BKM electronics

GILSON COMPANY, INC.

OPERATING MANUAL

Los Angeles Abrasion Machine

HM-70A & HM-70AF

Rev: 8-2023

PHONE: 800-444-1508
740-548-7298

P.O. Box 200, Lewis Center, Ohio 43035-0200
Email: customerservice@gilsonco.com **Product Web Page:** globalgilson.com

FAX: 800-255-5314
740-548-5314

Table of Contents Page

1.0 SAFETY 2
1.1 IMPORTANT SAFETY INSTRUCTIONS 2
2.0 UNPACKING 2
3.0 SETUP 3
4.0 OPERATION 4
5.0 MAINTENANCE 5
5.1 MOTOR CONTROLLER 5
5.2 GEARMOTOR BRAKE 5
5.3 LUBRICATION 6
5.4 DRIVE CHAIN 6
6.0 PARTS LISTS AND DIAGRAMS 7
6.1 HM-70A & HM-70AF OUTER CASE AND FRAME 7
6.2 HM-70A & HM-70AF INNER PARTS 8
6.3 HM-70A & HM-70AF CONTROL CONSOLE 10
6.4 HM-70A & HM-70AF DRUM / SUPPORT BEARING 11
6.5 M-70A & HM-70AF DRIVE SPROCKET 12
7.0 MASTER PARTS LIST 13
7.1 HM-70A & HM-70AF MASTER PARTS LIST 13
8.0 ELECTRICAL DIAGRAMS 14
8.1 60Hz/240V ELECTRICAL DIAGRAM 14
8.2 50Hz/240V ELECTRICAL DIAGRAM 15

1.0 SAFETY

1.1 IMPORTANT SAFETY INSTRUCTIONS

The buyer is responsible for ensuring that users are properly trained, that they are aware of all the information and instructions in this document, and that they are aware of the potential risks of operating the machine. The manufacturer will not be held responsible for any damage to people and/or property caused by non-compliance with any instructions in this manual.

⚠ WARNING: This machine operates on electric current. Improper operation could result in electric shock, electrocution, or an explosion!

- **ALWAYS** ensure the motor and other electrical components are properly configured for your intended use and available power source. The Los Angeles Abrasion Machine comes with a 1hp motor single phase wired for 220V/60Hz. It can also be ordered with special wirings: 220V/50Hz. Motors are **NOT** explosion-proof.
- **ALWAYS** check electrical wiring for loose connections and for pinched or frayed wiring.
- **ALWAYS** disconnect and lock out power supply before performing maintenance and repairs.
- The unit is not supplied with a power cord to ensure compliance with all local wiring codes. The correct voltage, frequency, and amperage must be supplied to the unit from a dedicated, grounded circuit which is protected by a properly sized circuit breaker or time delay fuse. Electrical connections should be performed by qualified personnel familiar with code requirements and local safety standards.

⚠ DANGER: DO NOT use this machine in an explosive or hazardous atmosphere. It is NOT explosion-proof or approved for operation in hazardous locations. Only operate the machine in a properly ventilated area.

⚠ WARNING: DO NOT operate the machine without having all guards and covers in place.

⚠ WARNING: When loading or unloading your sample and abrasive charge, be aware that you are handling substantial weights. Take care to lift, pull and dump sample in a safe, ergonomic manner to avoid injury. Know sample and abrasive charge weights before testing.

⚠ WARNING: Keep all parts of your body away from moving parts of the machine while it is operating.

⚠ WARNING: DO NOT wear loose clothing which might be caught in or on moving parts of the machine.

⚠ WARNING: ALWAYS wear safety glasses, hearing protection, and other personal protective equipment when operating, maintaining, or repairing this machine.

2.0 UNPACKING

The Los Angeles Abrasion Machine weighs about 1,200lbs crated and 1,050lbs uncrated. Use equipment to adequately to handle this weight safely. Wear safety glasses and work gloves.

1. Normally the LA Abrasion Machine will be shipped in a plywood crate. Disassemble the crate and remove the lag bolts holding the machine to the pallet. Use a fork lift of suitable capacity to remove the machine from the pallet.
2. Check your LA Abrasion Machine's electric motor and wiring to make sure it is what was ordered and is appropriate for your installation.
3. Check the machine for shipping damage. If you find concealed damage after you have signed for the LA, call the delivering carrier immediately for an inspection. Save all packing materials, and leave the LA as it is.
4. Check for any loose or missing parts and report any missing parts to Gilson.
5. Select an operating site which allows for electrical connection, proper grounding, access for opening, loading, and unloading of your LA Abrasion Machine, and access on the left side to perform necessary maintenance.

3.0 SETUP

Note: Read and understand all safety and set-up instructions for the LA Abrasion Machine before putting it into service. The part number references in parentheses can found in the PART LIST AND DIAGRAMS on Page 7.

The Los Angeles Abrasion Machine is assembled and ready to use, once you have removed the packing materials and properly connected it to your electrical wiring. No permanent mounting is required, but holes are provided at the corners of the main frame for fastening the machine in place if you wish.

Electrical requirement is 230V, 60Hz, 1-phase for Model HM-70A, and 230V, 50Hz, 1-phase for model HM-70AF, unless special motor characteristics have been ordered. The motor is 1hp.

1. Connect a fused, grounded power line to the Disconnect Enclosure (17A), using the access hole in the left side of the starter box. Follow National Electric Code recommendations.

Note: Open top cover first, then front doors. When the top cover is opened, a safety interlock cuts power to the machine.

2. The motor housing (25A) is supported on the bottom by stabilizing feet on long threaded rods. Adjust the rods and feet until the housing is stable and firmly supported on the floor.

3. Unpack the abrasive charge:

a. Open the top cover (30A) and front doors (7A).

b. Remove Drum Access Door (#1A) by loosening its upper knobs, removing its lower knobs and lifting out the door.

c. Remove the package of 12 steel balls which are the Abrasive Charge (HMA-130) used in the LA Abrasion Machine.

d. Replace drum access door and tighten knobs before proceeding. Close case doors.

4. Test the drum rotation:

a. Set the counter (18A) for 20 revolutions. Press the button below the column to be changed. Press the digit keys up or down under each column to change the values of the digits. When done, press the reset button.

b. Position the selector switch (35A) to JOG. Momentarily press JOG push button (36A) and observe through the window to verify that top of the drum rotates away from the front of the machine. If not, reverse electrical connections at the motor controller to correct the rotation.

c. Turn selector switch to RUN and push START. Drum will rotate for 20 revolutions and stop automatically. Push red emergency stop button (33A) if there is a problem.

