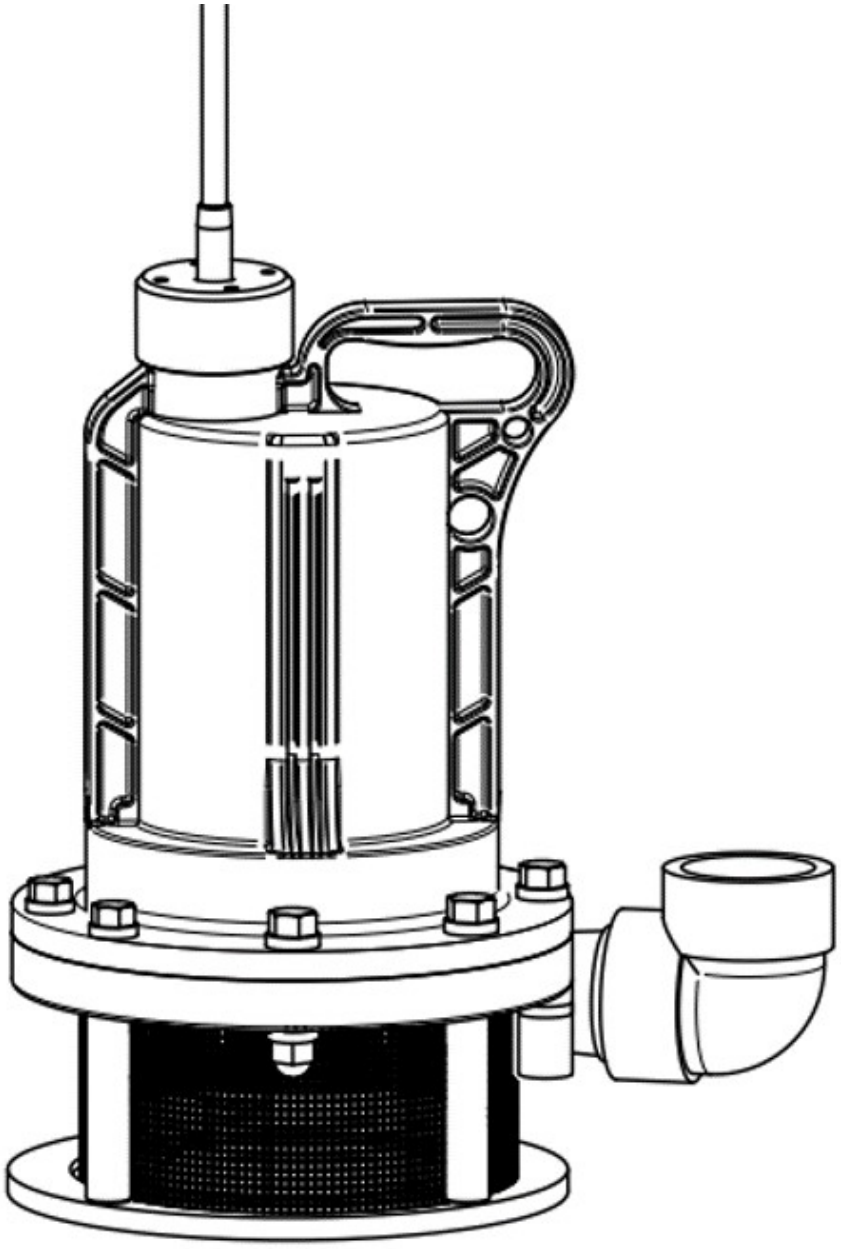
SUBMERSIBLE MAGNET DRIVE PUMP

SUBMERSE

YD-5002GWN1

INSTRUCTION MANUAL



World Chemical Co.,Ltd.

Version: 20250501

Preface

Thank you for purchasing World Chemical's SUBMERSE submersible magnet drive pump. To effectively use SUBMERSE for an extended period, operating it correctly and maintaining it as described in the instruction manual is necessary. Before use, please read and understand the safety precautions outlined in this manual."

Meanwhile, we are not responsible for any accidents resulting from the use of the pump in a manner not indicated in this manual. If additional safety measures are required, please contact your supplier or us. The specifications of the pump and the information in this manual are subject to change without prior notice for improvements or design modifications."

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⚠ Warning

Using with dangerous liquids or atmosphere

When transferring dangerous liquid using this pump, or using in potentially explosive atmospheres (only explosion-proof type), observe the equipment standards set forth by law and make sure to perform daily inspection to prevent liquid leakage. If the pump is operated under the abnormal conditions such as liquid leakage, it may cause a severe accident, such as a physical injury, an explosion, or fire. Always comply with instructions of the supplier or manufacturer of liquids.

Prohibited use of a damaged or modified pump

Using a damaged or modified pump may cause a physical injury, electric shock, or product failure. Such usage will not be covered by our warranty.

Cautions on transporting and lifting the pump

Use the hoist bolts when lifting a pump. If a hoist bolt is not available, use a belt sling to lift the pump with careful attention to the weight balance. Only a qualified person should perform this with a strong enough sling. The lightest pump weighs approximately a minimum of 50lbs (23kg). Do not hand carry the pump as much as possible, as it may cause an accident.

