

SMALL SIZE OIL FILTRATION SYSTEM

MODEL UFO-003

INSTRUCTION MANUAL

Important

Before Operating the UFO-003, small size oil filtration be sure to read this instruction manual thoroughly to ensure efficient and safe operation.

Size or Specifications of the model described in this manual are subject to change without notice for

ULVAC KIKO, Inc.

Special Notes

This pump has been used by many of our customers, but while it is rare for this to happen, this circulating pump inadvertently stops and as a result requires repair.

The reason for this is described below.

- (1) Rust forms on the circulating pump from the residual water, which results from the pump being stopped for a long time.
- (2) Foreign objects have built up in the circulator pump from circulating extremely contaminated oil.

To help prevent this circulating pump from stopping inadvertently and use it with peace of mind, we recommend that you consider the following items.

- (1) Rust tends to form while the circulating pump is stopped. Therefore, even after the work task is finished, continue to start up the pump only and circulate oil.
 - If the pump must be stopped for a long time, separate the water sufficiently after the vacuum pump has stopped, and drain it.
 - Thereafter, replace the vacuum pump oil with new oil, circulate the new oil (without water) in the pump and then stop the pump.
- (2) When the oil becomes extremely contaminated, replace it with new oil right away.

PREFACE

0-1.Before Use

We, ULVAC KIKO, Inc., thank you for purchasing our product, UFO-003.

When receiving the product, please confirm it is the same model as you ordered. And check if there are any damages on it during the transit.

For the name of each component part for oil filtration system in this manual, please refer to the Outside View on page #4.

A CAUTION	To ensure a long life for this product, read this manual carefully prior to installation, operation, inspection or maintenance. Also, pay attention to ascertain the details of safety, specification, operational precautions of this product.
NOTE	All rights as well as copyright are reserved by ULVAC KIKO, Inc. All materials in this manual shall not be copied without permission by ULVAC KIKO, Inc. Printed in Japan.

0-2.Marks & Symbols for Safety

For your complete understanding of items to be observed in this instruction manual and the warning labels on this product, marks/symbols are categorized as follows:

\wedge	"DANGER" indicates major hazardous situations, which present an immediate			
Z! DANGER	R threat of death or serious injury.			
\wedge	"WARNING" indicates hazardous situations, which may present a potential to			
WARNING WARNING	death or serious injury.			
\wedge	"CAUTION" indicates hazardous situations, where a potential hazard or			
CAUTION unsafe practice could cause personal injury or equipment damage.				
\wedge	"NOTE" indicates undesirable situations, where a potential hazard could cause			
NOTE equipment damage or abnormal operation.				

0-3. Safety Precautions

After the pump is operated to evacuate toxic gases, not only the pump filter, but also the pump oil gets contaminated. Please pay attentio time of maintenance.	
DANGER	For the elements/component parts, using the oil filtration system, please use specified ones for replacement. The use of any other products than the specified ones will cause oil leakage, malfunction of filtration, or explosion.

	Do not overhaul or repair or remodel this product. It will cause an accident,
DANGE	R abnormal action, or malfunction. Only authorized repairers or engineers should
	do it.
↑ WARNIN	NG Detach the oil filtration system from power source as checking.
2!\	
↑ DANGE	R If there is any abnormal noise, stop the pump immediately and get it inspected
<u> </u>	and repaired.
↑ WARNIN	NG Do not use this product in an explosive or flammable atmosphere. It will cause
<u> </u>	personal injuries or fires.
↑ WARNII	NG Do not bring this product close to fire or put into fire. It will cause an explosion
<u> </u>	or a fire.
↑ WARNIN	NG Do not touch the pump while operational.
<u> </u>	
↑ DANGE	R Do not install or remove anything during the operation (It will cause oil-leakage
<u> </u>	or explosion).
↑ WARNIN	NG Do not cut an element fiber, nor process adhesives, etc.(It will loose a fiber
<u> </u>	shape, and will not function as the element)
	If the fiber element got in your eyes, do not rub; it might cause some damages in
↑ WARNII	NG the eyes. After washing the eyes well with clean water, please receive a
<u>د</u>	treatment with a doctor immediately.
	In case of damages with the oil filtration system, turn off the switch immediately
A CAUTIO	and unplug the power line. For safety, please contact the place you purchased the
د ا	pump or the address listed in this manual.
1	1

DANGER	The power source for this unit is set for 100V. Do not use other than this.
DANGER	Be sure to connect an earth wire.

