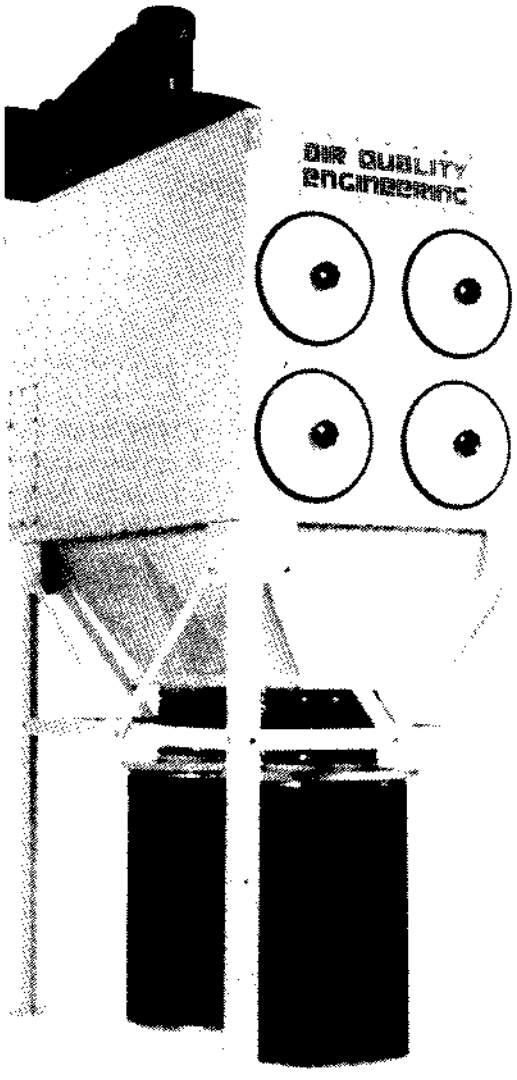
AQE
DUST COLLECTOR
MODEL 8000



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TECHNICAL SPECIFICATIONS

IMPORTANT

THE SPECIFICATIONS GIVEN IN THIS PUBLICATION DO NOT INCLUDE NORMAL MANUFACTURING TOLERANCES. THEREFORE, THIS UNIT MAY NOT MATCH THE LISTED SPECIFICATIONS EXACTLY. ALSO, THIS PRODUCT IS TESTED AND CALIBRATED UNDER CLOSELY CONTROLLED CONDITIONS, AND SOME MINOR DIFFERENCES IN PERFORMANCE CAN BE EXPECTED IF THOSE CONDITIONS ARE CHANGED. SPECIFICATIONS ARE SUBJECT TO CHANGE WITHOUT NOTICE IN THE INTEREST OF CONTINUING DEVELOPMENT.

MODEL: AQE 8000 Dust Collection System

DIMENSIONS: 113"H x 45"W x 83"D
143"H x 45"W x 83"D (with motor & blower)

WEIGHT:

Options	Installed	Shipping
W/O Motor	1,400 lbs.	1,625 lbs.
7.5 HP Motor	1,650 lbs.	1,875 lbs.
15 HP Motor	1,750 lbs.	1,975 lbs.

CONSTRUCTION: The AQE Model 8000 is constructed of 7, 11, and 12 gauge mild steel, then painted with a polyurethane coating. The AQE 8000 is manufactured with a standard 14" diameter inlet and two 14" diameter hopper outlets. Twelve inch diameter inlet is also available.

FILTER CARTRIDGE: Standard AQE Model 8000 Cartridges are manufactured of a nonwoven filter media rated at 99.8% efficiency for 0.5 micron size particulate. The standard filter is designed to withstand temperatures up to 200° F.

Dimensions:	30"H x 12 3/4" Outside Dia. x 8 3/8" Inside Dia.
Top/Bottom End Cap:	G60 Galvanized - Open
Gasket:	11" Outside Dia. x 10 1/4" Inside Dia. x 1/2"H Neoprene
Outer Retainer:	Cage, 98% Open
Inner Core:	Galvanized Expanded Metal
Filter Area:	275 Square Feet
Air Flow Range:	0-5500 CFM

CONTROLLER: The AQE Model 8000 comes standard with a Photohelic Controller. The Photohelic Controller operates the four solenoid and diaphragm valves utilized for reverse pulse cleaning. By simple adjustable presets, the reverse pulse cleaning is scheduled to clean at a desired pressure drop across the filters. This solid state controller is prewired and housed within a NEMA 4 enclosure. The reverse pluse controller offers the option of both on-line and off-line cleaning.

Line Input:	Any Line Voltage of 120 Vac, 50/60 Hz Low Minimum: 105 Vac
Load Output:	200 VA Maximum
Line Input Fuse:	3 AG 2 Amp
Temperature Range:	-40 to 140° F (-40 to 60° C)

AQE 8000 REVERSE PULSE SYSTEM:

Cartridge cleaning is accomplished by the use of 3/4" diaphragm valves and sonic nozzles positioned behind the cartridge filters. The specially designed sonic nozzles precisely directs and increases the air velocity into the cartridge filter to reverse pulse the contaminants from the filters.

