GWN series

Submersible pump " SUBMERSE "

World Chemical Co.,Ltd.

GWN series

Unequaled chemical submersible pump anywhere in the world “SUBMERSE”

Full-scale corrosion resistant pump to be usable for strong acid/alkali.

The main body is made of Carbon fiber reinforced polypropylene (CFR PP) and the wet parts kit is not contained any metal part, so it is possible to use the pump for strong acid and alkali.

SUBMERSE is a sealless pump!

Average submersible pump is adopted a mechanical seal and have to be completely damaged by liquid which goes into the motor. However, SUBMERSE is not invaded the inside of the motor by liquid because of the magnet drive.

SUBMERSE is oil free.

The sealless magnet drive pump does not have a oil bath type mechanical seal and no need to worry about oil leakage. It is a safety pump without contamination by oil.

Plastic wet parts kit resists to corrosion!

It is less corrosive than metal pumps and the frequency to replace parts is decresed!
It is free from troublesome such as the parts replacement or corrode soon.

Safe in magnet drive (Sealless structure)!

It protects the motor from liquid withnot need to worry about seal abrasion and motor damage.
Besides, it is not needed to worry about contamination by oil or waste water for no oil leakage from sealling.

- Cost reduction
- Work efficiency increase
- Safety
- Environmental protection

YD-5002GWN1 <Bore 50A/> <3PH / 50Hz: 200V, 380V, 440V 60Hz: 200V, 220V, 440V, 460V 1.1kW>

■ Disk type magnet drive

Basically, the coupling of the horizontal magnet pump is the outer of the columnar passive mange (impeller at the side of the pump) and the bowl-shaped magnet at the side of the motor. Therefore, it was said that the magnet drive is difficult to be used for a submersible pump which is easly locked by air and vulnerable for slurry, because It has a complicated water pass.
However, World Chemical Co., Ltd. adopts “disk type magnet drive” that two disk-shaped magnets rotate among a hard ceramic separating board. The simple water pass attaines the pump prevent air lock and slurry.

■ Specification for high temperature liquid

The insulation is H type and it is possible to use the pump for the liquid until 70 degrees as standard. SUBMERSE is active in using for high temperature & easy bubbling liquid or pumping from a deep pit which is the hard to use for a self-priming pump.

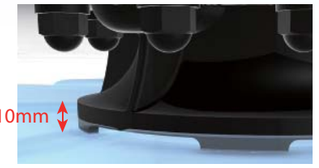
※ Do not use the attached PVC valve socket when the liquid temperature is 50 degrees and more. Remove the valve socket and do other plumbing. The change to a HT-PVC valve socket which is heat resistant is also available as an optional extra.

YD-25A6GWN1 <Bore 25A> <1PH / 100V, 0.26kW>

■ Possible to absorb at a minimum liquid level of 10mm.

Now it is possible to completely absorb liuqid by changing the sape of the suction inlet. Even if the pump is not immediately stopped while the liquid is completely absorbed, there is no need to worry about malfunction due to heat generation.

Short-term completely absorbed operation is available!



■ 100V, 1PH

Trouble wire works are unnecessary and anywhere to use.

Can use the pump soon at the emergency.

〈 Model description 〉

YD-50 02 GWN1-CP-A D 6 1-HP-Z

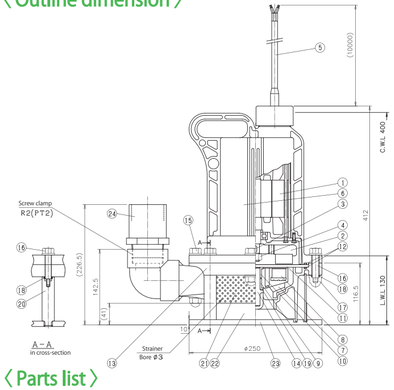
- **Bore**: 50 = 50A
- **Motor output**: 02 = 1.1kW
- **Model**: GWN1
- **Main material**: CFR PP
- **Bearing material**: R = PTFE; A = Alumina cermics
- **O-ring material**: E = EPDM; D = FPM
- **Frequency**: 5 = 50Hz; 6 = 60Hz
- **S.G.**: 1 = 1.1; 3 = 1.3; 5 = 1.5
- **Impeller type**: No mark = Standard; HP = High pressure(60Hz Only)
- **Option**: with cable sleeve

