

BLAST-IT-ALL®

LARRY HESS AND ASSOCIATES, INC.

185 PIPER LANE

SALISBURY, NC 28144 USA

800-535-2612

FAX: 704-638-9311

WARNING

DO NOT USE SAND. SAND WILL CAUSE SILICA DUST, WHICH IS THE CAUSE OF SILICOSIS DISEASE, A CONDITION OF MASSIVE FIBROSIS OF THE LUNGS. THIS STATEMENT INDICATES POTENTIAL PERSONNEL HAZARD. FAILURE TO COMPLY WITH THESE INSTRUCTIONS MAY RESULT IN PERSONAL INJURY.

WEBSITE FOR SILICOSIS:

<http://www.osha.gov/Silica/TT69D 1.html>

EQUIPMENT MANUAL

MM-593

SPR 9600

DATE: July 20, 2006

TABLE OF CONTENTS

	Page
List of Illustrations	1
Section 1 Introduction:	
1.1 General Information	2
1.2 Major Assemblies / Components	2
1.2.1 System Platform	2
1.2.2 Recovery Hopper (Low Profile)	2
1.2.3 Reclaimer	2-3
1.2.4 Media Storage Hopper	3
1.2.5 Pressure Tank	3
1.2.6 Dust Collector	3
1.2.7 Exhaust Fan	3
Section 2 Installation And Preparation For Use:	
2.1 Site Requirements	4
2.2 Main Equipment Platform	4
2.3 Reclaimer Installation	4
2.4 Hopper Installation	4
2.5 Blast Hose and Control Installation	4
2.6 Duct Installation (On Top Of Dust Collector)	5
2.7 Exhauster Blower Installation	5
2.8 Compressed Air Inlet	5
2.9 Flex Hose Installation / Sweep-In Recovery	5
Section 3 Operation Instructions:	
3.1 System Operation	6
3.2 Remote Dead-man Control Systems	6
3.3 Remote Blow-Down Controls (OPTIONAL)	6
3.4 Operation Instructions	6-7
Section 4 Trouble Shooting Procedures:	
4.1 No Abrasive Discharge	8
4.2 Abrasive Flow From Nozzle	8
4.3 No Air Pressure at Nozzle	8
4.4 Slow or No Media Recovery	8
MM-329 RPJ-2H Manual	21-35

LIST OF ILLUSTRATIONS

GENERAL ARRANGEMENT.....	PHOTO
SPR 9600 SWEEP-IN-FLOOR ASS'Y.....	A38129
RECLAIMER.....	A30093
SCREEN SECTION AND MEDIA STORAGE.....	A267
PRESSURE POT.....	B4139
DUST COLLECTOR.....	M2090
AIR HEADER & PULSE CONTROL BOX.....	B7111-1
DUCT, DUST COLLECTOR TO EXHAUST FAN.....	B12552-M
SOUND ATTENUATOR.....	A35342-M
STAND.....	B2231-M
MAGNEHELIC GAGE.....	004457
DUCT, BLOWER REPLACEABLE PARTS.....	PHOTO

SECTION 1 INTRODUCTION

1.1 GENERAL INFORMATION:

This manual provides operation and maintenance instructions for equipment manufactured by LARRY HESS & ASSOCIATES, Airport Industrial Park, Highway 29 South, Salisbury, NC 28145 USA. Please read this manual completely before attempting any erection procedures or operations of any sort.

1.2 MAJOR ASSEMBLIES / COMPONENTS:

- 1.2.1 SYSTEM PLATFORM
- 1.2.2 SWEEP-IN RECOVERY SYSTEM
- 1.2.3 RECLAIMER
- 1.2.4 HOPPER
- 1.2.5 PRESSURE TANK
- 1.2.6 DUST COLLECTOR
- 1.2.7 EXHAUST FAN

1.2.1 SYSTEM PLATFORM

1.2.2 RECOVERY SYSTEM:

The Floor Recovery Unit is a low profile recovery unit that has an adjustable air inlet for media flow. Spent blasting media and debris are manually swept into the recovery unit where they are pneumatically conveyed to the reclaim.

1.2.3 RECLAIMER:

The Reclaimer is of the centrifugal cyclone separator type using high velocity air to convey and separate the spent media from the dust and debris of the dry-blasting process. A tuning provision has been provided to allow the balancing of media reclamation and, conversely, the prevention of media carry-over into the dust collector. The provision is a vertically sliding sleeve in the top of the reclaimer housing. Adjustment is by external handle (rod) on top of the reclaimer. A pin through the hole in the rod allows adjustment in one-inch increments. The sliding sleeve can be adjusted in either direction as needed. As the dust collector material matures and coats, the reclaimer may have to be

re-adjusted. As the media is separated from the dust, all good media passes through a screen, which retains large particles from passing into the blast generator.

1.2.4 HOPPER:

The Hopper is for storage of the blast media. It is a ten (10) cubic feet.

1.2.5 PRESSURE TANK:

The Blast Tank is for reusing and pressurizing the blast media. It is a six and a half (6.5) cubic foot, single chamber pot. It features automatic operator remote control for one (1) operator.

1.2.6 DUST COLLECTOR:

The Dust Collector is a cartridge filter type. Air enters and is circulated through cartridge filters, trapping dust and leaving only clean air. A pulse control is used to clean the cartridges, allowing dust to fall into the hopper. Pulse requires 120V, 1 Phase. The power is controlled by motor starter.

1.2.7 EXHAUSTER FAN:

The Exhauster Fan provides high static air flow for recovery.

SECTION 2 INSTALLATION AND PREPARATION FOR USE

2.1 SITE REQUIREMENTS:

Locate components per plan view and component drawing.

NOTE: Refer to the illustrations in this manual to identify and install this equipment.

*****UNIT MUST BE LAG BOLTED TO FLOOR IN FINAL LOCATION*****

2.2 MAIN SYSTEM FRAME ASSEMBLY AND PLATFORM:

Place the main frame assembly where the system is to be located.

2.3 RECLAIMER INSTALLATION:

Using putty tape as sealant.

Raise the reclaim main body and attach to the top of the HOPPER using 3/8" x 1" self-threading bolts provided.

2.4 HOPPER INSTALLATION:

Using putty tape as sealant.

After attaching the reclaimer to the hopper raise the reclaim / hopper assembly and attach to the top of the blast tank using 3/8" x 1" bolts and nuts. Install the purge hose (3/4" hose) from the reclaimer inlet PURGE DUCT to the outlet port on the pressure tank. Install the screen vibrator tube to the fitting on the side of the hopper.

2.5 BLAST HOSE AND CONTROL INSTALLATION:

Attach the blast hose to the quick coupling on the media valve.

USING BLACK ELECTRICAL TAPE.

Secure the blast dead-man control (the larger control handle) to the blast hose. Attach the blow-off control handle (the smaller control) to the blast hose. Secure the BI-LINE to the blast hose.

2.6 DUST COLLECTOR TOP DUCT INSTALLATION:

Using putty tape as sealant.

Raise the TOP DUCT and attach to the top of the DUST COLLECTOR using 1 /4 " x 3 /4" self-threading bolts.

2.7 EXHAUSTER BLOWER INSTALLATION:

Attach the short section of 6" diameter flex hose to the flange point of the top duct. Lift the blower to the top of the dust collector and slide the other end of the short section of the 6" flex hose over the blower inlet. Secure the flex hose with the clamps provided. Secure the blower to the top of the dust collector with 3/8" x 1" bolts and lock nuts.

2.8 COMPRESSED AIR INLET:

Attach the (plant) compressed air line to the blast tank air inlet.

2.9 FLEX HOSE CONNECTIONS:

Attach the 6" flex hose to the sweep-in recovery unit and to the reclaim inlet. Secure with clamps.

Attach the 8" flex hose from the dust collector hopper inlet to the reclaim outlet. Secure with clamps.

SECTION 3 OPERATION INSTRUCTIONS

3.1 SYSTEM OPERATION

3.2 REMOTE CONTROL DEAD-MAN SYSTEM:

The dead-man control operates on 12 volt Electric Circuit. The system is activated when the switch handle is depressed to the blast position. When in this position, the 12 volt, 3-port solenoid is activated. Blasting will then begin. To stop the blast flow, the handle is released.

3.3 REMOTE CONTROL BLOW-DOWN SYSTEM:

The operator can grasp the blow down valve (THE SMALLER CONTROL VALVE) and hold while activating the blast dead-man. This will cut off the flow of blast media and allow only compressed air to flow through the blast hose.

3.4 OPERATING INSTRUCTIONS:

- A. At the (customer supplied) main control panel press the "start" push-button. The Exhauster Fan should operate.
- B. Be sure the remote control switch handle is raised and is clear of the body before supplying air to the system.
- C. Connect the air supply line to the blast tank.
- D. Adjust air supply regulator as required.
- E. Check for air leaks.
- F. Maintain an adequate supply of air.
- G. To start blast flow, depress the spring loaded remote control switch. The blast flow will commence.

WARNING

The bi-line DEAD-MAN remote control switch is designed to function as a dead-man control. Do not wire or tie down the lever to the handle at any time.

H. To stop air blast flow, release the dead-man remote control handle.

I. Adjust the media control valve for the desired media flow.

J. To determine if the reclaimer and dust collector systems are functioning properly, observe the accumulation of material in the dust collector.

K. If the media is being carried over into the dust collector, raise the sliding sleeve at the top of the reclaimer. "As the filter material matures there will be less carry over to the collector."

L. During normal usage, aim the nozzle at an angle of approximately 45 degrees to the surface of the work piece. Too steep of an angle will not achieve and better results and can aggravated bounce-back of the media towards the operator as well as lead to premature break-down of the media.

NOTE: Only abrasives manufactured or processed for blast cleaning should be used with this equipment.

SECTION 4 TROUBLE SHOOTING PROCEDURES

WARNING

Never attempt to do any maintenance on this system if it is under pressure or has the capability of being pressurized. Turn off all air supply and electrical supply sources before servicing.

4.1 NO ABRASIVE DISCHARGE FROM NOZZLE:

- A. Make certain that the blast hose is secure.
- B. Shut-off source of compressed air.
- C. Depressurize blast unit.
- D. Inspect the abrasive valve and blast hose for blockage.
- E. Check the supply of abrasives in reclaimer.

