IWAKI PUMPS

IWAKI Air Pump

APN-450

Instruction Manual

⚠Read this manual before use of product

Thank you for selecting an Iwaki APN-450 Air Pump. This instruction manual deals with *"Safety instructions"*, *"Outline"*, *"Installation"*, *"Operation"* and *"Maintenance"* sections. Please read through this manual carefully to ensure the optimum performance, safety and service of your pump.

Contents

This instruction manual should be kept on hand by the end user for quick reference.

Contact us or your nearest dealer if you have any questions.

Safety instructions

For the Safe and Correct Handling of the Pump

- "Safety Instruction" section deals with important details about handling of the product. Before use, read this section carefully for the prevention of personal injury or property damage.
- Observe the instructions accompanied with "WARNING" or "CAUTION" in this manual. These instructions are very important for protecting users from dangerous situations.
- The symbols on this instruction manual have the following meanings:

⚠ **WARNING**	**Nonobservance or misapplication of "Warning" sections could lead to a serious accident which may result in death.**
⚠ **CAUTION**	**Nonobservance or misapplication of "Caution" sections could lead to a personal injury or property damage.**

Types of Symbols

Indicates that "Warning" or "Caution" must be exercised. Inside this triangle, a concrete and practical image provided as a warning or caution message is depicted.

Indicates a prohibited action or procedure. Inside or near this circle, a concrete and practical image of the activity to be avoided is depicted.

Indicates an important action or procedure which must be performed or carried out without fail. Failure to follow the instructions herein can lead to malfunction or damage to the pump.

⚠ 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.

Safety instructions

⚠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

- **Do not use the pump in any condition other than its intended purpose**
  The use of the pump in any application other than those clearly specified may result in injury or damage. Use the pump in a specified condition.


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 alternations to the pump.


No Remodeling

- **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.


Prohibited

- **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 MSDS precautions from the solution supplier.


Wear protective gear

- **Do not touch the pump or pipe with bare hands**
  The surface temperature of the pump or pipe rises high along with gas temperature in or right after operation.

⚠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.


Prohibited

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


Electrical shock

- **Do not install/store the pump:**
  - In a flammable/corrosive atmosphere.
  - Where operating (or storage) temperature can fall below 0ºC or exceed 40ºC.


Prohibited

Safety instructions

⚠CAUTION

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

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

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

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

- **Preventative maintenance**
  Risk of fire or electric shock. The cable is not replaceable. The whole pump unit needs to be replaced when the cable is damaged.

- **Do no use a damaged 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 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.

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

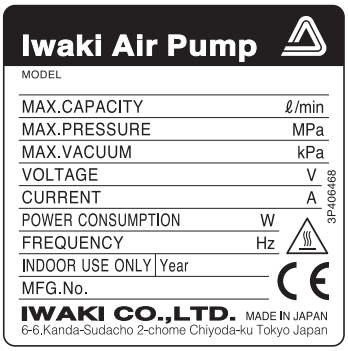
- **Damaged power cable**
  Do not use any damaged power cable for the prevention of a fire or electrical shock. The cable is not replaceable, so that the whole pump unit needs to be replaced when the cable is damaged.

- **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.

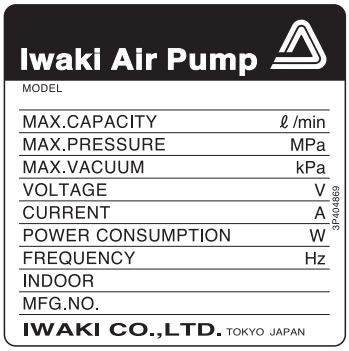
- **Grounding**
  Risk of electrical shock! Always properly ground the pump. Conform to local electric codes.

Outline

1. Unpacking & Inspection



Spec label for the European market



Spec label for any area other than the European market

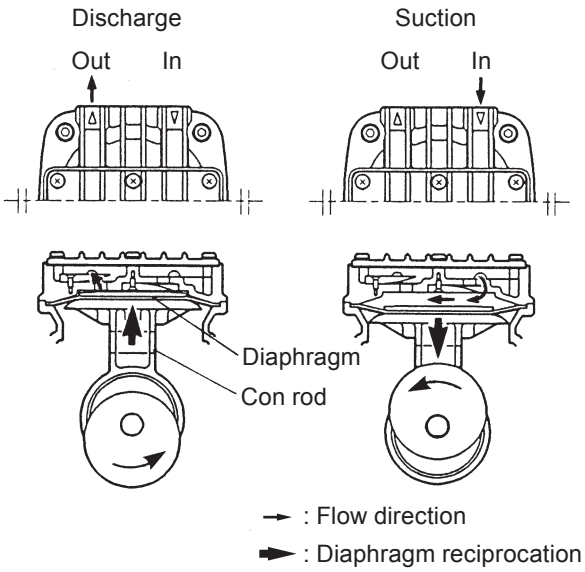
Open the package and check that the product conforms to your order. If any problem or inconsistency is found, immediately contact your distributor.

1. Check the nameplate to see if the information such as model codes, discharge capacity and discharge pressure are as ordered.
2. Check for transit damage, deformation and loose bolts.

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

2. Product outline

The APN-450 is a diaphragm type air pump.



■ Principle of operation

The rotary motion of the motor is converted through a connecting rod to the reciprocation of the diaphragm in the pump chamber, where gas is transferred from the inlet to outlet.

3. Specification

■ Pump

50/60Hz

Model		Max. air flow	Max. discharge pressure	Max. vacuum	Connection I.D.		Weight	Lowest starting temperature
					Tube	Thread		
APN-450	NAT	50/60 L/min	0.1MPa	13.33kPa [abs.]	ø12	Rc1/4	12kg	0°C
	NST						14.2kg	
APN-P450	NAT	100/110 L/min					12.8kg	
	NST						17.1kg	
APN-S450	NAT	50/60 L/min	-	3.33kPa [abs.]			13.0kg	
	NST						17.4kg	

■ Motor

Model		Input power				Output power	Power current			
		100V	115V	200V	220/240V	100/115/200/220/240V	100V	115V	200V	220/240V
APN-450	NAT	295/345W (50/60Hz)	-	310/323W (50/60Hz)	310W (50Hz)	200W	3.2/3.5A (50/60Hz)	-	1.60/1.65A (50/60Hz)	1.5A (50Hz)
	NST									
APN-P450	NAT		360W (60Hz)	310/380W (50/60Hz)				3.5A (60Hz)	1.60/1.90A (50/60Hz)	
	NST									
APN-S450	NAT		-	310/323W (50/60Hz)				-	1.60/1.65A (50/60Hz)	
	NST									

NOTE1. Observe the maximum discharge pressure of 0.1MPa.
NOTE2. Allowable gas temperature range is 0-40°C.
NOTE3. Allowable ambient temperature range is 0-40°C.
NOTE4. The air flow, maximum discharge pressure and maximum vacuum are obtained when ambient temperature is 20°C and change depending on gas characteristics and temperature fluctuation.
NOTE5. Allowable maximum noise level is 63dB at 1m (A scale).

■ Gas contact materials

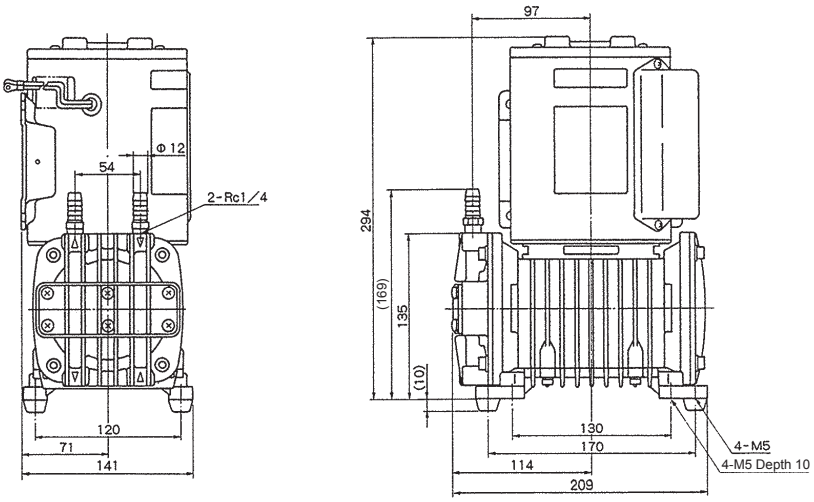
Parts \ Type	NAT	NST
Pump head	ADC12	SUS304
Valve	SUS631-CSP	
Diaphragm	PTFE (PTFE+EPDM)	
Retainer plate	ADC12	SUS304
Valve restraint	ADC12	GF reinforced PPS
Gasket	EPDM	FKM
Cover	ADC12	SUS304
Seat	PTFE	
Fitting	SUS304 equivalent	
Screw	SUS304 equivalent	
Tube	Nylon	ETFE

ADC12 : Aluminium die casting
SUS304 : Austenite stainless steel (18Cr-8Ni)
SUS631-CSP : Stainless steel for springs (17-Cr-7Ni-1Al)
PTFE : Polytetrafluoroethylene
EPDM : Ethylene propylene diene Monomer
PPS : Polyphenylene sulphide
FKM : Fluorine-contained rubber
ETFE : Ethylene tetrafluoroethylene

