

SK-O (L) 330- Pro Orbital and Linear Digital Shaker

SK-O (L) 180- Pro Orbital and Linear Digital Shaker

User Manual



SK-L330-Pro
SK-O330-Pro
SK-L180-Pro
SK-O180-Pro

Linear Digital shaker(7.5Kg)
Orbital Digital shaker(7.5Kg)
Linear Digital shaker(2.5Kg)
Orbital Digital shaker(2.5Kg)

*Please read the User Manual and the related Video of this instrument on our website carefully before use, and follow all operating and safety instructions!
The website www.dragon-lab.com*

DRAGONLAB

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Preface

Welcome to the “Orbital and Linear Digital Shaker User Manual” . Users should read this manual carefully, follow the instructions and procedures, and beware of all the cautions when using this instrument.

Service

When help needed, you can always contact manufacturer for technical support in the following ways:

Dragon Laboratory Instruments Limited

F3, Block 12, No.28 Yuhua Road, Shunyi District, Zone B,

Tian Zhu Airport Industrial Park, Beijing, P. R. China

Postcode:101318

Tel: 86-10-85653451/52/53

Fax: 86-10-85653383

E-mail: info@dragon-lab.com

Service Hotline: 400-1100-556

[Http://www.dragon-lab.com](http://www.dragon-lab.com)

Please provide the customer care representative with the following information:

- Serial Number (on the rear panel)
- Description of problem (i.e., hardware or software)
- Methods and procedures adopted to resolve the problems



- Your contact information

Warranty

You have purchased a DragonLab instrument. This instrument is warranted to be free from defects in materials and workmanship under normal use and service, for a period of 24 months from the date of invoice. The warranty is extended only to the original purchaser. It shall not apply to any product or parts which have been damaged on account of improper installation, improper connections, misuse, accident or abnormal conditions of operation.

For claims under the warranty please contact your local dealer. You may also send the instrument direct to our works, enclosing the invoice copy and by giving reasons for the claim. You would be solely liable for freight costs.

1. Safety Instructions

	<p>Warning!</p> <ul style="list-style-type: none"> • Read the operating instructions completely before use and follow the safety instructions. • Ensure that only trained staff work with the instrument.
	<p>Protective ground contact!</p> <ul style="list-style-type: none"> • Make sure the socket must be earthed (protective ground contact) before use.

- Wear the personal protective equipment in accordance with the hazard category of the media to be processed.
 - Splashing of liquids.
 - vibration force led to broken glass container.
 - The body, hair, clothes, jewelry are inhaled.
- Use the instrument following the safety instructions and profession safety rules to avoid any accident.
- Users are not allowed to touch moving parts of the instrument to avoid any accidents. Pay attention to protect hands or fingers from rolling when moving the instrument.
- Set up the instrument in a spacious area on an stable, clean, non-slip, dry and fireproof surface. Do not operate the instrument in explosive atmospheres, with hazardous substances or under water.
- Observe the vessel on the shaking table for medium

splashing out of liquid when setting the motor speed. Reduce the motor speed if the instrument is not running smoothly.

- Accessories must be securely attached to the instrument so that it cannot come off by itself, and vessels must be firmly placed on the shaking table to avoid any injury.
- Working with combustible media or flammable materials may result in additional hazards. Only process media that will not react dangerously to the extra energy produced through processing should be used on the instrument.
- Safe operation is only guaranteed with the accessories described in the “Accessories” chapter and by following the operating instructions in full. Always disconnect the plug before fitting accessories. Check the instrument and accessories beforehand for damage each time you use them. Do not use damaged components.
- The instrument may only be opened by trained technicians. And always disconnect the plug beforehand.
- The operating voltage required as stated on the instrument and voltage in the supply network must match.
- Do not cover the instrument. Protect the instrument and accessories from bumps and impacts.
- Keep away from high magnetic field.

2. Proper use

The instrument is designed for mixing or shaking liquids in schools, laboratories or factories. SK-330/180-Pro is suitable for usage in various attachments for mixing liquids in bottles, flasks, test tubes for a maximum supported weight of 7.5 kg(330)and 2.5Kg(180). This instrument is not suitable for use in residential areas or other areas that may cause danger to the user or instrument as mentioned in chapter 1.

3. Inspection

3.1 Receiving Inspection

Unpack the instrument carefully and check for any damages which may have arisen during transport. If it happens, please contact manufacturer for technical support.



Note:

If there is any apparent damage to the system, please do not plug it into the power line.

3.2 Listing of Items

The paking includes the following items:

Items	Qty
Main unit	1
Power cable	1
User manual	1

Table 1

4. Trial run

Do trial operation as follows:

- Make sure the required operating voltage and power supply voltage match.
- Ensure the socket is securely earthed.
- Plug in the power cable, Power ON the instrument.
- LCD displays the safe rotary speed limit.
- LCD displays operating mode.
- Turn the speed knob to set the rated rotary speed
- Press the speed knob. And the shaking function is switched ON.
- Press the motor regulation knob again. and the shaking function is switched OFF.

