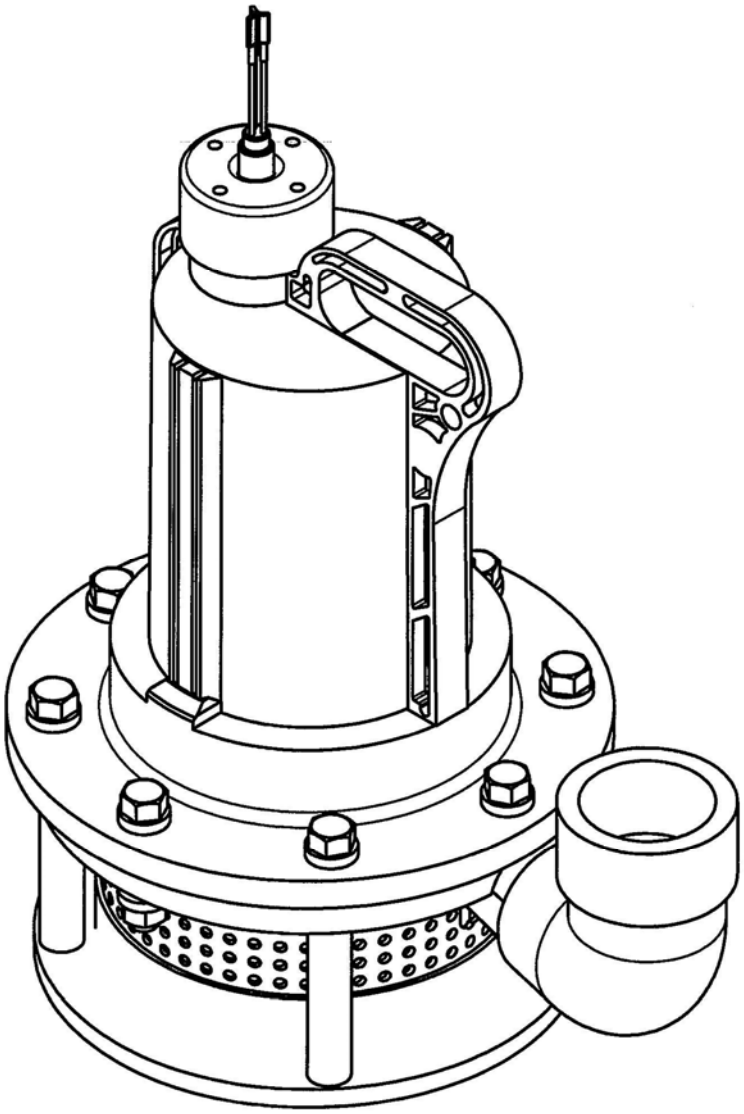
SUBMERSIBLE MAGNET DRIVE PUMP

SUBMERSE

YD-5002GWN

INSTRUCTION MANUAL
Version: 150908



World Chemical Co.,Ltd.

PREFACE

Thank you very much for purchasing World Chemical's submersible magnet drive pump "SUBMERSE".
To effectively use SUBMERSE for an extended period of time, it is necessary for the user to properly operate and maintain the pump in accordance with the instruction manual.

TABEL OF CONTENTS

SAFETY PRECAUTION (To be observed at all times)

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 or the pump is used improperly.

	**Warning:** Non-compliance can lead to fatal or serious injury.
	**Caution:** Non-compliance can lead to some injury and/or property damage.

- Safety rules to be observed are classified and explained under the following symbols. (The following are examples of picture displays).

	This symbol **cautions people to be careful**.
	This symbol signifies that this **action must not be taken**.
	This symbol indicates that the **action must be taken**.

 WARNING

(1) Dangerous liquids, and dangerous surroundings.

When using the pump to move dangerous liquids or when using in surroundings (only explosion prevention specifications) Liable to cause explosions, you must adhere to facility standards determined by law and always conduct daily check-ups to look for and prevent leakage. If the pump is operated under abnormal conditions, such as usage during a liquid leak, it could lead to serious accidents such as explosion or fire and personal injury. Please follow the manufacturer's instructions for handling liquid agents.

(2) Do not use damaged or modified pumps.

Do not use the pump if it has been damaged or modified. World chemical is not be responsible for any accident or damage of any kind caused by the user remodeling the pump without first obtaining permission or instruction from World Chemical.

(3) Caution when transporting or lifting the pump.

