

User's Manual

Portable Aspirator

MDA-015A

Please read this manual thoroughly to ensure safe and effective operation of this equipment.
Keep this manual in a safe place.

Please note that due to performance upgrade, the equipment described in this manual is subject to changes in dimensions and specifications without prior notice.

Ulvac Kiko, Inc.

Table of Contents

Items with shade include description on safety.

To Safely Use This Equipment

(1) Before Using	1
1. Target Users	1
2. Read the Manual Thoroughly	1
3. Keep This Manual in a Safe Place	1
4. Warranty	1
5. Statutory Requirements for Disposal	1
6. Safety during Repair	1
(2) Product Overview	2
1. Purpose of This Product and Actions that are Prohibited	2
2. Safety Device and its Purpose and Functions	2
3. Product Specifications	3
4. Individual Unit Specifications	4
5. Standard Accessories	4
6. Switch and Valve Usage Methods	4
7. Switch and Valve Layout	5
Exhaust system drawing	
Electrical wiring drawing	
(3) Opening the Package and Installation	6
1. General Cautions	6
2. Package upon Delivery	6
3. Installation Site	6
4. Power Supply	7
(4) Operations	8
1. Risks and Safety Measures upon Operations	8
2. Portable aspirator operation procedure	8
2-1 Preparation	8
2-2 Operations	9
2-3 Stop	9
3. Measures upon Abnormal Conditions	10
3-1 During power outages	10
3-2 Operation after recovery from power outage	10
(5) Maintenance and Repair	10
1. Risks and Safety Measure upon Maintenance and Repair	10
2. Maintenance and Repair that Can be Made by User	10
3. Removal, Maintenance, and Installation of Devices	11
3-1 Diaphragm type vacuum pump	11
4. Maintenance and Inspection Points	12
5. Troubleshooting	12
6. Storage of Equipment	13
7. Consumable List	13
(6) Disposal	14
1. Cautions upon Disposal	14
(7) Optional Parts	14
1. Standard Optional Parts List	14

Ulvac KIKO Address List

Use situation check seat

To Safely Use This Equipment

Thank you for purchasing our product. This pump is designed exclusively for vacuum evacuation, and it may malfunction or cause accidents if operated inappropriately. Please read the manual thoroughly, and pay specific attention to inspection, maintenance and safety guidelines. Read and fully understand the description of this manual to prevent serious accidents from occurring.









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Read this section before using the MDA-015A. Follow the instructions below to safely use the device and prevent personal injuries from occurring.

Please comply with them all the time.







The symbols below have the following meaning

	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.
		This indicates action or practice that should be made.
		Always make connection with the earth.
		This indicates the action or practice that should be prohibited.
		Do not disassemble.
		Do not touch.



Power Supply

 <p>Warning</p>	 <p>Check the capacity</p>	<p>Please prepare the following: Single-phase 100 V, 1.2 A or more (50/60Hz)</p> <p>Smaller power supply capacity may cause the breaker to trip due to overcurrent during the operation.</p>
	 <p>Do not share</p>	<p>For the primary power supply, a single power supply should be provided for the device, and other equipment should not be connected with it.</p> <p>Breaker capacity shortage may cause the breaker to trip due to overcurrent during the operation.</p>
	 <p>Check the cable capacity</p>	<p>Avoid using an extension cable. However, if it must be used by necessity, use the following cable.</p> <p>For 100-V power supply: 1.25 mm² or more</p> <p>If a thinner cable is used, this may cause overheating, ignition, or fire.</p>
	 <p>Avoid electrical shock</p>	<p>Do not remove the panels and cover with handle.</p> <p>When they must be removed, turn the POWER OFF and disconnect the primary side cable from the socket before removing the covers or panel.</p> <p>Otherwise, the operator may suffer electrical shock.</p>
	 <p>Avoid this action</p>	<p>Do not use with the primary side cable bundled up. In addition, do not place any objects on the cable.</p> <p>Otherwise, such action may cause electrical shock or fire.</p>
	 <p>Check the ground</p>	<p>Connect the primary side cable to a grounded outlet. If using a plug adapter, securely connect to ground.</p> <p>There is a risk of electrical shock when damaged or if there is a short circuit.</p>






