Refrigerated Incubator Shakers
Operation Manual
LOM-150/150-2

PLEASE READ THIS MANUAL CAREFULLY BEFORE OPERATION

Contents

SPECIFICATIONS DESCRIPTION

SPECIFICATIONS	MODEL	
	LOM-% 0#% $!&	LCM-% $8 #% $!&8
TEMP. RANGE	0℃ to 60℃	Ambient to 60℃
TEMP. ACCURACY	±0.1℃	
TEMP. CONTROL	PID Controller	
TEMP. DISPLAY	LED Digital Display	
SHAKING STROKE	25.4mm (3-point gravity balance orbiting)	
SHELF	1(adjustable)	
SHAKING SPEED	30 to300 r.p.m.	30 to150 r.p.m.
TIMER	999H / 999M / 999S	
HEATER	900W	
PLATFORM	Single	Double
COMPRESSOR	1/4hp	None
POWER VOLTAGE	110 V,60 Hz /220V,50Hz	
INSIDE MATERIAL	Stainless steel	
OUTSIDE BODY	Powder painting	
PLATFORM DIMENSIONS	480x380mm	
CHAMBER DIMENSIONS	600x500x500 mm	
OVERALL DIMENSIONS	680x690x890 mm	
WEIGHT(Approx.)	98	90

PANEL& KEY DESCRIPTION
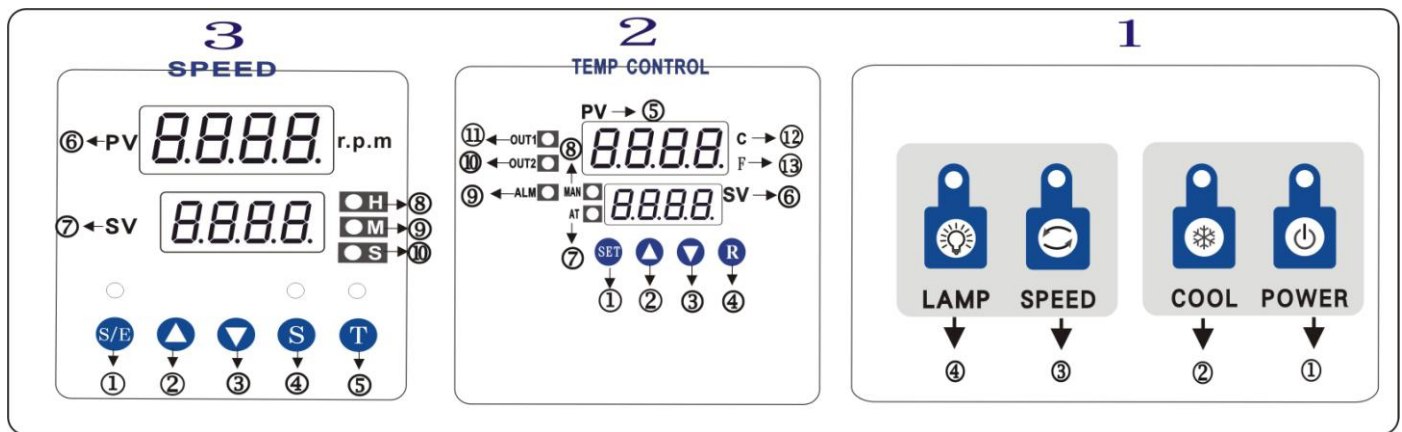
1. Main power switch: turn on/off main power

Cooling switch: turn on to start compressor (No this function)

Shaking speed switch: turn on to start shaking

Lamp switch: turn on / off the lamp

2. Temp. Control: display setting and actual temperature

3. Speed control: display setting and actual speed

OPERATIONS DESCRIPTION

After making sure voltage, please plug in 110V/ 220V socket.

(1.) Power:

POWER on, setting temperature

SPEED on, setting speed of shaking

(2.) Temperature control

1: Key for Setting/selecting: to select parameter for

viewing or adjusting

2: Key for decreasing gradually: to decrease parameter.

3: Key for increasing gradually: to increase parameter

4: return/ confirm key:

a. have monitor returned to PV value, display present
measuring value and setting value

b. clear latch alarm(when alarm condition has been
eliminated)

c. exit manual control mode, auto-calculating mode,
and calibrating mode

d. clear error message or auto-calculating error
message

e. restart constant temperature timer

f. Display output percentage on failure mode, with
manual control.

