

HG-15D & HG-15A
Digital & Analog Homogenizer

Certifications by - - -

- CE Marked Products.
- ISO 9001 Certified.
- PL Insurance.
- Patented(No. 10-0554098) Jog Shuttle Control System.

◇ English Page : P. 1 ~ 27

◇ Korean Page : P. 28 ~ 50

Operation Manual

(Version 2.1.1)

written for
HG-15D & HG-15A models



"HG-15D Set" Digital Homogenizer



"HG-15A Set" Analog Homogenizer.

Sales & Basic A/S :
By the Nearest Official Distributors.

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1




Safety Instructions

Please read this carefully for the safety before using the device. The indicated cautions are related to the safety and you should observe all safety and warning instructions.

Symbols (Pictograms) and the meaning

 <p>This symbol indicates caution (Including warning). There will be concrete descriptions.</p>	 <p>This symbol indicates inhibition. There will be concrete description.</p>
 <p>This symbol indicates inhibition regarding modification.</p>	 <p>This symbol indicates caution regarding heat.</p>
 <p>This symbol indicates the risk of explosion or fire.</p>	 <p>This symbol indicates the user must be kept away while operation.</p>
 <p>This Symbol indicates that this product is to be collected separately. The following apply only to users in European countries:</p> <ul style="list-style-type: none"> • This product is designated for separate collection at an appropriate collection point. Do not dispose of as household waste. <p>This product is required to comply with the European Union's Waste Electrical & Electronic Equipment(WEEE) Directive 2002/96/EC</p>	

Please read following warning for safety and proper use.

 <h2>WARNING</h2>	
	<p>Do not use a power source other than which the unit is designed to operate on. Inappropriate power supply may result in damage to the equipment. Adhere to all electrical codes.</p>
	<p>Please do not touch with wet hands. It may be caused an electric shock.</p>



Do not handle the power cord harshly. Disconnection or short may cause if you bend or put a heavy thing on the device.

When you take a plug out in a wall socket, turn the power off and then take the plug out carefully.



Insert the plug securely into a wall socket.

Loose connections result in excessive heat generation to the device and may cause arcing to occur at the connection.



Avoid using multi-point extension power cords. It may cause excessive heat generation and be the cause of a fire.

If you extend the power cord, use the cord to have sufficient electric capacity.



Be sure to operate the device only with the specified power supply.

When you connect the product specified by 100V to 200V, it may be caused to over-heat, electric shock or a short circuit to each part.

Do not connect wrong electricity since it is the cause of a fire.



Disconnect the power supply plug if the unit is not going to be used for an extended period of time.



This Symbol indicates that this product is to be collected separately.

The following apply only to users in European countries:

- This product is designated for separate collection at an appropriate collection point. Do not dispose of as household waste.

This product is required to comply with the European Union's Waste Electrical & Electronic Equipment(WEEE) Directive 2002/96/EC

Installing the device (repeated in the Section 6)



WARNING



Place the device on a level, horizontal surface to support the capacity of the device without vibration. If there is vibration, install the device on a support material with enough space. Small place may cause the device to drop.



Do not install at a dangerous place.

Do not operate the device where there are flammables. It could be caused serious accidents like explosion or fire.



Do not operate the device outside.
Avoid areas where the sun shines or rain directly on the device. It is very dangerous as cause over-heat or a short circuit.



Do not install the device where it can get damp or dust.
It may be caused overheating, a short circuit or a fire by damp or dust inside of the device.



Do not use this device when temperature fall below 15°C and rise above 35°C.



Do not use the device at a place with high temperature. Do not operate the device near a heater, blowing an air-conditioner. It may be caused an accident by over-heating.



The device should be set at a well ventilated place.
Be sure the holes on the side or rear surface of the body are not blocked by a wall or an object. And do not operate the device at a poor ventilated place or use closed.
It may cause a fire or damage of the device as not to release heat or insufficient ventilation may result.



Set the device a lightening place.
When you set the device at a dark place, it may cause an unexpected accident by mistake in operation.

Operating the device (repeated in the Section 7)

WARNING



Be careful to operate the device.
You should read this manual carefully before using.
The device should only be operated by laboratory personnel especially trained for this purpose and familiar with all precautionary measures required for working in a laboratory.



Operate after check the safety of the device.
If there is generated a slight shock or a poisonous gas from a sample, figure it out and make sure the safety using dustproof or a gas mask.

Do not put any objects inside.



When an object that is easy to be combustible like a stone, a metal or paper goes inside, it may cause a fire, an electric shock or a break down.

If do, pull out the mains plug from a socket and contact a manufacturer or a supplier.

Do not disassemble or remodeling by yourself.



It may cause damage to the designed safety.

We do not have any duties for an accident, quality deterioration or a defect caused by a customer.



If unexpected sound, smell or smog is generated, pull out the main plug and contact manufacturer or a supplier.



CAUTION



This device must be connected to an earthed power supply.



If you use radiation or contaminated samples, the responsibility is to the customer. Do not use this product to sterilization or disinfection.



Avoid the use with poisonous or flammable sample.
Never use with a explosive sample.



Please avoid ultraviolet lamps.
It could be cracked or faded.



Disconnect the power supply plug if the unit is not used for an extended period of time.



Do not insert too deeply Tool to Solution. The solution is likely to flow into the motor.

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Before Use

Thank you very much for purchase of HG-15D or HG-15A Homogenizer.

This operation manual describes performance, usage, cautions and notices for use of the purchased product. Before use, please confirm this manual and use properly.

Please read carefully and thoroughly all the safety instructions described in the Section 1 again.

And also, please keep this manual.

※ Modification of exterior or specifications could be made without notice to improve the quality and performance of the product.

□ PL Insurance Coverage

In preparation for accidents that may develop in the course of using products produced by DAIHAN Scientific, we subscribed to following PL Insurance coverage to give our customers a piece of mind when using the product.

[Contents].....

