

STALWART

SMH-35E+ **Digital Magnetic Hot Plate** **Stirrer**



User Manual

PREFACE

Thanks for choosing Digital Magnetic Hot Plate Stirrer. This operation manual describes function and operation of the instrument. In order to use the instrument properly, please read this manual carefully before operating the Instrument.

Opening Check

Please check the instrument and appendix with the packing list when you first open the packing case. If anything does not match with the packing list, please contact with the vendor or the producer.

Safety Warnings and Guidelines

1 Important operation information of the security

Users should have an entire conception of how to use the instrument properly before operating it. Please read this operation manual carefully before using the instrument.



It is forbidden operating before read the operation manual. 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. Otherwise, the instrument will lose the qualification of repair guarantee or cause accidents. The company will repair the instrument based on warranty description.



A.C. power's grounding should be reliable to safeguard against an electric shock. Make sure the power supply voltage matches the voltage that the instrument requests.

If the power cord is damaged, it must be replaced. When replacing, it must be replaced with the same type and size of the power cord. Do not put anything on the power cord when you use the instrument. Do not put the power cord in place where people walk around.

Must handheld the plug when plug or pull out the power cord. Should ensure that the plug is fully inserted. Don't pull the power cord when pull out the plug.



The instrument should be put in the place where of low temperature, little dust, no water, no sunshine or hard light, and of good aeration, no corrosively gas or strong disturbing magnetic field, and far away from central heating, camp stove and other hot resource. Do not put the instrument in wet and dusty place. The vent on the instrument is designed for aeration. Do not wall up or cover the vent.



Power off when operation finished. If do not use the instrument for a long period, pull off the connector plug, cover a piece of cloth on the instrument to prevent from dust.



Pull the connector plug from the jack at once in the following case, 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 Instruments Maintenance

The instrument and the accessories should be cleaned by cloth drenched with alcohol.

If there are smutches on the instrument, clean them with cloth.

4 After Service

1) Warranty Description

Within one month of delivery, the company is responsible of exchange for breakdown caused by material or manufacture.

Within 12 months of delivery, the company is responsible of free repair for breakdown caused by material or manufacture. Proven with defect under warranty, the company will exchange the instrument or free repair it alternatively.

Instrument under warranty period should be delivered to the appointed maintenance department by user. Freight from user to maintenance department will be borne by user. Freight for instrument resent to user will be borne by the company.

Repair out of warranty will be charged reasonable cost.

2) Warranty Coverage

Breakdown due to improper use, operation in inappropriate conditions, maintain or refitting without authorization are not in warranty coverage.

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Chapter 1 Introduction

TP-350E + intelligent digital display heating stirrer adopts anti-corrosion enamel stirring table, easy to clean, the edges are always kept cool, and the white surface can reflect the color change of temperature, visible to the naked eye. The maximum surface temperature can reach 340° C. Widely used in medical, biochemical, biological, chemical and other fields, it is the ideal liquid stirring equipment in your laboratory.

Features:

1. With metal case, high strength, quick heat dissipation, anti - corrosion.
2. Special heating technique, the heating plate can reach temperature up to 340°C.
3. The temperature control adopts fuzzy PID control algorithm, digital display, high precision, small temperature; single-touch operation, PT1000 temperature measurement inside and outside, SCR control output;
4. Stirring types are available for heating or stirring standard/non-standard reaction flasks from 50ml to 20L
5. Metal plate shell, firm and durable, thermostability and anti-corrosion.
6. The control panel designed 30° slopes for convenient operation.
7. Magnetic stirring technology. Steady working at low speed, powerful working at high speed.

