

GWN series

Submersible pump "SUBMERSE"



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.

Plastic wet parts kit resists to corrosion!

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

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.

Safe in magnet drive (Sealless structure)!

It protects the motor from liquid without 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.

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.

Cost reduction

Work efficiency increase

Safety

Environmental protection

YD-5002GWN1 < Bore 50A > < 3PH / 200V class • 400V class, 1.1kW >



■ Disk type magnet drive

Basically, the coupling of the horizontal magnet pump is the outer of the columnar passive mangle (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 easily 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 attains 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.

※ If the temperature of the liquid in use is 55°C and more, do not use the accompanying valve socket (made of PVC). Remove the valve socket and pipe separately.

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



■ Possible to pump all until the min. liquid level, 10mm.

It is possible to pump all by change of the suction shape and no need to stop the pump soon when pumping all liquid and worry about the damage by heat. (Proven by water test for a hour and more.)

Suction operation for a short time is available!



■ 100V, 1PH

Trouble wir works are unnecessary and it is used anywhere.
Can use the pump soon at the emergency.

Model description

YD-5002GWN1-CP-A D 61-HP-Z

Bore

50 = 50A

Model

Main material

CFR PP

Bearing material

R = PTFE
A = Alumina ceramics

Frequency

5 = 50Hz
6 = 60Hz

O-ring material

E = EPDM
D = FPM

S.G.

1 = 1.1
3 = 1.3
5 = 1.5

Impeller type

No mark = Standard
HP = High pressure

Option

with cable sleeve

Motor output

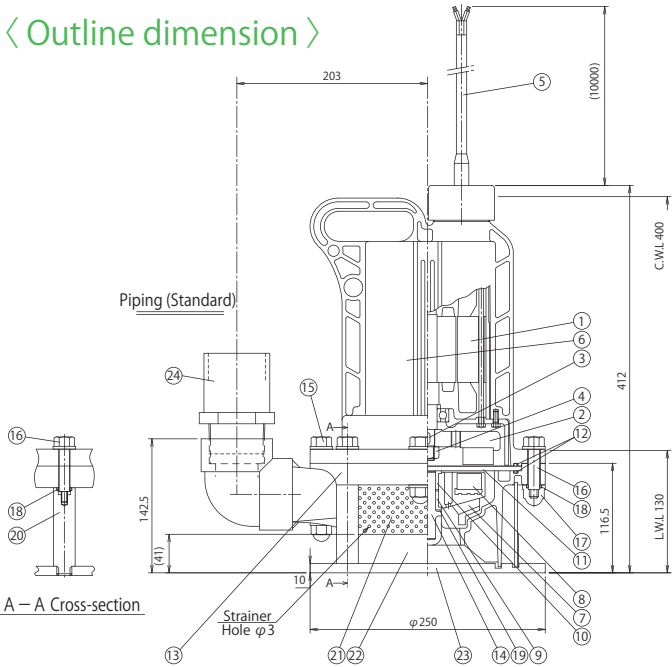
02 = 1.1kW

Standard specification

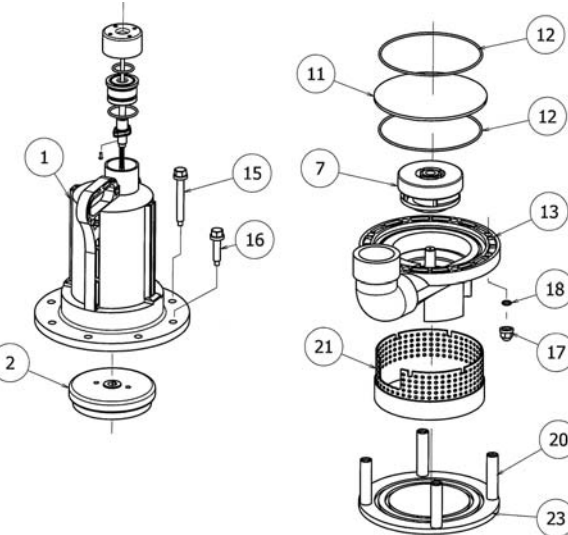
Model	Frequency	Standard performance		Motor output	Power	Insulation	Discharge bore	Liquid temperature	Weight
		Total head	Capacity						
5002GWN1	50Hz	8.3m	200L/min	1.1kW	200V × 3PH	H	50mm	70℃ MAX	23kg
5002GWN1	60Hz	8.3m	200L/min		200/220V × 3PH				
5002GWN1-HP	60Hz	11.9m	100L/min						

