



MARTIN® Insertable Dust Collector

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***Operator's Manual
M3416***

Important

MARTIN ENGINEERING HEREBY DISCLAIMS ANY LIABILITY FOR: DAMAGE DUE TO CONTAMINATION OF THE MATERIAL; USER'S FAILURE TO INSPECT, MAINTAIN AND TAKE REASONABLE CARE OF THE EQUIPMENT; INJURIES OR DAMAGE RESULTING FROM USE OR APPLICATION OF THIS PRODUCT CONTRARY TO INSTRUCTIONS AND SPECIFICATIONS CONTAINED HEREIN. MARTIN ENGINEERING'S LIABILITY SHALL BE LIMITED TO REPAIR OR REPLACEMENT OF EQUIPMENT SHOWN TO BE DEFECTIVE.

Observe all safety rules given herein along with owner and Government standards and regulations. Know and understand lockout/tagout procedures as defined by American National Standards Institute (ANSI) z244.1-1982, *American National Standard for Personnel Protection - Lockout/Tagout of Energy Sources - Minimum Safety Requirements* and Occupational Safety and Health Administration (OSHA) Federal Register, Part IV, 29 CFR Part 1910, *Control of Hazardous Energy Source (Lockout/Tagout); Final Rule*.

The following symbols may be used in this manual:



Danger: Immediate hazards that will result in severe personal injury or death.



Warning: Hazards or unsafe practices that could result in personal injury.



Caution: Hazards or unsafe practices that could result in product or property damages.



Important: Instructions that must be followed to ensure proper installation/operation of equipment.



Note: General statements to assist the reader.

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General

The MARTIN[®] Insertable Dust Collector is an automatic, reverse air dust filter designed to remove dust from the air in conveyor transfer points, silo vents, bucket elevators, and screens. The unit is made up of a group of filter elements mounted on a sealed frame. The elements are fitted side-by-side in an individual sealing arrangement that effectively separates the dirty (inlet) side of the filter from the clean (outlet) side. The elements are always removed for maintenance from the clean side of the filter.

This manual provides instructions for locating and installing the MARTIN[®] Insertable Dust Collector at a conveyor transfer point or silo. For instructions on installing units on bucket elevators or screens, call Martin Engineering or a representative. Information on unit components, assembly, electrical requirements, operation, maintenance, and troubleshooting can be found in the user manual supplied with your unit.

Location requirements for transfer point installations

To ensure the dust collector's maximum effectiveness, make sure the transfer point is properly sealed and designed with dust control in mind, as follows:

- **Chute length:** For standard materials or belt speeds up to 250 fpm (1.3 m/s), the transfer point chute length should equal 2 ft per 100 fpm (210 mm per 0.5 m/s) of belt speed. For very dusty materials or belt speeds of 300 fpm (1.5 m/s) and higher, the chute length should equal 3 ft per 100 fpm (914 mm per 0.5 m/s) of belt speed. When in doubt, make the chute longer.
- **Chute height:** For standard materials or belt speeds up to 250 fpm (1.3 m/s), the chute wall should be at least 12 in. (305 mm) high. For very dusty materials or belt speeds of 300 fpm (1.5 m/s) and higher, it should be at least 24 in. (610 mm) high.
- **Distance from load zone:** Locate dust collector as far from actual load zone as possible, and 1/3 of the chute length back from the chute exit point.

For best results, install a dust curtain at the exit of the chute. For information on transfer point wear liners and sealing systems, call Martin Engineering or a representative.

References

The following documents are referenced in this manual:

- American National Standards Institute (ANSI) z244.1-1982, *American National Standard for Personnel Protection - Lockout/Tagout of Energy Sources - Minimum Safety Requirements*, American National Standards Institute, Inc., 1430 Broadway, New York, NY 10018.
- Federal Register, Volume 54, Number 169, Part IV, 29 CFR Part 1910, *Control of Hazardous Energy Source (Lockout/Tagout); Final Rule*, Department of Labor, Occupational Safety and Health Administration (OSHA), 32nd Floor, Room 3244, 230 South Dearborn Street, Chicago, IL 60604.
- Donaldson[®] Torit[®] *Preventative Maintenance Schedule for DF, DFT, DFO, TD, HP, PJ, DLMC, Unicell, Maxcell Dust Collectors*, Donaldson Company, Inc., June 2003.

Torit[®] PowerCore[®] is a registered trademark of Donaldson Company, Inc.

Safety

All safety rules defined in the above documents and all owner/employer safety rules must be strictly followed when working on this equipment.

Materials required

In addition to standard hand tools, a hoist is required to install this equipment.

Before Installing Dust Collector

IMPORTANT

The delivery service is responsible for damage occurring in transit. Martin Engineering CANNOT enter claims for damages. Contact your transportation agent for more information.

1. Inspect shipping container for damage. Report damage to delivery service immediately and fill out delivery service's claim form. Keep any damaged goods subject to examination.
2. Remove dust collector from shipping container. Equipment in container should include dust collector and controller.
3. If anything is missing, contact Martin Engineering or representative.

⚠ WARNING

Before installing equipment, turn off and lock out/tag out energy source to conveyor and conveyor accessories.

