

INSTRUCTION MANUAL**DIAPHRAGM DRY VACUUM PUMP****MODEL DA-20Dx****MODEL DA-40Sx****MODEL DA-20DA-01****MODEL DA-40SA-01****(x: A=100V, B=115V, C=220V)****Request to Users**

Please read this manual thoroughly to ensure safe and effective use of the equipment.

Keep this manual in a safe place.

Due to periodic improvements in performance, the equipment described in this manual is subject to changes in dimensions and specifications without prior notice.

ULVAC KIKO, Inc.



Declaration of Conformity



We, Company:ULVAC KIKO,Inc.

of Address:291-7 Chausubaru Saito-city,Miyazaki (ZIP Cord:881-0037) Japan.

This declaration is issued under the sole responsibility of the manufacturer.
In accordance with the following Directive:

2006/42/EC	Machinery Directive
2011/65/EU+(EU)2015/863	RoHS Directive

declare under our sole responsibility that the product,

Type of Product	: Diaphragm Type Dry Vacuum Pump
Model Name	: DA-20DA, DA-20DB, DA-20DC, DA-20DA-01 DA-40SA, DA-40SB, DA-40SC, DA-40SA-01

to which this declaration related is in conformity with the following standards:

EN 1012-2:1996+A1:2009
Compressors and vacuum pumps – Safety requirements, Part2. Vacuum pumps
IEC EN 61010-1:2010+A1:2019
Safety requirement for electrical equipment for measurement, control and laboratory use
Part1.General requirement

following the provisions of

The person stated below will keep the following technical documentation:

- operating and maintenance instructions
- technical drawings
- description of measures designed to ensure conformity
- other technical documentation, e.g. quality assurance measures for design and production

Person authorized to compile the technical file:

(Name and address) Chris Goebel
ULVAC GmbH
Klausnerring 4 85551 Kirchheim b. München, Germany

05.Apr, 2023
Miyazaki , Japan
(date & place)

Makoto Uchimura
Development manager *Makoto Uchimura*
(name, function, signature)

We, Company:ULVAC KIKO,Inc.

of Address:291-7 Chausubaru Saito-city,Miyazaki (ZIP Cord:881-0037) Japan.

This declaration is issued under the sole responsibility of the manufacturer.
In accordance with the following Directive:

Supply of Machinery (Safety) Regulations 2008
(S.I. 2008 No. 1597, as amended by S.I. 2019 No. 696)

The Restriction of the Use of Certain Hazardous Substances in Electrical and
Electronic Equipment Regulations 2012 (S.I. 2012 No. 3032)

declare under our sole responsibility that the product,

Type of Product	: <u>Diaphragm Type Dry Vacuum Pump</u>
Model Name	: <u>DA-20DA, DA-20DB, DA-20DC, DA-20DA-01</u> <u>DA-40SA, DA-40SB, DA-40SC, DA-40SA-01</u>

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1. Before Using the Equipment

Thank you for purchasing this product. Your custom is very much appreciated.

This pump is designed solely for vacuum discharge, and may malfunction or cause accidents if not handled appropriately. Read the manual thoroughly, and pay due attention to inspections, maintenance, and safety.

Personnel Handling the Equipment

Only persons who have read this manual thoroughly, and have sufficient understanding of safety, pump specifications, and method of operation, may operate this pump.

Read the Manual Thoroughly

Read the manual thoroughly in order to use the equipment correctly. Read the section on Safe Use particularly closely.

Keep This Manual in a Safe Place

After reading this manual, be sure to keep it in a safe place, which is readily accessible to others needing to use it.

Copying This Manual Is Prohibited

No part of this manual may be copied for use by a third party without the express permission of the manufacturer.

Statutory Requirements for Disposal

Follow all statutory and local authority regulations when disposing of this pump.

Safety During Repair

Please provide a full description of the circumstances of use (particularly the use of dangerous materials) for the safety of repair personnel when requesting the manufacturer for repairs to the pump. Your request for repair of may be refused if these circumstances are unclear.

2.Checks When Opening Packaging

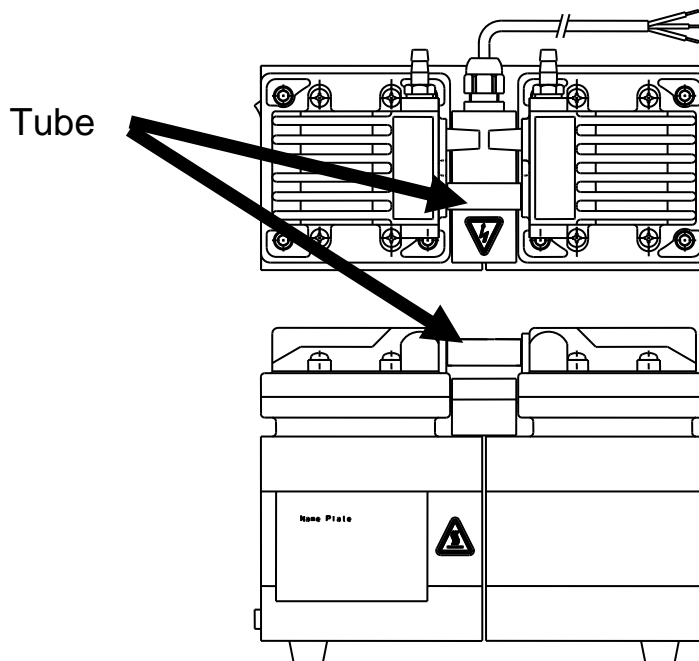
Check the following after opening the packaging.

