SWEED®
Machinery | Innovation | Solutions

SKYWALKER RECYCLING INCORPORATED—SEPARATION SYSTEM
EQUIPMENT DESCRIPTION

Feed & Primary Shredding Equipment

- (1) 30 HP PCR1034 Pre-Chopper w/Ram Assist
- (1) PCR1034 Outtake Conveyor w/Mag Cross Belt and Material Bypass

Separation Equipment

- (1) SG1826, 3-Lobe 40HP Granulator
- (1) TM1815 Turbo Mill System, to Airlock
- (1) Turbo-Mill By-Pass Option
- (1) 1K CFM 6” Duct Granny Spillway to Airlock
- (2) 3G Air Table System
- (1) 4” Duct 3G Spillway to Airlock
- (1) 12K Sock Dust Collection Unit

Electrical and Controls

- Standard Electrical: 3-Phase, 480 Volt
- 120V Control Voltage, w/24VDC optional with price adder
- Hoffman Enclosures, for Power Source (Motor Starters, VFD’s, etc.)
- Main enclosures are UL508A certified
- All other wiring to follow NEC standards
- (1) Allen Bradley 15” HMI, PanelView Plus series
- Allen Bradley CompactLogix PLC
- Ethernet communication for intelligent devices. VFD’s, Soft-Starts, HMI’s etc.
- Customer enabled cellular remote access for troubleshooting/updates
- Granulator load sensing for maximum performance
- Motors 10HP and below and miscellaneous 24VDC controls wired to terminal blocks in Hoffman junction boxes

PROCESS FLOW

1. Sweed PCR1034 Single-Shaft Pre-Chopper reduces material from a 1-1/2” to 3/4" minus, and drops chops onto outtake conveyor w/Magnetic cross-belt for ferrous removal prior to being fed into SG1826-3L Granulator.

2. Sweed SG1826-3L Granulator with high-speed (500 RPM) rotor, will process material to a 5/8” to 1/8” granular, dependent on material type. Granulators contain screens that can be changed to dictate output size and flow. Granulated material is pneumatically conveyed from the granulator spillway to the next process. The vacuum conveyance doubles as a cooling process for the granulator

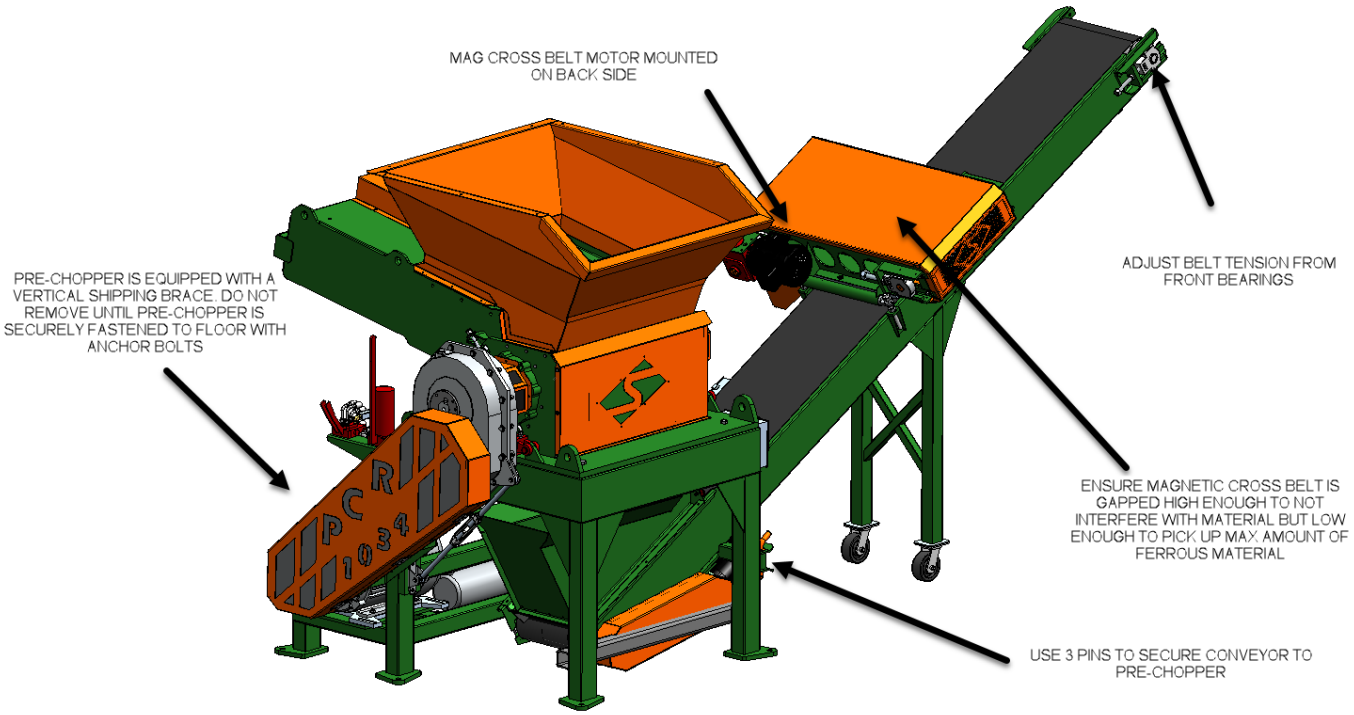
3*. After the material passes through the granulator the operator will have the option to use the Turbo-Mill processor or by-pass it. Typically, the Turbo-Mill will only be necessary when processing small gauge #2 products and will be by-passed when anything larger than 14 gauge is introduced. The by-pass will require manually sliding the turbo-mill (on guided track) out of the way and manually connecting the system directly to the blower.

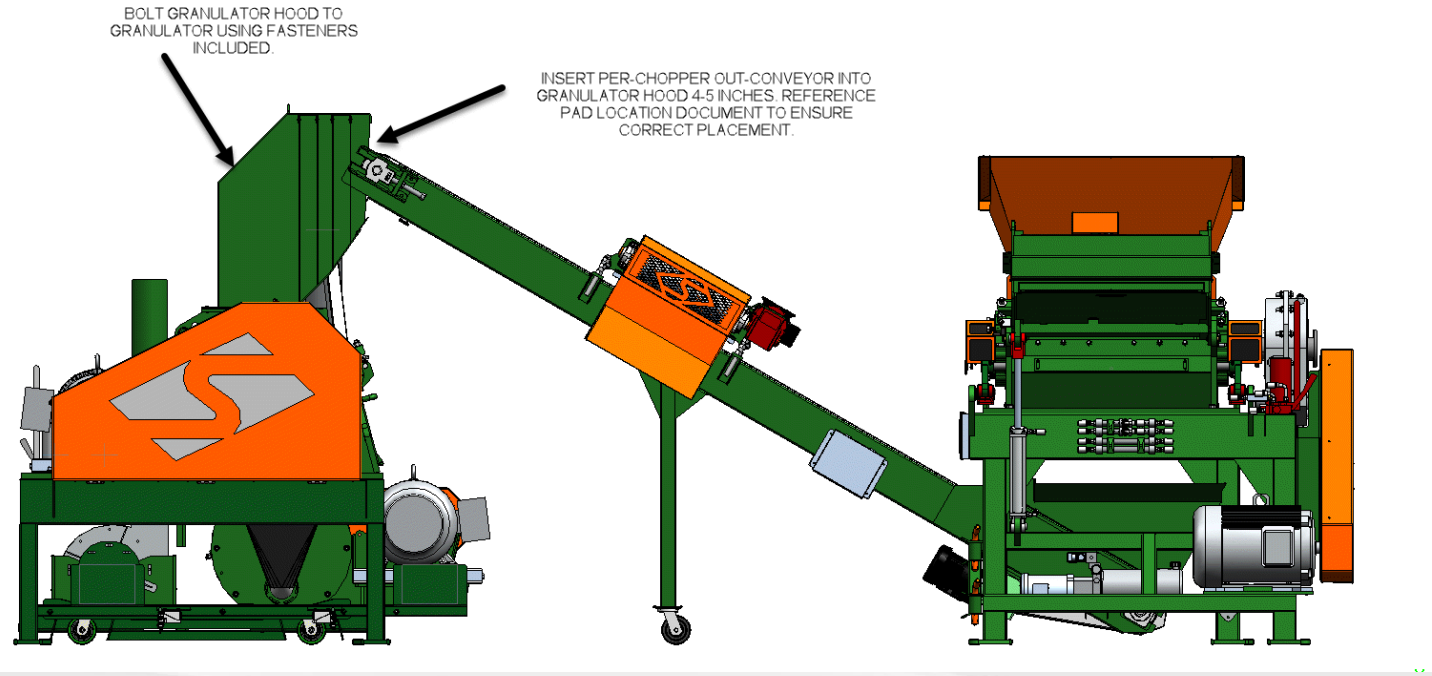
3. Sweed TM1815 Turbo-Mill is the third processor in the system, and is intended to process ACR, #2 ICW, harness and other low yield wire. The TM helps liberate fine copper wire from plastic and other byproduct, enabling a higher yield and cleaner sort at the air table

