

# Operation Manuals

**Benchtop High-Speed Refrigerated Centrifuge**

**Model: TGL-18MC**



Thanks for using Drawell centrifuge! In order to get quick and sincere service, please read the operation manuals carefully before you operate.

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## Safety Notices

We appreciate your business with Drawell. To prevent any potential accident, please operate centrifuges according to the following safety protocol.

1. Unplug the main power cord, when performing maintenance or when centrifuge is expected not being used for a long period of time.
2. Load the rotor with samples arranged symmetrically. Opposing tubes must be of equal weight. If necessary, use "water blank" tubes to balance sample tubes of unequal weight. Do not conclude that tubes are balanced by sight over volume. Use the pan balance provided in the centrifuge room for balancing tubes in rotors for the centrifuge.
3. Never exceed the maximum speed posted for the rotor!
4. Never use the rotor that appears damaged (e.g. O-rings missing, scratched, corroded, and cracked).

All centrifuges have the potential risk factors during operation; you must understand the operating procedures and safety precautions for the safe use of centrifuges.

Failed to operate the provisions of this manual may result in personal injury or property damage, be sure to abide by the rules. The Company is not liable for obligations for the consequences are not made in conformity with the rules and operations of this manual.

When start to use the centrifuge machine, please:

1. Press Power Switch first after plugged in;
2. Check the nut tight and rotors balance
3. Operate it according to the Operation Instructions.

## 1. Model & Name

DW-TGL-18MC Benchtop High-Speed Refrigerated Centrifuge

## 2. Technical description

DW-TGL-18MC Benchtop High-speed Refrigerated centrifuge, operates on the principle of centrifugal sedimentation for the separation, purification or concentration of solution with different density particles.

The centrifuge consists of housing, centrifugation chamber, drive system, control system and operating display panel, including rotors and tubes as accessory.

## 3. Technical Features

DW-TGL-18MC centrifuge, equipped with brushless motor, computer controller, door safety device etc. for simple operation, is widely used in the fields of biochemistry, radio immunity, environment protection, Chinese & western pharmaceutical for particles separation with different density.

## 4. Technical Data

Max. Speed: 20000r/m

Max. RCF: 27800×g

Max. Capacity: 4×100ml

Noise: ≤60dB (A)

Speed control Accuracy: ±50r/min

Temperature control: -20~+40°C

Power: AC220V 50Hz 5A

### Rotor data

Rotor Number	Max Speed (rpm)	RCF(xg)	Rotor
No.1 AR	18000	23200	12×1.5ml
No.2 AR	14000	14800	8×5ml

No.3 AR	13000	17760	12×10/15ml
No.4 AR	15000	21800	24×1.5/2ml
No.5 AR	14000	17600	48×0.5ml
No.6 AR	14000	18200	36×1.5/2ml
No.7 AR	12000	15140	6×50ml
No.8 AR	10000	10460	4×100ml
No.9 MPT	4000	1400	2×2×48holes
No.10 AR	8000	9800	8×50ml

Note : Speed and capacity can be customer designed

## 5. Installation & Working Conditions

### 5.1. Installation

- a).The centrifuge should be placed on the firm table with four feet contacting the table.
- b).Certain space should be allowed around the centrifuge for idea ventilation.
- c).Power: AC 220V 50Hz 10A with socket capacity > 10A , ground connection should be secured.

### 5.2. Working Conditions

- a).Environment Temperature: 5°C~35°C;
- b).Relative Humidity: ≤85%;
- c). The centrifuge operating room should be free from conductive dust, explosive or corrosive gas
- d).Power: AC 220V±22V 50Hz±1Hz, and separate ground connection should be provided in the centrifuge operating room

## 6. How to Operate

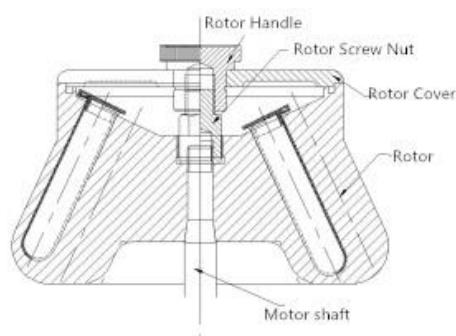
### 6.1 Installation requirements

Place centrifuge on a steady platform or table. Make four rubber cushions stand in balance to prevent vibration. Otherwise, add some pads to readjust the height up to the requirements (by user).

