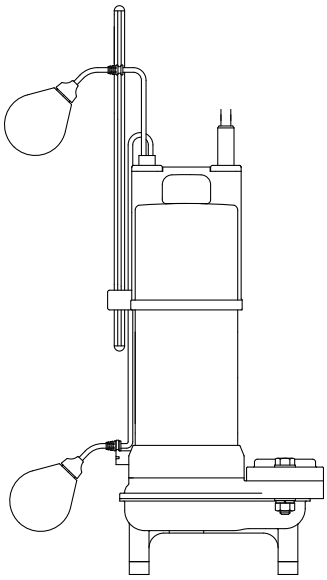
Uniting water with an abundant lifestyle ..... Kawamoto Pump

Reinforced resin submersible sewage pump

KAWA-PET®



WUO4 Type Instruction Manual

Thank you for purchasing the Kawamoto Submersible Sewage Pump.
Please make sure to read this manual and have a full understanding of the contents before starting use.
This manual provides precautions for preventing personal injuries or physical damage.
After reading, keep this instruction manual in a safe place for quick reference.

⚠ IMPORTANT SAFETY INSTRUCTIONS

1. This product must be disassembled, repaired or modified only by a qualified repair technician. Improper repairs could result in electric shock, fire, and water leakage.
2. When inspecting or replacing the product, always shut down the power before you start working. Failure to do so could result in earth leakage, electric shock, or injury.
3. Connect to the ground securely, and install a specialized earth leakage breaker at the power source side. Otherwise, earth leakage or fire may be caused.
4. Do not use this pump in places used by people (bathrooms, pools, lakes, etc.). Failure to do so could result in earth leakage and electric shock.
5. Carefully handle the resin sections while taking care not to hit them against objects. Failure to do so could result in electric shock or pump damage.
6. Do not suspend the pump with the power cable. Otherwise, the power cable may get broken, and electric shock or fire may be caused.

This manual provides precautions for using this product safely and for preventing personal injuries or physical damage.

The precautions are classified as “DANGER,” “WARNING,” and “CAUTION” to indicate the degree of possible injury or damage and urgency in case of improper handling.

All precautions are important matters related to safety and must be observed.

⚠ **DANGER** : Contents which if ignored could lead to imminent death or serious injury
⚠ **WARNING** : Contents which if ignored could lead to death or serious injury
⚠ **CAUTION** : Contents which if ignored could lead to personal injury or physical damage

[1] Introduction

Upon receiving the unit, check the following point immediately. If something wrong is found, promptly contact the dealer from whom the unit was purchased.

1. 1 Has the pump as ordered been delivered?
Check the model, bore, total head, frequency, power-supply voltage, rated power, etc.

1. 2 Are there any damage or any loosen bolts or nuts, etc. in transit?

1. 3 Are all accessories supplied?

Notes

1. Please make sure to read this manual and have a full understanding of the contents before starting use. This manual provides precautions for preventing personal injuries or physical damage.
2. The following cases may be out of the scope of warranty range: use outside of the application range, disobedience to caution and other messages, inappropriate repair and modification, problem occurred due to nature of God, problem occurred due to installation environment (abnormal power supply, foreign object, sand, etc.), conditions not complying laws, regulations, and equivalent rules, malfunction due to carelessness or by intention, problem due to replacement of consumables or due to resale.
3. When contacting us, please provide “model” and “manufacturing number” of your product.
4. For the disposal method of unnecessary parts and packing materials, check with laws, ordinances, or standards etc. based on the laws.

《 In case of problems, contact the place of purchase. 》

[2] Specifications

⚠ DANGER

- Always use this product within the specified specifications. Failure to do so could result in electric shock, fire, water leakage, etc.

⚠ CAUTION

- Pay extra attention if rusting, corrosion, or elution is not allowed depending on the purpose or the fluid quality. Select and consider including the pump and the whole equipment. Otherwise, unexpected damages may be caused.
- Select a product that is the most suitable for your application. Use for improper application may lead to an accident.
- The Danger, Warning, and Caution labels have contents that could endanger people’s lives or damage properties. Be sure to follow the instructions on the labels. Otherwise, the product may get broken, or electric shock, fire, injury, etc. may be caused.
- Do not use the product for fluids that are out of the range of specified fluid quality. Otherwise, the pump may get broken, and earth leakage, electric shock, and fire may be caused.
- For applications for living things (fish farm, fish preserve, and aquarium etc.) or for important facility, prepare the spare pump. Otherwise, malfunction of the pump will cause oxygen deficiency and water quality deterioration, causing risks to lives that are under influence of the pump.
- Do not install the pump in same water tank with the living things (fish farms, fish tanks, aquariums, etc.). Leakage of electrical current, leakage of fluid from the mechanical seal may cause death to the living things.
- For applications for transfer of food, check the use materials carefully. Failure to do so could result mixing of foreign objects.