Prohibited work with the power ON

Do not perform inspection or disassembly of the pump or motor while the power is ON. Rotating parts can cause physical injury. You can also be subject to electric shock. In addition to confirming the main power is OFF, check the hand switch of the pump as an additional safety measure before performing any work.

Connection of a ground wire

Using the motor without a ground wire connected may cause an electric shock. A qualified person must ground it according to the electric equipment technical standards and wiring regulations.

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. Install the terminal box cover in the designated position after wiring.

Installation of Ground Fault Interrupter (GFI)

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

Cautions on removing the pump

When removing the pump from pipes, close the suction and discharge pipe valves to ensure no spillage occurs. Directly touching chemical liquid may be hazardous, and may cause severe injuries. Wear protective equipment before starting work.

Caution

Prohibited use

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

Restriction on users

Only knowledgeable experts of the pumps should handle and perform installation, wiring, operation, or maintenance.

Cautions on unpacking

Check and confirm the proper side up when unpacking. When unpacking the crate, be careful with nails or wood chips to avoid any injury.

Ventilation

If any object is placed around the pump, it can block ventilation, causing the motor to overheat.
When handling poisonous or odorous liquid, install the pump where sufficient ventilation is available, due to risk of inhalation.

Repair and return

To request repair of a damaged pump, contact our sales representatives or your distributor.
When returning the pump using a carrier service or parcel delivery service, wash both inside and outside of the pump with clean water, make sure no liquid residue is left, and wrap it with a plastic bag.

Resin parts

The pump consists of resin parts, so a strong impact may damage parts or lead to physical injury. Do not strike the pump with any objects or climb on it. Additionally, install a pipe support to prevent a load being directly applied to the pump.

Starting of the pump

Make sure to check the rotational direction when starting the pump for the first time. Open the suction and discharge valves and ensure no liquid leakage near the pipe connection area. After air is released from the pipes and liquid is filled within the pump, briefly start to check the rotational direction. If the direction is reversed, in the three-phase power supply, switch two of the three cables. As a precaution, ensure the power supply is disconnected before performing any work.

Disposal of the pump

When discarding used pumps, dispose of them as industrial waste following the applicable laws and regulations after removing accumulated chemicals.

Protection measures for leakage

In case of liquid leakage from the damaged pump or pipe, take appropriate safety and protection measures.

■ Model Description

Model: YD-5002GWN1
YD-5002GWN1-HP (High pressure version, Only 60Hz)
Type: Chemical Submersible Magnet Drive Pump
Name: SUBMERSE

YD – 50 02 GWN1 – CP – A D 6 2 – HP - V
(1) (2) (3) (4) (5) (6) (7) (8) (9)

(1) Bore: 50 = 50A
(2) Motor output: 02 = 1.1kW = 1.5HP
(3) Main cover material: CFR PP
(4) Bearing material: R = PTFE A = Alumina Ceramic
(5) O-ring material: E = EPDM D = FPM
(6) Frequency: 5 = 50Hz 6 = 60Hz
(7) Specific gravity: 1 = 1.1 3 = 1.3 5 = 1.5
(8) Impeller: No mark = Standard type HP = High pressure type
(9) Special mark: (Ex.) V = Non-standard voltage Z = With PVC cable sleeve

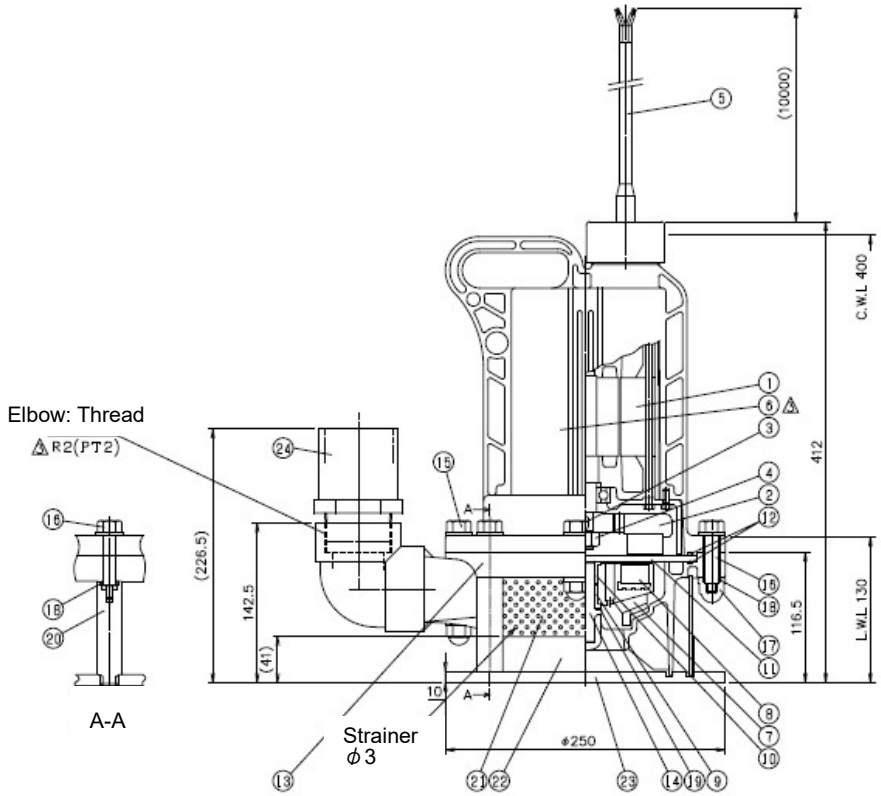
* When the special mark is other than above listed, it means a custom requirement by customer or special specification with some modifications added.

