Digital Overhead Stirrer

User Manual

LCD Digital Enhanced Overhead Stirrer

LED Digital Enhanced Overhead Stirrer

LCD Digital Overhead Stirrer

LED Digital Overhead Stirrer

Please read the User Manual carefully before use, and follow all operating and safety instructions!
Technical specifications and outline are subject to change without prior notice.

Ver.20180929

Contents

Preface 1
Service 1
Warranty 1
1. Safety Instructions 2
2. Proper Use 3
3. Inspection 3
   3.1 Receiving Inspection 3
   3.2 Listing of Items 3
4. System Assembly 4
5. Trial Running 5
6. Function 6
   6.1 Control 6
   6.2 Display 9
7. Overload Protection 10
8. Interface and Output (LCD digital) 10
9. Faults 11
10. Maintenance and Cleaning 13
11. Associated standards and regulations 13
12. Specifications 14
13. Ordering Informations 16

Preface

Welcome to the “Digital Overhead Stirrer 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 the service department of manufacturer for technical support .

Please provide the customer care representative with the following information：

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

Warranty

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 supplier. You may also send the instrument directly to manufacturer, enclosing the invoice copy and by giving reasons for the claim.

1. Safety Instructions

	Warning! • Read the operating instructions carefully before use. • Ensure that only trained staff works with the instrument.
	Protective ground contact！ • Ensure the socket must be grounded (protective ground contact) before use.

- When working wear personal safety guards to avoid the risk of:
  - Splashing liquids
  - Broken glass containers
- Follow the safety instructions, guidelines and accident prevention regulations.
- Do not touch the running parts, moving instrument care not rolling your fingers.
- Set up the instrument in a spacious area on a stable, clean, non-slip, dry and fireproof surface. Do not operate the instrument in explosive atmospheres, with hazardous substances or under water.
- Please note the vessel when set up the speed, to avoid splashing the sample. If the instrument does not run smoothly, please decrease the motor speed.
- Firmly secure the accessories and vessels in place to avoid damage or risk.
- Preparation of samples may lead to dangerous flammable. Only process samples that will not react dangerous.
- Use the standard accessories listed in the “accessories” section, and follow the instructions to use accessories to ensure safety. Please switch off the power before assembly of accessories, confirm the instrument and accessories are intact before switch on each time.
- The instrument only be opened by expert，please switch off before use.
- The voltage stated on the nameplate must correspond to the mains voltage.
- Do not cover the instrument during running. Prevent the collision and extrusion to instrument and accessories.
- Keep away from high magnetic field.

2. Proper Use

The instrument is designed for mixing sticky substance in schools, laboratories or factories. It can be installed on a variety of impeller, for different viscosity of the medium. This instrument is not suitable for using in residential areas or other constraints mentioned in Chapter 1.

Do not use the accessories recommended by the manufacturer, or failure to use the instructions, may be caused unsafe situation.

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/supplier for technical support.

Note:

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

3.2 Listing of Items

Item	Qty
Main unit	1
Power cable	1
User manual	1

Table 1

4. System Assembly

a. Install stand

The stand must be assembled according to the following instructions. Adjust the height of the main unit, and the distance from main unit to the support holder by rotating the locking device. Anti-drop protector can be adjusted up or down, ensure the locking position is suitable for fixing the main unit, and then attach the main unit to the stand.

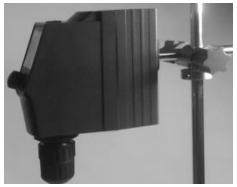


Figure 1

b. Install stirring impeller

Plug the stirring impeller into the drill chuck, and adjust the depth of stirring impeller into vessel. Rotate the drill chuck with your fingers to fix the stirring impeller.

Figure 2

Note:

1. Overhead stirrer is a high-speed running device. The system are required to lock securely the corresponding components in each step of the assembly to avoid any movement of the main unit or stirring impeller which would be caused harm or damage to peripheral instrument and personnel.
2. The stand is a support device for overhead stirrer. The corresponding components are required to be locked securely to avoid any movement which would be caused harm or damage.
3. When install main unit and anti-drop protector, take care of your fingers to avoid harm.