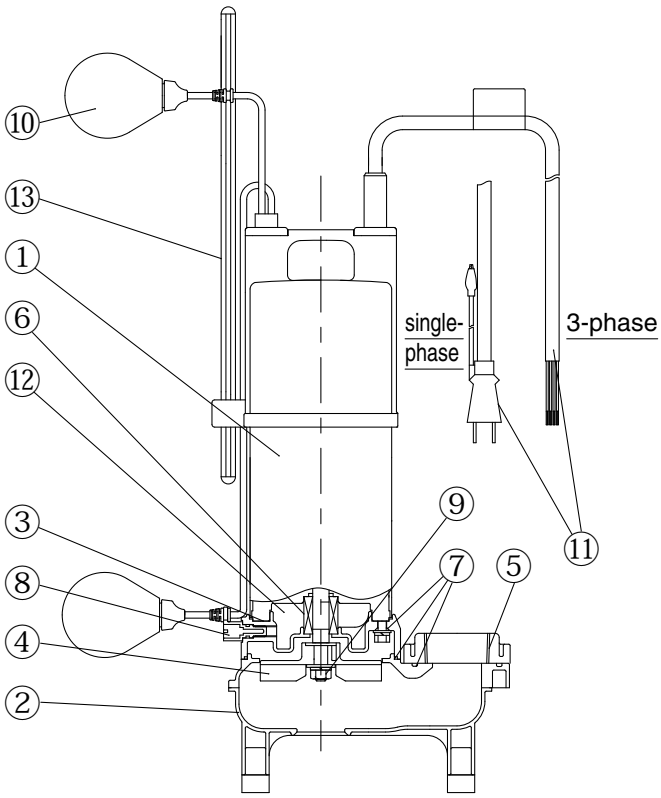
Liquid	Kind	Polluted water, sewage (pH5 to 9)
	Temperature	0 to 40°C
Solid object concentration, diameter		35mm sphere or less
Installation		Inside of sump pit or sewage tank
Installation conditions		Upright placement (Horizontal placement not possible)
Power voltage fluctuation		Within ±10% of rated voltage
Three-phase power supply interphase unbalance rate		3% or lower
Pump submerging depth		Within 5m

WUO4 Type : Non-automatic type
WUO4-L Type : Automatic operation type
WUO4-LN Type : Automatic alternate-parallel operation type (2 unit operation with WUO4-L type)

Note: This pump cannot be used for sea water and organic solvents.
Do not drive pump by inverter. Otherwise, it may malfunction.

[3] Construction of product

3. 1 Construction and parts list



This drawing shows the main type of WUO4-L type pump. The actual pump may differ slightly according to the models.

No.	Name
1	Motor
2	Casing
3	Casing cover
4	Impeller
5	Rhombic flange
6	Mechanical seal
7	O-ring
8	Special bolt
9	Nut
10	Float switch
11	Cable
12	Turbine oil
13	Rod

Note: Specifications, construction, etc. maybe changed prior notice.

3. 2 Standard Accessories

Name	Qty.
Nameplate(*)	1
Instruction Manual	1

(*): Attach at a highly visible place above ground.

[4] Installation and Piping

⚠ WARNING

- Keep the product away from fire such as a lit candle, lit cigarette, flames, or sparks. Otherwise, fire may be caused.
- When suspending the product for unloading, bring-in, or installation, check the weight on the catalog and installation drawing. Moreover, check the suspending method in the instruction manual for the proper operation. In addition, do not suspend a product that weighs more than the rated load of the suspending tool. If the suspending is not properly performed, the product may fall, and injury may be caused.
- Install the product surely by following the instruction manual. Inappropriate installation may cause earth leakage, electric shock, fire, injury by falling or over-tumbling. In addition, pump vibration may also be caused.
- Follow the applicable laws and regulations for the construction. Inappropriate construction not only fails to comply with regulations but also may cause electric shock, fire, injury by falling or over-tumbling.
- Do not use this pump in places used by people (bathrooms, pools, lakes, etc.). Failure to do so could result in electric shock due to earth leakage.
- If there is any possibility that internal pressure of the discharging pipe increases due to high temperature during summer time, install an appropriate depressurizing equipment (such as a safety valve). Due to pressure increase, the pipes and valves may get damaged, causing injury.
- Do not burn the resin and rubber parts at the site. Burning resin and rubber could result in emission of hazardous gases.
- Do not use the pump in an explosive environment. Otherwise, fire may be caused.

