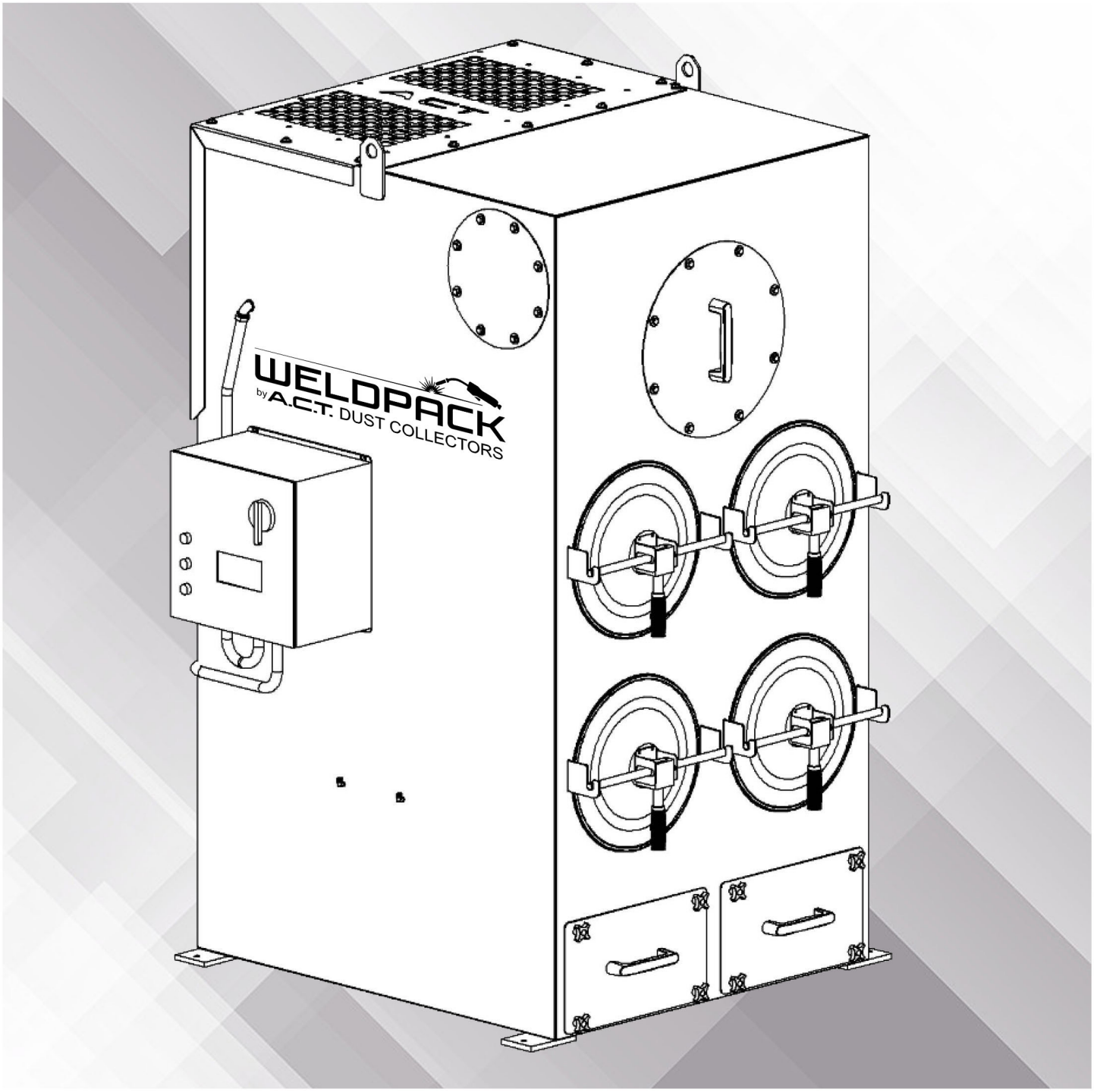
A.C.T. DUST COLLECTORS

Installation and Operation Manual



763-557-7162
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820 North Front Street, New Ulm, MN 56073

A.C.T.
DUST COLLECTORS

Product Data Sheet

Purchaser: _____

Order date: _____

A.C.T. Dust Collector Model: _____

Serial Number: _____

Filters: _____

Option/Accessories: _____

_____

_____

Fan/Blower

Manufacturer/Model: _____

Serial Number: _____

CAUTION!

Accidents happen, be careful and always follow all local and federal regulations!

Fires and explosions do occur in dust collectors. Many items in a dust form can become very flammable and/or explosive. It is very important that when installing a dust collector to check with and abide by all local and federal regulations. Precautions such as spark traps, detectors, and extinguishers are always recommended when sparks or explosive danger is present. Never throw any burning objects into the duct work or dust collector.

There is no way to guarantee 100% prevention of fires. However, the methods mentioned above will greatly reduce your risk. A.C.T. Dust Collectors will not be responsible in any way for any loss or damage associated with fires or explosions in your dust collector.

If your dust collector came with explosion vents or if explosive dusts are present, it is the owner's/operator's responsibility for full compliance with all authorities having jurisdiction. It is recommended that the NFPA codes be studied and applied, including, but not limited to 68, 69 and 654. Included in the NFPA standards is the issue of isolating your dust collector. Please contact us or an expert in the area regarding isolation of your dust collector in the event of an explosion. Unless a Kst test was performed, and we were provided with the results, the size of the explosion vents may be inaccurate and you may not be in compliance. It is the owner/operators responsibility to verify the Kst and Pmax values. We recommend that your process be evaluated regularly to make sure that you remain in compliance and the vent area is sufficient. A.C.T. Dust Collectors will not be responsible for ANY loss whatsoever resulting from an explosion associated with an ACT dust collector.

Dust collectors are tall and top heavy. Always be careful when handling them. Make sure your equipment is capable of making the lifts and moves you are trying to make. Be sure the foundation for the dust collector is proper and secure.

All plumbing and electrical should be performed by certified professionals and meet all codes and regulations. Never open any doors or access panels while the machine is in operation.

Always shut down the unit prior to service and lock out all disconnects.

Always wear proper safety equipment when working on or around your dust collector and follow all local and federal codes.

Table of Contents

Introduction

Thank you for your purchase of an A.C.T. Dust Collectors unit. Our goal is to provide you with a product of best quality, service, and pricing in the industry.

This manual is to provide general instructions in assisting you with the installation, operation, and maintenance of your equipment. It is the user's responsibility to ensure that the equipment is correctly installed and operated. It is also the user's responsibility to ensure and provide qualified personnel for the installation, operation, and maintenance of the equipment and to adhere to all applicable federal and local building and safety codes and regulations.

Any special instructions and certified drawings accompanying this equipment shall supersede this manual.

Keep this manual along with any special instructions and drawings necessary for assembly, operation, and maintenance with the equipment.

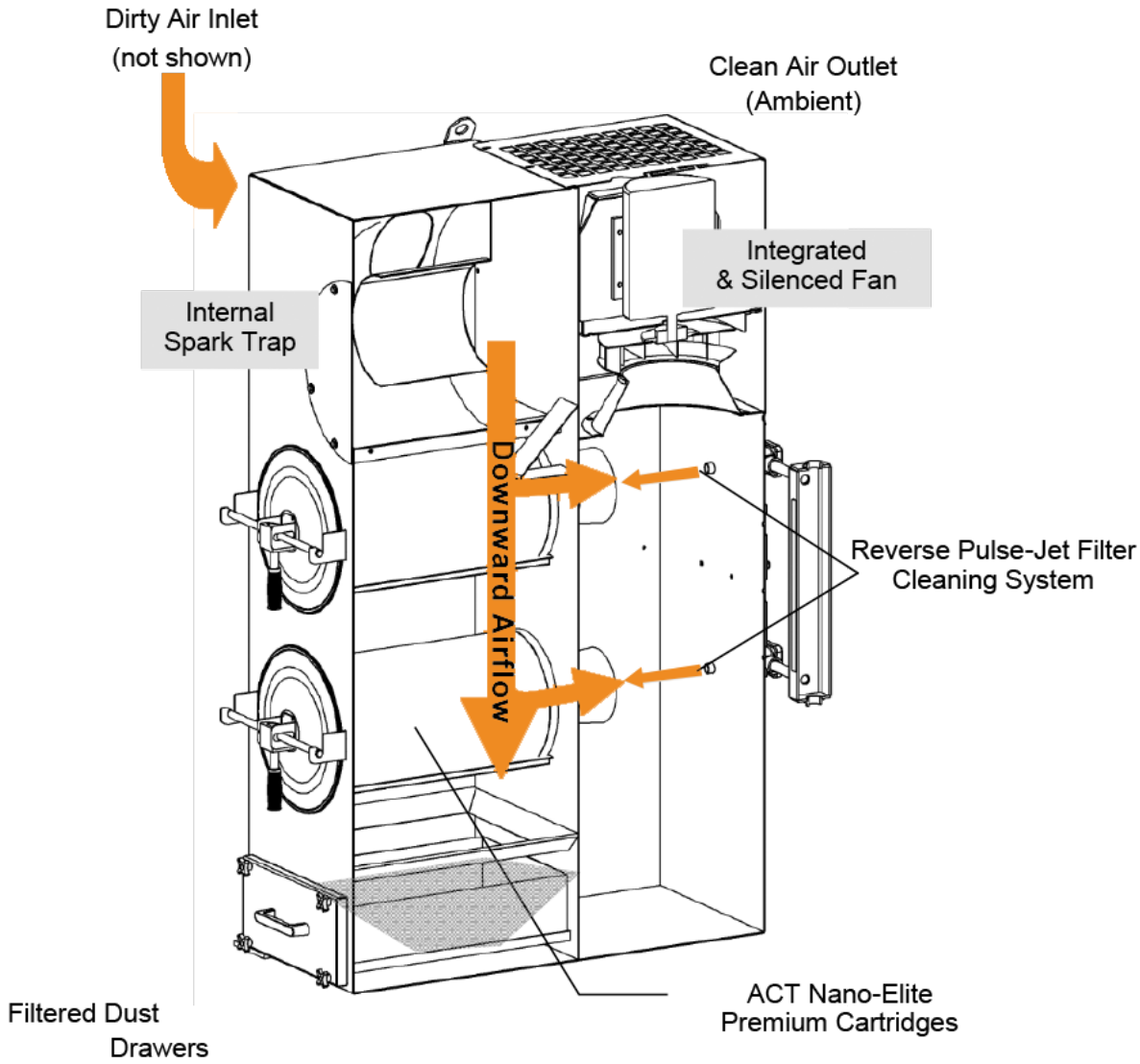
Recommended Tools for Install

Drill
Impact
9/16" Socket
9/16" Wrench
Anchoring Kit
Ladder
Lifting Chains/Straps

Operation Principle

The ACT cartridge dust collector is a pulse-jet air cleaning device that removes the particulates from dust-laden air and allows clean air to be exhausted. As dust enters through the dirty air inlet it passes through the cyclonic spark trap, the heavy particulate is then directed towards the drawers while the remaining fine dust is collected on the cartridge filter surface, allowing clean air to be exhausted back into the atmosphere.

To remove excess dust buildup on the filters, a timer board is used to sequentially open the diaphragm valves and release a pulse of compressed air. This venturi-assisted pressure pulse releases the accumulated dusts from the filters, allowing the particulate to drop down into the drawers.



Dust Filtration Process & Pulse-Jet Cleaning Process

Shipping and Receiving

All products from A.C.T. Dust Collectors are carefully inspected for quality and order completion prior to shipment.

Prior to unloading, inspect all components for any shipping damage and missing parts. Report and file a claim immediately with the carrier for any damage or missing items. Once filed, contact your A.C.T. Dust Collectors representative to notify them of the issue(s).

Any repairs to components with minor damage from transit must be approved in writing by the manufacturer.

WeldPack units are shipped bolted to wooden blocks, we recommend prior to installation that the blocks are removed from the mounting feet.

Handling

Handling should be performed by trained, able, and qualified personnel and be consistent with safe handling practices outlined by OSHA and local codes.

Review this manual and any additionally supplied certified drawing(s) to familiarize yourself with the lift points of each of the components.

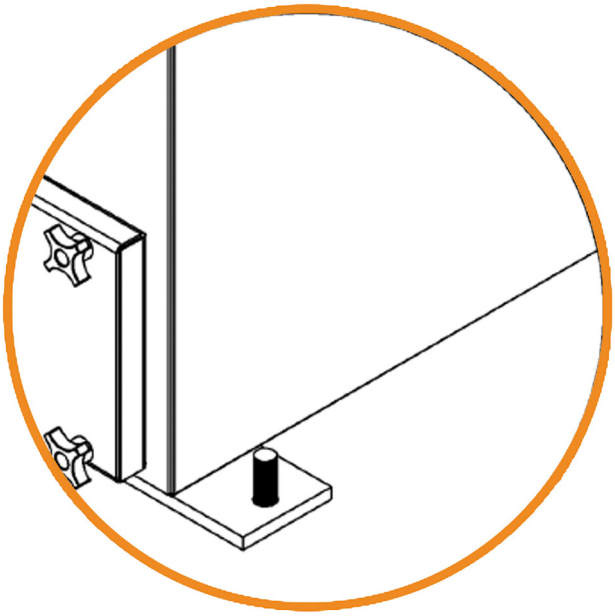
Verify the integrity and lift capacity of all handling equipment/components.

When handling the housing, it is recommended to utilize spreader bars to prevent any deformation during lifting. All lifting points are to be used.

Bolt Size	SAE Grade 5 Torque (ft-lb), dry
1/4-20	8.4
5/16-18	17.4
3/8-16	31
7/16-14	49
1/2-13	75
5/8-11	150
3/4-10	267

Assembly

Dust Collector Anchoring



1. Install 3/8 inch diameter anchor bolts with a minimum of 3 inches into the foundation. Ensure foundation complies with all local regulations and codes.
2. Use recommended SAE torque table for the anchor bolts.

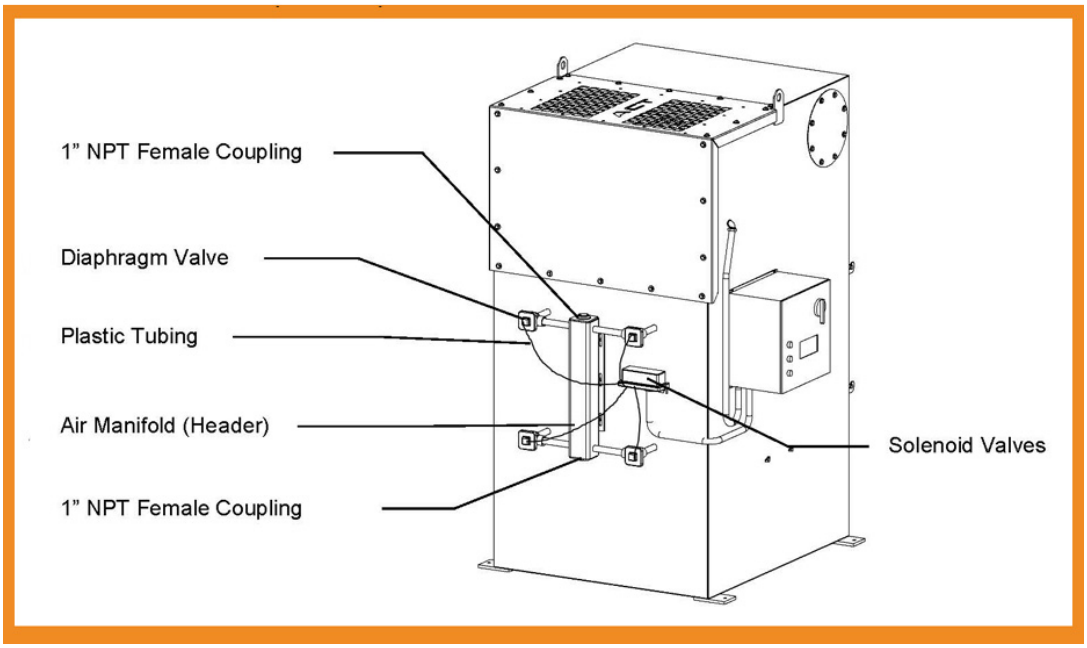
LaserPack units are shipped bolted to wooden blocks, we recommend prior to installation that the blocks are removed from the mounting feet.

Compressed Air

The supplied compressed air must be clean, dry, and oil- free. Set the compressed air pressure levels to 80-90 psi. Do NOT exceed 100 psi as damage may occur to the components.

Prior to installation, purge the compressed air lines of any dirt or buildup.

1. Install the compressed air pipe line to the air manifold to either the top or bottom 1” NPT coupling. Use thread sealant tape or compound on all connections.
2. A drip tee or ball valve installed on the bottom of the manifold is recommended to allow for the draining of any water buildup.
3. 3. It is also recommended to install a shut-off valve, pressure regulator, safety exhaust valve, and filter close to the collector.



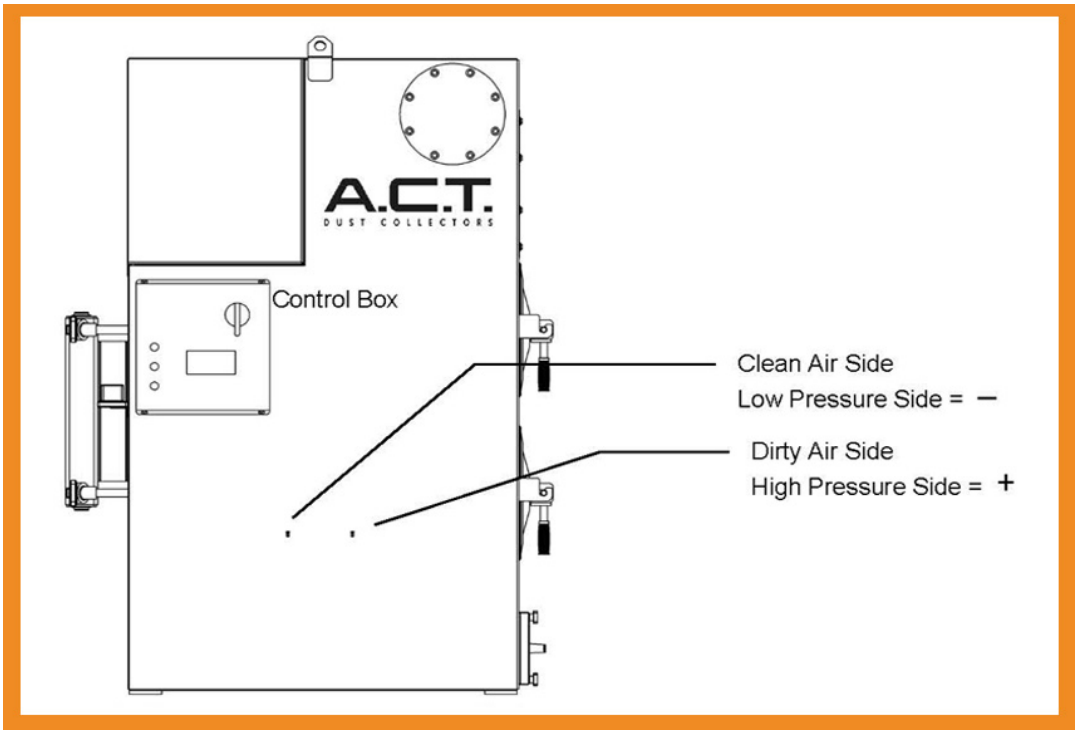
Electrical

All wiring but main power lines will be assembled by A.C.T. Dust Collectors. In the case of maintenance or repair, refer to below instructions.
Refer to nameplate in control panel for proper supply voltage.
Refer to page 10 for recommended timer board settings.

All wiring should be done by a certified electrician and in accordance with all local and federal codes.
Refer to the job specific electrical drawing(s) located in the panel and manual binder for detailed instructions.
Fan and timing board/solenoid wiring are to be in separate conduits. See diagram on page 10 for 5 HP fan wiring
See diagram on page 11 for 10 HP fan wiring

1. *Fan*
   - *Verify fan rotation by observing from the motor end. Another indication is poor fan performance or a lack of air movement.*
2. *Control Panel*
   - *The timer board is located inside the control box, mounted on the dust collector.*
   - *Once the timer board has been installed, the pressure gauge must be connected to the dust collector using customer supplied ¼" tubing (see figure below for low and high pressure ports). If the dust collector is installed outside, the tubing should UV resistant.*

- *IMPORTANT: Prior to operating the dust collector or adjusting the settings, ensure that the down time clean feature has been properly wired. This feature will allow the dust collector to clean itself during shut down, which will aid in prolonging the life of the filters.*



Timer Board Programming

Familiarize yourself with the timer board manual before programming the timer board.

