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# User's Guide



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## HMG-A Series Homogenizer HMG-B Series Homogenizer



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**WARNING:** These products are not designed for use in, and should not be used for, human applications.

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# HMG-A Homogenizer Unit

## Specifications:

Dimensions: 2.15"W x 7.875"H x 1.98"D (5.4 x 20.0 x 5.03cm)  
Weight: 1.4lb (0.6kg)  
Speed Range: 5,000 to 35,000 rpm (115v)

Wattage: 144W  
Voltage: 120v 50/60hz  
Current: 1.2 amps (120v)

Sample Volume Range: 0.03ml to 1L  
Noise Rating: 68dB  
Speed Control: Analog, variable speed, separate on/off switch  
Certification:



## Description:

The HMG-A Homogenizer Unit is a high-speed dispersing and emulsifying apparatus for processing flowable or liquid media. The HMG-A has a variable speed range from 5,000 to 35,000 rpm. A separate ON/OFF switch conveniently allows for the slide switch speed control to remain at your ideal homogenizing speed. The optional HMG-A stand consists of a support base with a matted surface plate, a 24" support post, and a homogenizer support bracket which holds the homogenizer unit as well as allowing for a 3" up and down movement of the homogenizer unit independent of the support rod.



## Operating Instructions:

- 1) Assembly of the homogenizer unit and stand (If using without stand assembly begin with step #2)
  - a. Insert the 24" long support post into the hole located at the back of the base and tighten the 3/8" hex bolt.
  - b. Loosen the locking knob on the motor support bracket and slide the homogenizer support bracket down over the end of the support post.
  - c. Lock the homogenizer support bracket in place by tightening the locking knob.
  - d. Loosen the locking screw located on the front of the homogenizer support bracket.
  - e. Insert the homogenizer unit into the bracket and tighten the locking screw.
  - f. Insert cord holder into top of support post.
  - g. Insert the power cord into the cord holder located in the top of the support post.
- 2) Check that the voltage quoted on the motor unit's type plate agrees with the available main voltage. Variations of +/- 10% are permissible.
- 3) After all of the above assembly operations have been completed and the electrical connections checked, a test run of the motor unit can be made. Do not use any generator probes at this time.

### **\*\*CAUTION\*\***

**RUNNING A GENERATOR PROBE WITHOUT LIQUID MEDIA CAN CAUSE DAMAGE TO THE BEARINGS, UNLESS THE LOWER BEARING OF THE GENERATOR PROBE HAS BEEN REPLACED WITH A SEALED & SHIELDED STAINLESS STEEL BEARING.**

- 4) Turn the On/Off switch to the On position.
- 5) The speed is controlled by the slide switch on the face of the homogenizer unit. The homogenizer unit has five (5) marked positions which relate approximately to the following:
  1. 5,000 to 8,000 rpm
  2. 9,000 to 11,000 rpm
  3. 12,000 to 17,000 rpm
  4. 18,000 to 24,000 rpm
  5. 25,000 to 35,000 rpm (120v)

## Care and Handling:

Please unpack the apparatus carefully and check that it is not damaged. It is important that any damage that occurred in transport is detected at the time of unpacking. If you do find such damage, the carrier must be notified immediately.

## Maintenance & Service:

1. The homogenizer should be given the care normally required for any electrical appliance.
2. Avoid wetting or unnecessary exposure to fumes.
3. The finish can be washed with water and soap or detergents, using a cloth or sponge.
  - a. Do not allow water to get inside the homogenizer unit.
  - b. Allow drying before using.
4. When necessary to replace homogenizer unit brushes;
  - a. Remove pair of black caps from either side of HMG-A homogenizer unit
  - b. Remove brush assembly
  - c. Replace with new brushes (contact authorized Service Department)
  - d. Replace black caps
  - e. Run in brushes
    - i. Let the HMG-A run at lowest speed for five minutes

## Environmental Conditions:

### Non-Operating Storage:

Temperature: -20 to 65 deg. C (-4 to 149 deg. F)

Humidity: 20% to 85% RH, non-condensing

### Operating Conditions:

Temperature: 18 to 33 deg. C (64 to 91 deg. F)

Humidity: 20% to 85 % RH, non-condensing

Altitude: 0 to 6,562 ft. (2000 M) above sea level

Installation Category II and Pollution Degree 2 in accordance with IEC 664.

## Safety

- 1) Never attempt to hold the lower end of the generator probe while it is attached to the homogenizer unit.
- 2) Over tightening the rotor knife onto the rotor shaft can result in breaking the shaft and/or distortion of the rotor knife.
- 3) Any servicing of the homogenizer unit, except brush replacement, should be performed by an authorized Service Department.
- 4) Use of any accessories or attachments other than those supplied by the manufacturer may be hazardous and voids all warranties.
- 5) The homogenizer unit is supplied with sealed ball bearings and requires no additional lubrication. Any additional lubrication to it can result in bearing and/or motor failure.
- 6) Running a generator probe without liquid media can cause damage to the bearings and consequently damage the generator probe.

