Corning® LSE™
Benchtop Shaking Incubator

CORNING

INSTRUCTION MANUAL

Models
6790 (120V US)
6791 (230V EU)

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1.0 GENERAL INFORMATION

1.1 Definition

Corning® LSE™ Benchtop shaking incubator is a combination product of a shaker and a temperature chamber, designed for simultaneous shaking and heat treatment of samples, saving time and laboratory space. It is suitable for daily use in biochemistry, microbiology, and many other laboratories.

1.2 Key Features

- High temperature working range.
- Large environment temperature range – suitable for cold room use.
- Digital readout of all parameters during run.
- Ability to change parameters during run (except timer).
- Last parameter memory, even if the device was switched off.
- Temperature accuracy +/- 0.5°C of absolute deviation from the set temperature in device working area.
- Incorporated **HOLD** and **RUN** time function with **1 minute** resolution.
- Special parallel temperature protection for your safety.
- Easy interchangeable platforms.
- Lid sensor.

2.0 TECHNICAL DESCRIPTION

2.1 Construction

The casing of the **benchtop shaking incubator** is made of steel plate varnished with polyurethane lacquer. Temperature chamber lid is made of Polymethyl methacrylate which is resistant to temperatures up to 90°C.

Equipment consists of an independent shaking device and temperature chamber. Both sections are driven and regulated via microcontroller driven electronics, which also control all necessary sensors for motor speed, temperature, lid, temperature safety fuse, time, and self-diagnostics.

3.0 INSTALLATION

3.1 Unpacking

Before starting the installation, carefully examine the delivery for possible damage or missing parts:

- Open the box and lift the device, together with the shock absorbers, out of the box.
- Remove the shock absorbers and check that the machine has not been visibly damaged during the transportation. Keep the packing material until you are sure that the machine functions properly.
- Check the information on the name plate on the rear side of the machine:
  - Type
  - Serial number
  - Article number
- Check that the main cord has a pin configuration that fits into a wall socket according to the local standard.

If any kind of damage occurred during transportation, immediately make a complaint to the carrier. Any incorrect delivery or missing parts should be reported to the distributor.

3.2 Selecting the right location

When selecting the right place for device, please consider the following:

- Put the device on a smooth, stable surface.
- Leave enough space on the back side of the device for normal air circulation.
- Leave enough working space around the device.
- Avoid areas with fast temperature and humidity changes, are in direct sunlight, are nearby heat producing devices, or where there is a possibility of shocks and/or **vibrations**.

Do not use the device in a flammable or explosive atmosphere!

3.3 Attaching power cord

Fit the main cord (included), into the main receptacle. Connect the other end of the cord to a grounded wall socket.

3.4 Attaching shaking platforms

Platforms of many sizes are available to suit a wide range of applications. These platforms mount to the shakers via four mounting posts which easily insert into four rubber mounting points on the shaking platform.

3.5 Starting up

3.5.1 Starting up checklist

- Unpack and place the device as specified.
- Open the lid and place samples.
- Close the lid cover.
- Switch on the device by the **ON/OFF** switch on the front panel (indicator light will illuminate).
- Refer to section 4.2 for instructions for setting parameters.

3.6 General safety recommendations

Before any installation read this User's Manual.

- Before cleaning, disconnect the device from the main power supply. Follow cleaning instructions in section 8.
- Do not use the device near water sources. Assure that no water drips in the device during cleaning or otherwise.
- Do not use device in explosive or flammable environments.

