

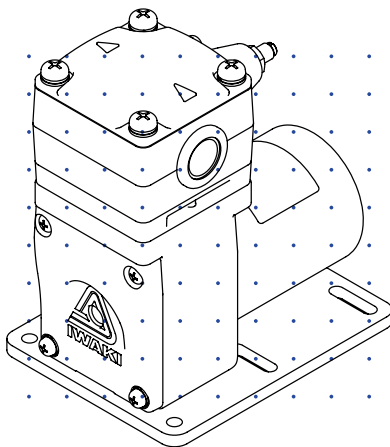
# Iwaki

## Reciprocating Diaphragm Liquid Pump

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### HSR-80

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## Instruction manual

Thank you for choosing our product.



Please read through this instruction manual before use.

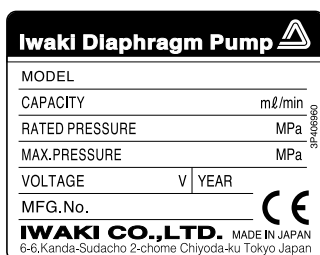
This instruction manual describes important precautions and instructions for the product. Always keep it on hand for quick reference.

## Order confirmation

*Open the package and check that the product conforms to your order. If any problem or inconsistency is found, immediately contact your distributor.*

### **a. Check if the delivery is correct.**

*Check the nameplate to see if the information such as model codes, discharge capacity and discharge pressure are as ordered.*



\*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.

### **b. Check if the delivery is damaged or deformed.**

*Check for transit damage and loose bolts.*

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# Safety instructions

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

## ■ Symbols

In this instruction manual, the degree of risk caused by incorrect use is noted with the following symbols. Please pay attention to the information associated with the symbols.



### **WARNING**

Indicates mishandling could lead to a fatal or serious accident.



### **CAUTION**

Indicates mishandling could lead to personal injury or property damage.

A symbol accompanies each precaution, suggesting the use of "Caution", "Prohibited actions" or specific "Requirements".

#### **Caution marks**



Caution



Electrical shock

#### **Prohibited marks**



Prohibited



Do not rework or alter

#### **Requirement marks**



Requirement



Wear protection



Grounding



## **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.



### 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 a specified conditions only.



### 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 alternations to the pump.



### 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.



### 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.



### Do not damage a 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.



### Do not operate the pump in a flammable atmosphere

Do not place explosive or flammable material near the pump.



## ! 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/store the pump:

- In a flammable atmosphere.
- In a dusty/humid environment.
- Where operating or storage temperature can fall below 0°C (32°F) or exceed 45°C (113°F).



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 product is not electromagnetically compatible. Take appropriate measures as necessary.



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.



---

**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.



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**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.



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**Static electricity**

When low electric conductivity liquids such as ultra-pure water and fluor inactive liquid (e.g. Fluorinert™) are handled, static electricity may generate in the pump and may cause static discharge. Take countermeasures to remove static electricity.



---

**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.



---

**Do not keep a valve closed in operation.**

Closed-discharge operation or closed-suction damages the pump, tubing, and any other related devices.





## 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 operating or storage temperature can fall below 0°C (32°F) or exceed 45°C (113°F).



- 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. An ambient temperature should not fall below 0°C (32°F) or exceed 45°C (113°F). An allowable liquid temperature changes with the pump models of:



- HSR-80PV in the range of 5°C (41°F) to 45°C (113°F), or
- HSR-80PE in the range of 0°C (32°F) to 45°C (113°F).

- 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.



Requirement

- The pump can not start with full discharge/suction pressure. Remove pressure before operation. Also, if the pump has been left stopped for a long time, operation may be unstable when restarted. Warm the pump up for 10 minutes with zero-pressure.



Caution

- 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.



Prohibited

- Do not clean the pump or nameplate with a solvent such as benzene, thinner or kerosene. This may discolour the pump or erase printing. Use a dry or damp cloth or a neutral detergent.



Prohibited

- Debris from the suction line can prevent the pump valve from opening or closing properly, so the pump output could reduce.



