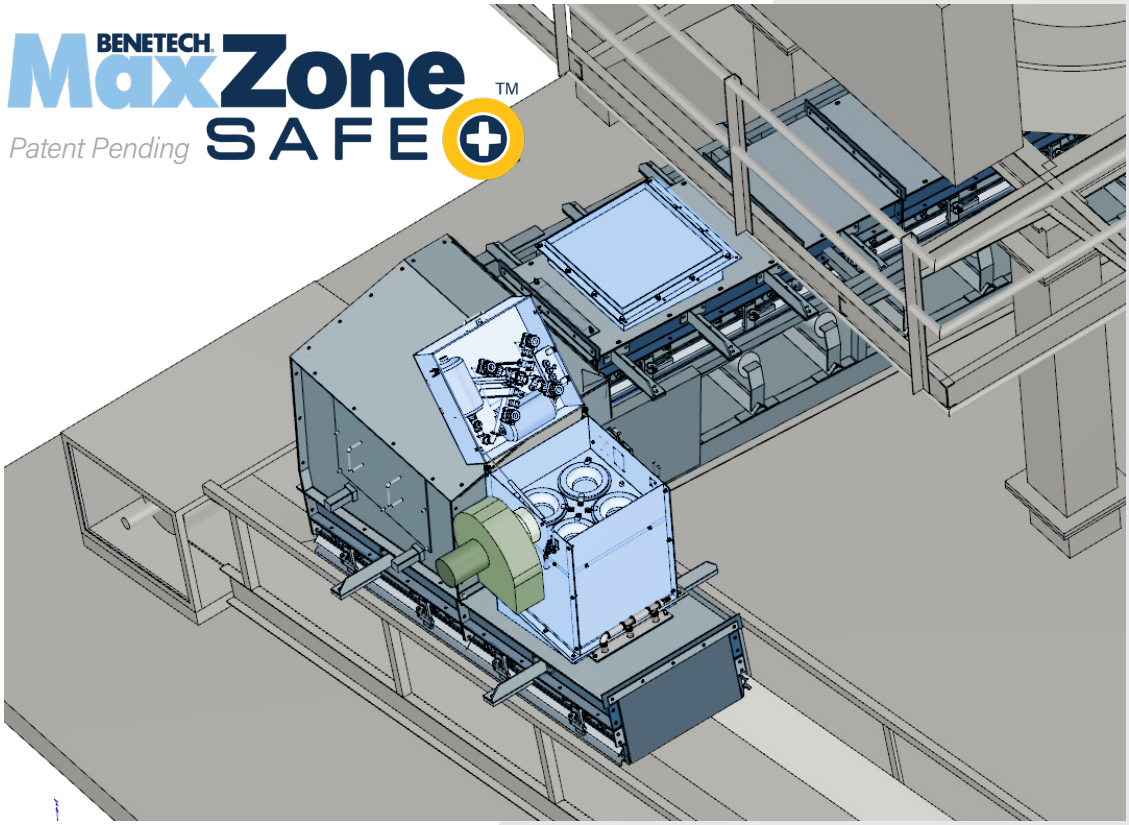
BENETECH®

SZ-XXX-X-XX-XHP
Dust Collection System

MaxZone Safe+™

INSTALLATION, OPERATION, & MAINTENANCE MANUAL



BENETECH

IMPORTANT

BENETECH, INC. HEREBY DISCLAIMS ANY LIABILITY FOR, BUT NOT LIMITED TO:

- IMPROPER INSTALLATION OF EQUIPMENT
- IMPROPER SIZING OF EQUIPMENT
- DAMAGE DUE TO CONTAMINATION OF MATERIAL
- USER'S FAILURE TO INSPECT EQUIPMENT
- USER'S FAILURE TO MAINTAIN EQUIPMENT
- USER'S FAILURE TO TAKE REASONABLE CARE OF THE EQUIPMENT
- INJURIES OR DAMAGE RESULTING FROM USE OR APPLICATION OF THIS PRODUCT CONTRARY TO INSTRUCTIONS AND SPECIFICATIONS CONTAINED HEREIN.

BENETECH, INC'S LIABILITY SHALL BE LIMITED TO REPAIR OR REPLACEMENT OF EQUIPMENT SHOWN TO BE DEFECTIVE.

The following notations are used throughout this manual.

DANGER

Denotes immediate hazards that will result in severe personal injury or death.

WARNING

Denotes hazards or unsafe practices that could result in personal injury.

CAUTION

Denotes hazards or unsafe practices that could result in product or property damages.

IMPORTANT

Denotes instructions that must be followed for proper installation and/or operation of equipment.

NOTE

Denotes general items to assist the reader/ installer/ operator.

SAFETY

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

Observe all local and governmental regulations concerning entry into confined spaces, welding, cutting, grinding, wash-down procedures and all Personal Protective Equipment (PPE) regulations.

Please pay close attention to all these alerts and warnings. They have been included here for your safety and for ease of installation.

Updated 2023-06

Table of Contents

1. General Information & References

The information and guidelines presented in this manual must be properly understood and implemented for safe and efficient operation. If you have any questions or problems that are not addressed herein, please contact our Customer Service Department or visit our website for more information:

- Customer Service: 800-843-2625
- Website: BenetechGlobal.com
- Visit our website for a list of Benetech distributors and information about our other products.

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.

2. Safety Information

All safety rules defined in this document and all owner/employer as well as state and federal safety rules must be strictly adhered to when working on/with this, or any, conveyor belt equipment.

DANGER

Do not touch or go near the conveyor belt or conveyor accessories when the belt is running. Limbs of the body or articles of clothing could get caught and be pulled into the conveyor, resulting in severe injury or death.

DANGER

Before installing, servicing, or adjusting the belt cleaner, turn off AND lock out/tag out all energy sources to the conveyor and conveyor accessories according to ANSI standards. Failure to do so could result in serious injury or death.