Environment

 Warning	 Avoid this action	<p>This product does not have explosion-proof design, and thus use in environments where inflammable substances are present should be avoided.</p> <p>Otherwise, explosion could occur, causing fire and burns.</p>
	 Avoid this action	<p>The pump is extremely hot during operation. Do not place flammable objects around it.</p> <p>This can cause fire.</p>
	 Ventilate	<p>Gases aspirated by this device are released into the air (indoors for example) through the exhaust outlet on the rear of the device. Some aspirated gases may release toxic substances, so exercise appropriate caution.</p> <p>Otherwise, oil spread may contaminate the room or affect human health.</p>
 Caution	 Ventilate	<p>Pump is heated during operation.</p> <p>Room temperature rises.</p>






Installation

 Warning	 Check the environment	<p>Install the equipment where the following conditions are satisfied.</p> <ol style="list-style-type: none"> 1) Flat surface 2) Floor with sufficient strength 3) Well-ventilated place 4) Place without direct sunlight 5) Room with temperatures between 7°C and 30°C. 6) Location where there is no risk of fire 7) Place without electrical noises, which may cause adverse effect to the product. <p>Otherwise, operation failure or durability degradation may occur.</p>
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Operations

 Caution	 Avoid this action	<p>Do not aspirate substances which are unsuitable for nitrile rubber. (liquid/hydrogen sulfide/acetone/lacquer/acetaldehyde/Freon gas/ammonia)</p> <p>These solvents are unsuitable for the diaphragm material (nitrile rubber) of diaphragm type dry vacuum pumps. Using these substances can drastically reduce the durability of the device.</p>
	 Open exhaust outlet	<p>Make sure the exhaust outlet is open.</p> <p>Take care to ensure there is no back pressure when connecting tubing.</p>
 Danger	 Avoid this action	<p>This product is not a medical remedy apparatus.</p> <p>Please do not use this product for human organism to become failure and the cause of the accident.</p>

Maintenance, Repair, and Disposal

 Caution	 Maintenance and repair range	<p>Maintenance and Repair that Can be Made by User.</p> <ol style="list-style-type: none"> 1) Diaphragm type vacuum pump replacement 2) Diaphragm type vacuum pump diaphragm replacement. 3) O-ring replacement (Excluding pump) <p>To make repair or maintenance other than the above, contact us.</p>
	 Wear protective equipment	<p>Wear protective equipment (gloves, glasses, etc.) when draining fluid from inside the collection jar or replacing the diaphragm.</p> <p>Some aspirated gases may cause toxic substances to be left in the collected liquid and inside the pump.</p>
	 Comply with regulations	<p>The device and all accessory parts must be disposed of in accordance with legal and regional municipality regulations.</p> <p>Comply with regulations upon disposal. For details on disposal, contact us.</p>
	 Avoid this action	<p>Do not use other manufacturer's optional parts for modification.</p> <p>We do not assume any responsibility for any damage due to such modifications.</p>

(1) Before Using

1. Target Users

Only persons who have used a vacuum exhaust unit or trained based on this manual may operate this equipment.

2. Read the Manual Thoroughly

Please read this manual thoroughly in order to use the equipment in a safe and correct manner.

Please pay particular attention when reading the section "To Safely Use This Equipment".

3. Keep This Manual in a Safe Place

Keep this manual in a safe place.

After reading this manual, be sure to keep it in a safe place where it is readily accessible to other users.

4. 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 - 30°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.

5. Statutory Requirements for Disposal

Follow all statutory and local authority regulations when disposing of this equipment including used oil.

Comply with regulations upon disposal. For details on disposal, contact us.

6. Safety during Repair

When requesting repairs to this product, provide a full description of the conditions of use (particularly any use of dangerous materials) for the safety of repair personnel.

In this case, fill in the Use Condition Check Sheet and attach to the product.

If the use conditions are unknown, repair may be refused.