Caution

# Overview

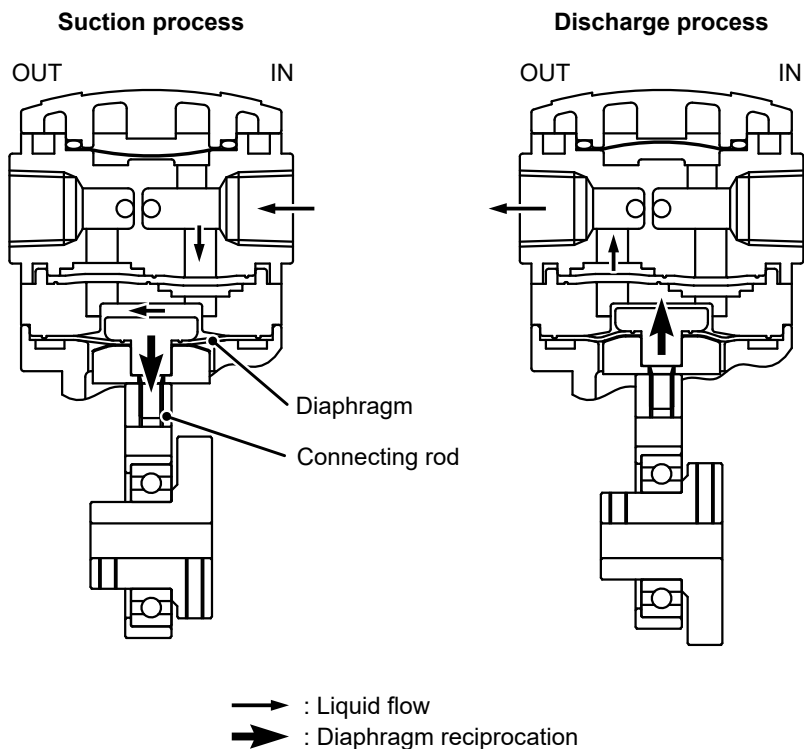
**Pump characteristics, features and part names are described in this section.**

## Introduction

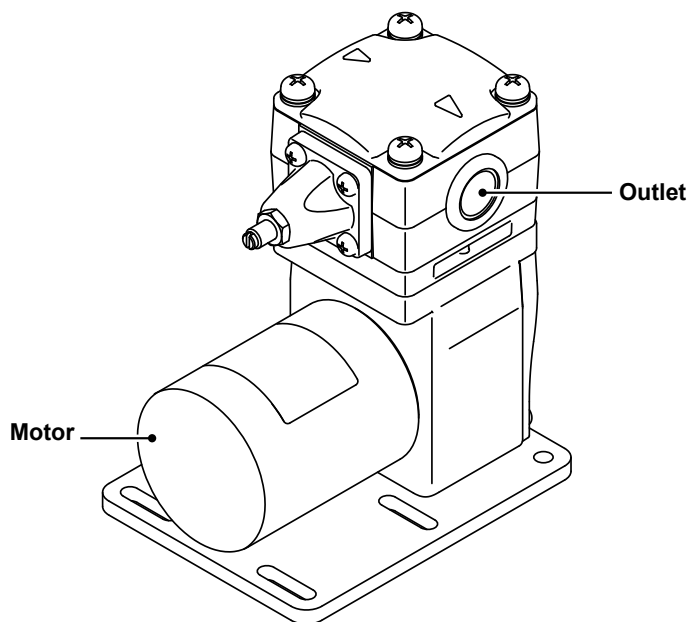
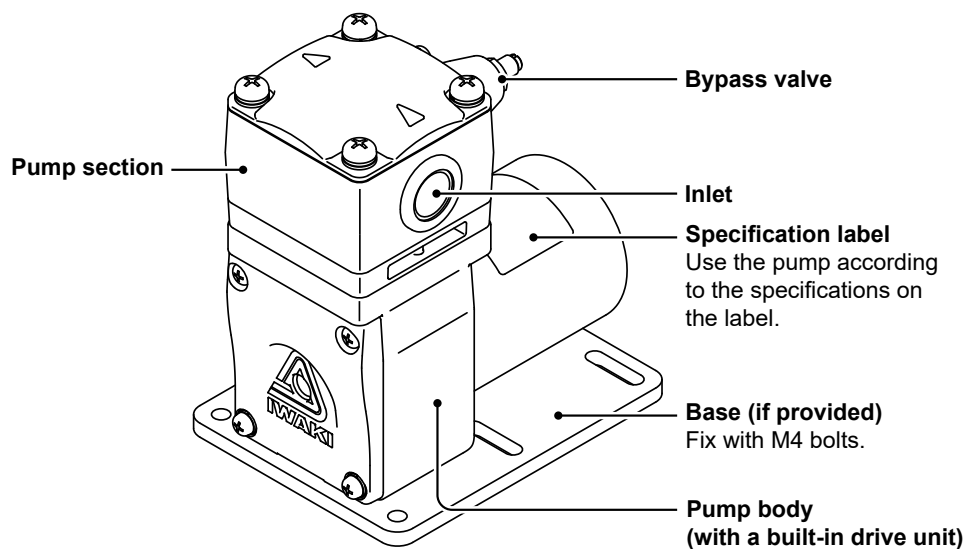
### **Pump structure & Operating principle**