0-4. Acceptance of Oil Filtration and Storage

(1) Acceptance of Oil Filtration

We deliver the product with utmost care. However, after unpacking, please check up and confirm items shown below just in case.

- (1) The product is what you ordered.
- (2) Accessories are accompanied.

Pump connection hose	O.D. φ 15×I.D. φ 9×1.5m	2 pcs.
Instruction Manual		1 copy
Hose nipple for connecting pump	O.D. ϕ 10.5(PT3/8screws)	2 pcs.
Hose Band		4 pcs.

- (3) Any damage during transportation.
- (4) Any loose or lost component parts.

If you find any problems or inferior conditions on the product, please contact your local agency or ULVAC KIKO, Inc.

	Please confirm that flanges are tightly shut.(A loose flanges might cause
DANGER oil-leaking or pump damages).	

(2) Storage and Installation of Product, and Required Conditions for Operation

Please observe the following conditions for storage, installation, and operation.

- ① Ambient temperature and humidity during operation: $7\sim40^{\circ}\mathrm{C}$
- ② Temperature on the surface during operation: NEVER above 80°C
- ③ Others (during both operation and storage):
 - a. No perishable atmosphere and flammable gas.
 - b. No areas with condensation.
 - c. No areas with dust.
 - d. Do not lay the pump sideways.
 - e. Keep away from a heat
 - f. No dry ambient atmosphere (store a pump in the humidity above 1 0 %RH)

↑ DANGER	Do not operate a pump outside.			
★ WARNING	Do not use a pump under explosive/inflammable atmosphere. (it might cause			
<u> </u>	injury or fire).			
⚠ WARNING	Do not give any shock, drop, or throw a pump.(it might cause a failure.)			
↑ WARNING	Do not wet the element. (It will loose a fiber shape, and does not function as			
<u> </u>	the element			

Δ		Please put a pump in a hard casing such as a cardboard box and store it unde	
	7	the dry atmosphere.	

0-5.Safety Precautions for an Element Replacement

	After the pump is operated to evacuate toxic gases, not only the pump and	
↑ DANGER	the filter, but also the pump oil gets contaminated.	
<u> </u>	Please pay attention in the time of maintenance.	
	For the elements/component parts, using the oil filtration system,	
Please use specified ones for replacement.		
Z! DANGER	The use of any other products than the specified one will cause oil leakage,	
	malfunction of filtration, or explosion.	
\wedge	Do not take apart or remodel a pump.	
Z! DANGER		
\wedge	No installing or removing while operational. (It might cause an oil-leaking or	
Z! DANGER	damages on the pump)	
^	Do not give any outer pressure, or not handle the element roughly.	
DANGER	(It will cause deform due to a fiber-shaping product).	
A	Install the element on the main body tightly. (Loose installation will cause a	
Z! DANGER	leaking).	
\wedge	Do not process the element fiber, such as cutting or adhering.	
! DANGER	(It will loose a fiber shape, and does not function as the element	
	If the fiber element got in your eyes, do not rub; it might cause some	
WARNING	damages in the eyes. After Washing the eyes well with clean water, please	
2:3	receive a treatment with a doctor immediately.	
	When replacing the element, put on some protective equipments, such as	
	rubber gloves and protective glasses. In case of getting vacuum pump oil	
WARNING	onto your hands, wash well with water and soap. If the oil got into your eye,	
	rinse the eye with pure water for 15minutes. Then please receive an	
	appropriate treatment with a doctor.	

