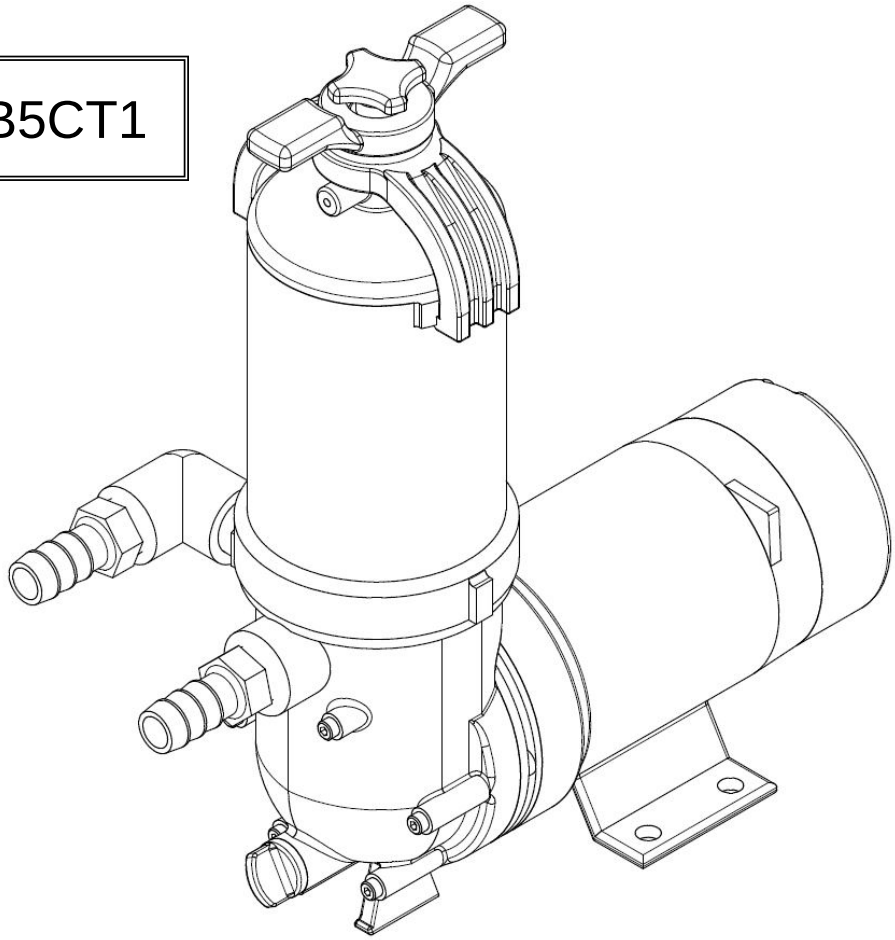
Self-priming filter pump

CHEMIFINE

INSTRUCTION MANUAL

Version: 240515

YD-13B5CT1



Notes

- Make sure that this instruction manual is delivered to the person responsible for use of this pump.
- Read and understand the cautions in this instruction manual before using.
  It is recommended to store the instruction manual where it can be easily accessed.

World Chemical Co.,Ltd.

PREFACE

Thank you for purchasing our product.

When using our YD-13B5CT1, Self-priming Filter pump, it is necessary to operate correctly and maintain periodically according to the instruction manual. Before using, read and understand the safety precautions in it.

Also, it is recommended to store the instruction manual always at hand while operating the pump.

World Chemical shall not be responsible for accidents caused by any usage method not described in this manual. When you need to take measures, we will let you be the judge of what is best for you.

The pump given in this manual might be changed with no prior notice due to product improvement.

TABLE OF CONTENTS

1. SAFETY PRECAUTIONS (To be observed at all time)

The following procedures are intended to protect you from personal injury and/or property damage.

- The following symbols classify the degree of danger and explain the damages that could occur when its contents are ignored and the pump is used erroneously.
- The type of rules to be observed are classified and explained under the following symbols. (The following are examples of picture displays.)

 **Warning**	Indicates that there is a possibility of "death or a serious injury".
 **Caution**	Indicates that there is a possibility of "an injury or property damage only.

	Indicates a "caution".
	Indicates a "prohibition".
	Indicates a "mandatory action".

 Warning

(1) Using for dangerous liquid or atmosphere

When transferring dangerous liquid by this filter pump, observe the equipment standards set forth by law and make sure to perform daily inspection to prevent liquid leak. If the filter pump is operated under the abnormal condition such as liquid leakage may cause a physical injury, an explosion or fire. In point of used liquid, comply with instructions or the supplier or manufacturer.

Never use the pump for combustible gas or flammable liquid. Do not place any combustible gas or flammable liquid nearby. (The motor does not have an explosion-proof structure.)

When handling chemical liquid, wear protective cloth, protective goggles, protective gloves, and rubber boots.

If chemical liquid contact with your skin, immediately wash it off with a large amount of pure water, and see a doctor as necessary.

If chemical liquid enters your eye, immediately wash it off with a large amount of pure water with your eye open, and see an ophthalmologist promptly.

(2) Prohibition to use a damaged or modified filter pump

Using a damaged or modified filter pump may cause a physical accident, electric shock, or failure. Such use shall not be covered by our warranty.

(3) Prohibition of work with the power on

Do not perform inspection or disassembly of the filter pump or motor while the power is on. It may cause you to get caught in the rotating part, or a physical accident such as an electric shock. In addition to the main power and operation switch, use the hand switch of the filter pump for multiple safety measures.

(4) Connection of an earth wire

Using the motor without an earth wire may cause an electric shock. A qualified person must ground it according to the guide book of electrical equipment and indoor wiring regulations. [The motor base has a connection point of an earth wire.]

(5) Protection of a power cord

Pulling, tucking, or damaging a power cord or motor lead wire may damage the cable, causing fire or an electric shock.

(6) Installation of ground-fault interrupter

If a ground-fault interrupter is not installed when using the filter pump, an electric shock may occur. Install a ground-fault interrupter or overcurrent protective device to prevent electric accidents or motor damage.

(7) Cautions on removing the filter pump

Touching chemicals directly may be hazardous, so wear protective equipment before starting work.

(8) When stopping and starting the filter pump at a bath with a high risk of producing hydrogen gas.

<u>At the time of shutdown</u>

Depending on types of chemical liquid (*1), metal components on the filter may generate hydrogen gas during the shutdown period.

At that time, when the valves of the inlet and outlet piping are fully closed, the front casing of the pump may be damaged due to the pressure of the generated gas.

When closing the valves of the piping to stop the filter pump, make sure to perform the following operations.

(1) Keep the air release bolt open for outgassing until operation starts.

(2) At the same time, open the drain plug to discharge all liquid in the front casing. Keep the drain plug open until operation starts.

<u>At the start of operation</u>

When starting the filter pump, pour priming water after closing the air release bolt and drain plug, and then turn the power switch “on”.

(*1) Bath with a high risk of producing hydrogen gas

(a) Plating bath with zinc substitution process (zincate bath and other plating bath)

(b) Electroless nickel plating bath

(c) Electroless copper plating bath

(d) Other plating bath that may disintegrate while stopped

(9) Device maintenance

Before maintenance, inspection, or repair of devices, turn off the wiring breaker of the primary-side power supply and put a "At work" sign to avoid human injury due to accidentally turning on the power.

