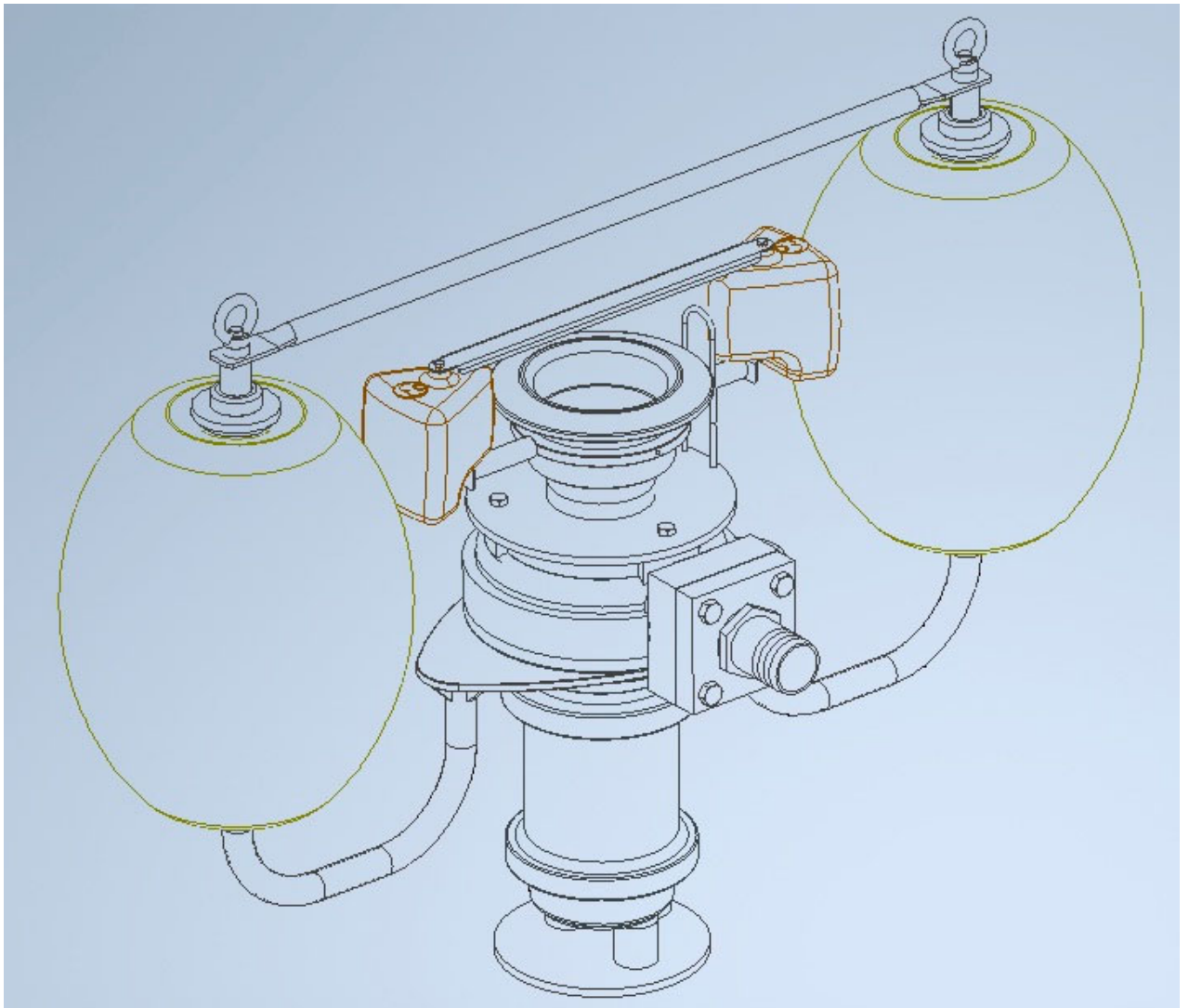


# SMASH SKIMMER

YD-1500PS

INSTRUCITON MANUAL

Version: 20260402



Thank you very much for purchasing our skimmer, YD-1500PS.

This skimmer is a device designed to efficiently collect floating substances such as debris and oil from the liquid surface, and it consists of floats and a submersible pump.

The features of each component and the handling instructions are explained below. Review them carefully and use this product accordingly.

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I. Model designation

II. Features

III. Float

IV. Submersible pump

V. Warranty / Repair

<b>Notice</b>	<p>This instruction manual is written for standard specification models. For special specification models, read this manual by replacing the relevant sections or terms with those corresponding to the actual specifications.</p>
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## • Safety Precautions.

Before using the product, read this section, "Safety Precautions," carefully and use it correctly.

In this manual, safety precautions are classified into the categories "Danger" and "Caution," and are defined as follows.



If handled improperly, it may lead to a hazardous situation that could result in death or serious injury.



If handled improperly, it may lead to a hazardous situation that could result in injury or property damage.

Even items classified as "Caution" may, depending on circumstances, lead to serious consequences. All instructions provided are important and must be strictly followed.

## • Precautions for Transportation and Installation.



- As this product weighs approximately 100 kg, be sure to use appropriate lifting equipment when transporting it. Since attached collected materials or oil may make it slippery, take sufficient care to prevent tipping or slipping. Also, be sure to disconnect the power cable before handling.
- Do not bend the power cable or motor lead wires excessively, apply excessive tension to them, or pinch them in narrow gaps. Damage to the cables may result in fire or electric shock.
- To prevent electric leakage, electric shock or motor failure, be sure to connect the grounding terminal.
- The power supply connection must be carried out by a qualified electrician in accordance with applicable electrical installation standards and regulations.



- When opening the wooden crate, take care to avoid injury from nails or wood splinters.

## • Precautions for Preparation and Operation



- As this product is equipped with a pump that has a high crushing capability, never touch the rotating parts during operation.  
Also, use the product in such a way that the rotating parts cannot be accessed during operation.
- During operation, take care to prevent the pump's power cable, lifting slings from being drawn into the rotating parts. Secure the power cable to the hose, and it is recommended to position the lifting slings so that they do not become excessively slack.
- The rotation direction of the submersible pump is counterclockwise when viewed from above. If it is rotating in the reverse direction, be sure to turn off the power before reconnecting the wiring.
- In the event of a power failure or when the motor protection devices are activated, the pump may restart unexpectedly. Be sure to turn off the main power supply.



- If any abnormality occurs, stop operation immediately and take appropriate corrective action.
- In the event of an emergency such as an earthquake or fire, stop the operation of the equipment.
- At startup, a reactive torque is applied to the product due to the starting reaction, so exercise caution.

## • Precautions for Maintenance and Inspection



- Turn off the main power before maintenance or inspection. Working while energized may cause entanglement or electric shock.



- If this product requires repair, contact your dealer or our sales representative.  
Before shipping, thoroughly clean the unit and ensure that no residual liquid is attached or leaking, then pack it securely and send it to us.

