



Equipment Type:	Variable Frequency and Voltage Vibratory Polisher
Model:	GIGA-S
Electrical Requirements:	110 / 220 Volts
Electrical Frequency:	50/60 Hz
Motor Frequency:	0-240 Hz
Motor Voltage:	50-220 V
Manual Revision Date:	April 24, 2022

Please read this instruction manual carefully and follow all installation, operating and safety guidelines.



GIGA-S Vibratory Polisher



INSTRUCTION MANUAL

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WARRANTY

Terms and Conditions applying to all PACE Technologies Products

1. LIMITED WARRANTY AND DISCLAIMER:

PACE Technologies Products are warranted for two years from the purchase date to be free from defects in material and workmanship under correct use, normal operating conditions, and proper application. PACE Technologies obligation under this warranty shall be limited to the repair or exchange, at PACE Technologies option, of any PACE Technologies Product or part which proves to be defective as provided herein. PACE Technologies reserves the right to either inspect the product at Buyer's location or require it to be returned to the factory for inspection. Buyer is responsible for freight to and from factory on all warranty claims. The above warranty does not extend to goods damaged or subjected to accident, abuse or misuse after release from PACE Technologies warehouse, nor goods altered or repaired by anyone other than specifically authorized PACE Technologies representatives. PACE Technologies shall not in any way be responsible for the consequences of any alteration, modification or misuse unless previously approved in writing by an officer of PACE Technologies. Note: Corrosion is considered a maintenance issue and not a warranty issue.

PACE TECHNOLOGIES MAKES NO EXPRESS WARRANTIES OTHER THAN THOSE WHICH ARE SPECIFICALLY DESCRIBED HEREIN. Any description of the goods sold hereunder, including any reference to Buyer's specifications and any description in catalogs, circulars and other written material published by PACE Technologies, is the sole purpose of identifying such goods and shall not create an express warranty that the goods shall conform to such description.

THIS WARRANTY IS EXPRESSLY IN LIEU OF ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED. THERE ARE NO IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR PARTICULAR PURPOSE. THIS WARRANTY STATES PACE TECHNOLOGIES ENTIRE AND EXCLUSIVE LIABILITY AND BUYER'S EXCLUSIVE REMEDY FOR ANY CLAIM FOR DAMAGES IN CONNECTIONS WITH PACE TECHNOLOGIES PRODUCTS. PACE TECHNOLOGIES WILL IN NO EVENT BE LIABLE FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES WHATSOEVER, NOR FOR ANY SUM IN EXCESS OF THE PURCHASE PRICE.

2. LIABILITY CAP:

PACE Technologies maximum aggregate liability for loss and damage arising under, resulting from or in connection with the supply or use of the Equipment and Consumables provided under this purchase, or from the performance or breach of any obligation (s) imposed hereunder, whether such liability arises from any one or more claims or actions for breach of contract, tort, (including negligence), delayed completion, warranty, indemnity, strict liability or otherwise, unless otherwise limited by the terms hereof, shall be limited to one hundred percent (100%) of the purchase price.

3. DELIVERY:

Customer assumes and shall bear the risk of all loss or damage to the Products from every cause whatsoever, whether or not insured, and title to such Products shall pass to Customer upon PACE Technologies delivery of the Products to the common carrier of Pace Technologies choice, or the carrier specified in writing by Customer, for shipment to Customer. Any claims for breakage, loss, delay, or damage shall be made to the carrier by the Customer and Pace Technologies will render customer reasonable assistance in prosecuting such claims.

4. ACCEPTANCE:

Customer shall inspect the Products promptly upon receipt of delivery. Unless customer objects in writing within thirty (30) business days thereafter, customer shall be deemed to have accepted the Products. All claims for damages, errors, or shortage in Products delivered shall be made by Customer in writing within such five (5) business day period. Failure to make any claim timely shall constitute acceptance of the Products.

5. PAYMENT:

Customer agrees to provide timely payment for the Products in accordance with the terms of payment set forth on the reverse side hereof or in any proposal submitted herewith. If any payment is not paid on or before its due date, Customer shall pay interest on such late payment from the due date until paid at the lesser of 12% per annum or the maximum rate allowed by law.

6. DEFAULT:

If Buyer is in default (including, but not limited to, the failure by Buyer to pay all amounts due and payable to Seller) under the work or purchase order or any other agreement between Buyer and Seller, Buyer's rights under the warranty shall be suspended during any period of such default and the original warranty period will not be extended beyond its original expiration date despite such suspension of warranty rights.

7. MISCELLANEOUS PROVISIONS:

This agreement has been made in and shall be governed by the laws of the State of Arizona. All disputes arising under or relating to the purchase of the equipment shall be brought and resolved solely and exclusively in the State of Arizona, Pima County. These terms and conditions and the description of the Products on the reverse side hereof or in any proposal submitted herewith constitute the entire agreement and understanding of the parties with respect to this sale and supersede all prior and contemporaneous agreements or understandings, inducements or representations, expressed or implied, written or oral, between the parties with respect hereto. Any term or provision of this Agreement may be amended, and any observance of any term of this Agreement may be waived, only by a writing signed by the party to be bounds. The waiver by a party of any breach shall not be deemed to constitute a waiver of any other breach. Should suit be brought on this Agreement, the prevailing party shall be entitled to recover its reasonable attorneys' fees and other costs of suit including costs and attorneys' fees incurred on appeal or in collection of any judgment., errors, or shortage in Products delivered shall be made by Customer in writing within such five (5) business day period. Failure to make any claim timely shall constitute acceptance of the Products.

8. RESTOCKING FEE:

All Returns are subject to a restocking charge equal to 15% (fifteen percent) of the Invoice, unless the Goods are proved to be non-conformed by PACE Technologies.

1.0 Safety Guidelines

1.1 Warning Sign

- ! This sign points to special safety features on the machine.

1.2 Safety Precautions

- ! Careful attention to this instruction manual and the recommended safety guidelines is essential for the safe operation of the **GIGA-S**.
- ! Proper operator training is required for operation of the **GIGA-S**. Any unauthorized mechanical and electrical change, as well as improper operation, voids all warranty claims. All service issues need to be reported to the manufacturer / supplier.
- ! Operate unit as specified in this manual.
- ! Disconnect power before opening unit.
- ! Ensure that any air slots on the machine remain unobstructed.

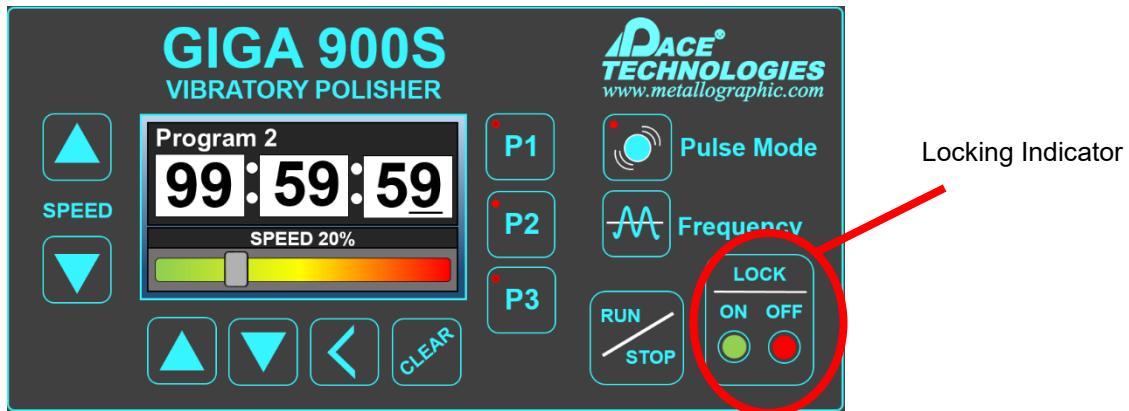
1.3 Emergency Statement

Do not attempt to counteract the safety lockout mechanism. Doing so could result in injury to yourself or the machine.

Ensure that the bowl is completely locked down before attempting to power on machine.

1.4 Safety Test

- ! Examine and verify that the **GIGA-S** safety devices and operating performance are in good working condition prior to use. The following safety check of the locking mechanism is required:



Test:

1. Activate the main switch.
2. Insert the locking handle into the side slot.
3. Rotate handle 180° counterclockwise to unlock the bowl.
4. Press Run/Stop button.

Proper Response:

The lock indicator on the front panel should flash green and the machine will not begin running a program. A message will display on the screen.

Malfunction:

Machine begins running a program or lock indicator shows that is ON.

Corrective Measure:

Disconnect power supply cord and call service technician before continuing use.

2.0 Product Description

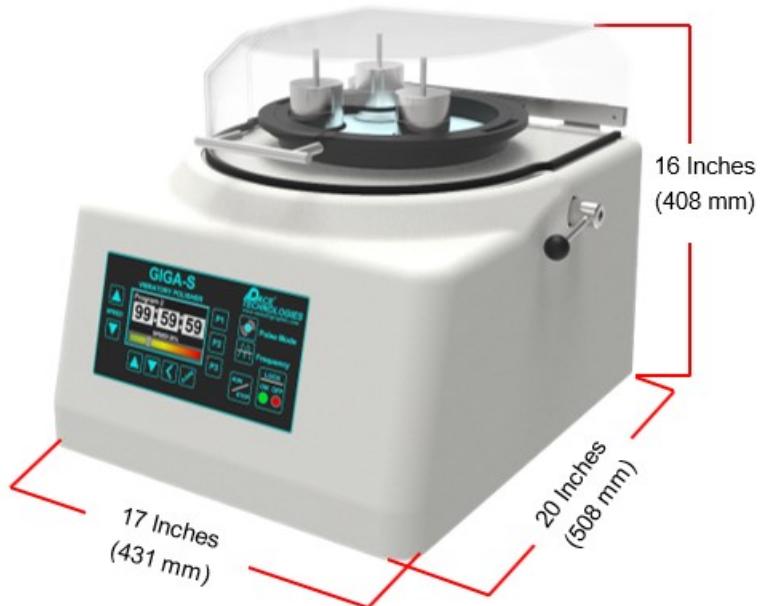
2.1 General Description



The **GIGA-S** is a metallographic vibratory polishing unit used for final polishing of specimens. The **GIGA-S** utilizes a piezoelectric (PZT) motor set to a specific customizable frequency and voltage to slowly polish the surface of a placed specimen. When used in conjunction with PACE polishing slurries, a sub-micron finish can be achieved on all materials. The **GIGA-S** accepts both 9 and 12 inch polishing bowls, which allows specimens with a large variety of shapes and sizes to be polished with minimal operator attention. Pulse Mode is a new feature to the **GIGA** line that reduces the risk of staining samples left in polishing slurries. This mode also stops certain polishing slurries from conglomerating after a procedure is completed.

