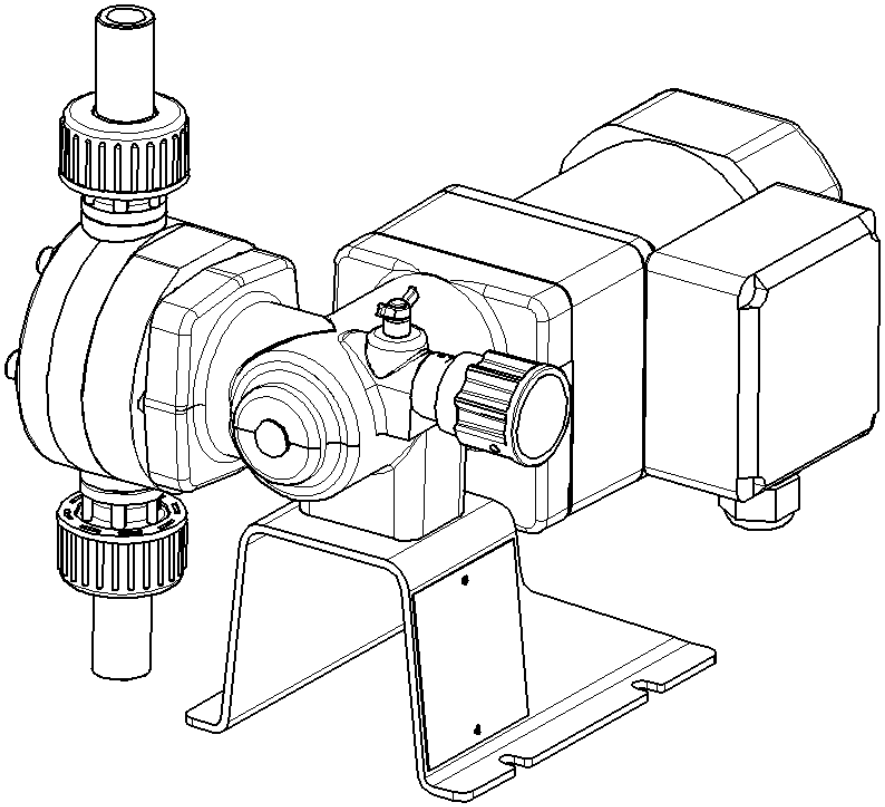
LANGO®

Chemical Metering Pump

GY Series

Instruction Manual



Recommendation

1. Make sure to read this Instruction Manual before unpacking, installation, wiring, operation and maintenance.
2. Keep this instruction manual in a place that allows for easy access by an operator.
3. We assume no responsibility in use of this pump outside the contracted specifications.

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1. Using the Pump Safely

1.1 How to use this manual

This instruction manual uses the symbols below for important matters so that you can use the GY Series pump correctly and safely. Since all items are important for your safety, be sure to follow them.

⚠ WARNING

The WARNING mark indicates a dangerous situation that may result in serious injury or even death if you ignore this mark and misuse the equipment.

⚠ CAUTION

The CAUTION mark indicates a hazardous situation that may result in bodily injury and/or physical damage if you ignore this mark and misuse the equipment.

ATTENTION

The ATTENTION mark indicates information that should be heeded in order to ensure the performance and long life of the equipment.

NOTE

The NOTE mark indicates a supplementary explanation.

TIP

The TIP mark indicates information for your reference.

1.2 Operational conditions

⚠ CAUTION

Using the equipment outside of these conditions for use may lead to a failure.

Use the pump under the following conditions:

- Environmental temperature: -10°C to +40°C
- Relative humidity: ≤85%
- Liquid temperature: +5°C to +40°C
- Viscosity: ≤50 mPa•s
- Do not use the pump with slurries.
- Protection level: Equivalent to IP55.
- If used outdoors, install the pump in a shaded area or attach the outdoors cover to avoid exposure to direct sunlight.

1.3 Operational safety

WARNING

- **Install the pump in a location where unauthorized personnel cannot touch it.**
- **Do not operate with wet hands. An electric shock may occur.**
- **For your safety, wear rubber gloves, a protective mask, and safety glasses when handling chemicals.**

CAUTION

- **If the pump is dropped or damaged, contact your dealer or . If you continue to use the pump in its current condition, an accident or a failure may result.**
- **Install a ground fault circuit interrupter (GFCI) on the power source. Otherwise, an electric shock or a failure may result.**
- **Be sure to ground the pump with a grounding cable. Otherwise, an electric shock may occur.**
- **Do not install the pump in a location with dust or high humidity. An electric shock or a failure may result.**
- **Secure the pump in a level location so that it does not move.**
- **If used outdoors, install the pump in a shaded area or attach the outdoors cover (optional) to avoid exposure to direct sunlight.**
- **Always use the pump joints with the hoses and hose nuts that are furnished or designated alternatives.**
- **If the piping on the discharge side has its valve left open and foreign matter gets stuck, pressure may exceed the pump's specifications and liquid may discharge, which could damage the pump and piping.**
- **If an abnormal condition occurs, such as smoke or a burning smell, stop operating the pump immediately and contact your dealer or . If you continue to use the pump in its current condition, a fire or electric shock may result.**
- **When disassembling the pump for maintenance or repair, be sure to check that the power has been shut off and that the pump has no voltage. Also, make sure the power does not turn ON while the pump is being repaired.**
- **Before performing maintenance and repair, release the pressure from the discharge piping, let out the liquid from the liquid ends, and clean the equipment.**

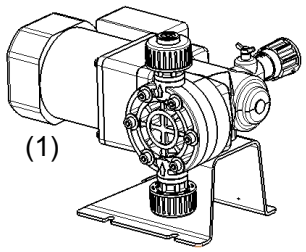
2. Unpacking

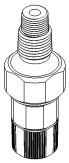
Unpack the equipment and check that it corresponds to your order based on the items below.

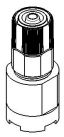
1. The model number is the one you ordered (see Section 3, “Model Display”, on page 4 for information about model number).
2. There was no damage during shipment from an accident or other cause, and no loose bolts or other fasteners.
3. The following items are included:

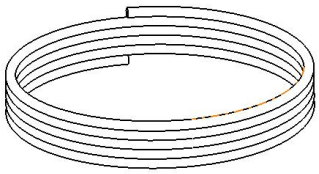
Packaged items

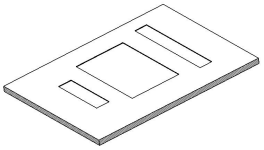
No.	Part name	Qty	Remarks
(1)	Pump	1	
(2)	Anti-siphon check valve	1	Screw thread: R 1/2 and R3/8
(3)	Foot valve	1	
(4)	PVC transparent braided tube	1	ϕ8 × ϕ13 × 5 m
(5)	Instruction manual	1	











NOTE

· If you have any questions, please contact your distributor or the sales office, representative office, or company head office found on the back of this manual.

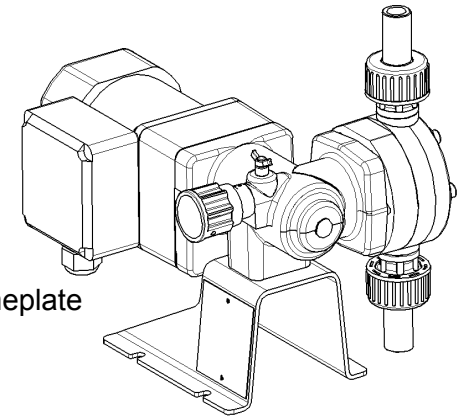
• If damage or an abnormality is found, please attach an accident certificate from the transport company and send it to immediately.

TIP

If you store the pump temporarily instead of using it immediately after unpacking, then keep it in a location with good ventilation that is free from dust.

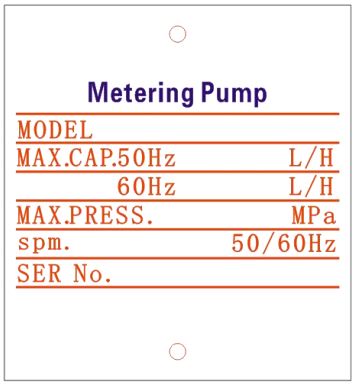
3. Model

The model on the pump nameplate consists of the following items.



Motor nameplate

Pump nameplate



MODEL GY 25 – C F

Series

Pump Flow

25
40
60
90
150

Diaphragm head

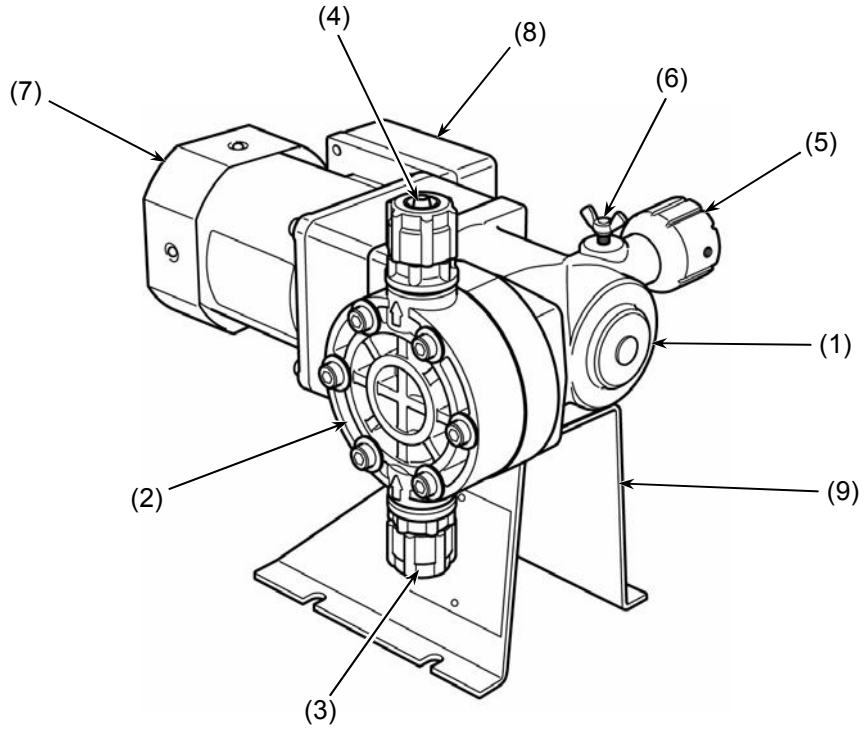
Mark	Material
C	**PVC**
4	**SUS304**
6	**SUS316**
F	**PVDF**
E	**PTFE**