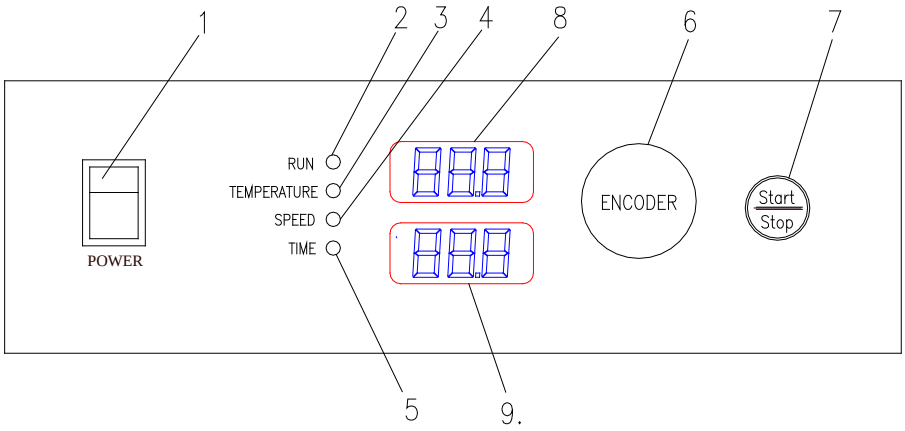
NOTE: If the device is not working properly, follow only commands and procedures outlined in this Instruction Manual. Use of any other commands, procedures, or adjustments could result in device destruction or longer service repair time.

If the equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be voided.

Not for use with flammable or explosive samples!

4.0 INSTRUCTIONS FOR USE

4.1 Introduction

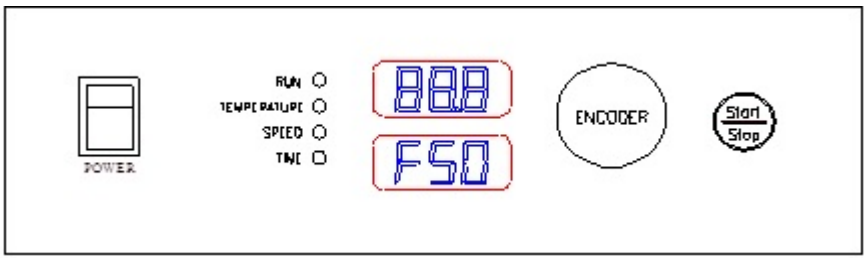


1. **POWER** switch: Switch to **ON** (power switch illuminates) or **OFF**.
2. **RUN**: Green light is on when incubator is running.
3. **TEMPERATURE:** Yellow light is on when the incubator is set to temperature.
4. **SPEED:** Yellow light is on when the incubator is set to speed.
5. **TIME:** Yellow light is on when the incubator is set on time.
6. **ENCODER**: Rotating the **Encoder** knob clockwise (+) or counter-clockwise (-) to change the Time, Speed, and Temperature settings. Push the **Encoder** knob to change between Time, Speed, and Temperature settings.

   If you rotate the **Encoder** knob fast, the value on display goes up or down quickly.
7. **START/STOP** key: **START** or **STOP** operating.
8. **TEMPERATURE** display.
9. **SPEED/TIME** display.

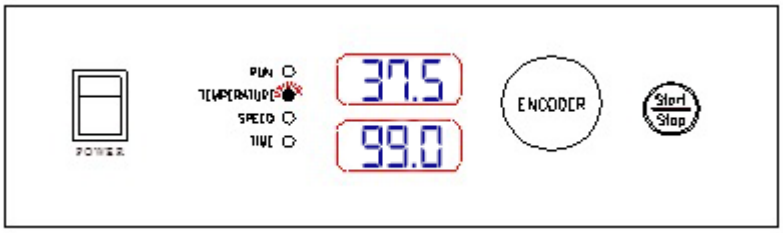
4.2 Basic Operation

- Press the **POWER** switch on the control panel. Shaking incubator automatically detects power supply frequency F50 or F60 and shows it on the display. Incubator will automatically be set to the last saved parameters.

