Operation Manual

BSOR-110

Double Tier Orbital Shaker

Thank you for Choosing Biolab products. Please read the "Operating Instructions" and "Warranty" before operating this unit to assure proper operation.

01 Introduction to control panel

\> "Move" key: Move to select the parameter to be changed.

⌒ "Increase" key: Increase the value of the selected parameter.

⌒ "Decrease" key: Decrease the value of the selected parameter.

SET "Set" key: Select an operation

OK "Confirm" key: 1. Confirm the changed parameter.

2. In other page, you can long press this key to return to the "running" page.

3. When the buzzer sounds, you can press this key to stop the buzz.

START "Start/Stop" key: Start/stop the oscillation of the rocking plate.
1. After the instrument is started, the buzzer sounds 3 times, the yellow lamp flashes 3 times and the LCD displays the "running" page:

S1	0rpm	A1
T1	0h0min	0

2. The figure following S1 indicates the revolutions per minute during running. rpm is an English unit of frequency, means revolutions per minute.

T1: Running time; timing through increase. The maximum set time for 0h0min is 500h59min. If a time is preset: after T1 reaches the set time, the oscillation is stopped and the buzzer continuously sounds for 10 seconds; and in case of interruption of the machine, the time is continuously accumulated after re-start of

the machine. If there is no time preset, the machine must be manually stopped; and if the machine is re-started, the original timing value is cleared to zero and the timing starts with 0 again. If the machine is not stopped all the time, then after the timing value is up to 500h59min, the timing value is cleared to zero and the timing starts with 0 again.

3. After the START key is pressed to start the machine, there is a letter "R" displayed on the LCD, which indicates that the voltage signal to control the rotation speed has been sent out. The characters A1 denote that it has been set that the running will be automatically recovered when the machine is re-powered on after power-off; the characters A0 denote that the above function is not set. The figure on the lower right corner indicates: the number of completed repeated/cyclic running times after the first sequence running is over within the operation range of repeated or cyclic running if the running program is set as repeated or cyclic running. If the figure on the lower right corner is S, it indicates that there is no rotation speed signal is from the speed detection sensor and the sensor may be damaged.

Set rotation speed and time:

1.1 Press the "SET" key, the LCD displays CODE/N0:O; press the "Increase" key to change O to 3, and then press the "OK" key, the LCD displays

S1(SV):	200 rpm
T1 (SV):	0h 0min

The SVs following S1 and T1 indicate that the current displayed are set values.

The default rotation speed after start of the machine is 200 rpm, which can be changed by pressing the "Increase" or "Decrease" key. If you want to set the time, you can press the "Move" key so that the white box is moved to the hour value, thus you can change the hour value, and then you can press the "Move" key so that the white box is moved to the minute value, thus you can change the minute value. After setting, press the "OK" key to confirm the set values and to save them; and then, long press the "OK" key to return to the "Running" page.

If the running program is multiple steps, maximum 8 steps can be set. You can press the "SET" key to enter the S2(SV), T2(SV) page, and then similarly conduct setting.

Note: If the rotation speed at a step is 0, the program will only execute to the

previous step; if the time at a step is set as 0, the oscillation will be conducted in non-limited period and manually stopping machine is required.

Repeated/cyclic program setting

Press the "SET" key again on the S8(SV), T8(SV) page, you can enter the " CYCLE" program setting page:

```
         Cycle
 N1:1-8  N2:0   N3:0
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N1: denotes which steps are required to be repeatedly/cyclically run. The posterior value must be larger than the previous one; if the posterior value is only 1 larger than the previous one, the program is to be repeatedly run and if the posterior value is 2 or above larger than the previous one, the program is to be cyclically run.

N2: denotes the number of repeated/cyclic running times within N1 after the operation steps within N1 are run once in sequence, of which the maximum is 8.

N3: denotes the actually completed number of repeated/cyclic running times within N1 after the operation steps within N1 are run once in sequence. The N3 value is the same as the value on the lower right corner of the "Running" page.

Midway return in multi-step program

If you want to return the initial state during running multi-step program, you can press the "Move" key for 4 seconds.

Overspeed alarm setting

After setting the Cycle program, you can press the "SET" key again to enter the page of overspeed alarm value for rotation

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    Si(SV): ±30rpm
         A: 1
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The default value after start of the machine is ±30 rpm, that is, when the rotation speed is out of the set rotation speed ±30 rpm, the buzzer will give a sound alarm but the machine is not stopped. If the rotation speed is beyond the maximum allowable rotation speed of the machine, the machine will be stopped.

A is for setting the function of automatic recovery of running after power-off. 1 indicates this function available, and 0 indicates this function unavailable. Press the "Move" key to move the white box onto 1, and then you can press the "Decrease" key to change 1 to 0; or you can press the "Increase" key to change 0 to 1.

Minimum and maximum rotation speed setting

In general, the default minimum rotation speed after start of the machine is 50 rpm and the default maximum is 300 rpm. If you require special specifications, they can be properly adjusted before the machine leaves the factory.

Rotation speed storage

The program has internally stored the control voltages for 50, 100, 150, 200, 250 and 300 rpm of the machine before the machine leaves the factory. If the speed detection sensor is damaged and there is no speed detection signal fed into the control board, the program will select a control voltage equal to or near the user set rotation speed to maintain oscillation, but there is an "S" displayed on the lower right corner of the LCD.

If you want to change the stored rotation speed values, you can press the "SET" key, so that the LCD displays the password page; change the password as 8 and confirm it, the LCD will display the allowable minimum and maximum rotation speeds page; press the "SET" key again, you can enter the rotation speed storage setting page.

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SV(1)  50rpm
 PV(1)   0rpm
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Press the "SET" key continuously, the serial number in the bracket will be changed and the rotation speed in the white box will be changed accordingly as well; select a rotation speed nearest to your requirement in the white box and set it as the required rotation speed; and then press the "START" key, the equipment starts to operate. When the actual rotation speed value following the PV(#) is equal to the set rotation speed value following the SV(#), you can press the "OK" key to store the voltage for this rotation speed.

Note: The voltage value for rotation speed must be arranged in ascending order of rotation speed.

Running and shutdown

1. After completing the above setting operations, press the "Start/Stop" key, the instrument will start to operate according to the just set program.

2. During the running of the instrument, you can press the "Start/Stop" key to stop the rotation of the tray. However, the screen still displays normally and the instrument is in power-on state.

3. After use of the instrument, you must turn off the master power switch on the right of the instrument and then remove the power plug.