DANGER

If this equipment is to be installed in an enclosed area, observe all confined space entry regulations and test the atmosphere for gas levels and dust content levels before using a cutting torch, welding equipment, or electric hand tools. Using a torch, welding, grinding, or drilling in an area with gas or dust may cause an explosion and/or fire resulting in serious injury or death.

WARNING

Before using a cutting torch, welders, or grinding equipment, cover the conveyor belt with a fire retardant/resistant cover. Make sure a water source/fire hose is readily available AND OPERATIONAL. Failure to do so can cause belt to catch fire.

WARNING

Belt cleaners are heavy and require two people to lift. Attempting to lift the belt cleaner without assistance could result in personal injuries and/or damage to the equipment.

WARNING

Remove all tools, parts, trash, and foreign objects from the installation area and conveyor belt before turning on the conveyor. Failure to do so can result in serious injury to personnel or damage the belt and conveyor.

NOTE

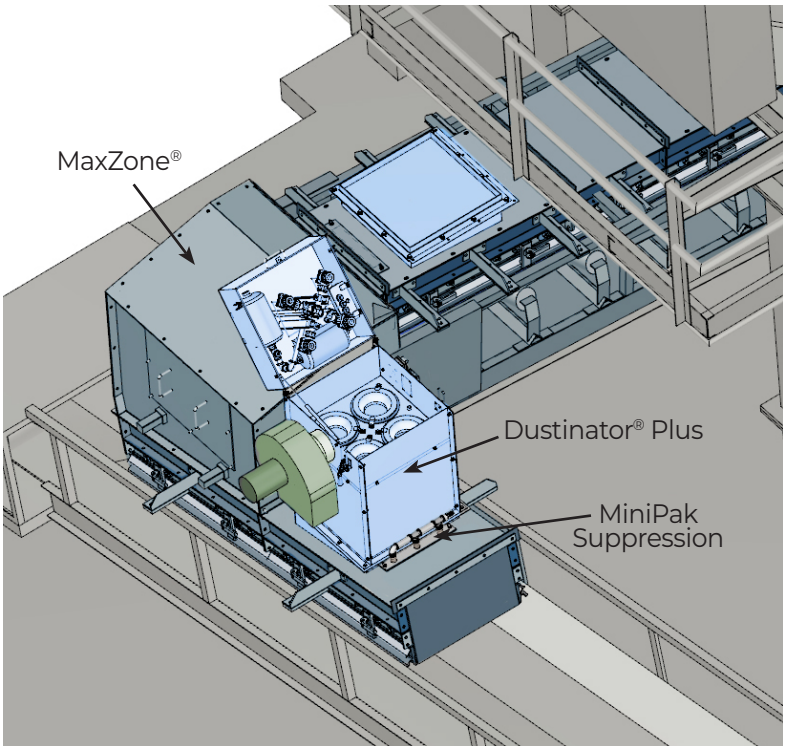
All dimensions in this manual are inches (mm).

3. Introduction to MaxZone Safe+

The MaxZone Safe+™ is a powerful combination of three Benetech technologies:

- **MaxZone® (Load Zone Containment System)** — Benetech's patented load zone containment with modular skirtboard, liner, and seal system
- **Dustinator® Plus (Dust Filtration System)** — patent-pending, self-purging, active dust collection and filtration system
- **MiniPak (Dust Suppression System)** — non-toxic chemical dust suppression system

The process of Bulk Material Handling on conveyor belt systems typically generate dust at loading interchanges, transfer points, inclines and within skirt systems.



Reducing material transfer area dust can reduce worker exposure associated with operations, such as handling cement, aggregate, coal, limestone, and frac sand associated with hydraulic-fracturing operations during oil and gas extraction. It is essential to limit these exposures to workers whenever possible.

Typical airborne dust arising from these transfer points can result in poor air quality and over exposure exceeding worker respirable MSHA dust limitations. In addition to respirable dust, area safety, additional equipment maintenance, and cleanup are also results of excessive area dust. Excessive dust can lead to dust piles in transfer buildings and on conveyor structural members which, under the right conditions, can cause fires.

The MaxZone Safe+™ system consists of a MaxZone® skirtboard system with the Dustinator® Plus installed on top near the conveyor loading point. The Benetech MaxZone Safe+™ system is an exceptional solution to reduce airborne dust and the resulting dust conditions.

The Dustinator® Plus consists of the dust box, pulsing self-purging filter system, compact blower (active system only), and air tank reservoir system. The system also utilizes a Benetech MiniPac suppression system which operates during the filter purge cycle.

Once the MaxZone Safe+™ is installed and running, the self-purging air filtering system will continuously and automatically clear the filter debris while in operation. Constant pressure differential monitors the filter air flow and automatically purges the filter system when needed. Additionally, the MaxZone Safe+™ system is intended to be used with a Benetech MiniPac local dust suppression system. This system provides suppression to the MaxZone® during the filter purging cycle.

Although the MaxZone Safe+™ system is designed to be used with the Benetech MiniPac suppression system, in some cases, alternative customer-supplied suppression systems can be substituted for the MiniPac system; however, a customer-supplied solenoid valve and supply hose with suppression must be provided for the entire system to operate as expected.

Consult Benetech, Inc. if you suspect there may be material incompatibility issues or have questions about product application and use. We can provide recommendations for your specific application.

