Donaldson®
Torit®

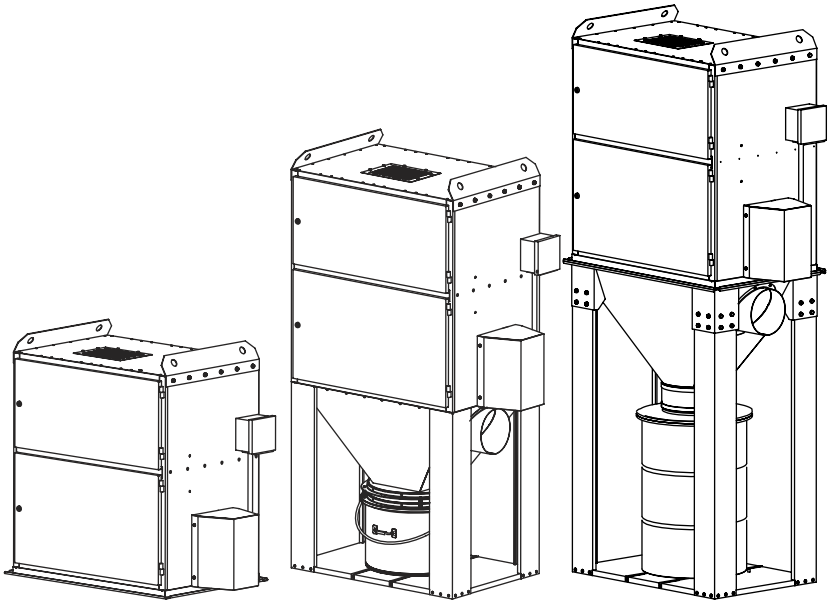
# Installation and Operation Manual

## Installation, Operation, and Service Information

## Unimaster® Dust Collector

### Models UMA 40, 70, 100, 150, and 250
**built after August 2005**

### Models UMA 450 and 750
**built after March 2006**



**UMA-H 250**
**Hopper Base**

**UMA-B 250**
**Bin Base**

**UMA-D 250**
**55-Gallon Drum Base**

Throughout this manual statements indicating precautions necessary *to avoid equipment failure* are referenced in a **Note.** Statements indicating potential hazards that could result in *personal injury or property damage* are referenced in a **Caution!** box.



IOM AD3547701
Revision 1

# Caution!

## Application of Dust Control Equipment

- Combustible materials such as buffing lint, paper, wood, aluminum or steel dust, weld fume, or flammable solvents represent fire or explosion hazards. Use special care when selecting and operating all dust or fume collection equipment when combustible materials are present to protect workers and property from damage due to fire and/or explosion. Consult and comply with National and Local Codes relating to fire or explosion and all other appropriate codes when determining the location and operation of dust or fume collection equipment.
- When combustible materials are present, consult with an installer of fire extinguishing systems familiar with these types of fire hazards and local fire codes for recommendations and installation of fire extinguishing and explosion protection systems. Donaldson dust collection equipment is not equipped with fire extinguishing or explosion protection systems.
- DO NOT allow sparks, cigarettes or other burning objects to enter the hood or duct of any dust or fume control equipment as these may initiate a fire or explosion.
- For optimum collector performance, use only Donaldson replacement parts.

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

## Contents



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



## Data Sheet

**Model Number** _____ **Serial Number** _____

**Ship Date** _____ **Installation Date** _____

**Customer Name** _____

**Address** _____

_____

**Filter Type** _____

**Accessories** _____

**Other** _____

## Description

The Unimaster series dust collectors are self-contained, intermittent-duty dust collectors with bag-style filters. Three standard configurations—UMA-B, UMA-H, and UMA-D provide effective cleaning in a variety of industrial settings.

Most popular is Model UMA-B and ships complete with fan, easy-access filter assembly, multiple-inlet hopper and dust bin with quick-release sealer gear. Model UMA-H is a control unit with fan and filter assembly only. The housing has an open bottom and flanges to bolt directly to a dust container or hopper. Model UMA-D includes a fan, easy-access filter assembly, multi-inlet hopper and drum cover assembly to fit a standard 55-gallon drum.

Standard sizes range from 43 to 753 sq ft of filter area and features a UMA controller to control the filter cleaning operation. Other options include explosion relief vents, static grounding, weather hoods and caster frames.

## Purpose and Intended Use

The Unimaster dust collectors are used to separate solid particulate from an airstream as part of a manufacturing process. It is an ideal choice for intermittent operations in plant processes. Several small units can be installed at dust generation sites throughout the plant resulting in total dust capture and flexibility. Some typical installations include blending/mixing, abrasive blasting, cleaning, cutting, drilling, grinding, milling, packing, polishing, sanding, and sawing.

**Caution!**

- Misuse or modification of this equipment may result in personal injury.
- Do not misuse or modify.