- (1) Is the product as you requested?
- (2) Are the accessories and necessary parts included?
Standard accessories
 - User's manual ----- x1
 - Inlet and outlet caps (fitted to inlet and outlet) ----- x2
- (3) Is the pump damaged in any way?
- (4) Are any external screws or inlet and outlet pipes loose? Are any components missing?
Contact your agent or the sales division of the manufacturer if there are any problems with the pump.

Note

Do not hold or push the tube at the top of the pump while removing it from the packaging.

Damage to the tube may affect performance of the pump.



3. Using the Pump Safely

To ensure that the pump is handled correctly, read this section thoroughly before use.

This manual and the warning labels on the pump include safety icons as an aid to understanding safety requirements.

These safety icons warn the operator and others of possible dangers and damage and should always be followed.

- **Safety icons**

The meanings of the safety icons are as follows.



Danger

Incorrect handling of the equipment is very likely to result in death or serious injury to the operator.



Warning

Incorrect handling of the equipment may result in death or serious injury to the operator.



Caution

Incorrect handling of the equipment may result in light or medium injuries to the operator or damage to the equipment.



Note

Incorrect handling of the equipment may result in damage to the equipment and hinder its correct operation.



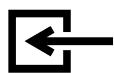
CAUTION TO HEAT

Temperature of some part of pump surface rises higher than 60°C (140 degF) when operated.
Do not touch the pump during operation.
There is a risk of burn.



CAUTION TO ELECTRIC SHOCK

Never fail to turn OFF the Power Supply of the pump when conducting the work related to electric wiring or electric parts.
There is a risk of electric shock.



Inlet

The Inlet pipe of the pump



Outlet

The Outlet pipe of the pump

- Cautions for Safety in Use

Danger

Applications

- (1) This pump is not designed to be explosion-proof, and should therefore not be used to discharge explosive gases. Such use may result in injury and fire.
- (2) In addition to discharge of gas via the outlet, gas may also leak from other parts of the pump, and it should therefore not be used with toxic gases. If toxic gas is discharged for any reason it is important to note that the interior of the pump will be contaminated by the gas, requiring appropriate caution during maintenance.

Maintenance and Repair

- (3) When requesting the manufacturer's service division to dismantle and repair the pump, always note the gas which the pump has been used with on the Usage Check Sheet. Note that if it has been used to discharge toxic gas for any reason it will be contaminated. **Please be aware that use with some gases will preclude dismantling and repair.**
- (4) Before maintenance disconnect the pump by the plug or the installed disconnection device.

Operation

- (5) Do not use the pump to suck corrosive gas, organic solvent, liquids, or condensable gas (water vapor, etc.).

Warning

Installation

- (1) Do not use the pump in an explosive atmosphere. Such use may result in injury and fire.
- (2) Ensure that there are no inflammable materials such as solvents in the vicinity when using the pump.
- (3) Ensure that the pump is freely ventilated to prevent overheating, which may result in fire or burns.
- (4) To be used with clean air only.

Warning

Power Supply

- (5) Always check the pump and install wiring with the power cord disconnected. Working with power connected may result in electric shock, or the pump starting unexpectedly.
- (6) Ensure that wiring is installed by persons qualified in accordance with regulations for wiring (e.g. technical standards for electrical equipment, requirements for internal wiring). Incorrect wiring with may result in fire.
- (7) Ensure that lead wiring is properly connected and insulated with insulation tape (or an insulating cap).
- (8) This pump has thermal protector. But it is detect of temperature only. Suitable overcurrent protection device shall be installed at the final installation.
- (9) Always ensure that the pump is correctly earthed. A dedicated earth leakage breaker is recommended. Failure to earth the pump correctly may result in electric shock if a fault or earth leakage occurs.
- (10) Use the pump only at the rated voltage. Use at other than the rated voltage will interfere with operation of the overload protection device, and this may result in the motor burning out, or fire.
- (11) Do not damage, modify, and pull the power cord, or place objects on it. Damage to the cord may result in electric shock or fire.
- (12) Always fully insert the power cord into the socket. Partial insertion may result in electric shock.
- (13) Remove the cord from the socket while holding the plug. Failure to do so may result in electric shock.
- (14) Touching the power cord with wet hands may result in electric shock.
- (15) Touching electrical wiring etc while inserting the power plug may result in electric shock.
- (16) The electric motor fitted to this pump incorporates a thermal protector, however it is not guaranteed to be open when it eventually fails at some time after the guaranteed 6000 cycles. For safety reasons therefore, it is necessary to fit an overload (over current), protection device and an earth leakage breaker.

Operation

- (17) Inserting fingers or objects into the motor inlet may result in electric shock, injury, or fire.
- (18) This pump is not designed to be explosion-proof. When using the pump, ensure that there are no inflammable materials such as solvents, or explosive gases, in the vicinity. Use under such conditions may result in injury or fire.
- (19) Do not operate the pump with the outlet blocked, or with equipment which may impede the flow of air placed in front of the outlet. Operation under such conditions will result in an increase in the internal pressure of the pump, and may result in rupture of the pump itself. This pump is not pressure resistant, and may be used at a maximum internal pressure of 30.0 kPa (gauge pressure).
Operation at a discharge resistance equivalent to 30.0 kPa (gauge pressure) may result in the motor being overloaded.
- (20) Do not use it for the human body.
And do not use in applications involving organ transplants, or contact with body fluids or living tissue.
- (21) Ensure that cooling and load conditions for the particular application are considered thoroughly, and that the temperature increase for each motor component is within the requirements for class of motor insulation as legally required in your country.

