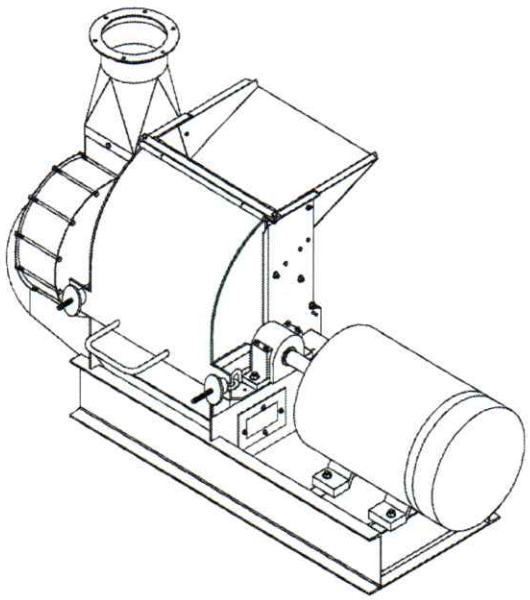
Colorado Mill Equipment
ECO-HMA100
Hammermill Manual



All personnel operating and maintaining this machine must first read this manual to ensure proper, safe and efficient operation and maintenance.

Please keep this manual for future reference.

For sales, parts, or service, contact:
COLORADO MILL EQUIPMENT, LLC
Canon City, CO 81212 • Phone: 719-275-1081 • Fax: 866-759-5894
sales@coloradomillequipment.com
www.coloradomillequipment.com

Colorado Mill Equipment - Limited Warranty

CME warrants our equipment/parts to be free of manufacturing with following terms, warranty period begins on the equipment ship date and extends to the following time limits:

- **New Equipment** – 1 year warranty against manufacturer defects in material & workmanship excluding consumables & high wear parts which have a 30 day warranty.
- **Replacement Parts** – 90 day warranty against manufacturer defects in material & workmanship.
- **Consumables & High Wear Parts:** Including, dies, die fasteners, rolls, roll parts, screens, hammers and belts – 30 day warranty against manufacture defects in material & workmanship.

Warranty does not cover normal wear and damage due to abuse, misuse, improper maintenance, improper assembly, failure to follow the instructions in the manual, or neglect of normal care.

Warranty may be limited or voided for applications considered abrasive, severe, or beyond original manufacturer specifications for the machine.

Warranty is not transferable and valid only on equipment sold in the USA and Canada. No warranty on equipment purchased in the USA and exported

Any alteration to equipment without express written consent of Colorado Mill Equipment will constitute a waiver of warranty by the buyer.

This warranty does not cover the removal of the defective part and installation of the repaired part.

All claims must be submitted in writing and authorization obtained from Colorado Mill Equipment to return defective parts for exchange.

Defective parts must be returned to Colorado Mill Equipment for exchange. Customer pays freight costs to Colorado Mill Equipment, once part has been examined and deemed by Colorado Mill Equipment to be within warranty, ground shipping of replacement will be provided.

Custom equipment, non-stock, or out of stock equipment may have extended lead times for shipping warranty parts.

Buyers, users, or anyone directing the purchase or use of said equipment shall determine the suitability of the product for its intended use, and said parties are specifically put on notice that they shall assume all risk and liability in connection herewith.

The foregoing warranties are in lieu of and exclude all other warranties not expressly set forth herein, whether expressed or implied by operation of law or otherwise, including but not limited to any implied warranties of merchantability or fitness.

Colorado Mill Equipment shall in no event be liable for incidental or consequential losses, damages or expenses in connection with exercise products.

Colorado Mill Equipment liability hereunder is expressly limited to the replacement of parts not complying with this warranty or, at Colorado Mill Equipment's election, to the repayment of an amount equal to the purchase price of the parts in question.

Colorado Mill Equipment is not responsible for labor charges incurred in the replacement of defective parts, loss of revenue for down time, or other losses associated from the machine not being operational.

Replacement products are warranted for the balance of the original warranty period.

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Section 1 – Safety Instructions

1.1 General Safety Precautions

COLORADO MILL EQUIPMENT, LLC ASSUMES NO RESPONSIBILITY FOR INJURIES TO PERSONNEL, OR DAMAGE RESULTING FROM CARELESS, IMPROPER, OR UNSAFE USE OF THIS EQUIPMENT.

IN ADDITION TO THE FEDERAL, STATE, AND LOCAL REGULATIONS, ALL OPERATORS AND MAINTENANCE PERSONNEL MUST BE TRAINED IN THE FOLLOWING SAFETY PROCEDURES TO AVOID THE RISK OF SERIOUS INJURY OR DEATH. IT IS EXTREMELY IMPORTANT THAT ALL MACHINE OPERATORS, OWNERS AND SUPERVISORS READ AND UNDERSTAND ALL THE SAFETY PRECAUTIONS LISTED IN THIS MANUAL

•Before performing any work on this equipment, it must be placed on a level surface and securely fastened.

•All the electrical connections to this equipment must be performed by a trained and authorized electrician, familiar with the national and local electrical codes.

•All electrical power disconnects and means of material flow to this equipment shall be locked out with an OSHA approved lock-out/tag-out device whenever maintenance, cleaning, adjustments, or service is performed on this equipment.