4.0 OPERATION

The HM-70A Los Angeles Abrasion Machine is designed to perform testing on mineral aggregates following the procedures in ASTM Standard Test Methods C131 and C535, and AASHTO T 96. The instructions in this manual pertain only to proper operation and maintenance of this machine. Please refer directly to the published test methods for proper testing protocols. Test methods are available from ASTM at www.ASTM.org or from AASHTO at www.transportation.org.

Note: Please read and understand all safety and set-up instructions for the LA Abrasion Machine before putting it into service.

1. Make sure your LA Abrasion Machine is properly wired and connected to your power supply.
2. Set the counter for 500 revolutions or other value as directed by test specifications. Press the digit key under each column up or down to change the values of the digits. When done, press the reset button.
3. Set the selector to JOG.
4. Look through the window in the top cover while you depress the JOG button to rotate the drum, which is marked at its DISCHARGE and FEED positions.

   The FEED position marked on the drum is preceded by an arrow. Use the FEED position for loading the sample and the charge and for removing the door before dumping.
5. Jog the drum around to FEED. If you rotate the drum too far and miss the position, continue to jog the drum another 360° to the proper position.

Note: NEVER rotate the drum around by hand.

6. Turn selector switch to OFF. Open cover and doors. Remove drum access door by loosening the upper two knobs, removing the lower two knobs, and lifting out the door. Leave the upper knobs on the drum.
7. Load sample and appropriate abrasive charge into drum. If you are working with a large, heavy sample, divide it and load it in stages. Install door and re-tighten all four knobs. Close cover and doors.
8. Press the **reset counter** button to restore the counter setting.
9. Turn selector switch to RUN, and push START button. Drum will rotate according to the counter setting and stop automatically. If problems arise, use red emergency stop to shut off machine.
10. At completion of test, the drum should stop with the drum access door at approximately the working position. Turn selector switch to OFF. If the drum access door is not in the desired position, turn selector switch to OFF and then to JOG. Push JOG button to rotate drum to FEED position. Turn selector to OFF. Open cover and doors and remove drum access door.
11. After removing the drum access door, RE-TIGHTEN THE TWO UPPER KNOBS SO THAT THEY WILL CLEAR THE BACK OF THE MACHINE FRAME. Make sure pan is in position below drum. Close cover and doors.
12. Move selector to JOG and push JOG button to rotate drum to DISCHARGE position. Sample and charge will be discharged into pan.
13. After discharge is complete, JOG drum back to FEED position. Turn selector to OFF.
14. Open top cover and doors and remove pan. LOADED PAN WILL BE HEAVY. BE CAREFUL WHEN LIFTING. GET HELP IF NECESSARY. Dump pan and replace pan under drum.
15. If you are finished testing, replace the drum door. Close doors and cover. Set selector to OFF. Throw machine lockout switch to OFF.

If an overload to the machine occurs, the drum will automatically stop rotating. After sufficient cool down time, you can resume operation:

- The motor controller will reset control to the motor after sufficient cool down time.
- Press START button. The LA Abrasion Machine will complete the number of revolutions remaining on the counter.

5.0 MAINTENANCE

Note: Read and understand all safety, operating and maintenance instructions for the LA Abrasion Machine before performing maintenance on it.

⚠ WARNING: ALWAYS disconnect and lock out electric power before performing maintenance!

5.1 MOTOR CONTROLLER

The LA Abrasion Machine is equipped with a motor controller located in the motor housing compartment. Although the parameters of the motor controller have been set at the factory, they can be changed if required. It is advised that these parameters not be changed unless done by a qualified technician. The manufacturer will not be responsible for any damage to the machine after the factory parameter settings have been changed. A few of the aspects that are controlled by these parameters:

- Motor Speed & Direction (Proper drum speed & direction)
- Motor Voltage & Hz
- Motor Overload Settings
- Drum Speed Acceleration
- Drum Speed Deceleration
- Dwell Time to Stop (Drum lid location)
- Jog Speed & Direction

If the drum does not rotate, there may be a fault at the motor controller not allowing the motor to run. To check the controller for a fault, remove the Motor Housing Cover (2A) and check to see if the screen of the motor controller is showing a fault code. Record the fault code and refer to the PowerFlex owner's manual for the cause of the fault. Correct the condition causing the fault and press the red STOP button on the controller to clear the fault. Refer to the PowerFlex owner's manual for more information.

5.2 GEARMOTOR BRAKE

The LA Abrasion Machine is equipped with a gearmotor equipped with a brake. The brake holds the drum in location whenever the drum is not rotating. Note that the brake defaults to the "engaged" position when there is no power applied to the motor. DO NOT attempt to rotate the drum by hand, damage to the brake can result. Refer to the gearmotor owner's manual for more information on the brake.

5.3 LUBRICATION

- The Gearbox of the Gearmotor is filled with grease at the factory. It is not necessary to replace the grease. Refer to the gearmotor owner's manual for more information.
- The Drive Chain should have only a surface film of oil, just enough to prevent rust.
- Drum Support Bearings are sealed and do not require lubrication.
- The Motor has sealed bearings. No lubrication is required.

5.4 DRIVE CHAIN

Inspect the drive chain about every 100 hours of operation. Refer to Figure 1.

1. Disconnect and lock out electric power. Use the lockout switch.
2. Remove the Motor Housing Cover.
3. Flex the section of Chain toward the back of the machine. If there is more than 1/4in of slack in the chain, adjust the chain. To adjust, loosen the motor mounting bolts and move the motor assembly until the chain has 1/4in slack. Re-tighten the motor mounting bolts securely.
4. Lubricate the drive chain. Maintain a surface film of oil, just enough to prevent rust.
5. Reinstall the motor housing cover. Reconnect power, but leave the lockout switch off till ready to operate machine.