An Iwaki HSR-80 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



*The model code represents the following information.*

**HSR - 80 P E R S B - D4 - 02**  
**a b c d e f g h**

**a. Series name**

**b. Pump head materials**

P : GFRPP

**c. Diaphragm/Valve materials**

V : FKM

E : EPDM

**d. Pump connection**

R : Rc $\frac{1}{4}$ " female thread

G : G $\frac{1}{4}$ " female thread

**e. Bypass valve**

No code: No bypass

S : Provided

**f. Base**

No code: No base

B : Provided

**g. Power voltage**

D4 : 24V BLDC motor (with 1-3VDC 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.**

## **!** Points to be observed

- 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

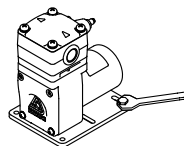
See the "Precautions for use" section before installation.

### **2** Anchor the pump

Use suitable M4 bolts.

#### NOTE

Do not install the pump on an unstable place.



## Pipework

Connect tubes to the pump.

### Before service:

- Cut the tube ends flat.

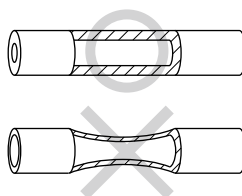
Tube end (Side view)



## Tube connection

- The short tubing with the minimum bends is optimal to reduce resistance.
- Use vinyl tubes resistant to the pumping pressure.  
Tube size should much the quick connectors to be used so leak or any other problems won't happen.

\*Do not have tubing bent or pressed, or the tube end may break.



Installation

### 1 Use the Rc $\frac{1}{4}$ " or G $\frac{1}{4}$ " male quick connectors (purchase separately) into the pump inlet/outlet

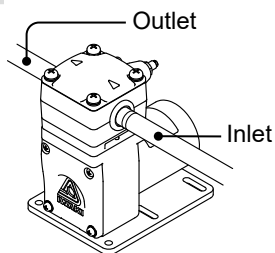
If necessary, use a thread sealing tape to the connector threads so the suction line, especially, won't take in air during operation.

\*All fittings and coupling nuts should be tightened by hand only. If necessary, a small tool may be used to make it snug. DO NOT use excessive force or large wrenches.

\*The connector threads to the pump inlet/outlet must be 8mm or shorter so it won't hit or break the plastic pump head.

## **2 Connect tubes into the quick connectors**

Use the tube that matches your quick connector and push it as far as it will go.



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

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

## **4 If necessary, 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 and burn out the motor. 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.

## **5 If necessary, install an air chamber on the discharge line**

Install an air chamber in order to reduce flow pulsation, piping vibration and overfeeding.

## **6 If necessary, install a 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.

## **7 If necessary, install a pressure gauge on the discharge line and monitor the discharge line pressure.**



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

### **! 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 EMC (electromagnetic compatibility) design. Use measures to have it EMC compatible in your equipment.
- 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 analog signal generator. If you want a feedback control, utilize this feature with an external flow sensor.
- Always use the analog signal (control signal) for cycling the pump. The analog signal range comes to the 1-3VDC range when the pump is ON and 0VDC when it's OFF.
- Always reduce the analog 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 1-3VDC analog signal line, and the 0-5VDC digital output line.
- 3

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

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

The diagram illustrates the wiring connections for a motor terminal block. The terminal block is labeled 'Motor terminal' and has four terminals: 'Red: Positive', 'Black: Negative', 'White: Control IN', and 'Green: Digital OUT'. The 'Black: Negative' terminal is connected to the negative (-) terminal of the '24VDC power supply'. The 'White: Control IN' terminal is connected to the positive (+) terminal of the '1-3VDC analog signal generator'. The 'Green: Digital OUT' terminal is connected to the positive (+) terminal of the 'External counter'. The negative (-) terminal of the 'External counter' is connected to the negative (-) terminal of the '24VDC power supply'.
- 5

Use an external fuse (e.g 3A) to protect the motor

# Operation

***The pump becomes ready after pipework and wiring is completed.***

## Pump operation

### Before operation:

- Check that the pump is firmly fixed on a mounting position.
- Check that a suction tube is connected to the pump inlet and a discharge tube is connected to the pump 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.

