AQUACOUNTER

OIL EVAPORATOR EV-2000L

INSTRUCTION MANUAL

HIRANUMA SANGYO Co., Ltd.
1739 Motoyoshida-cho ,
Mito-shi, Ibaraki 310-0836,
Japan
Phone : 81-29-247-6899
Fax : 81-29-247-6952

Preface

Thank you very much for purchasing the Model EV-2000L Oil Evaporator.

This Instruction Manual describes necessary items for the operation and the maintenance to use the Instrument safely and efficiently.
Be sure to read this Instruction Manual before starting the installation and operation.
This Instrument is an evaporator to measure water content in lubricating oil being combined with AQ Series Water Content Measurement Instrument (hereinafter Water Content Measurement Instrument).
To use other instruments, read instruction manuals furnished with the instruments.

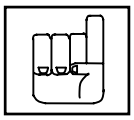
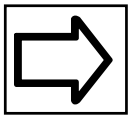
For Safety Use

1. Be sure to read this Instruction Manual before starting the operation.
2. Follow indications described on Caution Label.
3. To ensure a safe handling of reagents and chemicals for this instrument, request MSDS for reagent makers and follow instruction.
4. This Instrument is not explosion-proof constructions.
   When using flammable samples or reagents, choose places where ventilation is well performed.
5. Putting reagents, samples, or any other objects on the top of the instrument must be avoided. Otherwise, fire or malfunction may be caused.
6. Do not use this Instrument for other purposes than the original purpose.
7. Do not modify this Instrument.
8. Be sure to turn off the power before starting check, repair, or maintenance.
9. Ground the Instrument following this Instruction Manual.
10. Symbols used in this Instruction Manual are as follows.
    Especially the following are important.


WARNING


CAUTION

Be sure to read and follow them.

 **WARNING**	Needs your full attention	If misoperated, death or severe injury can be caused.
 **CAUTION**	Needs your attention	If not followed, injury or damage of Instrument can be caused, or good performances of Instrument cannot be obtained.
 **ADVICE**	Useful information	Knowledge to obtain good performances and functions of Instrument is described.
 **REFERENCE**	Application example or detailed explanation to be referred to.	Introduction of application example, pages of detailed explanation in this Manual.

Part Name	Toxic and harmful materials					
	Pb	Hg	Cd	Cr6+	PBB	PBDE
Chassis	○	○	○	×	○	○
Switching power supply	○	○	○	○	○	○
Wiring parts	×	×	×	×	×	×
Heater assembly	×	×	×	×	×	×
Fluorine grease	○	○	○	○	○	○
Silica Gel	○	○	○	○	○	○
Molecular sieves	○	○	○	○	○	○
Others	×	×	×	×	×	×

○ : Lower than regulation value

× : Upper than regulation value

AQUACOUNTER
OIL EVAPORATOR EV-2000L

INSTRUCTION MANUAL
Table of Contents

1 Installation

This chapter describes installation of Oil Evaporator combined with Water Content Measurement Instrument.

1.1 Location of installation

1.1.1 Power source

Source voltage: 100V to 240V , AC

Use Power source without rapid variation of voltage. Do not connect instruments whose load is Relay, Motor, or Thyristor etc. which may generate noises, to the same circuits.

Frequency: 50 / 60 Hz

Capacity: 600 VA or more

Ground: Grounding resistance should be 100 Ω or less.

1.1.2 Environment of Installation

Temperature in use: 5-30 °C With less variation.

Humidity in use: 45-85 %

Avoid condensation formation

Gas: Gas such as acid, alkaline, and organic solvent is not filled.

Dust: Dust-free.

Magnetism: Keep away from devices that generate strong lines of magnetic force.

1.1.3 Location

Floor area: 600 mm wide or more, 500 mm deep or more, (combined with Water Content Measurement Instrument).

Keep space of 100 mm or more at both sides.

Figure 1-1 shows an example of arrangement, top view.

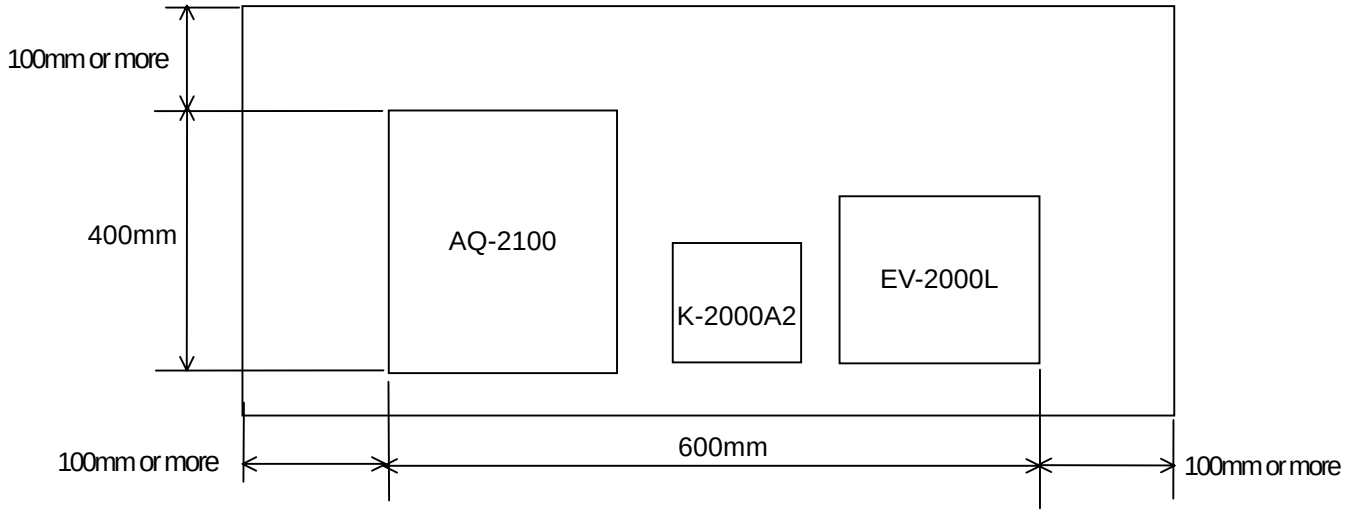


Figure 1-1 Example of Arrangement of AQ-2100 and EV-2000L

1.2 Cord Connections

1.2.1 Connecting Power Cord

Connect Power Cord to AC IN on Rear Panel of Instrument.

Connect Power Cord of Water Content Measurement Instrument to AC OUT.

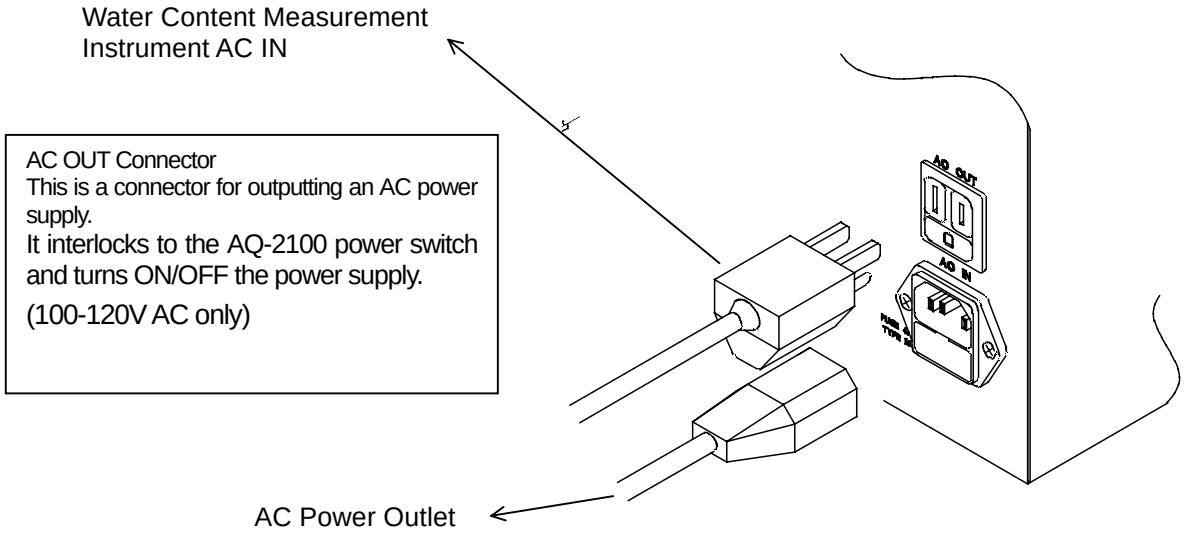
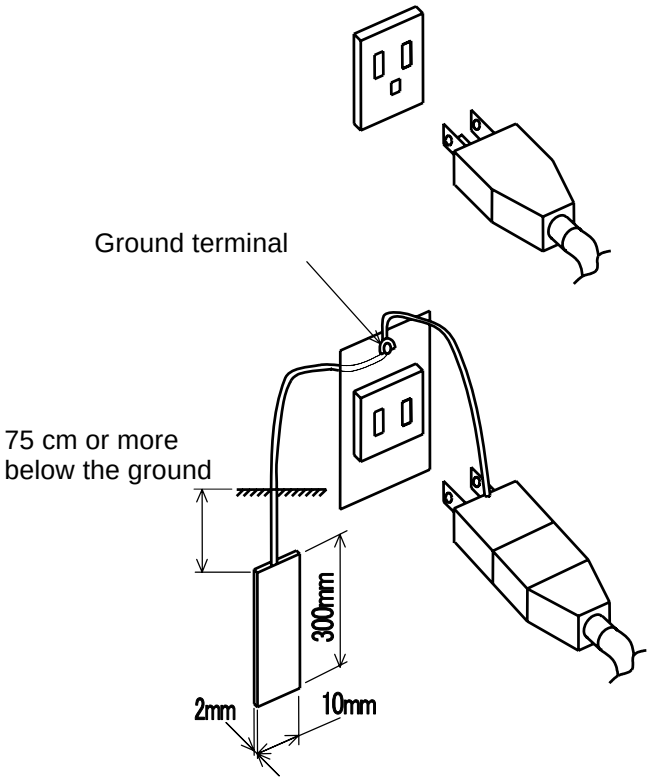