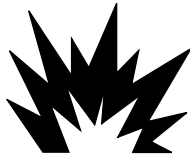
4. Turn off and lock out/tag out energy source according to ANSI standards (see "References").



⚠ WARNING

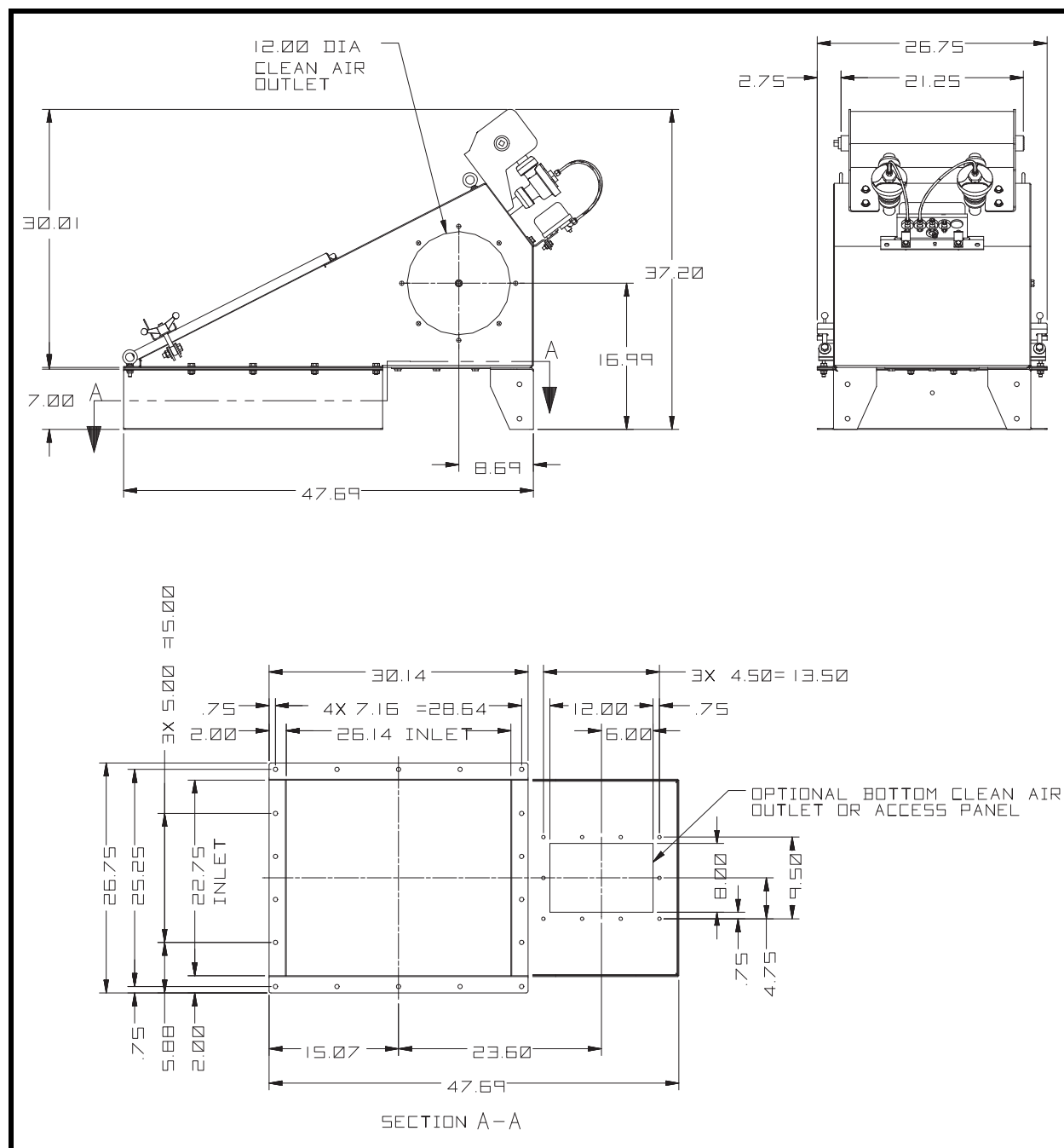
If equipment will be installed in an enclosed area, gas level or dust content must be tested before using a cutting torch or welding. Using a cutting torch or welding in an area with gas or dust may cause an explosion.

5. If using a cutting torch or welding, test atmosphere for gas level or dust content. Cover conveyor belt with fire retardant cover.



Installing Dust Collector

1. Make sure conveyor belt structure and chutework will support dust collector. See Table V for weight specifications.
2. Determine how to best install dust collector on your application. See Figures 1–4 for dimensions.
3. Follow instructions in the included installation manual to install dust collector.