5. Trial Running

Follow the instructions below to trial operate:

LCD Digital (Enhanced) Overhead Stirrer	LED Digital (Enhanced) Overhead Stirrer
•Ensure the required operating voltage and power supply voltage matched. •Ensure the socket must be earthed reliably. •Connect the power cable，ensure the power on and begin self-checking. •Rotate the stirring button and set stirring speed. •Press stirring button and start stirring. •Press again the stirring button and stop stirring.	•Ensure the required operating voltage and power supply voltage matched. •Ensure the socket must be earthed reliably. •Counter-clockwise rotate the speed control button to the end before switch on instrument. •Connect the power cable，ensure the power on and begin self-checking. •Clockwise rotate the speed control button to the target speed value, and start stirring function. •Counter-clockwise rotate the speed control button to stop stirring function.

If these operations above are normal, the instrument is ready to operate. If not, the instrument may be damaged during transportation, please contact technical support of manufacturer/supplier.

Note: Do not touch components of high-speed running instrument during operation to avoid damage and harm.

6. Function

6.1 Control

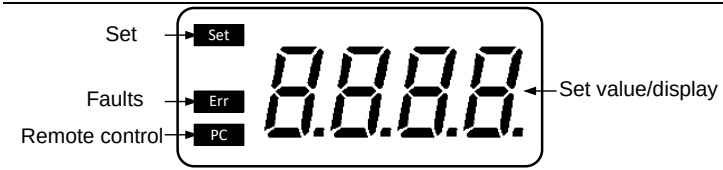
Figure 4 **LCD Digital (Enhanced) Overhead Stirrer**

Figure 5 **LED Digital Enhanced Overhead Stirrer**

	Items	Default settings
LCD Digital (Enhanced) Overhead Stirrer	Speed control button **Speed**	Set stirring speed, press the button to start/stop stirring function.
	Mode switch knob **Mode**	Shift speed and torque display. LCD displays the current speed value at initial running. LCD displays the current torque value when press the mode knob.
	LCD display	LCD displays the real working state and all setting values.
	Speed/torque light **RPM/Torque**	Yellow/Green LED display light. Different color of LED lights show the value for speed or torque that LCD screen currently displays. Yellow LED light shows that LCD screen currently displays speed. Green LED light shows that LCD screen currently displays torque.
	Power switch /Overload protection light **Power/Overload**	Green/Red LED display light. LED light shows green when switch on, LED light shows red when starts overload protection. When the torque reaches limited value, overload protection function will be started. At the same time overload protection light flashes, while the system stops running.
	Drill chuck	Can be held stirring impellers.
	Push-through agitator shaft	If needed, shaft can push-through agitator.
	Power switch **I/O**	Switch ON or OFF the instrument.

	Items	Default settings
LED Digital (Enhanced) Overhead Stirrer	Speed control button **Speed**	Set stirring speed, press the button to start/stop stirring function.
	LED display	LED displays speed value and warning code.
	Overload protection light **Overload**	LED display light. LED light shows red when starts overload protection. When the torque reaches limited value, overload protection function will be started. At the same time overload protection light flashes, while the system stops running.
	Power switch light **Power**	LED display light. LED light shows green when switch on.
	Drill chuck	Can be held stirring impellers.
	Push-through agitator shaft	If needed, shaft can push-through agitator.
	Power switch **I/O**	Switch ON or OFF the instrument.

6.2 Display

<table>
<tr><th colspan="2">LCD Digital (Enhanced) Overhead Stirrer</th><th colspan="2">LED Digital (Enhanced) Overhead Stirrer</th></tr>
<tr><td colspan="2"> 
</td><td colspan="2"> 
</td></tr>
<tr><td>Set</td><td>Display when set target speed value.</td><td rowspan="4">Display area</td><td rowspan="4">LED displays speed value under normal conditions.
LED displays warning code under abnormal conditions.</td></tr>
<tr><td>PC</td><td>Display when using external probe.</td></tr>
<tr><td>Err</td><td>Display in case of error happening.</td></tr>
<tr><td>Value set/display area</td><td>When Set display, this area shows setting value; When Set disappears, this area shows running value.</td></tr>
<tr><td colspan="2">• Place the overhead stirrer in safe and stable surface and connect power cable.
• Switch ON instrument.
• The instrument begins self-checking.
• When initialization is over, displays “set”, at the same time the area of value setting/display flashes that indicate can be set speed value.
• Rotate speed control button to set stirring speed.
• LCD display no longer flashes when press speed button, “set” disappear, the stirring function start.
• Press speed button again, LCD display flashes, “set” display, the stirring function close.</td><td colspan="2">• Place the overhead stirrer in safe and stable surface and connect power cable.
• Switch ON instrument.
• Clockwise rotate the speed control button to the target speed value, and start stirring function.
• Counter-clockwise rotate the speed control button to stop stirring function.</td></tr>
</table>

