
Operation Manual

Combi R515

Multipurpose Centrifuge

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Contact Us

If you have any questions, contact Hanil Scientific Inc. or place of purchase.

info@ihanil.com / techsupport@ihanil.com

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1. General Considerations

1.1 Safety

Follow precautions and all the safety requirements described on this user manual to prevent any damage and failure of equipment and loss of lives.

1. The centrifuge should be installed on flat surface to maintain level.
Abnormal vibration is caused when the device is installed on an inclined surface.
2. Check the voltage to be used, before connecting the centrifuge to the power source.
3. Only use rotors, parts, and accessories provided by Hanil Science INC.
Hanil Scientific INC. is not responsible for damages of the device and accidents caused by using parts and accessories not recommended.
4. Do not exceed the maximum rated speed of the rotor or buckets in use.
5. Make sure to prepare necessary safety measures before using samples that are toxic or radioactive samples or pathogenic or samples or infectious blood.
6. If the centrifuge is contaminated by toxic or radioactive samples or infectious blood samples, remove contaminants completely and take needful actions such as ventilation or isolation of centrifuge.
7. Substances that may generate volatile or explosive vapor can not be centrifuged.
8. The balancing work of samples should be done in advance before operation.
9. Before operation, rotor and chamber should be dry.
10. Do not attempt to slow or stop the spinning rotor by hand.
11. Only centrifuge with rotor and rotor lid firmly tightened.
12. Do not block vents.
13. When serving the centrifuge, be sure to remove contaminants in advance.
14. Repairs must be carried out by a technologist authorized by Hanil scientific INC.
15. According to IEC61010-2-020 maintain a 30cm “clearance envelope” around the centrifuge while the rotor is spinning.
16. Please contact the place of purchase for product repairs.

1. General Considerations

1.2 Transport & Storage



- The device and the accessories may only be stored in dry rooms.

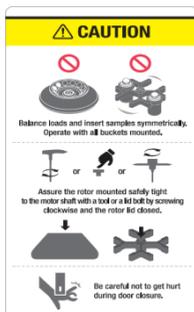
Ambient temperature 5 °C ~ 35 °C
Maximum relative humidity 30% ~ 85%
Air pressure 500 ~ 1060 hpa



- Only lift and transport the device with sufficient number of helpers.

Ambient temperature -10 °C ~ 40 °C
Maximum relative humidity 10% ~ 90%
Air pressure 500 ~ 1060 hpa

1.3 Safety label attached to a product



Insert tube symmetrically.

Firmly tighten the rotor lid.

Watch your fingers when close the door.



Mark indicating danger and warning

Mark indicating a place in danger of electric shock

1.4 Electric safety information

1. Use a power cord only provided with equipment.
2. Use sockets with a protective earth conductor and suitable power cord.
3. Do not use an extension cord.
4. Do not place anything on the power cable
5. Do not block vents.
6. If you have the following emergencies, shut off the power supply and unplug the power cord from outlet and contact your place of purchase.
 - Unusual noises or smell from the equipment.
 - Damage or wear of a power cord.
 - Breakdown of circuit breaker, fuse or safety device.
 - If you spill liquid on the equipment.
 - If the equipment is exposed to water.
 - If Some of equipment has been damaged.

2. Product description

2.1 Structure



- ① **Lid:**
Lid protects the inside of the chamber.
- ② **Lid lock:**
Maintaining the closed state of the door.
- ③ **RPM measuring window:**
Visual inspection for rotor stop or for a speed check using a stroboscope.
- ④ **Chamber:**
Where the rotor is loaded
- ⑤ **Lid packing :**
Block the inside
- ⑥ **Operation panel:**
Display and keys for operating the centrifuge.
- ⑦ **Emergency Lid Open Hole**

2.2 Delivery package

- ① Combi R515 Main body
- ② Power cable
- ③ User manual
- ④ Rotor Locking Tool (T wrench, for emergency lid open)
- ⑤ Optional items: Rotors or accessories

2. Product description

2.3 Specifications

Max. RPM	15,000 rpm
Max. RCF	26,664 xg
Max. Capacity	(Fixed angle) 6 x 250 mL, 36 x 1.5/2.0 mL (Swing-out) 4 x 750 mL, 76 x 15 mL, 4 MTPs
ACC ramps	10
DEC ramps	10
Power supply	AC 220V, 50/60Hz
Dimension(WxDxH,mm)	723 x 665 x 387
Weight(kg)	112
Cat.NO.	CB-R515

3. Installation

3.1 Packing Inspection



- Check packing conditions carefully, before unpacking.
- Contact Hanil Scientific Inc. immediately if damages found
- Check the delivery for completeness.

