

**EYELA**

Cold trap

**Uni-trap****Instruction Manual**

UT- 3000A  
3000L  
4000A  
4000L

**IMPORTANT**

This instruction manual is designed to use the product efficiently and safely with keeping its best performance.

**Be sure to read “Safety precautions”  
before use.**




Please keep this manual in a place easily accessible to every user.

# Safety precautions

## 1. Signal word for warning

Touching inappropriate parts during operation may cause you physical injury. However, if you know the proper information before use, you can avoid almost all these troubles.

Therefore, this manual categorizes the level of Importance and danger as below with alert mark and signal word. Please follow the instructions and use the product safely.

Alert mark Signal word	Definition
 DANGER	Mishandling the product will cause serious personal injury or loss of life.
 WARNING	Mishandling the product may cause serious personal injury or loss of life.
 CAUTION	Mishandling the product may injure users or cause property damage.

Though we are trying to look into conceivable risk of using the product, it is very difficult for us to expect of all of it. It means that all the instructions in this manual do not cover all the types of risk that may caused by the product. However, if you follow the instructions, you surely can handle and operate the product safely. Please use extreme care when handling the product and to prevent all the potential accidents and mechanical failures.

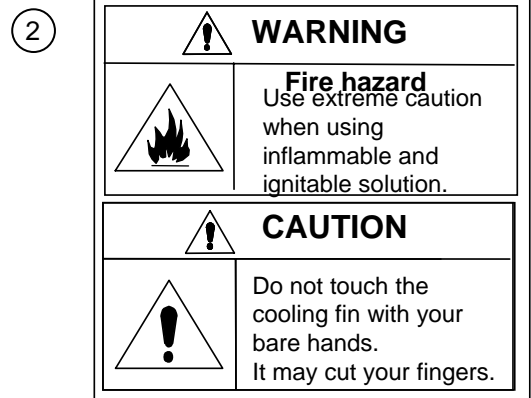
## 2. Warning display on the product

For high priority danger, warning label is attached on the machine body.

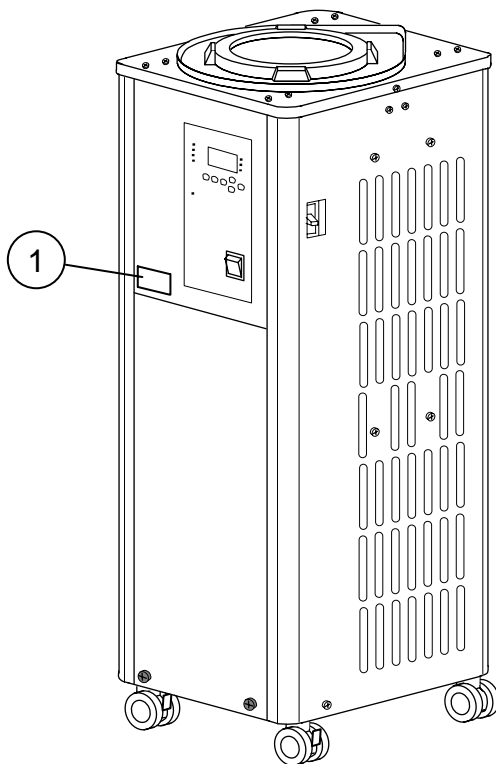
The position of the label is as below.

Please read the instructions carefully whenever using the machine.

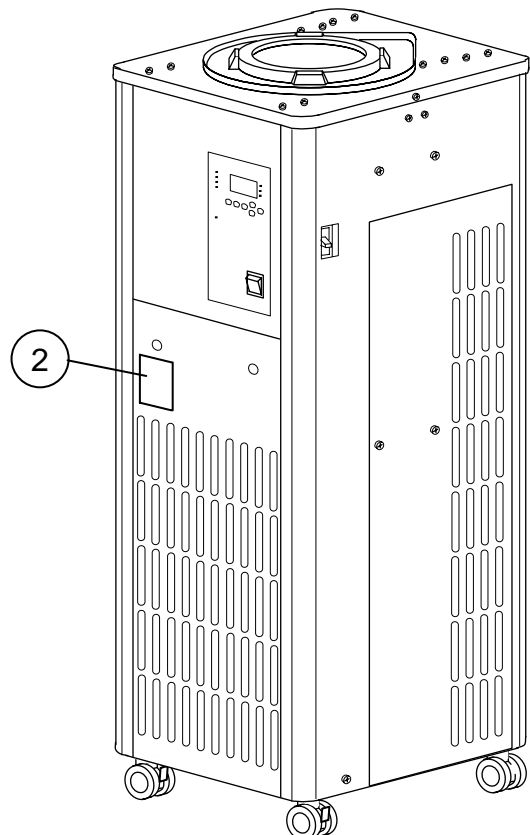
※ If you have any trouble reading the warning label because it is worn out and etc., please replace with new one. Do not hesitate in contacting us if you require new label.



UT-3000A



UT-3000L, 4000A, 4000L



# Congratulations on your purchase of a **EYELA** product.

## Introduction

This manual describes the procedure of installation, operation, troubleshooting, maintenance, check-up and disposal of cold trap, UT-3000A, 3000L, 4000A and 4000L. Please read this manual carefully before use.

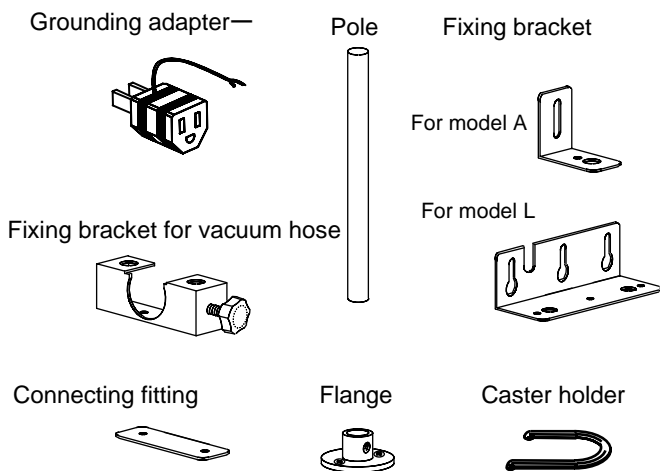
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## Items contained In your packing

Check the type and quantity of items before setting up.

No.	Name	Quantity
1	Main unit	1
2	Grounding adapter	1
3	Instruction manual	1
4	Clamp for fixing vacuum hose (with knob)	2
5	Connecting fitting	1
6	Pole	2
7	Flange	2
8	Fixing bracket (for model A)	3
	Fixing bracket (for model L)	1
9	Caster holder	4



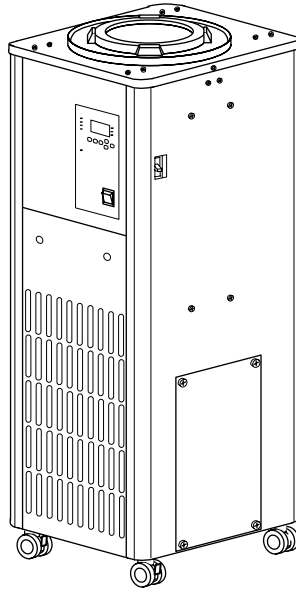
# 1 For safety use

This product is not designed with explosion-proof structure.  
Use extreme caution when handling it.

 WARNING

## Use extreme caution when handling inflammable or combustible solution.

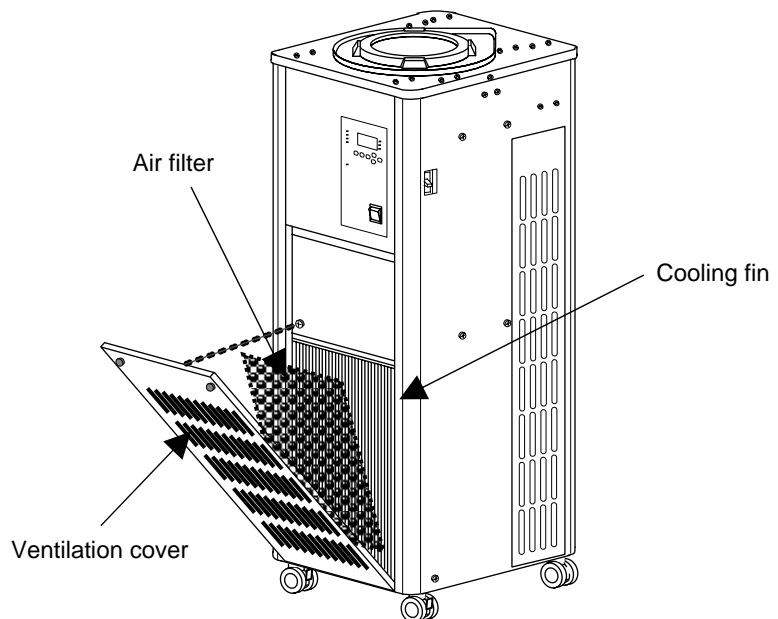
If you leave inflammable or combustible solution (ethanol and etc.) at room temperature or higher (lower for some solutions), it may evaporate and catch fire with some fire sources, and cause a fire and explode. Ventilate the space well before use.



 CAUTION

## Do not touch cooling fin with bare hands.

Do not touch cooling fin with bare hands while performing maintenance work. Edgy fin may cut your fingers (Cooling fin is not equipped with UT-3000A).



## 2 Outline of the product

### 2-1 Application



#### WARNING

**Do not remodel the product.  
Do not use it out of specified application.**

Remodeling or inappropriate use of the product may cause electric shock or malfunction.

This product is designed to collect vapor or hazardous vapor discharged from vacuum concentration device or vacuum dryer or desiccator to protect vacuum pump. If you use glass trap, which is one of the optional accessories, vapor of acid series and organic solvent series can be collected.

### 2-2 Specifications

Product name		Cold trap			
Model		UT-3000A	UT-3000L	UT-4000A	UT-4000L
Cooling system		Drum cooling system			
Trap system		Direct trap, gas trap			
Functions	Dehumidification amount (water type) ※1	Max.1kg	Max.4kg	Max.1kg	Max.4kg
	Minimal attainable temperature ※1,2	-50°C	-50°C	-80°C	-80°C
Features	Trap temperature display ※3	Digital display			
	Displayed resolution ※3	5°C			
	Trap defrosting function	Defrosting by hot gas			
	Ancillary function	<ul style="list-style-type: none"> <li>• Operating switch for vacuum pump (Output function for control unit for vacuum pump)</li> <li>• User adjustment mode (Calibrating displayed temperature, power recovery)</li> <li>• Detection system for trap bath (option)</li> </ul>			
	Safety features	Residual current device, excess current breaker, high-pressure switch (freezing cycle), over load relay for refrigeration unit, self-diagnosis function (detecting abnormal status, power failure alarm, detecting abnormal status of sensor, watch dog)			
Config.	Refrigeration unit	Cooling system, 450W	Cooling system, 675W	Cooling system, 450W×2	
	Refrigerant	HFC R-404A		HFC R-404A、R-23	
	Material of trap bath	SUS304			
	Temperature sensor	Thermo couple (Type T)			
Spec.	Dimension and capacity of bath	φ 153×225H・ Approx. 3.9ℓ	φ 200×395H・ Approx.9.1ℓ	φ 153×225H・ Approx.3.9ℓ	φ 200×395H・ Approx.9.1ℓ
	Diameter of end connection ※4	Inlet・outlet Ex. Diameter 17.3mm	Inlet・outlet Ex. diameter21.7mm	Inlet・outlet Ex. diameter17.3mm	Inlet・outlet Ex. diameter21.7mm
Range of available ambient temperature		5~35°C			
Ex. Dimension (W×D×H:mm) ※5		300×350×835	340×370×835	330×470×835	340×540×835
Mass		Approx. 33kg	Approx. 40kg	Approx. 60kg	Approx. 65kg
Voltage		7A , 700VA	10A , 1.0kVA	13A , 1.3kVA	13A , 1.3kVA
Rated supply		AC100V 50/60Hz			

※1 Figures mentioned here was measured under the following conditions; Room temperature 20°C, rated supply voltage: 50Hz, no load, with cover attached

※2 Temperature on the drum surface

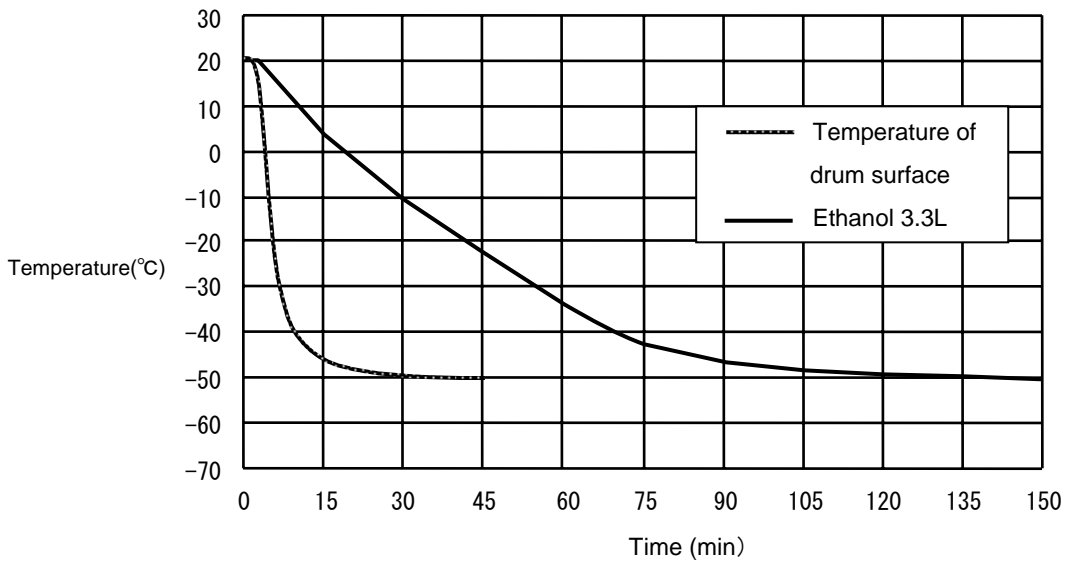
※3 Trap temperature display is rough indication.

※4 The dimension of "Cover with nozzle" (option) is included.