2.2 Basic Size Dimensions

Shown below with a 9-inch bowl installed.



2.2 Features

- Three easily programmable buttons for quick access to common polishing procedures
- Easy-lock bowl for quick cleaning and changing of polishing medium
- Two-piece bowl design for leak-free operation
- Interchangeable bowl provides ability to polish on a 9 or 12-inch surface
- New Pulse Mode feature for stain-free polishing if samples are left unattended after procedure has ended
- Quick-release slots for removing adhesive-backed polishing pads
- Removable hinged lid for easy cleaning

2.3 Technical Specifications

Electrical Specifications:	110 / 220 Volts (50 / 60 Hz)
Polishing Bowl Sizes	9inch, 12inch
Sample Holder Sizes:	1.00in (25mm), 1.25in (30mm), 1.50in (40mm), 2.00in (50mm)
Motor Type:	Piezoelectric
Weight:	Approx. 150 lbs. (68-kg)
Dimensions (W x H x D):	Approx. 17 x 16 x 20 inches (431 x 406 x 508mm)
Working Temperature:	32° - 100°F (0 – 40°C)
Shipping Temperature:	32° - 130°F (0 – 54°C)
Storage Temperature:	32° - 100°F (0 – 40°C)
Maximum Sample Diameter:	2.00in (50mm)
Maximum Weight in Bowl	23 lbs. (10.5kg)



EU Directives:

Machinery directive 2006/42/EC
RoHS Directive 2011/65/EU

EU Harmonized Standards:

EN ISO 1200:2010
EN 61010-1:2010
EN 61326-1:2006

3.0 Unpacking, Shipping and Installation

3.1 Unpacking

Unit is delivered in a box. Unpack and check for completeness of parts.

Measures W x H x D: Approx. 27 x 22.5 x 24 inches
(685 x 571 x 609mm)

Weight: Approx. 165 lbs. (75 kg)



When moving box, lift from the bottom.

It is recommended a minimum of two people assist when moving an object exceeding 40 lbs.

3.2 Shipping

The **GIGA-S** Vibratory Polisher is packaged in a custom box with form-fitting foam. The foam and box may be discarded after removal of the machine



When moving box, lift from bottom.

Team Lift Required

! Caution: Heavy equipment. Take care to avoid bodily injury.

Installation continued on following page.

3.3 Installation

The **GIGA-S** should be placed on a stable, flat surface with access to an electrical connection.

To reduce noise caused by rapid vibration of the unit, ensure surface is as sturdy as possible.



Locate the power plugin on the back of the **GIGA-S** machine. Plug the provided power cord into the mating hole. Flip the power switch to turn on. The switch will illuminate when power is available.

4.0 Start-up and Operation

4.1 General

The **GIGA-S** Vibratory Polisher is typically used as a final polishing step in the metallographic process. When used in conjunction with other PACE Technologies equipment and consumables, perfect sample preparation can be easily achieved.

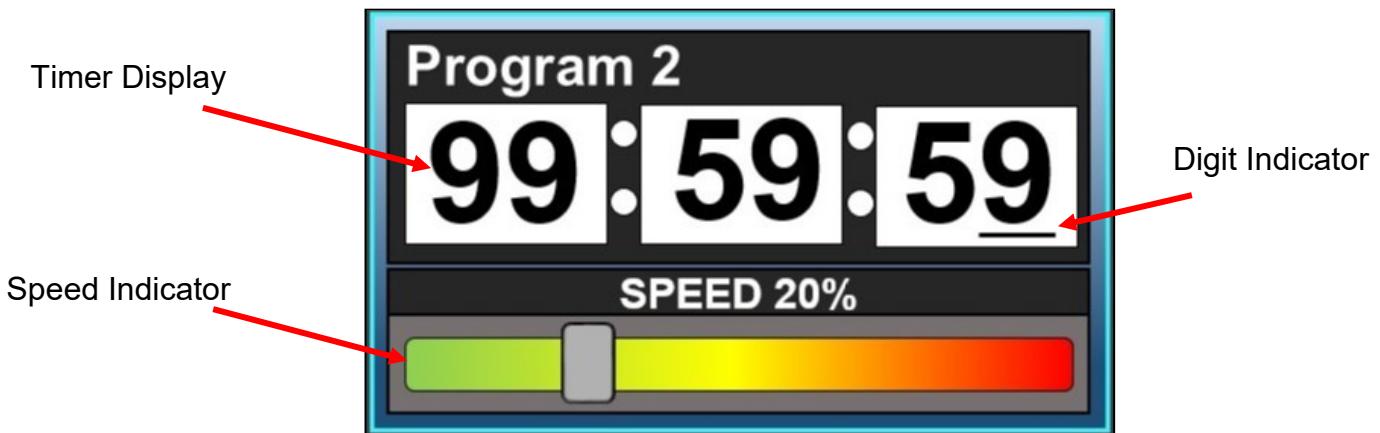


4.2 Screen Interface



The **GIGA-S** has a large print template that is used to run all functions of the machine. It is easy to use and program. All the button functions are explained in the following sections.

4.2.1 Display Screen



Timer Display:

99:59:59 Displays the countdown (or count up) of the procedure. Once the machine reaches 00:00:00 the machine will stop, unless Pulse mode is selected.

Speed Indicator:

Indicates the set speed of rotation. Higher speed settings cause samples to move around the bowl faster. If set too high, the vibration will be too much for proper polishing. Higher speeds will also cause more splashing of polishing liquids.



4.2.2 Template Buttons

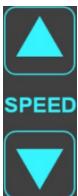
Programmable RPM Buttons:



Short Press: Changes the frequency, timer, pulse mode, and speed of the **GIGA-S** to the values programmed to the button

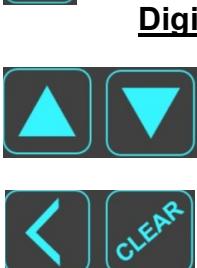
Long Press: This brings up program mode for selecting a desired time and speed. Pressing the Frequency button will bring up the frequency screen. Setting the parameter on this screen will save it to the button.

All of these parameters will be saved to the button and therefore activated on a short press of the button.



Speed Buttons:

Adjusts the speed setting of the bowl up or down in 5% increments.



Digit Adjustment Buttons:

Up/Down Buttons: Moves the digit above the Digit Indicator up or down by one increment.

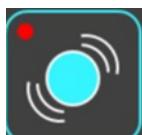
Left Button: Left Button moves the Digit Indicator over one space to the left.

Clear Button: Clears the timer to 00:00:00.

Run/Stop Button:



Starts the timer and runs the machine at the set parameters. Stopping the machine will not reset the timer. Use the Clear Button to set timer to 00:00:00.



Pulse Mode Button:

Toggles if pulse mode is activated after timer reaches 00:00:00. Press and hold to change factory settings.



Frequency Button:

Changes the screen to the frequency set screen (as seen at the bottom of the page). Use the digit indicator buttons to change to desired frequency. While on the frequency editing screen; edit each speed increment as needed. The machine is set at the factory for a smooth speed curve. Customized adjustments can be made to each speed setting.

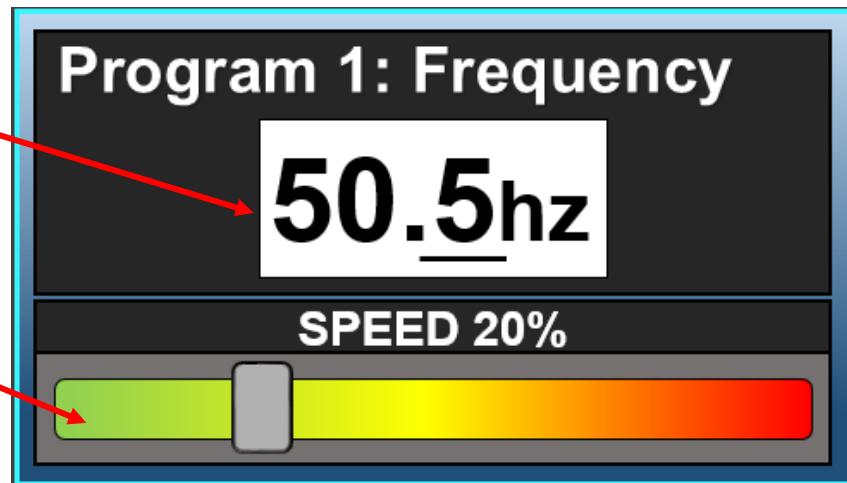


Lock Indicator:

Green Light: Indicates the lock is activated and the machine is able to start.

Green Light Flashing: Lock is not engaged and the machine will not start. The machine will also stop if the lock is disengaged while running.

