



Fly Ash Collector Operation Manual

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GENERAL INFORMATION

INTRODUCTION

The primary purpose of this unit is to remove particulate from gas stream. Centrifugal force is the method for particulate separation. The mechanical collector is a device used in air pollution control. Examples of its use would be the removal of fly ash from flue gas or the recovery of cement, lime or sinter dust.

OPERATING CONDITIONS

Operating conditions are shown on the applicable project drawings. These conditions must not be exceeded or the unit may be endangered and/or the warranty violated.

If any of the above safety or performance options are purchased, applicable operating and maintenance instructions are attached to this manual.

DESCRIPTION OF THE UNIT (FIGURE 1)

1. Dusty gas enters the inlet (1).
2. The dusty gas is directed down the inlet tube (3).
3. The dusty gas is caused to spin in the inlet tube by the spin vanes (2).
4. The particulate settles to the bottom of the inlet tube, is shaved off by the discharge boot (4) and falls into the hopper (7).
5. The dust is removed from the hopper (7) by the dust removal device such as a rotary feeder, valve or double dump valve at the discharge flange (8).
6. The cleaned gas is directed up the outlet tube (5) and exits the collector at outlet (6).

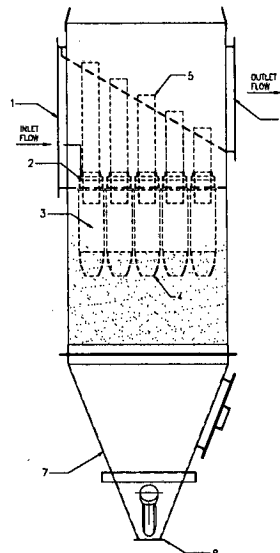


FIGURE 1

TROUBLE SHOOTING

1. Pressure is to be checked on a regular basis. Verify pressure drop across the unit by connecting a manometer to pressure taps in the duct just upstream and downstream of the unit. A large drop in pressure indicates plugged tubes or an unbalanced flow through the collector. The normal pressure drop across this unit will be 2-4 inch W.G, depending on load conditions. Refer to the drawing for actual pressure drop at design conditions.
2. More stack emission than normal indicates plugged tubes, excess dust in hoppers or hopper recycling.

YEARLY SERVICE

1. Check internal components for wear.
2. Clean out all air spinning valves.
3. Look at fiberglass gasket between tube-sheet and tube-body. Replace as required.

GENERAL OPERATION AND MAINTENANCE INSTRUCTIONS

For operation of the collectors, the following instructions will serve as a guideline.

1. The collectors have no moving parts resulting in a very simple scheme of operation. Gases enter the collector through the inlet section and flow to the annular area between the collection or inlet tube (large diameter tube) and the outlet tube (smaller diameter tube). Turning vanes in this annular area cause the gases to spin downward in the collection tube until the gases make a 180° reversal at the collection tube bottom and exit out the outlet tube and the outlet plenum.

2. There should be no leaks in the casing from outside to inside, particularly in the hopper zone. Valves used on the hopper discharge should be of the airlock type. Single and double gravity flap valves improperly maintained and operated reduce efficiency 50% and greater because of their inability to provide an air tight seal. Motorized double valves with a true air lock are satisfactory if the valves perform as designed and are maintained on a regular schedule.
3. Be sure collector is free of all construction debris before placing in service. Lifting lugs, fit-up clips, and other obstructions that are not cleaned out of the hoppers can and will prevent proper dust flow and can cause stoppages.
4. Hoppers should preferably be evacuated continuously. If this cannot be accomplished, the evacuation should be done before the hopper is filled to an elevation corresponding to 2/3 the total vertical height of the hopper.
5. Where the operation involves high moisture conditions at start-up and if by-pass dampers are provided, the by-pass dampers should be opened, and kept open until an equilibrium temperature is reached, at which time they can be closed. This will prevent build-up in the collector tubes which could be a cause of stoppage and inefficient collector performance.
6. During down-time maintenance periods, inspect inlet vanes, outlet vanes and boots for any build up of caked dust. Remove where found.
7. Collected material **MUST NEVER** be allowed to completely fill the hoppers of any centrifugal dust collector. If this occurs, the cyclone units themselves will become partially filled with dust and the equipment will cease to function as a collector.

