ONE CITY. ONE JACKSONVILLE.

City of Jacksonville, Florida

Neighborhoods Department
Environmental Quality Division
Ed Ball Building
214 N. Hogan St., 5th Floor
Jacksonville, FL 32202
(904) 255-7100
www.coj.net

SENT BY ELECTRONIC MAIL – RECEIVED RECEIPT REQUESTED

PERMITTEE

Dupuy Storage Florida, LLC
5330 5th Street West
Jacksonville, Florida 32254

Authorized Representative:
Ms. Caryn Sawyer, Vice President

Air Permit No. 0310622-002-AO
Air Operation Permit

Dupuy Storage Florida, LLC
Duval County, Florida

PROJECT

This is the final air operation permit, which authorizes the operation of Dupuy Storage Florida, LLC, which is a coffee storage facility, categorized under Standard Industrial Classification No. 5149. This is the initial operation permit for Dupuy Storage Florida, LLC. This project permits the operation of blending line for green coffee beans. The facility is located in Duval County at 5330 5th Street West in Jacksonville, Florida, 32254. The UTM coordinates are Zone 17, 428.82 km East and 3356.99 km North.

This permit is organized into the following sections: Section 1 (General Information); Section 2 (Administrative Requirements); Section 3 (Emissions Unit Specific Conditions); and Section 4 (General Conditions); Sections 5 (Common Conditions); and Section 6 (Common Testing Requirements). Because of the technical nature of the project, the permit contains numerous acronyms and abbreviations, which are defined in Appendix A of this permit and an Operation and Maintenance Plan is attached.

Permitting Authority: Applications for air operation permits are subject to review in accordance with the provisions of Chapter 403, Florida Statutes (F.S.) and Rules 62-4 and 62-210 of the Florida Administrative Code (F.A.C.). The Permitting Authority responsible for making a permit determination for this project is the Neighborhoods Department, Environmental Quality Division. The Permitting Authority's physical address and mailing address is 214 North Hogan Street, Suite 500, Jacksonville, Florida 32202. The Permitting Authority's telephone number is (904) 255-7100.

Petitions. A person whose substantial interests are affected by the proposed decision may petition for an administrative hearing in accordance with Sections 120.569 and 120.57, F.S. The petition must contain the information set forth below and must be filed (received) in the Office of General Counsel, City of Jacksonville, 117 West Duval Street, Suite 480, Jacksonville, Florida 32202. Petitions filed by the applicant or any of the parties listed below must be filed within 14 days of receipt of this notice. Petitions filed by any other person must be filed within 14 days of receipt of this proposed action. A petitioner must mail a copy of the petition to the applicant at the address indicated above, at the time of filing. The failure of any person to file a petition within the appropriate time period shall constitute a waiver of that person's right to request an administrative determination (hearing) under Sections 120.569 and 120.57, F.S., or to intervene in this proceeding and participate as a party to it. Any subsequent intervention will be only at the approval of the presiding officer upon the filing of a motion in compliance with Rule 28-106.205, F.A.C.

A petition that disputes the material facts on which the Permitting Authority's action is based must contain the following information: (a) The name and address of each agency affected and each agency's file or identification number, if known; (b) The name, address, and telephone number of the petitioner; the name, address and telephone number of the petitioner's representative, if any, which shall be the address for service purposes during the course of the proceeding; and an explanation of how the petitioner's substantial interests will be affected by the agency determination; (c) A statement of how and when each petitioner received notice of the agency action or proposed action; (d) A statement of all disputed issues of material fact. If there are none, the petition must so indicate; (e) A concise statement of the ultimate facts alleged, as well as the rules and statutes which entitle the petitioner to relief; (f) A statement of the specific rules or statutes the petitioner contends require reversal or modification of the agency's proposed action; and, (g) A statement of the relief sought by the petitioner, stating precisely the action petitioner wishes the agency to take with respect to the agency's proposed action. A petition that does not dispute the material facts upon which the permitting authority's action is based shall state that no such facts are in dispute and otherwise shall contain the same information as set forth above, as required by Rule 28-106.301, F.A.C.

Because the administrative hearing process is designed to formulate final agency action, the filing of a petition means that the Permitting Authority's final action may be different from the position taken by it in this notice. Persons whose substantial interests will be affected by any such final decision of the permitting authority on the application have the right to petition to become a party to the proceeding, in accordance with the requirements set forth above.

Mediation: Mediation is not available in this proceeding.

Effective Date: This permitting decision is final and effective on the date filed with the clerk of the Permitting Authority unless a petition is filed in accordance with the above paragraphs or unless a request for extension of time in which to file a petition is filed within the time specified for filing a petition pursuant to Rule 62-110.106, F.A.C., and the petition conforms to the content requirements of Rules 28-106.201 and 28-106.301, F.A.C. Upon timely filing of a petition or a request for extension of time, this action will not be effective until further order of the Permitting Authority.

Judicial Review: Any party to this permitting decision (order) has the right to seek judicial review of it under Section 120.68, F.S., by filing a notice of appeal under Rule 9.110 of the Florida Rules of Appellate Procedure with the clerk of the Office of General Counsel, City of Jacksonville, 117 West Duval Street, Suite 480, Jacksonville, FL 32202 [Telephone: (904) 630-1700; Fax: (904) 630-1731], and by filing a copy of the notice of appeal accompanied by the applicable filing fees with the appropriate District Court of Appeal. The notice must be filed within 30 days after this order is filed with the clerk of the Permitting Authority.

0310622-002-AO Effective Date: June 29, 2018
Renewal Application Due Date: April 1, 2023
Expiration Date: May 31, 2023

Executed in Jacksonville, Florida

Richard L. Robinson, P.E., Manager
Air Pollution Source Permitting Section

RLR/HDS

CERTIFICATE OF SERVICE

The clerk hereby certifies that this Air Permit package was sent by electronic mail, with a link to these documents made available electronically on a publicly accessible server, with received receipt requested before the close of business on the date indicated below to the following persons.

Ms. Caryn Sawyer, Vice President, Dupuy Storage Florida, LLC (csawyer@dupuygroup.com)
Mr. David Thompson, P.E., Trinity Consultants (DTHOMPSON@TRINITYCONSULTANTS.COM)
Mr. Joseph Waryold, Director of Operations, Dupuy Storage Florida, LLC (waryold@dupuygroup.com)
Mr. Stuart Bartlett, Environmental Consultant, FDEP, Northeast District (Stuart.Bartlett@floridadep.gov)
Mr. Wayne Walker, EQD (WLW@coj.net)
Ms. Shannon Stone, EQD (Stone@coj.net)
Ms. Patricia Gee-Jones, EQD (patricia@coj.net)

FILING AND ACKNOWLEDGMENT FILED, on this date, pursuant to Section 120.52(7), F.S., with the clerk, receipt of which is hereby acknowledged.

(Clerk) 6/29/18 (Date)

FACILITY DESCRIPTION

Dupuy Storage Florida, LLC is a coffee storage facility. The coffee blending equipment will allow the blending of raw green coffee beans. It is a six compartment blending line with a blender, cleaner, magnets for removing metal debris from the coffee and sacking stations.

The existing facility consists of the following emissions unit (EU).

EU No.	Emission Unit Description
001	**Blending Line for Green Coffee Beans – This emission unit is a six compartment blending line with a blender, cleaner, and magnets for removing metal debris from the coffee and sacking stations. The control device for this emission unit is an Airlanco 51055 E86 Style III Baghouse, Model No. 488 Double Mixer.**

APPLICABLE REGULATIONS

A summary of applicable regulations is shown in the following table.

Regulation	EU No(s).
Federal Rule Citations	
40 CFR 60, Appendix A	**001**
State Rule Citations	
Rule 62-204.800, F.A.C., Federal Regulations Adopted by Reference	**001**
Rule 62-210.200, F.A.C., Definitions	**001**
Rule 62-296.700, F.A.C., Reasonably Available Control Technology (RACT) Particulate Matter	**001**
Rule 62-296.711, F.A.C., Materials Handling, Sizing, Screening, Crushing and Grinding Operations	**001**
Rule 62-297.310, F.A.C., General Emissions Test Requirements	
Local Rule Citations	
Rule 2.201, JEPB	**001**
Rule 2.301, JEPB	**001**
Rule 2.1101, JEPB	**001**
Rule 2.1201, JEPB	**001**

FACILITY REGULATORY CLASSIFICATION

- The facility is not a major source of hazardous air pollutants (HAP).
- The facility does not operate units subject to the acid rain provisions of the Clean Air Act (CAA).
- The facility is not a Title V major source of air pollution in accordance with Chapter 62-213, F.A.C.
- The facility is not a major stationary source in accordance with Rule 62-212.400, F.A.C. for the Prevention of Significant Deterioration (PSD) of Air Quality.

The facility is a minor source of air pollution because the potential emissions of regulated air pollutants are less than 100 tons per year and the potential emissions of Hazardous Air Pollutants (HAPs) are less than 10 tons per year for a single HAP and less than 25 tons per year for total HAPs pursuant to Rule 62-210.200(PTE), F.A.C. and Rule 2.301, JEPB.

SECTION 2.
ADMINISTRATIVE REQUIREMENTS

1. Permitting Authority: The Permitting Authority for this project is the Neighborhoods Department, Environmental Quality Division. The Permitting Authority's physical address and mailing address is 214 North Hogan Street, Suite 500, Jacksonville, Florida 32202. All documents related to applications for permits to operate an emissions unit shall be submitted to the Permitting Authority.

2. Compliance Authority: All documents related to compliance activities such as reports, tests, and notifications shall be submitted to the Permitting Authority at the mailing address stated in Administrative Requirement No. 1. or submitted electronically to aircompliance@coj.net.

3. Appendices: The following Appendices are attached as a part of this permit: Appendix A (Citation Formats and Glossary of Common Terms) and an Operation and Maintenance Plan.

4. Applicable Regulations, Forms and Application Procedures: Unless otherwise specified in this permit, the construction and operation of the subject emissions units shall be in accordance with the capacities and specifications stated in the application. The facility is subject to all applicable provisions of: Chapter 403, F.S.; and Rules 62-4, 62-204, 62-210, 62-212, 62-213, 62-296 and 62-297, F.A.C. Issuance of this permit does not relieve the permittee from compliance with any applicable federal, state, or local permitting regulations.

5. New or Additional Conditions: For good cause shown and after notice and an administrative hearing, if requested, the Permitting Authority may require the permittee to conform to new or additional conditions. The Permitting Authority shall allow the permittee a reasonable time to conform to the new or additional conditions, and on application of the permittee, the Permitting Authority may grant additional time. [Rule 62-4.080, F.A.C. and Rule 2.1401, JEPB]

6. Modifications: No new emissions unit shall be constructed and no existing emissions unit shall be modified without obtaining an air construction permit from the Permitting Authority. Such permit shall be obtained prior to beginning construction or modification. [Rule 62-210.300(1), F.A.C., Rule 62-212.300(1)(a), F.A.C., Rule 2.301, JEPB, and Rule 2.401, JEPB]

7. Renewal: **Prior to 60 days before the expiration date of this permit, the permittee shall apply for a renewal of the permit**. A renewal application shall be timely and sufficient. If the application is submitted prior to 60 days before expiration of the permit, it will be considered timely and sufficient. If the renewal application is submitted at a later date, it will not be considered timely and sufficient unless it is submitted and made complete prior to the expiration of the operation permit. When the application for renewal is timely and sufficient, the existing permit shall remain in effect until the renewal application has been finally acted upon by the Permitting Authority. [Rule 62-4.090, F.A.C. and Rule 2.1401, JEPB]

8. The facility shall be subject to City of Jacksonville Ordinance Code, Title X, Chapter 360 [Environmental Regulation], Chapter 362 [Air and Water Pollution], Chapter 376 [Odor Control], and JEPB Rule 1 [Final Rules with Respect to Organization, Procedure, and Practice].

9. The facility shall be subject to JEPB Rule 2, Part Nos. I through IV, VI through VII and Part Nos. IX through XIV.

SECTION 3.
EMISSIONS UNIT SPECIFIC CONDITIONS
A. Blending Line for Green Coffee Beans

This section of the permit addresses the following emissions unit.

EU No.	Emission Unit Description
001	**Blending Line for Green Coffee Beans– This emission unit is a six compartment blending line with a blender, cleaner, and magnets for removing metal debris from the coffee and sacking stations. The control device for this emission unit is an Airlanco 51055 E86 Style III Baghouse, Model No. 488 Double Mixer.**

PERFORMANCE RESTRICTIONS

1. Reasonably Available Control Technology (RACT): RACT requirements including **Specific RACT Emission Limiting Standards for Stationary Emission Units** [Rule 62-296.700(3), F.A.C. and Rule 2.1101, JEPB]; **Maximum Allowable Emission Rates** [Rule 62-296.700(4), F.A.C. and Rule 2.1101, JEPB]; **Circumvention** [Rule 62-296.700(5),F.A.C. and Rule 2.1101, JEPB], and **Operation and Maintenance Plan** [Rule 62-296.700(6), F.A.C. and Rule 2.1101, JEPB] shall apply to this emission unit.