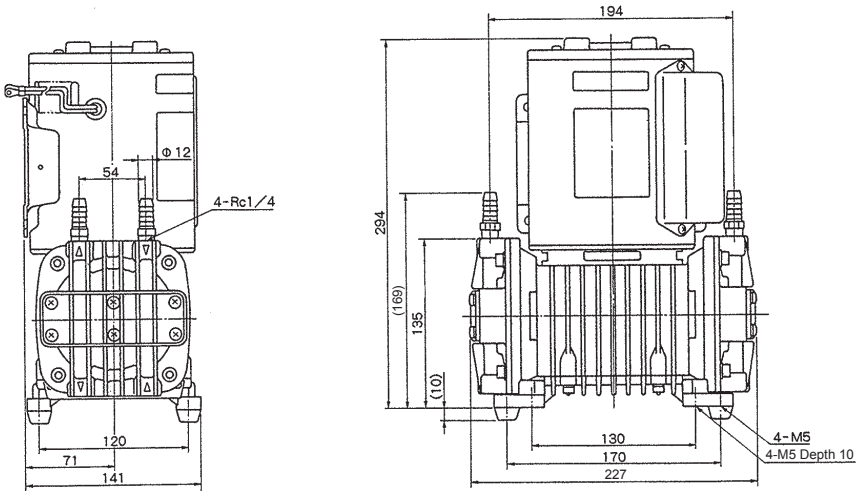
4. Dimensions

■ Aluminium pump head type

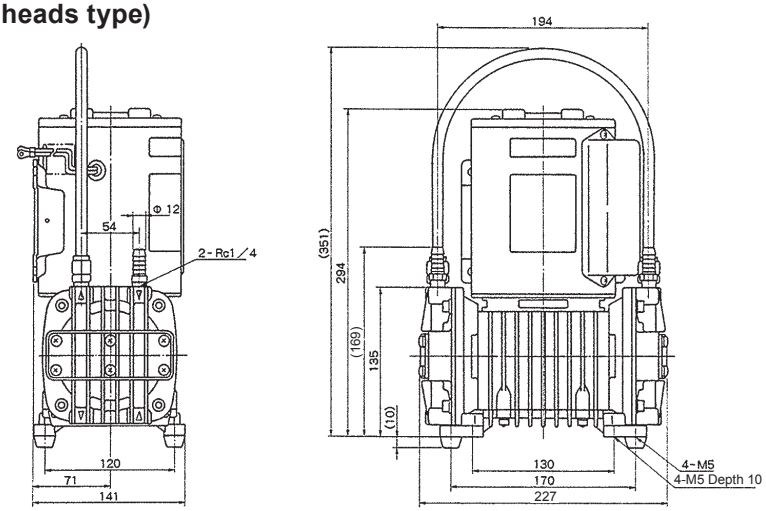
APN-450 (Single head type)



APN-P450 (Twin parallel heads type)

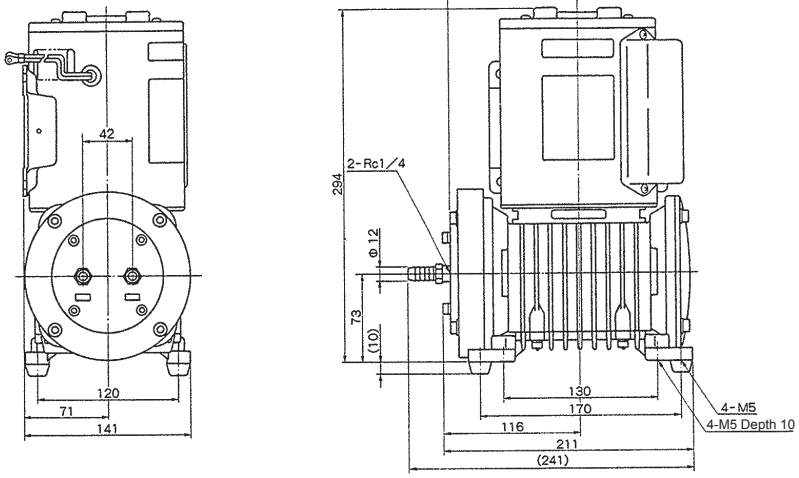


APN-S450 (Twin series heads type)

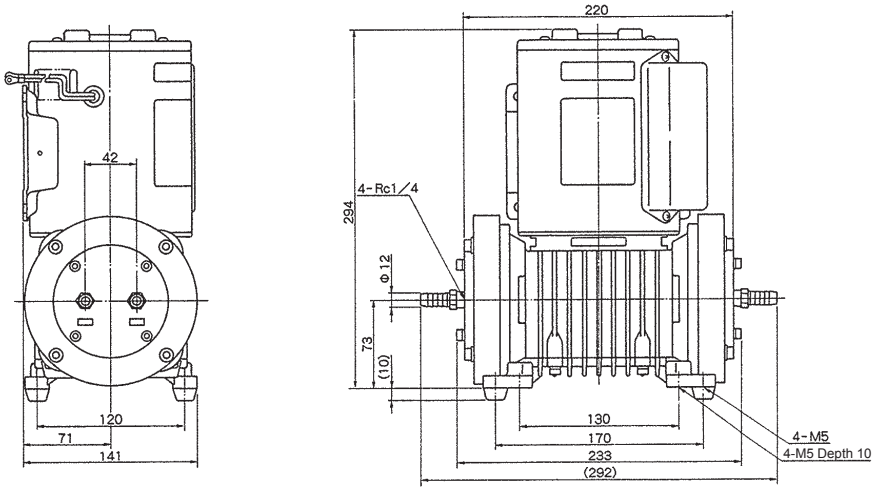


■ Corrosive resistant stainless steel pump head

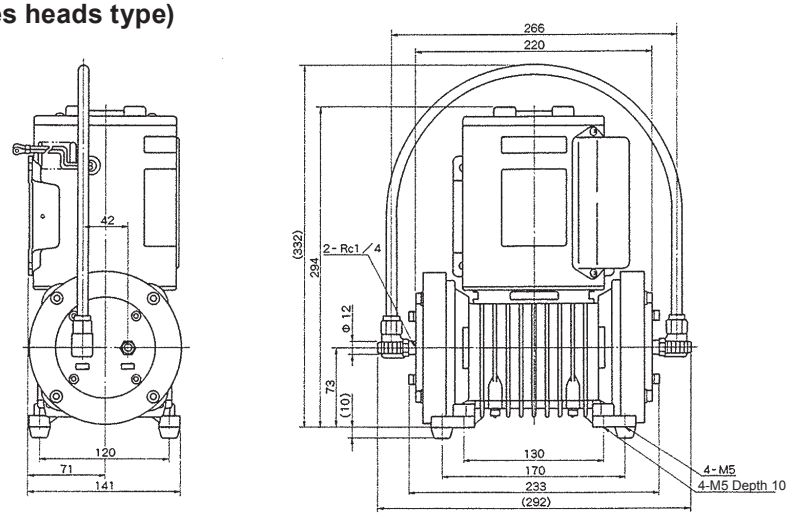
APN-450 (Single head type)



APN-P450 (Twin parallel heads type)

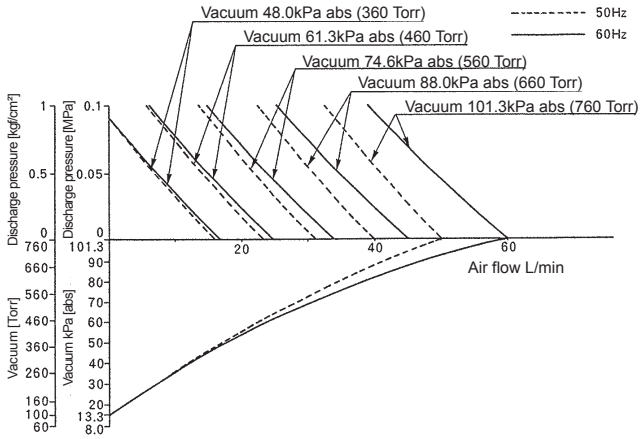


APN-S450 (Twin series heads type)

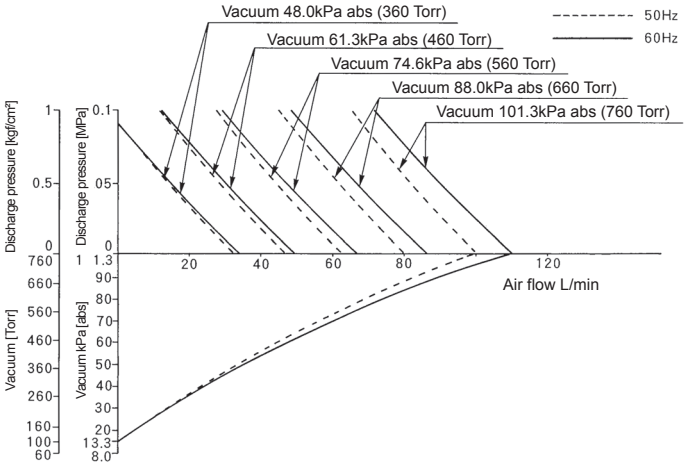


5. Performance curves

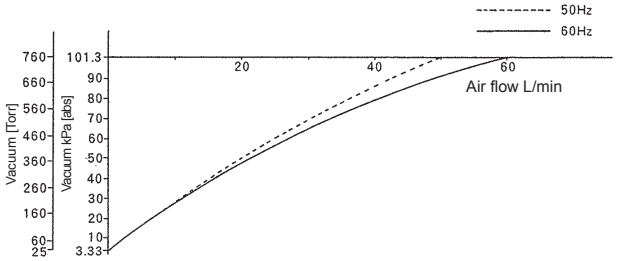
■ APN-450 (Single head type)



