



# Graphite Hot Plate

## LMGH-201

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## 1. Introduction

**Graphite Hot Plate LMGH-201** are available with various plate sizes and ideal for providing uniform heat to the samples from low to high capacities. Hotplate is made up of graphite and outer shell is made with iron plate welding which provides uniform heat condition across the area of hotplate. Maximum working temperature is 350°C with 10% accuracy and controlled by an elevated control panel. Provided with an on/off button and LED display for precise and repeatable temperature settings for continuous operations. Features a K type sensor for protection against the temperature overshoot.

## 2. Features

- PID and microprocessor controller
- Totally enclosed high purity graphite and keeps temperature uniformity
- Large heating surface
- Durable and stable operation
- Fast and uniform heating

## 3. Specifications

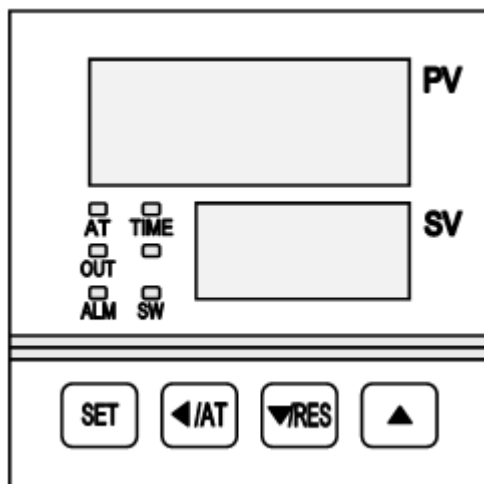
|                                     |                                      |
|-------------------------------------|--------------------------------------|
| <b>Model</b>                        | <b>LMGH-201</b>                      |
| <b>Working Time</b>                 | Continuous                           |
| <b>Maximum Temperature</b>          | 400°C                                |
| <b>Outer Shell</b>                  | Iron Plate welding, surface spraying |
| <b>Driving Mode</b>                 | No                                   |
| <b>Heating Power</b>                | 1200 W                               |
| <b>Continuous Operation</b>         | Yes                                  |
| <b>Timer</b>                        | No/Digital                           |
| <b>Operation Function</b>           | No                                   |
| <b>Temperature Sensor</b>           | K model                              |
| <b>Temperature Accurac</b>          | ±1% to ±10%                          |
| <b>Plate Temperature Uniformity</b> | ±10% to ±15%                         |
| <b>Exterior Size</b>                | 340×370×220                          |
| <b>Plate Size</b>                   | 300×300                              |
| <b>Plate Load</b>                   | 20 Kg                                |
| <b>Power Supply</b>                 | 220 V                                |
| <b>NW/GW</b>                        | 6.2/7 Kg                             |

## 4. Applications

It is widely used in chemical analysis, physical determination, heat treatment and experiments in laboratories of industrial mining enterprise, medicine and health, environmental protection, scientific research, biochemistry and colleges.

## 5. Instrument Introduction

### Panel Instruction



### Indicator light functions

- 1) **AT**: It flickers during self-tuning, it is not bright in any other state.
- 2) **OUT**: It is bright when heating output.
- 3) **TIME**: It is bright when time is set, it flickers in the process of timing.
- 4) **ALM**: It is bright when there is a temperature alarm.
- 5) **SW**: It is invalid

### Button function

- 1) **【SET】**: In normal state, press this button to enter the setting state.
- 2) **【◀/AT】**: “SHIFT” button. In the setting state, click this button to shift the set value. In normal state, press this button for 6 seconds to enter the auto-tuning selection state.
- 3) **【▼/RES】**: “DEC” button. In the setting state, click this button to reduce the set value. If you keep pressing this button, the value will reduce continuously. In the normal state, when the timer ends, press this button for 3 seconds, the controller will restart to work.
- 4) **【▲】**: “INC” button. In the setting state, click this button to increase the set value. If you keep pressing this button, the value will increase continuously.

## 6. Operations

- 1) Clean the hot plate on the steady platform, ensuring it is free of water, dirt, and other contaminants.
- 2) Place the flask with the sample or any other vessel on the hot plate.
- 3) Switch on the power supply. The indicator light will turn on, signaling that the hot plate is in operation.
- 4) Gradually turn the knob clockwise to increase the heating power or counterclockwise to decrease it.
- 5) While the hot plate is in use, monitor the test results closely to prevent any hazards.
- 6) After completing the test, turn off the power and wait for the hot plate to cool down completely before storing it.

