

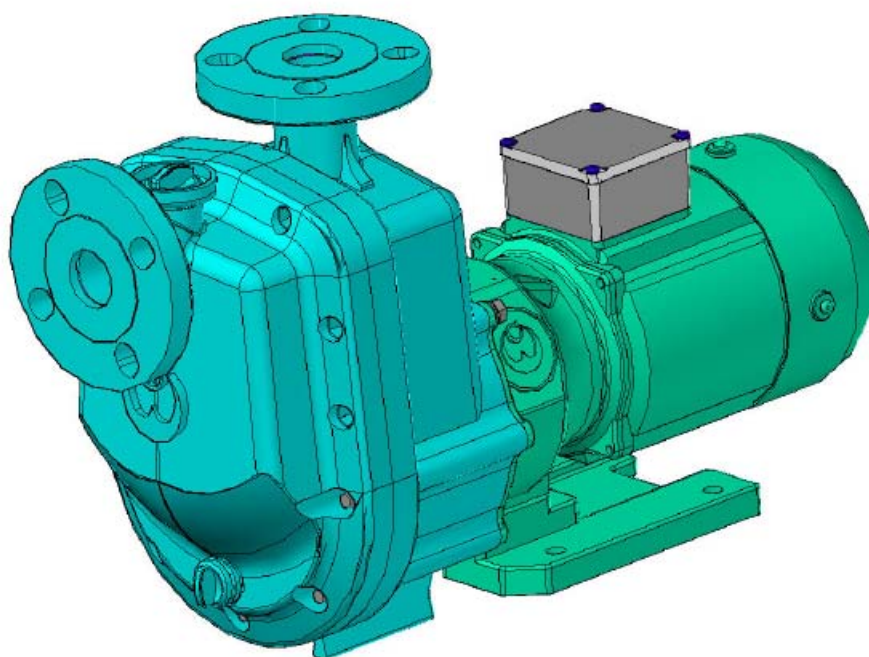
Corrosion Resistance Magnet Drive Pump

Super MAG

YD-GV(F)

INSTRUCTION MANUAL

Version: 151119



Preface

Thank you very much for purchasing World Chemical’s magnet pump “Super Mag”. Please read this manual thoroughly. An adequate understanding of this manual is required to maximize the pump’s performance and to assure safety and long-term efficiency. Store this manual where it can be easily accessed.



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

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

	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 surroundings.
When using the pump for dangerous liquids or in surroundings (only explosion prevention specifications), adhere to facility standards determined by law and conduct daily check to prevent leakage. If operate the pump under abnormal conditions, such as liquid leakage, it may cause serious accidents such as explosion or fire and personal injury. Regarding handing liquid, follow the liquid manufacturer.
-  (2) Do not use damaged or modified pumps.
Using the damaged or modified pumps may cause fatal accident, electric shock or pump damage. It is not covered by our warranty.
-  (3) Caution when transporting or lifting the pump.
Always use the hoist belt for pumps that come with them. When pumps do not have hoist belts, lift them with bolt slings while watching the weight balance. It should be performed by qualified personnel with enough strong slings. The lightest pumps' weight is around 10kg (22 lbs.), and do not carry the by hands as much as possible.
-  (4) Do not operate pumps with power on.
Do not inspect or dismantle pumps or motors with the power on. It may lead to personal injuries such as electric shock or getting caught in the rotor. Operate it with multiple safety devices such as the switch for main power supply, the operation switch, and the hand switch for the pump.
-  (5) Connecting earth cable.
If using the pump without connecting earth cable to the motor, it may cause electric shock. Connect it by qualified personnel under the electric facilities technical standards and interior wiring regulations.
-  (6) Protect power supply cord.
Over-stretching, pinching and damaging power supply cords or motor lead wires may cause fire or electric shock to damage it. Place the terminal box cover at the original position.
-  (7) Install Current Leak Circuit Breaker.
The operation without a current leak circuit breaker may cause electric shock. Install it or an over current protection device, and prevent electric accidents or pumps damage.
-  (8) Caution when removing pump.
When removing the pump from piping, make sure to close valves on the suction/discharge piping and check no liquid leakage. Direct contact with liquid may be harmful and wear protective gear when performing operation.
The hole on the bracket is for the check of the coupling rotation state when installing/removing the coupling with the motor shaft or maintenance.



CAUTION

-  (1) Unspecified use.
Do not use pumps for purposes other than specification in the spec sheet or the nameplate. Especially, check the motor specification (phase, voltage and frequency). Unspecified use may cause personal injuries, the pump or peripheral equipment damage.
-  (2) Restrictions of operator.
Transportation, installation, wiring, operation, servicing, and inspection should be performed by qualified personnel who have full knowledge on the handling the pump.
-  (3) Caution when opening package.
Open the package after checking upside down of the product. When opening a wooden crate, be careful of nails and silvers to get the product out without hurting you.
-  (4) Ventilation.
Do not place objects around the pump that might obstruct ventilation as the motor heats up. In handling toxic or odorous liquids, have the pump situated in a well-ventilated place to prevent poisoning.
-  (5) Repairs and returning the pump.
When repairing the damaged pump, contact your supplier. If sending the pump back by express, wash the interior and exterior with fresh water and check it without liquid. Then, wrap with a vinyl bag and pack it.
-  (6) Plastic (resin) parts.
The pump is made of resin and it may cause fatal accident for strong impact. Do not hit and get on top of the pump. Also attach piping supports not to apply any pipe load to the pump.
-  (7) Pump starting.
Check the direction of rotation at the starting up of the pump. In this time, open the suction and discharge valves and check no liquid leakage from the pipe connection. After exhausting air and filling the pump with liquid, check the direction of rotation by switching quickly. If the rotation is in reverse, switch two of the three phases in the three-phase power supply to change the direction of rotation. Make sure to power off before wiring it.
-  (8) Disposing of scrapped pump.
When disposing scrapped pumps, remove adherent liquid and discard it as industrial waste in law.
-  (9) Outflow protection.
Just in case liquid leaks to break the pump or pipes, take appropriate preventative measures.

Unpacking check

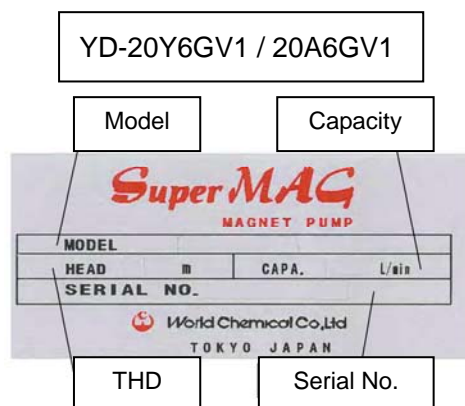
Check as follows and contact your supplier when you have any questions.

1. The indication in the nameplate (model, total head, capacity, motor specification, voltage and motor specification) is the same as your order.
2. Accessory is stocked with.
3. There is any damage and loose bolts during transportation.

Model description

YD – 20 Y6 GV 1 – CP – R D 5 2
 (1) (2) (3) (4) (5) (6) (7) (8) (9)

- (1) Suction / Discharge Bore : 20A
- (2) Motor output / Power Supply
 Y6: 3 Phase 200V 0.26kW (Indoor motor)
 A6: 1 Phase 100V 0.26kW (Indoor motor)
- (3) Model GV: Self-priming pump
- (4) Motor type 1:IE1
- (5) Wet Parts Kit Material
 CP: CFR-PP (Carbon Reinforced Polypropylene)
- (6) Bearing Material R: CFR-PTFE
- (7) O-ring Material
 D: FPM (Dai-el) E: EPDM
- (8) Frequency
 5: 50Hz 6: 60Hz
- (9) Limit of Specific Gravity
 2: Until 1.2



YD-250*/400*/500*GV(F) series



YD – 4001 GV 3 – GP – CD 5 1
 (1) (2) (3) (4) (5) (6) (7)

- (1) Bore / Motor output (3 phase, 200V)

Model	Suction bore	Discharge bore	Motor output
2500GV1	25A	25A	0.4kW
2501GV(F)3	25A	25A	0.75kW
2502GV(F)3	25A	25A	1.5kw
4001GV(F)3	40A	40A	0.75kW
4002GV(F)3	40A	40A	1.5kW
4003GV(F)3	40A	40A	2.2kW
5002GV(F)3	50A	50A	1.5kw
5003GV(F)3	50A	50A	2.2kW
5005GV(F)3	50A	50A	3.7kW

- (2) Model
 GV
 GVF
- (3) Motor type
 1: IE1
 3: IE3
- (4) Main material
 GP: GFR PP
 CF: CFR ETFE

(5) Bearing / O-ring material (250*/400*/500*GV(F) *series)

Model	YD-****GV(F)*-△△				
Material code	CD	CE	AD	AE	TT
Bearing	Carbon	Carbon	Almina ceramic	Almina ceramic	Special*1
O-ring	FPM (Dai-el)	EPDM	FPM (Dai-el)	EPDM	Special*1

*1) Special material: The material other than the standard material is used by consultation with the customer.

