User Instructions

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MID-RANGE 3D SHAKER
MODEL NOS. 099A VS20012/24/24CE

Contents

Glas-Col mid-range 3D shakers provide thorough mixing via a three-dimensional shaking action. The shaking action circulates liquid up and down, sideways and around for the most effective mixing.

The mid-range 3D shaker is designed to handle loads up to 34 pounds. Precise speed control is available from (0 to 160) cycles per minute. This unit is furnished with power switch, circuit breaker and 3-wire cord. The unit is available in 120 volts (Cat. No. 099A VS20012) and 240 volts (Cat. No. 099A VS20024 and 099A VS20024CE).

Unpacking

Due to the weight of the shaker, it is recommended that two people lift the mixer from the shipping package and place on a sturdy bench.

If the shaker is delivered from an environment that is below ambient conditions, let the mixer equalize for about 1 hour to current room conditions before operation.

Glassware Holders

One to four holders may be mounted to the mid-range 3D shaker. The load need not be balanced. Interchangeable holders are designed for securing 250mL through 2-Liter separatory funnels and 250mL through 1-Liter Erlenmeyer flasks.

All separatory funnel holders allow glassware to be rotated 180 degrees. The funnel can be filled, inverted for shaking and then reinverted for addition and/or extraction, while the funnel remains in the holder.

Installation of Shaker Base

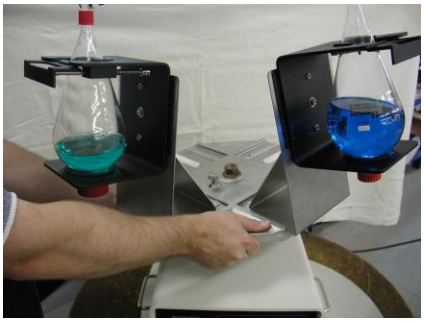
The shaker base has a weight of 165 pounds. Place the shaker base flat surface. To prevent the shaker from "walking" clean the surface and feet where the shaker will be placed before operating the unit. The shaker fits in a fume hood: a minimum 30" depth, 36" length, and 36" in height is needed when using 2-Liter separatory funnel holders. The shaker can be used in a standard 24" deep x 72" long fume hood when using separatory funnel holders up to and including 1-Liter.

Installation of Glassware Holders

The shaker allows easy, snap-in mounting of glassware holders.
It can accommodate up to four 2-liter separatory funnel holders, up to four 1-liter Erlenmeyer flask holders or any combination of one to four holders. Total load capacity is 34 pounds and balancing of load is not required.

Insert the base of the holder into the slots on the shaker platform. Push the holder toward the center of the platform until it locks into place. Make sure the holders are locked into place before operating the shaker.

Install the front two holders onto the shaker platform. The "lazy Susan" platform rotates to make loading and unloading of holders and glassware easy. Pull the knurled knob near the center of the platform in an upward motion with one hand and rotate the platform with the other hand. Release the knurled knob when rotation of the platform has begun. When the platform has rotated 180 degrees, the plunger of the knob will lock the platform into place.



After rotating the platform 180 degrees, the remaining two holders may be installed. Glassware may be loaded into the holders at any time after the holders have been installed onto the platform. Make sure the platform is locked into place before operating the shaker.

Loading of Glassware

Glassware may be placed into the holder any time after the holder has been installed onto the shaker platform. The holders have a spring-loaded assembly to make loading and unloading of glassware easy.

<u>Separatory Funnels</u>- Install the separatory funnels with the stopper in the up position. If the holder is not already positioned with the stopper retainer in the up position, release the front part of the holder assembly by loosening the black knob at the back of the holder support. Rotate the front part of the holder 180 degrees and secure by retightening the black knob.

Install the funnel by placing the bottom stopcock end of the funnel into the holder. Pull the handle on the right side of the holder forward. This will extend the top plate of the holder upward. Push the funnel forward into the holder until the top of the funnel comes in contact with the holder. Release the handle to allow the spring loaded top plate to secure the funnel into place. The funnel can now be filled (if not filled prior to installation).

Secure the funnel stopper by positioning the retainer plate above the stopper and tightening the knurled nut. The funnel is now secured and can be inverted for shaking by loosening the knob. Make sure the holder is tightened securely before operating the shaker.

<u>Erlenmeyer Flasks</u> – Install the Erlenmeyer flask by pulling the handle on the right side of the holder forward. This will extend the top plate of the holder upward. Insert the flask into the holder and push it as far into the holder as possible. Release the handle to allow the spring loaded top plate to secure the flask into place. The flask is now ready for shaking. The Erlenmeyer flask holder is designed to shake the flask in the upright position only. NOTE: Use stopper or capped flask only.

