www.capp.dk

CappRondo Refrigerated Centrifuge

Operating Manual

CR-1730R

Capp ApS
Landbrugsvej 10,
DK-5260 Odense S
Denmark
Tel.: +45 6613 6140
Fax: +45 6613 2770
Email: info@capp.dk

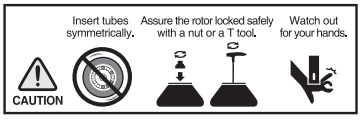
DOC. No. : C02DC00204-1704CAPP

CONTENTS

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.

1. Meanings of Symbols & Safety Precautions

1.1 Safety Labels on Instrument

Symbol	Meaning
	Attention and warning
	Attention and warning for electric shock
	Manual Door Open Hole
	Attention and warning for correct way of sample balancing in the rotor. Attention and warning for rotor coupling. Attention and warning for lid opening and closing.

1.2 Safety Precautions

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

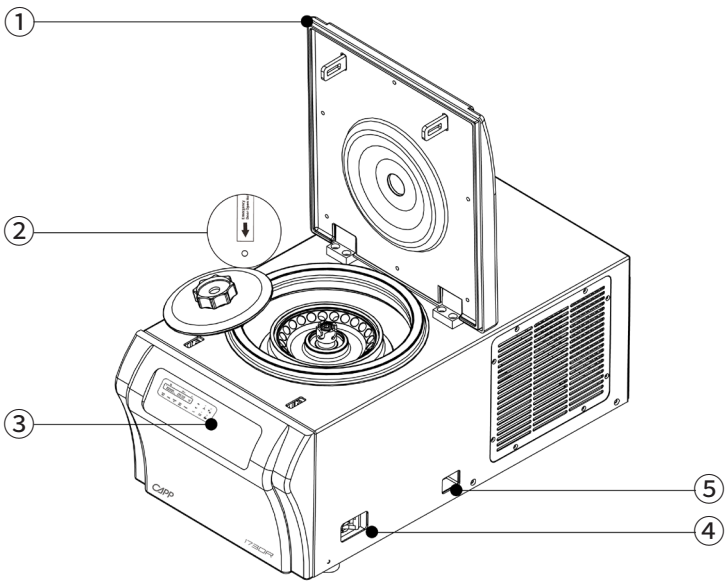
1. ALWAYS locate the instrument on a flat, rigid and stable table capable of withstanding the weight of the instrument and its spinning operation.
2. ALWAYS make a safety zone of 30 cm around the centrifuge to indicate that neither hazardous materials nor persons should be permitted within the area during operation.
   ALWAYS position the instrument with enough space on each side of instrument to ensure proper air circulation.
3. ALWAYS install the instrument within a temperature and humidity controlled environment.
   (Permissible ambient temperature: +5°C ~ +35 °C, Relative humidity: ≤ 85%)
4. Before connecting the power, check the rated voltage.
5. Should not use unapproved rotors and associated accessories. Only use rotors from Manufacturer with appropriate centrifugal tubes and suitable adaptors to embrace sample containers tightly enough inside rotors.
6. Before operating the instrument, check if the rotor and the rotor lid are securely fastened. Should operate the instrument with a rotor properly installed and secured to the motor shaft.
7. Mount the rotor on the motor shaft properly, check it with spinning manually.
8. Do not stop the rotor by touching with hand during the instrument is running.
9. Emergency lid open should be performed only when spinning is completely stopped.
10. Should not exceed the rated speed or specific gravity. Samples whose density is greater than 1.2g/ml must have reduced maximum rotational speed to avoid rotor failure.
11. The sample content should not exceed 80% of total capacity of a tube. Otherwise, it would cause spillage of sample fluid and even the tube breakage.
12. ALWAYS load the tubes symmetrically with evenly weighted samples to avoid rotor imbalance. If necessary, use the water blank to counterbalance the unpaired sample.
13. The operation speed should not exceed the highest value of the individual guaranteed g-forces of each centrifuge, rotor, bucket or adaptors and sample container, especially the guaranteed g-force of sample container should not be neglected.
14. The rotors should be cleaned and kept dry after every use for longer life and safety.
15. ALWAYS disconnect the power supply prior to maintenance care and service to avoid electrical shock.
16. ALWAYS use proven disinfection procedures after centrifuging biohazardous materials.
17. Should not centrifuge flammable, toxic, radioactive, explosive, or corrosive materials.
18. 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.

