

# STALWART

## Operation Manual

### SMH-35+

Magnetic Intelligent Color Display Heating Stirrer





# **Foreword**

**Thank you for purchasing magnetic intelligent color display heating stirrer. This Manual for users contains function and operation of the Instrument. In order to use the instrument properly, please read this manual carefully before using the Instrument.**

## **Opening Check**

**Please check the instrument and appendix with the packing list when you first open the packing case. If you find there is something wrong with the instrument or the appendix, please contact the vendor or the producer.**

# Safety Warnings and Guidelines

## 1. Important operation information of the security

Before operation, please have a perfect conception of how to use the Instrument. Read this manual carefully before using it.



Operation before reading the Manual is forbidden. Read the guidelines and directions below and carry out the countermeasure according to them.

## 2. Security

The operation, maintenance and repair of the Instrument should comply with the basic guidelines and the remarked warning below. Otherwise, it will affect the scheduled using life of the Instrument and the protection provided.



This product is a normal and an indoor Instrument which conforms to Standard B style- I type- GB9706.1.



Before operation, read the manual carefully. These units are designed for using in the laboratory environments by who're knowledgeable in safe laboratory practices.



The operator should not open or repair the Instrument by himself, which will result in losing the qualification of repair guarantee or occur accident. If there is some wrong with the Instrument, the company will repair it.



Before power on, guarantee the voltage used should be accordant to the voltage needed, and the rated load of electrical outlet should not lower than the demand. If the electric line is damaged, you should replace it with the same type. You should assure there's nothing on the electric line and you should not put the electric line in the ambulatory place. Hold the jack when you pull out the electric line, and don't pull the electric line.



This instrument should be placed in a place with low humidity, little dust and far away from water source and avoid direct sunlight and strong light source. The room should be well ventilated and free from corrosive gas or strong magnetic field interference. It should be far away from heating, furnace and other heat sources. Do not place the instrument in damp or dusty places.



Power off when you finish your work. Pull off the connector plug when there's long time no use of the Instrument and cover it with a cloth or plastic paper to prevent from dust.

Pull the connector plug from the jack immediately in the following cases, and contact the vendor:



- There is some liquid flowing into the Instrument.
- Drenched or fire burned.
- Abnormal operation such as abnormal sound or smell.
- Instrument dropping or outer shell damaged.
- The function has obviously changed.

### **3. The maintenance of Instrument**

- Tray and clamping of the instrument should be regularly cleaned with clean soft cloth drenched with a small amount of anhydrous alcohol
- If there is any stain on the surface of the instrument, it can be cleaned with soft cloth soaked with cleaning paste

### **4. After Sale Service Commitment**

#### **A) Content of warranty**

The company will be responsible for replacement due to fault caused by the materials and manufacturing from the date of delivery within 1 month. The company will provide free warranty due to fault caused by the materials and manufacturing from the date of delivery within 12 months. In the warranty period, the company will provide free repair service or replacement for those machines which are proved as defective apparatus selectively.

#### **B) Scope of Warranty**

Improper use or use under unmoral condition, damage caused by repair or modify without authority etc. do not belong to the scope of warranty. Out of Warranty period, charge the cost of fees appropriately.

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## Chapter 1 Introduction

SMH-35+ magnetic intelligent color display heating stirrer adopts special enamel plate heating technology, whose highest surface temperature can reach 340 °C. Magnetic stirrer stirring technology and humanized operation design can meet a variety of heating and stirring experimental requirements.

Its features are as follows:

- Special enamel plate surface heating surface to heat, beautiful, anti-corrosive and easy to clean;
- Unique heating way, the highest surface temperature can reach 340°C ;  
Temperature control using fuzzy PID control algorithm, high measuring precision, low blunt temperature (within + / - 5 °C), single key operation, internal and external PT1000 temperature measurement, thyristor controlled output with the function of broken accidentally protection ;
- The stirring function can be used to heat and stir 50ml-20l standard or non-standard reaction bottles.
- Brushless DC motor, stable performance, low noise, long life, without spark.
- Aluminum alloy shell, high strength, fast heat dissipation, corrosion resistance;
- 30 ° slope control panel for seated and standing point of view;
- Magnetic stirring technology, smooth at low speed, powerful at high speed;
- 4.3 inches color screen holographic display, convenient and intuitive.

