
User Manual

HyperVAC

HVC-2124 / HVC-2200

Product Model Name : _____

Date of Purchase : _____

hanil

HyperVAC

HVC-2124/HVC-2200

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www.ihanil.com

The appearance or specifications of the device is subject to partial change for improvement.

UM-H_HyperVAC(E)(Rev.4), 2023.11.27

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1. Safety Precautions

1.1 Using this manual

This manual is for the users who operate the device for the first time. This manual provides information on the detailed instructions, precaution, troubleshooting and maintenance care. Keep this manual nearby for future reference.

1.2 Safety Labels on the Device

The labels on the device represent safety instructions and directions.



Mark indicating danger and warning



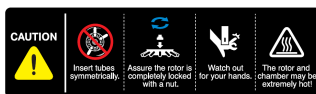
Attention and warning for electric shock



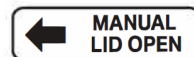
Mark indicating Biohazard warning



Mark indicating earth grounding



Attention and warning for rotor coupling



Indicate a hole for manual lid opening in case of emergency

1. Safety Precautions

1.3 Safety Precautions

Before using the device, please read this operation manual to ensure correct usage. Incorrect handling of the device may possibly result in personal injury or physical damage on the device or its accessories.

1. ALWAYS locate the device on a flat, rigid and stable table capable of withstanding the weight of the device and its spinning operation.
2. ALWAYS make a safety zone of 30 cm around the Device to indicate that neither hazardous materials nor persons should be permitted within the area during operation.
 - ▶ ALWAYS position the device with enough space on each side of device to ensure proper air circulation.
3. ALWAYS install the device within a temperature and humidity controlled environment (permissible ambient temperature: 5 ~ 35 °C, relative humidity: 30 ~ 85 %, atmospheric pressure: 500 ~ 1,060 hPa).
4. Before connecting the power, check the rated voltage.
5. Should not use unapproved rotors and accessories.
 - ▶ Only use rotors from Hanil Scientific Inc. with appropriate centrifugal tubes to embrace sample containers tightly enough inside rotors.
6. Before operating the device, check if the rotor is securely fastened.
 - ▶ Should operate the device with a rotor properly installed and secured to the motor shaft.
7. Do not stop the rotor by hands during the device is running.
8. Emergency lid release should be performed only when rotor is completely stopped.
9. ALWAYS load the tubes symmetrically with evenly weighted samples to avoid rotor imbalance. If necessary, use the water blank to counterbalance the unpaired sample.
10. The operation speed should not exceed the highest value of the individual guaranteed g-forces of each centrifuge, rotor, sleeves and sample container, especially the guaranteed g-force of sample container should not be neglected.
11. ALWAYS disconnect the power supply prior to maintenance and service to avoid electrical shock.

1. Safety Precautions

1.3 Safety Precautions

12. ALWAYS use proven disinfection procedures after centrifuging biohazardous materials.
13. Should not centrifuge flammable, toxic, radioactive or explosive materials.
14. When it is necessary to use toxic or radioactive materials or pathogenic micro-organisms which belong to the Risk Group II of WHO: "Laboratory Bio-Safety Manual," should follow national regulations.

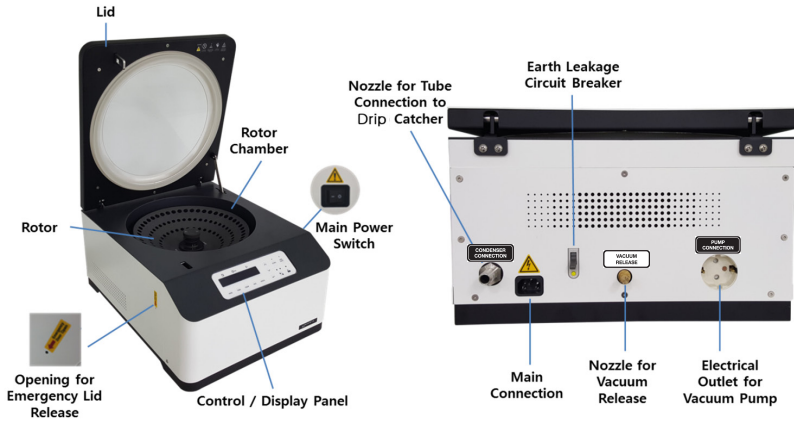


- Do not place dangerous materials within 30 cm distance around the device.
- Use the emergency lid release function only when the lid button on the control panel is dumb under the condition of complete stop of rotor running.
- Never try to open or move the device if it is not completely stopped.
- If the power input is more than +/-10% of the recommended voltage or fluctuates frequently, it may cause malfunction of the device and often result in serious damage.
- Install the device at the place without any kinds of corrosive gases.