Figure 1-2 Power Cord Connections

1.2.2 Connecting Ground Wire



If Power Outlet is 3-pin type, remove Plug Adapter, then connect.

If Power Outlet is 2-pin type, attach Plug Adapter, then connect.
If ground terminal is not near, use the furnished ground wire.

Figure 1-3 Ground Wire Connections

1.3 Tubing

1.3.1 Connecting Foaming Tube with Connecting Tube

1a. Apply enough fluorine grease to the taper of Foaming Tube with connecting tube furnished.

1b. Remove Common Stopper of Titration Cell Lid of Water content Measurement Instrument, and attach Foaming Tube with Connecting Tube.
Arrange the tip of Foaming Tube so that it will not touch the Stirrer in Titration Cell, and as deep as possible from the surface of the liquid.

1c. Connect Foaming Tube with Connecting Tube to Outlet of Connection Tube of this Instrument.

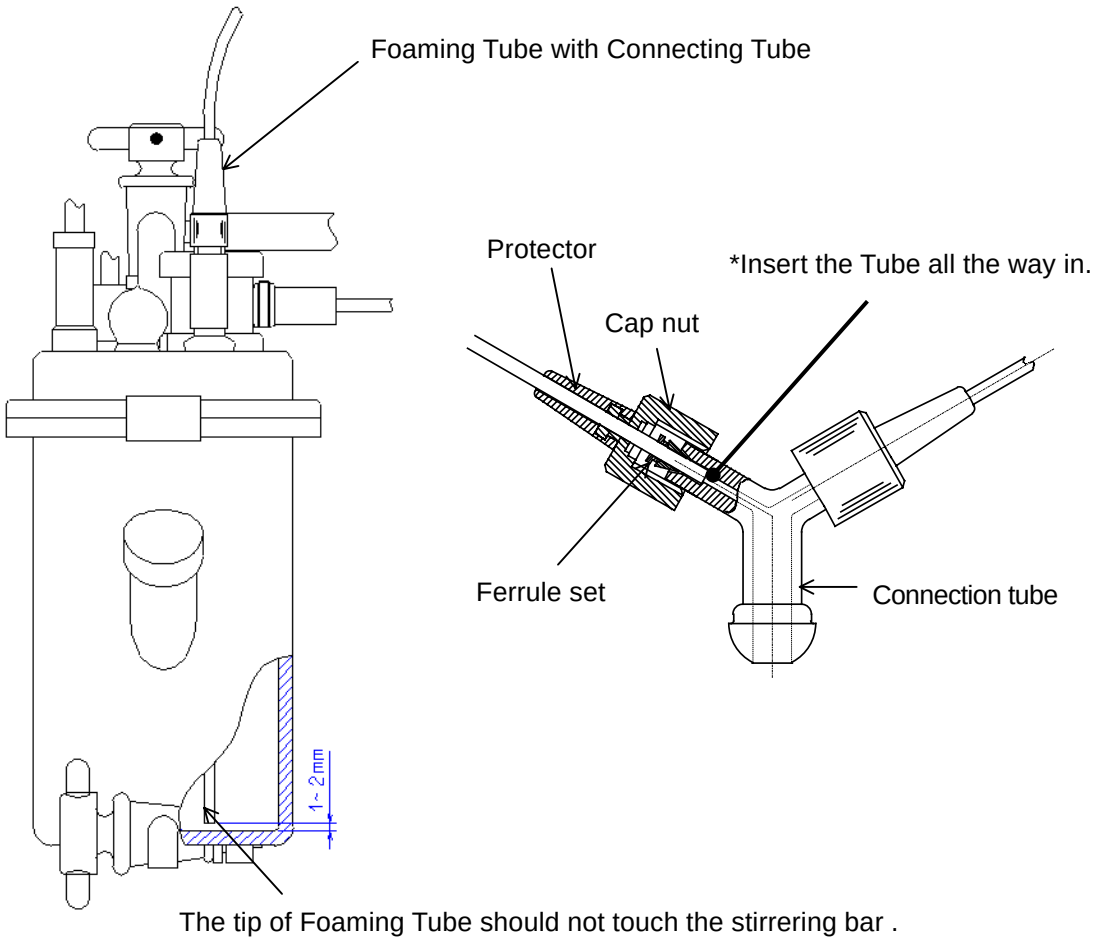


Figure 1-4 Connection of Foaming Tube with Connecting Tube

CAUTION

Be careful to handle Teflon Tube because it is easily folded.

1.3.2 Tubing of Carrier Gas

When N_2 Gas cylinder is used: Connect N_2 Gas cylinder and CARRIER GAS on Rear Panel of Instrument with the furnished Junflon Tube (Inside diameter: 4 mm, Outside diameter: 6 mm).

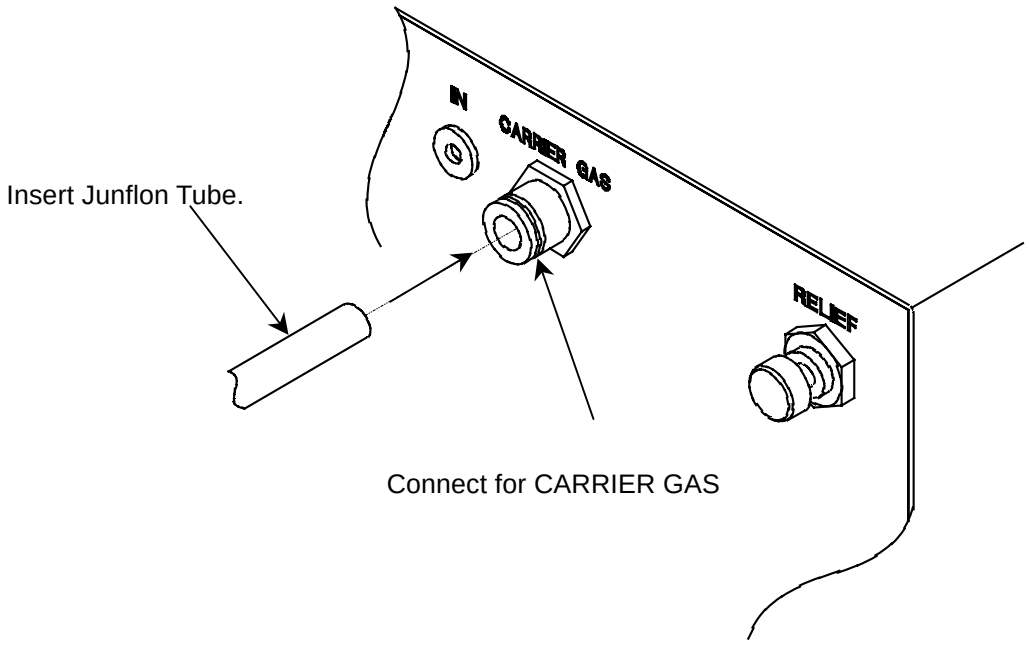


Figure 1-5 Tubing of N_2 Gas

CAUTION

The maximum N_2 gas pressure for Instrument is 0.8 MPa. If the pressure exceeds 0.8 MPa, the pressure-decreasing valve may be damaged. Attach Pressure Regulator to adjust the secondary pressure at 0.8 MPa or lower.