※5 Dimension of projection is not included.

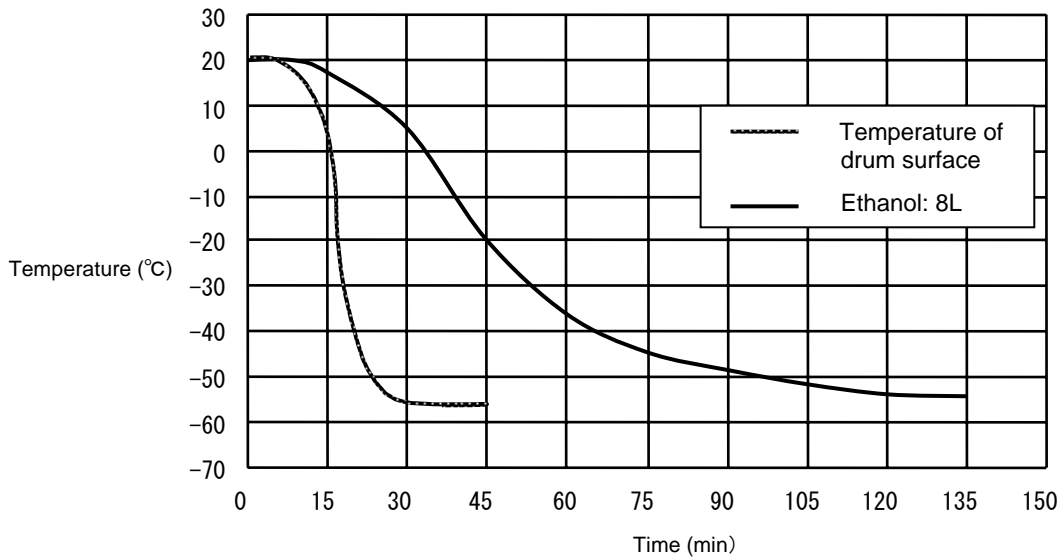
## 2-3 Cooling curve

UT-3000A



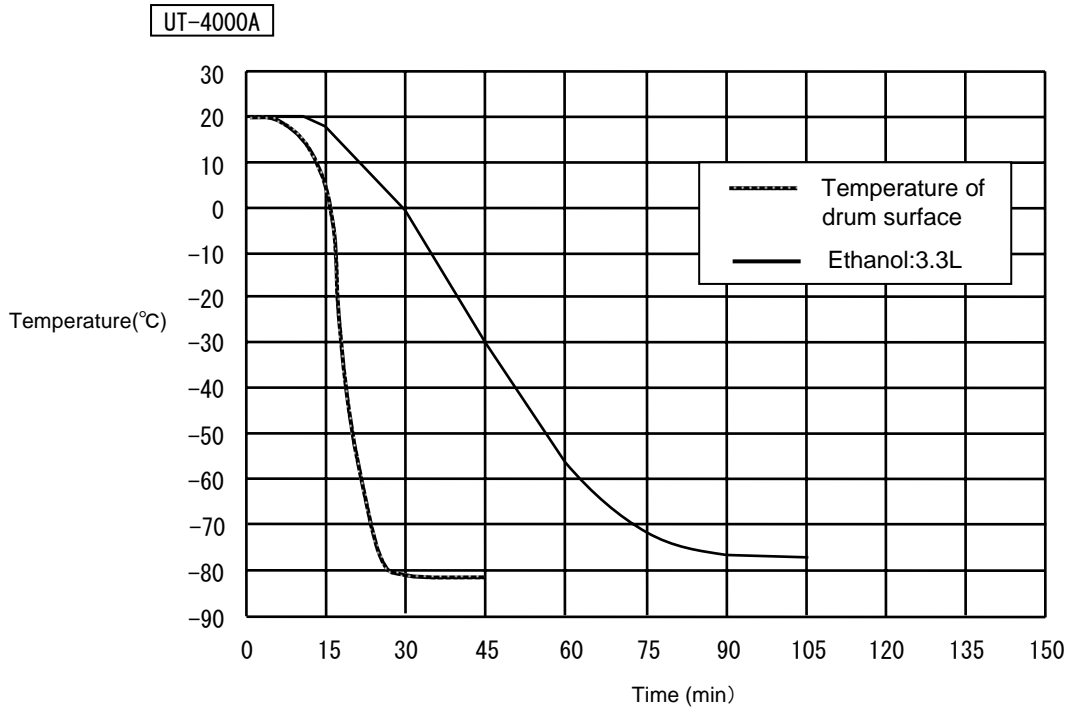
Conditions : Room temperature 20°C, Rated supply voltage (AC100V, 50Hz), With cover attached

UT-3000L



Conditions : Room temperature 20°C, Rated supply voltage (AC100V, 50Hz) , With cover attached

## 2-3 Cooling curve



Conditions: Room temperature 20°C, Rated supply voltage (AC100V, 50Hz), With cover attached

### Note

Temperature display is the value of outlet temperature of drum. If you use the drum as liquid tank, error will be increased depending on heat capacity. As time elapses, difference between liquid temperature and displayed trap temperature will be fewer



## 2-4 Options

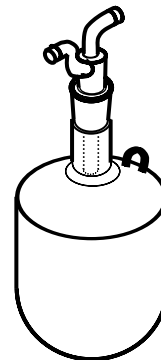
### 1. Glass condenser with handle (for UT-3000A,4000A)

No.	Product name	Spec.	Qty	Catalog No
1	Glass condenser with handle	500mL	1	217510
2	Teflon coating O ring	P6, Viton	2	
3	Nozzle cap		2	
4	Nozzle	Diameter:10mm	2	



### 2. High-capacity glass condenser (for UT-3000L,4000L)

No.	Product name	Spec.	Qty	Catalog No
1	High-capacity glass condenser	1800mL	1	182470



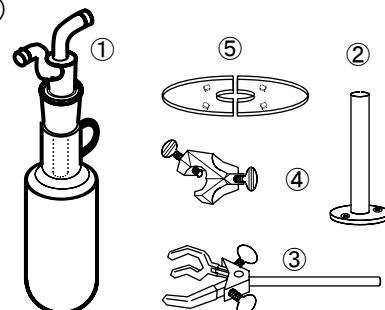
### 3. Low boiling glass condenser with handle (for UT-3000A,4000A)

No.	Product name	Spec.	Qty	Catalog No
1	Low boiling glass condenser with handle	500mL	1	217520
2	Teflon coating O ring	P6, Viton	2	
3	Nozzle cap		2	
4	Nozzle	Diameter 10mm	2	



### 4. Set of glass condenser C : Catalog No.217540 (For UT-3000A and 4000A)

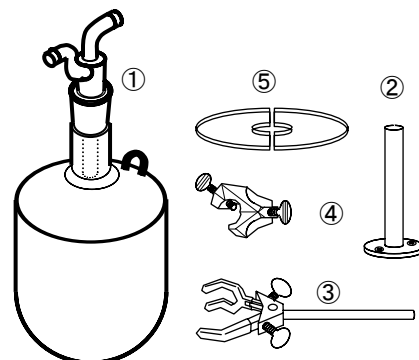
No.	Product name	Spec.	Qty	Catalog No
1	Glass condenser with handle	500mL	1	217510
2	Pole	P6, Viton	1	143380
3	Universal clamp		1	
4	Clamp holder		1	143360
5	Bath cover for glass condenser		1	



### 5. Set of high-capacity glass condenser : Catalog No. 181830 (For UT-3000L and 4000L)

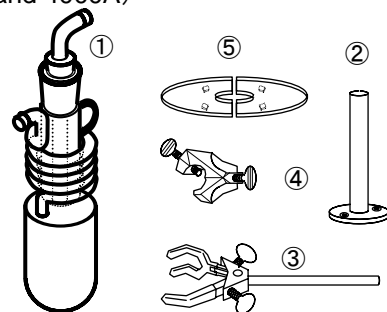
※Only available for UT-3000L and UT-4000L.

No.	Product name	Spec.	Qty	Catalog No
1	Glass condenser with handle	1800mL	1	182470
2	Pole		1	143380
3	Universal clamp		1	
4	Clamp holder		1	185910
5	Bath cover for glass condenser		1	



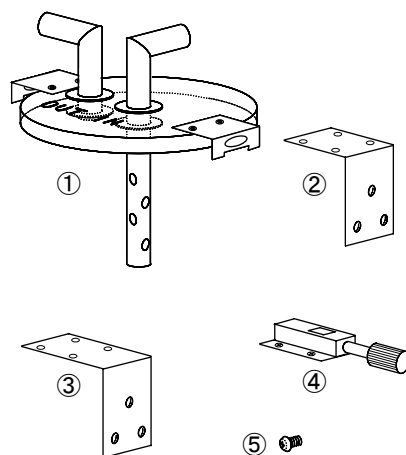
6. Set of low-boiling glass condenser C : Catalog No.217560 (for UT-3000A and 4000A)

No.	Product name	Spec.	Qty	Catalog No
1	Low-boiling glass condenser with handle	500mL	1	217520
2	Pole	P6, Viton	1	143380
3	Universal clamp		1	
4	Clamp holder		1	
5	Bath cover for low-boiling glass condenser		1	217590



7. Transparent cover with nozzle for UT-3000A and 4000A

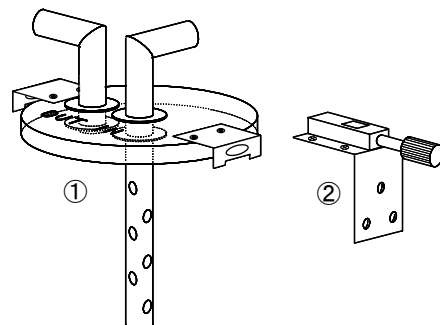
No.	Product name	Qty	Catalog No
1	Transparent cover with nozzle for UT-3000A and 4000A	1	216210
2	Clamp for transparent cover (for 3000A)	2	
3	Clamp for transparent cover (for 4000A)	2	
4	Push bolt	2	
5	Screw (including 2 spare screws)	10	



※Select the clamp depending on your model in current use.  
Attach push bolt with supplied screws.

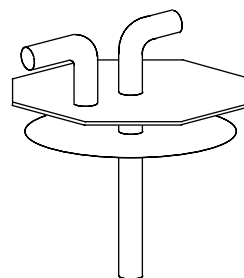
8. Transparent cover with nozzle for UT-3000L and 4000L.

No.	Product name	Qty	Catalog No
1	Transparent cover with nozzle for UT-3000L,4000L	1	216220
2	Clamp for transparent cover	2	



9. Cover with nozzle A (For UT-50 and 80)

No.	Product name	Qty	Catalog No
1	Cover with nozzle A for 3000A and 4000A	1	148940



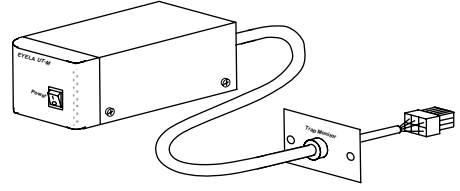
### 10. Trap monitor unit

This device detects dehumidified moisture content in the cold trap and blinks trap monitor lamp.

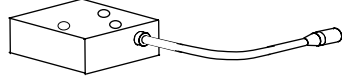
※Amount of dehumidified moisture content  
 UT-3000A,4000A  $1 \pm 0.6\%$   
 UT-3000L,4000L  $4 \pm 1\%$

Model	Catalog No.
UT-M	216400

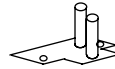
Substrate plate box



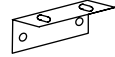
Main unit of sensor





Swivel plate for sensor



Clamp for substrate plate box



Supplied screws

-  M3 screw (× 2)
-  M3 flat surface screw (× 2)

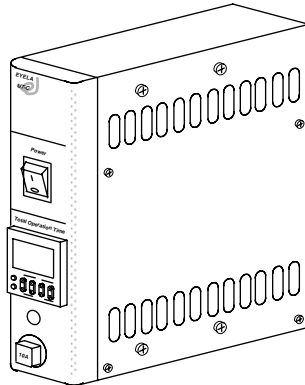
### 11. Control unit for vacuum pump

Vacuum pump can be turned on and off by vacuum pump switch on operation panel. This unit stops the operation of vacuum pump when power failure occurs and releases the air from the main unit through automatic leak valve. Also, it displays total operation hours of vacuum pump.

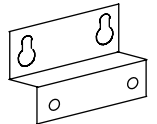
Model	Catalog No.
UT-C	216230

※ Maximum total hours that can be displayed on this unit is 999.9 hrs.

