

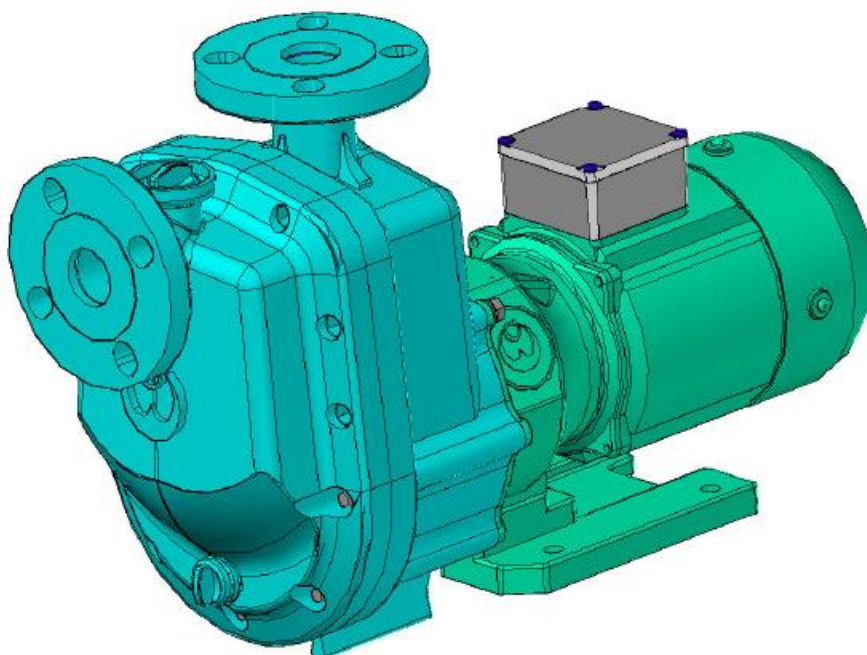
Corrosion Resistance Magnet Drive Pump

# *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.            |
| <b>Warning</b>  |  |
|  | Non-compliance can lead to some injury and/or property damage. |
| <b>Caution</b>  |  |

|   |   |
|---|---|
|  | 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

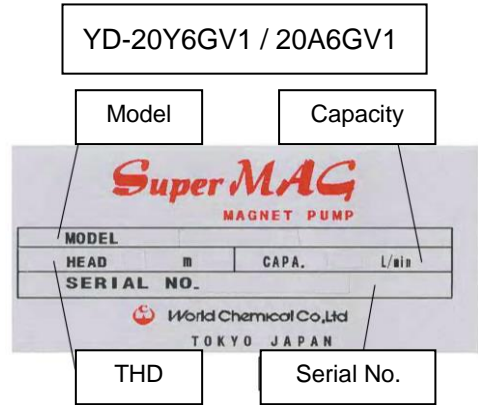
Check as follows and contact your supplier when you have any questions.

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.

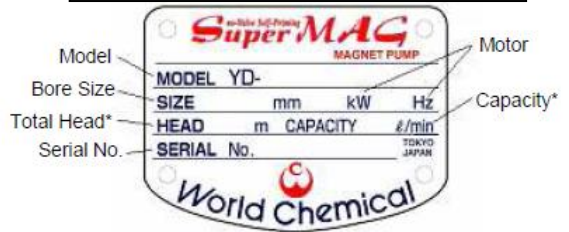
## Model description

**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 (1")     | 25A (1")       | 0.4Kw, 3/4HP |
| 2501GV(F)3             | 25A (1")     | 25A (1")       | 0.75kW, 1HP  |
| 2502GV(F)3             | 25A (1")     | 25A (1")       | 1.5kW, 2HP   |
| 4001GV(F)3             | 40A (1.5")   | 40A (1.5")     | 0.75kW, 1HP  |
| 4002GV(F)3             | 40A (1.5")   | 40A (1.5")     | 1.5kW, 2HP   |
| 4003GV(F)3             | 40A (1.5")   | 40A (1.5")     | 2.2kW, 3HP   |
| 5002GV(F)3 (50Hz only) | 50A (2")     | 50A (2")       | 1.5kw        |
| 5003GV(F)3             | 50A (2")     | 50A (2")       | 2.2kW, 3HP   |
| 5005GV(F)3             | 50A (2")     | 50A (2")       | 3.7kW, 5HP   |