## HMG-B Homogenizer Unit

### Specifications:

Dimensions:	2.75"W x 9"H x 2.75"D (6.9 x 22.8 x 6.9cm)
Weight:	3.2lb (1.4kg)
Speed range:	10,000 to 30,000 rpm
Wattage:	576W
Voltage:	120v 50/60hz
Current:	4.8 amps (120v)
Sample volume range:	0.03ml to 5L
Noise rating:	72dB
Speed control:	Variable speed, separate on/off switch, digital ready
Certification:	



### Description:

The HMG-B Homogenizer Unit is a hand-held or optional post-mounted 576 watt homogenizer with variable speed from 10,000 to 30,000 rpm. A separate ON/OFF switch conveniently allows for the speed control dial to remain at your ideal homogenizing speed. The HMG-B is designed to homogenize, emulsify, blend and mix organic and inorganic materials in a liquid/liquid, liquid/solid, or solid/solid state.

There is one optional stand available for use with the HMG-B Homogenizer Unit with a small footprint cast aluminum base. Both stands include a 24" (61cm) vertical support post, heavy duty clamp, and cross rod.



### Operating Instructions:

- 1) Assembly of the homogenizer unit and stand (If using without stand begin with step #2)
  - a. Screw the cross rod assembly into the threaded hole located in the back of the homogenizer unit.
  - b. Once the cross rod is threaded into the rear of the homogenizer unit, tighten the jam nut locking the cross rod in place.
  - c. Insert the 24" support post into the back of the base and tighten the locking screw.
  - d. Slide the post clamp down the support post and lock in place.
  - e. Insert the cross rod and homogenizer unit into the post clamp.
  - f. Insert end cap onto top of support post.
- 2) Check that the voltage noted on the back of the motor agrees with the available voltage. Variations of +/- 10% are permissible.

- 3) Insert the power cord into the proper voltage outlet.
- 4) After all of the above assembly operations have been completed and the electrical connections checked, a test run on the homogenizer unit can be made. Do not use any generator probe at this time.

**\*\*CAUTION\*\***

**RUNNING A GENERATOR PROBE WITHOUT LIQUID MEDIA CAN CAUSE DAMAGE TO THE BEARINGS, UNLESS THE LOWER BEARING OF THE GENERATOR PROBE HAS BEEN REPLACED WITH A SEALED & SHIELDED STAINLESS STEEL BEARING.**

- 5) Turn the on/off switch ( I / O ) to the on position.
- 6) The speed is controlled by the speed control dial located on the top of the homogenizer unit. The homogenizer unit has six (6) marked positions which approximately relate to the following:
  1. 10,000 rpm
  2. 14,000 rpm
  3. 18,000 rpm
  4. 22,000 rpm
  5. 26,000 rpm
  6. 30,000 rpm

**Care and Handling:**

Please unpack the apparatus carefully and check that it is not damaged. It is important that any damage that occurred in transport is detected at the time of unpacking. If you do find such damage, the carrier must be notified immediately.

**Maintenance & Service:**

1. The homogenizer unit should be given the care normally required for any electrical appliance.
2. Avoid wetting or unnecessary exposure to fumes.
3. The finish can be washed with water and soap or detergents, using a cloth or sponge.
  - a. Do not allow water to get inside the homogenizer unit.
  - b. Allow drying before using.
4. When necessary to replace homogenizer unit brushes please contact an authorize Service Department

**Environmental Conditions:**

**Non-Operating Storage:**

Temperature: -20 to 65 deg. C (-4 to 149 deg. F)

Humidity: 20% to 85% RH, non-condensing

**Operating Conditions:**

Temperature: 18 to 33 deg. C (64 to 91 deg. F)

Humidity: 20% to 85 % RH, non-condensing

Altitude: 0 to 6,562 ft. (2000 M) above sea level

Installation Category II and Pollution Degree 2 in accordance with IEC 664.



## Safety

- 1) Never attempt to hold the lower end of the generator probe while it is attached to the homogenizer unit.
- 2) Over tightening the rotor knife onto the rotor shaft can result in breaking the shaft and/or distortion of the rotor knife.
- 3) Any servicing of the homogenizer unit, except brush replacement, should be performed by an authorized Service Department.
- 4) Use of any accessories or attachments other than those supplied by the manufacturer may be hazardous and voids all warranties.
- 5) The homogenizer unit is supplied with sealed ball bearings and requires no additional lubrication. Any additional lubrication to the homogenizer unit can result in bearing and/or motor failure.
- 6) Running a generator probe without liquid media can cause damage to the bearings and consequently damage the generator probe

## Homogenizer Unit Generator Probes

### Description:

Our generator probes are manufactured out of 316 stainless steel for the utmost in chemical compatibility. They are precision crafted with a very narrow clearance between the inner rotating knife (rotor) and the outer tube (stator), which allows for quick, effective and repetitive processing, meaning you will get the results you want each and every time. Our generator probes are designed to be anti-foaming in design and are very easy to take apart and clean between samples. Appropriate cleaning procedures include chemically cleaning, autoclaving and flaming. Complete replacement parts for the generator probe are available, thereby extending the life of this valuable piece of equipment.

