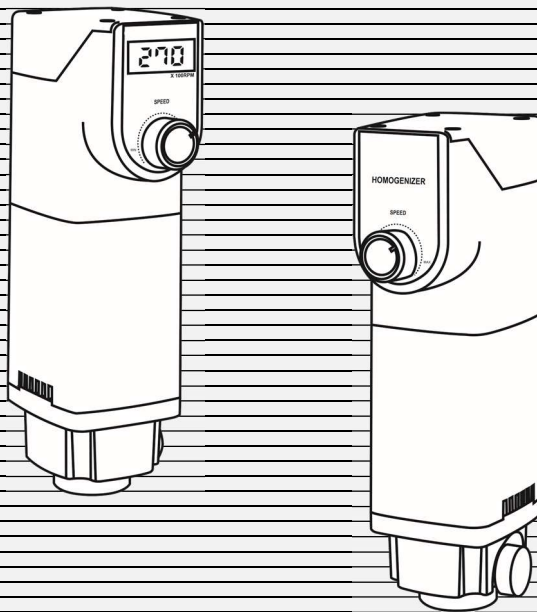


Laboratory Homogenizer **HGD-10**

OPERATING MANUAL

* Also for Analog Homogenizer, HGA-10



- We greatly appreciate your purchase of the HGD-10 Homogenizer.
- To be sure you take maximum advantage of all the features the HGD-10 has to offer, read these instructions carefully and use the set properly. Be sure to keep this manual for future reference, should any questions or problems arise.

SERIAL NO. _____

PLEASE RECORD UNIT SERIAL NUMBER ATTACHED TO THE
REAR OF THE UNIT FOR FUTURE REFERENCE.

English : 1 ~ 16 Page

Korean : 17 ~ 32 Page

■ SAFETY PRECAUTIONS

◆ Safety symbol used in the manual

Danger  The exclamation point within an equilateral triangle is intended to alert the user to the presence of important operating and maintenance instructions in the literature accompanying the appliance.	Dangerous voltage  The lightning flash with arrowhead symbol, within an equilateral triangle, is intended to alert the user to the presence of uninsulated "dangerous voltage"
Explosion hazard  If volatile and explosive chemical materials are used, the explosion may occur.	High temperature  Be careful not to use at high temperature.
Notice  If the user arbitrarily dismantles or transforms the product, the fatal damage of the product may be induced.	Approach prohibition  Prohibit the user from approaching to this area.
warning  If the product is mishandled while ignoring this symbol, the danger by which human beings are dead or severely injured may occur.	Contact prohibition  Prohibit the contact at the moment that leads to the accident.
Caution  If the product is mishandled while ignoring this symbol, the possibility in which human beings are injured or property damage occurs exists.	 Observe the safety rules.
 Be careful to maintain the horizontality of the product and not to fall to the ground.	 Earth
 Keep the product out of the direct rays of the sun.	 OFF position of power switch  ON position of power switch  Connection point of the neutral wire of installation  AC voltage

WARNING :

TO PREVENT FIRE OR SHOCK HAZARD, DO NOT EXPOSE THIS APPLIANCE TO RAIN OR MOISTURE.



CAUTION
RISK OF ELECTRIC SHOCK
DO NOT OPEN



CAUTION : TO REDUCE THE RISK OF ELECTRIC SHOCK, DO NOT REMOVE COVER. NO USER SERVICEABLE PARTS INSIDE. REFER SERVICING TO QUALIFIED SERVICE PERSONNEL.

● **Precautions at transportation and installation**



- Please never tilt or lay the product down during transportation.
- Be careful not to drop when transporting the product.
- This product was manufactured to move normally at the rated voltage. Confirm the voltage state before the installation of product.



- Install the product in a place where the floor is hard and flat.
- Keep the set free from moisture, water and dust. It may cause overheating or short circuit. (Pollution Degree 2)
- Do not install the product in a location at an altitude of over 2,000 meters. (6,562 feet).



- Avoid high temperatures : Install the product out of the direct rays of the sun.
- When the product is moved, separate the power plug from a wall outlet, and then move not to damage the product. The cord damage becomes the root cause for an electric shock or an ignition.



- If the product was moved or stored in high humidity state, identify the packaging state of the product before use.
In case that the carton box or wooden box is soaked in water, consult with an engineer about the matter. Do not operate the equipment before the safety is confirmed. This wetting state may be the cause of an electric shock or a fire.
- When installing and using the product, please certainly use the power cord provided with the products.