※ Cable = 2PNCT (1.25mm₂ × 10m)

Outline dimension



Exploded view



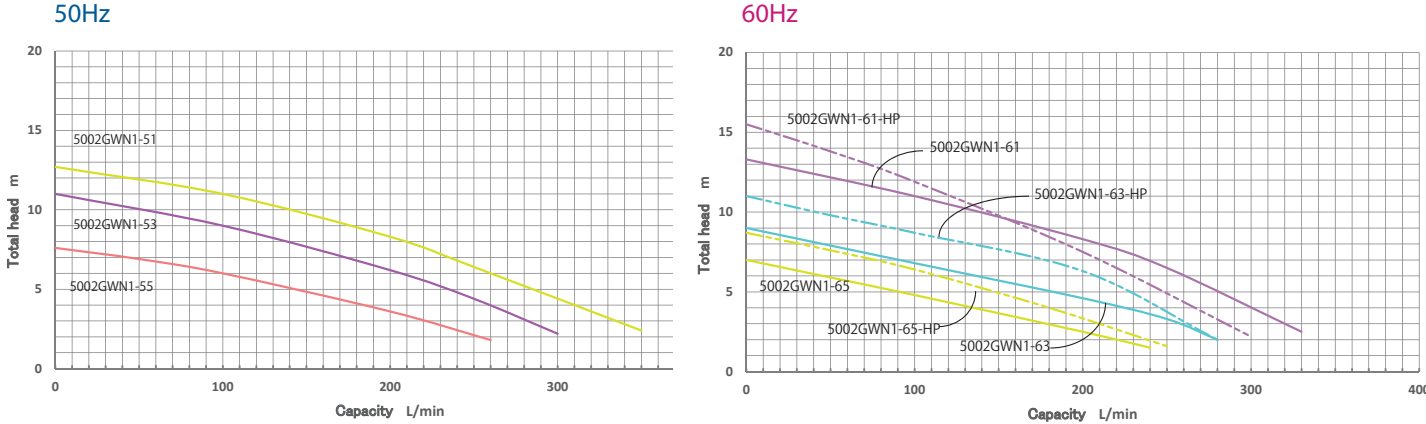
Parts list

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 / Ceramics
⑩	Rear bearing	PTFE series
⑪	Separating board	Ceramics
⑫	O-ring for separating 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

※ When using the pump for high temperature (55 degrees and more), do not use No. 24: the valve socket (made of PVC).

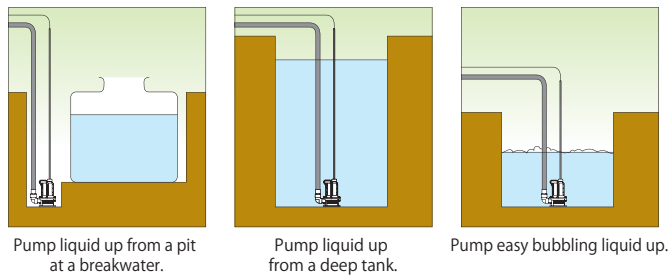
Performance curve



Use

- To pump up liquid or waste water from a deep/narrow pit/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



Structure

Separating 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 separating board. The simple water pass attains 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.

※ S.G. adjustment is available by impeller cutting.
※ Non standard voltage is also available. Consult us.

Caution in use

Range of corrosion

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 be corroded by sulfuric acid, nitric acid, hydrofluoric acid, chromic acid, sodium hypochlorite depending on the concentration. If necessary, ask the manufacturer.
2. 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 for 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.

Temperature limit

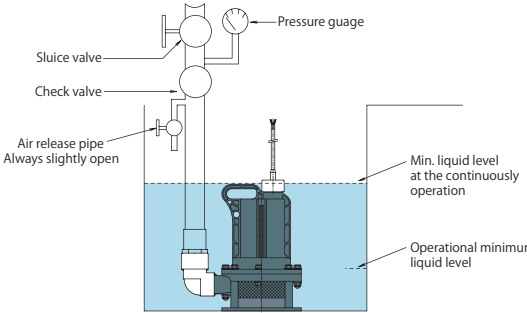
The insulation of the motor is H and it is possible to use the pump for the liquid until 70°C as standard.