All of the generator probes will fit any of the homogenizer units. The ability to scale-up in size is important, therefore, all of the generator probes are designed with this in mind. The choice of a generator probe depends on the end result desired and the material being treated. One of the most important items to consider in choosing a generator probe is the peripheral speed, which is critical for particle size reduction. The following shows the peripheral speeds that the individual units can reach in the medium:

5mm diameter generator probes	= 6 meters per second
7mm diameter generator probes	= 9 meters per second
10mm diameter generator probes	= 13 meters per second
20mm diameter generator probes	= 26 meters per second

All generator probes work on the same principal. The medium to be processed is pulled into the bottom of the tube by the rotor and forced out through the slots in the stator. The stator acts as an ideal flow breaker and prevents, to a large extent, the rotation of the medium and allows the introduction of large mechanical energies in a very small space. The vortex formation known in stirring is greatly reduced but cannot be avoided altogether. In the shearing gap between the rotor and the stator, about 1,000 times more energy is introduced into the medium than in stirring. The particles are pulled into the center of the rotor and then forced radially outward. In this process, the particles are reduced in size by hitting sharp edges, shearing between the edge of the rotor knife and the stator slots as well as cavitation. It usually takes only a few minutes to obtain a fine particle size reduction. Longer processing times achieve only a minor improvement in particle size reduction while increasing the temperature of the medium through the energy input.

### Attaching the Generator Probe to the Homogenizer Unit:

- 1) All generator probes are fitted to the homogenizer unit by inserting the upper end of the generator probe into the collar end of the homogenizer unit.
- 2) Align the vertical slots in the generator probe with the locating pins in the motor collar by rotating the generator probe.
- 3) Once aligned, push the generator probe inward as far as possible and turn the generator probe left. The collar is spring loaded so you will feel some resistance as you push the generator probe inward and turn it.

#### **\*\*CAUTION\*\***

### **AT NO POINT SHOULD EXCESSIVE FORCE BE NECESSARY TO CONNECT THE GENERATOR PROBE TO HOMOGENIZER UNIT**

- 4) Once you have turned the generator probe  $\frac{1}{4}$  turn, release the generator probe and you will hear a distinct click which the generator probe is dropping into its locked position.
- 5) To disconnect the generator probe from the homogenizer unit, push the generator probe up into the motor collar as far as possible and turn the generator probe clockwise  $\frac{1}{4}$  turn. The generator probe will be pushed out of the motor collar by the force of the internal spring.

#### **\*\*CAUTION\*\***

### **DO NOT REMOVE THE MOTOR COLLAR FROM THE HOMOGENIZER UNIT.**

### Operating Procedures:

- 1) The generator probe should be used within an open chamber (tube, beaker, or container).
- 2) The ideal situation is when the diameter of the generator probe is as large as the chamber will allow or as close.
- 3) Insert the generator probe into the medium that is to be homogenized. The depth to which the generator probe is inserted should be  $\frac{1}{3}$  of the liquid's height measured from the bottom of the chamber. According to the properties of the material, it may not be necessary to insert the generator probe to this depth. In case of heavy sediments, the generator probe may have to be positioned lower, but the generator probe must never come in contact with the bottom of the chamber.
- 4) **MID-BEARING NOTE:** All generator probes that are 120mm in length and longer contain a mid-bearing, which is located inside the generator probe approximately half way up the shaft. The mid-bearing must be lubricated by the sample/liquid during processing; therefore the sample volume should cover about half the length of the generator probe.
- 5) Start the homogenizer unit at the lowest possible speed and then slowly increase the speed to the desired level.
- 6) It is advisable that the generator probe be immersed within the container off-center. This off-center location will help minimize vortexing.
- 7) A generator probe has two (2) sets of venting holes. One set is located approximately 1" from the bottom of the generator probe and the second set is approximately 1" below the bottom of the generator probe collar. The lower hole aids in keeping the lower bearing lubricated, while the top hole allows venting of any liquid that might be forced up into the tube. There is no need to avoid liquid from entering the lower set of holes.
- 8) Once you have reached the level of processing that is required, reduce the homogenizer speed and start to slowly remove the generator probe from the chamber while the homogenizer is still slightly running. It is important that this be done slowly as you want to spin all medium from the generator probe back into the chamber and not outside of the chamber.
- 9) After spinning the medium off the generator probe while still in the chamber, the homogenizer can be turned off and the generator probe totally removed from the chamber.

## Dismantling the Generator Probe:

### Dismantling the 5mm generator probe

The following instructions are for the dismantling of only 5mm generator probe ONLY.

1. Unscrew the rotor knife from the bottom of the rotor shaft. Insert the 1/4" hex key (supplied in the tool kit) into the end of the rotor shaft collar and insert the screwdriver (supplied in the tool kit) into the rotor knife and turn the hex wrench counter clockwise.
2. Remove the rotor knife from the bottom of the generator probe tube and collar assembly.
3. Draw the rotor shaft and rotor shaft collar assembly upwards out of the tube and collar assembly. The PTFE (polytetrafluoroethylene) washer can be removed from the rotor shaft.
4. Remove the lower bearing from the bottom of the generator probe tube and collar assembly. The lower bearing should be replaced when worn before the rotor knife starts to rub against the side of the stator.
5. The rotor shaft collar assembly can be removed from the rotor shaft by loosening the set screw located at the side of the rotor shaft collar using the hex wrench end of the screw driver (supplied in the tool kit).

