
OPERATING AND INSTRUCTION MANUAL

PULSATRON UNIT



*****IMPORTANT*****

THIS MANUAL CONTAINS PRECAUTIONARY STATEMENTS RELATING TO WORKER SAFETY. READ AND SAVE THIS MANUAL COMPLETELY AND COMPLY AS DIRECTED. ALL THE POTENTIAL HAZARDS OF DUST AND MIST CONTROL SYSTEMS AND EQUIPMENT ARE IMPOSSIBLE TO LIST; THEREFORE, OBTAIN THE SERVICES OF A PROFESSIONAL INSTALLER. A FIRE PROTECTION EXPERT SHOULD BE OBTAINED IN THE EVENT THE PRODUCT IS INTENDED FOR USES WHICH PRESENT A POTENTIAL RISK OF FIRE OR FIRE PROPAGATION. REFER TO APPROPRIATE AUTHORITIES, AND DISCUSS YOUR INTENDED USE WITH A LEV-CO REPRESENTANT. WORKERS HANDLING EQUIPMENT OR SYSTEMS SHOULD BE INSTRUCTED TO CONDUCT THEMSELVES IN A SAFE MANNER.



**ALWAYS USE LEV-CO REPLACEMENT PARTS AND FILTERS TO MAINTAIN
WARRANTY.**

TO ORDER SPARE PARTS: CONTACT AS:

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Pickering, ON, CANADA L1W 3X4

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PRINCIPLES OF OPERATION

The **PULSATRON** combines the high efficiency of an air filter with the self-cleaning engineering used in continuous process dust collectors. The result is a low maintenance, high-efficiency filtration system for collection of dust and fumes.

High efficiency air filter grade media is pleated in a round cartridge and is cleaned by sequential pulses of compressed air, allowing continuous collection of dust and fumes without continuous maintenance.

The round filter cartridges are mounted against a tube sheet which separates the dirty air chamber from the clean air plenum. Each cartridge has a jet tube mounted directly above it. Above the jet tube is mounted a blowpipe with air orifice for compressed air flow.

Contaminated air enters the inlet of the unit and is deflected by the baffle plate to reduce the incoming velocity and to drop out larger particles. The remaining particles are collected on the outside of the filter elements. The filtered air passes upward through the cartridge and to the fan.

During cleaning, a short burst of compressed air pressurizes the filter element causing reverse air flow and dislodges the particles which fall into the hopper. Filter elements are cleaned one or several at a time so that the unit remains on the line at all times, thus making it a continuous flow on-line dust collector.

PULSATRON PERFORMANCE CHARACTERISTICS

	Number Of Cartridges	Num. of Diaphragm Valves	Cartridge Media Area (Sq. Ft.)	Compressed Air Usage (SCFM)*	Compressed Air Pressure
PFV- 4	4	4	1100	2	80-100 PSIG
PFV- 6	6	6	1650	3.5	80-100 PSIG
PFV- 8	8	4	2200	5	80-100 PSIG
PFV- 12	12	6	3300	3.5	80-100 PSIG
PFV- 16	16	8	4400	5	80-100 PSIG
PFV- 20	20	10	5500	6	80-100 PSIG
PFV- 24	24	12	6600	7	80-100 PSIG
PFV- 32	32	16	8800	10	80-100 PSIG

*Based on 10-second pulse cycle and 100 PSI.

CAUTION

Owning and operating **PULSATRON** machines involves certain known hazards. With knowledge and training these hazards can be minimized. Our engineers are available to guide you if necessary.

1. **EXPLOSION HAZARD** Venting may be required in some applications. Outside location of some equipment may be required. Consult competent advisers in this regard.
2. **FIRE HAZARD** No sparks should be allowed to enter the machine without a properly installed fire suppression system. **Mixing of combustible** materials should be **avoided**. Personnel should never allow smoking material to enter these machines.
3. **HIGH VOLTAGE** units operate on voltages of 110 to 575 AC volts. All service personnel should be aware of this fact and should have adequate training before any repairs are attempted on the equipment. All repairs are to conform to NEC electrical standards.
4. **PRESSURIZED AIR** Air pressure should be relieved before any repairs are attempted. All repairs are to conform to UBC plumbing standards.
5. **ROTATING MACHINERY** The fan inside this unit is rotating at 1740-3600 rpm. The electrical source should be locked out and the unit allowed to come to a full stop before any entry is made to the fan compartment.

