



Empire Abrasive Equipment

Cartridge Filter Collector System EM2-2 and EM2-4

Installation and Operation Manual

Installation, Operation, and Service Information



EM 2-2

EM 2-4

This manual is property of the owner. Leave with the collector when set-up and start-up are complete. Donaldson Company reserves the right to change design and specifications without prior notice.

Illustrations are for reference only as actual product may vary.



This is the safety alert symbol. It is used to alert you to potential personal injury hazards. Obey all safety messages that follow this symbol to avoid possible injury or death.

WARNING

Process owners/operators have important responsibilities relating to combustible hazards. Process owners/operators must determine whether their process creates combustible

dust, fume, or mist. If combustible dust, fume, or mist is generated, process owners/operators should at a minimum:

- Comply with all applicable codes and standards. Among other considerations, current NFPA standards require owners/operators whose processes involve potentially combustible materials to have a current Hazard Analysis, which can serve as the foundation for their process hazard mitigation strategies.
- Prevent all ignition sources from entering any dust collection equipment.
- Design, select, and implement fire and explosion mitigation, suppression, and isolation strategies that are appropriate for the risks associated with their application.
- Develop and implement maintenance work practices to maintain a safe operating environment, ensuring that combustible dust, fume, or mist does not accumulate within the plant.

Empire Abrasive Equipment recommends process owners/operators consult with experts to insure each of these responsibilities are met.

As a manufacturer and supplier of Industrial Filtration Products, Empire Abrasive Equipment can assist process owners/operators in the selection of filtration technologies. However, process owners/operators retain all responsibility for the suitability of fire and explosion hazard mitigation, suppression, and isolation strategies. Empire Abrasive Equipment assumes no responsibility or liability for the suitability of any fire and/or explosion mitigation strategy, or any items incorporated into a collector as part of an owner/operators hazard mitigation strategy.

Improper operation of a dust control system may contribute to conditions in the work area or facility that could result in severe personal injury and product or property damage. Check that all collection equipment is properly selected and sized for the intended use.

DO NOT operate this equipment until you have read and understand the instruction warnings in the Installation and Operations Manual. For a replacement manual, contact Empire Abrasive Equipment.

This manual contains specific precautionary statements relative to worker safety. Read thoroughly and comply as directed. Discuss the use and application of this equipment with an Empire Abrasive Equipment representative. Instruct all personnel on safe use and maintenance procedures.

Data Sheet

Model Number _____	Serial Number _____
Ship Date _____	Installation Date _____
Customer Name _____	
Address _____ _____	
Filter Type _____	
Accessories _____	
Other _____	

Contents

Description.....	1	Solid-State Timer Installation.....	13
Purpose and Intended Use	1	Preliminary Start-Up Check	15
Rating and Specification Information.....	2	Maintenance Information.....	16
Operation.....	3	Operational Checklist	16
Inspection on Arrival	4	Filter Removal and Installation.....	16
Installation Codes and Procedures	4	Filter Removal	17
Installation.....	4	Filter Installation.....	17
Foundations or Support Framing	5	Dust Disposal	17
Collector Location	5	Compressed Air Components.....	17
Site Selection	5	Optional Equipment.....	19
Rigging Instructions.....	5	Fan Blower	19
Hoisting Information	5	5-Gallon Pail Pack	20
Typical Installation.....	6	55-Gallon Drum Pack	20
Standard Equipment.....	7	Photohelic® Gauge	22
Hopper Installation.....	7	Inlet Collar Installation	24
Provisional Anchor Bolt Recommendations.....	7	Troubleshooting.....	25
Leg Installation	8		
Compressed Air Installation	11		
Electrical Wiring.....	11		

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DANGER

DANGER indicates a hazardous situation which, if not avoided, will result in death or serious injury.

WARNING

WARNING indicates a hazardous situation which, if not avoided, could result in death or serious injury.

CAUTION

CAUTION, used with the safety alert symbol, indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.

NOTICE

NOTICE is used to address practices not related to personal injury that may result in damage to equipment.

Description

The Empire filter cartridge dust collector is a continuous-duty collector with cartridge-style filters. The downward airflow design delivers high filtration efficiency while using less energy. Continuous duty means the filters can be pulse cleaned on-line without interrupting airflow through the collector. The filters are pulse-cleaned in sequence, one at a time, without turning the collector off.

Designed to increase the versatility of the collector, standard options include abrasion-resistant inlets, exhaust dampers, and plenum silencers.

Purpose and Intended Use



Misuse or modification may result in severe personal injury and/or property damage.

Do not misuse or modify.

Empire collectors are widely used on nuisance dust where the load to the collector is less than two grains per square foot. Some typical applications include abrasive blasting, grinding, pharmaceuticals, powder paint applications, sand handling, and welding. Choose the correct cartridge filter for the application and type of dust collected. Contact Empire Abrasive Equipment for selection assistance.

- Fibrous dusts often benefit from a cartridge with an open-pleat design, such as Fibra-Web®.
- Operations involving high temperature and humidity require special attention. Temperature, moisture content, and chemistry issues may exist, and custom design modifications to the collector may be required.
- Hygroscopic dust such as fertilizer, salt, and sugar should be handled under a controlled, low relative humidity environment.
- Flammable or explosive dust may require customized collector design options and special cartridges.
- Applications with high hydrocarbon or high oil content may require special treatment or filter media.

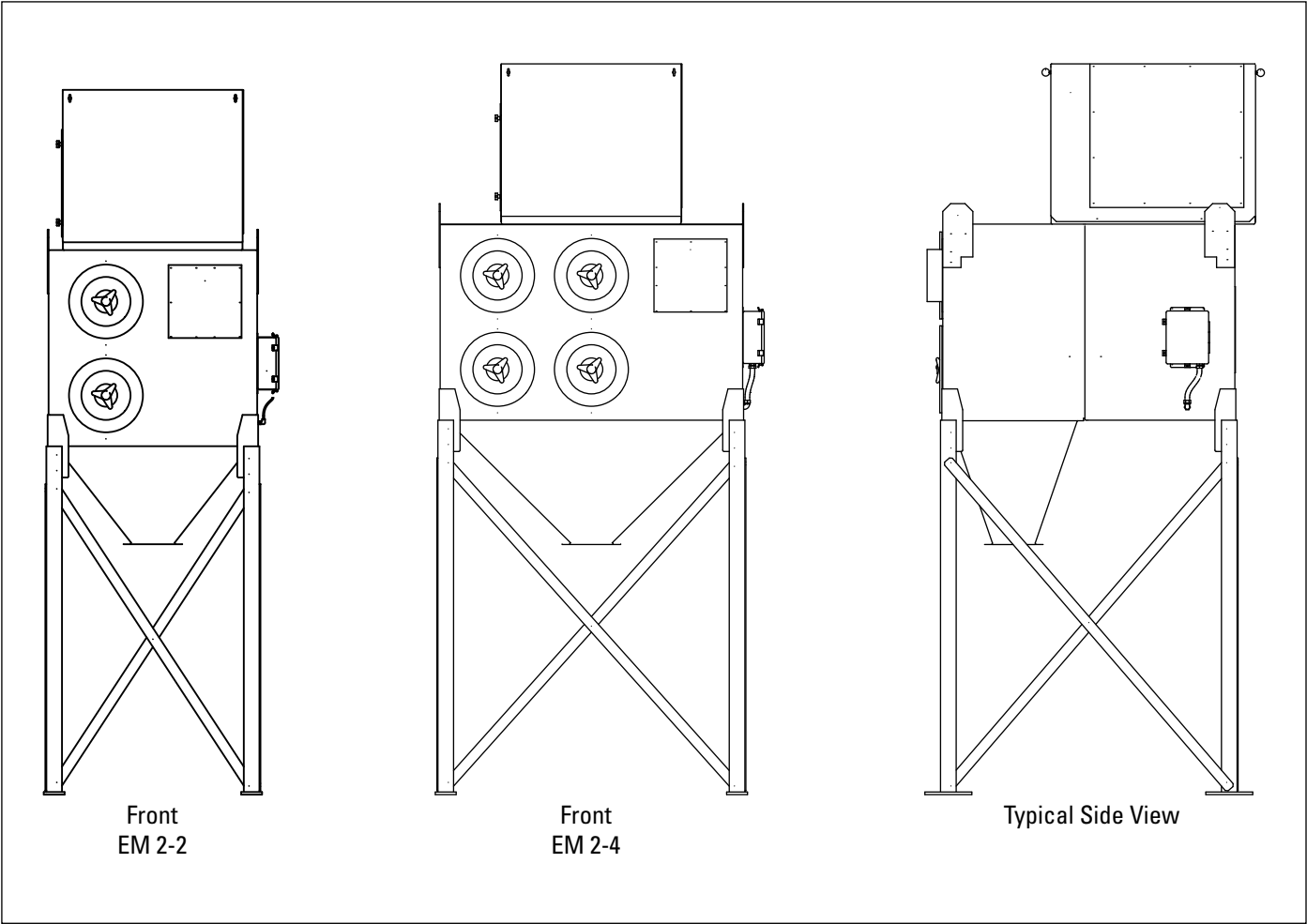


Combustible materials such as buffing lint, paper, wood, metal dusts, weld fume, or flammable coolants or solvents represent potential fire and/or explosion hazards. Use special care when selecting, installing, and operating all dust, fume, or mist collection equipment when such combustible materials may be present in order to protect workers and property from serious injury or damage due to a fire and/or explosion.