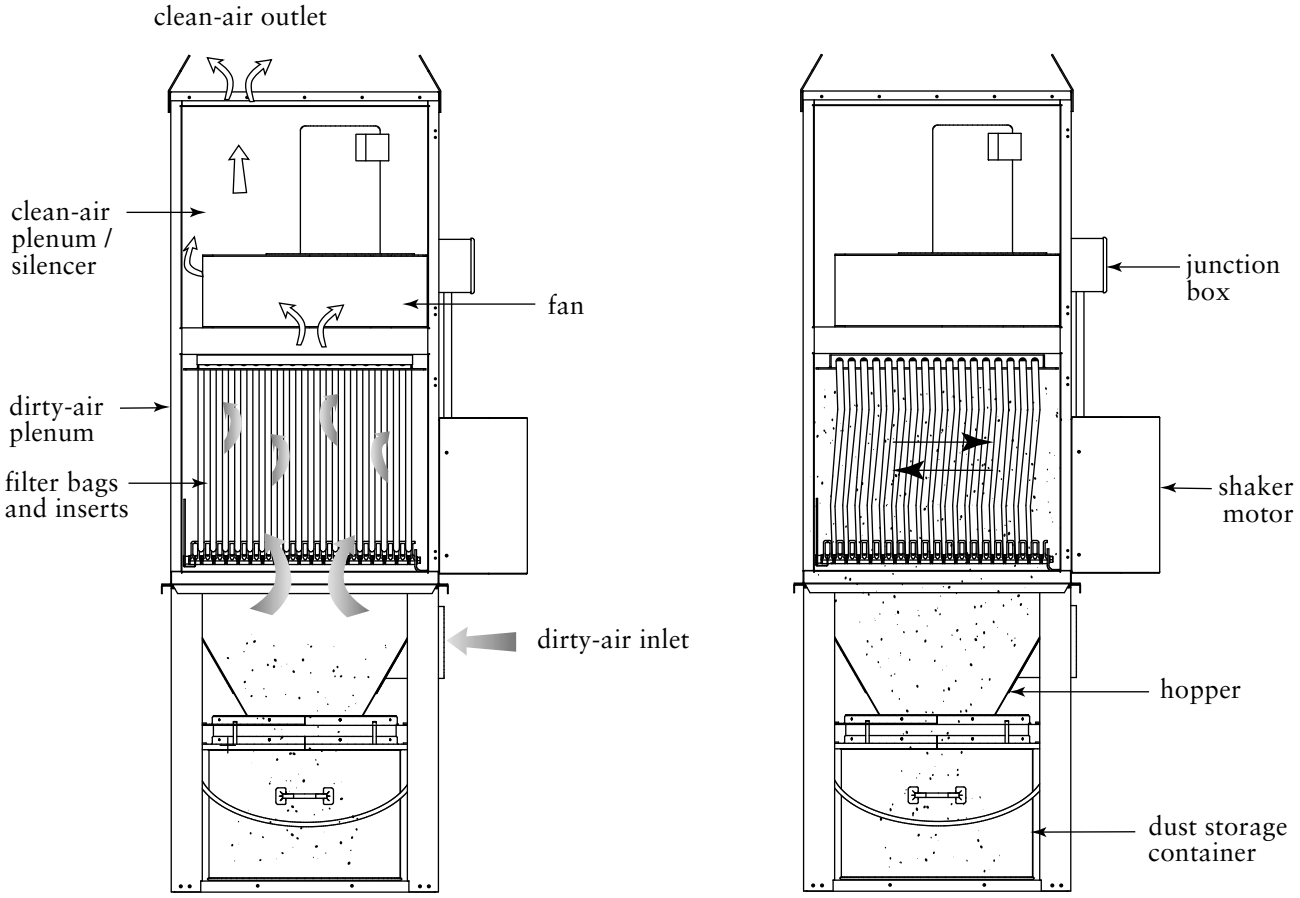
**Caution!**

- Combustible materials such as buffing lint, paper, wood, aluminum or steel dust, weld fume, and flammable solvents represent fire or explosion hazards.
- Use special care when selecting and operating all collection equipment when combustible materials are present to protect workers and property from damage due to fire and/or explosion.
- Consult and comply with National and Local Codes relating to fire or explosion, and all other appropriate codes when determining the location and operation of dust collection equipment.
- Donaldson equipment is not equipped with fire extinguishing or explosion protection systems.

## Operation

During normal operation, dust-laden air enters the unit through the dirty-air inlet. The velocity is reduced and natural pre-separation, caused by the effects of gravity, takes place and heavier particulate falls directly into the collection bin or hopper. Fine particles collect on the outside surface of the filter bag and clean, filtered air passes to the center of the bag and discharges through the clean-air outlet.

The Unimaster is an intermittent-duty collector, which means that cleaning starts when the fan is turned OFF and the appropriate fan run-down time is complete. The solid-state timer automatically starts the cleaning sequence 75-seconds after the fan is turned OFF. This is the fan run-down time. Power to controls must remain ON to operate the cleaning mechanism. The vibration motor starts and filter cleaning begins for a preset time of 30-seconds.




*Doors not shown on unit for illustrative purposes.

*Unit Operation*

## Inspection on Arrival

1. Inspect unit on delivery.
2. Report any damage to the delivery carrier.
3. Request a written inspection report from the Claims Inspector to substantiate claim.
4. File claims with the delivery carrier.
5. Compare unit received with description of product ordered.
6. Report incomplete shipments to the delivery carrier and your Donaldson representative.
7. Remove crates and shipping straps. Remove loose components and accessory packages before lifting unit from truck.

## Installation Codes and Procedures

**Caution!**

OSHA may have requirements regarding recirculating filtered air in your facility. Consult with the appropriate local authorities to ensure compliance with all codes regarding recirculating filtered air.

1. Safe and efficient operation of the unit depends on proper installation.
2. Authorities with jurisdiction should be consulted before installing to verify local codes and installation procedures. In the absence of such codes, install unit according to the National Electric Code, NFPA No. 70-latest edition.
3. A qualified installation and service agent must complete installation and service of this equipment.
4. All shipping materials, including shipping covers, must be removed from the unit prior to, or during unit installation.

   **Note:** Failure to remove shipping materials from the unit will compromise unit performance.

## Installation

### Site Selection

1. The unit can be used as a stand-alone collector or located in the top of storage silos and bins, or integrated into hoods for material handling equipment such as belt conveyors and bucket elevators.
2. Wind, seismic zone, and other live-load conditions must be considered when designing the mounting flange, hood supports, and/or pad for the collector. Contact your Donaldson representative for more information.
3. Provide appropriate clearance from heat sources and interference with utilities.

### Unit Location

1. When hazardous conditions or materials are present, consult with local authorities for the proper location and orientation of the unit.
2. Mounting flanges, hood supports, and/or pad must be capable of supporting the entire weight of the unit plus the weight of the collected material, and ductwork.
3. Locate the unit as close to the dust source as possible. Install anchor bolts to extend a minimum of 2-inches above foundation unless otherwise indicated on the Specification Control drawing.
4. Locate the unit to ensure easy access to electrical and connections, routine maintenance, and filter inspection and replacement.

**Caution!**

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

## Electrical Wiring

**Caution!**

- Electrical installation must be performed by a qualified electrician and comply with all applicable national and local codes.
- Turn power off and lock out electrical power sources before performing installation, service, or maintenance work.
- Do not install in classified hazardous atmospheres without an enclosure rated for the application.

1. All electrical wiring and connections, including electrical grounding, should be made in accordance with the National Electric Code, NFPA No. 70-latest edition.
2. Check local ordinances for additional requirements that apply.
3. The appropriate wiring schematic and electrical rating must be used. See unit's rating plate for required voltage.
4. If the unit is not furnished with a factory-mounted disconnect, an electric disconnect switch having adequate amp capacity shall be installed in accordance with Part IX, Article 430 of the National Electrical Code, NFPA No. 70-latest edition. Check unit's rating plate for voltage and amperage ratings.
5. Refer to the wiring diagram for the number of wires required for main power wiring and remote wiring.

## Rigging Instructions

*Suggested Tools & Equipment*

| | |
|---|---|
| Crane or Forklift | Socket Wrenches |
| Slings, Spreader Bars, and Clevis Pins | End Wrenches |
| Drift Pins | Large Crescent Wrench |
| Clamps | Drill and Drill Bits |
| Screwdrivers | Pipe Sealant |
| | Pipe Wrenches |

### Hoisting Information

1. Use all lifting points provided.
2. Use clevis connectors, *not hooks*, on lifting slings.
3. Use spreader bars to prevent damage to units casing.
4. Check the Specification Control drawing for weight and dimensions of the unit, subassemblies, and components to ensure adequate crane capacity.
5. Allow only qualified crane operators to lift the equipment.
6. Refer to applicable OSHA regulations and local codes when using cranes, forklifts, and other lifting equipment.
7. Lift unit and accessories separately, and assemble after unit is in place.
8. Use drift pins to align holes in section flanges during assembly.

**Caution!**

- Failure to lift the collector correctly can result in severe personal injury or property damage.
- Use appropriate lifting equipment and adopt all safety precautions needed for moving and handling the equipment.

## Standard Equipment

Unimaster dust collectors are delivered partially assembled. Unit installation, optional equipment assembly, and electrical connections are completed at the job site.

**Caution!**

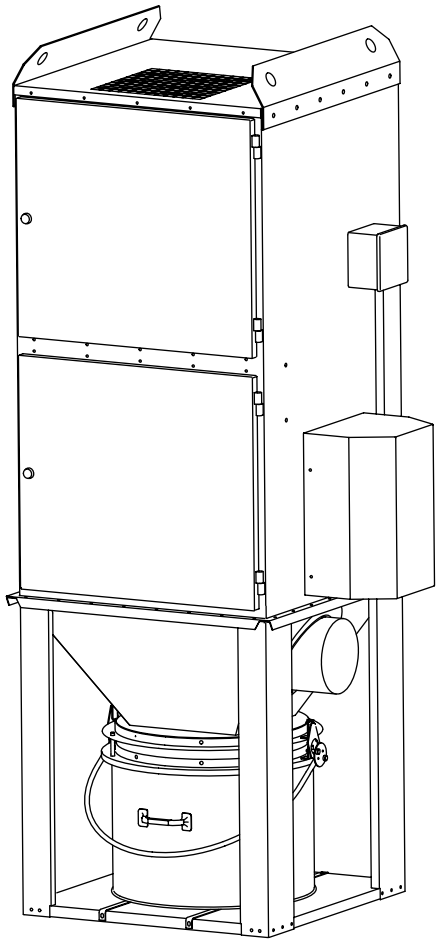
The collector has a high center-of-gravity and may overturn if not secured properly.

