

Three-one Motor BL Series / BLh Series

TYPE:BL300/BL600/BL1200/BL3000
TYPE:BLh300/BLh600/BLh1200/BLh3000

Instruction manual

Warranty certificate included

HEIDON
SHINTO Scientific Co., Ltd.



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- Before using the device, please thoroughly read this instruction manual and use the device in a correct, safe manner.
- In the event of a failure, please contact Heidon for repair and do not take the device apart on your own.
* Improper repairs and disassembly of the device voids the warranty and may also result in additional failures or accidents.
- The Three-one Motor has extremely strong torque. Please secure the container firmly in place, and be careful that the container does not move around and the contents do not splash out of the container.
- This appliance is designed for use in Japan only and cannot be used in any other country. No service is available outside of Japan.

Safety

Before using the device, please thoroughly read through this section, and operate the device in a correct manner.

This device is intended for industrial use and should not be used in households or near young children.



Warning

Failure to heed the following and operating the device incorrectly may lead to severe injury or death.

 Prohibited	<ul style="list-style-type: none"> Do not damage, destroy, modify, bend excessively, pull, twist or bundle in an unpowered state the power cord or otherwise place objects on it or pinch the power cord between two objects (Power cord may be damaged and result in fire and electrical shock) The Three-one Motor is not explosion proof. Do not operate it in dangerous environments (May result in fire, electrical shock and injury) Do not touch the rotating components while in motion (May result in injury and burns) Do not allow loose clothing or long hair to come close to any of the rotating components (May result in injury do to such becoming wrapped up in the device) Do not operate the device without properly securing both the agitator and container (May result in injury and the items falling over) 	 No wet hands	<ul style="list-style-type: none"> Do not plug or unplug the power cord with wet hands (May result in electrical shock)
	<ul style="list-style-type: none"> Do not modify or disassemble the device (May result in fire, electrical shock and injury) 	 Follow the instructions	<ul style="list-style-type: none"> Use 100V AC power (Using DC or 200V AC power may result in fire and electrical shock) *Excludes models rated for 220V Clean off the any dust that settles on the power cord (Dust on the power cord may result in electrical fires) Fully insert the plug on the power cord into the socket (Failure to fully insert the plug may result in electrical shock and fire) Follow the instructions in the instruction manual when installing the device (Device may move around and cause an injury) Always install the safety cover when there is a possibility that something may get wrapped up in the rotating components
	<ul style="list-style-type: none"> Do not spray or allow the device and power cord to get wet (May result in short circuiting and electrical shock) 		



Warning

Incorrectly operating this device may lead to injury or property damage

 Prohibited	<ul style="list-style-type: none"> Do not perform a Megger test using an insulation tester. Due to the circuit composition, doing so will result in a motor failure. Do not perform continuous agitation when the motor is overloaded (excessive load). Doing so will greatly reduce the life of the motor. Do not turn the device on and off by plugging/unplugging the power cord. (Always turn the device ON/OFF using the volume dial) Do not use any holding fixture other than a genuine Three-one Motor clamp holder. Do not loosen the free joint or clamp holder while agitating. Do not use the device in high temperature environments that exceed 40C or in high humidity environments. Doing so may result in a failure. Do not operate the volume dial and other switches with a hard object. Doing so may result in a failure. Do not rapidly turn the volume dial. 	 Do not touch	<p>Do not insert fingers or other objects into the rotating components while agitating (Doing so may result in injury. Pay particular attention to objects that may become wrapped up in the rotating components)</p>
		 Follow the instructions	<p>When the thermal protector activates and stops the device, turn the power OFF, and allow the motor to cool for about 30 minutes. Eliminate the cause of the overheating, and reduce the load on the motor. In the event that the motor falls into a liquid or liquid splashes on the motor, immediately unplug the device and arrange maintenance/service. (Simply drying the device and plugging it in again is dangerous and must be avoided)</p> <p>Wear gloves when installing, removing, assembling and maintaining the device (Failure to wear gloves may result in injury)</p>
		 Unplug the power cord	<p>Unplug the power cord when the device is not in use (May result in injury and burns or in electrical shock and electrical fires due to the deterioration of the insulation)</p>