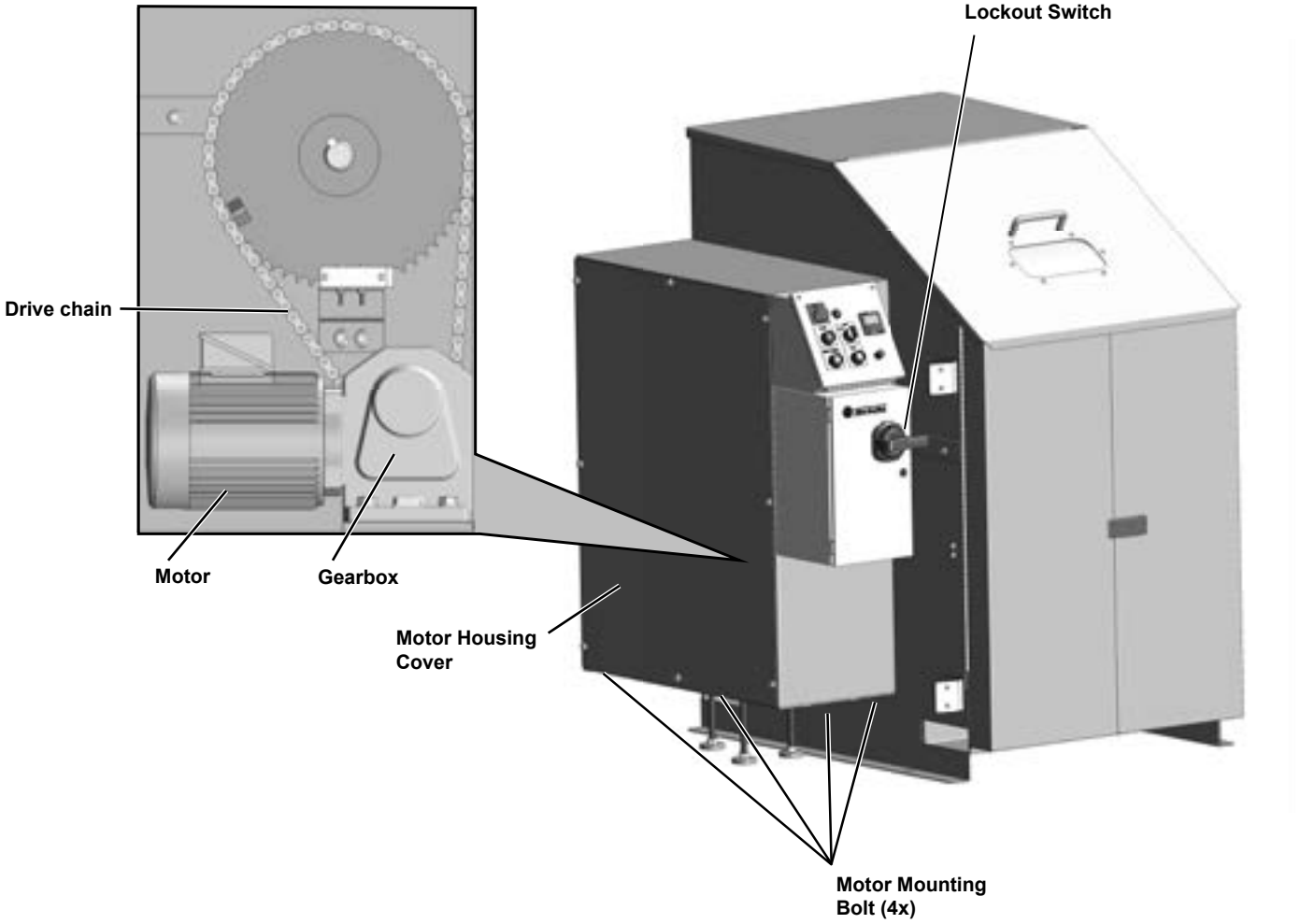
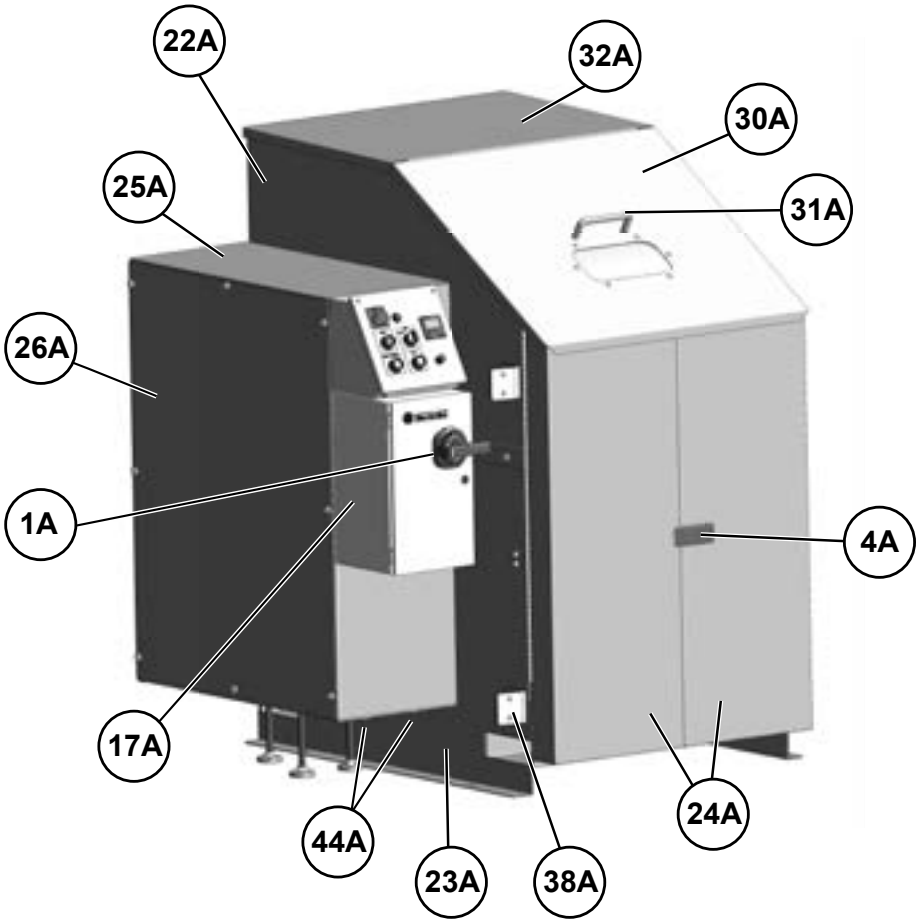