(6) Frequency

5: 50Hz 6: 60Hz

(7) Limit of specific gravity

1: 1.05/1.1 2: 2.2 3: 1.3 4: 1.4 6: 1.6 8: 1.8 G: 2.0

250*GV* series

Code/Model	2500GV1		2501GV3		2502GV3	
	50Hz	60Hz	50Hz	60Hz	50Hz	60Hz
No indication	1.05	1.05	-	1.1	-	
-G	-		2.0	1.8	-	2.0

400*GV3 series

Code/Model	4001GV3		4002GV3		4003GV3	
	50Hz	60Hz	50Hz	60Hz	50Hz	60Hz
No indication	1.1	-	-	1.1	-	
-G	-		1.8	-	-	1.4

500*GV3 series

Code/Model	5002GV3		5003GV3		5005GV3	
	50Hz	60Hz	50Hz	60Hz	50Hz	60Hz
No indication	1.1	-	1.1	1.1	-	1.2
-G	-		1.4	-	1.8	1.6

250*GVF3 series

Code/Model	2501GV3		2502GVF3	
	50Hz	60Hz	50Hz	60Hz
-F	-	1.1	-	
-G	2.0	1.6	-	1.8

400*GVF3 series

Code/Model	4001GVF3		4002GVF3		4003GVF3	
	50Hz	60Hz	50Hz	60Hz	50Hz	60Hz
-F	1.1	-	-	1.1	-	
-G	-		1.6	-	-	1.3

500*GVF3 series

Code/Model	5002GVF3		5003GVF3		5005GV3	
	50Hz	60Hz	50Hz	60Hz	50Hz	60Hz
-F	1.1	-	1.1	1.1	-	1.2
-G	-		1.4	-	1.8	1.6

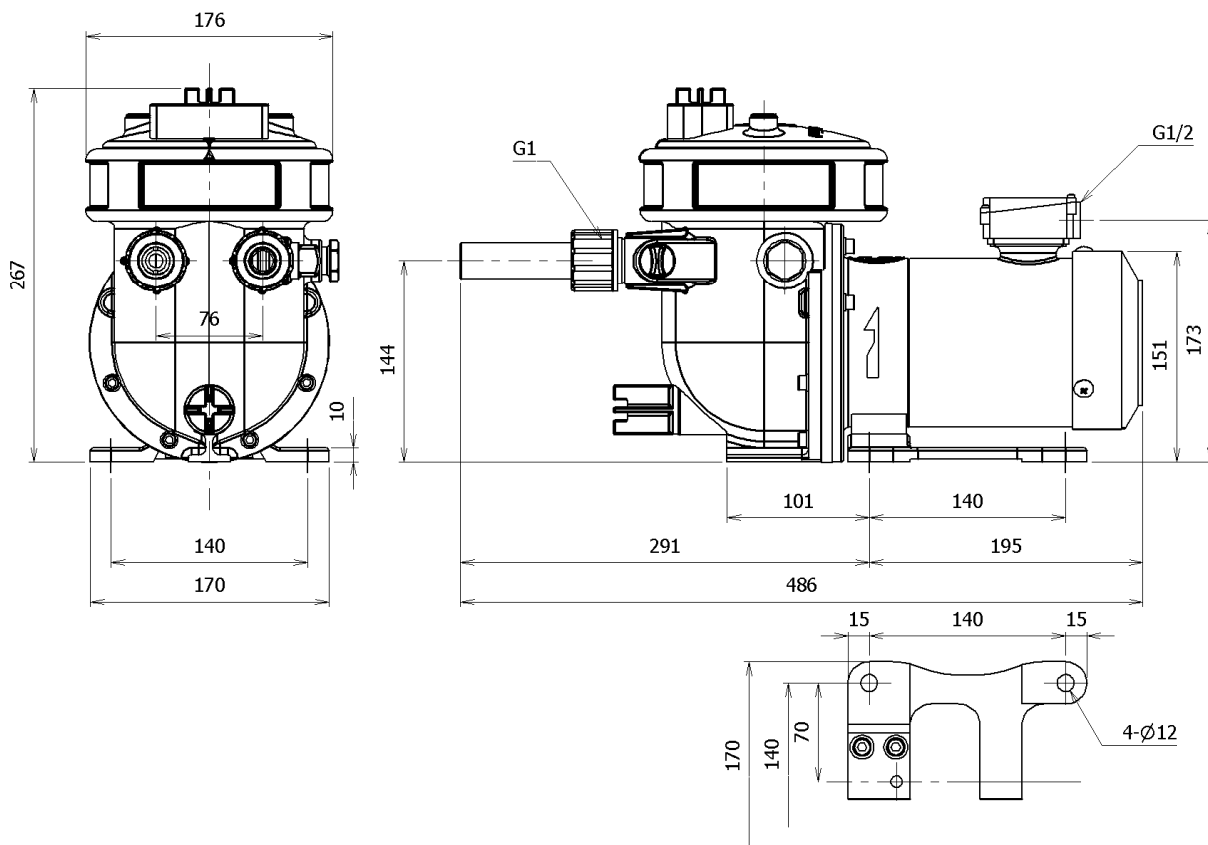
Specification

■ 20**GV1 series

Model		20Y6GV1	20A6GV1
Bore (Suc. x Dis.)		20A (0.8") x 20A (0.8") (Union connection)	
Motor output		0.26Kw (1/3HP) (Indoor motor)	
Standard spec. (m _L /min)	50Hz	6 – 30	
	60Hz	7 – 30	
Weight (kg)		10.0	
Limit of self-priming height (Normal temperature)		2.5 m	

* Motor is indoor type. If the pump is used outside, consult us.

Outline dimension YD-20Y6GV1 / 20A6GV1

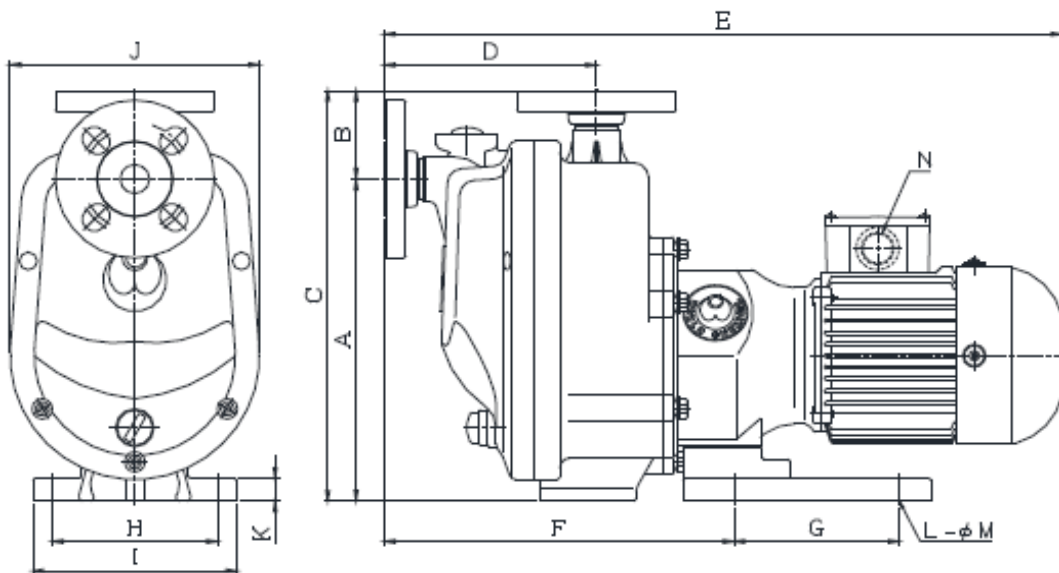


■ 250*GV(F)* series

Model			2500	2501		2502	
			GV1	GV3	GVF3	GV3	GVF3
Bore (Suc. x Dis.)			25A (1") x 25A (1")				
Motor output			0.4kW (1/2HP)	0.75kW (1HP)		1.5kW (2HP)	
Standard spec. (m _L /min)	50Hz	No ind. (-F)	8 - 80	-		-	
		-G	-	8 - 80	8 - 80	-	
	60Hz	No ind. (-F)	-	12 - 110	12 - 100	-	
		-G	-	8 - 80	8 - 80	12 - 110	12 - 105
Weight (kg)		GV	18.5	20.5		24.5	
		GVF	-	23		27	