Caution

(1) Prohibition of out-of-scope use

Do not use the filter pump with any specification other than listed on the filter pump specification or nameplate. Especially, check the motor power supply specifications (phase, voltage, and frequency) before connecting. Wrong use may cause a physical injury or damage of the filter pump or peripheral devices.

(2) Restriction on users

Perform to wire, operate or maintain by an expert with much knowledge about handling the filter pumps.

(3) Ventilation

If any obstacle blocking ventilation is placed around the filter pump, the motor may cause overheat.

When handling poisonous or odorous liquid, install the filter pump at the place with sufficient ventilation because of a risk of intoxication.

(4) Repair and return

If repairing the damaged filter pump, contact our sales representatives or your distributor.

When returning the filter pump by transportation service or parcel delivery service, wash the ins and outs of the filter pump with pure water, check no liquid adhered and wrap it with a plastic bag.

(5) Resin parts

The filter pump consists of resin parts, so a strong shock may damage it and is caused to physical injury. Additionally, install a piping support to prevent piping load from being applied directly on the filter pump.

The pressure capacity of the material is affected by temperature, because the filter pump is made of plastic, not metal. That is why take account of the allowable pressure, when using it for high temperature.

Component parts : Glass fiber reinforced polypropylene / Alumina ceramics / Polysulfone, etc.

O-ring : FPM and FKM (fluorine-contained rubber)

Use the filter pump with liquid that can be used with the above materials.

As an independent or interaction effect, the chemical resistance of the materials is affected by various conditions of used liquid such as a type, concentration, liquid temperature, interaction of the liquid, stress on the part, liquid-contact time, and other conditions. Therefore, chemical resistance cannot be guaranteed. When using the filter pump, check the chemical resistance by conducting chemical resistance tests of each material under the operating conditions as far in advance as possible.

Aging due to the environment to instal will necessarily occur. For using the filter pump safely for a long time, conduct daily inspection and take measures promptly including parts replacement.

The housing (Polysulfone) cannot be used for any liquid containing solvent, surface acting agent, or amine. It may cause a crack or damage.

If the inner wall of the housing (Polysulfone) discolors into white, replace it with a new item promptly because it may result in a crack or damage.

(6) Starting of the filter pump

Firstly, open the suction and discharge valves and check for no liquid leakage at the pipe connection.

The filter pump is a self-priming pump, but make sure to check that there is enough priming water in the filter pump and turn the power “on”. (Pour water before turning the power “on”, if there is not enough priming water.)

When operation is started, fully open the valve at the suction pipe, because the liquid is self-pumped from the suction piping by using the priming liquid in the filter pump.

Do not run the filter pump dry. It may burn the impeller bearing and shaft, and melt mold parts made of thermoplastic resin, causing liquid leakage and failure.

(7) Air release

When removing air from the housing, turn the air release bolt counterclockwise by one turn (360 degrees). This is enough to release air sufficiently, so do not turn it more than one.

If turning it more than one, the air release bolt is removed from the housing and liquid in the housing blow out.

(8) Disposal of the filter pump

When discarding used filter materials, dispose them as industrial waste according to the related laws and regulations after removing accumulated liquid.

(9) Leaked protection measure

Just in case, take appropriate protective measures for perchance leaking liquid due to damaged filter pump or pipe.

(10) Liquid to use

To use the filter pump for especially harmful liquid such as cyan, provide protective measures and sufficient safety measures in case of liquid leakage.

Limit of liquid to use	Temperature	: 60 degrees or less
	Viscosity	: 20mPa·s or less
Maximum pressure	100kPa (at 25 degrees)	

The filter pump is made of commodity plastic. The material is as described, and deterioration, damage, or melting of material may occur due to lower performance or aging of the plastic depending on the operating conditions. If the pump is used for such kind of liquid, its durability may drop significantly.

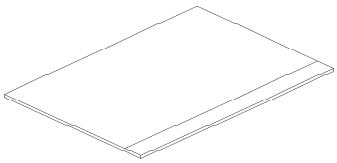
For these reasons, check and maintain the filter pump to be able to find any abnormality in the early stage.

If the liquid is used for the first time, consult us.

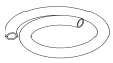
2. CAUTIONS ON OPERATION

Check that the following items are present after unpacking.

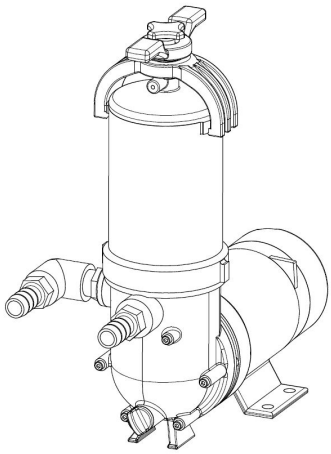
1. Instruction Manual 1
2. Pump 1
3. Air release hose (40cm) 1 [Outer diameter Φ13, Inner diameter Φ10]
4. Disassembly tool 1



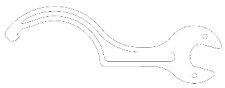
Instruction Manual



Air release hose



Pump



Disassembly tool

3. MODEL DISCRIPTION

YD - 13 B5 CT1 – GP – F D 7 2 - M

(1) (2) (3) (4) (5) (6) (7) (8) (9)

(1) Discharge bore: Equivalent to 13A

(2) Motor output : B5: Single-phase 100V / 55W (50/60Hz)

(3) Model: CT1: Self-priming filter pump

(4) Main material: GP: GFR-PP Glass fiber reinforced polypropylene

(5) Bearing material: F: PTFE

(6) O-ring material: D: FPM and FKM (fluorine-contained rubber)

(7) Frequency: 7: For both 50Hz and 60Hz

(8) Limit of liquid specific gravity. 2: Up to specific gravity of 1.2

(9) Option: M: With handy switch (including plug)

4. STANDARD SPECIFICATION

Model	YD-13B5CT1
Filtration rate (pure water standard)	50Hz：240～900 L/h 60Hz：300～1,020 L/h
Minimum flow rate (pure water standard)	2.0L/min
Maximum temperature to use (hot water)	60 degrees or lower
Maximum pressure (25 degrees)	0.1MPa
Main body weight	3.9kg
Applicable connection hose diameter	Inner diameter: 19mm
Self-priming ability (at 0.5m suction)	50Hz/60Hz: 35 sec.
Self-priming limit (pure water at 20 degrees)	0.5m

