



# **Installation & Service Manual for Small Portable Cartridge Collector**

**Model  
SPC-1000**

*March 16, 2006*

## Small Portable Cartridge Collector

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## Small Portable Cartridge Collector

### **Disclaimer**

Although instructions and recommendations are included for installation of your **Small Portable Cartridge Collector, SPC-1000**, the manufacturer does not assume responsibility for the installation of this equipment nor shall he be held liable for direct or consequential damages resulting from improper installation, application, maintenance or use.

The immense variety of contaminants make it impossible to list all of the potential hazards that may be encountered with air pollution control systems. It is therefore important that the application of the equipment be discussed with an AER Control Systems representative or application engineer prior to use. Additionally, users should consult and comply with all National and Local Fire, Electrical and /or other appropriate codes when determining the application, location and operation of any air pollution control equipment.

Collection of combustible or explosive materials and collection on flame or spark-generating operations may require specific system configurations (contact AER Control Systems LLC. Applications Engineering Department for questions and/or design assistance). The combined collection of combustible or explosive materials and contaminants from spark or flame generating operations, with a common collector or duct system, is not recommended, unless special design provisions have been made to the system (sparks or flames resulting from such operations may ignite the combustible or explosive material). Under no circumstances should anyone be allowed to discard a lighted cigarette, other burning materials, or refuse into an inlet hood or the duct of the collection system. It is the responsibility of the end user to comply with all applicable national, state, and local fire and safety codes.

This manual should be read completely before attempting Operation or Maintenance of this equipment. All work should be performed by qualified personnel according to local requirements.

### **WARNING**

**Failure to comply fully with the following instructions and local code requirements may increase your risk of physical injury due to fire, explosion or electrical shock.**

All data and dimensions in this manual have been thoroughly checked however, we cannot assume responsibility for possible errors or omissions. We reserve the right to change designs and/or specifications without notice.

## Small Portable Cartridge Collector

### **SECTION 1**

#### **Uncrating**

1. Remove banding and cardboard shipping carton and packing.
2. Extraction Arm is typically labeled and packed with the unit to be installed, Mounting hardware is included for mounting the arm. Be sure to check all boxes for any miscellaneous parts or hardware items before discarding.
3. Inspect the exterior of the unit and accessories for shipping damage or shortages that may not have been noticed or recorded when the shipment was initially received; you have 30 days to notify AER Control Systems LLC. of any discrepancies. Contact the shipping company if any damage or shortages have occurred.

#### **Description & Operation**

The Small Portable Cartridge Collector, SPC-1000 consist of a horizontally mounted filter cabinet which houses the cartridge filter. The cartridge has a filter media pack of 3 inch pleated media and is formed in the shape of a hollow cylinder. The interior of the cartridge cylinder is open to the pulse tank module, which periodically cleans the cartridges by compressed air, pulse jet flushing. Diaphragm valve is mounted to a compressed air reservoir tank and is activated by a manually controlled push button which opens the pulse valve for a brief second. During operation a short blast of compressed air to the interior of the filter results in media vibration and airflow reversal that back flushes collected contaminants off of the exterior surface of the filter cartridge. The motor/blower cabinet is located on the clean air side of the system after the pulse tank module and provides airflow for the collection system.