● Precaution in use



- Please be familiar with the user manual before using this product, and operation should be performed only by qualified personnel.
- This product must be used within the permitted standard load resistance.
- This product should be operated in a room with temperature maintain between 5°C and 40°C. Long-term use in an environment that exceeds the allowable range may cause a malfunction.



- Do not cut or process the power cord or do not bend it by force or pull or tie up it. In addition, if heavy things are placed on the power cord, it may cause damage and it may become the root cause of a fire or an electric shock.



- Please do not touch or manipulate the electrical parts such as the power plug with wet hands electric shock.
- Please do not operate the product by manipulation of the plug to avoid electric shock or short circuits.



- Do not operate the product in the outdoors. It is not allowed to use it at the place that is exposed to the sun or at the place that is gotten in the rain. This leads the product to overheating or electric malfunction.



- Do not use the product on a high place or at high temperature. Do not use the product near the heater or the wind of air conditioner.
The accident by the overheating of the equipment can occur.



- Do not operate the equipment at the place of an inflammable danger or a fire danger. This triggers the severe accident such as an explosion or a fire.



- Please do not use the flammable spray such as lacquers and paint, or volatile, flammable chemicals and its similar product, in the proximity of the product. They may cause the ignition due to the spark of switch.
- If you detect any noise, which is unlike any other time, or it exhibits wrong movement symptom, immediately turn off the power of the product and separate the power cable from the body.
- Please regularly check whether dust or dirt are on the power plug and completely connect the plug. If the plug is covered with dust, or the connection is not complete, it will cause an electrical shock or fire.
- Please separate the power plug from the outlet for safety when the product is unused for long periods of time to avoid overheating or ignition due to dust.
- Please handle the power cord carefully. Hold the plug when unplugging the cord
- The fluctuation of main power voltage should be lower than +/-10% of the nominal voltage.
- The maximum relative humidity is 80% at 31°C and 50% at 40°C.
- Please maintain the clean condition of this product by removing the foreign matter while gently wiping with the neutral detergent and a dry cloth after checking whether the foreign matter present or not, before and after using this product.

■ INTRODUCTION

Thank you for purchasing Homogenizer of LK LAB KOREA Co., Ltd.

We, LK LAB KOREA Co., Ltd., started to manufacture and supply highly reproducible and reliable products

in the basic equipment for basic science research such as biotechnology, medicine, environment, and chemistry. Especially, in various experimental equipment for various purposes, the accumulated know-how of LK LAB KOREA Co., Ltd. has achieved high convenience and reliability by achieving commonization and systematization of the methods of use.

This product is manufactured as subminiature size for the effective use in customer's laboratory, and it guarantees low noise and low vibration to maintain the comfortable environment of laboratory. In addition, it was designed by adopting electrical and instrumental safety devices to realize the use safety. We, LK LAB KOREA Co., Ltd. pursues customer satisfaction as the best value, We will do our best to implement steadily. Thank you.

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① BEFORE USING

Pay attention to the following before using this unit:

- **Moving the set**

To prevent short circuits or damaged wires in the connection cords, always unplug the power cord safely.

- **Before turning the power switch on**

Check once again that all connections are proper and that there are not problems with the connection cords.

- **About operating manual**

Read and understand all the instructions in the user manual before using the products.

In any case, we don't bear responsibility for the damage of product which occurs by no observance for the requirements of user manual. The contents of user manual may be changed or improved. Use only for the intended purpose which is described in the user manual. After reading, store this manual along with the warranty in a safe place.

- **Note that illustrations in this manual may differ from the actual set for explanation purposes.**

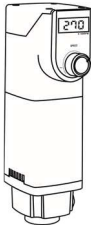
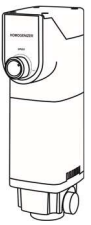
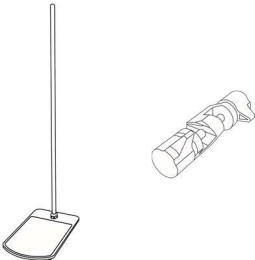
② FEATURES

The Homogenizer, which is produced by LK LAB KOREA Co., Ltd., is used for mixing the specimens after placing them into a test tube or dissolving the solids that exist in the test tube. It can be used in the laboratories of various fields such as life science, biochemistry, medical devices and so on, and its characteristic is as follows.