•If the disconnect is not in clear sight of the employee. A "Do Not Start" tag as described in Code of Federal Regulations, Title 29, Section 1910.145(f)(3), shall be affixed to any and all operating controls.

•Where more than one employee is engaged in working on machinery or equipment, each employee shall affix the employee's individual lockout device or lock to the disconnect switch or power supply.

•Only trained and designated employees shall operate, maintain or repair this equipment.

•Do not remove any guards or bypass any safety devices while the machine is in operation.

•Any rotating parts and mechanisms must be securely blocked before reaching into the machine to perform maintenance or cleaning.

•Do not put hands or tools into any openings on this equipment while in operation.

•If steam is used for product conditioning, all the federal, state and local codes and procedure must be followed.

WARNING!

FAILURE TO READ AND UNDERSTAND THIS MANUAL BY OWNERS, OPERATORS, SUPERVISORS, AND MAINTENANCE PERSONNEL IS A MISUSE OF THIS EQUIPMENT!

1.2 Hammermill Safety Specifications

Before powering up the machine – Do not attempt to power up this equipment or make any modifications or adjustments before reading and understanding the warnings and instructions contained in this manual. Check the unit for any physical damage, and any loose hardware or components. A qualified and authorized electrician can help you determine the power requirements, make the electrical connections required, power up and test your machine.

While operating the equipment– Severe injuries to persons operating the cooler can occur from reaching into the running machine. Do not operate the equipment with the safety guards removed and/or the cooling chamber door opened.

While performing preventative maintenance – Do not attempt to reach into the machine or perform any preventive maintenance before disconnecting the machine from the power supply. An OSHA approved power lock-out/tag-out device must be used to prevent accidental and unintended machine power up.

Equipment cleaning – Do not attempt to perform any of these procedures before disconnecting the machine from the power supply. An OSHA approved power lock-out/tagout device must be used to prevent accidental and unintended machine power up.

Electrical wiring – All electrical connections and wiring must be approved and performed by a licensed electrician familiar with all local, state, and national electrical codes and procedures.

EXTREMELY IMPORTANT

The words "DANGER", "WARNING" and "CAUTION" are used throughout this manual to designate the hazard level.

- **DANGER:** Indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.

- **WARNING:** Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.

- **CAUTION:** Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury. It may also be used to alert against unsafe practices or potential damage to machine.

Section 2 – Installation and Operation

2.1 Installation

Plan carefully where you will set your new mill. Be sure to allow plenty of space to service, operate, and inspect the mill. Overhead space and obstructions must also be considered because of discharge pipe routing and raising the Top Opening Section to change hammers or perform other service.

CME recommends attaching your new mill to a level concrete slab via the attachment points provided in the base of the machine. In order to reduce vibration and noise, wooden or rubber sills can be placed between the concrete and the machine base.

After the mill has been properly located, check mill speed and direction, and screen position before operating. The No. 65 Mill recommended speed is 3500 RPM. If an electric motor is used to drive the mill, obtain the services of a licensed electrician to connect power.

If using a V-Belt drive, align sheaves and adjust belt tension so that no slippage occurs at the rated load and RPM. Avoid excessive belt tension or premature bearing and/or belt failure is likely. Also, consult the V-Belt manufacturer for proper belt selection and maximum recommended belt speeds. Never operate the mill without proper guarding in place.

2.2 Setup

Before starting the mill, the following items should be checked:

1. Make sure the bearings are properly lubricated (See lubricating instructions)
2. Check that the desired screen is properly placed in the mill.
3. Screen change door is secure.
4. If applicable, place bags on sacking spouts.

The mill is now ready to operate. Avoid feeding a large quantity at one time into the mill. The greatest throughput can be obtained by uniform feeding so as not to shock or slug the mill which will reduce capacity and put undue strain on mill components. If no mechanical feed control is used, an Ammeter can be used to regulate feed rates so as not to go beyond the rated capacity of the motor.

2.3 Operating Principles

Coarse product is fed into the hammermill at the front of the grinding chamber. Gravity pulls the material down toward the bottom of the semi-circle screen. As the hammers are rotated inside the grinding chamber, the leading edges of the hammers break up the material into smaller parts. Additionally, this action throws the material around inside the grinding chamber to promote even grinding of the material and even wear of the screen. A flapper door located across the inlet prevents the material from being thrown back out of the grinding chamber. As the material is hammered small enough to filter through the screen, it is drawn by vacuum and gravity out of the grinding chamber. The vacuum continues to draw the material out to the cyclone separator where the heavier material is dropped to the cyclone discharge and the fines are driven to the dust bag manifold.

2.4 Operation

Preparation before running

1. Ensure that all hammer rods are properly installed and each pin is secured with a cotter pin on each end.
2. Ensure that all doors are closed and latched, and that all guards are in place.
3. Ensure that all components are properly lubricated with a grade #2 lithium grease.
4. Maintain the production area clean at all times, making sure that no metal or any other hard objects can mix in with the product and enter the grinding chamber.
5. The grinding chamber should be clear of any material that may have collected enough to prevent the free rotation of the hammers.

Machine start-up

METAL MUST BE REMOVED FROM PRODUCT VIA MAGNET BEFORE FEEDING INTO MACHINE

Start the machine without material being fed into the inlet. Apply power to start the machine. Allow the machine to achieve full operating speed and the hammers to become fully extended and balanced. Verify that air is flowing out of the cyclone and into the dust bags.