*****WARNING*****

ALL ELECTRICAL WORK SHOULD BE DONE BY LICENSED ELECTRICIAN TO THE
NATIONAL ELECTRICAL CODE AND ALL –PLUMBING SHOULD BE DONE BY
LICENSED PLUMBERS USING THE UNIFORM BUILDING CODE.

INSTALLATION

Mechanical

The PULSATRON is normally shipped by truck and should be checked for damage that may have occurred in route. Any damage should be noted and the carrier notified immediately.

NOTE:

THE PFV-4, PFV-6, PFV-8 AND PFV-12 CAN BE LIFTED BY A FORK LIFT, BY LOCATING THE FORKS UNDER THE CABINET. LARGER UNITS MUST BE LIFTED BY A CRANE OR BY TWO OR MORE FORK LIFTS. ALL UNITS HAVE LIFTING EYES.

The hopper legs and cross braces are shipped loose. The assembly should be through the following procedures:

- 1) Assemble legs, cross braces and horizontal braces together.
- 2) Lift and set cabinet into cradle created by Step 1.
- 3) Apply silicone sealant to bolt flange.
- 4) Lift under cabinet.
- 5) Install bolts and hardware to fasten cabinet and hopper together.

The inlet duct must be of proper size to handle the air volume at proper velocity. The inlet size provided is based on the highest air flow which the unit can handle with a 4000 FPM duct velocity. In most cases, an inlet duct reducer will be required. Installation of a fan damper should be made for throttling air flow into the unit. This will be explained in the "Operation Section" of this Manual.

Once installed on the legs, the hopper outlet should be high enough off the ground to place a 55-gallon barrel or barrels, or appropriate container, for holding collected material.

The hopper is not to be used as a storage device. All units are to have a hopper outlet device of some type (i.e. screw conveyor, rotary air lock) or drum connector, to allow collected material to be removed from the unit continuously during operation.

Installation (contd.)

Mechanical (contd.)

Compressed Air

***** COMPRESSED AIR SHOULD BE 90-100 PSI *****

The compressed air tank has 3/4" NPT inlet connections, one at each end for convenience. One end is to be used for air inlet. The other end should have attached to it a hand-operated valve to allow checking for water in air tank. A minimum 1/2" I.D. compressed air line is required. An air valve, bleed type regulator, gauge, filter, and dryer should be installed in the air supply near the unit for convenient shutdown and service of the unit.

For most applications, a Dayton 2Z321 Regulator and 2Z764 Dryer can be used. For areas with high humidity, refrigeration-type dryers should be used. It is recommended that a tee of at least 2 to 3" dia. with a pipe at least 3' long be installed on the inlet air with a valve at the bottom to allow water to accumulate and then drain from the system.

IMPORTANT: ANY OIL OR MOISTURE IN THE COMPRESSED AIR WILL EVENTUALLY GET TO THE CARTRIDGE, SATURATING THE MEDIA, GENERALLY REDUCING CARTRIDGE LIFE.

Pressure Gauge

A Magnahelic Gauge has been shipped with your PULSATRON unit. Connection to the unit should be at the pressure taps provided. Use aluminum or copper tubing, or hose for connection.

Connect the tap located in the clean-air plenum to the low pressure connection on the Magnahelic. Connect the tap in the dirty-air plenum to the high pressure connection on the Magnahelic.

Electrical

Blower

Refer to the Wiring Diagram for connection of any blower/motor controls.

Controls

The PULSATRON Cartridge Unit is equipped with a solid-state control which actuates 120 VAC solenoid valves at 24.9 watts each. Power (120 VAC - 50/60 Hz - 1 phase) is supplied to TB1-2 (Neutral) and TB1-3 (Hot).

INSTALLATION (contd.)

Controls (contd.)

**NOTE: THE NEUTRAL OF THE INPUT POWER MUST BE TO TB1-2.
ANY OTHER CONNECTION WILL VOID THE TIMER WARRANTY.**

Locate the control panel anywhere that offer easy access (preferably inside).