- Insurance: Products Liability Insurance
- Issuer: Machinery Insurance Cooperative
- Limit of Liability: Bodily Injury/Property Damage, 100 million KRW each
- Territory: Worldwide (U.S Excluded)
- Emergency Contact: DAIHAN Scientific
(TEL: 82-2-967-5235, FAX: 82-2-967-5231)

Introduction

Homogenizer HG-15 series are high performance Homogenizing systems.

Key features are as follows;

- Designed for Liquid and Tissue Samples
- Useful for All Dispersing and Homogenizing Application
- High Speed / High Quality / Low Noise : Max 27,000 rpm (without load)
- Extremely convenient user interface by jog-shuttle knob (Multi-functional turning knob: Turning + Push) (Patent pending) (HG-15D).
- Speed & Power Control optimized for the Sample
- High Efficiency Dispersing Tool made of Stainless Steel and PTFE
- Over-Heat Protection function
- Over-Load protection function (HG-15D).
- Remote Digital Controller : Fully Digital control using Microprocessor (HG-15D).
- LCD for Speed(RPM) and Power Bar Graph (HG-15D).
- Low Cost & High Efficiency
- CE Certified
- PL(Product Liability) Insurance

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Package Contents

For HG-15D model

Homogenizer HG-15D unit	[]
Dispersing Tool[HT1018 or HT1025]	[]
Stand[ST110]	[]
Stand Rod	[]
Clamp[CL200]	[]
Remote Controller	[]
L-Wrench	[]
Power Cord	[]
Operation Manual	[]

For HG-15A model

Homogenizer HG-15A unit	[]
Stand[ST110]	[]
Stand Rod	[]
Dispersing Tool[HT1018 or HT1025]	[]
Clamp[CL200]	[]
Operation Manual	[]

HG-15D Package Set A

(Unit, Remote Controller, Dispersing Tool(HT1018), Stand, Stand Rod, Clamp, Support Rod and L-Wrench).

HG-15D Package Set B

(Unit, Remote Controller, Dispersing Tool(HT1025), Stand, Stand Rod, Clamp, Support Rod and L-Wrench).

Single Unit(Unit, Support Rod and L-Wrench).

HG-15A Package Set A

(Unit, Dispersing Tool(HT1018), Stand, Stand Rod, Clamp, Support Rod and L-Wrench).

HG-15A Package Set B

(Unit, Dispersing Tool(HT1025), Stand, Stand Rod, Clamp, Support Rod and L-Wrench).

Single Unit(Unit, Support Rod and L-Wrench).

Models

Classification by Application

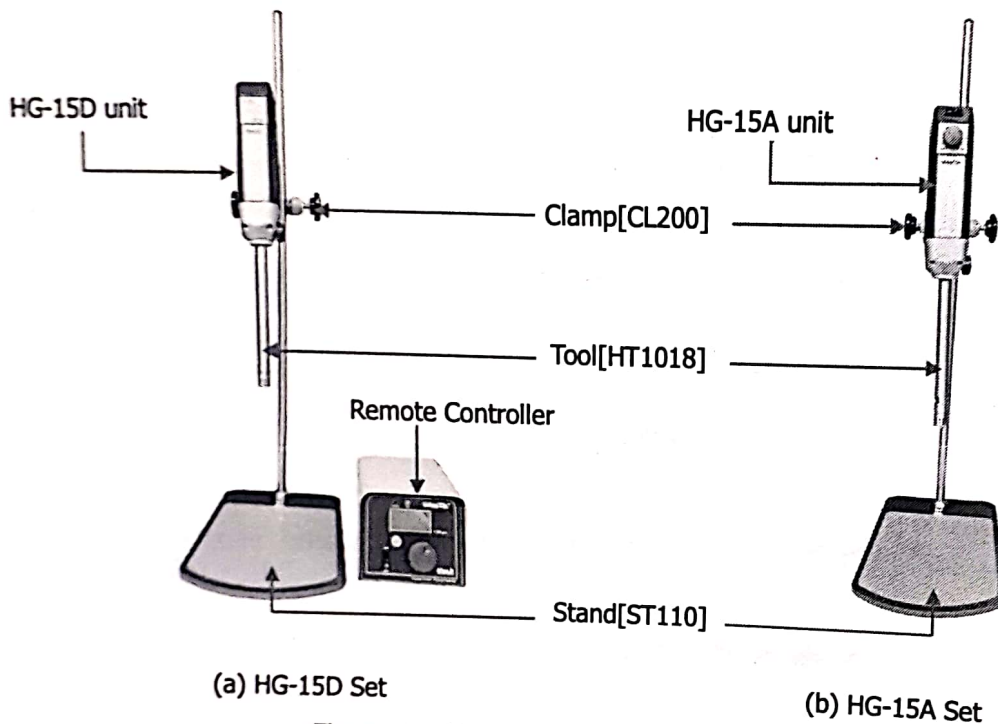
1. HG-15D : Digital Homogenizer with Remote Controller
2. HG-15A : Analog Homogenizer with Direct Controller

Appearance and Naming

Homogenizer HG-15 is composed of two types of models depending on the usage.

We display Homogenizer HG-15's overall model appearance <Figure 1>.

<Figure 1-(a)> is HG-15D set, <Figure 1-(b)> is HG-15A set.