If these operations above are normal, the instrument is ready to operate following the “operation” chapter. If these operations are not normal, the instrument may be in security protection state or be damaged.

If the mounting surface is not even, you can improve the stability of the instrument with the adjustable feet. To do this, turn the appropriate foot downward with the wrench until the instrument is standing securely on the surface.

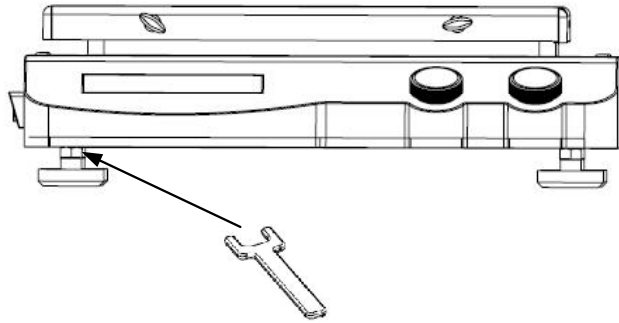


Figure 1

5. Control and Set

5.1 Control

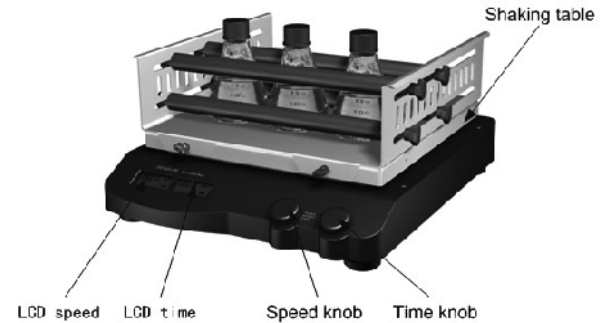


Figure 2

Items	Descriptions
Speed knob	Set the rated rotary speed. “rotation” is switched ON or OFF via pressing the knob.
Time knob	Set working time . “rotation” is switched ON or OFF via pressing the knob
LCD	Display the status of instrument and any set
Mains switch	Switch ON or OFF.

Table 2

- Put the instrument on stable and safe place and plug in the mains power.
- Turn ON the mains switch on the left panel.
- The instrument starts self-test.
- The instrument shows rated speed and time after initialization.
- Turn the speed knob on the left side to set the rated speed.
- Press the speed knob and characters on the left LCD do not flash any more, and the shaking function is switched ON.
- Press the speed knob again and characters on the left LCD begin to flash, and the shaking function is switched OFF.
- Turn the time knob on the left side to set the rated time
- Press the time knob and characters on the LCD do not flash any more, and the timing function is switched ON.
- Press the time knob again and characters on the right LCD begin to flash, and the timing function is switched OFF.

5.2 Set

5.2.1 Set time

The rated shaking time can be set by turning the time knob on the right. A distinction is made for the shaking time setting between timed mode and continuous operation. If continuous mode is selected, the shake can continue its shaking function for any amount of time with the previously set speed. If timed mode is selected, the shaker can run in the

set time. After the instrument is powered OFF and restarted, the set time is erased to zero blanking and it switches into offline operating mode.

If a target time (max. 19h 59min) and speed are set, users can activate the instrument with pressing the time knob, and the time begin to read,If:

A, pressing the time knob, the speed and the time will stop. Pressing the time knob again, restart the shake function, the time will use the pre-set time

B, pressing the speed knob, the speed and the time will stop; Pressing the time knob again, restart the shake function, the time not (There are flashing on the right of the LCD), pressing the time knob again restart the time function. The time will use the pre-set time.



Note:

The current set time can be varied at any time.

5.2.2 Setting Speed

The rated speed and upper speed limit can be set by turning the speed knob (As the Figure 6). The continuous mode can be switched ON with pressing the left knob without the time setting and switched OFF with pressing the knob again.. Adjust the motor speed knob slowly in order to keep the instrument running smoothly.



Note:

The current set speed can be varied at any time.

6. Operating modes

6.1 Mode A

Operating mode A is the default mode set in factory. After turning ON the instrument with the mains switch, the shaking and timing functions are turned OFF. The LCD displays the set time and speed values. They are adopted or varied when the corresponding functions are turned ON.

After turning ON the instrument, the following process will be shown on the display.

- The left LCD displays “SAF” and the right displays the upper speed limit(rpm) which can be set by pressing the speed knob and turning at the same time.



Figure 3

- The LCD displays run modes “StA” , “A” or “B” for about 2 seconds.



Figure 4

- The set or stored speed value is shown in the left display, and the set or stored time value is shown in the right display. Turn the speed knob and time knob can set the speed and time.

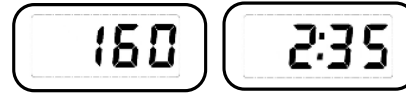


Figure 5

- After pressing the speed knob or time knob, the instrument begins to run at the set speed. The actual speed and time remaining are shown in the LCD. If the remaining has reached zero, the shaker stops its motion. Pressing the speed knob alone, the instrument will work at continuous mode(The time function is OFF)



Figure 6



Note:

The set values can be varied during shaking. Shaking can be stopped by pressing the left or right knob.