Connection of wiring between the control box and the collector should be made through water-tight conduit. As always, follow the National Electrical Code and your local electrical ordinances.

A step-down transformer is available as an option to provide 115 V with 230/460 V input.

Cartridge Installation

Installation of a cartridge is as follows:

- 1) Place the cartridge support in the horizontal position with the cartridge support plate in a position to rest the cartridge on.
- 2) Place the support into the impression in the bottom of the cartridge. Rotate cartridge 2 turns counter-clockwise to lengthen and tighten support.
- 3) Grasp the handle, and move into a vertical position, while guiding the top of the cartridge into the cartridge guides mounted on the tube sheet.

The handle should not require a great amount of force to bring to the vertical position. If it does, then adjustment is necessary. This can be done by simply turning the plate clockwise.

If the cartridge is too loose, then rotate the plate counterclockwise.

Proper adjustment of the cartridge is accomplished when the cartridge gasket compressed about 1/8". This can be checked by grasping an installed cartridge and trying to twist it. If it moves, it is too loose.

OPERATION

When the unit has been turned on, the cartridges begin to go to work cleaning the incoming air, and as dust begins to load onto the media, the cartridge becomes more efficient.

SPECIAL NOTE:

ALL CARTRIDGES MUST BE PRELOADED WITH DIATOMACEOUS EARTH OR NEUTROLITE BEFORE UNIT IS PUT INTO OPERATION. THIS IS DONE BY ADJUSTING THE CUSTOMER-FURNISHED DAMPER BEHIND THE BLOWER TO THE JOINT WHERE THE CFM IS WHAT IS RATED FOR THE APPLICATION. THEN DIATOMACEOUS EARTH IS FED IN AT 2# PER CARTRIDGE THE PRESSURE DROP ACROSS THE TUBE SHEET WILL INCREASE TO PROBABLY OVER 2" PRESSURE DROP ACROSS THE TUBE SHEET. THE SELF CLEANING SYSTEM SHOULD THEN CLEAN DOWN TO APPROXIMATELY 2". THE DAMPERS SHOULD BE READJUSTED TO PROPER DESIGN CFM. FROM THIS POINT FORWARD, THE SELF-CLEANING SYSTEM SHOULD NEVER CLEAN THE TUBE SHEET BELOW 2" PRESSURE DROP ACROSS THE TUBE SHEET.

At a factory pre-set interval (20 sec. to 2 minutes), the pulse timer is cycled on and compressed air is dumped into the cartridges, dislodging the dirt by back-flushing. The agglomerated dirt particles or chunks then fall into the hopper.

Two adjustments are provided on the solid state timer.

"ON TIME"--This is the time interval that the pulse valve is actually open, admitting compressed air to the filter. A setting of 100 milliseconds causes the solenoid valve to open for 100 milliseconds, which in turn pneumatically opens the diaphragm valve on the compressed air tank for 100 milliseconds. This is normally set at 170 milliseconds

"OFF TIME"--This is the time in between pulses, usually 20 sec. to 2 minutes.

At the end of the adjustment "Off Time" setting, #1 solenoid valve is energized ("On Time"). The control then steps to #2 solenoid, and continues until the last solenoid as indicated by the program jumper is energized. The control goes back to solenoid #1, and repeats on a continuous basis.

The "ON TIME" is factory-set at 170 milliseconds. The "OFF TIME" is factory-set at 20 sec. to 2 minutes.

More frequent filter cleaning can be obtained by reducing the "Off Time."

Operation (contd.)

Increasing the "On Time" on the timer board normally does not improve the filter cleaning.

On occasion, a pressure switch may be used to cycle the pulse timer on and off. This is to provide a less frequent pulse cleaning cycle due to light dust loading, varying dust volumes, or intermittent use.

Cleaning cycles should occur only after there has been a 1.5 to 2.0 static pressure increase in pressure drop across the tube sheet (as read on the Magnahelic Gauge) from the last clean cycle.

"OFF TIME" range on standard unit is adjustable from 2 seconds to 2 minutes. An increase or decrease of "OFF TIME" can be achieved by rotating the of time pot.