- You can get contact details on packing boxes and the back of the manual.

3.2 Installation

3.2.1 Selecting the location

Installation on hard and flat ground.

- Centrifuge should be installed on hard and flat place.
- If the centrifuge is installed in an inclined place, the shaft may be bent due to the weight of the rotor.

Good ventilation.

- For air circulation and safety, maintain a 30cm “clearance envelope” around the centrifuge while the rotor is spinning.



Constant temperature/ humidity

- Centrifuge equipped with the sensitive electronic software which is fragile with humidity and temperature.
- Must avoid direct ray or heater and be put in the ambience of controlled temp. and air

Avoid the corrosive gas

- Install the centrifuge in a place where corrosive gas is not generated.
- Sulfur dioxide gas and chlorine gas may cause corrosion

Leveling

- The shaft should be put exactly vertical on the horizontal flat ground by the leveling tool

3. Installation

3.2 Installation

3.2.2 Power connection



- Connect the device to voltage sources which correspond to the electrical requirements on the label attached to the device.
- Use sockets with a protective earth conductor and provided power cord.

1. Connect the power cable to the power socket on the right side of the product and plug the cord into the outlet.
2. Switch the centrifuge on using the power switch on the right side of the device.

4. Operation

4.1 Operation Panel



Button	Function
 <RPM/RCF>	Set RPM or RCF
 <TIME>	Set centrifugation time
 <TEMP>	Set the temperature: -10°C to 40 °C
 <TEMP LIMIT>	Keep the temperatureWhen centrifugation with sensitive samples
 <ACCEL>	Set acceleration rates in 10steps
 <DECEL>	Set deceleration rates in 10steps
 <START>	Start centrifugation
 <STOP>	Stop centrifugation
 <DOOR>	Open centrifuge door
 <CE>	Erase when input is wrong
 <VIEW SETTINGS>	Check the set value during centrifugation.
 <PROG>	Calling up a program
 <SAVE>	Save a program
 <ROTOR>	Check rotor condition
 <ENTER>	To set values
 <PULSE RUN>	The device decelerates and stops when the set rpm is reached

4. Operation

4.2 Opening and closing the lid



- The lid can only be opened if the centrifuge is switched on.
- Do not reach with your fingers between the housing and lid.
- Close the lid completely before operation.

- **Opening the lid**

Press the () door key

- **Closing the lid**

Put the lid on and press the edge of the lid.

4.3 Loading and removal of the rotor



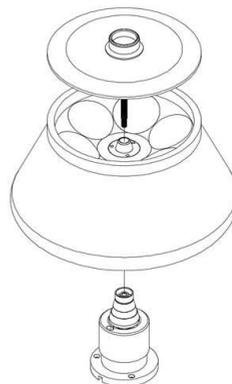
- Only use rotors , parts , and accessories provided by Hanil Science Inc.
- Do not use scatched or cracked rotor in use.

Loading

- ① Clean the motor shaft and the bore of the rotor.
- ② Load the rotor vertically onto the morot shaft.
- ③ Turn the handle of the rotor lid clockwise until the rotor nut is firmly tightened.
- ④ Check the rotor to make sure it loaded firmly.

Unloading

- ① Turn the handle of the rotor lid counterclockwise
- ② Lift up the rotor from the motor shaft.



4. Operation

4.4 Setting the Rotor ID.



- Before the operation, check and set the rotor ID.
- Rotor ID. is engraved on the rotor

Manual setting

- ① Press 'Rotor' () key, for 3 seconds.
 - ▶ The rotor is recognized at about 100 rpm.
 - ▶ Do not change the rotor ID

Automatic setting

- ④ When the power is turned on while the rotor is inserted, the rotor is recognized automatically.
 - ▶ If the rotor id is different, enter the rotor id as manual input.

* See 7. Rotor & Accessories for more info.