Instead of being separated from the gas stream, the dust will pass through the collector unit and cause wear on the induced draft fan. Also, extremely high concentrations of dust will be whirling around within the body of each cyclone unit, causing severe wear and shortening its life. After overfilling, there is a possibility that cyclone units will remain plugged when the hopper is emptied and the severe wear described will continue in the cyclone units that are so plugged. An inspection through the hopper access door should be made for plugged tubes and any that are found should be opened with a probe or air lance.

If the draft loss across the unit is higher than specified, the draft loss across the unit should be checked. If the draft loss is low, it means that the normal gas volume is not passing through the collector. Collector efficiency is impaired by (1) leakage of air into hopper zone through flanges, poke holes, access doors, and discharges valves (2) dust particles by-passing the collector caused the by-pass damper not being closed properly, (3) reduced centrifugal action resulting from reduced gas volume handled by the collector, (4) failure to seal weld the bottom tube sheet where adjacent sections are joined.

8. In the event of a drop in collector efficiency that cannot be corrected by restoring the draft loss to normal, the unit should be inspected for wear.

HOPPER ENTRY PROCEDURE

DANGER - AERATION AND IGNITION OF ASH REMAINING IN THE HOPPER MAY RESULT IN DEATH OR SERIOUS INJURY.

PROPER HOPPER ENTRY PROCEDURES MUST BE STRICTLY FOLLOWED. ENTRY INTO THE HOPPER IS COVERED BY USDOL – OSHA 29 CFR 1910.146 "PERMIT REQUIRED CONFINED SPACE" AND 29 C FR 1910.147 "LOCKOUT/TAGOUT" PROCEDURES. THIS HOPPER ENTRY PROCEDURE IS INTENDED TO SUPPLEMENT THE OSHA PROCEDURES AND YOUR COMPANY'S "LOCKOUT" PROGRAM AND "CONFINED SPACE PROCEDURE" THAT COMPLIES WITH THE OSHA PROCEDURES.

Since there is always a possibility of particulate buildup within hoppers due to fuels, boiler or process operation, the evacuation system, and hoppers. Particulate may not be completely discharged from the hopper. The particulate may also be highly combustible and contain toxic chemicals and gases. Before opening the access doors, the following precautions must be observed:

1. A boiler or process equipment shutdown of 96 hours, or sufficient time to allow the dust to cool is required. Under no circumstance should the access door be opened until it has been definitely established that there is no hot ash inside the hopper, regardless of the time involved.
2. Provide a large continuous platform of solid material immediately below the access door to catch the dust, help prevent aeration, and limit the danger of fire or explosion. Under certain circumstances, the ash or dust may ignite upon contact with the outside air. Ash ignition is more likely to occur if there is a gridded floor or other opening through which the ash can fall and be dispersed to mix with the air.
3. All personnel assigned to operate and maintain this equipment must have read and be thoroughly familiar with these instructions.
4. All personnel entering the hopper must comply with all of the requirements of OSHA 29 CFR 1919.146 "CONFINED SPACE ENTRY PROCEDURES" AND 29 CFR 1910.147 "LOCKOUT/TAGOUT PROCEDURES", and
5. Persons must work in pairs.
6. A fire extinguisher or similar device must be at hand.
7. There must be two separate means of egress from the area.

