

# INSTRUCTION MANUAL

## Suction System

### Model No.

Lafil 100 / 100<sup>eco</sup>

Lafil 200 - Plus / BioDolphin

Lafil 200<sup>eco</sup> - Plus / BioDolphin

Lafil 300 - Plus / BioDolphin

Lafil 400 - Plus / BioDolphin

Tech support



**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. 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<sup>eco</sup>.
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. In case of any issues with instrument, please contact the manufacturer or your service agent for assistance. Do NOT disassemble it improperly.
9. Please discard packing material according to local related 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 supply:  
Lafil 100 / 200 series: 100-240V~, 50/60Hz  
Lafil 300 / 400 series: 100-120V~, 50/60Hz or 200-240V~, 50/60Hz
  - (d) Altitude: Up to 2000 m
  - (e) Pollution degree: II
  - (f) Indoor use

## 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.



**Lafil 100 / Lafil 100<sup>eco</sup>**

Model	Standard Package Includes:
<b>Lafil 100</b>	Lafil 100 / 100 <sup>eco</sup> , 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
<b>Lafil 100<sup>eco</sup></b>	8-channel Tip Adaptor with Ejector
	Syringe Filter (0.45 µm, PTFE)
	Silicone Tube
	Repair Kit
	Power Adaptor



**Lafil 200 - Plus**

**Lafil 200<sup>eco</sup> - Plus**



**Lafil 200 - BioDolphin**

**Lafil 200<sup>eco</sup> - BioDolphin**

Model	Standard Package Includes:
<b>Lafil 200 - Plus</b> <b>Lafil 200<sup>eco</sup> - Plus</b>	Lafil 200 / 200 <sup>eco</sup> , Oil Free Vacuum Pump
	4L PP Vacuum Bottle with Quick-Coupling Connectors
	Plus, Suction Kit
	Syringe Filter (0.2 µm, PTFE)
	Silicone Tube
	Repair Kit
	Power Adaptor

\* The basic model of Lafil 200 - Plus (Cat. No. 197205b-01/02) is equipped with a PP vacuum bottle featuring a hose-barb connection, instead of quick-coupling connectors.

Model	Standard Package Includes:
<b>Lafil 200 - BioDolphin</b> <b>Lafil 200<sup>eco</sup> - BioDolphin</b>	Lafil 200 / 200 <sup>eco</sup> , Oil Free Vacuum Pump
	4L PP Vacuum Bottle with Quick-Coupling Connectors
	BioDolphin, Suction Kit
	Syringe Filter (0.2 µm, PTFE)
	Silicone Tube
	Repair Kit
	Power Adaptor

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



**Lafil 300 / 400 - Plus**



**Lafil 300 / 400 - BioDolphin**

<b>Model</b>	<b>Standard Package Includes:</b>
<b>Lafil 300 - Plus</b> <b>Lafil 400 - Plus</b>	Lafil 300 / 400, Oil Free Vacuum Pump
	1200 ml PES Vacuum Bottle
	Plus, Suction Kit
	Syringe Filter (0.2 µm, PTFE)
	Silicone Tube
	Repair Kit
	Power Cord

