Global Leader in High Security Information
End-of-Life Solutions for Over 50 Years

Operation and Maintenance Manual

SEM Model SSD1-HS Disintegrator

MAN-015 | Created: 12/10/2019 | ECN: 00486

Serial Numbers SSD1-0100 and up
Serial Numbers SSD1-0104-50 and up

For service, parts, and customer support, contact us:
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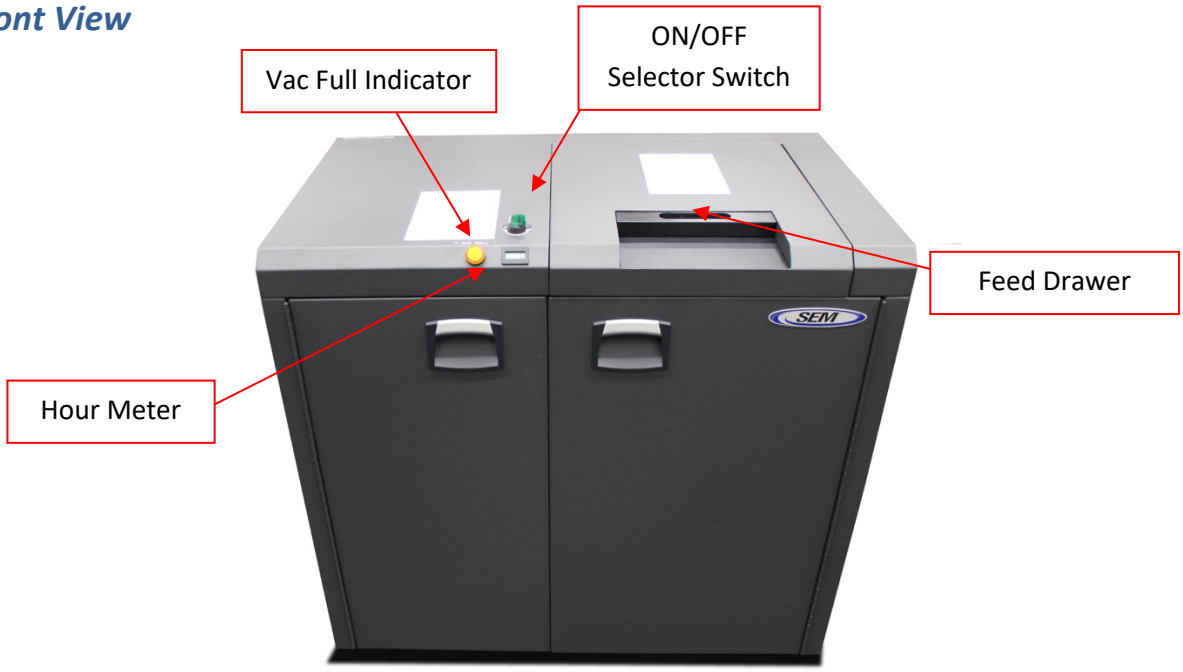
1 - Safety Considerations

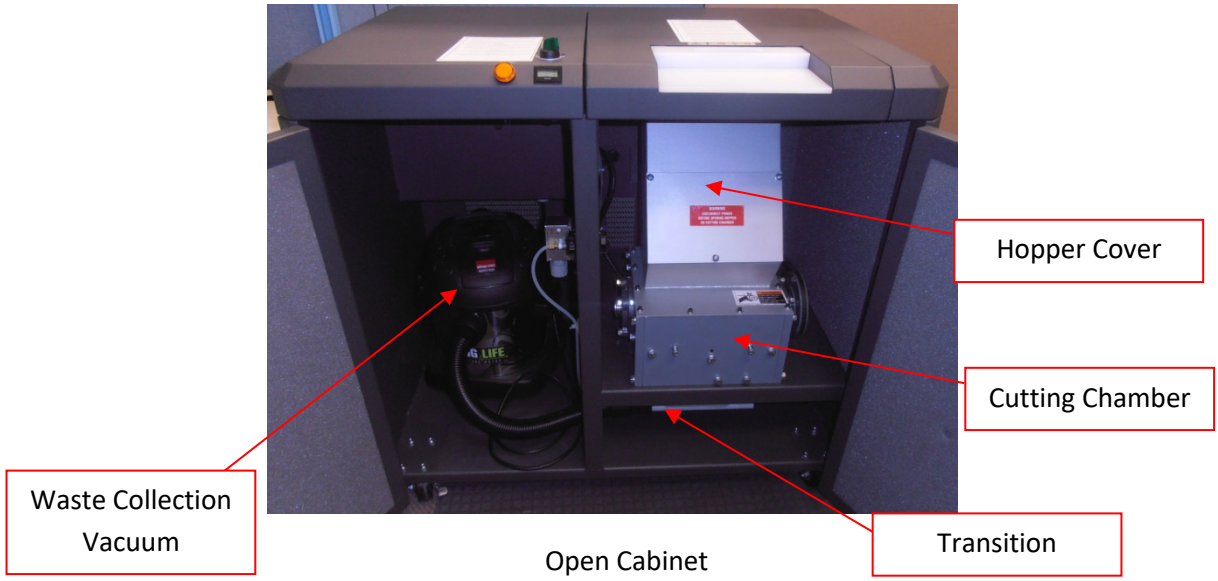
- ✓ Read and understand instruction manual and be aware of all warning labels.
- ✓ **Always** employ proper Lock Out Tag Out (LOTO) procedures when shredder is not in use, when servicing shredder or when performing routine shredder maintenance including cleaning.
- ✓ Make sure that all guards and access panels are in place at all times, unless the power is locked off for maintenance work or cleaning.
- ✓ SEM recommends that machine operators wear safety glasses, hearing protection, a mask, and if doing maintenance or opening the cutting chamber, cut resistant gloves. It is up to each customer to determine the PPE for their individual site.
- ✓ **Always** know where the emergency stop buttons are located.
- ✓ **Always** know or have quick access to emergency phone numbers.
- ✓ **Always** ensure that all maintenance and operating personnel read and understand this manual, including those personnel working second or third shift.
- ✓ **Always** have a standard break-in time for a new operator. A minimum of two hours is suggested.
- ✓ **Always** wear safety glasses when operating shredder.
- ✓ **Never** operate this or any other machine while under the influence of drugs, alcohol, or medications.
- ✓ **Never** wear loose fitting clothing, ties, or jewelry while in the vicinity of this shredder.
- ✓ **Never** allow long hair in the vicinity of the machine without use of a protective hair net.
- ✓ **Never** place any part of your body in or on any part of the machine while in operation.
- ✓ **Neve**r allow other personnel within ten feet of this machine while in operation.
- ✓ **Never** remove guards, perform maintenance, or clear jammed debris without first locking out power disconnect.
- ✓ **Never** allow horse play around machine.

