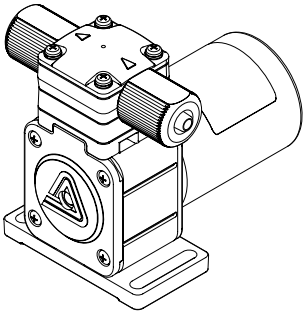
IWAKI

Iwaki Reciprocating Diaphragm Liquid Pump

HSR-03/-06/-09/-15 (built-in type)



Instruction manual

Thank you for choosing our product.

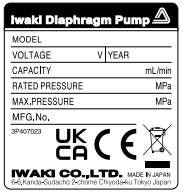
⚠ Please read through this instruction manual before use.

T1191-1 '24/10

Contents

Order Confirmation

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



b. Check for transit damage and loose bolts.

*The CE/UKCA markings on our product(s) are for us to market the product(s) into the European Union market/ the Great Britain (England, Wales and Scotland) market, however, the CE/UKCA markings do not ensure any safety or conformity of the product(s) outside the EU/GB markets. When the pump is incorporated into the equipment marketed in the EU/GB markets, such equipment must meet all the requirements of applicable directives/regulations.
In such a case, any person who places the equipment on the markets must carry CE/UKCA marks 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.


Electrical shock

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


Requirement

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 carries 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

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


Requirement

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.


Prohibited

Do not operate the pump in a flammable atmosphere
Do not place explosive or flammable material near the pump.


Prohibited

⚠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.


Requirement

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 or store the pump:
- In a flammable atmosphere.
- In a dusty/humid environment.
- Where ambient temperature can fall below 5ºC (41ºF) or exceed 40ºC (104ºF).


Prohibited

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


Requirement

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

Electromagnetic precautions
This built-in product is not electromagnetically compatible; however, use of a proper ferrite core and capacitors will give the electromagnetic compatibility (EMC). See page 9 for more info.


Requirement

Take measures in your equipment
Risk of fire or explosion. If there is a possibility that an flammable or explosive liquid is handled in your equipment, You must take proper measures against the risk.


Requirement

Do no use a damaged power cable
Risk of fire or electric shock. The cable is not replaceable. The whole pump unit needs to be replaced when the cable is damaged.


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.


Requirement

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.


Requirement

Static electricity
Use of a low conductivity liquid can build up static electricity and eventually damage the pump motor or your machine when it is discharged (static discharge). Protect (ground) the pump motor or your machine so that static electricity is removed properly.


Caution

Pay attention to magnet force
The pair of magnets in the pump and its magnetic force may adversely affect magnetic disks/cards or wrist watches. Do not bring them close to the pump.


Caution

Do not keep a valve closed in operation
Overpressure can damage the pump, tubing, and any other related devices with splay.


Prohibited

Precautions for Use

- Electrical work should be performed by a qualified electrician. Otherwise, personal injury or property damage may result.
- Do not install/store the pump:
  - In a flammable atmosphere.
  - In a dusty/humid environment.
  - Where ambient temperature can exceed 5-40ºC (41-104ºF).
- Allow sufficient space around the pump for easy access and maintenance.
- The pump is not waterproof. Do not operate the pump while wet with solution or water. Failure or injury may result. Immediately dry off the pump if it gets wet.
- Do not install the pump in a corrosive or flammable gas atmosphere. Keep good ventilation at the operation site.
- Allowable liquid temperature of the pump with:
  - EPDM valve: 5°C (41ºF) to 40°C (104ºF)
  - FKM valve: 10°C (50ºF) to 40°C (104ºF)
- Allowable ambient temperature of the pump with:
  - EPDM valve: 5°C (41ºF) to 40°C (104ºF)
  - FKM valve: 5°C (41ºF)* to 40°C (104ºF)

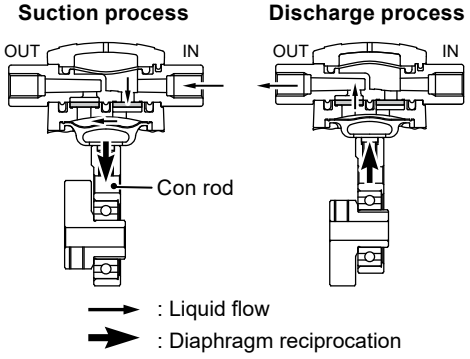
  *Except dry valves that are 10°C (50ºF) at the lowest.
- Keep the suction line pressure of the pump negative or atmospheric. Do not pressurize, or sharp deterioration to the lives of the bypass valve, diaphragm and bearing may result.
- Do not tube two or more pumps in series. It may prevent the motor from starting and lead to a burnout.
- 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.
- Do not apply power other than that specified on the nameplate. Otherwise, failure or fire may result.
- The pump can not start with full discharge/suction pressure. Release the pressure before operation. Operation may be unstable when the pump is restarted after a long time or when the pump/ambient temperature is too low. In such a case, warm the pump up for 10 minutes with zero-pressure.
- Risk of scald injury. The surface temperatures of the pump and motor rise high along with liquid temperature. Do not touch the pump or motor surface directly in or right after operation.
- Do not clean the pump or nameplate with a solvent such as benzine, thinner or kerosene. This may discolour the pump or erase printing. Use a dry or damp cloth or a neutral detergent.
- Debris from the suction line can prevent the pump valve from opening or closing properly, so the pump output could reduce.