Caution

Installation

- (1) The fine clearances used in this pump require that the following conditions be satisfied during storage, installation, and operation.
 1. Ambient temperature, relative humidity: 7~40°C, 85% RH or less during operation.
Height above sea level during storage and installation 1000m or less.
 2. Other conditions for storage and operation.
 - a) Horizontal floor of sufficient strength.
Do not install the pump either vertically or facing downwards.
 - b) No condensation.
 - c) Free of dust.
Ensure that water or dust does not enter the pump or motor during assembly.
 - d) Free of soot and oil.
 - e) Free of splashing or flooding.
 - f) Environment free of explosive gas.
 - g) Not subject to direct sunlight.
 - h) No danger of fire.
 - i) When storing the pump, or when operating it within other equipment, ensure that the temperature in the vicinity of the pump does not exceed 40°C.
 - j) When installing the pump, avoid mounting a vacuum pump directly on the base.
Employ anti-vibration rubber between the base and the vacuum pump.
 - k) Store the pump inside in well ventilated conditions. When the pump is operated outside, ensure that it is installed in accordance with a) - j) above.
- (2) There is a risk of hurting lower back. Lift the pump **with both hands definitely** to move and conduct work.
Abrasive particles of diaphragm may drain from the exhaust vent and pollute the room.
Exhaust it to out of the chamber by connecting pipes if necessary.
- (3) Install the main disconnection (suitable plug or switch/circuit breaker) device for safety.

Caution

Operation

- (4) Do not close the outlet while the pump is in operation.
- (5) Touching rotating components (ex motor, main shaft, axial joints, cooling fan) while the pump is in operation may result in injury.
- (6) The overload protector operates when the pump becomes excessively hot. Touching it in this condition may result in burns.
- (7) Touching the motor while the pump is in operation or while it is still hot immediately after having been switched off may result in burns.
- (8) Do not insert fingers or objects into, or peer into, the inlet or outlet during operation.
- (9) Ensure that the customer installs a trap if steam is generated. Ensure that condensate does not enter the vacuum pump. A malfunction may result if condensate enters the pump.
- (10) Do not approach or touch rotating components (e.g. cooling fan) under any circumstances while the pump is in operation.
- (11) Stop the pump before lifting and carrying it to another location.
- (12) Don't moving while the pump is in operation.

Maintenance and Repair

- (13) Ensure that the pump is discarded in accordance with appropriate legislation related to the treatment and cleaning of waste products. Ensure that the pump is discarded as an industrial waste product, and is not incinerated.
- (14) If the pump ceases operation, turn power OFF (set switch to O) immediately to prevent accidents, remove the power cord from the wall outlet, and contact your dealer or the manufacturer for inspection and repair.

Note

Installation

- (1) Ensure that the pump is not dropped, subjected to physical shock, or tipped over. A malfunction may result if the pump is handled in this manner.
- (2) Do not place objects on, or stand on, the pump. A malfunction may result if the pump is handled in this manner.
- (3) As the pump is not protected against entry of water, it is not guaranteed against splashing or flooding.

Applications

- (4) This pump is solely for use in vacuum extraction, and should not be run for long periods of time at near-atmospheric pressure. A malfunction may result if the pump is operated in this manner.
- (5) Do not use the pump for pressurization (Do not use the pump with a pressurized air supply).

Note

Operation

- (6) Ensure that the pump is used within an ambient temperature range of 7~40°C.

Use at high temperatures will dramatically reduce the life of the pump.

Install cooling equipment (e.g. a fan) if the pump is to be used at an ambient temperature in excess of 40°C, and set ambient temperature to 40°C or less.

- (7) Ensure that the pump outlet is free of back pressure when the pump is started. Back pressure at the pump outlet will result in overload on the motor, and may prevent starting.
- (8) The overload protector operates when the pump becomes excessively hot. Touching it in this condition may result in burns.

Maintenance and Repair

- (9) The pump is manufactured to accurate clearances, and should not be dismantled or modified under any circumstances.

- (10) Miscellaneous

* Problems (e.g. faults) with the vacuum pump shall be resolved by consultation between the two parties.

4. SPECIFICATIONS

Table.1 Specifications

Model	DA-20D		DA-40S	
Pumping Speed (50Hz/60Hz)	20 / 24 L/min		40 / 46 L/min	
Ultimate Pressure	5.3 × 10 ³ Pa		19.9 × 10 ³ Pa	
Weight	7.2 kg			
Suction/Exhaust Pipe	O.D. $\phi 9$ × I.D. $\phi 5$ mm (R1/4)			
Operating Ambient Temperature	7 ~ 40 °C			
Outside dimensions	118(W)×242(L)×178(H) mm		128(W)×242(L)×178(H) mm	
Motor	100V	115V		220V
	1 ϕ ,60W,4P,Capacitor run			
Rated Current (50Hz/60Hz)	1.60/1.60 A	1.50/1.50 A		0.80/0.80 A
Revolution (50Hz/60Hz)	1,200/1,450 r/min	1,395/1,683 r/min		1,390/1,680 r/min
Noise	55dB(A)			
Over Voltage Category	II			
Pollution Degree	2			

The noise dose not includes sound of suction and exhaust.