### 6.2 Rotor Installation

The drive spindle in the chamber and the inside cones of rotor should be first wiped with a piece of soft and clean cloth, then place the rotor with two hands to the cone side of the drive spindle in the centrifuge chamber, Washer should be placed before tightening the screw nuts.

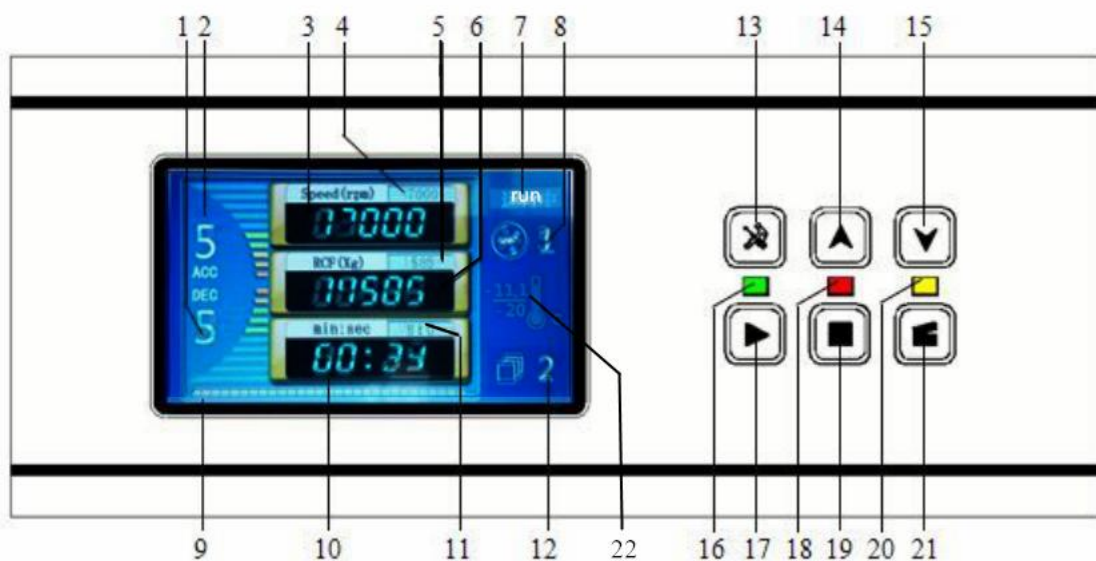
Firstly clasp the symmetric spoke of rotor, and put it on the rotor base vertically and placidly while the rotor bottom's location cone aims at the location cone of drive shaft; then put the flat gasket on the lead screw and screw down the cap nut. At last, hold up the rotor steadily (not shacking) by one hand, and put the solid wrench on the cap nut by another hand. In the mean while turn the wrench for 3 to 6 rounds in clockwise direction until the rotor connects the drive shaft closely.



### 6.3 Tubes Installation

Place the bracket into the slot of rotor; make sure that the bracket is turning smoothly, tube sets (adaptors) are placed into holes of brackets, the solution to be separated into the tubes. Visually check if the solution in the tubes is roughly equal before putting them into the tube sets

### 6.4 Preset



- 1-Dec 2-Acc 3-Real Speed 4- Speed Setting 5- RCF Setting 6- Real RCF  
7- State 8-Rotor No. 9-Speed Progress Bar 10-Real Time 11-Time Setting 12-Program  
13-Set key 14- Increase key 15- Decrease Button 16-Running Indicate Light  
17-Start key 18-Stop Indicate Light 19-Stop Key 20-Door Cover State Indicate Light  
21-Door Open Key 22-Temperature

#### a). Rotor type setting

Press [SET] once or continuous times to modify rotor type when “rotor” display window flashing or there is a bright spot at the right and bottom edge in stop status, and then press [▲]/[▼]to increase or decrease the number.Waiting for 3 seconds, the system will confirm your setting.

*Warning: The rotor type should be set according as the installed one.*

#### b). Rotation speed setting:

*Warning: The same rotor can hold buckets and accessories with different speed or RCF value.*

Press [SET] once or continuous times to modify speed value when 'SPEED/RCF' display window flashing or there is a bright spot at the right and bottom edge in stop/running status, and then press [▲]/[▼]to increase or decrease the current value. Waiting for 3 seconds, the system will confirm your setting.

**c). RCF setting:**

Press [SET] once or continuous times to modify RCF value when 'ROTOR' display window shows "F." and 'SPEED/RCF' display window shows the setup RCF value in stop/running status, and then press [▲]/[▼]to increase or decrease the current value. Waiting for 3 seconds, the system will confirm your setting.

