

LabTech



EH & EG SERIES

HOT PLATES

USER MANUAL



Thank you for selecting our HOTPLATES.

We are sure that you will be completely satisfied with the performance of this new unit entering your laboratory. We invite you to read carefully this user manual and to keep it close to the instrument for convenient and fast consulting. For any possible clarification or any request for assistance please contact either our local Representative or:

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HOTPLATES EH & EG SERIES

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1. INTRODUCTION

SPECIFICATION

The series of EH and EG temperature controllable, digital hotplate are electric heating instruments specially designed for laboratory application. It's a good choice for heating digestion, evaporation and acid distillation and fully satisfies the heating requirements of different laboratories

EH series

Model	Power	Type	Temp. range	Heating area	Temp. control mode	Temp. stability
EH20A Plus	2000W	corrosion-resistant	Ambient -200 °C	40L×30Wcm	switch (digital display)	± 5 °C
EH20B	2000W	corrosion-resistant	Ambient -200 °C	40L×30Wcm	PID (digital display)	± 1 °C
EH20D	2000W	corrosion-resistant	Ambient -200 °C	40L×30Wcm	PID (digital display)	± 0.2 °C
EH35A Plus	2000W	high temperature	Ambient -350 °C	40L×30Wcm	switch (digital display)	± 5 °C
EH35B	2000W	high temperature	Ambient -350 °C	40L×30Wcm	PID (digital display)	± 2 °C
EH45APlus	2800W	Graphite	Ambient -450 °C	36LX27Wcm	switch (digital display)	± 5 °C
EH45B	2800W	Graphite with ceramic coating	Ambient -450 °C	36LX27Wcm	PID (digital display)	± 2 °C
EH45C	2800W	Graphite with ceramic coating	Ambient -450 °C	36LX27Wcm	PID (digital display)	± 2 °C

Model	Power	Type	Temp. range	Heating area	Temp. control mode	Temp. stability
EG20A Plus	3000W	corrosion-resistant	Ambient -200 °C	60L×40Wcm	switch (digital display)	± 5 °C
EG20B	3000W	corrosion-resistant	Ambient -200 °C	60L×40Wcm	PID (digital display)	± 2 °C
EG35A Plus	3000W	high temperature	Ambient -350 °C	60L×40Wcm	switch (digital display)	± 5 °C
EG35B	3000W	high temperature	Ambient -350 °C	60L×40Wcm	PID (digital display)	± 2 °C
EG37A Plus	3200W	Graphite	Ambient -370 °C	54L×36Wcm	switch (digital display)	± 5 °C
EG37B	3200W	Graphite	Ambient -370 °C	54L×36Wcm	PID (digital display)	± 2 °C
EG37C	3200W	Graphite with Teflon coating	Ambient -370 °C	54L×36Wcm	PID (digital display)	± 2 °C

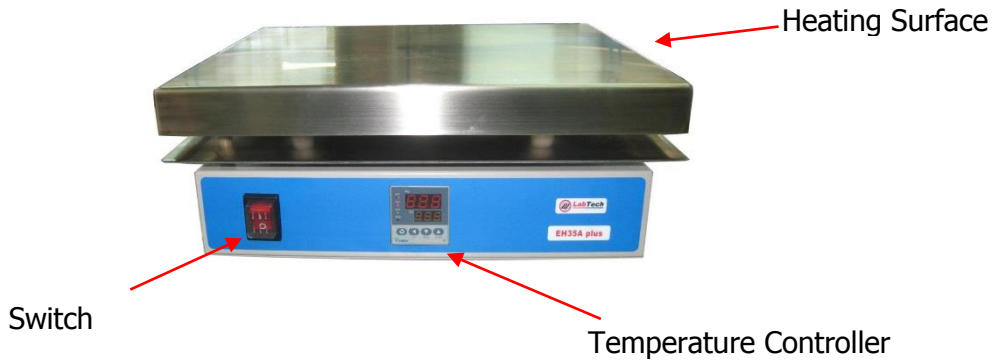
EG series

NOTE: the temperature stability is tested in standard operating mode.