DIAPHRAGM VALVES:

The body, cover, seal retainer and compression coupling connectors are pressure diecast aluminum.

Pilot Connections:	1/8"
Exhaust Connection:	Tapered Pipe Threads, 1/8"
Maximum Working Pressure:	125 psi (8.6 Bar)
Recommended Working Pressure:	90-110 psi (6.2-7.6 Bar)

SOLENOID VALVES:

The enclosure is made from pressure diecast aluminum. The coils are encapsulated in Nylon 6.

Pilot Valve Threads:	1/8"
Maximum Working Pressure:	125 psi (8.6 Bar)
Recommended Working Pressure:	90-110 psi (6.2-7.6 Bar)
Insulation:	Class B (130 C)
Conduit Thread:	3/4" NPT (M25 x 1.5)
Standard Voltage:	100-120 Vac, 50/60 Hz

MOTOR/BLOWER OPTIONS:

Both blowers are Backward Inclined Blowers with flanged inlet and outlet.

7.5 HP Motor and Blower:	208 Vac, 60 Hz, 3 Ø, 19 Amps 230 Vac, 60 Hz, 3 Ø, 17 Amps 460 Vac, 60 Hz, 3 Ø, 8.8 Amps Approximate weight: 300 lbs.
15 HP Motor and Blower:	208 Vac, 60 Hz, 3 Ø, 37.5 Amps 230 Vac, 60 Hz, 3 Ø, 34 Amps 460 Vac, 60 Hz, 3 Ø, 17 Amps Approximate weight: 400 lbs.

Blower and Motor HP Options	Airflow (CFM) at Static Pressure (Inches WG)							
	4"	5"	6"	7"	8"	9"	10"	12"
7.5 HP Motor	3800	3600	3450	3250	3200	3000	2750	2200
15 HP Motor	5700	5500	5400	5200	5000	4750	4500	4100