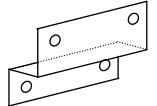
Control unit for vacuum pump



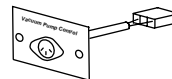
Clamp (top)



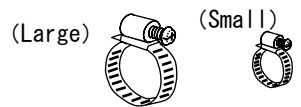
Clamp (bottom)



Connector unit



Hose band (2 piece each)



Φ20.5 Hose joint (2 pieces)

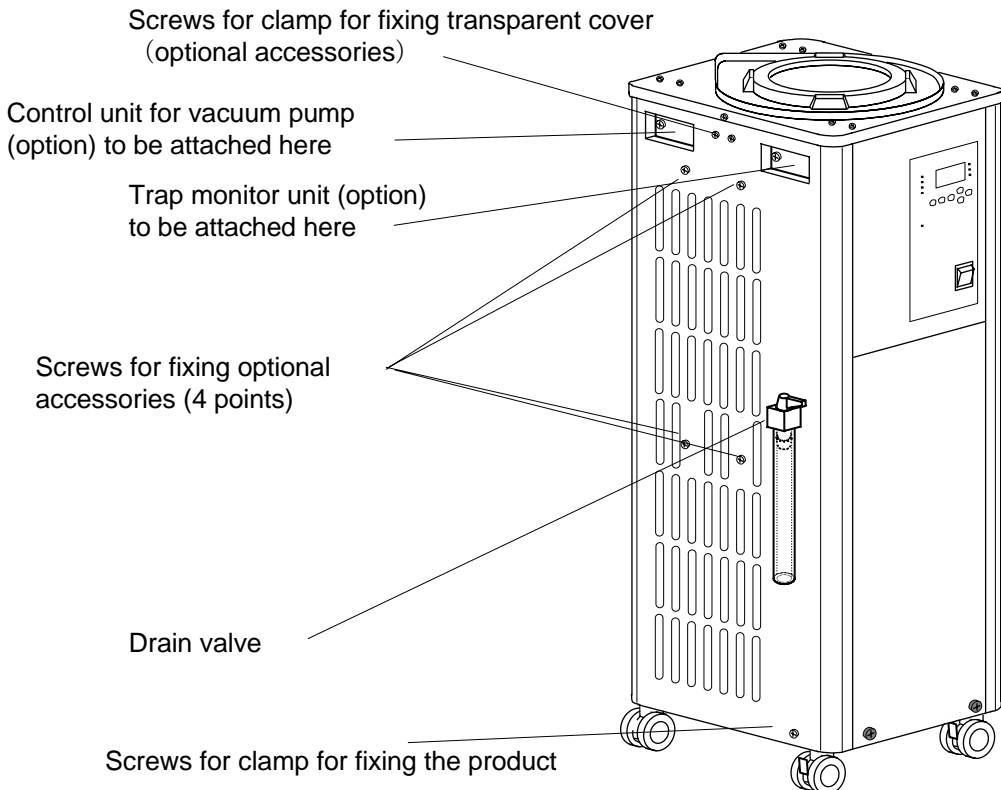
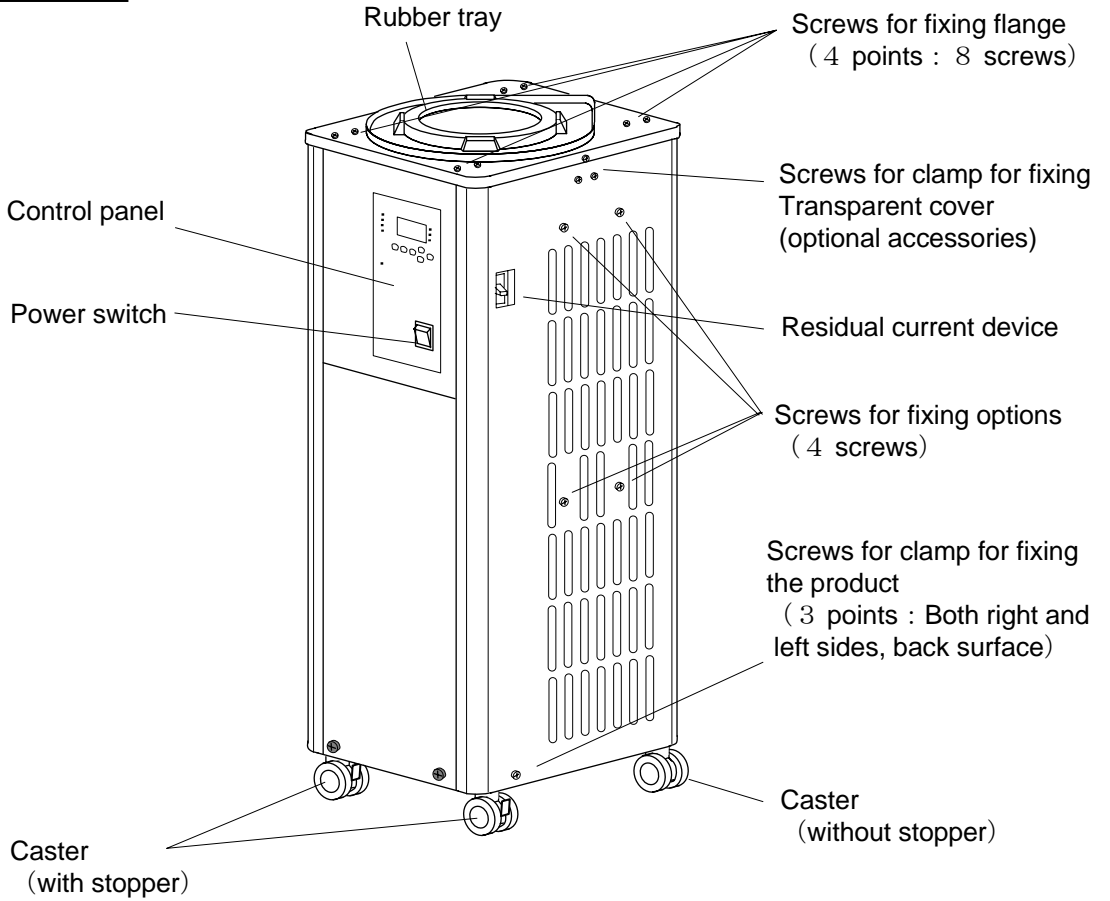


Φ16 Hose joint (2 pieces)

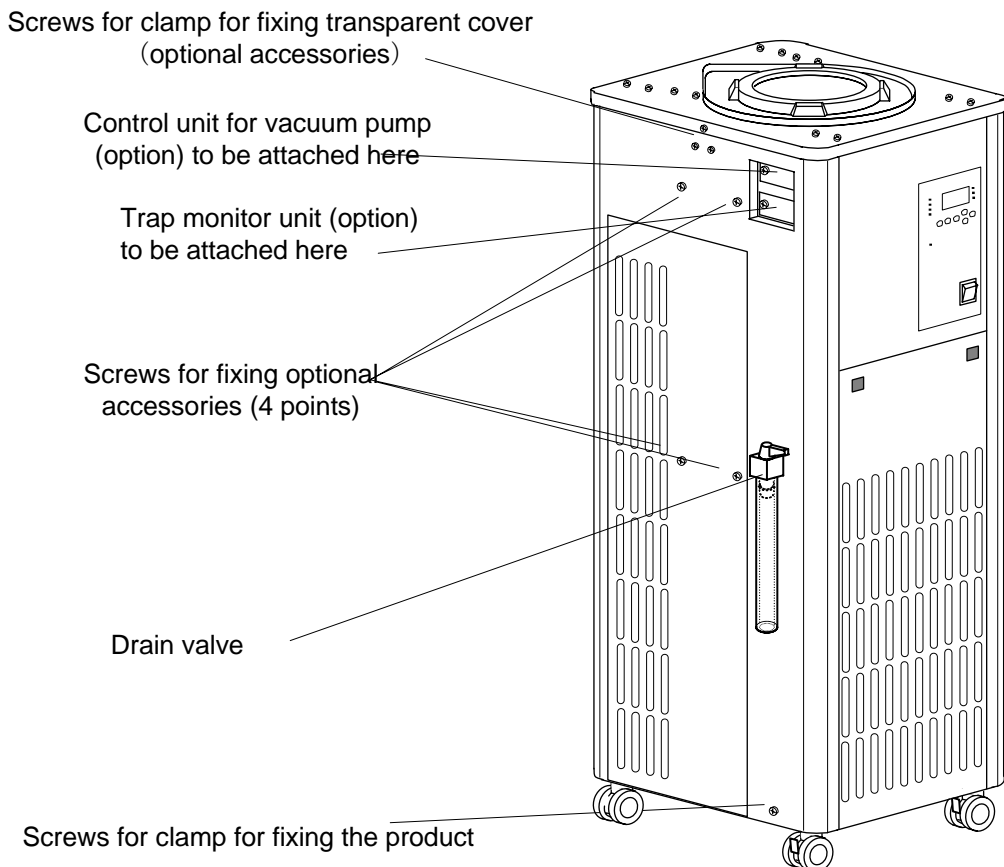
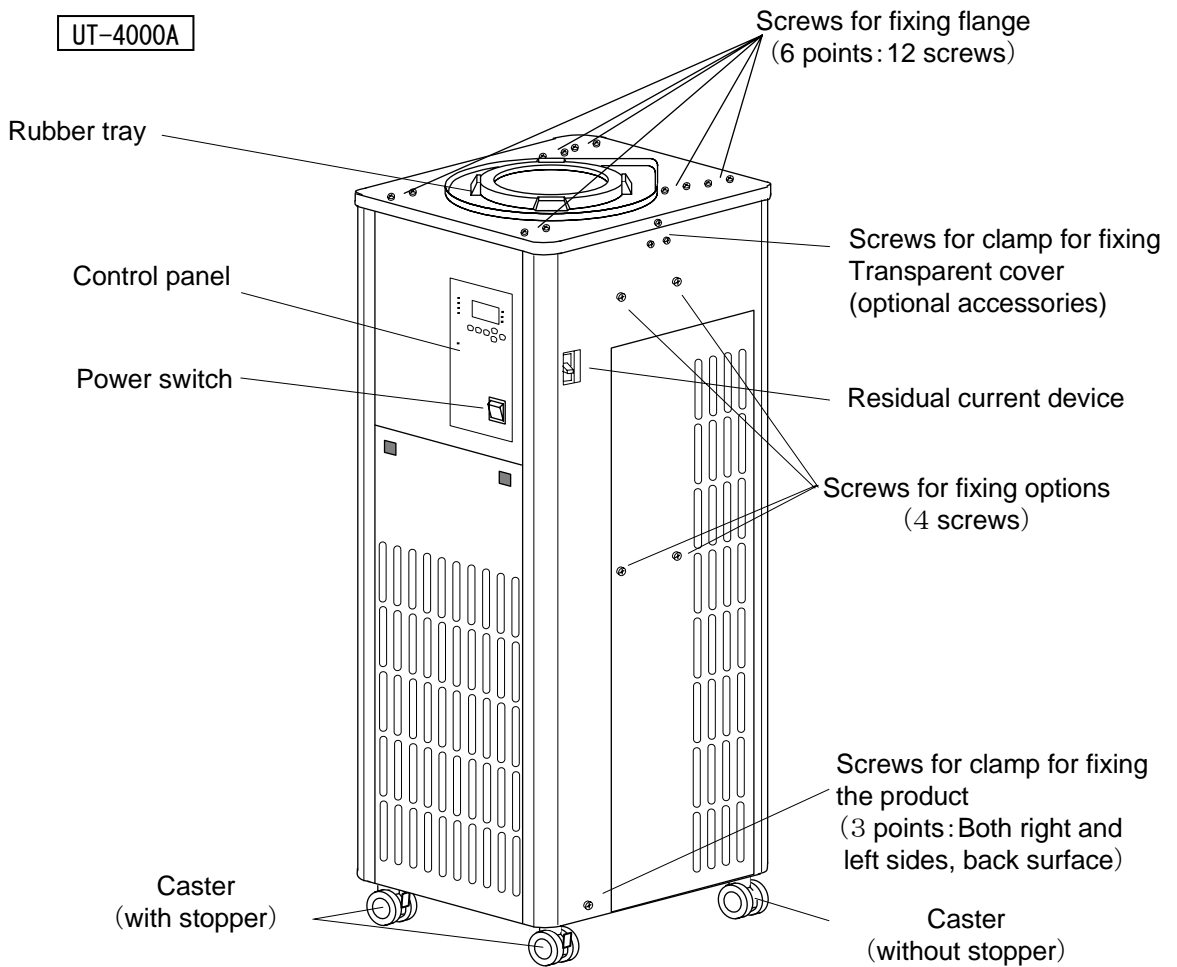