## Start-up

### 1 Open the suction line and the discharge line

### 2 Turn on power

\*Operation may occasionally be upset when a starting temperature is too low. Run the pump with zero discharge pressure until it warms up (a few minutes).

### 3 Run the pump at your duty point for commissioning

\*In case electric power has failed while the pump is running, switch off main 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 pressure and the liquid flow rate**

These parameters must meet the pump spec. See page 31.

## **5 Set the opening pressure of the built-in bypass valve (or an external relief valve if the pump doesn't have the internal bypass valve)**

See the next page if your HSR pump has the built-in bypass valve, or set the opening pressure of an external relief valve to 0.81MPa (117PSI) or below.

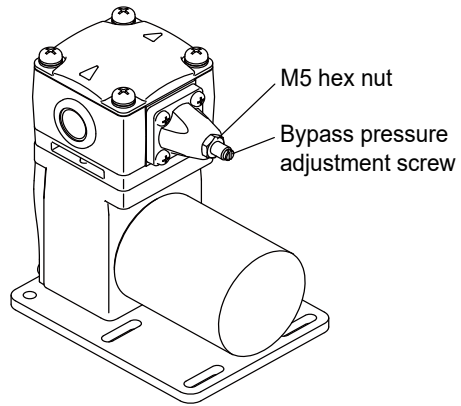
## **Bypass valve setting**

*The opening pressure of the built-in bypass valve is set to the 0.75 to 0.80MPa range (with tap water) when shipped from our factory. You can adjust the opening pressure along with operating conditions.*

### **Necessary tools:**

- A slotted screwdriver (0.80mm or 1/32" drive size)
- A 8mm spanner

- 1 Use the spanner to loosen the M5 hex nut**



- 2 Close the ball/needle valve slowly to give the back pressure to the pump where the bypass valve starts opening**

The pressure stops rising when it has reached the opening pressure of the bypass valve. Use the pressure gauge to determine the correct opening pressure.

- 3 Close the ball/needle valve completely**

## **4 Adjust the bypass pressure adjustment screw to the best opening pressure of the bypass valve**

Turn the bypass valve screw clockwise to increase the pressure or counter-clockwise to decrease.

## **5 Reiterate the step 2, 3, and 4 until the best opening pressure is obtained**

### **NOTE**

Do not exceed the discharge pressure of 0.81MPa or 117PSI.

## **6 Use the spanner to fasten the M5 hex nut**

### **NOTE**

- The built-in bypass valve is a supplementary protective device. Use it with an external relief valve so the bypass valve won't opens all the time.
- Liquids flow back from the discharge line to the suction line when the bypass valve is open. Note pump output reduces during this time.
- Generally, set the opening pressure of the bypass valve 0.15-0.20 MPa or higher than the max discharge pressure of the pump (0.6MPa).

## ***Before a long period of stoppage (1 week or more)***

*Depressurize and then empty the pump and plumbing.*

Do not 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 0-45°C (32-113°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 dangerous conditions, suspend operation immediately and check the following points. If the following measures do not help remove problems, contact your nearest distributor.*

| Problem                | Possible Cause  | 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.<br>• Correct wiring.<br>• Replace breaking wires. |
|                        | Wrong tubing or loose connection                          | • Check tubing and correct.  |
|                        | Diaphragm fixing screws are loose.                        | • Tighten the screws.  |
|                        | Eccentric shaft has worn.                                 | • Replace the pump.  |
|                        | 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 fixing screw is loose.                                | • Tighten the screw.   |
|                                       | Diaphragm is broken.  | • Replace the diaphragm.   |
|                                       | Worn pump valve   | • Replace the valve.   |
|                                       | Bypass valve has opened.  | • Remove clogging and open the discharge line.<br>• Adjust the opening pressure along with operating conditions. |
|                                       | Bracket cover fixing screws or diaphragm fixing screw is loose. | • Tighten the screw.   |
| 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 fixing screw is loose.                                | • Tighten the screw.   |
|                                       | Diaphragm is broken.  | • Replace the diaphragm.   |
|                                       | Bracket cover fixing screws or diaphragm fixing screw is loose. | • Tighten the screw.   |
|                                       | Eccentric shaft has worn.                                       | • Replace the pump.  |
|                                       | 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 fixing screw is loose.                                | • Tighten the screw.   |
|                                       | Diaphragm is broken.  | • Replace the diaphragm.   |
|                                       | Worn pump valve   | • Replace the valve.   |
|                                       | Bypass valve has opened.  | • Remove clogging and open the discharge line.<br>• Adjust the opening pressure along with operating conditions. |
|                                       | Bracket cover fixing screws or diaphragm fixing screw is loose. | • Tighten the screw.   |
|                                       | Pump is air locked.   | • Remove air from the pump.  |



*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.

