

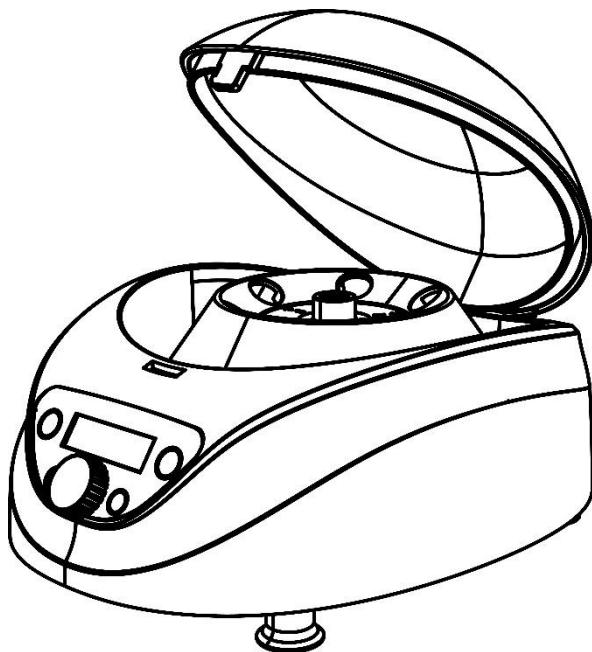


Centrifuges



# USER MANUAL

## DM0506 Clinical Centrifuge



CE FCC

12301604

Ver.20211215

This user manual needs to be read before operating this product.  
Please follow the safety instructions provided in this manual.



Centrifuges



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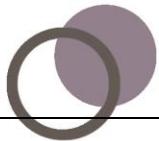
#### Common safety precautions

Carefully read the following safety precautions for a thorough understanding.

- Follow the instructions and procedures described in this manual to operate this centrifuge safely.
- Carefully read all safety messages in this manual and the safety instructions on the instrument.
- Safety messages are labeled as indicated below. They are in combination with signal words of “WARNING” and “CAUTION” with the safety alert symbol to call your attention to items or operations that could be dangerous to you or other persons using this instrument. The definitions of signal words are as follows:

#### WARNING : Personal Danger

Warning notes indicate any condition or practice, which if not strictly observed, could result in personal injury or possible death.

**⚠ CAUTION : Possible damage to instrument**

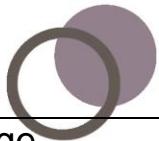
Caution notes indicate any condition or practice, which if not strictly observed or remedied, could result in damage or destruction of the instrument.

**NOTE :** Notes indicate an area or subject of special merit, emphasizing either the product's capability or common errors in operation or maintenance.

- Do not operate this centrifuge in any manner not described in this User manual.  
When in doubt or have any troubles with this centrifuge, ASK FOR HELP.
- The precautions described in this User manual are carefully developed in an attempt to cover all the possible risks. However, it is also important that you are alert for unexpected incidents. Be carefully operating this centrifuge.

**⚠ WARNING :**

- This centrifuge is not explosion-proof. Never use explosive or flammable samples.
- Do not install the centrifuge in or near places where inflammable gases are generated or chemicals are stored.

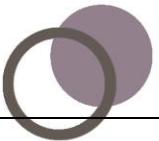


- Do not place dangerous material within 30cm around the centrifuge.
- Make sure to prepare necessary safety measures before using samples that are toxic, radioactive or contaminated with pathogenic micro-organisms at your own responsibility.
- If the instrument, rotor and/or accessories that has been contaminated by solutions with toxic, radioactive or pathogenic materials, clean it according to the decontamination procedure that you are specified.
- If you require services at site, please sterilize and decontaminate it in advance, and then notice the service center involved in the details of the particular materials.
- Do not handle the power cord or turn on or off the POWER switch with wet hands to void electrical shocks.
- For safety purposes, do not enter within 30cm around this centrifuge while it is in operation.
- While the rotor is rotating, never forcedly release the door lock.
- Unauthorized repairs, disassembly, and other services to the centrifuge except by our service center are strictly prohibited.



#### CAUTION

- This centrifuge must be located on one firm and level table.
- Make sure the centrifuge is horizontal before running.
- Make sure the angle between the door and cover is greater than 70 degrees



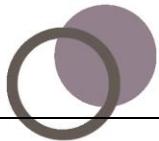
when open the door.