5 : Display actual temperature, parameter and error

message

6 : Display setting value, parameter and control output

value

7: auto-calculating LED (See the page 8)

8: Manual controlled LED **(See the page 8)**

9: Over Low LED **(No this function)**

10: Over heat LED **(See the page 9)**

11: Heating LED **(See the page 9)**

12: centigrade LED: LED on: means temperature is

     centigrade

13: Fahrenheit LED:LED on: means temperature is

     Fahrenheit

2.1 Setting temperature

    1. PV displays the actual temperature in chamber.
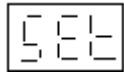
    2. SV displays the setting temperature

      Press ▲ to increase temperature gradually.

      Press ▼ to decrease temperature gradually.

    3. Setting temperature upon what you need.

2.2 <u>Setting parameter</u>

1. Press select key for 5 seconds to display $\boxed{5.EL}$, then release select key and re-press select key to modify temperature parameter.

2. SHIF setting is completed, and then press Ⓡ to make sure.

＊Note＊ **When LOCK =NONE and** no parameter is locked, user can change it freely.

1. **LOCK=SET,** all functions/parameters are locked.

2. **LOCK=USER,** all parameters are locked except **S/P.**

3. **LOCK=ALL, all parameters are locked to prevent from being changed**

- **Modify inaccurate temperature value(SHIF)**

In normal condition, set **SHIF** to "0", sometimes **PV** value is inaccurate because of detecting from different point; at this time please modify it by SHIF value.

(When SHIF=0, then PV=100℃

If **SHIF** setting = 20.00, then PV= 120℃

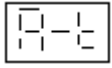If SHIF setting = −10.0 then PV= 90℃

For Example:

PV(actual temperature) is 100℃ and SV(temperature setting) is also100℃,

If Thermometer appears 120 ℃ or 90℃

Then set SHIF= 20 or−10

- **Auto-calculating LED:**

   Instrument has been set the best PID value; we suggest executing auto-calculating when temperature is unstable. Enter auto-calculating: press selecting key until ⛶ is displayed then release selecting key.   Press selecting key again for 5 seconds to enter auto-calculating(＊all parameters setting must be correct before executing auto-calculating and must be LOCK＝NONE.)

- **Manual controlled LED**

enter manual control mode for testing or system failure.

Enter manual control mode: Keep pressing selecting key until ⬚ is displayed then release; pressing selecting key about 5 seconds to enter manual control mode. (⬚ means OP1 output percentage, ⬚ means OP2 output percentage)

- **Over Low LED**

  LED on: means temperature OverLow protection is on: press select key, PV displays SP3, SV displays default Over Low protected value: -5 ℃

- **Over Heat LED**

  LED on: means overheat protection is on: press select key, PV displays SP2, SV displays default overheat temperature protected value: +5 ℃

  For example: the setting temperature is 100 ℃, and default overheat protected value is +5 ℃; when rising to 105 ℃ ⬚ LED will be on and stop heating.

● <u>Heating LED</u>

LED on: means heating now (*If the machine includes timer, chamber temperature start dropping after time out; at this time there is no heating though heating LED is on)

(3.) Speed control of shaking

PV: Display actual RPM (revolutions per minute)

SV: Display setting RPM or TIME

◑H   **Hour indicator Led**

.**◑M**   **Minute indicator Led**

◑S   **Second indicator Led**

1. **P/S (Power on/off): Press P/S to suspend working, or**
                          Press P/S for 5 seconds to power on/off.

2.   **▲ Increase key: Press it to increase parameter value.**
3.   **▼ Decrease key: Press it to decrease parameter value.**
4.   **S: Set RPM (revolutions per minute) / shift-key:**
     At set timing mode:
         S: Parameter Key: Press for 5 seconds to enter parameter key
              LO-   set lowest speed(default value: 20RPM)

              HR-   set highest value(default value: 300RPM)

              ARR: adjust inaccuracy

5.   **T: Set timing (Sound alarm 10 times when time up).**
     T: LOCK(Press for 5 seconds to enter "LOCK")

     ....SET –   SET PARAMETER TO LOCK(default)

ALL – SET "LOCK ALL KEYS"

......   (At LOCK mode, no key is operative. Only displays LOCK .)

NOO: UNLOCK

OPERATIONS DESCRIPTION

1. Press P/S key for 5 seconds to power on, PV displays actual speed and SV displays
  setting speed.

2. Set Shaking speed
  Press ▲ to increase gradually

  Press ▼ to decrease gradually

  Set RPM (revolutions per minute)

3. Timer setting(At suspend mode):
  Press T first to set timing, indicator Led on

  Then press ▲, ▼   to select hour, minute, second

  Press T,   SV flash

  Press ▲   to increase gradually

  Press ▼   to decrease gradually

  After setting,   press T to make sure, then press   P/S   to start to count down.