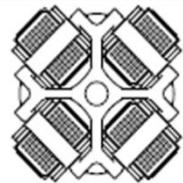
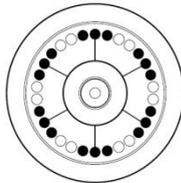
4.5 Loading tubes



- Only use tubes provided or approved by Hanil Science INC.
- Always use the same type of tube.
- Tubes should be loaded symmetrically.
- Do not exceed the maximum rated speed of the tube.
- Same volume of sample should be put on tubes.
- Check symmetric loading by balancing tubes with scales.

- ① Check the maximum load for each tube.
- ② Put tubes into rotor holes.
- ③ Tubes located opposite each other must be the same type and contain the same quantity

▶ Correct tube arrange



4. Operation

4.6 Setting RPM/RCF

- ① Press 'RPM/RCF' () key.
 - ▶ Select the rpm or rcf mode by pressing the 'RPM/RCF' () key.
- ② Press the numeric key to enter the value.
- ③ Press the 'Enter' () key to enter the value.

4.7 Setting run time

- ① Press 'Time' () key.
- ② Press the numeric key to enter the value.
 - ▶ Up to < 100hr
- ③ Press the 'Enter' () key to enter the value.

4.8 Setting Acceleration/Deceleration rate

- ① Press the 'Accel' () key or 'Decel' () key.
- ② Press the Numeric keys to select the Acc/Dec step.
 - ▶ The higher the setting step, the faster the acceleration speed.
 - ▶ The higher the setting step, the faster the deceleration speed.
 - ▶ Decel step '0' means natural brake.

4. Operation

4.9 Starting the centrifugation run

- ① Check the all parameters are correct and the lid is closed.
 - ▶ Start centrifugation with a beep.
 - ▶ If the lid is not completely closed, it will not work.
 - ▶ When the set time is reached, the device decelerated with a beep sound and stops .

4.10 End the centrifugation

- ① Press the 'Stop' ()key to abort centrifugation.
 - ▶ The device stops automatically when the set time is reached.

4.11 Pluse Function

- ① Press the 'Pulse' () key after set the RPM.
 - ▶ After reaching the set rpm value quickly, it decelerates automatically.
 - ▶ It takes about 1~2 minutes.

4.12 Saving / Recall programs

Saving a program

- ① Set the centrifugation time/speed/Accel/Decel values.
- ② Press 'Save' () key.
- ③ Select the program slot by pressing numeric keys.
- ④ Press the 'Enter' () key to save the program.

Recall a programs

- ① Press the 'Prog' ()key.
- ② Press the number of program slot you want using numeric keys
- ③ Press the 'Enter' () key to call up the program.

5. Maintenance

5.1 Care instructions

- ① Regularly inspect the rotor chamber for check the motor shaft is normal.
- ② Regularly check the rotor is not cracked or worn.
- ③ Rotate the shaft with your hand to make sure it turns smoothly.
- ④ Use the stop watch to check that the time setting is correct.

5.2 Cleaning



- Before cleaning the centrifuge, be sure to switch off the device and disconnect the power cord.

- **Outside of the device**

- ① Clean the outside of equipment with a soft and dry cloth.
 - ▶ If the device is contaminated, use a mild cleaning fluid to clean.
- ② Do not use aggressive chemicals on the device such as alcohol, benzene, acetone or phenol.
- ③ Use the stopwatch to check that the time setting is correct
- ④ Make sure do not scratch the surface of equipment when cleaning it.
 - ▶ Do not use a metal sponge.
 - ▶ If the device is rusted, remove it with a mild detergent and wipe it with a dry cloth.

- **Chamber**

- ① If the rotor chamber is not dry, wipe moisture from the chamber with a dry cloth.
- ② If the rotor chamber is dirty, wipe moisture from the chamber with a dry cloth.

- **Rotor**

- ① To prevent corrosion, take out the rotor from the rotor chamber.
- ② If any sample is spilt inside the rotor, wash and dry the rotor well.

- **Disposal**

In case of product is to be disposed of, the local wastes laws and regulations are to be observed.

6. Troubleshooting

6.1 Care instructions

If the device breaks down, contact your place of purchase or Hanil Scientific Inc.

6.2 General errors

If the device does not work properly, please check below.

