SCHUST
STANDARD PRODUCTS DIVISION
A Division of Schust Engineering, Inc.

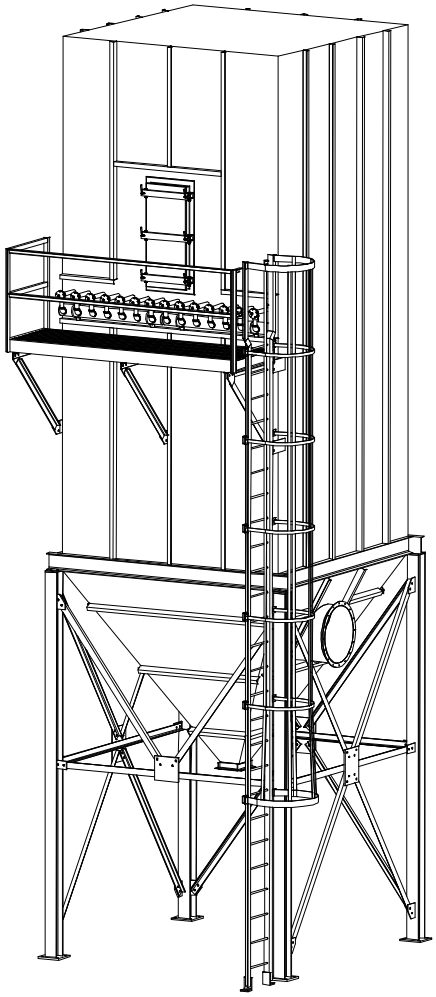
LIBERATOR
DUST COLLECTORS

OPERATION, INSTRUCTIONS & MAINTENANCE MANUAL

Illustrations are for reference purposes only. Actual products may vary and are subject to design and specification changes without prior notice.
See technical drawings supplied with equipment at the time of purchase for specific detail.

Model PBW

TB-OIM-R7



PULSE JET
BAGHOUSE W/ WALK IN PLENUM

Schust Engineering, Inc.
701 North Street Auburn, Indiana 46706 Phone: (260) 925-6550

FOR FURTHER INFORMATION, PARTS OR SERVICE:

CALL: 1 (260) 925-6550
FAX: 1 (260) 925-6093

Optimize collector performance!
Use only Schust OEM replacement parts and services.

Schust Engineering, Inc.

701 North Street Auburn, Indiana 46706

LIBERATOR
DUST COLLECTORS

Model Number _____ Serial Number _____

Ship Date _____ Installation Date _____

Customer Name _____

Address _____

_____

Filter Information _____

Options/Accessories _____

Other _____

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INTRODUCTION

With increased local and global awareness, the attention being given to the control of air pollutants, work area hygiene, capture, and disposal of nuisance dust in all industrial applications is becoming progressively more stringent. The proper design, installation, operation, and maintenance of collection equipment have never been more important.

This manual contains distinct advisory statements pertaining to operation and worker safety. Read this manual thoroughly. An understanding of dust control equipment operation is essential for safety. Improper operation or modification of this equipment may contribute to conditions in the work area or facility that could result in severe personal injury, product or property damage. Instruct all personnel on the safe use and maintenance procedures related to this equipment. Confer any uncertainty on application, use, or maintenance of this equipment with a qualified Schust representative.

All Local and National Codes must be considered when determining location and operation of dust collection equipment. Consult and comply as required.

Combustible and organic materials provide potential for fire and/or explosion hazards. You must consult with an expert in fire and explosion suppression systems, who are also familiar with local codes, for the selection, support, and installation guidance on the appropriate protection system(s).

NEVER allow sparks, flames, or any other ignition source to enter the hooding or ducting of a standard dust collector system, as this may result in the ignition or explosion of any combustible material collected.

Follow all OSHA Confined Space guidelines pertaining to this equipment. Please refer to the appropriate OSHA regulations for training, recognition, and qualification of confined space areas and permit required distinctions.

Schust recommends a schedule of inspection and timely repair of damaged, worn, or malfunctioning components to ensure safe and intended operation. Inspection and repair may be a requirement of any permitting. Please see your permit(s) for details should this be the case.

1.0 SAFETY RECOMMENDATIONS

IMPORTANT: No open flames, welding or sparks of any kind shall exist while servicing your unit. Dust laden air can be highly explosive. Most filter bags will burn if exposed to sparks, welding or open flames. Extreme care must be taken.

Because this unit may be under pressure or vacuum, do not attempt to open any device, doors or panels while fans or blowers are running.

Before servicing the collector, ensure the electrical power to the fan is shut off, locked out, and tested non operable.

This unit has a compressed air system with a maximum operating pressure of 100 psig. Ensure maximum design pressure is not exceeded.

Before servicing any portion of the compressed air system the supply air must be shut off, locked out, the pressure relieved and tested non operable.

If your unit is equipped with a rotary air lock and/or a screw conveyor, the chain/belt guards must be installed prior to start-up.

Before servicing any portion of the discharge system the electrical power must be shut off, locked out and tested non operable.

A dust collector is a Confined Space as defined by OSHA. Understand and follow all OSHA regulations pertaining to Confined Space Entry when servicing your dust collector.

1.1 PRIOR TO ENTRY:

A. Run the pulse cleaning system for 20 minutes with the fan off.

B. Discharge the solids from the hopper.

C. On noxious operations, purge the collector housing. Install a blank off plate in the inlet duct. Eliminate the source when possible. Continuous air monitoring and permit required per OSHA.