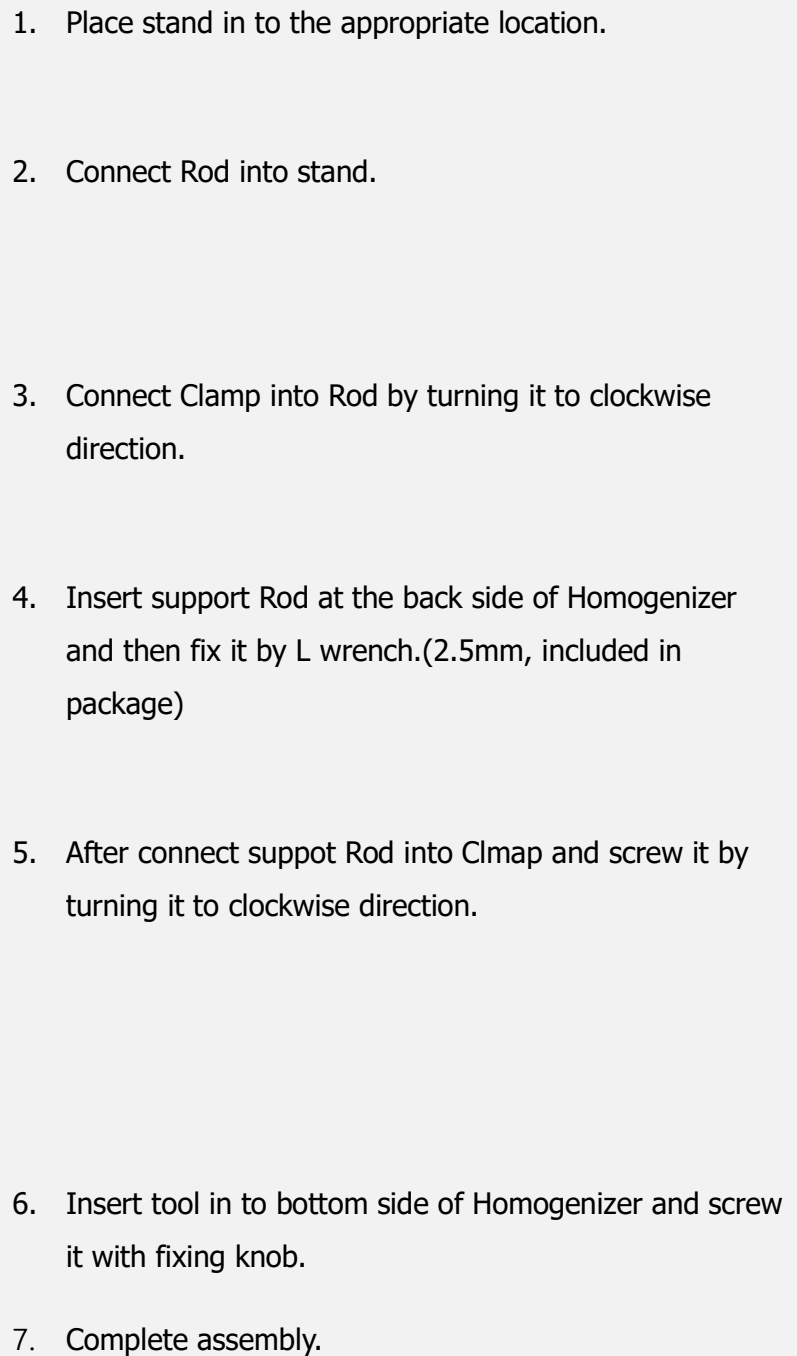
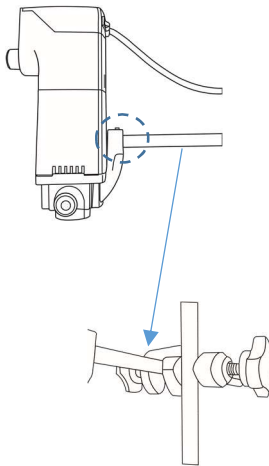
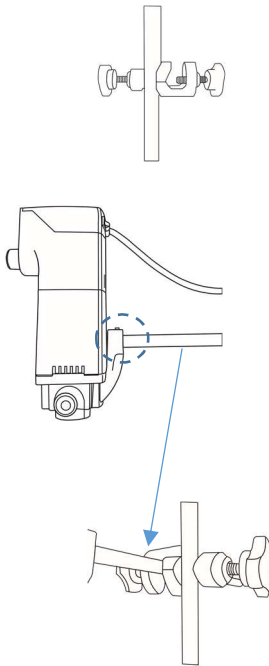
- Designed for Liquid and Tissue Samples
- High Fidelity FND Display - Easy-to-read FND for display of actual speed. (for HGD-10 model only)
- Convenient Speed Set Knob - Easy to use Speed Set Knob for quick and convenient selection of mixing speed.
- Safe & Fine Compatibility in Tools - Useful for All Dispersing and Homogenizing Applications and realize fine homogenizing.
- Overheat-Heat Protection function prevent malfunction of motor.

