant gloves (nitrile), and steel-toed boots. If coolant is hot, also wear heat-resistant gloves.

3.0 Required Tools, Parts & Lubricants

- Approved coolant (per OEM spec, e.g., propylene glycol/water mix or deionized water with inhibitor)
- Distilled or deionized water (for topping off if using a water-based coolant)
- Clean funnel with mesh filter
- Digital pressure gauge (0-100 psi range, $\pm 1\%$ accuracy) or calibrated analog gauge
- Refractometer or hydrometer (for verifying coolant concentration if applicable)
- Clean lint-free rags
- Flashlight
- ServiceGrid mobile device or paper log sheet

4.0 Step-by-Step Maintenance Procedure

1. Perform LOTO as per Section 2.0. Confirm the chiller is electrically isolated and all residual pressure in the coolant loop is vented to 0 psi by opening the vent valve momentarily (if equipped).
2. Locate the coolant reservoir sight glass or dipstick. Wipe the sight glass clean with a lint-free rag. Verify the coolant level is between the MIN and MAX marks. If no sight glass, remove the fill cap and visually inspect the level.
3. If the level is below the MIN mark, add approved coolant through the fill port using a clean funnel with a mesh filter. Add slowly to avoid air entrapment. Recheck level after each 1-liter addition until within range.
4. If the coolant is a water/glycol mixture, use a refractometer to measure the concentration. Take a few drops from the reservoir or a sample port. The concentration should be within OEM spec (typically 30-50% glycol). Adjust by adding concentrate or distilled water as needed.

5. Inspect the coolant for clarity and contamination. If the coolant appears cloudy, has visible particles, or has a foul odor, note this on the work order and flag for a full coolant change.
6. Attach the digital pressure gauge to the Schrader valve or pressure port on the coolant loop. Record the static pressure. Compare to OEM specification (typically 10-30 psi for closed-loop systems). If pressure is below spec, check for leaks and pressurize using a hand pump or by adding coolant until the system is full and pressurized.
7. If the system has an automatic air vent, ensure it is functioning. Manually bleed any trapped air from high points in the coolant loop by opening vent valves until a steady stream of coolant flows, then close.
8. Inspect all coolant hoses, fittings, and the pump seal for signs of leakage. Tighten any loose fittings to 20 Nm (or per OEM spec) using a torque wrench. Replace any damaged hoses or seals.
9. Check the expansion tank (if equipped) for proper air charge. With the system depressurized, the tank bladder pressure should be 2-3 psi below the system fill pressure. Adjust with a tire pump if necessary.
10. Record all readings (coolant level, pressure, concentration, visual condition) in ServiceGrid or on the PM log sheet. Note any discrepancies or parts needed for follow-up.

5.0 Verification & Return to Service

1. Remove all LOTO devices. Restore electrical power to the chiller.
2. Start the chiller and allow it to run for 5 minutes. Monitor the pressure gauge: it should rise to the operating range (typically 15-40 psi) as the pump runs. Listen for cavitation (rattling or whining from the pump).
3. Check the coolant sight glass again with the system running. The level should remain stable. If it drops, there may be an air lock or leak. Shut down and re-bleed air.
4. Verify the chiller reaches and maintains setpoint temperature within 10 minutes. Use an infrared thermometer to check supply and return line temperatures (should be within 2-5°C of each other).
5. Sign off on the PM work order in ServiceGrid, confirming all steps completed and the chiller is returned to production-ready status.

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.