#### **Optional Equipment**

Special Filters

Motor Starters

Mechanical Arm sizes

Various pulsing options including none or automatic

## Small Portable Cartridge Collector

### **SECTION 2**

#### **Applications - General**

1. Dust & Fume - The **Small Portable Cartridge Collector, SPC-1000** is designed for the capture and removal of **DRY** dust and/or fumes generated from sanding, grinding, welding and other industrial processes. The SPC-1000 cartridge collector is a modular system with an extraction arm consisting of a filter media/ cartridge filter module, collection trays and a final module containing the air reservoir tank and pulse-jet cleaning system, blower and motor. The unit can be arranged in a variety of configurations and can be equipped with specialized filters for application specific filtration requirements. Optional add-on filters are available including HEPA, Activated Carbon for odors, and pre-filters.
2. Size - It is important that the proper size unit has been selected for the application. Too little airflow will not draw the contaminant into the filter and the unit will not be completely effective. Too much airflow may result in loss of efficiency or the unit will pick up large or heavy solid particles increasing the frequency of maintenance or filter replacement. Questions regarding proper unit sizing should be directed to your local AER Control Systems representative or the main office (toll free 866-265-2372)
3. Models - Model codes are utilized to identify the various unit configurations available. The model SPC (Small Portable Cartridge) collector uses a direct drive blower (sometimes called a plug fan) along with the number 1000. The 1000 unit has a 1.5 HP direct drive motor and has one cartridge filter.
4. Dust Drawer - The removable dust drawer is required for dirt storage.
5. Portable - The SPC-1000 has four casters for portability, two 10 inch rear wheels and two 5 inch swivel front wheels.

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### **SECTION 3**

#### **Installation**

#### **Assembly & Installation SPC-1000**

Standard Collectors are pre-assembled for the SPC-1000 with the exception to the extraction arm. The assembly of the extraction arm consists of removing all the parts from the two boxes, one box is the arm and the other is the hood.

1. Bend the arm out until the angle between the arms is 45 degrees.
2. Attach the end of the gas spring extension to the swivel base using two M6 Metric bolts, washers, and nuts.
3. Attach the other end of the gas spring to the tube using two M6 Metric bolts, washers, and nuts.
4. Bolt the handle to the other tube using two M6 Metric bolts, washers, and nuts.
5. Attach the hood to both sections of the internal hood articulation arms using four M6 Metric bolts and nuts.
6. Slide the hose ends onto the hood, both tubes, and swivel base and secure with hose clamps.
7. Mount the swivel base to the surface you are bolting by using six M6 metric bolts, washers, and nuts.
8. Adjust the tension of the arm.

The collector will be pre-wired to an ON/OFF switch and power cord for 115 volts 1 phase (unless otherwise specified on the purchase order). Suitable overload protection is required to protect the motor, a correctly sized circuit breaker is fine. Refer to the electrical section. (Manual and Combination motor starters with fusible disconnect packages are available through most local AER Control Systems LLC. and distributors).

A connection for clean, dry, compressed air is located outside the pulse tank module and connected to the air reservoir tank. The supply airline should be purged to remove any debris before connecting it to the unit to prevent damage to the pulse valves on the system. The supply compressed air line should be equipped with a manual shut-off valve, a filter/separator, air regulator, and a pressure gauge and located close to the SPC-1000 system. If the unit is to be installed in an area where freezing temperatures or high humidity are to be expected, an air dryer capable of drying the compressed air to below the dew point must also be provided. If excessive moisture is present, check drain on the dryer frequently or install an automatic drain.

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## **SECTION 3**

### **Installation continued**

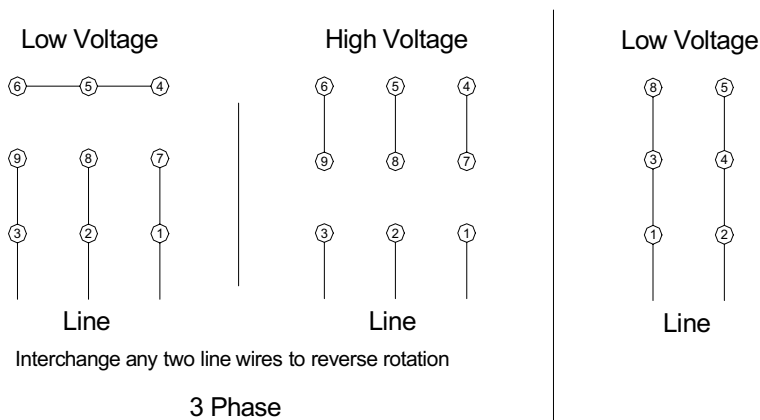
#### **Electrical**

The standard collector is wired for 115 volt, single phase with a switch and cord. Three-phase units are wired for the input voltage specified on the purchase order. Unless specified otherwise, standard units are wired for 460 volt, 3 phase, 60 Hz operation.

