

**EYELA**Rotary  
Vacuum**Evaporator****Instruction Manual****N-1300 Series**

This instruction manual is designed to use the product safely while keeping its best performance.

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

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

Thank you very much for purchasing

**EYELA** product.

## Foreword

This instruction manual explains procedures for installation, operation, troubleshooting, maintenance and inspection, and disposal of the following Rotary Vacuum Evaporators: N-1300

Be sure to carefully read this manual and understand its description before using this product.

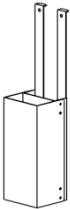


When using this product, also refer to the instruction manual of a water bath (SB type/OSB type) used with it.

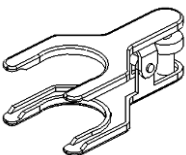
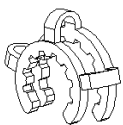

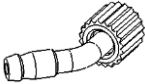

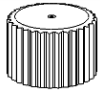
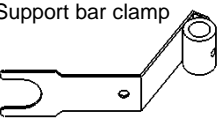

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## Package Contents

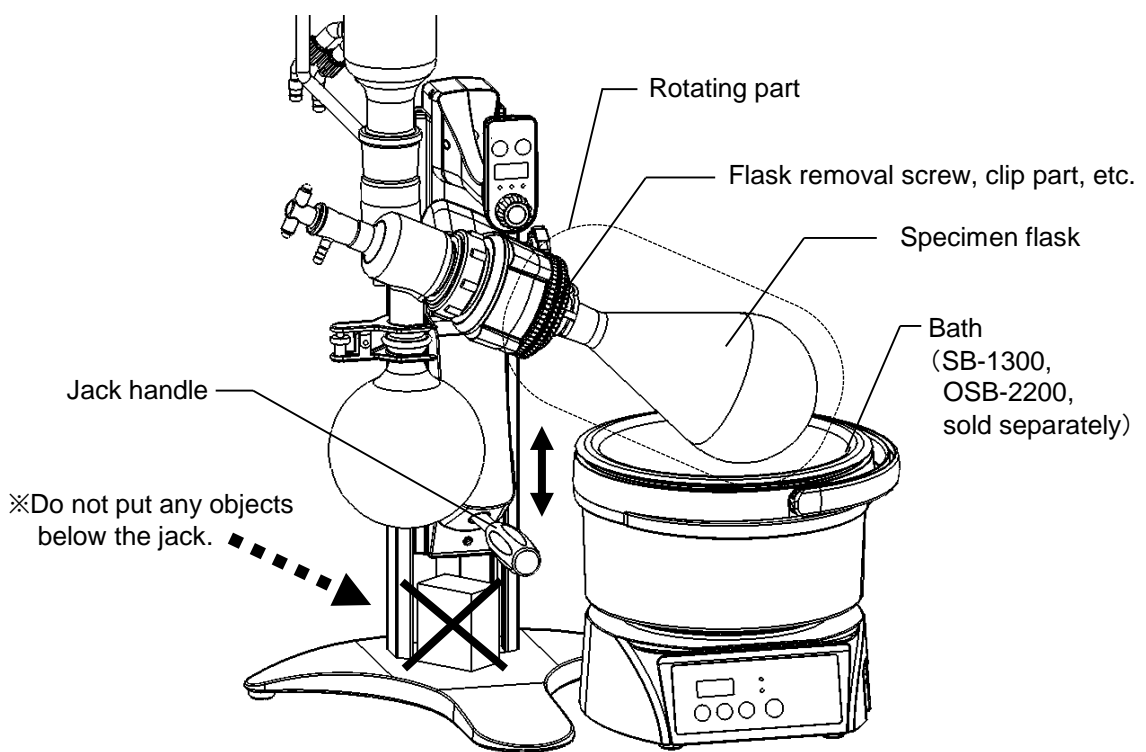
Be sure to check the types and quantity of parts before installing them.

Package 1 (Main unit)		N-1300		Vacuum seal		Power unit holder
1	Main unit	1		Sub seal	Main seal	
2	AC adopter	1				
3	Power cord	1				
4	Power unit holder	1				
5	Vacuum seal	1				
6	Instruction manual	1				

Package 2 (Glass set)		S type	V type	E type	Ball joint clamp	Eyela clip	Rotary joint ring
1	Cooler	1	1	1			
2	Specimen flask (1000ml)	1	1	1			
3	Receiver flask(1000ml)	1	1	1			
4	Rotary joint	1	1	1			
5	Capillary	1	1	1			
6	Ball joint clamp	1	1	1			
7	Eyela clip	1	1	1			
8	Rotary joint ring	1	1	1			
9	Adaptor	-	1	-			
10	Vacuum nozzle set (white)	1 set	1 set	1 set			
11	Coolant nozzle set (gray)	2 sets	2 sets	2 sets			
12	Screw plug	-	1	1			
13	Cooler clamp	-	1	1			
14	Cooler support bar	-	1	1			
15	Support bar clamp	-	1	1			
16	Set screw	-	3	3			

# 1 For safe operation

 <b>Caution</b>	<b>Do not touch the rotation parts while the flask is rotating</b> Do not touch the clip or the specimen flask while the flask is rotating. Your finger may be caught between the lips or the irregularly shaped parts on the flask removal screw to cause an injury.
 <b>Caution</b>	<b>Be cautions, high liquid temperatures bring the risk of burns</b> Do not touch the specimen flask or the bath when you use the product at a high liquid temperature. Also take care for the rotation speed of the flask for possible splashing and burning depending on the rotation speed.
 <b>Caution</b>	<b>Check the up/down movement range of the jack</b> If you touch the bath while performing up/down operation of the jack using the jack handle, you might be burn yourself. Carefully select the installation site of the jack. While lowering the jack, the flask may strike against the bath bottom and glass may break or the unit may fall down depending on the inclination angle of the specimen or the size of the flask used. Lower the flask down slowly and gently while watching how deep it is soaked and fix at the correct position.
 <b>Caution</b>	<b>Do not put any objects below the jack</b> If any objects is caught or placed between the bottom of the jack and the top surface of the stand base, a malfunction of the unit may occur or the unit may fall down and cause a personal injury.
 <b>Caution</b>	<b>Use the thicker type of Rotary Joint for large sample flasks</b> Use the thicker type of Rotary Joint when 2L or 3L Sample Flask is used. Otherwise there may be a possibility that the rotary joint is damaged that may cause some injury.



## 2 Product Outline

### 2-1 Application



#### Warning

**Never attempt to modify the product.  
Operate the unit for the specified purpose only.**

An electric shock or a malfunction may result if the product is modified or used for any purposes other than that specified.



#### Caution

**Take care for conditions and handling of glass parts**

Broken or flowed glass parts may result in accidents. Inspect for damages or flows on glass parts and take care when handling them.

This product is a rotary evaporator that is used for condensation, purification, and fractional distillation of solutions under reduced pressure.

※ This product is not explosion-proof. Never use the product for heating solvents under normal pressure or for chemical reaction.

### 2-2 Specifications

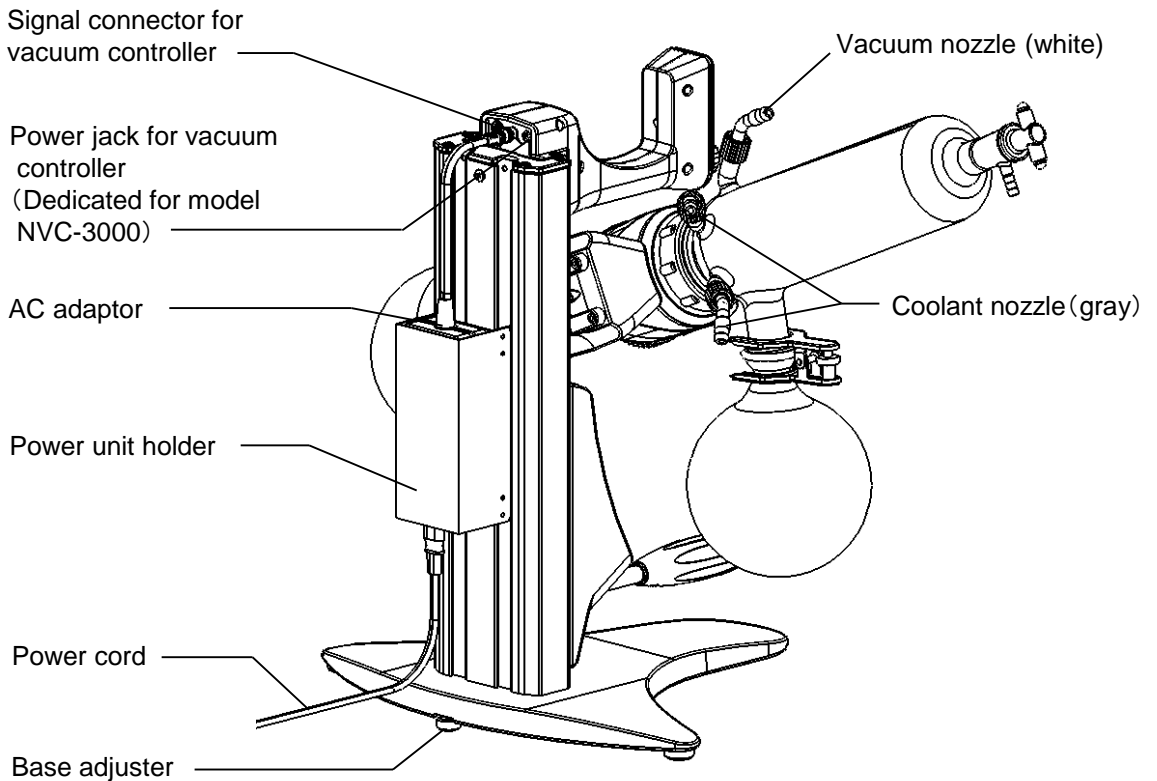
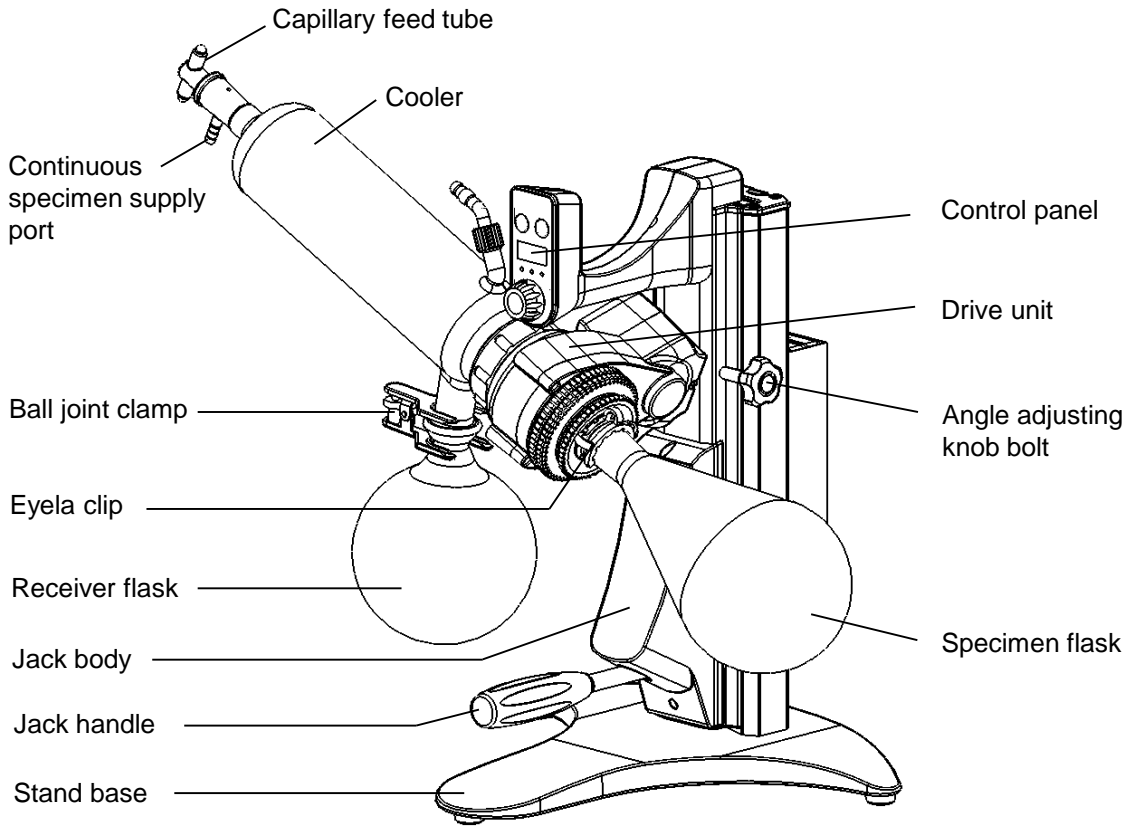
Product name		Rotary evaporator		
Type (Glass set)		N-1300S	N-1300V	N-1300E
Performance	Rev. speed range	10~310rpm		
	Evaporation capacity	Max.23mL/min (JIS 1L flask, evaporating amount of water)		
	Attainable vacuum level	399.9Pa (3mmHg) or less		
Functions	Rev. setting and display	Dial key setting and digital display		
	Safety function	Motor overload protection circuit		
	Jack function	Manual weight balance type		
Composition	Rotation motor	DC brushless motor		
	Cooler	Horizontal dual corrugated tube Cooling area:0.146m <sup>2</sup>	Horizontal dual corrugated tube Cooling area:0.146m <sup>2</sup>	Adaptor integrated vertical type dual snake pipe Cooling area:0.117m <sup>2</sup>
	Specimen flask	Pear shaped flask: 1L TS29/38		
	Receiver flask	Round flask:1L ball edger S35/20		
	Vacuum seal	Teflon + Teflon · Viton dual seal		
Standard	Connection port dia.	Nozzle O.D.: 10mm		
	Stand base	Round base 380W×342D (mm)		
	Jack stroke	180mm		
Operating environmental temperature range		5~35℃		
External dimensions (Highest position) (mm)		672W×342D ×504(684)H	479W×342D ×823(1003)H	514W×342D ×645(825)H
Mass		8.2kg	8.9kg	8.8kg
Power input		1.1A、110VA		
Rated power supply		AC100V~240V 50/60Hz		

※ Performance results have been measured at room temperature of 20℃, rated source voltage.

