INSTRUCTION MANUAL

Suction System

Model No.

Lafil 100 / 100^{eco}
Lafil 200 - Plus / BioDolphin
Lafil 200^{eco} - Plus / BioDolphin
Lafil 300 - Plus / BioDolphin
Lafil 400 - Plus / BioDolphin

Instruction Video



ROCKER

Please read this instruction manual before using this product.

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. Install the instrument in a clean, dust-less and ventilated area under 40°C.
3. Never use the instrument with any corrosive, chemical, flammable or toxic material.
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 except for Lafil 100 and Lafil 100^{eco}.
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. Suction accessories, including suction kit, vacuum bottle and overflow protection device, are made of POM, PP and PES. Please search for chemical compatibility chart before using.
8. Please discard packing material according to local related regulations.

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.



Lafil 100 / Lafil 100^{eco}

Model	Standard Package Includes:
Lafil 100 **Lafil 100^{eco}**	Lafil 100 / 100^{eco}, Oil Free Vacuum Pump
	1L PP Vacuum Bottle with GL45 Suction Cap
	Handle
	1-channel Tip Adaptor (150 mm)
	1-channel Tip Adaptor with Ejector
	8-channel Tip Adaptor with Ejector
	Syringe Filter (0.22 µm, PTFE)
	Silicone Tube
	Repair Kit
	Power Adaptor
	Instruction Manual



Lafil 200 - Plus
Lafil 200^{eco} - Plus



Lafil 200 - BioDolphin
Lafil 200^{eco} - BioDolphin

Model	Standard Package Includes:
Lafil 200 - Plus **Lafil 200^{eco} - Plus**	Lafil 200 / 200^{eco}, Oil Free Vacuum Pump
	4L PP Vacuum Bottle with Quick-Coupling Connectors
	Plus, Suction Kit
	Silicone Tube
	Repair Kit
	Power Adaptor
	Instruction Manual

Model	Standard Package Includes:
Lafil 200 - BioDolphin **Lafil 200^{eco} - BioDolphin**	Lafil 200 / 200^{eco}, Oil Free Vacuum Pump
	4L PP Vacuum Bottle with Quick-Coupling Connectors
	BioDolphin, Suction Kit
	Silicone Tube
	Repair Kit
	Power Adaptor
	Instruction Manual

* The accessories included in **Plus and BioDolphin Suction Kit** please refer to page 8.



Lafil 300 / 400 - Plus



Lafil 300 / 400 - BioDolphin

Model	Standard Package Includes:
Lafil 300 - Plus **Lafil 400 - Plus**	Lafil 300 / 400, Oil Free Vacuum Pump
	1200 mL PES Vacuum Bottle
	Plus, Suction Kit
	Silicone Tube
	Repair Kit
	Power Cord
	Instruction Manual

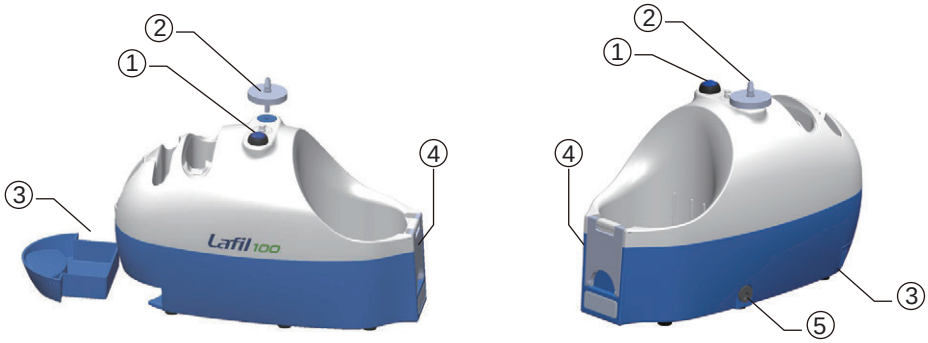
Model	Standard Package Includes:
Lafil 300 - BioDolphin **Lafil 400 - BioDolphin**	Lafil 300 / 400, Oil Free Vacuum Pump
	1200 mL PES Vacuum Bottle
	BioDolphin, Suction Kit
	Silicone Tube
	Repair Kit
	Power Cord
	Instruction Manual

* The accessories included in **Plus and BioDolphin Suction Kit** please refer to page 8.