■ APN-P450 (Twin parallel heads type)

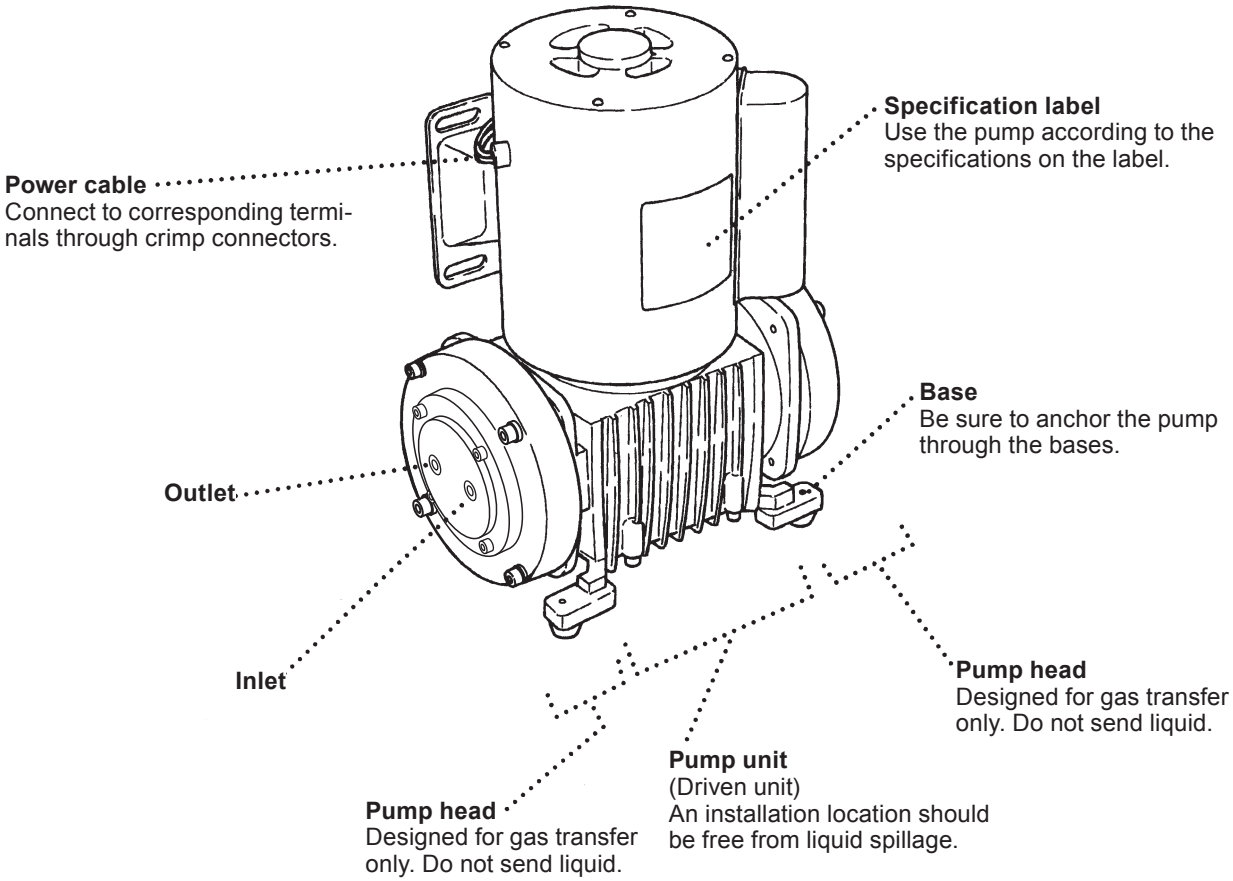


■ APN-S450 (Twin series heads type)



6. Overview

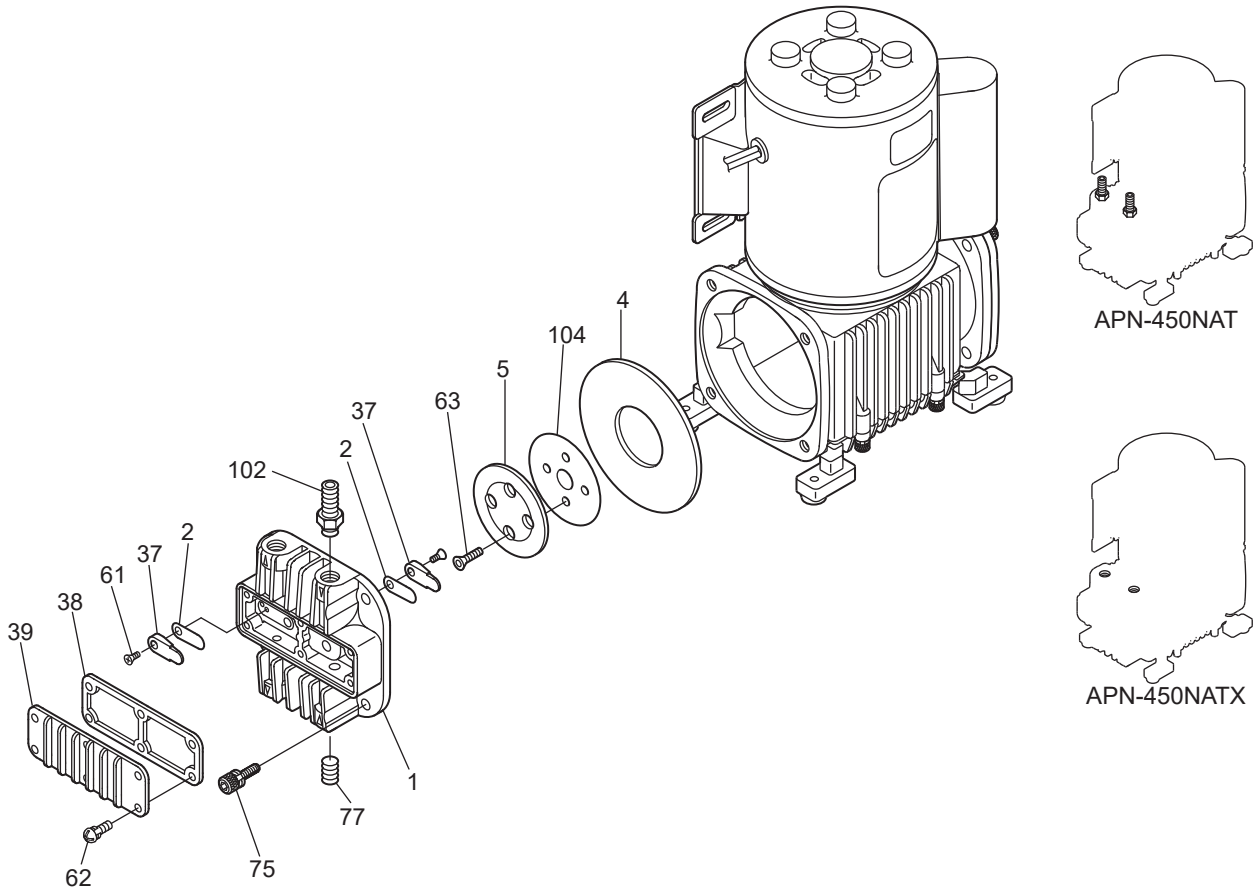
The illustration below shows an APN-450 twin head type.



7. Exploded view

■ APN-450NAT/NATX

See this exploded view when dismantling/assembling the pump. Do not dismantle the pump beyond the extent of the instructions on page 28-31, "Wear parts replacement".