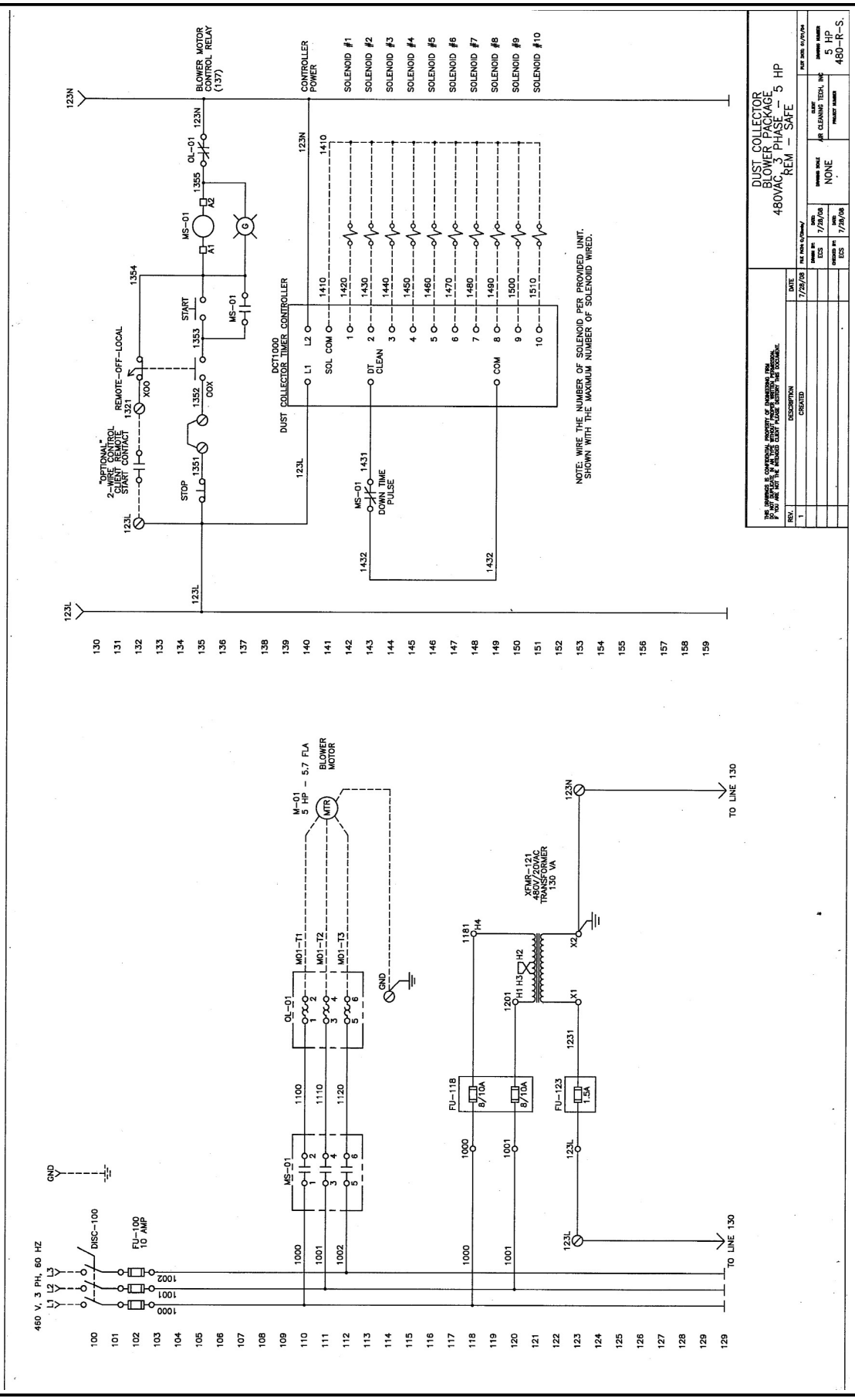
The table below summarizes the recommended settings. Consult with A.C.T. Dust Collectors for specific applications.

Table 2 – Recommended Timer Board Settings

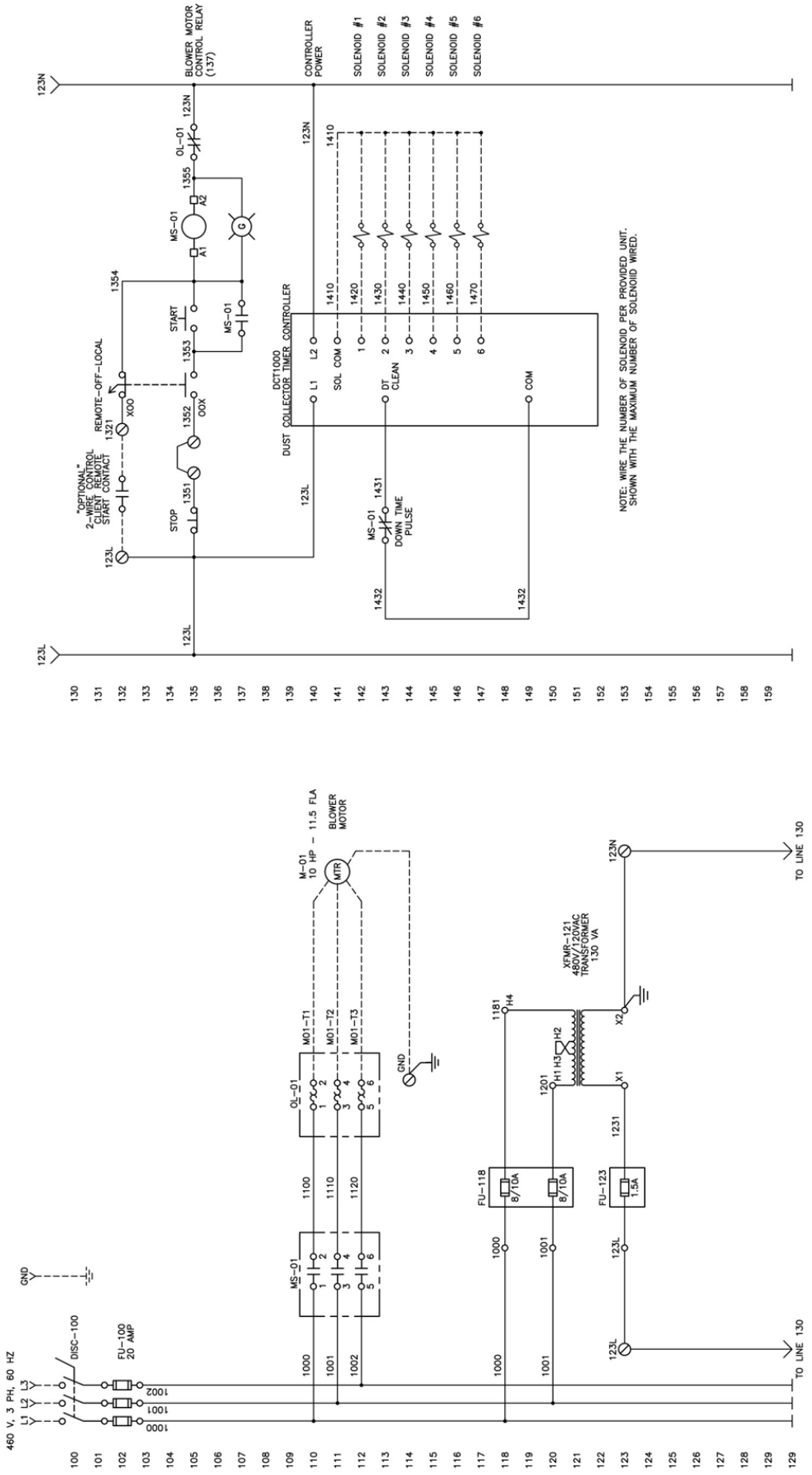
Feature	Settings
Process	Current pressure drop
Last Output	The highest output terminal value that has a wire installed in it. Terminal outputs have a range from 1-22 and are found near the bottom of the timer board.
Time Off	10
Time On	100
High Limit	1.00” above initial pressure drop (Contact Manufacturer for Questions)
Low Limit	Starting value of 1” below high limit value
High Alarm	10 (Unless alarm is installed - Consult Manufacturing)
Low Alarm	0 (Unless alarm is installed - Consult Manufacturing)
Cycle Delay	0
Down Time Cycles	10
Auto Alarm Reset	Unless notified, leave at factory setting of 5.

Check all connections for loose wires, If loose wires are present it can lead to over amperage and cause fuses to blow.

WIRING DIAGRAM—5 HP



WIRING DIAGRAM—10 HP



Start-Up Checklist

- Dust collector completely assembled
- Bolts tightened per specifications on page 6 of this manual
- Fan mounted to the collector after the collector is anchored properly
- Confirm the fan direction matches the rotation arrow on the fan.
- Wiring run to the fan motor from the starter
- Power run to the solenoid enclosure for each solenoid from the timer board outputs
- All wires secured tightly in their terminals per the diagram at the back of this manual
- Compressed air connected to the air manifold
- Compressed air regulator installed and set for 90-95 PSI
- ¼" air tubing connected from the timer board/control panel to the two fittings on the side of the unit
- Timer board programmed per the recommended settings on page 9

Once that is confirmed it is important to check any other accessories that may have been purchased with the unit that require wiring, this includes:

- Remote Start
- Fire Suppression

Before turning the collector on make sure:

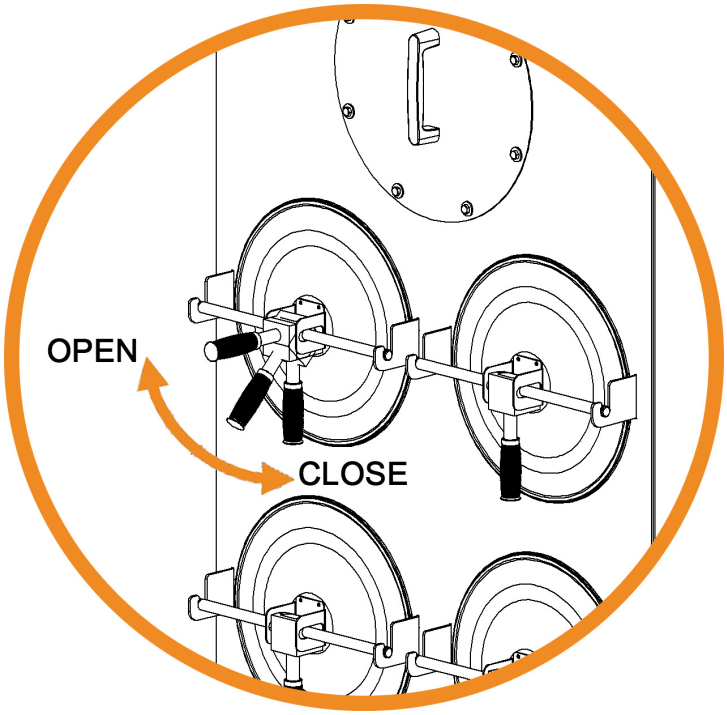
- Secure the dust drawers by tightening the provided knobs
- Dampers are open on your duct work
- Compressed air is turned on to the unit and confirm there are no air leaks
- All filters are in place and filter doors closed
- Make sure all terminal wiring is secure and tight

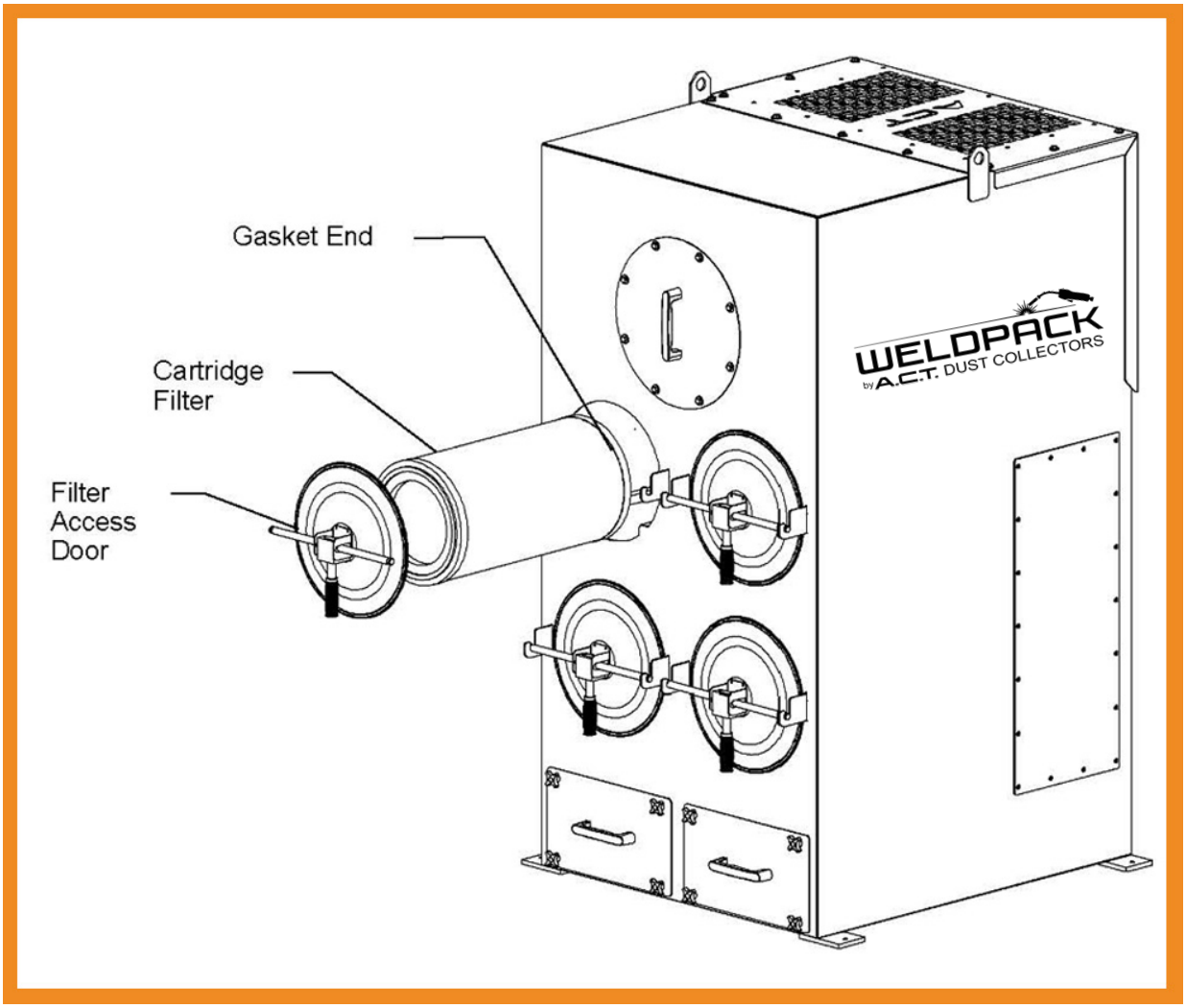
When using the Remote start feature make sure the control is switched to Remote instead of Local

Maintenance

Cartridge Filter Replacement

1. Turn off the fan and wait until the down time cleaning cycle is completed.
2. Lock out/ tag out power to the collector and fan.
3. Open the filter access door by pulling and lifting the cam handle.
4. Once door is loose, lift it off the securing hooks and set it down.
5. Reach into the collector and pull out all of the filters. (Or work your way top down to avoid dust from the upper filters falling down on to the new filters).
6. Once filters are removed, install new filters. Make sure that the gasket end goes into the collector first.
7. Reinstall the filter access door.

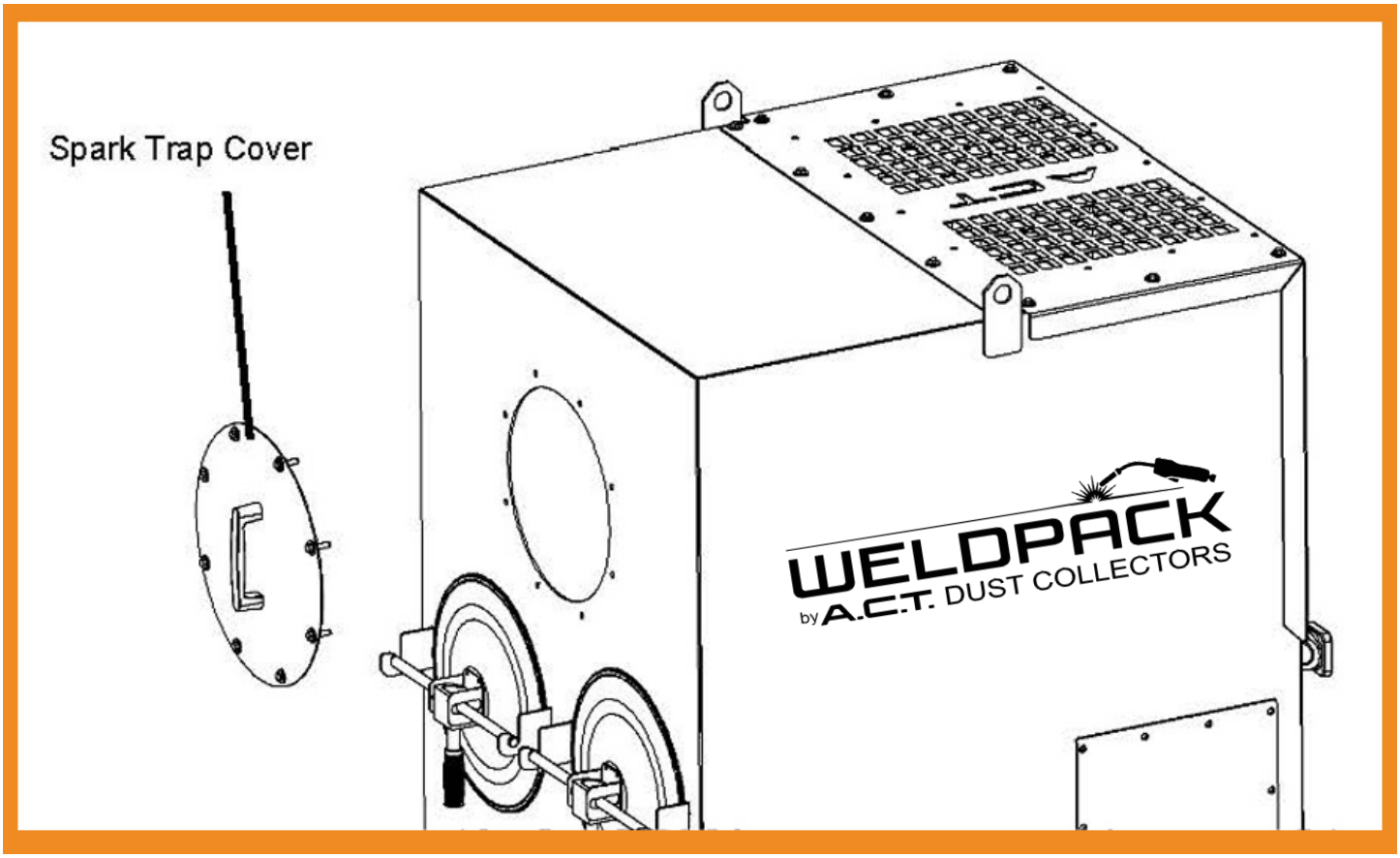




Maintenance

Spark Trap Cleaning

1. Turn off the fan and wait until the down time cleaning cycle is completed.
2. Lock out/ tag out power to the collector and fan.
3. Access the spark trap by unbolting the spark trap cover
4. Remove any debris or buildup inside of the spark trap.
5. Reinstall the spark trap cover.

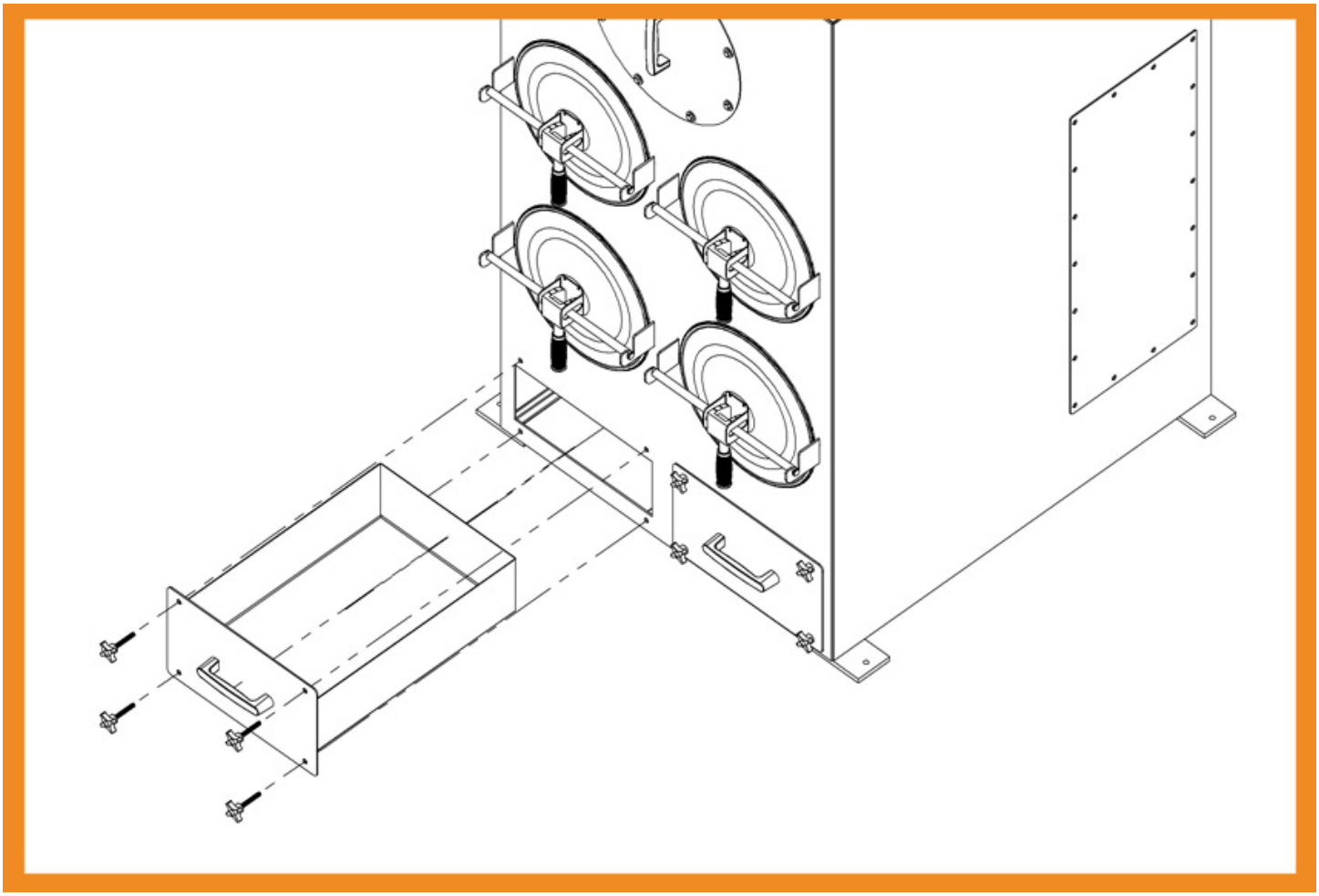


***Amount of dust collected will vary across applications. Initially check spark trap once a week and adjust as needed.**

Dust Drawers

Dust Drawers are used as an alternative to hopper and barrel collection methods. Dust is directed into the drawers by baffles inside the collector. It is recommended to check drawers at 1 week intervals initially to determine your dust loading, and adjust from there.

