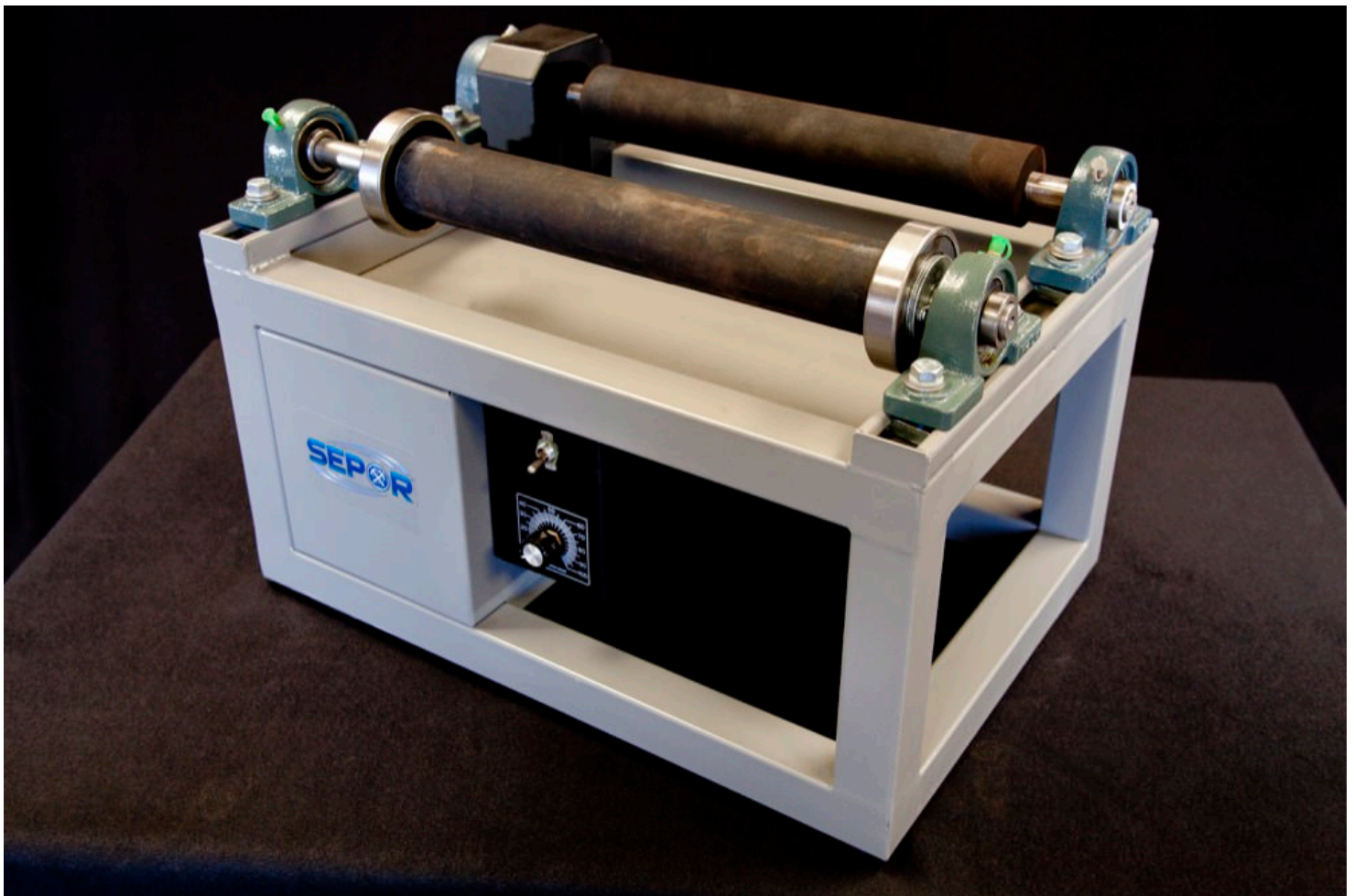




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OPERATING & MAINTENANCE MANUAL

2" x 13" ROLL DRIVES



INSTALLATION

Place the machine on a level surface to minimize jar migration.

Connect to the proper power supply, either 220 V/1 Ph/50-60 Hz. The 115 V machines have a electrical cord with plug supplied. The 220 V machines have the electrical cord supplied, but no plug.

The gear box has been filled with oil prior to shipment. In order to prevent oil from spilling during shipment, the breather plug has been removed and a solid plug has been put in its place. Before running the machine, the breather plug must be reinstalled. Remove the perforated side plate to access the gear box.