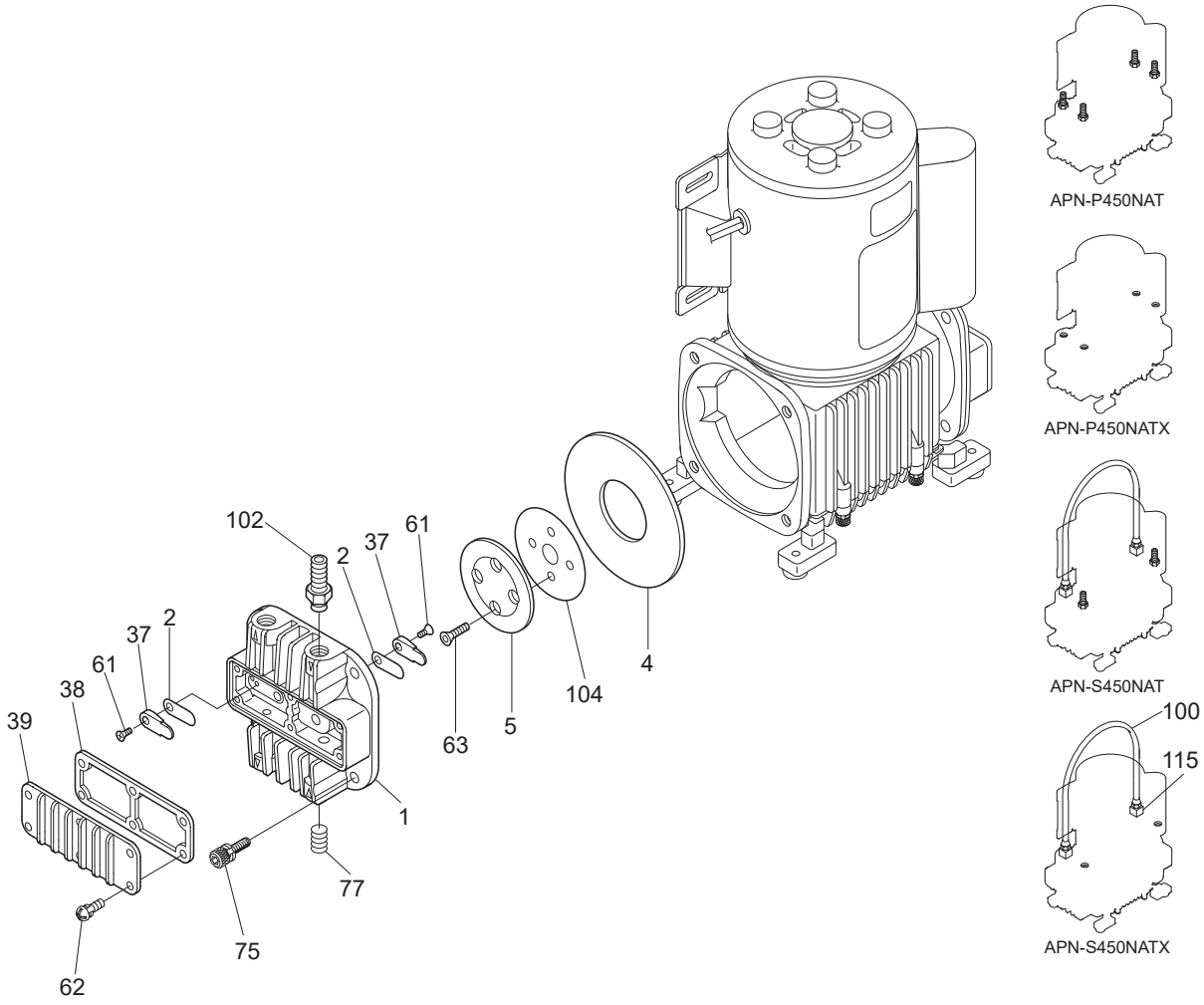


No.	Part names	Q'ty	No.	Part names	Q'ty
1	Pump head	1	61	Screw	2
2	Valve	2	62	Screw	6
4	Diaphragm	1	63	Screw	4
5	Retainer plate	1	75	Hex. socket head bolt	8
37	Valve restraint	2	77	Plug	4
38	Gasket	1	102	Fitting*	2
39	Cover	1	104	Seat	1

*NAT type only

■ APN-P/-S450NAT/NATX

See this exploded view when dismantling/assembling the pump. Do not dismantle the pump beyond the extent of the instructions on page 28-31, "Wear parts replacement".

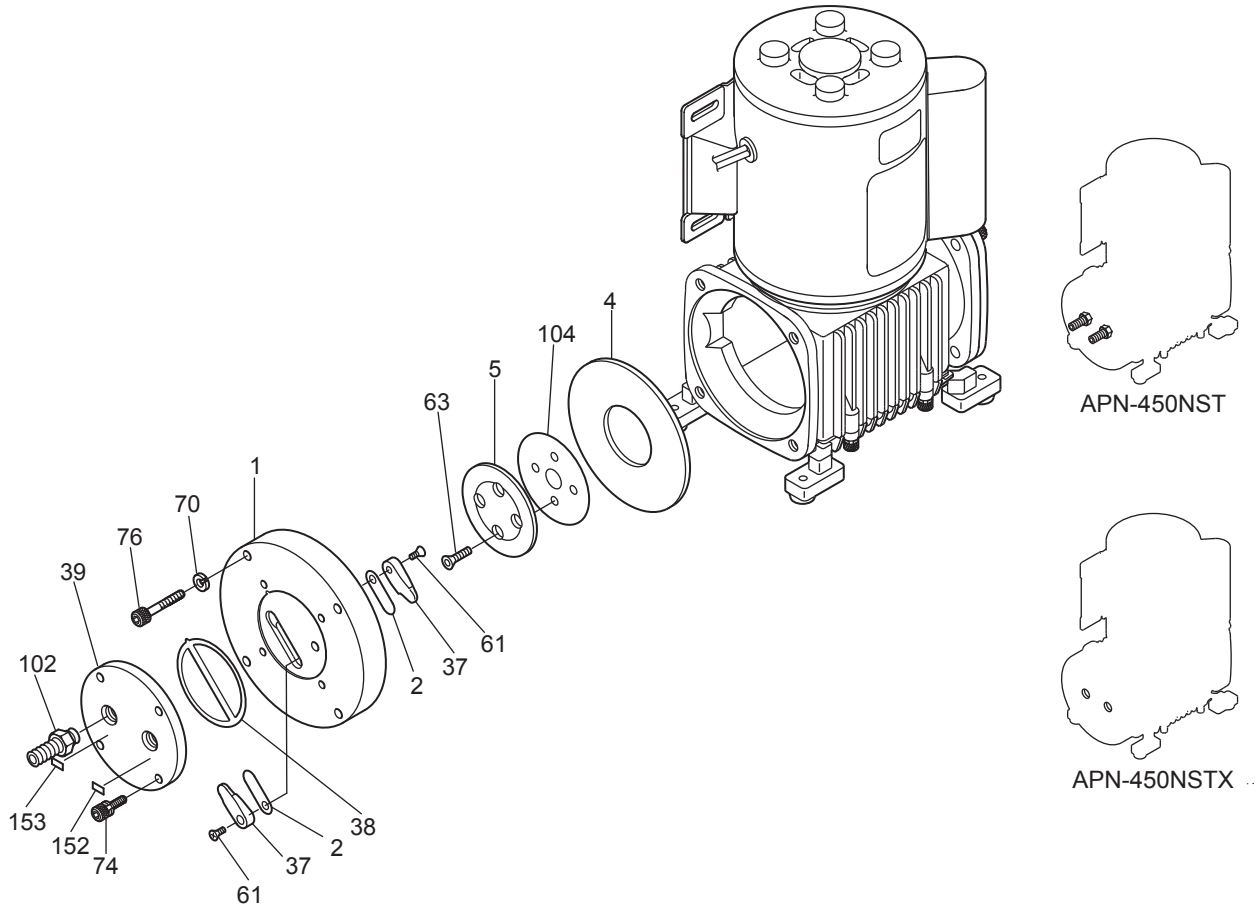


No.	Part names	Q'ty	No.	Part names	Q'ty
1	Pump head	2	62	Screw	12
2	Valve	4	63	Screw	8
4	Diaphragm	2	75	Hex. socket head bolt	8
5	Retainer plate	2	77	Plug	6
37	Valve restraint	4	100	Tube*¹	1
38	Gasket	2	102	Fitting*²	4
39	Cover	2	104	Seat	2
61	Screw	4	115	Joint*³	2

*¹APN-S type only
*²APN-P450NSTX type only
*³APN-S type only

■ APN-450NST/NSTX

See this exploded view when dismantling/assembling the pump. Do not dismantle the pump beyond the extent of the instructions on page 28-31, "Wear parts replacement".