Component names

Main unit



Accessories

Instruction manual (this manual)



Clamp holder



Safety cover

Optional accessories



Blade set (FS-7)



Collapsible stand (CS)

Electrical unit

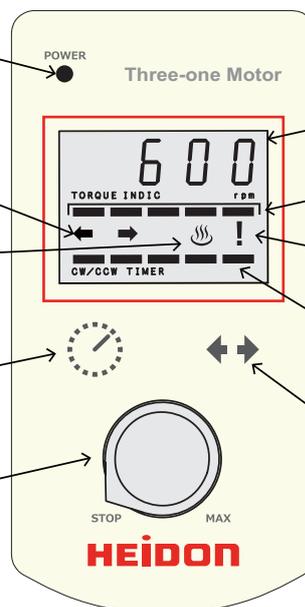
Power lamp
Lights up when the main power is ON

Rotational direction indicators
Indicates the direction of the rotation when agitating. The left-hand arrow is the forward direction and right-hand arrow is the reverse direction

Overheating warning
Indicates that the thermal protector has activated (motor is in the overheated state)

Agitation stop timer
Switch that activates a timer function for stopping agitation after a set length of time

Volume dial
Used to turn the agitator ON/OFF as well as set the speed



Speed display
Displays the rotational speed in RPM

Torque indicator
Displays the output ratio at the set speed with each bar representing 20%.

Overload warning
Indicates the current control circuit has activated (motor is in the overload state)

Forward/reverse timer bar graph
Displays the amount of time left until the rotation switches direction when using the forward/reverse timer as a bar graph

Forward/reverse timer switch
Switch that activates the forward/ reverse rotation using an automatic timer. It is also possible to manually switch between forward and reverse rotation. Please refer to page 5 for instructions on setting the timer.

Installation



Image of the completed installation

Preparation

Assemble the collapsible stand

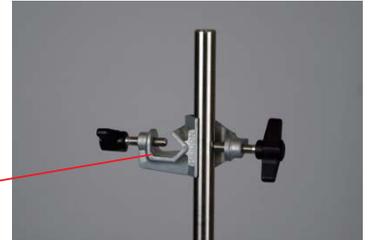
Detailed instructions can be found in the instruction manual that comes along with the collapsible stand (Type: CS).

Remove the Three-one Motor, clamp holder and safety cover from the packaging

When removing the motor, do not hold it by the LCD panel.

Attach the clamp holder

Attach the clamp holder to the collapsible stand (Type: CS). Loosen the lock screw on the clamp holder, and slide it onto the pole so that the V groove fits against the pole. Adjust the height, and then tighten the lock screw to secure the clamp holder in place.



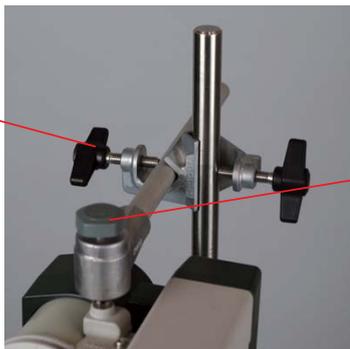
Be sure to attach the clamp holder so that the opening for the free joint arm faces up.

1

Attach the Three-one Motor

Attach the free joint arm to the clamp holder. Loosen the lock screw on the clamp holder, and insert the arm so that it fits securely in the V groove. Adjust the distance, and tighten the lock screw to secure the motor in place.

Lightly tighten the free joint lock screw, and provisionally secure the Three-one Motor so that it does not move.



Clamp holder lock screw

Free joint lock screw

2

When attaching, always support the motor with one hand to prevent it from falling

Attach the safety cover

Attach the safety cover to the Three-one Motor. Remove the nylon rivet from the safety cover attachment screw hole on the motor. Open the safety cover, and use a screw driver to fasten the screw containing threadlock. Wait about 30 minutes for the threadlock to dry.



Nylon rivet



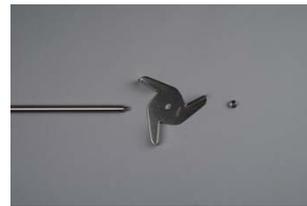
Screw containing threadlock

3

Do not over tighten the screw! Tighten only to the point that the safety cover will remain in the same position after letting go.