Always use the hoist bolt for pumps that come with them. For pumps without hoist bolts, hoist them carefully while watching the weight balance by using a belt sling. This operation must be performed by qualified personnel and the slings to be used should have sufficient strength. Do no carry pumps by hand as even the lightest pump weights more than 18kg (40Ibs.), and could cause accidents.

(4) Do not inspect or dismantle the pump or the motor with the power on.

Do not inspect or dismantle the pump or motor with the power turned on. This could lead to personal injuries from electric shock or from getting caught in the rotor. Work should be performed only after verifying that multiple safety precautions have been taken, such as the switch for main power supply is off, the operation switch is off, and the hand switch for the pump is off.

(5) Connecting grounding line.

Using the pump without attaching the ground line from the motor could cause electric shock. The grounding operation must be performed by a qualified person in accordance with electric facilities technical standards and interior wiring regulations.

(6) Protecting the power supply cord.

Stretching, pinching or otherwise damaging the power supply cords or motor lead wires could cause fire or electric shock. Always replace the cover of the terminal box before use.

(7) Installing Ground Fault Interrupter (GFI)

Electric shock might result if the pump is used without attaching ground fault interrupter device. Protect the pump from accidents and damages caused by current overload by always attaching circuit breakers, over-current protection devices and/or other protective devices.

(8) Caution when removing pump

Before removing the pump from piping, close the intake and discharge pipe valves and verifying there are no liquid leaks. Drain all liquid from the pump. Always wear protective gear when performing these operations as direct contact with the fluids could cause injuries.

CAUTION

(1) Unspecified use.

Do not use the pump for purposes other than those specified on the nameplate. Verify the power specification of motor (phase, voltage and frequency) prior to wiring the motor. Unspecified use could cause personal injuries or damage to the pump and peripheral equipment.

(2) Restrictions on persons handling the pump.

Transportation, installation, wiring, operation, servicing, and inspection should be performed only by an expert who has full knowledge of the handling the pump.

(3) Opening package.

Before opening the package verify that the top side of the package is up. When opening a wooden crate, be careful to avoid injury from nails and silvers when removing the product.

(4) Ventilation.

Do not obstruct ventilation of the motor. This could cause the motor to overheat. If handling toxic or odorous liquids, have the pump situated in a well-ventilated place to prevent poisoning.

(5) Repairs and returning the pump.

In the event of a pump failure, contact World Chemical or your nearest sales agent for repairs. If the pump is to be returned for repairs, decontaminate and clean interior and exterior of the pump before returning.

(6) Regarding thermoplastic (resin) parts.

The pump is made of thermoplastic resin material. Therefore, it could cause injuries if it becomes damaged through impact with other objects. Refrain from having people hit a pump against any objects. Attach piping support to avoid any pipe load stress on the pump.

(7) Verifying rotation direction of the motor and starting the pump.

Verify the direction of rotation when initially starting up the pump. Open the intake and discharge valves first, and check that there is no liquid leakage from the pipe connection. Verify the pipe is emptied of air and the pump is filled with liquid, and then, turn on the switch for a split second to check the direction of rotation. If the rotation reversed, switch two of the three phases in the three phase power supply to change the direction of rotation. Turn off the power supply and confirm that it is safe before switching the two phases.

(8) Disposing of scrapped pump.

When disposing a scrapped pump, thoroughly flush any hazardous materials from the pump and discard as industrial waste in accordance with the law.

(9) Leak protection.

Always take appropriate preventative measure to safeguard against liquid leaks in the event of a breakdown of the pump or piping.

MODEL DESIGNATION

MODEL: YD-5002GWN

YD-5002GWN-HP (High pressure type, Only 60Hz)