When Dry Air Pump (Option) is Used: Connect Tube from OUT of Dry Air Pump to CARRIER GAS on Rear Panel of Instrument.

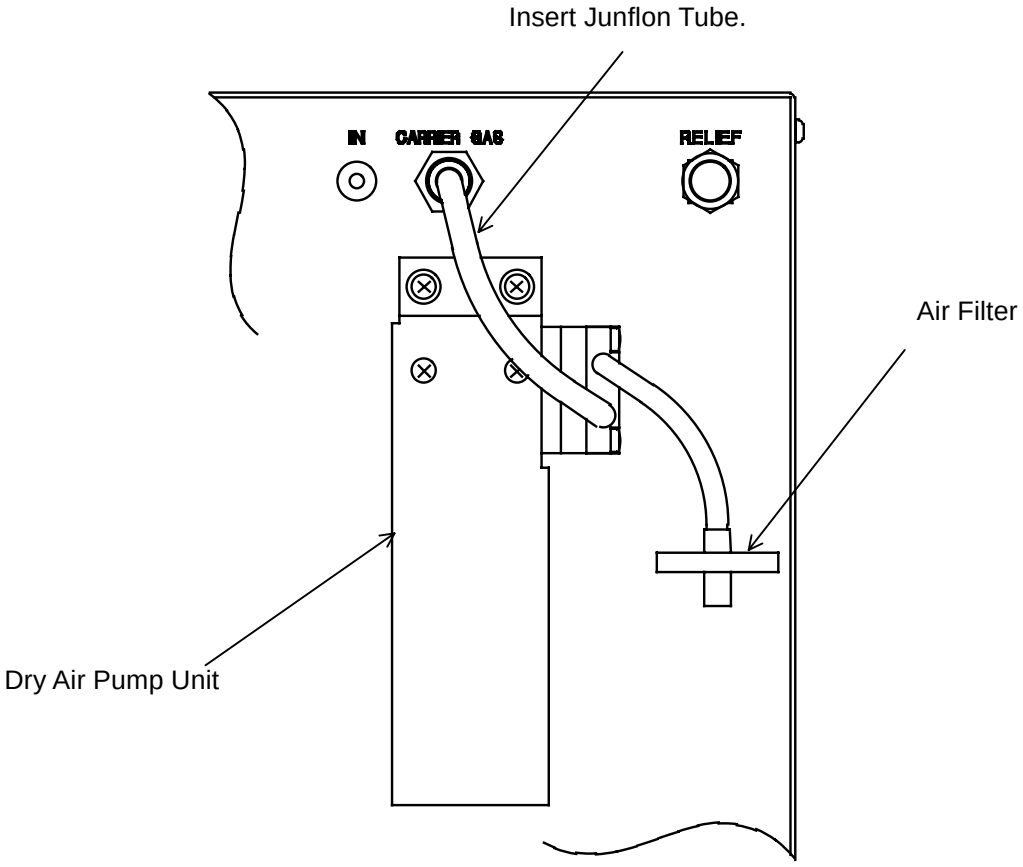


Figure 1-6　Tubing of Dry Air Pump

1.3.3 Tubing of Exhaust Gas

3a. Connect the furnished Drying Tube with 3-way valve to Titration Cell of Water Content Measurement Instrument.

3b. Insert the furnished Uni Tube into Outlet of Drying Tube with 3-way Valve, and arrange the outlet to the draft to exhaust.

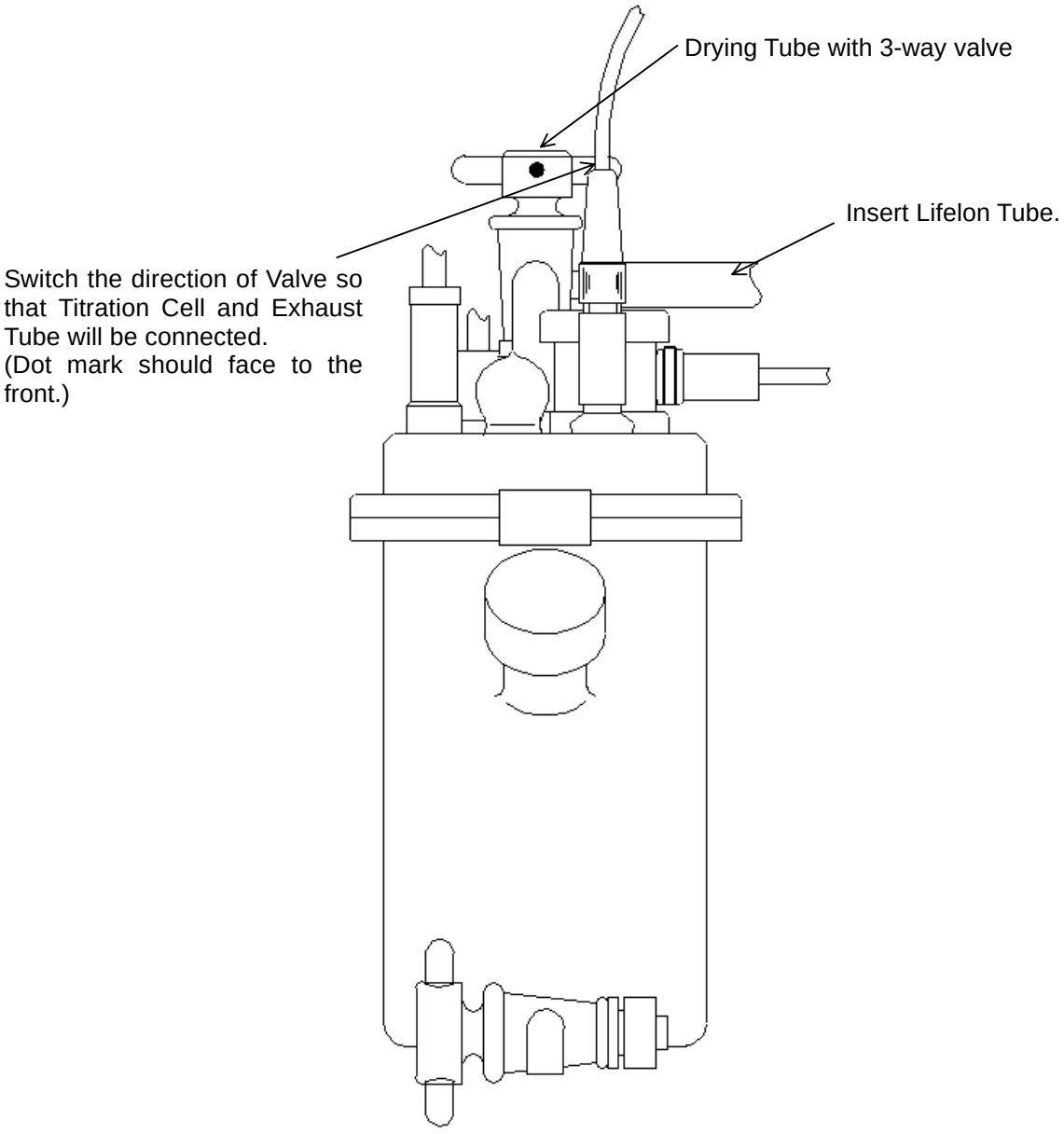


Figure 1-7 Tubing of Exhaust Tube

CAUTION

Exhaust Carrier Gas which comes out of Titration Cell to out of doors.
If it is exhausted indoors, it can be harmful to humans.

1.4 Preparation of Evaporation Chamber

1. Make sure Safety Plug (Glass taper plug) is affixed securely.
2. Make sure Cap Nut of Sample Inlet is tight enough. If loose, tighten it securely.
3. Apply fluorine grease to Joint of Evaporation Chamber, and fix it to Connection Tube with Ball Clip.