7. Overload Protection

Overhead Stirrer works continuous, the motor current is electronically limited to achieve security stall and overload protection. When the torque reaches limited value, overload protection function will be started. At the same time overload protection light flashes.

- Starts overload protection
  - When the setting speed value does not match the current medium viscosity, starts overload protection.
  - When the motor output shaft is stuck, motor protection starts.
- Refer to Chapter 9 for the solutions of overload protection and motor protection.

8. Interface and Output (LCD digital)

LED Digital (Enhanced) Overhead Stirrer makes use of special accessories and cables to connect external devices. Standard 9-pin interface is used to be connected to the PC.

- The cable between Overhead stirrer and PC are selected from the specified communication line of the EIA-standard RS232C, corresponding with DIN66020.
- Transmission method: Asynchronous signal transmission in start-stop-operation.
- Mode of transmission: Fully Duplex. 1 starts bit; 7 character bits; 1 stop bit.
- Transmission speed: 9600 bit/s
- Data communication from laboratory instrument to computer is only possible on demand of the computer.

Note:
Do not insert or remove the RS232C communication line when switch on!

9. Faults

LCD Digital (Enhanced) Overhead Stirrer	LED Digital (Enhanced) Overhead Stirrer
• Instrument cannot be powered ON when start stirring function. ■ Check whether the power cable is connected. • Speed cannot reach set point. ■ The setting speed value does not match the current medium viscosity, please reduce speed then re-start. • Stirring function suddenly stop ■ Overload protection light changed to red, display area shows “Er 03”, indicate the current failure is “overload protection”. When the setting speed value does not match medium viscosity that caused overload protection, should be first pressing speed control button to stop stirring function. Restart stirring after lowered setting speed value. If overhead protection continues starting, then repeat the process and gradually reduce the speed.	• Instrument cannot be powered ON when start stirring function. ■ Check whether the power cable is connected. • Stirring function suddenly stop ■ Overload protection light changed to red, display area shows “Er 03”, indicate the current failure is “overload protection”. When the setting speed value does not match medium viscosity that caused overload protection, should be first switching OFF the instrument. Switch ON the instrument after lowered setting speed value. If overhead protection continues starting, then repeat the process and gradually reduce the speed.

LCD Digital (Enhanced) Overhead Stirrer	LED Digital (Enhanced) Overhead Stirrer
■ Overload protection light changed to red, display area shows “Er 04”, indicate the current failure is “motor protection”. When the motor output shaft is stuck that caused motor protection, should be first pressing speed control button to stop stirring function, remove the block material, and then re-set original setting speed value to start stirring function.	■ Overload protection light changed to red, display area shows “Er 04”, indicate the current failure is “motor protection”. When the motor output shaft is stuck caused motor protection, should be first switching OFF the instrument, remove the block material, and then switch ON the instrument to start stirring function.

If these faults are not resolved, please contact manufacturer/supplier.

10. Maintenance and Cleaning

- Proper maintenance can keep instrument working properly and lengthen its lifetime.
- Do not spray cleanser into the instrument when cleaning.
- Do not remove the power line when cleaning. Only use recommended cleansers:

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

Before using other method for cleaning or decontamination, the user must ascertain with the manufacturer that this method will not damage the instrument. Wear the proper protective gloves during cleaning of the instrument.

Note:

- Electronic device can not clean with cleanser.
- If you require maintenance service, must be cleaned the instrument in advance to avoid pollution of hazardous substances, and to send back into original packing.
- If the instrument will not use for a long time, please switch off and place in a dry, clean, room temperature and stable location.