- (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  |

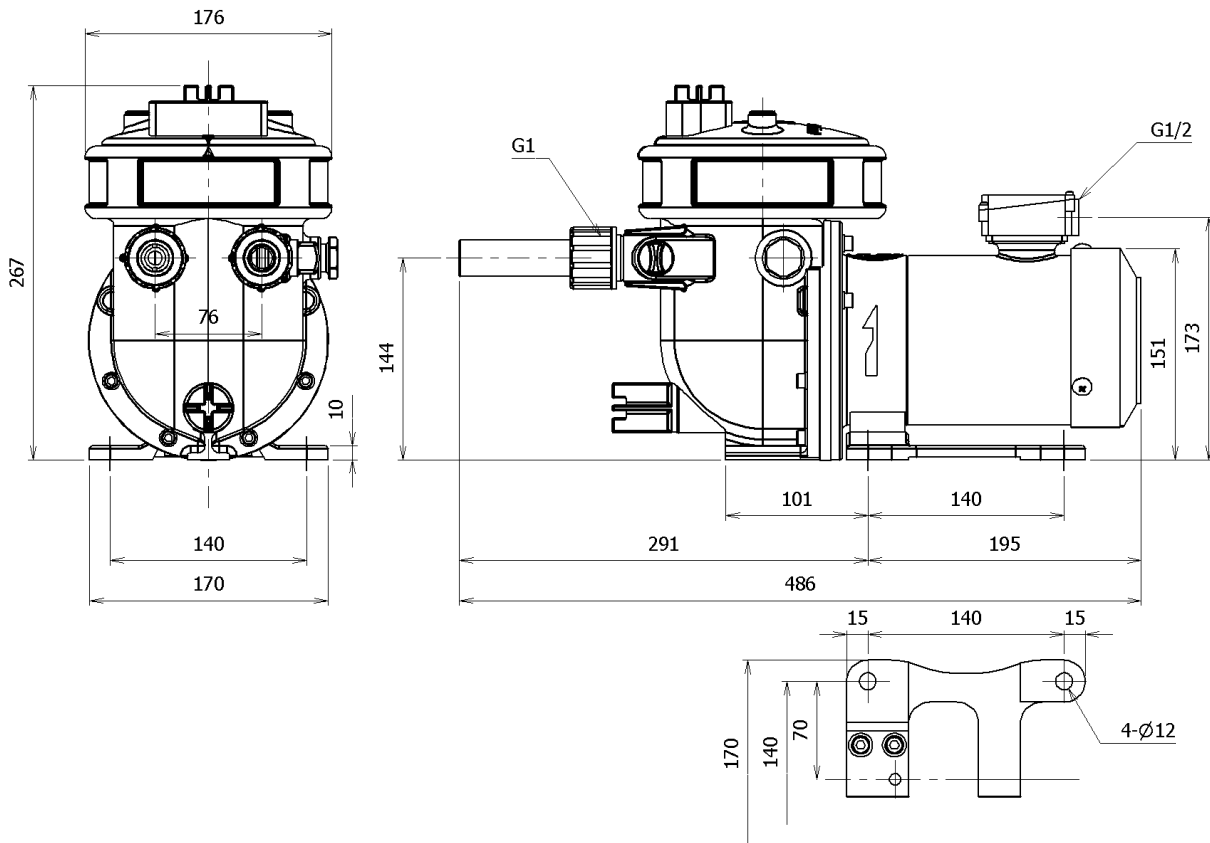
# Specification

## ■ 20\*\*GV1 series

|   |      |   |         |
|---|------|---|---------|
| Model   |      | 20Y6GV1                                       | 20A6GV1 |
| Bore (Suc. x Dis.)                                |      | 20A (0.8") x 20A (0.8")<br>(Union connection) |         |
| Motor output                                      |      | 0.26Kw (1/3HP) (Indoor motor)                 |         |
| Standard spec.<br>(m_L/min)                       | 50Hz | 6 – 30  |         |
|   | 60Hz | 7 – 30, 22ft-7.9gpm                           |         |
| Weight: kg, lbs.                                  |      | 10.0 / 22                                     |         |
| Limit of self-priming height (Normal temperature) |      | 2.5 m/ 8.2ft                                  |         |

