CMAXX

DUST & FUME COLLECTION SYSTEM

Installation, Operation, & Maintenance Manual

version - S24

IMPERIAL SYSTEMS®

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1. Introduction & Warranty

1.1 Introduction

Congratulations on your purchase of an Imperial Systems, Inc. product.

This product has been designed and manufactured to the strictest specifications. It is our utmost desire that you achieve success and are rewarded with years of service from your equipment purchase.

Carefully examine your equipment upon receipt. Report any damage immediately to the freight carrier and register any claim. Should any material or manufacturing defects be discovered, report your findings to our service department along with the model, serial number, and date of purchase. We want to make sure that you are satisfied with the equipment. As always, we welcome input on how our products can be improved to serve you better.

Read and understand this manual before using your equipment. Follow all safety instructions. Keep this manual in an accessible place at all times. Information provided in this manual is current as of the issue date. Imperial Systems, Inc. reserves the right to make design changes without further notice or liability.

Equipment modifications from original design and specifications are prohibited. Modifications may compromise safe operation of the machine, subjecting users to serious injury or death, and may void any remaining warranty.

This Operator's Manual does not replace, nor does its use release the owner from observing all safety codes and operating limitations, as well as any applicable federal, state, provincial, or local regulations.

1.2 Serial Number

The serial number plate is located in the lower left corner of the door below the CMAXX sticker.

For future reference, write your serial number in the space here:

Model – Model of dust collector that you have. The number in the model name represents the quantity of filters in the unit.

Job Number – Sales order number that the unit was sold under.

Serial Number – Serial number of the unit.

Date of Order – Date that the job was entered.

Customer – Customer that unit was sold to.

Filters - Part number for filters that were ordered with the unit.

A.T.C. Ratio – Air to cloth ratio that the unit was designed to operate at.

KST Value - KST Value is the explosive value of the dust being collected. The higher the value the more explosive the dust is.

Dust Type – Description of dust that collector was designed to filter.

INDUSTRY LEADING Lifetime WARRANTY

Imperial Systems, Inc. warrants to the original purchaser that the major structural components of the CMAXX™ dust collector will be free from defects in materials and workmanship for the lifetime of the equipment, if properly installed, maintained and operated under normal conditions. Imperial Systems, Inc. warrants filter cartridges to be free from defects in materials and workmanship for twelve (12) months from date of shipment. Imperial Systems, Inc. does not warrant damages which are due to corrosion, abrasion, normal wear and tear, product modification or product misapplication. Imperial Systems, Inc. also makes no warranty whatsoever as to any goods manufactured or supplied by others, including, but not limited to, electric motors and control components. After Imperial Systems, Inc. has been given adequate opportunity to remedy any defects in material or workmanship, Imperial Systems, Inc. retains the sole option to accept return of the goods, with freight paid by the purchaser, and to refund the purchase price for the goods on a prorated basis after confirming the goods are returned undamaged and in usable condition. Such a refund will be the full extent of Imperial Systems, Inc. liability. Imperial Systems, Inc. shall not be liable for any other costs, expenses or damages, whether direct, indirect, special, incidental, consequential or otherwise. The terms of this warranty may be modified only by a special warranty document signed by the President of Imperial Systems, Inc. There exist no other representations, warranties or guarantees except as stated in this paragraph. All other warranties, including merchant-ability and fitness for a particular purpose, whether express or implied, are hereby expressly excluded and disclaimed.

CMAXX IMPERIAL SYSTEMS INC. Lifetime WARRANTY

BREATHE BETTER, WORK SAFER

FOR LIFE

FAILURE TO USE GENUINE IMPERIAL SYSTEMS, INC. REPLACEMENT PARTS & FILTERS WILL VOID THIS WARRANTY.

1.4 IDA In-Line Deflagration Arrestor Certification

The IDA certification is optional. Contact Imperial Systems to verify if your CMAXX is equipped with the IDA certification. The CMAXX using the Proprietary DeltaMAXX IDA Filters is proven to completely isolate flame transmission and stop combustion from passing through the filters. With IDA you can safely return air back into the workplace.

This flame and deflagration isolation meets at least one of the required methods required by NFPA. Third party test results are available upon request.

To maintain IDA certification on collector, you must:

- Provide a dust sample for KST testing or provide a copy of a completed KST test.
- Dust cannot exceed a rating of 200 KST.
- Use Certified DeltaMAXX IDA Filters.
- Differential pressure cannot exceed 5 Inches of Water Column.
- Install a broken bag detector in return air duct.
- Install a burst indicator on pressure relief panel.
- Ground the dust collector

WARNING

Prevent serious injury or death.
Not following above requirements will void IDA rating and could result in property damage, death, or serious injury.

In the event of a deflagration the following must be performed before the unit is returned to service.

1. Inspect unit for any deformation, or stress cracks.
2. Inspect tube sheet to verify there is no deforming, and filters will seal against it properly.
3. Inspect door hardware for proper function, verify there is no deformation or stress cracks in latch mechanism.
4. Inspect lift rails for proper function.
5. Replace filters with Certified DeltaMAXX IDA Filters. Filters can only be purchased from Imperial Systems.
6. Replace pressure relief panel and burst indicator.
7. Replace door gasket.
8. Replace explosion vent braces.

Imperial Systems does offer an inspection service to verify your collector is operational. Please contact your sales representative for current pricing.

1.5 Fire Protection And Safety Equipment

The customer assumes the responsibility to contact their insurance company and or AHJ (Authority having Jurisdiction) to see what is required to meet the needs of fire protection, explosion ventilation, deflagration, isolation and any other related equipment. It is the customer's responsibilities to relay this information to Imperial Systems so that we can properly select and size the necessary equipment to meet their requirements.
The customer should adhere to any and all NFPA, OSHA, federal, state, codes, rules, and regulations.

WARNING

Filters are only bonded and grounded when using DeltaMAXX Prime Filters that are pushed back and properly touching the grounding tab and only if the collector is properly grounded.

2. Safety

2.1 Safety Alert Symbol and Signal Words

You must read, understand and follow the instructions given by the operating unit manufacturers, as well as the instructions in this manual. The safety information in this manual is denoted by the safety alert symbol:

This symbol means ATTENTION! BECOME ALERT! YOUR SAFETY IS INVOLVED!

The level of risk is indicated by the following signal words:

DANGER

DANGER - Indicates a hazardous situation, which, if not avoided, WILL result in death or serious injury.

WARNING

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

CAUTION

CAUTION - Indicates a hazardous situation, which, if not avoided, could result in minor or moderate injury.

NOTICE

NOTICE - Indicates a situation that could result in damage to the equipment or other property.

2.2 Operational Hazards

WARNING

Prevent serious injury or death.
Read and understand this manual before operating equipment.

WARNING

Prevent serious injury or death from moving parts.

Moving parts can crush and dismember.

Do not operate without guards and shields in place.

Disconnect and lockout power source before adjusting or servicing.

Carefully read all safety messages in this manual and on equipment safety signs. Keep safety signs in good condition and replace missing or damaged safety signs.

New equipment components and repair parts must include the current safety decal.

Learn how to properly operate equipment. NEVER operate or work around this equipment without proper instruction, while fatigued or under the influence of alcohol, prescription or non-prescription medication or if feeling ill.

Keep your equipment in proper working condition.

Know the regulations and laws that apply to you and your industry. This manual is not to replace any regulations or laws. Additional information may be found at:

www.nfpa.org or www.osha.gov.

If you do not understand any part of this manual, contact Imperial Systems, Inc. at 724-662-2801.

2.2.1 Prepare for Emergencies

Be prepared in case of emergencies. Keep a fire extinguisher and first aid kit close to the machine. Keep emergency phone numbers close to your phone. Know your address so emergency services can locate you if an emergency arises.

2.2.2 Replace Safety Signs

Replace missing or damaged safety signs. Safety sign locations are identified in Section 3 of this manual. Replacement safety signs are available from Imperial Systems, Inc.

2.3 Maintenance Hazards

Before servicing, disconnect and lockout power source. Read and understand this manual. If you do not understand any part of the manual, contact Imperial Systems, Inc. at 724-662-2801.

Always wear face and/or eye protection, safety shoes, and other protective equipment appropriate for the job.

Do not make unauthorized modifications. Contact Imperial Systems, Inc. at 724-662-2801 before you weld, cut/drill holes, or make any other modifications.