6.2 Mode B

When the instrument is turned ON and values for speed and time are erased to zero, users can set. The upper speed limit that has been set is taken over from operating mode A and cannot be modified. After the power has been turned OFF, the instrument will no longer automatically start up in operating Mode B by itself.

After turning ON the instrument and selected run mode, the following process will be shown on the display.

- The left LCD displays “SAF” and the right displays the upper speed limit(rpm) which cannot be changed.



Figure 7

- The LCD displays run modes “StA” for about 2 seconds.



Figure 8

- The set speed value is shown in the left display, and the set time value is shown in the right display. Then set the motor rotary speed and time.



Figure 9



Figure 10

- After pressing the speed knob or time knob, the instrument begins to run at the set speed. The actual speed and time remaining are shown in the LCD. If the remaining has reached zero, the shaker stops its motion.



Figure 11



Note:

The set values can be varied during shaking. Shaking can be stopped by pressing the left or right knob.

6.3 Switching the mode

Switch the operating mode as follows:

- Turn OFF the instrument with the mains switch.
- Hold down both knobs and turn ON the instrument with

the mains switch. After about 5 second, you can let go of the knobs.

- Switch between operating Modes A and B in order.

6.4 Switch the shaking direction

Change the shaking direction according to the steps as follows:

- Turn OFF the instrument;
- Press and hold time knob, at the same time turn on the instrument, release the time knob after 10 seconds;
- Switch the operation direction in turn.

7. Supported load

In order to ensure safe, the shaker must only be operated within the supported weight (7.5kg for 330 and 2.5Kg for 180).

Make sure the holding surface of the shaker is always clean and level. Ensure the individual shaking vessels must be placed evenly and fastened securely in the middle of the shaking table no matter one or multiple shaking vessels are placed.

8. Faults

- When switched ON, the instrument doesn't work
 - Check whether the power cable fitted well
 - Check whether the fuse is broken
- The speed cannot reach set value
 - Check whether it is overloaded
- The motor does not start via pressing the speed knob and time knob
 - Check whether the time is set to zero

9. Interface

SK-O330(180)-Pro/ SK-L330(180)-Pro Orbital and Linear Digital Shaker, special adapter and cable are used to link to external device and the Standard 9-pin interface to connect with the PC.

- The cable between the shaker and the computer used EIA Standard RS232C communication line, corresponding to the DIN 66020 interface.
- Transmission method: Asynchronous signal transmission.
- Mode of transmission: Fully Duplex.
- 1 start bit; 8 character bits; 1 stop bit.
- Transmission speed: 9600 bit/s



Note:

Forbid to plug in and plug off the power cable when the instrument working

10. Maintenance and cleaning

Use and maintain the instrument in right way to keep it in good operating state in order to lengthen its life time and avoid the damage to the instrument. Only use the cleaning agents which have been approved by manufacturer to clean the instrument.

Only use cleanser that we advised as below

Dyes	Isopropyl alcohol
Construction materials	Water containing tenside / isopropyl alcohol
Cosmetics	Water containing tenside / isopropyl alcohol
Foodstuffs	Water containing tenside
Fuels	Water containing tenside

For materials which are not listed, please request information from manufacturer or your supplier. Before using another than the recommended method for cleaning or decontamination, the user must ascertain that this method

does not destroy the instrument. Wear the proper protective gloves during cleaning of the instrument.

Note:

- Electrical instrument may not be placed in the cleansing agent for the purpose of cleaning.
- The instrument must be cleaned and put it into the initial packaging carton before sending to service for repair, avoiding the contamination of hazardous.
- Switch OFF the instrument and put it in the dry, clean, stable place at room temperature in long-term disuse.



11. Associated standards and regulations

Construction in accordance with the following safety standards

EN 61010-1

UL 3101-1

CAN/CSA C22.2(1010-1)

EN 61010-2-10

Construction in accordance with the following EMC standards

EN 61326-1

12. Technical data

Items	Parameters
Voltage [VAC]	100~240
Frequency [Hz]	50/60
Power [W]	30
Shaking movement	Orbital/ linear
Orbital diameter [mm]	10 (SK-O(L)330-Pro) / 4 (SK-O(L)180-Pro)
Max. shaking weight (with attachment) [kg]	7.5 (SK-O(L)330-Pro) / 2.5 (SK-O(L)180-Pro)
Motor type	External rotor brushless motor
Motor rating input [W]	28
Motor rating output [W]	15
Permissible ON time [%]	100
Speed range [rpm]	100-350(SK-L330-Pro) 100-500(SK-O330-Pro) 100-350(SK-L180-Pro) 100-800(SK-O180-Pro)
Speed display	LCD
Timer	Yes