## 2-5 Descriptions

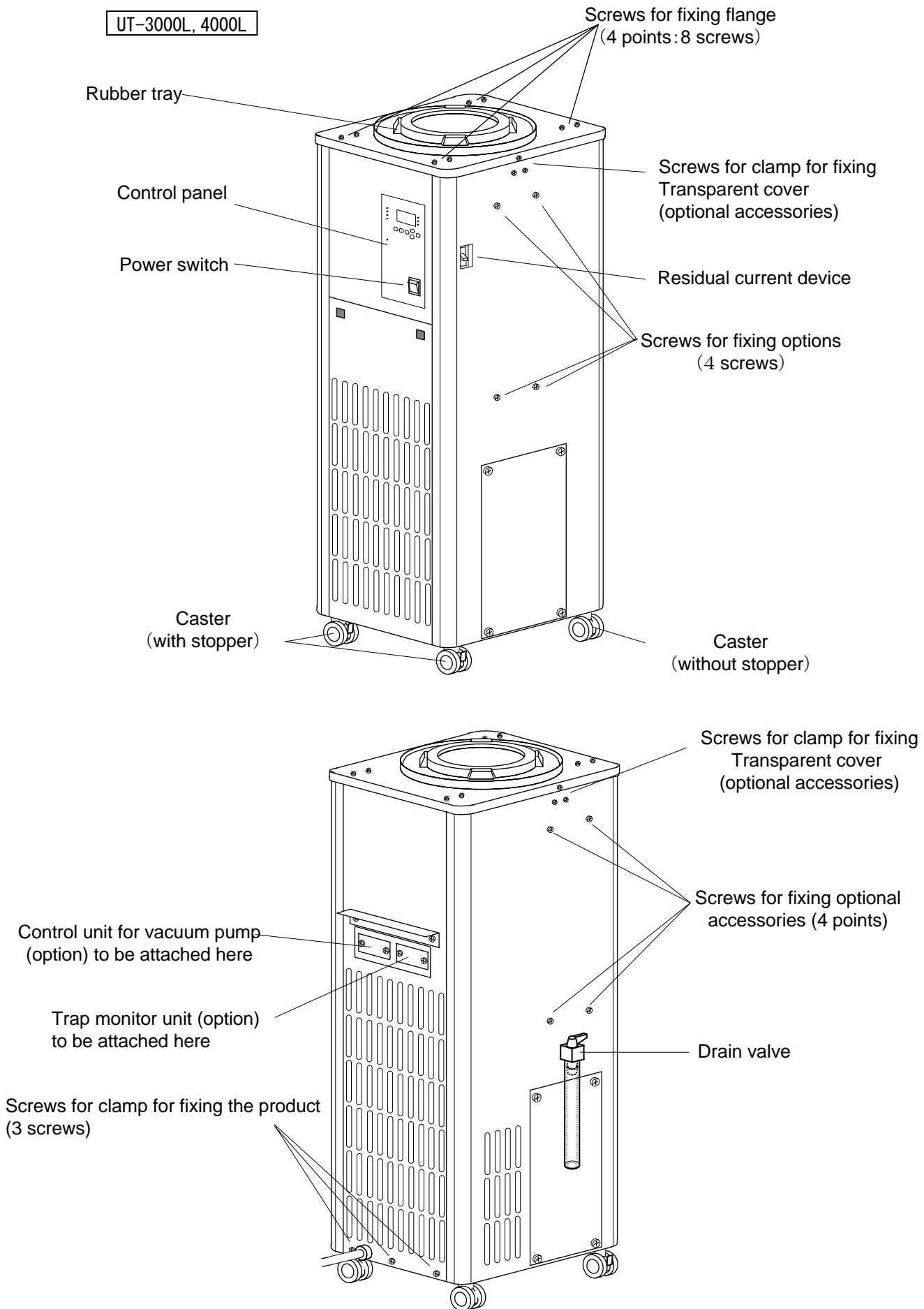
UT-3000A



## 2-5 Descriptions

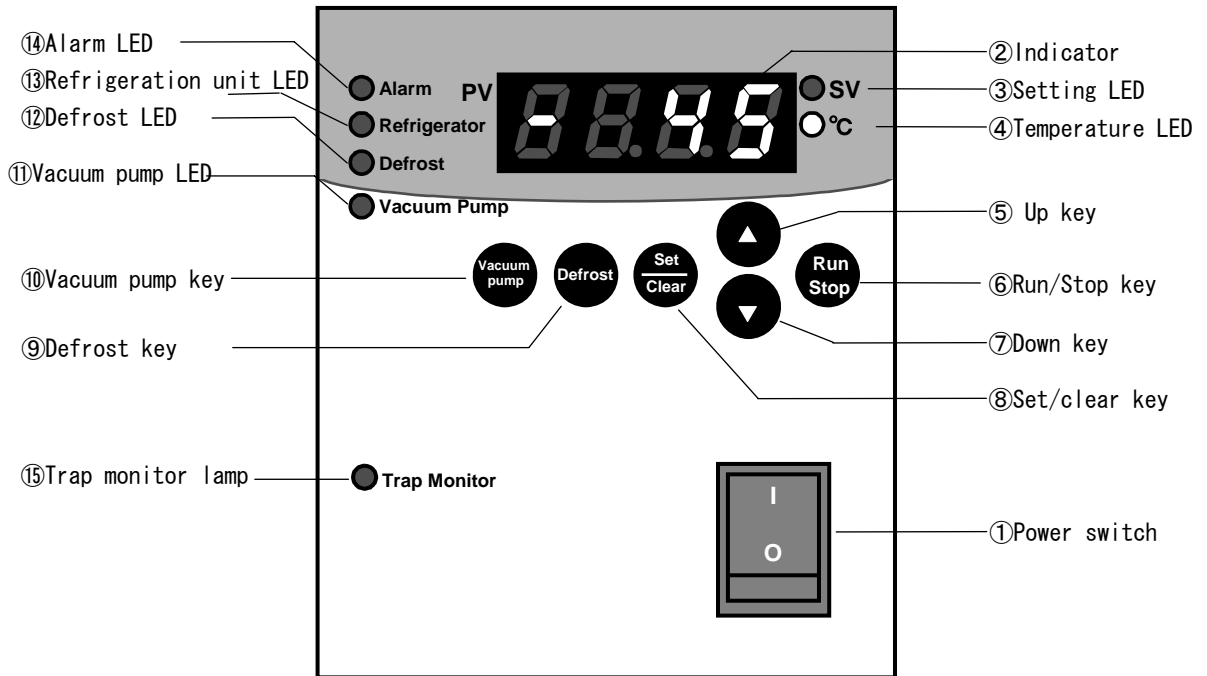


## 2-5 Descriptions



# 3 Descriptions of operating portion

## 3-1 Control panel



No.	Name	Functions	
①	Power switch	Turns on and off the instrument.	
②	Indicator	Displays trap temperature, alarm and character.	
③	Setting LED ※ 1	Lights up when displaying setting value (temperature and character) on the indicator.	
④	Temperature LED	Lights up when displaying temperature. Lights up at down time and blinks while the unit is controlled.	
⑤	Up key ※ 1	Changes the value and character as follow; Value : Each time you press the key, the value increases by 5. If you press and hold the key, the value increases continuously. Character : Each time you press the key, the character changes.	
⑥	Run/stop key	Starts and stops controlling. Stops defrosting while defrosting is executed.	
⑦	Down key ※ 1	Changes the value and character as follow; Value : Each time you press the key, the value decreases by 5. If you press and hold the key, the value decreases continuously. Character : Each time you press the key, the character changes.	
⑧	Set/clear key	Clears the alarm display when alarm is activated. If you hold down the key longer than 5 seconds, it switches from trap temperature display and user adjustment mode. In user adjustment mode, each time you press the key (for shorter than 5 sec.), it changes setting items and value.	
⑨	Defrost key	Holding down the key for longer than 5 sec, can start defrosting and stops defrosting forcibly.	
⑩	Vacuum pump key	Starts and stops running vacuum pump	※ Available only when connecting to optional accessories.
⑪	Vacuum pump LED	Lights up when controlling vacuum pump.	
⑫	Defrost LED	Lights up while defrosting is executed.	
⑬	Refrigeration unit LED	Lights up when refrigeration unit is turned on.	
⑭	Alarm LED	Lights up when the refrigeration unit or sensor is in abnormal status, or power failure alarm is activated.	
⑮	Trap monitor lamp	Blinks when eliminated moisture amount is detected by trap sensor monitor (option). (Refer to 5-3-2 Trap monitor on page 25.)	

※ 1 Not available when trap temperature is displayed. Only user adjustment mode is available.

## 3-2 Adjustment mode

Two adjustment modes are available in this unit.  
For more details about the setting of each mode, please refer to “5-4 How to adjust (adjustment mode)” on page 30.

※Be sure to read “5-4 How to adjust (Adjustment mode)” on page 30 before changing the preset value. Wrong setting does not proceed your desired operation.

### 1. Calibrating displayed temperature

Measured temperature can be matched to the value of temperature gauge.

※Available range : -20°C~20°C

### 2. Setting for power recovery

In case that the power supply is cut off because of turning off the power switch while running the instrument or sudden power failure, operating condition after power recovery can be set.

※Available settings

- 「 **cont** 」 : Continues the operation
- 「 **OFF** 」 : Stops running the product.
- 「 **on** 」 : Continues the operation.  
(Same operation as [cont])

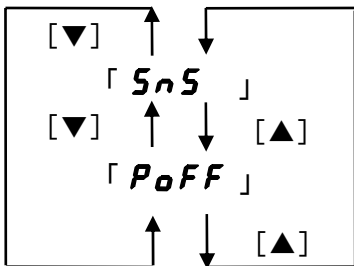
#### Available settings

Name	Character	Default value
Calibrating displayed temperature	<b>SnS</b>	0°C
Setting for power recovery	<b>PoFF</b>	<b>oFF</b>

Setting value and selected items in adjustment mode can be changed even during the operation and down time.

#### How to switch to adjustment mode

- 1) Press [ Set ] key for longer than 5 sec.  
Indicator displays 「 **SnS** 」 and switches to adjustment mode.
- 2) Each time you press [▲] or [▼] key, setting mode change as below.





### 3-3 Safety · alarm features



Following safety · alarm features are equipped with this product.

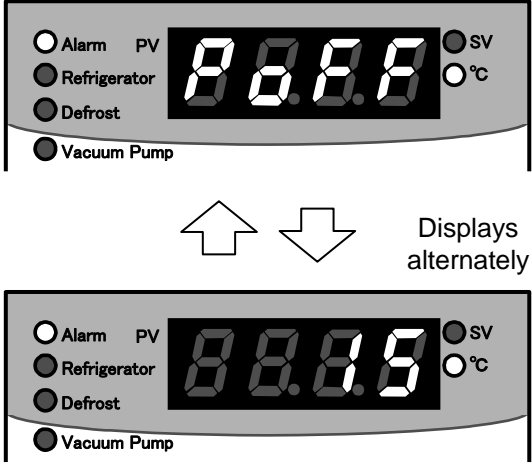

When you face any trouble, please refer to “Troubleshooting” on page 32.

#### Safety features

Safety device	Operations	Reasons why the device works.
Residual current breaker	Turns off the power	<ul style="list-style-type: none"> <li>Electric leakage hazard occurs, or excess current flows.</li> </ul>
Protective functions for refrigeration unit <ul style="list-style-type: none"> <li>Over load relay</li> <li>High pressure switch</li> </ul>	Refrigeration unit performs over load (over heat) operation and makes alarm lamp light up. Indicator displays 「oVL」 and stops refrigeration unit and vacuum pump.	<ul style="list-style-type: none"> <li>Refrigeration unit performs over load (over heat) operation</li> <li>Ambient temperature exceeds 35°C.</li> <li>Power supply and voltage limit exceeds rated value.(± 10%).</li> <li>Fan of refrigeration unit does not circle (not equipped with model 3000A.)</li> <li>Dirt adheres to air filter ( not equipped with model 3000A )</li> </ul>
Self-diagnosis function for controlling base plate (Watch dog)	Controlling base plate is in abnormal status and stops control.	<ul style="list-style-type: none"> <li>Ambient temperature exceeds 35°C.</li> <li>The trouble happened because of noise.</li> </ul>
Safety valve for vacuum pump (leak valve) ※Equipped with control unit for vacuum pump	Safety valve opens and makes vacuum system open, and prevents back run of oil from vacuum pump.	<ul style="list-style-type: none"> <li>Power failure occurred while the unit was controlled.</li> <li>The unit was turned off without stopping refrigeration unit and vacuum pump.</li> </ul>

#### Alarm features

Alarm name	Alarm display and operations	Reasons why alarm is activated.
Temperature sensor alarm	<ul style="list-style-type: none"> <li>Buzzer beeps for 15 seconds.</li> <li>All the controls (for refrigeration unit and vacuum pump) will be continued.</li> <li>[Alarm] LED lights up.</li> <li>Indicator displays the descriptions of alarm.</li> </ul> 	<p>Operating conditions</p> <ul style="list-style-type: none"> <li>Temperature sensor is disconnected.</li> </ul> <p>Releasing alarm</p> <ul style="list-style-type: none"> <li>Alarm can be released by turning on the power again.</li> <li>※ If you turn off the power without stopping refrigeration unit, power failure alarm will be activated.</li> </ul>
Refrigeration unit alarm	<ul style="list-style-type: none"> <li>Buzzer beeps for 15 seconds.</li> <li>All the controls (for refrigeration unit and vacuum pump) will be continued.</li> <li>[Alarm] LED lights up.</li> <li>Indicator displays the descriptions of alarm.</li> </ul> 	<p>Operating conditions</p> <ul style="list-style-type: none"> <li>Protective device for refrigeration unit (over load relay · high-pressure switch) works.</li> </ul> <p>Releasing alarm</p> <ul style="list-style-type: none"> <li>Alarm can be released by 「Set」 key.</li> <li>※Control will be re-started automatically after releasing alarm.</li> <li>Alarm can be released by 「Run/Stop」 key.</li> <li>※Control will be stopped after releasing alarm.</li> </ul>

Alarm name	Alarm display and operations	Reasons why alarm is activated.
<p>Power failure alarm</p>	<ul style="list-style-type: none"> <li>• Power recovery setting can stop and continue controlling.</li> <li>• [Alarm] LED lights up.</li> <li>• Alarm descriptions is displayed on indicator.</li> </ul> 	<p>Operating conditions</p> <ul style="list-style-type: none"> <li>• Power failure occurred while the refrigeration unit is controlled.</li> <li>• The unit is turned off without stopping refrigeration unit.</li> <li>※Power failure alarm does not activate when only vacuum pump is turned on. Vacuum pump gets stopped even when the power recovery setting is done.</li> </ul> <p>Releasing alarm</p> <ul style="list-style-type: none"> <li>• Alarm can be released by 「Set」 key.</li> </ul>
<p>Watch dog</p>	<ul style="list-style-type: none"> <li>• All controls (for refrigeration unit and vacuum pump) will be stopped.</li> <li>• Indicator turns off a light.</li> </ul> 	<p>Operating conditions</p> <ul style="list-style-type: none"> <li>• Controlling base plate is in abnormal status and can not recover automatically because of noise and etc.</li> </ul> <p>Releasing alarm</p> <ul style="list-style-type: none"> <li>• Alarm can be released by turning off the power again.</li> </ul>

## 4 Installation

### 4-1 Installation environment

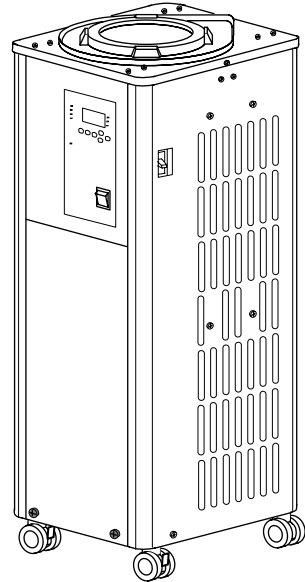
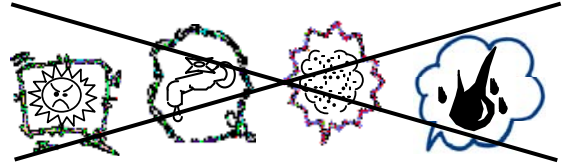


#### CAUTION

##### Select appropriate installation site that can be ventilated well.

Since air-cooled type refrigeration unit is equipped with this product, heat is exhausted from the unit.

Select the installation site that can be ventilated well so that the ambient temperature won't rise because of exhausted heat



Select the installation site that meets the following conditions.

- ⊙No inflammable solid or liquid or gas around the unit.
- ⊙Ambient temperature must be from 5 to 35°C.
- ⊙No dew condensation
- ⊙Lesser humidity and no dripping on the unit.
- ⊙Lesser dust
- ⊙No direct sun light
- ⊙Well-ventilated.
- ⊙Level and stable  
(Check the weight of the product during operation.)