D. Install catwalks and safety cables as required.

E. Secure doors in an open position or remove doors.

F. Wear proper PPE including a suitable respirator to protect all entrants from recognized hazards.

2.0 GENERAL OPERATION PRINCIPLE

2.1 FILTERING:

A. Solids laden air or gases enter the unit at the hopper inlet.

B. The air stream starts to slow down as it enters the hopper and some of the heavier or concentrated material begins to drop out and make its way toward the hopper discharge.

C. The air stream continues to flow and passes through the filter bag media.

D. Solids are retained on the filter bag surface.

E. The filtered air flows into the clean air plenum.

F. Filtered air then exits the unit through the exhaust port located on the clean air plenum.

2.2 PULSE JET AUTOMATIC FILTER CLEANING:

A. As the unit operates, particulate starts to accumulate on the filter surface. This accumulation of dust is known as the dust cake. The dust cake provides both filtration efficiency and concentrates the solids to create a dense mass (cake) that will release and fall through the air stream and into the discharge hopper when the pulse jet cleaning system is activated.

B. As the dust cake increases so does the pressure on the clean side as the fan works to overcome the continuously increasing restriction the dust cake creates. Pressure on the dirty side decreases.

C. Pulse jet cleaning automatically removes the dust cake and restores normal operating pressures. Standard units provide continuous cleaning at preprogramed intervals to maintain filter media and differential pressures. Units equipped with an optional clean on demand control system will begin to pulse when the pressure difference between the clean and the dirty side becomes higher than a predetermined set point or limit on the controller. Cleaning will stop when the pressure difference between the clean side and dirty side lowers to the predetermined set point on the controller.

1. Pulse jet cleaning consists of a momentary blast of compressed air directed into the clean side of selected filters.

2. Momentarily taking a row of filters off stream through pressure reversal.

3. Flexing the filter bags.

4. Solids are released.

NOTE: Different filter media perform best at different pressures and tend to be application benchmarked.

D. The dust cake removed falls toward the discharge hopper.

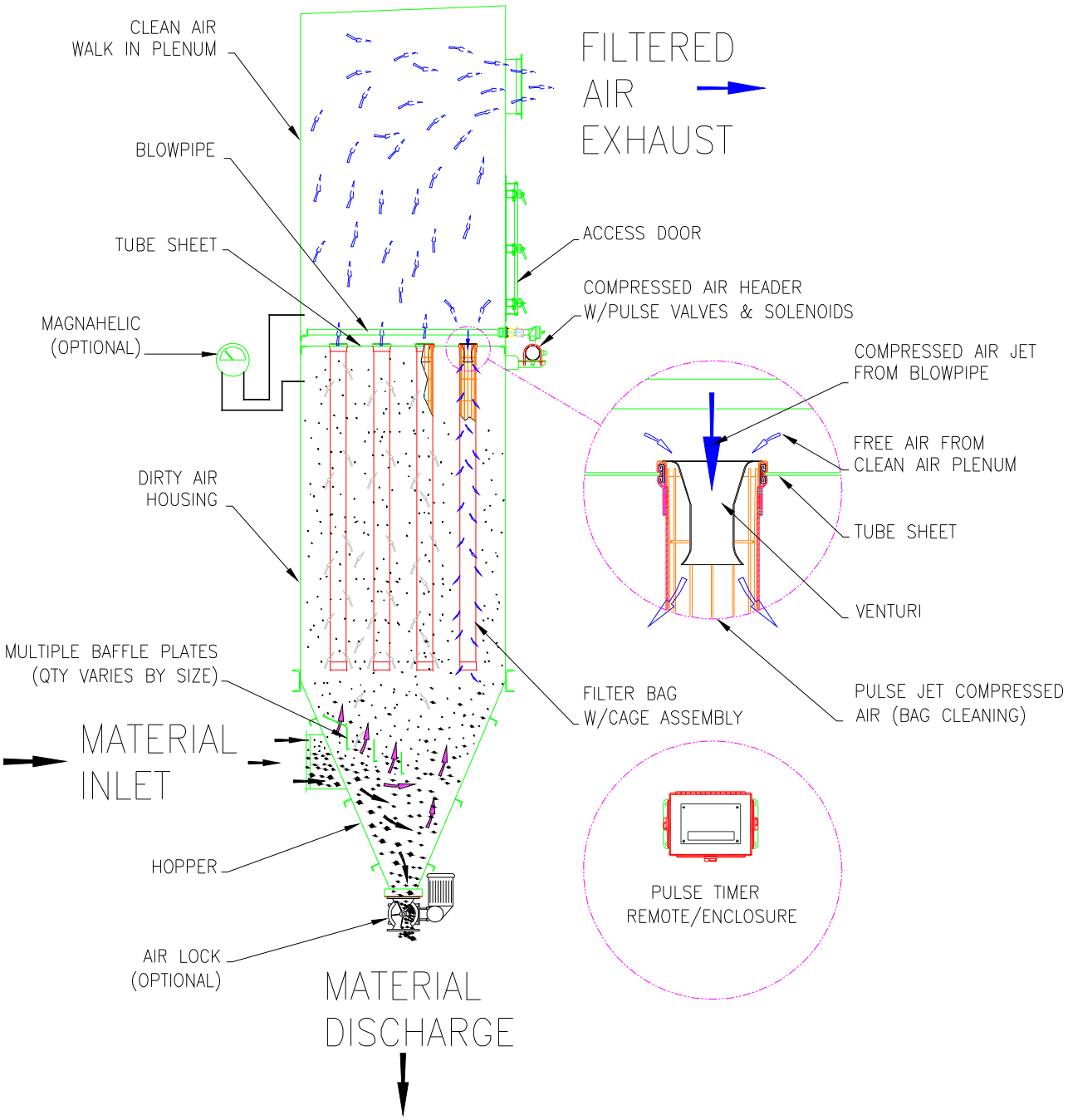
E. The difference in operating pressure between the clean side and the dirty side is reduced.