Connection (Suction/Discharge)

Mark	Type	Diaphragm head material
F	**Flange**	PVC, SUS, PVDF
R	**Hose**	PVC
U	**Union**	PVC
Y	**Screw-type**	SUS, PTFE

4. Pump Construction

4.1 Components



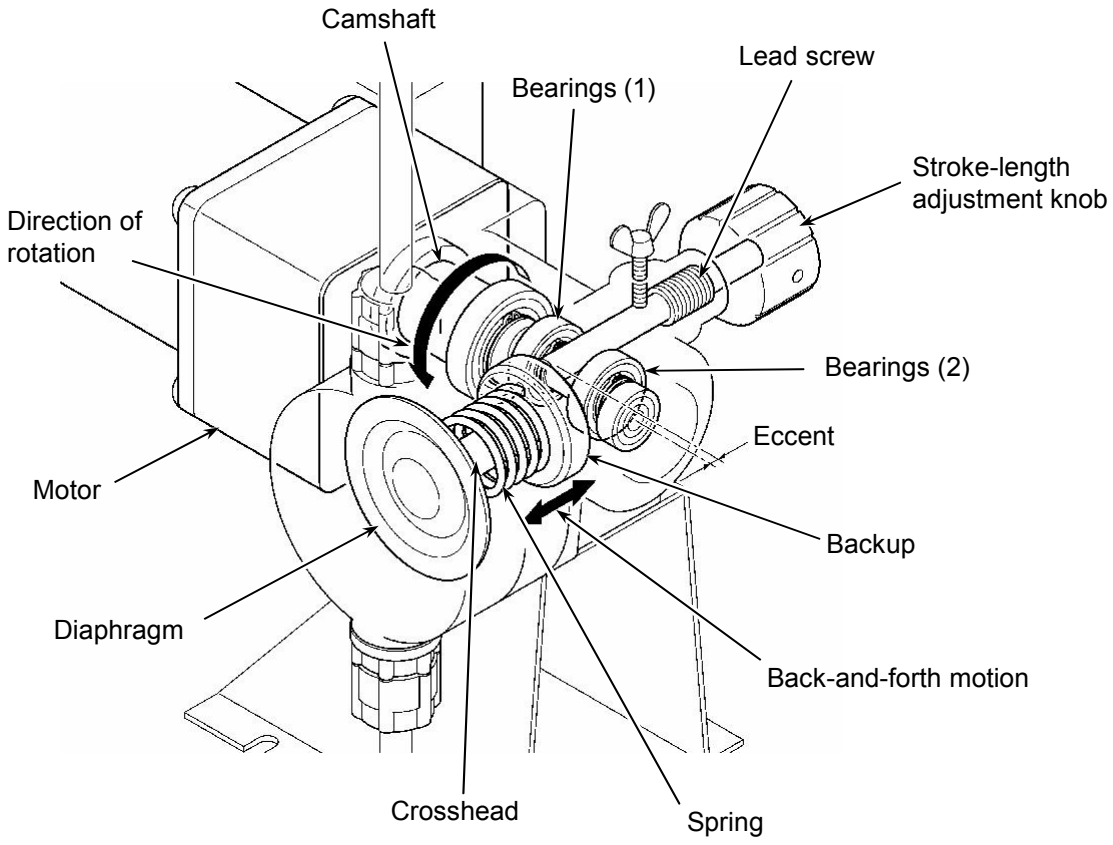
(1) Pump drive:	Moves the diaphragm in a back-and-forth motion.
(2) Pump head:	Performs suction and discharge using the back-and-forth motion of the diaphragm.
(3) Suction port:	Connects the suction hose.
(4) Discharge port:	Connects the discharge hose.
(5) Stroke length adjustment knob:	Varies the stroke length of the diaphragm’s back-and-forth motion to adjust the flow rate.
(6) Butterfly bolt:	Fixes the stroke length.
(7) Motor:	Powers the drive unit.
(8) Terminal box:	Terminates electric cable connections; wired to the source power (such as a control panel).
(9) Pump base:	Secures the pump using bolts.

4. Pump Construction

4.2 Construction

Two bearings are fastened eccentrically to the camshaft that is directly connected to the motor axle. The backup is constantly pressed against the bearings through spring resistance. When the crankshaft turns, it pushes out the backup through the eccentric movement of the bearings. Then the diaphragm at the end repeats a suction/discharge motion by the back-and-forth motion of the crosshead.

The end of the lead screw on the stroke-length adjustment knob is connected to the pushed out backup. Turning the lead screw and changing the backup stroke length (the length pushed out) thus becomes the mechanism for adjusting the flow rate.



5. Specifications

(Specifications for room temperature and clean water)

Pump model		GY25		GY40		GY60		GY90		GY150		GY200	
		50 Hz	60 Hz	50 Hz	60 Hz	50 Hz	60 Hz	50 Hz	60 Hz	50 Hz	60 Hz	50 Hz	60 Hz
Capacity (ml/min)	0 MPa	420	500	670	800	1000	1200	1500	1800	2500	3000	3500	4200
	0.3 MPa	380	460	640	760	830	1000	1150	1370	1950	2300	3000	3600
	0.5 MPa	370	440	600	730	800	960	1130	1350	1900	2280	2500	3000
	1.0 MPa	340	410	550	660	—	—	—	—	—	—	—	—
Stroke length (mm)		4								8			
Diaphragm dia. (mm)		65								84			
Motor power (W)		40								90			
Operating temperature		-10 to +40°C											
Liquid temperature		5 to 40°C											

6. Installation

6.1 Installation location

Avoid using the pump in these types of locations:

- Temperate of -10°C and below or +40°C and above, humidity of 85% and above
- Indoor locations with poor ventilation or relatively high humidity
- Outdoor locations with rain, wind, dust, or direct sunlight
- Installation surface with large vibrations

TIP

If the pump is used outdoors, protect it with the special outdoor cover (optional).

CAUTION

If used without the outdoor cover, the pump may be damaged by deterioration of the plastic through exposure to sunlight.

6.2 Precautions for installation

(1) Place the pump within 1 m of the tank.
(2) Ensure sufficient space for the maintenance inspection (border of 1 m or more).
(3) When handling the pump, do not drop it or subject it to a strong impact.

CAUTION

A strong impact may make the pump unable to exercise basic functions. Please handle with care.

(4) Liquids in which air bubbles are likely to form may be prevented from transmission due to gas lock. In this case, be sure to place the pump in a lower position than the tank (See 9. “Piping and Wiring” on p. 15).
(5) Fasten the pump base in a level location with the 4 fastening bolts furnished with the product.

CAUTION

Tilting the pump may cause the discharge rate to fall or a discharge failure to occur. Therefore, be sure to fasten the unit securely in a level position so that it does not vibrate.

6.3 Installing the tank

- Install the tank in a location where it is easy to perform maintenance inspections.
- If placed outdoors, install the tank in a shaded area where it will not be exposed to direct sunlight.

CAUTION

If the tank is exposed to direct sunlight, the temperature of the chemicals may rise and a decomposition reaction may ensue, which may cause the composition of the liquid to change. Also, problems may occur with the pump in use.

7. Piping and Wiring

7.1 Piping

Cut the furnished suction/discharge hose before use.

7.1.1 Connecting the suction/discharge hose.

(1) Run the braided PVC hose through the union collar and union nut, and push the end of the hose well into the hose joint.

(2) Fasten the hose, by setting the union collar, and then tightening the union nut by hand.

CAUTION

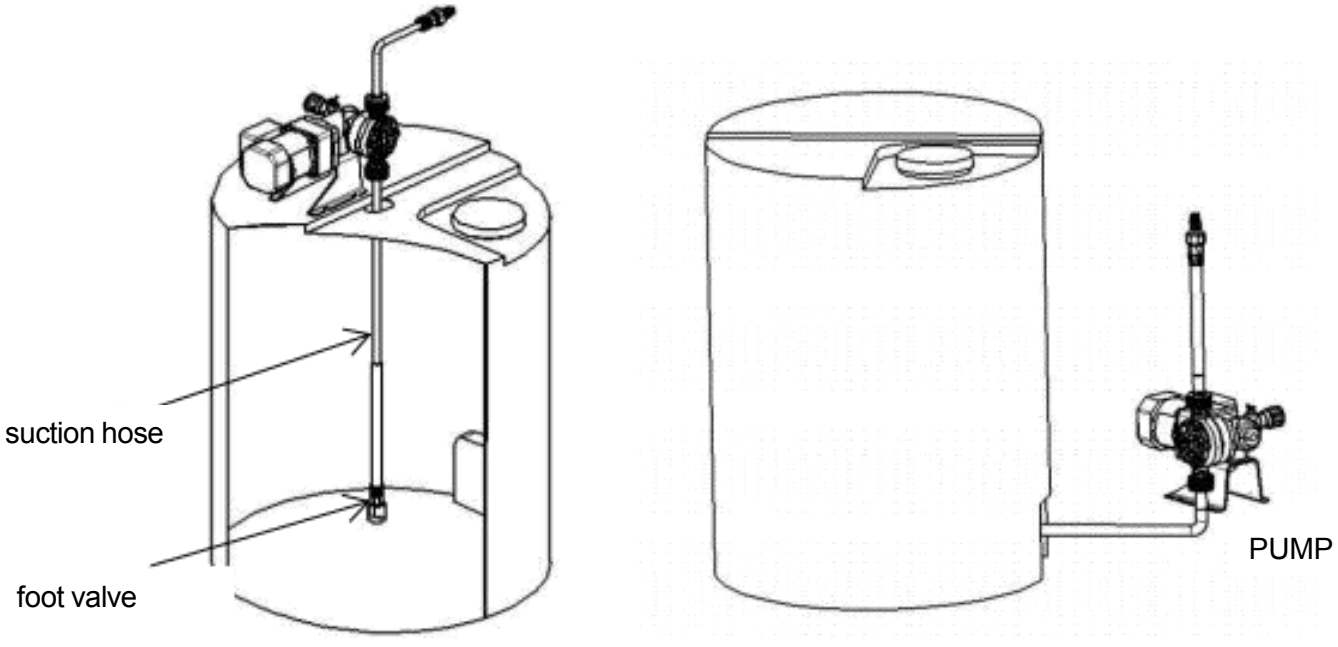
The union nut is made of plastic. Do not tighten the nut more than necessary. Also, do not use a wrench or other tools to fasten the nut. The union nut may break.