- Secure the collector to the lifting device.
- Use care when moving the unit.

### Unit Installation

***UMA-B 40 to 150***

1. Prepare the foundation in the selected location. Install anchor bolts to extend a minimum of 2-inches above foundation unless otherwise indicated on the Specification Control drawing.
2. Lift unit into position over the anchor bolts and lower *slowly*.
3. Level unit horizontally and vertically, using steel shims under legs where required.
4. Secure unit to anchor bolts using customer-supplied hardware.



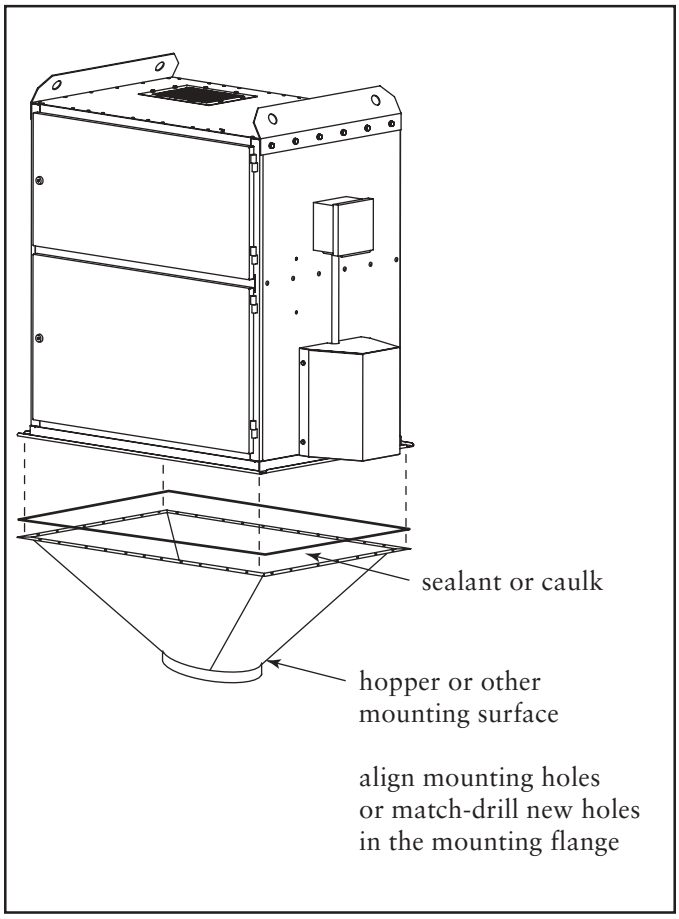
**UMA-B 150**
**Bin Base**

*Typical Installation, UMA 40 to 150 Bin*

### *UMA-H*

**Note:** Compare the position and spacing of the bolt pattern on the unit's mounting flange to the bolt pattern on the mounting surface.

1. Apply two strips of sealant or caulk to the mounting surface, one toward the inside of the bolt pattern and one toward the outside of the bolt pattern.
2. Lift unit into position over mounting surface and lower *slowly*.
3. Use drift pins to align holes.
4. Secure with bolts, washers, and hex nuts supplied. Tighten to form an airtight seal.




*Typical Installation, UMA-H*

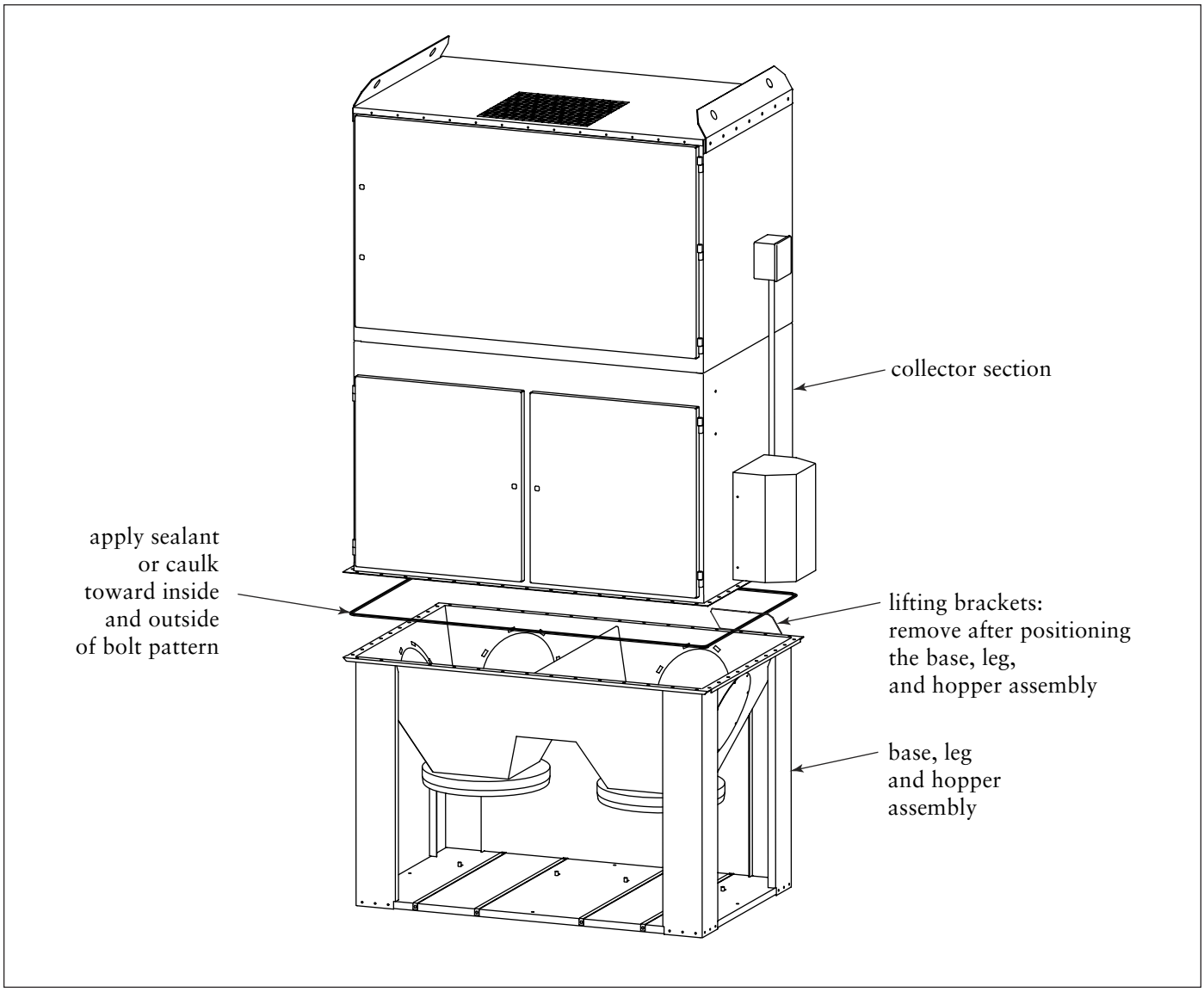
### *UMA-B 250 to 750, UMA-D, or Two-Piece Shipments*

1. Prepare the foundation in the selected location. Install anchor bolts to extend a minimum of 2-inches above foundation unless otherwise indicated on the Specification Control drawing.
2. Lift base, leg, and hopper assembly into position over the anchor bolts and lower *slowly*.
3. Level unit horizontally and vertically, using steel shims under legs where required.
4. Secure unit to anchor bolts using customer-supplied hardware.
5. Remove the lifting brackets from the top of the base assembly.
6. Apply two strips of sealant or caulk to the hopper's top flange: one toward the inside of the bolt pattern and one toward the outside of the bolt pattern.
7. Lift collector section into position over the base assembly and lower *slowly*.
8. Use drift pins to align holes.
9. Secure with bolts, washers, and hex nuts supplied. Tighten to form an airtight seal.