• **Other precautions**



- Do not use this product for any purpose other than its specified applications.  
Use outside the specified specifications is not covered by our warranty.
- For information regarding collected materials for this product, contact your dealer or our company.  
This unit must not be used with organic solvents, strong acids, or strong alkaline liquids.  
Never use it with flammable liquids.
- Do not modify the product, as any modifications made by the customer will void our warranty.
- Before disposing of this product, remove any attached foreign matter and dispose of it as industrial waste.

# SMASH SKIMMER

## YD-1500PS instruction manual

### I. Model designation

**EX) YD – 1500 PS – 02 V06 620 (N) (T)**  
(1)            (2)            (3)            (4)            (5)            (6)            (7)

(1) Outline

1500: within 1,500 mm

(2) Mode

PS series

(3) Submersible power

02: 1.5kW

(4) Submersible's cable material and length

V: VCT, P: 2PNCT / 06: 6 m, 10: 10 m (Length is expressed in meters.)

(5) Submersible's frequency and voltage

5: 50Hz, 6: 60Hz / 20: 200V, 22: 220V, 38: 380V, 40: 400V

(6) Debris protection net

N: Included, Blank: Not included

(7) Special condition

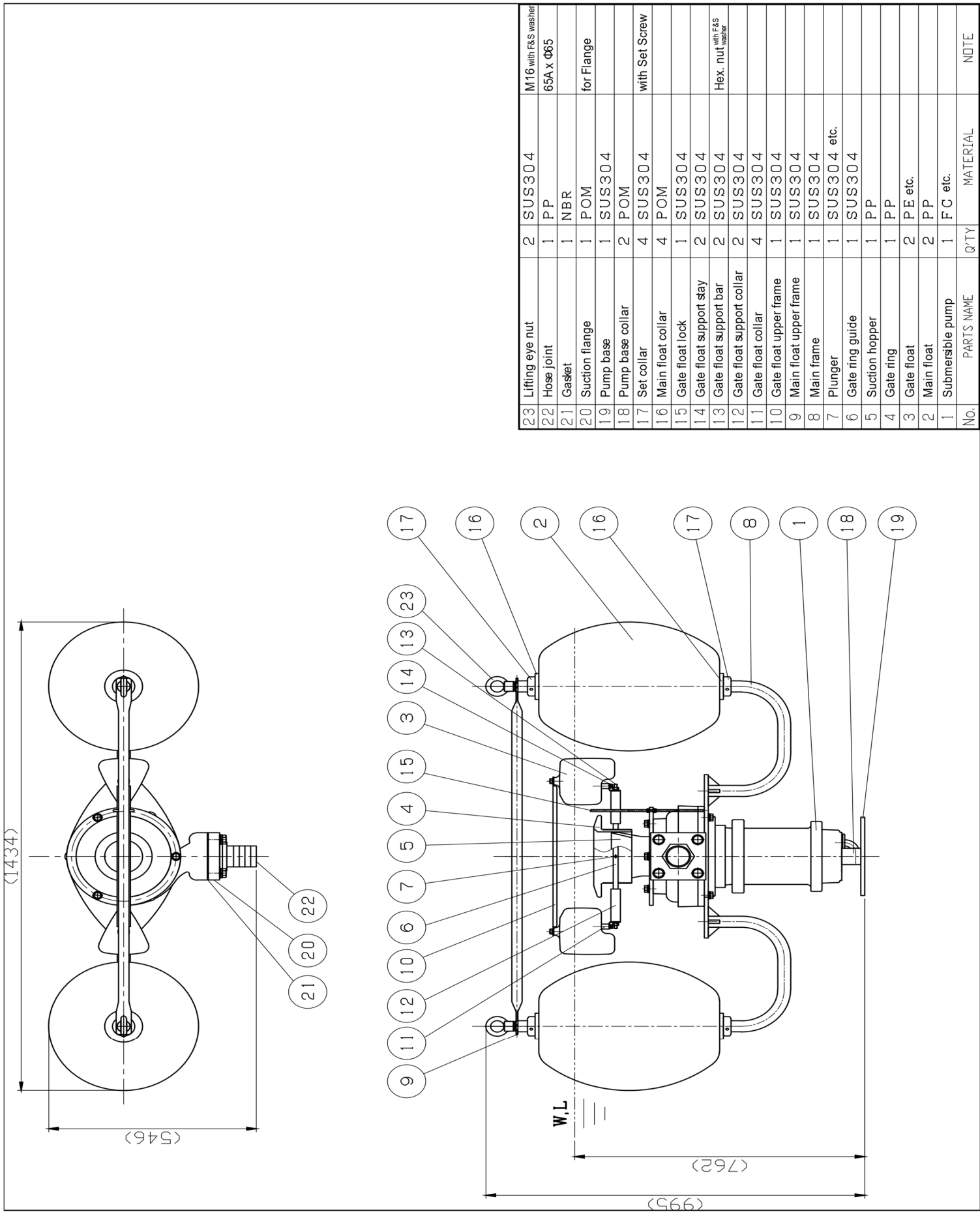
T: Special model

From (3) to (7)

TWSK: Special model for specific customer

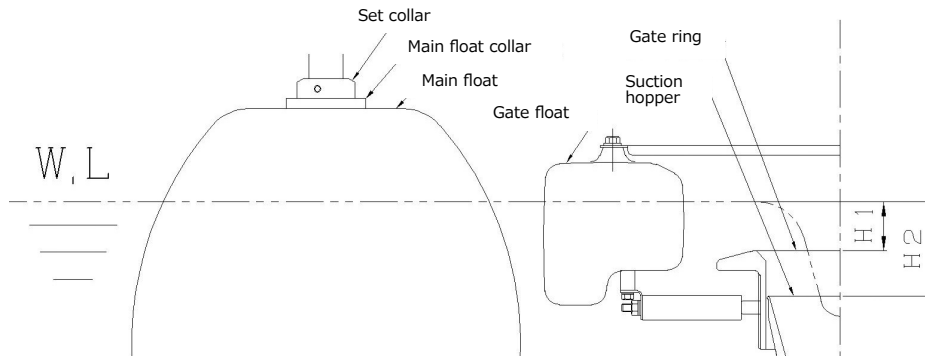
## II. Features

1. This skimmer is designed to float on a tank and collect floating objects.  
It mainly consists of two large floats (Main float), two small floats (Gate float), a supporting frame, a gate ring, a suction hopper, and a submersible pump.
2. The main floats provide sufficient buoyancy to support the weight of the frame, suction hopper, submersible pump, connecting fittings, and hoses.
3. The gate floats serve to maintain a constant distance (inlet head difference) between the inlet (gate ring) and the liquid surface even when the liquid level fluctuates.
4. Since the main floats and gate floats move independently of each other, the inlet head difference at the gate ring is not affected by the movement of the main floats, enabling stable collection.
5. The gate ring can be easily adjusted for the inlet head difference by rotating it with the screw mechanism.
6. Since this skimmer is integrated with the pump, it can efficiently collect floating objects continuously while drawing in surrounding debris simply by connecting the hose and supplying power.
7. The submersible pump is designed to smoothly transfer collected materials flowing in through the gate ring and offers excellent durability.
8. The product is mainly constructed of resin, cast iron, and stainless-steel materials, providing excellent corrosion resistance.
9. Since this product has no mechanically moving parts other than the submersible pump, it is easy to handle.
10. The structure is also designed for easy maintenance, such as removing clogged foreign matter and replacing the submersible pump.
11. Since the submersible pump used has a high crushing capability, it can crush and cut relatively small foreign matter for transfer.