Attach the blade to the agitator shaft

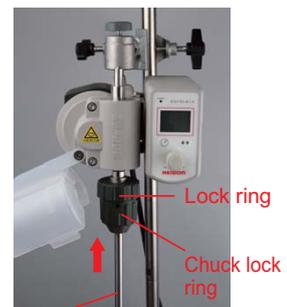
Attach the optional blade to the optional agitator shaft. For blades that attach to the end of the shaft, insert the screw on the bottom of the shaft into the oval hole in the blade, and use a box wrench to tighten the nut that comes with the shaft. (Pay attention to the orientation of the nut) For blades with a boss, pass the shaft through the boss, and tighten the boss screw using an Allen wrench.



4

Attach the agitator shaft assembly to the Three-one Motor

Attach the shaft assembly from Step 4 to the Three-one Motor. While holding down the lock ring on the keyless chuck, rotate the chuck lock ring in the counterclockwise direction to open the chuck. Insert the shaft into the opening on the bottom of the keyless chuck to the proper depth, and then rotate the chuck lock ring in the clockwise direction while holding down the lock ring to close the chuck.



Shaft assembly

5

Place the container to be used, and decide the position of the blade

Place the container under the Three-one Motor, and adjust the height of the blade. Operate the keyless chuck, and adjust the height of the agitation shaft so that the blade is sufficiently in the liquid. Close the keyless chuck with sufficient force to secure the shaft in place. Close the safety cover while making sure that it does not contact the keyless chuck. While supporting the motor, adjust the angle. Once the angle has been set, tighten the free joint lock screw to secure the motor in place.



Safety cover in the closed state



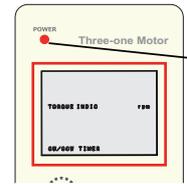
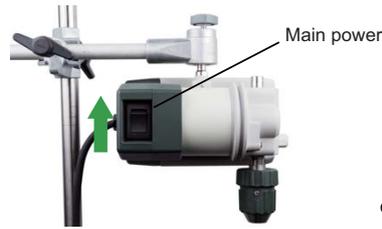
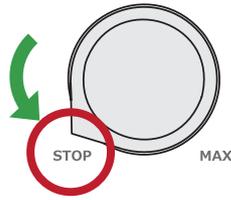
Free joint lock screw

6

Firmly secure the shaft in place so that it does not drop down while in use.

Operating instructions

1. Plug the power cord in, and turn the main power ON



Power lamp



Power lamp is on

Caution

- Always confirm that the volume dial is in the STOP position. [An error will be displayed if it is not (Err3)]
- Always ground the power supply in order to prevent possible accidents [Such as electrical shock]

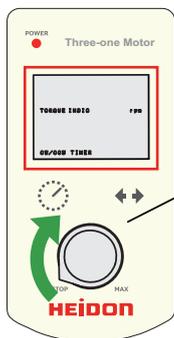
2. Operating the motor

Confirm the safety

Confirm one more time that the clamp holder, free joint, agitation shaft and safety cover are all securely secured in place. Confirm that the blade does not contact the bottom of the container. Also, confirm that the liquid will not splash out of the container.

Slowly turn the volume dial on the electrical unit in the clockwise direction and increase the speed.

Initially, rotate the dial until it “clicks” (about the 8 o'clock position). Once the shaft begins to rotate, confirm the safety points one more time, and slowly increase the speed. While looking at the speed display on the LCD panel, turn the dial until the desired speed is reached.

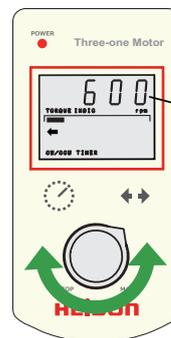


Turn the power ON

Volume dial



Turn the volume dial in the clockwise direction



Adjust the speed

Speed display (rpm)



Adjust the speed while looking at the speed display

Caution

- Because the Three-one Motor has strong torque, do not suddenly turn the volume dial.
- Pay attention not only to the speed display but also to the changes in the condition of the liquid.