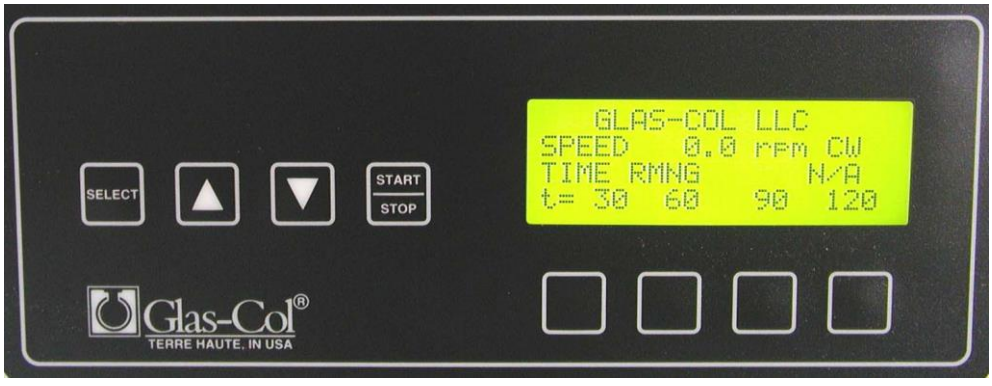
The Midrange Shaker has the following features:

- Micro-processor based control technology for control of BLDC motors
- Speed 10 to 160 rpm, Speed Display Resolution: 1 RPM, Speed Setting Increment: 10 RPM
- 4-line back-lit LCD display
- Built-in digital timer (seconds, minutes, hours)
- Preset run times of 30, 60, 90 and 120 seconds
- Communication port (USB)
- Fail Safe Mode to prevent speed fluctuations
- User-friendly membrane switch interface (4-button)
- Soft Start/Stop of motor
- Optional software for real time data acquisition

Control Menu Operation

Display 0: **Displayed a few seconds at boot up.**

Display 1:



Menus Operation:

SELECT key advances from Display 1 to Entry 2, Entry3, etc.
Up and Dn keys increment/decrement value of variable chosen.
Start/Stop utilizes values selected.

Entry 2: Displayed Select Button (seconds required menu)

("xxxx" represents actual Seconds of motor run duration selected.

Entry 3: Displayed Select Button (minutes required menu)

(Displayed if SELECT key pressed from Menu 2.
("xxxx" represents actual Minutes of motor run duration selected.

Entry 4: Displayed Select Button (hours required menu)

(Displayed if SELECT key pressed from Menu 3.
("xxxx" represents actual Minutes of motor run duration selected.

Speed:

Pushing the Start/Stop button will start the shaker at a speed of 10 RPM's from a zero speed setting. The up and down arrow keys can then change the speed by 1 rpm intervals. Holding down the up and down arrow keys will change the speed by 10 rpm intervals. Once the operating speed has been achieved, pressing the Start/Stop button will stop the shaker. **Caution: Pressing the Start/Stop button will cause the instrument to repeat the last speed and time setting.**

Select Button:

Pushing the select button advances through the menus of the mixer.

Safety:

This product has been designed for safe operation when in normal use. Please read the following Safety Information before operating the equipment.

- Unless specifically designated otherwise, Glas-Col mixers are not intended for use with flammables or in hazardous areas.
- Do not charge or remove a vessel while still in motion.
- Check the mixer before each operation. Damaged mixers should be removed from service immediately.

Safety Symbols:

The main categories of safety symbols appear below. Wherever warning and safety notices appear in this publication, the general interpretation reads as follows:

CAUTION

This symbol draws attention to cautions. It indicates the possibility of equipment damage.

NOTE

This symbol draws attention to notes. It indicates important additional information and special tips on the immediate subject matter.

Indicates potential danger due to a surface in motion.

Operating Specifications:

Power:	099A VS20012	120 Vac +/-10%, 10 amps 60 Hz.
	120 Vac +/-10%, 3 amps	
	099A VS20024	240 Vac +/-10%, 10 amps 50 Hz.
	099A VS20024CE	240 Vac +/-10%, 10 amps 50 Hz.
Operating Environment:		0 to 90% relative humidity
		32 to 100 ^{o}F/0 to 37 ^{o}C
Maximum Altitude		
Pollution Degree		2 (Normally only non-conductivity pollution occurs)
Installation Category II		Local Level (Connect to branch circuit and not directly to a main circuit, such as a fuse panel)
Storage		0 ^{o} C to 60 ^{o}C
Relative Humidity 5 to 80%		
Non-condensing @30 ^{o} C		

This mixer is intended for indoor use in laboratory setting.

Do not remove or tamper with the grounding means of this instrument. A qualified service technician should do maintenance on this instrument.

Follow site procedures for decontamination. Prior to any type of service performed on the instrument, decontaminate and document according to site procedures. Prior to servicing or shipping, the instrument must be free of any biohazardous material. When shipping, a copy of the decontamination form must be attached to the shipping documents.