**Figure 1. Dimensions for MARTIN® Insertable Dust Collector,
P/N INS-08XX and INS-10XX**

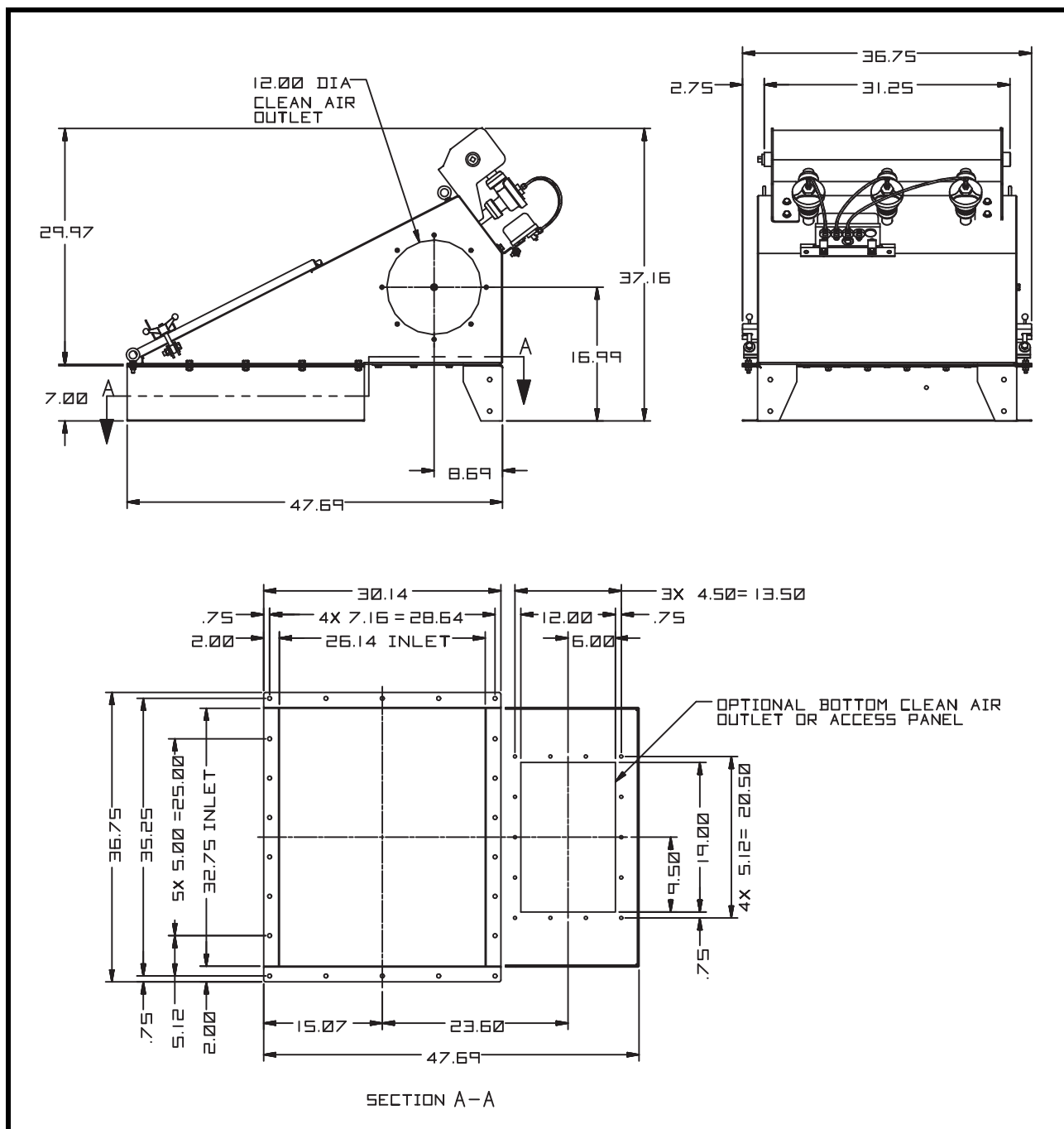


Figure 2. Dimensions for MARTIN® Insertable Dust Collector, P/N INS-15XX

Martin Engineering M3416-10/11

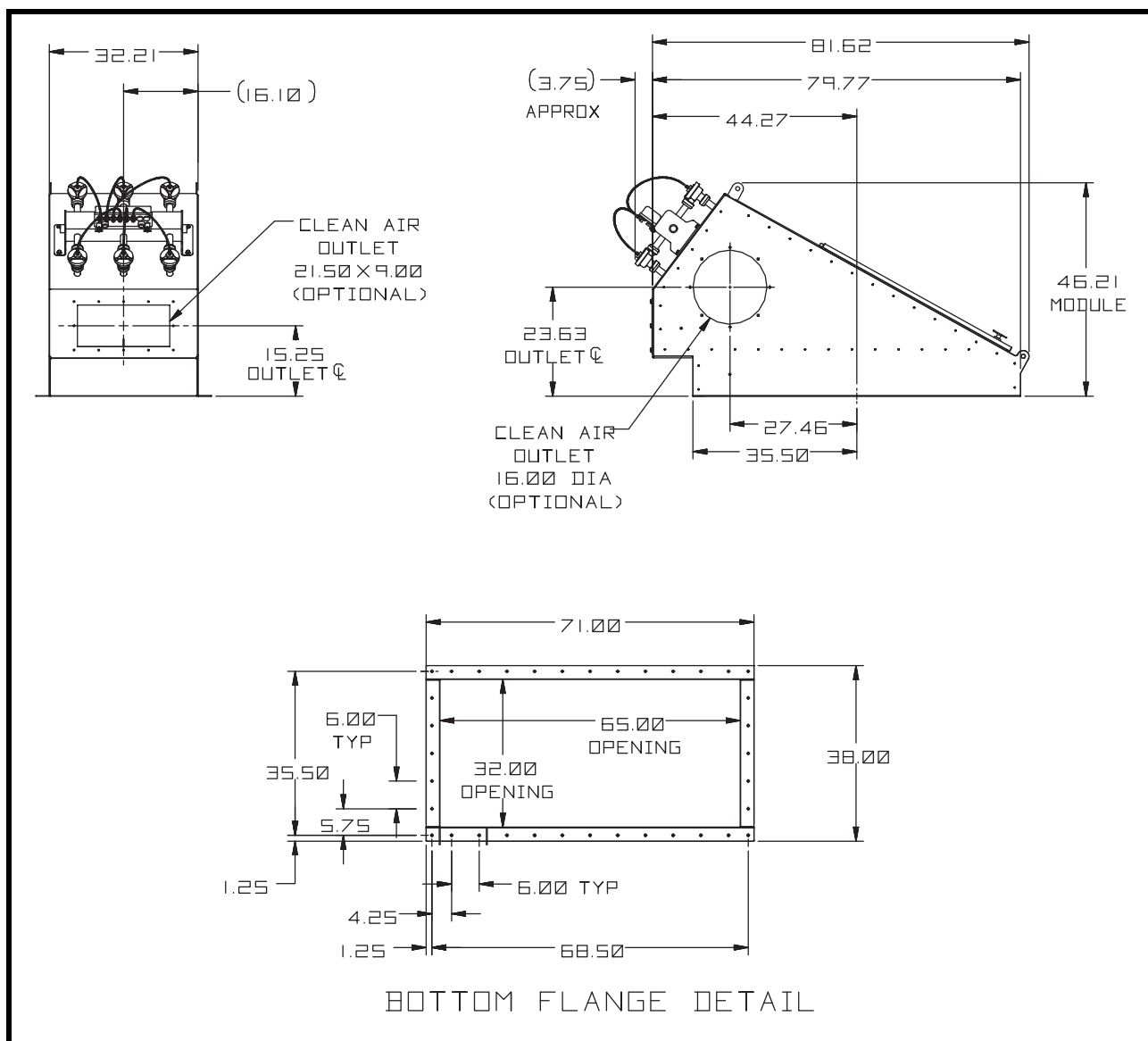


Figure 4. Dimensions for MARTIN® Insertable Dust Collector, P/N INS-30XX

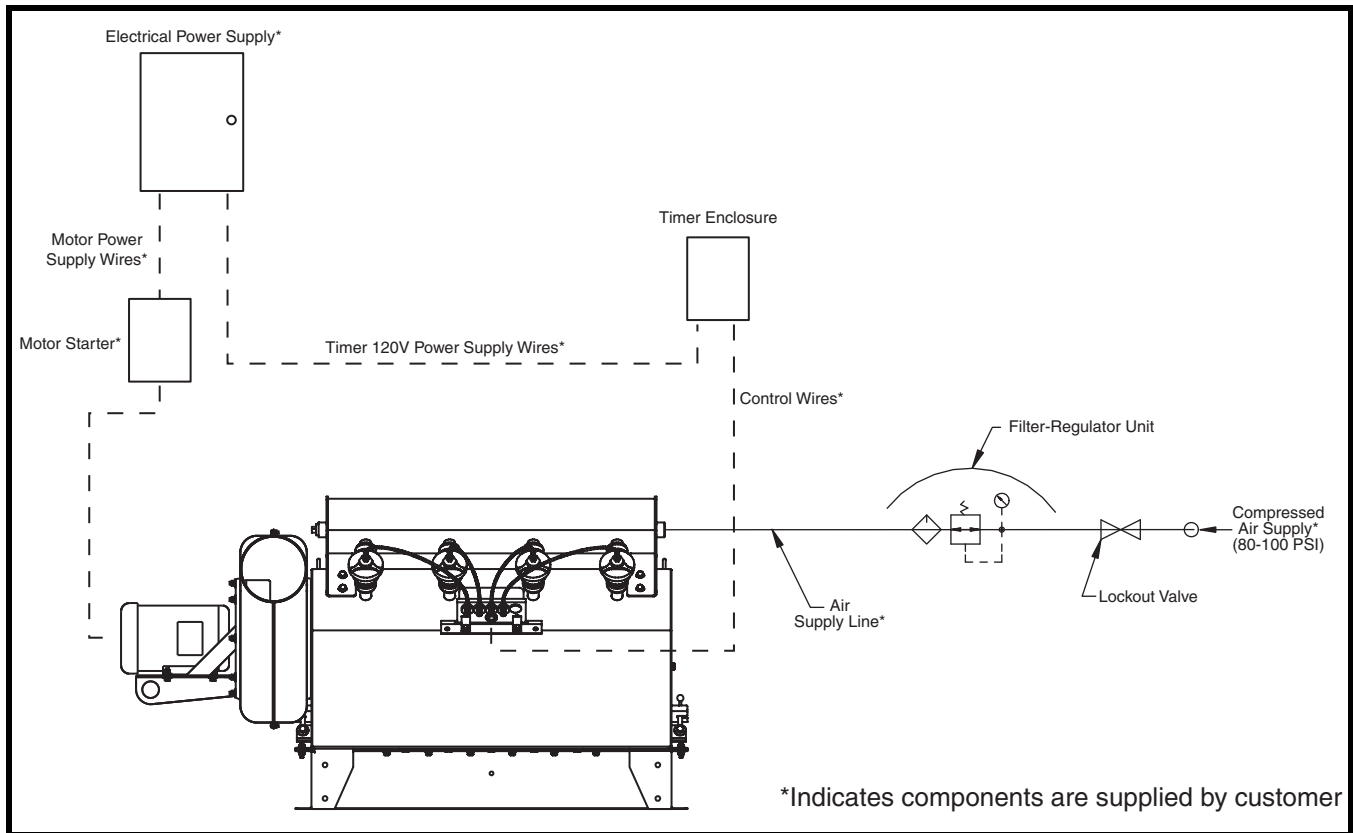


Figure 5. Electrical and Plumbing Detail

Electrical connections

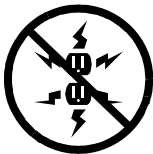
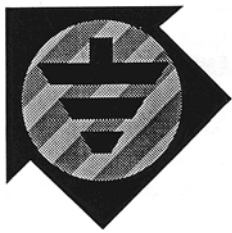
⚠ WARNING

All electrical work must be done to National Electrical Code (NEC) standards. See “References.”

⚠ DANGER

For explosion-proof dust collector units, properly ground unit to earth by connecting a ground wire to the earthing boss on the unit. Failure to properly ground the unit can result in a static electricity explosion, damage to equipment, and severe injury or death.

1. For explosion-proof units with INS-XE part numbers, properly connect a ground wire to the unit's earthing boss (located on the unit next to the symbol shown below) to prevent static electricity buildup. Use the brass screw provided to connect the ground wire to the unit.



⚠ WARNING

Before making any connections, lock out/tag out electrical supply to control system according to ANSI standards (see “References”).

2. Connect blower motor to power supply:
 - a. Determine power requirements for motor (see Table III).
 - b. Install a motor starter (not included) per local requirements and codes.
 - c. Interlock motor and timer enclosure and control per plant PLC.

Installing timer enclosure

CAUTION

Do not mount enclosure in area subject to shock, vibration, temperatures exceeding 130°F (55°C), or explosion. Damage to control system circuitry could result.

1. Determine location for timer enclosure.
2. Mount onto wall with fasteners.
3. Drill conduit holes in enclosure for solenoid and power wires. Use care not to damage internal components. Drill in most weather-proof location available on enclosure.