Motors used on the SPC-1000 collectors are UL recognized and internal wiring is UL rated at 600-volts. Input power line protection is required for the motor and electrical components. Line load and current requirements are identified on the motor nameplate. Unless ordered with the machine, the power switch for operating the machine, any fusible disconnect, motor starter or controller are to be provided by the customer/user and located externally to the machine.

After electrical hook up it is important to verify that the fan rotation is correct. Incorrect rotation results in much lower airflow and increased noise. For standard three phase installations, changing connections of any two of the three input power lines will usually reverse fan rotation. Rotation direction can be found on the side and/or back of the motor.

If it becomes necessary to change the input voltage, the wiring diagram on the motor and transformer nameplates show the appropriate wire connections - these diagrams are also shown below:

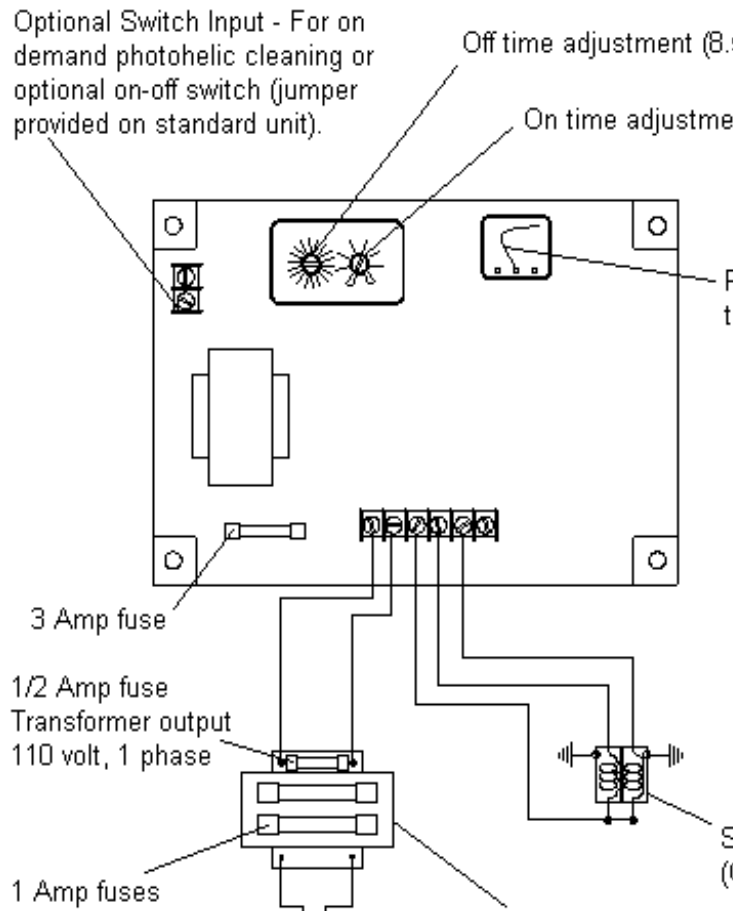


**Figure 1 - Motor Connection Diagram**

#### **NOTE**

**A motor starter with overload protection must be provided by the User. Thermal overload heaters are installed in the external motor starter. Consult the starter manufacturer for recommended heater size for the installed motor.**

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**Figure 2 - Optional Control Timer**



## Small Portable Cartridge Collector

### **SECTION 3**

#### **Installation continued**

#### **WARNING**

**Permanent damage to the motor will be sustained if connected to voltages other than the normal operating voltage for which the unit is pre-wired.**

#### **Control Systems**

MANUAL CONTROLS for the SPC-1000 include an integrated, push button operated pilot valve for the diaphragm valve. The compressed air tank and valve are fully enclosed and located between the cartridge and the blower.

#### **Compressed Air Requirements**

Air reservoir pressure should be set between 90-psig (the minimum pressure which will assure truly effective cleaning of the cartridges) and 105-psig (the maximum recommended working pressure of the valves and air reservoir).