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.

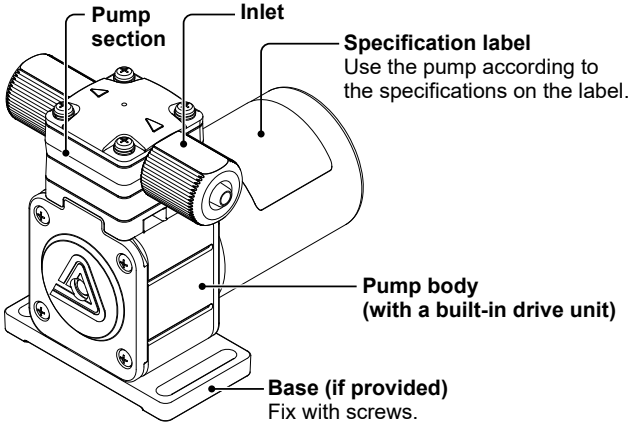
Overview

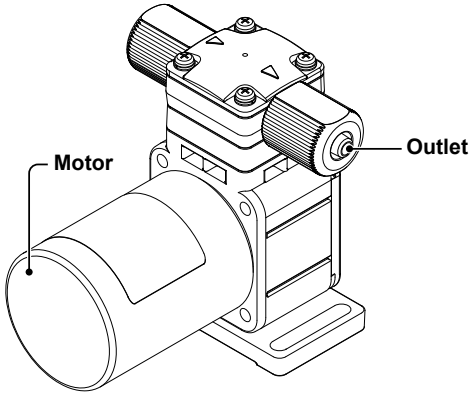
Pump characteristics, features and part names are described in this section.

An Iwaki HSR-03/-06/-09/-15 reciprocating diaphragm liquid pump is a built-in type diaphragm pump with a 24VDC brushless DC motor. The rotary motion of the motor is converted through a connecting rod to the reciprocation of the diaphragm in the pump chamber, where liquid is transferred from the inlet to outlet.



Part Names





Identification Codes

The model code represents the following information.

HSR - 03 P E M B - D4 - 02
a b c d e f g h

a. Series name
Liquid pump

b. Pump head size
03: HSR-03
06: HSR-06
09: HSR-09
15: HSR-15

c. Pump head materials
P: GFRPP

d. Chamber diaphragm/Valve materials
V: FKM
E: EPDM

e. Pump connection
No code: I.D.4×O.D.6 tubing
M: M5 female thread
U: ¼-28UNF female thread for a flat bottom fitting
*The HSR-03/-06 does not have tubing connection.

f. Base
No code: No base
B: Based

g. Power voltage
D4: 24VDC BLDC motor (with variable speed control)

h. Special specification
No code: Standard model
01-99: Customized model

Installation

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

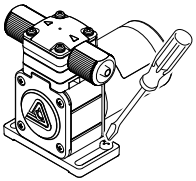
Observe the following points

- 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 operate the pump in a flammable atmosphere.

Pump Mounting

1 **Select a suitable place**
See the "Precautions for use" section before installation.

2 **Anchor the pump**
Use M3 screws. Do not install the pump on an unstable place.



Plumbing

Tubing over the fitting nut

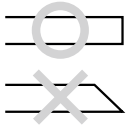
Observe the following points for plumbing.

- 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.

Before service:

- Select proper chemical resistant tubes/ fittings.
- The tubes/fittings should resist liquid temperature and pressure.
- Cut the tube ends flat.

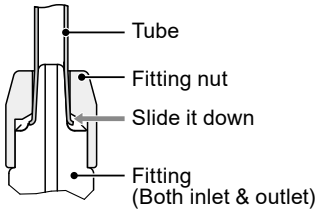
Tube end (side view)



■ Fitting nut (included in the shipping carton)

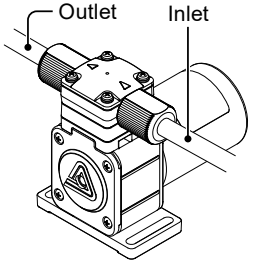
Use a tube that is pressure-/corrosion-resistant to specified operating conditions. Also, select proper tube materials. A split/cracked tube end or thin spots may come up depending on tube materials.

1 **Pass the tube through the fitting nut, and then slide it down onto the fitting as far as it will go**



2 **Tighten the fitting nut by hand**

*Do not use excessive force when tightening the plastic fitting nut. Over-tightening may crush tube too thin and weaken connection.