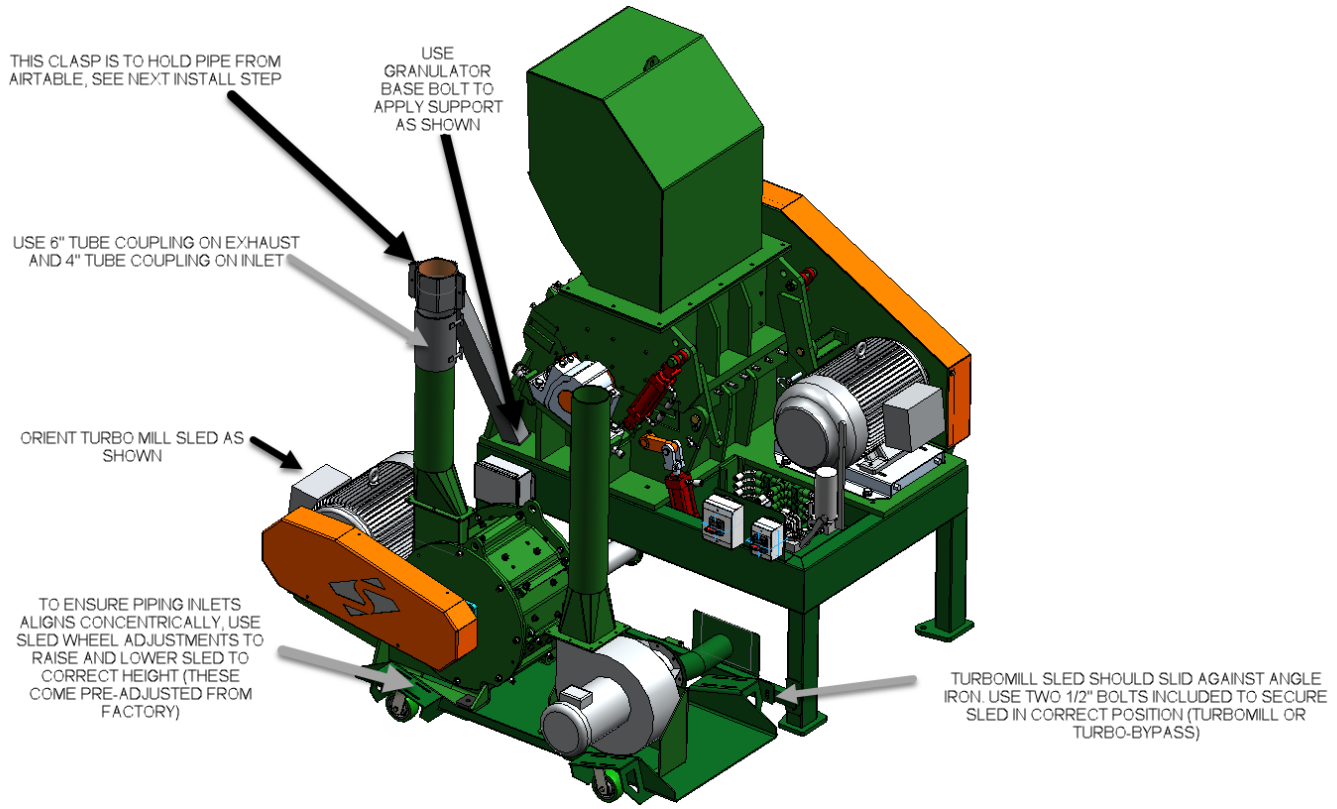
4. The first 3-G Air Separation Table is the primary separation process for all materials. The heaviest element on the table will fall off the front of the table whereas any less dense materials will fall off the back of the table. In most cases this first valuable product will be copper.

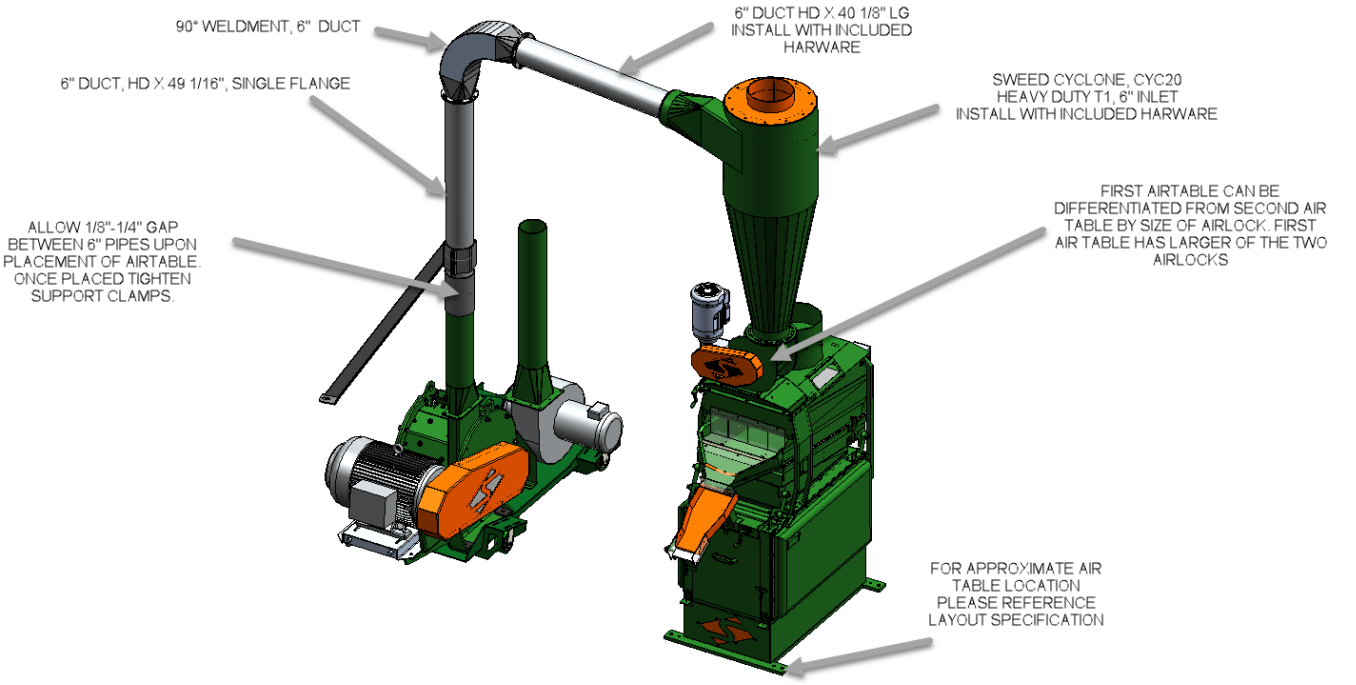
5. The less dense material from the first table (ex. PVC Insulation and Aluminum) will fall off the back of the first table and be conveyed to the second 3G air table. This second table will do a further separation and separate the aluminum from the remaining plastic. A second table is typically used for running bi-metal materials such as BX/ Tech Cable or Aluminum Copper Radiators.

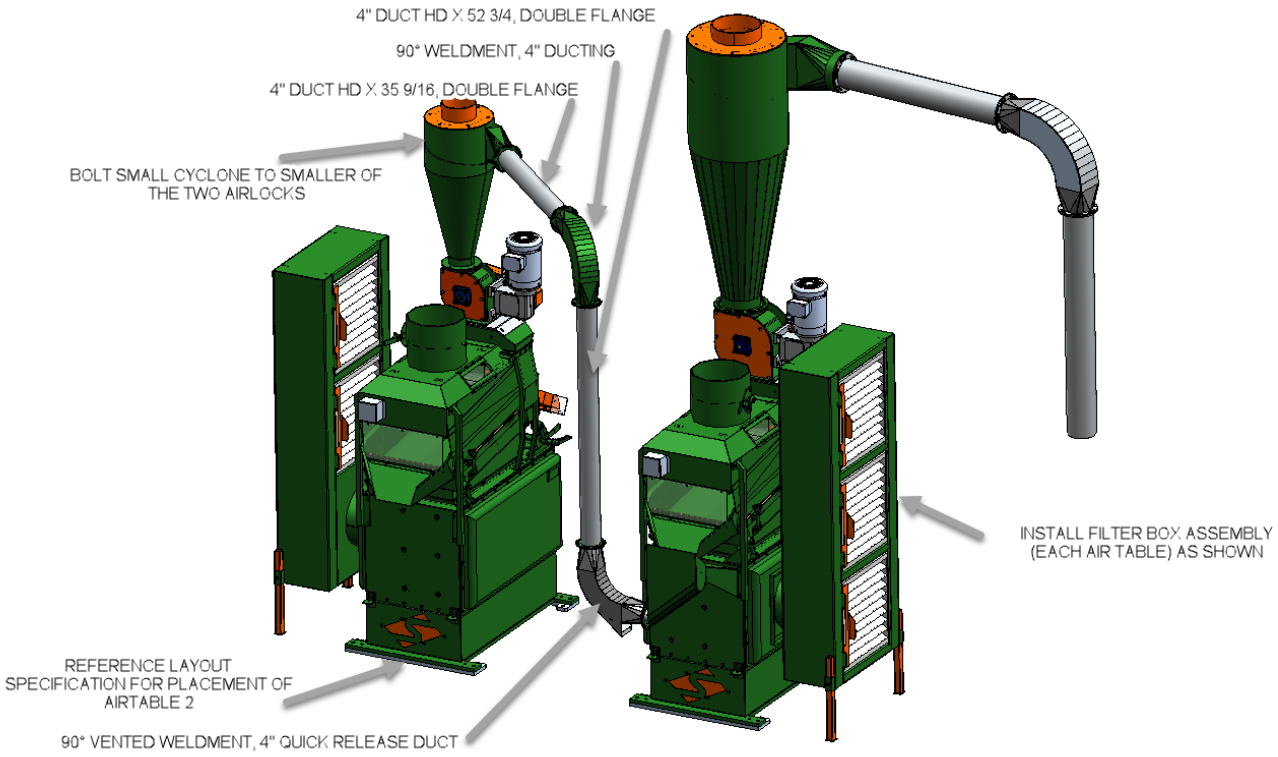
6. 12k CFM Dust-Collection w/Socks to remove dust and also provide air throughout the system