〈 Standard specification 〉

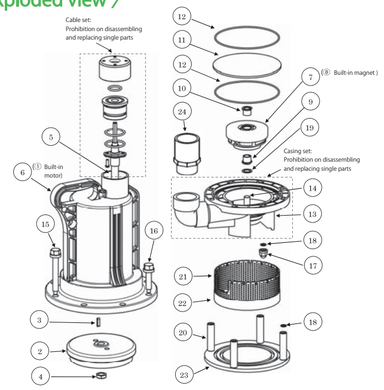
Model	Standard performance THD (m) — Capacity (L/min.)	S.G. limit	Frequency (Hz)	Power (kW)	Voltage (V)	Insulation	Liquid temp. MAX (℃)	Weight (kg)	Discharge bore (mm)
YD-5002GWN1-CP-□□51	8.3 — 200	1.1	50	1.1	3PH/200	H	60	23	50
YD-5002GWN1-CP-□□53	6.2 — 200	1.3							
YD-5002GWN1-CP-□□55	3.6 — 200	1.5							
YD-5002GWN1-CP-□□61	8.3 — 200	1.1	60		3PH/200 3PH/220				
YD-5002GWN1-CP-□□63	4.6 — 200	1.3							
YD-5002GWN1-CP-□□65	2.5 — 200	1.5							
YD-5002GWN1-CP-□□61-HP	11.9 — 100	1.1							
YD-5002GWN1-CP-□□63-HP	8.7 — 100	1.3							
YD-5002GWN1-CP-□□65-HP	6.4 — 100	1.5							

※ The standard performance in the table is in fresh water (S.G. 1.0: 20 degrees).
※ Changing to a non-standard voltage motor is available. (50Hz=380V／400V、60Hz=440V／460V)
※ Cabtyre cable (Made of 2PNCT, 10m) is adopted as the power supply cable and can be used for general acid and alkali except organic solvent.
It is possible to extend the cable to 20m.
A cable sleeve (soft PVC) is available as an optional extra. (Approx. 5m and no extend)

〈 Outline dimension 〉



〈 Exploded view 〉



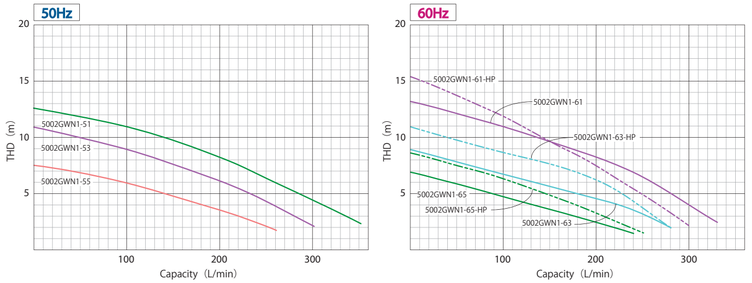
〈 Parts list 〉

No.	Parts name	Remarks
①	Motor	FC
②	Motor side magnet	Ferrite magnet
③	Key for motor side magnet	SS
④	Nut for motor side magnet	SS
⑤	Cable	CR , 2PNCT(10m)
⑥	Motor cover	CFR PP
⑦	Impeller	CFR PP
⑧	Impeller side magnet	Ferrite magnet
⑨	Front bearing	PTFE / Alumina ceramics
⑩	Rear bearing	PTFE series
⑪	Separation board	Ceramics
⑫	O-ring for separation board	EPDM/FPM

No.	Parts name	Remarks
⑬	Casing	CFR PP
⑭	Pump shaft	SiC
⑮	Set bolt 92	CFR PP
⑯	Set bolt 52	CFR PP
⑰	Nut for set bolt	CFR PP
⑱	O-ring for set bolt	EPDM/FPM
⑲	Floating washer	PTFE (Only for ceramics bearing)
⑳	Stand bolt	HT.PVC
㉑	Strainer	PP
㉒	Sludge fence	PP
㉓	Bottom board	PP
㉔	50A valve socket	PVC

※ Do not use the attached PVC valve socket when the liquid temperature is 50 degrees and more. Remove the valve socket and do other plumbing. The change to a HT-PVC valve socket which is heat resistant is also available as an optional extra.