TYPE: Chemical Submersible Magnetic Drive Pump

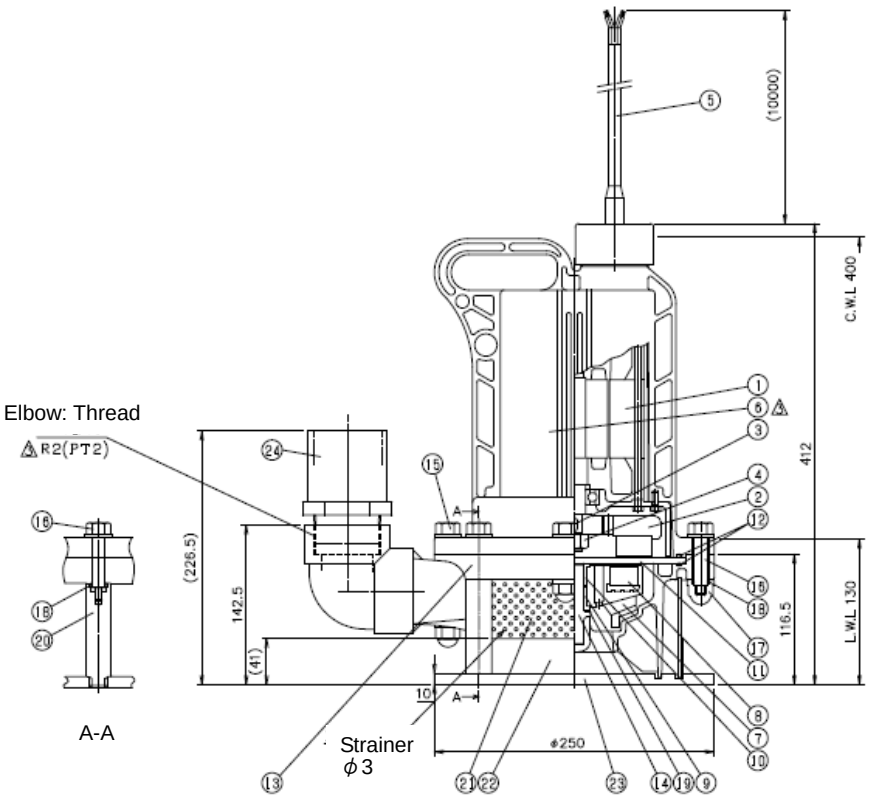
TRADE NAME: SUBMERSE

SPECIFICATION

Model	Frequency	Standard specification		Output	Power source	Discharge bore	Weight
		Total head	Capacity				
5002GWN	50Hz	8.3m	200L/min	1.1kW	200V x 3PH	50mm	23kg
5002GWN	60Hz	8.3m	200L/min		200/220V 60Hz		
5002GWN-HP	60Hz	11.9m	100L/min				

Pump							Motor		
Main material			CFR PP				Type		Dry three phase induction motor
Bore			50A				Insulator		H
Model			5002GWN		5002GWN-HP		Rated output		1.1kW
Frequency			50Hz	60Hz	50Hz	60Hz	Phase		3
Total head	Maximum	m	12	12.5		12.5	Pole		2
	Standard		8.3	8.3		11.9	Rated voltage	50Hz	200v
Capacity	Maximum	1/min	320	330		330		60Hz	200/220V
	Standard		200	200		100	Rated current	50Hz	4.7A
Others								60Hz	4.5A
Dimension	Outline	mm	380 x 250				Starting current	50Hz	24.1A
	Height		412					60Hz	23.1A
Weight		kg	23				Method of starting		Direct
Attached cable			3 types 4 cores				Rotating speed	50Hz	2810min-1
			1.25 ㎟ x 10m					60Hz	3370min-1
Thermal protector			Built-in motor				Liquid temperature (Max)		70℃

OUTLINE DIMENSION



No.	Parts name	Reference
1	Motor	FC
2	Motor magnet	Ferrite
3	Motro magnet key	SS
4	Motor magnet nut	SS
5	Cabtyre cable	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	Shaft	SiC

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

FEATURES OF SUBMERSE

SUBMERSE is constructed of Carbon Fiber Reinforced Polypropylene and a corrosion resistant shaft and structurally adopts a magnet drive system that does not require a shaft seal. That is why it is a submersible pump remains unaltered by the addition of strong acids and strong alkalis.

1. All wet kit parts are composed of corrosion resistant resin and ceramic.
2. The pump can also handle strong acids and strong alkalis.
3. The magnet drive system does not require a shaft seal and let the liquid enter the motor.
4. It has a simple construction, no consumables, and easy part replacement.
5. Operation of the pump is as simple as lowering it into a tank. The pump will also operate when suspended.
6. The pump has a handling for carrying and be suitable for emergency use.
7. For the discharge pipe, we have a system that employs flexible hose, as well as a system that employs a fixed piping constructed of polypropylene and heat resistant vinyl chloride.
8. Because a strong ceramic plate is used to isolate the motor from the pump chamber, it is fully reliable both in pressure resistance and chemical resistance.
9. If abnormal heat is detected electrically or mechanically during operation, the auto cut will operate to stop the motor by working the built-in thermal protector.

