



AIRWALL® DUST COLLECTION SYSTEM

**INSTALLATION, OPERATION, MAINTENANCE
AND REPLACEMENT PARTS MANUAL**

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PULSE SYSTEM WIRING DCT (D Size)

SAFETY SUMMARY

SAFETY PRECAUTIONS

These safety precautions have been prepared to assist the operator in practicing good shop safety procedures.

These safety precautions are to be used as a guide and supplement to all other safety precautions and warnings in:

- a. all other manuals pertaining to machines, controls and auxiliary equipment.
- b. local, plant and shop safety rules and codes.
- c. federal and state safety laws and regulations.

See the latest edition of the OCCUPATIONAL SAFETY AND HEALTH STANDARDS, available from the DEPARTMENT OF LABOR, WASHINGTON, D.C.

WARNING

Read all the Safety Precautions in this chapter before operating the equipment. Failure to follow this precaution may result in severe bodily injury.

GENERAL SAFETY INSTRUCTIONS AND CONSIDERATIONS

Machine owners and operating personnel must be aware that constant, day-to-day safety practices are a vital part of their job. Accident prevention must be one of the principal objectives of the job regardless of what activity is involved.

Know and respect your machinery. Read and practice the prescribed safety and checking procedures. Make sure that everyone who works for, with or near you fully understands, and, more importantly, complies with the following safety precautions and procedures.

PERSONAL SAFETY

Avoid sudden movement, loud noises and horse-play. Distractions may result in unsafe conditions for those working near equipment. Equipment can and will cause extensive damage and/or injury if the practice of horse-play is not totally prohibited.

SAFETY SUMMARY

Observe and follow safety instructions such as NO SMOKING, HIGH VOLTAGE and DANGER in your working area.

Accidents can occur that result in serious injury to you or others due to clothing and other articles becoming entangled or in contact with revolving parts, levers and electrical equipment.

- a. Do not wear neckties, scarves or loose-fitting clothing.
- b. Do not wear jewelry such as bracelets, watches, rings or necklaces.

Use safety protective equipment. An OSHA-NIOSH approved respirator must be worn at all times while blasting, changing filter cartridges, emptying dust collection drawers, and when handling media that contains free levels of silica and toxic material that are in excess of those allowed by applicable OSHA, USEPA, ACGIH or NIOSH regulations and recommendations. Wear clean, approved eye or face protection. Keep your protective equipment in good condition. Wear sturdy safety-toe shoes with slip-proof soles.

The following chart lists the permissible noise level exposures for hourly duration.

Permissible Noise Exposures

<u>Duration per</u> <u>Day, Hour</u>	<u>Sound Level dBa</u> <u>Slow response A Scale</u>
8	90
6	92
4	95
3	97
2	100
1	105
1/2	110
1/4 or less	115

Make sure the hearing protection is in good working order and replace as necessary. Wear hearing protection whenever you are in a noisy environment, such as a media blasting area, and when equipment is in operation. Noise from a blasting operation can exceed 120 dBa. See WARNING next page.

SAFETY SUMMARY

WARNING

Wear hearing protection whenever you are in a noisy environment, such as a blasting area, and when equipment is operating. Failure to follow this precaution may result in severe bodily injury.

WORK AREA SAFETY

Keep your work area clean. Dirty work areas with such hazards as oil, debris or water on the floor may cause someone to fall to the floor, into the machine or onto other objects, resulting in severe bodily injury.

Make sure your work area is free of hazardous obstructions and be aware of protruding equipment components.

Return tools and similar equipment to their proper storage place immediately after use. Keep work benches neat, orderly and clean.

Report unsafe working conditions to your supervisor or safety department. Worn or broken flooring, ladders and handrails, unstable or slippery platforms or scaffolds must be repaired before use. Do not use skids, stock, media drums or boxes as makeshift climbing aides.

LIFTING AND CARRYING SAFETY

Contact supervision if you have any questions or are not sure about the proper procedures for lifting and carrying.

Before lifting or carrying an object, determine the weight and size by referring to such things as tags, shipping data, labels and marked information or manuals.

Use power hoists or other mechanical lifting and carrying equipment for heavy, bulky or hard-to-handle objects. Use hookup methods recommended by your safety department. Know and use the signals for safely directing a crane operator. See WARNING next page.

If in doubt as to the size or type of lifting equipment, method or procedure for lifting, contact EnviroSystems Manufacturing, LLC before proceeding to lift the equipment or its components.

SAFETY SUMMARY

WARNING

Never place any part of your body under a suspended load or move a suspended load over any part of another person's body. Before lifting, be certain that you have a safe location for depositing the load. Never work on a component while it is hanging from a crane or other lifting mechanism. Failure to follow this precaution may result in severe bodily injury or death.

Always inspect slings, chains, hoists and other lifting devices prior to use. Do not use lifting devices, which are defective or questionable. Never use lifting devices, which have been painted as the paint, can hide stress or fatigue cracks.

Never exceed the safety rated capacity of cranes, eyebolts, hoists, slings or other lifting equipment. Follow standards and instructions applicable to any lifting equipment used.

SETUP AND OPERATION SAFETY

Do not set up or operate any machine until you read and understand all safety instructions.

Assign only qualified, fully trained personnel, instructed in safety and all machine functions, to operate any equipment.

Operators must carefully read, understand and fully comply with all machine-mounted warning and instruction plates. Do not paint over, alter or deface these plates. Replace all plates, which become illegible

Do not operate machinery with safety guards, shields, barriers, covers or other protective devices disconnected, removed or out of place. Interlocks are provided for various units. Do not remove or bypass them.

Never lean on a machine or reach over or through a machine. You may become caught between moving elements or you may accidentally activate start buttons or similar devices.

Be attentive during operation. Excessive vibration, unusual sounds, etc. can indicate problems requiring your immediate attention.

System power must be off if the equipment is left unattended. Shut off power to a machine when you leave the operating area or at the end of your work period. Never leave the machine running unattended. Make sure system power is off before cleaning

SAFETY SUMMARY

any machinery.

Working space around electrical equipment must be clear of obstructions. Provide adequate illumination to allow for proper operation.

MAINTENANCE SAFETY

Do not perform maintenance on this machine until you read and understand all the safety instructions. Assign only qualified service or maintenance personnel to perform maintenance and repair work on this machine. Consult the maintenance sections in this manual before starting any service or repair work. When in doubt, contact EnviroSystems Manufacturing, LLC, Tucson, Arizona.

Before removing or opening any electrical enclosure, cover, plate, or door, make sure the main disconnect switch is in the OFF position. Post a sign at the disconnect switch indicating that maintenance work is being performed. Working space around electrical equipment must be clear of obstructions. Provide adequate lighting to allow for proper operation and maintenance.

Before working on electrical circuits, turn the main disconnect switch OFF and lock it.

When removing electrical equipment, place numbered or labeled tags on those wires not marked. If wiring is replaced, make sure it is of the same type, length, and size and has the same load carrying capacity. An electrical technician must analyze the electrical system to determine the possible use of power retaining devices such as capacitors. Such power retaining devices must be disconnected, discharged, or made safe before maintenance is performed.

Unless expressly stated in applicable EnviroSystems Manufacturing, LLC documentation or by an EnviroSystems Manufacturing, LLC representative, do NOT work with electrical power "ON". If such statement or advice exists, working with electrical power "ON" should be performed by an EnviroSystems Manufacturing, LLC representative. The user must determine that any other person performing work with electrical power "ON" is trained and technically qualified. See DANGER: HIGH VOLTAGE next page.

DANGER: HIGH VOLTAGE

Before working on any electrical circuits, turn the machine main disconnect switch "OFF" and lock it.

Unless expressly stated in applicable EnviroSystems Manufacturing, LLC documentation or by an EnviroSystems Manufacturing, LLC representative, do NOT work with electrical power "ON".

SAFETY SUMMARY

If such statement or advice exists, working with electrical power "ON" should be performed by an EnviroSystems Manufacturing, LLC representative. The user must determine that any other person performing work with electrical power "ON" is trained and technically qualified.

Failure to follow this precaution may result in severe bodily injury or death.

DESCRIPTION AND SPECIFICATIONS

INTRODUCTION

The AirWall dust collection system is a stand-alone unit that may be installed in an existing booth or supplied as part of a turnkey EnviroSystems, LLC (ES) Contamination Control Booth (CCB) or blast booth. Capacities range from 4,000 to 16,000 cfm per unit.. Specifications are listed at the end of this chapter.

Because of the cfm capacity range, the AirWall units can be configured to meet required linear air flows for practically any size contamination control booth (CCB) or blast booth. Average airflow for a blast booth is 50 linear feet per minute. To determine the correct size AirWall unit for an example booth 16 ft. wide x 10 ft. high x 30 ft. long (Note: length is not a factor in the following equations):

Multiply width x height: $16 \times 10 = 160$ sq. ft.

Multiply sq. ft. x 50 fpm: $160 \text{ sq. ft.} \times 50 \text{ fpm} = 8000 \text{ cfm}$

Therefore, the example booth would require an AirWall unit with an 8,000 cfm capacity to maintain 50 linear feet per minute airflow.

The compact design of the AirWall unit permits installing two (2) or more units side-by-side to increase ventilation rates.

SYSTEM DESCRIPTION

The AirWall unit is designed with large area air inlets, resulting in low static pressure requirements. This allows the use of relatively low horsepower motors and low decibel level blowers. This results in cost efficient ventilation of large, dusty environments such as abrasive blasting, foundry or grinding operations, or any installation where airborne particles are a problem.

Note: AirWall units are not provided with explosion vents since, due to their design, the inlet air baffles provide this function.

Incoming air passes through the baffles on the front inlet where large or heavy particles are stopped and drop to the floor. This pre-separates the heavier particles. The dust-laden air then passes through the filter medium from the outside to the inside of the filter cartridges and out the open top of each cartridge. This leaves the dust on the outside surface of the cartridges. The filtered air then flows from the cartridges into the clean-air plenum above the filter cartridges where it is pulled into the fan inlet and exhausted.

DESCRIPTION AND SPECIFICATIONS

Options for the AirWall dust collection unit include:

1. Time delayed cleaning feature to provide automatic reverse pulsejet cleaning of filter cartridges during non-working hours.
2. Integrated control panel including disconnect, motor starter(s), control transformer, Photohelic gage and switch, and indicator lights. Up to four (4) AirWall units may be controlled from the central control panel.
3. Hoppers for use with large collection drums or a pneumatic conveying duct to transfer dust to a central collection point.
4. HEPA (High Efficiency Particulate Air) filter package.
5. Fan silencers to further reduce noise levels.

Each AirWall unit can provide filtration for a variety of dust or other airborne contaminants, removing sub-micron particles at a high efficiency rate. This allows the exhaust air to be redirected back into the workplace. This results in substantial cost savings from the conservation of energy otherwise required to heat or air condition the workplace, since none of this air needs to be exhausted to the outside.

FILTER CLEANING

Filter cleaning is accomplished by actuating a short burst of air that blows back-ward from the clean side of the cartridge. This dislodges the caked dust that then drops into collection drawers or optional dust collection hoppers. Each pulse cleans three filter cartridges leaving the remaining cartridges available to continue filtering the ventilation air. This allows the cleaning to take place without the need to stop the air ventilation system.

Descriptions of certain main filter cartridge cleaning system components are as follows:

1. Photohelic Gage and Switch. This device, monitors pressure differential between the dirty side and the clean side of the filter cartridges. The Photohelic gage has a black indicator needle, which reads from 0 to 4 in. of water gage s.p. (w.g.) (static pressure, water gage) vacuum differential. The normal operating range of the AirWall unit filter cartridges is between 2.0 and 3.0 in. s.p. (w.g.) vacuum differential. Two small knobs on the front of the gage establish two different set points – one low and one high.

The HIGH set point (right knob) is established at the point when the cleaning cycle is to start, normally about 3.0 in. s.p. (w.g.). The LOW set point (left knob) is established at the point when the cleaning cycle is to stop, normally about 2.0 in. s.p. (w.g.) vacuum differential.

DESCRIPTION AND SPECIFICATIONS

2. **Timer Control Board.** This solid state device controls the cleaning cycle of the filter cartridges. When the indicating needle on the Photohelic gage reaches the HIGH set point, a relay signals the timer control board to start the cleaning cycle. The timer control board then initiates a series of timed pulses, cleaning three filter cartridges with each pulse. This sequence starts left-to-right (facing the air inlet). The length of each pulse is adjustable from .05 to .5 second with the normal pulse time being 0.3 second.

A time delay between each pulse allows the air accumulator tank to recharge for the next pulse. This delay is adjustable between 8 and 180 seconds with the normal delay for the standard system being 8 seconds.

During the cleaning cycle, the controller will pulse each set or filter cartridges in turn until the pressure differential drops below the LOW set point on the Photohelic gage. When the LOW set point is reached, the cleaning cycle stops until the HIGH set point is again reached.

The timer control board's memory feature remembers which filter cartridge set was the last one cleaned. The next cleaning cycle will start with the next filter element in line. This feature ensures that all filter cartridges receive the same cleaning regardless of their position in the cycle.

NOTE: Because controller memory is lost when power is turned off, the manufacturer recommends that power to the timer control board be left on. Turning power to the control box off on a daily basis will defeat the memory function causing some filter cartridges to be cleaned more often than others.

3. **Air Pressure Accumulator Tank.** An air pressure accumulator tank is provided with five (5) 1 in. NPT valve connections and one (1) 1 in. air supply connection. A safety pressure relief valve is also installed on this tank. The entire capacity is released in one (1) pulse each time one of the diaphragm valves is opened.
4. **Solenoid Valves.** There are three (3) or five (5) solenoid-operated pilot valves in the AirWall unit. Each operates one (1) large diaphragm valve. The pilot valve releases a small amount of pressure, allowing a control diaphragm to depressurize and open a 1 in. diameter valve. Each pilot solenoid is energized in turn by the timer control board.
5. **Diaphragm Valves.** There are three (3) or five (5) pilot-operated diaphragm valves in each AirWall unit. When the pilot solenoid releases the

DESCRIPTION AND SPECIFICATIONS

diaphragm pressure holding the valve closed, the valve snaps open, immediately releasing the contents of the air accumulator tank through the opening in the valve and into a pulsejet blow pipe.

6. Pulsejet Blow Pipe. Each pulsejet blowpipe, located in the upper AirWall frame, contains three (3) orifices. These orifices are positioned above, and directed into, the opening of the filter cartridge through the tube sheet. As the pulse of air reaches the filter cartridge opening it travels down the entire length of the inside of the filter cartridge, dislodging the dust from the filter cartridge.

