INSTRUCTION MANUAL

Diaphragm-type Dry Vacuum Pump

Model: DAP-6D, 12S Series

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.

Contents

Pages with a shaded background are those, which contain items related to safety.
1.Before Using the Equipment1
2. Using the Pump Safely2
 Safety icons2 Cautions for Safety in Use2
3. Product Outline7
4.Dimentional Drawing8
5.Installation and Operation9
6.Cautions in Operation11
6.1 Cautions in Operation116.2 Startup in Cold Season116.3 Thermal Protector11
7.Maintenance, Inspection, and Repair12
7.1 Cautions for Maintenance, Inspection, and Repair127.2 Maintenance127.3 Regular Inspections127.4 Replacing and Cleaning Consumables137.5 TROUBLESHOOTING19
8. Storage 19
9.Conclusion 20
 Warranty

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. 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.



· Cautions for Safety in Use

<u> </u>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.

A 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.

Power Supply

- (4) 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.
- (5) 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.
- (6) Ensure that lead wiring is properly connected and insulated with insulation tape (or an insulating cap).
- (7) 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.
- (8) 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.
- (9) 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.
- (10)Always fully insert the power cord into the socket. Partial insertion may result in electric shock.
- (11)Remove the cord from the socket while holding the plug. Failure to do so may result in electric shock.
- (12)Touching the power cord with wet hands may result in electric shock.
- (13)Touching electrical wiring etc while inserting the power plug may result in electric shock.
- (14)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.

🕂 Warning

Operation

- (15) 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.
- (16) Inserting fingers or objects into the motor inlet may result in electric shock, injury, or fire.
- (17) 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.

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.

ACaution

Installation

 The fine clearances used in this pump require that the following conditions be satisfied during storage, installation, and operation.

- 1. Ambient temperature of 0 40°C and maximum relative humidity of 85% during operation.
- 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) Install it in the place where a moving object does not come in contact with.
- l) Keep it indoor ventilated.

ACaution

Operation

- (2) Do not close the outlet while the pump is in operation.
- (3) Touching rotating components (ex motor, main shaft, axial joints, cooling fan) while the pump is in operation may result in injury.
- (4) The overload protector operates when the pump becomes excessively hot. Touching it in this condition may result in burns.
- (5) 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.
- (6) 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.
- (7) Do not approach or touch rotating components (e.g. cooling fan) under any circumstances while the pump is in operation.
- (8) Stop the pump before lifting and carrying it to another location.
- (9) Do not give a fan cover part a shock. if give a shock , stop driving promptly, and confirm that a fan cover and a fan do not have damage. When a fan cover runs in a damaged state, you may result in injury.

Maintenance and Repair

- (10) 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.
- (11) 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.

<u>∧</u>Note

- (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.
- (4) When carry a pump, do not have a fan cover. A fan cover may be damaged.

Applications

- (5) 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.
- (6) Do not use the pump for pressurization (Do not use the pump with a pressurized air supply).



Operation

- (7) Ensure that the pump is used within an ambient temperature range of 0 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.
- (8) 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.
- (9) The overload protector operates when the pump becomes excessively hot. Touching it in this condition may result in burns.

Maintenance and Repair

- (10) The pump is manufactured to precise clearances, and should not be dismantled or modified under any circumstances.
- (11) Miscellaneous
 - * Problems (e.g. faults) with the vacuum pump shall be resolved by consultation between the two parties.

3. Product Outline

3.1 Purpose of Use and ProhibitionsThis product is a dry vacuum pump which employs reciprocating motion of a rubber diaphragm for vacuum discharge.Observe the following prohibitions to ensure normal operation of the pump.

Prohibitions

🕂 Warning

- (1) This pump employs only vacuum operation, and must not be pressurized.
- (2) Do not re-sell, repair, or modify this pump without the approval of the manufacturer.