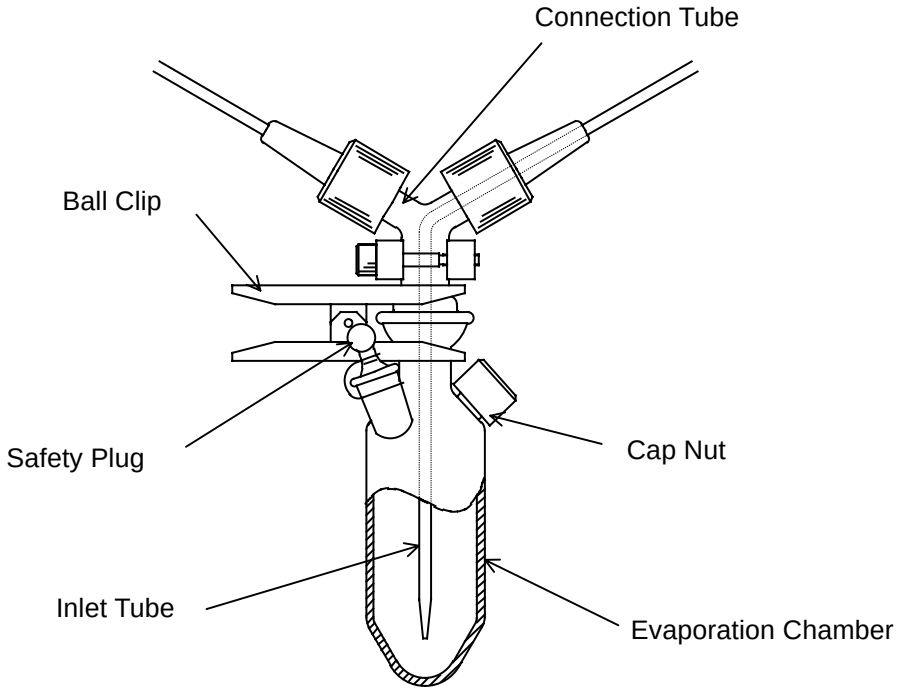


Figure 1-8 Preparation of Evaporation Chamber

1.5 Preparation of Dehydrated Toluene

When the furnished Dehydrated Toluene is used, omit the following procedure.

1. Put the furnished dehydrating agent (Molecular sieves) into reagent grade toluene,30 g per 500 g of toluene, plug tightly, and leave it for 12 hours or more.
2. Attach the furnished reagent bottle cap to the reagent bottle, and attach the Rubber Ball with Drying Tube.

CAUTION

Be sure to wear protection glasses and gloves when handling toluene and other solvents. If not, skin trouble or blindness can be caused.
If the vapor is inhaled, poisoning can be caused. Wear Gas Mask if necessary.

2 Name and Function of Individual Components

This chapter describes name and function of individual components of Oil Evaporator.

2.1 Front Panel

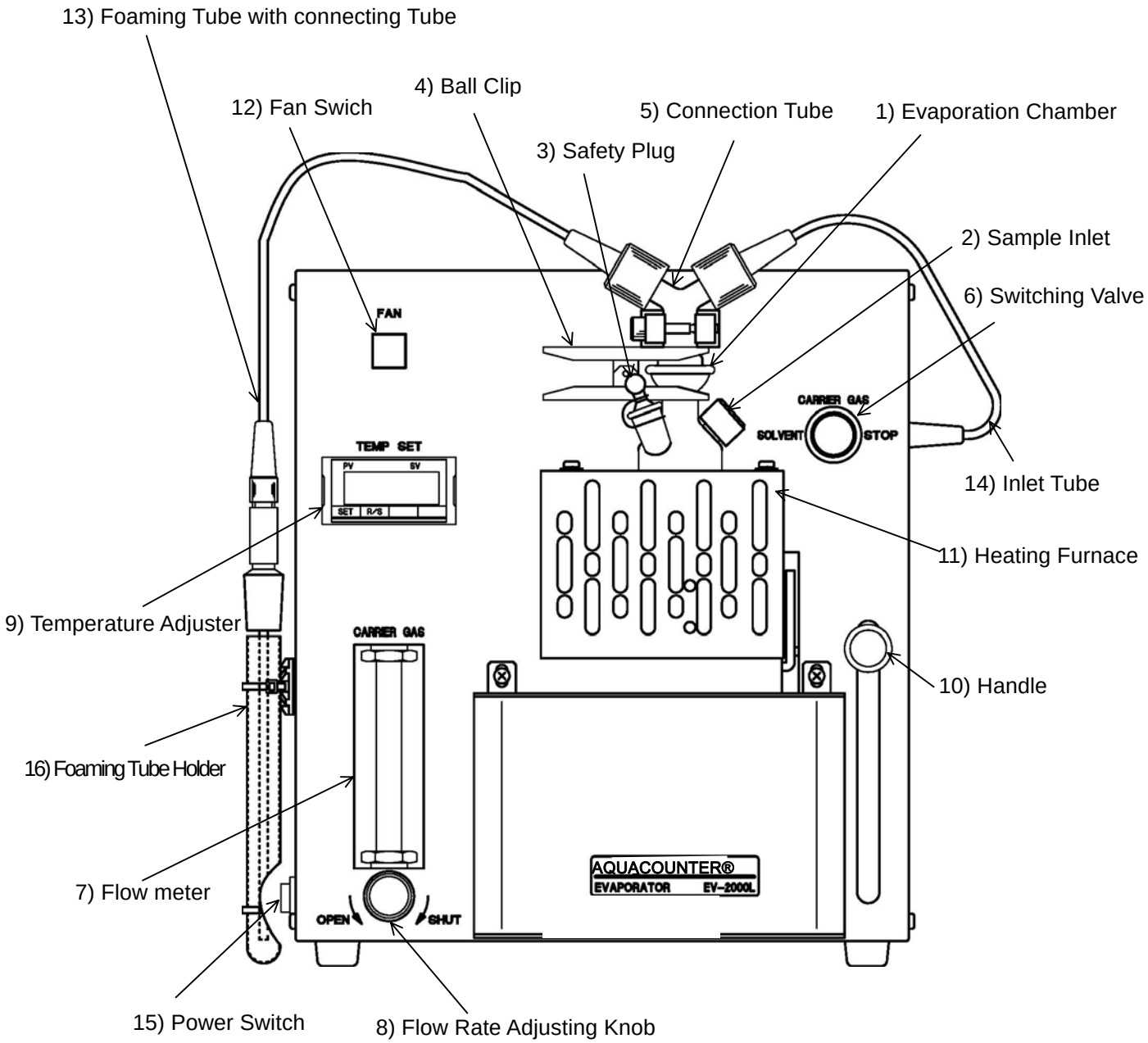


Figure 2-1 Front View

1) Evaporation Chamber

Glass Cell that performs azeotropic distillation of water content in sample and solvent.

2) Sample Inlet

Opening to which sample is injected. Rubber Packing for sample introduction is fixed with a cap nut. Sample is injected by Syringe through Rubber Packing for sample introduction.

3) Safety Plug

Glass taper plug which guards against bumping of sample and solvent.

4) Ball Clip

Clip that fixes Evaporation Chamber to Connection Tube. (Size: 18 / 10)

5) Connection Tube

Tube that introduces solvent and carrier gas to Evaporation Chamber, and introduces distillate liquid and carrier gas together to Titration Cell.

6) Switching Valve

Switching Valve that adds Carrier Gas or Solvent into Evaporation Chamber. When not used, set it at Stop position.

7) Flow meter

Indicates the flow rate of Carrier Gas. Unit is mL / min. Reading of the meeting point of the center of Float Ball in Indication Column and the indication scale shows the real flow rate.

8) Flow Rate adjusting knob

Sets the flow rate of Carrier Gas.

Turning to open increases the flow rate.

Turning to shut decreases the flow rate.

9) Temperature Adjuster

Adjuster to obtain the required evaporation temperature (Azeotropic temperature of water content in Sample and Solvent). If the solvent is toluene, heating temperature is set at 120 °C. For xylene, set at 140°C.

10) Handle

Moves Heating Furnace upward or downward.

When it reaches the upper dead point, it is fixed. When you want to lower it, pull the handle toward you.

11) Heating Furnace

Heats Evaporation Chamber.

Set the required temperature using Temperature Adjuster.

12) Fan Switch

Cools down Evaporation Chamber.