Applicable cartridge filter

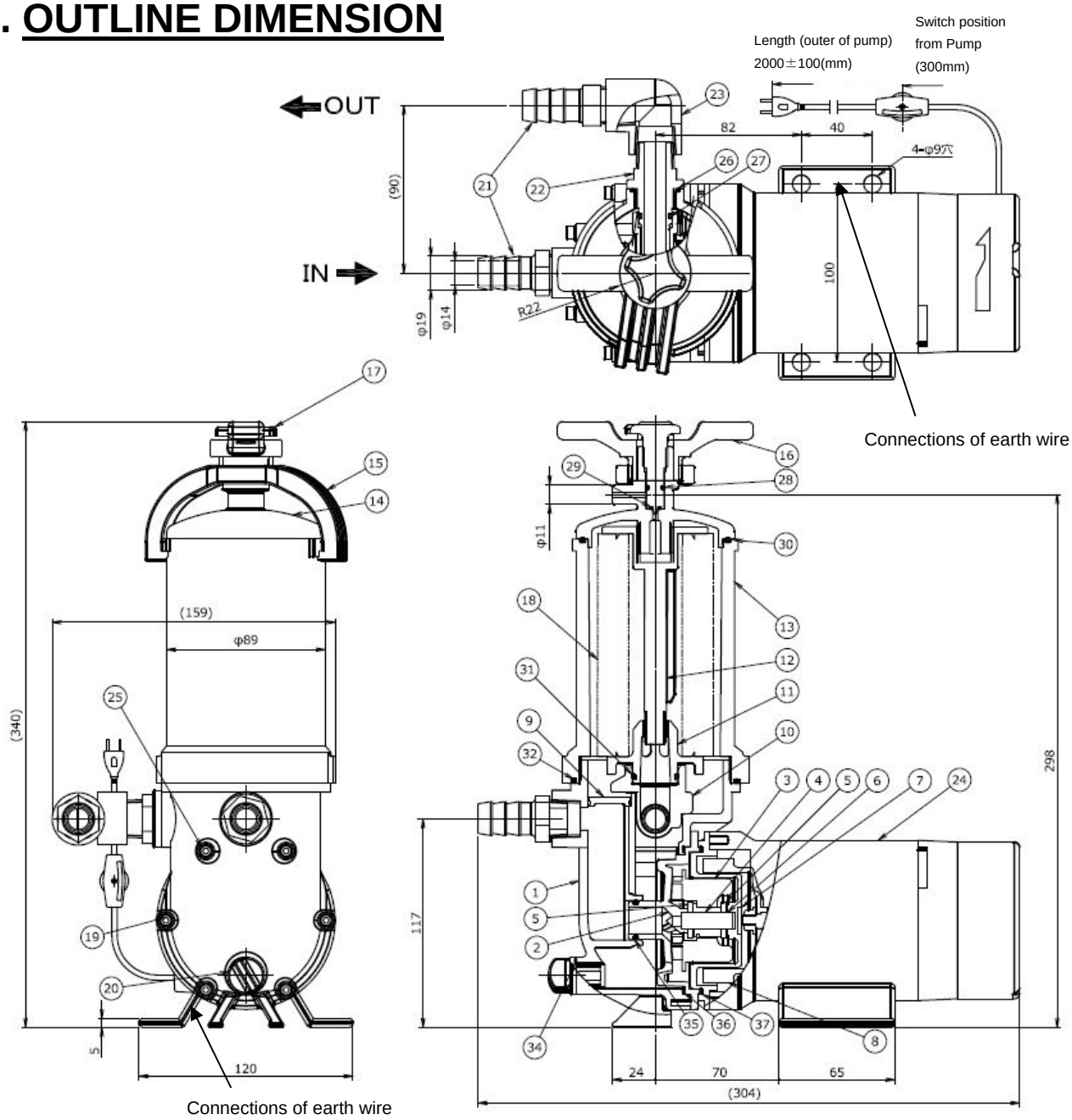
Depth Filter (Sell separately, Marketed product)