23	Lifting eye nut	2	SUS304	M16 with F&S washer
22	Hose joint	1	PP	65A x 065
21	Gasket	1	NBR	
20	Suction flange	1	POM	for Flange
19	Pump base	1	SUS304	
18	Pump base collar	2	POM	
17	Set collar	4	SUS304	with Set Screw
16	Main float collar	4	POM	
15	Gate float lock	1	SUS304	
14	Gate float support stay	2	SUS304	
13	Gate float support bar	2	SUS304	Hex. nut with F&S washer
12	Gate float support collar	2	SUS304	
11	Gate float collar	4	SUS304	
10	Gate float upper frame	1	SUS304	
9	Main float upper frame	1	SUS304	
8	Main frame	1	SUS304	
7	Plunger	1	SUS304 etc.	
6	Gate ring guide	1	SUS304	
5	Suction hopper	1	PP	
4	Gate ring	1	PP	
3	Gate float	2	PE etc.	
2	Main float	2	PP	
1	Submersible pump	1	FC etc.	
No.	PARTS NAME	Q'TY	MATERIAL	NOTE

### III. Float



#### 【Handling instruction】

1. Connect the hose to the hose joint at the discharge port of the submersible pump and fasten it securely with a hose clamp. After that, place the unit in the tank so that it floats on the water surface where floating materials are present.
2. The eyebolts (two locations) on the top of the main float can be used for lifting/lowering the unit and for mooring purposes. Use them to secure the skimmer at a location where floating oil accumulates.

Since this product weighs approximately 100 kg, use appropriate lifting equipment when handling or transporting it. Also, exercise extreme caution to prevent slipping, falling or dropping the unit, as attached collected materials or oil may make surfaces slippery.



3. Arrange the hose connected to the submersible pump so that no excessive force is applied to it. If excessive force is applied to the hose while the unit is moored, the gate ring may tilt, resulting in uneven collection performance, or interference may occur between the sliding parts of the suction hopper and the gate ring, which may adversely affect its vertical movement.
4. Ensure that the gate ring and the suction hopper are submerged in water.
5. We adjust the inflow head (H1 and H2 shown in the figure above) between the gate ring and the suction hopper in our factory water tank (fresh water) before shipment. However, if the liquid in the tank is not fresh water, the collected layer is thick or the floating material has high viscosity / low specific gravity, H1 and H2 may be affected due to changes in buoyancy and inflow velocity. In such cases, make appropriate adjustments as necessary.

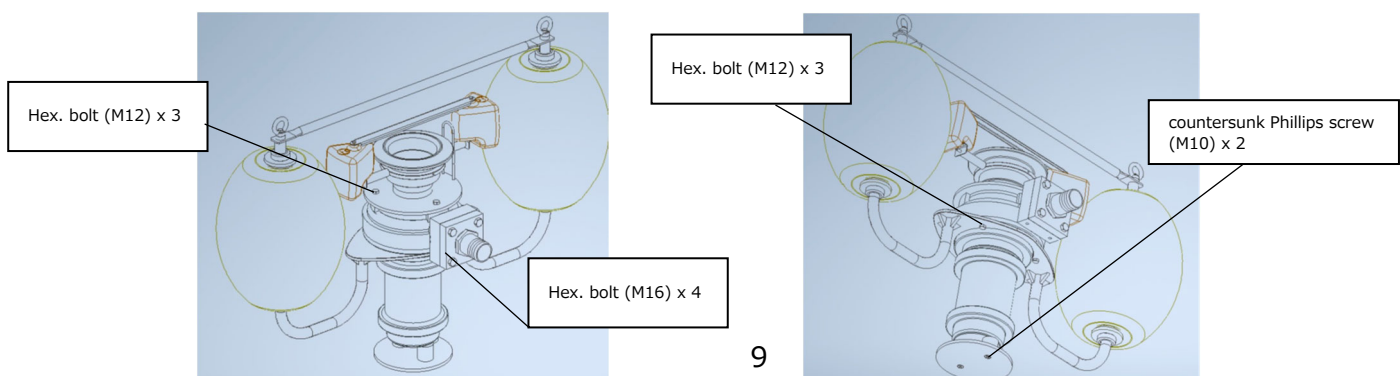
When making any adjustments, always turn off the main power supply before carrying out the work.



If work is performed while the power is still on, there is a risk of being caught in rotating parts or of electric shock.

6. When adjusting H1, rotate the gate ring while holding the gate float in place. Turning the gate ring clockwise (as viewed from above) increases H1 and increases the inflow rate. Conversely, turning it counterclockwise decreases H1 and reduces the inflow rate. The optimal inflow head H1 should be adjusted while maintaining a balance between the characteristics of the floating material (such as size, specific gravity, and viscosity), its thickness, and the pump flow rate.

7. The optimal inflow head  $H_1$  varies depending on the collected material and operating conditions. However, efficient collection can be achieved by adjusting the system so that the liquid level inside the gate ring is slightly lower than the surrounding liquid level.
8. When operating the skimmer in a consistently calm tank, it is generally not necessary to adjust  $H_2$ , which is the height between the suction hopper and the liquid surface. However, adjustment may be required if the liquid specific gravity changes or if the tank has waves or other disturbances. Adjust  $H_2$  so that the upper edge of the suction hopper is positioned approximately at the center height of the gate ring. Since the suction hopper is directly connected to the submersible pump and does not have its own adjustment mechanism for inflow head,  $H_2$  should be adjusted by changing the height of the main float. Before adjusting  $H_2$ , float the skimmer in the tank and measure the depth from the liquid surface to the upper edge of the suction hopper. Record any excess or deficiency in  $H_2$ . Loosen the M6 hex socket set screws on the set collars fixed above and below the main float so that the main float can move freely, and then reposition and secure the main float according to the required  $H_2$  adjustment. After floating the skimmer in the tank, confirm  $H_2$  and also check the buoyancy balance of the main float. If the upper edge of the suction hopper is not level and the buoyancy is uneven, readjust the relative heights of the main floats.
9. To ensure smooth and continuous operation of the skimmer, it should be periodically removed from the tank for cleaning according to the level of contamination. In addition, perform maintenance such as checking and retightening screws and other fastening components, inspecting for scratches or damage, managing oil inside the submersible pump, and checking insulation resistance.
10. If the surfaces of the floats or frame become dirty, foreign objects are more likely to adhere, and as these deposits accumulate, the responsiveness of the floats will deteriorate. In addition, if deposits build up in the gaps between the main float, gate float, gate ring, and suction hopper, their independent movements may be restricted. Therefore, carry out regular inspection and cleaning.
11. If foreign objects become clogged inside the casing of the submersible pump, remove the three M12 hex bolts securing the suction hopper. Then detach the suction hopper and the suction cover of the submersible pump, allowing you to remove any foreign objects trapped in the impeller.
12. The submersible pump is secured to the main frame at three points using M12 hex bolts, allowing it to be easily replaced. When replacing the pump, remove the two M10 Phillips countersunk screws fixing the pump base and collar at the lower section, and remove the four M16 hex bolts on the discharge flange at the outlet, after which the pump can be replaced.