ROLL SPACING ADJUSTMENT

The drive roll is the fixed roll with the belt guard, drive pulley and drive belt connected to the gear reducer. This roll should not be moved. The idle roll may be moved to set the spacing between the drive rolls, to accommodate various size jars. The idle roll spacing is set by loosening the pillow block bolts. These bolts do not have to be removed, just loosened. Once the bolts are loose, tap the roll, which will slide in the unistrut. Make sure to move each side equally, and that the rolls are PARALLEL before re-tightening the bolts.

OPERATION

Recommended jar sizes to use on the roll drive range from 4" diameter to 10" diameter. The RPM's of the jar are directly related to the RPM's of the rollers. The roll diameter is 2", and have a speed range from 20 to 500 RPM's. So, a jar with an eight inch diameter would have a top jar speed of 125 RPM's (132% of the jar's critical speed). (500 RPM x (2/8)) See enclosed Table of Grinding Jar, Roll Speeds for 2" Diameter Roll Drive. For drives with optional timers, set the timer for the desired amount of time (0-6 hours in 7.5 min increments),. When the pre-set time period expires, the power will be shut off to the machine. **NOTE that the timer must be turned past 0 for power to be supplied to the motor. No power will be supplied to the motor with the timer off (set to 0)**

The desirable operating speeds of the ball mill (jar's) is between 70% and 77% of its critical speed. The critical speed is the speed at which a particle's acceleration due to the centrifugal force from the mill's rotation is equal to the particle's acceleration due to gravity.

$$\text{Critical Speed (RPM's)} = \sqrt{\frac{76.6}{D1}}$$

D1 = Internal diameter of the jar (mill) measured in feet.

The Jar Drive should not be operated without the guards or side plate in place. The Sepor jar rolling machines are designed for continuous duty and may be used for extended periods of time. The jar rolling machines have been tested with up to 100 pound loads, with a 1/4 HP drive. For heavier loads, larger HP drives are required.

This roll drive is equipped with the Boston Gear Ratiotrol Solid State DC Motor Speed Control, for connection to 220 V/1 Ph/50 Hz electrical power source. The Ratiotrol is connected to a Intermatic Spring Wound Interval Timer, with 0-6 hour @ 15 minute intervals, and a Dayton and both are connected to a Boston Gear 1/4 HP/180 VDC Motor and Boston Gear 5:1 Gear Reducer.

During grinding, the jars will have a tendency to 'creep'. This cannot be avoided. To prevent the jars from sliding over the ends of the rolls, a stainless steel jar stop is in place at the end of the neoprene roll. If only one jar is used, place the jar near the jar stop to begin grinding.

Jar Critical Speed for Various Dia. Jars

Jar Diameter (In.)	Jar Critical Speed	70% of Jar Critical Speed	Roll Speed Required
4	133	93	149
5	119	83	166
6	108	76	182
7	100	70	197
8	94	66	210
9	88	62	223
10	84	59	235
11	80	56	246
12	77	54	257

Mathematical Relationship Between Jar Diameter and Jar Critical Speed

$$\text{Critical Speed (RPM's)} = \sqrt{\frac{76.6}{D1}}$$

D1 = Internal diameter of the jar (mill) measured in feet.

For Safe Operation, the Jar Drive should not be operated without the guards or side plate in place

The Sepor jar rolling machines are designed for continuous duty and may be used for extended periods of time. The jar rolling machines have been tested with up to 100 pound loads.

DRY GRINDING

The solids to be ground must be well crushed, preferably finer than 8 mesh, except for soft, easily ground material. For very hard material, a finer starting particle size would be desirable for optimum results from the jar mill.

The amount of material placed in the jar should be sufficient to cover the grinding jar, filling all voids between grinding media and slightly covering the grinding media. This will give the fastest grinding times. Up to a maximum of 40% of the jar volume may be utilized for feed material, however at the maximum material charge, grinding times will be increased. If the material being ground becomes clogged, or agglomerates into a plastic like state, grinding action will cease in the jar. The material must be removed and dried, or ground wet, dispersed in a liquid of up to 50% solids (by weight).

Grinding time varies with the percent media charge, the load of grinding material, the mill operating speed (% Critical Speed), and the type of material being ground. Experimentation will determine the optimum load, grinding time for material to be ground. It is generally true that the longer the grinding time, the finer the product becomes.

