
TECHNICAL DATA PACKAGE

January 5, 2024

C6155.021

cGMP SUITABLE HEAVY-DUTY WASHDOWN
LARGE CAPACITY ORBITAL SHAKER
W/ CUSTOM TAILGATE TOP

1-170 RPM \pm 2 RPM

2" STROKE, 500LB LOAD CAPACITY

120V, 50/60Hz, SINGLE PHASE



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www.EberbachLabtools.com

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I. MACHINE SPECIFICATIONS

Ia. MECHANICAL OVERVIEW

DIMENSIONS

- Stroke: 2.00" \pm 0.04"
- Speed: 1 – 170 RPM, set speed will be \pm 2 RPM
 - (Speeds over 150 RPM are not recommended without specifically engineered tops)
- Width: 61.1" \pm 0.5"
- Height: 70.2" \pm 1.0" (open)
 - Height: 44.7" \pm 1.0" (closed)
- Depth: 55.7" \pm 0.5"

SIZE & CAPACITY

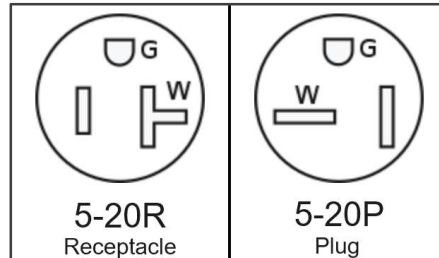
- Weight Unloaded: 2300lbs \pm 50lbs
- Max Capacity: 500lbs
 - See Load Capacity Chart for specific speed limits
- Tailgate Loading Capacity: 150lbs

FEATURES

- Base designed for use of narrow (21") forklift or pallet jack
- Stainless steel carrier with tailgate for ease of loading/unloading
- Lid gaskets are IPA compatible.
- CFD engineering services available upon request
- NSF UL certification available upon request

Ib. ELECTRICAL OVERVIEW

- 750W, IP65 Servo motor with 10:1 gear box
 - <10A Max amp draw
 - This is based on a motor overload (maximum amps, not normal running conditions) and max outlet amperage draw
 - 1.2kWh max power draw
 - This calculation is based on a motor overload (maximum wattage, not normal running conditions) and max outlet amperage draw
- Adjustable control pendant
 - Washdown 7" HMI touch panel for controlling machine
 - RJ45 Ethernet Port for accessing ProfiNet system
 - USB Port for accessing Data Logs on HMI
 - Audio/Visual alarm
- 115V Power Cord (NEMA 5-20P)



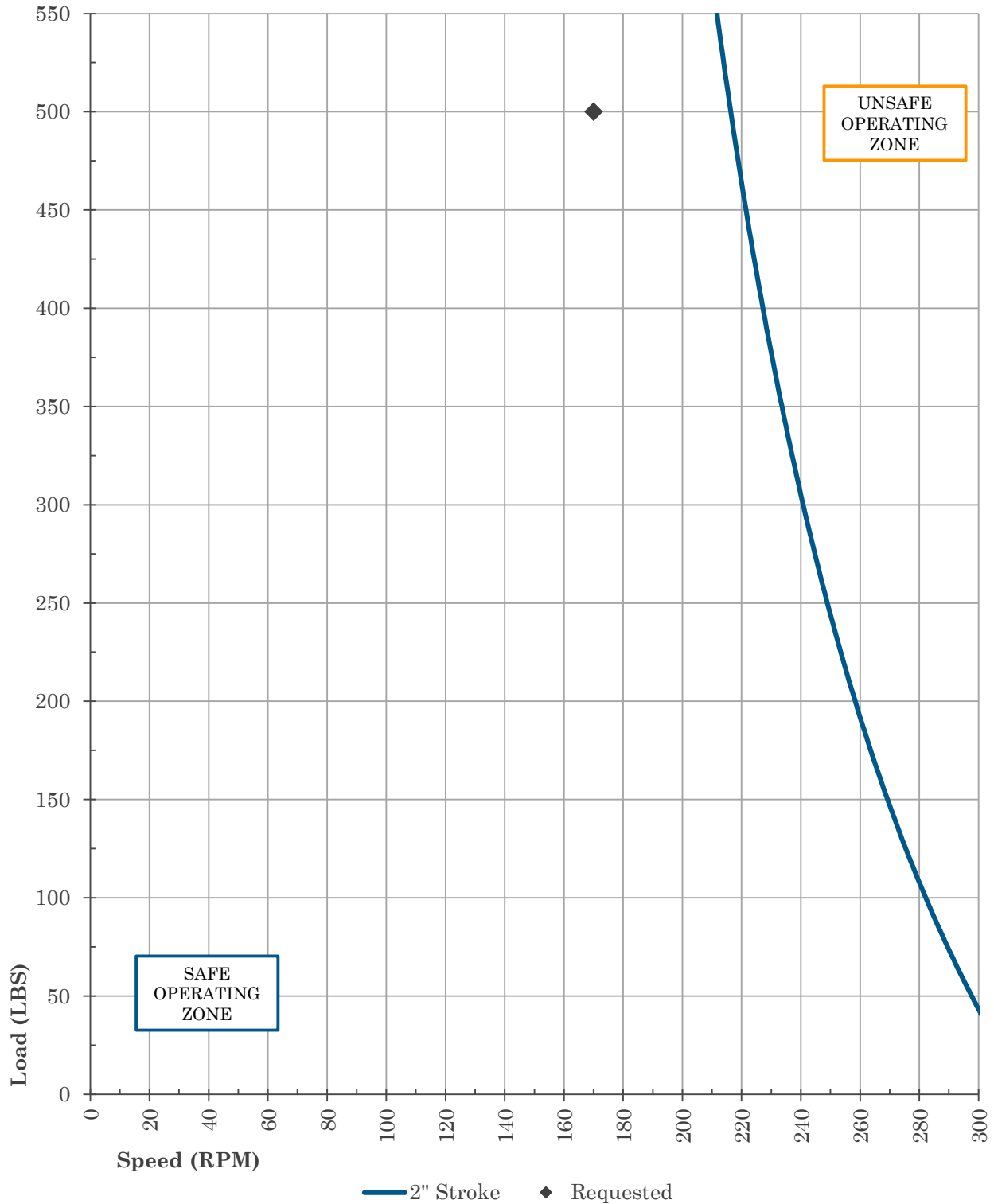
- Emergency Stop Buttons (“E-Stop”)
- IP66-rated electronics enclosure
- Remote diagnostic functionality available upon request

Ic. MAINTENANCE

- Wipe exposed surfaces of machine with isopropyl alcohol as needed.
- Keep touch screen free from dirt/debris.
- Verify E-Stop functionality once every three (3) months unless local safety ordinances require otherwise.
- Replace the Ethernet & USB port caps when the ports are not in use.

Id. LOAD CAPACITY CHART

***NOTE:** Always place containers in such a way as to balance the load in the center of the carrier.
See loading configuration page for balanced configurations.



Ie. **CONTROLS**

*NOTE: Electrical hardware shown below can change based on availability, Siemens components are an example. Eberbach works with multiple electrical hardware vendors and only uses high quality components from established vendors.