## Chapter 2 Specifications

### 1. The normal operating condition:

**Ambient temperature:** 4℃ □ 45℃

**The relative humidity:** ≤70%

**Power supply:** AC220V/AC110V,50/60Hz

### 2. The parameters and function

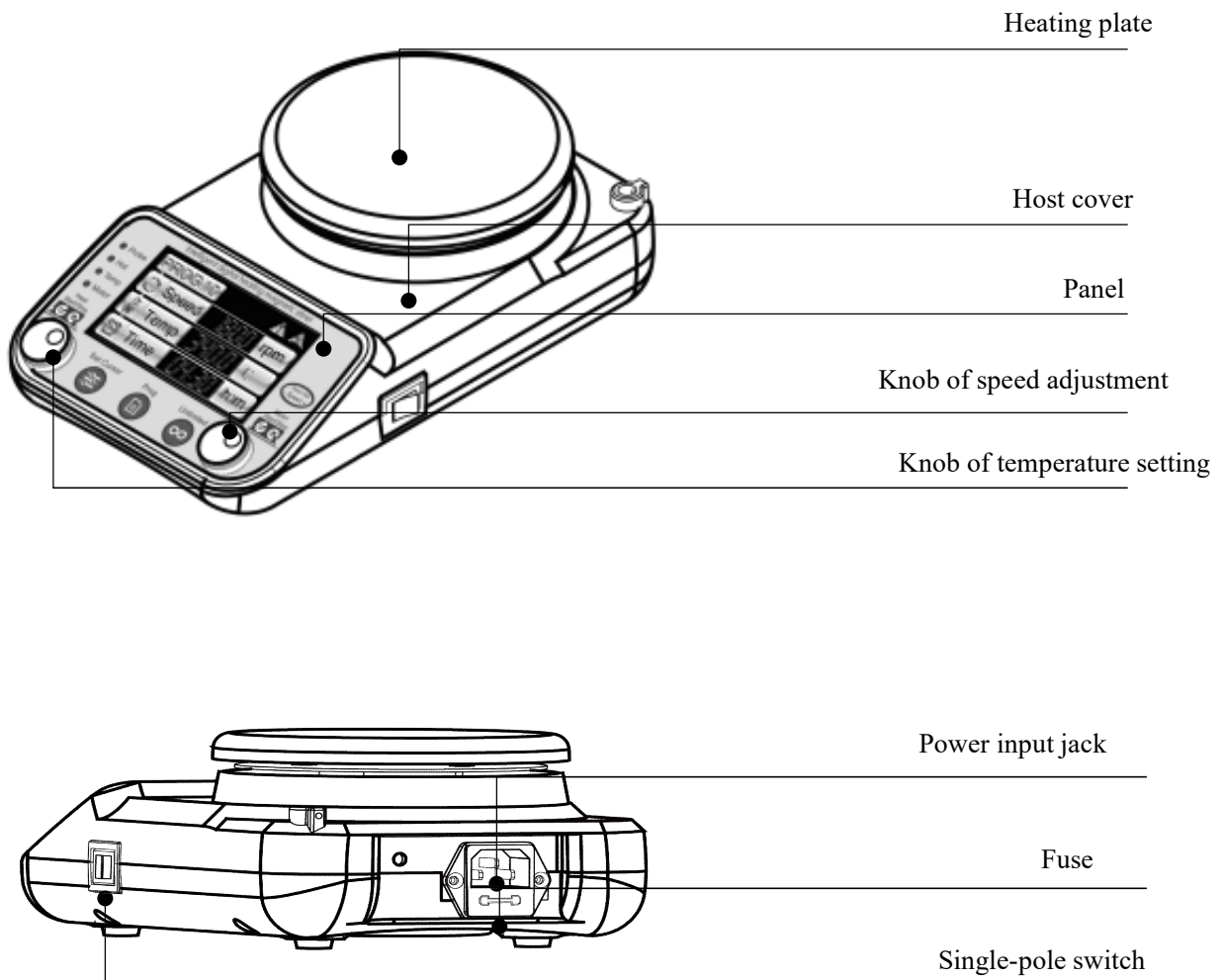
|  |                                       |
|--|---------------------------------------|
| Type                                       | SMH-35+                               |
| Diameter of Heating Plate                  | Φ137mm                                |
| Heating Plate Material                     | Ceramic                               |
| Speed Range                                | 80~1800rpm                            |
| Temp control range                         | R.T+5℃~340℃                           |
| Temp setting range                         | 30℃~340℃                              |
| Temp stability                             | ±3℃                                   |
| Timing range                               | 1min~99h59min 0 means infinite length |
| Number of stir point                       | 1                                     |
| Max. Stir Capacity (H <sub>2</sub> O)      | 20L                                   |
| Max length of stirrer                      | 80mm                                  |
| External temperature sensor interface      | PT1000                                |
| Minimum adjustable safety temperature loop | 50℃                                   |
| Max adjustable safety temperature loop     | 350℃                                  |
| Supply power                               | AC220V/AC110V, 50/60Hz                |
| Power                                      | 600W                                  |
| Fuse                                       | 250V, 4A/8A, Φ5x20                    |
| Dimension (W x D x H)                      | W.160×D.270×H.90mm                    |
| Net weight(kg)                             | 2.4kgs                                |



## Chapter 3 Basic Operation

This chapter mainly introduces the structure of the instrument, the function of the operation panel, and the preparatory work before starting up. When using this instrument for the first time, you should be familiar with the contents of this chapter before starting it up.