7.1.2 Piping configuration

(1) Connect the braided hose to the hose joints on the discharge side and the suction side of the pump liquid ends, as described in Section 7.1.1.

(2) Connect the discharge hose to the anti-siphon check valve and the suction hose to the foot valve.

TIP **The discharge hose should be set as vertical as possible in order to prevent air from accumulating.**

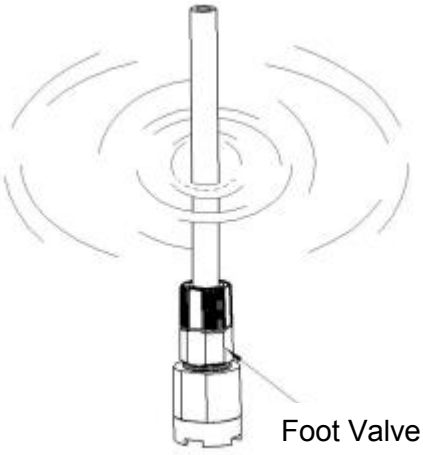


7.1.3 Installing the foot valve

TIP

The suction hose may have a tendency to curl up. If the hose is inserted in the tank in this condition, the weight of the foot valve alone may not keep the hose submerged. This is especially true on hot days in summer, when dissolved air may remain in the foot valve or hose and cause the hose to float up.
Therefore, be sure to take measures like the following:

- **Surround the suction hose with a sheath of similar PVC pipe.**
- **Run a rod along side the suction hose.**
- **Attach a weight to the foot valve**



Foot Valve

TIP

For better maintenance, we recommend that you install a source valve between the socket and the anti-siphon check valve. This valve should be selected in consideration of its anti-corrosion capabilities against the liquid in use.

CAUTION

Absolutely do not operate the pump with the source valve shut. The pump and piping may undergo high pressure (may pressurize) and the liquid may spew out, which could damage the equipment.

7.2 Wiring

This pump is only supplied as a stand-alone unit. For the power source, provide safety equipment such as breakers and a control panel with an ON/OFF switch. Also, set up an ammeter for monitoring pump operation.

⚠ WARNING

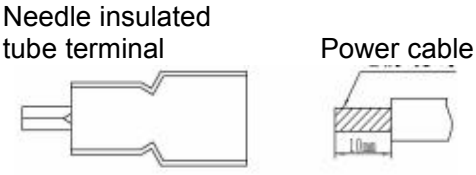
- **Wiring work should be done by a certified electrician.**
- **Electrical work should not be conducted until it has been confirmed that the power is OFF. Otherwise, an electric shock may occur.**
- **Be sure to ground the pump with a grounding cable. Otherwise, an electric shock may occur.**

⚠ CAUTION

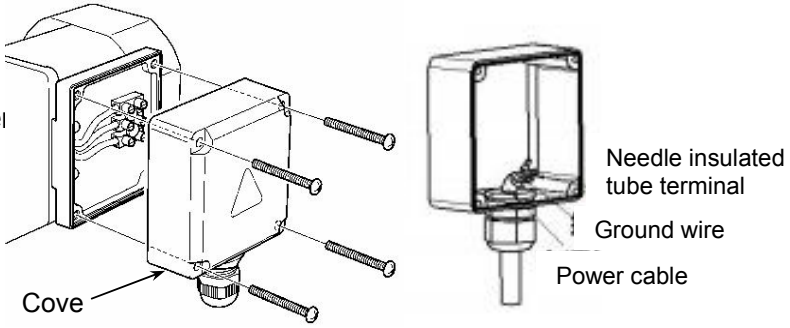
- **Check that the supplied voltage agrees with the rated voltage on the motor nameplate.**
- **Please arrange the wiring according to the electrical equipment standard and internal regulations.**

TIP

We recommend that you use a crimp contact with insulation tubing for connecting wires.
Remove the cable sheath so that about 10 mm of wire is exposed.
Cable thickness: 5 to 10 mm.



(1) Remove the terminal box cover and pass the electrical cable through the hole in the cover.

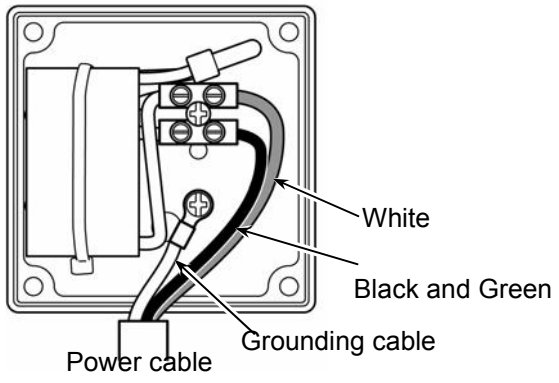


(2) Wire the electrical cable terminals to the motor terminal.

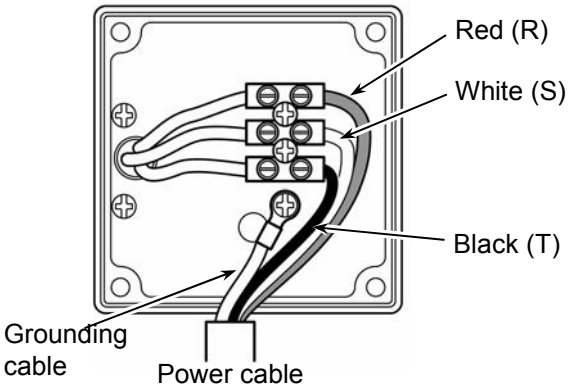
NOTE

Make sure the pump rotates in the proper direction when used. To confirm the direction of rotation, see page 12.

■ **Single-phase connection**



■ **3-phase connection** (wired for proper rotation)



(3) Re-attach the terminal box cover to its original state.

8. Operation

8.1 Pre-operation checks

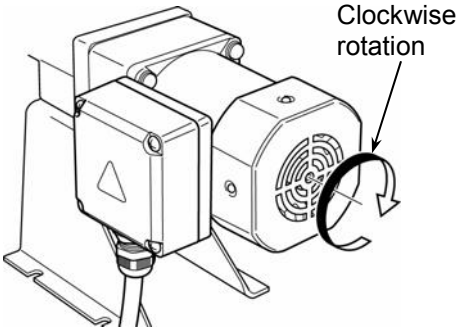
Check the following items before starting to operate the pump:

- There is no liquid leakage at the point of attachment for the anti-siphon check valve, in the piping, or where piping connects to the pump.
- The tank has a sufficient amount of chemicals.
- The foot valve is securely immersed in the chemicals.
- There are no errors in the electrical wiring.
- The valves in the piping have been set to “Open”.

WARNING

For your safety, wear rubber gloves, a protective mask, and safety glasses when handling chemicals.

8.1.1 Checking the direction of rotation



Turn ON the control panel switch. Look at the motor from the co fan side and make sure it is rotating clockwise (proper rotation).

CAUTION

If the motor is not rotating properly, redo the wiring.

8.2 Venting

Vent the air from the diaphragm head and the inside of the hose.
Be sure to vent the air when operating the pump for the first time or when the tank has been changed or refilled.

(1) Connect the air vent hose furnished with the pump to the air vent valve of the anti-siphon check valve. Return the opposite end to the tank.

Do not allow the air vent hose to enter the liquid inside the tank.

(2) into the control panel of the power supply, operation of the pump.
(3) Adjust the stroke length to 100%. Please refer to the "adjustment of 8.3 stroke length" on page 13.
(4) the exhaust valve towards the counterclockwise rotation of 1/2 to 1 turn, the air will be discharged to the hose, so that the pump body and hose filled with liquid medicine.
(5) Stop the pump.