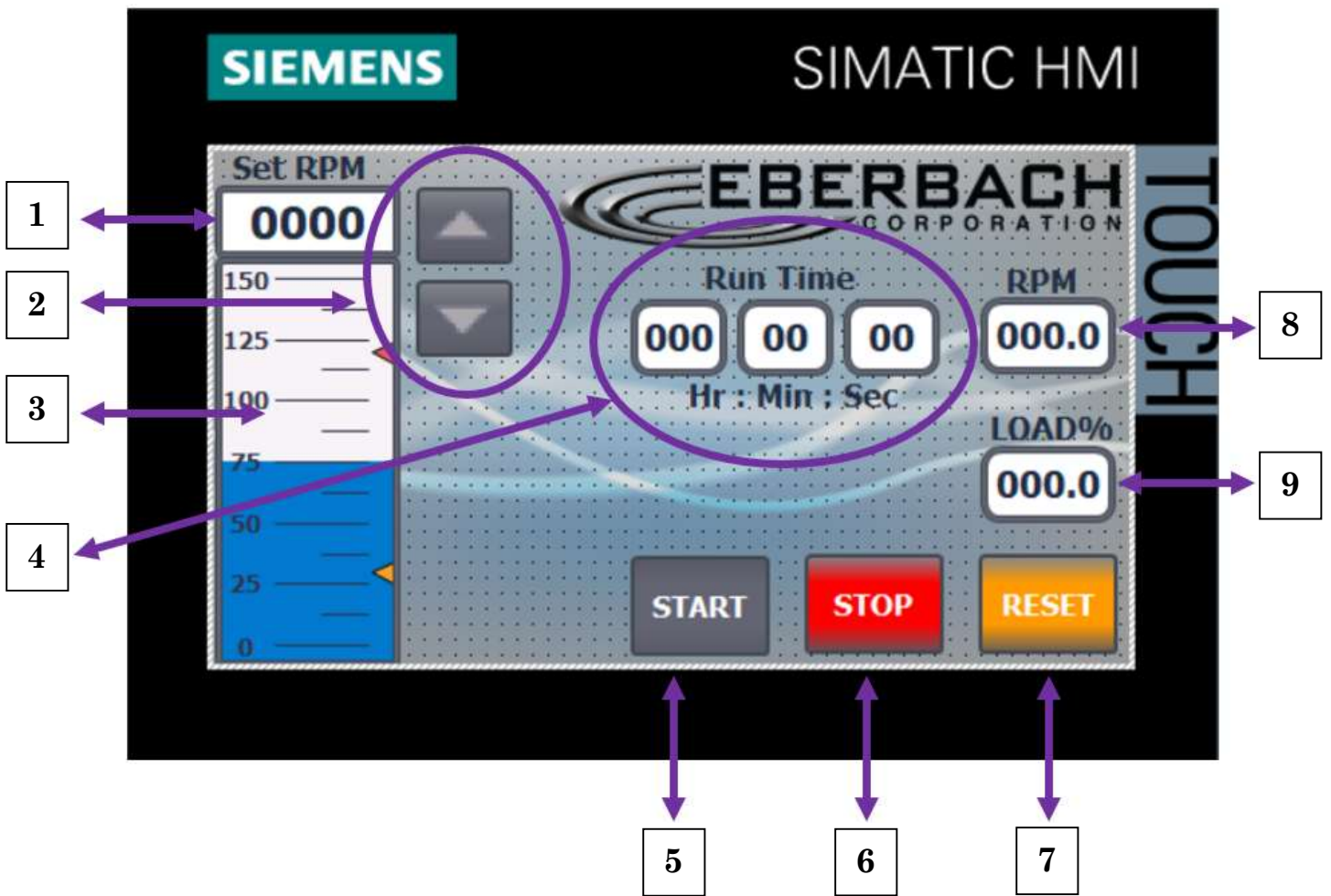
*NOTE: The following depictions of control screens are an example for reference only. Please refer to the C6155.021 Use & Care Manual for exact controls for this unit.

WELCOME SCREEN

Welcome screen is accessed by pressing F4. You will be able to end Simatic RUN TIME by pressing the Power button on the bottom left of the screen. 'Run' button goes to "BASIC RUN" page.

- 'Timed Run' button goes to "TIMED RUN" page.
- 'Alarm' button goes to the "USER ALARMS" page.
- 'Info' button will take users to "INFO" page.





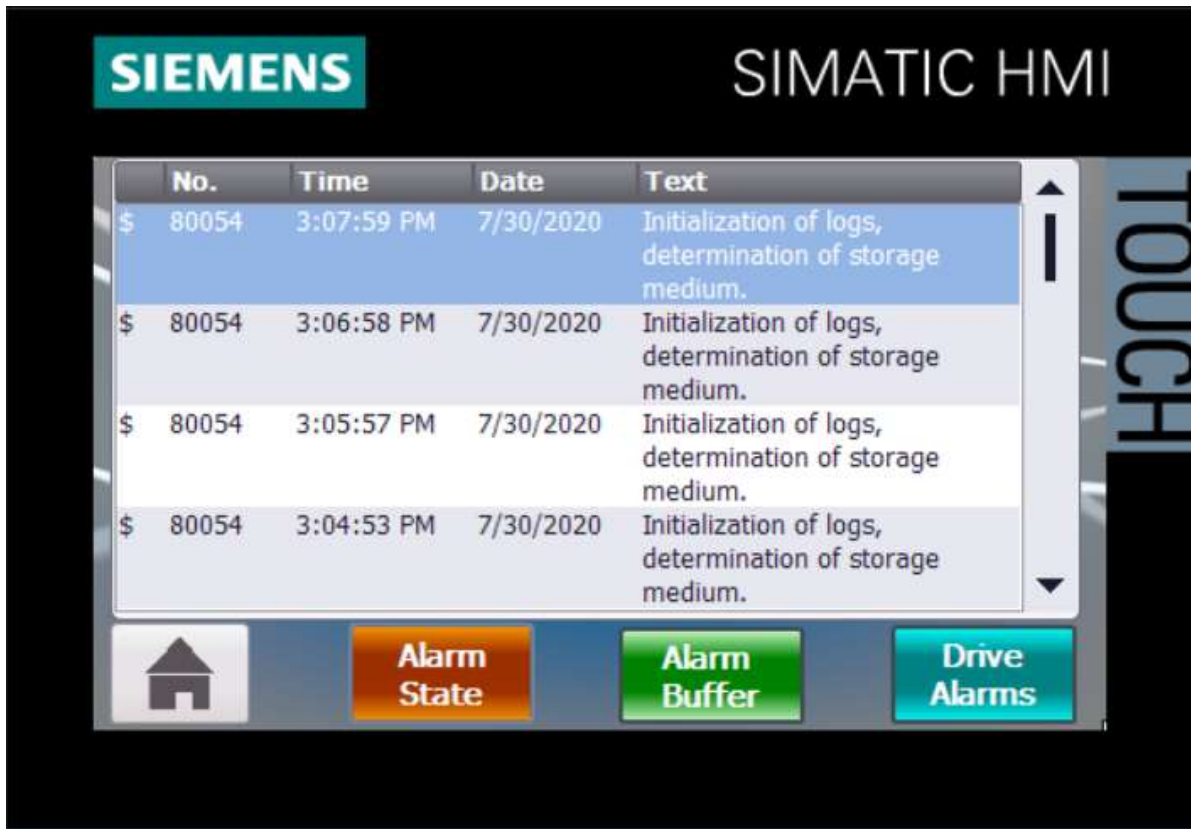
BASIC RUN

1. Set Speed Input Box
2. Set Speed Adjustment Arrows (1 RPM increments)
3. Set Speed Indicator
4. Elapsed Run Time (999:59:59) max value
5. Start Button (starts rotation)
6. Stop Button (stops rotation)
7. Elapsed Run Time Reset Button, resets Time to (0:00:00)
8. Tachometer Box (displays actual speed of machine)
9. Load Meter (monitors torque load as percentage)

PLC ALARM BUFFER

Shows PLC Alarms.

