DUST COLLECTOR

Operation Manual

Thank you for choosing Advanced Recycling Systems. We greatly appreciate your business and should you have any questions regarding this machine, please do not hesitate to contact us.

ARS Recycling Systems, LLC

4000 McCartney Road, Lowellville, OH 44436-9510

Phone: 330.536.8210 Fax: 330.536.8211

General Safety

BEFORE OPERATING THIS UNIT, READ AND UNDERSTAND THE OPERATION MANUAL COMPLETELY.

Become familiar with the equipment and safe operating procedures. Safe operation can be achieved only if the equipment is properly operated and maintained. Only individuals with proper training should operate or perform maintenance on this machine.

DANGERS, WARNINGS AND CAUTIONS

Dangers, warnings and cautions are used in this manual to alert the operator to special instructions concerning a particular procedure that may be hazardous if performed incorrectly. These "safety alerts" alone cannot eliminate the hazards that they signal. When performing any operation or service, strict compliance to these special instructions are major accident prevention measures. ARS Recycling can not anticipate every possible circumstance that might involve a hazard. The warnings in this manual and on all equipment are therefore not all inclusive.

OWNER / OPERATOR RESPONSIBILITIES

Knowledge of and performance of the procedures specified in this manual and the operation and instruction manuals of the component parts are the responsibility of the owner(s), operator(s), user(s) and all persons working on or near the unit described herein. Following these procedures and explicit adherence to the information described should ensure safe and reliable use, repair, and operation of the unit provided by ARS Recycling Systems, LLC.

It is also the responsibility of the owner(s), operator(s), user(s) to comply with all regulations and laws pertaining to jobsite safety, waste disposal and hazardous waste disposal.

Safe Operation

Warning

Only qualified personnel should attempt the installation operation and maintenance of this equipment. Do not touch electrical connections before power has been disconnected. Electrical shock can cause serious or fatal injury. Be sure system is properly grounded before applying power.

Engine exhaust can cause sickness or death. Operate in well ventilated areas only.

Engine exhaust is hot, avoid contact with exhaust parts.

Never enter a confined space without properly following your company's procedure.

Never operate this unit without all machine guards properly in their place.

Do not attempt any maintenance without following proper lock-out/tag-out procedures.

Do not place any extremities into or near inlets on the bag-house, waste chute or fan.

Do not operate unit for any reason with fan exhaust or coupling guard removed.

Personal Protective Equipment must be worn during operation.

Caution

Diesel fuel is highly flammable. Do not refuel while engine is running, while smoking or near open flames or sparks.

Battery gas can explode. Keep sparks and open flames away from battery.

Keep work area clean.

Keep body parts and clothing away from moving parts and vacuum openings.

Never wear loose clothing around moving parts or vacuum openings.

Use sure footing when ascending or descending ladders.

Dispose of waste properly.

Diesel Unit List of Major Equipment

Diesel Engine

Powers centrifugal fan

Centrifugal Fan

Supplies vacuum to the baghouse. Either a direct drive (80k systems) or belt drive (7k, 12k, 20k, 45k and 60k systems) is used to transfer power from the engine to the fan.

Baghouse

Main part of unit which houses the filter cartridges. Also incorporates hopper in the lower half to hold waste dust from the filters. This dust is removed by a hydraulic auger system or a gravity discharge system at the rear of the unit and should be emptied at least once per day.

Pulsation System

This system keeps the cartridges clean and increases their life span. It turns on automatically with the engine start switch in the “run” position. This system is preset from the factory and no adjustments are needed. Air: 75 psi max.

Waste Auger / Gravity Discharge

The hydraulically driven auger or gravity discharge system is located in the lowest part of the hopper. They are used to empty any waste that accumulates in the baghouse from the pulsation of the cartridges. The auger is controlled by an on/off switch at the rear of the unit adjacent to the waste valve/chute.

Diesel Machine Set Up

1. Make sure unit is on firm level ground and that all support legs are extended.
2. Connect any vacuum hoses and route them to where they are needed.
3. Connect the proper size airline to the unit's regulator/filter assembly. The supplied air must be dry. Moisture laden air will contribute to clogged filters and greatly reduce their life span. The regulator is preset from the factory and does not require adjustment.