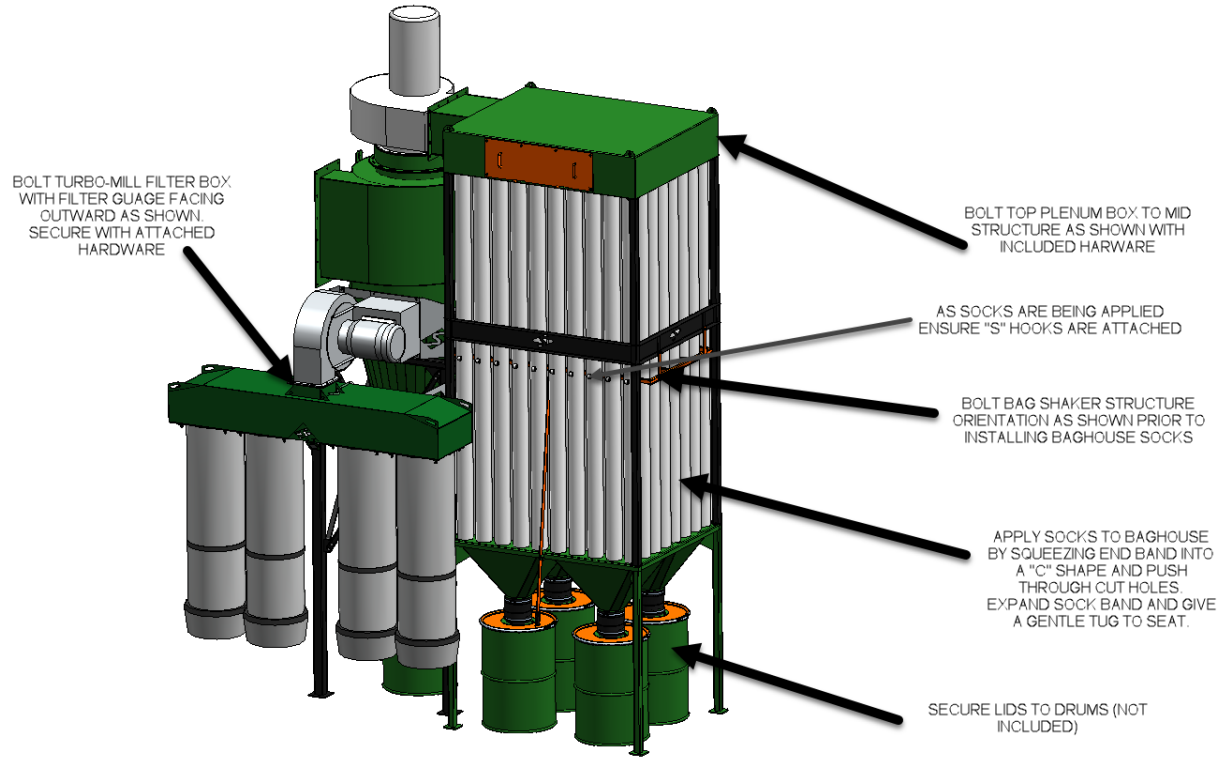

MAG CROSS BELT MOTOR MOUNTED ON BACK SIDE
PRE-CHOPPER IS EQUIPPED WITH A VERTICAL SHIPPING BRACE. DO NOT REMOVE UNTIL PRE-CHOPPER IS SECURELY FASTENED TO FLOOR WITH ANCHOR BOLTS
ADJUST BELT TENSION FROM FRONT BEARINGS
ENSURE MAGNETIC CROSS BELT IS GAPPED HIGH ENOUGH TO NOT INTERFERE WITH MATERIAL BUT LOW ENOUGH TO PICK UP MAX. AMOUNT OF FERROUS MATERIAL
USE 3 PINS TO SECURE CONVEYOR TO PRE-CHOPPER

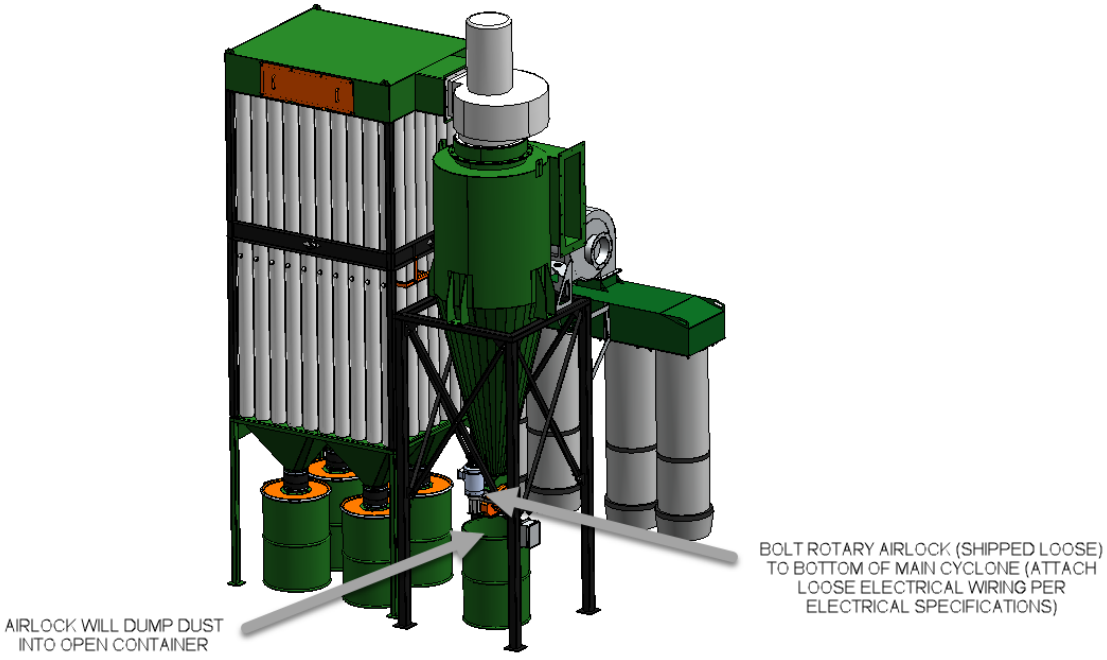

BOLT GRANULATOR HOOD TO GRANULATOR USING FASTENERS INCLUDED.
INSERT PER-CHOPPER OUT-CONVEYOR INTO GRANULATOR HOOD 4-5 INCHES. REFERENCE PAD LOCATION DOCUMENT TO ENSURE CORRECT PLACEMENT.


THIS CLASP IS TO HOLD PIPE FROM AIRTABLE, SEE NEXT INSTALL STEP
USE GRANULATOR BASE BOLT TO APPLY SUPPORT AS SHOWN
USE 6" TUBE COUPLING ON EXHAUST AND 4" TUBE COUPLING ON INLET
ORIENT TURBO MILL SLED AS SHOWN
TO ENSURE PIPING INLETS ALIGNS CONCENTRICALLY, USE SLED WHEEL ADJUSTMENTS TO RAISE AND LOWER SLED TO CORRECT HEIGHT (THESE COME PRE-ADJUSTED FROM FACTORY)
TURBOMILL SLED SHOULD SLID AGAINST ANGLE IRON. USE TWO 1/2" BOLTS INCLUDED TO SECURE SLED IN CORRECT POSITION (TURBOMILL OR TURBO-BYPASS)


90° WELDMENT, 6" DUCT
6" DUCT HD X 40 1/8" LG INSTALL WITH INCLUDED HARWARE
6" DUCT, HD X 49 1/16", SINGLE FLANGE
SWEED CYCLONE, CYC20 HEAVY DUTY T1, 6" INLET INSTALL WITH INCLUDED HARWARE
FIRST AIRTABLE CAN BE DIFFERENTIATED FROM SECOND AIR TABLE BY SIZE OF AIRLOCK. FIRST AIR TABLE HAS LARGER OF THE TWO AIRLOCKS
ALLOW 1/8"-1/4" GAP BETWEEN 6" PIPES UPON PLACEMENT OF AIRTABLE. ONCE PLACED TIGHTEN SUPPORT CLAMPS.
FOR APPROXIMATE AIR TABLE LOCATION PLEASE REFERENCE LAYOUT SPECIFICATION


4" DUCT HD X 52 3/4, DOUBLE FLANGE
90° WELDMENT, 4" DUCTING
4" DUCT HD X 35 9/16, DOUBLE FLANGE
BOLT SMALL CYCLONE TO SMALLER OF THE TWO AIRLOCKS
INSTALL FILTER BOX ASSEMBLY (EACH AIR TABLE) AS SHOWN
REFERENCE LAYOUT SPECIFICATION FOR PLACEMENT OF AIRTABLE 2
90° VENTED WELDMENT, 4" QUICK RELEASE DUCT

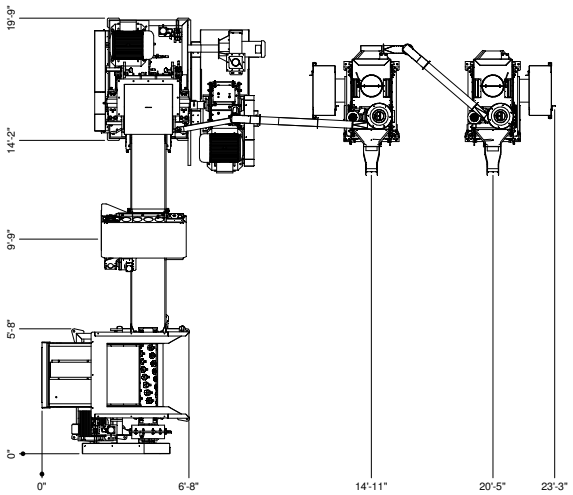

BOLT TURBO-MILL FILTER BOX WITH FILTER GUAGE FACING OUTWARD AS SHOWN. SECURE WITH ATTACHED HARDWARE
BOLT TOP PLENUM BOX TO MID STRUCTURE AS SHOWN WITH INCLUDED HARWARE
AS SOCKS ARE BEING APPLIED ENSURE "S" HOOKS ARE ATTACHED
BOLT BAG SHAKER STRUCTURE ORIENTATION AS SHOWN PRIOR TO INSTALLING BAGHOUSE SOCKS
APPLY SOCKS TO BAGHOUSE BY SQUEEZING END BAND INTO A "C" SHAPE AND PUSH THROUGH CUT HOLES EXPAND SOCK BAND AND GIVE A GENTLE TUG TO SEAT.
SECURE LIDS TO DRUMS (NOT INCLUDED)

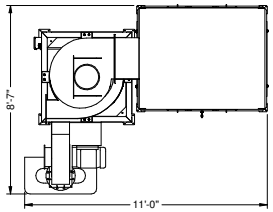

BOLT ROTARY AIRLOCK (SHIPPED LOOSE) TO BOTTOM OF MAIN CYCLONE (ATTACH LOOSE ELECTRICAL WIRING PER ELECTRICAL SPECIFICATIONS)
AIRLOCK WILL DUMP DUST INTO OPEN CONTAINER