⚠ CAUTION

- Cut the cable attached to the pump (3-phase) to a suitable length and insulate it. If the cable is bundled, it may generate heat causing cable disconnection, water outage or fire.
- While unpacking, be careful with nails and staples. Failure to do so could result in injury.
- Carefully handle the resin sections while taking care not to hit them against objects. Failure to do so could result in electric shock or pump damage.
- Do not scratch, damage, forcibly bend, pull, twist, bundle, or pinch the power cable. Do not put a heavy object on the power cable. Otherwise, the cable breaks, and fire or electric shock may be caused.
- Do not give a shock or tumble the product. Otherwise, the product may get broken.
- Prepare the spare pump for unexpected breakdown of the pump. Water supply may be stopped, and the facility may get stopped.
- Depending on the facility, attach a filter appropriate to the discharge side and flush sufficiently and confirm there are no foreign objects before using the pump. There may be a risk of contaminating the treatment solution with cutting oil, rubber mold releasing agents and other foreign matter at the time of product manufacturing, or cutting oil included in other foreign matter or the piping system.
- Remove the companion flange from the pump and insert into the pipe. Otherwise, damage or water leakage may be caused.
- Do not put objects on the product or do not mount on the product. Otherwise, the product may get broken or a mounted person may get injured by tumbling.
- Apply sealing agent to the screws on the pipe to prevent water leakage. Failure to do so could result in water leakage.
- Tidy up the surrounding environment before starting the installation, inspection, or other operation. Failure to do so could result in injury by slipping and tumbling.
- Prevent air from accumulating in the pipes. Failure to do so could result in abnormal operation of the pump.
- Do not forcibly insert steel pipe into the resin flange. Otherwise, damage or water leak may be caused.
- Do not suspend the pump with the power cable. Otherwise, the power cable may get broken, and electric shock or fire may be caused.

4. 1 Before installation

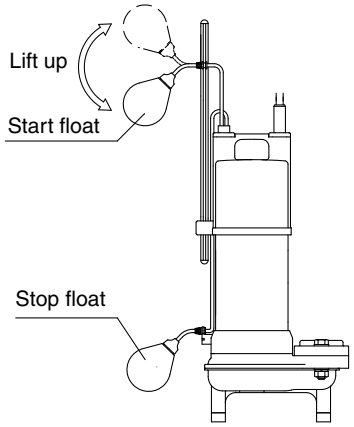
1. Measure the insulation resistance between the cable conductor (single-phase: power plug, 3-phase: U, V, W) and the grounding (E), and confirm that it is 20MΩ or more.
2. Refer to the following and confirm the operation of the float switch on automatically operated models.

   For the WUO4-L and -LN types, automatic operation is possible with the float switch and control circuit (built-in) when the power cable is connected to the power supply.
   For the WUO4-L type, independent automatic draining operation is possible.
   The WUO4-LN type can be used in combination with the -L type for automatic alternate discharge operation.

   Carry out the following procedures after connecting the power supply.
   Maintain each operation for two seconds or more. Otherwise, the confirmation of operation may not be carried out properly.
   Complete the confirmation of operation within one minute. When operation is continued for a long time with the motor frame part exposed to air, do not touch the motor frame part (metal section). It can be very hot and cause burns.

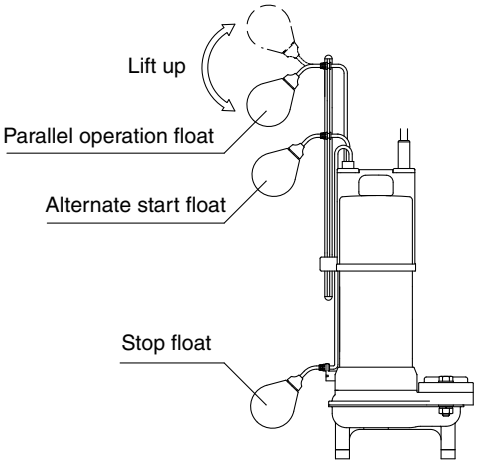
(1) WUO4-L type: Refer to the drawing on the right.

1. Set all float switches so that they face downward.
2. Lift up the float switches in the order of the stop float switch and start float switch. The pump will start.
3. Return the start float switch to its original position. And confirm that the pump operation continues.
4. Next, return the stop float switch to its original position. Then confirm that the pump stops.



(2) WUO4-LN type: Refer to the drawing on the right.

1. Set all float switches so that they face downward.
2. Lift up the float switches in the order of the stop float switch and alternate start float switch.
3. Return the alternate start float switch and stop float switch to their original positions.
4. Repeat steps 2 and 3 in order for three or more times. Confirm that once out of every two times, the pump starts when the alternate start float switch is lifted, and the pump stops when the stop float switch is returned to its original position.
5. Set all float switches so that they face downward again.
6. Lift up the float switches in the order of the stop float switch and parallel operation float switch. The pump will start.
7. Next, return the parallel operation float switch to its original position, and confirm that the pump operation continues.
8. Next, return the stop float switch to its original position, and confirm that the pump stops.