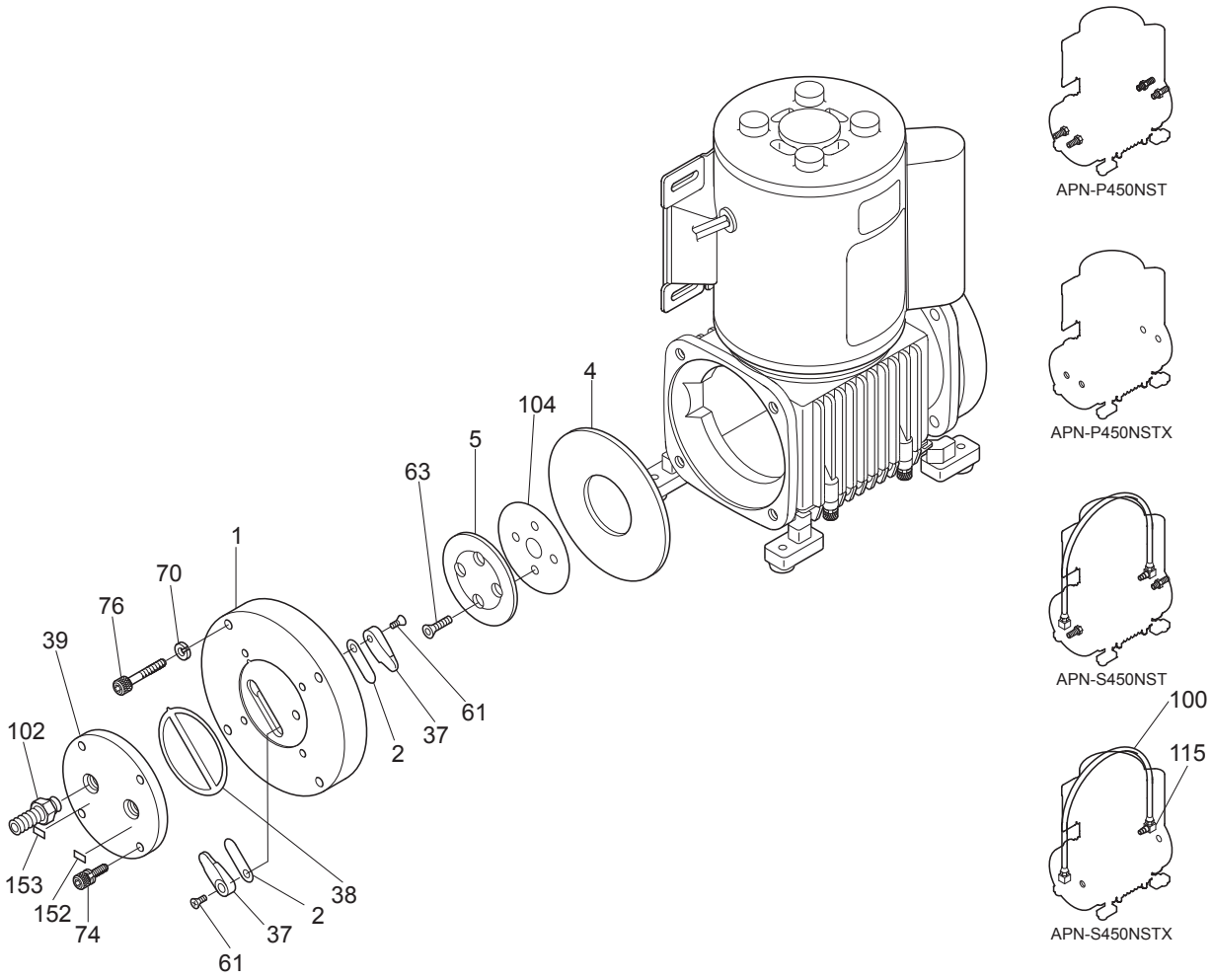


No.	Part names	Q'ty	No.	Part names	Q'ty
1	Pump head	1	63	Screw	4
2	Valve	2	70	Spring washer	4
4	Diaphragm	1	74	Hex. socket head bolt	4
5	Retainer plate	1	76	Hex. socket head bolt	4
37	Valve restraint	2	102	Fitting*	2
38	Gasket	1	104	Seat	1
39	Cover	1	152	Name plate (IN)	1
61	Screw	2	153	Name plate (OUT)	1

*NST type only

■ APN-P/-S450NST/NSTX

See this exploded view when dismantling/assembling the pump. Do not dismantle the pump beyond the extent of the instructions on page 28-31, "Wear parts replacement".



No.	Part names	Q'ty	No.	Part names	Q'ty
1	Pump head	2	70	Spring washer	8
2	Valve	4	74	Hex. socket head bolt	8
4	Diaphragm	2	76	Hex. socket head bolt	8
5	Retainer plate	2	100	Tube*¹	1
37	Valve restraint	4	102	Fitting*²	4
38	Gasket	2	104	Seat	2
39	Cover	2	115	Joint*³	2
61	Screw	4	152	Name plate (IN)	1
63	Screw	8	153	Name plate (Out)	1

*¹APN-S type only
*²APN-P450NSTX type only
*³APN-S type only

Installation

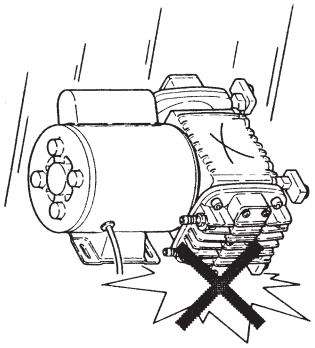
Installation

1. Before installation

Read through instructions in this section to ensure the optimum performance, safety and service of your pump.

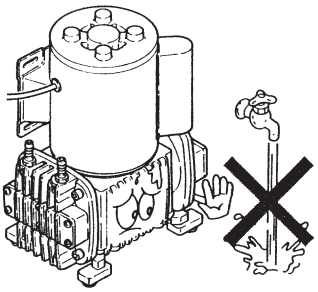
⚠ WARNING

- **Do not operate the pump in a flammable atmosphere**
  Do not place explosive or flammable material near the pump.
- **Do not use a damaged pump**
  Use of a damaged pump could lead to an electric shock or death.

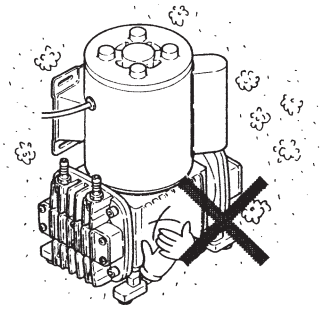


■ Precautions

- Use care handling the pump. Do not drop. An impact may affect pump performance.

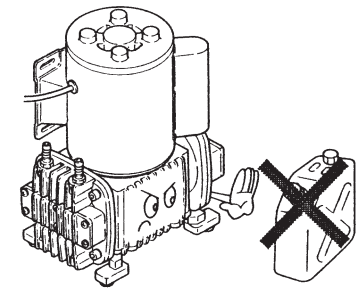


- Install the pump where it can be kept dry. Avoid using wet gas, or internal condensation will build up and consequently result in performance deterioration or the short lives of valves and a diaphragm.

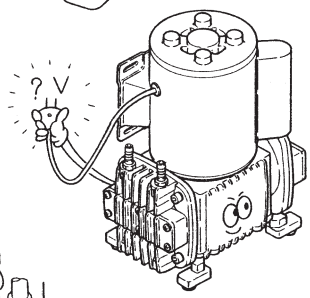


- Do not use the pump in a dusty place. Be sure to provide one end of a suction line with a filter to prevent foreign matters from getting into the pump. Otherwise, the pump performance may reduce or the lives of valves and a diaphragm may remarkably shorten.

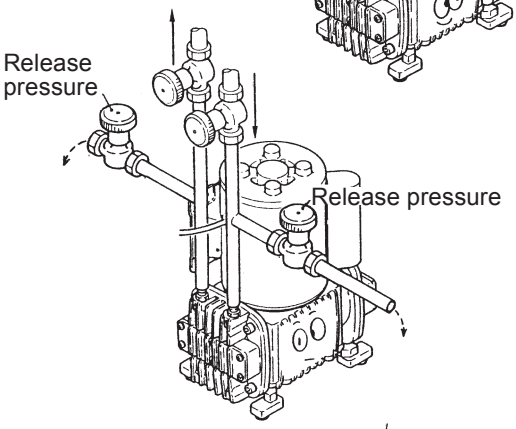
Installation



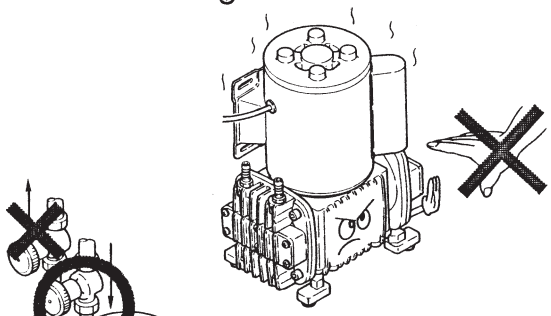
● Do not install the pump in a corrosive or flammable gas atmosphere. Keep good ventilation in a working area. Ambient temperature should not fall below 0°C or exceed 40°C. Observe the allowable gas temperature range of 0 and 40°C.



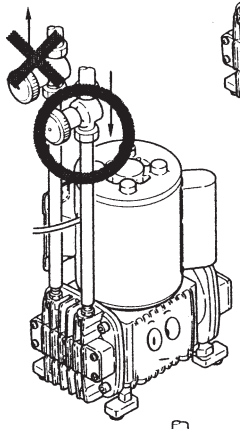
● Observe the rated voltage specified on the name plate. Applying any voltage than the rated one may result in failure.



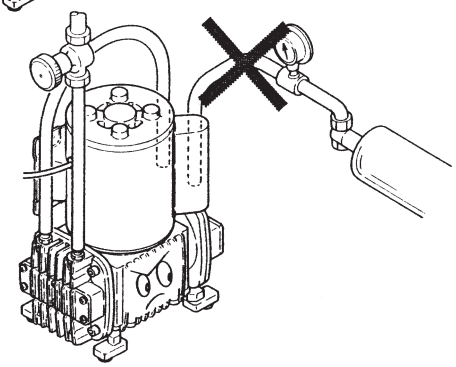
● The pump can not start with full discharge/suction pressure. Remove pressure before operation. After a long period of stoppage, pump performance at the beginning of operation becomes occasionally unstable. In this case, warm the pump up for 10 minutes with no discharge line pressure.