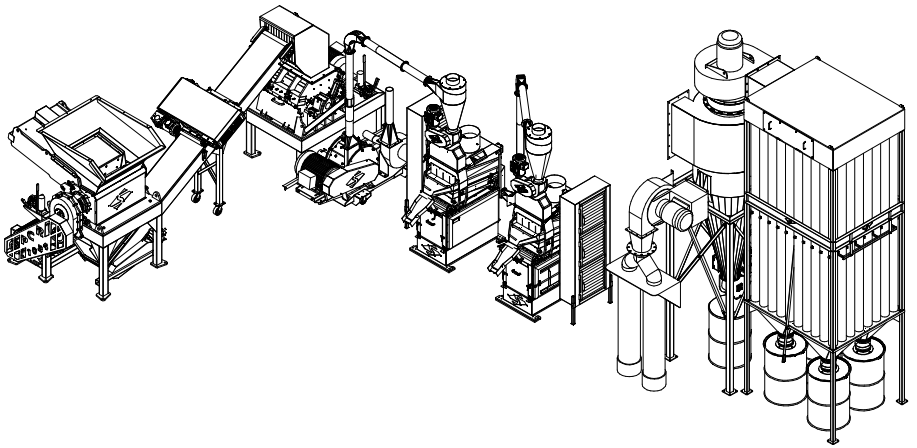
DRAWING NUMBER	SHEET
AD076310	1 OF 7

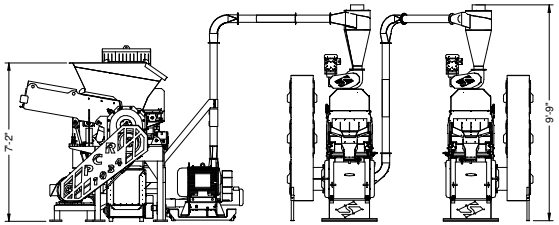
REVISION HISTORY

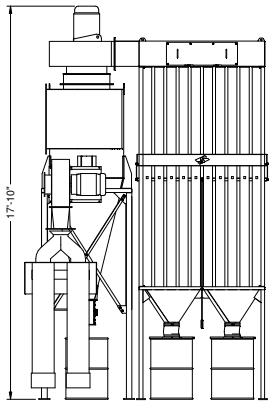
REV	DESCRIPTION	DATE	APPROVED











MATERIAL LIST

THIRD ANGLE PROJECTION

INTERPRET DRAWING IN ACCORDANCE WITH ASME Y14.5M-1994

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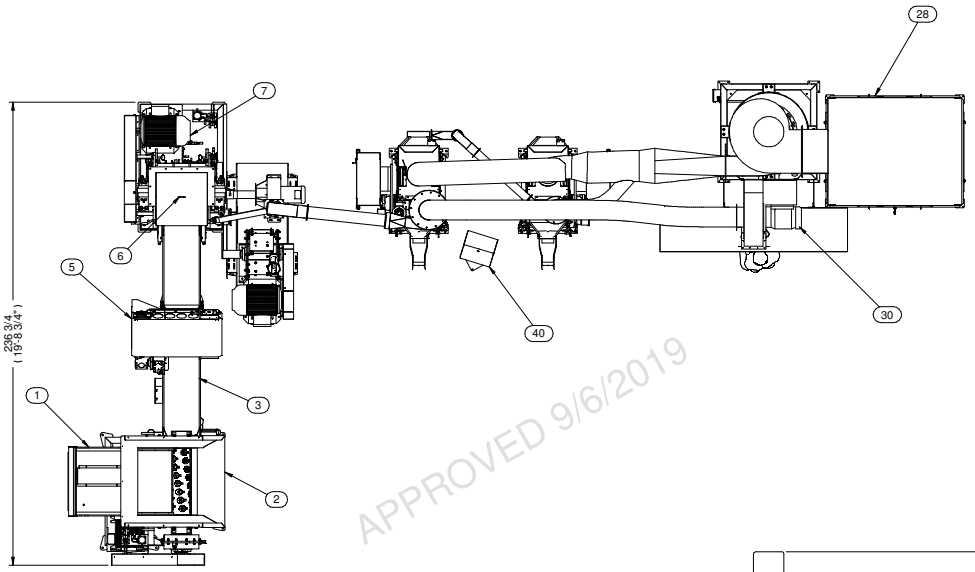
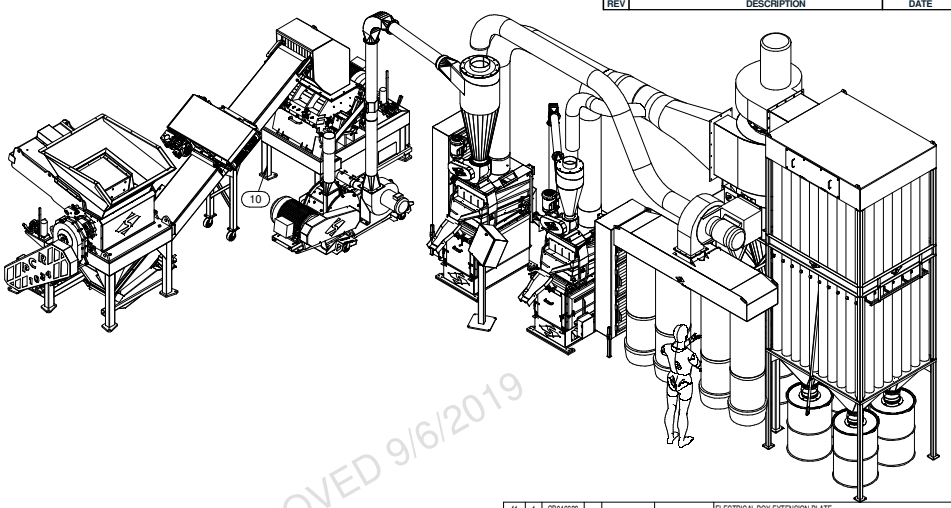
DRAWN BY	csalyer
DATE	7/9/2019
DESIGNED BY	csalyer
DATE	7/9/2019
CAD FILE NAME	AD076310
DWG TITLE	RECYCLING SYSTEM, PCR1034, SG1826, TM1815, G3, G3
TOLERANCES UNLESS OTHERWISE NOTED	PROJECT: 120V CONTROL, DUST COLLECTION
XX = +/- 0.02 MACH ANGLES = +/- 0.5 DEG XXX = +/- 0.005 FAB ANGLES = +/- 2 DEG 1/X = +/- 1/16 SURFACE TEXTURE =	
UNLESS OTHERWISE SPECIFIED, ALL DIMENSIONS ARE IN INCHES	SIZE: D — DRAWING NUMBER: AD076310 — REVISION
SCALE: 1:1	REFERENCE DRAWING — WEIGHT: 18694.1 lb — SHEET: 1 OF 7