■ Specification

Model	Frequency	Standard Specification		Output	Power	Discharge bore	Weight
		Total head	Capacity				
5002GWN1	60Hz	8.3m (27ft)	200L/min (52gpm)	1.1kW	200/220V/460V 60Hz	50mm (2")	23kg (50lbs)
5002GWN1-HP	60Hz	11.9m (39ft)	100L/min (26gpm)				

Pump				**Motor**		
Main material		**Carbon Fiber Reinforced Polypropylene**		Type		Dry three phase induction motor
Bore		50A=2"		Insulator		H
Model		**5002GWN**	**5002GWN-HP**	Rated output		1.1kw=1.5HP
Frequency		60Hz	60Hz	Phase		3
Total head	Max	41	47	Pole		2
	Standard	27	39	Rated Voltage	60hz	460V (200V/220V)
Capacity	Max	87	80			
	Standard	52	26	Rated Current	60hz	4.5A(4.75A/4.38A)
Others						
Dimension	Outline	15" x 9.8" x 16" (H)		Starting Current	60hz	23.1A(23.03/22.73A)
	Height					
Weight		50lbs		Method of Stating		Direct
Attached cable		2PNCT 4cores		Rotating speed		3410min-1 (3340/3390min-1)
		1.25mm2x 10m (32ft)		Liquid temperature (max)		140F (0-60℃)
Thermal protector		Built-in motor				

■ Outline dimension



No.	Part name	Remarks
1	Motor	FC
2	Motor magnet	Ferrite
3	Motor magnet key	SS
4	Motor magnet nut	SS
5	Cabtyre Cable 10m (32ft)	2PNCT
6	Motor cover	CFR PP
7	Impeller	CFR PP
8	Impeller magnet	Ferrite
9	Front bearing	PTFE / Ceramic
10	Rear bearing	PTFE
11	Separating board	Ceramic
12	O-ring for separating board	FPM / EPDM
13	Casing	CFR PP
14	Pump shaft	SiC

No.	Part name	Remarks
15	Set bolt 92	CFR PP
16	Set bolt 52	CFR PP
17	Set bolt nut	CFR PP
18	O-ring for set bolt	FPM / EPDM
19	Floating washer	PTFE (Only Ceramic bearing)
20	Standoff bolt	HT, PVC
21	Strainer	PP
22	Sludge fence	PP
23	Bottom plate	PP
24	50A Valve socket	PVC

* When the temperature of the liquid is high (131F/ 55C degrees and more), do not use No. 24: Valve socket (PVC). If using a valve socket, HT-PVC valve socket is recommended.

■ Features

SUBMERSE is constructed of Carbon Fiber Reinforced Polypropylene and a corrosion resistant ceramic shaft. Additionally, the structure is a magnet drive type which does not require a shaft seal, which makes the submersible pump compatible with strong acid and strong alkaline liquids that the previous pumps could not handle.

1. All the wet parts are made of corrosion resistant resin and ceramic.
2. The pump can be used for strong acid and alkaline liquids.
3. It is a magnet drive structure which does not require a shaft seal. Liquid will not enter the motor.
4. There are little consumables and parts are replaceable.
5. Operation of the pump is as simple as placing it in a tank. If proper fixation is provided, hanging operation is possible.
6. Easy grip for carrying, and durable construction ideal for emergency purpose.
7. A ceramic plate is used between the motor and pump chamber, which makes it resistant to both heat and chemicals.
8. A thermal protector is incorporated. If motor overload is detected from any cause, the thermal protector is activated to stop the motor.

■ Precautions in handling

1. Slurry will accelerate bearing wear. Especially when the pump is used in a sedimentation tank, mount the pump to prevent slurry from entering the pump, or clean any slurry before reaching the pump. (Replacement of the bearing is easy. Use a ceramic bearing on liquids with slurry.)
2. Completely submerge the pump to use. Operation with air may cause pump failure.
3. If the check valve is attached at the discharge pipe, air will not be released, which will cause dry running. If you attach the check valve, install the air release pipe beneath to always release air.
4. If the pump is not completely submerged in liquid and exposed to air, the motor will not cool down, causing a damage to the motor resin cover.
5. A liquid level gauge malfunction can cause dry running. Check before the operation.
6. Make sure to attach the strainer to the pump in order to prevent debris from entering, and always clean it to be clog-free. If it is clogged, the pump may overheat.
7. When considering electric wiring, ensure the wiring gauge is adequate to prevent voltage drop.
8. When the liquid temperature is high (131F/55C degrees and higher), change the material of the valve socket (PVC) at the discharge outlet. (High temperature- PVC is recommended.)
9. Do not use the pump for highly concentrated sulfuric acid (50% and more).
10. Frequently starting and stopping the pump causes premature damage to the pump, so limit the frequency to 6 times or less per hour.

■ Operating temperature

YD-5002GWN1: 140 Fahrenheit / 60 Celsius (MAX.) Cable material: 2PNCT

■ Minimum required liquid level during operation

Minimum required liquid level for continuous operation is 16 inches (400 mm).