Frequency Display



Speed Indicator

4.3 Locking Mechanism

Insert the locking handle straight into the side port of the GIGA. Once inside, the handle should be guided into the hex-shaped hole on the bowl locking mechanism. Rotate the handle about 180 clockwise. The front panel will indicate when the bowl is engaged in the lock. Remove the handle and place next to the machine. The handle should not be left in the machine while it is running.

4.4 Finding the Correct Frequency

The frequency set at the factory is ideal for compression mounts that have been mounted in their respective GIGA sample holders. The **GIGA-S** is fully capable of handling irregular and heavy objects. If the user wishes to place a large or irregularly shaped object in the bowl, it is recommended to adjust the frequency to ensure optimal polishing. If similar parts are polished often, the ability to save the procedure is available. The desired frequency can be found as follows:

1. Lock down the GIGA bowl and ensure the Locking Indicator is ON.
2. Fill the GIGA bowl with the intended polishing medium.
3. Place the sample(s) inside the bowl.
4. If the user plans to program settings for one of the buttons, follow the directions in section 4.5 Programming a Button.
5. Start the machine with the Run/Stop button.
6. Press the frequency button and adjust up or down until the sample starts to move.
7. Continue adjusting the frequency up or down in small increments until the sample is moving at the desired rate in a continuous smooth circle.
8. Press frequency again to save the parameter.



4.5 Programming a Button



1. Press and hold the button that you would like to set parameters to: P1, P2, or P3.
2. Set the timer to desired time.
3. Change the speed to desired speed setting.
4. Toggle Pulse mode on or off.
5. Press button again to save.

4.6 Finding the Correct Speed

Once the optimal frequency is found, the speed setting needs to be set. Speed is simply the amplitude of the vibration. Increase the speed to make the specimen(s) rotate faster. If they are moving smoothly across the surface of the bowl, the speed setting is ideal. Once the samples start to jiggle or lift noticeably from the bowl, the speed is too high and will not be as effective at polishing.

5.0 Vibratory Polishing Basics

Vibratory polishing is a specialized polishing technique notable for its low sample deformation. It utilizes easily available standard polishing abrasives such as those sold at PACE Technologies, and requires minimal operator skill, reducing damage from human error.

Vibratory polishing uses a spring and motor to create the vibration, and by angling the spring mechanism, this causes the specimen to rotate around the polishing bowl. This results in minimal damage to the sample, but can require up to several hours of polishing. The advantages can be seen in the below figures. Figure 1 and 2 show the effect of polishing a low-carbon steel with standard polishing techniques while figure 3 shows the results using vibratory polishing. As you can see, vibratory polishing is an effective polishing technique for removing surface deformation.

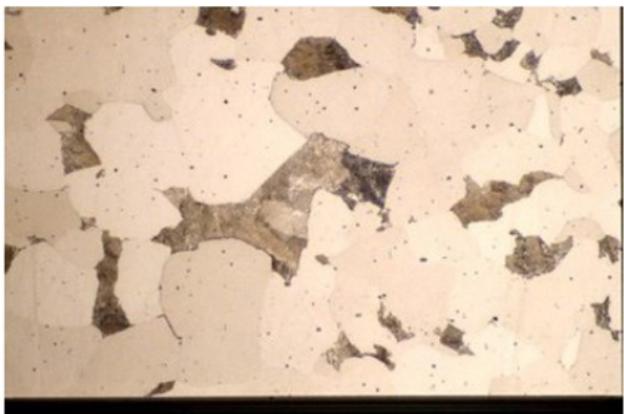


Figure 1: 1080 Steel, standard polishing, 400X B.F., etchant 2% Nital, mag. 400X

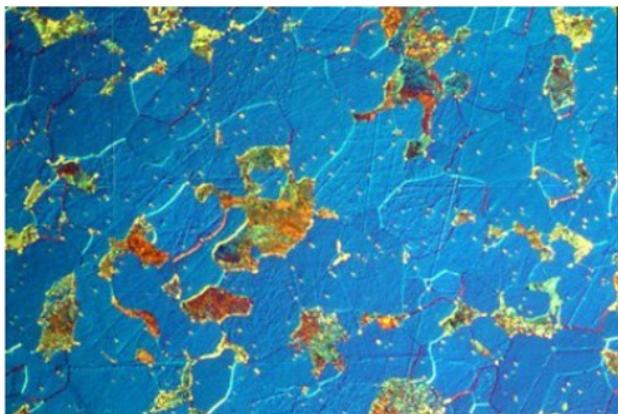


Figure 2: 1080 Steel, standard polishing, 400X DIC., etchant 2% Nital, mag. 400X

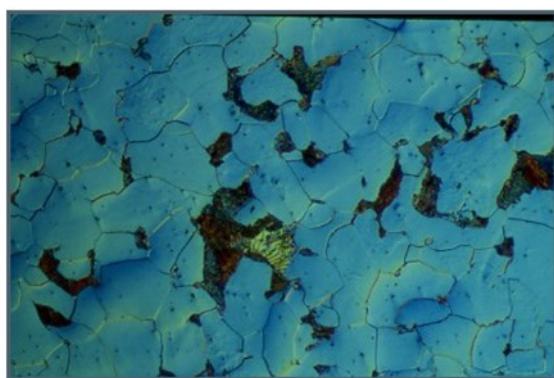


Figure 3: 1018 Steel, vibratory polishing, 400X DIC., etchant 2% Nital, mag. 400X.

6.0 Maintenance

6.1 Introduction

The **GIGA-S** polisher is a low maintenance machine. In order to maintain proper performance, it is advised to properly clean the polishing bowl after every use. Some abrasive slurries will conglomerate and introduce contamination to future polishing steps if not properly cleaned. The hinged hood should be wiped down with a damp cloth when small contaminants can be seen. If a large amount of sloshing has occurred, the hood should be removed and thoroughly cleaned to reduce the risk of contamination.

6.2 Instructions

Take a damp cloth and lightly scrub the surface of the cover and hood. Do not use chemicals to clean.

To remove the hood for cleaning, loosen the four thumb screws on the back of the machine (shown below). Clean the hood with soapy water. Place the hood back onto the hinges and tighten the thumb screws to secure the hood back in place.

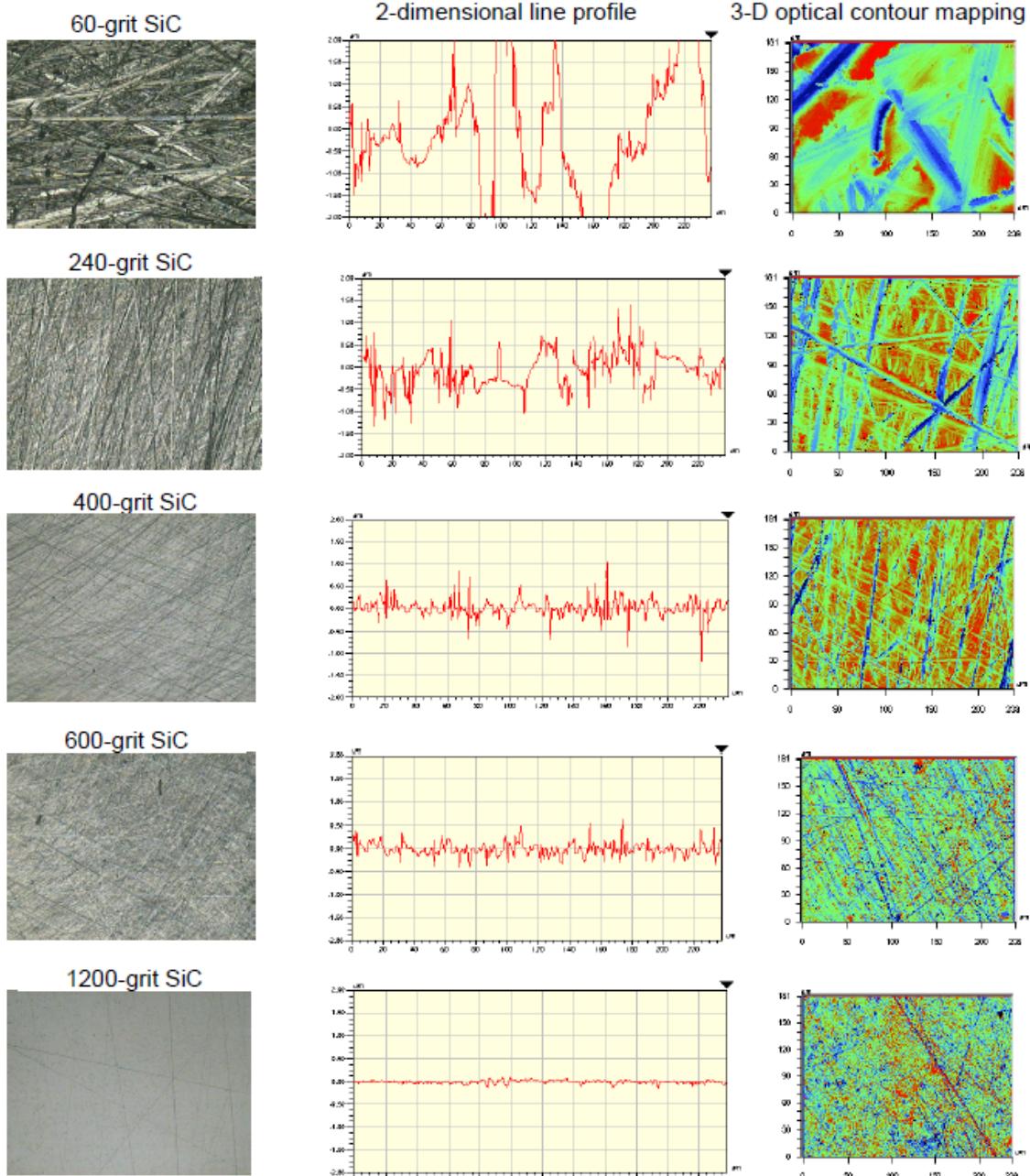
It is recommended to clean the hood after use before slurries or other polishing mediums have time to dry.