5. DIMENSIONAL DRAWING

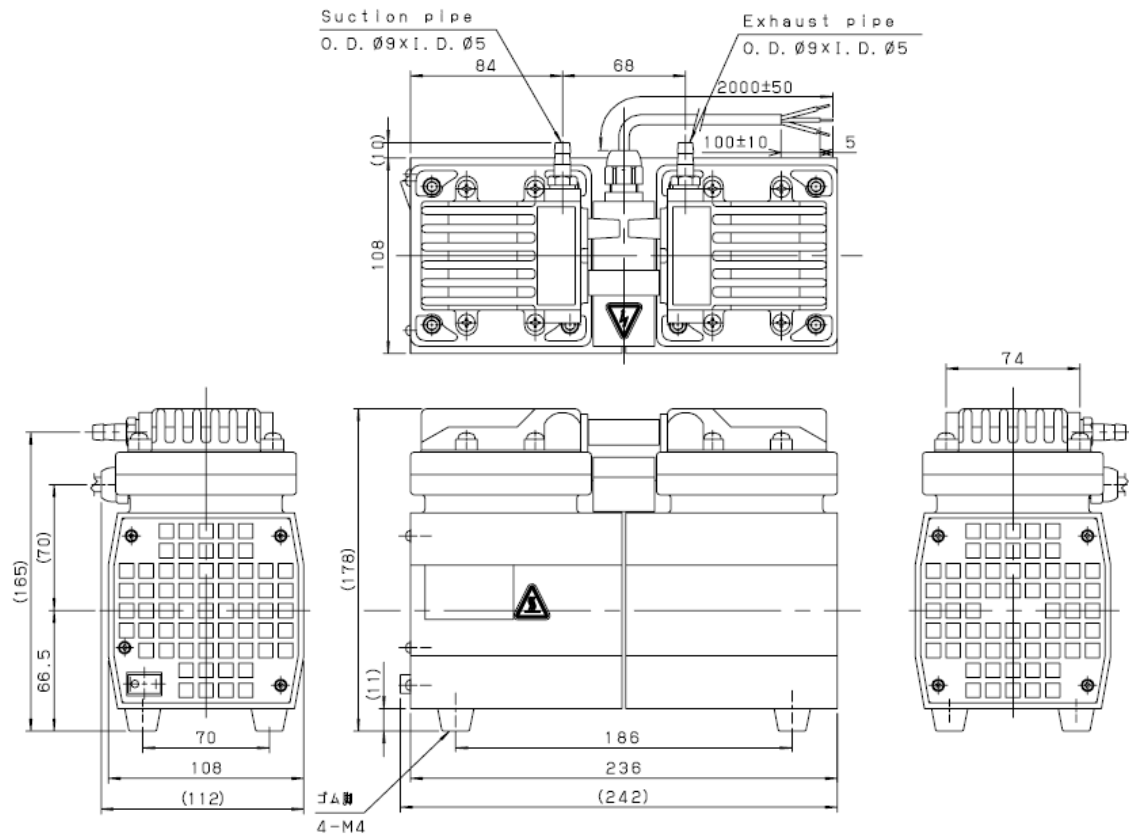


Fig.1 DA-20D

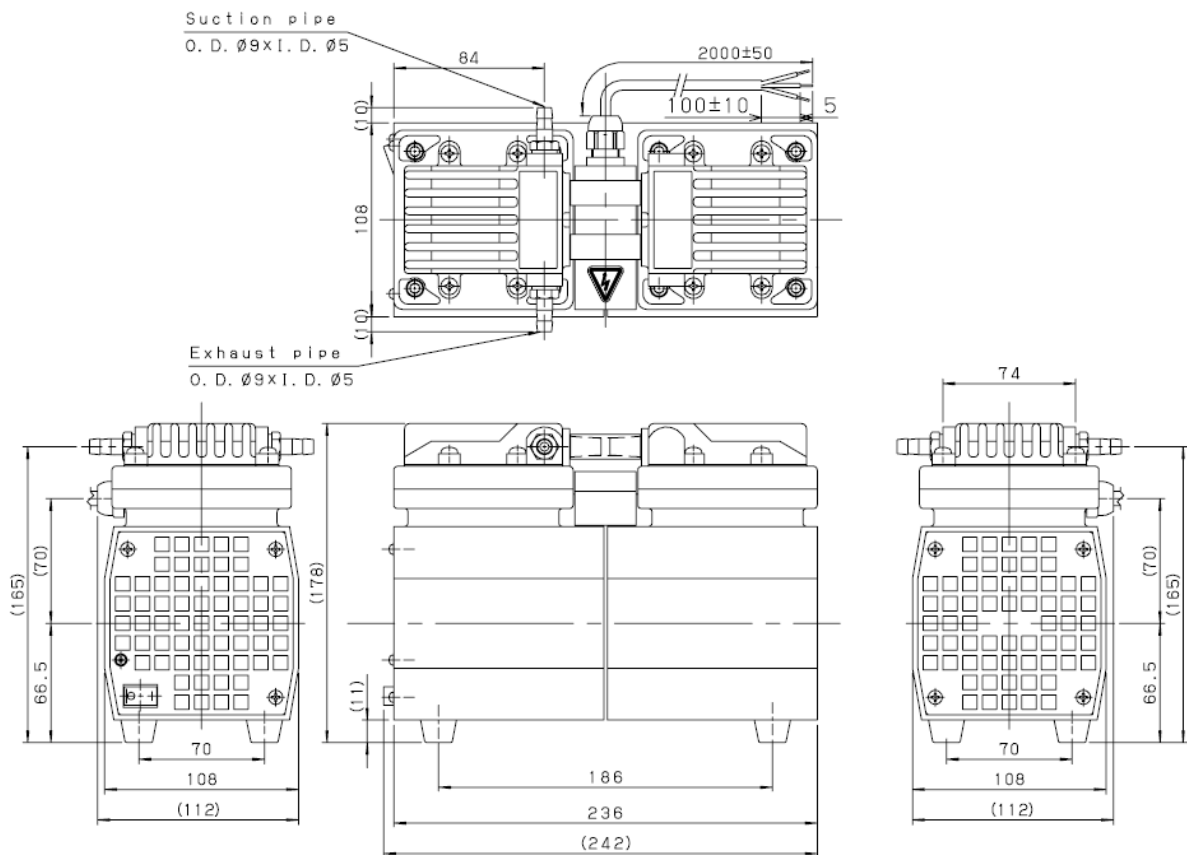


Fig.2 DA-40S

6. INSTALLATION AND OPERATION

- (1) Before starting operation, remove the cap from the suction pipe of the pump.
- (2) Install the pump in a place as free from dust and moisture, where the pump can be easily checked and maintained.
- (3) Install the pump tightly in a stable horizontal position.
- (4) Install the pump in a place where ambient temperature is 7~40°C.
- (5) In case of assembling the pump in a system
 - Pay an attention particular to the ambient temperature is 7~40°C.
 - Float the pump from the system using a rubber shock absorber, install the pump so that vibration is not transmitted to the system.
 - By removing the fixed rubber legs ,do not install the pump directly to the system.There would be a case that the pump casing is deformed and a load occurs to the motor bearing.
- (6) After verifying that the power switch of the pump is turned OFF, connect the power cord to the power supply specified the motor rating.
- (7) Turn ON the pump to check that pump is pumping.
- (8) After that, turn OFF the power to stop the pump.
- (9) Make piping arrangement ensuring that no leakage occurs in the suction pipe. Use as short a hose as possible. If a long hose is used, it will take longer to pump.
- (10) Make piping arrangement so that the exhaust port pressure is under backing pressure.
- (11) In case of selecting the inlet pipe and exhaust pipe that are not from our products, please select the exhaust pipe that has same or larger inner diameter length with the inlet pipe.
- (12) Typical vacuum pumping diagram is as shown in Fig-3. Timing valve (Pump vent valve in Fig-3) to start easily the pump is attached close by the pump. Also, isolation valve to keep the chamber in vacuum is equipped between the pump and the chamber.
(When pump is operating : Isolation valve is open, timing valve is closed)
(When the pump is at stop : Isolation valve is closed, timing valve is open)

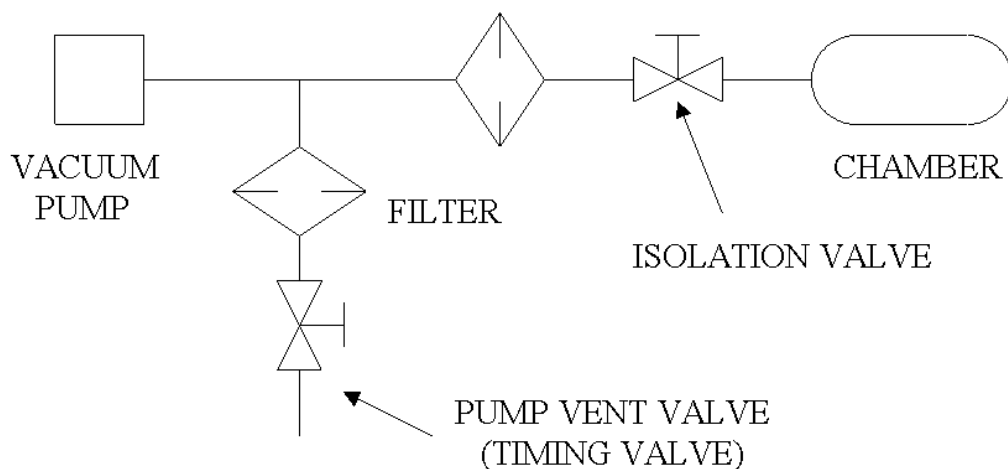


Fig. 3 Vacuum pumping diagram

7. CAUTIONS IN OPERATION