EH SERIES

EH20A Plus/EH35A Plus/EH45APlus

The control panel consists of the following keys:



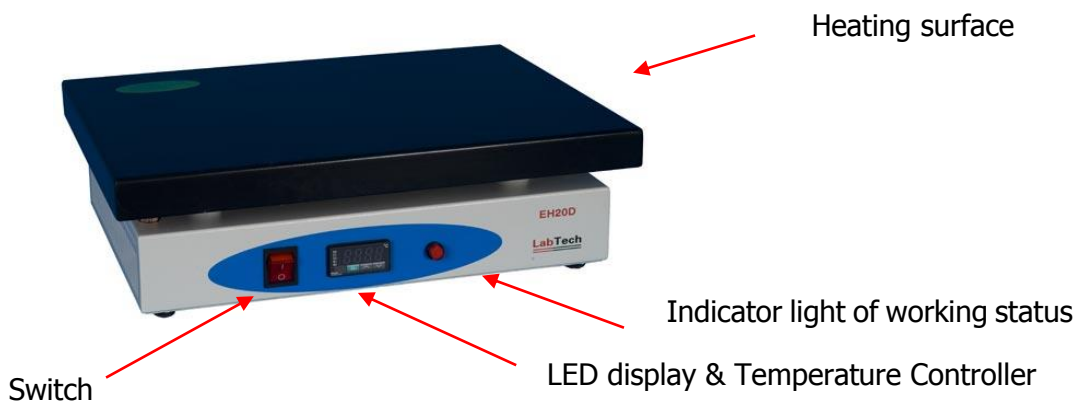
EH20B/EH35B/EH45B/EH45C

The control panel consists of the following keys:



EH20D

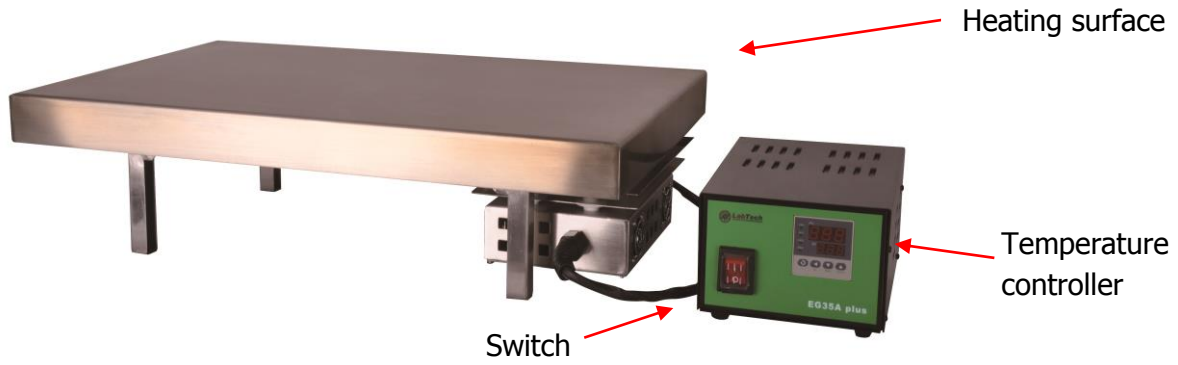
The control panel consists of the following keys:



EG SERIES

EG20A Plus/EG35A Plus/EG37A Plus

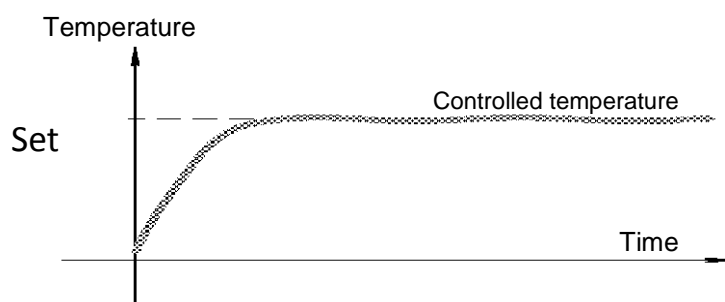
The control panel consists of the following keys:



The control panel consists of the following keys:



Graph of Temperature Control



2. SAFETY RULES

General Information

Please read carefully this user manual before starting to use the instrument and follow its prescriptions with the utmost care. This User Manual is part of the delivery, hence must be always kept together with the instrument on its working place.

It is imperative that every person operating with this system has read and fully understood this manual. The non-observance of the instructions contained herein or improper use may involve damages/injuries that are not covered by product liability.

Electrical safety



The instrument has to be used within the rated voltage. Prior to use, please check if the wire is aged. In case of aged wires, please contact the after-sales service for inspection.

It is forbidden to disassemble the instrument and to connect internal circuit parts, in order to avoid a short circuit or open circuit.