## IV. Submersible pump

### 1. BE SURE TO READ FOR YOUR SAFETY.

Be sure to thoroughly read this SAFETY PRECAUTIONS before using.

The precaution describes to use the skimmer correctly and prevent danger of damage to you or to others. The precautions are classified into two categories: WARNING and CAUTION to clear the level of the harm and damage and urgency. However, CAUTION may at times lead to a more serious problem, too. In either case, they are indications for safety and be observed carefully.

- **WARNING:** It may lead to death or injury to humans, if ignoring the sign.
- **CAUTION:** It may cause injury to humans and other physical damage, if ignoring the sign.
- **NOTICE:** Others.
- **Explanation of symbols**



: It shows Danger, Warning or Caution. The inside symbol shows the abstract context.

(The left means Caution for electric shock.)



: It shows prohibition. The inside symbol shows the abstract context.



(The left means Disassembly prohibition.)

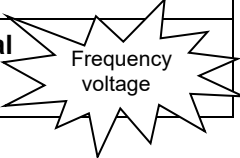


: It shows imposition or instruction. The inside symbol shows the abstract context.



























(The left means Wire the earth cable.)

### Precaution to the specification













 <b>CAUTION</b>	
	<ul style="list-style-type: none"> <li>● Do not use the product for other than the set specification. If not, it leads to <b>electrical leakage, electrical shock, fire or liquid leakage.</b></li> </ul>









### Precaution for transportation/installation

 <b>WARNING</b>			
	<p>When lifting the pump, always use the designated lifting fixtures. Improper lifting may cause the pump to fall or be damaged, resulting in personal injury.</p> 		<p>Install the product properly under the instruction manual. If it is failure, it causes electrical leakage, electrical shock, fire, water leakage, or injury.</p> 
	<p>Electrical work shall be carried out in accordance with the applicable electrical standards and wiring regulations. Be sure to install a ground fault circuit interrupter (GFCI) and an overcurrent protection device of appropriate capacity (commercially available, sold separately) exclusively for the pump. Improper wiring or inadequate installation of the ground fault circuit interrupter or overcurrent protection device may result in electric leakage or fire. In the worst case, it may lead to an explosion.</p> 		<p>Do not share the grounding connection with other equipment. Ensure that the pump is properly grounded. Install a dedicated ground fault circuit interrupter (GFCI) and overcurrent protection device (commercially available, sold separately) for the pump. If the pump malfunctions and current leakage occurs, electric shock may result.</p> 
 <b>CAUTION</b>			
	<p>Ensure that the pump is properly grounded. Do not connect the grounding wire to a gas pipe, water pipe, lightning rod, or telephone grounding wire. Improper grounding may result in electric shock.</p> 		<p>Do not use the pump if the cable is damaged. Also, ensure that the cable ends are securely connected to the terminal block. Failure to do so may result in electric shock, short circuit, or fire.</p> 
	<p>Do not damage the cable or subject it to excessive bending, pulling, twisting, modification, or bundling. A damaged cable may cause current leakage, short circuit, electric shock, or fire.</p> 		<p>Provide overflow prevention measures, such as a standby pump. Failure to do so may result in damage to surrounding walls, floors, and equipment.</p> 
	<p>Ensure that all pump piping is installed properly to prevent leakage. Improper installation may result in damage to surrounding walls, floors, equipment, or other property.</p> 		<p>When transporting the pump manually, ensure that a sufficient number of personnel are assigned according to the weight of the pump. When lifting the pump, do not lift with your back alone; bend your knees and lift properly. Failure to do so may result in back injury.</p> 
	<p>This pump is not designed for dust or explosion-proof service. Do not install it in locations where toxic or corrosive gases containing acids, alkalis, organic solvents, paints, or similar substances are present, such as machinery or chemical plants, or in dusty environments. Failure to do so may result in fire or other hazardous conditions.</p> 		<p>When using a hose, secure it properly to prevent movement. If the hose moves during operation, it may cause liquid to splash or result in injury.</p> 



## Precautions for Trial Run and Operation

⚠ WARNING		
	Do not operate the pump while anyone is inside the tank. Electric shock may occur if there is a current leakage.	
	Never start the pump while it is suspended. The reaction torque generated at startup may cause injury.	
⚠ CAUTION		
	Do not use the pump with a power supply other than the rated voltage. In particular, when using a generator, avoid sharing the generator with other electrical equipment whenever possible. Doing so may cause malfunction, resulting in pump failure, electrical leakage, or electric shock.	
	Do not use the pump for liquids other than water, such as oil, seawater, or organic solvents. Doing so may cause pump failure, resulting in electrical leakage or electric shock.	
	Do not use the pump with hot water above 40°C. Failure to follow this instruction may result in pump failure, electrical leakage, or electric shock.	
	Do not insert any foreign objects, such as bottles, wires, or other metal objects, into the pump suction inlet. Doing so may cause pump failure or abnormal operation, resulting in electrical leakage or electric shock.	



## Precautions for Maintenance and Inspection

⚠ WARNING		
	Before performing maintenance or inspection, always switch off the power supply. Do not handle the pump or perform any work with wet hands. Failure to follow these instructions may result in electric shock or personal injury.	
	If any abnormal condition is detected (such as a burning smell), switch off the power supply, stop operation immediately, and contact the dealer from whom you purchased the pump. Continuing to operate the pump under abnormal conditions may result in electric shock, fire, or water leakage.	
⚠ CAUTION		
	After reassembling the pump, always perform a test run before returning it to service. Improper assembly may cause abnormal operation, resulting in electric shock or water leakage.	