Starting the Diesel Engine.

Pre-Start Checklist

1. Be sure there is adequate fuel supply for the work day. Running the diesel engine out of fuel will introduce air into the injector system and cause unnecessary down time. It may cause severe damage to the PTO unit, the coupling (80k units) or belts (all other units) or to the engine itself. This damage **will not** be covered under warranty.
2. Check engine oil level. Oil level should be at the "full" mark.
3. Check Diesel Exhaust Fluid levels daily. DEF tank levels must be maintained at all times. Refill the tank as needed.

Use Diesel Exhaust Fluid in **DEF Tank Only**. IF DEF is filled into engine fuel tank or other fluid compartment, DO NOT Operate Engine until system is properly purged. Refer to engine manual or contact dealer immediately.

Units equipped with a belt drive: check belt tension every two-three months and adjust accordingly. Adjustment should be one inch of travel at the middle of the belt. Adjust as necessary.

Starting the Diesel Engine and Engaging the Fan

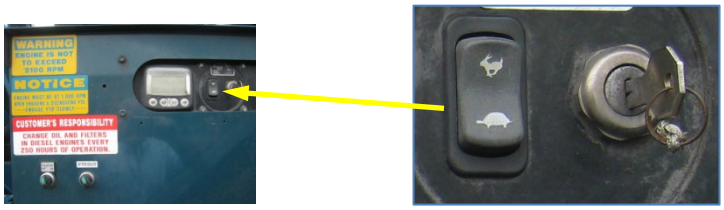
Warning
NEVER run the engine above the labeled maximum speed – severe damage to the engine, coupling or fan, as well as personal injury may occur!

Digital Systems

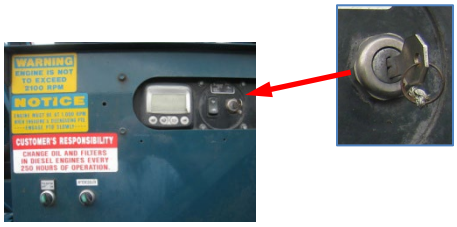
1. Perform the daily pre-start checks. (see engine operation manual)
2. Engine controls should be set to low idle speed.

   7k and 12k units: See Analog Systems

   20k, 40k, 60k and 80k units: The lower half of the rocker switch (denoted with a turtle icon) should be depressed.



3. Turn the ignition key clockwise to start the engine *or p*ush in on ignition switch and turn clockwise. Once started, release the switch and it will return to the "run" position. This will also start the pulsation system on some models.



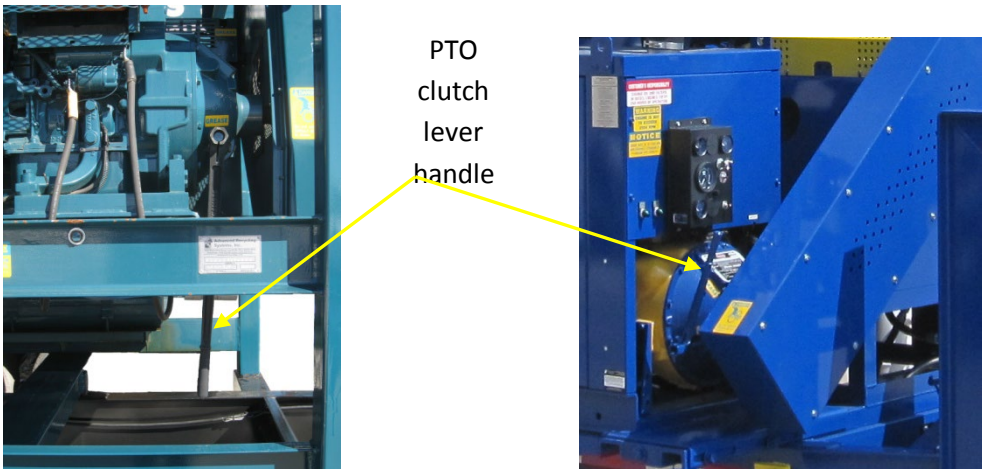
4. For compressor equipped units, turn the Pulsation System *and* Aftercooler knob clockwise for "on" position.