<Figure 1> Homogenizer HG-15 series appearance

	Unit	Clamp	Tool	Stand	Stand Rod	Support Rod	Remote Controller
HG-15D Set A	HS-15D	CL200	HT1018	ST110	Ø16Xh800	Ø12.7XL250	Remote Controller
HG-15D Set B	HS-15D	CL200	HT1025	ST110	Ø16Xh800	Ø12.7XL250	Remote Controller
HG-15D Single	HS-15D				Ø16Xh800		Remote Controller
HG-15A Set A	HS-15A	CL200	HT1018	ST110	Ø16Xh800	Ø12.7XL250	
HG-15A Set B	HS-15A	CL200	HT1025	ST110	Ø16Xh800	Ø12.7XL250	
HG-15A Single	HS-15A				Ø16Xh800		

* The above specification is about Package set A or B. (Refer to 26 page)

* Single Unit (HG-15D) is Stirrer unit only. (Refer 26 page)

* Single Unit (HG-15A) is Stirrer unit only. (Refer 26 page)

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Installation

1. After receiving the unit and putting it on the specified place of use, remove the wrapping.
2. Check the unit on eventual transport damages. In case there are some transport damages found please inform the forwarder and your contractor. If there is no damage please go to point 3.
3. Let the unit stand for a few minutes so that the all the internal parts and components of the unit can be stabilized.
4. Connect the mains cord to the socket.

**WARNING**

Place the device on a level, horizontal surface to support the capacity of the device without vibration. If there is vibration, install the device on a support material with enough space. Small place may cause the device to drop.



Do not install at a dangerous place.

Do not operate the device where there are flammables. It could be caused serious accidents like explosion or fire.



Do not operate the device outside.

Avoid areas where the sun shines or rain directly on the device. It is very dangerous as cause over-heat or a short circuit.



Do not install the device where it can get damp or dust.

It may be caused overheating, a short circuit or a fire by damp or dust inside of the device.



Do not use this device when temperature fall below 15°C and rise above 35°C.



Do not use the device at a place with high temperature. Do not operate the device near a heater, blowing an air-conditioner. It may be caused an accident by over-heating.

The device should be set at a well ventilated place.



Be sure the holes on the side or rear surface of the body are not blocked by a wall or an object. And do not operate the device at a poor ventilated place or use closed. It may cause a fire or damage of the device as not to release heat or insufficient ventilation may result.



Set the device a lightening place.

When you set the device at a dark place, it may cause an unexpected accident by mistake in operation.



Do not insert too deeply Tool to Solution.

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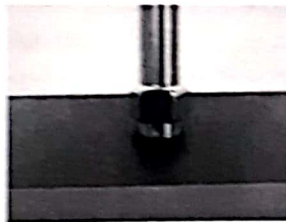
Assembly

How to assemble HG-15D Set

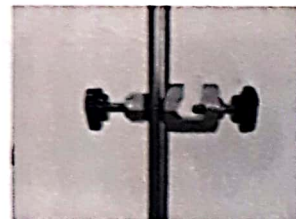
1. Place stand in to the appropriate location. <Figure 2>
2. Connect Rod into stand. <Figure 3>
3. Connect Clamp into Rod by turning it to clockwise direction. <Figure 4>
4. Insert support Rod at the back side of Homogenizer and screw it with L-Wrench. <Figure 5>
5. After No. 4, connect support Rod into Clmap and screw it by turning it to clockwise direction. <Figure 6>
6. Insert tool in to bottom side of Homogenizer and screw it with fixing knob. <Figure 7>
7. Connect 2sets of ports at the back side of Remote Controller into remote controller back side. <Figure 8>
8. Complete assembly. <Figure 9>



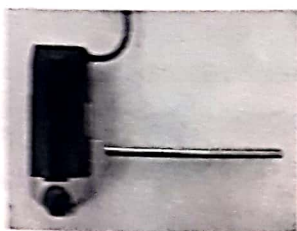
<Figure 2> Stand(ST110)



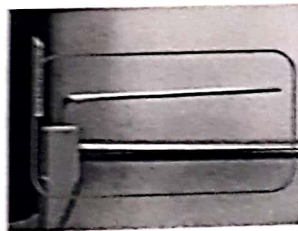
<Figure 3> Stainless Steel Rod



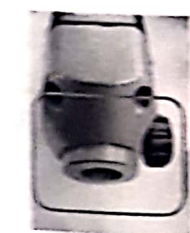
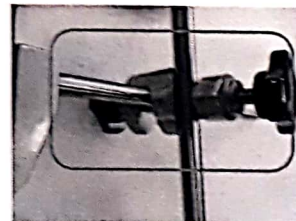
<Figure 4> Clamp(CL200)



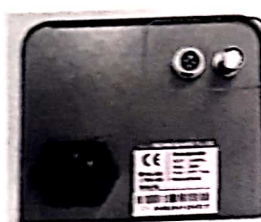
<Figure 5> Homogenizer, support Rod and L-Wrench



<Figure 6> Homogenizer, Support Rod and Clamp



<Figure 7> Homogenizer and Tool



<Figure 8> Controller and connector of Homogenizer

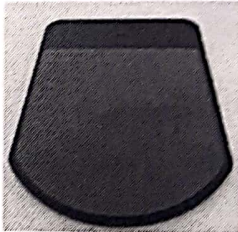


<Figure 9> Completed

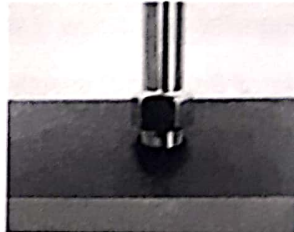


How to assemble HG-15A Set

1. Place stand in to the appropriate location. <Figure 10>
2. Connect Rod into stand. <Figure 11>
3. Connect Clamp into Rod by turning it to clockwise direction <Figure 12>
4. Insert support Rod at the back side of Homogenizer and screw it with L-Wrench. <Figure 13>
5. After No. 4, connect support Rod into Clamp and screw it by turning it to clockwise direction. <Figure 14>
6. Insert tool in to bottom side of Homogenizer and screw it with fixing knob. <Figure 15>
7. Check out Jog Shuttle Knob location as "0" at the upper side of product. <Figure 16>
8. Complete assembly. <Figure 17>



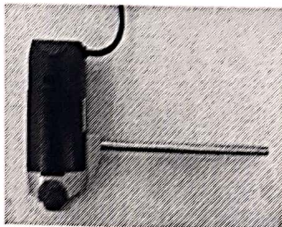
<Figure 10> Stand(ST110)