PRECAUTIONS IN HANDLING SUBMERSE

1. In cases of slurry, use ceramic bearing. (Floating washer is consumable part.)
2. In case of high concentrations of sulfuric acid, more than 93%, SUBMERSE cannot be used.
3. Never operate SUBMERSE in air.

SERVICE LIQUID TEMPERATURE FOR SUBMERSE

Maximum: 70℃ Cable material: 2PNCT

MINIMUM LIQUID LEVEL DURING OPERATION

The liquid level must be retained the depth to submerge the pump during the operation.
(The liquid depth of continuous operation: 400mm and more than the level to install the pump.)
The operation under the liquid depth of continuous operation should be less than 5 minutes and do not operate the pump for the short time continuously.

* Depending upon the situation, the built-in thermal protector works to protect the motor and it cause the pump stop.
In this situation, stop the operation and verify that the pump is not abnormal. Then, retain the proper liquid level and start the operation.

The operational liquid level is 130 mm under the installation surface of the pump, when decreasing the liquid level on a temporary basis.

* By the liquid state, even if the liquid level is over the operational liquid level, the pump could be incapacitate due to entering air.
* Do not operate the impeller in air, because it could cause to damage the rotating parts.
(The minimum continuous operation liquid level: C. L. W
The minimum operational liquid level: L. W. L) See *OUTLINE DIMENSION*.

MODEL DESIGNATION

YD – 50 02 GWN – CP – A D 6 2 – HP - V

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

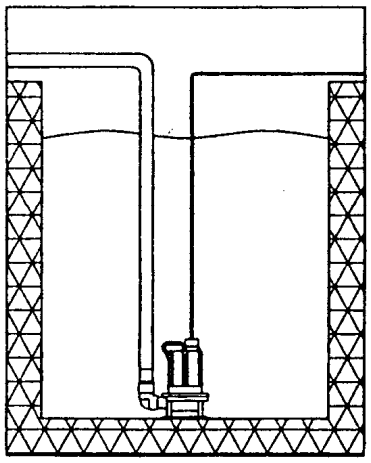
(1)	Bore:	50 = 50A		
(2)	Motor output:	02 = 1.1kW		
(3)	Cover main material:	CFR PP		
(4)	Bearing material:	R = PTFE	A = Ceramic	
(5)	O-ring material:	E = EPDM	D = FPM	
(6)	Frequency:	5 = 50Hz	6 = 60Hz	
(7)	Specific gravity:	1 = 1.1	3 = 1.3	5 = 1.5
(8)	Impeller:	No mark = Standard		HP = High pressure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

* A special character will be added to the end of the model designation when special material or special specification is requested.

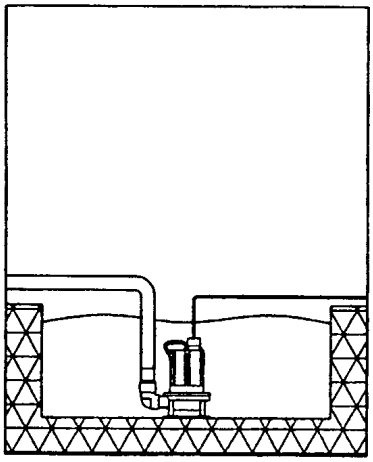
EXAMPLES OF USE

1. Pumping liquid or waste liquid from a deep or narrow pit or tank.
2. Pumping forming liquid.
3. Pumping chemical liquid from sealed tank.
4. Circulation of liquid in a tank
5. Mixing liquid in a tank or a device
6. Transferring on an emergency basis

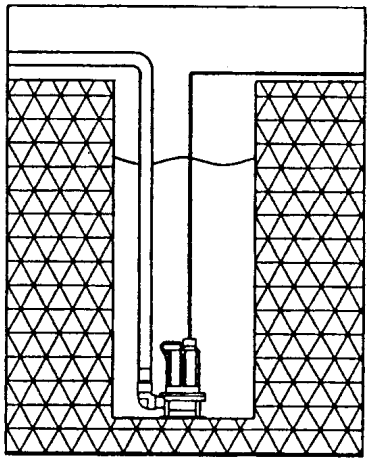
Pumping from a deep tank



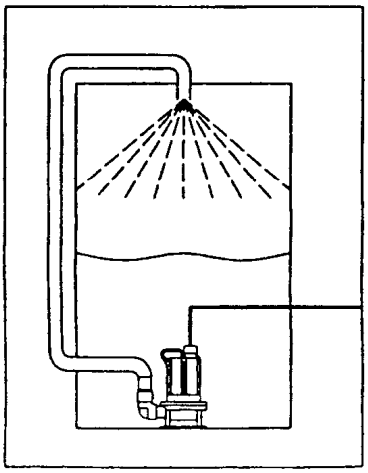
Pumping from a shallow tank that foams easily