(2) Product Overview

1. Purpose of This Product and Actions that are Prohibited

This device is a portable aspirator equipped with a diaphragm type vacuum pump. This is different from a water aspirator in that the ultimate pressure it can reach is not affected by tap water pressure or temperature and can be used even in locations with no tap water source.

This also helps save on tap water and allows for stable ultimate pressure to be maintained at low pressure.

To safely and correctly use this product, avoid the following actions that are prohibited.



Avoid this action

- Please do not do the resale of this device and acidolysis and reshuffle.
- This product is not a medical remedy apparatus. Please do not use this product for human organism to become failure and the cause of the accident.

2. Safety Device and its Purpose and Functions

Item	Purpose	Functions	How to Check
Overcurrent	Diaphragm type dry vacuum pump protection	The diaphragm type dry vacuum pump circuit protector operates to stop power flow. The fuse melts and cuts of the power supply.	N/A



Avoid this action

Operation with the safety devices above disabled is prohibited.

3. Product Specifications

Item	Specifications
Pressure adjustment range	6.6 -98 kPa
Pressure indication	Analog
Aspiration pressure adjustment	Needle valve
Aspiration port external diameter	φ9 mm × 1
Collection jar	450 cc × 1
Vacuum pump	DA-15D (Special)
Structure	Diaphragm type dry vacuum pump
Evacuation speed	12/15 L/min (50/60 Hz)
Ultimate pressure	6.6 kPa
Ambient pressure for usage	7-30°C
Power Supply	AC 100 V 1.2 A or above (50/60 Hz)
Electric motor	0.12 kVA
Dimensions	Width 178 mm × Depth 300 mm × Height 311 mm
Weight	Approx. 8 kg

4. Individual Unit Specifications

Unit	Model and Specifications	Quantity
1) Diaphragm type dry vacuum pump	- Model DA-15D (Special) - Evacuation speed: 12/15 L/min (50/60Hz) - Ultimate pressure 6.6×10^3 Pa - Required power supply: 0.12 kVA	1 set
2) Bourdon tube vacuum gauge	- Model DT1/8×50 - Pressure graduation 0-0.1 MPa	1 pc.

5. Standard Accessories

1) Power supply cable	- 100 V single phase, with power outlet, 2 m	1 pc.
2) Fuse	- 1 A $\Phi 6.4 \times 30$ mm	1 pc.
3) Plug adapter	- Plug with grounding wire for 100-V power supply	1 pc.
4) Aspiration port cap	- for $\Phi 12$	2 pcs.
5) User's manual	- Plain paper	1 pc.