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

## Outline dimension YD-20Y6GV1 / 20A6GV1

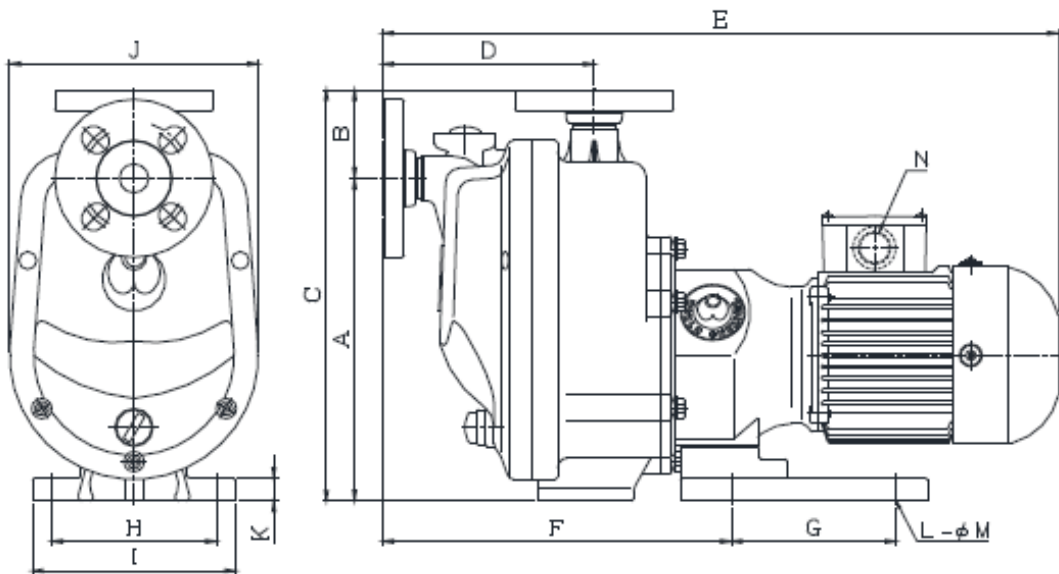


■ 250\*GV(F)\* series

| Model                       |      |              | 2500                | 2501           |                | 2502           |               |
|-----------------------------|------|--------------|---------------------|----------------|----------------|----------------|---------------|
|                             |      |              | GV1                 | GV3            | GVF3           | GV3            | GVF3          |
| Bore (Suc. x Dis.)          |      |              | 25A (1") x 25A (1") |                |                |                |               |
| Motor output                |      |              | 0.4kW<br>(1/2HP)    | 0.75kW (1HP)   |                | 1.5kW (2HP)    |               |
| Standard spec.<br>(m_L/min) | 50Hz | No ind. (-F) | 8 - 80              | -              |                | -              |               |
|                             |      | -G           | -                   | 8 - 80         | 8 - 80         | -              |               |
|                             | 60Hz | No ind. (-F) | -                   | Max:62ft,31gpm | Max:59ft,29gpm | -              |               |
|                             |      | -G           | -                   | Max:59ft 29gpm | Max:39ft 22gpm | Max:63ft 31gpm | Max:59ft31gpm |
| Weight: kg, lbs.            |      |              | GV                  | 18.5           |                | 20.5/ 45       |               |
|                             |      |              | GVF                 | -              | 23/ 50         |                | 24.5/ 55      |

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 | 255 | 70 | 325 | 167 | 533 | 275 | 130 | 130 | 160 | 196 | 18 | 4-Φ12 | PF3/4 |
| 2501GV(F)3 |     |    |     |     | 562 |     |     |     |     |     |    |       |       |
| 2502GV(F)3 |     |    |     |     | 592 |     |     |     |     |     |    |       |       |

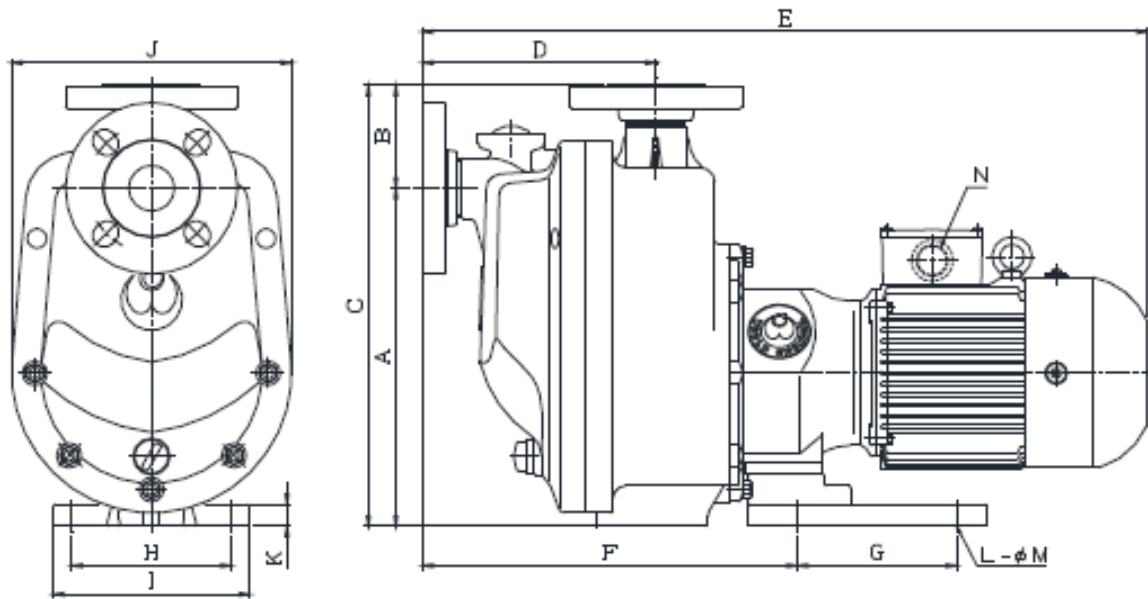


■ 400\*GV(F)3 series

| 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.<br>(m_L/min) | 50Hz | No ind. (-F) | 11 - 160                | 10 - 110 | -               |                | -              |                |  |
|                             |      | -G           | -                       | -        | 11 - 160        | 11 - 160       | -              |                |  |
|                             | 60Hz | No ind. (-F) | -                       | -        | Max:86ft, 75gpm | Max:82ft,74gpm | -              |                |  |
|                             |      | -G           | -                       | -        | -               | -              | Max:83ft,74gpm | Max:83ft,74gpm |  |
| Weight: kg, lbs.            |      |              | GV                      | 22.5/ 49 |                 | 26.5/ 57       |                | 29/ 63         |  |
|                             |      |              | GVF                     | 25/ 55   |                 | 29/ 63         |                | 31.5/ 69       |  |