Fire safety

Numerous reagents are flammable and explosive. When the solvent vapor concentration



reaches a certain level, it would be flammable and could cause fire. The instrument should be kept away from the sources of ignition and high temperature places. If there

is solvent pungent smell, carefully check whether there is gas or liquid leakage, and turn off the power.

Chemical safety

The instrument is an instrument for organic chemical sample pretreatment. The involved



chemical solvents have harmful effects on the human health. Despite the instrument is fully closed and features full vent design, it is recommended to pay attention to the

personal safety during the use. Regular check of liquid waste barrels as well as working conditions of the vent fan are required to avoid the risk of leakage caused by corrosion and to avoid the formation of organic solvent vapors affecting operators' health. If there is a fault, please contact the after-sales service.

3. INSTALLATION

The unit should be located in a clean environment where ambient temperature is between 10°C and 35°C (50°F to 94°F).

Never place the unit in a location where excessive heat, moisture or corrosive materials are present.

The unit provides extra protection against the risk of electrical shock by grounding appropriate metal parts. The extra protection may not function unless the power cord is connected to a properly grounded outlet. It is the user's responsibility to assure a proper ground connection is provided.

4. OPERATION PROCEDURE

HOW TO OPERATE EH20A Plus /EH35A Plus/EH45Plus

Controller

- ① PV window: displays the actual temperature and parameter name
- ② SV window: displays the temperature setpoint, alarm and value of parameters
- ③ Temperature increase key
- ④ Temperature decrease key
- ⑤ Transposition key (Self-tuning start key)
- ⑥ Parameter set key
- ⑦ LED display
 - OP1--Output
 - AU1--Auxiliary alarm no.1
 - AU2-- Auxiliary alarm no.2
 - PRG--Program Running



Temperature Control

Under basic display status, the temperature can be set by pressing ◀, ▼ or ▲. ◀ is the transposition key. Press ▼ to decrease the value and ▲ to increase the value, at the same time the transposition point will be flashing. Press and hold ▼ or ▲ to decrease or increase the value quickly.

NOTE: the function menu includes self-calibration, unlock parameter setup, etc. They are factory set parameters. Please do not change these parameters if not necessary. If you want to change them, please kindly contact the Labtech Service Team.

HOW TO OPERATE EH20B/EH35B/EH45B/EH45C

Control Panel



SET Set or check temperature, holding time and other parameters.

SHIFT/AT In set interface, the key is a digital transposition key. In other interface, press and hold the key for 6 seconds to enter or quit auto-calibration system.

DEC/RERUN In set interface, press the key to decrease value, press and hold it to speed up the value decrease. In other interface, press and hold the key for 3 seconds can rerun the system after finishing the heating method.

INC/LED In set interface, press the key to increase value, press and hold it to speed up the value increase. In another interface, press the key to backlight on/off.

Temperature Control

Switch on the unit and the LCD will display "8888" for 3 seconds then enter into normal interface.

How to set temperature and holding time on setpoint?

Press SET key to enter the temperature set interface, SP will be displayed on the upper line, then the temperature can be set up via \triangle ∇ \leftarrow

Press SET key again to enter the holding time set interface, ST will be displayed on the upper line, then the desired holding time can be set on the setpoint. Press SET key again to save and quit the set interface.

The lower line of the LCD screen displays the total running time. When the requested temperature reaches the setpoint, the timer starts and the second signal of time flashes. The screen will display End when the holding time is over, also the beeper will keep buzzing for 30s. Press and hold ∇ to rerun the unit.

Note: the holding time can be set from 00:01 to 99:59.

Set the holding time to 0, the lower line of the LCD screen will display the setpoint temperature and the hotplate will keep the heating state.

When the unit is overheating, the buzzer will sound and ALM will be displayed on the LCD screen. If the overheating state is caused by the temperature set operation, there will be no