2 – General Overview

2.1 Front View



Closed Cabinet

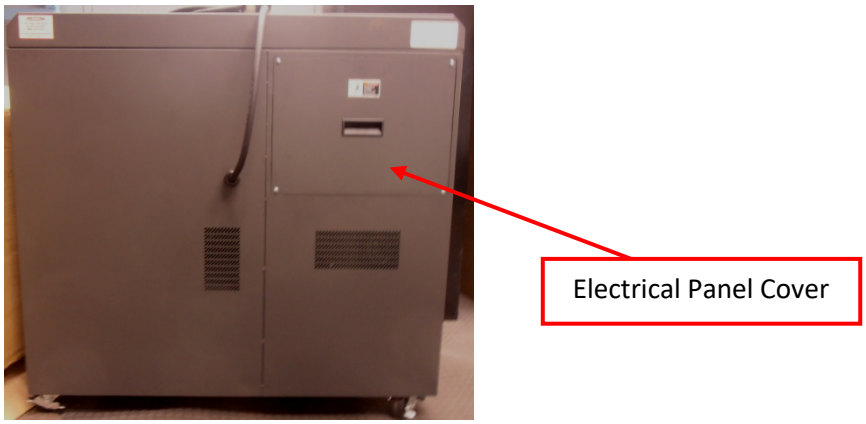


Open Cabinet

2.2 Rear View

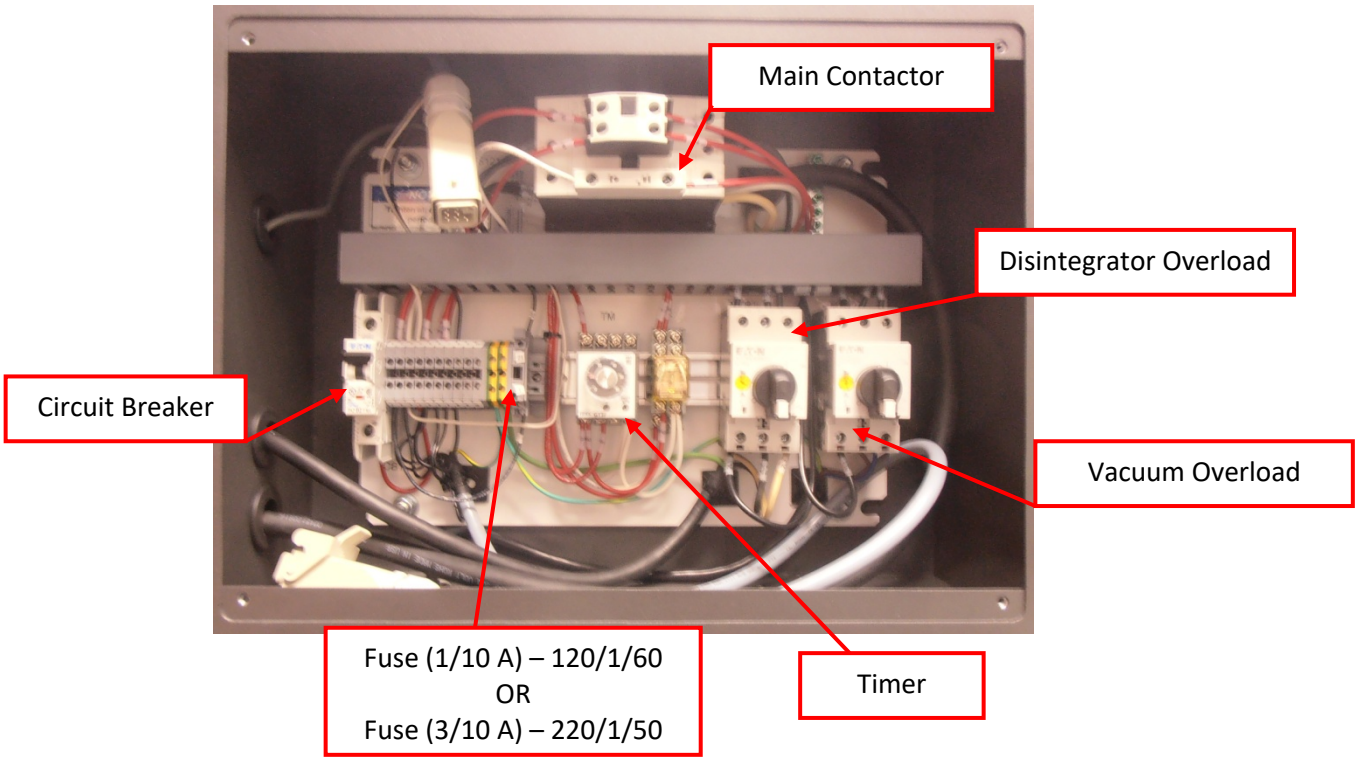
Accessing the electrical panel:

- Tools Required: Phillips head screwdriver or 5/32” Allen wrench.
- The electrical panel is located at the rear of the machine and is accessible from the rectangular cover that is held in place by four bolts. See section 7.3 for electrical panel diagrams.



Rear Cabinet

2.3 Electrical Panel



3 - Unpacking

The Model SSD1-HS has been secured to a pallet for shipping. Please inspect equipment immediately for any shipping damage.

Important Note: Prior to unpacking, if there is any visible damage to the machine or to the crate during shipping, the receiver must note what is damaged on the Bill of Lading and contact the shipping company immediately.

Packaging: Retain all packaging for a minimum of 90 days after receiving.

Tools needed:

- Hammer
- Pry bar
- Strap cutters
- Fork truck (lifting capacity minimum 1,000 lbs.)

Unpacking:

1. Cut straps and remove plastic wrapping from the unit.
2. Pry off the two boards parallel to the front and rear of the unit.
3. Using a lift truck, slide forks under unit and lift off the pallet.
4. Transport unit towards its designated receptacle and rest on to the ground. Be sure to lock casters in place to reduce chances of unwanted movement.

Unit Location:
The Model SSD1-HS can be located in an office or warehouse area within 10 feet of a wall receptacle. It is recommended that the machine be at least 3-4 inches away from the wall for proper ventilation.