Cartridge length: 122~125mm

Cartridge inner diameter: MinΦ28mm

Cartridge outer diameter: Φ65mm

5. OUTLINE DIMENSION



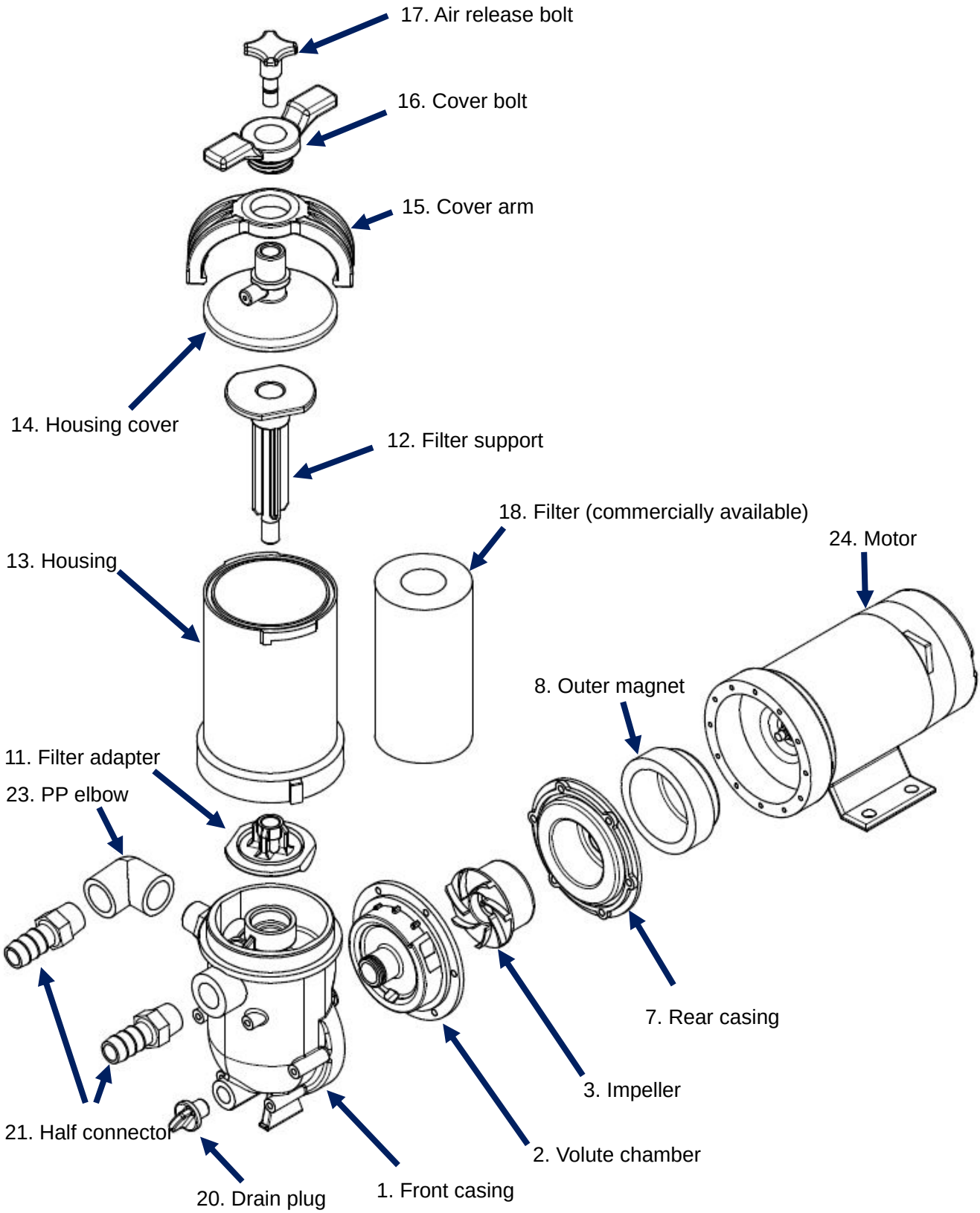
PARTS DESCRIPTION

No.	Part name	Material	Quantity	Remark
1	Front casing	GFR-PP	1	
2	Volute chamber	GFR-PP	1	
3	Impeller	GFR-PP+Ferrite	1	
4	Bearing	PTFE	1	
5	Thrust ring	Alumina ceramics	2	
6	Shaft	Alumina ceramics	1	
7	Rear casing	GFR-PP	1	
8	Outer magnet	GFR-PP+Ferrite	1	Plastic magnet
9	Self-priming chamber cover	GFR-PP	1	
10	Discharge elbow	GFR-PP	1	
11	Filter adapter	GFR-PP	1	
12	Filter support	GFR-PP	1	
13	Housing	PSF	1	
14	Housing cover	GFR-PP	1	
15	Cover push arm	GFR-PP	1	
16	Cover push bolt	GFR-PP	1	
17	Air release bolt	GFR-PP	1	
18	Filter		1	122~25mm (Marketed product)
19	Hexagon socket head bolt(with W, SW)	SUS304	4	M4 X 60mm
20	Drain plug	GFR-PP	1	
21	Connector	PP	2	R1/2
22	Discharge piping	GFR-PP	1	
23	PP elbow	PP	1	Rc1/2
24	Motor		1	55W
25	Hexagon socket head bolt(with W, SW)	SUS304	2	M4 X 80mm
26	Outer O-ring for discharge piping	FPM	1	
27	Inner O-ring for discharge piping	FPM	1	
28	O-ring for air release bolt: 1	FPM	1	
29	O-ring for air release bolt: 2	FKM	1	
30	O-ring for housing cover	FPM	1	
31	O-ring for filter adapter	FPM	1	
32	O-ring for housing	FPM	1	
34	O-ring for drain plug	FPM	1	
35	O-ring for self-priming chamber	FPM	1	
36	O-ring for volute chamber	FPM	1	
37	O-ring for rear casing	FPM	1	

Repair Parts Purchase List

Unit No.	Item name	Part No.	Part name	Material	Quantity
1	Pump set	1	Front casing	GFR-PP	1
		2	Volute chamber	GFR-PP	1
		3	Impeller	GFR-PP+Ferrite	1
		4	Bearing	PTFE	1
		5	Thrust ring	Alumina ceramics	2
		6	Shaft	Alumina ceramics	1
		7	Rear casing	GFR-PP	1
		9	Self-priming chamber cover	GFR-PP	1
		10	Discharge elbow	GFR-PP	1
		19	Hexagon socket head bolt (with W, SW)	SUS304	4
		20	Drain plug	GFR-PP	1
		21	Half connector	PP	2
		25	Hexagon socket head bolt (with W, SW)	SUS304	2
		33	O-ring for self-priming chamber cover	FPM	1
		34	O-ring for drain plug	FPM	1
		35	O-ring for self-priming chamber	FPM	1
		36	O-ring for volute chamber	FPM	1
		37	O-ring for rear casing	FPM	1
2	Housing set	13	Housing	PSF	1
		32	O-ring for housing	FPM	1
3	Motor set	8	Outer magnet	GFR-PP+Ferrite	1
		24	Motor		1
4	Filter support set	11	Filter adapter	GFR-PP	1
		12	Filter support	GFR-PP	1
		14	Housing cover	GFR-PP	1
		15	Cover arm	GFR-PP	1
		16	Cover bolt	GFR-PP	1
		17	Air release bolt	GFR-PP	1
		28	O-ring for air release bolt: 1	FPM	1
		29	O-ring for air release bolt: 2	FPM	1
		30	O-ring for housing cover	FPM	1
		31	O-ring for filter adapter	FPM	1
5	Piping elbow set	21	Connector	PP	2
		22	Discharge piping	GFR-PP	1
		23	PP elbow	PP	1
		26	Outer O-ring for discharge piping	FPM	1
		27	Inner O-ring for discharge piping	FPM	1
6	O-ring set	26	Outer O-ring for discharge piping	FPM	1
		27	Inner O-ring for discharge piping	FPM	1
		28	O-ring for air release bolt: 1	FPM	1
		29	O-ring for air release bolt: 2	FPM	1
		30	O-ring for housing cover	FPM	1
		31	O-ring for filter adapter	FPM	1
		32	O-ring for housing	FPM	1
		34	O-ring for drain plug	FPM	1
		35	O-ring for self-priming chamber	FPM	1
		36	O-ring for volute chamber	FPM	1
		37	O-ring for rear casing	FPM	1

EXPLOWDED VIEW



6. INSTALLATION (indoor)

Installation place

(1) Install the filter pump at the place which is 50cm and more higher than the liquid level of the tank.

(2) The place is a well-drained where its outer perimeter will not be exposed to any chemical liquid or gas (chlorine gas). (To protect the housing, pump and motor)

(3) Ambient temperature of 0 to 40 degrees, relative humidity of 90% RH or less

(4) When using for expensive liquid for precious metals or especially harmful liquid like cyan, provide protective measures and sufficient safety measures in case of liquid leakage.

(5) (To attach hose bands: "No hose is provided. Prepare it by yourself".)

(6) Fix the motor base and mount with bolts/nuts is for fall-prevention .

(7) Connect the 100V power cable to the two lead wires from the motor. On this occasion, installing a handy switch near the filter pump is ease to use.