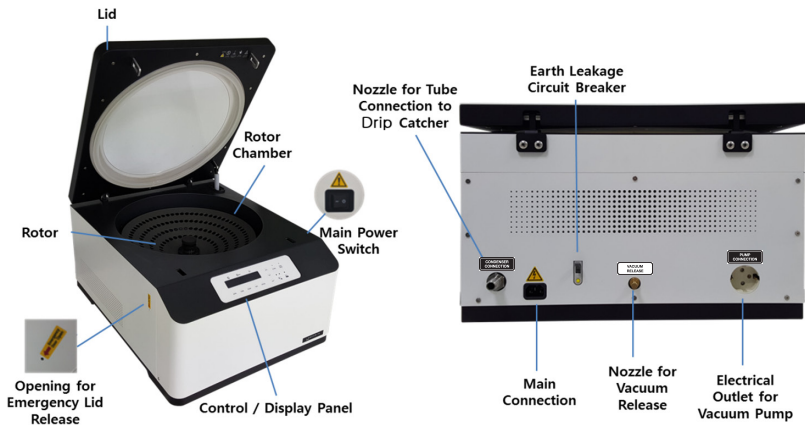
2. Product Description

2.1 Product Description

[HVC-2124]



[HVC-2200]



2. Product Description

2.2 Delivery Package



- Check all parts for damage that may have occurred during transportation.
- Check the delivery for completeness.

- Hyper VAC 2124/2200
- AC Power cable
- Emergency release tool

2. Product Description

2.3 Technical Specifications

	HVC-2124	HVC-2200
Max. RPM	200 ~ 2,000 RPM	200 ~ 2,000 RPM
Max. Capacity	120 x 1.5 / 2.0 ml microtubes or 48 x 1.5 / 2.0 ml + 76 x 0.5 ml microtubes	200 x 1.5 / 2.0 ml microtubes 12 x 50 mL
Auto Start / Stop	Yes	Yes
Chamber Heating Temperature Range	OFF, 4 ~ 65 °C*	OFF, 4 ~ 65 °C*
Vacuum Pressure	1 ~ 1,013 mbar	1 ~ 1,013 mbar
Operating Time	< 23 hr 59 min or continuous Default value: 0 h 0 m (continuous)	< 23 hr 59 min or continuous Default value: 0 h 0 m (continuous)
Centrifuge Dimension (W x D x H, mm)	375 x 445 x 252	475 x 560 x 350
Weight (kg)	22.5 (without Rotor)	37 (without Rotor)
Power Requirements	220~230V AC, 50/60Hz	20~230V AC, 50/60Hz

*Temperature setting can be turned off or set from 4 to 65°C.

If you set it lower than room temperature, the set temperature cannot be reached because there is no refrigeration function.

If you set the temperature higher than room temperature, the heating function operates to reach at the set temperature.

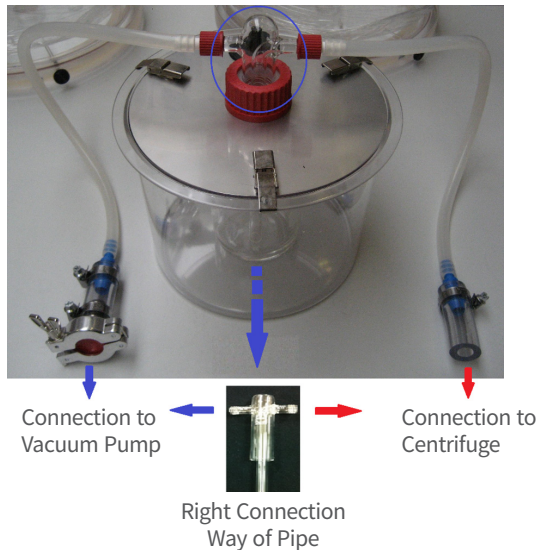
3. Installation

3.1 Unpacking

1. Open the box and lift out the device carefully.
2. The system should be horizontally lifted up on the flat table.
3. Insert the Emergency Lid Release Tool into 'Opening for Emergency Lid Release' on the left side of the main body.
 - ▶ Remove the protection material inside the main body; Vacuum Concentrator series are delivered with the basic rotor mounted, and the protection material is inside the main body for rotor protection.
4. It is now ready for installation.