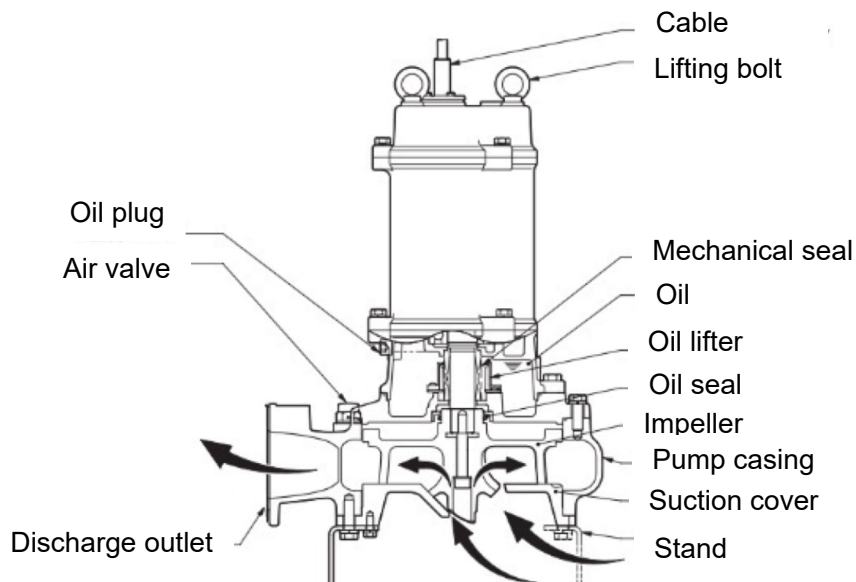
## Precautions in the Event of a Power Failure

⚠ WARNING		
	In the event of a power failure, switch off the power supply and stop the pump. Unexpected startup of the pump when power is restored can be extremely dangerous to anyone near the pump.	

## Others

⚠ CAUTION		
	Do not use this pump for potable water applications. Failure to follow this instruction may result in adverse effects on human health.	

## 2. PARTS NAME



## 3. BEFORE USE

After unpacking, check the following items.

### ➤ Product inspection

Check the product for any damage that may have occurred during transportation, and make sure that all bolts, nuts, and other fasteners are securely tightened.

### ➤ Specification check

Check the nameplate on the pump to ensure that the product matches your order. Pay particular attention to the rated voltage and frequency.

### ➤ Accessory check

Check the accessories supplied with the product.

NOTE: If you find any defect or discrepancy in the product, contact the dealer from whom you purchased it.

### ➤ Product specifications

**CAUTION:** Do not use the pump outside its specified operating conditions. Failure to follow this instruction may result in electric shock, electrical leakage, fire, or water leakage.

### ■ Standard specifications

Liquid	Properties and Temperature	Sewage, wastewater, sewage containing solids, or liquids containing foreign matter / 0 to 40 degrees
Pump	Impeller	Non-clog
	Shaft seal	Double mechanical seal
	Bearing	Sealed ball bearing
Motor	Specifications	Dry-Type Submersible Induction Motor / 4 pole
	Insulation class	F
	Built-in protective device	Circle thermal protector (Output: 7.5kW or less) Miniature protector (Output: 11kW and over)
	Oil	Turbine oil VG32 (Additive-free)
Piping connection		JIS 10K Flange

**4. INSTALLATION**

**CAUTION:** Use the pump within  $\pm 5\%$  of the rated power supply voltage.

Do not use this pump with seawater or organic solvents.

The liquid temperature must be within the range of 0 to 40°C. Failure to follow these instructions may result in pump failure, electrical leakage, or electric shock.

**NOTE:** If this product is to be used with special solutions, consult the dealer from whom you purchased it.

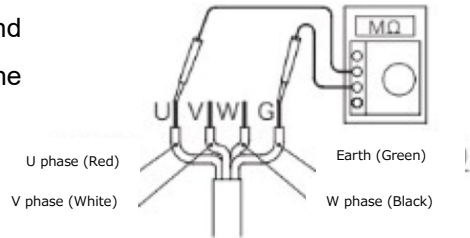
■ **Maximum operating pressure**

**CAUTION:** Do not use the pump in locations where it may be subjected to water pressure exceeding the values specified below.

Applicable models	Maximum operating pressure
Models with an output of 5.5 kW or less	0.3MPa (3kgf/cm <sup>2</sup> ): Discharge Pressure During Operation
Models with an output of 7.5 kW or less	0.4MPa (3kgf/cm <sup>2</sup> ): Discharge Pressure During Operation
Models with an output of 11 kW or less	0.5MPa (3kgf/cm <sup>2</sup> ): Discharge Pressure During Operation

➤ **Preparation and Checks Before Installation**

Measure the insulation resistance between each cable conductor and the ground wire (green) using a megohmmeter and confirm that the motor insulation resistance is within the specified range.



Insulation Resistance Criteria: 20MΩ and more

**NOTE:** The insulation resistance criteria (20MΩ and more) shown above apply to new or repaired pumps. For the insulation resistance criteria after installation, refer to Section 7, "Maintenance and Inspection."

➤ **Installation precautions**

**WARNING:** When installing the pump, take its weight and center of gravity into consideration. If the pump is not properly lifted or supported, it may fall or be damaged, resulting in personal injury or property damage.

**CAUTION:** Never install, lift, or transport the pump by suspending it from the cable. Damage to the cable may result in electric leakage, electric shock, or fire.

- (1) Do not bend the cable or use it in place of a rope during transportation or installation.
- (2) Fasten the cable to the hose to prevent it from being caught in the pump.

**CAUTION:** Operating the pump with a loose or hanging cable may cause the cable to be caught in the impeller, resulting in cable breakage, impeller damage, or water ingress. This may lead to electric leakage or electric shock.

## 5. ELECTRICAL WIRING

### ➤ Electrical wiring work

**WARNING:** Electrical wiring work must be performed by qualified personnel and carried out in accordance with applicable electrical codes and regulations, such as the Technical Standards for Electrical Installations and the Internal Wiring Regulations. Never allow unqualified personnel to perform electrical wiring work, as it is not only a violation of the law but also extremely dangerous.

Improper wiring or other electrical installation defects may result in electric leakage, fire, or electric shock. Be sure to install a dedicated earth leakage circuit breaker (ELCB) and an overcurrent protection device for the pump. Failure to do so may result in electric shock or explosion in the event of pump failure or electrical leakage.

Ensure that the power supply and wiring have sufficient capacity with an adequate safety margin.

### ➤ Grounding

**WARNING:** Be sure to connect the grounding wire securely. Failure to do so may result in electric shock in the event of pump failure or electrical leakage.

**CAUTION:** Do not connect the grounding wire to gas pipes, water pipes, lightning rods, or telephone grounding wires. Improper grounding may result in electric shock.

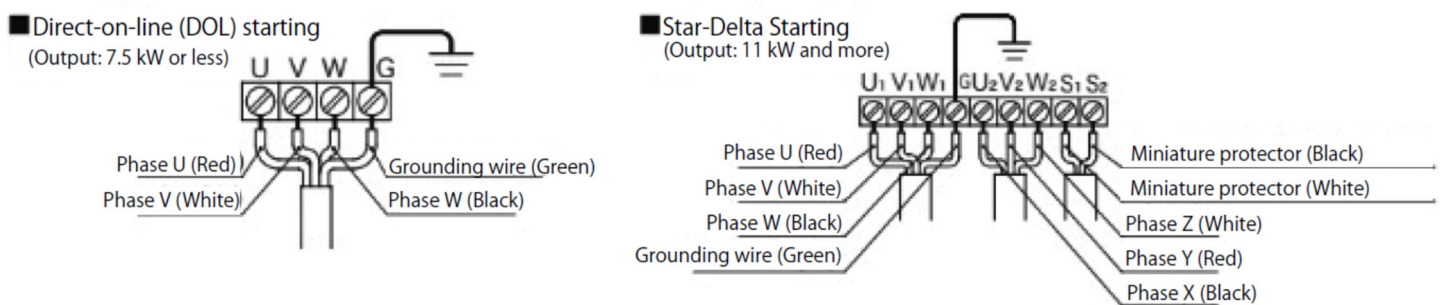
### ➤ Power connection

**WARNING:** Before connecting the power cable to the terminal block, be sure to turn off the power supply (such as the earth leakage circuit breaker). Failure to do so may result in electric shock, short circuits, or injury caused by the unexpected startup of the pump.