4. Key Things to Consider For Optimal Installation

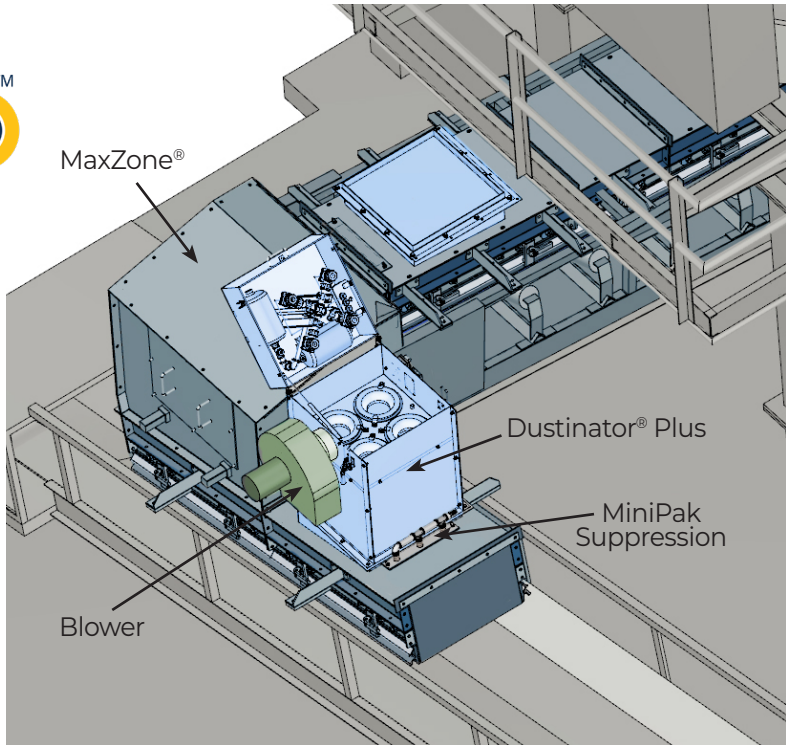
1. Proper positioning of the Dustinator® Plus directly after material transfer point on the MaxZone® skirtboard system.
2. MaxZone B-Plus seal must be properly adjusted at belt interface to limit escapement of dust.
3. Access to a electrical connection with ability to lockout / tagout for periodic maintenance.
4. Adequate air and water supply for purging and suppression of the system.
5. References to the following publications:
   - MaxZone® Installation Manual
   - MiniPak Installation Manual
   - MiniPak Operations Manual

5. How the MaxZone Safe+ System Works

The MaxZone Safe+™ consists of three powerful Benetech technologies: MaxZone®, Dustinator® Plus, and MiniPak.

1. Mined material drops securely onto the load belt by the MaxZone® skirtboard, liner, and seal containment system.
2. Mounted above the discharge end of the skirt, the Dustinator® Plus acts as a dry dust collection system removing nearly all types of airborne dust.
3. The system utilizes an air blower system (in green) starting with a conveyor run signal generating a vacuum to remove material using four (4) micron filters.
4. The Dustinator® Plus filtration system uses pressure differential controls to determine when filters are near dust saturation and automatically completes a self-purge cleaning cycle. This cycle cleans the filters and discharges the material back onto the belt.
5. Just prior to the dry dust filter purge cycle, a water solenoid valve on the MiniPak is activated providing a suppressant solution. This system instantly sprays the specialized dust suppression agent to capture and minimize dust from the filter cleaning cycle.
6. The entire system repeats, as required, to maintain control of the airborne dust.

BENETECH MaxZone™ SAFE+ *Patent Pending*



Dustinator® Plus & MiniPak Suppression
installed on the MaxZone®

6. Before Installing the MaxZone Safe+™ System

1. Inspect ALL shipping containers for damage and correct number of items (skids, pallets, cartons, boxes, etc.). Report damage and/or shortages to delivery service immediately and fill out delivery service's claim form. Keep ALL damaged goods for examination. Benetech is NOT responsible for damage that occurred during transit. If any items are missing, IMMEDIATELY contact Benetech, Inc. or an authorized representative.
2. All Benetech MaxZone Safe+™ and Dustinator® Plus units are shipped from our facilities unassembled. Care should be taken while assembling the systems to ensure no parts are lost or damaged. Dispose of shipping containers according to local regulations.
3. Gather tools. Minimum tools required for installation are:
   - Tape Measure/String
   - Drill Bits/Hole Saw
   - Level/Straight Edge
   - Angle Finder
   - Welder/Drill
   - Open/Box End Wrenches
   - Socket Set
   - Marker/Soapstone (welder's chalk)
4. Turn off and lock out/tag out energy source according to ANSI standards (see "References") and local plant regulations.
5. If using a cutting torch or welding:
   - Obtain a weld or burn permit as required.
   - Test atmosphere for gas level or dust content. Cover conveyor belt with fire retardant cover. Verify locations of fire extinguishers and operational water hoses prior to beginning cutting / welding operations.

WARNING

Before installing equipment, turn off AND lockout/tagout all energy sources to the conveyor and conveyor accessories according to ANSI standards. Failure to do so could result in serious injury or death.