Safe & measures

1. A thermal protecotr, which protect the motor from heat by overload and single phase operation, is incorporated, but **make sure to set a ground fault interrupter to prevent the accident by electric leakage.** It prevents the motor burn for the motor stop by liquid invasion as well as the prevention of electric leakage.
※ Whenever using, check the insulation resistance of the motor.
2. **Do not disassemble the motor and cable. It may cause electric leakage.**

Installation example

Install piping as referred to the right picture to prevent water hammer.
Minimum liquid level at the continuous operation is 400 mm. (Condition of the motor fully submerged)
Operational minimum liquid level is 130 mm. (It is possible to pump up, but cooling of the motor run short. As a guide, only 10 minutes are available.)



Operational caution

1. Slurry accelerates abrasion of the bearing. Specially when using the pump in a settlement tank, mount the pump not to take in slurry or clear slurry. (It is easy to replace a bearing. If slurry is mixed with liquid in use, use the ceramics bearing.)
2. Fully submerge the pump in liquid in use. Operatin in the air causes trouble.
3. If the pump is operated with a check valve at the discharge pipe, dry running may occur not to release air. When a check valve is attached, install an air release pipe below the check valve to always release air.
4. If the pump is exposed from the liquid during operation, the motor is not cooled and the plastic motor cover may be damaged by heat.
5. Operatino failure of a liquid level sensor causes dry running. Check the operate normally before use.
6. Do not remove the strainer not to take in dust in use. Besides always clean it not to clog dust. If dust is clogged, pumping failure occurs and causes the pump burn.
7. Consier the bore of the electric wire when the cable is extended to prevent a voltage drop.
8. When the pump is used for high temperature liquid (55°C and more), change the material of the valve socket (PVC) to other material.

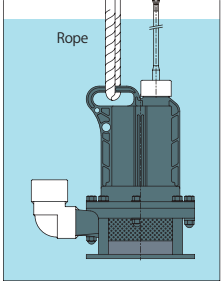
Handling caution

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

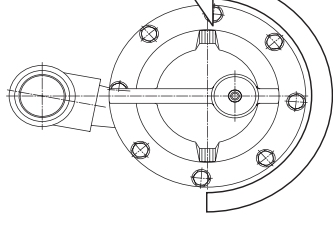
1. SUBMERSE is magnet drive system. If dry running occurs, the bearing and shaft may be damaged and the plastic parts may be deformed by heat. 三相動配線接続により逆回転する場合がありますが、逆回転の場合、正回転に比べて60%程度に揚水量や吐出圧力が下がります。また電流値も低い値を示しますので逆回転の確認ができますが、これらの確認方法が取れない場合、図①のように、ロープで吊り下げ水没させた状態で瞬間的に起動/停止を行い、反動方向により確認する方法もあります。
2. 正回転の場合、起動した瞬間にポンプは図②Aのように上から見て左方向に動きます。(確認作業中は吐出配管からの液噴出にご注意ください)

Picture ①

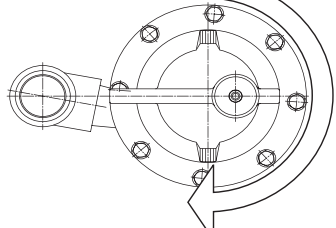


Submerge and hang the pump in a container or pit whose size is enough big for the pump, and check the rotating direction.

Picture ② A
Positive rotation



Picture ② B
Negative rotation



Small Submersible magnet pump

Model description

YD-25 A6 GWN1-CP-RD52-Z

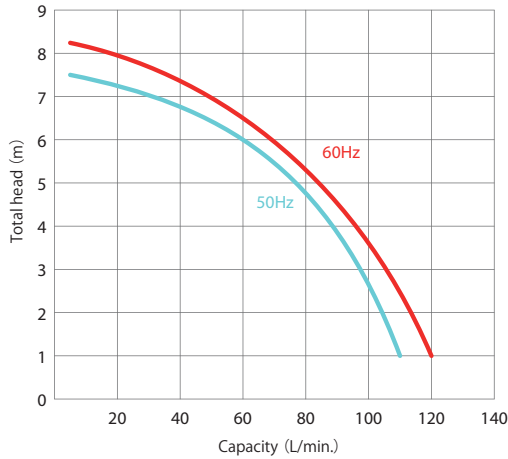
- Discharge bore: 25: Compatible with Φ25
- Motor output: A6: 0.26kW (100V/1PH)
- Model
- Main material: CP: CFR PP
- Bearing material: R: CFR PTFE
- O-ring material: D: FPM
- Frequency: 5: 50Hz, 6: 60Hz
- S.G.: 2: 1.2
- Option: with Cable sleeve

Standard performance

Model	Frequency	S.G.	Hose dimension	Std. performance		Motor			Liquid temp.	Weight
				Total head	Capacity	Output	Voltage/PH	Insulation		
YD-25A6GWN1-CP-RD52	50Hz	1.2	Inner : 25mm Outer : 33mm	6m	60L/min	0.26kW	100V 1PH	E	40℃ MAX	14Kg
YD-25A6GWN1-CP-RD62	60Hz			6.5m	60L/min					

※ Cabtire cable (2PNCT, 5m) is used as the power cable and available for common acid or alkali except organic solvent.