**Note:** The air reservoir system has a 120-psig-relief valve.

The total consumption of compressed air is variable and is dependent upon how often the manual push button is depressed causing the diaphragm valve to open and the air pressure in the reservoir at the time of the air pulse. If the valve is opened for 0.1 second and the air reservoir pressure is at 100-psig, approximately 0.9 cubic feet of free air will be used per pulse. While the cartridges are being cleaned, the average usage rate in CFM of free air depends upon the time in between the next pulse. If the valve opens at 30-second intervals (2 pulses per minute) the average usage rate during a cleaning cycle would be (0.9 cu. ft./pulse) x (2 pulses/minute) = 1.8 CFM of free air.

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### **SECTION 4**

#### **Ordering Replacement Parts**

Information required for prompt delivery of replacement parts will be:

1. Model and Serial Number
2. Part Number and Description

Contact your local AER Control Systems LLC. distributor for replacement parts. Use either our toll free telephone number or our website [www.aercontrolsystem.com](http://www.aercontrolsystem.com) to obtain the nearest AER Control Systems LLC. distributor's name and telephone number.

**1-866-265-2372**

<b>Part Number</b>	<b>Description</b>	<b>Qty</b>
1002-06	Motor 1.5HP 1PH 115V	1
1016-05	280 Wheel	1
1017-05	280 Cone	1
1043-11	Cartridge One End Open 15"L	1
1218-01	Diaphragm Air Valve 3/4"	1
1110-01	Pushbutton Relief	1
1089-01	Pressure Relief Valve	1

## Small Portable Cartridge Collector

### **SECTION 5**

#### **Maintenance**

#### **Operation & Maintenance**

Lubrication or other routine periodic preventative maintenance is not required. All that is needed is an occasional check of fasteners, hoses and clamps and an overall visual check of the unit . Periodic replacement of the cartridges is required when necessary. Always empty the dust drawer before it fills completely. Do NOT allow the dust to collect to the point where it begins to touch the bottom of the cartridge filter, since this would result in the dust being re-entered into the air stream, re-depositing on the cartridge and shortening their life.

#### **Cartridge Replacement SPC-1000**

The pressure drop across the cartridge will eventually reach a point at which the airflow and suction are too low. At this time, the cartridges should be replaced as follows:

1. Shut off electrical power to the blower by unplugging the electrical cord.
2. Open the cartridge access door on the front of the filter cartridge module.
3. Slide the cartridges out on the rail by grabbing the cartridge and pulling it toward you. Remove the cartridge for inspection or replacement.
4. Reinstall cartridge by sliding the cartridge into the cabinet on the rail.
5. Close the cartridge access doors.

## Small Portable Cartridge Collector

### Troubleshooting

Problem	Cause	Solution
Motor Fails to Start	No Power To Unit	Check circuit breaker fuses, replace or reset if necessary. Check for proper wire connections to and from the starter and collector (if supplied).
	Power to unit	Check wires from power cord and switch on the collector to the motor. Check motor wiring. Check to see if motor is faulty.
Low airflow and/or suction	Blower is running backwards	Check rotation of blower. If running backwards, interchange 2 of the 3 input power leads (3 phase motors only). Single phase switch wires 5 & 8.
	Cartridges are not being cleaned	Check air pulse system to see if it is working correctly. Check air pressure.
	Obstruction in ducting	Check arm for blockage. Check for dampers in the arm they may be closed. Improper duct design.
Contaminant blowing out of the collector exhaust	Hole in the cartridge	Replace cartridge.
	Cartridge not properly installed	Check for correct cartridge orientation. Check cartridge gasket, gasket must seal around hole in tube sheet of cartridge cabinet. Check cartridge access door, knob should be tight for proper door and filter sealing
No air pulse when pushbutton is depressed.	Valve is leaking	Check tube to pulse valve for leaks.
		Replace diaphragm valve seals or valve.
Unit is not pulsing, but motor is running (optional timer)	No power to timer board	Check for blown fuses, replace if necessary. Check transformer.
	Power is getting to timer board	Check to see if compressed air is on, and connected to unit. Check wiring from board to valve assembly. Check to see if valves are opening.
Unit is not pulsing, but motor is running (units with delay timer or Photohelic pulse option)	Not set properly	Check timer set points. Off time be set for a longer period than you expect. Check high and low pressure set points on the Photohelic gauge. High pressure set point may be set too high.
Unit pulses all of the time (optional timer)	Off time may be set too short.	Check timer board settings, Timer board is designed for pulse intervals every 8.5 sec to 3 minutes.
	Set times on the Photohelic Gauge option are not properly set	High Pressure and/or Low Pressure set points may be set too low.