DESCRIPTION AND SPECIFICATIONS

AIRWALL SPECIFICATIONS

Model	AW LD-40	AW LD-60	AW LD-80
<u>Unit Dimensions</u>			
<u>Height</u> (Excludes Blower Height)			
Inch	60	60	60
(mm)	(1524)	(1524)	(1524)
<u>Width</u>			
Inch	45	45	45
(mm)	(1143)	(1143)	(1143)
<u>Depth</u>			
Inch	45	45	45
(mm)	(1143)	(1143)	(1143)
<u>Blower Dimensions</u>			
<u>Height</u>			
Inch	30.6	31.7	36.9
(mm)	(777)	(805)	(937)
<u>Width</u>			
Inch	36.2	39.9	43.9
(mm)	(920)	(1014)	(1115)
<u>Depth</u>			
Inch	33.1	36.5	40.1
(mm)	(841)	(927)	(1019)
<u>Blower</u>			
No.	1	1	1
<u>HP</u>			
(KW)	3	5	7.5
	(2,2)	(3,7)	(5,6)
<u>CFM</u>			
(Cu M/MIN)	4000	6000	8000
	(113)	(170)	(227)

DESCRIPTION AND SPECIFICATIONS

Filter cartridges (Standard)

No.	9	9	9
Total Filter Area			
Sq. Ft.	2160	2160	2160
(Sq. M)	(194)	(194)	(194)
Air-To-Filter Ratio	1.8:1	2.78:1	3.7:1

Air Requirements

Pulse Air Supply: 1.8 CFM @ 90 – 100 psi (6,2 – 6,9 bars)

Electrical Requirements

Fan Motor: 208/230/460 VAC, 3-phase, 60 Hz

Pulse System: 120 VAC, 1-Phase, 60 Hz

DESCRIPTION AND SPECIFICATIONS

AIRWALL SPECIFICATIONS

Model	AW MD-60	AW MD-80	AW MD-100
<u>Unit Dimensions</u>			
<u>Height</u> (Excludes Blower Height)			
Inch	60	60	60
(mm)	(1524)	(1524)	(1524)
<u>Width</u>			
Inch	80	80	80
(mm)	(2032)	(2032)	(2032)
<u>Depth</u>			
Inch	48	48	48
(mm)	(1219)	(1219)	(1219)
<u>Blower Dimensions</u>			
<u>Height</u>			
Inch	31.7	36.9	39.9
(mm)	(805)	(937)	(1014)
<u>Width</u>			
Inch	39.9	43.9	48.2
(mm)	(1014)	(1115)	(1224)
<u>Depth</u>			
Inch	36.5	40.1	42.4
(mm)	(927)	(1019)	(1077)
<u>Blower</u>			
No.	1	1	1
HP	5	7,5	10
(KW)	(3,7)	(5,6)	(7,5)
CFM	6,000	8,000	10,000
(Cu M/MIN)	(170)	(227)	(283)

DESCRIPTION AND SPECIFICATIONS

Filter cartridges (Standard)

No.	15	15	15
Total Filter Area			
Sq. Ft.	3,600	3,600	3,600
(Sq. M)	(334)	(334)	(334)
Air-To-Filter Ratio	2.5:1	2.22: 1?	2.78:1

Air Requirements

Pulse Air Supply: 1.8 CFM @ 90 – 100 psi (6,2 – 6,9 bars)

Electrical Requirements

Fan Motor: 208/230/460 VAC, 3-phase, 60 Hz

Pulse System: 120 VAC, 1-Phase, 60 Hz

DESCRIPTION AND SPECIFICATIONS

Model	AW HD-100	AW HD-120	AW HD-160
<u>Unit Dimensions</u>			
<u>Height (Excludes Blower Height)</u>			
Inch	96	96	96
(mm)	(2438)	(2438)	(2438)
<u>Width</u>			
Inch	80	80	80
(mm)	(2032)	(2032)	(2032)
<u>Depth</u>			
Inch	48	48	48
(mm)	(1219)	(1219)	(1219)
<u>Blower Dimensions</u>			
<u>Height</u>			
Inch	39.9	37.5	52.1
(mm)	(1014)	(953)	(1323)
<u>Width</u>			
Inch	48.2	52.9	52.9
(mm)	(1224)	(1344)	(1344)
<u>Depth</u>			
Inch	42.3	48.9	48.9
(mm)	(1074)	(1242)	(1242)
<u>Blower</u>			
No.	1	1	1
<u>HP</u>			
(KW)	10	15	20
	(7,5)	(11,2)	(14,9)
<u>CFM</u>			
(Cu M/MIN)	10,000	12,000	16,000
	(284)	(340)	(454)

DESCRIPTION AND SPECIFICATIONS

Filter cartridges (Standard)

No.	15	20	30
Total Filter Area			
Sq. Ft.	3,600	4,725	6,975
(Sq. M)	(324)	(425)	(628)
Air-To-Filter Ratio	2.5:1	2.22: 1	2.78:1

Air Requirements

Pulse Air Supply: 1.8 CFM @ 90 – 100 psi (6,2 – 6,9 bars)

Electrical Requirements

Fan Motor: 208/230/460 VAC, 3-phase, 60 Hz

Pulse System: 120 VAC, 1-Phase, 60 Hz

INSTALLATION and START-UP

GENERAL INFORMATION

The AirWall dust collection unit will arrive disassembled for shipment and must be reassembled by the customer or his agent. Unit assembly, with the exception of the electrical and air connections, can usually be accomplished by anyone with a basic understanding of common hand tools.

Besides a common set of hand tools, a forklift or chain-fall will be required to position the fan and motor on top of the AirWall unit clean-air plenum.

NOTE: EnviroSystems Manufacturing, LLC (ES) must rely on the skill and expertise of its customers and the customer's installation contractor to ensure that all electrical connections are made correctly and air connections and regulation devices are installed and operating properly.

UNCRATING AND INSPECTION

The AirWall unit and related components are shipped on separate skids and some of these components may be drop shipped directly from an approved ES vendor to shorten delivery time.

NOTE: Use extreme care when handling the unit and components. Careless handling can damage delicate parts or affect alignments.

Compare the number of items received against the carrier's Bill of lading. Inspect all items for apparent damage. Immediately report any shortages or obvious damage to the carrier and to ES.

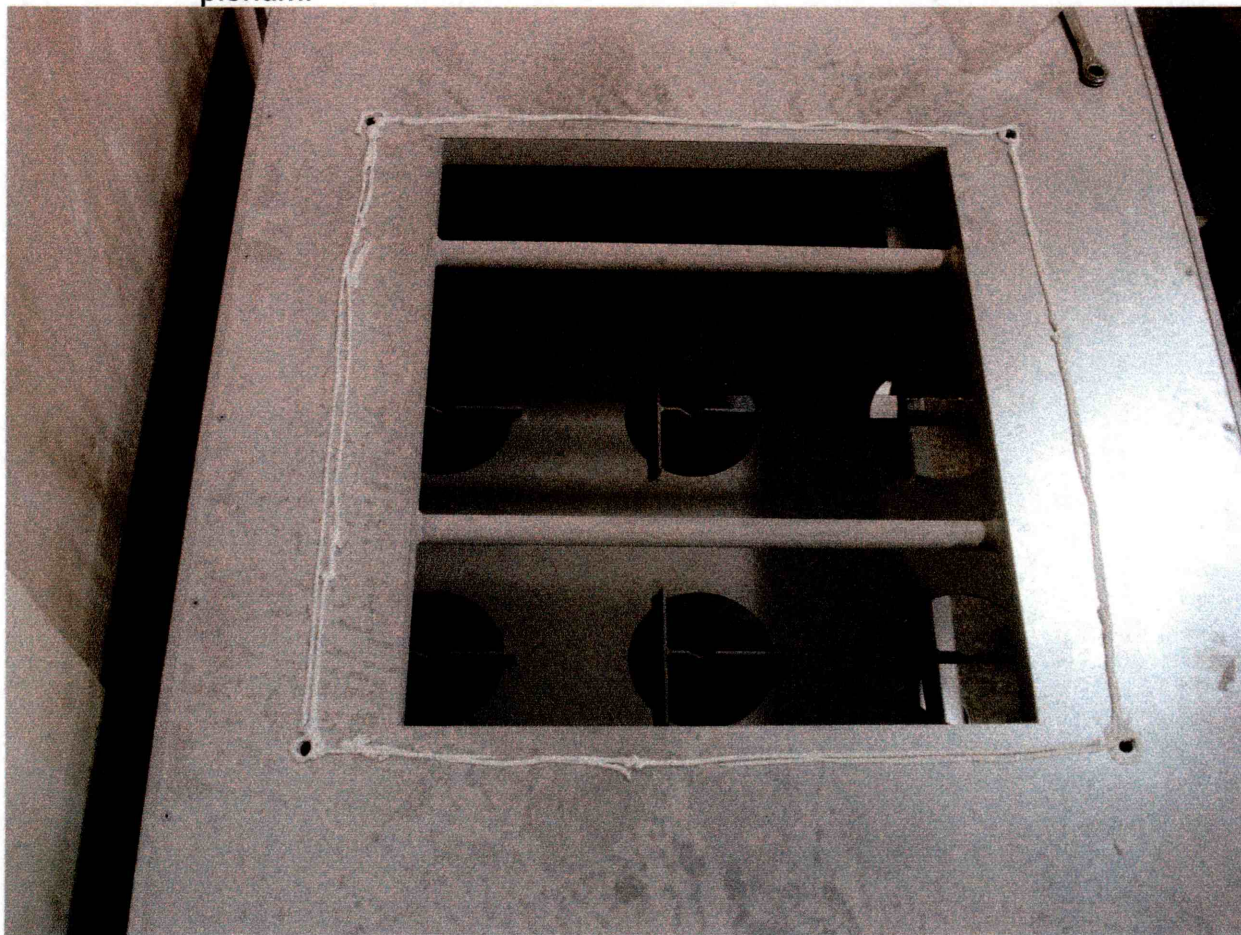
NOTE: Do not return any damaged components without first contacting ES.

POSITIONING FOR ASSEMBLY

1. Position the AirWall unit filter section where it will be permanently located.
2. Check all setscrews and bolts on the exhaust fan/motor assembly to make sure they have not loosened in transit. If necessary, retighten the setscrews and bolts.
3. Rotate the fan impeller by hand to make sure it has not shifted in transit or been damaged during shipment.
4. Open the access door, located in the clean-air plenum, above the inlet baffles on the front of the AirWall unit.

INSTALLATION and START-UP

5. Apply a bead of sealant around the fan inlet opening on top of the cleaning plenum.

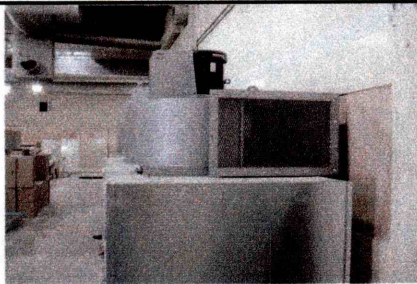


6. Use a forklift or chain-fall to lift the exhaust fan and motor assembly into position on top of the filter cartridge section clean-air plenum. See CAUTION.

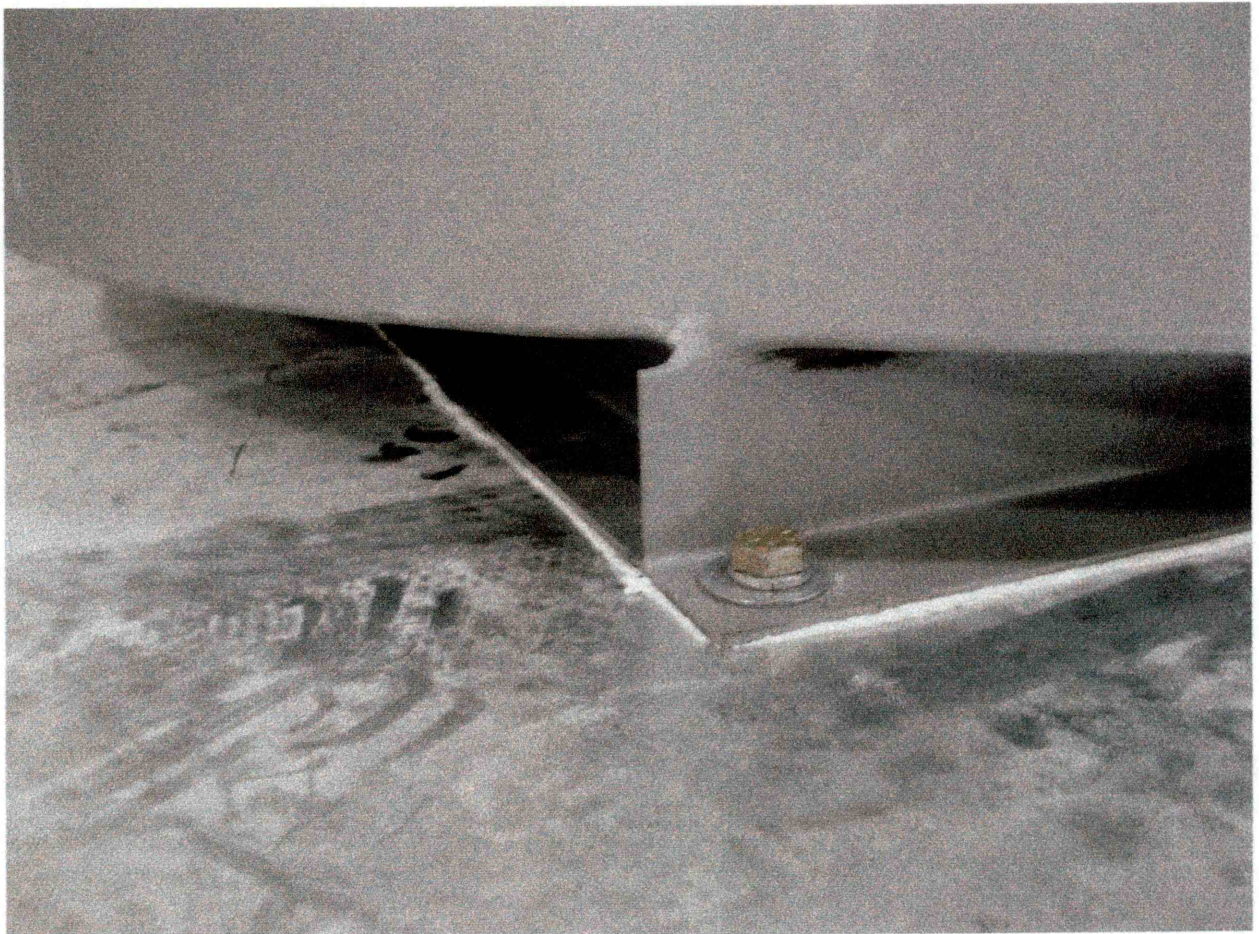
CAUTION

Do not hoist the fan-motor assembly by lifting on the fan or shaft. Failure to follow this instruction may cause damage to the fan/motor components.