4.2 ABRASIVE FLOW IS SPITTING OR IRREGULAR:

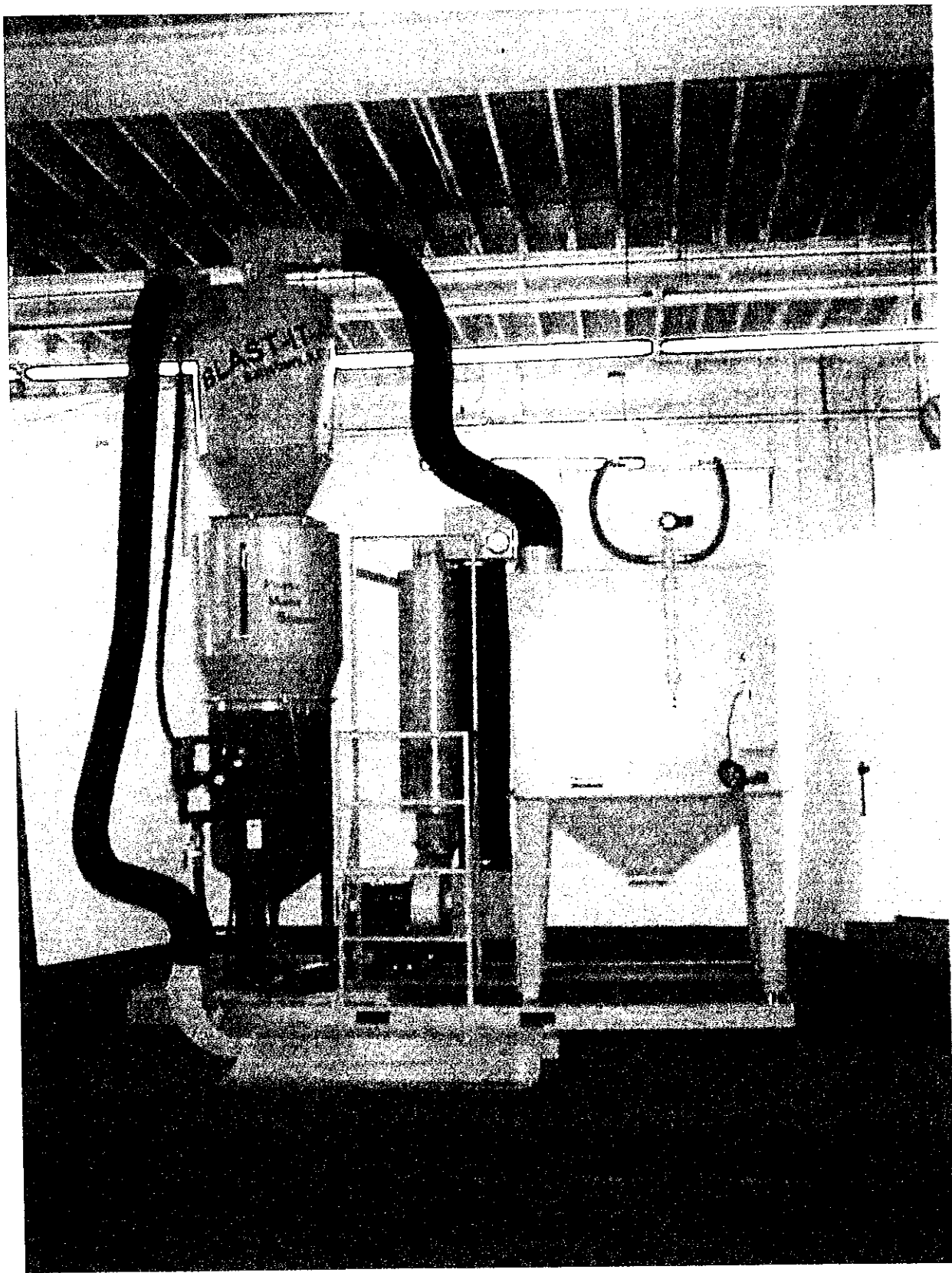
- A. Adjust media control valve.
- B. Excess moisture within the air lines will cause an unsteady stream of abrasive from the nozzle. Check the air dryer on the blast generator.

4.3 NO AIR PRESSURE:

- A. Check the bi-line (dead-man) switch for leaks. When the handle is lowered to the blasting position with the safety button in, there should be no air escaping from the switch body.

4.4 NO RECOVERY FROM LOW PROFILE SWEEP-IN

- A. Check for blockage in flex hose. Check fan rotation.
- B. Check fan for rotation.



Exploded perspective view of a multi-layered rectangular frame assembly. The assembly consists of several rectangular layers (02, 03, 04, 05) and a central core (01). A circular component (06) is shown at the bottom left, likely a fastener or connector. Dashed lines indicate the alignment and assembly sequence of the layers.

06	1	ELBOW FLEX HOSE ADAPTOR	A38383	UPDATED 05/10/07
05	1	PERFORATED PLATE COVER	A38129-5	3/8 x 8 x 48 PLAS-MED
04	1	PERFORATED PLATE COVER	A38129-4	3/16 x 8 x 48
03	1	FLOOR MEDIA TROUGH	A38121	
02	1	FLOOR TROUGH ASS'Y.	B3562	
01	1	ELBOW W/ ADJ. AIR FLOW	A38096-N	UPDATED 09/19/07
ITEM NO.	QTY	DESCRIPTION	DWG. NO. / MATERIAL	

CONFIDENTIAL

THE DISCLOSURES AND CONTENTS OF THIS DRAWING ARE
CONFIDENTIAL AND ARE THE EXCLUSIVE PROPERTY OF
BLAST-IT-ALL, DIV. OF LARRY HESS & ASSOCIATES, INC.
THIS DRAWING IS NOT TO BE COPIED OR REPRODUCED WHOLLY
OR IN PART WITHOUT WRITTEN PERMISSION OF
LARRY HESS & ASSOCIATES, INC.

#3	UPDATED	DEC	09/19/07			
#2	UPDATED	DEC	05/10/07			
#1	UPDATED	DEC	05/26/05			
REV.	DESCRIPTION	BY	DATE			

ELECTRIC ASS'Y. PMS 9400

MATERIAL:

PER DWG

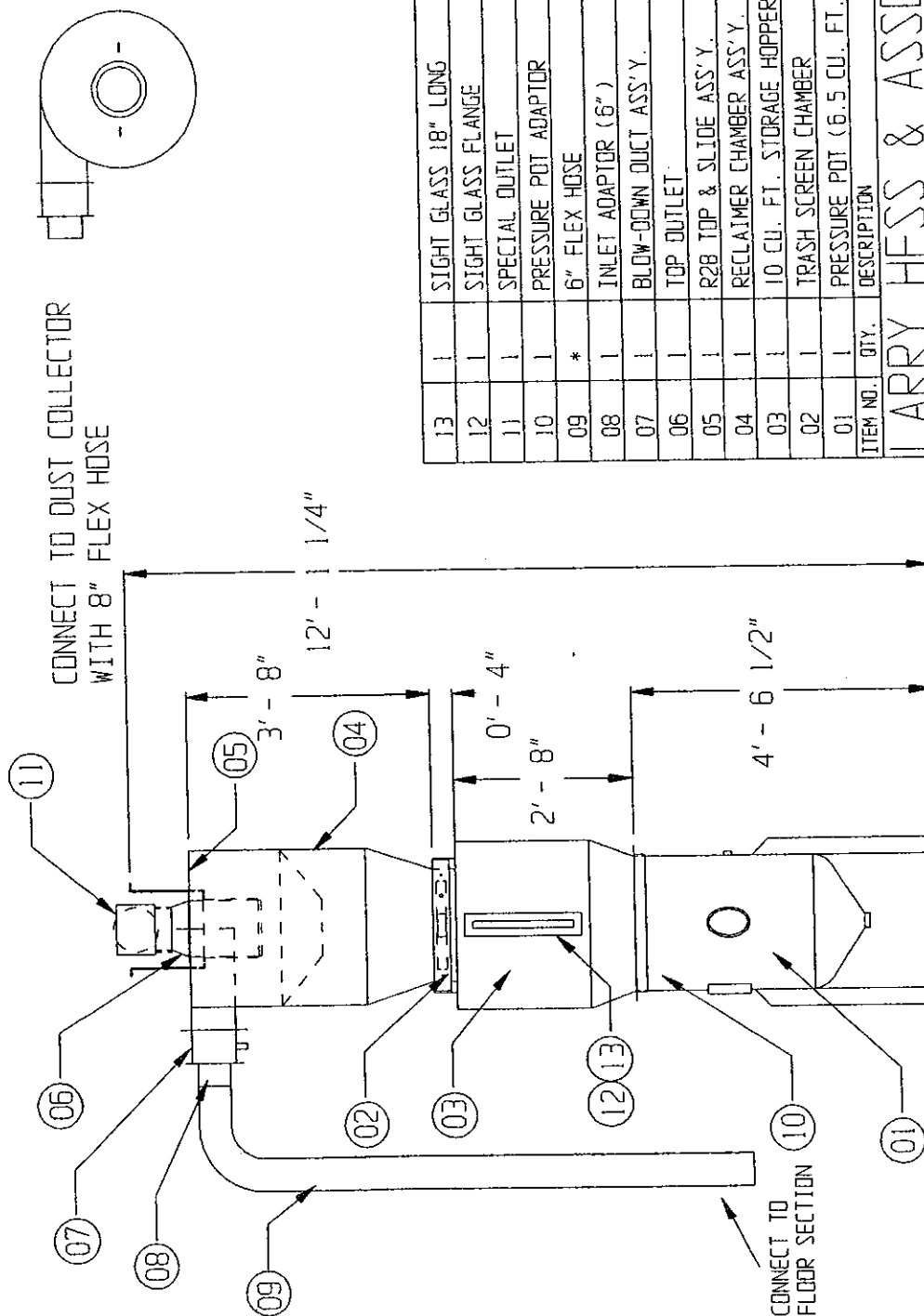
DRAWING NO.:

A38129

ASSY.: 81339

ASSY.: 81339

CONNECT TO DUST COLLECTOR
WITH 8" FLEX HOSE



13	1	SIGHT GLASS 18" LONG	010829
12	1	SIGHT GLASS FLANGE	B2123-3
11	1	SPECIAL OUTLET	B1328
10	1	PRESSURE POT ADAPTOR	A30076
09	*	6" FLEX HOSE	19-096
08	1	INLET ADAPTOR (6")	A12765
07	1	BLOW-DOWN DUCT ASS'Y.	B1342
06	1	TOP OUTLET	A30085
05	1	R28 TOP & SLIDE ASS'Y.	A1300
04	1	RECLAIMER CHAMBER ASS'Y.	A30037 (LESS STAND)
03	1	10 CU. FT. STORAGE HOPPER	B1231
02	1	TRASH SCREEN CHAMBER	A267
01	1	PRESSURE POT (6.5 CU. FT.)	
		DESCRIPTION	DWG. NO. / MATERIAL

ITEM NO.	QTY.	DESCRIPTION	DWG. NO. / DATE
LARRY HESS & ASSOCIATES, INC			
SALISBURY, NORTH CAROLINA			

DESCRIPTION:

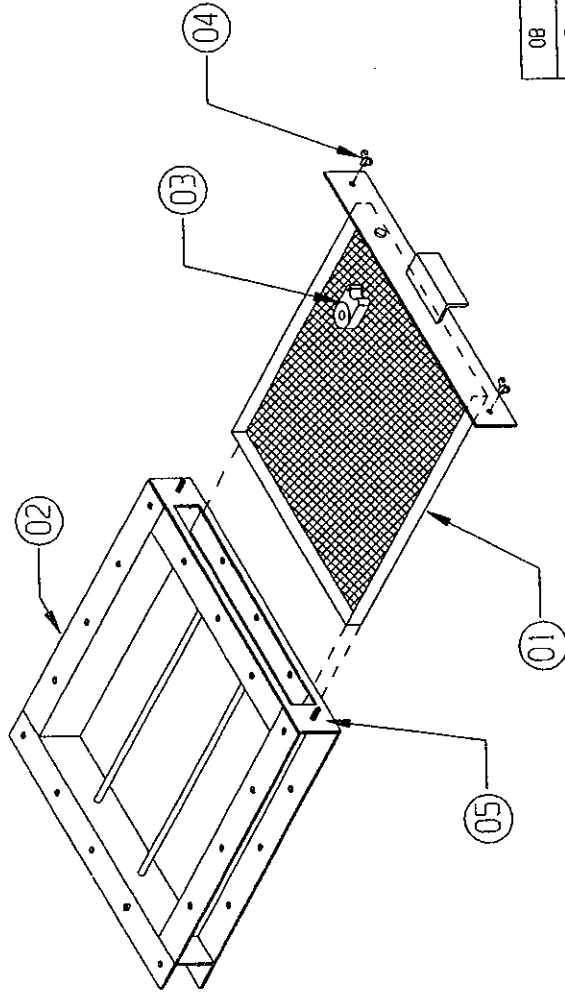
28" REFLAIME MECH. ASS'Y.