NOTE: The aftercooler is used on units with air compressors on board. The aftercooler should only be run with air temperatures of 40°F or higher ambient. When air temperature is below 40°F, the aftercooler should be left disabled and powered off.

5. Let the engine idle until warm. (Never exceed 1200 rpm until engine is warm.) Avoid long idle periods. If engine is to idle for more than 5 minutes, shut down and restart when needed.

6. Check all gauges for normal engine operation. If operation is not normal, shut down engine and determine the cause.

7. For models not equipped with an automatic PTO, ***Slowly*** but firmly engage the clutch.



8. Increase engine speed to operating rpm by pressing the upper half of the rocker switch (denoted by a rabbit icon).

If your system has an analog control (shown below), it will most likely have a throttle control cable. To adjust speed, locate and turn the throttle control knob (shown below) left or right to decrease or increase rpm's.

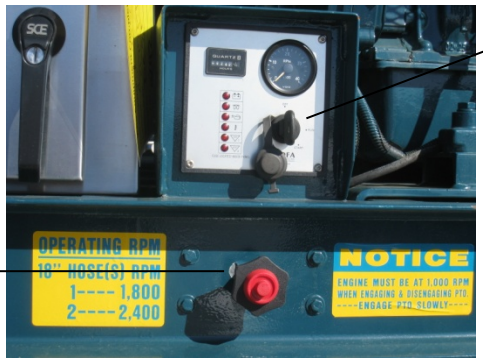
Analog Systems

Ignition Switch

Tattle tale bypass Switch must be held in while starting the engine and held in approximately 10 seconds after start.

Toggle Switch

Throttle Control



Ignition Switch

Note: Units equipped with engine mounted compressors and drying systems, See page 19.

Aftertreatment System-Exhaust Filter — Cleaning

NOTE: Some engine models are not equipped with a diesel particulate filter (DPF).

The diesel particulate filter (DPF) is a critical component in the engine's emissions control system, which is required to meet governmental emissions regulations. The exhaust filter captures diesel particulate matter or "soot" to prevent its release into the atmosphere. This soot must be eliminated from the DPF to keep it functioning properly. The process of eliminating collected soot is carefully controlled by the engine control unit (ECU) and is called "exhaust filter cleaning" or "**regeneration**". During this process, a rise in exhaust temperature occurs and allows the soot to be oxidized within the DPF.

Under normal machine operation and with the system in AUTO mode, the exhaust filter system requires minimal operator interaction. To avoid unnecessary buildup of diesel particulates or soot in the exhaust filter system;

1 — Utilize automatic (AUTO) exhaust filter cleaning mode.
2 — Avoid unnecessary idling.
3 — Use proper engine oil (See Fuels, Lubricants, and Coolants Section for recommendations).
4 — Use only ultra-low sulfur fuel (See Fuels, Lubricants, and Coolants Section for recommendations).

Operating the engine in AUTO Mode allows the ECU to perform intelligent exhaust filter cleaning as required. The Exhaust Filter Cleaning Indicator will illuminate when the system is actively performing an exhaust filter cleaning. During this process, the dosser will inject small amounts of fuel into the exhaust stream to assist in cleaning the exhaust filter. When the exhaust filter cleaning process has completed its cycle, the cleaning indicator will atomically turn off.

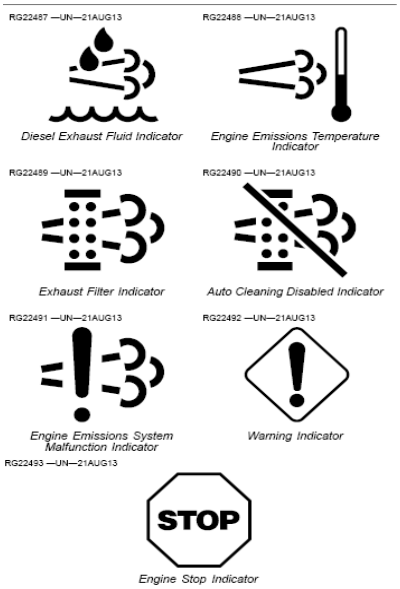
During regeneration or exhaust filter cleaning operations, the engine will run at elevated idle and hot temperatures for approximately 30 minutes.