Outline dimension

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



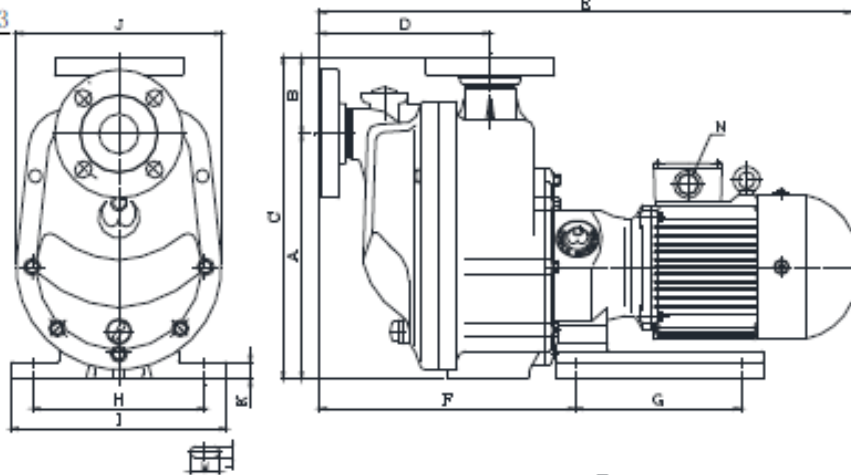
|            | A   | B  | C   | D   | E   | F   | G   | H   | I   | J   | K  | L-φM  | N     |
|------------|-----|----|-----|-----|-----|-----|-----|-----|-----|-----|----|-------|-------|
| 4001GV(F)3 | 276 | 84 | 360 | 190 | 592 | 305 | 130 | 130 | 160 | 228 | 18 | 4-φ12 | PF3/4 |
| 4002GV(F)3 | 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

■ 500\*GV(F)3 series

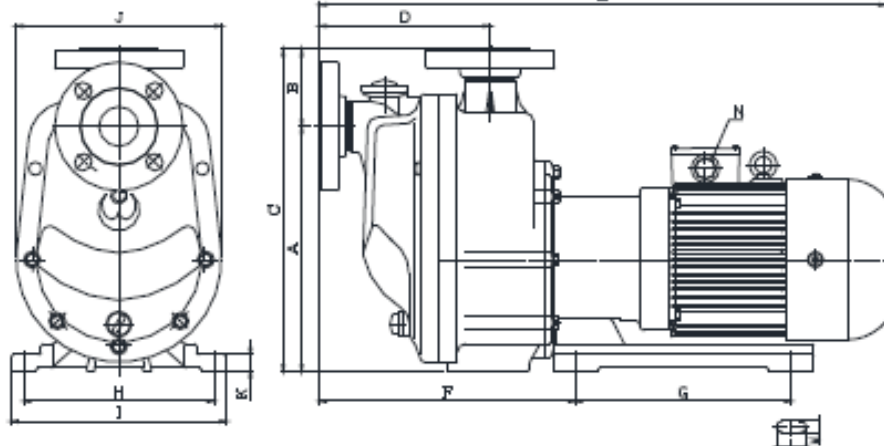
| Model                                   |      | 5002                |          | 5003        |                    | 5005                |                     |                         |
|---|------|---------------------|----------|-------------|--------------------|---------------------|---------------------|-------------------------|
|   |      | 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.<br>(m <sub>L</sub> /min) | 50Hz | No ind. (-F)        | 17 - 200 | 15 - 200    | 18 - 250           | 17 - 250            | -                   |                         |
|   |      | -G                  | -        |             | 17 - 200           |                     | 18 - 250            |                         |
|   | 60Hz | No ind. (-F)        | -        |             | Max: 94ft<br>89gpm | Max: 92ft,<br>95gpm | Max:115ft,<br>95gpm | Max:<br>111ft,<br>95gpm |
|   |      | -G                  | -        |             | -                  | -                   | Max: 93ft, 95gpm    |                         |
| Weight: kg, lbs..                       |      | GV                  | 29.5/ 65 |             | 32/70              |                     | 53/ 116             |                         |
|   |      | GVF                 | 32.5/ 71 |             | 35/ 77             |                     | 56/ 123             |                         |

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

YD-5002/5003GV(F)3



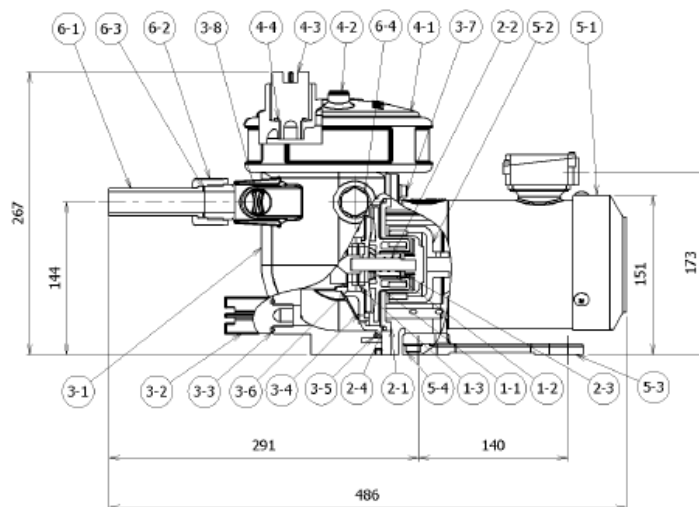
YD-5005GV(F)3



|            | 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 |
| 5005GV(F)3 |     |    |     |     | 713 |     |     |     |     |     |    |         |       | 261 | 230 |