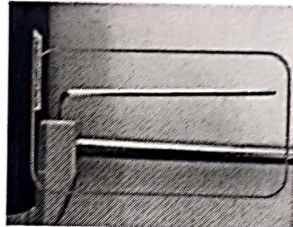
<Figure 11> Stainless Steel Rod



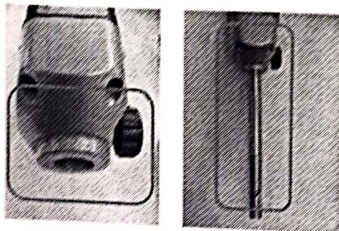
<Figure 12> Clamp(CL200)



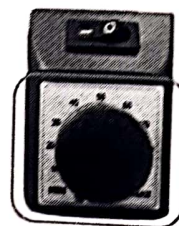
<Figure 13> Homogenizer, support Rod and L-Wrench



<Figure 14> Homogenizer, Support Rod and Clamp



<Figure 15> Homogenizer and Tool



<Figure 16> Jog Shuttle Knob Location as "0" point



<Figure 17> Completed

WARNING

Be careful to operate the device.



You should read this manual carefully before using.

The device should only be operated by laboratory personnel especially trained for this purpose and familiar with all precautionary measures required for working in a laboratory.



Operate after check the safety of the device.

If there is generated a slight shock or a poisonous gas from a sample, figure it out and make sure the safety using dustproof or a gas mask.



If unexpected sound, smell or smog is generated, pull out the mains plug and contact manufacturer or a supplier.



Do not put any objects insides.

When an object that is easy to be combustible is like a stone, a metal or paper goes insides, it may cause a fire, an electric shock or a break down.

If do, pull out the mains plug from a socket and contact a manufacturer or a supplier.



Do not disassemble or remodeling by yourself.

It may cause damage to the designed safety.

We do not have any duties for an accident, quality deterioration or a defect caused by a customer.



All the mechanisms and electric/electronic devices in this machine are designed and developed by the manufacturer. The devices could be disassembled and serviced only by the engineers of manufacturer or by engineers approved by manufacturer.



Do not touch the device with wet hand while operation.



Do not turn on and off frequently. It could damage the compressor by overload.
Do not insert too deeply Tool to Solution.



CAUTION



This device must be connected to an earthed power supply.



If you use radiation or contaminated samples, the responsibility is to the customer. Do not use this product to sterilization or disinfection.



Homogenizer MUST be used with a dispersing tool sunk in liquid. If the dispersing tool is stirred in the air, it could be seriously damaged and it's also very dangerous.



You must check that the Control Knob's location is "0" before turning on the Power Switch. If the unit is powered on with non-zero value of the Control Knob, dispersing tool could have fatal damage. (for HG-15A Analog model only)



Use applied liquid with proper viscosity. If you use HG-15 series for homogenizing sample of higher viscosity in long time, it could be a cause of trouble.



Use proper dispersing tools for applied sample. If you use improper dispersing tool for homogenizing sample of high viscosity, it could be a cause of trouble. You have to pay attention not to be stained with acid or basic material.



Please be careful that liquid should not penetrate into the part of control panel or back plane.



When you turn off or turn on the power switch of homogenizer, pay attention not to touch on the rotator of dispersing tool, please. Don't touch dispersing tool during operation of homogenizer.



Please don't operate the homogenizer over 10 minutes in order to prevent the unit from damages caused by long time operation.



Avoid a sample that is poisonous or flammable. Never use for an explosive sample.



Please avoid ultrasonic lamps. It could be cracked or faded.



Disconnect the power supply plug if the unit is not going to be used for an extended period of time.

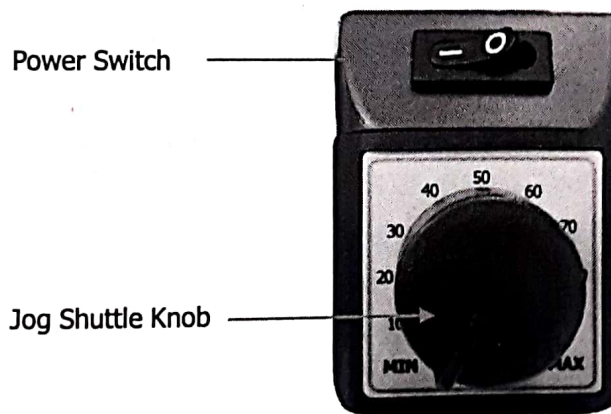
Controller Details

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<Figure 18> HG-15D Remote Controller

(Caution) RPM Figures displayed in RPM SV and current RPM (RPM PV) is 1/10 RPM. For example, if it is displayed as 300, actual RPM is 3,000.