To clean the **GIGA-S** polishing bowl, simply remove the bowl from the locking plate and properly dispense of any polishing medium. Remove the polishing cloth and continue to wash the bowl as needed.

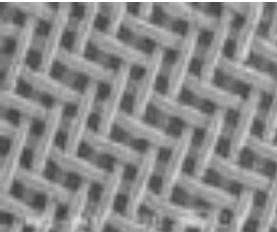
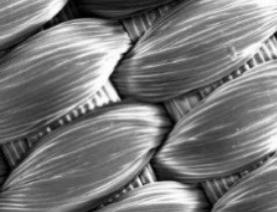
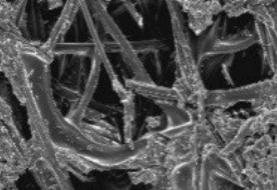
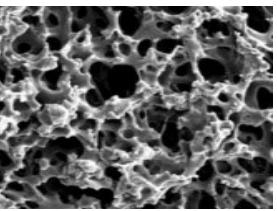
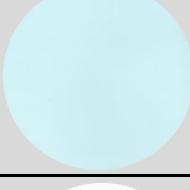
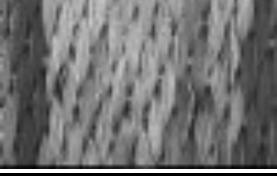


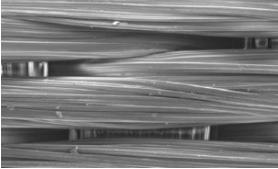
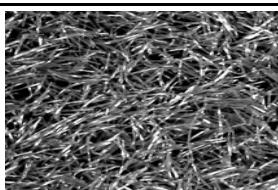
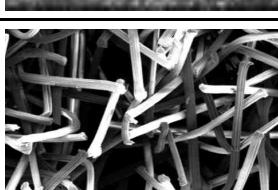
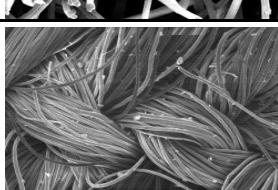
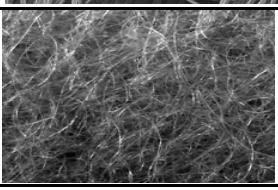
7.0 Metallographic Consumables

7.1 SiC Abrasive Paper, Surface Roughness



7.2 SiC Polishing Pads

SEM Photograph	Polishing Pad Abrasive Application	Macro Image
	CERMESH™ Metal Mesh Pad is a wire-mesh surface useful for coarse and intermediate lapping/polishing. The texture of this wire allows for the abrasive to become semi-fixed, thus offering the advantage of increased stock removal while minimizing damage.	
	POLYPAD™ Polishing Pad is a very tightly woven and rugged polishing pad for intermediate polishing which provides good removal and flatness.	
	TEX PAN™ Polishing Pad is commonly used as an intermediate polishing pad for metals and ceramics. It is low-napped for superior edge retention.	
	BLACK CHEM™ 2 Polishing Pad is a porometric polymer pad that has a consistency similar to a porous rubber type of pad. It has a low nap and is widely used for chemical-mechanical polishing (CMP).	
	DACRON® 2 Polishing Pad is a low-napped polishing pad for polishing primarily with 1 – 9 micron diamond abrasives. It is also a very effective pad for coarser alumina abrasives.	
	NYPAD™ Polishing Pad is a low-napped silk polishing pad for intermediate polishing primarily with mid-sized intermediate diamond abrasives.	

SEM Photograph	Polishing Pad Abrasive Application	Macro Image
	GOLD PAD Polishing Pad is a low-napped polishing pad for intermediate polishing primarily with 1 - 3 micron diamond abrasives.	
	ATLANTIS Polishing Pad is a low-napped intermediate polishing pad for most metals. It is a stacked pad for better contouring to the specimen surface with minimal relief.	
	MICROPAD™ Polishing Pad is the most common high-napped final polishing pad for metals and polymers. The high nap provides a very soft and gentle polishing action.	
	TRICOTE™ Polishing Pad is a tight high-napped final polishing pad for most metals. It has a tighter nap than the MICROPAD™ polishing pads.	
	NAPPAD™ Polishing Pad is another high-napped final polishing pad useful for most metals and polymers. It is especially useful for very soft materials such as aluminum and copper.	
	MOLTEC™ 2 Polishing Pad - is a natural (wool) pad used for final polishing.	
	FELT PAD - is a thick felt pad for polishing glass and large surface area parts (sapphire windows, etc.)	

7.3 Educational Etchant Database

<https://database.metallographic.com/pace-etchant.php>

Etchant Database

Over 2200 etchants

Search fields

Material or metal type

Specific alloys

Etchant name

Micro vs Macro etchant

Keyword

MSDS for etchant chemicals

- Material

Name: Aluminum

Specific Alloy: 2xxx

- Etchant

Etchant Name: ----- any -----

Etchant Type: Chemical

Micro/Macro: Micro

- Keyword Search

Enter a keyword at least type 3 char

- Browse Product: 20 results.

Result 1

Primary Material: Aluminum
Specific Alloy: 2xxx
Micro/Macro: Micro
Etchant Type: Chemical
Etchant Name: Graff and Sargent
Etchant Composition:
84 ml Water 15.5 ml HNO₃ 0.5 ml HF 3 g CrO₃
Condition:
Immerse sample 20-60 seconds with mild agitation.
Comments and Warning:
For 2xxx, 3xxx, 6xxx and 7xxx wrought aluminum alloys.
Reference:
G. Vander Voort, Metallography Principles and Practice; McGraw-Hill, New York (1984), p. 611.

PRINT REPORT

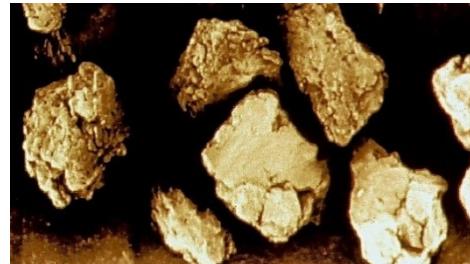


7.4 Polycrystalline Diamond Abrasives

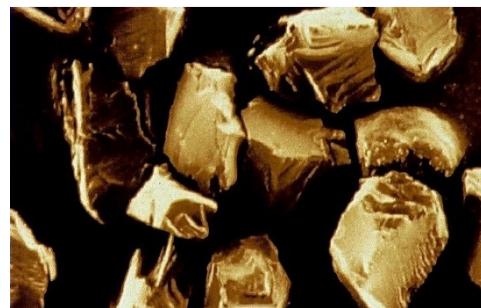
Polycrystalline diamond is a synthetic diamond which provides better surface finishes and higher removal rates than monocrystalline diamond. The following are advantages of a polycrystalline diamond over a monocrystalline diamond:

- Higher removal rates (self-sharpening abrasive)
- Very uniform surface finish
- Improved uniformity of particle size distribution
- Harder / tougher particles
- Blocky shaped particles
- Hexagonal microcrystallites (equally hard in all directions)
- Extremely rough surface (more cutting points)
- Surface area is 300% greater than with a monocrystalline diamond
- No abrasion-resistant directionality (abrasion is independent of particle orientation)

Diamond Size (μm)	Color Code
0.10	Charcoal
0.25	Gray
0.50	White
1.0	Blue
3.0	Green
6.0	Yellow
9.0	Red
15	Brown
30	Orange
45	Purple



Polycrystalline Multifaceted Diamond



Monocrystalline Blocky Diamond

7.5 Final Polishing Abrasives

Final polishing abrasives include fine diamond, alumina, and colloidal silica. For successful microstructural preparation, the polishing abrasive / cloth combination must be appropriately matched to the specimen hardness, fracture toughness, and corrosion properties of the specimen.

7.5.1 Colloidal Silica

Colloidal silica is a relatively soft abrasive with high chemical activity. It is an ideal chemical-mechanical polishing (CMP) abrasive. The chemical activity of colloidal silica results from the electrochemical balance (zeta potential) required to keep very fine particles from aggregating. This chemical balance also produces a surface phenomenon which makes the specimen surface more chemically active. This produces a surface layer which can be mechanically removed by the colloidal silica particles themselves, or by the mechanical scrubbing of the surface with the polishing pad.

For ceramics, the combination of fine polycrystalline diamond and colloidal silica improves surface finishes and increases polishing rates.



7.5.2 Nanometer Alumina

Nanometer alumina is a polycrystalline colloidal alumina processed by a proprietary seeded gel process. Polycrystalline alumina offers two significant improvements over conventional alumina calcining processes:

- Tighter, better controlled particle size distributions
- Harder alpha alumina particles

The improved uniformity of particle size distribution is a result of less particle aggregation which produces significantly less scratching in soft metals such as aluminum, tin, lead, copper, and soft steels.

Nanometer alumina is available in acidic (pH 4) or basic (pH 10) range.