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. Specifications

Items	Specifications			
	LCD Digital Enhanced Overhead Stirrer	LCD Digital Overhead Stirrer	LED Digital Enhanced Overhead Stirrer	LED Digital Overhead Stirrer
Max. stirring quantity (H_2O) [L]	40	20	40	20
Motor rating input [W]	120	60	120	60
Motor rating output [W]	100	50	100	50
Voltage [VAC]	100-240	100-240	100-240	100-240
Frequency [Hz]	50/60	50/60	50/60	50/60
Power [W]	130	70	130	70
Speed range [rpm]	50-2200	50-2200	50-2200	50-2200
Speed display accuracy [rpm]	±3	±3	—	—
Speed display	LCD	LCD	LED	LED
Speed display accuracy [rpm]	±1	±1	±1	±1
Max. torque [Ncm]	60	40	60	40
Max. viscosity [mPas]	50000	10000	50000	10000
Overload protection	LED light flash, auto stop	LED light flash, auto stop	LED light flash, auto stop	LED light flash, auto stop

Items	Specifications			
	LCD Digital Enhanced Overhead Stirrer	LCD Digital Overhead Stirrer	LED Digital Enhanced Overhead Stirrer	LED Digital Overhead Stirrer
Motor protect	LED light flash, auto stop	LED light flash, auto stop	LED light flash, auto stop	LED light flash, auto stop
Chuck range diameter [mm]	0.5-10	0.5-10	0.5-10	0.5-10
Dimension[W x H x D] [mm]	83 x 220 x 186	83 x 220 x 186	83 x 220 x 186	83 x 220 x 186
Weight [kg]	2.8	2.6	2.8	2.6
Protection class acc. to DIN/EN 60529	IP21	IP21	IP21	IP21
Temperature [℃]	5-40	5-40	5-40	5-40
Permission relative humidity [%]	80	80	80	80
RS232 interface	Yes	Yes	No	No

Table 2

13. Ordering Information

Accessories

18900069	Drill chuck
18900070	Stand packing 1(WxD: 200x315mm), including plate basic, support holder(H: 780mm) and fixing device
18900131	Stand packing 2(WxD: 200x315mm), including U-type basic, support holder(H: 780mm) and fixing device
18900071	Crossed stirrer, shaft length 40cm,stirrer diameter 5cm, 316L stainless steel
18900072	Straight stirrer, shaft length 40cm,stirrer diameter 6cm, 316L stainless steel
18900073	Blade stirrer, shaft length 40cm,stirrer diameter 6.8cm, 316L stainless steel
18900074	Centrifugal stirrer, shaft length 40cm,stirrer diameter 9cm, 316L stainless steel
18900075	Crossed stirrer, shaft length 35cm,stirrer diameter 6.5cm, PTFE-coated
18900076	Straight stirrer, shaft length 35cm,stirrer diameter 7cm, PTFE-coated
18900077	Blade stirrer, shaft length 35cm,stirrer diameter 6.8cm, PTFE-coated
18900078	Centrifugal stirrer, shaft length 35cm,stirrer diameter 8.5cm, PTFE-coated

顶置式电子搅拌器

使用说明书

LCD 数控型顶置式强力电子搅拌器

LED 数显型顶置式强力电子搅拌器

LCD 数控型顶置式电子搅拌器

LED 数显型顶置式电子搅拌器

请仔细阅读说明书并在其操作指导下安全使用本仪器。

外形和性能指标如有变动，概不另行通知。

目录

前言.....1
如何获取帮助.....1
质量保证.....1
1. 安全事项.....2
2. 使用范围.....3
3. 检查.....3
3.1 开箱检查.....3
3.2 装箱清单.....3
4. 系统组装.....4
5. 试运行.....5
6. 功能设置.....6
6.1 控制.....6
6.2 显示.....8
7. 电机保护及过载保护.....10
8. 接口和输出（适用于 LCD 数显型）.....10
9. 故障诊断.....11
10. 维护和清理.....12
11. 相关标准.....12
12. 技术参数.....13
13. 订货信息.....15