Normal operation

CAUTION: Do not leave the machine unattended while in operation!
Begin feeding material slowly into the machine. Initially the rate of feed will be slow until material begins to flow through the screen. Once material begins to discharge through the cyclone, gradually increase the feed rate until optimal production is achieved for your particular material. You will notice a decrease in production if the feed rate is excessive.

Machine shutdown

In order to shut down your hammermill, first stop the supply of material to the hammermill. Allow the hammermill to continue to run until material no longer discharges from the cyclone. At this point it is safe to shut down the hammermill.

Section 3 – Maintenance

Warning: System motors must be de-energized and locked out before attempting repair or maintenance.

3.1 Daily maintenance

1. After each shift, clear accumulated material from the inlet, inside the grinding chamber, and under the screen.
2. Check for any loose bolts or components.
3. Grease pillow-block bearings on the rotor shaft and bearings on the motor with lithium-based #2 grease
4. Check the hammers for excessive or uneven wear in the pin holes and on the hammer tips.

   CAUTION: Do not flip over hammers that are excessively worn. This may cause the mill to become unbalanced, cause damage to equipment and/or personnel, and is a potential safety hazard.
5. Check the hammer pins for excessive wear under the hammers and inside the rotor plates.
6. Check the belts for signs of wear and proper tension.
7. Check the screen for holes, cuts, excessive wear, and irregular wear patterns.
8. Check the mill-base vibration mounts for cracks and other damage.
9. Check the mill and blower housings for cracks in welds and flanges.

3.2 Screen Changing Procedure

1) Disable power source so there is no danger of the mill starting during this procedure.
2) Loosen the screen carrier handle by turning it clockwise at least seven turns.
3) Pull up the handle with one hand and with the other hand, open the screen cage door.
4) Release the handle and allow the carrier to drop into the bottom hopper of the mill.
5) Pull the screen out by grasping the exposed end and pulling toward you and upward.
6) In order to reinstall the screen, insert either end of the screen in the mill at the screen change door opening.
7) Push screen all the way in so it makes contact with the stop in front of the mill at the base of the breastplate.
8) Pull up on the carrier handle until the screen touches the stop at the base of the top opening section.
9) Close the screen change door and secure into position by tightening the carrier handle and making sure the screw is well back in the slot on top of the screen change door.

Note: Heavier or thicker screens require more pressure to install or remove because they do not bend or slide as easily as thinner screens. If the screen is bent and does not fit properly, it will need to be reshaped to the proper form, or replaced.

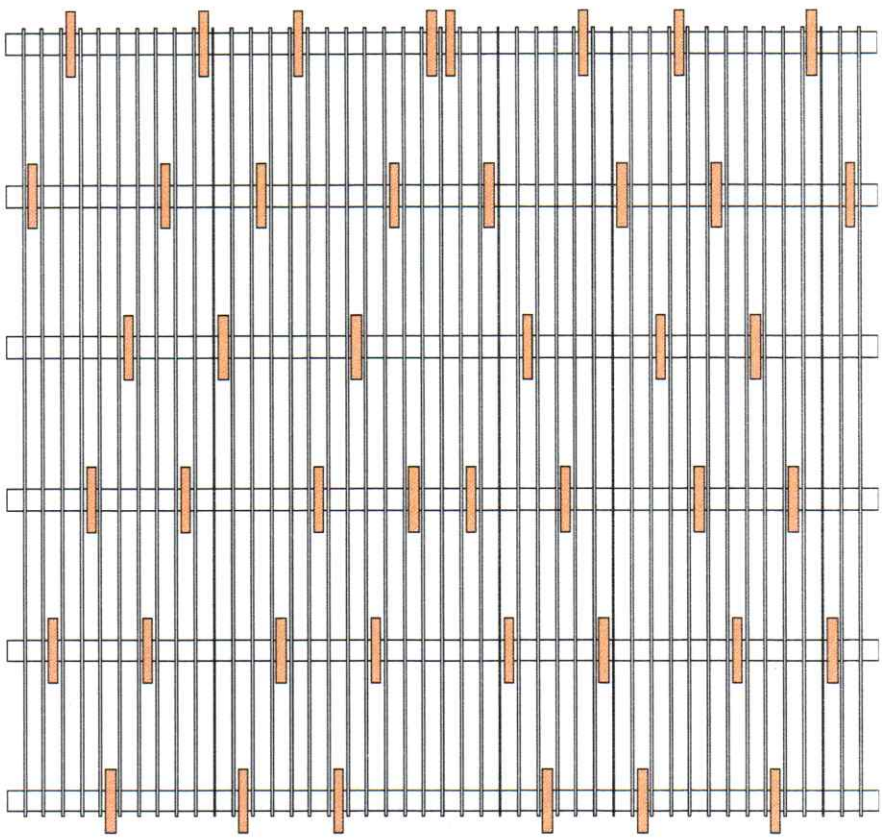
3.3 Bearings

Bearings are factory prelubricated. If mill is outdoors, relube 2-3 per year. If subjected to severe outdoor service, relube 2-3 times per week. If in a high contamination/washdown environment, relube once per week.

When relubricating, inject grease until a thin bead of fresh grease is visible at the seal lip. Use Pillow Block grease, No.2 Lithium base grease or equivalent.