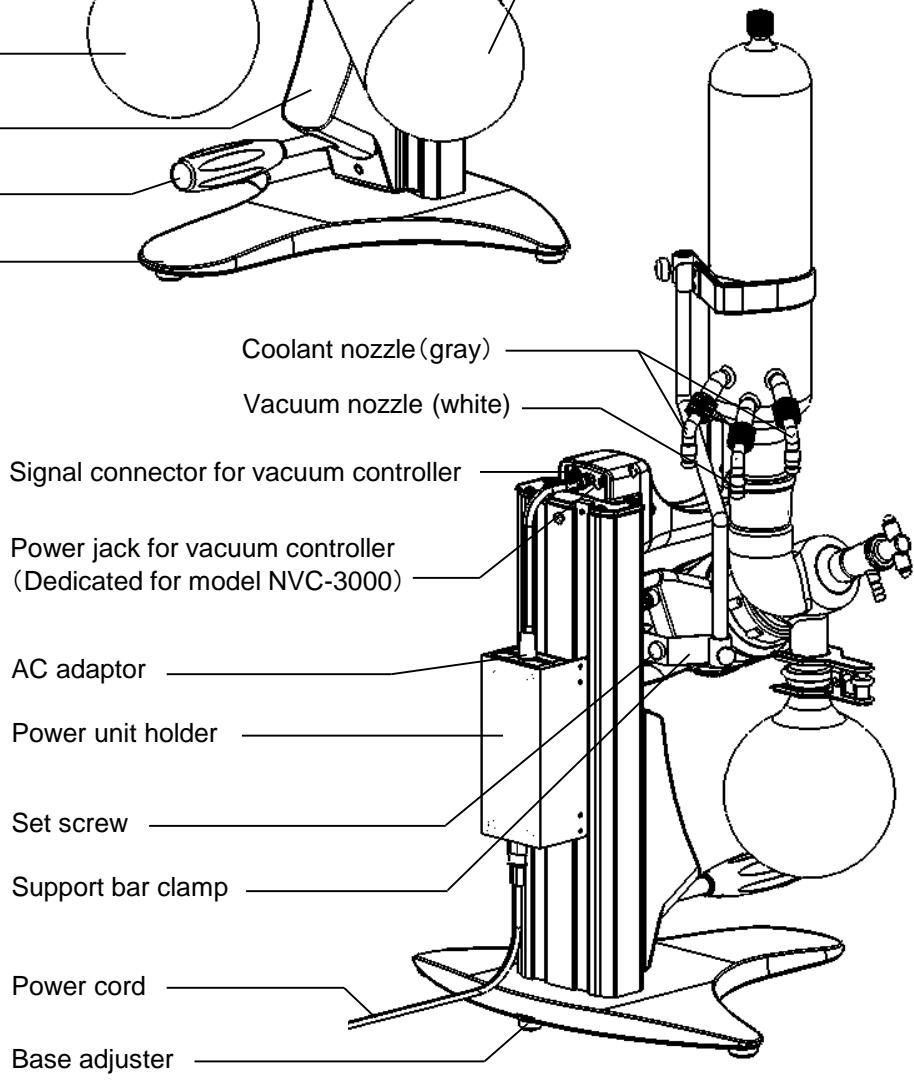
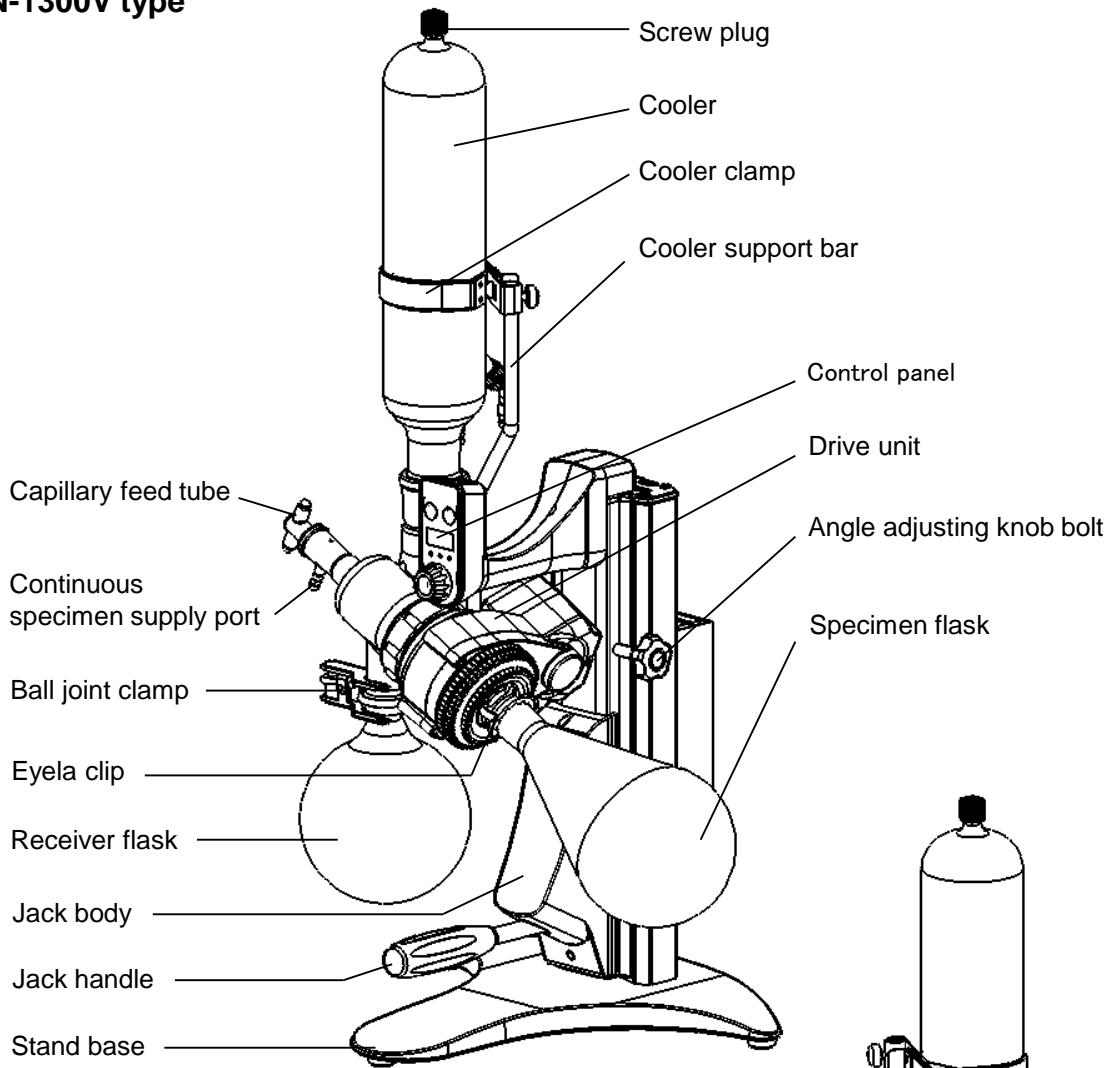
※ Evaporating capacity differs depending on the decompression, bath temperature, coolant temperature or other conditions.

## 2-3 Names of parts

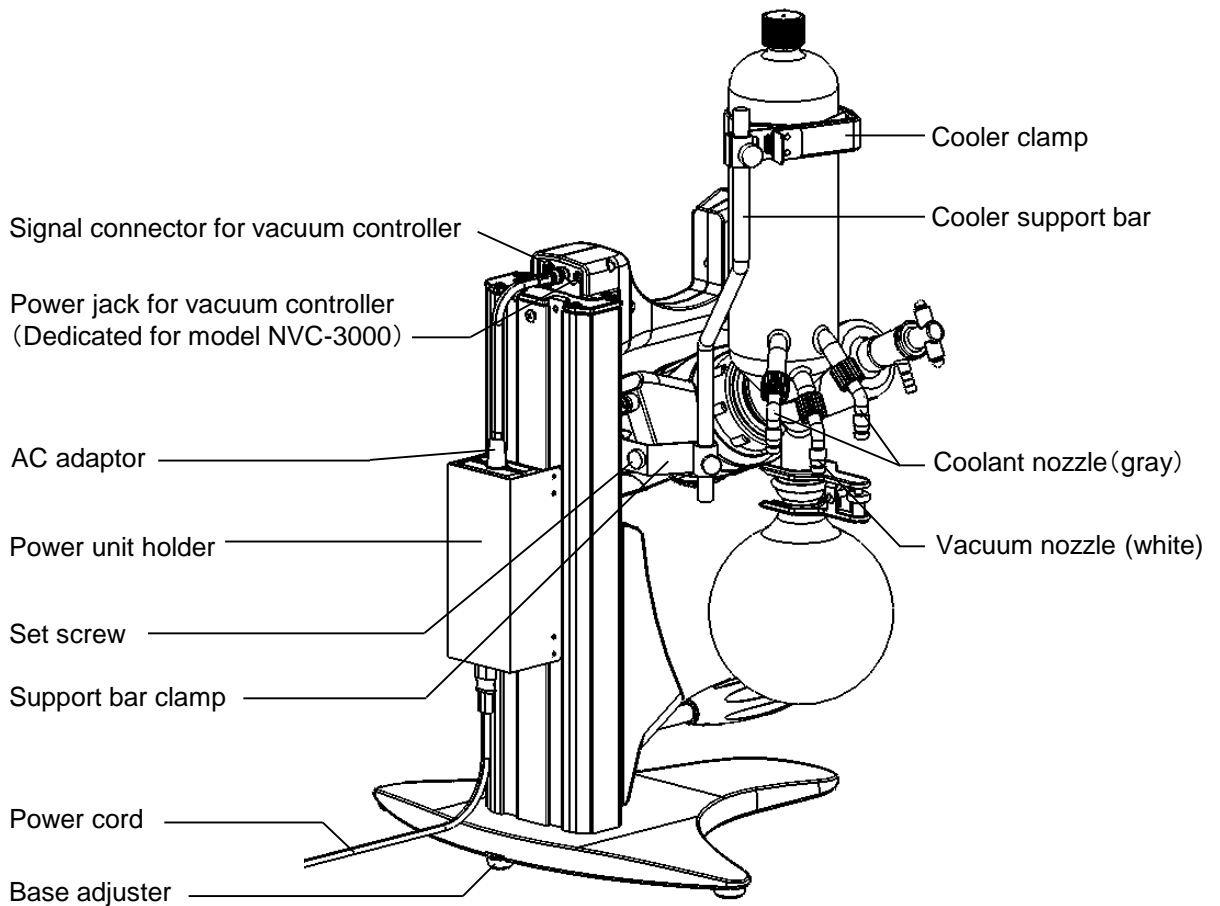
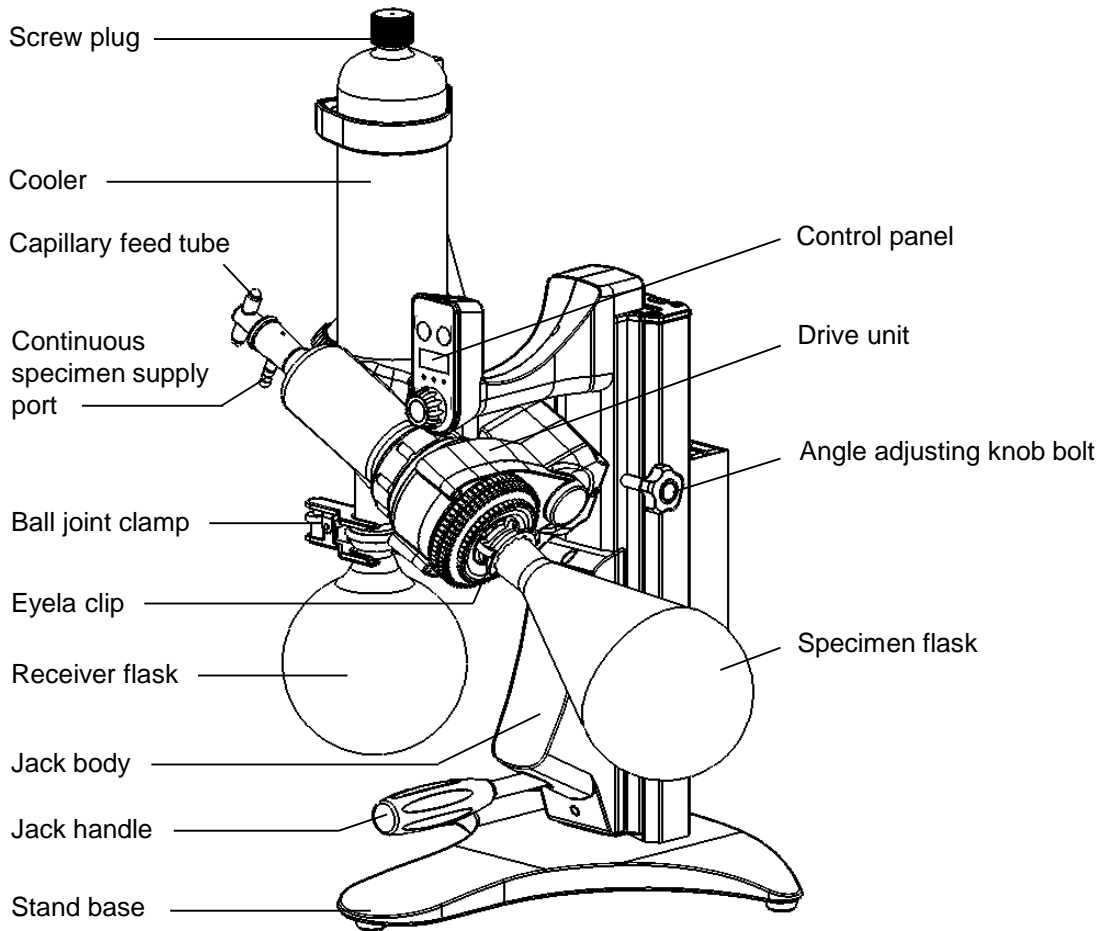
### N-1300S type



**N-1300V type**

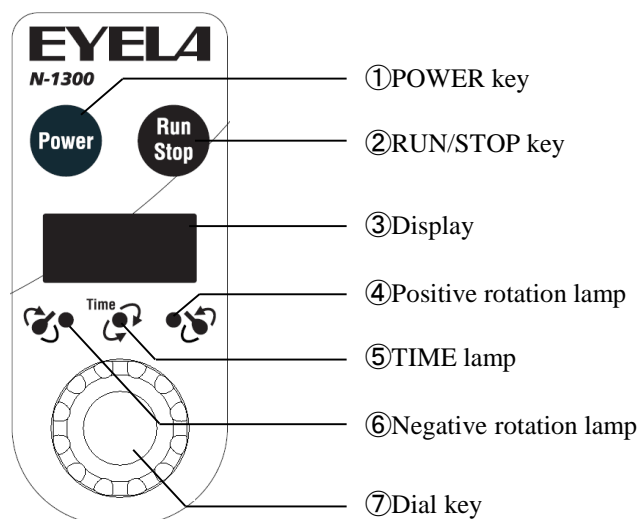


## N-1300E type



# 3 Names and functions of control assembly

## 3-1 Control panel



No	Name	Functions
①	POWER key	Pressing this key illuminates the display.
②	RUN/STOP key	Pressing this button once starts rotation and pressing again stops rotation.
③	Display	Displays the rotation speed. Displays an alarm during a malfunction.
④	Positive rotation lamp	Illuminates while the specimen flask is in the positive rotation mode or is rotating in the positive direction. *Setting on factory shipping
⑤	TIME lamp	Illuminates during the positive rotation/negative rotation timer mode.
⑥	Negative rotation lamp	Illuminates while the specimen flask is in the negative rotation mode or is rotating in the positive direction.
⑦	Dial key	Pressing this key flashes the display and you can turn the knob to make various settings. Keeping this key pressed longer allows you to switch among positive rotation/negative rotation/timer mode.

## 3-2 Alarm functions

The product has the following safety functions.

If you encounter with an abnormality, take appropriate measures referring to P.20

“Possible causes of troubles and solutions”.