NOTE

- Do not place dangerous materials within 30 cm distance around the instrument, and that is also recommended by IEC 61010-2-020.
- Use the emergency lid open 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 instrument 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 instrument and often result serious damage.
- Install the instrument at the place without any kinds of corrosive gases.

2. Product Description & Technical Specifications

2.1 Product Description



① Lid
② Emergency Lid-Lock Release Hole
③ Display & Control Panel
④ Power Switch
⑤ Power Socket

2.2 Accessory

User Manual | AC Power Cord | Emergency Lid Open Tool | Rotor Locking Tool | Lubricant (grease)

2.3 Technical Specificaitions

Max. RPM / Max. RCF (Fixed angle)	17,000 rpm / 27,237 x g
Max. RPM / Max. RCF (Swing-out)	13,000 rpm / 16,343 xg
Max. capacity (Fixed angle)	30 x 1.5/2.0 ml, 12 x 5.0 ml, 8 x 8 PCR strips
Max. capacity (Swing-out)	16 x 1.5/2.0 ml
Temp range (°C)	-20 ~ 40
FAST cool button	Yes
Time control	Pulse, timed < 100 min, or continuous
Time counting range	Selectable, at set speed or from starting
RCF/RPM conversion	Yes
Noise level (dependent on rotor)	≤56 dB
ACC/DEC ramps	9/10 steps (17/17 sec)
Program memory	100
Parameters on display window	RPM(RCF), Operation Status, Lid Open/Close, Min:Sec, Temp, (ACC), (DEC)
Display	Blue LCD
Rotor Identification	Automatic
Imbalance cutout	Yes
Safety lid lock	Yes
Lid drop protection	Yes
Power supply (V/Hz)	220V~ 60Hz
Power Requirement (VA)	2KVA
Dimension (W x D x H)	310 x 620 x 265 mm
Weight without rotor	43 kg
CE MARK	Yes
Cat. No.	CR-1730R

NOTE **This instrument has following functions for safety**

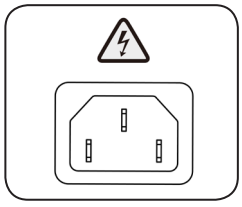
- ▶ Automatic rotor identification function
- ▶ Automatic detection and alarms for imbalance, excess speed and heating

3. Installation

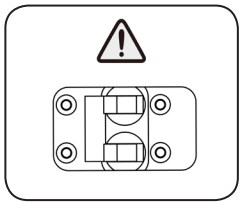
3.1 Power On / Off and Lid Release

3.1.1 Power On / Off

1. Connect the AC power cord to the power socket on the back of the instrument and put the plug into the outlet.
▶ Check the proper power.



2. Turn on the instrument by pressing the power switch on the right side of the instrument. Turn on the switch [I].



3.1.2 Lid Release

For lid opening, the lid button [⏏] is used.
Display shows the status of the lid (open ⏏ , closed ▬).

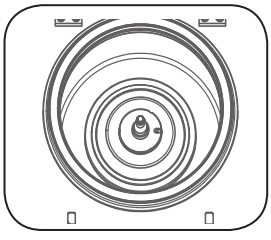
1. Touch [LID] button when the lid is closed (Lid LED shows off).
▶ When the lid is open, the display status changes from ⏏ to ▬ and lid LED turns on.

NOTE **This instrument has following functions for safety**

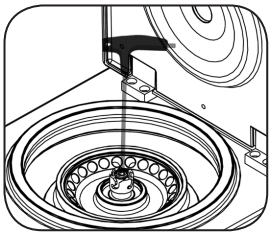
- ▶ The lid is not opened while the instrument is running
- ▶ If the lid is opened, the instrument could not be operated even with pressing the [▶/■] button.
- ▶ For operational safety, this instrument has the automatic rotor recognition function.
- ▶ When you supply the power, "Rotor Scan…" will be appeared. If the rotor is absent, the "Error 9" will be appeared. This message will be cleared after rotor coupling and running.
- ▶ The lid is not automatically opened after finishing operation to keep the sample at proper temperature
- ▶ Power Failure: If there is any power failure during the operation, lid is not opened with [⏏] button. The lid can be opened only when the operation is completely stopped and the power is on again. If you want to open the lid at the power failure, please refer to '4.10 Emergency Lid Open'