F. A new dust cake begins to form on the dirty side of the filter bags.

2.3 **SOLIDS REMOVAL:**

A. Dust is typically removed from the collector by means of a rotary air lock valve or other discharge equipment located at the bottom of the hopper.

B. Process dust may be reclaimed or disposed of at this point.



3.0 RECEIVING YOUR UNIT

Prior to accepting shipment of your collector, care must be taken to inspect all equipment received for both proper count/quantity and for damage that may have occurred during shipping. Any and all irregularities must be noted on the carrier's copy of the shipping receipt. This information is vital and will assist in the settling of any claims for damages or shortages. Whether prepaid or collect freight, all equipment is shipped FOB from point of origin.

THE PURCHASER MUST BRING ANY CLAIMS FOR TRANSPORTATION DAMAGES OR SHORTAGES AGAINST THE CARRIER.

Once your claim has been filed with the carrier, please contact Schust Engineering. We will then recommend appropriate repair/replacement options or assist in returning to the factory depending on the extent of the damages.

3.1 INSPECTION OF UNIT:

NOTE:
Please note any of the above discrepancies on the shipping receipt and notify Schust Engineering immediately. No corrections may be made without the expressed written consent of Schust Engineering.

A. HOUSING:

Carefully examine the sheet metal housing of your collector. The unit should be inspected for rips, cracks, crushing, and or dents. A damaged housing may seriously affect the structural integrity and operation of the unit.

B. CONTROLS AND CLEANING SYSTEM:

The timer assembly, air header, pulse valves, and solenoid enclosures, need to be checked for signs of impact, loose fittings, etc.

C. COMPONENTS:

A count of all components received needs to be verified against the carrier's manifests and packing lists. Inspect shipping containers for rough handling, which may have resulted in hidden damage.

D. GENERAL:

The entire unit should be checked against the purchase order and drawings for configuration correctness.

4.0 ON SITE STORAGE RECOMMENDATIONS

NOTE:
Inside storage of all components is highly recommended. However, if temporary outside storage cannot be avoided, the following guideline is a recommendation only.

4.1 STANDARD BAGHOUSES AND EXTENDED MODEL MID SECTIONS:

A. Ports on the pulse and pilot valves must be plugged and taped to keep insects, dirt, and moisture out.

B. The pulse valves, pilot valves, compressed air header, and components must be protected from the weather. A tarp may be considered.

C. Position the unit so that water/moisture will not get into or remain in the tube sheet area.

D. The unit must be blocked up as to keep flanges and air headers out of the water and dirt.

E. If outside storage is anticipated to be more than four weeks, it is recommended to remove the timer panel and solenoid enclosure(s) (if mounted.) These components should be stored in a cool dry area along with any associated tubing and fittings. It is important to cap any ports and seal openings during this procedure.

4.2 EXTENDED MODEL BAGHOUSES CLEAN AIR PLENUM AND HOPPER:

A. The equipment must be blocked up as to keep flanges and air headers out of the water and dirt.

B. Many units are supplied with a bare steel interior. If storage is anticipated to be more than two weeks the interior should be prime coated, depending on the application.

C. Covering the unit with a tarp is not recommended as damage can occur to the painted surfaces during high humidity, high temperature, and or direct sunlight storage conditions. Do so at your discretion.

D. Care should be taken to ensure water does not accumulate and remain in the housing stiffeners at any time during storage. Damage to painted surfaces can occur.

4.3 BAGS AND CAGES:

A. Bags should be stored inside, in a cool dry area protected from moisture, insects, and rodents.

B. For extended storage, boxes of bags should be wrapped in plastic or stretch film to protect from moisture.

C. If for any reason bags get wet, immediately lay them out with plenty of ventilation in order to prevent mold and mildew.

E. It is recommended to store cages in a cool dry place if possible.

F. If cages are stored outside they need to be up out of the dirt and water. Cages should be covered. Store cages outside at your discretion.

G. Cages should be stored horizontally, no more than two to three containers high, and protected from significant snow loads where applicable.

4.4 ACCESSORIES:

A. All gages, switches, gaskets, hardware, and items not specifically called out should be stored inside, in a cool dry location protected from insects, moisture, and rodents.

B. Rotary valve rotor and interior should be well oiled. It is important that the lubricant maintain compatibility with product being collected. Vegetable oil at a minimum is recommended. However, do so at your discretion. Cover with a tarp at your discretion.

C. Platforms and ladders stored outside need to be blocked up as to keep them out of the water and dirt.

D. Screw conveyors can be stored outside with care taken to ensure the unit is blocked up out of the water and dirt, level, and well supported. Position the unit so that water/moisture will not get into or remain inside the unit. Cover with a tarp at your discretion.

5.0 LIFTING AND RIGGING GUIDELINES

SAFETY NOTE:
Only trained, qualified personnel should perform rigging and setting operations. Use only certified, inspected, commercially available rigging equipment properly sized and configured for each lift.

5.1 GENERAL RECOMMENDATIONS:

A. Use all of the lifting lugs provided on the dust collector unit or section when making a lift.

B. Vertical lifts require a spreader beam when lifting lugs are located below the roofline of the collector or section. Failure to do so may result in crushing of the top of the collector or section.

C. NEVER lift the collector or section by any attachment. Use lifting lugs only.

D. All movements during the rigging process should be made in a slow, uniform manner as to avoid bouncing of the load. Should this occur the unit should be lowered and lift points inspected for stress. Repair and freshen up lift points and rigging as required.