Main Part Diagram

(1). Vacuum Pump

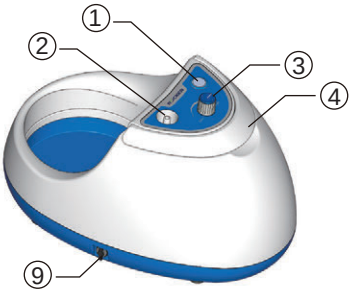
Lafil 100 / Lafil 100^{eco}



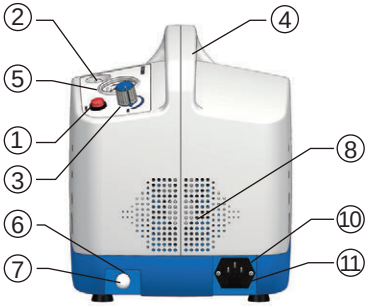
Position	Designation	Position	Designation
1	Power Switch	4	Centrifuge Tube Rack
2	Inlet (Syringe Filter)	5	DC Socket
3	Liquid Collection Tray		

* The power switch of Lafil 100^{eco} is black with blue light. Refer to **Troubleshooting** when light is flickering.

Lafil 200 / Lafil 200^{eco}

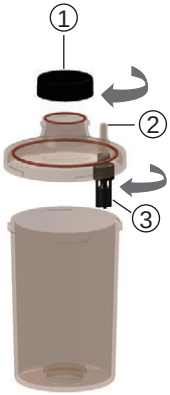


Lafil 300 / 400



Position	Designation	Position	Designation
1	Power Switch	7	PE Muffler
2	Inlet	8	Ventilation Outlet
3	Vacuum Regulator	9	DC Socket
4	Handle	10	AC Socket
5	Vacuum Gauge	11	Fuse Holder
6	Washer		

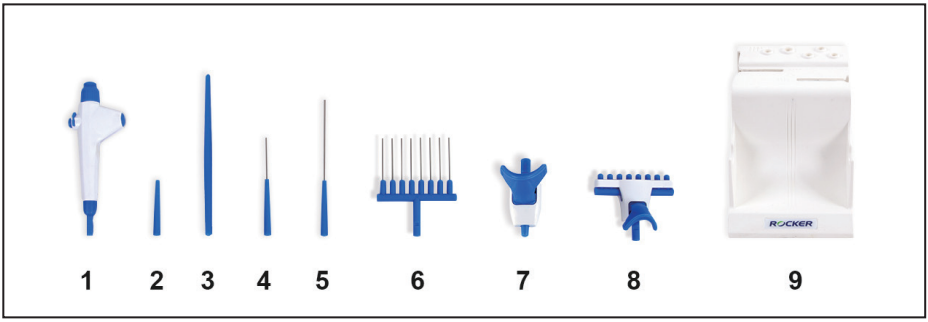
(2). Vacuum Bottle

Bottle	1000 mL PP Bottle	1200 mL PES Bottle	4000 mL PP Bottle
Model	Lafil 100 / 100^{eco}	Lafil 300 / 400	Lafil 200 / 200^{eco}
			

1. The silicone tube and overflow protection device are installed on inside of the cap corresponding to each "**LIQ**" and "**AIR**".
   - Overflow protection device is not included in 1000 mL PP Bottle.
2. The entire vacuum bottle are autoclavable (121°C, 1 bar, 20 min).
3. The material of vacuum bottle, which is PP and PES, are applicable to most of low concentrated chemicals, please refer to chemical compatibility chart before use.

Position	Designation	Position	Designation
1	"**LIQ**" Liquid Inlet	3	Overflow Protection Device
2	"**AIR**" Air Outlet		

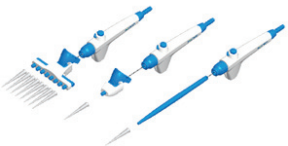
(3). Suction Kit



*** The suction kit except for rack is available for autoclave.**

BioDolphin, Suction Kit			
1	Handle	6	8-channel SS adaptor (40 mm)
2	1-channel tip adaptor (50 mm)	7	1-channel tip adaptor with ejector
3	1-channel tip adaptor (150 mm)	8	8-channel tip adaptor with ejector
4	1-channel SS adaptor (40 mm)	9	Rack
5	1-channel SS adaptor (80 mm)		

Plus, Suction Kit			
1	Handle	7	1-channel tip adaptor with ejector
3	1-channel tip adaptor (150 mm)	8	8-channel tip adaptor with ejector



The fitting can be easily plugged into the handle for replacing quickly.

