DIVERSITECH
air pollution solutions

Operation & Maintenance Manual

WB-4000-D

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CARTRIDGE DUST COLLECTOR

Weld Booth Model WB-4000D

IMPORTANT READ THIS MANUAL BEFORE INSTALLATION, OPERATION OR SERVICE.

By nature and variety of dusts, it is impossible to list all potential hazards related to dust control equipment or systems. Therefore, it is imperative that the application and use of this equipment be discussed with an DIVERSITECH distributor, and that this manual is read in its entirety and all personnel involved with this equipment are instructed to comply with the statements pertaining to safety.

- **INSTALLATION**
- **OPERATION**
- **SERVICE**

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PRECAUTIONARY STATEMENTS

APPLICATION OF DIVERSITECH CARTRIDGE DUST COLLECTORS

1. Due to potential fire hazards, do not mix combustible materials with material that would be a potential source of ignition.

Examples of Combustible Materials:

Wood Dust
Paper Dust
Lint from fabric or buffing wheels
Grinding dust from painted surfaces
Aluminum or magnesium dusts

Examples of Potential Ignition Sources

Grinding dust from ferrous metals
Hot ash or sparks from any source

2. Unless the equipment was originally designed for collection of explosive material and proper disclaimer on record this equipment must not be used for the collection of any materials where there is a risk of explosion. Pressure relief vents or explosion vents must not be applied to the equipment or adjoining systems.
3. Equipment location, installation and operation must comply with all National and Local Fire Codes. When in doubt contact the proper authorities.
4. The electrical installation must conform to all local codes and the National Electric Code.
5. Workers and operators are to be instructed to keep burning objects, such as cigarettes, safely away from inlets leading to the equipment.
6. All personnel involved with the use of this equipment must comply with the statements pertaining to worker safety as noted in this manual.

Introduction

DIVERSITECH Weld Booth Dust Collectors are designed to filter out solid particulate and dusts such as Weld fume and grinding dust. The cleaned air is then returned to the work space to eliminate the need to exhaust treated air. Once the unit is mounted, connection of electrical power and compressed air complete the installation.

Note: If the unit has the optional fire suppression system please refer to the Fire Trace Manual and Smoke Detector manual for maintenance information.

Explanation of Operation

During normal operation, contaminated air is pulled through the top section of the cartridge collector cabinet. The cabinet design distributes the contaminated air uniformly across the vertically arranged filter cartridges. A portion of the dust will collect on the surface of the cartridge media as the dust free air passes through the media, through the vertical venturi, into the horizontal clean air duct and to the blower for return to the work space. The dust that collects on the cartridge media will be repelled into the downward air flow by the reverse jet pulse cleaning system. This is controlled by a digital pulse control. At prescribed times a brief burst of compressed air will be released to a row of cartridge filters, fired upwards through the vertical venturi, into the core of the cartridge filter to impact the dust away from the filters surface. The dust is caught by the downward flow and once again moved towards the settling chamber. The dust drawer of the DIVERSITECH Collector contains no airflow inlets or outlets. In fact, airflow is never close to the dust drawer. This eliminates the possibility of re-entrainment of the dust once it gets into this section of the dust collector cabinet.

Initial Installation Considerations

The location of the unit(s) must be planned to maximize effective operation, service and maintenance. Should questions arise or assistance is needed consult your DIVERSITECH distributor.

After the installation, clearance must be available to service the following components:

1. Filters
2. Fan
3. Valves
4. Controls
5. Dust drawer

Inspection

Upon receipt, the collector and the optional components must be checked for damage or loss incurred during shipping. Damage must be noted on the bill of laden and a claim be filed with the carrier immediately.

Mechanical Installation of Weld Booth WD-4000D

Note:

Should question arise concerning total weight, consult your DIVERSITECH Distributor or the DIVERSITECH Factory.