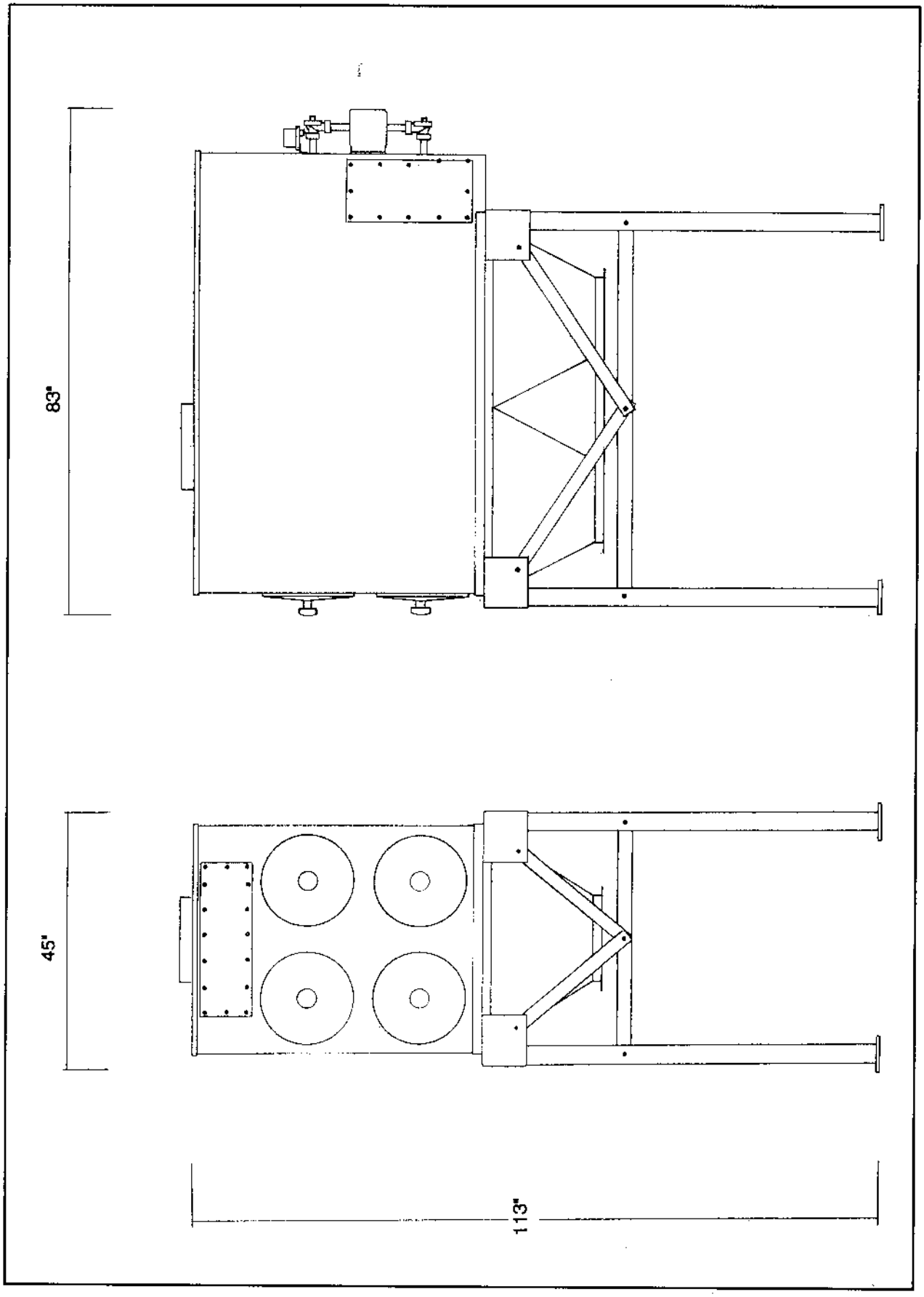

FIG. 1

PLANNING THE INSTALLATION

INTRODUCTION

Clean air in industry creates safe and healthy working conditions. The requirements for clean air are based on the regulations of the Occupational Safety and Health Administration (OHSA) and on the recommendations of the American Society of Heating, Refrigeration, and Air Conditioning Engineers (ASHRAE).

Normally, clean air is defined in regulations and recommendations as air having a limited amount of contaminant in it, commonly expressed as parts per million, or milligrams per cubic meter. Approved counteractions are intended to lower or eliminate the amount of contaminants in the air. One of the more common methods of achieving this goal is through the use of dust collectors.

IMPORTANT

This manual contains specific information concerning safety and precautionary measures. Read this manual thoroughly before attempting to assemble or operate this machine. It is impossible to list every potential hazard associated with dust collection equipment or systems. Use of this equipment must be discussed with an Air Quality Engineering representative.

APPLICATION OF DUST COLLECTION EQUIPMENT

1. Avoid mixing combustible materials, such as paper dust, wood dust, aluminum, magnesium and buffing lint, with dust generated from grinding ferrous metals. There is a potential fire hazard caused by sparks in the dust collector.

2. When collecting emissions from steel or combined metal shavings, the dust collector should be located a minimum of 40 feet away from the source to reduce any potential fire hazards.

Dust collectors do not contain fire extinguishing equipment. An expert in the field of fire extinguishing equipment should be consulted for his/her recommendations for the installation of proper fire extinguishing equipment.

3. Some dust collection systems require explosion venting. Consult with an insurance underwriter or a NFPA Manual to determine proper venting size. Consult the proper authority to determine the method of venting, as well.

4. Do not allow any machine operator to put lit cigarettes or any burning object into the hood or ducting of any dust collecting system.

INSTALLATION

WHEN INSTALLING THIS PRODUCT...

1. Read these instructions carefully. Failure to follow them could damage the product or cause a hazardous condition.

2. Check that the ratings given in the instructions and on the product are suitable for your application.

3. Installer must be a trained, experienced service technician.

4. After installation is complete, check out product operation as instructed in this manual.

CAUTION

Connect the power source after mounting all equipment to prevent the risk of electrical shock.

COMPRESSED AIR REQUIREMENTS

1. The air supply must be oil and moisture free.

2. The air compressor must be of sufficient size to provide a minimum of nine cfm to the AQE 8000 Dust Collector.

UNPACKING

When shipment is received, it should be carefully inspected to make certain the equipment and all items listed on the packing list is received and in good condition. All damages and/or shortages should be noted on the Bill of Lading; and the purchaser should take immediate steps to file reports and damage claims with the carrier. Damage incurred to a unit in transit is the responsibility of the carrier.

PREINSTALLATION INSTRUCTIONS

Remove the four filter access doors, and examine the seals between the filters and between the filters and the tube sheet. Make sure that all seals are in good condition. Replace the filter access doors once inspection is complete.

