

BALANCING AN OSPREY CYCLONE

A TECHNICAL SOURCE FOR EMPLOYEES AND CLIENTS OF OSPREY

TECHNICAL BULLETIN

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Purpose of Balancing

The Osprey cyclone is designed to operate with a slight positive pressure on its air outlet. If there is too much vacuum on the outlet, excessive dust and material will be pulled from the top of the cyclone, and the cyclone efficiency will drop. An unbalanced cyclone will lead to premature failure of a drum filter media. The cyclone should be balanced during initial system startup, any time a change is made to the system, and as a maintenance check every 6 months.

Balancing Procedure

The cyclone is balanced by adjusting the manual slide gates in the cyclone outlet duct until the static pressure near the cyclone outlet is slightly positive: +250 Pa (+1 in. w.c.). A magnehelic gauge or digital airflow meter is used to measure the static pressure during the adjustment process.

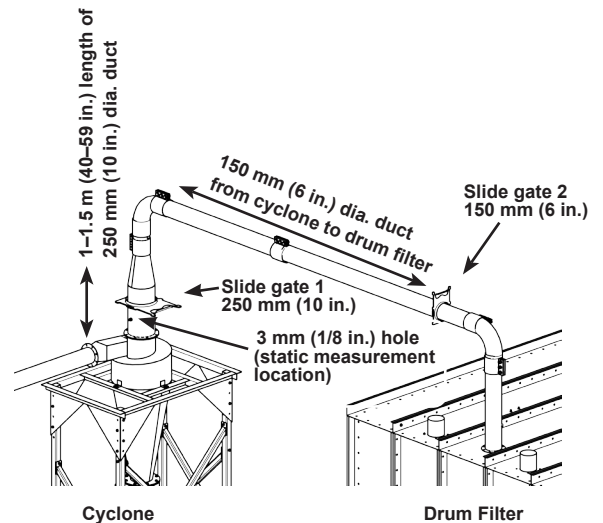
Step 1. Verify that the cyclone ducting and slide gates are properly installed.

Refer to the Osprey cyclone installation drawings for the specific installation requirements of your system. The typical requirements are listed below:

- A 1–1.5 m (40–59 in.) long straight section of 250 mm (10 in.) duct should be installed on the cyclone outlet.
- A 250 mm (10 in.) slide gate (slide gate 1) should be installed in this straight section, near the top of the section.
- After the slide gate, the ducting should transition to the required conveying duct size. This duct size can vary per application, but is typically 150 mm (6 in.).
- A 150 mm (6 in.) slide gate (slide gate 2) should be installed in the duct run between the cyclone and the drum filter. This gate should be installed near the drum filter so that there is reasonable distance between the two gates.

Note: The cyclone can be balanced using just one 250 mm (10 in.) slide gate, but it is sometimes easier to balance the cyclone if a second 150 mm (6 in.) slide gate is also installed and adjustable.

Step 2. Prepare the duct for air measurements.

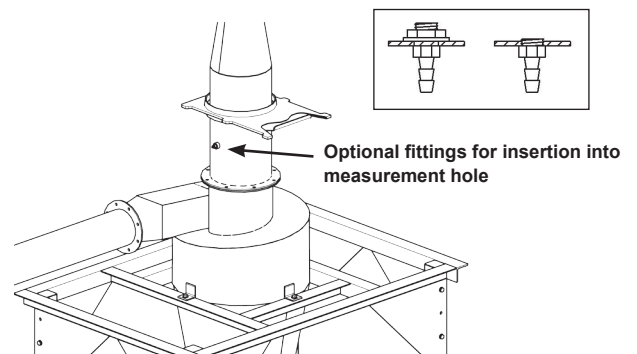


Drill a 3 mm (1/8 in.) measurement hole in the cyclone outlet duct and de-burr the edges.

- The hole should be located within 1 m (40 in.) of the cyclone outlet.
- The hole must be located between the cyclone and the slide gate.

The hole can now be used to take readings, but should be plugged with a plastic hole plug when not in use. Dust will leak out of duct if the hole is not plugged.

(Optional) If preferred, a pressure fitting can be installed in the drilled hole. There are fittings designed to thread into the duct and fittings that are designed to be secured with a nut, depending on preference. If a fitting is used, it must be a type that can be plugged when not being used.





Step 3. Take a static pressure reading.

A magnehelic gauge or digital airflow meter is used to take the static pressure reading. Connect one end of the pneumatic tubing to the positive (+) port on the gauge (or meter), and the other end to the cyclone duct hole/fitting.

- If the duct has a pressure fitting: Securely connect the tubing to the fitting by pushing it onto the fitting.
- If the duct has a hole, but no fitting: Hold the tubing securely against the duct so that the opening in the tube aligns with the hole, and completely covers hole.