Performance curve



Use

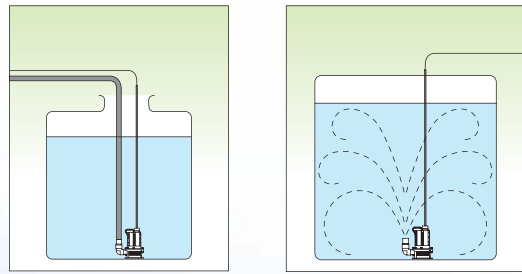
- To pump up liquid to replace.
- To pump up liquid from a deep chemical tank.
- To pump liquid out from a tank truck.
- Pump for a raw tank in a waste water plant.
- To pump up liquid at breakwater.
- For breaking bulk of chemical liquid.
- To transfer easy bubbling liquid.

Feature

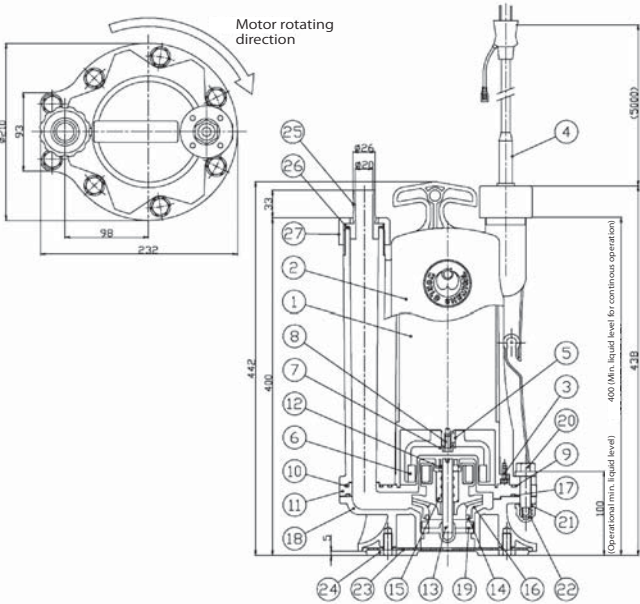
- 100V / 1PH power: Handy and quick plug in !
- Pump up until 10mm at minimum: Pumping up operation for a short time !



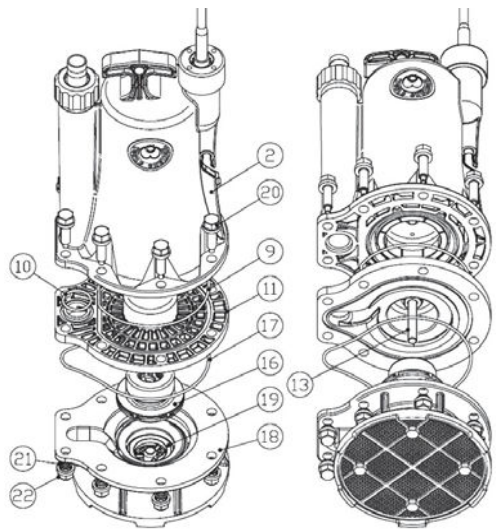
Example of installation



Outer dimension



Explowded view



Parts list

No.	Parts nam	Qty	Material	Remarks
1	Motor	1	FC	
2	Motor cover	1	CFR PP	
3	Hex. bolt	4	SUS304	M5×15
4	Cabtire cable	1	CR	2PNCT
5	Key	1	S45C	5×5×10
6	Outer magnet	1	Ferrite magnet	
7	Flat washer	1	SUS304	
8	Hex. bolt	1	SUS304	M6×15
9	O-ring for rear casing	1	FPM	
10	O-ring for discharge side	1	FPM	P38
11	Rear casing	1	CFR PP	
12	Rear thrust ring	1	Alumina ceramics	
13	Pump shaft	1	Alumina ceramics	
14	Mouth ring	1	CFR PTFE	