3.2 Rotor Coupling and Disassembling

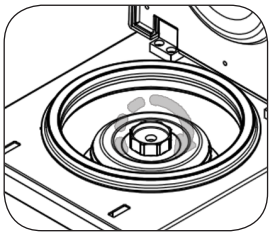
1. Before coupling a rotor, clean the motor shaft, rotor, and chamber with soft dry towel.
▶ If you find any foreign substances, they must be removed from the motor shaft, rotor and chamber.



2. Mount a proper rotor into the motor shaft and fix it using Rotor Locking Tool.
▶ To assemble the rotor, rotate the Rotor Locking Tool **clockwise** until tightly assembled.
▶ To disassemble the rotor, rotate the Rotor Locking Tool **counterclockwise**.
▶ Grasp the rotor with one hand and assemble or disassemble the rotor using the Rotor Locking Tool.



3. After placing the sample tubes into the holes of the rotor, close the rotor by rotating the rotor lid nut clockwise
▶ To close the rotor lid, rotate **clockwise**.
▶ To open the rotor lid, rotate **counterclockwise.**



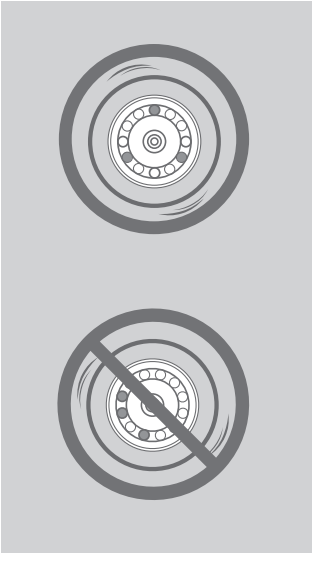
CAUTION

When you run a fixed angle rotor, make sure that the rotor lid is tightly closed.
If you don't close the rotor lid completely, it will be crushed.

3.3 Positioning of Sample Tubes

1. Before loading sample tubes, check the water drop or dirt in the rotor hole or inner adaptor.
▶ If you find any water drops or dirt in the rotor hole or adaptor, remove them with soft and dry cloth.

2. The sample tubes should be placed in the rotor holes in a balanced way.
▶ The sample tubes should be loaded symmetrically with the density and the weight considered to avoid imbalance.
▶ In case the number of samples cannot make balance in weight, please use control tubes. Otherwise, it can cause noise or vibration, which may damage the instrument.
▶ Only use appropriate centrifugal tubes and do not exceed the speed beyond the tube's max g-strength.

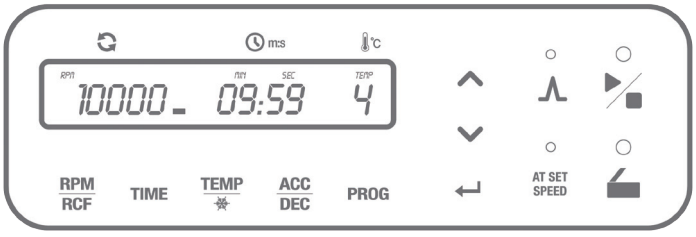


NOTE

For the safety, the instrument has 'Imbalance Cut-off' function to sense the imbalance of the loaded tubes.

4. Operation

4.1 Key Functions of Control Panel



☐ RPM/RCF
RPM/RCF indicates rotating speed.
The maximum RPM/RCF of 1730R is 17,000/27,237.

☐ TIME
Time can be set at 'Minute' and 'Second' with the range up to 99 min 59 sec (00:00: continuous).

☐ TEMP
Temperature can be set from -20 degree to 40 degree.
When [TEMP] button is kept pressed for longer than 2 seconds, it can reach rapid refrigeration up to the setting temperature value (Fast Cool).

☐ ACC/DEC
The acceleration and deceleration rates can be set from 1 to 9 and from 0 to 9, respectively.
The DEC '0' in deceleration means natural deceleration. As the number increases, the acceleration or the deceleration becomes faster.

☐ PULSE
[PULSE] button is for quick and short spin-down.
Rotor spins while the button is kept pressed and stops immediately as the button is released.