Allow the engine and the exhaust filter time to return to normal operating temperature before stopping the engine. Avoid disabling the cleaning procedure unless absolutely necessary. Repeated disabling, stopping, or ignoring prompts to perform a cleaning procedure will cause additional engine power limitations and *can lead to dealer required service*.

Exhaust gases and exhaust filter components reach temperatures hot enough to burn people, ignite, or melt common materials. Servicing machine or attachments during exhaust filter cleaning can result in serious personal injury. **Avoid exposure or contact with hot exhaust gases and components.**

Refer to Engine OEM documentation for more information.

Aftertreatment Indicators Overview



IMPORTANT: The operator will be informed by the operator warning system when the emission control system does not function correctly and/or an engine malfunction is detected by the engine control unit. Ignoring the operator warning signals will lead to an emission related derate, resulting in an effective disablement of non-road mobile machinery operation.

It is essential to take prompt action to rectify any incorrect operation, use or maintenance of the emissions control system in accordance with the rectification measures indicated by the warnings referenced below.

The Diesel Exhaust Fluid (DEF) indicator illuminates when the DEF is low. Fill DEF tank.

When the DEF indicator is combined with the warning indicator or engine stop indicator engine performance is reduced by the Engine Control Unit (ECU) because the DEF is below a measurable level. Fill DEF tank.

When engine emissions temperature indicator illuminates exhaust gas temperature is high, elevated idle is active, or exhaust filter cleaning is in process. The machine can be operated as normal unless the operator determines the machine is not in a safe location for high exhaust temperatures and disables auto cleaning.
When engine emissions temperature indicator is combined with the warning indicator or engine stop indicator engine performance is reduced by the ECU because the exhaust gas temperature is higher than expected. Follow Diagnostic Trouble Code (DTC) procedure or see your authorized servicing dealer.

When the exhaust filter indicator illuminates the exhaust filter cleaning is in process, aftertreatment system has a fault, or the exhaust filter is in need of cleaning and the operator has disabled auto exhaust filter cleaning. If conditions are safe, the operator should enable the auto exhaust filter clean setting or perform manual service regeneration or follow DTC procedure.

When the exhaust filter indicator is combined with the warning indicator engine performance is reduced by the ECU because there is an aftertreatment system fault or the soot level of the exhaust filter is moderately high. If conditions are safe, the operator should enable the auto exhaust filter clean function. If conditions are not safe, the operator should move the machine to a safe location and engage the auto exhaust filter cleaning mode. Perform manual service regeneration or follow DTC procedure.

When the exhaust filter indicator is combined with the engine stop indicator engine performance is further reduced by the ECU because there is an aftertreatment system fault or the soot level of the exhaust filter is extremely high. If this combination is present, see your authorized servicing dealer.

The auto cleaning disabled indicator illuminates when the operator has engaged the request to disable the auto exhaust filter cleaning function. This icon remains illuminated until the operator re-engages automatic exhaust filter cleaning from the diagnostic gauge. Disabling auto mode is not recommended for any situation unless it is safety-related or if the fuel tank lacks the required fuel to complete the cleaning process.

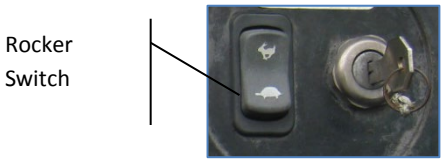
The engine emissions system malfunction indicator illuminates when engine emissions are outside of normal operating range or engine emissions system fault. Follow DTC procedure or see your authorized servicing dealer.

When the engine emissions system malfunction indicator is combined with the warning indicator engine performance is reduced by the ECU because the engine emissions are outside of normal operating range or engine emissions system fault. Follow DTC procedure or see your authorized servicing dealer.