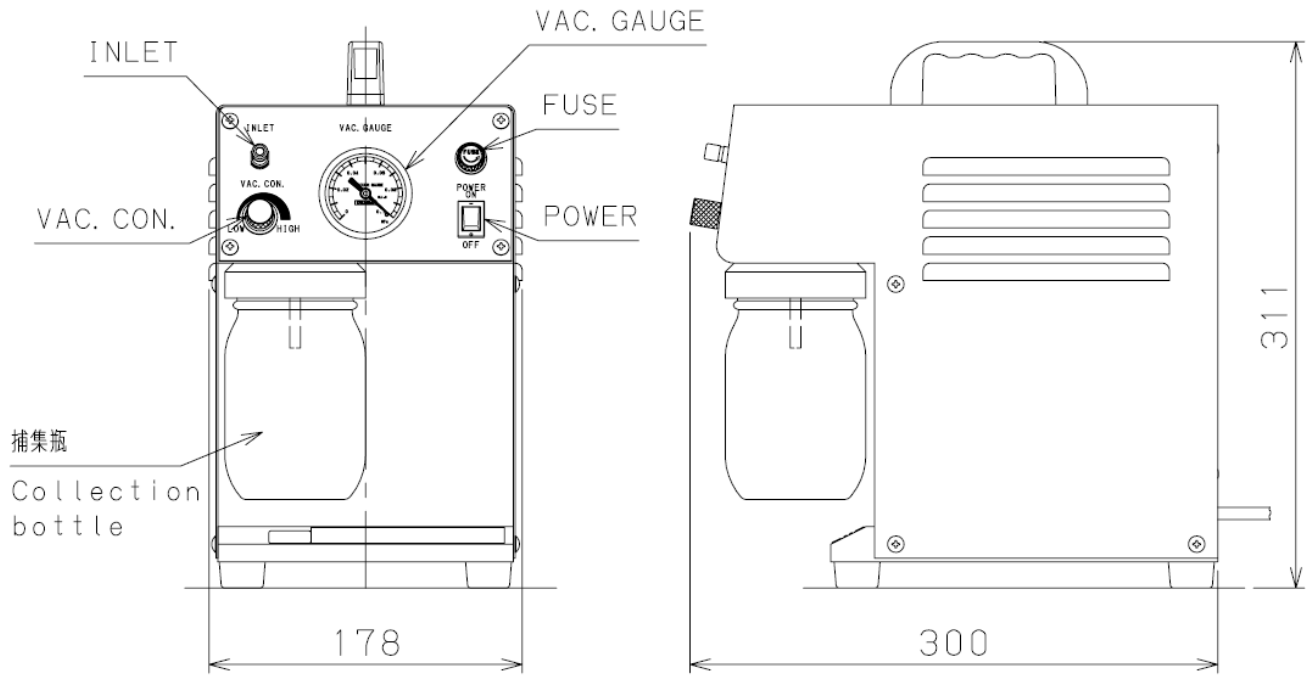
6. Switch and Valve Usage Methods



Confirm the safety and condition of switches and valves before operating.

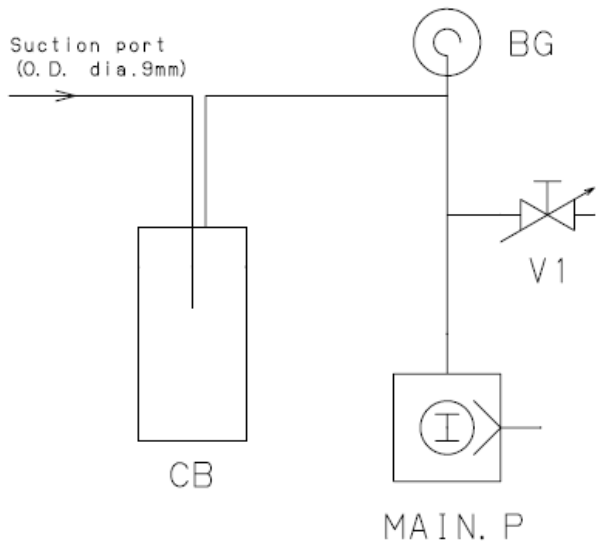
Name	How to Operate
Power switch	Rocker switch Manual ON-OFF
VAC. CON. Valve (Needle valve)	Screw tightening type HIGH: Clockwise (open) LOW: Counter clockwise (close)

7. Switch and Valve Layout

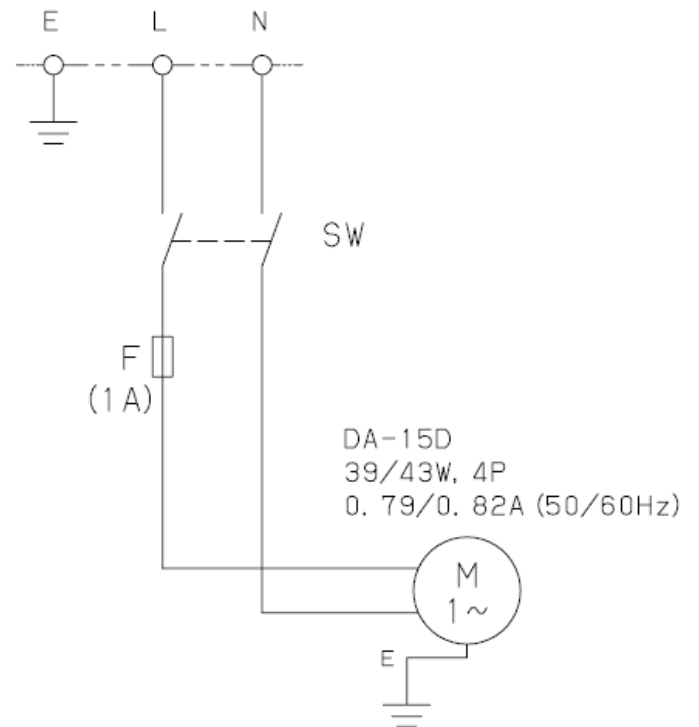


Exhaust system drawing

Electrical wiring drawing




AC100V , 1 ϕ , 0.12kVA (50/60Hz)