Chapter 2 Specifications

1. The Normal Operation Condition

Ambient Temperature: 4℃ □ 45℃
 Relative Humidity: ≤70%
 Power: AC220V, 50/60Hz

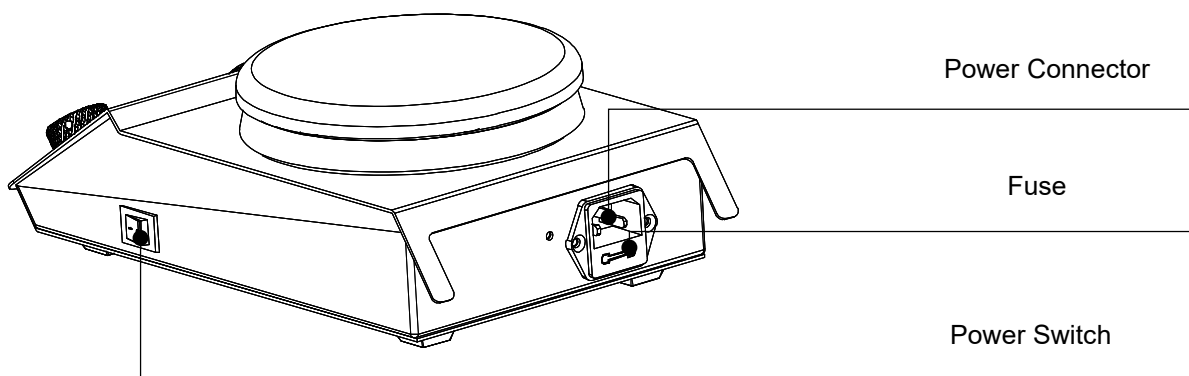
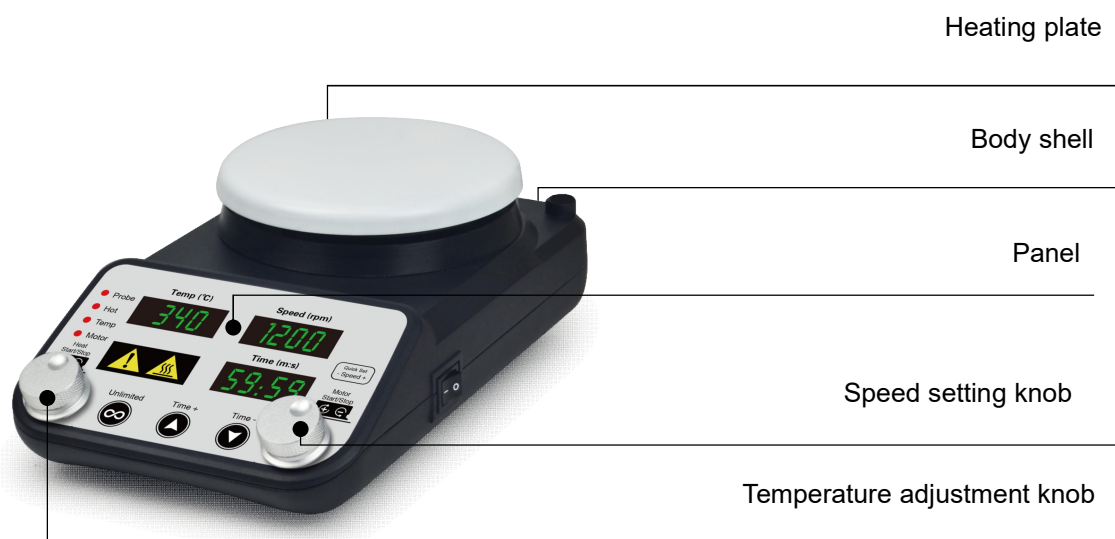
2. The Basic Parameters and Specifications

TYPE	SMH-35E+
Diameter of Heating Plate	φ137mm
Heating Plate Material	Ceramic
Speed Range	200 ~1200 rpm
Temp. Range	R.T. +5 ~340 °C
Temp setting range	30°C ~340°C
Temp stability	±3°C
Timing range	1min~99h59min 0 means infinite length
Stirrer Point	1
Max. Stir Capacity (H2O)	20 L
Max. Length of Stirrer Bar	80mm
External temperature sensor interface	PT1000
Min. Adjusted Safety Temperature Loop	50 °C
Max.Adjusted Safety Temperature Loop	350 °C
Voltage	220V AC /110V AC
Power	600W
Dimension (WxDxH)	160×270×90 mm
Net Weight	2.3 kgs