INSTALLATION and START-UP



7. Position the fan exhaust pointing off any one of the four sides. If the exhaust is to be pointed off the side of the AirWall unit, the front and rear clearance will change depending on which side the exhaust is pointed. Align the mounting holes in the fan/motor assembly with the mounting holes in the top plate of the clean-air plenum.
8. Use the 2 1/2" bolts, flat washers, and flange nuts to secure the assembly firmly into place. Wipe away any sealant, which may have squeezed out.



10. If HEPA (High Efficiency Particulate Air) filters have been specified, attach them at this time. General instructions are as follows:

INSTALLATION and START-UP

- a. Apply sealant, or a closed-cell foam gasket material, to the flange attachment surface on the inlet side of the safety filter assembly. Attach the transition duct, using the duct flange doublers provided.
- b. Move the filter assembly, together with any required transition ducting up to the rear of the AirWall unit. Align the open end of the transition ducting with the fan exhaust duct flange. Apply sealant or a closed-cell foam gasket material to the fan exhaust flange-mating surface.

NOTE: In reference to Steps A and B, neither a support platform nor a transition duct is provided due to differences in facility installation.

- c. Open the access doors.
- d. Slide the pre-filters into the slots provided. Make sure the air flow direction is correct.
- e. Install the HEPA or safety filter on the back wall of the filter stand. The gasket will seat on the metal frame. Once the filter is in place, swing the locking bolts into position so that the locking bolts hook on the edge of the filter corners.
- f. Evenly tighten all four (4) corners to 29 in. lbs. (3,3 Nm).
- g. Close the access doors. Position the positive sealing latches on both sides of the access doors and tighten to provide a 50 percent gasket compression.

NOTE: Refer to the HEPA filter manufacturer's product documentation for specific information regarding your HEPA application or installation.

ELECTRICAL CONNECTIONS

The electrical requirements for the exhaust blower motor are 208/230/460 VAC, 3-phase, 60 Hz power. Only a qualified electrician should connect this device to an appropriate motor starter.

NOTE: Whenever possible, EECI attempts to deliver the fan motor wired for your specific voltage requirements. It is recommended, however, that your electrician verify the motor terminal connections to ensure proper wiring for your installation.

The electrical requirements for the Photohelic gage and switch are 120 VAC, single phase, 60 Hz. Only a qualified electrician should make the connection of this device.

THIS DOCUMENT AND THE DATA DISCLOSED HEREIN AND HEREWITH IS NOT TO BE REPRODUCED USED OR DISCLOSED IN WHOLE OR IN PART TO ANYONE WITHOUT THE WRITTEN AUTHORIZATION OF ENVIROSYSTEMS.

TABLE 1: REVISION HISTORY

REV	DATE	CHANGE DESCRIPTION
C	8/15/92	IMMERSION TANK WIRING
B	8/15/92	IMMERSION TANK WIRING
A	8/15/92	LAC UPDATE

TABLE 2: APPROVALS

APPROVALS	DATE
DESIGN: KEA	2/15/92
CHECKED: TLD	2/18/92
TEST: TLD	1/10/92
REVIEWED: KEA	1/10/92

TABLE 3: FUNCTION VALUES

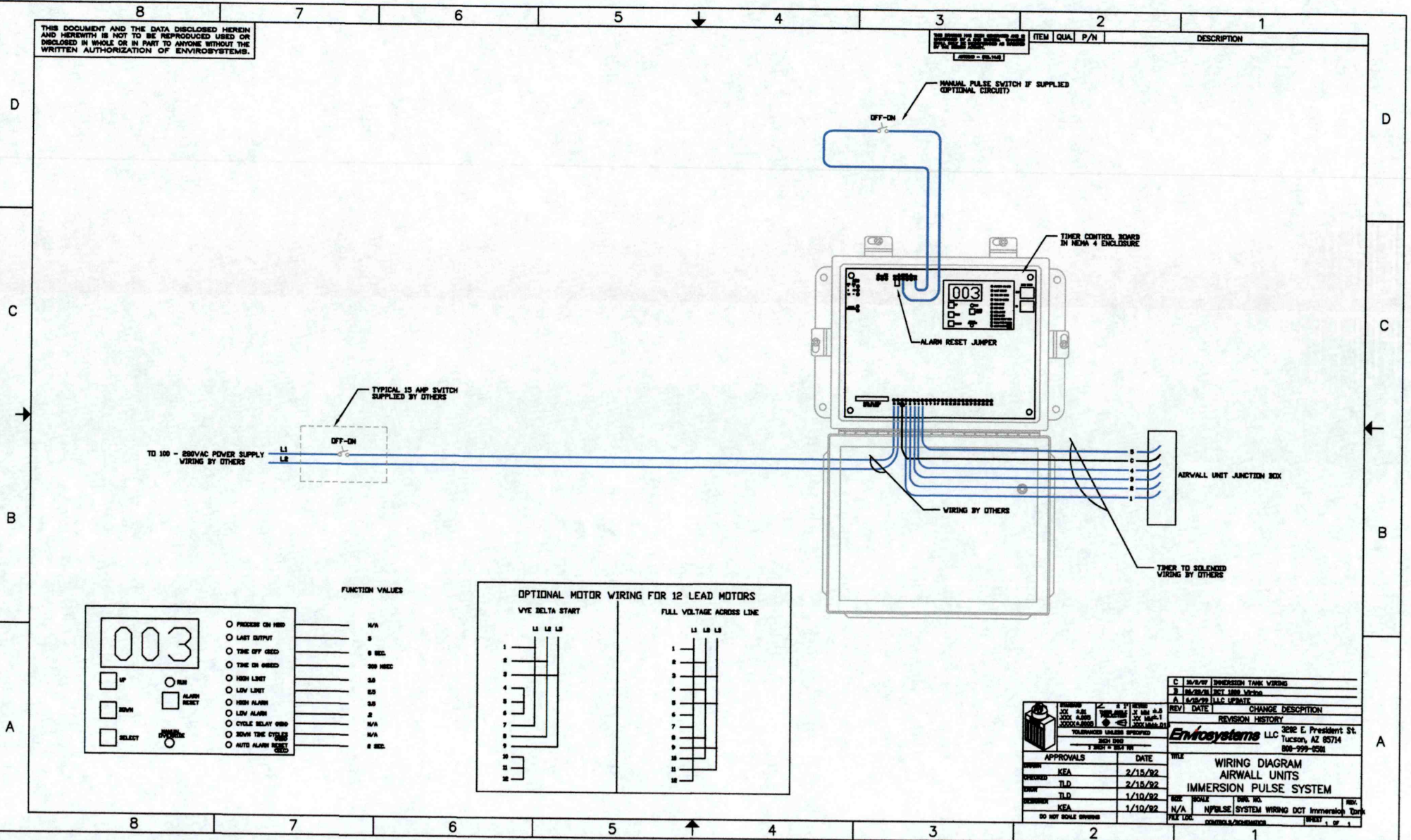
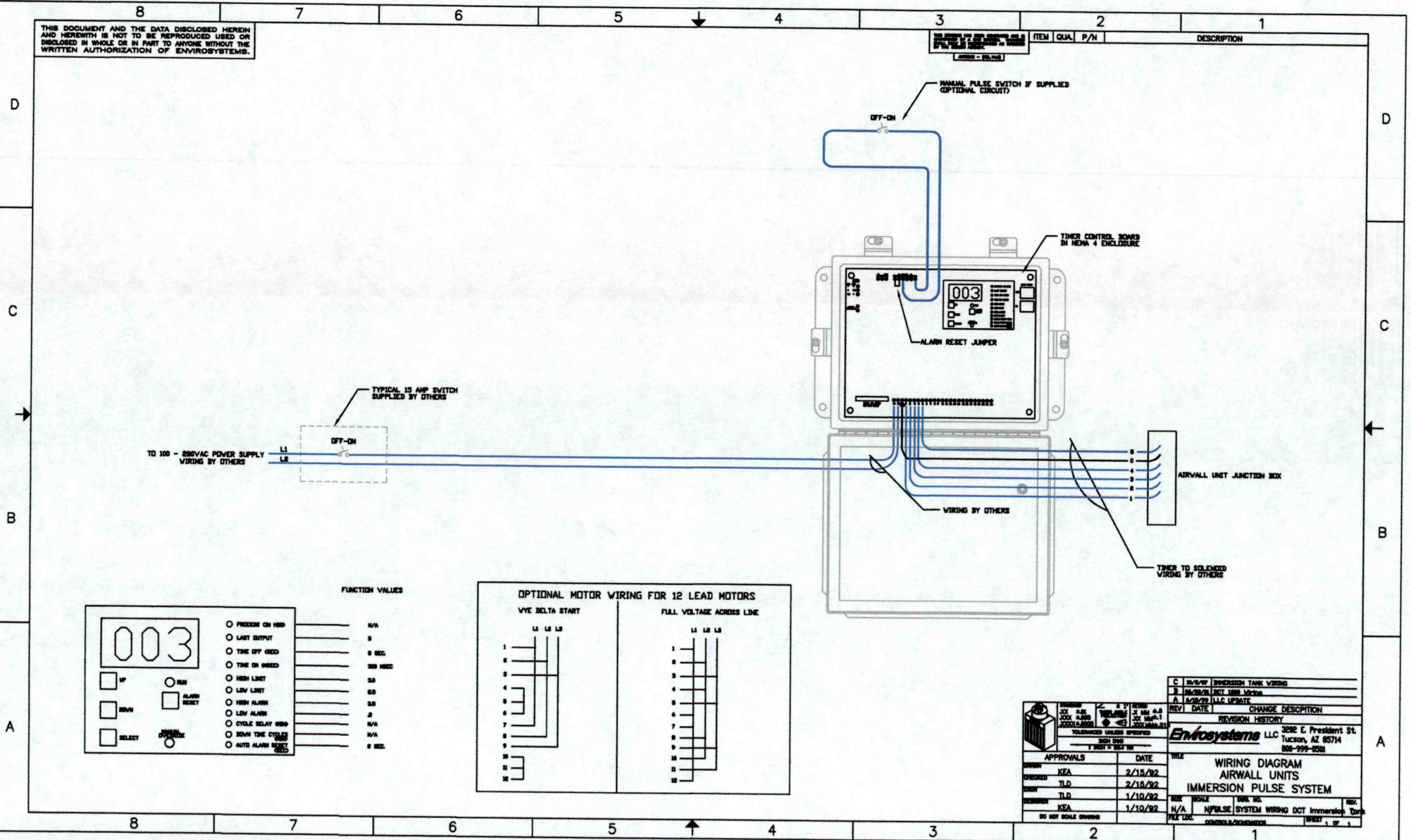
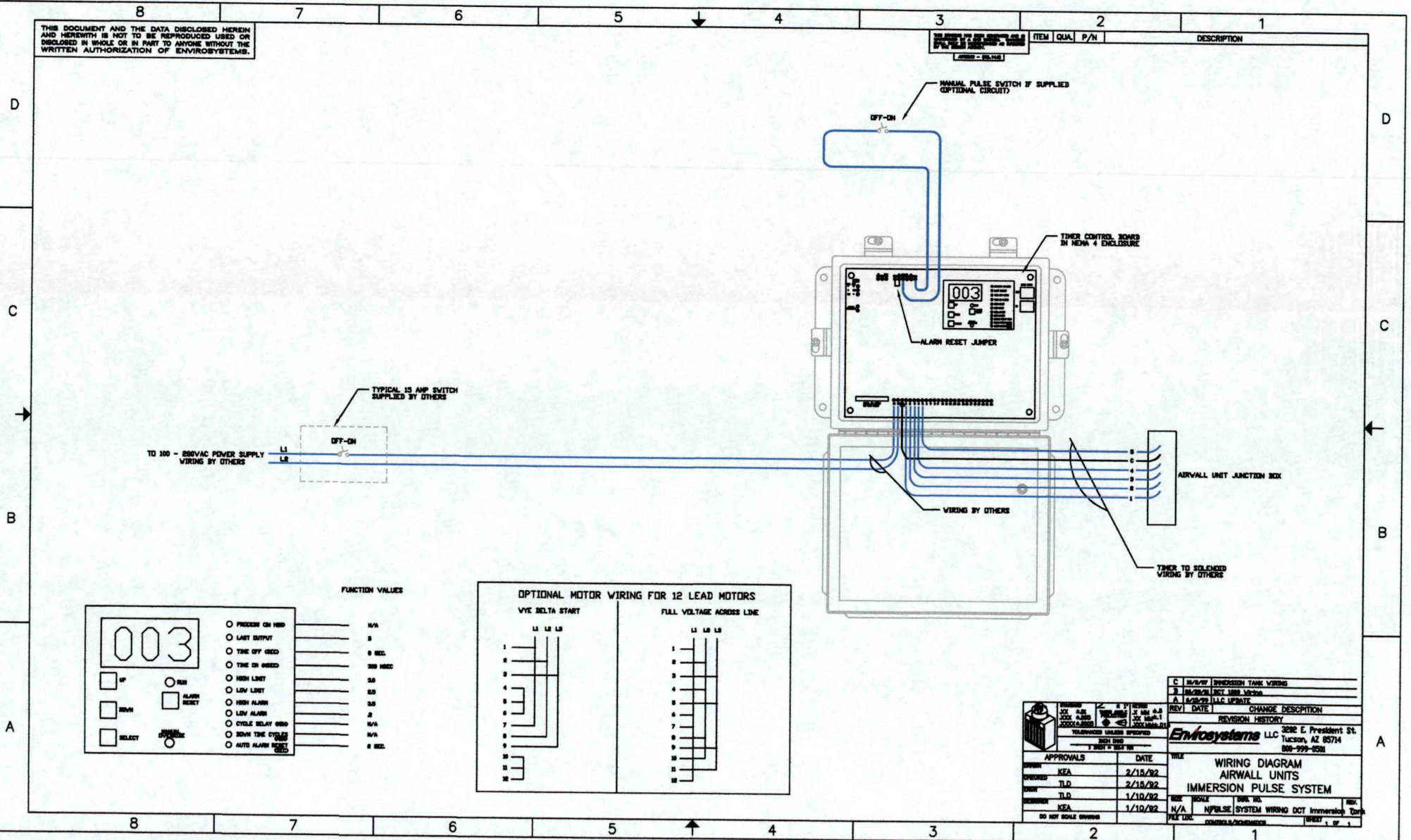
FUNCTION	VALUE
○ PROCEED ON HSB	N/A
○ LAST OUTPUT	5
○ TIME OFF USED	5 SEC.
○ TIME ON USED	500 SEC.
○ HIGH LIMIT	5.0
○ LOW LIMIT	5.0
○ HIGH ALARM	5.0
○ LOW ALARM	5.0
○ CYCLE DELAY USED	N/A
○ 30MIN TIME CYCLE USED	N/A
○ AUTO ALARM RESET USED	5 SEC.