Consult and comply with all National and Local Codes related to fire and/or explosion properties of combustible materials when determining the location and operation of all dust, fume, or mist collection equipment.

Standard equipment is not equipped with fire extinguishing or explosion protection systems.

Rating and Specification Information



Collectors are rated for the following loads as calculated per relevant sections of the IBC 2012 code*:

Basic Wind Speed & Exposure90 mph, Exposure C
Seismic Spectral Acceleration, S 1.5 g
Seismic Spectral Acceleration, S^s 0.6 g
Installed Collector Base Elevation.....Grade
Risk Category..... II
Compressed air supply, psig 90-100
Housing rating, inches water gauge +/-20
Control power 120-Volt 50/60 Hz

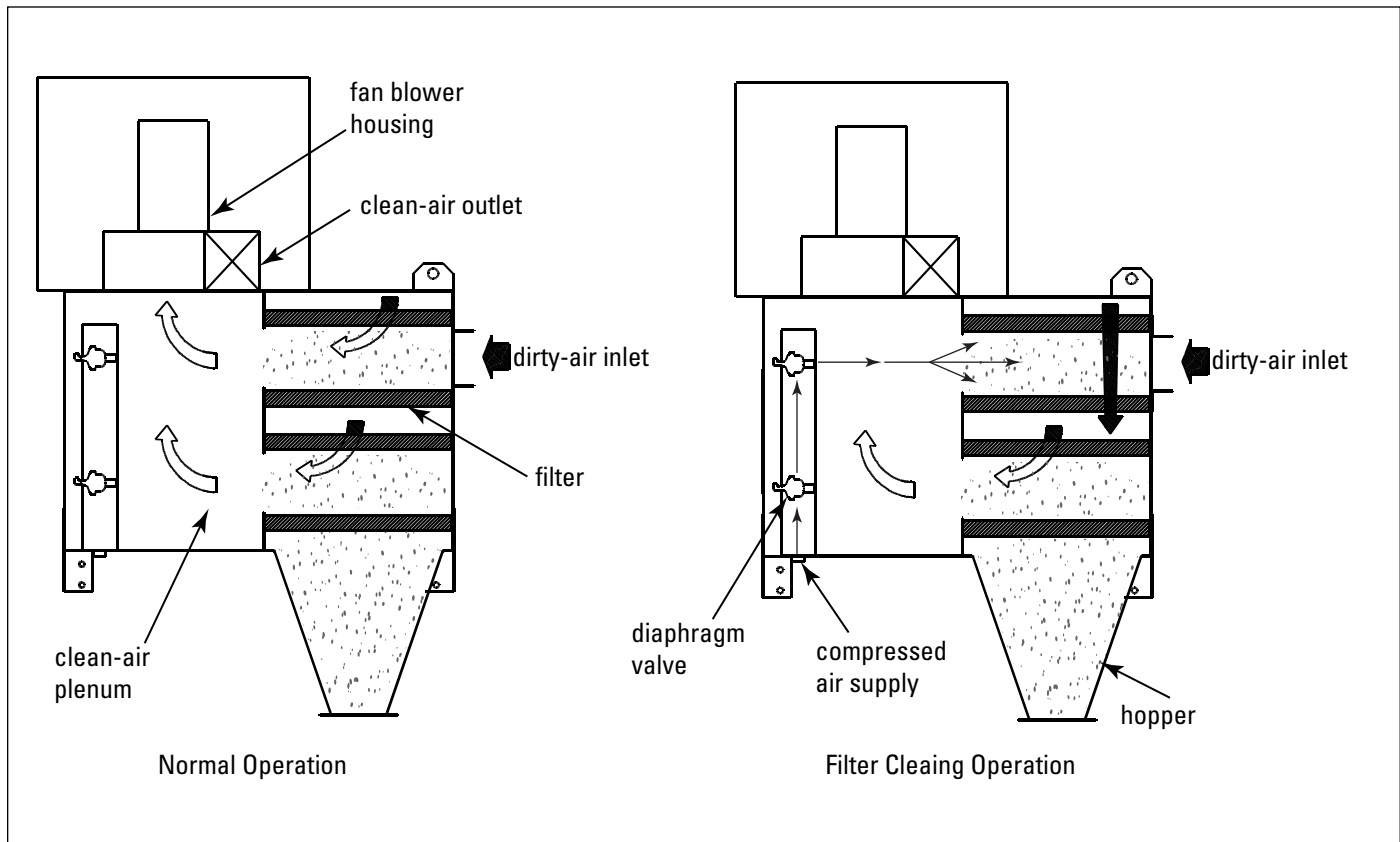
*If collector was supplied with a Record Drawing, the specifications on the drawing will supersede the standard specifications above.

Operation

During normal operation, dust-laden air enters the collector through the dirty-air inlet. Airflow is directed downward through the collector and heavier particulate falls directly into the hopper. The filters remove fine particulate and clean, filtered air passes through the filter to the clean-air plenum and discharges through the clean-air outlet.

Filter elements are cleaned automatically and sequentially. The result is that only one row (1 cartridge filter) may be off-line for cleaning at any given time.

During the filter cleaning purge, the solid state timer energizes a solenoid valve, causing the corresponding diaphragm valve to send a pulse of compressed air through the filter (from the inside outward), removing the collected contaminants from the outside surfaces of the filter. The dust falls into the hopper and then into the dust storage container.



Collector Operation

Inspection on Arrival

1. Inspect collector on delivery.
2. Report any damage to the delivery carrier.
3. Request a written inspection report from the Claims Inspector to substantiate any damage claim.
4. File claims with the delivery carrier.
5. Compare collector received with description of product ordered.
6. Report incomplete shipments to the delivery carrier and your Empire Abrasive Equipment representative.
7. Remove crates and shipping straps. Remove loose components and accessory packages before lifting collector from truck.
8. Check for hardware that may have loosened during shipping.
9. Use caution removing temporary covers.

Installation Codes and Procedures



Codes may regulate recirculating filtered air in your facility.

Consult with the appropriate authorities having jurisdiction to ensure compliance with all national and local codes regarding recirculating filtered air.

Safe and efficient operation of the collector depends on proper installation.

Authorities with jurisdiction should be consulted before installing to verify local codes and installation procedures. In the absence of such codes, install collector according to the National Electric Code, NFPA No. 70-latest edition and NFPA 91 (NFPA 654 if combustible dust is present).

A qualified installation and service agent must complete installation and service of this equipment.

All shipping materials, including shipping covers, must be removed from the collector prior to or during collector installation.

NOTICE

Failure to remove shipping materials from the collector will compromise collector performance.

Inspect collector to ensure all hardware is properly installed and tight prior to operating collector.

Installation



Use proper equipment and adopt all safety precautions needed for servicing equipment.

Electrical service or maintenance work must be performed by a qualified electrician and comply with all applicable national and local codes.

Turn power off and lock out electrical power sources before performing service or maintenance work.

Do not install in classified hazardous atmospheres without an enclosure rated for the application.

Turn compressed air supply OFF, bleed and lock out lines before performing service or maintenance work.



Site selection must account for wind, seismic zone, and other

load conditions when selecting the location for collectors.

Codes may regulate acceptable locations for installing dust collectors. Consult with the appropriate authorities having jurisdiction to ensure compliance with all national and local codes regarding dust collector installation.

Collectors must be anchored in a manner consistent with local code requirements. Anchors must be sufficient to support dead, live, seismic, and other anticipated loads.

Consult a qualified engineer for final selection of anchorage.

NOTICE

Do not set compressed-air pressure above 100-psig as component damage can occur.

All compressed air components must be sized to meet the system requirements of 90-100-psig supply pressure.

The compressed-air supply must be oil and moisture free. Contamination in the compressed air used to clean filters will result in poor cleaning, cleaning valve failure, or poor collector performance.

Purge compressed air lines to remove debris before connecting to the collector's compressed air manifold.

The collector is suitable for either indoor or outdoor installations. Reference the Rating and Specification Information.

Foundations or Support Framing

Prepare the foundation or support framing in the selected location. Foundation or support framing must comply with local code requirements and may require engineering.

Foundation and support framing must be capable of supporting dead, live, wind, seismic and other applicable loads. Consult a qualified engineer for final selection of foundation or support framing.

Collector Location

WARNING

Empire Abrasive equipment is not designed to support site installed ducts, interconnecting piping, or electrical services. All ducts, piping, or electrical services supplied by others must be adequately supported to prevent severe personal injury and/or property damage.

When hazardous conditions or materials are present, consult with local authorities for the proper location of the collector.

CAUTION

Dust collection equipment can reach peak sound pressure levels above 80 dB (A) in some circumstances. Noise pollution should be considered when selecting the collector location.

Locate the collector to ensure easy access to electrical and compressed air connections, to simplify solids collection container handling and routine maintenance, and to ensure the straightest inlet and outlet ducts.

Site Selection

This collector can be located on a foundation or structural framing.

Provide clearance from heat sources and avoid any interference with utilities when selecting the location.