3.4 Hammers

Hammers are double-ended and have four wearing edges. When the cutting corner has become worn and rounded, the capacity of the mill will be reduced and the hammer will need to be replaced. The amount of grinding which can be done on each corner depends on the type of material being ground. Generally, depending on material and conditions, each corner of a hammer should grind from to 100 to 200 tons before becoming worn enough to replace. If the feed contains any sand or grit, the hammers will wear much faster. The first change should use the same hole for the pivot rod and turn each hammer so the opposite edge will do the grinding. The next change will be to use the opposite hole. Check hammers and pivot rods periodically for wear and replace before breakage. When changing or replacing hammers or pivot rods, be sure the hammers are positioned in the same order. If the arrangement is different, the rotating assembly will be out of balance which will result in damage to your mill and bearings (See Hammer Arrangement Diagram). It is recommended to keep a set of hammers and pivot rods for spares, along with an assortment of screens.



Hammer Arrangement Diagram

3.5 Weekly Inspection

Notice: The following items should be checked at least every 50 hours of operation

1) **Bearings** – Lubricate if necessary. When replacing bearings, follow manufacturers recommendations.

2) **Hammers** – Check for uniform wear. If you don't have uniform wear, reverse or replace with new hammers.

3) **Hammer Pivot Rods** – Check for round, even wear. Replace rods when they are 1/3 worn or cut.

4) **Fan** – Check for uniform wear. Fan case and liner should also be inspected. If the liner is worn badly, replace before it wears through. If the fan is wearing unevenly, it must be repaired or replaced with a new fan.

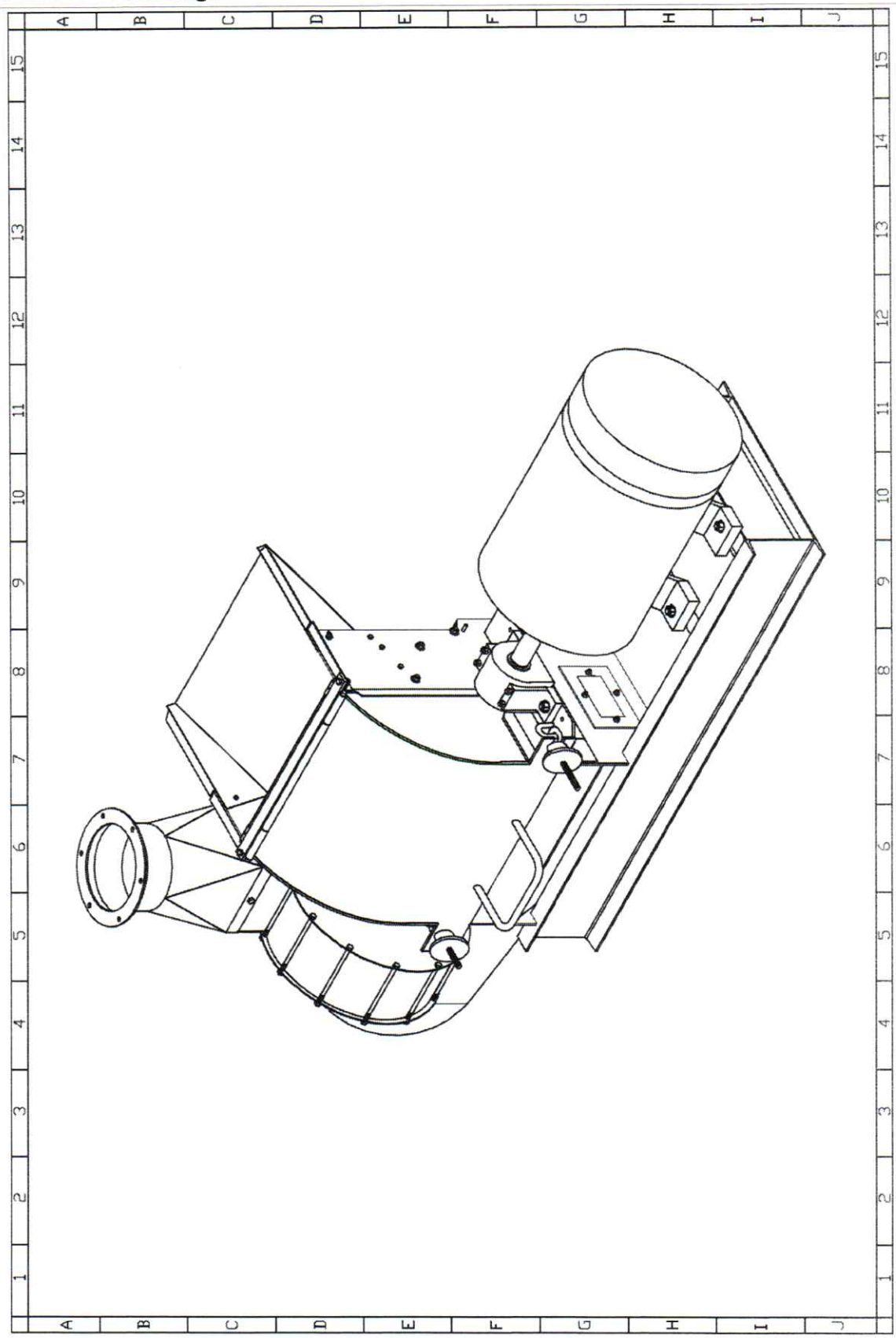
5) **Vibration** – Any excessive vibration will shorten the life of your mill and should be eliminated immediately. Vibration is usually caused by uneven wear of fan and/or hammers. Check whether fan / hammers are vibrating by running mill without either one running. This will help isolate the vibration. If hammers are out of balance, replace with new ones. If fan is out of balance, have a machinist rebalance or contact CME for assistance. If vibration cannot be eliminated from rotating assembly, remove it and return it for balancing. The entire rotation assembly is designed to be replaced or removed without taking the whole mill down. In case of continuous operation, a spare rotating assembly is recommended to prevent prolonged downtime.