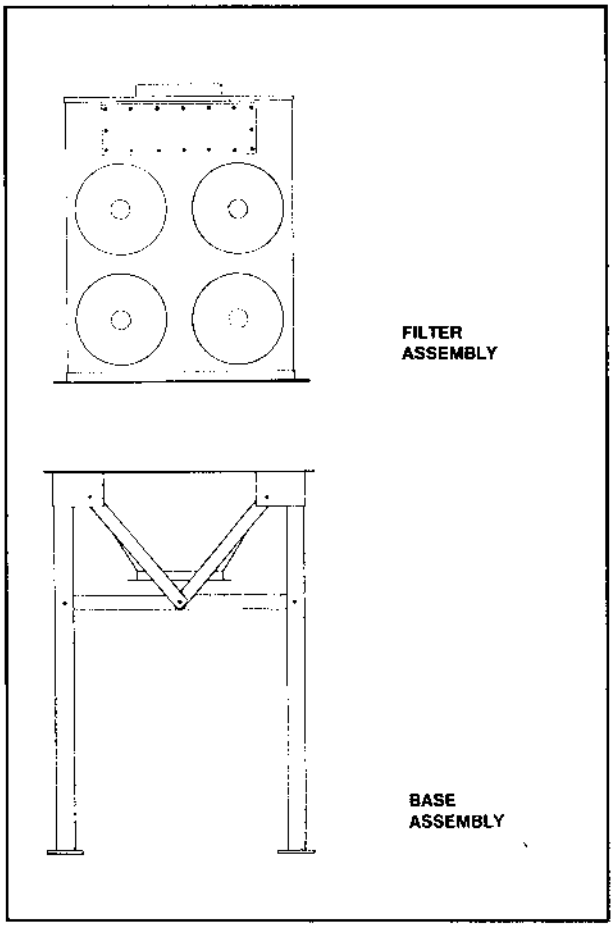

FIG. 2

The dust collector is usually mounted on a concrete foundation inside the factory next to the dust collection operation. However, dust collectors can be installed outside, as well. When calculating for foundation or roof mounting, the weight of the dust collector, material collected, and auxiliary equipment must be considered together with the wind and seismic loads. See Specifications for weights and dimensions.

The dust collector should be located with consideration for emptying the hopper, shortest run for location of ductwork, and electrical and air connections and maintenance.

WARNING FOR ROOFTOP MOUNTING

The location must be clear of all obstructions, such as utility lines or roof overhang, as a crane must be used to move the collector into position.

OFF-LOADING AND ASSEMBLY

A forklift is recommended for unloading, assembly, and installation of the dust collector. Assembly should be performed near the place where the unit will be operated.

WARNING

Do not lift unit from any point other than the lifting lugs.

Remove the base assembly, filter assembly, and fan (optional) from the shipping pallets. See Fig. 2. Remove the bolts in the base assembly which hold the hopper to the legs. Some of the bolts on the leg assembly may need to be loosened, not removed, so that when the filter assembly is lowered onto the base assembly adjustments can be made to line up all the bolt holes. Lift the upper filter assembly high enough for the base assembly to slide underneath. Align sections to be bolted together, and use the silicone sealant provided to lay a bead of sealant on the flange of the base.

Lower the filter housing onto the base assembly. When aligning the bolt holes, it is best to start with the four corners. Insert the bolts but do not tighten them down. Once the bolts for the four corners have been lined up, the rest of the bolts can be inserted. Do not tighten any bolts until all the bolts have been lined up and inserted. Tighten all the bolts, taking care to insure an airtight integrity.

OPTIONAL BLOWER / DAMPER INSTALLATION INSTRUCTIONS

WARNING

Do not lift the fan by its shaft, wheel, flanges, or inlet support. Turn the rotating assembly by hand to insure that it does not strike the housing. If the assembly strikes the housing, a correction must be made prior to start up.

Handle the blower with care. It must be handled using nylon ropes or well-padded chains and cables to protect the blower's coating and housing. Blowers are best lifted using one strap under the blower's scroll and another strap around the bearing base.

Lift the blower into place above the unit. Use the silicone sealant provided to lay a bead of sealant around the opening. Set the motor down onto the cabinet. Use the hardware provided, and tighten all the bolts taking care to insure an airtight integrity.

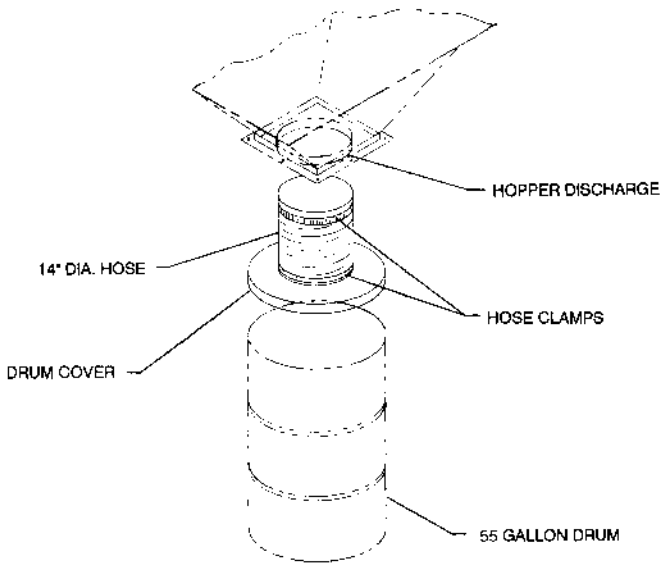

FIG. 3

Lift the damper assembly into position, and tighten all the bolts. Leave the damper in a wide open position until the unit is fully assembled. The fan damper will need to be adjusted before the unit is operated. This step is discussed further in Setup and Operation.