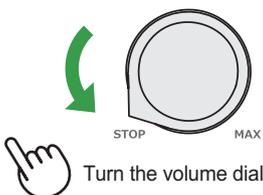
3. Stopping the device

Turn the volume dial on the electrical unit in the counterclockwise direction, and stop the rotation.

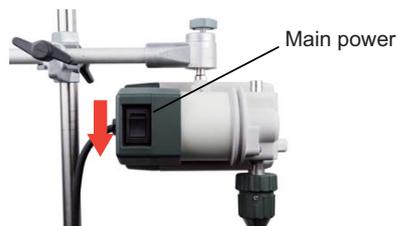
Turn the dial until there is a “click.” Confirm that the rotation stops and the speed display turns off.

Turn the main power OFF, and unplug the power cord.

Stop the motor



Turn the volume dial in the counterclockwise direction



Main power



Caution

- The device is still in the powered state even when the volume dial is in the STOP position, so always turn the main power OFF when not using the device.
- Do not use excessive force when turning the volume dial [May result in a failure]
- Do not touch the power cord with wet hands [May result in electrical shock]

Operating instructions

4. Operating in forward and reverse

Begin operating the motor normally, and set the desired speed

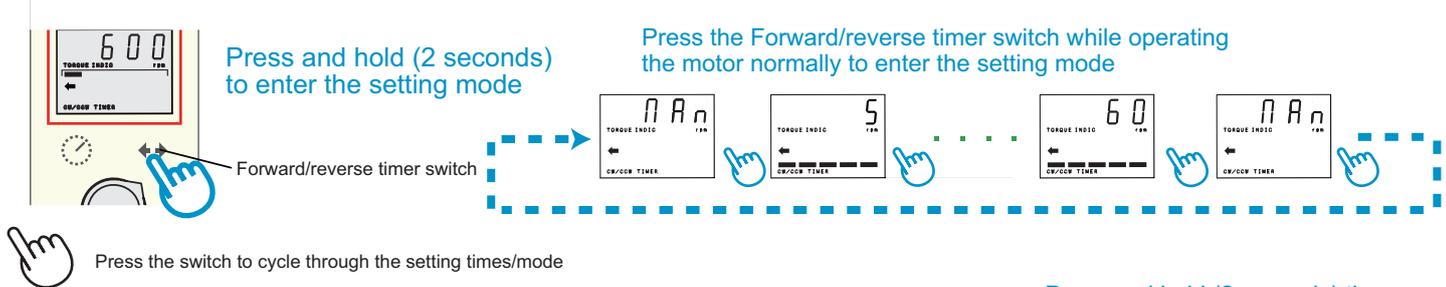
Refer to Step 2. Operating the motor.

Press and hold (2 seconds) the Forward/reverse timer switch to enter the setting mode

Press and hold (2 seconds) the Forward/reverse timer switch. When the motor enters the setting mode, it will stop and the speed display will change to either the timer setting or manual changeover mode.

Set either the reverse rotation time or manual changeover mode

When the Forward/reverse timer switch is pressed again, the display will change from 5 → 10. This numerical value is the reverse rotation time. By pressing the switch, it is possible to cycle through 5 → 10 → 20 → 30 → 45 → 60 (seconds) (timer mode) → Manual $\Pi A n$ (Manual changeover mode).



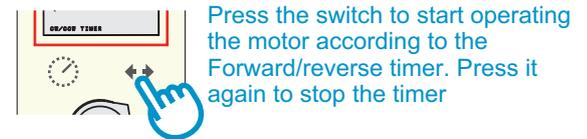
Press and hold (2 seconds) the Forward/reverse timer switch to save the setting

After selecting the desired setting, press and hold (2 seconds) the Forward/reverse timer switch. When the figure begins to flash, release the switch to save the setting.



Starting and stopping the Forward/reverse timer

After setting the timer mode, press the Forward/reverse timer switch to start operating the motor according to the Forward/reverse timer. Press the switch again to stop operating the motor according to the Forward/reverse timer.



Manually switching between forward/reverse rotation

After selecting the manual changeover mode, press the Forward/reverse timer switch to switch between forward and reverse rotation. The rotation will change direction each time the switch is pressed.