3.2 Connection with Supplying Device

The following pictures guide a way for connecting a Drip catcher kit with Centrifuge and Vacuum Pump.





3. Installation



3.3 Switching On the Device

1. After connecting the AC Power cord to the mains power on the right back of the device, turn on the Earth Leakage Circuit Breaker.
▶ Check the power on.
2. Turn on the main power on the right side of the device.

3.4 Opening the Lid

1. For opening lid, press the  button.
 - Should press the  button when the lid is closed (Lid LED turns off).
 - Close the lid until hearing clank shut.
 - When the lid is open, the lid LED turns on.



- The lid is not released while the device is running.
(With the vacuum pump connected, the lid is released only when the vacuum is released.)
- If the lid is opened, the device cannot be operated even with pressing the  button.
- Power Failure: If there is any power failure during operation, lid is not open with  the button. Lid can be released only when the operation is completely stopped and the power is on. If you want to release the lid in the event of a power failure, refer to '3-5. Emergency Lid Release.

3. Installation

3.5 Emergency Lid Release



- Manual lid opening should be performed only when spinning is completely stopped. Otherwise, harmful damage can be accompanied.
- After opening the lid manually, it is recommended to wait until the main power turns back on.



For emergency lid release, you can use the Emergency Lid Release Tool only when the device is completely stopped.

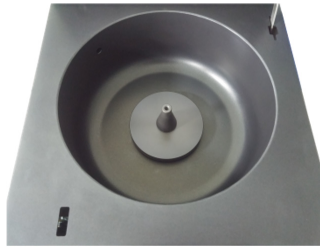
The lid can be unlocked manually with the Emergency Lid Release Tool through the Opening for Emergency Lid Release.

1. Find the Opening for Emergency Lid Release on left side of the device.
2. Insert Emergency Lid Release Tool into the opening and push it until the lid is released.

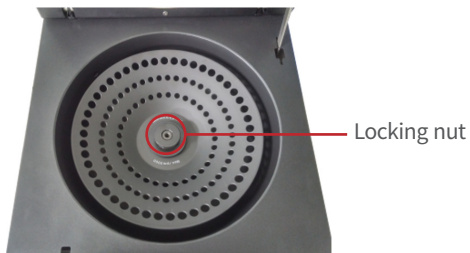
3. Installation

3.6 Installing/Removing the Rotor

1. Before installing a rotor, clean the motor shaft and chamber with soft dry towel.



2. Load a rotor into the motor shaft. Lock it with the Locking Nut.
- To install the rotor: Rotate the locking nut clockwise until tightly assembled.
 - To remove the rotor: Rotate the locking nut counterclockwise.