- Be careful not put your fingers or hands between the door and cover when the door off.
- Do not move or relocate this centrifuge while it is running.
- If fluid spills in the rotor chamber, please promptly clean and dry with a dry cloth to avoid sample contamination.
- Ensure to remove any objects and fragments of the tubes dropped inside the rotor chamber before running this centrifuge.
- Cautions on rotors
  - (1) Always check for corrosion and damages on the rotor surface before using it. Do not use the rotor if an abnormality is found.
  - (2) Do not set the centrifuge speed beyond the allowable minimum speed of the rotor kits (rotor or adapters). Make sure to run it below the allowable minimum speed.
  - (3) Do not exceed the allowable imbalance.
  - (4) Use the rotor and tubes within their actual capacities.
  - (5) If the rotor is attached with a lid, ensure it is tightened before operation.
- If any abnormal condition occurs during operation, please stop it immediately and contact our service center. Notify the service center is a warning code if displayed.
- Vibrations are likely to damage the centrifuge, contact our service center if abnormality observed.



## 1. Performance indicators

|   |  |
|---|--|
| Maximum rotation speed                    | 5,000rpm(300-5,000rpm) step: 10rpm   |
| Maximum relative centrifugal acceleration | 2,600×g, step: 10×g  |
| Capacity                                  | 15ml×6   |
| Timing                                    | 30s-99 min; HOLD (continuous running)  |
| Drive motor                               | Brushless motor  |
| Safety performance                        | Door lock, overspeed, and onboard diagnosis system.  |
| Power                                     | Single phase, 100-240V, 50/60Hz, 2A  |
| Dimensions (mm)                           | (L) 300×(W) 240×(H) 180  |
| Weight                                    | 5.2kg  |
| Acceleration and deceleration time        | 35s↑40s↓   |
| Noise                                     | ≤56dB  |
| Other functions                           | Rotation speed/RCF switch, sound notification, 2-level deceleration; predefined and customizable |



programs.

## 2. Conformity to standards

The centrifuge's structure conforms to the following safety standards:

EN 61010-1

EN 61010-2-10

UL 3101-1

The centrifuge's structure conforms to the following electromagnetic compatibility standard:

EN 61326-1

Compliant with the following EU standards:

EMC standard: 89/336/EWG

Mechanical Design: 73/023/EWG

## 3. Environmental requirements

### 3.1. Basic operating requirements

- (1) Power supply: single phase, 100-240V, 50/60Hz, 2A, sinusoidal waveform.
- (2) Ambient temperature: 2~40°C.



(3) Relative humidity: ≤80%.RH

(4) No vibration or air flow present nearby that might affect performance.

(5) No conductive dust, explosive gas or corrosive gas exists in ambient air.

### 3.2. Transport and storage conditions

(1) Range of ambient temperature: -40°C-55°C.

(2) Range of relative humidity: ≤93%.RH

(3) The centrifuge must remain upright while in transit, suitably protected using wooden Kart box

(4) Lift the centrifuge by the chassis only.

(5) Pay attention to the centrifuge's weight while in transit (see "0.1. Performance indicators").

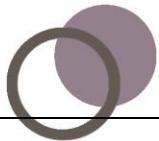
## 4. Installation

Users must strictly comply with the installation instructions contained in this chapter.

Be advised! Remove the rotator before moving the centrifuge.

 Warning

- Improper power connection might damage the centrifuge.



- Before connecting the power supply, please check the power supply for compliance with the requirements.

#### 4.1. Mounting position

- (1) This centrifuge must be mounted on a solid, flat and tabletop with contact between the four feet of the centrifuge and the tabletop. Don't mount the centrifuge on any sliding tabletop, otherwise significant vibration might occur. Carefully place the centrifuge to avoid damage.
- (2) The ideal ambient temperature is  $20^{\circ}\text{C} \pm 5^{\circ}\text{C}$  and the ambient temperature should not be more than  $30^{\circ}\text{C}$ . Avoid direct sunlight on this centrifuge.
- (3) Place the centrifuge properly and keep  $>30\text{cm}$  space from the rear and  $>10\text{cm}$  space on both sides to ensure effective air cooling.
- (4) Ensure that there is no water leakage/ heat loss near the centrifuge as it may cause the rise in temperature and thereby leading to centrifuge failure.

#### 4.2. Connection between power cable and ground wire

##### Warning

- Don't touch the power cable with wet hands and avoid electric shocks.
- Ensure that the centrifuge is well grounded.

- (1) This centrifuge uses two-core power cable and two-core flat plug, the latter of



which may be directly connected to the power socket.

(2) Ensure the rated current of the power socket is correct (>10A) and it complies to local electrical safety regulations before connecting the device to power supply.