MAIN. P: ダイアフラム型ドライ真空ポンプ
Diaphragm type dry vacuum pump
V1: 圧力調整バルブ
Pressure regulating valve
BG: ブルドン管真空計
Bourdon gauge
CB: 補集瓶
Collection bottle

(3) Opening the Package and Installation




1. General Cautions

 Check	<ol style="list-style-type: none">1) Is the product what you requested?2) Are the accessories and all necessary parts included?3) Check that no damage has occurred during shipping.4) Maintain a space of more than 15 cm from the equipment for safety upon installation.
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2. Package upon Delivery

The main unit is shipped packed in a cardboard box.

3. Installation Site




 Warning	 Check the environment	<p>Install the equipment where the following conditions are satisfied.</p> <ol style="list-style-type: none">1) Flat surface2) Floor with sufficient strength3) Well-ventilated place4) Place without direct sunlight5) Room with temperatures between 7°C and 30°C.6) Location where there is no risk of fire7) Location where no corrosive chemicals or gases are present.8) Place without electrical noises, which may cause adverse effect to the product. <p>Otherwise, operation failure or durability degradation may occur.</p>
 Check	After the installation, confirm that the product has clearance of at least 15 cm from the wall for safety.	

4. Power Supply

 Warning	 Check the capacity	Use a primary power supply of the following specifications: Single-phase 100V, 1.2A or above (50/60Hz) Smaller power supply capacity may cause the breaker to trip due to overcurrent during the operation.
<p>Specifications of Primary Cable Connection (Portions Connecting with the Equipment)</p> <p>100 V cable, Length: 2 m Head: 3P plug with ground (with adapter)</p>		
 Warning	 Do not share	For the primary power supply, a single power supply should be provided for the device, and other equipment should not be connected with it. Breaker capacity shortage may cause the breaker to trip due to overcurrent during the operation.
	 Check the cable capacity	Avoid using an extension cable. However, if it must be used by necessity, use the following cable. Use 100 V cable of 1.25 mm ² or more. If a thinner cable is used, this may cause overheating, ignition, or fire.
	 Avoid electrical shock	Do not remove the panels and cover with handle.. When they must be removed, turn the POWER OFF and disconnect the primary side cable from the socket before removing the covers or panel. Otherwise, the operator may suffer electrical shock.
	 Avoid this action	Do not place any object on the cable for the primary side. Otherwise, such action may cause electrical shock or fire.

(4) Operations

1. Risks and Safety Measures upon Operations

 Caution	 Avoid this action	<p>Do not aspirate substances which are unsuitable for nitrile rubber. (liquid/hydrogen sulfide/acetone/lacquer/ acetaldehyde/Freon gas/ammonia)</p> <p>These solvents are unsuitable for the diaphragm material (nitrile rubber) of diaphragm type dry vacuum pumps. Using these substances can drastically reduce the durability of the device.</p>
	 Open exhaust outlet	<p>Make sure the exhaust outlet is open. Take care to ensure there is no back pressure when connecting tubing.</p>

2. Portable aspirator operation procedure

<p>2-1 Preparation</p> <ol style="list-style-type: none">1) Please put a device in the installation location.2) The rear of the device should be at least 15 cm away from the wall for cooling purposes.3) A cap is attached to the aspiration port. Remove the cap and connect tubing (rubber tubing, etc.) when necessary. (Open the exhaust outlet.)4) Set the VAC. CON. valve to LOW.5) Plug the power cable firmly and completely into the closest outlet and make sure the cable is not loose.6) This concludes operation preparation.