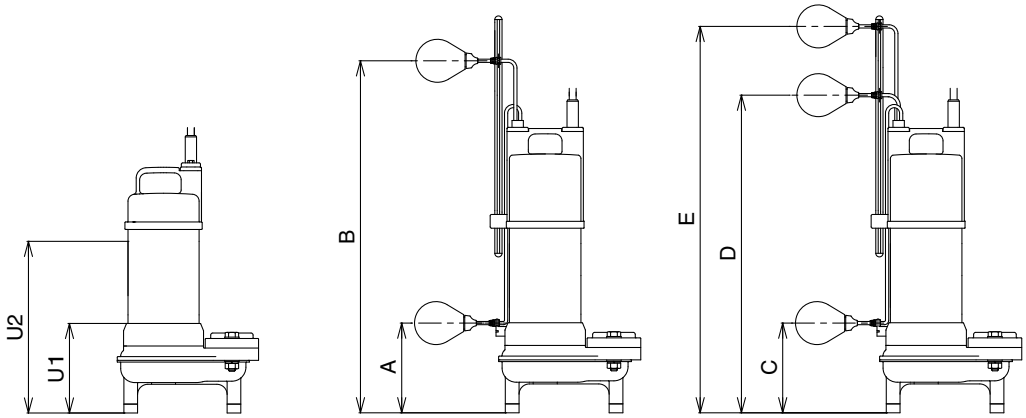


4. 2 Installation

1. Install the pump in a flat and sturdy place.
2. When carrying out alternate parallel operation with two pumps (WUO4-L + -LN), install the two pumps on the same surface.
3. Do not install the pump where it may be affected by the water that flows into the tank. Install the piping, power cable, and ropes to where they will not obstruct the operation of the pump or float switches, etc.
4. If the pump might be submerged in sediment, etc., install the pump higher than the floor level.
5. Support the power cable properly. If the slack cable is sucked, it may occur cable disconnection and cause electric shock.

6. The operation water level is as shown below.

<WUO4> <WUO4-L> <WUO4-LN>



U1：Minimum water level for operation (Operation at a water level lower than this could result in pumping failure or vibration, etc.)

U2：Minimum water level for continuous operation (Do not operate for 20 minutes or more at a water level lower than this. The protection switch could activate and cause the pump to stop.)

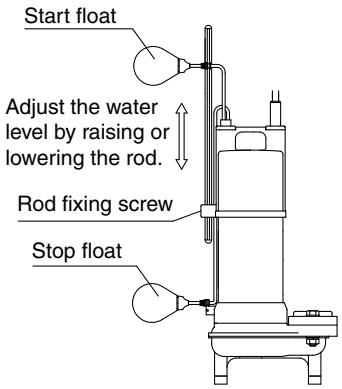
WUO4-L Type A: Stop water level B: Start water level

WUO4-LN Type C: Stop water level D: Start water level (alternate) E: Parallel operation water level

Type	WUO4		WUO4-L		WUO4-LN		
	U1	U2	A	B	C	D	E
WUO4-40-0.15S2	130	256	130	512	130	462	562
WUO4-40-0.25S2	130	256	130	512	130	462	562
WUO4-40-0.25T4	130	240	130	496	130	446	546
WUO4-50-0.4S2	135	270	135	500	135	450	550
WUO4-50-0.4T4	135	250	135	480	135	430	530
WUO4-50-0.75	135	270	135	500	135	450	550

4. 3 Start float switch adjustment

Use at the factory float switch position for normal use. When adjustments are necessary for water tanks, follow the instructions below.



(1) WUO4-L type: Independent automatic operation

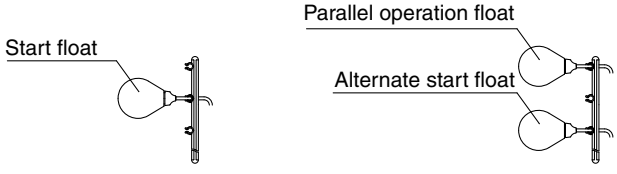
1. Adjust the start float switch position by loosening the rod screw.

* The height for the float switch is only a reference for water level operation. Be sure to confirm the water level during actual operation.

* When setting the start float lower than U2 (minimum water level for continuous operation), be sure to set continuous operation to within 20 minutes, and starting frequency to within 10 times / hour.

* Do not remove the float switch from the rod.