CONFIDENTIAL

THE DISCLOSURE AND CONTENTS OF THIS DRAWING ARE
CONFIDENTIAL AND ARE THE EXCLUSIVE PROPERTY OF
BLAST-IT-ALL® A DIV. OF LARRY HESS & ASSOCIATES, INC.,
THIS DRAWING IS NOT TO BE COPIED OR REPRODUCED WHOLLY
OR IN PART WITHOUT WRITTEN PERMISSION OF
LARRY HESS & ASSOCIATES, INC.

DRAWN BY: DEC	DATE: 06/09/05	SCALE: $1/2" = 1'$	JOB NO.:	DRAWING NO.: A30093
CHECKED BY:	DATE:	EXPIRATION DATE: DEC 2006	ASS'Y.:	

REV.	DESCRIPTION	BY	DATE
------	-------------	----	------



08					
07					
05	3 FT.	1/8" x 3/4" GASKET		24-021	
04	2	1/4" WING NUT		30-510	
03	1	VIBRATOR (OPTIONAL)		16-919	
02	1	TRASH SCREEN HOUSING		A268	
01	1	REPLACEMENT DRAWER (1/4" HOLES)		010581-1	
01	1	REPLACEMENT DRAWER (3/16" HOLES)		010581	
ITEM NO.	QTY.	DESCRIPTION		DWG. NO. / MATERIAL	

LARRY HESS & ASSOCIATES, INC.
SALISBURY NORTH CAROLINA

DESCRIPTION: TRASH SCREEN ASM.

010580

MATERIAL:

DATE:	SCALE:	ASB NO.	STD.	DRAWING NO.:
1/19/84	3/32" = 1"			A267
S.K.	FRACTIONAL:	DECIMAL:	NET ASST.:	
DATE:				

CONFIDENTIAL

THE DISCLOSURES AND CONTENTS OF THIS DRAWING ARE
CONFIDENTIAL AND ARE THE EXCLUSIVE PROPERTY OF
BLAST-IT-ALL® A DIV. OF LARRY HESS & ASSOCIATES, INC.
THIS DRAWING IS NOT TO BE COPIED OR REPRODUCED WHOLLY
OR IN PART WITHOUT WRITTEN PERMISSION OF
LARRY HESS & ASSOCIATES, INC.

REV.	DESCRIPTION	BY	DATE
#1	MADE MANUAL DWG.	DEC	5/28/03

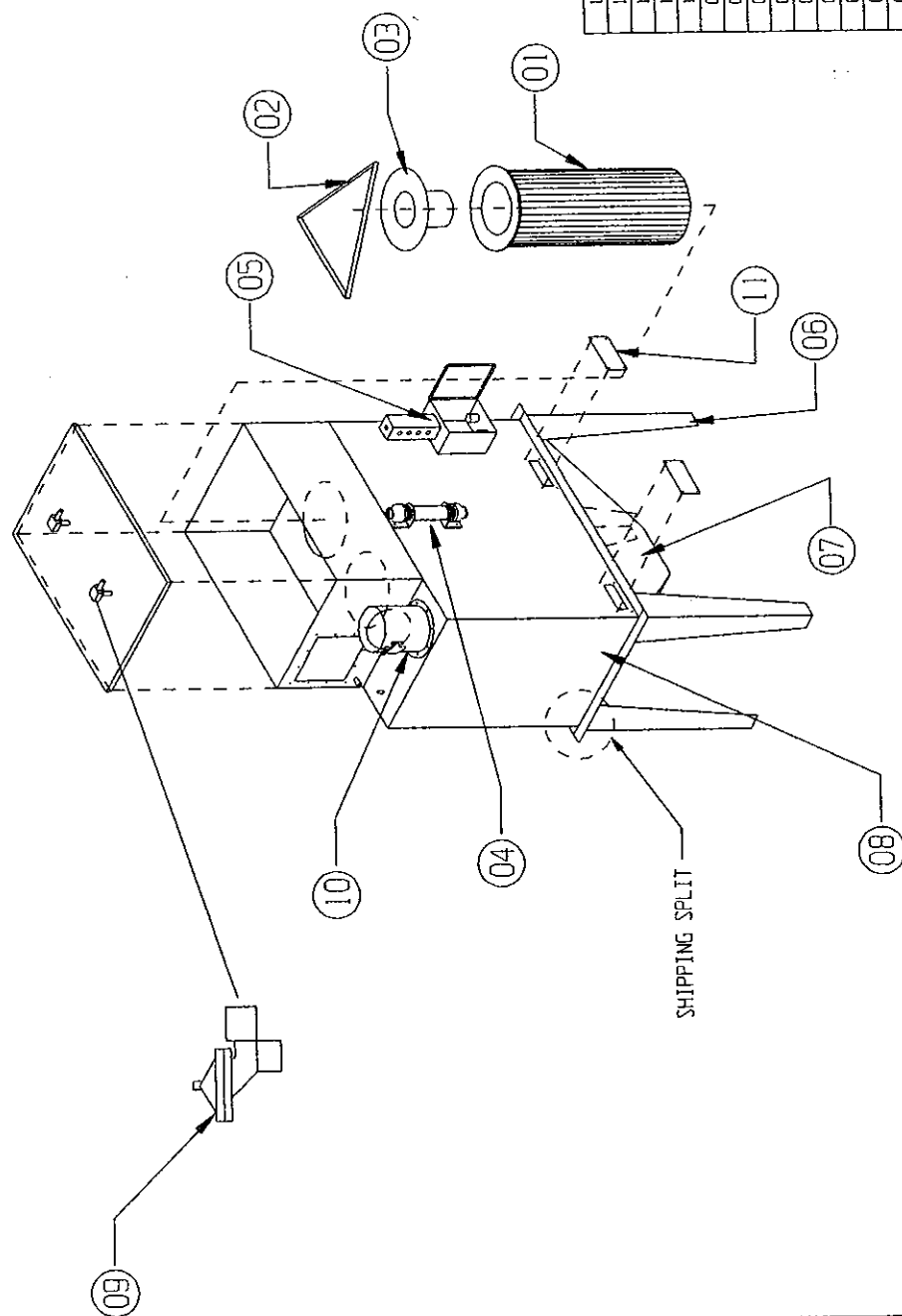
The diagram illustrates a vacuum system for a screen vibrator. Key components include:

- Vacuum Chamber (10):** A large rectangular vessel containing a screen vibrator (12) and a vacuum pump (11).
- Vacuum Pump (11):** A cylindrical pump connected to the chamber via a pipe (13).
- Manifold and Valves (14, 15, 16, 17, 18):** A complex piping system with multiple valves and connections leading from the chamber and pump to the screen vibrator and other components.
- Screen Vibrator (12):** A mechanical component inside the chamber, connected to the vacuum system.
- Pressure Gauge (19):** A circular gauge connected to the vacuum line (20) to monitor pressure.
- Control System (21, 22, 23, 24):** A series of electrical or pneumatic control components, including a solenoid valve (21) and a pressure switch (22), connected to the vacuum line.
- AIR IN (25):** An inlet for air into the system, connected to a valve (26) and a pressure gauge (27).
- TO SCREEN VIBRATOR (28):** A line indicating the connection to the screen vibrator.

24	1	BALL VALVE, 1/4"	14-463
23	1	GAUGE, 1/8"	16-820
22	1	REGULATOR, 1/8"	001564
21	1	81 LINE 55'	16-872
20	1	PURGE ADAPTOR	
19	1	CONTROL, DEADMAN (AIR)	16-857
18	1	NOZZLE, 3/8"	20-644
17	1	NOZZLE HOLDER	14-111
16	1	BLAST HOSE, 1 1/4" x 50'	18-103-50
15	1	QUICK COUPLING	14-104
14	1	TANK COUPLING, 1 1/4"	14-117
13	1	PRESSURE POT POP-UP VALVE	1016020
12	1	PRESSURE POT POP-UP SEAL	1016050
11			
10	1	AIR FILTER 1 1/2"	001968
09	1	BLOW DOWN HOSE, 3/4" x 17'	18-101
08	1	COMBO VALVE	16-877
07	1	BALL VALVE, 1/2"	14-382
06	1	AIR GAGE	16-819
05	1	BALL VALVE, 1 1/2"	14-419
04	1	REGULATOR, 1-1/2"	002920
03	1	NOZZLE HOLDER	14-109
02	1	MICRO VALVE	16-878
01	1	PRESSURE POT 6 CU. FT.	011727-A
ITEM	QTY	DESCRIPTION	PART NO.

LARRY HESS & ASSOCIATES

6.0 PRESSURE POT PMS/SPR		JOB NO.	STD.	ITEM NO.
ENGINEER	LJF	DATE	06/20/06	DWG. NO. B4139



*NOTE: AFTER PLACING THE TOP SECTION OF THE RPJ DUST COLLECTOR ON THE BOTTOM SECTION PLACE FORKLIFT COVERS OVER HOLES. USE PUTTY TAPE BETWEEN ALL BOLT TOGETHER FLANGES.

CONFIDENTIAL

THE DISCLOSURE AND CONTENTS OF THIS DRAWING ARE
CONFIDENTIAL AND ARE THE EXCLUSIVE PROPERTY OF
BLAST-IT-ALL, A DIV. OF LARRY HESS & ASSOCIATES, INC..
THIS DRAWING IS NOT TO BE COPIED OR REPRODUCED WHOLLY
OR IN PART WITHOUT WRITTEN PERMISSION OF
LARRY HESS & ASSOCIATES, INC..