1. Remove bolts or knobs holding drawers in place.
2. Pull out drawer and dispose of contents, making sure to follow any local regulations for material waste.
3. Replace drawers and replace bolts or knobs.



Monitor the differential pressure to gauge the filter life so you know when to empty your dust drawers and replace the filters

Additional Options (Sold Separately):

These are optional items that can be purchased with an A.C.T. Dust Collector, depending on the dust collector purchased, size and shape may vary slightly.

Bag-In Bag-Out Collars

Bag-in/bag-out collars are used when harmful dusts are present or simply to minimize exposure to any dust. They minimize the amount of dust the operator comes in contact with by allowing the operator to replace the filters by using a bag strapped onto the collar. Although this procedure does greatly reduce exposure to the dusts, it is hard to completely avoid any exposure. It is strongly recommended that the operator still use proper protective clothing, including respirators.

1. Remove the filter access cover and set it aside. If you would like, you can use a bag for this process to further minimize exposure. Starting at the top row of the dust collector will prevent dusts from falling on to new filters already installed in the rows below.

2. Take a new bag and place it over the outside of the bag collar. Secure the bag around the collar with the provided strap. Securely tighten the strap.

3. Grab the bottom of the bag, reach in and twist the filter to drop off any dust that may be in the pleats of the filter, and then pull the filter out into the bag.

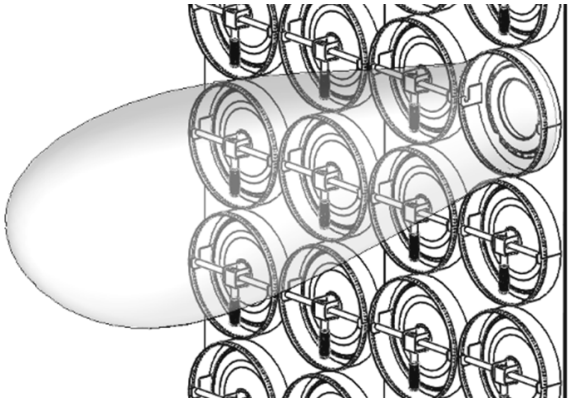
4. Before removing the bag from the collar, it is recommended that you twist the bag to prevent the dust from escaping and use a tie to seal off the bag.

5. Remove the bag from the collar.

6. If there are two filters in your filter access hole, repeat this process for the next filter.

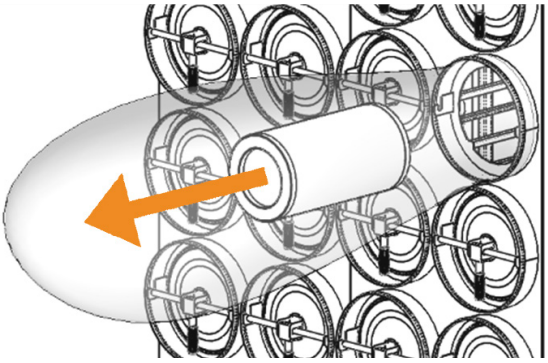
7. Place the new filter into the filter access hole. To further minimize exposure to dusts, this can be done by first loading the new filter into a bag.

8. Replace the filter access door and continue this process until all filters have been replaced.



Secure bag on to the collar

Reach in and grab the filter with the bag



Remove the filter while still inside of the bag

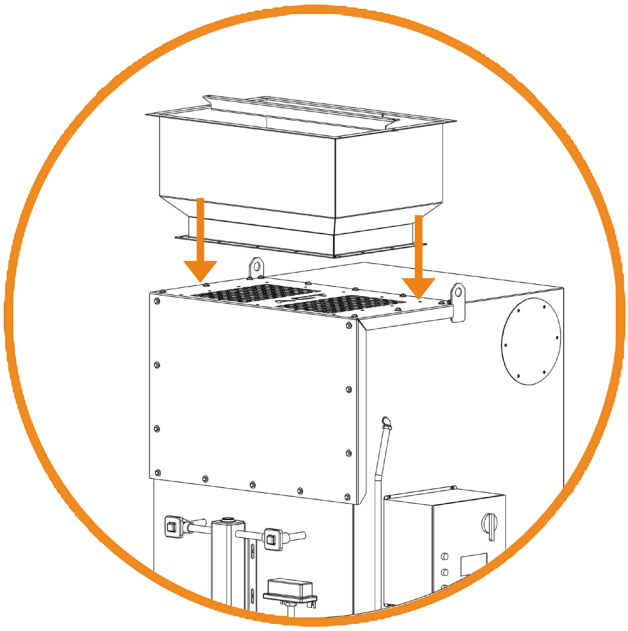
Additional Options (Sold Separately):

These are optional items that can be purchased with an A.C.T. Dust Collector, depending on the dust collector purchased, size and shape may vary slightly.

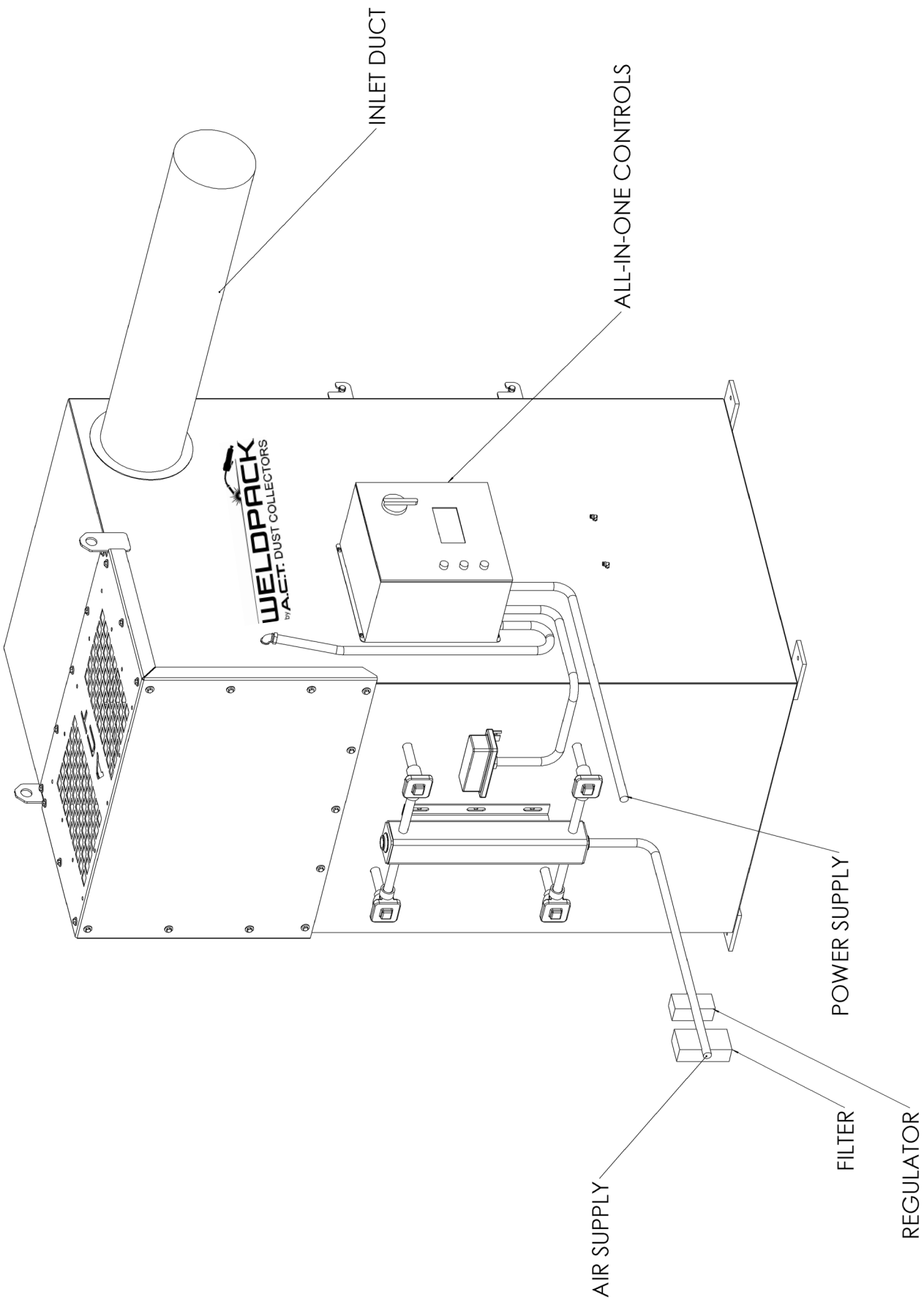
HEPA Adder

If you purchased the optional HEPA housing for the laser pack the kit will include, the HEPA filter housing, the filters, hardware to install the housing, and a magnehelic gauge with air tubing.

1. First you need to lift the housing into place using the appropriate lifting mechanism.
2. Once it is in place align the bolt holes and use the hardware supplied to secure it to the top of the dust collector, Reference the diagram below.
3. Once that is secure connect in the air tubing to the HEPA housing and run the air hose down to the magnehelic gauge
4. The gauge needs to be installed in a convenient easy to access location so it can be monitored as needed.

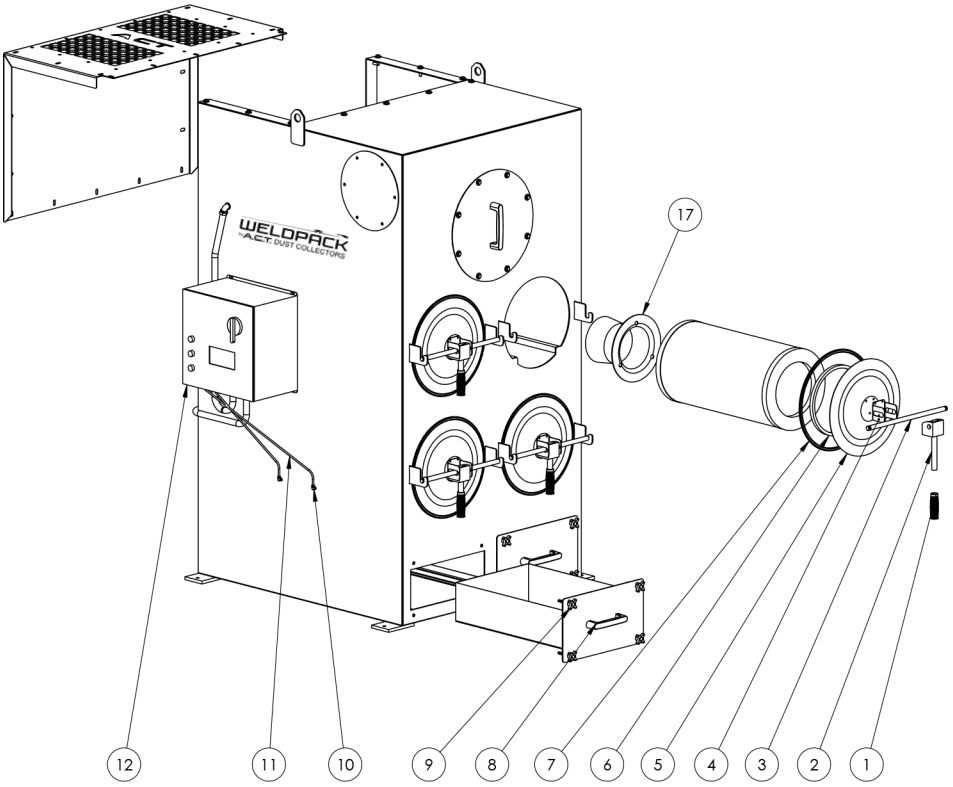


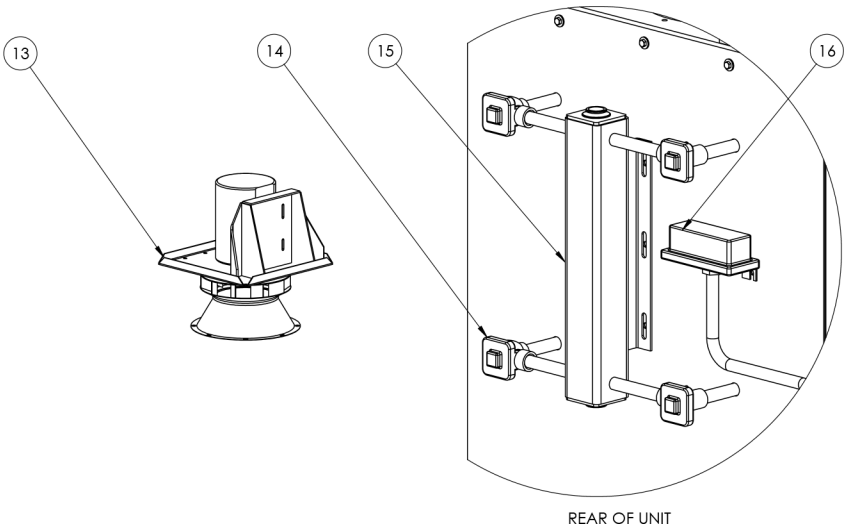
Full Unit Diagram



Critical Parts List

Critical Spare parts are always in stock.





REAR OF UNIT

ITEM	PART NUMBER	DESCRIPTION
1	DC76001	Door Handle Rubber Grip
2	DC71500	Cam Bracket
3	DC13002	Door Rod
4	DC79500	Door Handle
5	DC13001	Filter Access Door
6	DC45003	Gasket Inner Door
7	DC79750	Outer Door Gasket
8	DC76510	Pull Handle
9	DC76550	Star Knob
10	DC40003	90 Degree Air Fitting
11	DC40001	Polyethylene Tube 1/4"
12	Varies	Varies
13	Varies	Varies
14	DC20002	Diaphragm Valve 3/4"
15	Varies	Varies
16	Varies	Varies
17	DC71000	Venturi

Troubleshooting

Problem	Probable Cause	Solution
Poor performance - not enough suction or air movement	Fan rotation in wrong direction	Rewire three phase wires to change fan rotation
	Closed damper or obstruction in airstream	Slowly open damper or remove obstruction
	VFD	Verify settings and operating speed
	System design	Verify fan performance to fan curve with airflow, static pressure, and amperage readings
		Re-evaluate system design to verify that the fan is properly sized for the application or nothing has changed since product selection (i.e. added a new weld station)
	System effects	Check along the duct system to ensure that there is no abrupt changes in airflow (i.e. inlet box with no turning vanes, mitered elbow with no vanes, etc.)
	Filters at end of life	Replace filters
	Not enough compressed air	Verify that the pressure is high enough for effective cleaning (set to 90-100 psi)
High differential pressure	Dirty filters	Activate cleaning by reducing the "high limit" or manually pulse by following the instructions in timer board manual
		Replace filters near end of life
	Not enough compressed air	Verify that the pressure is high enough for effective cleaning (set to 90-100 psi)
	Defective cleaning system	Verify solenoids, diaphragm valves, and timer board are functioning and properly wired
Motor over-amping	Fan design	Overloading radial-bladed fans may require a damper to reduce the horsepower requirements
	Electrical	Verify correct motor supply voltage
	Fan/motor sized incorrectly	Confirm system requirements with airflow measurements
		Replace fan with larger unit

Troubleshooting

Problem	Cause	Solution
Zero differential pressure reading	Wrong pressure high/low pressure tubing connection	Swap the connections of the pressure reading plastic tubing on the side of the collector
	Pressure reading tubing kink or leakage	Inspect tubing for kinks or leakage
	Filters/Bypass	Verify filters are installed and that there is no bypass of dust
	Defective timer board	Replace board. (1-800-422-1316)
Cleaning system not pulsing	Solenoid	Listen for clicking noise to verify solenoids are opening/closing. Replace if defective.
		If located in frigid outdoors temperatures, a solenoid heater may be required
	Diaphragm Valve	Replace worn diaphragms. (1-800-422-1316)
	Timer board	Manually pulse by following instructions in timer board manual. Verify it is correctly installed.
		Defective. Replace board. (1-800-422-1316)
No down-time cleaning	Timer board	Verify settings on timer board
	Electrical	Call A.C.T. to verify electrical drawings and specifications. (1-800-422-1316)
Dust discharging from outlet	Filter damage	Inspect filters for tears along filter media and gaskets.
	Filters installed incorrectly	Verify that the filters are installed correctly with gasket end towards the collector.
	Pulse pressure set too high	Decrease compressed air pressure.

Warranty

Air Cleaning Technology, Inc. (A.C.T. Dust Collectors) warrantees the equipment to be free from defects in materials and workmanship for a period of 10 years from the date of purchase. This warranty does not cover any damage due to normal wear and tear including, but not limited to, corrosion, abrasion, elements, and modifications. This warranty covers parts only. This warranty covers only the parts manufactured exclusively for Air Cleaning Technology, Inc. All other parts will be covered by individual manufacturer's warranty.

ATTENTION DISCLAIMER

For stainless steel dust collector installation, there is a possibility of thread galling on the supplied fasteners. To avoid this occurrence as best as possible, please follow the steps outlined below.

1. Slowing down the installation RPM speed will frequently reduce, or sometimes solve completely, the problem. As the installation RPM increases, the heat generated during tightening increases. As the heat increases, so does the tendency for the occurrence of thread galling.

2. Lubricating the internal and/or external threads frequently eliminates thread galling. The suggested lubricants should contain substantial amounts of molybdenum disulfide (moly), graphite, mica, or talc. Some proprietary, extreme pressure waxes may also be effective. You must be aware of the end use of the fasteners before settling on a lubricant. Stainless steel is frequently used in food related applications, which may make some lubricants unacceptable. Lubricants can be applied at the point of assembly or pre-applied as a batch process similar to plating. Several chemical companies offer anti-galling lubricants. One such source, EM Corporation, suggests their Permaslik¨ RAC product for use at the point of assembly. They suggest Everlube¨ 620C for batch, pre-applying to stainless steel fasteners.

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Form: OMM-10-0509
Effective: 5/4/09
Supersedes: OMM-10-0207
Part No.: 01225

Installation, Safety, Operation & Maintenance Instructions And Parts List

For Models CPF and CPAF

Arrangement 4 Blowers.

NOTE

READ ENTIRE MANUAL, INCLUDING "SECTION IV. INITIAL UNIT STARTUP" BEFORE ATTEMPTING TO INSTALL AND OPERATE THIS EQUIPMENT.

BLOWER SPECIFICATIONS

BLOWER SERIAL NUMBER: _____ **MFG. DATE:** _____

NOTE: The serial number above is a required reference for any assistance. It is stamped on the blower nameplate.

BLOWER SPECIFICATIONS:

Model: _____ **Arrangement:** _____ **Rotation:** _____

Wheel Size and Type: _____

BLOWER PERFORMANCE DATA: (If entered on order)

CFM: _____ **SP:** _____ (Inches of Water Gauge) **Motor BHP:** _____

Density: _____ **Altitude:** _____ (Ft. above S.L.) **Airstream Temperature:** _____°**F.**

Fan RPM: _____ **Maximum Safe Fan RPM:** _____ **DO NOT EXCEED THIS RPM**

MOTOR DATA: (This section is completed only if the motor was supplied by Cincinnati Fan)

HP: _____ **RPM:** _____ **Voltage:** _____ **Phase:**_____

Hz: _____ **Frame Size:** _____ **Enclosure:** _____ **Efficiency:** _____

IF Motor is EXP, Class(es) & Group(s) are:_____

Manufacturers Model Number: _____ **CFV Part Number:** _____

ATTENTION: RECEIVING DEPARTMENT

All Cincinnati Fan products are packaged to minimize any damage during shipment. The freight carrier is responsible for delivering all items in their original condition as received from Cincinnati Fan. The individual receiving this equipment is responsible for inspecting this unit for any obvious or concealed damage. If any damage is found, it should be noted on the bill of lading before the freight is accepted and the receiver must file a claim with the freight carrier.

LONG TERM STORAGE NOTICE

If this blower will NOT be installed and put into operation within 30 days, refer to the "Long Term Storage Instructions" on page 12. Failure to follow all applicable long term storage instructions, will void your warranty. This blower should be stored indoors in a clean, dry location.

⚠ DANGER

				
Hazardous voltage can cause electrical shock and death.	High speed rotating equipment can cause severe personal injury.	Lock out/Tag out to prevent personal injury BEFORE starting ANY service or inspection.	Avoid injury. NEVER operate without ALL required safety guards in place.	Avoid injury. You MUST read and understand all instructions in this manual BEFORE installing.