## 5. Structure

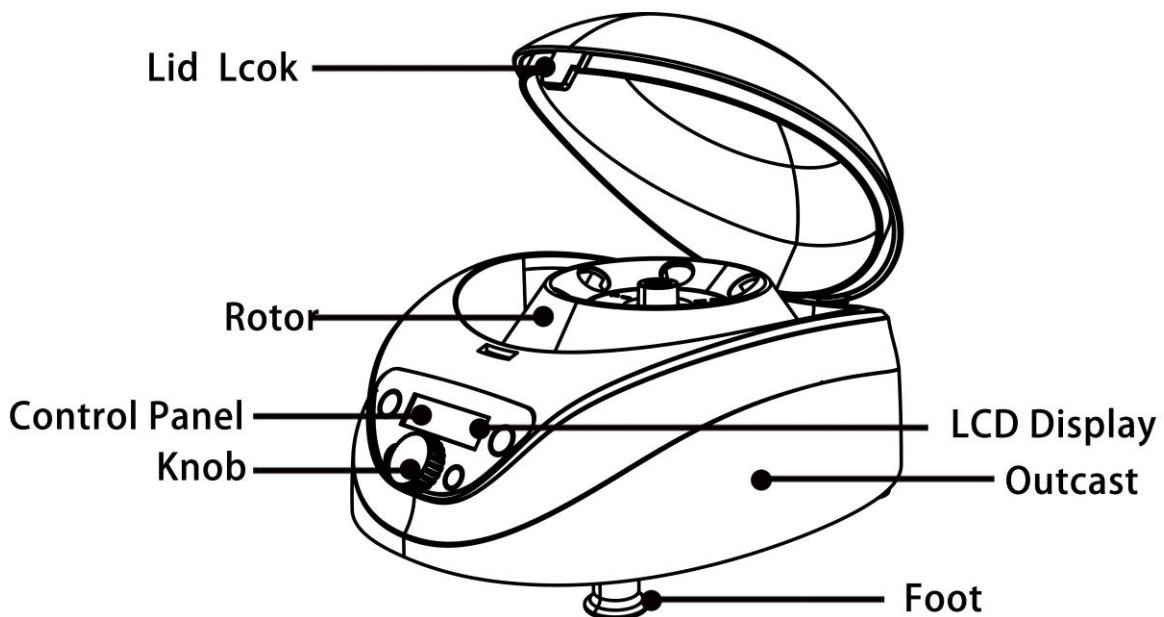


Figure 0.1 Front view of centrifuge

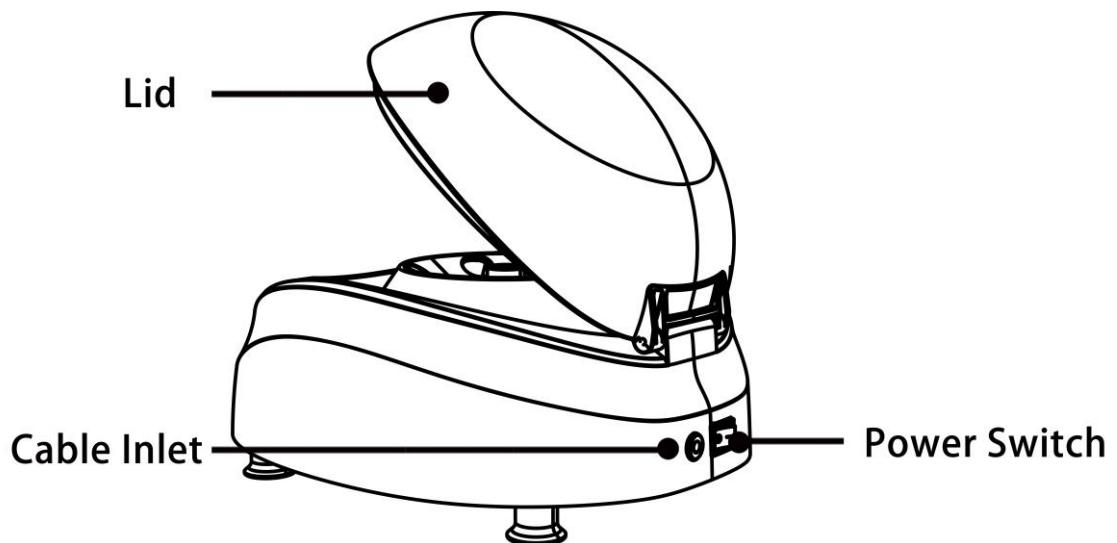


Figure 0.2 Rear View of the centrifuge

## 6. Operating panel

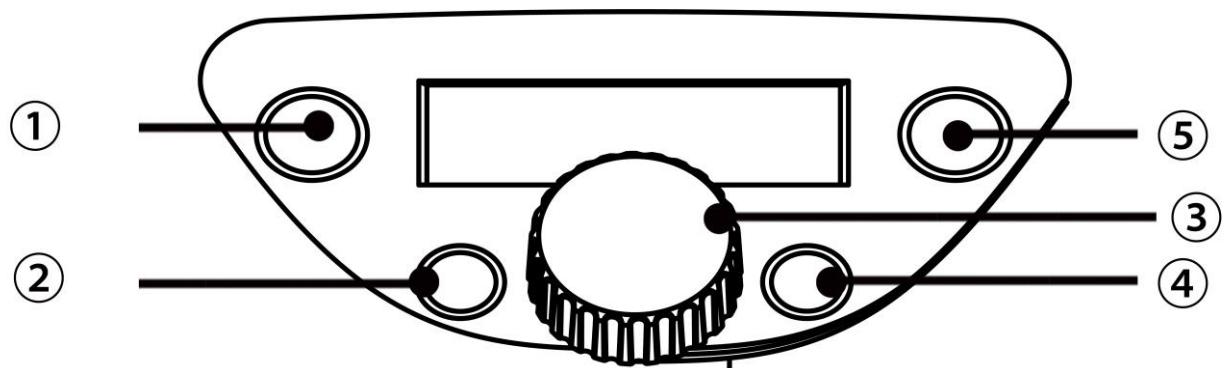




Figure 0.1 Control panel layout

| No. | Legend | Name               | Function  |
|-----|--------|--------------------|---|
| 1   |        | Door lock open key | When the rotor is fully stopped, press this key to release the door lock. When the rotor is still running, the door will remain locked. |
| 2   |        | Program #1 key     | Press this key load/edit the predefined program #1.   |
| 3   |        | Parameter knob     | Rotate this knob to adjust the parameter setting of speed, RCF, timer or deceleration.  |
| 4   |        | Program #2 key     | Press this key load/edit the predefined program #2.   |
| 5   |        | Start/Stop key     | When the centrifuge is ready to run, press this key to start running; While the centrifuge is running, press this key to stop.          |



Speed Section Lid Status Timer Section

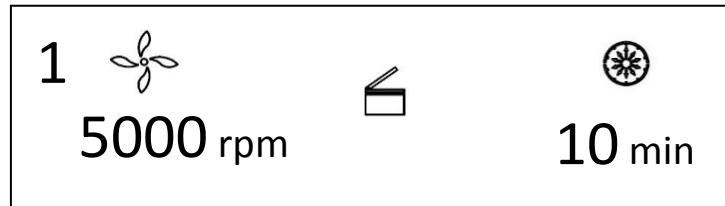


Figure 0.2 Main display schematics

The main display is shown in Figure 0.2. At this time, the speed is set at 5,000rpm, indicating the set running time of 10 min.

When the speed icon rotates, it indicates that the machine is in run mode. The icon rotates quicker at higher centrifuge speed.

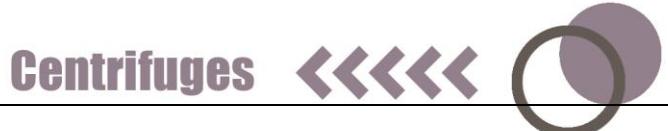
The time display icon divides the entire running time into 10 equal parts, displaying the ratio of elapsed time to the total time.