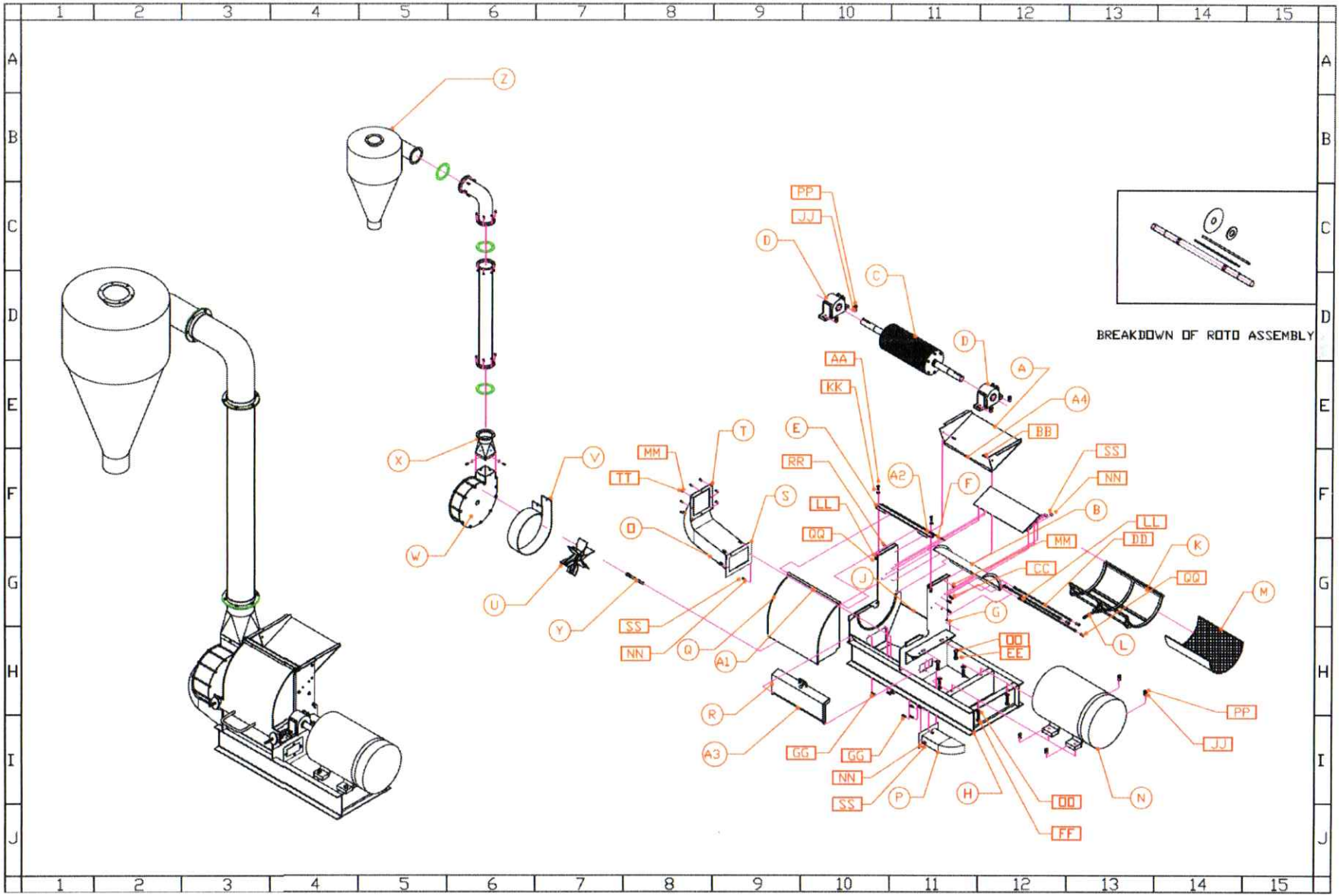
Appendix A – Parts

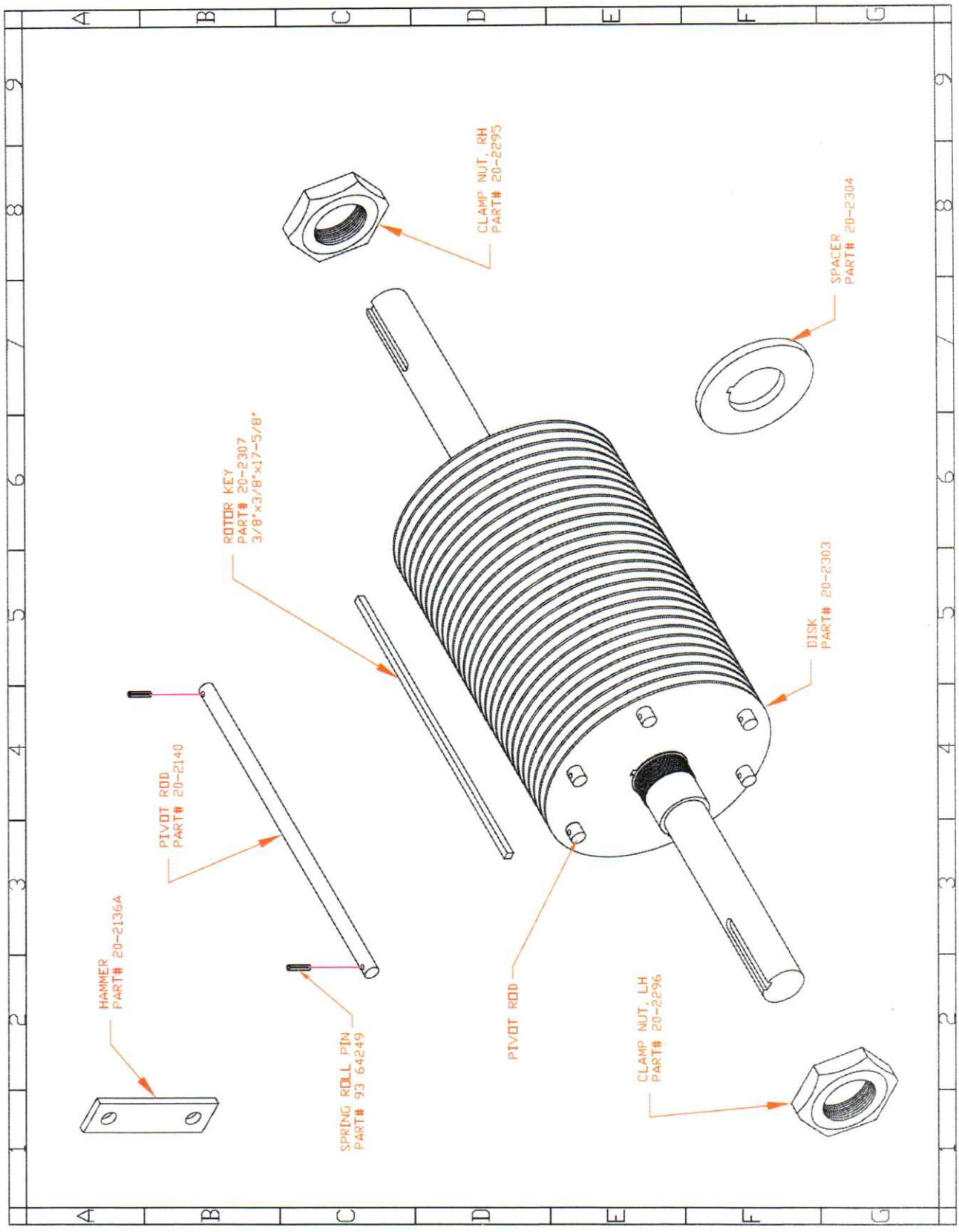
Diag	Part #	Description	Quant	Note
A	20 2220	Hopper	1	
B	20 2235	Breast Plate	1	65D 85D
C	20 19065D	Roto Assembly	1	Inc Shaft, Disc, Pivot Rods, Hammers
D	72 6010	Pillow Block Bearing	2	2 3/16" Rad, 2-Bolt
E	20 2211	Top Cross Bar	1	-65B 85D
F	20 2229	SAF Door	1	65B 65D 85D
G	20 2217A	Side Plate	2	65 85 Laser Cut
H	20 2277	Hammermill Foundation	1	33 ½" X 70" For 85
J	20 2241	Lower Mill Housing	1	W/ Fan & Bottom Discharge
K	20 2245	Screen Carrier	1	65 85
L	20 2246	Screen Carrier Locking Handle	1	65 85
M	20 2318	Screen	1	3/16"
N	20 2223	Motor	1	
O	20 2251	Fan Supply Chute	1	
P	20 2250AA	Vent Pipe	1	65 85 HM
Q	20 2202A	Top Opening Section	1	65 85 Hammermill All
R	20 2243	Screen Carrier Door	1	65HM
S	20 2253	Vent Cover	1	All Sizes
T	20 2254	Fan Housing Cover Plate	1	
U	50 8004BC	Fan Wheel	1	18" D X 6½" Wx6 Blade X 2 3/16" Bore
V	50 1914	Liner Heavy	1	#5 Elev. Fan
W	50 1972	Fan Housing	1	#85 Housing Bored 2 5/8"
X	20 2178	Outlet	1	#5 Elev. Fan
Y	20 2264	Fan Housing Support Bolt	1	
Z	45 #7 COLL	#7 Collector	1	
A1	20 2208	Hinge Rod	1	65B 65D 85D
A2	20 2232	Hng Rd	1	65B 65D 85D
A3	20 2249	Hng Pin	1	45B 45D 45BF
A4	20 2223	Hinge Rod For Feed Hopper	1	9/16" X 18 ½" 65 or 85