2. Restricted Operation: The hours of operation are not limited (8760 hours per year). [Permit No. 0310622-001-AC, Rule 62-210.200(PTE), F.A.C. and Rule 2.301, JEPB]

3. Volumetric Flow Rate: The volumetric flow rate for the AIRLANCO 51055 E86 Style III Baghouse, Model No. 488 Double Mixer is 17,100 dry standard cubic feet per minute (dscfm). [Rule 62-296.700(4)(a), F.A.C. and Rule 2.1101, JEPB]

4. Permitted Capacity: The permitted capacity for the blending line for the green coffee beans shall be limited to 35,000 lbs/hr. [Permit No. 0310622-001-AC, 62-210.200(PTE), F.A.C., and Rule 2.301, JEPB]

EMISSIONS STANDARDS

5. Visible Emissions Standard: Visible emissions shall be limited to 5% opacity. [Permit No. 0310622-001-AC, Rule 62-296.711(2)(a), F.A.C. and Rule 2.1101, JEPB]

6. Particulate Matter Standard: Particulate matter emissions shall not exceed 0.03 gr/dscf (4.40 pounds per hour and 19.26 tons per year). [Permit No. 0310622-001-AC, Rule 62-296.711(2)(b), F.A.C., and Rule 2.1101, JEPB]

TESTING REQUIREMENTS

7. Testing Notification: The permittee shall notify the Compliance Authority in writing **at least 15 days prior to any required tests**. Tests shall be conducted in accordance with the applicable requirements specified in Section 6 (Common Testing Requirements) of this permit. [Rule 62-297.310(9), F.A.C. and Rule 2.1201, JEPB]

8. Test Results Submittal: The permittee of an emissions unit for which an emissions test is required shall submit a written test report to the Compliance Authority specified by permit, on the results of each such test as soon as practicable but **no later than 45 days** after each test is completed. Test reports may be submitted electronically. [Rule 62-297-310(10), F.A.C. and Rule 2.1201, JEPB]

9. Operating Conditions during Emission Testing: Testing of emissions shall be conducted with the emissions unit operating at the testing capacity as defined below. If it is impracticable to test at the testing capacity, an emissions unit may be tested at less than the testing capacity. **If an emissions unit is tested at less than the testing capacity, another emissions test shall be conducted and completed no later than 60 days after the emissions unit operation exceeds 110% of the capacity at which its most recent emissions test was conducted. Testing capacity is defined as at least 90% of the maximum operation rate specified by the permit.** [Rule 62-297.310(3), F.A.C. and Rule 2.1201, JEPB]

10. Frequency of Compliance Test:

    a. Testing for the determination of compliance for particulate matter (PM) shall be performed **upon request of the Permitting Authority** in accordance with EPA Reference Method (RM) 5 (as described in 40 CFR 60, Appendix A). The **minimum sample volume shall be 30 dry standard cubic feet.** [Rule 62-296.711(3)(b), F.A.C. and Rule 2.1101, JEPB]

    b. Testing for the determination of compliance for opacity shall be performed **annually from the date of March 1, 2018** in accordance with EPA Reference Method (RM) 9 (as described in 40 CFR 60, Appendix A). Testing shall be conducted for a **minimum period of 30 minutes.** [Rule 62-296.711(3)(a), Rule 62-297.310(5)(b), F.A.C., Rule 2.1101, and Rule 2.1201, JEPB]

11. Test Methods: Required tests shall be performed in accordance with the following reference methods:

Method	Description of Method and Comments
5	Determination of Particulate Matter Emissions from Stationary Sources (Upon Request)
9	Visual Determination of the Opacity of Emissions from Stationary Sources

The above methods are described in Appendix A of 40 CFR 60 and are adopted by reference in Rule 62-204.800, F.A.C. No other methods may be used unless prior written approval is received from the Permitting Authority. [Rules 62-204.800, F.A.C., Appendix A of 40 CFR 60, and Rule 2.201, JEPB]

RECORDS AND REPORTS

12. Test Reports: The permittee shall prepare and submit reports for all required tests in accordance with the requirements specified in Section 6 (Common Testing Requirements) of this permit. For each test run, the report shall also indicate the process rate and total emissions. [Rule 62-297.310(10), F.A.C. and Rule 2.1201, JEPB]

13. Record Retention: The above records shall be retained for a **minimum period of 2 years** and shall be made available to the Compliance Authority upon request. [Rule 62-296.700(6)(e), F.A.C. and Rule 2.1401, JEPB]

14. Operation and Maintenance Plan: The permittee shall use the best operational practices in the attached Operation and Maintenance (O&M) Plan. The O&M Plan shall be part of this permit. Records shall be maintained file for a **minimum period of 2 years** and made available to the Compliance Authority upon request. [Rule 62-296.700(6), F.A.C. and Rule 2.1101, JEPB]

SECTION 4.
GENERAL CONDITIONS

The permittee shall comply with the following general conditions from Rule 62-4.160, F.A.C.

1. The terms, conditions, requirements, limitations and restrictions set forth in this permit, are "permit conditions" and are binding and enforceable pursuant to Sections 403.141, 403.727, or 403.859 through 403.861, F.S. The permittee is placed on notice that the Permitting Authority will review this permit periodically and may initiate enforcement action for any violation of these conditions.

2. This permit is valid only for the specific processes and operations applied for and indicated in the approved drawings or exhibits. Any unauthorized deviation from the approved drawings, exhibits, specifications, or conditions of this permit may constitute grounds for revocation and enforcement action by the Permitting Authority.

3. As provided in Sections 403.987(6) and 403.722(5), F.S., the issuance of this permit does not convey any vested rights or any exclusive privileges. Neither does it authorize any injury to public or private property or any invasion of personal rights, nor any infringement of federal, state, or local laws or regulations. This permit is not a waiver of or approval of any other department permit that may be required for other aspects of the total project which are not addressed in this permit.

4. This permit conveys no title to land or water, does not constitute State recognition or acknowledgment of title, and not constitute authority for the use of submerged lands unless herein provided and the necessary title or leasehold interests have been obtained from the State. Only the Trustees of the Internal Improvement Trust Fund may express State opinion as to title.

5. This permit does not relieve the permittee from liability for harm or injury to human health or welfare, animal, or plant life, or property caused by the construction or operation of this permitted source, or from penalties therefore; nor does it allow the permittee to cause pollution in contravention of Florida Statutes and Florida Administrative Code, unless specifically authorized by an order from the Permitting Authority.

6. The permittee shall properly operate and maintain the facility and systems of treatment and control (and related appurtenances) that are installed and used by the permittee to achieve compliance with the conditions of this permit, as required by Florida Administrative Code. This provision includes the operation of backup or auxiliary facilities or similar systems when necessary to achieve compliance with the conditions of the permit and when required by Florida Administrative Code.

7. The permittee, by accepting this permit, specifically agrees to allow authorized Permitting Authority personnel, upon presentation of credentials or other documents as may be required by law and at reasonable times, access to the premises where the permitted activity is located or conducted to:

   a. Have access to and copy any records that must be kept under conditions of the permit;

   b. Inspect the facility, equipment, practices, or operations regulated or required under this permit; and

   c. Sample or monitor any substances or parameters at any location reasonably necessary to assure compliance with this permit or Florida Administrative Code. Reasonable time may depend on the nature of the concern being investigated.

8. If, for any reason, the permittee does not comply with or will be unable to comply with any condition or limitation specified in this permit, the permittee shall immediately provide the Permitting Authority with the following information:

   a. A description of and cause of noncompliance; and

   b. The period of noncompliance, including dates and times; or, if not corrected, the anticipated time the noncompliance is expected to continue, and steps being taken to reduce, eliminate, and prevent recurrence of the noncompliance. The permittee shall be responsible for any and all damages which may result and may be subject to enforcement action by the Permitting Authority for penalties or for revocation of this permit.

9. In accepting this permit, the permittee understands and agrees that all records, notes, monitoring data and other information relating to the construction or operation of this permitted source which are submitted to the Permitting Authority may be used by the Permitting Authority as evidence in any enforcement case involving the permitted source arising under the Florida Statutes or Florida Administrative Code, except where such use is prescribed by Sections 403.111 and 403.73, F.S. Such evidence shall only be used to the extent it is consistent with the Florida Rules of Civil Procedure and appropriate evidentiary rules.

10. The permittee agrees to comply with changes in Florida Statutes and Florida Administrative Code after a reasonable time for compliance; provided, however, the permittee does not waive any other rights granted by Florida Statutes or Florida Administrative Code rules. A reasonable time for compliance with a new or amended surface water quality standard, other than those standards addressed in Rule 62-302.500, F.A.C., shall include a reasonable time to obtain or be denied a mixing zone for the new or amended standard.

11. This permit is transferable only upon Permitting Authority approval in accordance with Rules 62-4.120 and 62-730.300, F.A.C., as applicable. The permittee shall be liable for any non-compliance of the permitted activity until the transfer is approved by the Permitting Authority.

12. This permit or a copy thereof shall be kept at the work site of the permitted activity.

13. This permit also constitutes:

    a. Determination of Best Available Control Technology (not applicable);

    b. Determination of Prevention of Significant Deterioration (not applicable); and

    c. Compliance with New Source Performance Standards (not applicable).

14. The permittee shall comply with the following:

    a. Upon request, the permittee shall furnish all records and plans required under Florida Administrative Code. During enforcement actions, the retention period for all records will be extended automatically unless otherwise stipulated by the Permitting Authority.

    b. The permittee shall hold at the facility or other location designated by this permit records of all monitoring information (including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation) required by the permit, copies of all reports required by this permit, and records of all data used to complete the application for this permit. These materials shall be retained at least three years from the date of the sample, measurement, report, or application unless otherwise specified by Florida Administrative Code rule.

    c. Records of monitoring information shall include:

        (1) The date, exact place, and time of sampling or measurements;

        (2) The person responsible for performing the sampling or measurements;

        (3) The dates analyses were performed;

        (4) The person responsible for performing the analyses;

        (5) The analytical techniques or methods used;

        (6) The results of such analyses.

15. When requested by the Permitting Authority, the permittee shall within a reasonable time furnish any information required by law which is needed to determine compliance with the permit. If the permittee becomes aware the relevant facts were not submitted or were incorrect in the permit application or in any report to the Permitting Authority, such facts or information shall be corrected promptly.

SECTION 5.
COMMON CONDITIONS

Unless otherwise specified in the permit, the following conditions apply to all emissions units and activities at the facility.

EMISSIONS AND CONTROLS

1. Plant Operation - Problems: If temporarily unable to comply with any of the conditions of the permit due to breakdown of equipment or destruction by fire, wind or other cause, the permittee shall notify the Permitting Authority as soon as possible, but at least within one working day, excluding weekends and holidays. The notification shall include: pertinent information as to the cause of the problem; steps being taken to correct the problem and prevent future recurrence; and, where applicable, the owner's intent toward reconstruction of destroyed facilities. Such notification does not release the permittee from any liability for failure to comply with the conditions of this permit or the regulations. [Rule 62-4.130, F.A.C. and Rule 2.1401, JEPB]

2. Circumvention: The permittee shall not circumvent the air pollution control equipment or allow the emission of air pollutants without this equipment operating properly. [Rule 62-210.650, F.A.C. and Rule 2.301, JEPB]

3. Excess Emissions Allowed: Excess emissions resulting from startup, shutdown or malfunction of any emissions unit shall be permitted providing (1) best operational practices to minimize emissions are adhered to and (2) the duration of excess emissions shall be minimized but in no case exceed 2 hours in any 24-hour period unless specifically authorized by the Permitting Authority for longer duration. Pursuant to Rule 62-210.700(5), F.A.C., the permit may specify more or less stringent requirements for periods of excess emissions. Rule 62-210-700(Excess Emissions), F.A.C., cannot vary or supersede any federal NSPS or NESHAP provision. [Rule 62-210.700(1), F.A.C. and Rule 2.301, JEPB]

4. Excess Emissions Prohibited: Excess emissions caused entirely or in part by poor maintenance, poor operation, or any other equipment or process failure that may reasonably be prevented during startup, shutdown or malfunction shall be prohibited. [Rule 62-210.700(1), F.A.C. and Rule 2.301, JEPB]

5. Excess Emissions - Notification: In case of excess emissions resulting from malfunctions, the permittee shall notify the Permitting Authority in accordance with Rule 62-4.130, F.A.C. A full written report on the malfunctions shall be submitted in a quarterly report, if requested by the Permitting Authority. [Rule 62-210.700(5), F.A.C. and Rule 2.301, JEPB]

6. VOC or OS Emissions: No person shall store, pump, handle, process, load, unload or use in any process or installation, volatile organic compounds (VOC) or organic solvents (OS) without applying known and existing vapor emission control devices or systems deemed necessary and ordered by the Permitting Authority. [Rule 62-296.320(1), F.A.C. and Rule 2.1101, JEPB]

7. Objectionable Odor Prohibited: No person shall cause, suffer, allow or permit the discharge of air pollutants, which cause or contribute to an objectionable odor. An "objectionable odor" means any odor present in the outdoor atmosphere which by itself or in combination with other odors, is or may be harmful or injurious to human health or welfare, which unreasonably interferes with the comfortable use and enjoyment of life or property, or which creates a nuisance. [Rule 62-296.320(2), F.A.C., Rule 62-210.200(Definitions), F.A.C., Rule 2.1101, JEPB, and Rule 2.301, JEPB]

8. General Visible Emissions: No person shall cause, let, permit, suffer or allow to be discharged into the atmosphere the emissions of air pollutants from any activity equal to or greater than 20% opacity. This regulation does not impose a specific testing requirement. [Rule 62-296.320(4)(b)1, F.A.C. and Rule 2.1101, JEPB]

9. Unconfined Particulate Emissions: No person shall cause, let, permit, suffer or allow the emissions of unconfined particulate matter from any activity, including vehicular movement; transportation of materials; construction, alteration, demolition or wrecking; or industrially related activities such as loading, unloading, storing or handling; without taking reasonable precautions to prevent such emissions.

   a. Any permit issued to a facility with emissions of unconfined particulate matter shall specify the reasonable precautions to be taken by that facility to control the emissions of unconfined particulate matter.

   b. Reasonable precautions include the following:

      (1) Paving and maintenance of roads, parking areas and yards.

      (2) Application of water or chemicals to control emissions from such activities as demolition of buildings, grading roads, construction, and land clearing.

(3) Application of asphalt, water, oil, chemicals or other dust suppressants to unpaved roads, yards, open stock piles and similar activities.

(4) Removal of particulate matter from roads and other paved areas under the control of the owner or operator of the facility to prevent re-entrainment, and from buildings or work areas to prevent particulate from becoming airborne.

(5) Landscaping or planting of vegetation.

(6) Use of hoods, fans, filters, and similar equipment to contain, capture and/or vent particulate matter.

(7) Confining abrasive blasting where possible.

(8) Enclosure or covering of conveyor systems.

c. In determining what constitutes reasonable precautions for a particular facility, the Permitting Authority shall consider the cost of the control technique or work practice, the environmental impacts of the technique or practice, and the degree of reduction of emissions expected from a particular technique or practice.

[Rule 62-296.320(4)(c), F.A.C. and Rule 2.1101, JEPB]

RECORDS AND REPORTS

10. Records Retention: The permittee shall hold at the facility or other location designated by this permit records of all monitoring information (including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation) required by the permit, copies of all reports required by this permit, and records of all data used to complete the application for this permit. These materials shall be retained at least three years from the date of the sample, measurement, report, or application unless otherwise specified by Florida Administrative Code rule. [Rule 62-4.160(14)(b), F.A.C. and Rule 2.1401, JEPB]

11. Emissions Computation and Reporting:

a. *Applicability.* This rule sets forth required methodologies to be used by the owner or operator of a facility for computing actual emissions, baseline actual emissions, and net emissions increase, as defined at Rule 62-210.200, F.A.C., and for computing emissions for purposes of the reporting requirements of Rule 62-210.370(3) and Rule 62-212.300(1)(e), F.A.C., or of any permit condition that requires emissions be computed in accordance with this rule. This rule is not intended to establish methodologies for determining compliance with the emission limitations of any air permit. [Rule 62-210.370(1), F.A.C. and Rule 2.301, JEPB]

b. *Computation of Emissions.* For any of the purposes set forth in Rule 62-210.370(1), F.A.C., the owner or operator of a facility shall compute emissions in accordance with the requirements set forth in this Rule.

(1) Basic Approach. The owner or operator shall employ, on a pollutant-specific basis, the most accurate of the approaches set forth below to compute the emissions of a pollutant from an emissions unit; provided, however, that nothing in this rule shall be construed to require installation and operation of any continuous emissions monitoring system (CEMS), continuous parameter monitoring system (CPMS), or predictive emissions monitoring system (PEMS) not otherwise required by rule or permit, nor shall anything in this rule be construed to require performance of any stack testing not otherwise required by rule or permit.

