AQE4000

Overhead Cartridge System

AIR QUALITY
ENGINEERING

Air Quality Engineering Inc., has a policy of continuing product improvement and reserves the right to make changes in design and specification without notice.

Before you get started please review the following:

Purchase Date: _____

Serial Number: _____

Type of filter and AQE P/N: _____

Customer Technical Support:

To contact Air Quality Engineering use:

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Brooklyn Park, MN 55428
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763.531.9823

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Disclaimer
All statements, technical information and recommendations in this manual or related documents are believed reliable, but the accuracy and completeness thereof are not guaranteed or warranted, and they are not intended to be, nor should they be understood to be representation or warranties concerning the products described.

Specifications are subject to change without notice.

This unit is to be used exclusively for source control in industrial applications in California.

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CAUTION

** ANY ACCUMULATED DUST MAY BE HAZARDOUS AND POSE A POTENTIAL FIRE/EXPLOSION HAZARD **

Combustible materials, such as aluminum, magnesium, paper, buffing lint, and dust must not be mixed or exposed to dust generated from grinding ferrous metals due to the potential fire hazard caused by hot sparks within the air cleaner/cartridge collector.

At no time should the air cleaner/cartridge collector be exposed to lit cigarettes or any burning objects.

When dust collectors are used to collect flammable or explosive compounds, the dust collector must be located outside the building. When collecting extremely flammable dusts, drums should be emptied at least once daily and properly disposed of. Installer should consult and comply with all national and local fire codes or any other appropriate codes when determining the operation of dust collector equipment. Dust collectors are not fire or explosion proof and do not include any fire extinguishing equipment.

Explosion relief vents are required for some applications. Dust collectors with explosion vents should be located on the outside of the building. Some applications may require additional spark arrestors or fire extinguishing equipment. Consult with your NFPA manual (to order your NFPA manual, call l-800-344-3555), with your Air Quality Engineering, Inc representative *or* with your insurance company for more information. Air Quality Engineering, Inc can provide explosion relief vents upon special order.

Cartridge collection equipment should be kept clean at all times to avoid the accumulation of material except in the discharge drums.

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.

THE AQE4000 CAPTURES SMOKE, DUST, AND OTHER DRY AIRBORNE POLLUTANTS INTHE WORKPLACE. THE AQE4000 IS A SELF CONTAINED AND CONTINUOUS CLEANING CARTRIDGE AIR CLEANER THAT CAN BE USED IN SOURCE CAPTURE APPLICATIONS TO PROVIDE HEALTHIER WORKING CONDITIONS.

DIMENSIONS: See figure 1

WEIGHT:

Options	Weight
Unit	656 lbs.
6” Dia Arm	47 lbs
8” Dia Arm	72 lbs

CABINET: 16 Ga. Welded steel cabinet with a baked enamel paint.

ARM ASSEMBLY 13’ long x 6” or 8” diameter. Externally supported arm with full 360º arm rotation. Arm assembly incorporates gas springs which provides easy up and down movement. Spun aluminum hood with flange. Hood moves easily vertically and horizontally.

FILTER CARTRIDGE: Four high efficiency cartridge filters. 12 3/4” diameter x 30”. 1100 sq. ft. total. 99.8% efficient at .5 micron.

FILTER CLEANING: Self-Cleaning Reverse Pulse Jet System which utilizes two, one inch diaphragm valves. Requires 80-120 psi of shop supplied compressed air.

PULSE CONTROLLER: Standard pulse controller has pulse frequency adjustment from 15 seconds to 8 hours. Optional photohelic controller monitors the pressure differential across the filters and pulses the cartridges within the set differential pressure range.

MOTORIZED IMPELLER: Electronically commutated (EC) backward curved fan 208-480/60/3

POWER:

Pulse Controller:
Standard: 120 VAC, 60 Hz, 1 amp fuse
Photohelic: 120 VAC, 60 Hz, 3 amp fuse
Diaphragm Valve: 120 VAC, 60 Hz, .05 amps
Motor: 208-240V 9.2 amps max 3 phase
440-480V 5.3 amps max 3 phase