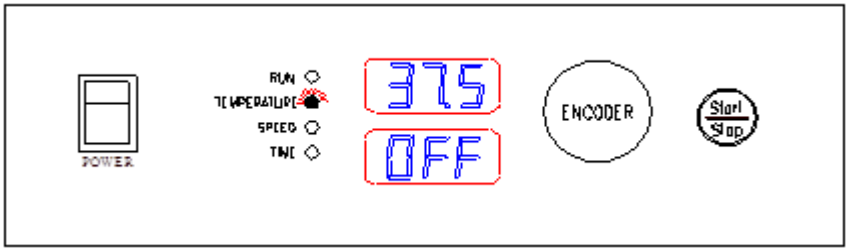


- **To set Temperature:** Press and hold the **Encoder** knob for more than 2 seconds. The **Temperature** indicator light will blink. Rotate knob clockwise (+) or counter-clockwise (-) to set **Temperature** to desired value:

  37.5 ⇒ 37.5°C

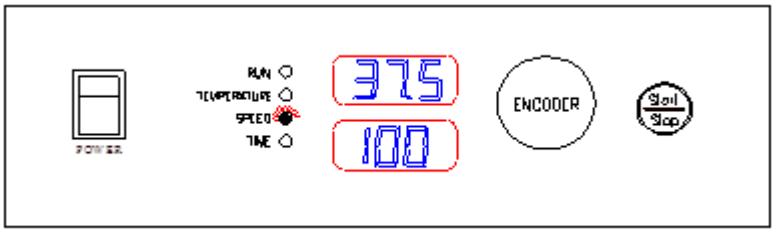


- If you want to use the shaking incubator **without temperature regulation,** set the display to **OFF**. The **OFF** function will display when you rotate the **Encoder** knob below 0.0°C or above 70.0°C.



To set **Speed**: Press **Encoder** knob until the **Speed** light blinks. Rotate the **Encoder** knob clockwise (+) or counter-clockwise (-) to set **Rotating Speed** to desired value:

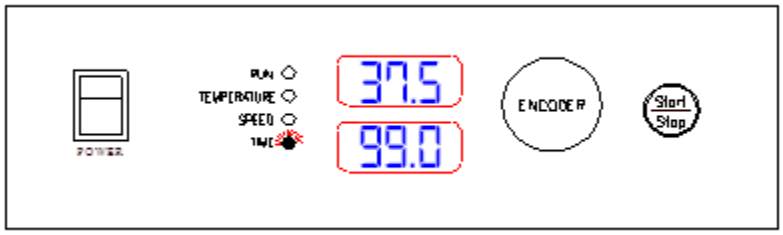
34 ⇒ 34 rpm
120 ⇒ 120 rpm



- If you want to use the shaking incubator **without shaking,** set **OFF** on display. The **OFF** function will display when you rotate the **Encoder** knob under 20 rpm or above 300 rpm.

To set Time: Press the **Encoder** knob until the **Time** indicator light blinks. Rotate the **Encoder** knob clockwise (+) or counter-clockwise (-) to set **Time** to desired value between 1 minute to 99 hours:

70.3 ⇒ 70 hr 30 min
1.55 ⇒ 1 hr 55 min
0.43 ⇒ 43 min
0.01 ⇒ 1 min

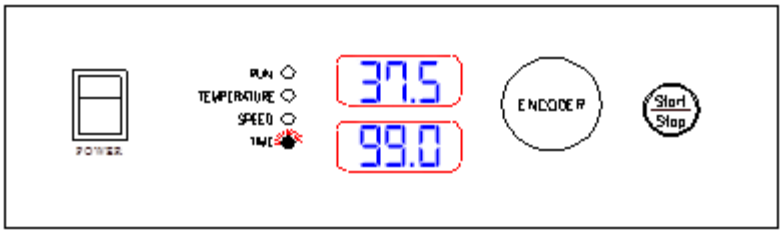


- To set **Time** to **hold** (continued operation) - set **HLd** on the display. The **HLd** function will display when you rotate the **Encoder** knob to under 0.01 minute or above 99.0 hours.
- Press **START/STOP** key once to exit the changing of parameters. You are now in starting mode. The light from the parameter that was last changed will remain on.

Note: To exit the changing of parameters, always press the **START/STOP** key once.

- Press the **START/STOP** key to start the operation.
- The time will begin counting down and the **Run** indicator light will be illuminated.

