Sternvent Co., Inc

Installation, Operation and Maintenance Manual

Cyclone Dust Collectors

Model Sizes 16, 20, 24, 34, 36, 44, and 48

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Model Number	_____	Job Number	_____
Type of Dust	_____	Voltage	_____
Sales Rep	_____	Installation Date	_____
Customer/Name	_____	Location	_____

Options Included _____

_____

Notes _____

_____

1.0 SAFETY

IMPORTANT

This manual contains specific precautionary statements relative to worker safety. Read this manual thoroughly and comply as directed. It is impossible to list all of the potential hazards of dust control equipment or systems. It is imperative that the specific use of the equipment be discussed with a Sternvent representative. Personnel involved with the equipment or systems, should be instructed to conduct themselves in a safe manner.

1. Do not mix combustible dusts such as wood, paper, or buffing with dust generated from grinding ferrous metals, due to the potential fire hazard caused by sparks in the dust collector. DO NOT MIX FERROUS METALS WITH ALUMINUM DUST.

2. This dust collector should never be used for the collection of magnesium dust. Special precautions and safety items are required for use with aluminum dust. It is not possible to list all hazardous materials which are not suitable for collection by this type of dust collector. It is the responsibility of the user to consult with their liability insurance company and the National Fire Protection Association (NFPA), Quincy, MA 02269, telephone number 800-344-3555 (www.nfpa.org) for procedure to be followed for the collection of specific dust.

3. Under no conditions, should anyone put lit cigarettes or any burning object into the hood or ducting of any dust control system.

4. For fire and explosion safety, The preferred and sometimes required location for a dust collector is outdoors. Some dust collection systems should include safety devices such as an explosion relief vent, sprinkler head, spark detection and extinguishing system in the main duct, abort gate, isolation valve and explosion suppression.

   The authority housing jurisdiction (AHJ), which may be the building inspector, fire marshal, liability insurance company or other party, shall determine which safety devices may be required.

5. If you smell smoke or have other reasons to believe there is a fire in the dust collector or dust storage container below the dust collector, DO NOT open the door or container cover unless you are a trained fire fighter. The fire can flash over and discharge a fireball that can cause severe burns and/or an explosion.

2.0 INTRODUCTION

2.1 General

Congratulations on your selection of a Sternvent Cyclone dust collector. As the owner/operator of this unit you have an important responsibility to see that it is operated and maintained in a safe manner. The unit will require very little attention to keep it in good operating condition. This manual has been prepared to guide you in the installation, operation and maintenance of this dust collector. Reference may be made to various configurations and options which may or may not be part of your particular system.

2.2 Description

Cyclone dust collectors are mechanical separators that use centrifugal forces to remove particulate from the airstream. The Cyclone provides high-efficiency separation due to its high inlet velocity, long tapered cone, and internal helix.

2.3 Intended Use

Cyclones are most commonly used in applications generating high dust loads, such as woodworking and machining, where coarse or large dust particles are produced. The Cyclone can be used alone or with filter bags, depending on whether the discharge air is exhausted to the atmosphere or returned to the plant.

When air streams have high dust concentration of coarse and fine particles from a production operation, the Cyclone is used as a pre-cleaner to a jet pulse bag or cartridge dust collector.

2.4 Operational Description

The Cyclone cleans the air by centrifugally separating the dust from the air stream. Dust laden air enters tangentially and is forced into a downward spiral. The dust particles, which are heavier than air, concentrate in a thin layer next to the Cyclone wall. When the helix of dust and air reaches the bottom, the air flow reverses and escapes up the center of the Cyclone. The particles fall into the dust container. Those particles of dust which are too small to be captured by the Cyclone are caught by the optional after filter bags.