7. CARTRIDGE FILTER

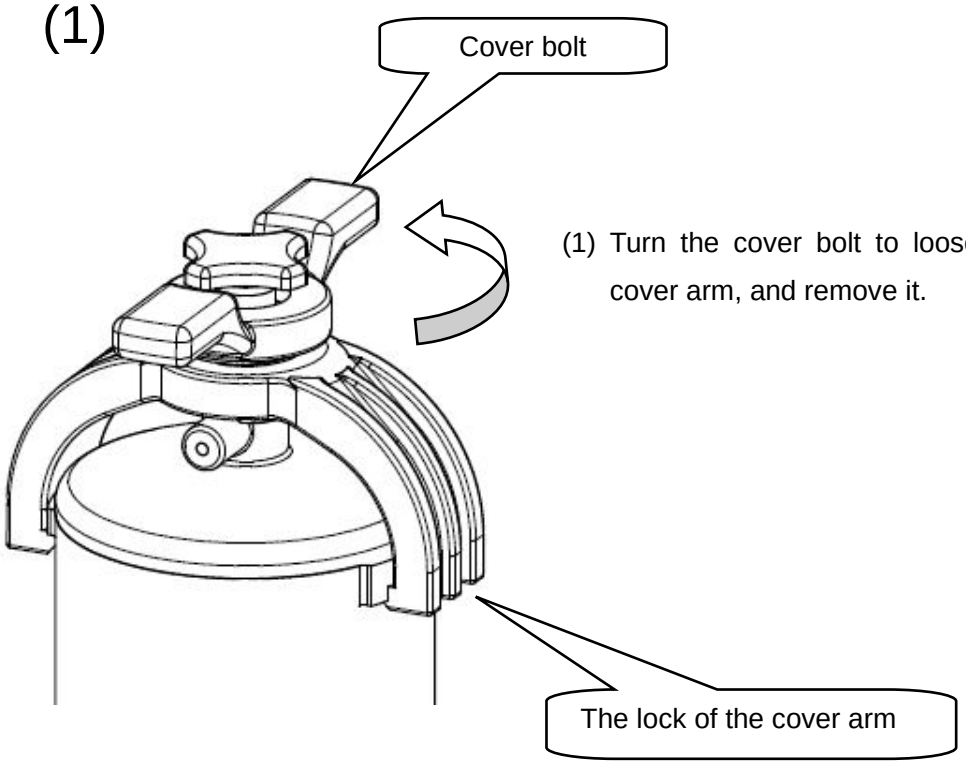
Caution

- O-ring for housing is a consumable part. It is recommended to replace it when exchanging the filter. A worn O-ring may cause liquid leakage, and should be replaced early.
- No filter is attached with this filter pump. If necessary , prepare it by yourself.

The descriptions of steps (1) through (5) are as follows.

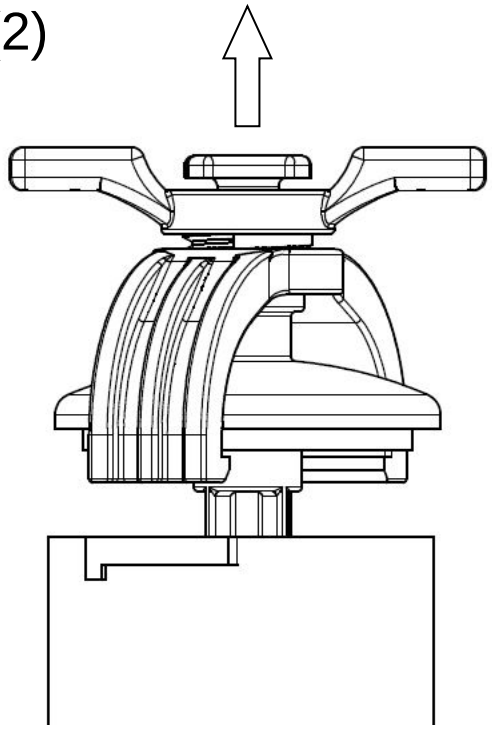
Installing the Cartridge Filter

(1)



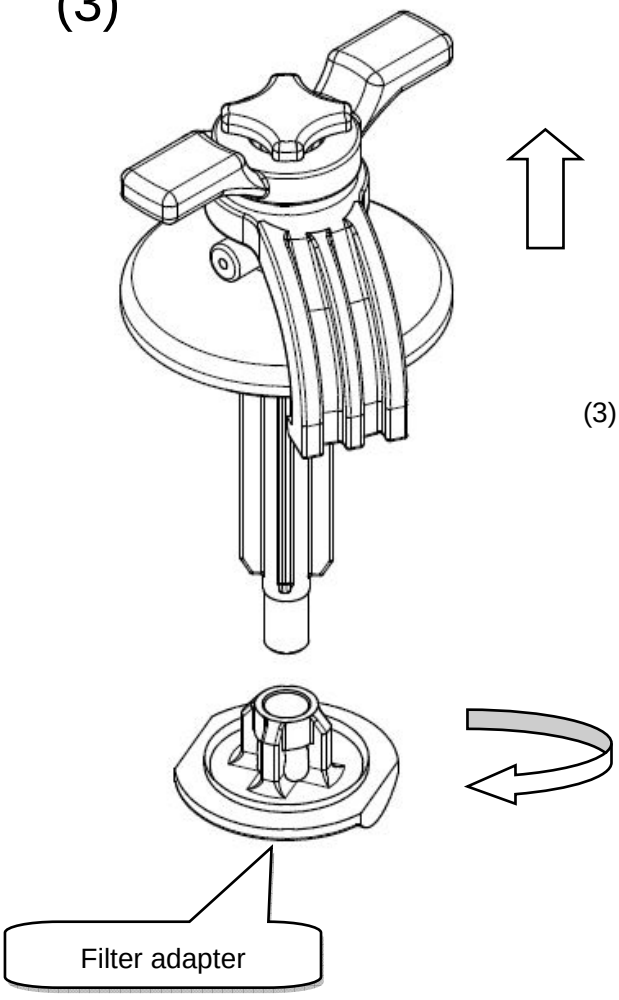
(1) Turn the cover bolt to loosen the lock of the cover arm, and remove it.

(2)



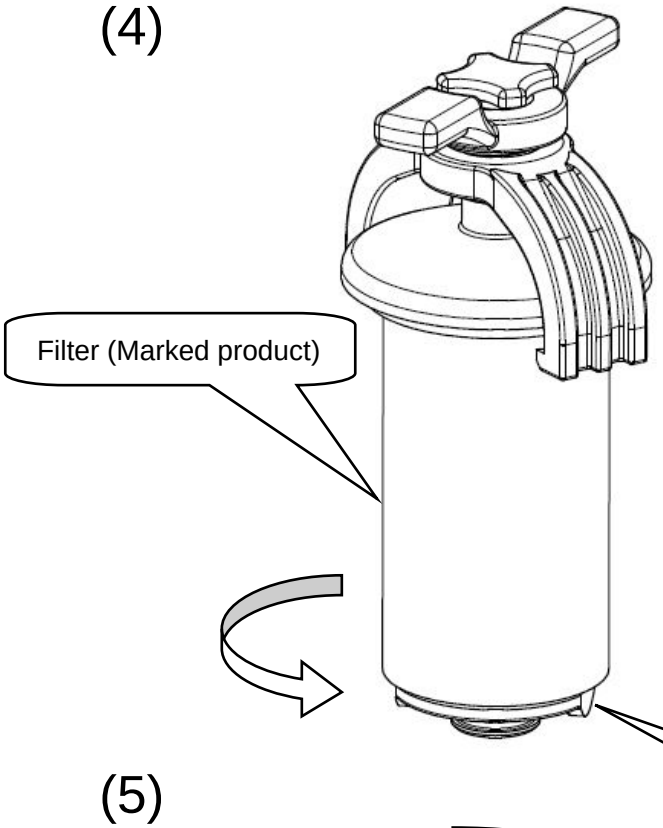
(2) Lift it upward.

(3)



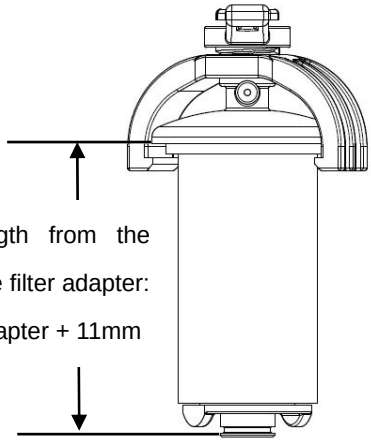
(3) Remove the filter adapter and install the 1/2L filter.