Time and **Speed** can be alternately viewed in the bottom display by pressing the **Encoder** knob during the run.



4.3 Changing parameters during operation

Note: You cannot modify time during operation.

- If you want to change the **Temperature** during operation, press and hold the **Encoder** knob for more than 2 seconds. **Temperature** indicator light blinks. Rotate the **Encoder** knob clockwise (+) or counter-clockwise (-) to set the desired value. The **Temperature** indicator light will continue to blink until the desired value is set. To set the desired value, press **START/STOP key only ONCE.** The shaking incubator goes back to working parameters and actual temperature will show on the display. Holding the **Encoder** knob for more than 2 seconds will toggle the display back to the temperature.

- To change **Speed** or **Temperature** during operation, press and hold the **Encoder** knob until the **Temperature** or **Speed** indicator light blinks. To switch between setting **Temperature** and **Speed**, press the **Encoder** knob one time until the desired indicator light is illuminated. When finished press the **START/STOP** key one time to exit.

- When the run is completed, **End** appears on the display and the **Run** indicator light pulses. The Run indicator light will only turn off when the shaking incubator has come to a complete stop. The last used values for **Time**, **Speed,** and **Temperature** will remain for the next run.

If you lift the lid during operation the shaking incubator will immediately stop and the message “Opn Lid” appears on displays. When you close the lid again, the shaking incubator will resume operation.

In the event of a power outage, the shaking incubator will restart automatically, as soon as the electricity returns. A warning will be displayed indicating the power had been off. Pressing the “Encoder” knob will turn this off.

4.4 Shaking without heating

If you want to shake the samples without heating them, set **Temperature** to **OFF**.

4.5 Heating without shaking

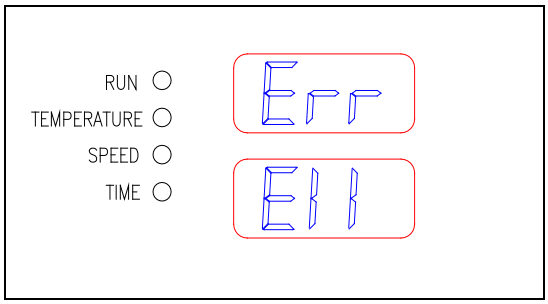
If you want to heat the samples without shaking them, set **Speed** to **OFF**.

5.0 TROUBLESHOOTING

5.1 Errors

Device will constantly check functions vital for safety and reliable operation. An error message will appear if there is a problem detected.

Sample of Error display:



5.2 Description of possible errors

Error Code	Description	Solution
E 11	Something is wrong with the motor regulation (PWM regulator, pulse generator, motor). Shaking incubator is automatically stopped.	Contact Corning Customer Service.
E 12	The motor does not reach set speed in 30 seconds. Shaking incubator is automatically stopped.	Contact Corning Customer Service.
E 13	Set speed oscillates for more than 100 rpm in 2 seconds. Shaking incubator is automatically stopped.	Contact Corning Customer Service.
E 21	Temperature sensor does not work properly. Shaking incubator is automatically stopped.	Check temperature sensor for any visible damage or material obstructions. Contact Corning Customer Service.
E 22	Temperature sensor notices 5°C higher temperature than set temperature. Shaking incubator is automatically stopped.	Verify set temperature is not set more than +/- 5 degrees below chamber temperature. Contact Corning Customer Service.
E 23	Set temperature is not reached in 2 hours. Shaking incubator is automatically stopped.	Verify that nothing is obstructing the lid from properly closing. Check that the circulating fan on the back panel is functioning. Contact Corning Customer Service.