**d). Temperature setting:**

Press [SET] once or continuous times to modify centrifugation temperature when 'TEMP' display window flashing or there is a bright spot at the right and bottom edge in stop/running status, and then press [▲]/[▼]to increase or decrease the current value. Waiting for 3 seconds, the system will confirm your setting.

**e). Time setting:**

Press [SET] once or continuous times to modify centrifugation time when 'TIME' display window flashing or there is a bright spot at the right and bottom edge in stop/running status, and then press [▲]/[▼]to increase or decrease the current value. Waiting for 3 seconds, the system will confirm your setting.

**f). Program memory:**

Press [SET] once or continuous times to select the Number of program, then set the parameters according to the above instruction, Waiting for 3 seconds, the system will confirm your program setting. (please memory parameter one by one ,most for 35 programs memory)

**g). Acceleration setting:**

Press [SET] once or continuous times to modify Acc curve when 'SPEED/RCF' display window shows "ACC X" in stop/running status, and then press [▲]/[▼]to



increase or decrease the current value(The higher the value, the shorter the Acc time;vice versa). Waiting for 3 seconds, the system will confirm your setting.

#### **h). Deceleration setting**

Press [SET] once or continuous times to modify Dec curve when 'SPEED/RCF' display window shows "DEC X" in stop/running status, and then press [▲]/[▼]to increase or decrease the current value(The higher the value, the shorter the Dec time; vice versa). Waiting for 3 seconds, the system will confirm your setting.

#### **i). Start or brake**

Press [▶] after you confirm the setup parameters, and press [■] to brake at any time during a run. If you want to know the RCF during a run, press the [RCF] (RCF light should be on) to check RCF value under the current speed. The centrifuge will be back to the running status in 4 seconds automatically.

If you want to know the setup parameters during a run, press the [SET] to check the setup parameters. The centrifuge will be back to the running status in 4 seconds automatically (in the case of no setup revising).

If the time is counted down to "0" or it is stopped automatically for trouble, the centrifuge will brake and stop automatically. When the speed is 0 r/min for model , you can press [STOP] to open the door lid(if the electricity cuts off,insert the special unlock tool into the door opening hole and push it horizontally to open the door lid). Then the buzzer tweets 15 times, and press [RCF] to eliminate the buzz; if you press [STOP] to stop the operation during a run, the buzzer won't tweet.

#### **j). Rotor disassembly: (after finishing adjust or centrifuge)**

First clasp the spoke of rotor with one hand, and put the solid wrench on the cap nut by another hand. In the mean while turn the wrench for 3 to 6 rounds in counterclockwise direction to loose the cap nut until the rotor can be separated from driving shaft. If the rotor is not taken out from the drive shaft for a long time and blocked, you can beat the surrounding spoke of rotor several times slightly with wooden or rubber hammer. Then clasp the symmetric spoke of rotor and lift slightly by both hands, and put the rotor on the flat table and ground covered with soft pad.

*Warning : All actions on the rotor must be soft for avoiding the damage of driving shafting.*

## **7. Safety Notice**

- a). The centrifuge will not be allowed to operate under any condition if the speed exceeds the rated speed for the rotor and brackets.
- b). The rotor or tube is prohibited for further use if any corrosion or crack occurred.
- c). The door will not be allowed to open when the centrifuge is under operation.
- d). If the rotor is not in use for three months, it should be subjected to operating for 10 min before it can be allowed to operate at its max speed.

## **8. Maintenance**

- a). Dry the centrifuge chamber, rotor and tube with a piece of clean and soft cloth after operation.
- b). Check regularly to find if there is any corrosion or crack on the rotor, bracket, tube sets and tubes.
- c). Pls heating the temperature of the centrifuge to 25°C to 30°C for 10 minutes after using and make sure it is no more water left in the container so as to avoid the rusting.

If the centrifuge will not be in use for a month, take out the rotor from the chamber, grease the cone side of drive spindle and the center hole of the rotor, and keep the rotor in a dry place.

### **Error analysis:**

#### **Imbalance protection: E1**

During a run, the system will be stopped automatically since the high vibration caused by imbalance exceeds extent value and displaying "E1".

#### **Over-speed protection: E2**

The system can not work when the setting speed is over max speed. Or, the system will be stopped automatically for actual speed is excess of rotor max speed or the set up speed by 500r/min. “E6” will be then displaying.

**Door lid protection: E3**

Since the centrifuge runs at high speed, it will not run for the door lid opening. If forcing the door lid open during a run, the system will be stopped automatically and “E3” will be then displaying.

**Door open Error during running: E4**

Door open during the machine running.