### Dismantling 7mm, 10mm, and 20mm generator probes

The following instructions are for the dismantling of all other generator probes except 5mm.

1. Unscrew the rotor knife from the bottom of the rotor shaft. Insert the 1/4" hex key (supplied in the tool kit) into the end of the rotor shaft collar and insert the screwdriver end into the rotor knife and turn the hex wrench counter clockwise.
2. Remove the rotor knife from the bottom of the generator probe tube and collar assembly
3. Remove the rotor shaft collar assembly by loosening the setscrew located in the side of the rotor shaft collar from the rotor shaft using the hex wrench end of the screwdriver tool (For convenience, do not fully remove the setscrew from within the rotor shaft collar assembly).
4. Remove the PTFE washer from the rotor shaft. Draw the rotor shaft downwards out of the generator probe tube and collar assembly. (If rotor shaft does not slide out, press down on the rotor shaft from the top of the generator probe tube and collar assembly using the hex wrench end of the screwdriver tool).
5. Remove the lower bearing from the end of the generator probe tube and collar assembly using the screwdriver. The screwdriver should be inserted high enough to reach the inner side of the lower bearing. Put the flat side of the screwdriver against the lower bearing, and then pull the handle of the screwdriver against the saw-teeth or open-slotted end of the generator probe. The lower bearing should come out. The lower bearing should be replaced when it shows signs of wear and before the rotor shaft collar starts to come in contact with the inside wall of the motor collar or starts to rub on the top of the generator probe tube and collar assembly.

## Assembly of the Generator Probe:

### Assembling 5mm generator probe

The following instructions are for the assembly of only 5mm generator probe.

1. Insert the lower bearing into the bottom of the generator probe tube and collar assembly. Take the rotor knife and place it into the bottom of the generator probe tube and collar assembly and push the lower bearing into its proper location. The proper location is when the end of the rotor knife is flush with the bottom of the generator probe tube and collar assembly.
2. Attach the rotor shaft collar to the end of the rotor shaft. Make sure that the setscrew in the rotor shaft collar lines up with the flat on the end of the rotor shaft. The rotor shaft collar should be located as close to the end of the rotor shaft as possible. Slide the PTFE washer up the rotor shaft until it contacts the rotor shaft collar.
3. Insert the rotor shaft with the rotor shaft collar and PTFE washer attached into the upper end of the tube and collar assembly.

4. The rotor shaft should rotate freely within the generator probe tube and collar assembly. If the rotor shaft does not rotate freely, remove the rotor shaft from the tube and collar assembly and inspect both the upper and lower bearings for any possible damage. Replace any damaged bearings.
5. Insert the rotor knife into the end of the generator probe tube and collar assembly and rotate the knife clockwise while holding the rotor shaft collar.
6. Once the rotor knife is threaded onto the end of the rotor shaft, insert the ¼" hex wrench into the end of the rotor shaft collar and the screwdriver into the end of the rotor knife and lightly tighten.
7. With the rotor knife attached, place the generator probe with the blade end downward onto a flat surface. Loosen the setscrew located on the side of the rotor shaft collar. Push the rotor shaft collar downward until the nylon washer is in contact with both the bottom of the rotor shaft collar and the top of the upper bearing. Tighten the set screw and check that the generator rotates freely.

### Assembling 7mm, 10mm, and 20mm generator probes

The following instructions are for the assembly of all other generator probes except 5mm.

1. Slide the lower bearing onto the rotor shaft.
2. Attach the rotor knife to the rotor shaft by screwing it together until tight (hand tighten).
3. Insert the rotor shaft into the end of the generator probe tube and collar assembly. Then push the rotor knife up into the end of the generator probe tube and collar assembly until it cannot go any further. This will put the lower bearing into its proper place. The rotor shaft should stick out through the upper bearing located in the top of the generator probe tube and collar assembly.
4. While pushing against the rotor knife, place the PTFE washer over the end of the rotor shaft and put the rotor collar assembly onto the rotor shaft.
5. While holding the rotor knife, align the setscrew on the side of the rotor shaft collar and the flat end on the rotor shaft so they are facing each other. Once lined up with one another, tighten the setscrew against the flat end of the rotor shaft using the hex wrench end of the screwdriver tool (supplied in the tool kit).
6. Insert the ¼" hex key (supplied in the tool kit) into the end of the rotor shaft collar and insert the screwdriver end into the rotor knife and turn the hex wrench clockwise to confirm its tight (Over tightening of the rotor knife onto the rotor shaft can result in breaking of the rotor shaft and/or distorting of the rotor knife).

### Generator Probe Maintenance:

Regular maintenance and inspection / replacement of wearing generator probe parts are recommended and will thereby extend the life of this valuable piece of equipment.