DIMENSIONS

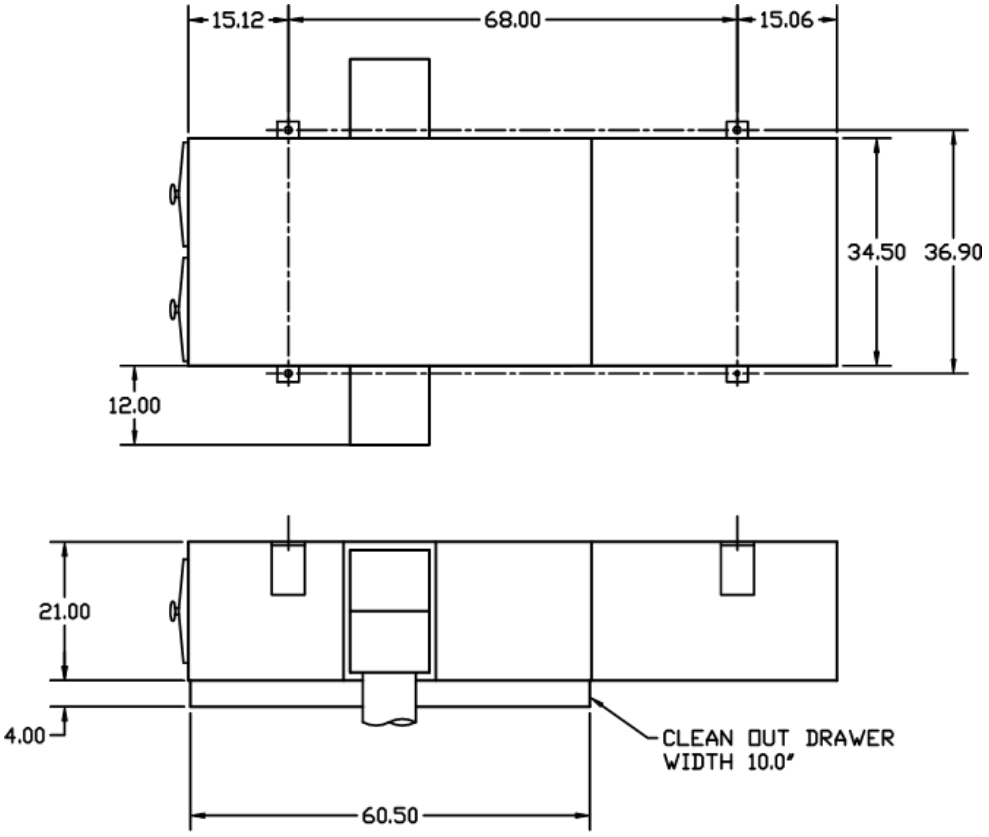

FIGURE 1 – DIMENSIONS

PLANNING THE INSTALLATION

- WARNING -

Air Quality Engineering, Inc. air cleaners are not explosion-proof. They must not be installed where there is danger of vapor, gas or dust explosion.

INTRODUCTION

Clean air is the subject of numerous laws and regulations. Typical requirements in the United States are those put out by the Occupational Safety and Health Administration (OSHA). Private groups, such as the American Society of Heating, Refrigeration and Air Conditioning Engineers (ASHRAE), have also published numerous recommendations.

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 media air cleaners.

At no time should a media air cleaner be placed where there is a potential for explosion due to the presence of explosive dusts, gases or vapors.

Contact the nearest Air Quality Engineering, Inc., representative for assistance in determining the correct application of a media air cleaner.

SIZING

Sizing is that part of the installation which determines how many air cleaning units are required to maintain a desired level of air quality. The process of sizing an application involves roughly calculating the number of air cleaners needed and then modifying the calculation according to the specific characteristics of each application.

Since this is going to be used for source capture air cleaning, a hood is installed where the contaminants are generated and an attached hose feeds the contaminants to a source capture plenum. The plenum transfers the contaminants directly into the air cleaner (hose and plenum are ordered as accessories). The actual number of contaminant sources that can be ducted into one air cleaner may vary depending on the nature of the contaminants. The composition, quantity and rate of generation of the contaminants determines the air velocity needed to effectively capture these contaminants at the source. The required air velocity, in turn, not only affects the hood design and location but it also sets limits on how much hose can be used before the air pressure drop becomes too great for effective contaminant capture.

Therefore, when sizing an application for source capture air cleaning, it is necessary to keep in mind how the specific contaminants, the hood and the needed velocity all combine to affect the number of stations which can be attached to a single unit and the number of units which will be needed for a particular application.

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Or reference our website:
http://www.air-quality-eng.com/buyer-resources/air-cleaners-sizing/

SOURCE CAPTURE CLEANING

When selecting a location for a media air cleaner that uses a hood and hose to capture the contaminants at the source, note the available stand or ceiling mounting areas that will provide satisfactory air distribution for the air cleaner outlet. Choose the location that will keep the air pressure drop caused by the length of the hose within an acceptable range. Do not mount the outlet of the air cleaner so close to a wall that it inhibits the airflow. Also, the outlet of an air cleaner should not be located such that it interferes with the source capture process of another air cleaner hood.

To effectively control atmospheric contamination at its source, proper hood design is necessary. Minimum airflow and power consumption are also important factors in designing an effective local exhaust system to control contamination.

Capturing air contaminants at their source requires the creation of sufficient airflow past the contaminant source to remove the contaminated air and draw it into an exhaust hood. Fine airborne dust particles, mist, vapors, gases and fumes follow air currents. Airflow alone is sufficient to capture these contaminants.

Larger dust particles tend to have a trajectory, or throw, in air. Capturing these heavier particles calls for barriers and proper hood placement to direct the particles into the hood before they fall out of the air stream. This placement should also prevent particle scattering.

Basic knowledge of the contaminated airflow to be controlled is necessary before an effective hood or enclosure can be designed. The more complete and effective the design, the more economical and efficient the installation will be.