Tubing over thread fittings

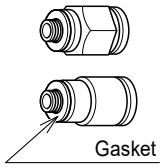
Observe the following points for plumbing.

- Use the best suitable tube to your M5 thread fitting or ¼-28UNF flat bottom fitting, which is purchased separately. Look at the specification section on page 16 and the SDS (Safety Data Sheet) of your chemical to see if your fitting & tubing can stand for the maximum possible pressure/temperature of the pump or a possible chemical attack.
- Do not use excessive force when tightening a metal fitting to the plastic pump head/female thread.
- The pump inlet/outlet and the M5 male thread fitting or the flat bottom fitting are integrated into a face seal coupling when combined properly. Do not use thread seal tape to the thread which may adversely affect the face sealing.

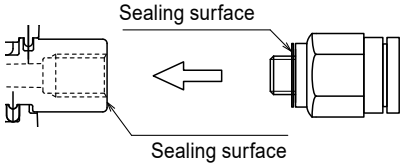
■ M5 male thread fitting

1 **Purchase separately an M5 male fitting with a gasket**

*Use a gasket in place to make sure it is sealed.



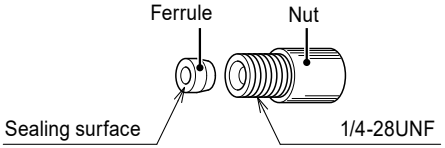
2 **Tighten the M5 male fittings to the pump inlet and outlet by hand**



3 **Connect the tube to the male fitting**

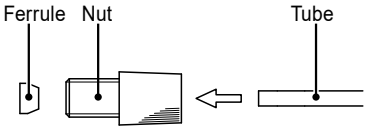
■ ¼-28UNF flat bottom fitting

1 **Purchase two general flat bottom fittings separately**

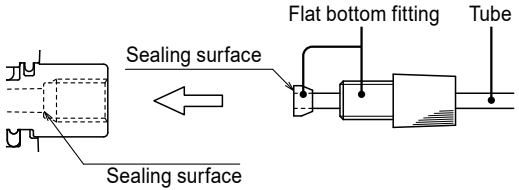


2 **Pass the suction tube end into the flat bottom fitting, and then slide it down into the ferrule as far as it will go**

Make sure the tube end is cut flat as it is a part of the sealing surface.



3 **Finger-tighten the nut to the pump inlet/outlet and securely establish a face sealing**



Peripheral devices

1 **Provide ball valves or needle valves near the pump inlet and outlet**

So they can shut off the liquid when service is performed.

2 **Install a relief valve on the discharge line**

The metering pump by nature keeps running, exceeding the limit pressure of the discharge line if it is blocked. This may damage the pump/plumbing with a chemical leak and the motor with fire. To reduce these risks, install a relief valve on the discharge line (close to the pump), and set the opening pressure to 0.81MPa (117PSI) or below.

3 **Install an air chamber on the discharge line**

in order to reduce flow pulsation, piping vibration and overfeeding.

4 **If necessary, install back pressure valve on the discharge line**

If the discharge line pressure is lower than the suction line pressure, the pump valve won't close during operation and overfeeding takes place. Always give some back pressure (e.g. 0.05MPa) to the pump outlet so the pump valve "checks" the liquid flow at each shot.

5 **Install a pressure gauge close to the pump outlet**

so as to monitor the discharge line pressure.

Glossary

Overfeeding is the condition that valves in the pump stay open and liquid continues flowing into discharge line. This physical phenomenon takes place when the discharge line pressure has fallen below the suction line pressure.

Wiring

Wiring for power source, earthing and external signal.

Observe the following points

- Electrical work should be performed by a qualified electrician. Conform to local electric codes.
- Do not apply power other than the rated voltage. Otherwise, failure or fire may result. Ensure the pump is properly grounded.
- Be sure to turn off power before service is performed. An electrical shock or short circuit could lead to pump failure.
- This built-in product is not electromagnetically compatible; however, use of a proper ferrite core and capacitors will give the electromagnetic compatibility (EMC). See the next page.
- The maximum length of the power line and the signal line is 3m. Use measures when extending these lines over that length and make sure this product is free from an inductive noise in your equipment (EMS).
- The drive circuit generates the high-speed switching noise of the FET. Make sure devices in your equipment are not affected by that noise (EMI).
- This pump speed can be controlled by an analogue signal generator. If you want a feedback control, utilize this feature with an external flow sensor.
- Always use the 1-5VDC control signal for cycling the pump. The 1-5VDC is the range where the pump is ON and 0VDC when it's OFF.
- Always reduce the 1-5VDC control signal to 0VDC before turning ON or OFF the pump power.

■ Power & External signal cables

1 **Turn off power**

2 **Electrically-connect the motor with the 24VDC power supply**

Use the red (positive) lead wire and the black (negative) lead wire.