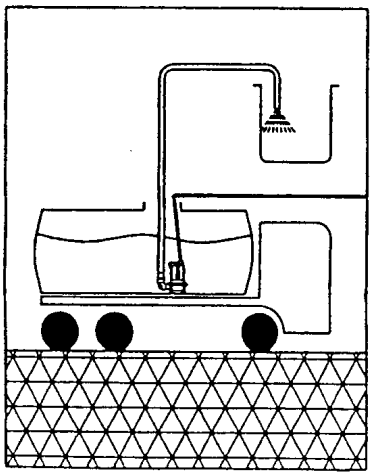
Pumping liquid from a narrow and deep tank



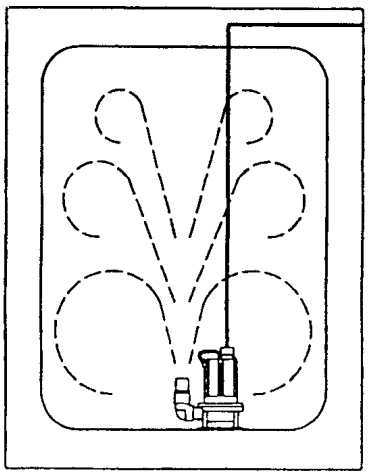
Scrubber system (Washing system)



Transferring from a pump truck



For mixing



OPERATIONAL PRECAUTIONS

1. Electric wiring

   Before starting operation, always check the direction of rotation. If U (red), V (white), W (black), and ground (green) are connected to the U, V, W and earth respectively for power supply, the motor will rotate in the forward direction (clockwise as viewed from the top).

   The following is a reference for checking the direction of rotation:

   1-(1) In reverse rotation, the discharge output is only 30% of the forward rotation.

   1-(2) If the pump is placed in water, rotation will be in the forward direction the moment the switch is turned on.

   Note: If the direction of rotation is counterclockwise, two of the three lines (red, white or black) are switched.

2. Precautions for Electric wiring

   2-(1) To prevent electric shock, always connect a green ground wire to the earth plate or bar before connecting the cable.

   2-(2) When inching the pump to test the direction of rotation, never operate the motor in air. The pump may otherwise deform from the heat and incur damage.

   2-(3) Always use a circuit breaker to prevent any problems in emergency cases.

   Note: To prevent electrical shock or fire, the user is obligated to provide a leak breaker according to the industrial safety and Health Regulation and Electric Equipment Technical Standard.

3. Voltage during operation

   When voltage is low, the current will increase, and the stator temperature will rise to operate the thermal protector to protect the motor. Since low voltage causes poor performance, use the pump at a voltage within the specified range.

   Note: The service voltage for this pump is within ±10% of the rated voltage.

4. Thermal protector (Protection Instrument)

   When the temperature of the motor coil is near burning temperature due to electrical or mechanical causes, the thermal protector (which prevents burns) will automatically operate within the motor and will cut off the electrical circuit and stop the motor. At this time, carefully inspect the source of the thermal protector, and make any appropriate changes before resuming operation.

   Note: Always cut off the power supply before inspection. The thermal protector will automatically reset itself.

ORDER OF DISASSEMBLY

Please see *EXPLODED VIEW*.

1. To disassemble the pump, first remove the four set bolts (16), which fasten the casing (13) from the stud bolts (21).
2. Remove the bottom board (23) with the stand bolts (20), and the strainer (21).
3. After removing the set bolts (15) (16), place the entire pump horizontally and pull the casing (13) to separate. An impeller (2) has been secured to the motor cover (1) through the separating board.
4. Remove o-ring for separating board (12) and move the impeller attached to the driving side magnet (2) outward to remove.