A complete enclosure is often the best way to start. Once a source is ideally enclosed, provide access and working openings as required. This concept can be used to develop booths, side- or downdraft hoods and side shields.

The access and working openings must be kept to a minimum. Whenever possible, they must also be kept away from the contaminated airflow. Any inspection and maintenance openings should be provided with tight doors whenever possible.

A hood that is open and does not enclose or confine the contaminant should be avoided. Open hoods can be used but exhaust volumes must be large and cross drafts nearby can easily upset draft control.

Canopy hoods are effective in controlling operations that may suddenly release surges of gases and vapors. Hot processes are an example.

However, canopies should not be used where people may be working in the airflow between contaminant source and canopy because exhaust airflow can actually increase the worker's exposure to the contaminant. Plating tanks and cementing tables typically have this problem with canopy-type hoods.

The duct takeoff in the exhaust hood should be located in the normal line of contaminant travel. Arrange the duct openings to distribute the exhaust airflow throughout the hood. This is especially important with large, shallow hoods where air movement tends to concentrate close to the duct opening. The airflow can be spread around the hood by using multiple duct takeoffs, interior baffles or filter banks.

Air intake from areas not needing airflow or without contaminants can be controlled with flanges. Flanges minimize airflow from areas outside the desired air collection area. Usually the flange width is equal to the hood diameter but not exceeding 6 inches (152.4 mm). Flanges may increase the effectiveness of the hood allowing a reduction in hood airflow requirements by up to 25 percent.

Exhaust airflow requirements are calculated after the hood design is determined. The airflow volume is calculated using the enclosure's known open area and the airflow velocity needed to collect the contaminants. The collected airflow must be sufficient to prevent the escape of any contaminated air. Table 1 shows airflow capture velocities for various type of processes.

Where enclosing the process is impractical, the hood should be located as close to the source as possible. The airflow must be adequate to maintain the capture velocity required to carry the contaminants to the hood opening. See Fig. 4.

TABLE 1 – CONTAMINANT CAPTURE VELOCITIES[a]

CONTAMINANT DISPERSAL CONDITION	EXAMPLES	CAPTURE VELOCITY fpm	CAPTURE VELOCITY m³/hr.
Released with practically no velocity into quiet air.	Evaporation from tanks, degreasing, etc.	50-100	914-1829
Released at low velocity into moderately still air.	Spray booths, intermittent container filling, low speed conveyor transfers, welding, plating, pickling.	100-200	1829-3658
Active generation into zone of rapid air motion.	Spray painting in shallow booths, barrel filling, conveyor loading, crushers.	200-500	3658-9144
Released at high initial velocity into zone of very rapid air motion.	Grinding, abrasive blasting, tumbling.	500-2000	9144-36,576

In each category above, a range of capture velocity is shown. The proper choice of values depends on several factors.

Lower End of Range
1. Room air currents minimal or favorable to capture.
2. Contaminants of low toxicity or of nuisance value only.
3. Large hood-large air mass in motion.

Upper End of Range
1. Disturbing room air currents.
2. Contaminants of high toxicity.
3. High production, heavy use.
4. Small hood-local control only

[a]From INDUSTRIAL VENTILATION MANUAL by American Conference of Governmental Industrial Hygienists.

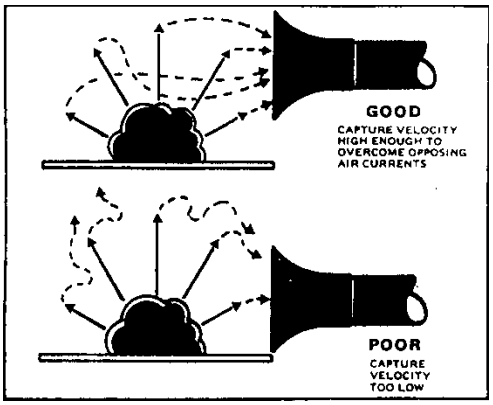

FIGURE 4 – CAPTURE VELOCITY

Collecting contaminants is accomplished by eliminating or minimizing natural air currents at the contaminant site and by pulling the air into the exhaust hood. The airflow velocity must be high enough to overcome any opposing air currents and maintain the capture velocity. See Fig. 4.

Source of air motion to either minimize or use to advantage in hood design:
- Thermal air currents from heat generating operations.
- Machinery motion (conveyor belts, grinders, etc.).
- Material motion (dumping or container filling).
- Operator movements.
- Room air currents (generally 50 fpm [85 m³/hr.] minimum, could be much higher).
- Spot heating, cooling or ventilation equipment near area.

See Fig. 5.