*The same black (negative) lead wire is shared by the 24VDC power line, the 1-5VDC analogue signal line, and the 0-5VDC digital output line.

3 **Electrically-connect the motor with an external 1-5VDC analogue control signal generator (motor speed control)**

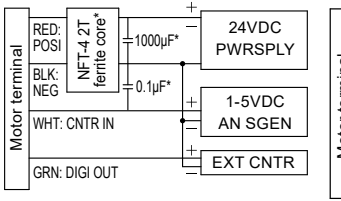
Use the white (positive) lead wire and the black (negative) lead wire.

*When stopping the pump, supply 0VDC to the pump through the 1-5VDC analogue signal line.

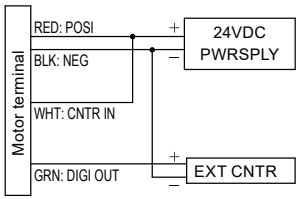
4 **Electrically-connect the motor with an external counter that handles the 0-5VDC incoming digital signal**

Use the green (positive) lead wire and the black (negative) lead wire.

1-5VDC Variable Motor Speed (EMC)



Max Motor Speed (NOT variable)



*To conform to the EMC directive EN61000-6-2 and EN61000-6-4, install the NFT-4 2T ferrite core, the 1000µF capacitor and the 0.1µF capacitor.

POSI: Positive
NEG: Negative
CNTR: Control
DIGI: Digital
PWRSPLY: Power supply
AN SGEN: Analog signal generator
EXT CNTR: External counter

5 **Use an external fuse (e.g 2A) to protect the motor**

Operation

The pump is ready after tubing and wiring are completed.

Before operation

- Check that the pump is firmly fixed on a mounting position.
- Check that a suction tube is connected to the inlet and a discharge tube is connected to the outlet.
  *If a suction line and a discharge line are connected the other way around, pumping process is inverted.
- Check that every tube connection is secured.
- Check that electrical wiring is properly done without the possibility of short-circuit and protected by a good fuse.
- Check that power voltage that is specified on the nameplate is applied to the pump.

1 **Open the suction and discharge lines**
Do not close the discharge line in operation. See page 3 also.

2 **Turn on power**
Operation may be upset when an ambient temperature is too low (below 10°C or 41°F). Run the pump with zero discharge pressure until it warms up (10 minutes).

3 **Run the pump at your duty point for commissioning**
In case electric power has failed while the pump is running, switch off mains power. Otherwise, the motor may not restart or may burn out depending on a line pressure at the time of power recovery.

4 **Check the discharge/suction pressure, and liquid flow rate**
Use the pressure gauge, flow meter, or so. These parameters must meet the pump spec. See page 16and 18.

■ Before a long period of stoppage (1 week or more)
Depressurize and then empty the pump and plumbing

Do not install/store the pump:
- In a flammable/corrosive atmosphere.
- In a dusty/humid environment.
- In direct sunlight or wind & rain.
- Under mechanical vibration.
- Where ambient temperature can exceed 5-40°C (41-104°F).

Maintenance

This section describes troubleshooting, inspection, wear part replacement, exploded views and specifications.

Observe the following points

- Follow instructions in this manual for replacement of wear parts. Do not disassemble the pump beyond the extent of the instructions.
- Always wear protective clothing such as an eye protection, chemical resistant gloves, a mask and a face shield during disassembly, assembly or maintenance work.
- Risk of electrical shock. Be sure to turn off power to stop the pump and related devices before service is performed.

Troubleshooting

If you notice any abnormal or hazardous conditions, suspend operation immediately and check the following points. If the following measures do not help remove problems, contact your nearest distributor.

States	Possible Causes	Corrective Action
The pump does not run.	Power voltage is too low or too high.	• Observe the rated voltage of 24VDC.
	The pump is not powered.	• Check the pump is switched ON. • Correct wiring. • Replace breaking wires.
	Wrong tubing or loose connection	• Check tubing and correct.
	Diaphragm is loose.	• Tighten the diaphragm.
	Eccentric shaft has worn.	• Replace the pump.
The pump does not run.	Connecting rod bearing has worn.	• Replace the pump.
	Motor failure (e.g. breaking wires, bearing damage or so)	• Replace the pump.
	The suction line is pressurized.	• Do not pressurize the suction line. Keep it 0MPa or below.
Pump operation unintentionally stops.	Power voltage is too low or too high.	• Observe the rated voltage of 24VDC.
	The suction line is pressurized.	• Do not pressurize the suction line. Keep it 0MPa or below.
	Discharge line pressure is higher than the maximum.	• Observe the maximum discharge pressure.
	Connecting rod bearing has worn.	• Replace the pump.
	Motor failure (e.g. breaking wires, bearing damage or so)	• Replace the pump.
Flow and pressure are too low.	Wrong tubing or loose connection	• Check tubing and correct.
	Pump head mounting screws are loose.	• Tighten the screws.
	Diaphragm is loose.	• Tighten the diaphragm.
	Diaphragm is broken.	• Replace the diaphragm.
	Worn pump valve	• Replace the valve.
	Bracket cover fixing screws are loose.	• Tighten the screws.
Significant noise	Power voltage is too low or too high.	• Observe the rated voltage of 24VDC.
	Pump head mounting screws are loose.	• Tighten the screws.
	Diaphragm is loose.	• Tighten the diaphragm.
	Diaphragm is broken.	• Replace the diaphragm.
	Bracket cover fixing screws are loose.	• Tighten the screws.
	Eccentric shaft has worn.	• Replace the pump.