## Parts name / Material / Structure

YD-20Y6GV1 / 20A6GV1

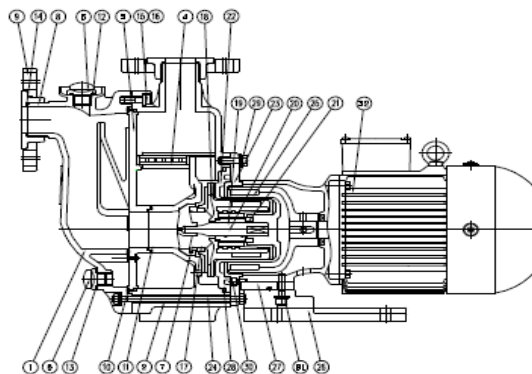


| No. | Parts name                         | Qty | Material                 | Set condition    |
|-----|------------------------------------|-----|--------------------------|------------------|
| 1-1 | Impeller                           | 1   | PP + Magnet              | Impeller set     |
| 1-2 | Bearing                            | 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                           |                           |                         |
| 18  | Impeller                   | 1     | GFR PP+PP+Magnet                   | CFR ETFE + Magnet         |                         |
| 19  | Bearing                    | 1     | GFR PPS+Carbon/Ceramic             | CFR ETFE+Carbon/Ceramic   |                         |
| 20  | Shaft                      | 1     | Alumina ceramic                    |                           | Rear casing set         |
| 21  | Rear thrust ring           | 1     | Alumina ceramic                    |                           |                         |
| 22  | Rear casing                | 1     | GFR PP                             | CFR ETFE                  |                         |
| 23  | Rear casing support        | 1     | FC200                              |                           | Rear casing support set |
| 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).

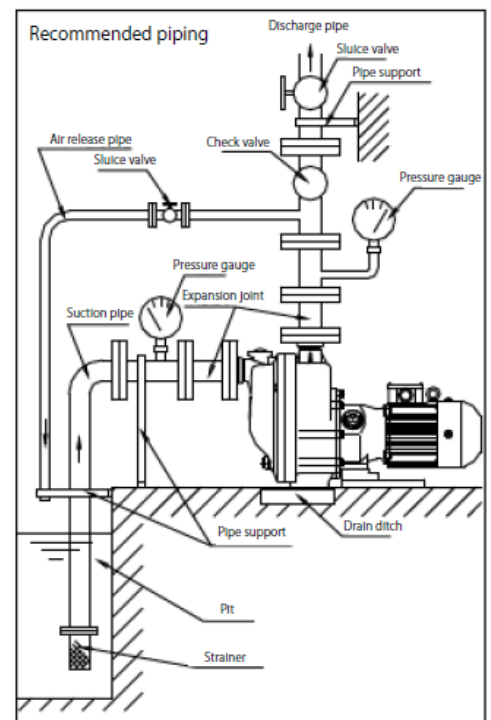
## 3. Drain Ditch

- (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/0.15 gal       |
| 250*GV(F)* | 2.0L/ 0.52gal       |
| 400*GV(F)3 | 3.0L/ 0.79gal       |
| 500*GV(F)3 | 4.0L/ 1gal          |





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 (1.32gal)  |
| 2500GV1, 2501GV(F)3, 4001GV(F)3                             | 10 L/min (2.6gal)  |
| 2502GV (F)3, 4002GV(F)3, 4003GV(F)3, 5002GV(F)3, 5005GV(F)3 | 20 L/min (5.28gal) |

## 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)

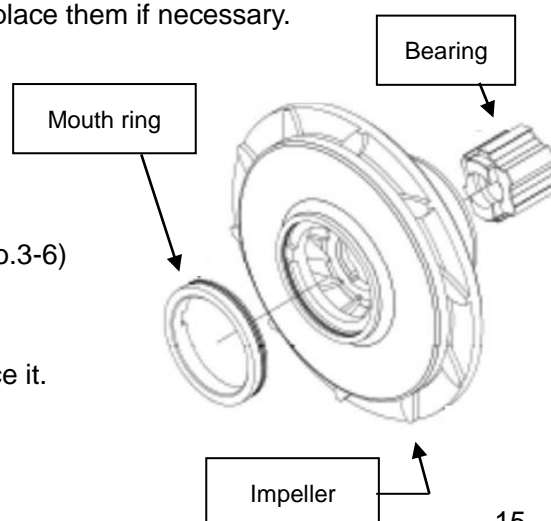
If they have crack, damage or abrasion, replace it.

(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.