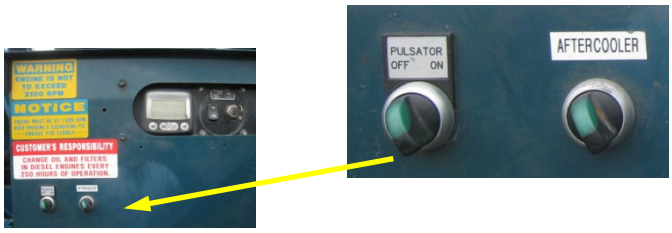
Shutting down the Diesel Engine

Digital Systems

1. Slowly bring the engine back to idle by depressing the lower half of the high/low rocker switch (turtle icon). The engine will return to the preset idle speed.



2. For compressor equipped units, turn Pulsation System *and* Aftercooler knob counter-clockwise for "off" position.



3. For models not equipped with an automatic PTO: Once the 1000 rpm idle speed is reached, firmly disengage the PTO. If the engine is equipped with an automatic PTO, simply let the engine idle until cool.

4. Once the engine has cooled to normal operating temperature, it may be shut down.
Turn the key/ignition switch counter-clockwise to the "off" position. Key may now be removed.

Analog Systems

1. Engine controls should be set to low idle speed by turning the throttle control cable.

Throttle Cable

2. For compressor equipped units, turn the Pulsation System and Aftercooler knob counter-clockwise for “off” position.

3. For models not equipped with an automatic PTO: Once the 1000 rpm idle speed is reached, firmly disengage the PTO.

PTO clutch lever

4. Once the engine has cooled to normal operating temperature, it may be shut down. Turn the ignition switch counter-clockwise to the “off” position.

Emptying the Baghouse

The baghouse hopper should be emptied at least once a day. This will ensure that there is proper air space for the cartridge filters to operate efficiently and correctly without overloading.

1. Shut down vacuum system (see shutting down diesel engine). Engine must remain at idle speed.
2. Place drum under waste chute at rear of machine with barrel lid provided.
3. Open rear/bottom waste valve.
4. Auger equipped units: pull out the push button switch located adjacent to the waste valve or rotate auger switch to on position.

This will start the auger and push the excess dust that has accumulated in the bottom hopper of the baghouse out through the waste valve at the rear into the drum. Be sure to monitor the amount of waste going into the barrel to avoid overfilling and spilling of dust.

5. Once all excess dust has emptied from the baghouse, depress the push button to stop the auger or rotate the auger switch to off position.
6. Close the waste valve to ensure no fugitive dust falls out during transport or while in use.

It is the responsibility of the owner(s), operator(s) and user(s) to comply with all regulations and laws pertaining to waste disposal and hazardous waste disposal.

Electric Unit List of Major Equipment

Electric Engine

Powers centrifugal fan

Centrifugal Fan

Supplies vacuum to the baghouse. Either a direct drive (80k systems) or belt drive (7k, 12k, 20k, 45k and 60k systems) is used to transfer power from the engine to the fan.

Baghouse

Main part of unit which houses filter cartridges. Also incorporates hopper in the lower half to hold waste dust from the filters. This dust is removed by an electric driven auger or a gravity discharge system and should be emptied at least once a day.

Pulsation System

This system keeps the cartridges clean and increases their life span. It turns on automatically by pushing the pulsator start button. This system is preset from the factory and no adjustments are needed.

Waste Auger/Gravity Discharge

An electrically driven auger or gravity discharge chute is located in the lowest part of the hopper. It is used to empty any waste that accumulates in the baghouse from the pulsation of the cartridges. The auger is controlled by an on/off switch at the rear of the unit adjacent to the waste valve/chute.

Electric Unit Machine Set Up

1. Make sure unit is on firm level ground and that all support legs are extended.

2. Connect any vacuum hoses and route them to where they are needed.

3. Connect the proper size airline to the unit's regulator/filter assembly. The supplied air must be dry. Moisture laden air will contribute to clogged filters and greatly reduce their life span. The regulator is preset from the factory and does not require adjustment. 75 psi max.

4. Electrical requirements for the DC7E, DC12E and the DC 20E are as follows: A 460-volt, 3 phase, 4 wire, 60 Hz input with at least a 50-amp circuit breaker.

   Electrical requirements for the DC 45E: 460-volt, 3 phase, 4 wire, 60 Hz input with at least a 300-amp circuit breaker service.

   Connections are made at the disconnect inside the main control cabinet and should be done by a qualified electrician.