Name	Display	Causes	Operation
Abnormal rotation alarm ※1		<ul style="list-style-type: none"> <li>Measured number of rotation has not reached or is considerable below the setting.</li> <li>The motor or the control assembly is malfunctioning.</li> </ul>	<ul style="list-style-type: none"> <li>[A19] flashes</li> <li>Control stops</li> </ul>
Power outage recovery alarm (When the power outage recovery function is OFF)	 ↓↑Displayed alternately 	<ul style="list-style-type: none"> <li>The power was shut off during rotation due to power outage and then turned on again.</li> </ul>	<ul style="list-style-type: none"> <li>[PoF]⇔[0] is displayed alternately</li> <li>Rotation stops</li> </ul>
Power outage recovery alarm (When the power outage recovery function is ON)	 ↓↑Displayed alternately 	<ul style="list-style-type: none"> <li>You can set whether rotation will stop or resume automatically when power is recovered by setting ON/OFF for the power outage recovery function.</li> </ul>	<ul style="list-style-type: none"> <li>[Pon]⇔[Number of measured rotations] is displayed alternately</li> <li>Rotation continues</li> </ul>

※1. Please do not run empty, because rotating without placing the glass set can result into defective rotation.



# 4 Installation

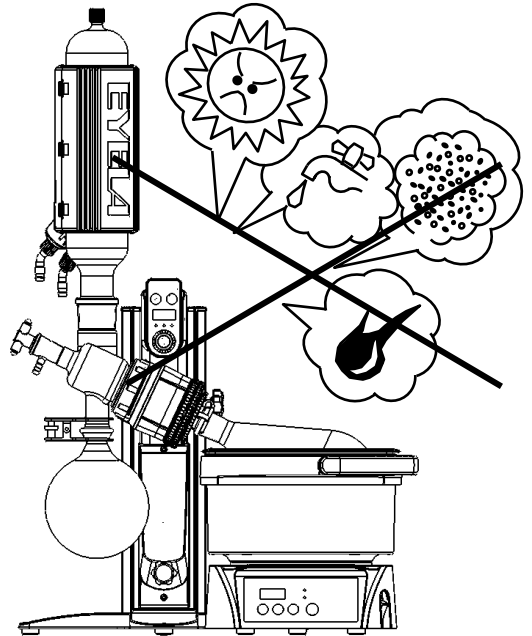
## 4-1 Installation environment



### Warning

**Never install the product in a potentially hazardous atmosphere.**

The product is not explosion-proof. Use in a potentially hazardous atmosphere may cause a fire or other accidents.



**Select a place that meets the conditions below for installing this product:**

- Place free of flammable gas, liquid, or solid materials in the vicinity of the product.
- Place where the ambient temperature can be kept within a range of 5~35°C.
- Place free from condensation
- Place with less humidity and free from splashing water
- Place with minimum dust
- Place free from direct sunshine
- Place where airy or well-ventilated
- Level, stable, and firm place

## 4-2 Connecting utilities



### Warning

**Confirm the voltage, phase, capacity, and the type of receptacle of power supply.**

Wrong connection of power supply may cause fire or electric shock

- (1) Check the product type as well as the voltage, phase, and capacity of power supply to be connected. Power supply to be connected to the product is as shown in the right.

- (2) Check the receptacle of installation place.

- ※ Do not connect the power plug yet ※First make sure that the sheath of the power cord is not damaged. Otherwise, an electric shock may result.
- ※ Use the supplied power cord only. A fire or an electric shock may result from insufficient capacity.

Power cord specification

Name	Cord No	Cable		Section area of electric wire(AWG)	Areas supported
		Length	O.D.		
115V Power code A type	267699	Approx.2.0m	Approx.5.8mm	0.8mm <sup>2</sup> (AWG18)	North America
220V Power code O type	267698	Approx.1.8m	Approx.5.7mm	0.75mm <sup>2</sup> (AWG18)	China
220~240V Power code B type	267695	Approx.2.0m	Approx.5.6mm	0.75mm <sup>2</sup> (AWG18)	U.K., India
220~240V Power code C type	267697	Approx.2.0m	Approx.5.6mm	0.75mm <sup>2</sup> (AWG18)	Europe



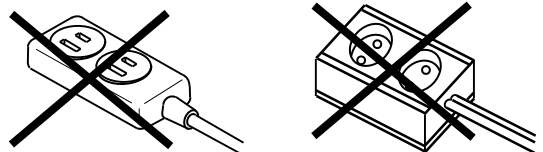
### Warning

**Do not use the branching socket or table tap.**

Burn-out of the cable or a fire may result from over current.

Power supply to connect	
Voltage	Capacity
AC115~240V	15A

- ※Never use a branching socket or a table tap for connecting to the power supply.



# 5 Operation

## 5-1 Preparation for operation

### Caution

#### Be careful for jumping of the jack.

This jack is always under a lifting force.  
When you release lock, be sure to operate by putting your hand on the jack.

### Caution

#### Be care for handling of glass parts.

Glass parts are easily damaged and take care for their handling to prevent a personal injury.

### 1. Raising the jack

The jack is spring-operated.  
The spring has been adjusted so that its vertical weight is balanced only when a glass parts is installed.

When releasing the lock while any glass parts are not installed, hold the control case assembly by hand to avoid it from popping up from a strong lifting force.

(1) While pressing the control case assembly downward, grasp the jack handle and turn it anti-clockwise to release the lock.

※ Lock releasing operation is step-less. Slightly loosening the lock will release it with a brake still applied and loosening it further will free the lock. You can only use a light force to tighten to apply the brake to engage the lock.

(2) Raise the jack, turn the jack handle clockwise to engage the lock.

### 2. Adjusting the base adjuster

Use the base adjuster behind the stand base to adjust level of the unit.  
Turning the base adjuster anti-clockwise will lower the adjuster. Lower the adjuster until it comes into contact with the stand.

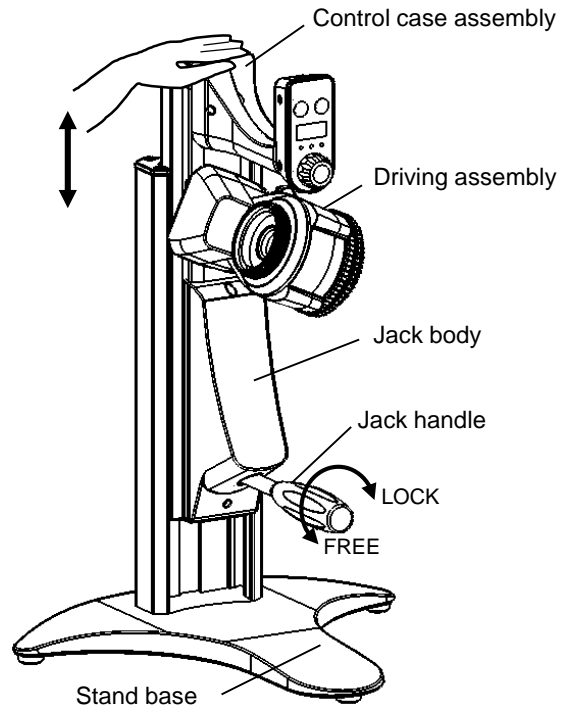
#### Reverse side specification

When using the unit in the reverse side specification ( the specimen flask is at the left ) , follow the procedures in 6.Changing to the reverse side specification on P.13.

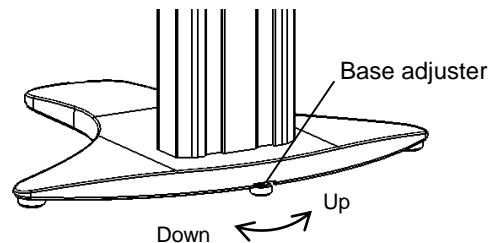
### Caution

#### Be sure to raise the jack before setting glass parts.

First raise the jack before setting glass parts. If the jack is raised during setting work, a personal injury may result.



※Because the upward force is stronger, hold the control case assembly or the top of the driving assembly by hand when releasing the lock and raise or lower by adjusting the holding force of the hand.



### 3. Installing the rotary joint

(1) Turn the lock sleeve (light blue) anti-clockwise by around a half turn while holding the lock housing (black).  
The sleeve ring spring inside will widen.

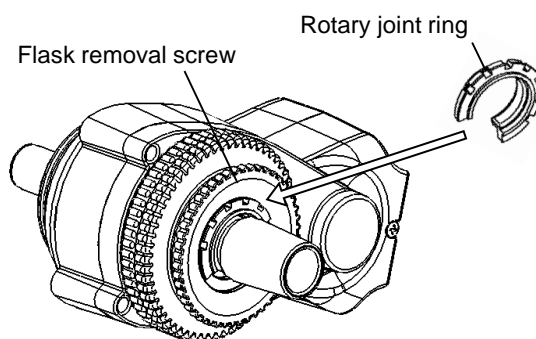
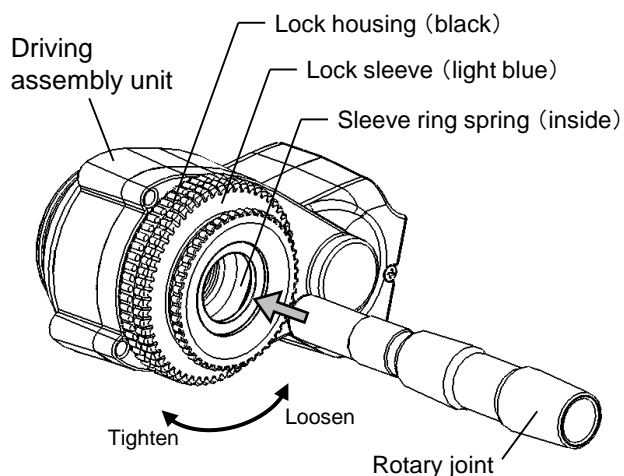
(2) While holding the lock housing (black), securely insert the rotary joint into the driving assembly and turn the lock sleeve (light blue) clockwise to tighten securely.  
The internal sleeve ring spring will tighten.

※ If the rotary joint is not inserted and fixed securely, improper rotation, fall-off the specimen flask or vacuum leak may result.

(3) Put the rotary joint ring over the joint ring and fix it inside the flask removal screw.

(4) To remove the rotary joint, turn the flask removal screw anti-clockwise to the point where it will not come off the lock sleeve (light blue) and pull out the rotary joint while turning the lock sleeve (light blue) anti-clockwise.

※ When 2L or 3L size of the sample flask is used, use the thicker type of Rotary Joint ( Option ) should be used.



### 4. Installing the vacuum seal

Wrong orders or direction in installation of the main seal or the sub seal will degrade vacuum level or accelerate wear of the seal.

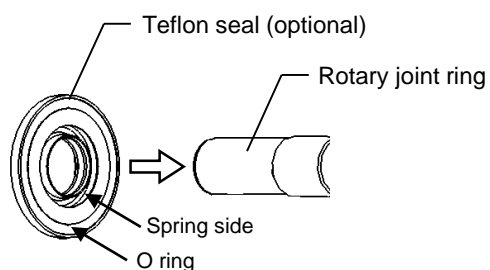
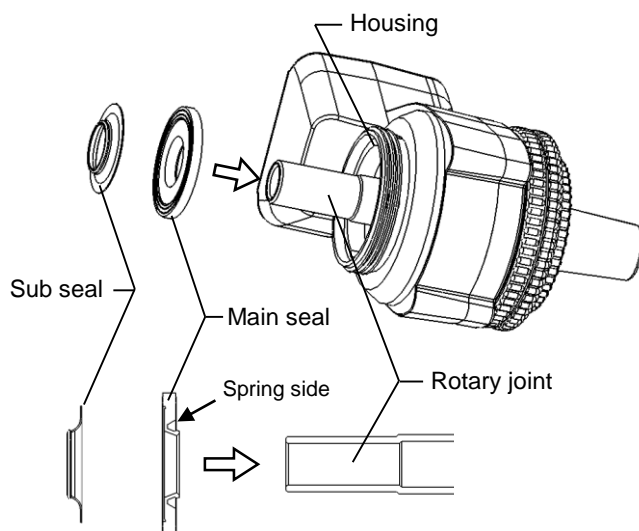
(1) Insert the main seal with its side with the spring visible at the body side through the rotary joint into the housing.

(2) Put the sub seal over the rotary joint and insert into the housing taking not to make the seal surface peel.

- ※ Be sure to install the rotary joint before installing the vacuum seal.
- ※ Take care for the direction of the seal.
- ※ During washing, take care not to damage the seal lip and allow it to dry completely after washing.
- ※ When you use the vacuum seal for the first time, it might produce a screeching sound at the contact with the rotary joint, in which case lightly apply water or vacuum grease at the contact surface.
- ※ The vacuum seal is a consumable part.

#### ● Teflon seal (optional)

It is a Teflon vacuum seal for organic solvents. Unlike ordinary vacuum seals, it does not require any sub seal. Its material is hard and you need to insert slowly in the direction shown without applying excessive force.



## 5. Installing the cooler and a flask

For a vertical cooler (V and E models), carry out “7. Installing a support bar clamp” on P.13 before starting the procedures below.

### For an S type glass set



**Caution**

#### Take care for conditions and handling of glass parts

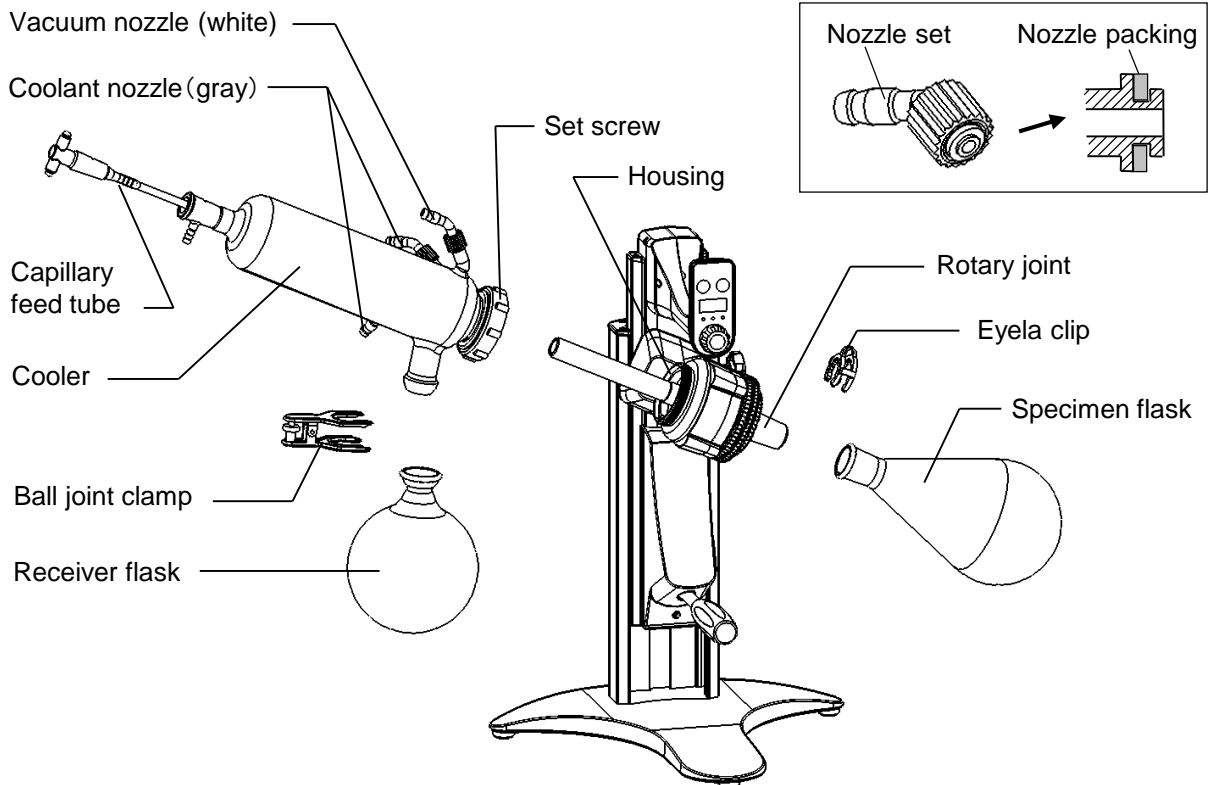
Broken or flawed glass parts may result in accidents. Inspect for damages or flaws on glass parts and take care when handling them.



