

# **Digital heating mantles with stirring**

## **Series 658**

### **User's Manual**

## Security warning

1. Do not store volatile, flammable and explosive materials in the equipment, otherwise it may cause explosion or fire.
2. It is not allowed to place the equipment in rain, damp or water splashing place, otherwise it may cause electric leakage, short circuit or electric shock.
3. Do not insert metal objects such as iron nails or iron wires into any holes and gaps of the equipment, otherwise electric shock or injury will be caused by accidental contact of the above objects.
4. Nonprofessional technicians are not allowed to dismantle, repair or refit the equipment, otherwise fire or electric shock may be caused due to improper operation.
5. Do not damage or damage the power plug or power lead. If the plug is loose, the power cord must be replaced, otherwise fire or electric shock may be caused.

## Product features

1. The shell is made of high-quality material by stretching process, and the surface is treated by electrostatic spraying process.
2. The use of advanced electronic thyristor temperature control circuit can easily and quickly adjust the heating power, so as to achieve the effect of directly controlling the temperature of the instrument.
3. The heating sleeve is sealed in the high-temperature insulation layer with high-quality nickel chromium resistance wire, woven into a hemispherical internal heating sleeve, which has the characteristics of large heating area, fast heating, no open fire, uniform heating, intuitive temperature display, safe and energy-saving, good use effect, etc.

## Technical specifications

Series		658			
References		JGB005	JGB006	JGB007	JGB008
Capacity (ml)		250	500	1000	2000
Method		Surface heat conduction			
Performance	Working mode	Continuous / Timing function			
	Exterior	Cold rolled steel plate, chemicals resistant surface coating			
	Heater	Nichrome wire Ocr 27A17Mo2			
	Set	Rotary knob			
	Display	Digital, LED type			
	Power (kW)	0.15	0.25	0.35	0.45
	Outside size (diameter * H mm)	φ 196*176		φ 262*231	
	Voltage (50/60Hz)	AC220 V	AC220 V	AC220 V	AC220 V
	Current	0.7 A	1.1 A	1.6 A	2.0 A
	Stirring	Yes			
	Maximum Speed	1600 rpm			
	Minimum Speed	200 rpm			
	Drive	Motor			
Motor Power	0.01 kW				

## Note

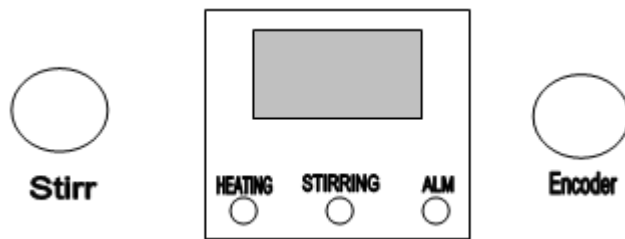
1. The power supply must be consistent with the voltage required by the instrument. The power socket should be a three hole safety socket with good grounding protection.
2. The liquid in the container shall not overflow into the heating sleeve to prevent electric leakage.
3. Since the surface of the heating sleeve is sealed with insulating material and coated with grease, it should be heated to remove grease when it is used for the first time. White smoke will be generated until the heating is smokeless and the power is turned off. After the temperature of the heating sleeve drops, it can be used normally.
4. When using it, should first add the liquid into the container, and then put it into the heating sleeve for heating.

## Instructions

### Preparation

1. Place the instrument on the table, install the temperature probe support and insert the plug of the sensor into the sensor base of the instrument.
2. Put the container containing liquid into the heating sleeve of the instrument and place the sensor in the heated liquid.

### Panel



1. “HEATING” : When there is heating output, it will be on, otherwise it will be off
2. “ALM” : When there is temperature deviation alarm or abnormal temperature measurement value, it will be on, otherwise it will be off
3. “STIRRING” : It is always on when the mixing switch is on

### Operation

1. After the instrument is powered on and the display window displays for 2 seconds, it enters the normal display state.
2. Timing function (constant temperature and positive timing, setting range: 0 ~ 999 min, factory value: 0)
  - ① In the normal display state, long press the encoder (button HEAT) for 3 seconds, and the password prompt LC and password value are alternately displayed. Through rotating the encoder, enter password 1, Then click the encoder, the time prompt ST and its current value are displayed alternately, and the required setting value is modified by rotating the encoder; Then click the encoder to return to the normal display state, and the timing setting value will be saved automatically.
  - ② When the timing setting value is 0, it means that there is no timing function and the instrument runs continuously.
  - ③ When the timing setting value is not 0, in the normal display state, if the constant temperature timing is not started, the decimal point of the nixie tube is always on, When the constant temperature timing starts, the decimal point flashes. When the timing time is up, the operation ends, the heating output is disconnected, and the nixie tube displays END.
  - ④ The method of starting running again after running  
Power on the instrument again  
Repeat the operation of ① to set the timing value to 0