WET GRINDING

Viscosity of the material should be equivalent to a free flowing slurry, but the slurry may be as much as 60% solids. The grinding material batch size will vary, but generally a loading of feed material between 20% to 40% of the jar volume will produce the desired results.

Again, the optimum load can be determined by experimenting with the volumetric charge of material to be ground.

LUBRICATION GUIDE

The following lubricants, or their equivalents, are suggested. These are recommended for normal operating conditions with ambient temperatures to 100 degrees F.

Mechanical Unit	Exxon Product
Anti Friction Bearings	Unirex N2
Packing Glands	Unirex N2
Gear Boxes	Exxon Product
Worm Gear Type	Spartan EP-5
Helical Gear Type	Nuto 63

SINGLE TIER, 13" JAR ROLL DRIVE • 010E-027

Item #	Description	QTY
010E-A001	13" Jar Mill Frame	1
010E-X001	Bearing Guide Rolling Mill 2"	2
010E-X002	Bearing Cover Jar Rolling Mill	2
010E-SW003	Drive Rolls 2"x12"L Rubber	2
CNT-DCX203C	DC Controller DCX203C-17A	1
MO-M1135046	1/4hp 90V DC 500rpm 16lbs	1
784ST125	3/4" Pillow Blocks UCP204-12	4
762ST174	V-Belt Pulley 240L	1

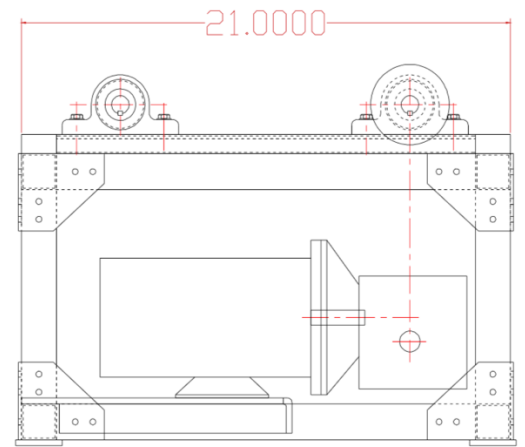
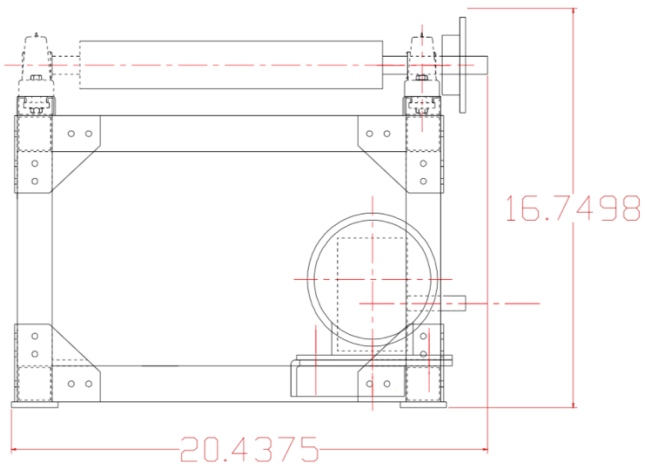
TWO (2) TIER, 13" ROLL DRIVE • 010E-029

Item #	Description	QTY
010E-B001	13" 2 Tier Mill Frame	1
010E-X001	Bearing Guide Rolling Mill 2"	2
010E-X002	Bearing Cover Jar Rolling Mill	2
CNT-DCX203C	DC Controller DCX203C-17A	1
MO-M1135046	1/4hp 90V DC 500rpm 16lbs	1
784ST125	3/4" Pillow Blocks UCP204-12	8
762ST174	V-Belt Pulley 240L	1
010E-SW003	Drive Rolls 2"x12"L Rubber	4