前言

欢迎使用《顶置式电子搅拌器使用说明书》。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的过程中遇到任何问题和需要帮助，请及时与制造商/供货商的售后服务部门取得联系。

请您准备以下资料：

- 产品序号（在仪器背板上）
- 质保卡
- 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

根据制造商的质量保证条款，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，请联系制造商/供货商。

1. 安全事项

	警告! • 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。
	安全接地保护! • 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：
  搅拌液体飞溅
  玻璃容器破碎
- 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，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搅拌桨下的容器，避免样品溅出。如果仪器运行不平稳，请调低电机转速。
- 搅拌桨必须可靠连接，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，用于对粘稠物质进行搅拌。本仪器可以安装多种搅拌桨，适用不同粘度的介质。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，请联系制造商/供货商。

注意：

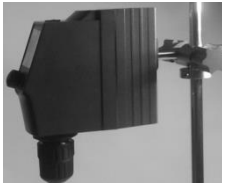
如发现仪器上有任何明显的损伤，请不要将其连接到电源。

3.2 装箱清单

名称	数量
主机	1 台
电源	1 个
使用说明书	1 本

表 1

4. 系统组装

c.	安装标准支架套装 将标准支架套装按照图示进行安装，通过旋转支架上的锁紧把手调整主机的高度及主机与支架的距离。脱落保护可以上下调整，锁紧位置应可保证主机挂靠此位置时搅拌桨不会触及仪器摆放平面。将顶置搅拌器主机安装在标准支架套装上。	 图 1
d.	安装搅拌桨 将搅拌桨插入顶置搅拌器主机的钻夹头孔中，调整搅拌桨进入容器的深度，一只手捏住钻体并带住搅拌桨主轴，使搅拌桨自然垂直，处于“放松”状态，另一只手慢慢旋转钻夹头外套，对搅拌桨进行紧固定位（如图 2 所示）	 图 2

注意：

1．顶置搅拌器为高速运行装置，系统组装中的每一步骤都需锁紧相应部件，避免主机本身或搅拌桨位置移动对人员或系统周边带来破坏性伤害。

2．标准支架为顶置搅拌器的支撑装置，组装时需将其各连接部件锁紧，避免连接松动导致的破坏性伤害。

3. 调整主机和脱落保护装置高度时，请注意不要碾压到手指。

5. 试运行

按照下列步骤进行试运行操作：

LCD 数显型	LED 数显型
• 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 • 旋转速度调节按钮，设置相应的转速 • 按动速度调节按钮，旋转功能开启 • 再次按动速度调节按钮，关闭搅拌功能	• 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，将速度调节旋钮旋至最左边，打开电源开关，开机自检 • 顺时针旋转速度调节旋钮至目标转速位置，搅拌功能启动 • 逆时针旋转速度调节旋钮至最左边，搅拌功能关闭