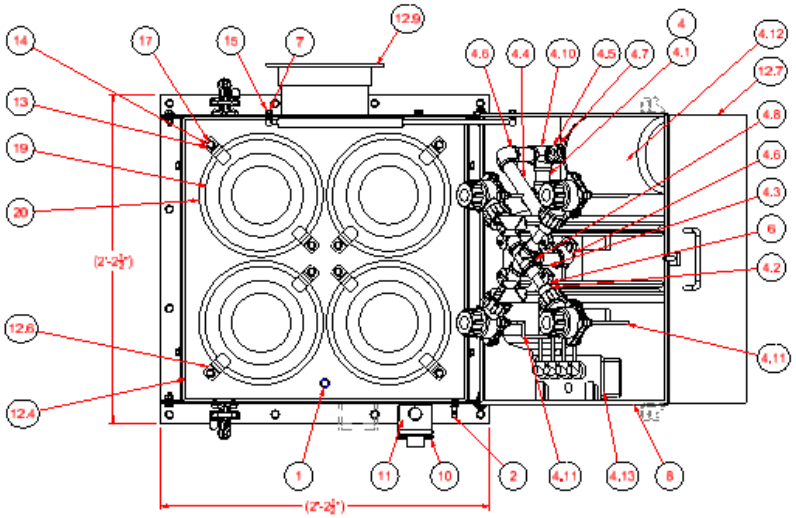
DANGER

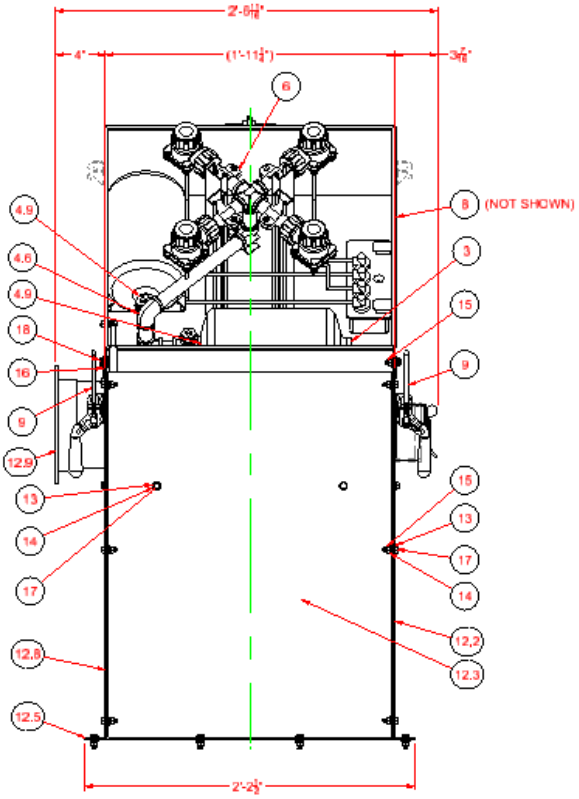
If this equipment is to be installed in an enclosed area, observe all confined space entry regulations and test the atmosphere for gas levels and dust content levels before using a cutting torch, welding equipment, or electric hand tools. Using a torch, welding, grinding, or drilling in an area with gas or dust may cause an explosion and/or fire resulting in serious injury or death.

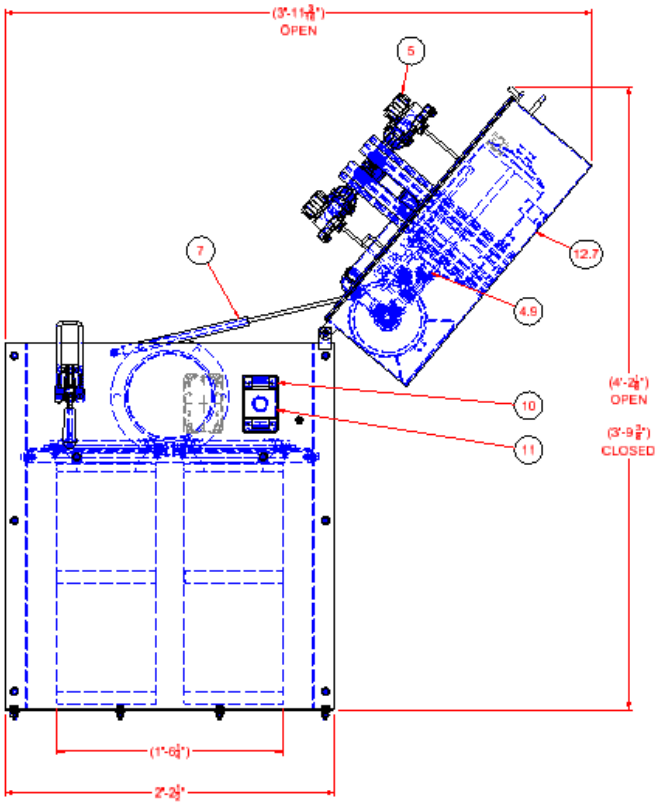
7. General Specifications

General Dimensions and Requirements

- Footprint: 26.5" x 26.5" (at Base Flange)
- Height: 50-1/8" (Open), 46" (Closed, Operating)
- Weight: 165 lb.
- Voltage: 240 Single Phase
- Air: 90 PSI
- Water: Clean Supply, 40-60 PSI Ideal, (must be less than 100 PSI), 20 GPM flow rate







8. Installing the MaxZone Safe+™ System

IMPORTANT
Read **ENTIRE SECTION** before beginning ANY work.