Always use Imperial Systems, Inc. replacement parts.

WARNING

Disconnect and lockout power source before performing inspections, service or maintenance.

WARNING

Keep clear of moving components.
Moving parts can crush and cut.
Follow lockout procedure before servicing.

WARNING

Entanglement hazard.
Keep clear of moving components.

Wear proper protective equipment appropriate for the job.

2.4 Hazards from Modifying Equipment

Do not make any alterations to your equipment. Altering may cause your equipment to be unsafe and may void the manufacturers' warranty.

2.5 Pressurized Air Hazards

Compressed air can cause serious injury or death.

WARNING

Do not use compressed air for any other purpose than that for which it is provided.

Never direct a stream of compressed air towards your body or the body of another person.

Before using, check all components for damage or wear. Make sure connections are tight and hoses are in good condition.

2.6 Safety Warning Labels

WARNING

To protect you and others against death or serious injury, all labels shown must be on machine and must be legible.

If any of these labels are missing or cannot be read, contact Imperial Systems, Inc. for replacement labels.

2.6.1 Safety Labels

4. Unloading Equipment

4.1 Recommended Tools & Equipment

- Screw Pin Clevis
- Drift Pins
- Wrenches
- Lifting Slings and Chains
- Pipe Wrenches
- Socket Wrenches
- Impact Wrench
- Crane or Forklift
- Drill and Drill Bits
- Large Cresent Wrench
- Pipe Sealant
- Screwdrivers
- Spreader Bar
- Impact Sockets

4.2 Rigging Instructions

Do not make any alterations to your equipment. Altering may cause your equipment to be unsafe and may void the manufacturers' warranty.

1. Use all lifting points provided on the unit.
2. Use screw pin clevises, not hooks on lifting slings.
3. Use spreader bars to prevent damage to the unit's frame.
4. Refer to certified drawings for the weight and dimensions of the unit, subassemblies, and accessories to ensure adequate crane capacity.
5. Only qualified personnel should be allowed to lift or rig the equipment.
6. Refer to applicable OSHA regulations and local codes when using cranes, forklifts, and other lifting equipment.
7. Lift the unit and accessories separately and assemble after the unit is in place.
8. Use drift pins to align holes during assembly.

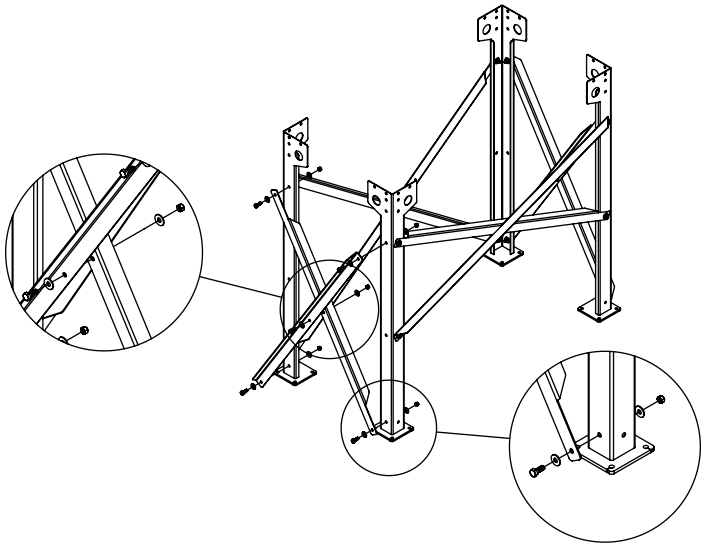
5. Assembly & Installation

5.1 Assembly Video

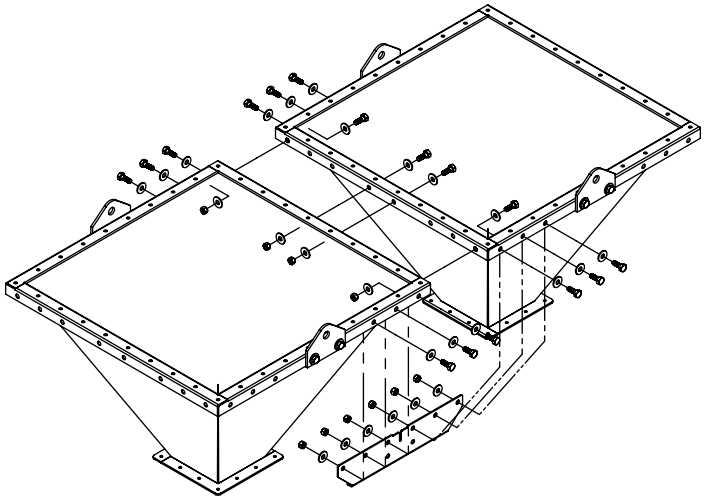
Click above or **visit www.isystemsweb.com/cmaxx-install-video/** to view the full installation and download the installation checklist.

5.2 Assembly

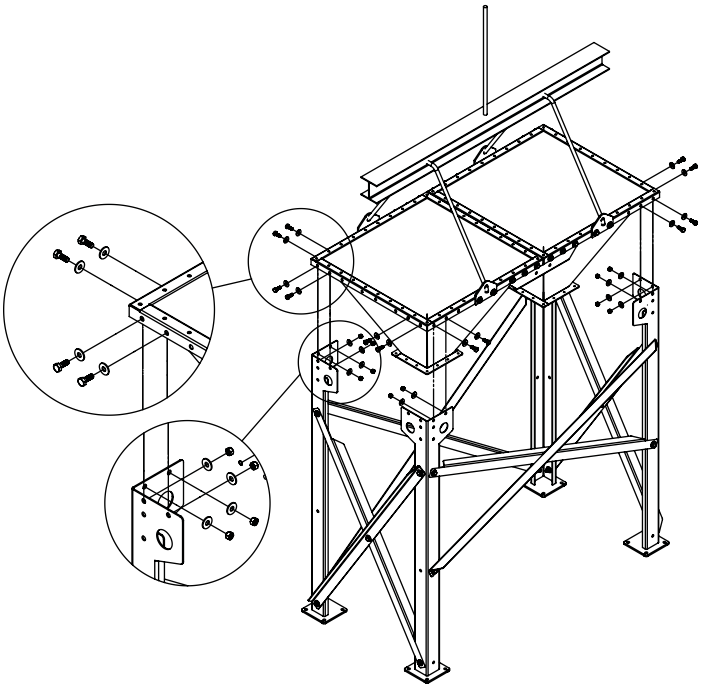
1. Locate and assemble the support structure according to the assembly drawing that came with your CMAXX. Leave all of the hardware loose at this time.



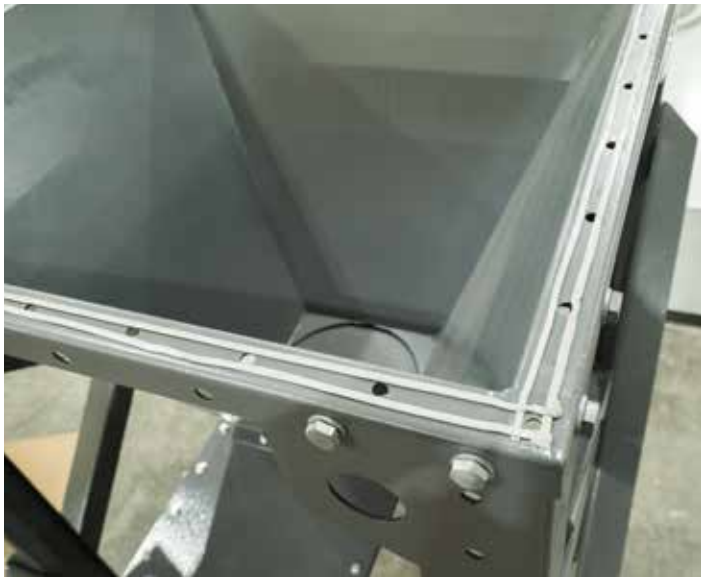
2. If your CMAXX is equipped with multiple hoppers orientate the hoppers per the assembly drawing ensuring that the alignment stickers are in the proper location. bolt the hoppers together using supplied hardware, and gusset brackets.