<Figure 19> HG-15A Analog Type controller

Operation

A. Operation method of Remote Digital Controller (for HG-15D)

1. How to operate

- 1) Place appropriate Dispersing Tool into product (Homogenizer) main body.
- 2) Connect two connectors which are connected to product (Homogenizer) body to the back side of Remote Controller.
- 3) After checking power socket at the back side of Remote Controller, insert power code to appropriate electricity consent.
- 4) Check out power switch at front side of Remote Controller.
- 5) LCD screen will be powered on when pressing power switch to "On" from "off".
- 6) LCD screen initial mode is RPM setting Mode (Set RPM).
- 7) There will be "0" and sometimes it displays other than "0" at the initial Set RPM mode.
- 8) If the number displayed is not "0", it means particular RPM SV has been stored.
- 9) In case of "0" is displayed, using Jog Shuttle Knob, RPM SV setting can be attained.
- 10) After setting of RPM SV, product does not operate immediately.
- 11) After setting RPM SV and then after pressing Jog Shuttle Knob approximately 2 or 3 seconds RPM SV setting figure is stored.
- 12) RPM SV range is from 2,000 to 27,000 RPM.
- 13) From Set RPM Mode, if pressed MODE button once, it is changed to set Timer Mode.
- 14) There will be "0" in Set Timer Mode, and sometimes it displays other numbers.
- 15) If the number displayed is not "0", it means particular Timer SV has been stored
- 16) In case of "0" is displayed, using Jog Shuttle Knob, Timer SV can be attained.
- 17) Timer SV range is from 10sec to 15 min.
- 18) If Timer SV is "0", it means Timer SV is not operative.
- 19) After setting Timer SV and then after pressing Jog Shuttle Knob once approximately 2 or 3 seconds, Timer SV figure is stored.
- 20) From Set Timer Mode, if you press MODE button once, it is changed to Safety(Locking) Mode.
- 21) From Safety(Locking) Mode, if you press MODE button once, it is changed to SET RPM Mode.
- 22) At Set RPM Mode, if you press Jog Shuttle Knob once about 1 second, product operates until set RPM.
- 23) Timer will be counting down when the product reaches up to set RPM SV.
- 24) After completion of countdown, buzzer will be ringing three times.
- 25) When operating product again with currently set RPM SV and Timer SV, if you press Jog shuttle once about 1 second, product does operate with the same condition.
- 26) When you finish using product, power off main power switch and LCD screen will be off.
- 27) Disconnect main powder switch at the back side of Remote Controller.

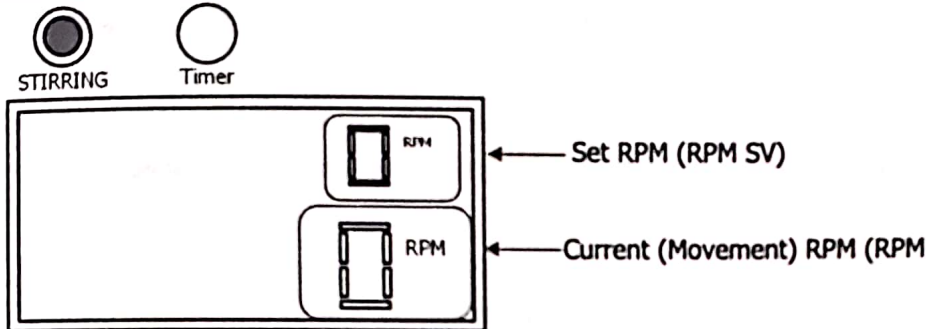


While using product, if you either use dispersing tool without sample or use product in the air with no sample, it could have very critical trouble to the product and it could be the reason of defect of product.

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.

2. Each mode description

1). RPM Setting (Set RPM) Mode:



At initial MODE (Set RPM), if you turn the Jog Shuttle Knob to Clockwise direction, RPM figure (RPM SV) in the LCD Display screen will be increased. If you turn the Jog Shuttle Knob to counter clockwise direction, RPM SV and RPM PV will be decreased. In case of storage for Set RPM, press Jog Shuttle about 2 or 3 seconds, then, LCD Display will be blinking 2 times and set RPM will be stored.

RPM SV range: 2,000~27,000 RPM.



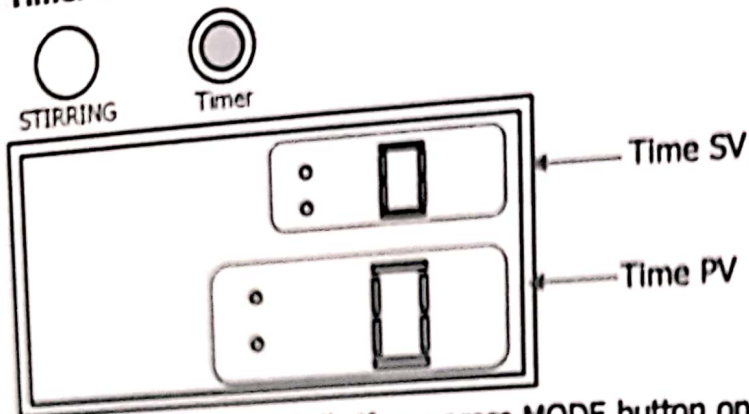
After Setting RPM SV, push Jog Shuttle Knob 1 time(1 sec), the unit will be operate. If you set RPM SV only, it is operate continually, please setting RPM SV and Timer SV together and then push Jog Shuttle Knob 1 time(1 sec), the unit will be operate.




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.

2). Timer Setting(Set Timer) Mode:

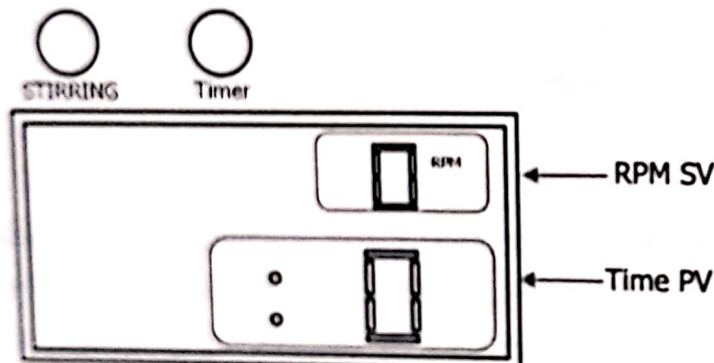


At initial MODE (Set RPM), if you press MODE button once, it is changed to Set Timer MODE and if you turn Jog Shuttle Knob to clockwise direction, Time SV in the LCD display will be increased. If you turn Jog Shuttle Knob to counter clockwise direction, Time SV in the LCD display will be decreased. After timer setting, if you press Jog Shuttle Knob  about 2 or 3 seconds, LCD display screen will be blinking two times and time SV will be stored.

Timer SV range: 10 sec ~ 15 min

If Timer setting is "0", it means continuous operation.

3). Locking (Safety) Mode



From Set Timer MODE, if you press MODE button, it is changed to Locking Mode.

In Locking Mode, it is impossible to input or modify figure of LCD screen using Jog Shuttle Knob.

