

# INSTRUCTION MANUAL

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## Gravity-fed Microplate Washer

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### **Model No.**

BioWasher 100

BioWasher 100 - T



**ROCKER**

Please read this instruction manual before using this product.



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# 1. Important Notice

This instrument is designed for laboratory usage only. Please read this manual carefully before installing and operating. The instrument shall not be modified in any way. Any modification will void the warranty and may result in potential hazard. We are not responsible for any injury or damage caused by any non-intended purposes and modifying the instrument without authorization.

1. Check the voltage specified on the name plate and ensure it matches the line voltage in your location.
2. Never use the instrument with any corrosive, chemical, flammable or toxic material.
3. Keep equipment away from flammable or explosive materials. Install it in a clean, dustless and ventilated area.
4. The instrument is not designed to start against applied vacuum. To prevent damage, verify that the pump inlet is at atmospheric pressure before each start. If necessary, the inlet can be vented to atmosphere by partially unscrewing the vacuum regulator knob.
5. The pump has a thermal protection device that automatically shut off when it becomes overheated.
6. Do not use any lubricant, which may damage the pump.
7. Vacuum bottle and overflow protection device are made of PP. Please search for chemical compatibility chart before using.
8. In case of any issues with equipment, please contact the manufacturer or your service agent for assistance. Do NOT disassemble it improperly.
9. Please discard packing materials in accordance with relevant local regulations.
10. Visit the official website and refer to the latest product guide for more information.
11. Operating Condition
  - (a) Ambient temperature: 5 ~ 40°C
  - (b) Relative humidity: 80% RH Max.
  - (c) Power input: 100-240V, 50/60Hz
  - (d) Altitude: Up to 2000 m
  - (e) Pollution degree: II
  - (f) Indoor use

*\* When handling hazardous chemical and biological solutions, take all appropriate protective measures.*

*\* Before operation, please check whether the compatibility of contact materials of equipment with sample solution.*

## 2. Unpacking

Please check if the package is complete without any damage before unpacking. When unpacking, please make sure you have all accessories that indicated on the list. If there is any problem, please keep the serial number along with packing case and contact your local distributor immediately for assistance.



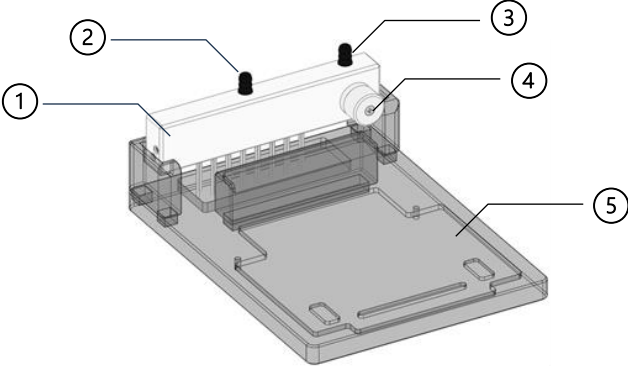
Model		Standard Package Includes:
BioWasher 100		8-Channel Dispenser
		Microplate Stand
		Spare Parts Kit
BioWasher 100 - T		Lafil 200, Vacuum Pump
		PP Vacuum Bottle with Quick-Coupling Connector, 4000 mL
		PP Buffer Bottle, 4000 mL
		Silicone Tube
		Power Adaptor
		Instruction Manual

- A Dura-Clamp® Tubing Flow Valve is attached in package.

# 3. Main Part Diagram

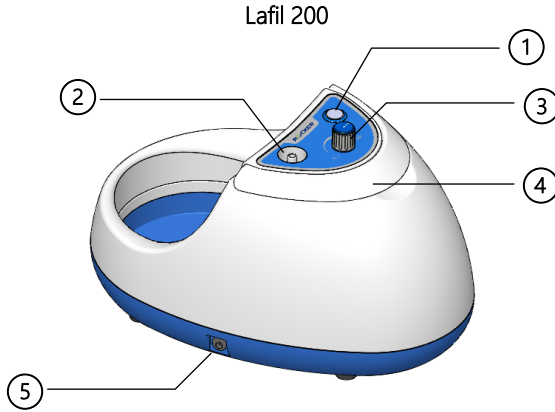
(1) Microplate Wash Kit

BioWasher 100



Item	Designation	Item	Designation
1	8-Channel Dispenser	4	Dispense Button
2	Outlet Port	5	Microplate Stand
3	Inlet Port		