Keep the minimum liquid level during operation, enough to submerge the whole pump. (Liquid level for continuous operation: 16 inches/400mm or higher from the pump's bottom surface.) Operation below the required liquid level, such as for dead head operation, should be less than 5 minutes.

Do not repeatedly run for less than 5 minutes.

Depending on the operational situation, the incorporated thermal protector may get activated to stop the pump in order to protect the motor. In that case, stop the operation for a while. Check the pump status and ensure the proper liquid level to resume the operation.

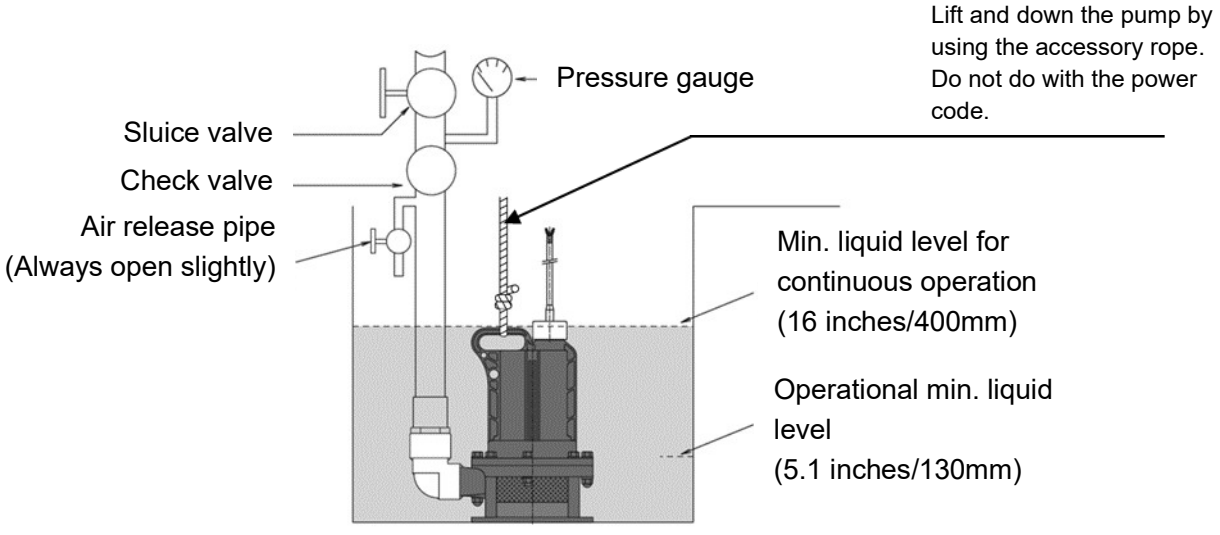
Minimum liquid level for operation is 5.1 inches (130 mm).

The minimum liquid level for operation is 5.1 inches/130mm from the pump's bottom surface.

- Even with the proper operational liquid level, depending on the liquid surface condition, there is a chance that the operation may be interrupted due to air entering.
- If the impeller of the pump runs with air, the rotating parts may be damaged.

■ Example of installation

To prevent water hammer, refer to the following image for pipe installation. During installation, use appropriate equipment, such as the accessory rope, to lift and down the pump. Do not use the power cord for lifting purposes. This may cause electrical leakage.

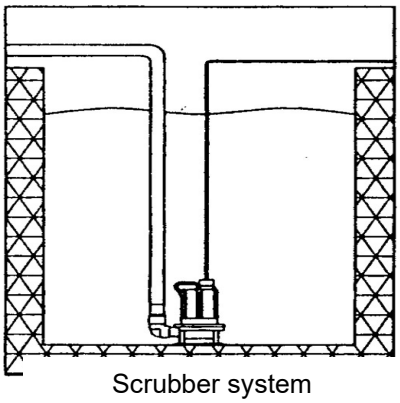


■ Usage

1. To pump chemical liquids or wastewater from a deep or narrow tank.
2. To pump liquids that are easily aerated.
3. To pump chemical liquids from a sealed tank.
4. To circulate liquids in a tank.
5. To mix liquids in a tank or an equipment.
6. To pump or transfer liquids in an emergency.

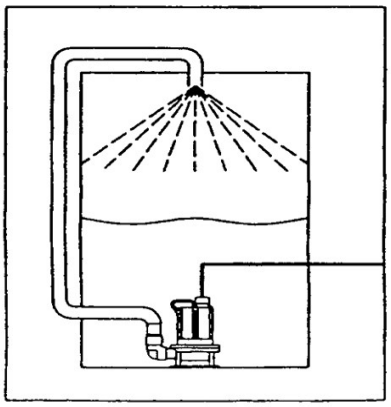
Samples of usage

Pumping liquid from a

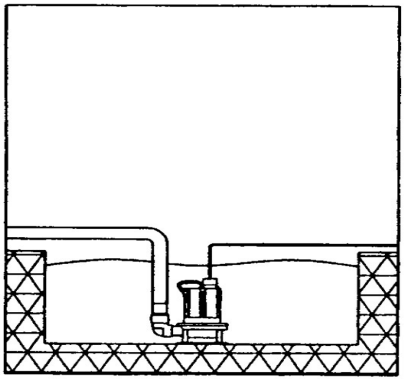


Scrubber system

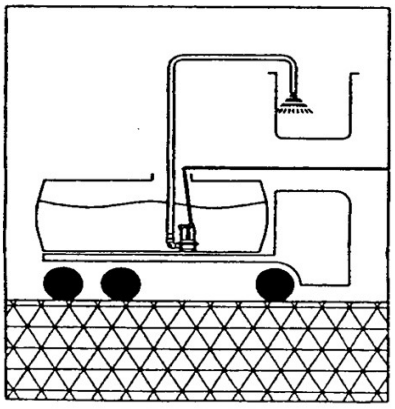
(Washing system)



