



# **SILOVENT**

REVERSE PULSE DUST COLLECTOR

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## **OPERATION AND MAINTENANCE MANUAL**



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## 01. INTRODUCTION

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Thank you for purchasing a Clyde-Apac Silo-Vent Dust Collector from AES Environmental. Clyde-Apac has designed and manufactured its Silo-Vent Dust Collectors for over 40 years.

With successful installations throughout Australasia and servicing all types of product mix. Clyde-Apac's standard range of Silo-Vents are well suited for the market place however, if required our skilled engineers can produce a design for any application that you are after.



## 02. DESCRIPTION

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Clyde-Apac Reverse Pulse Dust Collector incorporates a computer designed continuous cleaning system for the removal of dust or fumes from industrial gas streams.

1. The Dust Collector is divided by a cell plate into two compartments: the clean air chamber and the dirty air chamber.
2. The filter elements are retained in the cell plate by a double RF Snaptex Seal in bag system or wing nuts in cartridge system. The filter elements can be installed and removed without tools.
3. The contaminated air passes through the filter elements leaving dust particles on the filtration surface. These particles build up into a permeable filter cake, the degree of permeability being dependent on the characteristics of the dust.
4. The Reverse Pulse system is a fully automatic cleaning system where a short pulse of high pressure air combined with an induced secondary air flow, inflates the filter elements and causes the dust to be released from the filter elements.
5. As the dust cake builds up on the filter elements, the pressure differential increases and causes a reduction of air flow.
6. In order to control the increase in resistance, a solid-state timer signals a solenoid to operate a diaphragm valve releasing compressed air from a reservoir into the blow tubes then down into the filter elements.
7. The filter elements that are pulsed are only a fraction of the total filtration area and are off line for about 200 milliseconds. This enables the collector to run continuously on line.
8. The pressure drop across the filter bags is normally monitored by a Manometer or Magnahelic Gauge. The pressure drop is a direct indication of the resistance across the clean to dirty side of the filter elements.



### 03. SEQUENTIAL TIMER

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The timer is a solid-state sequencer designed to provide an adjustable duration pulse to output channels in a continuous cycle. The time interval between pulse output and pulse duration is set by the DWELL TIME and PULSE TIME.

#### SPECIFICATIONS

<b>Input Voltage</b>	<b>85 to 240 VAC - 50-60 Hz</b>
<b>Dwell Time</b>	<b>1-180 seconds</b>
<b>Pulse Time</b>	<b>50-500 milliseconds</b>
<b>Operating Temperature</b>	<b>-15°C-60°C</b>
<b>Output</b>	<b>2 Amp at 110-240 VAC</b>



## 04. FILTER ELEMENT INSTALLATION

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Clyde-Apac Reverse Pulse Dust Collector is designed for tool free filter element changing. Start the filter element installation furthest away from the access ladder or door, then working back towards the ladder.



**Before working on any Silo-Vent Dust Collector ensure that it is isolated electrically and compressed air is turned off. Eliminate any ignition sources and use appropriate safety equipment. Please follow proper procedures for working from heights before opening the lid.**

### 1. Filter Bag

Take hold of RF Snaptex Seal on the open end of the filter bag and deform it into a kidney shape. Carefully pass the filter bag through the hole in the cell plate without damaging the filtration surface. If you are installing Armourtex or PTFE Laminate filter bags, we would recommend the use of installation sleeves. Insert the RF Snaptex Seal into the cell plate with the cell plate between the two felt seals.

Slowly release the seal ensuring the cell plate is central between the felt rings. The filter bags should be installed with all the side seams of the filter bags facing the same direction. When the seal is released, it should snap into the cell plate; sometimes it may need a gentle push. Do not force or hammer the snap band into position.

If the snap band is difficult to install, start installation of the filter bag again, 180° from where you started the first time. This will allow a slight compression of the felt and should enable easier fitting.

The filter cage is then gently fed through the opening of the filter bag until it sits on the cell plate and hangs vertically in the housing without touching any other filter bags.

### 2. Cartridge Installation

Place the gasket into a groove on the open-end cap of the cartridge. Carefully pass the cartridge through the hole in the cell plate without damaging the filtration surface. Rotate the cartridge slightly and lock the cartridge in position, then tighten the wing nuts by hand.

Never install a half set of new filter bags with a half set of old or dirty filter bags. Air finds its path of least resistance and will blind off the new filter bags very quickly (sometimes in a matter of hours).



## 05. FILTER ELEMENT REMOVAL

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We consider all dust as a health risk and recommend that correct PPE is used with additional safety equipment ie. protective breathing apparatus and safety clothing to be used when changing the filter elements.



**Before working on any Silo-Vent Dust Collector ensure that it is isolated electrically and compressed air is turned off. Eliminate any ignition sources and use appropriate safety equipment. Please follow proper procedures for working from heights before opening the lid.**

### 1. Isolate Electricals and Air

Ensure all electricals and pneumatics have been isolated, tagged and locked as per the companies isolation procedures before commencement of any maintenance.