TABLE OF CONTENTS

I. GENERAL

A. Unpacking:

Be careful not to damage or deform any parts of the blower when removing it from the packaging container. **All the packaging material should be kept in the event the blower needs to be returned.**

Handling:

Handling of the blower should be performed by trained personnel and be consistent with all safe handling practices. Verify that all lifting equipment is in good operating condition and has the proper lifting capacity. The blower should be lifted using well-padded chains, cables or lifting straps with spreader bars. Lifting eye locations are provided in the blower base. **NEVER lift the blower by an inlet or discharge flange, blower or motor shaft, motor eye bolt, or any other part of the blower assembly that could cause distortion of the blower assembly.**

B. Safety Instructions & Accessories:

1. **Safety Instructions:**
   All installers, operators and maintenance personnel should read AMCA Publication 410-96, **"Recommended Safety Practices for Users and Installers of Industrial and Commercial Fans".** This manual is included with the blower. Additional copies can be requested by writing us at Cincinnati Fan, 7697 Snider Rd., Mason, OH 45040-9135.
2. **Sound:**
   Some blowers can generate sound that could be hazardous to personnel. It is the responsibility of the user to measure the sound levels of the blower and/or system, determine the degree of personnel exposure, and comply with all applicable safety laws and requirements to protect personnel from excessive noise.

3. **Air Pressure and Suction:**
   In addition to the normal dangers of rotating machinery, the blower can present additional hazards from the suction or pressure created at the blower inlet or discharge. Suction at the blower inlet can draw materials into the blower where they become high velocity projectiles at the discharge and cause severe personal injury or death. It can also be extremely dangerous to persons in close proximity to the inlet or discharge as the forces involved can overcome the strength of most individuals.

⚠ WARNING

NEVER OPERATE A BLOWER WITH A NON-DUCTED INLET AND/OR DISCHARGE. IF THE BLOWER INLET AND/OR DISCHARGE IS NON-DUCTED, IT IS THE USERS RESPONSIBILITY TO INSTALL AN INLET AND/OR DISCHARGE GUARD.

4. **Temperature:**
   Many blowers, blower components and all motors operate at temperatures that could burn someone if they come in contact with them. If this potential hazard could exist in your installation, steps must be taken by the user to protect anyone from coming in contact with this equipment.
5. **Spark Resistance:** (Per AMCA Standard 99-0401-86 and ISO 13499)

⚠ DANGER

NO GUARANTEE OF ANY LEVEL OF SPARK RESISTANCE IS IMPLIED BY SPARK RESISTANT CONSTRUCTION. IT HAS BEEN DEMONSTRATED THAT ALUMINUM IMPELLERS RUBBING ON RUSTY STEEL CAN CAUSE HIGH INTENSITY SPARKS. AIR STREAM MATERIAL AND DEBRIS OR OTHER SYSTEM FACTORS CAN ALSO CAUSE SPARKS.

6. **Safety Accessories:**
   Guards:
   All moving parts must be guarded to protect personnel. Safety requirements can vary, so the number and types of guards required to meet company, local, state and OSHA regulations must be determined and specified by the actual user or operator of the equipment.

   NEVER start any blower without having all required safety guards properly installed. All blowers should be checked on a regular schedule, for missing or damaged guards. If any required guards are found to be missing or defective, the power to the blower should be immediately turned off and locked out in accordance with OSHA regulations. Power to the blower should NOT be turned back on until the required guards have been repaired or replaced.

   This blower can become dangerous due to a potential "windmill" effect, even though all electrical power has been turned off or disconnected. The blower wheel should be **carefully** secured to prevent any rotational turning ***BEFORE*** working on any parts of the blower/motor assembly that could move.
7. **Access or Inspection Doors:**

⚠ DANGER

NEVER OPEN ANY ACCESS OR INSPECTION DOORS WHILE THE BLOWER IS OPERATING. SERIOUS INJURY OR DEATH COULD RESULT FROM THE EFFECTS OF AIR PRESSURE, AIR SUCTION OR MATERIAL THAT IS BEING CONVEYED. DISCONNECT OR LOCK OUT POWER TO THE BLOWER AND LET THE BLOWER WHEEL COME TO A COMPLETE STOP *BEFORE* OPENING ANY TYPE OF ACCESS OR INSPECTION DOOR.

II. INSTALLATION

A. Vibration:

Before any mounting method is selected, the user should be aware of the effects vibration will have on the blower, motor and other parts. Improper blower installation can cause excessive vibration causing premature wheel and/or motor failure, that is not covered under warranty. Vibration eliminator pads, springs or bases should be properly installed to prevent any blower vibration from transmitting to the foundation or support structure.

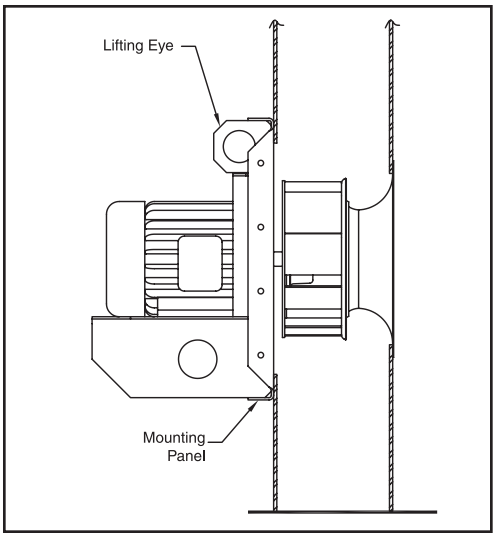
⚠ WARNING

SHUT THE BLOWER DOWN IMMEDIATELY IF THERE IS ANY SUDDEN INCREASE IN VIBRATION.

B. Mounting Methods:

The blower wheel for this model blower was dynamically balanced before assembly. The completed blower was also tested at the operating speed to make sure it conformed to Cincinnati Fan vibration limits. However, proper mounting is necessary to make sure the blower will operate smoothly. The vibration levels this blower will acturally operate at will depend on how rigidly the blower is mounted. If the structural support the blower is mounted on is too weak, severe vibration problems can occur. Plug fans are designed to be mounted to a plenum or main support structure, like oven walls. The panel is bolted directly to the wall and the blower wheel is mounted on the blower shaft that passes through a hole in the wall. See **Fig. 1** on page 4.

Fig. 1



The plug fan panel has a formed channel on all four sides to add to the rigidity of the blower and the mounting structure. The front of the panel also contains pre-punched holes to mount the panel to your structure.
Plug fans are shipped with an inlet bell, but it is the users responsibility to provide the mounting structure and hardware to mount the bell. In most cases, the inlet bell mounting structure is an internal wall or plenum. The wall or plenum MUST be parallel with the mounting structure the blower is bolted to, to maintain the correct wheel-to-inlet bell clearance shown in **Table 1** below. The inlet bell plenum or wall must also be rigid enough to prevent movement or pulsation of the inlet bell during operation.

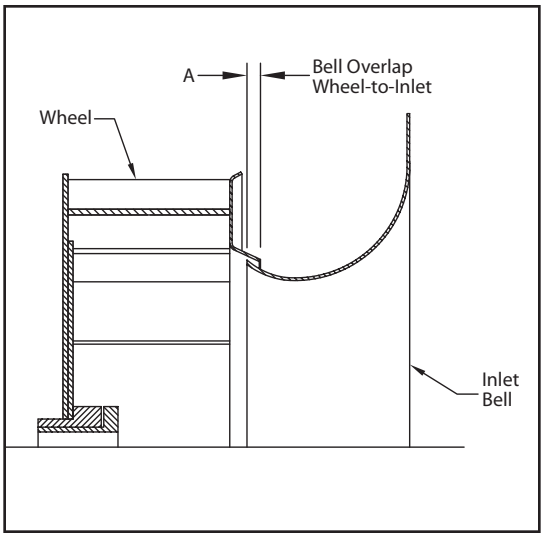


Table 1

Fan Size	"A" Dimension	Fan Size	"A" Dimension
120	1/8	200	5/16
130	1/8	220	5/16
150	5/16	240	3/8
160	5/16	270	7/16
180	5/16	300	1/2

C. Safety Guards:

Cincinnati Fan offers guards, as optional, to keep your blower in compliance with OSHA safety regulations. It is the responsibility of the user to make sure this blower meets all local, state and OSHA safety regulations. If you have a specific guard requirement not covered by OSHA, please contact the local Cincinnati Fan sales office for assistance.

D. Set Screw and Taper-lock Bushing Torque Values:

All blower wheel set screws are tightened to the proper torque prior to shipment. Some wheels may have taper-lock hubs and split, taper-lock bushings to secure the wheel to the blower shaft.

NOTE: Check all set screw or taper-lock bushing torques. Forces encountered during shipment, handling, rigging and temperature can affect factory settings. For correct torque values, see **Tables 2** and **3** below

Table 2

SET SCREW TORQUE VALUES		
Diameter & Number of Treads/Inch	**Hex Wrence Size (Across Flats)**	**Required Torque (Inch Pounds)**
1/4-20 5/16-18	1/8” 5/32”	65 165
3/8-16 7/16-14	3/16” 7/32”	228 348
1/2-13 5/8-11	1/4” 5/16”	504 1104

Table 3

TORQUE VALUES FOR TAPER-LOCK BUSHINGS	
Taper-lock Bushing Size	**Required Torque (Inch Pounds)**
H	95
B P	192 192
Q R	350 350

⚠ CAUTION

Set screws should NEVER be used more than once. If the set screws are loosened, they MUST be replaced. Use only knurled, cup-point, set screws with a nylon locking patch.

III. ELECTRICAL

A. Disconnect Switches:

All blower motors should have an independent disconnect switch located in close visual proximity to turn off the electrical service to the blower motor. **Disconnects must be locked out in accordance with OSHA “lock out-tag out” procedures any time inspection or maintenance is being performed on the blower and/or motor assembly. The “lock out-tag out” procedure should be performed by a licensed electrician or authorized personnel.**

All disconnects should be sized in accordance with the latest NEC codes (National Electric Codes) and any local codes and should be installed only by a licensed electrician. “Slow blow” or “time delay” fuses or breakers should be used since the initial start-up time for the blower motor, although rare, can be up to 10 seconds.

B. Motors:

⚠ DANGER

ALL WIRING CONNECTIONS, INSPECTION AND MAINTENANCE OF ANY MOTOR MUST BE PERFORMED BY A LICENSED ELECTRICIAN IN ACCORDANCE WITH THE MOTOR MANUFACTURERS RECOMMENDATIONS, ALL ELECTRICAL CODES AND OSHA REGULATIONS. FAILURE TO PROPERLY INSTALL, MAKE WIRING CONNECTIONS, INSPECT OR PERFORM ANY MAINTENANCE TO A MOTOR CAN RESULT IN MOTOR FAILURE, PROPERTY DAMAGE, EXPLOSION, ELECTRICAL SHOCK AND DEATH.

1. **DO NOT connect or operate a motor without reading the motor manufacturers instructions supplied with the motor.** The basic principle of motor maintenance is: **KEEP THE MOTOR CLEAN AND DRY.** This requires periodic inspections of the motor. The frequency of the inspections depends on the type of motor, the service and environment it will be subjected to and the motor manufacturers instructions.
2. **Cleaning:** Cleaning should be limited to exterior surfaces only. **Follow motor manufacturers cleaning instructions.**
3. **Lubrication:** Most small motors have sealed bearings that are permanently lubricated for the life of the motor. Some larger motors have grease plugs that should be replaced with grease fittings to perform re-lubrication. These motors, or any motor with grease fittings, should be lubricated in accordance with the motor manufacturers recommendations. Lubrication frequency depends on the motor horsepower, speed and service. **BE SURE** you use compatible grease and **DO NOT** over grease.
4. **Location:** If the motor will be outside and subjected to the weather, it is recommended that a weather cover be installed to keep rain and snow off of the motor. No motors are guaranteed to be “watertight”. Be careful to allow enough openings between the motor and the motor cover to let the motor ”breath”. If the back end of the motor is covered, the cover should be no closer than 3” to the back of the motor for proper ventilation.
5. **Wiring Connections:** All wiring connections should be made for the proper voltage and phase as shown on the motor nameplate. Connections should follow the motor manufacturers recommendations as shown on the wiring schematic. This wiring diagram will be located on the outside of the motor, inside of the motor conduit box or on the motor nameplate. **Reversing some wires might be necessary to get the correct blower rotation.**
6. **Motors with Thermal Overload Protection:** If a motor is equipped with thermal overloads, the thermal overload must be wired per the wiring schematic to be operable. ***There are 3 types of thermal overloads:***
   a. **Automatic:** These will automatically shut the motor down if the internal temperature exceeds the design limits.

⚠ DANGER

MAKE SURE YOU LOCK OUT THE POWER TO THE MOTOR BEFORE INSPECTING ANY MOTOR WITH AUTOMATIC THERMALS, WHEN THE THERMALS COOL DOWN, THEY WILL ALLOW THE MOTOR TO AUTOMATICALLY START UP AGAIN, UNLESS YOU HAVE LOCKED OUT THE POWER TO THE MOTOR.

b. **Manual:** These motors will have a button on them. If the motor overheats, it will shut down. After you have inspected the motor and eliminated the over heating problem, you will need to "reset" it by pushing the button. **Lock out the power BEFORE inspecting the motor.**

c. **Thermostats:** This type of thermal is a temperature sensing device **ONLY**. If the motor overheats, the thermostats will open or close (depending on the type) and send a **"signal"** to the electrical box. ***THEY WILL NOT TURN THE MOTOR OFF.*** **These are pilot circuit devices that must be connected to the magnetic starter circuit.**

7. **EXPLOSION PROOF Motors:** No motor is explosion proof. Explosion proof motors are designed so if there is an explosion **WITHIN** the motor, the explosion will be **CONTAINED INSIDE** the motor and not allowed to get out to the atmosphere. All explosion proof motors must be selected based on the atmosphere and/or the environment the motor will be operating in. Explosion proof motors are designed, rated, and labeled for their operating conditions based on Classes, Groups and "T" Codes. **The Class, Group and "T" code of an EXP motor MUST be selected based on the atmosphere and/or environmental conditions the motor will be operating in. Consult the NEC (National Electric Code) and the NFPA (National Fire Protection Association) for the proper EXP motor Class, Group and "T" Code required for your specific application and location.**

⚠ DANGER

IF AN EXPLOSION PROOF MOTOR IS USED IN AN AREA CONTAINING VOLITILE LIQUIDS, GASES, FUMES OR DUST FOR WHICH THE MOTOR WAS NOT DESIGNED TO OPERATE IN, AN EXPLOSION AND/OR FIRE CAN OCCUR

NOTICE:

a. **All EXP motors have some type of thermal overload as required by UL (Underwriters Laboratories). Refer to all of Section 6 above.**

b. **All EXP motors are required to have the UL (Underwriters Laboratories) and CSA (Canadian Standards Association) listing numbers on the motor name plate or on a separate plate attached to the motor. The Class, Group and "T" Code the motor is designed for must also be listed.**

8. **Normal Motor Operating Temperatures:**
   Using your hand to test the normal running temperature of a motor can be a very painful experience;
   The normal operating temperature of a fully loaded, open type, electric motor operating in a 70°F. (21°C.) ambient temperature is 174°F. (79° C.)

C. Maximum Blower Speed and Motor Speed Controllers:

If you will be using any type of motor speed controller with this blower, DO NOT exceed the maximum safe blower speed. Installing and using a speed control device requires special training and certification as required by the speed control manufacturer. See the manufacturers instructions for proper use, installation and wiring connections for the maximum speed settings. It may be necessary to "block out" some speeds to eliminate a resonant vibration problem. The maximum safe blower speed is shown on the data sheet shipped with the blower. If you have lost the data sheet, contact Cincinnati Fan or our sales office for your area. You must have the serial number from the **blower** name plate for us to determine the maximum safe blower speed.

Cincinnati Fan will only extend the motor manufacturers warranty, when used with a speed controlling device, if the motor has the words **"Inverter Duty"** marked on the motor name plate. If the motor does not have **"Inverter Duty"** marked on the motor name plate, and you have a motor failure, you will be required to contact the motor manufacturer for any service or warranty claims.

IV. INITIAL UNIT STARTUP

NOTICE: Failure to complete and document all the following pre-startup and both post-startup checks, listed in sections A (below) and B on page 9, could void all warranties.

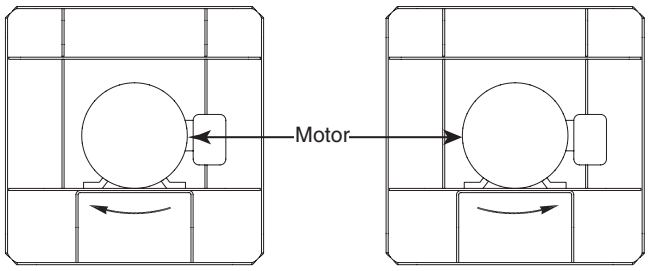
A. Pre-Startup & Post-Startup Checks: (Check blocks as each step is completed. Retain this for your records.)

A1. Pre-Startup Checks Completed By: _____ DATE: _____
A2. 8 Hour, Post-Startup Checks Completed By: _____ DATE: _____
A3. 3 Day, Post-Startup Checks Completed By: _____ DATE: _____

MAKE SURE POWER TO THE MOTOR IS LOCKED OUT BEFORE STARTING PRE-START OR POST-START CHECKS.

1. ☐☐☐ Check all blower hardware to make sure it is tight.
2. ☐☐☐ Check the blower wheel set screws to make sure they are tight per **Table 2** on page 5.
3. ☐☐☐ If the blower wheel has a taper-lock bushing, make sure the bolts are tightened per **Table 3** on page 5.
4. ☐☐☐ Make certain there is no foreign material in the blower housing (optional) that can become a projectile.
5. ☐☐☐ Make sure any inspection doors are securely bolted or locked.
6. ☐☐☐ Ensure all electrical power components are properly sized and matched for your electrical system.
7. ☐☐☐ Check the blower wheel, by turning the wheel by hand to ensure it rotates freely.
8. ☐☐☐ Check that any required guards are properly secured.
9. ☐☐☐ If your blower is mounted on an elevated support structure, make sure the structure is welded at all the joint connections, welds have not cracked and the structure is properly braced to prevent "side sway".
10. ☐☐☐ **Never** subject a "**cold**" blower to a "**hot**" gas stream. If the blower will be handling "hot gases" greater than 150°F (65°C) it is imperative that the blower be subjected to a gradual rate of temperature increase, not to exceed 15°F/minute (8°C/minute). The same temperature limits are also important when the blower is experiencing a drop in temperature until the temperature drops down to 150°F (65°C). Only, when the entire blower has reached an equilibrium temperature of 150°F (65°C), or less, should the power be turned off.
11. ☐☐☐ Make sure the power source connections to the blower motor are per the motor manufacturer's instructions.
12. ☐☐☐ Make sure the blower wheel is stationary prior to startup. **Starting a blower with a wheel that is rotating backwards can cause wheel damage.**
13. ☐☐☐ Apply power to the blower motor momentarily (i.e. "bump start") to check for proper blower wheel rotation. If the blower is rotating in the wrong direction, reconnect the motor leads per the motor manufacturer's wiring schematic. **Blower rotation is determined by viewing the blower from the motor side of the blower, NOT from the inlet side**. After reconnecting the leads, repeat this step. **See Fig. 2 below.**

Fig. 2



Clockwise (CW) Rotation **Counter-Clockwise (CCW) Rotation**

14. ☐☐☐ Apply power to the motor and let it come up to full speed. Turn off the power. Look and listen for any unusual noise or mechanical abnormality while the blower wheel is still spinning. If any are noticed, lock out the power, wait for the blower wheel to come to a complete stop, locate the cause and correct it.
15. ☐☐☐ Unlock power and start the blower.
16. ☐☐☐ Measure, record and keep the following motor data for future reference and comparison:
(Single phase motors will only have L1 and L2 leads)

Amperage draw on each motor lead: L1 _____ L2 _____ L3 _____
(Running amps **SHOULD NOT** exceed the motor name plate amps for the voltage being operated on).

Voltage coming to motor leads: L1_____ L2_____ L3_____
(Should be about the same input voltage on all leads)

B. Vibration:

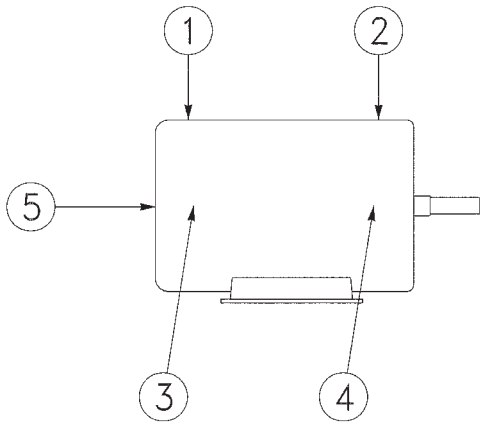
The blower was balanced at the factory to comply with ANSI/AMCA Standard 204-05, Category BV-3. However, rough handling in shipment and/or erection, weak and/or non-rigid foundations, and misalignment may cause a vibration problem after installation. After installation, the vibration levels should be checked by personnel experienced with vibration analysis and vibration analysis equipment.

NOTE:

The blower **SHOULD NOT** be operated if the vibration velocity of the blower exceeds 0.40 inches per second, filter out, if the blower is rigidly mounted. If the blower is mounted on isolators or on an isolator base, it **SHOULD NOT** be operated if the vibration velocity of the blower exceeds 0.65 inches per second, filter out.

Vibration readings for direct driven blowers should be taken at the top, sides and end of the motor as per **Fig. 3** below. After you have taken your vibration readings, write them down in the spaces below and keep for future comparison.