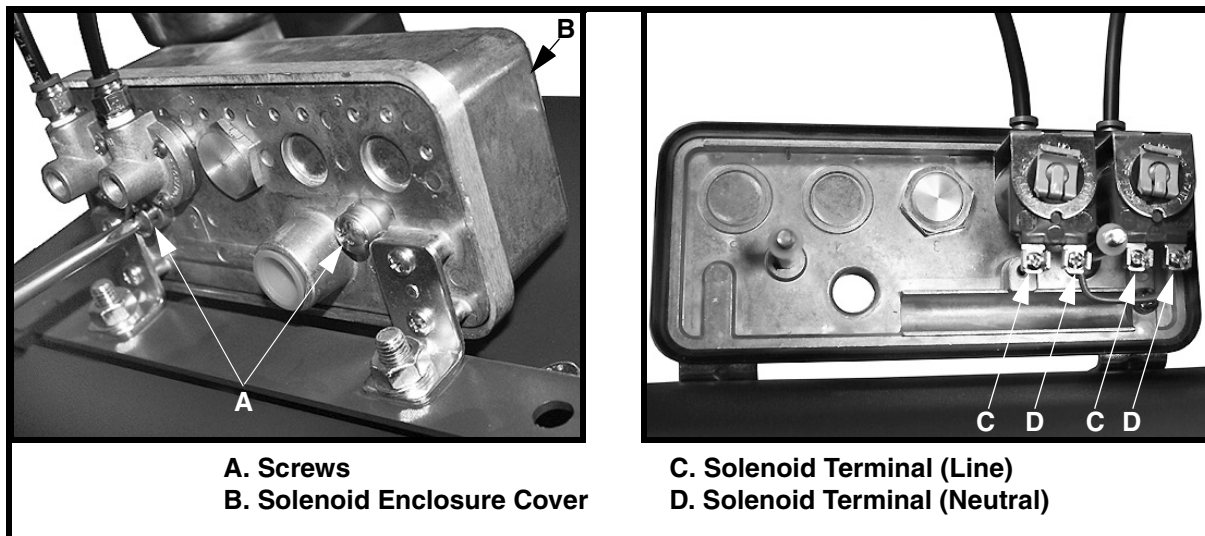


Figure 6. Solenoid Enclosure

4. Loosen screws (A) and remove solenoid enclosure cover (B).

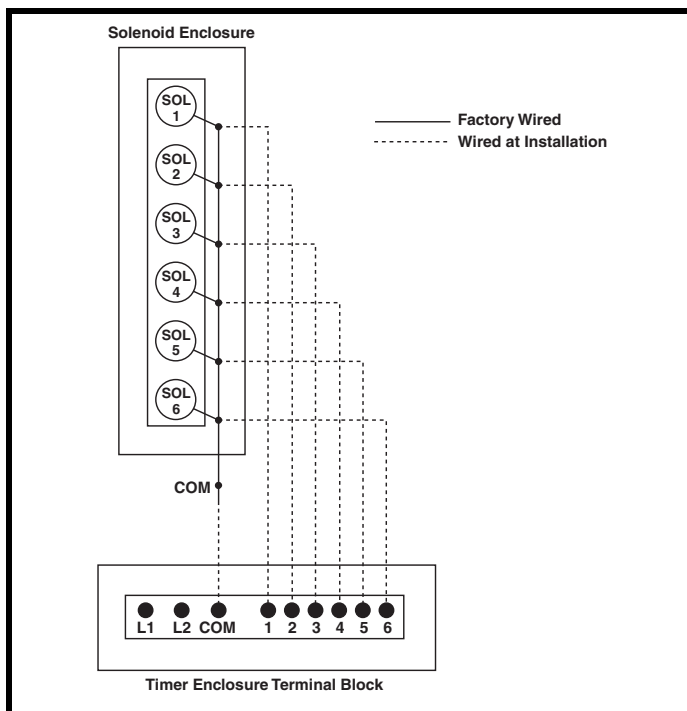


Figure 7. Solenoid Wiring Schematic

5. Using electrical connectors, route required wires from solenoid valves to timer enclosure. Connect wires to solenoid terminals.
6. Reinstall solenoid enclosure cover (B, Figure 6).

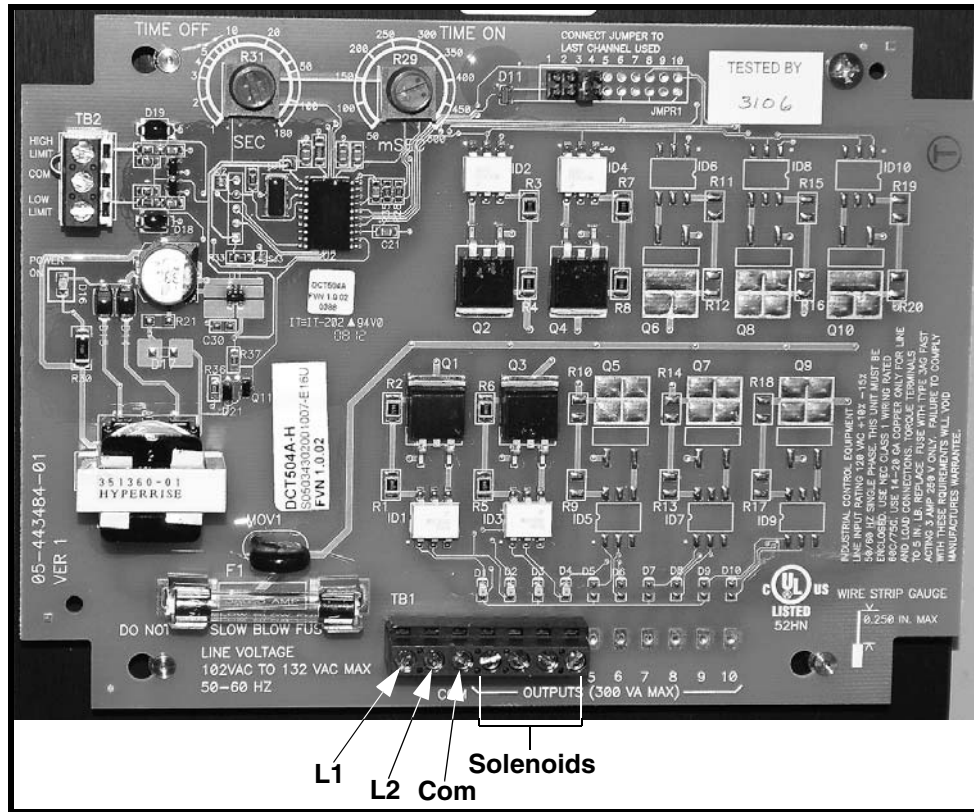


Figure 8. Timer Enclosure Electrical Connections

7. Route power wire (120VAC 60Hz) into timer enclosure.
8. Connect ground wire to ground terminal. Connect neutral wire to terminal labeled L2. Connect phase wire to terminal labeled L1.
9. Reinstall timer enclosure cover.

Initial Operation of Dust Collector

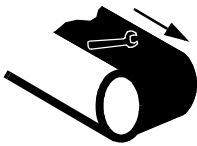
IMPORTANT

Read entire section before beginning work.