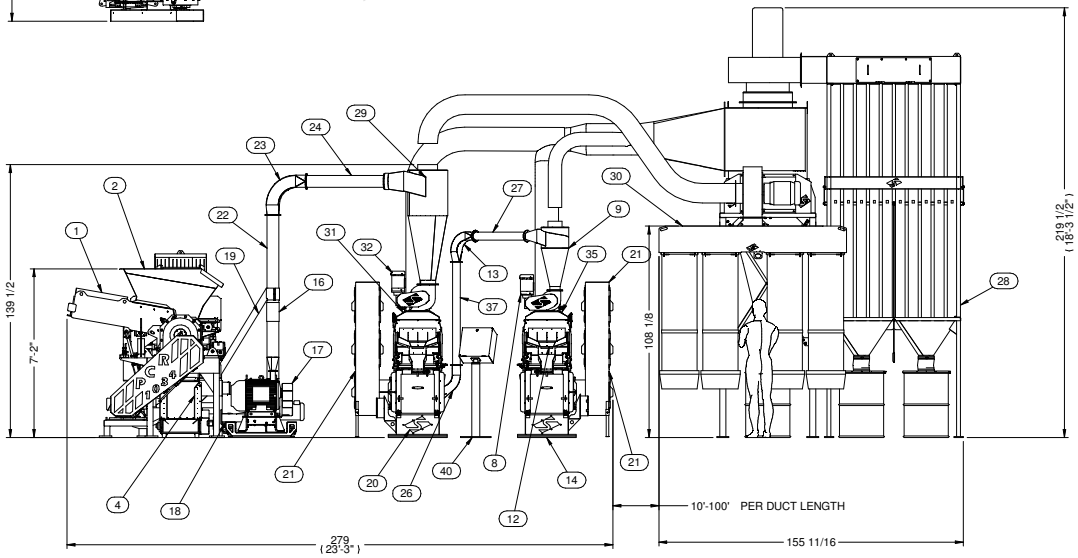
DRAWING NUMBER	SHEET
AD076310	1 OF 4

REVISION HISTORY

REV	DESCRIPTION	DATE	APPROVED







#	QTY	SWEED #	REV	MANUFACTURE	MFR'S PART #	DESCRIPTION	BinLoc
41	1	CB046623				ELECTRICAL BOX EXTENSION PLATE	
40	1	AE074832				MECH ELEC, SKYWALKER 600/3/60, 120V CONTROL	
39	2	BX039747		MCMASTER-CARR	5723ST193	SIGN, DANGER, VINYL WITH ADHESIVE 7"X10"	
38	1	AB076798				GRANULATOR EXHAUST TUBE, 4" X 15 3/16" LONG	
37	1	AB076787				4" DUCT HD X 52 3/4, DOUBLE FLANGE	
36*	1	FA000048				BOLT, 5/16-18 X 3/4	18C
35	1	CB046563				CONNECTION PLATE, 5 1/2"	
34*	4	FA000044				BOLT, 3/8-16 X 3/4 HEX HEAD GRADE 5	18E
33*	3	FA000110				WASHER, 3/8 LOCK SPLIT	18E
32	1	AB075830	A			ROTARY AIRLOCK, 8"	
31	1	CB046562				CONNECTION PLATE, 8" AIRLOCK	
30	1	AD076347				FILTER DUST ASSEMBLY, 15HP EQ, 4 CARTRIDGE	
29	1	AD076342				SWEED CYCLONE, CYC20	
28	1	AD076335				8K CFM DUST COLLECTION SYSTEM	
27	1	AB076786				4" DUCT HD X 35 9/16, DOUBLE FLANGE	
26	1	AB074292				90° VENTED WELDMENT, 4" QUICK RELEASE DUCT	
25*	1	AD074343				MATERIAL CHUTE ASSY	
24	1	AB076788				6" DUCT HD X 40 1/8" LG	
23	1	AB076789				90° WELDMENT, 6" DUCT	
22	1	AB076791				6" DUCT, HD X 49 1/16", SINGLE FLANGE	
21	2	AD075761				FILTER BOX ASSY, 5-BANK	
20	1	AD076325				3G RH AIRTABLE ASSY COMPLETE, 575/3/60	
19	1	AB076800				DUCT SUPPORT BRACE	
18	1	AB076799				GUIDE ANGLE WELDMENT	
17	1	AD076352				SLIDE CART, TURBOMILL OPTION	
16	1	BX039746		MORRIS	2-6001	COUPLING, 6" TUBING, MORRIS DUAL QUICKON II	
15	1	BX039485		MORRIS	2-4001	COUPLING, 4" TUBING, MORRIS DUAL QUICKON II	
14	4	CB036775				CROSS BAR	
13	1	AB074287				90° WELDMENT, 4" DUCTING	
12	1	AD076324				3G LH AIRTABLE ASSY COMPLETE, 575/3/60, F2 MTR	
11	1	AB074296				TRANSITIONAL SPILLWAY WELDMENT	
10	1	AD072261				STAND WELDMENT,	
9	1	AD065331				CYCLONE TOP ASSY	
8	1	AD076344				5 1/2" AIRLOCK TOP ASSY	
7	1	AD076329				SG1826AC 40HP, 575/3/60, MANUAL VALVES	
6	1	AB066651				CONVEYOR FED INFEED HOUSING	
5	1	AD076318				MCB 2026 AA 575/3/60	
4	1	AB066241				EXHAUST CHUTE ASSY	
3	1	AD076317				INCLINE CONVEYOR IC1713 DUAL MAG, PRECHOPPER MT W/ROLLERS, 575/3/60	
2	1	AD066981	A			HOPPER ASSEMBLY	
1	1	AD076319				PCR1034 AC 30HP, 575/3/60, FOOTED STAND	

MATERIAL LIST

THIRD ANGLE PROJECTION

INTERPRET DRAWING IN ACCORDANCE WITH ASME Y14.5M-1994

DRAWN BY: bradt — DATE: 7/9/2019
DESIGNED BY: bradt — DATE: 7/9/2019
CAD FILE NAME: AD076310

SWEED®

DWG TITLE: MECH, SKYWALKER 600/3/60, 120V CONTROL

PROJECT: TOP LEVEL SYSTEM

TOLERANCES UNLESS OTHERWISE NOTED
XX = +/- 0.02 MACH ANGLES = +/- 0.5 DEG
XXX = +/- 0.005 FAB ANGLES = +/- 2 DEG
1/X = +/- 1/16 SURFACE TEXTURE =

UNLESS OTHERWISE SPECIFIED, ALL DIMENSIONS ARE IN INCHES

SIZE: D — DRAWING NUMBER: AD076310 — REVISION

SCALE: 1:1 — WEIGHT — SHEET

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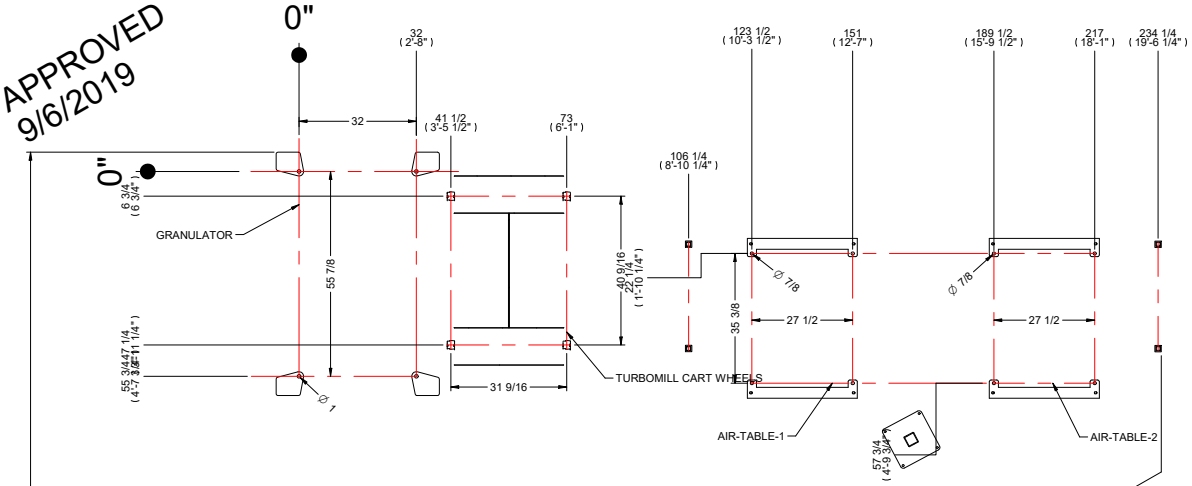
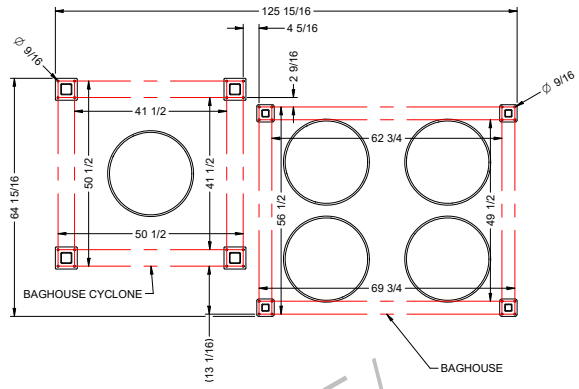
DRAWING NUMBER	SHEET
AD076310	3 OF 6

REVISION HISTORY

REV	DESCRIPTION	DATE	APPROVED

APPROVED 9/6/2019





MAIN PROCESSING

BAGHOUSE / CYCLONE

SWEED ANCHOR BOLT SPECIFICATIONS

Wedge Anchor Diameter (in)	Minimum Embedment Depth (in)*	Installation Torque (FT-LB)
1/4	1-1/8	4
3/8	1-1/2	25
1/2	2-3/4	55
5/8	3	90
3/4	3-1/2	110
7/8	4-1/4	250
1	4-3/4	300

* min. embedment depth is distance anchor is installed in concrete after wedge has expanded
1. Deeper install depths are allowed
2. Anchor manufactures specifications supercede Sweeds specifications if different.

FOOTPAD SPECIFICATIONS

SPECIFICATIONS OUTLINED IN THIS DOCUMENT ARE FOR CONTRACTOR QUOTING PURPOSES AND INSTALLTION DETAILS ONLY.
ALL LOCATIONS ARE SUBJECT TO CHANGE TO ALLOW BEST MACHINE LOCATION AND SETUP. EXACT DIMENSIONS SHOULD BE USED FOR APPROXIMATE FLOOR LOCATIONS PRIOR TO MACHINE PLACEMENT.

FLOOR BOLTING SPECIFICATIONS				REQ' STUD DIAMETER							MIN. EMBEDMENT DEPTH	STEEL PAD THICKNESS
MACHINE	PAD/MACHINE	BOLTS/PAD	TOTAL	0.25	0.375	0.500	0.625	0.750	0.875	1.000	INCHES	INCHES
PCR1034 AC (PRE-CHOPPER)	6	1	6						X		4 1/4	0.75
SG1826AC (GRANULATOR)	4	1	4						X		4 1/4	0.75
G3 AIRTABLES 1	2	2	4					X			3 1/2	0.75
G3 AIRTABLES 2	2	2	4					X			3 1/2	0.75
SWEED CYC40	4	4	16			X					2 3/4	0.38
8K DUST COLLECTION	4	4	16			X					2 3/4	0.38

MATERIAL LIST

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XX +/- 0.02 MACH ANGLES = +/- 0.5 DEG
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UNLESS OTHERWISE SPECIFIED, ALL DIMENSIONS ARE IN INCHES

SCALE: 1:1

SWEED®

DWG TITLE: MECH, SKYWALKER 600/3/60, 120V CONTROL

PROJECT: TOP LEVEL SYSTEM

SIZE: D | DRAWING NUMBER: AD076310 | REVISION: 0

REFERENCE DRAWING(S) | WEIGHT | SHEET

APPROVED 9/6/2019

SAFETY AND OPERATION MANUAL

01	**Scope**	This manual covers all information and requirements to operate the Sweed Recycling System supplied to Skywalker
02	**Standards / Environment**	
02.A	Electrical	Machine is built in accordance with all N.E.C and local requirements.
02.B	Storage Temp. Range	-13°F to +131°
02.C	Mechanical	Machine/System is design and tested before shipment at Sweed's Facility to ensure correct machine tolerance and electrical integration and operation.
02.D	Defects	Machine will be free from defects; small paint discontinuities may be present prior to receiving from testing machine at facility.
02.E	Altitude Limit	3,300 ft
02.F	Operating Temp. Limit	104 Deg-F
02.G	Ambient Humidity	NA (system indoors)
02.H	Weather Exposure	No Rain; No Direct Sunlight on UV sensitive rubber Components or synthetic components.
02.I	Welding	Do not weld to machine; may result in voiding warranty, damage machine or result in bodily injury.
03	**Operating Personnel**	
03.A	Requirements	Trained operators and maintenance technicians who have read and understand manual only.
03.B	Req. Clearance	If applicable, operators should stay in safe zones outline by company standards and guidelines (if applicable).
03.C	Warning Labels	See Figure (1) for all labels used on sweed equipment, familiarize yourself with them and meanings before operation.