E. Use several taglines to help control the load from spinning or swinging.

6.0 ASSEMBLING THE DUST COLLECTOR

The Schust standard baghouse is shipped pre-assembled as a single unit. Extended models will be shipped in three sections: Clean air plenum (upper), mid section (middle), hopper (lower). It is highly recommended that the general arrangement drawings and general rigging and lifting guidelines be reviewed at length prior to assembly. Attention should be given to the approximate weights, lifting lug locations, and orientation of inlet and outlet flanges, access doors, compressed air headers, etc.

Soil bearing, foundations, anchors, etc. should be verified suitable for collector installation and is the responsibility of the purchaser.

Dust collectors are manufactured from sheets of steel and are by nature, quite flexible. These units may tend to flex during shipping, handling, and setting. Therefore, some difficulty can be anticipated during the assembly process. Even though care has been taken to maintain dimensional accuracy and alignment when manufactured, temporary bracing, alignment techniques, and tools are common in the field assembly process.

6.1 ASSEMBLY SEQUENCE:

1. Set the support steel. This must be performed with care. This is the foundation. Any discrepancies at this point will compound as the rest of the unit is being assembled. Precision leveling and squaring required.

2. Place the unit or hopper on/in the support steel. Square and align bolt holes. Install fasteners. Torque to appropriate specifications. When assembling extended models it may be

appropriate to not final tighten and torque bolts until mid-section and hopper flanges are aligned for ease of assembly.

NOTE:
Do not lower the mid section onto the hopper flange until alignment is accomplished. Damage can occur.

3. Rig and lift the mid section in a level manner. With the section positioned 1/2 to 1.0" over the hopper begin the bolt hole alignment process. Starting in the center of a long side and working toward the ends, insert tapered drift pins. If the unit or wall has flexed out of square it may be necessary pull or pry it back into square. Depending on the size of the unit hydraulic jacks and or ratchet straps or chains may be required. When holes are aligned, lower the section onto the hopper evenly. **Failure to do so may damage flange and compromise the seal.** Install remaining fasteners. Torque to appropriate specifications.

4. Rig and lift the clean air plenum in a level manner. With the section positioned 1/2 to 1.0" over the mid section begin the bolt hole alignment process. When holes are aligned lower the section. Install remaining fasteners. Torque to appropriate specifications.

5. Seal weld the entire interior perimeter of flanged connections. Install 2" X ¼" bar stock in any damaged areas or gaps. Seal weld all the way around.

6.2 FILTER INSTALLATION, BAGS AND CAGES:

SAFETY NOTE:
The inside of your dust collector is considered a confined space. Please follow OSHA requirements when entering for any reason.

A. Remove the blowpipes inside the clean air plenum. The blowpipes are held in place by means of a bulkhead fitting on one end. A nut and bolt combination on the other end. Remove the nut and bolt and loosen the bulkhead. Slide the blowpipe out of the bulkhead. Care should be taken not to drop any fasteners into the hopper. Damage to the discharge equipment may result.

B. Prior to installation, inspect all filters for signs of damage, mold, open seams, etc. **Do not install damaged filters.**

C. Lower the closed end of the filter into the tube sheet hole. Extra care must be taken not to scrape the sides of the filter on the tube sheet especially when the filter has a special coating or finish.

D. Form the snap band end of the bag into the shape of a kidney by pulling inward. Seat the vertical seam into the tube sheet hole first. Align the beads of the cuff so that one is above and one is below the tube sheet then release the band. The filter should spring into position and create and audible snap as it seats. **Check for a good seal. Snap band <u>should not</u> be able to spin freely in the hole.**

E. Lower a cage into the installed filter. Continue pushing the cage into the filter until the upper collar flange comes into contact with the tube sheet.

F. Continue on until all filters and cages are installed.

G. Reinstall the blowpipes with the air holes facing down.

H. Secure the access door.

NOTE: At this point we typically recommend ultraviolet leak testing and filter conditioning (pre-coat) to ensure intended operation. This is especially important on critical or toxic processes or where EPA stack testing will eventually be performed for permitting requirements. **Schust Engineering provides system start-up services if assistance is needed.**