### Note

- The power must accord with the machine.
- Make sure the power line has safety distance from the heating mantle.
- When the machine meets fault, please cut off the Electricity first.

**6.1** When the controller is switched on, all displays light up for 2 seconds, display windows show the version number and controller model for 2 seconds, then it starts running.

### 6.2 Temperature and Time Setting

#### 1) Without Timing Function:

In the normal state, press the "SET" button to enter the temperature setting state, Windows displays the prompt "SP" and the temperature set point value. Using the "SHIFT", "DEC" and "INC" buttons, the user can edit the temperature set value. Press the "SET" button again, the controller will return to its normal state, the setting value will be saved automatically.

#### 2) With Timing Function

- In the normal state, press the "SET" button to enter the temperature setting state. Windows displays the prompt "SP" and the temperature set point value. Re-press the "SET" button to enter the time setting state, Windows displays the prompt "ST" and the time set point value. Press the "SET" button again, the controller will return to its normal state, The set values will be saved automatically.
- When the time is set to "0", it indicates the timer is inoperative, the controller will run continuously, and the under window will display the temperature set point value. If there is time set, the under window displays the running time, its decimal point and the "TIME" indicator are lit, when the timer starts, its decimal point and the "TIME" indicator flicker. When the timer ends, the under window will display the "End" prompt, the buzzer will sound for EST (In Parameter Table 2) seconds, it can be muted by pressing any button, press the "DEC" button for 3 seconds, the controller will restart to work.

**6.3** If the upper window show the prompt “---”, it indicates that the temperature sensor has faults or temperature exceeds the measuring range or the controller itself is faulty, the controller will cut off the heat output automatically, the buzzer will sounds continuously, “ALM” indicator is lit, Please check the temperature sensor and its wiring carefully.

**6.4** When over temperature alarm, the buzzer beeps continuously, "ALM" indicator is lit, the heat output is cut off. If the over temperature alarm is caused by the change of the temperature setting value, "ALM" warning light is lit, but the buzzer does not beep.

**6.5** When the buzzer sounds, press any key to mute.

## 6.6 Auto-Tuning

- In the normal state, press the “SHIFT” button for 6 seconds, the controller will enter the auto-tuning selection state, the upper window displays the prompt “AT”, the under window displays "0", change "0" to "1" by pressing the “INC” button, then press the “SET” button, the controller will run the auto-tuning program, the “AT” indicator flickers. After the auto-tuning end, the indicator stops flickering, PID parameter value is saved automatically. In the auto-tuning process, press the “SHIFT” button for another 6 seconds, the controller will stop the auto-tuning program.
- During the Auto-tuning process, if the temperature alarm, the buzzer does not beep, the "ALM" indicator is not lit, the heat output will be cut off; the “SET” button is invalid, the under window always displays temperature set point value.

## 6.7 Internal Parameters Settings

In the normal state, press the “SET” button for 3 seconds, Windows will display the prompt “Lc” and the password value. Adjust the password to the required value, then press the “SET” button again, it will enter the internal parameters setting state. Press the “SET” button for another 3 seconds, it will return to the normal state, the set value will be saved automatically.

**Parameter Table 1**

| Prompt     | Name              | Function description                                                                          | (Setting range)             |
|------------|-------------------|-----------------------------------------------------------------------------------------------|-----------------------------|
| <b>Lc</b>  | Password key      | When “Lc=3”, enter the next parameters.                                                       | 0                           |
| <b>ALH</b> | Over-temp alarm   | If “PV>(SV+ALH)”, the ALM indicator turns on. The buzzer sounds and the heat output turn off. | (0~100.0℃)<br><b>Note 1</b> |
| <b>P</b>   | Proportional band | Adjustment of proportional function.                                                          | <b>Note 2</b>               |
| <b>I</b>   | Integration time  | Adjustment of integration function.                                                           | (1~2000S) 300               |
| <b>D</b>   | Differential time | Adjustment of differential function.                                                          | (0~1000S) 200               |