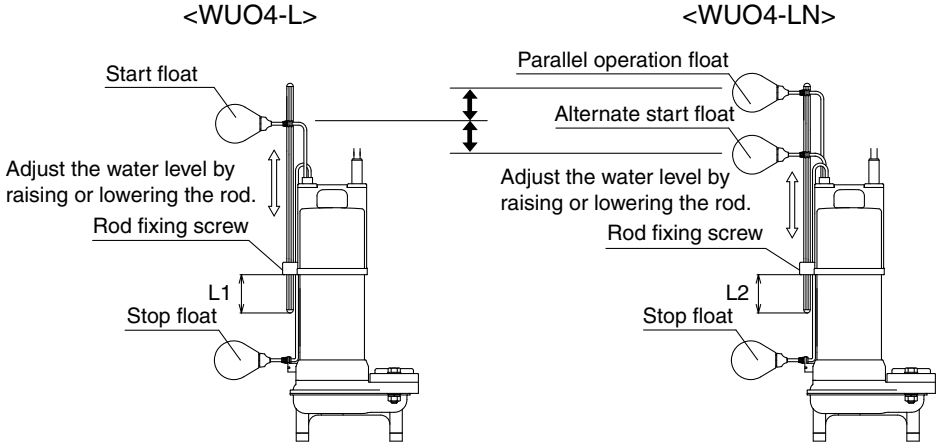
<WUO4-L> <WUO4-LN>



* The stop float switch cannot be adjusted.

(2) WUO 4-L + LN type: Automatic alternating operation

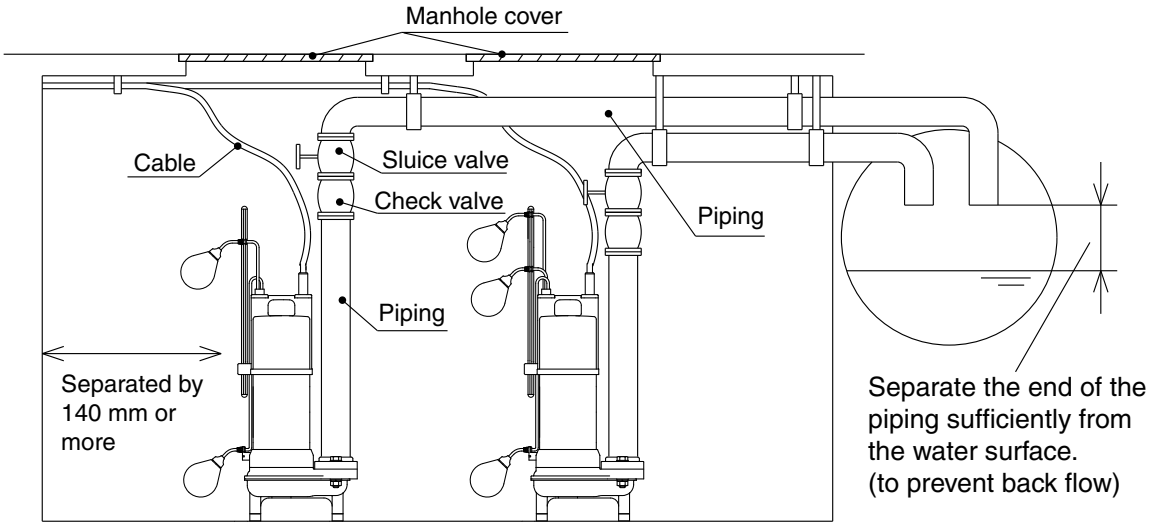
1. When adjusting the L type start float switch, LN type alternate start float switch and parallel operation float switch, loosen the rod screw and set the position.
2. Set L1 and L2 to the same length. By setting them to the same length, the position of the float switch will be adjusted to the position allowing automatic alternating operation. When not set to the same length, there is a possibility that automatic alternating operation will not be properly performed.



4. 4 Piping

1. Securely fix the piping and hoses.
2. Use the pipes for wastes (Kawamoto VCO Type or VCOA Type) when installation check valve.
3. Installation of a detachable device should be done according to the "Detachable device UJP type" instruction manual included with the detachable device.

＜Example of Installation and piping＞



Note: When using with the detachable type, install the sluice valve and check valve outside the tank. If they are installed in the tank, mounting the pump will not be possible.

[5] Electrical work

⚠ WARNING

- Electrical work must be performed by a professional engineer. Improper wiring and connection could result in malfunction, earth leakage, electric shock, and fire.
- Be sure to make the ground connection before starting any electrical operations. Operations without secure grounding could result in malfunction, earth leakage, electric shock, and fire. Moreover, do not connect a ground wire to the gas pipe, water pipe, lightning rod, ground wire for telephone, etc. Incomplete grounding work could result in electric shock.