Fig. 1

6.0 PARTS LISTS AND DIAGRAMS

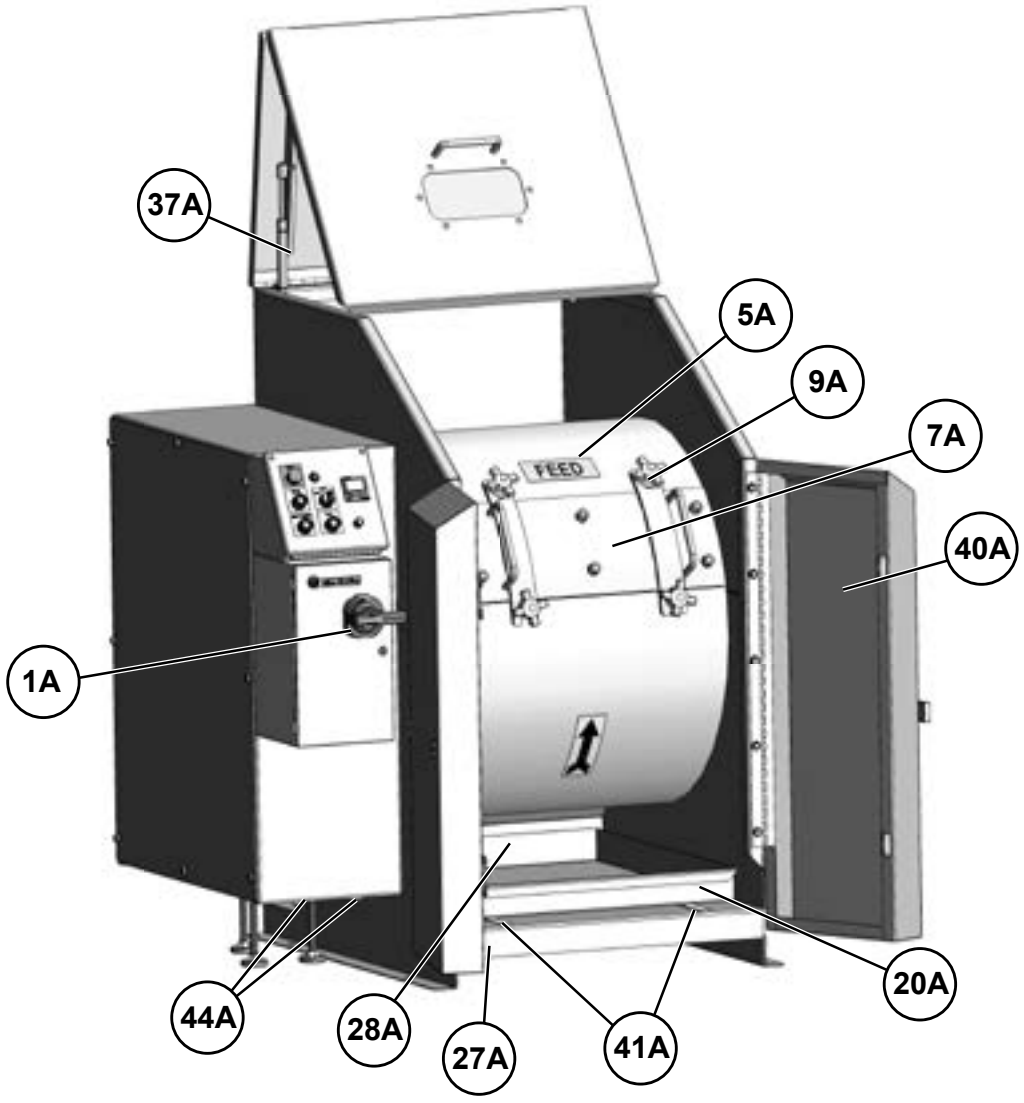
6.1 HM-70A & HM-70AF OUTER CASE AND FRAME

Item No.	Description
OUTER CASE & FRAME PARTS	
1A	Machine Lockout Switch
4A	Door Latch
17A	Disconnect Enclosure
21A	Abrasive Charge: 12 Hardened Steel Balls Order separately as HMA-130 (Not shown)
22A	Upper Main Case
23A	Lower Main Case
24A	Doors
25A	Motor Housing
26A	Motor Housing Cover
30A	Front Top Cover
31A	Front Top Cover Handle
32A	Back Top Cover
38A	Door Stops
44A	Motor Mount Bolt (4)