**Caution**

#### Be sure to raise the jack before setting glass parts.

First raise the jack before setting glass parts. If the jack is raised during setting work, a personal injury may result.



(1) Allow the cooler to tightly contact against the vacuum seal in the housing and then tighten with the cap screw.

When you have tighten to some extent, re-tighten both the cap screw and the cooler at the same time and position the receiver flask so that its fixing opening faces downward.

(2) Fix the receiver flask to the cooler with the ball joint clamp.

(3) Fix the specimen flask to the rotary joint with the Eyela clip.

(4) Gently insert the capillary into the cooler.

(5) Install two coolant nozzles (gray) and a vacuum nozzle (white) to the cooler.

Make sure that the nozzle packing sits in the groove before installation.

(6) Follow the procedures above in the reversed order to remove.

## For an V type glass set



### Caution

#### Take care for conditions and handling of glass parts

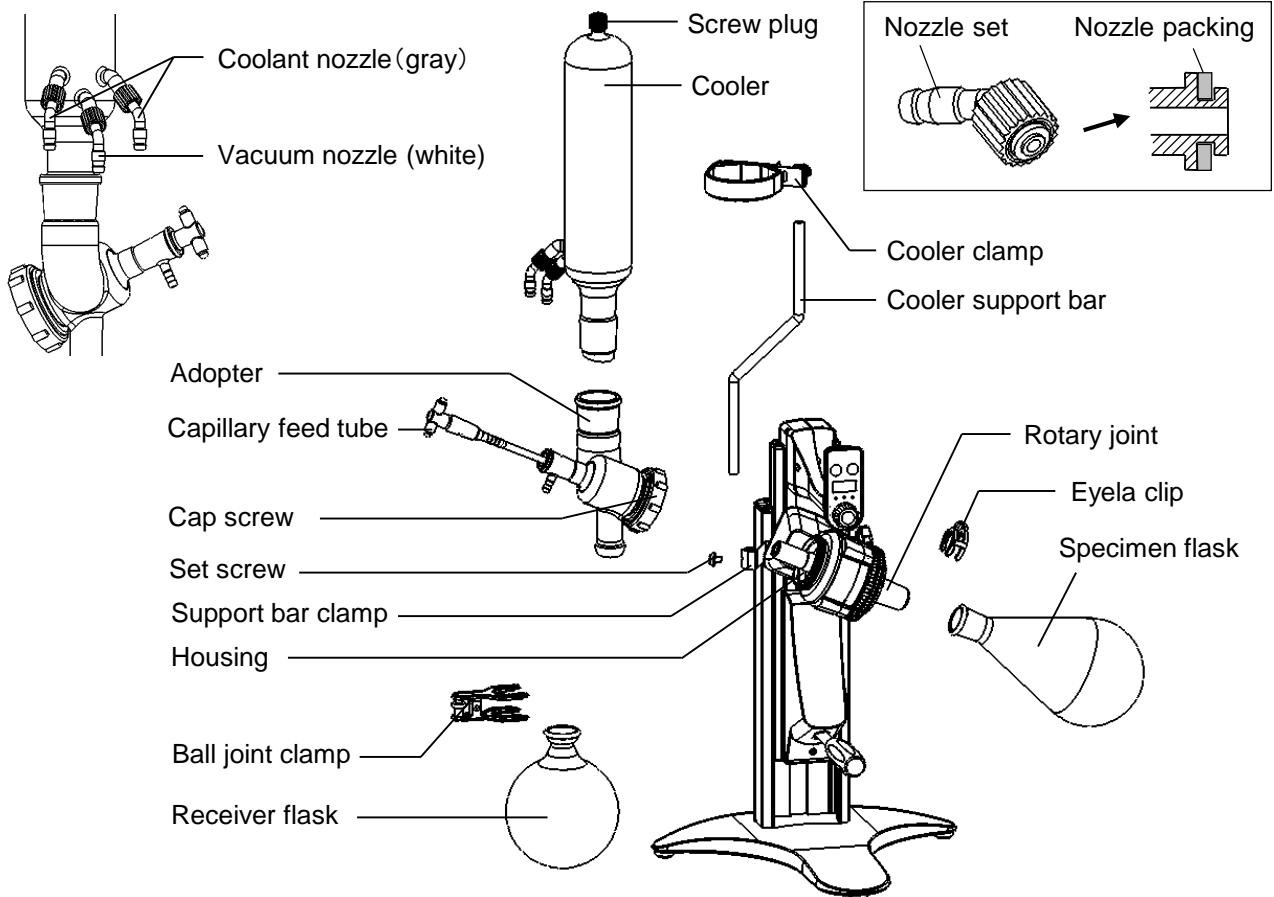
Broken or flawed glass parts may result in accidents. Inspect for damages or flows on glass parts and take care when handling them.



### Caution

#### Be sure to raise the jack before setting glass parts.

First raise the jack before setting glass parts. If the jack is raised during setting work, a personal injury may result.



- (1) Tentatively fix the cooler support bar in the hole of the support bar clamp with the set screw. (Adjust the position after setting a glass part.)
- (2) Allow the adaptor to tightly contact against the vacuum seal in the housing and then tighten with the cap screw.  
When you have tightened to some extent, re-tighten both the cap screw and the adaptor at the same time and position the receiver flask so that its fixing opening faces downward.
- (3) Install the cooler to the adaptor.
- (4) Install the cooler clamp.  
Adjust the cooler support bar and the cooler positions and fix with the set screw.
- (5) Fix the receiver flask to the cooler with the ball joint clamp.
- (6) Fix the specimen flask to the rotary joint with the Eyela clip.
- (7) Gently insert the capillary into the adaptor
- (8) Install two coolant nozzles (gray), a vacuum nozzle (white) and screw plug to the cooler.  
Make sure that the nozzle packing sits in the groove before installation.
- (9) Follow the procedures above in the reversed order to remove.

## For an E type glass set



### Caution

#### Take care for conditions and handling of glass parts

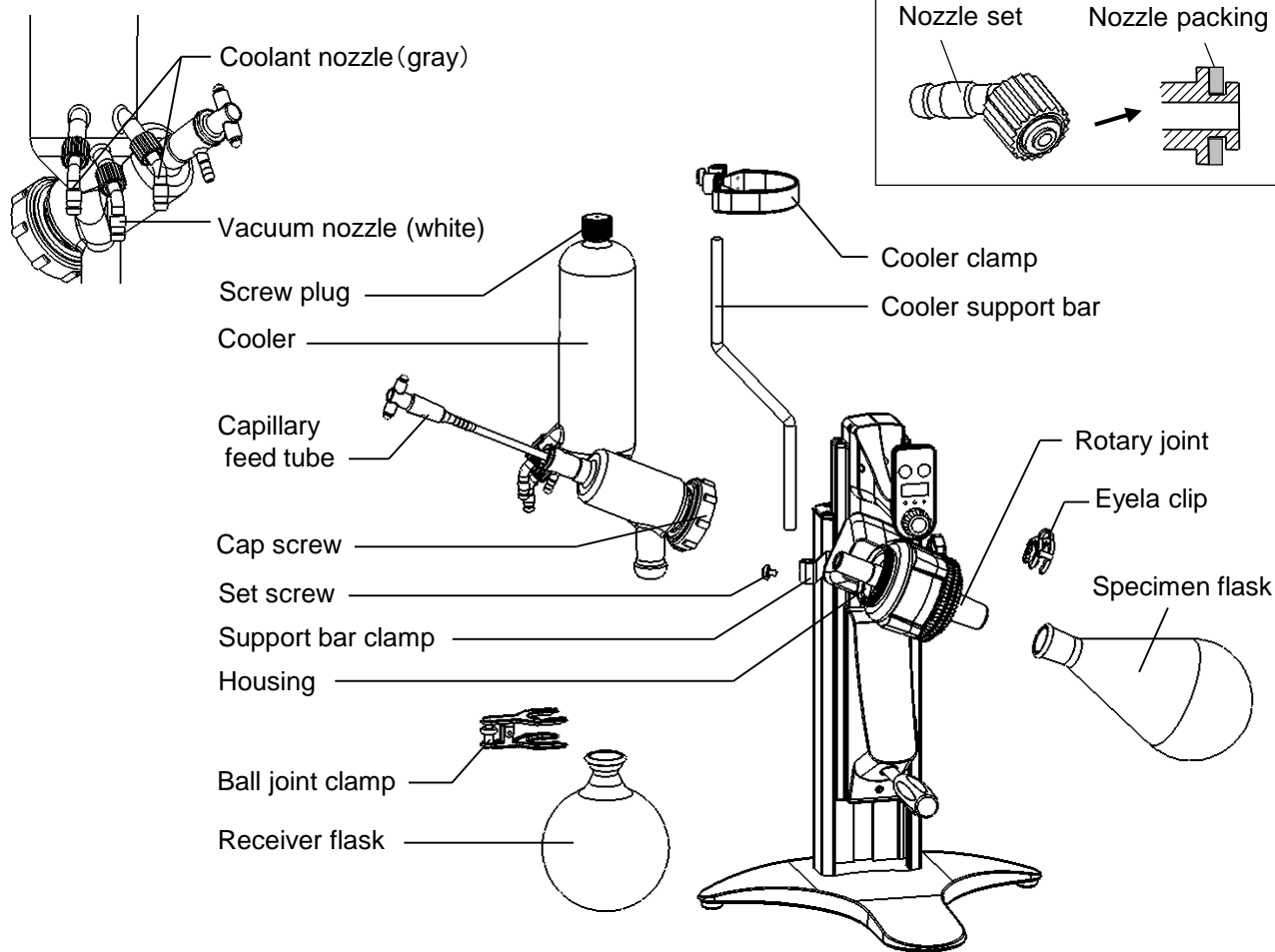
Broken or flowed glass parts may result in accidents. Inspect for damages or flows on glass parts and take care when handling them.



### Caution

#### Be sure to raise the jack before setting glass parts.

First raise the jack before setting glass parts. If the jack is raised during setting work, a personal injury may result.



- (1) Tentatively fix the cooler support bar in the hole of the support bar clamp with the set screw. (Adjust the position after setting a glass part.)
- (2) Allow the adapter to tightly contact against the vacuum seal in the housing and then tighten with the cap screw.  
When you have tightened to some extent, re-tighten both the cap screw and the adapter at the same time and position the receiver flask so that its fixing opening faces downward.
- (3) Install the cooler clamp.  
Adjust the cooler support bar and the cooler positions and fix with the set screw.
- (4) Fix the receiver flask to the cooler with the ball joint clamp.
- (5) Fix the specimen flask to the rotary joint with the Eyela clip.
- (6) Gently insert the capillary into the adapter
- (7) Install two coolant nozzles (gray), a vacuum nozzle (white) and screw plug to the cooler.  
Make sure that the nozzle packing sits in the groove before installation.
- (8) Follow the procedures above in the reversed order to remove.

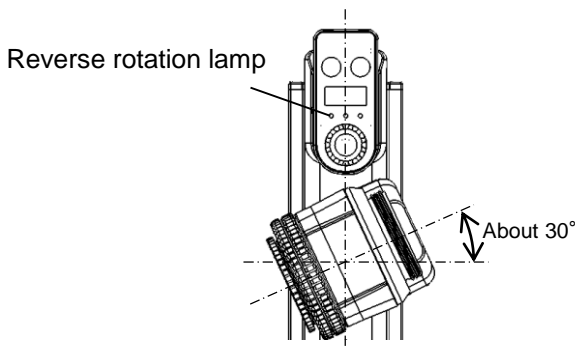
## 6. Switching to the reverse direction specification

### Caution

#### **Raise the jack before switching to the reverse direction.**

Raise the jack before switching.  
If the jack is raised accidentally during setting, a personal injury may result.

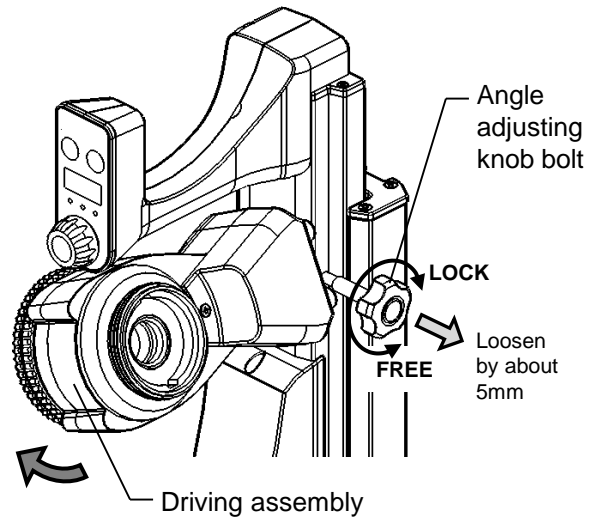
- (1) Raise the jack body.
  - (2) Loosen the angle adjusting knob bolt by about 5mm.
  - (3) Turn the driving assembly clockwise until it is slanted by about 30° and securely tighten the angle adjusting knob.
- ※ Also switch the rotation direction of the specimen flask to the reverse rotation. (See “1. Rotation mode, setting the power outage recovery mode” on P.17.)



### Caution

#### **Switching to the reverse direction shall be made before setting a glass part.**

Switch to the reverse direction before setting a glass part. Glass part installed may be broken and cause a personal injury.



## 7. Installing the support bar clamp

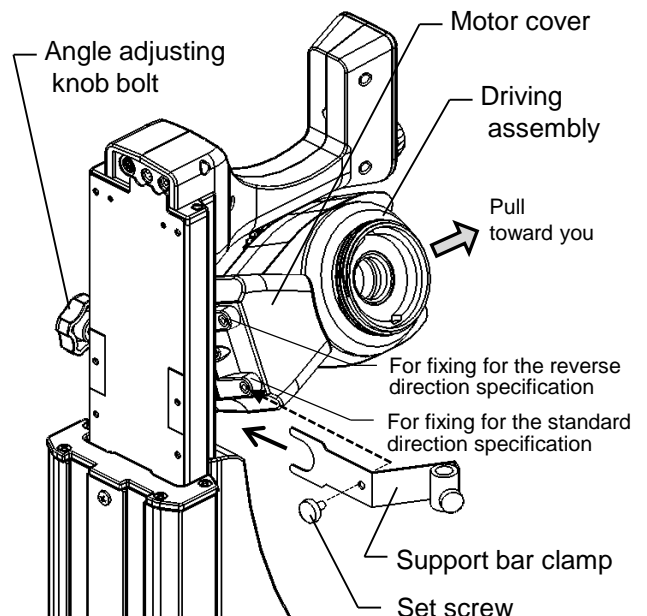
### Caution

#### **Raise the jack before setting the support bar clamp.**

First raise the jack before setting the support bar clamp. If the jack is raised accidentally during setting, a personal injury may result.