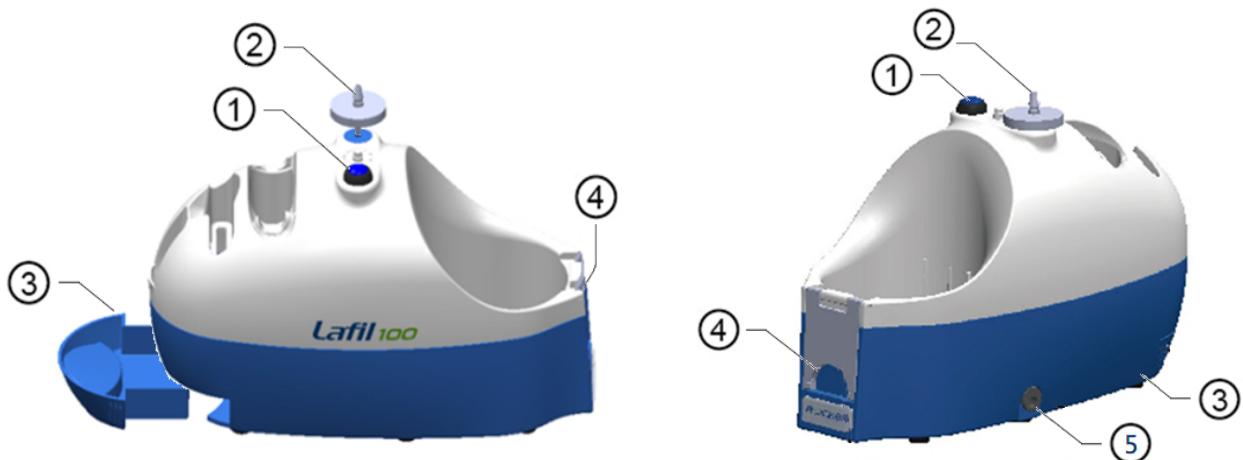
<b>Model</b>	<b>Standard Package Includes:</b>
<b>Lafil 300 - BioDolphin</b> <b>Lafil 400 - BioDolphin</b>	Lafil 300 / 400, Oil Free Vacuum Pump
	1200 ml PES Vacuum Bottle
	BioDolphin, Suction Kit
	Syringe Filter (0.2 µm, PTFE)
	Silicone Tube
	Repair Kit
	Power Cord

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

### 3. Main Part Diagram

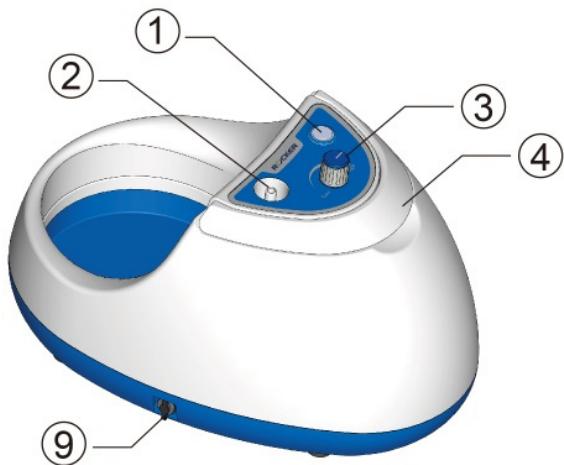
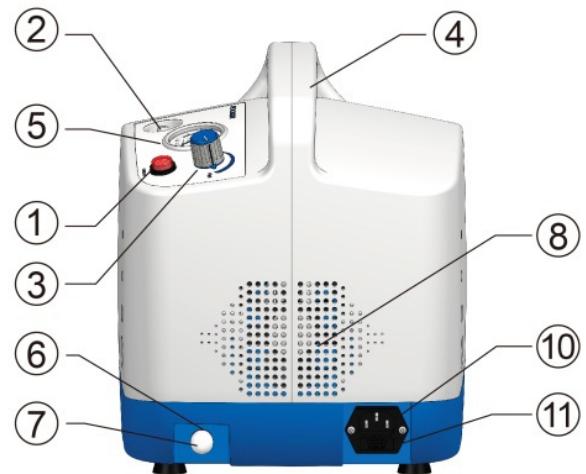
#### (1) Vacuum Pump

**Lafil 100 / Lafil 100<sup>eco</sup>**



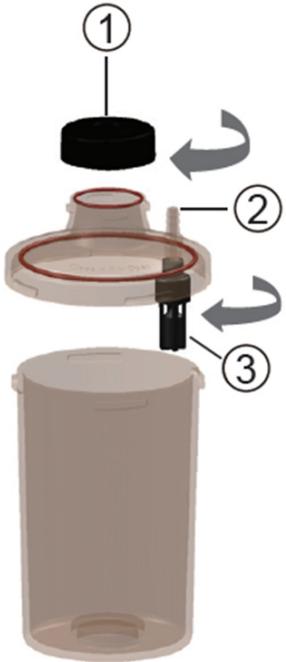
Item	Designation	Item	Designation
1	Power Switch	4	Centrifuge Tube Rack
2	Inlet (Syringe Filter)	5	DC Socket
3	Liquid Collection Tray		

\* The power switch of Lafil 100<sup>eco</sup> is black with blue light. Refer to **6. Troubleshooting** when light is flickering.