3. Bolt on the temporary lifting lugs to the hoppers to assist in lifting the hoppers onto the structure. Lift hoppers onto support structure and fasten to the structure using the supplied hardware. Use alignment pins as necessary to align holes. Leave all hardware loose at this time.

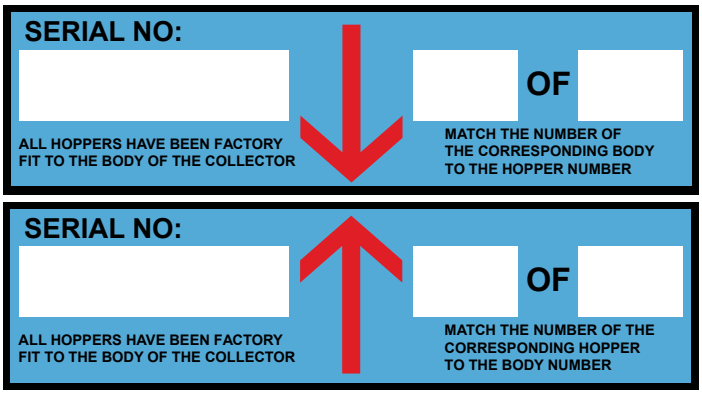


4. Remove the temporary lifting lugs from the hoppers, and apply two rows of sealant on the hopper flange surface. (See following graphic.)

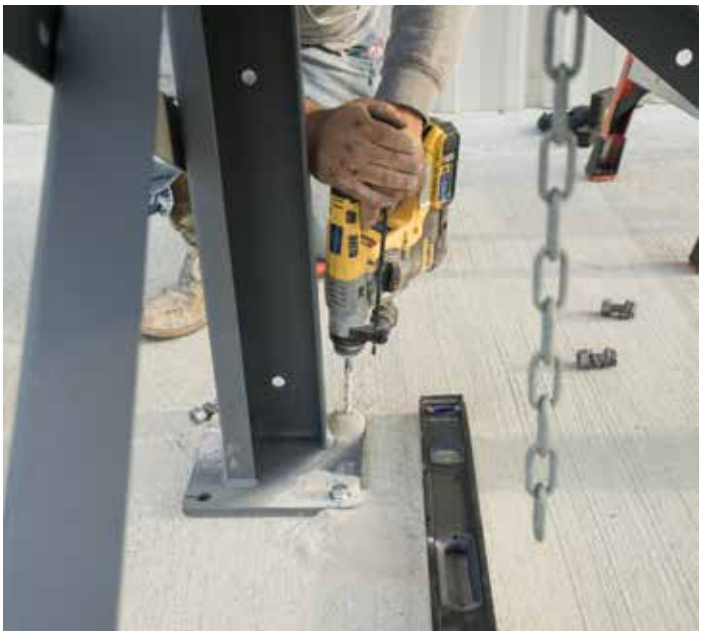


5. Properly rig the body of the CMAXX and lift into place over the hoppers using alignment pin bars to align the hopper flange holes to the holes in the base of the CMAXX body. The arrows on the alignment stickers should be aligned to each other.

6. Once all of the hardware is installed in the base flange of the CMAXX and properly tightened, proceed with tightening all of the support structure hardware.



7. Securely anchor the CMAXX structure to the foundation using the holes in the foot pads.



5.3 Compressed Air Installation

- Remove the pipe plug from the end of the air header tank and connect the compressed air supply line. Supply line must be minimum 1 in. diameter. Use pipe sealant or thread sealing tape on all compressed air connections.
- Install a customer supplied regulator with gauge, filter, and automatic condensate valve in the compressed air supply line.
- Note: all compressed air components must be sized to meet maximum system requirements per the chart on the next page at 80 PSI. See specification drawing shipped with the unit.

CMAXX Diaphragm Valve Air Consumption @ 80 PSI							
		1" Diaphragm Valve			1.5" Diaphragm Valve		
On Time (msec)		100	150	200	100	150	200
Off Time (sec)	5	31.2	62.4	96.0	33.6	66.0	102.0
	10	15.6	31.2	48.0	16.8	33.0	51.0
	15	10.4	20.8	32.0	11.2	22.0	34.0
	20	7.8	15.6	24.0	8.4	16.5	25.5
	25	6.2	12.5	19.2	6.7	13.2	20.4
	30	5.2	10.4	16.0	5.6	11.0	17.0
	35	4.5	8.9	13.7	4.8	9.4	14.6
	40	3.9	7.8	12.0	4.2	8.3	12.8
	45	3.5	6.9	10.7	3.7	7.3	11.3
	50	3.1	6.2	9.6	3.4	6.6	10.2
	55	2.8	5.7	8.7	3.1	6.0	9.3
	60	2.6	5.2	8	2.8	5.5	8.5

NOTICE

Do not increase supply pressure above 100 PSI. Component damage can result.

- The compressed air supply must be oil and moisture free. Contamination in compressed air used to clean filters will result in poor cleaning, reduced filter life, cleaning valve failure, and poor collector performance.
- Purge compressed air lines to remove debris before connecting to the units compressed air manifold.
- Turn off compressed air supply and bleed lines before performing service or maintenance work.

NOTICE

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.

5.4 Electrical

5.4.1 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.

5.4.2 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.

Note: Supply voltage to the timer controller must match the rated voltage of the pilot valve solenoids.

5.4.3 Electrical Enclosures Preventative Maintenance

Monthly

- Visual inspection of all wire connections for discoloration and check tightness
- Visual inspection of fans and filters, clean as necessary
- Make sure the fans in the cabinet run, adjust thermostat if necessary to operate fans
- Listen to fans for excessive noise, replace if excess noise is heard or unit has failed
- Remove dust and debris from inside the cabinet by vacuum only. Blowing compressed air can cause damage.
- When the unit is running, make sure the fans inside the **drive** operate by feeling the air above the drive to see if air is being moved out of the drive.
- Make sure the area around the fans and filters external to the enclosure is clear so air can be moved.
- Make sure wire trough covers are in their proper place.
- Make sure air tubing is seated properly and is connected on both ends.

Yearly

- Thermal imaging scan to look for hot spots, take corrective action as necessary.

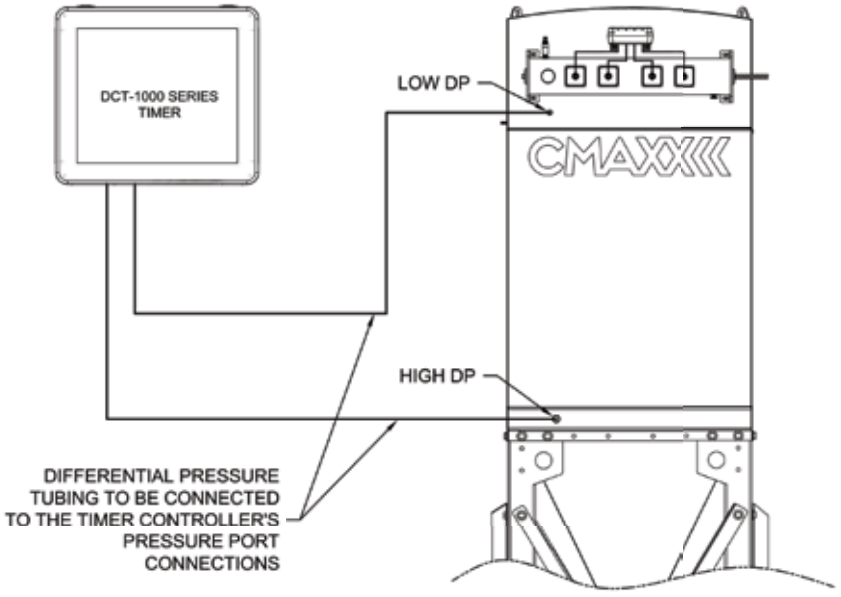
5.5 Differential Pressure Kit Installation

There are high and low pressure ports on the CMAXX that need connected to the pressure transmitter on the timer control board via 1/4" OD tubing.

The low-pressure port (-) is located in the clean air side of the dust collector near the air header tank, and the high-pressure port (+) is located in the base frame of the CMAXX.