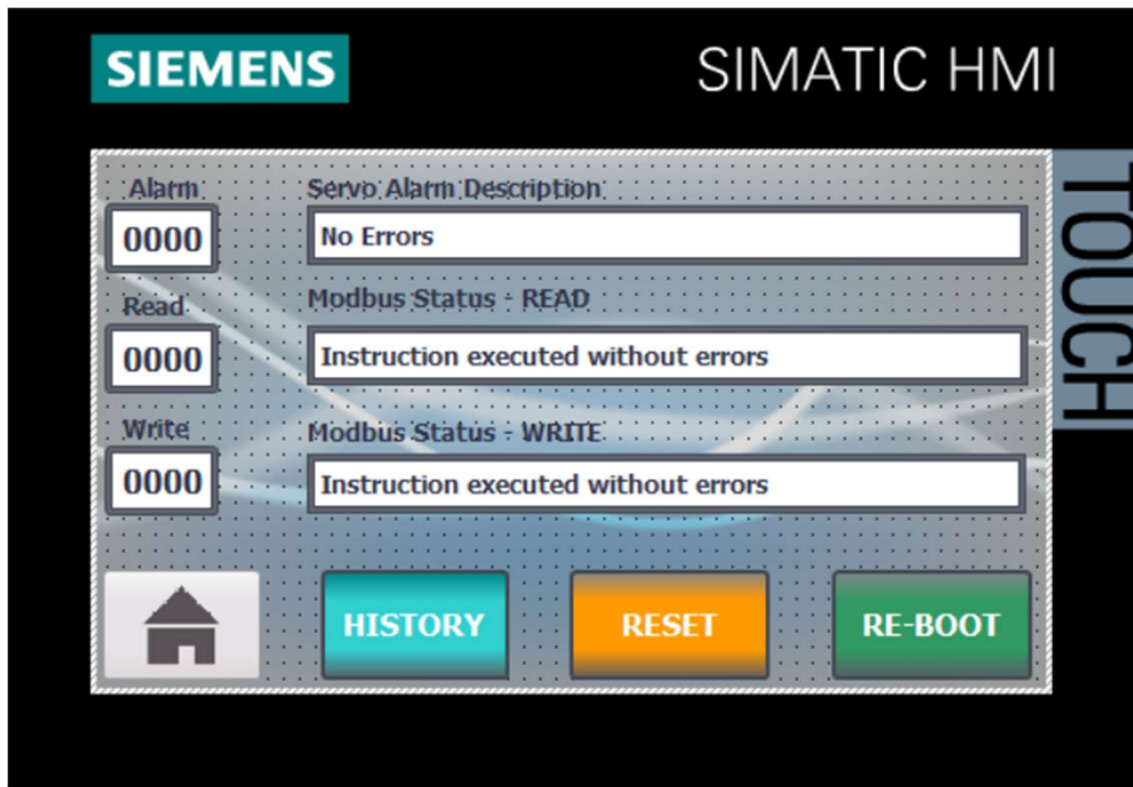
1. Press the Home Icon to go to 'WELCOME SCREEN.'
2. Press the 'Drive Faults' button to go to 'DRIVE ALARMS' screen.



DRIVE ALARMS

1. Press the F3 button to access the User Alarms.
2. Press the “REST” button to clear the alarm.
3. Press the “PLC ALARMS” to bring up the PLC Alarm buffer.
4. Press the “DRIVE ALARMS” to bring up the Drive Alarms page

***NOTE:** You can check Drive Modbus status which shows the communication from the Drive to the PLC. The status should be constantly updating every second from read and writes. You can clear Drive Alarms with the RESET button. Press the HISTORY button to see the last few Drive Alarms saved into the memory bank.



If. ALARMS AND FAULTS

There are three conditions that will sound the Alarm:

1. **EMERGENCY STOP** is pressed. This can be cleared when the E-STOP is released, and the machine has come to a full stop.



2. **NET ERROR**. This is a failure to communicate between PLC and Motor Drive.



3. **DRIVE FAULT**. This can be caused by the Servo Motor and Drive. Go to the Drive Alarms page and attempt to reset the Alarm. Power cycle will also clear the drive alarm. If alarm cannot be cleared, contact Eberbach for support.



II. MACHINE TESTING QUALIFICATION & VALIDATION

IIa. OBJECTIVE

The purpose of this protocol is to provide comprehensive document that validates the C6155.021 conforms with the quoted specifications; after manufacturing (FAT), prior to shipping (IQ), upon receipt at client's facility (OQ), and after installation at client's facility (SAT).

IIb. SCOPE

This technical data package includes inspection procedures and acceptance criteria of tests to be performed. The scope of this document is limited to the C6155.021.

IIc. RESPONSIBILITIES

Responsibilities between Eberbach and Client are defined as follows:

Task	Responsible Group
Prepare FAT/IQ/OQ/SAT Documentation	Eberbach
Perform FAT	Eberbach
Provide FAT Data to Customer	Eberbach
Perform IQ/OQ/SAT	Client
Review & verify the IQ/OQ/SAT	Client
Approve the IQ/OQ/FAT/SAT	Client

Eberbach is responsible for:

- Preparing the IQ/OQ/FAT/SAT documentation
- Performing FAT
- Provide FAT documentation to customer
- Installation support
- Use and Care manuals

Client is responsible for:

- Reviewing and approving this IQ/OQ/FAT/SAT documentation
- Performing the IQ/OQ/SAT
- All rigging activities required
- All electrical installation requirements

II d. REFERENCE

- C6155.021 Use and Care

IIe. FACTORY ACCEPTANCE TEST (FAT)

(Eberbach's Responsibility)

Step	Description	Specification or Acceptance Criteria	Result	
			Pass	Fail
1	Validate Run, unloaded	Set machine to run at 50 RPM. Speed must be within ± 2 RPM for 5 min	<input type="checkbox"/>	<input type="checkbox"/>
2	Validate Run, unloaded	Set machine to run at 100 RPM. Speed must be within ± 2 RPM for 5 min	<input type="checkbox"/>	<input type="checkbox"/>
3	Validate Run, with 9x 20L $\frac{3}{4}$ full carboys	Set machine to run at 150 RPM. Speed must be within ± 2 RPM for 5 min	<input type="checkbox"/>	<input type="checkbox"/>
4	Validate Timed Run, unloaded	Set Machine for a 5-minute timed run @ 50 RPM. Verify the machine stops after 5 minutes.	<input type="checkbox"/>	<input type="checkbox"/>
5	Verify E-stop	During machine operation, verify E-stop functionality at all locations.	<input type="checkbox"/>	<input type="checkbox"/>
6	Confirm machine finish	Machine panels and base are free from scratches. (cGMP compliant SS if applicable).	<input type="checkbox"/>	<input type="checkbox"/>
7	Confirm machine finish	Confirm that there are no sharp corners on machine / accessories.	<input type="checkbox"/>	<input type="checkbox"/>
8	Validate stroke	Does the machine provide a 2" displacement? Must be within $\pm .04$ "	<input type="checkbox"/>	<input type="checkbox"/>
9	Verify firmware version	Verify the firmware version: _____	<input type="checkbox"/>	<input type="checkbox"/>
10	Cumulative Run Time Validation	Machine Run Off Time, min 8hrs: _____	<input type="checkbox"/>	<input type="checkbox"/>
11	Machine Documentation Completed	Verify the Use and Care for the machine is completed and packaged with the machine.	<input type="checkbox"/>	<input type="checkbox"/>

IIf. INSTALLATION QUALIFICATION (IQ)

(Client's Responsibility)

Step	Description	Specification or Acceptance Criteria	Result	
			Pass	Fail
1	Space Requirements	Measure installation space for placement of equipment. 62.5" x 56.0" (Width x Depth)	<input type="checkbox"/>	<input type="checkbox"/>
2	Electrical Power	Check for electrical requirements. 120V, 50/60 Hz, Single Phase	<input type="checkbox"/>	<input type="checkbox"/>
3	Equipment Inspection	Inspect shipped products for signs of damage that may have occurred during shipping. Keep packaging material until Operation Qualifications (OQ) has been completed. Contact Eberbach immediately if any shipping damage has occurred.	<input type="checkbox"/>	<input type="checkbox"/>
4	Equipment documentation provided by Eberbach	Verify receipt of Use and Care from Eberbach.	<input type="checkbox"/>	<input type="checkbox"/>
5	Review FAT	Verify that FAT has been completed by Eberbach	<input type="checkbox"/>	<input type="checkbox"/>