### **\*\*CAUTION\*\***

**RUNNING THE GENERATOR PROBE WITH MISSING OR WORN COMPONENTS CAN CAUSE DAMAGE TO THE GENERATOR PROBE AND/OR HOMOGENIZER UNIT.**

### Perform an upper washer check:

1. Is the upper white Polytetrafluoroethylene (PTFE) washer missing? These tend to get misplaced when cleaning and often the generator probe is reassembled without the PTFE washer.
2. Is the white PTFE washer worn?
3. If you answered yes to either of these questions, then you will need to order replacement upper PTFE washers. This item is the same for all generator probes. Please contact an authorized Service Department.

### Perform a lower bearing maintenance check:

1. It is time to replace your lower Polytetrafluoroethylene (PTFE) bearing if...
  - a. The inside diameter of the lower PTFE bearing fits loosely on the outside diameter of the shaft
  - b. And/or you are able to wiggle and tilt the PTFE bearing

2. Find the correct lower bearing for your generator probe.
  - a. Refer to the Generator Probe Drawings within this manual.
  - b. Speak with an authorized Service Department that will assist you in finding the correct part.

### Upper SS bearing maintenance check:

1. Replacement of upper stainless steel bearing should be performed by an authorized Service technician.

### Mid-Bearing maintenance check:

1. All generator probes that are 120mm in length and longer contain a mid-bearing, which is located inside the generator probe approximately half way up the shaft.
  - a. The mid-bearing must be lubricated by the sample/liquid during processing; therefore the sample volume should cover about half the length of the generator probe.
2. Replacement of mid-bearing should be performed by an authorized Service technician.

### Tips to maximize generator probe performance.

1. Never run the generator probe dry. The generator probe requires liquid sample/medium to lubricate the bearings during processing.
2. Without the liquid, the bearings can burn out and cause damage to the generator probe itself.
3. Make sure you are processing the recommended sample volume for the generator probe you are using. If you are unsure if this is the correct generator probe for your application, please contact a sales representative before using the generator probe.
4. Always begin homogenizing at a low rpm, and then gradually increase the speed to your target level.
5. Please follow the instructions in the manual to ensure that you attach the generator probe properly to the homogenizer unit.
6. We recommend taking apart and cleaning generator probe after each daily uses or in between samples, depending on your protocols.

## Multi-Generator Probe Pack Introduction

### Description:

The Multi-Generator Probe Pack are manufactured from 316 stainless steel and PTFE and consists of a generator probe tube, rotor shaft and knife assembly, drive collar and a set of PTFE bearings. Multi-Generator Probes require use of the Multi-Generator Adapter to attach to a homogenizer unit in order to operate.

### Attachment of the Adapter to the Homogenizer Unit:

- 1) Align the grooves in the side of the Adapter's upper collar with the two (2) pins in the bottom of the homogenizer motor collar.
- 2) Push the Adapter into the homogenizer motor collar.
- 3) Once inserted as far as it will go, turn the Adapter left until you feel the Adapter lock into place. This should be approximately ¼ turn. The collar is spring loaded so you will feel some light resistance as you pushup, inward, and turn.

### Attachment of the Multi-Generator Probe to the Adapter:

- 1) Remove a Multi-Generator Probe from the box.
- 2) Push the spring loaded sleeve on the Adapter upward.
- 3) While the sleeve is pulled back, insert the grooved end of the Multi-Generator Probe into the Adapter.

- 4) Once the Multi-Generator Probe has been inserted as far as possible into the Adapter, the bottom sleeve of the Adapter can be released. Releasing the bottom sleeve will lock the Multi-Generator Probe in place. Pulling gently on the Multi-Generator Probe will ensure that the Multi-Generator Probe is locked securely in place.

#### Removal of the Multi-Generator Probe from the Adapter:

- 1) With the homogenizer unit in an upward position, (Multi-Generator Probe pointing downward), slide the bottom spring loaded sleeve of the Adapter upward. Sliding the bottom sleeve of the Adapter upward will allow the Multi-Generator Probe to drop out of the Adapter.

2)

#### **\*\*CAUTION\*\***

**CARE SHOULD BE TAKEN WHEN HANDLING THE MULTI-GENERATOR PROBE, ESPECIALLY WHEN REMOVING THE MULTI-GENERATOR PROBE FROM THE ADAPTER. DO NOT LET THE MULTI-GENERATOR PROBE DROP AS THIS COULD DAMAGE THE TEETH OF IT.**

#### Operating the Multi-Generator Probes:

Once attached to the Adapter, the Multi-Generator Probe can be used like any other generator probe.