Once pressed, fan starts. Pilot lamp lights up during the fan operation.

Pressed again to stop fan and the pilot lamp goes out.

13) Foaming Tube with Connecting Tube

Tube that introduces distillate liquid and Carrier Gas together to Titration Cell. It is attached to Titration Cell.

14) Inlet Tube

Introduces Solvent and Carrier Gas to Connection Tube.

15) Power Switch

Power ON/OFF Switch.

16) Foaming Tube Holder

Foaming tube with connecting tube can be put into this holder when not in use.

(When fluid is retained in the holder, remove it with a pipette or in other proper way.)

2.2 Rear Panel

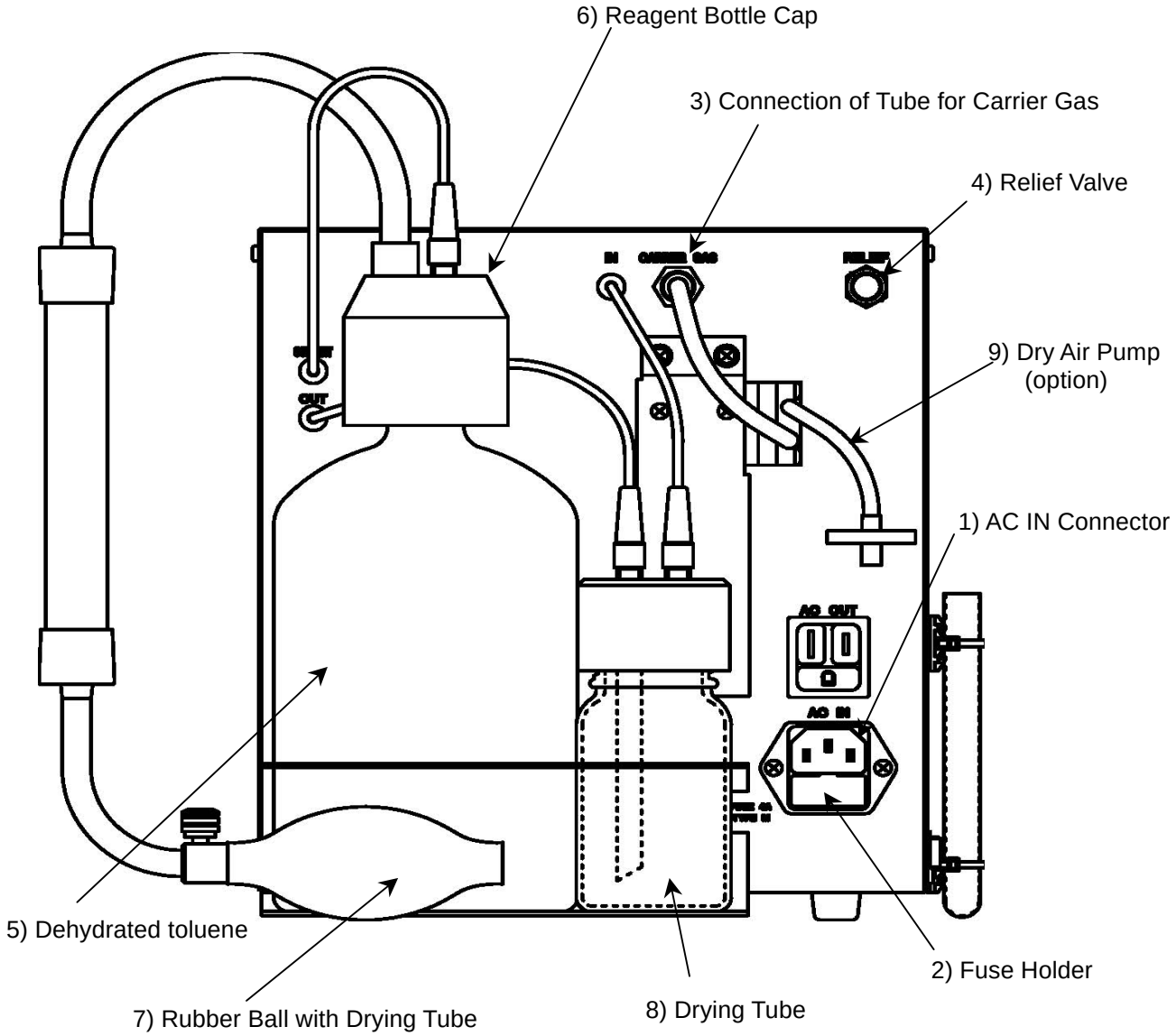


Figure 2-2 Rear Panel

1) AC IN Connector

Power Cord is connected.

2) Fuse Holder

Holds Fuse for preventing over current of Power.

3) Connection Port of Tube for Carrier Gas

Connects Tube for Carrier Gas.

4) Relief Valve

When the supplied pressure of Carrier Gas becomes too high (0.2 MPa or higher), Relief Valve works to release Carrier Gas.

5) Dehydrated Toluene

Used for azeotropic distillation.

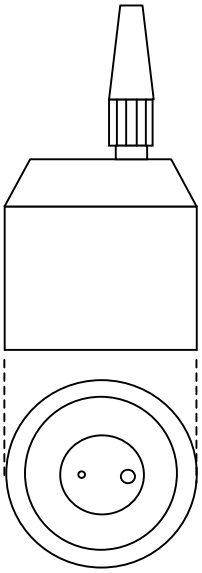
When the furnished dehydrated toluene has run out, add about 30 g of Dehydrating Agent (Molecular Sieves) to commercially available reagent grade toluene, leave it overnight, then replace the empty bottle with this bottle.

6) Reagent Bottle Cap

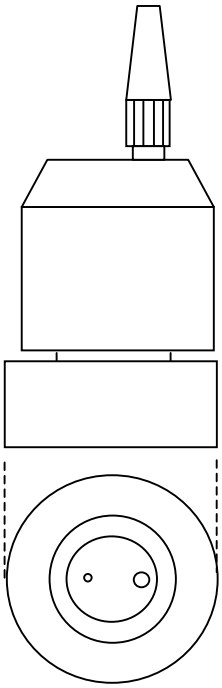
Cap that is exclusively used for dehydrated toluene.

Open the reagent bottle and attach the appropriate bottle cap.

Two different types of the bottle cap are supplied as standard since the shape of the reagent bottle opening varies from supplier to supplier.



Cap for reagent bottle (P/N E320236-A)



Cap for reagent bottle (P/N E320237-A)
Fits to AQUASTAR[R] brand Karl Fischer reagent bottle. This type can be divided into two pieces. For larger bottle opening, detach the bottom ring from the cap.

For USA export only.

7) Rubber Ball with Drying Tube

Rubber Ball to increase pressure for transferring Solvent to Evaporation Chamber.

A drying tube with silica gel to remove moisture of the air is attached at the middle way.

8) Drying Tube

Dries Carrier Gas.

Molecular Sieves is filled.

9) Dry Air Pump (Option)

Generates Carrier Gas. This is an option.

3 Operation

This chapter describes the basic operation of Oil Evaporator.

This chapter offers the guide to basic correct operation to perform the optimum measurements.

3.1 Measuring Operations

3.1.1 Turning on the Power

1. Pull down the Power Switch on the left side of Instrument toward you (Turning On).

   Temperature Adjusters of Water Content Measurement Instrument and this instrument are turned on, and the current temperature of Heating Furnace is displayed.