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。请联系制造商/供货商。

注意：仪器运行过程中禁止接触外部高速运行部件，以免造成破坏性伤害。

6. 功能设置

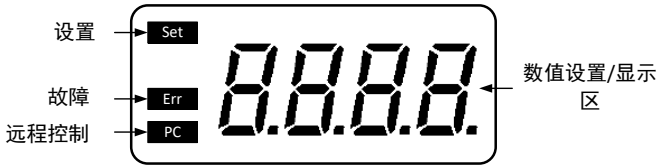
6.1 控制

图 4　**LCD 数显型**

图 5　**LED 数显型**

LCD 数显型		LED 数显型	
转速调节旋钮 **Speed**	设定电机转速，按下旋钮开启/关闭搅拌功能。	转速调节旋钮 **Speed**	设定电机转速，开启搅拌功能
模式切换按钮 **Mode**	切换电机转速与扭矩的显示。系统初始运行时 LCD 显示为当前电机转速值，按下 Mode 按键后 LCD 显示当前电机扭矩值。		
LCD 液晶屏	液晶显示屏显示仪器当前工作状态及各项设置	LED 显示屏	LED 显示屏显示仪器当前转速及错误代码等信息
转速/扭矩显示指示灯 **RPM/Torque**	绿/橙双色LED指示灯。通过LED指示灯颜色区别当前LCD液晶屏显示的数值为转速还是扭矩，LED指示灯为 绿色表征LCD当前显示为转速，LED指示灯为橙色表征LCD当前显示为扭矩。	过载保护指示灯 **Overload**	LED 指示灯。当系统扭矩达到限定值时，过载保护启动，过载保护指示灯亮，同时系统停止运行
电源/过载保护指示灯 **Power/Overload**	绿/红双色LED指示灯。开启电源开关LED指示灯为绿色，仪器过载保护时LED指示灯为红色。当系统扭矩达到限定值时， 过载保护启动，过载保护指示灯亮，同时系统停止运行。	电源指示灯 **Power**	LED 指示灯。开启电源开关 LED 指示灯亮
钻夹头	可夹持标准规格搅拌桨。		
穿透式搅拌桨	搅拌桨可穿透主机。		
电源开关 **I/O**	打开/关闭仪器主电源。		

6.2 显示

<table>
<tr><th colspan="2">LCD 数显型</th><th colspan="2">LED 数显型</th></tr>
<tr><td colspan="2"> 
</td><td colspan="2"> 
</td></tr>
<tr><td>Set</td><td>设置目标转速数值时显示</td><td rowspan="4">显示区</td><td rowspan="4">正常情况下显示仪器当前转速；
异常情况下显示错误代码</td></tr>
<tr><td>PC</td><td>外接 PC 进行远程控制时显示</td></tr>
<tr><td>Err</td><td>仪器发生故障时显示</td></tr>
<tr><td>数值设置/显示区</td><td>Set 出现时该区域显示为设置数值；
Set 消失时该区域显示为运行数值</td></tr>
<tr><td colspan="2">• 将顶置搅拌器置于安全平稳处，接入电源
• 打开仪器面板上的电源开关
• 仪器执行开机自检
• 等待仪器初始化结束，“set”显示、同时数值设置/显示区闪烁，表征可以设置转速
• 旋转转速调节按钮，设置搅拌转速
• 按动转速调节按钮， 液晶显示字符不再闪烁，“set”字符消失，搅拌功能开启
• 再次按动转速调节按钮， 液晶显示字符闪烁，“set”字符显示，</td><td colspan="2">• 将顶置搅拌器置于安全平稳处，接入电源
• 打开仪器面板上的电源开关
• 仪器执行开机自检
• 顺时针旋转速度调节旋钮至目标转速位置，搅拌功能启动
• 逆时针旋转速度调节按钮至最左边，搅拌功能关闭</td></tr>
</table>

搅拌功能关闭	

7. 电机保护及过载保护

顶置搅拌器工作时连续运转，电机通过电子限流安全回路实现过载保护功能。当系统扭矩达到限定值时，过载保护启动，同时操作面板上的过载保护灯亮。

- 过载保护启动
  - 目标转速与当前介质粘度不匹配时，过载保护启动
  - 电机输出轴被卡住时，电机保护启动
- 解决办法参照第 9 章故障诊断。

8. 接口和输出（适用于 LCD 数显型）

LCD数显型顶置式电子搅拌器使用专用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机连接。

- 顶置搅拌器与PC机之间的连接线采用指定的EIA标准RS232C通信线，对应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PC机的数据通信只能由PC发出请求

注意：

禁止在开机状态下拔插串口线。

9. 故障诊断

LCD 数显型	LED 数显型
• 开启搅拌功能仪器不启动 ■ 请检查电源线是否连接紧密 • 转速无法达到设定值 ■ 设定转速与当前介质的粘度不匹配，请调低转速后再次启动 • 搅拌功能突然中止 ■ 电源/过载保护指示灯变成红色显示，数值设置显示区显示“Er 03”表征当前故障为“过载保护”，是由目标转速与介质粘度不匹配造成的，应先按动转速调节按钮关闭搅拌功能，调低目标转速后启动搅拌功能，如过载保护继续启动，则重复上述过程，逐步调低转速。 ■ 电源/过载保护指示灯变成红色显示，数值设置显示区显示“Er 04” 表征当前故障为“电机保护”，是由电机输出轴卡住造成的，应先按动转速调节按钮关闭搅拌功能，移开止动物质，重新设置原目标转速后启动搅拌功能。	• 开启搅拌功能仪器不启动 ■ 请检查电源线是否连接紧密 • 搅拌功能突然中止 ■ 过载保护指示灯亮，显示区显示“Er 03”表征当前故障为“过载保护”，是由目标转速与介质粘度不匹配造成的，应先关闭电源开关，调低目标转速后再次开启电源开关启动搅拌功能，如过载保护继续启动，则重复上述过程，逐步调低转速。 ■ 过载保护指示灯亮，显示区显示“Er 04” 表征当前故障为“电机保护”，是由电机输出轴卡住造成的，应先关闭电源开关，移开止动物质，重新设置原目标转速后开启电源开关启动搅拌功能。