● Surface temperature may rise high in operation. Do not touch the pump body directly or place the objects which may be deformed by heat close to the pump.

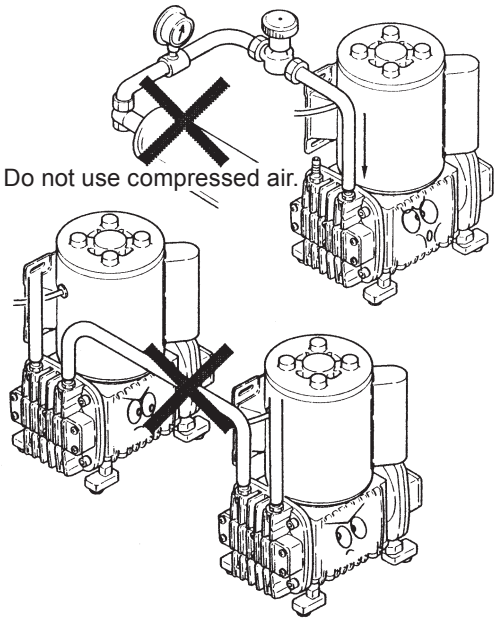


● Always use a suction valve to adjust an air flow.



● The APN-S450 is designed for vacuum application only. The outlet must be open-ended to the atmosphere.

Installation



- If the compressed air (higher pressure than atmospheric pressure) is transferred to the pump, sharp deterioration to the lives of the valves, diaphragm and bearing may result. Always keep atmospheric or lower pressure in the suction line.

- Do not tube two or more pumps in series. It may prevent the motor from starting and lead to a burnout.

- Indoor use only
  This product is not dust-/water-proof. Do not install it out of doors, in a humid place or a place where the pump can get wet.

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

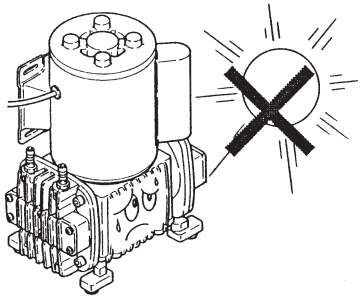
2. Installation/Tubing/Electrical wiring

⚠ WARNING

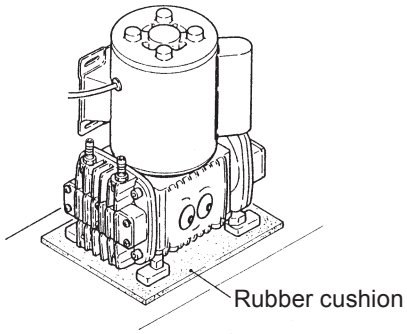
If you notice any abnormal or dangerous conditions, suspend operation immediately and inspect/solve problems.

■ Installation

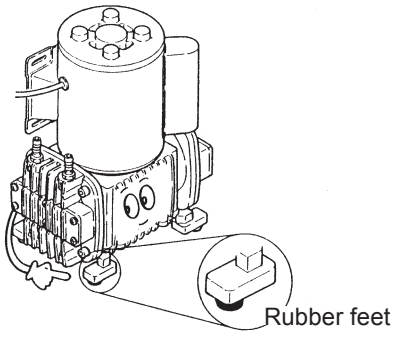
1. Ambient temperature around the pump should not fall below 0°C or exceed 40°C. Observe the allowable maximum ambient humidity of 90%RH. This product is designed for indoor use only.



2. Allow sufficient space around the pump for easy access and maintenance. Place a rubber cushion under the pump to isolate it from vibration. Anchor the pump through 8 thread holds beneath the base.



3. Fit the rubber feet to the base when just placing the pump on a flat surface.

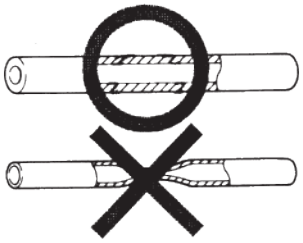


4. Cut tube ends flat beforehand.

Installation

■ Tubing

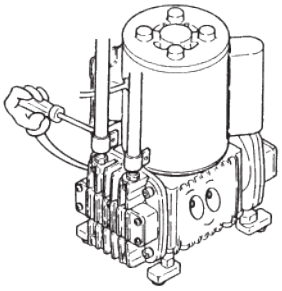
1. Use the vinyl tubes sustainable under the maximum possible pressure. The use of a thin and light tube may reduce suction force and an air flow.



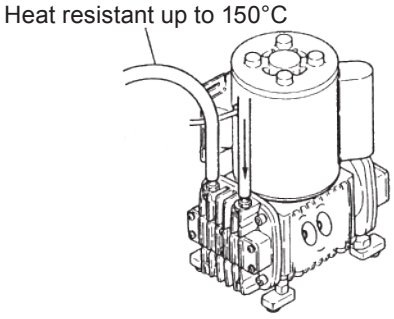
⚠CAUTION
Do not have tubing bent or pressed.
Otherwise, the tube end may break.

2. The short tubing with the minimum bends is optimal to reduce resistance.

3. Be sure to secure tube connection by using a screw/band tube clamp in order to eliminate the possibility of leakage.

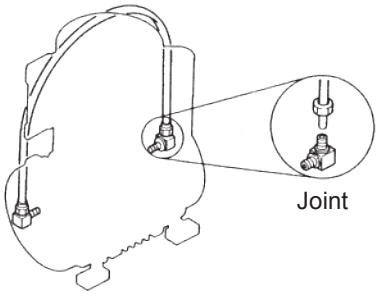


4. In case of providing a discharge line to the outlet of the APN-450 single head type or the APN-P450 twin parallel head type, tube material should be heat-resistant of 150°C or more. Hot gas may be discharged through the outlet depending on operating conditions.



5. The APN-S450 twin series heads type needs the attached tube connected via the joints. First fit the joints to the tube ends and connect them to the appropriate inlet and outlet of the pump.

NOTE: If the suction line connection is imperfect, the pump entrains air and so the full performance will not be achieved.



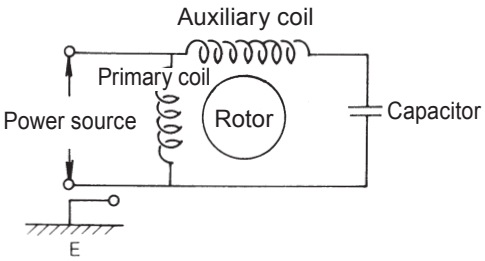
■ Electrical wiring

Electrical wiring must be performed by a qualified electrician. It is not the manufacture's responsibility for personal injury or property damage resulting from unauthorized service. Contact us or your nearest distributor for wiring as necessary.

<Before wiring>

1. Check that the main power is turned off.

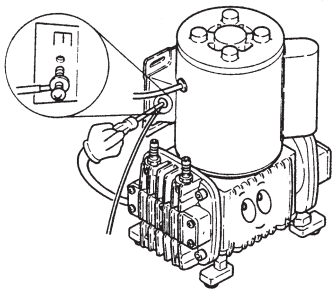
2. Electrical work should be performed in accordance with local electric codes, with an appropriate wire gauge or so.



3. Apply the specified power voltage. See the spec label.

4. When an earth leakage breaker is used and has tripped, always investigate and solve root causes. Be sure to unplug the pump before investigation is performed.

5. Earth the pump through the earth terminal with a M4 screw.



Operation

Operation

1. Before operation

1. Before pump operation, check that each tube connection is secured.

2. Check that a suction line is connected to the inlet and a discharge line to the outlet.

⚠CAUTION

If a suction line and a discharge line are connected the other way around, pumping process is inverted.

3. Check that the pump is firmly fixed on a mounting position.

2. Pump operation

Operate the pump according to the following steps.

No.	Procedure	Points to be Checked
1	Check tubing, wiring and voltage.	● See "■ Tubing" and "■ Electrical wiring" sections. ● Check the spec label to see if power supply voltage is correct.
2	Open valves.	● Fully open both discharge and suction lines.
3	Supply power to the pump.	● Smooth starting may not be obtained when ambient temperature is 10°C or below. In this case, run the pump with no discharge line pressure for a few minutes to warm it up.
4	Adjust air flow.	● Provide a running-in period before full scale operation. ● Always adjust an air flow by a suction valve.
5	Check the operation	● After starting, check a pressure gauge to see if suction and discharge line pressure are correct and an air flow meter to see if the specified air flow is obtained. ● Keep a suction line pressure at or below atmospheric pressure. ● 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.

■ Stop and storage

● Before a long period of stop (1 week or more):
- Release pressure from the pump/tubing and turn off the main power.
- Keep the inside of the pump head free from residual gas.

● Do not store the pump:
- Where ambient temperature falls below 0°C or exceeds 40°C.
- In a flammable or corrosive atmosphere.
- In a dusty/humid place.
- Under vibration.

Maintenance

Maintenance

1. Troubleshooting

If you notice any abnormal or dangerous conditions, suspend operation immediately and inspect/ solve problems. Contact us or your nearest distributor as necessary.