CAUTION

- **Make sure that the hose is attached to the air vent valve. If air is vented without the hose attached, chemicals will be discharged with the air. This may be a hazardous situation depending on the chemicals being handled.**

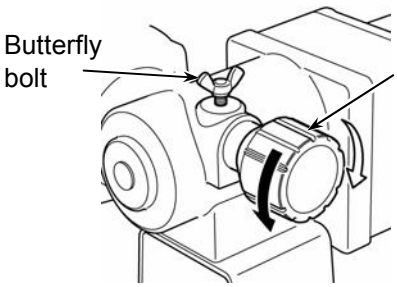
8.3 Adjusting the stroke length

CAUTION

- **The stroke length should be adjusted when the pump is running.**
- **Depending on the movement of the backup while the pump is running, the stroke length adjustment knob may be hard to turn sometimes and easy to turn at other times. Do not force the knob when it is hard to turn. Instead, watch the timing and turn the knob when it is easy to turn.**

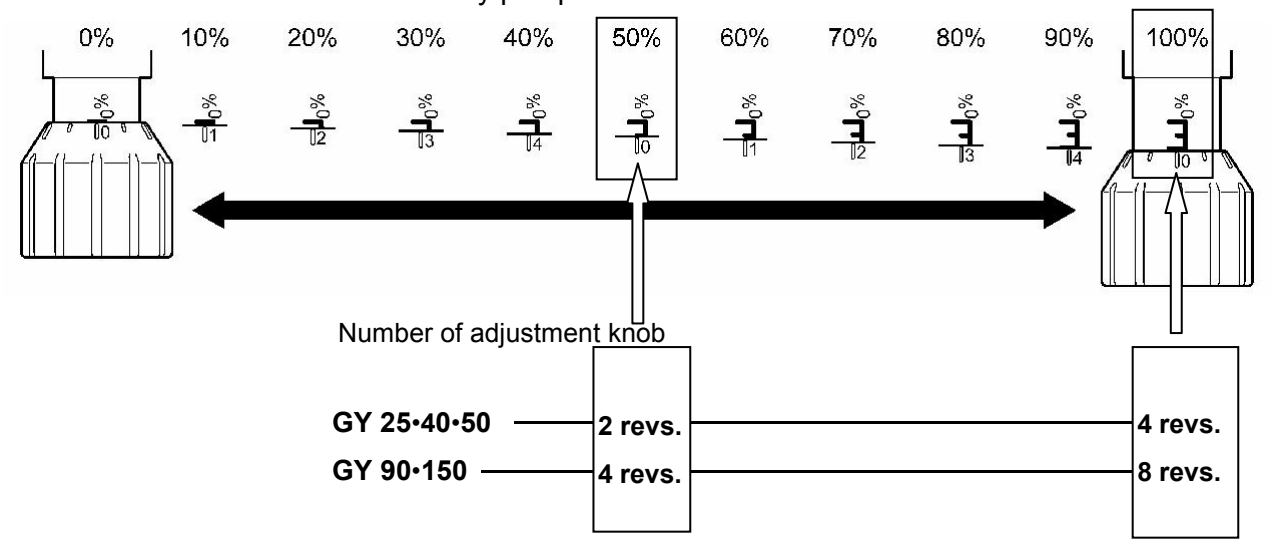
(1) Loosen the butterfly bolt.

(2) Adjust to the desired stroke length (expressed in %) by turning the stroke length adjustment knob. To shorten the stroke length: turn the knob clockwise.
To lengthen the stroke length: turn the knob counterclockwise.



Stroke length display (%)

The stroke length can be checked against a ring scale represented by the position of the numbers (0, 1, 2, 3, 4) on the adjustment knob. The stroke length is displayed in percent, and the knob can be rotated between 0% and 100%.
The number of knob rotations varies by pump model.

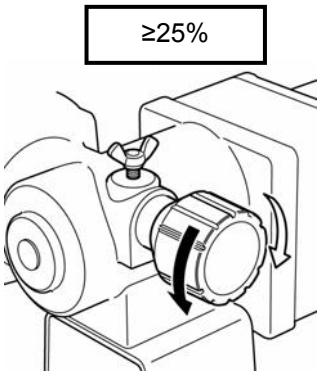


(3) After adjustment, fasten the butterfly bolt securely.

CAUTION

If the butterfly bolt is not adequately fastened, then the lead screw may rotate during operation and could cause the pump discharge rate to change.

8.4 Starting operation



(1) Open the valves in the piping and start the pump.

(2) Using an ammeter, check that the load current is within the rated value.

ATTENTION

Avoid running the pump at a stroke length below 25%. The discharge accuracy may fall. We recommend that you operate this pump at a stroke length of 25% or higher as much as possible.

8.4.1 Checking the flow rate

Measure the discharge rate under actual (local) use conditions.

- Repeat the flow rate measurements several times. The pump is operating normally when the discharge rate shows no fluctuation. However, please note that the discharge rate will change if the discharge pressure changes.
- Prepare a graph of the relationship between the stroke length and discharge rate and set the actual measurement of discharge rate.

NOTE

When the discharge rate is changed by adjusting the stroke length, measure the flow rate after the discharge pressure has stabilized.

8.5 Stopping and restarting

Turn the power OFF to stop the pump. Restarting the pump will not be a problem even if the pump is restarted with the previously set stroke length (discharge pressure).

9. Maintenance Instructions

Inspect the details below. If you find something abnormal, stop pump operation immediately. Take appropriate measures, referring to “Troubleshooting” on page 16. Be sure to follow these points when conducting a maintenance inspection:

⚠ WARNING

- **Do not work with wet hands. An electric shock may occur.**
- **For your safety, wear rubber gloves, a protective mask, and safety glasses when handling chemicals.**

⚠ CAUTION

- **When disassembling the pump, be sure to check that the power is shut off and that no voltage is applied to the pump. Also, make sure the power is not turned ON while the pump is being worked on.**
- **Before doing pump maintenance, be sure to release the pressure from the discharge pipe, let out the liquid from the liquid ends, and clean the equipment.**

ATTENTION

- **We recommend that you always keep replacement supplies on hand (such as diaphragms, valve seats, O-rings, ball valves, and ball guides).**
- **Aim for cleaning the tank every 3 months and keep it free from dirt. This cleaning interval should be set to match dirt conditions.**

9.1 Inspections during routine use

- Check the volume of liquid in the tank. Refill the liquid if it is low. Check that there is no sediment in the tank or anything caught in the filter.
- Check that the pump is not dry-running.
- If liquid is leaking from the bottom of the diaphragm, the diaphragm may be damaged and should be inspected.
- Check that the needle of the pressure gauge for measuring the pump discharge pressure is in its normal position.

9.2 Preparations for extended non-use

- Operate the pump with clean water for about 30 minutes, then clean inside the liquid ends. After cleaning is done, turn the pump’s power OFF.
- Be sure to clean the inside of the tank, the filter, and the suction pipe well.
- Store the pump in a dust-free location that is free from direct exposure to sunlight and has good ventilation.

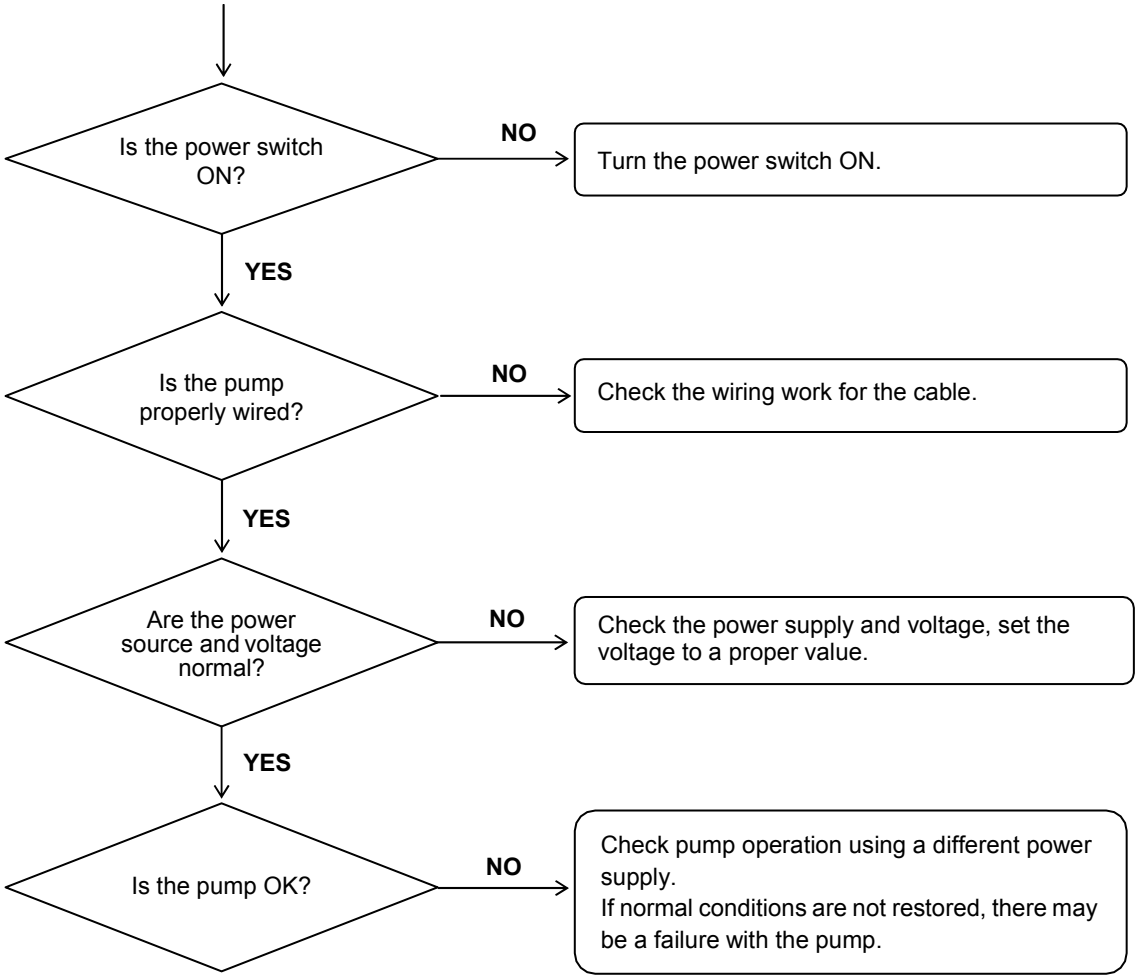
9.3 Preparations for re-use

- Check the volume of liquid in the tank. Replenish if low.
- Check that there is no turbidity in the tank from sediment and liquid. If the quality of the liquid has deteriorated, clean inside the tank and replace with new chemicals.
- If liquid leaks due to a loose or damaged pipe, check that there is no blockage.
- Check that the valves on the suction side and in the discharge pipe are open.
- Check that the designated power supply is properly connected.
- Inspect the equipment for any wiring errors, short circuits, or electric leakage.
- Check that nothing is stuck to the ball valve or valve seat of the liquid ends.

