Filter Cleaning System Troubleshooting Matrix

Version 1.0 Release: 11/10

To use this troubleshooting matrix, please make the closest selections in (1), (2), and (3) meeting the description of your particular problem. Then examine each possible source listed in (4) which will narrow down the possible causes (5), and ultimately recommend an appropriate remedy (6).
Please note: This troubleshooting matrix is a guide only and should not be the only point of reference for resolving problems with filter cleaning systems or the dust collector itself. If your specific filter cleaning system problem is not described below or is more complex to resolve please contact the Goyen or Mecair representative in your area, or your system supplier.

(1) Category	(2) Main Symptom	(3) Secondary symptom	(4) Possible source of problem	(5) Possible cause	(6) Remedy
Pressure loss	Cleaning system manifold pressure decays to below the desired value.	Pressure does not recover completely between pulses	Compressed air supply to manifold	Restriction to compressed air feed pipe to manifold. For instance; isolating ball valves not fully open.	Ensure feed pipes provide adequate flow to the system.
				Manifold feed pipe diameter is too small.	Ensure feed pipes provide adequate flow to the system.
				External load on compressed air supply, such as a new process using air from same compressor.	Ensure compressed air supply system is able to meet the compressed air demand.
				Compressor not adequately sized, or running under capacity.	Ensure compressed air supply system is able to meet the compressed air demand.
			Pulsing frequency	Pulse rate of valves is faster than the recovery time for the manifold to reach set system pressure	Increase pause time between pulses. Or adjust compressor cycle settings.
	Cleaning system manifold pressure continuously decays between pulses to zero pressure or well below specification. System cannot be pressurised.	Pressure decay rate is slow.	Leakage at diaphragm valve	Leakage past the main diaphragm.	(1) Replace using diaphragm repair kit, (2) clean internal valve seats, (3) determine source of foreign matter and eliminate.
				Leakage through the valve integral pilot exhaust port	(1) Replace component using pilot repair kit, (2) clean internal valve seats, (3) determine source of foreign matter and eliminate.
			Leakage at pilot valve	Leakage at pilot line fittings	Ensure good seals at pilot line connections.
				Leaks within the pilot lines	Replace pilot lines.
				Leakage at the pilot valve exhaust port	(1) Replace component using pilot repair kit, (2) clean internal valve seats, (3) determine source of foreign matter and eliminate.
			Leakage at valve to manifold attachment	Incompatible/out of tolerance stub pipe threads.	Check threads, if out of specification correct them.
				Poor use of thread sealant or sealing tape.	(1) remove valve, (2) clean off sealant from valve and stub pipe, (3) carefully re-apply according to sealant instructions.
				Dresser nut seals damaged	Replace dresser nut seals using dresser nut seal replacement kit.
				Dresser nuts loose	Tighten firmly by hand or with the use of chaingrips, or dresser-nut spanner tool.
				Valve to manifold O-ring seal damaged or missing (FS, MM, or Mecair 400/500 series)	Inspect and replace if necessary. Also ensure sealing surfaces are clean and undamaged.
			Leakage at other fittings on the manifold	Leaks through welds or fittings	Identify leak locations and consult factory (if a TES supplied manifold) or contact the manifold fabricator for repairs.
			Leakage at the manifold itself	Leaks through welds.	Identify leak locations and consult factory (if a TES supplied manifold) or contact the manifold fabricator for repairs.
		Air leaking through solenoid pilot exhaust	Damaged sealing tip on armature/plunger	Age/wear	Replace using pilot repair kit.
				Foreign matter such as metal shavings and grit	(1) Replace component using pilot repair kit, (2) clean internal valve seats, (3) determine source of foreign matter and eliminate.
				Heat aging	Check that application temperature is within the operating range of the product. Install an appropriate pilot repair kit.
			Damaged pilot orifice seat	Foreign matter such as metal shavings and grit	(1) Replace valve (2) determine source of foreign matter and eliminate.
		Air leaking through secondary diaphragm exhaust	Damaged secondary diaphragm seat	Age/wear	Replace using diaphragm repair kit.
				Foreign matter such as metal shavings and grit	(1) Replace diaphragm repair kit, (2) clean internal valve seats, (3) determine source of foreign matter and eliminate.
				Heat aging	Check that application temperature is within the operating range of the product. Install appropriate diaphragm repair kit

