OPERATION MANUAL

LLG-uni*THERMIX* 1 pro
with heating function

LLG-uni*THERMIX* 2 pro
with heating function and cooling function

Thank you very much for purchasing this
LLG-uni*THERMIX* pro.
Please read the following instructions carefully
and always keep this manual within easy reach.

Contents

1. Safety Instructions

⚠	**Warning!** • Read the operating instructions carefully before use. • Ensure that only trained staff works with the instrument.
(hot surface symbol)	**Risk of burn!** • Please be careful when touching the housing parts and the dry bath which can reach a temperature of 110 °C. Please refer to technical parameters. • Pay attention to the residual heat after switching off.
(ground symbol)	**Protective ground contact!** • Make sure that the socket is grounded (protective ground contact) before use.

• Set up the instrument on a stable, clean, non-slip, dry and fireproof surface. Do not operate the instrument in explosive atmospheres, with hazardous substances or under water.
• Temperature must always be set at least 50 °C lower than the flame point of the media used.
• Be aware of hazards caused by
  - Flammable materials or media with a low boiling temperature
  - Overfilling of media
  - Use of unsafe containers
• Process pathogenic materials only in closed vessels.
• Check the instrument and accessories prior to each use.
• Do not use damaged components. Safe operation is only guaranteed with the accessories provided by the manufacturer. Accessories must be securely attached to the device. Always disconnect the plug before fitting accessories.
• The instrument can only be disconnected from the main power supply by pulling out the main or the connector plug.
• Ensure that the main power supply cable does not touch the dry bath. Do not cover the device.
• The instrument may only be opened by experts.

2. Proper Use

The instrument is designed for heating liquids in schools, laboratories or factories.
• Please make sure that the minimum distance between any obstacles (such as other devices or walls) is not <100 mm.

> 100mm
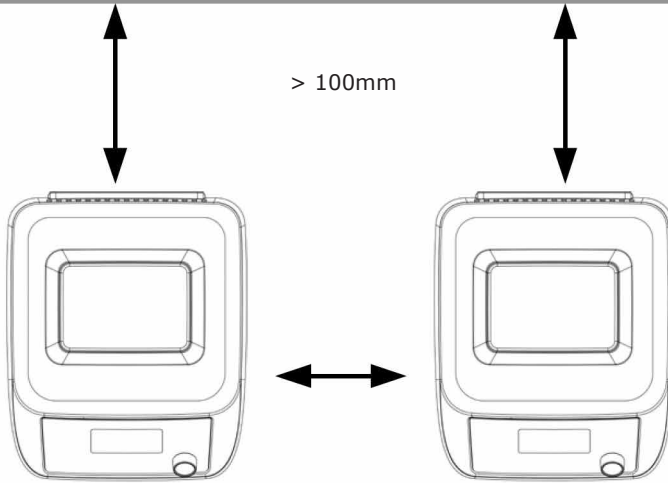
Figure 1

3. Inspection

3.1 Receiving Inspection

Unpack the equipment carefully and check for any damages which may have arisen during transport. Please contact your local LLG-Labware supplier for technical support.

⚠	**Note:** If there is any apparent damage to the system, please do not plug it into the power line.

3.2 Listing of Items

The package includes the following items:

Items	Qty
Main unit	1
Power cable	1
User Manual	1

Also included are four additional suction feet, which must be used for the LLG-uni*THERMIX* pro together with the attachment for 5 ml tubes (6.263 495).
When using the heating block 6.263 495, please exchange the feet.