14					
13					
12					
11	4	FDR/LIFT COVER		A2642	
10	1	B* DAMPER INLET ASS'Y.		A2682	
09	2	SOLENOID VALVE		003285	
08	1	RPJ-2H (PMS)		D2026-3	
07	1	SUMP ASS'Y.		A2432	
06	4	LEGS (36")		A2515-3	
05	1	CONTROL BOX (REFER TO DRAWING)		87111	
04	1	MANIFOLD (REFER TO DRAWING)		87111	
03	2	CARTRIDGE CAP		A2463	
02	2	CARTRIDGE HOLDER		010849	
01	2	CARTRIDGE		006970 / 010899	
ITEM NO.	QTY	DESCRIPTION		ONG NO. / MATERIAL	

LARRY HESS & ASSOCIATES, INC.
SALT LAKE CITY, NORTH CAROLINA

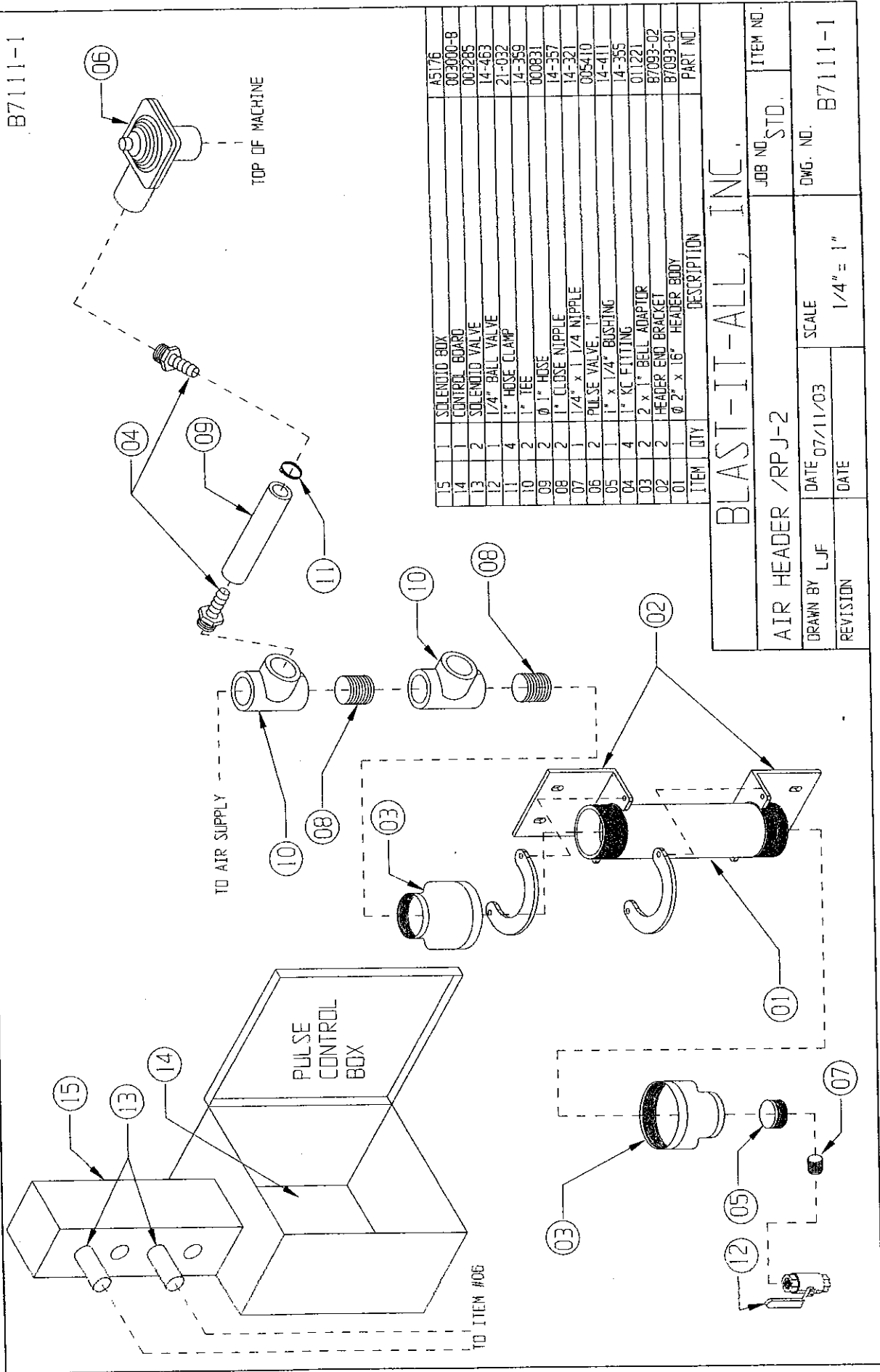
Material:	(1200 CFM)
Material:	

14 GA.

ORDERING NO.: M2090

DESCRIPTION:	(1200 CFM) 2 CARTRIDGE DUST COLLECTOR		
QTY	1	DATE	8/01/94
LOC	CEC	SIZE	3/64" = 1"
DATE	08/01/94	APPROVED	NOT SET
BY		DATE	

B71111-1

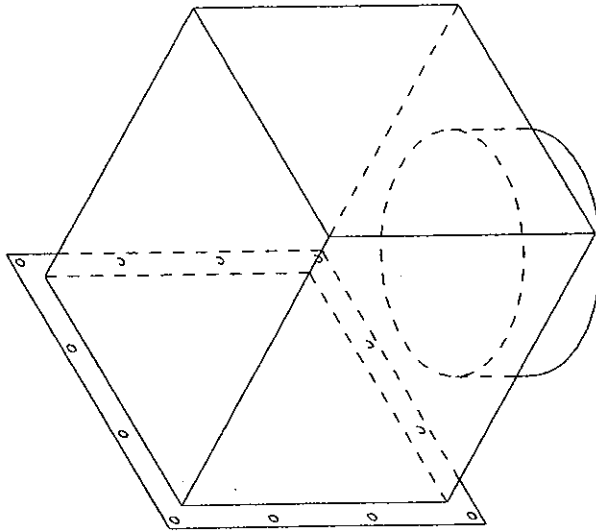


ITEM	QTY	DESCRIPTION	PART NO.
15	1	SOLENOID BOX	A5176
14	1	CONTROL BOARD	00300-8
13	2	SOLENOID VALVE	003285
12	1	1/4" BALL VALVE	14-463
11	4	1" HOSE CLAMP	21-032
10	2	1" TEE	14-359
09	2	Ø 1" HOSE	000831
08	2	1" CLOSE NIPPLE	14-357
07	1	1/4" x 1 1/4" NIPPLE	14-321
06	2	PULSE VALVE, 1"	005410
05	1	1" x 1/4" BUSHING	14-411
04	4	1" KC FITTING	14-355
03	2	2 x 1" BELL ADAPTOR	011221
02	2	HEADER END BRACKET	B7093-02
01	1	Ø 2" x 16" HEADER BODY	B7093-01

BLAST-IT-ALL, INC.

AIR HEADER /RPJ-2		JOB NO.	STD.	ITEM NO.
DRAWN BY	LJF	DATE	07/11/03	DWG. NO.
REVISION		SCALE	1/4" = 1"	B71111-1

B12552-M



LARRY HESS & ASSOCIATES, INC.
SALISBURY, NORTH CAROLINA

MATERIAL:

DESCRIPTION: VENTILATION DUCT (DC TO BLOWER)

PER DWG

DRAWING NO.:

B12552-M

DATE:

07/20/05

BY:

DEC

SCALE:

1/4" = 1'

STANDARD

AS SHOWN

SEE

SECTION

1/4" = 1'

STANDARD

AS SHOWN

SEE

SECTION

1/4" = 1'

STANDARD

AS SHOWN

SEE

SECTION

1/4" = 1'

STANDARD

AS SHOWN

SEE

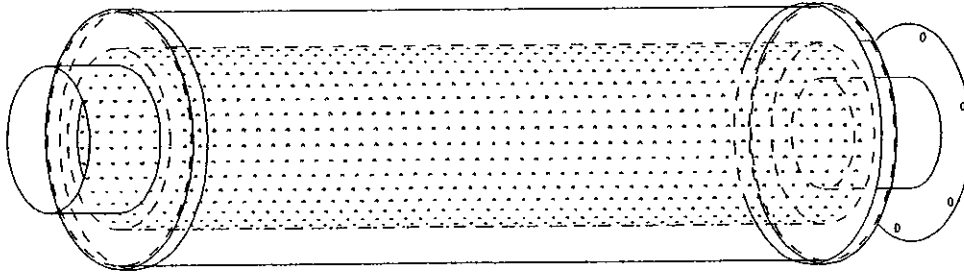
CONFIDENTIAL

THE DISCLOSURES AND CONTENTS OF THIS DRAWING ARE
CONFIDENTIAL AND ARE THE EXCLUSIVE PROPERTY OF
BLAST-IT-ALL® A DIV. OF LARRY HESS & ASSOCIATES, INC.
THIS DRAWING IS NOT TO BE COPIED OR REPRODUCED WHOLLY
OR IN PART WITHOUT WRITTEN PERMISSION OF
LARRY HESS & ASSOCIATES, INC.

REV. DESCRIPTION

BY DATE

A35342



NOTES:

- 1) USE PUTTY TAPE TO SEAL ALL FLANGED CONNECTIONS.
- 2) USE 1/4"-20 SELF TAPPER TO BOLT DUCT SECTIONS TOGETHER.

CONFIDENTIAL

THE DISCLOSURES AND CONTENTS OF THIS DRAWING ARE CONFIDENTIAL AND ARE THE EXCLUSIVE PROPERTY OF BLAST-IT-ALL® A DIV. OF LARRY HESS & ASSOCIATES, INC. THIS DRAWING IS NOT TO BE COPIED OR REPRODUCED WHOLLY OR IN PART WITHOUT WRITTEN PERMISSION OF LARRY HESS & ASSOCIATES, INC.

LARRY HESS & ASSOCIATES, INC.
SALISBURY, NORTH CAROLINA

DESCRIPTION:
SOUND ATTENUATOR ASS'Y.

MATERIAL:

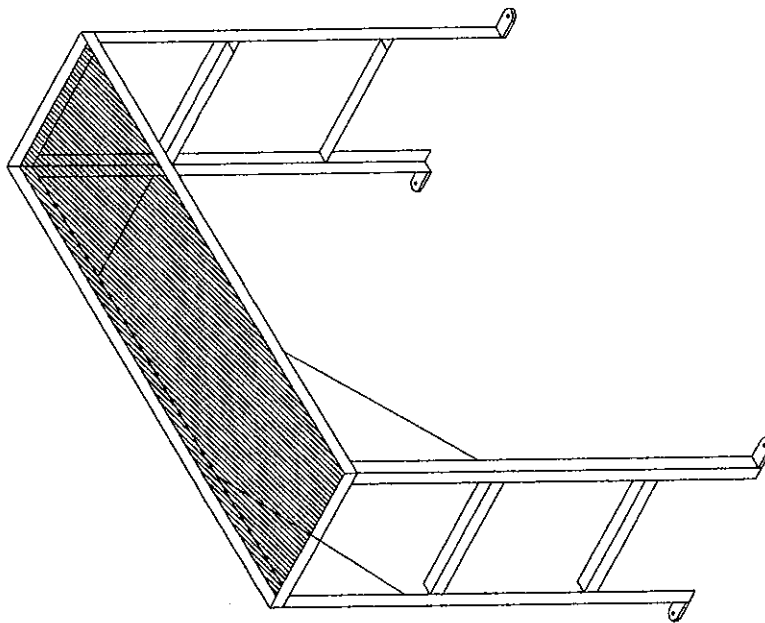
PER DWG.