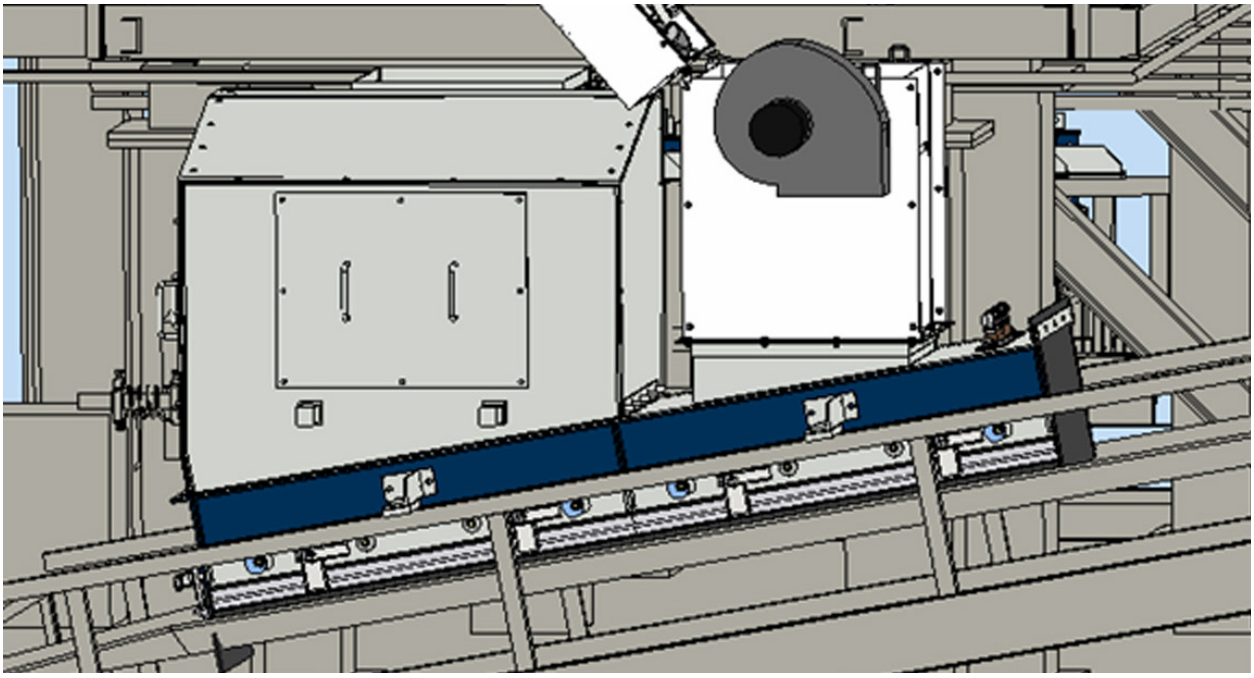


Figure 2

Figure 2 illustrates a typical proper location and installation position for the Benetech MaxZone Safe+™ Dust Collection System, approximately five (5) feet from the transfer point. Other placement and positions may be possible based on specific customer locations. This system is designed to be used in conjunction with the MaxZone® skirtboard system.

Information for Installing the MaxZone® system is shown in the "MaxZone-Installation-Manual_REV-2021-07-29-002." Once the MaxZone® system is installed at the correct location on transfer point, the Dustinator® Plus is placed on top of the MaxZone® skirt system.

9. Installing the Dustinator® Plus

To install the MaxZone Safe+™, follow the steps detailed in this section.

The MaxZone Safe+™ system is designed to be used in conjunction with a MaxZone® skirt system, however the Dustinator® Plus can be used with any properly sealed skirt system. The Dustinator® Plus can draw up to 1000 CFM. The mounting of the Dustinator® Plus should be within five (5) feet of the transfer point or five (5) feet from the final transfer point if multiple transfer points are on the same belt.

With the MaxZone® system properly installed and adjusted per the installation manual. A MaxZone® top cover will be replaced with the Dustinator® Plus mounting cover as shown in Figure 2 below. The Dustinator® Plus adapter cover, is installed directly in place of the existing flat or peaked hood cover as shown in Figure 3 using the 1/2-13 x 1" long cover bolts. This top cover allows direct base flange mounting to the Dustinator® Plus along with the Benetech suppression manifolds.

The Dustinator® Plus unit can now be set in place and will be secured using (12) 5/16" X 1" long hex head bolts. Secure the Dustinator® Plus and apply clear silicone around the mounting flange edges. The Dustinator® Plus fully mounted on the MaxZone Safe+™ system is shown in Figure 4.

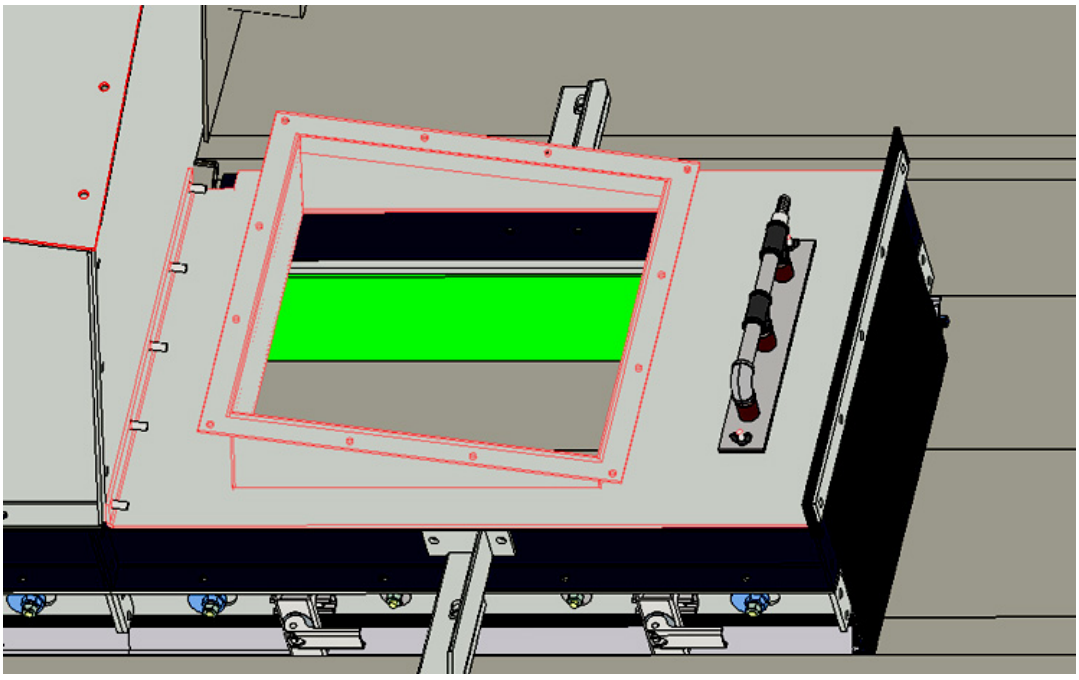


Figure 3

The Dustinator® Plus system will be used with a Benetech MiniPak suppression system (see MiniPak Installation Guide and MiniPak Operations Manual). For best performance results, a dust suppression system should be used in conjunction with the MaxZone Safe+™ system. This system will require a water supply of 20 GPM and a 40-60 PSIG solenoid valve, plus related piping/hose.