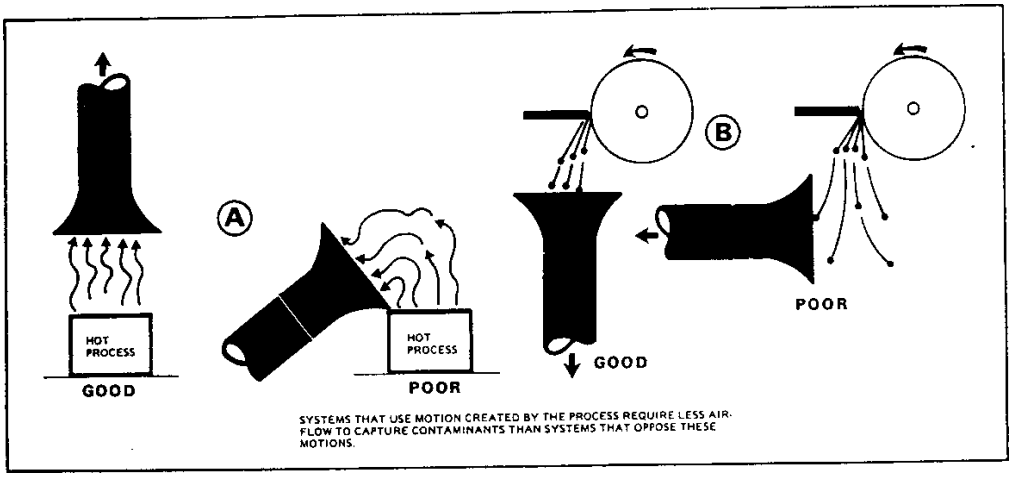

FIGURE 5 – UTILIZING PROCESS MOTION

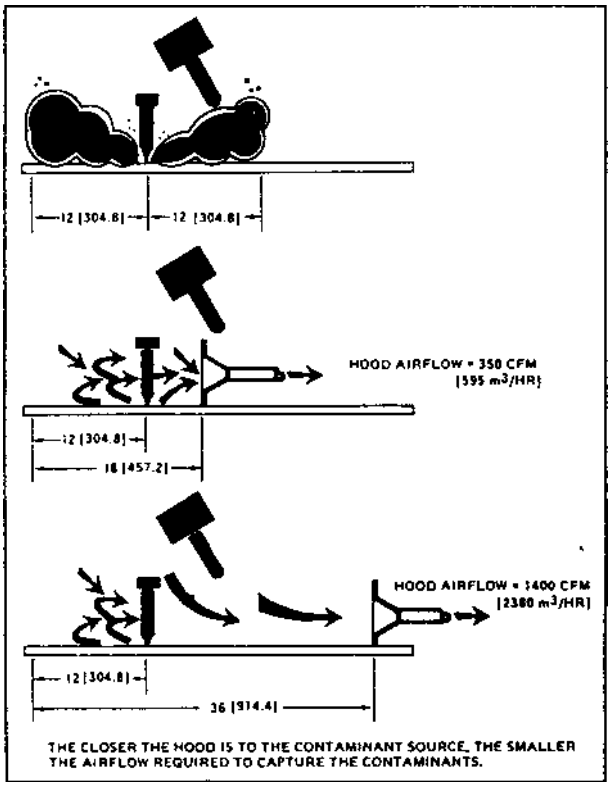

FIGURE 6 – HOOD LOCATION, AIRFLOW NEEDED INCREASES WITH DISTANCE FROM WORK

The airflow needed in a hood design is affected by hood shape, size and location. The hood should be as close as possible and enclose the operation as much as possible.

Suction in a duct opening will draw in air equally from all directions. As distance from the inlet opening increases, the decrease in airflow velocity occurs more quickly. The velocity in feet per minute (fpm) equals the cubic feet per minute (cfm) from Fig. 10 divided by inlet area in feet (0.35 for 8-inch hose).

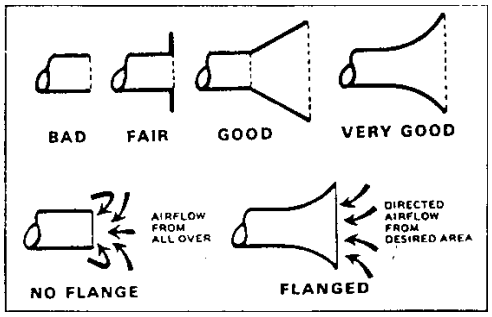

FIGURE 7 – HOOD FLANGES

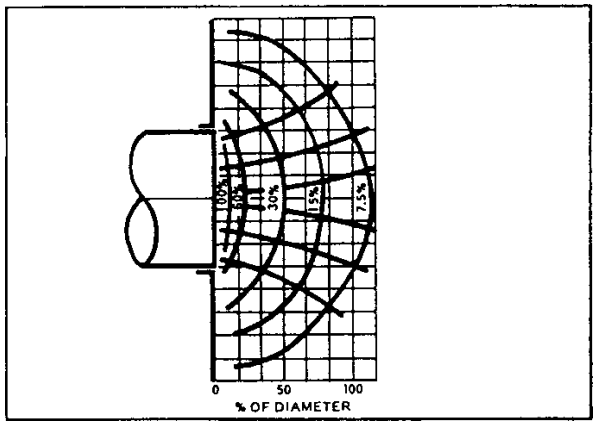

FIGURE 8 – VELOCITY CONTOUR (IN PERCENTAGE OF OPENING VELOCITY) FOR FLANGED CIRCULAR OPENING

When utilizing thermal airflow occurring in a process, exhaust airflow should be greater than the process airflow. This will minimize air spillage at the rim of the hood.