(a) If the emissions unit is equipped with a CEMS meeting the requirements of Rule 62-210.370(2)(b), F.A.C., the owner or operator shall use such CEMS to compute the emissions of the pollutant, unless the owner or operator demonstrates to the Permitting Authority that an alternative approach is more accurate because the CEMS represents still-emerging technology.

(b) If a CEMS is not available or does not meet the requirements of Rule 62-210.370(2)(b), F.A.C, but emissions of the pollutant can be computed pursuant to the mass balance methodology of Rule 62-210.370(2)(c), F.A.C., the owner or operator shall use such methodology, unless the owner or operator demonstrates to the Permitting Authority that an alternative approach is more accurate.

(c) If a CEMS is not available or does not meet the requirements of Rule 62-210.370(2)(b), F.A.C., and emissions cannot be computed pursuant to the mass balance methodology, the owner or operator shall use an emission factor meeting the requirements of Rule 62-210.370(2)(d), F.A.C., unless the owner or operator demonstrates to the Permitting Authority that an alternative approach is more accurate.

(2) Continuous Emissions Monitoring System (CEMS).

(a) An owner or operator may use a CEMS to compute emissions of a pollutant for purposes of this rule provided:

1) The CEMS complies with the applicable certification and quality assurance requirements of 40 CFR Part 60, Appendices B and F, or, for an acid rain unit, the certification and quality assurance requirements of 40 CFR Part 75, all adopted by reference at Rule 62-204.800, F.A.C.; or

2) The owner or operator demonstrates that the CEMS otherwise represents the most accurate means of computing emissions for purposes of this rule.

(b) Stack gas volumetric flow rates used with the CEMS to compute emissions shall be obtained by the most accurate of the following methods as demonstrated by the owner or operator:

1) A calibrated flow meter that records data on a continuous basis, if available; or

2) The average flow rate of all valid stack tests conducted during a five-year period encompassing the period over which the emissions are being computed, provided all stack tests used shall represent the same operational and physical configuration of the unit.

(c) The owner or operator may use CEMS data in combination with an appropriate f-factor, heat input data, and any other necessary parameters to compute emissions if such method is demonstrated by the owner or operator to be more accurate than using a stack gas volumetric flow rate as set forth at Rule 62-210.370(2)(b)2., F.A.C., above.

(3) Mass Balance Calculations.

(a) An owner or operator may use mass balance calculations to compute emissions of a pollutant for purposes of this rule provided the owner or operator:

1) Demonstrates a means of validating the content of the pollutant that is contained in or created by all materials or fuels used in or at the emissions unit; and

2) Assumes that the emissions unit emits all of the pollutant that is contained in or created by any material or fuel used in or at the emissions unit if it cannot otherwise be accounted for in the process or in the capture and destruction of the pollutant by the unit's air pollution control equipment.

(b) Where the vendor of a raw material or fuel which is used in or at the emissions unit publishes a range of pollutant content from such material or fuel, the owner or operator shall use the highest value of the range to compute the emissions, unless the owner or operator demonstrates using site-specific data that another content within the range is more accurate.

(c) In the case of an emissions unit using coatings or solvents, the owner or operator shall document, through purchase receipts, records and sales receipts, the beginning and ending VOC inventories, the amount of VOC purchased during the computational period, and the amount of VOC disposed of in the liquid phase during such period.

(4) Emission Factors.

(a) An owner or operator may use an emission factor to compute emissions of a pollutant for purposes of this rule provided the emission factor is based on site-specific data such as stack test data, where available, unless the owner or operator demonstrates to the Permitting Authority that an alternative emission factor is more accurate. An owner or operator using site-specific data to derive an emission factor, or set of factors, shall meet the following requirements.

1) If stack test data are used, the emission factor shall be based on the average emissions per unit of input, output, or gas volume, whichever is appropriate, of all valid stack tests conducted during at least a five-year period encompassing the period over which the emissions are being computed, provided all stack tests used shall represent the same operational and physical configuration of the unit.

2) Multiple emission factors shall be used as necessary to account for variations in emission rate associated with variations in the emissions unit's operating rate or operating conditions during the period over which emissions are computed.

3) The owner or operator shall compute emissions by multiplying the appropriate emission factor by the appropriate input, output or gas volume value for the period over which the emissions are computed. The owner or operator shall not compute emissions by converting an emission factor to pounds per hour and then multiplying by hours of operation, unless the owner or operator demonstrates that such computation is the most accurate method available.

(b) If site-specific data are not available to derive an emission factor, the owner or operator may use a published emission factor directly applicable to the process for which emissions are computed. If no directly-applicable emission factor is available, the owner or operator may use a factor based on a similar, but different, process.

(5) Accounting for Emissions During Periods of Missing Data from CEMS, PEMS, or CPMS. In computing the emissions of a pollutant, the owner or operator shall account for the emissions during periods of missing data from CEMS, PEMS, or CPMS using other site-specific data to generate a reasonable estimate of such emissions.

(6) Accounting for Emissions During Periods of Startup and Shutdown. In computing the emissions of a pollutant, the owner or operator shall account for the emissions during periods of startup and shutdown of the emissions unit.

(7) Fugitive Emissions. In computing the emissions of a pollutant from a facility or emissions unit, the owner or operator shall account for the fugitive emissions of the pollutant, to the extent quantifiable, associated with such facility or emissions unit.

(8) Recordkeeping. The owner or operator shall retain a copy of all records used to compute emissions pursuant to this rule for a period of 5 years from the date on which such emissions information is submitted to the Permitting Authority for any regulatory purpose.

[Rule 62-210.370(2), F.A.C. and Rule 2.301, JEPB]

c. *Annual Operating Report for Air Pollutant Emitting Facility*

(1) The Annual Operating Report for Air Pollutant Emitting Facility (DEP Form No. 62-210.900(5) shall be completed each year for the following facilities:

(a) All Title V sources.

(b) All synthetic non-Title V sources.

(c) All facilities with the potential to emit 10 tons per year or more of volatile organic compounds or 25 tons per year or more of nitrogen oxides and located in an ozone nonattainment area or ozone air quality maintenance area.

(d) All facilities for which an annual operating report is required by rule or permit.

(2) Notwithstanding Rule 62-210.370(3)(a), F.A.C., no annual operating report shall be required for any facility operating under an air general permit.

(3) By April 1 of the year following each calendar year, an annual operating report shall be submitted to the appropriate Department of Environmental Protection (DEP) division, district or DEP-approved local air pollution control program office. However, if the annual operating report is submitted using the DEP's electronic annual operating report software, there is no requirement to submit DEP Form No. 62-210.900(5) to any DEP or local air program office. Each Title V Source shall submit the annual operating report using the DEP's electronic annual operating report software, unless the Title V source claims a technical or financial hardship. A technical or financial hardship is claimed by submitting DEP Form No. 62-210.900(5) to the DEP Division of Air Resource Management at:

AOR and Major Air Pollution Source Annual Emissions Fee
P.O. Box 3070
Tallahassee, Florida 32315-3070

(See http://www.dep.state.fl.us/air/emission/eaor/ for information regarding annual operating reports.)

(4) Emissions shall be computed in accordance with the provisions of Rule 62-210.370(2), F.A.C., for purposes of the annual operating report.

[Rule 62-210.370(3), F.A.C. and Rule 2.301, JEPB]

d. *Facility Relocation.* Unless otherwise provided by rule or more stringent permit condition, the owner or operator of a relocatable facility must submit a Facility Relocation Notification Form (DEP Form No. 62-210.900(6) to the Permitting Authority at least 30 days prior to the relocation. A separate form shall be submitted for each facility in the case of the relocation of multiple facilities which are jointly owned or operated. [Rule 62-210.370(4), F.A.C., and Rule 2.301, JEPB]

SECTION 6.
COMMON TESTING REQUIREMENTS

EMISSIONS TESTING REQUIREMENTS

1. Applicability: Unless otherwise stated in a specific rule, permit, or other order, the general requirements set forth in Rule 62-297.310(2) through (10), F.A.C., shall be used for regulated stationary sources' emissions tests for comparison with air pollution emission-limiting standards that are enforceable under state law. An emissions test is an emissions rate test, a concentration test, or an opacity test. [Rule 62-297.310(1), F.A.C. and Rule 2.1201, JEPB]

REPORTS

2. Test Reports:

   a. The owner or owner's authorized agent of an emissions unit for which an emissions test is required shall submit a written test report to the compliance authority specified by permit, on the results of each such test as soon as practicable but no later than 45 days after the last run of each test is completed. Test reports may be submitted electronically.

   b. If the owner or owner's authorized agent of an emissions unit for which an emissions test is required submits the results of each such test electronically using the EPA Electronic Reporting Tool (ERT), the written report specified in Rule 62-297.310(10)(a), F.A.C., need not be submitted, provided the conditions of Rule 62-297.310(10)(b)1. through 3., F.A.C., are met:

      (1) The owner or owner's authorized agent shall submit the test information using the ERT as soon as practicable but no later than 45 days after the last run of each test is completed;

      (2) The test information shall provide, as a minimum, the information specified in Rule 62-297.310(10)(c)1. through 24., F.A.C.; and

      (3) The compliance authority specified by permit must receive written notification, no later than 45 days after the last run of each test is completed, of the date that the test data was submitted using the ERT.

   [Rule 62-297.310(10), F.A.C. and Rule 2.1201, JEPB]

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APPENDIX A
CITATION FORMATS AND GLOSSARY OF COMMON TERMS

CITATION FORMATS

The following illustrate the formats used in the permit to identify applicable requirements from permits and regulations.

Old Permit Numbers

Example: Permit No. AC50-123456 or Permit No. AO50-123456

Where: "AC" identifies the permit as an Air Construction Permit
"AO" identifies the permit as an Air Operation Permit
"123456" identifies the specific permit project number

New Permit Numbers

Example: Permit Nos. 099-2222-001-AC, 099-2222-001-AF, 099-2222-001-AO, or 099-2222-001-AV

Where: "099" represents the specific county ID number in which the project is located

"2222" represents the specific facility ID number for that county

"001" identifies the specific permit project number

"AC" identifies the permit as an air construction permit

"AF" identifies the permit as a minor source federally enforceable state operation permit

"AO" identifies the permit as a minor source air operation permit

"AV" identifies the permit as a major Title V air operation permit

PSD Permit Numbers

Example: Permit No. PSD-FL-317

Where: "PSD" means issued pursuant to the preconstruction review requirements of the Prevention of Significant Deterioration of Air Quality

"FL" means that the permit was issued by the State of Florida

"317" identifies the specific permit project number

Florida Administrative Code (F.A.C.)

Example: [Rule 62-213.205, F.A.C.]

Means: Title 62, Chapter 213, Rule 205 of the Florida Administrative Code

Code of Federal Regulations (CFR)

Example: [40 CRF 60.7]

Means: Title 40, Part 60, Section 7

GLOSSARY OF COMMON TERMS

°F: degrees Fahrenheit
µg: microgram
AAQS: Ambient Air Quality Standard
acf: actual cubic feet
acfm: actual cubic feet per minute
ARMS: Air Resource Management System (Department's database)
BACT: best available control technology
Btu: British thermal units
CAM: compliance assurance monitoring
CEMS: continuous emissions monitoring system
cfm: cubic feet per minute
CFR: Code of Federal Regulations
CAA: Clean Air Act
CMS: continuous monitoring system
CO: carbon monoxide

bhp: brake horsepower
COMS: continuous opacity monitoring system
DARM: Division of Air Resource Management
DEP: Department of Environmental Protection
Department: Department of Environmental Protection
dscf: dry standard cubic feet
dscfm: dry standard cubic feet per minute
EPA: Environmental Protection Agency
ESP: electrostatic precipitator (control system for reducing particulate matter)
EU: emissions unit
F: fluoride
F.A.C.: Florida Administrative Code
F.A.W.: Florida Administrative Weekly
F.D.: forced draft
F.S.: Florida Statutes
FGD: flue gas desulfurization
FGR: flue gas recirculation
ft^2: square feet
ft^3: cubic feet
gpm: gallons per minute
gr: grains
HAP: hazardous air pollutant
Hg: mercury
I.D.: induced draft
ID: identification
kPa: kilopascals
lb: pound
MACT: maximum achievable control technology
MMBtu: million British thermal units
MSDS: material safety data sheets
MW: megawatt
NESHAP: National Emissions Standards for Hazardous Air Pollutants
NO_X: nitrogen oxides
CO_2: carbon dioxide
NSPS: New Source Performance Standards
O&M: operation and maintenance
O_2: oxygen
Pb: lead
PM: particulate matter
PM_{10}: particulate matter with a mean aerodynamic diameter of 10 microns or less
ppm: parts per million
ppmv: parts per million by volume
ppmvd: parts per million by volume, dry basis
QA: quality assurance
QC: quality control
PSD: prevention of significant deterioration
psi: pounds per square inch
PTE: potential to emit
RACT: reasonably available control technology
RATA: relative accuracy test audit
RBLC: EPA's RACT/BACT/LAER Clearinghouse
SAM: sulfuric acid mist
scf: standard cubic feet
scfm: standard cubic feet per minute
SIC: standard industrial classification code
SIP: State Implementation Plan
SNCR: selective non-catalytic reduction (control system used for reducing emissions of nitrogen oxides)
SO_2: sulfur dioxide
TPD: tons/day
TPH: tons per hour
TPY: tons per year
TRS: total reduced sulfur
UTM: Universal Transverse Mercator coordinate system
VE: visible emissions
VOC: volatile organic compounds

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AIRLANCO

PULSE JET FILTER

INSTALLATION, OPERATION, & MAINTENANCE MANUAL

AGI
AG GROWTH INTERNATIONAL

Read this manual before using product. Failure to follow instructions and safety precautions can result in serious injury, death, or property damage. Keep manual for future reference.

Part Number: AL-PJF R0

Revised: Aug/14

This product has been designed and constructed according to general engineering standards[a]. Other local regulations may apply and must be followed by the operator. We strongly recommend that all personnel associated with this equipment be trained in the correct operational and safety procedures required for this product. Periodic reviews of this manual with all employees should be standard practice. For your convenience, we include this sign-off sheet so you can record your periodic reviews.

Date	Employee Signature	Employer Signature

a. Standards include organizations such as the American Society of Agricultural and Biological Engineers, American National Standards Institute. Canadian Standards Association, International Organization for Standardization, EN Standards, and/or others.