1. Unbolt and remove the master booth from skid. (Master booth is the one with the dust collector on the top)
2. Rig and lift the master booth up and move it to the desired final position and anchor it to the floor.
3. Unbolt and remove the slave booth from the skid. **NOTE: THE SLAVE BOOTH CAN BE INSTALLED TO LEFT, RIGHT OR REAR OF THE MASTER BOOTH.**
4. Determine the desired location for the slave booth. Remove and **RETAIN** the access cover from the desired side of the master booth. The slave booth ships with only a cover on the back. (If the slave is to be positioned back to back with the master, remove and **RETAIN** the back cover**.)**
5. On the inside of each booth there is a hinged door allowing access to the spark filters. Open the hinged door and remove the spark filters in order to gain access to the nuts and bolts holding the covers and to facilitate connection of the booths.
6. Set the slave booth in desired place and bolt both booths together using the holes available.
7. Anchor the slave booth to the floor.
8. Install covers retained in earlier steps on all remaining openings on both booths.
9. Reinstall spark filters and secure hinged door.
10. Feed one light power supply cable through the hole provided in the top of the slave booth and connect the power cable to the light.
11. Connect compressed air and electrical per Installation Manual.

Compressed Air Supply

The compressed air supply is used to reverse jet pulse the dust coated cartridge filters. A 1" diameter (minimum) dedicated supply with 80-90 PSI is required. The air supply line to the accumulator tank must include water, oil and particulate filtration. Water and/or oil in the compressed air will reduce the effectiveness of the reverse jet pulse cleaning, destroy the

cartridge filters and cause excessive differential pressure across the filters resulting in greatly reduced air flow along with premature filter replacement.

Note:

The air line must be free of oil and water. Oil and/or water will destroy cartridge filters.

A customer supplied regulator with a 160 PSI gage must be installed to monitor air pressure. Prior to the final connection of the air line to the collector manifold, the air line should be purged. This will remove debris that could damage the valves and block the nozzles in the blow pipes.

Electrical / Controls

Note:

All of the electrical installation must be performed by a qualified electrician and in accordance with the local codes.

The blower motor operates with 208-230/460 volt, 60 cycle, and 3 phase electrical power unless specified otherwise with the equipment order. Electrical power is connected to the Motor Starter Control Box Located on the front of the collector. Inside the Motor Starter is a decal that confirms the voltage the motor was set up for at the factory. Should this need to be changed to the other voltage listed above, the motor will have to be rewired in accordance to the data label on the motor. Access the motor from the blower door of the collector.

The blower motor will need to be energized through a motor starter with over load protection. The electrical components must be sized and selected in accordance to the national electric code.
Nominal Full Load Amperes are as follows:

	Voltage			
Horse Power	**208V**	**230V**	**460V**	**575V**
3	10.0	8.0	4.0	3.5
5	15.00	13.0	6.5	5.0
7.5	20.0	18.0	9.0	7.0
10	30.0	24.0	12.0	10.0
15	40.0	37.0	18.5	15.0
20	55.0	48.0	24.0	20.0

The blower is designed to rotate clock wise when viewed from the motor side. If the blower is running in reverse, the air volume will be approximately 1/2 the designed air volume. Also, excessive noise will be generated. Once the motor is wired, energize the blower motor for a brief instant ("JOG"). Check the rotation and if it is in reverse, switch any two input wires of the 3 phases, (T1, T2, and T3).

When the reverse jet pulse cleaning system is initiated, a digital pulse control timer controls the air solenoid valves, releasing a brief burst of compressed air backwards through the filters to expel the collected dust off the filter cartridges and down towards the settling area.
The sequential timer can be activated by monitoring differential pressure across the filters and energizing the timer at a predetermined set point. The timer will continue the reverse jet pulse cleaning until differential pressure is reduced to a predetermined pressure.

Note:

A manual that details the operation of the pulse control is available under separate cover.

Pre-Start Up

Turn the fan "ON" for a brief instant (JOG) and check rotation. Rotation must be clockwise when viewed "OVER THE MOTOR" from the discharge side. If the rotation is correct start motor.