Rigging Instructions

Suggested Tools & Equipment

Clevis Pins and Clamps	Lifting Slings
Crane or Forklift	Pipe Sealant
Drift Pins	Pipe Wrenches
Drill and Drill Bits	Screwdrivers
End Wrenches	Socket Wrenches
Adjustable Wrench	Spreader Bars
Torque Wrench (inch/lbs, 9/16-in Socket)	

Hoisting Information

WARNING

Failure to lift the collector correctly can result in severe personal injury and/or property damage.

Use appropriate lifting equipment and adopt all safety precautions needed for moving and handling the equipment.

A crane or forklift is recommended for unloading, assembly, and installation of the collector.

Location must be clear of all obstructions, such as utility lines or roof overhang.

Use all lifting points provided.

Use clevis connectors, not hooks, on lifting slings.

Use spreader bars to prevent damage to collector's casing.

Check the Specification Control drawing for weight and dimensions of the collector and components to ensure adequate crane capacity.

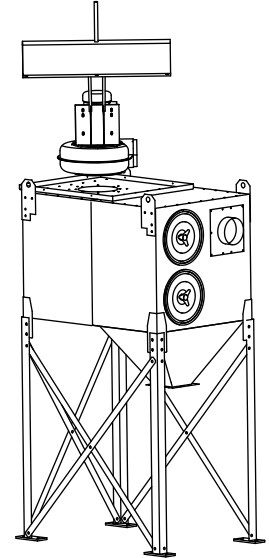
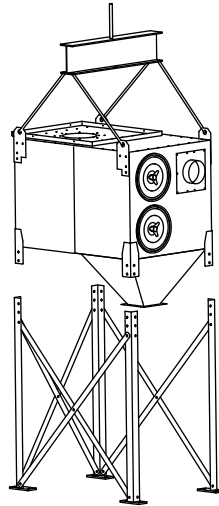
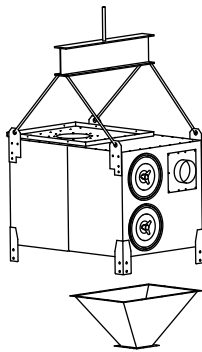
Allow only qualified crane or forklift operators to lift the equipment.

Refer to applicable OSHA regulations and local codes when using cranes, forklifts, and other lifting equipment.

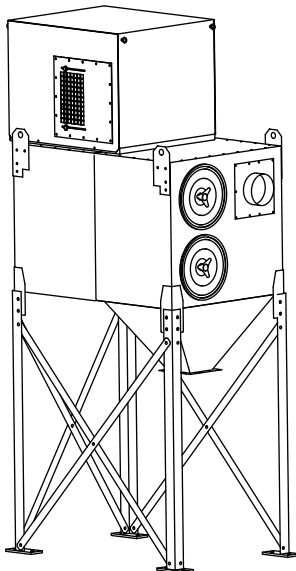
Lift collector and accessories separately and assemble after collector is in place.

Use drift pins to align holes in section flanges during assembly.

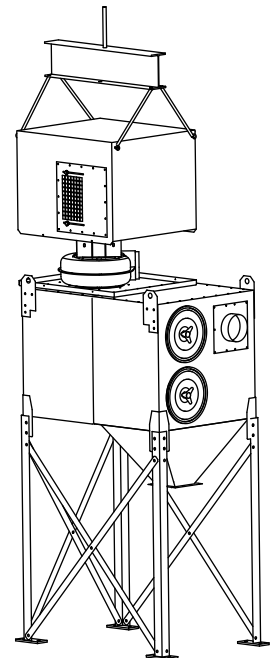
Typical Installation



1. Stand hopper on the discharge end.
2. Apply sealant around the top flange of the hopper toward the inside edge of the bolt pattern.
3. Lift collector into position over the hopper and lower slowly
4. Use drift pins to align holes and secure with hardware provided.
5. Assemble legs and cross braces.
6. Lift unit and hopper assembly into position over legs and lower slowly
7. Fasten legs to unit and to foundation.



8. Lift assembled unit to location.
9. Support and level unit.
9. Tighten all hardware.
10. Remove crane.



Standard Equipment

Hopper Installation

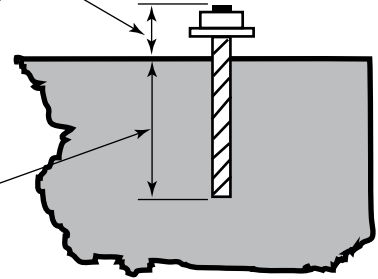
1. Stand the hopper up on the discharge end (hopper outlet).
2. Apply the sealant to the top flange all around toward the inside edge of the bolt pattern.
3. Lift the collector from the pallet. Position the collector over the hopper and lower slowly.
4. Use drift pins to align holes.
5. Lower collector onto the hopper. Secure collector to hopper flange using 3/8-in thread-forming screws and flat washers. Tighten all hardware securely.

Provisional Anchor Bolt Recommendations

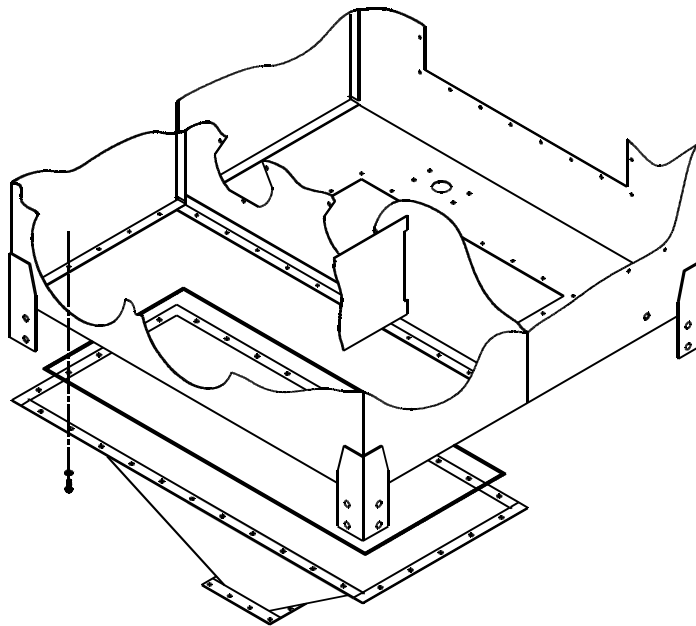
1. Consider Hilti HIT-HY 200 Anchor System or equivalent. Quantity of anchor bolts should match the number of holes provided in the base plates.
2. Anchor diameter is typically 1/8-in less than baseplate hole diameter.
3. Corrosive environment or outdoor installation may require stainless steel anchors.

Anchor should project a minimum of 1 3/4-in and account for nut, washer, base plate and shims/grout.

Embedment depth



Typical Foundation Anchor



Hopper Installation

Leg Installation

WARNING

Anchors must comply with local code requirements and must be capable of supporting dead, live, wind, seismic, and other applicable loads.

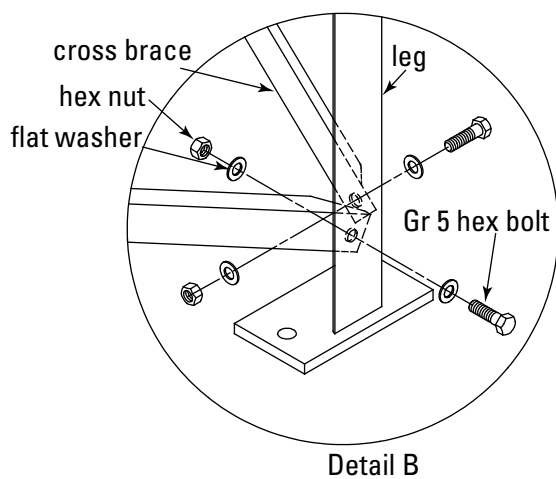
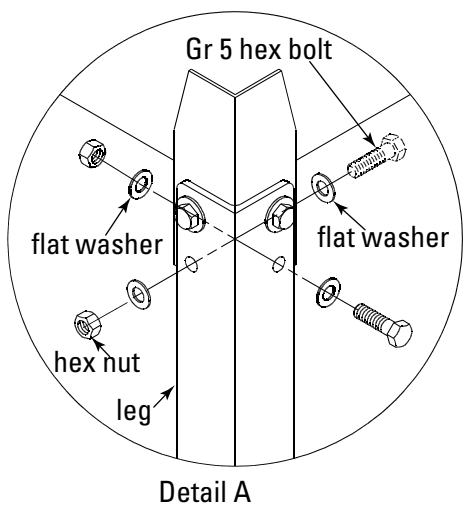
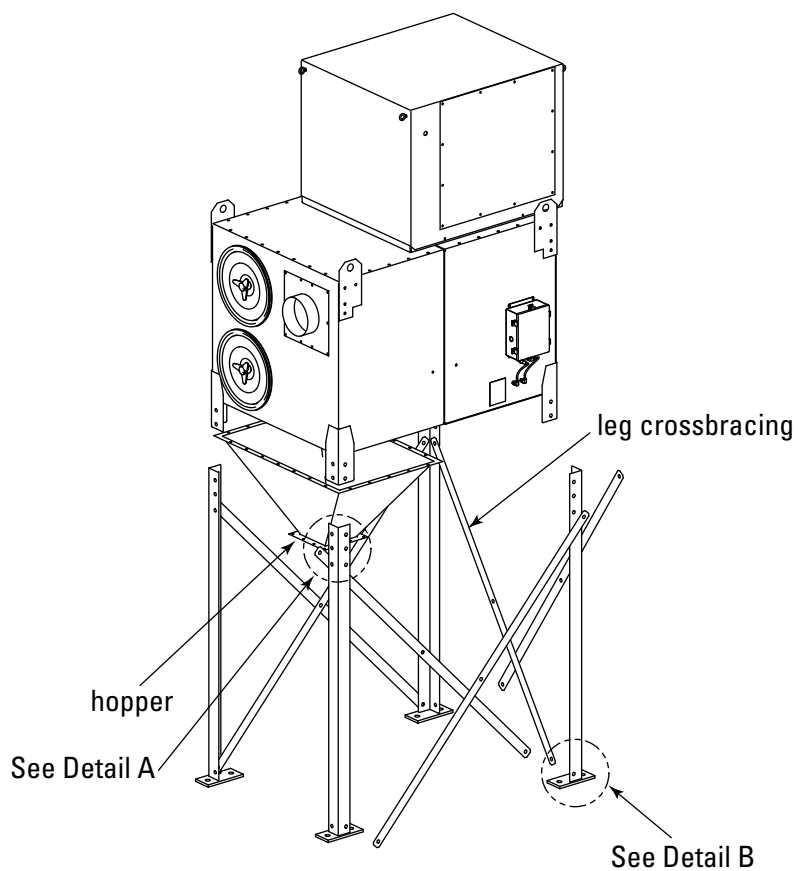
Anchor sizes shown are provisional, as final anchor sizing will depend on jobsite load conditions, collector location, foundation/ framing design variables and local codes.