Outline dimension

YD-2500GV1 / 2501 / 2502GV(F)3



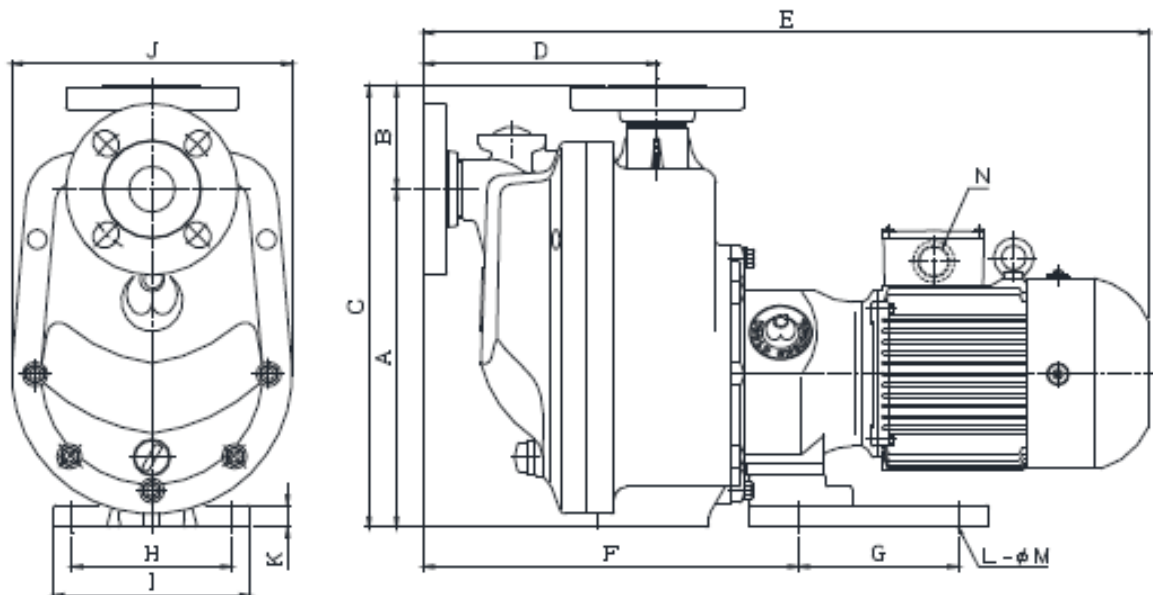
	A	B	C	D	E	F	G	H	I	J	K	L-φM	N
2500GV(F)1					533								
2501GV(F)3	255	70	325	167	562	275	130	130	160	196	18	4-φ12	PF3/4
2502GV(F)3					592								

■ 400*GV(F)3 series

Model		4001		4002		4003	
		GV3	GVF3	GV3	GVF3	GV3	GVF3
Bore (Suc. x Dis.)		40A (1.5") x 40A (1.5")					
Motor output		0.75kW (1HP)		1.5kW (2HP)		2.2kW (3HP)	
Standard spec. (m _L /min)	50Hz	No ind. (-F)	11 - 160	10 - 110	-		-
		-G	-		11 - 160	11 - 160	-
	60Hz	No ind. (-F)	-		17 - 200	15 - 200	-
		-G	-		-	-	17 - 200 16 - 200
Weight (kg)		GV	22.5		26.5		29
		GVF	25		29		31.5

Outline dimension

YD-4001 / 4002 / 4003GV(F)3



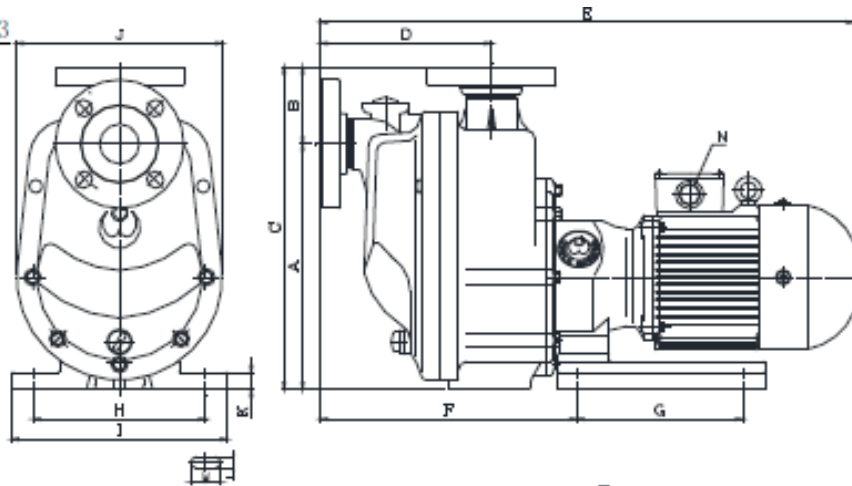
	A	B	C	D	E	F	G	H	I	J	K	L-φM	N
4001GV(F)3	276	84	360	190	592	305	130	130	160	228	18	4-φ12	PF3/4
4002GV(F)3					622								
4003GV(F)3					622								

■ 500*GV(F)3 series

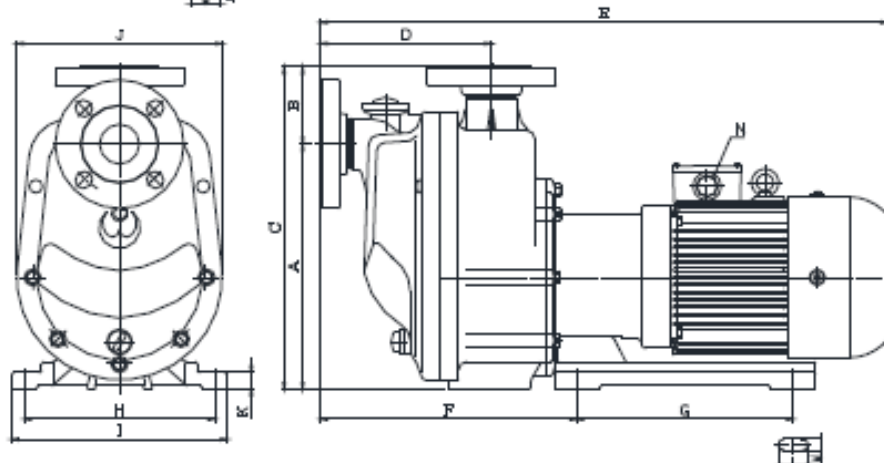
Model		5002		5003		5005	
		GV3	GVF3	GV3	GVF3	GV3	GVF3
Bore (Suc. x Dis.)		50A (2") x 50A (2")					
Motor output		1.5kW (2HP)		2.2kW (3HP)		3.7kW (5HP)	
Standard spec. (m _L /min)	50Hz	No ind. (-F)	17 - 200	15 - 200	18 - 250	17 - 250	-
		-G	-		17 - 200		18 - 250
	60Hz	No ind. (-F)	-		18 - 250	17 - 250	28 - 200 23 - 300
		-G	-		-	-	18 - 250
Weight (kg)		GV	29.5		32		53
		GVF	32.5		35		56