If you press MODE button once again, it goes back to initial Set RPM MODE.

3. Storage function of setting figure:

This product contains functions of saving for the setting figures during the Set RPM and Set Timer MODE into memory inside of the product. It is function of saving for frequently used setting figures, so, it enables user to use saved setting figures without making any additional setting when there is powder off.

4. Power off:

To temporarily suspend product operation during the operation, press Jog Shuttle Knob once about 1 second. To maintain product's durability we recommend that you temporarily suspend product using Jog Shuttle, and powder off main power switch.



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.

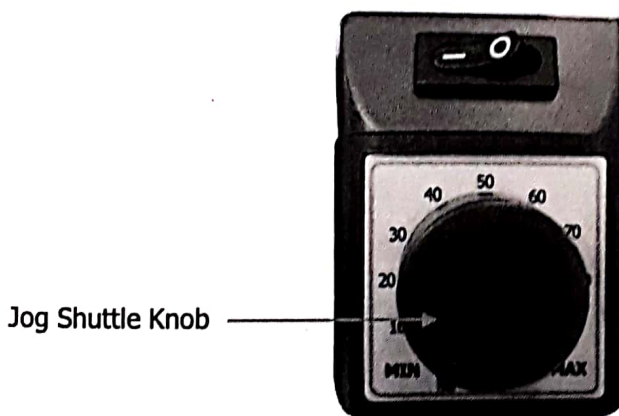
Dispersing tool of the product should be operated with sample or should be used when water is provided along with the product. Do not insert too deeply Tool to Solution.

B. Direct Controller Operation (for HG-15A)

1. Preparation procedure

- **Check point:** Before main power switch "on", please make sure to have Jog Shuttle Knob at "0" location for sure. If powder is supplied when Jog Shuttle Knob is not at "0" position. During the powder supply, there might be critical trouble to Dispersing Tool.
- Connect fully appropriate dispersing tool into product main body.
- Connect main power code to appropriate power socket.
- During power "On", turn Jog Shuttle Knob into clock wise direction to start operation of product.

2. Speed Control:



If you turn Jog Shuttle Knob into clockwise direction, RPM will be increased, turn Jog Shuttle into counter clockwise, RPM will be decreased.

- ### 3. Power off:
- After using product, Jog Shuttle Knob should be turned back to "0" and stop the product from the operation and power off.

Important notice and measurement

- **Overload detection function (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 (HG-15D / HG-15A)
- **Malfunction detection:** when there is any hindrance or obstacle to Homogenizer's Dispersing Tool or when mixing substance which exceed limit of revolving torque of unit, unit stop operation by itself to prevent damage to the product(HG-15D)

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.



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.

Specifications

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Model	Homogenizer Package-Set "HG-15A-Set"
Speed Range & Adjustment	Max. 27,000 rpm (without load), Stepless
Working Range	1 ~ 2,500ml
Motor Rating (Input / Output)	Input : 300W , Output : 150 W
Controller	Analog Phase Controller
Safety Device	Over Heat Protector
Usable Dispersing Tool	Φ 8mm Stator "HT1008", Φ 10mm Stator "HT1010", Φ 10mm Stator "HT1018", Φ 25mm Stator "HT1025"
Material	Aluminum Die-casting and ABS-Unit, Stainless Steel (# 304)-Tool
Permissible Temp. & Moisture	Ambient +5 ~ 50℃, 85%
Extension Arm Size	Φ 12.7 × L250mm
Dimension & Weight	60 × 75 × h215mm, 2.5kg
Packing Size & Gross Weight	320 × 300 × h190mm, 5 kg
Power Consumption	150W
Power Supply & Cord Plug*	1 Phase, AC 120V, 60Hz or AC 230V, 50 / 60Hz, with Cord/Plug

Model	Homogenizer Package-Set "HG-15D-Set"
Speed Range & Resolution	2,000 ~ 27,000rpm (without load), 10 rpm-Control
Working Range	1 ~ 2,500ml
Motor Rating (Input / Output)	Input : 300W , Output : 150 W
Timer & Alarm	99hr 59min (with Continuous run.), Timer-end Alarm
Display	Digital LCD Display with Back-Light Function
Controller	Digital Feedback Controller (Remote Type)
Safety Device	Over Load & Over Heat Protector
Usable Dispersing Tool	Φ 8mm Stator "HT1008", Φ 10mm Stator "HT1010", Φ 10mm Stator "HT1018", Φ 25mm Stator "HT1025"
Material	Aluminum Die-casting and ABS-Unit, Stainless Steel (# 304)-Tool
Permissible Temp. & Moisture	Ambient +5 ~ 50℃, 85%
Extension Arm Size	Φ 12.7 × L250mm
Dimension & Weight	60 × 75 × h215mm, 2.5kg
Packing Size & Gross Weight	580 × 340 × h230mm, 6 kg
Power Consumption	150W
Power Supply & Cord Plug*	1 Phase, AC 120V, 60Hz or AC 230V, 50 / 60Hz, with Cord/Plug

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Maintenance

1. If you don't use the device for a long time, please plug out, dry up the machine and keep with packing.
2. When you need exchange of a component for repair, you **MUST** use an original component provided by manufacturer.
3. In the warranty period specified on the warranty sheet included in this operation manual, breakdown of the machine in spite of normal/proper use will be treated by manufacturer or by an official agent of manufacturer.
4. The manufacturer or its agent is not in charge of breakdown caused by abnormal use or by ignoring the warnings and cautions described in this manual.
5. Before cleaning the machine, please be sure to pull the power cord off.
6. For cleaning of the machine, we recommend you to use neutral detergent and soft cloth. Do not use coarse cloth, strong chemicals or organic solution.

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Troubles and Solutions

Situation	Confirmations and Solutions
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.

※ If you have any problem other than the above, please call technical service of manufacturer or an official agent.