6.3 FLANGES AND DOORS:

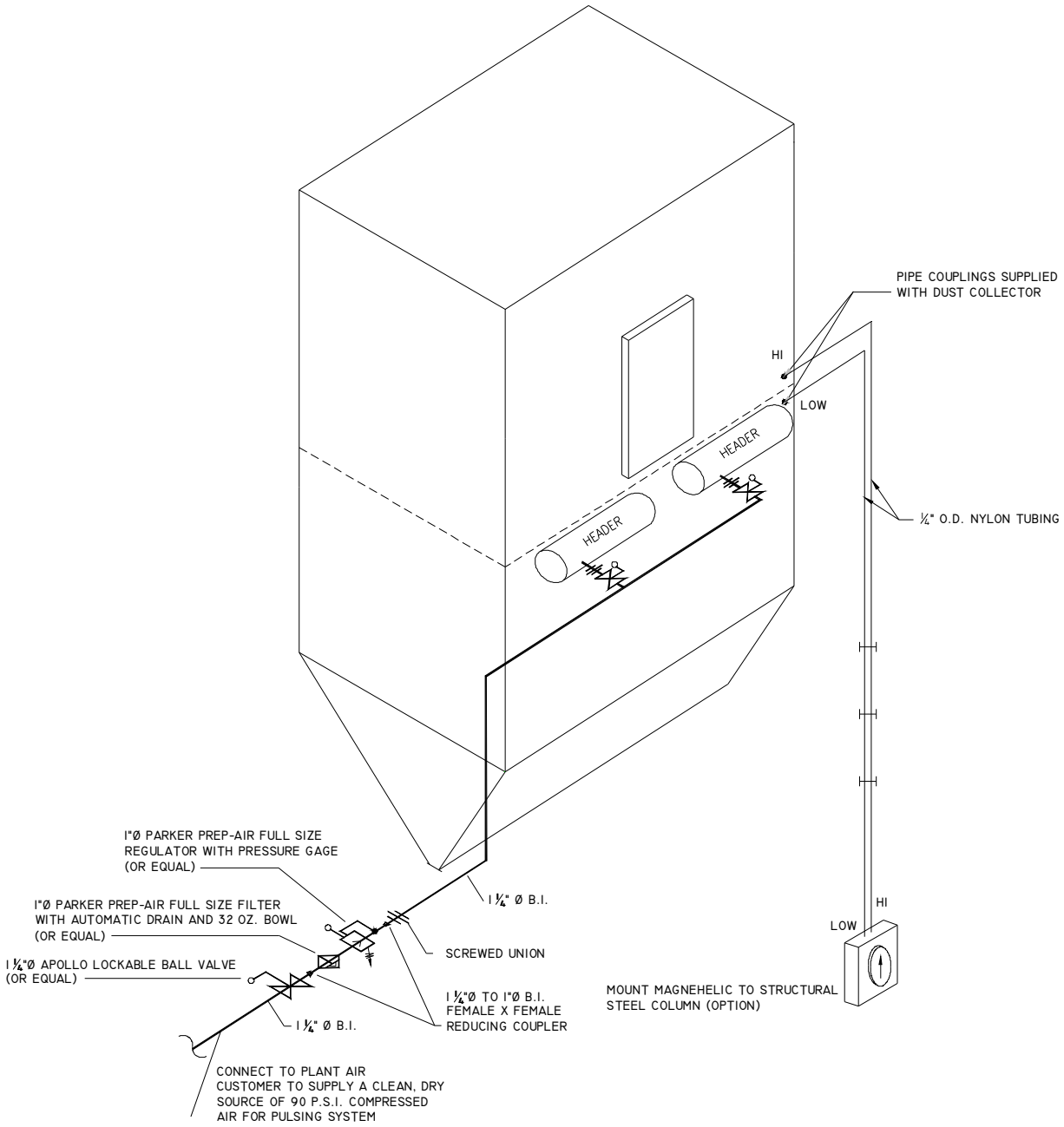
All flanges must have fasteners installed and be tightened to appropriate specifications. All doors should be hand tightened only. Excess pressure or over tightening may damage seals, distort components, and leakage may result.

6.4 ELECTRICAL SUPPLY:

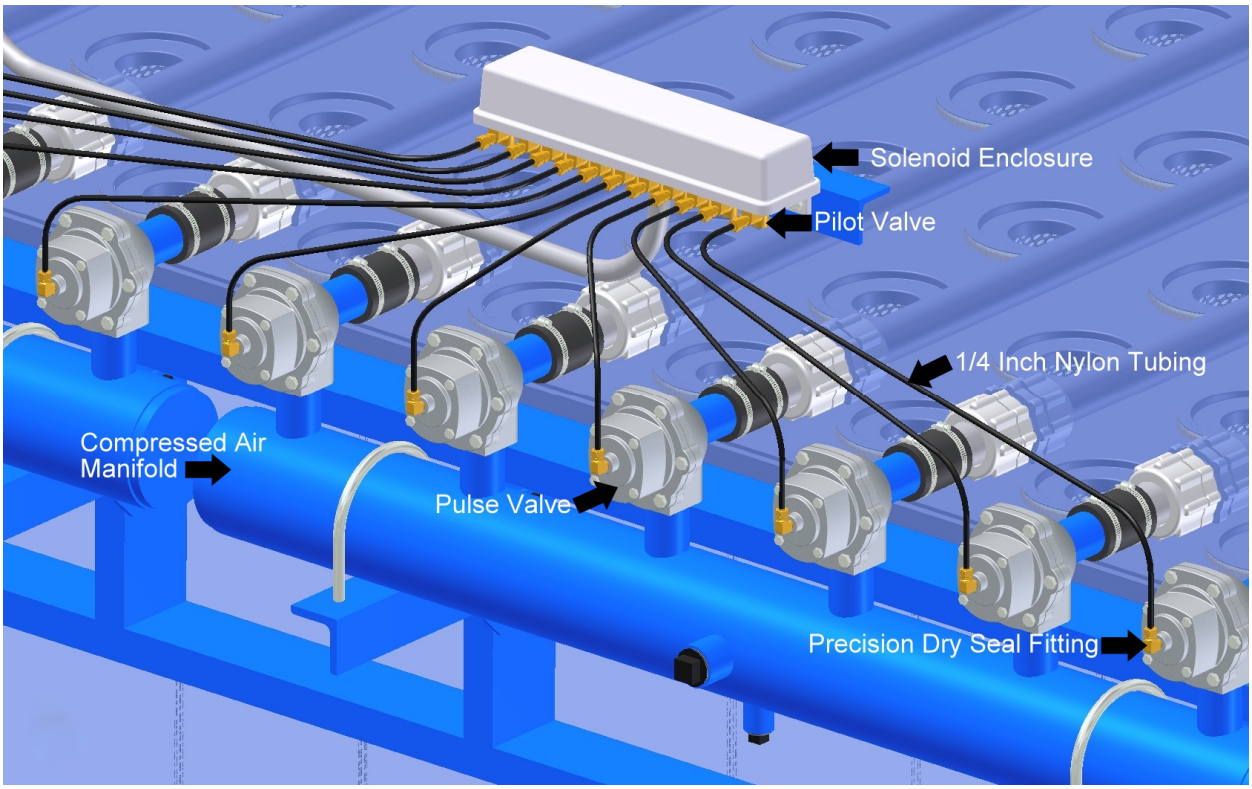
<u>SAFETY NOTE:</u>
Only qualified personnel or contractor should perform electrical installation. A 120-volt at 60-hertz electrical source (line input) is to be connected to the timer board of the pulse jet cleaning system. The circuit must be well grounded and free of transient spikes. It is highly recommended to run conduit into the bottom of the timer enclosure using seal tight connections especially for units located outside which may be subject to rain or snow.

