

NO.47700-2-01-12

Small Oil Filtration System

(Oily Water Separation)

Instruction Manual UFW-003

Caution

Be sure to read this manual for safety and efficiency beforehand. The dimensions/specifications of the models of these products may be changed without notice for quality improvement

ULVAC KIKO, Inc

<u>Special Notes</u>

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.

0. Preface

- 0-1.Caution before using this product.
 - We are happy that you have chosen our products.
 - Please confirm as following points once you receive this product.
 - -The product at hand is the exact one you placed the order.
 - -There are not any defects caused by delivery.

Please refer to P3, external view for parts' description of oil filtration system in this instruction manual.

\wedge	Make sure to read this manual before installation, operation and	
Warning	maintenance and keep our product running for long. Please	
	understand items to note for operation and safety of this product.	
Note Note	This manual is prohibited to make copies without our permission for the third party's use.	

0-2.Symbol Marks for Safety

We put symbol marks in this manual and for this product for better understanding for this instruction manual and items to pay attention or to keep them as a rule. We show the symbols and their definitions as follows.

Danger	This mark means that a user's life is very high possibly in danger for death or heavy injury/sickness if he or she fails to operate or handle.	
Marning	This mark also means that a user's life is possibly in danger for death or heavy injury/sickness if he or she fails to operate or handle.	
Caution	This mark means that a user might get injured quite badly or the machine might get big damage if he or she fails to operate or handle.	
Note Note	This mark means that the machine might get damage or might not work normally if a user fails to operate or handle.	

0-3. Items to Note for Safety

DangerPlease note that oil filtration system's body and its phazardous when you evacuate toxic gas with vacuur		Please note that oil filtration system's body and its pump oil are
		hazardous when you evacuate toxic gas with vacuum pump.
		Please be careful at maintenance.
$\mathbf{\Lambda}$		Make sure to use the specified items for elements/components or
	Danger	parts for oil filtration system. Unspecified items may cause oil
		leakage, failure in filtering and breakage.

	Ask for check up and trouble shooting immediately when you observe abnormal phenomenon.	
	Perform maintenance with power switch of oil filtration system turned off.	
A Danger	Do not disassemble or remodel/rebuild (detune).	
	Do not mount nor remove while operating the machine. It may cause oil leakage and breakage.	
Danger	Please ask our service companies or our dealers for overhauling.	
	Do not operate in explosive or flammable atmosphere. It may cause injury or fire.	
	Do not put it near or into fire. It may cause explosion and fire.	
	Do not touch the pump while operating.	
\wedge	Do not cut fibers of elements.	
∠!∆ _{Warning}	Do not attach them with an adhesive.	
	Don'ts actions may cause deformation of fibers and elements may	
	not function.	
\wedge	Consult with doctors immediately without robbing your eyes after	
U Warning	washing them with clean water when fibers of elements happen to	
	come into your eyes, in fear of damaging your eyes.	
	Turn off power switch and plug off when you find breakage in oil	
<mark>∐N</mark> ote	filtration system. Please ask our dealers which offered you this	
	product or contact listed in this instruction manual for it.	

	Power source of this machine is at single phase voltage 100V. The other voltage is not available.	
▲ Danger	Make sure to set ground connection. (Earthing)	

0-4. Accepting and keeping oil filtration system

(1) Accepting oil filtration system

Please confirm the following points after unpacking, although we ship them with special care.

①The items in the package are what you ordered.

②There are accessories in the package too.

①Pump connection hose	Ο.D. φ 15×I.D. φ 9×1.5m	2 pcs
②Hose nipple for connecting pump	O.D. φ 10.5(PT3/8)	2 pcs
③Hose band		4 pcs
④Hose nipple for draining	Ο.D. φ 10(PT1/4)	1 pc
5 Hose of vinyl for draining	φ 9× φ 12×0.5m	1 pc
6 Instruction manual		1 copy

③There is not any damage during transportation.

④Please contact our dealers if you find any defect or failing of our products caused by delivery

\wedge	Make sure the flanges tightly shut before using our product. (A loose
Danger	flange may cause oil leakage or pump damage.