10. Troubleshooting

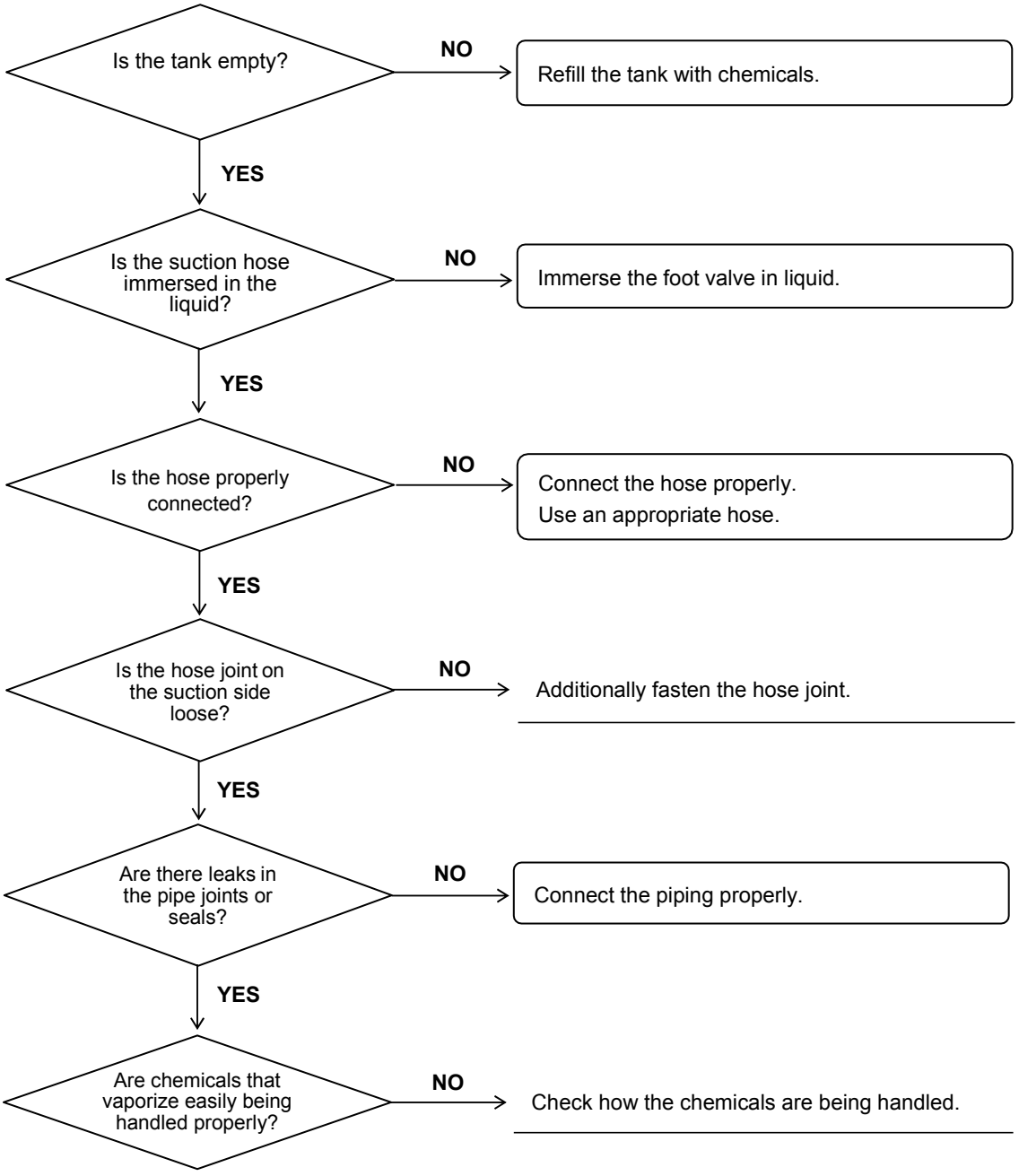
The flow charts below show pump problems and symptoms, together with their causes and solutions. There will often be multiple causes that interact with each other to form a problem and a single cause cannot be identified.
In this case, use these flow charts as a set of tentative guidelines.