☐ PROG (Program)
Max. 100 programs can be saved and recalled.
When [PROG] button is kept pressed for longer than 2 seconds, all buttons can be locked or unlocked.

☐ UP/DOWN
When setting up the RPM/RCF and Time, you can put the set value with up and down button.

☐ ENTER
[ENTER] button is for completion of data setting.

☐ LID
[LID] button is to open the closed centrifuge lid.

☐ AT SET SPEED
AT SET SPEED mode counts the run time once the actual run speed reaches to the set speed value.
[AT SET SPEED] button is for setting the number of sound and volume as user mode (touch for more than 2 seconds).

☐ START/STOP
[START/STOP] button is to start or stop centrifugation.

4.2 Setting Rotation Speed (RPM/RCF)

1. [Touch [RPM/RCF] once.

▶ The RPM mode is activated by touching [RPM/RCF].
▶ If the RCF mode is selected, touch [RPM/RCF] once more.
▶ The input RPM value flickers on the display window and can be set here.

2. Touch Up [^] or Down [v] button to change input value.

▶ RPM setting unit: 10 rpm
▶ RCF setting unit: 1 xg
▶ If you keep holding finger on the Up/Down buttons for more than 5 seconds, the RPM/ RCF value is gradually increased or decreased with 100 rpm, 1000 rpm unit and 10 xg, 100 xg and 1000 xg unit.
▶ If you do not touch the Up/Down button for 15 seconds, the setting mode is cleared.

3. Touch the [ENTER] button to save the setting value.

4.3 Setting Time

Time can be set at 'Minute' and 'Second' and the operation time is available up to 99 min 59 sec or continuous (00 min 00 sec).
Two alternative time counter modes are available. When 'AT SET SPEED' mode is not set, the time count starts at the point when START/STOP [▶/■] button is pressed.
On the other hand, the 'AT SET SPEED' mode counts the time of rotation at the set speed.

4.3.1 Setting AT SET SPEED

1. [Touch [AT SET SPEED] button once.

▶ **AT SET SPEED Mode** : For exact time control, this instrument can be set with AT SET SPEED mode which counts the run time once the actual run speed reaches to the set speed value and stops when the deceleration begins.

*[AT SET SPEED] lamp turns on: From t1 to t2
*[AT SET SPEED] lamp turns off: From t0 to t2

4.3.2 Setting Time

Time setting unit: 1min. / 1 sec.

1. Touch [TIME] button once.
▶ If [TIME] button is touched once, the input value of the 'SEC' sign flickers.

2. Touch Up [^] or Down [v] button to change the second value.
▶ If you do not touch the Up/Down button or 15 seconds, the setting mode is cleared.
▶ Touch [ENTER] button to pass the 'MIN' value setting.

3. Touch Up [^] or Down [v] button to change the minute value.
▶ If you do not touch the Up/Down button for 15 seconds, the setting mode is cleared.
▶ Touch [ENTER] button to complete the setting.
▶ When the Up/Down button is kept pressed for more than 5 seconds, the TIME value is increased or decreased with 10 sec./ 10 min. unit.

4.4 Setting Temperature and Fast Cool

Time setting unit: 1min. / 1 sec.

4.4.1 Setting Temperature

1. Touch [TEMP] button.
▶ The input value of the 'TEMP' sign flickers on the display window and can be set here

2. Touch Up [^] or Down [v] button to change input ACC or DEC value.
▶ If you do not touch the Up/Down button for 15 seconds, the setting mode is cleared.
▶ Touch [ENTER] button to complete the setting.

4.4.2 Setting Fast Cool

1. Setting the temperature. (Please refer to 4.4.1 Setting Temperature).

2. After installation of the rotor and closing the lid of instrument, touch the [TEMP] button for more than 2 seconds.
▶ For fast cooling, the instrument is refrigerated down to the set temperature in a short time.
▶ During the fast cooling, the rotor runs at low speed (1,000 rpm).
▶ The passed time is showed on the display window.

4.5 Setting Acceleration / Deceleration (ACC/DEC)

Acceleration (level: 1~9) and deceleration (level: 0~9 (0: spontaneous deceleration)) can be controlled according to the sample characteristics

1. Touch [ACC/DEC] button.
▶ The input value of the ACC or DEC value appears on TEMP position of the display window and can be set here.