(2) The required condition for storage, installation and operation

Please keep the conditions as follows for storage, installation and operation.

- ① Ambient temperature/humidity at operation $7^{\circ}C \sim 40^{\circ}C$
- ② Temperature on the surface at operation Prohibited to operate at more or 80°C
- ③ The others (for the both storage and operation)
 - ${\rm a}$. There is not perishable atmosphere and flammable gas.
 - b. There is not condensation.
 - ${\rm c}$. There is not contamination or dust.
 - d . Do not lay nor fall it sideways.
 - e. Keep away from a heat.
 - ${\rm f}$. Do not put it in dry atmosphere. (Keep it at humidity more or 10%RH)

A Danger	Do not operate it in the open air.	
\wedge	Do not run it under the explosive/flammable environment. It may	
Danger	cause injury and fire.	
	Avoid hard hit. Do not drop it. Do not throw it. (It may cause failure.)	
\wedge	Do not wet element with water. (It may cause deformation of fibers	
∠! <u>Warning</u>	and element may not function.)	
	Keep it in its hard cardboard box, protecting from moisture.	

0-5. Precautions of replacing elements.

Please note that oil filtration system's body and its pump oil are	
hazardous when you evacuate toxic gas with vacuum pump.	
Please be careful at maintenance.	
Make sure to use the specified items for elements/components or	
parts for oil filtration system. Unspecified items may cause oil leakage,	
failure in filtering and breakage.	
Do not disassemble or remodel/rebuild(detune).	
Do not mount nor remove while operating. (It may cause oil leakage or breakage.)	
Do not press from the external. Do not handle elements wildly. (fibers may deform, for fiber is molded form.)	
Mount elements in the body for sure. Loose attachment may cause leakage.	
Do not cut fibers of elements. Do not attach them with an adhere for processing. (Fivers, molded form may deform and may not function.)	
Consult with doctors after washing your eyes with clean water if fibers	
of elements come into your eyes, without robbing your eyes,	
preventing from damage in your eyes.	

Marning Put on protection glasses, safety clothes and rubber gloves at ele replacement. Wash your hands with water and soap if you happed touch oil of vacuum pump. Get treatment by doctors if you happed	
	fifteen minutes.

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1. Oil Filtration System's Feature

Thank you for your choosing our products.

Compact oil/water separation oil filtration system, model UFW-003 is specially designed for oil rotation vacuum pump in all kinds of vacuum equipments. The elements set in this model are the elements special for oil/water separation. It is efficient to continue oil/water separation when you suck water with vacuum pump for drying machine. This product enables you to keep quality of vacuum pump and to reduce failure and oil replacement.

2. Specifications

Model		UFW-003	
Element		Oil/water separation element :F(SUS)	
Filtration		Circulating filtration system	
Capacity of filt	ration	0.6/0.72 L/min. (50/60Hz)	
Max. capacity	of removing	Continuo sonarato drain	
water or moitu	re	Continue, separate, drain	
Accuracy in re	moving water	100~200ppm	
Max. acid neut	tralization ability	0.1mol/ element	
Relief pressure	Э	0.35MPa	
Power source		Single phase 100V 25W (50/60Hz)	
Full load curre	nt	0.6A/0.6A (50/60Hz)	
Range of circu	llation oil	Erom10 to80°C	
temperature			
Weight		Approx.8.4Kg (body weight)	
Dimension		235W×245L×418H	
Necessary oil		Approx. 1L (Prepare separately)	
		(Oil quantity for vacuum pump is necessary separately.)	
Element's life	Water/moisture	Replace at increased oil pressure	
cycle	Particles	Replace at increased oil pressure	
	Acid	Oil analysis or regular replacement	
Accessories		① Pump connection hose (O.D. ϕ 15×I.D. ϕ 9×1.5m 2pcs)	
		② Brass hose nipple for pump connection(PT3/8× ϕ 10.5 2pcs)	
		③ Hose band (4pcs)	
		(4) Hose nipple for draining (PT1/4× ϕ 10 1pc)	
		(5) Plastic tube for draining(O.D. ϕ 12×I.D ϕ 9×0.5m 1pc)	
		6 Instruction manual (1 copy)	