Instructions:

1. Thread a push connect fitting into both 1/8" NPT differential pressure ports on the CMAXX (there are both straight and 90 degree fittings supplied so that you can use the fitting that will work best in your application).
2. Thread the push connect fittings into the 1/8" NPT ports on the bottom of the timer controller (typically, the straight fittings work best on the control panel).
3. The differential pressure kit comes with a 100' roll of silver tubing. This tubing will be used to connect the high-pressure port on the CMAXX to the (+) pressure port on the timer controller, and the low-pressure port on the CMAXX to the (-) pressure port on the timer controller.
4. To connect the tubing into the push to connect fitting cut the end of the tubing square and firmly push the tubing into the fitting until it fully clicks into place.
5. When running the tubing between the CMAXX and timer controller do not kink the tube or clamp so tight that is crushes it. If your installation requires the timer controller to be located further away from the CMAXX than 50' an additional differential pressure tubing kit can be purchased.



CMAXX Installation Checklist

Thank you for purchasing an Imperial Systems CMAXX Dust & Fume Collector. Here is a list of items that you will need for the installation and need to complete prior to the system startup for your unit.

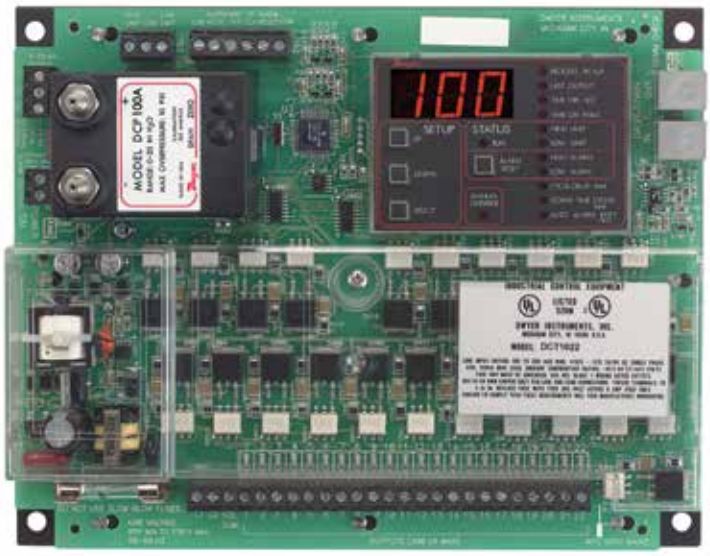
- Check with your insurance company and or local fire marshal to make sure the system you are installing meets all NFPA and or OSHA rules and guidelines.
- Level concrete pad for the collector to sit on. We recommend the pad to be at least 3' larger in all directions than the actual footprint of the machine. You will also need to take any ladders and duct supports into consideration when planning your concrete.
- Collector must be fully assembled and sealed per assembly instructions (see owner's manual for details)
- All ducting shall be fully run from the process collection points to the collector. Note: all ducting needs to be properly installed per manufacturer's specifications and fully sealed to prevent water leaks.
- A compressed air line will need to be run to the collector's air header tank. A 3/4" minimum diameter line of clean, dry, oil-free compressed air at 80 PSI is required. Typical usage of compressed air is 31 CFM at 80 PSI.
- The collector will need to be wired once installed. Below is a list of common items and a description for each. All these items (if equipped) will need to be wired prior to scheduling the system startup. See owner's manuals for wiring instructions.
  - Fan: the fan will need to be completely wired from the starter and ready to run, and proper rotation verified.
  - Cleaning System: timer controller will need to be energized and the solenoid outputs wired to the solenoids on top of the air header tank. There will be one solenoid for each diaphragm valve.
  - Solenoid heater: if the optional solenoid heater is included, there will need to be a 120V 100-watt circuit run to the solenoid enclosure on the air tank with the solenoids.
  - Explosion Vents: there is a break wire sensor that is required to shut the collector down in the event of a fault. This must be a low voltage 24VDC circuit.
  - Explosion isolation valve: If the system is equipped with an EIV there will be a separate control panel supplied that sends a signal to shut down the collector. There is a particulate sensor in the bottom of the valve. The wiring must be run separately in its own conduit and must penetrate the control panel in the intrinsic barrier section of the panel.
- Differential pressure tubing needs to be run from the high and low ports on the collector to the ports on the timer controller.

6. DCT1000

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) can be used to take full advantage of all the features the DCT1000 offers, or an external pressure switch can be used for High/Low limit control.

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.



SETTINGS

- Last output: This number needs to match number of diaphragm valves on CMAXX.
- Time Off: 10 seconds
- Time On: 150 Milliseconds
- High Limit: 3.0 INWC
- Low Limit: 2.0 INWC
- High Alarm: 6.0 INWC
- Low Alarm: 0.0 INWC
- Cycle Delay: 0 Minutes
- Down Time Cycles: 5 Minutes
- Auto Alarm Reset: 5 Seconds

6.1 Programming Master Controller

The menu item that you are currently accessing is indicated by the illumination of an LED. To change menu items push the “select”, push “UP” to increase a value or push “DOWN” to decrease a value. 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.

6.1.1 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 out-put 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 maybe 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.

6.1.2 Time Off (sec)

Time Off Setup 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.

6.1.3 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.

6.1.4 High Limit (Only with DCP Installed)

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.

6.1.5 Low Limit (Only with 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 setable 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.

6.1.6 High Alarm (Only with 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 setable 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.

6.1.7 Low Alarm (Only with 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 setable 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.

6.1.8 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.

6.1.9 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, 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.

6.1.10 Auto Alarm Reset (sec) (Only with 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, 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.

6.2 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.

7. Startup

Imperial Systems, Inc. offers a system startup service. Please contact your sales representative for current pricing on this service.

1. Check all hardware to make sure it is tight, and all duct connections are sealed properly.
2. Check that filters are installed properly and that all lift rails are in up position.
3. Check that compressed air is on and regulated to 80 PSI (Recommend using a minimum of 1 in. diameter pipe to plumb the compressed air to the CMAXX).

4. Check that timer controller is on and properly programmed. See section 6 for programming instructions.
5. Set timer controller to continuous and verify that diaphragm valves pulse properly. You should hear a short pulse of air every 10 seconds in the dust collector.
6. Set timer controller to on demand for normal operation.
7. Verify that pressure ports on body of CMAXX are plumbed to timer controller
8. If using a drum kit with slide gate, make sure slide gate is open and drum is connected and sealed. Hopper on CMAXX is not intended to store material.
9. Set fan outlet damper to 75% open.
10. Bump start fan and verify wheel is rotating in proper direction.
11. Start fan and allow to reach full operating speed. Check AMP draw. Fan should be operating below full load amp rating on motor name plate. If operating above full load amps, gradually close fan outlet damper until amps drop below full load amps value.
12. It is recommended that air readings are taken at startup and the fan outlet damper is adjusted to match the rated CFM of your dust collector. A dust collector operating above the designed CFM will experience reduced filter life.

NOTICE

Operating dust collector above the design CFM will reduce filter life.

8. MAINTENANCE

Monitor the differential pressure daily. Maintaining a log of the differential pressure can assist in troubleshooting the collector if any issues were to come up. Once the differential pressure rises above 5 INWC and will not clean below 5 INWC the filters will need to be replaced.

Perform a monthly visual inspection of air tank, and pulse tube lines for leaks. Listen to the diaphragm valves fire to verify they are operating correctly.

Inspect the door seals annually. Open the access doors and verify the door seals are intact and not breaking down. A properly sealed door will have a consistent layer of dust on the inside of the door. If there is streaking in the dust around the seal, then there is most likely a leak in the seal.

Annually visually inspect the inside of the collector for signs of wear and material buildup in the hoppers (it is normal to have material buildup on the framework inside the collector) and verify the filter lift rails are all the way up fully seating filters against the tube sheet.

It is normal for your filters to be coated with dust. This layer of dust on the filters helps with their efficiency. The best way to determine the condition of your filters is the differential pressure. As long as the differential pressure is below 5INWC then they are performing as they should.

If your collector is equipped with other safety devices or discharge devices please refer to that devices manual for maintenance instructions.

WARNING

Filters are only bonded and grounded when using DeltaMAXX Prime Filters that are pushed back and properly touching the grounding tab and only if the collector is properly grounded.

The Safety Pentagon (all features patent pending) is designed to improve the safety and performance of filters. The anti-ramp rails will prevent the filters from ramping (sliding over each other) as they are installed. The double gaskets on the filter pans provide a reliable seal against dust. Filters are completely grounded to the dust collector via a connection point aligned with the pans. The lift rail door stop system will prevent doors from closing if lift rails are not raised back to proper position. As a redundant safety feature, the Sure-Stop system uses the filter channels and door indexing bar to block the door from closing if filters aren't installed properly.