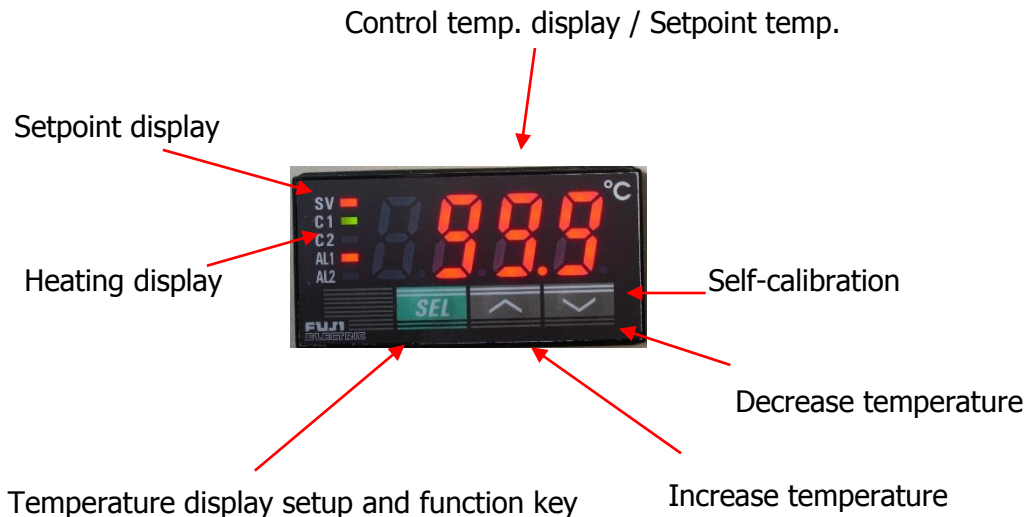
buzz and only ALM be displayed on the screen. Pressing any key can stop the buzzer. In parameter set interface, the screen will turn to normal interface automatically when there is no operation in 1 minute.

If "----" appears in the upper line of the LCD screen, there must be a malfunction of the temperature sensor or the controller itself, therefore please contact the Labtech Service Team.

Note: during operation, if the temperature is higher than 10°C in comparison to the setpoint and still rising, please switch off the unit immediately and contact the Labtech Service Team.

HOW TO OPERATE EH20D

Controller



Temperature Control

Press the **SEL** key one time to turn on the SV indicator, that's come to temperature setpoint menu.

Press ▲ and ▼ to adjust the temperature.

Press the **SEL** key one time to exit the temperature setpoint menu and the SV indicator light will turn off.

Press and hold the **SEL** key to enter the function menu of the D controller. After entering the menu, press and hold the **SEL** key until the real temperature appears and loose the **SEL** key to exit the function menu.

NOTE: the function menu includes self-calibration, unlock parameter setup, etc. They are factory set parameters. Please do not change these parameters if not necessary. If you want to change them, please kindly contact the Labtech Service Team.

HOW TO OPERATE EG20A Plus/EG35A Plus/EG37APlus

Controller

- ① PV window: displays the actual temperature and parameter name
- ② SV window: displays the temperature setpoint, alarm, and value of parameters
- ③ Temperature increase key
- ④ Temperature decrease key
- ⑤ Transposition key (Self-calibration start key)
- ⑥ Parameter set key
- ⑦ LED display
 - OP1--Output
 - AU1--Auxiliary alarm no.1
 - AU2-- Auxiliary alarm no.2
 - PRG--Program Running



Temperature Control

Under basic display status, the temperature can be set by pressing ◀, ▼ or ▲. ◀ is transposition key. Press ▼ to decrease the value and ▲ to increase the value, at the same time the transposition point will be flashing. Press and hold ▼ or ▲ to decrease or increase the value quickly.

NOTE: the function menu including self-calibration, unlock parameter setup, etc. They are factory set parameters. Please do not change these parameters if not necessary. If you want to change them, please kindly contact the Labtech Service Team.

HOW TO OPERATE EG20B/EG35B/EG37B/EG37C

Controller

SET Set or check temperature, holding time and other parameters.

SHIFT/AT in set interface, the key is a digital transposition key. In other interface, press and hold the key for 6 seconds to enter or quit the auto-calibration system.

DEC/RERUN In set interface, press the key to decrease value, press and hold it to speed up the value decrease. In other interface, press and hold the key for 3 seconds can rerun the system after finishing the heating method.

INC/LED in set interface, press the key to increase value, press and hold it to speed up the value increase. In another interface, press the key to backlight on/off.


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Switch ON the unit and the LCD will display "8888" for 3 seconds then enter into normal interface.

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The lower line of the LCD screen displays the total running time. When the actual temperature is up to the setpoint, the timer starts and the second signal of time flashes. The screen will display End when the holding time is over also the beeper will keep buzzing for 30s. Press and hold  to rerun the unit.

Note: the holding time can be set from 00:01 to 99:59.

Set the holding time to 0, the lower line of LCD screen will display the setpoint temperature and the hotplate will keep the heating state.

When the unit is overheating, the buzzer will alarm and ALM will be displayed on the LCD screen. If the overheating state is caused by the temperature set operation, there will be no buzz and only ALM be displayed on the screen.

Press any key can stop the buzzer.