States	Possible causes	Solutions
Pump does not run.	The pump is not powered.	Check wiring.
	Motor failure	Replace with a new motor. Contact us.
	Plumbing damage or poor connection	Repair plumbing as necessary, or secure connection.
	Wear of an eccentric shaft	Replace the con rod unit. Contact us.
	Wear of the con rod unit bearing	Replace the con rod unit. Contact us.
	Wear of motor bearings	Replace a motor with new one. Contact us.
	Voltage reduction	Keep the rated voltage.
	Suction line pressure is higher than atmospheric pressure.	Keep the pressure at or below atmospheric pressure.
Unintentional operation stop.	Motor failure	Replace with a new motor. Contact us.
	Wear of the con rod unit bearing	Replace the con rod unit. Contact us.
	Wear of motor bearings	Replace a motor with new one. Contact us.
	Voltage reduction	Keep the rated voltage.
	Suction line pressure is higher than atmospheric pressure.	Keep the pressure at or below atmospheric pressure.
	Discharge line pressure is higher than the specified one.	For the series head type, keep the pressure equal to atmospheric pressure.
Reduction of air flow/discharge pressure	Plumbing damage or poor connection	Repair plumbing as necessary, or secure connection.
	Pump head fixing screws are loose.	Tighten them at specified torque.
	Diaphragm fixing screws are loose.	Tighten them at specified torque.
	Diaphragm damage	Replace with a new one.
	Clogging	Remove clogging.
	Worn valves	Replace with new ones.
	Bracket/Diaphragm fixing screws are loose.	Secure them.
Abnormal noise	Pump head fixing screws are loose.	Tighten them at specified torque.
	Diaphragm fixing screws are loose.	Tighten them at specified torque.
	Diaphragm damage	Replace with a new one.
	Bracket/Diaphragm fixing screws are loose.	Secure them.
	Wear of an eccentric shaft	Replace the con rod unit. Contact us.
	Wear of the con rod unit bearing	Replace the con rod unit. Contact us.
	Wear of motor bearings	Replace a motor with new one. Contact us.

2. Maintenance & Inspection

Handling of the pump, maintenance and inspection should be carried out within the descriptions of this instruction manual.

It is not the manufacturer's responsibility for personal injury or property damage resulting from unauthorized service. Contact us or your nearest distributor as necessary.

■ Daily inspection

Pay attention to the following items during operation. Stop operation on sensing danger and solve problems on the Troubleshooting section.

No.	States	Points to be checked	How to check
1	Operation	● If air is pumped. ● If the suction and discharge pressure are normal. ● If power voltage and current are normal.	● Air flow meter, pressure gauge or visual inspection ● See a spec label.
2	Starting	● If abnormal noise or vibration occurs. They are signs of abnormal operation. ● A baseplate, if installed, under the pump may resonate with operation, making a mechanical noise. Insert a rubber cushion as necessary to reduce resonance.	● Visual or audio inspection ● Visual or audio inspection
3	Air leak or ingress from pump head joints and a suction line	● Tighten a loose joint.	● Air flow meter, pressure gauge or visual inspection
4	Pump and motor surface temperature rise	● Pump and motor surface temperature should be at or below a total of ambient temperature plus 50°C.	● Thermometer

■ Wear parts

If pump performance has remarkably reduced, replace diaphragms and valves with new ones.

Wear part duration varies with the pressure, temperature and characteristics of liquid.

Values in the table below are collected in continuous operation at the rated voltage and 20°C ambient temperature with 20°C gas.

Pump models	Load range	Estimated life			
		Valve	Diaphragm	Seat	Gasket
APN-(450 / P450 / S450)NAT-NATX	All range	8000hr	4000hr		
APN-(450 / P450 / S450)NST-NSTX		8000hr	4000hr		

3. Wear part replacement

For a long period of operation wear parts need to be replaced periodically.

⚠ CAUTION

- **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.
- **Do not touch the pump or pipe with bare hands**
  Risk of burning. The surface temperature of the pump or pipe gets high in or right after operation.
- **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.

■ Before dismantlement

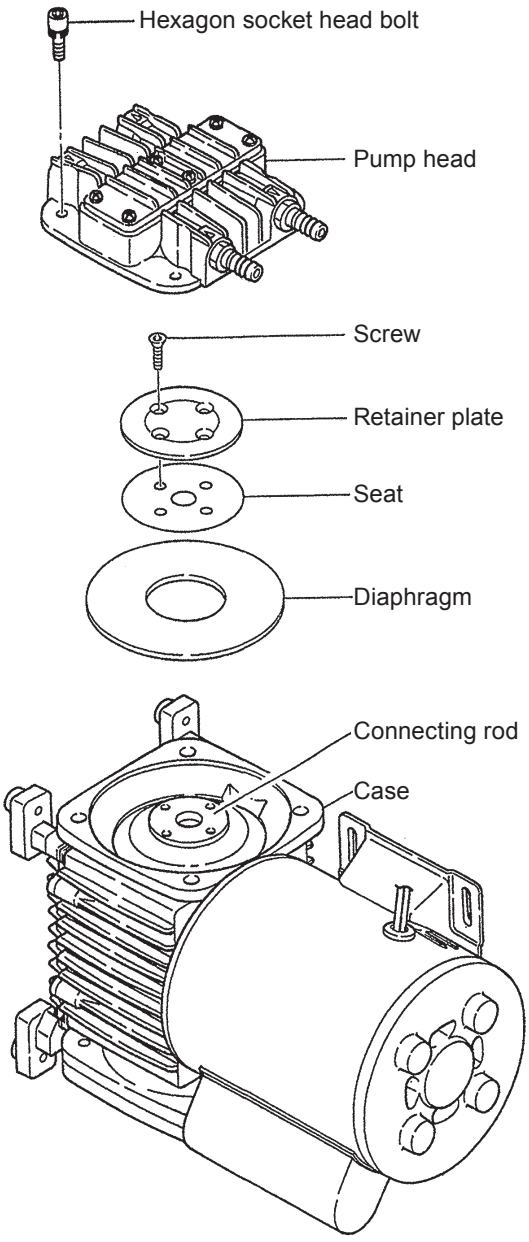
a. Turn off power to stop the pump. Then start to remove wiring including an earth wire.

b. Remove the pump from plumbing system and for the convenience of dismantlement.

■ Corrosion resistant (stainless) type

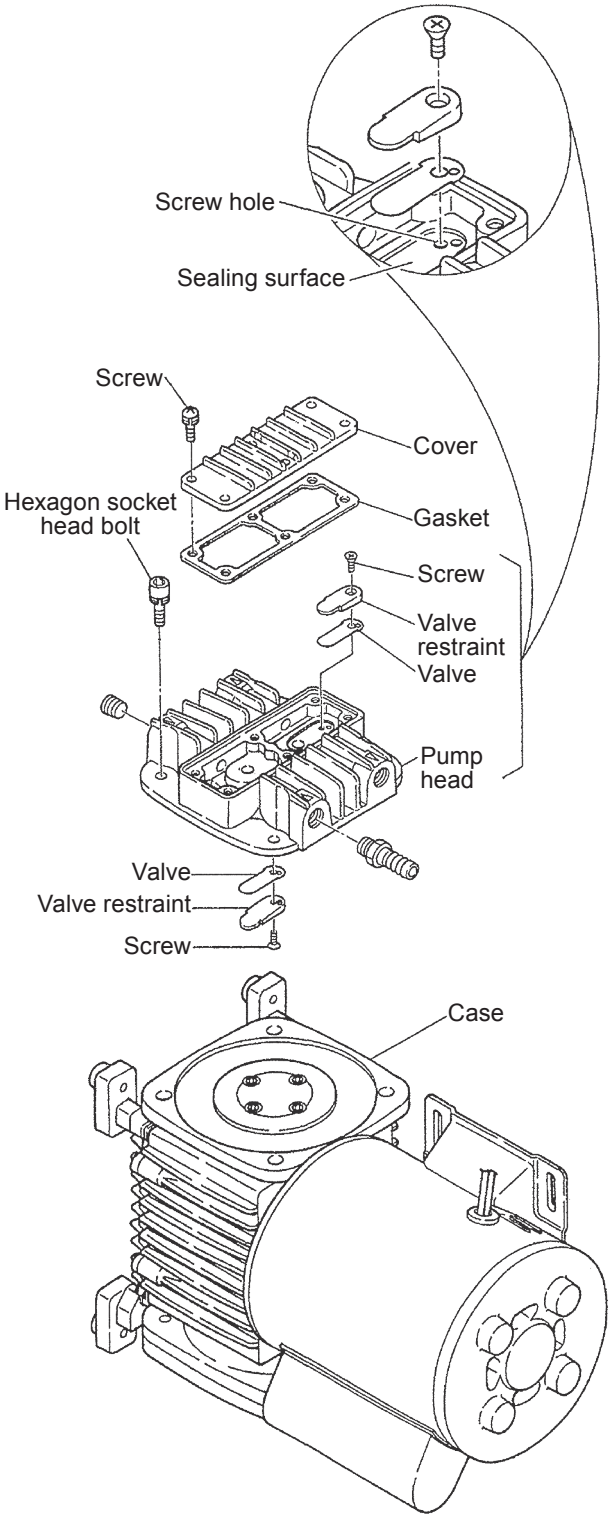
<APN-450NAT/NATX, APN-P/-S450NAT/NATX>

Go through the following steps to take apart or put together the pump. Do not dismantle the pump beyond the extent of the instructions.