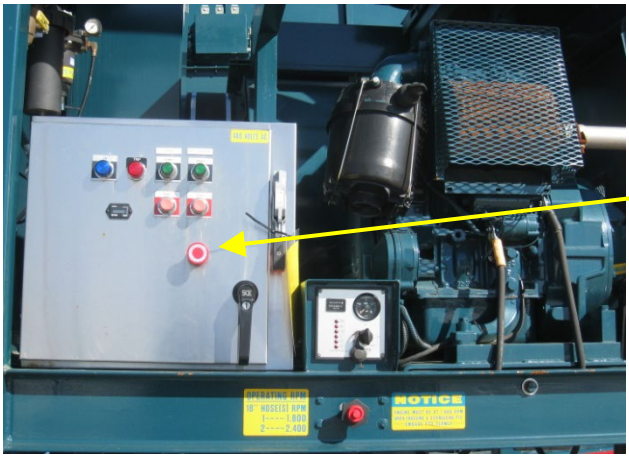
Only qualified personnel should attempt the installation operation and maintenance of this equipment. Do not touch electrical connections before power has been disconnected. Electrical shock can cause serious or fatal injury. Be sure system is properly grounded before applying power.

After sufficient electrical connections are made, and both 20" hose connections are open along with a dry air supply, you are ready to collect dust through the system.

Electric Unit Starting the System

Units equipped with a belt drive: (20k, 45k and 60k units) check belt tension every two-three months and adjust accordingly. Adjustment should be one inch of travel at the middle of the belt. Adjust as necessary.

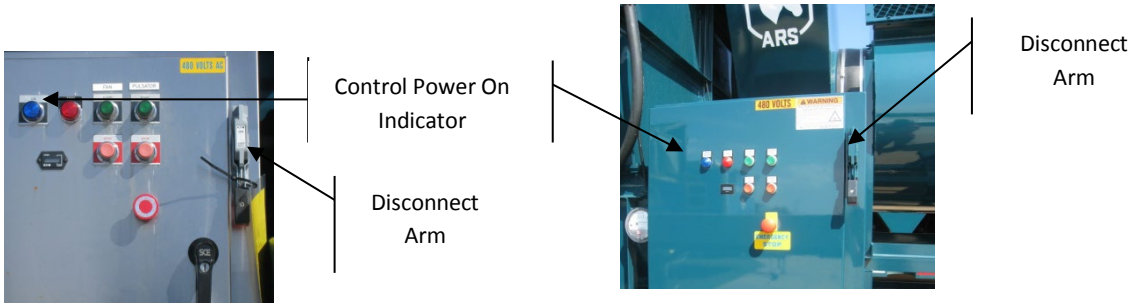
Caution: The 7k and 12k units are equipped with one (1) E-Stop. This emergency stop is located at the main control panel and must be pulled out for the unit to operate. Pushing the switch in will shut down the entire system.



The 20k, 45k, 60k and 80k units are equipped with two (2) E-Stops. One at the main control panel and one at the auger start/stop station at the rear of the unit. Both switches must be pulled out for unit to operate. Pushing in either switch will shut down the entire system.

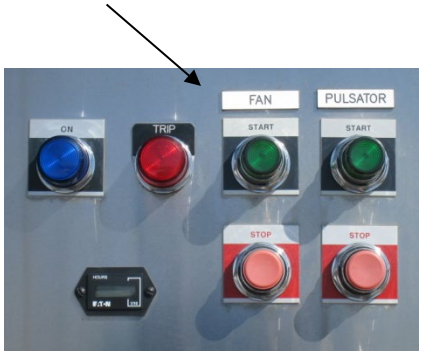
Emergency Stops

1. Push the disconnect arm UP. This arm is located on the upper right of the control panel.



Light should illuminate on front of panel.