TABLE 4: OPTIONAL MOTOR WIRING FOR 12 LEAD MOTORS

VYE DELTA START		FULL VOLTAGE ACROSS LINE	
L1	L2	L1	L2
1	2	1	2
3	4	3	4
5	6	5	6
7	8	7	8
9	10	9	10
11	12	11	12

WIRING DIAGRAM DETAILS:

- Power Supply:** TO 100 - 200VAC POWER SUPPLY WIRING BY OTHERS. Includes a TYPICAL 15 AMP SWITCH SUPPLIED BY OTHERS.
- Timer Control Board:** Features a digital display (003), ALARM RESET JUMPER, and a MANUAL PULSE SWITCH IF SUPPLIED (OPTIONAL CIRCUIT).
- Junction Box:** AIRWALL UNIT JUNCTION BOX with terminals 1 through 5. Includes a note: TIMER TO SOLENOID WIRING BY OTHERS.
- Wiring:** Blue lines indicate connections from the power supply, through the switch, to the timer board, and then to the junction box.



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TABLE 1: REVISION HISTORY

REV	DATE	CHANGE DESCRIPTION
C	8/15/92	IMMERSION TANK WIRING
B	8/15/92	IMMERSION TANK WIRING
A	8/15/92	LAC UPDATE

TABLE 2: APPROVALS

APPROVALS	DATE
DESIGN: KEA	2/15/92
CHECKED: TLD	2/18/92
TEST: TLD	1/10/92
REVIEWED: KEA	1/10/92

TABLE 3: FUNCTION VALUES

FUNCTION	VALUE
○ PROCEED ON HSB	N/A
○ LAST OUTPUT	5
○ TIME OFF USED	5 SEC.
○ TIME ON USED	500 SEC.
○ HIGH LIMIT	5.0
○ LOW LIMIT	5.0
○ HIGH ALARM	5.0
○ LOW ALARM	5.0
○ CYCLE DELAY USED	N/A
○ 30MIN TIME CYCLE USED	N/A
○ AUTO ALARM RESET USED	5 SEC.

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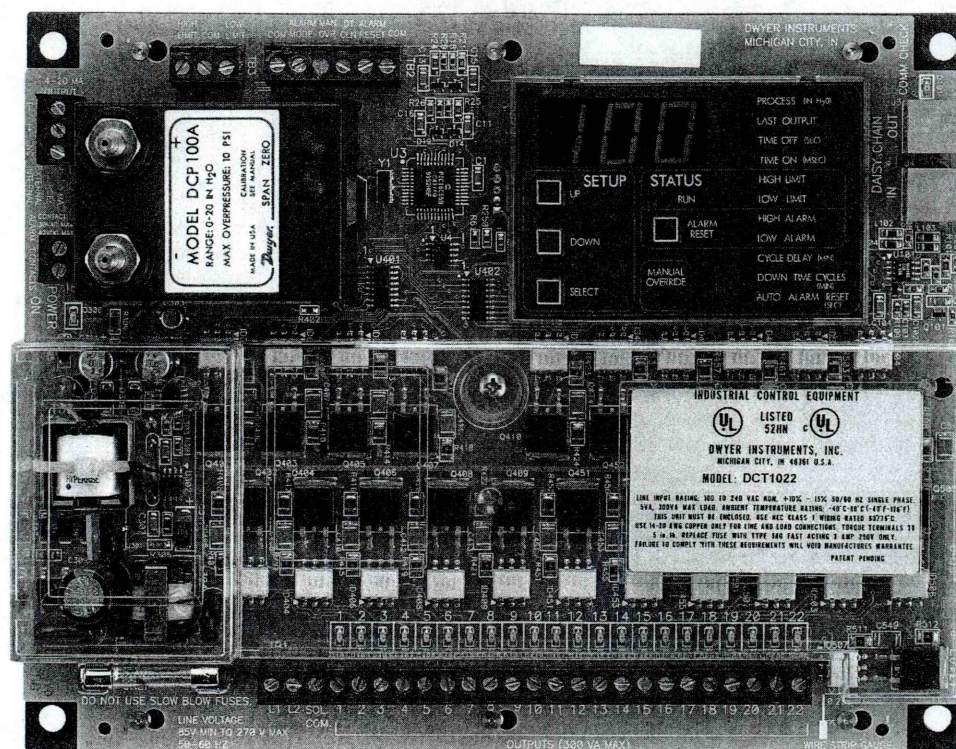
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- Wiring:** Blue lines indicate connections from the power supply, through the switch, to the timer board, and then to the junction box.



Series DCT1000 Dust Collector Timer Controller

Specifications – Installation and Operating Instructions



Thank you for purchasing the DCT1000 Dust Collector Timer Controller. You have selected a state of the art dust collector timer control that will provide years of dependable operation and service.

The DCT1000 Dust Collector Timer Controller was designed to be used with pulse-jet type dust collectors for on-demand or continuous cleaning applications.

Continuous cleaning applications do not require external inputs and can be used for time based "on-demand" cleaning through use of the cycle delay feature.

For on-demand applications, the plug-in pressure modules (DCP100A/200A) can be used to take full advantage of all the features the DCT1000 offers, or an external pressure switch (such as the Dwyer Photohelic®) can be used for High/Low limit control.

As with traditional Dwyer products, the Dwyer DCT1000 was designed so that it is easy to use, thus allowing for a quick and easy start up for your dust control applications. The contents inside this installation and operating manual will guide you through the features of the DCT1000 and how they can be applied to get the most out of your dust control requirements.

SPECIFICATIONS

DCT1000 Timer Controller:

Output Channels: 6, 10, & 22 channels. Expandable to 255 channels using DCT1122 & DCT1110 channel expander boards.

Power Requirements: 85 to 270 VAC, 50 or 60 Hz.

Solenoid Supply: 3A maximum per channel.

Fuse: 3A @ 250 VAC. Low voltage control circuitry is isolated from the line voltage for system safety.

Temperature Limits: -40 to 140°F (-40 to 60°C).

Storage Temperature Limits: -40 to 176°F (-40 to 80°C).

On Time: 10 msec to 600 msec, 10 msec steps.

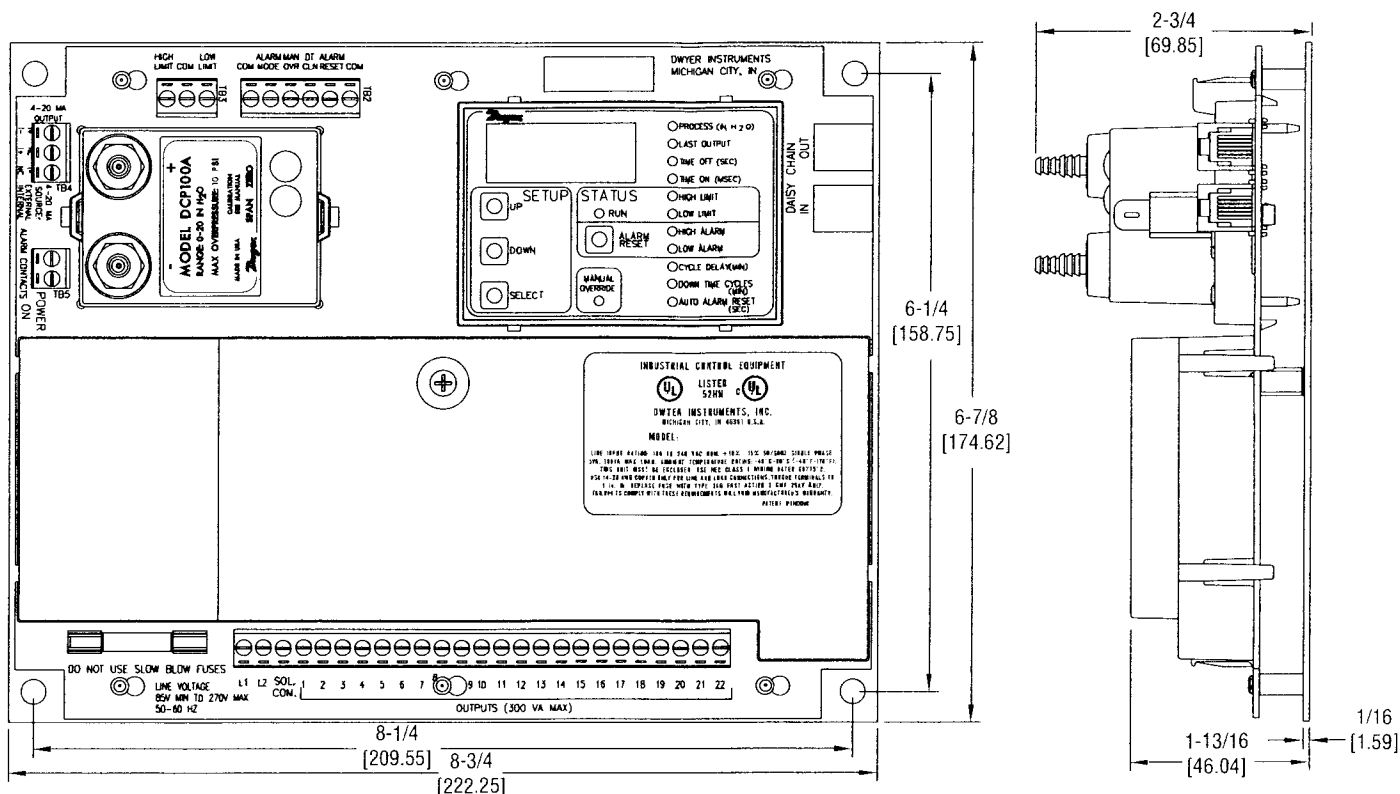
On Time Accuracy: ±10 msec.

Off Time: 1 second to 255 seconds, 1 second steps.

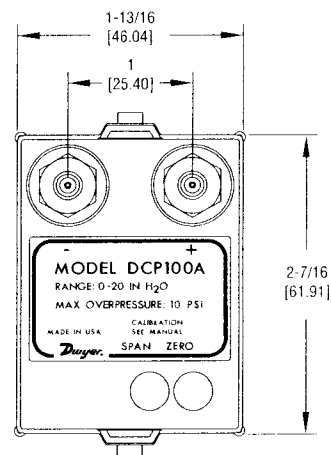
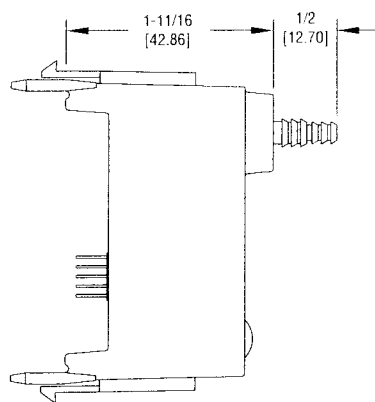
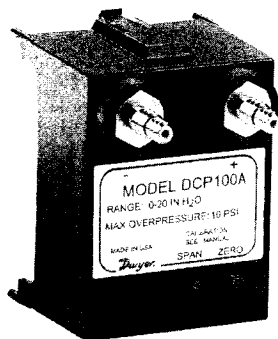
Off Time Accuracy: ±1% of the value or ±50 msec, whichever is greater.

Weight: 1 lb 3.0 oz (538.6 g).

Agency Approvals: UL, cUL.



**Figure 1 – Dimensional Specifications for the DCT1000
(shown with optional module DCP100A)**



The DCP100A or DCP200A pressure modules are designed exclusively for use with the Dwyer DCT1000 Dust Collector Timer Controller boards for on-demand cleaning requirements. These series of modules are available in 10" w.c. [2.49 kPa] or 20" w.c. [4.98 kPa] ranges, which allow for differential process pressure measurement as indicated on the display of the master controller. An isolated 4-20 mA readout channel is provided for remote pressure display. The 4-20 mA output may be wired either for use with an external power supply and indicator or using the isolated on-board 24 volt power supply to power the loop.

SPECIFICATIONS

Pressure Ranges: 10" w.c. or 20" w.c.

Temperature Limits: -40 to 140°F (-40 to 60°C).

Pressure Limit: 10 psi (68.95 kPa).

Pressure Limit (differential): 10 psi (68.95 kPa).

Accuracy: ±1.5% F.S. @ 73°F (22.8°C).

Output Signal: 4-20 mA.

Alarm Contacts: 1.5A inductive load, 3A resistive load @ 30 VAC or 40 VDC.

Process Connections: Two barbed connections for use with 1/8" (3.18 mm) or 3/16" (4.76 mm) I.D. tubing.

Weight: 5.5 oz (155.9 g).

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1.0 Installing the DCT1000



Warning: Always install and service this device with the power off and a lockout installed if required. Line voltages will be exposed at the power/output connector and at the fuse. For this reason, we have installed a

plastic guard to protect the user from accidentally contacting line voltages.

Please note that the power guard serves as a safety feature and should not be removed under any circumstances.

For ease of installation and maintenance, the connectors and fuse have been left unprotected. The open frame design of the DCT1000 will require an enclosure that meets appropriate safety and local code requirements. For optimal performance, the enclosure should also protect the controller from dirt, water and direct sunlight. There are no special orientation requirements, and the controller mounts easily using the mounting holes on the factory installed base plate.

Caution: Do not run control wires, communication cables, or other class 2 wiring in the same conduit as power leads. The system may malfunction if class 2 wiring is run together with power conductors.

1.1 Power Requirements

The controller has a "universal" power supply that will allow operation on 120 VAC to 240 VAC power lines. The input voltage must be between 85 VAC and 270VAC either 50 or 60 Hz. No circuit changes are required when switching between these voltages. The solenoid loads, however, must be sized to accommodate the line voltage selected.

1.2 DCT1000 Terminal Connections

The line and solenoid connections are located at the lower edge of the board below the plastic guard. The terminal block is a "Euro" style connector system that clamps the wire within the connector body. The connector will accept wire sizes from 14 to 22 AWG. The wire should be stripped to no more than 0.25 inches to avoid shorts or expose line voltages creating a potential safety hazard. To assist you in determining the proper wire gauge required, a strip gauge is provided at the lower right corner of the board. The connector system used on the DCT1000 is specified for single connection but you can piggyback to a single lug provided that local codes allow for this and good workmanship practices are followed. To power up the master controller and the channel expander, connect line power to L1 and L2 (see Dimensional Specifications, Figure 1). Connect the solenoids between the selected output and the solenoid common. Solenoid common and L2 are internally connected. Switches connected to the control inputs at the top of the board must be isolated contacts connected only to the relevant terminal and to the common terminals. The following subparagraphs describe the external switch connections. Refer to figure 2 for switch connection illustration.