2. Touch Up [^] or Down [v] button to change input ACC or DEC value.
▶ Input the desired level of ACC from 1 to 9. (Level 9: The fastest acceleration)
▶ Input the desired level of DEC from 0 to 9. (Level 0: Natural deceleration / Level 9: The fastest deceleration).
▶ If you do not touch the Up/Down button for 15 seconds, the setting mode is cleared.
▶ Touch [ENTER] button to complete the setting.

4.6 START / STOP

START/STOP [▶/■] button is used to start or stop the centrifugation.

4.6.1 START

1. After setting the RPM/RCF, Time, TEMP and ACC/DEC, touch START/STOP [▶/■] button.
▶ When the rotation starts, the 'START LED' is turned on.
▶ [START/STOP] button can be ready only when the lid is closed.
▶ When you touch [ENTER] button during operation, display window shows the saved setting parameters.

4.6.2 STOP

2. Touch [▶/■] button to stop spinning.
▶ If you touch [START/STOP] button, the operation stops immediately.
▶ When you touch [START/STOP] button twice, the operation is stopped with DEC 9.

NOTE Stop at the Maximum Braking Deceleration

Touch [▶/■] button twice for the fastest deceleration.
And the rotation stops at the maximum deceleration rate (DEC9) regardless of the set DEC value.

4.7 PULSE (Short Spin)

This function can be used for the quick and short spin-down. If the touched pulse [⅄] button is released, the centrifuge decelerates immediately. (Short Spin)

1. Touch [⅄] button and release at the point you want to stop the operation. And then, the centrifuge decelerates immediately.
▶ If the actual speed reaches the set value, the centrifuge starts to decelerate even when [PULSE] button is kept pressed.

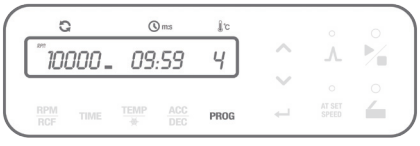
4.8 Save / Call Program

4.8.1 SAVE

The set parameters (speed, time and ACC/DEC) can be stored in the individual programs and recalled for next use.

1. Set parameters (RPM/RCF, Time, Temperature and ACC/DEC, etc.) and save them in the program. (refer to 4.2 Setting Rotation Speed / 4.3 Setting Time / 4.4 Setting Temperature and Fast Cool / 4.5 Setting Acceleration / Deceleration)

2. Touch [PROG] button twice.
▶ The program number flickers and the “SAVE” sign appears on the display window



3. Touch Up [^] or Down [v] button to select the program number and touch [ENTER] button to complete the saving.
▶ If you do not touch the Up/Down button for 15 seconds, the setting mode is cleared.
▶ Maximum 100 programs can be saved. (Program number: 00 to 99)

4.8.2 Call Program

The saved programs from 0 to 99 can be recalled at need.

1. Touch [PROG] button once.
▶ The program number flickers and the "CALL" sign appears on the display window.

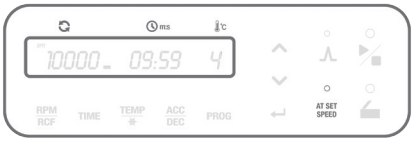
2. Touch Up [^] or Down [v] button to select the program number you want to recall and then touch [ENTER] button.
▶ If you do not touch the Up/Down button for 15 seconds, the setting mode is cleared.

4.9 End Alarm

Users can select the preferred end alarm.
Repeat account and sound pitch of the end alarm can be selected

4.9.1 Access to End Alarm

1. Keep [AT SET SPEED] button pressed for more than 2 seconds.
▶ 'Sound rPt' appears on the display window.
▶ Touch Up [^] or Down [v] button to select the mode (Sound rPt (Repeat)/ Sound LEVEL) and then touch [ENTER] button.