Diag	Part #	Description	Quant	Note
AA	93 13209	HCS ½ – 13 X 1 ½ Z5	2	2- Bolts – Top Cross Bar
BB	93 13059	HCS 5/16 – 18 X 1 ½ Z5	2	2- Hopper
CC	93 13110	HCS 3/8 – 16 X 1 ¾ Z5	6	Plate Below Hopper
DD	20 2238	Clamp Bolt 65b 65d 85d	3	
EE	93 13363	HCS ¾ – 10 X 1 ½ Z5	4	Pillow Block Bearing Bolts
FF	93 13365	HCS ¾ – 10 X 3 Z5	4	4 Motor Bolts
GG	93 13109	HCS 3/8 – 16 X 1 ½ Z5	8	Side Plate and Fan Supply – 4 Each
HH	93 12055	HCS 5/16 – 18 X 1 P5	8	
JJ	93 33632	L/W Z ¾	8	
KK	93 33030	USS F/W ½ Z	2	
LL	93 33626	L/W Z ½	8	
MM	93 33620	L/W Z 5/16	10	
NN	93 33622	L/W Z 3/8	14	
OO	93 33017	USS F/W ¾ P	8	
PP	93 36116	Fin Hex Nut ¾ – 10 Z	8	
QQ	93 36160	Fin Hex Nut ½ – 20 Z	8	
RR	93 37748	Wing Nut 5/16 – 18	2	
SS	93 36106	Fin Hex Nut 3/8 – 16 Z	14	
TT	93 36104	Fin Hex Nut 5/16 – 18 Z	8	

Appendix B – Drawings

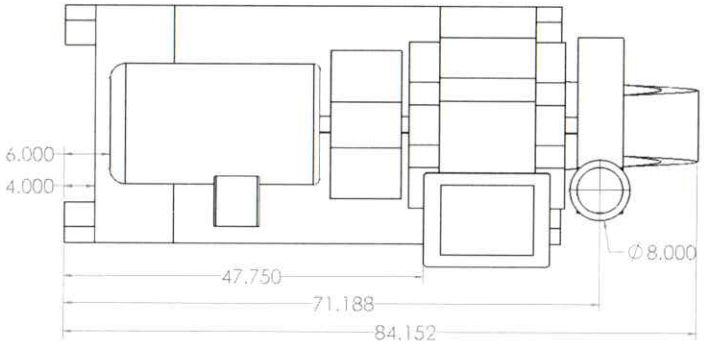


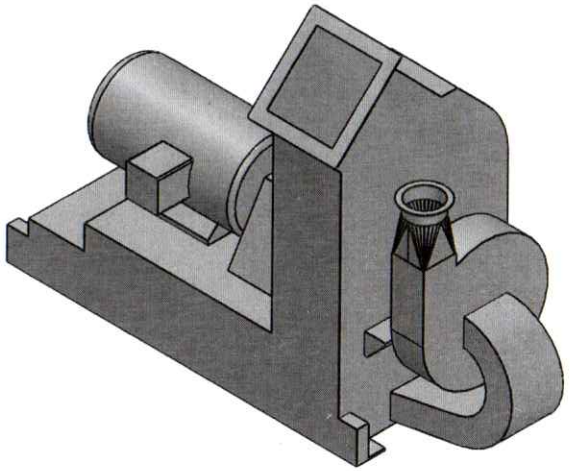

BREAKDOWN OF ROTO ASSEMBLY

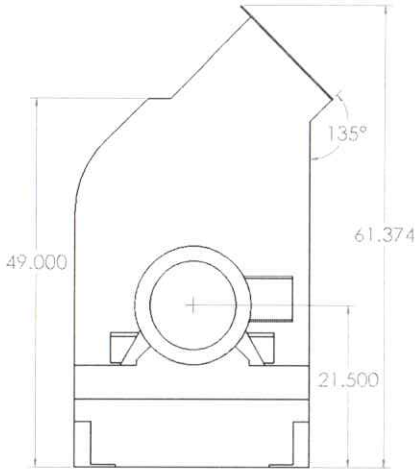

CLAMP NUT, RH
PART# 20-2295
SPACER
PART# 20-2304
ROTOR KEY
PART# 20-2307
3/8"x3/8"x17-5/8"
DISK
PART# 20-2303
PIVOT ROD
PART# 20-2140
HAMMER
PART# 20-2136A
SPRING ROLL PIN
PART# 93 64249
PIVOT ROD
CLAMP NUT, LH
PART# 20-2296

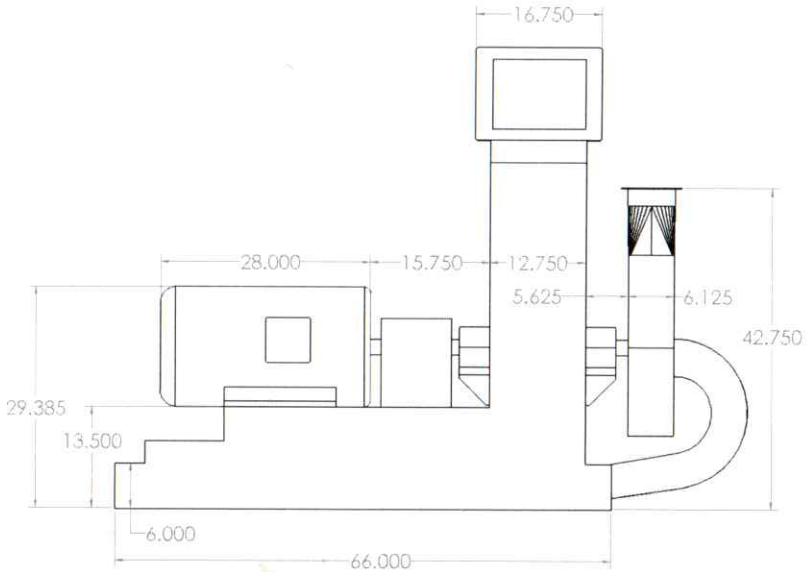
- Surge Hopper
- Rubber Isolation Pads -