Once the MaxZone® skirt system is located correctly and mounted with the skirt liners fully adjusted, the Dustinator® Plus skirt system top cover can be mounted directly on the MaxZone®.

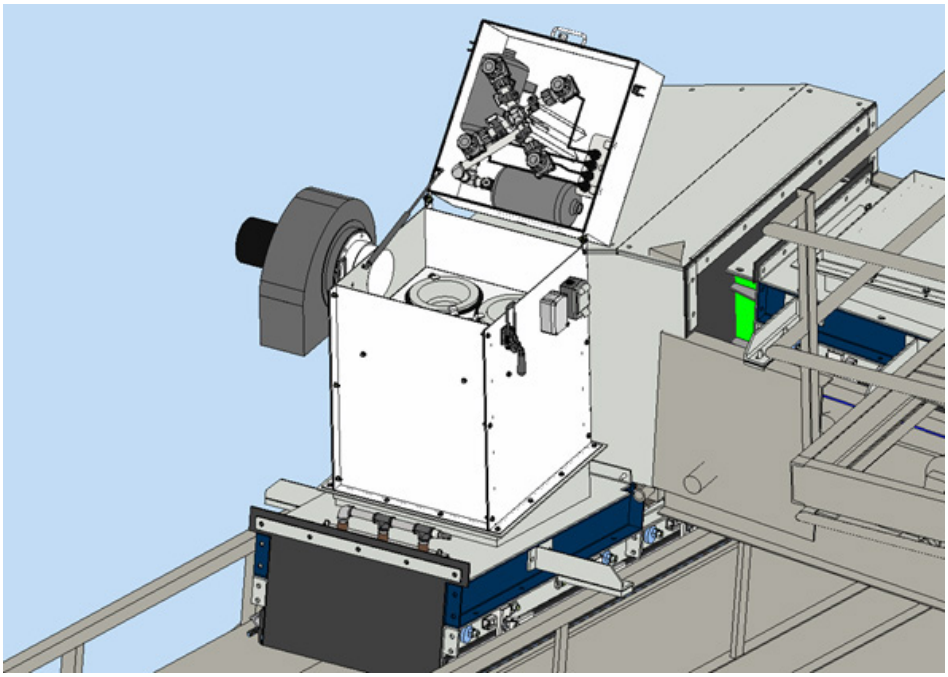


Figure 4

Figure 4 illustrates mounting the Dustinator® Plus and Blower Motor to the MaxZone® system.

10. Blower Motor Installation

All electrical installation work should be done by qualified personnel familiar with the construction, operation, and hazards involved with the equipment. The appropriate work practices of NFPA 70E should be followed. The 1000 CFM Blower Motor is wired for 230V Single Phase. The Blower Motor is UL Rated and recognized for this voltage and wiring arrangement. It is recommended that the Blower rotates only when the conveyor belt is operating, install proper controls to achieve this.

Motor Wiring

The Blower Motor rotation should be such that the Dustinator® Plus is exhausting from the filter hood. The Dustinator® Plus control wiring is shown on drawing E0001-90821RD01. Check the motor to ensure the correct rotation. The motor should be wired according to the motor data plate. A flexible conduit for the motor junction box connection is recommended from the Dustinator® Plus to the disconnect.

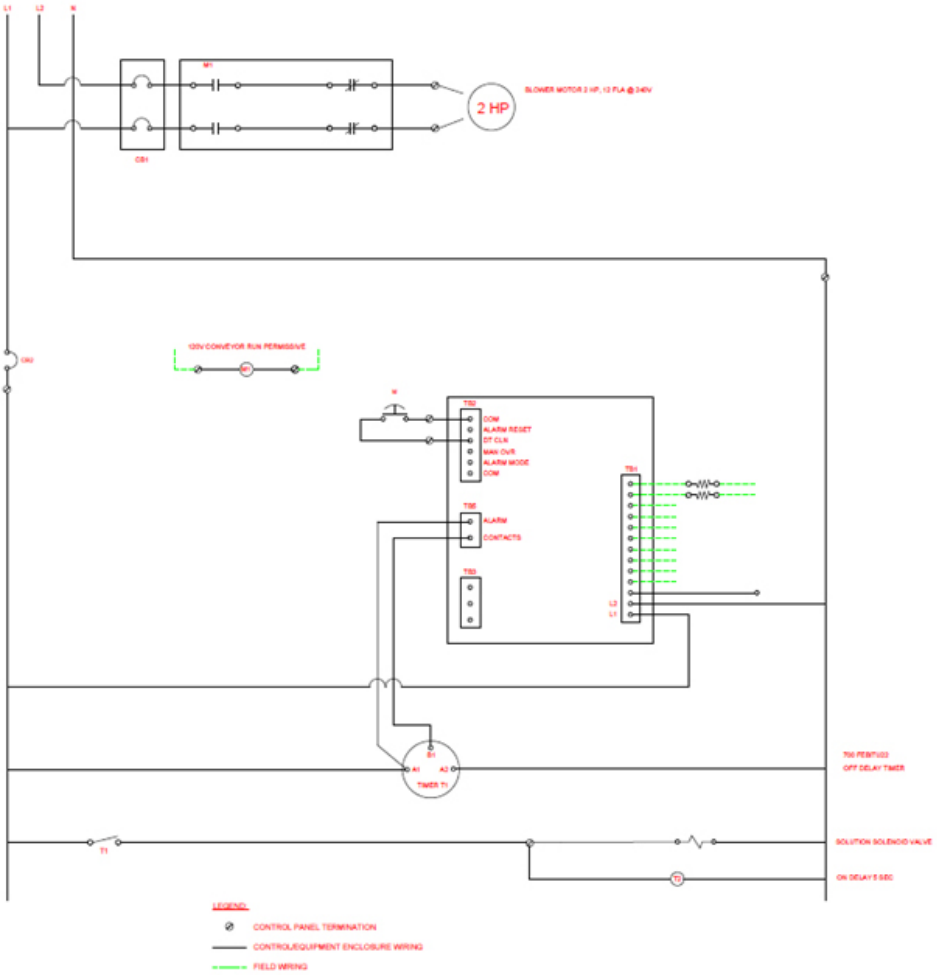


Figure 5

Figure 5 illustrates the Blower Motor and Control Panel Wiring Diagram, Drawing E0001-90821RD01.