10.1 Pump does not start

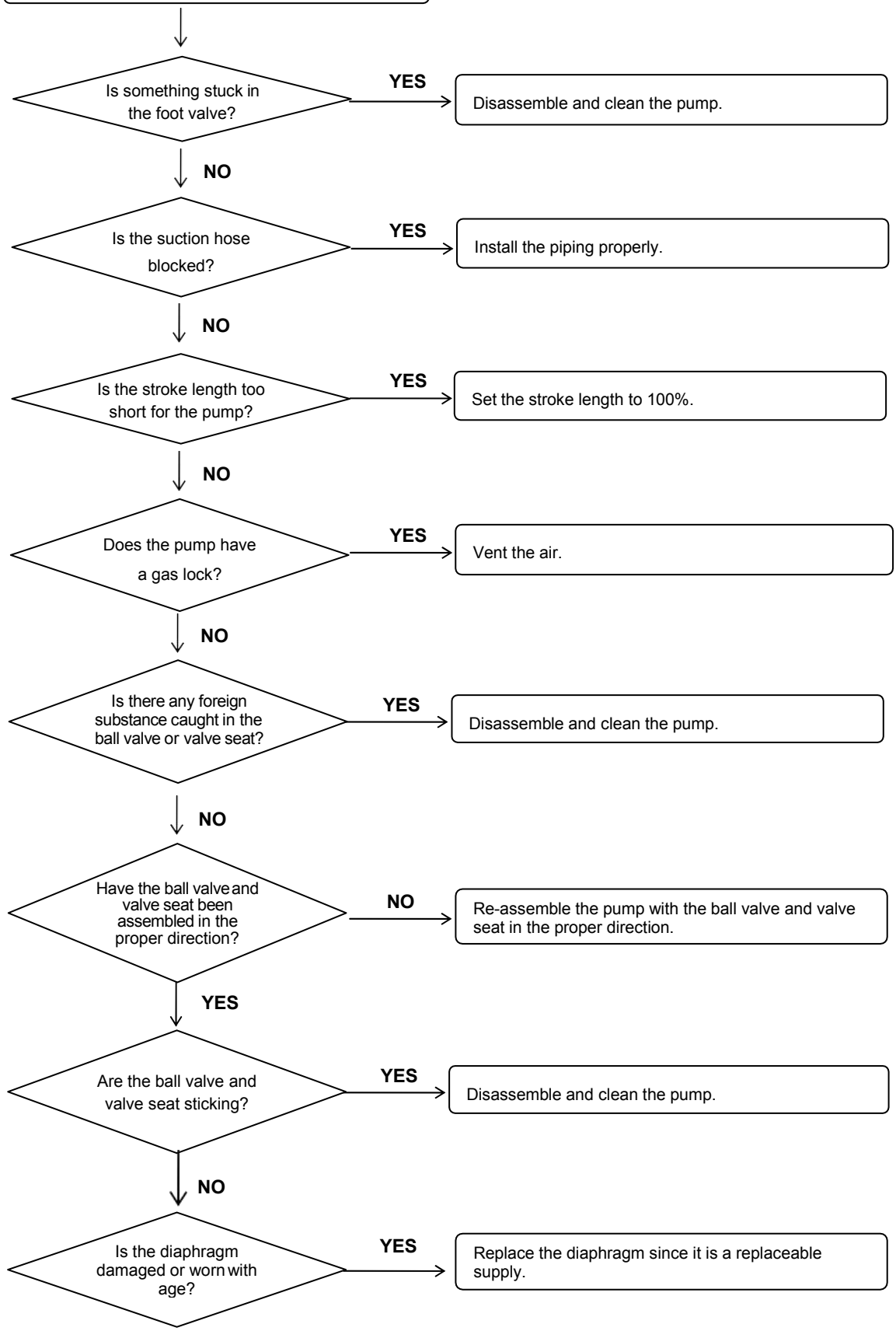


10.2 Pump runs but liquid is not pumped

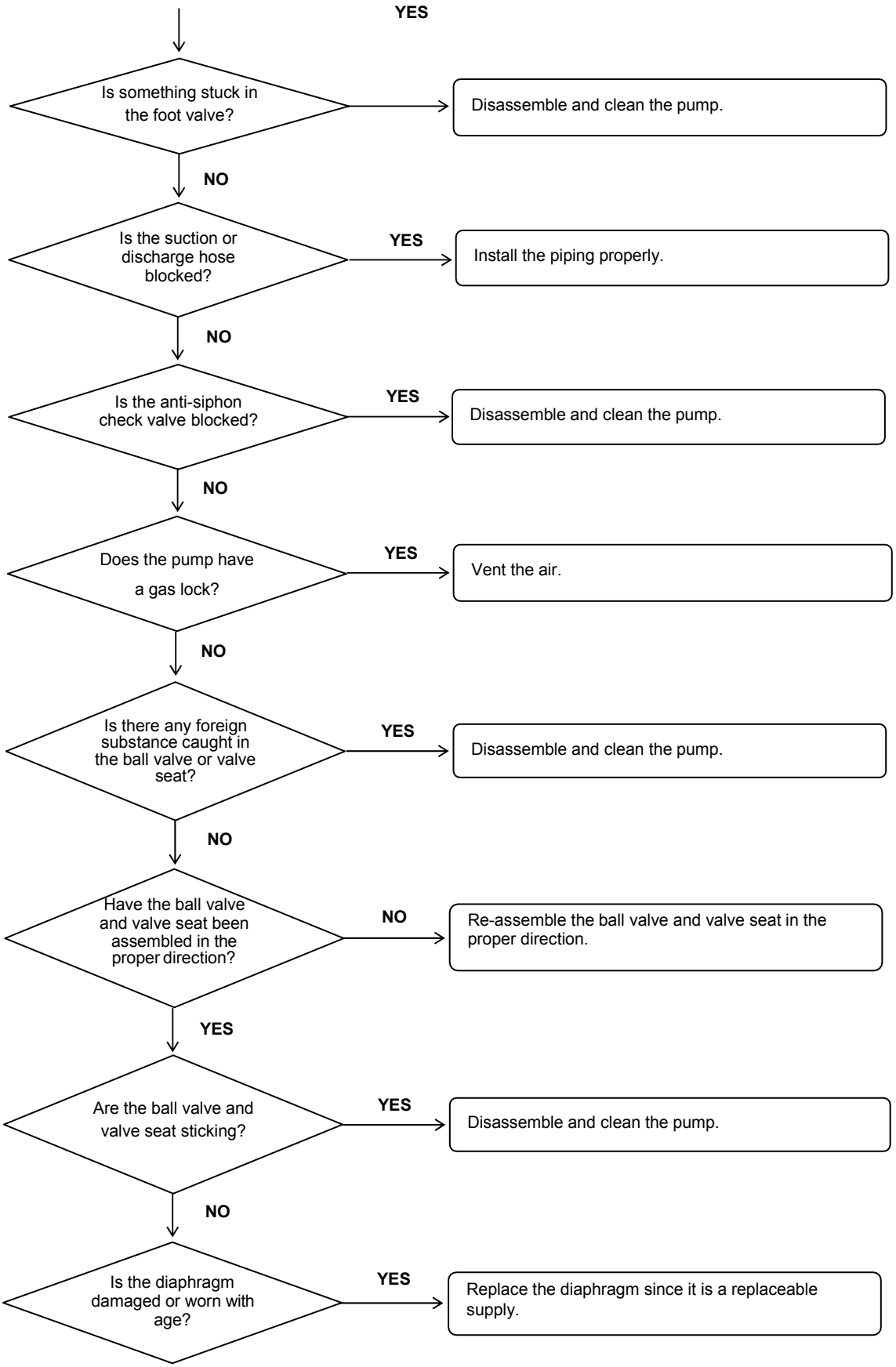
10.2.1 Air has entered the pump



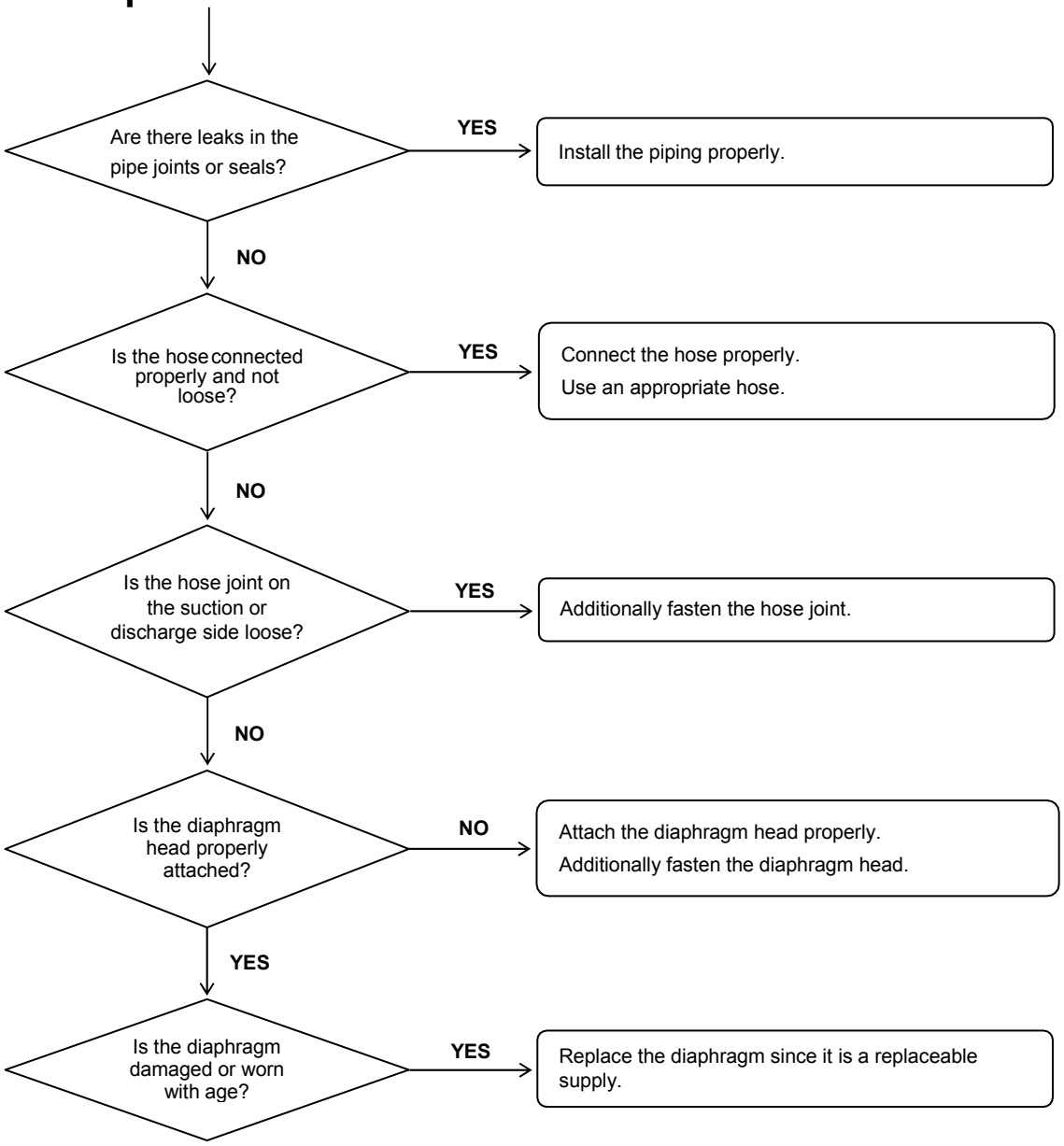
10.2.2 Liquid is not pumped



10.3 Pump runs but liquid is not discharged



10.4 Liquid leaks



11. Spare Parts

Follow the instructions below when replacing parts.

WARNING

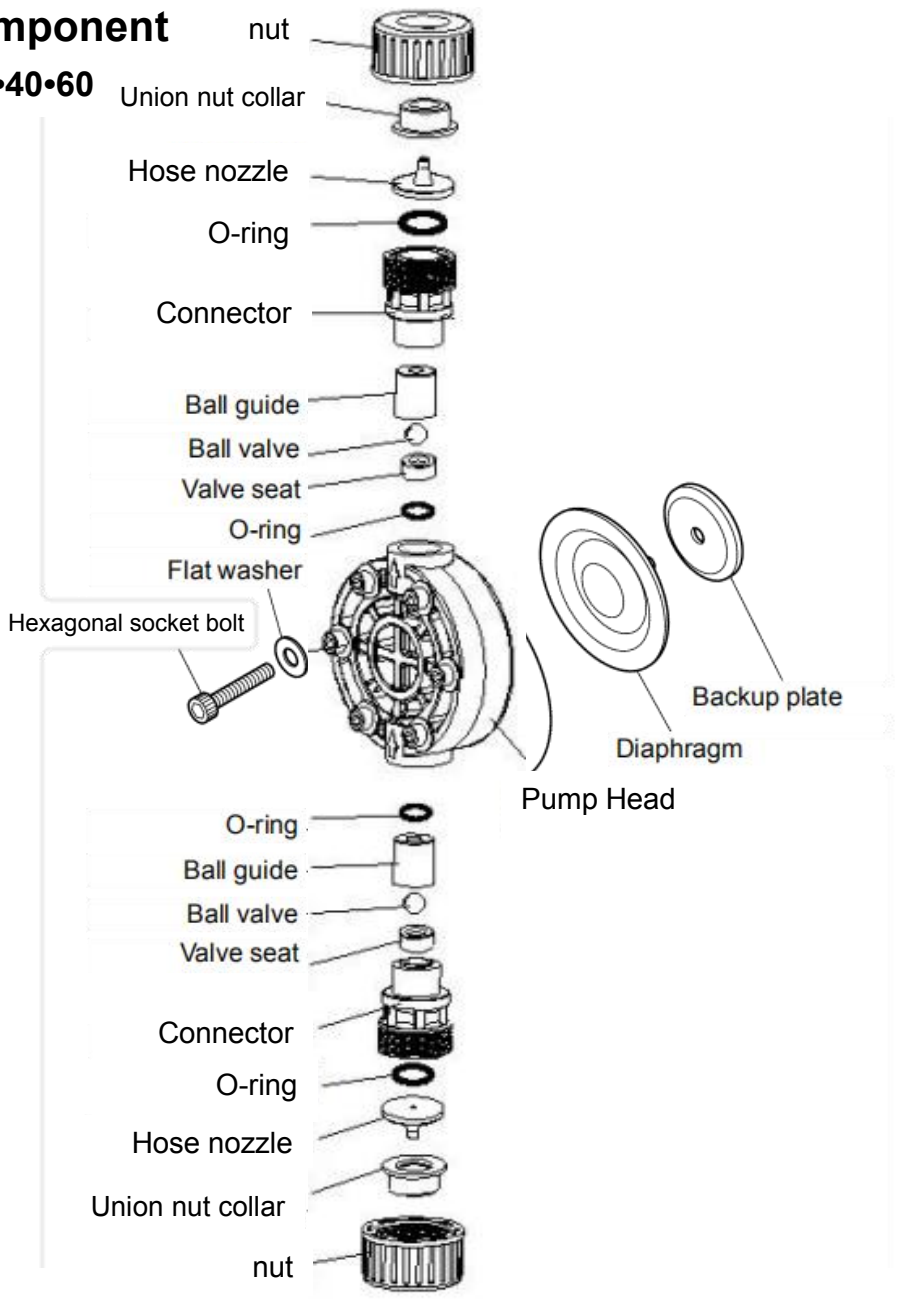
For your safety, wear rubber gloves, a protective mask, and safety glasses when handling chemicals.