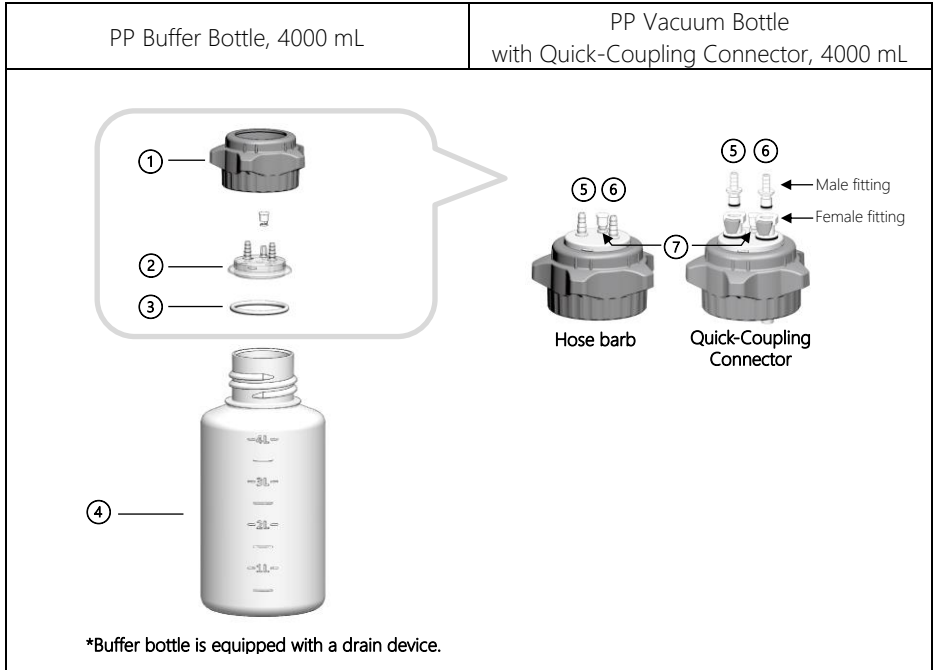
(2) Vacuum Pump



Item	Designation	Item	Designation
1	Power Switch	4	Handle
2	Air Inlet	5	DC Socket
3	Vacuum Regulator		



### (3) Bottle

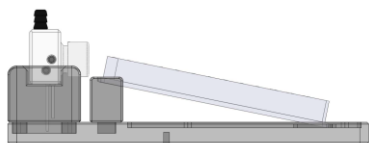


Item	Designation	Item	Designation
1	Cap	5	"AIR" Air Outlet
2	Cap Adaptor	6	"LIQ" Liquid Inlet
3	O-ring	7	Cap Lid
4	Vacuum Bottle		

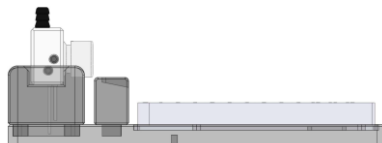
## 4. Installation



Gravity-fed Microplate Washer System Assembly Diagram



Place the microplate tilted on the microplate stand

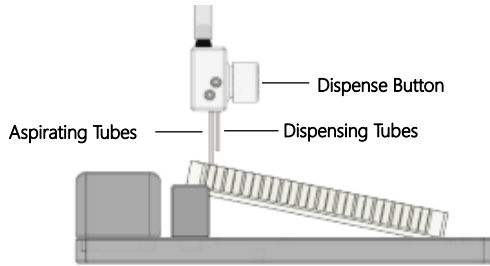


Place the microplate flat on the microplate stand

1. Connect the inlet port of 8-channel dispenser and the outlet of PP buffer bottle using  $\varnothing 4.2 \times 8$  mm tubing of an appropriate length.  
\***Buffer bottle must be 60 cm higher than dispenser**, should keep venting by inserting a syringe filter on one port of cap.  
\*A Dura-Clamp® tubing flow valve could be installed on the tube and regulate the flow rate.  
\*These 2 ports are marked with yellow bands.
2. Locate the 4000 mL PP vacuum bottle inside of Lafil 200 vacuum pump as shown above.
3. Connect the outlet port of 8-channel dispenser and the "LIQ" port of PP vacuum bottle using  $\varnothing 4.2 \times 8$  mm tubing of an appropriate length.  
\*These 2 ports are marked with blue bands.
4. Connect the air inlet of Lafil 200 vacuum pump and "AIR" port of PP vacuum bottle using  $\varnothing 6 \times 12$  mm tubing.
5. Adjust the vacuum source to the appropriate level using vacuum regulator.

6. Place the microplate either tilted or flat on the microplate stand.
7. Before operating, please press the dispense button of the manifold and make sure each pipeline is full of cleaning agents.
8. Ready to use.