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UFO/UFW Check sheet of the current situation (For maintenance/repair)

1.General Description of Oil Filtration

Thank you very much for taking your choice on our UFO-003 small sized oil filtration system. This unit is especially made for oil rotary vacuum pump, which is used for various types of vacuum units. Element of oil filtration unit is very unique, which is capable of removing moisture, acid, and particles. It also features laminated adsorption, being able to process in large amounts with high accuracy. By this unit, it will make possible to decrease the frequency of oil change and failure of a vacuum pump.

Another model, UFW-003, as specifications for oil-water separation which is capable of continually separating a large amount of water, is available.

2. Specifications

Model		UFO-003
Element		Standard Element
Filtration		Circulating Filtration type
Capacity of Filtrati	ion	0.6/0.7 L/min. (50/60Hz)
Maximum capaci removal	ity of water	300cc
Water disposal pre	cision	below 100ppm
Maximum acid no ability	eutralization	0.4mol/1 element
Particle removal al	oility	0.1μm
Relief Pressure		0.35 to 0.4MPa
Power Source		Single-phase 100V 25W (50/60Hz)
Full Load Current		0.6A/0.6A (50/60Hz)
Range of circulation oil temperature		10 to 80°C
Weight		Approx. 8.4Kg(Net Weight)
Dimensions		246W×245L×418H
Necessary Oil		Approx.1L (prepare separately) (Necessary oil for a vacuum pump is also needed separately)
Guideline for Replacement of	Water	replace when oil pressure rises
Element of	Particles	replace when oil pressure rises
	Acid	Oil analysis or regular replacement
Attachment		Pump connection hose (O.D. ϕ 15×I.D. ϕ 9 1.5m 2 pcs.) Hose nipple for pump connection (PT3/8× ϕ 10.5 2 pcs.) Hose band (4pcs) Instruction manual (1 copy)
Optional Parts		Pressure switch or Warning buzzer Drain oil valve (2 ways valve)

<Description of 3-ways valve>

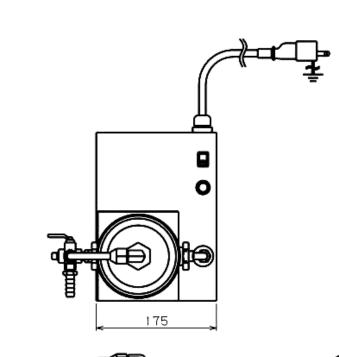
Inlet side 3-way valve

Titler side o	way varve		
direction			at Caso
	Refill port side	Closed position	Inlet port side

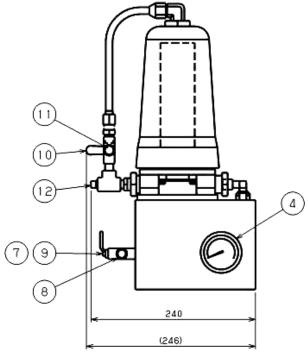
Outlet side 3-way valve

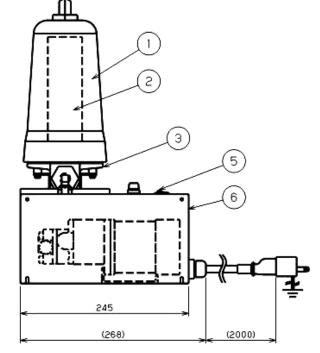
direction			
	Upper side (oil drain side)	Closed position	Drain port side