1.2.1 External Pressure Connection

The controller may be used with an external pressure limit switch or sensor to provide demand-cleaning operation. The high limit and low limit inputs may be used for this purpose. A simple on-off system can be established with a single pressure switch connected to the high limit input. Better control can be achieved with a high and low limit switch/gage such as the Dwyer Photohelic®. In this on-demand mode, time on, time off, and cycle delay may be programmed to define the cleaning cycle. A three pin terminal block (TB3) provides connection for external high and low limit switches (see Figure 2 on the next page). These switches must be isolated contacts. The common line must not be connected to equipment ground or protective ground, since these may introduce electrical noise and cause improper operation or possible damage to the control board. The operation of these inputs are summarized as follows (see next page):

Current Operation	Low Limit Switch	High Limit Switch	Next Operation
Hold	Open	Open	Hold
Hold or Run	X	Closed	Run
Hold	Ø	Open	Hold
Hold	Closed	Ø	Run
Run	Closed	≠	Run
Hold	Closed	Ø	Run
Run	≠	Open	Hold
Ø Transition from open to closed			
≠ Transition closed to open			
X Either open or closed			

Note: If a DCP100A or DCP200A pressure module is installed in the master controller, the switching functions are ignored.

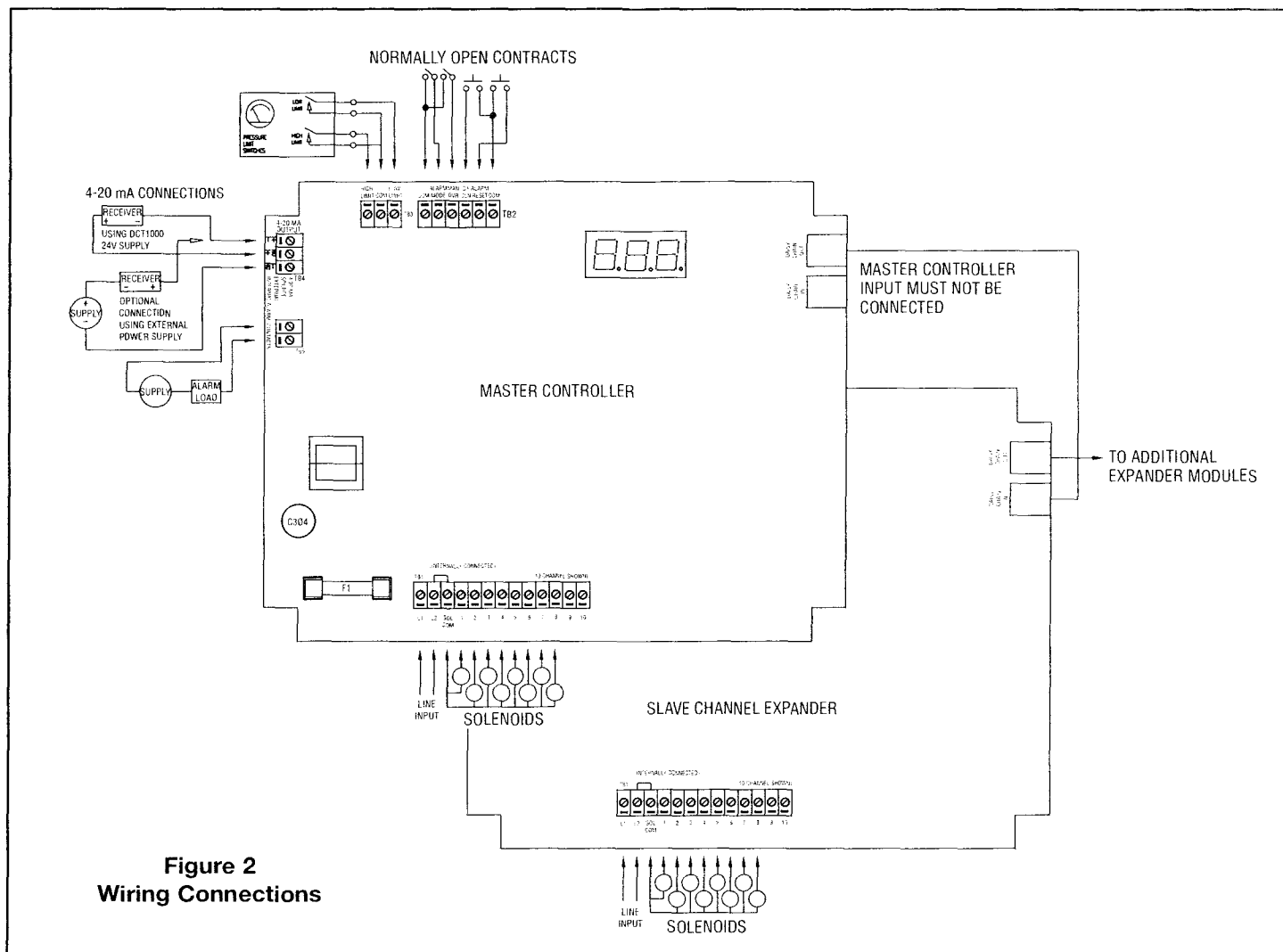


Figure 2
Wiring Connections

1.2.2 Manual Override Switch Connection

The manual override function allows the system to be set to the run mode regardless of other conditions. This mode is enabled when the manual override terminal and common are connected. It is disabled when they are disconnected. If the controller is to be run in continuous mode, a jumper wire may be wired across these terminals. When manual override is needed on a periodic basis, wire a SPST toggle switch between the manual override terminal and the common terminal.

1.2.3 Down Time Clean Connection

The down time clean operation forces the system into a run cycle for a programmed length of time between 0 – 255 minutes. The operation is initiated by connecting the down time clean terminal to a common terminal. This function is best accomplished through use of an external normally open switch.

1.2.4 Connecting Multiple Timer Boards

Both master controller boards and slave boards can have up to a maximum of 22 channels each. The system may be expanded up to 255 channels using master controller boards and slave boards. The DCT1000 will automatically detect the total number of channels involved and make their outputs available. You will note that both the master controllers and slave boards have a telephone style connector mounted on the upper right hand side of the board. These connectors are for use in systems requiring slave boards that must be daisy chained together to provide additional channel capability. For systems that require the slave boards, the master controller must not have any connection made to its daisy chain input unless it is designated as a slave control itself. (For larger systems requir-

ing more than three slave boards, a master controller must be used as the fourth slave board to satisfy power requirements.) This sequence would repeat itself until the limit of 255 channels has been reached. The cables used are not ordinary telephone style cables.

Caution: Do not use telephone jumper cables. These have a "twist" in the connection and may damage the controllers. Cables designed for use with the DCT1000 are available from Dwyer Instruments (Model DCAC02-2 ft., DCAC04-4 ft., etc.).

1.2.5 Continuous Cycle Mode

The master controller has several operating modes available for different applications. Starting with the most basic mode, it is capable of operating in a continuous cleaning cycle. This can be initiated by either placing a jumper between the high limit input and the common, or the manual override input to the common connection. Controlling this cycle are three setup parameters: time off, time on, and cycle delay. Time on and time off specifically deal with the solenoid on time and the time interval between the end of the on pulse and the start of the next. The cycle delay allows a delay of up to 255 minutes to be programmed between the end of one complete cleaning cycle and the beginning of the next. This allows additional options for defining a cleaning profile.

1.3 DCP Installation

Caution: Prior to installing the DCP100A/200A please review the operating specifications carefully.

Some operating systems, especially in pneumatic conveying applications, may see static pressure or vacuum conditions that exceed the capability of the DCP100A/200A pressure module. For these conditions there are a number of alternate Dwyer pressure products that can be used to meet your application requirements, all of which can be terminated to the Dwyer DCT1000 Dust Collector Timer Controller. For more information on these and other Dwyer products, please call us at (219) 879-8000, or visit us on the web at www.dwyer-inst.com or www.dust-controls.com.

1.3.1 Location

The system should be located in an enclosure that meets relevant safety standards and electrical codes. There are no other special orientation requirements as the pressure module is not orientation sensitive. Care should be observed when routing the air hoses to ensure that any potential condensation or moisture will not drain into the sensor. Where heavy condensation is present, a drip loop or an in-line filter should be installed to ensure long term operation.

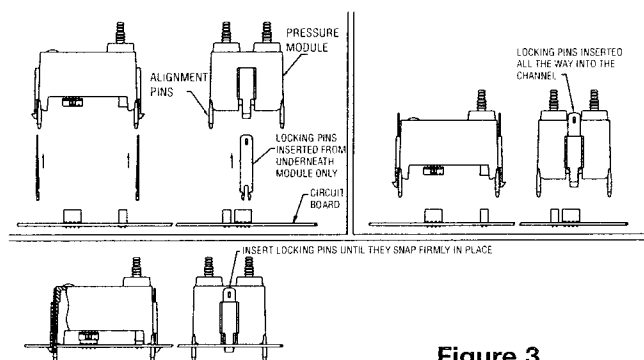


Figure 3
DCP Installation

1.3.2 Connecting DCP to Master Controller

The pressure module is attached to the Master Controller using integral connectors on both units. The insertion ports for the pressure module are located in the upper left quadrant of the DCT1000 Master Controller. The pressure module can be removed by compressing the retaining clips on each end of the module, then gently pulling the module out of the master controller board. When inserting the module, the following procedure should be adhered to insure proper installation:

- Examine the bottom of the pressure module and note the orientation of the connectors.
- Align the module so that these connectors match the connector receptacles on the controller board.
- Orient the module with the four alignment pins over their respective mounting holes.
- Gently press the module into the connectors and snap the retaining clips on either end of the module into their slots.
- Always install and service this device with the power off and a lockout installed if required. "Hot" plugging the pressure module into an operating system may damage the system or cause the calibration parameters to be erased.

When installing or removing the module make sure to orient the module straight with board. Installing or removing the module at any angle may break the alignment pins.

1.3.3 Pressure Model Locking Pins

The DCP100A and DCP200A are supplied with locking pins to secure the module. In normal operation these are not required since the latching tabs are sufficient to secure the module even in a high vibration environment. However if the unit is to be shipped or used where severe mechanical shock could be encountered the locking pins ensure the module will not snap out of the board.

To install the locking pins, from underneath the module insert one pin behind each of the two latching tabs. Press these all the way into the channel. The ends of the tabs will extend through the slots at the top of these channels. Next insert the module in the board as described above, making sure it is properly aligned and snaps firmly in place. Press the exposed locking tabs down until the tab is seated behind the latch in the board. To remove the module, slide the locking tabs up using a small screw driver then remove the module as described above. See Figure 3.

1.3.4 DCP Connections

When a pressure module is installed, the 4-20 mA process signal and the alarm relay contacts are available. The 4-20 mA circuit is isolated from ground and other signals. The alarm relay contacts are isolated, normally open contacts. Pressure connections may be made to the stepped hose barbs with either 1/8" or 3/16" I.D. tubing.

Caution: Do not force the module into the connectors. Forcing the insertion may damage the connectors. Properly aligned, the module should snap into place.

1.3.5 DCP Maintenance

The pressure module should require very little maintenance under normal operational conditions. However, periodic calibration may be desirable to assure accuracy of the readings. The module may be removed and returned to the factory for calibration.

1.4 Alarm Mode Switch Connection

The auto alarm reset is controlled by the alarm mode switch connection. To enable the auto alarm reset the alarm mode input must be connected to a common connection. A jumper may be used when auto alarm reset is always active. A switch may be used if there are times that the auto alarm reset must be disabled. The switch must be an isolated contact and wired such that no connection is made between either of the wires and ground. See Figure 2 Wiring Connections.

1.4.1 Alarm Reset Switch Connection

The alarm may be reset either by pressing the Alarm Reset button on the control panel or by an external switch connected between the alarm-reset terminal and one of the common terminals. The alarm reset will only operate if the pressure module is installed and the pressure has returned to a normal condition. See Figure 2 Wiring Connections.

1.4.2 Connecting the 4-20 mA Loop

The pressure module provides an isolated 4-20 mA output, which may be used to remotely monitor the differential pressure across the dust bags or cartridges. The connection is made on the master control module at the terminal block designated for this signal. The connection is a 2-wire configuration with the option of using either an external 15 to 35 VDC power source or using the internal 24 VDC source. See Figure 2 Wiring Connections.

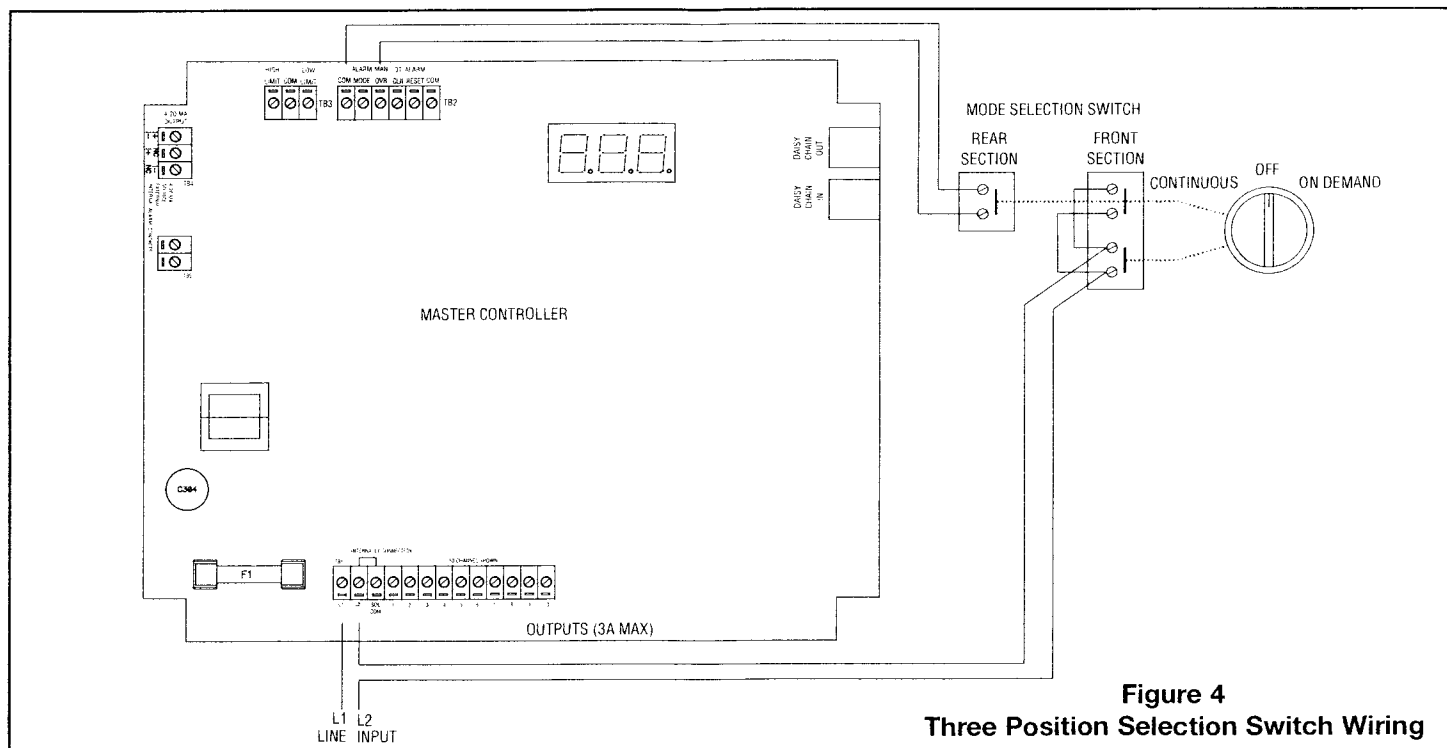


Figure 4
Three Position Selection Switch Wiring

1.4.3 Connecting the Alarm Relay

With the pressure module installed, a relay contact is provided for controlling an external alarm. This relay is a single form-A contact. It is activated when either the high alarm threshold is exceeded, or the pressure drops below the low alarm threshold. The connection is made at the two-pin connector TB5. See Figure 2 Wiring Connections

1.5 Three Position Selection Switch Wiring

An optional mode selection switch is available with the weather-proof enclosure. With this switch the user may select either continuous cleaning, on-demand cleaning, or off. This switch is supplied factory wired as shown in Figure 4. The switch has a front and rear section. The front section, consisting of two independent contacts, controls the power to the board. These contacts must be wired in parallel as shown in the diagram. The rear section controls the manual override, which when closed will force the system into a continuous must be reconnected, follow the wiring diagram.