Adherence to Department of Transportation (DOT) regulations must be followed when shipping any decontaminated instrument.

Decontamination of equipment parts and any other surfaces potentially contaminated with biohazardous material must be cleaned with 0.5% sodium hypo chlorite in water (diluted bleach) or a bleach alternative, allowed to stand for 15 minutes and rinsed with water, as described in the Maintenance section.

Agency Approvals

UL file number E752046

UL® is a registered trademark of Underwriter's Laboratories, Inc.

Instrument Troubleshooting

Indication	Probable Cause(s)	Corrective Action
No Power/or display	➢ Power to unit may be turned off.	➢ Check the power switch.
	➢ Breaker may be tripped.	➢ Press in white indicator on back of unit. **Note:** Resetting the breaker switch more than once and re-powering may be indicative of an internal problem, contact Technical Support for follow-up.
	➢ Input power may not be present.	➢ Measure power upstream for required level.
Keypad not functional	➢ Processor is malfunctioning.	➢ Power the unit off and then back on to reset firmware ➢ Contact Technical Support for follow-up.
Communication	➢ Other mixers not communicating.	➢ Reset software if applicable.
Rack Movement (Once rack has been securely placed)	➢ Worn Foam Pad.	➢ Replace with R80 654.
Excessive Vibration	➢ Worn vibration mounts.	➢ Contact Technical Support.
Blank Display		➢ LCD is not working or displaying properly. Power instrument off and back on. A continuous illumination or no-illumination is indicative of a "PROBLEM". Contact Technical Support.

Decontamination Form:

The completion of this form is a requirement to help reduce the risk of injury during equipment servicing. Decontamination procedures must be completed and documented appropriately on this form.

Decontamination of equipment parts and any other surfaces potentially contaminated with biohazardous reside must be cleaned with 0.5% sodium hypo chlorite in water (diluted bleach) or a bleach alternative, allowed to stand for 15 minutes and rinsed with water.

The completed form must then be attached to the equipment prior to shipment and/or servicing. A copy of this form should also be included in the shipping documents.

Decontamination Form

Equipment Type: _____ Serial Number: _____

Date of decontamination: _____

Type of disinfectant used: _____

Name: _____

Company: _____

Address _____

Phone: _____

Signature _____

MAINTENANCE

The motor shaft bearing should be lubricated with a Valvoline® Synpower grease after 400 hours of operation. The grease fittings of the bearing on the motor shaft are accessible just above the top of the base where the shaft protrudes. The shaker should be protected from mechanical damage, chemical spillage and corrosive atmospheres so far as possible.

LIMITED WARRANTY

Glas-Col warrants products of its manufacture to be free from defects in workmanship **for one year** and agrees to repair or replace without charge any products found defective upon examination at the factory. With proper care and operation, Glas-Col products will give long and efficient service. Chemical spillage, overheating, overloading, and general misuse will greatly reduce the service life. Glas-Col is not responsible for damage due to improper installation or through attempts to operate the apparatus beyond its rated capacity, intentional or otherwise. Normally expendable parts are not covered by this warranty.

LIMITATION OF WARRANTY

APART FROM SUCH WRITTEN STATEMENT OF WARRANTY, THERE ARE NO WARRANTIES, EXPRESSED, IMPLIED OR STATUTORY, WHICH EXTEND BEYOND THE DESCRIPTION OF THE PRODUCTS ON THE FACE HEREOF.

Glas-Col products are intended only for legal and legitimate purposes in commercial laboratory and industrial settings.

Returns:

Call or fax Customer Service for a Return Goods Authorization (RGA) number before returning a Glas-Col product.

Reference the RGA number on the shipping box and on a written description of the problem.

A 20% restock charge of the net price is charged for all standard product returned to stock.

Safety and Caution Messages

- Always follow your company and safety procedures when using laboratory equipment. In addition, there are numerous safety references such as The National Fire Protection Council, American Chemical Society, National Fire Protection Association, etc. Such references often apply to your specific discipline and procedure.
- Be certain to check power source to insure that it is of proper voltage, is grounded and has adequate capacity for the intended load. Do not operate any unit beyond its rated voltage.
- Do not alter product construction features, such as disconnecting or removing electrical grounding devices. Such alteration may cause shock hazard, unsatisfactory product performance and the warranty to be voided.
- Protect power cords and other electrical devices from corrosive and damaging materials as much as possible. Always insure all safety equipment is in proper use i.e. hoods, apparel, shields, etc.
- Insure all locking pins, knobs, screws, etc. are in place and tightened securely.
- Be certain to check are above and all around the unit to make sure there is sufficient clearance to allow for proper operation.
- Glas-Col laboratory equipment should be inspected regularly. Do not use if power cords or other parts are worn or damaged in any way.
- Equipment that must be left unattended should be operated through an automatic controlling device.

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