③ PRODUCT INSTALLATION

Composition identification

Basic Components		Qty
1	 "HGD-10" Digital Homogenizer Unit (Support Rod is included)	1
2	 "HGA-10" Analog Homogenizer Unit (Support Rod is included)	
3	 "HG1018" Homogenizer Tool	1
4	 "HG1025" Homogenizer Tool	
5	 Stand & Clamp	1
6	 Operating Manual (L wrench (2.5mm) is included)	1

How to install

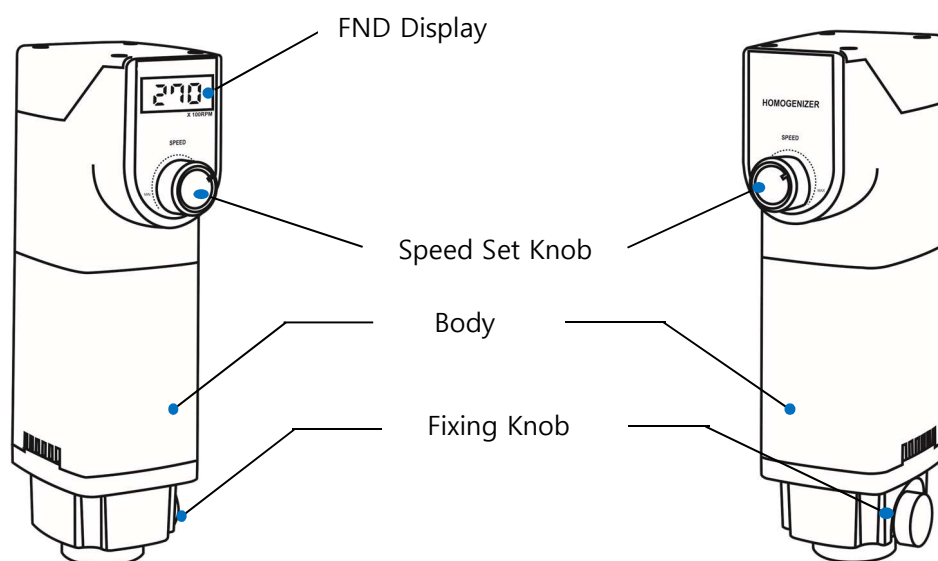


Product specification

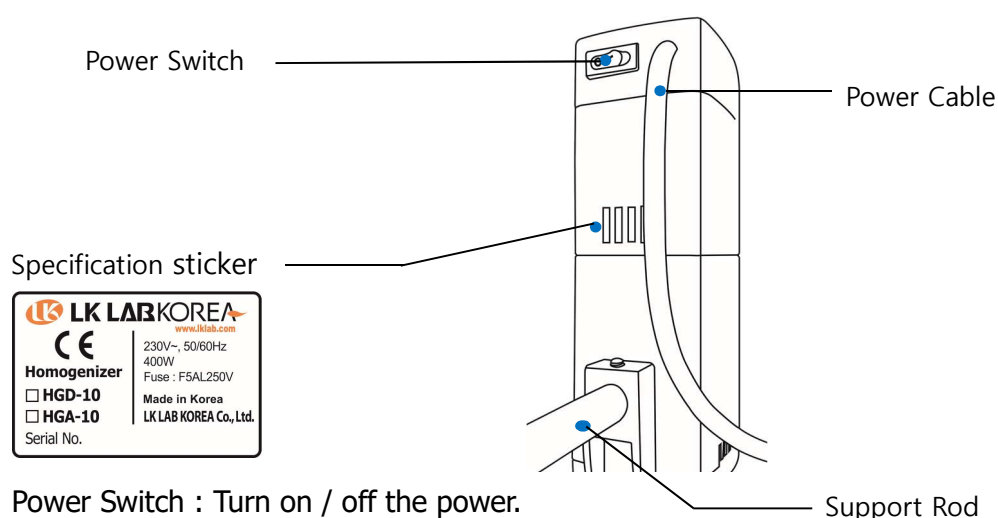
Model	HGD-10	HGA-10
Speed Range	3,000 to 27,000rpm (without tool)	About 27,000rpm (without tool)
Maximum Volume (H ₂ O)	2,500ml	
Motor Rating(Input/Output)	400 / 300 W	
Speed Control	Stepless	
Display	3 Digit FND	
Safety Devices	Over Heat Protector	
Permissible Temp. & Humidity	5°C~40°C, <80%	
Usable Dispersing Tool	Ø8mm Stator "HZ1008", Ø10mm Stator "HZ1010 Ø18mm Stator "HZ1018", Ø25mm Stator "HZ1025"	
Material	ABS & Aluminum Stainless Steel(#304)-Tool	
Extension Arm Size	Ø12.7 X L250mm	
Dimensions (w x d x h) & Weight	73 x 100 x 210mm, 1.4kg	
Packing Size (w x d x h) & Gross Weight	280 x 290 x 120mm, 1.9kg	
Power Consumption	400W	
Power Supply	1 Phase, AC 120V, 60Hz or AC 230V, 50/60 HZ	