2-2 Operations

- 1) Turn the POWER switch ON.
Start the diaphragm vacuum pump.
- 2) Set the VAC. CON. to HIGH.
Adjust pressure to desired pressure.
(Setting the pressure to 40 kPa or above may cause the Bourdon tube vacuum gauge needle to sway slightly, however this is not abnormal. The swaying is caused by the diaphragm pulsing.)

2-3 Stop

- 1) Turn the POWER switch OFF.
Stop the diaphragm vacuum pump.
- 2) Set the VAC. CON. to HIGH.
- 3) Remove the collection bottle and dispose of the collected liquid
(set to LOW to remove).

Precautions




- 1) If stopped while there is still a vacuum, the pump will not start when the device is restarted.
Turn the VAC.CON. knob to the right to let air in and remove the vacuum.
- 2) If an overload occurs for any reason, the glass fuse in the fuse holder melts, and the circuit is broken.
After checking the cause of the overload, replace the fuse and repair the circuit.
- 3) Once the liquid in the collection bottle has reached the specified level, stop the device and rotate the bottle to the left to remove and dispose of the collected liquid.
- 4) Aspirating mists will have little effect.
(Some types of mist may decrease performance.)
If liquid is taken in directly, the pump will lock and the fuse will blow.
- 5) The diaphragm material is nitrile rubber, so aspirating corrosive gases or organic solvents can shorten the life of the diaphragm and as such is not covered by warranties.

3. Measures upon Abnormal Conditions

<p>3-1 During power outages</p> <ol style="list-style-type: none"> 1) Turn the POWER switch OFF. 2) Set the VAC. CON. to HIGH.
<p>3-2 Operation after recovery from power outage</p> <p>Follow the steps "2-1 Preparation" and "2-2 Operations" under 2. Portable Aspirator Operation Procedure".</p>

(5) Maintenance and Repair

1. Risks and Safety Measure upon Maintenance and Repair

 Caution	 Wear protective equipment	<p>Wear protective equipment (gloves, glasses, etc.) when draining fluid from inside the collection bottle or replacing the diaphragm.</p> <p>Some aspirated gases may cause toxic substances to be left in the collected liquid and inside the pump.</p>
	 Avoid this action	<p>Do not use other manufacturer's optional parts for modification.</p> <p>We do not assume any responsibility for any damage due to such modifications.</p>

2. Maintenance and Repair that Can be Made by User

<ol style="list-style-type: none"> 1) Diaphragm type vacuum pump main unit and diaphragm replacement. 2) O-ring replacement (Excluding pump) To make repair or maintenance other than the above, contact us. 3) Exchange of the fuse

3. Removal, Maintenance, and Installation of Devices

3-1 Diaphragm type vacuum pump

- 1) Required tools: Phillips head screwdriver ×1
M5 hexagonal Allen wrench ×1
- 2) Removal procedure
 - All device equipment stopped.: Check
 - Device primary power supply disconnected.: Check
 - Remove collection bottle.
 - Remove the attachment screws (Truss head screw (M4×8)) for the back panel from 4 locations.
 - Remove the attachment screws (Truss head screw (M4×8)) for the cover with handle from 6 locations.
 - Remove the attachment screws (Truss head screw (M4×8)) for the front panel from 4 locations.
 - Lift the handle to remove the cover with handle.
 - Disconnect the silicon tube from the pipe.
 - Remove four places of hexagonal socket bolts(M5×12) and spring washers(M5) and washers (M5) which attach a diaphragm type vacuum pump mount to base.
 - Remove the pump mount attachment screws (M5×16) and spring washers (M5) from 4 locations.
 - Remove the diaphragm type vacuum pump base plate hexagonal socket bolts and flat washers (M5) from 4 locations on 2 plates.
- 3) Diaphragm replacement
Refer to the separate "Diaphragm Type Vacuum Pump User's Manual".
- 4) Order of attachment
 - Attach the diaphragm type vacuum pump base plate hexagonal socket bolts and flat washers (M5) at 4 locations on 2 plates.
 - Attach the pump mount attachment screws (M5×16) and spring washers (M5) at 4 locations.
 - Attach a diaphragm type vacuum pump mount to base by four places of hexagonal socket bolts(M5×12) and spring washer(M5) and flat washer(M5).
 - Connect the silicon tube to the pipe.
 - Fasten the cover with handle into place.
 - Attach the attachment screws (Truss head screw (M4×8)) for the front panel at 4 locations.
 - Attach the attachment screws (Truss head screw (M4×8)) for the cover with handle at 6 locations.
 - Attach the attachment screws (Truss head screw (M4×8)) for the back panel at 4 locations.
 - Attach the collection bottle.