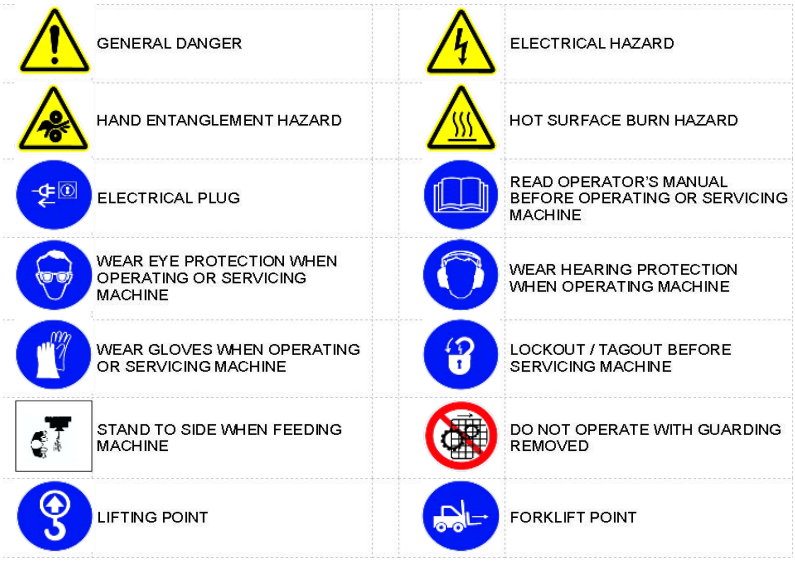


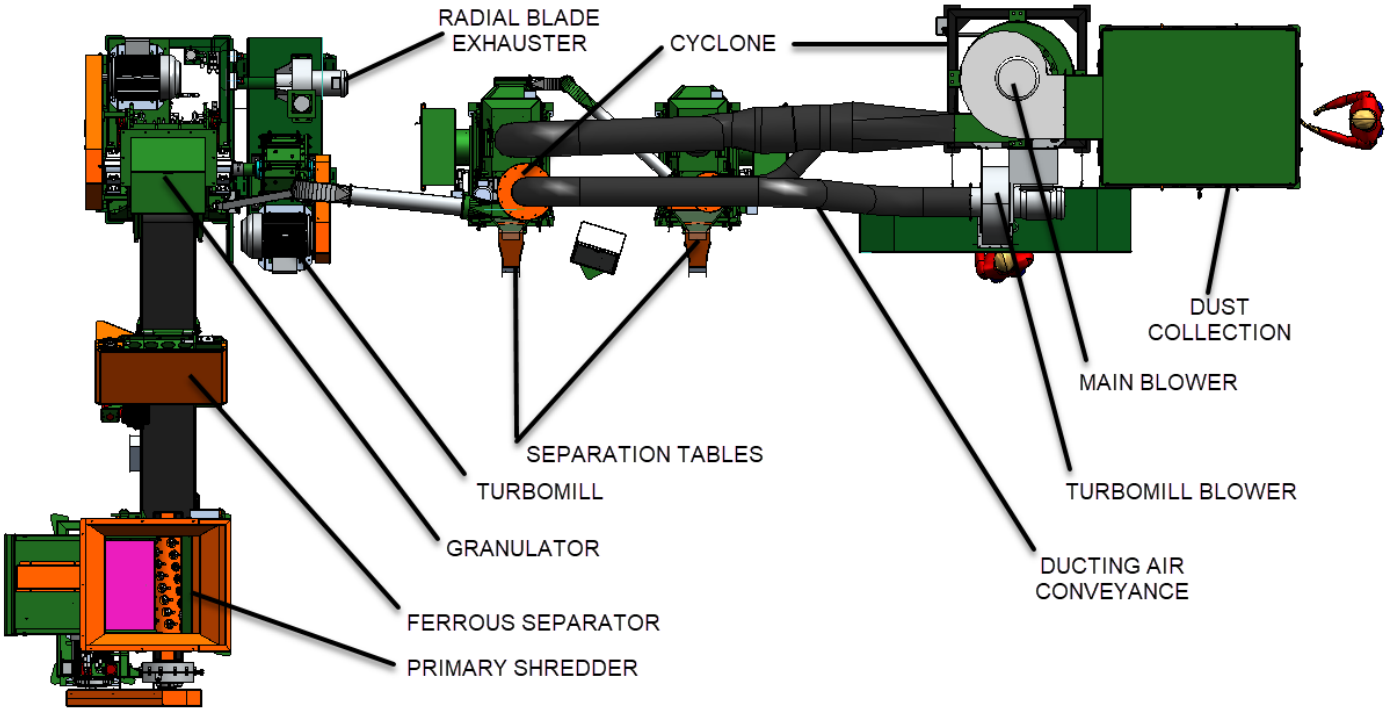
Figure 1. *Sweed Machinery Machine Labels*

04	**Operating Risk / Safety**	
04.A	E-Stops	Located throughout system; when pressed will de-energize entire system. Once pressed, button must be pulled to reset system.
04.B	Lockout	Never operate or remove any system components that are secure unless the system is electrically locked out and all moving parts are motionless.
04.C	Material Discharge	Do not place hands or stand near discharge area of machine.
04.D	Machine Hopper / Opening	While rare, it is possible for processed material to kick out of infeed hood. Stand to the side when feeding material into Separation System. Do not look in hood when the machine is running. Keep body parts away from underneath the machine where material is ejected from the cutting chamber.
04.E	Entanglement Hazard	When feeding material into the system, be cautious of entanglements in the scrap material as it is draw into the infeed hood. This material can hook on clothing and wrap around body parts, pulling the operator towards the machine.
04.F	Machine Exhaust Hopper	Hopper must be suitable for the material being processed; strong enough to hold material when full, not damaged from impact of chopped material, non-flammable where applicable.
04.G	Material Jams	Prior to clearing a jam or performing any maintenance, all motors should be turned off and electrically locked out.
04.H	Machine Guards	Never operate the system unless all guards and covers are in place and secure; do not circumvent the safety switches connected to these guards.

04.I	Belts	Ensure V-Belts are properly aligned, and that tension is within tolerance. See independent machine manuals for specifications and proper installation/maintenance.
04.J	Fasteners	Extreme care should be taken to see that all bolts are always properly tightened. During operation of the system, bolts may come loose from vibration and should be checked on a weekly basis.
04.K	Dull knives	For safe operation, do not operate with dull knives
04.L	Feed Material	This system is designed for the granulation and separation of plastic, copper, brass, aluminum, non-ferrous and limited amounts of ferrous materials. Do not feed any other materials into the machine.
04.M	Cleanliness	The system work area must be kept clean and uncluttered during the periods of operation or maintenance. No tools or other metal objects should be left on or around the machines. Any tools or metal objects that mistakenly fall into the hopper feed opening can cause severe damage to internal cutting chamber, rotors, knives, and screen components.
04.N	Increased Wear	Possible due to allowing material to spin on feedworks for extended time. Ensure material is not slipping during operation.
04.O	Flammable Material	DO NOT cut flammable material
04.P	Access by climbing	DO NOT climb on machines
04.Q	Fall Hazard	User is to ensure utility connections from electrical wiring, pneumatic hoses and hydraulic lines do not present a slip, trip or fall hazard.
05	**PPE Requirements**	
05.A	Eye Protection	Required when operating or maintaining machines.
05.B	Hand Protection	Required when handling material being processed or maintaining machines.
05.C	Hearing Protection	Required when operating machines.
05.D	Breathing Protection	May be required if processed material creates airborne dust / fiber when processed.

06	**Machine Functions**	This section outlines each component contained in system and its function in separation. For details on each process or specifications refer to *System Specifications.* document.
06.A	Primary Shredder	Low speed, high torque, single shaft, screened machine. Reduces material further to manageable size for granulators. Selecting the correct screen size is crucial for allowing granulators to operate at maximum efficiency. Too much material will over burden granulators causing shredders to stop running. Unless accompanied with a surge bin prior to granulation.
06.B	Granulator	High speed, low torque, single shaft machine. High rotor velocity chops material into small particles. Machine continues to chop until the material is small enough to pass through screen. Screen size is dependent on material being processed. Optimally the cut material is just small enough to liberate the copper and/or aluminum from the plastic. Similar size particles facilitate separation on the system's air separation tables.
06.C	Ferrous Separators	Ferrous metal separation machine that can be perpendicular or in line to conveyor where ferrous material may reside during conveyor transport. Exhaust of separating machine needs a bin or scrap container to catch ferrous material.
06.D	Ducting Conveyance	Pipe containing material under vacuum as it's transferred from machine 'A' to machine 'B'. Heavy duty elbows are used to resist wear caused by the material scrubbing the side walls. Typical airflow stays above 4000FPM to ensure material doesn't not settle in elbows and static zones. Pipe diameter is sized accordingly to maintain required CFM under specified static pressure
06.E	Turbomill	Machine designed to continually high-speed impact material to liberate problematic plastic encasement in addition to ensuring correct air table separation for #2 copper. DO NOT process granular sized material through the turbomill as it can damage blades.
06.F	Separation Table	Used to separate granulated particles based on density using high speed air and vibration through screened bed.
06.G	Radial Blade Exhauster	Blower fan specifically designed to transport material by using fan blades to come into direct contact with material. Blades add static pressure and air flow to system.
06.H	Cyclone	Cyclones are used to separate the material from the air conveying it. Air and material enter cyclone through the top side. Material drops out of cyclone bottom while air escapes through the top.

06.I	Airlock	Airlocks allow material to pass out of an airstream under suction without disrupting static pressure. Airlocks are located under cyclones.
06.J	Blower	Radial Blade Fan used to pull air (under vacuum) through system dust hoods and cyclone to filter media in baghouse.
06.K	Baghouse / Dust Collection	Box where filter cartridges are mounted to filter dust, remaining in system air, prior to exhausting to atmosphere.