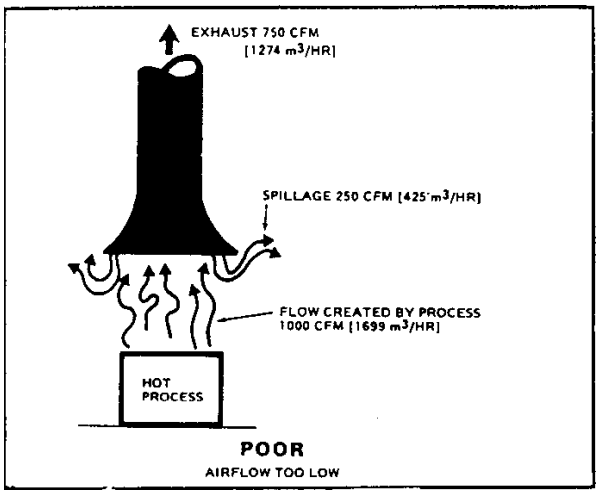

FIGURE 9 – MAINTAIN ADEQUATE AIRFLOW

For further information on ventilation and hood design, refer to a more complete source, such as:

INDUSTRIAL VENTILATION, by American Conference of Governmental Industrial Hygienists, published by Committee on Industrial Ventilation, Lansing, Michigan 48106.

HANDBOOK OF VENTILATION FOR CONTAMINANT CONTROL, by Henry J. McDermott, published by Ann Arbor Science, Box 1425, Ann Arbor, Michigan 48106.

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 the ratings given in the instructions and on the product to make sure the product is suitable for your application.

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

4. After installation is complete, check out product operation as provided in these instructions.

UNPACKING

Check all air cleaner components carefully when unpacking for damage or missing parts. Remove all shipping cardboard. Be sure to inspect all packing materials before discarding them.

- CAUTION -

1. Do not connect the power source until after the air cleaner is mounted. This will prevent electrical shock or equipment damage.

2. Be sure to turn the air cleaner off before servicing it. The air cleaner motor may be equipped with an automatic thermal overload. Should the motor become overheated, it will automatically stop. It will automatically start after a sufficient period of cooling (several minutes to an hour).

3. If the air cleaner must be turned on for an electrical check, be extremely careful in avoiding electrical shock. Also, take care when working near the air cleaner's moving parts.

STAND MOUNTING

Securely place the air cleaner on an appropriate stand or cart and locate as close to the contaminant source as possible. The position should also allow satisfactory distribution of air from the outlet of the air cleaner. If a source capture hood, plenum and hose are used, observe the instructions in PLANNING THE INSTALLATION for selecting a suitable location for the unit.

OVERHEAD MOUNTING

When installing the air cleaner in an overhead location, it is important to select an overhead mounting location for the air cleaner that provides easy access for filter maintenance. Do not place a ladder against the air cleaner when it is mounted overhead in order to gain access to the air cleaner interior.

Be certain that the mounting hardware (not included) from the air cleaner to the ceiling provides adequate strength and stability and that it is securely attached to the overhead structure. Do not fasten the air cleaner to a false ceiling, to plaster or to plasterboard. In some cases, it may be necessary to construct supports that will bear the weight of the air cleaner when it is hung in an overhead location. We recommend using 1 ½" x 1

½" x ⅛" steel angle.

Supports from the air cleaner to the ceiling should be diagonally braced to keep the air cleaner stable when the source capture arm(s) is moved.

The bottom of the air cleaner should be mounted higher than 10' from the floor. A forklift is recommended for installation of the dust collector

ATTACHING THE ARM(S) / DUCT(S)

For units with arms first apply silicone to the flange on the inlet plenum for the arm and bolt the inlet plenum to the air cleaner. Then grease the collar(s) on the arm. Use the enclosed spacers, bolts, and washers to secure the arm to the inlet plenum.

For ducted models, attach the inlet plenum for ducting to the air cleaner and attach your ductwork.

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 1" 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

- CAUTION -

This procedure should be attempted only by persons qualified to install electrical wiring.

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

The electronic timer box requires 115 Vac for operation. An ON/OFF switch should also be installed and three wires run from the electronic timer box to the solenoid valves, one common run to the neutral inside the electronic timer box, and 1 from each of 2 of the 4 outputs inside the box. (Note: not all 4 outputs are used; you can use the first two outputs, or for doubling the maximum offline, use outputs 1 and 3. The program jumper adjusts the number of outputs used. See Fig. 12.) The diaphragm valves wire connections are located in a 2" x 4" electrical box mounted on the side of the blower compartment. Do not connect anything to terminals A, B and C inside the electronic timer box. The electronic timer box should be mounted where it will be convenient to access.