8.1 Filter Handling and Replacement

NOTICE

Improper handling of a filter can ruin the filter

NEVER handle filters by the pleated paper media. This will damage the filters. Only handle by the top metal pan. Do not poke, hook, or puncture the filters with the filter removal tool or any other object. Do not attempt to force the door closed if it will not shut after filter install.

8.1.1 Filter Removal

1. Lift filter cam lever and lock it in the extended position.

2. Using lever in extended position, lower lift rail assembly. Repeat on both sides of the filter before attempting to remove.

3. After lowering lift rails, remove the filters. Either grasp the filter by the metal pan on top, or use the filter tool. Only use the filter tool to capture the filter by the metal pan. Do not handle the filter media with your hands or the filter tool.

8.1.2 Filter Replacement

1. Make sure that cam levers have been used to lower all lift rail assemblies.
2. Remove the filters from their boxes. DO NOT handle the filter material. Handle filters only by the pans on top.
3. Align the filter pan with the lift rails. If correctly aligned, filters should slide easily on the lift rails. If filters will not slide into place, remove all filters and check that they are aligned properly. The Sure-Stop system (patent pending) will block filters that are improperly installed.
4. Return the lift rails to their normal position with the cam levers.
5. Close the collector's doors. If the doors do not close, the filters may not be installed correctly. Verify that the lift rails are locked in place and the filters are pushed back into the unit. If this does not work. remove filters and reinstall.

8.2 Safety Valve Maintenance

If a valve is discovered to be leaking it can be cleared by manually operating the valve to a pressure that will cause it to operate. Please note that valves with metal-to-metal seats are not absolutely "bubble tight" and they will allow a pressure loss over a period of time. If a valve has a leak it should be replaced, as leaks are self-propagating.

Safety relief valves must be inspected and tested for operation periodically. It is the users responsibility to determine the frequency of inspection as they are the only party familiar with the operating conditions and the relative hazards of an inoperative valve. It is recommended that at the very least each valve should be inspected semi-annually. Local ordinances may require more frequent inspection. Testing should be done by operating the valve either through the use of the operating device on the valve or if it doesn't have an operating device it should be connected to a source of pressure that will cause it to operate.

Valves that are capacity certified by the ASME are factory sealed. Tampering, altering, or adjustment of these valves voids any warranty and liability of the manufacturer. Repairs or resetting will be made only by the factory. Please contact the factory prior to returning any valve for service and securely package valves for shipping.

Complete Timer Controller		
Part #	**Description**	**Compatibility**
430042	6 Channel Timer Control Nema 4x with DP Module	CM002 - CM012
430042.001	10 Channel Timer Control Nema 4x with DP Module	Up to a CM020
430042.010	22 Channel Timer Control Nema 4x with DP Module	Up to a CM048 - larger sizes consult Imperial
Replacement Timer Boards		
Part #	**Description**	**Compatibility**
430042.014	6 Channel Timer Board with pressure module	CM002 - CM012
Contact Factory	10 Channel Timer Board with pressure module	Up to a CM020
Contact Factory	22 Channel Timer Board with pressure module	Up to a CM048 - larger sizes consult Imperial
Contact Factory	DP Module DCP100 10 W.G.	All that have these timer boards
Hardware		
Part #	**Description**	
Contact Factory	Positive Pressure Drum Kit with Manual Slide Gate	
430054	55 Gallon Drum with lid	
Contact Factory	Drum Cover Lid with 10" Opening	
420041	Hose Clamp for 10" Flex Hose	
430055.002	Flex Hose Medium Duty Clear - 10" Per Foot	
Contact Factory	10" Manual Slide Gate	
430054.002	Drum Ring/Lever Lock	
Diaphragm Valves		
Part #	**Description**	**Compatibility**
430035.001	1" Goyen Diaphragm Valve	Pre 2019 CM002 - CM006
430035.002	1.5" Goyen Diaphragm Valve	Pre 2019 CM008 and up
430106.001	1" Goyen Diaphragm Valve Repair Kit Standard	Pre 2019 CM002 - CM006
430106.014	1" Goyen Diaphragm Valve Repair Kit Viton High Temp	Pre 2019 CM002 - CM006
430106	1.5" Goyen Diaphragm Valve Repair Kit Standard	Pre 2019 CM008 and up
430106.013	1.5" Goyen Diaphragm Valve	Pre 2019 CM008 and up
430106.001	1.5" Goyen Diaphragm Valve Repair Kit Standard High Temp	Pre 2019 CM008 and up
430054.006	1" Autel Diaphragm Valve	CM002 - CM006
430054.007	1.5" Autel Diaphragm Valve	CM008 and up
430054.009	1" Autel Diaphragm Valve Repair Kit Standard	CM002 - CM006
430054.011	1" Autel Diaphragm Valve Repair Viton High Temp	CM002 - CM006
430054.010	1.5" Autel Diaphragm Valve Repair Kit Standard	CM008 and up
430054.012	1.5" Autel Diaphragm Valve Repair Kit Standard High Temp	CM008 and up

Pilot Solenoid Valve	
Part #	**Description**
430106.003	Standard replacement Pilot Solenoid Valve
Contact Factory	Viton High Temp Replacement Solenoid Valve
430106.002	Standard Pilot Solenoid Valve Repair Kit
Contact Factory	Viton High Temp Pilot Solenoid Valve Repair Kit
Dust Collector Hardware	
Part #	**Description**
430057	Rope Caulk 100' Roll
996013.010	Imperial Grey CMAXX Touch Up Paint (Spray Can)
Contact Factory	Imperial Blue Header Tank Touch Up Paint (Spray Can)
510019	Cartridge Removal Tool 3 Deep, 4 -8 ft.
510019	Cartridge Removal Tool 4 Deep, 4 - 8 ft.
510020	Cartridge Removal Tool 6 Deep, 6 - 12 ft.
Explosion Vents and Fire Protection	
Part #	**Description**
430023.022	Explosion Vent, 36 x 44
43023.010	Burst Indicator Lead Cable
430048.001	Sprinkler Vertical Mounted 215 Degrees F
430048	Sprinkler Side Wall Mounted 215 Degrees F

Explosion Vents and Fire Protection		
Part #	**Description**	**Compatibility**
Contact Factory	Particulate Monitor to detect broken filters	Multiple Options
Contact Factory	Dust Level Sensor	Multiple Options
After Filter Gauge		
Part #	**Description**	**Compatibility**
430008.001	Magnahelic Gauge 0 - 10" WC	
430008.005	Gauge Mount	
430021	Magnahelic Gauge Filter	Pre 2019
460021.001	Magnahelic Gauge Filter	
420016	100' 1/4" Silver Poly Tubing	
660001.007	Differential Pressure Tubing Kit	
430008	2 1/2" Pressure Gauge, Header Tank	

CMAXX Cartridge Filters - DeltaMAXX Prime - 2020 and later	
Part #	**Description**
204401201M	400 ft² Prime Nanofiber Filter
204401202M	400 ft² Prime Fire Retardant Nanofiber Filter
204401203M	400 ft² Prime Fire Retardant Nanofiber Filter with Ground Wire
204401228M	400 ft² Prime FIre Retardant Filter IDA Certified Nanofiber Filter
204401205M	400 ft² Prime Fire Retardant Nanofiber Filter IDA Certified with Ground Wire
204401206M	400 ft² Carbon Impregnated Filter
204401207M	245 ft² Spunbond Filter
204401210M	245 ft² Spunbond Hydrophobic/Oleophobic Filter
204401212M	245 ft² Spunbond PTFE Filter
CMAXX Cartridge Filters - DeltaMAXX -2018 and earlier	
460010013M	350 ft² Nanofiber Filter
460010002M	350 ft² Nanofiber Fire Retardant Filter
460010042M	350 ft² Nanofiber Fire Retardant Filter with Ground Wire
460010026M	350 ft² Fire Retardant IDA Filter
460010043M	350 ft² Fire Retardant IDA Filter with Ground Wire
460010014M	350 ft² Carbon Impregnated Filter
460010006M	225 ft² Spunbond Filter
460011M	225 ft² Spunbond Hydrophobic/Oleophobic Filter
460010018M	225 ft² Spunbond PTFE FIlter
NOTE: DeltaMAXX Prime filters will fit into all models of CMAXX Dust & Fume Collectors. If you collector was manufactured in 2019 or early 2020, or if you're uncertain which filters you need, please contact Imperial Systems at 800.919.3013.	
Overbags	
Part #	**Description**
460022	DeltaMAXX Overbag
460022.004	DeltaMAXX Prime Overbag
After Filters	
460023	24 x 24 x 2 Panel Pre-Filter
460024	24 x 24 x12 Panel HEPA Filter
	24 x 24 x 12 95% ASHRAE