(1) Category	(2) Main Symptom	(3) Secondary symptom	(4) Possible source of problem	(5) Possible cause	(6) Remedy
Pulse valve does not open	Pulse valve does not open	Air is exhausted from pilot exhaust port(s) - remote or integral pilots - when pilot is actuated.	Pulse controller	Pulse setting too short	Increase pulse duration setting
				Weak signal and only partial lift of pilot armature (plunger).	Check output voltage and amps meet solenoid requirements.
			Main diaphragm bleed.	Bleed pins are over size or missing	Replace with correct pins.
				Diaphragm bleed holes are torn or stretched (only for valves with bleed holes in diaphragm).	Replace diaphragm
			Main diaphragm.	Diaphragm is damaged (torn or has holes)	Replace diaphragm
		Weak air exhaust at remote pilot.	Pneumatic remote pilot line and connections	Pneumatic remote pilot line is partially blocked or kinked.	inspect and replace/repair.
				Pneumatic remote pilot line bore is smaller than 4mm	Replace with appropriate size pneumatic tube
				Pneumatic remote pilot line is longer than 2m (for single diaphragm valves).	Relocate pilot valves closer to diaphragm valves and shorten pilot lines.
				Pneumatic remote pilot line is longer than 4m (for dual diaphragm valves).	Relocate pilot valves closer to diaphragm valves and shorten pilot lines.
				Pneumatic pilot line fittings are restrictive (effective bore diameter smaller than 4mm)	Inspect and replace fittings.
				Pneumatic pilot line fittings are partially blocked.	Inspect and repair/replace fittings.
		Air exhaust is either weak or not exhausted from integral pilot exhaust port(s)	Solenoid	The solenoid is not being energised.	Check controller and connections. Also check solenoid continuity (i.e no open or short circuits.
				The solenoid has burned out	Feel temperature of solenoid (should not be hot to touch), examine for evidence that solenoid is heat affected (discoloration, warping etc). Replace solenoid.
			Plunger/armature	Plunger is not lifting due to wear or deformation caused through age.	Check movement, should be smooth but not loose. If movement is rough, tight or loose, replace using pilot repair kit.
			Pilot exhaust port blockage	Exhaust port is blocked by foreign matter.	Examine exhaust port and clear the foreign matter.
			Silencers/noise attenuators	The silencer is significantly restricting the pilot exhaust flow.	(1) If dirty, replace the silencer with new ones. (2) Try different model silencer. (3) Remove silencer alltogether.
		Air is not exhausted from remote pilot exhaust port(s)	Solenoid	The solenoid is not being energised.	Check controller and connections
				The solenoid has burned out	Feel temperature of solenoid (should not be hot to touch), examine for evidence that solenoid is heat affected (discoloration, warping etc). Replace solenoid.
			Plunger/armature	Plunger is not lifting due to wear or deformation caused through age.	Remove pilot ferrule tube. Check movement of plunger inside tube, should be smooth but not loose. If movement is rough, tight or loose, replace using pilot repair kit.
			Pilot exhaust port blockage	Exhaust port is blocked by foreign matter.	Examine exhaust port and clear the foreign matter.
			Silencers/noise attenuators	The silencer is significantly restricting the pilot exhaust flow.	(1) If dirty, replace the silencer with new ones. (2) Try different model silencer. (3) Remove silencer alltogether.
			Remote pilot line and connections	Remote pilot line is blocked or kinked.	Inspect and replace/repair.
				Pneumatic pilot line fittings are blocked.	Inspect and repair/replace fittings.
Pulse valve does not close	Pulse valve remains open, draining manifold pressure	Air continues to be exhausted at pilot or secondary diapragm exhaust ports.	Pilot armature/plunger	Mechanically stuck in open position	Inspect and replace with pilot repair kit.
				Residual magnetic field	(1) Ensure that the installation is not affected by stray magnetic fields, (2) replace solenoid.
			Controller	Controller output remains energised	Check controller. Reprogram or replace.
			Remote pilot connections	Pilot line cut	Replace pilot line.
				Pilot line disconnected	Reconnect.
		No air being exhausted at pilot. Air may be exhausted at secondary dipahragm exhaust ports.	Main diaphragm	Severely damaged/fractured	Inspect and replace with diaphragm repair kit.
			Secondary diaphragm	Severely damaged/fractured	Inspect and replace with diaphragm repair kit.
			Valve bleed	Blocked (primary or secondary)	Inspect and ensure bleed paths are clear.