IIg. OPERATION QUALIFICATION (OQ)

(Client's Responsibility)

Step	Description	Specification or Acceptance Criteria	Result	
			Pass	Fail
1	IQ completed	Has the IQ been performed by the client?	<input type="checkbox"/>	<input type="checkbox"/>
2	Inspect equipment upon receipt	Validate that the equipment was received in good condition and that there is no damage to the equipment or packaging.	<input type="checkbox"/>	<input type="checkbox"/>
3	Equipment set up	Unpack & assemble the equipment per IQ.	<input type="checkbox"/>	<input type="checkbox"/>
4		Verify the equipment/machine set up is completed.	<input type="checkbox"/>	<input type="checkbox"/>
5	Begin SAT	Client to conduct SAT.	<input type="checkbox"/>	<input type="checkbox"/>

IIh. SITE ACCEPTANCE TEST (SAT)

(Client's Responsibility)

Step	Description	Specification or Acceptance Criteria	Result	
			Pass	Fail
1	Validate Run, unloaded	Set machine to run at 50 RPM. Speed must be within ± 2 RPM for 5 min	<input type="checkbox"/>	<input type="checkbox"/>
2	Validate Run, unloaded	Set machine to run at 100 RPM. Speed must be within ± 2 RPM for 5 min	<input type="checkbox"/>	<input type="checkbox"/>
3	Validate Run, with 9x 20L $\frac{3}{4}$ full carboys	Set machine to run at 150 RPM. Speed must be within ± 2 RPM for 5 min	<input type="checkbox"/>	<input type="checkbox"/>
4	Validate Timed Run, unloaded	Set Machine for a 5-minute timed run @ 50 RPM. Verify the machine stops after 5 minutes.	<input type="checkbox"/>	<input type="checkbox"/>
5	Verify E-stop	During machine operation, verify E-stop functionality at all locations.	<input type="checkbox"/>	<input type="checkbox"/>
6	Confirm machine finish	Machine panels and base are free from scratches. (cGMP compliant SS if applicable).	<input type="checkbox"/>	<input type="checkbox"/>
7	Confirm machine finish	Confirm that there are no sharp corners on machine / accessories.	<input type="checkbox"/>	<input type="checkbox"/>
8	Validate stroke	Does the machine provide a 2" displacement? Must be within $\pm .04$ "	<input type="checkbox"/>	<input type="checkbox"/>
9	Verify firmware version	Verify the firmware version: _____	<input type="checkbox"/>	<input type="checkbox"/>
10	Cumulative Run Time Validation	Machine Run Off Time, min 8hrs: _____	<input type="checkbox"/>	<input type="checkbox"/>
11	Machine Documentation Completed	Verify the Use and Care for the machine is completed and packaged with the machine.	<input type="checkbox"/>	<input type="checkbox"/>

IIi. PERFORMANCE QUALIFICATION

Eberbach provides custom engineering solutions. Please contact Eberbach for custom IQ/OQ/PQ for specific work.

III. MACHINE MATERIAL OF CONSTRUCTION (MOC) DOCUMENTATION

IIIa. MATERIAL CERTIFICATION

Material can be provided for the following items upon request:

Part Number	Description	Material
CP6145.010.002	INLET DRIP GUARD	316SS
CP6155.003.001	DRIVE ENCLOSURE STANDOFF	304SS
CP6155.003.313	MOTOR MOUNT	316SS
CP6155.003.224	FRONT PANEL	316SS
CP6155.003.225	BACK PANEL	316SS
EP6155.S.201	ROUND SUPPORT	303SS
EP6155.SS.220	TOP COVER	316SS
EP6155.SS.221	RIGHT SIDE PANEL	316SS
EP6155.SS.222	LEFT SIDE PANEL	316SS
EP6155.SS.226	FRONT & BACK MOUNTING BRACKET	316SS
EP6155.SS.227	SIDE MOUNTING BRACKET	316SS
EP6155.025	LOWER BEARING LADDER	A36 STEEL
EP6155.S.015	BEARING RETAINER	303SS
EP6155.S.101	ECCENTRIC BLOCK	303SS
EP6155.S.213	SPINDLE	17-4SS
EP6155.S.253	RETAINING WASHER	303SS
EP6155.S.252	CRANK PIN	17-4SS
EP6155.S.202	UTILITY BOX SUPPORT	303SS
EP6155.205	UPPER BEARING LADDER	A36 STEEL

*Non-Eberbach manufactured parts will not have material certifications available

IIIb. ELECTRONICS DATA

Technical data sheets can be provided upon request:

Part Number	Description
6544.1	EMERGENCY STOP BUTTON
6288.2	IP68 USB PORT PANEL MOUNT
6288.7	IP68 ETHERNET PANEL MOUNT
6558.5	TRANSFORMER
6760.46	IP65 15A CIRCUIT BREAKER SWITCH
6269	125V AC PANEL MOUNT RECEPTACLE
6272.5	AC INLET C20
7107.1	DRIVE



Figure similar

SIMATIC HMI MTP700, Unified Comfort Panel, touch operation, 7" widescreen TFT display, 16 million colors, PROFINET interface, configurable from WinCC Unified Comfort V16, contains open-source software, which is provided free of charge. See enclosed Blu-Ray.

General information	
Product type designation	MTP700 Unified Comfort
Display	
Design of display	TFT
Screen diagonal	7 in
Display width	152.4 mm
Display height	91.4 mm
Number of colors	16 777 216
Resolution (pixels)	
• Horizontal image resolution	800 pixel
• Vertical image resolution	480 pixel
Backlighting	
• MTBF backlighting (at 25 °C)	50 000 h; At 25°C
• Backlight dimmable	Yes; 5-100 %
Control elements	
Keyboard fonts	
• Numeric keyboard	Yes; Onscreen keyboard
• alphanumeric keyboard	Yes; Onscreen keyboard
Touch operation	
• Design as touch screen	Yes
• Design as multi-touch screen	Yes
Installation type/mounting	
Mounting position	vertical
Mounting in portrait format possible	Yes
Mounting in landscape format possible	Yes
maximum permissible angle of inclination without external ventilation	35°
Supply voltage	
Type of supply voltage	DC
Rated value (DC)	24 V
permissible range, lower limit (DC)	19.2 V
permissible range, upper limit (DC)	28.8 V
Input current	
Current consumption (rated value)	0.45 A
Current consumption, max.	1 A
Starting current inrush It	0.5 A ² ·s
Memory	
Flash	Yes
RAM	Yes



Figure similar

SIMATIC S7-1200, CPU 1211C, compact CPU, DC/DC/relay, onboard I/O: 6 DI 24 V DC; 4 DO relay 2 A; 2 AI 0-10 V DC, power supply: DC 20.4-28.8 V DC, program/data memory 75 KB