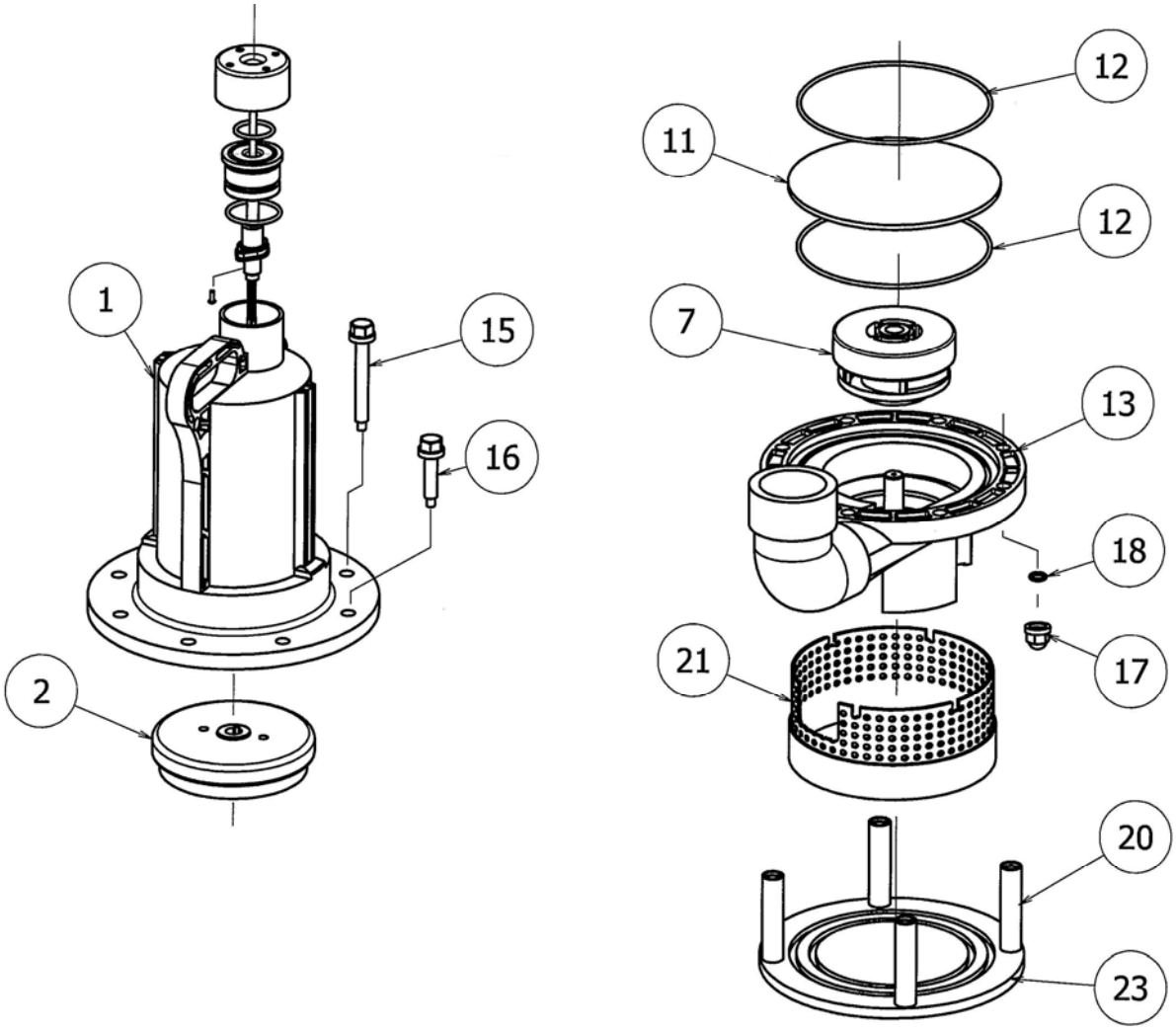
* Do not disassemble the motor (cable included). Please contact a distributor in your area or customer service at the time of an overhaul of the motor.

ORDER OF ASSEMBLY

1. Place the o-ring (12) on the grove in the motor cover (1) and gently mount the separating board (11).
2. Slide the impeller (7) from the edge of the separating board (12) to the center. Be sure not to slide the impeller quickly so that the impeller (7) that is pulled toward the dive magnet (2) by magnetic force may not damage the separating board (11).
3. To set an installation position of the casing (13), insert the pump shaft that is part of the casing (13) into the bearing of the impeller (7), and tighten the casing with the bolts.
4. Attach the stand bolts to the bottom board (23). Place the strainer (21) on the bottom board, and tighten it with set bolts (16).