Check to assure that air leaks do not exist at the seams of any field assembled cabinet components such as Duct connections or the booth connections

Check the compressed air system for leaks. Confirm 80 PSI minimum air pressure and 90 maximum air pressure.

Assure the compression couplings of the pulse valves are tight.

Check each valve to assure each valve pulses as required.

Check each valve for leaks. It is normal for the bleed air port to release a burst of air at each pulse.

Check adequacy of air supply by assuring no less than 40%drop in pressure during pulse.

Filter Installation

Should the filter be shipped loose from the collector they must be installed as follows prior to start up?

Be sure the horizontal flange around the venturi is clean. With care not to damage filter cartridge place gasket side down on flange. Rotate filter slightly to assure no binding and proper location on the flange.

Most DIVERSITECH dust collectors use two filters, stacked vertically on each venturi. Position second filter directly on top of first filter, gasket side down and centered vertically with lower filter.

Place filter cap with gasket side down on top of the top filter cartridge and centered on opening. Turn "T" handle, clockwise, down against filter cap so that the dimple penetrates the threaded bore of the "T" handle. Continue to rotate "T" handle until gaskets are approximately 30%compressed.

Start Up

New filters should be properly pre-conditioned before start up. Factory pre-conditioned filters are available from DIVERSITECH. Filters not pre-conditioned can be conditioned in the field. Please contact your DIVERSITECH Distributor for assistance.

Start system fan and confirm the designed air volume and actual air volume are within 10%. If the air volume is more than the designed volume adjustments should be made to reduce the volume to the designed volume.

If air volume is low and the contaminant is not being captured, adjustments will need to be made. Consult your DIVERSITECH Distributor.

Apply compressed air to the manifold. Turn the reverse jet pulse control on. Apply power to other auxiliary equipment as required.

COMMENTS REGARDING FILTER DIFFERENTIAL PRESSURE DURING OPERATION:

Depending on dust loading and Air-To-Cloth Ratio, reaching equilibrium of filter differential pressure will vary from a few hours to many weeks. Low dust loading will normally develop 2-3" w.g. with normal loading 3-6" w.g. and with high loading 6 - 8" w.g.

Low dust loading typically shows a steady level of differential pressure with very little fluctuations once equilibrium is reached. By contrast, heavy loading can produce significant "Ups and Downs" in operating differential pressure.

Do make immediate "Off-Time" time reductions on the timer board dial if significant increases in operating differential pressure are discovered. However, if differential pressure drops, do not be too quick to increase "Off-Time", and then only in small steps.

NOTE:
A critical step in start up is to reach an acceptable operating equilibrium point. This must be reached gradually in order to not damage the filters by blinding. While achieving equilibrium, you want to clean the filters more often than required instead of not often enough. Gradually and tentatively increase valve "Off Time" until equilibrium is reached. Also, making notes and recording the results will help gage the effectiveness of various DIVERSITECH filters and filter pretreatment. Should questions arise contact your DIVERSITECH distributor.

Shutdown

Shutdown consists of shutting down the blower motor. With systems that include a "Cycle Down" feature the reverse jet pulse cleaning will be activated. This will clean the filter cartridges while the unit is off line, for a preset amount of time. Once the cleaning cycle is complete the collector is ready to be energized when needed.

Caution:
Off line cleaning can cause pressure waves to feed back through the inlet of the collector and the attached duct work. Precautions might be needed to prevent dusting.

Maintenance Safety

Care with the design of DIVERSITECH collectors has minimized safety hazards for the maintenance and production personnel.

Caution:
Personnel involved with the DIVERSITECH collector must be familiar with the operation and the information in this manual.

1. Only competent, safety conscious personnel should have access to the area.

2. Work crews should consist of 2 or more people.

3. All areas below the collector must be "OFF-LIMITS" when overhead work is performed.

4. Objects lifted by crane or hoist must be securely fastened and carefully handled to prevent injury.

Maintenance Procedures

With sound periodic and routine maintenance programs you will receive a long service life from your DIVERSITECH collector. Schedules should be changed as a result of experience, determined after a reasonable period of operation.