- (1) Raise the jack body.
- (2) Loosen the angle adjusting knob bolt, pull out the driving assembly and insert the support bar clamp between the ring of the connecting rod of the driving assembly and the jack.
- (3) Install the support bar clamp into the motor cover fixing screw hole with the set screw.
- (4) Securely tighten the angle adjusting knob bolt.

- ※ For the reverse direction specification, change the driving assembly in the reversed direction before installation.



## 8. Adjusting the angle of the drive body

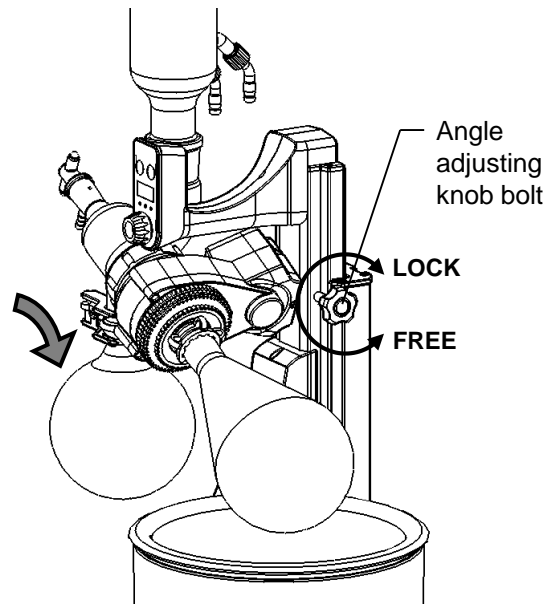


### Caution

#### Adjust the angle of the drive body while holding the cooler with hand.

When you loosen the angle adjusting knob bolt, the drive may suddenly incline from the weight of the cooler or specimen and fall down and you might be injured with broken glass.

- (1) Lift the jack body.
- (2) Loosen the angle adjusting knob bolt to adjust the angle while supporting the cooler with a hand.
- (3) Check the vertical position of the jack and its position relative to the bath and then securely tighten the angle adjusting knob bolt.



## 9-1. Connecting the vacuum hose and the coolant hose

- ※ Connecting hose is not included. Prepare a correct size after confirming the I.D. of the connecting port.
- ※ Take care not to apply excessive force when connecting. The connecting part is made of glass and resin, which might break if excessive force is applied.

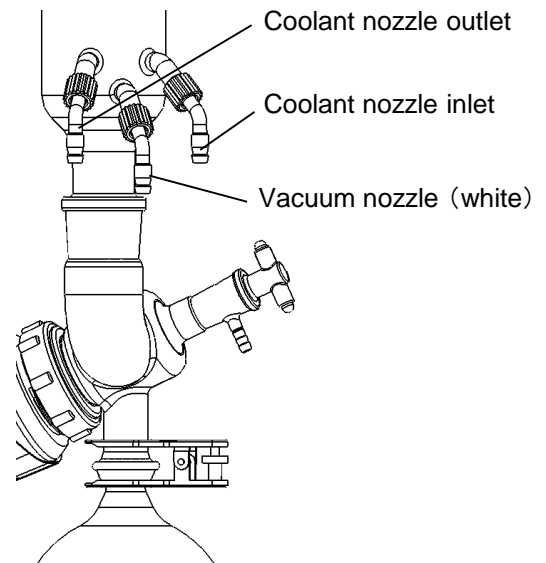
- (1) Connect the vacuum nozzle and the suction port of your decompressing unit using a vacuum hose.

- ※ When connecting the vacuum hose, take care not to intermix the suction port and the exhaust port of the decompressing unit. If the hose is connected in the wrong direction, the unit will be compressed and cause a malfunction.

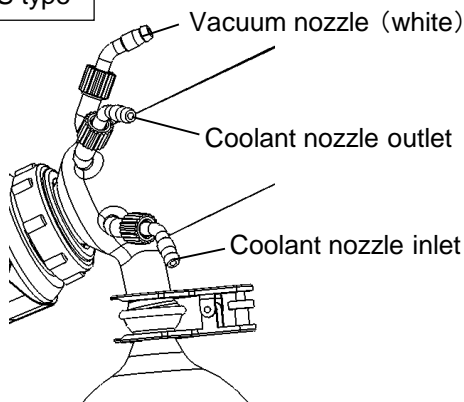
- (2) Connect the cooler coolant nozzle and the circulation port of you coolant circulation unit using a connecting hose through the hose holder.

- ※ Allow the coolant to circulated from the outside of the corrugated tube.

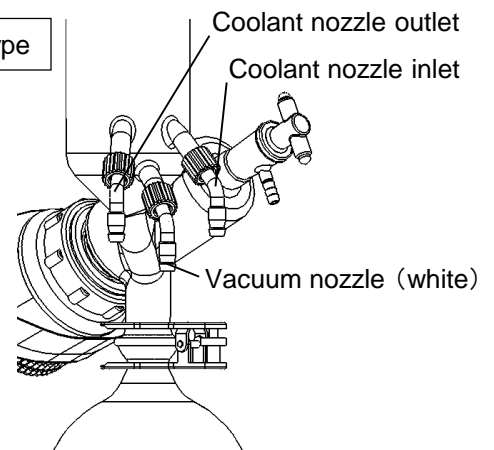
For V type



For S type



For E type





## 9-2.Connecting the fingertip cooling hose (optional)

You can connect/disconnect the hose using the optional fingertip connector.

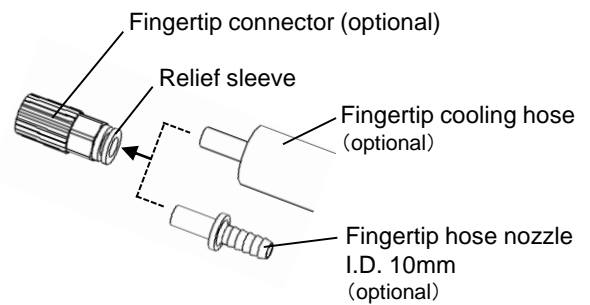
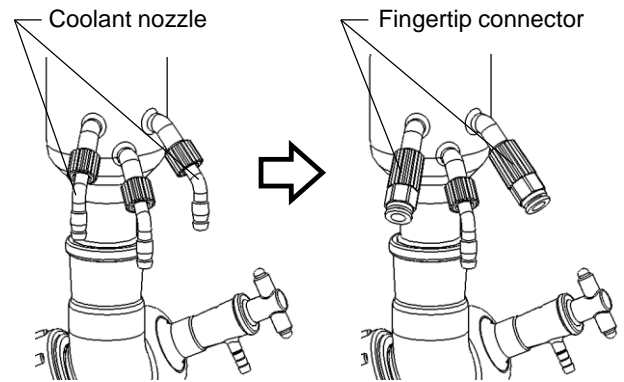
- ※ The connecting hose is not included. Prepare a correct size after confirming the I.D. of the connecting port.
- ※ Take care not to apply excessive force when connecting. The connecting part is made of glass and resin, which might break if excessive force is applied.

(1) Install two standard coolant nozzles (gray) to the fingertip connector.

Remove the coolant nozzle, make sure that the internal packing for the fingertip connector has been set and install to the cooler.

(2) Insert the fingertip cooling hose into the inlet/outlet of coolant directly. Or insert the fingertip hose nozzle to which the connecting hose is installed.

(3) When removing the fingertip connector, pull out the fingertip cooling hose or the fingertip hose nozzle while pressing the relief sleeve with a finger.



## 10. Installing the AC adaptor and connecting the power supply cord

(1) Insert the power unit holder into the groove in the back of the stand base pillar from above.

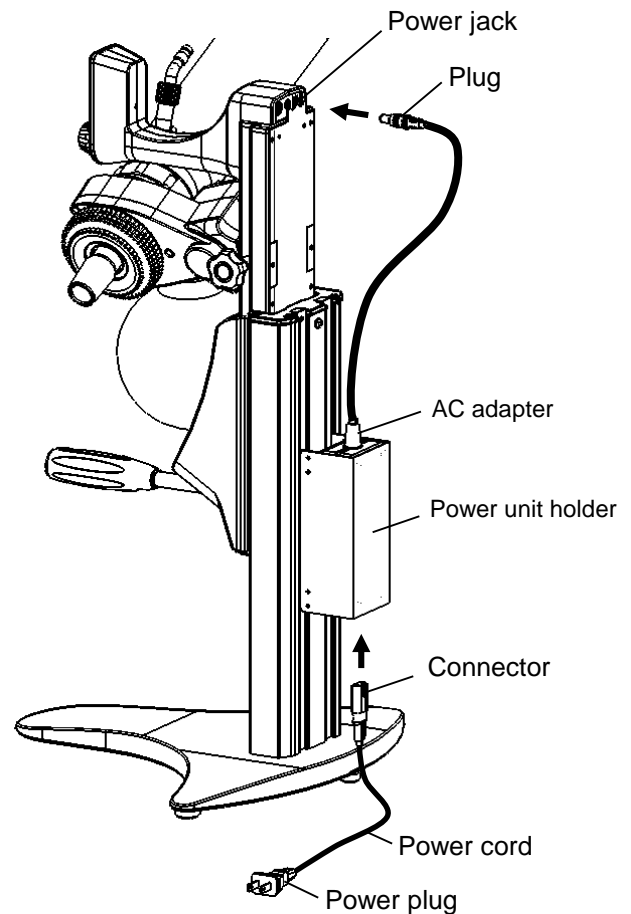
(2) Insert the AC adapter into the power unit holder and insert the plug into the power jack at the back of the control case.

※ There are two power jacks, any of which can be used equally. The remaining one shall be reserved for the set product "Vacuum control unit model NVC-3000" and any other object must not be inserted here to avoid an accident or a malfunction.

※ AC adapter cables can be gathered by putting them in the gap between the pillar and the power unit holder. Make sure the connecting plug will not be subject to excessive force by checking the jack stroke. Making the cables short forcibly will cause an accident or a malfunction.

(3) Insert the power cord connector into the socket at the bottom of the AC adapter.

(4) Insert the power plug to the outlet of the bus (Model SB-1300 • OSB-2200) or a power outlet.



## 5-2 Operating procedures



### Caution

#### Stop operating the unit if you notice any abnormal conditions.

If you notice any abnormal condition, immediately turn the power switch OFF and refer to the section “Causes of troubles and countermeasures”.



### Caution

#### Never touch the specimen flask or the bath during condensation.

The bath and the specimen flask will be hot during condensation and there is a danger of burning.



### Caution

#### Take care for conditions and handling of glass parts

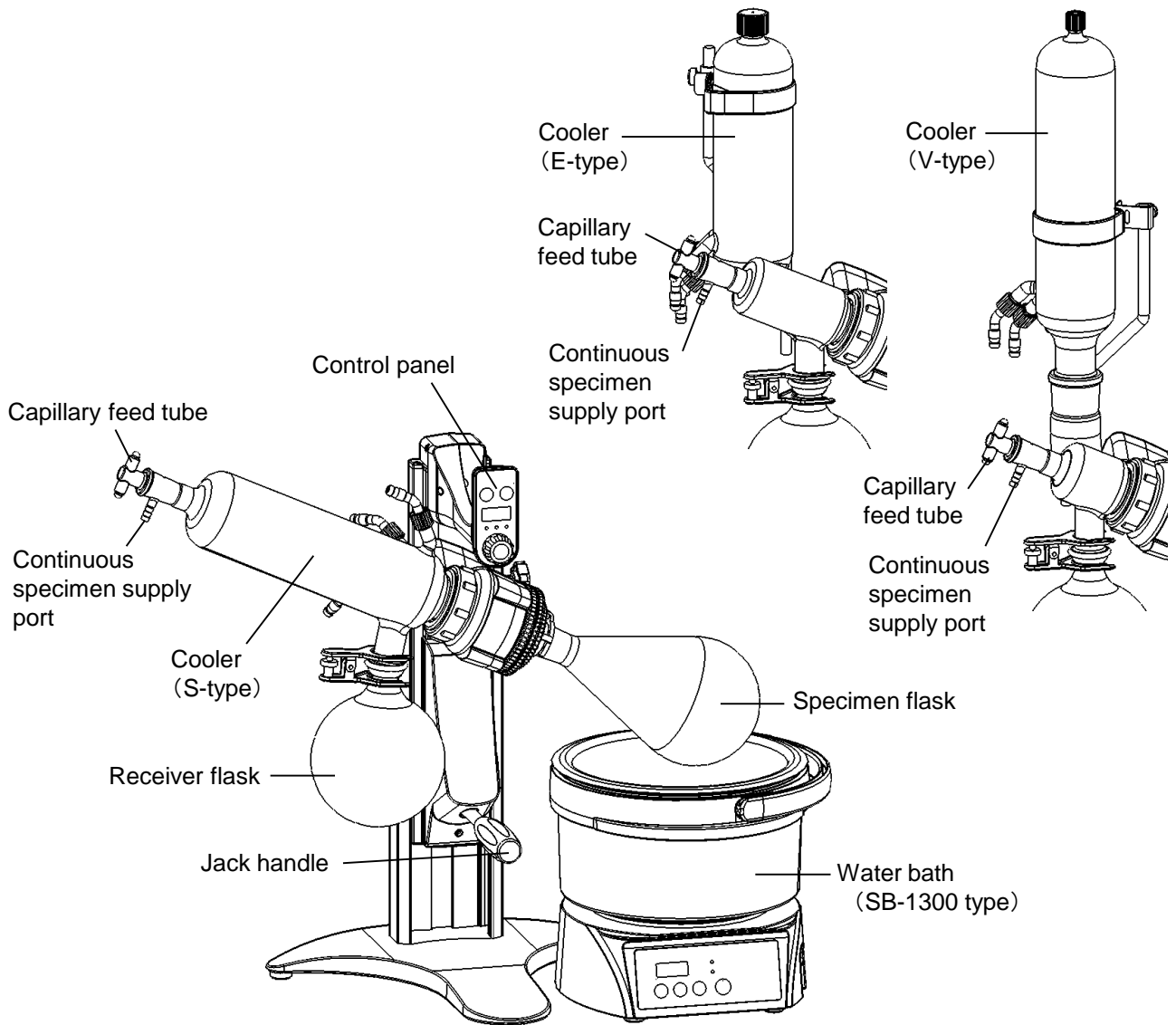
Broken or flawed glass parts may result in accidents. Inspect for damages or flaws on glass parts and take care when handling them.