### 4-2 Installation conditions



#### CAUTION

##### Keep enough space around the unit.

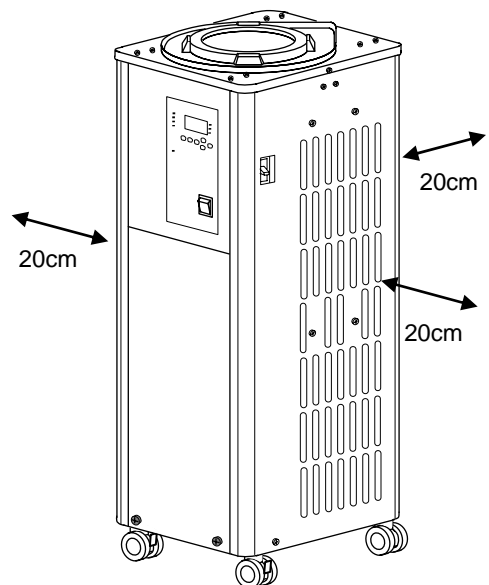
To keep the best performance of the product, leave the space between product and wall, ceiling plane. The distance between the product and wall, ceiling plane must be longer than the one mentioned in the right picture.



#### CAUTION

**This is a heavyweight product.  
Use caution when carrying the product.**

- UT-3000A : Approx. 33kg
- UT-3000L : Approx. 40kg
- UT-4000A : Approx. 60kg
- UT-4000L : Approx. 65kg



## 4-3 Installation



### CAUTION

#### Do not incline the main unit.

As refrigeration unit is equipped with the main unit, do not lay down the product or incline it when carrying.

#### 1. Precautions for carrying and setting up the product

1) Lift caster's stop lever (2 levers on the front) to unlock.

2) Move the unit to installation site.

※ If you move the product onto bumpy place, caster may be damaged.

In such a case, carry the product.

3) At installation site, hold and lower the caster's stop lever to lock.

4) Insert supplied caster holders (4 pieces) into the wheel to fix the caster.

#### 2. Fixing the product (How to use the clamp)

Clamps should be attached to fix the product on the floor in case an earthquake occurs. Two ports (Diameter:  $\phi$  7mm  $\cdot$   $\phi$  12mm) are available to fix the anchor bolt.

1) Remove the screws on both sides and back surface (3 points) with using screw driver.

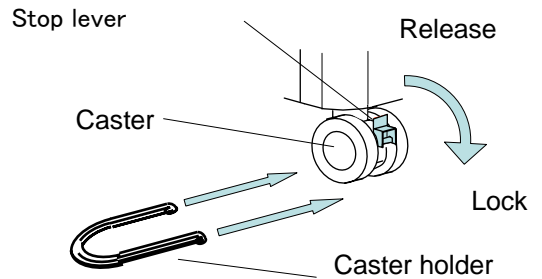
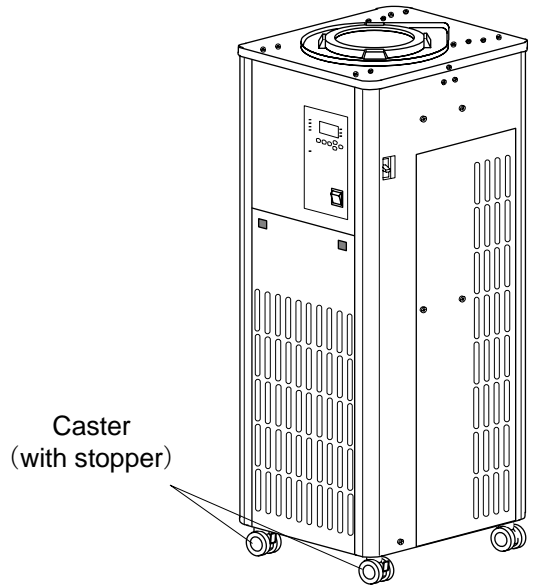
2) With using screw driver, fix the clamps (3 points) with these screws.

※Model A: Fix the clamp onto both sides and back surface

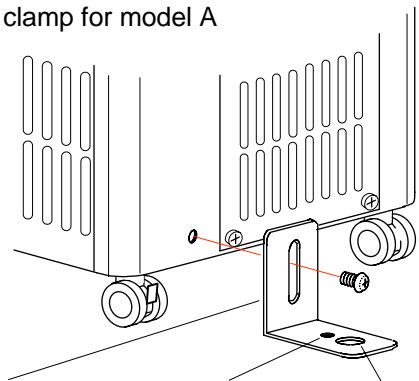
※Model L: Fix the clamp on the back surface

3) Fix the clamp, anchor bolt onto the floor (3 points).

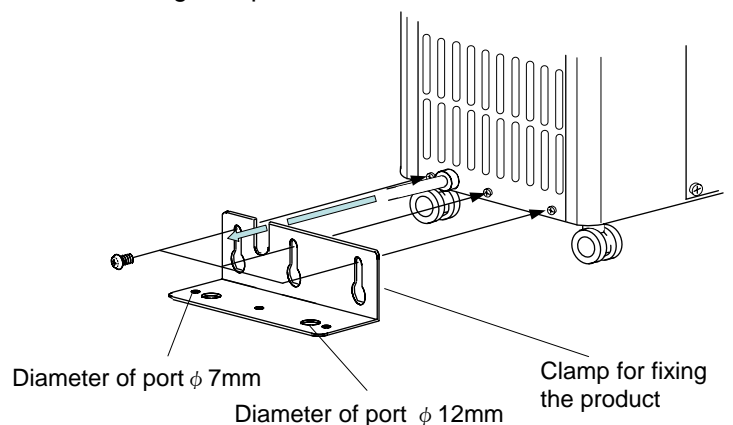
※Anchor bolt is not supplied with the product. Please purchase it if required.



#### Fixing clamp for model A



#### Fixing clamp for model L



## 4-4 Utility connection

### WARNING

**Check the voltage, phase and capacity of power source before connecting.**

Inappropriate connection may cause a fire or electric shock hazard.

### WARNING

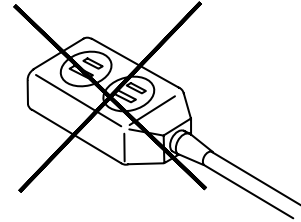
**Connect earth wire properly.**

For preventing electric shock hazard, do not connect earth wire to gas pipe nor water pipe.

### WARNING

**Ground the unit properly.**

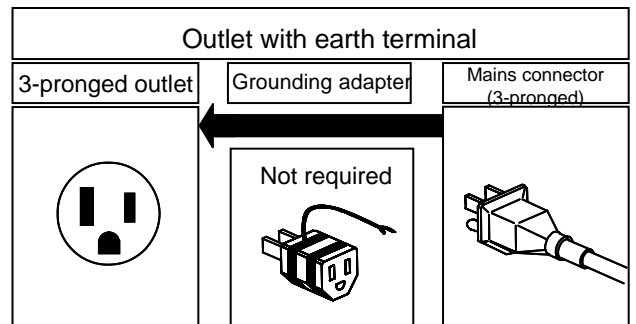
Without grounding the unit, the product may cause electric shock hazard.



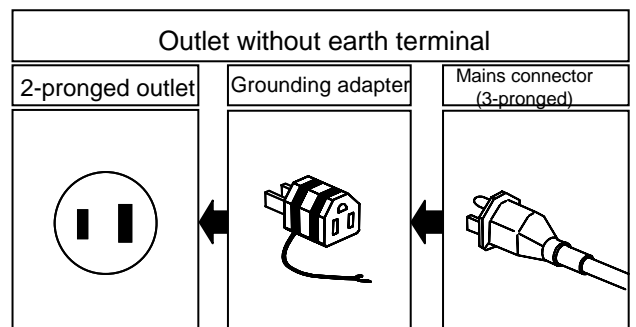
1. Check the voltage, phase and capacity of the power source. Required power source is as shown in right table.

Model	Required power source	
	Voltage	Capacity
UT-3000A	AC-100V	15A
UT-3000L		
UT-4000A		
UT-4000L		

2. Check the outlet at installation site.  
(Do not connect mains connector yet.)  
If the outlet has earth terminal, mains connector can be connected without any trouble.



If the earth terminal is not available, please consult with your closet electric appliance shop to conduct the third type grounding construction work.



## 5 Operation

### 5-1 Preparation



#### WARNING

Use extreme caution when using inflammable and combustible solution.

If you leave inflammable or combustible solution (such as methanol) out at room temperature or higher (or lower for some solutions), it may catch fire and explode because of some ignition sources. Also, take care not to overflow the solution out of the bath. Ventilate well before using these solutions.



#### CAUTION

Use solution that does not impinge on the material of interior part of the unit.

Material of the inner part of the unit is made of stainless, brass (plating), silicon and chloroprene rubber. Do not use solution that does not impinge on these materials.



#### CAUTION

Make sure that there's no residual water on the drainage route.

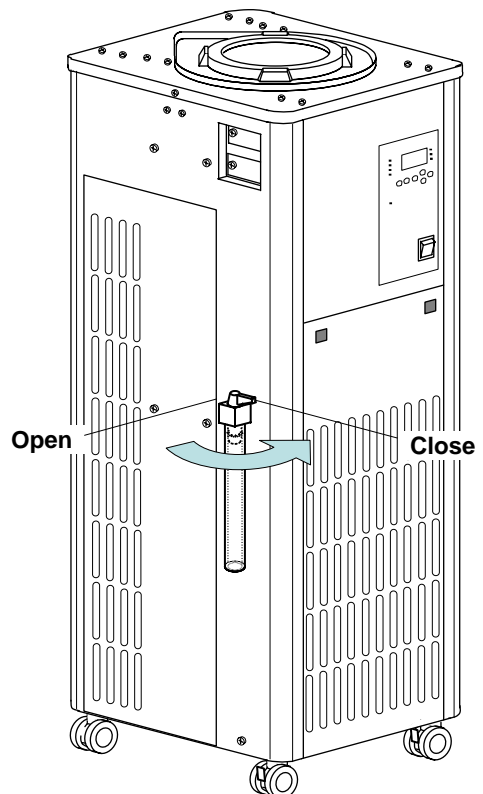
When using the unit as a cooling or liquid bath with some water left in the drain hose or valve after defrosting in the trap directly, water may be frozen and may not be drained. In such a case, water can not be melt by defrosting.

#### 1. Checking drain valve

Make sure that drain valve is closed.

#### 2. Connecting mains connector

Make sure that residual current device and power switch are turned off before plugging mains connector into outlet.



## 5-2 How to operate

### CAUTION

Stop using the product if you find any trouble.

If you find any trouble, turn off the residual current device immediately and see the section "Troubleshooting".

### CAUTION

Do not touch antifreeze in the trap bath.

As the antifreeze is in low temperature while the unit is running or for a while after turning off the unit, touching antifreeze may cause you cold injury. Also, do not drain the water while the unit is in low temperature

Please read the following description if the water type solvent will be trapped. Use gas trap if the solvent is acid or organic solvent type (Refer to 5-3-1 How to use glass condenser" on page 23).

1. Setting transparent cover with nozzle and the cover A with nozzle (option).
  - 1) Attaching clamp "Assy" for fixing transparent cover
 

With cross-slot screwdriver, remove 6 screws on both sides of the main unit to insert these on the sides of the clamp for fixing the cover.

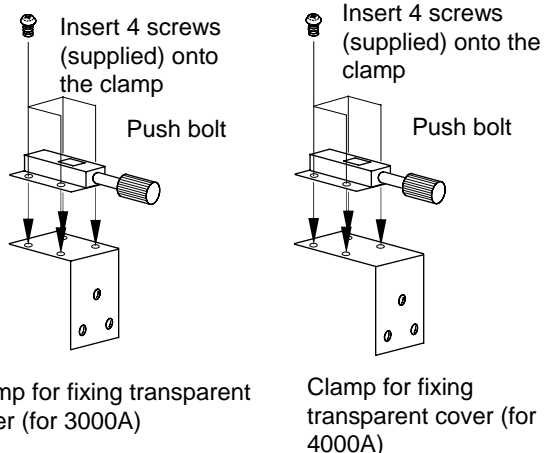
※For model UT-3000A and 4000A, attach push bolt to the cover before attaching the clamp.

※Above-procedure is not required for the cover A with nozzle.
  - 2) Setting transparent cover with nozzle (Cover A with nozzle)
    - (1) Make sure that no dirt adheres to trap packing or the cover, and no damage on the packing or the cover.
 

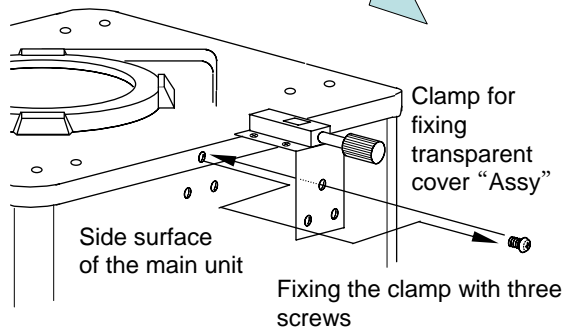
※Dirt or damage on the packing or the cover may worsen the trap efficiency. Also, poor displacement of the vacuum pump may worsen the trap efficiency.
    - (2) Set the clamp for locking facing the same direction to the clamp with nozzle.
 

※Attach the transparent cover with nozzle and trap packing tightly.

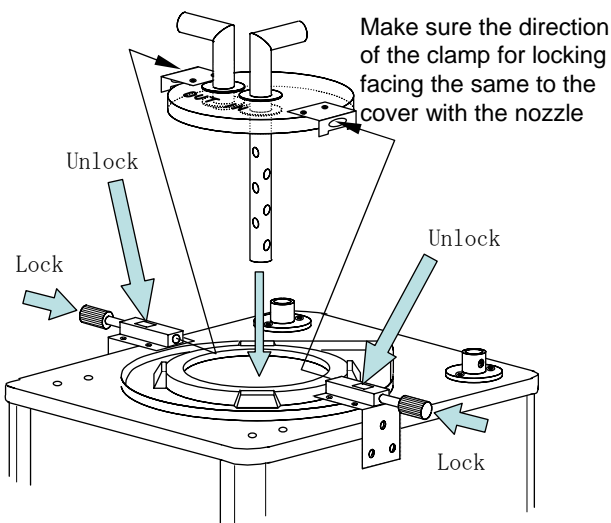
How to set up the clamp "Assy" for transparent cover (Available only for mode 3000A and 4000A)



Setting up the clamp "Assy" for transparent cover



Setting up transparent cover with nozzle



(3) Make sure that the direction of 「IN」 and 「OUT」 of the nozzle and set the cover softly on the rubber dish.

※ Fit the cover A and trap packing tightly.