Fig. 3



VIBRATION METER PROBE POSITIONS

For Arrangement 4 Blowers

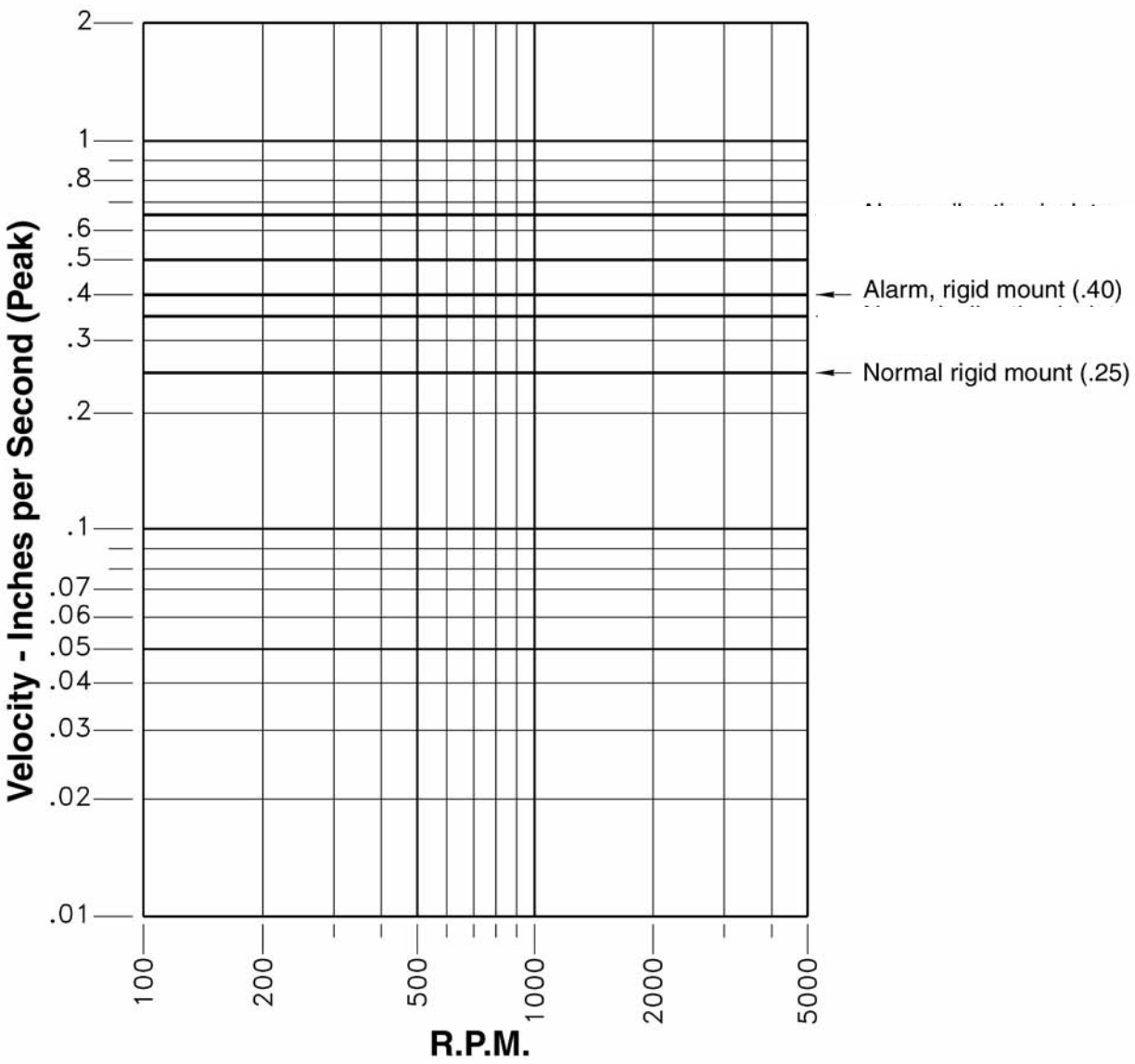
	1	2	3	4	5
A					
B					
C					

A Pre-Startup ..... Readings taken by: _____ **Date:** _____

B 8 Hour Post-Startup ..... Readings taken by: _____ **Date:** _____

C 3 Day Post-Startup ..... Readings taken by: _____ **Date:** _____

Fig. 4 Vibration Severity Chart



V. ROUTINE INSPECTION & MAINTENANCE

Periodic inspection of all the blower parts is the key to good maintenance and trouble-free operation. The frequency of inspections must be determined by the user and is dependent upon the severity of the application, **BUT,** it should **NEVER** exceed a 12 month period. The user should prepare an inspection and maintenance schedule and make sure it is adhered to.

⚠ WARNING

BEFORE STARTING ANY INSPECTION OR MAINTENANCE, BE SURE BLOWER IS TURNED OFF, POWER IS LOCKED OUT AND THE BLOWER WHEEL HAS BEEN CAREFULLY SECURED TO PREVENT WIND MILLING. IF THE OPERATING CONDITIONS OF THE BLOWER ARE TO BE CHANGED (SPEED, PRESSURE, TEMPERATURE, ETC.) CONSULT CINCINNATI FAN OR OUR SALES OFFICE FOR YOUR TERRITORY TO DETERMINE IF THE UNIT WILL OPERATE SAFELY AT THE NEW CONDITIONS.

A. Hardware:

All blower and foundation hardware should be checked to make sure it is tight. All set screws or taper-lock bushing bolts should be tightened to the torque values shown in **Tables 2 and 3** on page 5.

NOTE: If any set screws have become loose, they must be thrown away and replaced. **NEVER** use set screws more than once. **Replace with knurled, cup-point set screws with a nylon locking patch.**

B. Motor Bearing Lubrication:

1. Motor Bearings:

Most smaller motors have sealed bearings that never require re-lubrication for the life of the motor. For any motors

with grease fittings, consult the motor manufacturers recommendations with reference to the lubrication frequency and the type of grease that should be used.
DO NOT over grease the motor bearings. Generally, 1-2 shots should be enough. Use a hand operated grease gun at no more than 40 PSI. ***IF POSSIBLE, CAREFULLY*** **lubricate the motor bearings while the motor is running.**

C. Wheel Balance:

All blower wheels are balanced at the factory. It is not uncommon that additional "trim balancing" is required after the blower is assembled. Trim balancing of the blower assembly, in the field, is typically always necessary for all replacement wheels. **After any wheel is installed, the final balance of the entire blower assembly should be checked. Refer to Section B on page 8 and Fig. 4 on page 9.**
Airstream material or chemicals can cause abrasion or corrosion of the blower parts. This wear is generally uneven and, over time, will lead to the wheel becoming unbalanced causing excessive vibration. When that happens, the wheel must be rebalanced or replaced. Other airstream components should also be inspected for wear or structural damage and cleaned or replaced if necessary. **After cleaning any blower wheel, it should be balanced and then "trim balanced" on the blower shaft.**

To balance a blower wheel:

1. **Add balancing weights for fabricated aluminum, steel or stainless steel wheels:**
   Balance weights should be rigidly attached to the wheel at a location that will not interfere with the blower housing nor disrupt air flow. They should (if at all possible) be welded to the wheel. When trim balancing the wheel, on the blower shaft**,** be sure to ground the welder **directly** to the wheel. Otherwise, the welding current will likely pass through the blower shaft and damage the blower and/or motor bearings.

NOTE:

Removing any Backward Inclined or Airfoil wheel requires special attention when reinstalling it. Make sure you reinstall the wheel so the proper wheel-to-inlet bell clearance is maintained. Failure to do this will affect the blower's airflow (**CFM**), and/or static pressure (**SP**) capabilities and efficiency. See **Table 1** on page 4**.** Consult Cincinnati Fan or our local sales office for your area for assistance if necessary.

D. Vibration:

As mentioned previously in this manual, excessive vibration can cause premature motor failure that could lead to catastrophic failure of the blower. After performing any routine maintenance, the vibration readings should be taken again. New readings should be taken (maximum every 12 months) and compared to the readings you recorded in **Fig. 3**, on page 6, during the initial startup. **If any major differences are present, the cause should be determined and corrected before the blower is put back into operation.**
The most common causes of vibration problems are:

1. Wheel unbalance
2. Mechanical looseness
3. Poor blower inlet and/or discharge conditions
4. Foundation stiffness

E. Safety Equipment & Accessories:

It is the user's responsibility to make sure that any safety guards required by company, local, state and OSHA regulations are properly attached and fully functional at all times. If any guards become defective or non-functional at any time, **the power to the blower MUST be turned off and locked out** until complete repairs and/or replacements have been made, installed and inspected by authorized personnel. Any accessories used in conjunction with the blower should also be inspected to make sure they are functioning within their intended limits and design specifications. The manufacturer's maintenance manuals should be referred to for correct maintenance procedures. These accessories include, but are not limited to, the following:
Shaft seals, inspection doors, vibration isolators or vibration bases, air flow or pressure measuring equipment, hoods, controls, special coatings, silencers, expansion joints, valves, flexible connectors and filters.

VI. ORDERING REPLACEMENT PARTS:

Under normal conditions, you should not need any spare or replacement parts for at least 24 months after shipment from Cincinnati Fan. That does not include any wear due to abrasion, corrosion, excessive temperatures, abuse, misuse, accident or any severe conditions the fan was not designed for.

A. If this fan is vital to any process that could cost you lost revenue, we strongly recommend that you keep a blower wheel and motor at your location.

B. If this fan is vital for the safety of any people and/or animals, we strongly recommend that you keep a complete blower/motor assembly, as originally ordered, at your location.

To order any parts or complete units, contact us for the name of our sales office for your area. Or you can find them on our website at: **www.cincinnatifan.com**

WE MUST HAVE THE BLOWER SERIAL NUMBER FROM THE BLOWER NAME PLATE TO IDENTIFY PARTS CORRECTLY.

VII. TROUBLESHOOTING

Potential problems and causes listed below are in no order of importance or priority. The causes are only a list of the most common items to check to correct a problem. If you find the cause of a problem, **DO NOT** assume it is the **ONLY** cause of that problem. Different problems can have the same causes.

⚠ DANGER

Troubleshooting should only be performed by trained personnel. Any potential electrical problems should only be checked by a licensed electrician. All safety rules, regulations and procedures MUST be followed. Failure to follow proper procedures can cause property damage, severe bodily injury and death.

PROBLEM	CAUSE
Excessive Vibration	1. Loose mounting bolts, set screws or taper-lock hub bolts. 2. Worn or corroded blower wheel. 3. Accumulation of foreign material on blower wheel. 4. Bent motor or blower shaft. 5. Worn motor and/or blower bearings. 6. Motor out of balance. 7. Support structure not sufficient. 8. Weak or resonant foundation.
Airflow (CFM) Too Low	1. Blower wheel turning in wrong direction (**rotation**). 2. Actual system static pressure (**SP**) is higher than expected. 3. Motor speed (**RPM**) too low. 4. Wheel not properly located relative to the inlet bell.
Airflow (CFM) Too High	1. Actual system static pressure (**SP**) is lower than expected. 2. Motor speed (**RPM**) too high.
Motor Overheating	**NOTE: A normal motor will operate at 174°F. See B-8 on page 6.** 1. Actual system static pressure **(SP)** is lower than expected. 2. Voltage supplied to motor is too high or too low. 3. Motor speed (**RPM**) too high or defective motor. 4. Air density higher than expected. 5. Motor wired incorrectly and/or loose wiring connections.
Excessive Noise	1. Wheel rubbing. 2. Worn or corroded blower wheel. 3. Accumulation of foreign material on blower wheel. 4. Loose mounting bolts, set screws or taper-lock hub bolts. 5. Bent motor shaft. 6. Worn motor bearings. 7. Motor out of balance. 8. Motor bearings need lubrication. 9. Vibration originating elsewhere in system. 10. System resonance or pulsation. 11. Inadequate or faulty design of blower support structure. 12. Blower operating near “stall” condition due to incorrect system design or installation.
Fan Doesn’t Operate	1. Motor wired incorrectly and/or loose wiring connections. 2. Incorrect voltage supply. 3. Defective fuses or circuit breakers. 4. Power turned off elsewhere. 5. Defective motor.

VIII. LONG TERM STORAGE INSTRUCTIONS: (Storage exceeding 30 days after receipt of equipment)

NOTE: Failure to adhere to these instructions voids all warranties in their entirety.

1. Storage site selection:
   (a) Level, well-drained, firm surface, in clean, dry and warm location. Minimum temperature of 50°F (10°C).
   (b) Isolated from possibility of physical damage from construction vehicles, erection equipment, etc.
   (c) Accessible for periodical inspection and maintenance.
2. The blower should be supported under each corner of its base to allow it to "breathe". Supports (2 x 4's, timbers, or railroad ties) should be placed diagonally under each corner.
3. If the equipment is to be stored for more than three (3) months, the entire blower assembly must be loosely covered with plastic, **but not tightly wrapped**.
4. Initial inspections must be made of the blower components, and immediate corrective action taken if discrepancies are found, to insure adequate protection of the equipment during storage.
5. Storage Maintenance:
   A periodic inspection and maintenance log, by date and action taken, must be developed and maintained for each blower. See example below. Each item must be checked monthly.

EXAMPLE:

Storage / Maintenance Schedule Log

ITEM	ACTION	DATES CHECKED
1	Re-inspect units to insure any protective devices used are functioning properly. Check for scratches in the finish which will allow corrosion or rust to form.	
2	Rotate blower wheel a minimum of 10 full revolutions to keep the motor bearing grease from separating and drying out. ***This is a critical step.***	

6. General Motor Procedure:

   If the motor is not put into service immediately, the motor must be stored in a clean, dry, warm location. Minimum temperature of 50°F. (10°C,). Several precautionary steps must be performed to avoid motor damage during storage.

   a. Use a "Megger" each month to ensure that integrity of the winding insulation has been maintained. Record the Megger readings. Immediately investigate any significant drop in insulation resistance.
   b. **DO NOT** lubricate the motor bearings during storage. Motor bearings are packed with grease at the factory. Excessive grease can damage the insulation quality in the motor.
   c. If the storage location is damp or humid, the motor windings **must** be protected from moisture. This can be done by applying power to the motor's space heaters, (IF AVAILABLE) while the motor is in storage. If the motor does not have space heaters, storing it in a damp or humid location will, very quickly, cause internal corrosion and motor failure which is not warranted.
   d. Rotate motor shaft a minimum of 10 full turns each month to keep bearing grease from separating and drying out.

***NOTE*:**

For specific storage instructions, for the actual motor and any accessory parts that were supplied, refer to the manufacturer's instructions.

IX. LIMITED WARRANTY:

Cincinnati Fan & Ventilator Company (Seller) warrants products of its own manufacture, against defects of material and workmanship under normal use and service for a period of eighteen (18) months from date of shipment or twelve (12) months from date of installation, whichever occurs first. This warranty does not apply to any of Seller's products or any part thereof which has been subject to extraordinary wear and tear, improper installation, accident, abuse, misuse, overloading, negligence or alteration. This warranty does not cover systems or materials not of Seller's manufacture. On products furnished by Seller, but manufactured by others, such as motors, Seller extends the same warranty as Seller received from the manufacturer thereof. Expenses incurred by Purchaser's in repairing or replacing any defective product will not be allowed except where authorized in writing and signed by an officer of the Seller.

The obligation of the Seller under this warranty shall be limited to repairing or replacing F.O.B. the Seller's plant, or allowing credit at Seller's option. **THIS WARRANTY IS EXPRESSLY IN LIEU OF ALL OTHER WARRANTIES EITHER EXPRESSED OR IMPLIED INCLUDING THE WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE AND OF ALL OTHER OBLIGATIONS AND LIABILITIES OF THE SELLER. THE PURCHASER ACKNOWLEDGES THAT NO OTHER REPRESENTATIONS WERE MADE TO PURCHASER OR RELIED UPON BY PURCHASER WITH RESPECT TO THE QUALITY OR FUNCTION OF THE PRODUCTS HEREIN SOLD.**

Removal of the Sellers nameplate or any generic fan nameplate containing the fan serial number voids all warranties, either written or implied. Failure to complete and document all the pre-startup and post startup checks and perform the suggested routine maintenance checks voids all warranties, either written or implied.

LIMITATION OF LIABILITY:

Notice of any claim, including a claim for defect in material or workmanship, must be given to Seller in writing within 30 days after receipt of the equipment or other products. Seller reserves the right to inspect any alleged defect at Purchaser's facility before any claim can be allowed and before adjustment, credit, allowance replacement or return will be authorized. See **RETURNS** below. Seller's liability with respect to such defects will be limited to the replacement, free of charge, of parts returned at Purchaser's expense F.O.B. Seller's plant and found to be defective by the Seller.

IN NO EVENT WILL SELLER BE LIABLE FOR SPECIAL, INDIRECT, INCIDENTAL OR CONSEQUENTIAL DAMAGES, WHETHER IN CONTACT, TORT, NEGLIGENCE, STRICT LIABILITY OR OTHERWISE, INCLUDING WITHOUT LIMITATION DAMAGES FOR INJURY TO PERSONS OR PROPERTY, LOST PROFITS OR REVENUE, LOST SALES OR LOSS OF USE OF ANY PRODUCT SOLD HEREUNDER. PURCHASER'S SOLE AND EXCLUSIVE REMEDY AGAINST SELLER WILL BE THE REPLACEMENT OF DEFECTIVE PARTS AS PROVIDED HEREIN OR REFUND OF THE PURCHASE PRICE FOR DEFECTIVE PRODUCTS, AT SELLER'S SOLE OPTION. SELLER'S LIABILITY ON ANY CLAIM, WHETHER IN CONTRACT, TORT, NEGLIGENCE, STRICT LIABILITY OR OTHERWISE, FOR ANY LOSS OR DAMAGE ARISING OUT OF OR IN CONNECTION WITH PURCHASER'S ORDER OR THE PRODUCTS OR EQUIPMENT PURCHASED HEREUNDER, SHALL IN NO CASE EXCEED THE PURCHASE PRICE OF THE EQUIPMENT GIVING RISE TO THE CLAIM.

RESPONSIBILITY:

It is the understanding of the Seller that Purchaser and/or User will use this equipment in conjunction with additional equipment or accessories to comply with all Federal, State and local regulations. The Seller assumes no responsibility for the Purchaser's and/or User's compliance with any Federal, State and local regulations.

RETURNS:

Cincinnati Fan & Ventilator Company assumes no responsibility for any material returned to our plant without our permission. An **RMA** (Return Material Authorization) number must be obtained and clearly shown on the outside of the carton or crate and on a packing slip. Any items returned must be shipped freight prepaid. Failure to comply will result in refusal of the shipment at our receiving department.

DISCLAIMER

This manual, and all its content herein, is based on all applicable known material at the time this manual was created. **Any parts of this manual are subject to change at any time and without notice.**

If any statements, diagrams and/or instructions contained herein, **for components not manufactured by the Seller,** conflict with instructions in the manufacturer's manual (i.e.: motors, bearings, dampers, etc.), the instructions in the manufacturer's manual, for that component take precedent.

Should you want the latest version of this manual, please contact us or our sales office for your area. Or, you can print a current version by going to our website at: **www.cincinnatifan.com**

cincinnati fan

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X. PARTS DRAWING:

PLEASE NOTE

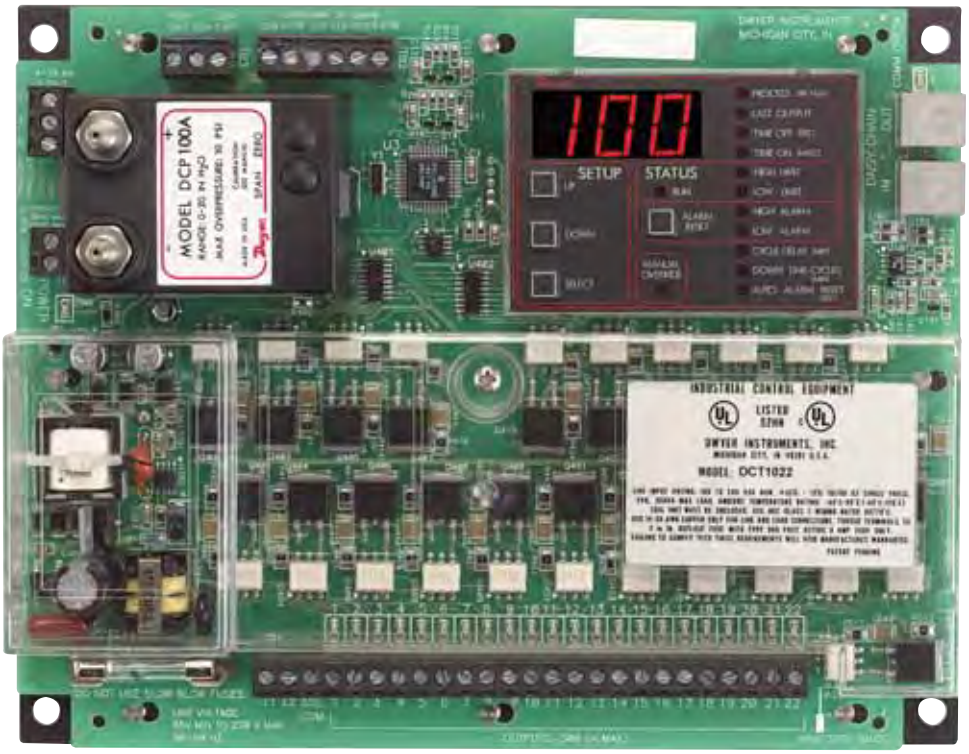
Cincinnati Fan manufactures many models and arrangements with special variations. For that reason, the maintenance manuals contained on our website do not include a parts drawing nor the completed blower or fan specifications on page 1. For the parts drawing of all the standard components and specifications for the specific blower or fan that you have, please contact our local Cincinnati Fan sales office for your area.

You will need to give them the serial number shown on the blower or fan nameplate so they can supply you the correct information.

Click on ***"Contact a Sales Rep"*** on our website for the name and contact information for our local sales office for your area. **www.cincinnatifan.com**

Series DCT1000 Dust Collector Timer Controller

Specifications – Installation and Operating Instructions



Thank you for purchasing the DCT1000 Dust Collector Timer Controller. You have selected a state of the art dust collector timer control that will provide years of dependable operation and service.