8.0 Troubleshooting

More extensive troubleshooting, repair guides, videos, & parts list are provided online at www.metallographic.com or

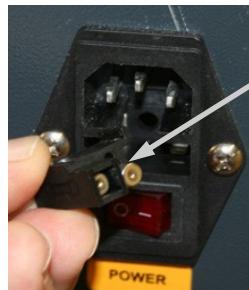
<https://www.metallographic.com/PACE-service/GIGA-service.html>

Problem	Cause	Solution
No power or function	a. Unit is disconnected from main electrical power supply	a. Verify electrical source and connection
	b. Main power switch is off	b. Turn on main power switch
	c. Blown fuse	c. Replace fuse
Samples won't rotate	a. Frequency isn't properly set	a. Reset frequency according to procedure in section 4.4
	b. Voltage isn't properly set	b. Increase voltage or speed

Pry open fuse holder with small flat head screwdriver



Replace fuse
(10 amp fast blow)

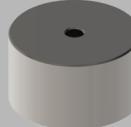
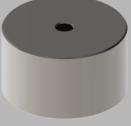
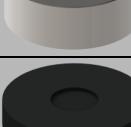
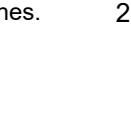


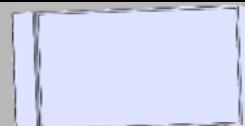
9.0 List of Spare Parts

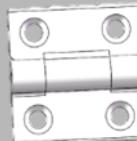
Part no.	Description	Images
	Mechanical	
GS-M-001	Base plate	
GS-CBS-A	Chuck bearing support	
GS-CBS-B	Chuck bearing support-slide	
GS-M-002	Locking Sensor Hex Mount	
GS-M-003	Lock Sensor Chip	
GS-HANDLE-A	Removable Handle Main Body	

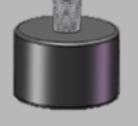
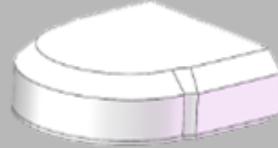
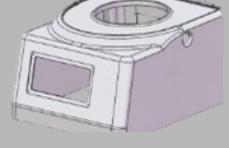
Part no.	Description	Images
	Mechanical	
GS-HANDLE-B	Removable Handle Shaft Arm	
GS-HANDLE-C	Removable Handle Allen	
GS-9IN-BOWL-A	9in Removable Bowl Base (pt1)	
GS-9IN-BOWL-B	9in Removable Bowl Pressure Ring (pt2)	
GS-12IN-BOWL-A	12in Removable Bowl Base (pt1)	
GS-12IN-BOWL-B	12in Removable Bowl Pressure Ring (pt2)	
GS-BOWL-C	Removable Bowl Magnet Plate (pt3)	

Part no.	Description	Images
	Mechanical	
GS-M-004	Hood Hinge (pt1)	
GS-M-005	Hood Hinge Plate (pt2)	
GS-M-009	Locking Extension Housing	
GS-M-006	Plastic mat	
GS-M-007	Chuck pressed kit	
GS-M-008	Magnetic chuck	
GS-1.00IN-SH-A	1in sample holder	

Part no.	Description	Images
	Mechanical	
VIB-WT-0100	1-inch weight block	
GS-SH-ROD-C	Weight block connect rod	
VIB-0125	1.25-inch sample holder	
VIB-WT-0125	1.25-inch weight block	
VIB-0150	1.5-inch sample holder	
VIB-WT-0150	1.5-inch weight block	
VIB-0200	2-inch sample holder	
VIB-WT-0200	2-inch weight block	
PLATE-0100	1-inch & 1.25-inch mounting plate	
PLATE-0200	1.5-inch & 2-inch mounting plate	

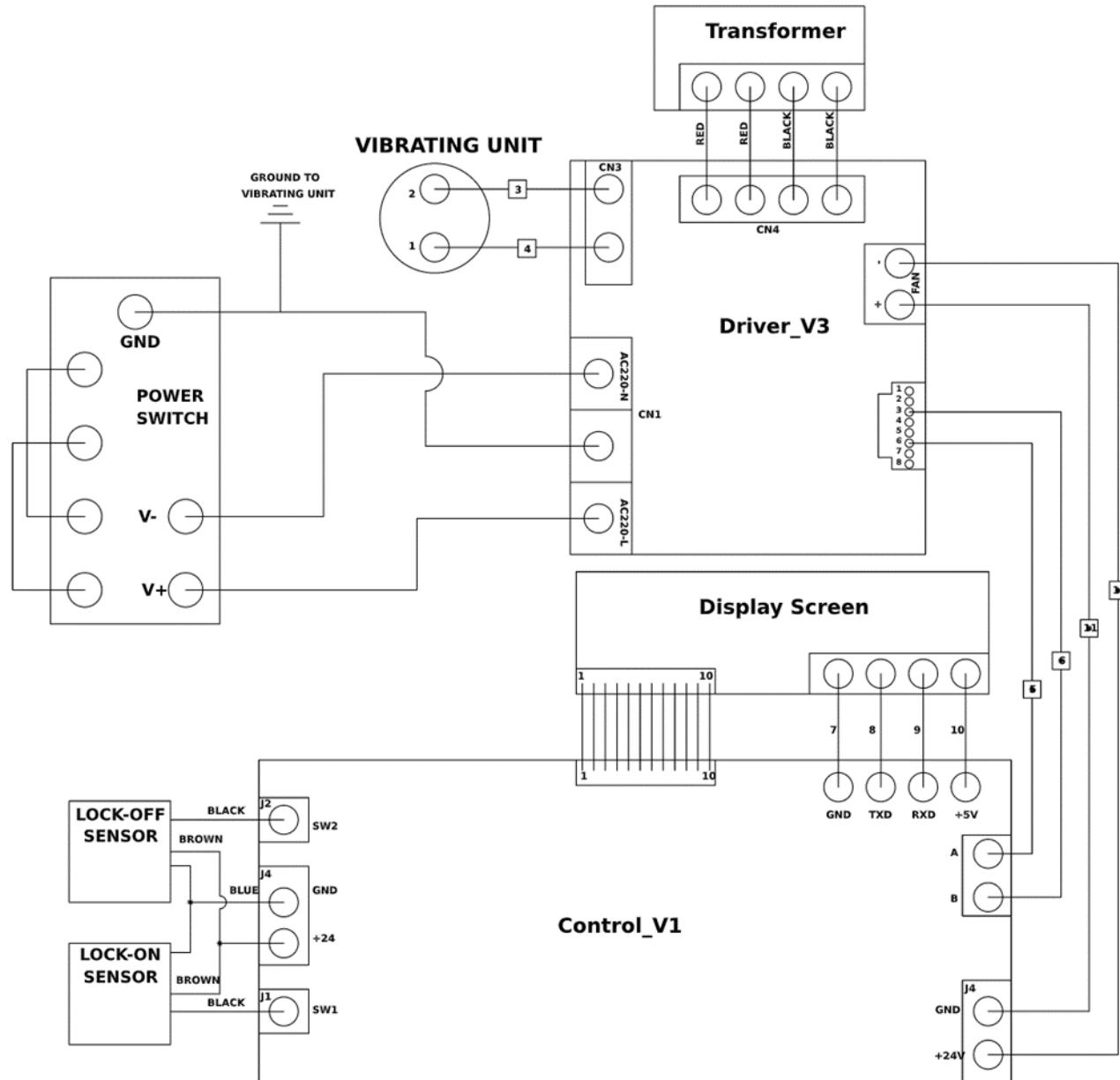
Part no.	Description	Images
Sheet Metal Parts		
GS-F-001	Back Panel	
GS-F-002	Locking Sensor Switch Bracket	
GS-F-003	Hinged Hood Long Bar pt3	
GS-F-004	Template Frame	
Standard Parts		
GS-003	PZT Motor	
POW-F-SWITCH	Power Switch and Fuse Holder	
SEN-B1-MS	B1 Metal Sensor	
SRN-4.2IN	4.3in LCD Screen	

Part no.	Description	Images
Standard Parts		
GS-HANDLE-D	Round Black Bakelite Ball End	
GS-005	High head knurled handle screw	
HNG-DH-001	Damped Hinge	
OR-9-5	9inch O ring	
OR-12-5	12inch O ring	
GS-006	TFE washer	
GS-007	Thin nut	
GS-T	GIGA-S Template	

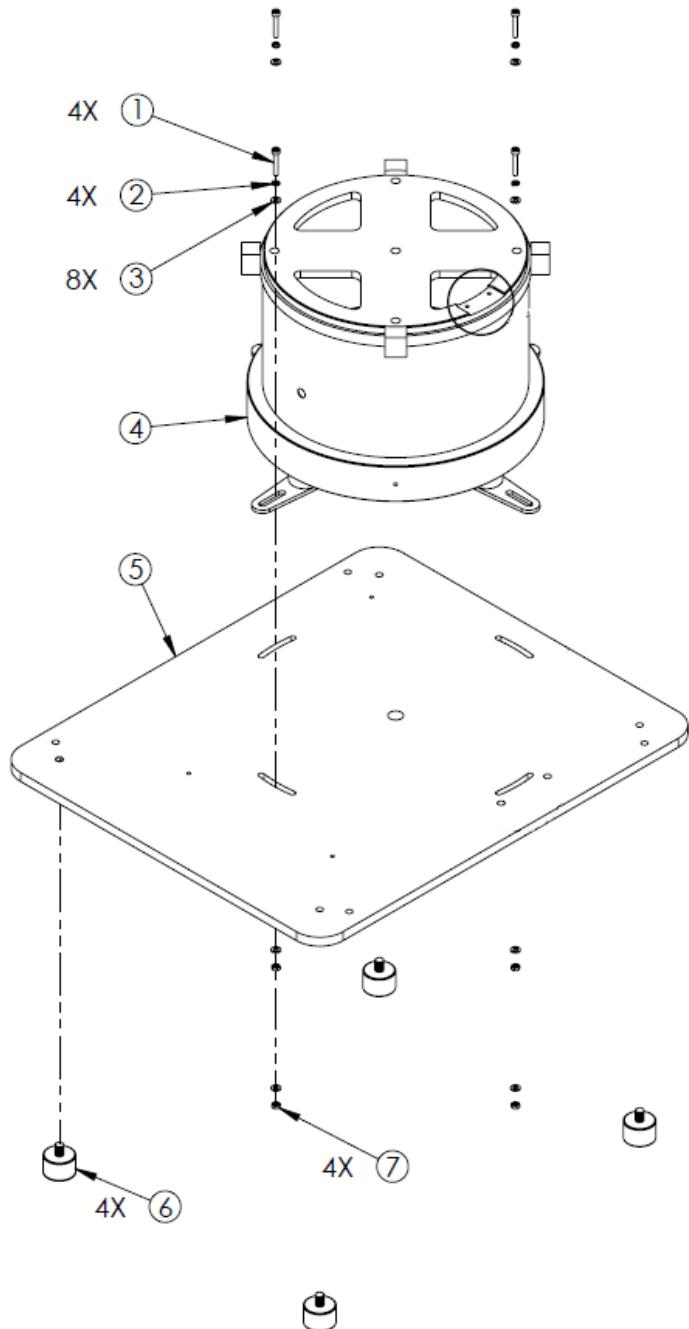
Part no.	Description	Images
Standard Parts		
GS-008	Circle brush	
OR-8-1.5	O ring 8*1.5	
M8-FEET	Base Feet (set of 4)	
Assemblies		
GS-A-2.00IN-SH	Hood	
GS-A-HANDLE	SMC cover	