In parameter set interface, the screen will turn to normal interface automatically when there is no operation in 1 minute.

If "---" appears on the upper line of the LCD screen, there must be a malfunction of the temperature sensor or the controller itself, therefore please contact the Labtech Service Team.

Note: during operation, if the temperature is higher than 10°C in comparison to the setpoint and still rising, please switch off the unit immediately and contact the Labtech Service Team.

5. SOLVENTS TABLE

Solvent	Formula	Molar mass in g/mol	Evaporation energy in J/g	Boiling point at 1013 mbar	Density in g/cm ³	Vacuum in mbar for boiling point at 40 °C
Acetone	CH ₃ C(=O)CH ₃	58.1	553	56	0.790	556
n-amylalcohol, n-pentanol	C ₅ H ₁₂ O	88.1	595	37	0.814	11
Benzene	C ₆ H ₆	78.1	548	80	0.877	236
n-butanol	C ₄ H ₁₀ O	74.1	620	118	0.810	25
tert. butanol (2-methyl-2-propanol)	C ₄ H ₁₀ O	74.1	590	82	0.789	130
Chlorobenzene	C ₆ H ₅ Cl	112.6	377	132	1.106	36
Chloroform	CHCl ₃	119.4	264	62	1.483	474
Cyclohexane	C ₆ H ₁₂	84.0	389	81	0.779	235
Diethylether	C ₄ H ₁₀ O	74.0	389	35	0.714	850
1,2-dichloroethane	C ₂ H ₄ Cl ₂	99.0	335	84	1.235	210
1,2-dichloroethylene (cis)	C ₂ H ₂ Cl ₂	97.0	322	60	1.284	479
1,2-dichloroethylene (trans)	C ₂ H ₂ Cl ₂	97.0	314	48	1.257	751
Diisopropyl ether	C ₆ H ₁₄ O	102.0	318	68	0.724	375
Dioxane	C ₄ H ₈ O ₂	88.1	406	101	1.034	107
DMF (dimethyl-formamide)	C ₂ H ₇ NO	73.1		153	0.949	11
Acetic acid	C ₂ H ₄ O ₂	60.0	695	118	1.049	44
Ethanol	C ₂ H ₆ O	46.0	879	79	0.789	175
Ethylacetate	C ₄ H ₈ O ₂	88.1	394	77	0.900	240
Heptane	C ₇ H ₁₆	100.2	373	98	0.684	120
Hexane	C ₆ H ₁₄	86.2	368	69	0.660	360
Isopropylalcohol	C ₃ H ₈ O	60.1	699	82	0.786	137
Isoamylalcohol (3-methyl-1-butanol)	C ₅ H ₁₂ O	88.1	595	129	0.809	14
Methylethylketone	C ₄ H ₈ O	72.1	473	80	0.805	243
Methanol	CH ₄ O	32.0	1227	65	0.791	337
Methylene chloride, dichloromethane	CH ₂ Cl ₂	84.9	373	40	1.327	850
Pentane	C ₅ H ₁₂	72.1	381	36	0.626	850
n-propylalcohol	C ₃ H ₈ O	60.1	787	97	0.804	67
Pentachloroethane	C ₂ HCl ₅	202.3	201	162	1.680	13
1,1,1,2-tetra-chloroethane	C ₂ HCl ₄	167.9	247	146	1.595	20
Tetrachlorocarbon	CCl ₄	153.8	226	77	1.594	271
1,1,1-trichloroethane	C ₂ HCl ₃	133.4	251	74	1.339	300
Tetra-chloro-ethylene	C ₂ Cl ₄	165.8	234	121	1.623	53
THF (tetrahydrofurane)	C ₄ H ₈ O	72.1		67	0.889	374
Toluene	C ₇ H ₈	92.2	427	111	0.867	77
Trichloroethylene	C ₂ HCl ₃	131.3	264	87	1.464	183
Water	H ₂ O	18.0	2261	100	1.000	72
Xylene (mixture)	C ₈ H ₁₀	106.2	389			25
o-xylene	C ₈ H ₁₀	106.2		144	0.880	
m-xylene	C ₈ H ₁₀	106.2		139	0.864	
p-xylene	C ₈ H ₁₀	106.2		138	0.861	

6. SERVICE

The LABTECH worldwide technical support network consists of highly trained Field Service Engineers, Technical Support Specialists and Service Coordinators who are ready to quickly assist customers with answers and solutions to service needs and application questions.

For any possible clarification or any request for assistance please contact either our local Representative or:

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