3. External View

Item no.	Description	Item no.	Description
1	Filter case	10	PP elbow
2	Housing head	(1)	Nylon hose
3	Motor	12	Oil supply port
4	Oil pressure pump	13	Power cord
5	Pressure gauge	14)	Power supply adopter
6	Three way valve	15	Switch
7	Inlet	16	Fuse(1A)
8	Outlet	(17)	Earthing
9	Drain port(Stop valve)		





<Three Way Valve Definition>

Inlet port side three way valve

Direction			
	Refill port side	Closed position (CLOSE)	Inlet port side

Outlet side three way valve

Direction			
	Upper side	Closed	Drain port sido
	(oil drain side)	position(CLOSE)	Drain port side

4. Circuit Diagram(Oil inflow system diagram)





5. Installation

5-1.Location of Installation

Place it horizontally near a vacuum pump.

Length of connecting hose	Within 1.5m
Vertical interval to the pump	The same level or within a range of lower level of 1m

Circular pumps are of pressurized type. Sucking failure or other failures may occur if the connecting hose in IN side is too longer or if the interval to the pump is too wide. The following locations are not proper for installation.

- ① Vibrating places
- ② The places with flammable vapors or particular gas.
- ③ The places under high temperature/humid
- ④ The places possibly might suffer from damage by heat/water

5-2.Connection to a vacuum pump

GCD series' models only are adoptable for our oil rotary pump.

Additional set up is required when we adopt the other models. Please contact us for further in detail.

Follow instructions at the previous page, P5 drawings and Section 6 for connecting to a vacuum pump.

5-3. Oil and water separating element

If the element is soaked with water beforehand for 1 to 2 minutes, it helps form the water separation membrane and improves its function at the operation outset. Always soak with water before use.

To remove, refer to "10. Replacement of Elements."

6. Preparation for operation and supply

- 6-1. Place this body and oil rotary vacuum pump at the height of the surface of oil or lower than it, within 1m. The oil in the body may reflux (back run) towards the pump side, if you set the body higher than the pump.
- 6-2. Connect the body to the oil rotary vacuum pump as described in Section 4.
 - 1) Mount brass hose nipple of accessory in oil inlet and outlet port of GCD series models.
 - Connect between inlet port ① and oil drain port of vacuum pump.
 Fix it with hose band firmly.
 - Connect accessory tube between oil drain port ③ and oil supply port of vacuum pump. Attach it together with hose band tightly.
- 6-3. For oil supplement, install the tube into the oil refill port of the Inlet side 3-way valve.
- 6-4. Prepare oil for supply beforehand. (Refer to UFW-003 for the oil quantity of IL and vacuum pump)

- 6-5. Place the leading edge of tube in the container of supply oil, having the inlet side three way valve towards the side of supply port side. Place the outlet side three way valve's face upward.
- 6-6. Plug power cord in consent. Turn on switch to operate.

The circular pump runs and oil flow into the vacuum pump. The proper quantity of oil pour in according to the oil level guage of vacuum pump. Switch inlet side three way valve off from supply port side on to supply port side after oil reaches at the specified quantity

- 6-7. Check if there is leakage in every section. Supply oil after switching three way valve on to the supply port side again if you find the quantity is less by checking level gauge of vacuum pump.
- 6-8. Set nylon hose nipple of accessory in drain valve. Attach nylon hose of accessory (length 0.5m) here. It is a hose for draining water after oil/water separation.

7. Operation

- 7-1. Switch inlet side three way valve on to the inlet side. Get the outlet side three way valve's face upwards.
- 7-2. Confirm that power cord plugs in consent. Turn on the main switch and it starts running.
- 7-3. Water separated from oil collect in a filter case bottom (the blue section) during operating. Open the drain valve and drain the water when water reaches up to the blue section, the bottom of filter case.
- 7-4. Pay special attention to draining water always during operation. The full water in filter case floods out to the vacuum pump side and run around inside the vacuum pump to cause failure. Be careful about water.