Caution: Do not interconnect the low voltage manual override leads with the power leads. This will destroy the control board as well as pose a serious shock hazard

2.0 Programming the DCT1000 Master Controller

We've made it easy to navigate the DCT1000. Menu items can be accessed simply by pressing the "SELECT" button. The menu item that you are currently accessing is indicated by the illumination of an LED. To change menu items, all you have to do is push "UP" to increase a value or push "DOWN" to decrease a value. There are no keystrokes that you need to memorize, special combinations, or passwords that are required.

The master controller is equipped with an on board display and programming information center. The controller will power-up with the process indicator illuminated. If a pressure module is installed, the display will indicate the measured pressure in inches of water (w.c.); otherwise it will normally be blank.

2.1 • Last Output

The Last Output setup selects the last channel to be activated. When first selected, the display will flash the last output available in the system. With single board installations, this will be the number of channels installed, typically 6, 10 or 22. This value becomes more important when multiple modules are installed. The last output value flashed will be the sum of all channels available in the system.

After the last available channel indication has completed, the currently programmed last channel value is displayed. This value may be changed using the "UP" and "DOWN" buttons. The minimum value is one while the maximum value is the maximum number of installed channels, including all expansion modules.

The default value is the maximum number of channels. Pressing "SELECT" will change the setup mode to Time Off Setup.

2.2 • Time Off (Sec.)

Time off defines the period of time between solenoid activations when no channels are enabled. This may be set between one second and 255 seconds. The factory default is 10 seconds. The display will show the current time off setting when the time off setup mode is entered. The value may be changed using the Up and Down buttons. Pressing both "UP" and "DOWN" simultaneously and holding for approximately four seconds will restore the default value of 10.

2.3 • Time On (msec)

Time On Setup sets the solenoid on time. The display will indicate the currently programmed time on setting. This is measured in milliseconds. Using the "UP" and "DOWN" buttons, the value may be changed. The value may be set between 10 msec and 600 msec in 10 msec increments. Pressing the "UP" and "DOWN" buttons simultaneously for approximately four seconds will restore the factory default value of 100 msec. Pressing the "SELECT" button will advance the setup mode to the High Limit setup if the pressure module is installed. With no pressure module, it will step to Cycle Delay Setup.

2.4 • High Limit [Only available when DCP connected]

The High Limit Setup, available only with a pressure module installed, sets the pressure at which the cleaning cycle will begin. This value may be between zero and the pressure module full scale pressure. Normally, the High Limit should be above the Low Limit. If, however, the High Limit pressure is set below the Low Limit, the cleaning cycle will begin when the High Limit is exceeded and stop when the pressure falls below the High Limit. The Low Limit in this case will have no effect. Pressing "SELECT" will change the system to the Low Limit Setup mode.

2.5 • Low Limit [Only available when DCP installed]

The operation of the Low Limit, available only with a pressure module installed, is identical to the High Limit except this value sets the pressure where the cleaning cycle will end. The upper settable value is the calibration pressure of the pressure module and the lower limit is zero. Pressing "SELECT" will change the system to the High Alarm Setup mode.

2.6 • High Alarm [Only available when DCP installed]

The operation of the High Alarm Setup is identical to the High and Low Limit Setup and is only available when a pressure module is installed. The High Alarm default is 0. The upper settable value is the full scale pressure of the pressure module and the lower limit is zero. Pressing "SELECT" will change the system to the Low Alarm Setup mode.

2.7 • Low Alarm [Only available when DCP installed]

The operation of the Low Alarm Setup is identical to the High and Low Limit Setup. The Low Alarm default is 0. The upper settable value is the full scale pressure of the pressure module and the lower limit is zero. Pressing "SELECT" will change the system to the Cycle Delay Setup mode.

2.8 • Cycle Delay (min)

The cycle delay inserts a delay time between the end of the last channel and the beginning of the first channel. This may be set to between zero and 255 minutes. The factory default is zero. Setting the value to zero will disable the delay. Pressing "SELECT" will change the system to the Down Time Cycles Setup mode.

2.9 • Down Time Cycles (min)

The Down Time Cycles setup will select a value between zero and 255 minutes. The factory default is one minute. Selecting zero will disable the operation. When the down time cycles is activated by shorting the down time cycles input to the common terminal, (see figure 2) the system will enter a forced cleaning mode for the programmed duration. *NOTE:* The cycle delay, if one is programmed, will not be inserted in the timing cycle. Pressing "SELECT" will change the system to the Auto Alarm Reset Setup mode, if a pressure module is installed, or to Process when no pressure module is available.

2.10 • Auto Alarm Reset (sec) [Only available when DCP installed]

The Auto Alarm Reset Setup, available only when a pressure module is installed, allows the auto alarm reset time to be selected. This value may be set between zero and 255 seconds. The factory default value is five seconds. When the auto alarm reset is enabled by shorting the auto alarm reset terminal to a common terminal, (See Figure 1) the alarm will be reset after the pressure returns to the normal range and the timeout has expired. Pressing "SELECT" will change the system to Process mode.

3.0 Maintenance Support and Diagnostics

We have also included a number of features that will aid maintenance personnel in diagnosing problems or verifying that the system is operating.

3.1 Restoring Factory Defaults

The DCT1000 has been programmed with factory default values that meet most industry operating conditions. In the event that you want to restore all of the parameters to the original factory default values:

- (1) Return the master controller to the process mode.
- (2) Press and hold both "UP" and "DOWN" buttons.

The display will indicate a 10-second countdown, at the end of which all parameters will be restored to factory defaults. Releasing the switches prior to the end of the count will stop the process and no modification will be made. Likewise, in each of the parameter setup modes, pressing and holding the "UP" and "DOWN" buttons simultaneously will reset the individual default value, leaving other settings unchanged.

3.2 Power Indicator

A power on LED indicator is provided at the center left edge of the board. This will be illuminated when the power supply is operating properly. If the power LED is not illuminated, the primary power may be off or there is a fault in the power circuit.

3.3 Active Channel Indicator

Located just above the solenoid terminations, you will find that each channel is provided with an LED that is illuminated when the triac switch is on. This allows a visual correlation between the channel being pulsed and the operation of the solenoid.

3.4 Comm Check Indicator

The comm check indicator can be found in the upper right hand corner of the slave and master controller board (just above the "out" terminal, a telephone style connector). This indicator is used for two purposes. First, on a master controller a brief flash once per second is produced to indicate that the system is operating. Second, this indicator is used to show when the communication check operation is performed on slave boards. The master controller will check each of the slave boards at a rate of about one inquiry per second, starting with the slave board connected directly to the master controller and ending with the last slave board in the chain. The master controller will flash its Comm Check LED for about 250 msec each time it makes a communication check. The external module selected for test will also flash its Comm Check LED for about the same time each time it is interrogated. Observing this test sequence will indicate that the communication between boards is operational. When a slave board powers up, the Comm Check LED will be illuminated continuously. It will be extinguished when the master controller has initialized its communication channel. This indicator then shows that a master controller is operating and that each slave board is responding properly on the daisy chain.

3.5 Error Codes

Error codes will be displayed on the three-digit display when certain faults occur. Most of these indicators are associated with the daisy chain communication, but certain error codes pertain to single board operation also. These codes are:

Display	Meaning	Action Required
Err 1	This is a "watchdog" reset that is enabled when the master controller isn't able to cycle through its operation.	Make sure all electrical connections are appropriately shielded so the master controller is not disrupted by noise.
Err 2	The pressure module has failed to respond to the request of the master controller.	The master controller will try to recover from the fault. If unsuccessful, replace the pressure module.
Err 3	Communication error in the daisy chain interface. This will only appear when the master controller is used in conjunction with a slave board.	Make sure the control cable used in the daisy chain interface is properly shielded from noise.
Err 4	The master controller has detected a change in module configuration or a fault in one of the modules.	Reinstall all modules in accordance with the instructions in the factory IOM.
Err 5	If the fault described in "Err 4" is not corrected, the master controller will reconfigure the modules that are responding properly and operate at a degraded condition.	Reinstall all modules. Contact factory if the problem persists.
Err 6	A message error affecting the software of the master controller or one of its modules.	Check the integrity of all connecting cables used to drive slave boards for additional solenoids. Also check the electrical grounding of the system installation.
Err 7	Indicates that one of the triac drivers are not functioning.	Return to factory for evaluation and repair.
Err 8	Internal Error.	Contact the factory.
Err 9	Unassigned message code.	Contact the factory.

4.0 Glossary of Terms

- **Run Mode:** The term used when the timer board is firing the solenoids.
- **Pressure Module:** The pressure measurement subsystem that includes the software and hardware for on-demand cleaning, alarms and signal retransmission of the process variable (i.e., the differential pressure across the dust bags).
- **Master Controller:** The primary timer board that contains all of the major features, connections for external inputs and power to drive the DCT1000 Dust Collector Timer Controller system.
- **Power Guard:** A plastic shield that covers the output triacs and other line voltage circuitry.
- **Demand Cycle Mode:** A process in which the run mode is enabled through the on-board pressure module or an external switch such as the Dwyer Photohelic®.
- **Euro Connector:** A "caged" connection used to terminate solenoids, incoming power, or external switches on the DCT1000.
- **Continuous Cycle Mode:** A time based cycling mode dependent on solenoid time on/off settings and time set between complete cycles.
- **Manual Override:** Allows the user to override the DCT1000 remotely or from the master controller panel through use of a switch or a wire jumper.
- **Slave Board:** A channel expander that is used in conjunction with the master controller to accommodate additional solenoids on large dust collection systems. It can be recognized easily as it does not have the on-board display panel or the power supply present. A master controller may also be used as a slave board.

Still need help? Please feel free to contact one of our customer service representatives at 219-879-8000 or visit us on the web at www.dwyer-inst.com or www.dust-controls.com. Thank you for choosing Dwyer Instruments.

INSTALLATION and START-UP

FILTER CLEANING SYSTEMS

With the standard filter cleaning system, the reverse pulse is released from the diaphragm valve by the solenoid pilot valve, which is activated in turn by the timer control board.

On-Demand Filter Cleaning System. A Photohelic gage and switch are used to initiate the filter cleaning sequence. This unit is a sophisticated and sensitive device.

Therefore, any questions regarding the electrical connection of this device should be referred to EECI at 1-800-999-0501 before proceeding. Refer to the electrical schematic labeled "Pulse System Wiring" provided with this manual. Do not connect circuit test equipment to the timer control board. See CAUTION.

CAUTION

Do not connect circuit test equipment to the timer control board. The use of certain types of test equipment can seriously damage the timer control board components. Failure to follow this instruction will void the warranty.

1. EECI recommends that the timer control board be mounted next to the AirWall unit, or within 4 to 6 ft. of the unit.
2. The common (white) lead, along with wires numbered 1 through 5, have been pre-wired into the junction box located on the AirWall unit. Leads in this junction box are numbered 1 through 5, with an additional common (white) lead. Run these leads through suitable conduit into the Photohelic control panel. Since the distance from the junction box to the Photohelic control panel is not known for your installation, this cable is not supplied.
3. From the junction box, connect wires 1 through 5 to terminals 1 through 5 on the timer control board.
4. Connect the common lead (white) from the AirWall unit to the common terminal on the sequence controller board. These connections allow the timer control board to energize the solenoids inside the AirWall unit clean-

INSTALLATION and START-UP

air plenum, which in turn opens the diaphragm valves and pulses the filter cartridges.

5. Connect the positive (hot) lead from 120 VAC to L1 on the Photohelic control card.
6. Connect the common lead (white) from 120 VAC to L2 on the Photohelic control card.
7. Connect the ground (green) lead to the ground terminal provided in the timer Control board box.

Integrated Control Panel. The electrical requirements for the integrated control panel are 208/230/460 VAC, 3-phase, 60 Hz power. Only a qualified electrician should connect this device to an appropriate protected power source. If your AirWall unit has this optional control panel, the electrical schematic will be supplied with the manual.

PNEUMATIC CONTROL CONNECTIONS

In addition to the electrical connections, two (2) pneumatic control connections must be made from the AirWall unit to the Photohelic Gage. These connections should be made with ¼ in. (6mm) nylon poly tube.

To complete the pneumatic control connections:

1. Push the 1/4 in. (6mm) tubes into the brass bulkhead quick-disconnect fittings located on the AirWall unit.
2. Connect these two (2) lines to the Photohelic gage as follows:
 - a. Connect the high-pressure tube from the Photohelic gage to the lower port on the AirWall unit.
 - b. Connect the low-pressure tube to the upper port on the AirWall unit.

COMPRESSED AIR CONNECTION

The air pressure accumulator tank located inside the AirWall upper air plenum should be supplied with clean, dry compressed air between 90 and 110 psi. Total air consumption is variable and is dependent on the type and concentration levels of airborne dust and the set points used for determining the cleaning cycle. Typical air consumption will be approximately 1.8 CFM per AirWall unit.