6.5 **COMPRESSED AIR:**

The Schust Liberator Series pulse jet collectors come equipped with 1-1/4" female couplers provided on each compressed air manifold (header). A 90-PSI minimum supply of **clean, dry,** compressed air is to be delivered to the collector. See the compressed air piping schematic for recommended installation configuration. NOTE: Do not use tape for threaded connections. Use only flexible white, non-hardening pipe and joint compound *if desired.*



TYPICAL COMPRESSED AIR PIPING SCHEMATIC



7.0 CLEANING SYSTEM SET-UP

Schust Liberator Series pulse jet dust collectors typically come with controls mounted, fully wired, and programmed.

7.1 PULSE VALVES/PILOT VALVES:

Each pulse valve needs to be connected to an individual pilot valve. Remove all shipping protective caps from both pulse valves and the pilot valves. From left to right connect the furthest left pulse valve mounted on the compressed air manifold to the furthest left pilot valve mounted in the solenoid enclosure using the fittings and tubing provided. Continue sequence until all lines are connected.

NOTES:

Liberator pulsejet collectors come with precision, dry-seal tube compression fittings specifically designed to be used with the 1/4" nylon tubing. However, Schust recommends using a non-hardening PTFE type sealant to ensure no leaks. *Check each connection for tightness prior to pressurizing the manifold. Never back off a dry seal connection for alignment purposes.*

7.2 INITIAL CONTROL SETTINGS:

Compressed Air Regulator Gage: **Application specific*

Photohelic® Pressure Gage Set Points:

Low: **Application specific*
High: **Application specific*

Timer Board Settings:

On Time: **Application specific*
Off Time: **Application specific*

** Please contact Schust Engineering.*

8.0 START UP/SHUT DOWN

8.1 INITIAL START UP CHECKLIST:

Safety should be given the highest priority during start-up. Follow all OSHA lock out, tag out, and confined space requirements. It is recommended that initial start-up be performed or supervised by Schust Engineering.

A. Check all foundation anchors for tightness. Ensure any and all ladders, platforms, handrail, and toe board fasteners are secured, complete, and meet OSHA requirements.

B. Any and all ducting and piping should be free of debris and moisture.

C. Visually inspect the interior of the hopper, midsection, and clean air plenum. Remove all loose items.

- Visually check to ensure a filter and cage are in every hole.
- Ensure all blowpipes are installed and the bulkhead fittings and opposite end fasteners are tight.
- Secure all access doors.
- Ensure material handling discharge equipment is properly lubricated and free of foreign material.

D. Operate any discharge equipment. Check for binding, rotation, etc. Ensure operation as intended.

E. Inspect explosion panels, if supplied, for damage and integrity. **Read, understand, and follow all OEM operating parameters**

and safety requirements specifically associated with your explosion panels and system.

F. Inspect the cleaning system to ensure all tubing is installed. Gently tug on each line to make sure it is snug. If the line pulls out trim it back and re secure. Ensure all shipping plugs are removed from the exhaust ports.

G. Ensure the compressed air system is capable of supplying 90-100 psig of clean, dry air. Set the regulator to 20 psig. Slowly open the ball valve. Check system for leaks. Drain pressure. Repair as needed. Increase pressure incrementally. Test for leaks. Drain and repair as needed. Final regulator setting may be application specific.

H. Energize the timer control. (If equipped with a Photohelic® turn both the low and high set points to the left or lowest setting.) The cleaning system should begin to pulse. Check each pilot valve for operation by placing a finger close to the exhaust port. Note: The timer sequence of operation is **not** in order from left to right as plumbed. This is by design. Please see the equipment specific electrical schematic for sequence. Repair any pilot or pulse valve that is not operating or remains open.

I. The pressure in the manifold must fully recover prior to the next pulse. It is important to ensure adequate air volume is delivered. Especially when other systems connected to the same air supply are operating at full capacity.

J. Set the low-pressure set point and the high set point on the Photohelic® controller (if equipped.)

K. Check fan for proper rotation. If fan is running backwards proper system volume will not develop. Correct as needed. **Set the fan damper to 2/3 open or less position.**

SAFETY NOTE:
Only qualified personnel or contractor should perform electrical installation.

8.2 START UP SEQUENCE:

1. Ensure all access doors and any openings are securely closed.
2. Verify that the compressed air supply system is on.
3. Verify supply regulator pressure at 85 – 90 psig.

4. Energize the control panel.

5. Start the dust discharge and removal equipment. Follow proper sequence for rotary air locks, screw conveyors, live bottom bin activators, and pneumatic conveyor systems.