For safe and trouble-free operation, please pay attentions for the following items in operating pump.

7.1 Cautions in Operation

- (1) This pump is designed exclusively for vacuum pumping. So backing pressure of the pump is needed to keep lower than 30kPa (Gauge pressure) by a reasonable means.
- (2) Use the pump at an ambient temperature of 7~40°C.
- (3) Use the pump in an environment where it is not likely that dust, dirt, etc. are admitted into the pump.
- (4) This pump is not designed explosion-proof. So do not use it in the vicinity of inflammable solvent or the like, which can be very dangerous.
- (5) This pump is only for dry air. When a large amount of vapour enters, it causes the breakdown.
- (6) Start the pump with the suction side and exhaust side under atmospheric pressure. Otherwise, it is not so easy to start the pump.
- (7) If the pump is stopped under reduced pressure and is started immediately after that, the pump may not restart. To restart it, vent the pump to atmospheric pressure.

If the pump is used for other applications, consult with us.

7.2 Startup in Cold Season

In a cold season, it may sometimes be difficult to start the pump due to hardened bearing grease, diaphragm or others. In that event, proceed as follows.

- (1) Vent the suction port to atmospheric pressure and turn ON/OFF the power switch until the pump starts.
- (2) Operate the pump for several minutes with the suction port vented to atmospheric pressure to warm up the pump.
- (3) Operate the pump as usual after the pump is warmed up.

7.3 Thermal Protector

- (1) This pump incorporates a auto reset type thermal protector. It automatically cuts off the motor power circuit to prevent the motor from being damaged by burning when the pump stops rotating due to trouble or when the pump is energized with an overcurrent due to overload during operation.
- (2) If the thermal protector is activated, turn OFF the power switch and contact our representative or ULVAC KIKO. Never touch the motor, which is still very hot.
- (3) Restart operation after eliminating the cause of trouble and verifying that the motor temperature has lowered.