Items	Parameters
Timer display	LCD
Time setting range [min]	1 – 1199
Run type	Time / Continuous operation
Dimensions [D × W × H mm]	420 × 370 × 100(SK-O(L)330-Pro)/340 × 300 × 100(SK-O(L)180-Pro)
Weight [kg]	13.5(SK-O(L)330-Pro)/ 8.1(SK-O(L)180-Pro)
Permissible ambient temperature [° C]	5 – 40
Permissible relative humidity	80%
Protection class acc. To DIN EN60529	IP21
RS232 interface	Yes

Table 3

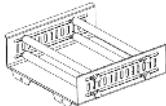
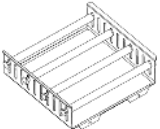
13. Products and Accessories


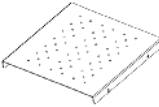

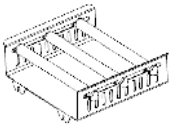
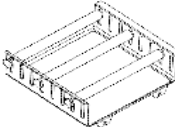
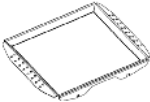
Cat.No	Descriptions
831010010000	SK-L180-Pro Linear Digital Shaker (2.5Kg),No Attachment, Cn plug, 110/220/50Hz/60Hz
831010030000	SK-L180-Pro Linear Digital Shaker (2.5Kg),No Attachment, Euro plug, 110/220/50Hz/60Hz
831010040000	SK-L180-Pro Linear Digital Shaker (2.5Kg),No Attachment, UK plug, 110/220/50Hz/60Hz
831010050000	SK-L180-Pro Linear Digital Shaker (2.5Kg),No Attachment, USA plug, 110/220/50Hz/60Hz
832010010000	SK-O180-Pro Orbital Digital Shaker (2.5Kg), No Attachment, Cn plug, 110V/220V/50Hz/60Hz
832010030000	SK-O180-Pro Orbital Digital Shaker (2.5Kg), No Attachment, Euro plug, 110V/220V/50Hz/60Hz

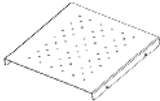




Cat.No	Descriptions
832010040000	SK-O180-Pro Orbital Digital Shaker (2.5Kg), No Attachment, UK plug, 110V/220V/50Hz/60Hz
832010050000	SK-O180-Pro Orbital Digital Shaker (2.5Kg), No Attachment, USA plug, 110V/220V/50Hz/60Hz
831010020000	SK-L330-Pro Linear Digital Shaker (7.5 Kg), No Attachment, Cn plug, 110V/220V/50Hz/60Hz
831010060000	SK-L330-Pro Linear Digital Shaker (7.5 Kg), No Attachment, Euro plug, 110V/220V/50Hz/60Hz
831010070000	SK-L330-Pro Linear Digital Shaker (7.5 Kg), No Attachment, UK plug, 110V/220V/50Hz/60Hz
831010080000	SK-L330-Pro Linear Digital Shaker (7.5 Kg), No Attachment, USA plug, 110V/220V/50Hz/60Hz
832010020000	SK-O330-Pro Orbital Digital Shaker (7.5 Kg), No Attachment, Cn plug, 110V/220V/50Hz/60Hz

Cat.No	Descriptions
832010060000	SK-O330-Pro Orbital Digital Shaker (7.5 Kg), No Attachment, Euro plug, 110V/220V/50Hz/60Hz
832010070000	SK-O330-Pro Orbital Digital Shaker (7.5 Kg), No Attachment, UK plug, 110V/220V/50Hz/60Hz
832010080000	SK-O330-Pro Orbital Digital Shaker (7.5 Kg), No Attachment, USA plug, 110V/220V/50Hz/60Hz

Accessories

Accessories Figure	Cat.No and Designation	Operation mode
	18900027 SK330.1	SK 330.1 Universal Attachment
	18900040 SK330.3	SK330.3 Lengthways Roller Attachment

	18900041 SK330.4	SK330.4 Dish Attachment (with slip-resistant foil)
	18900028 SK 330.2	SK 330.2 Fixing Clip Attachment
	18900036	Bars for SK330.1 Universal Attachment, black
	18900025 SK 180.1	SK 180.1 Universal Attachment
	18900038 SK180.3	SK180.3 Lengthways Roller Attachment
	18900039 SK180.4	SK180.4 Dish Attachment (with slip-resistant foil)

	18900026 SK 180.2	SK 180.2 Fixing Clip Attachment
	18900037	Bars for SK180.1 Universal Attachment, black
	18900029 SK330.2.1	Fixing Clips for Flask Volume 25 ml
	18900030 SK330.2.2	Fixing Clips for Flask Volume 50 ml
	18900031 SK330.2.3	Fixing Clips for Flask Volume 100 ml



	18900032 SK330.2.4	Fixing Clips for Flask Volume 200/250 ml
	18900033 SK330.2.5	Fixing Clips for Flask Volume 500 ml
	18100319 RS232 9-Pin interface line	Suitable to shakerPC Software used

Table 4

Note:

*The software ShakerPC can be download free on our website
www.dragon-lab.com.*

SK-O330(180)-Pro圆周数显型摇床 SK-L330(180)-Pro线性数显型摇床

使用说明书



- SK-L330-Pro 线性数显型摇床(7.5Kg)
- SK-O330-Pro 圆周数显型摇床(7.5Kg)
- SK-L180-Pro 线性数显型摇床(2.5Kg)
- SK-O180-Pro 圆周数显型摇床(2.5Kg)

请仔细阅读说明书或观看我公司有关该仪器的相关使用指导视频，并在说明书或视频的操作指导下安全使用本仪器。

视频下载地址为我公司网站www.dragon-lab.com的视频下载中心

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前言

欢迎使用《SK-O330(180)-Pro/ SK-L330(180)-Pro圆周/线性数显型摇床使用说明书》。用户在使用本仪器前应仔细阅读本说明书，按说明书指导进行操作，并了解各种注意事项。。

如何获取帮助

如果您在安装和使用SK-O330(180)-Pro/ SK-L330(180)-Pro圆周/线性数显摇床的过程中遇到任何问题和需要帮助，请及时与**大龙兴创实验仪器**(北京)有限公司的售后服务部门取得联系，联系方法如下：

公司地址：**大龙兴创实验仪器**(北京)有限公司
北京市顺义区空港工业区 B 区裕华路28号12号楼3层，
101318

电话：86-10-85653451 / 52 / 53

传真：86-10-85653383

电子邮箱：info@dragon-lab.com

维修服务热线：400-1100-556

售后服务邮箱：service@dragon-lab.com

网址：Http://www.dragon-lab.com

请您准备以下资料：

- 产品序号（在仪器背板上）
- 问题现象的描述
- 您为了解决问题所采用的方法和操作步骤
- 您的电话、传真和E-mail地址等联络方式

质量保证书

您所购买的是**大龙兴创实验仪器**(北京)有限公司生产的实验室仪器。根据**大龙兴创实验仪器**(北京)有限公司的质量保证条款，在本说明书规定的正常使用条件和操作方法下使用该仪器时，该仪器的保修期为24个月（自购买之日起）。由于错误安装与操作、私自拆卸与维修以及其他违反说明书中规定的操作条款造成的仪器性能下降和损坏，不能按照本质量保证进行维修。

如出现质保条款中的相关问题，请联系供货商。

1. 安全事项

	<p>警告!</p> <ul style="list-style-type: none"> 在使用仪器之前请仔细阅读本说明书，并根据以下安全说明进行操作。 只有经过专业培训的人员才可以操作本仪器。
	<p>安全接地保护!</p> <ul style="list-style-type: none"> 为保证安全，使用本仪器前请确认电源插座接地良好。

- 工作时，请穿戴个人防护工作服装，以避免可能由以下事项引发危险：
 - 振荡液体飞溅
 - 机械振荡力导致玻璃容器破碎
 - 身体、头发、衣服及首饰等被卷入
- 根据安全事项说明和职业安全准则操作仪器，避免意外伤害。
- 不要触碰仪器的运动部件，避免头发、衣服等卷入仪器。搬动仪器时注意不要碾压到手指。
- 请把仪器置于宽敞通风的区域内使用，并确保工作台平稳、洁净、干燥、阻燃且具有一定的摩擦力。请勿在室外，危险物质环境，水中运行本仪器。
- 设置仪器转速时请注意振荡板上放置的容器，避免样品溅出。如果仪器运行不平稳，请调低电机转

- 速。
- 配件必须可靠连接，容器必须稳固放置，避免发生危险。
- 制备易燃样品可能会导致危险。只能制备在振荡过程中不会产生危险反应的样品。
- 请使用“配件”章节中列出的标准配件，并按照本说明书使用配件以确保安全。在装配附件之前请先切断电源，每次开启仪器之前请确认仪器及其附件未被损坏。
- 只有专业人员才能打开仪器，打开仪器之前请拔出电源插头。
- 铭牌上指定的工作电压必须与电网供电电压相匹配。
- 仪器在使用过程中不要遮盖仪器。防止撞击和挤压仪器及配件。
- 请勿在强磁场区域使用本仪器。

2. 使用范围

本仪器是为学校、实验室和工厂等应用环境设计的，用于对液体进行振荡混匀。本仪器可以安装多种配件，适用烧杯、烧瓶及试管等容器。最大承重为7.5kg (330) 和2.5Kg(180)。本仪器不适合在住宅区以及第1章中规定的一些限制条件下应用。未使用制造商推荐的配件，或者未按使用说明进行操作，可能会出现不安全的情况。