07	**HMI Overview**	**This section shows HMI display overview and correct navigation within Screen.**
07.A	HMI FLOWCHART	Figure 2

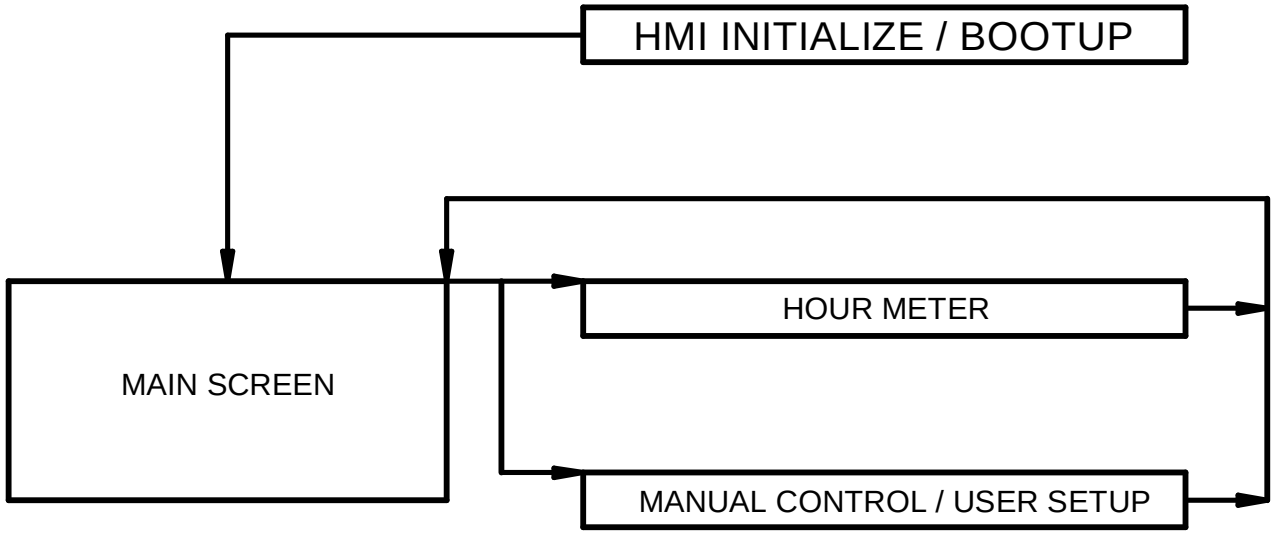
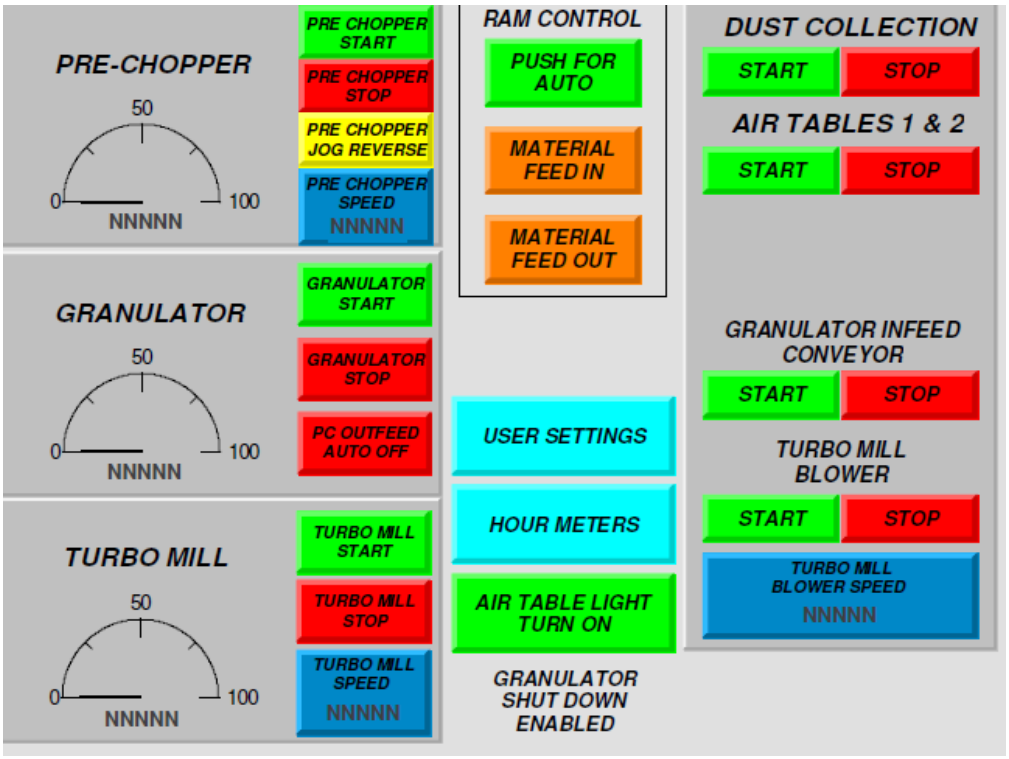


Figure 2. *Sweed Machinery HMI Flow Chart*

The touch screen is very intuitive group of control screens. There are three different layers. The first screen is the main screen control panel which controls the different sections of the system. The second screen is the setup screen which allows various amperage settings for both the pre-chopper and granulator for feeding; and allows the full control of turning on and off each motor within each section of the system for testing. The third screen is the hour meter screen which allows users to track total life hours of the main processors, knife life meters which can be reset for different project, as well as a project timer to track the individual run of a particular type of wire being processed.

MAIN SCREEN GRAPHIC USER INTERFACE OVERVIEW (GUI).



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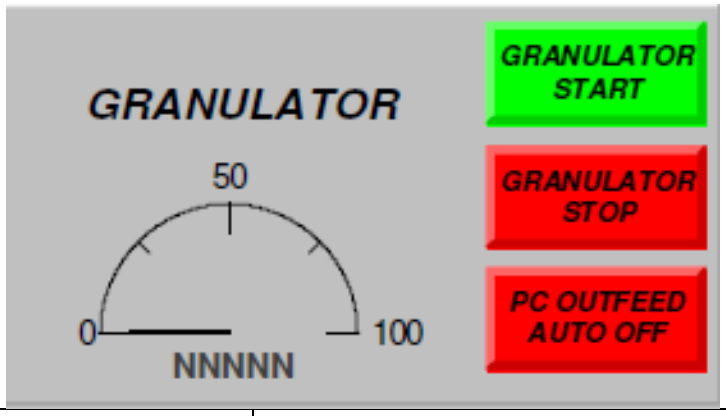
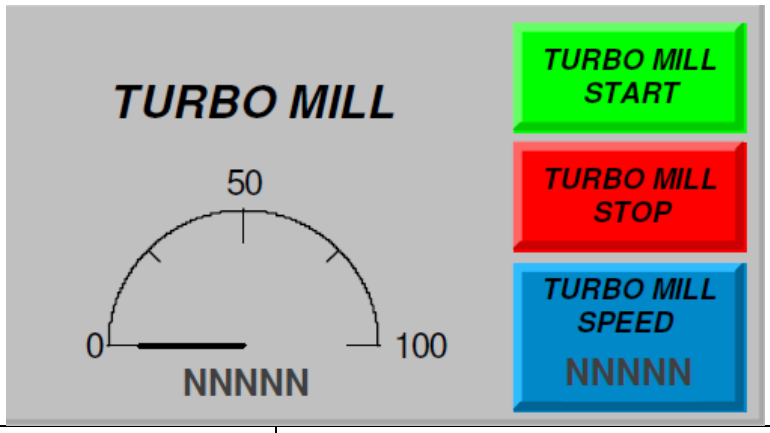
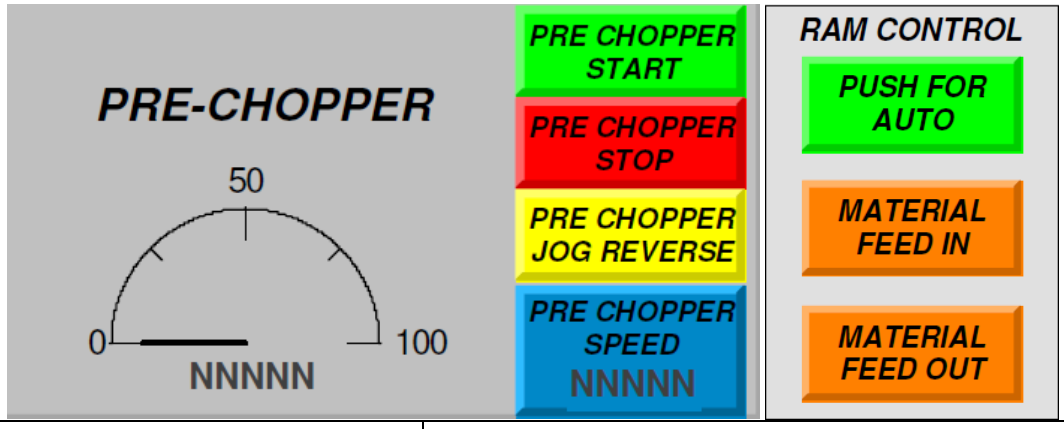
0	02/07/2020	BRAD T.	ORIGINAL ISSUE OF REV 0 OPERATIONAL MANUAL	BJT



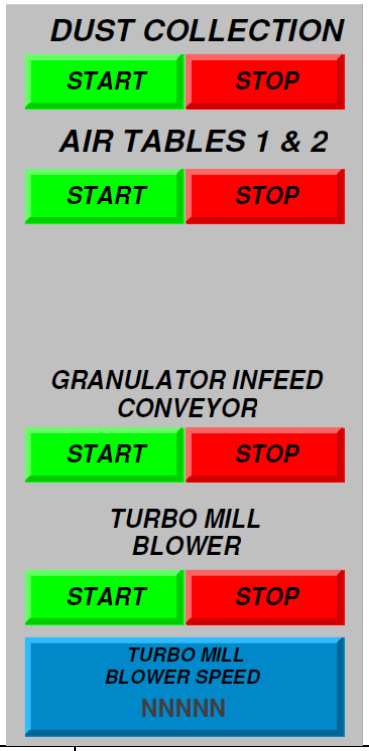
08	Granulator Start	User Interface Overview
08.A	Granulator Start/Stop	When started, PLC will allow start-up of granulation process. Once motor(s) are 'at speed' HMI will allow next process to be enabled by user. When stopped, PLC will ensure amp level is low enough and majority of material has exhausted from cutting chamber prior to shut down. This may take a minute depending on the load when stop button is pressed. During this time a "stop initiated" sign will flash.
08.B	PC Outfeed Auto	*Pre-Chopper outfeed* auto allows user to place an automatic feed loop into place where granulator is fed based off input amps.
08.C	Amp Meter Graphic	Amp meter displays active motor running amps. Meter will show active amps for ease of identifying optimal material input on granulators. When Auto speed is enabled the PLC will limit or increase work created on the granulator for optimal operational performance. Delays in amp readings may occur as material flow into granulators is not immediate. User should identify and record running amps to identify best throughput specifications per material being processed.