Characteristics of the thermal protector

Operation temperature	135±5°C
Reset temperature	85±10°C

7.4 Fluctuations in the power voltage and frequency

Standard: Rotation electricity machine general rules

JIS C 4034-1:1999, JEC-2137-2000

To the voltage change and frequency change in Domain A, in main rated values, it operates continuously, and can be used practically convenient, and to the voltage change and frequency change in Domain B, it shall operate with main rated values and shall be used practically convenient.

However, operation with "it is convenient and safe is maintained on "practical use, it means not resulting in the grade which shortens a life remarkably, and the characteristic, a temperature rise, etc. do not apply correspondingly in the state of rating. Moreover, main rating shows rated torque (N·m).

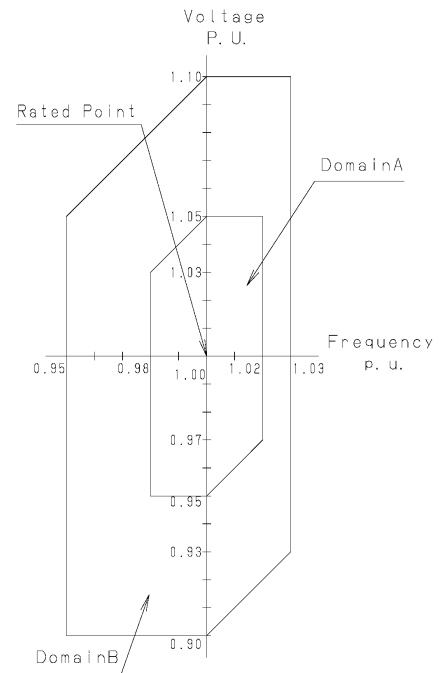


Fig. 3-1
Change region of the voltage and frequency

8. Maintenance, Inspection, and Repair

8.1. Cautions for Maintenance, Inspection, and Repair

Cut the main power supply before doing the maintenance work.

Danger

When requesting the manufacturer's service division to dismantle and repair the pump, always note the gas, which the pump has been used with on the Usage Check Sheet. Note that if it has been used to discharge toxic gas for any reason it will be contaminated. Please be aware that use with some gases will preclude dismantling and repair.
Cut the main power supply before doing the maintenance work.

Note

The fine clearances used in this pump require skill in its assembly. If a repair technician is unavailable, replacement of all consumables should be left to the manufacturer's service division.

8.2 Maintenance

The following checks are required at least once every three days during operation.

If a problem is found, take the measures described in 7.5 TROUBLESHOOTING.

- (1) Check for abnormal noises.
- (2) Check for abnormal heating of the pump.
- (3) Check that gas is discharged normally.
- (4) Dust is absorbed with the vacuum cleaner.

Table2. List of Consumable parts

Description	Qty	Material	Life expectancy
Diaphragm	2 pcs	HNBR	6,000~8,000 hrs
Suction/exhaust valve	4 pcs	SUS	6,000~8,000 hrs
Pump head cover gasket	2 pcs	NBR (Option EPDM)	6,000~8,000 hrs
Air filter	2 pcs	Urethane foam	6,000~8,000 hrs
Bearing	1 set	—	Approx. 15,000 hrs

The life expectancy of these parts vary considerably depending on the operating conditions.

Replacement of the bearing will be undertaken by ULVAC KIKO, Inc. of Sales Office.

See 【Sales, service agency, and the where to make contact】 of the end of instruction manual.

8.3 Scheduled Inspection

Periodically check consumable parts in "table3. List of Consumable parts" once every 6,000 hours of operation and replace them according to the "Guideline for replacement".

Guideline for replacement:

- Diaphragm
Replace the diaphragm if a small crack, wear, hardening or deformation is found on the surface.
- Suction/exhaust valve
Replace the valve if deformation, breakage, bend or the similar is found.
- Pump head cover gasket
Replace the pump head cover gasket if hardening, crack, elongation or the similar is found.
- Air filter
Replace the air filter if dirt, clogged, hardening or the similar is found.
- Bearing
If grease runs out or unusual sound or vibrating sound of the motor is perceived, contact our representative for repair.

Table3. Scheduled Inspection

Operating hours	Location	Check	Checking method
6,000 hrs	Diaphragm	Deformation, crack and hardening	Visual check
	Suction/exhaust valve	Deformation and crack	Visual check
	Pump head cover gasket	Damage and leak	Visual check
	Air filter	Dirt, clogged and hardening	Visual check
	Bearing	Unusual sound	Auditory check

- Follow state law and local government regulations for disposal of the pump.

8.4 Replacement of Consumable parts

CAUTION : Before replacing consumable parts, be sure to turn OFF the power.

Tools to be used:

- Allen wrench, opposite side 8, 4 mm
- Wrench, opposite side 17 mm
- Philips screwdriver
- Locking agent "Locktite®242"

(1) Replacement of diaphragm

Remove the four cross-recessed head machine screws (M5×12) ② and the pump head ① should be removed. Remove the hexagon socket head cap screws (M6×20) ④ and the pump head ③ should be removed. Remove the pump head cover and two cross-recessed counter sunk head cap screws (M5×10) ⑥, and remove the diaphragm keep plate ⑤. Replace a total of two diaphragms ⑦, one piece each for one pump head with new ones.