The blower motor requires either a 208-240 or 440-480 Vac, three phase line for operation. The blower motor has automatic overload protection so there is no need for additional thermal overload protection. There is on/off switch and potentiometer speed control on the air cleaner to control the fan. The blower motor wire connections are located in a 4"x4" electrical box mounted on the side of the blower compartment.

CHECKOUT AND OPERATION

CHECKOUT

Before operating the air cleaner, check out the installation using the following procedures:

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

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

3. Double check the air line connections and the air fittings in the control box and on the unit.

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

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. The settings within the timer box have been preset at the factory. The OFF timer controls the length of time between pulses and the ON timer controls the duration of the pulse. The OFF timer can be adjusted for up to 16 hours of operation between pulses.

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.

4. Close the door of the control box and tighten all door clamps.

5. Turn the power to the blower and turn potentiometer handle clockwise. Select desired speed rotating the handle.

6. 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.

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

SERVICE

- CAUTION -

Always disconnect the power to the air cleaner before working on or near the air cleaner.

Do not place a ladder against the air cleaner when it is mounted in an overhead position. A lift platform should be used to gain access to the air cleaner for filter removal and servicing.

The air cleaner was designed to support only the weight of the internal components; motor, blower, and filters. Do not climb in or on the air cleaner. Failure to heed this warning could result in damage to the air cleaner or bodily injury

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 supplied and that the air valves are opening and closing properly. It is also advisable to check that the collected material is flowing freely into the dust drawer.

DUST DRAWER MAINTENANCE
Do NOT use the dust drawer 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 dust drawer, it will get redeposited on the filters and shorten their life.

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

FILTER MAINTENANCE AND SERVICE
Pressure 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 filter life.

FILTER REPLACEMENT
Note: Remove ALL Filters before installing the new filters.

1. Shut off the electrical power to the blower and the reverse pulse controller.

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.

EXTENDING CARTRIDGE LIFE
Note: Do NOT reuse damaged filters because filtering efficiency will be compromised.

1. Cartridge life can be extended by manually blowing out the cartridge filters

2. To manually clean the filters, remove the filters from the AQE 4000 and blow the dust off using a handheld blow gun attached to a shop air line. Air flow should be directed from the inside of the cartridge to the outside of the cartridge.

TROUBLESHOOTING

A) CLEANING CYCLE WILL NOT START OR WILL NOT REPEAT

1. Open the electronic pulse controller. Adjust the OFF time of the electronic timer. Turning the OFF time counter-clockwise will shorten the length of time between pulses. Turn the power to the electronic pulse controller on. The first LED light should flash and the unit should pulse. A few minutes after this (with the OFF timer turned fully counter-clockwise) the second LED should flash and the unit should pulse again. If the LED lights do not flash, see if the line input fuse is intact and be sure the board is receiving power. If the fuse is bad, replace it. Do not replace the fuse with a larger capacity fuse. Damage to the circuit board will result.

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

3. If the electrical circuit checks out but a diaphragm valve is still not functioning, the problem is with the diaphragm valve or the solenoid on the diaphragm valve. Turn the power to the control box off. If the valve is continuously releasing air open the diaphragm valve and look for cracks in the diaphragm. If a crack or leak that cannot be repaired is found, the valve must be replaced. If no leak is found, go to #4.

4. If a closed valve will not open, then depressurize the air reservoir. Remove the four screws holding the main body of the solenoid valve together. Inspect the internal parts for operation. If dirt is the problem, clean the parts and reassemble. If the internal parts of the diaphragm valve are excessively worn or not smoothly operating a diaphragm rebuild kit will need to be ordered or the diaphragm valve will need to be replaced.

B) INSUFFICIENT AIR FLOW

1. Increase the fan speed by rotating the potentiometer handle.

2. Make sure that the arms or ducts are mounted tightly to the unit and that there is no leakage between the unit and arms or ducts.

3. Make sure that the fan exhaust grille is not blocked. Fan exhaust grille should be free of debris.

4. Make sure that the filter cartridge themselves are not too plugged with particulate. If they appear to be plugged, confirm that the units are pulsing properly and that the air pressure in the air reservoir is between 90-105 psi.

5. Check the dust drawer to confirm that it is not overflowing.

6. Make sure there is no blockage in the arms or ducts.

7. Confirm the dust drawer is securely attached and the gaskets are intact.

C) EXCESSIVE DUST DISCHARGING OUT OF EXHAUST

Note: It is normal for a small amount of dust to exit the air cleaner while reverse pulsing.

1. Make sure that all 4 filter cartridges are properly installed and that the gaskets on the filter cartridges are intact.