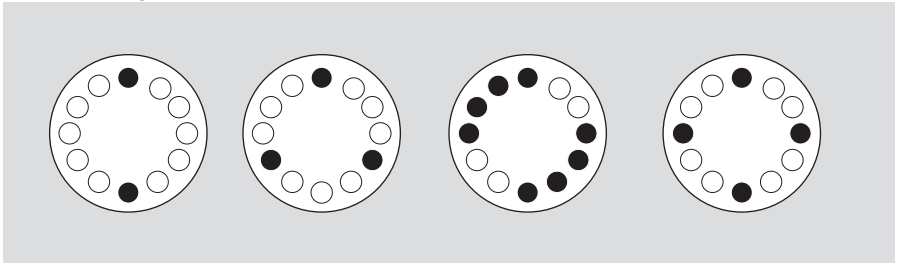
3. Installation

3.7 Positioning of Sample Tubes

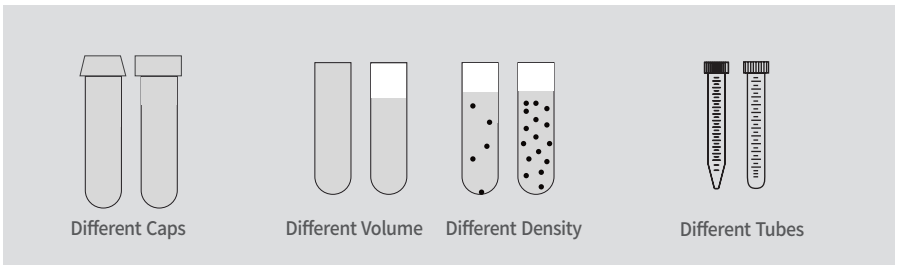


- If it is hard to make balance with the samples, please employ control tubes. Otherwise, it may bring about noise or vibration, which may lead to damaging the device.

Correct Arrangement



Wrong Usage of Tubes

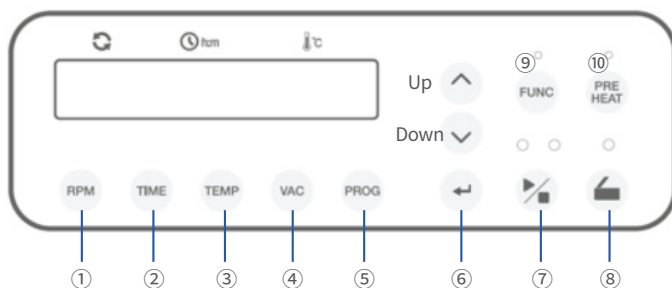


1. Before loading sample tubes, check the water drop or dirt in the rotor hole or inner sleeve.
 - ▶ If you find water drops or dirt in the rotor or inner sleeve, remove it with soft dry cloth.
2. Tubes should be placed in the rotor with equal amount of samples at symmetrical positions.
 - ▶ Only use appropriate centrifugal tubes and do not exceed the speed beyond the max g-force allowed for the tubes.

4. Operation

4.1 Key Functions of Control Panel

[Main Display]




①	Use to set the of RPM (200 ~ 2,000 rpm)
②	Use to set time, available range up to 23 hr 59 min or continuous
③	Use to set temperature (RT ~60 °C) . Display the set temperature while idle, and actual temperature during operation.
④	Use to display the vacuum pressure for checking the vacuum level
⑤	Use to save the set values or recall the saved parameters (Saving capacity max. 100 memories).
⑥	Use to confirm the parameter setting / Check the preset values during operation
⑦	Use to start or stop operation
⑧	Use to open the device lid. Only activated when the vacuum is released.
⑨	Use for (1) manual on/off of vacuum pump. It is only activated while the device is idle. And use to (2) move to Sub Display from Main Display. Refer to 6-1-2. Sub Display for more detailed information.
⑩	Use to start operation at the set chamber temperature. PRE-HEAT LED blinks during the setting and is kept on when the setting is completed.

4. Operation

4.1 Key Functions of Control Panel

[Sub Display]

Sub Display appears upon the  button after setting the operating conditions.

- Sub Display function is for manual ON/OFF of vacuum pump. But it can be used only when the machine is not operating.
- Normally, adjustment of the Sub Display is not used for operation but for Emergency Lid Release in any emergency conditions. The detailed method & sequence for the Emergency Lid Release are stated in section 6-7-3.
- If you press the  button after setting the Sub Display function, you can go to the Main Display again.
- Function LED blinks during the Sub Display setting and is kept on when the setting is completed.

4. Operation

4.2 Setting the RPM

1. Press the **RPM** button once.
 - RPM mode
 - RPM LED flickers on the display window.
2. Press the **^** or **v** button to change input value and then press the **←** button to complete the setting.

- ▶ Speed setting unit (display unit): 10 rpm (1 rpm)
- ▶ Speed setting range: (200 ~ 2,000 rpm)

4.3 Setting the Time

1. Press the **TIME** button once.
 - The set time LED flickers with beeping sound.
2. Press the **^** or **v** button to change input value and then press the **←** button to complete the setting.
 - Time is counted down after starting centrifugation.

