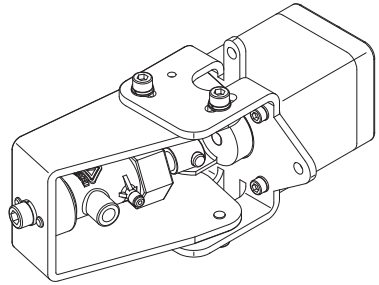
IWAKI

Iwaki Hicera Pump

V-07AF_66-P (built-in type)



Instruction manual

Thank you for choosing our product.

⚠ Please read through this instruction manual before use.

This instruction manual describes important precautions and instructions for the product. Always keep it on hand for quick reference.

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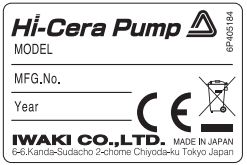
Contents

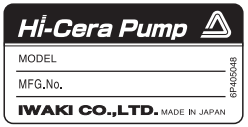
Order confirmation **2**
Safety Instructions **2**
WARNING **2**
CAUTION **3**
Precautions for Use **4**
Overview **4**
Part Names **5**
Identification Codes **5**
Installation **6**
Pump Mounting **6**
Plumbing **7**
Before plumbing 7
Tube connection 7
Wiring **7**
Lead wires 7
Motor 7
Motor specification 7
Wiring 7
Motor connector specification 8
Sensor 8
Motor rotation detection 8
Wiring diagram 8
Sensor connector specification 8
Operation **8**
Starting the pump 8
Stoppage 9
Preventative measures against seizing 9
Speed of acceleration 9
Inching 10
Restart at the time of motor step-out 10
Maintenance **10**
Troubleshooting **10**
Inspection **11**
Daily inspection 11
Wear Part Replacement **12**
Wear part list 12
Pump head 12
Disassembly & Assembly 12
Before service is performed 12
Disassembly 13
Assembly 13
Specifications/Outer Dimensions **14**
Specifications 14
Pump unit 14
Stepping motor 14
Hall IC 14
Outer dimensions 15
EC DECLARATION OF CONFORMITY **15**

Order Confirmation

a. Check the nameplate to see if the information such as model codes is as ordered.



Spec label for the European market



Other markets

b. Check for transit damage and loose bolts.

*The CE marking on our product(s) is for us to market the product(s) into the European market, however, the CE marking does not ensure any safety or conformity of the product(s) outside the European market. When the pump is incorporated into the equipment marketed in the European market, such equipment must meet all the requirements of applicable directives.
In such a case, any person who places the equipment on the market must carry a CE mark on the equipment as a manufacturer.

Safety Instructions

Read through this section before use. This section describes important information for you to prevent personal injury or property damage.

■ Symbols

⚠WARNING	Indicates mishandling could lead to a fatal or serious accident.
⚠CAUTION	Indicates mishandling could lead to personal injury or property damage.

⚠Export Restrictions

Technical information contained in this instruction manual might be treated as controlled technology in your countries, due to agreements in international regime for export control.

Please be reminded that export license/permission could be required when this manual is provided, due to export control regulations of your country.

⚠WARNING

Turn off power before service
Risk of electrical shock. Be sure to turn off power to stop the pump and related devices before service is performed. Prevent others from restoring power during service.


Turn Off Power

Stop operation
If you notice any abnormal or dangerous conditions, suspend operation immediately and inspect/solve problems.



Do not use the pump in any condition other than its intended purpose
The use of the pump in any conditions other than those clearly specified may result in failure or injury. Use this product in specified conditions only.


Prohibited

Do not modify the pump
Alterations to the pump carry a high degree of risk. It is not the manufacturer's responsibility for any failure or injury resulting from alterations to the pump.


Do not rework or alter

Wear protective clothing
Always wear protective clothing such as an eye protection, chemical resistant gloves, a mask and a face shield during disassembly, assembly or maintenance work. The specific solution will dictate the degree of protection. Refer to SDS precautions from the solution supplier.


Wear protectors

Do not damage the power cable
Do not pull, knot, or crush the power cable. Damage to the power cable could lead to a fire or electrical shock if cut or broken.


Caution

⚠CAUTION

Qualified personnel only
The pump should be handled or operated by qualified personnel with a full understanding of the pump. Any person not familiar with the product should not take part in the operation or maintenance of the pump.



Use specified power only
Do not apply power other than that specified on the nameplate. Otherwise, failure, fire or electrical shock may result. Ensure the pump is properly grounded.



Do not run pump dry
Do not run the pump dry for more than 3 minutes (even during degassing). Otherwise, frictional heat may build up and cause the plunger to seize in the cylinder. Optimize your system to eliminate any possibility of dry running.