The DCT1000 Dust Collector Timer Controller was designed to be used with pulse-jet type dust collectors for on-demand or continuous cleaning applications.

Continuous cleaning applications do not require external inputs and can be used for time based “on-demand” cleaning through use of the cycle delay feature.

For on-demand applications, the plug-in pressure modules (DCP100A/200A) can be used to take full advantage of all the features the DCT1000 offers, or an external pressure switch (such as the Dwyer Photohelic®) can be used for High/Low limit control.

As with traditional Dwyer products, the Dwyer DCT1000 was designed so that it is easy to use, thus allowing for a quick and easy start up for your dust control applications. The contents inside this installation and operating manual will guide you through the features of the DCT1000 and how they can be applied to get the most out of your dust control requirements.

SPECIFICATIONS

DCT1000 Timer Controller:

Output Channels: 6, 10, & 22 channels. Expandable to 255 channels using DCT1122 & DCT1110 channel expander boards.

Power Requirements: 85 to 270 VAC, 50 or 60 Hz.

Solenoid Supply: 3A maximum per channel.

Fuse: 3A @ 250 VAC. Low voltage control circuitry is isolated from the line voltage for system safety.

Temperature Limits: -40 to 140°F (-40 to 60°C).

Storage Temperature Limits: -40 to 176°F (-40 to 80°C).

On Time: 10 msec to 600 msec, 10 msec steps.

On Time Accuracy: ±10 msec.

Off Time: 1 second to 255 seconds, 1 second steps.

Off Time Accuracy: ±1% of the value or ±50 msec, whichever is greater.

Weight: 1 lb 3.0 oz (538.6 g).

Agency Approvals: UL, cUL.

DWYER INSTRUMENTS, INC.
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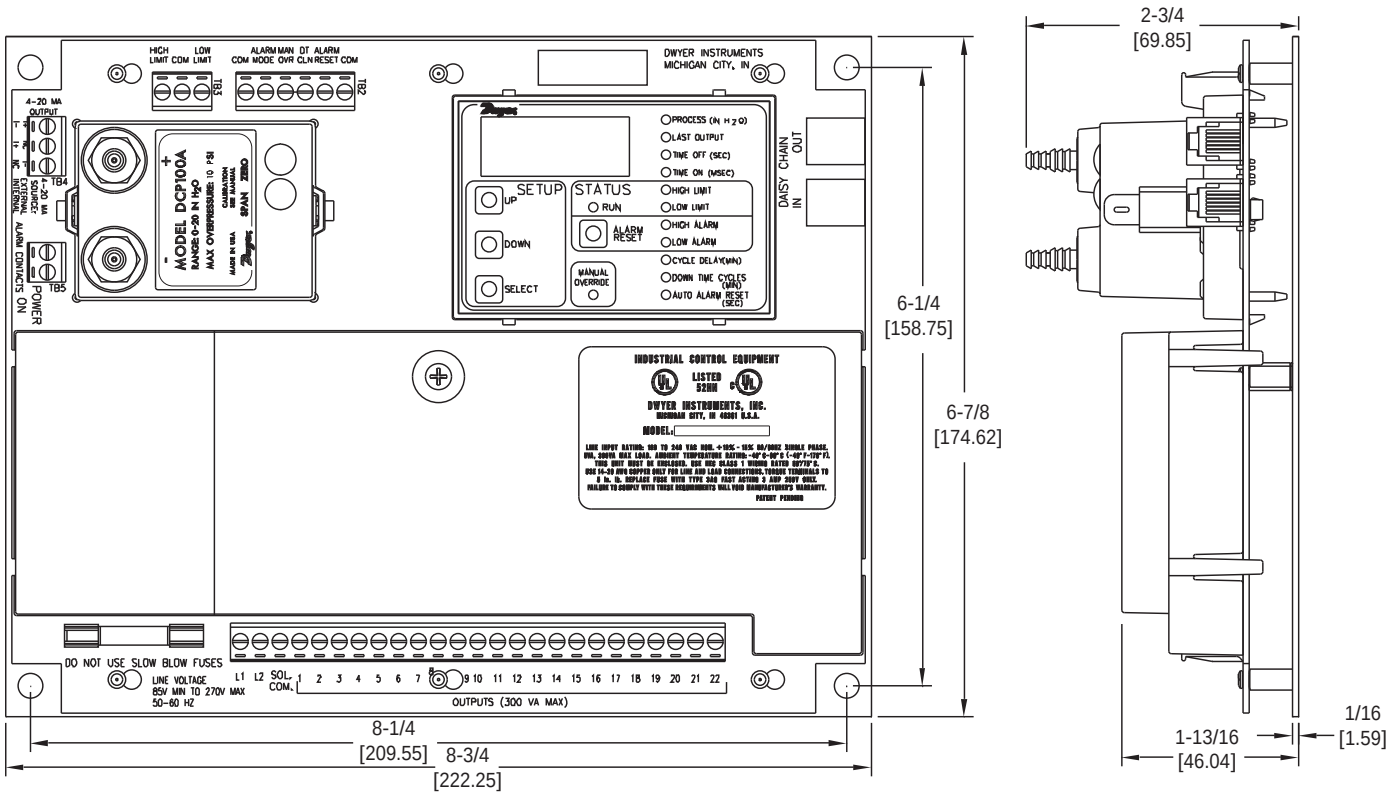
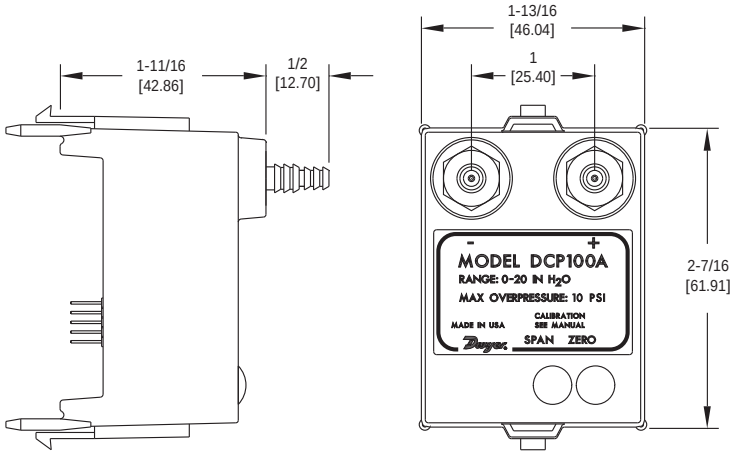


Figure 1 – Dimensional Specifications for the DCT1000 (shown with optional module DCP100A)



The DCP100A or DCP200A pressure modules are designed exclusively for use with the Dwyer DCT1000 Dust Collector Timer Controller boards for on-demand cleaning requirements. These series of modules are available in 10″ w.c. [2.49 kPa] or 20″ w.c. [4.98 kPa] ranges, which allow for differential process pressure measurement as indicated on the display of the master controller. An isolated 4-20 mA readout channel is provided for remote pressure display. The 4-20 mA output may be wired either for use with an external power supply and indicator or using the isolated onboard 24 volt power supply to power the loop.

SPECIFICATIONS

Pressure Ranges: 10″ w.c. or 20″ w.c.
Temperature Limits: -40 to 140°F (-40 to 60°C).
Pressure Limit: 10 psi (68.95 kPa).
Pressure Limit (differential): 10 psi (68.95 kPa).
Accuracy: ±1.5% F.S. @ 73°F (22.8°C).
Output Signal: 4-20 mA.
Alarm Contacts: 1.5A inductive load, 3A resistive load @ 30 VAC or 40 VDC.
Process Connections: Two barbed connections for use with 1/8″ (3.18 mm) or 3/16″ (4.76 mm) I.D. tubing.
Weight: 5.5 oz (155.9 g).

Table of Contents

1.0 Installing the DCT1000

Warning: Always install and service this device with the power off and a lockout installed if required. Line voltages will be exposed at the power/output connector and at the fuse. For this reason, we have installed a plastic guard to protect the user from accidentally contacting line voltages.

Please note *that the power guard serves as a safety feature and should not be removed under any circumstances.*

For ease of installation and maintenance, the connectors and fuse have been left unprotected. The open frame design of the DCT1000 will require an enclosure that meets appropriate safety and local code requirements. For optimal performance, the enclosure should also protect the controller from dirt, water and direct sunlight. There are no special orientation requirements, and the controller mounts easily using the mounting holes on the factory installed base plate.

Caution: Do not run control wires, communication cables, or other class 2 wiring in the same conduit as power leads. The system may malfunction if class 2 wiring is run together with power conductors.

1.1 Power Requirements

The controller has a “universal” power supply that will allow operation on 120 VAC to 240 VAC power lines. The input voltage must be between 85 VAC and 270VAC either 50 or 60 Hz. No circuit changes are required when switching between these voltages. The solenoid loads, however, must be sized to accommodate the line voltage selected.

1.2 DCT1000 Terminal Connections

The line and solenoid connections are located at the lower edge of the board below the plastic guard. The terminal block is a “Euro” style connector system that clamps the wire within the connector body. The connector will accept wire sizes from 14 to 22 AWG. The wire should be stripped to no more than 0.25 inches to avoid shorts or expose line voltages creating a potential safety hazard. To assist you in determining the proper wire gauge required, a strip gauge is provided at the lower right corner of the board. The connector system used on the DCT1000 is specified for single connection but you can piggyback to a single lug provided that local codes allow for this and good workmanship practices are followed. To power up the master controller and the channel expander, connect line power to L1 and L2 (see Dimensional Specifications, Figure 1). Connect the solenoids between the selected output and the solenoid common. Solenoid common and L2 are internally connected. Switches connected to the control inputs at the top of the board must be isolated contacts connected only to the relevant terminal and to the common terminals. The following subparagraphs describe the external switch connections. Refer to figure 2 for switch connection illustration.

1.2.1 External Pressure Connection

The controller may be used with an external pressure limit switch or sensor to provide demand-cleaning operation. The high limit and low limit inputs may be used for this purpose. A simple on-off system can be established with a single pressure switch connected to the high limit input. Better control can be achieved with a high and low limit switch/gage such as the Dwyer Photohelic®. In this on-demand mode, time on, time off, and cycle delay may be programmed to define the cleaning cycle. A three pin terminal block (TB3) provides connection for external high and low limit switches (see Figure 2 on the next page). These switches must be isolated contacts. The common line must not be connected to equipment ground or protective ground, since these may introduce electrical noise and cause improper operation or possible damage to the control board. The operation of these inputs are summarized as follows (see next page):

Current Operation	Low Limit Switch	High Limit Switch	Next Operation
Hold	Open	Open	Hold
Hold or Run	X	Closed	Run
Hold	Ø	Open	Hold
Hold	Closed	Ø	Run
Run	Closed	≠	Run
Hold	Closed	Ø	Run
Run	≠	Open	Hold

Ø Transition from open to closed
≠ Transition closed to open
X Either open or closed

Note: *If a DCP100A or DCP200A pressure module is installed in the master controller, the switching functions are ignored.*

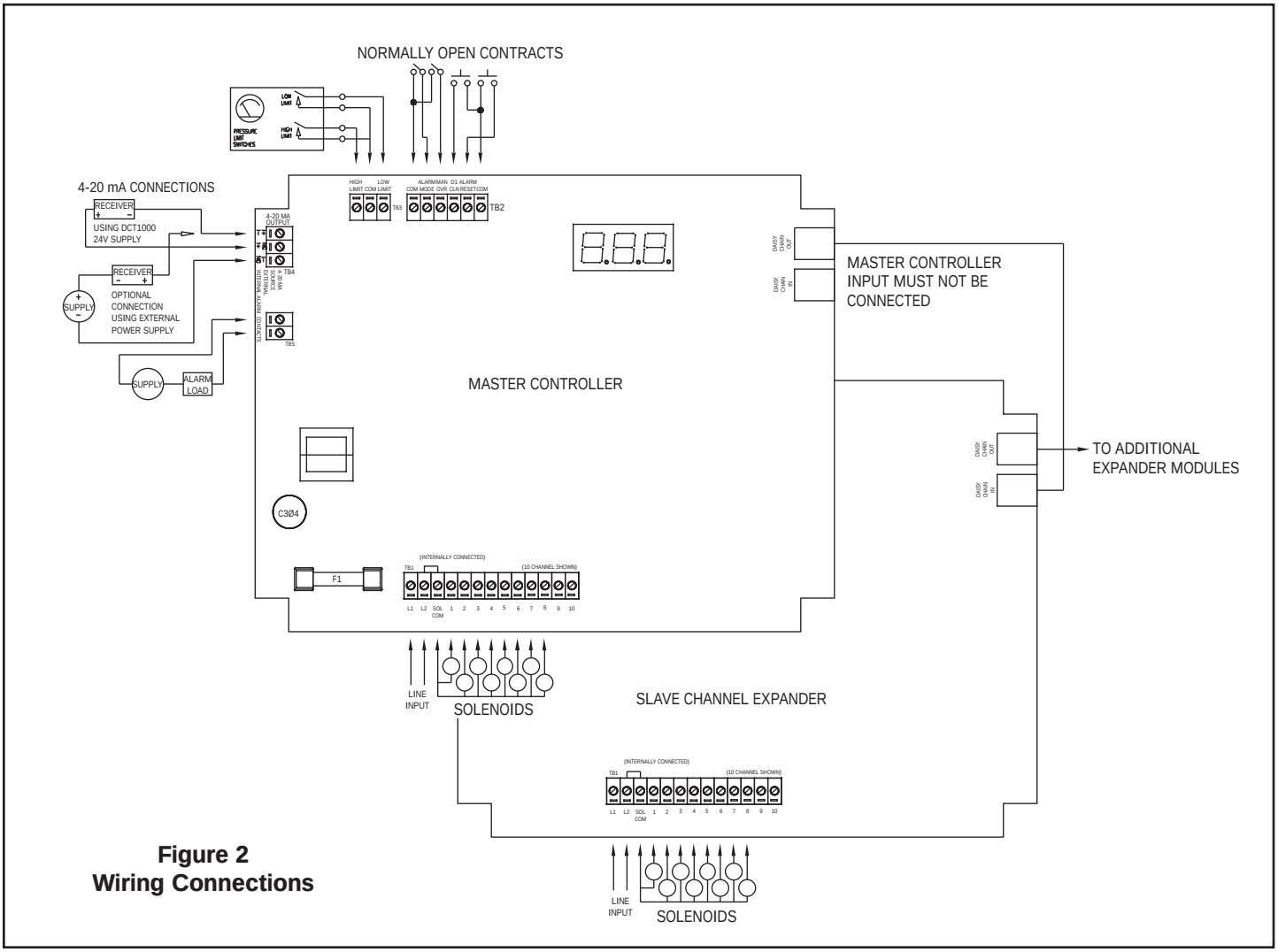


Figure 2
Wiring Connections

1.2.2 Manual Override Switch Connection

The manual override function allows the system to be set to the run mode regardless of other conditions. This mode is enabled when the manual override terminal and common are connected. It is disabled when they are disconnected. If the controller is to be run in continuous mode, a jumper wire may be wired across these terminals. When manual override is needed on a periodic basis, wire a SPST toggle switch between the manual override terminal and the common terminal.

1.2.3 Down Time Clean Connection

The down time clean operation forces the system into a run cycle for a programmed length of time between 0 – 255 minutes. The operation is initiated by connecting the down time clean terminal to a common terminal. This function is best accomplished through use of an external normally open switch.

1.2.4 Connecting Multiple Timer Boards

Both master controller boards and slave boards can have up to a maximum of 22 channels each. The system may be expanded up to 255 channels using master controller boards and slave boards. The DCT1000 will automatically detect the total number of channels involved and make their outputs available. You will note that both the master controllers and slave boards have a telephone style connector mounted on the upper right hand side of the board. These connectors are for use in systems requiring slave boards that must be daisy chained together to provide additional channel capability. For systems that require the slave boards, the master controller must not have any connection made to its daisy chain input unless it is designated as a slave control itself. (For larger systems requiring more than three slave boards, a master controller must be used as the fourth slave board to satisfy power requirements.) This sequence would repeat itself until the limit of 255 channels has been reached. The cables used are not ordinary telephone style cables.

Caution: Do not use telephone jumper cables. These have a “twist” in the connection and may damage the controllers. Cables designed for use with the DCT1000 are available from Dwyer Instruments (Model DCAC02-2 ft., DCAC04-4 ft., etc.).

1.2.5 Continuous Cycle Mode

The master controller has several operating modes available for different applications. Starting with the most basic mode, it is capable of operating in a continuous cleaning cycle. This can be initiated by either placing a jumper between the high limit input and the common, or the manual override input to the common connection. Controlling this cycle are three setup parameters: time off, time on, and cycle delay. Time on and time off specifically deal with the solenoid on time and the time interval between the end of the on pulse and the start of the next. The cycle delay allows a delay of up to 255 minutes to be programmed between the end of one complete cleaning cycle and the beginning of the next. This allows additional options for defining a cleaning profile.

1.3 DCP Installation

Caution: Prior to installing the DCP100A/200A please review the operating specifications carefully.

Some operating systems, especially in pneumatic conveying applications, may see static pressure or vacuum conditions that exceed the capability of the DCP100A/200A pressure module. For these conditions there are a number of alternate Dwyer pressure products that can be used to meet your application requirements, all of which can be terminated to the Dwyer DCT1000 Dust Collector Timer Controller. For more information on these and other Dwyer products, please call us at (219) 879-8000, or visit us on the web at www.dwyer-inst.com or www.dust-controls.com.

1.3.1 Location

The system should be located in an enclosure that meets relevant safety standards and electrical codes. There are no other special orientation requirements as the pressure module is not orientation sensitive. Care should be observed when routing the air hoses to ensure that any potential condensation or moisture will not drain into the sensor. Where heavy condensation is present, a drip loop or an in-line filter should be installed to ensure long term operation.

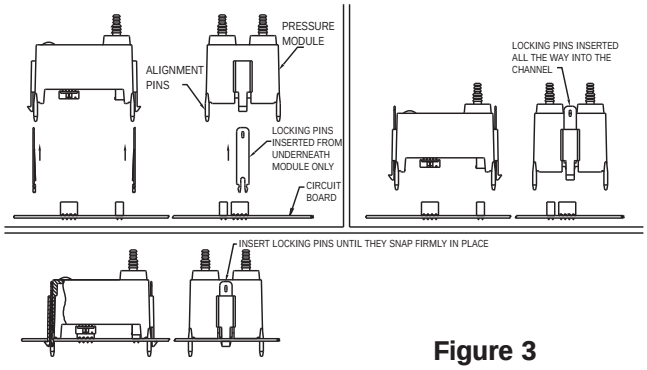


Figure 3
DCP Installation

1.3.2 Connecting DCP to Master Controller

The pressure module is attached to the Master Controller using integral connectors on both units. The insertion ports for the pressure module are located in the upper left quadrant of the DCT1000 Master Controller. The pressure module can be removed by compressing the retaining clips on each end of the module, then gently pulling the module out of the master controller board.

When inserting the module, the following procedure should be adhered to insure proper installation:

- Examine the bottom of the pressure module and note the orientation of the connectors.
- Align the module so that these connectors match the connector receptacles on the controller board.
- Orient the module with the four alignment pins over their respective mounting holes.
- Gently press the module into the connectors and snap the retaining clips on either end of the module into their slots.
- Always install and service this device with the power off and a lockout installed if required. “Hot” plugging the pressure module into an operating system may damage the system or cause the calibration parameters to be erased.

When installing or removing the module make sure to orient the module straight with board. Installing or removing the module at any angle may break the alignment pins.

1.3.3 Pressure Model Locking Pins

The DCP100A and DCP200A are supplied with locking pins to secure the module. In normal operation these are not required since the latching tabs are sufficient to secure the module even in a high vibration environment. However if the unit is to be shipped or used where severe mechanical shock could be encountered the locking pins ensure the module will not snap out of the board.

To install the locking pins, from underneath the module insert one pin behind each of the two latching tabs. Press these all the way into the channel. The ends of the tabs will extend through the slots at the top of these channels. Next insert the module in the board as described above, making sure it is properly aligned and snaps firmly in place. Press the exposed locking tabs down until the tab is seated behind the latch in the board. To remove the module, slide the locking tabs up using a small screw driver then remove the module as described above. See Figure 3.

1.3.4 DCP Connections

When a pressure module is installed, the 4-20 mA process signal and the alarm relay contacts are available. The 4-20 mA circuit is isolated from ground and other signals. The alarm relay contacts are isolated, normally open contacts. Pressure connections may be made to the stepped hose barbs with either 1/8″ or 3/16″ I.D. tubing.

Caution: Do not force the module into the connectors. Forcing the insertion may damage the connectors. Properly aligned, the module should snap into place.

1.3.5 DCP Maintenance

The pressure module should require very little maintenance under normal operational conditions. However, periodic calibration may be desirable to assure accuracy of the readings. The module may be removed and returned to the factory for calibration.

1.4 Alarm Mode Switch Connection

The auto alarm reset is controlled by the alarm mode switch connection. To enable the auto alarm reset the alarm mode input must be connected to a common connection. A jumper may be used when auto alarm reset is always active. A switch may be used if there are times that the auto alarm reset must be disabled. The switch must be an isolated contact and wired such that no connection is made between either of the wires and ground. See Figure 2 Wiring Connections.

1.4.1 Alarm Reset Switch Connection

The alarm may be reset either by pressing the Alarm Reset button on the control panel or by an external switch connected between the alarm-reset terminal and one of the common terminals. The alarm reset will only operate if the pressure module is installed and the pressure has returned to a normal condition. See Figure 2 Wiring Connections.