3.0 INSTALLATION

3.1 Inspection On Arrival

1. Inspect the shipping crate for shipping damage before removing the dust collector from the crate.

2. Report any damage to the delivery carrier. Whenever possible note on bill of lading before trucker leaves.

3. Photograph the shipment before and during unpacking to document damage.

4. Request a written inspection report from the claims inspector to substantiate claim.

5. Report incomplete shipments to the delivery carrier and your Sternvent representative.

6. Remove the upper crating material from the base skid. Remove lag screws, strapping, etc., that attach the equipment to the skid.

3.2 Site Selection and Unit Location

1. The preferred and sometimes required location for a dust collector is outdoors if there is a potential for fire or explosion.

2. The Cyclone should be located with consideration for maintenance, inspection, shortest possible run for duct and electrical work and access for emptying dust receptacle (drum, bin or hopper).

3. When hazardous conditions or materials are present, consult with local authorities for the proper location of the collector.

4. If unit is installed indoors and has an explosion vent, then provision must be made to duct the explosion vent to outside of building, away from normally occupied areas.

5. Prepare the concrete pad in the selected location. Anchor bolts should be a minimum of 5/8" diameter, with 5" embedment. The pad design and anchor bolt system should be calculated by a structural engineer.

3.3 Hoisting

1. A forklift with long forks is recommended for moving the skid.
2. Use all lifting points provided
3. Use clevis connectors, *not hooks*, on lifting slings.
4. Lift support stand and attach to floor or concrete pad.
5. Carefully lift Cyclone from horizontal position to vertical position. Attach to support stand or hopper.

Caution!

- Failure to lift the collector correctly can result in severe personal injury or property damage.
- Use appropriate lifting equipment and adopt all safety precautions needed for moving and handling the equipment.
- A crane or forklift is recommended for unloading, assembly, and installation of the collector.

3.4 Model/Style Specific Installation

Style	Includes	Installation
CYD	Support legs and 55 gallon drum assembly. *(Most popular style)*	Attach flex hose to bottom of cyclone and drum cover. Install drum.
CYA	Support legs, two 55 gallon drum assemblies and Y fitting.	Attach Y fitting with screws to bottom of cyclone. Caulk. Attach flex hoses, Y, and drum covers.
CYH	Dust storage hopper with slide gate discharge and legs. (A separate support stand is required.)	Caulk where cyclone base plate attaches to roof of hopper.
CYL	Motorized rotary airlock and receiver for discharge of material. (A separate support stand is required.)	Attach receiver and airlock to bottom of cyclone.
CYB	Base with door and pull out drawer.	Caulk where cyclone base plate attaches to roof of bin.
CYM	Cyclone and fan. Requires airtight dust container and support legs.	Connect bottom of cyclone to an airtight dust container or receiver and airlock.
CY	Cyclone body only. Requires fan, airtight dust container and support legs.	Connect bottom of cyclone to an airtight dust container or receiver and airlock. Attach duct to fan.

NOTE: Body and cone for cyclone sizes 36, 44 & 48 are flanged and shipped in 2 pieces. Position the pieces so that inlet and blower discharge are in desired locations. Apply caulking to either flange. Fasten with hardware provided.

IMPORTANT: All connections under the cyclone (drum, drum cover, flex hose, y fitting, hopper, airlock, etc.) must be 100% airtight. Any slight leak will prevent the dust from swirling downward and cause most of it to go out the exhaust or overload the after filter bags if provided.

3.5 General Installation

1. Attach round to rectangular inlet to cyclone with straight side on top. Use hardware provided and caulking.

2. Attach fan discharge elbow, transition or duct to fan discharge flange. Protect fan discharge from fingers, birds, and weather.

3. SILENCER or HUSH UNIT(optional). The silencer is designed to attenuate the sound level of the exhaust air. Attach to fan discharge flange with hardware provided. Use caulking.

4. AFTER FILTER (optional). The after filter permits recirculation of the air in the work area, where allowable by law. It filters the air which is exhausted from the fan on top of the cyclone. Three styles are available.