# 5. Operation



1. Hold the and lean the aspirating tubes against the wall of the microplate well.
2. Start the pump by pressing power switch and press the dispense button to start dispensing.
3. Release the button to stop dispensing once the wells are filled with buffer.
4. Repeat the dispensing process for the next row of wells until all wells are filled.
5. Lean the aspirating tubes against the wall of the microplate well and aspirate the waste while keeping button released.
6. Repeat the aspiration process for the next row of wells until all wells are emptied.
7. Repeat step 1. ~ 6. for several times to complete the process as required.
8. After the final wash, turn the plate over and tap it gently 4 ~ 5 times on a lint-free paper towel to remove any remaining wash buffer for optimal cleaning.  
\*If the ELISA procedure requires oscillation for cleaning, gently shake the microplate wells, wait a few seconds, and then aspirate the waste.
9. Switch off the pump and empty the waste once the experiment is finished.

## 6. Maintenance

1. The vacuum pump is not autoclavable. Please clean the surface by pure water, 75% ethanol or isopropanol (IPA).
2. After each use, please wipe the remaining liquid on the stand and dispenser.
3. Please suck in pure water to clean the tubing after every use to avoid crystallization of salt.
4. After finishing the experiment, please keep pumping the air for at least 2 minutes to withdraw the residual steam.
5. 8-channel dispenser, buffer bottle, vacuum bottle and silicone tube are autoclavable (121°C, 1 bar, 20 minutes). Please ensure to rinse with pure water and separate each part before autoclave.  
**\*Microplate stand CANNOT be autoclaved.**
6. If the pipeline is blocked, please soak in water for half an hour, then clear the blockage with the L-type cleaning rod or replace the tube.
7. O-ring(s), silicone tube(s) are consumables, it is recommended to replace it on a yearly basis or as needed to ensure good operation.

# 7. Troubleshooting

Issue	Cause and Solution
<p>Button sprang open</p>	<ul style="list-style-type: none"> <li>• Button broken → Replace a new button.</li> <li>• Over pressure → Check and make sure the pressure is under 10 psi.</li> </ul>
<p>Button leakage</p>	<ul style="list-style-type: none"> <li>• O-ring sealing → Replace the O-rings.</li> <li>• Button broken → Replace a new button.</li> </ul>
<p>Weak dispensing</p>	<ul style="list-style-type: none"> <li>• Pipeline blockage → Clear the blockage with the L-type cleaning rod or replace the stainless steel.</li> <li>• Insufficient height of buffer bottle → Adjust the pressure (&lt; 10 psi).</li> <li>• O-ring sealing → Replace the O-rings.</li> <li>• Loose tubing → Replace or re-tighten the silicone tubes.</li> <li>• Excessive tightness of the buffer bottle cap → Loosen the cap to balance the pressure (insert a syringe filter).</li> </ul>
<p>Weak aspirating</p>	<ul style="list-style-type: none"> <li>• Poor vacuum → Adjust the vacuum to the appropriate level.</li> <li>• Air leakage → Replace or tighten the silicone tubes.</li> </ul>
<p>Failed to start (Lafil 200)</p>	<ul style="list-style-type: none"> <li>• Loose plug → Reconnect plug to socket firmly.</li> <li>• Wrong voltage → Reconnect to power specified on name plate.</li> <li>• Wrong power adaptor → Plug in the power adaptor from manufacture of instrument.</li> <li>• Blown fuse → Replace a new fuse.</li> <li>• Vacuum exists → Release vacuum and restart the pump.</li> <li>• Switch is broken → Contact distributor for assistance.</li> </ul>
<p>Failed to adjust vacuum (Lafil 200)</p>	<ul style="list-style-type: none"> <li>• Faulty vacuum regulator → Contact distributor for assistance.</li> <li>• Faulty vacuum gauge → Contact distributor for assistance.</li> </ul>

# Ordering information

196100-00	BioWasher 100, Microplate Wash Kit
196100-01(02)-T	BioWasher 100 - T, Gravity-fed Microplate Washer, AC100-240V adaptor, US plug (EU plug)
197200-01(02)	Lafil 200, Oil Free Vacuum Pump, AC100-240V adaptor, US plug (EU plug)
196811-00	8-Channel Dispenser
196100-02	Microplate Stand
196100-03	Spare Parts Kit
196100-05	PP Buffer Bottle, 4000 mL
197200-53	PP Vacuum Bottle with Quick-Coupling Connector, 4000 mL
197000-39	Overflow Protection
199100-68	Silicone Tube, $\varnothing$ 4.2 × 8 mm, 200 cm
196100-31	Dynalon® Dura-Clamp Tubing Flow Valve, accepts tubing OD 3.2 ~ 11 mm

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