8. Shut down

- 8-1. Terminate it by turning off the main switch.
- 8-2. Close the both inlet and outlet side three way valves(at the middle position).(To close them with the inlet side three way valve's face upwards and outlet side three way valve's face sideways.)

Note) Do not run it with three way valves (the both inlet's and outlet's) closed. It is dangerous. Make sure to close it when you terminate operation. (The oil might flow back.)

9. Maintenance and Check up

Interval period between maintenance and check up depends on each condition of using this system and environment.

Perform them regularly as in the schedule subject to availability of use and following the check points as below.

9-1. Maintenance

Confirm the following check points once a day.

- (1) Is there a leakage at the connection section with vacuum pump?
- (2) Do you find oil vapor or oil leaking out of connection hoses or pipes and the machine body?
- (3) Do you hear abnormal noise?

Please take action of 12. 'Failure and Countermeasure' if you find it abnormal.

9-2. Regular check up

Check points	Detail	
Element	The condition of increase in pressure and oil	
	contamination	
Oil pressure pump	The condition of sucking and draining	
Housing	Defect, leak, crack, damage or etc. The condition of	
	deterioration of O ring and such components.	
Connection hose	The deterioration condition. The condition of	
and joints	contamination.	
Every piping	Crack, loose, breakage. The condition of	
	contamination	
Pressure gauge	A gauge pointer goes out of order.	
	Check points Element Oil pressure pump Housing Connection hose and joints Every piping Pressure gauge	

We suggest that overhaul should be performed every two years for longer lifetime of our product.

Please ask us or our dealers for overhauling for this product is assembled of mechanical ingenuity.

9-3. List of Consumables

Description	No. of
	units
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.

9-4 When to replace elements

- Replace elements when the pressure of circular pump in the outlet side reaches to 0.3MPa or more during operation.
- ②Replace elements when the quality becomes inferior due to deterioration of water separation membrane affected by the particles excluded from the above.

10. Replacement of Elements

- 10-1. Replace elements in the condition of 9-4.
- 10-2. Prepare a container beforehand for disposal oil.
- 10-3. Put the container for disposal under the hose at drain port.
- 10-4. Turn off power source of 10-4 UFW-003.
- 10-5. Open drain valve. (Oil drop down)
- Set outlet side three way valve in the close positior (in the middle position).
 Set inlet side three way valve to the supply port Sid. (Oil drain out.)
- 10-7. Turn on power source of UFW-003.Run it for a few minutes.Drain out all the oil inside.



- 10-9. Loosen joint in the upper side of filter case and put off hose.
- 10-10. Rotate the filter case anti-clockwise and remove it. (If it is stiff, put rubber bands in three places, rotate it with your hands. Or you can easily rotate it with a belt trench. The other tools may damage it.)



Belt trench BW-2 (made by Super Tool Co.,)

- 10-11. Remove elements from housing head.
- 10-12. Set new elements after cleaning inside and around the housing head.
- 10-13. Set a filter case and attach hoses.
- 10-14. Close drain port.
- 10-15. Supply oil as described from 6-2 to 6-7.

11. Replacement of oil

- 11-1. Drain oil of vacuum pump as described from 10-2 to 10-8.Provided that inlet side three way valve should be in the inlet side. (Outlet side three way valve is in close position.)
- 11-2. Supply oil in the vacuum pump as described from 6-2 to 6-7.



Filter case

12. Failure and Countermeasure

Phenomenon Causes		Failed to operate	Failed to suck oil	Oil leak out	Failed to clean oil	Pressure buzzer switch rings	Countermeasure
Pc	Power source is not on.	0					Confirm power source.
ower s	Voltage failure	0					Set rated voltage $\pm 10\%$.
source	Poor piping	0					Maintenance and trouble shooting of piping
	Clog in piping		0			0	Clean piping
Piping	Poor piping		0	0			Maintenance and trouble shooting of piping
Circ	Pump lock	0					Maintenance and trouble shooting of pump
ular p	Rotor failure		0				Repair pump.
duno	Defective oil seal			0			Repair pump.
	Defective relief valve		0				Repair pump.
Element	Clog in element		0			0	Replace elements
	Inferior element function				0		Replace elements.
	Failure in set up for filtering time				0		Lengthen filtering time.