STYLE	CYCLONE SIZE	DESCRIPTION & INSTALLATION
23" DIA with zipper	16	Single filter with zipper bottom attaches with clamp filter with square to round transition to fan discharge. (For indoor installation only)
12" DIA with zipper	20-44	Multiple filters, with zipper bottom, which hang from collars on plenum. Suspend from ceiling. Bolt transition to fan discharge. Clamp filters in place. (For indoor installation, unless ordered with side panels)
5" DIA with Snap Ring on both end	20-44	Multiple tubular filters which are factory installed in plenum and dust chamber (or hopper). Support legs included. Whenever possible the legs are sized to line up after filter with the cyclone blower discharge. Inlet to be cut with saw (do not use torch) in field. Refer to model drawing at end of this manual. Caulk & attach transition between fan discharge flange and after filter. If optional motorized shaker is included, wire to controller and fan motor starter. Shake filter every few hours for 15-30 seconds with blower off. (For indoor installation, unless ordered with weather proof enclosure).

5. EXPLOSION RELIEF VENT (optional). The explosion relief door allows for quick release of pressure caused by a dust explosion in the dust collector. If the dust collector is installed indoors, the explosion relief vent must be vented out of the building, away from normally occupied areas. Include an access door in the duct or removable section so that door hardware may be inspected and oiled every six months.

6. BELT DRIVEN BLOWER (standard for 20HP and larger). DO NOT ATTEMPT TO MAKE ANY PULLEY CHANGES. Each pulley is sized for proper operation. Consult Sternvent if assistance is required. Check belt tension after initial two months of operation and re-adjust if necessary. After first inspection, check belt tension every six months.

7. ELECTRICAL. wiring and hook-up should be done by a qualified electrician. Follow wiring diagram on motor. Make sure that the voltage at the motor corresponds to the motor name plate. The motor manufacturer will guarantee the motor only if the voltage is within 10% of the rating. Use appropriate safety device such as a magnetic starter with overload heaters.

IMPORTANT: Check for correct blower rotation, clockwise, as indicated by arrow on blower housing by starting and stopping motor and viewing either blower wheel (if duct is not already connected to discharge), motor cooling fan (located at rear end of TEFC motors) or motor shaft and pulley (belt driven units). Incorrect rotation will substantially decrease blower efficiency. If rotation is incorrect: on 3 phase motors switch any 2 leads: on single phase follow motor nameplate wiring diagram.

IMPORTANT: DO NOT run the motor for extended periods of time until the ductwork is in place and connected. If you do, you will overload the motor. DO NOT run the collector with either drum cover off, doors or hopper slide gate open. This will also overload the motor.

8. DUCTWORK- If ductwork is not properly designed and sized, the suction of the dust collector will be greatly reduced as well as increased chance of fire or explosion. The designer of the ductwork must be experienced with dust collection systems. The ductwork should have shortest possible runs, long sweep elbows which have a radius that is 1-1/2 times the diameter of the elbow and at least 45° branches from the main duct. Use duct sealant and rivets to connect the pipes. Do not use plastic pipe because static electricity can cause a fire or explosion.

4.0 START UP PROCEDURE CHECK LIST

☐ 1. Check all electrical screw terminals for tightness.

☐ 2. Confirm that line voltage matches motor name plate.

☐ 3. Start & stop fan motor. Is motor rotation in direction of arrow?

☐ 4. Start fan. Is drum cover and flex or hopper slide gate air tight? (A slight leak in this area will push dust up through the cyclone and out the fan discharge to atmosphere or filter bags.)

☐ 5. Amperage draw on each of the three power lines (3 phase) should be no greater than 10% of the motor nameplate.

5.0 MAINTENANCE

5.1 MAINTENANCE SCHEDULE

Daily or Weekly- Inspect the dust level in the 55 gallon drum(s) or other dust storage container. Do not over fill. Empty as necessary.

Monthly- Inspect the fan exhaust for excessive emissions. Inspect the flexible hose and drum cover, etc, to make sure they are airtight.