## Inlet Assembly

All models are shipped with the inlet specified at the time of order. Side inlets are not interchangeable with back inlets. Contact Donaldson if additional changes are necessary.

1. Remove the inlet blank from the specified location.
2. Replace damaged sealant if necessary.
3. Secure inlet to unit using the hardware removed in Step 1.




*Typical Installation, UMA-B 250 to 750, UMA-D, or Two-Piece Shipment*

## Electrical Connection

**Caution!**

- Electrical installation must be performed by a qualified electrician and comply with all applicable national and local codes.
- Turn power off and lock out electrical power sources before performing installation, service, or maintenance work.
- Do not install in classified hazardous atmospheres without an enclosure rated for the application.

The UMA controller operates the fan and shaker in the proper sequence to ensure effective filter cleaning. The controller contains an across-the-line fan starter and an across-the-line shaker motor starter.

1. Mount the controller in a convenient accessible location, free of vibration and temperature extremes.

   **Note:** Do not mount the controller on the unit. Mechanical vibration can damage the control.

2. Using the wiring diagram supplied with the controller, connect the power lead from a customer-supplied disconnect switch to the terminal block inside the controller, complying with all applicable codes for motor branch circuits.

   **Note:** The national electric code requires all connections to the electrical enclosure be of the same rating.

3. Install conduit from the controller to the junction box located on the side of the collector. Use conduit and fittings compatible with the rating of the controller's enclosure.
4. Make the connections from the manual motor protector inside the controller to the terminal block in the junction box.

### *UMA Controller*

The UMA Controllers are used with three-phase, 50- or 60-Hz power supplies or optional single-phase power, and suitable for fan motors rated to and including 30 horsepower.

#### Operation

**Start**

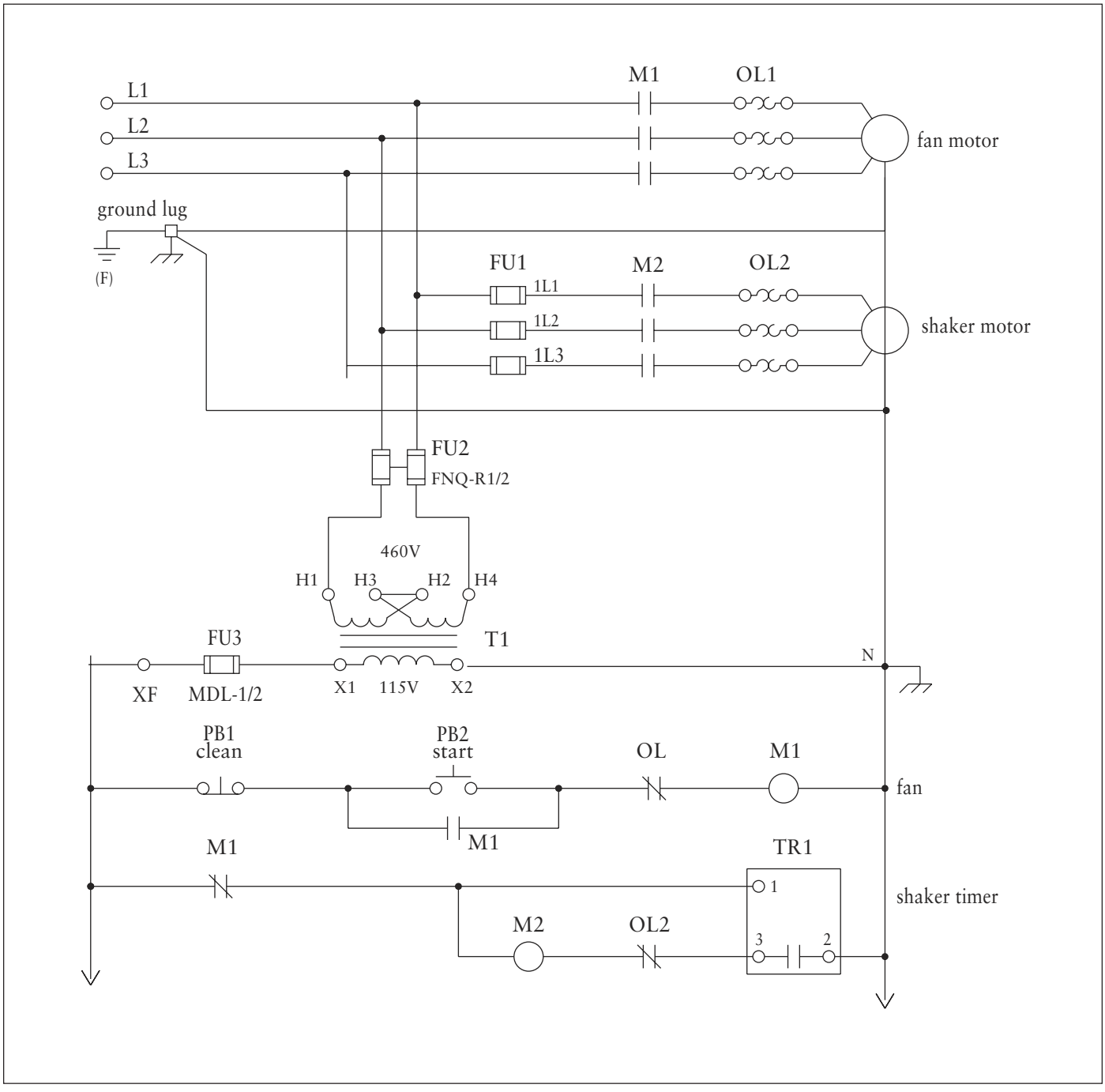
- Press START button.
  - Fan contactor M1 is energized, timer module sets, and the fan motor starts. Average operating period for fan is 4 hours.