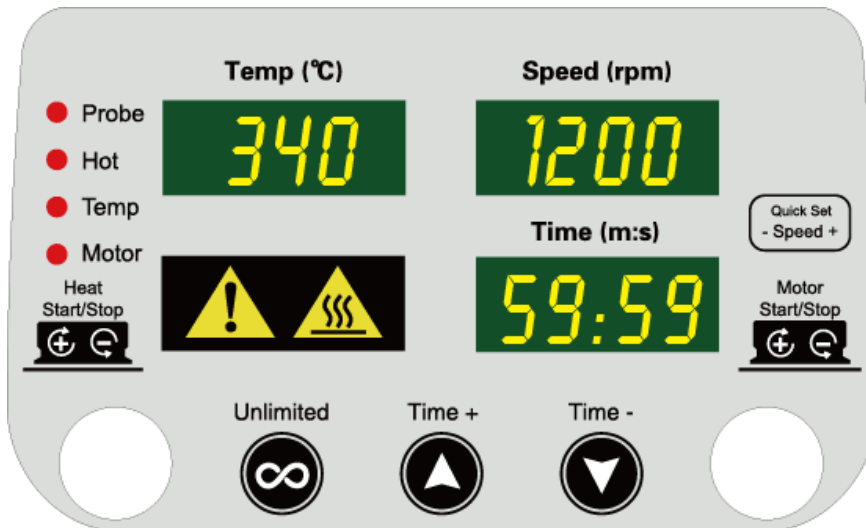
Chapter 3 Preparation

This chapter mainly describes the instrument's mechanical structure, the keyboard and functions of each key, as well as preparations before power on. Please learn this chapter well before the orbital shaker is to be operated at the first time.

1. Structure Description



2. Keyboard and Display Panel



3. Knob instructions



Clockwise rotate the left knob to increase temperature, anticlockwise rotate the knob to decrease temperature. Press this knob to start heating, press again to stop heating.



Clockwise rotate the right knob to increase speed/time, anticlockwise rotate the knob to decrease speed/time. Press this knob to start operation, press again to stop.

4. Key Description



Press this button to increase the time. Long press time to increase quickly.



Press this button, the time will decrease, and long press time will decrease quickly.



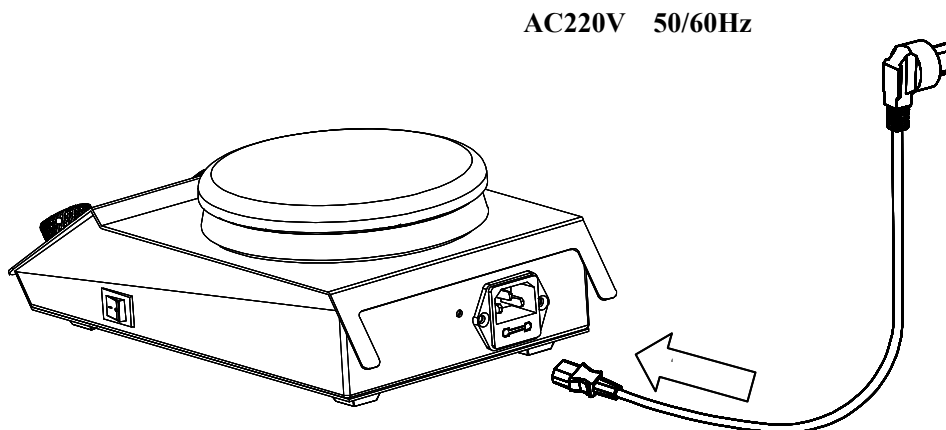
Press this button, the time is displayed as 00:00, which means infinity, the instrument will always running. Press again to return to the original set time.