INSTALLATION and START-UP

Use the following procedure to complete the compressed air connection. Although the AirWall unit is designed for a 1 in. NPT supply line, the supply line may be smaller than 1 in. but should not be smaller than .375 in. or excessive accumulator recharge time will result. The 1 in. coupling in the tube sheet may be bushed for smaller air supply lines.

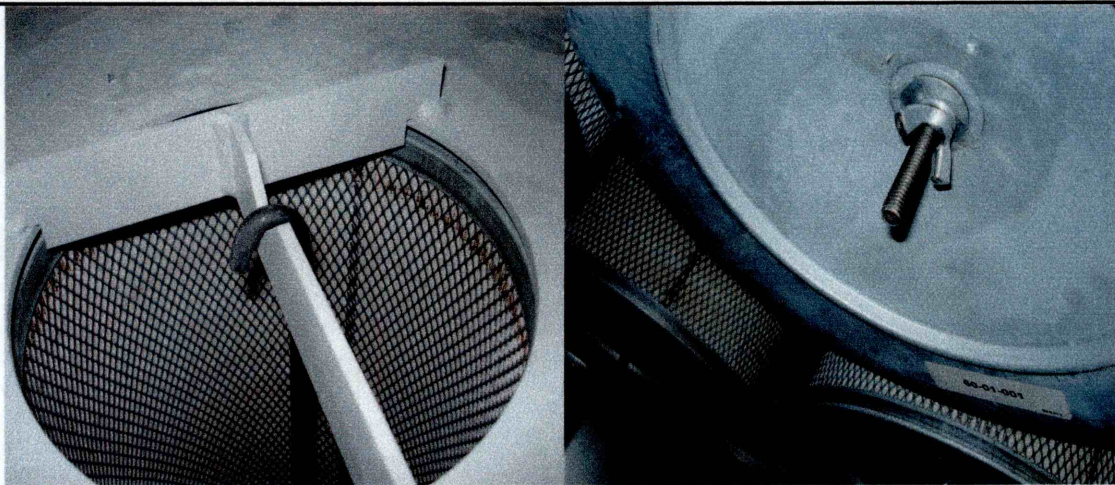
NOTE: Since each customer installation is different, EECI has not cut the hole through the AirWall unit which is necessary for the installation of the air supply line.

1. Cut a hole in the side of the dirty-air (lower) plenum bulkhead sufficient in size to accommodate the supply line diameter.
2. Externally mount a shut-off valve with a nipple or stub pipe extending through the hole and connect the pipe to the fitting provided in the bottom of the tube sheet. This connection is positioned between the back two rows of filter openings.
- 2.
3. Connect an air hose or hard plumbing from the compressed air source to the shut-off valve on the side of the AirWall unit.
4. Slowly open the shut-off valve to allow pressure to build in the accumulator tank. When the tank has reached full line pressure of 90 to 110 psi, close the shut-off valve.
5. Inspect the tank, valves and fittings, including the solenoid valves inside the cleaning system control box, for air leaks.
6. Tighten fittings and clamps as required.
7. Reopen the air shut-off valve.

INSTALLING FILTER CARTRIDGES

1. Remove the filter cartridges from their boxes. Inspect for damage.
2. Locate the support rod assemblies.
3. Carefully guide the threaded rod of the support rod down through the filter cartridge and through the center hole in the bottom of the cartridge. Place a filter cartridge retaining nut on the threaded end of the support rod.

INSTALLATION and START-UP



4. Beginning with the back row, gently lift the filter cartridge and position the hooked end of the support rod in the hole in the spider assembly welded in the opening of the tube sheet. The short, right-angle bend in the support rod will keep the support rod from turning completely around when it is positioned in the spider assembly.
5. With the spider assembly centering the filter cartridge in line with the tube sheet hole, guide the cartridge up against the spider assembly by tightening the filter cartridge-retaining nut on the end of the support rod.
6. While ensuring that the filter cartridge is aligned with the hole in the tubesheet, tighten the filter cartridge-retaining nut enough to compress the seal and test by making sure the filter cartridge can no longer be rotated by hand.
7. Repeat this procedure for the entire back row of filter cartridges.
8. Make one last inspection of all filter cartridges in the completed row for proper alignment and tightness before proceeding to the next row.
9. Proceed to the next row and repeat the procedure for the entire row of filter cartridges.
10. Again, make one last inspection of all filter cartridges in the completed row of filter cartridges.
11. Install the inlet baffles on the front of the AirWall unit by lifting and hanging the baffle assemblies. Make sure the support lip on the top of the baffle assembly interlocks with the lip on the top of the air inlet opening.
12. Install the dust collection drawers in the base of the AirWall unit.

INSTALLATION and START-UP

INITIAL START UP PROCEDURE

WARNING

Wear clean, approved eye or face protection while performing the initial start up procedure. Failure to follow this instruction may result in serious personal injury.

Checking Fan Rotation

Use the following procedure to check the fan rotation.

1. With the electrician present, press the START pushbutton on the motor starter and immediately press the STOP pushbutton. This momentary power application will jog the motor and start the fan turning on the AirWall unit. As the fan coasts to a stop, visually inspect the fan exhaust outlet and ensure that the fan rotation is in the correct direction. See WARNING.
-

WARNING

Never place hands or other objects such as tools into the fan inlet or exhaust openings. Failure to follow this instruction may cause serious personal injury.

Normally, there is an arrow on the blower indicating proper rotation of the fan blades. If this arrow is not visible carefully look into the fan exhaust outlet and confirm that the fan blades are moving toward you. If the fan blades are rotating away from you, have your electrician reverse the motor direction.

2. After assuring that the fan is turning in the proper direction, restart the AirWall unit and allow it to come up to speed. Ask your electrician to use an amp probe or ammeter to take amp and volt readings after the fan has rotated up to full speed to make sure the motor is not being overloaded.

OPERATION and MAINTENANCE

OPERATIONS

CAUTION

Avoid mixing combustible dust with dust from spark generating operations, such as ferrous or non-ferrous material grinding operations. Under no circumstances should lighted cigarettes, etc. be permitted to enter the air inlet or dust collection drawers of the AirWall unit. Failure to follow this instruction may result in severe damage to the equipment and personnel injury.

Filter Cleaning Operation

The filter cleaning system uses compressed air to back flush or pulse accumulated particulate from the cartridge pleats. A timer control board starts the cleaning sequence. The system begins cleaning the filters anytime the pressure differential between the entrance (dirty) side of the filter cartridges and the exit (clean) side reaches a pre-determined level. This differential is constantly monitored by a Photohelic gage and switch or digital pressure sensing module. As the filter cartridges become more restricted by dust accumulation, the exhaust fan creates a greater vacuum or pressure drop in the clean air plenum on the clean side of the filter cartridges. The Photohelic gage or digital sensing module monitors this vacuum and, as the pre-determined high set point is reached, reverse pulse cleaning cycle is started automatically.

At the start of the cleaning cycle, a time delay of approximately 8 seconds will elapse. This is referred to as the "off time" and is the time necessary between pulses for the pressure accumulator to recharge for the next pulse.

At the end of the "off time," a pilot solenoid will release the pressure on a diaphragm valve and a short burst of air will be transmitted through an orifice in a blow-pipe located above each of the rows of filter cartridges. The AirWall LD models have 3 blow-pipes, while the AirWall MD and HD models have 5 blow-pipes. The air pulse will cause a shock wave to blow backward through the filter cartridge. This dislodges the accumulated dust, which falls into dust collection drawers at the bottom of the AirWall unit. The pulse time is adjustable from .05 to .5 seconds in duration and is referred to as the "on time". Normal pulse time is 0.3 second.

The cleaning cycle will continue with an "off time" and "on time", producing a full pulse each time, until the Photohelic gage or digital sensor module registers a pressure drop sufficient to stop the cleaning process. This is pre-determined and is referred to as the low set point. The high and low set points can be adjusted using the two adjustment

OPERATION and MAINTENANCE

knobs located on the front of the Photohelic gage or the keypad on the digital sensor module. Adjustments can be made as required to accommodate various process variables and to maintain the filters at their optimum efficiency.

Integrated Control Panel (ICP). An optional NEMA 12 ICP is available with controls for starting up to four (4) AirWall unit's along with their on-demand filter cleaning controls. These controls include:

MAIN POWER - Disconnect switch

PURGE CONTROL - OFF indicator light and MAN/OFF/AUTO selector switch

FAN MOTORS - RUN indicator light and START/STOP selector switch

FILTER PRESSURE - Photohelic gage and switch or digital sensor module

MAIN POWER

This switch provides on/off switching and over-current protection for the Integrated Control Panel

PURGE CONTROL

The FILTER PURGE controls consist of the OFF indicator light and the MAN/OFF/AUTO selector switch. The MAN/OFF/AUTO selector switch controls the operation of the Photohelic gage and switch or digital sensor module and must be in the AUTO position to enable on-demand cleaning..

When the selector switch is set to the MAN (manual) position the reverse pulse solenoids will activate sequentially every 8 seconds (adjustable between 8-180 seconds). This filter cartridge cleaning cycle will continue until the switch is set to the OFF or AUTO position.

When the selector switch is set to the OFF position, operation of the reverse pulse solenoids is disabled and the OFF indicator light is illuminated.

When the selector switch is set to the AUTO position and the AirWall unit fan is running, the operation of the reverse pulse solenoids is determined by the setting of the Photohelic pressure gage and switch. The cleaning pulses will continue until the Photohelic low setpoint is reached, the dust collector fans are stopped, or the MAN/OFF/AUTO selector switch is set to the OFF or MAN (manual) position.

OPERATION and MAINTENANCE

FAN MOTOR

The fan motor controls consist of a RUN indicator light and a START/STOP selector switch. Turning the selector switch clockwise to the START position and holding it until the ON indicator light illuminates will start one or more (up to four) AirWall units.

DUST COLLECTION DRAWERS

At the start/end of each shift, check the dust collection drawers located in the bottom of the air filtration/dust collection unit. Dispose of any waste accumulation according to federal, state and local environmental regulations. See WARNING.

WARNING

Always wear OSHA-NIOSH approved respiration equipment when emptying the dust collection drawers. Failure to follow this instruction may cause serious personal injury.

OPERATION and MAINTENANCE

MAINTENANCE

MOISTURE ACCUMULATION

At the start/end of each shift, press the MOISTURE DRAIN pushbutton to allow any water to escape from the pulse accumulator tank. The MOISTURE DRAIN pushbutton is located on the left front of the AirWall unit.

CHANGING FILTER CARTRIDGES

WARNING

When changing filter cartridges, always wear OSHA-NIOSH approved respiration equipment, coveralls and gloves. Failure to follow this instruction may cause serious personal injury.

When it becomes necessary to change filter cartridges, keep in mind that a dirty filter cartridge weighs between 27 and 30 lbs. The stacked filter cartridge arrangement weighs between 54 and 60 lbs. Therefore, it is recommended that two (2) people assist each other in removing the dirty filter cartridges because of the weight dropping down when the filter cartridge retaining nut is removed from the threaded end of the support rod. See WARNING.

WARNING

Because of the weight of the dirty filter cartridges, two (2) people should perform the removal of the dirty cartridges. Failure to follow this instruction may result in personal injury.

After removing all of the dirty filter cartridges from the AirWall unit, install a new set of filter cartridges using the procedure outlined in Installation Section, INSTALLING FILTER CARTRIDGES.

DUST COLLECTION DRAWERS

At the start/end of each shift, check the dust collection drawers located in the bottom of the air filtration/dust collection unit. Dispose of any waste accumulation according to federal, state and local environmental regulations. See WARNING

OPERATION and MAINTENANCE

WARNING

Always wear OSHA-NIOSH approved respiration equipment when emptying the dust collection drawers. Failure to follow this instruction may cause serious personal injury.

FAN MOTOR LUBRICATION

The most common cause of premature bearing failure is improper lubrication. The fan motor provided with AirWall dust collection systems will be one of two types.

One type has sealed-for-life bearings and requires no maintenance. The other type motor provided with the fan has grease fittings on the top and bottom of the motor. If safety permits, the initial lubrication may be done while the motor is running until some purging occurs at the seals. Refer to the decal on the fan for the re-lubrication interval for normal operating conditions. Hours of operation, temperature and environmental conditions will affect the lubrication frequency. Adjust frequency depending on the condition of the purged grease.

Lubricate the grease fittings with a high quality NLGI No. 2 or No. 3 multi-purpose ball bearing grease having rust inhibitors and anti-oxidant additives. Suggested greases are:

Shell Alvania No. 2
Mobil Mobilith SCH 100
Texaco Premium RB2
American-Rykon Premium 2

Lubricate bearings prior to an extended shutdown or storage period. Rotate the motor shaft monthly to prevent corrosion. If fans are to be shut down or stored for more than 30 days, it is important that the bearings are filled with grease and the fan rotated by hand from time to time so that the grease can be spread on the bearing components.

TROUBLESHOOTING

The following is a list of possible problems and their causes that may occur on start-up, or develop later during actual operation.

The following may cause noise:

- a. Impeller hitting the inlet of the fan or cutoff plate, loose impeller.
- b. Bad bearings are a common source of noise when defective, lacking

OPERATION and MAINTENANCE

- c. lubricant or lubricant is dirty. Noise can also be caused when the bearings are loose on the bearing support or the shaft, seals misaligned or fretting corrosion occurs between the inner and outer bearing races.
- c. Bent or undersized shaft. If two (2) or more bearings are on the same shaft, they must be carefully aligned.
- d. An electrical AC hum caused by a defective starting relay.
- e. Obstruction in high velocity air stream can cause rattle or pure tone whistle.

An air flow noise or hollow whistle type of noise from the clean air plenum when the compressed air line is opened is an indication of a loose or leaking vent line or fitting between a diaphragm valve and its pilot solenoid. These are located in the clean air plenum. The affected valve can be quickly isolated by holding a hand below each of the blow-pipes until the one leak is located. Follow the black ¼" poly tube line from the diaphragm valve on the affected blow-pipe back to its pilot valve. Remove, inspect and re-install the line after checking the tightness of the fittings in both the diaphragm and the pilot solenoid valves.

REPLACEMENT PARTS

ORDERING REPLACEMENT PARTS

To order replacements parts for your AirWall unit, write to:

Envirosystems Manufacturing, LLC.

or:

Phone: 1-800/999-0501 or 520/573-3064

Fax: 520/573-3068

E-Mail: envirosystems@att.net

Web: www.envirosystemslc.com

Be sure to include, or have access to, the following:

1. Your name, company name, complete shipping address and phone number
2. Model number
3. Serial number (this number is located on a plate attached to the AirWall unit)
4. Purchase order number if non-warranty

The following replacement parts are common to all standard AirWall models.