A Note

- (3) This pump is not designed to be corrosion-proof. Use it only with clean air at normal temperature, or gases of equivalent characteristics.
- (4) Do not attempt to discharge gases containing particles, dust, water, or corrosive gases.
- (5) Do not operate the pump for long periods at near-atmospheric pressure.
- 3.2 Specifications

Table 3.1 Product Specifications(50/60 Hz)

Model		DAP-6D	DAP-12S	
Pumping Speed	50Hz	6L/min	12L/min	
	60 Hz	7L/min	14L/min	
Ultimate Pressure		$6.65 imes 10^3 \mathrm{Pa}$	$24.0 imes10^3$ Pa	
Motor		single phase, 10 W, 4P, capacitor operation		
Rated Current	100V	0.5/0.5 A		
	200V	0.25/0.25 A		
	220V	0.25/0.25 A		
Revolution	100V	1275/1530 r/min		
	200V	1320/1600 r/min		
	220V	1320/1600 r/min		
Weight		1.9 kg		
Suction/Exhaust Pipe		Rc1/8		
Operating Ambient Temperature		0°C to 40°C		
Outside dimensions (mm)		$91(W) \times 163(L) \times 100.6(H)$		

4. Dimensional Drawing



Fig.-2 DAP-12S Dimensions

5. Installation and Operation

- (1) Install the pump in a place as free from dust and moisture, where the pump can be easily checked and maintained.
- (2) Install the pump tightly in a stable horizontal position.
- (3) Use the pump at an ambient temperature of 0°C to 40°C, equal to or less than meters above the sea level 1000m, and humidity 85% RH (relative humidity).
- (4) In case of assembling the pump in a system
 Pay an attention particular to the ambient temperature: 0°C 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.

The base region installation hole position can be open in reference to Fig 3 in a long hole.



Fig.-3 DAP-6D,12S Holes position and size for installation

- (5) After verifying that the power switch of the pump is turned OFF, connect the power cord or the motor lead to the power supply according to the motor rating.
- (6) Turn ON the pump to check that pump is pumping.
- (7) After that, turn OFF the power to stop the pump.
- (8) Install either a circuit protector or a glass pipe fuse.
- (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) When attaching the pipe to the exhaust or suction opening, tighten the pipe to a torque of 6 N·m. Too much tightening force could damage the exhaust or suction opening.
- (11) Make piping arrangement so that the exhaust port tree tram is a backing pressure.
- (12) 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.
- (13) Typical vacuum pumping diagram is as shown in Fig-4. (Timing valve)Pump vent valve 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 a stop: Isolation valve is closed, timing valve is open)



6. Cautions in Operation

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

6.1 Cautions in Operation

- (1) This pump is designed exclusively for vacuum pumping. So a backing pressure of the pump is needed to keep lower than 30 kPa (Gauge pressure) by a reasonable means.
- (2) Use the pump at an ambient temperature of 0° C to 40° C.
- (3) Do not use the pump to suck corrosive gas, organic solvent, liquids, or condensable gas (water vapor, etc.).
- (4) Use the pump in an environment where it is not likely that dust, dirt, etc. are admitted into the pump.
- (5) This pump is not designed as an explosion-proof. So do not use it in the vicinity of inflammable solvent or the like, which can be very dangerous.
- (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.

6.2 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.

6.3 Thermal Protector

- (1) This pump incorporates a manual 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 over current 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.

7. Maintenance, Inspection, and Repair

7.1. Cautions for Maintenance, Inspection, and Repair

<u> </u>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.

A 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.

7.2 Maintenance

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

- (1) Check for abnormal noises.
- (2) Check for abnormal heating of the pump.
- (3) Check that gas is discharged normally.

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

7.3 Regular Inspections

Inspect consumables after 10,000 hrs of operation, and replace and clean in accordance with the Replacement and Cleaning Guide on the following page. Refer to 7.4 Replacing and Cleaning Consumables for procedures.

Request replacement by the manufacturer's service division if a repair technician is not available.

<Consumables List>

Table 2 Consumables List

Description	Qty	Material	Life expectancy
Diaphragm	2 paces	EPDM	10,000 hrs
Suction/exhaust valve	4 paces	FPM	10,000 hrs
Head gasket	2 paces	EPDM	10,000 hrs
Bearing	1 set	_	10,000 hrs

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.