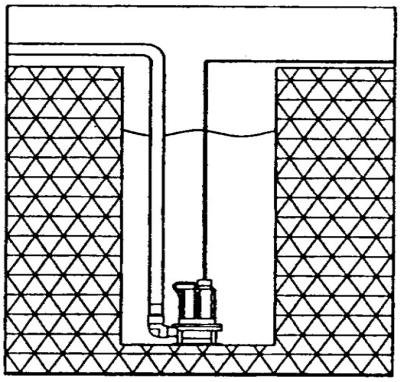
Pumping easily aerated liquid or from a shallow



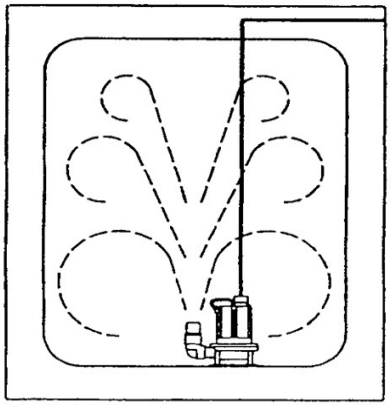
Using for a tank truck



Pumping liquid from a narrow and deep tank



For mixing



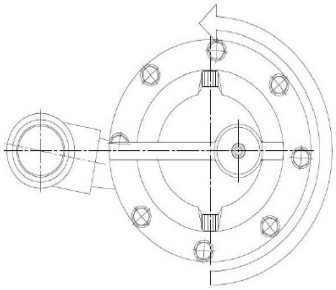
Check before operation

1. Electric wiring

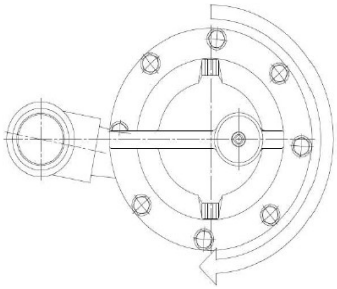
   Before starting operation, check the rotational direction. Connect U (red), V (white), W (black), and ground (green) wires to start the pump. The rotational direction can be checked as follows:

   1-(1) In reverse direction, the discharge amount will be 30% of what it would be in the forward direction.

   1-(2) When turning the switch ON while the pump lifted in water, it should be a counterclockwise rotation observed from the above.



Forward rotation



Reverse rotation

Note: In case of the reverse rotation, switch two of the three cables (Red, White, and Black).

2. Precautions in electric wiring

   - Make sure to connect a green ground wire to a ground plate or bar before connecting the Cabtyre Cable 10m(32ft) with Plug to prevent electric shock.
   - Never test the pump in the air. Generated heat may deform the pump and cause failure.
   - Install a circuit breaker to prevent unexpected problems.

   Note: To prevent electric shock or fire, the user is obligated to provide a circuit breaker according to the industrial safety and health regulations and electric equipment technical standards.

<Cabtyre Cable side>	Red – U White – V Black – W Green – Ground	<Motor cable side>

3. Voltage during operation

   If voltage is low, current increases. This can cause the thermal protector to be activated as the temperature of the stator increases. Low voltage causes pump performance failure. Use the pump with the voltage within the specified range.

   Note: Applicable voltage for this pump

   Continue use : Within ±5% of the rated voltage.

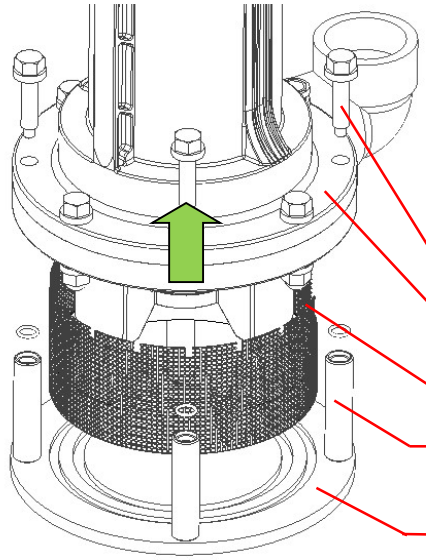
   Temporary use: Within ±10% of the rated voltage.