DUST COLLECTION DRUM

Place the 55 gallon drums (customer provided) under the dust collector. Then place the drum covers supplied with the unit on top of the drums with the gasketed surface contacting the top of the drum. Place one hose clamp over each end of the 14 inch flexible hose, and position the flexible hose between the hopper and the drum cover. Slide the hose into place, and tighten the hose clamps. Repeat the steps for the other drum. (See Fig. 3.)

PHOTOHELIC GAGE AND CONTROL BOX

The control box should NOT be mounted to the base of the unit. It should be mounted on a wall or other nearby support. Make sure it is accessible and readable. High and low pressure fittings are located on the bottom of the control box. These can be connected to the high and low pressure fittings on the filter housing. This control box requires 115 Vac, and it is convenient to have this mounted near the ON/OFF switch for the fan. An ON/OFF switch for the control box is necessary so when the fan is turned off the control box can be turned off also.

PNEUMATIC HOOKUP

Note: The air supply must be free of oil and moisture. Purge the air lines to remove any debris before connecting to the air manifold.

Run a 3/4" pipe size, compressed air, supply line to the unit. The air line should be equipped with a manual shutoff valve, filter, air regulator, and pressure gage all located close to the unit. If the unit is to be installed in an area where freezing temperatures are to be expected, an air dryer capable of drying the compressed air to below the dew point must be provided. Use Teflon tape on all the air fittings to insure an airtight integrity. Pressurize the system to 90-105 psig, and check for leaks. Then close the manual shutoff valve, and bleed the air from the line and air reservoir.

ELECTRICAL HOOKUP

Note: All electrical work needs to be performed by a qualified electrician in accordance with local city and state regulations.

The control box requires 115 Vac for operation. An ON/OFF switch should also be installed and five wires run from the photohelic control box to the solenoid valve. The solenoid valve is mounted above the air reservoir on the back of the duct collector. See Fig. 5.

The blower motor requires either a 208-230 or 460 Vac, three phase line for operation. The blower motor, also, requires the electrician to install a thermal protection device and a starter to it. An ON/OFF switch is also required for the blower. The switch should be mounted in close proximity to the control box ON/OFF switch.

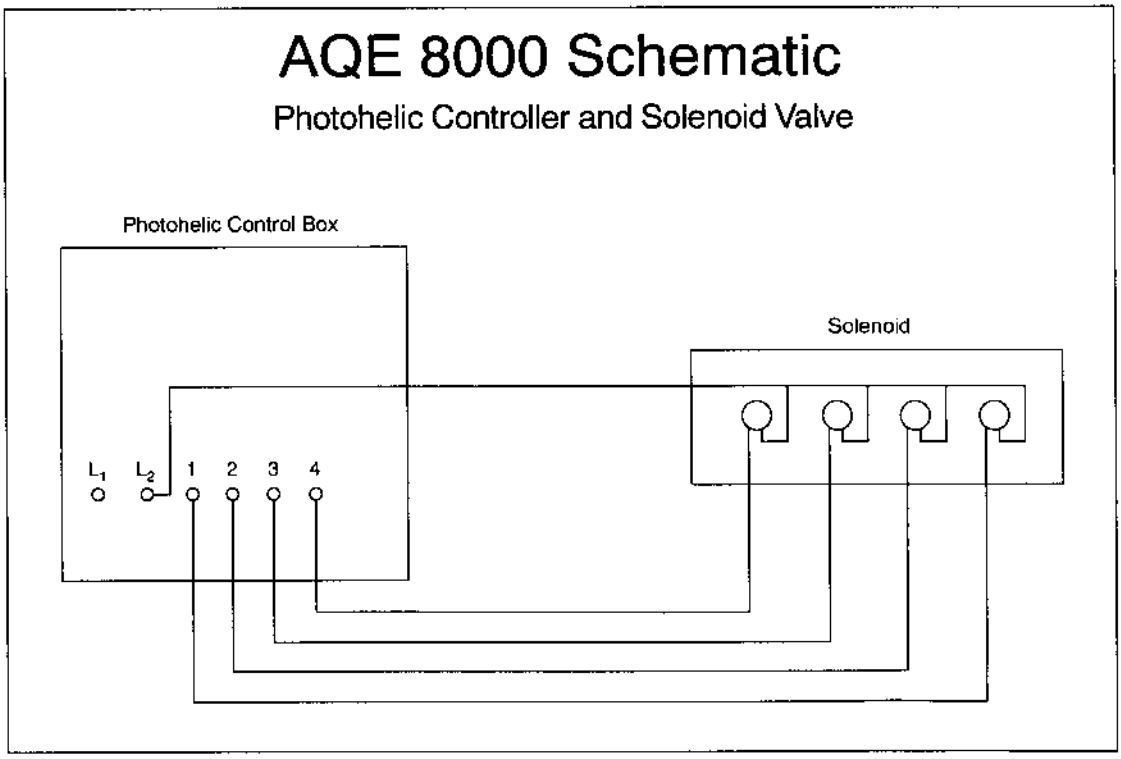

FIG. 5

OPERATION AND CHECKOUT

CHECKOUT

Before operating the dust collector, check out the installation using the following procedures:

1. Observe that the dust collector is securely mounted to the floor so that it will not move and damage the air, electrical, or duct connections.