**Lafil 200 / Lafil 200<sup>eco</sup>****Lafil 300 / 400**

Item	Designation	Item	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 <sup>eco</sup>	Lafil 300 / 400	Lafil 200 / 200 <sup>eco</sup>
			

1. The silicone tube and overflow protection device are installed on inside of the cap corresponding to each "LIQ" and "AIR".

- The 1000 mL PP Bottle does NOT include an overflow protection device. An optional SC45 suction cap kit (Cat. No. 197000-61-P2) is available to add this device.

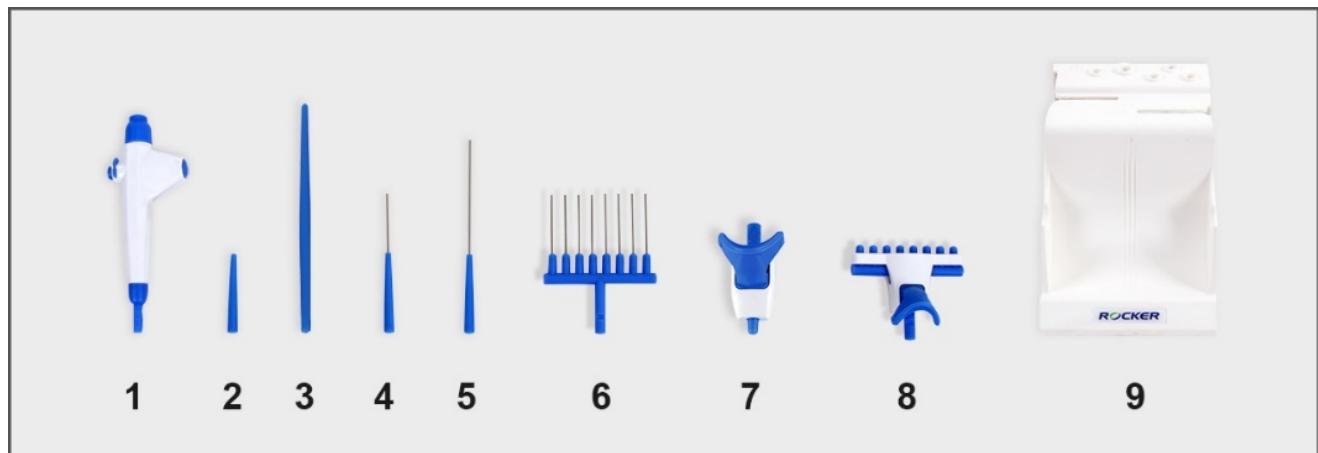
2. The entire vacuum bottle are autoclavable (121°C, 1 bar, 20 min).

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.

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

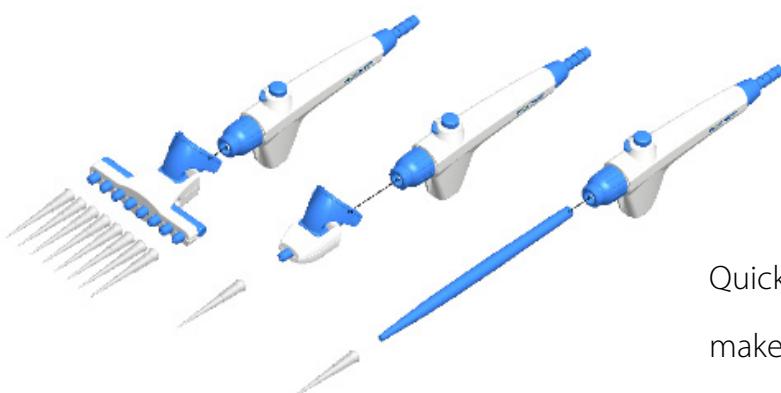
### (3) Suction Kit

Except for the rack, the suction kit is autoclavable, and the fitting can be easily plugged into the handle for quick replacement.



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



Quick connection  
makes easy installation of adaptors.