5. Operating the motor with the Agitation stop timer

Begin operating the motor normally, and set the desired speed

Refer to Step 2. Operating the motor.

Press and hold (2 seconds) the Agitation stop timer switch to enter the timer setting mode

Press and hold (2 seconds) the Agitation stop timer switch. When the motor enters the time setting mode, it will stop and the speed display will change to the timer setting.

Set the agitation stop time

When the Agitation stop timer switch is pressed again, the display will change from 00.30 → 01.00 → 02.00. This numerical value is the time until agitation stops. By pressing the switch, it is possible to cycle through 00.30 → 01.00 → 02.00 ... 23.00 → 24.00 → 00.30 (hours.minutes).

Press and hold (2 seconds) the Agitation stop timer switch to save the setting

After selecting the desired setting, press and hold (2 seconds) the Agitation stop timer switch. When the figure begins to flash, release the switch to save the setting.

Starting and stopping the Agitation stop timer

When the Agitation stop timer switch is pressed while operating the motor normally, the Agitation stop timer will start. Press the switch again to return to operating the motor normally. While operating the motor under the Agitation stop timer, the speed display will alternate between displaying the speed and the remaining time. When the set time has passed, the motor will stop and the display panel will turn off.

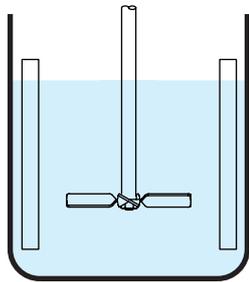


- If no button is pressed for 30 seconds while in the timer setting mode, the motor will revert to normal operation. [Agitator will start rotating]
- Do not press any of the timer buttons with your fingernails or other hard objects. [May result in a failure]
- Pay attention to changes in the surface of the liquid that can occur when changing between forward and reverse rotation depending on the shape of the blade.
- After operating the motor with the Agitation stop timer, turn the speed volume to the STOP position.

Optimum agitation

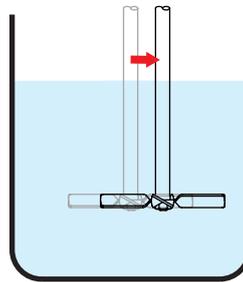


- A wide range of techniques and experience are necessary to perform agitation at the optimum agitation efficiency. It is impossible to explain everything in this manual, but it should be possible to increase agitation efficiency by executing the points described below.



Attach baffles

Attach baffles to both sides of the container. Baffles prevent swirling and create turbulent flow. Baffles should be attached whenever possible.



Offset the agitator

When it is not possible to attach baffles, offset the agitator away from the center of the container. This prevents swirling and creates turbulent flow.

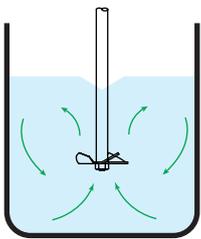
Use both forward and reverse rotation

The Three-one Motor can be operated in forward and reverse. Using this function, it is possible to prevent swirling and create turbulent flow.

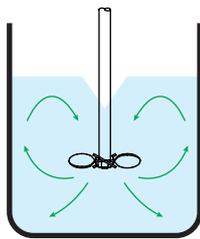


- When mixing regular liquids, (divide the liquid into 3 equal parts and) position the blade 1/3 of the way up from the bottom.
- When using deep containers, it is effective to use a blade with a boss to mix at multiple levels.

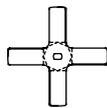
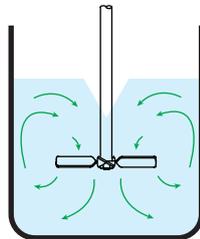
Flow pattern images of the blades *Flow during forward rotation. FS-7 blade set (excluding some blades)



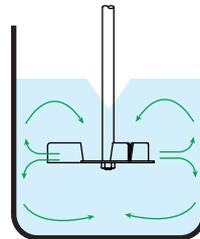
Fan



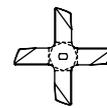
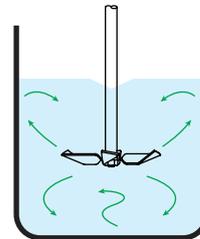
Propeller R



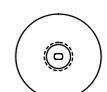
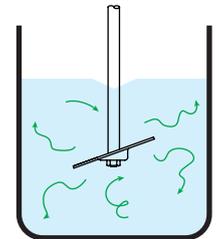
Square cross



Turbine



Soft cross



Butterfly

What to do in case of a “Possible failure”

In the event that any of the following conditions occurs, perform the indicated process. In the event that the motor does not return to normal, please contact the distributor or the Heidon service department.