Significant noise	Connecting rod bearing has worn.	• Replace the pump.
	Motor failure (e.g. a worn motor bearing)	• Replace the pump.
Low suction lift	Wrong tubing or loose connection	• Check tubing and correct.
	Pump head mounting screws are loose.	• Tighten the screws.
	Diaphragm is loose.	• Tighten the diaphragm.
	Diaphragm is broken.	• Replace the diaphragm.
	Worn pump valve	• Replace the valve.
	Bracket cover fixing screws are loose.	• Tighten the screws.
	Pump is air locked.	• Remove air from the pump.
	Ambient temperature is too low.	• Run the pump with zero discharge pressure until it warms up (10 minutes).

Drainage

No drain port is provided to this pump. See the drainage procedure below.

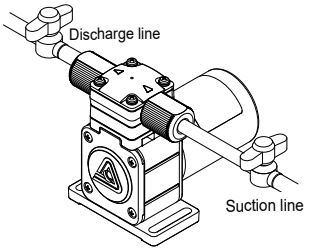
Observe the following points

- Turn off power before service is performed.
- 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.
- 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.
- Risk of fire or electric shock. Install the pump where it can be kept dry.
- Do not drain chemical liquids directly on the ground or the floor. Dispose of chemicals in accordance with local rules and regulations.
- The pump is not water-proof or dust-proof. Do not operate the pump while wet with solution or water. Failure or injury may result. Immediately dry off the pump if it gets wet.
- Dilute and flush out harmful liquid before removing a tube or a pipe.

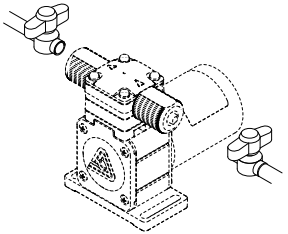
■ Blowdown

1 **Turn off power**
Risk of electrical shock. Be sure to turn off power to stop the pump and related devices before service is performed.

2 **Close both the discharge and suction lines**

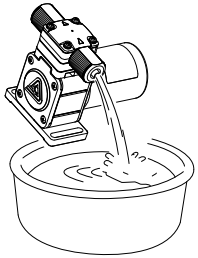


3 **Remove tubing or piping from the pump inlet and outlet**
Collect chemical liquid from the pump and plumbing in a drain pan.
*Release the pressure from the discharge line before disconnecting plumbing or disassembly of the pump to avoid solution spray.



4 **Remove anchoring screws from the pump**

5 **Drain residual liquid directly into the drain pan**
Drain from both the inlet end and the outlet end.



Inspection

Perform daily and periodic inspections to keep pump performance and safety.

Daily inspection

Check the following points every day. If you notice any abnormal or dangerous conditions, suspend operation immediately and remove problems according to the "Troubleshooting" section.
Wear parts must be renewed when the design life is exceeded. Contact your distributor for detail.

No.	Items	Points to be checked
1	Pump operation	• If the rated power voltage & amps are observed.
		• If the suction and discharge pressure are normal.
2	Noise and vibration	• If abnormal noise or vibration occurs. They are signs of abnormal operation.
3	A liquid leak or an entrained air	• If a liquid leaks or a gas is entrained from the pump and plumbing. Fasten joints as necessary.

Wear Part 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.

Wear part list

If pump performance has remarkably reduced or every time when the pump is taken apart for maintenance and repair, renew the wear parts listed below (especially the pump valve).

Model code	Max pressure	Design life		
		Pump valve	Diaphragm	Chamber diaphragm
HSR-03/-06/ -09/-15	0.6MPa	4000hr	4000hr	4000hr

*An actual life of parts varies with the pressure, temperature and characteristics of liquid.
*The design life above is calculated based on continuous operation (clean water) at 24VDC power voltage and the room/liquid temperature of 20°C.
*The design life above is not guaranteed.
*Every time a pump is taken apart, use new wear parts including the new pump valve to reassemble so that good water-tightness is obtained.

Disassembly & Assembly

■ Before service is performed

Release the pressure from the discharge line before disconnecting plumbing or disassembly of the pump to avoid solution spray. Flush any residual liquid from wet ends including the pump head and valves.