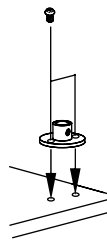
3) Fixing transparent cover with nozzle

Push the lock of the clamps for fixing transparent cover attached on both sides and fix the cover with nozzle. Pressing unlock button on the clamp can release the lock .

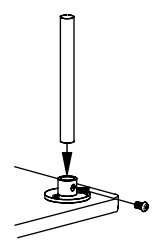
※ Make sure that clamp for fixing transparent cover is locked.

Attaching flange and pole

Attaching flange



Attaching pole



2. Connecting vacuum hose

1) Attaching the clamp for fixing vacuum hose

(1) With cross slot screwdriver, loosen the screws on the front surface and attach the flange.

※ If you'd like to change the position of the flange, insert the screw on the port where the removed screws are inserted.

(2) With cross slot screwdriver, loosen the screws on the flange and attach the pole.

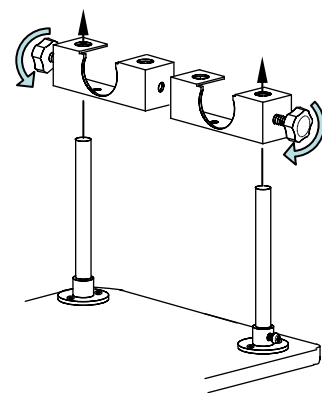
(3) Get the clamp for fixing vacuum hose through the pole and fix it by turning the knob.

The clamp for fixing vacuum pump can be set horizontally and vertically. Set the clamp suitable for your desired setting for vacuum hose.

※ Set the point for hanging hose on the front.

Attaching the clamp for fixing vacuum hose

Horizontally setting ( 2 points)



2) Connecting and fixing vacuum hose

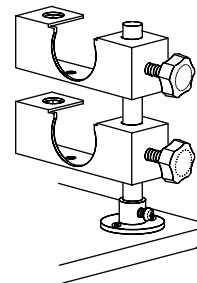
(1) Connect 「IN」 side of the transparent cover with nozzle to vacuum unit, and also connect 「OUT」 side to vacuum hose.

※ Make sure 「IN」 side and 「OUT」 side of the nozzle. Wrong connection may worsen the trap efficiency.

※ Vacuum hose is not supplied with the product.

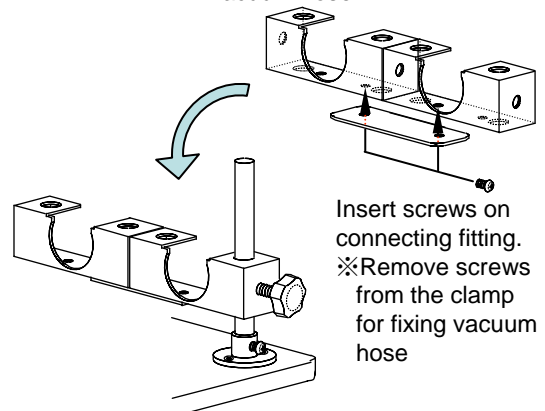
Please purchase it separately. For the nozzle that has external diameter 17.3mm, connect vacuum hose that has bore diameter 12mm or 15mm, and for the nozzle that has external diameter 21.7mm, connect the hose that has bore diameter 15mm or 18mm. Also, as a optional accessory, vacuum hose adapter (joint for different diameter) is available.

Vertical setting



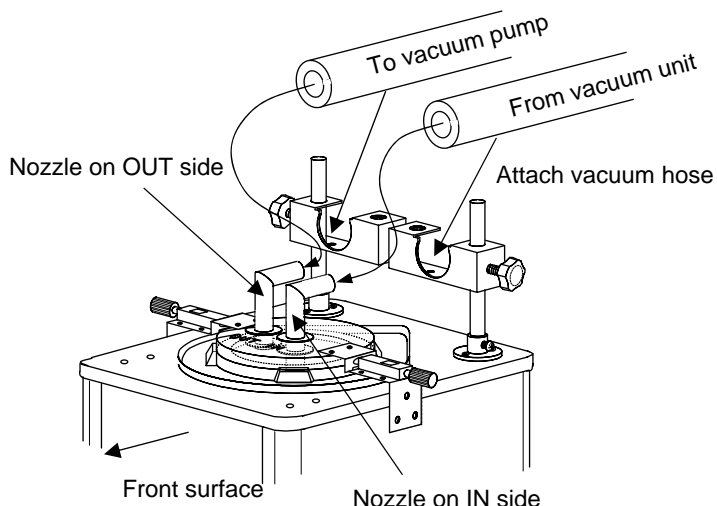
Horizontally setting ( 1 point)

Connecting the clamp for fixing vacuum hose





Connecting and fixing vacuum hose



Vacuum hose (option)

Specification	Length	Catalog No.
18 (Bore diameter) × 42mm (Ex. Diameter)	5m	119230
12 (Bore diameter) × 30mm (Ex. Diameter)	5m	119210
9 (Bore diameter) × 12mm (Ex. Diameter)	5m	119190

Vacuum hose adapter (option)

Specification	Diameter	Catalog No.
Adapter A	22 × 17mm	119240
Adapter B	17 × 13mm	119250
Adapter C	17 × 10mm	119260
Adapter D	22 × 13mm	119270
Adapter E	20 × 13mm	119280
Adapter F	22 × 10mm	191660

3. Running the unit

1) Turn on residual current device.

2) Turn on the power switch.

After showing initial display (for approx. 5 sec.), trap temperature will be displayed.

※ 「」 displays specified value of the product or alphabet.

3) Press [Run/Stop] key.

「Temperature LED」 blinks and control gets started. 「Refrigeration unit LED」 lights up and refrigeration unit starts running.

However, refrigeration unit won't work for 6 minutes after turning on the power switch (for 5 minutes for UT-4000A).

UT-3000A and 3000L

The unit will be cooled down in approx. 5 minutes after running refrigeration unit and drum shaped inner wall will be frosted (the condition of frost formation and required time differ depending on the environment).

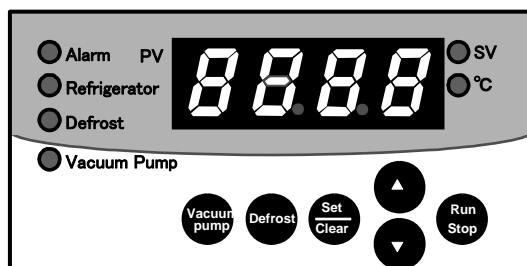
UT-4000A and 4000L

Refrigeration cycle has one-way side and two-way side. First, one-way side starts running and two-way side starts running in approx. 5 minutes after that. Refrigeration will not be executed until both sides start running.

※ Status of LE

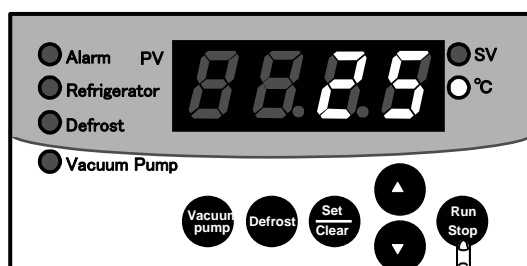
- Turning a light off
- Lighting up
- Blinking

Initial display



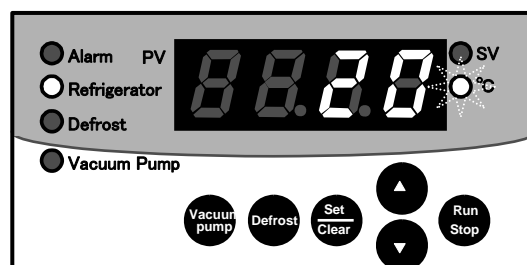
After approx. 5 sec.

Trap temperature display



Press (once)

Starting control (for refrigeration unit)



#### 4. Exhaust



Do not execute vacuuming while the inner wall of drum surface is not cooled down well.

Executing vacuuming while the drum surface is not cooled down may exhaust toxic gas.

Turn on vacuum pump after trap temperature reaches at the appropriate value ( UT-3000 A,L : lower than -40°C、 UT-4000A,L : lower than -70°C). When turning on vacuum pump, vapor generated from vacuum unit is collected in the trap bath.

#### 5. Defrosting and stopping control

1) Turn off the power switch of vacuum pump.

2) Remove the hose from [IN] and [OUT] side of the nozzle, and also remove the cover A.

3) Press [Defrost] key for longer than 5 seconds. Defrost will be started.

※Defrost can be executed even during control or downtime.

※ Defrosting will be completed automatically when the temperature reaches at the value for shutdown or elapses the setting time. Then, all the controls (refrigeration unit LED and defrost LED turns off a light and temperature LED lights up) gets stopped. Temperature and time for shut down of each mode is as below;

Model	Temperature	Time
3000A,3000L,4000L	45°C	1 hour
4000A	50°C	1 hour

4) When the ice can be removed from the trap bath, drain the water from the drain.

※Wear rubber gloves when removing the ice.

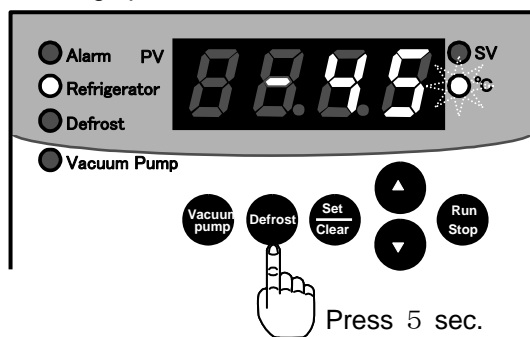
※The progress of ice run differs depending on ambient temperature and dehumidified amount. In some cases, ice may not be removed easily, however, afterheat of defrosting can melt the ice gradually. If the ice can not be removed in 10 minutes after stopping defrosting, execute defrosting again.

#### 6. Completing operation

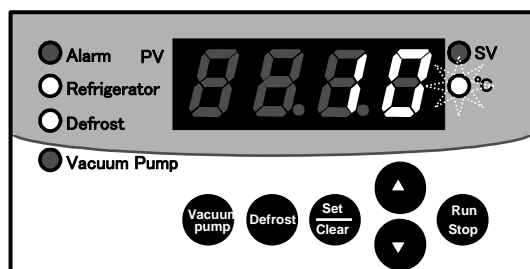
1) Turn off the power switch.

「Trap temperature display」 and 「temperature LED」 turns off a light.

While the unit is controlled  
(During operation)

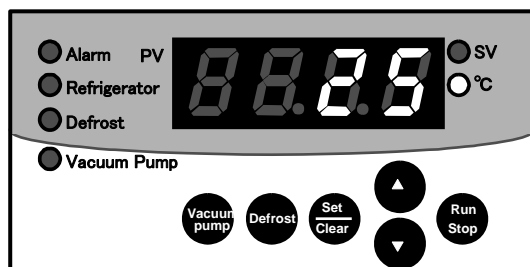


During defrosting



Automatic stop

Trap temperature display



2) Wipe off the water in the trap bath with soft cloth.

※When acid or organic solvent type are trapped, wash the glass condenser and piping system well.

Procedure after the completion of the operation

If you do not use the unit for a long time, turn off the residual current device and unplug the mains connector from outlet.

## 5-3 How to use optional accessories

### 5-3-1. How to use glass condenser set

**When using acid or organic solvent type, use glass trap condenser.**

#### WARNING

Do not have an impact on glassware.

Having an impact on glassware may break the glass and cause you physical injury. Use extreme caution when handling it.

Choose glass condenser suitable for your purpose of your use.

※Procedure mentioned below is an example for setting glass condenser set C.

#### 1. Setting glass condenser set

1) Remove the screws that are attached to the position where pole can be set, and fix the pole with screws. Also, attach clamp holder to the pole.

2) Hold glass condenser with universal clamp and put it in the trap bath and fix it with clamp holder.

3) After pouring heat transfer liquid into trap bath, set the glass condenser cover.

※ Amount of heat transfer liquid when using glass condenser

Glass condenser set C : Approx. 2.5L

Low-boiling glass condenser set C : Approx. 2.5L

Large size glass condenser set : Approx. 4.5L

#### 2. Connecting vacuum hose

Connecting to glass condenser set C and low-boiling glass condenser set C

##### 1) Setting up nozzle set

Push o ring into the slot of the nozzle and insert it into the vacuum hose through nozzle cap.

※External diameter of nozzle: 10mm

※Nozzle, o ring and nozzle cap are consumable products.

##### 2) Setting nozzle set

Attach nozzle set to the glass condenser.

Connect vacuum unit to [IN] side and connect vacuum pump to [OUT] side.

※Glass condenser has [IN] side and [OUT] side.

Wrong connection will worsen trap efficiency.

※Low-boiling glass condenser C can not be used for water and high-boiling solvent. If this device will be used in such condition, corrugated tube will be frozen and vacuuming can not be executed.

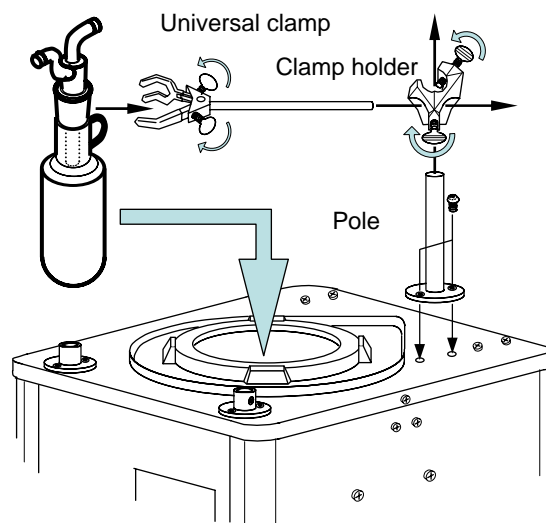
#### CAUTION

Do not overflow the heat transfer liquid

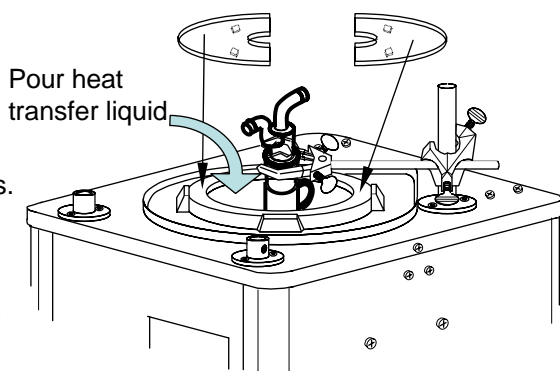
Do not refill the liquid after cooling down the unit. If you do so, water level will be higher because of temperature rise and liquid will be overflowed, which may cause some trouble. Also, make sure that heat transfer liquid won't be overflowed when pouring it on the bath or setting glass condenser.