Note: This machine is equipped with locking swivel casters for easy movement on flat surfaces. Due to the weight and size of the unit, SEM recommends using a forklift with a minimum lifting capacity of 1,000 lbs. instead of pushing the unit up or down inclined surfaces so as to avoid potential damage to the unit and harm to personnel due to loss of control while moving the unit.

4 – Installation

4.1 Power Requirements

FOR 110-120 VOLT/1-Phase/60HZ/1 HP
This machine has been supplied with a power cord and male plug for 30 amp service.
The male plug is a NEMA # L5-30P and requires a female connection as noted below, to be installed by the customer.
Ref: NEMA # L5-30R.

FOR 220 VOLT/1-Phase/50HZ/1 HP
Note to Installer:
This machine has been supplied with a power cord for 20 amp service.

Note: Any oversea shipments at 220 Volt/1-Phase/50HZ must supply their own plug unless otherwise specified at time of the order.

FOR 220 VOLT /1-Phase/50HZ/1 HP with 2 power cords
This machine has been supplied with two separate power cords for 13 Amp service. Be sure that both cords are plugged into dedicated outlets.

Alternative Options:

- Replace plug with customer supplied substitute while maintaining proper amperage ratings. This must be done by a licensed electrician while observing local electrical codes.
- This machine can be hardwired to a safety disconnect for permanent installations. This must be done by a licensed electrician while observing local electrical codes.

4.2 Resetting Overloads

In the event of a voltage or amperage spike, one or both of the overloads on the electrical panel will trip in order to prevent damage to the unit. This will cause the unit to shut down immediately, on both single and double power cord units.

- De-energize the unit using proper LOTO procedures.
- Open the electrical panel cover on the back of the unit on the vacuum side. Requires Philips head screwdriver, 5/32” or 9/64” Allen wrench.
- Reset any tripped overloads or safety disconnects. Tripped overload will point sideways.
- Plug in the unit to test if it is on and replace the electrical panel cover.

5 – Operation

Please read this section carefully. Most problems occur during the first hours of operation. Most problems can be eliminated by careful review of the operating, maintenance, and recommended service instructions.

Product destruction rate depends on the material, size of media, and the desired particle size. All units are equipped with timed shutdown to help prevent jamming of the disintegrator. When **Selector Switch** is in the ***OFF DELAY*** position, the disintegrator will run for an additional three to five minutes to clear the chamber. This will help to prevent jams that would require some disassembly to gain access to the cutting chamber.

5.1 Start-Up Procedure

NOTE: The cutting chamber cabinet is equipped with safety switches that will immediately shutdown the machine when either the door is opened or the feed mechanism is removed to prevent injury. Both doors should remain closed while the machine is in operation. Do **NOT** use the door switch as a method of shutting down the machine, as jams and possible injury can occur. Always use the selector switch to initiate a timed shutdown and avoid jamming.

Pre-start-up:

- ✓ Familiarize yourself with all controls and button locations.
- ✓ Ensure that all guards and covers are in place.
- ✓ Ensure the area is clean.
- ✓ Check the vacuum capacity and install a new waste bag if necessary.

Start–up:

1. Plug the machine into an appropriate receptacle.
2. Make certain that the cabinet doors are closed. Safety switches will prevent startup if either door is open.
3. Pull top-feed door toward the front of the machine until it reaches a stop.
4. Turn green selector switch to ***START.*** It will pop over to ***ON*** after turning to ***START***.
5. Listen for machine to engage.

5.2 Shutdown Procedure

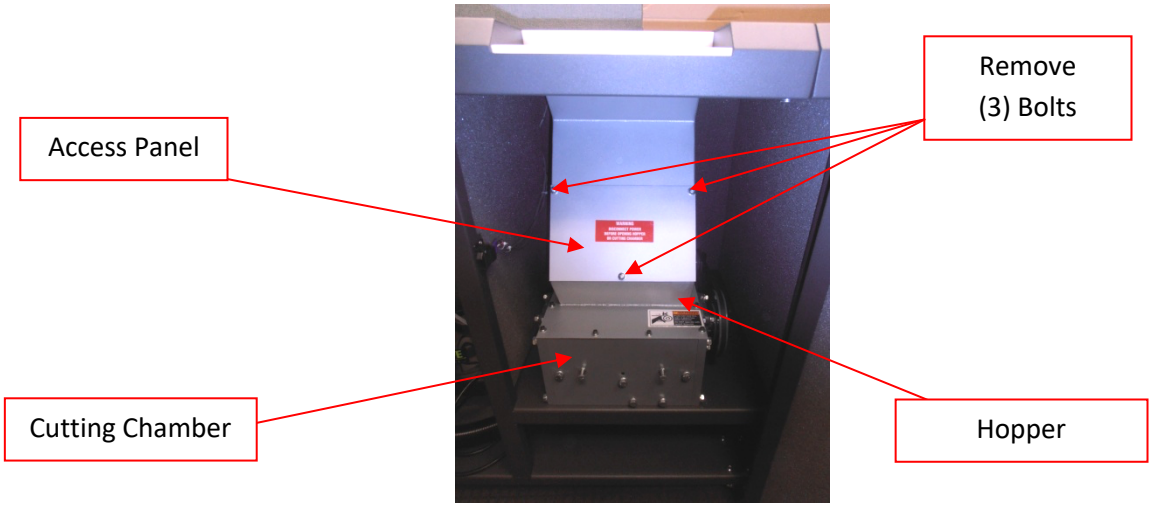
To shut down the machine, wait 60 seconds after the last piece of media is fed despite its listed feed rate, then turn the selector switch to the ***OFF*** position. This will initiate a timed shutdown. The machine will continue to run for three minutes, while the cutting chamber, hopper, and evacuation line are cleared of any partially destroyed material.

5.3 Clearing a Jam

Important: In case of emergency or overfeeding, opening the front door of the disintegrator cabinet will disengage a safety limit switch and immediately shut down the machine. This procedure should be reserved for emergency situations only. **Bypassing the timed shutdown can result in a jam.**

To clear a jammed or locked rotor:

1. Make sure selector switch is in ***OFF*** position.
2. De-energize machine using proper LOTO procedures.
3. Open front door of disintegrator cabinet.
4. Remove plate on front hopper to access the cutting area.
5. Remove loose product (SEM recommends wearing cut resistant gloves).
6. Rotate rotor toward the rear of the machine (using the drive belt) to free its movement.
   Note: Make sure that the rotor can make two full rotations. Otherwise, the machine is still considered jammed and will still have material in the chamber.