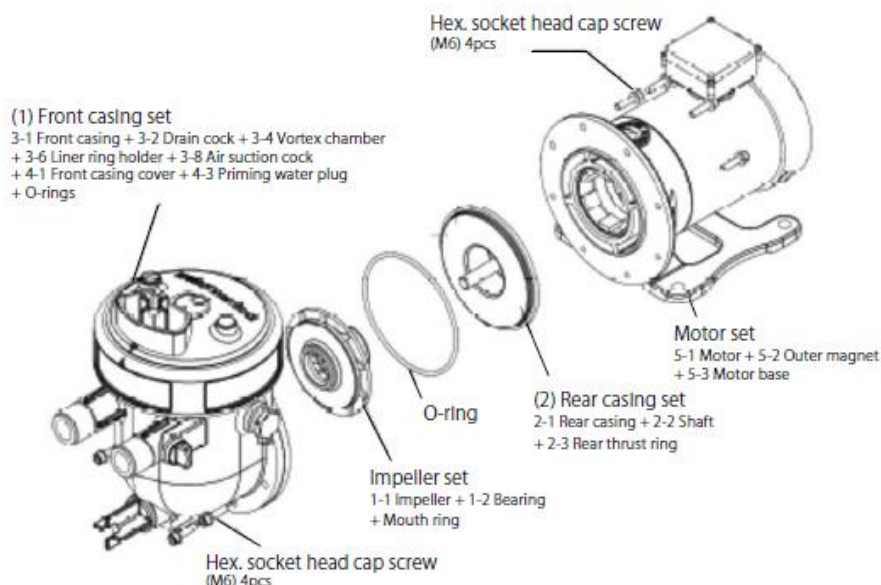
2. Assembly
- Assembly is in the reverse order of disassembly. Clean the sliding parts and O-rings thoroughly with no entering dust or scratch. As well tighten the bolts evenly.
- (1) Install the rear casing with the shaft and the rear thrust ring to the motor with bracket with the outer magnet.
  - (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·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>

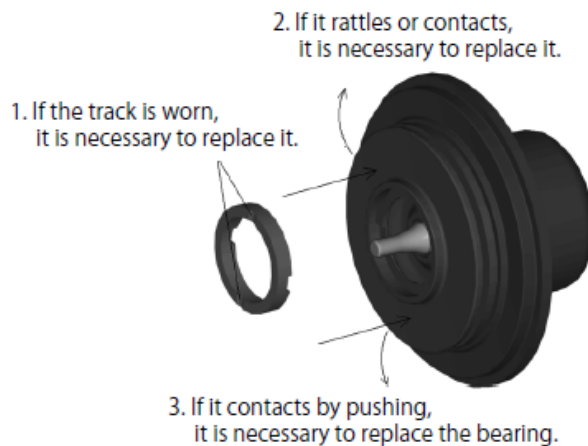
Check that the direction is clockwise as viewed from the motor fan cover at the start. If it is in reverse, switch two of the three phases in the three-phase power supply.

## 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



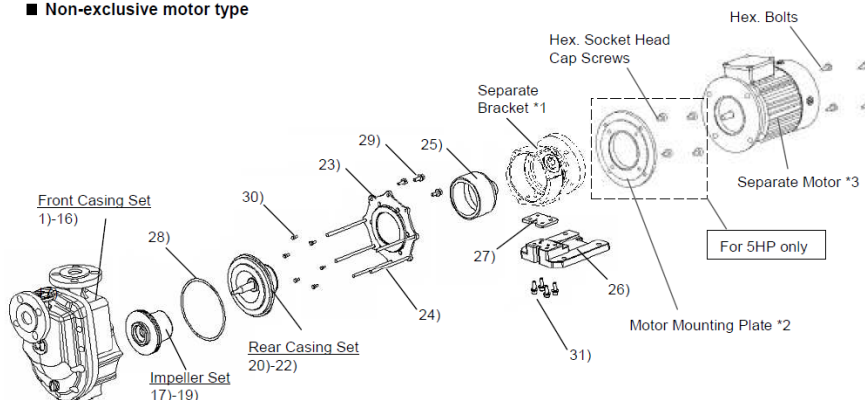
Assembling the pump delivered without separate motor

- (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.)