1 **Turn off the 24VDC power and the pump**

2 **Depressurize the pump and tubing**

■ **Diaphragm replacement**

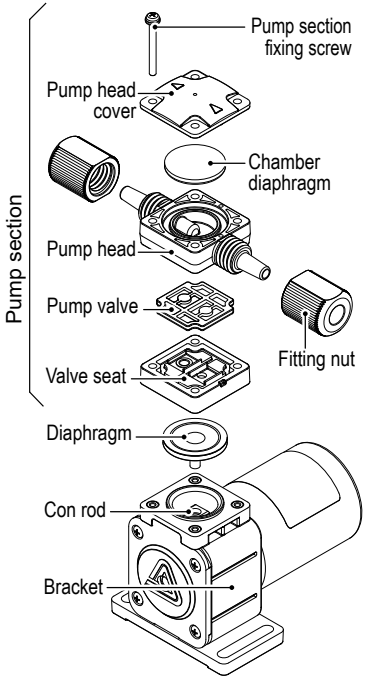
1 **Unscrew and remove the pump section from the bracket**

2 **Unscrew and remove the diaphragm from the connecting rod**

3 **Screw the new diaphragm into the connecting rod as far as it will go**

4 **Replace the pump valve and the chamber diaphragm with new parts**

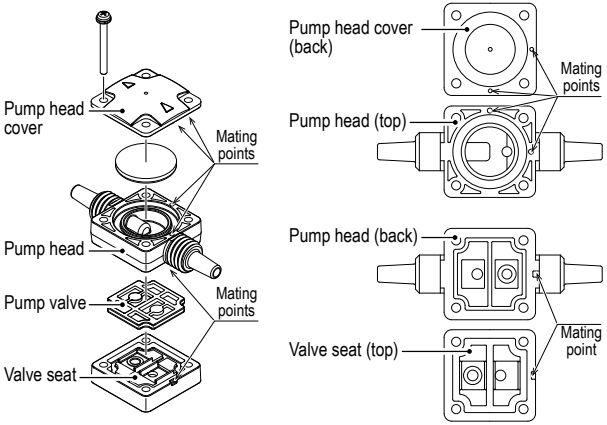
*Every time a pump is taken apart, use new wear parts including the new pump valve to reassemble so that good water-tightness is maintained.



5 **Rebuild the pump section**

The pump head cover, the pump head, and the valve seat have mating points.

*Make sure these parts are mated together before fastened.



6 **Pull up the diaphragm to the top (TDC)**

Mount the pump section onto the bracket and fasten the fixing screws by 0.19N•m.

NOTE

- Do not loosen any screws other than the pump section fixing screws.
- The connecting rod, the bracket cover, the bracket, and the motor are not replaceable. If any of these parts have failed, it is necessary to replace the whole pump.

Specifications/Outer Dimensions

Specifications

Information in this section is subject to change without notice.

■ Pump

Model code	Rated flow mL/min	Rated pressure MPa	Max flow mL/min	Max pressure MPa	Motor		Control signal VDC	Suction lift m	Inlet/ outlet size	Weight
					Voltage VDC	Amps A				
HSR-03	30	0.5	60	0.6	24	0.26	1-5	2	M5 or ¼-28 UNF female thread	170g
HSR-06	60		90			0.36				
HSR-09	90		135			0.26			I.D.4× O.D.6 tubing or M5 or ¼-28 UNF female thread	190g
HSR-15	150		230			0.36				

*Observe the maximum pressure of 0.6MPa.
*Observe the rated flow of each pump size. These rated flows would be obtained with clean water at 20ºC (68ºF). An actual flow rate would change with liquid characteristics (e.g. viscosity and specific gravity) and different liquid temperatures.
*The max flow of each pump size is a reference value that would be obtained at zero pressure (however, this is unrealistic as siphoning takes place around zero pressure.).
*The suction lift of 2m is obtained if the pump is installed at the sea level and would reduce if it is installed at higher elevations.
*Allowable liquid temperature of the pump with:
- EPDM valve: 5°C (41ºF) to 40°C (104ºF)
- FKM valve: 10°C (50ºF) to 40°C (104ºF)

*Allowable ambient temperature range of the pump with:
- EPDM valve: 5°C (41ºF) to 40°C (104ºF)
- FKM valve: 5°C (41ºF)* to 40°C (104ºF)
*Except dry valves that are 10°C (50ºF) at the lowest.

*Pumps with tubing connection can use the limited tube size of I.D. 4mm and O.D. 6mm.
*Maximum operating noise with 20ºC (68ºF) clean water (1m away from the pump front, A scale).