#### **\*\*CAUTION\*\***

**SHOULD BE TAKEN NOT TO RUN THE MULTI-GENERATOR PROBE DRY, WHICH CAN RESULT IN THE FAILURE OF THE PTFE BEARINGS AND SUBSEQUENT DAMAGE TO THE MULTI-GENERATOR PROBE DURING OPERATION OF THE HOMOGENIZER UNIT, PLEASE ENSURE THAT THE LOWER BEARING IS WITHIN THE LIQUID OF THE SAMPLE BEING PROCESSED.**

#### Dismantling of the Multi-Generator Probe:

1. Insert the allen wrench end of the screwdriver (supplied in the motor unit tool kit) across and through the open slot of the Multi-Generator Probe.
2. While firmly holding the drive collar at the upper end of the Multi-Generator Probe (opposite end of the screwdriver) turn the screwdriver counter clockwise. If the drive collar is not held securely it will spin with the screwdriver, thereby not allowing the knife assembly and rotor shaft to be unscrewed from the drive collar.
3. With the drive collar removed, the rotor shaft knife assembly will slide out the bottom of the Multi-Generator Probe tube.
4. The upper PTFE bearing can now be removed from the upper end of the Multi-Generator Probe tube.
5. The lower PTFE bearing can now be removed from the lower end of the Multi-Generator Probe tube.
6. Multi-Generator Probe parts can now be placed on a tray and autoclaved as necessary.

#### Multi-Generator Probe Maintenance:

Regular maintenance and inspection / replacement of lower bearings are recommended and will thereby extend the life of this valuable piece of equipment.

### Perform a lower bearing maintenance check:

1. It is time to replace your lower Polytetrafluoroethylene (PTFE) bearing if...
  - c. The inside diameter of the lower PTFE bearing fits loosely on the outside diameter of the shaft
  - d. And/or you are able to wiggle and tilt the PTFE bearing
2. This item is the same for all Multi-Generator Probe. You will need to order the Multi-Generator Probe lower PTFE bearings from an authorized Service Department.

### Tips to maximize your Multi-Generator Probe performance:

1. Never run the Multi-Generator Probe dry. The Multi-Generator Probe requires liquid sample/medium to lubricate the bearings during processing.
2. Without the liquid, the bearings can burn out and cause damage to the Multi-Generator Probe itself.
3. Make sure you are processing the recommended sample volume for the Multi-Generator Probe you are using. If you are unsure if this is the correct Multi-Generator Probe for your application, please contact a sales representative before using the Multi-Generator Probe.
4. Always begin homogenizing at a low rpm, and then gradually increase the speed to your target level.
5. Please follow the instructions in the manual to ensure that you attach the Multi-Generator Probe properly to the homogenizer unit.
6. We recommend taking apart and cleaning Multi-Generator Probe after each use.