2. Press Blank key of Water Content Measurement instrument to start blank elimination.

3.1.2 Setting Heating Temperature

1. Press SET key of Temperature Adjuster to obtain Setting Temperature Switch Mode. (See Figure 3-1.)

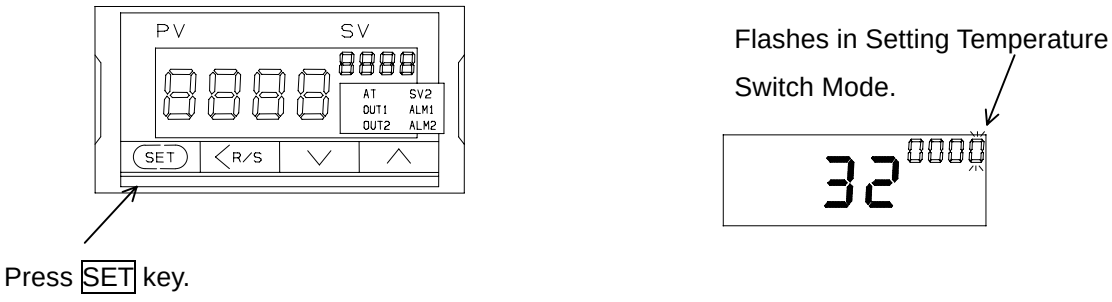


Figure 3-1 Setting 1 of Temperature Adjuster

2. Change Setting Figure by using ◁ key.
   Set temperature by using ▽ or △ key.

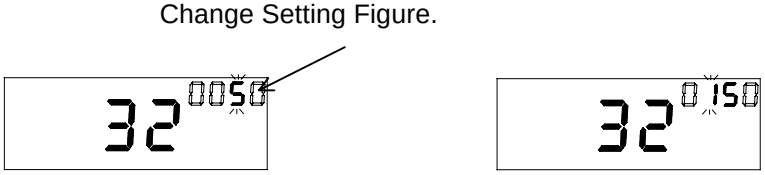
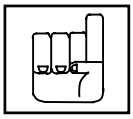


Figure 3-2 Setting 2 of Temperature Adjuster



ADVICE

Setting temperature depends on Solvent.

Toluene : 120 °C

Xylene : 140 °C

3. After setting, press SET key to finish.

WARNING

When heating Temperature is set, the temperature of Heating Furnace rises.

Do not touch Heating Furnace, do not put flammable things near Instrument, or burns or fires can be caused.

3.1.3 Adjusting Flow Rate of Carrier Gas

1. Set Switching Valve at CARRIER GAS.
2. Use Flow Rate Adjusting Knob to adjust Flow Rate to 50 mL/min.

3.1.4 Injecting Solvent

1. Make sure Switching Valve is set at STOP or CARRIER GAS.
2. Loosen Knurled Screw attached to Rubber Ball with Drying Tube, and compress the Rubber Ball 3-4 times.
3. Set Switching Valve at SOLVENT; inject 5 mL of Solvent into Evaporation Chamber. (Rough target is the bottom of Scale Line of Evaporation Chamber.)
   After injecting, set Switching Valve at CARRIER GAS.

CAUTION

Inject Solvent after Evaporation Chamber has been cooled down.

If not, Evaporation Chamber is cooled rapidly and electrolyte in Titration Cell may reversely flow to Evaporation Chamber. Be careful.

3.1.5 Eliminating Blank

1. Lift heating Furnace whose temperature has reached the set temperature, and heat Evaporation Chamber.
2. Make sure Water Content Measurement Instrument is eliminating Blank, and wait until the background becomes stable.

ADVICE

To perform high precision measurement, make the background be 20 µg H_20/min or less. Large background is resulted from low dryness in Titration Cell, low dehydration of Carrier Gas or Solvent. See Chapter 4, 4.2, 9 "Check when Background is Large". For judging background stability, see Instruction Manual for Water Content Measurement Instrument.

3.1.6 Preparing Sample

1. Wash Syringe and Needle furnished with Water Content Measurement Instrument with water, and dry them well.
2. Apply Fluorine grease to the sliding surface and the tip of Syringe, fix Needle to Syringe.
3. Draw sample into Syringe, and wash the inside of Syringe 1-3 times with the Sample.
4. Draw sample with Syringe, then draw a small amount of the air so that the sample will not remain in the Needle.
   Attach a piece of silicone rubber to the tip of Needle.
5. Rapidly Measure weight of Syringe holding sample precisely.

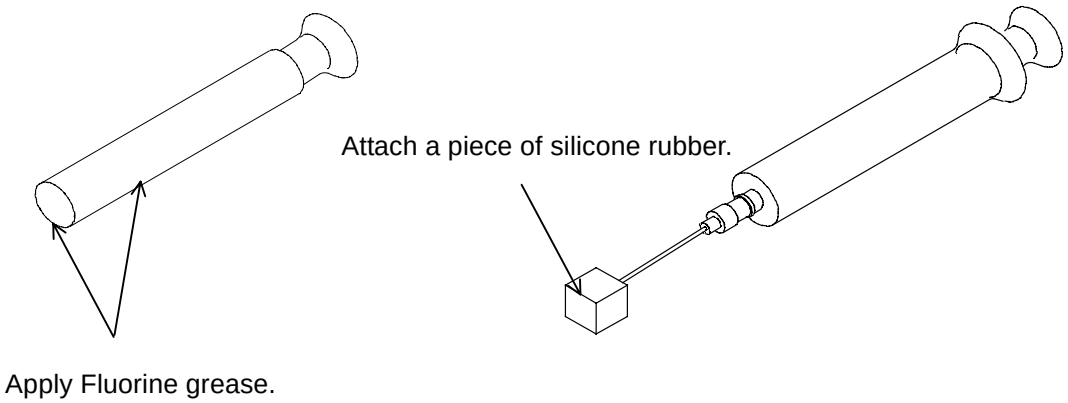


Figure 3-3 Preparing Sample

3.1.7 Injecting Sample

1. Make sure the background is stable.
   Press SAMPLE key of Water Content Measurement Instrument.
2. Remove the piece of silicone rubber; inject Sample into Sample Inlet of Evaporation Chamber.
   Be careful so that the tip of Needle will not touch the Solvent or the inside wall of Evaporation Chamber.
3. Draw Sample stuck to the tip of Needle, remove Needle, and insert the tip of needle into the piece of silicone rubber.

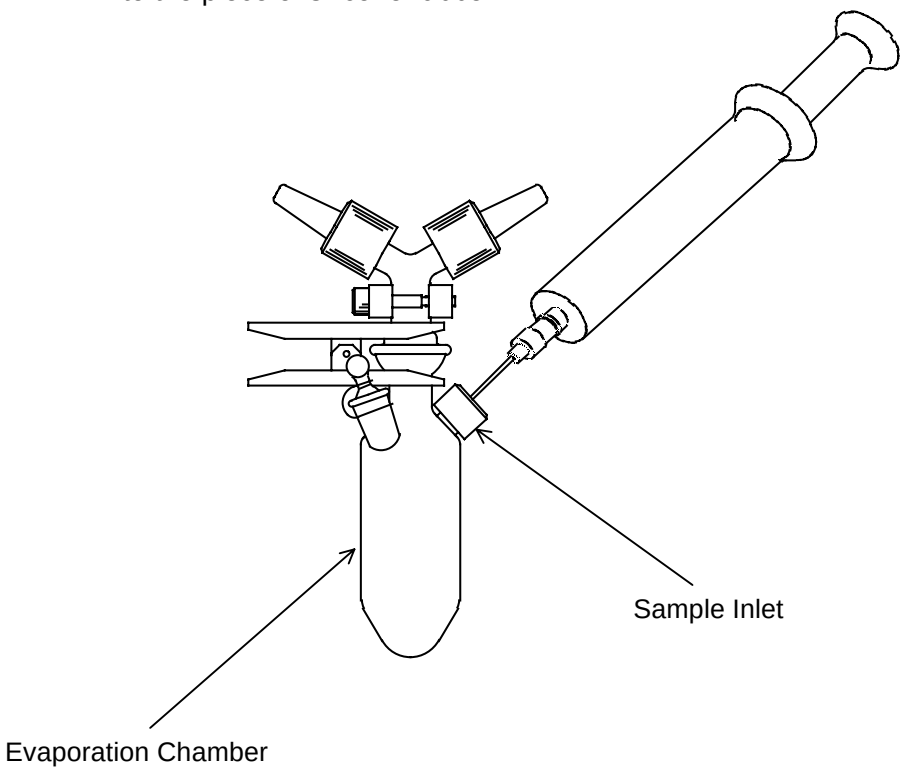
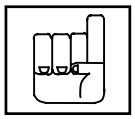


Figure 3-4 Injecting Sample

3.1.8 Starting Measurement

Press TITRATION key of Water Content Measurement Instrument and start Water Content measurement.



ADVICE

Since distillation speed of water content is slow for some samples, measurement is finished before completing titration for the whole water content in some cases.
In such a case, set Titration Start Delay Timer (S-TIMER) of Water Content Measurement Instrument at about 1 minute.
For setting of detailed measurement conditions, see Instruction Manual for Water Content Measurement Instrument, or Water content measurement data book.

3.1.9 Reweighing Syringe

1. Weigh Syringe precisely after injecting sample.
2. Obtain sample injection volume, and input it into S.SIZE of Water Content Measurement Instrument.
   (See Instruction Manual for Water Content Measurement Instrument)

3.1.10 Finishing Measurement

After completing measurement, descend Heating Furnace, remove Safety Plug, and draw waste solution using the furnished Waste Solution Bottle.