(4)



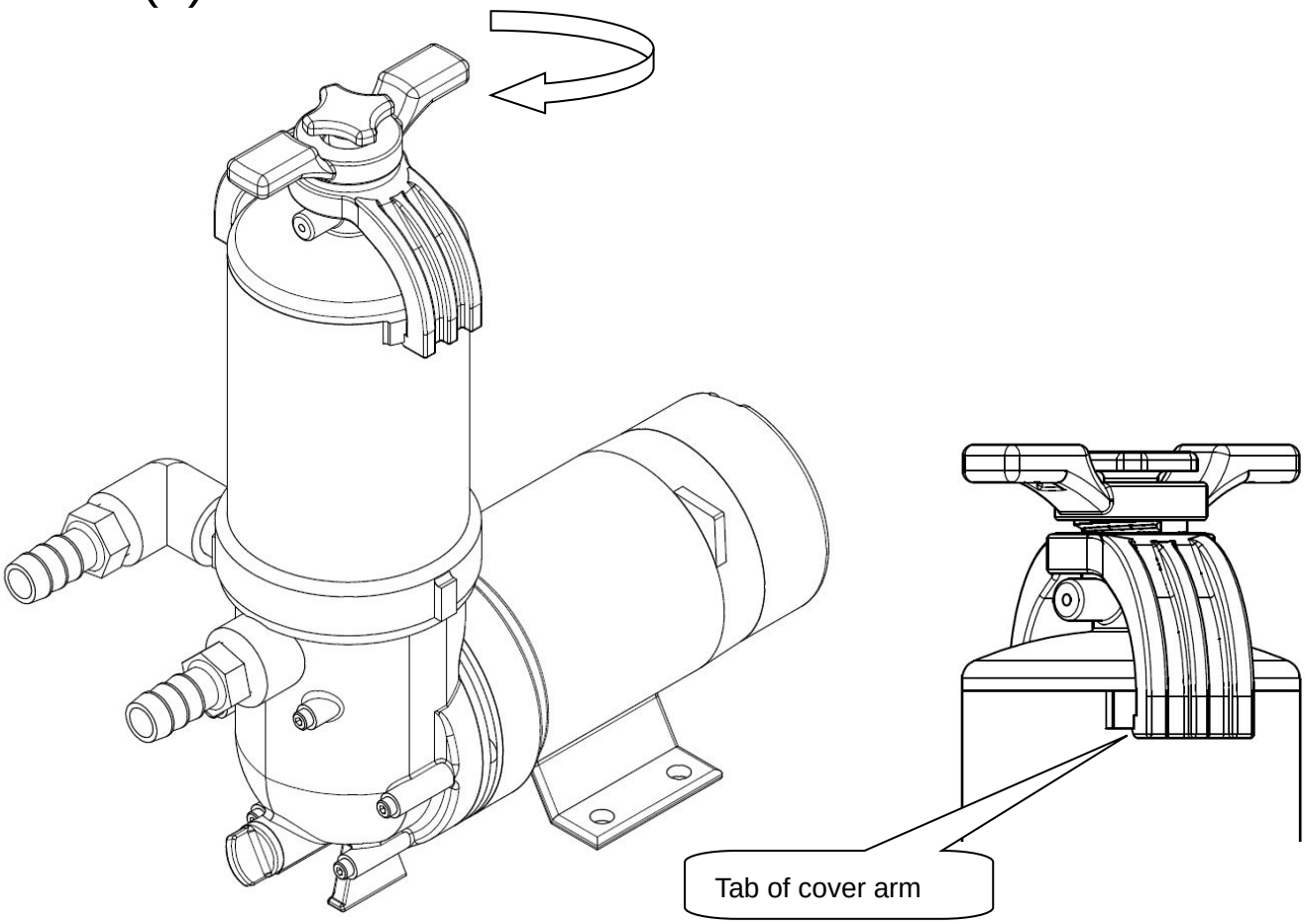
(4) Install the fillter

Tighten the filter adapter.



The recommended length from the cover to the bottom of the filter adapter: The length of the filter adapter + 11mm

(5)

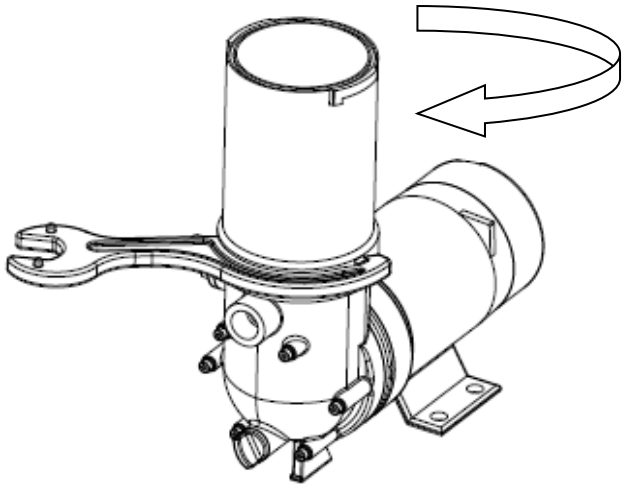


(5) After the claw of the cover arm is hooked onto the housing, turn the bolt for the cove to tighten.

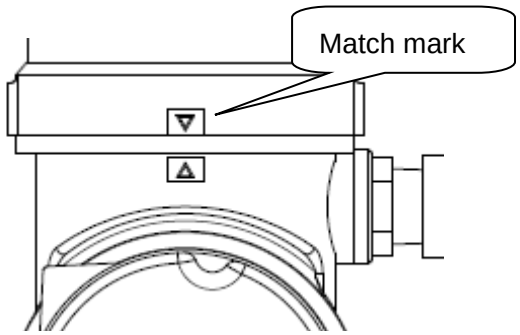
If the liquid leaks even if it has been tightened sufficiently, it is recommended to replace the O-ring.

8. MEASURES WHEN REMOVING THE HOUSING

When disassembling the housing for cleaning, make sure to assemble the filter pump by using the special tool. If not, it is not tightened with the sufficient torque and may cause liquid leakage.



Tighten it to the match mark.
Notice: When heat cycle happens or elasticity of O-ring decreases, it may be necessary to tighten it 5-10 mm more than the match mark.



* If liquid leakage occurs after tightening more, it is recommended to replace the O-ring.

9. Maintenance / Check

◆ Daily check

Make sure to conduct a start-up check before operation.
If any leakage is found, stop the operation and take appropriate measures.

Inspection details	Inspection frequency	
	Daily	Monthly
1-1 Leakage from hose connection	◎	
1-2 Leakage from cover packing and O-ring	◎	
1-3 Loose parts of deteriorated packing	◎	
1-4 Hose deformation check due to liquid temperature	◎	
1-5 Filter pump deformation	◎	
1-6 Hose band loosened check	◎	
1-7 Loosen bolt		◎
1-8 Stain in cartridge filter	◎	
1-9 Priming water in filter	◎	
1-10 Cleaning	◎	

◆ Periodical check

Overhaul the pump periodically for smooth use.
When the location change or moving the pump for repair, make sure to remove the liquid and clean the pump for your safe.
※Check term: Once every 12 months or once every 1000 hours. Please keep an inspection record

◆ Check the following consumable parts periodically and replace them when needed.