Hopper access panel

To restart:

1. Re-secure plate on front hopper.
2. Connect to power.
3. If necessary, reset overload switch or circuit breaker (located in electrical panel on rear of machine).
4. Close main door.
5. Turn selector switch to ***START*** position.

NOTE: Repetitive jams also can be a result of knives that require sharpening. If machine has no power, reset circuit breakers and overload on electrical panel.

6 - Feeding Information

6.1 Overview

- Before introducing any material into the feed slot, the machine and vacuum must be turned on and operating. The material collection vacuum must be checked periodically and emptied for continued operation.

- **New Operators:** New operators should be given a minimum two hour break-in/training period when starting to use this machine.

- When destruction is complete, allow the unit to operate for 60 seconds after the last piece of material is destroyed before initiating the three minute timed shutdown. This will prevent build up in the cutting area and evacuation line, ensuring proper operation for the next user.

- Vacuum collection bags must be periodically changed for proper operation. The **Vac Full** light will illuminate when vacuum pressure drops, indicating that the bag is full. DO NOT INSERT ANY ADDITIONAL MATERIAL. Wait 60 seconds from last fed piece and initiate timed shutdown. Bypassing timed shutdown at any point may cause a jam on start up.

- In the event of a voltage spike, no matter the cause, on both single and double cord machines, one or both overloads will trip and the machine will shut down. Open the electrical panel and reset the overloads. See sections 2.2 and 2.3 for locations.

- **Vac Full:** Do not shut down the machine when the vac full light comes on. Wait 60 seconds and initiate timed shutdown before changing bag.

Note: For optimal sound reduction after inserting media or other materials, close feed drawer. Destruction rates can vary depending on the screen size selected.

Feeding: See feed rate chart in section 6.3

1. Connect power to the machine.
2. Turn selector switch to ***START***.
3. Listen for vacuum and cutting chamber to engage.
4. Pull feed drawer toward front of machine.
5. Place material into feed drawer.
6. Close feed drawer and the material will fall into the cutting chamber.
7. Repeat 4-6. Note that closing the feed drawer all the way after each feed cycle provides the most sound reduction.

6.2 Acceptable Materials and Required Deconstruction

It's imperative that this section is not overlooked while using the Model SSD1-HS. Most media types contain some materials that are hazardous to both the machine and the user.

Certain devices, such as phones and tablets, will need to be deconstructed to remove parts including batteries, thick metal pieces, glass, and more. For instructions on the disassembly of phones, tablets, and other devices please use online resources, using search terms such as "teardown" or "disassembly" and the product name. There are many tutorials available online.

Please carefully read the lists below and contact SEM customer service with any questions: 1-800-225-9293.

This device is not intended to shred full encased SSDs, only the boards.

Acceptable Materials:

- Solid state drives (with case removed)
- RAM, PC boards
- Flash drives (with removed metal casings)
- Floppy and Zip disks
- SIM chips and SD cards
- Flash memory

The materials listed above have been tested and approved for destruction using the Model SSD1-HS. Please contact the manufacturer before attempting to destroy anything not listed here.

Caution: Care must be taken when destroying media with the Model SSD1-HS. In some instances the media shown above will have undesirable counterparts that should not be introduced to the machine. Below is an example of what should **NEVER** be destroyed using this machine.

- Hard disk drives
- Capacitors
- Batteries
- Glass
- Thick metal parts
- Screws

6.3 Feed Rate

Important: See the following chart for feed rates and throughputs for various types of media that can be disintegrated using the SSD1-HS.

Important: The feed rate should be adjusted accordingly depending on the size of the media being destroyed. Larger material should have a reduced feed rate.

Important: All throughputs listed use a standard 1/16” screen.

Name	Description	Size (inches)	Feed Rate (pcs/sec)	Throughput (pcs/hr)
RAM	PC internal memory sticks	5.0 x 1.5	1/30	120
Thumb Drive	PCB only	1.0 x 0.5	5/60	300
3.5" SSD	Standard size	3.5 x 4.0	1/60	60
2.5" SSD	Laptop size	2.5 x 3.0	1/60	60
Phone Board	Cell phone PCB	4.0 x 1.0	1/30	120
Tablet Board	Processor, WiFi, Audio PCB	4.0 x 2.0	1/30	120
PCB A	Half size HDD PCB	3.5 x 3.0	1/60	60
PCB B	Laptop HDD PCB	2.5 x 3.0	1/60	60
PCB C	Full size HDD PCB	3.5 x 4.0	1/60	60
SIM	Cellphone chip	0.5 x 0.5	4/15	1000
MicroSD	Small data storage	0.4 x 0.4	4/15	1000
Flash Memory	Digital camera storage	0.75 x 0.75	4/60	240

Keep a copy of this chart by the unit for operator reference.

Important: Feed rate is a vital characteristic that needs to be approached carefully, as over-feeding the unit will cause accelerated knife wear as well as potential jams.

7 – Maintenance

Important / Caution: Before performing any service or maintenance on this machine, make certain to de-energize the machine using proper LOTO procedures.

7.1 General Maintenance

Cleaning:

Every eight hours of operation:

1. De-energize unit using proper LOTO procedures.
2. Clean all surfaces inside unit and outside with cleaning solution.
3. Wipe up excess cleaning solution and vacuum all other loose debris.

Lubrication:

Minimum twice yearly or as needed:

1. Grease fittings are accessible on top of the rotor bearings on each side of the cutting chamber.
2. Grease with **Gulflex "A"** multi-purpose, or equivalent.

Filter Change:

Approximately every 16-20 hours:

1. De-energize unit using proper LOTO procedures. SEM recommends wearing a mask, gloves, and eye protection
2. Remove the vacuum from the vacuum cabinet.
3. Unlock the tabs on the sides and pull the vacuum from the container. Remove the hose if necessary.
4. Pull the filter out of the middle and replace it.
5. Replace the vacuum in the container and reattach hose if necessary.

7.2 Emptying the Waste Collection Vacuum

The waste collection vacuum is located inside of the cabinet on the lowest shelf. The vacuum has a four-gallon capacity and should be checked regularly. Upon the first few cycles, operators should frequently check the vacuum so that they can gauge how often it will need to be emptied. Follow the instructions below to check/empty the waste collection vacuum. A **Vac Full** indicator located on the top cover will illuminate when the vacuum is full.

When the light comes on, wait 60 seconds then initiate timed shutdown.