### 1. Structure sketch



## 2. Keyboard and Display Panel



- a) Probe means external sensor
- b) Hot means heating indicator light
- c) Temp means heating running indicator light
- d) Motor means stir running indicator light
- e) Set Cursor means set the adjustment segment (Temp/Time)
- f) Prog means one key to invoke built-in program
- g) Unlimited means one key to run for long time.

## 3. Key Function



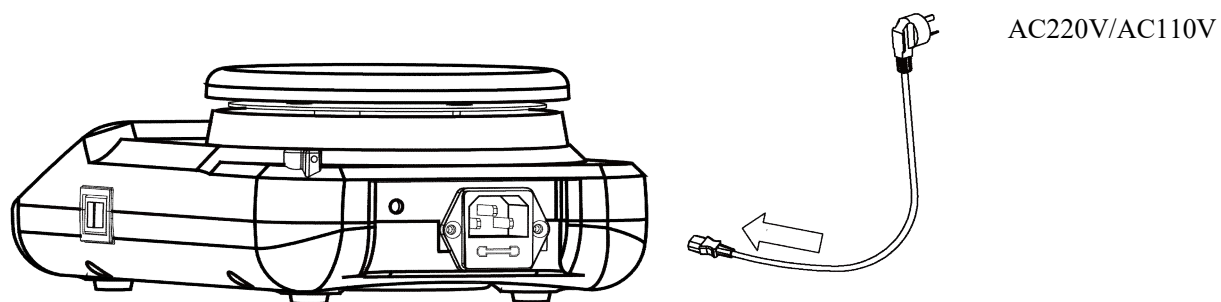
Left knob is used to set the temperature or time, clockwise rotate to increase knob, anticlockwise rotate to decrease knob.



Right knob is used to set speed, clockwise rotate to increase knob, anticlockwise rotate to decrease knob.

#### 4. Power connector

Put the instrument on a stable and level table. Insert the columnar socket of the power line into the power input socket on the back of the instrument as the following picture shows, and connect the other end of the power line to the power grid. The power grid voltage is required to be AC220V/AC110V.



## Chapter 4 Operation Guide

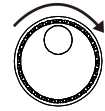
### 1. Setting of speed, temperature and time

- a) Turn on the power switch, the screen displays the main interface, with the sound of "di". (refer to picture one)



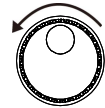
Picture one

- b) The right knob is used to set the speed, clockwise to increase while anticlockwise to decrease(refer to picture two and picture three)
- c) The left knob is used to adjust the temperature or time. While default condition , it adjust temperature .The user can switch the temperature or time through the Set Cursor key, clockwise to increase while counterclockwise to decrease.(refer to picture two and three)



Picture two

- d) In the process of operation, the instrument can also adjust the temperature and speed for convenient operation.



Picture three

- e) When the temperature of the disk surface is above 50 degrees, the user turns off the instrument switch, and the instrument display screen does not close to remind the user that the instrument is still in a high temperature state with Hot light beside still on.
- f) Temp lamp flashes when the instrument is heated.Temp lamp is long on when the instrument is thermostatic. Motor lamp is long on when the Motor is in the state of agitation.
- g) When the instrument is in standby state, click the Prog key can invoke 10 built-in fixed programs, which contain different speed, temperature and time parameters.
- h) When the instrument is in standby mode, click the Unlimited key to run for a long time, when the time goes to zero.

### 2. Start and stop

- A) Press the left knob once can start or stop temperature control separately
- B) Press the right knob t once can star and stop stirring state separately.

**Operation precautions:**

- 1. When using an external sensor, please insert the sensor into the tested product with a depth of more than 10mm.**
- 2. It is forbidden to move the instrument, or adjust the knob at will and pull out the sensor head during the operation of the instrument, otherwise the instrument will operate abnormally, and some damage will be caused in serious cases; you should press the knob first, and then perform the operation after the instrument stops.**

## Chapter 5 Failure Analysis and Handling

### Failure analysis and processing procedures

| No. | Phenomenon   | Cause                                    | Remedy                                 |
|-----|--|--|--|
| 1   | No display   | No power                                 | Check the connection of power          |
|     |  | Switch Failure                           | Exchange the switch                    |
|     |  | Others                                   | Contact the seller                     |
| 2   | Shaking too heavily                                    | Mixing samples are placed asymmetrically | Place the mixing samples symmetrically |
| 3   | The actual speed is different from the displayed speed | Failure in control board                 | Contact the seller                     |
| 4   | “ERR” in the display                                   | Motor or sensor malfunction              | Contact the seller                     |
| 5   | Heating plate does not heat                            | Temperature sensor breakdown             | Contact the seller                     |
|     |  | Heat block damage                        |  |
| 6   | Press invalid  | Press-key failure                        | Contact the seller                     |

### Annex 1: Wiring Diagram of Magnetic Intelligent Color Display Heating Stirrer

(Below diagram is just for reference. It is subject to change without prior notice.)