## 4. Installation and Operation

### (1) Suction System Operation



- A. Turn on the pump, block the pump inlet and regulate the desired vacuum using vacuum regulator, then turn off the pump.
  - Vacuum regulation is applicable only to Lafil 200 / 200<sup>eco</sup> / 300 / 400.
- B. Assemble the vacuum pump and vacuum bottle as shown in 3. Main Part Diagram, then put the assembled bottle onto the Lafil vacuum pump.
  - The syringe filter should be installed to maintain suction efficiency and block aerosols:
    - Lafil 100 / 100<sup>eco</sup>: Insert the syringe filter into air inlet of main unit.
    - Lafil 200 / 200<sup>eco</sup> / 300 / 400: Install the syringe filter between the vacuum bottle outlet (AIR) and pump inlet.
- C. Connect the pump inlet and the vacuum bottle outlet (AIR) using silicone tube.
  - All syringe filters are hydrophobic PTFE and prevent liquid and aerosols from entering the pump. Replace the filter if it becomes wet or dirty, following the original or better specification:
    - Lafil 100 / 100<sup>eco</sup> syringe filter: Cat. No. 197100-43 (PTFE, 0.45 µm, 25 mm)
    - Lafil 200 / 200<sup>eco</sup> / 300 / 400 syringe filter: Cat. No. 167200-65 (PTFE, 0.2 µm, 50 mm)
- D. Connect the vacuum bottle inlet (LIQ) to handle of suction kit using long silicone tube.
- E. Choose the suitable fitting and plug it into the handle according to type of container being used, e.g. 96 well plate, 10 cm dish, and cell culture flask.
- F. Turn on the pump, attach an appropriate pipette tip, and press the switch to start suction waste liquid.
- G. After finishing experiment, suck pure water to rinse the flow path. Then turn off the vacuum pump and clean the suction kit if needed.
- **Energy-saving models Lafil 100<sup>eco</sup> and Lafil 200<sup>eco</sup> automatically stop when reaching maximum vacuum and resume operation when activated again.**

## (2) Flexible Usage of Lafil Suction System

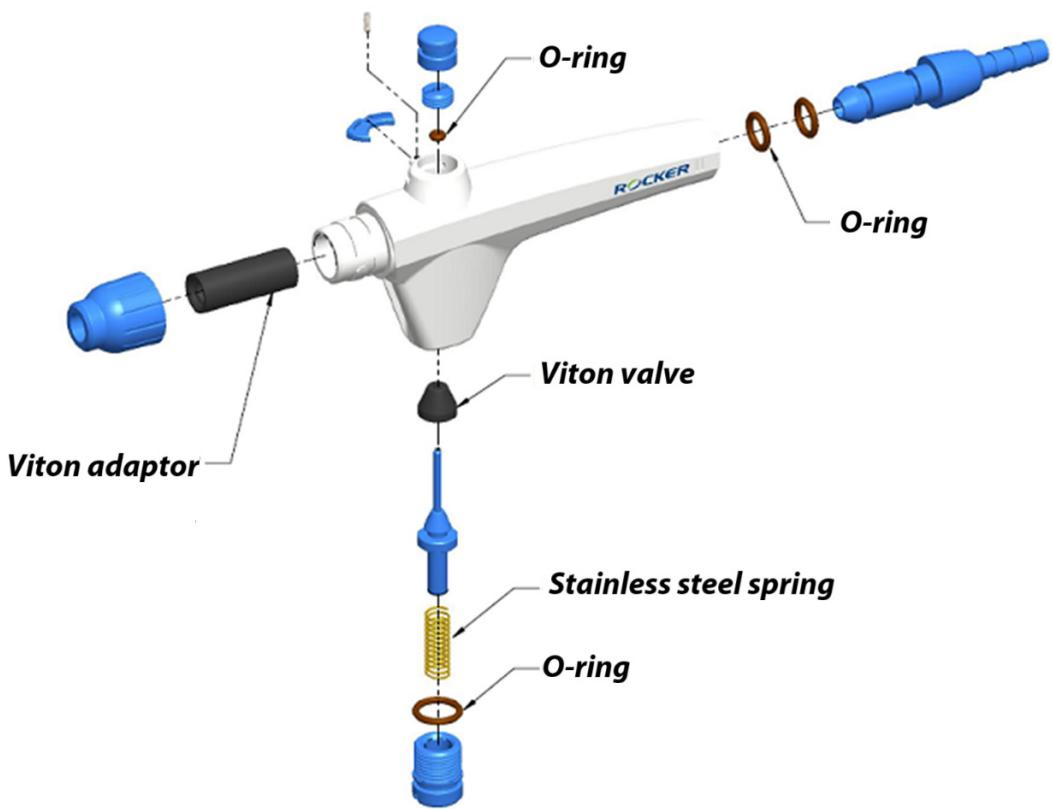
Model	Lafil 100 / 100 <sup>eco</sup>	Lafil 200 / 200 <sup>eco</sup>
Compatible with	(Std.) 1000 mL PP bottle (Opt.) 500 mL glass bottle	(Std.) 4000 mL PP bottle (Opt.) 3500 mL glass bottle