## 7.Rotor preparation

### 7.1.Prepare the samples to be separated

### 7.2.Place samples into the centrifuge tube

The amount of sample should not exceed the working volume capacity of the centrifuge tube.



⚠ Caution: Adding excessive samples into the centrifuge tube will result in leakage, therefore don't add excessive samples.

## 7.3. Ensure the balanced centrifuge tube

- Although this centrifuge may be used with visually confirmed balance, it is suggested that samples be weighed using a balance to ensure balanced centrifuge tube in order to prolong the service life of centrifuge.
- Although the imbalance to some extent is allowed (See 011.1.2.Rotor and adaptor), don't run this centrifuge under poor balance conditions.

## 7.4. Check the rotor

Check the rotor for any corrosion or scratch before use.

⚠ Caution:

- Avoid using the rotor with scratches or corrosion.
- Never use the rotor of other brands/ specifications on this centrifuge.
- Do not expose the rotor and its accessories to direct sunlight/Ultraviolet.



## 7.5. Insert the centrifuge tubes symmetrically onto the rotor in place without imbalance

### ⚠ Caution:

- Ensure to tighten the rotor to the main shaft firmly and the lid is secured properly on the rotor. Otherwise, the rotor might fall OFF while the centrifuge is in operation, resulting in centrifuge or rotor damage.
- Tighten the rotor lid and rotor firmly.

## 8. Operation

### 8.1. Normal operation

Turn ON the power switch, the most recent settings will be loaded and shown on the LCD display as in Fig. 8-1.



Figure 0.1 The most recent settings loaded and shown



- The speed set to 5000rpm and the timer set to 10min.
- The lid lock is released.