Problemc	Recommended Action
Power failure	Check the power cord connection. Check the power fuse of the device.
Device cannot be started	Check the lid is closed completely.
Lid cannot be opened	Press the 'Lid open button'. Check the power connection.
Lid cannot be closed	Remove the dirt at the door latch and close the lid. Check the lid latch is not damaged.
Unusual noise and vibration	Check the device whether it is installed on the hard and flat place
	Reload the rotor symmetrically. Reload the tubes symmetrically. Tighten the clamping of the rotor with wrench by turning clockwise

6. Troubleshooting

6.3 Care instructions

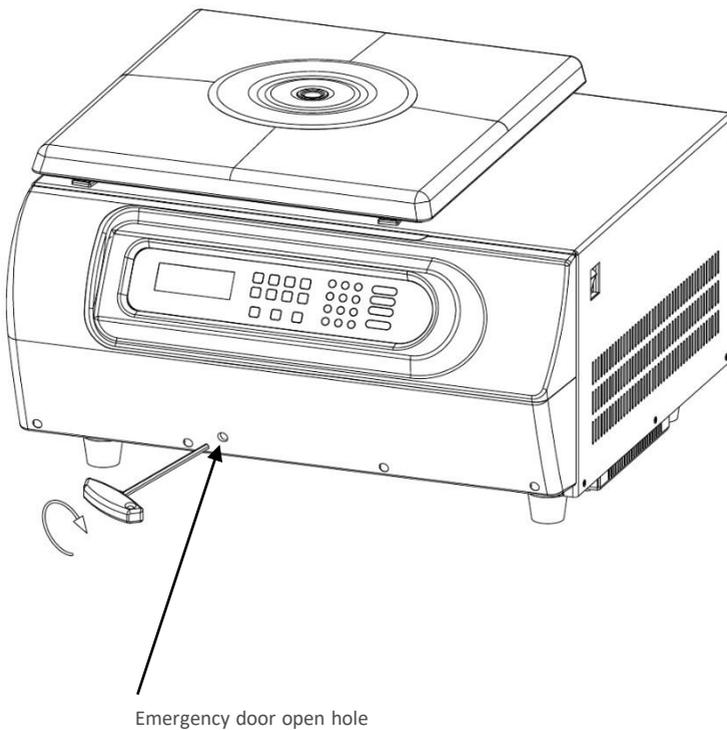
Error code	Problem	Cause	Recommended Action
E1	Imbalance error	<ul style="list-style-type: none"> Asymmetrical placement of tubes. Irregular volume of sample in tubes. Loosened rotor to the shaft. Swaying or operation the unstable ground. 	<ul style="list-style-type: none"> Check the tightness of rotor loading. Check the proper loading of tubes. Check the stable ground or worktable.
E2	Over speed	<ul style="list-style-type: none"> 10% over the set RPM. Incorrect tuning of motor and controller. 	<ul style="list-style-type: none"> Check controller and motor. Switch power on/off and re-start.
E3	Motor overheat	<ul style="list-style-type: none"> Temp. rises inside of motor. 	<ul style="list-style-type: none"> Check the stator of motor. Switch power off, restart after 1 hour.
E4	Door Open error	<ul style="list-style-type: none"> Door open during operation. 	<ul style="list-style-type: none"> Check door latch Restart after grounding.
E5	Low speed	<ul style="list-style-type: none"> -10% less than the set speed. 	<ul style="list-style-type: none"> Check the voltage. Switch power off and re-start.
E6	System error	<ul style="list-style-type: none"> Error of controlling system. 	<ul style="list-style-type: none"> Switch power off and re-start.
E7	Over current error	<ul style="list-style-type: none"> The device current is above 10A. 	<ul style="list-style-type: none"> contact your place of purchase or Hanil Scientific Inc.
E8	Power failure	<ul style="list-style-type: none"> No voltage is supplied to the device. 	<ul style="list-style-type: none"> Check the voltage. Switch power off and re-start.
E9	High voltage error	<ul style="list-style-type: none"> Motor voltage rises abnormally. 	<ul style="list-style-type: none"> contact your place of purchase or Hanil Scientific Inc.
None	Unkown Rotor ID	<ul style="list-style-type: none"> No rotor Rotor recognition error Foreign matter in the sensor 	<ul style="list-style-type: none"> Reload the rotor Remove foreign matter from the sensor

6. Troubleshooting

6.4 Emergency door open

If the centrifug door cannot be opened, you can activate the emergency open manually.

1. Wait for rotor to stop before activating the emergency open.
2. Insert the provided T-wrench into the emergency release hole and turn it clockwise until the lid is released.