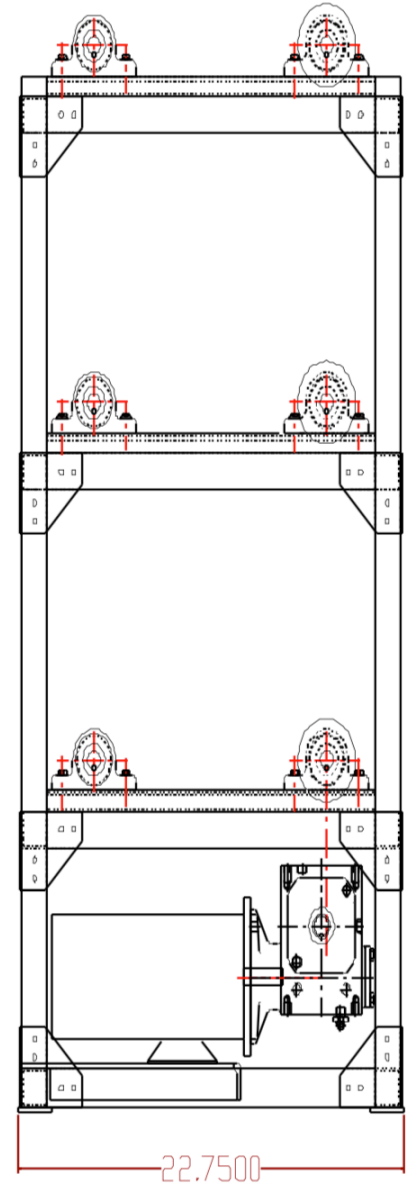
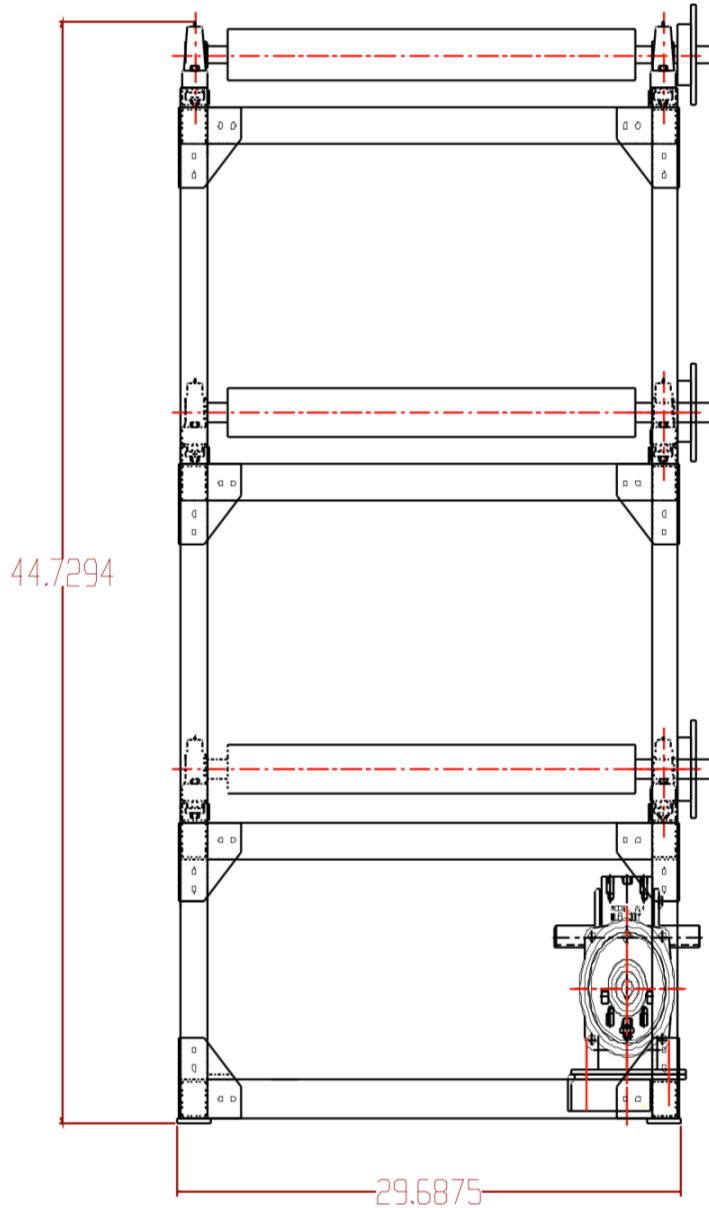
THREE (3) TIER, 13" ROLL DRIVE • 010E-030

Item #	Description	QTY
010E-B001	13" 3 Tier Mill Frame	1
010E-X001	Bearing Guide Rolling Mill 2"	2
010E-X002	Bearing Cover Jar Rolling Mill	2
CNT-DCX203C	DC Controller DCX203C-17A	1
MO-M1135046	1/4hp 90V DC 500rpm 16lbs	1
784ST125	3/4" Pillow Blocks UCP204-12	12
762ST174	V-Belt Pulley 240L	1
010E-SW003	Drive Rolls 2"x12"L Rubber	6

2" Diameter, 13" Long Rolls, JAR DRIVE



2" Diameter, 3 Tier, 13" Long Rolls, JAR DRIVE



WIRING