Consult a qualified engineer for final selection of suitable anchors.

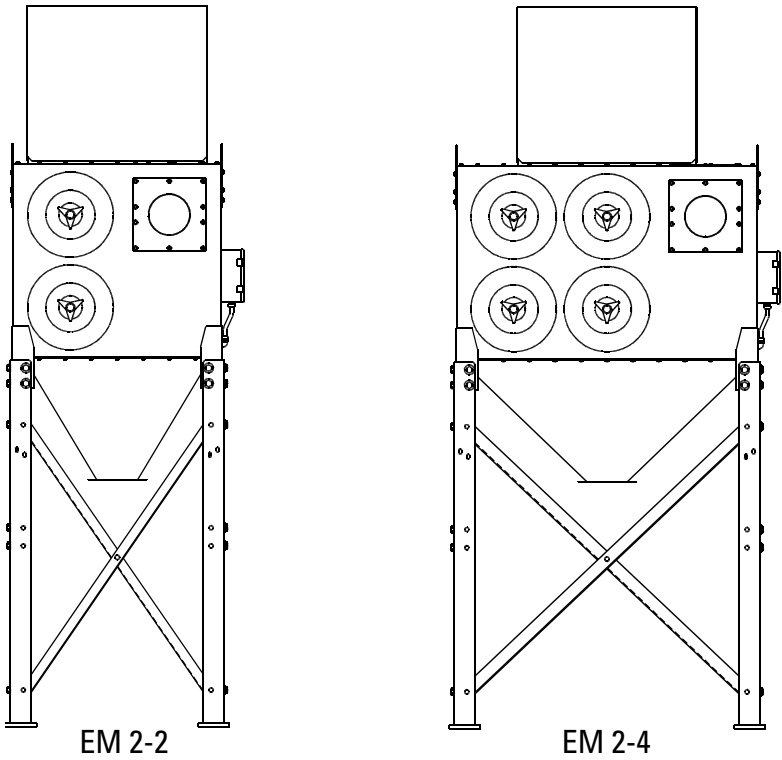
Leg sets for standard collector sizes are shown in the Rating and Specification Information. Reference Typical Foundation Anchor and leg assembly drawing shipped with the collector prior to starting assembly.

The position of the legs and cross bracing for each collector size are shown in Leg Positioning.

1. Prepare the foundation or support framing in the selected location. Locate and install anchors.
2. Stand the leg set up and position as shown in Leg and Cross Brace Assembly.
3. Lift the entire collector (cabinet and hopper) assembly into position over the leg set and lower into position carefully.
4. Use a set of drift pins to align the holes in the collector and legs, and attach the legs with the 3/4" - 10 x 1-3/4" long bolts, washers and nuts. Do not tighten hardware at this time.
5. Use a set of drift pins to align the holes in the cross braces to the rear side of the leg set. Attach the cross braces with 3/4" - 10 x 1-3/4" long bolts, washers and nuts. Do not tighten hardware at this time.
6. Recheck the position of the leg sets and cross bracing found in Leg Positioning, Leg Bolting Details and the assembly drawing.
7. Lift the assembled collector onto the foundation anchor bolts. Fasten each leg pad to the anchor bolts with flat washers, lock washers, and nuts (provided by customer). Do not tighten hardware at this time.
8. Level the collector while it is still being supported by the crane. Tighten all hardware on legs, cross bracing, and foundation anchors.
9. Before disconnecting the crane, recheck all of the hardware to make sure it is securely tightened. After checking hardware, disconnect the collector from the crane (refer Typical Installation.)



Leg and Cross Brace Assembly



Leg Positioning
Standard Leg Packs—Front View

Compressed Air Installation

WARNING

Turn compressed air supply OFF, bleed and lock out lines before performing service or maintenance work.

A safety exhaust valve should be used to isolate the compressed air supply. The safety exhaust valve should completely exhaust pressure in the collector manifolds when closed, should be capable of being interlocked with fire or explosion mitigation equipment and should include provisions to allow closed-position locking.

NOTICE

Do not set compressed-air pressure above 100-psig as component damage can occur.

All compressed air components must be sized to meet the system requirements of 90-100-psig supply pressure.

The compressed-air supply must be oil and moisture free. Contamination in the compressed air used to clean filters will result in poor cleaning, cleaning valve failure, or poor collector performance.

Purge compressed-air lines to remove debris before connecting to the collector's compressed-air manifold.

1. Remove the plastic pipe plug from the collector's air manifold and connect the compressed-air supply lines. Use thread-sealing tape or pipe sealant on all compressed-air connections.
2. Install a customer-supplied shut-off valve, bleed-type regulator with gauge, filter, and automatic condensate valve in the compressed-air supply line.
3. Set compressed-air supply pressure to a level suitable for the filters (90-psig). The pulse-cleaning controls are factory set to clean one or more filters every 10-seconds during a cleaning cycle.

Electrical Wiring

WARNING

Electrical installation, service, or maintenance work must

be performed by a qualified electrician and comply with all applicable national and local codes.

Turn power off and lock out electrical power sources before performing service or maintenance work.

Do not install in classified hazardous atmospheres without an enclosure rated for the application.

All electrical wiring and connections, including electrical grounding, should be made in accordance with the National Electric Code (NFPA No. 70-latest edition).

Check local ordinances for additional requirements that apply.

The appropriate wiring schematic and electrical rating must be used. See collector's rating plate for required voltage.

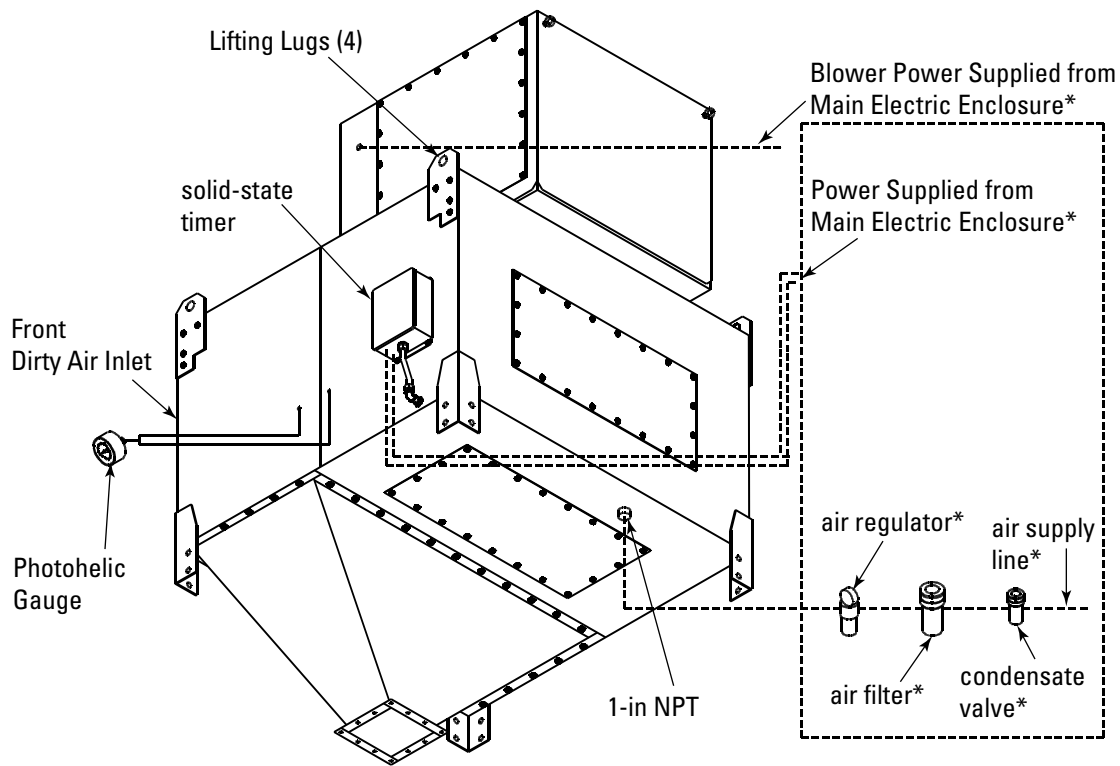
An electric disconnect switch having adequate amp capacity shall be installed in accordance with Part IX, Article 430 of the National Electrical Code (NFPA No. 70-latest edition). Check collector's rating plate for voltage and amperage ratings.