• Head gasket

Replace the pump head cover gasket if hardening, crack, elongation 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.

Operating hours	Location	Check	Checking method
	Diaphragm	Deformation, crack and hardening	Visual check
10,000 hrs	Suction/ exhaust valve Deformation and crack		Visual check
	Head gasket	Damage and leak	Visual check
	Bearing	Unusual sound	Auditory check

Table 3 Locations for Maintenance and Inspection

• disposal

When dispose of a pump , obey to a law of a country and a regulations of local autonomy, dispose of a pump.

7.4 Replacing and Cleaning Consumables

- The pump becomes very hot after operation. After stopping the pump, leave it for 30 minutes to cool, and replace and clean components only after it has cooled to a safe temperature.
- X Always put on dust mask and gloves before replacing diaphragms and valves. Any fine particles produced by mechanical wearing may become airborne causing a health risk if inhaled.

% Always use gloves to prevent injury when replacing diaphragms.

Tools Required for Setup

Have the following tools on hand and perform the replacement while referring to the diagram.

If there is no repair technician available, or if you do not have access to the required tools,

please make the appropriate request to our repair services department.

Required Tools

•

- 1. Phillips head (+) screwdriver- No.2
- 2. Torque screwdriver- No.2 (0.25-0.30 Nm, 1.2 Nm, 4.0 Nm)
- 3. Tri-wing bit (special tool)

* This bit is to be used with the torque screwdriver (0.25-0.30 Nm). Please see the pictures below. Use this to fasten/loosen the tri-wing screws.





Tri-wing screw

- Tri-wing bitTri-4. Anti-loosening agent for screws
Replacing diaphragm : Loctite 242 or Loctite 243
 - Replacing valve : Loctite 262 or Loctite 263
- 5. Rag
- 6. Solvent for wiping (something that has no effect on rubber, such as ethanol)
- 7. Dust mask (for nose and mouth), gloves, protective eyewear

*Use items No.5 and 6 to wipe down any dirty area when replacing the part.

Part Replacement Procedure

Definition of Terms

In the replacement procedure, the terms "primary side" and "secondary side" shall be used to refer

to specific locations.

Refer to the terms and diagram below when performing the replacement.



i. Parts Removal





*First unplug the pump's power cable from the main power supply.

Step 1: Remove the pump head. First, remove the 8 small pan head screws (M4 \times 12) shown in the picture on the left, and then remove the pump head.

Step 2: Remove the valve. First remove (1) the small flat head screw (M4×6), and then you can remove (2) the pump head cover and (3) the head gasket. Next, use the tri-wing (bit) screwdriver to remove (4) the tri-wing screw, (5) the valve holder and (6) the valve. * The picture shown is the primary side of the DAP-12S, but the procedure is the same for the secondary side of the DAP-12S and both the primary and secondary sides of the DAP-6D.



Step 3: Remove the diaphragm. First, remove (1) the small flat head screw (M5 \times 12) as shown in the diagram, then remove (2) the push plate for the diaphragm and (3) the diaphragm.

*The procedure is the same for both primary and secondary sides of all models.

* Please be careful when removing (2) the push plate for the diaphragm and (3) the diaphragm, as they tend to adhere to each other and they are therefore hard to remove.

This step completes the parts removal procedure. The next section is the assembly.

ii. Attaching Parts & Assembly



Concave positioning guide

Step 4: Attach the diaphragm. Put the new diaphragm on the connecting rod to replace the old one removed in Step 3. The connecting rod, diaphragm and the push plate for the diaphragm have either a concave or a convex part to help provide a correct assembly. Align those positioning guides on the same position. Make sure that there is no space on either front and rear sides of the push plate for the diaphragm, as this implies misalignment.







Step 5: Using the torque screwdriver (4.0 Nm) and the small flat head screw (M5×12), fasten the diaphragm and the push plate for the diaphragm aligned in Step 4. Before fastening tightly, check the alignment of the diaphragm. Also, apply the Loctite 242 or Loctite 243 onto 2-4 threads from the screw tip for the small flat head screws.