Caution

Do not close the suction or discharge line during operation
Operating the pump with a closed suction or discharge line can cause abnormal pressure buildup, resulting in damage to the pump, piping, and system components.


Prohibited

Keep electric parts and wiring dry
Risk of fire or electric shock. Install the pump where it can be kept dry.


Prohibited

Ventilation
Fumes or vapours can be hazardous with certain solutions. Ensure proper ventilation at the operation site.


Caution

Do not install/store the pump:
• In a flammable atmosphere. • In a dusty/humid environment.
• Where ambient temperature can exceed 0-40ºC.
• In direct sunlight or wind & rain.


Prohibited

Electromagnetic precautions
This product is not protected against electromagnetic fields. Take appropriate measures as necessary.



Spill precautions
Ensure protection and containment of solution in the event of plumbing or pump damage (secondary containment).



Do not use the pump in a wet location
The pump is not waterproof. Use of the pump in wet or extremely humid locations could lead to electric shock or short circuit.


Prohibited

Install a GFCI (earth leakage breaker)
An electrical failure of the pump may adversely affect other devices on the same line. Purchase and install a GFCI (earth leakage breaker) separately.


Electrical shock

Preventative maintenance
Follow instructions in this manual for replacement of wear parts. Do not disassemble the pump beyond the extent of the instructions.



Do not use a damaged pump
Use of a damaged pump could lead to an electric shock or death.


Prohibited

Disposal of a used pump
Dispose of any used or damaged pump in accordance with local rules and regulations. If necessary, consult a licensed industrial waste disposal company.



Install a relief valve
If the discharge line's pressure rating cannot withstand the maximum possible pressure, install a relief valve to depressurize the line. The relief valve set pressure must not exceed the discharge line's maximum allowable pressure.



Do not touch the pump or pipe with bare hands
Risk of burns. The surface temperature of the pump or piping becomes very high during and immediately after operation.


Caution

Precautions for Use

- Anchor the pump with four M4 bolts so it doesn't vibrate. Mount vibration isolators to each pump foot as necessary.
- When two or more pumps are installed together, vibration may be significant, resulting in poor performance or failure. Select a solid foundation (concrete) and fasten anchor bolts securely to prevent vibration during operation.
- Allow sufficient space around the pump for easy access and maintenance.
- Install the pump as close to the supply tank as possible.
- Observe the maximum suction lift of 1 meter (with clean water). Note it varies with liquid characteristics.
- Delivery of viscous liquid is not allowed.
- Delivery of slurry is not allowed, or the pump may break in a short period of time.
- For the operation with adhesive liquid, take the following measures for the prevention of a stuck plunger:
  a. In operation, flush out the pump head with clean water or cleaning liquid via the cleaning ports.
  b. After operation, disassemble the pump head and clean with the water or the liquid. Use of tap water for flushing is not allowed.
- Use care handling the pump. Do not drop. An impact may affect pump performance. Do not use a pump that has been damaged to avoid the risk of electrical damage or shock.
- Observe the allowable liquid temperature range of 0-60ºC.
- Commissioning is required in order to expel air from tubing.
- Solution in the discharge line may be under pressure. Release the pressure from the discharge line before disconnecting plumbing or disassembly of the pump to avoid solution spray.
- Wear protective clothing when handling or working with pumps. Consult solution SDS for appropriate precautions. Do not come into contact with residual solution.
- Do not allow foreign matters to enter the pump. Clogging may cause the plunger to be locked or damaged, hindering a liquid circulation.
- Do not clean the pump or nameplate with a solvent such as benzine or thinner. This may discolour the pump or erase printing. Use a dry or damp cloth or a neutral detergent.
- Always stop the pump with the plunger extended to the full, so the cylinder will not retain liquid in it.
- A small amount of fluid can flow back to the suction line right when the plunger stops rotating in the cylinder. To prevent the back flow, keep the discharge and suction line pressure to the same level or use a solenoid/check valve.
- Do not change the pump head angle from the default position.
- A slight amount of leakage may occur from the plunger lip sealing depending on liquid characteristics. Take measures to protect the motor or any other peripheral devices from getting wet with a possible leak. For the preventive mounting direction of the pump, see page 6.