Before re-assembling the diaphragm, apply a thin coat of locking agent (Locktite® 242 or the like) to the hexagon socket head cap screws (M5×10) ⑥.

(2) Replacement of suction/exhaust valve

Remove the four cross-recessed head machine screws (M5×12) ② remove the pump head cover ①.

Then remove the four hexagon socket head cap screws (M6×20) ④, and remove the pump head ③.

Remove a cross-recessed head machine screws (M3×5) ⑧, remove pump head both sides and replace the suction/exhaust valve ⑨, and replace with a new one.

Before reassembling the suction/exhaust valve, apply a thin coat of locking agent (Locktite® 242 or the like) to the machine screws (M3×4) ⑧.

Fix the plain washer ⑩ to suction side and fix the exhaust valve guard ⑪ to exhaust side.

The plain washer⑩places as its round corner touches suction/exhaust valve.

Similarly replace the suction/exhaust valve one side.

(3) Replacement of pump head cover gasket

Remove the four cross-recessed head machine screws (M5×12) ②, and remove the pump head cover ①.

Open piece each of black pump head cover gasket ⑫ is located in the pump head cover ① for one head (total two). Remove and replace them with new ones.

(4) Replacement of air filter

Remove the four cross-recessed head machine screws (M5×12) ②, and remove the pump head cover ①.

Open piece each of gray air filter ⑬ is located in the pump head cover for one head total two. Remove and replace them with new ones.

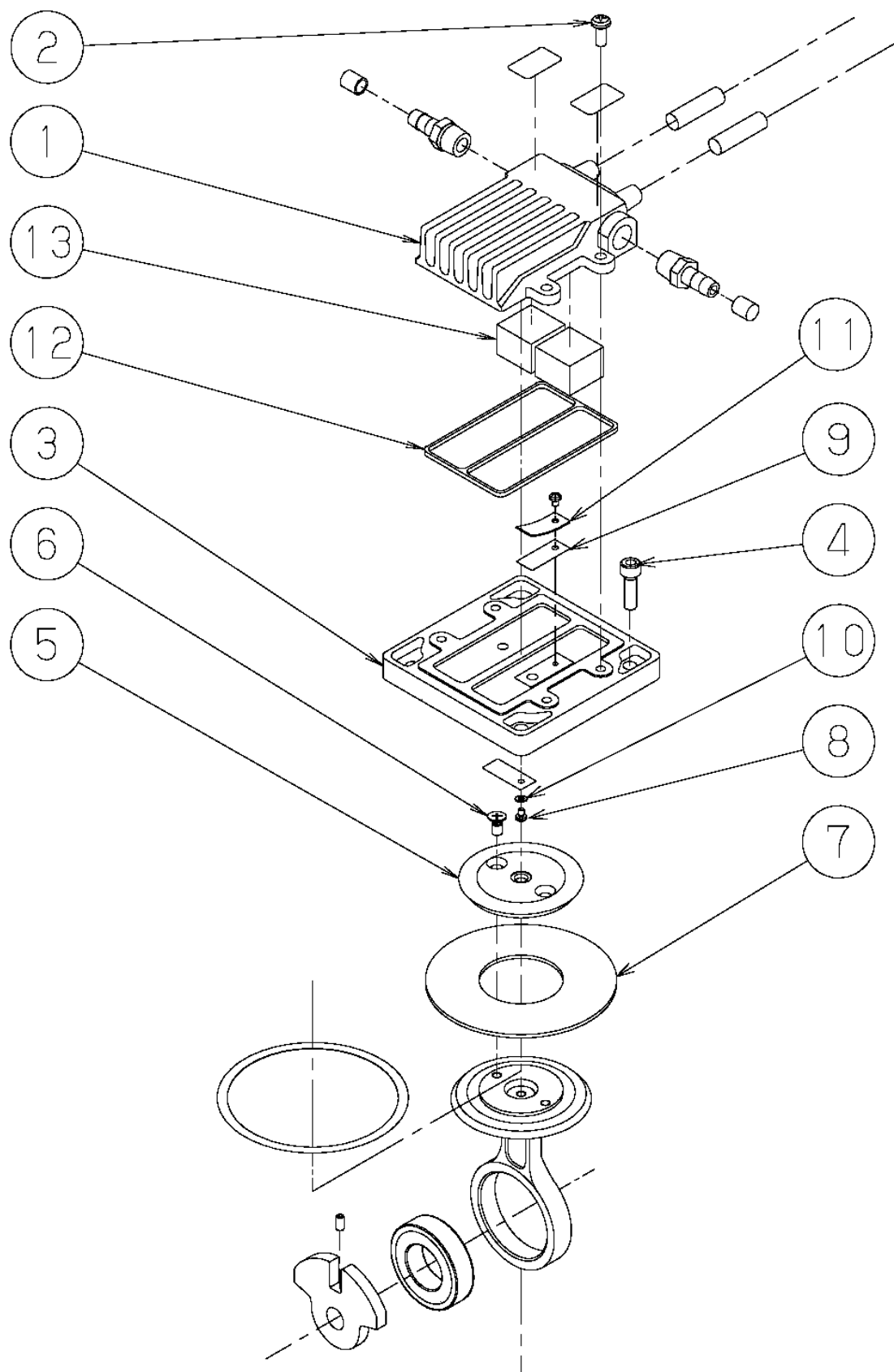


Fig.4 Exploded view (DA-40S)