The MaxZone Safe+™ and Dustinator® Plus system is designed to complete a self-purging filter cycle based on CFM flow through the Donaldson Torit TL875 Pleated Filter inserts.

The cleaning system utilizes a pressure differential switch within the on-board Dwyer dust collector timer controller. This pressure differential switch activates the pulse cleaning filter system. The cleaning system has a lower threshold, which is the differential pressure at the end of each of the cleaning cycle. The lower threshold is set at 2.5 IWC. This lower threshold is easily attainable at all flow rates when filters are not loaded.

The controlled air-jet pulses are done using electrical control valves and the pressure system is via 90 PSI plant supplied air along with two internal 1.32 Gallon air reservoirs. The air pressure is also monitored via an internal pressure switch. The electronic control board is programmed to initiate air-jet pulses at 7 IWC in a loaded filter condition and continues air-jet pulsing until the filters are clean.

The Dustinator® Plus control board and timers are preset at Benetech. Additional settings may be available.

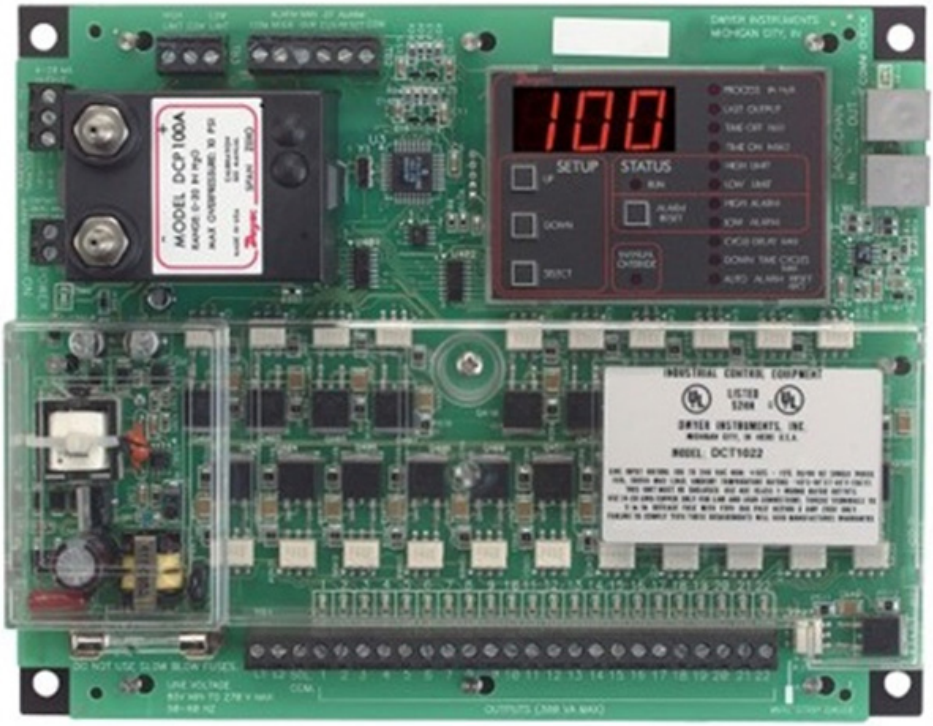


Figure 6: Dwyer DCT1000 Control Board

Figure 6 illustrates the electronic control board with the on-board pressure and differential switch, which will be mounted within the board enclosure and mounted on the outside of the Dustinator® Plus.

Figure 7 illustrates the Dustinator® Plus electrical control panel cabinet Door Layout and Back Panel layout. The Dustinator® Plus internal wiring is completed at the factory and no changes to the control board, timing, settings or internal wiring will be required.