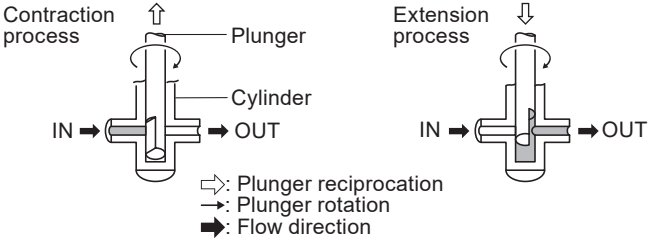
In accordance with the European Directive 2012/19/EU on waste electrical and electronic equipment (WEEE), this product features the crossed-out wheelie bin symbol. When this product is disposed of in household wastes, toxic components included in it can cause major environmental and human health problems. Use appropriate waste collection systems for recovery and recycling. Contact your local distributor or nearest Iwaki company for the detailed collection systems.

Overview

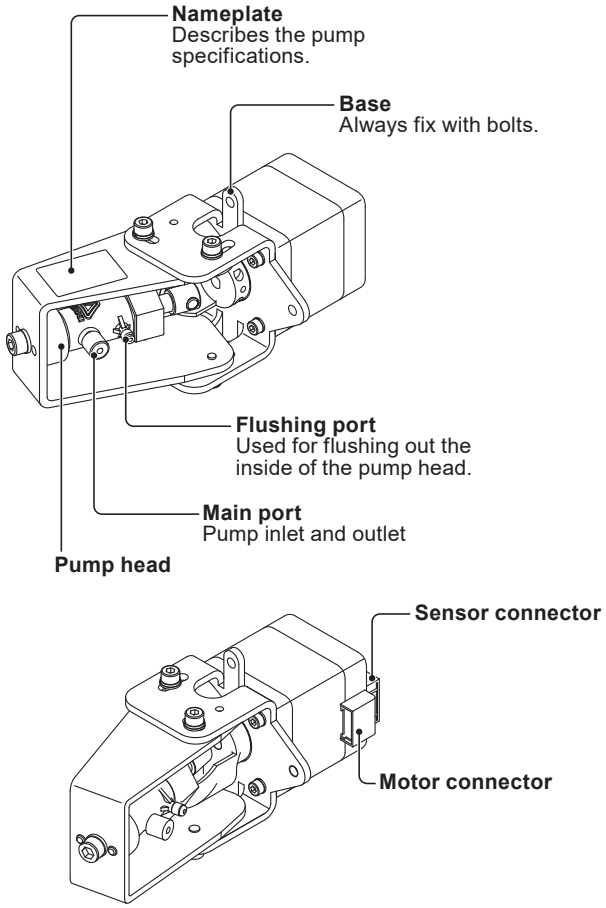
The Hicera pump is a metering pump with fine ceramic wet ends such as a plunger, a cylinder and other related parts.
The plunger reciprocates and rotates in the cylinder where liquid is taken in from a suction line and then delivered to a discharge line.

Principle of operation

In the suction process, the rotating plunger contracts to take in liquid into the cylinder from a suction line as the duct on the plunger passes the inlet. In the discharge process, the rotating plunger extends to let out liquid from the cylinder to a discharge line as the duct on the plunger passes the outlet.



Part Names



Identification Codes

The model codes represent the following information.

V - 07 A F P 6 6 - P 01
a b c d e f g h i

a. Series name
V: Hicera pump

b. Plunger diameter
07: ø7 mm

c. Plunger/Cylinder
A: Al_2O_3/Al_2O_3

d. Wet end materials
F: PVDF

e. Flushing port
P: Pumps with flushing ports
No code: No flushing ports

f. Joint
6: 1/4-28UNF

g. Motor power voltage
6: 24VDC

h. Motor specification
P: Stepping motor

i. Discharge capacity per shot
01: 0.1mL/shot
02: 0.2mL/shot
03: 0.3mL/shot

Installation

Installation of the pump, tubing and wiring are described in this section.

Observe the following points

- Risk of electrical shock. Be sure to turn off power to stop the pump and related devices before service is performed.
- If you notice any abnormal or dangerous conditions, suspend operation immediately and inspect/solve problems.
- Do not use a damaged pump. Use of a damaged pump could lead to an electric shock or death.
- This dedicated pump is designed for built-in application only. Its rotating parts are not protected. Provide a safety protection to your host machine as necessary.

Pump Mounting

Necessary tools

- Four M4 bolts (pump mounting)
- Adjustable wrench or spanner

1 **Select a suitable place.**

Select the best installation location. See the caution section as well. Also, install the pump as close to the supply tank as possible.

NOTE

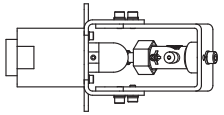
Observe the maximum suction lift of 1 meter (with clean water). Note it varies with liquid characteristics.

2 **Select a mounting direction.**

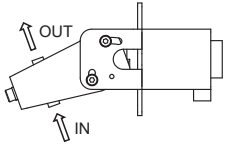
NOTE

Mounting directions are limited. Any direction other than the following examples may cause performance reduction or failure.