如上述方法都无法排除故障，请联系制造商/供货商。

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，切勿使溶液进入机内。
- 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，请先咨询制造商售后服务部门。在采用其他清理方法之前，用户必须与制造商/供货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			
	LCD 数显型顶置式强力电子搅拌器	LCD 数显型顶置式电子搅拌器	LED 数显型顶置式强力电子搅拌器	LED 数显型顶置式电子搅拌器
最大搅拌量(H_2O) [L]	40	20	40	20
电机输入功率 [W]	120	60	120	60
电机输出功率 [W]	100	50	100	50
电压 [VAC]	100-240	100-240	100-240	100-240
频率 [Hz]	50/60	50/60	50/60	50/60
功率 [W]	130	70	130	70
转速范围 [rpm]	50-2200	50-2200	50-2200	50-2200
转速控制精确度 [rpm]	±3	±3	—	—
转速显示	LCD	LCD	LED	LED
转速显示分辨率 [rpm]	±1	±1	±1	±1
最大扭矩 [N.cm]	60	40	60	40
过载保护	LED 灯闪烁，自动停止	LED 灯闪烁，自动停止	LED 灯亮，自动停止	LED 灯亮，自动停止
电机保护	LED 灯闪烁，自动停止	LED 灯闪烁，自动停止	LED 灯亮，自动停止	LED 灯亮，自动停止
最大粘度 [mPas]	50000	10000	50000	10000
钻夹头夹持直径范围	0.5-10	0.5-10	0.5-10	0.5-10

项目	参数			
	LCD 数显型顶置式强力电子搅拌器	LCD 数显型顶置式电子搅拌器	LED 数显型顶置式强力电子搅拌器	LED 数显型顶置式电子搅拌器
[mm]				
外形尺寸(WxHxD) [mm]	83 x 220 x 186	83 x 220 x 186	83 x 220 x 186	83 x 220 x 186
重量 [kg]	2.8	2.6	2.8	2.6
保护级别 (DIN EN 60529)	IP21	IP21	IP21	IP21
环境温度 [ºC]	5-40	5-40	5-40	5-40
相对湿度 [%]	80	80	80	80
RS232 接口	有	有	无	无

表 2

13.订货信息

产品编号	描述
附件	
18900069	钻夹头
18900070	支架套装 1，包括平板底座(宽 200mm; 深 315mm)、支杆(高 780mm)和夹头
18900131	支架套装 2，包括 U 型底座(宽 200mm; 深 315mm)、支杆(高 780mm)和夹头
18900071	四叶片式搅拌桨，杆长 40cm，搅拌桨直径 5cm, 316L 不锈钢
18900072	一字式搅拌桨，杆长 40cm，搅拌桨最大直径 6cm, 316L 不锈钢
18900073	扇片式搅拌桨，杆长 40cm，搅拌桨最大直径 6.8cm, 316L 不锈钢
18900074	离心式搅拌桨，杆长 40cm，搅拌桨最大直径 9cm, 316L 不锈钢
18900075	四叶片式搅拌桨，杆长 35cm，搅拌桨最大直径 6.5cm, PTFE 涂层
18900076	一字式搅拌桨，杆长 35cm，搅拌桨最大直径 7cm, PTFE 涂层
18900077	扇片式搅拌桨，杆长 35cm，搅拌桨最大直径 6.8cm, PTFE 涂层
18900078	离心式搅拌桨，杆长 35cm，搅拌桨最大直径 8.5cm, PTFE 涂层

表 3