Outline dimension YD-5002 / 5003 / 5005GV(F)3

YD-5002/5003GV(F)3



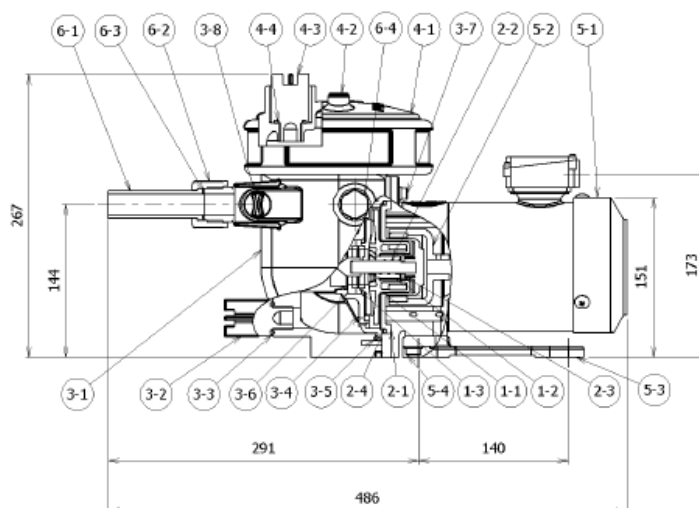
YD-5005GV(F)3



	A	B	C	D	E	F	G	H	I	J	K	4-LxM	N
5002GV(F)3	296	93	389	206	643	309	200	208	260	248	20	14 x 36	PF3/4
5003GV(F)3					713		261	230				36 x 14	
5005GV(F)3													

Parts name / Material / Structure

YD-20Y6GV1 / 20A6GV1

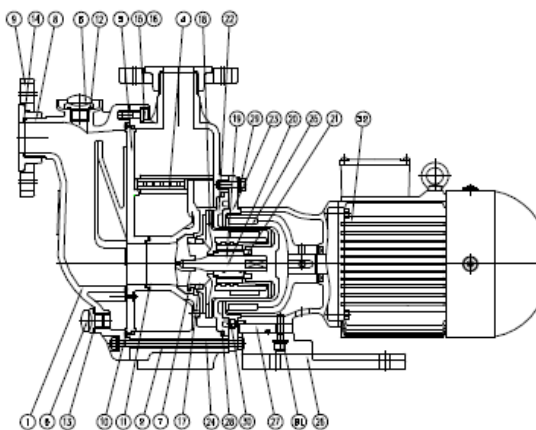


No.	Parts name	Qty	Material	Set condition
1-1	Impeller	1	PP + Magnet	Impeller set
1-2	Bearing	1	CFR PTFE	
1-3	Mouth ring	1	CFR PTFE	
2-1	Rear casing	1	CFR PP	Rear casing set
2-2	Shaft	1	Alumina ceramic	
2-3	Rear thrust ring	1	Alumina ceramic	
2-4	O-ring for rear thrust ring	1	EPDM / FPM	
3-1	Front casing	1	CFR PP	Front casing set
3-2	Drain cock	1	CFR PP	
3-3	O-ring for drain cock	1	EPDM / FPM	
3-4	Vortex chamber	1	CFR PP	
3-5	O-ring for vortex chamber	1	EPDM / FPM	
3-6	Liner ring holder	1	CFR PP + Alumina ceramic	
3-7	Hex. socket head cap screw (M6x25)	8	SUS304	
3-8	Air suction cock	1	CFR PP	
4-1	Front casing cover	1	CFR PP	Motor set
4-2	Front casing cover cap	2	CFR PP	
4-3	Priming water plug	1	CFR PP	
4-4	O-ring for priming water plug	1	EPDM / FPM	
5-1	Motor with bracket *1	1	FCD12 + Steel motor	Motor set
5-2	Outer magnet	1	Ne-Fe-B + FC450	
5-3	Motor base	1	FC200	
5-4	Hex. socket head cap screw (M8x25)	4	SUS304	
6-1	Union socket	2	C-PVC	Accessory
6-2	Union nut	2	GFR PP	
6-3	O-ring for union socket	2	EPDM / FPM	
6-4	Plug	1	PP	

*1: The motor is indoor type. If it is use outdoor, consult us.

Parts name / Material / Structure

YD-250* / 400* / 500*GVF(F)*



No.	Parts name	Qty	Material		Set condition
			YD-GV*	YD-GVF*	
1	Suction casing	1	GFR PP	CFR ETFE	Casing set
2	Discharge casing	1	GFR PP	CFR ETFE	
3	Separate board	1	GFR PP	CFR ETFE	
4	Grating board	1	GFR PP	CFR ETFE	
5	Priming water plug	1	GFR PP	CFR ETFE	
6	Drain plug	1	GFR PP	CFR ETFE	
7	Liner ring	1	Alumina ceramic + GFR PPS	Alumina ceramic + CFRETFE	
8	Lap joint	2	GFR PP	CFR ETFE	
9	Flange	2	GFR PP	GFR PP (Black)	
10	Packing	1	(EPDM / FPM) *1		
11	O-ring	1	(EPDM / FPM)		
12	O-ring	1	(EPDM / FPM)		
13	O-ring	1	(EPDM / FPM)		
14	O-ring	2	(EPDM / FPM)		
15	Hex. socket head cap screw	4	SUS(M6:for 25* / M8: for 40*, 50*)		
16	Hex. socket head cap screw	10	SUS(M6:for 25* / M8: for 40*, 50*)		
17	Mouth ring	1	CFR PTFE		Impeller set
18	Impeller	1	GFR PP+PP+Magnet	CFR ETFE + Magnet	
19	Bearing	1	GFR PPS+Carbon/Ceramic	CFR ETFE+Carbon/Ceramic	Rear casing set
20	Shaft	1	Alumina ceramic		
21	Rear thrust ring	1	Alumina ceramic		
22	Rear casing	1	GFR PP	CFR ETFE	Rear casing support set
23	Rear casing support	1	FC200		
24	Stud bolt	3 / 5	SUS(25*GV(F): 3pcs)		
25	Outer magnet	1	FCD450-10+Magnet		
26	Base	1	GFR PP / FC450-10		
27	Base biscuit	1	FC200 (25*GV(F)/505GV(F)*: No)		
28	O-ring	1	(EPDM / FPM)		
29	Hex. bolt	3	SUS M8x25		
30	Hex. socket head cap screw	6	SUS M6 x 12		
31	Hex. socket head cap screw	4	SUS M8		
32	Motor with bracket *2	1	FC200 + Alumina alloy		

*1: FPM: Dai-el

*2: When assembly of the 5HP general motor, the mounting plate is necessary.

Handling instructions

Because of the powerful magnetic force of this pump, extra precaution is necessary in addition to the normal one such as dry running or reverse rotation operation.

1. People with pacemakers and other electronic devices for maintaining bodily functions do not use this magnet pump. The inside magnet is more powerful than ordinary magnets used every day.
2. Do not place your hand between the magnets. If there are articles made of iron such as knives, scissors or iron masses nearby, the magnet could attract to them in an instant, causing injury to the hand holding the article or causing the plastic surrounding the magnets to crack.
3. Do not place floppy disks, computer memory or magnetic tapes, because they are easily magnetized.

Prohibited on conventional magnet pumps

1. Dry Running

Dry running generates friction heat at sliding parts such as the shaft and bearing and plastic parts around them become deformed. As the result, the impeller eccentrically rotates, the pump does not work properly and damaged.

- If the pump is operated without priming liquid during the suction valve is closed, dry running occurs.

2. Liquid with slurry

Basically, do not use the magnet drive pump for liquid with slurry. Even if thin liquid with slurry is transferred by the pump, the pump and parts are damaged and make the life shorten.

(If using the pump for liquid with slurry, consult us in advance.)

3. Cavitation*

If the pump is used with cavitation, it may cause the pump vibration, the basic performance degradation or damage inside the casing.

The causes may be that suction pipes are long, thin, many bending, high temperature liquid or strainers clogged.

- Cavitation is the phenomenon that the liquid inside becomes low pressure locally by liquid action and air bubbles occur.

(When air bubbles break, impact occurs and makes noise & vibration. It also causes the surface erosion and the performance degradation.)

4. Erosion

The product is mainly made of GFR PP or CFR ETFE. When purchasing it, consider the corrosion resistance against liquid and select the pump. The pump life may be shortened depending on the liquid type and temperature. When changing the transferred liquid or condition, consult us.