- Install an earth leakage breaker for this product only. Otherwise, short circuit, electric shock, or fi re may be caused.
- Avoid connecting multiple electric devices to one outlet (octopus outlet) and construct wiring by using the special wiring. Otherwise, earth leakage, electric shock, or fire may be caused.
- Remove dust from the power plug, wire connecting part, junctions, and terminals. Accumulated dust may be heated up and causes fire.
- Before turning on the power, check that the wire connecting part and junctions are not loose or unconnected. Even one part loosened or disconnected could result in fire or electric shock.
- Insert the power plug completely and do not use damaged plugs. If the plug is inserted incompletely, electric shock or fire may be caused.

⚠ CAUTION

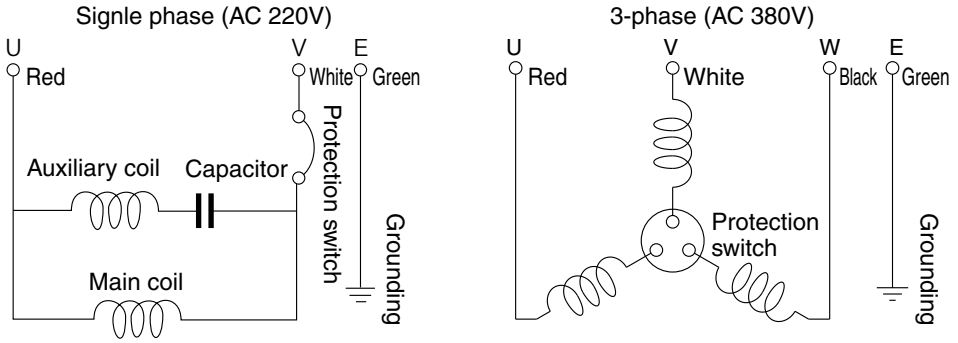
- Do not feed the power cable and control cable in one pipe or duct. Erroneous operation of the product or other equipment may be caused.
- If the outlet has to be prepared outside under unavoidable situation, use waterproof outlet. Failure to do so could result in earth leakage, electric shock, or fire.
- Do not scratch, damage, forcibly bend, pull, twist, bundle, or pinch the power cable. Do not put a heavy object on the power cable. Otherwise, the cable breaks, and fire or electric shock may be caused.
- Cut the cable attached to the pump to a suitable length and insulate it. If the cable is bundled, it may generate heat causing cable disconnection, water outage or fire.

5. 1 Use (Kawamoto ECD type) when using a control panel to operate pump.

5. 2 Refer to the control panel and float switch instruction manual for the connection methods when carrying out water level control operation using a control panel.
Do not use an electrode types as it could malfunction due to the sewage, etc.

5. 3 Do not extend the cables. If a long cable is required, contact the place of purchase.

5. 4 WUO4 motor circuit diagram.



[6] Operation

⚠ WARNING

- When connecting or disconnecting the wiring, always shut down the power before you start operating. Failure to do so could result in electric shock.
- After the power is turned on or while the power is on, do not touch the charging part of the control panel, motor terminals, and cable ends. Otherwise, earth leakage, electric shock, or fire may be caused.
- In case of the power outage, turn off the power switch. Otherwise, the product and the facility may get damaged, or the pump may suddenly start moving and cause injury at the time of power recovery.
- Do not put hands or feet near the suction port during operation. Suction into the port may cause injury.
- Do not splash water on the control panel. Otherwise, electric shock, short circuit, or fire may be caused.

- Do not disassemble or inspect the pump while protection switch (motor burnout prevention device) is working. Since the pump is still being supplied with power, it may restart operations without warning and cause electric shock or injury.
- Do not use under conditions of prolonged continuous operations or intensive repetition of starting operations. There is a risk of leakage from the mechanical seal or malfunction of the pump.
- After the power is turned on, do not touch the power supply or operation switches with wet hands. Otherwise, electric shock or injury may be caused.