No.	Parts name	Qty	Material	Remarks
15	Bearing	1	CFR PTFE	
16	Impeller	1	CFR PP	
17	O-ring for casing	1	FPM	
18	Casing	1	CFR PP	
19	Liner ring	1	Alumina ceramics	
20	Set bolt 37	8	CFR PP	
21	O-ring for set bolt	8	FPM	P12
22	Nut for set bolt	8	CFR PP	
23	Strainer	1	CFR PP	
24	Hex. bolt	4	PVC	M10×20
25	Hose joint	1	CFR PP	
26	O-ring for hose joint	1	FPM	P34
27	Hose joint nut	1	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 alumina ceramics and adopts two-point mounting structure for durability.

Bolt, Nut

Stainless bolt is molded with CFR PP and not needed to be worried about corrosion.

Rear casing

Magnet drive system is adopted without a mechanical seal and completely block the pump and motor.

Operating precautions

Range of corrosion

- CFR PP (Carbon fiber reinforced polypropylene plastic): It is used for the main body and available for common acid and alkali, but sulfuric acid, nitric acid, hydrofluoric acid, chromic acid or sodium hypochlorite erodes it depending on the concentration. If needed, consult with the liquid manufacturer.
- Ceramics: Highly pure and chemical resistance ceramics are adopted and used for acid and alkali.
- Seal material: It is possible to select O-ring depending on the chemical resistance. EPDM O-ring for alkali and FPM O-ring for acid are prepared. They are not used for organic solvent.
- 2PNCT: The cabtire cable is made of 2PNCT which can be used for acid and alkali except organic solvent.

Limit temp.

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

Safety & measures

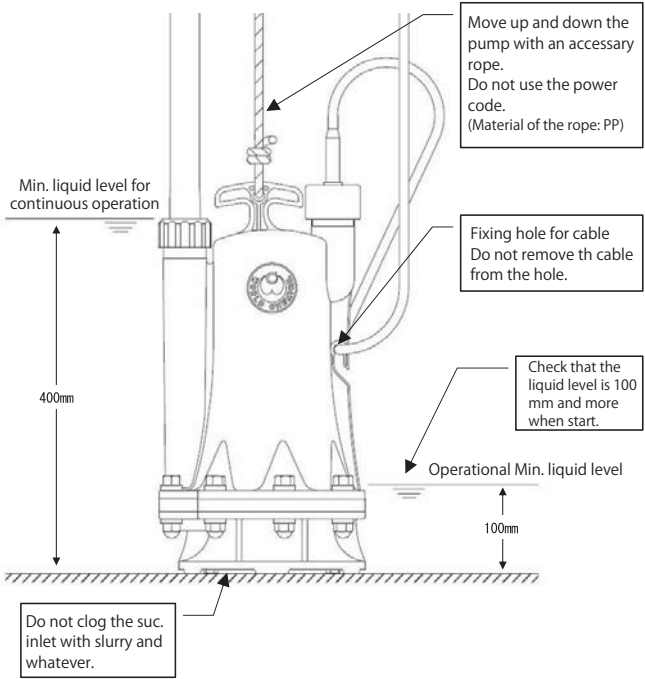
- The incorporated thermal protector works and the pump may stop to protect the motor depending on the operational condition. In this case, stop the operation for a while and check no failure of the pump. Then, re-start the pump after keeping the appropriate liquid level.
- Do not disassemble the motor or connection of the cabtire cable. It may lead to the accident by electric leakage.

Installing & operational precautions

Minimum required flow rate during operation : 5L/min

The minimum liquid level for continuous operation is 400mm. (at the state that the motor is completely submerged.)

The operational minimum liquid level is 100mm. (It is possible to pump up, but please operate within approx. 5 minutes for lack of motor cooling.)



- Do not lift the pump with the electric cable.
- Make sure to connect the earth cable with the plug to the earth.
- Do not run dry.
- Do not pump up sludge or slurry.

Countermeasures to Air lock

If there are any liquid space in the discharge pipe when the pump stops, pump failure may be occurred by air lock when the pump re-starts. Besides, the same situation may be occurred after dead head operation. Therefore, it is recommended to install an air release valve in the discharge pipe or pour priming liquid into the casing after releasing air before operation. When a check valve is installed in the discharge pipe, install a bypass pipe for air release below the valve. (If the air release pipe is not installed, air lock may be occurred.)



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