Every 6 Months- Lubricate shaft bearings, if a belt drive unit.

Every 12 Months- Lubricate motor.

5.2 UNIT SPECIFIC

CYD & CYA series. Do not allow dust drum(s) to overfill otherwise the collected dust will come out of the exhaust. Shut off fan before inspecting. Drum cover and hose must be air tight. Check cover gasket frequently. Any slight leak will cause dust to be discharged from fan.

CYB series. Do not allow dust drawer to overfill, otherwise collected dust will come out of the exhaust. Shut off fan before inspecting. Check door gasket frequently for positive seal. Any slight leak will cause dust to be discharged from fan.

CYH series. Do not let dust in the hopper get closer than 10" to the cone end of the cyclone, otherwise the collected dust will come out of the exhaust. Check dust level through sight glass on the front of the hopper.

5.3 LUBRICATION

Grease- Bearing grease will lose its lubricating ability over time, not suddenly. The lubricating ability of a grease, over time, depends primarily on the type of grease, the size of the bearing, the speed at which the bearing operates and the severity of the operating conditions.

A high grade poly urea-based ball or roller bearing grease should be used. Recommended greases for standard service conditions are Exxon Mobil Polyrex EM, Texaco Polystar, Rykon Premium #2, Pennzoil Pen 2 Lube and Chevron SRI. Lithium based greases are not compatible with poly urea-based greases.

Motors- Motors that are 3HP and larger typically have two grease fittings. Lubricate motor bearings every 12 months or 3,000 hours of use, whichever comes first, with .25-.50 oz of grease.

Shaft Bearings- Belt drive models (20HP and larger) have shaft bearings. Lubricate every 6 months or 1,500 hours, whichever comes first with .25-.50 oz of grease.

If motor will operate 24 hours per day or in a dirty, dusty, high humidity or extreme weather or temperature environment, consult motor manufacturer for lubrication recommendations.

When adding a lubricant, keep all dirt out of the area. Wipe the fitting completely clean and use clean grease dispensing equipment. More bearing failures are caused by dirt introduced during greasing than from insufficient grease.

Explosion door-optional. Open the door and inspect the hinges and Brixon latches every six months or more frequently if cold and/or dusty environmental. Make sure all parts move freely. Typically the hinge and Brixon latch pivot point, which is the bearing pin about which the laminated cam pivots, should be oiled every six months with SAE 10-20 oil. For additional information contact Brixon Manufacturing Co. at 1-800-LATCHES.

5.4 AFTER FILTERS – MAINTENANCE

Zipper bottom style. Shut off blower, unzip and shake out collected dust into suitable container. Do not allow more than one foot of dust to accumulate in each bag.

Tubular style. Shut off blower, shake filters with either hand shaker or optional motorized shaker for 15-30 seconds every 3-4 hours. Remove dust from dust chamber or optional hopper/drum. Do not allow to overfill.

5.5 AFTER FILTERS – REPLACEMENT

If system begins to loose suction and shaking of filters does not improve suction, then filter bags should be replaced. Typical filter life is 2-5 years. Filter removal and washing is not recommended, since the filters may shrink and not be able to be re-installed.

Zipper bottom style. Unscrew clamp while holding onto bag. Slip off of collar. Slide new bag onto collar. Rotate until zipper is in desired location. Position clamp above lip on collar and tighten.

Tubular style. Filters have a grooved spring sewn in both ends, which permit the filter to snap into plenum and dust chamber cell plates and form an air tight seal. (If after filter is enclosed, remove both access panels with care. Two people are required, due to the weight of panels). Remove cap end and shaft collar from one side of each shaker bar. Pull

shaker bar from other end to remove from filter bags. Remove one row of filters and replace with new filters.

To remove a filter bag, start at the bottom, use both hands to grab filter and press against spring to collapse and pull away from cell plate. Repeat for top of filter. Before installing new filters, make sure openings are clean and free from particles.