- CFR PP
Tolerable temperature: 0 – 80°C (32 – 176F)
Incompatible liquids: Nitric acid, concentrated sulfuric acid, chromium acid and strong oxidant such as sodium hypochlorite
- GFR PP
Tolerable temperature: 0 – 70°C (32 – 158F)
Incompatible liquids: Nitric acid, concentrated sulfuric acid, chromium acid, sodium hypochlorite, caustic soda
- CFR ETFE
Tolerable temperature: 0 – 60°C (32° – 140F°)
Incompatible liquids: Trichloroethane, Trichloroethylene

Installing / piping precaution

1. Installing precaution

- (1) If a large amount of air enters in pumps, it does not pump properly and causes a breakdown.
 - The suction pipe is the state of the negative pressure. If air enters for the connection installing failure, liquid is not pumped and the temperature of priming liquid is raised. It may cause the pump damage.
 - Use the suction pipe whose bore is the same as the suction inlet. Do not use the pipe which is bigger than the suction inlet, because it may cause the self-priming ability decline or failure.
- (2) Place a strainer at the suction inlet to prevent foreign objects from entering the pipe. However, clean the strainer periodically to prevent clogging and minimize loss resistance.
- (3) It is recommended to place check valves on the discharge pipe to prevent “water hammer”. At the bottom, place a bypass for air exhaust.
 - The discharge pipe is long or the capacity is 10m (30ft.) and more.
 - The tip of the discharge pipe is 9 m (27 ft.) and more from the liquid level in a suction tank.
 - Two or more pumps that are parallel to one another are used.
- (4) Create bending sections or expansion joints on the piping to prevent pump deformation and liquid leakage caused by thermal expansion of pipe.
- (5) The inside of the pump is mainly made of resin. Do not create any impact.
- (6) Arrange the pipe flange and the pump flange parallel to one another and do not tighten the bolts excessively. Bolt: M16. Recommended tightening torque: 19.6N·m or 200kgf·cm (14.45lbw-ft)
- (7) When installing, fit the dimension of the pump. If not, the casing may be damaged.
- (8) When using the pump outside, use the water proof cable at the service entrance to prevent rain into the terminal box.

2. Do not apply piping load.

- (1) Install the piping support to apply the piping load completely.
- (2) When high temperature liquid (40°C (104 ° F) and more), create bending or expansion joints in the pipe to prevent the pump from load for heat expansion.
- (3) Prevent to use metal pipes as much as possible and use resin pipes.

*Using metal pipes for strong sulfuric acid or caustic soda is usual. Especially, follow the prohibition (2) and (3).

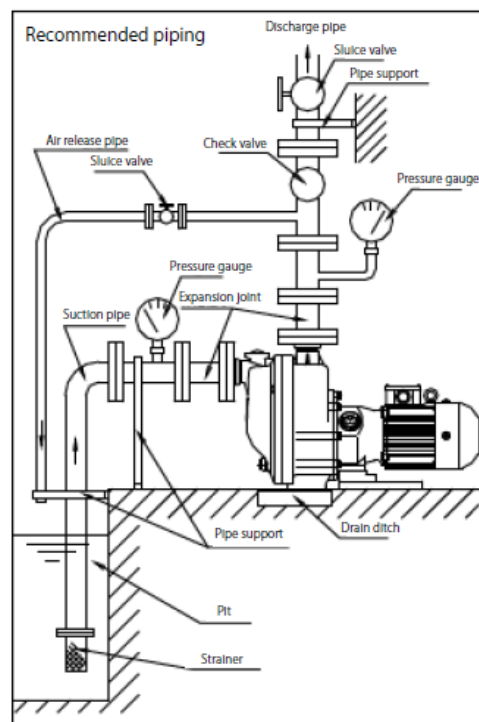
3. Drain Ditch

- (1) Arrange drain ditches as liquid leaks flows to a wastewater pit.
- (2) If not, set a drain pan.

4. Precaution before priming liquid

After pouring priming liquid, tighten the priming water plug firmly. If the pump is operated with loosen O-ring, it may cause self-priming failure.

Model	Min. priming liquid
20*GV1	0.6L
250*GV(F)*	2.0L
400*GV(F)3	3.0L
500*GV(F)3	4.0L



Operation precaution

1. Before starting operation.
 - (1) Clean pipes and tanks. If foreign objects enter the pump, not only the performance decrease, but also cause a breakdown.
 - (2) Pour priming water from the priming water plug on the top of the suction casing and release air. From next time, it is not necessary to do it for the self-priming structure.
 - (3) Check that the flange bolts are tightened firmly. Loose bolts may cause liquid leakage, injury to people and damage to other facilities.
 - (4) Check the rotation direction of motor. If the motor rotates in reverse, rewire two phases of the three-phase power supply. It is clockwise as viewed from the motor fan.
 - (5) Tighten the drain plug more. If it is loosened at the start of the operation, the self-priming ability decreases dramatically and it may cause the pump damage.

2. No dry running.

Sliding parts are cooled by self-circulation with pumped liquid. If the pump is operated with no liquid, it may damage by heat. If dry running occurs, do not suddenly pour liquid in it rather than leave it an hour and more. A sudden flow of liquid may rapidly cool the heated sliding parts and severely damage them beyond repair.

3. Liquid seal operation by mistake (Suction & discharge valves are closed.)

When operating pumps with the suction & discharge valves closed, the inside is subjected to high pressure and temperature. If the pump is disassembled in this situation, steam and hot water are spewed. Make sure to check decreasing in temperature completely and do it.

When the pump inside is damaged by liquid seal operation, not only parts but also pump may have to be replaced.

4. Range of the used liquid temperature

Vapor pressure, viscosity, and corrosiveness are changed depending on the temperature of the used liquid. Use the pump under allowing leeway of the pump performance in mind of them.

 - Range of the used liquid temperature: 0 – 80°C (32 – 176 F) <20**GV1 series>
 0 – 70°C (32 – 158F) <GV* series>
 0 – 60°C (32 – 140 F)<GVF* series>

* The self-priming height and time are changed depending on the liquid temperature.

5. Change of the used liquid specific gravity or viscosity

If the specific gravity and viscosity are changed a lot, the pump's performance capacity, efficiency, and axial movement power may be changed by pumped liquid. Take them into consideration and use the pump within an appropriate leeway.

6. Use conditions change

The pump is manufactured under the specification based on the meeting before purchase. If the use condition is changed, consult us.

7. Limit of the pump pressure resistance

Avoid going over the discharge pressure of the pump as the following the limit. (at 25 degrees)

Model	20**GV1	250*GV*	400*GV3	500*GV3	250*GVF*	400*GVF3	500*GVF3
Limit (MPa)	0.25	0.32	0.41	0.53	0.32	0.41	0.45

8. Easy foamy liquid

Easy foamy liquid by stirring for surfactant reduces self-priming ability dramatically. No self-priming sometimes happens. In this case, take measures such as placing foot valves.

9. Frequent on / off switching

Frequent switching on / off of a pump may hasten pump damage. Turn on the pump less than six times in an hour.

10. Minimum flow rate

Operate pumps at the capacity higher than the following figure.

Model	Minimum flow rate
20Y6GV1, 2A6GV1	5 L/min
2500GV1, 2501GV(F)3, 4001GV(F)3	10 L/min
2502GV (F)3, 4002GV(F)3, 4003GV(F)3, 5002GV(F)3, 5005GV(F)3	20 L/min

Maintenance / Consumable parts YD-20Y6GV1 / 20A6GV1

1. Daily check

- (1) Check that there are no vibrations or any abnormal noises and it works smoothly.
- (2) Compare the current value during operation with the rated current value and check that the operating load is normal. Also, the discharge pressure, capacity and current value is on the level than ever before.
- (3) Check the liquid level in the suction tank. (The empty tank during operation = the pump damaged)

2. Periodical check

- (1) Periodically overhaul is recommended for a smooth operation.
- (2) When replace or carrying pumps for repair, drain and wash the pump thoroughly.

3. Consumable parts check

Periodically check the following consumable parts, and replace them if necessary.

(1) Mouth ring (No. 1-3)

Check the wear volume as viewed from the front.
Replace it if it has dents.

(2) Bearing (No. 1-2)

Check no crack / damage and rattle with the shaft.

(3) Rear thrust ring (No.2-3)/Shaft (No. 2-2)/Liner ring (No.3-6)

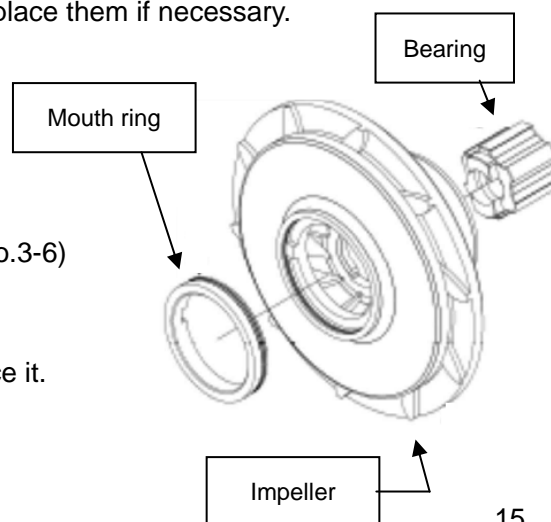
If they have crack, damage or abrasion, replace it.