**CAUTION:** Do not use the pump if the cable is damaged. Failure to do so may result in electric shock, short circuits, or fire.

Connect the wiring as shown below.

Securely connect the cable terminal to the control panel terminal block, ensuring that the connection is tight and free from looseness.



**NOTE:** Unused cable ends have been properly terminated. If the cable is stripped or modified, be sure to re-terminate the exposed cable ends.

### ➤ Motor protection device

The pump is equipped with a built-in motor protection device.

#### 1. Circle thermal protector

If an overcurrent condition or abnormal overheating occurs due to any of the causes listed below, the pump will automatically stop regardless of its operating condition to protect the motor.

The motor protection device is designed to reset automatically. If the motor protection device has been activated,

make sure that the power supply (such as the earth leakage circuit breaker) is completely switched off, disconnect the cable from the terminal block, and eliminate the cause of the problem before restarting the pump.

- \* Extreme fluctuations in the power supply voltage.
- \* Operation under overload conditions.
- \* Phase-loss operation or locked-rotor operation.

## 2. Miniature protector

The miniature protector is embedded in the motor winding. If the motor winding overheats abnormally for any reason, the bimetal element in the miniature protector will operate and send a signal. By incorporating a dedicated electrical circuit into the external starter panel or control panel, the motor current can be interrupted to protect the motor.

The miniature protector automatically resets when the motor temperature decreases. However, restarting must be carried out from the external starter panel or control panel.

**NOTE:** Our miniature protector uses a normally closed (NC) contact. The contact opens when the protector operates and remains closed during normal operation.

To protect the motor against overcurrent, be sure to install a motor circuit breaker, thermal overload relay, or equivalent protective device in the external starter panel or control panel.

By installing a phase-failure relay (3E relay), the motor can be protected against overcurrent, phase loss, and reverse-phase operation.

**NOTE:** If the motor protection device has been activated, make sure that the power supply (such as the earth leakage circuit breaker) is completely switched off. Disconnect the cable from the terminal block and be sure to eliminate the cause of the problem before restarting the pump.

Do not operate the pump under extremely low water level conditions or with debris clogging the impeller. Such operation not only prevents the pump from delivering its specified performance, but may also cause excessive noise, abnormal vibration, and pump failure.

**CAUTION:** Especially when long cable runs are required, route the control cable and power cable separately. If they are installed in the same conduit, the protection device may malfunction or operate incorrectly.

## 6. OPERATION

### ➤ Before operation

(1) Check the nameplate of this product again to ensure that the voltage and frequency are correct.

**CAUTION:** Make sure that the power supply voltage and frequency are correct. Incorrect voltage or frequency may not only prevent the product from delivering its specified performance but may also result in damage to the product.

**NOTE:** Check the pump nameplate for confirmation.

(2) Check the wiring, power supply voltage, earth leakage circuit breaker rating, and motor insulation resistance.

■ Insulation resistance criteria = 20MΩ and higher

**NOTE:** The insulation resistance criterion (20 MΩ or higher) applies to a new or repaired pump. For the insulation resistance criteria after installation, refer to the section "Daily Inspection and Periodic Inspection."

(3) Set the thermal overload relay (or 3E relay) to the pump's rated current.

**NOTE:** Refer to the pump nameplate for the rated current value.

### ➤ Test operation

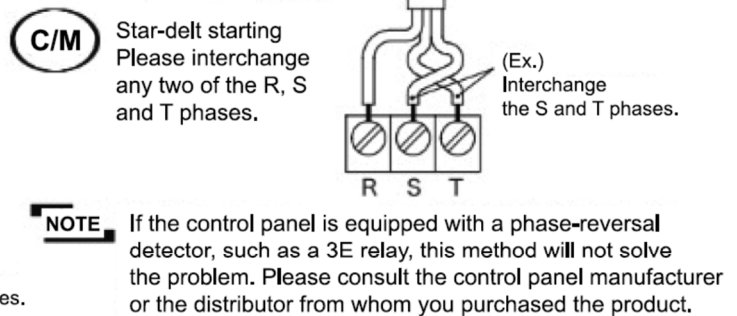
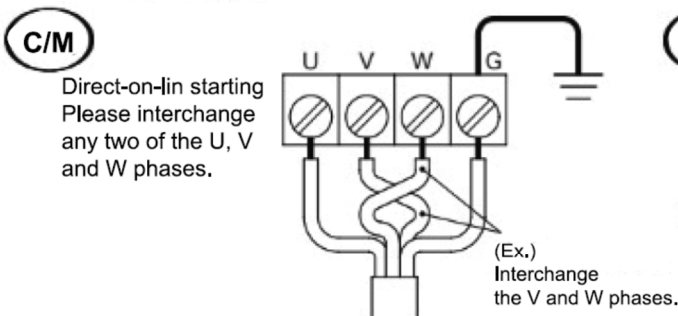
**WARNING:** Do not start the pump while it is hanging freely. Doing so may result in serious accidents or personal injury due to the reaction force caused by pump rotation.

(1) Run the pump briefly (1 to 2 seconds) and check the direction of impeller rotation. Viewed from above the pump, correct rotation is indicated when the reaction direction is counterclockwise.

**CAUTION:** Always check the direction of rotation with the pump out of the water. If the pump rotates in the reverse direction while submerged, it may be damaged and could result in electrical leakage or electric shock.

(2) If the pump rotates in the reverse direction, take the following corrective actions.

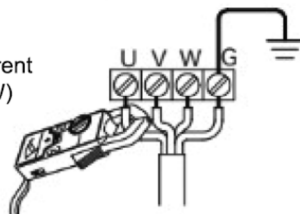
**CAUTION:** When changing the wiring to correct reverse rotation, ensure that the power supply (earth leakage circuit breaker) is switched off and that the impeller has completely stopped rotating. Failure to do so may cause electric shock or a short circuit.



(3) Connect the pump to the piping and submerge it in the liquid.

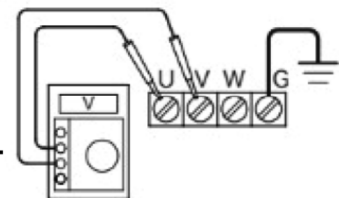
(4) Operate the pump for a short period (3 to 10 minutes) and check the following items.

Using an AC clamp meter, measure the operating current of each phase (U, V, and W) at the terminal block.