- ▶ Time setting range: 23 hr 59 min or continuous

4.4 Setting the Temperature

1. Press the **TEMP** button once.
2. Press the **^** or **v** button to change input value and then press the **←** button to complete the setting.

- ▶ Temp setting unit & display unit: 1 °C
- ▶ Temp setting range: 4 ~65 °C
- ▶ If you want to turn off the temperature setting, press the **v** button to until OFF appears




Temperature Pull-up time(2000rpm, Vacuum on, RT)

- RT->30°C : 20min
- RT->45°C : 60min
- RT->65°C : 90min




★ While pull-up time, the temperature can be displayed higher than the actual internal temperature of chamber

4. Operation

4.5 Saving a Program


1. Set parameters. (Refer to 4-2 ~ 4-4.)
2. Press the **PROG** button longer than 3 seconds.
 - Check the message of “PROGRAM SAVE: ##” on the display window.
3. Press the  or  buttons to change input Program number.
 - Save up to 100 programs. (Program numbers from 0 to 99)
4. Press the  button to complete the saving.

4.6 Calling up a Program

1. To recall the saved program, press the **PROG** button shortly (less than 1 sec.).
 - Check the message of “PROGRAM CALL: ##” on the display window.
3. Press the  or  buttons to select program number you want to call up and then press the  button.

4.7 Start / Stop

[Start]

1. After setting RPM, Time and Temp., press the  button.
 - During running, a ‘Start LED’ is turned on.
 - The device runs only when the lid is closed.











[Stop]

1. You can stop the operation by pressing the  button.

4. Operation

4.8 Operation Sequence

[Detailed Sequences for Operation]

1. Fill the chamber of Drip Catcher kit with ice.
2. Turn on the centrifuge and the vacuum pump.
3. Set the parameters according to your preferences. (RPM / TIME / TEMP)
4. Press the **FUNC** button then  or  button to switch the status of the vacuum pump. Press the  button upon setting each function. Normally, you don't need to adjust the values for these functions.
5. Press the  button to start operation with your set values.
 -  If you set your speed above 1,000 rpm, the vacuum pump starts to operate at 1,000 rpm. If you set it below 1,000 rpm, the vacuum pump starts to operate at your set RPM.
 -  Operation starts before the chamber reaches to the set temperature. If you want to start the operation at your set temperature, you can use the PRE-HEAT function. Press the **PRE HEAT** button before pressing the  button. Then the operation starts after reaching your set temperature. **PRE HEAT** LED blinks while setting and is kept on upon the completion of the setting. Press the  button to start operation.
6. If you want to stop the operation, press the  button.
 - Vacuum pump stops.
 - Vacuum Release function is activated and the releasing is completed. Function LED blinks during the release and is kept on upon the completion of the release.
 - With the vacuum released, alarm beeps and Lid LED blinks for 5 seconds when the rotor completely stops.
7. To open the lid, press the  button after the vacuum release. Then lid lock is released for 5 seconds with the Lid LED on, and you may open it within the time.

4. Operation

4.8 Operation Sequence

[Operating Status for Each Part (VacPump / Release / Heater)]

Power ON (Start status: default setting)	VacPump	Release	Heater
	OFF	OFF	OFF
Setting Temperature and Running Device (~20 min.)	VacPump	Release	Heater
	OFF	OFF	OFF
Until reaching the set RPM (Refer to	VacPump	Release	Heater
	OFF	OFF	ON
After reaching the set RPM or 1,000 rpm	VacPump	Release	Heater
	ON	OFF	ON
Press the STOP button.	VacPump	Release	Heater
	OFF	ON	OFF
After completing the Stop -Return to the Start Status (default setting)	VacPump	Release	Heater
	OFF	OFF	OFF

4.9 Manual Operation

If you need to adjust the function of vacuum pump, to release it or execute emergency open, you can use manual operation.

1. Turn on the main power.
2. Press the **FUNC** button.
3. Check the display. (Default: Vacuum pump: OFF / Release: OFF)
4. Press the **FUNC** button and then press the **^** or **v** buttons to set the status of the vacuum pump. You can switch on or off vacuum pump and release the vacuum on your need. You need to press the **←** button after setting each function.
5. If you want to execute the emergency lid open, the release has to be set as 'ON'.
6. When the vacuum release is completed, alarm beeps and Lid LED blinks for 5 seconds.
7. Press the **⏏** button and open the lid within 5 seconds while the Lid LED blinks.