6.0 TECHNICAL SPECIFICATIONS

6.1 Technical Data

Heater power	700W
Fan power	17W
Shaking motor power	35W
Fuse	2 x 3.15A 250V 2 x 6.3A 120V
Environment temperature	4°C to 65°C
Relative humidity	Up to 85%, non-condensing
Speed regulation	Digital, load independent, from 20 to 300 rpm in 1 rpm steps
Shaking orbit	19 mm
Temperature operating range	5°C above room temperature to 70.0°C
Temperature sensor	PT100
Temperature accuracy	±0.5°C
Temperature stability	±0.5°C
Timer	1 min to 99.0 hours, timer HOLD (**Hld**) function
Capacity	16 x 125 mL, 9 x 250 mL, 5 x 500 mL, 4 x 1,000 mL
Dimensions (W x D x H)	370 x 530 x 400 mm (14.6” x 20.9” x 15.7 inches)
Weight	20.2 kg (44.4 lbs.)
Overvoltage category	Installation Category I

7.0 TEMPERATURE RE-ADJUSTMENT

Note: Temperature re-adjustment procedure is only for qualified technical persons.

Measure the temperature in the middle of the incubator or in a sample (preferred) for a minimum of 2 hours. A calibrated digital thermometer with precision of 0.1°C or more should be used. After 2 hours or more, read the temperature on the thermometer and compare it with the temperature on the display of the shaking incubator. The difference between the temperatures on the thermometer and the display is the value to be entered.

Example 1:
Temperature on the thermometer is 37.9°C. Temperature on the display is 37°C.
Difference is 37.9 - 37 = 0.9
Value is 0.9

Example 2:
Temperature on the thermometer is 36.2°C. Temperature on the display is 37°C.
Difference is 36.2 - 37 = -0.8
Value is -0.8

Procedure for temperature calibration:

- Press and hold the **Encoder** knob for more than 5 seconds – message **Cor** (correction) appears on display.
- Press the **Encoder** knob once, then turn the **Encoder** knob until the value calculated above is displayed – paying attention to the plus or minus sign. When you set the value, press the **Encoder** knob again.
- Press **START/STOP** key to finish the temperature re-adjustment.

Note: Temperature re-adjustment procedure is only for qualified technical persons.

8.0 MAINTENANCE AND CLEANING INSTRUCTIONS

8.1 Cleaning of the working chamber (painted stainless steel)

The working chamber should be cleaned regularly with mild cleaning solutions. Abrasive cleaners should not be used. Spills should be cleaned up immediately.

Use cleaners with neutral pH for decontamination. Stainless steel platform can be decontaminated by autoclaving (120°C).

8.2 Maintenance and cleaning of the PMMA (acrylic) lid

Maintenance

Acrylic glass is sensitive to scratching. Use only a soft cloth and non-abrasive cleaners.

Grease and oil that may have accidentally spilled can be cleaned with hexane, petroleum, or other chemicals in aromatic base.

Cleaning

Use:

- It is best to use 2% aqueous solution of non-aggressive cleaning products (dishwashing detergent).
- Wipe the surface with a lightly damp soft cloth.
- Remove dust and dirt with dry soft cloth.

Do not use:

- Do not use acetone, benzene, paint thinner, carbon tetrachloride, or other aggressive liquids, because they can damage the surface of the acrylic lid.
- Do not use cleaners containing ketones or esters.
- Do not use cleaners with solid and abrasive particles.
- Do not use polishes.
- Never clean the surface with products containing acetone or other solvents or with cleaning products for chemical cleaning, paint thinner, gasoline, and similar. Avoid any contact with these chemicals.
- Do not use detergents with high levels of alcohol.

Device can be very hot after operating, especially if used at temperatures higher than 60°C. Do not touch the platform until it is cooled.