(1) Category	(2) Main Symptom	(3) Secondary symptom	(4) Possible source of problem	(5) Possible cause	(6) Remedy
Diaphragm spring failures	Diaphragm springs fail rapidly usually damaging the diaphragms.	Diaphragm resonance, often accompanied by deep resonating or fluttering sounds during pulsing.	Air supply starvation to the valve inlet.	Very small manifolds, with pressure at end of pulse less than 70% of starting pressure.	Replace manifold system with higher volume manifolds to ensure residual pressure is 70% of pre-pulse pressure, **OR** shorten pulse duration.
				Long pipes connecting to valve inlets.	Reduce pipe lengths or increase pipe diameters.
				Partially blocked valve inlets (eg. Partly closed ball valves at valve inlet)	Ensure any valves inline with the pulse valves are fully open or removed entirely.
				Air supply path through small manifolds connected in series by small connecting pipes.	Replace manifold system with higher volume manifolds to ensure residual pressure is 70% of pre-pulse pressure. Increase the diameter of connecting pipes to minimum 1.5 x the nominal pulse valve outlet size.
			Valve bleed paths	Bleed paths partially blocked by foreign matter such as thread sealing material, grit, etc.	Clean manifold system, clear bleed paths.
			Valve outlet restriction very low.	Very large An/Ap ratio (>1.5), or no blowtube connections. This is particularly a problem if in combination with valve air supply starvation.	Introduce a small restriction to the valve outlet, to assist in developing some backpressure at the valve outlet.
					Where relevant, replace nitrile diaphragms with the Shockwave molded diaphragm equivalent.
Insufficient filter cleaning	Insufficient cleaning flow delivered to the filters	Very low pressure drop in manifolds during the pulse	Pulse jet valve	Valve not opening	Refer to relevant analysis in this document.
			Blowtube and attachments	Blowtube/nozzle orifices are too small or undrilled.	Check required orifice sizes using GOCO. Confirm actual orifice sizes meet the recommended sizes. If too small, drill the orifices to the correct size.
		Residual pressure immediately after pulsing is less than 70% of the starting pressure.	Manifold	Very small manifold, holding insufficient air mass to support good filter cleaning	Check required manifold size using GOCO. If manifold is very much undersize, replace with correct size manifold.
		Initial manifold pressure is low.	Air supply pressure	Supply pressure settings or supply flow rate to manifolds.	Increase manifold system pressure.
		High manifold pressures, but low flow discharged from blowtube orifices.	Blowtube and attachments	Blowtube/nozzle orifices are too small or undrilled.	Check required orifice sizes using GOCO. Confirm actual orifice sizes meet the recommended sizes. If too small, drill the orifices to the correct size.
			Pulse jet valve/blowtube combination	Pulse valve flow delivery is too small to meet reverse flow requirements of the dust collector	Check pulse system design using GOCO. Discuss with Goyen engineers for possible solutions. May require larger valves and blowtubes.
		Obvious signs of pulse jet misalignment on plenum floor near filter openings and possible filter failures near top of filter elements.	Blowtube and attachments	Ratio of total orifice area to blowtube cross-section area (An/Ap) exceeds 0.8 without use of Nozzles. This results in significant pulse jet misalignment and reduced cleaning flow entering the filter elements.	Check pulse system design using GOCO. Discuss with Goyen engineers for possible solutions. Likely to require implementation of GOCO nozzles, with appropriately sized orifices.
Premature filter failure	Filters develop tears or holes near filter opening.	Failures occur consistently at same filter location and in the same place on the filter.	Blowtube and attachments	Ratio of total orifice area to blowtube cross-section area (An/Ap) exceeds 0.8 without use of Nozzles. This results in significant pulse jet misalignment and reduced cleaning flow entering the filter elements.	Check pulse system design using GOCO. Discuss with Goyen engineers for possible solutions. Likely to require implementation of GOCO nozzles, with appropriately sized orifices.
		Consistently very low dP accross filters.	Pulse system design	Excessive filter cleaning pressures.	Check pulse system design using GOCO. Discuss with Goyen engineers for possible solutions. May be as simple as a reduction in manifold pressures.
Filter over-cleaning	Much lower than expected filter dP, with dust collector flowrates as expected.	High dust emissions, although filters are intact. Little obvious dust cake formation	Pulse system design	Excessive filter cleaning pressures.	Check pulse system design using GOCO. Discuss with Goyen engineers for possible solutions. May be as simple as a reduction in manifold pressures.