1.4.2 Connecting the 4-20 mA Loop

The pressure module provides an isolated 4-20 mA output, which may be used to remotely monitor the differential pressure across the dust bags or cartridges. The connection is made on the master control module at the terminal block designated for this signal. The connection is a 2-wire configuration with the option of using either an external 15 to 35 VDC power source or using the internal 24 VDC source. See Figure 2 Wiring Connections.

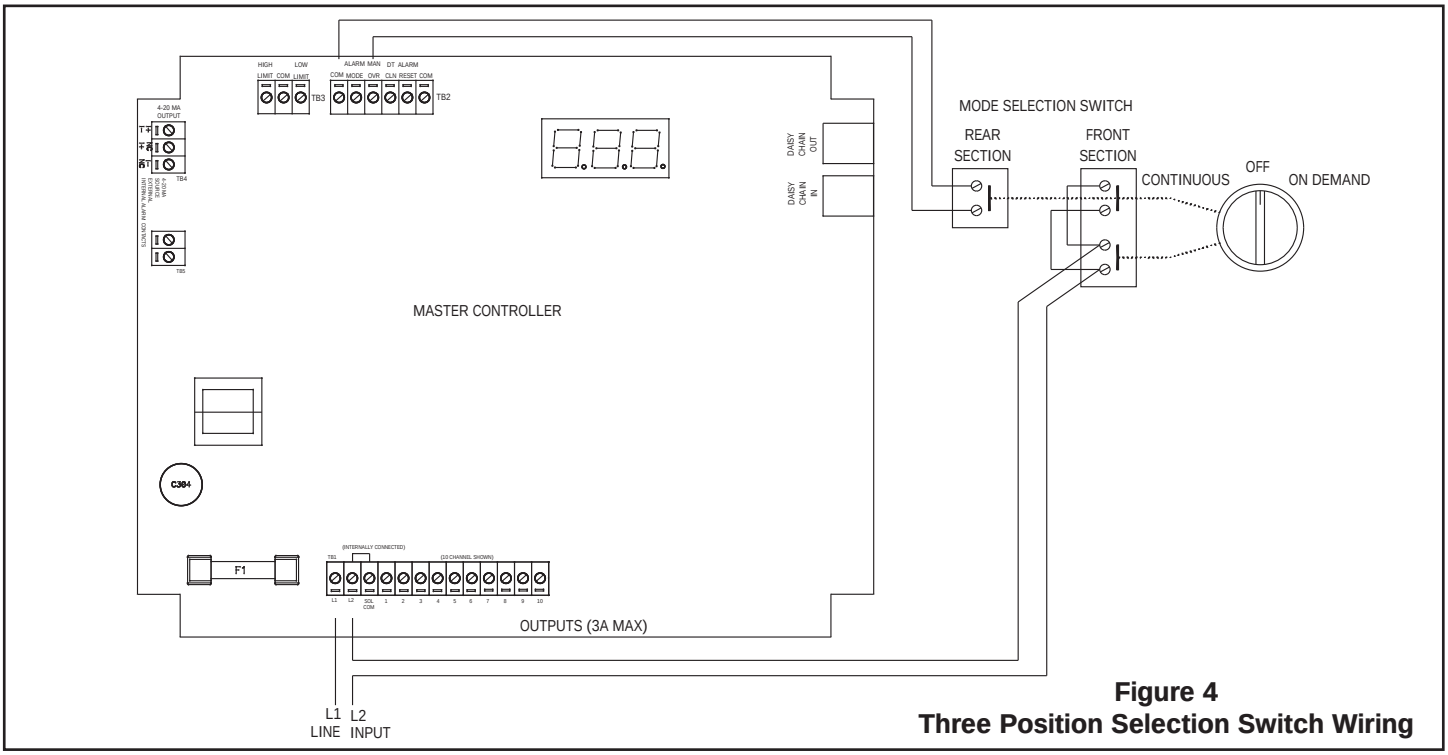


Figure 4
Three Position Selection Switch Wiring

1.4.3 Connecting the Alarm Relay

With the pressure module installed, a relay contact is provided for controlling an external alarm. This relay is a single form-A contact. It is activated when either the high alarm threshold is exceeded, or the pressure drops below the low alarm threshold. The connection is made at the two-pin connector TB5. See Figure 2 Wiring Connections

1.5 Three Position Selection Switch Wiring

An optional mode selection switch is available with the weather-proof enclosure. With this switch the user may select either continuous cleaning, on-demand cleaning, or off. This switch is supplied factory wired as shown in Figure 4. The switch has a front and rear section. The front section, consisting of two independant contacts, controls the power to the board. These contacts must be wired in parallel as shown in the diagram. The rear section controls the manual override, which when closed will force the system into a continuousmuct be reconneccted, follow the wiring diagram.

Caution: Do not interconnect the low voltage manual override leads with the power leads. This will destroy the control board as well as pose a serious shock hazard

2.0 Programming the DCT1000 Master Controller

We've made it easy to navigate the DCT1000. Menu items can be accessed simply by pressing the "SELECT" button. The menu item that you are currently accessing is indicated by the illumination of an LED. To change menu items, all you have to do is push "UP" to increase a value or push "DOWN" to decrease a value. There are no keystrokes that you need to memorize, special combinations, or passwords that are required.

The master controller is equipped with an on board display and programming information center. The controller will power-up with the process indicator illuminated. If a pressure module is installed, the display will indicate the measured pressure in inches of water (w.c.); otherwise it will normally be blank.

2.1 • Last Output

The Last Output setup selects the last channel to be activated. When first selected, the display will flash the last output available in the system. With single board installations, this will be the number of channels installed, typically 6, 10 or 22. This value becomes more important when multiple modules are installed. The last output value flashed will be the sum of all channels available in the system.

After the last available channel indication has completed, the currently programmed last channel value is displayed. This value may be changed using the "UP" and "DOWN" buttons. The minimum value is one while the maximum value is the maximum number of installed channels, including all expansion modules.
The default value is the maximum number of channels. Pressing "SELECT" will change the setup mode to Time Off Setup.

2.2 • Time Off (Sec.)

Time off defines the period of time between solenoid activations when no channels are enabled. This may be set between one second and 255 seconds. The factory default is 10 seconds. The display will show the current time off setting when the time off setup mode is entered. The value may be changed using the Up and Down buttons. Pressing both "UP" and "DOWN" simultaneously and holding for approximately four seconds will restore the default value of 10.

2.3 • Time On (msec)

Time On Setup sets the solenoid on time. The display will indicate the currently programmed time on setting. This is measured in milliseconds. Using the "UP" and "DOWN" buttons, the value may be changed. The value may be set between 10 msec and 600 msec in 10 msec increments. Pressing the "UP" and "DOWN" buttons simultaneously for approximately four seconds will restore the factory default value of 100 msec. Pressing the "SELECT' button will advance the setup mode to the High Limit setup if the pressure module is installed. With no pressure module, it will step to Cycle Delay Setup.

2.4 • High Limit [Only available when DCP connected]
The High Limit Setup, available only with a pressure module installed, sets the pressure at which the cleaning cycle will begin. This value may be between zero and the pressure module full scale pressure. Normally, the High Limit should be above the Low Limit. If, however, the High Limit pressure is set below the Low Limit, the cleaning cycle will begin when the High Limit is exceeded and stop when the pressure falls below the High Limit. The Low Limit in this case will have no effect. Pressing "SELECT" will change the system to the Low Limit Setup mode.

2.5 • Low Limit [Only available when DCP installed]
The operation of the Low Limit, available only with a pressure module installed, is identical to the High Limit except this value sets the pressure where the cleaning cycle will end. The upper settable value is the calibration pressure of the pressure module and the lower limit is zero. Pressing "SELECT" will change the system to the High Alarm Setup mode.

2.6 • High Alarm [Only available when DCP installed]
The operation of the High Alarm Setup is identical to the High and Low Limit Setup and is only available when a pressure module is installed. The High Alarm default is 0. The upper settable value is the full scale pressure of the pressure module and the lower limit is zero. Pressing "SELECT" will change the system to the Low Alarm Setup mode.

2.7 • Low Alarm [Only available when DCP installed]
The operation of the Low Alarm Setup is identical to the High and Low Limit Setup. The Low Alarm default is 0. The upper settable value is the full scale pressure of the pressure module and the lower limit is zero. Pressing "SELECT" will change the system to the Cycle Delay Setup mode.

2.8 • Cycle Delay (min)
The cycle delay inserts a delay time between the end of the last channel and the beginning of the first channel. This may be set to between zero and 255 minutes. The factory default is zero. Setting the value to zero will disable the delay. Pressing "SELECT" will change the system to the Down Time Cycles Setup mode.

2.9 • Down Time Cycles (min)
The Down Time Cycles setup will select a value between zero and 255 minutes. The factory default is one minute. Selecting zero will disable the operation. When the down time cycles is activated by shorting the down time cycles input to the common terminal, (see figure 2) the system will enter a forced cleaning mode for the programmed duration. *NOTE:* The cycle delay, if one is programmed, will not be inserted in the timing cycle. Pressing "SELECT" will change the system to the Auto Alarm Reset Setup mode, if a pressure module is installed, or to Process when no pressure module is available.

2.10 • Auto Alarm Reset (sec) [Only available when DCP installed]
The Auto Alarm Reset Setup, available only when a pressure module is installed, allows the auto alarm reset time to be selected. This value may be set between zero and 255 seconds. The factory default value is five seconds. When the auto alarm reset is enabled by shorting the auto alarm reset terminal to a common terminal, (See Figure 1) the alarm will be reset after the pressure returns to the normal range and the timeout has expired. Pressing "SELECT" will change the system to Process mode.

3.0 Maintenance Support and Diagnostics

We have also included a number of features that will aid maintenance personnel in diagnosing problems or verifying that the system is operating.

3.1 Restoring Factory Defaults
The DCT1000 has been programmed with factory default values that meet most industry operating conditions. In the event that you want to restore all of the parameters to the original factory default values:

(1) Return the master controller to the process mode.
(2) Press and hold both "UP" and "DOWN" buttons.

The display will indicate a 10-second countdown, at the end of which all parameters will be restored to factory defaults. Releasing the switches prior to the end of the count will stop the process and no modification will be made. Likewise, in each of the parameter setup modes, pressing and holding the "UP" and "DOWN" buttons simultaneously will reset the individual default value, leaving other settings unchanged.

3.2 Power Indicator
A power on LED indicator is provided at the center left edge of the board. This will be illuminated when the power supply is operating properly. If the power LED is not illuminated, the primary power may be off or there is a fault in the power circuit.

3.3 Active Channel Indicator
Located just above the solenoid terminations, you will find that each channel is provided with an LED that is illuminated when the triac switch is on. This allows a visual correlation between the channel being pulsed and the operation of the solenoid.

3.4 Comm Check Indicator
The comm check indicator can be found in the upper right hand corner of the slave and master controller board (just above the "out" terminal, a telephone style connector). This indicator is used for two purposes. First, on a master controller a brief flash once per second is produced to indicate that the system is operating. Second, this indicator is used to show when the communication check operation is performed on slave boards. The master controller will check each of the slave boards at a rate of about one inquiry per second, starting with the slave board connected directly to the master controller and ending with the last slave board in the chain. The master controller will flash its Comm Check LED for about 250 msec each time it makes a communication check. The external module selected for test will also flash its Comm Check LED for about the same time each time it is interrogated. Observing this test sequence will indicate that the communication between boards is operational. When a slave board powers up, the Comm Check LED will be illuminated continuously. It will be extinguished when the master controller has initialized its communication channel. This indicator then shows that a master controller is operating and that each slave board is responding properly on the daisy chain.

3.5 Error Codes

Error codes will be displayed on the three-digit display when certain faults occur. Most of these indicators are associated with the daisy chain communication, but certain error codes pertain to single board operation also. These codes are:

Display	Meaning	Action Required
Err 1	This is a "watchdog" reset that is enabled when the master controller isn't able to cycle through its operation.	Make sure all electrical connections are appropriately shielded so the master controller is not disrupted by noise.
Err 2	The pressure module has failed to respond to the request of the master controller.	The master controller will try to recover from the fault. If unsuccessful, replace the pressure module.
Err 3	Communication error in the daisy chain interface. This will only appear when the master controller is used in conjunction with a slave board.	Make sure the control cable used in the daisy chain interface is properly shielded from noise.
Err 4	The master controller has detected a change in module configuration or a fault in one of the modules.	Reinstall all modules in accordance with the instructions in the factory IOM.
Err 5	If the fault described in "Err 4" is not corrected, the master controller will reconfigure the modules that are responding properly and operate at a degraded condition.	Reinstall all modules. Contact factory if the problem persists.
Err 6	A message error affecting the software of the master controller or one of its modules.	Check the integrity of all connecting cables used to drive slave boards for additional solenoids. Also check the electrical grounding of the system installation.
Err 7	Indicates that one of the triac drivers are not functioning.	Return to factory for evaluation and repair.
Err 8	Internal Error.	Contact the factory.
Err 9	Unassigned message code.	Contact the factory.

4.0 Glossary of Terms

• **Run Mode:** The term used when the timer board is firing the solenoids.

• **Pressure Module:** The pressure measurement subsystem that includes the software and hardware for on-demand cleaning, alarms and signal retransmission of the process variable (i.e., the differential pressure across the dust bags).

• **Master Controller:** The primary timer board that contains all of the major features, connections for external inputs and power to drive the DCT1000 Dust Collector Timer Controller system.

• **Power Guard:** A plastic shield that covers the output triacs and other line voltage circuitry.

• **Demand Cycle Mode:** A process in which the run mode is enabled through the on-board pressure module or an external switch such as the Dwyer Photohelic®.

• **Euro Connector:** A "caged" connection used to terminate solenoids, incoming power, or external switches on the DCT1000.

• **Continuous Cycle Mode:** A time based cycling mode dependent on solenoid time on/off settings and time set between complete cycles.

• **Manual Override:** Allows the user to override the DCT1000 remotely or from the master controller panel through use of a switch or a wire jumper.

• **Slave Board:** A channel expander that is used in conjunction with the master controller to accommodate additional solenoids on larger dust collection systems. It can be recognized easily as it does not have the on-board display panel or the power supply present. A master controller may also be used as a slave board.

Still need help? Please feel free to contact one of our customer service representatives at 219-879-8000 or visit us on the web at www.dwyer-inst.com or www.dust-controls.com. Thank you for choosing Dwyer Instruments.

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DWYER INSTRUMENTS, INC.
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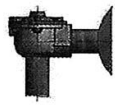
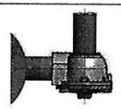
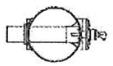
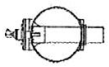
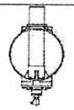
www.dwyer-inst.com
e-mail: info@dwyer-inst.com

allation and Maintenance

'arning! 	• To prevent injury, damage or malfunction the installation of diaphragm valves and accessories must only be performed by technically competent personnel, following these instructions.
	• Make sure that electrical power is isolated from the system before installing or opening this product.
	• For your safety DO NOT pressurise the system until all valves are fully secured and tightened. DO NOT attempt to remove a fitted valve while the system is under pressure.
	• Wear safety glasses and personal protective equipment at all times while working on the system.
	• The 40MMR, 62MR or 76MR valve may be supplied as part of a complete valve and manifold system. The valve body, manifold and pipe outlet are a single integral unit, and should under no circumstances be disassembled. Disassembly will lead to certification and warranty becoming void.
	• Valves require inlet and outlet pipes to be restrained. The valve is not a structural member.

ALLATION

it the only as n:	 YES	 NO	 YES	 NO
	 YES	 YES	 YES	 NO
	Mounting underneath the manifold allows oil, water and grit to become trapped in the valve, reducing reliability.			

Installation Instructions:	Secure the valve inlet to the manifold.	- Tighten DD nuts to 20N.m.		
		-MM valves mount on the face of the manifold, which must be flat within 0.2mm (0.008"). O rings between the valve and the manifold should be coated with a suitable silicone lubricant.		
		-MM valve mounting template drawings are available:	25MM P / 25MM D 40MM P / 40MM D 76MM CA102MM / RCA102MM	690048 / 690046 690045 / 609999 690151 691055 / 691056
		-76MM and 102MM should be tightened to 20N.m (14.8 lbf.ft), working in a pattern. For example – tighten every alternate screw until all are tight.		
	Secure the blow tube to the valve outlet. Ensure the blow tube is supported and restrained; connection to the valve is not for blow tube support or restraint.			
	Remote pilot valve connections for RCA/RCAC valves should be made with straight fittings where possible. Tubing bore diameter must be 3.2-4.2mm (0.13-0.17") minimum.			
	Electrical supply connection to the solenoid coil should match the parameters printed on the coil. Supply voltage should be in the range of nominal voltage +10% / -15%.			
Start Up:	Once valve is installed, supply clean, dry air at the required pressure to the manifold, not exceeding 860kPa (125psi).			
	Check for leaks at all joints.			
	Check the electrical connection at the on-board or remote pilot valve enclosure. Turn on power supply.			
	Check valve exhaust for adequate venting and noise suppression.			
	Switch electrical control on and observe for several cycles.			

MAINTENANCE

Application conditions, manifold pressures, and cycle rates can vary widely. To guarantee good operational health of the valve components we recommend annual inspection and servicing of replaceable parts as described below. Goyen recommend that appropriately qualified personnel conduct all maintenance activities

Serviceable parts are:	• Diaphragms and springs.
	• Pilot valve plunger and spring.
	• Seals
	• Solenoid coils (ensure the correct voltage is used).
	Refer to Kit list below for ordering codes. All other items are non-serviceable.

Note – valves supplied as a part of a complete manifold system should not be disassembled from the manifold. Maintenance does not require disassembly from the manifold.	
Main Valve maintenance procedure:	1. De-pressurise the manifold system. Isolate electrical power.
	2. Loosen the cover screws and remove diaphragm assembly / spring (if supplied).
	3. Clean all components.
	4. Check that air passages and bleed holes are clear.
	5. Exchange all worn components using the appropriate replacement kit.
	6. Assemble cover to body and tighten screws. Refer to torque values listed below.
	7. Ensure valve exterior is reasonably clean, and free from dust build-up.
Pilot Valve maintenance procedure:	1. De-pressurise the manifold system.
	2. Turn off the electrical power supply.
	3. Remove coil assembly.
	4. Loosen the ferrule retainer screws and remove ferrule / plunger assembly.

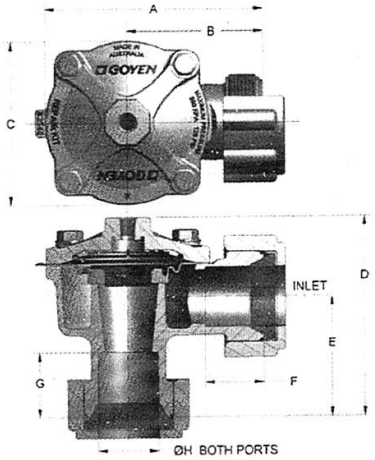
tyco Flow Control **Environmental Systems**

GOYEN

RCAC20DD4 and RCAC25DD4 Reverse ılse Valve

Installation Instructions

Dimensions – RCAC20DD4/RCAC25DD4

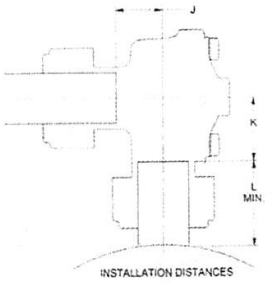


Dimensions

Valve Model	A		B		C		D		E		F	
	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch
...AC20DD4	103.7	4.08	66.7	2.63	74.0	2.91	81.6	3.21	44.2	1.74	25.4	1.00
RCAC25DD4	124.7	4.91	77.7	3.06	94.0	3.70	115.4	4.54	69.7	2.74	33.3	1.31

Valve Model	G		H		J		K		L	
	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch
RCAC20DD4	25.4	1.00	27.2	1.07	20.0	0.79	41.0	1.61	48.0	1.89
RCAC25DD4	38.1	1.50	34.2	1.35	31.7	1.25	44.4	1.75	59.0	2.32

Installation Distances



Maintenance Kits:

Valve	Nitrile	Shockwave	Viton
Diaphragm Kit			
...AC20DD4	N/A	K2034	K2033
...CAC25DD4	N/A	K2546	K2551
Dresser Seal Kit			
CA/RCA20DD4	K2008	N/A	K2009
CA/RCA25DD4	K2508	N/A	K2507

WARNING: To prevent injury, damage or malfunction read the following instructions carefully. If in doubt, please contact your Tyco/Goyen representative for further advice.

WARNING: Wear safety glasses at all times when working on the system.

Valve Installation and Security:

- Install the valve so that the ingress of water and dust through the exhaust ports is avoided.
- Slide the valve onto the tank stub pipes and tighten the dresser nut to max. torque 22Nm (16ft/lbs). Insert blowpipes into outlet and tighten the dresser nut to maximum torque 22Nm (16ft/lbs). Check for leaks at valve inlet on system pressurisation.
- When using the DD4 valves the blowtube must be independently restrained.

WARNING: For your safety do not pressurise the system until all valves are fully secured and compression nuts tightened. Do not attempt to remove a fitted valve while the system is under pressure.

Start Up Procedure:

1. Ensure tank and air delivered are clean and free from particulate.
2. Ensure blowtube is secured, mounted and appropriately sealed at the baghouse wall.
3. Ensure that the valve is securely mounted to the pressure vessel.
4. Apply the required system pressure to pressurise vessel. **DO NOT EXCEED 860KPA (125PSI)**
5. Carefully check the installation for leaks.
6. Switch the filter cleaning controller to continuous cycle. Observe several operations and check for correct firing sequence.

Operation:

Recommended on time range: 50-500ms.
Recommended time between pulses: 1 minute or greater.