4.9.2 Setting the Repeat Count of End Alarm

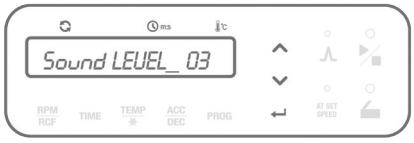
1. Check the "Sound rPt" on the display window

2. Touch Up [^] or Down [v] button to change the repeat count and then touch the [ENTER] button.
▶ The mode is passed to 'Sound Level' by touching [ENTER] button.
▶ Repeat counts of end alarm: 0~99
(0: silent, 99: 99 times)

4.9.3 Setting the Sound Pitch of End Alarm

1. Check the "Sound LEVEL" on the display window.

2. Touch Up [^] or Down [v] button to change the repeat count and then touch the [ENTER] button.
▶ The mode is passed to 'Sound Level' by touching [ENTER] button.
▶ Repeat counts of end alarm: 0~99
(0: silent, 99: 99 times)



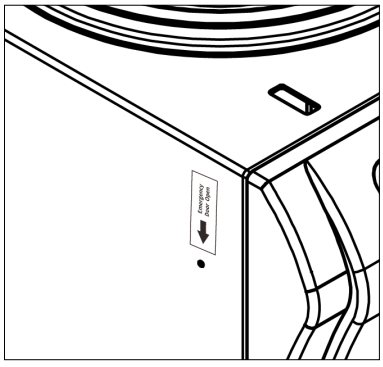
4.10 Emergency Lid Open (Manual Lid Release)

When the lid of the instrument is not opened by pressing the lid button due to an accidental power shut-off or any unexpected causes, users can manually open the lid by following the instruction.

1. Check if the rotor in the centrifuge is completely stopped.

2. Find a hole for manual lid control on the left side of the instrument

3. Insert Emergency Lid-Lock Release Tool into the hole and push it until the lid is released.
▶ After the lid is opened, it is recommended to wait until electricity gets back to normal



CAUTION

The manual lid release should be performed only when spinning is completely stopped.
If not, it could bring about harmful damage to the operators or the samples

5. Maintenance

Outer Part of Instrument

1. Clean the outside of the instrument with dry soft cloth. If necessary, dip the cloth in neutral detergent and clean any contaminated area. Keep completely dry after cleaning.
2. Do not use any volatile chemicals such as alcohol, benzene, benzole, and thinner, etc.
3. Be careful not to make scratches on the surface of the instrument.
   Scratches may cause corrosion on the surface of the instrument.
   Any parts with rust should be cleaned with neutral detergents and kept dry.

Chamber

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

Shaft

1. Always keep the motor shaft clean to avoid any imbalance problem caused by the contaminants.
2. After using the instrument, take out the rotor from the shaft and clean the shaft with dry soft cloth to keep dry.
3. If the rotor cannot be easily removed from the shaft, do not pull the rotor by force and call a service engineer authorized by Manufacturer.

Rotor

1. If any parts become contaminated, clean them with soft wet cloth and keep the rotor 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 instrument.
3. While the instrument is not used, remove the rotor from the motor shaft and stand it upside down.

6. Troubleshooting

6.1 Checklist

If any problems occur in the centrifuge, please check the following list before contact your local partner.

Symptom	Checklist
Power failure	Please refer to [3.1.1 Power On / Off]. Make sure the AC Power cord completely connects the instrument to the power outlet. Check the power switch is on.
Can't be started.	If the lid is not closed completely, the instrument does not run.
Can't open the lid	Check the lid status on the display window and close the lid completely if not. Please refer to [3.1.2 Lid Release].
Can't close 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 the Emergency Lid-Lock Release Tool. Please refer to [4.10 Emergency Lid Open].
Noise and vibration during running	Please check if the table and the instrument keep level.
	Please recheck the three coupling status on the following. 1. Balanced coupling of the rotor to the motor shaft 2. Complete fixing of the rotor by the Rotor Locking Nut 3. Fastening of the rotor lid and the rotor. Please refer to [3.2 Rotor Coupling and Disassembling].
	Check the balanced positioning of the samples in the rotor. Please refer to [3.3 Positioning of Sample Tubes].

6.2 Error Codes

If any of the following error messages comes up with beeping sound, press [ENTER] button to stop the beep and clear the error status. If the error message does not disappear, check into the current status by referring to the following information.