Clean

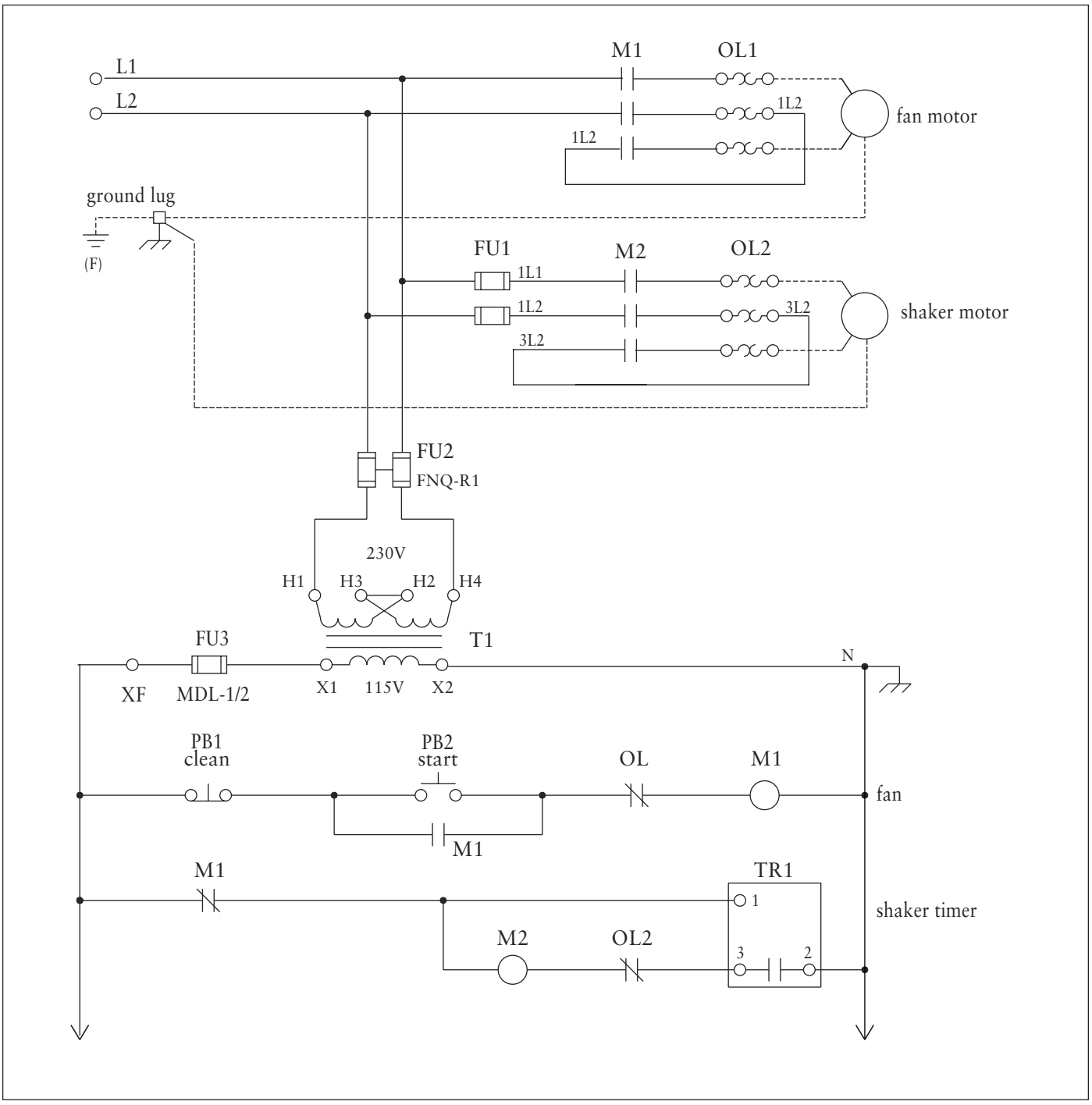
- Press CLEAN button.
  - Fan contactor M1 is de-energized and the timer is energized.
  - After approximately 75-seconds, the shaker motor contactor M2 is energized and the shaker motor runs for approximately 30-seconds.
  - Shaker motor contactor is de-energized and the timer resumes inactive status.

    **Note:** Before a cleaning cycle can start by pressing the CLEAN button, the M1 fan contactor must have been energized for at least 30-seconds.

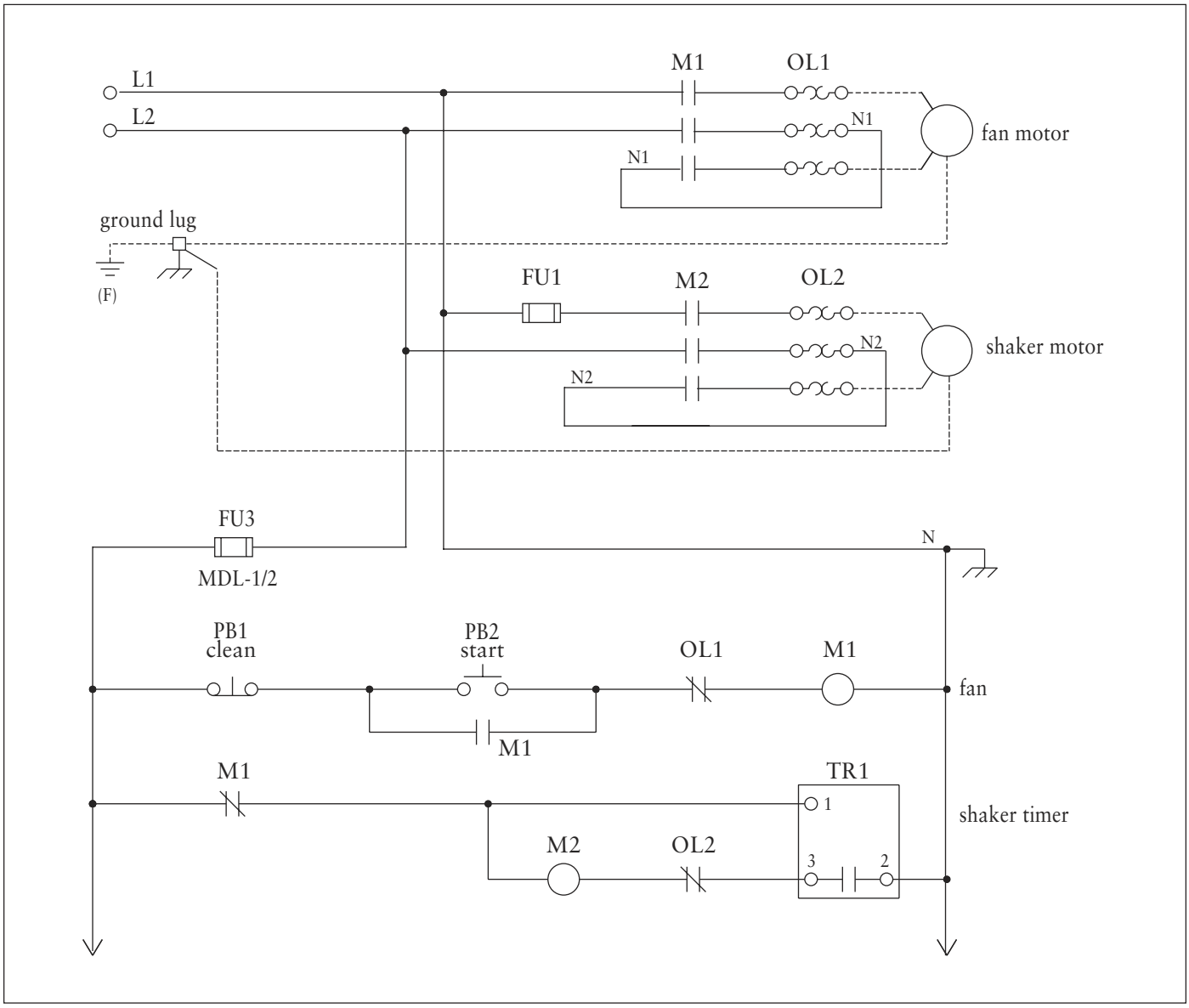
In the event of a power supply failure during a cycle, an internal safety feature ensures the controller automatically resets ready for the fan to be restarted. Reapplying power does not require the cycle to be completed.




*Typical Wiring Diagram, Three-Phase Power Supply*




*230-Volt, Single Phase Power Supply Wiring Diagram*




*115-Volt, Single Phase Power Supply Wiring Diagram*

## Optional Equipment

### Explosion Vents

**Note:** Standard explosion vents are intended for outdoor installations only.

**Caution!**

- Personal injury, death, or property damage can result from material discharge during venting.
- The material discharged from an enclosure during the venting of an explosion should be directed safely to an outside location.
- The risk of damage or injury can be minimized or avoided by locating vented equipment outside buildings and away from normally occupied areas.