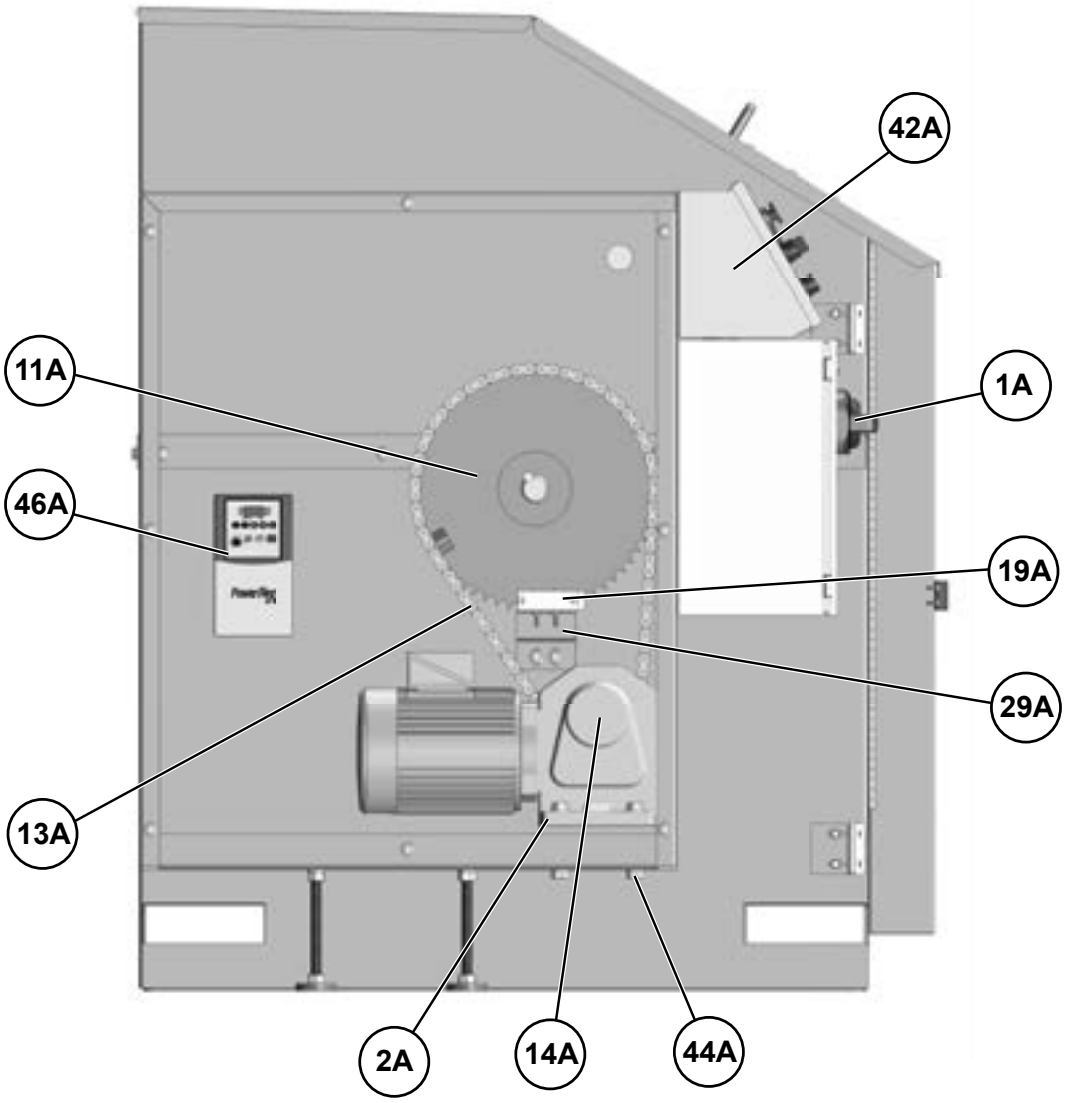


6.2 HM-70A & HM-70AF INNER PARTS

Item No.	Description
INNER PARTS	
1A	Machine Lockout Switch
5A	Drum
7A	Drum Access Door
9A	Drum Access Door Knob
20A	Sample Catch Pan Order separately as HMA-131
27A	Base of Frame
28A	Pan Stop
37A	Gas Springs
40A	Sound Damping Material
41A	Wear Strips
44A	Motor Mount Bolt (4)

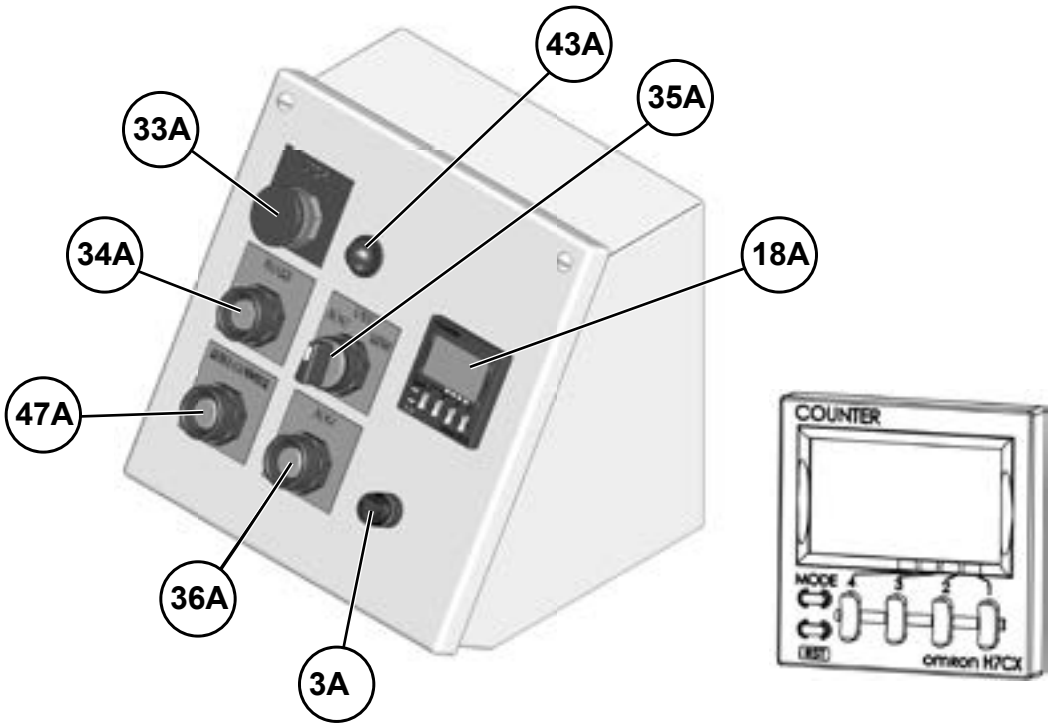


Item No.	Description
INNER PARTS	
2A	Motor & Gearbox Mount
11A	Driven Sprocket
13A	Drive Chain
14A	Gearmotor, 230V/60Hz, 1-Phase, 1,725rpm
19A	Revolution Sensor (Limit Switch)
29A	Limit Switch Bracket
42A	Control Console
44A	Motor Mount Bolt (2 of 6)
46A	Motor Controller