## Small Portable Cartridge Collector

### Specifications

Specifications	SPC-1000
Nominal Airflow - CFM	1000
Available External pressure - IN. H2O	1-2
Filters - Qty.	1
Total Filter Area - Sq. Ft.	150
Motor - HP	1.5
Motor Temp. Max - C	40
Compressed Air	90-105 psig
Tank Qty.	1
Tank Volume - Cu. Ft.	0.25
Diaphragm Valve	(1) .75 in.
Program Timer: Off Time On Time	Manual - Pushbutton
Timer Input Power	N/A
Blower/Motor Type	Plug Fan
Inlet	1 std.
Drive	Direct
Voltage	115/230
Frequency - Hz	50/60
Phase	1
Frame - NEMA	56C
Power Factor	85
Efficiency	70
Start current Amps (60hz)	50/25
Full Load Amps (60hz)	16/8
Insulation Class - min.	B
Enclosure	TEFC
Service Factor	1.15
Duty Cycle	Continuous
Bearing Grease	Exxon Polyex EM
Specification	UL & CSA Apporved



## **Limited Warranty**

AER Control Systems LLC warrants all products sold only to purchasers for use in business or for resale, against defects in workmanship or materials under normal use, for one (1) year after the date of purchase from AER Control Systems LLC. Misapplication of the product, decomposition by reaction or chemical action and wear caused by abrasion will not constitute, or be considered as a defect. Warranty is void if the product has been subject to damage, unreasonable use, neglect, improper service, improper installation, or other causes not arising from defects in original materials or workmanship. Any part that is determined to be defective in material or workmanship and returned to an AER Control Systems LLC distributor or authorized service facility, as AER Control Systems LLC designates, shipping costs prepaid, will be, as the exclusive remedy, repaired or replaced at AER Control Systems LLC's option. AER Control Systems LLC shall not be liable for any incidental or consequential cost, expenses, or damages resulting from any failure, defect, or malfunction of this product, liability is expressly disclaimed. AER Control Systems LLC's liability in all events is limited to and will not exceed, the purchase price of the product. Title and risk of loss pass to the buyer on delivery to the common carrier. If a product is damaged in transit, the recipient MUST make note of the damage upon receipt of the product and file a claim with the carrier. AER Control Systems LLC will make a good faith effort for prompt correction or other adjustment, with respect to any product that proves to be defective within the warranty period.

Collection of combustible or explosive materials and collection on flame or spark-generating operation any require specific system configurations (contact AER Control Systems LLC's Applications Engineering Department for questions and/or design assistance). The combined collection of combustible or explosive materials and contaminants from spark or flame generating operations, with a common collector or duct system, is not recommended, unless special design provisions have been made to the system (sparks or flames resulting from such operations may ignite the combustible or explosive material). Under no circumstances should anyone be allowed to discard a lighted cigarette, other burning materials, or refuse into an inlet hood or the duct of the collection system. It is the responsibility of the end user to comply with all applicable national, state, and local fire and safety codes. AER Control Systems LLC's liability for consequential and incidental damage resulting from a fire or explosion is expressly disclaimed.

Installation of suitable overload protection such as a motor starter, according to NEC guidelines, is required. Failure to provide proper overload protection will void warranty coverage on electrical components in the system. (Combination motor starters with fusible disconnect packages are available through your local AER Control Systems LLC representative). To ensure optimum collector performance, always use AER Control Systems LLC replacement filters.