IMPORTANT: Please remove the spark baffle filters in each booth on a monthly basis and wash with detergent. Not cleaning these filters could result in a fire.

Routine maintenance consists of the following:

1. Observe the filter differential pressure at least once every 8 hours of operation. Each application will vary. Refer to "Comments Filter Differential Pressure during Operation" at the beginning of page 7.

2. Assure the collected dust is removed from the dust storage container as required.

3. Assure the predetermined cleaning schedule is proper to maintain pressure differential equilibrium.

4. Confirm the reverse jet pulse cleaning takes place at the predetermined schedule.

5. Observe compressed air supply to confirm pressure of 80 PSI minimum.

6. Perform general house keeping on collector and surrounding area.

Periodic maintenance consists of the following:

1. Replace filters when reverse jet pulse cleaning is no longer effective to reduce differential pressure to the normal operating range.

2. Clean the internal parts of the reverse jet pulse control with a quality electrical cleaning chemical.

3. Clean the internal components of the fan control.

4. Remove any accumulated dust from the pressure port that is connected to the Magnehelic Gage or Reverse Jet Pulse Control or both. This is located inside the dust collector on the dirty air side.

5. Replace the cartridge filter caps after every 4th filter change or before if failure of gasket seal occurs.

Note: Be certain the compressed air is off and the pressure relieved before servicing any components that contain compressed air.

6. Follow the manufacturer's maintenance schedule for the compressed air filters.

7. Tighten the couplings of the valves for the reverse jet pulse cleaning.

8. Remove any moisture that has accumulated in the compressed air manifold and accumulator.

9. Inspect and clean diaphragm valves. A thorough cleaning normally rectifies operational problems with valves; however any worn or damaged parts are to be replaced. Use the following procedure to inspect and repair valves:

A. Main Diaphragm
- a. Switch off air supply and drain the system.
- b. Unscrew the main diaphragm cover bolts and remove the valve cover.
- c. Inspect the spring and diaphragm for dust and damage. Remove dust with water and replace damaged parts with diaphragm repair kits for 1" or 1.5" valves.
- d. Replace valve cover and valve cover bolts.

B. Solenoid Diaphragm
- a. Switch off air supply and drain the system.
- b. Unscrew the bonnet bolts and remove the bonnet.
- c. Inspect the diaphragm for dust and damage. Remove dust with water and replace damaged parts with diaphragm repair kit for 1" or 1.5" valves.
- d. Replace the valve bonnet and valve bonnet bolts.

C. Solenoid Coil
- a. Switch off air supply and drain system.
- b. Apply proper voltage to the coil and listen for a pronounced "Click" as the pole moves.
- c. If a pronounced "Click" occurs and the valve does not function follow instructions for replacing the main diaphragm and solenoid diaphragm.
- d. If the "Click" is not heard, replace the solenoid with either a part for the 1" valve or for the 1.5" valve.

10. Check and replace if necessary the access door gaskets and dust drawer gaskets if applicable.

Cartridge Filter Replacement

Note: Depending on the contaminant being collected, it is advised to wear a dust respirator when handling dirty filters.

Turn the "T" handles counter-clockwise until clearance is obtained above the cartridge filter. Remove top cover from top of filter. Slide plastic bag over filter and pull it down to cover top filter and remove. Cover the bottom filter with a plastic bag and remove. Repeat this with all filters.

Note: Discard filters according to all local codes and regulations. Please help protect the environment.

Follow filter installation instructions on page 7 to replace filters.