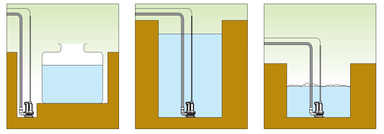
〈 Performance curve 〉



〈 Use 〉

- To pump up liquid and waste water from a deep or narrow tank.
- To pump easy bubbling liquid up/out.
- To pump liquid out from a sealed tank.
- To circulate liquid in a tank.
- To stir liquid in a tank/equipment.
- To pump out in case of emergency.

〈 Installation example 〉



Pump liquid up from a pit at a breakwater. | Pump liquid up from a deep tank. | Pump easy bubbling liquid up.

Structure

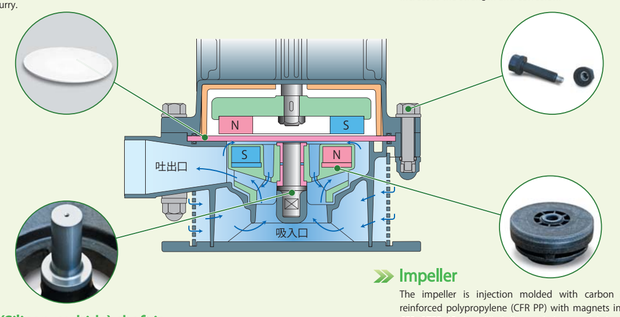
Separation board

The disk type magnet drive system is adopted that two disk-shaped magnets, drive side magnet and passive magnet, rotate among a hard ceramic separation board.

The simple water pass attaines the pump prevent air lock and slurry.

Even the bolt is our original.

The exclusive bolts are stainless molded with carbon fiber reinforced polypropylene (CFR PP) and combine metal strength and high corrosion resistance. Besides, O-ring is installed at the joint of the molded nut and it increases the strength and corrosion.



SiC (Silicon-carbide) shaft is adopted as standard.

SiC resists to heat shock more than ceramic and the abrasion resistance is suitable for the pump shaft for the submersible pump.

Impeller

The impeller is injection molded with carbon fiber reinforced polypropylene (CFR PP) with magnets inside. CFR PTFE (Carbon-filled fluoroethylene resin) bearing, which slides with the shaft, is press inserted at the center of the impeller.

〈 Caution in use 〉

Range of corrosion

The pump can be used for acid and alkali, because the pump body is made of CFR PP (Carbon fiber reinforced polypropylene) and there is no metal parts for the wet parts kit.
However, it may be corrosive depending on concentration and temperature of liquid. (Ex. Sulfuric acid, Nitric acid, hydrofluoric acid, Chromic acid, sodium hypochlorite)
Ask us about corrosion resistance.

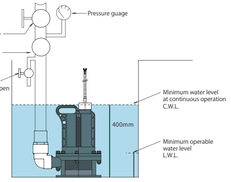
1. **CFR PP (Carbon fiber reinforced polypropylene)**
   It is used for the body of SUBMERSE and possible to use for general acid and alkali, but may be corroded by sulfuric acid, nitric acid, hydrofluoric acid, chromic acid, sodium hypochlorite depending on the concentration. Ask us when using the pump for the above liquid.
2. **Alumina ceramics**
   Highly chemical resistant and pure ceramics is adopted and the pump can be used for acid and alkali.
3. **Sealing material**
   O-ring is selectable according to liquid in use. EPDM O-ring for alkali & FPM O-ring for acid are prepared. Not for organic solvent.
4. **2PNCT**
   The cable is made of 2PNCT and resists to acid and alkali except for organic solvent. A cable sleeve (soft PVC) is available (5m).