④ Check before operation

Product structure



- SPEED Set Knob : Regulating of homogenizing speed.
- FND Display : Show present speed value and it has to 100 times with displayed value (for HGD-10 only) .
- Fixing Knob : Screw it for tool holding.



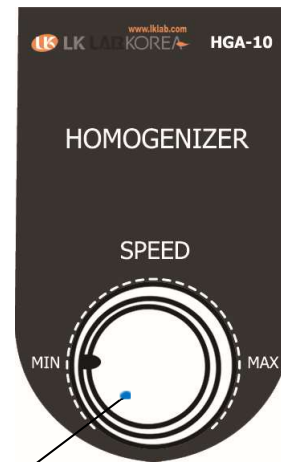
- Power Switch : Turn on / off the power.
- Power Cable : Embedded power cable.
- Support Rod : For holding to Stand Rod with clamp.
- Specification sticker : Recording the specification and serial number of product.

Control panel

<Digital Homogenizer>



<Analog Homogenizer>



Speed Set
In Stepless

- FND Display : Show the present value of speed – should X100 RPM for real value.
- Speed Set : Stepless speed set system.

Acceleration if it is regulated to clockwise.

Deceleration if it is regulated to anticlockwise.

⑤ OPERATION

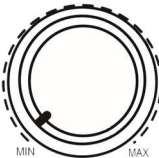
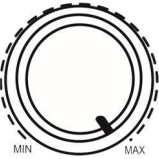
- Confirm whether the power cable is normally connected or not.
- Confirm whether or not the Dispersing Tool into Homogenizer.
- Confirm whether or not the setting of sample with Dispersing Tool.



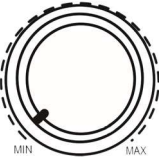
While using product, if you either use dispersing tool without sample or use product in the air with no sample, it could have very critical trouble to the product and it could be the reason of defect of product. Dispersing tool of the product should be operated with sample or should be used when water is provided along with the product. Do not insert too deeply Tool to Solution.

- As the shaking of the product may occur when it is immediately operated at the state in which the speed regulating knob is set as the maximum, initiate it at the lower speed and then regulate it to speed up.

Digital Homogenizer (HGD-10)

Controller	How to operate
	1. Check point: Before main power switch "on", please make sure to have Speed Set Knob at "MIN" location for sure. 2. If power is supplied when Speed Set Knob is not at "MIN" position. During the power supply, there might be critical trouble to Dispersing Tool
 Point of movement speed	3. Adjust the knob to be placed at the appropriate position using the SPEED Set Knob of the controller. 4. If you turn Speed Set Knob into clockwise direction, SPEED will be increased, turn Speed Set Knob into counter clockwise, RPM will be decreased.
	5. SPEED range is from 3,000 to 27,000 RPM. Please x100 with displayed value.

Analog Homogenizer (HGA-10)

Controller	How to operate
	1. Check point: Before main power switch "on", please make sure to have Speed Set Knob at "MIN" location for sure. If power is supplied when Speed Set Knob is not at "MIN" position. During the power supply, there might be critical trouble to Dispersing Tool
 Point of movement speed	2. Adjust the knob to be placed at the appropriate position using the Speed Set Knob of the controller. 3. If you turn Speed Set Knob into clockwise direction, SPEED will be increased, turn Speed Set Knob into counter clockwise, RPM will be decreased.
	4. RPM range is about from 3,000 to 27,000 RPM.