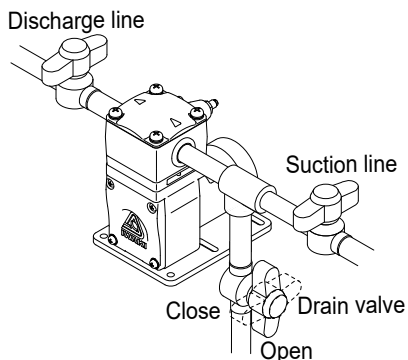
## **Blowdown**

### **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.

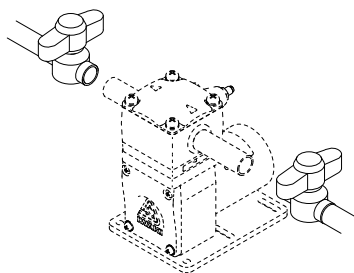
## 2 Close both the discharge and suction lines

Use a drain valve if it's equipped on the suction line and then move to the next step.



## 3 Unscrew the Rc $\frac{1}{4}$ " or G $\frac{1}{4}$ " male quick connectors from the pump inlet and outlet

Collect chemical liquid from the pump and plumbing in a drain pan.



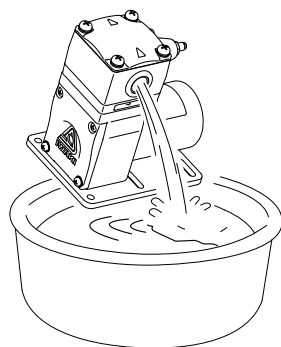
### NOTE

Release the pressure from the discharge line before disconnecting plumbing or disassembly of the pump to avoid solution spray.

## 4 Remove anchoring bolts of the pump

## 5 Drain residual liquid directly into the drain pan

Drain from both the inlet end and the outlet end.



*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, renew wear parts including the diaphragm units and the pump valve.*

| Model code | Max pressure | Design life |                |                   |                |
|------------|--------------|-------------|----------------|-------------------|----------------|
|            |              | Pump valve  | Diaphragm unit | Chamber diaphragm | Gasket /O ring |
| HSR-80     | 0.6MPa       | 8000hr      | 8000hr         | 8000hr            | 8000hr         |

\*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.

\*If the internal bypass valve has failed, you will need to replace the Pump head assembly to retrieve that function.

### Before service is performed

*Depressurize the pump system before service is performed.*

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

**2** Depressurize the pump and tubing

## Diaphragm unit/ Gasket replacement

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

\*Do not take apart the pump section at this point.

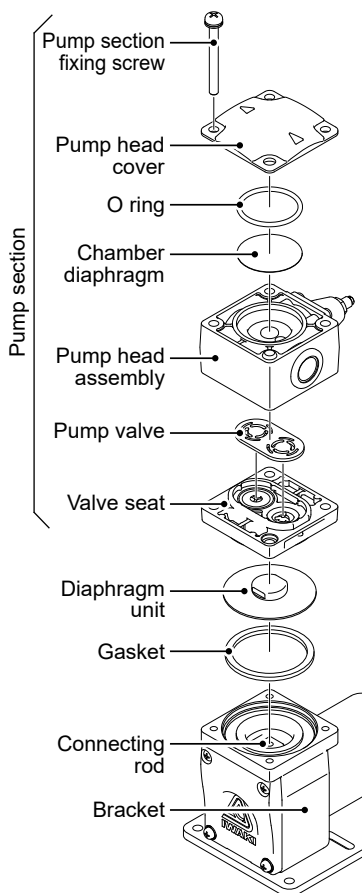
- 2 Use a 14mm spanner to catch/unscrew the diaphragm unit and then remove the gasket from the bracket**

- 3 Place a new gasket onto the bracket groove**

- 4 Use a 14mm spanner to tighten the diaphragm unit by  $1.5\text{N}\cdot\text{m}$**

- 5 Push down the Diaphragm unit until it bottoms out**

Mount the pump section onto the bracket and fasten the fixing screws by  $1.5\text{N}\cdot\text{m}$ .