4. Thermal protector (Protection Instrument)

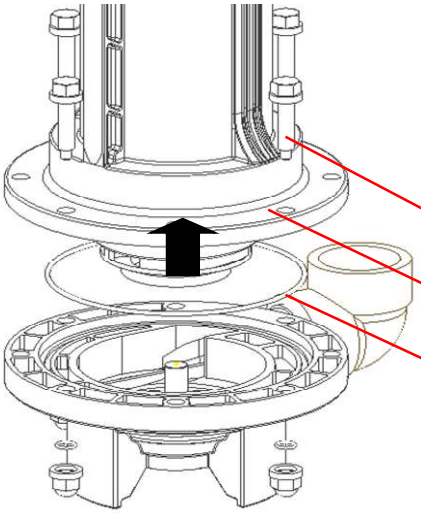
   When the temperature of the motor coil is near the maximum temperature limit from electrical or mechanical reasons, motor burn protection function will be activated and stop the motor by cutting off the electric circuit. Carefully investigate the cause which activated the thermal protector, remove that factor, and resume the operation.

   Note: Make sure to turn off the power before investigating. The thermal protector will automatically resume.

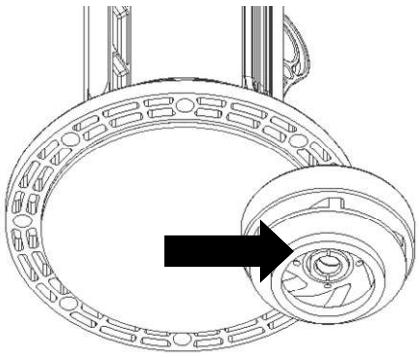
■ Disassembly



1. Remove 4 set bolts (16) from the standoff bolts (20) which are affixed to the casing (13).
2. The bottom board (23) with the standoff bolts (20) and the strainer (21) are removed.



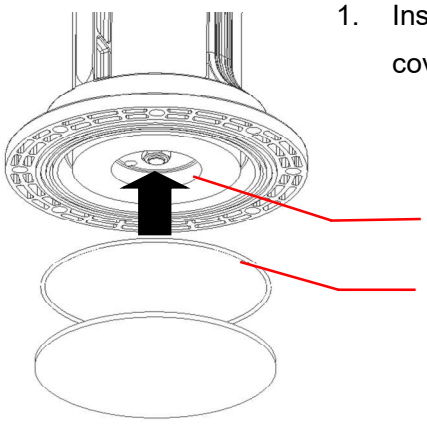
3. After removing the rest of the set bolts (15) (16), pull the casing (13) forward to separate. The impeller (7) is secured on the motor cover (6) through the separating board (11).



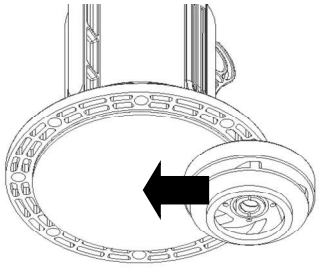
4. Remove the O-ring for separating board (12), and move the impeller (7) attached to the motor side magnet (2) outward to remove.

- Do not disassemble the motor (including the cable). When maintenance of the motor is required, contact your distributor.

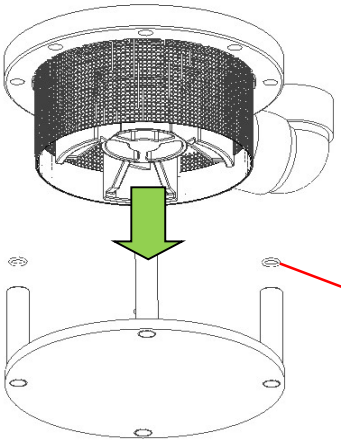
■ Assembly



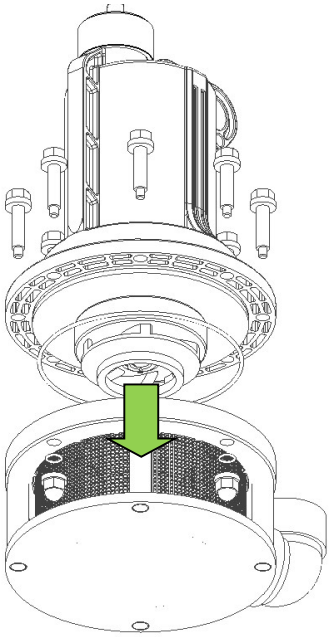
1. Insert the O-ring for separating board (12) in the groove of the motor cover (6).



2. Slide the impeller (7) from the side of the separating board (11) to the center. Do not move the impeller (7) quickly, as the separating board (11) could be damaged by impact caused when the impeller (7) approaches to the motor magnet (2) as a result of magnetic force.



3. Attach the standoff bolts (20) to the bottom board (23) and put the casing (13) on the strainer (21). Attach the O-rings for set bolts (18) to the standoff bolts (20).