#### 8.1.1 Rotor installation and replacement

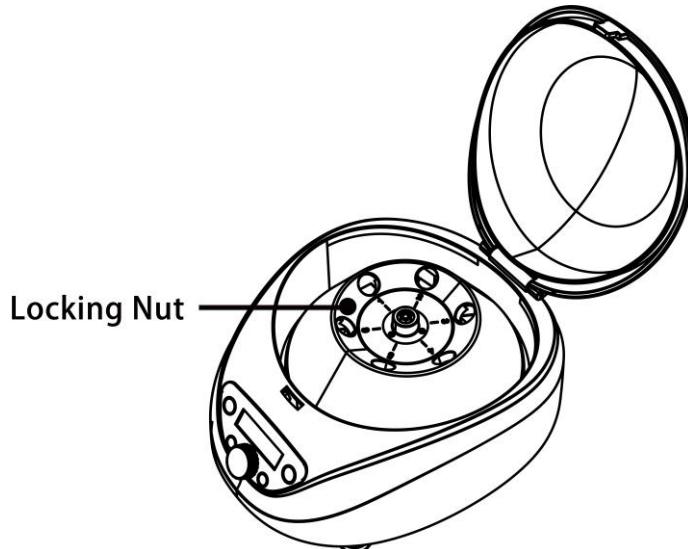
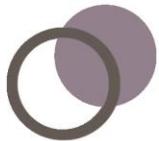


Figure 0.2 Rotor installation

- When placing the rotor, ensure the full contact between the rotor and the motor shaft.
- After placing the rotor in place, rotate the rotor gently with hands to check for normal operation of the rotor. Check and adjust the rotor position once again.
- Hold the rotor with one hand, and rotate the locking nut clockwise using the rotor wrench with the other hand. Tighten the rotor and main shaft firmly.
- Close the lid and run the centrifuge.



- Dismantle the rotor in a similar manner with opposite rotating direction (counterclockwise).

 **Caution**

- Ensure the rotor is properly mounted on the centrifuge firmly.

#### 8.1.2. Set operating parameters

The parameter knob  is used to adjust the parameter settings. Press the knob gently to select the setting, make it blinking on the display and ready to be adjusted. Rotate the knob clockwise to increase and counterclockwise to decrease the parameter. Rotate the knob quicker to adjust the parameter more dramatically. The minimum rotation speed increment is 10rpm, the minimum RCF increment is 10g and the minimum timer increment is 1second.

##### (1) Set the rotation speed

- Press the parameter knob  to choose the rotation speed parameter value in rpm. The speed parameter should blink on the display.
- Rotate the know to adjust the rotation speed value to desired setting.
- The minimum speed is 300rpm, and the minimum increment is 10rpm.
- The parameter increases or decreases in a cyclic way. Turn the knob clockwise or anticlockwise to increase or decrease the adjusting



parameter values. If you continue rotating the knob when the parameter hits the upper limit, it will start from the lower limit again.

## (2) Set the run time

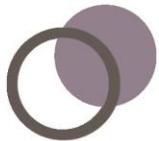
- Press the parameter key  to select the time parameter and wait until its value blinks.
- Rotate the knob and set the timer to desired setting within the range of 30s-99min.
- Set the timer to HD to disable it and run the centrifuge in a mode without time limit.

## (4) Modify the predefined program

- Press the program #1 key  (or program #2 key 

### 8.1.3. Start Run

- (1) Press the  key to start running.



- The rotor will start rotating only when the lid is locked.
- Timer starts to count down as soon as the speed reaches the set value.

## (2) Inquire and change the settings

- The setting can be modified when the centrifuge is running at the set speed.
- Press the knob to go back to settings screen. Follow the instructions in 0 to review and modify the settings. Wait for 7 seconds, the settings will be updated, the display will go to the running screen again and the centrifuge will run on the new settings.

- The timer will continue to count down without reset.

## (3) Error message

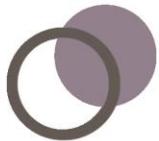
- The centrifuge will automatically stop if any failure occurs while running, with the error code shown in the timer section on the LCD display. Please look up the cause of failure and take appropriate action in Table 0.1.

### 8.1.4. Stop running

- (1) When the time is up or you press the Start/Stop key  while running, the centrifuge will stop running.

- The centrifuge will beep to notify the user when the rotor fully stops.

- (2) The lid lock will be released when the rotor fully stops.



- Press the  key to release the lock if the lid is still locked.
- The current settings will be stored. It will be loaded automatically as soon as the centrifuge is switched ON next time.

(3) Retrieve the rotor and samples.

## 8.2.RCF operation

Turn power switch ON and set the centrifuge to RCF (relative centrifugal force) mode.

### Caution

- The relative centrifugal force set should not exceed the maximum relative centrifugal force allowed by the centrifuge tube and its adaptor.
- The relative centrifugal acceleration is calculated based on the maximum centrifugal radius and operating speed of the rotor. (See 012.RCF calculation).