4. Maintenance and Inspection Points

Unit	Maintenance and Inspection	Timing of Maintenance and Inspection
Aspirator	Verify there is no liquid in the collection bottle.	Before every use.
	Dispose of liquid in the collection jar every time the device is stopped.	After every use.
Diaphragm type vacuum pump	Verify performance (ultimate pressure).	As necessary

5. Troubleshooting

Symptom	Cause	Troubleshooting
Ultimate pressure is poor, ultimate pressure is unstable or evacuation performance is low.	The ambient temperature at the installation site is high.	Use air conditioning to decrease the ambient temperature to 30°C or lower.
	Operation time is too long after installation or long termination.	Run for 24-48 hours then check again.
	Leakage is detected.	Check areas around components that were maintained before ultimate pressure changes.
	Diaphragm type vacuum pump is defective.	Refer to the "Diaphragm Type Vacuum Pump User's Manual".
	Failure in measuring instrument	Replace the measuring instrument.
Aspiration failure	Foreign material has been aspirated.	Disassemble the diaphragm type vacuum pump and examine it.
Main unit is hot.	Pump motor is overloaded.	Disassemble the pump and examine it.
	There is a short circuit in the electrical wiring.	Check the wiring.
The diaphragm type vacuum pump will not start.	Overloaded Liquid has been aspirated.	Disassemble the diaphragm type vacuum pump and examine it.

6. Storage of Equipment

Observe the following guidelines to store the equipment.
1) Place of storage - Floor with sufficient strength - Location with good ventilation - Location with no vibration. - Location without direct sunlight - Location where room temperature is below normal temperature. - Location where no chemicals or gases or other substances which can have a corrosive effect on the exterior of the device are present.
2) Cautions before and upon storing - Attach the cap to the aspiration tube.

7. Consumable List



Location of Use	Parts	Specifications	Material	Quantity	Replacement by user
Rack	Rubber Foot	-----	NBR	4	OK
	Rubber cap	-----	NBR	1	NG
	Collection bottle	450cc	—	1	OK
	nozzle O-ring	P16	NBR	1	NG
Instrument panel	Rocker switch	AJ7202BF	—	1	NG
	Fuse	1A φ6.3 × 30mm	—	1	OK
	Needle valve O-ring	P3	NBR	1	OK
Gas pipe	Silicon tube	φ5×φ9	—	1 set	OK
Diaphragm type vacuum pump	Diaphragm	-----	NBR	2	OK
	O-ring	-----	NBR	4	OK
	Valve	-----	FPM	2	OK
	Bearing	-----	—	1 set	NG

(6) Disposal

1. Cautions upon Disposal

 Caution	 Comply with regulations	<p>The device and all accessory parts must be disposed of in accordance with legal and regional municipality regulations.</p> <p>Comply with regulations upon disposal. For details on disposal, contact us.</p>
Applied regulations: Rules of waste disposal and cleaning		
Disposal methods: 1) Transportation: Industrial waste contractors 2) Disposal: Industrial waste contractors		

(7) Optional Parts

 Caution	 Avoid this action	<p>Do not use other manufacturer's optional parts for modification.</p> <p>We do not assume any responsibility for any damage due to such modifications.</p>
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1. .Standard Optional Parts List

Name of optional parts	Purpose	Installation conditions
Vibration absorption mat	To prevent fluctuation by the vibration of the device	Installable by user

Usage Status Check Sheet (for use in Operation 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: _____

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

* You are requested to ship the package to our Service Division (CS Center). (See the attached list of addresses.)