### Warning

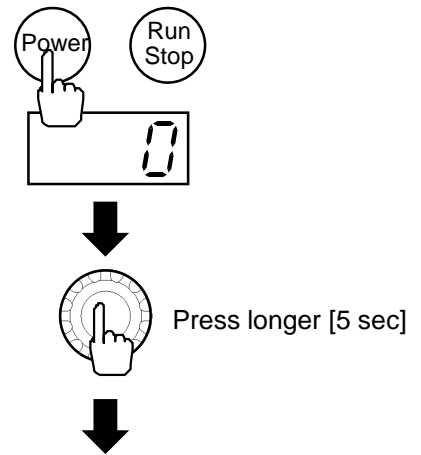
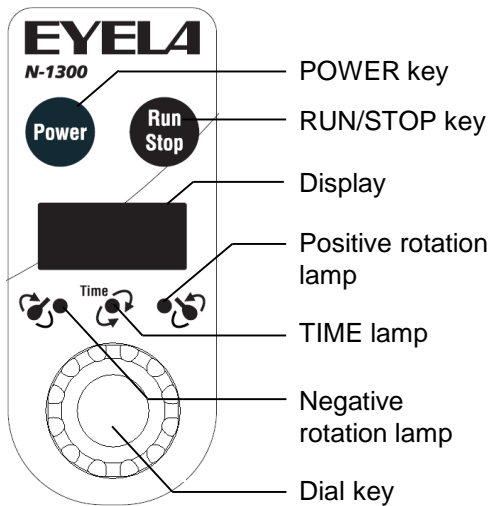
#### Never spill specimen on the unit.

If any specimen is spilt on the body or on the bath, immediately wipe it out. Some types of specimen may be ignited with heat of the body or the bath.



# 1. Setting a rotation mode and the power outage recovery mode

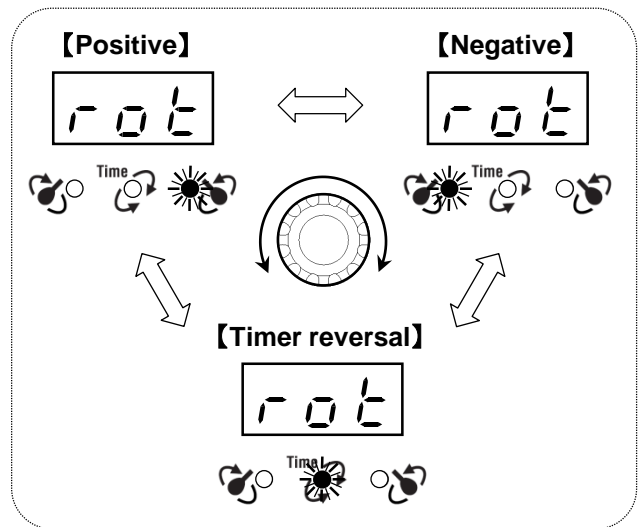
The mode is set at the positive rotation mode \*specimen flask is at the right side in the standard rotation direction setting (and the power outage recovery mode is OFF at the factory shipping).



## ■ Rotation mode

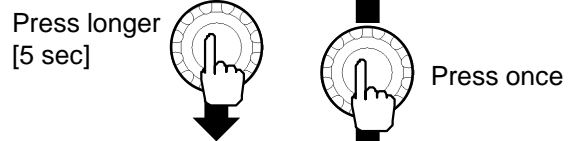
- 【Positive】 : Standard rotation direction when the specimen flask is used at the right side.
- 【Negative】 : Reversed rotation direction when the specimen flask is used at the left side.
- 【Timer reversal】 : This item is used to set the positive/negative automatic switching and their rotation time.

## ■ Setting a rotation mode

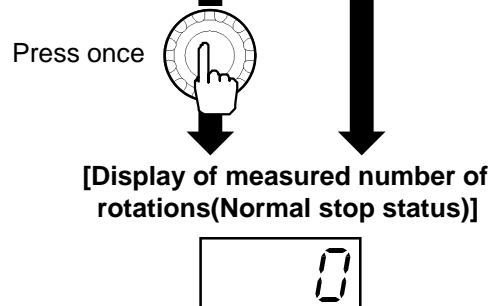
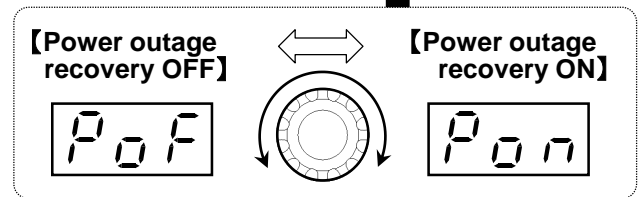


## ■ Power outage recovery mode

- 【Power outage recovery OFF】 : When power is shut off during rotation and rotation stops when power recovers. Alternately displays the measured number of rotations [0] and [PoF]. Display can be cleared by pressing the dial key.
- 【Power outage recovery ON】 : When power is shut off during rotation and rotation resumes when power recovers. Alternately displays the measured number of rotations [0] and [Pon]. Display can be cleared by pressing the dial key.



## ■ Setting the power outage recovery mode

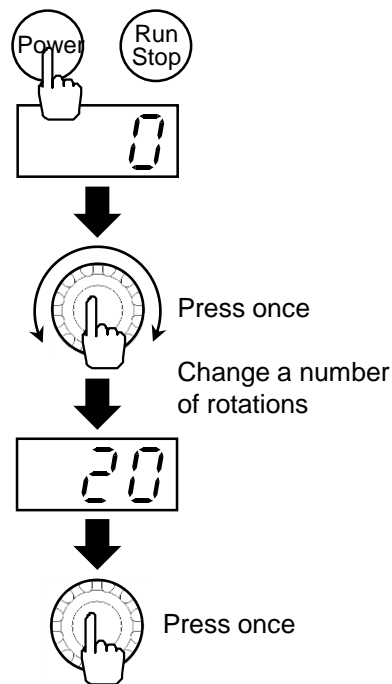


- (1) Press the POWER key. The display comes on and displays the number of rotation as [0].
- (2) Press the dial key long for 5 seconds or more. The display indicates [rot] and setting of the rotation mode is enabled.
- (3) Turn the dial key to select one of Positive↔Negative↔Time reversal lamps. Press the dial key once to switch to the display of the measured number of rotations \*normal stop status).
- ※ Both the TIME lamp and the rotation direction lamp come on when setting the timer reversal mode.
- (4) To set the power outage recovery mode, press the dial key for 5 seconds or more in the rotation mode. When the display indicates [PoF], turn the dial key to select one of [PoF]↔[Pon]. Press the dial key once to switch to the display of the measured number of rotations (normal stop status).

## 2. Enter a number of rotations

You can change the number of rotations during rotation.

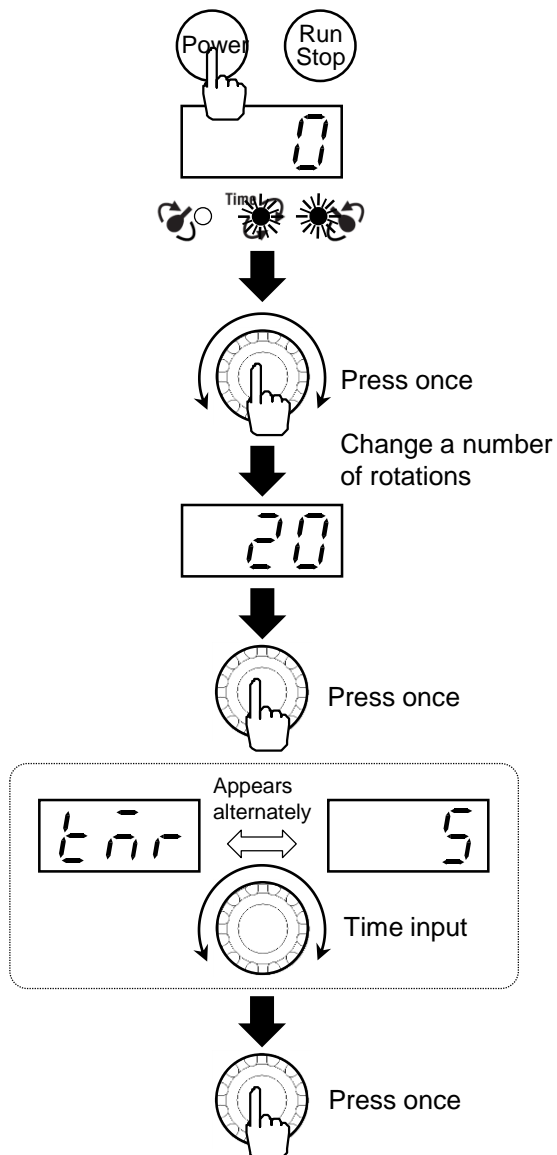
- (1) Press the POWER key. The display comes on and indicates a rotation number as [0].
- (2) Press the dial key once.  
The display indicates flashing [20] or the number of rotations in the previous session and you can enter a number of rotations.
  - ※ The number of rotations is 20rpm at the factory shipping.
- (3) Turn the dial key to adjust to the number of rotations you want and determine by pressing the key once.
  - ※ Turning the dial slowly increments the number by one and quickly increments by 10.
  - ※ Indication on the display flashes (input is enabled) for 20 seconds.



## 3. Inputting the timer reversal mode

You can change the number and time of rotations during rotation.

- (1) Press the POWER key. The display, the TIME lamp and the positive rotation lamp come on.
  - ※ Follow the procedures in “Setting the rotation mode and the power outage recovery mode” on P.17 to set to the timer reversal mode.
- (2) Press the dial key once.  
The display indicates flashing [20] or the number of rotations in the previous session and you can enter a number of rotations.
  - ※ The number of rotations is 20rpm at the factory shipping.
- (3) Turn the dial key to change the number of rotations, press the key once to enter. Then the display will indicate the timer indication [tmr] and the time used in the previous session alternately and you can enter a timer setting.
  - ※ The minimum time of the timer is 5 seconds at the factory shipping.
- (4) While the display [tmr] is flashing, turn the dial key to change the rotation time (sec) and press the key once to enter the time.
  - ※ The timer setting range is between 5 and 999seconds.
  - ※ Indication on the display flashes (input is enabled) for 20 seconds.



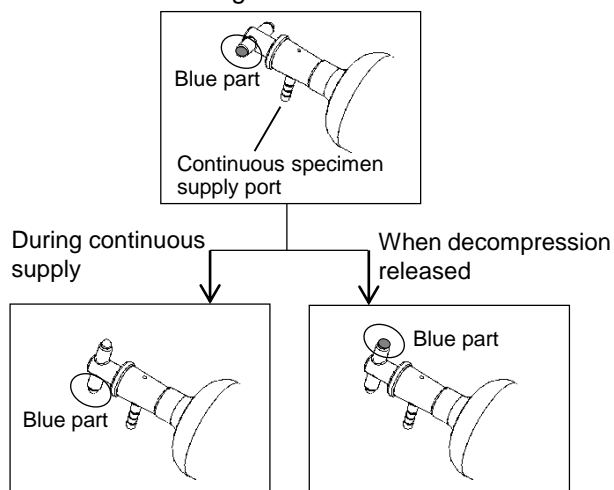
## Operation

- (1) Set the temperature for the water bath and coolant.  
(Refer to the operation manuals of the water bath and the coolant circulation unit for operating procedures of them.)
- (2) Turn the power switch ON.
- (3) Close the capillary cock. Turn it so that the blue mark will face you.  
※ Apply some vacuum grease before operating the unit.
- (4) Supply or set specimens with the procedures (I) or (II) below.  
※ Some older type rotary joints have a shorter inserting part for Eyela clip and clipping may be imperfect.  
In that case, lightly press the specimen flask before starting operation.

### (I) To supply specimens continuously

- ① Connect the continuous specimen supply port and the specimen container with a tube.
- ② Gently lower the jack so that the specimen flask will be lowered into the bath.
- ③ Press the Run/Stop key. The specimen flask will rotate. Follow the procedures in “2.Inputting a number of rotation” and “3. Inputting the timer reversal mode@ on P.18.
- ④ Start the decompression unit to decompress inside the evaporator.
- ⑤ Align the capillary cock with the continuous specimen supply port (blue mark points downward) and supply specimen.

### During concentration

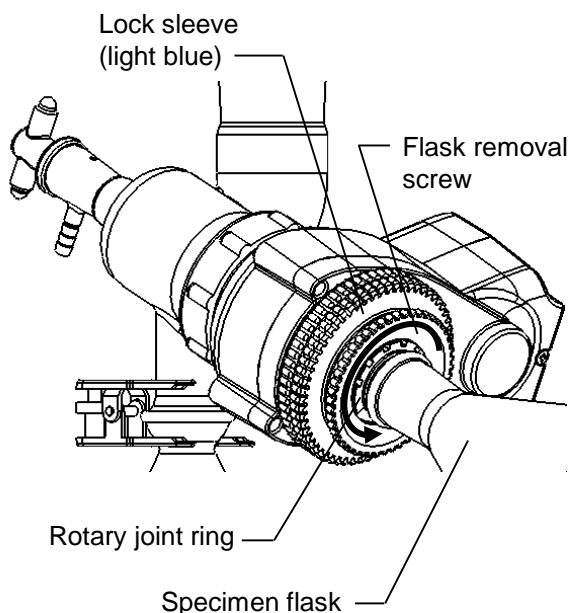


### (II) When specimen will not be put in serial

- ① Remove the specimen flask, put specimen directly in the flask and then set it.
- ② Activate the decompressing unit to start decompression in the evaporator.
- ③ Slowly lower the jack to put the specimen flask in the bath.
- ④ Press the Run/Stop key. The specimen flask will rotate. Follow the procedures in “2.Inputting a number of rotation” and “3. Inputting the timer reversal mode@ on P.18.

## Stopping operation

- (1) Press Run/Stop key to stop rotation, gently raise the jack and then take out the specimen flask.
- (2) Open the capillary cock (blue mark points upward) and return the internal pressure to the normal pressure.
- (3) Stop the decompression unit.
- (4) If you are not going to set specimens, stop operation of all of the coolant circulation unit and the water bath.  
※ Note that the bath and the specimen flask are hot for some time after completion of concentration and may cause burning.
- (5) To remove the specimen flask, remove the Eyela clip, hold the lock sleeve (light blue) not to turn as shown in the right figure, turn the flask removal screw anticlockwise and apply the rotary joint ring to the mouth of the specimen flask to remove.
- (6) Remove the ball joint clip while supporting the receiver flask from underside.



## Procedures after operations

If you are not going to use the product for a long time, remove the power plug out of the outlet.

## 6 Causes of troubles and solutions

Contact your dealer or the nearest service center for troubles not listed here.