(4) Impeller (No.1-1)

If there is abrasion or corrosion on the surface, replace it.

(5) Rear casing (No. 2-1)

If there is abrasion or corrosion inside, replace it.



- (6) Front casing (No.3-1)
If there is abrasion or corrosion inside, replace it.
 - (7) O-ring (No.2-4, 3-3, 3-5, 4-4, 6-3)
If there is harden, less elastic or crack, replace it.
4. Consumable parts change
- (1) Front casing set (2) Rear casing set (including O-ring) (3) Impeller set

Disassembly / Assembly YD-20Y6GV1 / 20A6GV1

The magnet force which is used in a pump is powerful, be careful of it during disassembly or assembly. As well make sure to close the suction and discharge valves during them.

1. Disassembly
 - (1) Drain the liquid remaining inside the pump and wash the interior thoroughly.
 - (2) Remove 8 hex socket head cap screws (M6) and remove the front casing. (Do not disassemble the front casing set to maintain the proper function.)
 - (3) Pull the impeller out to forward. Do not scratch them with care.
 - (4) When putting sharps such as scraper between the rear casing and rear motor bracket and lifting the rear casing, the rear casing is pull out to forward.
2. Assembly

Assembly is in the reverse order of disassembly. Clean the sliding parts and O-rings thoroughly with no entering dust or scratch. As well tighten the bolts evenly.

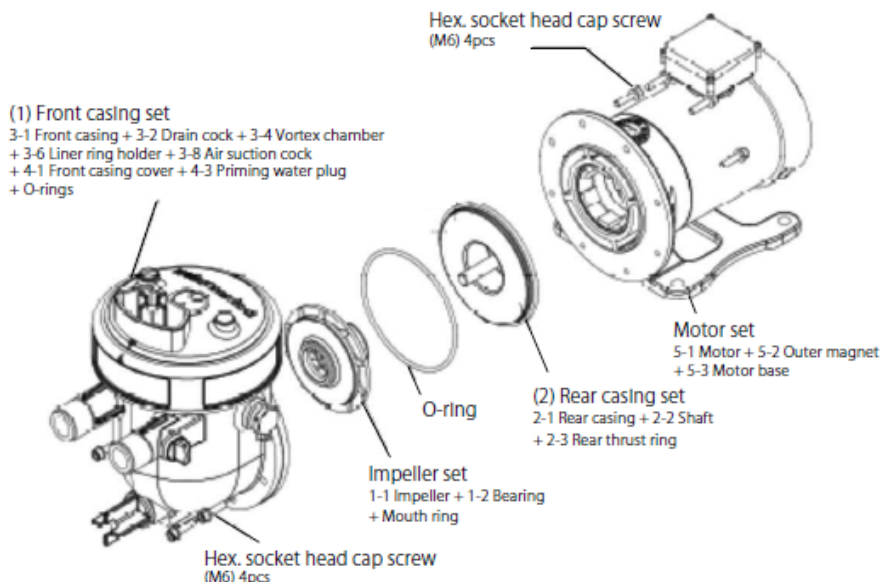
 - (1) Install the rear casing with the shaft and the rear thrust ring to the motor with bracket with the outer magnet.
 - (2) Install the O-ring to the rear casing assemble with the front casing.
 - (3) Tighten 8 hex. socket head cap screws (M6) by required torque.
Required torque: $2.5N \cdot m$
 - (4) Pipe and prime the liquid (0.6L)fully from the priming cock.

Note: When disassembly or assembly, it is recommended to replace O-ring. After assembly, remove the motor fan cover and turn the fan by a hand to check it rotates smoothly.

<Rotation direction check of the motor>

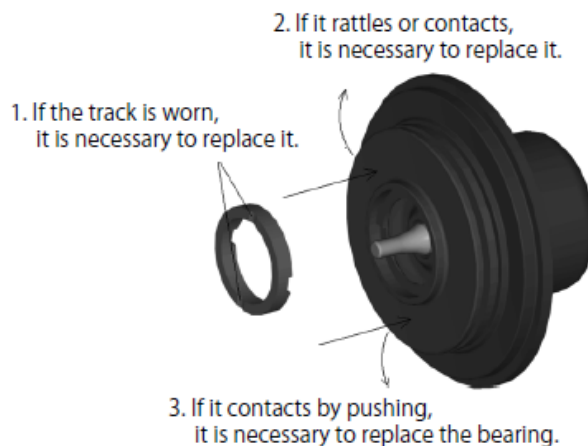
Check that the direction is clockwise as viewed from the motor fan cover at the start. If it is in reverse, switch two of the three phases in the three-phase power supply.

Exploded view YD-20Y6GV1 / 20A6GV1



Maintenance / Consumable parts YD-250* / 400* / 500*GV(F)* series

1. Daily check
 - (1) Check that there are no vibrations or any abnormal noises and it works smoothly.
 - (2) Compare the current value during operation with the rated current value and check that the operating load is normal. Also, the discharge pressure, capacity and current value is on the level than ever before.
 - (3) Check the liquid level in the suction tank. (The empty tank during operation = the pump damaged)
2. Periodical check
 - (1) Periodically overhaul is recommended for a smooth operation.
 - (2) When replace or carrying pumps for repair, drain and wash the pump thoroughly.
3. Consumable parts check
Periodically check the following consumable parts, and replace them if necessary.
 - (1) Mouth ring (P11 No. 17)
Check the wear volume as viewed from the front.
Replace it if the track is bald.
 - (2) Bearing (No. 19)
Check no crack / damage and the rattle with the shaft increases.
 - (3) Rear thrust ring (No. 21)
If it is worn to contact with the rear casing, replace it.
 - (4) Shaft (No. 20)
Check that there is no crack or damage.
 - (5) Liner ring (No. 7)
Check no crack or damage on the alumina ceramic.
 - (6) Impeller (No. 18)
If there is abrasion or corrosion on around the impeller, replace it.
 - (7) Rear casing (No. 22)
Check no abrasion or corrosion inside or outside.
 - (8) Casing (No. 1, 2)
If there is abrasion or corrosion. replace it.



- (9) O-ring, Pacing (No. 12, 13, 28)
If there is harden, less elastic or crack, replace it.

4. Consumable parts change: Please replace the following parts as set.
 - (1) Front casing set
Front casing + Liner ring + Separating board + Grating board
+ Lap joint + Flange + Priming water plug + Drain plug + O-ring + Packing
 - (2) Rear casing set
Rear casing + Rear thrust ring + Shaft
 - (3) Impeller set
Impeller + Mouth ring + Bearing
 - (4) O-ring for casing

Disassembly / Assembly YD-250* / 400* / 500*GV(F)* series

The magnet force which is used in a pump is powerful, be careful of it during disassembly or assembly. As well make sure to close the suction and discharge valves during them.

1. Disassembly
 - (1) Drain the liquid remaining inside the pump and wash the interior thoroughly.
 - (2) Remove hex. nuts (3 or 5 pcs) in the front and 3 hex socket head cap screws and remove the front casing from the rear casing support. (Do not disassemble the front casing set to maintain the proper function.)
 - (3) Pull the impeller out to forward. Do not scratch them with care.
 - (4) When putting sharps such as scraper between the rear casing and rear motor bracket and lifting the rear casing, the rear casing is pull out to forward.
 - (5) When removing the flange from the casing, use a plastic hammer. Hit lightly and remove it from the lap joint.
2. Assembly

Assembly is in the reverse order of disassembly. Clean the sliding parts and O-rings thoroughly with no entering dust or scratch. As well tighten the bolts evenly.

 - (1) Assemble the outer magnet with the motor. At that time, adjust that the height of the bracket and outer magnet is 13 mm. (If it is the dedicated motor, it is completed to push the shaft to the end.)
 - (2) Attach the rear casing support with bracket.
 - (3) Place the rear casing and insert the impeller to the shaft with care not to get a hand.
 - (4) Install the O-ring to the rear casing and assemble with the front casing.
 - (5) After tightening all bolts, pipe it and pour priming water from the priming water plug.

The recommended tightening torque is as follows.