DRAWING NO.: A35342

DATE:	04/11/06	SCALE:	3/64" = 1"	JOB NO:	
DATE:		FUNCTION:	DESIGN	REV. ASS'Y:	
DATE:		REVISION:			

REV.	DESCRIPTION	BY	DATE

B2231-M



LARRY HESS & ASSOCIATES, INC.
SALISBURY, NORTH CAROLINA

MATERIAL:

DESCRIPTION: SPR 9600 STAND

B2231-M

DRAWING NO.:

STP

1.

100

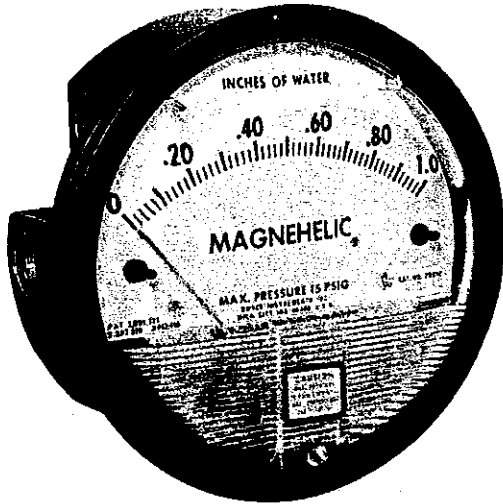
30761

50	1
----	---

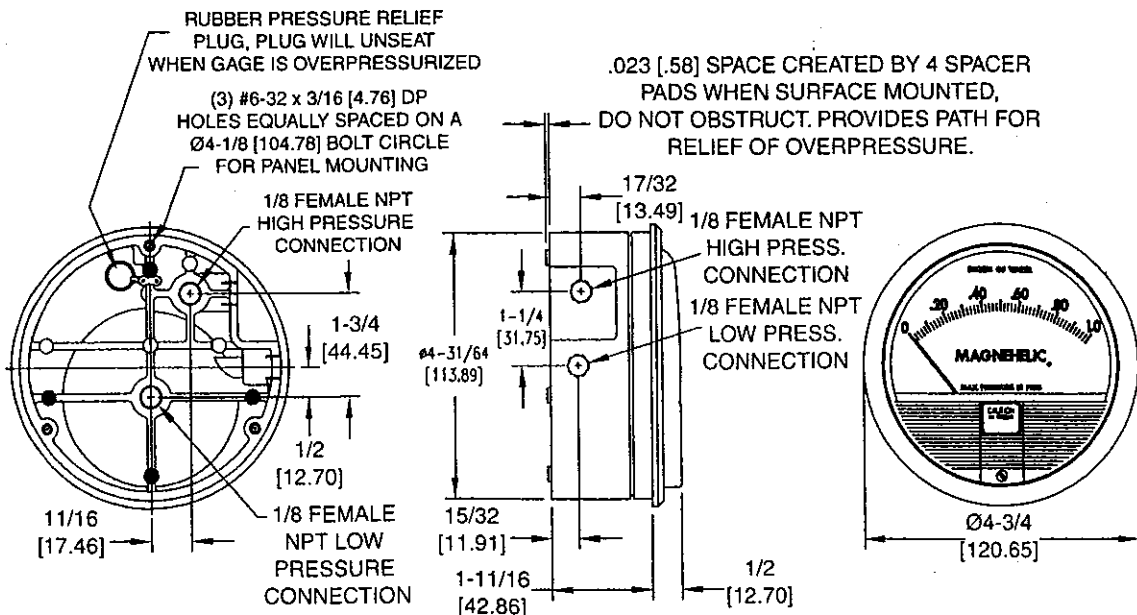
Check for:

CONFIDENTIAL

THE DISCLOSURES AND CONTENTS OF THIS DRAWING ARE
CONFIDENTIAL AND ARE THE EXCLUSIVE PROPERTY OF
BLAST-IT-ALL® A DIV. OF LARRY HESS & ASSOCIATES, INC.
THIS DRAWING IS NOT TO BE COPIED OR REPRODUCED WHOLLY
OR IN PART WITHOUT WRITTEN PERMISSION OF
LARRY HESS & ASSOCIATES, INC.

Magnehelic® Differential Pressure Gage**OPERATING INSTRUCTIONS****Dwyer****SPECIFICATIONS****Dimensions:** 4-3/4" dia. x 2-3/16" deep.**Weight:** 1 lb. 2 oz. (510 g)**Finished:** Baked dark gray enamel.**Connections:** 1/8" female NPT high and low pressure taps, duplicated, one pair side and one pair back.**Accuracy:** Plus or minus 2% of full scale, at 70°F (21.1°C). (Model 2000-0, 3%; 2000-00, 4%).**Pressure Rating:** 15 PSI (1.03 bar)**Ambient Temperature Range:** 20° to 140°F (-7 to 60°C).**Standard gage accessories** include two 1/8" male NPT plugs for duplicate pressure taps, two 1/8" male NPT pipe thread to rubber tubing adapters, and three flush mounting adapters with screws.**PART NO. 004457-10****Caution:** For use with air or compatible gases only.

For repeated over-ranging or high cycle rates, contact factory.

Not for use with Hydrogen gas. Dangerous reactions will occur.**DWYER INSTRUMENTS, INC.**

P.O. BOX 373 • MICHIGAN CITY, INDIANA 46361, U.S.A.

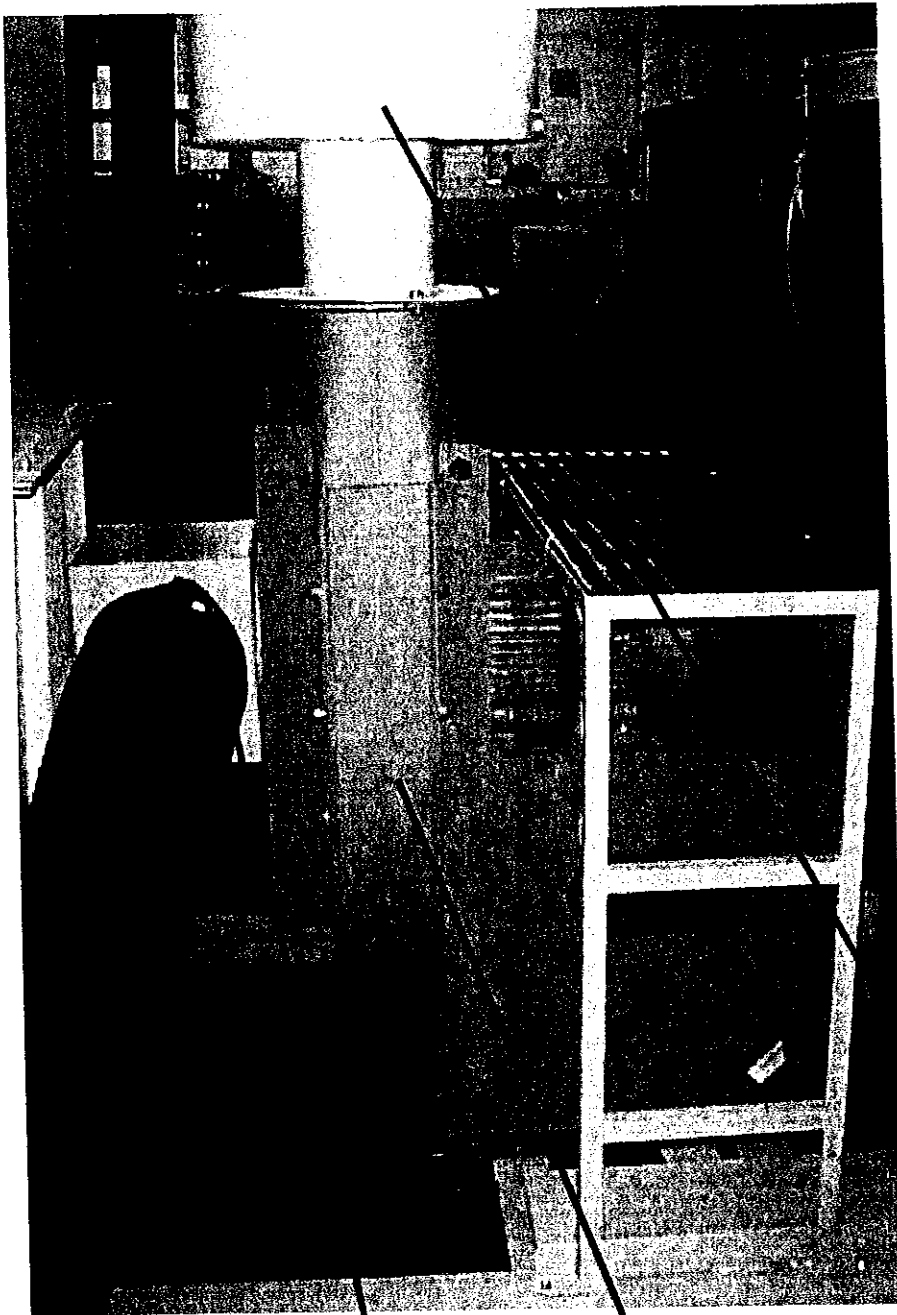
Phone: 219/879-8000

www.dwyer-inst.com

Fax: 219/872-9057

e-mail: info@dwyer-inst.com

Lit-By Fax: 888/891-4963



**BLOWER ADAPTOR BOX
PN# A35353**

**SOUND ATTENUATOR
PN# A35342**

BLOWER PN# 010687

BLAST-IT-ALL®

REVERSE PULSE DUST COLLECTOR

WARNING

DO NOT USE *SAND*. SAND WILL CAUSE SILICA DUST, WHICH IS THE CAUSE OF SILICOSIS DISEASE, A CONDITION OF MASSIVE FIBROSIS OF THE LUNGS. *THIS STATEMENT INDICATES POTENTIAL PERSONNEL HAZARD. FAILURE TO COMPLY WITH THESE INSTRUCTIONS MAY RESULT IN PERSONAL INJURY.*

WEBSITE FOR SILICOSIS:

<http://www.osha.gov/Silica/IT69D 1.html>

RPJ-2

LARRY HESS & ASSOCIATES, INC
P.O. BOX 1615
SALISBURY, NC 28145-1615
TOLL 1-800-535-2612 / FAX 704-636-9311
www.blast-it-all.com OR sales@blast-it-all.com

Table of Contents

<i>Specifications and Instructions</i>	<i>1-2</i>
<i>Pre-Start Check</i>	<i>3</i>
<i>Operation</i>	<i>4</i>
<i>Maintenance</i>	<i>5</i>
<i>Troubleshooting.....</i>	<i>5</i>
<i>Illustration & Parts List</i>	<i>6</i>

Specification and Instructions for RPJ Collectors

1.0 General Description

The MODEL RPJ COLLECTORS are cartridge filter jet pulse type collectors. These collectors may be supplied as a complete unit or they may be supplied in two sections ready for installation in the users plant. A top opening door is provided for the inspection and/or replacement of the filter cartridges and the air pulsing system components. If the unit is supplied with a hopper it is of the pyramidal type forming the lower part of the collector. An air inlet is located either on the side or top depending on the size of the collector. The dirty air stream passes through the inlet and is deflected away from the cartridges to help prevent premature cartridge wear. As the dirty air enters the collection chamber the velocity reduces due to the expanded area. The heavier particles drop into the Dust Drawer or Hopper. The air separates as it is drawn into the cartridge filter(s). The air goes through the cartridge media for the final separation of the solids (dirt) from the air stream. Solid particles are captured on the filter media as the air stream passes through and into the center section of the cartridge and is exhausted from the collector. Compressed air jets are used periodically to BACK FLUSH (CLEAN) the filter pleats causing the collected particles to fall down into the drawer or hopper.