4. Control & display

4.1 Control

Figure 2: Thermo Mix

Vent Holes

RS 232 Interface
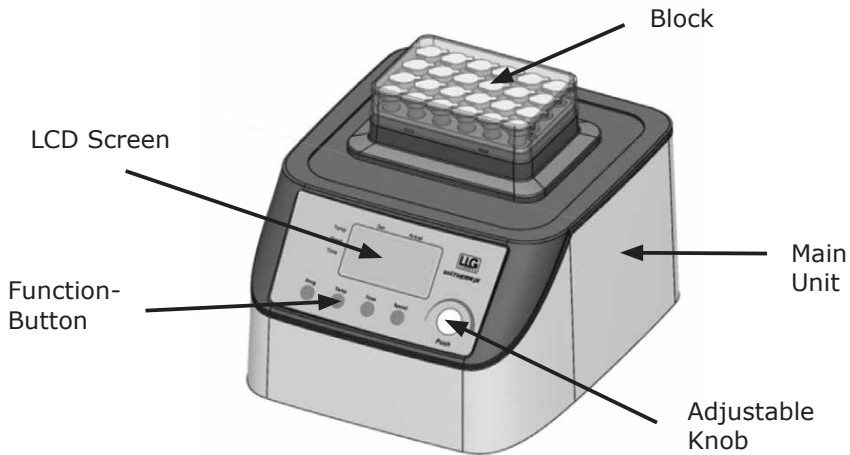
Power Switch
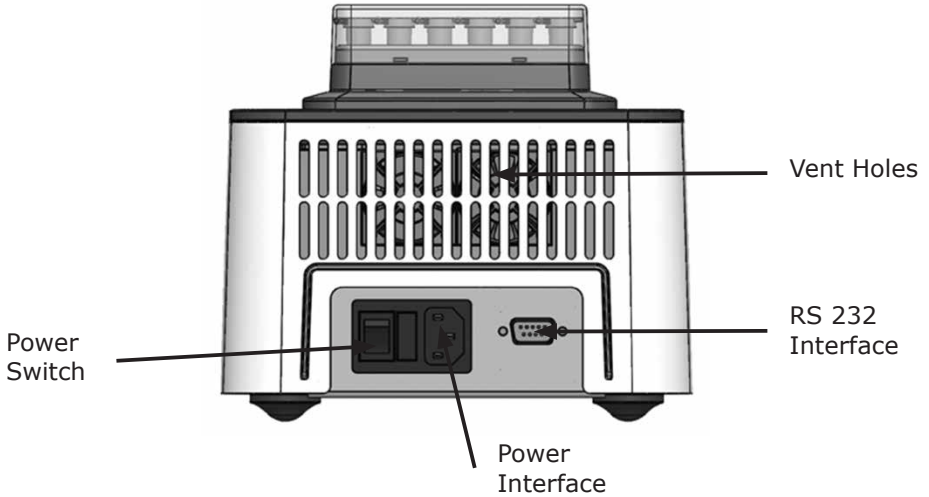
Power Interface

Figure 3: Interface & Power Switch

Item	Introduction
Block	Changeable unit for different tube sizes
LCD Screen	Displays the set and actual parameters
Function Button	Switch the input parameters or programming
Adjustable Knob	At parameter setting state, rotate this knob to set values; after setting, push it to start working. At working state, push shortly to pause or push longer (approx. 3 sec) to stop the unit.
RS232 Interface	Used for temperature calibration
Power Interface	Connect the power cable
Power Switch	Power on/off

4.2 Display
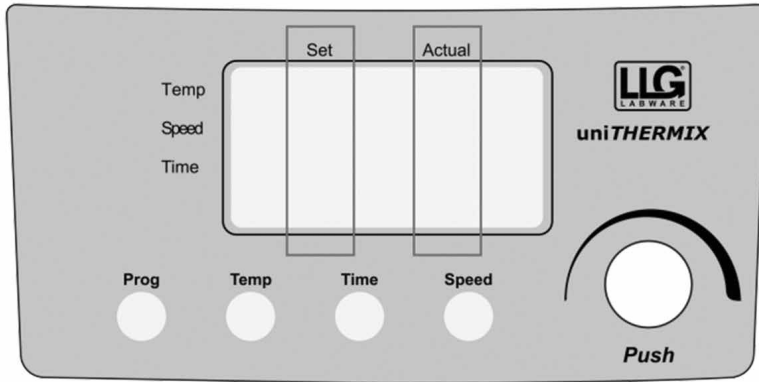
Item	Introduction
Set value area	Displays the set parameters
Actual value area	Displays the actual parameters
Prog	Program button, used for programming
Temp	Temperature setting button, when pressed, the temperature characters of the setting area are flashing
Time	Time setting button, when pressed, the time characters of the setting area are flashing
Speed	Mixing speed setting button, when pressed, the speed characters of the setting area are flashing
Adjustable knob	At parameter setting state, rotate this knob to set values; when finished the parameter setting, push it to start working. If pressed while running, the unit pauses. If the knob is pressed for > 3 sec the unit stops.

5. Operation

5.1 Parameter setting methods

a. Press the function button. The corresponding characters of the setting area will then start flashing.
b. Rotate the parameter setting knob and set the target parameters.
c. Wait 3 s, the corresponding character will stop blinking, indicating that the parameter setting procedure has been completed.

Note:
when switched on, the setting area of the screen will display parameters of the last run.
When the time is adjusted to 00:00, the system will be operated in continuous run mode.