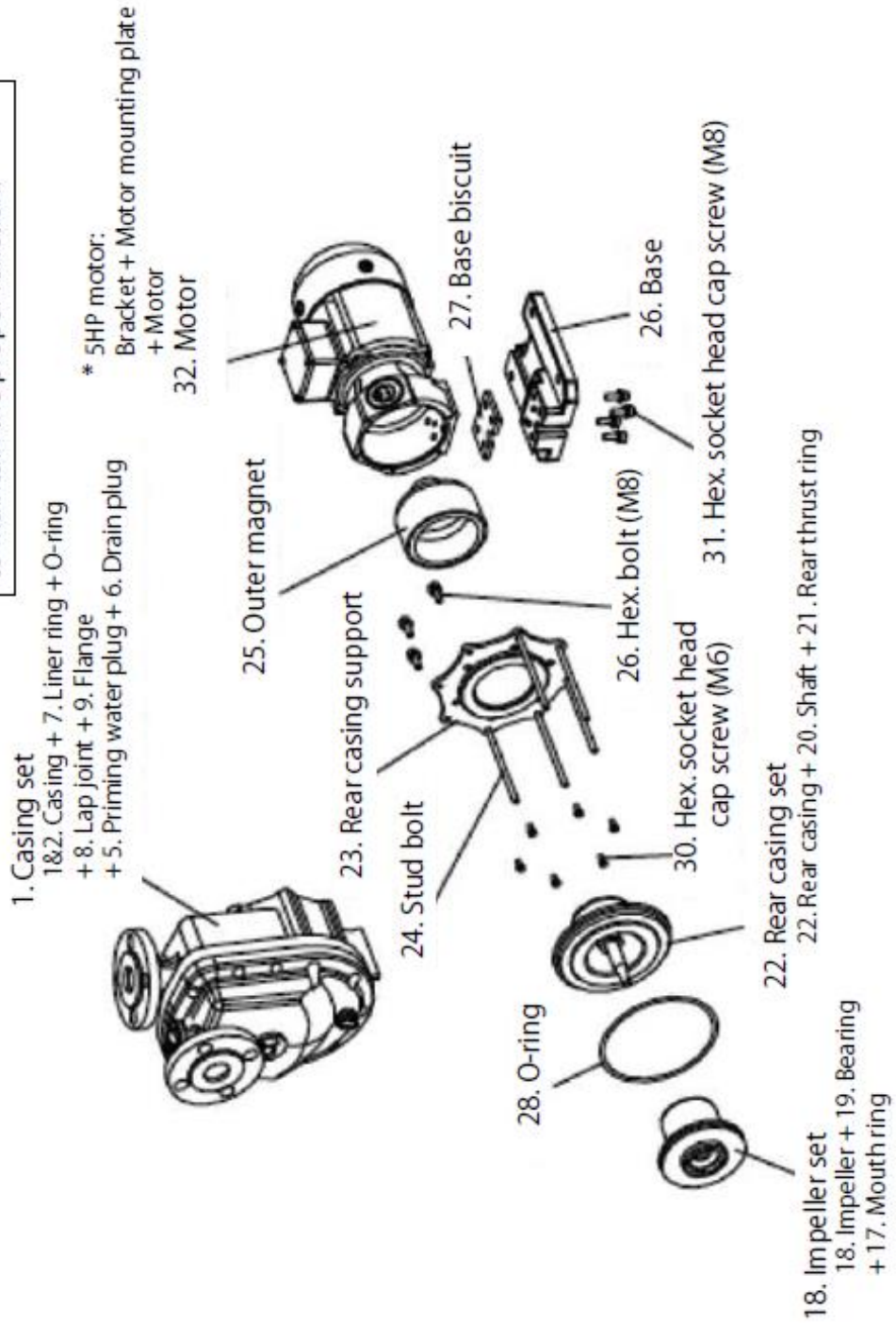
\*2: For 5HP motor, a motor mounting plate (FC) is added between the separate bracket and motor.  
(NEMA motor mounting plate is used for the US version.)

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



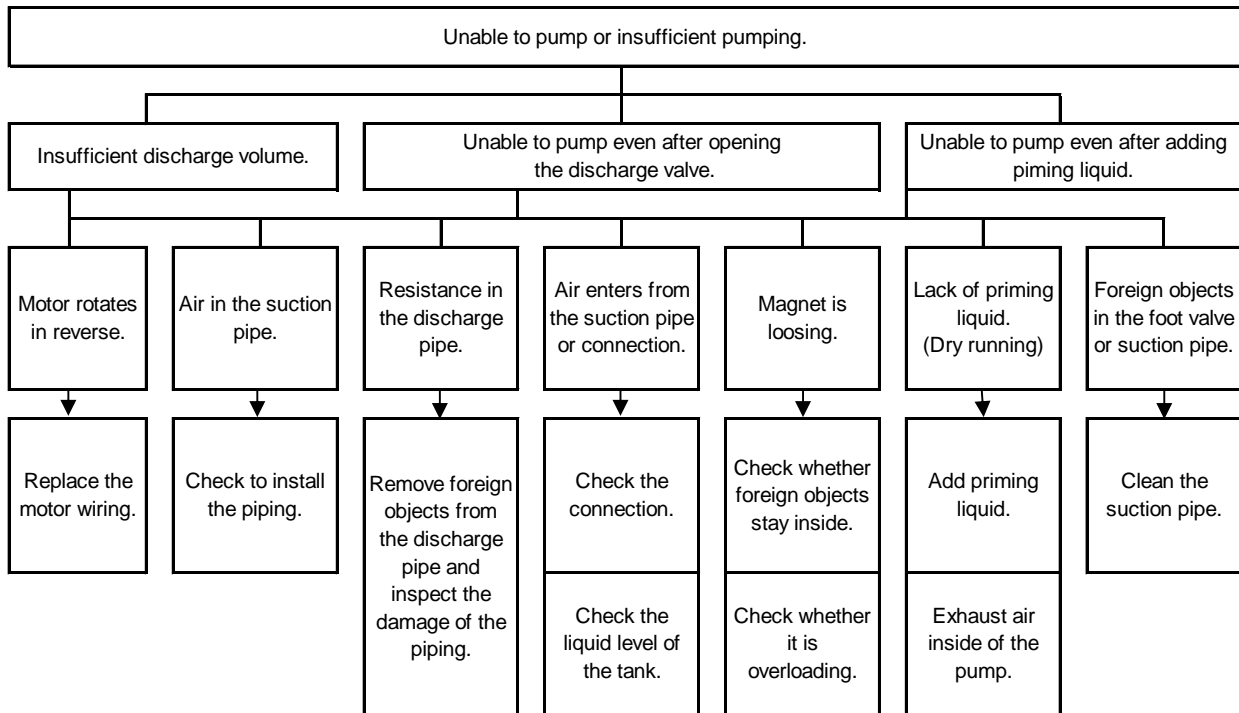
# Exploded view 250\* / 400\* / 500\*GV(F) series