Limit temperature

1. The motor insulation is class H and it is possible to use the pump for the liquid until 70℃ as standard.
2. If the pump is used for high temperature liquid (50 degrees and over), do not use the PVC valve socket for the discharge outlet. Remove it and piping separately. As its option, it is also available to change to the HT-PVC valve socket that is resistant to high temperature.

Safety & measures

1. A thermal protector, which protects the motor from heat by overload and single phase operation, is incorporated, but make sure to set a groud fault interrupter to prevent the accident by electric leakage. It prevents the motor burn by the motor stop due to liquid invasion as well as preventing electric leakage into the liquid.
   ※ Whenever using, check the insulation resistance of the motor.
2. Do not disassemble the motor and connection of the cable, causing electric leakage.



Installation example

Plumb piping as referred to the right picture to prevent water hammer.
Minimum required flow at an operation: 10 L/min.
Minimum liquid level at continuous operation is 400 mm. (The motor fully submerged)
Minimum operable liquid level is 130 mm. (Pumping up is possible, but it run short of cooling of the motor. The operation should be within 10 minutes as a guide.)

Oprational caution

1. Liquid with slurry accelerates abrasion of the bearing. Specially when using a pump in a settlement tank, mount the pump not to take up slurry or clear slurry. If liquid is mixed with slurry, use a pump with a ceramics bearing.
2. Fully submerge the pump in liquid in use. Operation in the air causes trouble.
3. If a pump is used with a check valve at the discharge piping, dry running may occure not to release air. When a check valve is attached, install an air release pipe below the check valve to always release the air.
4. If the pump is exposed from the liquid during operation, the plastic motor cover may be broken by heat because the motor is cooled.
5. Dry running operation may be caused by a liquid level sensor failure. Check for the normal operation before use.
6. Do not remove the strainer in use to prevent dust from a pump. Besides always clean it not to be cloged. If the strainer is clogged with dust, pumping failure occurs and the pump may burn.
7. Consier the bore of the electric wire when the cable is extended to prevent a voltage drop.
8. If the pump is used for high temperature liquid (50 degrees and over), do not use the PVC valve socket for the discharge outlet. Remove it and piping separately. As its option, it is also available to change to the HT-PVC valve socket that is resistant to high temperature.

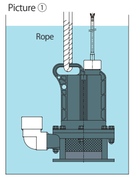
Handling caution

The main material of the pump is plastic and may be damaged when fallen or hit. Handl the pump carefully. If the cable is hauled when the pump is left, the cable may be pinched off. Make sure to use the accompanying rope.
Pay attention not to get injured or damage the pump by forced handling the pump and parts.

How to check the rotating direction

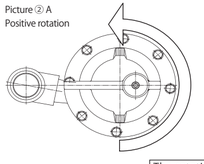
1. SUBMERSE is magnet drive system. If dry running occurs, the bearing and shaft may be damaged and the plastic parts may be deformed by heat. Three phase pump may rotate in reverse depending on the wiring conneciton. If in reverse, the pumping volume and discharge pressure are decreased approx. 30% compared to the possitive rotation. Since the current value shows a low value, the negative rotation can be confirmed. However, if it is not possible, turn on /off the pump instatly while hanged and submerged as referred Picture ① to confirm recoil direction.
2. When it is right, the pump moves to left direction as veiwed from the above such as Picture ② at the moment it starts. (Be careful of liuqid blowout from the discharge piping while checking.)

Picture ①

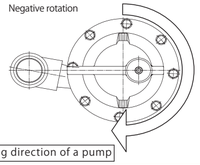


Submerge and hang the pump in a container or pit whose size is enough big for the pump, and check the rotating direction.