2.0 Design Considerations

2.01 Maximum negative pressure: 12" WG.

2.02 Design operating temperature: 150 F

2.03 Compressed air supply: 80 to 90 PSIG operating pressure with a 100 PSIG being the maximum design.

3.0 Installation and arrangement

The user will place the unit on a flat level surface. The self-supporting base and/or structure provided does not require anchor bolts for indoor applications. If the unit is to be located outdoors, the user must provide adequate anchoring consistent with the appropriate building codes. When locating the unit, allow sufficient space to allow filter removal from the top of the unit (usually 3 feet).

4.0 Basic Construction

4.01 Basic Unit: The basic unit is fabricated from 12 gauge carbon steel. All seams are continuously welded to form a solid seal. The filter/air pulsing access door(s) are gasketed. The air jet valves are designed especially for this type air pulse application and are operated through the sequence control by manual push buttons or by timed unit depending on the model or the unit.

4.02 Filter Cartridges: Each cartridge contains approximately 250 pleats and the number of filter units depends of the unit size. The open end of the cartridge has a lip under which a special composition gasket is mounted. Any cuts, gouges or tears in this gasket will cause premature failure of the filtering unit.

4.03 Cleaning Control: The cleaning us actuated by a one of two means. On the manual cleaning units a manual push-button is provided. On the larger units a solid state controller it provided. On some units this control may be shipped loose for installation by the customer.

5.0 Reverse Pulse Jet Air System

The compressed air manifold is to be supplied with compressed air at 85 PSIG. The user must provide a pressure regulator to maintain this pressure. The air supply must be clean and free of moisture. Air consumption rates for 85 PSIG are determined as follows in standard cubic feet of compressed air:

Number of pulse valves (cartridges) x 1.75 SCF

Example: 2 cartridges x 1.75 SCF= 3.5 SCF

If we clean every 3 minutes the usage is divided by 3 or 1.16 SCFM.

6.0 Paint

One coat of primer is applied to all interior and exterior surfaces. A finish coat of industrial enamel is applied to the exterior.

7.0 Shipment

The smaller units without hopper(s) are shipped assembled. The units with hoppers are shipped in two sections. The filters, filters hold-downs, and control box require field installation.

8.0 Compressed Air Piping

The compressed air piping installed by the user shall be a minimum of 1/2" sch 40. **In addition a pressure regulator must be provided and installed by the user.**

Pre-Start Check

1.0 Pre Start Checklist

Review all components to assure that they are operational.

- 1.01 **All Ductwork** - The inlet and exhaust ducting must be inspected to assure it is properly installed and complete.*
- 1.02 **Dust Drawer / Hopper Gaskets** - The gasket on the drawer edge must be installed and attached to the drawer. This drawer must be closed and secured before operation.*
- 1.03 **Compressed Air Piping** - A pressure regulator must be installed and set for 85 PSI. Make sure the air is clean and dry.*
- 1.04 **Wiring** - Motors must be wired and installed with proper overload protection.*
- 1.05 **Sequence Control Box** - Provide incoming wiring. Control will be pre-set. The control box is to be field installed.*
- 1.06 **Electrical Protection Devices** - Fuses, circuit, breakers, heaters, etc., must be properly sized and installed.*
- 1.07 **System Fan** - Make sure the rotation of the fan is correct.*

Operation

1.0 Start-Up and Operation

- 1.01 Turn on compressed air supply.
- 1.02 Start system: CHECK FAN ROTATION
- 1.03 Check seals.

2.0 Filter Cleaning

- 2.01 If the unit is equipped with automatic pulse cleaning, the cleaning cycle will be timer and activated when the unit is in operation.
- 2.02 If the unit is not equipped with a automatic pulse package, the filters are cleaned by manually pushing the clean pulse air valve. This will allow the cartridge to be pulse cleaned. **(PULSE AND RELEASE)**
THIS NEEDS TO BE OPERATED AT LEAST ONCE EACH HOUR OF OPERATION OR MORE IF A DIRTY CABINET CONDITION EXISTS.

3.0 Dust Drawer / Hopper Emptying

The collector must be shut down before any attempt is made to empty the dust container.

- 3.01 Shut system down
- 3.02 Un-latch dust drawer / hopper.
- 3.03 Remove and empty container in to approved dust receptacle.
- 3.04 Replace drawer or container and secure.

NOTE: MAKE SURE GASKET SEAL IS IN PLACE.

Maintenance

Regular maintenance is consistent with satisfactory and efficient operation of any dust collector. Remember to clean and inspect the filter regularly and do not allow the dust container(s) to overfill.

1.0 Weekly

- 1.01 Compressed air pressure set at 85 PSI.*
- 1.02 Drain all moisture from compressed air lines.*
- 1.03 Check and record pressure drop across the filters with customer supplied manometer.*
- 1.04 Empty dust container. The container may have to be emptied more frequently depending on use.*

2.0 Monthly

- 2.01 Inspect dust container gasket(s).*
- 2.02 Remove and inspect filter cartridge.*
- 2.03 Replace cartridge if evidence of dirt is inside.*

3.0 Yearly

- 3.01 Check all gaskets and replace if required.*
- 3.02 Remove all cartridges and inspect for wear. If evidence of dirt is inside replace filters.*

4.0 Filter Removal

- 4.01 Open filter access area.*
- 4.02 Remove filter hold-down device.*
- 4.03 Pull out filters "being careful not to knock off dust into clean air area"*

5.0 Filter Cartridge Replacement

- 5.01 Brush any dust that may have fallen into the clean air compartment into the dust bin. Remove any bits of the old filter gasket that may have stuck to the filter plate.*
- 5.02 Slowly place cartridges in holes.*
- 5.03 Replace the hold-down bars and attach with the holding nuts. Maintain even pressure at all points.*
- 5.04 Close collector.*

Troubleshooting

1.0 Visibility poor in cabinet

1.01 Pulse Interval Time Too Long:

Adjust the knob in the sequence control panel to shorter time. (The larger unit the shorter the time required).

1.02 Filter(s) Wet:

Make sure there is not moisture in the compressed air lines.

1.03 Filter(s) Blinded:

- A. *Blinded filters can be the result of operating the unit too long without cleaning or the cleaning interval is too long.*
- B. *The dust drawer or bin is over full. A full bin will cause severe dust reintrainment, which will overload (blind) the filters. Remove the filters from the unit and clean or replace.*

2.0 Control Circuit Fails to Operate:

2.01 *If the diaphragm valve does not operate, this generally indicates a leak in the tubing. If the control tube has a leak the diaphragm valve will remain open and no pressure will build up in the log manifold.*

2.02 *Compressed Air Bleed Down: If a diaphragm valve will not return to the closed position, this indicates either a break in the diaphragm, a leaking control line, or a control pulse solenoid is stuck in the open position.*

2.03 *Check to make sure there is sufficient air pressure flow to the log manifold.*

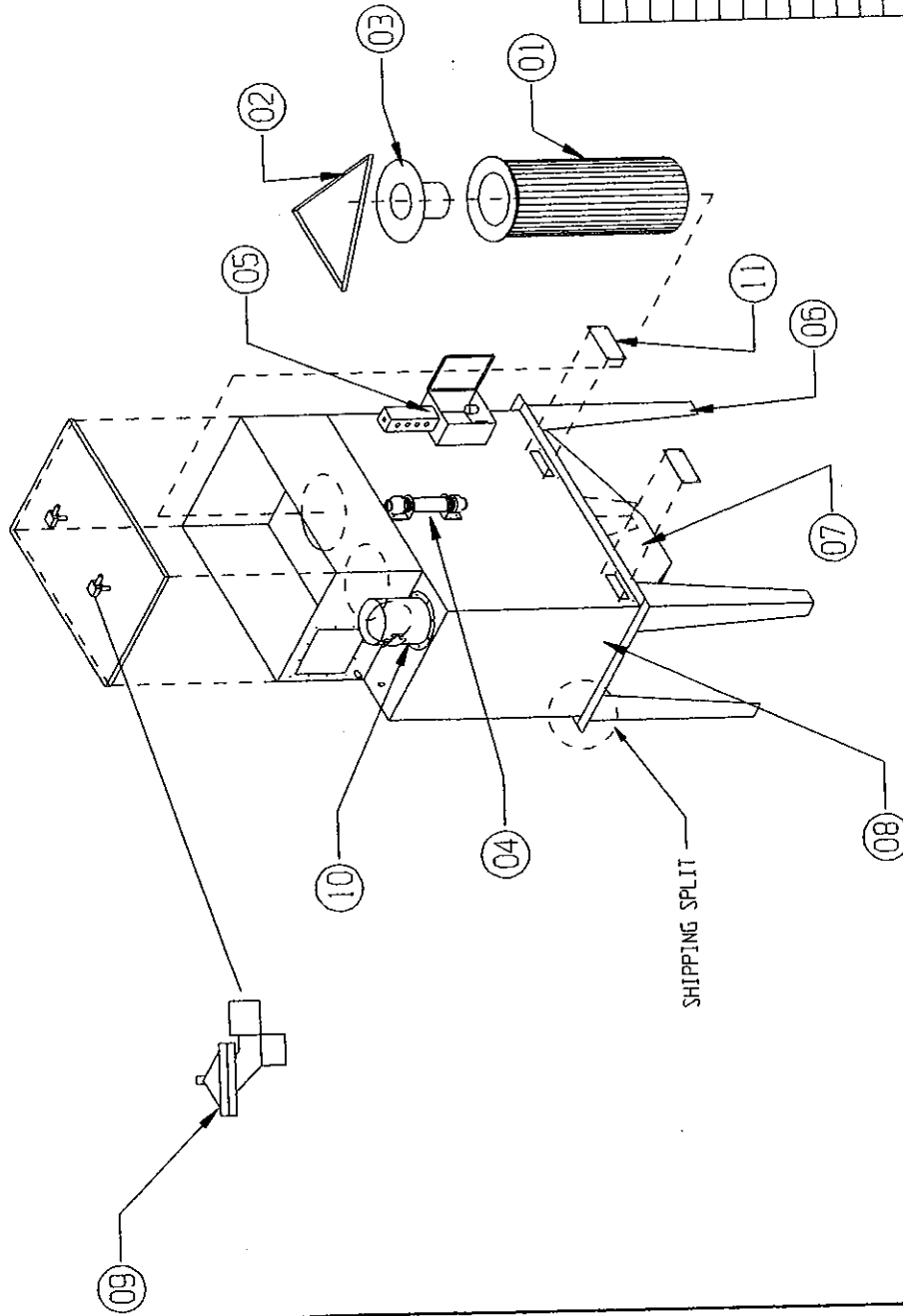
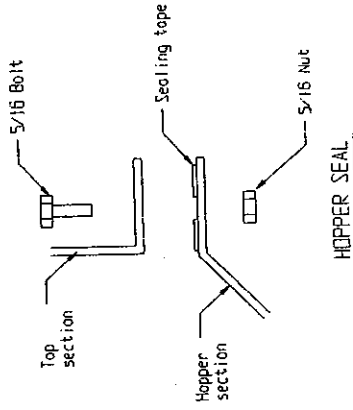
3.0 Puff or Dust Out Exhaust After Each Cleaning:

3.01 *Cleaning too often: Clean less often or increase the interval on the control panel.*

3.02 *Filter Worn: Remove and inspect filters for pin holes, spots, or other locations where dust may be passing through the filter media. Replace filter cartridges if required.*

4.0 Continuous Dust Out Exhaust:

- 4.01 Broken, torn, or punctured filter media. Locate and replace cartridge.
- 4.02 Poor seal between cartridge and collector plate: Look for dust patterns around the filter seals. Re-tighten or replace filter. Do not attempt to repair gasket seal.