2. Confirm the filter cartridges are not dented, deformed or otherwise damaged.

3. Confirm that the access covers are securely attached.

ELECTRICAL SCHEMATICS

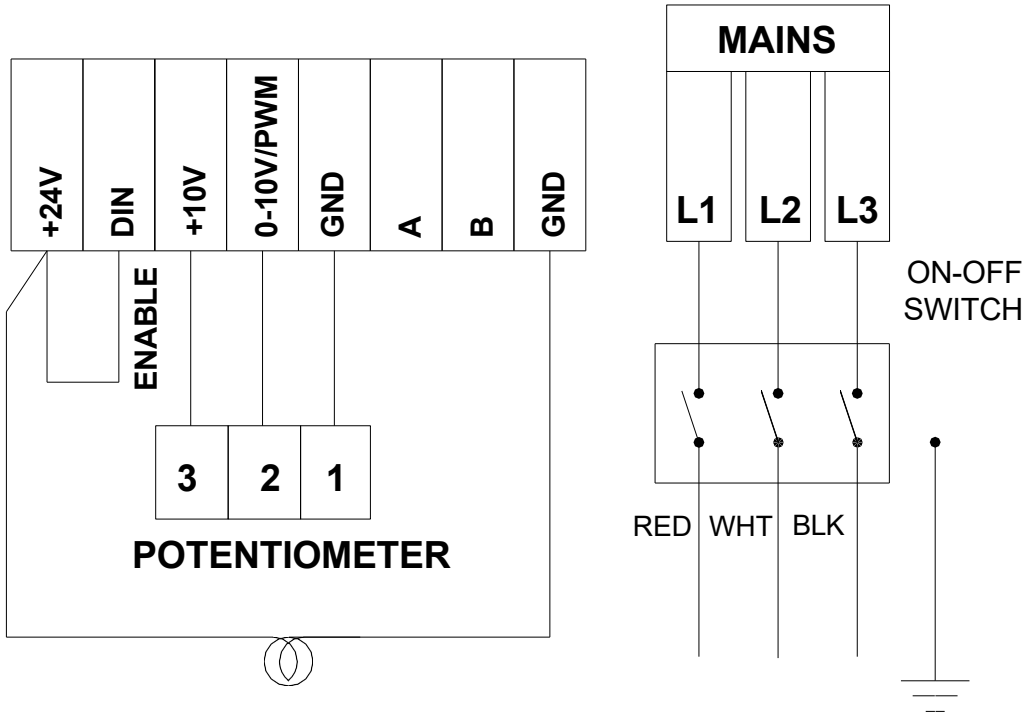

FIGURE 10 - BLOWER SCHEMATIC

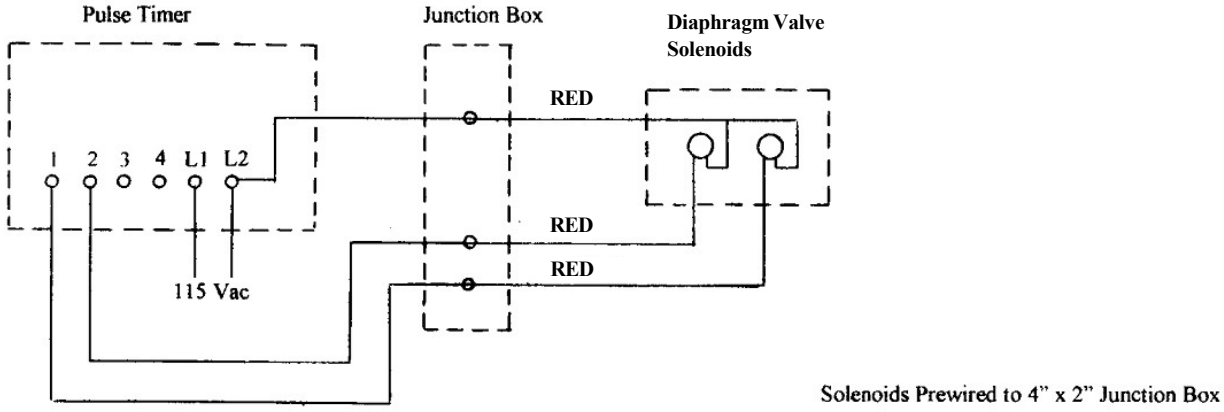

FIGURE 11 - ELECTRONIC PULSE TIMER / SOLENOID SCHEMATIC

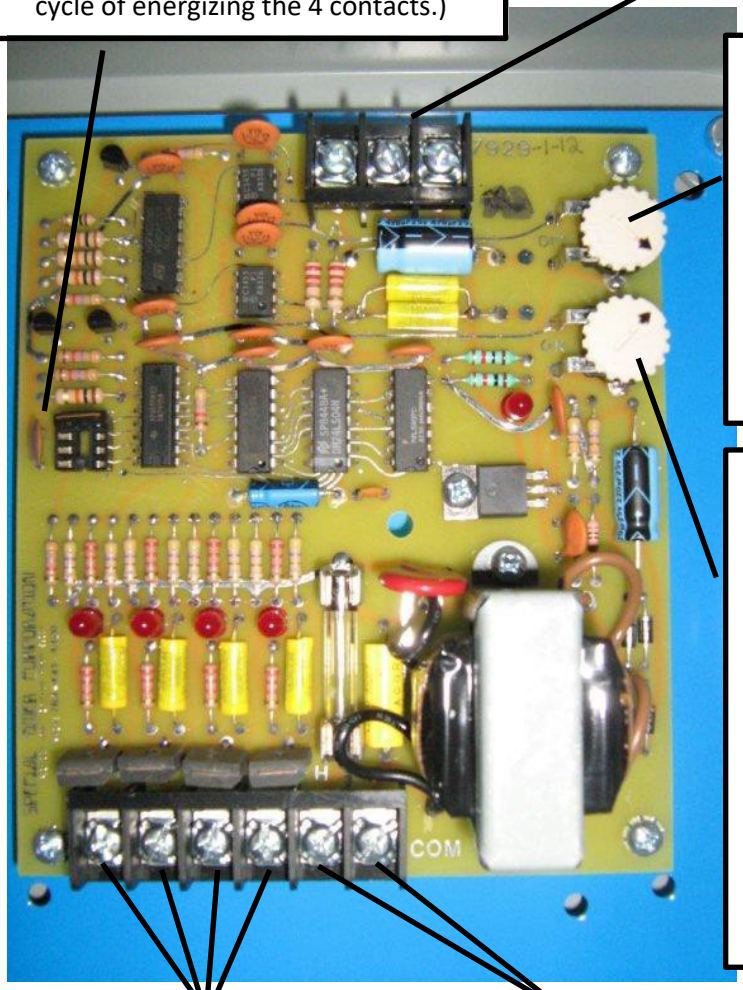

FIGURE 12 - ELECTRONIC PULSE TIMER CIRCUIT BOARD

PARTS LIST

NO.	DESCRIPTION	PART NO.
1	Impeller Industrial EC 3 Phase	40086
2	Potentiometer for EC Impeller	10347
3	Optional Photohelic Control Board	10268
3	Pressure Module for 10268	10269
4	Standard Electronic Timer Circuit Board	10255
5	Diaphragm Valve with Built in Solenoid (2 required per AQE 4000)	10353
6	Cellulose blended Cartridge with 275 sq. ft. of filter media (4 per machine)	41115
7	Flame Retardant Cartridge Filter with 275 sq. ft of filter media	41116
8	HO Treated Polyester Cartridge	41213
9	On/Off Switch	10350

CERTIFICATE OF WARRANTY

THREE-YEAR LIMITED WARRANTY

Air Quality Engineering, Inc. (AQE), warrants to the original purchaser, subject to the conditions below, that ifthe "Product" covered by this warranty should fail to perform by reason of improper workmanship or material, AQE will during the period of three (3) years from the date of original purchase either (i) replace the product or (ii) provide all necessary parts to repair the product without charge. The decision to replace the product or the necessaryparts shall rest solely with AQE. This three-year limited warranty does not apply to main filter elements. AQE will replace without charge the main filter elements during the period of thirty (30) days from the date of original purchase if the main filter elements fail to perform by reason of improper workmanship or material. This warranty is valid only under the following conditions:

CONDITIONS

1. REGISTRATION: The purchaser's completion and mailing of the Registration Card to Air Quality Engineering, Inc., 7140 Northland Drive North, Minneapolis, Minnesota 55428-1520 within 30 days of original purchase.