- Press the parameter knob  to choose the rotation speed unit as  $xg$ . If the RCF value flashes it indicates that the RCF value can be set as it is in adjustment mode.



- Turn the knob to adjust the relative centrifugal acceleration, in increments of 10xg.
- Wait for 7 seconds to update the settings.

See Section0 for operation instructions.

### 8.3. Set deceleration level

Press and hold the knob for 5 seconds, after a beep sound, you can adjust the deceleration between 2 levels by rotating the knob. Level 1 is the default, and it is suitable for most applications. Set it to Level 2 for slower deceleration.

## 9. Maintenance and servicing

### 9.1. Cleaning

#### Caution

- Possible damage to the centrifuge if you clean or sterilize it not following the instruction in this manual.
- Disconnect the power supply before cleaning the centrifuge.



## (1) Centrifuge

- The color of housing might change and the label thereon might fall OFF if the centrifuge is exposed to ultraviolet for a prolonged period of time and hence cover the centrifuge with cloth to avoid exposure to light.
- Clean the centrifuge using a cloth/ sponge soaked with neutral cleansing agent in case if it is dirty after use.
- The centrifuge can be sterilized using cloth soaked with 70% alcohol solvent.

## (2) Centrifugal chamber

### ⚠ Caution

- Never pour water or other solvents directly into the centrifugal chamber as they might enter the drive unit and cause corrosion or damage to the bearings.

## (3) Drive shaft

- It is suggested that the drive shaft be subjected to periodical maintenance by wiping it using soft cloth and applying a thin layer of silicone grease on it.

## (4) Outer Lid

- Clean or sterilize the outer lid in the same manner as mentioned under subsection (1) centrifuge.



## (5) Rotor

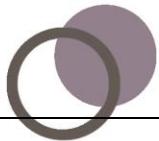
- If the rotor is left unused for a prolonged period of time, remove the rotor and its lid (if there is any rotor lid) from the centrifugal chamber, and place the rotor upside down to dry the rotor hole and prevent corrosion.
- Use clean water to rinse the rotor cavities if there is sample leakage from the centrifuge tubes. Dry the rotor thoroughly and apply a thin layer of silicone grease on it.
- Clean the rotor regularly (every 3 months recommended). Ensure the cavities and the drive shaft hole are clean. Apply a thin layer of silicone grease.

## 10. Common failures and solutions

### 10.1. List of common failures

This centrifuge is capable of onboard diagnosis. When the centrifuge fails, the time display window will indicate the failure code, leading to the immediate identification of possible failure causes.

| Phenomenon | Possible cause | Solution |
|------------|----------------|----------|
|------------|----------------|----------|



|  |                          |  |  |
|--|--------------------------|--|--|
| No display after power ON                |                          | <ul style="list-style-type: none"> <li>No power supply to the power socket.</li> </ul>   | <ul style="list-style-type: none"> <li>Eliminate the failure and reconnect the power supply.</li> </ul>                                      |
| Abnormal vibration                       |                          | <ul style="list-style-type: none"> <li>Misfitting between the rotor and the drive shaft.</li> <li>The tubes are not balanced.</li> </ul>   | <ul style="list-style-type: none"> <li>Mount the rotor properly again.</li> <li>Balance the tubes with scale and load them again.</li> </ul> |
| Alarm code indicated on the time display | E-02<br>Lid failure      | <ul style="list-style-type: none"> <li>The lid is opened while running.</li> <li> is pressed when the lid is opened.</li> </ul> | <ul style="list-style-type: none"> <li>Immediately close the cover.</li> <li>Close the outer lid before operation.</li> </ul>                |
|  | E-09<br>Imbalanced rotor | <ul style="list-style-type: none"> <li>The tubes are not balanced.</li> </ul>  | <ul style="list-style-type: none"> <li>Balance the tubes with scale and load them again.</li> </ul>  |
|  | Others                   | <ul style="list-style-type: none"> <li>Check the service manual.</li> </ul>  | <ul style="list-style-type: none"> <li>Contact the service center.</li> </ul>  |

Table 0.1 Common failures and solutions



- Error code E-01 ~ E-09 are related to erroneous operation. The centrifuge may continue running after elimination of the failure.

## 10.2. How to open the outer lid

### 10.2.1 When turned ON

Reminder: When the centrifuge is switch power ON, open the outer lid only when the rotor is not running.

- (1) When the centrifuge is turned ON, the outer lid opens automatically.
- (2) At the end of centrifuge operation, the outer lid remains locked.
- (3) When the rotor stops, press  key and unlock the outer lid and one can observe that the lid can be opened now.

### 10.2.2 When power is OFF

When the lid cannot be opened in case of unexpected power failure, the outer lid may be opened as follows:

- (1) Check whether the rotor is in run mode.
  - Look at the rotor through the transparent lid and ensure that it is fully stopped.
- (2) Release the lock manually by the lever.