Accessories

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Clamp (Default)



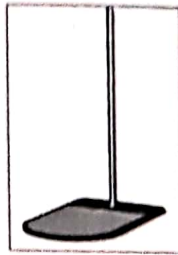
<Figure 20> Clamp

Catalog No	Descriptions
DH.WOS502010	CL200 , Clamp for Stirrer or Homogenizer (Default for HG-15A, HG-15D)

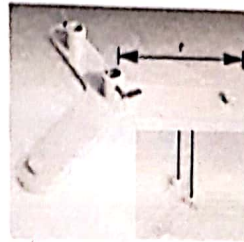
Stand (Optional)



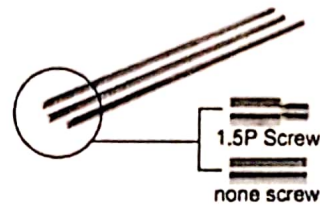
(a)



(b)



(c)

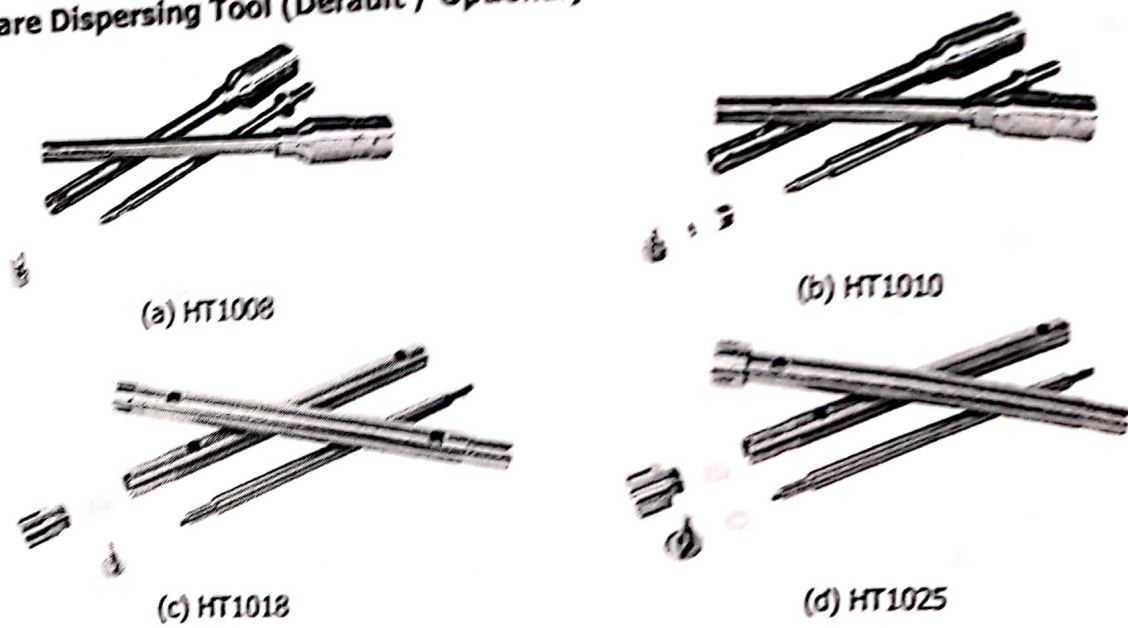


(d)

<Figure 21> Stand

Catalog No	Descriptions
(a) DH.WOS501510 ST110	Standard Plate Stand Ø16 x H800 mm Rod, 20 x 35 cm Plate (Optional for HG-15A,HG-15D)
(b) DH.WOS501515 ST120	Wide Plate Stand Ø23 x H1000 mm Rod, 30 x 40 cm Plate (Optional for HG-15A,HG-15D)
(c) US.2040	Stand r=150mm (Optional for HG-15A,HG-15D)
US.2041	Stand r=185mm (Optional for HG-15A,HG-15D)
(d) DH.WOS502001	Stainless Steel Rod, " RD501 ", ø 16 X h800mm, non-screw (Optional for HG-15A,HG-15D)
DH.WOS502002	Stainless Steel Rod, " RD502 ", ø 16 X h1000mm, non-screw (Optional for HG-15A,HG-15D)
DH.WOS502003	Stainless Steel Rod, " RD503 ", ø 16 X h1200mm, non-screw (Optional for HG-15A,HG-15D)
DH.WOS502031	Stainless Steel Rod, " RD531 ", ø 23 X h800mm, non-screw (Optional for HG-15A,HG-15D)
DH.WOS502033	Stainless Steel Rod, " RD533 ", ø 23 X h1200mm, non-screw (Optional for HG-15A,HG-15D)
DH.WOS502011	Stainless Steel Rod, " RD511 ", ø 16 X h800mm, 1.5P screw (Optional for HG-15A,HG-15D)
DH.WOS502012	Stainless Steel Rod, " RD512 ", ø 16 X h1000mm, 1.5P screw (Optional for HG-15A,HG-15D)
DH.WOS502013	Stainless Steel Rod, " RD513 ", ø 16 X h1200mm, 1.5P screw (Optional for HG-15A,HG-15D)
DH.WOS502021	Stainless Steel Rod, " RD521 ", ø 23 X h800mm, 1.5P screw (Optional for HG-15A,HG-15D)
DH.WOS502022	Stainless Steel Rod, " RD522 ", ø 23 X h1000mm, 1.5P screw (Optional for HG-15A,HG-15D)
DH.WOS502023	Stainless Steel Rod, " RD523 ", ø 23 X h1200mm, 1.5P screw (Optional for HG-15A,HG-15D)

Spare Dispersing Tool (Default / Optional)