*NOTE: AFTER PLACING THE TOP SECTION OF THE RPJ DUST COLLECTOR ON THE BOTTOM SECTION PLACE FORKLIFT COVERS OVER HOLES. USE PUTTY TAPE BETWEEN ALL BOLT TOGETHER FLANGES.

CONFIDENTIAL

THE DISCLOSURES AND CONTENTS OF THIS DRAWING ARE CONFIDENTIAL AND ARE THE EXCLUSIVE PROPERTY OF LARRY HESS & ASSOCIATES, INC. THIS DRAWING IS NOT TO BE COPIED OR REPRODUCED WHOLLY OR IN PART WITHOUT WRITTEN PERMISSION OF LARRY HESS & ASSOCIATES, INC.

ITEM NO.	QTY	DESCRIPTION	QTY	DESCRIPTION
14				
13				
12				
11	4	FORKLIFT COVER		A2642
10	1	8" DAMPER INLET ASS'Y.		A2682
09	2	SOLENOID VALVE		003285
08	1	RPJ-2H (PWS)		02026-3
07	1	SUMP ASS'Y.		A2432
06	4	LEGS (36")		A2515-3
05	1	CONTROL BOX (REFER TO DRAWING) 87111		
04	1	MANIFOLD (REFER TO DRAWING) 87111		
03	2	CARTRIDGE CAP		A2463
02	2	CARTRIDGE HOLDER		010849
01	2	CARTRIDGE		006870 / 010859
				DWG. NO. / MATERIAL

LARRY HESS & ASSOCIATES, INC.
SALTSBURY, NORTH CAROLINA

DESCRIPTION: 2 CARTRIDGE DUST COLLECTOR (1200 CFM)
MATERIAL: 14 GA.

DRAWING NO.: M2090

REV. DESCRIPTION BY DATE

A2509

3/8 x 3 ALL THREAD BOLT (30-124.2) TRIANGULAR CARTRIDGE HOLDER (010849)
 3/8 LOCK NUT (30-507)

OVERSIZED WASHER
 (010848)

GASKET

3/8 LOCK NUT (30-507)

DISPLACEMENT TUBE (A2463)

CARTRIDGE FILTER (006870)

CONFIDENTIAL

THE DISCLOSURES AND CONTENTS OF THIS DRAWING ARE
 CONFIDENTIAL AND ARE THE EXCLUSIVE PROPERTY OF
 BLAST-11-ALL (INC) A DIV. OF LARRY HESS & ASSOCIATES, INC.
 THIS DRAWING IS NOT TO BE COPIED OR REPRODUCED WHOLLY
 OR IN PART WITHOUT WRITTEN PERMISSION OF
 LARRY HESS & ASSOCIATES, INC.

REV.	DESCRIPTION	BY	DATE
1	ADDED DISP. TUBE	DEC	02/03/97

LARRY HESS & ASSOCIATES, INC.
 SALISBURY, NORTH CAROLINA

DESCRIPTION:

RPJ CARTRIDGE INSTALLATION

MATERIAL:

PER DWG.

DRAWING NO.: A2509

DATE	SCALE	DATE	SCALE
6/02/95	3/16" = 1"	6/02/95	3/16" = 1"
DEC	DEC	DEC	DEC

PULSE CONTROL BOX

TO AIR SUPPLY

TOP OF MACHINE

ITEM	QTY	DESCRIPTION	PART NO.
01	1	Ø 2" x 16" HEADER BODY	B7093-01
02	2	HEADER END BRACKET	B7093-02
03	2	2 x 1" BELL ADAPTOR	011221
04	4	1" KC FITTING	14-355
05	1	1" x 1/4" BUSHING	14-411
06	2	PULSE VALVE, 1"	005410
07	1	1/4" x 1 1/4" NIPPLE	14-321
08	2	1" CLOSE NIPPLE	14-357
09	2	Ø 1" HOSE	000831
10	2	1" TEE	14-359
11	4	1" HOSE CLAMP	21-032
12	1	1/4" BALL VALVE	14-463
13	2	SOLENOID VALVE	003285
14	1	CONTROL BOARD	003000-B

ITEM	QTY	DESCRIPTION	PART NO.
14	1	CONTROL BOARD	003000-B
13	2	SOLENOID VALVE	003285
12	1	1/4" BALL VALVE	14-463
11	4	1" HOSE CLAMP	21-032
10	2	1" TEE	14-359
09	2	Ø 1" HOSE	000831
08	2	1" CLOSE NIPPLE	14-157
07	1	1/4" x 1 1/4 NIPPLE	14-321
06	2	PULSE VALVE, 1"	005410
05	1	1" x 1/4" BUSHING	14-411
04	4	1" KC FITTING	14-355
03	2	2 x 1" BELL ADAPTOR	011221
02	2	HEADER END BRACKET	87093-02
01	1	Ø 2" x 16" HEADER BODY	87093-01

DATE	BY	DESCRIPTION
		BLAST-IT-ALL, INC.

AIR HEADER /RPJ-2

JOB NO.	ITEM NO.
800	1
801	2
802	3
803	4
804	5
805	6
806	7
807	8
808	9
809	10
810	11
811	12
812	13
813	14
814	15
815	16
816	17
817	18
818	19
819	20
820	21
821	22
822	23
823	24
824	25
825	26
826	27
827	28
828	29
829	30
830	31
831	32
832	33
833	34
834	35
835	36
836	37
837	38
838	39
839	40
840	41
841	42
842	43
843	44
844	45
845	46
846	47
847	48
848	49
849	50
850	51
851	52
852	53
853	54
854	55
855	56
856	57
857	58
858	59
859	60
860	61
861	62
862	63
863	64
864	65
865	66
866	67
867	68
868	69
869	70
870	71
871	72
872	73
873	74
874	75
875	76
876	77
877	78
878	79
879	80
880	81
881	82
882	83
883	84
884	85
885	86
886	87
887	88
888	89
889	90
890	91
891	92
892	93
893	94
894	95
895	96
896	97
897	98
898	99
899	100

DRAWN BY	DATE	SCALE
	07/11/03	

DWG. NO.

$$1/4'' = 1''$$

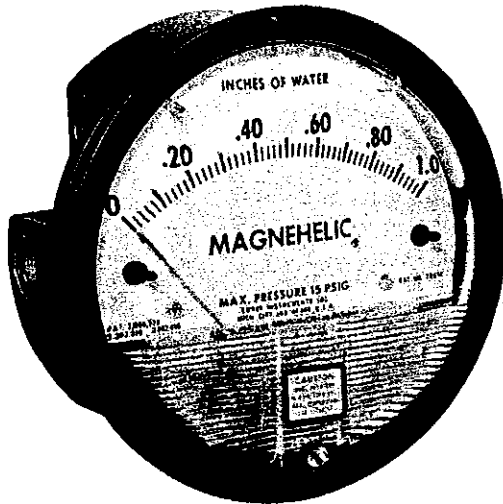
18

DATE _____

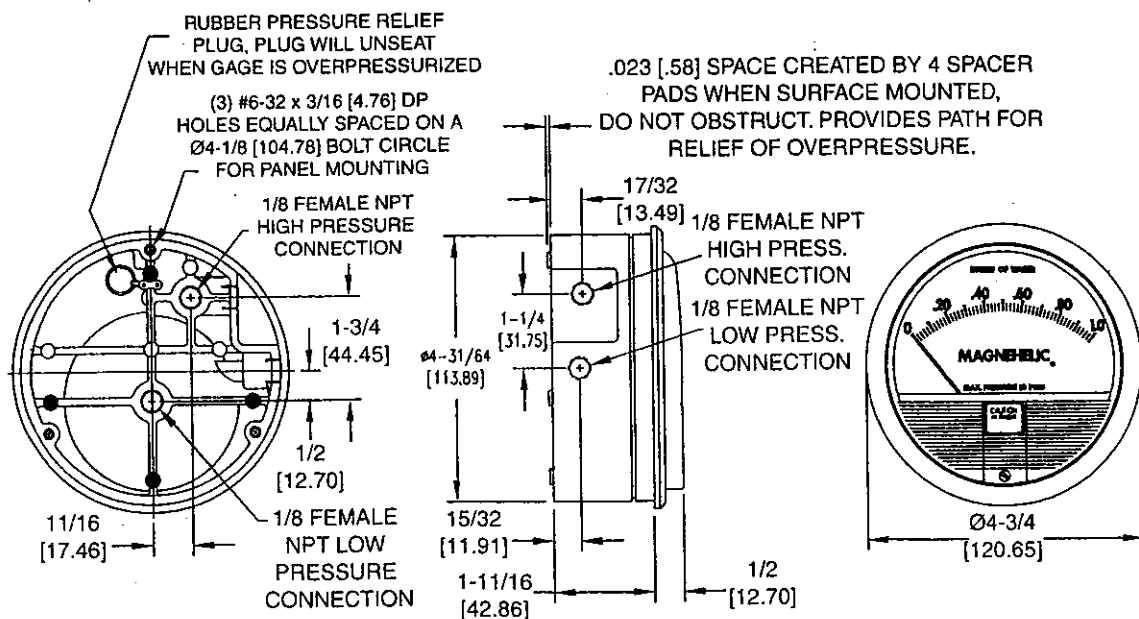
--	--

Magnehelic® Differential Pressure Gage

OPERATING INSTRUCTIONS

**PART NO. 004457-10****SPECIFICATIONS****Dimensions:** 4-3/4" dia. x 2-3/16" deep.**Weight:** 1 lb. 2 oz. (510 g)**Finished:** Baked dark gray enamel.**Connections:** 1/8" female NPT high and low pressure taps, duplicated, one pair side and one pair back.**Accuracy:** Plus or minus 2% of full scale, at 70°F (21.1°C). (Model 2000-0, 3%; 2000-00, 4%).**Pressure Rating:** 15 PSI (1.03 bar)**Ambient Temperature Range:** 20° to 140°F (-7 to 60°C).**Standard gage accessories** include two 1/8" male NPT plugs for duplicate pressure taps, two 1/8" male NPT pipe thread to rubber tubing adapters, and three flush mounting adapters with screws.**Caution:** For use with air or compatible gases only.