5. Indicator light description

- a) Probe: External sensor
- b) Hot: High temperature indicator
- c) Temp: Heating operation indicator
- d) Motor: Stir running indicator

6. Power connection and external PT1000 connection

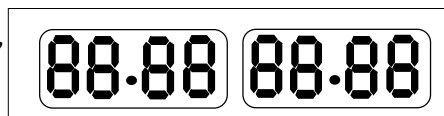
Place the instrument on a stable, horizontal workbench, insert the cylindrical socket of the power cord into the power input socket on the back of the instrument as shown in the figure, and connect the other end of the power cord to the power grid. The grid voltage must be AC220V. Insert the external PT1000 plug into the round hole on the back of the instrument, and then fix it on the bracket.



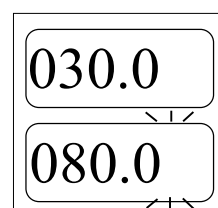
Chapter 4 Operation Guide

1. Speed, Timing and Temperature Setting

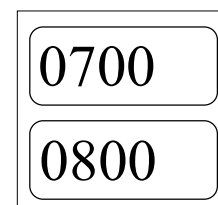
- a) Turn on the power switch, the display will show “8” one by one, and the instrument enters initialization.



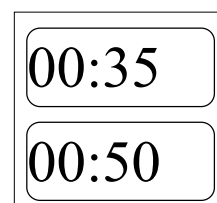
- b) The display at Temp shows 30.0, indicating that the temperature of the last instrument operation was 30 degrees. The left knob increases the setting value clockwise, and decreases the setting value counterclockwise. To change the setting value to 80 ° C, rotate the left knob clockwise until the display window value is 80.0 and stop turning. The speed is continuously variable, without screen, Clockwise rotate the right knob to increase value, contrarotate the knob to decrease value.



- c) The display at Speed shows 700, which indicates that the speed of the last instrument operation was 700 rpm. The right knob increases the setting value clockwise, and decreases the setting value counterclockwise. To change the setting value to 800rpm, turn the right knob clockwise until the display window value is 800, and stop turning.



- d) The display at Time shows 35 to indicate that the set time of the last instrument run is 35 minutes. Press “Time +” to increase the setting value and press “Time-” to decrease the setting value. To change the setting value to 50min, press “Time +” until the display window value is 50. If you want the instrument to run all the time, press “Unlimited” , the display at Time will



show 00:00, then press the instrument again to restore the original setting value.

Note! When the time is set to 00:00, it means that the time running value is infinite.

- e) Supports the instrument to reset the target value without pressing the stop key during operation, which is convenient for users to operate.
- f) When the surface temperature is higher than 50 degrees, turn off the single-pole switch. The display of the instrument does not turn off to remind the user that the instrument is still in a high temperature state, and the hot light next to it is always on. When the instrument is temperature-controlled, the Temp light flashes, and the instrument temperature is constant, it will longtime on; when the motor is in the stirring state, the Motor light is on, and when the display shows the temperature of the external PT1000, the probe light is on.

2. Stop / Start

- a) Click the Speed knob once to run the current program, click again to stop, the buzzer will sound an alarm.
- b) Click the knob at Temp once to run the current program, click again to stop, the buzzer will sound an alarm.



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 Trouble Shooting

Failure Analysis and Processing Procedures

No.	Phenomenon	Possible Causes	Processing Procedure
1	No signal display when power on.	No power	Check the power
		Broken switch	Exchange the switch
		Others	Contact with the seller
2	Shaking heavily	Sample not put in the center	Put the sample in center position
3	Actual speed and displayed speed are not matching	Broken controller	Contact with the seller
4	No heating from heating plate	Broken temperature sensor Broken heating wire	Contact with the seller
5	Invalid knob	Broken knob	Contact with the seller

Appendix A: Wiring Diagram of SMH-35E+

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