⚠ CAUTION

- Do not use this product in a range outside the rated voltage. Failure to do so could result in fire or electric shock.
- Check that the rotating direction is right. If rotated in the wrong direction, impeller nuts or bolts may get loose and cause an accident.
- Do not touch rotating parts or insert fingers or objects in the opening during operation. Failure to do so could result in electric shock, damage, or personal injury.
- Shut off the power when not using the product for a long time. Failure to do so could result in earth leakage, electric shock, or fire from insulation deterioration.
- Do not idle or perform shut off operation of a certain period of time. In addition, do not allow mixing of air into the handling fluid. Otherwise, casing, bearing, shaft seal may get damaged, or pumping becomes unavailable. In addition, the pump may get overheated, causing a burn.
- Do not operate a 50Hz-specified pump in 60Hz. Otherwise, a breakage due to an excessive pressure or motor burnout due to overload may be caused.
  Do not operate a 60Hz-specified pump in 50Hz. The pump performance may be degraded.
- Use valves in the designated condition. Otherwise, the product cannot be operated properly, causing damages in the units.
- At startup of the operation after longtime storage or a recess, perform a trial operation by following the “installation” and “operation” procedures in a specified order. There are possibilities of pump constraint by seizure, motor burnout, or idling by water drainage.
- At the time of trial operation, remove air in the product and pipes thoroughly. Failure to do so may cause air lock of the pump, temperature increase, causing breakdown or accident.
- Confirm that there is sufficient turbine oil in the mechanical seal chamber. Running the pump with a low oil level could greatly shorten the life of the mechanical seal.
- If the outlet has to be prepared outside under unavoidable situation, use water-proof outlet. Failure to do so could result in earth leakage or electric shock.
- Do not touch the pump, motor, and so on during or immediately after operation. These parts can be very hot and cause burns.
- Operate the equipment within the specification range. Failure to do so may cause equipment damage or accident.

6. 1 Before Operation

1. Verify that the earth leakage breaker capacity, the power supply voltage, and the wiring are correct.
2. Submerge the motor in water higher than the minimum water level for continuous operation (refer to section 4-2). If the water level is lower, the protection switch (motor burning prevention device) could activate. For the WUO4-L and -LN types, submerge the motor in water higher than the starting water level (refer to section 4-2). The pump will not start if the water level is lower than the starting water level.

6. 2 Trial operation

1. Turn the power ON and check the pump rotation direction. When the pump starts, if there is a reaction in the direction of the arrow attached to the top the pump is rotating in the forward direction. If the pump rotates in the reverse direction, the discharge rate could drop and the current could increase.
   In this case, turn the power OFF and interchange two of the three power cables.
   The pump rotation direction check is not necessary for single-phase pumps.
2. Confirm that water is discharged from the piping and hoses, etc., with force. Confirm that there are no abnormalities with the pressure, current, operational sound or vibration, etc.

6. 3 Operation

1. If the pump is operated for a long time at a water level lower than the minimum water level for continuous operation with the motor exposed in the air, the motor frame (metal section) will be hot, so do not touch it with hands, etc. Failure to do so could result in burning.
2. Operate the pump within ten times / hour.
   Operation at a high frequency could result in deterioration of the motor insulation and damage to the electrical parts, etc.
   The pump is often operated a high frequency especially when used in a small pit, so always check the operation frequency.

[7] Inspection and Maintenance

⚠ WARNING

- If the product stops working or if any abnormality is sensed (i.e., broken cable or burning smell), stop operation immediately and shut down the power. Then contact the place of purchase for inspection or repairs. If the product is continuously operated in an abnormal condition or the repair is inappropriate, earth leakage, electric shock, fire, and/or water leakage may be caused.
- This product must be disassembled, repaired or modified only by a qualified repair technician. Improper repairs could result in malfunction, damage, electric shock, and fire.
- When inspecting or replacing the product, always shut down the power before you start working. Failure to do so could result in earth leakage, electric shock, or injury.
- When moving and reinstalling the product, consult the place of purchase. If the product is improperly installed, earth leakage, electric shock, fire, or water leakage may be caused.
- If the motor insulation resistance is decreased to 1MΩ or lower, immediately contact the place of purchase. Otherwise, the motor may get burnt out, or electric shock or fire may be caused.
- When repairing the product, use our genuine parts. If any part other than the genuine parts is used, malfunction or accidents may be caused. In addition, the product could not be used with its optimal condition.
- Before inspecting or replacing electrical parts such as the control panel, turn off the power supply, and then confirm there is no electrical voltage with a tester, etc. There is a danger of electric shock or injury.
- Do not disassemble or inspect the protection switch (motor burnout prevention device) when in operation. Since the pump is still being supplied with power, it may restart operations without warning and cause electric shock or injury.
- After the power is turned on, do not touch the power supply or operation switches with wet hands. Otherwise, electric shock or injury may be caused.

⚠ CAUTION

- Before starting disassembly or inspection, check that the internal pressure is zero. Failure to do so could result in spouting of water causing accident and injury.
- At startup of the operation after long-time storage or a recess, perform a trial operation by following the “installation” and “operation” procedures in a specified order. There are possibilities of pump constraint by seizure, motor burnout, or idling by water drainage.
- To use the product safely for a long time, conduction of both periodical and daily inspections are recommended. Failure to do so may cause malfunction of pump and accident. For the periodical inspection, consult the place of purchase.
- Periodically check the performance of protective relay. The product does not operate properly at the time of accident, causing electric shock or malfunction.
- Replace the consumables periodically. When the consumables are continuously used in deteriorated and worn-out condition, accidents such as water leak, seizure, and malfunction may be caused. For the periodical inspection and replacement of parts, consult the place of purchase.
- When the pressure gauge or the compound gauge is used, keep the cock closed while the gauge is not used for measurement. If the cock is kept opened all the time, the pressure gauge or the compound gauge may get broken.
- Be sure to perform the inspection by following the inspection items. Otherwise, generation of malfunction cannot be prevented in advance, causing accidents.