3.Outside view

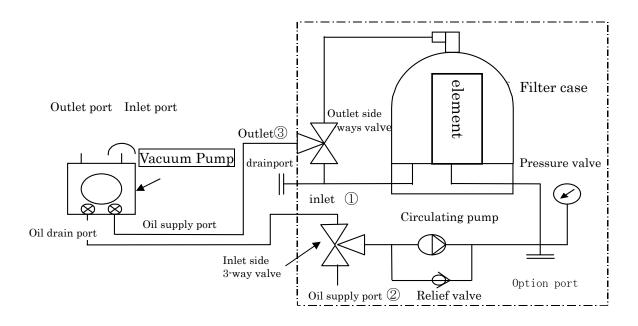


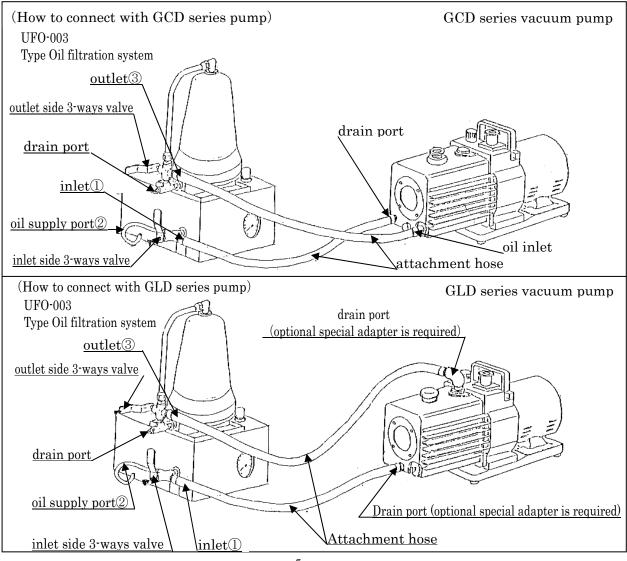
Item No.	Name
1)	Filter case
2	Element
3	Housing head
4	Pressure gauge
5	Power switch
6	Stage
7	Inlet 3-ways valve
8	Inlet
9	Inlet port
(10)	Outlet side 3-way
19	valve
(1)	Outlet
12	Drain port plug





4.Circuit Diagram(Oil inflow system diagram)





5.Installation

5-1.Location of installation

Place it horizontally nearby a vacuum pump

Length of connecting hose	within1.5m	
Vertical interval to the pump	same level or within a range of lower level of 1m	

For a pressurized pump, if the connecting hose of "IN" side is too long, or vertical interval to the vacuum pump is too wide, it will cause a failure on inlet or damages on the circulating pump.

Also, avoid these inadequate places for installation.

- 1) Places that occur rough vibrations.
- 2) Places that generate inflammable vapors or special gases
- 3) Places in high-temperature and humidity, or that suffer heat/water disasters.

5-2. Connection to vacuum pump

The model, which can be connected to our oil-sealed rotary pump, is the GCD series only.

In case of connecting to other models, an optional adaptor and additional set-up work is necessary; please consult us for further details.

Please connect it to the vacuum pump by following the procedures described on previous page and Section 6 below.

6. Preparation for Operation and Supplement

- 6-1.Place this vacuum pump the same level as oil level or lower (within 1m).

 (If the unit is placed higher than the pump, the oil might flow back to the pump side).
- 6-2. Connect the unit to the oil rotary pump by following the procedure on Section 4.
- 1) Install the attached hose nipple tubes into both the oil inlet and oil drain port of the GCD series.
- 2) Connect the inlet① to the oil drain port of the vacuum pump by using the attached tube, and fix it firmly with the hose band.
- 3) Connect the outlet③ to the oil inlet of the vacuum pump by using the attached tube, and fix it firmly with hose band.
- 6-3. For oil supplement, install the tube into the oil refill port of the Inlet side 3-way valve.
- 6-4.Prepare oil as supplement: 1 litter for the UFO 003 and necessary amount of oil for the vacuum pump.
- 6-5. Turn the Inlet side 3-way valve to the oil supply port② side, and insert the tip of the container of the supplement oil. Place the Outlet side 3-way valve face upward.

- 6-6.Plug into an outlet for single-phase 100V, and switch on. It starts operating the circulating pump, and then the oil flows into the vacuum pump; proper amount of oil should be flown into the pump depending on the oil level on the gauge.
 - After a certain amount of oil reaches at a specified level, turn the Inlet side 3-way valve to the inlet① side from the oil supply port②
- 6-7. Check the oil level and any oil leakage. If the amount of oil is insufficient, turn the 3-way valve back to the side of the oil supply port and supply oil.

7.Operation

- 7-1. Turn the Inlet side 3-way valve to the inlet side. Put the Outlet side 3-way valve face upward.
- 7-2.Be sure that power source plug is connected to the outlet for single-phase 100V. Turn on the main switch; it starts operating.