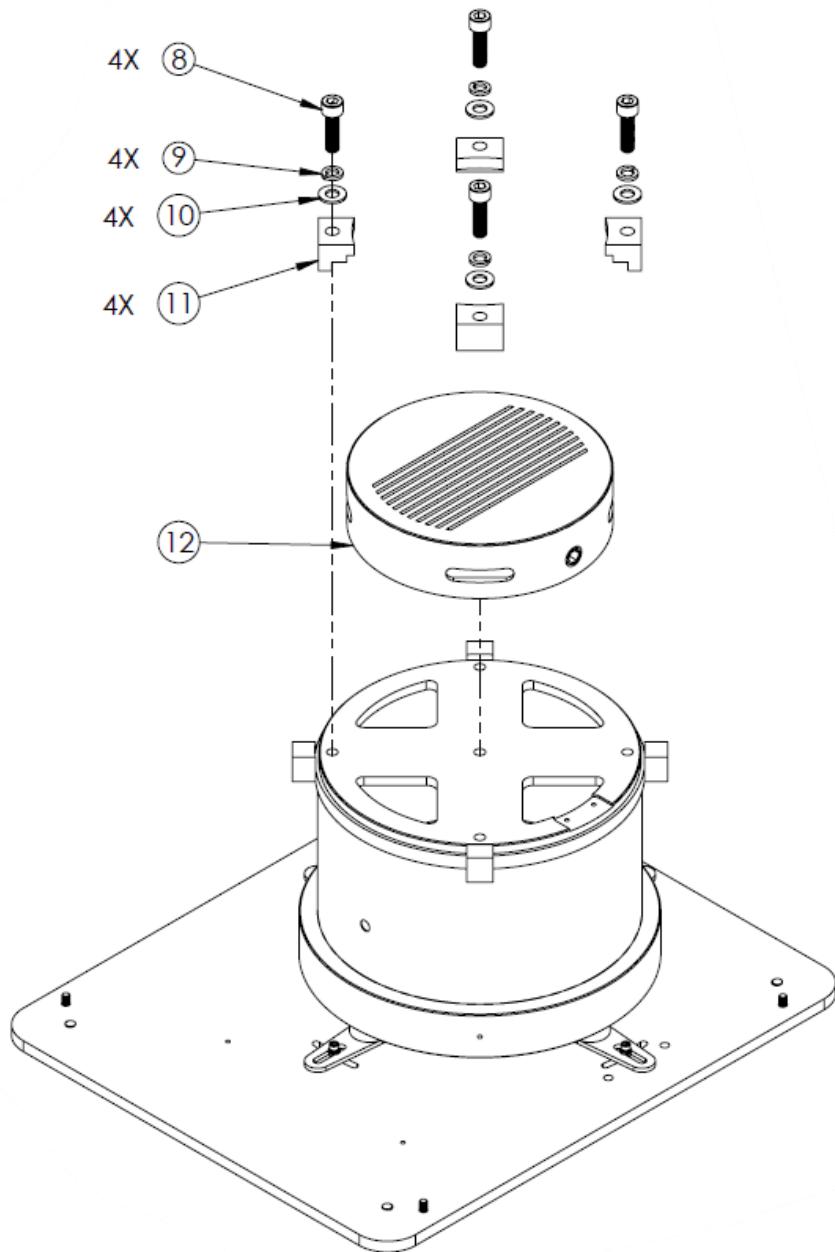
10.0 Electrical and Mechanical Drawings

10.1 Electrical Drawing

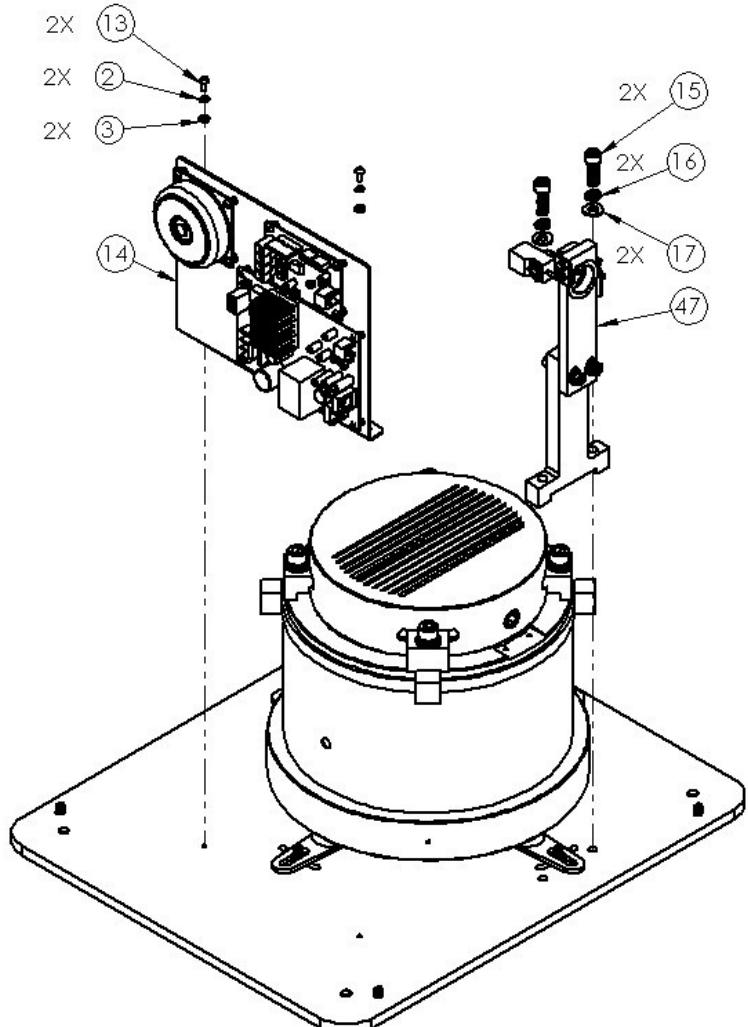


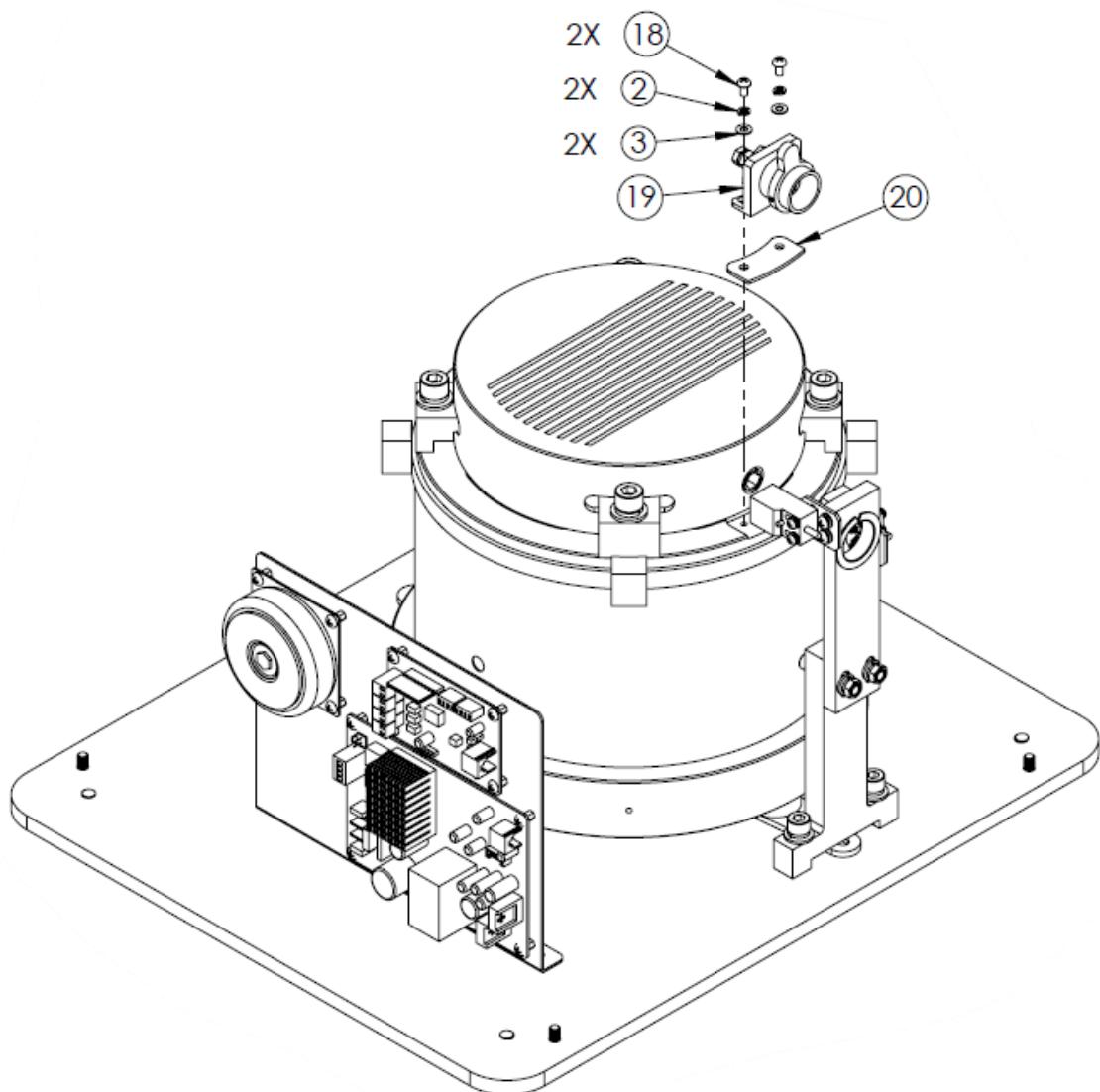
10.2 Mechanical Drawings

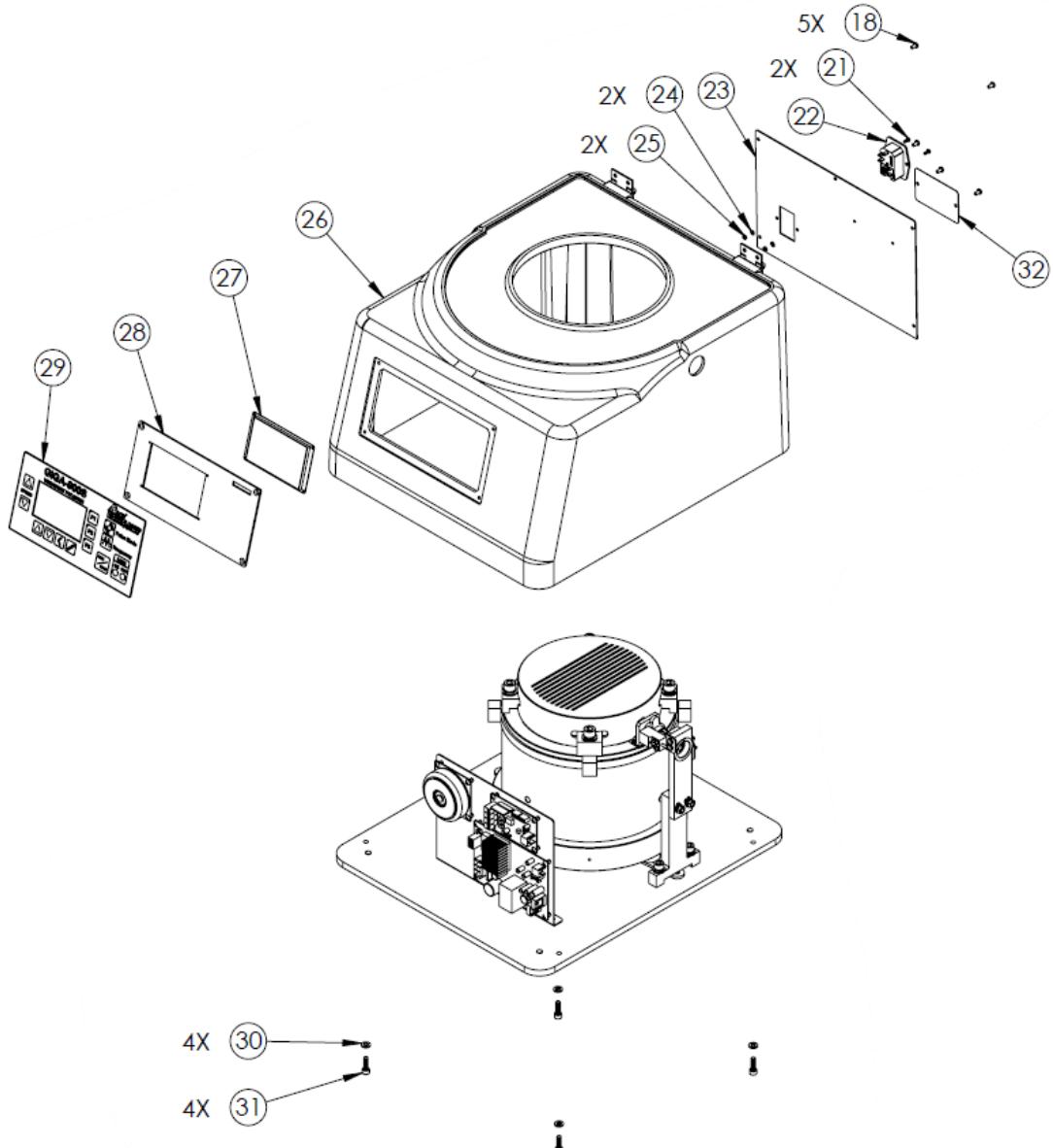


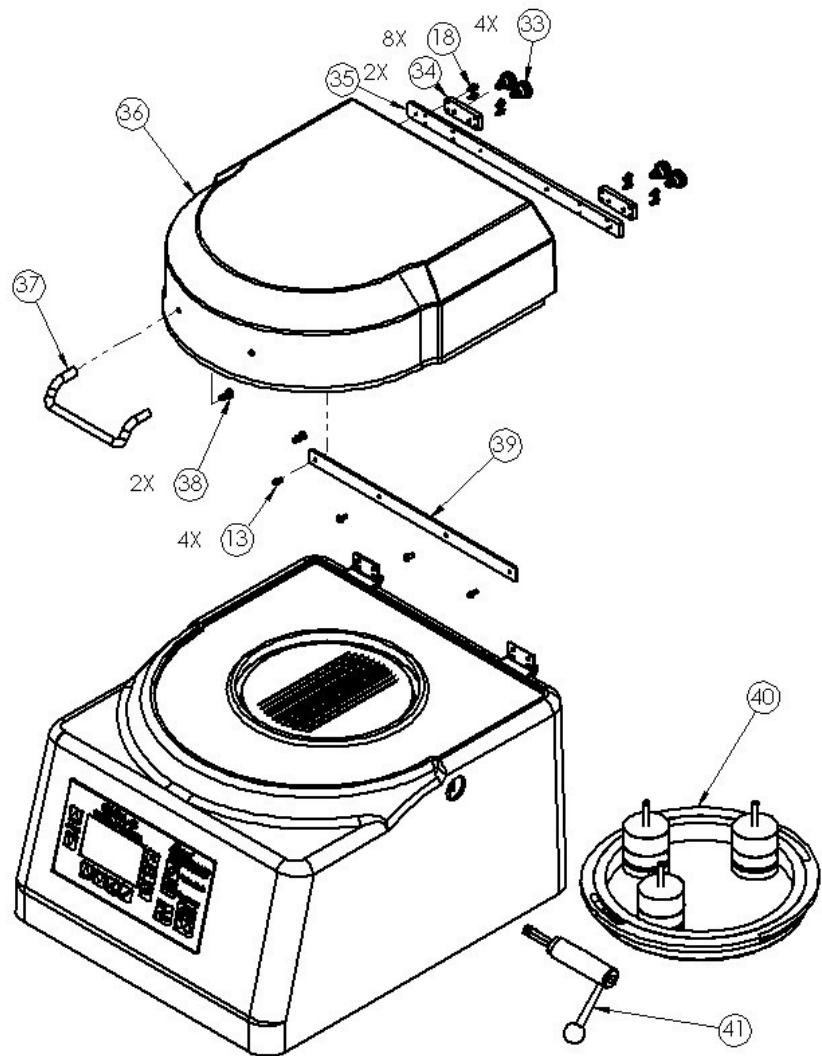


1. INSTALL HANDLE ALIGNMENT ASSEMBLY
2. INSTALL ELECTRONICS PANEL ASSEMBLY

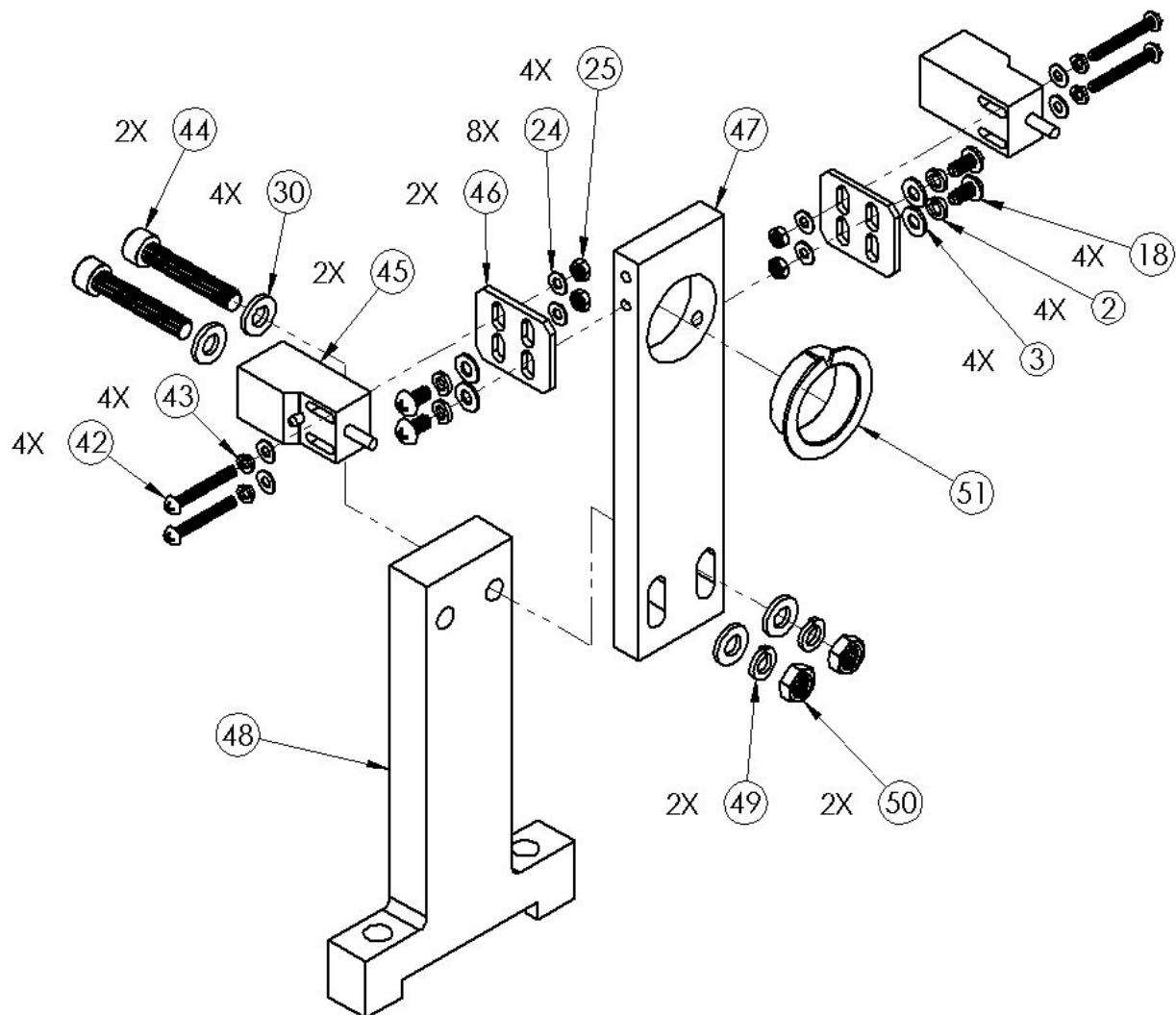


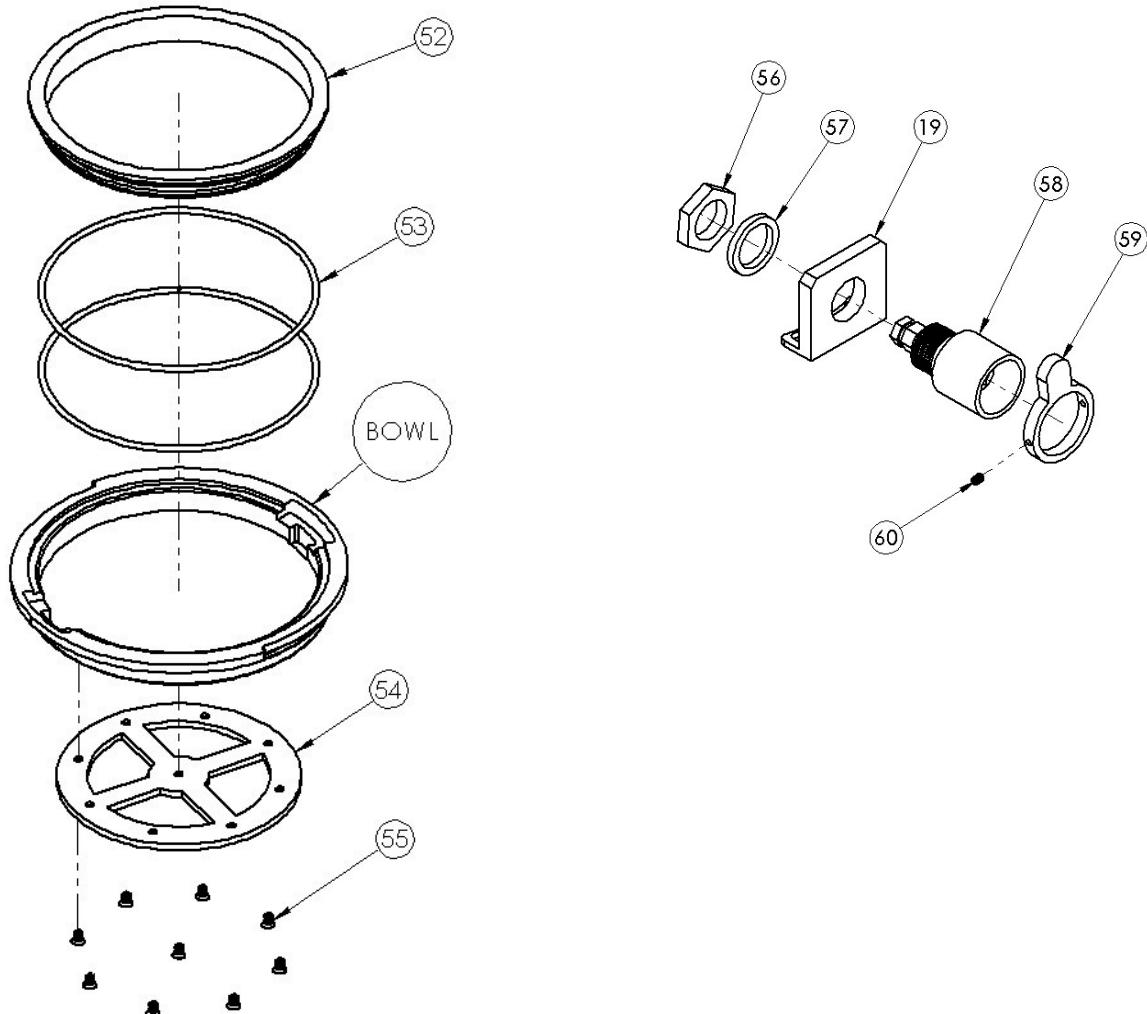






1. ASSEMBLE AND ATTACH LID
2. RUN MACHINE AT MAX POWER FOR HOUR
3. CHECK FOR ANY LOOSE FASTENERS
4. CORRECT ANY ALIGNMENT ISSUES





ITEM NO.	DESCRIPTION	PART NUMBER	QTY.
1	M4 0.7 x 16mm Allen Bolt	Stock	4
2	M4 Lock Washer	Stock	12
3	M4 Flat Washer	Stock	16
4	PZT Motor	GS-003	1
5	Base Plate	GS-M-001	1
6	Rubber Feet	M8-FEET	4
7	M4 Hex Nut	Stock	16
8	M10 1.5 x 35 Allen Bolt	Stock	4
9	M10 Lock Washer	Stock	4