5.2 Start and Stop

Start:
After finishing the parameter input, push the adjustable knob to start the system.
In the display you will read "Run" indicating that the system is operating (see below)

	Set	Actual
Temp.	30.5	30.5
Speed	1500	----
Timer	07:00	07:00
Prog.		RUN

Pause:
Push the adjustable knob to pause the system. When the system is in this state mixing functions are paused, however, the temperature control function is still working. Please see below:

	Set	Actual
Temp.	30.5	30.5
Speed	1500	––––
Timer	07:00	07:00
Prog.		Pause

Resume:
In the pause state, push the adjustable knob, this will restart the unit. The display will show "Run" again.

Stop:
In the working state, a long push of the adjustable knob will stop the current instrument run. Mixing, temperature control and timer are stopped. Refer to next figure.

	Set	Actual
Temp.	30.5	
Speed	1500	
Timer	07:00	
Prog.		

Note:
If 10 min after pausing the system is not restarted the unit will automatically power off.

5.3 Running

5.3.1 „Single Step" Work Without Saving

When powered on, the screen shows the parameters of the last run, or factory settings.
Push the Temp, Speed, Time button respectively. The corresponding characters will flash.
Rotate the Adjustable knob to set the parameters. If time is set to 00:00, the system is set to continuous working mode.

After the setting is completed, push the adjustable knob to start the unit. Refer to next figure.

	Set	Actual
Temp.	30.5	
Speed	1500	
Timer	07:00	
Prog.		

	Set	Actual
Temp.	30.5	30.5
Speed	1500	800
Timer	07:00	06:59
Prog.		RUN

5.3.2 Multiple Step programming (without Saving)

a. The program set in the "single step" is the first step by default (see section 5.3.1).
   Refer to next figure.

	Set	**Actual**
Temp.	30.5	
Speed	1500	
Timer	07:00	
Prog.	1–1	

b. Push the Prog. Button and start to set the second step.
   The last line in the "Set column" shows 1-2 now. Refer to the figure below.

	Set	**Actual**
Temp.	–––.–	
Speed	–––––	
Timer	––:––	
Prog.	1–2	

Note:
Before the setting of the second step is completed, the system indicates that there is only one step. After the setting is completed the actual step number will be displayed correctly. Refer to the next figure.

	Set	**Actual**
Temp.	30.5	
Speed	1500	
Timer	07:00	
Prog.	2–2	

c. Repeat this step to set additional program steps.

	Set	**Actual**
Temp.	30.5	30.5
Speed	1500	800
Timer	07:00	06:59
Prog.	2–2	RUN

Note:
(1) After rotating the adjustable knob to set the parameters, please wait 3 seconds.
(2) Before the time has not been set, the step is not completed. If set to 00:00, the unit will be operated in continuous run mode.
(3) Before completing the setting of the current step, the next step cannot be set.

5.3.3 Program with Saving mode

Programming of a method which should be saved is identical as explained in the section before (programming without saving). After the programming is completed, push the adjustable knob for 3 sec, the program name characters start flashing (refer to the "red part" in the figure below). Rotate the Adjustable knob to set the program number, and then push the adjustable knob to complete the programming. The program is now saved.

	Set	**Actual**
Temp.	30.5	
Speed	1500	
Timer	07:00	
Prog.	P1 5–1	

5.3.4 Working mode

The "set column" (see below) shows the set parameters, whereas the "Actual column" indicates the actual temperature and speed. In timed working mode, the time shows the countdown time. In continuous working mode, the running time is displayed. Refer to the next figure.

	Set	**Actual**
Temp.	30.5	30.5
Speed	1500	1500
Timer	07:00	06:59
Prog.		RUN

In "Multiple Step Without Saving" mode, Prog. shows the program and step number. The figure below shows a program with a total of 5 steps, with the second step currently being active.

	Set	**Actual**
Temp.	30.5	30.5
Speed	1500	800
Timer	07:00	06:59
Prog.	5–2	RUN

In "Multiple Step with Saving" mode, it shows P1, 5-2, which means program 1 has 5 steps, currently running the second step. Refer to below figure.

	Set	**Actual**
Temp.	30.5	30.5
Speed	1500	800
Timer	07:00	06:59
Prog.	P1 5–2	RUN

5.3.5 Load Program

In the power on state, a long push of the Prog. Button, enters the load program mode. Rotate the adjustable knob to show the saved programs, from P1 to a maximum of 9 programs. Switch to the program you want, and short push the Prog. Button to check the program in detail. Then push the adjustable knob to start the program.

5.3.6 Single function running

If Temperature is set to ---.-, then the unit is operated without temperature control function.
If Timer is set to 00:00, it means "continuous mode".
If speed is set to -----, the mixing function is disabled.

6. Troubleshooting

- Instrument can't be turned ON
  - Check whether the power line is unplugged
  - Check whether the fuse is broken or loose
- Power error during self-test
  - Switch OFF the unit, then switch ON

If these problems persist please contact your local LLG-Labware supplier.