CAUTION

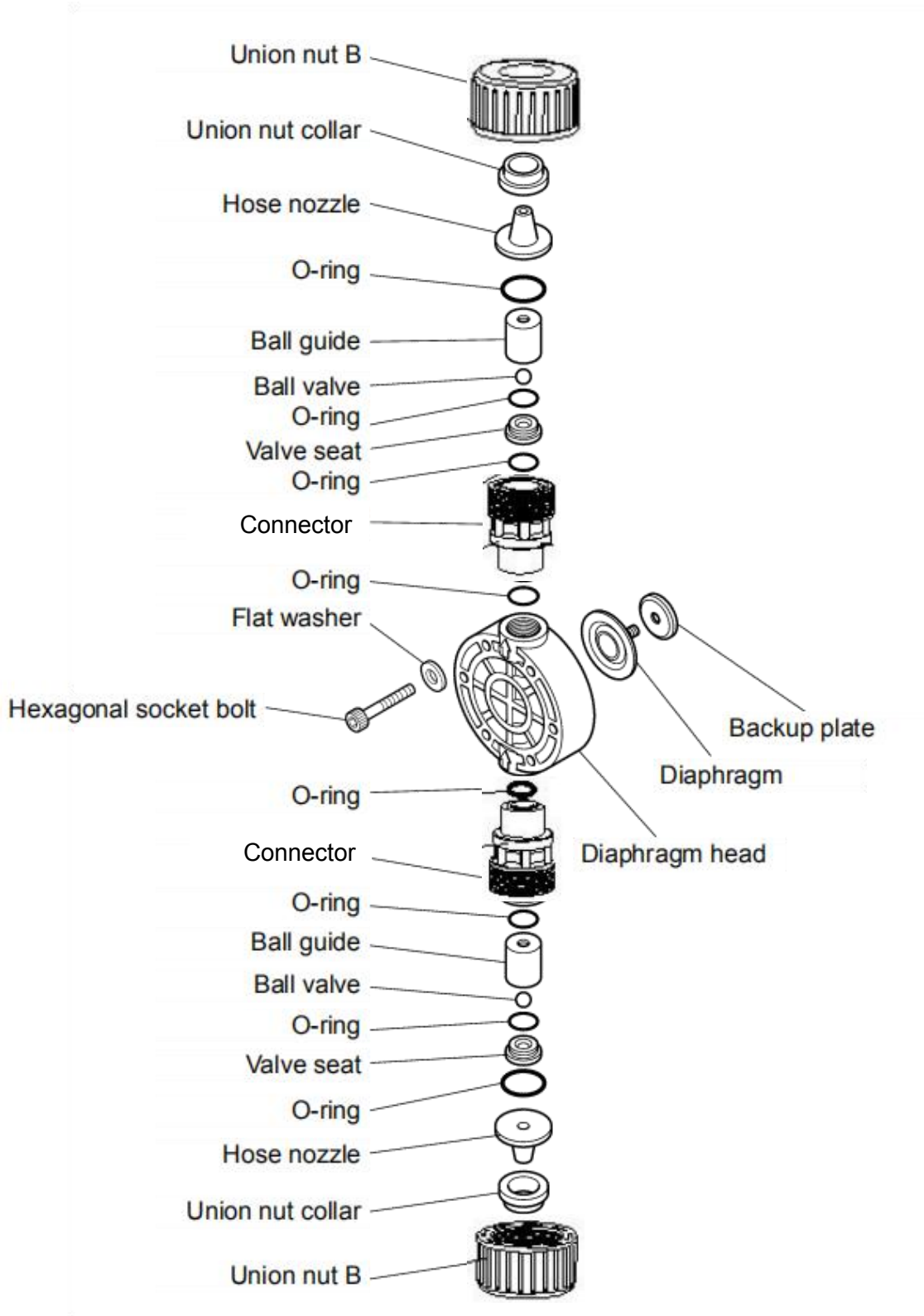
- Make sure the source power has been turned OFF.
- Release the pressure from the discharge hose. Disassemble the unit after atmospheric pressure is reached.
- During assembly, be sure not to drop any parts or leave out any parts from assembly.

11.1 Component

■ **GY 25•40•60**



■ GY 90•150•200


Union nut B
Union nut collar
Hose nozzle
O-ring
Ball guide
Ball valve
O-ring
Valve seat
O-ring
Connector
O-ring
Flat washer
Hexagonal socket bolt
Backup plate
Diaphragm
O-ring
Connector
Diaphragm head
O-ring
Ball guide
Ball valve
O-ring
Valve seat
O-ring
Hose nozzle
Union nut collar
Union nut B

11.2 Consumables

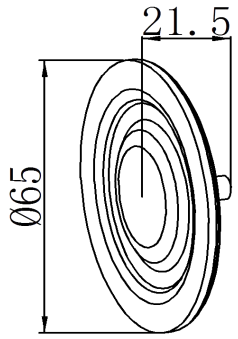
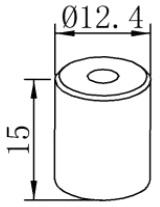
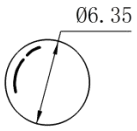
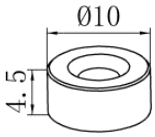
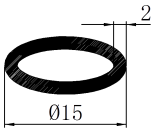
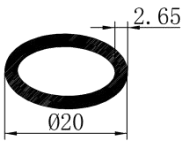
TIP

We recommend that you prepare consumables (a set of spare parts for the liquid ends).

ATTENTION

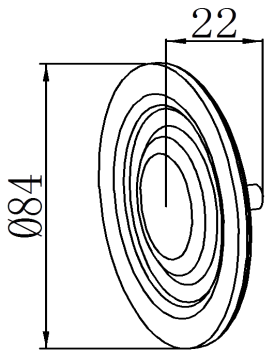
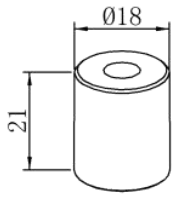
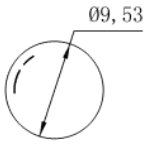
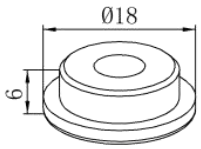
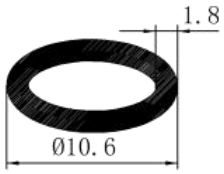
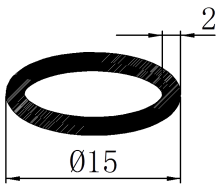
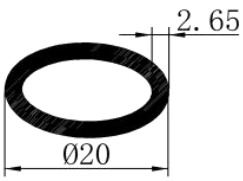
Replace supplies one year after start of use, regardless of total operating time.

■ GY 25•40•60

Part name	External view, dimensions (mm)	Material	Qty
(1) Diaphragm		PTFE/ EPDM	1
(2) Ball guide		PVC	2
(3) Ball valve		Ceramic	2
(4) Valve seat		FKM, EPDM	2
(5) O-ring		FKM, EPDM	2
(6) O-ring		FKM, EPDM	2

11. Spare Parts

■ GY 90•150•200

Part name	External view, dimensions (mm)	Material	Qty
(1) Diaphragm		PTFE/ EPDM	1
(2) Ball guide		PVC	2
(3) Ball valve		Ceramic	2
(4) Valve seat		PVC	2
(5) O-ring		FKM, EPDM	2
(6) O-ring		FKM, EPDM	2
(7) O-ring		FKM, EPDM	2

11.3 Ball valve

(1) Turn the power OFF.

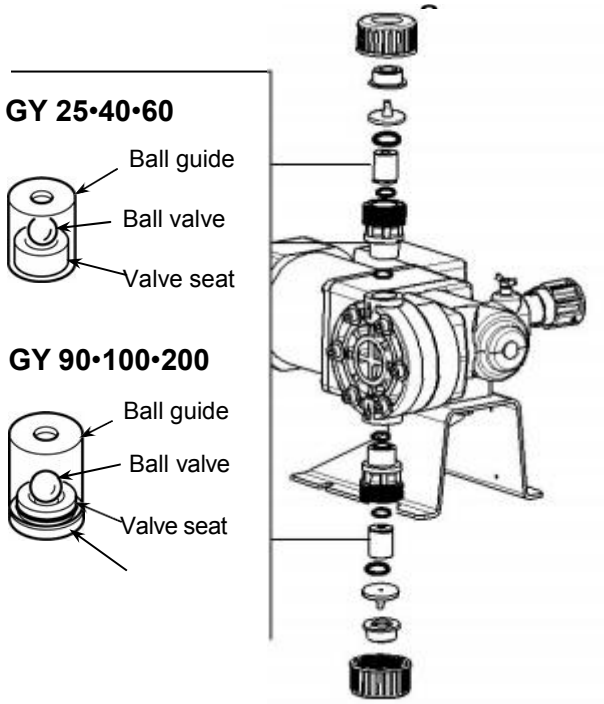
(2) Release the pressure from the discharge pipe, then remove the hose connection.

(3) Remove the hose joint.

(4) Remove the ball guide, ball valve, and valve seat on the discharge and suction sides.

(5) Set the new ball valve in place. Re-assemble the pump in reverse order of disassembly.

(6) After assembly, operate the pump and vent the air. Confirm that the area where the valve is connected has no leaks.



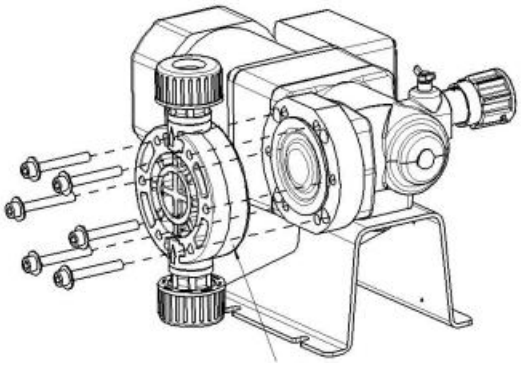
11.4 Diaphragm

(1) Turn the power OFF.

(2) Release the pressure from the discharge pipe, then remove the hose connection.