⚠ WARNING

Dust collector may produce loud noise when mounted on structure. See OSHA 1910.95 for guidelines. If required, wear ear protection to avoid impairment or loss of hearing.

1. If dust collector produces loud noise according to OSHA 1910.95, wear ear protection.



⚠ WARNING

Failure to remove tools from installation area and conveyor belt before turning on energy source can cause serious injury to personnel and damage to belt.

2. Remove all tools and fire retardant cover from installation area and conveyor belt.



⚠ DANGER

Do not touch or go near conveyor belt or conveyor accessories when conveyor belt is running. Body or clothing can get caught and pull body into conveyor belt, causing severe injury or death.

3. Turn power ON at the source.
4. Start blower fan for one second, then stop.
5. Check motor and fan for the correct rotation by referencing the rotation sticker located on the motor mounting plate. Check for smooth operations of fan wheel and motor. If motor is not rotating in correct direction, lock out/tag out energy source and reverse rotation.
6. Ensure damper is set in completely closed position.
7. Turn compressed air on at the source. Adjust the regulator until pressure is between 90 and 100 PSI (6.2–6.8 Bar).
8. Turn conveyor belt ON and ensure material is flowing.
9. Turn the blower fan ON.
10. Open the damper 50% while the dust collector is under dust load.
11. Operate dust collector for 5 to 10 minutes.
12. Open the damper until the transfer point is under a negative air flow.
13. Operate and maintain dust collector according to user manual supplied with your unit.

Maintenance

Table I. Preventative Maintenance Schedule

Item	Frequency	Procedure
Monitor Exhaust of Fan to ensure filter integrity.	Daily	Monitor exhaust from fan. The exhaust should remain visibly clean. If a leak of dust develops, it will be noticed as a visual puff from the fan exhaust immediately after a cleaning pulse. If dust is visible consult your Installation and Operation Manual for troubleshooting recommendations.
Collector Filter Pressure Drop	Weekly	Visually inspect and record the operating pressure drop across each dust collector. It is normal for the pressure drop to fluctuate during operation as the collector passes through cleaning cycles, and as production schedules fluctuate from light to heavy. New filters may have a pressure drop of less than 1" w.g., however, as filters become seasoned, they will reach an equilibrium pressure drop. Generally 1 to 6" w.g. is considered normal. An excessively high pressure drop could be an indication of a malfunction in the cleaning mechanism, excessive airflow, plugged filters, or heavy dust loading conditions. Consult your Installation and Operation Manual for troubleshooting recommendations.
Filter Pressure Drop Pneumatic Lines	Monthly	To ensure correct pressure drop indication, remove one line at a time from the pressure drop indicating gauge barb fitting. Using a minimum 20 psi compressed air, blow through the line back towards the dust collector. <i>(Do not use more than 25 psi to blow through clear poly tubing as damage may occur.)</i>
Compressed Air Supply	Monthly	Air dryers and automatic condense valve should be used prior to each dust collector. Inspect monthly to ensure proper operation, and that moisture is being removed from the compressed air supply. Troubleshoot, repair, or replace per the specific manufactures' instructions. Consult your Installation and Operation Manual for correct pulse pressure recommendations for the dust collector.
Pulse Diaphragms	Every 3 Months	Apply electrical and pneumatic service to the pulse cleaning control. Activate the pulse cleaning sequence by placing the control in continuous cleaning mode. Approximately every ten (10) seconds an audible pulse should be heard. This process should be performed simultaneously with the solenoid check described below.
Electrical Solenoids	Every 3 Months	Apply electrical and pneumatic service to the pulse cleaning control. Activate the pulse cleaning sequence by placing the control in continuous cleaning mode. Approximately every ten (10) seconds an audible pulse should be heard. Additionally, each solenoid should be inspected manually by placing a large flat, light-weight surface (<i>cloth</i>) behind each solenoid enclosure. As each solenoid is activated, in that particular enclosure, visually inspect the test surface for movement. <i>(When the solenoid is energized, compressed air is released from the diaphragm valves through the solenoid.)</i>
Verify conditions of Filters	Every 6 Months	If filter element pressure drop exceeds 6" w.g. verify proper system airflow according to original design recommendations. Remember that excessive airflow can increase pressures drop. Change filters if necessary. Always use Donaldson superior filters for best performance and life.
Verify operations of Pulse Cleaning System	Every 6 Months	Inspect Diaphragms, Solenoids and Timer to ensure proper filter cleaning. Consult the Installation and Operation Manual for your dust collector for the correct On and Off time settings for Pulse cleaning intervals and duration.
Check fan and motor	Every 6 Months	Check motor and fan for the correct rotation by referencing the rotation sticker located on the motor mounting plate. Check for smooth operations of fan wheel and motor. Inspect for and tighten belts, nuts, bolts and set screws as needed. Consult the Installation and Operation Manual for troubleshooting recommendations as needed.
Adjust exhaust Damper as needed	Every 6 Months	Airflow should be adjusted to match design recommendations. Excessive airflow can shorten filter life and cause fan motor failure.
Install filters correctly	During filter changes	Consult the Installation and Operation Manual for recommendations to correctly install new filters. Install new filters correctly and adequately tightened to prevent dust leakage. Improperly installed or inadequately tightened filters can allow dust to pass through the dust collector.
Adjust exhaust Damper	Immediately after filter changes	Because the pressure drop or restriction to airflow through the filters will decrease when new filters are installed, airflow through the collector will increase. Because of this it is necessary to adjust the fan damper to restrict the airflow through the collector to the recommended level immediately after installation of new filters. As the filters age and the pressure drop or restrictions to air increases, you may need to open the damper to reach design conditions.