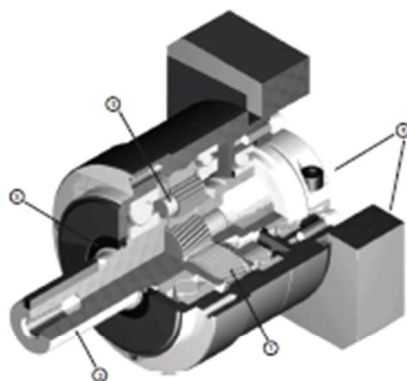
General information	
Product type designation	CPU 1211C DC/DC/relay
Firmware version	V4.6
Engineering with	
• Programming package	STEP 7 V18 or higher
Supply voltage	
Rated value (DC)	
• 24 V DC	Yes
permissible range, lower limit (DC)	20.4 V
permissible range, upper limit (DC)	28.8 V
Reverse polarity protection	Yes
Load voltage L+	
• Rated value (DC)	24 V
• permissible range, lower limit (DC)	20.4 V
• permissible range, upper limit (DC)	28.8 V
Input current	
Current consumption (rated value)	300 mA; CPU only
Current consumption, max.	900 mA; CPU with all expansion modules
Inrush current, max.	12 A; at 28.8 V DC
It	0.8 A ² ·s
Output current	
for backplane bus (5 V DC), max.	750 mA; Max. 5 V DC for CM
Encoder supply	
24 V encoder supply	
• 24 V	L+ minus 4 V DC min.
Power loss	
Power loss, typ.	8 W
Memory	
Work memory	
• integrated	0.75 kbyte
Load memory	
• integrated	1 Mbyte
• Plug-in (SIMATIC Memory Card), max.	with SIMATIC memory card
Backup	
• present	Yes
• maintenance-free	Yes
• without battery	Yes
CPU processing times	
for bit operations, typ.	0.08 μs; / instruction

SGM7J Gear Motors

The SGM7J gear motor product family pairs SGM7J servo motors with high precision, low backlash inline planetary gear heads resulting in a portfolio of rotary actuators fit for a wide range of applications. The family of gear motors has been thoroughly tested and adheres to the high levels of quality and performance expected from Yaskawa.

The high precision gear heads offer a variety of application advantages:

- **Quiet operation** – helical cut gears contribute toward reduced vibration and noise
- **High precision** – a standard backlash of 5 arc-min make this gear head ideal for the most accurate applications
- **High rigidity and torque capacity** – achieved with a design which incorporates uncaged needle roller bearings
- **Optimized adapter bushing** – minimizes inertia allowing for more output torque to be realized
- **No leakage through the seal** – high viscosity, anti-separation grease does not liquefy and does not migrate away from the gears
- **Maintenance-free** – no need to replace the grease for the life of the unit. The reducer can be positioned in any orientation



Model Designations

S7J 01 A C - VL 050 - 05

S-7 Series
Gear Motors:
SGM7J

1st+2nd
digits

3rd
digit

4th
digit

5th
digit

6th
digit

7th
digit

1st+2nd digits Rated Output

Code	Specification
01	100 W
02	200 W
04	400 W
08	750 W
15	1.5 kW

3rd digit Power Supply Voltage

Code	Specification
A	200 VAC battery type
B	200 VAC batteryless type
D	400 VAC battery type