Under normal operation, pressure drop should stabilize in the 1.5" to 3" W. G. range. If the pressure drop continues above 3", more frequent cleaning is needed. If the pressure drop goes below 1.5", reduced cleaning is indicated; increase "OFF TIME."

"Off Time" can be reduced to 2 seconds if necessary for adequate cleaning, provided there is sufficient compressed air supply to maintain 80 PSI at the compressed air tank.

Operation (contd.)

If insufficient compressed air is available to maintain 80 PSI at compressed air tank, then "OFF TIME" can be increased by rotating pot clockwise, thus allowing for time between pulses for recovery. This will increase filter life but may increase the pressure drop across the cartridges. Pressure drop, in a few cases, has run as high as 9" but generally should never exceed 5-6". Increasing time between pulses will help conserve compressed air.

A pressure switch is available as an option, and has a range of adjustment up to 5" W.G. An initial set point of 3" is recommended. When the pressure drop across the tube sheet reaches the set point, the switch energizes the solid state control causing filters to be cleaned. When the pressure drop then falls below the set point, control is de-energized and pulse cleaning stops.

Blower Wiring and Installation

IF THE FAN COMPONENT HAS BEEN OPENED, BE CERTAIN THAT IT IS CLEAN BEFORE OPERATING THE UNIT. FLYING OBJECTS WILL RESULT.

The following applies whether the blower is supplied by the factory or others.

If blower is provided, follow all local electrical and safety codes, as well as the National Electric Code (NEC) and the Occupational Safety and Health Act (OSHA).

The blower should not be connected through the pulse control in any way.

When installing blower switching and control devices, a disconnect switch should always be provided at the collector. This is provided so the unit cannot be started while service is being done on the dust collector or blower.

Blowers should always have a downstream damper to adjust initial velocity so that the filter design velocity is not exceeded.

- 1) Perform the following to start the unit: With air supplied to the air tank, adjust pressure to a minimum of 80 PSI.
- 2) Turn the pulse control ON. Make certain that all valves are opening or pulsing.

OPERATION (contd.)

Blower Wiring and Installation (Contd.)

- 3) Turn the blower ON.*
- 4) Check motor current. If motor is over-current, and the air flow is above the design air flow, the blower speed must be reduced, or the inlet damper needs to be closed. Initial filter pressure drop as read on the Magnahelic Gauge will be low for new filters at about 1.00" W.G. Operating pressure drop should average 2-5 inches for most applications.

*If this is a new installation start-up, air flow measurements must be made to assure that there is not too much air moving into the collector. Too much air will exceed the design filter velocity, and impingement of the cartridges will take place. Refer to special note under operation.

Consult your local representative or the factory if the design filter velocity ratio is not known. It will generally run between 1 and 2 FPM.

TROUBLESHOOTING

The **PULSATRON** should give many years of trouble-free service. But, as with all mechanical equipment, breakdowns will occur. This will be noticed because air flow and suction are reduced, or there is a puffing from the exhaust of the blower during the cleaning operation.

If the air flow or suction is too low, first check the Magnahelic Gauge for pressure drop across the cartridges. If there is no pressure drop, then the blower is not on or running backwards, or there is a restriction in the duct system.

If the pressure drop, as read on the Magnahelic Gauge, is high, then increased cleaning needed. Rotate OFF TIME control counterclockwise. If pressure drop does not come back down under continuous pulsing, several steps should be taken:

- 1) Verify that compressed air pulse is reaching the filters. First check the compressed air pressure gauge. Gauge should drop at least 15 PSI each time the unit pulses, i.e. from 80 PSI to 65 PSI. If not, check controls--115 V power input, solenoid valves properly wired, and tubing from solenoid valves to diaphragm valves properly connected. Check output of solid state control output is 115 V, when unit is operating.

If pulse is operating properly, but pressure drop is too high, proceed to Step 2.

- 2) Turn off blower. Turn on control, and pulse unit through at least six complete cleaning cycles. This can be accomplished quickly by rotating the TIME OFF control counterclockwise. Make certain that the air tank recovers between pulses.