## Pump valve/ Chamber diaphragm/ O ring replacement

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

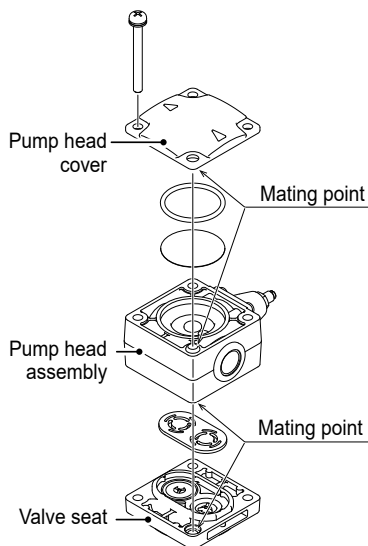
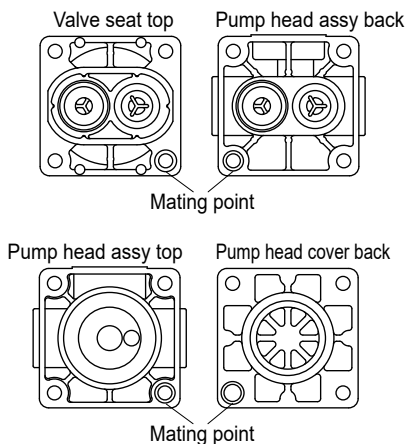
Take apart the pump section.

### 2 Renew the old pump valve, chamber diaphragm, and O ring

### 3 Rebuild the pump section

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

\*Make sure these parts are mated together before fastened.



### 4 Push down the diaphragm until it bottoms out

Mount the pump section onto the bracket and fasten the fixing screws by 2.0N•m.

#### NOTE

- Do not loosen any screws other than the pump section fixing screws.
- Do not take apart the diaphragm unit and the pump head assembly further beyond the extension of these instructions.
- The connecting rod, the bracket cover, the bracket, and the motor are not replaceable. If any of these parts has failed, it is necessary to replace the whole pump.

## Specification

Information in this section is subject to change without notice.

### ■ Pump

| Rated flow                            | Rated pressure | Max flow        | Max pressure | Motor   |      | Motor rpm                     | Suction lift | Inlet/outlet size | Weight |
|---------------------------------------|----------------|-----------------|--------------|---------|------|-------------------------------|--------------|-------------------|--------|
|                                       |                |                 |              | Voltage | Amps |                               |              |                   |        |
| 800ml/min<br>(2000min <sup>-1</sup> ) | 0.5MPa         | 1400ml/min (RV) | 0.6MPa       | 24VDC   | 1.4A | 1000 to 3000min <sup>-1</sup> | 2m           | Rc1/4" or G1/4"   | 700g   |

\*Observe the maximum pressure of 0.6MPa.

\*Observe the rated flow of 800ml/min. The rated flow would be obtained with clean water at 20°C (68°F). An actual flow rate would change with liquid characteristics (e.g. viscosity and specific gravity) and different liquid temperatures.

\*The max flow of 1400ml/min. is a reference value that would be obtained at 3000 min<sup>-1</sup> and zero pressure (however, this is unrealistic as siphoning takes place at 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 changes with the pump models of:

- the HSR-80PV in the range of 5 to 45°C (41-113°F), or
- the HSR-80PE in the range of 0 to 45°C (32-113°F).

\*Allowable ambient temperature range is 0-45°C (32-113°F).

\*Maximum operating noise with 20°C (68°F) clean water is 50dB (1m away from the pump front, A scale).

### ■ Wet end materials

| Model              | PV          | PE   |
|--------------------|-------------|------|
| Pump head          | GFRPP       |      |
| Valve seat         |             |      |
| Valve (pump valve) | FKM         | EPDM |
| Diaphragm unit     | PTFE+SUS316 |      |
| Chamber diaphragm  | PTFE        |      |