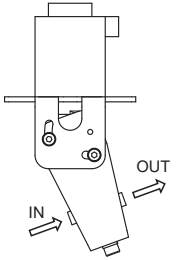
a. Laid in a horizontal position on its side. There is no limitation on the inlet and outlet directions.



b. Laid in a horizontal position on its back. The inlet must be directed downwards to take in and deliver liquid upwards.



c. Laid in a vertical position on its head. The inlet must be directed downwards to take in and deliver liquid upwards.



3 **Anchor the pump with the M4 bolts.**

Be sure to fix the pump at four points.

NOTE

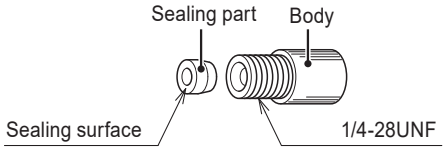
Install vibration isolators to each pump foot as necessary.

Plumbing

Before plumbing

The following parts are needed for tube connection to the pump inlet/outlet. Purchase separately.

Flat bottom fitting (general)



Tube connection

Observe the following points for plumbing.

- Have tubing length shortest with the minimum number of bends in order to reduce pipe resistance.
- The pump inlet and outlet should be completely sealed for the prevention of air ingress into a flow line. An imperfect suction line connection especially entrains air and reduces performance.
- The main port and the flat bottom fitting are integrated into a face seal coupling when combined properly. Do not use thread seal tape to the 1/4-28UNF thread which may adversely affect the face sealing.
- Select proper tube sizes for the flat bottom fitting which is purchased separately and the flushing ports. A tube should be pressure-/corrosion-resistant to specified operating conditions.
- Use a band to secure tubes to the flushing ports so that it will not come off under pressure or by an external force.
- Install a shutoff valve in a suction line when the pump is installed in a flooded suction system.
- The ECTFE main and flushing ports may break. Do not use excessive force.

Wiring

A driver and PLC/controller are necessary for pump operation. Purchase separately.

Observe the following points

- Electrical work should be performed by a qualified electrician. Always observe applicable codes or regulations.
- Do not perform wiring work while electric power is ON. Otherwise, an electrical shock or a short circuit may result. Be sure to turn off the power before wiring work.

Lead wires

Use two UL1007 AWG #24 lead wires. One is for motor wiring and the other is for sensor wiring.

Motor

This pump is equipped with a 2-phase bipolar stepper motor. Select and electrically connect a suitable driver according to the motor specification below.

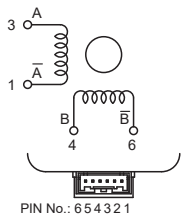
■ Motor specification

Driving method	Two bipolar constant current drive
Power voltage range	24VDC±10%
Motor current	0.69A/phase (0-PEAK)
Rated microstep	1/8
Rated pull-out torque	150mN•m or more (at 300rpm)

NOTE

Keep the motor surface temperature at 80ºC or below. Or the stepper motor may break or the service life may be shorten.

■ Wiring



STEP \ PIN No. Ph.	3 (A)	4 (B)	1 (Ā)	6 (B̄)
1	+	+	–	–
2	–	+	+	–
3	–	–	+	+
4	+	–	–	+

■ **Motor connector specification**

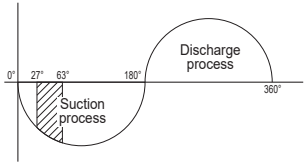
	Motor	User PLC/Controller
Maker	J.S.T. Mfg. Co.,Ltd.	J.S.T. Mfg. Co.,Ltd.
Housing	B06B-PASK	PAP-06V-S
Contact (post)	-	SPHD-001T-P0.5

Sensor

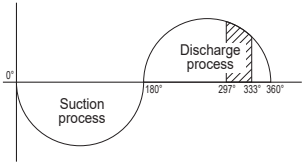
■ **Motor rotation detection**

The rotation detector monitors motor rotation and transmits a signal for about 9º in the detection range below.

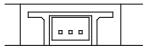
Detection range with operation in a clockwise rotation (seen from the pump head side) : 27-63º



Detection range with operation in a counter clockwise rotation (seen from the pump head side) : 297-333º



■ **Wiring diagram**



PIN No.
3 2 1

PIN No.	SIGNAL
1	GND
2	OUT
3	Vcc

■ **Sensor connector specification**

	Sensor	User PLC/Controller
Maker	J.S.T. Mfg. Co.,Ltd.	J.S.T. Mfg. Co.,Ltd.
Housing	S3B-PH-SM4-TB	PHR-3
Contact (post)	-	SPH-002T-P0.5S

Operation

Observe the following points

Do not run pump dry or run it with a discharge valve or a suction valve closed for more than 3 minutes.