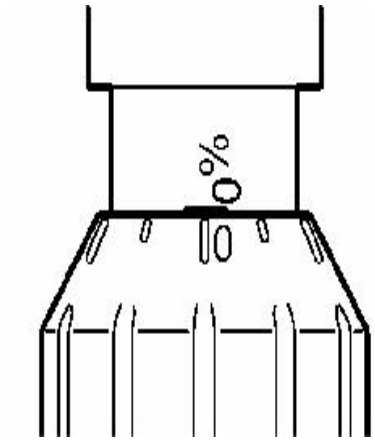
(3) Remove the 6 bolts from the diaphragm head, then remove the diaphragm head.

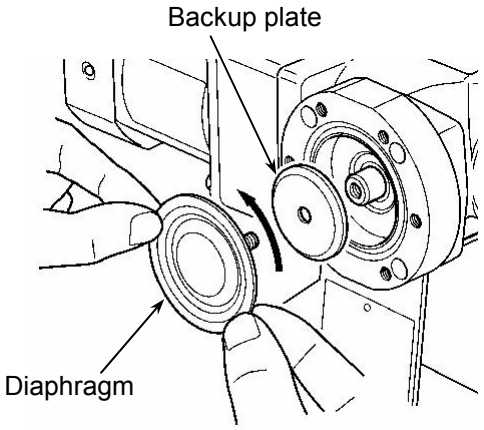
(4) Adjust the stroke length to 0%. Remove the diaphragm by turning it counter-clockwise. (Remove the backup plate at the same time.)



CAUTION

Do not omit the cover plate when assembling



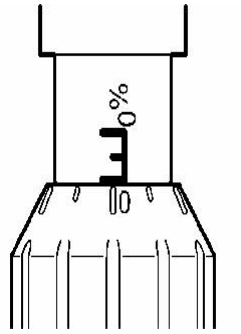


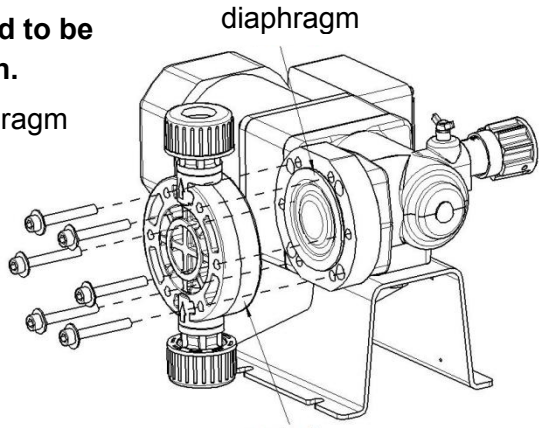
(5) Install a new diaphragm.

CAUTION

Holding the circumference of the diaphragm, turn it clockwise until it stops. The diaphragm does not need to be strongly tightened. It may break if tightened too much.

(6) Adjust the stroke length to 100%. Re-attach the diaphragm head.



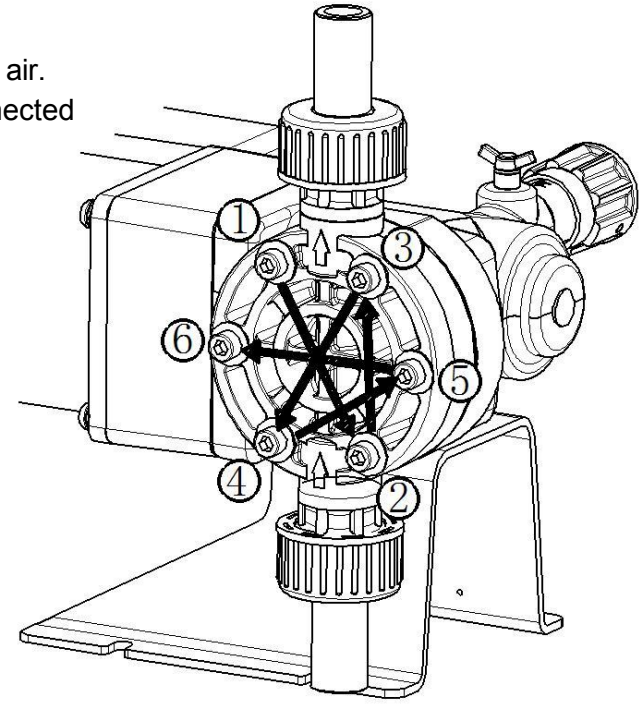


Pump head

CAUTION

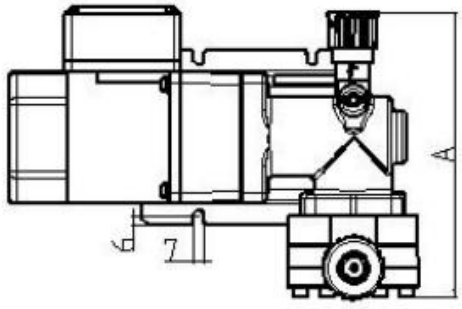
Fasten the bolts for the diaphragm head in their numerical order. Make sure they are not fastened unevenly. If fastened unevenly, the liquid may leak.

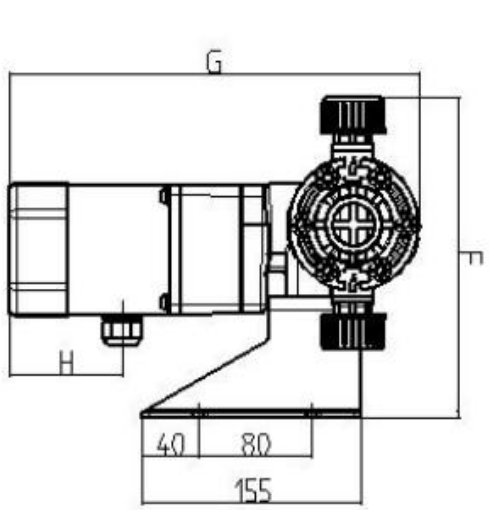
(7) After assembly, operate the pump and vent the air. Confirm that the area where the diaphragm is connected has no leaks.

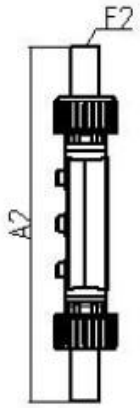


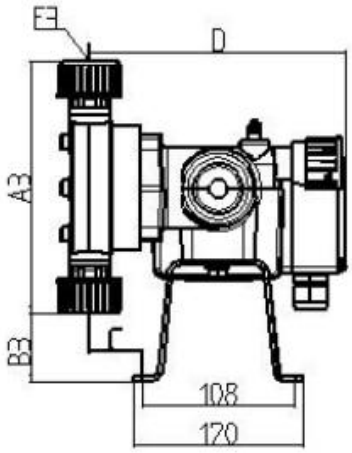
12. Dimensions

Units: mm









型式	材质	A	A2	A3	B3	C	D	E2	E3	F	G	H
GY25 •40 •60	PVC	198	246	174	46	29	180	Φ20	Φ8 X ϕ 13	221	289	80
GY90 • 150	PVC	211	263	192	38	29	188	Φ20	Φ8 X ϕ 13	229	300	80

13. Warranty and Repair Procedures

13.1 Warranty

This provision, if attached to the quotation, constitutes a quotation together with the specifications, and you are deemed to have approved each item described below as a part of the contract unless a written separate agreement has been made when the contract has been concluded. Even if a part of this provision will not be applied by agreement with you, other items except for the associated items shall still become effective.

Warranty provision

1. Warranty

1) Our warranty period based on this provision shall be one year from the delivery date of the object product from us.
2) If our product to be delivered has any failure due to a cause which is clearly judged to be based on a defect of our manufacturing or material, we will assume responsibility for this failure.

2. Limit of warranty

If it is confirmed by both you and us that any defect or trouble has occurred due to any of the following items, we will be free from warranty responsibility based on this provision and the other responsibility of any nature and any kind.

1) If the object product was used under conditions different from our handling instructions, or specifications or the other normal usage.
2) If installation, piping, operation, running, repair or rework of the object product was improperly or inaccurately carried out by any person other than us.
3) If the object product was used for purpose or by usage not specified in the specifications or the product instruction manual.
4) If any failure or damage was caused due to chemical or fluid frictional corrosion by liquid to be handled.
5) If any failure or damage was caused due to a fact that there exists a defect in material of a part which does not directly contact the handling liquid which cannot be found by a normal technical level in the manufacturing process of the object product.
6) If any failure or damage was caused due to use of parts which we do not manufacture or do not specify.
7) If the object product was broken by frost in another status which is not under conditions that the tank discharge port is opened and water is discharged and then the inside is dried.
8) If occurrence of vibration and pressure increase in the piping system of the object product executed by us is due to another factor in the related system.

3. Content of warranty

Our warranty for the object product shall be limited to repair of defective parts or offering of replacement products by us. Please note that we will provide or replace parts such as packing, gaskets, bearings and filtering sand which have consumable characteristics at a charge even in the warranty period. If our technician is dispatched to the specified place and the defective parts are repaired or replaced by the technician based on your request, expense to dispatch our technician shall be separately paid by you based on Article 9.

We will assume no responsibility of any nature and any kind for damages such as passive damage or indirect damage, spillover damage other than

contracted objects and damage caused by nuclear accidents in addition to the Article 2.

13.2 Repair procedures

If you find any abnormality during use of this pump, immediately stop operation and inspect whether it is due to failure. Refer to the section of “Troubleshooting” on page 16.

(1) When requesting repair, contact the dealer from which you ordered, or our nearest headquarters, branch or sales office listed on the back cover.
(2) When requesting repair, inform us of the pump model No. and serial No. described on the nameplate, the operating period and operating status and the failure location and its situation.
(3) When returning the pump to us for repair, make sure to sufficiently clean the inside of the pump before returning it because it is dangerous that the handled liquid remaining in the pump flows out during transportation.

ATTENTION **Instruction Manual may be subject to change without prior notice**

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