

Dust Collector Differential Pressure Gauge Calibration

1.0 Maintenance Objective & Frequency

The objective of this procedure is to calibrate the differential pressure (DP) gauge on the dust collector to ensure accurate indication of filter loading. An inaccurate DP gauge can lead to premature filter cleaning, reduced collection efficiency, or bag damage due to overpressure. This calibration ensures the gauge reads within $\pm 2\%$ of full scale across the operating range. Perform this calibration every 6 months or whenever the gauge is replaced or suspected of drift.

2.0 Lockout/Tagout (LOTO) & Safety

- **Electrical Isolation:** Disconnect and lock out the main power supply to the dust collector control panel. Verify zero voltage with a multimeter.
- **Pneumatic Isolation:** Close the compressed air supply valve to the pulse-jet cleaning system. Bleed residual air from the manifold.
- **Mechanical Isolation:** Ensure the dust collector fan is at a complete stop and the impeller is locked out if accessible.
- **Mandatory PPE:** Safety glasses, cut-resistant gloves, hearing protection (if near active equipment), and dust mask if residual dust is present.

3.0 Required Tools, Parts & Lubricants

- Certified digital manometer or DP calibrator (range 0-10 in. w.c. or equivalent, accuracy $\pm 0.5\%$ of reading)
- Silicone tubing (¼ inch ID, 3 feet length) with barbed fittings
- Small flathead screwdriver (for zero adjustment screw)
- 5mm Allen key (for gauge mounting bracket, if applicable)
- Teflon tape (for sealing NPT threads)
- Replacement gauge (if existing gauge is out of tolerance and non-adjustable)
- Lint-free cloth and isopropyl alcohol (for cleaning ports)

4.0 Step-by-Step Maintenance Procedure

1. Perform LOTO as per Section 2.0. Confirm all energy sources are isolated and tagged.
2. Locate the differential pressure gauge on the dust collector. Note the high-pressure port (clean air side) and low-pressure port (dirty air side).
3. Disconnect the existing tubing from both ports of the gauge. Cap the ports on the collector side to prevent dust ingress.
4. Clean the gauge ports and tubing ends with isopropyl alcohol and a lint-free cloth. Inspect for damage or blockage.
5. Connect the certified digital manometer to the gauge ports using the silicone tubing. Ensure a leak-free connection by tightening barbed fittings hand-tight plus a quarter turn.

6. Apply a known pressure differential using the calibrator (e.g., 2.0 in. w.c., 5.0 in. w.c., 8.0 in. w.c.). Record the gauge reading at each point. The gauge must read within $\pm 2\%$ of the applied value.
7. If the gauge has an external zero adjustment screw, set the applied pressure to 0.0 in. w.c. and adjust the screw until the gauge reads zero. Recheck at the test points.
8. If the gauge cannot be adjusted to within tolerance, replace it with a new gauge. Apply Teflon tape to the NPT threads of the new gauge and tighten to 15 Nm using a torque wrench.
9. Reconnect the original tubing to the gauge ports. Ensure the high-pressure port connects to the clean air side and the low-pressure port to the dirty air side. Verify tubing is not kinked.
10. Remove the caps from the collector ports and reconnect the tubing. Secure all connections with zip ties if necessary.

5.0 Verification & Return to Service

1. Remove all LOTO devices. Restore compressed air supply and electrical power to the dust collector.
2. Start the dust collector fan and allow the system to reach normal operating conditions (e.g., airflow, filter loading).
3. Observe the DP gauge reading. Compare it to the reading on the certified manometer temporarily connected in parallel (if available) or to historical baseline data. The gauge should indicate within $\pm 2\%$ of the expected DP for the current filter condition.
4. Initiate a pulse-jet cleaning cycle and verify that the DP gauge responds correctly (drops after cleaning).
5. Check for any air leaks at the gauge ports and tubing connections using a soapy water solution. Bubbles indicate a leak; tighten or replace fittings as needed.
6. Sign off on the PM work order in ServiceGrid, documenting the calibration results (as-found and as-left readings) and any parts replaced.

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.