CAUTION

When exhausting Waste Solution, do it after Evaporation Chamber has been cooled down.
Cooling time can be shortened by using Fan at the front of Instrument.
If Sample does not dissolve in solvent such as toluene, xylene etc. (grease etc.), remove Evaporation Chamber from Connection Tube, and exhaust the waste through Ball Joint.

3.1.11 Continuing Measurement

When continuing measurement after exhausting the waste solution, start again the procedure from 3-5 Injecting Solvent.

CAUTION

When the insides of Evaporation Chamber and Tubing are dirty with samples, wash them with dehydrated toluene, then start measurement. For washing way, see Chapter 4, 4.2 "Maintenance Check".

3.1.12 Turning off the Power

Push down Power Switch on the left side of Instrument toward the rear (Power Off).

3.1.13 Releasing Pressure in Solvent Bottle

Loosen Knurled Screw of Rubber Ball with Drying Tube.

CAUTION

If left being pressured, leak can be caused if tubing is loose.

3.1.14 Closing Drying Tube with 3-Way Valve

Switch the Valve so that Titration Cell and Desiccant are connected.

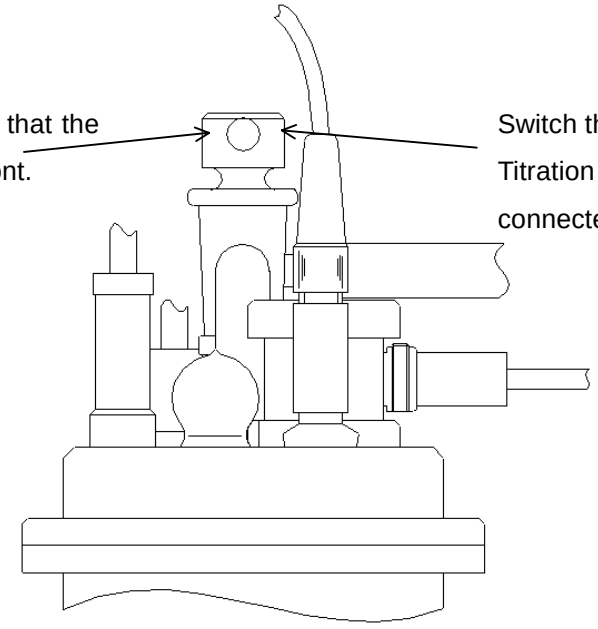


Figure 3-5 Switching Valve

3.1.15 Stopping Switching Valve

When not in use, set it at STOP position.

CAUTION

When Switching Valve position is CARRER GAS, solvent in Evaporation Chamber may reversely flow to Drying tube. Be careful.

3.1.16 Removing Foaming Tube with Connecting Tube

Remove the Foaming Tube with Connecting Tube from Titration Cell Lid, wipe off solvent stuck to the surface off. Attach Common Stopper to Titration Cell Lid.

4 Maintenance and Check

This chapter describes daily check and maintenance of Oil Evaporator.
Perform daily checks and keep the best conditions of Instrument.
The items and the main contents of this chapter are as follows.

4.1 Daily Check

4.1.1 Loose Connection of Tubing

Check leakage and tightness of Tubing connections. If loose, tighten it with your fingers (without using a tool).

4.2 Maintenance Check

For regular replacement parts, contact Maintenance Service Office.

4.2.1 Replacing Molecular Sieves

When background of Carrier Gas becomes large, remove the lid of Drying Tube, and replace Molecular Sieves with new one. Perform replacing work quickly to prevent moisture absorption.

4.2.2 Replacing Silica Gel

When the color of Silica Gel of Rubber Ball with Drying Tube becomes pink or white, replace the Silica Gel with new one.

4.2.3 Replacing Fuse

(1) Error Phenomenon

The thermoregulator display does not turn on when the POWER switch is turned ON.

(2) Cause

Fuse is blown.

(3) Replacement Frequency

When failure occurs.

(4) How to Replace (See Figure 4-5.)

Disconnect the power cable from the AC IN connector, and pull the fuse holder out by pushing the hooks on both sides of the fuse holder.

Replace the blown-off fuse with a space fuse. There are two types of fuse as shown below.

WARNING

Before replacing a fuse, make sure that the power cable is disconnected from the AC IN connector.

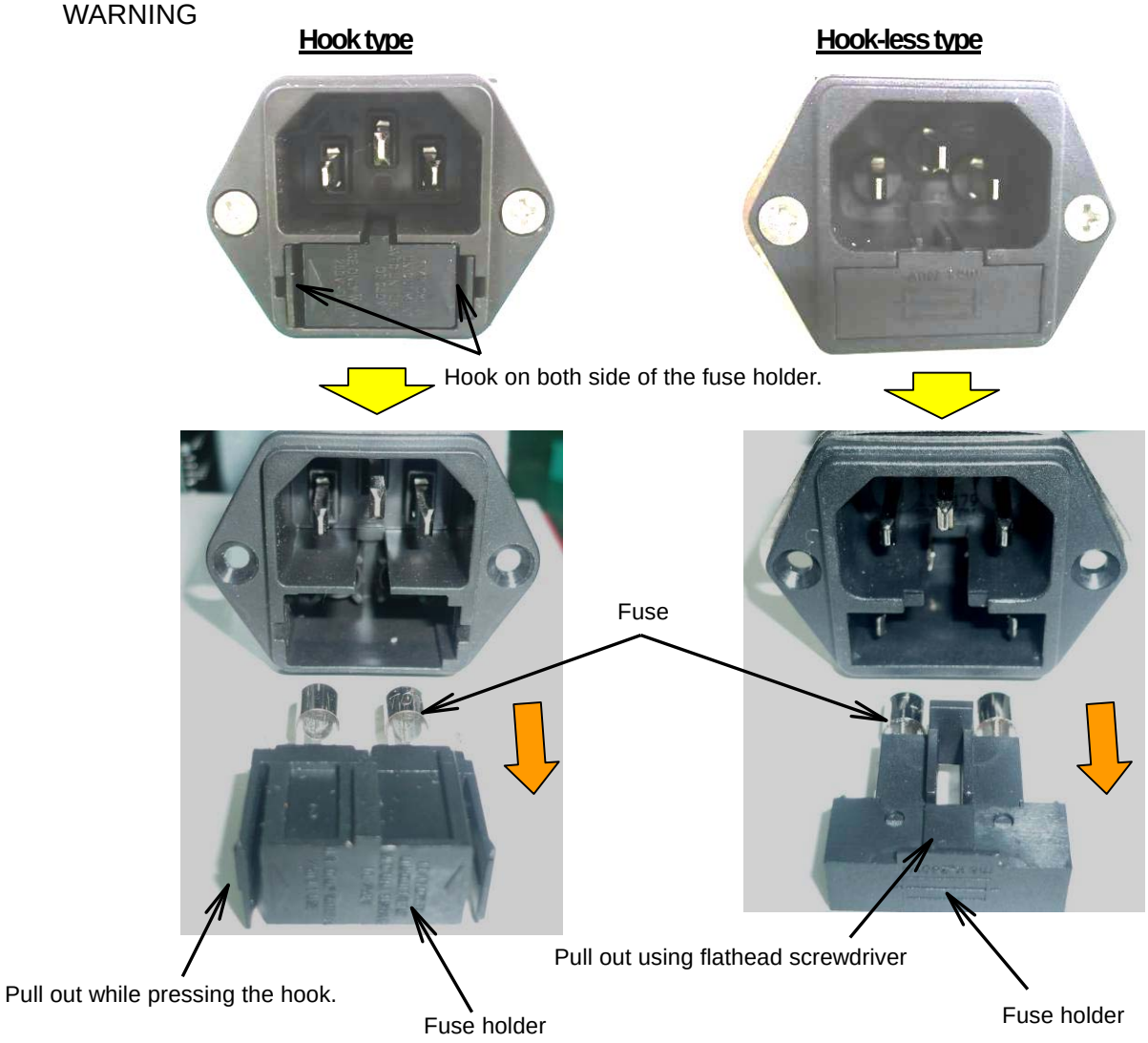


Figure 4-5. Fuse Replacement

4.2.4 Cleaning Evaporation Chamber

When Evaporation Chamber becomes dirty, clean it as follows.