For repeated over-ranging or high cycle rates, contact factory.

Not for use with Hydrogen gas. Dangerous reactions will occur.**DWYER INSTRUMENTS, INC.**

P.O. BOX 373 • MICHIGAN CITY, INDIANA 46361, U.S.A.

Phone: 219/879-8000

www.dwyer-inst.com

Fax: 219/872-9057

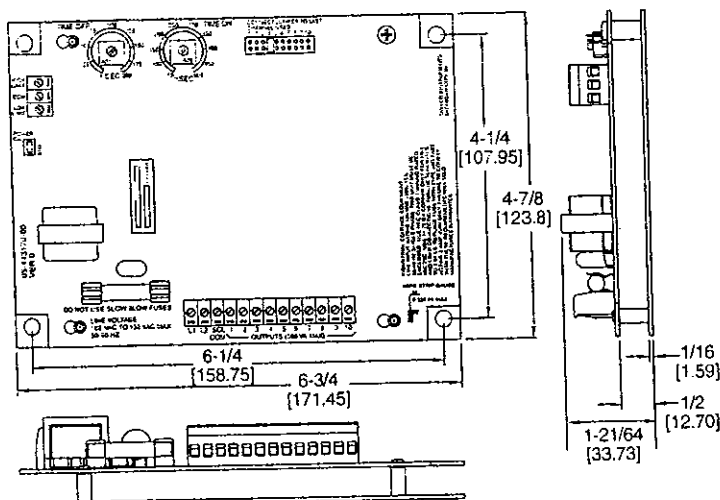
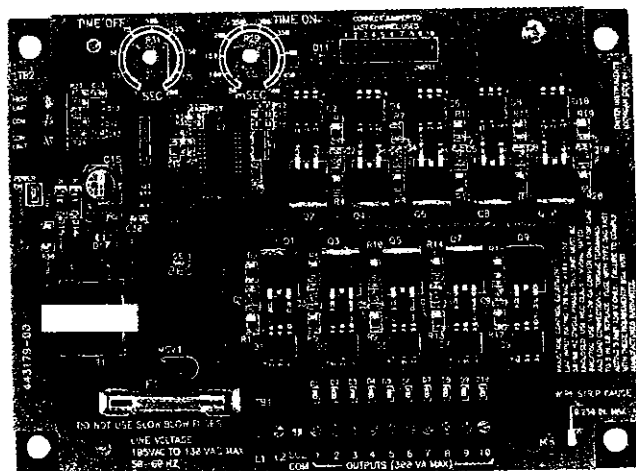
e-mail: info@dwyer-inst.com

Lit-By Fax: 888/891-4983



Series DCT 500 Timer Controller

Specifications - Installation & Operating Instructions



Introduction

The Series DCT 500 Timer Controller is a timing system for pulse-jet type dust collectors or pneumatic conveying systems in either continuous or on-demand cleaning applications. It is provided with either 4, 6, or 10 channels. The DCT 500 was designed for ease of installation in your dust collector system. For installations requiring fewer channels than available on the board, a shorting plug is provided to allow selection of the last used channel. Time-on and time-off settings are selected using two potentiometers. High-limit and low-limit control inputs are provided for use with on-demand systems. When used in a continuous mode the high-limit input is jumpered. For safety, the control circuitry including the control inputs and the last channel jumper, is isolated from the power line.

Installation



Warning: Always install and service this device with the power off and a lockout installed if required. Line voltages are exposed on the board. As

a result, this device is not intended to be installed in any open location. It must be installed within an enclosure that meets appropriate safety and local code requirements. Follow applicable safety procedures when installing or servicing this product.



Warning: Always replace the fuse with the proper type and rating. The fuse is Type 3 AG fast acting 3 Amp @ 250V. DO NOT use slow-blow type fuses. Failure to comply with this requirement will pose a serious safety risk and will void manufacturer's warranty.

Power Requirements

The controller is designed for operation on 120 VAC 50/60 Hz power. The input voltage must be between 102 VAC and 132 VAC either 50 or 60 Hz. The solenoid loads must be rated for 120 VAC operation.

Location

The system must be located in an enclosure that meets relevant safety standards and electrical codes. There are no other special

PHYSICAL DATA

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

Operating Ambient Temperature: -40°F to 176°F (-40°C to 80°C).

Weight: 9 oz (255 gm).

Power: 102 to 132 VAC 50 or 60 Hz, 1.8W max no load power.

Fuse: Type 3AG, 3A @250VAC.

Output Channels: 4, 6, and 10 channels available.

Solenoid supply: 300 VA.

On Time: 50 msec to 500 msec.

On Time Accuracy: ±5% of setting.

Off Time: 1 second to 200 seconds.

Off Time Accuracy: 5% of setting.

orientation requirements. Mount it using the four mounting holes in the baseplate. The baseplate back is flush, so no special spacers are needed to accommodate obstructions except for those imposed by the location itself.

Connections

The line and solenoid connections are located at the lower edge of the board. 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 gages. These terminals should be torqued to 5 in. lb. The connectors are specified for single connection but multiple wires may be connected to a single lug provided local codes allow this and good workmanship practices are followed. When using stranded wire, make sure that there are no "stray" strands. These pose safety hazards and may cause system failure or damage. Connect the line power to L1 and L2. Connect the solenoids between the selected output and the solenoid common. Solenoid common and L2 are internally connected. Refer to Figure 2-1.

The wire should be stripped to no more than 0.25 in. A strip gauge is provided at the lower right corner of the board. Longer than this may cause shorts or expose line voltages to possible contact.

Switches connected to the control inputs at the top of the board must be isolated normally open contacts connected only to the relevant terminal and to the common terminals.

The following subparagraphs describe the external switch connections. Refer to figure 2-1 for switch connection illustration.

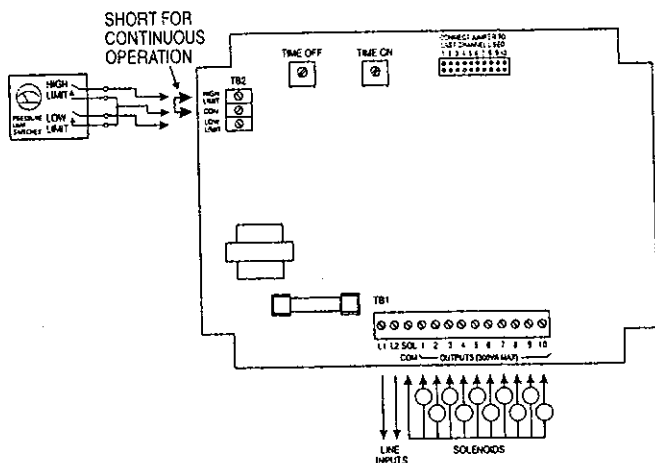


FIGURE 2-1 Switch Connections

External Limit Switch Connection

The controller may be used with an external pressure limit switch or sensor to provide demand-cleaning operation. A three pin terminal block provides connection for external high and low limit switches. 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® pressure gage. The switches must be isolated contacts between the high or low limit input and the common connection. The wiring from the switches must be two or three wires with no other connections made to these. 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 is summarized as follows:

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

Operating Modes

Continuous Cycle Mode

The DCT 500 has two 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 placing a jumper between the high limit input and the common connection. Two setup parameters control operation: time off, time on. 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.

Demand Mode

Demand mode operation can be configured using the high limit and low limit inputs. A simple on-off system can be setup with a single pressure switch connected to the high limit input. Better control can be achieved with a high and low limit switch set such as is provided in the Photohelic® pressure gage. In this on-demand mode, time on and time off may be programmed to define the cleaning cycle.

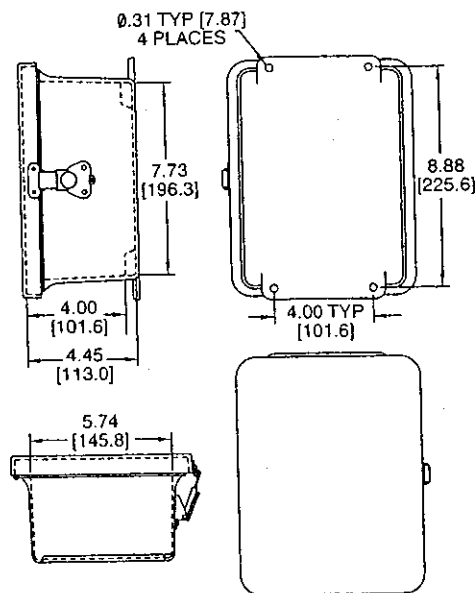
System Setup

Last Channel Selection

A jumper connector is provided to select the last channel used. Place the jumper on the two pins corresponding to the last channel used in the installation.

Time Off and Time On Setup

Time off defines the period of time between solenoid activations when no channels are enabled. This value may be set between 1 second and 200 seconds with a resolution of 1 second. Time on defines the solenoid on time. The value may be set between 50 msec and 500 msec with a resolution of 10 msec. If adjustments are made while the system is in operation, the new setting will take effect in the following solenoid cycle. Do not use excessive force to turn the potentiometers. This will damage the



Weatherproof Enclosure Option

WARRANTY

Larry Hess & Associates, Inc. Warrants to the original purchaser the merchandise sold to be free from defects in material and workmanship under normal use and service for a period of one (1) year. Upon prompt notification by the buyer, to LHA, components that are determined by LHA to be defective will be repaired or replaced at no additional charge, F.O.B. our factory.

Manufacturer shall have the right to inspect prior to replacing all merchandise in question.

This warranty does not apply to parts that are directly involved in the blasting operation.
Example: gun, gun parts, viewing window, hose, gloves, etc.

Manufacturer shall not be required to pay any removal or installation charges whatsoever under this warranty.

Manufacturer shall not be liable for prospective profits, special or consequential damages, nor shall any recovery of any kind against manufacturer be greater in amount than the cost of repairs of defects in workmanship.

This warranty does not apply to damage caused by accidents, damage in transit, alterations by unauthorized personnel, abuse or damage by flood, fire, or acts of God, nor by artificially generated electric currents or any other cause whatsoever except defects in material or factory workmanship.

In all cases, defective parts must be returned to Larry Hess & Associates, Inc. before credit is issued.

If genuine BLAST-IT-ALL® replacement parts are not used, the warranty is void.

This warranty is in lieu of all other warranties expressed or implied and releases Larry Hess & Associates, Inc. of all other obligations and liabilities whatsoever. This warranty neither assumes nor authorizes any person to assume any obligation other than those specified by this warranty.

WARNING

DO NOT USE *SAND*. SAND WILL CAUSE SILICA DUST, WHICH IS THE CAUSE OF SILICOSIS DISEASE, A CONDITION OF MASSIVE FIBROSIS OF THE LUNGS. *THIS STATEMENT INDICATES POTENTIAL PERSONNEL HAZARD. FAILURE TO COMPLY WITH THESE INSTRUCTIONS MAY RESULT IN PERSONAL INJURY.*

BLAST-IT-ALL®

Larry Hess & Associates, Inc.

Airport Industrial Park

185 Piper Lane

P.O. Box 1615

Salisbury, NC 28145-1615