1. De-energize unit with proper LOTO procedures.
2. Ensure you are wearing appropriate PPE (gloves, mask, eye protection at minimum).
3. Open the vacuum cabinet.
4. Pull the vacuum forward and remove it from the cabinet.
5. If necessary, disconnect the vacuum's power cord.
6. Open the two clips on either side of the vacuum.
7. Remove the vacuum lid and set aside.
8. If the **Vac Full** light is illuminated, then remove and replace the bag. Take caution in removing the bag as dust particles may disseminate.
9. Install a new vacuum bag.
10. Reinstall vacuum in reverse order.

NOTE: The waste collection level should be checked frequently and during every pre-startup procedure. Overfilling the waste collection vacuum can result in damage to the vacuum unit and to the machine. If the **BIN FULL** light is illuminated, change the bag immediately to avoid damage to the unit.

7.3 Accessing the Cutting Chamber

The drive belt should be inspected periodically for excessive wear or damage. The cutting chamber is where the shredding occurs. One might need the access it to clear a jam, service the knives, or adjust the drive belt. Follow the steps below to access the cutting chamber:

1. Tools Required:
    a. 7/16” socket wrench
    b. Phillips head screwdriver
    c. 5/32” Allen wrench
2. De-energize the unit using proper LOTO procedures.
3. Remove the feed assembly (two bolts under the feed assembly and inside door) using Phillips head screwdriver or 7/16” socket wrench.

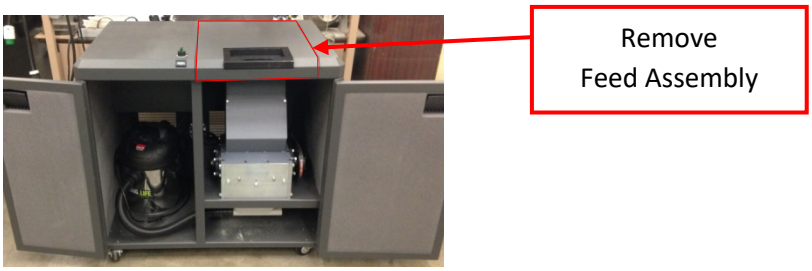


Figure 5.0: Feed assembly

4. Lift Feed Assembly up from the front while pulling it towards the operator of the machine.
5. Remove the 12 #10-32” screws using 5/32” Allen wrench in the bottom of the hopper.

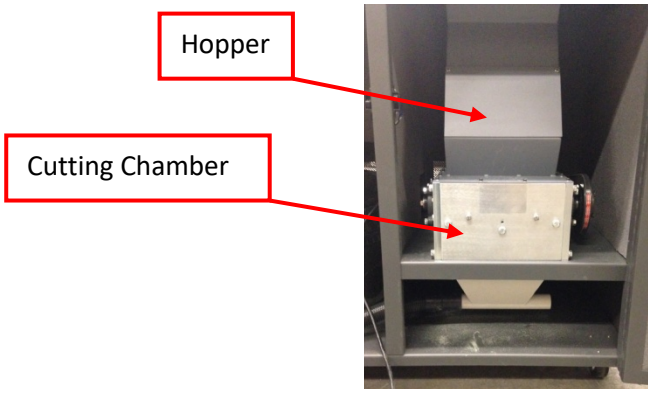


Figure 5.1: Removing hopper

7.4 Knife Removal and Sharpening

Blade changes should be done as needed and is recommended based on usage as knife wear varies depending on the material being destroyed. In all cases, knives should be changed and sharpened at a minimum of 25 hours of usage to avoid excess dust and potential jams. SEM highly recommends that this work be completed by SEM trained technicians. Damage to equipment and harm to personnel may occur if work is not performed correctly.