3. 检查

3.1 开箱检查

用户如发现任何包装损伤，请在收据上注明。在打开包装后如果发现任何内部损伤，请联系供货商。



注意：

如发现仪器上有任何明显的损伤，请不要将其连接到电源。

3.2 装箱清单

名称	数量
SK-O(L)330-Pro或 SK-O(L)180-Pro摇床主机	1台
电源线	1根
SK-330(180)-Pro使用说明书	1本

表1

4. 试运行

按照下列步骤进行试运行操作：

- 检查铭牌上指定的工作电压与电网供电电压是否匹配；
- 插座是否接地良好；
- 连接好电源线，打开电源开关，开机自检；
- 显示安全转速限制；

- 显示工作模式；
- 旋转速度调节按钮，设置相应的转速；
- 按动速度调节按钮，振荡功能开启；
- 再次按动速度调节按钮，关闭振荡功能。

如果上述操作运行正常，说明仪器可以开始正式使用。如果无法正常运行，仪器可能存在安全设置或者已损坏。请联系供货商。

如果放置仪器的表面不够平坦，可以用扳手调节地脚高度，提高仪器运行的平稳性。

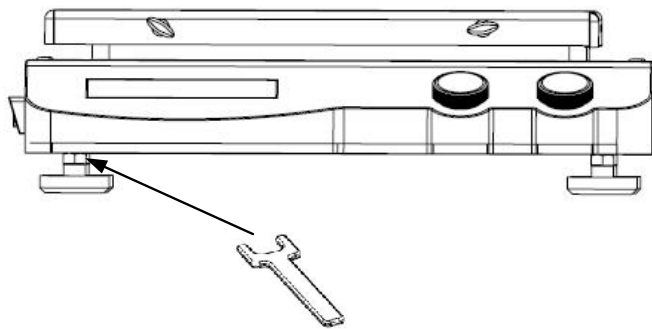


图1

5. 控制和设置

5.1 控制

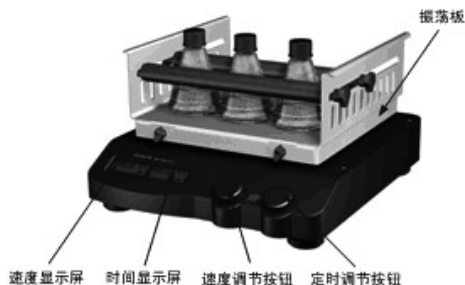


图2

名称	说明
速度调节按钮Speed	设定电机旋转转速，按下旋钮开启/关闭振荡功能。
定时调节按钮Time	设定振荡时间，按下旋钮开启/关闭振荡功能。
LCD	液晶显示屏显示仪器当前工作状态及各项设置。
电源开关	打开/关闭仪器主电源。

- 将摇床置于安全平稳处，接入电源；

- 打开仪器左侧面板的电源开关；
- 开机自检；
- 等待仪器初始化结束，显示设置转速和定时时间；
- 旋转速度调节按钮，设置振荡转速；
- 按动速度调节按钮，左侧液晶显示字符不再闪烁，“set”字符消失，振荡功能开启；
- 再次按动左侧速度调节按钮，左侧液晶显示字符闪烁，“set”字符显示，振荡功能关闭；
- 旋转时间调节按钮，设置工作时间；
- 按动时间调节按钮，右侧液晶显示字符不再闪烁，“set”字符消失，定时功能开启；
- 再次按动时间调节按钮，右侧液晶显示字符闪烁，“set”字符显示，定时功能关闭。

5.2 设置

5.2.1 定时时间

旋转右侧时间调节按钮可以设定振荡时间。定时工作模式和持续工作模式的区别在于，持续工作模式会在当前设定速度下一直工作，而定时工作模式则按照定时时间进行工作。时间（最大19h59min）设定后，设定转速后，按动时间调节按钮后，仪器开始运转，定时开始，如果：

- 按动时间调节按钮，仪器停止振荡，定时停止；再次按动时间调节按钮重新开启振荡工作，定时以已设定的时间重新开始。

b. 按动速度调节按钮，仪器停止振荡，定时停止；再次按动速度调节按钮将重新开始振荡工作，定时功能未开启（右侧屏幕闪烁），如需定时则需再次按动时间调节按钮，定时将以已设定的时间重新开始。



注意：

仪器在运转过程中，时间设置值可以随时更改，更改并重新开启后仪器按照新设置值开始定时。

5.2.2 振荡速度

速度调节按钮可以设置速度值和速度上限值（如6.1所示）。在定时功能未开启的情况下，按动速度调节按钮开启持续工作模式，再次按动速度调节按钮仪器停止振荡。

调节振荡速度时须缓慢调节，以使仪器平稳运行。



注意：

仪器在运转过程中，转速设置值可以随时更改，更改后仪器将按照新设置值开始振荡。

6. 工作模式

6.1 工作模式A

工作模式A是仪器出厂默认的模式。打开仪器电源开关，振荡和定时功能是关闭的。液晶屏显示存储的速度设置值和时间设置值。仪器各项功能沿用存储设置值，可以修改设置值。

开启仪器，液晶屏按下列流程显示：

- 左侧液晶屏显示“SAF”字符，右侧液晶屏显示振荡速度上限值（单位是rpm）。按一下速度调节按钮并立刻旋转它，可设置速度上限值。



图3

- 液晶屏显示工作状态“StA”、“A”或“B”字符，持续2秒钟。



图4

- 左侧液晶屏显示振荡速度设定值或存储值，右侧液晶屏显示时间设定值或存储值。旋转速度调节按钮可设置振荡速度，旋转时间调节按钮可设置定时时间。



图5

- 当速度和时间值设定后，单独按动时间调节按钮

(或先后按下速度调节与时间调节按钮) 仪器进入定时振荡状态, 当剩余工作时间为0时工作停止; 单独按下速度调节按钮, 仪器进入持续工作状态(定时功能未开启)。

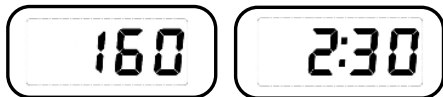


图6



注意:

振荡工作进行中, 可修改设定值。

在定时工作状态下, 按动速度调节按钮或时间调节按钮均可以停止工作。

6.2工作模式B

仪器开启后, 速度值和时间值清零, 用户自行设置。但速度上限值沿用模式A的设定值, 用户不能修改。断电重启后, 仪器不会自行启动至工作模式B。

打开仪器电源开关, 选定工作模式后(如6.3所示), 液晶屏按下列流程显示:

- 左侧液晶屏显示“SAF”字符, 右侧液晶屏显示储存的电机转速上限值(单位是rpm)。不能修改速度上限设定值。



图7

- 液晶屏显示工作状态“StA”字符, 持续2秒钟。



图8

- 左侧液晶屏显示电机转速设定值, 右侧液晶屏显示时间设定值。设置振荡速度和定时时间。

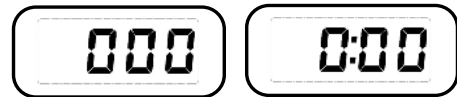


图9

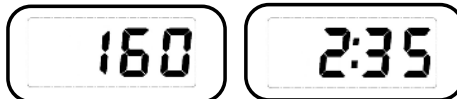


图10

- 当速度和时间值设定后, 单独按动时间调节按钮(或速度调节按钮与时间调节按钮先后按下) 仪器进入定时振荡状态, 当剩余工作时间为0时, 振荡工作停止; 单独按下速度调节按钮, 仪器进入持续

工作状态（定时功能未开启）。

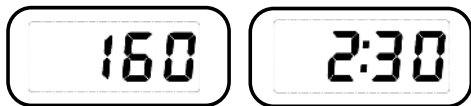


图11



注意：

振荡工作进行中，可修改设定值。

在定时工作状态下，按动速度调节按钮或时间调节按钮均可以停止振荡工作。

6.3 模式切换

依下列步骤切换工作模式：

- 关闭仪器电源；
- 按住速度调节按钮和时间调节按钮同时打开仪器电源开关，5秒钟后同时松开速度调节按钮和时间调节按钮；
- 依次切换A、B两种工作模式。

6.4 方向切换

依下列步骤切换摇床运转方向：

- 关闭仪器电源；
- 按住时间调节按钮同时打开仪器电源开关，10秒钟后松开时间调节按钮；
- 依次切换仪器运转方向

7. 承重

SK-O (L) 330-Pro的最大的承重量是7.5kg，SK-O (L) 180-Pro的最大的承重量是2.5kg。

确保仪器放置的工作台必须洁净且水平。使用单个容器时，请确保容器位于振荡板中间，使用多个容器时，请确认容器放置均匀且稳固。

8. 故障诊断

- 打开电源仪器不启动
 - 请检查电源线是否连接紧密
 - 请检查电源保险管是否损坏或松动
- 转速无法达到设定值
 - 请检查摇床载重是否超过最大承重量
- 按动时间调节按钮时混匀和定时功能无法启动
 - 请检查仪器时间设定是否为零

9. 接口和输出

SK-O330(180)-Pro/ SK-L330(180)-Pro圆周/线性数显摇床使用专用的配件和电缆连接其它外部设备。采用标准9针接口实现与PC机的连接。

- 摇床与计算机之间的连接线采用指定的EIA标准RS 232C通信线，对应的DIN 66020接口。
- 传输模式：双向通信。

- 1起始位；8位字符；1停止位。
- 传输速率：9600 bit/s。
- 实验室仪器到计算机的数据通信只能由计算机发出请求。



注意：

禁止在开机状态下拔插串口线

10. 维护和清理

- 正确地使用和维护仪器，使其处于良好的工作状态，有利于延长使用寿命。保持仪器整洁，切勿将溶液流入机内。
- 维护和清理之前必须切断电源，只能使用我们推荐的方法清理仪器。祛除方法：

染料	异丙醇
建筑材料	水溶表面活性剂/异丙醇
化妆品	水溶表面活性剂/异丙醇
食物	水溶表面活性剂
燃料	水溶表面活性剂

上表没有列出的材料，请先咨询仪器制造商。在采用其他清理方法之前，用户必须与制造商确认该方法不会损坏仪器。清理仪器时，请戴上合适的保护手套。



注意：

- 电子设备不能用清洁剂清理。
- 送修仪器必须清理，同时避免危险物质的污染，并把仪器放回原始包装箱发送。
- 当产品长期不用时，请将仪器断电存放，并置于干燥，洁净，常温，平稳处。