Part Numbers

See the following tables for MARTIN® Insertable Dust Collector unit assembly part numbers. For replacement filter elements, manifold valves, and solenoid valves, call Martin Engineering at 800-544-2947.

Table II. MARTIN® Insertable Dust Collector Part Numbers

Item	Description	Part Number	Quantity
1	CPV PowerCore® Dust Collector	Table III	1
2	TRB Fan Pack	Table III	1
3	CPV PowerCore® DC Manual Kit	38435-K (See Table IV)	1
4	Adapter Flange Weldment	Table III	1
5	Hardware Kit	Table III	1

Table III. MARTIN® Insertable Dust Collector Part Numbers

Part No.	Airflow CFM	Voltage	P/N Item 1	P/N Item 2	P/N Item 4	P/N Item 5
INS-084	0-800	460V 60Hz	38432-2	38433-2	38627-CPV-2	38627-2H
INS-084E	0-800	460V 60Hz	38432-2E	38433-2E	38627-CPV-2	38627-2H
INS-084EH	0-800	460V 60Hz	38432-2EH	38433-2E	38627-CPV-2	38627-2H

INS-103	0-1000	380V 50Hz	38432-2	38434-3-38050	38627-CPV-2	38627-2H
INS-104	800-1000	460V 60Hz	38432-2	38433-3	38627-CPV-2	38627-2H
INS-104E	800-1000	460V 60Hz	38432-2E	38433-3E	38627-CPV-2	38627-2H
INS-104EH	800-1000	460V 60Hz	38432-2EH	38433-3E	38627-CPV-2	38627-2H

INS-153	1000-1500	380V 50Hz	38432-3	38434-3-38050	38627-CPV-3	38627-3H
INS-154	1000-1500	460V 60Hz	38432-3	38433-3	38627-CPV-3	38627-3H
INS-154E	1000-1500	460V 60Hz	38432-3E	38433-3E	38627-CPV-3	38627-3H
INS-154EH	1000-1500	460V 60Hz	38432-3EH	38433-3E	38627-CPV-3	38627-3H

INS-184	1500-1800	460V 60Hz	38432-4	38434-3	38627-CPV-4	38627-4H
INS-184E	1500-1800	460V 60Hz	38432-4E	38434-3E	38627-CPV-4	38627-4H
INS-184EH	1500-1800	460V 60Hz	38432-4EH	38434-3E	38627-CPV-4	38627-4H

INS-203	1500-2000	380V 50Hz	38432-4	38434-5-38050	38627-CPV-4	38627-4H
INS-204	1800-2000	460V 60Hz	38432-4	38433-5	38627-CPV-4	38627-4H
INS-204E	1800-2000	460V 60Hz	38432-4E	38433-5E	38627-CPV-4	38627-4H
INS-204EH	1800-2000	460V 60Hz	38432-4EH	38433-5E	38627-CPV-4	38627-4H

INS-303	2000-3000	380V 50Hz	38432-6	38434-7.5-38050	38627-CPV-6	38627-6H
INS-304	2000-3000	460V 60Hz	38432-6	38434-5	38627-CPV-6	38627-6H
INS-304E	2000-3000	460V 60Hz	38432-6E	38434-5E	38627-CPV-6	38627-6H
INS-304EH	2000-3000	460V 60Hz	38432-6EH	38434-5E	38627-CPV-6	38627-6H

Table IV. CPV Powercore® DC Manual Kit Part Numbers

Item	Description	Part Number	Quantity
1	Nipple Hex 1-NPT	36009	5
2	Union 1-NPT Galvanized	36274	2
3	Valve Ball Safety Shutoff 1 NPT	32284-04	2
4	Gauge Air GLYSRL Fill 1/4-NPT 160 PSI	34842	1
5	Filter/Regulator 1-NPT	38736	1
6	Operator's Manual	M3416	1

Table V. MARTIN® Insertable Dust Collector Part Numbers and Weights

MARTIN® Insertable Dust Collector*			
Part No.	DCE Model No.	Weight lb (kg)	Adapter Flange P/N
38432-2	CPV-2	320 (145)	38627-CPV-2
38432-3	CPV-3	400 (181)	38627-CPV-3
38432-4	CPV-4	500 (227)	38627-CPV-4
38432-6	CPV-6	655 (297)	38627-CPV-6

Dust Collector Motor*		
Part No.	Power hp	Weight lb (kg)
38433-2	2	63 (29)
38433-3	3	87 (39)
38433-5	5	124 (56)
38434-3	3	155 (70)
38434-5	5	178 (81)

* For explosive environments, add an E to end of dust collector and motor part numbers.

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