Français

AVERTISSEMENT: Pour éviter toute blessure, dommage ou dysfonctionnement, veuillez lire attentivement les instructions suivantes. En cas de doute, veuillez contacter un représentant de Tyco / Goyen pour de plus amples conseils.

AVERTISSEMENT: Veuillez porter en permanence des lunettes de sécurité lorsque vous travaillez sur le système.

Installation de la Valve et Securite:

- Installez la valve de telle sorte que l'eau ou la poussière ne puissent pénétrer à l'intérieur des orifices d'échappement.
- Glissez la valve sur les conduits d'échappement du réservoir et serrez l'écrou de raccord rapide avec un couple maximum de 22Nm (16ft/lbs). Insérez les busillons dans la sortie et serrez l'écrou de raccord rapide avec un couple maximum de 22Nm (16ft/lbs). Vérifiez qu'il n'y a pas de fuites à l'entrée de la vanne sur le système de pressurisation.
- En cas d'utilisation de DD4, le busillon doit être maintenu de façon indépendante.

AVERTISSEMENT: Pour votre sécurité, ne pressurisez pas le système tant que toutes les vannes ne sont pas entièrement fixées et les écrous de compression serrés. N'essayez pas de démonter une vanne en place alors que le système est sous pression.

Procédure de démarrage:

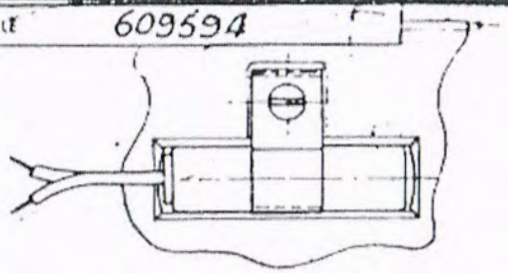
1. Assurez-vous que le réservoir et l'air fourni sont propres et exempts de particules.
2. Assurez-vous que le conduit d'expulsion est solidement fixé, monté et dûment scellé au mur du filtre à manches.
3. Assurez-vous que la vanne est solidement fixée au réservoir sous pression.
4. Appliquez la pression de système nécessaire pour pressuriser le réservoir. NE PAS DÉPASSER 860KPA (125PSI)
5. Vérifiez soigneusement que l'installation ne présente pas de fuite.
6. Basculez le contrôleur de nettoyage du filtre en cycle continu. Observez plusieurs opérations et vérifiez que la séquence d'allumage est correcte.

Fonctionnement:

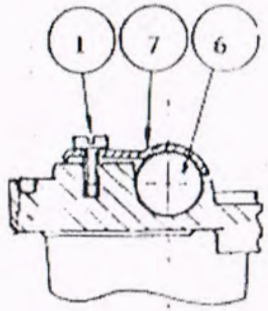
Plage de temps conseillée : 50-500ms.
Temps recommandé entre les impulsions : 1 minute ou plus.

Pour les dimensions, consultez la Figure 1
Pour les distances d'installation, consultez la Figure 2

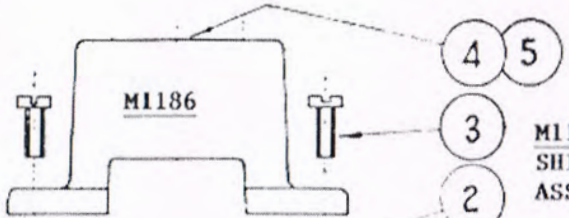
FILE 609594



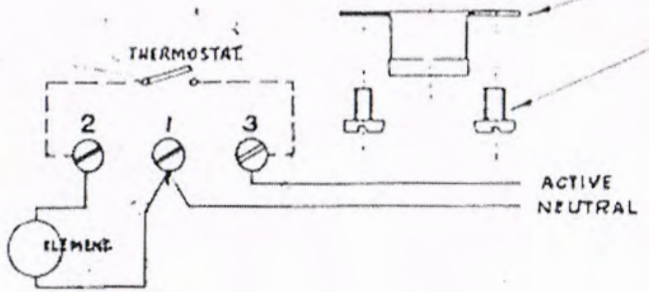
TOP VIEW
M100



END VIEW
M100



M1186
SHIPPED FULLY
ASSEMBLED



ITEM.	PART N°	DESCRIPTION.	P	N°OFF.
7	E 609286	RETAINING CLIP		1
6	M100	HEATER ELEMENT	P	1
5	M800	SCREW 8UNC X 3/8	P	3
4	D 60455-1	TERMINAL BLOCK.		1
3	M530	SCREW 6UNC. X 3/8	P	2
2	M 725	THERMOSTAT	P	1
1	M 801	SCREW 8UNC. X 1/4	P	3

PART NUMBER TABLE

GOYEN CONTROLS CO. PTY. LIMITED
268-292 MILPERRA ROAD, MILPERRA, SYDNEY, 2214

1/2 DIA. HEATER ACCESSORY KIT.

MATL —	FIRST USED ON
M1186 THERMOSTAT M100 ELEMENT	
REMOVE ALL BURRS, FLASH AND SHARP EDGES	
TREATMENT —	

ALL DIMENSIONS IN INCHES
UNLESS OTHERWISE STATED
TOLERANCES:
FRACTIONAL SIZE ± .010"
DECIMAL DIMENSIONS ± .002"
UNLESS OTHERWISE SPECIFIED

Scale	FULL SIZE		
		Drawn	MLC
Traced		Checked	
Date	13-6-78	Approved	

E

609594

Description:

Enclosures are suitable for ATEX Category Ex II 3GD, IP65 and other non-hazardous applications, for piloting Goyen diaphragm valves.

Product Markings:

CE ATEX II 3GD
Ex nA II T6 Gc
Ex tc IIIC T55°C Dc IP65

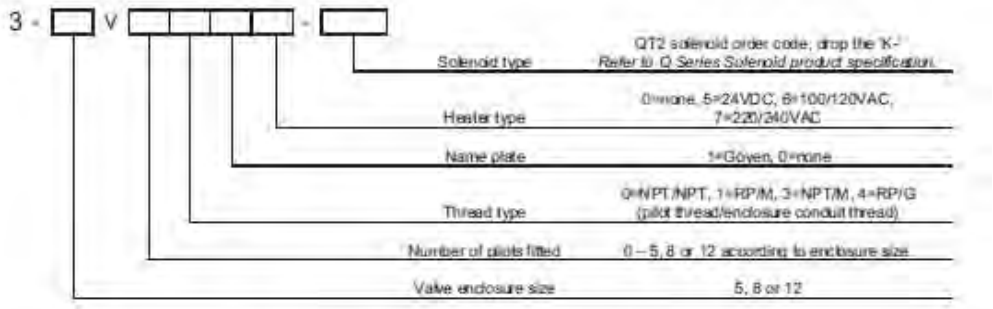
Supplier's Declaration of Conformity # DoC 005/2012

Operating Parameters:

Maximum Operating Pressure	860 kPa (125 psi)	Minimum Temperature	-40°C (-40°F)
Recommended Operating Pressure	760 kPa (110 psi)	Maximum Temperature	82°C (180°F)
Minimum Operating Pressure	30 kPa (5 psi)	The valves are to be used to pulse air or inert gas only.	

Restrictions: This product's certifications are valid only for product that has not been modified since leaving the Goyen factory. Modifications made to the enclosure such as the fitment of additional gaskets, the addition or removal of pilot valves and coils, changes in markings, or physical modifications made to the enclosure itself will invalidate the product certifications. Only activities described in 'Installation' and 'Maintenance' may be conducted without affecting the certification of the product.

Product Identification:



Example: 3-8V6010-330
8 valve enclosure, fitted with 6 pilots, with NPT pilot and conduit thread type, Goyen name plate, no heater element and 220/240VAC 50/60Hz solenoids.

Note that enclosures are pre-wired with QT2 type solenoids only.

Note: ATEX/CSA Certification is not valid if a heater element is installed.

USA
Goyen Valve Corporation
Telephone 732 364 7800

CHINA
Pentair Water & Environmental Systems
Telephone 86 21 5239 8810 Fax 86 21 3211 4582

UNITED KINGDOM
Pentair Environmental Systems Ltd.
Telephone 44 1256 817 800 Fax 44 1256 332 760

MALAYSIA
Goyen Controls Co. Pty. Ltd.
Telephone 60 3 7987 6839 Fax 60 3 7987 7839

GERMANY
Pentair Umwelttechnik GmbH
Telephone 49 6432 95299-0 Fax 49 6432 95299-24

ITALY
Mecair S.r.l
Telephone 39 0362 3751 Fax 39 0362 367 279

AUSTRALIA
Goyen Controls Co. Pty. Ltd. ABN 60 000 168 098
268 Milperra Road, Milperra NSW 2214
Telephone 1800 805 372 Fax 1300 658 799

http://www.cleanairsystems.com

INSTALLATION

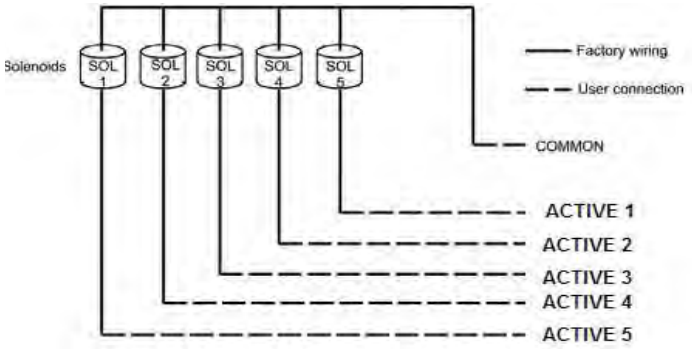
WARNING! Ensure that the enclosure is correctly assembled with all cover screws tightened between 1.7 – 2.5 Nm (15 – 22 lbf-in) prior to applying power. Keep cover closed while circuits are live.

WARNING! Wear safety glasses at all times when working on the system.
WARNING! Refer to EN 1127-1 for the restrictions on tools which may be used if working in an explosive atmosphere.

Mounting: Enclosures should be mounted in a horizontal position, where the pilot valves and solenoid assemblies are in the preferred vertical orientation.

Electrical connections: Refer to diagram. (Typical example of 3-5V wiring)

The included Goyen QT2 solenoids are provided with screw terminals. These solenoids are neutrally linked at the factory for customer convenience.



Grounding Terminal: The internal grounding terminal must be used for the equipment grounding connection.

Cable Entry: Appropriate cable glands or conduit must be used. Thread options are listed in the product identification table on page 1.

For the **3-5V** enclosure, entry options are: M20, 1/2″ NPT, 1/2″ G.

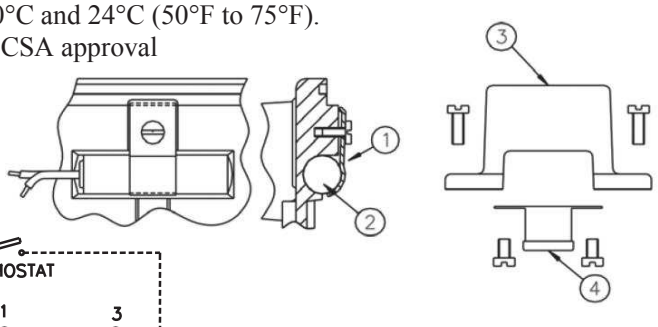
For the **3-8V & 3-12V** enclosures, entry options are: M25, 3/4″ NPT, 3/4″ G.
(An appropriate blanking plug must be fitted if a cable entry port is not used).

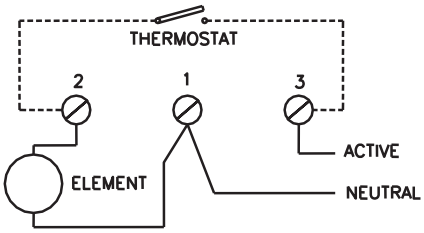
Heater Option: The **3-8V & 3-12V** enclosures can be fitted with an internal heater to reduce condensation. The heater is thermostatically controlled between 10°C and 24°C (50°F to 75°F).
Note: Heater Option is not available with ATEX or CSA approval

1. Heater retaining clip
2. Heater element
3. Wiring terminal block
4. Thermostat element

Heater voltage options

220/240vac	100W
110/120vac	100W
24vdc	48W





Pneumatic connections: Connect these pilot valves to the dust collector reverse pulse jet valves using metric 4 mm ID tubing (.157" ID) or 1/4" tubing (.162" ID) and a maximum length of 1.5 m (4.9 ft). A maximum of 8.0 Nm (70 lbf-in) may be used when installing fittings in the valve's inlet or exhaust port.

Solenoid performance: Refer to the table below

Voltage & Frequency	Inrush Current	Hold Current	Power
220v 50Hz / 240v 60Hz	148 / 143 mA	105 / 94 mA	23.1 VA
100v 50Hz / 120v 60Hz	234 / 255 mA	180 / 152 mA	19.8 VA
24v 50/60Hz	1338 / 1096 mA	963 / 716 mA	23.1 VA
110v DC	212 mA	212 mA	24 W
24v DC	873 mA	873 mA	20 W

Electrical pulse times:

"On-time" range from 50 to 500 milliseconds. Minimum "off-time" of 1 minute.

MAINTENANCE

Annual maintenance of serviceable parts is recommended. Refer to maintenance kits table listed below. Damaged coils may be replaced (ensure the same voltage is used). All other items are non-serviceable. Goyen recommend that appropriately qualified personnel conduct all maintenance activities. Certification of qualified maintenance staff and facilities may be required under some certification schemes. Inappropriate service invalidates the product certifications.
Mounting screws for pilot body to be tightened to 1.5 Nm (1 lbf-ft).
Securing nuts for pilot valves to be tightened to 13Nm (9.5 lbf-ft).
Cover mounting screws to be tightened between 1.7 – 2.5 Nm (1.3 – 1.8 lbf-ft).

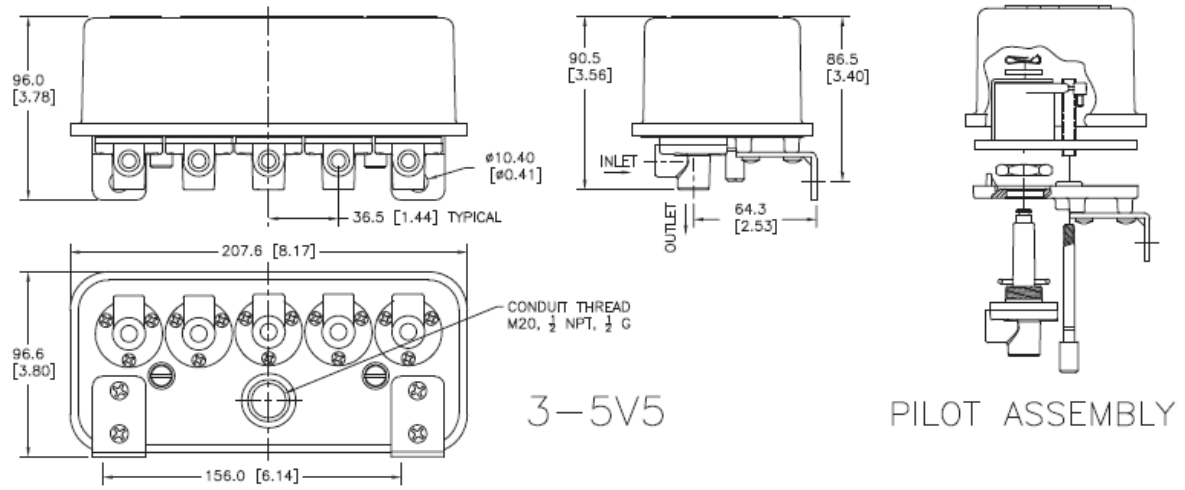
SPARE PARTS

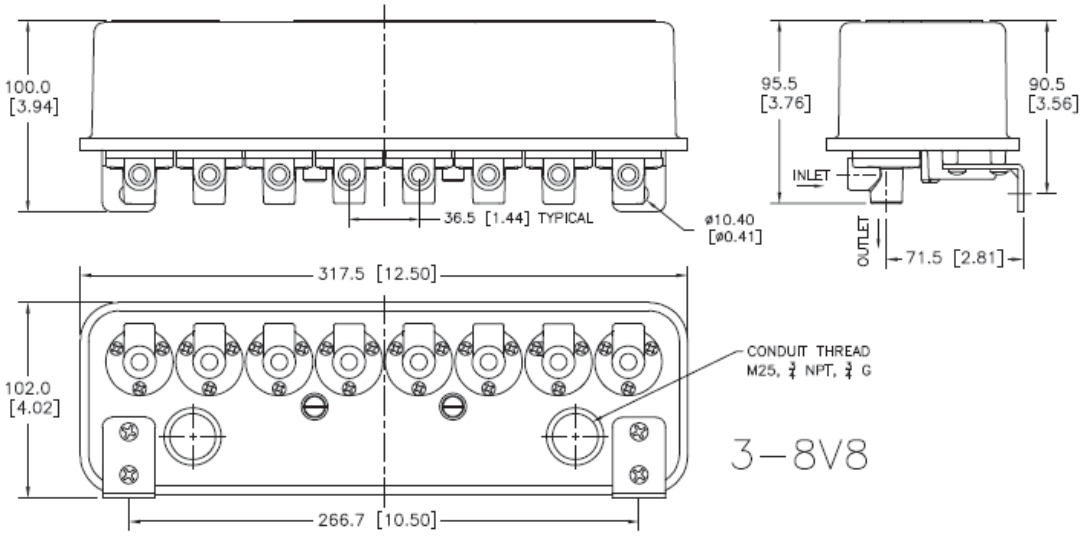
Coil Kits (Single Coil)	
Part No.	**Description**
K0330	220/240v AC
K0331	100/120v AC
K0332	24v AC
K0334	110v DC
K0336	24v DC
K0337	12v DC

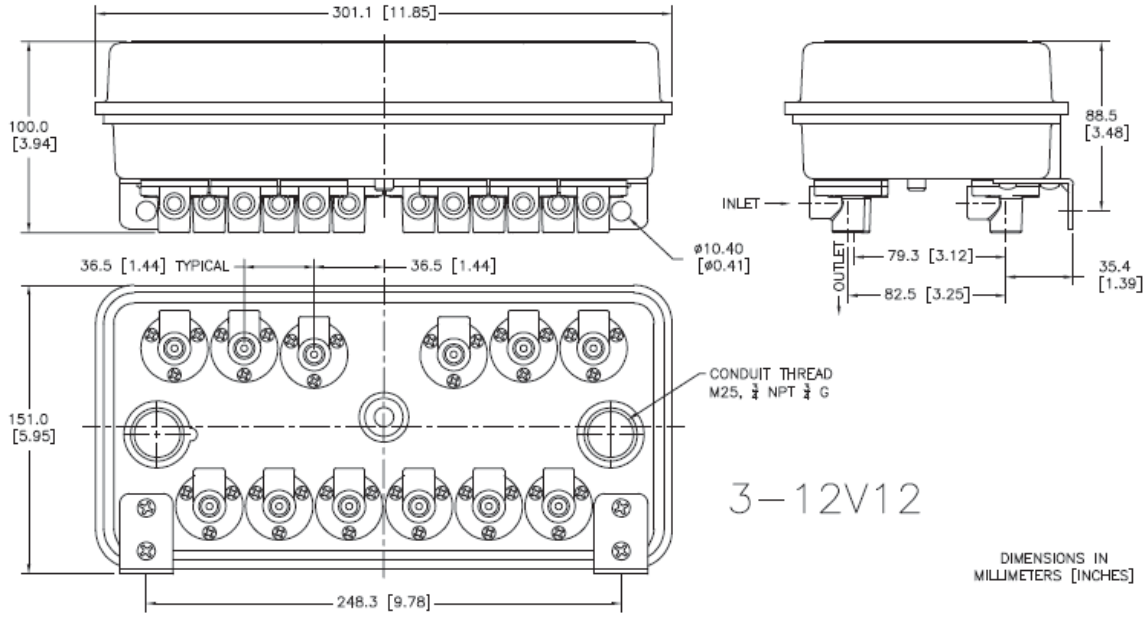
Maintenance Kits	
Part No.	**Description**
K0380	Nitrile replacement seal, armature, spring and ferrule kit.
K0384	Viton replacement seal, armature, spring and ferrule kit.

CONSTRUCTION DETAILS

Base, cover & pilot body	Aluminium (diecast)
Ferrule	305 stainless steel
Armature	430FR stainless steel
Seals	Nitrile rubber
Screws	304 stainless steel
Coil clip	Spring steel (plated)
Solenoid	Goyen type QT2 (purple) Class B (130°C) self-extinguishing Nylon PA-6


96.0 [3.78]
ø10.40 [ø0.41]
36.5 [1.44] TYPICAL
90.5 [3.56]
86.5 [3.40]
INLET
OUTLET
64.3 [2.53]
207.6 [8.17]
CONDUIT THREAD M20, ½ NPT, ½ G
96.6 [3.80]
156.0 [6.14]
3–5V5
PILOT ASSEMBLY


100.0 [3.94]
36.5 [1.44] TYPICAL
ø10.40 [ø0.41]
95.5 [3.76]
90.5 [3.56]
INLET
OUTLET
71.5 [2.81]
317.5 [12.50]
CONDUIT THREAD M25, ¾ NPT, ¾ G
102.0 [4.02]
266.7 [10.50]
3–8V8


301.1 [11.85]
100.0 [3.94]
ø10.40 [ø0.41]
88.5 [3.48]
INLET
OUTLET
79.3 [3.12]
82.5 [3.25]
35.4 [1.39]
36.5 [1.44] TYPICAL
36.5 [1.44]
CONDUIT THREAD M25, ¾ NPT ¾ G
151.0 [5.95]
248.3 [9.78]
3–12V12
DIMENSIONS IN MILLIMETERS [INCHES]