Starting the pump

1 **Check if plumbing and wiring are done correctly.**

2 **Check the spec label to see if the power supply voltage is correct.**

3 **Fully open both suction and discharge valves.**

4 **Set the speed of acceleration.**

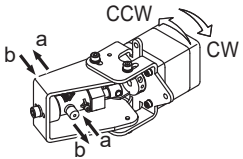
See page 9 for detail.

5 **Prime and run the pump for testing.**

Check if a flow direction is correct.

*In a clockwise rotation (seen from the pump head), liquid flows in the direction of “a”.

*In a counter clockwise rotation (seen from the pump head), liquid flows in the direction of “b”.



6 **Check liquid flows without a hitch.**
If you notice any abnormality, turn off power and investigate/solve root causes. Refer to the troubleshooting section.

7 **Make sure air has been completely expelled from the pump and a tubing system.**
If not, an accurate flow can not be obtained.

8 **Adjust the number of pulse signals to meet a target flow rate.**
Discharge capacity per minute is determined by the formula of:

Liquid volume per shot (mL/shot) × pump rotation speed (rpm).

NOTE
- The enclosure of your equipment in which the pump is built may resonate with a pump operating noise in some rpm range.
- A slight leak may occur in operation from the plunger depending on individual difference. The leak is allowed as long as the pump meets the specified performance.

Stoppage

1 **Flush out the pump head with clean water via the main and the flushing ports (CIP) every time a sticky or settling liquid is delivered.**
Take apart and then clean the pump head manually (COP) as needed.

2 **Before a long period (one week or more) of stoppage, take apart and clean the pump head (COP).**

Preventative measures against seizing

Determine the speed acceleration time and perform inching to keep the optimal pump performance.

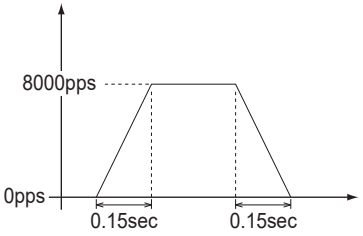
■ Speed of acceleration

In order to eliminate the possibility of step-out, always start or stop the motor in a start/stop region (400 pps or below).
Note the start/stop region (where the stepping motor can start or stop safely without stepping out) reduces as starting torque (current setting of the motor) gets lower, and motor acceleration to above that region with no acceleration time may often trigger motor step-out.
When a stepping motor driver is set to 1/8 microstep and 0.69A/phase (0-PEAK) and a specified rate is 8000 pps, for example, start the motor at 800 pps or below and take at least 0.15 sec for acceleration to 8000 pps.
Note the acceleration time required may change with operating conditions such as pipe resistance and other factors. Determine an optimal acceleration time according to your system.

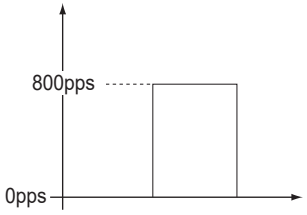
Recommendable setting (operation above 800 pps)

# of pulses at start (start/stop region): 800 pps (/30 rpm) or below
Speed of acceleration to 8000 pps: 0.15 sec or more

Uniformly accelerated motion:
Acceleration to above 800 pps

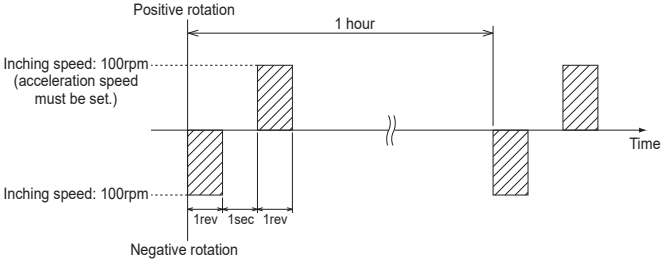


Rectangular motion:
Acceleration to below 800 pps



■ **Inching**

Delivery of some liquid, which forms precipitate such as silica in between the cylinder and the plunger, may adversely affect the plunger motion. Rotate the motor one revolution in negative and then positive rotation (inching) per hour while your system is left stopped. Inching will keep a plunger wet in the cylinder and will prevent plunger lock. Be sure to set the optimal acceleration time. See page 9, the "Speed of acceleration" section, for detail.



■ **Restart at the time of motor step-out**

In case the stepping motor has stepped out, stop sending the pulse signal once and then just restart the motor in the start/stop region.