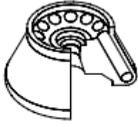


7. Rotor and accessories

7.1 Rotors and accessories

	Rotor	Capacity	Rotor ID
Angle Rotors	A0.2-48	48x0.2ml	18
	A2.0-24	24x1.5/2.0ml	1
	A2.0-36	36x1.5/2.0ml	14
	A10-12	12x10ml	2
	A15-12	12x15ml	4
	A15c-12	12x15ml Conical	8
	A50-6	6x50ml	5
	A50c-6	6x50ml Conical	6
	A50-8	8x50ml	7
	A85-6	6x85ml	9
	A250S-6	6x250ml	10
Swing Rotors	S500-4	4x 500ml	12
	S750-4	4x750ml	13

7. Rotors and accessories

Rotor		Adaptable Centrifuge	Tube Capacity Bottom Type	Required Adaptor	Bore Ø x L (mm) Radius (mm)	Max. RPM (rpm) Max. RCF (xg)
A0.2-48  <p>Hole angle : $\angle 45^\circ$ Max. Capacity : 48 x 0.2 mL Size (ø x H) : ø200 x 56 mm Incl. a coupling bolt lid</p>	Combi R515	0.2 mL	-	6.5 x 17 88.9	12,500 15,530	
		0.2 mL PCR strip	-			
	Combi 508	0.2 mL	-	6.5 x 17 88.9	8,000 6,361	
		0.2 mL PCR strip	-			
A2.0-24  <p>Hole angle : $\angle 40^\circ$ Max. Capacity : 24 x 1.5/2.0 mL Size (ø x H) : ø202 x 79 mm Max. height for tube fit : 46 mm Incl. a coupling bolt lid</p>	Combi R515	1.5/2.0 mL	-	11.5 x 38 80.8	15,000 20,325	
		0.5 mL	TR0.5		8 x 37 76.5	15,000 19,244
		0.2 mL	TR0.2		6 x 21 67	15,000 16,854
	Combi 508	1.5/2.0 mL	-	11.5 x 38 80.8	8,000 5,781	
		0.5 mL	TR0.5		8 x 37 76.5	8,000 5,473
		0.2 mL	TR0.2		6 x 21 67	8,000 4,795
	A2.0-36  <p>Type : Fixed Angle Rotor 30° Max. Capacity : 36 x 1.5/2.0 mL Size (ø x H) : ø240 x 64 mm Max. height for tube fit : 49 mm Incl. a coupling bolt lid</p>	Combi R515	1.5/2.0 mL Micro-filter tube	-	11.5 x 38 115.7	14,000 25,353
			0.5 mL	TR0.5		8 x 37 111
0.2 mL			TR0.2		6 x 21 100	14,000 21,913
Combi 508		1.5/2.0 mL Micro-filter tube	-	11.5 x 38 115.7	8,000 8,279	
		0.5 mL	TR0.5		8 x 37 111	8,000 7,942
		0.2 mL	TR0.2		6 x 21 100	8,000 7,155
A10-12  <p>Hole angle : $\angle 36^\circ$ Max. Capacity : 12 x 10 mL Size (ø x H) : ø179.9 x 82 mm Max. height for tube fit : 85.5 mm Incl. a coupling bolt lid</p>	Combi R515	10 mL Round	-	16.3 x 74.5 85.1	15,000 21,407	
	Combi 508				8,000 6,089	
A15-12  <p>Hole angle : $\angle 25^\circ$ Max. Capacity : 12 x 15 mL Size (ø x H) : ø205 x 109 mm Max. height for tube fit : 109.5 mm Incl. a coupling bolt lid</p>	Combi R515	15(16) mL Round	-	19 x 96 106	15,000 26,664	
	Combi 508				8,000 7,585	
A15c-12  <p>Hole angle : $\angle 25^\circ$ Max. Capacity : 12 x 15 mL conical Size (ø x H) : ø215 x 121 Max. height for tube fit : 124.5 mm Incl. a coupling bolt lid</p>	Combi R515	15 mL Conical	-	17 X 115 99.4	15,000 25,004	
	Combi 508				8,000 7,105	

* Radius : From the center of the rotor to the inner end of tube carrier.