2. Check that the filters are in place and that the filter doors are tight.

3. Check that the base and filter sections are securely bolted together and that the side and front access panels are secured. Also, check that the legs and leg support members are bolted together securely.

4. Check that the blower and damper are both bolted down securely.

5. Observe that the duct work is properly mounted and out of the way of forklifts and other machinery.

6. Double check the air line connections and the air fittings in the control box and on the unit. Also, check the air lines from the solenoid to each of the valves. Make sure all lines are secure.

7. Check that all electrical connections are properly mounted and that they meet local codes.

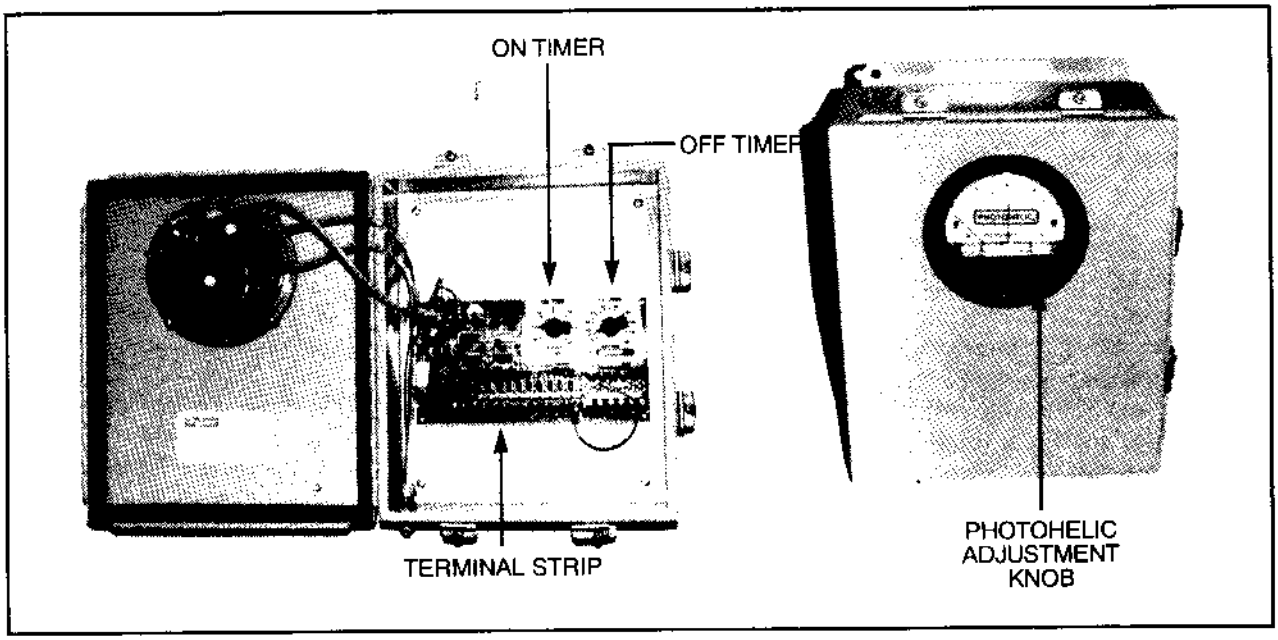

FIG. 4

OPERATION

1. Turn on the air supply to the air reservoir and adjust to 90-105 psig. This is the proper setting for efficient filter cleaning.

2. Open the door of the control box. Set the OFF timer for 5 seconds. Set the ON timer for 0.10 seconds. Adjust the set point of the photohelic switch/gage to zero. (See Fig. 4.).

3. Turn on the power to the control box. The line pilot lamp should light. If it doesn't, check the fuse, the ON/OFF switch, and the power panel. Approximately five seconds after the pilot lamp lights the output lamp at Terminal No. 1 should light for 0.10 seconds, and you will hear the first diaphragm valve "pulse." Five seconds after that the output lamp at Terminal No. 2 should light for 0.10 seconds, and so on. Keep watching to make sure that the lamps at all the terminals light and that the pulse is heard for each terminal. This will cycle and Terminal No. 1 will light and pulse again.

4. Set the OFF timer for ten seconds, and leave the ON timer set at 0.10 seconds. Close the door of the control box, and tighten all door clamps.