  Press S   to display RPM

  Press T   to display time

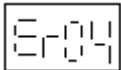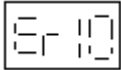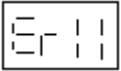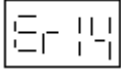**4. default slow-start/stop, rpm range 10~250**
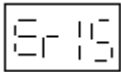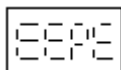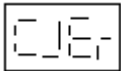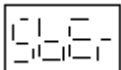
5. default rpm: 100

6. default time: nil

TROUBLESHOOTING

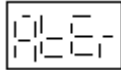| SITUATION	CAUSE	TROUBLESHOOTING
1.LED is off when power on	a. NO power input b. Power plug is loose c. Abnormal voltage input d. Fuse blowout e. Power cord disconnection or bad connection	a. Check power supply system b. Plug in firmly or replace the socket c. Check power supply and stop using temporarily d. Check power voltage and reset e. Replace switch f. Replace power cord
2.After temperature setting,Heating LED=(OUT1) is off	a. Chamber(bath)inside actual temperature is higher than setting temperature b. PT platinum breakdown c. Thermometer output signal···nil	a. Waiting for temperature dropping or cooling b. Replace c. Ask for repair
3.Heating LED is on but temperature can not rise	a. Heater disconnection b. Bad heater circuit c. Bad control circuit d. High temperature protection-setting, locking e. Water level of floating ball is too low(water bath)	a. Ask for repair b. Ask for repair c. Ask for repair d. Reset e. Water supply
4.Temperature keep rising and out of control	a. Temperature is out of control b. Heater circuit is out of control c. P.I.D.value is not correct d. S.S.R. breakdown	a. Ask for repair b. Ask for repair c. Re-calculating automatically d. Ask for repair
5.Temperature can not drop down	a. cold media run out b. compressor breakdown	a. Ask to repair b. Ask to repair
6.temperature tolerance is large	a. Temperature is unstable b. P.T.D.value is not set or not correct c. Temperature setting is too close to room temperature d. circulating fan or motor cannot work e. PT platinum bad connection f. Air circulation inside is blocked	a. Suspend for 30 minute b. Re-calculating AT automatically c. Add cooling system or dropping ambient temperature d. Ask for repair e. Ask for repair f. Improve articles placement

Error message and trouble shooting for temperature controller

error code	display symbol	error description	trouble shooting
4	Er-04	Parameter setting conflict, for example: When OUT2=COOL, user cannot select DIRT,PB and TI can not be "0"	If user selects OUT2=COOL to control cool/heat, then PB and TI can not be "0" and OUT1 should select REVR.
10	Er 10	Function code error during signal communication	Use correct function code
11	Er 11	Communication error: register address out of range	Do not issue an over-range register address to the salve
14	Er 14	Try to change the "read only data" or to change the "protected data value" during signal communication	Avoid changing "read only data" or "protected data value"
15	Er 15	Data address is overflowed during signal communication	Avoid input data overflowed
26	AuEr	Auto calculating failure	1. Try again 2. Don't change the setting value during auto calculating 3. PB/TI can not be "0". 4. Press "R"key 5. Give up auto calculating
29	EEPr	Permanent storage EEPROM fault	send it back to maker for repair
30	CJEr	Cold junction compensation for thermocouple malfunction	send it back to maker for repair
39	SbEr	Input sensor break, or input current below 1mA if4-20mAis selected, or input voltage below 0.25V if 1-5V is selected	send it back to maker for repair

MAINTENANCE & CLEANING

1. Please follow specification to use the specified socket. Do not use old or loosened socket, and not use same socket with other machines. Instead of general extended line, please use single circuit and specified extended line to avoid overload, and to ensure operating smoothly and service life. Please make sure voltage before use; we are not responsible for any damage caused by insufficient voltage.

2. Please install it on smooth floor to avoid shaking and noise.

3. When moving, please do not tilt over angle of 45 degree, cooling performance will be affected if over 45 degree. If it has been tilted over 45 degree please keep still for 2 -- 4 hours before switching on cooling system to prevent damage of compressor

4. Please switch off main power and open door for 2~3 days to dry inside and parts, and to extend its service life

WARRANTY CARD

Product Name	
Model Number	
Serial Number	
Date of purchase	
Warranty period	
Company Stamp	(Invalid without company stamp)

Condition of warranty

1. **One-year warranty from the date of purchase.**

2. **In case damage is under normal condition of use within warranty, we will repair at no charge.**

3. **In case any manufacturing defect is found, it will be replaced with a new one free of charge.**

4. **Damage caused by card lost, human negligence, misuse or acts of God during warranty, we will repair at a reasonable charge.**

5. **This warranty card is invalid without company stamp, and will not be re-issued in case it is lost.**