- The lever is hidden under the right bottom of the centrifuge.
- Pull the lever to the right and release the lock. Then open the lid.

## 11. Introduction to rotor and centrifuge tube

### Caution

- Carefully read the user manual and correctly install and use the rotor correctly.
- Don't exceed the maximum allowed speed of the rotor, test tube and adaptor. The maximum allowed speed by certain adaptors is lower than the maximum speed of the rotor and check before operation.

### 11.1. Rotor description

#### 11.1.1. Rotor structure

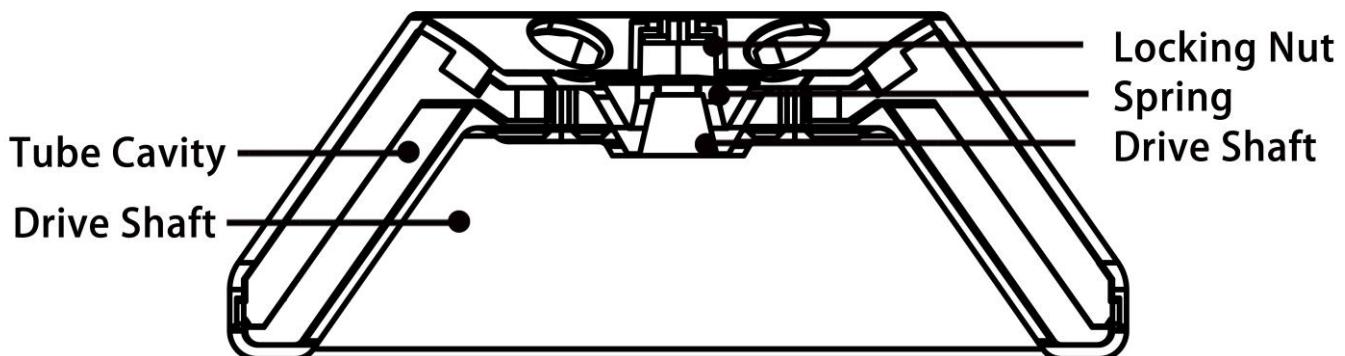




Figure 0.1 Rotor structure

### 11.1.2. Rotor and adaptor

The rotors and adaptors which are suitable for use with this centrifuge are listed as follows:

| Rotor Model | Rotor No. | Centrifuge tube                 | Adaptor | Max speed (rpm) | Max RCF (xg) | Balance Tolerance(*) |            |
|-------------|-----------|---------------------------------|---------|-----------------|--------------|----------------------|------------|
|             |           |                                 |         |                 |              | Mass                 | Volume(**) |
| A6-15P      | 01        | 1.5/2.0ml micro centrifuge tube | A2P17   | 5000            | 1817         | 2.0g/tube            |            |
|             |           | φ13x75 Blood collection tube    | A5P17   | 5000            | 2236         | 2.0g/tube            |            |
|             |           | 15ml tube                       |         | 5000            | 2600         | 2.0g/tube            |            |
|             |           | φ13x100 mm                      |         | 5000            | 2600         | 2.0g/tube            |            |



|  |                   |  |      |      |               |  |
|--|-------------------|--|------|------|---------------|--|
|  | tube              |  |      |      |               |  |
|  | φ16x100mm<br>tube |  | 5000 | 2600 | 2.0g/<br>tube |  |

Table 0.1 List of rotors and adaptors

\* : The tolerance is applied to tube pairs placed symmetrically in the rotor.

\*\*: The volume tolerance is a rough estimate. There is no strict match to mass tolerance.

### 11.1.3.Precautions

(1) The density of sample that the centrifuge rotor can separate is less than 2.0g/ml.

If the density of sample to be separated exceeds 2.0g/ml, please calculate the allowed rotation speed using the following formula:

Allowed rotation speed (rpm) = maximum rotation speed  $\times$  (2.0 (g/ml) /sample density (g/ml))<sup>1/2</sup>

(2) If the rotor is left unused for long time, please remove the rotor from the centrifugal chamber, remove the rotor lid and place the rotor upside down to dry the rotor hole and prevent corrosion.

(3) If any sample leaks into the rotor hole, flush the rotor hole with clean water and apply a thin layer of silicone grease on the rotor surface after it dries up.



(4) It is suggested that the rotor to be cleaned once in every three months to ensure cleanliness of the tube hole and main shaft hole before applying a thin layer of silicone grease.

#### 11.1.4. Autoclaving

##### ⚠ Warning

- The high strength plastic rotor CANNOT be autoclaved.