**C/M** If the operating current exceeds the rated value, the pump motor may be overloaded. Refer to Section 4, "Installation," and ensure that the pump is used under the correct operating conditions.

Measure the voltage at the terminal block using an AC voltmeter (multimeter). The supply voltage must be within ±5% of the rated voltage.



**C/M** If the supply voltage is outside the allowable range, the power supply capacity, extension cable, or electrical wiring may be the cause. Refer to Section 5, "Electrical Wiring," and use the pump under proper conditions.

**CAUTION:** If excessive vibration, abnormal noise, or an unusual odor occurs, immediately turn off the power and contact your distributor. Continued operation under abnormal conditions may cause electric shock, fire, or electrical leakage.

(5) If no abnormalities are found during the test run, continue normal operation.

**WARNING:** The pump body may become extremely hot during operation. Do not touch the pump with bare hands during operation or immediately after shutdown, as this may result in burns.

During pump operation, pay close attention to the operating water level. Dry running may cause pump failure.

If the motor protection device trips and stops the pump due to overload operation or a pump malfunction, make sure that the power supply (including the earth leakage circuit breaker) is completely disconnected. Then remove the cable from the terminal block and identify and eliminate the cause of the shutdown before restarting the pump.

If the pump is started and stopped frequently (including automatic operation), set the water levels so that the number of starts does not exceed the following guidelines:

- Models with output ratings from 0.4 kW to 7.5 kW: maximum 10 starts per hour
- Models with output ratings from 11 kW to 22 kW: maximum 6 starts per hour

In addition, the operating time for each pump should be limited to approximately 12 hours per day and 4,000 hours per year.

**NOTE:** Submersible pumps draw a high starting current when they are started, causing the motor winding temperature to rise rapidly. Repeated starting and stopping can accelerate the deterioration of the winding insulation and adversely affect motor life. Therefore, special care should be taken to avoid excessive start-stop frequency.

## 7. MAINTENANCE AND INSPECITON

Periodic maintenance and inspection are necessary to maintain the pump's performance. If any abnormal condition is observed, refer to Section 8, "Causes of Trouble and Corrective Actions," and take appropriate measures promptly. We also recommend preparing a spare pump for emergency situations.

### ➤ Before inspection

**WARNING:** Make sure that the power supply (including the earth leakage circuit breaker) is completely disconnected and disconnect the cable from the power outlet or terminal block. Failure to do so may result in electric shock or serious injury caused by the unexpected startup of the pump.

#### (1) Pump cleaning

Remove all deposits from the pump surface and wash the pump with clean tap water. Pay particular attention to the impeller and pump casing, ensuring that any entangled debris and surface deposits are completely removed. Such contamination may cause overload operation or abnormal vibration.

#### (2) Pump external inspection

If the paint is peeling, any part is damaged, or any bolts or nuts are loose, disassembly and repair may be required. consult the distributor from whom you purchased the product.

**NOTE:** Prepare touch-up paint separately as required. If any damaged parts or loose bolts and nuts are found, the pump may require disassembly and repair. Consult the distributor from whom you purchased the product.

### ➤ Daily and Periodic Inspections

Frequency	Inspection items
Every day	Operating current: Check that the value is within the rated range. Supply voltage: Tolerance: $\pm 5\%$ of the rated voltage
Once a month	Insulation resistance: Reference Value: 1 M $\Omega$ or higher <b>NOTE:</b> If the insulation resistance has decreased significantly compared with the previous inspection, the motor section should be inspected.
Every six months	Lifting chain: If damage, corrosion, or excessive wear is found, replace the part. Remove any dirt, scale, or other deposits adhering to the surface.
Once a year	Oil: Inspect every 6,000 operating hours or every 12 months, whichever comes first.
Every two years	Oil: Inspect every 9,000 operating hours or every 24 months, whichever comes first. Mechanical seal: Inspection and replacement require specialized equipment. Consult the distributor from whom you purchased the product.
Every 2 to 5 years	Overhaul: Carry out this inspection even when the pump is operating normally. For pumps used in continuous operation, the inspection should be performed more frequently. Consult the distributor from whom you purchased the product.

**NOTE:** Refer to "Oil Inspection and Replacement Procedures" for details on oil inspection and replacement.

**NOTE:** When pumping wastewater containing oil, grease, paint, fine ash, or other fine particulate matter, more frequent inspections are required, as cable swelling or water ingress through the mechanical seal may cause pump failure.

➤ **Storage During Shutdown**

When the pump is to be shut down for a long period, lift the pump out, clean and dry it, and then store it indoors.

**NOTE:** When reinstalling the pump, always perform a test run before placing the pump into operation.

When the pump is left installed underwater, run it periodically (approximately once a week) to prevent impeller lock-up caused by rust formation.

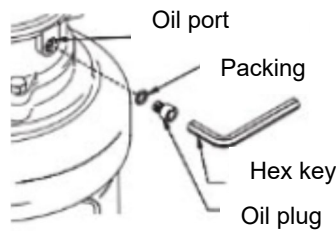
➤ **Oil Inspection and Replacement Procedures**

**Oil inspection**

Remove the oil plug and drain a small amount of oil. Tilt the pump body so that the oil plug faces downward, and the oil can be drained easily.

If the drained oil is milky or contains water,

the shaft sealing device (such as the mechanical seal) may be faulty. In such a case, the pump requires disassembly and repair.



Specified oil: Turbine oil VG32  
(non-additive)  
Unit: ml

Model	Specified amount
Output: 1.5 to 3.7kW	1,250
Output: 5.5 to 7.5kW	4,200
Output: 11kW	5,400
Output: 15kW	5,700

**Oil replacement**

Remove the oil plug and drain all the oil completely. Then, fill the specified amount of oil through the oil port.

Do not discharge the drained oil into rivers or sewage systems. Dispose of it properly in accordance with applicable regulations. The gasket and O-ring of the oil plug must be replaced with new ones each time oil is inspected or replaced.

(3) Long-Term Storage

For long-term storage, we recommend storing the pump as follows.

- ① Store the pump avoiding outdoor locations, direct sunlight, high temperature and high humidity areas, condensation-prone areas, freezing conditions, locations where foreign matter or dust may enter, and environments containing corrosive gases. (Recommended conditions: 10°C to 30°C, relative humidity below 95%)
- ② For motor-equipped products, operate the pump once every six months.  
(If this is not possible, rotate the impeller manually to turn the motor.)
- ③ Before operation, check that all bolts are not loose. If any are loose, tighten them before starting operation.
- ④ Even during operation shutdown or long-term storage, perform periodic inspections based on the storage period in accordance with the maintenance inspection items.
- ⑤ Before starting operation, ensure that the motor insulation resistance is 1 MΩ or higher.
- ⑥ Confirm that no foreign matter, dust, or liquid is adhering to live (energized) parts.
- ⑦ If the pumped liquid tends to solidify or form deposits, thoroughly drain and wash the pump before storage.