5. Maintenance

5.1 Outer Part of Device

1. Clean the outside of the device with dry soft cloth. If necessary, dip the cloth in neutral detergent and clean contaminated area. Keep the device completely dry after cleaning.
 2. Do not use any volatile chemicals such as alcohol and benzene, etc.
 3. Be careful not to make scratches on the surface of the device. The scratches can cause corrosion on the surface of the device.
- ▶ If any rust is found on the vacuum pump, clean it with neutral detergents and keep it dry.

5.2 Chamber

1. Keep the chamber clean and dry after every use.
2. If the chamber is contaminated, dip the cloth in neutral detergent and clean contaminated area.

5.3 Motor Shaft

1. Always keep the motor shaft clean to prevent from any imbalance problem caused by contaminants.
2. After using the device, take out the rotor from the shaft and clean the shaft with dry soft cloth to keep dry.

5. Maintenance

5.4 Rotor

1. If any parts become contaminated with samples, clean the rotor with soft wet cloth and keep them dry.
2. Be careful not to make scratches inside or on the surface of rotors. Any small scratches can cause corrosion of the rotor and big damage to the device.
3. While the device is not used, keep the rotor separated from the motor shaft.

5.5 Transportation of Device

1. If you need to move or ship the device, pay special attention to protecting the motor shaft from any physical impact or turbulence.
2. Fill inside the chamber with proper materials to keep the motor shaft in place and not to be influenced by physical pressure.

6. Troubleshooting

6.1 Possible Problems

If any problems occur in the device, please check the following list before contact your local Hanil Scientific Inc. partner or Hanil Scientific Inc.

Symptom	Recommended Action
Power failure	Connect the AC Power cord and make sure that the line is completely connected between the device and power outlet. Check the power switch is on (Refer to 3-3).
Can't be started	If the lid is not closed completely, the device can't run. Check the Lid LED on the display window and close the lid completely.
Can't open the lid	If the power is out, check the main fuse for the laboratory to supply the power. If it is not solved shortly, open the lid with emergency lid tool manually for safety of sample (Refer to 3-5 Emergency Lid Open.).
Can't close the lid	Remove the dirt at the lid latch and then close the lid completely again. If the lid is not closed by any reason, please contact our service team.
Noise and vibration during running	Please, check if the table and the device keep level.
	Please, re-check the coupling status of the following. 1. the balanced way of coupling of the rotor into the motor shaft 2. the completeness of fixing of the Rotor Locking Nut on the rotor (Refer to 3-6. Installing/Removing the Rotor.)
	Check the balanced positioning of samples in the rotor (Refer to 3-7. Positioning of Sample Tubes.) and load the same weight of samples symmetrically.

6. Troubleshooting

6.2 Error Codes

Error	Possible Causes	Solution
Error 1	RPM Sensor	<ul style="list-style-type: none">- Turn off and on the main power to check the device.- If the error code keeps coming up, please contact us.
Error 2	Lid Open	<ul style="list-style-type: none">- If lid opens while the device running or the device has any trouble in lid sensor, this message may come up.- Remove the dirt at the lid latch and then close the lid completely. Check the Lid LED on the display window. If the error code keeps coming up, please contact us.
Error 3	Motor Overheating	<ul style="list-style-type: none">- If the motor is overheated, this message may appear.- Keep the main power off for an hour, and then turn on to check the device.- If the error code keeps coming up, please contact us.
Error 4	Low Voltage	<ul style="list-style-type: none">- If the input power (V/Hz) is at least 10% less than the recommended, this message may appear.- Turn off the main power and check the voltage of the Power supply (V/Hz).- Use AVR to provide proper power.
Error 5	High Voltage	<ul style="list-style-type: none">- If the input power (V/Hz) is at least 10% more than the recommended, this message may appear.- Turn off the main power and check the voltage of the Power supply (V/Hz).- Use AVR to provide proper power.
Error 6	Overspeed	<ul style="list-style-type: none">- If the rotor spins faster than allowed, it may cause overload to motor capacity or trouble in the output of motor.- Turn off and on the main power to check the device.- If the error code keeps coming up, please contact us.
Error 7	Low Temperature	<ul style="list-style-type: none">- If the actual temperature is lower than the set temperature, this message may come up.- If the error code keeps coming up, please contact us.
Error 8	High Temperature	<ul style="list-style-type: none">- If the actual temperature is higher than the set temperature, this message may come up.- If the error code keeps coming up, please contact us.