5. Adjust the photohelic above 7"wg. Turn on the power to the blower.

6. Make sure that the blower is correct. If rotation is not correct, two leads to the motor will need to be switched. Have trained personnel perform this.

7. Partially close the damper, if so equipped, so as to avoid exceeding the design airflow when the filters are new and clean. Adjust the fan damper as necessary to achieve the specified airflow. Airflow volume can be determined by means of a pitot tube or anemometer. Record both the initial airflow and the pressure drop for future reference. Mark the damper's position at the initial flow.

8. Check the exhaust. Exhausted air should be relatively clean. If a leak has developed, it will be first noticed after a cleaning pulse as a puff of dust.

9. Check the pressure drop on the photohelic gage. The reading depends upon the individual duct setup and the number of intake sources but the reading should be between 1-6 inches. A pressure drop of 3-4 inches is normal for seasoned filters.

Note: If the dust collector does not appear to be operating properly, refer to the Troubleshooting section.

SERVICE

The dust collector does not require routine maintenance. However, it is advisable to check daily to see that the electrical power and compressed air are still applied and that the air valves are opening and closing properly. It is also advisable to check that the collected material is flowing freely out of the hopper.

DRUM MAINTENANCE AND SERVICE
Do NOT use the hopper as storage for the collected dust. It is simply a large funnel from which the dust must be removed on a continual basis. If dust is allowed to collect in the hopper, it will get redeposited on the filters and shorten their life.

Always empty the dust storage drum before it completely fills. The dust collector must be shut off to empty the drum.

FILTER MAINTENANCE AND SERVICE
Presure drop across the filters normally increases rather rapidly when the filter elements are new and clean but then climbs much slower throughout the rest of their life. To maintain the designed airflow, the airflow damper must be periodically readjusted in the open direction. Once the damper is fully opened and the designed airflow can no longer be maintained, the filters must be replaced.

BLOWER MOTOR MAINTENANCE
See manufacturer's manual for motor maintenance schedule.

CHANGING THE FILTERS
Note: Remove ALL the filters before installing the new filters.

1. Shut off the electrical power to the blower and the control box.

2. Remove the access doors by unscrewing the knob, and place the doors out of the way. Check the seals on the doors to make sure they are in good condition.

3. Rotate the filters to break the seals. This will also allow dust from the top of the filters to drop free. Remove the filters from the unit and place into bags.

4. Examine the tube sheet, and make sure the gasket sealing area is free of any dust and debris to insure a proper seal for the new filters.

5. Install the new filters gasket side first. Replace the filter doors and hand tighten.

Note: Filters must seal at both ends. Make sure the rear seal is making contact with the tube sheet and aligned properly prior to door replacement. If the filters do not seal, a dust leak will result.

TROUBLESHOOTING

A) CLEANING CYCLE WILL NOT START OR WILL NOT REPEAT
Check the photohelic gage. The cleaning cycle will not begin unless the pressure drop is higher than the set point. Make sure the set point is well below the gage reading for the following tests:

1. Check the pressure in the air reservoir. It should be between 90-105 psi.

2. Open the control box, and see if the line pilot light is on. If not, check the line input fuse and voltage. If the fuse is bad, replace it. Do not replace the fuse with a larger capacity fuse. Damage to the circuit board will result.

3. Check the reset wire on the circuit board. It should be connected to either the last terminal a solenoid valve is connected to, or it should be connected to the terminal with the next larger number. Reset the OFF timer to five seconds and the ON timer to .25 seconds. Turn the power off for at least five seconds and then turn it on again. The neon lamps at the load terminals should light one at a time in five second intervals starting with No. 1, and so on. If the neon lamp at Terminal 1

did not come on for even a split second and none of the other lamps come on, go to #5.

4. If the pulse cycle is initiated but the fuse blows, there is possibly a short circuit between the solenoid valve and the circuit board. Replace the fuse, and watch at what terminal the fuse blows. The board contains more terminals than are used on the unit. Disconnect the lead from the terminal which is believed to be bad, and move the rest of the terminal connections down one. If it still fails to operate properly, there might be a short from the control box to the connections in the solenoid valves. Check the continuity of these wires, particularly the "common" wire from the control board to the solenoid valves.

5. If the load output lamps still do not light as previously described, then disconnect the GREEN and BLACK wires which run from the photohelic to the board. If the controller will still not operate, then the board is defective. If the controller starts to operate, turn if off; and reconnect the GREEN and BLACK wires to their appropriate locations; and unplug the plug from the photohelic. Turn the controller on. If it begins to work, then the photohelic is defective. If the controller does not work, then there is a short in the wires that run from the board to the photohelic.

B) CLEANING PULSE CYCLE NEVER STOPS

1. Check the set point of the photohelic. If it is lower than the pressure shown by the gage, set it higher. The cycle should stop after the last valve has pulsed.