Installation and Operation

• Suction System Operation

A. Turn on the pump, block the inlet and regulate the desired vacuum by vacuum regulator and turn it off.
   • Vacuum regulation is only applicable on Lafil 200 / 200^{eco} / 300 / 400.

B. Assemble the vacuum pump and vacuum bottle as shown in previous part, then put the installed bottle in the Lafil series vacuum pump.
   • The syringe filter must be inserted into inlet of Lafil 100 / Lafil 100^{eco} then connect tube to vacuum bottle to prevent the liquid from overflowing into pump.
   • The syringe filter (Cat. No. 197100-43) of Lafil 100 is hydrophobic PTFE, 0.22 µm pore size, 25 mm diameter, please change a new one followed above specification if it gets wet or dirty.

C. Connect the inlet of vacuum pump and outlet of vacuum bottle (**AIR**) with silicone tube.
   • A HEPA filter or 0.22µm filters can be connected between vacuum pump and vacuum bottle to prevent particles reduces the suction efficiency.

D. Connect the inlet of vacuum bottle (**LIQ**) and handle of suction kit with long silicone tube.

E. Choose the suitable fittings and plug into handle according to used container, e.g. 96 well plate, 10 cm dish, and cell culture flask.

F. Turn on the pump, connect the appropriate pipette tips, and press the switch to start suction your waste liquid.

G. After finishing experiment, turn off the vacuum pump and clean the suction kit if needed.

• Energy-saving model, Lafil 100^{eco} and Lafil 200^{eco}, will stop operating when achieving the max. vacuum and resume working when operated again.



Suction System Assembly Diagram

• Suction System Operation

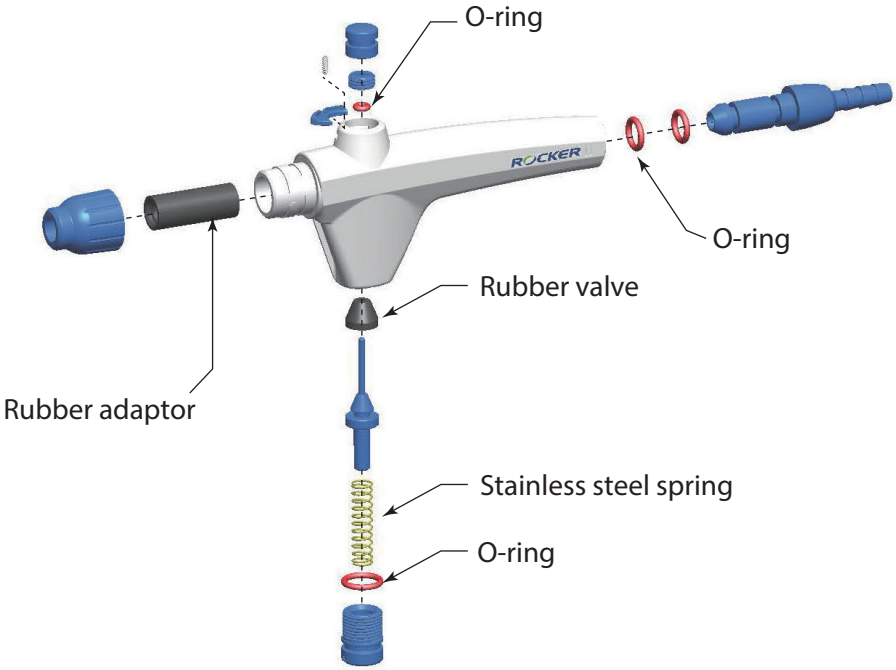
Model	Lafil 100 / 100^{eco}	Lafil 200 / 200^{eco}
Compatible with	1000 mL PP Bottle (standard) 500 mL Glass Bottle (optional)	4000 mL PP Bottle (standard) 3500 mL Glass Bottle (optional)
		

* GL45 suction cap is necessary when glass bottle is used in suction system.