Picture ② A
Positive rotation



Picture ② B
Negative rotation



The rotating direction of a pump

Single phase

Submersible magnet pump

〈 Model description 〉

YD-25 A6 GWN1-CP-R D 5 2-Z

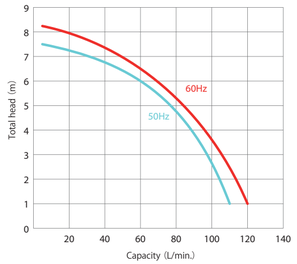
- 25: Discharge bore — 25: Compatible with Φ25
- A6: Motor output — A6: 0.26kW (100V/1PH))
- GWN1: Model
- CP: Main material — CP: CFR PP
- R: Bearing material — R: CFR PTFE
- D: O-ring material — D: FPM
- 5: Frequency — 5: 50Hz, 6: 60Hz
- 2: S.G. — 2: 1.2
- Z: Option — with Cable sleeve

〈 Standard performance 〉

Model	Std. performance THD (m) - Cap. (L/min.)	S.G.	Freq. (Hz)	Power (kW)	Voltage (V)	Ins.	Liq. temp. MAX (℃)	Weight (kg)	Discharge bore	Hose bore diameter(mm)
YD-25A6GWN1-CP-RD52	6.0 - 60	1.2	50	0.26	1PH/100	E	40	14	Equivalent to 25A	Inner: 25 Outer: 33
YD-25A6GWN1-CP-RD62	6.5 - 60		60							

※ The standard performance as above is for clear water (S.G. 1.0) at 20℃.
※ Cabtire cable (2PNCT, 5m) is used as the power cable and available for common acid or alkali except organic solvent.
It is possible to extend the cable to 10 m.
As an option, the cable can be cover with the cable sleeve. (Soft PVC) (Approx. 5 m and extension is not available.)

〈 Performance curve 〉



〈 Use 〉

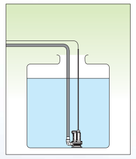
- Pumping up liquid to replace.
- Pumping up liquid from deep chemical tanks.
- Pumping liquid out from tank trucks.
- Pump for a raw tank in wastewater plant.
- Pumping up liquid at breakwater.
- Subdividing chemical liquid.
- Transfering easy bubbling liquid.

Feature

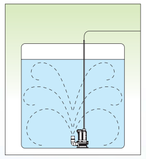
■ 100V / 1PH power
Handy and quick plug in !

■ Pump up until 10mm at minimum
Taking-up operation for a short time is available!

〈 Example of installation 〉

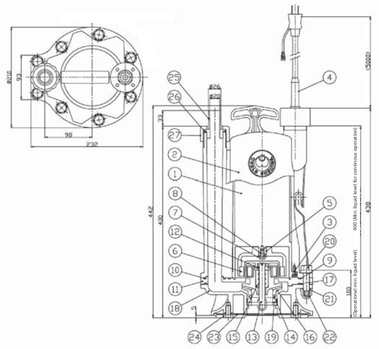


Pump up liquid from a tank. (to replace)

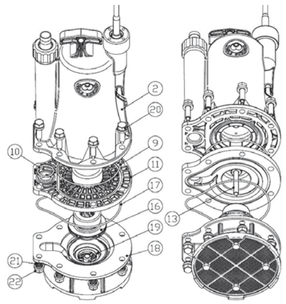


Mixing

〈 Outer dimension 〉



〈 Explowded view 〉



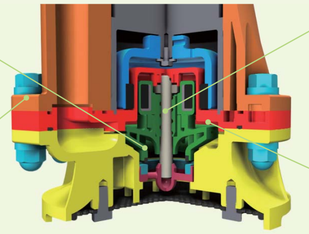
〈 Parts list 〉

No.	Parts nam	Material
①	Motor	FC
②	Motor cover	CFR PP
③	Bolt to motor	SUS304
④	Cabtire cable	CR
⑤	Key	S45C
⑥	Outer magnet	Ferrite magnet
⑦	Flat washer	SUS304
⑧	Bolt for outer magnet	SUS304
⑨	O-ring for rear casing	FPM
⑩	O-ring for discharge outlet	FPM
⑪	Rear casing	CFR PP
⑫	Rear thrust ring	Alumina ceramics
⑬	Pump shaft	Alumina ceramics
⑭	Mouth ring	CFR PTFE