■ Important notice and measurement

- Overload Heat Protection (Temperature detection): Velocity which could exceeds limit of Homogenizer capacity: Due to operation time, RPM if there is any overload in the motor, unit detects it and stop operation (for HGD-10 and HGA-10)
 - ➔ In case of suspension of operation due to overload, it is recommended that unit is sufficiently cooled down and re operated after suspending the unit. In case of suspension of operation due to malfunction of unit from hindrance or obstacle, it is recommended that user use product again after removing obstacles and for the suspension of operation due to high velocity material, it is good to either change homogenizer to bigger one or change dispersing tool to appropriate one to be feasible for high velocity material.
- Please do cleaning Dispersing Tool for long life after every experiment by running with clean water.

⑥ Product management

Regular inspection

Classifications	A period of checking time		
	Day	Week	Month
Connection state of the source of electric power	√		
Damage of power cable	√		
Cleaning state of power cable	√		
Assembly state of accessories	√		
Cleaning state of regulator	√		
Shape preservation of regulating foot		√	
Extent of noise		√	
Normal control of movement mode		√	
Normal control of regulating knob		√	
Separate and clean the tool		√	

Cleaning and storage

● Cleaning of the product

Maintain the cleaning state of the product by regular cleaning. The regular maintenance of the product extends the use period of the product and minimizes the contamination of specimen.

1. Confirm whether or not any foreign matters exist, and if yes, immediately wipe off them.
2. Do not use abrasive or detergent based on solvent.
3. If a chemical substance stains the product, wear gloves and a mask which are composed of chemical resistance material and wipe off them with a piece of dry cloth.
4. When cleaning the product, you must separate the power cord from the body.
5. For the part from which the contaminant is not easily erased, wipe off only the part with the towel wetting with the solvent that has low freezing point.

● Disposal of the product



- When the warranty period of the product is terminated, it should be disposed in accordance with the management regulation of wastes of the corresponding territory.

● Storage of the product

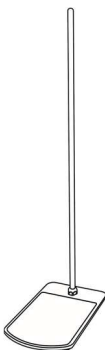
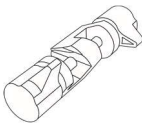
1. If the product is not used for long time, separate the power socket from the body, wrap and store it.
2. Store them in the same place not to lose the components.

⑦ Troubleshooting

Error identification

Situation	Corrective Action
Power failure	- Confirm the power cord is plugged. - Confirm the supplied electricity is proper and regulated.
Too big noise	Check connection of tool. If noise comes from body, Please call technical service.

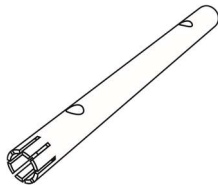
⑧ Accessory

Component	Ordering Number	Information
		Standard Plate Stand, 25x37cm Plate with Rod and Silicon Pad
		Clamp, up to Ø23mm Rod
	H01-04-190	"HG1008" Homogenizer Tool, Rotor Ø6.1, Stator Ø8, 1~50 ml



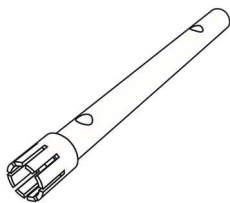
H01-04-191

"HG1010"
Homogenizer Tool, Rotor $\Phi 7.5$,
Stator $\Phi 10$, 1~100 ml



H01-04-192

"HG1018"
Homogenizer Tool, Rotor $\Phi 12.7$,
Stator $\Phi 18$, 10~1000 ml



H01-04-193

"HG1025"
Homogenizer Tool, Rotor $\Phi 17.0$,
Stator $\Phi 25$, 50~2500 ml

■ Free warranty service

If any malfunction due to the flaw of the product occurs within 2 years from the purchasing date, the product is free repaired or replaced it with the same kind product after inquiring our head office

■ Onerous service

- In case after a lapse of warranty service period of 2 years. In case the product is arbitrarily remodeled or repaired.
- In case the malfunction by natural disaster. (fire, damage of sea water, gas disaster, flood damage and so on).
- In case the malfunction occurs by not observing the safety caution and warning described in the user manual.
- In case the malfunction occurs by the handling carelessness of the user.

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