WHEN OPENING HOPPER ACCESS DOORS, THE FOLLOWING PROCEDURES MUST BE OBSERVED:

1. Check the temperature of the hopper. If the access door is hot, DO NOT OPEN THE DOOR. Allow a shutdown period of 96 hours, or sufficient time for the dust to cool, before opening the doors; under no circumstances should the access door be opened until it has been definitely established that there is no hot ash inside the hopper, regardless of the time involved. Exercise care when checking the temperature if the hopper and access doors are insulated.
2. Check that the fan system is turned off and locked out. DO NOT enter a collecting or storage unit without first altering all control room personnel, securing all control equipment in the shutdown position and tagging the related equipment "OUT OF SERVICE" to prevent any material from entering the unit.
3. Check for dust buildup of bridging in the hopper by:
 - a) Visual observation from above the hopper.
 - b) Rapping on the door (a dull sound on uninsulated equipment may indicate dust buildup in that area),
 - c) Other means provided on the hopper. Visual observation of dust buildup or bridging is the most reliable method.
4. Remove dust buildup or bridging in the hopper by one of the following methods: OBSERVE ALL SAFETY PRECAUTIONS WHEN THERE IS A POSSIBILITY OF DUST FALLING FROM ANY HOPPER OPENING.
 - a) Check that the dust discharge device is operating correctly; repair if required.
 - b) Rod out the dust buildup in the hopper through the poke holes.
 - c) Rod out the dust buildup in the hopper from an opening in the top of the hopper.
 - d) If the dust will not flow through the discharge valve opening exercise EXTREME CAUTION to prevent bodily injury from falling ash and hot toxic gasses. Confirm that solid decking is below opening to prevent aeration of the falling ash. All personnel in the vicinity should wear protective fire resistant clothing, gloves, boots and headgear.
 - e) The hopper access door is not a dust cleanout device. It should only be used as such as a last resort.
5. Be sure that the safety chain is attached. The chain is intended to prevent large quantities of HOT ASH from discharging through the access door should the hopper unexpectedly contain collected material.
6. Twist the release handles until they are clear of the hinged door, or, if bolted doors are used, remove all bolts except the two top bolts; loosen these bolts, but do not remove them.
7. Swing the hinged door slightly ajar with the safety chain in place, or pull the bolted door out slightly on the bolts, to allow dust and gases in the frame to escape.

8. Swing the hinged door open, or for a bolted door, remove one bolt and allow the door to hang on the remaining bolt. Securely fasten the door open to prevent accidental closure while inside the unit.
9. Block off any overhead opening to prevent material from falling on personnel working below. Planks may be used to block the opening.
10. Do not enter the collector without notifying your partner that you will be inside the unit.

REPLACEMENT PARTS-PRICING

6" Collector	-	25 Tubes Total
6 FG	-	\$ 4.05 each
6 F/A Tube	-	133.20 each
9" Collector	-	9 Tubes Total
9 SPIN	-	\$ 44.55 each
9 FG	-	6.75 each
9 F/A Tube	-	222.22 each



Project _____
File No. _____
By _____ Date _____
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TERRIE -

Fix THE Following & THE

Email BACK TO ME -

THANKS

John.

**MECHANICAL
FLY-ASH COLLECTOR
OPERATION AND MAINTENANCE
MANUAL**

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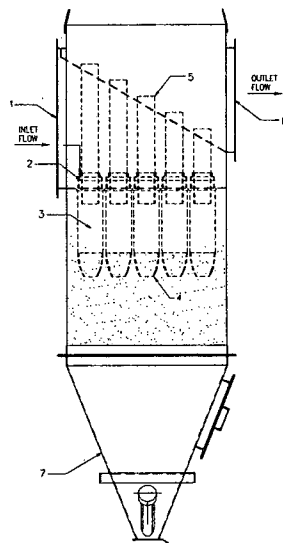


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6. During down-time maintenance periods, inspect inlet vanes, outlet vanes and boots for any build up of caked dust. Remove where found.
7. On those units equipped with sectionalizing or control dampers after the unit has been at operating temperature for several hours, fill all of the damper bearings with graphite silicone lubricant. Heat will melt out all grease originally applied at the factory as a preservative.
8. Collected material **MUST NEVER** be allowed to completely fill the hoppers of any centrifugal dust collector. If this occurs, the cyclone units themselves will become partially filled with dust and the equipment will cease to function as a collector.

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