
Air Compressor Tank Blow Down and Moisture Drain Preventative Maintenance SOP

1.0 Maintenance Objective & Frequency

The objective of this procedure is to remove accumulated water condensate, oil emulsion, and particulate sediment from the air compressor receiver tank. Regular blow down prevents internal corrosion, reduces the risk of water slugging downstream pneumatic components, and maintains air quality. This PM also verifies the functionality of automatic drain valves if equipped.

Frequency: Daily (manual drain) or as indicated by automatic drain cycle timer (typically every 30 minutes of compressor run time). For facilities with high humidity or high duty cycles, increase frequency to twice per shift.

2.0 Lockout/Tagout (LOTO) & Safety

- **Electrical Isolation:** Disconnect and lock out the main disconnect switch for the air compressor unit. Verify zero voltage with a rated voltmeter.
- **Pneumatic Isolation:** Close the isolation valve between the receiver tank and the plant air distribution header. Bleed any residual pressure from the tank by opening the manual drain valve momentarily (if safe to do so) or by using the automatic drain test button.
- **Mechanical Isolation:** Ensure the compressor is fully stopped and cannot start automatically (e.g., pressure switch, timer, or remote start).
- **Mandatory PPE:** Safety glasses with side shields, hearing protection (if compressor is still running nearby), and chemical-resistant gloves (for handling condensate that may contain oil).

3.0 Required Tools, Parts & Lubricants

- Appropriately sized container (5-gallon pail or larger) to collect condensate.
- Rags or absorbent pads for spill control.
- Adjustable wrench or socket set (size as per drain valve, typically 7/8" or 1-1/16").
- Flashlight for visual inspection of tank interior (if access port available).
- Replacement drain valve kit (if valve is leaking or stuck).
- Teflon tape or pipe thread sealant (for valve replacement).

4.0 Step-by-Step Maintenance Procedure

1. Verify LOTO is applied: confirm the compressor disconnect is locked out and tagged, and the header isolation valve is closed.
2. Position the collection container directly under the tank drain valve. Ensure the container is large enough to hold the expected volume of condensate (typically 1-5 litres for a standard 200-gallon tank).
3. Slowly open the manual drain valve (ball valve or petcock) by turning counterclockwise. Open only partially at first to control the flow and avoid splashing.

4. Allow the condensate to drain completely. Observe the flow: initial discharge will be water and oil emulsion; final discharge should be mostly air. If the flow stops prematurely, the drain may be clogged with sediment.
5. If the drain is clogged, close the valve, remove the drain fitting, and use a small wire or pick to clear the blockage. Reinstall the fitting with new Teflon tape if necessary.
6. Once the tank is fully drained (no more liquid exiting, only air), close the manual drain valve firmly by turning clockwise. Do not overtighten.
7. If the compressor is equipped with an automatic drain valve (timer or solenoid type), test its operation: press the manual test button or cycle the timer to verify the valve opens and closes properly. Listen for the click of the solenoid and observe a brief burst of air/condensate.
8. Inspect the drain valve and surrounding piping for signs of leakage, corrosion, or damage. Tighten any loose fittings or replace worn components as needed.
9. Clean up any spilled condensate using rags or absorbent pads. Dispose of collected condensate according to local environmental regulations (may contain oil).
10. Remove LOTO: remove personal lock and tag, close the lockout hasp, and restore power to the compressor.

5.0 Verification & Return to Service

1. Open the header isolation valve to repressurize the receiver tank. Allow the compressor to run through one full cycle (load/unload) to stabilize system pressure.
2. Monitor the automatic drain valve (if equipped) for proper cycling during the compressor run cycle. Confirm it opens and closes without sticking.
3. Check for any air leaks at the drain valve or piping connections using a soap-and-water solution or ultrasonic leak detector. Bubbles indicate a leak that must be repaired.
4. Verify that the compressor reaches its normal cut-out pressure and that the tank pressure holds steady when the compressor is off (no pressure drop over 5 minutes).
5. Record the PM completion in ServiceGrid: log the date, time, volume of condensate drained, any parts replaced, and observations (e.g., excessive oil carryover, sediment).
6. Sign off on the work order and return the equipment to production.

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.