2. If it has not stopped pulsing, open the door of the control box; and make sure that the reset wire is connected to the last terminal a solenoid valve is connected to. If it is connected, make sure the wires from the photohelic are connected correctly. Temporarily connect a jumper from the RED/ GREEN terminal to the BLACK terminal. The pulsing should now stop after the last valve has pulsed. If the cycling did not stop, the control board is bad.

3. If the jumper wire from the previous section stopped the control from pulsing, turn the power to the control box off; and unplug the plug from the photohelic. Look closely at the plug for the tiny letters identifying each of the pins. Check that the color codes on the wires are correct. The RED wire connects to Pin A; the WHITE connects to B; the BLACK connects to D; and the GREEN connect to E. Check the continuity of each wire from the pin to the circuit board. If the cable is faulty, repair or replace it.

4. If the connections and the cable are good, connect a DC volt meter across the RED/GREEN and WHITE terminals and the circuit board. Turn the power on. The voltage across these terminals should be at least 1.2 volts DC. If the voltage is lower than this, the control board is defective. If the voltage checks out okay, then the photohelic is faulty and must be returned for repair.

C) ONE DIAPHRAGM VALVE STAYS OPEN

1. Turn off the power to the control box. If the valve stays open, check for leaks in the BLACK plastic tubing, fittings, or the connections to the solenoid valves. If leaks are found, tighten, repair, or replace as necessary.

2. If turning off the power caused the valve to close, the output stage of the control associated with that valve has shorted out. Check this by opening the control box and turning the power to the control box on. Watch to see which load output lamp stays on; then follow the steps in Section A, Paragraph 5 about switching the terminal connections.

3. If neither of these solve the problem, go to Section E, Pneumatic Troubleshooting.

D) ONE DIAPHRAGM VALVE STAYS CLOSED

1. Follow the test from Section A, #4. If the load lamp from the nonfunctioning diaphragm valve does not light, then follow the steps outlined in Section A, #5.

2. If the lamp does not light at the proper time but the diaphragm valve still doesn't function, go to Section E, Pneumatic Troubleshooting.

3. If the valve checks out pneumatically, then the problem must be in the coil of the solenoid valve or the coil. Check the trouble spot by a continuity check, and repair or replace as needed.

E) PNEUMATIC TROUBLESHOOTING

1. If the electrical circuit checks out but a diaphragm valve still is not functioning, the problem is in the diaphragm, solenoid valve, or in the tubing connecting them. Turn the power to the control box off. If an open valve does not close, check for leaks in the BLACK tubing or the fittings connecting the solenoid. If leaks are found, repair as neccessary. If no leaks are found, hold a finger over the small bleed port at the bottom of the valve. If there is no air coming out of this port or air leaking out from around the

solenoid, look for cracks in the diaphragm and the solenoid valve. If a crack or leak that cannot be repaired is found, the valve must be replaced. If no leak is found, go to #3.

2. If a closed valve will not open, then depressurize the air reservoir. Remove the three screws holding the body of the solenoid valve to the ferrule retainer. Remove the small spring and plunger, and examine all the parts. If dirt is the problem, clean the parts and reassemble. If the plunger or rubber seat appears to be excessively worn or if the plunger hangs up on the assembly, then a solenoid rebuild kit will need to be ordered.

3. Depressurize the air reservoir. If there is nothing wrong with the solenoid valve, check the tubing between the solenoid and the diaphragm valve. Check the tubing for kinking or plugging. Remove the bolts, and take the cover off of the diaphragm valve. Remove the springs and diaphragms. Clean any dirt that may have entered the valve. Also, check the short tube which goes through the diaphragm. Examine the diaphragm and the nylon disc attached to it, if any. A hole in the diaphragm or disc will eventually fail, at which time a rebuild kit must be ordered to restore the valve to new condition.

F) HIGH PRESSURE DROP OR SHORT FILTER LIFE

1. Check that the photohelic gage is not set too high.

2. Check that the ON and OFF timers are adjusted properly.

3. Check that the air in the air reservior is between 90-105 psi. Below 90 psi, the cleaning effectiveness is significantly reduced.

4. Make sure that the air line has not become contaminated with oil or water, and make sure that the air line filters are functioning properly.

5. Check the hopper for buildup. Dust must be continuously discharged and the drums kept clean.

6. Check the filters to make sure that they were not preblinding during the initial stages of operation due to lack of proper damper adjustment.

7. Check the actual airflow to make sure it does not exceed the proper design flow rate. For every specific dust and particle size, there is a practical limit to the airflow rate through the filter media. If this is exceeded, the filters will have a shorter than normal operating life.

8. Check the dust being collected. Some materials inherently tend to blind the fabric dust collectors. Dust, such as soda ash, should be suspected. Chemical reactions can also take place in the dust collector that may affect the filters. Oil or oily smoke or other hydrocarbons in the air stream will also blind the filter elements.