<Figure 22> Spare Dispersing Tool

Catalog No	Descriptions
(a) DH.WHG02108	Dispersing Tool, "HT1008", Rotor ϕ 6.1, Stator ϕ 8mm, 1~50ml (Optional for HG-15A, HG-15D)
(b) DH.WHG02110	Dispersing Tool, "HT1010", Rotor ϕ 7.5, Stator ϕ 10mm, 1~100ml (Optional for HG-15A, HG-15D)
(c) DH.WHG02118	Dispersing Tool, "HT1018", Rotor ϕ 12.5, Stator ϕ 10mm, 10~1000ml (Default for HG-15A, HG-15D)
(d) DH.WHG02125	Dispersing Tool, "HT1025", Rotor ϕ 20, Stator ϕ 25mm, 50~2500ml (Optional for HG-15A, HG-15D)

Model	(1)"HT1008"	(2)"HT1010"	(3)"HT1018"	(4)"HT1025"
Working Range	1 ~ 50ml	1 ~ 100ml	10 ~ 1,000ml	50 ~ 2,500ml
Stator Diameter	ϕ 8 mm	ϕ 10 mm	ϕ 10 mm	ϕ 25 mm
Rotor Diameter	ϕ 6.1 mm	ϕ 7.5 mm	ϕ 8.3mm	ϕ 20 mm
Gap between Rotor & Stator	0.25 mm	0.2 mm	0.25 mm	0.35 mm
Allowable Max. Speed	27,000 rpm		20,000 rpm	15,000 rpm
Immersion Depth Min.	35 mm		60 mm	
Immersion Depth Max	70 mm		130 mm	
Shaft Length	138 mm		225 mm	
Bearing Material	PTFE			
Suitable for Solvent	Yes			
Max. Temperature	180°C			
Sterilization Method	All Methods			
Suspensions & Emulsions	Suspension : 10 ~ 50 μ m, Emulsion : 1 ~ 10 μ m			

* Test Condition : 1.8 liters of water in the 2 liters capacity beaker.

PRODUCT INSPECTION CERTIFICATE (HOMOGENIZERS)

모델명 Model Name	<input checked="" type="checkbox"/> HG-15D Unit <input type="checkbox"/> HG-15D-Set-A <input type="checkbox"/> HG-15D-Set-B	제품크기 및 무게 Product Size & Weight	60 X 75 X h 215mm, 2.5kg	Produced By 생산자
제조일 Manufacture Date	2019. 09. 23	입력 전원 Input Power	<input checked="" type="checkbox"/> 230V 50Hz/60Hz <input type="checkbox"/> 120V 60Hz	정순용
Serial No.	0400513199P 005	속도범위 Speed Range	2,000 ~ 27,000RPM	검사자 Inspected By
				전재천
No.	검사 항목(Inspection Item)	판정 기준(Inspection Method)	Insp. Result(O/X)	
1	외관 Exterior	BODY의 외관상태 확인 Check the exterior of Body	도장상태, 오염, 흠집, 색상 등 이상이 없을 것. There should be no contamination, scratches, discolor, etc on the metal plate painting.	O
		조절 노브, 전원스위치 등 외관상태 확인 Check the exterior of control knob, power switch etc.	조절 노브, 전원스위치의 오염, 흠집, 파손 등 이상이 없을 것. There should be no contamination, scratches, damage at Control knob, Power switch, etc	O
		제품표시 사항 Product description	제품라벨에 제품명, 모델명, 제품번호의 누락이 없고, 스티커가 부착되어 있을 것. There should be no missing of product name, model name, product number on product label and no omission sticker.	O
2	조립 Assembly	부속품에 대한 체결상태 Connection of parts	볼트의 풀림, 누락, 깨짐 등이 없을 것 There should be no loosening, missing, damages on bolts connection.	O
		조그셔틀 노브확인 Check the Jog Shuttle Knob	조그셔틀 동작에 이상이 없을 것 There should be no errors on Jog Shuttle work.	O
		Tool 고정 상태 확인 Check the fixing state of Tool set	모터 샤프트와 흔들림 뒤틀림 없을 것. There should be no loosening, trembling and twisting.	O
3	동작 Operation	회전동작 시 LCD 및 LED 표시 상태를 확인 Check the LCD and LED display during rotation operation.	각 모드의 표시, 색상 및 백라이트 점등상태의 이상이 없을 것. There should be no failurs in backlight display, each mode display and color etc.	O
		동작상태 확인 Check the operation status	최소 RPM 설정 후 30min. 동작 시 200rpm±10% 이내 일 것. The tolerance of minimum RPM should be within ±10% during 30 min. working under no-load operation at 200 RPM setting.	O
			27000RPM 설정 후 10min. 동작 시 27000rpm±10% 이내 일 것. The tolerance of 27,000 RPM should be Within ±10% during 10 min. working under no-load operation at maximum RPM setting.	O
4	안전 Safety	접지저항 Ground resistance	측정 값이 0.5Ω 이하 일 것(접지 저항계 사용) Ground resistance should be under 0.5Ω(ground resistance meter)	O
		배전 판 내의 부품배치 및 배선상태 Parts arrangement and wiring in distribution board	전기배선 와이어의 꼬임, 피복의 손상으로 인한 전기 쇼트가능성이 없을 것 There should be no twisted wire, no possibility of electrical shorts by wire cover peel off.	O
5	포장 Packing	구성품의 누락여부 확인 Check the missing of Components	1)Unit : 렌치, ROD, 명판, manual, QC Certificate, 보증서 등 구성품 누락이 없을 것. 2)Package-set : 렌치, ROD, Clamp, Tool, 명판, manual, QC Certificate, 보증서 등dml 누락이 없을 것. (Tool-SET-A: HT1018, SET-B: HT1025) 1)Unit : There should be no missing in components - L wrenchs, ROD, Name Plate, manual, QC Certificate, Warranty card. 2)Package-set : There should be no missing in components - L wrenchs, ROD, Clamp, Tool, Name Plate, manual, QC Certificate, Warranty card.	O
		포장상태 이상여부 확인 Check the Packing state	포장박스 외관에 파손이 없고 스티커(제품구분 / 제품고유번호)부착에 누락이 없을 것. There should be no damage of packing box and no missing of the stickers (product type & Serial No.)	O