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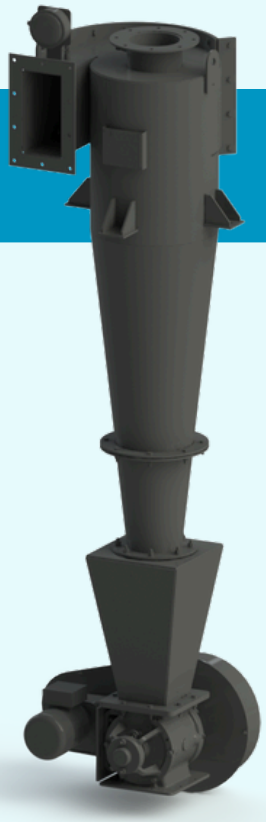

CYCLONE TROUBLESHOOTING

Common issues like plugging, reentrainment, and reduced efficiency are often symptoms of flawed design, poor sealing, or overlooked support components. This guide outlines the most frequent pitfalls and how to address them before they compromise your system. Use these insights to optimize efficiency, reduce maintenance, and ensure long-term reliability.

If you have any questions or need assistance troubleshooting your system, don't hesitate to reach out to the team at Heumann Environmental—our experts are here to help.

SYMPTOM	POSSIBLE PROBLEM	SOLUTION
Low Inlet Velocity, Particulate Accumulation, and/or Inlet Flow Eddies	Inadequate precautions taken for inlet design of vertical elbows.	If possible, the elbow can be made far upstream or given a wider turn radius. Additionally, one may utilize a flat bottom inlet transition as described below.
	Improper inlet transition design—particularly with angles over 30° or poorly arranged ductwork.	Use a flat-bottom, concave inlet transition with an angle under 30° (ideally 15–20°) to direct eddies upward and reduce solids buildup, encouraging uniform flow into the cyclone.

SYMPTOM	POSSIBLE PROBLEM	SOLUTION
Pressure Drop is too High	Significant variation between minimum and maximum flow rates can lead to excessively high pressure drops and/or inlet velocities at peak flow conditions.	Size the ductwork and cyclone inlet to maintain adequate conveying velocities at minimum flow conditions. If the flow range is too wide, consider using parallel cyclones that can be taken off-line as flow decreases.
	Gas flow rate is too high as a result of incorrect initial design of the duct work or fan.	Leave alone unless it is causing process problems. If so, change the fan operation or add additional flow restrictions in the system to reduce the flow rate and cyclone pressure drop.
	Leakage into the system ahead of the cyclone.	Repair ductwork and/or potential hood leaks.
	Cyclone has an internal obstruction.	Safely remove the internal obstruction.
	Incorrect cyclone design.	Redesign components and/or replace the unit.

SYMPTOM	POSSIBLE PROBLEM	SOLUTION
Pressure Drop is too Low	Too low a gas flow rate for the cyclone design resulting from incorrect initial design of the ductwork or fan.	Consult HEC to see if an alternate outlet tube could solve this problem. Change the fan operation or replace it with a larger fan. Redesign other system components to reduce their pressure drop making it available for the cyclone.
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	Air leakage into the cyclone assembly.	Repair leaks with appropriate care and caution.
	Air leakage into downstream system components.	
	Incorrect initial design of the cyclone unit.	If loss of collection efficiency is not an issue, then the problem may be left alone. Should it be a problem, see the next symptom.

SYMPTOM	POSSIBLE PROBLEM	SOLUTION
Low Collection Efficiency	Incorrect initial design.	If the acceptable pressure drop and/or collection efficiency can be met by redesign then that is what should be done. Always redesign before scrapping the initial unit.
	Leakage into the cyclone.	Patch up the leaks by appropriate means and ensure air locks are gas-tight and functional.
	Poor inlet ductwork design.	Redesign inlet ductwork and replace.
	Internal obstructions or plugging.	Safely remove the obstruction. Should plugging be a recurring issue, look for root causes such as condensation or too small a discharge diameter.

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SYMPTOM	POSSIBLE PROBLEM	SOLUTION
Plugging	Cyclone discharge diameter is too small.	Redesign and replace cyclone cone to have a larger discharge diameter.
	If the unit has a dished head, material may be accumulating in the dead space.	Replace the dished head with a flat roof, false roof, or refractory-lined flat roof.
	Material is naturally sticky.	Improve internal surface finishes by applying PTFE coating, electropolish, etc.
	Excessive condensation.	Insulate and/or heat trace.
Erosion	Excessively high inlet velocity.	Reduce the flow rate or redesign and replace the inlet for lower velocities.
	Naturally erosive particulate.	Minimize the inlet velocity while maintaining requirements. Design the cyclone to be more abrasion resistant with proper geometry and access for easy repairs and/or replacement.