NOTE

If the plunger has stuck in the cylinder, disassemble and clean the inside of the pump head. See page 13 for detail.

Maintenance

Troubleshooting, inspection, wear part replacement, exploded views and specifications are described in this section.

Important

Follow instructions in this manual for replacement of wear parts. Do not disassemble the pump beyond the extent of the instructions.

Troubleshooting

First check the following points. If the following measures do not help remove problems, contact us or your nearest distributor.

States	Possible causes	Solutions
The pump does not start to run.	Power is not supplied.	• Supply power.
	Wrong wiring or disconnection	• Correct wiring.
	Plunger lock due to crystallization*	• Take apart the pump head and clean wet ends.
	High specific gravity or high viscosity	• Use an applicable pump model.
	Clogging due to foreign matters	• Remove foreign matters. Replace parts if damaged.
	Faulty driver	• Replace as necessary.
The pump does not deliver liquid during operation.	A suction or a discharge line is closed during operation.	• Open both the suction and discharge lines.
	A suction line is crushed.	• Replace as necessary.
	A supply tank is empty.	• Replenish the supply tank.
	The motor is rotating the other way around.	• Correct the rotational direction with a user controller.
	Wrong tubing or poor connection	• Check and fix tubing.

The flow rate is too small.	Air ingress through a tube joint	• Keep tube joints air-tight.
	Development of cavitation	• Build up a flooded suction system. • Reduce a motor rpm, liquid temperature, and tubing resistance.
	Pump rotation speed is too low.	• Increase a rotation speed.
	A lip seal is crushed or not there.	• Replace as necessary.
	A suction line is crushed.	• Replace as necessary.
Significant vibration or noise.	Clogging due to foreign matters	• Remove foreign matters. Replace parts if damaged.
	Discharge pressure is too high.	• Reduce discharge pressure.
	A suction or a discharge line is closed during operation.	• Open both the suction and discharge lines.
	Air ingress through a tube joint	• Keep tube joints air-tight.
	Development of cavitation	• Build up a flooded suction system. • Reduce a motor rpm, liquid temperature, and tubing resistance.
	A supply tank is empty.*	• Replenish the supply tank.
	Anchor bolts are loose.*	• Fasten anchor bolts.
	Sympathetic vibration with the pump and other parts of system	• Fit vibration isolators to each foot. • Reduce the pump speed.
Liquid leaks.	Discharge pressure is too high.	• Reduce discharge pressure.
	A suction or a discharge line is closed during operation.	• Open both the suction and discharge lines.
	A lip seal is crushed or not there.	• Replace as necessary.
Pump stops.	Wrong wiring or disconnection	• Correct wiring.
	Plunger lock due to crystallization	• Take apart the pump head and clean wet ends.
	Clogging due to foreign matters	• Remove foreign matters. Replace parts if damaged.
	Discharge pressure is too high.	• Reduce discharge pressure.
	A suction or a discharge line is closed during operation.	• Open both the suction and discharge lines.

The causes with the * mark are typical cases of failure.

Inspection

Perform daily inspection to keep pump performance and safety.

Daily inspection

Check the following points. If you notice any abnormal or dangerous conditions, suspend operation immediately and inspect/solve problems according to the troubleshooting section.
When wear parts come to the life limit, replace them with new ones. Contact us or your nearest distributor for detail.

No.	States	Points to be checked	How to check
1	Pumping	• If liquid is pumped.	Flow meter or visual inspection
		• If a discharge and a suction pressure are normal.	Pressure gauge
2	Noise and Vibration	• If abnormal noise or vibration occurs. They may be a sign of abnormal operation. • If it's a sympathetic vibration, mount vibration isolators to each pump foot to reduce noise or oscillation as necessary.	Visual or audio inspection
3	Air ingress from pump head joints and a suction line	• If there is evidence of leakage. Find and tighten a leak point as necessary. See page 7 as well. • If pumped liquid includes air bubbles. Check the joints/line for loose connection and retighten as necessary.	Visual inspection
4	High surface temperature of the pump and the motor	• If the motor surface temperature is in the allowable range (the max ambient temperature plus 40°C at a maximum). Note the pump surface temperature gets high or low along with liquid temperature.	Touch or use a thermometer

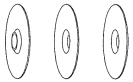
Wear Parts Replacement

To run the pump for a long period, wear parts need to be replaced periodically. It is recommended that the following parts are always stocked for immediate replacement. Contact us or your nearest distributor for detail.

Precautions

- Solution in the discharge line may be under pressure. Release the pressure from the discharge line before disconnecting plumbing or disassembly of the pump to avoid solution spray.
- Rinse wet ends thoroughly with clean water.