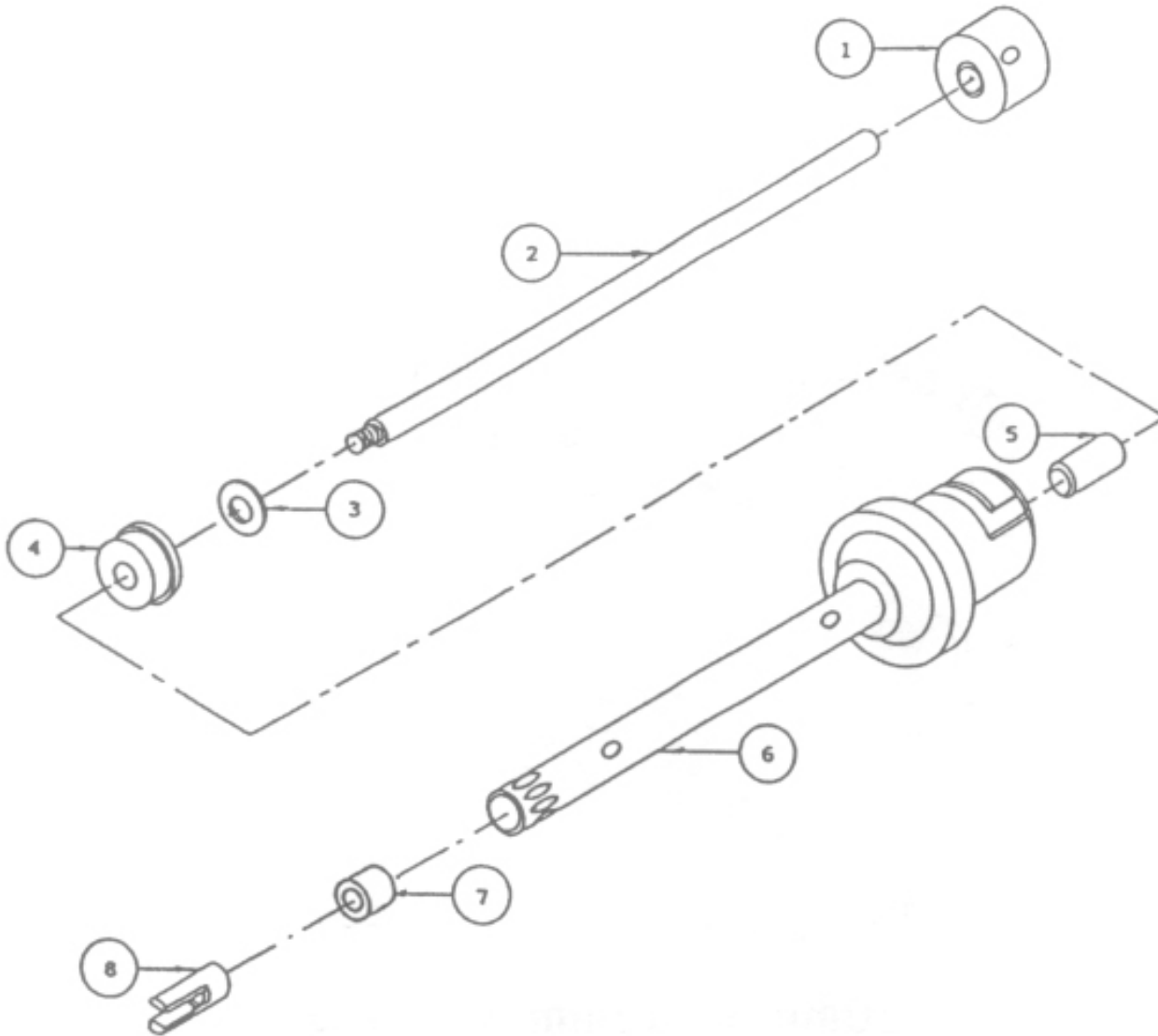
### All Generator Probe Cleaning

- 1) Immediately after you have finished working with the generator probe, the generator probe must be cleaned so that the substance residues do not stick to the rotor and stator and allow small bacterial cultures to form in undesirable places.
- 2) For this purpose, the generator probe should be run in a solvent, which dissolves the substance residue and does not harm the components. The rotor and stator are cleaned as the solvent is pumped through the generator probe.
- 3) Please ensure that all cleaning processes are compatible with 316SS and PTFE.
- 4) For a more thorough cleaning it is recommended that your generator probe be disassembled and cleaned via one of the following processes;
  - a. Chemical process - Germicidal solutions (formalin, phenol, alcohol etc.) can disinfect in most cases.
    - i. Residues of the germicide must subsequently be removed with sterilized water.
    - ii. Please ensure that all chemical processes are compatible with 316SS and PTFE.
  - b. Sterilizing by humid heat – This means sterilizing with steam at a pressure of 2 bar above atmosphere and a temperature of 120°C.
    - i. Generator probes are heat resistant up to 390° F / 198° C.
  - c. Sterilizing by hot air - Hot air sterilization is normally carried out at 160 to 190°C.
    - i. Generator probes are heat resistant up to 390° F / 198° C
  - d. Flaming - This method can be used, however, it is only effective on external surfaces.
    - i. Generator probes are heat resistant up to 390° F / 198° C

## Generator Probe Index: Drawings and Spare Parts List

### 5mm, 7mm, and 10mm Generator Probes:

Use the drawing below to assist with the generators listed.



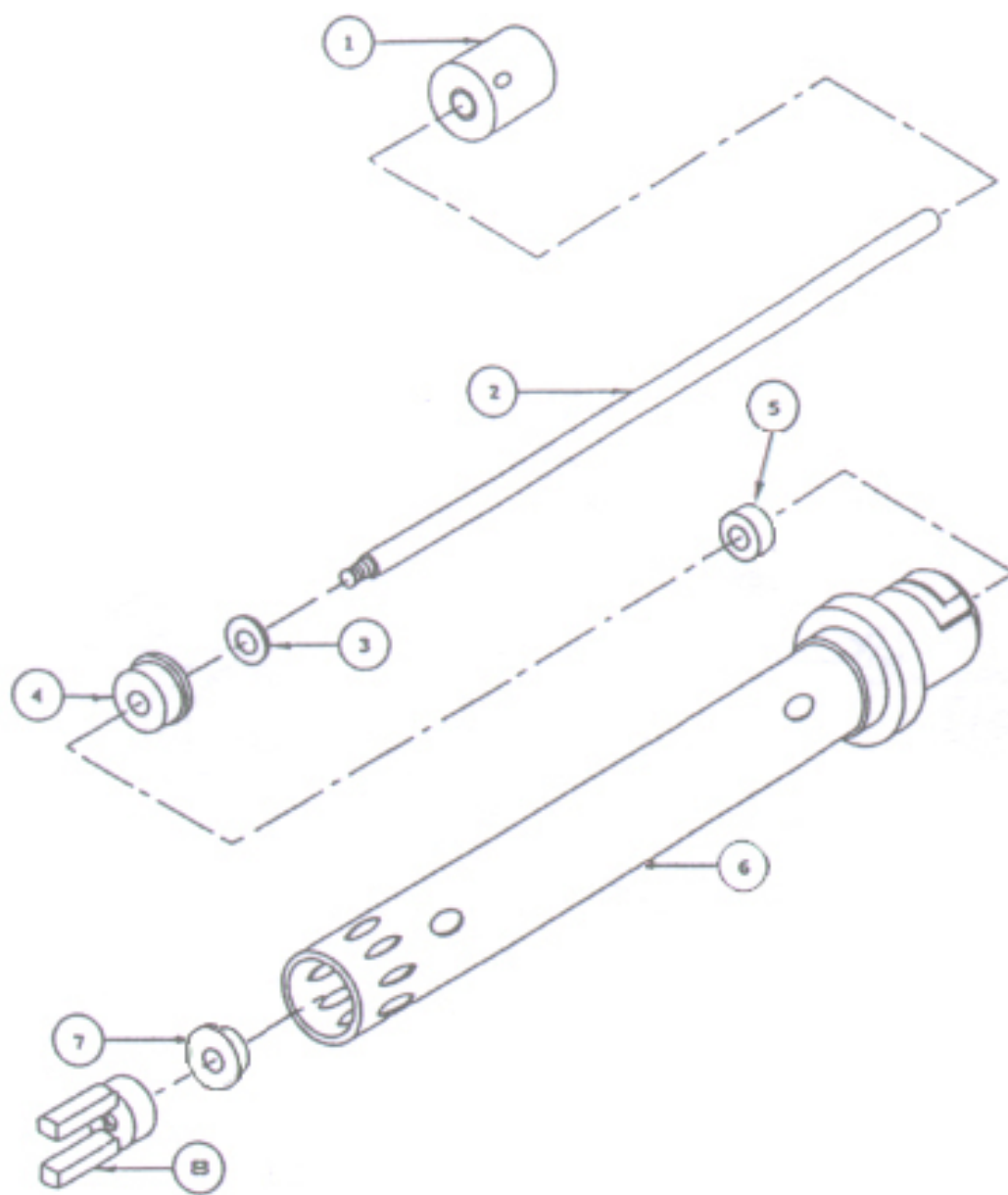
### **Generator Probe Replacement Parts**