Symptom	Causes	Countermeasures
The display will not come on even if the POWER key is pressed.	The power plug is off the outlet or is not inserted completely.	Insert the power plug into the outlet securely.
	The connector of the power cord is not inserted into the AC adaptor socket completely or is come off.	Insert the power cord connector in the AC adaptor socket securely.
	The plug of the AC adaptor is not inserted into the power jack at the back of the control case securely or is come off.	Insert the plug of the AC adaptor is not inserted into the power jack at the back of the control case securely.
	AC adapter, power cord or DC plug code is disconnected or malfunctioning.	Replace any defective part.
	Power is not supplied.	Turn the ELB on the distribution board ON.
	The display board or the control board is malfunctioning.	Immediately stop operation and contact your dealer or the nearest service center.
The display comes on but does not rotate. (The motor is not rotating.)	The control board is malfunctioning.	Immediately stop operation and contact your dealer or the nearest service center.
	The motor is malfunctioning.	
	The bearings have become rusty.	
The display comes on but does not rotate. (The motor is rotating.)	The timing belt is defective.	
Rotation makes hunting.	The lock sleeve (light blue) that tightens and fixes the rotary joint has loosened.	Turn the lock sleeve (light blue) clockwise while holding the lock housing (black) to tighten securely.
	The amount of specimen is too large (Standard RJ including the specimen flask: Approx. 1.5kg, thickness RJ: approx. 2kg) Or items or powder specimens are distributed unevenly causing the load fluctuation of the specimen too large.	Reduce the specimen or change the number of rotations to avoid uneven distribution of specimen during rotation.
	The control board is malfunctioning.	Immediately stop operation and contact your dealer or the nearest service center.
	The motor is malfunctioning.	
	The pulley and the belt are worn.	
Strange noise is heard during rotation.	The vacuum seal is worn.	Replace the vacuum seal.
	The lock sleeve (light blue) that tightens and fixes the rotary joint has loosened.	Turn the lock sleeve (light blue) clockwise while holding the lock housing (black) to tighten securely.
	The motor is malfunctioning.	Immediately stop operation and contact your dealer or the nearest service center.
	The bearing of the driving assembly is rusty.	
	The pulley and the belt are worn.	
The vacuum level is low. Decompression leakage is occurring.	The decompressing unit performance has been compromised.	By kinking the vacuum hose between the decompressing unit and this unit to cut off the vacuum line to check for leakage on this unit.
	The tapered sliding part on the specimen flask is not closely contacted to the sliding part of the rotary joint. The Eyela clip has come into contact with the rotary joint.	Some older type rotary joints have a shorter inserting part for Eyela clip and clipping may be imperfect. In that case, lightly press it during decompression.
	The lock sleeve (light blue) that tightens and fixes the rotary joint has loosened.	Turn the lock sleeve (light blue) clockwise while holding the lock housing (black) to tighten securely.
	The vacuum seal is worn.	Replace the vacuum seal.
	The rotary joint is worn.	Replace the rotary joint.
	The nozzle packing of the vacuum nozzle set is deteriorated.	Replace the nozzle packing of the nozzle set.
	The vacuum hose is deteriorated.	Replace the vacuum hose.
The jack cannot be raised or lowered. The jack cannot be locked. The jack operation is sluggish or produces a strange noise.	The jack lock mechanism is broken.	Immediately stop operation and contact your dealer or the nearest service center.
	The coil spring is deteriorated.	
	The jack slide bearing is worn or rusty.	

Symptom	Cause	Countermeasures
Rotation error alarm [A19] is displayed.	The set rotation is not reached or considerably below it due to overload or rusty bearing.	Remove any overload. If this alarm still occurs, immediately stop operation and contact your dealer or the nearest service center. You can clear [A19] indication by pressing the dial key.
	The motor or the control board is malfunctioning.	Immediately stop operation and contact your dealer or the nearest service center.
Power outage recovery alarm (at OFF) [PoF]⇔[0] is displayed alternately and rotation will stop.	Power shut off during rotation and then recovered.	You can clear the indication by pressing the dial key. The alarm display can also be cleared by resuming rotation by pressing the RUN/STOP key.
Power outage recovery alarm (at ON) [Pon]⇔[Number of measured rotations] is displayed alternately during rotation.	Power shut off during rotation and then recovered.	You can clear the indication by pressing the dial key.
[___] (underbar only) is displayed.	The display board and the control board are malfunctioning.	Immediately stop operation and contact your dealer or the nearest service center.

# 7 Maintenance and inspection

## 7-1 Cleaning and care of the product



### Caution

Never attempt to disassembly the product.

The unit contains parts with high voltage applied or may become hot, and disassembly may cause an electrical shock or an injury.

- (1) Turn the power switch OFF and remove the power plug off the outlet before maintenance work.
- (2) Use a moistened and well wriggled soft cloth for cleaning. Use mild detergent for stubborn dirt and completely wipe remaining detergent after cleaning.

## 7-2 Replacing consumable parts

Wear or deterioration of parts listed in the right table will deteriorate rotation or the vacuum level. Regular check them and replace as necessary.

The sleeve ring spring and the lock sleeve (light blue) are used to press the rotary joint against the sleeve (rotation mechanism) to secure. Repeated insertion/removal of the rotary joint will wear and deteriorate the sleeve. Excessive wear and deterioration will cause slippery of the rotary joint or the rotary joint to come off when you remove the flask.

Follow the procedures below to replace the worn or deteriorated sleeve ring spring and the lock sleeve (light blue).

- (1) When you remove the rotary joint for the first time, turn the flask removal screw anticlockwise to a point where it will not come off out of the lock sleeve (light blue) and pull it out together with the rotary joint while turning the lock sleeve (light blue) anticlockwise.
- (2) Remove the sleeve ring spring set in the sleeve groove.
- (3) Put a new sleeve ring spring into the groove.
- (4) Check that the sleeve ring spring will tighten by screwing the new lock sleeve (light blue).
- (5) Turn the lock sleeve (light blue) counterclockwise by one full turn to widen the internal sleeve ring spring.
- (6) While securely inserting the rotary joint, turn the lock sleeve (light blue) clockwise to securely tighten. The internal sleeve ring spring will tighten and the rotary joint is secured.

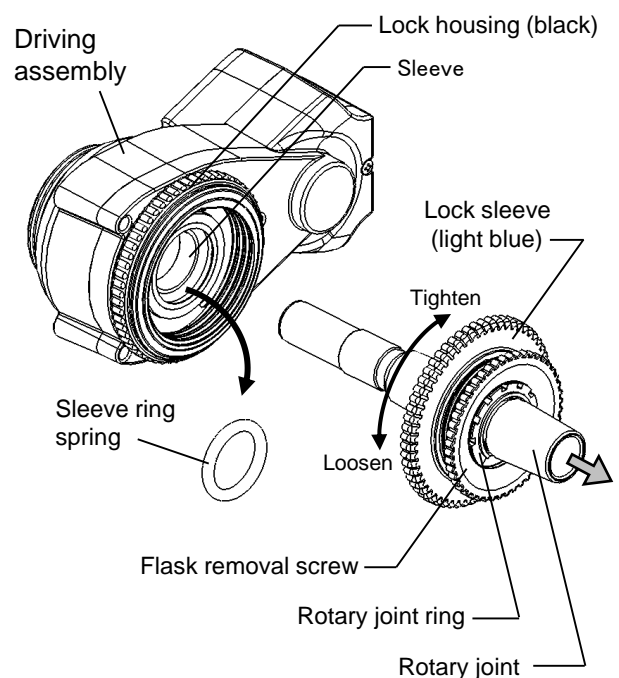


### Caution

Use a correct method and items for cleaning or caring the product.

When cleaning or maintaining the product, never splash water to the exterior or the inside directly, do not put any foreign materials and never use the cleanser, thinner, oil, kerosene, acid, and equivalent. Otherwise, the user may suffer electric shock or damage to the product.

Name	Standard	Code No
Rotary joint	272mm TS29/38	142500
Rotary joint	178mm TS29/38	142520
Vacuum seal	For N•NE	142610
Nozzle packing (12)	For N•NE	142691
Sleeve ring spring	For N-1300	267620
Lock sleeve (light blue)	For N-1300	267630





## 8 Disposal of Products

Disposal of product or part must be done according to the specified disposal method.

Principal components parts and disposal method

Components	Components	Weight	External dimensions	How to discard
Main body	N-1300S	Approx. 8.2kg	672 (W) × 342 (D) × 504 (H)	Request the disposal operator for disposal.
	N-1300V	Approx. 8.9kg	479 (W) × 342 (D) × 823(H)	
	N-1300E	Approx. 8.8kg	514 (W) × 342 (D) × 645(H)	

Components	Major materials
Main unit (stand base)	Aluminum
Main unit (jack assembly)	Aluminum, iron, stainless steel, PBT-GF, POM, PA6,
Glass part	Glass, stainless steel, PP, PA6

\* We ask you to discard packing materials after classifying them by material types.

## **9 After-sale Services**

1. In case the product does not function satisfactorily, check first by referring to the page on troubleshooting to see if this is actually a trouble.
2. If the product remains unsatisfactory even after checking, contact the shop from which the user has purchased the product or the service center described in the manual and request repair.
3. Repair during the guarantee period will be made according to the guarantee stipulations.
4. After expiration of the guarantee period, the charged repair will be made at the customer's request.


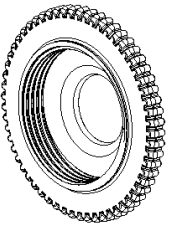
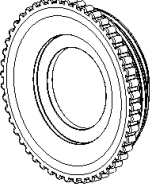
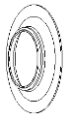
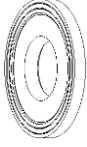
# 10 Reference material

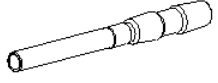
Class	Name of typical substances	Formula (Molecular formula)	MW (molar weight)	Boil (b.p) (°C) (1013hPa)	Density (g / cm <sup>3</sup> ) (20 °C)	Evap. latent heat (cal / g) (1013hPa)	Vacuum level (×hPa)		
							b.p=25 °C	b.p=30 °C	b.p=40 °C
Low-boiling substance	Diethyl ether	C <sub>4</sub> H <sub>10</sub> O	74.1	34.6	0.736	89.8	770	Atomo p	Atomo p
	n-pentane	C <sub>5</sub> H <sub>12</sub>	72.2	36.1	0.626	92.6	678	931	Atomo p
	Ethyl bromide	C <sub>2</sub> H <sub>5</sub> Br	109.0	38.4	1.451	549.7	598	705	Atomo p
	Dichloromethane	CH <sub>2</sub> Cl <sub>2</sub>	84.9	39.8	1.326	78.7	571	678	Atomo p
	1.2.dichloroethylene(trans)	C <sub>2</sub> H <sub>2</sub> Cl <sub>2</sub>	97.0	48.0	1.284	75.0	532	452	798
	Cyclopentane	C <sub>5</sub> H <sub>10</sub>	70.1	49.0	0.745	97.2	412	519	705
	Acetone	C <sub>3</sub> H <sub>6</sub> O	58.1	56.3	0.788	125.0	332	399	545
	1.1-dichloroethane	C <sub>2</sub> H <sub>4</sub> Cl <sub>2</sub>	99.0	57.4	1.175	69.0	306	359	539
	Methyl acetate	C <sub>3</sub> H <sub>6</sub> O <sub>2</sub>	74.1	57.8	0.934	98.1	279	346	532
	Chloroform	CHCl <sub>3</sub>	119.4	61.3	1.486	58.8	266	332	466
	Methanol	CH <sub>4</sub> O	32.0	64.7	0.794	264.0	159	199	332
	n-hexane	C <sub>6</sub> H <sub>14</sub>	86.2	68.7	0.659	91.8	199	239	372
	Carbon tetrachloride	CCl <sub>4</sub>	153.8	76.8	1.595	46.6	159	173	279
	Ethyl acetate	C <sub>4</sub> H <sub>8</sub> O <sub>2</sub>	88.1	77.1	0.901	88.2	129	159	239
	Ethanol	C <sub>2</sub> H <sub>6</sub> O	46.0	78.4	0.785	204.0	80	102	173
	Benzene	C <sub>6</sub> H <sub>6</sub>	78.1	80.1	0.874	94.2	126	159	239
	2-propanol	C <sub>3</sub> H <sub>8</sub> O	74.1	82.0	0.786	159.2	57	77	136
	1.2-dichloroethane	C <sub>2</sub> H <sub>4</sub> Cl <sub>2</sub>	99.0	83.5	1.257	77.3	111	146	199
1-propanol	C <sub>3</sub> H <sub>8</sub> O	60.1	97.8	0.804	162.6	27	36	67	
2-butanol	C <sub>4</sub> H <sub>10</sub> O	74.1	99.5	0.807	134.4	21	29	57	
Water		H <sub>2</sub> O	18.0	100.0	0.9970≠1	540.0	32	43	73
High-boiling substance	Formic acid	CH <sub>2</sub> O <sub>2</sub>	46.0	100.6	1.214	120.4	53	70	113
	Propyl acetate	C <sub>5</sub> H <sub>10</sub> O	102.1	101.8	0.889	80.3	41	55	93
	Toluene	C <sub>7</sub> H <sub>8</sub>	92.2	110.6	0.866	98.6	45	59	94
	1,1,2-trichloroethane	C <sub>2</sub> H <sub>3</sub> Cl <sub>3</sub>	133.4	113.5	1.442	68.7	33	40	68
	1-butanol	C <sub>4</sub> H <sub>10</sub> O	74.1	117.7	0.810	141.3	9	13	24
	Acetic acid	C <sub>2</sub> H <sub>4</sub> O <sub>2</sub>	60.0	118.0	1.050	96.8	19	27	43
	2-pentanol	C <sub>5</sub> H <sub>12</sub> O	88.2	119.3	0.810	97.8	8	12	21
	Tetrachloroethylene	C <sub>2</sub> Cl <sub>4</sub>	165.8	121.0	1.623	50.0	24	31	53
	Isoamyl alcohol	C <sub>5</sub> H <sub>12</sub> O	88.1	130.8	0.809	116.0	4	7	12
	Chlorobenzene	C <sub>6</sub> H <sub>5</sub> Cl	112.6	131.7	1.106	77.6	16	19	33
	1-pentanol	C <sub>5</sub> H <sub>12</sub> O	88.2	138.0	0.814	120.6	4	5	9
	m-xylene	C <sub>8</sub> H <sub>10</sub>	106.2	139.1	0.860	81.9	12	15	27
	o-xylene	C <sub>8</sub> H <sub>10</sub>	106.2	144.4	0.876	82.9	9	12	21
Styrene	C <sub>8</sub> H <sub>8</sub>	104.2	145.2	0.901	100.8	10	13	21	
							Vacuum level (×hPa)		
							b.p=70 °C	b.p=90 °C	b.p=120 °C
High-boiling substance	Styrene	C <sub>8</sub> H <sub>8</sub>	104.2	145.2	0.901	100.8	81	173	492
	1-hexanol	C <sub>6</sub> H <sub>14</sub> O	102.2	157.1	0.819	107.2	27	70	266
	Butyric acid	C <sub>4</sub> H <sub>8</sub> O <sub>2</sub>	88.1	163.5	0.958	113.9	20	57	199
	1-heptanol	C <sub>7</sub> H <sub>16</sub> O	116.2	176.3	0.822	438.9	9	33	133
	1-octanol	C <sub>8</sub> H <sub>18</sub> O	130.2	195.2	0.824	98.2	4	13	67
	Ethylene glycol	C <sub>2</sub> H <sub>6</sub> O <sub>2</sub>	62.1	197.4	1.116	219.8	4	12	53
	Caproic acid	C <sub>6</sub> H <sub>12</sub> O	116.2	205.8	0.927	133.0	3	8	40
	1-nonol	C <sub>9</sub> H <sub>20</sub> O	144.3	213.5	0.827	134.0	3	8	37
	Glycerin	C <sub>3</sub> H <sub>8</sub> O <sub>3</sub>	92.1	290.0	1.262	158.4	5hPa /150 °C		

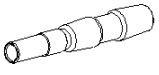
## Examples

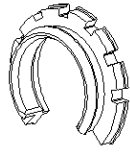
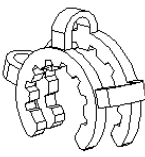
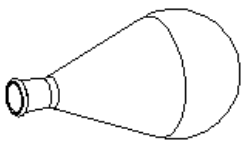
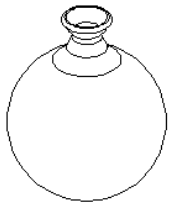
- Coolant temp. = 10 °C、 bath temp = 50 °C • • Appropriate boiling point = 25 °C (recommended range:20~30 °C)
- Coolant temp. = 10 °C、 bath temp = 40 °C • • Appropriate boiling point = 22 °C (recommended range:20 ~25 °C)
- Coolant temp. = 5 °C、 bath temp = 40 °C • • Appropriate boiling point = 18 °C (recommended range:15~20 °C)