10	M10 Flat Washer	Stock	4
11	Chuck pressed kit	GS-M-007	4
12	Magnetic Chuck	GS-M-008	1
13	M4 0.7 x 10mm Pan Head	Stock	6
14	GIGA-S Electrical fixing plate	GS-F-005	1
15	M8 1.25 x 25mm Allen Bolt	Stock	2
16	M8 Lock Washer	Stock	2
17	M8 Flat Washer	Stock	2
18	M4 0.7 x 8mm Pan Head	Stock	21
19	Fixed Mount	GS-M-009	1
20	Plastic Mat	GS-M-006	1
21	M3 0.5 x 8mm Pan Head	Stock	2
22	Power Switch	POW-F-SWITCH	1
23	Back Panel	GS-F-001	1
24	M3 Flat Washer	Stock	11
25	M3 Hex Nut	Stock	6
26	SMC cover	GS-002	1
27	4.3in Screen	SRN-4.2IN	1
28	Template Frame	GS-F-004	1
29	GIGA Template	GS-T	1
30	M6 Flat Washer	STOCK	8
31	M6 1.0 x 20mm Allen Bolt	STOCK	4
32	Machine Number TEMP	STOCK	1

ITEM NO.	DESCRIPTION	PART NUMBER	QTY.
33	High head knurled handle screw	GS-005	4
34	Hood Hinge Plate pf2	GS-M-005	2
35	Hood Hinge- pt1	GS-M-004	1
36	GIGA Hood	GS-001	1
37	Handle	Stock	1