9. Troubleshooting

Problem	Probable Cause	Solution
Blower fan motor does not start.	Improper motor wire size.	Rewire using the correct wire gauges as specified by national and local codes.
	Motor not wired properly.	See motor manufacturers wiring diagram. Check and correct motor wiring for the supply voltage present. Follow wiring diagram and the National Electric Code.
	Motor not wired for available voltage.	Check the power supply to the motor circuit on all leads.
	Input circuit down.	Check power supply to motor circuit on all leads.
	Electrical supply circuit down.	Check the power supply circuit for proper voltage. Check for any fuse or circuit breaker fault. Replace as necessary.
Blower fan motor starts, but does not stay running.	Incorrect motor-starter installed.	Check for the proper motor starter and replace if necessary.
	Blower fan damper control not adjusted properly.	Check airflow in duct. Adjust damper control until proper airflow is achieved and the blower motor's amp draw is within the manufacturer's rated amps.
	Electrical circuit overload.	Check that power supply circuit has sufficient power to run all the equipment.
Clean air outlet discharging dust.	Filter cartridges not installed properly.	See filter installation.
	Filter cartridge damage, dents in the end caps, gasket damage or holes in pleated media.	Replace filters as necessary. Use only genuine DeltaMAXX replacement filters.
Insufficient airflow.	Fan rotation backwards.	Compare rotation to the blower manufacturers rotation arrow.
		Check that all access doors are in place and secured. Check that the hopper discharge opening is sealed and the optional attachments are installed correctly.
	Exhaust fan area restricted.	Check fan exhaust area for obstructions. Remove material or debris. Adjust fan outlet damper if equipped.
	Filter cartridges need replacement.	Replace filters if necessary. Use only genuine Imperial Systems DeltaMAXX repalcement filters.
	Lack of compressed air.	Check that a minimum of 75-psig is available. See compressed air installation.
	Pulse cleaning not energized.	Use a voltmeter to check supply voltage to the timer board. Check and replace the fuse on the timer board if necessary.
	Dust storage container overflowed or plugged.	Clean out the dust storage container.
	Pulse valves leaking compressed air.	Lock out all electrical power to the unit and bleed the compressed air supply. Check for debris, valve wear, or diaphragm failure by removing the diaphragm cover on the pulse valves. Check for solenoid leaks or damage. Check for leaks in the tubing from the pulse valve to the solenoid valves. Replace as necesssary.

Continued on next page

Problem	Probable Cause	Solution
Insufficient airflow.	Solid state timer failure.	Using a voltmeter, check supply voltage to the timer board. Check and replace the fuse on the timer board if necessary. If the fuse is good and input power is present, but output voltage to the solenoid valves is not, replace the timer board.
	Display on ΔP doesn't return to sero when at rest.	Recalibrate DCP pressure module with pressure tubing attached as described in timer controller installation.
On Demand pressure cleaning does not start.	High setpoint no adjusted for system conditions.	Check tubing for kinks, breaks, contamination, or loose connections.
Pulse cleaning never stops.	Bypass terminals on the timer board jumpered.	Remove jumper wire on solid state timer board bypass terminal.
	High or low setpoint not adjusted for system conditions.	Adjust setpoint to current conditions.
	Pressure tubing disconnected or plugged.	Check tubing for kinks, breaks, contamination, or loose connections.
Alarm light is on.	Alarm setpoint too low.	Adjust to a higher value.
	Excess pressure drop.	Check cleaning system and compressed air supply. Replace filter cartridges if they do not clean down.
	Pressure tubing disconnected or plugged.	Check tubing for kinks, breaks, contamination, or loose connections.
Clean output lights flash but system is not functioning.	Improper wiring.	Check wiring between the timer control board and the solenoid valve coils.
	Defective solenoids.	Check all solenoid coils for proper operation.
	Timer board not powered.	Check power light on timer board's LED display. If not illuminated, check the fuse on the timer board. Replace as necessary.
	Timer board deffective.	If LED is illuminated, observe the output display. Install a temporary juicer across the main override terminal to the COM terminal. Output LED's should flash in seqeunce. Check output using a multimeter measure from SOL COM to a solenoind output. The needle will deflect whe the LED flashes for that output if voltage is present at output terminals during flash, replace board if necessary.
Low Alarm light flashing.	Not set to zero during setup.	Set Low Alarm setting to 0.0 INWC then hit reset to enable it.
Door not closing.	Filters are not loaded correctly.	Make sure the filters are full pushed a back into the correct position. Then lift filter rails into the locked postion using the cam levers.

10. CMAXX Diagram

A. Silencer

B. Fan

C. Solenoid Enclosure

D. Pressure Relief Valve

E. Pressure Gauge

F. Diaphragm Valve

G. Compressed Air Fitting

H. Differential Low Pressure Port

I. Differential High Pressure Port

J. Filter Removal Tool

K. Door Handle

L. Hopper

M. Manual Slide Gate

N. Flex Hose or Rhino Drum System

O. Collection Drum Kit

P. Header Tank

Q. Serial Tag

R. Dirty Air Inlet

S. Lifting Lug

T. Clean Air Plenum

U. Dirty Air Plenum

V. Access Door

W. Filter Pulse Pipe

X. Tube Sheet

Y. Filter Gasket

Z. Filter Pan

AA. Pleated Filter Material

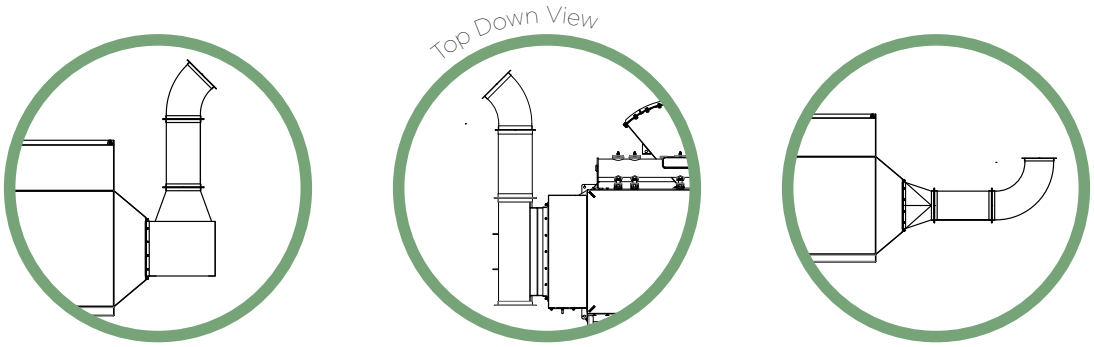
BB. Filter Lift Rail Handle

CC. Filter Lift Rail Door Stop

DO'S & DON'TS OF DUCT DESIGN

When designing a dust collection system, it is critical to keep in mind the relationship between the duct work and the inlet. If improperly designed, the layout can create upset conditions within the collector, potentially damaging the filters and affecting the efficiency of the unit.