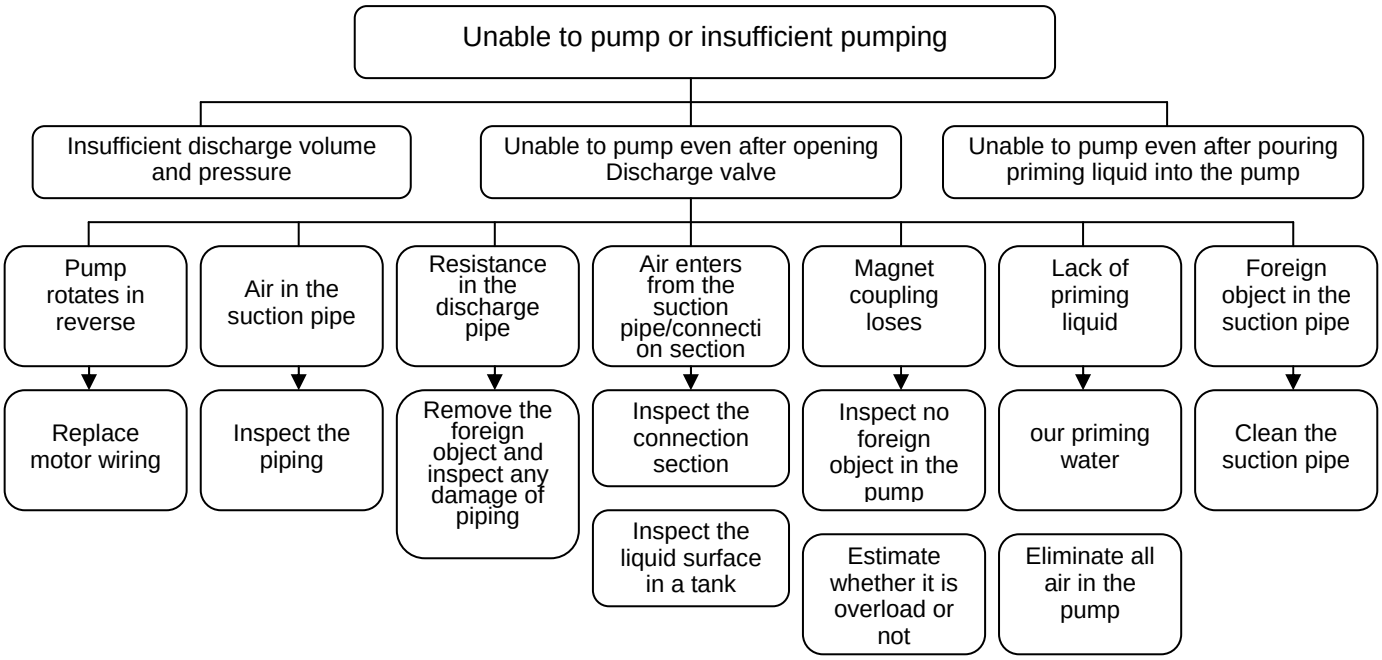
* Tightening torque for set bolt (15) (16) is 8N･m.