GENERATOR PROBE	6 Tube and Collar	2 Rotor Shaft	1 Rotor Collar	8 Rotor Knife	3 Washer	4 Upper Bearing	5 Mid Bearing	7 Lower Bearing
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## 20mm Generator Probe:

Use the drawing below to assist with the generators listed.



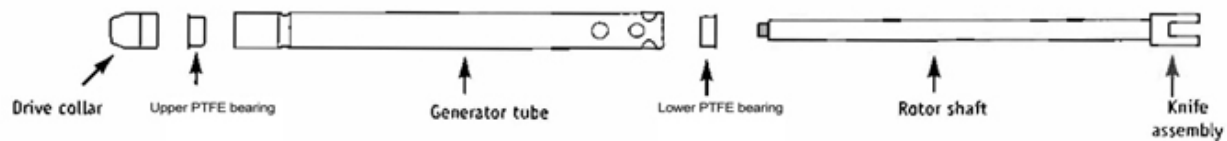
### Generator Probe Replacement Parts

GENERATOR PROBE	6 Tube and Collar	2 Rotor Head	1 Rotor Shaft	8 Rotor Collar	4 Upper Knife	5 Mid Washer	7 Lower Bearing
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## Multi-Generator Probe Index: Drawing and Spare Parts List

### Multi-Generator Probe:

Use the drawing below to assist with the generator probe list.





## WARRANTY/DISCLAIMER

OMEGA ENGINEERING, INC. warrants this unit to be free of defects in materials and workmanship for a period of **13 months** from date of purchase. OMEGA's WARRANTY adds an additional one (1) month grace period to the normal **one (1) year product warranty** to cover handling and shipping time. This ensures that OMEGA's customers receive maximum coverage on each product.

If the unit malfunctions, it must be returned to the factory for evaluation. OMEGA's Customer Service Department will issue an Authorized Return (AR) number immediately upon phone or written request. Upon examination by OMEGA, if the unit is found to be defective, it will be repaired or replaced at no charge. OMEGA's WARRANTY does not apply to defects resulting from any action of the purchaser, including but not limited to mishandling, improper interfacing, operation outside of design limits, improper repair, or unauthorized modification. This WARRANTY is VOID if the unit shows evidence of having been tampered with or shows evidence of having been damaged as a result of excessive corrosion; or current, heat, moisture or vibration; improper specification; misapplication; misuse or other operating conditions outside of OMEGA's control. Components in which wear is not warranted, include but are not limited to contact points, fuses, and triacs.

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## RETURN REQUESTS/INQUIRIES

Direct all warranty and repair requests/inquiries to the OMEGA Customer Service Department. BEFORE RETURNING ANY PRODUCT(S) TO OMEGA, PURCHASER MUST OBTAIN AN AUTHORIZED RETURN (AR) NUMBER FROM OMEGA'S CUSTOMER SERVICE DEPARTMENT (IN ORDER TO AVOID PROCESSING DELAYS). The assigned AR number should then be marked on the outside of the return package and on any correspondence.

The purchaser is responsible for shipping charges, freight, insurance and proper packaging to prevent breakage in transit.

FOR **WARRANTY** RETURNS, please have the following information available BEFORE contacting OMEGA:

1. Purchase Order number under which the product was PURCHASED,
2. Model and serial number of the product under warranty, and
3. Repair instructions and/or specific problems relative to the product.

FOR **NON-WARRANTY** REPAIRS, consult OMEGA for current repair charges. Have the following information available BEFORE contacting OMEGA:

1. Purchase Order number to cover the COST of the repair,
2. Model and serial number of the product, and
3. Repair instructions and/or specific problems relative to the product.

OMEGA's policy is to make running changes, not model changes, whenever an improvement is possible. This affords our customers the latest in technology and engineering.

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