4a. Remove Ball Clip which fixes Connection Tube and Evaporation Chamber, and remove Evaporation Chamber.

4b. Remove Fluorine grease stuck to the fitting parts using acetone, thinner, etc. Wash the inside of Evaporation Chamber being careful not to damage the surface, rinse enough to remove detergent sediment, heat the Chamber to about 60 °C to dry.

4c. When reinstalling, apply Fluorine grease enough to Ball Joint Part.

4.2.5 Cleaning Inlet Tube

When Inlet Tube becomes dirty, remove the Inlet Tube from Connection Tube and Switching Valve. Clean Inlet Tube like Evaporation Chamber, or replace Inlet tube with the furnished Inlet Tube.

4.2.6 Cleaning Connection Tube and Foaming Tube with Connecting Tube

If Connection Tube or Foaming Tube with Connecting Tube becomes dirty, clean it as follows.

6a. Put about 5-10 mL of toluene or xylene into Evaporation Chamber.

6b. Perform heating distillation until it becomes clean.
[Heating temperature] Toluene: 120°C / Xylene: 140°C

4.2.7 Replacing Anode Solution

(When Coulometric K.F. Titrator is used for water content determination)

When using Oil Evaporator, as solvent is added and increased, methanol in Anode Solution is vaporized and absorption of water becomes low.
When the volume of Anode solution is increased by 30-40 mL, as rough standard, replace the whole Anode Solution with new one.
For the replacing way, see Instruction Manual supplied with Water Content Measurement Instrument.

4.2.8 Replacing Titration Solvent

(When Volumetric K.F. Titrator is used for water content determination)

When repeating measurement, as Titration liquid and Solvent of Oil Evaporator are added and increased, methanol is vaporized, and absorption of water becomes low.

When the total of Titration liquid and Solvent exceeds about 40 mL, as rough standard, replace the whole Titration Solvent.

For the replacing way, see Instruction Manual for Water Content Measurement Instrument.

4.2.9 Check when Background is Large

- When Titration Cell is the Cause

  If Background does not become small even though Carrier Gas is stopped, Titration Chamber may be the cause.

  Perform measures seeing Maintenance Check in Instruction Manual for Water Content Measurement Instrument.

- When Carrier Gas is the Cause

  If Background becomes small by stopping Carrier Gas, transfer Carrier Gas without putting Solvent into Evaporation Chamber, and measure Background.

  If Background does not become small, desiccant may be the cause.

  Replace Molecular Sieves.

- When Dehydrated Solvent is the Cause

  If the above mentioned checks are not effective for improvement, dehydrated Solvent may be the cause. Check as follows.

  1. Exhaust Solvent in Evaporation Chamber, set Switching Valve at CARRIER GAS.
  2. When Background becomes stable, read Background value (Background value is assumed A μgH_2O/min).
  3. Inject about 5 mL of Solvent into Evaporation Chamber, lift heating Furnace ([Heating temperature] Toluene: 120°C / Xylene: 140°C) and heat Evaporation Chamber.
  4. Read Background value when it becomes largest (Background value is assumed B μgH_2O/min).
  5. If the value of (B-A) exceeds 5 μgH_2O/min, deteriorated dehydrating agent or short dehydrating time may be the cause.

     Wait for a while, then measure difference of Background values again.

     If not improved, add Dehydrating agent into the reagent bottle.

4.2.10 Replacing Air Filter for Dry Air Pump

If the flow rate of Carrier Gas decreases, or becomes nothing, replace Air Filter with new one.

4.3 Parts for Maintenance and Articles of Consumption

4.3.1 Parts for Maintenance

Parts No.	Description	Remarks
E310511-A	Foaming tube with connecting tube	
E323312-A	Evaporation chamber	
E316503-1	Connector	
D320234-A	Rubber ball with drying tube	
E333713-1	Thermocouple	
HSJ821010-03	Glass-enclosed fuse(MS-4A)	2pcs,MS-4A
HSK621189	Power supply unit	ZWS75PF-24
D316543-A	Heater	

4.3.2 Articles of Consumption

Parts No.	Description	Remarks
E320211-A	Fluorine grease	5 g
E323394-A	Rubber packing for sample injection	10pcs
HSG363001	Silica gel	500 g
HSG363006	Molecular Sieves	500 g
D316504-A03	Inlet Tube	3pcs

5 Troubleshooting

This chapter describes measures for Oil Evaporator against abnormality.

No.	Abnormality	Remedy	Reference section
1	Temperature does not rise.	Check setting temperature of Temperature Adjuster. If proper, Temperature Adjuster, Heater, or Power Supply may be failed. Contact our Sales Office.	3.2
2	Temperature rises too high.	Check setting temperature of Temperature Adjuster. If proper, Temperature Adjuster or Thermocouple may be failed. Contact our Sales Office.	3.2
3	Carrier gas does not flow.	Check leak or clogging of tubing (Drying Bottle etc). When Dry Air Pump is used, replace Air Filter with new one.	4.2, 10
4	Solvent is not injected.	Check tightness of Knurled Screw of Rubber Ball with Drying Tube, and Cap of Reagent Bottle. If tightening is not effective, check tubing for leak and clogging (Drying Tube etc).	3.4
5	Collection rate of Water Content is low.	Clean Foaming Tube with Connecting Tube and Connection Tube.	4.2, 6
6	Reproducibility is low.	See Instruction Manual for Water Content Measurement Instrument.	
7	Measurement time is too long.	See Instruction Manual for Water Content Measurement Instrument.	

6 Specifications

This chapter describes specifications whose contents are prepared for keeping the best conditions of Instrument.

6.1 Standard Specifications

1. Evaporation method

   Indirect Draft Azeotropic Distillation method (With drafting N_2 gas or dry Air, distillation is performed).

2. Temperature adjustment

   Selectable, Automatic temperature adjustment.

3. Carrier gas

   N_2 gas or dry Air. Flow rate : 30-300 mL/min (Settable)

4. Carrier gas inlet pressure

   0.8 MPa or less (Recommended pressure: 0.1MPa)

5. Carrier gas desiccant

   Molecular Sieves 100 g

6. Heater

   About 100 VA, Band heater

7. Sample volume

   About 10 mL or less

8. Measurement Range

   The same as that of Water Content Measurement Instrument.

9. Solvent

   Toluene, Xylene

   Volume for one measurement : 5-10 mL.

10. Power source

    100 V to 240 V AC, 50/60 Hz, 150VA.

11. Size

    220 (W) × 340 (D) ×265 (H) mm

12. Weight

    About 7 kg

6.2 Standard Composition

No.	Parts No.	Item	Q'TY	Remarks
1		Evaporator EV-2000L	1	
2	(D316504-A)	Inlet tube	5	
3	D320234-A	Rubber ball with drying tube	1	
4	E310511-A	Foaming tube with connecting tube	1	
5	E320236-A	Cap for reagent bottle	1	
6	E320237-A	Cap of reagent bottle(For USA export only.)	1	
7	E320268-A	Drying tube with a three-way stop valve	1	
8	E323394-A	Rubber packing for sample injection	1	10pcs
9	E323312-A	Evaporation chamber	1	
10	E700407-1	Vinyl instrument cover	1	
11	E780317-1	Plug adapter	1	
12	E780318-1	Power cord	1	125V, 2.7m
13	E780320-A	Ground wire	1	3m
14	E780662-A	Washing bottle	1	for counter solution (cathlyte) exchange
15	HSF229070-05	Junron tube	1	ϕ 4 × ϕ 6 5m
16	HSG153161-05	Lifelon tube	1	ϕ 7 × ϕ 10 5m
17	(HSJ821010-02)	Glass-enclosed fuse(MS-4A)	1	2pcs,MS-4A
18	(HSL395102)	Ball clip 18/10	1	
19	(HSG363006)	Molecular Sieves	1	500g
20	HSG363001	Silica gal	1	500g
21	E320211-A	Fluorine grease	1	5g
22	E316563-1	Instruction manual EV-2000L	1	

AQUACOUNTER
OIL EVAPORATOR
EV-2000L

Rev 1.2

Instruction Manual

The first edition 2005/06/15

The second edition 2008/04/28

HIRANUMA SANGYO Co,, Ltd.

1739 Motoyoshida-cho , Mito-shi

Ibaraki 310-0836 , Japan

Phone : +81-29-247-6899

Fax : +81-29-247-6952

Parts No. E316562-1

Parts No. E316563-1