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

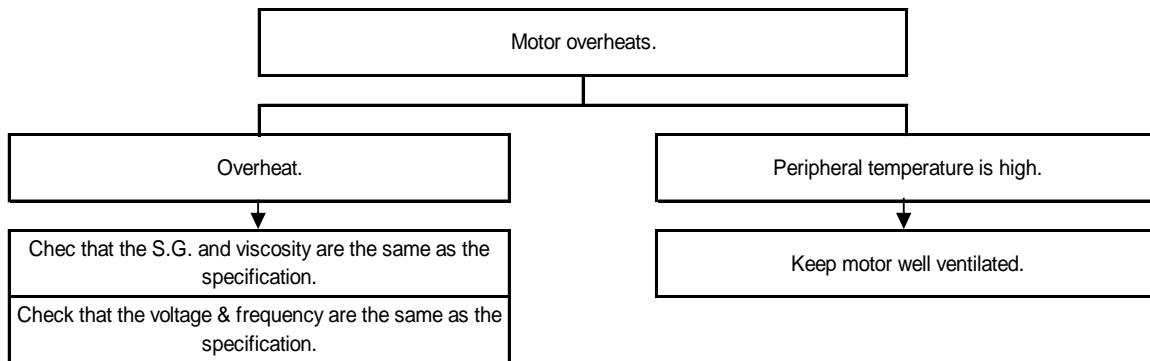


# Troubleshooting

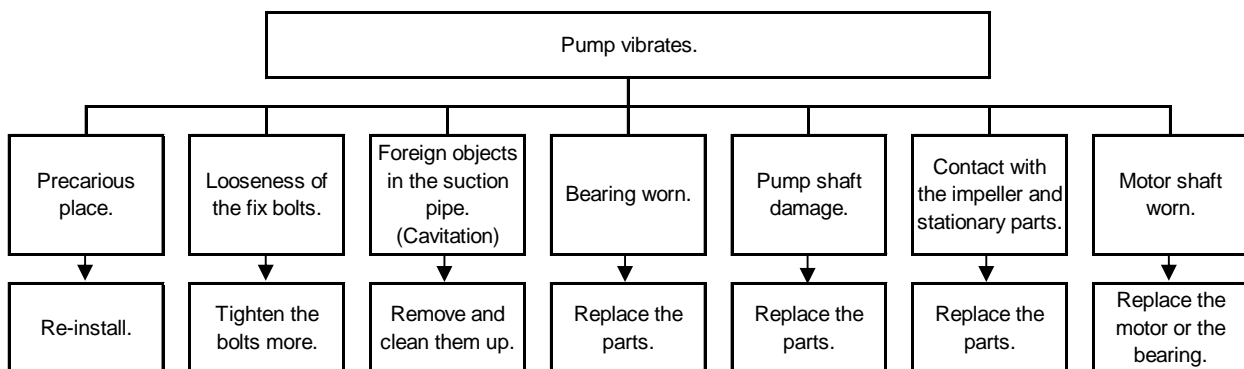
## 1. Pump up failure and insufficient pumping.



## 2. Motor overheats.



## 3. Pump vibrates.





# Limited 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) We provide no warranty support if the defect or damage is caused by any of the following:
    - Breakdown or damage after the warranty period.
    - Breakdown or damage due to improper use or safekeeping.
    - Breakdown or damage caused by the use of unauthorized parts of service.
  - (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) 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.

GOOD PROTECTION AND MUST BE CAPITALIZED

WE ARE NOT RESPONSIBLE OR LIABLE FOR ANY LOSS, INCONVENIENCE OR DAMAGE, WHETHER SPECIAL, DIRECT, INCIDENTAL, CONSEQUENTIAL, OR OTHERWISE, AND WHETHER KNOWN OR SHOULD HAVE BEEN KNOWN TO US, INCLUDING LOST PROFITS, GOODWILL, DAMAGE TO OR REPLACEMENT OF OTHER EQUIPMENT AND PROPERTY AND PERSONAL INJURY RESULTING FROM ANY BREACH OF WARRANTY, THE INABILITY TO USE THE PRODUCT OR UNDER ANY LEGAL THEORY IN CONTRACT OR TORT. THESE WARRANTIES AND REMEDIES ARE YOUR SOLE AND EXCLUSIVE WARRANTIES AND REMEDIES IN CONNECTION WITH THE SALE AND USE OF THE PRODUCT. NO OTHER WARRANTIES, ORAL OR WRITTEN, EXPRESS OR IMPLIED, ARE GIVEN. OUR LIABILITY IS LIMITED TO THE ACTUAL PURCHASE PRICE YOU PAID TO THE RETAIL SELLER OF THE DEFECTIVE PRODUCT.

THIS IS MANDATORY:

Some states do not allow the exclusion or limitation of implied warranties or liability for incidental or consequential damages, or do not allow a limitation on how long an implied warranty lasts, so the above limitations or exclusions may not apply to you. You are advised to contact applicable state laws for a full determination of your rights. This warranty gives you specific legal rights, and you may have other rights which vary from state to state.

**GOOD PROTECTION:**

No dealer, agent or employee is authorized to make any modification, extension, change or amendment to this 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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402, Fu Yuan Road, Xiang Cheng Economic District, Su Zhou, China

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