<u>QUANTITY</u>	<u>PART DESCRIPTION</u>	<u>PART NUMBER</u>
1	Button, bleeder, 2-way	32-21-001
1	Controller, sequence, 6-position	25-02-001
4	Drawer, complete, galvanized	14-11-002
*	Filter cartridge, bottom	60-01-001
*	Filter cartridge, top	60-01-002
1	Gage, Photohelic, 3004	37-02-001
1	Gasket, Foam, .5 in. x .156 in. (12,7mm x 4,0mm)	41-01-001
2	Lock, sash, aluminum	16-05-001
12	Pull, door/drawer, zinc, 5.75 in.	16-03-001
*	Rod, support, cartridge filter, 29.5 in.	11-12-002
*	Rod, support, cartridge filter, 55 in.	11-12-001
1	Tubing, polyethylene, roll, .250 in.	32-02-000
1	Valve, diaphragm	31-03-001
1	Valve, safety pressure relief, .250 in. , 125 psi	31-24-001

* Quantity dependent on AirWall Model

REPLACEMENT PARTS

The following replacement parts are common to AirWall Models AW60-MD, AW80-MD and AW100-MD.

<u>QUANTITY</u>	<u>PART DESCRIPTION</u>	<u>PART NUMBER</u>
2	Baffle, (section) galvanized	14-11-001
4	Strip, corner	14-10-019

The following replacement parts are common to AirWall Models AW100-HD, AW120-HD and AW160-HD.

<u>QUANTITY</u>	<u>PART DESCRIPTION</u>	<u>PART NUMBER</u>
2	Baffle, (section) galvanized	14-11-004
4	Strip, corner	14-10-020

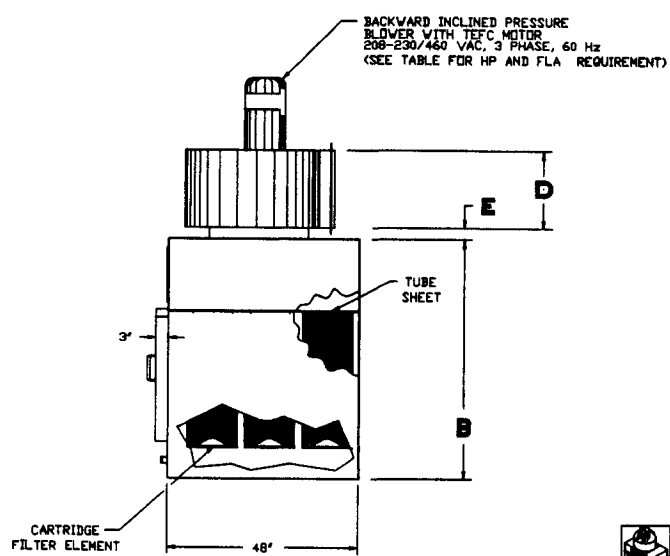
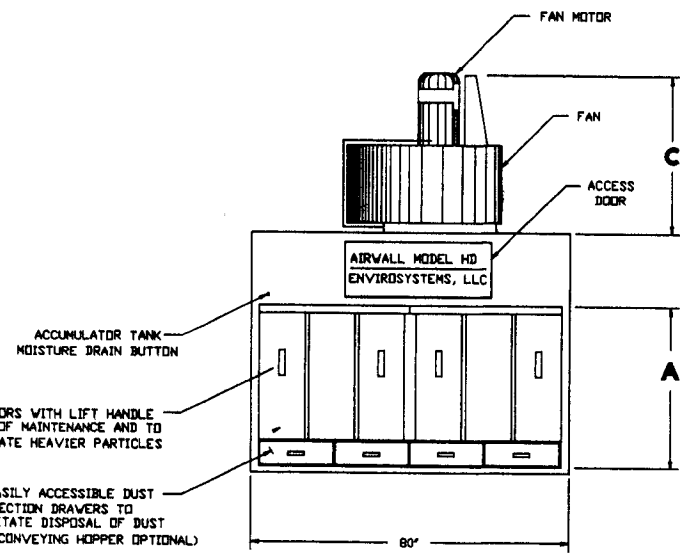
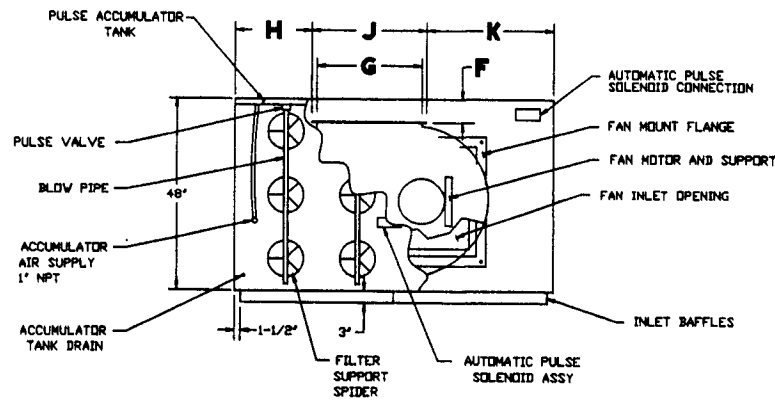
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ITEM QTY P/N DESCRIPTION

NOTES:

- ALL SYSTEMS INCORPORATE REVERSE PULSE-JET CLEANING USING AUTOMATIC SEQUENCE CONTROL, DIAPHRAGM VALVES, AIR PRESSURE ACCUMULATOR TANK & PULSE-JET BLOW PIPE, FACTORY ASSEMBLED. FAN SHIPPED SEPARATELY.
- CONSTRUCTION IS GAUGE GALVANIZED STEEL ON STRUCTURAL SQUARE STEEL TUBE FRAME.
- LARGE AREA AIR INLET REDUCES AIR VELOCITIES THROUGH BAFFLES, RESULTS IN LOWER OPERATING PRESSURE DROP AND LESS HP REQUIREMENT.
- FIELD CONNECTION POINTS:
ELECTRICAL: 3 PH, LINE TO STARTER AND STARTER TO MOTOR.
1 PH, 120V, TO PULSE CONTROL SYSTEM.
AIR: 1" NPT FITTING (LOCATED IN BOTTOM LEFT TUBE SHEET).
- COMPRESSED AIR REQUIRED: 90-100 PSIG OF CLEAN, DRY AIR. SYSTEM USES APPROX. 3 CFM.
- POWER: 208/230/460 VAC, 3 PHASE, 60 HZ. SEE CHART BELOW FOR FLA REQUIREMENT 180 VAC, 1 PH, 60 HZ. <5.0 A
- OPTIONS: (SELECT AS REQUIRED)
A. ☐ SAFETY MONITORING FILTER PACKAGE DOES NOT INCLUDE DUCTING FROM FAN (CONSULT FACTORY) (SHIPPED LOOSE)
☐ SAFETY FILTER, ASHRAE 95%
☐ SAFETY FILTER, HEPA
B. ☐ 380/575 VAC ELECTRICAL SYSTEMS
C. ☐ 50 HZ ELECTRICAL SYSTEMS
D. ☐ FAN SILENCERS. (SHIPPED LOOSE)



MODEL NO.	TOTAL CFM	QTY REQ'D	CARTRIDGE FILTER ELEMENT TOTAL FLTR AREA (SQ. FT.)	AIR TO FLTR RATIO	BLOWER	FAN INLET OPENING	A	B	C	D	E	F	G	H	J	K	AIRWALL PART NO.	MOTOR FLA @ 208/230V	460V
AV60MD	6,000	15	3,600	1.67 : 1	5 HP	31X31	78"	60"	58"	14.8"	2"	3-3/4"	27-1/4"	14-1/8"	30-1/4"	35-3/8"	1007	38.8/68.0	14.0
AV80MD	8,000	15	3,600	2.22 : 1	7-1/2 HP	34X34	78"	60"	37"	16.43"	2"	1-3/4"	30-1/8"	11"	33-1/8"	35-7/8"	1009	48.3/48.0	21.0
AV100MD	10,000	15	3,600	2.78 : 1	10 HP	34X34	78"	60"	41"	20.01"	2"	1-3/4"	30-1/8"	11"	33-1/8"	35-7/8"	1010	62.1/34.0	27.0

		REVISION HISTORY 2008 E. Presidents St. Tucson, AZ 85714 800-999-0501	
APPROVALS KEA GJ KEA	DATE 2/10/91 2/10/91 1/10/91	TITLE AIRWALL MODEL MD GENERAL DATA	
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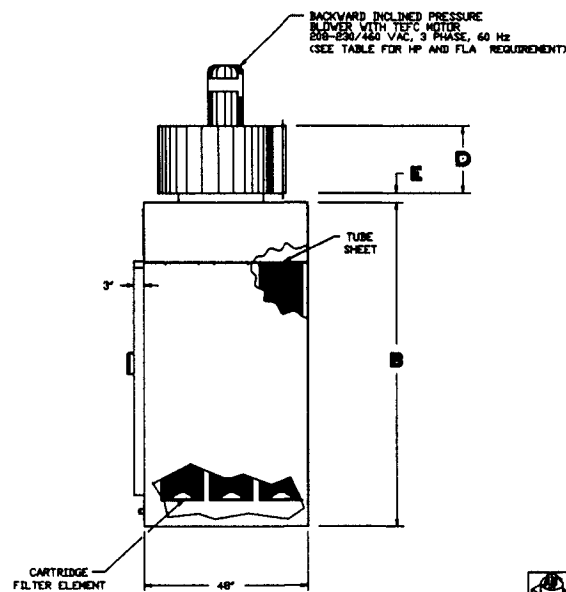
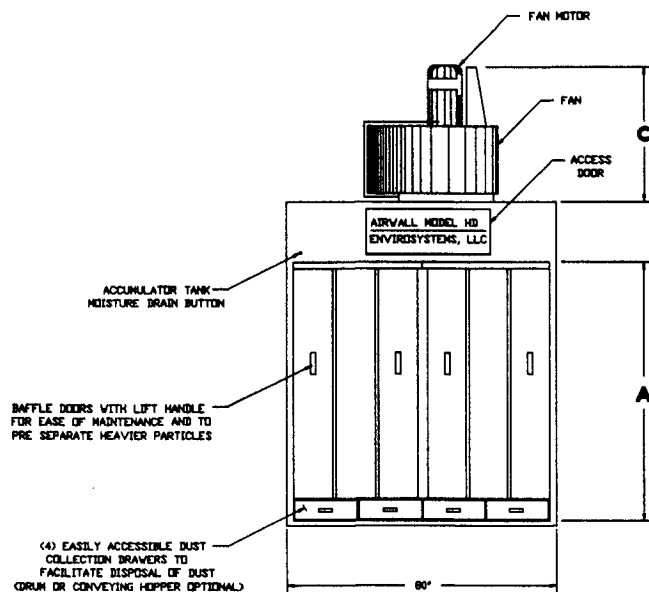
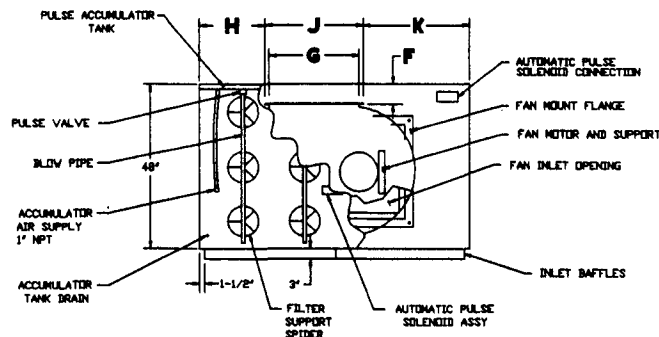
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ENVROSYSTEMS
1800 - 854-8

ITEM QTY P/N DESCRIPTION

NOTES:

- ALL SYSTEMS INCORPORATE REVERSE PULSE-JET CLEANING USING AUTOMATIC SEQUENCE CONTROL, DIAPHRAGM VALVES, AIR PRESSURE ACCUMULATOR TANK & PULSE-JET BLOW PIPE, FACTORY ASSEMBLED. FAN SHIPPED SEPARATELY.
- CONSTRUCTION IS GAUGE GALVANIZED STEEL ON STRUCTURAL SQUARE STEEL TUBE FRAME.
- LARGE AREA AIR INLET REDUCES AIR VELOCITIES THROUGH BAFFLES, RESULTS IN LOWER OPERATING PRESSURE DROP AND LESS HP REQUIREMENT.
- FIELD CONNECTION POINTS:
ELECTRICAL 3 PH. LINE TO STARTER AND STARTER TO MOTOR.
1 PH. 120V. TO PULSE CONTROL SYSTEM
AIR 1" NPT FITTING LOCATED IN BOTTOM LEFT TUBE SHEET.
- COMPRESSED AIR REQUIRED: 90-100 PSIG OF CLEAN, DRY AIR. SYSTEM USES APPROX. 3 CFH
- POWER: 208/230/460 VAC, 3 PHASE, 60 HZ. SEE CHART BELOW FOR FLA REQUIREMENT
120 VAC, 1 PH, 60 HZ. <3.0 A
- OPTIONS (SELECT AS REQUIRED):
A. ☐ SAFETY MONITORING FILTER PACKAGE. DOES NOT INCLUDE DUCTING FROM FAN (CONSULT FACTORY) (SHIPPED LOOSE)
☐ SAFETY FILTER, ASHRAE 95%
☐ SAFETY FILTER, HEPA
B. ☐ 380/575 VAC ELECTRICAL SYSTEMS
C. ☐ 30 HZ ELECTRICAL SYSTEMS
D. ☐ FAN SILENCERS (SHIPPED LOOSE)



MODEL NO.	TOTAL CFH	CARTRIDGE FILTER ELEMENT	BLUVER	FAN INLET OPTIONS	A	B	C	D	E	F	G	H	J	K	AIRWALL FILTER NO.	MOTOR FLA @ 208/230V	MOTOR FLA @ 460V
AV10000	10,000	80	4,785	10 HP	34134	78"	94"	41"	28"	3-5/4"	27-1/4"	14-1/8"	30-1/4"	30-5/8"	1007	28.2/28.0	14.0
AV15000	15,000	80	4,785	15 HP	34134	78"	94"	49"	18-1/4"	1-3/4"	30-1/8"	11"	30-1/8"	30-7/8"	1009	48.3/48.0	24.0
AV16000	16,000	80	6,975	80 HP	34134	78"	94"	49"	22-1/8"	1-3/4"	30-1/8"	11"	30-1/8"	30-7/8"	1010	68.1/64.0	27.6

		REVISION HISTORY SOLE E. President: ST TUCSON, AZ 85714 800-999-0521	
APPROVALS DESIGN: KEA CHECKED: GEI APPROVED: KEA		DATE 2/18/91 2/18/91 1/10/91	
GENERAL DATA MODEL NO. N/A SERIAL NO. N/S AV HD DATA		TITLE: AIRWALL MODEL HD PROJECT/REVISED:	