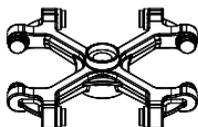
7. Rotors and accessories

Rotor		Adaptable Centrifuge	Tube Capacity Bottom Type	Required Adaptor	Bore Ø x L (mm) Radius (mm)	Max. RPM (rpm) Max. RCF (xg)
A50-6  Hole angle : $\angle 30^\circ$ Max. Capacity : 6 x 50 mL Size (ø x H) : ø200 x 109 mm Max. height for tube fit : 118.7 mm Incl. a coupling bolt lid		Combi R515	50 mL Round	-	29 x 100 96.1	15,000 24,174
			15 mL Round	TR15(50)	17 x 94 89.9	15,000 22,614
			15 mL Conical	TR15c(50)	17 x 105 91	15,000 22,891
		Combi 508	50 mL Round	-	29 x 100 96.1	8,000 6,876
			15 mL Round	TR15(50)	17 x 94 89.9	8,000 6,433
			15 mL Conical	TR15c(50)	17 x 105 91	8,000 6,511
A50c-6  Hole angle : $\angle 23^\circ$ Max. Capacity : 6 x 50 mL conical Size (ø x H) : ø205.7 x 119 mm Max. height for tube fit : 118.1 mm Incl. a coupling bolt lid		Combi R515	50 mL Conical	-	30 x 108.6 91	15,000 22,891
		Combi 508				8,000 6,511
A50-8  Hole angle : $\angle 30^\circ$ Max. Capacity : 8 x 50 mL Size (ø x H) : ø213 x 110.7 mm Max. height for tube fit : 108 mm Incl. a coupling bolt lid		Combi R515	50 mL Round	-	29 x 100 98.9	15,000 24,878
			15 mL Round	TR15(50)	17 x 94 92.8	15,000 23,344
			15 mL Conical	TR15c(50)	17 x 105 93.9	15,000 23,621
		Combi 508	50 mL Round	-	29 x 100 98.9	8,000 7,077
			15 mL Round	TR15(50)	17 x 94 92.8	8,000 6,640
			15 mL Conical	TR15c(50)	17 x 105 93.9	8,000 6,719
A85-6  Hole angle : $\angle 25^\circ$ Max. Capacity : 6 x 85 mL Size (ø x H) : ø209.1 x 112 mm Max. height for tube fit : 115.4 mm Incl. a coupling bolt lid		Combi R515	85 mL Round	-	38.3 x 95 97.6	15,000 24,551
			50 mL Round	TR50(85)	29 x 95 92.9	15,000 23,369
			50 mL Conical	TR50c(85)	29.5 x 100 93	15,000 23,394
			15 mL Round	TR15(85)	17 x 94 89	15,000 22,388
			15 mL Conical	TR15c(85)	17 x 100 89.2	15,000 22,438
		Combi 508	85 mL Round	-	38.3 x 95 97.6	8,000 6,983
			50 mL Round	TR50(85)	29 x 95 92.9	8,000 6,647
			50 mL Conical	TR50c(85)	29.5 x 100 93	8,000 6,654
			15 mL Round	TR15(85)	17 x 94 89	8,000 6,368
			15 mL Conical	TR15c(85)	17 x 100 89.2	8,000 6,382
A250-6  Hole angle : $\angle 25^\circ$ Max. Capacity : 6 x 250 mL Size (ø x H) : ø295.6 x 147.8 mm Max. height for tube fit : 124 mm Incl. a coupling bolt lid		Combi R515	250 mL Round	-	62 x 103 138.3	8,000 9,896

7. Rotors and accessories

Swing-out Rotors for Combi Series

S750-4



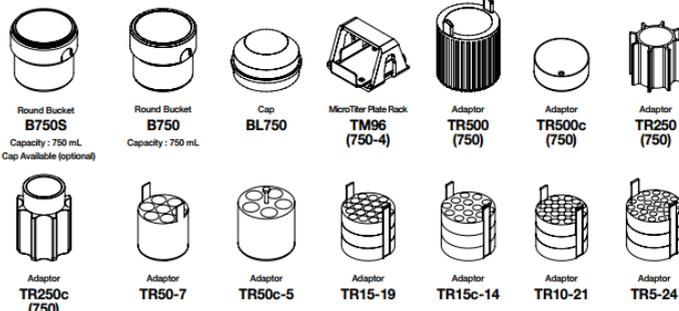
∠90°

Max. RPM : 4,000 rpm

Size (W x D x H)