\* When using GL45-thread glass bottles, the GL45 suction cap must be used. The SC45 suction cap kit (Cat. No. 197100-61-P2) is recommended as it provides overflow protection.



## 5. 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°C, 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 is consumables and should be changed while it gets wet or dirty. Please change a syringe filter with hydrophobic PTFE, 0.45 µm or 0.22 µm pore size, or equivalent.
7. O-ring(s), adaptor, valve of handle and silicone tube(s) and 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 model; 1.5A fuse for 220V model.



## 6. Troubleshooting

Issue	Cause and Solution
<b>Failed to start</b>	<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>
<b>Failed to adjust vacuum</b>	<ul style="list-style-type: none"> <li>• Loose regulator → Tighten regulator by yourself or contact distributor for assistance.</li> <li>• Faulty vacuum regulator → Contact distributor for assistance.</li> <li>• Faulty vacuum gauge → Contact distributor for assistance.</li> </ul>
<b>Poor vacuum</b>	<ul style="list-style-type: none"> <li>• Improperly vacuum setting → Adjust the vacuum regulator.</li> <li>• Clogged muffler → Replace a new muffler.</li> <li>• Air leakage → Replace or tighten the tubing and accessories that possible leaks.</li> </ul>
<b>Low suction speed</b>	<ul style="list-style-type: none"> <li>• Improperly vacuum setting → Adjust the vacuum regulator.</li> <li>• Air leakage → Replace or tighten the tubing and accessories that possible leaks.</li> <li>• Full vacuum bottle → Empty the vacuum bottle.</li> <li>• Blocked syringe filter → Replace a new syringe filter.</li> </ul>
<b>Flickering light on power switch (Lafil 100<sup>eco</sup> only)</b>	<ul style="list-style-type: none"> <li>• Folded tube → Unfold the tube and restart the instrument.</li> <li>• Blocked syringe filter → Replace a new syringe filter and restart the instrument.</li> </ul>
<b>Others</b>	<ul style="list-style-type: none"> <li>• Contact distributor for assistance.</li> </ul>

# Ordering information

197100-01(02)	Lafil 100, Portable Suction System, AC100~240V adaptor, US plug (EU plug)
197110-01(02)	Lafil 100 <sup>eco</sup> , 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)
197205b-01(02)	Lafil 200 - Plus, Suction System (PP vacuum bottle w/ hose barb), AC100~240V adaptor, US plug (EU plug)
197213-01(02)	Lafil 200 <sup>eco</sup> - BioDolphin, Suction System, AC100~240V adaptor, US plug (EU plug)
197215-01(02)	Lafil 200 <sup>eco</sup> - 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
197200-47	4000 mL PP Vacuum Bottle (Hose barb)
197100-43	Syringe filter for Lafil 100 series (PTFE, 0.45 µm, 25 mm)
167200-65	Syringe filter for Lafil 200 / 300 / 400 series, (PTFE. 0.2 µm, 50 mm)
197000-60	GL45 Suction Cap
197000-61-P2	SC45 Suction Cap Kit (w/ overflow protection device)
199100-30	Handle of BioDolphin Suction Kit
199100-51	BioDolphin Repair Kit (include L type cleaning rod, SS spring, silicone sleeve)
199100-68	Silicone tube, Ø4.2 x 8 mm, 2 m
197100-48	Anti-UV Cloth Cover for Lafil 100 / Lafil 100 <sup>eco</sup>
197400-45	PE Muffler (1/8 PT) for Lafil 300 / 400

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