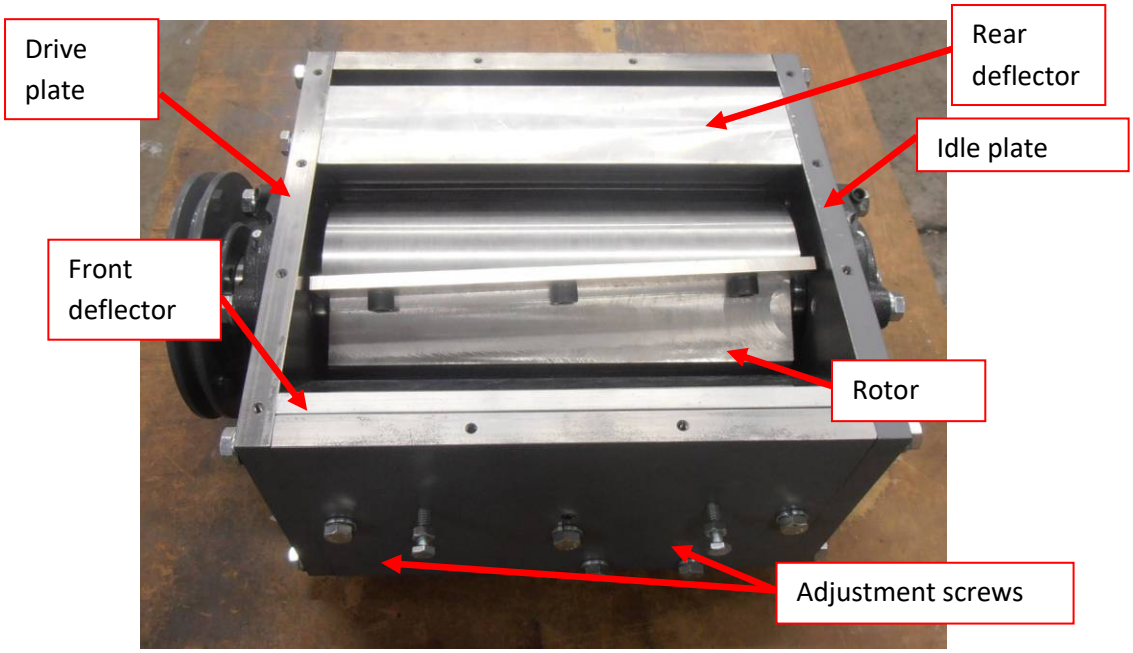


Figure 1 – Chamber Overview

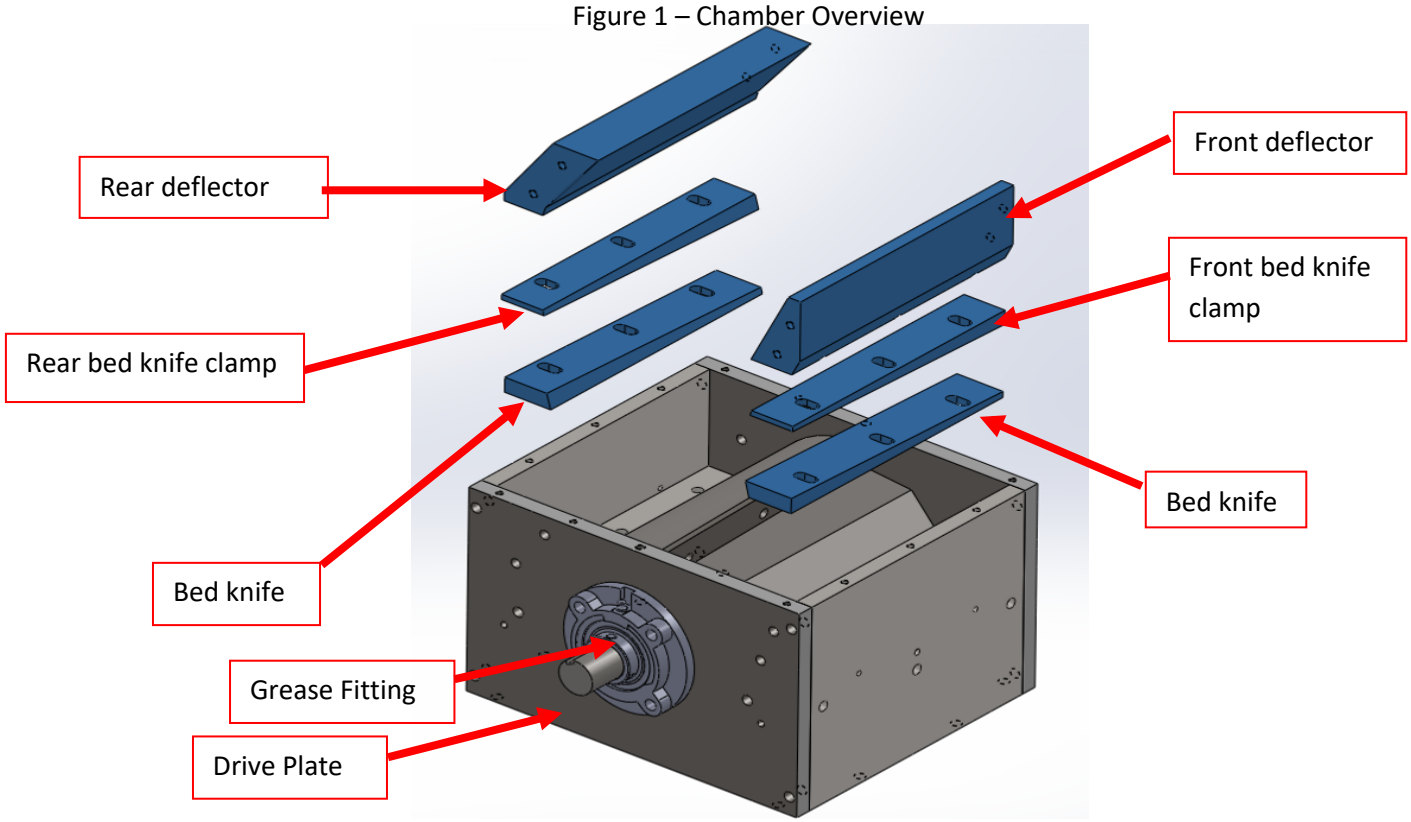


Figure 2 – Exploded Chamber

Note: While changing knives, it is recommended to wear abrasive resistant cut gloves

To avoid downtime, it is best to have a spare set of sharp knives on hand at all times. Dull blades removed from the machine must be sharpened as a set (3 rotor/2 bed) by a qualified sharpener to ensure proper operation. SEM offers sharpening services. Call 800-225-9293 for more information.

1. Remove front and rear deflectors. Requires 1/2" wrench.

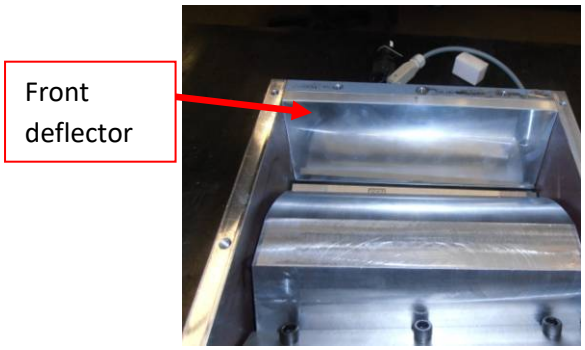


Figure 3

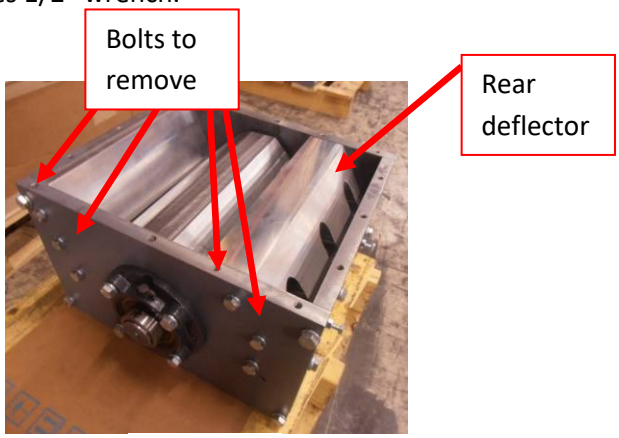


Figure 4

2. Remove bolts from rotor knives and remove knives**.** Requires 5/16" Allen drive socket bit.

   CAUTION: Knives are sharp.

3. Remove bolts from bed knives.
   a. Replace one knife at a time.
   b. Make sure to keep track of the bed knife clamps.
4. Wipe bed knife clean and place atop bed knife seat with **thicker end towards drive plate** and blades facing rotor**.** One knife will be upside down.

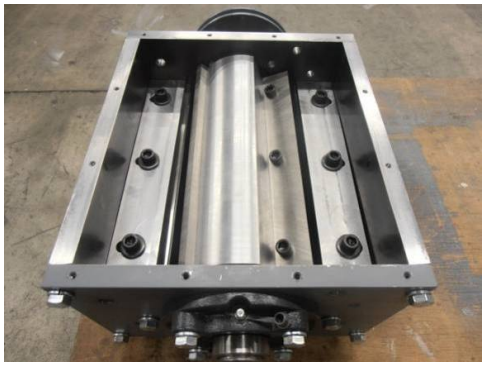


Figure 5 – Shown with bolts

5. Wipe bed knife clamp clean and place atop bed knife with thick end towards idle plate (opposite drive) and the tapered side facing the rotor and the wide part of the taper being on the bottom.