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|           |                                  |                                                                                                                                    |                       |
|-----------|----------------------------------|------------------------------------------------------------------------------------------------------------------------------------|-----------------------|
| <b>T</b>  | Control cycle                    | The temperature control cycle.                                                                                                     | (1~60S) <b>Note 3</b> |
| <b>Pb</b> | Temperature deviation correction | It is usually used to correct errors in low temperature measurement.<br><br>$Pb = \text{Actual value} - PV$                        | (-50.0~50.0°C)<br>0   |
| <b>PL</b> | Temperature slope correction     | It is usually used to correct errors in high temperature measurement.<br><br>$PK = 1000 \times (\text{Actual value} - PV) \div PV$ | (-999~999)<br>0       |

**Note1: NTC: 5.0; Others: 20.0**

**Note2: NTC: (0~100.0℃)10.0; Others: (0~300.0℃) 35.0**

**Note 3: For PCE-E8007 /PCE-E8002, the value is 20, and 5 for others**

**Parameter table 2**

| Prompt     | Name                      | Function description                                                          | (Setting range) |
|------------|---------------------------|-------------------------------------------------------------------------------|-----------------|
| <b>Lc-</b> | Password key              | When "Lc=9", enter the next parameters.                                       | 0               |
| <b>doT</b> | Temperature decimal point | 0: No decimal point display                                                   | (0~1)           |
| <b>ndT</b> | Timer mode                | 0: No timer function.<br>1: Start timing when the temp reaches the set value. | (0~2)<br>1      |
| <b>Hn</b>  | Timer unit                | 0: Minute.                                                                    | (0~1)           |

**Note 4: PT100: (0~400℃) 300.0; NTC: (0~100℃) 100.0; K: (0~600℃) 300.0**

**Parameter table 3**

| Prompt     | Name          | Function description          | (Setting range) |
|------------|---------------|-------------------------------|-----------------|
| <b>Lc</b>  | Password key  | When "Lc=567", enter the next | 0               |
| <b>rST</b> | Factory reset | 0: cancel; 1: confirm         | (0~1) 0         |

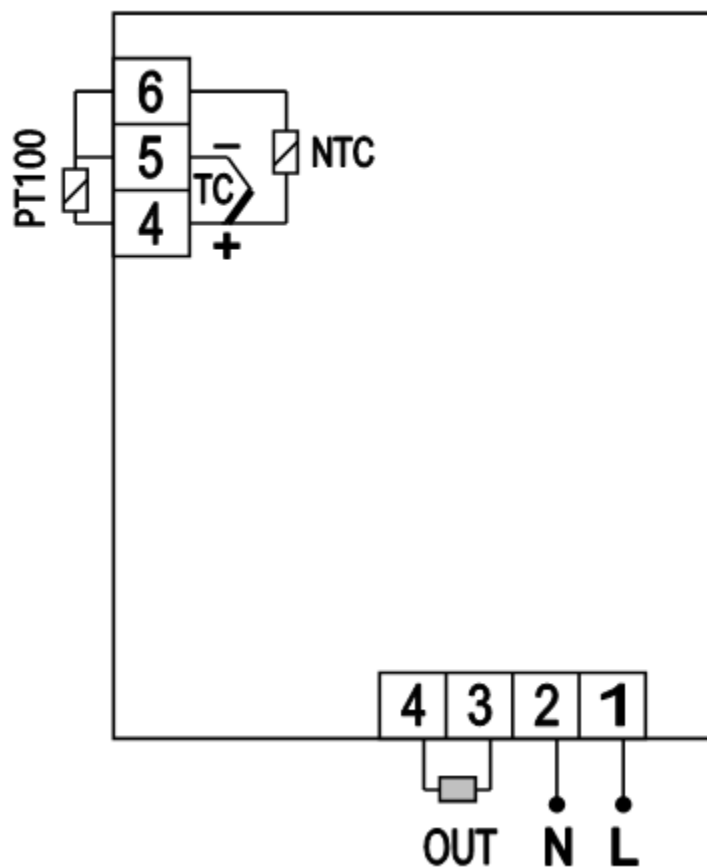
### 7. Maintenance

- 1) Proper maintenance can keep instruments working in a good state and lengthen its lifetime.
- 2) Be careful not spray the cleanser into the instrument when cleaning.
- 3) Unplug the power line when cleaning.

#### **Storage and transportation**

- Keep it in dry and clean room with good ventilation and no corrosive gas
- Prevent it from wetting by the rain and avoid violent collision in transportation.

## 8. Wiring



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