Diaphragm & seat dismantlement

1. Lay the pump on its side with the pump head upwards. See the left picture.
2. Remove 4 hexagon socket head bolts with a 5mm hexagon wrench and detach the pump head.
3. Remove 4 screws with a 3mm hexagon wrench and take out a retainer plate, seat and diaphragm.
4. Place a new diaphragm onto the connecting rod.
5. Place a new seat and retainer plate onto the diaphragm. Apply locking agent (LOCKTITE No.222) or equivalent) to the thread of the screws and tighten them with a 3mm hexagon wrench by 3.4N•m to fasten these parts onto the connecting rod.
6. Press down the diaphragm until it bottoms out and then mount the pump head with 4 hexagon socket head bolts.
   Tighten hexagon socket head bolts in diagonal order until they bottom out.



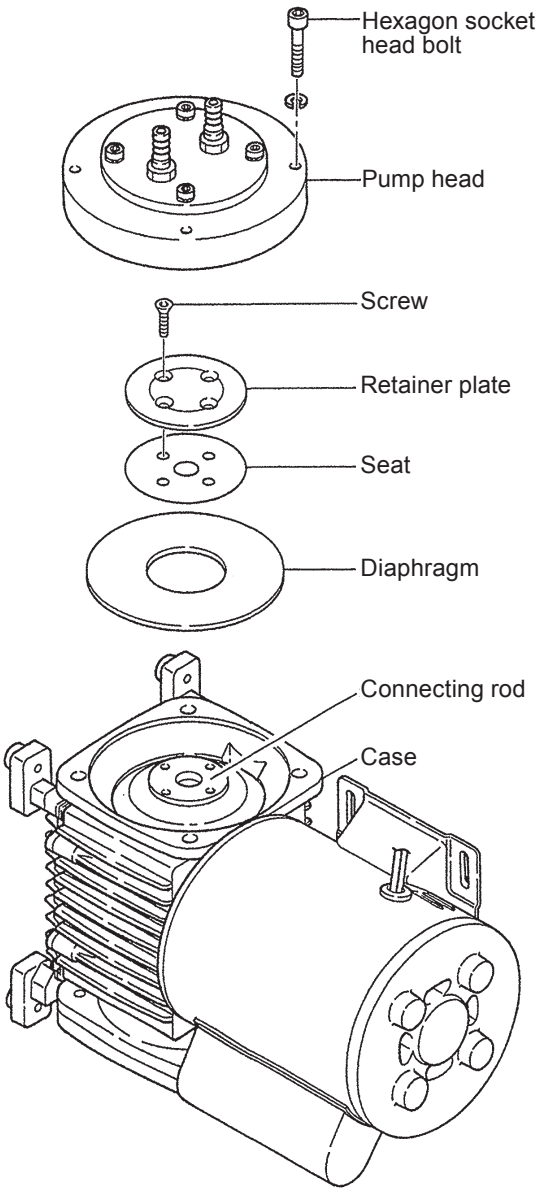
Valve replacement

1. Remove the pump head.
2. Remove all the cover mounting screws to take out the valve restraint and valve.
   Clean valve insertion areas and sealing surfaces on the pump head.
3. Take out the valve beneath the pump head as well.
4. Place a new valve and fasten a screw. Note the valve can not be mounted upside down.
5. Place a new gasket onto the pump head and secure the cover with the mounting screws by 2.8N•m. Do not forget to attach the gasket or catch it in the cover.
6. Press down the diaphragm until it bottoms out and then mount the pump head with 4 hexagon socket head bolts.
   Tighten hexagon socket head bolts in diagonal order until they bottom out.
7. Follow the same step for the other pump head of the twin heads type.

■ Corrosion resistant (stainless) type

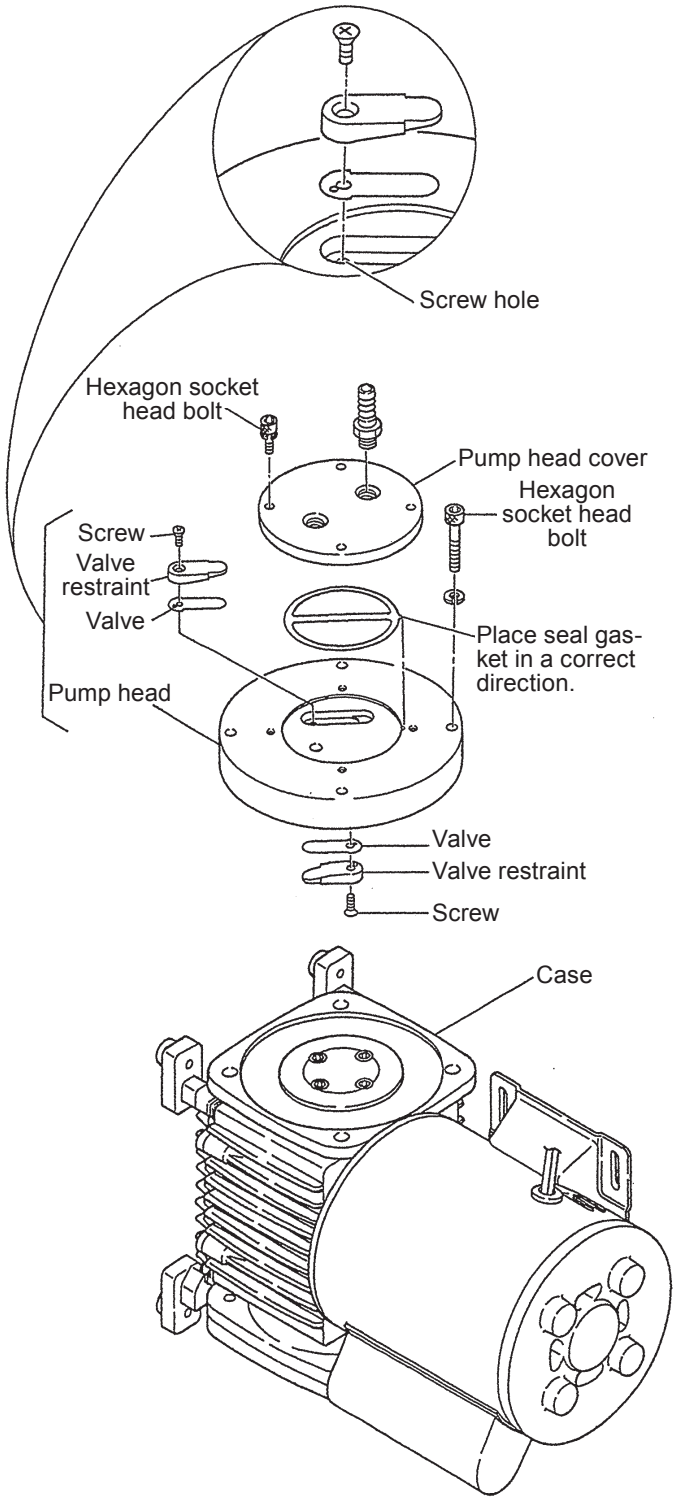
<APN-450NST/NSTX, APN-P/-S450NST/NSTX>

Go through the following steps to take apart or put together the pump. Do not dismantle the pump beyond the extent of the instructions.



Diaphragm & seat dismantlement

1. Lay the pump on its side with the pump head upwards. See the left picture.
2. Remove 4 hexagon socket head bolts with a 5mm hexagon wrench and detach the pump head.
3. Remove 4 screws with a 3mm hexagon wrench and take out a retainer plate, seat and diaphragm.
4. Place a new diaphragm onto the connecting rod.
5. Place a new seat and retainer plate onto the diaphragm. Apply locking agent (LOCKTITE No.222 or equivalent) to the thread of the screws and tighten them with a 3mm hexagon wrench by 3.4N•m to fasten these parts onto the connecting rod.
6. Press down the diaphragm until it bottoms out and then mount the pump head with 4 hexagon socket head bolts.
   Tighten hexagon socket head bolts in diagonal order until they bottom out.



Valve replacement

1. Remove the pump head.
2. Remove the 4 hexagon socket head bolts on the cover with a 4mm wrench to remove valve retainers and valves.
   Clean valve insertion areas and sealing surfaces on the pump head.
3. Place a new valve and fasten a screw. Note the valve can not be mounted upside down.
4. Place a new gasket onto the pump head and secure the cover with hexagon socket head bolts. Tighten hexagon socket head bolts in diagonal order until they bottom out.
5. Press down the diaphragm until it bottoms out and then mount the pump head with 4 hexagon socket head bolts.
   Tighten hexagon socket head bolts in diagonal order until they bottom out.

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

AIR PUMP

(MODEL NAME)

APN SERIES AC TYPE

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 EN1012-1: 2010
EN IEC63000: 2018 EN1012-2: 1996 + A1: 2009

(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.

T. Sawada.

TSUTOMU SAWADA

DEPUTY SENIOR GENERAL MANAGER,

QUALITY ASSURANCE HEAD OFFICE

Tokyo, Sep. 13, 2021

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

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