6. Start the main exhaust fan.

7. Start the dust-laden air through the collector. **Partial loading on initial start-up is recommended,** thus allowing the filters to be slowly and evenly coated. (See section 8.1, K) **Industry Best Practices: New Filter Start-up recommended procedures are available from Schust upon request. Open the fan damper to achieve system volume *after* sufficient preloading of filter media.**

8.3 SHUT DOWN SEQUENCE:

1. Reverse the start-up procedure.

9.0 TROUBLESHOOTING

SAFETY NOTE:
Only trained, qualified personnel or contractor should perform troubleshooting. Schust Engineering can provide technical services.

9.1 MAIN FAN WILL NOT START:

A. NO POWER:

1. No power to the motor. Check for blown fuses, overloads, loose wires, main disconnect switch is off, etc.

B. FAN BELTS:

1. Fan belt(s) are no longer on the sheaves. Lock out unit and look inside the fan guard. If belt(s) are missing/fallen off, or broken, replace with new correct size belt(s). Belt alignment and tension is critical to proper operation.

9.2 HIGH PRESSURE DROP ACROSS THE FILTER BAGS:

The pulse cleaning system may not be working correctly. **For example:** Say the differential pressure controller (switch) for this scenario, is set to begin the pulse cleaning system at an upper set point of 6" water gage and a lower set point of 4". When the pulse cleaning system starts to cycle the pressure should begin to drop. When the pressure difference across the

filters is reduced to the lower set point the pulse system should stop. Therefore, the pressure gage is intended to read 6" or less in this case.

Higher readings may be an indication that the main air stream flowing through the collector is becoming restricted. This can produce potential process problems such as poor suction through the duct system and or at the pick-up points.

Filter bags subjected to very high differential pressure can be damaged.

A. PRESSURE GAGE:

1. Check the tubing between the pressure gage and the dust collector housing for leaks. Ensure connections as intended. Look for loose fittings, cracked, or pinched tubing. Replace or repair as needed.

2. Using clean, dry compressed air, pressurize the tubing sending compressed air down the line toward the collector. Ensure the lines and connectors are clear. **NEVER apply compressed air to the gage**.

3. Zero the gage. Remove both pressure lines from the gage. Using the external zero screw located on the front of the gage, turn as needed to set the indicating pointer exactly on the zero mark.

4. Reconnect both lines. Ensure the upper and lower set points are at application-determined values. Observe for proper operation.

B. COMPRESSED AIR:

1. Check to make sure the compressor supplying the collector is on and capable of delivering 90 psig or more of pressure to the collector. NOTE: *Manifold pressure is application specific and may be regulated at a different pressure.*

2. Check the ball valve to ensure it is turned to the on position. (Handle position runs in the same direction of the supply pipe.)

3. Check the regulators for function and settings.

4. Observe for proper operation. The manifold pressure must able to recover prior to the next pulse. If not, check to make sure the compressed air system is in good operating condition,

correctly sized, and supply lines are not too small or restricted. NOTE: *Too long of "On-time" or too short of "Off-time", timer board settings may contribute to above symptoms.*

C. MANIFOLD PRESSURE:

1. Listen for the sound of compressed air flowing continuously through a pulse valve and into the blow pipe. This is an indication that one or more of the pulse valves are stuck in the pulsing position. Repair/rebuild kits are available for both the pulse valves and the pilot valves. Contact your Schust representative.

2. Check the tubing between the pilot valve and the pulse valve for leaks. Ensure connections to the pulse valve and the pilot valve enclosure as intended. Look for loose fittings, cracked, or pinched tubing. Replace or repair as needed.

3. Check for dirt or debris in the pilot and or pulse valves.

D. TIMER BOARD:

1. Look for signs of damage to the timer and housing. Replace and repair as needed.

2. Check for 120 VAC line voltage power input to the timer. If voltage is present an indicator should be on. If not check the fuse on the timer board. **Replace with only the same size and type**. Ensure the hot side of the supply voltage line is connected to L1 as this is the fused terminal.

3. Check the wiring between the timer and the solenoids for open or short circuits.

4. After performing the above steps and the board still appears not to be functioning properly, please contact your Schust Engineering representative for service or part replacement.

E. DUST NOT DISCHARGING FROM THE HOPPER:

1. Check the hopper for overloading condition. Dust can bridge across the discharge causing the hopper to fill with dust. Correct by repairing the discharge equipment. Replace with higher capacity equipment. Or, install hopper vibrators, etc. as required to keep the hopper clear.

2. NEVER store material in the hopper. Ensure hopper is clear prior to shutting the system down.

F. FILTER BAGS:

If the cleaning system appears to be working correctly however, high pressure is still indicated on the gage, the filter bags could be loaded (permeated) with fine dust. This is a condition known as blinding.

Collectors with blinded or caked bags may possibly be put back into service by first running the pulse cleaning system with the main fan not running. Set the "Off Time" on the timer board to 3 seconds or to the lowest setting in which the compressed air system can recover to the regulated operating pressure between pulses. Run the cleaning system for 15 to 30 minutes. Reset the timer board to the original design setting. Turn the main fan on. If the pressure drop is not lower the filter bags need to be changed.

G. AIR FLOW TOO HIGH:

1. If the main airflow is too high, dust may not pulse off the filter bags during cleaning. An excessive pressure drop across the dust collector will result. In some cases, filter damage and blinding may occur. Dust will build up in the system.

2. If the system is installed with a fan damper check to see if it is still in the same original location. If it has been opened up set it back to the original setting. System rebalancing may be required.

3. Test to see that the fan is turning at the original RPM not faster. Original RPM is critical to proper operation.

4. If the associated duct or hooding has been removed or modified, higher system volumes may occur. Contact Schust Engineering for system evaluation services.