*Be careful when applying Loctite, as too much or too little can cause damage.

*Be sure to always follow the appropriate tightening torque. Failure to do so can lead to product damage. Step 6: Attach the valve. Put the new valve on the pump head to replace the old one removed in Step 2. As shown in the pictures below, make sure that the valve is fully pushed in on both the suction and the exhaust sides. Also ensure that there is no gap between the valve and the pump head. In addition, align the position of the valve so its sides do not touch the inner wall of the dent on the pump head.







Step 7: Using the torque screwdriver (0.25-0.30 Nm) with the tri-wing bit attached, fasten the valve aligned in Step 6 with the tri-wing screw (M3×4). Apply the Loctite 262 or Loctite 263 onto 2-4 threads from the screw tip for the tri-wing screw.

After tightening the tri-wing screw, re-check the alignment of the valve.

*Be careful when applying Loctite, as too much or too little can cause damage.

*Be sure to always follow the appropriate tightening torque. Failure to do so can lead to product damage.



Step 8: Place the head gasket on the pump head. The head gasket has notches on both sides as positioning guides. Align the notches to the pins on the pump head.



Step 9: Place the pump head cover on the head gasket. As with the head gasket, the pump head cover has notches on both sides as positioning guides. Align the notches to the pins on the pump head.

Once they are aligned correctly, using the torque screwdriver (1.2 Nm), fasten them with the small flat head screw (M4×6).

Do the same for Steps 6 through 9 on the opposing pump head.

*Be sure to always follow the appropriate tightening torque. Failure to do so can lead to product damage.

Step 10: Attach the pump head. First, using connecting tubes, connect the primary and secondary side pump heads. DAP-6D has one connection point and DAP-12S has two. (The picture on the left is of DAP-6D.)

After connecting the two pump heads, fasten them by tightening the screws at their corners in order (1) through (4), going over them three times, gradually tightening each one of them.

Finally, use the torque screwdriver (1.2 Nm) to tighten. *Be sure to always follow the appropriate tightening torque. Failure to do so can lead to product damage.

The parts replacement procedure is now complete.



7.5 TROUBLESHOOTING

Table	4	TROUB	LESHO	OTING
-------	---	-------	-------	-------

_

		Possible cause	Corrective action
Improper	1.	Power line trouble	Repair.
pump rotation	2.	Faulty power switch	Correct poor contact or connection.
or no start	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 0°C - 40°C range.
	10.	Starting the pump in case its inside is vacuum pressure.	Vent pump to atmospheric pressure.
Unusual sound	1.	Bearing damaged	*Replace
	2.	Diaphragm broken	Replace.
	3.	Motor damaged	*Replace.
Inadequate	1.	Diaphragm damaged	Replace.
Pump Performance	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 0°C - 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.

8. Storage

Turn OFF the power switch, unplug the power cord, store the pump in a place as free from dust and moisture as possible.

9. 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: 0 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 S	erial 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, () year	rs and () moi	nths			
□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 Che	cks					
5. Others:						
Compony Name						
Addross:	ge.					
Tel· Fax	E-mail [.]					
Agent Name: Personnel in char	ae:		_			
Address:						
Tel: Fax:						
* In case you do not have any direct transaction with us,	please b	e sure	to fill in the agent name.			
 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/

株式会社アルバック 規格品事業部 東日本営業部 〒253-8543 神奈川県茅ヶ崎市萩園2500 TEL:0467-89-2416

株式会社アルバック 規格品事業部 西日本営業部 〒532-0003 大阪府大阪市淀川区宮原3-3-31 上村ニッセイビル5F TEL:06-6397-2286

ULVAC KIKO,Inc. https://ulvac-kiko.com/en

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



https://showcase.ulvac.co.jp/en/

ULVAC,Inc.

Components Division 2500 Hagisono, Chigasaki, Kanagawa, 253-8543, Japan TEL:+81-467-89-2261