8.Shutdown

- 8-1. Turn off the main switch.
- 8-2. Close both the Inlet side 3-way valve and Outlet side 3-way valve (neutral position).
 - *The Inlet side 3-way valve faces upward; the Outlet side 3-way valve places sideways.
- Caution) The 3-way valve (both Inlet and Outlet) are never to be operational with "closed position!" It is extremely dangerous. However, they must be closed during its shut-down. (the oil would back up).

9.Maintenance & Check

The frequency of maintenance for the unit varies considerably, depending on how it has been used or circumstances on the system.

Regarding the following check items, please set up plans and implement regularly according to the circumstances.

9-1.Maintenance

Please check up the following items at least once a day while its operation.

- (1) If any oil leakage from the connecting part on the vacuum pump.
- (2) If any oil leakage from the connecting hose, pipes, or the main unit.
- (3) If any abnormal noise from the pump.

If any trouble, follow the instructions written on the "Trouble-check List."

9-2.Regular Check-up

	Check-up Item	Content of checking
1)	Element	Increase in pressure contamination of oil
2	Oil pressure pump	Condition of inlet and outlet
3	Housing	Damages · Cracks · Flaws · Corrosion · Deterioration
	Housing	of O-rings
4	Connecting hose.	State of deterioration/adhesion of dirt or taint
4)	Joints/Fittings	State of deterioration/adnesion of dirt or taint
5	Piping	Cracks·Loose·Damages·Adhesion of dirt or taint
6	Pressure gauge	Incorrectness of gauge pointer

In order to use the unit over the long time, implementing an overhaul once every 2 years is recommended.

Due to its highly sophisticated assembly, please contact ULVAC KIKO or our dealers for the overhaul.

9-3.List of consumable supplies

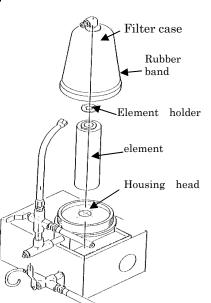
Name	qty.
Element	1
Pump connection hose	2
O-ring (AS-238)	1
O-ring (G-100)	1

*The O-rings are used between filter case and housing head.

10. Replacement of Element

- 10-1.Replace the element when: the outlet pressure of the circulating pump is above 0.3MPa, or absorption of the element deteriorates.
- 10-2. Prepare the container for oil drain beforehand.
- 10-3. Place the container under the drain port.
- 10-4. Turn off the power of the UFO-003.
- 10-5.Remove the drain port with a wrench. (Beware of oil leaks).
- 10-6. Turn the Outlet side 3-way valve to "closed position" (neutral position).

Turn the Inlet side 3-way valve to the refill port side. (oil comes out).



- 10-7. Turn on the power source of the UFO-003, and operate for a few minutes. Drain all the oil inside.
- 10-8. Stop operating after making sure that draining stops from the drain port.
- 10-9.Loosen the upper joint of the filter case and remove the hose.
- 10-10.Remove the filter case by turning it anti-clockwise.

 (If it is stiff, put rubber bands three places around the case and turn it. It is also easy to turn it by using a belt wrench. Should not use any other tools for removing; it might cause damages).



Belt wrench BW-2 (by Supertool Inc.)

- 10-11. Remove the element from the housing head.
- 10-12. After cleaning the inside and outside of the housing area, place a new element.
- 10-13.Install the filter case and the hose.
- 10-14. Install a plug to the drain port. (Be sure to fix with the seal tape around screw area).
- 10-15. Supply some oil by following the directions on Section 6-2 \sim 6-7.

Caution) If the oil is badly degraded, and frequent replacement of the element is needed, a drain valve (optional) is very useful.