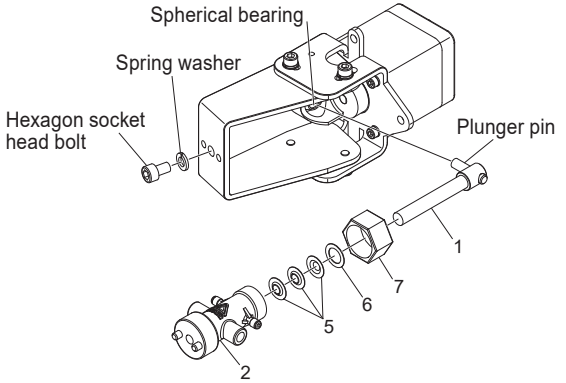
Wear part list

	Lip seal	Back seat
Part names		
Estimated life	2000hr	Every time the pump head is taken apart (if it has worn).
# of parts	3	1

*Wear part duration varies with the pressure, temperature and characteristics of liquid.
*The estimated life is calculated based on the continuous operation at 0.3MPa with clean water at ambient temperature.

Pump head

See this exploded view when dismantling/assembling the pump. Do not dismantle the pump beyond the extent of instructions in this manual.



No.	Part names	Q'ty	Materials
1	Plunger unit	1	Al_2O_3
2	Pump head unit	1	PVDF, Al_2O_3, Stainless steel
5	Lip seal	3	PTFE
6	Back seat	1	PTFE
7	Hexagon cap nut	1	PP

Disassembly & Assembly

■ Before service is performed

1 **Turn off power and stop the pump.**

2 **Close the suction line.**

3 **Drain and empty the pump head unit and the discharge line.**

■ Disassembly

1 **Remove tube connections from the pump head unit (2).**

NOTE

Solution in the discharge line may be under pressure. Release the pressure from the discharge line before disconnecting plumbing or disassembly of the pump to avoid solution spray.

2 **Remove the pump from a foundation.**

3 **Loosen the connection at the top of the pump head unit (2) by removing the spring washer and the hexagon socket head bolt.**

4 **Take out the pump head unit (2) from the spherical bearing with the plunger unit (1) in it.**

5 **Remove the hexagon cap nut (7) from the pump head unit (2) and pull out the plunger unit (1) by rotating it slowly.**

6 **Slip the three lip seals (5) out of the plunger unit (1) with slow rotation.**

NOTE

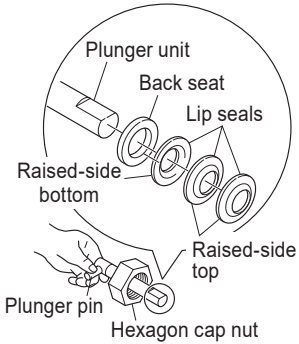
- Be careful not to damage lip seals.
- Clean all parts thoroughly after disassembly.
- Use care handling the plunger unit and cylinder. Do not drop. An impact may damage these ceramic parts.

7 **Remove the back seat (6) and hexagon hex nut (7) from the plunger unit (1).**

■ Assembly

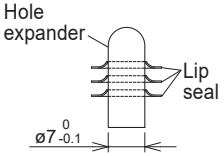
1 **First slide the cap nut (7), the back seat (6) and then the lip seals (5) onto the plunger unit (1) as far as they will go.**

- Take lip seals one by one to softly rotate and slide onto the plunger unit.
- See the right enlarged photo for the mounting direction of the lip seals.
- Use a 7 mm hole expander to widen the I.D. of new lip seals. Leave the seals in the right conditions for 1 hours or more.



NOTE

- Keep the mounting direction of lip seals.
- Do not bend or scratch the lip seals with the edge of the plunger unit.
- Degrease and clean the plunger unit with benzine or thinner after this process.



2 **Hold the plunger pin and pass the plunger unit (1) slowly through the pump head unit (2), rotating it right and left.**

NOTE

Do not pass the plunger unit in friction with the pump head unit. It may be stuck.

3 **Tighten the cap nut (7) to the pump head unit by 0.5 N•m.**

4 **Apply an appropriate amount of silicon oil to the plunger unit surface.**

Use of the Shin-Etsu Chemical KF-96-20cs silicone oil is recommended.

5 **Move the plunger unit back and forth for about 10 reciprocation in the cylinder to give a lubricating property to between the plunger and the lip seals.**

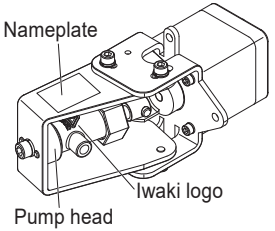
6 **Pull out the plunger end from the pump head unit and fit the plunger pin into the spherical bearing.**

Use the Dow Corning Toray MOLYKOTE® HP-500 to keep good lubrication to the plunger pin.