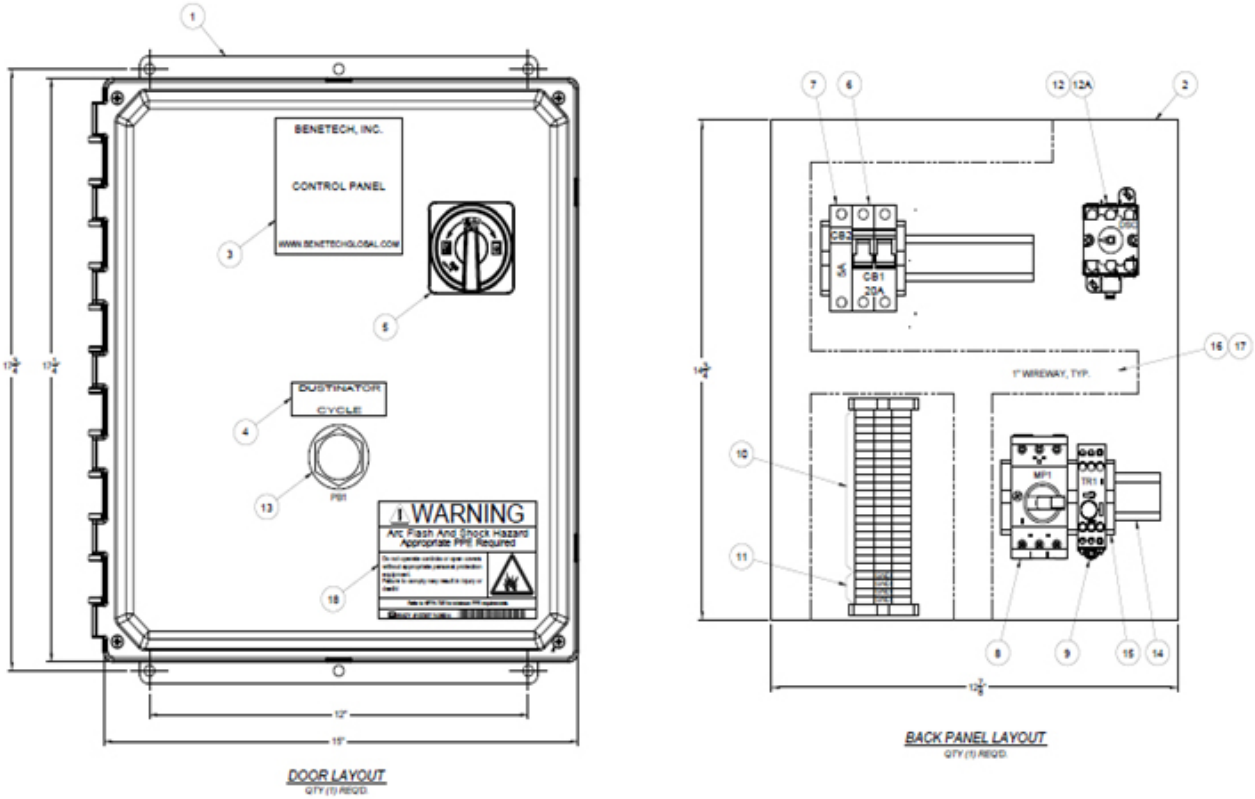


Figure 7: Dustinator® Plus Control Panel

After the Installation is complete, visually inspect all electrical power connections, air, and water connections and blower mounting. Ensure the filter media is installed and secured. Check the top cover seal and close the Dustinator® Plus top cover securing with the two over center clamps located on the right and left side near the top of the unit.

11. Dustinator® Plus Operation and Maintenance

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.

DANGER

Do not touch or go near the conveyor belt or conveyor accessories when the belt is running. Limbs of the body or articles of clothing could get caught and be pulled into the conveyor, resulting in severe injury or death.

DANGER

Before installing, servicing, or adjusting the belt cleaner, turn off AND lock out/tag out all energy sources to the conveyor and conveyor accessories according to ANSI standards. Failure to do so could result in serious injury or death.

1. Once installation is complete and all conditions for a safe startup have been confirmed, turn on Dustinator® Plus, water supply, air supply and conveyor belt system.
2. Check the water and air for proper system(s) pressure and ensure there are no leaks in the system. Re-tighten as required.
3. Periodic Filter inspection and maintenance MUST be performed on a regular basis to ensure the equipment is functioning properly. The filter purging cycle is based on a pressure differential between the filter side and atmospheric pressure. Noticeable increases in frequency of the filter purging cycle indicates a clogged or loaded filter system. Inspect the Filter elements for wet or dry encrusted material. Clean or replace the filters as necessary. If problems persist, contact Benetech Inc.
4. During inspection, check all air and water supplies and filters for blockage prior to startup.
5. Ensure all hardware and fasteners for the mounting equipment are tight.
6. Remove equipment from service if there is any indication it is not functioning properly. Call Benetech, Inc. or a representative for assistance.

NOTE

Maintenance inspection should be performed no less than weekly. Some applications may require more frequent maintenance inspections.

12. Troubleshooting

NOTE

The Dustinator equipment is subject to a wide variety of bulk materials characteristics and performs under extreme operating conditions. It is not possible to predict all circumstances that may require troubleshooting. Contact BENETECH, INC. or a representative if you are experiencing problems other than those listed in the "Troubleshooting" section below. Do not return the equipment to operation until the problem has been identified and or/and corrected.

Symptoms and Corrective Actions

Insufficient Filter Cleaning

Filters may be wet or clogged. A Continuous Increase in frequency of the Filter purging system and pressure differential readings may indicate saturated or end of life filter systems. Clean or replace filters. Wet filter media can prevent the filters from purging properly. Remove the filters, dry completely and gently clean any dried material from the filter surfaces. Reinstall the filters and "dry run" the filter purging system.

Residual Dusting at MaxZone Plus® Exit

The system is designed to operate with filtered water of sufficient pressure. If there is limited or no water, check the water solenoid for functionality and ensure the water filter is free of contaminants clogging the water filter(s).

The system also uses a Benetech MiniPac to provide suppressing during the filter purging process. If the BT205 Surfactant has run out, residual dusting may occur during the operation of the system. Ensure the system surfactant is being replenished at the correct rate and required intervals per the MiniPac operations manual, MINIPAK SYSTEM INSTALLATION GUIDE.

Restricted Air and Water Flow

During inspection, check all air and water supplies and filters for blockage prior to startup. All air and water filters should be free flowing for maximum performance.

Other Problems

Contact Benetech, Inc. or a representative.

NEW PRODUCT

BENETECH MaxZone SAFE+™
Patent Pending

COMBATING RESPIRABLE
CRYSTALLINE SILICA EXPOSURE

MaxZone Safe+™

Researchers at the National Institute for Occupational Safety and Health (NIOSH) have identified Respirable Crystalline Silica (RCS) as a particularly serious exposure risk. RCS is associated with operations, such as handling cement, aggregate, coal, limestone, and frac sand associated with hydraulic fracturing operations during oil and gas extraction.

In consideration of the numerous problems associated with dust generated by bulk materials, Benetech designed and developed the MaxZone Safe+™ — a powerful combination of bulk material containment and dust filtration, collection, and suppression technologies.

FEATURES & BENEFITS

- Achieves over 90% dust reduction in airborne dust
- Developed under a Research Collaboration Agreement with NIOSH
- Designed to meet MSHA-compliant standards
- Captures a variety of fugitive dust particles, including fine silica dust
- Self-purging dust containment, filtration, collection, & suppression system

Capturing Respirable Crystalline Silica Dust

BENETECH®

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