7. Maintenance and Cleaning

- Proper maintenance can prolong the instruments lifetime.
- Do not spray cleanser into the instrument when cleaning.
- Unplug the power line when cleaning.
- Only use recommended cleansers:

Dyes	Isopropyl alcohol
Construction materials	Water containing tenside / Isopropyl alcohol
Cosmetics	Water containing tenside / Isopropyl alcohol
Foodstuffs	Water containing tenside
Fuels	Water containing tenside

8. Associated Standards and Regulations

Construction in accordance with the following safety standards:
EN 61010-1 UL 3101-1 CAN/CSA C22.2(1010-1) EN 61010-2-10
Construction in accordance with the following EMC standards:
EN 61326-1
Associated EU guidelines:
EMC-guidelines: 89/336/EWG Instrument guidelines: 73/023/EWG

9. Specifications

	LLG-uni*THERMIX* 1 pro	**LLG-uni*THERMIX* 2 pro**
Functions	Heating & mixing	Heating & cooling & mixing
Temperature range	Room temp. + 5 °C~100 °C	25 °C below room temp. to approx. 100 °C
Temperature setting range [°C]	15 °C /100 °C	-5 °C /110 °C
Control accuracy [°C at 20-45 °C]	±0,5	±0,5
Uniformity [°C at 20-45 °C]	Max. ±0,5	Max ±0,5
Max heating rate [°C /s]	5.5	5.5
Max cooling rate [°C /s]	---	5 (100 °C - Roomtemp.) 0,5 (unter Below roomtemp.)
Speed range [rpm]	300-1500	300-1500
Mixing diameter [mm]	3	3
LCD-display	LCD	LCD
Program	6 stages, 9 programs	6 stages, 9 programs
Voltage	220-240 V	220-240 V
Frequency	50/60 Hz	50/60 Hz
Power	200 W	200 W

10. Accessories:

LLG-uni*THERMIX* 1 pro, EU plug	6.263 482
LLG-uni*THERMIX* 1 pro, UK plug	6.263 483
LLG-uni*THERMIX* 2 pro, EU plug	6.263 484
LLG-uni*THERMIX* 2 pro, UK plug	6.263 485
Heating block for LLG-uni*THERMIX* 1/2 pro, used for 0,2 ml/ 96-well-PCR plate	6.263 498
Heating block for LLG-uni*THERMIX* 1/2 pro, used for 0.5 mL tubes, 40 holes	6.263 486
Heating block for LLG-uni*THERMIX* 1/2 pro, used for 1.5 mL tubes, 40 holes	6.263 487
Heating block for LLG-uni*THERMIX* 1/2 pro, used for 2 mL tubes, 40 holes	6.263 494
Heating block for LLG-uni*THERMIX* 1/2 pro, used for 15 mL tubes, 28 holes	6.263 496
Heating block for LLG-uni*THERMIX* 1/2 pro, used for 50 mL tubes, 8 holes	6.263 497
Heating block for LLG-uni*THERMIX* 1/2 pro, used for 96/384 microplate	6.263 499
Heating block for LLG-uni*THERMIX* 1/2 pro, used for 5 mL tubes, 28 holes	6.263 495

11. Warranty

This product is warranted to be free from defects in material and workmanship for a period of three (3) years from date of purchase.
This warranty is valid only if the product is used for its intended purpose and within the guidelines specified in this instruction manual. This warranty does not cover damage caused by accident, neglect, misuse, improper service, natural forces or other causes not arising from defects in original material or workmanship. This warranty does not cover any incidental or consequential damages, commercial loss or any other damagesfrom the use of this product.

The warranty does not cover damage to paint or finish and defects or damages caused by physical and chemical abuse or normal wear and tear. The warranty is invalidated by any nonfactory modification, which will immediately terminate all liabilities on us for the products or damages caused by its use. The buyer and its customer shall be responsible for the product or use of products as well as any supervision required for safety. If requested the products must be returned to the distributor in well packed and insured manner and all shipping charges must be paid.

Information on the disposal of electrical and electronic devices in the European Community:

The disposal of electrical devices is regulated within the European Community by national regulations based on the European Directive 2012/19/EU on waste electrical and electronic equipment (WEEE). According to these regulations, any devices supplied after 13.06.2005 in the business to business sphere, to which this product is assigned, may no longer be disposed of in municipal or domestic waste. They are marked with the following symbol to indicate this. As disposal regulations within the EU may vary from country to country, please contact your supplier if necessary.

PRODUCT DISPOSAL

In case the product is to be disposed of, the relevant legal regulations are to be followed.

Notes

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