11.Oil Replacement of Vacuum Pump

- 11-1. For oil draining of the vacuum pump, follow the directions on Section 10-2 to 10-8. The Inlet side 3-way valve should face to the inlet side. (The Outlet side 3-way valve is at closed position)
- 11-2. For supplying oil into the vacuum pump, follow the directions on Section 6-2 to 6-7

12. Troubleshooting & Remedy

	Problem	Does not operate	Defect in absorption of the oil	Oil leakage	Defect in cleaning the oil	Pressure switch buzzer goes	Remedy
P	Power source is off	0					Confirm if the power is on
Power	Defect in voltage system	0					Rated voltage± 1 0 %
er	Defect in wiring	0					Inspect and repair wiring
Pi	Clog in piping		0			0	Clean the pipe
Piping	Defect in piping		0	0			Check the pipe and repair
C:	Pump · lock	0					Check the pump and repair
ircu	Defect in rotor		0				Repair the pump
latir	Defect in oil seal			0			Repair the pump
Circulating pump	Defect in relief valve		0				Repair the pump
Element	Clog in element		0			0	Replace the element
	Defect in element				0		Replace the element
ıent	Shortage of filtration hours				0		Longer the filtration time

Caution 1) Pressure switch and buzzer are optional

Caution 2) If any questions or inconvenience, consult your local sales representative for further assistance.

13.Anti Chemicals

13-1. Quality for the component parts (Main part only)

1	Element	Special quality of material
2	Filter case	AS resin
3	Housing head	PE resin
4	Piping/Joint	SUS (stainless steel)
		PE (polyethylene)
		BS (brass)
(5)	Circulating pump	FC-250 (steel casing)
6	Valve	BS
7	Hose	PVC

13-2.Anti solvent/Anti chemicals (summary)

• Acetone	Δ
• Benzene	Δ
• Diethyl ether	Δ
· Ethyl acetate	Δ
• Ethyl alcohol	0
 Trichloroethylene 	Δ
· Acetate	Δ
· Chlorine gas	Δ
• Ammonia gas	0
· Hydrogen sulfide	0
• Freon	Δ
• Water	0

 $\bigcirc \cdots$ No problem $\triangle \cdots$ Caution

14.Disposal

Dispose of the element of the oil filtration system in accordance with the laws or regulations/ordinance specified by the local government.

When disposing of the unit connected with a vacuum pump, which exhausts toxic gas to human body, consign disposal to a specialized processor.

Pump oil is hazardous as well as vacuum pumps, main bodies, and elements.

15. Warranty

- (1) The warranty period for this unit is valid for one year from the day of purchase; however, consumable parts are excluded.
- (2) If failure occurs within the period of warranty in condition of normal pump operation, repair of the pump with no charge should be guaranteed.
 - ① Ambient temperature for operation: 7 to 40°C
 - ② Type of exhaust gas of vacuum pump and temperature: Dry air 7 to 40°C
 - ③ Used and operated in accordance with the instructions manual.
- (3) These cases listed below should be repaired at your expense even within the period of warranty.
 - ① resulted from natural disasters, earthquakes, or fires.
 - ② resulted from special ambient environment, such as brine damages, public nuisance
 - ③ resulted from condition of use which is contrary to the terms for use written on the instruction manual (ex., specifications, maintenance, or check-up).
 - ④ When our technical staff judged that it resulted from the use which is contrary to the terms of use for the unit.

16.Finally

This instructions manual is limited to general description for the unit;

If there is any question or trouble, please feel free to contact and consult us for further assistance.

Usage Situation Check Sheet

(for overhaul repair)

For safety of repairers, please fill out the form and attach it to the product.
Date of entry: / / (D/M/Y)
Your Name:
Person in Charge:
Tel – Extension
Purchase Place
Person in Charge
Tel – Extension
Model Name Serial No.
1. Why do you request an overhaul? (Select among the items below)
$\Box \mathbf{Breakdown}$
Situation: □Abnormal Sound □Wrong Pressure □Malfunction
others
□Periodical Inspection, Periodical Repair
□Others
2. What kind of gas the pump sucked?
(1) Is the gas toxic? Yes No
(2) The kind and name of the gas
3. How long has the pump operated?
About Hr □24Hr Continuous Running □Intermittent Running
4. Others
5. Contents of Request
\Box Immediate repair if the estimate is within (¥
${ exttt{ o}}$ Others

Please copy this sheet and use repeatedly.

If this sheet is not attached,

it is possible that we cannot undertake the overhaul, repair, or inspection.