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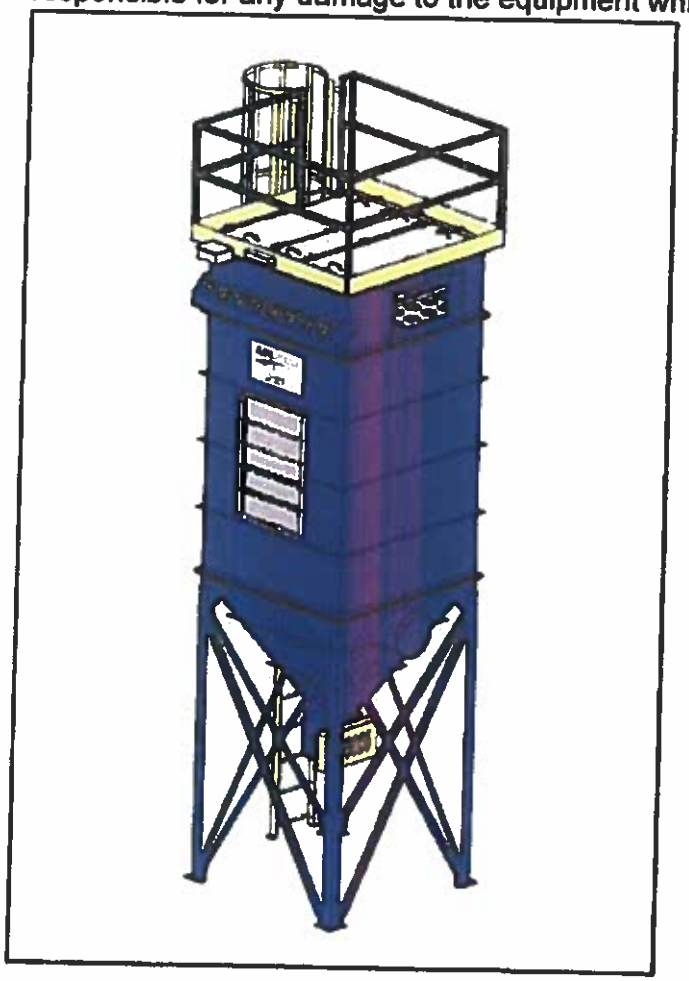
1. Introduction

AIRLANCO, along with all of our employees, thank you for selecting us to fulfill your needs for environmental control equipment.

Pulse jet filters provide a mechanically simple, efficient, and economical means to separate particulate from a gas stream. The absolute minimum of moving parts enhances the efficiency and durability of the system. This manual will provide the information needed for an operator or maintenance technician to understand the process of fabric filtration and the mechanical operation of your AIRLANCO pulse jet filter. Understanding these basic principles will assure that this filter will provide years of dependable service with minimum maintenance.

RECEIVING YOUR EQUIPMENT

A visual inspection of your equipment should be performed before it is removed from the truck. Dents, scratches, and other damage should be noted and photographed. The structural integrity of the filter housing will be adversely affected by dents. AIRLANCO should be notified of any structural damage to your equipment immediately. Packing lists should be checked thoroughly and shortages should also be reported to AIRLANCO. It is the purchaser's responsibility to file shortage reports and damage claims with the carrier and the supplier. The carrier is responsible for any damage to the equipment while it is in transit.



2. Safety

2.1. GENERAL SAFETY INFORMATION

The Safety Alert symbol identifies important safety messages on the product and in the manual. When you see this symbol, be alert to the possibility of personal injury or death. Follow the instructions in the safety messages.

Why is SAFETY important?

- Accidents disable and kill.
- Accidents cost.
- Accidents can be avoided.

SIGNAL WORDS: Note the use of the signal words **DANGER**, **WARNING**, **CAUTION**, and **NOTICE** with the safety messages. The appropriate signal word for each message has been selected using the definitions below as a guideline.

DANGER
Indicates an imminently hazardous situation that, if not avoided, will result in serious injury or death.

WARNING
Indicates a hazardous situation that, if not avoided, could result in serious injury or death.

CAUTION
Indicates a hazardous situation that, if not avoided, may result in minor or moderate injury.

NOTICE
Indicates a potentially hazardous situation that, if not avoided, may result in property damage.

YOU are responsible for the **SAFE** use and maintenance of your equipment. **YOU** must ensure that you and anyone else who is going to work around the equipment understands all procedures and related **SAFETY** information contained in this manual.

Remember, **YOU** are the key to safety. Good safety practices not only protect you, but also the people around you. Make these practices a working part of your safety program.

Important: *Below are general instructions that apply to all safety practices. Any instructions specific to a certain safety practice (e.g., Operational Safety), can be found in the appropriate section. Always read the complete instructional sections and not just these safety summaries before doing anything with the equipment.*

- It is the equipment owner, operator, and maintenance personnel's responsibility to read and understand **ALL** safety instructions, safety decals, and manuals and follow them when assembling, operating, or maintaining the equipment. All accidents can be avoided.

- Equipment owners must give instructions and review the information initially and annually with all personnel before allowing them to operate this product. Untrained users/operators expose themselves and bystanders to possible serious injury or death.
- Use this equipment for its intended purposes only.
- Do not modify the equipment in any way without written permission from the manufacturer. Unauthorized modification may impair the function and/or safety, and could affect the life of the equipment. Any unauthorized modification of the equipment voids the warranty.
- Do not allow any unauthorized person in the work area.

2.2. OPERATIONAL SAFETY

1. Do not operate this equipment without guards, access doors, and covers secured.
2. Lock out power before servicing this equipment.
3. This equipment is automatically controlled and will start at any time without warning.
4. Do not enter access plenum while system fan is operating: airflow can pull service door closed causing severe injury or entrapment.
5. OSHA considers some filter housings a confined space. Follow procedures as set forth by your safety administrator.

CAUTION	
	Failure to follow these instructions may result in personal injury or property damage.

2.3. SAFETY DECALS

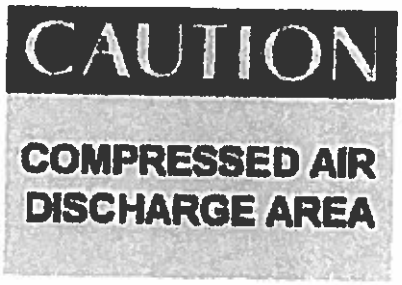
- Keep safety decals clean and legible at all times.
- Replace safety decals that are missing or have become illegible. See decal location figures that follow.
- Replaced parts must display the same decal(s) as the original part.
- Replacement safety decals are available **free of charge** from your distributor, dealer, or factory.

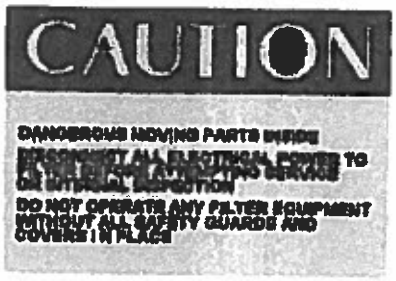
2.3.1. DECAL INSTALLATION/REPLACEMENT

1. Decal area must be clean and dry, with a temperature above 50°F (10°C).
2. Decide on the exact position before you remove the backing paper.
3. Align the decal over the specified area and carefully press the small portion with the exposed sticky backing in place.
4. Slowly peel back the remaining paper and carefully smooth the remaining portion of the decal in place.
5. Small air pockets can be pierced with a pin and smoothed out using the sign backing paper.

2.3.2. SAFETY DECAL LOCATIONS AND DETAILS

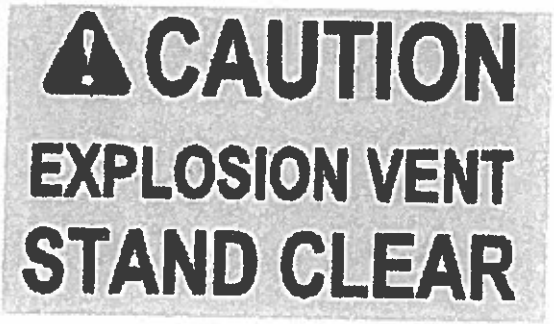
Replicas of the safety decals that are attached to the equipment and their messages are shown in the figure(s) that follow. Safe operation of the equipment requires that you familiarize yourself with the various safety decals and the areas or particular functions that the decals apply to, as well as the safety precautions that must be taken to avoid serious injury, death, or damage.


CAUTION
COMPRESSED AIR
DISCHARGE AREA


CAUTION
DANGEROUS MOVING PARTS INSIDE
DO NOT OPERATE ANY FILTER EQUIPMENT
WITHOUT ALL SAFETY GUARDS AND
COVERS IN PLACE

CAUTION
DO NOT OPEN
DOOR WHILE SYSTEM
IS OPERATING

CAUTION
COMPRESSED
AIR


CAUTION
EXPLOSION VENT
STAND CLEAR

3. Installation

3.1. FILTER

AIRLANCO pulse jet filters, depending on size, will be shipped either as complete units or in sections. All units require the installation of the filter elements along with connections to 110 VAC and compressed air. Larger filters are shipped in major subassemblies that are bolted together at the job site and set on the foundation. Refer to the general arrangement drawing for details on the number of sub-assemblies and the extent of assembly required for your unit.

3.2. COMPRESSED AIR

AIRLANCO pulse jet filters having bags and cages require 90-100 psi clean (5 micron filter), dry (dew point -40°F), and compressed air. Cartridge filters require 60 psi max. This supply is connected to the filter header. The general arrangement drawing will note the location and pipe size for the compressed air feed.

3.3. LUBRICATION

There are no lubrication requirements on a pulse jet filter. However, discharge devices such as a rotary airlock will require lubrication. Refer to the specific manuals for lubrication of this equipment.

3.4. TOP ACCESS BAG AND CAGE INSTALLATION

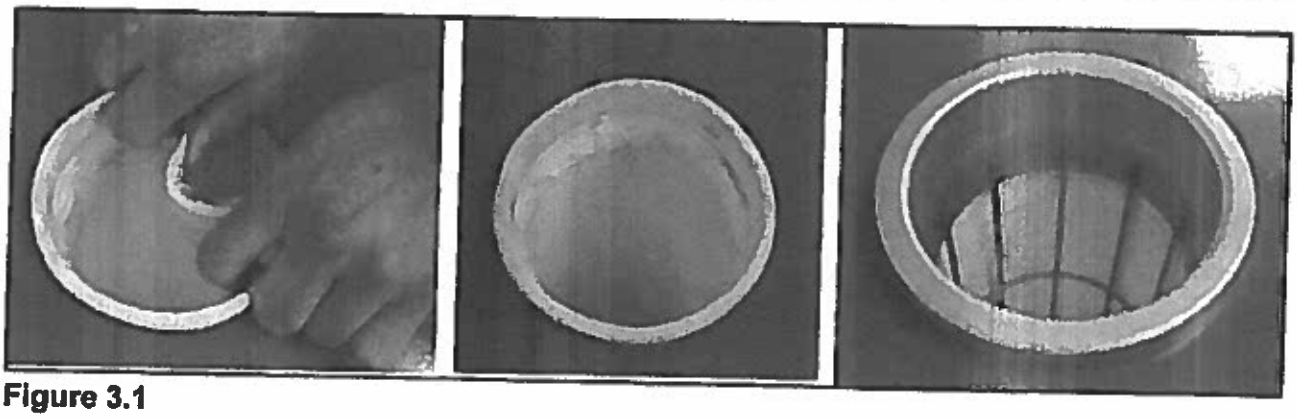


Figure 3.1

1. Lower the bottom of the bag through the hole in the tubesheet.
2. Fold the snap band (bag top) to insert it into the tubesheet hole.
3. Fit the groove of the snap band to the edge of the tubesheet and allow the band to snap into place.
4. Check the fit of the snap band. It should fit securely all around with no wrinkles in the snap band. The top of the bag should be above the tubesheet approximately 3/8".
5. Slide the cage into the bag until it rests on the tubesheet.

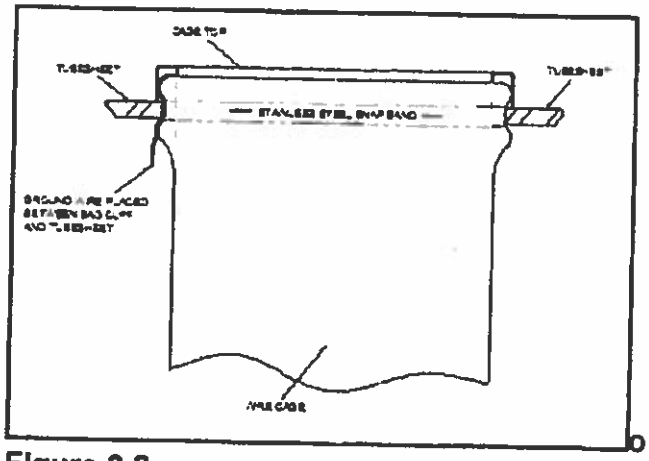


Figure 3.2

OPTIONAL GROUNDING STRIP

If the bags are equipped with a grounding strip, fold the wire over the top of the bag and down its side prior to fitting in the tubesheet. The wire should be between the bag cuff and the tubesheet as shown in the illustration.

3.5. BOTTOM ACCESS CARTRIDGE INSTALLATION

1. Before entering the filter, slide the clamp band over the rubber collar at the top end of the cartridge.
2. Enter the filter and fit the cartridge collar over the bag cup.
3. Move the cartridge up and down over the bag cup until the raised lip inside the cartridge collar snaps into the groove in the bag cup.
4. Tighten clamp until cartridge cannot be turned by hand.

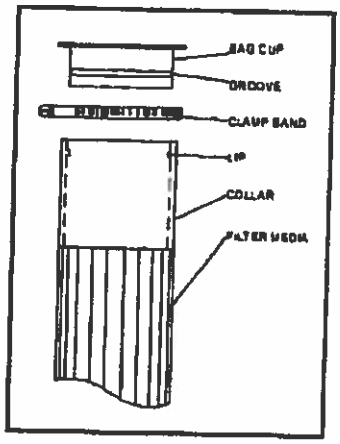


Figure 3.3

3.6. BOTTOM ACCESS BAG AND CAGE INSTALLATION

1. Before entering filter housing, slide cage into bag. Align seam in bag with split in cage collar.
2. Fold top 3" of bag and ground strip (if supplied) into cage.

3. Slide clamp band over bag and cage, aligning it above the cage collar ridge.
4. Enter filter housing with bag, cage, and clamp band assembly. Slide the cage collar over the bag cup until locking ridges are engaged. Position clamp screw 90° from bag seam. Tighten clamp band until bag and cage assembly cannot be turned by hand.

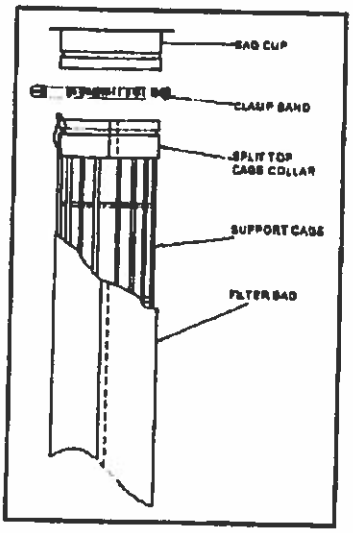


Figure 3.4

3.7. E86 CARTRIDGE INSTALLATION

1. Check the sealing gaskets on the cartridge before installation. They should be secure on both ends. Loose gaskets may be re-attached with silicone caulk. Minor damage may be repaired with silicone caulk. Major damage will require replacement of the gasket. Contact AIRLANCO (800-500-9777) for replacement parts.
2. Insert the cartridge into the cartridge plate hole. Avoid contact between pleated media and edges, as this could damage the media.
3. Align the flange holes with the studs in the cartridge plate.
4. Tighten the wing nuts by hand until the flange touches the cartridge plate, fully compressing the gasket. Do not use tools.