11. 相关标准

仪器结构符合以下安全标准：

EN 61010-1
 UL 3101-1
 CAN/CSA C22.2(1010-1)
 EN 61010-2-10

仪器结构符合以下电磁兼容标准：

EN 61326-1

12. 技术参数

项目	参数
电压 [VAC]	100~240
频率 [Hz]	50/60
功率 [W]	30

项目	参数
运行方式	圆周/直线
周转直径 [mm]	10 (SK-O(L)330-Pro) / 4 (SK-O(L)180-Pro)
允许振荡承重量(含夹具) [kg]	7.5 (SK-O(L)330-Pro) / 2.5 (SK-O(L)180-Pro)
电机类型	直流无刷电机
电机输入功率 [W]	28
电机输出功率 [W]	15
允许连续运转时间 [%]	100
速度范围 [rpm]	100-350(SK-L330-Pro) 100-500(SK-O330-Pro) 100-350(SK-L180-Pro) 100-800(SK-O180-Pro)
转速显示	LCD
计时器	是
计时器显示	LCD
时间设置范围 [min]	1 ~ 1199
运行方式	定时 / 连续运转

项目	参数
外形尺寸 [mm]	420 × 370 × 100(SK-O(L)330-Pro)/ 340 × 300 × 100(SK-O(L)180-Pro)
重量 [kg]	13.5(SK-O(L)330-Pro)/ 8.1(SK-O(L)180-Pro)
允许环境温度 [° C]	5 ~ 40
允许相对湿度	80%
DIN EN60529保护方式	IP21
RS232接口	有

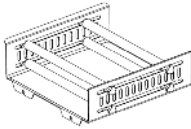
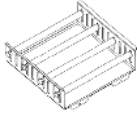

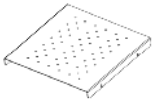
13. 产品及配件信息


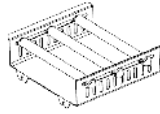
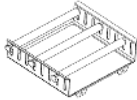
产品信息



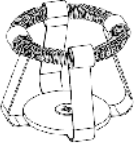
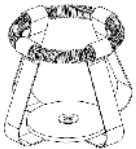
产品编号	描述
831010020000	SK-L330-Pro水平型数显摇床 (7.5 Kg), 无夹具, 国标插头, 220V/50Hz
832010020000	SK-O330-Pro圆周型数显摇床 (7.5 Kg), 无夹具, 国标插头, 220V/50Hz
831010010000	SK-L180-Pro水平型数显摇床 (2.5Kg), 无夹具, 国标插头, 220V/50Hz


832010010000	SK-O180-Pro圆周型数显摇床 (2.5Kg), 无夹具, 国标插头, 220V/50Hz
--------------	--

配件信息

图示	产品编号及名称	适用范围
	18900027 SK 330.1滚轴托架 套件	适用于各种器皿, 滚轴位置可调
	18900040 SK330.3纵向滚轴 夹具	用于各种容器
	18900041 SK330.4培养皿托 架, 带胶垫	适用于培养皿
	18900028 SK 330.2空白钉板, 与锥形瓶夹具配套	适用于烧瓶, 配合 烧瓶固定卡具使用 (不含卡具)

图示	产品编号及名称	适用范围
	18900036 容器固定棒, 黑色	用于SK330.1通用 夹具, 带两端螺栓
	18900025 SK 180.1滚轴托架 套件	适用于各种器皿, 滚轴位置可调
	18900038 SK180.3纵向滚轴 夹具	用于各种容器
	18900039 SK180.4培养皿托 架, 带胶垫	适用于培养皿
	18900026 SK 180.2钉板托 架套件	适用于烧瓶, 配 合烧瓶固定卡具 使用 (不含卡 具)

图示	产品编号及名称	适用范围
	18900037 容器固定棒, 黑色	用于SK180.1通用夹具, 带两端螺圈
	18900029 25ml锥形瓶夹具	25 ml 锥形瓶夹具, 与空白钉板配套使用
	18900030 50ml锥形瓶夹具	50 ml 锥形瓶夹具, 与空白钉板配套使用
	18900031 100ml锥形瓶夹具	100 ml 锥形瓶夹具, 与空白钉板配套使用

图示	产品编号及名称	适用范围
	18900032 200/250ml锥形瓶夹具	200/250ml锥形瓶夹具, 与空白钉板配套使用
	18900033 500ml锥形瓶夹具	500 ml 锥形瓶夹具, 与空白钉板配套使用
	18100319 RS232 九针串口线	配合ShakerPC软件使用

备注：软件ShakerPC请到我公司网站www.dragon-lab.com的下载中心免费下载。

表5

Dragon Laboratory Instruments Limited

大龙兴创实验仪器（北京）有限公司

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