(1) Bearing (No.4) The inner diameter of the new one is ϕ 9.0mm

Check no crack or damage.

Check that the rattle between the bearing and the shaft is not big. (The limit of the inner diameter is ϕ 9.5mm)

If the total abrasion with the shaft is 0.5mm and more, recommend replacing it.

(2) Shaft (No.6) The outer diameter of the new one is ϕ 9.0mm

Check no crack or damage.

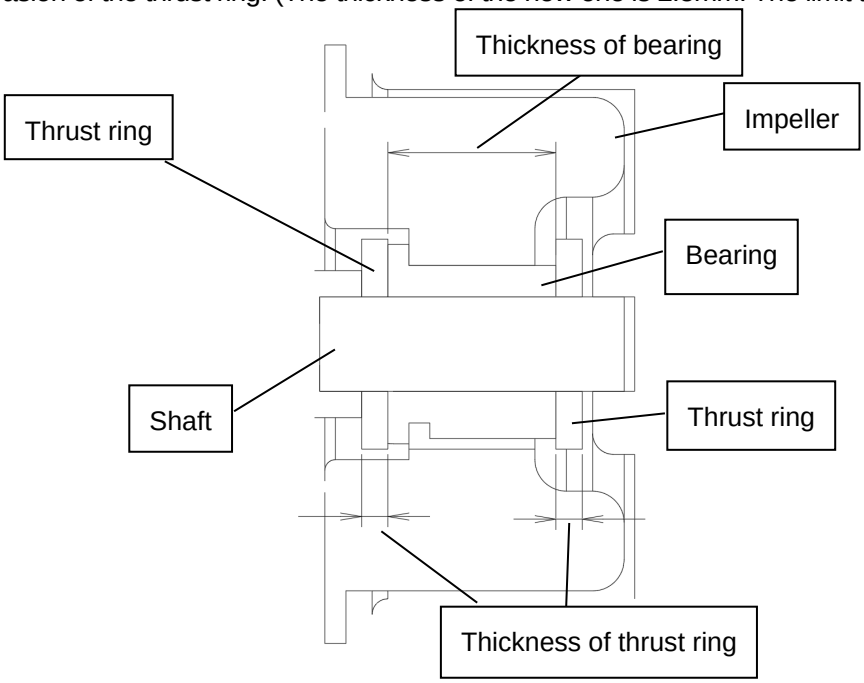
Check that the rattle between the shaft and the bearing is not big. (The limit of the outer diameter is ϕ 9.5mm)

If the total abrasion with the shaft is 0.5mm and more, recommend replacing it.

(3) Thrust ring (No.5)

Check no crack or damage.

Check the abrasion of the thrust ring. (The thickness of the new one is 2.5mm. The limit thickness is 2.0mm)



(4) Impeller (No.3) The outer diameter of the new one is ϕ 12.

Check no abrasion, scratch or damaged around the impeller.

(5) Rear casing (No.7)

Check no abrasion, scratch or damaged inside / outside of the rear casing.

(6) Casing (No.1)

Check no abrasion, scratch or damaged inside / outside of the casing.

(7) Vortex Chamber (No.2)

Check no foreign objects in the vortex chamber.

(8) O-ring (No.26~37)

Check that the rubber does not become hard and less-elasticity by degradation or swelling.

10. OPERATION

⚠ Caution

- Make sure to check before operation.
- Before turning the power “on” of the filter pump, make sure to pour priming water through the cover at the top of the housing. At least the priming water is 200cc. If the priming water is too little, it causes dry running and the filter pump damage. After priming water, close the housing cover.
  → Dry running prohibited
- After turning the power “on” of the filter pump, check for leakage, the pump part, motor operation sound, liquid discharge state, and vibration. If any abnormality occurs, stop the device immediately and take appropriate measures.
- In case of a power failure or power supply failure, turn the power “off”. Later, turn the power “on” one by one after the power is recovered.
- Turn the air bleeding bolt counterclockwise by one turn (360 degrees) to release air from the housing during operation. This is enough to release air sufficiently and do not turn it more than one. If more than one, liquid in the housing leaks from the thread of the air release bolt.
- If air enters from the joint of the suction pipe, it may cause the filter pup damage for pumping failure.
- If the liquid easily bubbles when stirring due to a surface acting agent, the self-priming ability may significantly reduce or fail completely.

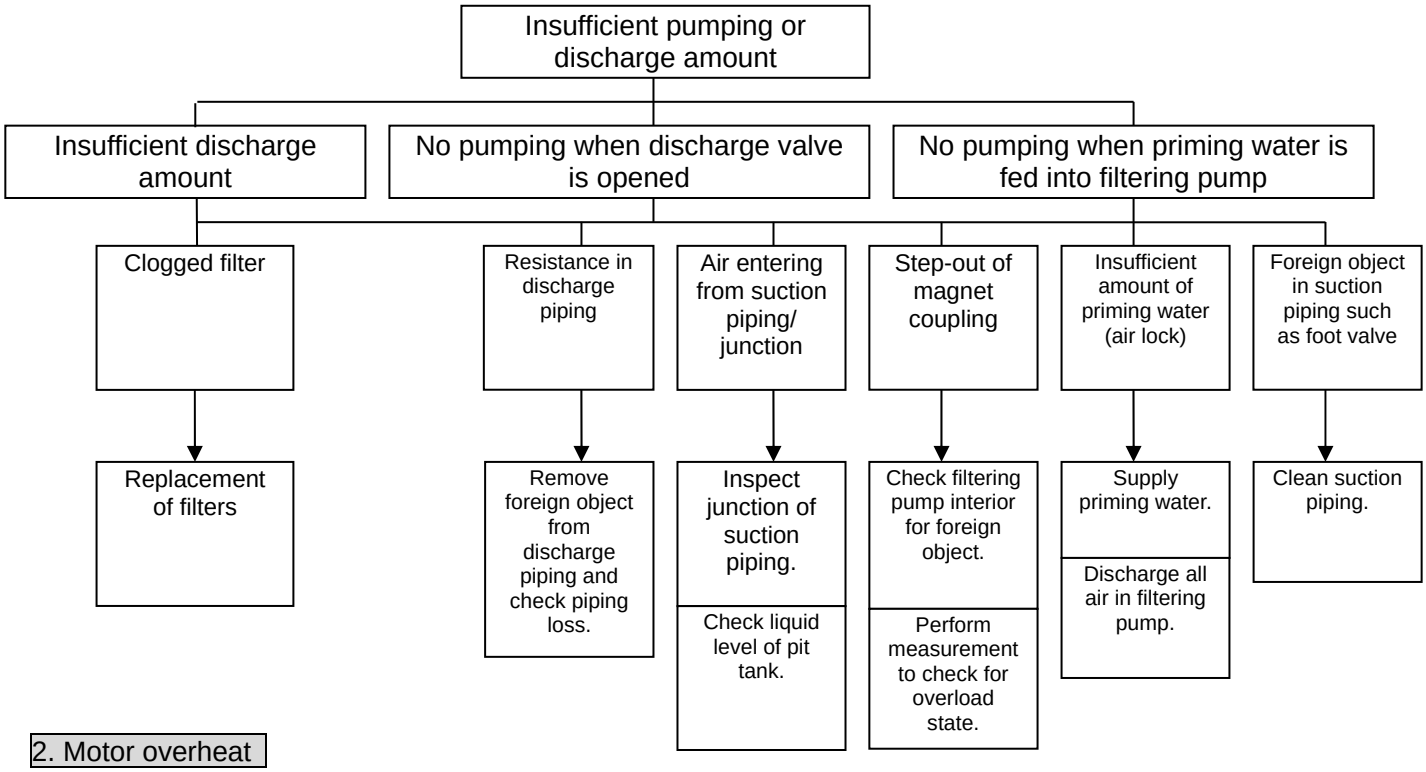
Operation order

Operate as the following order after installation, inlet/outlet piping, and start-up check.