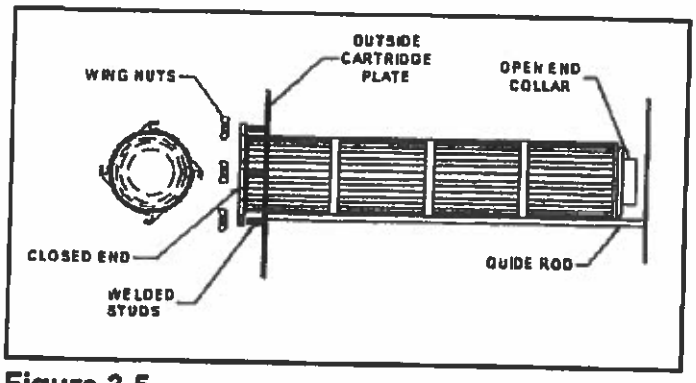


Figure 3.5

3.8. EXPLOSION VENTS

Fike CORPORATION

INSTALLATION INSTRUCTIONS
Explosion Vents

06-308

WARNING

- Read these instructions carefully and completely before attempting to unpack, install or service the explosion vent.
- Handle the explosion vent with extreme care. DO NOT bend, poke, or in any way distort the explosion vent.
- Do not locate vent assembly where personnel are exposed to the vent or the area above or in front of the vent, as they may be injured by the release of pressure, flame, noise, particles, and/or process material.
- Locate the explosion vent so that the discharge does not ignite other combustibles, resulting in an ensuing fire or secondary explosion.
- Interfacing equipment and/or machinery must also be protected.
- Flow arrows on round explosion vent tags, or explosion vent tag for square and rectangular vents must be directed to the atmospheric side of the process.
- Provisions shall be made to prevent personnel from standing or walking on vents, as they risk falling through.
- The vent opening is to be left free and clear. Nothing, i.e. goods or products, is allowed to obstruct the vent area as this will decrease vent efficiency.
- Install the enclosed DANGER sign in a conspicuous location near the zone of potential danger.

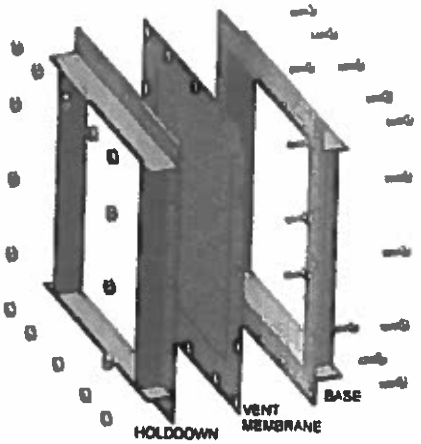
GENERAL

An explosion vent is a pressure relief device, designed to give an instantaneous opening at a predetermined pressure. Its purpose is to protect the equipment from excessive pressures caused by dust or gas deflagrations.

INSPECTION/PREPARATION

WARNING: Always handle the explosion vent with extreme caution. Handle the explosion vent by its edges only. Damage to the functional area (center) or seat area of the explosion vent may adversely affect the performance of the explosion vent. Read the explosion vent tag completely before installing to confirm that the size and type are correct for your system.

1. Carefully remove the explosion vent from its packaging container.
2. Inspect the explosion vent for damage.
3. If foreign material is present, carefully clean the explosion vent with a solvent that is compatible with your media.



4. Two personnel are recommended for handling of all vents larger than 24" x 30" (600 x 1000 mm) (rectangular) and 30" (800 mm) (round) or larger.
5. CV-SF vents require vent frames with back-up bars to properly function (consult Fike for design requirements).

INSTALLATION

WARNING: The vent opening should be left free and clear. Do not insulate any part of the explosion vent or frame without consulting Fike.

Important: When explosion vents are installed horizontally, the use of drainage/weep holes in the holddown frame is required.

1. Use base/inlet of explosion vent frame as a template to indicate placement of explosion vent on the vessel or duct to be protected.
2. Cut the vessel or duct opening to the marked size. The marked size should match the size identified on the vent tag.
3. Weld or bolt the inlet angle frame to the vessel or duct.

Important: The explosion vent frame must be installed such that the seat area is flat and bolt holes remain perpendicular (square and rectangular vent frames) or circular (round vent frames).

4. If sealing is a particular concern due to the nature of the process, apply a process compatible silicone sealant or gasket to provide seal between explosion vent and inlet frame.
5. If using a gasket, select a gasket material that is compatible with the process, with a suggested thickness of 1/16" (1.5 mm) maximum. The gasket is to have the same inside diameter and outside diameter as the explosion vent frame.
6. Install the explosion vent and outlet flange aligning the bolt holes. DO NOT force the explosion vent hole alignment.
7. Apply light oil to the threads and install the nuts and bolts hand tight.
8. Torque each bolt to the value identified on the explosion vent tag.

Caution: The torque values should not be exceeded as this may cause failure of the bolt and/or damage to the vent.

BURST INDICATOR

The explosion vents can have as an option an integrated electric burst indicator designed for intrinsically safe service. Refer to Burst Indicator Instructions / Drawing for electrical and dimensional specifications.

Caution: Unacceptably high voltage or currents will permanently damage the electrical system and the use of a non approved intrinsically safe power supply may even be the eventual ignition source of a dust or gas explosion. All burst indicators must be installed in an intrinsically safe circuit which conforms to the applicable national standard.

WARNING: Do not bend the electrical cable at any angle at a distance of less than 8 inch (20cm) from the mechanical bracing part and do not lift the explosion vent by the electrical cable, as this may damage the electrical circuit.

WARNING: The maximum torque values as mentioned on the nameplate must not be exceeded as this will permanently damage the electrical circuit.

MAINTENANCE

The explosion vent is maintenance-free due to its basic design and concept. Periodic visual inspections should be performed in accordance to the operating parameters and severity of service. All operational system parameters should be observed as a standard maintenance practice. The explosion vent must be replaced if they appear damaged, corroded, or leaking.

Note: Severe service is defined as rapid changes in pressure, high pressure, high temperature, or corrosive process.

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4. Operation

4.1. DEFINITIONS

Table 4.1

ACR	Air to Cloth Ratio. The velocity that a gas moves through filter media. Divide the gas volumetric flow rate (cfm) by the total area of filtration media in (sq. ft.)
Agglomeration	To gather into a mass.
Bag	Filter element: sock. Usually supported by a wire cage.
Blinding	Filter media becomes air impermeable due to moisture, temperature, or other causes.
Cake	Agglomeration of dust particles on the surface of a filter element.
Can Velocity	Upward speed of air moving through a filter housing (fpm). Divide the gas volumetric flow (cfm) by the cross sectional area of the baghouse (sq. ft.).
Cartridge Filter	Filter element consisting of a pleated filter media supported on a steel or plastic skeletal frame.
CFM	Cubic Feet per Minute - gas flow rate.
Clean Air Plenum	Section of a baghouse directly above the tubesheet and filter bags or cartridges.
Dew Point	The temperature at which water vapor in a gas will condense into a liquid state.
Filter Cake	The accumulation of dust on a filter element before cleaning. This cake assists in the filtration of dust.
Filter Element	Refers to a filter bag or cartridge.
Header	The pressurized reservoir that contains the compressed air supply for pulsing.
Inch of Water	A unit of pressure equal to the pressure exerted by a column of water one inch in height at a standard temperature. 27.7 in. wg. = 1psi.
Interstitial Velocity	The apparent velocity of a gas as it passes through the filter element matrix. It is found by dividing the gas flow rate (cfm) by the cross sectional area of the filter housing less the area occupied by the filter elements.
Pressure Drop	The resistance of flow of a fluid between two points.
Pulse Duration	The length of time a cleaning pulse lasts.
Pulse Frequency	The time between pulses in a baghouse cleaning system.
Pulse Jet	Generic name given to all pulsing dust collectors.
Purge Pipe	Pipe with holes in it that extends into a filter clean air plenum and delivers cleaning air from the header to the filter elements.
Re-entrainment	The phenomenon whereby dust is collected from the air stream and then is returned to the air stream. Occurs when dust is pulsed from a filter element and then caught by an upward moving air stream.
Seeding	The application of a relatively coarse, dry dust to a filter element before start-up to provide an initial filter cake for immediate high efficiency and to protect filter elements from blinding.
Tubesheet	The steel plate from which the filter elements are suspended. Separates the clean air and dirty sections of the baghouse.
Venturi	Device used to increase the efficiency of a compressed air pulse.

4.2. THE FILTRATION PROCESS

Filtration is a dry method of particulate collection in which an array of many individual targets is assembled into a porous structure through which aerosol-laden gas is passed. In a filter, the collection target is the filter media. Inertial, diffusional, electrostatic, and direct interception are the primary forces that influence the collection of dry particulate on the filter media. As collection proceeds, particles impinge upon previously collected particles and a deposit is built up, which, in turn, becomes the principal collection medium. This agglomeration of particles is referred to as a "filter cake." Filtration efficiency is not maximized until this filter cake has formed.

As the dust cake builds on the filter element surface, it becomes increasingly difficult for the gas to pass through the element. A differential pressure gauge mounted on the filter measures the force required to move air through the filter media. Normal pressure drop for a filter will fall in the range of 1 to 5 inches of water after the elements are broken in. The differential pressure reading will increase as the elements get dirty. The dust cake must eventually be removed from the filter element surface or airflow will fall to unacceptable levels.

Pulse jet filters are continuous self-cleaning units. A high-pressure blast of clean, dry compressed air is injected into each filter element at periodic intervals. This air is stored in a reservoir called a header. Several purge pipes are attached to the header and extend into the clean air plenum above rows of filter bags or cartridges. Holes are drilled in the purge pipes directly above each of the filter elements. Several elements are cleaned by one purge pipe. A solid state timer controls a solenoid that opens a diaphragm valve allowing air to flow from the reservoir into the purge pipe and filter element. The element experiences a shock wave while air is forced through it in a direction opposite to the dirty air flow. A portion of the dust cake will fall away from the bag into the filter's hopper. It is normal for some of the dust to re-entrain itself onto the filter element.

High Temperature Precautions: Moisture is one of the most predominant causes for fabric filter failures. Care must be taken in applications involving high humidity gas streams. Dryers and other combustion processes pose the greatest danger for condensation in the filter. The filters and gas stream temperatures must be maintained at 50°F above the dew point of the gas stream. Excursions near or below the dew point of the gas stream will result in condensation of the gas on the baghouse and filter media. This moisture will change the desired dust cake into an undesirable mud cake, which is difficult to remove and may permanently damage the filter media. Corrosion is also intensified under these conditions. Filters operating under high humidity conditions at any temperature should be protected from gas condensation. This will require heating the filter to 50°F above the gas stream temperature and insulation of the filter and ducting. Failure to take these precautions will result in unsatisfactory performance of the equipment and possible catastrophic failure of the filter media.

Mechanical Operation: AIRLANCO Pulse Jet Filters are available with continuous or "on demand" cleaning control. Cleaning duration and frequency are adjustable on the timer board. Dwyer Photohelic® pressure switches can be used to control the cleaning cycle, which will conserve energy, reduce element wear, and lower emissions by maintaining a set pressure drop across the filter elements. Filter bags are made from felted fibers and are supported on a rigid wire cage. Filter cartridges are made from pleated filter media and supported on skeletal frames. The composition of the fiber will vary depending on the dust and

gas chemistry, temperature, and gas stream humidity. Consult AIRLANCO engineering (800-500-9777) for further information on the characteristics and types of available filter media.

Filter elements are suspended in the filter from the tubesheet in one of the following configurations:

- Top access filter with bag and cage elements
  - A filter bag is inserted into the tubesheet and held in place with a snap band. A wire cage is then inserted into the bag for support. The cage collar rests on top of the tubesheet.
- Bottom access filter with bag and cage elements
  - A wire cage is slipped into each bag for support. This bag and cage assembly is attached to bag cups on the underside of the tubesheet with a clamp.
- Top access filter with cartridge elements
  - Cartridges are self supporting. The cartridge is inserted through the top face of the tubesheet. A flexible tab at the top of the cartridge snaps through the tubesheet, locking the cartridge into place.
- Bottom access filter with cartridge elements
  - Cartridges are self supporting. The cartridge is equipped with a flexible collar that slips over the bag cup on the bottom side of the tubesheet. The cartridge is then secured with a clamp.

Dust is collected on the surface of the filter media and eventually forms a cake. When a pulse of compressed air is injected into the filter element, a shock wave is induced that causes the dust cake to break away. Some of this air will pass through the filter media in a reverse direction and further separate the dust cake from it. The name "Reverse Pulse Jet" is derived from this cleaning method. Separated dust falls into the hopper where it is removed through an airlock or other airtight device. The airlock prevents air from entering the hopper through its discharge. Leakage at the hopper's discharge will cause re-entrainment of dust onto the filter elements, which could contribute to high differential pressures.

The solid state programmable timer is available with 3 to 32 output connections. A potentiometer is provided for the adjustment of the pulse duration and frequency. Duration of the pulse is factory set at 50 milliseconds. Frequency of the pulse is factory set at 10 to 15 seconds.

4.2.1. SOLENOID AND DIAPHRAGM VALVE

Cleaning air passes from the header through a large diaphragm valve, through the purge pipe, then into the filter element. This diaphragm valve is controlled by the timer board with a normally closed solenoid valve (see Figure 4.1).