If pressure drop has been reduced to 3" or less, after pulsing with the fan off, then unit is handling more CFM than the application will allow (filter velocity too high). Throttle blower and check air flow consult your local representative or the factory.

If pressure drop does not come down appreciably, filters are not cleaning due to either moisture, oil or impingement.

IF MAGNEHELIC READING IS STEADILY INDICATING +4, REPLACE FILTERS

Troubleshooting (cont)

Remove and inspect filters for signs of moisture. Moisture in the compressed air can cause the filter to plug with moist dust which will not pulse clean as designed. Remove several filters and blow off from the inside with compressed air hose to inspect for moisture stains on the filter media. Blow cartridges off **FROM INSIDE TO OUTSIDE**, to avoid further plugging of filter. A compressed air dryer is required. Bleed the compressed air tank on the **Pulsatron** to check for a buildup of condensation.

Damp filters may possibly be salvaged by allowing them to dry out and then blown out with a compressed air nozzle from the inside of the filter.

Heavy puffing at the blower exhaust during the pulse cycle normally indicates a loose or torn cartridge requiring replacement.

Torn cartridges and a bad seal are easily found in one of two methods:

Method 1 - Remove the cartridges, and inspect the inside surfaces. Broken or torn media is represented by a dirt buildup inside the cartridge opposite the tear.

Poor tube sheet seal is seen with a buildup of dirt opposite the leak around the end cap of the cartridge.

Method 2 - For "S" Series Units - Remove the inspection panel and observe where a dirt buildup may be occurring on the roof. Then go to that cartridge and inspect it in the same manner mentioned above.

SERVICE

Cartridge Replacement

"PFV" Series Units:

The cartridges are changed by:

- 1) Opening the access door.
- 2) Slowly move the square tube handle up, releasing the cartridge.
- 3) Place a plastic bag over the cartridge.
- 4) Pull cartridge toward the access door.
- 5) Grasp plastic bag around bottom of cartridge, and tie bag with tie-wrap.
- 6) Remove cartridge.
- 7) Continue as above with the remaining cartridges.
- 8) Clean the tube sheet, dirty air plenum, and hopper of built up, caked-on dirt.
- 9) Install clean cartridges, starting with last one first.
- 10) Install the cartridge as described in the Installation Section.

NOTE: BE SURE THAT THE GASKET ON TOP OF THE CARTRIDGE MAKES A POSITIVE SEAL AFTER INSTALLATION.

After replacement of the cartridges, the unit may puff during start-up. This is normal and should last for 3-5 minutes. The seasoning procedure in special note under operation should be repeated on new cartridges.

Service (contd.)

Normal Maintenance

NOTE: SHUT OFF COMPRESSED AIR SUPPLY BEFORE SERVICING ANY AIR CIRCUITS.

The diaphragm valves are serviced by removing the cover bolts and replacing the diaphragm. The solenoid valves are not repaired. The complete valve must be replaced.

Failure of the diaphragm valve will cause a continuous release of compressed air. A failed solenoid coil will prevent compressed air from flowing to the filters. A pinched or stopped up tube leading to the solenoid will also cause the diaphragm not to allow air flow.

Check hopper periodically to insure that material is not bridging or sticking, causing the hopper to fill up. Check blower, V-belts, and fan bearings periodically. Refer to Instructions on Blower for service. Normally, blower bearings are greased once a year with Texaco Molytex #2 Grease, or equal.

Inspect filters at least once a year for evidence of poor cleaning action and holes in media. Dust on the inside of the cartridge indicates either failure of the media or a bad seal between the cartridge and tube sheet.

PARTS LIST - ALL UNITS - PULSATRON

REPLACEMENT PARTS

ITEM DESCRIPTION	PART NUMBER
Filter Cartridge (V-Series)	FLCA3OCCLFF
Solid State Control 7929 (For V-4)	EPCB04P
Solid State Control 7937 (For V-6, V-8)	EPCB1OP
Solenoid Valve Complete VASO1	VASO1
(V-Series)	
Diaphragm Valve (V-Series)	VAD1.75
Diaphragm Valve Repair Kit (V-Series)	VAD1.75RK