09	Turbomill Start	User Interface Overview
09.A	Turbomill Start/Stop	[1]When started, PLC will allow start-up of Turbomill process. Once motor is 'at speed' HMI will allow next process to be enabled by user. When stopped, PLC will ensure amp level is low enough and majority of material has exhausted from cutting chamber prior to shut down. This may take a minute depending on the load when stop button is pressed. During this time a "stop initiated" sign will flash. [1]Turbomill will only start if interlocks are engaged. This includes correct start position and exhaust in line with Air table 6" ductwork and non-fused disconnect located on back of granulator. **DO NOT START TURBOMILL IF QD EXHAUST SLEEVES USED TO CONNECT EXAHUST LINES ARE NOT IN PLACE. FAILING TO APPLY QD CONNECTORS MAY CASUE BODILY HARM FROM DEBRI EXHAUSTING AT HIGH SPEEDS.** Ensure that during a turbomill startup the Turbomill Blower is also running. This will allow the cyclone above air table 1 to separate material correctly and pull material from turbomill.
09.B	Turbomill Speed	*'Turbomill Speed'* is designed to help user apply settings to help dictate how long the material stays in the turbomill during processing. Speeding up turbomill RPM will decrease materials processing time in turbomill. Slowing down RPM allows more material processing time within the turbomill. Processing times are dictated by how the fine copper strands are processes on the air tables. Longer material dwell times in turbomill will help "ball-up" fine copper to allow more efficient separation. Longer turbomill processing times though will decrease throughput of the system. User will find an optimal setting once the system is running to allow high efficient system processing.
09.C	Amp Meter Graphic	Amp meter displays active motor running amps. Meter will show active amps for ease of identifying optimal material input on turbomill.

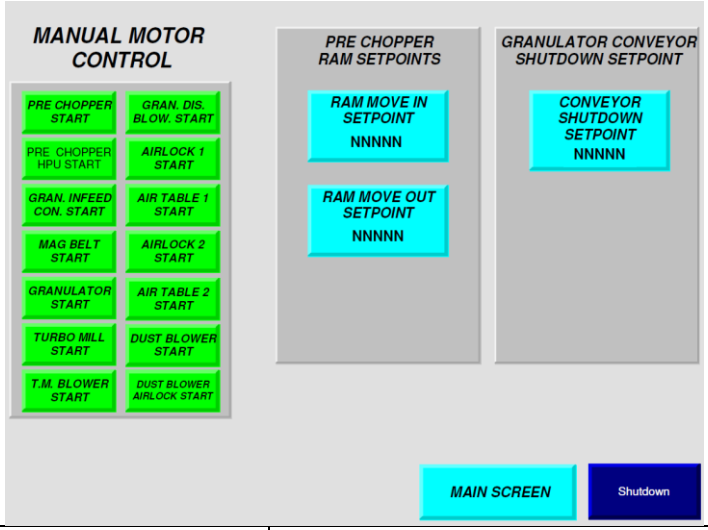


10	Pre-Chopper Start	User Interface Overview
10.A	Pre-Chopper Start/Stop	When started, PLC will allow start-up of Pre-chopper process.
10.B	Pre-Chopper Jog Reverse	*Reverse Jog* on shredder is used to dislodge any material that may have jammed during operation. Shut down machine and hold jog reverse. If lodged material does not break free follow company lock-out tag-out procedure before manually removing material.
10.C	Pre-Chopper Speed	Variable Hz to speed up and slow down pre-chopper throughput. User will need to match pre-chopper throughput with granulator throughput. This is done by adjusting pre-chopper rotor speed.
10.D	Amp Meter Graphic	Amp meter displays active motor running amps. Meter will show active amps for ease of identifying optimal material input on pre-chopper.
10.E	Ram Control Push for Auto	This will allow an automatic ram assist action to start. If shredder material is breached in hopper the ram will cycle allowing material to start processing again. Use this setting if material needs assistance when being pushed into pre-chopper cutting knives.
10.F	Material Feed In	When pressed, allows user to manual stroke ram in.
10.G	Material Feed Out	When pressed, allows user to manual stroke ram out.



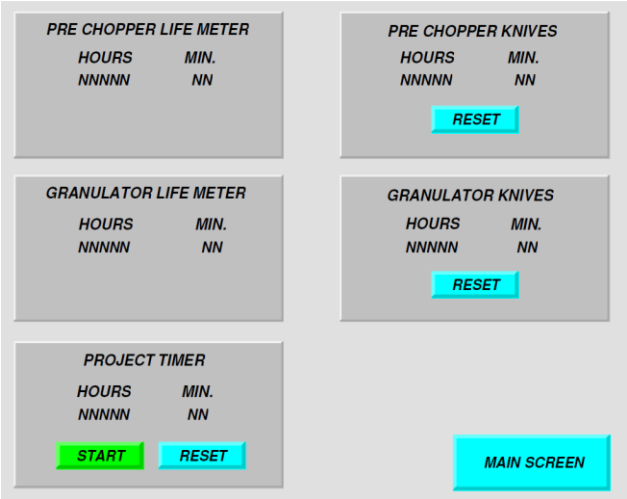
11	Blowers / Air tables	User Interface Overview
11.A	Dust Collection Start/Stop	When started, PLC will allow start-up of main blower / cyclone system. This should be running whenever material is being processed.
11.B	Air Tables 1 & 2	When pressed, Air Table blower and Air Table deck separation will start. Is required to have main blower running before turning on air tables. It is also required to have turbomill blower running prior to turning on turbomill processing.
11.C	Granulator Infeed Conveyor	When Started, this will transfer material from shredder to granulator. After starting conveyor, user may place pre-chopper outfeed “auto-on” cycle to automatically start and stop pre-chopper for smooth granulation processing.
11.D	Turbomill Blower	Only operational when turbomill is in place with exhaust port and interlock non-fused disconnect turned on. This is required to run when turbomill is being used.
11.E	Turbomill Blower Speed	This is used to control the Blower Fan Speed to limit or increase material transfer through the turbomill. Use this setting in conjunction with turbomill RPM to find correct separation setup.

MANUAL CONTROL SCREEN AND PRE-SET OPTIONS PAGE 2



12	**MANUAL MOTOR CONTROL**	**Manual Control is used only for motor direction verification and troubleshooting. All HMI push screen buttons are momentary operation when user holds screen selection.**
13	**Pre-Chopper Ram setpoints**	**User Interface Overview**
13.A	Ram Move-in Setpoint	User input amp specification for actuation of auto ram in.
13.B	Ram Move-out Setpoint	User input amp specification for actuation of auto ram out.
13.C	Granulator Conveyor Shutdown Setpoint	User amp target setpoint input to allow granulator input conveyor to stop while granulator's target setpoint amps decrease. Once amps decrease conveyor will auto restart.

HOUR METER



14	**HOUR METER CONTROL**	**The Sweed Separation System comes with an hour meter interface to allow user to document and keep track of knife and machine maintenance scheduling intervals. User should keep accurate records to ensure maximum life and return on investment.**

TIPS AND GUIDELINES FOR OPTIMAL PROCESSING

Separation Tables

Separation tables have an inclined vibrating screen deck to separate chopped material. High volume, low pressure air is passed through the screen. The air lifts the lighter material to the surface leaving the heavier material underneath and in contact with the vibrating screen. The vibrating screen causes all material to climb to the high end of the screen, the air moving up through the screen will move the lighter product down towards the low side. This process will create a uniform burden on the screen with a separation line. This separation line should be around 3/4 of the way to the high end.

There are many adjustments that can be made to the table, deck tilt, vibration frequency and pitch and air flow.

The good news is many of the adjustments will only be made once unless you are processing dramatically different material., For processing copper and aluminum wire, the frequency is around 1250 rpm. Table tilt is around the max incline. The pitch will be at the max setting. The air flow is the one which needs adjustment and monitoring to get good separation. Even in the same load of material there can be large differences in the base material, so adjustments to the tables will need to be monitored and the air flow adjusted. The gate on the top end needs to be set so the copper comes off cleanly.

Air adjustment: If you have too much air flow, you will lose the desired material off the low end of the table. If there is not enough air flow, you will start getting trash in your desired product.

Amount of material on the Table: For good separation, the table screen needs to be fully covered by material. Uncovered will allow air to leave the screen without lifting and moving material.

Note: For ease of trouble shooting, it is best to make only one adjustment at a time.

Note: It takes around 2-3min. for an adjustment to become evident.

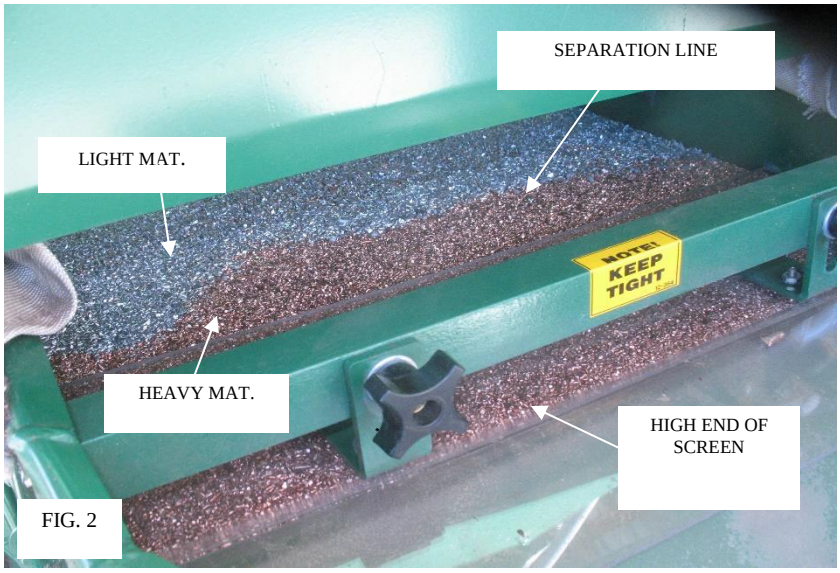


FIG. 2

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Granulator / Pre-Chopper

To maximize throughput the granulator and Pre-Chopper need to run at 75% to 95% of motor full load amps. Also, the screen selection is very important. The material needs to be chopped fine enough to liberate the material but not so fine as to over tax the system. If the screens are too small, the granulator will be overworking resulting in reduced knife life and less though put. With a larger screen the through put goes up and the knife life increases, but the material may not have adequate separation. It is best to find the largest screen possible while still allowing good separation. The screens should complement each other. This means when the correct screens are in place both machines should run at 80 to 95 percent of full load amps without one of the machines overloading or being under worked.