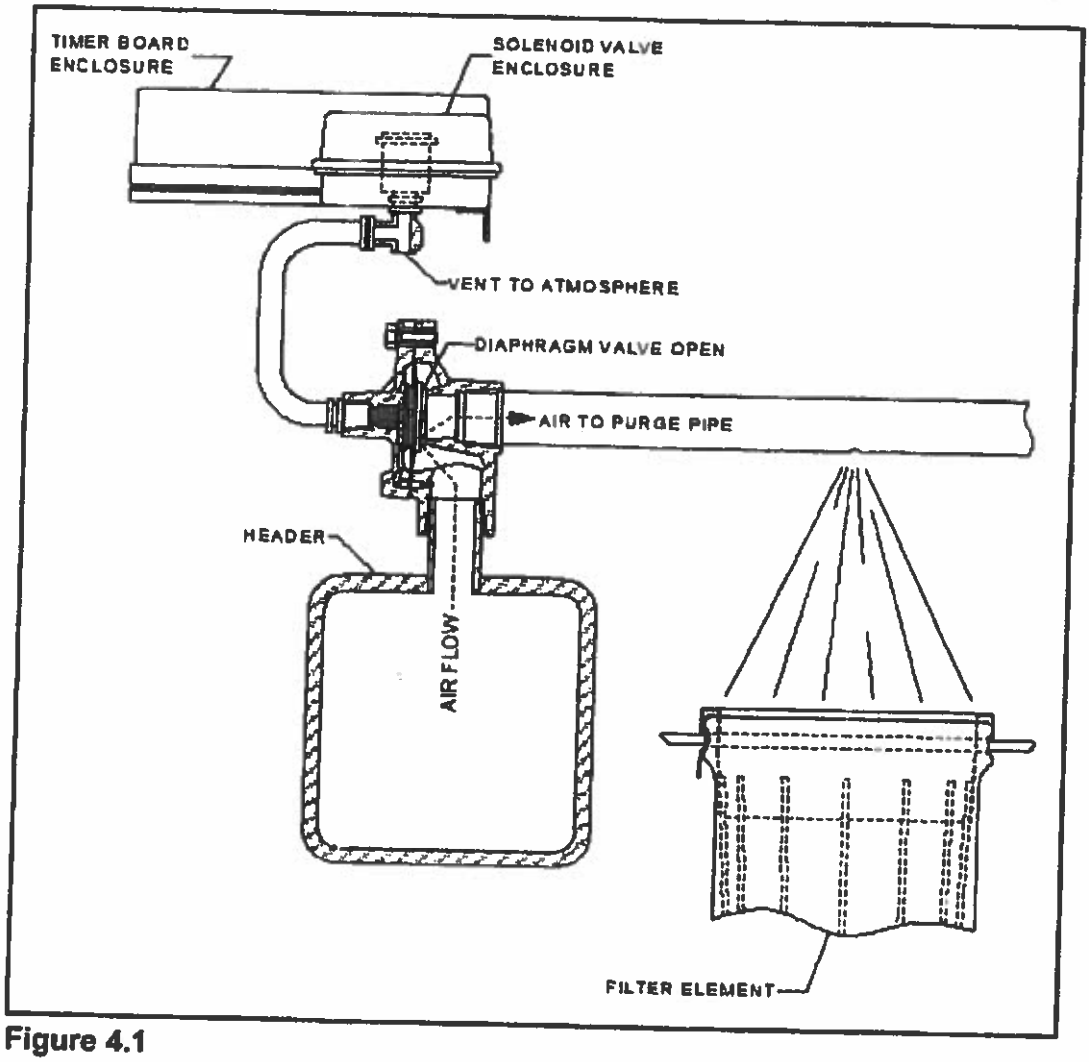

Figure 4.1

4.2.2. Pulse Jet Theory of Operation

1. Dust-laden air or gas enters the dust collector through the inlet.
2. Air passes through the filter media while solids are retained on the media's surface.
3. A signal from the timer actuates the opening of the normally closed solenoid valve.
4. Opening of the solenoid valve releases the air pressure in the tube connecting the solenoid to the diaphragm valve, causing the valve to open.
5. A momentary pulse of compressed air flows from the air header down the purge pipe and out into each filter bag. This momentary pulse takes all bags in one row offline through pressure reversal.
6. Solids are released to fall into the filter hopper or bin.
7. Filtered air exits through the clean air plenum exhaust.

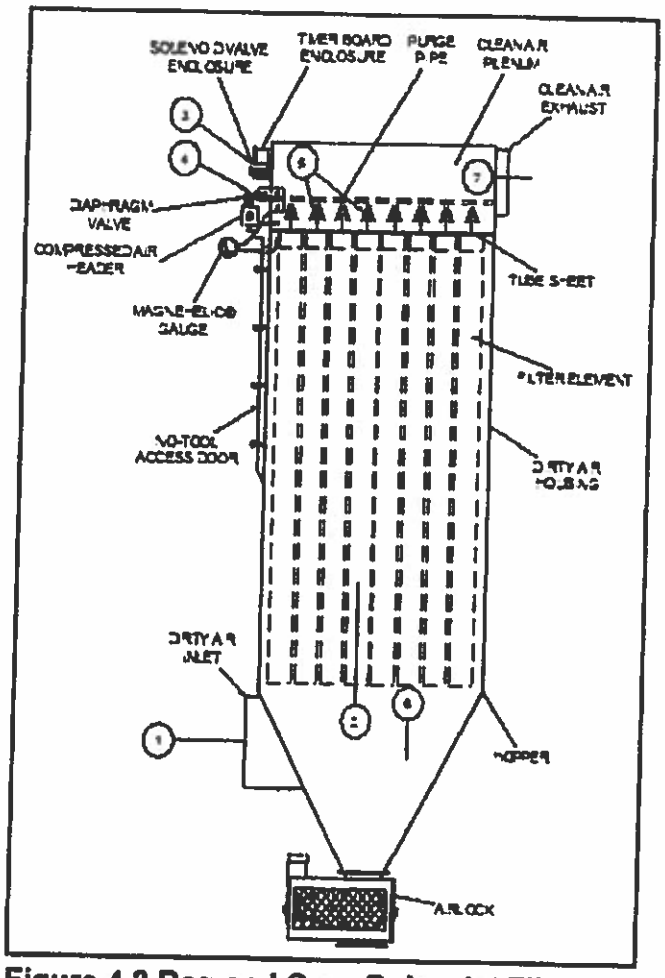

Figure 4.2 Bag and Case Pulse Jet Filter

4.2.3. E-86 THEORY OF OPERATION

1. Dust laden air or gas enters the dust collector through the inlet.
2. Air passes through the filter media while solids are retained on the media's surface.
3. A signal from the timer actuates the opening of the normally closed solenoid valve.
4. Opening of the solenoid valve releases the air pressure in the tube connecting the solenoid to the diaphragm valve causing the valve to open.
5. A momentary pulse of compressed air flows from the air header down the purge pipe and out into each filter cartridge. This momentary pulse takes all cartridges in one row offline through pressure reversal.
6. Solids are released to fall into the filter hopper or bin.
7. Filtered air exits through the clean air plenum exhaust.

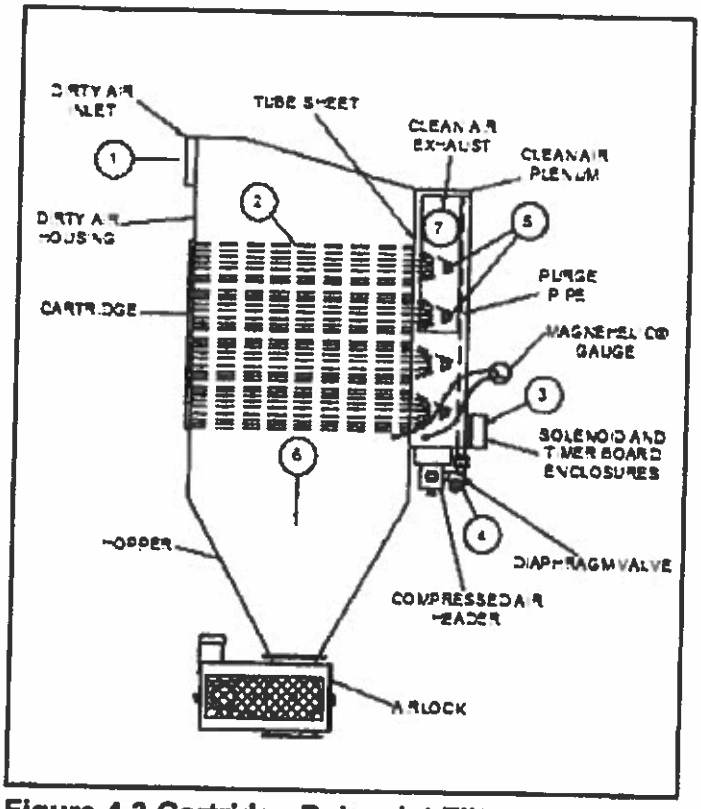

Figure 4.3 Cartridge Pulse Jet Filter

4.3. FILTER MEDIA PROPERTIES

FILTER MEDIA IS MANUFACTURED FROM VARIOUS MATERIALS, WHICH PROVIDE DIFFERENT BENEFICIAL CHARACTERISTICS. BELOW IS A FABRIC SELECTION CHART, WHICH SUMMARIZES SOME OF THE PROPERTIES OF COMMON FABRIC MATERIALS.

Table 4.2

Material	Acid Resistance	Alkali Resistance	Solvent Resistance	Strength & Abrasion	Flame Resistance	Filtration Properties	Relative Cost	OPerating Temp °F
Polypropylene	E	E	E	E	P	G	1	180
Acrylic	G	F	G	G	P	G	2	260
Polyester	G	G	G	E	G	E	1	275
Ryton	E	E	E	G	E	V	6	375
Nomex	F	G	V	G	E	E	4	425
Teflon	E	E	E	G	E	F	8	450
Fiberglass	E	F	E	P	E	F	3	500
P-84	V	F	V	G	E	E	5	500

P = Poor, F = Fair, G = Good, V = Very good, E = Excellent

POLYPROPYLENE

This synthetic is available in both continuous filament and staple fiber form and is produced as either a felt or woven material. Its major limitation is its low maximum continuous operating temperature of 180°F (88°C). Oxidizing agents,

copper, and related salts damage polypropylene. Its primary benefit is that it is non-hygroscopic (does not chemically react with water). It exhibits great resistance to static build-up and abrasion, and provides a slick surface for good dust cake release during bag cleaning. Polypropylene is widely used in the food, detergent, chemical processing, pharmaceutical, and tobacco industries.

ACRYLIC

These synthetic fibers offer good hydrolytic resistance over a limited temperature range: 260°F (127°C) continuous and 275°F (135°C) surge. The homopolymer versions, such as Draylon T® produced by Farbenfabriken Bayer AG, are normally recommended. Acrylic fibers are used in the manufacture of ferrous and nonferrous metals, carbon black, cement, lime, fertilizers, and following spray-dryers in coal-fired burners. They are also used extensively in wet-filtration applications.

POLYESTER

Today, polyesters are among the most widely used fabrics for general applications below 275°F (135°C), their maximum continuous-use temperature. Their maximum surge temperature is about 300°F (149°C). Polyester fibers are produced in both filament and staple form and are available in both woven and felted fabrics. The primary damaging agents are water (hydrolysis) and concentrated sulfuric, nitric, and carbolic acids. They have good resistance to weak alkalies and fair resistance to strong alkalies at low temperatures. They have good resistance to most oxidizing agents and excellent resistance to most organic solvents.

RYTON

This is a relatively new synthetic fiber with a moderate temperature range: 375°F (190°C) continuous and 450°F, (232°C) surge. It will hydrolyze, but only at temperatures above 375°F. It has excellent resistance to both acids and alkalies, which makes it very useful in combustion-control applications. Its early applications have been on industrial coal-fired boilers, waste-to-energy incineration (with and without spray dryers), titanium dioxide, and installations where Nomex does not perform well due to chemical or hydrolytic attack.

NOMEX

This is a commonly used fiber for applications in the 275-400°F (135-204°C) range. It is produced in both filament and staple fiber form and is available as both woven and felted fabrics. It has excellent thermal stability, shrinking less than 1% at 350°F (177°C). The fiber is flame resistant, but when impregnated with combustible dusts, will support combustion that will melt and destroy the fabric. Nomex will begin to hydrolyze at 375°F (190°C) when the relative humidity is 10% or greater. Hydrolysis changes the normal white or gray fabric to a red-brown color. The presence of acids will catalyze the hydrolysis process. Unacceptably short bag life will result where sulfur oxides (SOx) and moisture are present and frequent dew point excursions occur, such as in coal-fired boilers. Some acid-retardant finishes have been developed for Nomex, but have been found to improve bag life by no more than 50%, leaving most bag life cycles unacceptably short.

TEFLON® (PTFE)

Teflon® is unique among synthetics in its ability to resist chemical attack across the entire pH range throughout its operating temperature range of 450°F (232°C) continuous, to 500°F (260°C) surge. This fluorocarbon fiber is non-adhesive, has

zero moisture absorption, and is unaffected by mildew or ultraviolet light. The primary shortcomings of Teflon® are its high cost and relatively poor abrasion resistance. However, the higher cost can often be justified through longer bag life in extremely corrosive atmospheres. Felted Teflon® is also produced in combination with staple glass fibers and marketed by DuPont as Tefaire®. This combination produces some improved filtration and flow characteristics. Applications of Teflon® include coal-fired boilers, waste-to-energy incinerators, carbon black, titanium dioxide, primary and secondary smelting operations, and chemical processing.

FIBERGLASS

Most fiberglass fabrics are woven from minute 0.00015 inch (.0038 mm) filaments. Many variations of yarn construction, fabric weaves, and fabric finishes are available. It is also produced in a felted form. Fiberglass has the highest operating temperature range available in conventional fabrics: 500°F (260°C) continuous and 550°F (288°C) surge. Above 500°F (260° C), the fiberglass itself is not directly damaged, but the finish which provides yarn-to-yarn lubrication begins to vaporize, resulting in accelerated mechanical wear of the glass fibers. Fiberglass is noncombustible, has zero moisture absorption (cannot hydrolyze), has excellent dimensional stability, and has reasonably good strength characteristics. Woven glass fabrics have high tensile strength characteristics but relatively low flex strength, especially in the fill (circumference) direction of the bag, and low abrasion resistance. Care must be taken to minimize flexing and rubbing. Fiberglass fabrics have relatively good resistance to acids, but impurities in the glass fibers are attacked by hydrofluoric, concentrated sulfuric, and hot phosphoric acids. They also have poor resistance to hot solutions of weak alkalies, acid anhydrides, and metallic oxides. For these reasons, glass fabrics should not be operated below the acid dew point. Fiberglass fabrics are used extensively with coal-fired boilers and high temperature metals applications.

P-84

P-84 is an aromatic polymer fiber produced in felt form only. The unique shape of the fiber produces improved capture efficiency characteristics. This fabric is specified at 500°F. Composites are available that take advantage of the superior filtration characteristics of P-84 while reducing its cost. Any of the previous felted materials can be combined with P-84 to produce a fabric composite that exhibits the characteristics of both materials.

4.3.1. MEDIA TREATMENTS

SURFACE TREATMENT OF FILTRATION MEDIA

Various types of surface treatment are available to enhance the filter media performance. Discussion of these treatments and their benefits are beyond the scope of this manual. Please consult AIRLANCO at 800-500-9777 for further information on this subject.

PRE-COATING FILTER MEDIA

Fine, moist, or adhesive dusts will contribute to premature blinding of filter media. Pre-coating of the filter media with a layer of an inert dust of known particle size distribution, such as calcium carbonate ($CaCO_3$), can minimize problems associated with these types of dusts. Consult AIRLANCO at 800-500-9777 for information and recommendations regarding the pre-coating of your filter bags.

4.4. OPERATION

Proper startup and shutdown procedures are very important in the successful operation of a bag house filter. A typical ambient air dust collection system should follow this sequence of operation.