Note1) Pressure switch and buzzer are of option.

Note2) Fill in the form, the last page of this instruction manual, 'Check list for the current situation' when you return this product due to failure. Attach this form to the product.

Note3) Inquire us any other unclear points.

13. Anti Chemicals

13-1. Material quality of components/parts (major ones only)

①Element	Particular material (metal section sus)
②Filter case	AS resin
③Housing head	PE resin
④ Piping/joint	SUS (stainless steel)
	PE (polyethylene)
	BS (brass)
⑤Circular pump	FC-250 (steel casing)
⁶ Valve	BS
⑦Hose	PVC

13-2. Anti solvent/anti chemicals (Summary)

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

 $\bigcirc \cdots$ NO PROBLEM $\triangle \cdots$ CAUTION

14. Disposal

Dispose of oil filtration system's body and elements in concordance with regulations and laws in each local area. Have the body connected to vacuum pump, vapouring out toxic gas dangerous for health and life disposed of by hazardous waste disposal firms. Not only vacuum pump, body and elements, but pump oil are hazardous too.

Oil is included in drainage. Please dispose according to local regulations and laws.

15. Assurance

- This product's assured period is for a year starting on delivered day.
 Provided that consumables are excluded for assurance.
- (2) No charge for repair of this product in normal condition and within assured period.
 - ① Ambient temperature/humid from 7 to 40° C
 - 2 Type of exhaust gas of vacuum pump and temperature Dry air from 7 to 40° C
 - ③ Handle and operate, following this instruction manual.
- (3) Charge for repair even in assured period in the cases below.
 - ① Defect/failures caused by natural disasters, earth quakes or fire.
 - ② Defect/failures caused by the particular environment of brine damages and pollution.
 - ③ Failure caused by different condition from described in this instruction manual(Specification, maintenance, check up and etc)
 - ④ Failure identified by our technical staff as effect of not meeting with the condition for this product.

16. Closing

How to handle and operate this product is explained as above, but the contents are focused only on general issues. Please feel free to ask us further in detail if you have any questions or problems.

ULVAC

Check Sheet for UFW: The Current Situation.

(For Check up/Repair) Issue date:

[Send to] ULVAC Kiko,Inc. 1-10-4,Kita-shinyokohama,Kohoku-ku, Yokohama,Kanagawa-ken,223-0059,Japan

CS Center. Service Dep. Phone no:045-533-0509

FAX:045-533-0512

Customer name		
A person in charge		
Phone no.	Fax no.	
Purchase date:	Dealer's name	
Model name	Serial no.(M F G. N o)	
Requested delivery date:		

1. Your request in detail:

- □ Repair request during assured period (Charge free)
- □ Request for overhaul of evaluation target or of defective or faulty machine. (Charge free)
- □ Immediate repair request (Charged)
- □ Request for regular check up (Overhaul) (Charged)
- □ Request for estimation for the repair and repair.
- 2. The situation of failure/defect
 □ Abnormal noise
 □ Pressure failure
 □ Operation failure
 □ The other
- 3. Purpose for vacuum pump or pump name. <u>Vacuum pump model type :</u> Purpose (Model name) :
- 4. Type of vacuum sucking gas
 - (1) Effect on health/life: Harmless Hazardous
 - (2) <u>Gas type/description</u> (Mandatory to fill in)
- 5. Operation environment of UFW
 - (1) <u>Operation hours</u> : <u>hr</u> = 24 br continuous operation = operation
 - □ 24hr continuous operation □ operation between intervals
 - (2) Installation location :
 - (3) Ambient temperature :
 - (4) <u>Set up pressure : Pa</u>
 - (5) Oil in the machines :
- 6. Other information

Approved by