8.5 TROUBLESHOOTING

Table 4. TROUBLESHOOTING

	Possible cause	Corrective action
Improper pump rotation or no start	1. Power line trouble	Repair.
	2. Faulty power switch	Correct poor contact or connection.
	3. Voltage drop	Adjust line voltage and examine power cable.
	4. Cord broken	Repair or replace.
	5. Connecting rod locked	Disassemble pump head and check inside.
	6. Breaker is activated.	Locate cause.
	7. Bearing faulty	* Replace.
	8. Thermal protector is activated.	Turn OFF power and eliminate cause of trouble.
	9. Low temperature atmosphere	Keep temperature within 7~40°C range.
	10. Starting the pump in case its inside is vacuum pressure.	Vent pump to atmospheric pressure. Height above sea level during storage and installation 1000m or less.
Unusual sound	1. Bearing damaged	* Replace
	2. Diaphragm broken	Replace.
	3. Motor damaged	* Replace.
Inadequate Pump Performance	1. Diaphragm damaged	Replace.
	2. Suction/exhaust valve damaged	Replace.
	3. Leak in suction pipe	Clean or replace.
	4. Voltage drop	Adjust voltage or improve power circuit.
	5. In ambient temperature adequate	Keep temperature within 7°~40°C range.
	6. Leak in piping or connection	Check location of leak, diameter and length of piping, and repair.

The maintenance of the items marked with * are undertaken by ULVAC KIKO.

9. STORAGE

Turn OFF the power switch, unplug the power cord, attach the cap to the suction/exhaust ports and store the pump in a place as free from dust and moisture as possible.

10. CONCLUSION

This manual contains only general information about pump operation. Therefore, if you come up with any question or trouble, contact our representative or ULVAC KIKO.

Warranty

- (1) The warranty for this pump (this equipment) extends for a period of one year from the date of shipment.
- (2) Any malfunctions or defects which occur under normal usage conditions during the warranty period will be repaired free of charge.

Note, the warranty stated here is an individual warranty covering the pump. In addition, the scope of the warranty coverage concerning repairs is limited to the repair and/or replacement of parts.

Normal usage conditions refer to the following:

- a) Ambient temperature and humidity during operation: 7 - 40°C, below 85% RH
 - b) Operation in accordance with the user manual
- (3) Repair fees will incur during the warranty period for the following cases:
- a) Malfunctions due to a natural disaster or fire.
 - b) Malfunctions caused by special atmospheric conditions, such as salt damage, inflammable gas, corrosive gas, radiation or pollution.
 - c) Malfunctions caused by usage conditions that differ from those stated in the user manual (performance specifications, maintenance and inspection, etc.).
 - d) Malfunctions caused by modifications or repairs carried out by a party other than the manufacturer, or by a service company not approved by the manufacturer.
 - e) Malfunctions caused by noise (electric disturbance).
 - f) Malfunctions that occur when not using a rated power supply.
 - g) Malfunctions that occur when there is an abnormal rise in internal pressure due to the pump exhaust outlet being blocked during operation, etc.
 - h) Malfunctions that occur, when the pump is damaged as a result of being dropped or falling, etc.
 - i) Malfunctions which are determined by the manufacturer's technical personnel to be caused by conditions that do not comply with the usage conditions for this vacuum pump.
 - j) Malfunctions due to the replacement of consumables.
- (4) Disclaimer
- a) We shall not be liable for any malfunctions of our products caused by the customer, regardless if the malfunction does not fall within the warranty period, nor shall we be liable for any loss of opportunity for the customer's clients or for compensation for any damages to other products, labor costs, production loss, transportation expenses and other related work.
 - b) We shall not be liable for any claims and patent infringements, including secondary damages, filed a claim by a third party against the customer.

Usage Status Check Sheet (for use in Instruction Manual)

- * For the purpose of safety control of repair personnel, fill in within the heavy line frame and attach the sheet to the item of which repair is requested.
- * In case this sheet were not attached or filled in, your request of repair and service may not be accepted.
- * In accordance with the Private Information Protection Law, the provided information will be used only for determining the cause of failure and whether detoxifying washing should be conducted. It will never be provided to any third person.

Model Name: _____ Manufacturer's Serial No.: _____

1. Inhaled Gas * Please be sure to fill in.

(1) Whether there is harmful effect on human bodies Yes No (Sing your name below.)

(2) Whether there is unusual smell Yes No

(3) Type and Name of Gas: _____

* Industrial Safety and Health Law designates particular substances as the materials to be notified.

2. Usage Status

Operation Method: Approx. () hours per day, () years and () months

☐ Continuous Operation ☐ Intermittent Operation

Usage: _____

3. Failure Status ☐ Unusual Noise ☐ Abnormal Pressure ☐ Abnormal Actuation ☐ Oil Leakage

Other Symptoms: _____

4. Detail of Request ☐ Repair (Overhaul) ☐ Regular Checks

5. Others: _____

Company Name: _____ Personnel in charge: _____

Address: _____

Tel: _____ Fax: _____ E-mail: _____

Agent Name: _____ Personnel in charge: _____

Address: _____

Tel: _____ Fax: _____

* In case you do not have any direct transaction with us, please be sure to fill in the agent name.

6. Confirmation

The gas and substance used in this pump or unit is harmless to human bodies, or it is not contaminated by any substance harmful to human bodies.

Signed _____ (seal) Date: _____

* Please send the parcel to our Service Division. (See attached contact information.)

* In order to avoid a trouble during transportation, please evacuate oil from any oil pump before shipping.

アルバック機工株式会社

<https://ulvac-kiko.com>

製品情報・サービス拠点・お問い合わせはこちらから



<https://showcase.ulvac.co.jp/ja/>

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Please contact us for products, Service Base or other Inquiries from here.



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