Note: Care must be taken to not pinch the hose as it is pressed against the duct, as it will result in a false reading.

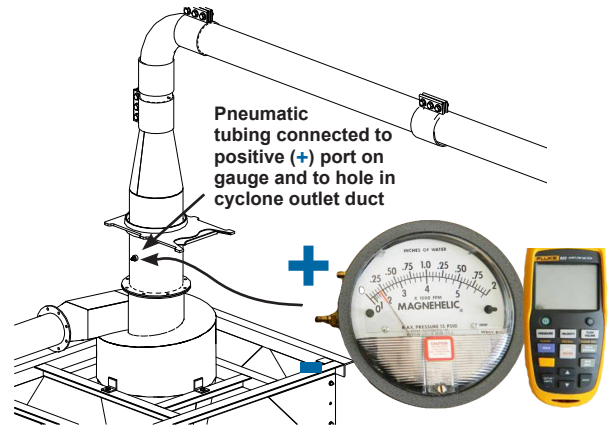
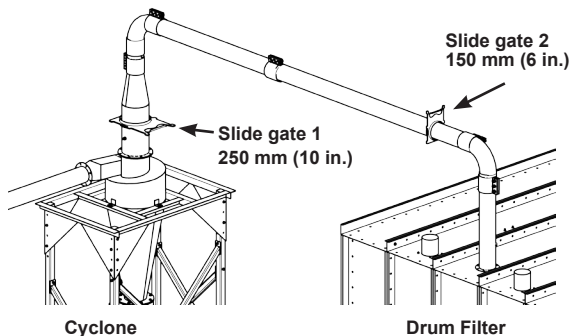
Read the static pressure on the gauge/meter:

The target pressure is +250 Pa (+1 in. w.c.), and the acceptable range is 0 to +500 Pa (0 to +2 in. w.c.).

Note: If the static pressure in the duct is negative, instead of positive, the digital meter will display a negative number. Magnehelic gauges cannot display a negative number, so the needle will move to zero, and try to move past zero. If the gauge reads zero, move the pneumatic tubing to the negative (-) port to check if a negative pressure is displayed.

Step 4. Adjust the slide gates (if required).

If the static pressure reading is between 0 and +500 Pa (0 and +2 in. w.c.), then the cyclone is balanced. If the static pressure is outside of this range, the slide gates should be adjusted accordingly until the desired pressure is obtained. Refer to Table 1 for reference on which adjustments to make.



Continue adjusting the slide gates until the static pressure is at the target of +250 Pa (+1 in. w.c.), or within the acceptable range of 0 to +500 Pa (0 to +2 in. w.c.). As a general rule:

- If the static pressure reading is within 750 Pa (3 in. w.c.) of the target range, then it is best to adjust slide gate 1 until the target is reached. This gate is used for “fine-tuning.”
- If the static pressure reading is more than 750 Pa (3 in. w.c.) out of range, then it is usually easiest to adjust slide gate 2 first, in order to get the reading closer to the target. Slide gate 2 is used for coarse adjustment.

Step 5. Mark and secure the slide gate(s) in position.

Mark the slide gate with a marker to indicate the gate position. This mark can be referenced later in case the gate is accidentally adjusted. Tighten the retaining bolt on the slide gate housing to secure the gate in place. The slide gate will move from vibration if it is not properly tightened.

Step 6. Plug the measurement hole.

Double-check the static pressure reading, and then plug the hole in the duct using a plastic cap. If the optional pressure fittings are used, then install an appropriate cap on the fitting to seal it.

Step 7. Balancing is complete.

The cyclone is now balanced and ready for use. Record the date in your maintenance schedule, and re-balance every 6 months, or any time a change is made to the system.

Table 1. Static Pressure Reading Actions

Static Pressure Reading	Result	Action Required
+250 Pa (+1 in. w.c.)	Matches target pressure	None
0 to +500 Pa (0 to +2 in. w.c.)	Within acceptable pressure range	None required. Continue adjusting if preferred.
+501 Pa (+2.01 in. w.c.) or higher	Inadequate vacuum boost from filter	*Open slide gate(s) incrementally to increase vacuum boost.
Less than 0 Pa (0 in. w.c.) (negative pressure in duct)	Excessive vacuum boost from filter	**Close slide gate(s) incrementally to decrease vacuum boost.
*If all slide gates are fully open and the static pressure is still high, the drum filter is not providing enough vacuum to overcome the pressure losses of the duct. Check the drum filter status and duct lengths, or contact Osprey for help.		
**Do not close a slide gate more than halfway; this can start to restrict material flow. Add additional gates instead.		

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