No.	Parts name	Material
⑮	Bearing	CFR PTFE
⑯	Impeller	CFR PP
⑰	O-ring for casing	FPM
⑱	Casing	CFR PP
⑲	Liner ring	Alumina ceramics
⑳	Set bolt 37	CFR PP
㉑	O-ring for set bolt	FPM
㉒	Nut for set bolt	CFR PP
㉓	Strainer	CFR PP
㉔	bolt for strainer	PVC
㉕	Hose joint	CFR PP
㉖	O-ring for hose joint	FPM
㉗	Nut for hose joint	CFR PP

Structure

Impeller
The impeller is injection molded with carbon fiber reinforced polypropylene (CFR PP) with magnets inside. CFR PTFE (Carbon-filled fluoroethylene resin) bearing, which slides with the shaft, is press inserted at the center of the impeller.



Shaft
It is made of almina ceramics and double support structure (two-point support) due to durability.

Bolt, Nut
Stainless bolt is molded with CFR PP.
Do not worry about corrosion.

Rear casing
The pump does not have a mechanical seal. The magnet drive system is adopted and interrupts the pump and motor.

〈 Operating precautions 〉

Range of corrosion

The pump can be used for acid, because the pump body is made of CFR PP (Carbon fiber reinforced polypropylene) and there is no metal parts for the wet parts kit.
However, it may be corrosive depending on concentration and temperature of liquid. (Ex. Sulfuric acid, Nitric acid, hydrofluoric acid, Chromic acid, sodium hypochlorite)
Ask us about corrosion resistance.

1. **CFR PP (Carbon fiber reinforced polypropylene)**
   It is used for the body of SUBMERSE and possible to use for general acid, but may be corroded by sulfuric acid, nitric acid, hydrofluoric acid, chromic acid, sodium hypochlorite depending on the concentration. Ask us when using the pump for the above liquid.
2. **Alumina ceramics**
   Highly chemical resistant pure ceramics is adopted.
3. **Sealing material**
   FPM is as standard.
4. **2PNCT**
   The cable is made of 2PNCT and resists to acid except for organic solvent. A cable sleeve (Soft PVC) is available (Approx. 5m).

Limit temp.

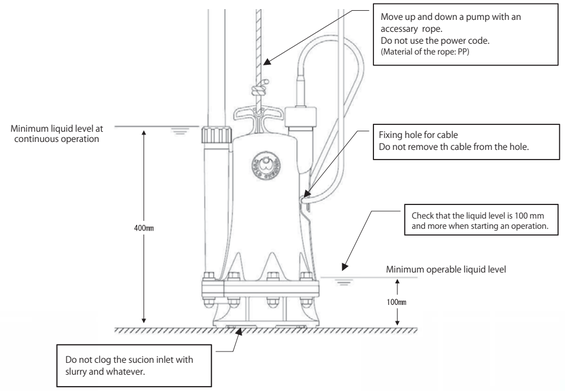
The standard type pump can be used for liquid until 40℃.

Safety & measures

1. The incorporated thermal protector works and the pump may stop to protect the motor depending on the operational condition.
   In this case, stop the operation for a while and check there is no problem with the pump.
   Make sure to check that the aprropriate liquid level is ensured when restarting the operation.
2. Do not disassemble the motor and connection of the cabtire cable. It may lead to the accident by electric leakage.

Installing & operational precautions

Minimum required flow at an operation: 5 L/min.
Minimum liquid level at continuous operation is 400 mm. (The motor fully submerged)
Minimum operable liquid level is 100 mm.



- Do not move up and down a pump with the electric cable. Use th acceaary rope.
- Make sure to connect the earth wire with the plug to the earth.
- Do not run pumps dry.
- Do not use pumps to take up sludge or slurry.