Refer to the wiring diagram for the number of wires required for main power wiring and remote wiring.

WARNING

Turn power off and lock out electrical power sources.

Turn compressed air supply OFF, bleed and lock out lines before performing service or maintenance work.



*customer-supplied

Compressed Air and Component Installation

Solid-State Timer Installation

WARNING

Electrical installation, service or maintenance work during

installation must be performed by a qualified electrician and comply with all applicable national and local codes.

Turn power off and lock out electrical power sources before performing installation, service, or maintenance work.

Do not install in classified hazardous atmospheres without an enclosure rated for the application.

A 4-PIN solid-state timer is used to control the filter cleaning system.

1. Using the wiring diagram supplied, wire the fan motor, fan-motor starter, solid-state timer, and solenoid valves. Use appropriate wire gauge for rated amp load as specified by local codes.
2. Plug the program lug into the pin that corresponds with the number of solenoid valves controlled for 4-PIN.
3. With power supply ON, check the operation of the timer and valves. The valves should open and close sequentially at factory set 10-second intervals.
4. If a gauge or similar device is used to control the solid-state timer, the jumper on the pressure switch portion of the timer should be removed. The solenoid valves pulse only when the differential pressure reaches the high-pressure setpoint. The valves will continue to pulse until the low-pressure setpoint is reached.

The solid-state timer voltage must match the voltage of the rating of the timer provided (typically 120 VAC, 240 VAC also available).

Input
105-135V/50-60Hz/1Ph

Output Solenoids
The load is carried and turned ON and OFF by the 200 watt maximum-load-per-output solid-state switch.

Pulse ON Time
Factory set at 100-milliseconds, or 1/10-second.

NOTICE Do not adjust pulse ON time unless the proper test equipment is available. Too much or too little ON time can cause shortened filter life.

Pulse OFF Time
Factory set at 10-seconds, adjustable from 1.5-sec minimum to maximum 30-seconds.

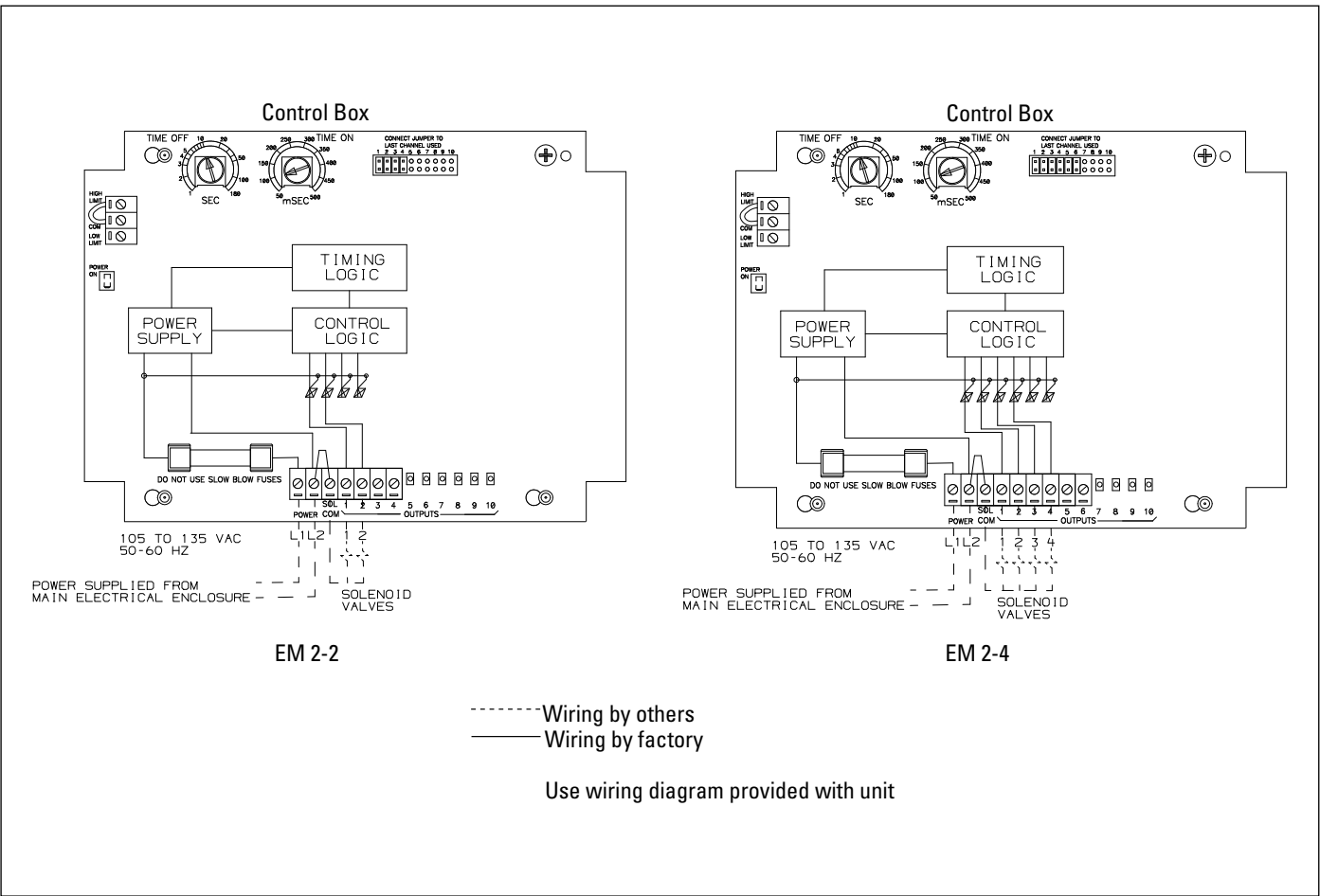
Operating Temperature Range
-40° F to 150° F

Transient Voltage Protection
30 Joule Varistor.

Solenoid Valves
115-Volt at 19.7 watts each

Compressed-Air
Set compressed-air supply pressure to a level suitable for the filters (90-psig). The pulse-cleaning controls are factory set to clean one or more filters every 10-seconds during a cleaning cycle.

NOTICE Do not increase supply pressure above 100-psig as component damage can occur.



Solid-State Timer Typical Wiring Diagram

Preliminary Start-Up Check

Instruct all personnel on safe use and maintenance procedures.

WARNING

Electrical work during installation, service or maintenance must be performed by a qualified electrician and comply with all applicable national and local codes.

Turn power off and lock out electrical power sources before performing service or maintenance work.

Turn compressed air supply OFF, bleed and lock out lines before performing service or maintenance work.

Check that the collector is clear and free of all debris before starting.

Do not install in classified hazardous atmospheres without an enclosure rated for the application.

Optional fans over 600 lbs must be independently supported.

1. Check all electrical connections for tightness and contact.
2. Check for proper rotation as noted on the fan and/or hopper discharge device housing.

To reverse rotation, single-phase power supply:
Follow manufacturer's instructions on the motor's nameplate.

To reverse rotation, three-phase power supply:
Switch any two leads on the motor junction box.

WARNING

Do not look into fan outlet to determine rotation. View the fan rotation through the back of the motor.

Check that the exhaust plenum is free of tools or debris before checking blower/fan rotation.

Stand clear of exhaust to avoid personal injury.

Do not interchange a power lead with the ground wire. Severe personal injury and/or property damage may result.

3. All access panels should be sealed and secure.
4. Check that the dust container is properly sealed and clamped.

5. Check that fan exhaust damper is set to the fully-closed position.
6. Check and remove all loose items in or near the inlet and outlet of the collector.
7. Check that all remote controls and solenoid enclosures (if applicable) are properly wired and all service switches are in the OFF position.
8. Check that all optional accessories are installed properly and secured.
9. Turn power ON at source.
10. Turn the compressed-air supply ON. Set compressed-air supply pressure to a level suitable for the filters (90-psig).
11. Turn fan motor ON.
12. Adjust airflow with the exhaust damper.

NOTICE

Excess airflow can shorten filter life, cause electrical system failure and fan motor failure.

13. Turn powered hopper discharge devices ON.

Maintenance Information

Instruct all personnel on safe use and maintenance procedures.

WARNING

Use proper equipment and adopt all safety precautions needed for servicing equipment.

Use appropriate access equipment and procedures. Note the standard collector is not equipped with access platforms unless noted on the specification drawings.

Electrical service or maintenance work must be performed by a qualified electrician and comply with all applicable national and local codes.

Turn power off and lock out electrical power sources before performing service or maintenance work.

Do not install in classified hazardous atmospheres without an enclosure rated for the application.