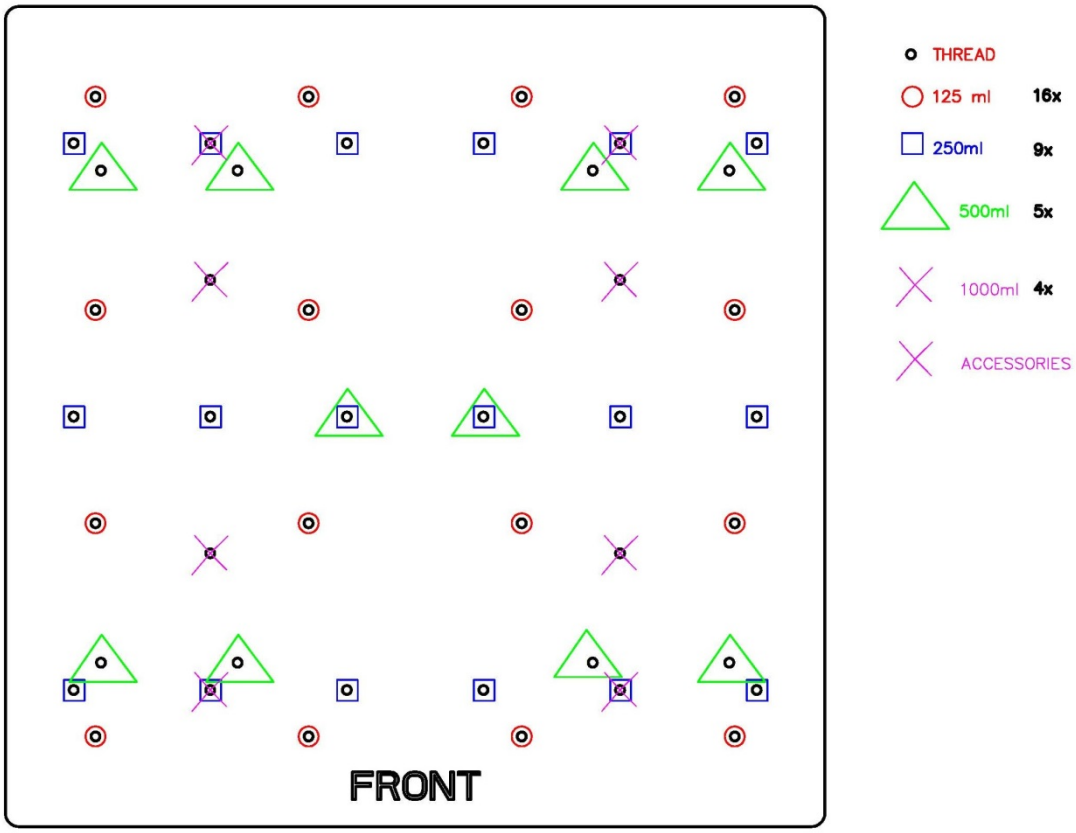
Before you begin cleaning the device, unplug the main cord from the power supply socket.

Check with the manufacturer before using any other cleaning or decontamination methods to assure that the equipment is will not be damaged.

9.0 POSITIONING OF ATTACHMENTS ON THE SHAKING PLATFORM

Capacity of platform is: 16 x 125 mL flasks, 9 x 250 mL flasks, 5 x 500 mL flasks, 4 x 1000 mL flasks.

Use the following diagram as a guideline for positioning different flasks and accessories.



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The Corning products are warranted against defects in materials and workmanship for two years unless otherwise outlined on your sales order. If any defect occurs in the instrument during this warranty period, Corning will repair or replace the defective parts at its discretion without charge. However, the following defects are specifically excluded:

- Defects caused by improper operation.
- Repair or modification done by anyone other than a Corning or an authorized Corning agent
- Use of spare parts supplied by anyone other than Corning
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- Corrosion caused by improper solvents or samples

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Corning Benchtop Shaking Incubator models 6790 and 6791

According to Directive 2012/19/EU of the European Parliament and Council of 4th July 2012 on waste and electronic equipment (WEEE) as amended, Corning Benchtop Shaking Incubator is marked with the crossed-out wheeled bin and must not be disposed of with domestic waste.

Consequently, the buyer shall follow the instructions for reuse and recycling of waste electronic and electrical equipment (WEEE) provided with the products and available at the following link: **www.corning.com/weee.**

For additional information, visit **www.corning.com/lifesciences** or call 1.800.492.1110. Outside the United States, call 978.442.2200.

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