Trouble Shooting Guide

Symptom	Possible Cause	Remedy
Blower does not start.	a. Open electrical supply circuit. b. Blower motor not wired for available voltage.	Trace circuit back from correct interruption. Rewire motor within motor box for proper voltage per motor data label.
Blower motor starts but does not continue operating.	a. Incorrect overload protection installed. b. Loose or incorrect termination of motor wiring. c. Incorrectly sized wire for motor load.	Replace overload protection with correctly sized components. Check all termination's of motor wiring. Rewire motor circuit with proper wire size.
Dust Discharge from Collector outlet.	a. Filter cartridges not properly installed. b. Damaged filter cartridge. c. Damaged filter cap(s). d. Worn filter cap. e. Loose filter clamping "T" Handle.	Reinstall filters according to page 8. Replace damaged filters. Replace damaged filter cap(s). Replace all filter caps. Tighten loose "T" Handle.
Insufficient Air Flow	a. Blower rotating backwards. b. Collector not sealed properly. c. Blower exhaust area blocked. d. Filter cartridges need to be	Check blower rotation. Blower should be rotating clockwise when viewed looking down over the motor. Refer to page 5 under Electrical for changing rotation direction. Check that all access panels, doors, dust drawers, drum lids and flex hose connections are tight. Check exhaust area for blockage and eliminate all material that causes restrictions. Remove and replace filter cartridges

	replaced.	per instructions on page 11.
Symptom	**Possible Cause**	**Remedy**
	e. Compressed air volume inadequate.	Increase available air volume. Refer to page 5.
	f. Compressed air pressure inadequate.	Increase air pressure to Maximum of 100 PSI.
	g. Compressed air contaminated with oil or water.	Eliminate source of contamination and purge compressed air line.
	h. Pulse cleaning not working.	Confirm input power to timer board or controller. Refer to pulse control manual for further information.
	i. Pulse cleaning not set up as required.	The “on-time” and “off-time” must be set to optimize filter pressure differential equilibrium. Refer to pages 6 and 7 of this manual and to the timer board controller manual for additional detail.
	j. Reverse jet pulse valves not operating.	Clean, repair or replace valves. Refer to page 8.

REPLACEMENT PARTS LIST
DIVERSITECH MODEL WB-4000DCA

PART DESCRIPTION	PART NO.	QTY. PER UNIT
Filter, Cartridge 351D91A3292	2493	X each
Plate, Filter Cap with gasket	1222	X each
"T" Handle, Filter Clamp	1224	X each
"T" Handle, Access Door Latch	1023	X each
Gasket, Door Seal	1214	X feet
Valve, 1.5" Double Diaphragm	1221	X each
Motor, XX HP 3 Phase, 3500 RPM, TEFC	1041	X each
Fan Wheel XX"	1052	X each
Venturi, Inlet, XX"	1054	X each
Control, Reverse Jet Pulse, IT-X	1458	1 each

LIMITED EQUIPMENT WARRANTY

For a period of 2 years from the date of purchase, all Diversitech products are warranted to be free from defects in material, workmanship, and construction, when used in accordance with installation, maintenance instructions, and expressly stated proper use application(s). Diversitech Inc. will repair or replace, at our option, any defective parts which fail during the warranty period. This warranty is limited to replacement parts ONLY, and does not cover personal liability, property loss, normal wear; and does not cover losses resulting from (or due to) improper installation, inadaqueate maintenance, misapplication, misuse, or use above rated capacities.

FREIGHT CLAIMS

Shipments must be inspected upon arrival. All Diversitech units are sold ex-plant. Therefore, it is the receiver's responsibility to file any freight claims with the carrier for obvious or concealed damages. Damaged shipments must be refused at time of receipt, by consignee.

RETURN MATERIAL POLICY

Prior to the return of material, for whatever reason, a return manufacturing authorization number (RMA#) is required from the Diversitech customer service department. This procedure is necessary for proper control and handling of returned materials. Call 1-800-361-3733 or email support@diversitech.ca to obtain an RMA.

All material must be returned prepaid. Credit will be given for returns for warranty repair or replacement. Freight collect shipments, or freight without an RMA, will not be accepted. It is the shipper's responsibility to ensure that material being returned to Diversitech is adequately packaged for shipment to preclude damages.

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