## 8. TROUBLESHOOTING

**WARNING:** Be sure to turn off the power before inspecting the pump. Failure to do so may lead to a serious accident. Before requesting repairs, carefully read this instruction manual and perform the necessary inspections again. If the problem still persists, contact the distributor from whom you purchased the product.

Symptom	Cause	Countermeasure
Does not start or stops immediately.	<ol style="list-style-type: none"> <li>1. No power supply (e.g., power outage).</li> <li>2. Abnormality in the automatic control unit (control panel).</li> <li>3. Protective device (protector) is activated due to jamming of foreign matter or similar causes.</li> <li>4. Motor burnout.</li> <li>5. Cable disconnection or poor connection.</li> <li>6. Voltage drops due to excessive cable length.</li> </ol>	<ol style="list-style-type: none"> <li>1. Contact the power company or an electrical contractor for corrective action.</li> <li>2. Investigate the cause and perform professional repair.</li> <li>3. Inspect the pump section and remove any foreign matter.</li> <li>4. Repair or replace the unit.</li> <li>5. Replace the cable or connect it correctly.</li> <li>6. Shorten the extension cable or replace it with a thicker one.</li> </ol>
The protective device operates.	<ol style="list-style-type: none"> <li>1. Motor abnormality (burnout or water ingress, etc.).</li> <li>2. Pump designed for 50 Hz operation is being operated at 60 Hz.</li> <li>3. High liquid temperature.</li> <li>4. Prolonged dry running (operation in air).</li> <li>5. Overcurrent.</li> </ol>	<ol style="list-style-type: none"> <li>1. Repair or replace the unit.</li> <li>2. Check the nameplate and replace the pump if necessary.</li> <li>3. Lower the liquid temperature.</li> <li>4. Raise the water level after stopping the pump.</li> <li>5. Refer to the section on overcurrent.</li> </ol>
The pump is running but does not pump water.	<ol style="list-style-type: none"> <li>1. Air lock has occurred.</li> <li>2. Blockage inside the pump or piping.</li> <li>3. Partial clogging in the piping or malfunction of a valve.</li> <li>4. Motor is rotating in reverse.</li> </ol>	<ol style="list-style-type: none"> <li>1. Stop the pump once and restart it or clean the air valve.</li> <li>2. Remove any blockage.</li> <li>3. Remove any blockage and repair or replace the valve.</li> <li>4. Change the power supply wiring.</li> </ol>
Insufficient discharge flow.	<ol style="list-style-type: none"> <li>1. Severe wear of the impeller or casing.</li> <li>2. High piping losses.</li> <li>3. Low operating water level causing air suction.</li> <li>4. Pump designed for 60 Hz operation is used at 50 Hz.</li> <li>5. Leakage from piping.</li> <li>6. Foreign matter adhering inside the piping or pump.</li> </ol>	<ol style="list-style-type: none"> <li>1. Repair or replace each component.</li> <li>2. Review the operating plan.</li> <li>3. Raise the water level or lower the pump position.</li> <li>4. Check the nameplate and replace the pump.</li> <li>5. Inspect and repair.</li> <li>6. Remove any blockage.</li> </ol>
Overcurrent occurs.	<ol style="list-style-type: none"> <li>1. Large imbalance in supply voltage.</li> <li>2. Significant voltage drops.</li> <li>3. Phase loss.</li> <li>4. Pump designed for 50 Hz operation is used at 60 Hz.</li> <li>5. Motor is rotating in reverse.</li> <li>6. Foreign matter adhering inside the pump.</li> <li>7. Motor bearing damage.</li> </ol>	<ol style="list-style-type: none"> <li>1, 2. Contact the power company or an electrical contractor for corrective action.</li> <li>3. Inspect the wiring connections and the magnetic contactor.</li> <li>4. Check the nameplate and replace the pump if necessary.</li> <li>5. Rewire the power supply connections.</li> <li>6. Remove any blockage.</li> <li>7. Disassemble the pump and replace the bearings.</li> </ol>
The pump cannot be lifted due to the removable installation system.	<ol style="list-style-type: none"> <li>1. The detachable mechanism is rusted and seized.</li> <li>2. The guide hook is stuck in the guide pipe.</li> <li>3. Cables or chain are caught or entangled.</li> </ol>	<ol style="list-style-type: none"> <li>1. Gently shake the lifting chain and slowly pull it up.</li> <li>2. Loosen the lifting chain slightly and then slowly pull it up while shaking it.</li> </ol>

## V. Warranty / Repair

### 1. Warranty Period and Coverage

- ① The warranty period of the product is 12 months from the date of shipment from our factory. For the submersible pump section, the warranty period is limited to 3,000 hours of operation.
- ② If a failure or damage occurs during the warranty period, despite proper use in accordance with this instruction manual, due to manufacturing defects, we will repair the defective or damaged part free of charge.
- ③ Even within the warranty period, repairs will generally be charged in the following cases:
  - Failure or damage caused by use or storage not in accordance with this instruction manual.
  - Failure or damage caused by misuse, improper repair, or modification.
  - Failure or damage caused by fire, earthquake, flood, lightning, other natural disasters, pollution, salt damage, gas damage, abnormal voltage, or use of power supply outside specified conditions (voltage, frequency).
  - Wear or deterioration of consumable parts such as gaskets and O-rings.
  - Failure or damage caused by transportation after purchase, relocation of installation site, or dropping.
- ④ We shall not be responsible for any failure or damage to products manufactured according to specifications or materials designated by the customer.
- ⑤ We do not guarantee against chemical or fluid corrosion of the handled liquid, nor wear or abnormal conditions caused by slurry. Materials selected by us at the time of contract represent recommended materials only and do not guarantee corrosion resistance against the actual service fluid.
- ⑥ If any ambiguity arises in determining the cause of failure or damage, the matter shall be resolved through consultation between the customer and our company.
- ⑦ We shall not be liable for any repair costs or other damages arising from failure or damage caused by use not in accordance with this instruction manual.

### 2. Repair

(Request)

For repair inquiries, contact the supplier from whom you purchased the product.  
Before returning the product, clean it thoroughly, then pack and ship it back.

If you notice any abnormality during operation, stop the pump immediately and inspect it to determine whether a malfunction has occurred. Refer to the section "Troubleshooting" for possible causes and corrective actions.

- ① If repair is required, contact the supplier from whom you purchased the product or our sales office.
- ② Before requesting repair service, read this instruction manual again carefully and inspect the product once more.
- ③ If on-site service is provided at a remote location, the travel expenses incurred will be charged to the customer.
- ④ When requesting repair service, provide the following information:
  - Model name and serial number
  - Period of use and operating conditions
  - Location and condition of the malfunction
  - Pumped liquid (liquid name, specific gravity, liquid temperature, and whether it contains slurry)

If the product is to be returned, thoroughly clean the inside of the pump before shipping it back, as any leakage of the pumped liquid during transportation may be extremely hazardous.

#### Installation record

Model:	
Purchase date:	Serial number:
Start of operation:	Place of purchase:

Ver.20251201



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