2. AUTHORIZATION: The purchaser will contact AQE at (800) 328-0787 for authorization, returned goodsnumber (RGA) and the shipping address. AQE will direct the purchaser to either return the necessary parts orthe product at AQE's option.

3. PROPER DELIVERY: The shipping, freight prepaid or delivery of the parts or the product to AQE in either its original carton or in a carton assuring similar protection of the product with the returned goods number (RGA) clearly displayed on the outside of the carton.

4. UNAUTHORIZED REPAIR: A showing by the original purchaser that the product has not been altered, repaired or serviced by anyone other than an authorized service technician using genuine AQE parts.

5. UNAUTHORIZED PARTS: A showing by the original purchaser that the product has had only genuine AQE parts and filters used in its operation and maintenance.

6. SERIAL NUMBER INTACT: A showing by the original purchaser that the serial number has not been altered or removed.

7. MISUSE: A showing by the original purchaser that the product has not been involved in an accident, freight damaged, misused, abused or operated contrary to the instructions contained in the Owner's Manual.

Air Quality Engineering, Inc.'s, sole responsibility shall be to repair or replace the product within the termsstated above. AQE SHALL NOT BE LIABLE FOR ANY CONSEQUENTIAL DAMAGES RESULTING FROM ANY BREACH OF WARRANTY, EXPRESS OR IMPLIED, APPLICABLE TO THIS PRODUCT. Some states do not allow the exclusion or limitation of consequential damages so this limitation may not apply to you.

THIS WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, AND THE WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE HEREBY EXCLUDED BEYOND THE THREE-YEAR DURATION OF THIS WARRANTY. Some states do not allow limitations on how long animplied warranty lasts so the above limitation may not apply to you.

This warranty gives you specific legal rights and you may also have other rights that vary from state to state.

AIR QUALITY ENGINEERING, INC.
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BROOKLYN PARK, MINNESOTA 55428-1520

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