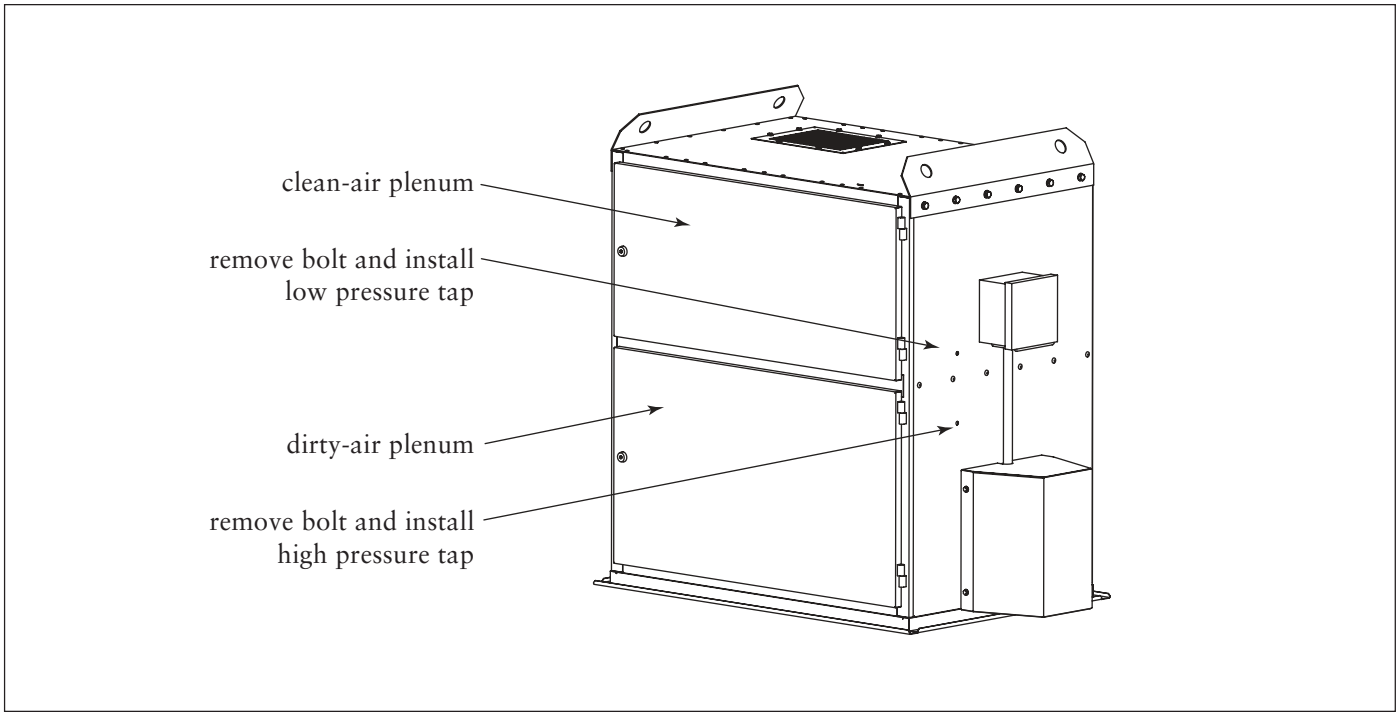
**Note:** Remove all shipping materials, including covers, from the explosion relief vents prior to installation. Failure to remove shipping covers will seriously compromise explosion vent operation.

- Explosion relief vents must be safely directed outdoors away from personnel, buildings, property, offices, walkways, and catwalks to reduce risk of damage to property and personal injury. Explosion venting calculations are based on formulas from NFPA-68, 1998 for outdoor applications only, with no duct or obstructions on the explosion vent panel.
- Explosion vents are suitable for negative pressure installations only.
- Contact Donaldson for assistance in calculating safe and specific venting requirements for Torit equipment.

### Magnehelic Gauge

The Magnehelic is a differential pressure gauge used to measure the pressure difference between the clean- and dirty-air plenum and provides a visual display of filter change requirements. Mount the high-pressure tap in the dirty-air plenum and the low-pressure tap in the clean-air plenum.

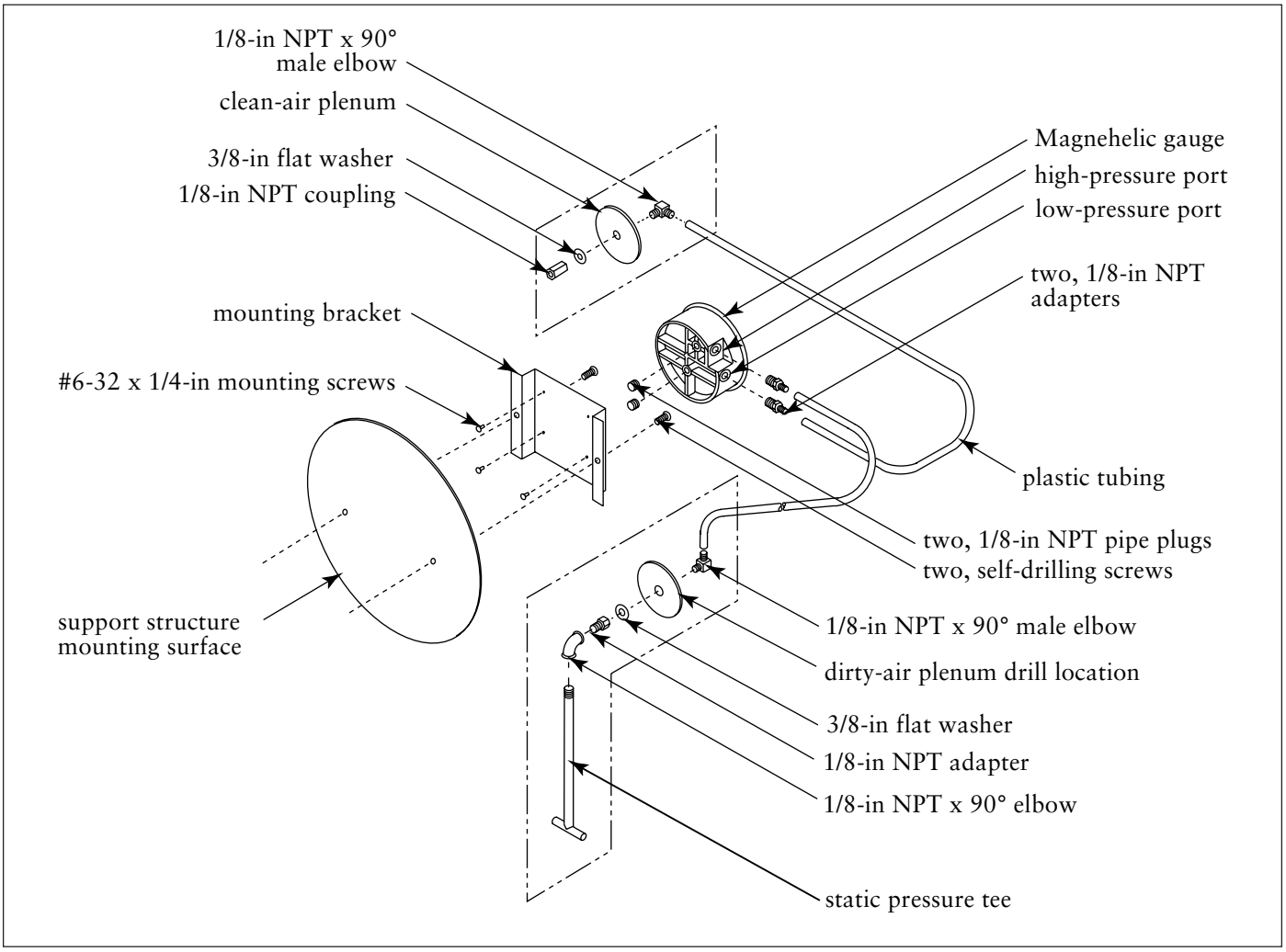
1. Choose a convenient, accessible location on or near the unit for mounting that provides the best visual advantage.
2. Mount the pressure tap hardware on the clean-air chamber panel. Mount the pressure tap with the tee inside the dirty-air chamber.
3. Plug the pressure ports on the back of the gauge using two, 1/8-in NPT pipe plugs. Install two 1/8-in NPT male adapters supplied with the gauge into the high- and low-pressure ports on the side of the gauge. Attach the mounting bracket using three, #6-32 x 1/4-in screws.
4. Mount the gauge and bracket assembly to the supporting structure using two, self-drilling screws.