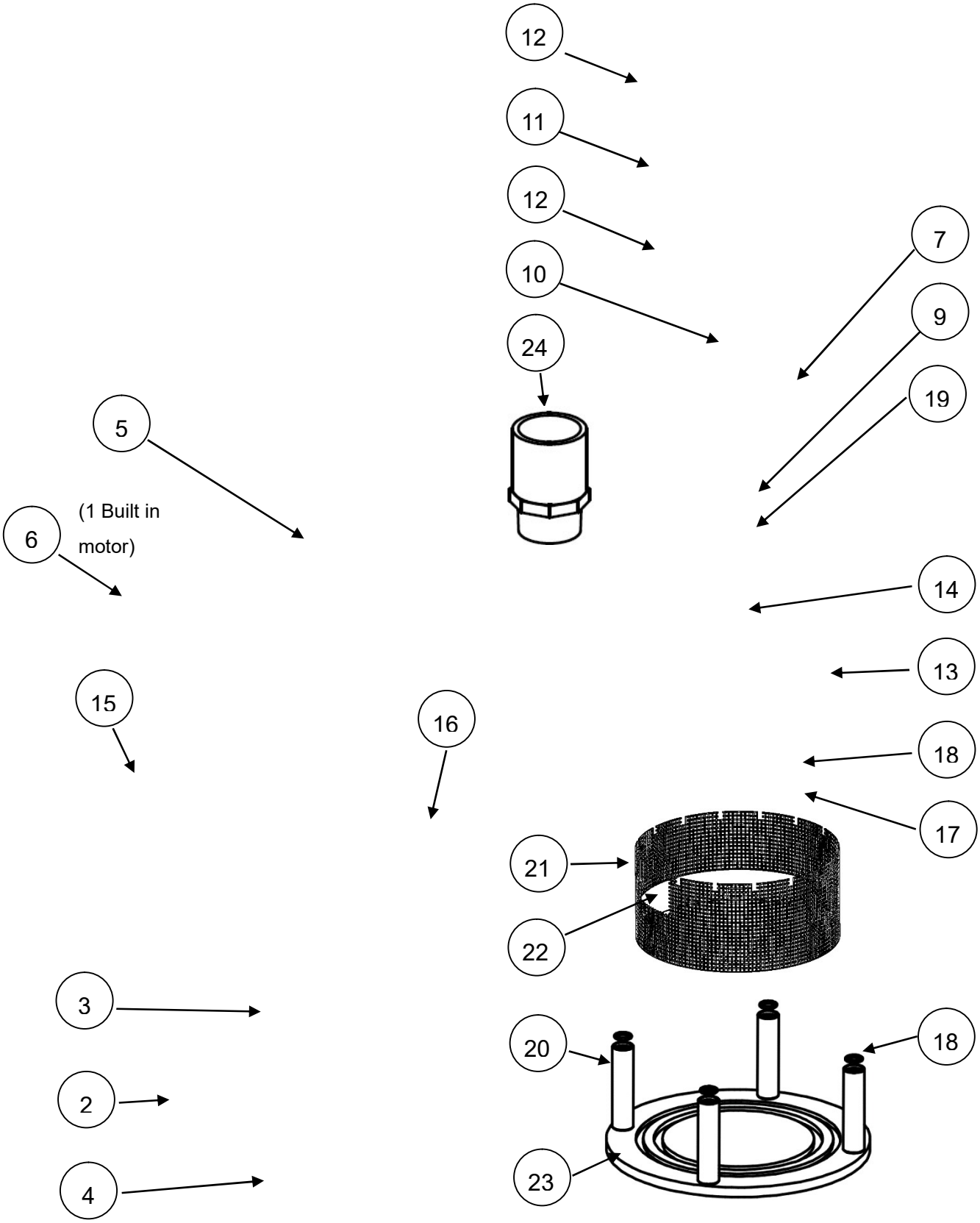


4. Attach the O-ring for separating board (12) to the casing (13) and put the parts assembled in the above procedures 1 & 2. Insert the bearing of the impeller (7) so that the inner diameter fits to the outer diameter of the pump shaft (14).

5. Insert the set bolts (15) (16). Install the O-rings for set bolts (18) to the nuts (17). Attach the nuts for the set bolts (17) first, then attach the standoff bolts (20).

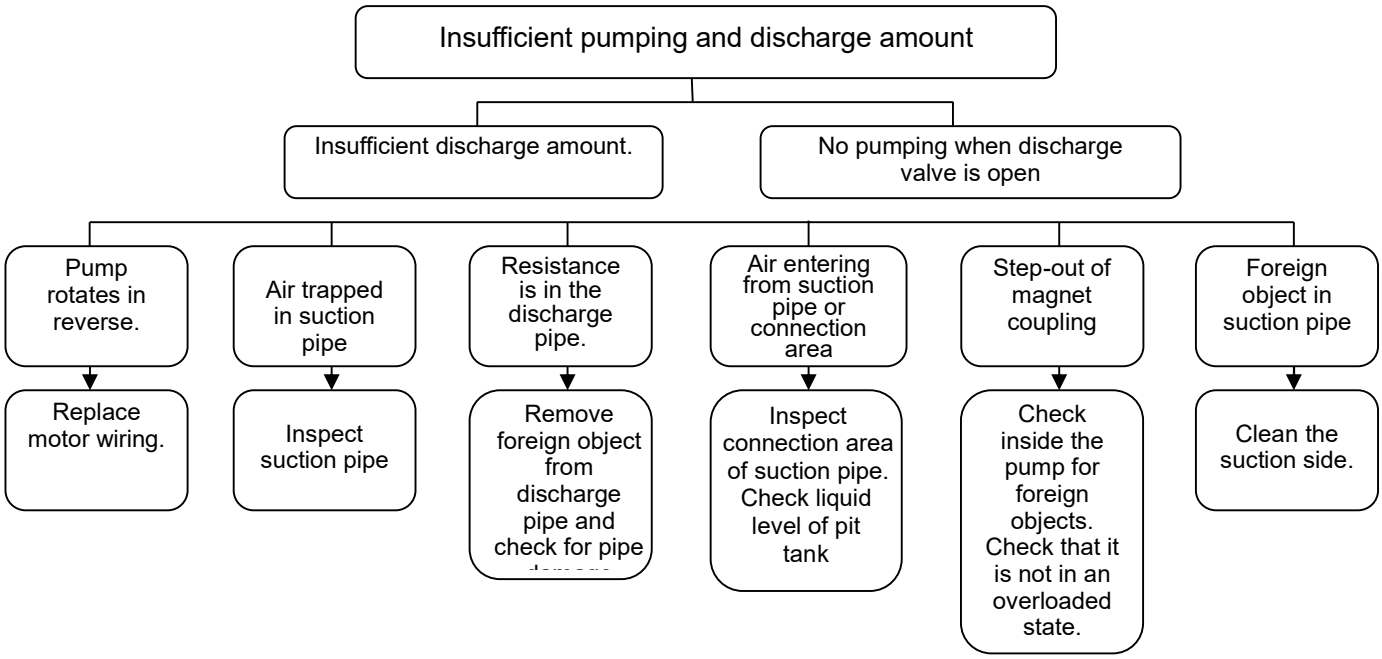
- The tightening torque is 8N･m to tighten the set bolts (15) (16). Tighten opposing bolts diagonally to fix.