Front bed knife clamp

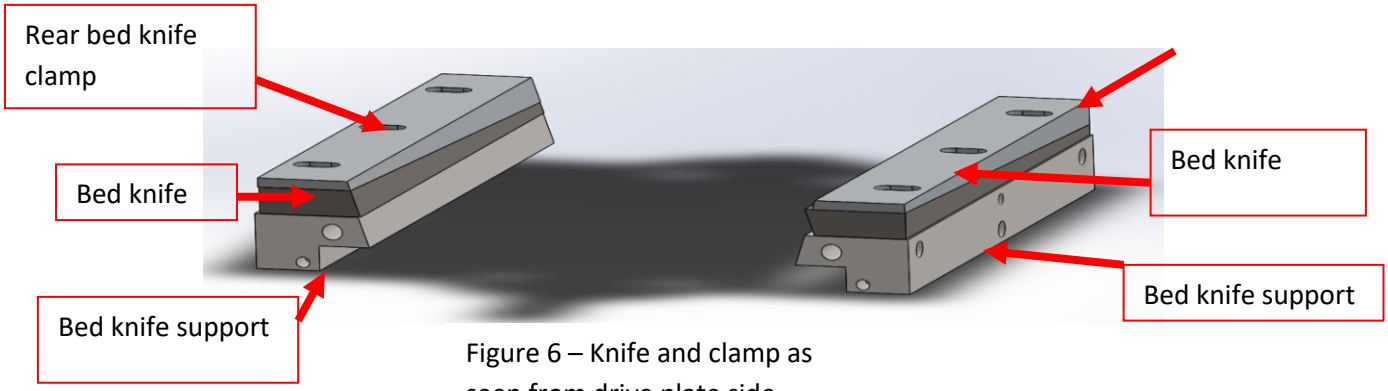


Figure 6 – Knife and clamp as seen from drive plate side

6. Install bed knife bolts with six 3/8”-16 x 1 1/2" socket head cap screw and six 3/8” thick black washer through top of clamp. Set to hand tight. The flat side of washer should be touching clamp.
7. **Repeat steps 4-6 for the second bed knife.**
8. Wipe off rotor flats and rotor knives before attaching them one at a time with nine 3/8”-24 x 3/4" socket head cap screw. Beveled edge of knife sits in notch of rotor corner.

Figure 7

9. Torque rotor knives to 50-55ft./lbs. using a torque wrench with a 5/16” Allen drive socket bit.

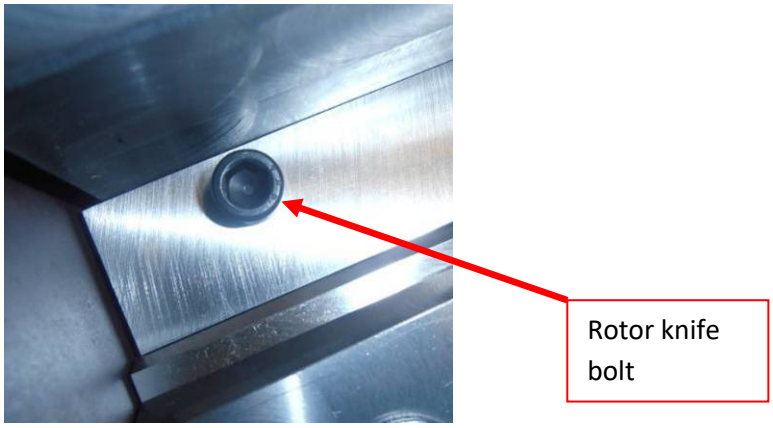


Figure 8

10. Set clearance between rotor and bed knives to .005” using adjustment screws and a feeler gauge, rotating the knives in reverse (clockwise) so flat to flat contact will not cut feeler gauge.

a. Process may need to be repeated until proper clearance is achieved.

b. Double check clearance after tightening bolts as gap should be checked on each knife on rotor and across the whole surface of each knife.

c. Adjustment screws require a 7/16” wrench.

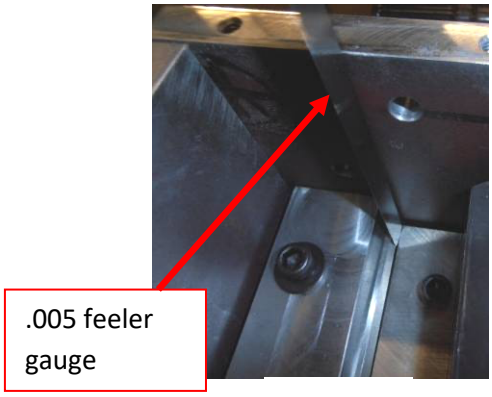


Figure 9

Figure 10

11. Torque bed knives to 45-50 ft./lbs. Torque wrench should not be used as a socket wrench and should be calibrated to ensure proper tightening to avoid damage. SEM offers a complete toolkit for this system. Double check knife clearance after torqueing bolts.

12. Attach front and rear deflectors as shown with eight 5/16”-18 x 1 1/4" hex bolt and 5/16” lock washer. Requires 1/2" wrench.

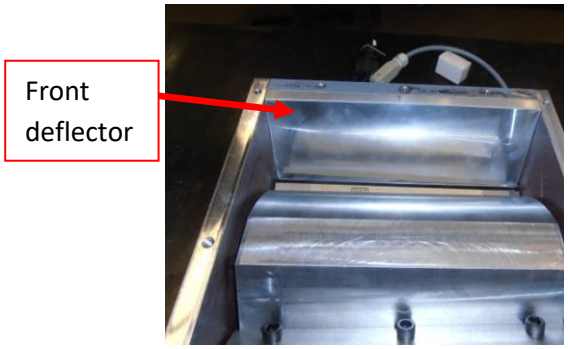


Figure 11

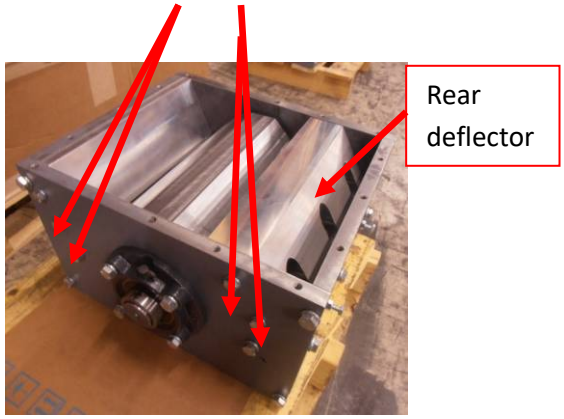


Figure 12

13. Do a final check of bolt torques, assembly bolt tightness, and knife gapping.

14. Contact SEM for details about service and re-sharpening.

Note: Knives must be sharpened as a complete set (2 bed knives and 3 rotor knives) and can be sharpened two or three times provided they are not damaged or overused between sharpening, which will reduce the life of the knife. Failure to sharpen or replace knives will result in excess dust, frequent jamming of cutting chamber, reduced throughput, excess vibration, and increased noise throughout the machine. Contact SEM for sharpening and service plans.