4th digit Brake Option

Code	Specification
Blank	No brake
C	24 V Brake

5th digit Gear box backlash

Code	Specification
VL	5 arc-min backlash

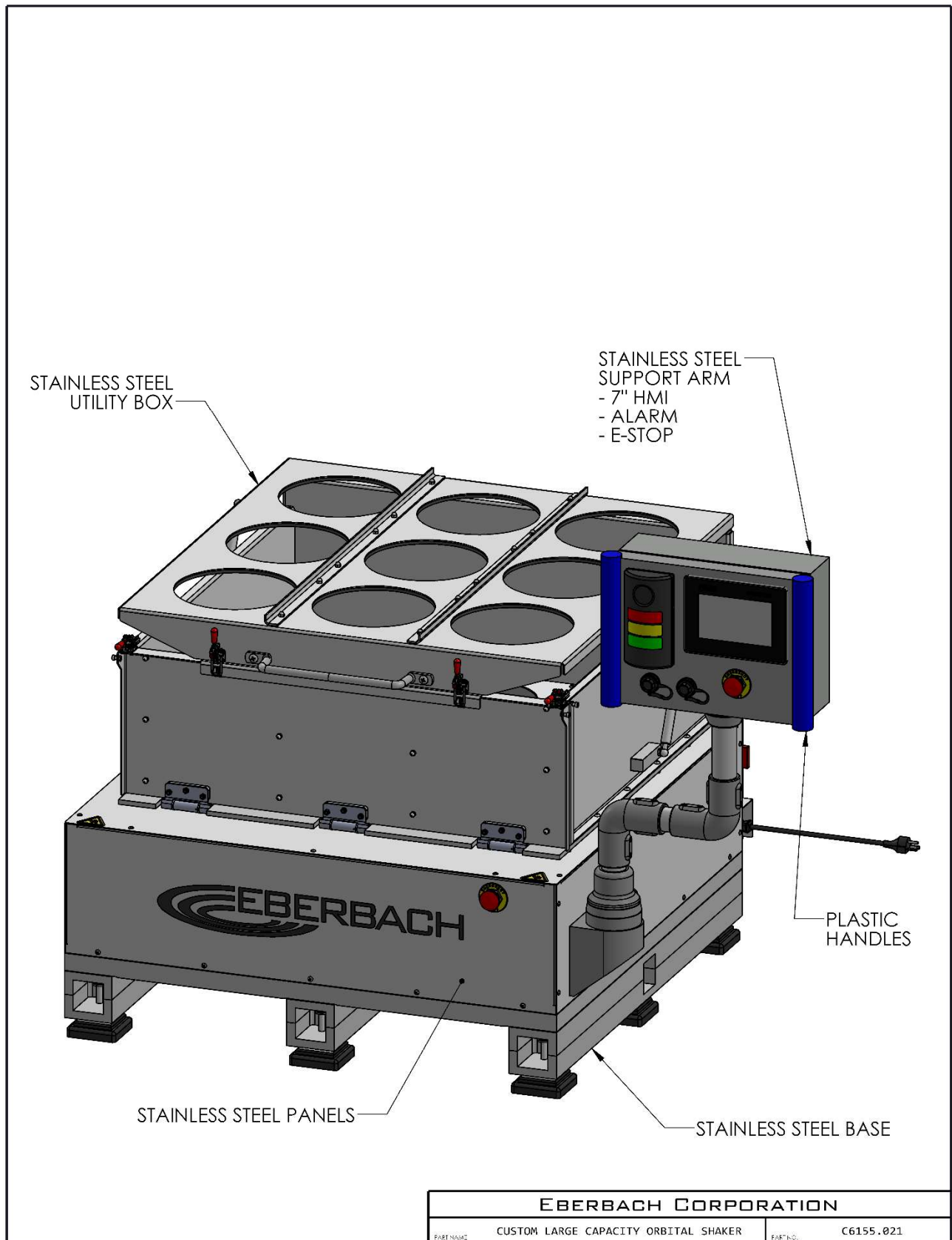
6th digit Gear head frame size

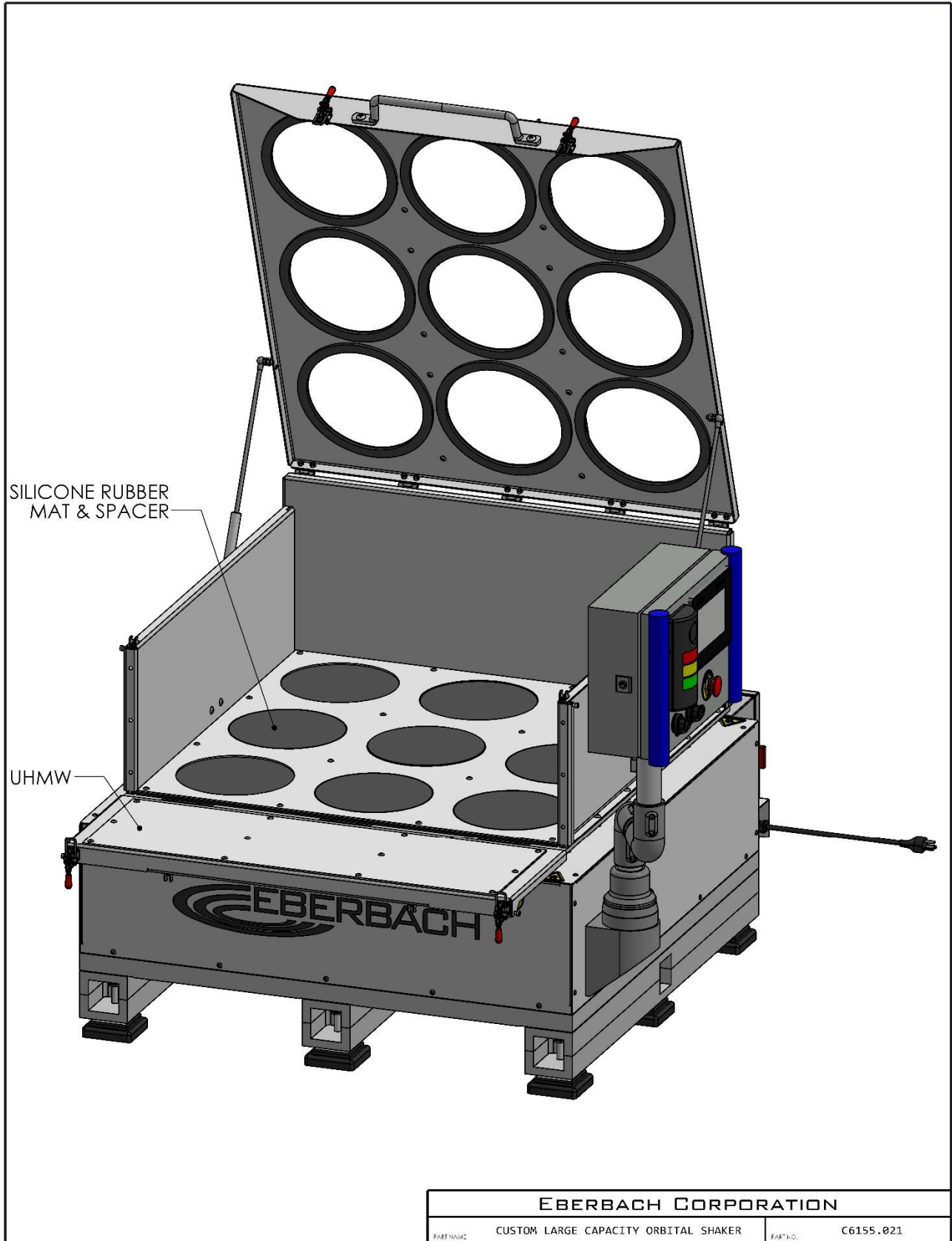
Code	Specification
050	50 mm
070	70 mm
090	90 mm
120	120 mm
155	155 mm

7th digit Gear Ratio

Code	Specification
03	3:1 Ratio
05	5:1 Ratio
10	10:1 Ratio
25	25:1 Ratio
50	50:1 Ratio