*Magnehelic Gauge Pressure Tap Location*

5. Thirty-five feet of plastic tubing is supplied and must be cut in two sections. Connect one section of tubing from the gauge's high-pressure port to the pressure fitting located in the dirty-air chamber. Connect remaining tubing from the gauge's low-pressure port to the fitting in the clean-air chamber. Additional tubing can be ordered from your representative.

6. Zero and maintain the gauge as directed in the manufacturer's Operating and Maintenance Instructions provided.




*Magnehelic Gauge Assembly*

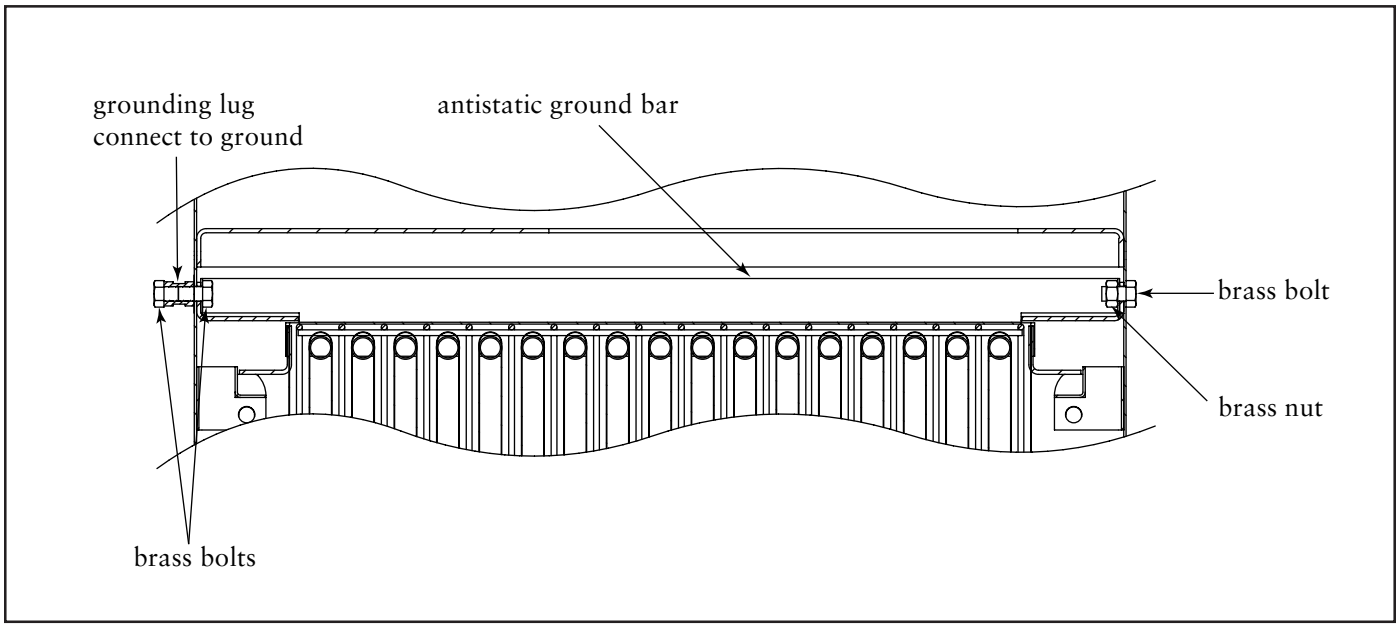
### Caster Base

Models UMA 40 to 250 must be lifted into the optional caster frame.

### Static Grounding

Units using antistatic filter bags must be properly grounded.

1. If the collector is ordered with antistatic filter bags, the grounding lug and internal components are factory installed.
2. Connect the grounding boss to ground using the grounding lug provided.




*Static Grounding*

## Preliminary Start-Up Check

1. Check all electrical connections for tightness and contact.
2. Check for and remove all loose items in or near the inlet and outlet of the unit.
3. Check that all remote controls are wired into the control system, and all service switches are in the OFF position.
4. Check that all optional accessories are installed properly and secure.
5. Check that hopper discharge is open and the storage container is sealed, if equipped. Excess airflow to the blower will cause electrical failure.
6. Turn power ON at source.
7. Turn the fan motor ON then OFF to check for proper rotation by referencing the rotation arrow located on the motor's mounting plate.

   **To reverse rotation, single-phase power supply:**

   Follow manufacturer's instructions on the motor's nameplate.

   **To reverse rotation, three-phase power supply:**

   Turn electrical power OFF at source and switch any two leads on the output-side of the fan-motor starter.

**Caution!**

- *Do not* look into fan outlet to determine rotation.
- Check that the exhaust plenum is free of tools or debris before checking blower/fan rotation.
- Stand clear of exhaust to avoid personal injury.

## Start-Up

Press the Start button on the controller panel to start the unit.

## Shut-Down

1. Press the Clean button on the controller.
2. The fan stops when fan run-down cycle is complete.
3. The cleaning cycle starts and when finished, the unit turns OFF.

## Service Information

**Caution!**

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

### Operational Checklist

1. Monitor overall performance of the collector.
2. Monitor exhaust.
3. Monitor pressure drop across filters.
4. Monitor dust disposal.

#### *Check Weekly*

1. Pressure drop across filters range from 1 to 6 "wg.
2. Inspect explosion relief vent, if equipped, for damage, snow, or ice.

#### *Check Monthly*

1. Door seals for condition and contact. Replace or adjust as necessary.
2. Check that the clean-air chamber is free of dust accumulation. If dust is present, check the surrounding filter bags for tears or loose seals.
3. Check rubber seals for tears and over compression.
4. Check that the shaker mechanism bolts are tight and secure. Check for diaphragm wear or damage, broken locators on the shaker bar, or torn shaker-bar support straps. Replace as necessary.