Error	Possible Causes	Actions
Error 1	Motor	▶ If the speed does not reach 200 rpm within 2 seconds after motor starts to operate, this message may appear. ▶ Check whether the motor is normally working or not. ▶ If the error message does not disappear, please contact a Service Engineer of your local partner.
Error 2	Lid Open	▶ If the lid opens while spinning or has any trouble in the lid sensor, this message may come up. ▶ Remove the dirt at the lid latch and close the lid completely. Check the lid closing status on the display window. ▶ If the error message does not disappear, please contact a Service Engineer of your local partner.
Error 3	Motor Overheating	▶If the motor is overheated, this message may come up. Keep off the power supply for an hour, and turn on the power to check up the instrument. ▶If the error message does not disappear, please contact a Service Engineer of your local partner
Error 4	Low Voltage	▶ If the power input (V/Hz) is at least 10% lower than the recommended power, this message may come up. ▶ Turn off the power supply and check the voltage of the Power supply (V/Hz). ▶ Use AVR to provide proper power.
Error 5	High Voltage	▶ If the power input (V/Hz) is at least 10% higher than the recommended, this message may come up. ▶ Turn off the power supply and check the voltage of the Power supply (V/Hz). ▶ Use AVR to provide proper power.
Error 6	Overspeed	▶ If the instrument spins faster than allowed (1,000 rpm higher than the set speed), it may cause overload to motor capacity or any trouble in the output of motor. ▶ Turn off and on the power supply to check up the instrument. ▶ If the error message does not disappear, please contact a Service Engineer of your local partner.

Error	Possible Causes	Actions
Error 7	System	▶ If the installed software has any bugs, this message may come up. ▶ Contact a Service Engineer of your local partner and get the firmware upgrade. Wire disconnection or tuning of the instrument must be performed only by a Service Engineer authorized by Manufacturer.
Error 8	Imbalance	▶ Check the balance status of the samples in the rotor (please refer to [3.3 Positioning of Sample Tubes]) and turn off and on the instrument to check the status. ▶ If the error message does not disappear, please contact a Service Engineer of your local partner.
Error 9	RPM Sensor	▶ If the rotor recognition fails, this message comes up. ▶ The message will be cleared by coupling an appropriate rotor. Please refer to [3.2 Rotor Coupling and Disassembling.] Disassemble and couple a compatible rotor and turn off and on the instrument to check out the status. ▶ If the error message does not disappear, please contact a Service Engineer of your local partner.
Error 11	Chamber Temperature	▶ If the instrument is not reached to setting temperature within an hour, this message is appeared. ▶ Please contact a Service Engineer of your local partner.
Error 12	Temp. Sensor	▶ If there is a faulty in the temperature sensing of chamber or over heated, this message is appeared. ▶ Please contact a Service Engineer of your local partner.
Error 15	Motor Temperature Sensor	▶ If the motor temperature sensor does not normally work, this message may come up. ▶ Please contact a Service Engineer of your local partner.
Error 16	Compressor Temperature	▶ If the temperature of compressor is over heated up, this message is appeared. ▶ Please contact a Service Engineer of your local partner.
Error 17	Data communication Error	▶ If the data can't be transmitted from the main board to the display module, this message is appeared. ▶ If the error message does not disappear, please contact a Service Engineer of your local partner.

7. Rotors and Accessories

Rotors and accessories for CR-1730R

CR-17-24	Fixed angle rotor of CR-1730R for 24 x 1.5mL / 2.0mL microtubes
CR-17-30	Fixed angle rotor of CR-1730R for 30 x 1.5mL / 2.0mL microtubes
CR-17-18	Fixed angle rotor of CR-1730R for 18 microfilter tubes
CR-17-5	Fixed angle rotor of CR-1730R for 12 x 5mL snap cap microtubes
CR-17-PCR	Fixed angle PCR-tube Rotor of CR-1730R for 64 PCR tubes or 8 rows of PCR strips
CR-17-D8	Drum Rotor of CR-1730R for 8 microtubes (buckets are not included)
CR-17-D16	Drum Rotor of CR-1730R for 16 microtubes (buckets are not included)

Buckets for Rotors of CR-1730R

CR-17-B8	Single tube bucket Drum Rotor CR-17-D8 (total 8 buckets are required)
CR-17-B16	4-tube bucket Drum Rotor CR-17-D16 (total 4 buckets are required)

Buckets for Rotors of CR-1730R

CR-17-02	0.2 mL adaptor of microtube rotors
CR-17-05	0.5 mL adaptor of microtube rotors

MEMO

MEMO