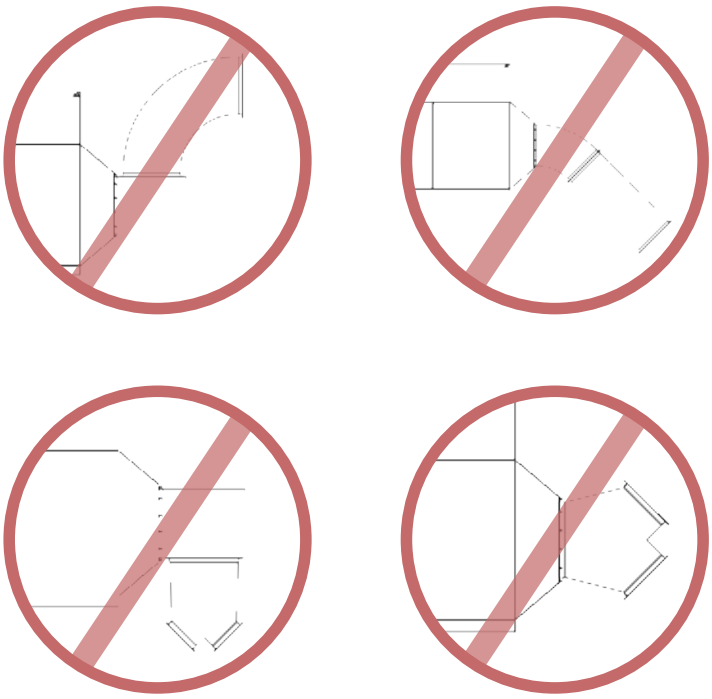
DO design your system this way



Basic Tips for Duct Design

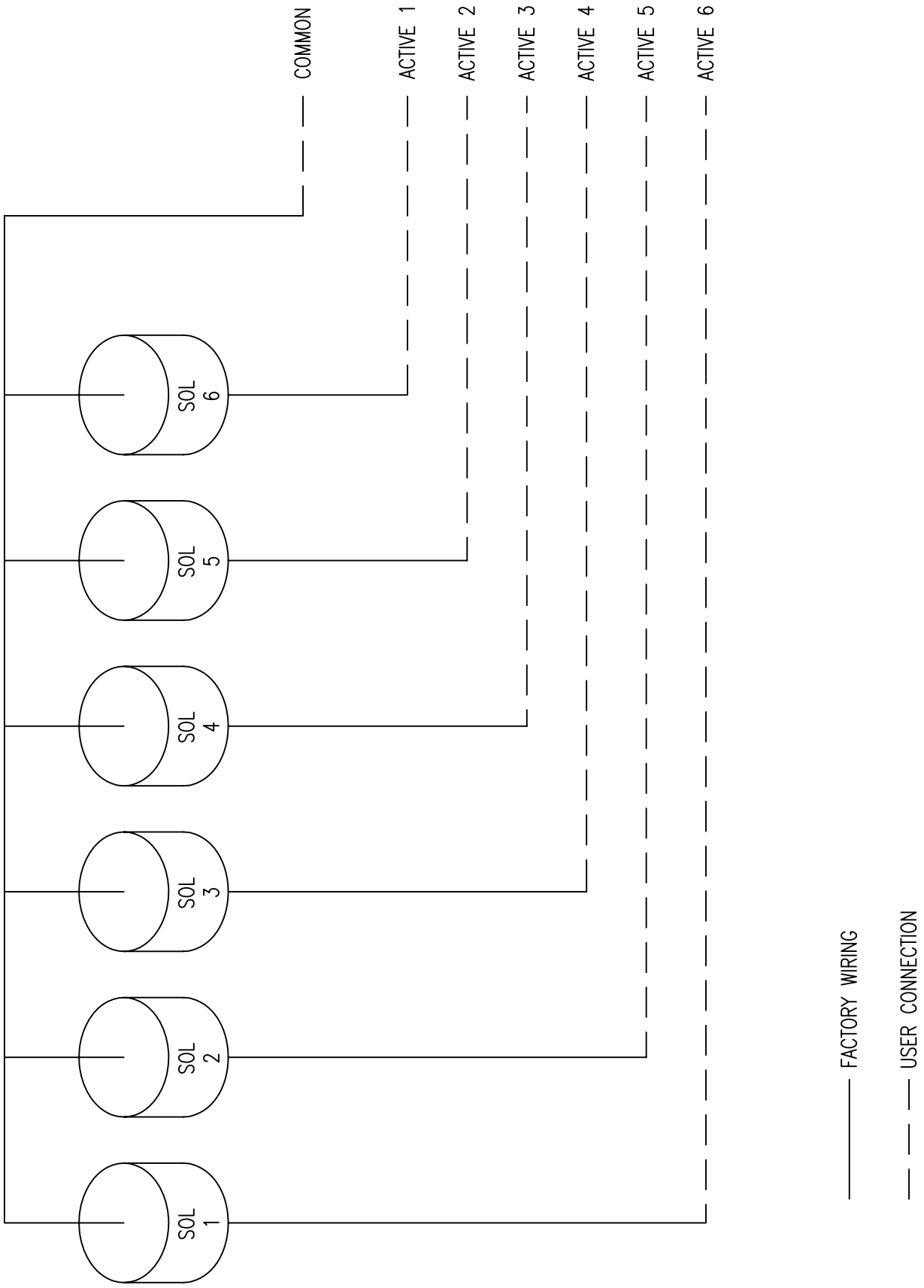
- All transitions are recommended to be 1x the duct diameter in length.
- All pieces of duct immediately following a transition is recommended to be at least 2x the duct diameter before the next fitting.
- All elbows in the duct before an inlet are recommended to be at least 2x the centerline radius.