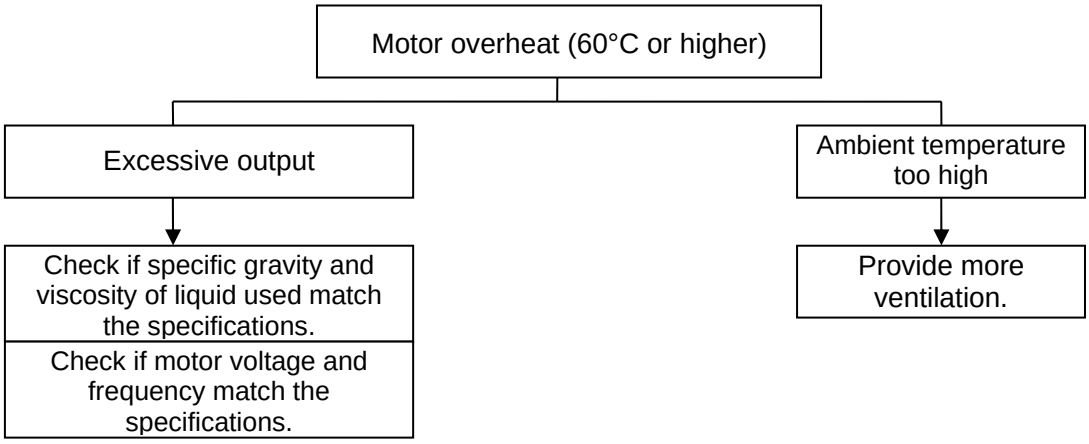
(1) Check that the drain plug, housing, housing cover and air release bolt are closed.
(2) Check that the valves of the inlet/outlet piping are open and start the operation.
(3) When the housing is filled with liquid after the operation is started, turn the air release bolt counterclockwise by one (360 degrees) and release air in the housing. At this time, hold the air release hose by hand and put the tip of the hose into a container to collect liquid.

11. TROUBLESHOOTING

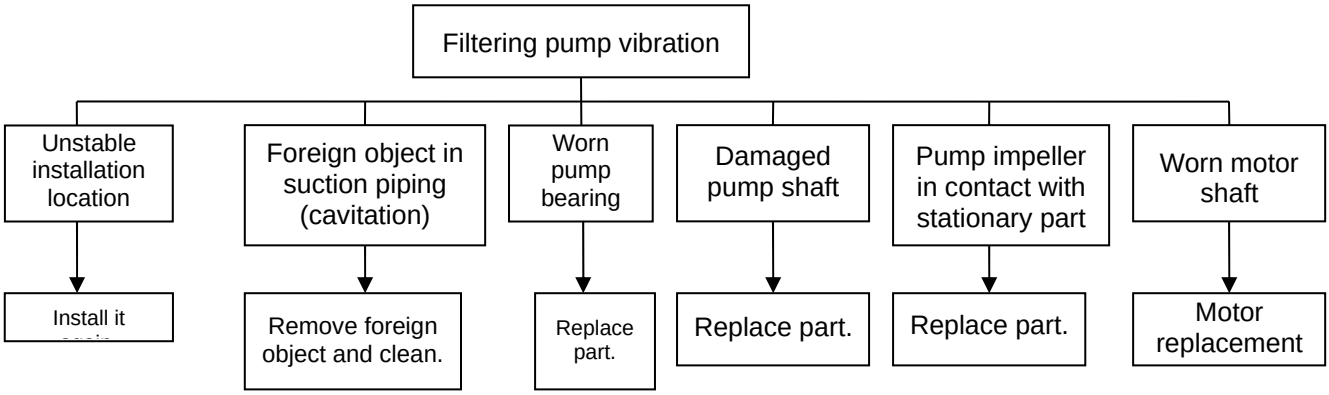
1. Insufficient pumping or discharge amount



2. Motor overheat



3. Filtering pump vibration



12. WARRANTY AND REPAIR

1. Warranty period and coverage
   (1) The warranty period is 12 months from dispatched from our factory.
   (2) During warranty period, if the pump breaks down or is damaged at the use under the condition instructed in this manual due to manufacturing defect(s), the failure parts are repaired free of charge.
   (3) Even if the failure occurs within the warranty period, the followings are repaired or replaced for compensation in principle.
      - Breakdown or damage due to different use or safekeeping from the instructions in this manual.
      - Breakdown or damage due to incorrect use or unjust repair or modification.
      - Breakdown or damage as result of pollution, salt damage, gas damage, abnormal voltage or undesigned power (voltage, frequency) as well as fire, earthquake, flood disaster, lightning strike or other natural disaster.
      - Abrasion or degradation of consumable parts like a gasket or O-ring.
      - Breakdown or damage during transportation, for relocation or fall after your purchase
   (4) We cannot be responsible for the break down or damage of the customer-specified pump.
   (5) Irregularities or breakdowns due to chemical or hydrodynamic corrosion by liquid are not covered under the warranty. The material chosen at the time of the contract is only a recommendation. We do not guarantee the chemical resistance of the material.
   (6) If the determination of the cause for the breakdown or damage is questionable, it attributes to the negotiation between the customer and us.
   (7) Expenses or other damage incurred as a result of breakdowns at the use under the different condition from the instruction in this manual are not covered under the warranty.

2. Repair

Notice:

For repair, consult the supplier. When returning a pump, thoroughly clean and pack the wet parts kit.

If irregularities are detected during operation, stop the operation immediately for check. (Refer to the section on “troubleshooting”).

   (1) Consult your supplier or us for repair.
   (2) Read this manual again and re-check before requesting repair.
   (3) When visiting to a distance location for repair, the travel expenses are charged.
   (4) Inform the followings when requesting repair.
      - Model name and serial number
      - Use duration and condition
      - Damages parts and condition
      - Liquid (Name, Specific gravity, Temperature, Slurry)

      If liquid leaks during transportation, it is very dangerous, so make sure to clean inside thoroughly. When ordering replaced parts, specify the name in the parts name list (P8, 9). Although, inform the parts’ number and material, too.

Installation record

Model:	
Purchase date:	Serial number:
Start date:	Supplier:

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WORLD CHEMICAL CO., LTD. / Japan

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