2. Start the blower motor, push Fan Start button on front of control panel.

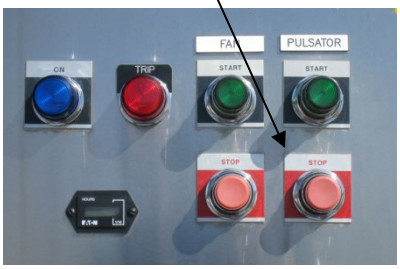


3. Start the pulse system by pushing the Pulsator Start button.

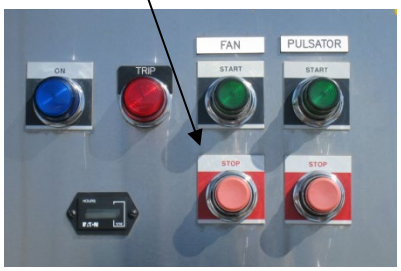
System is ready.

Electric Unit Shutting Down the System

1. Stop the pulse system, push the Pulsator Stop button.



2. Shut down the blower motor, push Fan Stop button on the front of the control panel.



3. Push the disconnect arm DOWN/OFF. This arm is located on the upper right of the control panel.

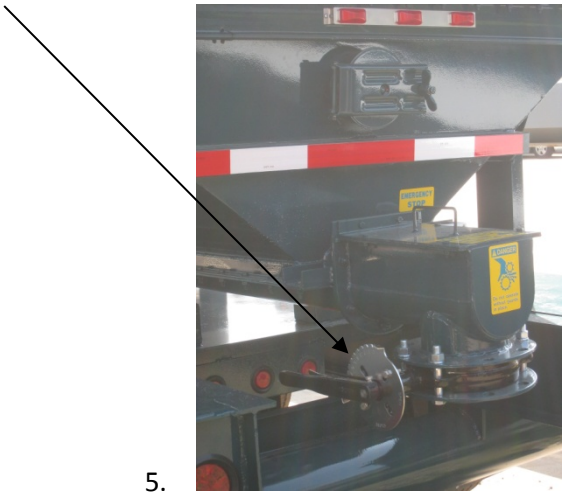
Disconnect Arm

Electric Unit Emptying the Baghouse

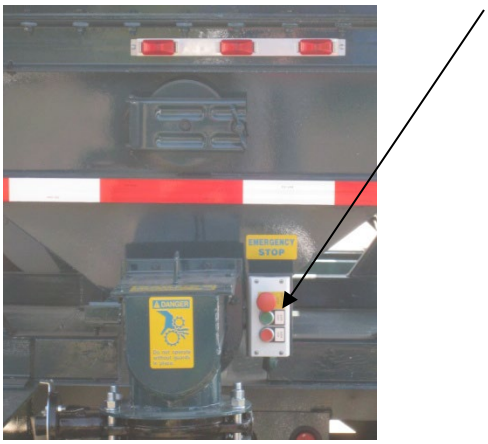
The baghouse hopper should be emptied at least once a day. This will ensure that there is proper air space for the cartridge filters to operate efficiently and correctly *without* overloading.

1. Shut down vacuum system, push Pulsator stop button on the control panel.
2. Push the Fan Stop button on the control panel.

Motor must remain off at this time.

3. Place drum under waste chute at rear of machine with barrel lid provided.
4. Open rear waste valve.
5. 

6. For units equipped with augers: press the start button at remote auger start/stop station.



This will start the auger and push the excess dust that has accumulated in the bottom hopper of the baghouse out through the waste valve at the rear into the drum. Be sure to monitor the amount of waste going into the barrel to avoid overfilling and spilling of dust.

7. Once all excess dust has emptied from the baghouse, depress the Stop button to stop the auger.

8. Close the waste valve on all units to ensure no fugitive dust falls out during transport or while in use.

It is the responsibility of the owner(s), operator(s) and user(s) to comply with all regulations and laws pertaining to waste disposal and hazardous waste disposal.

Optional Air-Dry System

Desiccant Dryers

1. Check salt level daily using the sight gauge (pictured below).

Sight Gauge

2. Check hatch gaskets when inspecting levels.

3. Check drain hoses for any obstructions.

4. Check drain hose on filter.

5. Pressurize system and check for leaks.

6. Drain the bottom of the salt tank at least once every 4 to 8 hours, depending on use.

7. Drain compressed air filters at the end of every day.

Filter

IMPORTANT

Use of chemicals other than manufacturers recommended desiccant will void the warranty on the dryer.

There are several factors that affect filter cartridge life.

1) Clean dry air is very important. Make sure that your drying system is working properly and that the Desiccant Tank has salt in it at all times. Also drain the water out of the tanks at least once per day.