Turn compressed air supply OFF, bleed and lock out lines before performing service or maintenance work.

NOTICE

Do not set compressed-air pressure above 100-psig as component damage can occur.

All compressed air components must be sized to meet the system requirements of 90-100 psig supply pressure.

The compressed-air supply must be oil and moisture free. Contamination in the compressed air used to clean filters will result in poor cleaning, cleaning valve failure, or poor collector performance.

Purge compressed air lines to remove debris before connecting to the collector's compressed air manifold.

Operational Checklist

1. Monitor the physical condition of the collector and repair or replace any damaged components.

Routine inspections will minimize downtime and maintain optimum system performance. This is particularly important on continuous-duty applications.

2. Periodically check the compressed air components and replace compressed air filters.

Drain moisture following the manufacturer's instructions. With the compressed air supply ON, check the cleaning valves, solenoid valves, and tubing for leaks. Replace as necessary.

3. Monitor pressure drop across filters.

Abnormal changes in pressure drop may indicate a change in operating conditions and possibly a fault to be corrected. For example, prolonged lack of compressed air will cause an excess build-up of dust on the filters resulting in increased pressure drop. Cleaning off-line with no airflow usually restores the filters to normal pressure drop.

4. Monitor exhaust.
5. Monitor dust disposal.

Filter Removal and Installation

WARNING

Use proper safety and protective equipment when removing contaminants and filters.

Dirty filters may be heavier than they appear.

Use care when removing filters to avoid personal injury and/or property damage.

Turn power off and lock out electrical power sources before performing service or maintenance work.

Turn compressed air supply OFF, bleed and lock out lines before performing service or maintenance work.

CAUTION

Do not operate with missing or damaged filters.

Filter Removal

1. Start at the top access port.
2. Remove access cover by turning knob counterclockwise.
3. Break the seal between the filter cartridge and the sealing surface.
4. Slowly rotate the cartridge 1/2-turn to remove dust that may have accumulated on the top of the filter.
5. Slide the filter out the access port along the suspension yoke.
6. Dispose of properly.
7. Clean the sealing surface.

NOTICE

Clean dust from gasket sealing area to ensure a positive filter gasket seal.

8. Check for an accumulation of dust in the storage area and empty as necessary.

Filter Installation

1. Slide the new filter cartridge onto each suspension yoke.

NOTICE

Insert the filter, gasket end first.

2. Wipe cover gaskets clean and replace covers. Tighten securely by hand.

NOTICE

Inspect and replace any covers with damaged or missing gaskets. Failure to do so may result in leakage in the collector.

Tighten access covers securely by hand.
Gaskets must be compressed to seal properly.

3. Turn electrical power and compressed air supply ON before starting collector.

Dust Disposal

NOTICE

To avoid possible damage to the fan motor, maintain a seal below the collector if servicing the dust storage device while the fan is running.

1. Empty dust container(s) (drum or bin) as necessary to minimize dust in the hopper.
2. If the optional 55-gallon drum attachment is used, empty when dust container is 2/3 full.
3. If optional slide gate is used, close gate before servicing dust container.

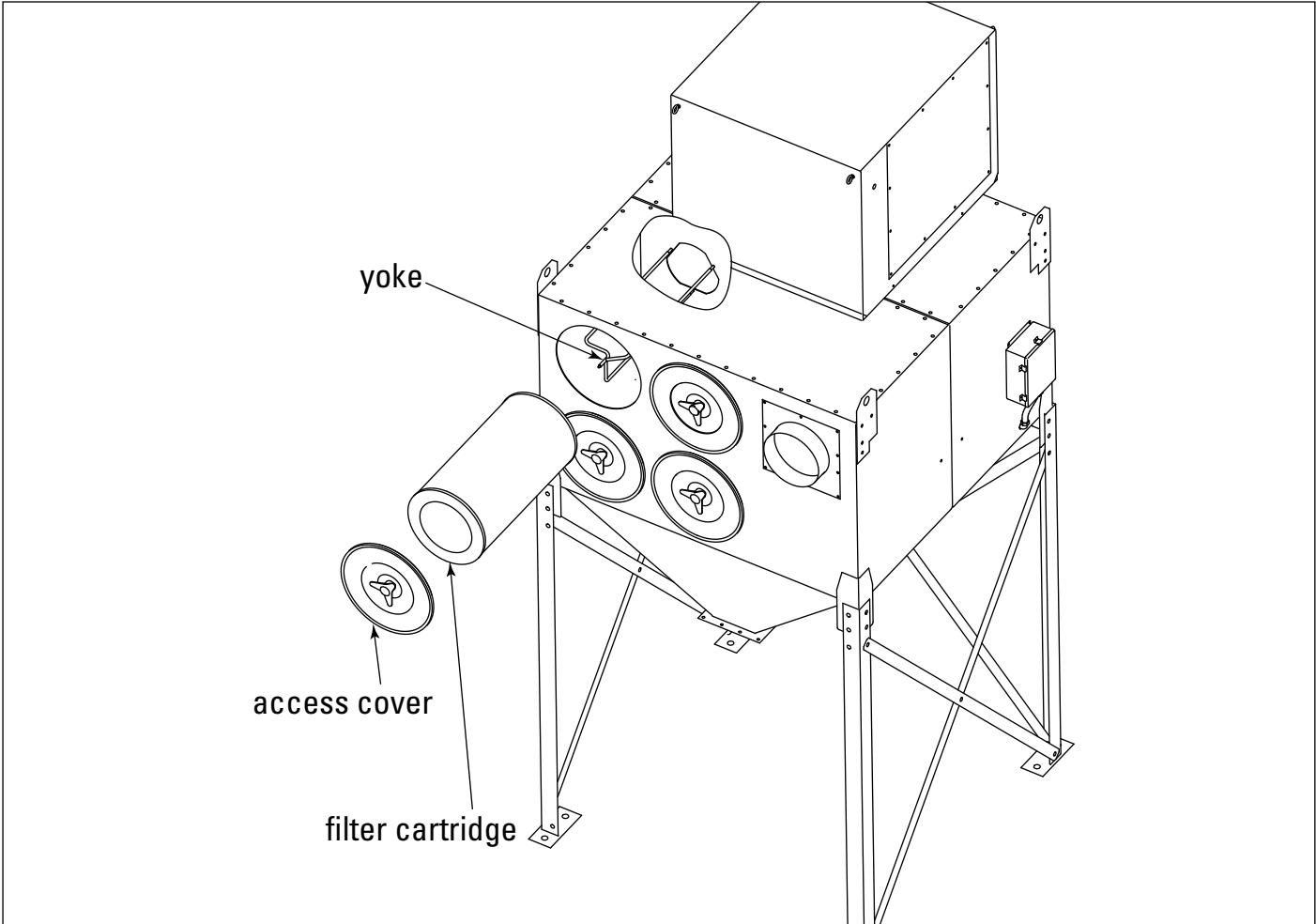
CAUTION

Sharp edge of slide gate may result in personal injury while closing the slide gate. Keep hands clear when operating the slide gate.

4. Check integrity of gasket under drum cover.
5. Replace or reinstall dust container and open gate (if applicable).

Compressed Air Components

1. Periodically check the compressed air components and replace damaged or worn components as necessary.
2. Drain moisture following the manufacturer's instructions.
3. With the compressed-air supply ON, check the cleaning valves, solenoid valves, and tubing for leaks. Repair or replace as necessary.



Filter Removal and Installation

Optional Equipment

Fan Blower

WARNING

Failure to lift the fan correctly can result in severe personal injury and/or property damage.

Use appropriate lifting equipment and adopt all safety precautions needed for moving and handling the fan.

A crane or forklift is recommended for unloading, assembly, and installation of the fan.

Location must be clear of all obstructions, such as utility lines or roof overhang.

CAUTION

To avoid personal injury and/or damage to equipment, ensure fan blowers are properly attached to equipment.

NOTICE

The use of a damper or variable fan drive (VFD) is required to control airflow through the collector. Lack of a control damper or VFD will shorten filter life.

The Torit Radial Blade (TRB) fan blower can be mounted to the top of the collector.

For complete information, see the most current version of the TRB Fan Installation, Operation and Maintenance manual.

5-Gallon Pail Pack

1. Apply sealant to the hopper flange or the pail cover mounting plate flange toward the inside edge of the bolt pattern.
2. Fasten the pail pack to the hopper using the bolts, washers, and nuts supplied.
3. Place pail beneath seater mechanism.
4. Tighten clamps on either side by pulling down.

55-Gallon Drum Pack

The drum pack is designed to fit a customer-supplied, standard 55-gallon drum and provides easy access for dust removal and disposal. A flexible hose connects the drum cover to the hopper. Placing a pallet under the drum allows heavier materials to be moved quickly using a forklift or pallet jack. If a pallet is used, the length of flexible hose may need to be shortened.



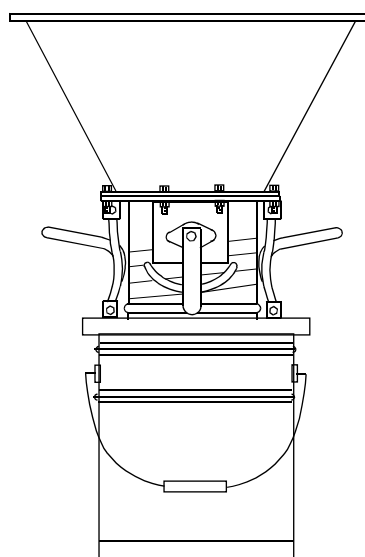
CAUTION Sharp edge of slide gate may result in personal injury while closing the slide gate. Keep hands clear when operating the slide gate.