To install a new filter, start at the top. Locate the seam and shaker look in proper position. Using both thumbs together, collapse the spring, engage the groove of the filter in the ell plate. Release the spring slowly and carefully. Allow it to snap into shape. Repeat for bottom of filter, making sure it is not twisted. Re-install shaker bars, collars and caps.

5.6 SPARE PARTS-Call 1-800-383-DUST

It is recommended that the following spare parts be stored at the installation site for routine maintenance purposes. Consult with your sales representative or the factory to determine quantities required.

- Flexible hose for drum
- Gasket for drum cover
- Rubber tips for rotary airlock
- Filter bags

When ordering replacement parts, please provide the **model number** and **serial** or **job number** from the plate on the dust collector. Also provide the type of dust that the equipment collects.

6.0 TROUBLESHOOTING

Problem	Probable Cause	Remedy
Motor will not start	Open circuit	Check for fuse or circuit breaker fault. Replace as necessary. Check starter reset button.
	Improper wire size	Rewire using the correct wire gauge as specified by national and local codes.
	Motor leads not wired correctly	Check and correct motor lead wiring. See motor wiring diagram on motor.
	Motor not wired for available voltage	Correct motor leads for proper supply voltage. A 10% differential is permissible.
Motor runs hot, starter overload trips	Starter or supply voltage connections loose	Check all wiring connections for tightness. Loose connections can cause motor to single phase (getting power on 2 legs only).
	Duct work or dust drum not installed or hopper slide gate open	If too much air reaches the fan, the motor will overload. Correct condition.
Motor whines and is not running at full speed	Motor is single phasing (getting power on 2 legs only) or motor leads connected for wrong voltage	Check power lines at motor with amp meter. Check motor connections.
Insufficient airflow	Motor wired for 460v and power is 280v or less	Correct wiring for proper supply voltage. A 10% differential is permissible.
	Fan rotation backwards	Proper fan rotation is clockwise when looking down at the fan motor. A radial fan running backwards will deliver only 50% of its rated air capacity.
	Improper duct or hood size	Check and replace if necessary

Problem	Probable Cause	Remedy
Insufficient airflow (cont'd)	Fan exhaust area restricted	Check fan exhaust area for obstructions. Remove material or debris.
	Obstruction in duct	Check and remove obstructions.
	Filter bags clogged	Check and clean or replace as necessary.
	Too many duct branches have been added to system	The dust collector does not have the air flow capacity for the additional branches and machines. Modify ducts and add another dust collector.
Excess vibration	The fan impeller is damaged or bearings are worn	Shut off the unit immediately to prevent serious personal injury and/or property damage.
Excessive dust exiting the fan or into the after filter	Air leakage under cyclone or dust container is overfilled	Check the dust storage receptacle (drum, bin or hopper) including flexible hose for inward leakage by listening and feeling. Any slight leak will prevent the dust from swirling down into the dust receptacle. All connections under the cyclone must be 100% airtight. Dust storage receptacle may be overfilled and filling up body of cyclone.
Excessive wear of cyclone body.	Abrasive dust or leak under the cyclone	Abrasive dusts will wear through the cyclone, usually in the cone section. Replace with rubber lined cyclone. Also caused by a leak under the cyclone, which allows dust to spin and remain suspended in the cyclone rather than swirl downward.

WARRANTY

Sternvent Co., Inc. equipment is warranted against defects in materials and workmanship if properly installed, maintained and operated under normal conditions, for a period of one year from date of shipment (with the exception of filters and flexible connections, which carry a ninety (90) day warranty, and motors which are warranted by their manufacturer). In the event of defects developing within that period, under normal and proper use, Sternvent Co., Inc. will furnish FOB its plant, without charge, parts required to replace material found defective. Sternvent Co., Inc. shall not be held liable for any further costs, expenses, indirect or consequential damages, and liability shall not exceed price of purchased equipment.