Attaching glass condenser

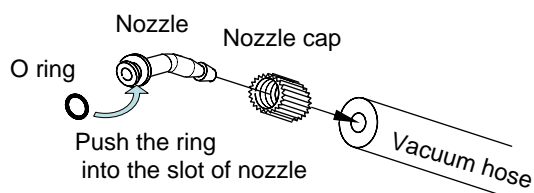
Glass condenser



Cover B for glass condenser



Setting nozzle



### Large size glass condenser

Connect vacuum unit to [IN] side of vacuum condenser and also connect vacuum pump to [OUT] side with vacuum hose

※ Glass condenser has [IN] side and [OUT] side.

Wrong connection will worsen trap efficiency.

※ Diameter of glass condenser is 10mm (13mm for large size condenser). If the diameter of the condenser does not match to the size of your pump, use vacuum hose adapter (refer to “Vacuum hose adapter” on page 21) .

### 3. Running the unit

Please follow the instructions “5-2. How to operate, 5-3 Running the unit” on page 21.

### 4. Exhaust

Turn on vacuum pump after trap temperature reaches at the appropriate value ( UT-3000A,L : at  $-40^{\circ}\text{C}$ , UT-4000A,L : at  $-70^{\circ}\text{C}$ ). When turning on vacuum pump, vapor generated from vacuum unit is collected in inner wall of the glass condenser.

※ If the vapor is condensed in the glass condenser, it may damage the condenser. Please note that some solvents can not be condensed and collected by adjusting vacuum piping system (ex. Leaking vacuum system).

### 5. Stopping the unit

- 1) Turn off vacuum pump
- 2) Stop running the unit.
- 3) Remove vacuum hose from the glass condenser.
- 4) Remove the condenser and dispose trapped solvent.
- 5) Drain heat transfer liquid from trap bath after the liquid gets warm.

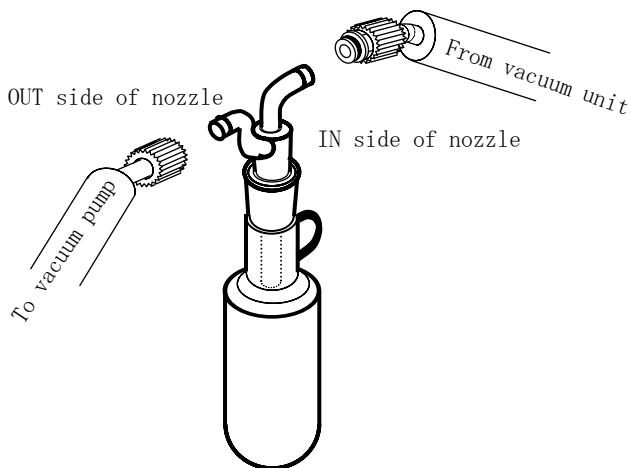
It takes approx. 3 minutes to drain heat transfer liquid. However, if the liquid is not heated well, it may take longer because of high viscosity. Also, please do not drain the low temperature heat transfer liquid.

### Procedure after the completion of operation

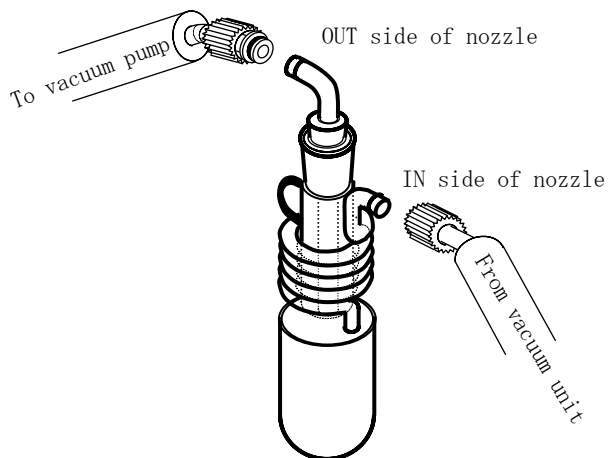
If you do not use the unit for a long time, turn off the residual current device and unplug the mains connector from outlet.

### Setting nozzle set

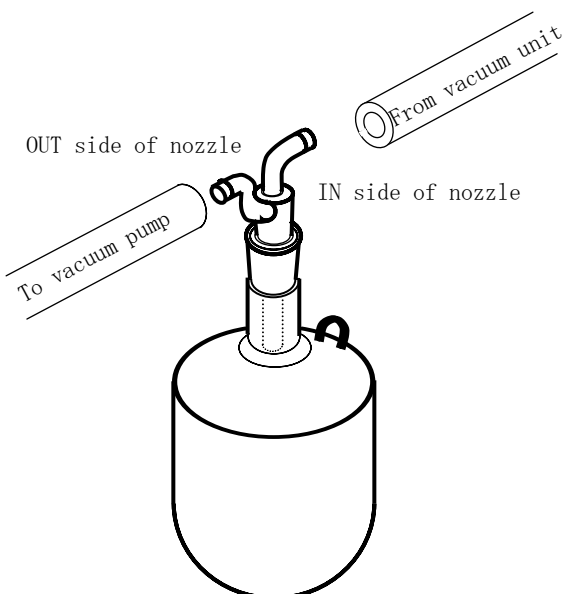
#### Glass condenser set C



#### Low-boiling glass condenser set C



#### Large size glass condenser set



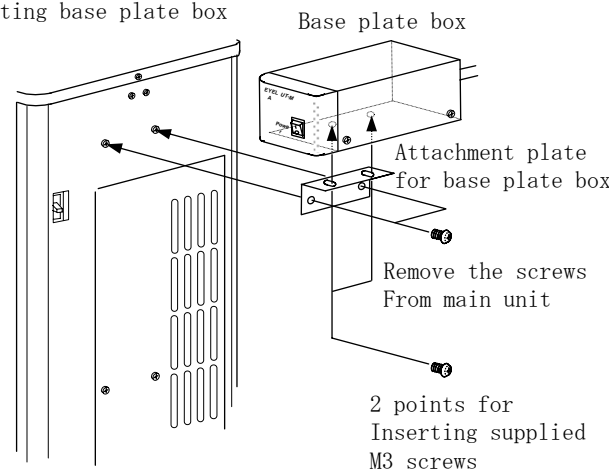
## 5-3-2. Setting trap monitor

- ※Before setting the monitor, turn off the main unit and unplug the mains connector.
- ※When using trap monitor, transparent cover with nozzle (option) is required.
- ※To set the monitor, cross slot screwdriver is required.
- ※Since the setting position differs depending on the mode, please check the position by referring the description in the manual on page 8-9.
- ※Base plate box can be attached to either right or left side.
- ※When setting the monitor together with the control unit for vacuum pump, the base plate box can be attached onto the control unit for vacuum pump.

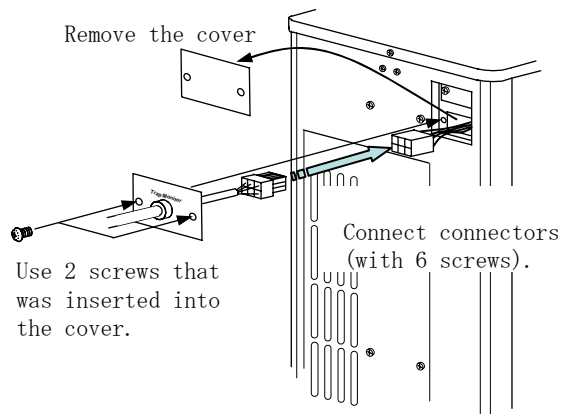
1. Set attachment board on the base plate box with M3 screws.
2. Remove screws (option) to fix the base plate box.
3. Remove the cover on the left side of the main unit where trap monitor unit can be attached, and insert the connector of the box (6 pins: male connector) into female connector (6 pins) .
4. Push the connector that is connected to the main unit and attach lead wire.
- ※Makes sure that lead wire is not tucked.
5. With using M3 screws, set the sensor receiver on the transparent cover with nozzle.
6. Get the pole on the receiver through two ports of the main unit of the sensor.
- ※Make sure that lead wire is in the back of the main unit if the sensor.
7. Insert sensor cable's plug into the connector of base plate box.

※Below picture is UT-4000A

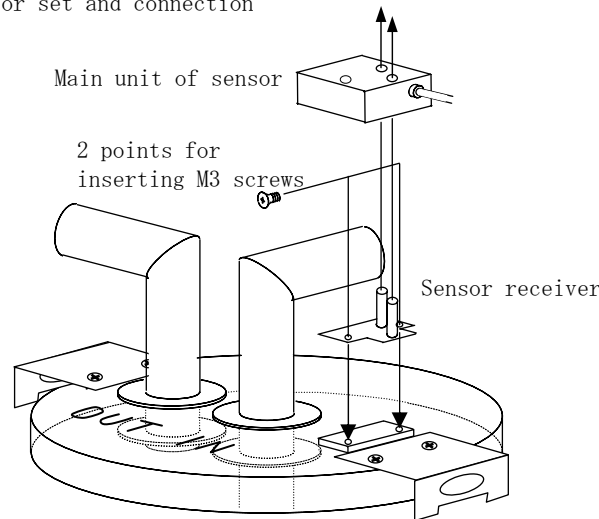
Setting base plate box



Connecting connector

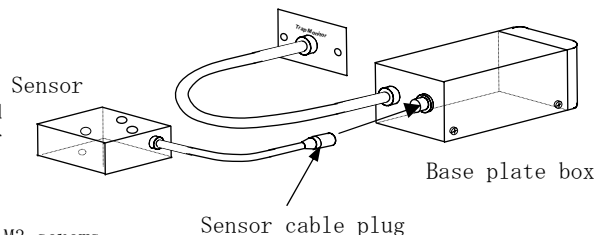
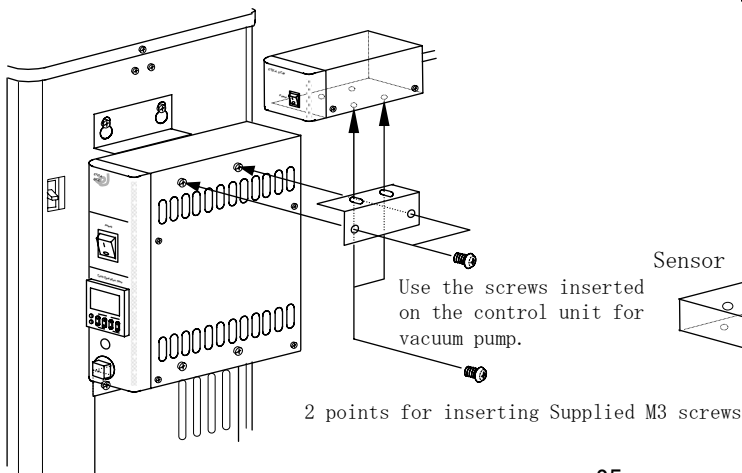


Sensor set and connection



※Position of sensor receiver differs depending on the model.

Setting the box on the control unit for vacuum pump



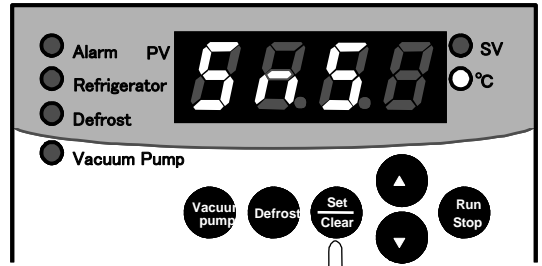
## 5. Setting for power recovery

In case of power failure, you can set power recovery setting.

(When turning off the power switch without stopping control, the product considers it as a power failure.)

- (1) Press [Set] key for longer than 5 seconds. The mode changes to adjustment mode and indicator shows 「SnS」 to enter into calibrating displayed temperature mode.

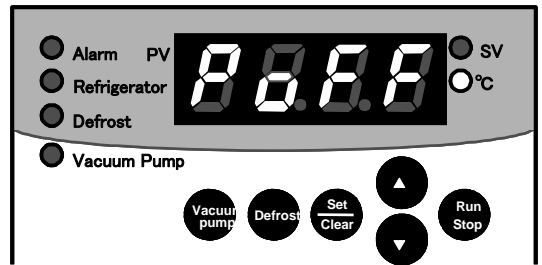
(1) Move to adjustment mode



Press longer than 5 sec.

- (2) Press [▼] key once to display power recovery setting

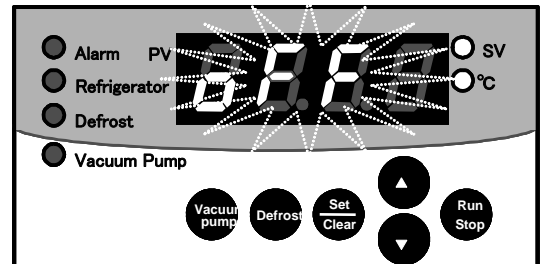
(2) Moves to power recovery setting



Press

- (3) Press [Set] key. Indicator changes to show setting character for power recovery setting (blinking).

(3) Displaying the setting



※First, displayed setting character (blinking) is the one that was set previous time.  
Factory default is 「OFF」.

- (4) Press [▲] or [▼] key to set the character.

※Setting character changes in order as below.

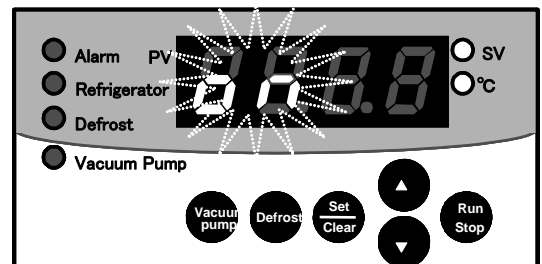
「cont」 : Continuing to control

「OFF」 : Stopping control

「on」 : Continuing to control

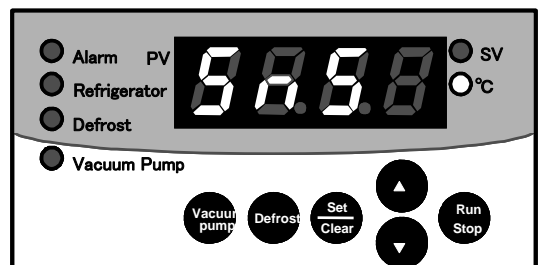
(Operation is the same as above 「cont」 setting.)