Model	Torque
250*GV*	7.0N·m
250-GVF3	6.5N·m
400*GV3, 500*GV3	10.0N·m
400*GVF3, 500*GVF3	7.0N·m

Note:

- (1) The magnet force is strong and use the plastic or wood spacer no to get finger.
- (2) When re-assembly, it is recommended to replace new O-rings.
If using the old O-rings, it may cause liquid leakage.
- (3) After assembly, remove the motor fan cover and rotate it by a hand. Check it rotates smoothly.

<Rotation direction check of the motor>

Check that the direction is clockwise as viewed from the motor fan cover at the start. If it is in reverse, switch two of the three phases in the three-phase power supply.

Assembling the pump with standard off-the-shelf motor

- (1) Put the standard off-the-shelf motor on the workbench with the motor shaft-side up. The opposite side of terminal box should be located right in front of you.



- (1)' Only for 5HP

Insert and tighten the screws to secure the bracket firmly to the motor mounting plate.

Screws: CAP M10x20 4pcs.



- (2) Tighten the stud bolts into the holes of the rear casing support.

Hex. Nuts:

250-252GV(F) --- M6 5pcs.

401-503GV(F) --- M8 5pcs.



- (3) Insert and tighten the bolts with washers to secure the bracket (with mounting plate for 5HP) to the motor. The base installation side of the bracket should be located at the opposite side of the terminal box.

Bolts and washers:

250GV(F) --- Hex. Bolts M8x25 4pcs.

Spring washers M8 4pcs

251-503GV(F) --- Hex. Bolts M10x25 4pcs.

Spring washers M10 4pcs.

505GV(F) --- Hex. Bolts M12x30 4pcs.

Spring washers M12 4pcs.



- (4) Insert the motor shaft into the hole of the outer magnet until the upper face of the outer magnet has located at 13mm (0.05 inches) above the upper surface of bracket.

Insert two screws into the fixing holes of outer magnet with hex wrench from the hole (see arrow) of the bracket. Tighten them to secure the outer magnet to the motor shaft.



- (5) Tighten the bolts to secure the base to the bracket.

Screws: 250-252GV(F) --- CAP M8x25(W/SW) 4sets

The following bolts should be installed with the base joint.

401-403GV(F) --- CAP M8x35 (W/SW) 4sets

502-503GV(F) ---CAP M8x45 (W/SW) 4sets

505GV(F) --- CAP M8x30 (W/SW) 4sets



- (6) Tighten the screws to secure the rear casing support to the bracket. The stud bolts side should be located at the base side.

Screws: CAP M6x12 6pcs.



- (7) Install the rear casing into the opening of the rear casing support. Carefully insert the impeller set into the rear casing along the pump shaft. There is a strong magnetic attraction between the impeller and the outer magnet. Do not pinch your fingers. Then, install the O-ring to the rear casing.

O-rings:

250-252GV(F) --- P-140

401-403GV(F) --- G-160



- (8) Insert the front casing along the stud bolts. Tighten the bolts to secure the casing to the rear casing support.

Bolts:

For rear casing support (Common use)

Hex. Bolts M8x25 (W/SW) 3sets

For front casing

250-252GV(F) --- Hex. Nuts M6 (W/SW) 5sets

401-505GV(F) --- Hex. Nuts M8 (W/SW) 5sets



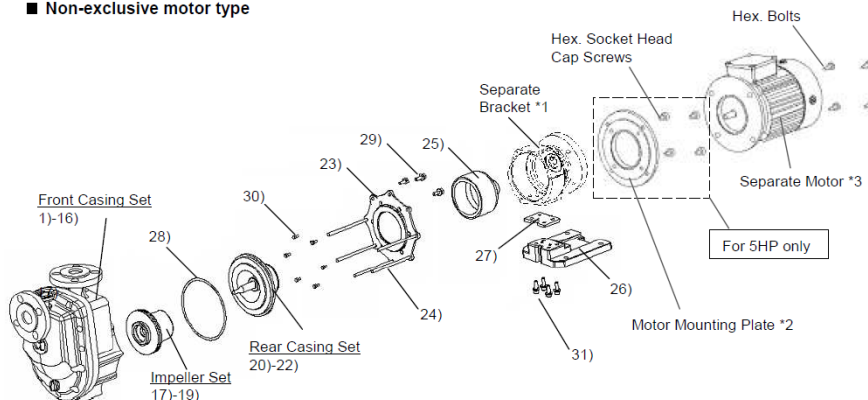
Assembling the pump delivered without separate motor

- (1) Remove the Hex. Nuts (M6 or M8, 5pcs.) on the front side of the casing (lower part), and Hex. Bolts (M8x25, 3pcs.) on the rear side (upper part). Separate the casing, rear casing support and bracket from each other.
- (2) Remove the pump base from the bracket.
- (3) Fix the bracket to the motor (see (3) on P25), and insert the motor shaft into the outer magnet. (see (4) on P26)
- (4) Assemble the rest parts in the same procedure of "2-3. Assembling the pump with standard off-the-shelf motor" from (5) on P26.

The following is the NEMA frame No. and the motor bolt size for the NEMA motor used in the U.S.A.

Model	HP	NAMA frame	Motor bolt size	Qty
250GV	3/4	56C	3/8" x 1.5"	4
251GV(F)	1			
252GV(F)	2			
402GV(F)	2			
403GV(F)	3			
503GV(F)	3	184TC	1/2" x 1"	
505GV(F)	5			

■ Non-exclusive motor type



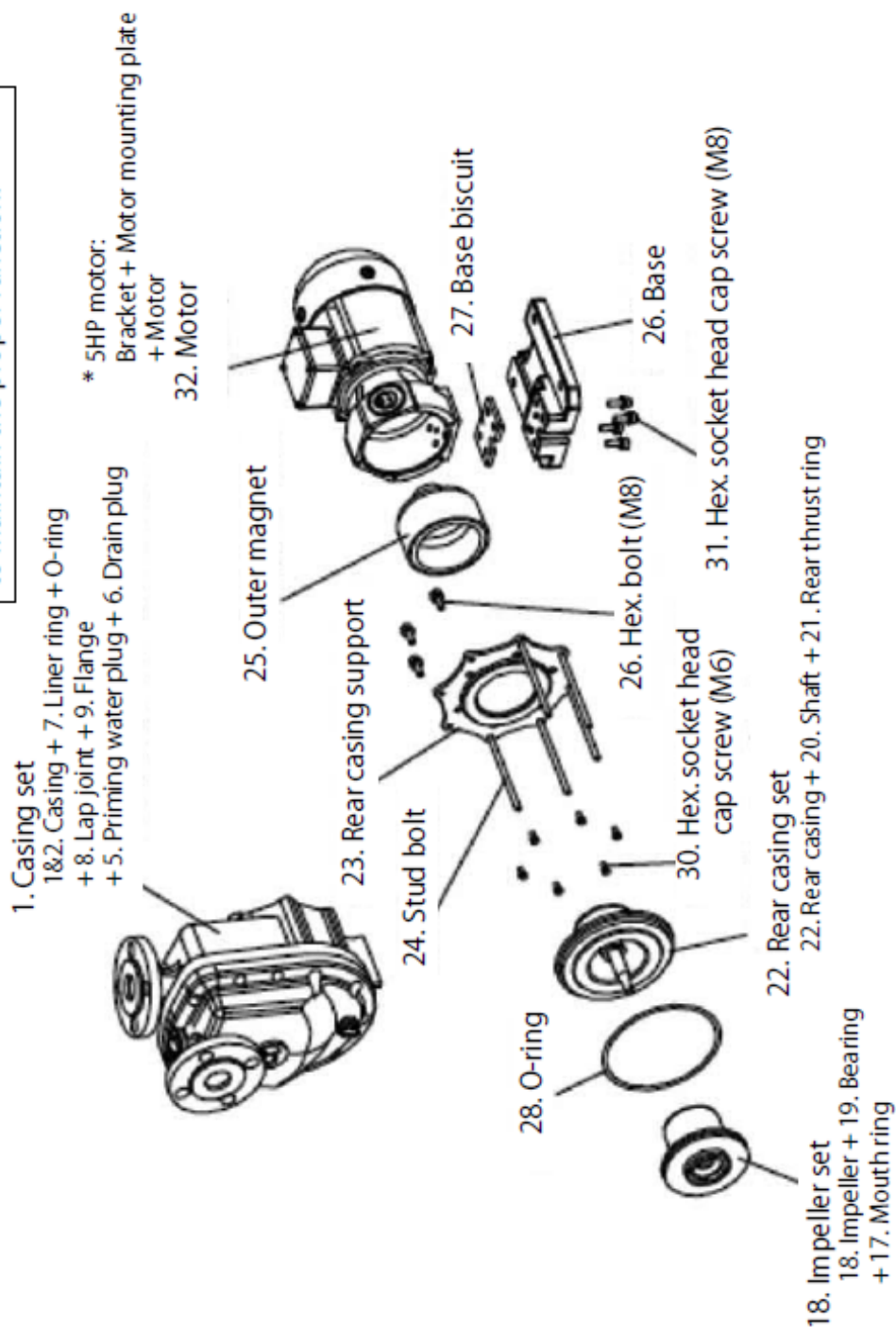
*1: Separate bracket is used for non-exclusive motor as an individual part.
(Separate NEMA bracket is used for the US version.)