6. Troubleshooting






6.2 Error Codes

Error	Possible Causes	Solution
Error 9	Vacuum	- It cannot detect the vacuum level.
Error 10	Motor	- It cannot recognize the motor. - Please contact us.

- ▶ Any wire disconnection or tuning of the device must be performed only by a service engineer who is authorized by Hanil Scientific Inc.
- ▶ Before contact Hanil Service, please check the serial number of the device indicated on the product label.

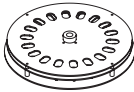
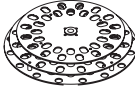
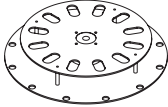
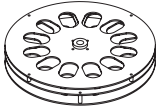
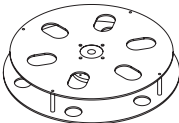
7. Rotors & Accessories

[Rotors for HVC-2124 (1)]

Cooling Trap	Tube/ Plate Type	Sleeve	Max. Tube Capacity	Hole Diameter (mm)
HRV-m0.5/2.0-124 	1.5 or 2.0 mL /0.5 mL	-	48 x 1.5/2.0 mL + 76 x 0.5 mL	11.1 /8
HRV-m2.0-120 	1.5/2.0 mL	-	120 x 1.5/2.0 mL	11.1
HRV-50-6 Incl. 6 ea x HLV-50 	50 mL /50mL Conical	HLV-50 /HLV-50c	6 x 50 mL /6 x 50 mL conical	30.4 x 101
HRV-15-12 Incl. 12 ea x HLV-15 	15 mL	HLV-15	12 x 15 mL	18 x 93
HRV-mw-2 	Microplate	-	2 loadings of microplate	130.3 x 88.5




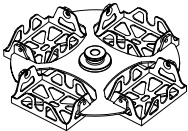
7. Ordering Information

[Rotors for HVC-2124 (2)]

Cooling Trap	Tube/ Plate Type	Max. Tube Capacity
HRV-10-18 	10 mL	18 x 10 mL vial tube
HRV-10-32 	10 mL	32 x 10 mL
HRV-15c-12 	15 mL conical	12 x 15 mL conical
HRV-20-12 	20 mL	12 x 20 mL vial tube
HRV-50c-6 	Microplate	6 x 50 mL conical

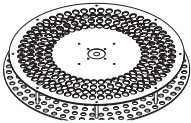
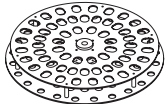

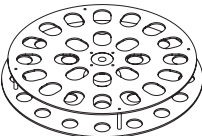
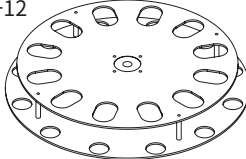
7. Ordering Information

[Rotors for HVC-2200 (1)]

Cooling Trap	Tube/ Plate Type	Sleeve	Max. Tube Capacity	Hole Diameter (mm)
HRV-m2.0-200 	1.5 or 2.0 mL /0.5 mL	-	48 x 1.5/2.0 mL + 76 x 0.5 mL	11.1 /8
HRV-15-48 Incl. 48 ea x HLV-15 	15 mL	HLV-15	48 x 15 mL	18 x 93
HRV-50-12 Incl. 12 ea x HLV-50 	15 mL	HLV-15	12 x 15 mL	18 x 93
HRV-mw-4 	Microplate Deep-well plate	-	4 loadings of microplate	86.3 x 128.3

7. Ordering Information

[Rotors for HVC-2200 (2)]

Cooling Trap	Tube/ Plate Type	Sleeve
HRV-5-192 	5 mL	192 x 5 mL
HRV-8-60 	8 mL	60 x 8 mL vial tube
HRV-15c-24 	15 mL Conical	24 x 15 mL conical
HRV-30-24 	30 mL	24 x 30 mL vial tube
HRV-50c-12 	50mL conical	12 x 50 mL conical

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