HSR-03	40dB(A)
HSR-06	45dB(A)
HSR-09	45dB(A)
HSR-15	50dB(A)

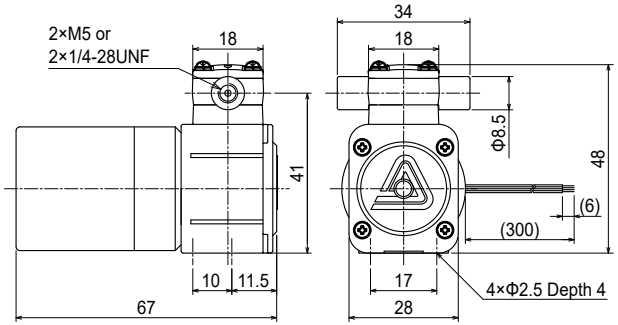
■ Wet end materials

Parts \ Model	PV	PE
Pump head	GFRPP	
Valve seat		
Valve (pump valve)	FKM	EPDM
Diaphragm	PTFE (bonded to EPDM)	
Chamber diaphragm	FKM	EPDM

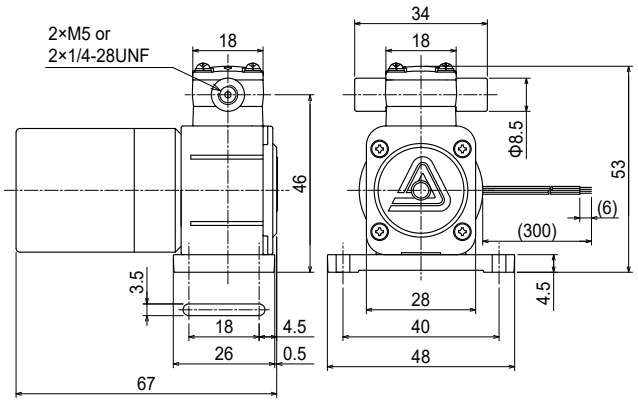
GFRPP : Glass fibre reinforced polypropylene
FKM : Fluorine-contained rubber
EPDM : Ethylene propylene diene monomer
PTFE : Polytetrafluoroethylene

Outer dimensions

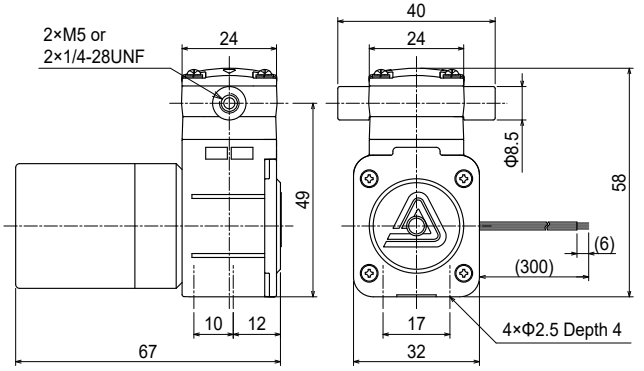
■ HSR-03/-06 with female thread connection (no base)



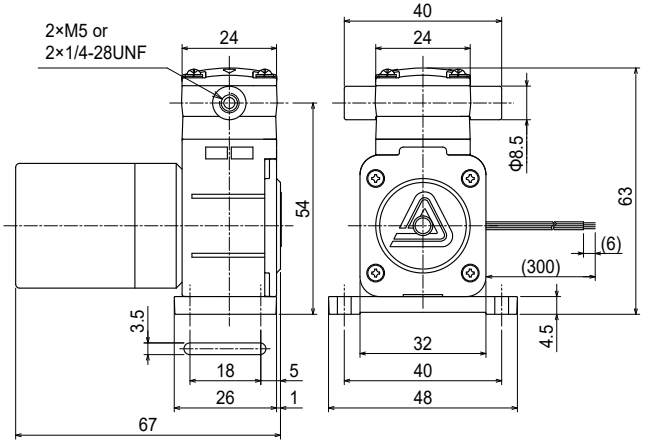
■ HSR-03/-06 with female thread connection (based)



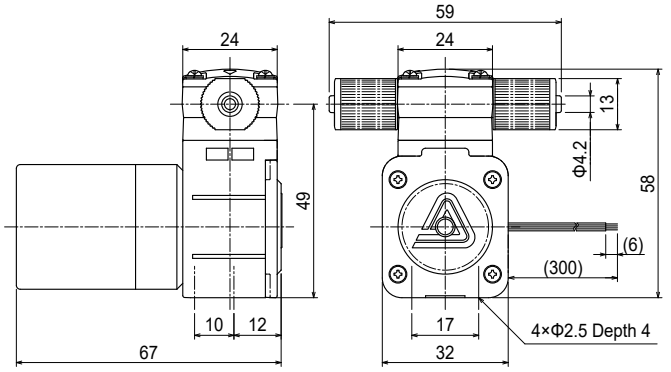
■ HSR-09/-15 with female thread connection (no base)