With Slide Gate

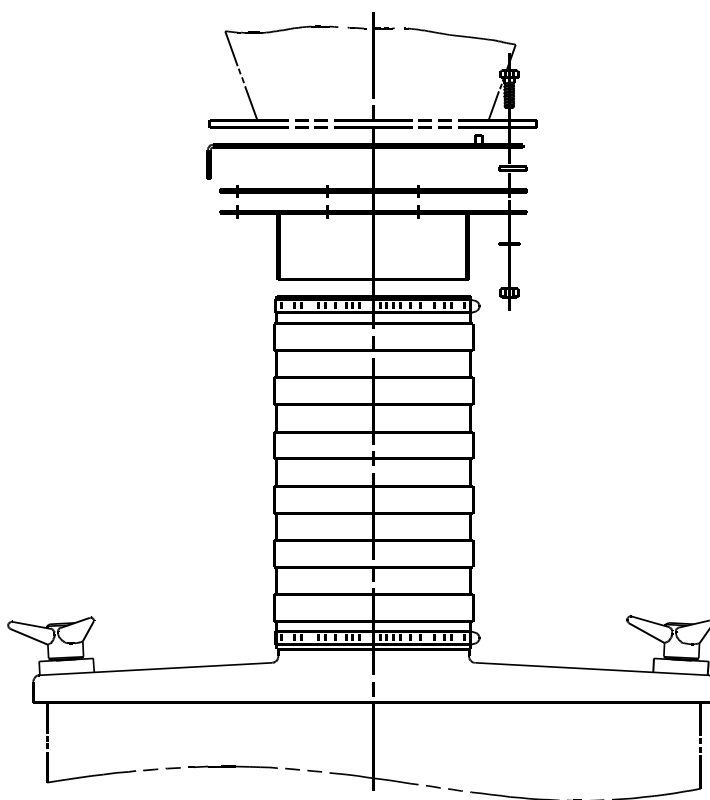
1. Place the 1/8-in gasket spacer between the hopper flange and slide gate as shown.
2. Attach the drum pack and slide gate to the hopper flange using 3/8-16 bolts, washers, and hex nuts.
3. Attach the drum cover to the 55-gallon drum.
4. Use latches to secure the cover to the drum, if equipped.
5. Connect the flexible hose between the drum cover and slide gate. Secure with hose clamps.

Without Slide Gate

1. Place 1/4-in diameter rope-type sealant between the hopper flange and the drum cover mounting flange toward the inside edge of the bolt pattern.
2. Fasten using the bolts, washers, and nuts supplied.
3. Attach the drum cover to the 55-gallon drum.
4. Use latches to secure the cover to the drum, if equipped.
5. Connect the flexible hose between the drum cover and the adapter. Secure with hose clamps.



5-Gallon Pail Pack with Gate Valve



55-Gallon Drum Pack with Slide Gate

Photohelic® Gauge

WARNING

Electrical installation, service, or maintenance work must

be performed by a qualified electrician and comply with all applicable national and local codes.

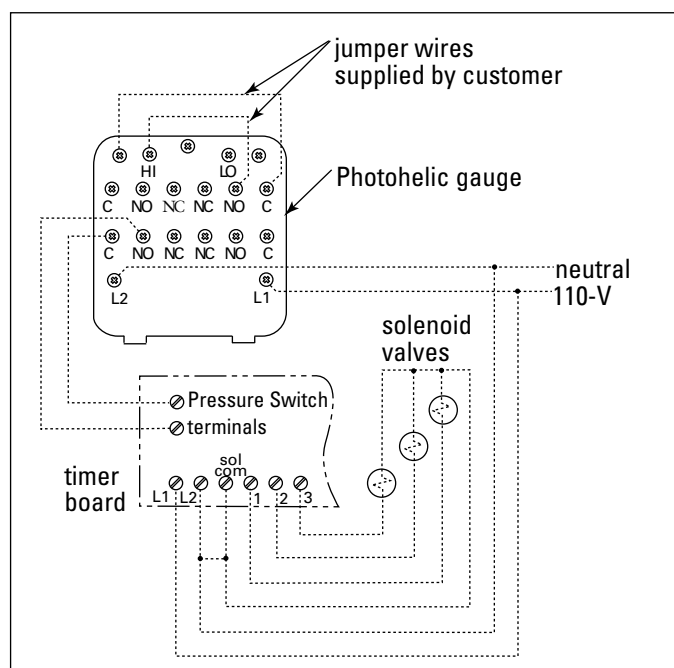
Turn power off and lock out electrical power sources before performing service or maintenance work.

Do not install in classified hazardous atmospheres without an enclosure rated for the application.

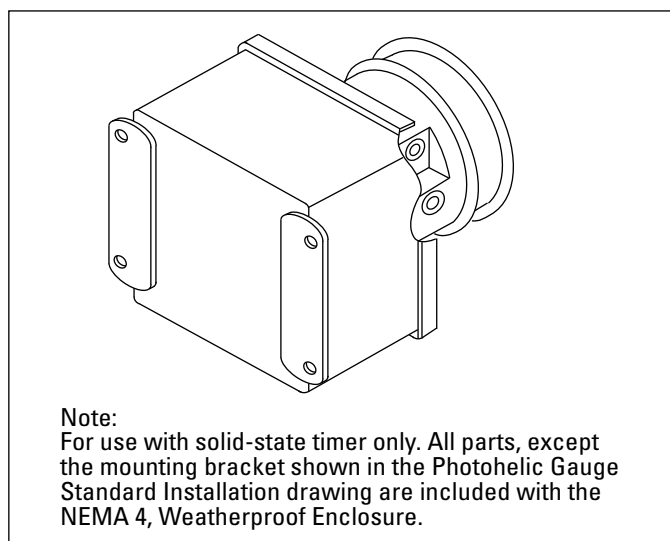
The Photohelic combines the functions of a differential pressure gauge and a pressure-based switch. The gauge function measures the pressure difference between the clean-air and dirty-air plenums and provides a visual display of filter condition. The high-pressure tap is located in the dirty-air plenum and a low-pressure tap is located in the clean-air plenum. The pressure-based switch function provides high-pressure ON and low-pressure OFF control of the filter cleaning system.

1. Choose a convenient, accessible location on or near the collector for mounting that provides the best visual advantage.

2. Mount the gauge to the remote panel or door using the mounting ring, retaining ring, and four #6-32 x 1 1/4-in screws. Do not tighten screws. Connect two, 1/8-in NPT x 1/4-in OD male adapters to the gauge's high- and low-pressure ports. Tighten screws.
3. On the back of the gauge, remove four #6-32 x 5/16-in screws and plastic enclosure. Set aside. Add two jumper wires supplied by customer. Remove the jumper from the pressure switch located on the timer board, if equipped. Using the 3/4-in conduit opening, wire the gauge as shown. Reassemble and fasten enclosure securely.
4. Thirty-five feet of plastic tubing is supplied and must be cut in two sections. Connect one section of tubing from the gauge's high-pressure port to the pressure fitting located in the dirty-air plenum. Connect remaining tubing from the gauge's low-pressure port to the fitting in the clean-air plenum. Additional tubing can be ordered from your representative.
5. Zero and maintain the gauge as directed in the manufacturer's Operating and Maintenance Instructions provided.
6. To install the Photohelic Gauge mounted in a NEMA 4, Weatherproof Enclosure, follow Steps 4 and 5.