7.1 Daily inspection

Check point		Acceptance criteria
Motor	Insulation resistance	Insulated resistance is 1MΩ or more
	Ball-bearing	Operation noise & vibration should be unchanged from initial condition.
Current		Nameplate rated current value or less
Voltage		Within ±10% of rated voltage

1. When the motor insulation resistance is less than 1MΩ, repair or replace the motor.
2. Daily inspections are essential for detecting problems quickly. It is therefore recommended to keep a daily operation log.

7. 2 Perform the inspection every 3,000 operation hours, or every 6 months.

Check point	Acceptance criteria
Mechanical seal	No clouding or darkening in turbine oil and no penetration of pumping water
Turbine oil	

7. 3 Replacing consumables

The following parts are consumables. Replace the parts by referring to the replacement schedule guideline.

Check point	Replacement schedule	Condition as a guide for replacement
O-ring	At every disassembly or inspection	–
Mechanical seal	2 years	When the turbine oil is clouded or pumping water is penetrating
Ball-bearing	3 years	When the bearing becomes hot, or when abnormal noise or vibration is generated
Turbine oil	–	When the turbine oil is clouded or pumping water is penetrating

Output (kW)	Turbine oil amount (L)
0.15, 0.25	0.08
0.4, 0.75	0.14

* If lubricated more than specified, the life of the mechanical seal will be greatly shortened because of internal pressure increase in the mechanical seal chamber.

[8] Troubleshooting

⚠ WARNING

- If the product stops working or if any abnormality is sensed (i.e., broken cable or burning smell), stop operation immediately and shut down the power. Then contact the place of purchase for inspection or repairs. If the product is continuously operated in an abnormal condition or the repair is inappropriate, earth leakage, electric shock, fire, and/or water leakage may be caused.
- When inspecting or replacing the product, always shut down the power before you start working. Failure to do so could result in earth leakage, electric shock, or injury.
- This product must be disassembled, repaired or modified only by a qualified repair technician. Improper repairs could result in malfunction, damage, electric shock, and fire.

8. 1 Protection switch（motor burning prevention device）

This pump has a built-in switch, so the pump may stop in the following cases to prevent the motor from burning.

- ・When the voltage fluctuates greatly (±10% or higher)
- ・When the frequency fluctuates greatly (±1% or higher)
- ・When operated continuously at a water level lower than the minimum water level for continuous operation
- ・When open-phase operation or constrained operation is carried out

The protection switch is automatically reset after a set time, and the pump will start operating, so always shut the power OFF before carrying out inspections.

8. 2 Troubleshooting

Problem	Cause	Countermeasure	Manual page No.
Pump does not run	The power plug is disconnected. (single phase)	Insert the power plug into the socket.	
	The earth leakage breaker has tripped.	Reset the earth leakage breaker.	
	The protection switch has activated.	Refer to “8.1 Protection switch”.	
	Operation of the float is obstructed.	Remove the obstruction, and check the float operation.	5
Pump operates, but no water is discharged. Prescribed discharge amount / pressure is not obtained.	Sluice valve is closed.	Open the sluice valve.	
	The suction opening is clogged.	Remove any foreign matter.	
	Air is trapped in the pump.	Stop the pump once and then restart.	
	The pump rotation direction is reversed (3-phase).	Correct the connection.	8, 9
Overload (over-current) occurs	The pump rotation direction is reversed (3-phase).	Correct the connection.	8, 9
	Foreign matter is stuck in the pump.	Contact your dealer for inspection and repairs.	
Pump vibrates	The piping is not securely fixed.	Securely fix the piping.	7
	Foreign matter is stuck in the pump.	Contact your dealer for inspection and repairs.	
	The motor's ball-bearings are worn.	Contact your dealer for inspection and repairs.	
Pump does not automatically operate	Operation of the float is obstructed.	Remove the obstruction, and check the float operation.	5
	The float switch is faulty.	Contact your dealer for inspection and repairs.	
	The control section built into the pump or the control panel is faulty.	Contact your dealer for inspection and repairs.	

There may be unexpected cause of the troubles, so when any abnormality is found, it is important to take measures immediately. If the cause of the fault is unclear, always contact your dealer.
Notify the pump type, serial No, and fault (abnormality) state when contacting your dealer.

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