38	M6 x 13mm Pan Head	Stock	2
39	GIGA-S Hinged Hood Long Bar pt3	GS-F-003	1
40	Bowl	GS-9IN-BOWL GS-12IN-BOWL	1
41	Removable Handle Assembly	GS-HANDLE-A GS-HANDLE-B GS-HANDLE-C	1
42	M3 0.5 x 20mm Pan Head	Stock	4
43	M3 Lock Washer	Stock	4
44	M6 1.0 x 30mm Allen Bolt	Stock	2
45	B1 Metal Sensor	SEN-B1-MS	2
46	Locking Sensor Switch Bracket	GS-F-002	2
47	Chuck bearing support-Slide	GS-CBS-B	1
48	Chuck bearing support	GS-CBS-A	1
49	M6 Lock Washer	Stock	2
50	M6 Hex Nut	Stock	2
51	Dry Bearing	OR-9-5 OR-12-5	1
52	GIGA-S Removable Bowl Pressure Ring (pt2)	GS-9IN-BOWL-B GS-12IN-BOWL-B	1
53	Press O Ring (9 or 12 inch)	OR-9-5 OR-12-5	2
54	Removable Bowl Magnet Plate(pt3)	GS-BOWL-C	1
55	M6 1.0 x 10mm Flat Head	Stock	11
56	Thin Locking Nut	GS-007	1
57	TFE Washer	GS-006	1
58	Locking Sensor Hex Mount	GS-M-002	1
59	Lock Sensor Chip	GS-M-003	1
60	M3 Set Screw	Stock	2