EXPLODED VIEW

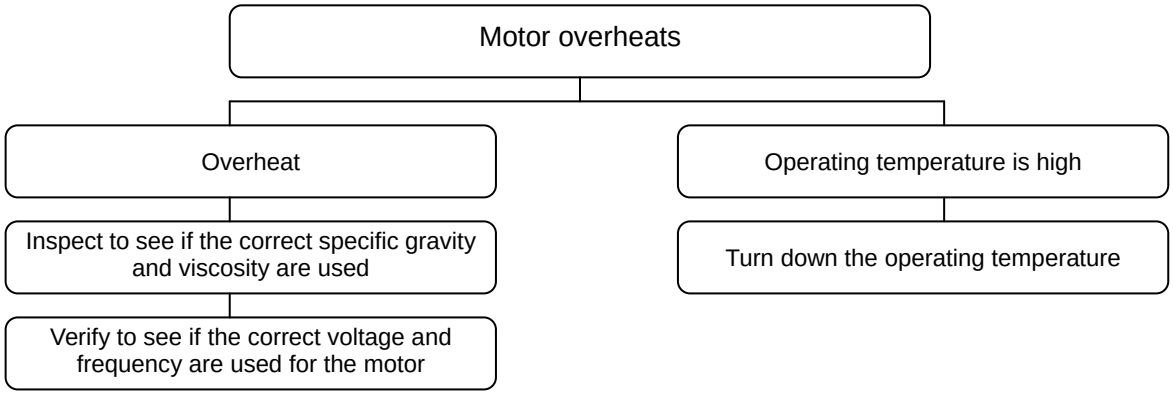


TROUBLESHOOTING

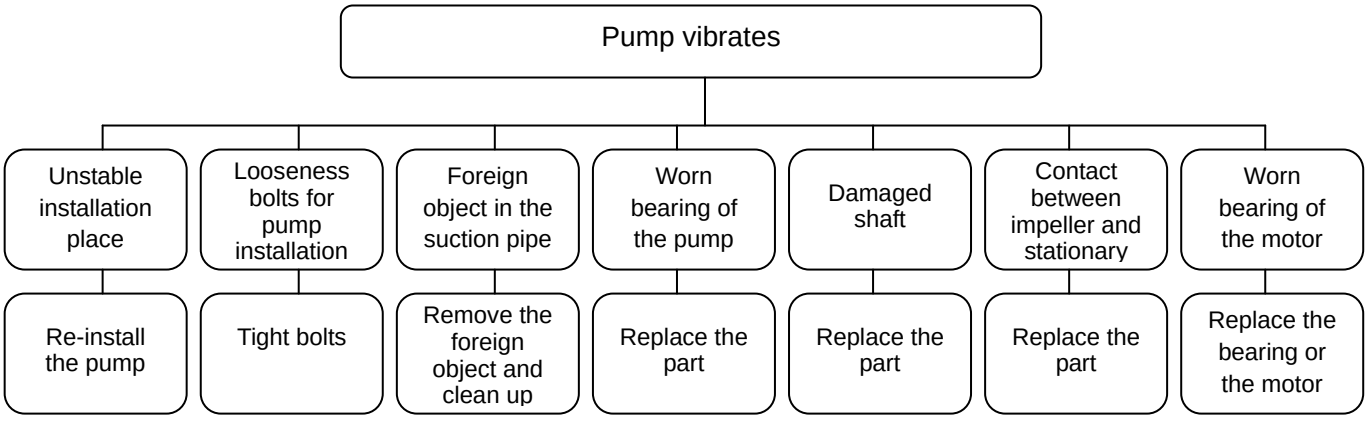
1. Unable to pump or insufficient pumping



2. Motor overheats



3. Pump vibrates



WARRANTY PERIOD AND COVERAGE

1. The warranty period is one year from the date of delivery.
2. During the warranty period, if the unit fails or becomes damaged in a normal operating condition due to manufacturing defect(s), the failure or damaged part(s) will be repaired free of charge.
3. There will be a service charge for repairing the following failure(s) or damage(s) and for the replacement of worn part(s):
   a. Any failure or damage occurring after the warranty period.
   b. Any failure or damage due to improper use or safekeeping.
   c. Any failure or damage due to the use of part(s) manufactured by other or the use of unauthorized parts.
   d. Any failure or damage from repair or modification performed by an unauthorized agent.
   e. Any failure or damage as result of natural disaster or force majeure.
4. The manufacturer is not responsible for any failure or damage of a product operated according to the specification or material designated by the customer.
5. The warranty does not cover irregularities or failures caused by chemical or hydrodynamic corrosion, or the property of the liquid pumped. The material chosen at the time of purchase is strictly a recommendation; the chemical resistance of the material is not guaranteed.
6. Any disputes over the cause of a failure or damage shall be resolved through discussion between the customer and the manufacturer.
7. Travel expenses for non-warranted repair service to a remote location will be the responsibility of the customer.
8. Damages and costs of damages incurred as a result of pump failure during operation is not covered under the warranty.

REPAIR

Attention: For repair, please contact the local supplier of our products. When returning a pump, please clean the wet kit parts thoroughly with water and pack properly.

If any irregularity is detected during operation, immediately stop the pump and inspect it.
(See the section *TROUBLESHOOTING*.)

   a. To request a repair service, please contact your local supplier or the manufacturer’s service department.
   b. Before requesting repair service, please carefully read the instruction manual again and recheck the pump.

c. When requesting repair service, please provide us with the following information:
   - Model name and serial number
   - How long the unit has been used and its condition
   - Damaged section and its condition
   - Liquid pumped (name of liquid, specific gravity, liquid temperature, presence of slurry)

When returning a failed pump, please ensure to thoroughly wash the inside of the pump to prevent the danger of liquid leakage form the pump during transit.
When ordering replacement or spare parts, please provide the part names, part numbers and material listed in the table in the section *OUTLINE DIMENSION*.

MODEL	YD-
SERIAL NO.	
DISTRIBUTOR	
DATE OF PURCHASE	

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