6.3 HM-70A & HM-70AF CONTROL CONSOLE

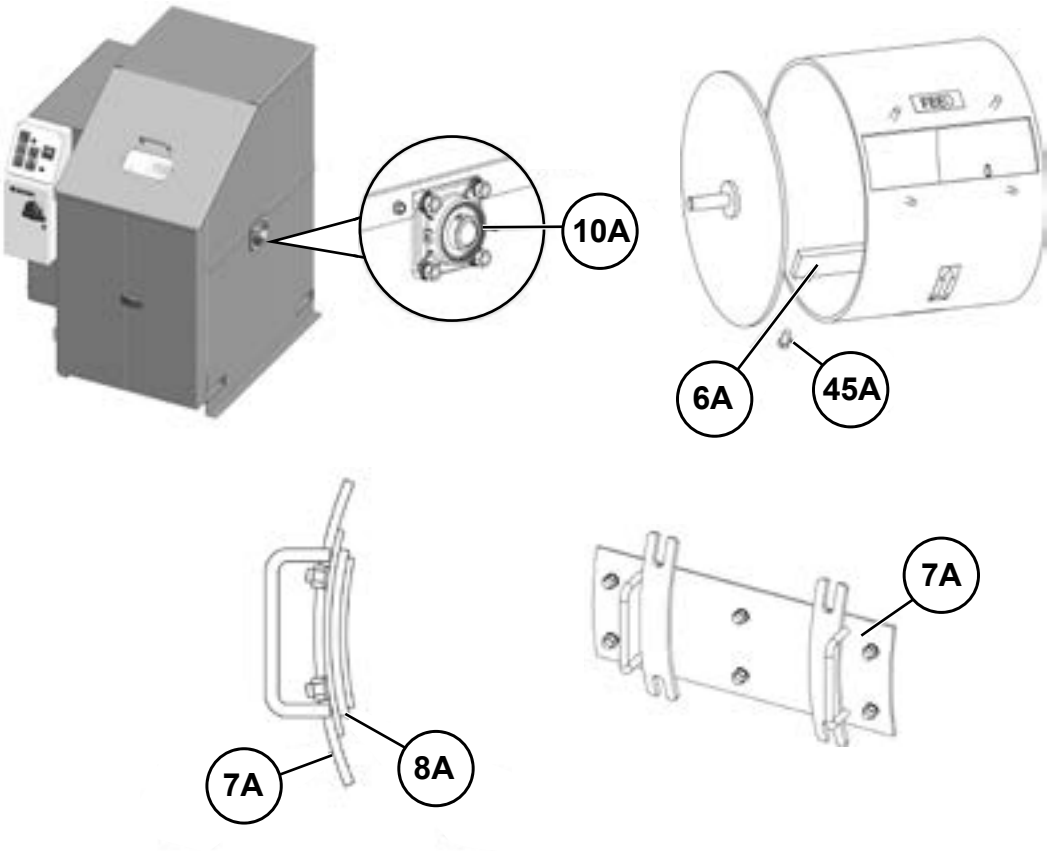
Item No.	Description
CONTROL CONSOLE PARTS	
3A	Fuse
18A	Revolution Counter
33A	Stop Button
34A	Start Button
35A	Off-Jog-Run Button
36A	Jog Button
43A	Power-On Lamp
47A	Reset Counter Button



6.4 HM-70A & HM-70AF DRUM / SUPPORT BEARING

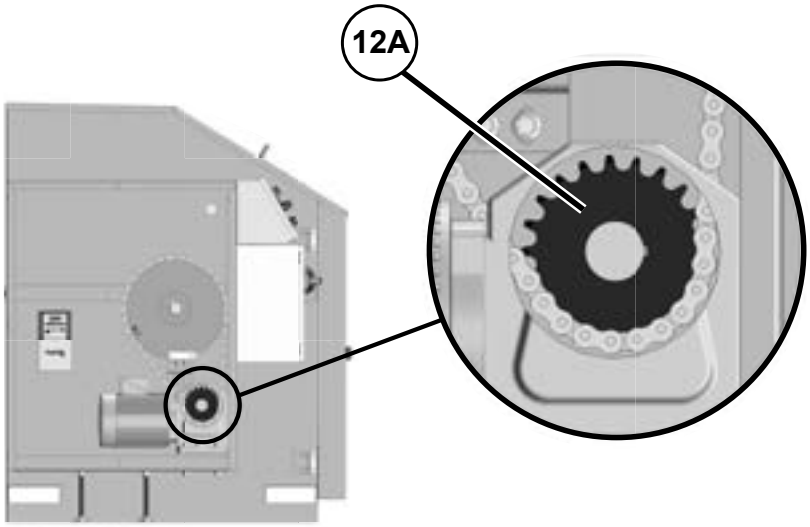
Item No. Description

DRUM AND DRUM SUPPORT BEARING PARTS	
6A	Drum Shelf, Internal
7A	Drum Access Door
8A	Gasket
10A	Drum Support Bearing
45A	Shelf Bolt (1 of 5)