7 **Place the pump head into the pump frame.**

Fix the pump head unit at its top by 2.8N•m with a spring washer and the hexagon socket head bolt.

*The pump head must be placed with the logo directed toward the nameplate on the frame as shown in the right figure.



Specifications/Outer Dimensions

Specifications

Information in this section is subject to change without notice.

■ Pump unit

Model code	Flow volume per shot (mL/shot)	Flow rate (mL/min)	Discharge pressure (kPa)	Stroke rate (rpm)	Weight (kg)
V-07AF_66-P01	0.1	0.5-30	150	5-300	0.7
V-07AF_66-P02	0.2	1-60			
V-07AF_66-P03	0.3	1.5-90			

*The above information is based on pumping clean water at rated voltage, ambient temperature and zero discharge pressure.
*The flow volume per shot were collected at 100rpm with a discharge line open to the atmosphere.
*Allowable room temperature: 0-40°C
*Allowable liquid temperature: 0-60°C (non-freezing)
*Allowable ambient humidity: 35-85%RH (non-condensing)
*The maximum allowable suction lift is 1m, but then can change with liquid characteristics.
*Flush the pump head with clean water or solvent after operation with the crystallizing or adhesive liquid.

■ Stepping motor

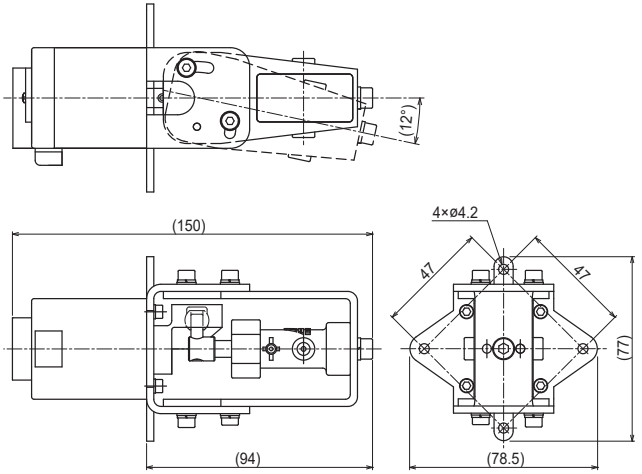
Type	Basic step angle	Power voltage	Insulation class
2-phase bipolar	1.8º	24VDC±10%	B

■ Hall IC

Power voltage Vcc	Output open-circuit voltage Vo	Output inflow current Isink	Output saturation voltage Vsat	Power current Icc
4.5-18DCV	Vcc	15mA	0.4V (Vcc=12V, Isink=10mA)	8 mA (Vcc=12V)

Outer dimensions

Sizes are shown in mm.



EC DECLARATION OF CONFORMITY

A copy of the original Declaration of Conformity

(SUPPLIER'S NAME)
WE
IWAKI CO.,LTD.

(ADDRESS)
6-6 2-CHOME KANDA-SUDACHO CHIYODA-KU TOKYO JAPAN

(PRODUCT)
DECLARE UNDER OUR SOLE RESPONSIBILITY THAT THE PRODUCTS
HICERA PUMP

(MODEL NAME)
V SERIES

TO WHICH THIS DECLARATION RELATES ARE IN CONFORMITY
WITH THE FOLLOWING STANDARDS OR DIRECTIVES AS FAR AS APPLICABLE

(DIRECTIVES)
MACHINERY DIRECTIVE 2006/42/EC (ANNEX IIA)
RoHS DIRECTIVE 2011/65/EU

(STANDARDS)
EN ISO12100: 2010 EN809: 1998 + A1: 2009 EN IEC63000: 2018

(A PERSON WHO IS AUTHORISED TO COMPILE THE TECHNICAL FILE
IN THE COMMUNITY)
IWAKI EUROPE GMBH
SIEMENSRING 115 D-47877 WILLICH GERMANY

NOTE: THIS DECLARATION BECOMES INVALID IF TECHNICAL OR OPERATIONAL MODIFICATIONS ARE INTRODUCED WITHOUT THE MANUFACTURER'S CONSENT.

T. Sawada.

TSUTOMU SAWADA
DEPUTY SENIOR GENERAL MANAGER,
QUALITY ASSURANCE HEAD OFFICE

Tokyo, Sep. 13, 2021

(PLACE AND DATE OF ISSUE) **(NAME AND SIGNATURE OR EQUIVALENT MARKING OF AUTHORIZED PERSON)**

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