■ Exploded view

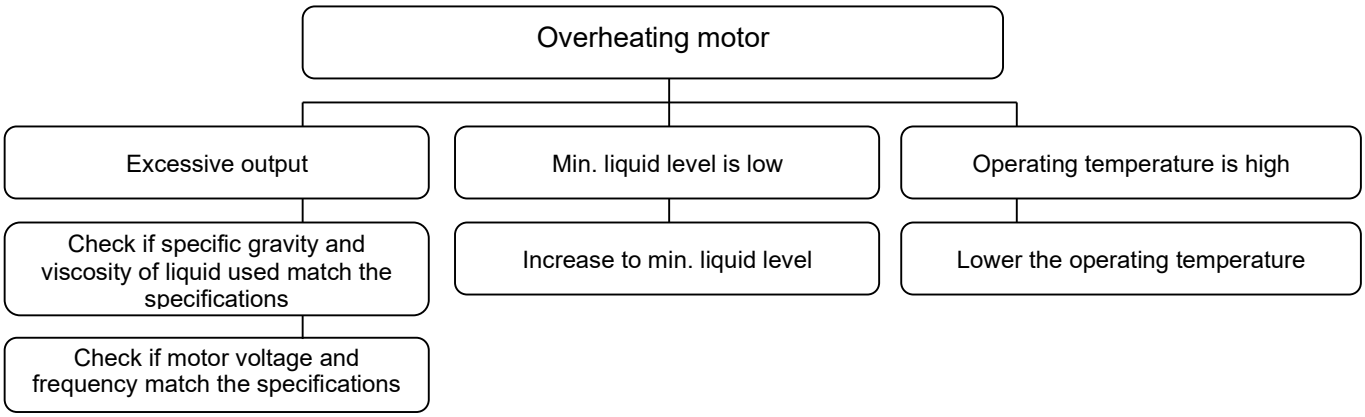


Troubleshooting

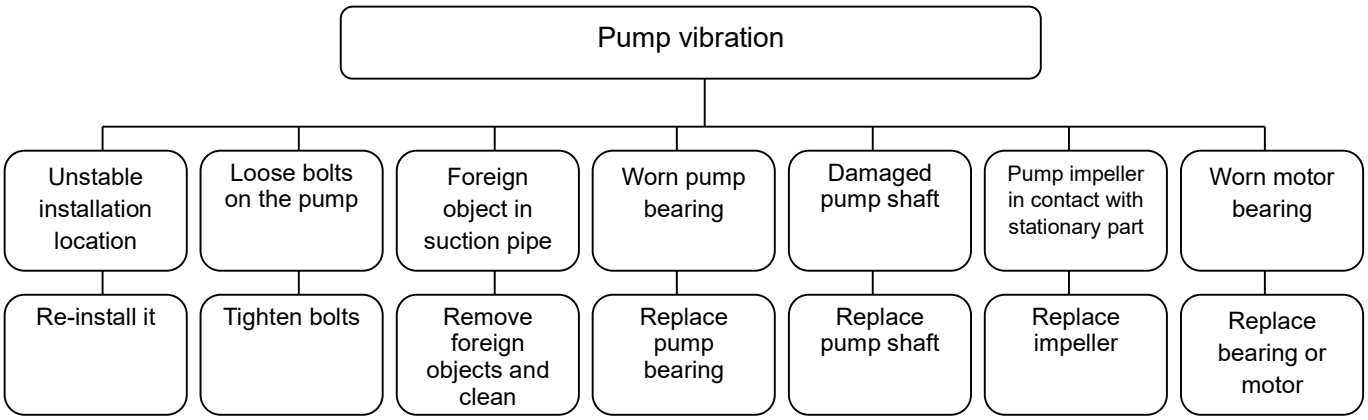
1. Insufficient pumping and discharge amount



2. Overheating Motor



3. Pump vibration



Warranty / 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 packing 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 (P7, 9, 10). Although, inform the parts’ number and material, too.

Installation record

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

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