1. Start the dust removal system that transfers collected material from the filter hopper. This could include rotary airlocks, pneumatic conveying equipment, etc. This step is not applicable for Style II bin vent filters.
2. Start the bag house cleaning mechanism. Before starting additional equipment, let the cleaning mechanism run long enough to allow the filter temperature and humidity to stabilize with ambient conditions and to remove any material that may have been left from the previous day's operation. This is most important in high humidity climates.
3. Start the main system fan.
4. Start the operation or process where dust is being collected.

4.4.1. SHUT DOWN

Reverse the order of the operation sequence to shut down the bag house.

1. Shut down the operation or process where dust is being collected.
2. Shut down the main system fan.
3. Shut down the bag house cleaning mechanism after allowing the collected material to be discharged from the collector.
4. Shut down the dust removal system that transfers material from the filter hopper (not applicable for Style II bin vent filters).

4.5. MAGNEHELIC GAUGE OPERATION

The Magnehelic® gauge is used to measure the differential pressure between the clean gas side (top plenum) and the dirty gas side of the baghouse. It measures the force required to pass air through the filter media.

Normal pressure drop for a filter will fall in the range of 1 to 5 inches of water after the elements establish a dust cake. The differential pressure reading will increase as the elements get dirty. Eventually, the dust cake must be removed from the filter element surface or air flow will fall to unacceptable levels.

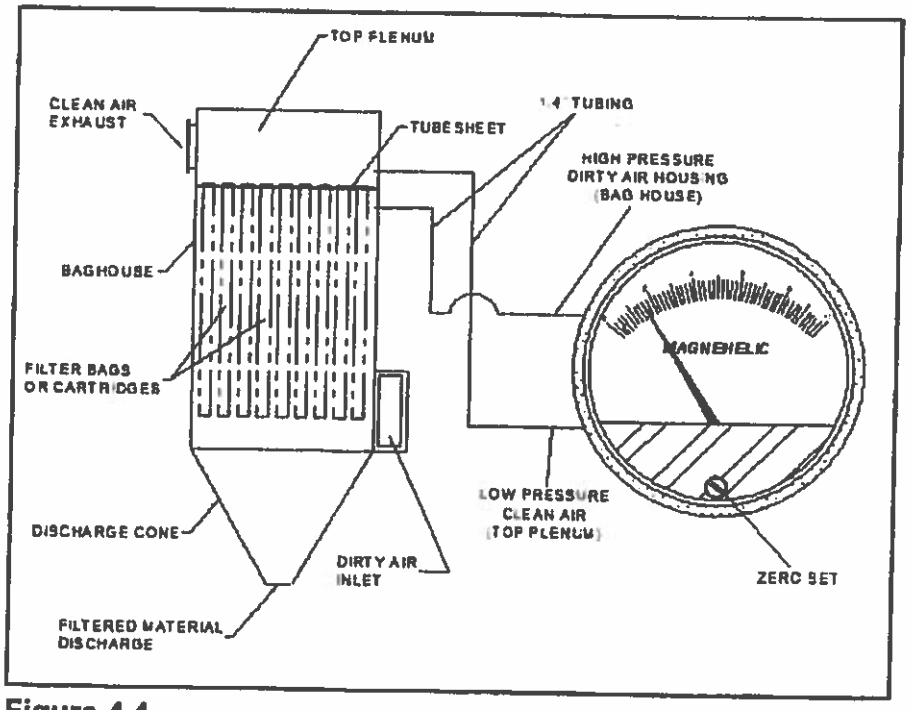
TOP PLENUM
CLEAN AIR EXHAUST
TUBE SHEET
1.4" TUBING
HIGH PRESSURE DIRTY AIR HOUSING (BAG HOUSE)
BAGHOUSE
MAGNEHELIC
FILTER BAGS OR CARTRIDGES
LOW PRESSURE CLEAN AIR (TOP PLENUM)
DISCHARGE CONE
DIRTY AIR INLET
ZERO SET
FILTERED MATERIAL DISCHARGE

Figure 4.4

5. Maintenance

Very little maintenance is required to achieve maximum efficiency and life from your AIRLANCO pulse jet filter. The following items should be periodically serviced.

LUBRICATION

Pulse jet filters have no lubrication requirements.

TIMER ADJUSTMENTS

Do not change the timer adjustments until the filter has had several weeks to stabilize. This break-in period is required for the filter media to develop a stable dust cake. After the break-in period, the pulse interval can be increased in order to conserve energy and compressed air. Increase the pulse interval by adjusting the potentiometer clearly marked on the timer board. Adjust in 5 second increments allowing 24 hours of operation between adjustments. Observe the differential pressure of the unit after 24 hours. The pulse interval can be extended until an increase in differential pressure is observed in the filter. Do not change the pulse duration. It should be 40 to 50 milliseconds for best results.

CLEANING AND REPAIR

The external portion of this unit should be treated as any other metal surface that is subject to corrosion. Periodic cleaning and painting when required.

Dust may enter the clean air plenum through a leaking or broken filter element. Remove accumulated dust from clean air plenum and replace filter element immediately. Dust in the clean air side of a filter element will reduce the life and performance of the element.

SOLENOID AND DIAPHRAGM VALVES

The solenoid and diaphragm valves may require periodic maintenance depending on the quality of the compressed air supplied to the unit.

FILTER ELEMENTS

Filter elements do not require any periodic maintenance. However, at some point the elements will require replacement. This will be indicated by persistent high differential pressure across the elements. Many factors affect the life of filter elements. Refer to the section on troubleshooting if low element life or persistent wear problems are evident.

ROTARY VALVE (AIRLOCK)

Refer to airlock operation and maintenance manual.

SCREW CONVEYOR

The roller chain drive should be kept tight enough so that the chain cannot "climb the sprocket" and should be oiled lightly once per month. The auger bearings have been factory pre-lubricated with high quality grease and for normal conditions of service require no further lubrication. Periodic lubrication may be advisable when service is abnormal with respect to speed, temperature, exposure to moisture, dirt, or corrosive chemicals, or where extremely long life is required. Remove pipe plug and replace with a standard grease fitting to lubricate.

6. Troubleshooting

The pulse jet is a continuous self-cleaning filter. A jet of high-pressure air from a compressed air header is directed into each bag at periodic intervals. Air is distributed to each row of filter bags through a diaphragm valve and blow tube equipped with drilled nozzles. The high-pressure reverse flow of air momentarily stops the normal flow and creates a shock wave that knocks the dust from each bag. A percentage of the dust cake will fall away from the bag into the filter hopper. It is normal for some of the dust to re-entrain on to the bag.

Troubleshooting the pulse jet is a straightforward process, but does require some preliminary information to simplify the process. Complete the worksheet on the following page before calling AIRLANCO (800-500-9777) for service.

Figure 6.1

Pulse Jet Troubleshooting Worksheet

Customer Name_____

Location_____

Contact Name_____

Phone_____ Cell Phone _____ Fax _____

Email Address _____

Filter Model _____ Serial # _____

☐ How long has the filter been in service?_____

☐ When did the problem start?_____

☐ Please provide a complete description of the problem and a detailed description of the system layout.

_____

_____

☐ Are the airlock and discharge auger operating, and in the correct rotation?

☐ Airlock Model # _____ Airlock Serial # _____

☐ Is the timer board energized?_____

Control Voltage 110V ☐ 220V ☐ 24VDC ☐ Other_____

☐ Does the filter have an adequate supply of compressed air, and is it turned on?

☐ Is the compressed air supply regulated to 90-100 PSIG for bags or to 60 PSIG for cartridges?

☐ Are any bags, cartridges, and/or blank-out plugs missing?

☐ Check the tubing between the solenoid valves and diaphragm valves for cracks or splits.

6.1. TROUBLESHOOTING: POSSIBLE CAUSES AND SOLUTIONS

PROBLEM: HIGH DIFFERENTIAL PRESSURE ACROSS TUBESHEET

- Bad Gauge
  - Check the gauge by blowing into it. Do not use compressed air that could damage the gauge. Replace the gauge if the needle does not move.
- Leaking Gauge Lines
  - Check the full length of both lines for cracks, splits or breaks. Replace both lines with new tubing. Copper tubing may be recommended if the environment is harsh. Clogged gauge lines will give the same result. Check the small filter, located on the inside of the baghouse just below the tubesheet. Clean or replace it as required.
- Low Header Pressure
  - Pulse jet filters require 90 - 100 PSIG for bags and 60 PSIG for cartridges. Ensure that the pipe to the filter is of adequate diameter for the length of the run. Check for leaks in the supply line and other equipment. Check the filter diaphragm and solenoid valves for correct operation. A ruptured diaphragm valve or a stuck solenoid valve will drain a compressor. A cracked or broken line from the solenoid valve to the diaphragm valve will have the same effect.
- Timer board malfunction
  - Most timers in use today are solid state. They either work or they do not. Timers are equipped with a slow blow fuse to protect from power surges. If a timer does not function, replace the fuse. Replace the timer board if fuse replacement doesn't correct the problem.
- Timer board adjustments
  - The filter cleaning pulse will be at equal and regular intervals when the timer board is operating correctly. Pulse frequency (the time between cleaning pulses) is factory set at 15 seconds. It may be adjusted to optimize cleaning efficiency and compressed air use. Allow 24 hours of operation between adjustments to permit the filter to stabilize. Over cleaning will reduce filter element life expectancy and use excessive compressed air. Pulse duration (length of cleaning pulse) is factory set at 40 to 50 milliseconds. Typically, this setting should be maintained for best cleaning and air use.
- Media Blinding
  - Excessive moisture is the most common cause of blinding. High humidity, condensation, and leaks in the duct are typical sources. In high humidity areas, the filter should be operated under no load until air temperatures stabilize. The air stream temperature crossing the dew point, either from ambient high humidity or from process moisture, causes condensation. It may be necessary to pre-heat and insulate the filter to avoid dew point issues. Duct leaks are found by inspection and routine preventive maintenance.

- Interstitial or "Can" Velocity too high
  - Check the system airflow with the original design values. The fan speed may have been increased, duct layout may have been modified, or other changes made in the system may have reduced static pressure. Any increase in CFM will increase interstitial velocity and tend to "float" dust in the filter. A change in the process could result in smaller particle sizes in the dust, which would have the same effect as increased CFM. In either case, it may be necessary to install a larger filter or reduce airflow to the original design.
- Bag Fit on Cages
  - Check the bag fit on cages with a pinch test. You should be able to pinch at least ½" of fabric at any position. Bags that are too tight will not allow the bag to "pop", knocking the dust cake loose when cleaned. Replace the bags if they are too tight.
- Rotary Valve (Airlock) Leakage
  - Air leakage through a worn out valve rotor into the filter hopper will re-entrain dust onto the filter bags. Air leakage will also keep the collected dust from properly feeding out of the hopper, potentially plugging the filter. Replace the airlock.
- High Dust Load
  - Filters can handle very high dust loads under normal conditions when properly sized. Has something changed in the process, to either increase material flow or to decrease particle size? Compare current operating conditions to the original design. It may be necessary to install a larger filter or reduce airflow to the original design.

PROBLEM: LOW DIFFERENTIAL PRESSURE ACROSS THE TUBESHEET

- Bad Gauge
  - Check the gauge by blowing into it. Do not use compressed air that could damage the gauge. Replace the gauge if the needle does not move.
- Leaking Gauge Lines
  - Check the full length of both lines for cracks, splits or breaks. Replace both lines with new tubing. Copper tubing may be recommended if the environment is harsh. Clogged gauge lines will give the same result. Check the small filter in the line. It is located on the inside of the baghouse just below the tubesheet. Clean or replace it as required.
- Holes in Bags
  - Replace all bags. See section on poor bag life.
- System Air Volume too low
  - Check the duct system for plugs and closed blast gates. Check the main system fan for correct RPM or a closed damper.
- Bag & Cage Installation
  - Look for dust in the clean air plenum or discharging from the system fan. Bags may be missing or may not be properly installed in the tubesheet. Refer to the instruction manual for correct installation.
- Blank-Out Plugs

- Plugs may be missing or improperly installed. Refer to the instruction manual for correct installation.

PROBLEM: DUST IN EXHAUST AIR

- Start Up Period
  - Allow the filter to run for 48 to 96 hours to establish a dust cake. Some applications will require "seeding" or pre-coating the bags with an appropriate material to establish a cake.
- Holes in Bags
  - Replace all bags. See section on poor bag life.
- Bag & Cage Installation
  - Look for dust in the clean air plenum or discharging from the system fan. Bags may be missing or may not be properly installed in the tubesheet. Refer to the instruction manual for correct installation.
- Blank-Out Plugs
  - Plugs may be missing or improperly installed. Refer to the instruction manual for correct installation.

PROBLEM: POOR BAG LIFE

- Abrasion
  - Provide an inlet transition to make use of the full inlet area. Stubbing a duct onto a plate on the inlet will result in high velocity. Do not mount a duct elbow directly on the filter inlet, as this will cause eccentric loading and potentially damaging airflows.
- Damaged Cages
  - Filter cages that are bent, have broken wires, or have corrosion will cause premature failure of the filter bags. Inspect and replace as soon as possible. Corrosion problems may require coated or stainless steel cages.
- High Air Volumes
  - High air to cloth ratios can shorten filter bag life. Compare current operating conditions to the original design.
- Media Blinding
  - Excessive moisture is the most common cause of blinding. High humidity, condensation and leaks in the duct are typical sources. In high humidity areas, the filter should be operated under no load until air temperatures stabilize. The air stream temperature crossing the dew point, either from ambient high humidity or from process moisture, causes condensation. It may be necessary to pre-heat and insulate the filter to avoid dew point issues. Duct leaks are found by inspection and routine preventive maintenance.
- Incorrect Filter Media
  - High temperatures, chemical content, and dust composition will affect filter media life. Consult AIRLANCO (800-500-9777) for alternative media selections.

PROBLEM: HOPPER PLUGGING

- Cleaning System malfunction
  - Refer to the section on High Differential Pressure.
- Rotary Valve (Airlock) Leakage
  - Air leakage through a worn out valve rotor into the filter hopper will re-entrain dust onto the filter bags. Air leakage will also keep the collected dust from properly feeding out of the hopper, potentially plugging the filter. Replace the airlock.
- Airlock/Auger Speed
  - If your filter is equipped with an auger/airlock combination slave drive and operating conditions have changed, the airlock/auger speed may need to be increased.