H. PARTICLE SIZE AND DUST LOAD:

1. If possible, compare the dust particle size to the original design specifications. Finer dust may cause a higher pressure drop. If the application has changed or the system is seeing a higher dust loads than originally designed contact Schust Engineering for system evaluation services.

I. MOISTURE:

1. Inspect the dust collector housing and ductwork for holes, cracks, leaks, and areas where water could enter the collector.

2. Condensation. If moisture has been condensing inside the collector, check the dew point of the incoming air stream. It may be necessary to insulate the collector and associated ductwork to keep the surface temperatures above the dew point and prevent condensation on the filter bags.

3. Moisture/oil present in the compressed air used for cleaning. Any moisture/oil present in the cleaning air will be transferred directly to the filter media. Moisture combined with fine particles can result in solidification of product and filter failure. Clean dry air is required.

9.3 LOW PRESSURE DROP ACROSS THE FILTER BAGS:

A. PRESSURE GAGE:

1. Check the tubing between the pressure gage controller and the dust collector housing for leaks. Ensure connections as intended. Look for loose fittings, cracked, or pinched tubing. Replace or repair as needed.

2. Using clean, dry compressed air, pressurize the tubing sending compressed air down the line toward the collector. Ensure the lines and connectors are clear. **NEVER apply compressed air to the gage**.

3. Zero the gage. Remove both pressure lines from the gage. Using the external zero screw located on the front of the gage, turn as needed to set the indicating pointer exactly on the zero mark.

4. Reconnect both lines. Ensure the upper and lower set points are at application-determined values. Observe for proper operation.

B. FILTER BAGS:

1. Check and ensure the filter bags are installed correctly as described earlier in the Bag & Cage Installation section of this manual. Inspect filters for excessive wear, tears, and holes. Replace with OEM filters as needed.

C. DUCT AND DAMPERS:

1. Blocked ductwork and/or too many closed dampers will result in low pressure drop across the collector. Clear any blockage in the duct and reset dampers to original positions. If associated duct or hooding has been removed, capped, or modified, varied system volumes may occur. Contact Schust Engineering for system evaluation services.
2.

D. HOUSING:

1. Check the tube sheet (flat steel sheet from which the filters are suspended) and the collector housing for holes, cracks, or loose gaskets, which would permit air to bypass the collector or filter bags.

9.4 DUST COMING FROM THE EXHAUST STACK:

A. CONTINUOUS:

1. Holes in the filter bags.

2. Filters not installed correctly or wrong size.

3. Filter bag missing.

4. Holes in the tube sheet.

B. PUFF ONLY AFTER EACH CLEANING SYSTEM PULSE:

1. Compressed air manifold pressure too high. If the pulsing pressure is higher than the application specified value, the filter bags may flex excessively and allow fine dust to pass through the bag material.

2. Worn filter bags. Thin worn bags may not stop fine dust when flexed by the cleaning system. Inspect filter bags for wear. Replace with OEM filters as needed.

3. Residual dust. Dust may be present in the clean air plenum due to bag failure, incorrect filter installation, torn filter, wear, hole in the tube sheet, etc. The cleaning system pulsing air may stir up the dust and allow it to escape into the exhaust stack after each pulse. Locate and repair the problem. Clean the clean air plenum/tube sheet prior to putting the unit back in service to avoid further symptoms.

4. Holes formed in the bottom of a bag will often allow the bag to fill with dust up to the location of the hole. Several inches of dust can accumulate. Pulsing air will stir up this dust and allow it to exit the collector through the exhaust. Replace filters as needed. Clean the clean air plenum prior to putting the unit back in service to avoid further symptoms.

9.5 **SHORT FILTER LIFE:**

This is often a very complicated problem to diagnose. Please call Schust Engineering for recommendations. The following may be helpful in performing some preliminary qualifications:

1. Temperature. Operating temperature above the recommended limit of the filter bag material.

2. High moisture. High moisture content in the collector may cause certain filter materials to shrink or degrade. Elevated temperatures will accelerate this process.

3. Chemical attack. Certain chemicals in the air stream and or dust can degrade filter material.

4. Filter bag cage failure. Corroded, rusted, or broken cages can cause excessive bag wear. Stainless steel and coated cages are available.

10.0 **ROUTINE MAINTENANCE**

The following includes general recommendations for maintenance. Frequency will vary based on actual operating conditions and duty cycle requirements. This guideline is not intended to satisfy any permit requirements should they exist. Please contact Schust Engineering for third party inspection and system performance reports should you have the need.

10.1 **INSPECTION:**

1. Daily. Check unit differential pressure.

2. Weekly. Check pulse timer board settings, solenoid, and pulse valves for operation. Listen for uniform time intervals between blasts/pulses.

3. Monthly. Lubricate fan, rotary valve and screw conveyor. Inspect seals on the rotary valve and screw conveyor for dust loss.

4. Quarterly. Check for dust accumulation in the clean air plenum.

10.2 **REPAIRS:**

1. Filter Bags. Replacement.

2. Pilot Valve. Repair kits are available if a valve is stuck open or fails to operate.

3. Pulse Valves. Repair kits are available if a valve is stuck open or fails to operate.

4. Timer Board. Fuse replacement or circuit board replacement.

5. Rotary Valves. Usually a matter of seal and blade replacement. More detailed information is supplied with the valve.

6. Screw Conveyors. Periodic replacement of the belts and shaft seals. Inspect hanger bearings during filter bag change. Failure can be indicated by a squeal.

7. Fans. Periodic replacement of the belts. Belt tension and sheave alignment is important to operation. Periodic bearing replacement. Ensure fan wheel balance is maintained.

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