*2: For 5HP motor, a motor mounting plate (FC) is added between the separate bracket and motor.
(NEMA motor mounting plate is used for the US version.)

*3: Separate NEMA motor is used for the US version.

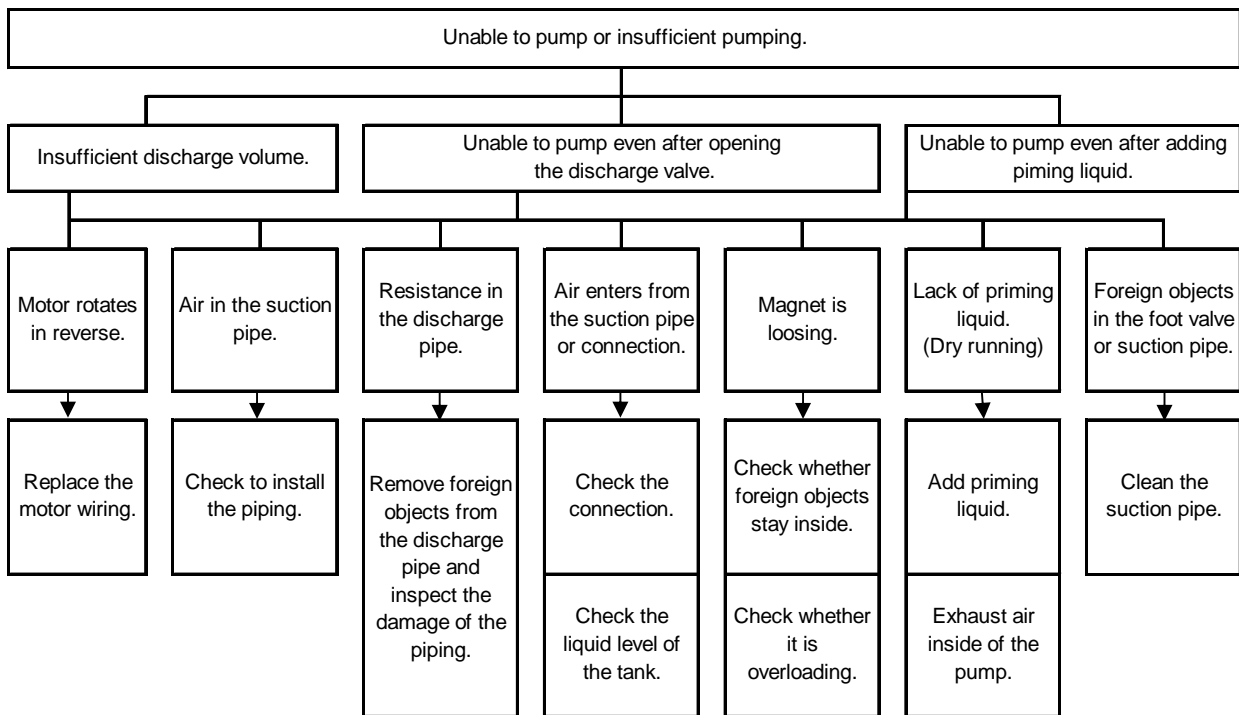
Exploded view 250* / 400* / 500*GV(F) series

Do not disassemble the front casing set to maintain the proper function.

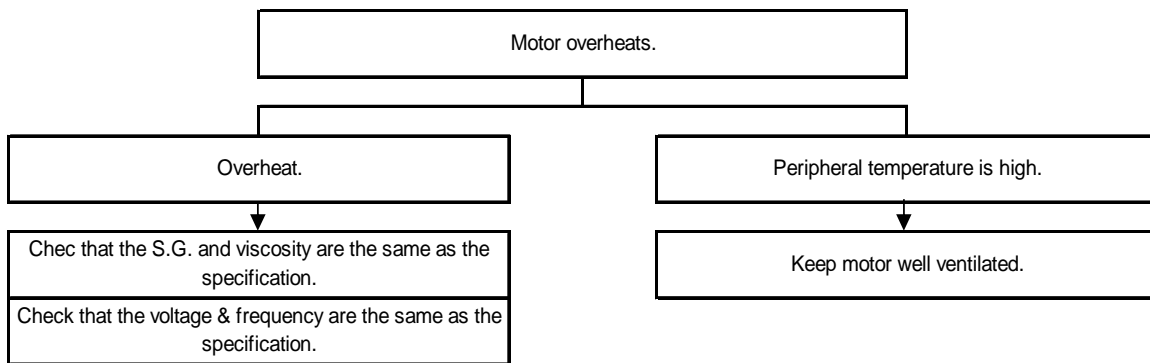


Troubleshooting

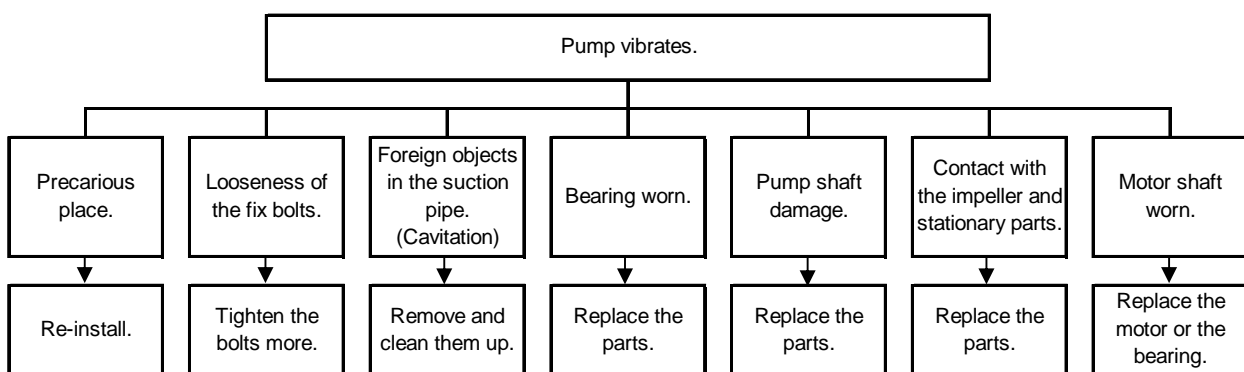
1. Pump up failure and insufficient pumping.



2. Motor overheats.



3. Pump vibrates.



Warranty / Repair

1. Warranty period and coverage

- (1) The warranty period is a year from delivered out of our factory.
- (2) During warranty period, if the pump breaks down or damages in normal operating condition due to manufacturing defect(s), the failure parts are repaired free of charge.
- (3) The following breakdown or damage are repaired or replaced of worn out parts for compensation.
 - After the warranty period.
 - Improper use or safekeeping.
 - Use parts manufactured by others or unauthorized parts.
 - Repair or modification by others or unauthorized company.
 - Natural disaster or accidental force.
 - Use the pump under the condition other than confirmed with the instruction manual or specification sheet agreed separately.
 - Cause other than the delivered pump.
 - Use other than original.
 - Not to be foreseen by the technology when the shipment.
- (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 attribute to the negotiation between the customer and us.
- (7) Travel expenses incurred for non-warranted repair to a remote location are charged.
- (8) Expenses or other damage incurred as a result of breakdowns during operation 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) Inform the followings when requesting repair.
 - Model name and serial number
 - Use duration and situation
 - Damages parts and condition
 - Liquid (Name, Specific gravity, Temperature, Slurry)

If liquid leaks during transportation, it is very dangerous and make sure to clean inside thoroughly.

When ordering replaced parts, specify the name in the parts name list (P10, 11). Although, inform the parts' number and material, too. (

Installation record

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



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