Note: *The above is intended as a quick reference for common problems that may be encountered with a pulse jet dust filter. If you are experiencing any difficulties that are not covered here or have any questions concerning your AIRLANCO filter, complete the worksheet on page 30 and contact AIRLANCO at www.airlanco.com or at 800-500-9777.*

7. Appendix

7.1. DIAGRAMS

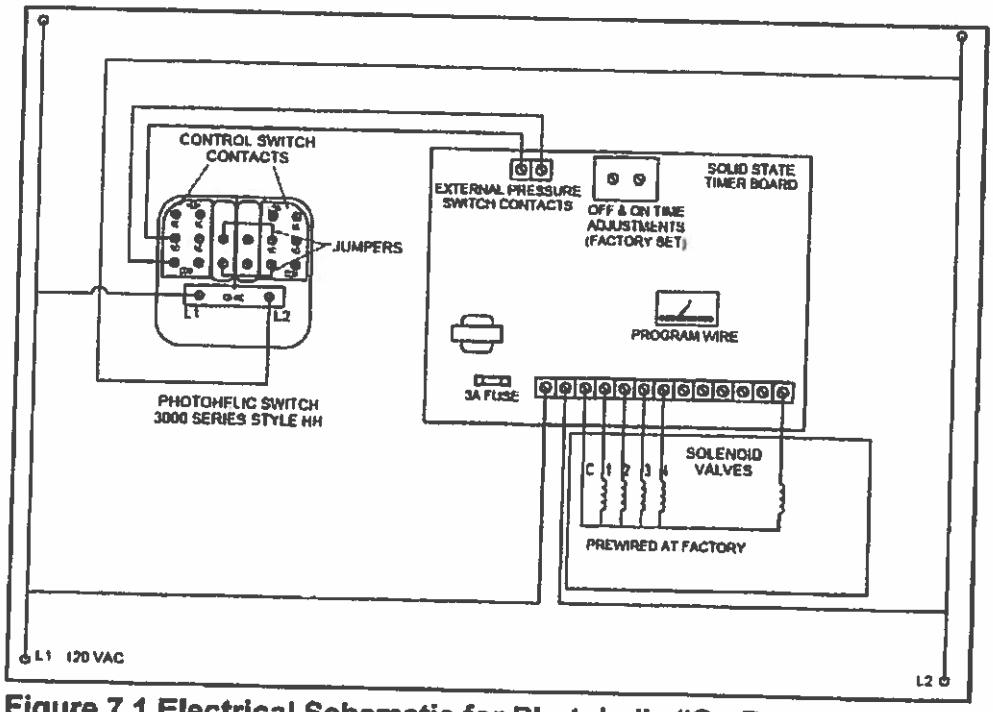

Figure 7.1 Electrical Schematic for Photohelic "On Demand" Control of Timer Circuit

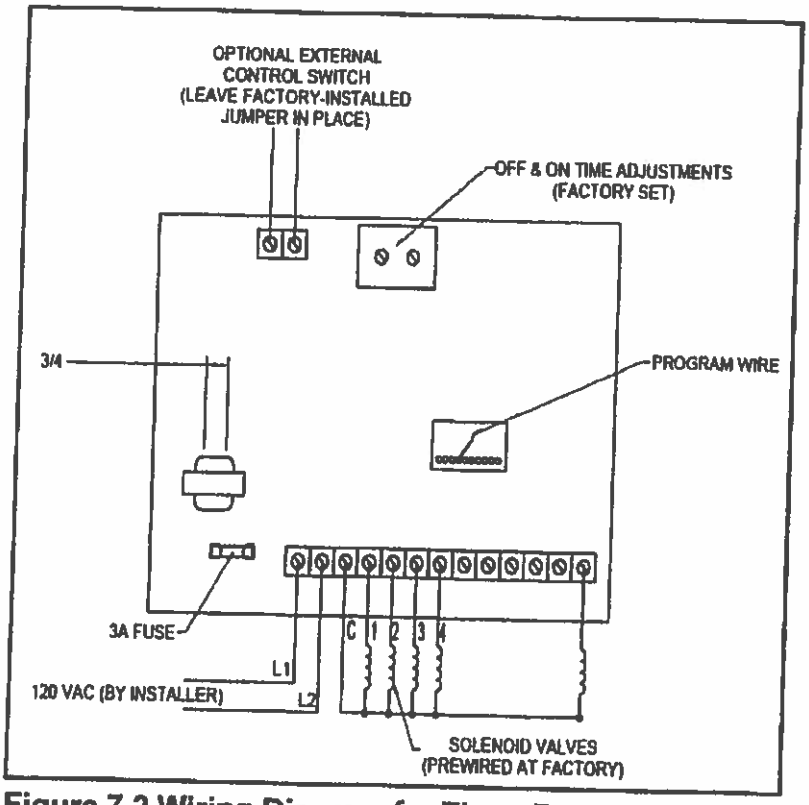

Figure 7.2 Wiring Diagram for Timer Board

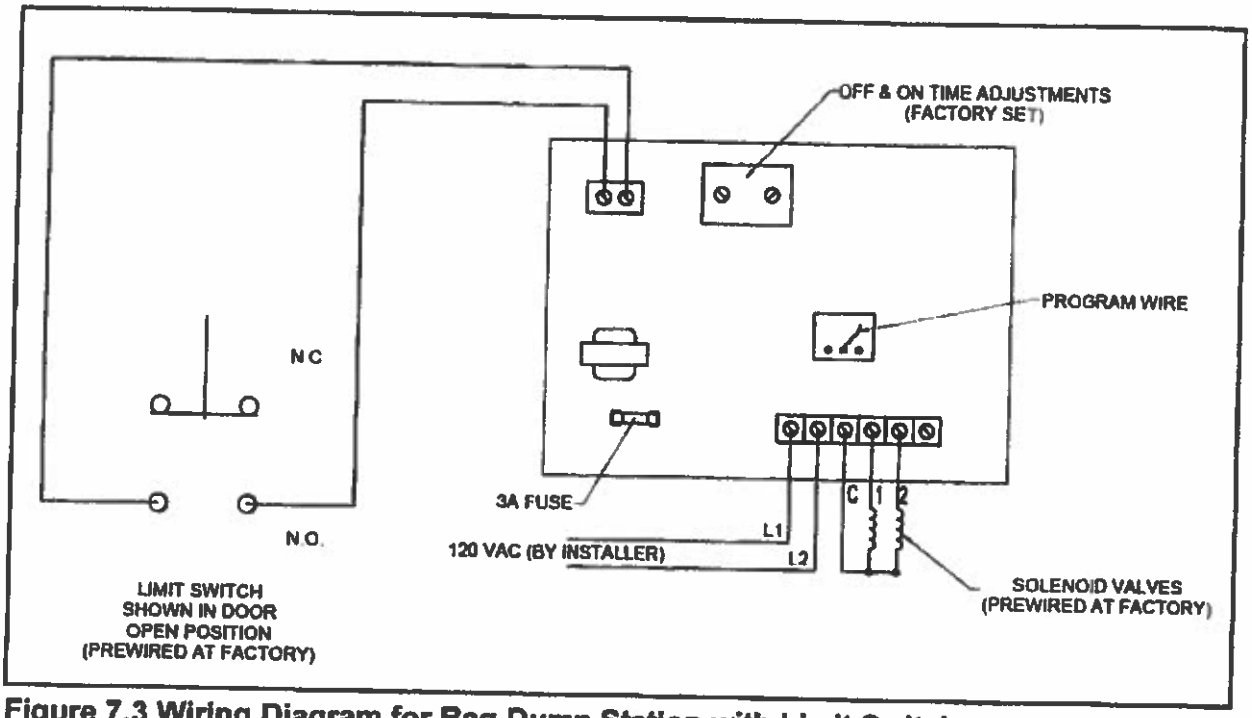

Figure 7.3 Wiring Diagram for Bag Dump Station with Limit Switch

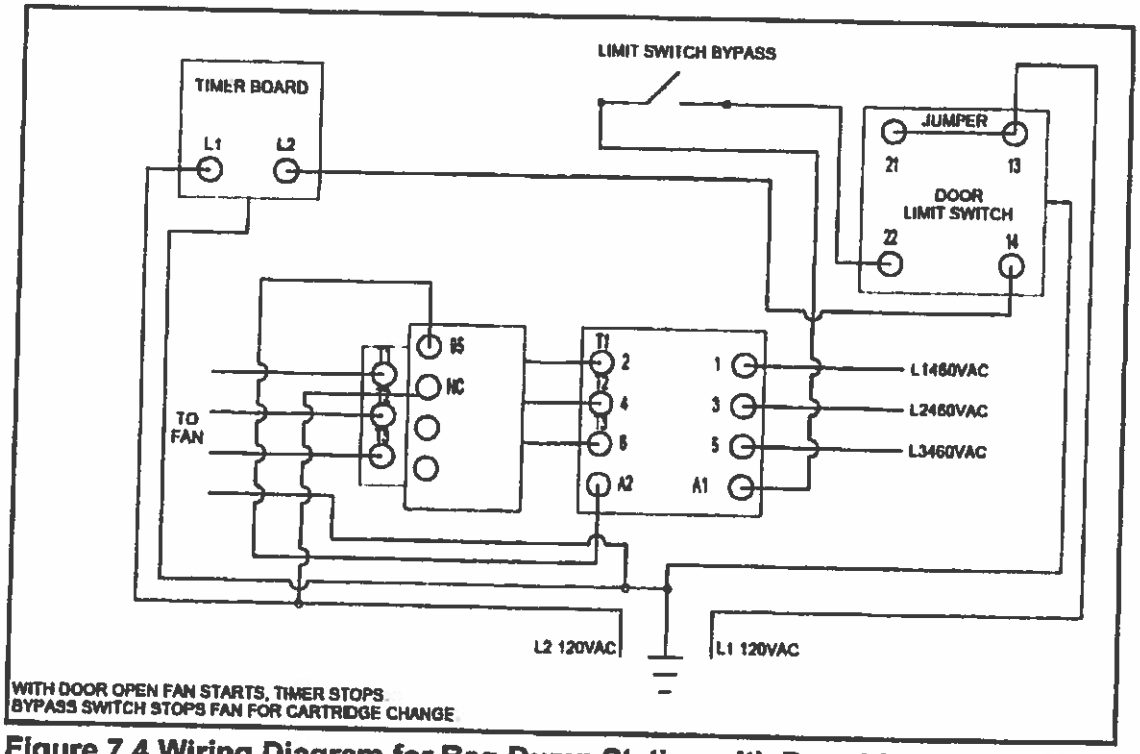

Figure 7.4 Wiring Diagram for Bag Dump Station with Door Limit Switch and Bypass

TERMS AND CONDITIONS

The ADDRESSEE is hereinafter referred to as PURCHASER and AIRLANCO as SELLER.

A.Shipments, deliveries and performances of work shall at all times be subject to the approval of the SELLER'S Credit Department and the SELLER may at any time decline to make any shipment or delivery or perform any work except upon receipt of payment or upon terms and conditions or security satisfactory to such Department.

B.If PURCHASER has resale tax permit and materials are for resale, PURCHASER should show this information on his purchase order.

C.Unit paid for, the title to and ownership and right of possession of material covered by this contract shall be and remain in the SELLER until SELLER'S right to lien attaches to said materials in the structure for which it is intended, and in case the PURCHASER shall become insolvent, or refuse or neglect to pay for materials herein provided, the SELLER may at its option, without process of law, retake possession of any or all materials wherever the same may be found, except as above provided, and credit the account of the PURCHASER with the value thereof to the SELLER, less the necessary cost and freight charges in retaking the same.

D.It is expressly understood that there are not understandings or agreements other than those expressed herein

E.After acceptance of order, but before shop drawings are made or an order placed in production, or before buying, or before manufacturing special materials or products, an order may be changed or canceled by mutual agreement confirmed in writing; but after making shop details or placing an order in production or ordering or manufacturing special materials or products, an order may not be changed or canceled without the PURCHASER assuming charges for loss incurred. Such charges will be invoiced at cost plus 15%.

F.Promises of shipment are estimates based upon information at the time and, to the best of our knowledge, are accurate. Every effort will be made to ship on schedule, but we assume no liability for delays.

G.No materials or equipment will be accepted for return without first obtaining our approval. All products manufactured by or sold by AIRLANCO are warranted to be free of latent defects in either materials or workmanship. Any product failing to meet said standards, in either materials or workmanship will be replaced, in exchange for part in which defect was found. Unless otherwise stated, PURCHASER'S claims must be registered within 60 days after date of shipment and must be substantiated by our inspection. No claims will be allowed for correction of alleged misfits, unless the SELLER shall have been notified and his responsibility proved. Ordinary inaccuracies of shop work shall not be considered misfits. See additional warranty conditions in Section J.

H.Any modification or change in specifications, design, or price by either the PURCHASER or SELLER affecting this quotation must be confirmed in writing, showing the number and date of the quotation or order.

I.SELLER certifies that the products covered hereby are fabricated by it in accordance with all federal laws.

WARRANTY

J.The property sold hereunder is warranted for one full year against defective workmanship or materials. Such warranty is expressly limited to replacing or repairing any property sold hereunder, which is demonstrated to seller's reasonable satisfaction to have been defective at the time of delivery thereof. The liability of the seller for defective goods sold under this warranty is hereby expressly limited to the cost of the repairs to alterations of, corrections on, or replacement of said defective property and no other claims or demands whatsoever shall be made upon or required to be allowed by the seller. Seller shall not, however, be liable for any charges for repairs, alterations, corrections or replacement of the property as set out above, unless it has first received written notice from the buyer of any alleged defect and had a reasonable opportunity to inspect same. In no event shall seller's liability, exceed such specific direct costs for labor, materials and transportation to repair, alter, correct, or replace said defective property as it shall have previously been approved in writing. Seller shall not be liable for any special, indirect, or consequential damages.

Seller will use all reasonable means to deliver within the time specified, but shall not be held responsible or liable for any loss, damage, detention or delay caused by accidents, strikes, lockouts, fire, explosions, theft, lightning, windstorm, earthquake, floods, storms, riots, civil commotion, malicious mischief, act of God or by any other cause beyond its reasonable control whether or not the same is herein specified and in any event, seller shall not be liable for any special, indirect or consequential damages arising therefrom.

This warranty is expressly accepted by the buyer in lieu of any or all other warranties or representations, express or implied, in fact or in law arising out of the sale of the property and of all duties or liabilities of seller to the buyer arising out of the use of the property sold; and no agreement or understanding varying or extending the same will be binding upon seller unless in writing and signed by a duly authorized officer of seller. All electrical equipment carries standard manufacturer's warranties.

AIRLANCO is a Division of Ag Growth Industries Partnership
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Website: www.airlanco.com

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AIRLANCO

08/18/2017

Sales Order # 004123

Bratney Equipment Company
3400 109th Street
Des Moines, IA 50322
Attn: Mike Anderson

Ref: Dupuy – Jacksonville, FL

AIRLANCO AIR QUALITY ASSURANCE

- 1 ea. 51055 E-86 STYLE III FILTER – 17,100 CFM OF COFFEE BEAN DUST @ 70° F – 3.28:1 AIR TO MEDIA RATIO – SPUN BOND POLYESTER CARTRIDGES

Based on 2 micron and larger particles, Airlanco guarantees their baghouse (fabric filters) when properly applied and maintained, to have a 99.99% or better mass efficiency rating on the dust laden incoming gas stream. As a general statement, emissions will not exceed .0025 grains of dry soil particulate matter per dry standard cubic foot of air.

Differential pressure normal operating range is ½"-6" W.C. as indicated by the Magnehelic Gauge

Nathan Huning
Senior Sales Engineer

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