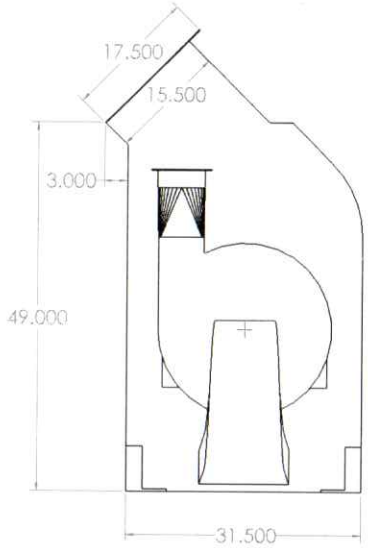
9'7"
61







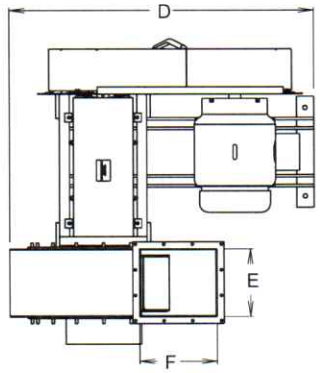




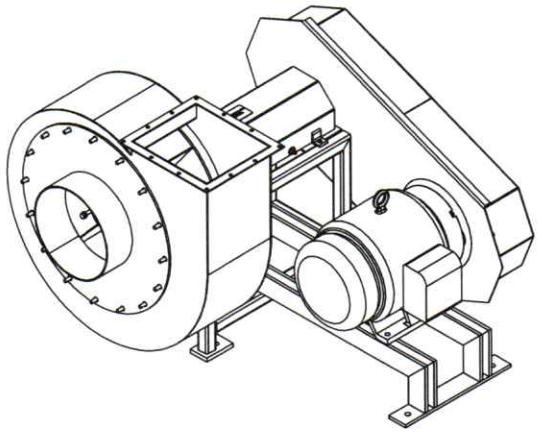
SIZE D DWG. NO. HMA 50 Solid REV
SCALE: 1:8 WEIGHT: SHEET 1 OF 1

FC Arr9FB FANS

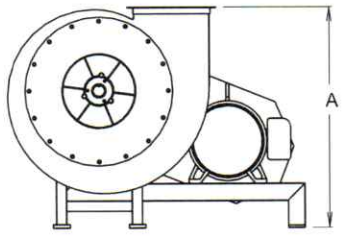
KICE INDUSTRIES, INC. / 5500 Mill Heights Drive / Wichita, KS 67219 www.kice.com / sales@kice.com



TOP VIEW



MODEL #	A	B	C	D	E	F	EST. WEIGHT
FC - 5	20 1/2	14 1/4	27 11/16	31 3/4	4 1/2	5 1/4	230
FC - 7	22 1/2	14 1/4	32 15/16	31 1/4	6 5/8	7 1/4	269
FC - 9	27 1/2	17	38 1/4	35 1/2	8 1/2	9 3/8	431
FC - 11	32 5/8	20 1/8	42 1/2	44 1/4	9 3/4	11 1/4	580
FC - 13	35 7/8	20 7/8	48	51 3/8	11 1/4	13	742
FC - 15	40 7/8	23 7/8	51 3/4	56 13/16	13	14 7/8	945
FC - 17	46 5/8	27 5/8	55 7/8	61 3/8	15 1/8	17 1/8	1225
FC - 19	51 1/8	30 1/8	59 3/8	63 13/16	16 5/8	18 7/8	1841
FC - 21	56 1/8	32 5/8	64 7/8	72 5/16	18 1/8	20 3/4	1841
FC - 23	62 1/8	36 1/8	71 1/2	72 13/16	19 3/4	22 7/8	2049
FC - 26	71 1/8	41 7/8	73 1/2	85 1/16	21 1/2	25 1/4	2696
FC - 29	77 7/8	45 3/8	77	90 13/16	25	28 5/8	3103



FRONT VIEW

NOTES:

DIMENSIONS SHOWN MAY DEPENDING ON JOB REQUIREMENTS

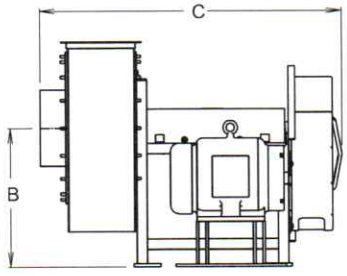
MATERIALS OF CONSTRUCTION PER SPECIFIC JOB

FOOTPRINT UPON REQUEST

MOTOR SIZE PER SPECIFIC JOB

STANDARD ORIENTATION SHOWN, MOTOR LEFT, CW ROTATION, VERTICAL UP DISCHARGE

MOTOR POSITION, DISCHARGE DIRECTION AND HOUSING ROTATION MAY VARY PER SPECIFIC JOB REQUIREMENTS



SIDE VIEW