### 3. Temperature setting and running time checking

#### 1) If there is no timing function (the timing setting is 0):

In the normal display state, click encoder to enter the temperature setting state. SP and its current setting value are displayed alternately. By rotating the encoder, modify to the desired setting value; then click encoder to return to normal display status, and the temperature setting value will be saved automatically.

#### 2) If there is a timing function (the setting value of timing is not 0):

In the normal display state, click the encoder to enter the temperature setting state, the prompt SP and its current setting value are alternately displayed, and the required setting value is modified by rotating the encoder; then click the encoder to enter the running time viewing state, and the prompt UT and its current running time are alternately displayed (not modifiable); then click the encoder to return to the normal display state, the temperature setting value is saved automatically.

### 4. Upper deviation over temperature alarm

When the upper deviation overtemperature alarm occurs, the ALM alarm light will always be on and the heating output will be disconnected.

### 5. Abnormal temperature measurement alarm

If "---" is displayed on the upper row of the display window, it means that the temperature sensor is faulty or the temperature exceeds the measuring range or the instrument itself is faulty, the instrument will automatically disconnect the heating output, and the ALM alarm light is always on. Please check the temperature sensor and its wiring carefully

## Reference and setting of internal temperature parameters

In the normal display state, long press the encoder for 3 seconds, the password prompt LC and password value are alternately displayed, and the required password value can be modified by rotating the encoder; then click the encoder, if the password value is not correct, the instrument will automatically return to the normal display state; if the password value is correct, it will enter the internal parameter setting state; then click the encoder to modify each parameter in turn.

In this setting state, long press the encoder for 3 seconds to return to the normal display state, and the parameter value is saved automatically. See the table below for details.

Note: in the parameter table, the temperature setting value is referred to as SP, and the temperature measurement value is referred to as PV.

Parameter table-1

Indicator	Name	Parameter function description	Factory default
Lc	Password	When Lc=3 can view and modify parameter values	0
AH-	Upper deviation over temperature alarm	When $PV > SP + AH$ , over temperature alarm for the upper deviation	(0~100°C) 20
P-	P-band	Time proportion regulation <b>Note: when p = 0, it is position control</b>	(0~300°C) 30
I-	Integration time	Integral action regulation	(1~999second) 300
d-	Differential time	Differential action regulation	(0~999second) 200
T-	Control period	Heating control cycle	(1~60second) 5

nP-	Heating percentage	Maximum heating power output percentage at temperature control	(0~100%) 100
Pb-	Measure the temperature Deviation correction	Used to correct the error of low temperature measurement. $Pb = \text{actual temperature value} - PV$	(-50~50°C) 0
PL-	Correction of the slope of measurement temperature	Correction of errors in high temperature measurement. $PL = 1000 * (\text{actual temperature value} - PV) \div PV$	(-199~999) 0

Parameter table-2

Indicator	Name	Parameter function description	Factory default
Lc	Password	Lc=9 can view and modify parameter values	0
nH-	Maximum set value	The maximum of the temperature set point	(0~400°C) 380

Parameter table-3

Indicator	Name	Parameter function description	Factory default
Lc	Password	Lc=27 can view and modify parameter values	0
AT-	self-adjusting	0: Cancel self-adjusting 1: Open self-adjusting	(0~1) 0

Parameter table-4

Indicator	Name	Parameter function description	Factory default
Lc	Password	Lc=67 can view and modify parameter values	0
rS-	Restore factory value	0: Cancel; 1: confirm	(0~1) 0

### System self-adjusting

When the temperature control effect is not ideal, the system can be self-tuning. There will be a large overshoot in the process of self-tuning. Please take this factor into consideration before system self-tuning.

After the self-tuning is turned on, three points of the nixie tube will flash. After the self-tuning is completed, the points of the nixie tube will stop flashing. The instrument will get a group of better PID parameters, and the parameter values will be saved automatically.

In the process of self-tuning, it is forbidden to modify the temperature setting value, except Parameter table-3, cannot access other parameter table.

### Packing list

Manual: 1      Power cable: 1      Temperature sensor support kit: 1      Temperature sensor:1