6.5 M-70A & HM-70AF DRIVE SPROCKET

Item No.	Description
DRIVE SPROCKET	
12A	Drive Sprocket

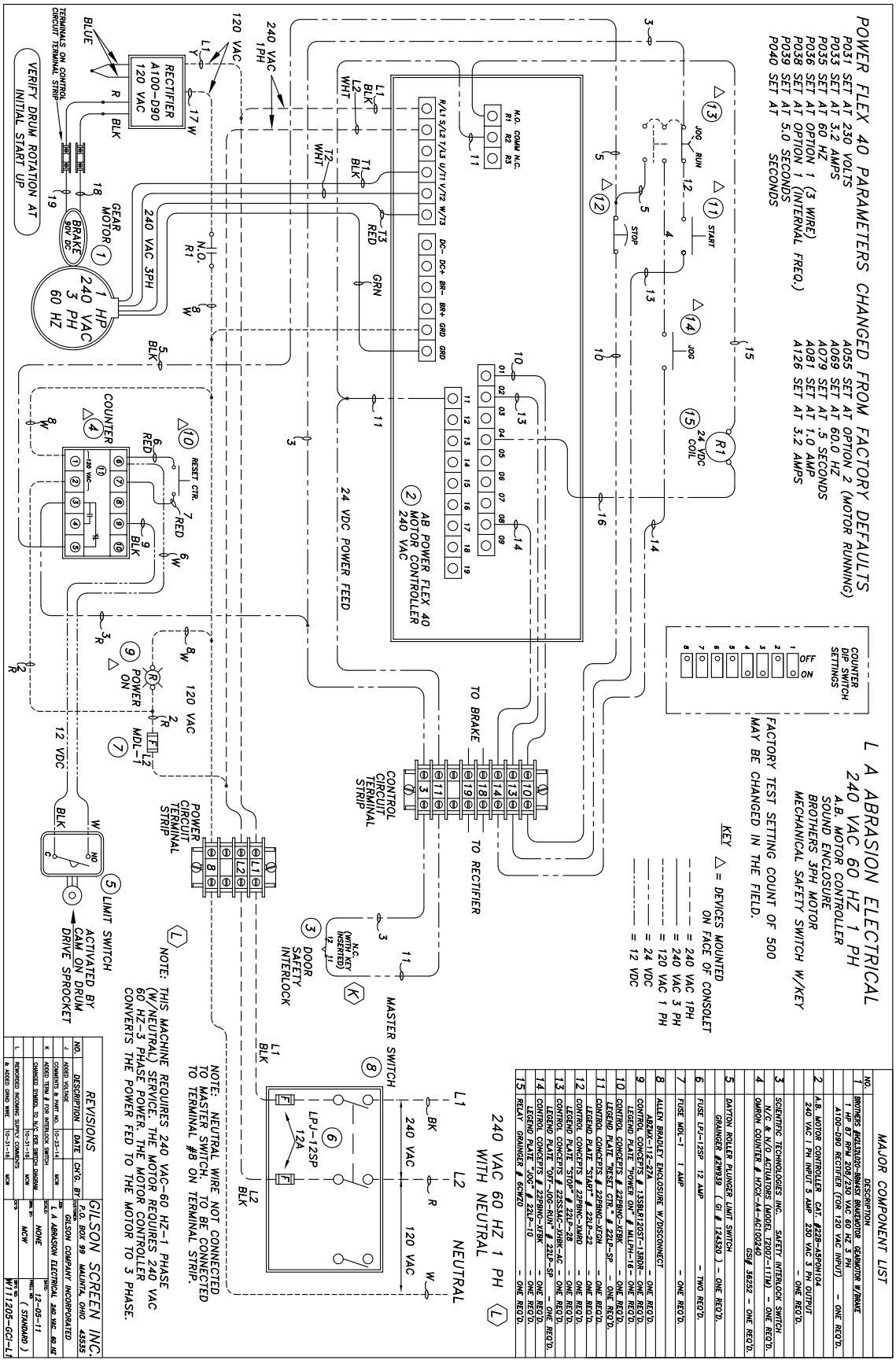


7.0 MASTER PARTS LIST

7.1 HM-70A & HM-70AF MASTER PARTS LIST

Item No.	Page No.	Description	No. Req'd
1A	7,8	Machine Lockout Switch	1
2A	9	Motor and Gearbox Mount	1
3A	10	Fuse	1
4A	7	Door Latch	1
5A	8	Drum	1
6A	11	Drum Internal Shelf	1
7A	8, 11	Drum Access Door	1
8A	11	Drum Access Door Gasket	1
9A	8	Drum Access Door Knob	1
10A	11	Drum Support Bearings	2
11A	9	Driven Sprocket	1
12A	12	Drive Sprocket	1
13A	9	Drive Chain	1
14A	9	Gearmotor	1
17A	7	Disconnect Enclosure	1
18A	10	Revolution Counter	1
19A	9	Revolution Sensor (Limit Switch)	1
20A	8	Sample Catch Pan, order separately as HMA-131	1
21A	7	Abrasive Charge: 12 Hardened Steel Balls, order separately as HMA-130	1 Set
22A	7	Upper Main Case	1
23A	7	Lower Main Case	1
24A	7	Doors	1 Set
25A	7	Motor Housing	1
26A	7	Motor Housing Cover	1
27A	8	Base of Frame	1
28A	8	Pan Stop	1
29A	9	Limit Switch Bracket	1
30A	7	Front Top Cover	1
31A	7	Front Top Cover Handle	1
32A	7	Back Top Cover	1
33A	10	Stop Button	1
34A	10	Start Button	1
35A	10	Off-Jog-Run Button	1
36A	10	Jog Button	1
37A	8	Gas Springs	2
38A	8	Door Stops	1
40A	8	Sound Damping Material	1
41A	8	Wear Strips	1
42A	9	Control Console	1
43A	10	Power-On Lamp	1
44A	7, 8, 9	Motor Mount Bolt	6
45A	11	Shelf Bolts	5
46A	9	Motor Controller	1
47A	10	Reset Counter Button	1
48A	-	Brake Rectifier	1
49A	-	Relay	1