7.5 Screen Change

Remove and Replace Screen:

1. Tools required: 1/2" deep socket wrench with extension.
2. Open the cutting chamber door.
3. Remove the four bolts from the corners of the transition using a 1/2” socket wrench and lower it carefully as there may be material inside. Leave the nuts in the middle of the front and rear plates.
4. The screen will be exposed under the platform. Remove six 5/16”-18 nuts from the screen, using a 1/2” deep socket with extension and lower it carefully so as to not spill any remaining material.
5. Inspect screen for damage.
    a. Note that material resting on the screen is not considered to be adequately destroyed.
    b. Particle size integrity cannot be guaranteed if screen is damaged – contact manufacturer.
6. Align new/empty screen with set screws and replace the six 5/16”-18 nuts.
   Caution: Material resting on the screen may fall through upon removal. **SEM recommends eye protection, mask, and gloves as minimum PPE.**

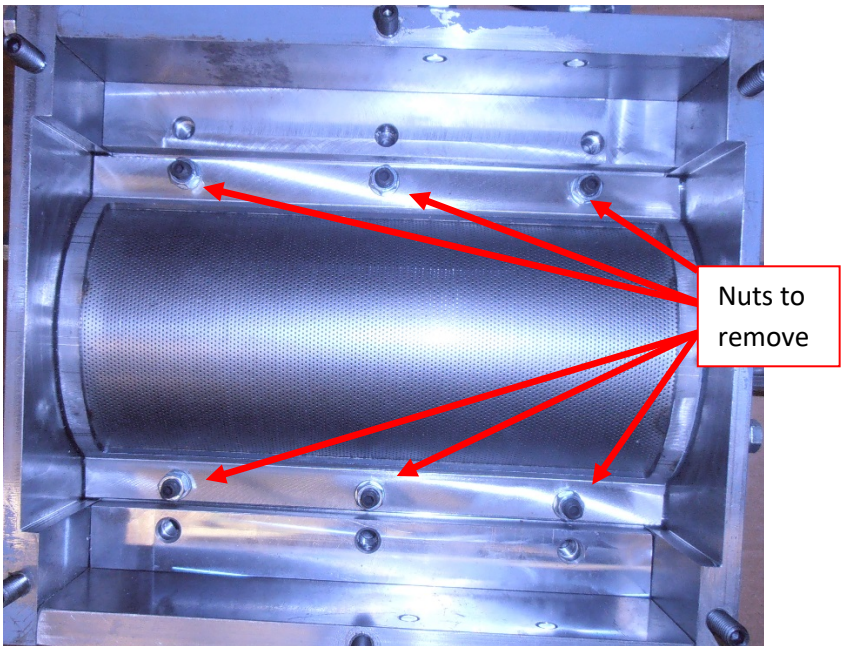
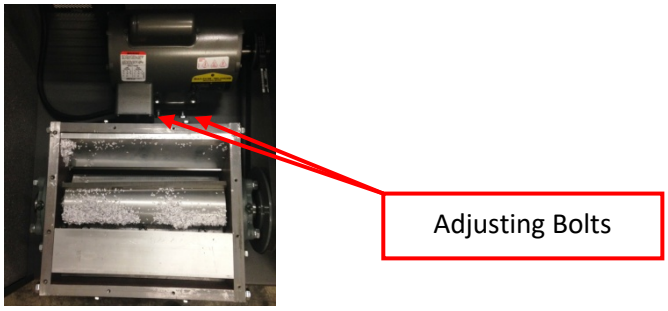


Figure 13

7.6 Drive Belt Adjustment

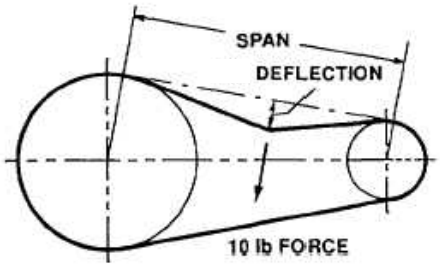
The drive belt should be inspected periodically for excessive wear or damage. Follow the steps below to adjust the belt if there is excessive slack or the belt feels too tight.

1. Tools Required:
    a. 5/32” Allen wrench (for hopper screws)
    b. Two 9/16” wrench (for adjusting bolts)
2. Follow the procedure for **Accessing the Cutting Chamber** (Section 6.2).
3. Check the tension of the drive belt to the image below, pinching the belts between your thumb and forefinger and applying pressure. Approximately 3/16” to 1/4” deflection is recommended.



Motor adjustment

4. Turn the adjusting bolts EVENLY, clockwise to tighten, counterclockwise to loosen. One wrench will be for the nut and the other for the bolt head.



Checking belt tension

5. Reinstall hopper and feed assembly in reverse order.

IMPORTANT: Belt should be checked and tightened if required after first two days of operation. After that, check tension monthly and replace belt yearly. See Section 8 for spare parts.

8 – Spare Parts

Option	Description	Part NO.
Maintenance Kit	Assortment of tools for machine maintenance	553TK200
Standard Knife Set	(1) Set of Standard Knives (3 rotor & 2 bed)	391200K/3
Vacuum Bags	4 Gallon Bags for SSD1-HS Vac, 2/Pack	9196400
Vacuum Filter	HEPA Filter for SSD1-HS Vac	9034100
Drive Belt	Model 200/SSD1 Drive Belt	V3VX355
Security Screen*	Standard 1/16" Security Screen	SSD1-8490-116
iWitness	Scanner and software for easily logging parts	iWitness

*Other screen sizes are available

9 – Electrical Schematics

Electrical schematics are available upon request for the following voltages:

- 120V/1-phase/60Hz
- 220V/1-phase/50Hz
- 220V/1-phase/50Hz – 2 power cords

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