IIIc. RENDERINGS



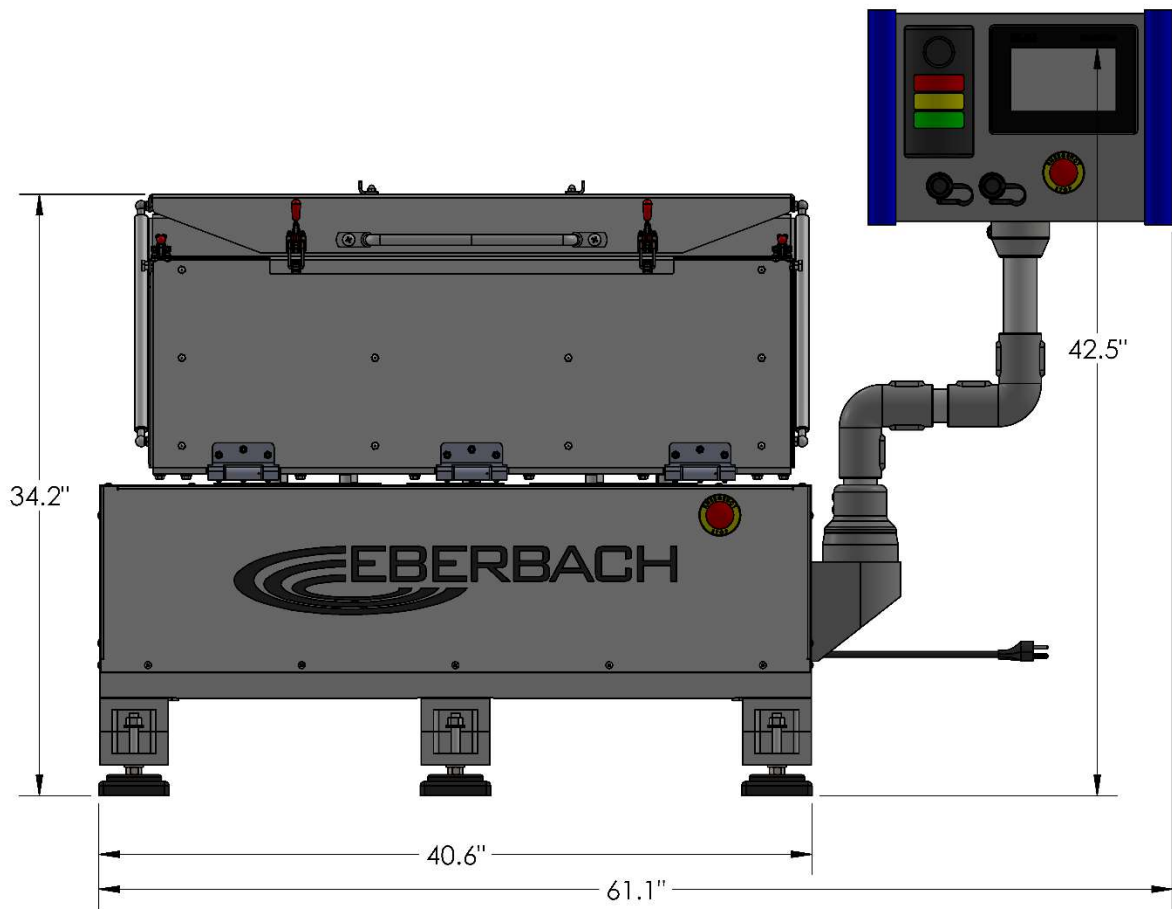


LOADING CONFIGURATION

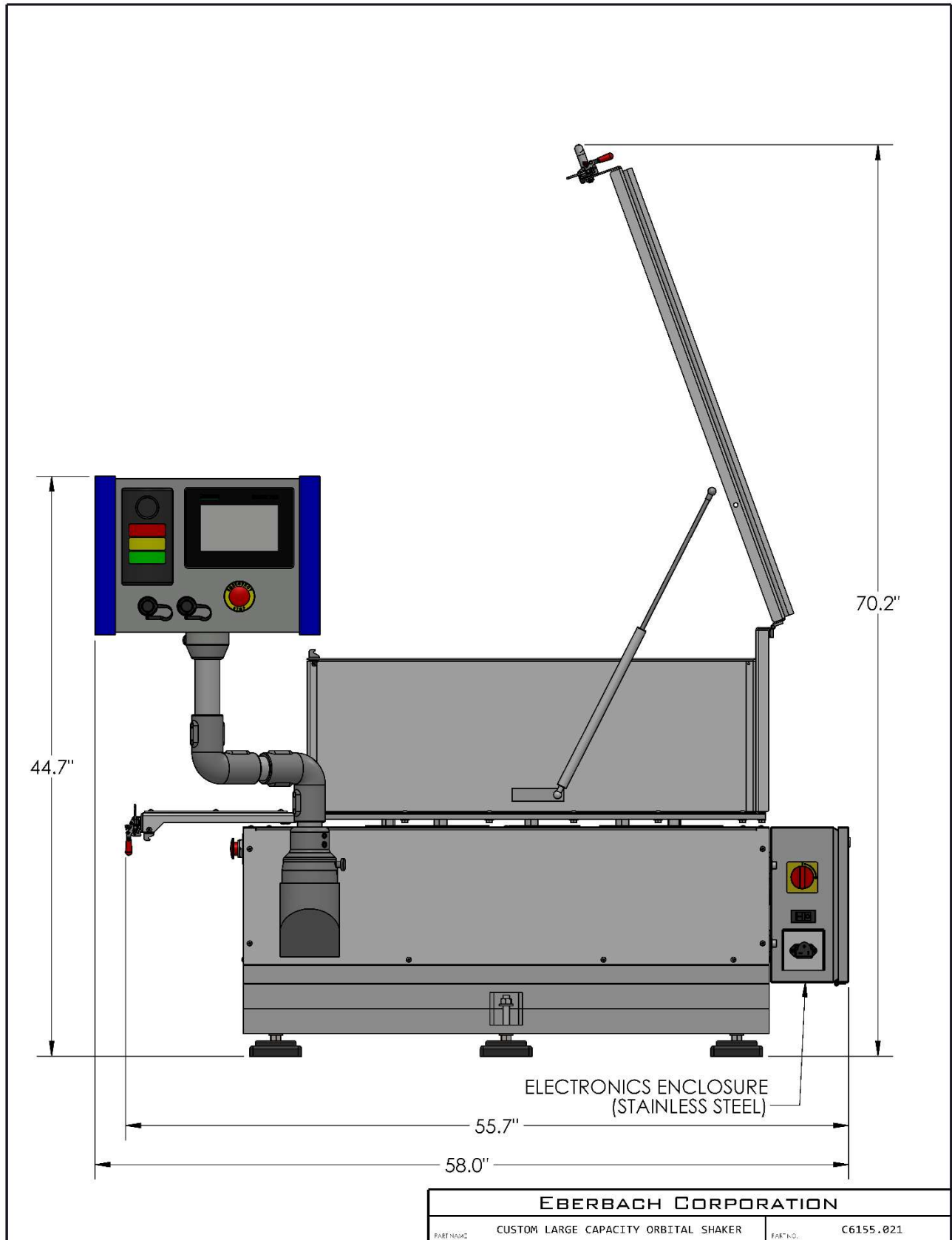


FRONT OF MACHINE

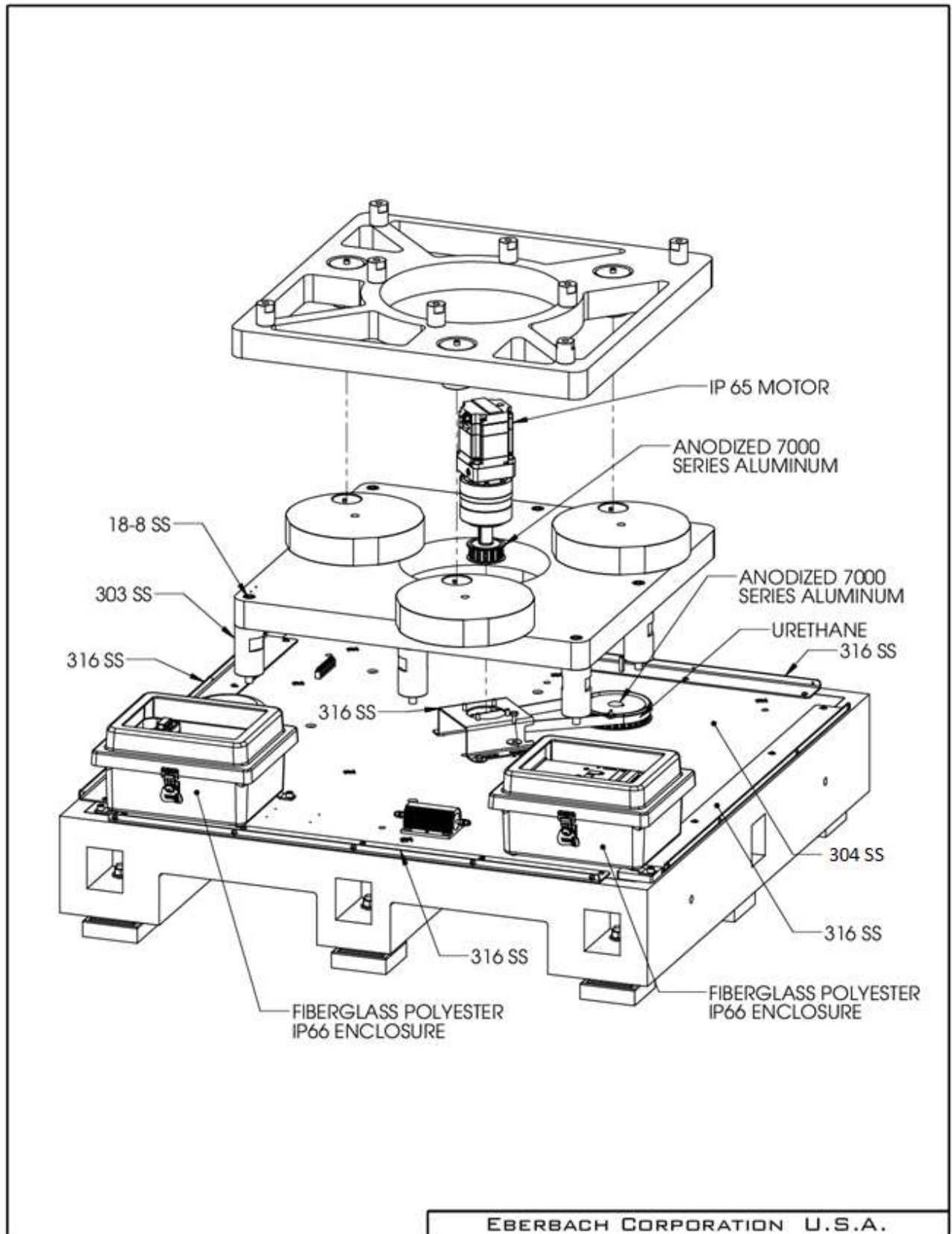
EBERBACH CORPORATION

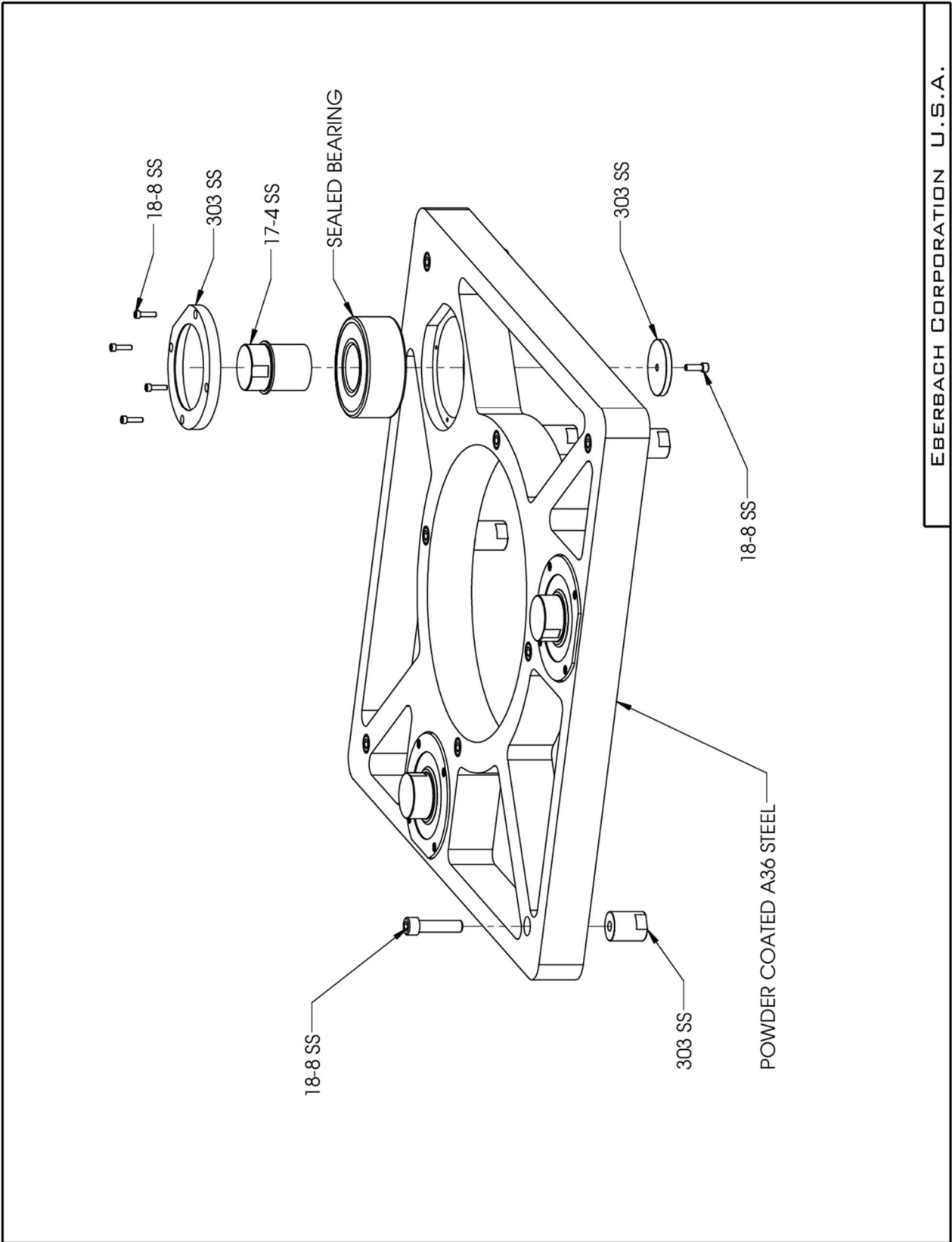


EBERBACH CORPORATION		
PART NAME	CUSTOM LARGE CAPACITY ORBITAL SHAKER	PART NO. C6155.021

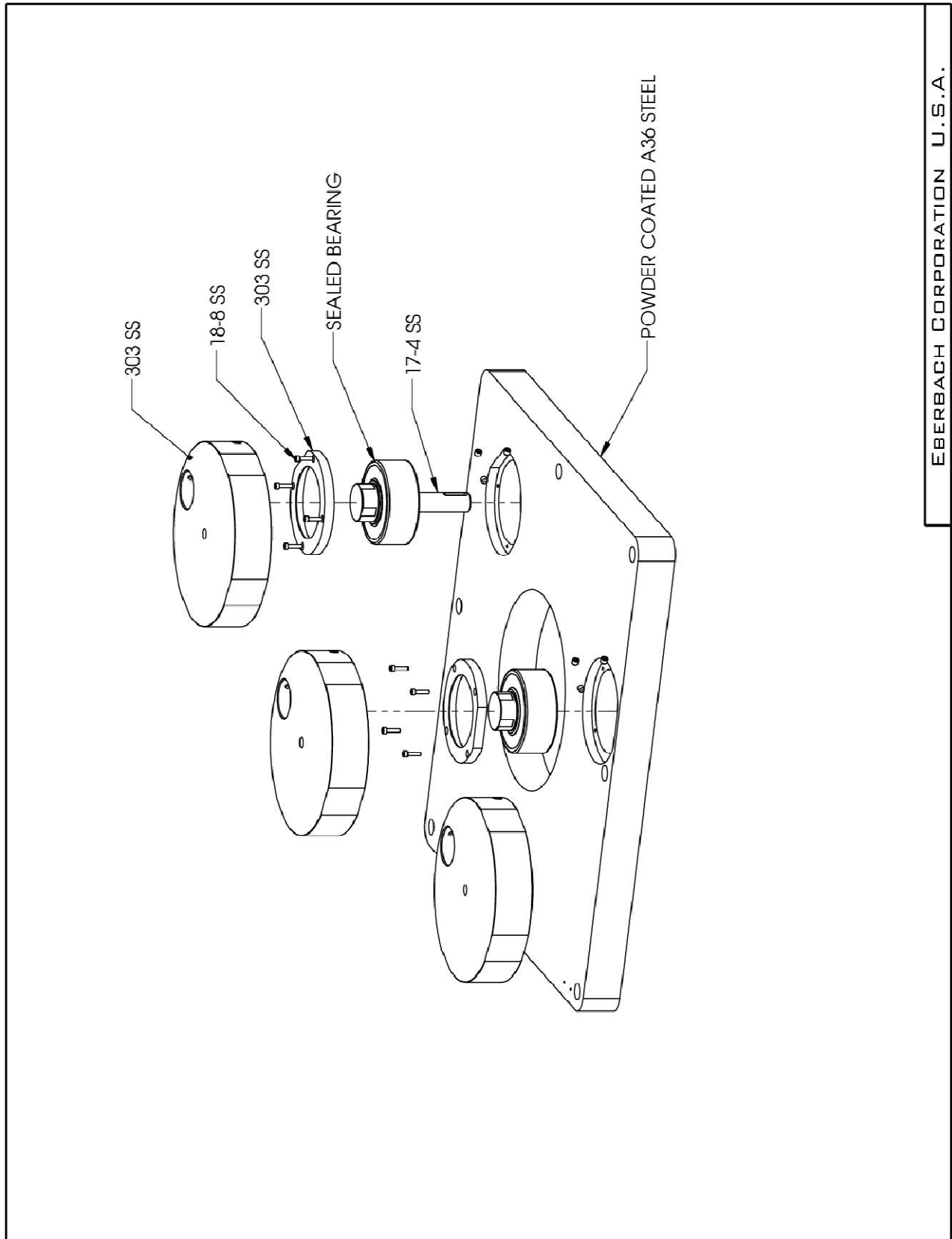


III.d. MATERIAL INFORMATION





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EBERBACH CORPORATION U.S.A.

IIIe. SPARE PARTS LIST

Part Number	Description	Quantity
4332	DUST FREE TIMING BELT	1
5503	TAILGATE CABLE	2
6649.1	115V POWER CORD, NEMA 5-20, C19	1
CP6155.005.090	1/8" CLEAR SILICONE PAD	4
CP6155.005.091	3/16" WHITE SILICONE PAD	1
CP6155.005.109	IPA COMPATABLE LID GASKET	9

IV. CUSTOMER SIGN OFF

January 5, 2024

C6155.021

CGMP SUITABLE HEAVY-DUTY WASHDOWN

LARGE CAPACITY ORBITAL SHAKER

W/ CUSTOM S/S CARRIER

1-170 RPM \pm 2 RPM, 2" STROKE

120V, 50/60HZ, SINGLE PHASE

All purchases are governed by the legal contract available online at www.eberbachlabtools.com/About-Us/Terms.html (the "Terms"). Buyer agrees that this Technical Data Package is governed in all respects by the terms in the relevant quotation and the Terms (and only the Terms) which together form a binding contract between Eberbach and Buyer. The Terms are incorporated herein by reference and this Technical Data Package or Eberbach's acceptance of this order is expressly limited to, and expressly made conditional on, Buyer's acceptance of the Terms.

Buyer expressly acknowledges that the Products purchased pursuant to this Technical Data Package are "Custom Products" as described in the Terms.

The person executing this Technical Data Package on behalf of Buyer is an authorized representative of Buyer; this Technical Data Package has been duly and validly executed and delivered by Buyer and constitutes the legal, valid, and binding obligation of Buyer, enforceable against Buyer in accordance with its terms.

Name

Title

Signature

Date