8.1 60Hz/240V ELECTRICAL DIAGRAM

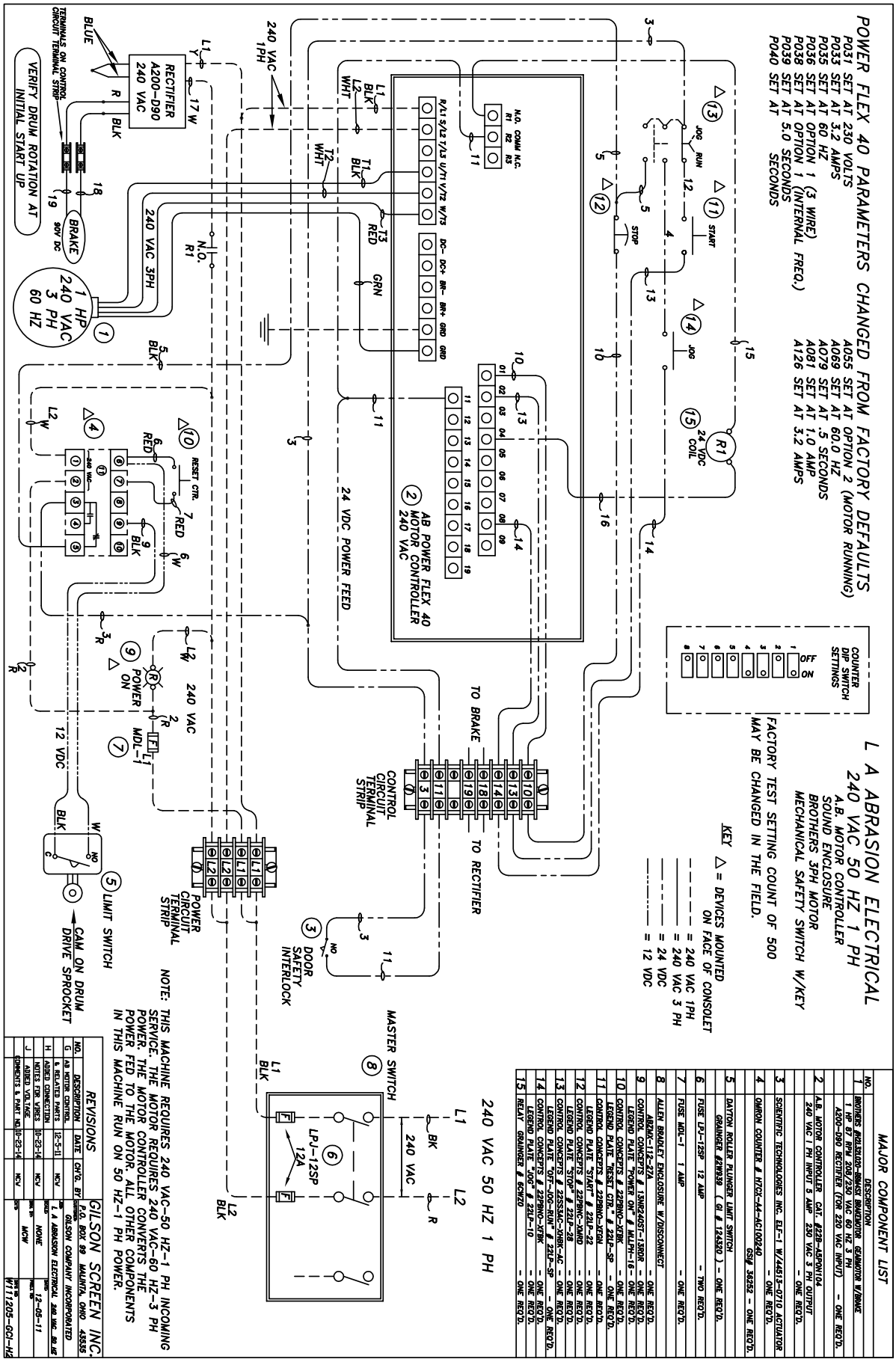


NO.	MAJOR COMPONENT LIST DESCRIPTION
1	BROTHERS #W2L3102-BM4SX ARMENMOTOR GEARMOTOR W/BRAKE 1 HP 87 RPM 208/230 VAC 60 HZ 3 PH A100-D90 RECTIFIER (FOR 120 VAC INPUT) - ONE REQ'D.
2	A.B. MOTOR CONTROLLER CAT: #2228-ASP0N104 240 VAC 1 PH INPUT 5 AMP 230 VAC 3 PH OUTPUT - ONE REQ'D.
3	SCIENTIFIC TECHNOLOGIES INC. SAFETY INTERLOCK SWITCH N/C & N/O ACTUATORS (MODEL 12007-117M) - ONE REQ'D.
4	OMRON COUNTER # H7CX-A4-AC100240 OS# 36252 - ONE REQ'D.
5	DAYTON ROLLER PLUNGER LIMIT SWITCH GRAINGER #2W939 (OS # 124320) - ONE REQ'D.
6	FUSE LPJ-125SP 12 AMP - TWO REQ'D.
7	FUSE MDL-1 1 AMP - ONE REQ'D.
8	ALLEN BRADLEY ENCLOSURE W/DISCONNECT ABEMI-112-27A - ONE REQ'D.
9	CONTROL CONCEPTS # 1559LR1205T-13RDR- ONE REQ'D.
10	CONTROL CONCEPTS # 22PBNO-XFBK - ONE REQ'D.
11	CONTROL CONCEPTS # 22PBNC-XFGN - ONE REQ'D. LEGEND PLATE "RESET CTR." # 22LP-SP - ONE REQ'D.
12	CONTROL CONCEPTS # 22PBNO-XWHD - ONE REQ'D. CONTROL CONCEPTS # 22PBNC-XWHD - ONE REQ'D.
13	LEGEND PLATE "STOP" # 22LP-28 - ONE REQ'D. CONTROL CONCEPTS # 22SS3AC-1MRK-AC - ONE REQ'D. LEGEND PLATE "OFF-JOG-RUN" # 22LP-SP - ONE REQ'D.
14	CONTROL CONCEPTS # 22PBNO-XFBK - ONE REQ'D. LEGEND PLATE "POWER ON" # MLLH1-16 - ONE REQ'D.
15	LEGEND PLATE "JOG" # 22LP-10 - ONE REQ'D. RELAY GRAINGER # 6CW20 - ONE REQ'D.

NO.	REVISIONS DESCRIPTION	DATE	CK'D.	BY
J	ADDED VOLTAGE	10-23-14	MCW	
K	COMMENTS & PART NO. ADDED TERM # FOR INTERLOCK SWITCH	10-23-14	MCW	
L	CHANGED SYMBOL ID. NO. REL SWITCH DIAGRAM	10-31-14	MCW	
M	REVISED WIRING SCHEMATIC & ADDED OHMS WIRE	10-31-14	MCW	

GILSON SCREEN INC.
P.O. BOX 99 MALINTA, OHIO 43535
GILSON COMPANY INCORPORATED
SIZE: D | DWG. NO.: L A ABRASION ELECTRICAL 240 VAC 60 HZ
SCALE: NONE | WT.: LBS.
DATE: 12-05-11
SHT. NO.: 1 OF 1 | REV: L (STANDARD)
CAD FILE: W11205-GCI-L1

8.2 50Hz/240V ELECTRICAL DIAGRAM



MAJOR COMPONENT LIST

NO.	DESCRIPTION
1	BROTHERS #VEM3402P-BM4SH MOTOR W/BRAKE 1 HP 87 RPM 230/230 VAC 60 HZ 3 PH A200-D90 RECTIFIER (FOR 220 VAC INPUT) - ONE REQ'D.
2	A.B. MOTOR CONTROLLER CAT. #22B-ABF0N104 240 VAC 1 PH INPUT 3 AMP 230 VAC 3 PH OUTPUT - ONE REQ'D.
3	SCIENTIFIC TECHNOLOGIES INC. ELE-1 W/44815-0710 ACTUATOR - ONE REQ'D.
4	OMRON COUNTER # H7CX-A4-AC100240 GSW# 36252 - ONE REQ'D.
5	DAYTON ROLLER PLUNGER LIMIT SWITCH GRAINGER #2W939 (GE # 124330) - ONE REQ'D.
6	FUSE LPJ-12SP 12 AMP - TWO REQ'D.
7	FUSE MDL-1 1 AMP - ONE REQ'D.
8	ALLEN BRADLEY ENCLOSURE W/DISCONNECT - ONE REQ'D.
9	ABZMK-112-Z2A CONTROL CONCEPTS # 1SNR24057-1.5RDR - ONE REQ'D.
10	LEGEND PLATE "POWER ON" # MLLPH-16 - ONE REQ'D. CONTROL CONCEPTS # 22PBMO-XPBK-SP - ONE REQ'D.
11	AMBER LEGEND PLATE "START" # 22LP-22 - ONE REQ'D. CONTROL CONCEPTS # 22PBMO-1GMRD - ONE REQ'D.
12	LEGEND PLATE "STOP" # 22LP-28 - ONE REQ'D. CONTROL CONCEPTS # 22PBMO-1RMGN - ONE REQ'D.
13	LEGEND PLATE "OFF-JOG-RUN" # 22LP-3P - ONE REQ'D. CONTROL CONCEPTS # 22PBNO-XPBK - ONE REQ'D.
14	LEGEND PLATE "JOG" # 22LP-10 - ONE REQ'D.
15	RELAY GRAINGER # 6CW2D - ONE REQ'D.