Maintenance

1. The vacuum pump is not autoclavable. Please clean the surface by pure water, 75% ethanol or isopropanol (IPA).
2. Please suck in pure water to clean the tubing after every use.
3. After finishing the experiment, please keep pumping the air for at least 2 minutes to withdraw the residual steam.
4. Suction accessories (except for rack), vacuum bottle and silicone tube are autoclavable (121℃, 1 bar, 20 min). Please ensure to rinse with pure water and separate each part before autoclave.
5. Rack in suction kit is made of ABS which is not autoclavable, please clean it with pure water, 75% ethanol or isopropanol (IPA).
6. Syringe filter of Lafil 100 / Lafil 100^{eco} is consumables and should be changed while it gets wet or dirty. Please change a syringe filter with hydrophobic PTFE, 0.22 μm pore size, 25 mm diameter or equivalent.
7. O-ring(s), silicone tube(s) and rubber pieces are consumables, it is recommended to replace it on a yearly basis or as needed to ensure good operation.
8. When replace fuse on Lafil 300 / 400, get the spare fuse from the fuse holder. (4A fuse for 110V; 1.5A fuse for 220V)


O-ring
ROCKER
O-ring
Rubber valve
Rubber adaptor
Stainless steel spring
O-ring

Troubleshooting

Problem	Reason and Solution
Failed to start	• Loose plug → Reconnect plug to socket firmly. • Wrong voltage → Reconnect to power specified on name plate. • Wrong power adaptor → Plug in the power adaptor from manufac ture of instrument. • Blown fuse → Replace a new fuse. • Vacuum exists → Release vacuum and restart the pump. • Switch is broken → Contact distributor for assistance.
Failed to adjust vacuum	• Loose regulator → Tighten regulator by yourself or contact distributor for assistance. • Faulty vacuum regulator → Contact distributor for assistance. • Faulty vacuum gauge → Contact distributor for assistance.
Poor vacuum	• Improperly vacuum setting → Adjust the vacuum regulator. • Clogged muffler → Replace a new muffler. • Air leakage → Replace or tighten the tubing and accessories that possible leaks.
Low suction speed	• Improperly vacuum setting → Adjust the vacuum regulator. • Air leakage → Replace or tighten the tubing and accessories that possible leaks. • Full vacuum bottle → Empty the vacuum bottle. • Blocked syringe filter à Replace a new syringe filter.
Flickering light on power switch (Lafil 100^{eco} only)	• Folded tube → Unfold the tube and restart the instrument. • Blocked syringe filter → Replace a new syringe filter and restart the instrument.

Ordering Information

197100-01(02)	Lafil 100, Portable Suction System, AC100-240V adaptor, US plug (EU plug)
197110-01(02)	Lafil 100^{eco}, Portable Suction System, AC100-240V adaptor, US plug (EU plug)
197203-01(02)	Lafil 200 - BioDolphin, Suction System, AC100-240V adaptor, US plug (EU plug)
197205-01(02)	Lafil 200 - Plus, Suction System, AC100-240V adaptor, US plug (EU plug)
197213-01(02)	Lafil 200^{eco} - BioDolphin, Suction System, AC100-240V adaptor, US plug (EU plug)
197215-01(02)	Lafil 200^{eco} - Plus, Suction System, AC100-240V adaptor, US plug (EU plug)
197303-11/22	Lafil 300 - BioDolphin, Suction System, AC110V, 60Hz (AC220V, 50Hz)
197305-11/22	Lafil 300 - Plus, Suction System, AC110V, 60Hz (AC220V, 50Hz)
197403-11/22	Lafil 400 - BioDolphin, Suction System, AC110V, 60Hz (AC220V, 50Hz)
197405-11/22	Lafil 400 - Plus, Suction System, AC110V, 60Hz (AC220V, 50Hz)
197000-60-500	500 mL Laboratory Glass Bottle with GL45 Suction Cap
197000-60-3500	3500 mL Laboratory Glass Bottle with GL45 Suction Cap
197100-10	1000 mL PP Vacuum Bottle
197000-11	1200 mL PES Vacuum Bottle
197200-53	4000 mL PP Vacuum Bottle with Quick-coupling Connectors
197100-43	Syringe Filter for Lafil 100 / Lafil 100^{eco}
197000-60	GL45 Suction Cap
199100-30	Handle of BioDolphin Suction Kit
199100-00	New BioDolphin Suction Kit - LB
199200-00	Plus Suction Kit - LB
199100-51	Repair Kit (include L type cleaning rod, SS spring, silicone sleeve)
199100-68	Silicone Tube (Φ4.2 x 8 mm), 200cm
197100-48	Anti-UV Cloth Cover for Lafil 100 / Lafil 100^{eco}
197400-45	PE Muffler (1/8 PT)

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