GFRPP : Glass fiber reinforced polypropylene

FKM : Fluorine-contained rubber

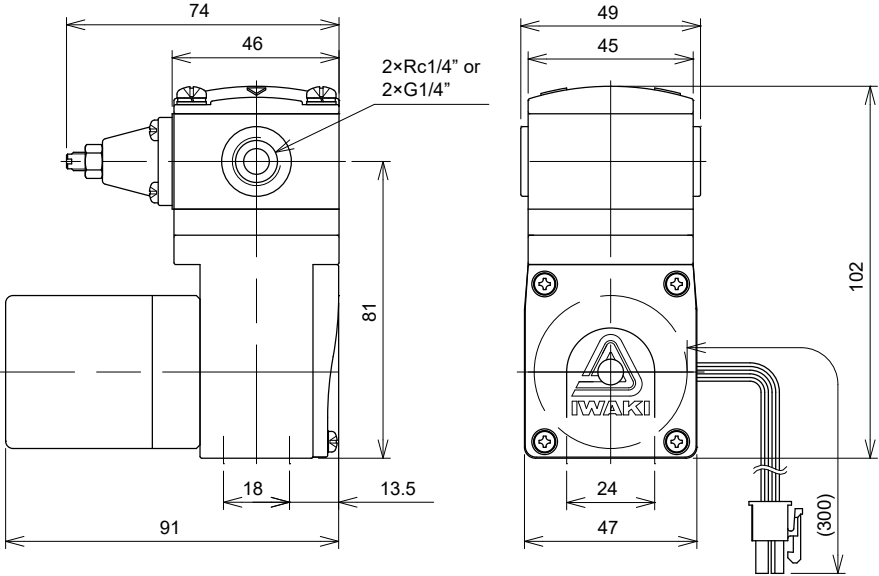
EPDM : Ethylene propylene diene monomer

PTFE : Polytetrafluoroethylene

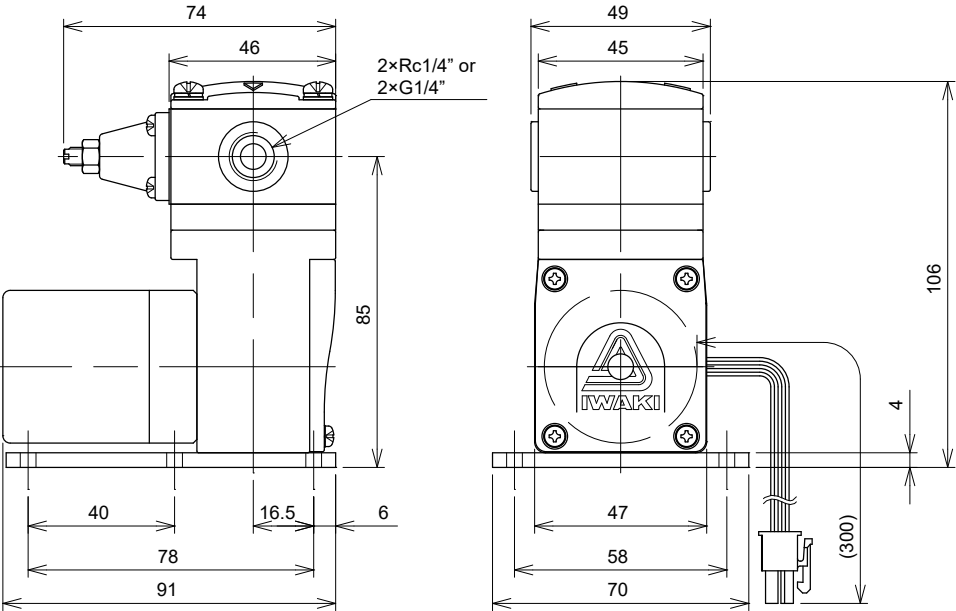
SUS316 : Austenite stainless steel

Outer dimension

■ No base type

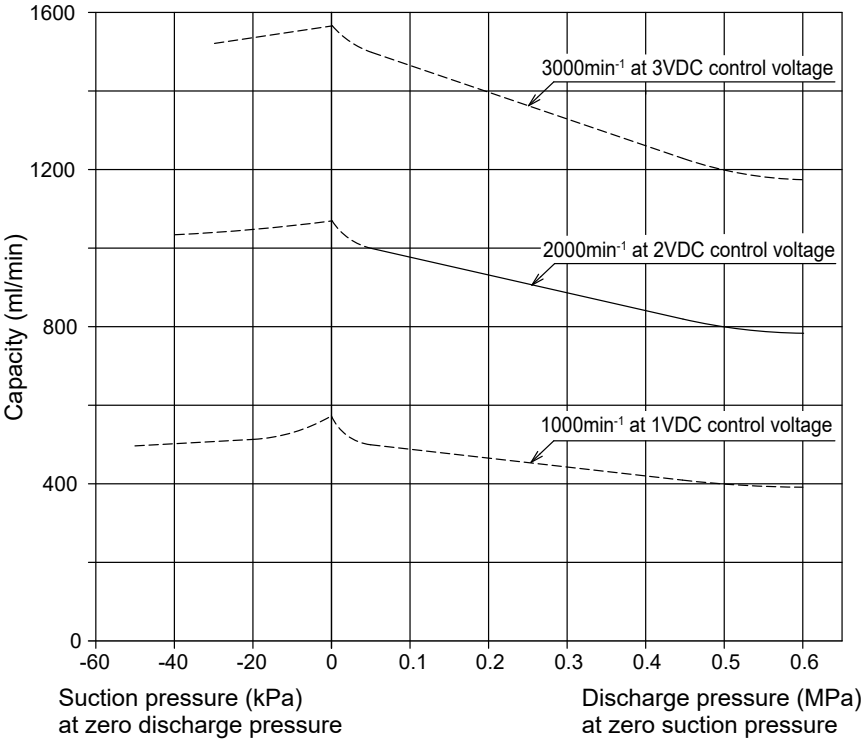


■ Based type

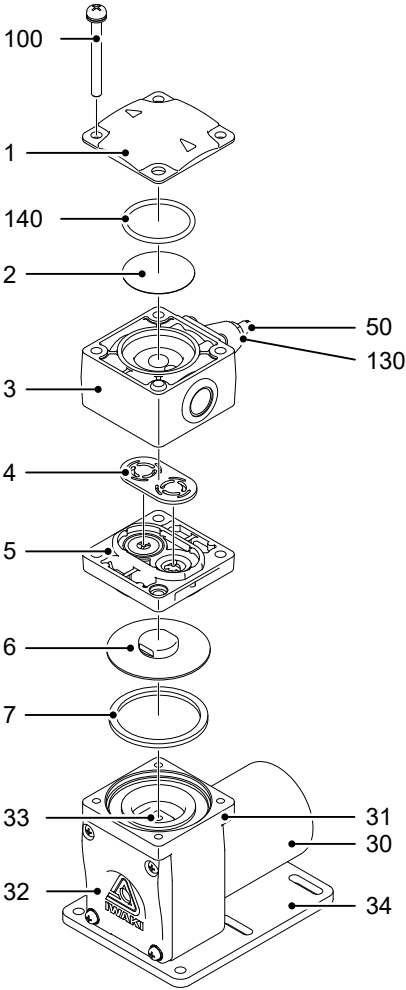




Performance curves



# Part names & Structure



| No. | Part names          | Q'ty |
|-----|---------------------|------|
| 1   | Pump head cover     | 1    |
| 2   | Chamber diaphragm   | 1    |
| 3   | Pump head assembly  | 1    |
| 4   | Valve (Pump valve)  | 1    |
| 5   | Valve seat          | 1    |
| 6   | Diaphragm unit      | 1    |
| 7   | Gasket              | 1    |
| 30  | Motor               | 1    |