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### Filter Removal

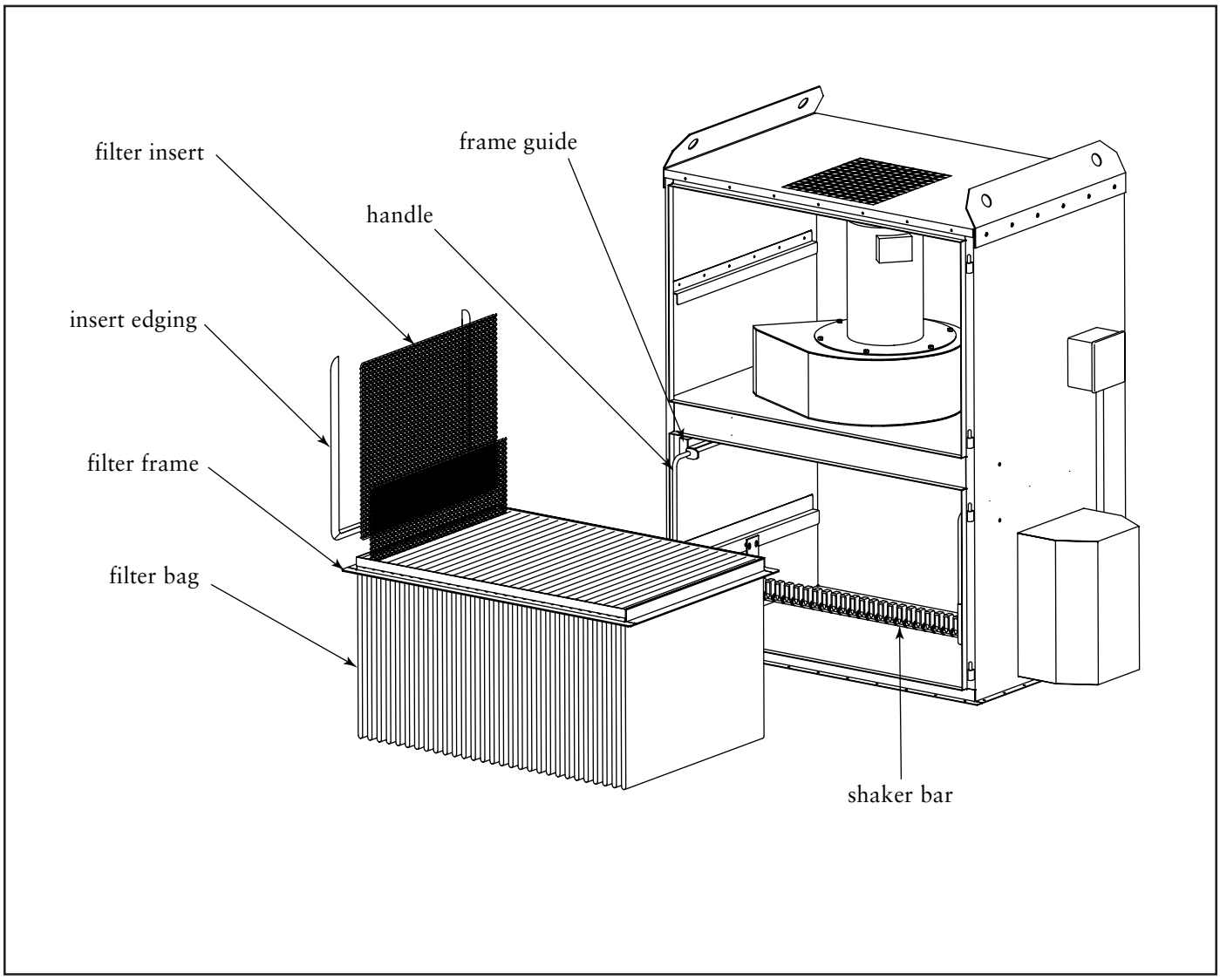
1. Lock out electrical power sources. Open and remove the filter access door.
2. Lower the retention handles in the bag chamber.
3. Slide the filter assembly out through the filter access door.
4. Remove filter inserts from filter bags. Check for broken mesh or worn material especially at the area of filter bag damage. Replace inserts as necessary.

**Caution!**

- Use proper safety and protective equipment when opening the collector to remove contaminants and filters.
- Dirty filters may be heavier than they appear.
- Use care when removing filters to avoid personal injury.
- Do not drop filters.

### Filter Replacement

1. Insert the filter bag into the filter frame placing individual filter pockets between the locating bars, and fold filter bag collar over the top flange.
2. Place insert edging around sides and bottom edges of each filter insert.
3. Insert one filter insert into each pocket of the filter bag.
4. Slide the filter assembly on the frame guides until the bottom corners of the filter bags contact the shaker bar.
5. Insert bag pockets into the shaker bar slots.
6. Push the filter assembly into the unit and check that all pockets are firmly seated in the shaker bar.
7. Lift retention handles.
8. Replace and secure the filter access door.




*Filter Removal and Replacement*

## Troubleshooting

| Problem | Probable Cause | Remedy |
|---|---|---|
| **Blower fan does not work** | Improper motor wire size | Rewire using the correct wire gauge as specified by national and local codes. |
| | Not wired correctly | Check and correct motor wiring for supply voltage. See motor manufacturer's wiring diagram. Follow wiring diagram and the National Electric Code. |
| | Unit not wired for available voltage | Correct wiring for proper supply voltage. |
| | Input circuit down | Check power supply to motor circuit on all leads. |
| | Electrical supply circuit down | Check power supply circuit for proper voltage. Check for fuse or circuit breaker fault. Replace as necessary. |
| **Partial loss of suction** | Filters plugged | Check that the dust container is not full and that the equipment served is operating. Turn fan OFF and allow the controller to perform several complete cleaning cycles. Remove filter bag, vacuum outside surface, and reinstall. Replace damaged or torn filter bags. |
| | Motor speed low | Check all supply voltage, phase, and motor connections. |
| | Fan rotation backward | Check and correct. See Preliminary Start-Up on Page 21. |
| **Total loss of suction** | Blower motor stopped | Check motor starter overloads, fuses, and interlocks. Check motor connections. |
| | Filters plugged | Check that the dust container is not full and that the equipment served is operating. Turn fan OFF and allow the controller to perform several complete cleaning cycles. Remove filter bag, vacuum outside surfaces, and reinstall. Replace damaged or torn filter bags. |
| | Obstructed ductwork | Check and remove obstructions. |
| **Clean-air outlet discharging dust** | Filter bags not installed correctly | See Filter Removal and Replacement on Page 22. |
| | Torn or damaged filter bags | Replace as necessary. |

## Service Notes

| Date | Service Performed | Notes |
|---|---|---|

## Service Notes

| Date | Service Performed | Notes |
|---|---|---|

## The Donaldson Torit Warranty

Donaldson warrants to the original purchaser that the major structural components of the goods will be free from defects in materials and workmanship for ten (10) years from the date of shipment, if properly installed, maintained and operated under normal conditions. Donaldson warrants all other Donaldson built components and accessories including Donaldson Airlocks, TBI Fans, TRB Fans, Fume Collector products and Donaldson built Afterfilter housings for twelve (12) months from date of shipment. Donaldson warrants Donaldson built filter elements to be free from defects in materials and workmanship for eighteen (18) months from date of shipment. Donaldson does not warrant against damages due to corrosion, abrasion, normal wear and tear, product modification, or product misapplication. Donaldson also makes no warranty whatsoever as to any goods manufactured or supplied by others including electric motors, fans and control components. After Donaldson has been given adequate opportunity to remedy any defects in material or workmanship, Donaldson 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 after confirming the goods are returned undamaged and in usable condition. Such a refund will be in the full extent of Donaldson's liability. Donaldson 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 a Director, General Manager or Vice President of Donaldson. Failure to use genuine Donaldson replacement parts may void this warranty. **THERE EXIST NO OTHER REPRESENTATIONS, WARRANTIES OR GUARANTEES EXCEPT AS STATED IN THIS PARAGRAPH AND ALL OTHER WARRANTIES INCLUDING MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, WHETHER EXPRESS OR IMPLIED ARE HEREBY EXPRESSLY EXCLUDED AND DISCLAIMED.**

## Parts and Service

For genuine Donaldson Torit replacement filters
and parts, call the Parts Express Line

**800-365-1331 USA**
**800-343-3639 within Mexico**

**www.donaldsontorit.com**

For faster service, have unit's model and serial number,
part number, description, and quantity available.

Donaldson®
*Filtration Solutions*

Donaldson Company, Inc.
Industrial Air Filtration
P.O. Box 1299
Minneapolis, MN 55440-1299
dustmktg@mail.donaldson.com

Donaldson Company, Inc. is the leading designer and manufacturer of dust, mist, and fume collection equipment used to control industrial-air pollutants. Our equipment is designed to help reduce occupational hazards, lengthen machine life, reduce in-plant maintenance requirements, and improve product quality.


Printed in USA
IOM AD3547701, Revision 1
November 2006