**Over-current Ea**

(motor power supply is too large, causing large loads due to excessive increases the speed, or drive damage.)

**Over-voltage(shutdown) Eb**

(DC voltage is too high, causing the rise due to large load speed too fast, or drive damage.)

**Under-voltage Ec**

(DC voltage is too low, causing the rise due to un-enough speed, or drive damage.)

**No Speed trouble: E-7**

The centrifuge will not stop when velocity-measuring system is broken, “E7” will display.

**Error manipulation: E-8**

Before a run error occurs, the system can not work; during a run set wrongly, the setup would be invalid. In stand-by mode press [START] key, “E8”will be then displaying while it can not start.

**IPM trouble: E-9**

While IPM has trouble, the system can not work and “E9” will be then displaying.

## 9. Trouble Shooting

### 1. No power indication after the machine is powered on:

- a). Check if the power supply is OK.
- b). Check if the plug and sockets are well connected.
- c). Check if the fuse is burned. The correct size of the fuse is F10A250V( $\Phi 5 \times 20$ )
- d). Check if the power indicator is burned.

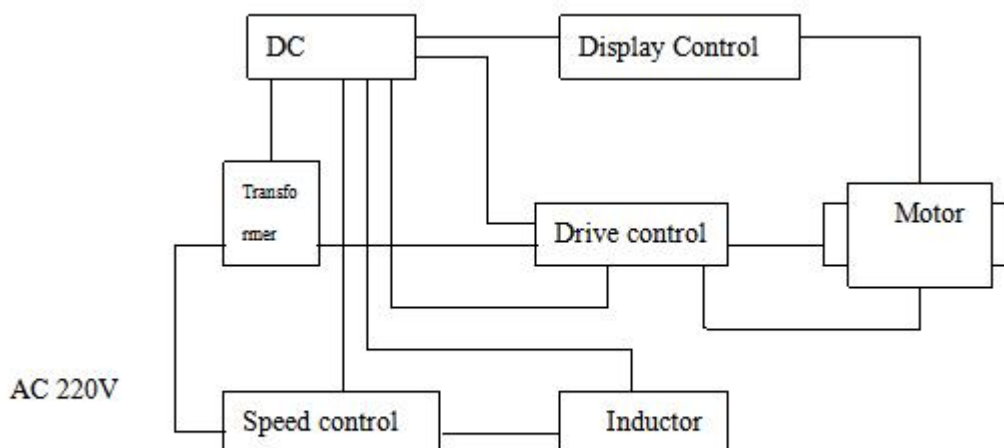
### 2. After power on, the power indication is OK, but the operation of machine is abnormal:

- a). Check if the time or speed is set .
- b). Check if the control circuit is normal.

### 3. Abnormal vibration occurred after starting the machine:

- a). Check if there is any foreign materials in the tube set, check if the solution in the tubes are properly arranged.
- b). Check if the tube set of swing rotor is properly contacted with the bracket.

## 10. Electrical Block



**Fig. 2 Electrical Connection Block**

## **11. Quality Warranty**

The centrifuge is guaranteed for quality, replace three months after it is sold, free of charge repairing and maintenance for one year after it leaves factory due to the material defects or others caused by the factory. Accessories and technical service are to be provided at any time.

## Quality Certificate

### **Benchtop High-Speed refrigerated Centrifuge DW-TGL-18MC**

Max.Speed: 18000r/min

Max.RCF: 23200xg

Serial No: XY-XF2020173

It is certified that the centrifuge is passed quality inspection & test .

Test Department:

Date: 2-Sep-2020

## Packing List

Ser.No	Description	Quantity	Remark
1	Centrifuge	1set	√
2	Rotor	1pcs	√
3	Certificate	1pcs	√
4	Operation Instruction	1pcs	√
5	Packing List	1pcs	√
6	Solid wrench	1pcs	√
7	Adapter	1 set	
8			

Rotor No.	Max Speed (rpm)	RCF(xg)	Rotor	
No.1 AR	18000	23200	12×1.5ml	
No.2 AR	14000	14800	8×5ml	
No.3 AR	13000	17760	12×10/15ml	
No.4 AR	15000	21800	24×1.5/2ml	
No.5 AR	14000	17600	48×0.5ml	
No.6 AR	14000	18200	36×1.5/2ml	
No.7 AR	12000	15140	6×50ml	
No.8 AR	10000	10460	4×100ml	√
No.9 MPT	4000	1400	2×2×48holes	
No.10 AR	8000	9800	8×50ml	

Packed by:

Inspector:

Date:

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