### 2. Filter Bag

When the filter bags need replacing due to emissions or high pressure drop, lift the top lids (please follow proper procedures for working from heights before opening the lid.) The cages can then be removed and put off to one side. The filter bags can then be taken out by "breaking the back" off the RF Snaftex Seal. This can be done by hand or a sharp kick with the toe of a work boot. The filter bags can be removed by pulling out through the cell plate into a plastic rubbish bag or, if the collector is fitted with an access door, dropping the filter bags into the bottom of the hopper where they can be removed into waste bins or rubbish bags.

### 3. Cartridge Removal

When the cartridges need replacing or washing due to emissions or high pressure drop, lift the top lid and loosen the wing nuts that hold the cartridges in position. Rotate the cartridges slightly and the cartridge can then be taken out. Ensure the cell plate is cleaned; wire brush and vacuum, if necessary, before installation of new filter bags.



## 06. FILTER CAGES

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1. Clyde-Apac cages are made from 4mm wire and welded to a solid cap and a Clyde-Apac induction collar on the other open end.
2. Although these cages are extremely robust, we recommend that they be checked for broken welds and that the installer should run his hands over the cages to ensure there is no roughness, rust or buildup of product. Roughness on the cages will cause premature filter bag failure.
3. Broken welds must be repaired as they are a major cause of filter bag failure. Any rust or roughness should be sanded or ground smooth before the cages are reinstalled.

## 07. FILTER ELEMENTS

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In a Clyde-Apac Silo-Vent Dust Collector, operating under normal conditions, we would expect the filter elements to last approximately two years.

In some applications, filter element life has been as long as five or six years. There are, however, many variables that determine element life.

To ensure long filter element life we would recommend the pressure drop across the filters should be kept below 150mm water gauge in filter bag or 100mm water gauge (in cartridge). This will also maintain high flows without damaging the filter material.

We recommend a weekly log be kept of the pressure differential; this enables a filter element life history and operating profile to be established. This is extremely important in determining the cause of any excursions from normal operating conditions.

Should you consider changing from the filter media originally supplied, it is recommended that you consult Clyde-Apac first.



## 08. SHUT DOWNS

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At shut down or at the end of a run, especially when Silo-Vent Dust Collectors are running intermittently, they should be wired up to the fan so that when the fan is turned off it continues to pulse down for five to ten minutes.

This removes any residual dust cake and prevents the cake being affected by moisture or humidity, giving longer life and higher air flow.

For prolonged shut down periods, or when filter elements are handling hygroscopic dusts, they should be removed, vacuumed and stored to prevent the cake from setting.

## 09. COMPRESSED AIR AND TIMER

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The reservoir should be connected to the compressed air with at least a 20mm diameter pipe. A line filter should be installed to ensure removal of water and oil from the supply. This should be fitted as close to the reservoir as is possible and should not be smaller than the diameter of the pipe.

In sensitive process areas, air driers are often used.

For an effective pulse, a constant supply of clean, dry compressed air is required at 700 kPa with a minimum of 450 kPa being maintained after each pulse.

The pulse system is factory set and should not be adjusted without discussion with Clyde-Apac.

The pulse setting, however, is adjustable on the timer card and can be set by:

**DWELL TIME SCREW:** Intervals between pulses normally up to 40 second cycle time.

**PULSE TIME SCREW:** The pulse duration should be set to create a short sharp pulse, 0.04~0.1 seconds.



## 10. START UP

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After final checks of:

1. electrical connections and voltage supply,
2. compressed air supply,
3. fan direction,

the collector is ready for commissioning.

In some hygienic collectors, there may be a requirement to test the filter elements and seals for leaks with fluorescent tracer powder before introduction of product.

During start-up with clean filter elements, there will be very little resistance across the collector until a dust cake builds up. This could cause the fan motor to overload so we would recommend throttling the fan air flow.

This reduction of air flow is also good policy in that takes the pressure off the clean filter elements and allows the dust cake to build up gradually at or below the designed filter velocity.

Running at half the designed air flow for the first few hours will help prevent high speed fine particles being forced into the filtration material, which could tend to blind this material off.

## 11. MAINTENANCE

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The simplicity of Clyde-Apac's Silo-Vent ensures minimum maintenance.

The dust collector can be monitored easily and effectively with a Manometer or Magnahelic Gauge, but we must emphasise that the connection tubes must be free of dust when taking readings.

The clean air chamber should be thoroughly clean, particularly in operation, to prevent dust being pulsed down into other filter bags.



## 12. WARRANTY AND REPLACEMENT PARTS

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### WARRANTY

This Silo-Vent Dust Collector is protected by a Two (2) year warranty covering all materials, components and workmanship.

To maintain this warranty, contact your nearest AES Environmental office on 1300 550 116 or email [service@aesenvironmental.com.au](mailto:service@aesenvironmental.com.au) with reference details of your dust collector, including date of purchase, serial number and the nature of the fault.

### REPLACEMENT PARTS

Only genuine Clyde-Apac replacement parts should be used in this dust collector. A continuing 100% ex-factory availability of all replacement items is maintained.

The use of non-genuine parts may significantly compromise the protection afforded by the dust collector and may invalidate the warranty.

To obtain replacement parts, contact your nearest Clyde-Apac branch or distributor with the following information:

(a) Full description of part(s).

#### SPARE PARTS

- Diaphragm Kit
- Solenoid Kit
- Spare frames, filters and cartridges

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*In keeping with our policy of continuing product improvement, we reserve the right to alter specifications without notice.*



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