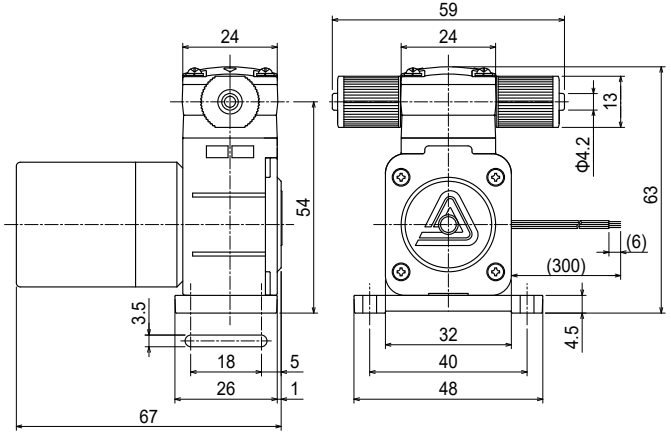
■ HSR-09/-15 with female thread connection (based)



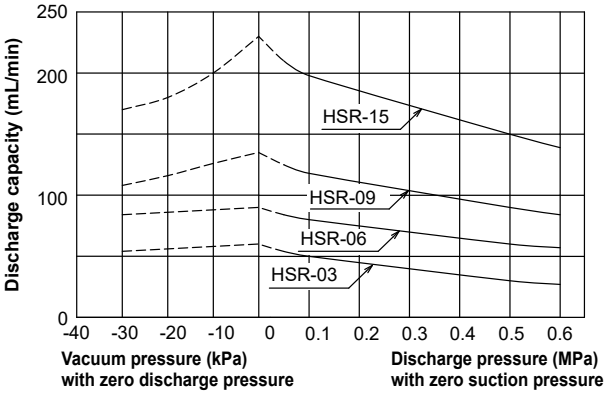
■ **HSR-09/-15 with tubing connection (no base)**



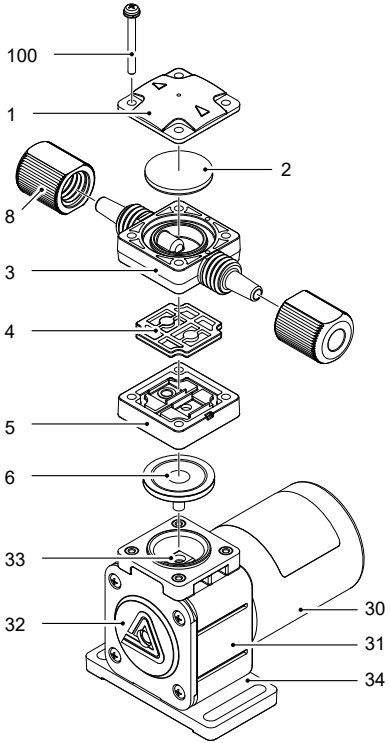
■ **HSR-09/-15 with tubing connection (based)**



Performance curve



Exploded view



No.	Part names	Number of parts	
		Pumps with tubing connection	Pumps with thread connection
1	Pump head cover	1	1
2	Chamber diaphragm	1	1
3	Pump head	1	1
4	Valve	1	1
5	Valve seat	1	1
6	Diaphragm	1	1
8	Fitting nut	2	-
30	Motor	1	1
31	Bracket	1	1
32	Bracket cover	1	1
33	Connecting rod	1	1
34	Base	1	1
100	Screw	4	4

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
RECIPROCATING DIAPHRAGM LIQUID PUMP

(MODEL NAME)
HSR 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)
EMC DIRECTIVE 2014/30/EU
RoHS DIRECTIVE 2011/65/EU

(STANDARDS)
EN ISO12100: 2010 EN61000-6-2: 2005 EN IEC63000: 2018
EN809: 1998+A1: 2009 EN61000-6-4: 2007+A1: 2011

(A PERSON WHO IS AUTHORISED TO COMPILE THE TECHNICAL FILE
IN THE COMMUNITY)
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NOTE: THIS DECLARATION BECOMES INVALID IF TECHNICAL OR OPERATIONAL MODIFICATIONS ARE INTRODUCED WITHOUT THE MANUFACTURER'S CONSENT.

TOSHINORI YANAGIHARA
EXECUTIVE OFFICER SENIOR GENERAL MANAGER,
ENGINEERING HEAD OFFICE

Tokyo, July. 12, 2024

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

DOCUMENT NO. IS-51K-618

UK 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
RECIPROCATING DIAPHRAGM LIQUID PUMP

(MODEL NAME)
HSR SERIES

TO WHICH THIS DECLARATION RELATES ARE IN CONFORMITY WITH THE
FOLLOWING REGULATIONS OR STANDARDS AS FAR AS APPLICABLE
(REGULATIONS)
S.I. 2008/1597 SUPPLY OF MACHINERY (SAFETY)
S.I. 2016/1091 ELECTROMAGNETIC COMPATIBILITY
S.I. 2012/3032 RESTRICTION OF HAZARDOUS SUBSTANCES

(STANDARDS)
EN ISO12100: 2010 EN61000-6-2: 2005 EN IEC63000: 2018
EN809: 1998+A1: 2009 EN61000-6-4: 2007+A1: 2011

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Tokyo, July. 12, 2024

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