| 31  | Bracket             | 1    |
| 32  | Bracket cover       | 1    |
| 33  | Connecting rod unit | 1    |
| 34  | Base                | 1    |
| 50  | Bypass valve screw  | 1    |
| 100 | Screw               | 4    |
| 130 | Nut                 | 1    |
| 140 | O ring              | 1    |

# 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)  
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 MODI-  
FICATIONS ARE INTRODUCED WITHOUT THE MANUFACTURER'S CONSENT.



TSUTOMU SAWADA

DEPUTY SENIOR GENERAL MANAGER,

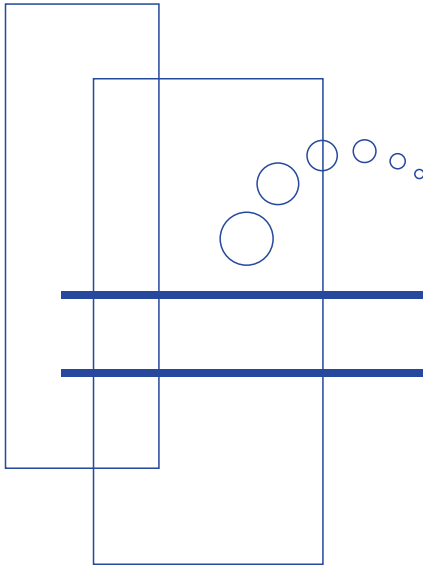
QUALITY ASSURANCE HEAD OFFICE

Tokyo, Mar. 7, 2022

(PLACE AND DATE OF ISSUE)

(NAME AND SIGNATURE OR EQUIVALENT MARKING OF AUTHORIZED PERSON)

DOCUMENT NO. IS-51K-604



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