2) Pulsing of cartridges. You want to make sure that your pulsators are turned on at all times. When you shut down for the day let your pulsators run for a few minutes without having the fan engaged. This will help clear the filters.

3) Emptying of hopper. Make sure you empty the hopper at least once a day depending on dust load. It is important that the dust does not build up inside of the hopper to prolong filter life.

Normally we will see a delta of 10 on the gauge when the cartridges need changed but if you are seeing dust coming out of the fan, or you have a severe loss of suction, it may be time to change your filters.

You should expect to have a life of 1800 to 2500 plus hours for your cartridges.

If you have any additional questions please contact ARS RECYCLING SYSTEMS.

Phone 330-536-8210

Baghouse Filter Replacement

CAUTION: Only individuals with proper training should operate or perform maintenance on this machine. Before performing any maintenance on this unit, the unit and/or compressor must NOT be running. All hoses must be disconnected. After maintenance has been performed, all hoses connected to the machines must have retaining devices in place.

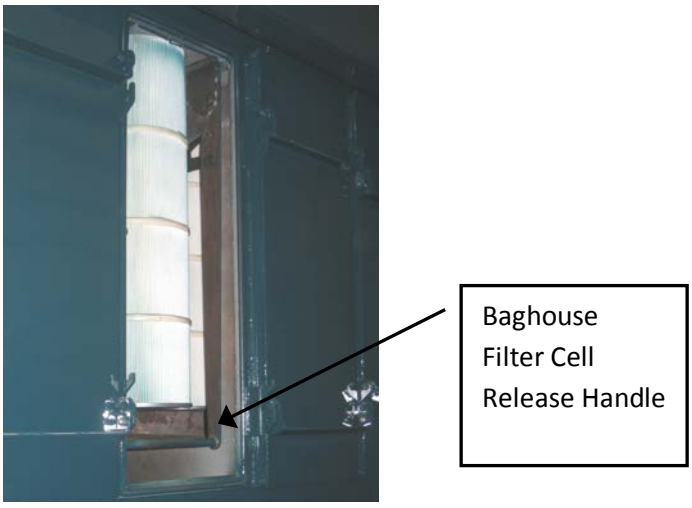
Proper personal protection equipment must be worn during operation.

1. Remove locking device(s) from side of baghouse.
2. Rotate door handles upward.

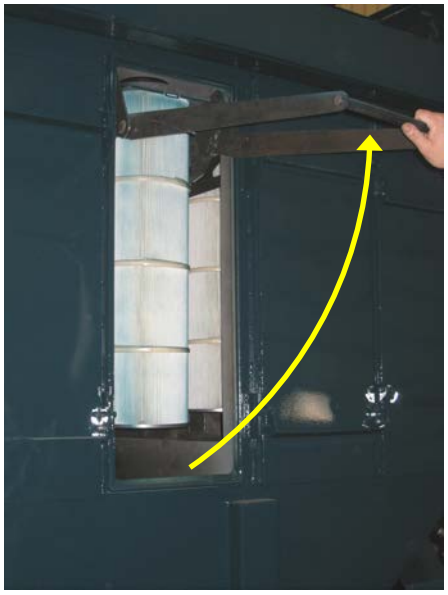
Baghouse Filter Replacement

3. Lift up and remove each door from the baghouse filter cells.

4. Locate the release handle just inside the baghouse filter cell.



5. Pull filter release handle outward and upward until it is in the horizontal position.



Baghouse Filter Replacement

6. Slide each filter cartridge out until it reaches the outside of the baghouse. Rotate cartridge upward to release it from interlocking filter head plates. Repeat this process to remove each filter cartridge from each filter cell.

7. Reverse the process to install new filters; rotating the filter cartridges downward to interlock the filter head plates. Once in place, the entire row of filter cartridges should sit within the baghouse enclosure.

Baghouse Filter Replacement

10. Slowly bring the release handle downward to the vertical position.

This action will raise and secure the filters.

Baghouse Filter Replacement

11. Reinstall the doors of each filter cell compartment. Rotate the door handles downward into locking position.

12. Reinstall locking device on side of baghouse.