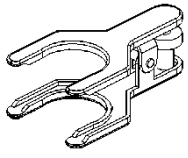
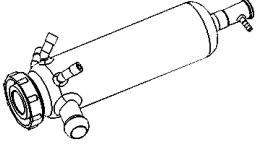
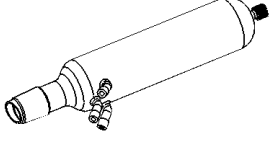



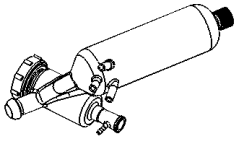
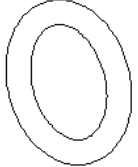
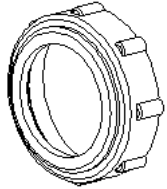
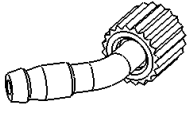
① Vacuum seal (standard)				② Sleeve ring spring				③ Lock sleeve (light blue)				④ Flask removal screw			
Sub		Main													
															
No.	Code No.	Std.	Q'ty	No.	Code No.	Std.	Q'ty	No.	Code No.	Std.	Q'ty	No.	Code No.	Std.	Q'ty
1	142610	For N•NE	2set	2	267620	For N-1300	1	3	267630	For N-1300	1	4	267640	For N-1300	1

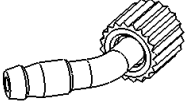
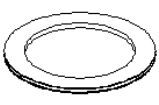

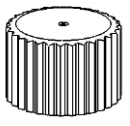
⑤ Rotary joint for S type		No	Standard				Thick type				Transparent edging type					
			Code No.		Std. •total length		Coe No.		Std. •total length		Code No.		Std. •total length			
			5-1		142500		TS29/38 • 272mm		116560		TS29/38 • 272mm		116600		TS29/38 • 272mm	
			5-2		142510		TS24/40 • 272mm		116570		TS24/40 • 272mm		116610		TS24/40 • 272mm	


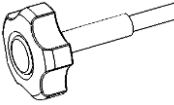
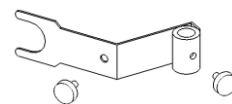
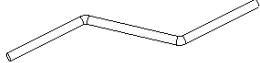
⑥ Rotary joint for V•E types		No	Standard				Thick type				Transparent edging type					
			Code No.		Std. •total length		Code No.		Std. •total length		Code No.		Std. •total length			
			6-1		142520		TS29/38 • 178mm		116580		TS29/38 • 178mm		116620		TS29/38 • 178mm	
			6-2		142530		TS24/40 • 178mm		116590		TS24/40 • 178mm		116630		TS24/40 • 178mm	

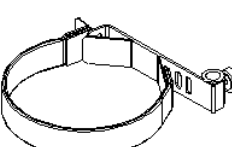

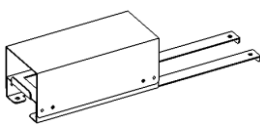
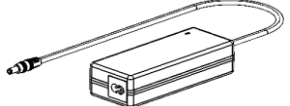
⑦ Rotary joint ring				⑧ Eyela clip				⑨ Specimen flask 1000mL				⑩ Receiver flask 1000mL			
															
No.	Code No.	Std.	Q'ty	No.	Code No.	Std.	Q'ty	No.	Code No.	Std.	Q'ty	No.	Code No.	Std.	Q'ty
7-1	192600	For TS29	2	8-1	142540	For TS29	2	9-1	116190	TS29/38	1	10	116340	S35/20	1
7-2	217020	For TS24	2	8-2	142550	For TS24	2	9-2	116270	TS24/40	1				

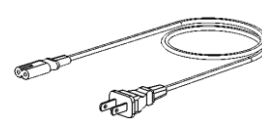
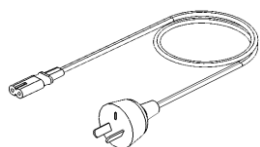
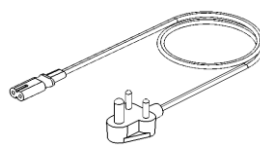
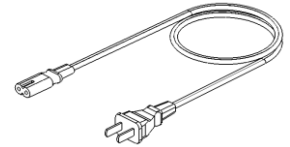
⑪ Ball joint clip				⑫ Cooler S type				⑬ Cooler V type				⑭ Adaptor			
															
No.	Code No.	Std.	Q'ty	No.	Code No.	Std.	Q'ty	No.	Code No.	Std.	Q'ty	No.	Code No.	Std.	Q'ty
11	202790	S35	1	12-1	268830	Standard		13-1	268890	Standard		14-1	268850	Standard	
				12-2	268840	Chemical coating		13-2	268900	Chemical coating		14-2	268860	Chemical coating	

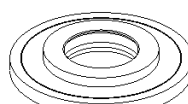

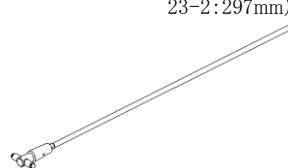
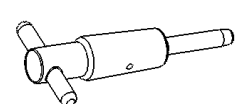
⑮ Cooler E type				⑯ Ring spring				⑰ Cap screw				⑱ Nozzle set (white)			
															
No.	Code No.	Std.	Q'ty	No.	Code No.	Std.	Q'ty	No.	Code No.	Std.	Q'ty	No.	Code No.	Std.	Q'ty
15-1	268870	Standard		16	142710	For N•NE	1	17	142700	For N•NE	1	18	142690	For N•NE	3 sets
15-2	268880	Chemical coating													

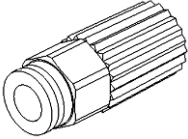
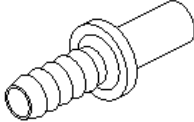
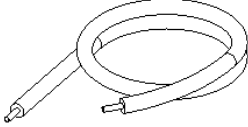
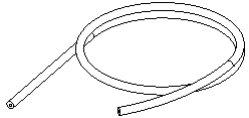
<b>19</b> Coolant nozzle set (gray)				<b>20</b> Nozzle packing (standard)				<b>21</b> Airtight stopper (for V cooler)				<b>22</b> Airtight stopper (for E cooler)			
															
No.	Code No.	Std.	Q'ty	No.	Code No.	Std.	Q'ty	No.	Code No.	Std.	Q'ty	No.	Code No.	Std.	Q'ty
19	178900	For N•NE	2 sets	20	142691	For N•NE	12	21	232840	For N•NE	1	22	255830	GL25	1

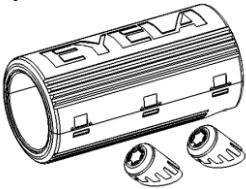
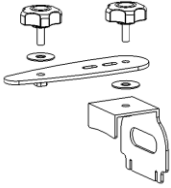
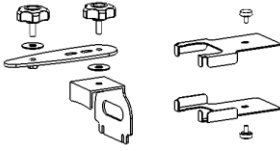
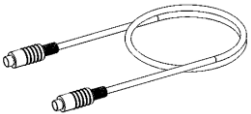
<b>23</b> Capillary (Standard) (Teflon tube:565mm)				<b>24</b> Angle adjusting knob bolt (M6×55L)				<b>25</b> Support bar clamp				<b>26</b> Cooler support bar			
															
No.	Code No.	Std.	Q'ty	No.	Code No.	Std.	Q'ty	No.	Code No.	Std.	Q'ty	No.	Code No.	Std.	Q'ty
23	116540	TS19/40	1	24	267650	For N-1300	1	25	267660	For N-1300	1	26	192620	For N-1300	1

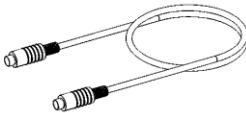
<b>27</b> Cooler holder				<b>28</b> Set screw				<b>29</b> Power unit holder				<b>30</b> AC power adaptor			
															
No.	Code No.	Std.	Q'ty	No.	Code No.	Std.	Q'ty	No.	Code No.	Std.	Q'ty	No.	Code No.	Std.	Q'ty
27	185240	For N•NE	1	28	187910	For N•NE	2	29	267670	For N-1300	1	30	267680	For N-1300	1

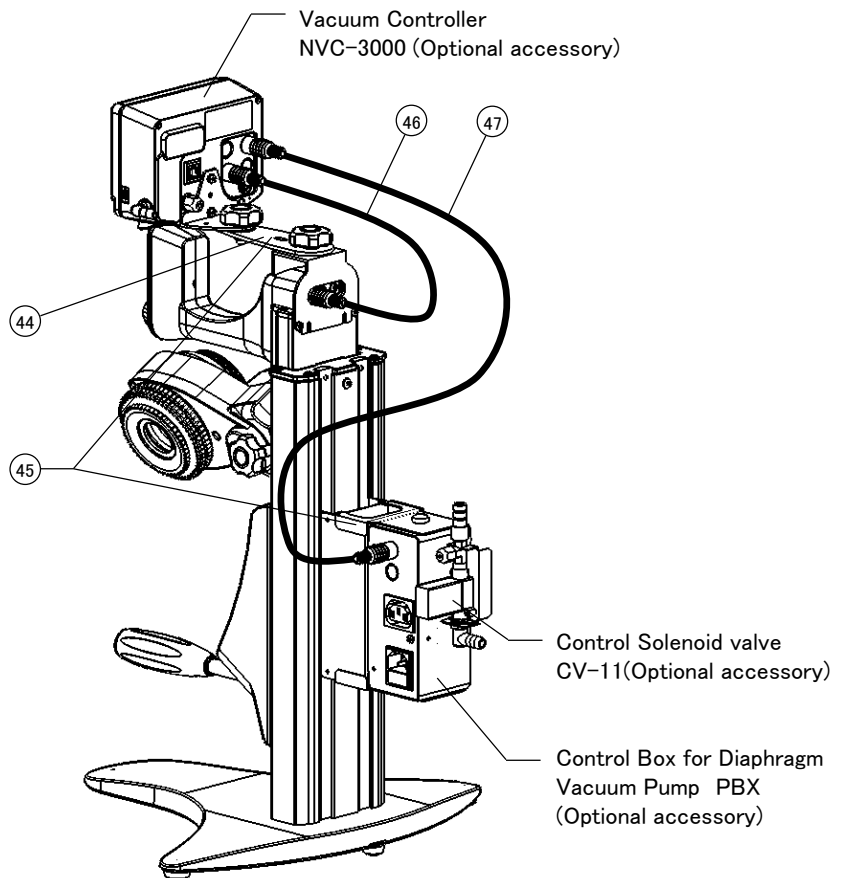
<b>31</b> AC power cord 115V A type (North America)				<b>32</b> AC power cord 220V O type (China)				<b>33</b> AC power cord 230V B type (U.K., India)				<b>34</b> AC power cord 230V C type (Europe)			
															
No.	Code No.	Std.	Q'ty	No.	Code No.	Std.	Q'ty	No.	Code No.	Std.	Q'ty	No.	Code No.	Std.	Q'ty
31	267699	For N-1300	1	32	267698	For N-1300	1	33	267695	For N-1300	1	34	267697	For N-1300	1

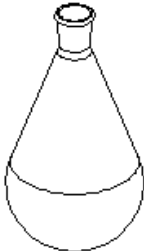
<b>35</b> Teflon seal (optional)				<b>36</b> For nozzle set Viton O ring (optional)				<b>37</b> Capillary (glass made 23-1:510mm 23-2:297mm)				<b>38</b> Teflon capillary			
															
No.	Code No.	Std.	Q'ty	No.	Code No.	Std.	Q'ty	No.	Code No.	Std.	Q'ty	No.	Code No.	Std.	Q'ty
35	244980	N-1200	1	36	202770	For N•NE	4	37-1	142590	For S type	1	38	245000	TS19/38	1
								37-2	142600	For V•E types	1				

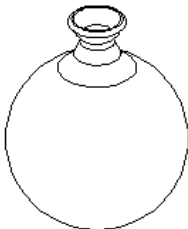
<b>39</b> Fingertip connector (Connection dia.10mm)				<b>40</b> Fingertip hose nozzle (Nozzle I.D.10mm)				<b>41</b> Fingertip cooling hose (Tube I.D.6.5×O.D. 10mm)				<b>42</b> Vacuum hose (I.D.6×O.D. 15mm)			
															
No.	Code No.	Std.	Q'ty	No.	Code No.	Std.	Q'ty	No.	Code No.	Std.	Q'ty	No.	Code No.	Std.	Q'ty
39	267980	For N•NE	2	40	247210	For N•NE	2	41-1	244940	2m	1	42	119170	5m	1
								41-2	244950	5m	1				

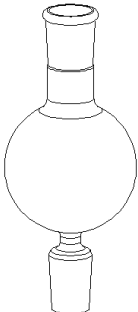
<b>43</b> Condensation prevention cover				<b>44</b> Fixing plate for NVC-3000				<b>45</b> Fixing plate for PBX (NVC-3000)				<b>46</b> Communication cable COM-0.5m			
															
No.	Code No.	Std.	Q'ty	No.	Code No.	Std.	Q'ty	No.	Code No.	Std.	Q'ty	No.	Code No.	Std.	Q'ty
43-1	270730	For S	1	44	269480	For N-1300	1	45	269490	For N-1300	1	46	269450	For N-1300	1
43-2	270740	For V•E	1												

<b>47</b> Connecting cable NVC-PBX NP0.5m			
			
No.	Code No.	Std.	Q'ty
47	269390	For N-1300	1



Specimen (Pear shaped) flask 	Std. Code No.	TS29/38	TS29/38 Chemical coating	TS24/40	TS24/40 Chemical coating
	50mL	116140	228240	116220	228310
	100mL	116150	228250	116230	228320
	200mL	116160	228260	116240	228330
	300mL	116170	228270	116250	228340
	500mL	116180	228280	116260	228350
	1L	116190	228290	116270	228360
	2L	116200	228300	116280	228370

Receiver flask 	Std. code No.		S35/20 (JIS std.)		S35/20 (JIS std.) Chemical coating	
	With drain cock	500mL	116370		228440	
		1L	116380		228450	
	100mL		116300		228380	
	200mL		116310		228390	
	300mL		116320		228400	
	500mL		116330		228410	
	1L		116340		228420	
	2L		116350		228430	
	Jacket type 1L		116390		-	

Trap ball 	Std. Code No.	TS29/38→				TS24/40→			
		→29/38	→24/40	→19/33	→15/30	→24/40	→19/33	→15/30	
	100mL	116700	116710	156700	116720	116730	156710	116740	
	200mL	116750	116760	156680	116770	116780	156690	116790	
	300mL	116800	116810	156650	116820	116830	156660	116840	
	500mL	116850	116860	156610	—	156630	156640	—	
	Coating	100mL	228680	228690	228700	228710	228720	228730	228740
		200mL	228750	228760	228770	228780	228790	228800	228810
		300mL	228820	228830	228840	228850	228860	228870	228880
		500mL	228890	228900	228910	—	228920	228930	—