Failure condition	What to check
[Loc] is displayed on the LCD panel	The Loc mark is displayed when rotation is restricted for at least 2 minutes due to agitating a highly viscous substance or other cause. Turn the power OFF and then back ON to restore the motor to the normal state.
[Err1] is displayed on the LCD panel	This error is displayed following abnormal operation when the speed reaches or exceeds a preset level. Return the volume dial to STOP to clear the error condition. *Service is necessary if this error occurs often.
[Err2] is displayed on the LCD panel	This error is displayed when the speed has not reached 0 when changing the rotation direction. Return the volume dial to STOP to clear the error condition. *Service is necessary if this error occurs often.
[Err3] is displayed on the LCD panel	This error occurs when the volume dial is not in the STOP position when the power is turned ON. Return the volume dial to STOP to clear the error condition.
[---] is displayed on the LCD panel	This occurs when the thermal protector activates. Eliminate the cause of the overheating (high load, high ambient temperature, etc.), turn the power OFF and allow the motor to cool for at least 30 minutes before using again.
Speed display flashes	This occurs when the current control circuit activates. A load that exceeds the capability of the motor has occurred (overload). This can shorten the life of the motor, so the motor should not be operated in an overloaded state.

Specifications

Motor	DC brushless motor, Type B insulation, 130°C, BL: 40W, BLh: 80W	Safety components	Current limiter, Thermal protector, Safety cover
		Chuck	8mm collet-type keyless chuck
Timer function	Forward/reverse timer. Agitation stop timer	Power cord	2m cord with a 2-pole grounded plug
		Power supply	100V, 50/60Hz (standard)
LCD Panel display	Speed: digital, 4 digit display / Overload indication, Torque indicator: 1 bar represents 20%	Outer dimensions	W135 x D175 x H209mm
		Weight	2.2kg
Speed regulation	Feedback regulation / Forward/reverse rotation switching	Accessories	Clamp holder, Safety cover, Instruction manual (this manual)

Speed and Torque

BL300	5 to 300rpm	·	1.3N/m	BLh300	5 to 300rpm	·	2.6N/m
BL600	10 to 600rpm	·	0.7N/m	BLh600	10 to 600rpm	·	1.3N/m
BL1200	20 to 1200rpm	·	0.3N/m	BLh1200	20 to 1200rpm	·	0.7N/m
BL3000	50 to 3000rpm	·	0.1N/m	BLh3000	50 to 3000rpm	·	0.2N/m

Service

Please consult the store from which you purchased this device regarding service.



Please use the Heidon homepage for information and to send "e-mail" inquiries



<http://www.heidon.co.jp/>

Warranty certificate (factory service)

Based on the following stipulations, this certificate guarantees the performance of free repairs for a period of one (1) year from the date the product is received. In the event of a failure that occurs under normal operating conditions within the warranty period, please request the seller or Heidon for service and provide evidence of the sales date.

Stipulations concerning free repairs

- Free repairs will be provided for failures within the warranty period that occur under correct operating conditions performed in accordance with the cautions indicated in the Instruction Manual.
- Free repairs will not be provided in the event of the following, even if such occurs during the warranty period:
 - Failures and damage resulting from improper use or as a result of repairs or modifications performed by the user
 - Failures and damage resulting from moving, dropping, etc. the device after receipt
 - Failures and damage resulting from natural disasters, such as fires, earthquakes, floods and lightning, pollution, salt damage, power supplies outside of the specifications (voltage, frequency) or abnormal voltages.
 - Failures and damage resulting from usage under certain conditions (high temperature, high humidity, ambient environment, etc.)
- This warranty certificate is only valid within Japan

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