### 11.2. Centrifuge tube

11.2.1. Please clean and sterilize the centrifuge tube by reference to the following table.

Table 11.2 Conditions for cleaning and sterilization of centrifuge tube

O: Yes X: No

| Condition |                | Material                             | PA | PC | PP |
|-----------|----------------|--------------------------------------|----|----|----|
| Cleaning  | Fluid cleaning | Acidic cleaning agent (pH5 or lower) | X  | X  | X  |
|           |                | Acidic cleaning agent (above pH5)    | O  | O  | O  |
|           |                | Alkaline cleaning agent (above pH9)  | O  | X  | O  |

|               |                           |  |                              |   |   |
|---------------|---------------------------|--|------------------------------|---|---|
|               |                           | Alkaline cleaning agent (pH9 or lower) | O                            | O | O |
|               |                           | Neutral cleaning agent (pH7)           | O                            | O | O |
|               |                           | 70°C hot water                         | O                            | O | O |
|               |                           | Ultrasonic cleaning                    | Neutral cleaning agent (pH7) | O | O |
| Sterilization | Autoclaving               | 115 °C (0.7kg/cm <sup>2</sup> ) 30min  | O                            | O | O |
|               |                           | 121 °C (1.0kg/cm <sup>2</sup> ) 20min  | X                            | O | O |
|               |                           | 126 °C (1.4kg/cm <sup>2</sup> ) 15min  | X                            | X | X |
|               | Boiling sterilization     | 15-30min                               | O                            | O | O |
|               | Ultraviolet sterilization | 200-300nm                              | X                            | X | X |
|               | Gas sterilization         | Ethylene oxide                         | O                            | X | O |
|               |                           | Formaldehyde                           | O                            | O | O |

PA: polyallomer PC: polycarbonate PP: polypropylene

#### 11.2.2. PC centrifuge tube cleaning

PC material has relatively low chemical stability to alkaline solvent, therefore use



of cleaning agent with pH value of over 9 should be avoided. Some neutral cleaning agents still have pH value of over 9 after being diluted as recommended by the vendor, therefore use of cleaning agent with pH value of 7-9 only is recommended.

#### 11.2.3. Autoclaving of PA, PC and PP centrifuge tube

PA begins softening at the temperature of 120°C, while PC and PP begin softening at 130°C. Generally, PA may be sterilized for 30 min at 115°C ( 0.7 kg/cm<sup>2</sup> ), while PC and PP may be sterilized for 20 min at 121 °C( 1.0 kg/cm<sup>2</sup> ). Too high temperature would result in deformation of centrifuge tube.

When autoclave is used, take the following steps:

- ( 1 ) Place the centrifuge tube upright with opening facing upward. If the centrifuge tube is placed in an inclined or horizontal manner, it will deform due to the effect of gravity.
- ( 2 ) Remove the threaded cover and inner cover to prevent deformation or crack of the centrifuge tube.
- ( 3 ) Take the centrifuge tube only when the autoclave cools down to the room temperature.

#### 11.2.4. Service life of centrifuge tube

The service life of plastic centrifuge tube depends upon the nature of sample, rotor



speed and centrifugation temperature. When the plastic centrifuge tube is used for centrifugation of conventional neutral samples (pH5-pH9), its estimated service life at the maximum rotation speed is as follows:

High-quality centrifuge tube (PA, PC, PP): 30-50 times.

Conventional centrifuge tube: about 10 times (frequency of use may be increased in case of low-speed application use)

The service life of centrifuge tube is also related to the cleaning and sterilization conditions.

Note: Never use any centrifuge tube with cracks.

## 12.RCF calculation

Relative centrifugal force (RCF ) can be calculated using the following formula:

$$RCF = 1.118 \times r \times n^2 \times 10^{-5}$$

r-rotation radius, unit: cm; n-rotation speed, unit- rpm



## 13. Warranty

### 13.1. Unit warranty

The entire unit will have one-year warranty period commencing from delivery date under the conditions of normal maintenance.

### 13.2. Rotor warranty

The rotor will have 5-year warranty period from the date of delivery. Don't use any rotor damaged due to corrosion or fatigue. The damage to the entire unit or rotor due to any of the following reasons is outside the scope of warranty:

- ( 1 ) Damage due to improper installation;
- ( 2 ) Damage due to brutal or improper operation;
- ( 3 ) Damage due to relocation or transport after completion of installation;
- ( 4 ) Damage due to dismantling or modification by any unauthorized entity or individual;
- ( 5 ) Damage due to use any parts not supplied by our company, such as rotor and adaptor;
- ( 6 ) Damage due to natural disasters, including fire and earthquake;
- ( 7 ) Wearing parts and parts with warranty period.



## After-sales services

To ensure safe and efficient operation of the centrifuge, periodical maintenance is required. If the centrifuge fails, don't attempt to repair it. Please contact the service center.

Centrifuges <<<<



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