: 277 x 277 x 55 mm

Bucket/Adaptor for S750-4

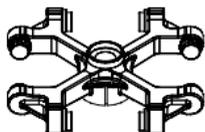


Buckets and Rack Information of S750-4

Bucket	Required Adaptor	Tube Capacity Bottom Type	Tube per Adaptor / Rotor	Bore (Ø x L, mm)	Max. height for tube fit (mm)	Max. RPM (rpm) Max. RCF (xg)
B750S / B750  BL750 	-	 750 mL Flat	1 / 4	99 x 103	150	4,000 3,515
	TR500(750)	 500 mL Flat	1 / 4	75.5 x 98.7	138.7	4,000 3,458
	TR500c(750)	 500 mL conical Conical	1 / 4	99 x 58	142	4,000 3,515
	TR250(750)	 250 mL Flat	1 / 4	62.3 x 87	138	4,000 3,443
	TR250c(750)	 250 mL conical Conical	1 / 4	60.5 x 124.4	138.5	4,000 3,452
	TR50-7	 50 mL Round	7 / 28	29.2 x 97	138	4,000 3,443
	TR50c-5	 50 mL conical Conical	5 / 20	29 x 91	142	4,000 3,515
	TR15-19	 15 mL Round	19 / 76	17.2 x 87	138	4,000 3,443
	TR15c-14	 15 mL conical Conical	14 / 56	17 x 89	140	4,000 3,479
	TR10-21	 10 mL Round	21 / 84	16 x 87	138	4,000 3,443
	TR5-24	 3 mL / 5 mL Round	24 / 96	13.2 x 60 (3 mL) 13.2 x 87 (5 mL)	138	4,000 3,443
TM96(750-4) Radius : 163.5 mm Bucket bore (w x d x L, mm) : 88 x 128.5 x 42 Max. height for tube fit : 142 mm (w/ cap), 159 mm (w/o cap)		 MTP	1 / 4	88 x 128.5 x 42		4,000 2,925

7. Rotors and accessories

S500-4



∠90°
 Max. RPM : 4,500
 Size (W x D x H)
 : 262 x 262 x 55 mm

Bucket/Adaptor for S500-4



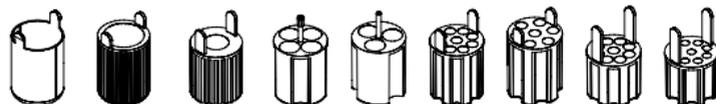
Round Bucket
B500
 Capacity : 500 mL
 * Cap included



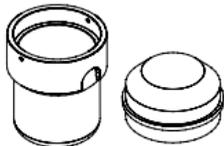
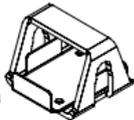
Cap
BL500



MicroTiter Plate Rack
TM96
 (500-4)



Buckets and Rack Information of S500-4

Bucket	Required Adaptor	Tube Capacity Bottom Type	Tube per Adaptor / Rotor	Bore (Ø x L, mm)	Max. height for tube fit (mm)	Max. RPM (rpm) Max. RCF (xg)
 <p>Radius : 194 mm Bucket bore (ø x L, mm) : 80 x 111 Max. height for tube fit : 144 mm (w/ cap), 157.7 mm (w/o cap) Incl. cap</p> <p>Combi R515 Max. RPM : 4,500 Max. RCF : 4,392 xg Combi 508 Max. RPM : 4,000 Max. RCF : 3,435 xg</p>	TR500(500)	 500 mL Flat	1 / 4	73 x 125	142	4,500 4,347
	TR250(500)	 250 mL Flat	1 / 4	62 x 100	139.5	4,500 4,290
	TR100(500)	 100 mL (85 mL) Round	1 / 4	38.5 x 84.5	139.5	4,500 4,290
	TR50-4	 50 mL Round	4 / 16	29.5 x 85.5	139.5	4,500 4,290
	TR50c-3	 50 mL Conical	3 / 12	30 x 90	140	4,500 4,302
	TR15-9	 15 mL Round	9 / 36	16.5 x 85	139.5	4,500 4,290
	TR15c-7	 15 mL Conical	7 / 28	17 x 95.5	140.5	4,500 4,313
	TR10-9	 10 mL Round	9 / 36	17 x 64	138.9	4,500 4,279
	TR5-9	 5 mL Round	9 / 36	13 x 64	138	4,500 4,256
TM96(500-4)		 MTP	1 / 4	-		4,000 2,755

MEMO

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