(4) Inputting your setting



- (5) Press [Set] key. Displayed character (blinking) is fixed and indicator shows 「SnS」 to enter into calibrating displayed temperature.

(5) Determining the setting  
Moves to buzzer setting



※Changed character will not be available until you press [Set] key.

※To change other setting items, press [▲] or [▼] key to select the item.

※If you do not need to change the item, press [Set] key for longer than 5 seconds.

Indicator changes to show “Measured temperature”.

※If no key operation will be done for longer than a minute, indicator will show measured temperature

## 6 Troubleshooting

Trouble	Cause of trouble	Countermeasure
Residual current device can not be turned on.	Electric leakage hazard occurs.	Stop running the product and contact your local dealer or closest customer service center.
	Excess current flows.	
No display is shown on indicator when turning on power switch.	Mains connector is not plugged into outlet or not plugged into outlet completely.	Turn off the power switch and plug the mains connector into the outlet.
	Power is not supplied.	Turn on the breaker on distribution board
	Residual current device is not turned on.	Turn on the device.
	Residual current device is impaired.	Stop running the product and contact your local dealer or closest customer service center.
	Power switch is impaired.	
	Temperature sensor is impaired.	
Refrigeration unit does not work.	Refrigeration unit is impaired.	Reduce heat load. Use the unit where the ambient temperature is lower than 35°C. After elapsing the setting time. Make sure that refrigeration unit works.
	SSR is impaired.	
	Over load relay holding circuit and high pressure switch are working (Alarm for refrigeration unit is activated.).	
	Protection timer for refrigeration unit works.	
The unit is not cooled down.	Refrigeration unit does not work.	Stop running the product and contact your local dealer or closest customer service center.
	Fan in the refrigeration unit does not circle. (Not equipped with UT-3000A) ※1	
	Gas is leaking.	
The unit is cooled down poorly.	Gas is leaking.	Set the temperature lower than 35°C. Set the appropriate heat load. Set the appropriate installation site (refer to page 15).
	Fan in the refrigeration unit does not circle. (Not equipped with UT-3000A) ※1	
	Ambient temperature exceeds 35°C.	
	Heat load is too heavy.	
	Some obstacles disturbs the exhaust of the unit.	
Alarm is activated. Alarm for refrigeration unit is activated. Overload relay holding circuit works. Or high pressure switch works.	Ambient temperature exceeds 35°C.	Set the temperature lower than 35°C.
	Heat load is out of the capacity of cooling capability.	Set the appropriate heat load.
	Dirt adheres to air filter.	Clean the filter.
	Fan in the refrigeration unit does not circle. ※1	Check the fan whether it is impaired or not.
	Power source and voltage is too low.	Check the power and voltage.
	Power failure alarm is activated.	Power failure occurred during control.
Power switch is turned off without stopping control.		
Sensor alarm is activated.	Power switch is turned off without stopping vacuum control.	Stop running the product and contact your local dealer or closest customer service center.
	Sensor is disconnected.	
Control gets stopped without activating alarm Description on the indicator is not clear.	Self diagnosis device (watch dog) on controlling base plate worked because of noise and etc.	Change the power source and reboot the unit. If that failure mode still remains, Stop running the product and contact your local dealer or closest customer service center.
Options Vacuum pump does not work.	Mains connector of control unit for vacuum pump is not plugged into outlet.	Please refer to 「5-3-3.How to use the control unit for vacuum pump」 on page 26 and plug each mains connector into outlet.
	Mains connector of the pump is not pulled into the outlet of the control unit.	

	Trouble	Cause of trouble	Countermeasure
Option	Vacuum pump does not work.	Vacuum pump is not turned on.	Turn on the switch.
		Plug for lead wire for control is not connected.	Connect the plug into the connector for controlling vacuum pump in the main unit.
	Exhaust sound does not change for about a minute after running vacuum pump (pressure does not rise)	Vacuum pump and connecting hose of the main unit is not connected.	Connect the hose to nozzle tightly.
		Drain valve is open.	Close the valve.
		Dirt adheres to the space between the cover with nozzle and packing.	Remove the dirt.
Pressure does not return to atmosphere pressure after stopping vacuum pump.	Leak valve is impaired.	Stop running the product and contact your local dealer or closest customer service center.	
	Filter for leak is clogged.	Change the filter.	
Option	Trap monitor does not work.	Connector (female) in the base plate box is not connected the connector (male) on the main unit side.	Connect the connector properly.
		Plug of the sensor cable is not connected to the connector in the base plate box.	Connect the cable properly.
		Transparent cover is dirty.	Clean the cover.

- ※1 When using UT-3000L, fan for concentrator is turned on and off around displayed trap temperature 「-65°C」 to prevent over cooling caused by low ambient temperature. Please do not take this phenomenon as malfunction of the unit.



## 7 Maintenance • checkup

### 7-1 Consumable parts

Rubber tray (material: chloroprene rubber) and vacuum hose (material: silicon rubber) are consumable products. As the life of these products differ depending on solvents that are trapped, or use conditions, check the condition regularly.

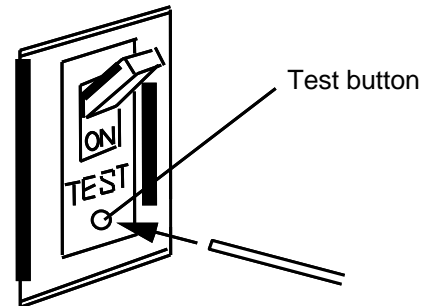
### 7-2 Operation test of residual current device



#### **Conduct operation test for residual current device.**

If residual current device does not work properly, electric shock occurs when a short is caused. So please conduct the test more than once in a month.

Plug the main connector and push the test button of the device with thin stick while the mains switch is turned on. The condition is normal if the device works and the mains switch is turned off.



## 7-3 Cleaning and caring the product



### WARNING

#### Do not disassemble the unit.

Some parts in the unit are under electric pressure and high pressure. So disassembling the unit may cause electric shock or cause users physical injury.



### CAUTION

Do not touch trap bath with bare hands.

Since heat transfer liquid in the trap bath is in low temperature while the unit runs and for a while after the operation, touching the liquid with bare hands may cause you cold injury.

1. Cleaning the filter of refrigeration unit (Not equipped with UT-3000A)
  - ※Before cleaning, turn off residual current device and power switch, and unplug the mains connector.
  - ※Clogged air filter worsens the cooling capability. Also, it causes malfunction in refrigeration unit.
  - ※The condition of the filter differs depending on the environment and operating time. So please clean the condition regularly.
    - (1) Press both sides edges of the cover simultaneously to open the cover.
    - (2) Take the filter out and wash it with water or mild detergent.
    - (3) After washing, please dry it well and attach to the same position.
2. Cleaning wire condenser (Only available for model UT-3000A)

Wire condenser (black) is equipped on the back of the unit. Clean the dirt on the condenser with soft broom or air blow. Air condenser may be in high temperature while the unit runs and right after the operation is completed. Also, touching the edge of wire with bare hands may cause you physical injury.
3. Cleaning the strainer

Strainer is attached to drain outlet in the trap bath to clean the dirt. Clean the strainer regularly. Before cleaning the strainer, drain ice-out water and heat transfer liquid.

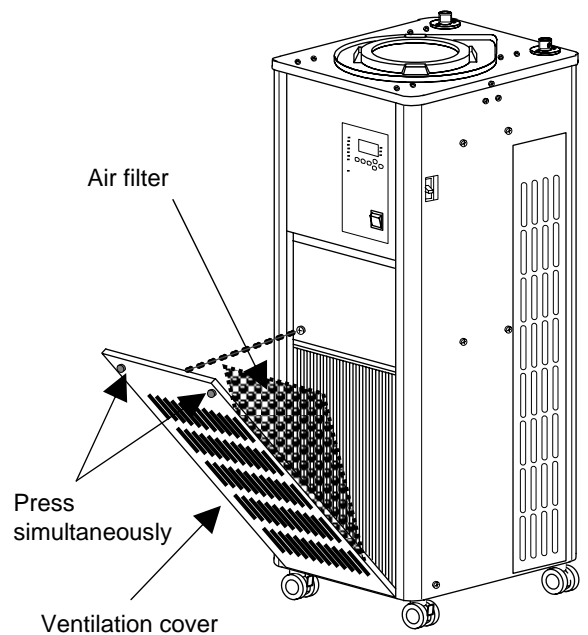
4. Cleaning the product
  - ※Before cleaning, turn off the residual current device and power switch, and unplug the mains connector.

Clean the main unit with soft wet cloth after wringing water tightly. Use mild detergent for greasy dirt and wipe off the dirt with soft cloth.



### CAUTION

Latch for ventilation cover may be damaged if you pull it. When the one side of the latch is locked, press the side that is locked to open the cover.



### CAUTION

**Use appropriate product for cleaning and caring the product in proper way.**

When cleaning and caring the product, do not pour water directly on the external and internal part of the unit, and also do not use cleanser, thinner, petrol, lamp oil, acid and related products. These products may cause electric shock hazard or damage the unit.

## 9 Disposal of the product

When disposing the product, please follow the instructions as below.

Main components and disposal instructions

Component	Specification	Total weight	Dimension (mm)	Disposal method
Main unit	UT-3000A	33kg	300 (W) × 350(D) × 835 (H)	Contact waste disposer.
	Refrigerant gas (R404A) in the refrigeration unit	Approx. 140g	_____	For disposing the gas R404A, contact waste disposer.
			_____	

Component	Specification	Total weight	Dimension (mm)	Disposal method
Main unit	UT-4000A	60kg	330 (W) × 470(D) × 835(H)	Contact waste disposer.
	Refrigerant gas (R404A) in the refrigeration unit	Approx.2 20g	_____	For disposing the gas R404A, contact waste disposer.
	Refrigerant gas (R23) in the refrigeration unit R23	Approx. 95g	_____	For disposing the gas R23, contact waste disposer.

Component	Specification	Total weight	Dimension (mm)	Disposal method
Main unit	UT-3000L	40kg	340 (W) × 370(D) × 835(H)	Contact waste disposer.
	Refrigerant gas (R404A) in the refrigeration unit	Approx. 370g	_____	For disposing the gas R404A, contact waste disposer.
			_____	

\* Please separate packing materials by separating each type of material.

1. When the machine does not work properly, please check and see whether it has malfunction or not by referring to pages of troubleshooting.
2. If that failure mode still remains, please contact your local dealer or customer service center mentioned on the manual.

## 5-4 How to set adjustment mode)

### 1. Calibrating displayed temperature

When the temperature measured by temperature gauge differs from the value on the indicator, this function calibrates the displayed temperature.

※Do not use this function out of its specified temperature.

※Wrong setting may cause a big difference between the displayed value and actual temperature, and also cause malfunction.

- (1) Press [Set] key for longer than 5 seconds.  
The mode moves to adjustment mode and indicator displays 「SnS」to display calibrated temperature.

- (2) Press [Set] key.  
Indicator changes to display calibrated temperature (blinking).

※First, displaying calibrated temperature (blinking) is the value that was input previous time.  
Factory default is 0°C.

- (3) Press [▲] and [▼] key to input calibrating temperature.  
Each time you press [▲] and [▼] key, the temperature increases / decreases by 5 °C. If you hold down the key, the value increases continuously.

- (4) Press [Set] key.  
Displayed calibrating temperature (blinking) is fixed and indicator displays 「PoFF」to change to power recovery setting.

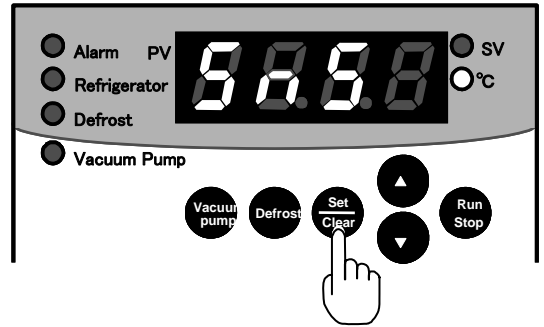
※Calibrated temperature will not be available until you press [Set] key.

※To change other setting items, press [▲] or [▼] key to select the item.

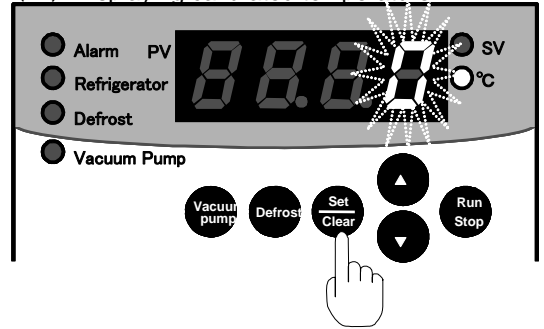
※If you do not need to change the item, press [Set] key for longer than 5 seconds.  
Indicator changes to show "Measured temperature".

※If no key operation will be done for longer than a minute, indicator will show measured temperature.

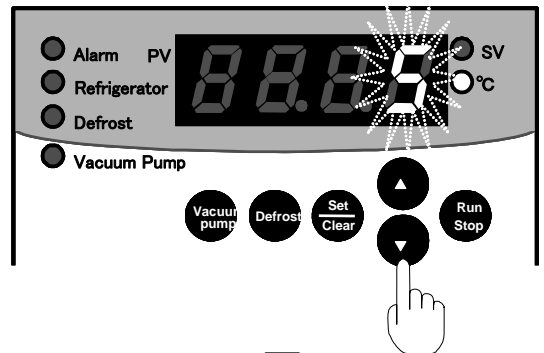
(1) Moves to adjustment mode



(2) Displaying calibrated temperature



(3) Inputting calibrated temperature



(4) Determining calibrated temperature  
Moves to upper temperature limit alarm