DO NOT design your system this way

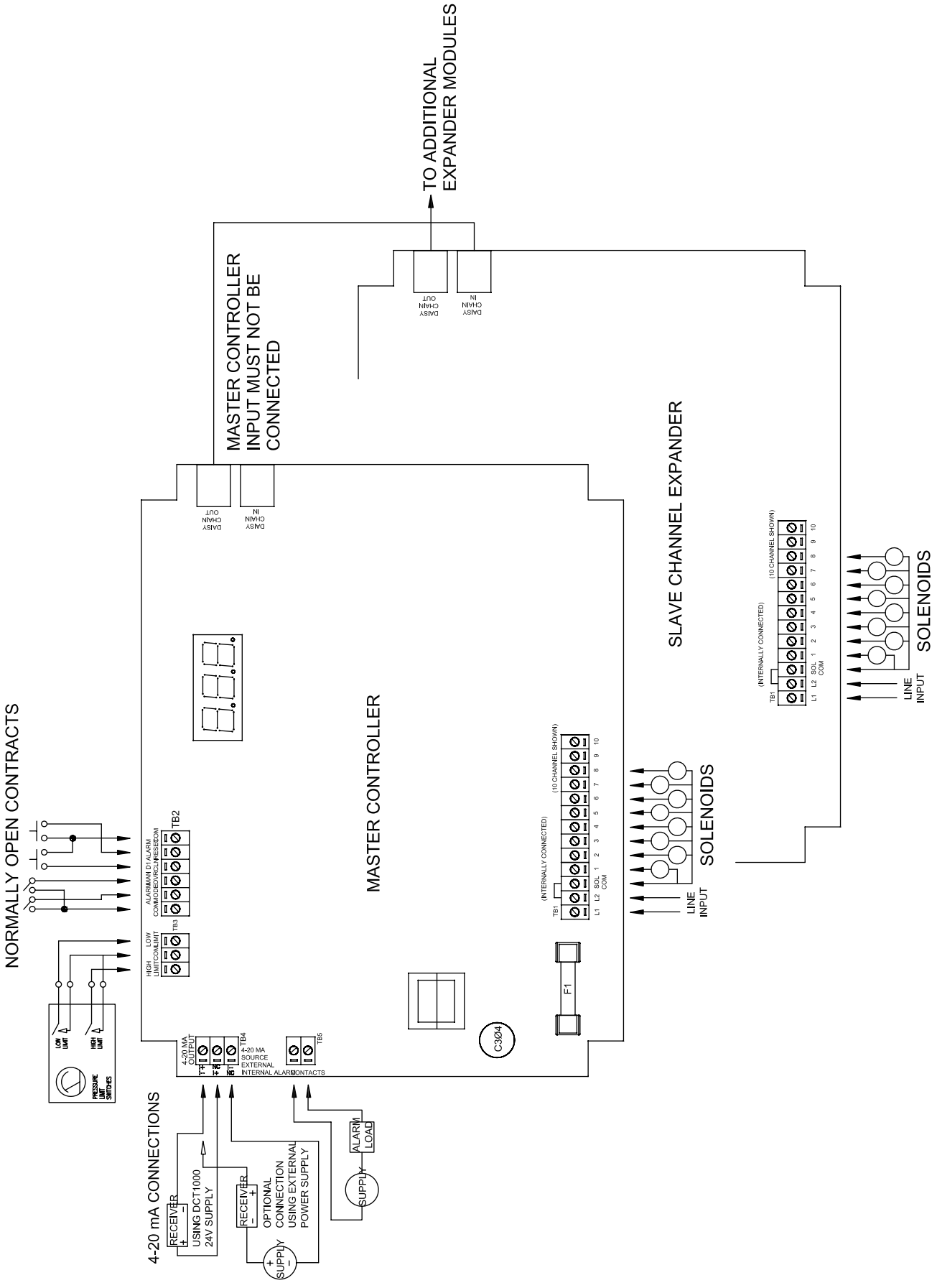


11. Electrical

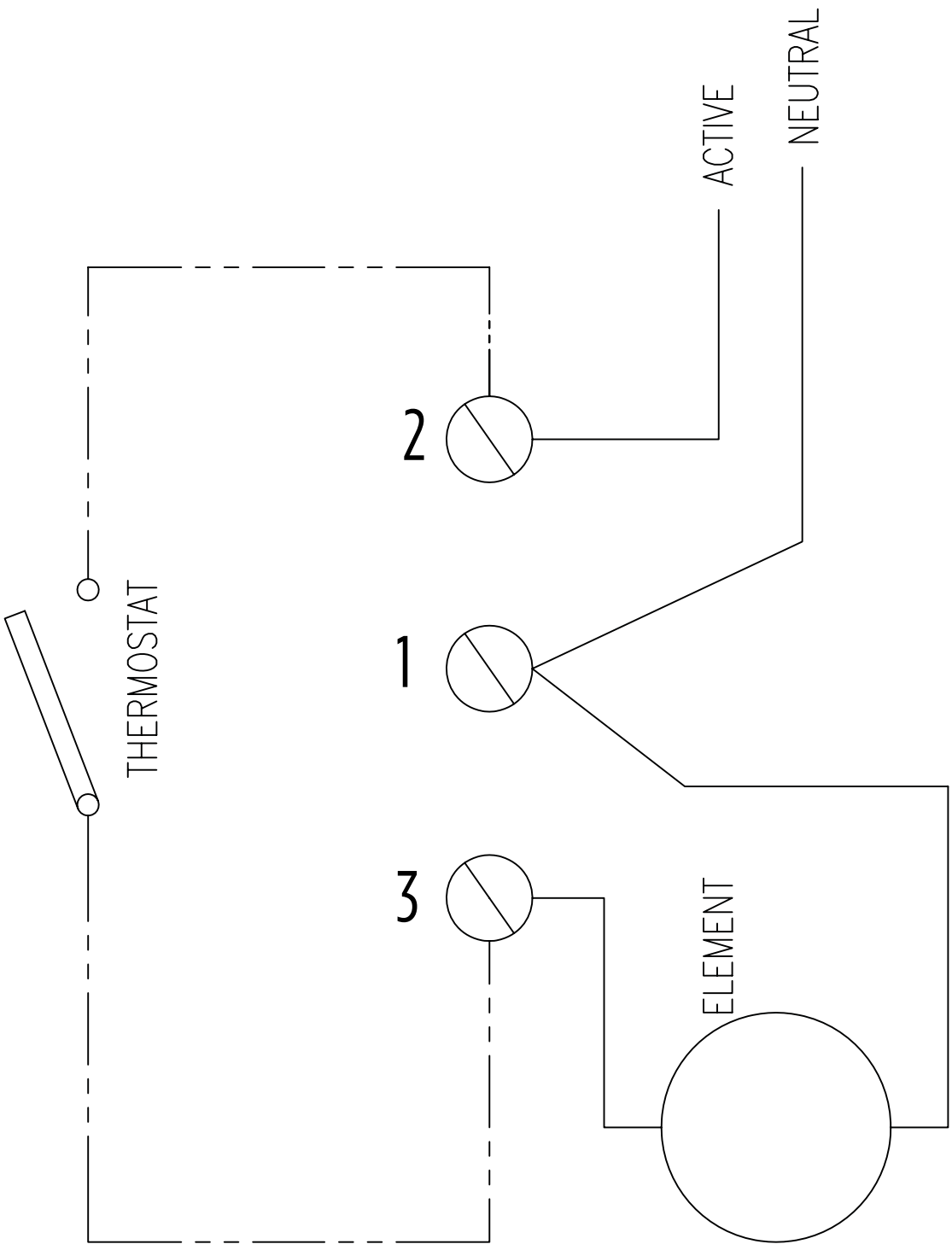
11.1 Solenoid Schematic



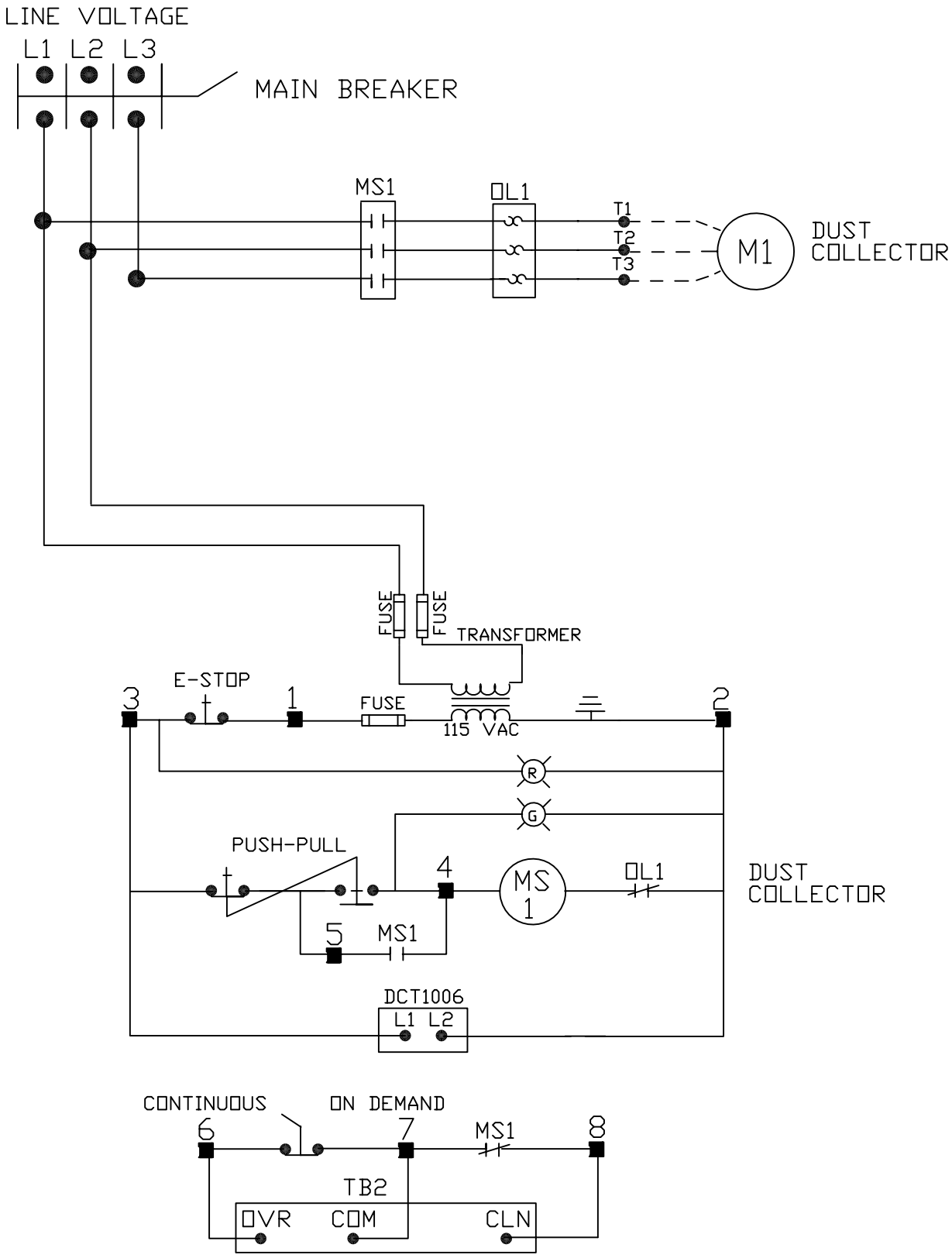
11.2 DCT1000 Schematic



11.3 Solenoid Heater Schematic (Optional)



11.4 Integrated Controls Wiring Diagram



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