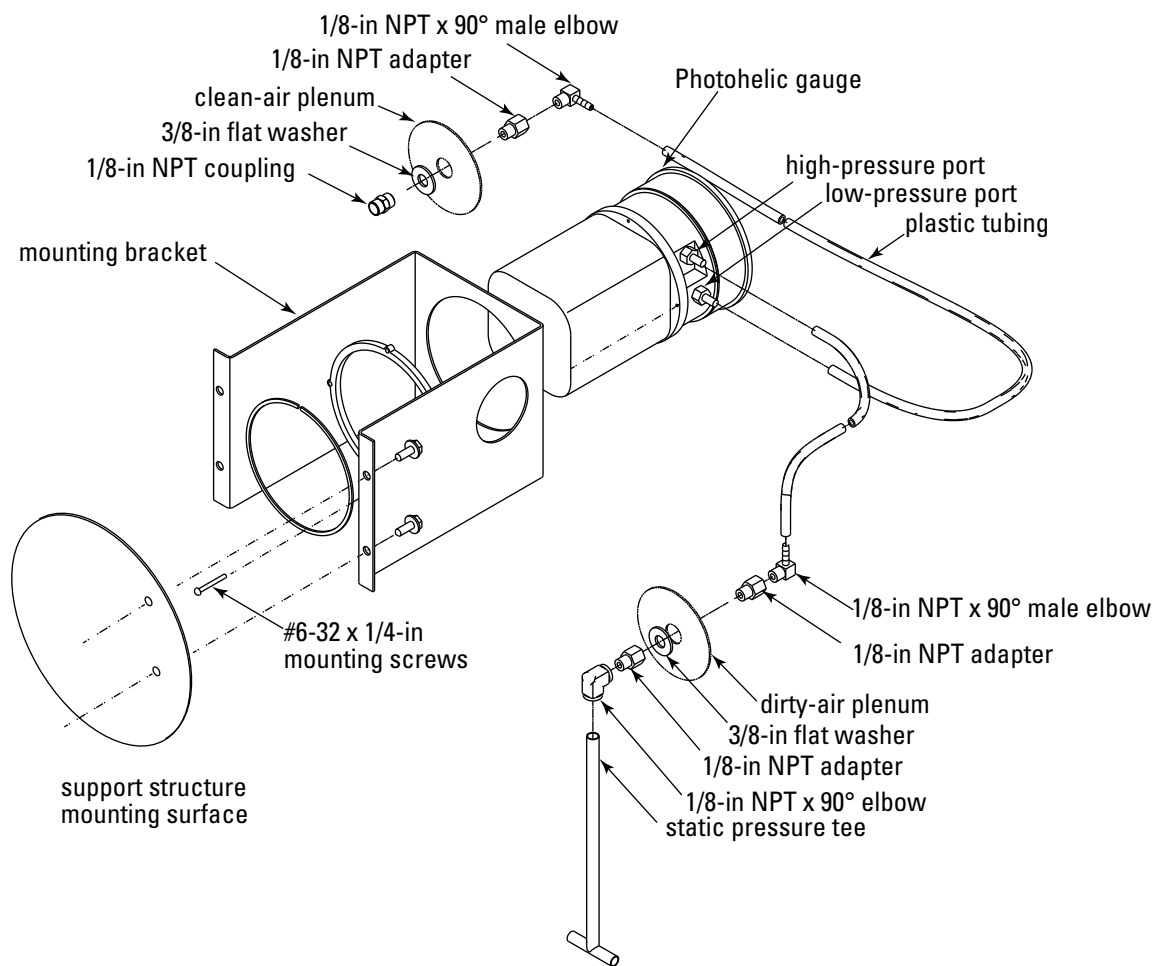


Photohelic Gauge Wiring Diagram



Note:
For use with solid-state timer only. All parts, except the mounting bracket shown in the Photohelic Gauge Standard Installation drawing are included with the NEMA 4, Weatherproof Enclosure.

Photohelic Gauge in Optional NEMA 4 Weatherproof Enclosure

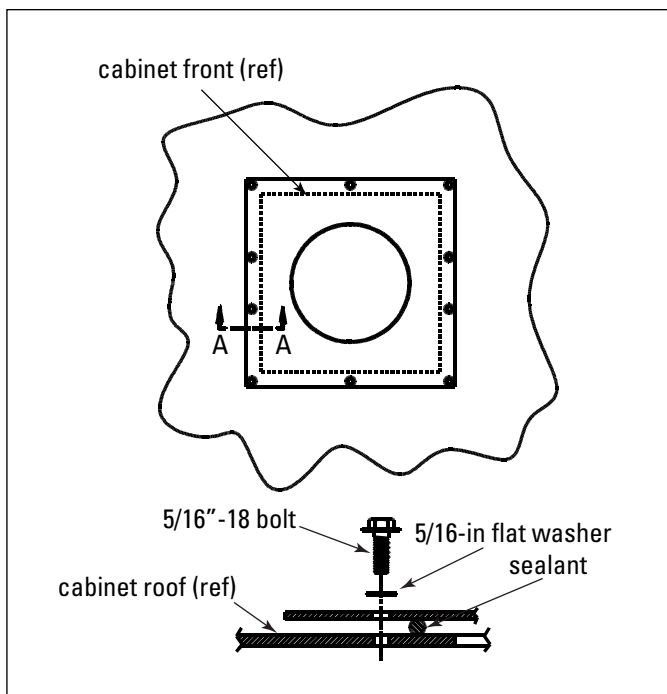


Photohelic Gauge Installation

Inlet Collar Installation

The inlet collar location and size is standard for the EM 2 dust collector. The inlet is installed on the collector before shipping and is covered with plywood.

1. If installation is required, apply the sealant onto the inlet collar plate mounting surface.
2. Position the inlet collar plate onto the collector inlet mounting surface by aligning the holes and fasten securely in place using the supplied 5/16" - 18 x 1" long bolts.



Inlet Collar Installation

Troubleshooting

Problem	Probable Cause	Remedy
Fan blower and motor do not start	Improper motor wire size	Rewire using the correct wire gauge as specified by national and local codes.
	Not wired correctly	Check and correct motor wiring for supply voltage. See motor manufacturer's wiring diagram. Follow wiring diagram and the National Electric Code.
	Collector not wired for available voltage	Correct wiring for proper supply voltage.
	Input circuit down	Check power supply to motor circuit on all leads.
	Electrical supply circuit down	Check power supply circuit for proper voltage. Check for fuse or circuit breaker fault. Replace as necessary.
	Damaged motor	Replace damaged motor.
Fan blower and motor start, but do not stay running	Incorrect motor starter installed	Check for proper motor starter and replace if necessary.
	Access doors are open or not closed tight	Close and tighten access doors. See Filter Installation.
	Hopper discharge open	Check that dust container is installed and properly sealed.
	Damper control not adjusted properly	Check airflow in duct. Adjust damper control until proper airflow is achieved and the blower motor's amp draw is within the manufacturer's rated amps.
	Electrical circuit overload	Check that the power supply circuit has sufficient power to run all equipment.
Clean-air outlet discharging dust	Filters not installed correctly	See Filter Installation.
	Filter damage, dents in the end caps, gasket damage, or holes in media	Replace filters as necessary. Use only genuine Empire replacement parts. See Filter Installation.
	Access cover(s) loose	Tighten access doors securely. See Filter Installation.
Insufficient airflow	Fan rotation backwards	Proper fan rotation is clockwise from the top of the collector. The fan can be viewed through the back of the motor. See Preliminary Start-Up Check.
	Access doors open or not closed tight	Check that all access doors are in place and secured. Check that the hopper discharge opening is sealed and that dust container is installed correctly.
	Fan exhaust area restricted	Check fan exhaust area for obstructions. Remove material or debris. Adjust damper flow control.
	Filters need replacement	Remove and replace using genuine Empire replacement filters. See Filter Removal and Installation.
	Lack of compressed air	See Rating and Specification Information for compressed air supply requirements.

Problem	Probable Cause	Remedy
Insufficient airflow continued	Pulse cleaning not energized	Use a voltmeter to check the solenoid valves in the control panel. Check pneumatic lines for kinks or obstructions.
	Dust storage area overfilled or plugged	Clean out dust storage area. See Dust Disposal.
	Pulse valves leaking compressed air	Lock out all electrical power to the collector and bleed the compressed air supply. Check for debris, valve wear, pneumatic tubing fault, or diaphragm failure by removing the diaphragm cover on the pulse valves. Check for solenoid leaks or damage. If pulse valves or solenoid valves and tubing are damaged, replace.
	Solid-State timer failure	Using a voltmeter, check supply voltage to the timer board. Check and replace the fuse on the timer board if necessary. If the fuse is good and input power is present but output voltage to the solenoid is not, replace the timer board. See Solid-State Timer Installation.
	Solid-State timer out of adjustment	See Solid-State Timer and Solid-State Timer Wiring Diagram.
Pulse cleaning never stops	Pressure switch not wired to the timer board correctly	Connect the pressure switch on the timer board to Terminals 7 and 8 on TB3.
	Pressure switch terminals on the timer board jumpered	Remove jumper wire on Solid-State Timer board before wiring to the Delta P Control.
	High Pressure On or Low Pressure Off setpoint not adjusted for system conditions	Adjust setpoints to current conditions.
	Pressure tubing disconnected, ruptured, plugged, or kinked	Check tubing for kinks, breaks, contamination, or loose connections.
Alarm light is ON	Alarm setpoint too low	Adjust to a higher value.
	Excess pressure drop	Check cleaning system and compressed air supply. Replace filters if filters do not clean down.
	Pressure tubing disconnected, ruptured, plugged, or kinked	Check tubing for kinks, breaks, contamination, or loose connections.

Troubleshooting

Problem	Probable Cause	Remedy
Cleaning light is ON, but cleaning system not functioning	Improper wiring	Check wiring between the Delta P Control and the timer board, and between the timer board and solenoid valve coils.
	Defective solenoids	Check all solenoid coils for proper operation.
	Timer board not powered	Check power ON light on timer board's LED display. If not illuminated, check the supply voltage to the timer board. Check the fuse on the timer board. Replace if necessary.
	Timer board defective	If LED is illuminated, observe the output display. Install a temporary jumper across the pressure switch terminals. Output levels should flash in sequence. Check output using a multimeter set to 150-Volt AC range. Measure from SOL COM to a solenoid output. The needle will deflect when LED flashes for that output if voltage is present. If LED's do not flash, or if no voltage is present at output terminals during flash, replace the board.

Parts and Service

For genuine Empire Abrasive Equipment Company replacement filters
and parts, call:

1-800-497-4543

Parts Ordering Information

When ordering parts, have the collector model and serial number,
part number, quantity, part number, and description available.



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